NOVOSENSE
纳芯微电子

NOVOSENSE
Product Selection Guide

- Signal Sensing
- System Interconnection
- Power and Driver

www.novosns.com

About NOVOSENSE

NOVOSENSE Microelectronics (NOVOSENSE, SSE Code 688052) is a highly robust & reliable analog and mixed signal IC design company. Since its establishment in 2013, the company has been focusing on signal sensing, system interconnection and power drive, providing comprehensive semiconductor products and solutions such as sensor, signal chain, isolator, interface, power driver, power management, which are widely used in automotive, industrial, information communication and consumer electronics markets.

With the mission of "Sense and Drive the Future, Build a Green, Smart and Connected World with Semiconductors", the company is committed to providing chip-level solutions to link the digital world and the real world.

For more information and sample application, please visit: www.novosns.com

"Sense and Drive the Future, Build a Green, Smart and Connected World with Semiconductors”

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Power & Driver

Temperature Sensor

Part number	Product description	Package	Temperature range	Supply voltage	Working current	Port type	Max. resolution	Max. precision	Typical application
NST1001	High-precision dual-pin digital pulse output temperature sensor	TO-92S/ DFN-2	-50°C~150°C	1.65V~5.5V	30μA	Pulse count output	0.0625°C	±0.5°C	NTC replacement, quick response probe, 2-wire temperature probe, gas meter temperature compensation, wearable and IoT temperature measurement
NST1001HA	High-precision dual-pin digital pulse output temperature sensor with maximum accuracy of ±0.2℃	DFN-2	-50°C~150°C	1.65V~5.5V	30μA	Pulse count output	0.0625°C	±0.1°C	NTC replacement, quick response probe, 2-wire temperature probe, gas meter temperature compensation, wearable and IoT temperature measurement
NS18B20	High-precision single-BUS digital temperature sensor	TO-92S	-55°C ~125°C	2.7V~5.5V	26μA	One wire protocol	0.0625°C	±0.5°C	NTC replacement, quick response probe, 2-wire temperature probe, gas meter temperature compensation, wearable and IoT temperature measurement

Part number	Product description	Package	Temperature range	Supply voltage	Working current	Port type	Max. resolution	Max. precision	Typical application
NST175	Digital temperature sensor with I²C/SMBUS interface in industrial-qualified package	MSOP-8/ SOIC-8	-55°C ~125°C	1.62V~5.5V	30μA	I²C/SMBUS	0.0625°C	±0.5°C	LM75/TMP75 replacement, server temperature measurement, battery temperature measurement, SSD temperature measurement, board-level temperature measurement
NST118	Small-size high-precision digital temperature sensor with I²C/SMBUS port	DFN-6	-40°C~125°C	1.71V~3.6V	6.5μA	I²C/SMBUS	0.0625°C	±0.1°C	x117 substitution, wearable temperature monitoring, medical thermometer, battery temperature measurement, industrial IoT, environmental monitoring, etc.
NST117	Small-size high-precision digital temperature sensor with I²C port	DFN-6	-55°C~125°C	1.62V~5.5V	30μA	I²C/SMBUS	0.0625°C	±0.2°C	x117 series substitution, wearable temperature monitoring, medical thermometer, battery temperature measurement, industrial Internet of Things, environmental monitoring, etc.
NST112 -DSTR	SOT563 is a high-accuracy and low-power digital temperature sensor with a I²C/SMBUS port	SOT563	-40°C~125°C	1.71V~3.6V	6.5μA	I²C/SMBUS	0.0625°C	±0.5°C	1X2 series substitution, board level temperature measurement, server temperature measurement, battery temperature measurement, SSD temperature measurement, IoT temperature monitoring, etc.
NST112x	WLCSP is a high-accuracy and low-power digital temperature sensor with a I²C/SMBUS port	DSBGA-4	-40°C~125°C	1.5V~3.6V	6.5μA	I²C/SMBUS	0.0625°C	±0.1°C	1X2 series substitution, wearable temperature monitoring, board level temperature measurement, server temperature measurement, battery temperature measurement, SSD temperature measurement, IoT temperature monitoring, etc.
NST103	WLCSP is a low-power digital temperature sensor with a I²C/SMBUS port	DSBGA-4	-40°C~125°C	1.5V~3.6V	6.5μA	I²C/SMBUS	1°C	±1°C	X103 series substitution, mobile phone, laptop, SOLID-state disk, server, telecommunication, set-top box, sensor, low power environment
NST461	High-precision and high-resolution I²C/SMBUS remote and local temperature sensors (1L+1R)	WQFN-10	-40°C~125°C	2.1V~3.6V	37μA	I²C/SMBUS	0.0625°C	±0.5°C	X461/451 substitution, X4x1 compatibility, laptop, desktop, solid-state drive, server, telecommunication, Industrial Internet of Things, etc.
NST1412	High-precision I²C/SMBUS remote and local temperature sensors (1L+1R)	MSOP-10	-40°C~125°C	3V~3.6V	37μA	I²C/SMBUS	0.125°C	±0.5°C	EMC1412 substitution, laptop, desktop, solid-state drive, server, telecommunication, Industrial Internet of Things, etc.
NST1413	High-precision I²C/SMBUS remote and local temperature sensors (1L+2R)	MSOP-10	-40°C~125°C	3V~3.6V	37μA	I²C/SMBUS	0.125°C	±0.5°C	EMC1413 substitution, laptop, desktop, solid-state drive, server, telecommunication, Industrial Internet of Things, etc.
NST20	High-precision, low-power analog output temperature sensor (negative temperature coefficient)	SC70-5	-55°C~130°C	2.4V~5.5V	20μA	Analog output	-11.77mV/°C	±0.5°C	X20 series substitution, laptop temperature monitoring, smart phone temperature measurement, temperature monitoring of portable medical devices, industrial Internet of Things and power system, power module temperature measurement, environmental monitoring &HVAC, etc.
NST86	High-precision, low-power analog output temperature sensor (negative temperature coefficient)	SC70-5	-50°C~150°C	2.4V~5.5V	20μA	Analog output	-10.9mV/°C	±0.5°C	X86 series substitution, laptop temperature monitoring, smart phone temperature measurement, temperature monitoring of portable medical devices, industrial Internet of Things and power system, power module temperature measurement, environmental monitoring &HVAC, etc.
NST235	High-precision, low-power analog output temperature sensor (positive temperature coefficient)	SC70-5 SOT23-3	-40°C~150°C	2.3V~5.5V	20μA	Analog output	10mV/°C	±0.5°C	X235 series substitution, laptop temperature monitoring, smart phone temperature measurement, temperature monitoring of portable medical devices, industrial Internet of Things and power system, power module temperature measurement, environmental monitoring &HVAC, etc.
NST60	High-precision, low-power analog output temperature sensor (positive temperature coefficient)	SOT23-3	-40°C~125°C	2.4V~5.5V	20μA	Analog output	6.25mV/°C	±0.5°C	X60 series substitution, laptop temperature monitoring, smart phone temperature measurement, temperature monitoring of portable medical devices, industrial Internet of Things and power system, power module temperature measurement, environmental monitoring &HVAC, etc.

NST1001: D-NTC® Digital Pulse Output Temperature Sensor

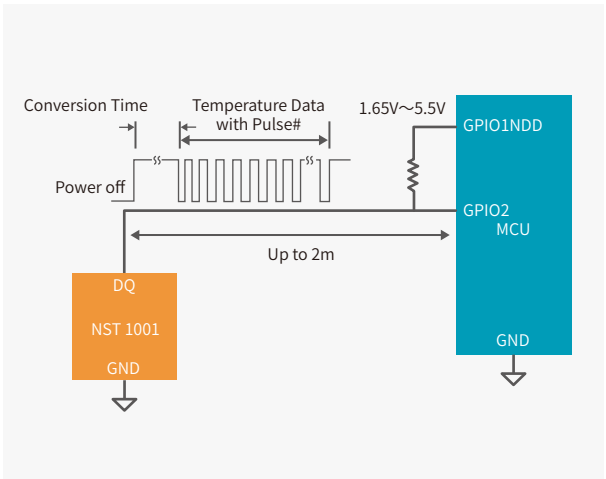
Product introduction

NST1001 is a high-precision double-pin digital output temperature sensor. NST1001 features pulse counting digital output and high precision in a wide temperature range, which can be directly connected with MCU, while ensuring measurement accuracy and reducing overhead. The NST1001 device supports a maximum accuracy of ±0.75 °C over temperatures ranging from -50 °C to 150 °C, while providing extremely high resolution (0.0625 °C) without system calibration or hardware/software compensation. The pulse-counting digital port is designed for direct connection to GPIO or comparator inputs to simplify component implementation. Simple two-pin architecture is adopted. So the NST1001 device can be easily converted into a two-wire temperature probe.

Product feature

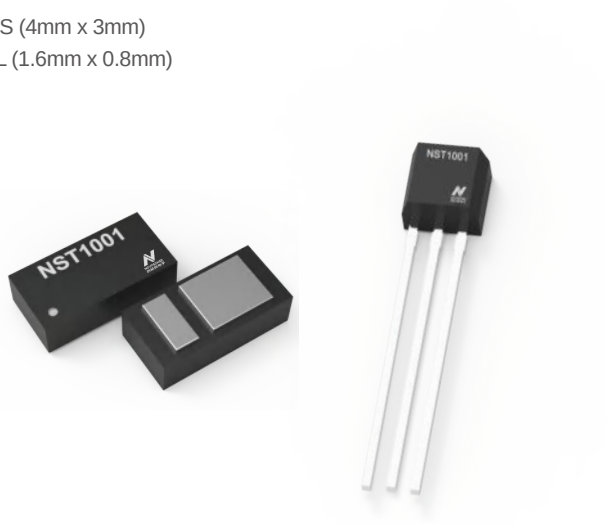
- Operating temperature range: -50°C~150°C
- High accuracy in full temperature range
  25°C~45°C: ±0.2°C (typical) @ NST1001
  25°C~45°C:±0.2°C(max.) @ NST1001HA
  Accuracy within range -20 °C~85°C: ±0.5°C (max.)
  Accuracy within range -50°C~-20°C: ±0.75°C (max.)
  Accuracy within range 85°C~150°C: ±0.75°C (max.)
- High resolution: 0.0625°C（1 LSB）
- Quick temperature response: silicone oil τ63%0.21S（DFN2L）
- Single temperature conversion time: 50mS
- Ultra-low power consumption: 30μA operating current, zero standby power consumption
- Supply voltage range: 1.65V to 5.5V
- Pulse count type digital output to reduce the AD conversion port on master side
- Support dual pin simplified temperature measurement solution
- DFN2L ultra small packaging, with same resistance size as 0603

Functional block diagram



Package

- TO-92S (4mm x 3mm)
- DFN2L (1.6mm x 0.8mm)



Application

Power metering

Gas meter temperature measurement

Smart closestool

Digital temperature probes

Smart Wearable devices,

Industrial Internet of things

Battery temperature detection

NS18B20: High-precision Single-BUS Digital Temperature Sensor

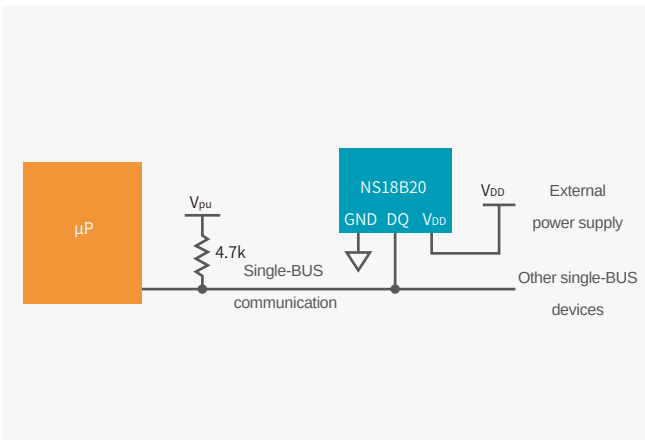
Product introduction

NS18B20 is a high-precision one wire temperature measurement chip with temperature sensor ranging from -55°C to +125°C. According to user needs, digital conversion accuracy and temperature measurement speed can be set by configuring registers. The chip has built-in 5-byte non-volatile storage unit for users, 3 bytes for high and low temperature alarm and accuracy configuration, and another 2 bytes for storing user-defined information. The maximum error is ±0.5°C in the range from 10°C to +85°C, and ±1°C in the whole temperature range. NS18B20 has two working modes, namely, parasitic power supply and external power supply. The parasitic power supply can be powered by data line without external power supply. Each NS18B20 has a unique 64-bit serial number that allows multiple devices to be connected to the same BUS using an one wire port. Therefore, with this feature, a single processor can be used to control multiple NS18B20 sensors. NS18B20 is widely used in distributed temperature environment monitoring and temperature control system.

Product feature

- Single-BUS communication, saving wiring resources
- Each device has a unique serial number ID
- Wide temperature range 55°C to 125°C
- Maintain high accuracy in full temperature range
  -10°C~85°C: +0.5°C
  -55°C~-10°C: ±1°C
  85°C~125°C: ±1°C
- Conversion time is short, only 40ms
- No additional strong pull up is required for temperature conversion
- Temperature measurement range exceeding 100°C and can be powered via digital interface
- Simple application, no additional components required
- Operating voltage range 2.7V~5.5V
- >±8KV(HBM) strong ESD protection
- Programmable 9-12 digit output
- Users can configure alarm threshold by themselves TO-92S package, with small size

Functional block diagram



Package

- TO-92S (4.5mm x 3.5mm)

Application

Distributed temperature measurement

Process monitoring and control system

Industrial Internet of Things

White household appliances

Temperature monitoring

NST175: Digital Temperature Sensor with I²C Port in Industrial-qualified Package

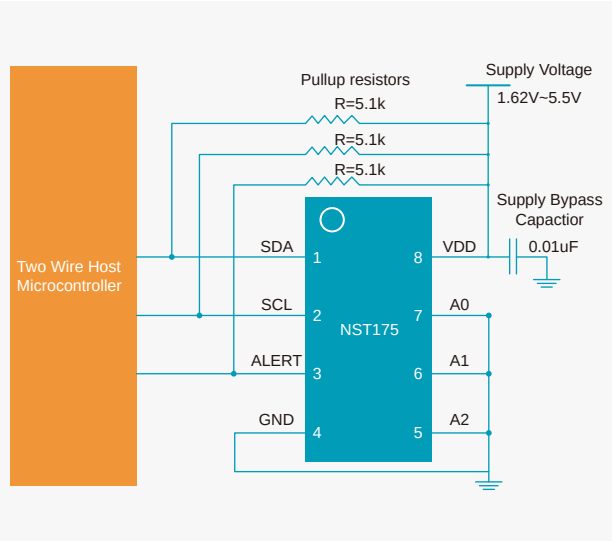
Product introduction

The NST175 is a low-power, high-precision digital temperature sensor ideal as an alternative to negative temperature coefficient (NTC) and positive temperature coefficient (PTC) thermistors. The device provides typical accuracy of ±0.5 °C without calibration or signal adjustment from external components. NST175 temperature sensor is a highly linear product, which can sense the temperature without complex calculation or lookup. The on-chip 12-bit analog-to-digital converter (ADC) provides resolution as low as 0.0625 °C. The NST175 is compatible with SMBUS and I²C, allowing a maximum of 27 devices to be connected to one BUS and supporting the SMBUS alarm function. The NST175 has a rated operating range of -55 °C to 125 °C and is ideal for extended temperature measurement in a wide range of communications, computing, consumer products, Internet of Things, environmental, industrial and instrumentation applications. NST175 comes in industry-qualified MSOP8 and SOP8 packages.

Product feature

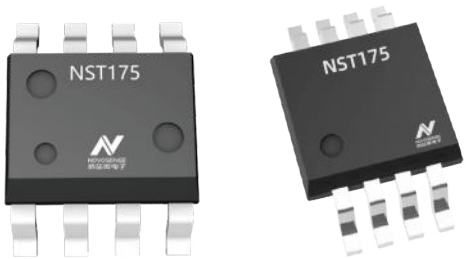
- Maintain high accuracy in full temperature range:
  - -20°C~ 85°C: ±0.5°C (typical)
  - -55°C~-20°C: ±2°C (max.)
  - 85°C~125°C: ±2°C (max.)
- Maximum resolution 0.0625°C, optional
- Up to 27 device addresses supported
- Wide supply voltage range: 1.62V to 5.5V
- Working current: 30μA (typical)
- Static current: 0.1μA (typical)
- Digital port: Compatible with SMBUS, I²C

Functional block diagram



Package

- MSOP8 (3.0mm x 3mm)
- SOP8 (4.9mm x 3.91mm)



Application

- System temperature monitoring
- Computer peripherals overheating protection
- Laptop
- IoT application
- Communication device
- Power supply temperature monitoring
- Thermostat control
- Environmental monitoring, heating ventilation air conditioning (HVAC)

NST118: Small Ultra-high-precision Digital Temperature Sensor with I²C Port

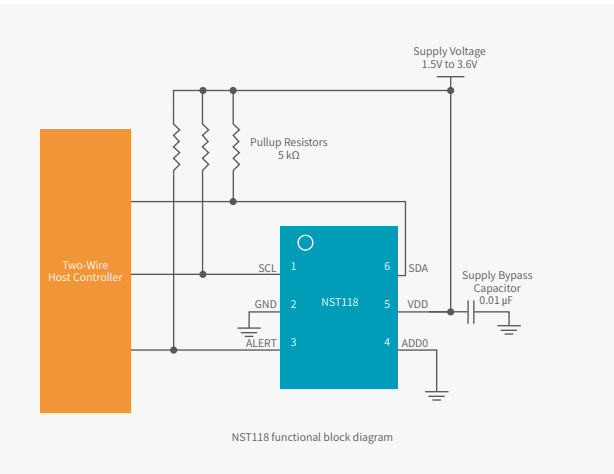
Product introduction

NST118 is a low power-consumption ultra-high-precision digital temperature sensor. It is an ideal substitute for negative temperature coefficient (NTC) and positive temperature coefficient (PTC) thermistors. The NST118 has I²C and SMBUS compatible ports, supports up to four device addresses, and has programmable alarm and SMBUS reset capabilities. It achieves accuracy up to ±0.2 °C (Max) in the range of 25 °C to 45 °C without calibration. The NST118 has low power consumption, which minimizes the impact of spontaneous heat on measurement accuracy. The NST118 temperature sensor is highly linear and does not require recombination calculations or lookup to derive the temperature. The 12-bit on-chip analog-to-digital conversion provides resolution up to 0.0625°C . The NST118 temperature sensor operates from -40°C to 125°C and is suitable for consumer products, industrial equipment, Internet of Things and automotive markets. The NST118's DNF(2mm x 2mm) package is also compatible with the NST117.

Product feature

- High accuracy in -40°C ~125°C wide temperature range
- Ultra precision at 25°C ~45°C ±0.2°C (maximum)
- I²C/ SMBUS compatible port
- Resolution rate: 12 bits, resolution: 0.0625°C
- User programmable over-temperature alarm threshold
- Low static current:
  Static current 2.9μA@1Hz in operating mode (typical)
  Static current 0.5μA in shutdown mode (typical)
- Input voltage range: 1.71 V to 3.6 V
- Digital output

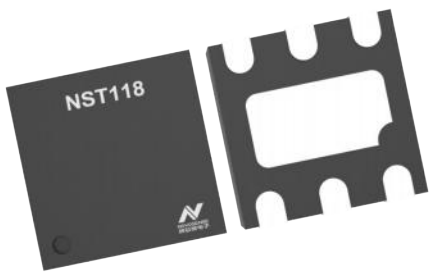
Functional block diagram



NST118 functional block diagram

Package

- DFN6(2mmx2mm)



Application

Wearable devices (TWS, watches, bracelets, etc.)

Laptop

Industrial Internet of Things（IoT）

Communication infrastructure

Power system monitor

Environmental monitoring and HVAC

NST117: Small-size High-precision Digital Temperature Sensor with I²C Port

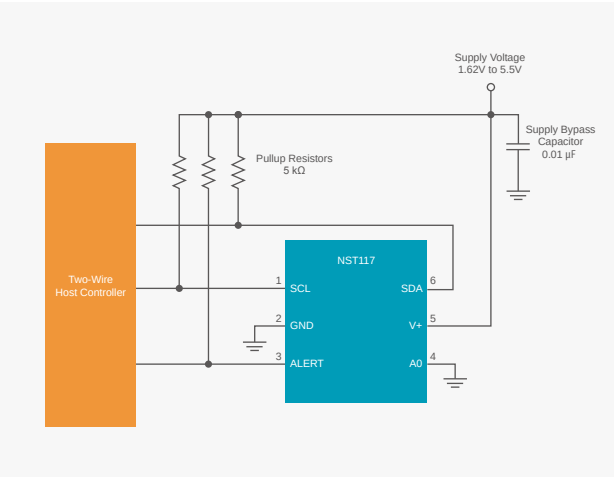
Product introduction

The NST117 is a low-power, high-precision digital temperature sensor ideal as an alternative to negative temperature coefficient (NTC) and positive temperature coefficient (PTC) thermistors. The device provides typical accuracy of ±0.2 without calibration or signal adjustment from external components. NST117 temperature sensor is a highly linear product, which can sense the temperature without complex calculation or lookup. The on-chip 12-bit analog-to-digital converter (ADC) provides resolution as low as 0.0625 °C. The NST117 is compatible with SMBUS and I²C, allowing a maximum of 3 devices to be connected to one BUS and supporting the SMBUS alarm function. The NST117 has a rated operating range of -55 °C to 125 °C and is ideal for extended temperature measurement in a wide range of communications, computing, consumer products, Internet of Things, environmental, industrial and instrumentation applications. NST117 comes in industry-standard DFN-6 packages.

Product feature

- Maintain high accuracy in full temperature range:
  30°C~ 45°C: ±0.2°C (typical)
  -20°C~ 85°C: ±0.5°C (typical)
  -55°C~125°C:±2°C (max.)
- Maximum resolution 0.0625°C, optional
- Up to 3 device addresses supported
- Wide supply voltage range: 1.62V to 5.5V
- Working current: 30μA (typical)
- Static current: 0.1μA (typical)
- Digital port: compatible with SMBUS, I²C

Functional block diagram



Package

- DFN6 (2mm*2mm)

Application

Smart wearable

Medical thermometer

Industrial automation

Power temperature measurement

Server

Communication device

Hard disk

Laptop

Electronic temperature control

NST112: High-precision Low-power I²C Port Digital Temperature Sensor with Ultra-small SOT563 and DSBGA Package

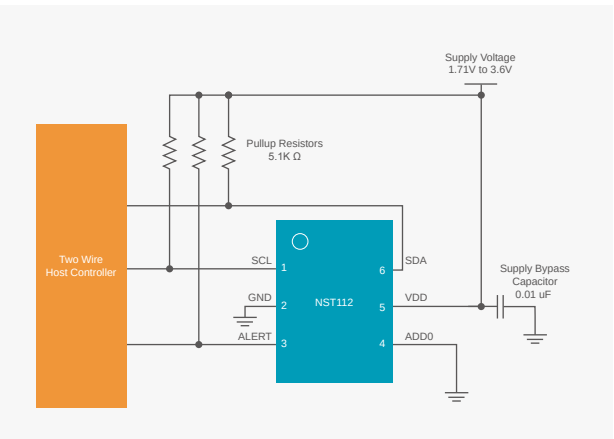
Product introduction

NST112 is a low power-consumption high-precision digital temperature sensor. It is suitable for substitution of negative temperature coefficient and positive temperature coefficient thermistor. The NST112 has an port compatible with I²C and SMBUS, programmable alarm and SMBUS reset functions, and supports up to four devices on a single BUS. In addition, it achieves accuracy up to ±0.5 °C in the range of -20 °C to 85 °C without calibration. The NST112 temperature sensor is highly linear and does not require recombination calculations or lookup to derive the temperature. The NST112 features 12bit analog-to-digital conversion and provides up to 0.0625°C resolution. The NST112 temperature sensor can operate normally in the temperature range of -40 °C to 125 °C, which makes it suitable for operation in communications, computers, consumer products, environmental, industrial and instrumentation. The NST112 is an extremely low-power sensor that can be used for temperature measurement applications in the Internet of Things. The NST112 is available in both SOT563 and DSBGA(4) packages, with the DSBGA(4) achieving output accuracy up to ±0.1 °C at temperature range.

Product feature

- Operating temperature range: -40°C~150°C
- High accuracy in -40℃~125℃ wide temperature range:
  25 °C ~ 45 °C: 0.1°C (typ.)@DSBGA
  -20 °C ~ 60°C: 0.5°C (max.)@DSBGA
  -20°C~85°C: ±0.5°C（typ.）
  -40°C~-20°C: ±1°C（max.）
  -85°C~125°C: ±1°C（max.）
- I²C/ SMBUS compatible port
- Resolution rate: 12 bits, resolution: 0.0625°C@SOT563
- Resolution rate:14 bits, resolution: 0.015625 @DSBGA
- Over-temperature alarm value presetting
- Ultra-low static power consumption
  2.9μA@1Hz
  6.5μA@4Hz
- Supply voltage range: 1.71 V to 3.6 V with SOT563 package, 1.5V to 3.6V with DSBGA package
- Digital output

Functional block diagram



Package

- SOT563(6) (1.6mm x 1.2mm)
- DSBGA(4) (0.75mm x 0.75mm)

Application

- Portable and battery-powered applications
- Power system monitor
- Communication infrastructure
- General system thermal management
- Industrial Internet of Things
- Computer peripheral thermal protection
- Laptop
- Storage devices such as solid state disks (SSDs)
- Smart wearable devices

NST103: Digital Temperature Sensor with I²C Port in Wafer-level Package

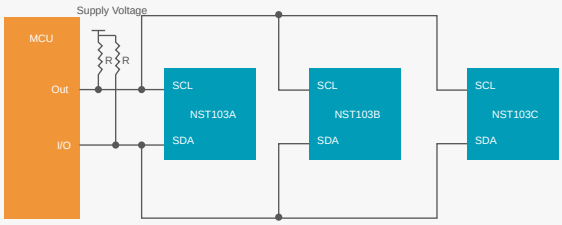
Product introduction

The NST103 is a digital output temperature sensor in a 4-pins wafer chip scale package (WCSP). The resolution of NST103 reading temperature can reach 1°C. The NST103 has a two-wire port compatible with both I²C and SMBUS ports. In addition, the port supports multiple device access (MDA) commands, allowing the master to simultaneously communicate with multiple devices on the BUS without having to send commands individually to each NST103 on the BUS. It can connect up to 8 NST103s in parallel and be easily read by the host. The NST103 is particularly ideal for space-constrained, power-sensitive applications that have multiple temperature measurement areas that must be monitored. The specified operating temperature range of NST103 is -40°C to 125°C.

Product feature

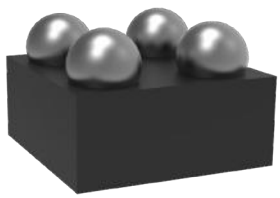
- Multiple device access (MDA)
- Global read/write operations
- I²C/ SMBUS compatible
- Resolution: 8 bits
- Precision: The typical value is ±1°C(-10°C to 100°C)
  Maximum error in the whole temperature range: ±3°C
- Low static current: In operating mode, the current is 3 μA@0.25Hz
  The static current in shutdown mode is 1.0μA
- Input voltage range: 1.5V to 3.6V
- Digital output

Functional block diagram



Package

- WLCSP (DSBGA) (0.75mm x 0.75mm)



Application

Cellphone

Solid-state drive

Laptop

Server

NST461: Small-size High-precision I²C Interface Remote and Local Digital Temperature Sensor

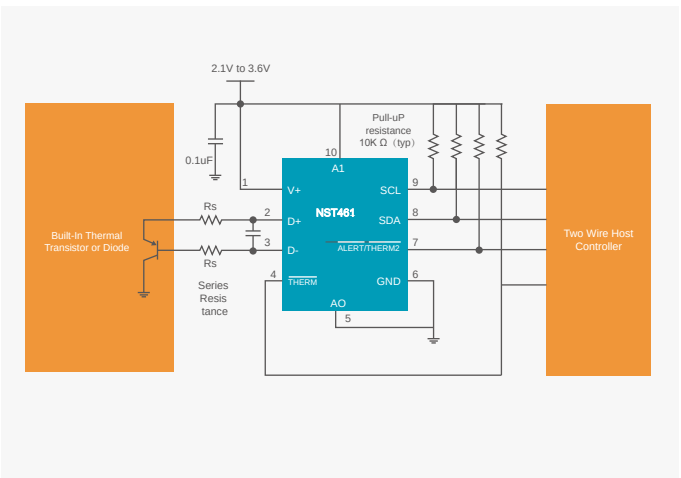
Product introduction

NST461 is a remote temperature sensor monitor with built-in local temperature sensor. The transistors connected to its remote temperature sensors are usually low-cost NPN or PNP type transistors or substrate thermal transistors and diodes, which are essential components of microcontrollers, microprocessors or FPGAs. On-chip 12-bit analog-to-digital conversion provides resolution up to 0.0625°C for local and remote temperature sensors. The NST461 is compatible with I²C and SMBu interfaces, supports programmable pin addresses for up to nine devices, and has programmable alarm and SMBUS reset capabilities. NST461 includes series resistance cancellation, programmable non-ideal factor (η factor), programmable offset, programmable temperature limit, programmable digital filter, diode fault detection and temperature alarm, improving output accuracy and noise performance, and providing a reliable solution for thermal monitoring. With an operating voltage range of 2.1V to 3.6V and a temperature range of -40 °C to 125 °C, the NST461 is ideal for multi-position, high-precision temperature measurements in a wide range of applications, including communications, computing, instrumentation and industry.

Product feature

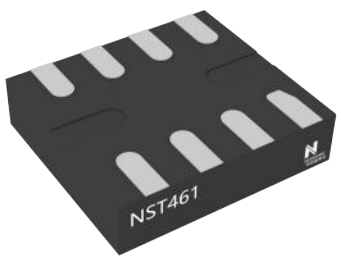
- Remote temperature detector: ±1°C max. accuracy
- Local temperature monitor: ±1°C max. accuracy
- Resolution rate: 12 bits, resolution: 0.0625°C
- Power supply and logic voltage range: 2.1 V to 3.6 V
- 37-μA working current（1 SPS）
- 4-μA shutoff current
- Series resistance error elimination
- η- factor and offset correction
- Programmable digital filter
- Diode fault detection
- SMBUS and I²C serial interface
- Compatible with programmable pin addresses

Functional block diagram



Package

- WQFN(10) (2.0mm x 2.0mm)



Application

Processor and FPGAtemperature monitoring

Communication device

Servers and personal computers

Test and measurement equipment

LED lighting and projector thermal control

Industrial control unit

Storage device

NST1412/NST1413: High-precision Remote and Local Temperature Sensors with Digital Interface in Industrial-qualified Package

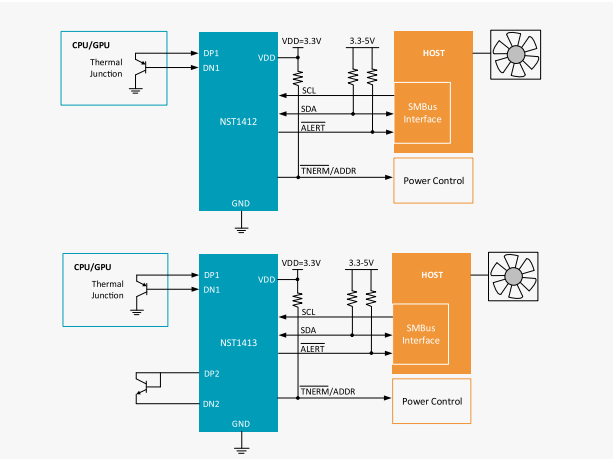
Product introduction

NST1412 and NST413 are remote temperature sensor monitors with built-in local temperature sensors. The transistors connected to its remote temperature sensors are usually low-cost NPN or PNP type transistors and diodes, which are essential components of microcontrollers, microprocessors or FPGAs. For local and remote temperature sensors, 11-bit on-chip analog-to-digital conversion provides resolution up to 0.125 °C. The NST141x two-wire serial interface is compatible with I²C and SMBUS™ interfaces and can use up to nine different pin programmable addresses. In addition, NST141x integrates additional features such as series resistance cancellation, programmable non-ideal factor (η factor), programmable offset, programmable temperature limits, programmable digital filters, diode fault detection and temperature alarm to improve accuracy and noise resistance, achieving a reliable thermal monitoring solution. With an operating voltage range of 3V to 3.6V and a temperature range of -40 °C to 125 °C, the NST141x is ideal for multi-position, high-precision temperature measurements in a wide range of applications, including communications, computing, instrumentation and industry. The NST1412 supports single channel local and single channel remote temperature monitoring, and the NST1413 supports single channel local and dual-channels remote temperature monitoring.

Product feature

- Remote temperature detector:
  ±1°C max precision（-20°C<T_{Diode}<85°C）
  Resolution rate: 11 bits, resolution: 0.125°C
  -Support diode filter capacitors up to 1nF
- Local temperature monitor:
  ±1°Cprecision （-20°C<T_{Diode}<85°C）
  Resolution rate: 11 bits, resolution: 0.125°C
- Automatic remote diode type identification and optimization setting
- Series resistance cancellation
- Programmable temperature threshold alarm
- I²C/SMBUS digital output

Functional block diagram



Package

- NST412 - MSOP(8) (3.0mm x 3.0mm)
- NST413 - MSOP(10) (3.0mm x 3.0mm)

Application

- Processor and FPGA temperature monitoring
- Communication device
- Servers and personal computers
- Test and measurement equipment
- LED lighting and projector thermal control
- Industrial control unit
- Storage device

NST20/NST60/NST235/NST86: High-precision and Low-power Analog Output Temperature Sensor

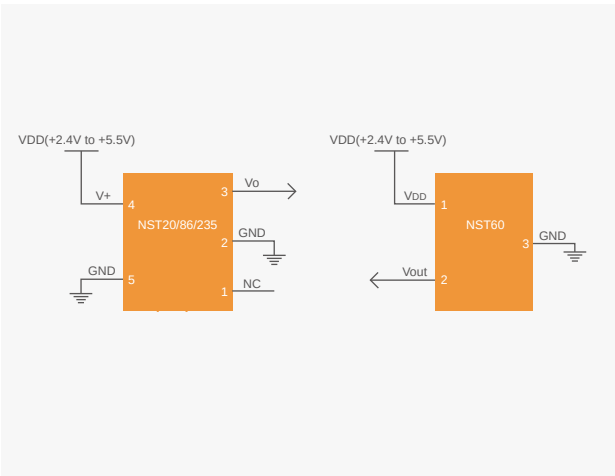
Product introduction

NST20/60/235/86 is a series of precision CMOS integrated circuit linear analog output temperature sensor. Input voltages range is from 2.4V to 5.5V. The maximum temperature error in the whole temperature range is within ±2.5°C. 20μA typical static current and 0.1μA typical shutdown static current can greatly reduce the power loss of battery-powered equipment. Class-AB output drivers provide a powerful maximum output of 500μA, which can drive capacitive loads up to 1000pF, and can be directly connected to the ADC sample-hold input end. With excellent accuracy and a powerful linear output driver, the NST20/60/235/86 analog output temperature sensor is an extremely cost-effective alternative to passive thermistors.

Product feature

- Operating temperature range:
  NST20: -55°C~ 130°C
  NST60: -40°C ~125°C
  NST235: -40°C~150°C
  NST86: -55°C~ 150°C
- High accuracy: ±1.5°C (typical)
- Wide input voltage range: 2.4V~5.5V
- Output drive capacity: 500μA
- Output short circuit protection
- Analog output parameter:
  NST20: -11.77mV/°C negative slope output
  NST60: 6.25mV/°C positive slope output
  NST235: 10 mV/°C positive slope output
  NST86: -10.9mV/°C negative slope output
- Low static current:
  Operating mode current 20μA (typical)

Functional block diagram



Package

- SOT23(3) (2.9mmx1.3mm)
- SC70(5) (2.0mmx1.25mm)

Application

- Smart phones, computers, fax machines, printers, etc.
- Automotive infotainment system
- Portable medical device
- Industrial automation and control
- Wireless and telecommunications infrastructure
- Electronic testing equipment
- Environmental monitoring and HVAC
- Grid infrastructure

MEMS Pressure Sensor

MEMS Pressure Sensor

Part number	Product description	Package	Temperature range	Supply voltage	Operation current	Pressure range	Output type	Accuracy	Typical application
NSPGM1	Automotive integrated gauge pressure sensor module (range can be customized)	Ceramic substrate PCBA	-40°C~90°C	3.0V~5.5V	2.9mA	0~±6kPa	Absolute / Ratio-metric	±2.5% F.S.	FTPS fuel steam pressure, KPS crankcase ventilation pressure detection, vacuum boosting system, industrial control
NSPGM2	Automotive integrated gauge pressure sensor module (range can be customized)	Ceramic substrate PCBA	-40°C~130°C	3.0V~5.5V	2.9mA	0~±5kPa /±100kPa	Absolute / Ratio-metric	±2.5% F.S.	Automotive GPF differential pressure detection, FTPS fuel vapor pressure, KPS crankcase ventilation pressure detection, vacuum boosting system, industrial control
NSPAS3M	Automotive-qualified integrated absolute pressure sensor (range can be customized)	SOP-8 (7.0mmx 7.0mm)	-40°C~125°C	4.5V~5.5V	2.9mA	10kPa~ 400kPa	Absolute / Ratio-metric	±0.5% F.S.	Motorcycle intake manifold pressure sensor, ECU atmospheric monitoring, seat pressure detection, EV/HEV vacuum boosting system, canister desorption pressure detection, gas/refrigerant leak detection, industrial vacuum degree detection
NSPAS3	Automotive integrated gauge pressure sensor module (range can be customized)	SOP-8 (7.0mmx-7.0mm)	-40°C~130°C	4.5V~5.5V	2.9mA	10kPa ~400kPa	Absolute / Ratio-metric	±0.5% F.S.	Motorcycle/automobile TMAP sensor, EV/HEV vacuum boosting system, canister desorption pressure detection, ECU atmospheric monitoring, battery pack pressure detection, seat pressure detection, industrial vacuum degree detection
NSPAS1	Automotive integrated gauge pressure sensor module (range can be customized)	SOP-8 (7.3mmx-7.3mm)	-40°C~125°C	4.5V~5.5V	3.1mA	10kPa ~400kPa	Absolute / Ratio-metric	±0.5% F.S.	Motorcycle/automobile TMAP sensor, EV/HEV vacuum system, canister desorption pressure detection, ECU atmospheric monitoring, battery pack pressure, seat pressure detection, industrial vacuum degree detection
NSPGS2	Gauge pressure sensor integrated with air nozzle in SOP-6 package (range can be customized)	Single air nozzle SOP-6 (7.0mmx-7.0mm)	-40°C~70°C	3V~5.5V	2.5mA	-100kPa ~350kPa	Analog/I²C	±1% F.S.	Coffee machine, health pot, vacuum cleaner, vacuum juicer and other small household appliances, air cushion bed, massage chair, smart sphygmomanometer and other health care applications, industrial control, and IoT pressure detection
NSPGD1	Gauge pressure sensor integrated with air nozzle in DIP-8 package (range can be customized)	Single air nozzle DIP-8 (10.4mmx-10.4mm)	0°C~70°C	3V~5.5V	3mA	-10kPa~ 10kPa	Analog /I²C/ Frequency	±1% F.S.	Washing machine, dishwasher, water purifier and other household appliances, pressure switch, negative pressure vacuum detection, gas pressure detection ventilator, oxygen generator, anesthesia instrument, biological safety cabinet
NSPGD2	Gauge pressure sensor integrated with air nozzle in DIP-6 package (range can be customized)	Single air nozzle DIP-6 (8.5mmx-8.5mm)	-20°C~85°C	3V~5.5V	3mA	-100kPa ~350kPa	Analog/I²C	±1% F.S.	Coffee machine, health pot, vacuum cleaner, vacuum juicer and other small household appliances, air cushion bed, massage chair and other health care applications, smart sphygmoma-nometer, oxygen machine, industrial control, IoT pressure detection
NSPDS5/7	Differential pressure sensor with dual air nozzle in SOIC-16 package (range can be customized)	Dual air nozzle SOIC-16 (10.3mmx-7.5mm)	-20°C~70°C	3V~5.5V	2.4mA	±125Pa ~±350kPa	Analog/I²C	±1% F.S.	Fire fighting residual pressure monitoring, ventilator, oxygen generator, anesthesia instrument, HVAC/VAV, biological safety cabinet, environmental monitoring, industrial micro differential pressure detection, etc.
NSPDS9	Ultra-low range differential pressure sensor with dual air nozzle in SOIC-16 package (range can be customized)	Dual air nozzle SOIC-16 (10.3mmx-7.5mm)	-20°C~70°C	3V~5.5V	2.4mA	±125Pa ~±1kPa	Analog/I²C	±1% F.S.	Fire fighting residual pressure monitoring, ventilator, oxygen generator, anesthesia instrument, HVAC/VAV, biological safety cabinet and other micro differential pressure detection
NSPGS5	Differential gauge pressure sensor with single air nozzle in SOIC-16 package (range can be customized)	Single air nozzle SOIC-16 (10.3mmx-7.5mm)	-20°C~70°C	3V~5.5V	2.4mA	-10kPa~ 10kPa	Analog/I²C	±1% F.S.	Ventilator, oxygen generator, anesthesia instrument, biosafety cabinet, etc.

Part number	Product description	Package	Temperature range	Supply voltage	Bridge arm resistance	Pressure range	Output type	Accuracy	Typical application
NSP1830	High-performance and high-reliability MEMS differential pressure sensor (range can be customized)	MEMS wafer (1.8x1.8x0.4 mm)	-40°C~125°C	5V	6.3kΩ	0kPa~±100kPa/500Kpa	analog voltage output (mV)	±0.05% F.S.	White household appliances, medical electronics, automotive electronics, industrial control
NSP1831B	High-performance and high-reliability MEMS micro differential pressure sensor (range can be customized)	MEMS wafer (2x2x0.4mm)	-40°C~125°C	5V	5.3kΩ	0kPa~±6kPa	analog voltage output (mV)	±0.2% F.S.	White household appliances, medical electronics, automotive electronics, industrial control
NSP1831A	High-performance and high-reliability MEMS micro differential pressure sensor (range can be customized)	MEMS wafer (2x2x0.4mm)	-40°C~125°C	5V	5.3kΩ	0kPa~±10kPa	analog voltage output (mV)	±0.2% F.S.	White household appliances, medical electronics, automotive electronics, industrial control
NSP1832	High-performance and high-reliability automotive-qualified MEMS differential pressure sensor with PT pad (range can be customized)	MEMS wafer (1.65x1.65x0.4mm)	-40°C~150°C	5V	5.3kΩ	0kPa~±5kPa /±100kPa	analog voltage output (mV)	±0.2% F.S.	EVAP/FTPS fuel steam, GPF/DPF vehicle exhaust detection
NSP1833	High-performance and high-reliability MEMS micro differential pressure sensor (range can be customized)	MEMS wafer (2.5x2.5x0.4 mm)	-40°C~85°C	5V	5.3kΩ	0kPa~±1kPa	analog voltage output (mV)	±0.2% F.S.	White household appliances, medical electronics, industrial control
NSP1630	High-performance and high-reliability absolute pressure sensor (range can be customized)	MEMS wafer (1x1x0.4mm)	-40°C~125°C	5V	5.3kΩ	0kPa~200kPa	analog voltage output (mV)	±0.1% F.S.	TMAP intake manifold pressure detection, BPS battery pack pressure detection
NSP1631	High-performance and high-reliability large-range absolute pressure sensor (range can be customized)	MEMS wafer (1x1x0.4mm)	-40°C~125°C	5V	5.3kΩ	0kPa~500kPa	analog voltage output (mV)	±0.1% F.S.	Turbo-TMAP pressurized intake pressure detection
NSP1632	High-performance and high-reliability automotive-qualified MEMS absolute pressure sensor with Pt pad (range can be customized)	MEMS wafer (1x1x0.4mm)	-40°C~150°C	5V	5.3kΩ	0kPa~100kPa/200kPa	analog voltage output (mV)	±0.1% F.S.	TMAP intake manifold pressure detection, BPS battery pack pressure detection, and EGR-TMAP exhaust gas recirculation pressure detection

NSPGM1 series: Automotive-qualified Integrated Differential Pressure Sensor Module

Product introduction

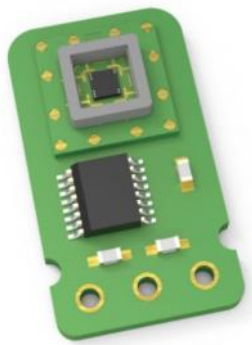
NSPGM1 series is a calibrated differential pressure sensor launched by NOVOSENSE for automotive fuel vapor pressure detection and exhaust differential pressure detection. The product adopts automotive-qualified signal conditioning chip to calibrate and compensate the MEMS die output, which can convert pressure signals in a specific range into analog output voltage. This product can provide standard output in the temperature range from -40°C to 90°C without customer calibration, which can accelerate the process of product development and mass production.

The NSPGM1 series has an optional pressure range from -6kPa to 6kPa, support analog ratio-metric/absolute output. The module package is convenient for usage and flexible for multi-applications. It is not only suitable for automobile fuel steam pressure detection and vacuum boosting system detection, but also suitable for industrial control and instrumentation and other fields.

Product feature

- Operating temperature range: -40°C~90°C
- Pressure range -6kPa ~ +6kPa, which can be customized
- The comprehensive accuracy in the full temperature range is better than ±2.5%F.S.
- Support 5V power supply and direct power supply within 18V in absolute voltage output mode
- Support -24V to 28V over voltage and reverse voltage protection
- Fluorinated gel protection, compatible with oil and gas environment
- Support absolute output/proportional output, with output curve customized
- It can be calibrated many times, with the function of factory reset adjustment
- Package: ceramic substrate module package (13.1mm x 23.1mm)

Package



Application

Automotive

- FTPS fuel steam pressure detection
- VBS vacuum boosting system
- Crankcase ventilation pressure sensor

Industrial

- Negative pressure vacuum detection
- Gas pressure monitoring

NSPGM2 series: Automotive-qualified Integrated Differential Pressure Sensor Module

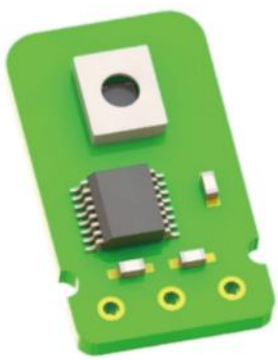
Product introduction

NSPGM2 series is a calibrated differential pressure sensor launched by NOVOSENSE for automotive fuel vapor pressure detection and exhaust differential pressure detection. The product adopts automotive-qualified signal conditioning chip to calibrate and compensate the precious metal MEMS die output, which can convert pressure signals in a specific range into analog output voltage. Its unique ceramic substrate packaging process makes the product resistant to oil vapor and other media corrosion, MEMS die is independent packaging and flexible design. This product can provide standard output in the temperature range from -40°C to 130°C without customer calibration, which can accelerate the process of product development and mass production. The module package is convenient for usage and flexible for multi-applications. It is not only suitable for automobile fuel steam pressure detection and engine exhaust emission SCR system (National V and VI emission standards), but also suitable for industrial control and instrumentation and other fields.

Product feature

- Operating temperature range: -40°C~130°C
- Pressure range ±5kPa~ ±100kPa, which can be customized
- The comprehensive accuracy in the full temperature range is better than ±2.5%F.S. (±0.18kPa)
- Support 5V power supply and direct power supply within 18V in absolute voltage output mode
- Support -24V to 28V over voltage and reverse voltage protection
- Fluorinated gel protection, compatible with oil and gas environment
- Support absolute output/proportional output, with output curve customized
- It can be calibrated many times, with the function of factory reset adjustment
- Package: ceramic substrate module package (13.1mm x 23.1mm)

Package



Application

Automotive

- FTPS fuel steam pressure detection
- GPF/DPF exhaust differential pressure detection
- VBS vacuum boosting system sensor
- EGR system differential pressure detection
- Crankcase ventilation pressure sensor

Industrial

- Negative pressure vacuum detection
- Gas pressure monitoring

NSPAS3M series: Automotive-qualified Integrated Absolute Pressure Sensor

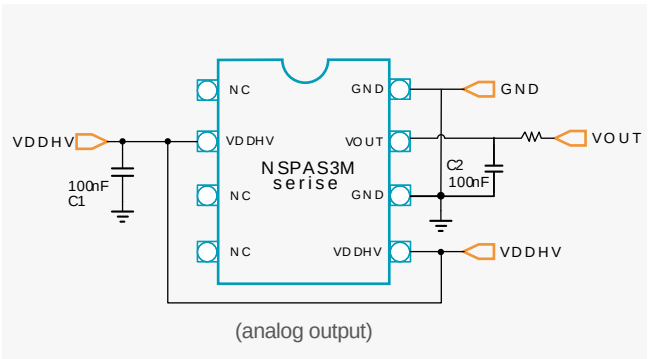
Product introduction

The NSPAS3M series is a submillisecond responsive absolute pressure sensor product for the motorcycle intake manifold pressure sensor market. The product adopts automotive-qualified signal conditioning chips to calibrate and compensate the MEMS die output, which can convert pressure signals from 10kPa to 400kPa into analog output signals with a customized output range from 0 to 5V. While ensuring excellent reliability of the product, it integrates two chips into one package, greatly reducing the package size. At the same time, this products can provide standard output within the accuracy range in its operation temperature range without customer calibration, which can accelerate the process of product development and mass production; this product complies with the AEC-Q100 reliability standard.

Product feature

- Width operating temperature range: -40°C~125°C
- High accuracy in full temperature range:
  - Better than ±1.5%F.S. in the range of 0°C~85°C
  - Better than ±1.5%F.S. in the range of -40°C~125°C
- Support -24V to 28V over voltage and reverse voltage protection
- Support 5V power supply and direct power supply within 18V in absolute voltage output mode
- Fluorinated gel protection, compatible with oil and gas environment
- Faster response time less than 1ms
- Support absolute output/ratio-metric output, with output curve customized
- Pressure range: 10kPa~400kPa, which can be customized
- AEC-Q100 qualified

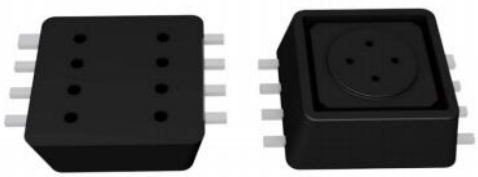
Functional block diagram



(analog output)

Package

SOP-8 (7.0mm x 7.0mm)



Application

Automotive

- Motorcycle intake manifold pressure sensor
- ECU/VCU atmospheric pressure detection
- Seat air bag pressure detection
- VBS vacuum boosting system sensor
- Canister desorption pressure detection

Industrial

- Gas/refrigerant leak detection
- Pressure transmitter
- Industrial vacuum degree testing

NSPAS3 series: Automotive-qualified Integrated Absolute Pressure Sensor

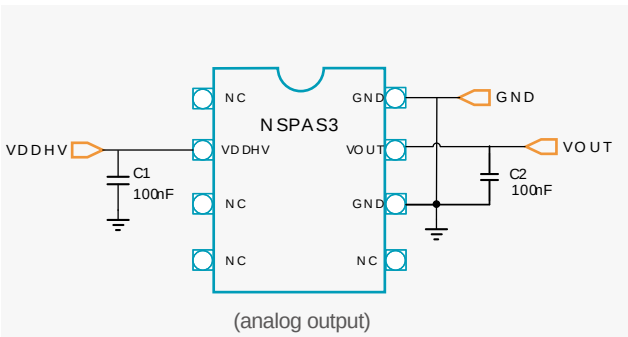
Product introduction

The NSPAS3 series is a calibrated absolute pressure sensor launched by NOVOSENSE for the automotive intake manifold pressure sensor. The product adopts automotive-qualified signal conditioning chips to calibrate and compensate the MEMS die output, which can convert pressure signals from 10kPa to 400kPa into analog output signals with a customized output range from 0 to 5V. While ensuring excellent reliability of the product, it integrates two chips into one package, greatly reducing the package size. At the same time, this products can provide standard output within the accuracy range in its operation temperature range without customer calibration, which can accelerate the process of product development and mass production; this product complies with the AEC-Q100 reliability standard.

Product feature

- Width operating temperature range: -40°C~130°C
- High accuracy in full temperature range:
  - Better than ±1%F.S. in the range of 0°C~85°C
  - Better than ±1.5%F.S. in the range of -40°C~130°C
- Support -24V to 28V over voltage and reverse voltage protection
- Fluorinated gel protection, compatible with oil and gas environment
- Faster response time less than 0.8ms
- Support absolute output/ratio-metric output, with output curve customized
- Disconnection detection, output clamping, output alarm function
- Pressure range: 10kPa~400kPa, which can be customized
- AEC-Q100 qualified

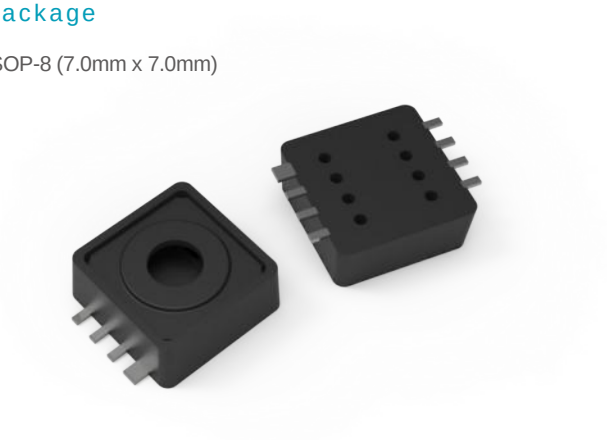
Functional block diagram



(analog output)

Package

SOP-8 (7.0mm x 7.0mm)



Application

Automotive

- Motorcycle three-in-one sensor
- Vehicle TMAP intake pressure detection
- BPS battery pack thermal runaway pressure detection
- EGR-TMAP exhaust gas recirculation pressure detection
- Canister desorption pressure detection
- VBS vacuum boosting system sensor
- ECU/VCU atmospheric pressure detection
- Seat air bag pressure detection

Industrial

- Gas/refrigerant leak detection
- Pressure transmitter
- Industrial vacuum degree testing

NSPAS1 series: Automotive-qualified Integrated Absolute Pressure Sensor

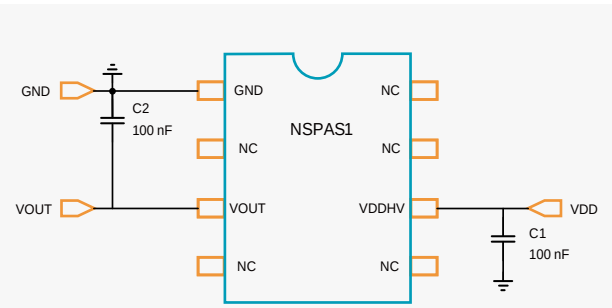
Product introduction

NSPAS1 is a calibrated absolute pressure sensor launched by NOVOSENSE for vehicle intake pressure, NEV vacuum boosting system and motorcycle electronic injection. The product adopts automotive-qualified signal conditioning chip to calibrate and compensate the output of MEMS piezoresistive die, ensuring excellent reliability of the product while integrating the two chips to greatly reduce the package size. At the same time, this product can provide standard output in its operation temperature range without customer calibration, which can accelerate the process of product development and mass production; the product complies with the AEC-Q100 reliability standard.

Product feature

- Operating temperature range: -40°C~125°C
- High accuracy in full temperature range:
  - Better than ±1%F.S. in the range of - 0°C~85°C
  - Better than ±1.5%F.S. in the range of - -40°C~125°C
- Support -24V to 28V over voltage and reverse voltage protection
- Fluorinated gel protection, compatible with oil and gas environment
- Faster response time less than 0.8ms
- Support absolute output/ratio-metric output, with output curve customized
- Disconnection detection, output clamping, output alarm function
- Pressure range 10kPa~400kPa, which can be customized
- AEC-Q100 qualified

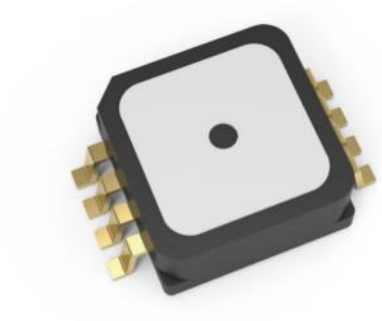
Functional block diagram



(analog output)

Package

SOP-8 (7.3mm x 7.3mm)



Application

Automotive

- Motorcycle three-in-one sensor
- Vehicle TMAP intake pressure detection
- BPS battery pack thermal runaway pressure detection
- EGR-TMAP exhaust gas recirculation pressure detection
- Canister desorption pressure detection
- VBS vacuum boosting system sensor
- ECU/VCU atmospheric pressure detection
- Seat air bag pressure detection

Industrial

- Gas/refrigerant leak detection
- Pressure transmitter
- Industrial vacuum degree testing

NSPGS2 series: Integrated Gauge Pressure Sensor with Air Nozzle in SOP Package

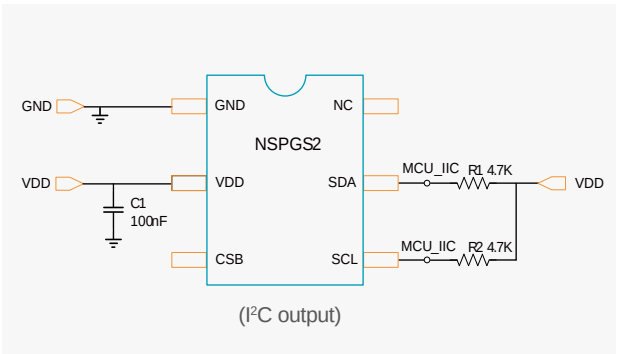
Product introduction

NSPGS2 is a calibrated gauge pressure sensor launched by NOVOSENSE for the market of small household appliances and healthcare equipment. This series of products adopts high-performance signal conditioning chip to calibrate and compensate the temperature and pressure of MEMS piezoresistive die. It comes in SOP6 package form with vertical air nozzle for easy soldering and use. This series of pressure sensors can convert pressure signals from -100kPa to +350kPa into analog/digital output signals with a customized output range. They are suitable for pressure detection of non-corrosive gases compatible with the structural materials of pressure sensitive components, especially for small household appliances, healthcare, industry and the IoT.

Product feature

- Customizable range: -100kPa ~+350kPa
- Wide temperature range: -40°C~70°C
- The comprehensive accuracy in the full temperature range is better than ± 2.5%
- Analog voltage output/ I²C digital output
- High stability, 100% calibration, temperature compensation
- Packaging with single air nozzle, easy to install and seal
- Front air intake for chips avoid blockage

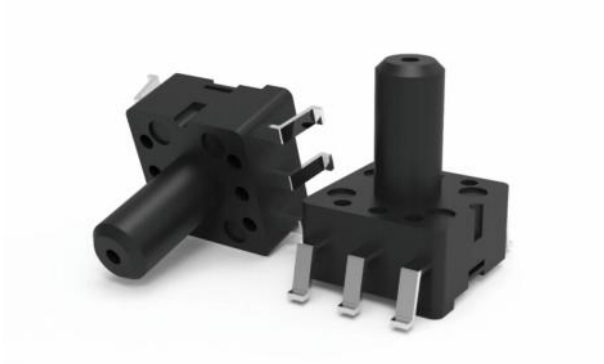
Functional block diagram



(I²C output)

Package

SOP-6 (6.3mm x 7.0mm)



Application

- **Industrial**: Pressure transmitter; Pressure switch; Negative pressure vacuum detection
- **Medical**: Sphygmomanometer; Oxygen generator; Biosafety cabinet
- **Home appliances**: Coffee machine; Health pot; Vacuum cleaner; Sweeper; Vacuum juicer
- **Consumption**: Air mattress; Massage chair; Inflator

NSPGD1 series: Integrated Gauge Pressure Sensor with Air Nozzle in DIP8 Package

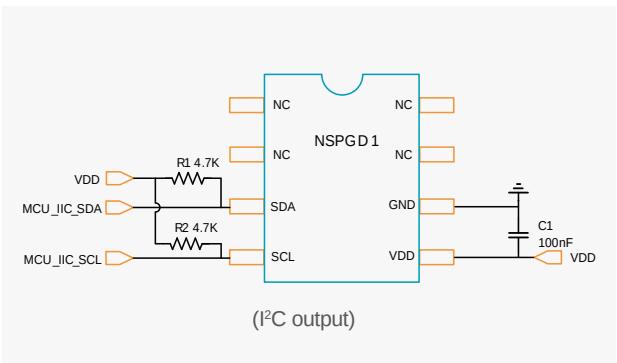
Product introduction

NSPGD1 is a series of calibrated gauge pressure sensors launched by NOVOSENSE for the home appliance and medical market. The series of products adopts high-performance signal conditioning chip to calibrate and compensate the temperature and pressure of MEMS piezoresistive die output. The NSPGD1 series integrated pressure sensor has an optional pressure range from -10kPa to +10kPa. It adopts DIP8 package form with air nozzle, which is convenient for soldering and use. It is suitable for gauge pressure detection of non-corrosive gases compatible with pressure sensitive components, especially for non-contact liquid level detection. It is also suitable for industrial, IoT and other fields. This series pressure sensor supports analog output /I²C digital output and unique frequency output, which is more flexible for multi-applications.

Product feature

- Customizable range: -10kPa ~ +10kPa
- Wide temperature range: 0°C~70°C
- The comprehensive accuracy in the full temperature range is better than ± 2.5%
- Analog voltage /I²C digital output/frequency output
- High stability, 100% calibration, temperature compensation
- DIP package with air nozzle, easy to install and seal
- Front air intake for chips avoid blockage
- Internal waterproof moisture-proofing treatment

Functional block diagram



(I²C output)

Package

DIP-8 (10.4mm x 10.4mm)

Application

Home appliances
- Washing machine
- Dishwasher
- Coffee machine
- Water purifier

Industrial
- Pressure switch
- Negative pressure vacuum detection
- Gas pressure detection

Medical
- Ventilator
- Oxygen generator
- Anesthesia apparatus
- Biosafety cabinet

NSPGD2 series: Integrated Gauge Pressure Sensor with Air Nozzle in DIP6 Package

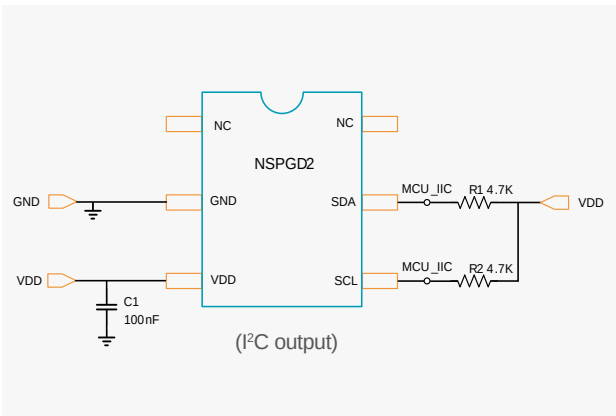
Product introduction

NSPGD2 is a calibrated gauge pressure sensor launched by NOVOSENSE for the market of household appliances and healthcare equipment. This series adopts high-performance signal conditioning chip to calibrate and compensate the temperature and pressure of MEMS piezoresistive die. The pressure sensor has an optional pressure range from -100kPa to +350kPa, supporting analog output/digital I²C output. The DIP package with air nozzle is convenient for soldering and use. It is suitable for gauge pressure detection of non-corrosive gases compatible with the structural materials of pressure sensitive components, especially for small household appliances, healthcare and other fields, as well as industrial and IoT.

Product feature

- Supply voltage: 3V~5.5V
- Operating temperature range: -20°C~85°C
- Customizable range: -100kPa ~+350kPa
- The comprehensive accuracy in the full temperature range is better than ±2.5%F.S.
- Optional output mode (analog /I²C digital output)
- High stability, 100% calibration, temperature compensation
- DIP package with air nozzle, easy to install and seal

Functional block diagram



(I²C output)

Package

DIP-6 (8.5mm x 8.5mm)

Application

- **Industrial**: Pressure transmitter; Pressure switch; Negative pressure vacuum detection
- **Medical**: Sphygmomanometer; Oxygen generator; Biosafety cabinet
- **Home appliances**: Coffee machine; Health pot; Vacuum cleaner; Sweeper; Vacuum juicer
- **Consumption**: Air mattress; Massage chair; Inflator

NSPDSx series: Dual-nozzle Integrated Differential Pressure Sensor

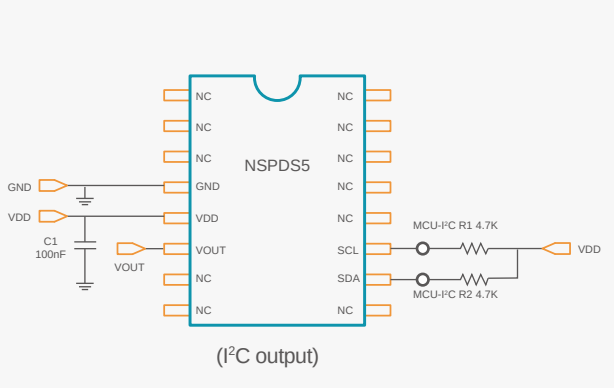
Product introduction

The NSPDSx is a calibrated pressure sensor launched by NOVOSENSE for the differential pressure monitoring market. The series of products adopts high-performance signal conditioning chips to calibrate and compensate the temperature and pressure of advanced MEMS piezoresistive die. JEDC-standard SOIC-16 package with double vertical barb air nozzle is adopted for convenient soldering and use. The NSPDSx series integrated pressure sensors have an optional pressure range from ±125Pa to ±350kPa, which are suitable for the pressure detection of non-corrosive gases compatible with the structural materials of pressure sensing elements, and also for consumer, medical, industrial and IoT fields. This pressure sensors supports analog output /I²C digital output and can be installed directly on standard printed circuit boards for multi-applications.

Product feature

- Supply voltage: 3V~5.5V
- Operating temperature range: -20°C~70°C
- High accuracy in full temperature range, and customizable pressure range
  - NSPDS9: ±125Pa~±1kPa, ±1%F.S.
  - NSPDS5/7: ±125Pa~±350kPa, ±1.5%F.S.
- Optional output mode (analog /I²C digital output)
- High stability, 100% calibration, temperature compensation
- Dual vertical barb air nozzle package, easy to install and seal

Functional block diagram



(I²C output)

Package

SOIC-16 (7.5mm x 10.3mm)

Application

Industrial

- Fire residual pressure monitoring
- HVAC/VAV
- Pressure transmitter
- Pressure switch
- Negative pressure vacuum detection
- Gas pressure monitoring

Medical

- Ventilator
- Oxygen generator
- Anesthesia apparatus
- Biosafety cabinet
- Sphygmomanometer

NSPGS5 series: Single-nozzle Integrated Gauge Pressure Sensor

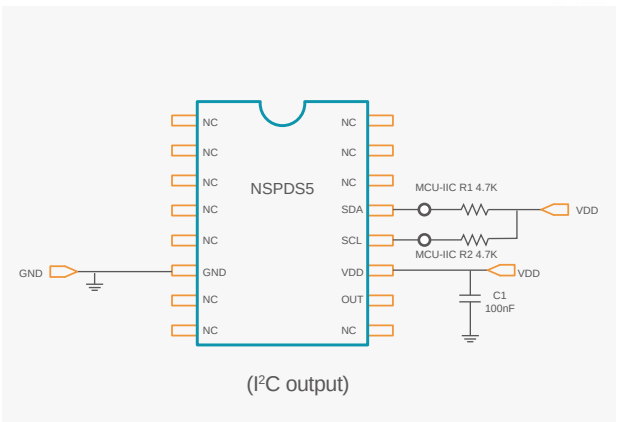
Product introduction

The NSPGS5 series is a calibrated pressure sensor launched by NOVOSENSE for the gauge pressure monitoring market. The series of products adopts high-performance signal conditioning chips to calibrate and compensate the temperature and pressure of advanced MEMS piezoresistive die. JEDC-standard SOIC-16 package with single nozzle is adopted for convenient soldering and use. The NSPGS5 series integrated pressure sensors have an optional pressure range from -10kPa to +10kPa, supporting analog output. They are suitable for the pressure detection of non-corrosive gases compatible with the structural materials of pressure sensing elements, and also for consumer, medical, industrial and IoT fields.

Product feature

- Supply voltage: 3V~5.5V
- Operating temperature range: -20°C~70°C
- Customizable range: -10kPa~+10kPa
- The comprehensive accuracy in the full temperature range is better than ±1%F.S.
- Output mode optional (analog /I²C digital output)
- High stability, 100% calibration, temperature compensation
- Single vertical nozzle package, easy to install and seal

Functional block diagram



(I²C output)

Package

SOIC-16 (7.5mm x 10.3mm)

Application

Industrial

- Gas pressure detection
- Pressure switch
- Negative pressure vacuum detection

Medical

- Ventilator
- Sphygmomanometer
- Oxygen generator
- Anesthesia apparatus
- Biosafety cabinet

NSP183x: High-performance and High-reliability MEMS Differential Pressure Sensor Wafer

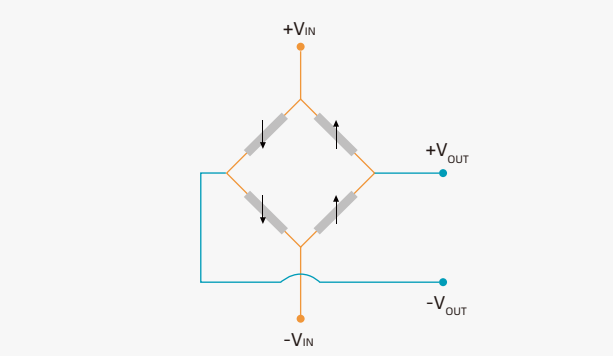
Product introduction

NOVOSENSE NSP183x series MEMS differential pressure sensor wafer is mainly made via the piezoresistive effect of silicon with NOVOSENSE independent R&D MEMS micro machining process design. The sensor wafer manufacturing platform is qualified by IATF16949, and the front/back side of every wafer pass AOI tested which compiles with AEC-Q103 standards. This series of MEMS wafers can realize differential pressure detection, which can be widely used in automotive electronics, medical electronics, white household appliances and industrial control fields. Meanwhile, NOVOSENSE also launched unique precious metal differential pressure MEMS series products, which mainly adopts precious metal double-pad structure design and stability enhanced shielding layer technology, and specially used in automotive exhaust system and other harsh environment.

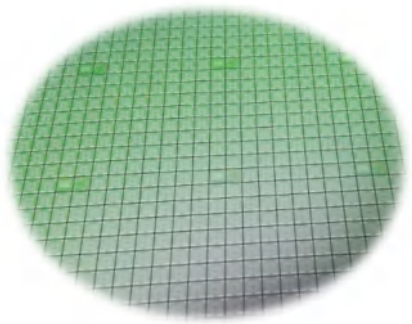
Product feature

- Operating temperature range: -40°C~85°C, -40°C~125°C and -40°C~150°C
- Pressure range: 0kPa~±1kPa, 0kPa~±6kPa/±10kPa and 0kPa~±100kPa/±500kPa
- The accuracy and stability in the life cycle are better than 1%F.S.
- Automotive-qualified IATF16949-certified process platform
- Comply with RoHS & REACH and halogen-free requirements
- Compiles with AEC-Q103 standard

Functional block diagram



Package



Application

Automotive
- FTPS fuel steampressure detection
- GPF/DPF exhaust differential pressure detection
- VBS vacuum boosting system sensor
- EGR system differential pressure detection
- Crankcase ventilation pressure sensor

Industrial
- Fire residual pressure monitoring
- HVAC/VAV
- Pressure transmitter
- Pressure switch
- Negative pressure vacuum detection
- Gas flow monitoring

Medical
- Ventilator
- Sphygmomanometer
- Oxygen generator
- Anesthesia apparatus
- Biosafety cabinet

Home appliances
- Washing machine
- Dishwasher
- Coffee machine
- Vacuum cleaner
- Water purifier
- Vacuum juicer

Consumption
- Air mattress
- Massage chair
- Air pump

NSP163x: High-performance and High-reliability MEMS Absolute Pressure Sensor Wafer

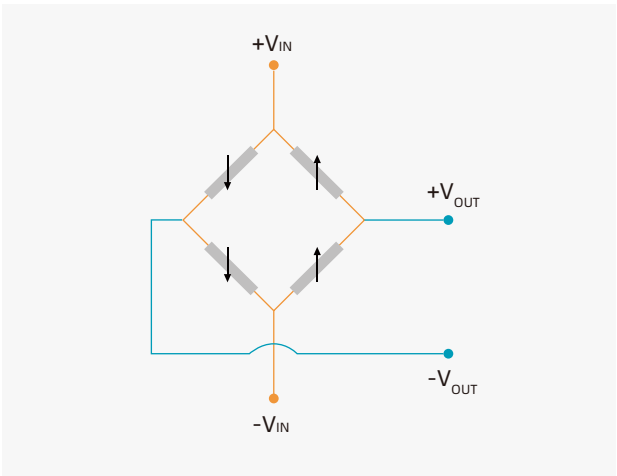
Product introduction

NOVOSENSE NSP163x series MEMS absolute pressure sensor wafer is mainly designed by using the piezoresistive effect of silicon with independently developed MEMS micromachining process. The sensor wafer manufacturing platform is qualified by IATF16949, and the front/back side of every wafer pass AOI tested which complies with AEC-Q103 standards. This series of MEMS wafers can realize absolute pressure detection, which can be widely used in automotive electronics, medical electronics, white household appliances and industrial control fields. Meanwhile, NOVOSENSE also launched a unique series of precious metal MEMS products, which are specially used in harsh environment such as automotive exhaust system.

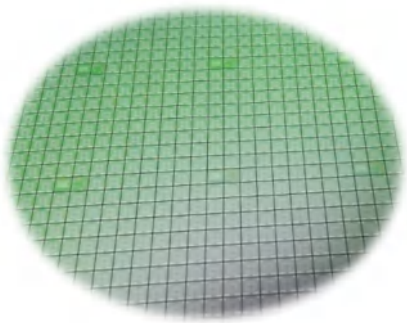
Product feature

- Operating temperature range: -40°C~125°C, -40°C~150°C
- Pressure range: 0kPa~100kPa/200kPa/500kPa
- The accuracy and stability in the life cycle are less than 1%F.S.
- Automotive-qualified IATF16949-certified process platform
- Comply with RoHS & REACH and halogen-free requirements
- Complies with AEC-Q103 standard

Functional block diagram



Package



Application

Automotive

- Motorcycle three-in-one sensor
- Vehicle TMAP intake pressure detection
- BPS battery pack thermal runaway pressure detection
- EGR-TMAP exhaust gas recirculation pressure detection
- Canister desorption pressure detection
- VBS vacuum assist sensor
- ECU/VCU atmospheric pressure detection
- Seat air bag pressure detection
- EV/HEV vacuum boosting system sensor

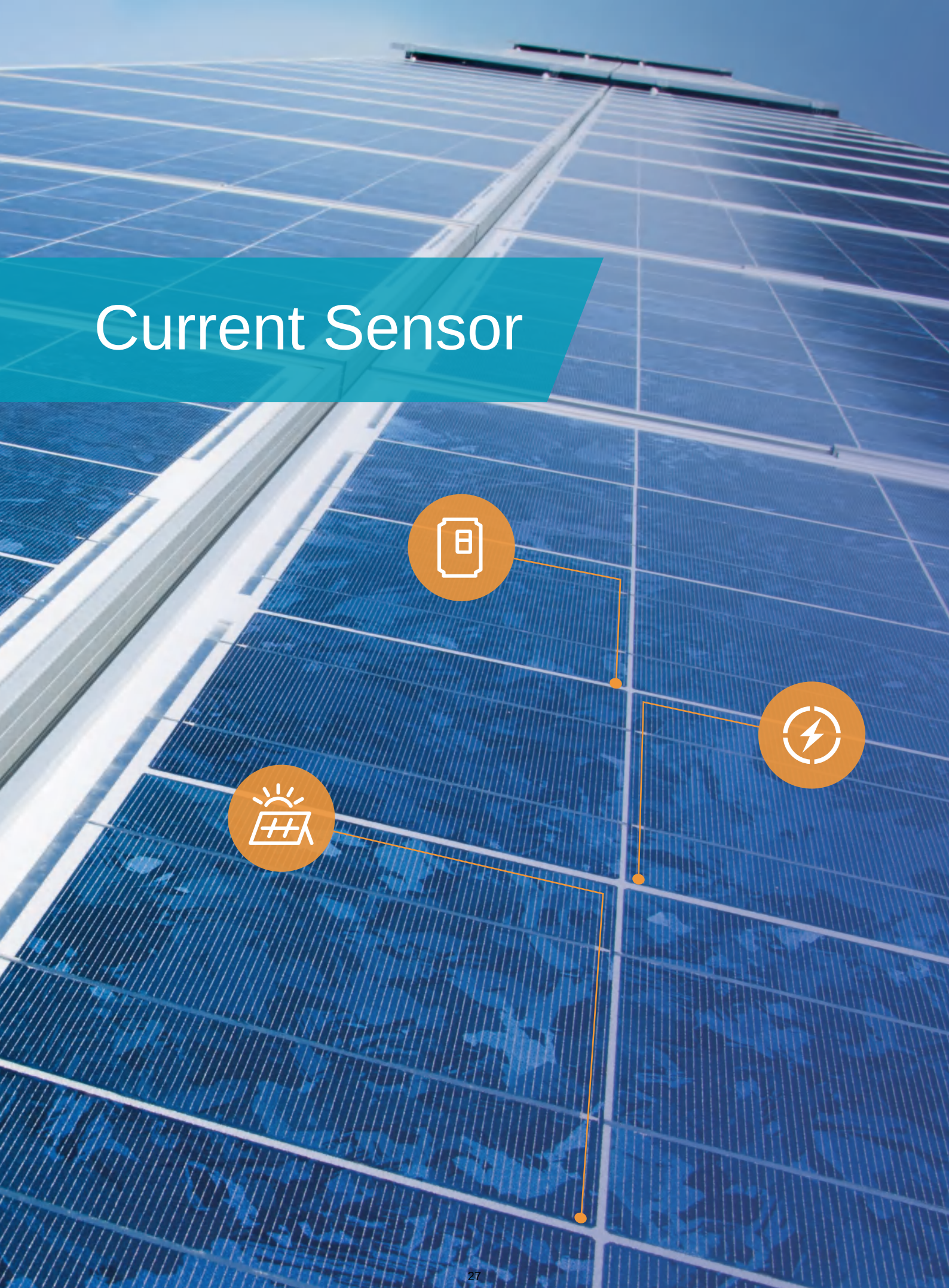
Industrial

- Pressure transmitter
- Industrial vacuum degree testing

Consumption

- Altimeter
- Barometer

Current Sensor



Current Sensor

Part number	Product feature	Package	Range ability	Supply voltage	Isolation voltage / operating voltage	Creepage distance / electric clearance	Temperature range	Signal bandwidth / response time	Typical application
NSM2011	Wide current range available AC/DC measurement Conduction resistance as low as 0.85mOhm Proportional output +/-2% current measurement accuracy	SOICW-16	20~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~125°C	240kHz /2.2μs	Photovoltaic inverter Automotive OBC, DC/DC, charging gun, PTC heater Industrial inverter Power supply Service robot Unmanned aerial vehicle Two-wheeled vehicle
NSM2012	Wide current range available AC/DC measurement Support proportional output or fixed output Reference voltage output +/-2% current measurement accuracy	SOIC-8	5~65A	3.3V/5V	3000Vrms@1min 600VDC (424VAC)	4mm/4mm	-40°C ~125°C	400kHz /1.5μs	
NSM2013	Wide current range available AC/DC measurement Conduction resistance as low as 0.85mOhm Fixed output Reference voltage output +/-2% current measurement accuracy	SOICW-16	20~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~125°C	240kHz /2.2μs	
NSM2015	Wide current range available AC/DC measurement Conduction resistance as low as 0.85mOhm Fixed output Reference voltage output Integrated over-current protection +/-2% current measurement accuracy	SOICW-16	20~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~125°C	320kHz /1.5μs	
NSM2016	Wide current range available AC/DC measurement Fixed output Integrated over-current protection +/-2% current measurement accuracy	SOIC-8	5~65A	3.3V/5V	3000Vrms@1min 600VDC (424VAC)	4mm/4mm	-40°C ~125°C	380kHz /1.5μs	

NSM2011/2012/2013/2015/2016: Chip-level Current Sensor with Integrated Current Path

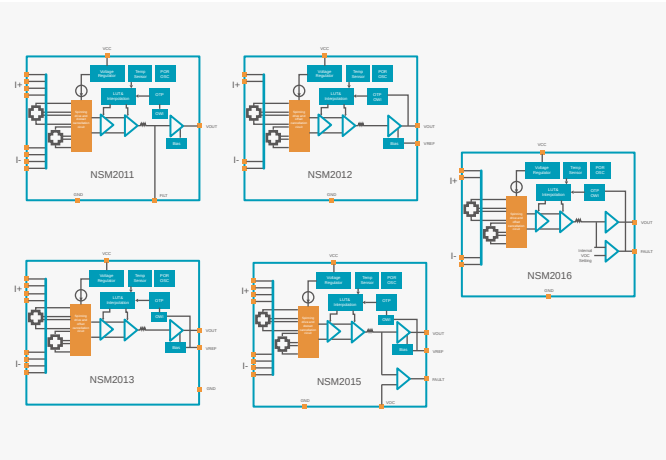
Product introduction

NSM201X series is a chip-level current sensor under 100A launched by NOVOSENSE which is mainly used for isolation measurement of current under 100A.

Product feature

- Wide current range available 5A~100A
- AC/DC input
- 3.3V/5V single power supply
- Input conduction impedance as low as to 0.85mOhm
- ±2% current measurement accuracy
- Withstand up to 13kA surge current (8μs /20μs surge current waveform)
- Multiple output type
  Single-end proportional output
  Pseudo difference fixed output
- Two types of package
  Narrow-body SOIC 8-pin package: 600VDC working isolation voltage / 3000 Vrms @ 1min Withstand isolation voltage (NSM2012/NSM2016)
  Wide-body SOIC16-pin package: 1550VDC working insulation voltage / 5000 Vrms @ 1 min Withstand isolation voltage (NSM2011/NSM2013/NSM2015)
- Overcurrent protection OCD output (NSM2015/NSM2016)
  Overcurrent protection response in micro seconds
  Overcurrent protection threshold is configurable

Functional block diagram



Safety certificate

- UL62368/EN62368 safety certification

Package

NSM2012/2016: SOP8

NSM2011/2013/2015: SOW16

Application

Automotive	OBC	DC/DC	PTC heater	Charging gun	PDU
Industrial	PV inverter	Industrial frequency converter	Power supply (UPS, SMPS)	PDU	
Consumer	Service robots	Drones	Two-wheeled vehicles	Vacuum cleaners	

Magnetic Position Sensor

Magnetic Position Sensor

Part number	Product feature	Package	Range ability	Supply voltage	Interface form	Accuracy of angle measurement	Response time	Temperature range	Typical application
NSM3011	The axial angle is measured based on planar Hall Differential Hall detection can resist external stray magnetic field Provide OWI user-programmable communication port Automotive-qualified model and industrial-qualified model available	SOIC-8	0~360° Support user defined samll range measurement as well	3.3V/5V	14-bit linear DAC analog output 12-bit resolution PWM output	±1° The accuracy can reach ±0.2° after four-section calibration	120μs (10μs after dynamic Angle compensation is enabled)	-40°C ~125°C	**Automotive:** Valve angle sensor (throttle, EGR, ball valve, expansion valve, etc.) Accelerator pedal angle sensor Electronic gear shifter Wiper position sensor Body height sensor **Industrial:** Industrial steering gear angle sensor Non-contact rotary button switch **Consumer:** Home printer Hand-held marking gun Moving curtain angle detection
NSM3012	The axial angle is measured based on planar Hall Differential Hall detection can resist external stray magnetic field Provide SPI and OWI user-programmable communication interfaces Automotive-qualified model and industrial-qualified model available	SOIC-8	0~360° Support user defined small range measurement as well	3.3V/5V	14-bit linear DAC analog output 12-bit resolution PWM output Three-line SPI communication	±1° The accuracy can reach ±0.2° after four-section calibration	120μs (10μs after dynamic Angle compensation is enabled)	-40°C ~125°C	
NSM3013	The axial angle is measured based on planar Hall Differential Hall detection can resist external stray magnetic field Provide OWI user-programmable communication port Automotive-qualified model and industrial-qualified model available	SOIC-8	0~360° Support user defined small range measurement as well	3.3V/5V	14-bit linear DAC analog output 12-bit resolution PWM output UVW output Z-direction programmable threshold judgment switch output (SON)	±1° The accuracy can reach ±0.2° after four-section calibration	120μs (10μs after dynamic Angle compensation is enabled)	-40°C ~125°C	

NSM3011/3012/3013: Hall-based Angle Sensor

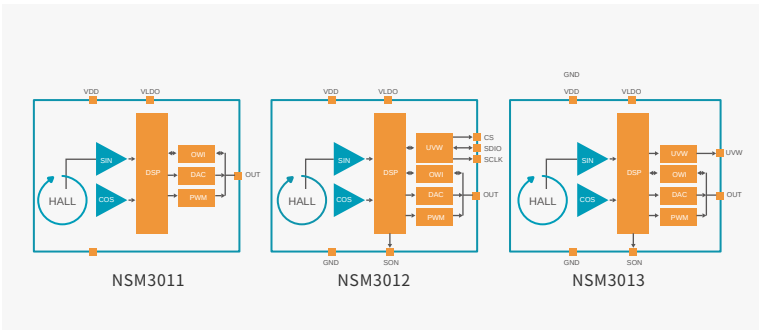
Product introduction

The NSM301X is a non-contact rotation angle sensor that supports accurate rotation angle measurement of 360° in ambient temperatures ranging from -40°C to 125°C. This series is based on planar Hall array, which converts the angle position information of bipolar magnet into analog voltage, PWM, SPI and other output forms through internal DSP. The NSM301X provides SPI and OWI interfaces for signal path configuration as well as erasable programming register blocks (MTP). It has an automatic gain (AGC) adjustment module that can adjust the gain of the signal path to accommodate different mechanical constraints and magnetic fields. This approach provides maximum flexibility in system design because it can be integrated directly into existing architectures, providing high accuracy. The chip supports 3.3V, 5V power supply voltage (different power supply versions)

Product feature

- Operating temperature: -40°C to 125°C
- Various output interface forms: 14-bit linear DAC analog output or 12-bit resolution PWM output, SPI output UVW output, Z-direction programmable threshold judgment switch output (SON)
- Provide SPI and OWI user-programmable communication interfaces
- Provide angle output with accuracy of ±1°
- Support four-section fitting one by one, with fit accuracy up to ±0.2°
- Built-in automatic gain compensation circuit to compensate the gain loss caused by the temperature characteristics of the magnet and the Z-direction installation position tolerance
- It has abnormal diagnosis function
- Differential Hall detection can resist external stray magnetic field
- NOVOSENSE's new chopper and spin current excitation technology make angular temperature drift very small
- Automotive-qualified and industrial-qualified model available, with automotive-qualified model meeting AEC - Q100 reliability standard

Functional block diagram



Package

SOP8

Application

Automotive

- Valve angle sensor (throttle, EGR, ball valve, expansion valve, etc.)
- Accelerator pedal angle sensor
- Electronic gear shifter
- Wiper position sensor
- Body height sensor

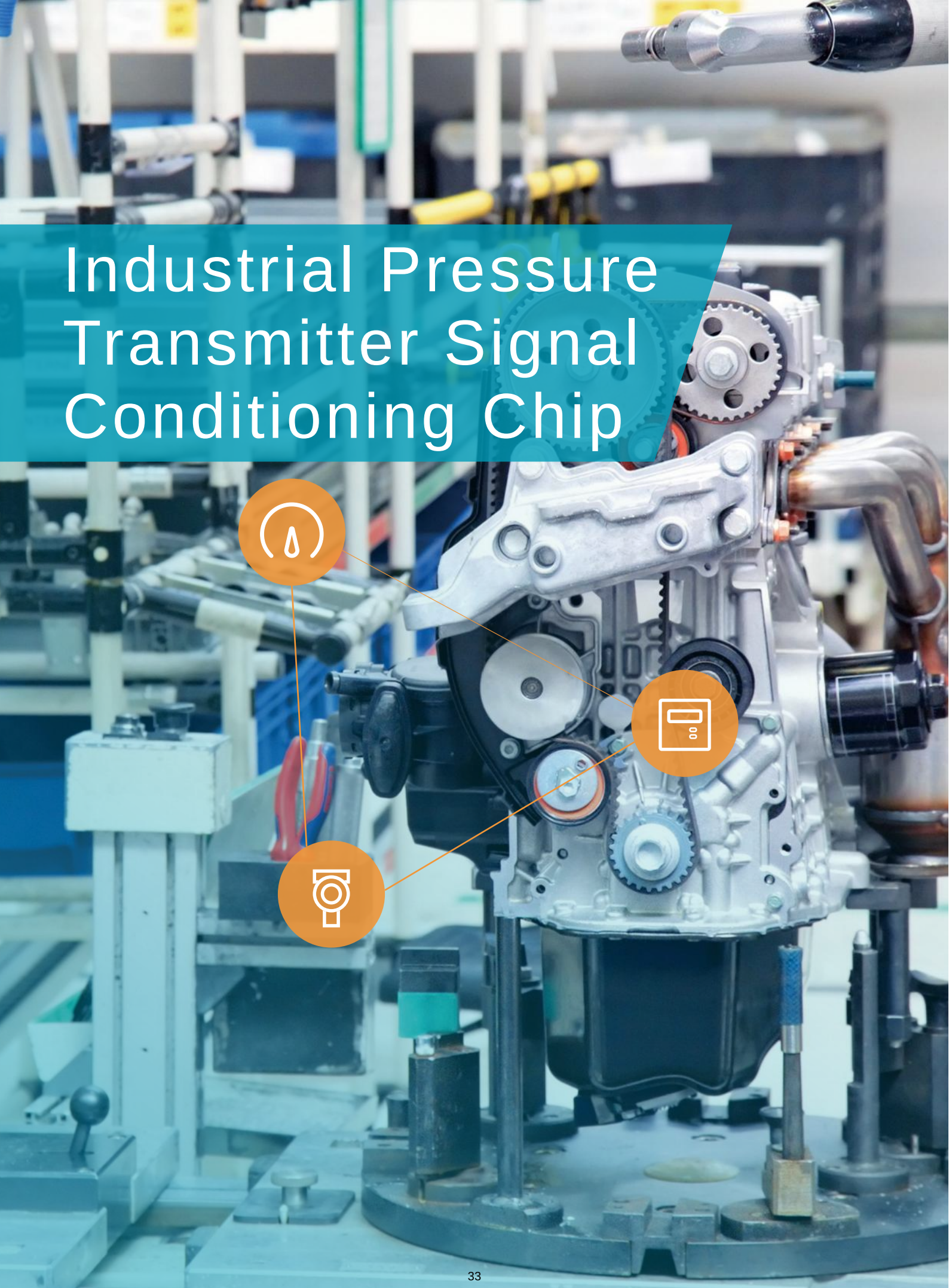
Industrial

- Industrial steering gear angle sensor
- Non-contact rotary button switch

Consumer

- Home printer
- Hand-held marking gun
- Moving curtain angle detection

Industrial Pressure Transmitter Signal Conditioning Chip



Industrial Pressure Transmitter Signal Conditioning Chip

Part number	Product description	Sensor input type supported	Package	Temperature range	Supply voltage	Output type	Power Shunt Down function supported	Non-volatile memory	Typical application
NSA2860 _SSOP16	General industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	SSOP16	-40~150°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20mA output PWM OWI	No	EEPROM	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2860 _TSSOP	General industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	SSOP16 TSSOP20	-40~150°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20mA output PWM I²C SPI OWI	No	EEPROM	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2860 X-QQNR	General EMC-enhanced industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	QFN20	-40~125°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage Industrial transmitter standard 0~5V/0~10V/4~20mA output PWM I²C SPI OWI	No	EEPROM	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2862 X-DQNR	General EMC-enhanced industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	QFN20	-40~125°C	3~5.5V	I²C SPI OWI	Yes	EEPROM	BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter IOT industrial transmitter
NSC2860 X-DQNR	General industrial capacitive pressure transmitter signal conditioning chip	apacitive pressure sensor	QFN20	-40~125°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20mA output PWM I²C SPI OWI	No	EEPROM	Capacitive industrial pressure transmitter

NSA2860/NSA2860X: Industrial Transmitter Signal Processing Chip Supporting 4~20mA Output

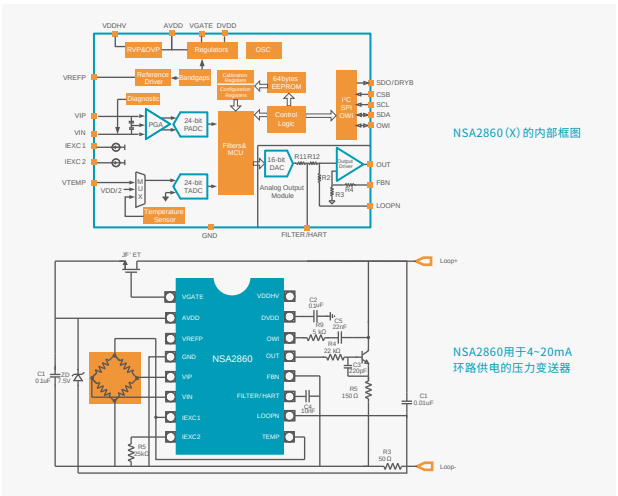
Product introduction

NSA2860 (X) is a specially developed ASSP chip for 4~20mA current output or 0~5V/0~10V voltage output industrial transmitter. NSA2860 (X) has an internal integrated bridge drive, dual constant current source drive, PGA and 24-bit high-precision ADC, which can be easily used for interface bridge pressure sensors or temperature sensors such as RTD/TC. The chip integrates the customer programmable digital calibration logic, and also provides a convenient OWI interface that can communicate directly with the analog line of 4~20mA, making it convenient for the customer to calibrate the sensor after assembly and save the calibration coefficient. In addition, the NSA2860 (X) also integrates with an external JFET controller, which can be used directly under standard industrial loop power supply conditions of 24V without the need for an additional power controller. In the past few years, this chip has been widely used in industrial pressure transmitters, industrial temperature transmitters and other field instruments, and its reliability and stability has been fully verified by a large number of shipments in the industrial field.

Product feature

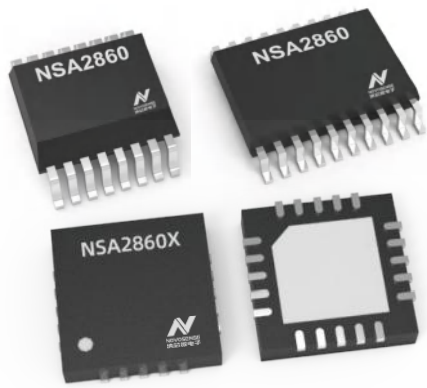
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Integrated dual constant current source output, supporting three-wire or four-wire RTD temperature sensor input
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support SPI BUS or I²C digital interface, which can also be used as digital transmitter analog front-end
- OWI interface, which can support customer calibration after assembly in the case of two-wire 4~20mA connection
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Low static current, with 1.5mA working current perfectly supporting 4-20mA loop power supply
- The power pin VDDH can withstand high voltage shocks up to 28V to achieve high reliability in industrial field applications

Functional block diagram



Package

- NSA2860_SSOP16: SSOP16
- NSA2860_TSSOP: TSSOP20
- NSA2860X-QQNR: QFN20



Application

- Industrial pressure transmitter and temperature transmitter
- Industrial field instrument analog front-end
- PLC/DCS analog input/output

NSA2862X: Analog Front-end Chip for Low-power Digital Industrial Sensor

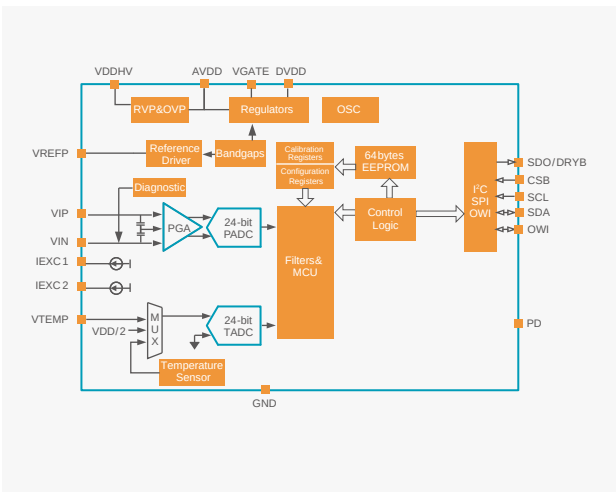
Product introduction

The NSA2862X is an analog front-end chip specially developed for digital industrial transmitters or IIoT industrial sensors requiring low sleep power consumption. NSA2862X has an internal integrated bridge drive, dual constant current source drive, PGA and 24-bit high-precision ADC, which can be easily used for interface bridge pressure sensors or temperature sensors such as RTD/TC. Its integrates customer-programmable digital calibration logic and EEPROM, so that customers can easily carry out sensor assembly calibration and calibration coefficient saving. The NSA2862X has a dedicated PD pin that can be used in industrial wireless sensor applications to set the chip to a low-power off state with 100nA static sleep current. Over the past few years, the chip has been widely used in industrial pressure IoT meters, and its reliability and stability has been fully verified in the industrial field by a large number of shipments.

Product feature

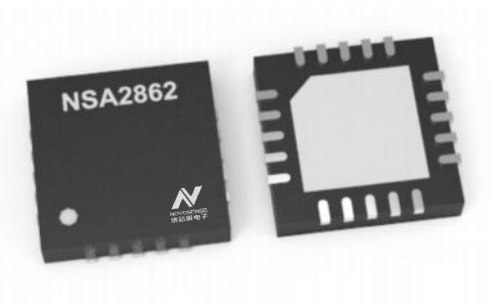
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Integrated dual constant current source output, supporting three-wire or four-wire RTD temperature sensor input
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support SPI BUS or I²C digital interface, which is used as digital transmitter analog front-end
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Power Down mode is supported. The static current in sleep mode is at 100nA level at room temperature

Functional block diagram



Package

- NSA2862X_DQNR: QFN20



Application

- Industrial pressure transmitter and temperature transmitter
- Industrial field instrument analog front-end
- PLC/DCS analog input

NSC2860X: Capacitive Industrial Transmitter Signal Processing Chip Supporting 4~20mA Output

Product introduction

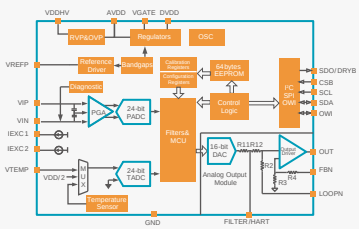
NSC2860X is an ASSP chip specially developed for 4~20mA current output or 0~5V voltage output industrial transmitter. NSC2860X has an integrated capacitive voltage conversion circuit, which specially designed for interface capacitive pressure sensors. It integrates the customer programmable digital calibration logic, and also provides a convenient OWI interface that can communicate directly with the analog line of 4~20mA, making it convenient for the customer to calibrate the sensor after assembly and save the calibration coefficient. In addition, the NSC2860X also integrates with an external JFET controller, which can be used directly under standard industrial loop power supply conditions of 24V without the need for an additional power controller. Over the past few years, the chip has been widely used in application of industrial capacitive pressure transmitter, and its reliability and stability has been fully verified in the industrial field by a large number of shipments.

Product feature

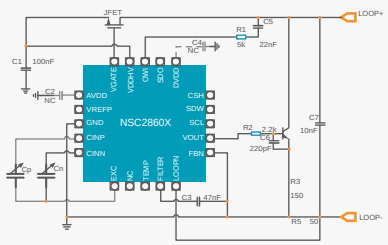
- Integrated capacitive voltage conversion circuit, supporting capacitive pressure sensor interface
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support SPI BUS or I²C digital interface, which can also be used as digital transmitter analog front-end
- OWI interface, which can support customer calibration after assembly in the case of two-wire 4~20mA connection
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Low static current, with 1.5mA working current perfectly supporting 4-20mA loop power supply
- The power pin VDDH can withstand high voltage shocks up to 28V to achieve high reliability in industrial field applications

Functional block diagram

NSC2860X internal block diagram

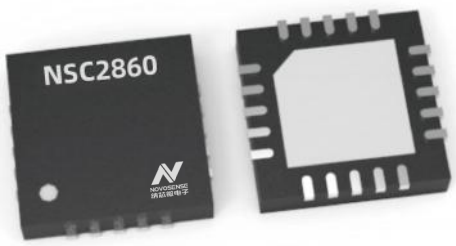


NSC2860X is used for 4~20mA loop powered pressure transmitter



Package

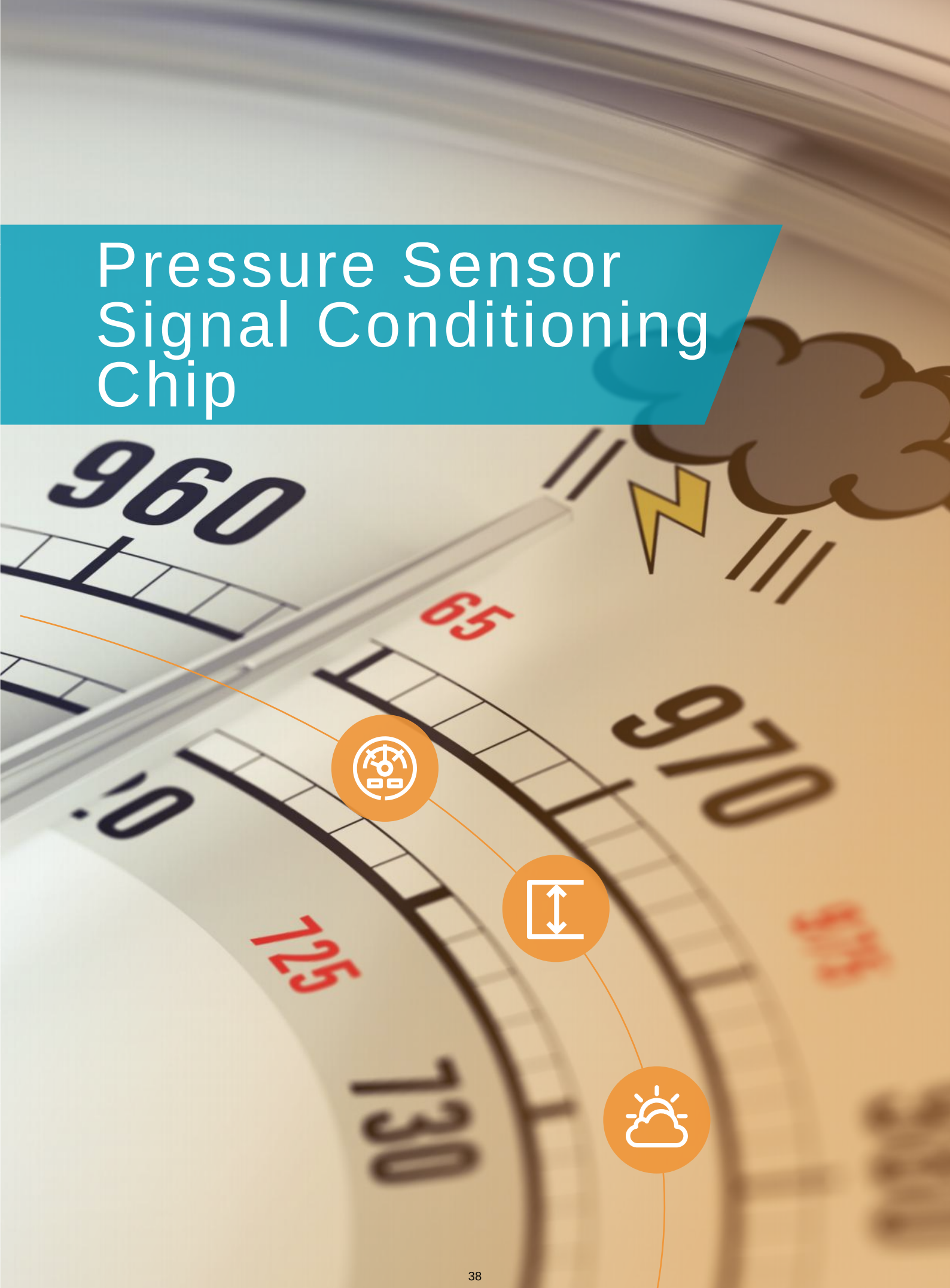
- NSC2860X-DQNR: QFN20



Application

Industrial capacitive pressure transmitter

Pressure Sensor Signal Conditioning Chip



Pressure Sensor Signal Conditioning Chip

Part number	Product description	Sensor input type supported	Package	Temperature range	Supply voltage	Output type	Non-volatile memory	Key words of selection	Typical application
NSA2200	General low-cost voltage/resistance bridge signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor	KDG	-40~125°C	1.8~5.5V	I²C SPI OWI	OTP	Low-cost digital output	Altimeter Consumer pressure gauge
NSA2300	General low-cost voltage/resistance bridge signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor	SOP8 MSOP10 KDG	-40~125°C	1.8~5.5V	Analog voltage I²C SPI OWI	OTP	Low-cost analog + digital output	Altimeter Consumer pressure gauge Additional automotive pressure sensor ear/forehead thermometer (thermopile sensor)
NSA2302	General low-cost voltage/resistance bridge signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor (with bias voltage)	MSOP10 KDG	-40~125°C	3~5.5V High-voltage direct power supply is supported with an external JFET	Analog voltage I²C SPI OWI	EEPROM	Low cost analog + digital output, rewritable EEPROM	Additional automotive pressure sensor ear/forehead thermometer (thermopile sensor)
NSA2860_SSOP16	General industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	SSOP16	-40~150°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20-mA output PWM OWI	EEPROM	Industrial transmitter, cost optimized version	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter
NSA2860_TSSOP	General industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	SSOP16 TSSOP20	-40~150°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20-mA output PWM I²C SPI OWI	EEPROM	Industrial transmitter, full function	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2860X-QQNR	General EMC-enhanced industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	QFN20	-40~125°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage Industrial transmitter standard 0~5V/0~10V/4~20-mA output PWM I²C SPI OWI	EEPROM	Industrial transmitter, small package	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2862X-DQNR	General EMC-enhanced industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	QFN20	-40~125°C	3~5.5V	I²C SPI OWI	EEPROM	IoT pressure sensor	BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter IOT industrial transmitter
NSC2860X-DQNR	General industrial capacitive pressure transmitter signal conditioning chip	Capacitive pressure sensor	QFN20	-40~125°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20-mA output PWM I²C SPI OWI	EEPROM	Capacitive input industrial pressure level transmitter	Capacitive industrial pressure transmitter
NSA9260	High-reliability automotive-qualified resistance pressure sensor conditioning chip	Wheatstone bridge resistance pressure sensor	SSOP16	-40~150°C	Wheatstone bridge resistance pressure sensor	Analog voltage PWM OWI	EEPROM	Automotive pressure ordinary analog output type	Automotive pressure sensor
NSA9260X	EMC-enhanced high-reliability automotive-qualified resistance pressure sensor conditioning chip	Wheatstone bridge resistance pressure sensor	SSOP16	-40~150°C	Wheatstone bridge resistance pressure sensor	Analog voltage PWM OWI	EEPROM	Automotive pressure EMC-enhanced analog output type	Automotive pressure sensor
NSC9260	High-reliability automotive-qualified capacitive pressure sensor conditioning chip	Capacitive pressure sensor	SSOP16	-40~150°C	Capacitive pressure sensor	Analog voltage PWM OWI	EEPROM	Automotive capacitance pressure ordinary analog output type	Automotive pressure sensor
NSC9260X	EMC-enhanced high-reliability automotive-qualified capacitive pressure sensor conditioning chip	Capacitive pressure sensor	SSOP16	-40~150°C	Capacitive pressure sensor	Analog voltage PWM OWI	EEPROM	Automotive capacitance pressure EMC-enhanced analog output type	Automotive pressure sensor
NSC9262	LIN-interface High-reliability automotive-qualified resistance pressure sensor conditioning chip	Capacitive pressure sensor	SSOP16	-40~150°C	Capacitive pressure sensor	OWI LIN	EEPROM	Automotive capacitance pressure LIN output type	Automotive pressure sensor
NSC9264	SENT-interface High-reliability automotive-qualified resistance pressure sensor conditioning chip	Capacitive pressure sensor	SSOP16	-40~150°C	Capacitive pressure sensor	OWI SENT	EEPROM	Automotive capacitance pressure SENT output type	Automotive pressure sensor

NSA2200: Digital Output Pressure Sensor Interface Chip

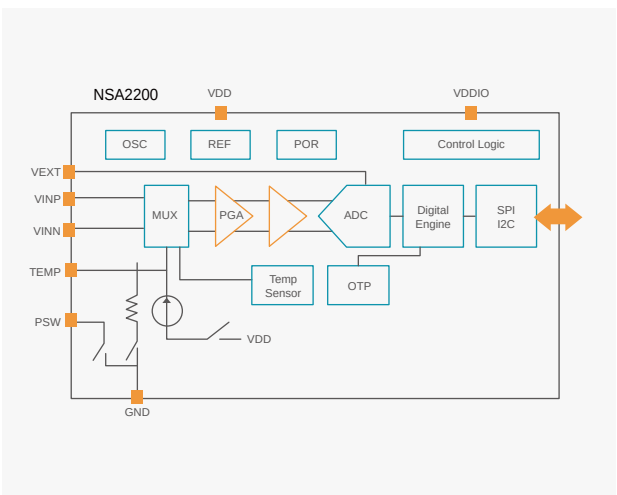
Product introduction

NSA2200 is an interface chip for low-cost pressure sensors. It integrates pressure sensor bridge driver, with high precision PGA, 24-bit ADC, customer programmable digital calibration logic and customer-writable OTP. NSA2200 supports sensor nonlinear fitting calibration as well as temperature compensation for sensor sensitivity and bias errors. The supply method of this chip is wafer Know Good Die. Customers can choose to seal NSA2200 with their own pressure sensor sensitive source in one package. After calibration, it can be used as digital output pressure sensor.

Product feature

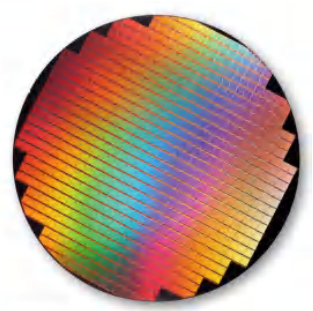
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Support sensor diagnosis and output clamp function
- Excellent noise performance: 600nV@OSR = 1024X, Gain = 32X (equivalent to input noise) Calibration accuracy: 0.05% FSO (support second order temperature coefficient and third order nonlinear calibration)
- High-precision internal temperature sensor, (absolute accuracy < 0.5°C, resolution < 0.01°C); support a variety of external temperature sensors (diode, two-terminal thermistor, three terminal thermistor, etc.)
- Support 1.8V to 5.5V power supply
- Support sleep working mode to greatly reduce MCU load. The static current under sleep is at 200nA level at room temperature, and supports Power Down of external bridge power supply.
- Support SPI BUS or I²C digital interface output

Functional block diagram



Package

- KDG



Application

Consumer/industrial pressure sensor modules (washing machine level/pressure cooker/coffee machine/soybean milk machine, etc.)

Barometer

Altimeter

Weather forecaster

Electronic weight scale

NSA2300: Pressure Sensor Interface Signal Conditioning Chip Compatible with Analog and Digital Output

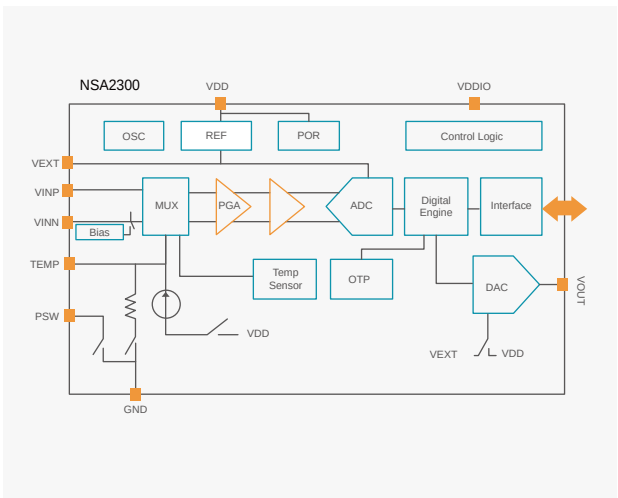
Product introduction

NSA2300 is a low-cost pressure sensor interface chip, with both analog output and digital output supported. It integrates pressure sensor bridge driver, with high precision PGA, 24-bit ADC, customer programmable digital calibration logic and customer-writable OTP. NSA2300 supports sensor nonlinear fitting calibration as well as temperature compensation for sensor sensitivity and bias errors. The packaging mode of this chip is SO8 or MSOP10, and the shipment mode of wafer Know Good Die can also be provided.

Product feature

- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Support sensor diagnosis and output clamp function
- Excellent noise performance: 600nV@OSR = 1024X, Gain = 32X (equivalent to input noise) Calibration accuracy: 0.05% FSO (support second order temperature coefficient and third order nonlinear calibration)
- High-precision internal temperature sensor, (absolute accuracy < 0.5°C, resolution < 0.01°C); support a variety of external temperature sensors (diode, two-terminal thermistor, three terminal thermistor, etc.)
- Support 1.8V to 5.5V power supply
- Support sleep working mode to greatly reduce MCU load. The static current under sleep is at 200nA level at room temperature, and supports Power Down of external bridge power supply.
- Support SPI BUS or I²C digital interface output, with analog proportional/fixed output mode.

Functional block diagram



Package

- SO8, MSOP10, KDG

Application

Consumer/industrial pressure sensor modules (washing machine level/pressure cooker/coffee machine/soybean milk machine, etc.)

Barometer

Altimeter

Weather forecaster

Electronic weight scale

Automobile additional pressure sensor module

NSA2302: Pressure Sensor Interface Signal Conditioning Chip Compatible with Analog and Digital Output

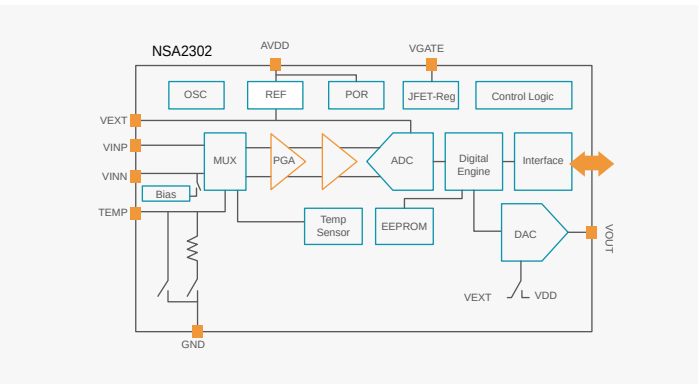
Product introduction

The NSA2302 is a highly integrated, low-cost, high-precision interface chip designed for bridge sensors to collect, amplify and calibrate sensor signals. The NSA2302 integrates a low-noise gauge amplifier (PGA), a low-power 24-bit Σ-Δ ADC, a DSP for digital calibration, and a 12-bit DAC. The NSA2302 supports second-order temperature drift calibration for sensor zero temperature, sensitivity and up to third-order nonlinear calibration, with digital calibration accuracy up to 0.1%. The calibration logic is based on the calibration parameters stored in the internal EEPROM and calculated by the built-in DSP. The NSA2302 also supports direct high-voltage supply applications with an internal JFET controller. The NSA2302 supports both I^2C/SPI digital output and analog output, and supports one-wire interface (OWI) multiplexing analog pins for post-sensor calibration.

Product feature

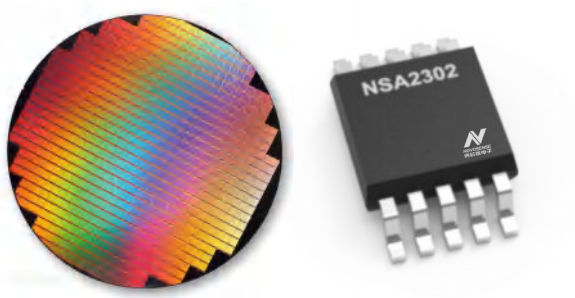
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Support sensor diagnosis and output clamp function
- Excellent noise performance: 600nV@OSR = 1024X, Gain = 32X (equivalent to input noise) Calibration accuracy: 0.05% FSO (support second order temperature coefficient and third order nonlinear calibration)
- High-precision internal temperature sensor, (absolute accuracy < 0.5°C, resolution < 0.01°C); support a variety of external temperature sensors (diode, two-terminal thermistor, three terminal thermistor, etc.)
- VDD supports 3V to 5.5V power supply and external high-voltage power supply through JFET controller
- Support sleep working mode to greatly reduce MCU load. The static current under sleep is at 200nA level at room temperature, and supports Power Down of external bridge power supply.
- Support SPI BUS or I^2C digital interface output, with analog proportional output

Functional block diagram



Package

- SO8, MSOP10, KDG



Application

Automobile additional pressure sensor (A/C pressure sensor/TMAP sensor)

Consumer/industrial pressure sensor modules (washing machine level/pressure cooker/coffee machine/soybean milk machine, etc.)

NSA2860/NSA2860X: Industrial Transmitter Signal Processing Chip Supporting 4~20mA Outputchip Supporting 4~20mA Output

Product introduction

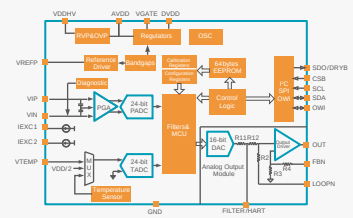
NSA2860 (X) is a specially developed ASSP chip for 4~20mA current output or 0~5V/0~10V voltage output industrial transmitter. NSA2860 (X) has an internal integrated bridge drive, dual constant current source drive, PGA and 24-bit high-precision ADC, which can be easily used for interface bridge pressure sensors or temperature sensors such as RTD/TC. The chip integrates the customer programmable digital calibration logic, and also provides a convenient OWI interface that can communicate directly with the analog line of 4~20mA, making it convenient for the customer to calibrate the sensor after assembly and save the calibration coefficient. In addition, the NSA2860 (X) also integrates with an external JFET controller, which can be used directly under standard industrial loop power supply conditions of 24V without the need for an additional power controller. In the past few years, this chip has been widely used in industrial pressure transmitters, industrial temperature transmitters and other field instruments, and its reliability and stability has been fully verified by a large number of shipments in the industrial field.

Product feature

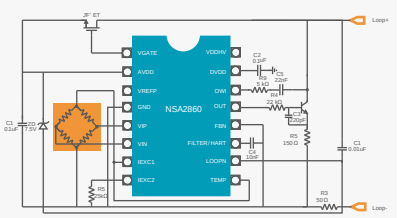
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Integrated dual constant current source output, supporting three-wire or four-wire RTD temperature sensor input
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support SPI BUS or I²C digital interface, which can also be used as digital transmitter analog front-end
- OWI interface, which can support customer calibration after assembly in the case of two-wire 4~20mA connection
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Low static current, with 1.5mA working current perfectly supporting 4-20mA loop power supply

Functional block diagram

NSA2860 (X) internal block diagram



NSA2860 is used for 4~20mA loop powered pressure transmitter



Package

- NSA2860_SSOP16: SSOP16
- NSA2860_TSSOP: TSSOP20
- NSA2860X-QQNR: QFN20

Application

Industrial pressure transmitter and temperature transmitter

Industrial field instrument analog front-end

PLC/DCS analog input/output

NSA2862X: Analog Front-end Chip for Low-power Digital Industrial Sensor

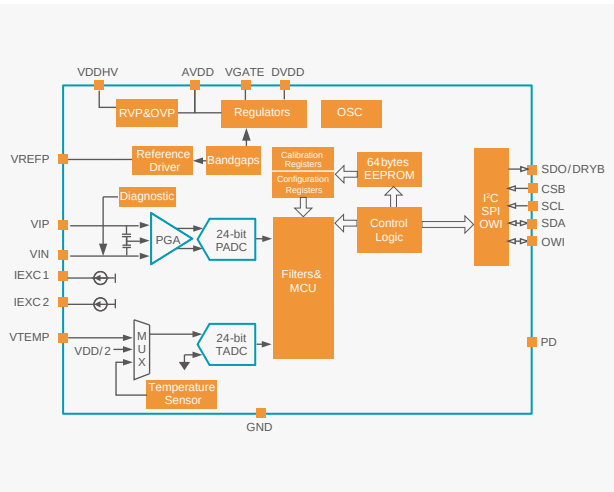
Product introduction

The NSA2862X is an analog front-end chip specially developed for digital industrial transmitters or IIoT industrial sensors requiring low sleep power consumption. NSA2862X has an internal integrated bridge drive, dual constant current source drive, PGA and 24-bit high-precision ADC, which can be easily used for interface bridge pressure sensors or temperature sensors such as RTD/TC. Its integrates customer-programmable digital calibration logic and EEPROM, so that customers can easily carry out sensor assembly calibration and calibration coefficient saving. The NSA2862X has a dedicated PD pin that can be used in industrial wireless sensor applications to set the chip to a low-power off state with 100nA static sleep current. Over the past few years, the chip has been widely used in industrial pressure IoT meters, and its reliability and stability has been fully verified in the industrial field by a large number of shipments.

Product feature

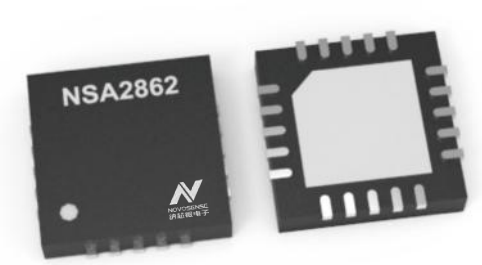
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Integrated dual constant current source output, supporting three-wire or four-wire RTD temperature sensor input
- Support SPI BUS or I^2C digital interface, which is used as digital transmitter analog front-end
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Power Down mode is supported. The static current in sleep mode is at 100nA level at room temperature

Functional block diagram



Package

- NSA2862X_DQNR: QFN20



Application

Industrial pressure transmitter and temperature transmitter

Industrial field instrument analog front-end

PLC/DCS analog quantity input

NSC2860X: Capacitive Industrial Transmitter Signal Processing Chip Supporting 4~20mA Output

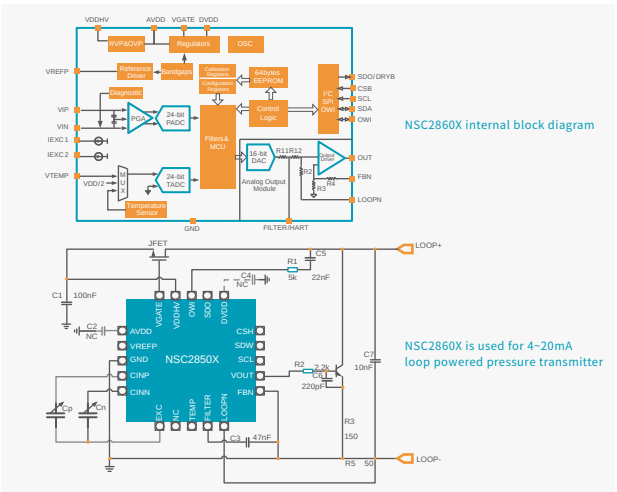
Product introduction

NSC2860X is an ASSP chip specially developed for 4~20mA current output or 0~5V voltage output industrial transmitter. NSC2860X has an integrated capacitive voltage conversion circuit, which specially designed for interface capacitive pressure sensors. It integrates the customer programmable digital calibration logic, and also provides a convenient OWI interface that can communicate directly with the analog line of 4~20mA, making it convenient for the customer to calibrate the sensor after assembly and save the calibration coefficient. In addition, the NSC2860X also integrates with an external JFET controller, which can be used directly under standard industrial loop power supply conditions of 24V without the need for an additional power controller. Over the past few years, the chip has been widely used in application of industrial capacitive pressure transmitter, and its reliability and stability has been fully verified in the industrial field by a large number of shipments.

Product feature

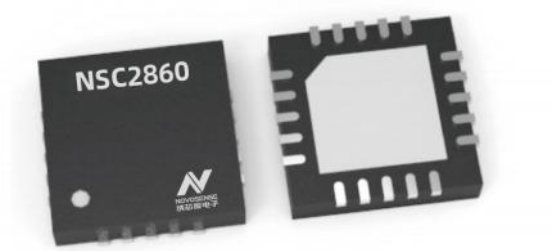
- Integrated capacitive voltage conversion circuit, supporting capacitive pressure sensor interface
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support SPI BUS or I²C digital interface, which can also be used as digital transmitter analog front-end
- OWI interface, which can support customer calibration after assembly in the case of two-wire 4~20mA connection
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Low static current, with 1.5mA working current perfectly supporting 4-20mA loop power supply
- The power pin VDDH can withstand high voltage shocks up to 28V to achieve high reliability in industrial field applications

Functional block diagram



Package

- NSC2860X-DQNR: QFN20



Application

Industrial capacitive pressure transmitter

NSA9260(X): Signal Conditioning Chip for Resistive Bridge Automobile Pressure Sensor

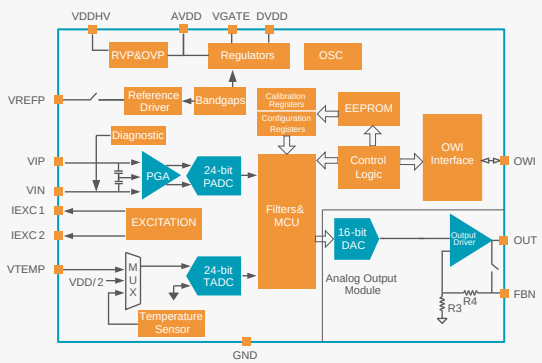
Product introduction

NSA9260 (X) is an EMC enhanced AECQ100 compliant high integration chip for signal conditioning of resistance bridge automotive pressure sensors. The NSA9260 (X) adopts a high-precision variable gain instrument amplifier and a 24-bit ADC to form the main signal measurement channel, and a 24-bit ADC to form the auxiliary temperature measurement channel. With built-in digital processing engine, the NSA9260X supports second-order temperature drift calibration and the highest third-order nonlinear calibration for sensor zero temperature and sensitivity of the sensor. The calibration accuracy can be up to 0.1%, and its calibration coefficients are stored in a set of programmable EEPROMs. NSA9260X supports over-voltage and reverse-voltage protection, analog voltage output and PWM output, as well as sensor diagnosis.

Product feature

- Support -24V to 28V over voltage and reverse voltage protection for automotive sensor applications
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Support sensor diagnosis and output clamp function
- High-precision 1X ~ 256X variable gain instrument amplifier, up to 8x digital gain
- Built-in digital processor-based sensor calibration logic, supporting post-customer calibration, up to third-order nonlinear calibration and second-order temperature sensitivity and offset calibration
- Calibration data can be stored in EEPROM, p multiple times programmable
- Ratio-metric or absolute voltage output, supporting PWM output as well
- Enhanced EMC performance
- Proprietary OWI communication mode, supporting calibration after sensor assembly
- Operating temperature range: -40°C ~ 150°C, compatible with AECQ100 standard

Functional block diagram



Package

- SSOP16

Application

Auto pressure sensor module
(TMAP, automotive air conditioning pressure, oil pressure sensor, brake pressure sensor, etc.)

Industrial transmitter

NSC9260(X): Signal Conditioning Chip for Capacitive Automobile Pressure Sensor

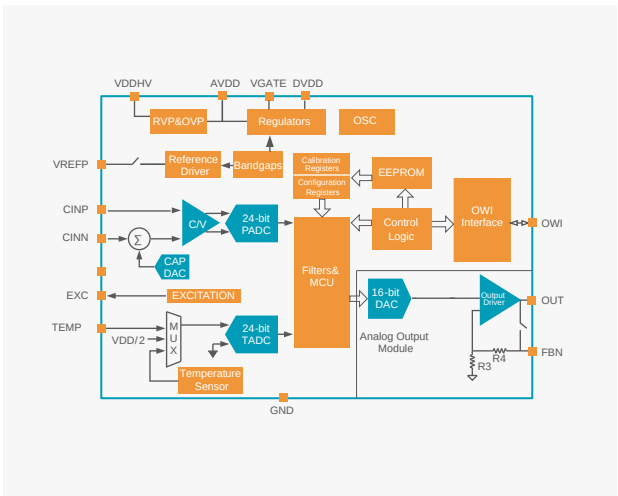
Product introduction

NSC9260 (X) is an EMC enhanced AECQ100 compliant high integration chip for signal conditioning of capacitive automotive pressure sensors. The NSC9260 (X) adopts a capacitance voltage conversion circuit and a 24-bit ADC to form the main signal measurement channel, and a 24-bit ADC to form the auxiliary temperature measurement channel. With built-in digital processing engine, the NSC9260X supports second-order temperature drift calibration and the highest third-order nonlinear calibration for sensor zero temperature and sensitivity of the sensor. The calibration accuracy can be up to 0.1%, and its calibration coefficients are stored in a set of programmable EEPROMs. NSC9260 (X) supports over-voltage and reverse-voltage protection, analog voltage output and PWM output, which is mainly used in automotive capacitive pressure sensors for measuring pressure values above 1MPa.

Product feature

- Support -24V to 28V over voltage and reverse voltage protection for automotive sensor applications
- It integrates C/V capacitive voltage conversion circuit and 24-bit high-precision ADC, which can easily measure capacitance of capacitive pressure sensor, calculate and convert it to pressure.
- Built-in digital processor-based sensor calibration logic, supporting post-customer calibration, up to third-order nonlinear calibration and second-order temperature sensitivity and offset calibration
- Calibration data can be stored in EEPROM, multiple times programmable
- Ratio-metric or absolute voltage output, supporting PWM output
- Enhanced EMC performance
- Proprietary OWI communication mode, supporting calibration after sensor assembly
- Operating temperature range: -40°C ~ 150°C, compatible with AECQ100 standard

Functional block diagram



Package

- SSOP16

Application

Auto capacitive pressure sensor module (automotive air conditioning pressure, brake pressure, etc.)

NSC9262: Capacitive Automobile Pressure Sensor Signal Conditioning Chip Supporting LIN BUS

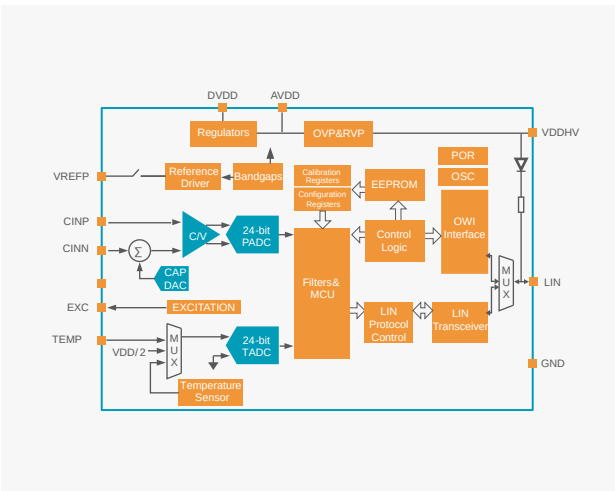
Product introduction

NSC9262 is an EMC enhanced AECQ100 compliant high integration chip for signal conditioning of capacitive automotive pressure sensors, with LIN BUS interface provided. NSC9262 adopts a capacitance voltage conversion circuit and a 24-bit ADC to form the main signal measurement channel, and a 24-bit ADC to form the auxiliary temperature measurement channel. With built-in digital processing engine, the NSC9262 supports second-order temperature drift calibration and the highest third-order nonlinear calibration for sensor zero temperature and sensitivity of the sensor. The calibration accuracy can be up to 0.1%, and its calibration coefficients are stored in a set of programmable EEPROMs. NSC9262 supports over voltage and reverse voltage protection, supports LIN BUS interface and meets LIN BUS specifications. It is mainly used in the application of capacitive pressure sensors for measuring pressure values above 1MPa in automobiles.

Product feature

- Support -40V to 40V over voltage and reverse voltage protection for automotive sensor applications
- It integrates C/V capacitive voltage conversion circuit and 24-bit high-precision ADC, which can easily measure capacitance of capacitive pressure sensor, calculate and convert it to pressure.
- Built-in digital processor-based sensor calibration logic, supporting customer calibration, up to third-order nonlinear calibration and second-order temperature sensitivity and offset calibration
- Calibration data can be stored in EEPROM, programmable multiple times
- Meet the LIN BUS specification 1.3/2.0/2.1
- Proprietary OWI communication mode, supporting calibration after sensor assembly
- Operating temperature range: -40°C ~ 150°C, compatible with AEC-Q100 standard

Functional block diagram



LIN BUS certification

- LIN BUS certification LIN1.3/2.0/2.1

Package

- SSOP16

Application

Automotive capacitive air conditioning pressure sensor module

NSC9264: Capacitive Automobile Pressure Sensor Signal Conditioning Chip Supporting SENT BUS

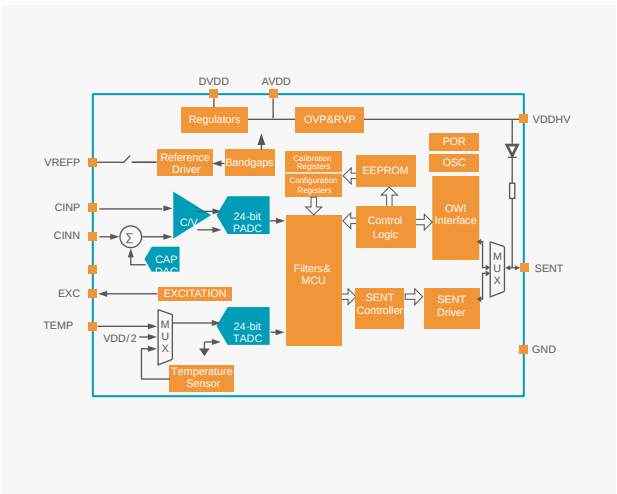
Product introduction

The NSC9264 is an EMC-enhanced AECQ100 high-integration chip for signal conditioning of capacitive automotive pressure sensors with a SENT BUS interface. NSC9264 adopts a capacitance voltage conversion circuit and a 24-bit ADC to form the main signal measurement channel, and a 24-bit ADC to form the auxiliary temperature measurement channel. With built-in digital processing engine, the NSC9264 supports second-order temperature drift calibration and the highest third-order nonlinear calibration for sensor zero temperature and sensitivity of the sensor. The calibration accuracy can be up to 0.1%, and its calibration coefficients are stored in a set of programmable EEPROMs. NSC9264 supports over voltage and reverse voltage protection, supports SENT BUS interface and meets SAE J2716 BUS specifications. It is mainly used in the application of capacitive pressure sensors for measuring pressure values above 1MPa in automobiles.

Product feature

- Support -24V to 24V over voltage and reverse voltage protection for automotive sensor applications
- It integrates C/V capacitive voltage conversion circuit and 24-bit high-precision ADC, which can easily measure capacitance of capacitive pressure sensor, calculate and convert it to pressure.
- Built-in digital processor-based sensor calibration logic, supporting customer calibration, up to third-order nonlinear calibration and second-order temperature sensitivity and offset calibration
- Calibration data can be stored in EEPROM, programmable multiple times
- Meet SAE J2716 protocol specification, meet fast and slow channel output and provide diagnostic function
- Proprietary OWI communication mode, supporting calibration after sensor assembly
- Operating temperature range: -40°C ~ 150°C, compatible with AECQ100 standard

Functional block diagram



Package

- SSOP16

Application

Automotive capacitive pressure sensor module

MEMS Microphone Signal Conditioning Chip

50

MEMS Microphone Signal Conditioning Chip

Part number	Product description	Product feature	Supply voltage/current	AOP	Bias range / step size	Gain range/ step size	Noise	Output mode	Typical application
NSC6272	Analog output MEMS microphone signal conditioning chip	Low cost analog output MEMS microphone signal conditioning Bias adjustment step length 0.3V Gain adjustment step 0.5dB	1.6V~3.6V /125μA	128dBV	7.5V~16V/0.3V	-4dB~11dB/ 0.5dB	4μVrms	Analog	TWS headset Smart television Smart household appliances Smart speaker
NSC6273	Analog output MEMS microphone signal conditioning chip	Low cost analog output MEMS microphone signal conditioning Bias adjustment step length 0.3V Gain adjustment step 0.5dB	2.3V~3.6V /125μA	130dBV	7.5V~16V/0.3V	-4dB~11dB/ 0.5dB	4μVrms	Analog	TWS headset Smart television Smart household appliances Smart speaker
NSC6280	Analog output MEMS microphone signal conditioning chip	Enhanced analog output MEMS microphone signal conditioning Bias adjustment step length 0.3V Gain adjustment step 0.5dB Increase EMI anti-interference of high frequency signal, make it more suitable for use in mobile phone and other applications	1.6V~3.6V /120μA	132dBV	6V~15.5V/0.3V	-1.5dB~11dB /0.5dB	4μVrms	Analog	Mobile/PAD
NSC6360	Digital output MEMS microphone signal conditioning chip	Enhanced digital output MEMS microphone signal conditioning Enhanced power supply PSRR	1.62V~3.6V /300μA@ 768kHz，750μA@2.4MHz	117dBF.S.	7.6V~15.9V /1.18V	9dB~17dB/ 0.6dB	4.5μVrms	Digital	Laptop Smart speaker
NSC6362	Digital output MEMS microphone signal conditioning chip	Enhanced digital output MEMS microphone signal conditioning Enhanced power supply PSRR	1.62V~3.6V /330μA@ 768kHz,780μA@2.4MHz	120dBF.S.	7.5V~14.4V/0.3V; 15V~19.2V/0.6V	0dB~23dB/ 0.5dB	3μVrms	Digital	Laptop Smart speaker
NSC6364	Digital output MEMS microphone signal conditioning chip with I2S interface	I2S interface Multiple modes including performance, low power and standby mode Low power consumption Suitable for mini size package	1.65V~3.6V /540μA@3.072MHz，285μA@768kHz	120dBSPL	4.7V~12.7V/0.5	AGain：4.9dB~15.7dB/1.8dB-DGain: -1.9dB~3.8dB/0.5dB	4μVrms	Digital	Wearable devices Remote control Internet of Things Smart home appliances Game consoles

NSC6272/NSC6273: Analog Output MEMS Microphone Signal Conditioning Chip

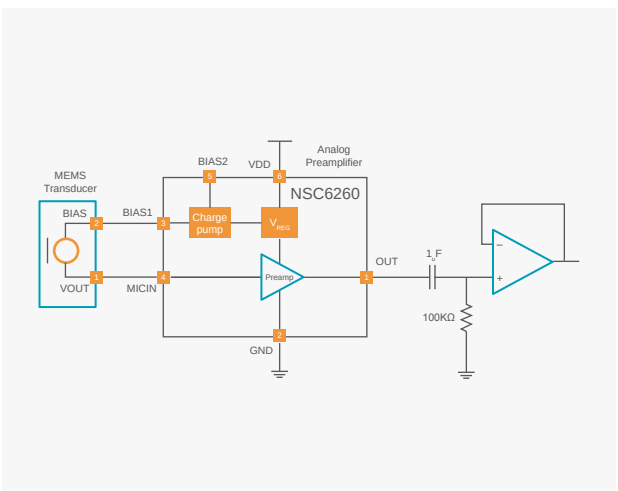
Product introduction

NSC6272/NSC6273 is a MEMS microphone preamplifier. The NSC6272/NSC6273 features an integrated low-noise offset MEMS microphone circuit, as well as a high-performance analog preamplifier that provides true sound quality and supports flexible microphone systems. The bias voltage and analog preamplifier gain can be adjusted via an internal fuse bank (OTP), so the NSC6272/NSC6273 can support MEMS sensors with different parameters. It can also increase yields and provide better sensitivity consistency. The NSC6272/NSC6273 has two output pads for bias voltage at different positions, one of which can be selected as required at the top plate of the MEMS microphone. The AOP performance of NSC6273 is 130dBV, which is improved compared to 128dBV of NSC6272.

Product feature

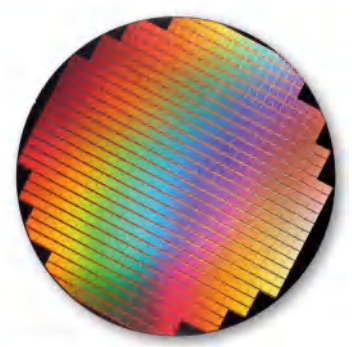
- Working voltage: 1.6V～3.6V for NSC6272, 2.3V~3.6V for NSC6273
- Current drain: 125μA typ.
- Equivalent input noise: 4μVrms（-108dBV）
- Gain adjustment (OTP): -4dB～11dB with 0.5dB/Step
- Frequency response: 20Hz～20kHz
- Bias voltage: 7.5V～16V with 0.3V/Step
- Working temperature: -40°C～85°C

Functional block diagram



Package

- KGD



Application

TWS headset

Smart television

Smart household appliances

Smart speaker

NSC6280: Analog Output MEMS Microphone Signal Conditioning Chip

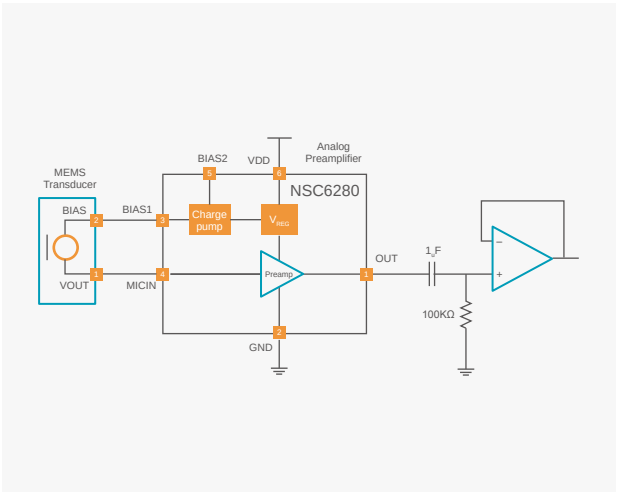
Product introduction

NSC6280 is a MEMS microphone preamplifier. The NSC6280 features an integrated low-noise offset MEMS microphone circuit, as well as a high-performance analog preamplifier that provides true sound quality and supports flexible microphone systems. The bias voltage and analog preamplifier gain can be adjusted via an internal fuse bank (OTP), so the NSC6280 can support MEMS sensors with different parameters. It can also increase yields and provide better sensitivity consistency. The NSC6280 has two output pads for bias voltage at different positions, one of which can be selected as required at the top plate of the MEMS microphone. In addition, the NSC6280 is used for relatively high-end mobile phone applications. This chip has been subjected optimization in respect of high-frequency EMI interference and yield in mass production.

Product feature

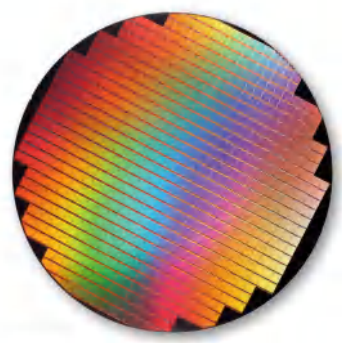
- Working voltage: 1.6V～3.6V
- Current drain: 120μA typ.
- Equivalent input noise: 4μVrms（-108dBV）
- Gain adjustment (OTP): -4dB～11dB with 0.5dB/Step
- Frequency response: 20Hz～20kHz
- Bias voltage: 6V～15.5V with 0.3V/Step
- Working temperature: -40°C～85°C

Functional block diagram



Package

- KGD



Application

Cellphone

PAD products

NSC6360: Digital PDM Output MEMS Microphone Signal Conditioning Chip

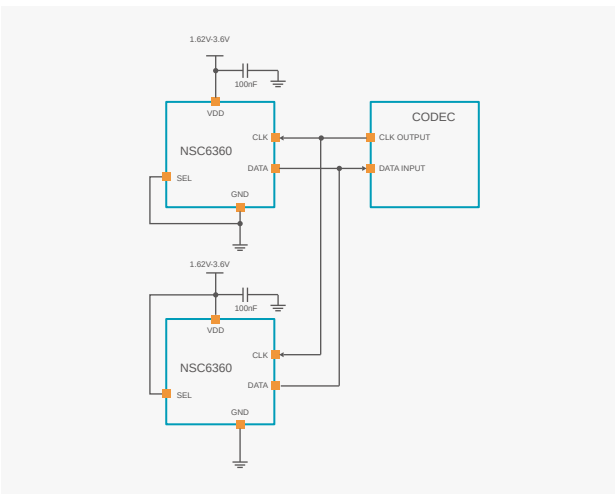
Product introduction

The NSC6360 is a PDM output preamplifier for MEMS digital microphones. The chip integrates a low noise bias circuit for MEMS microphones and a high performance analog pre-amplifier circuit to provide high quality audio signal output and high flexibility for MEMS microphones. The built-in OTP is adjustable for bias and gain, so the NSC6360 supports MEMS microphone sensors with different parameters for better sensitivity consistency. Customers can integrate the chip into the MEMS digital microphone chip for audio signal conditioning. The NSC6360 chip has an extremely low startup and wake time of 20ms, programmable gain bias voltage, and left and right channel polarity. The NSC6360 supports dynamic current adjustment based on the input clock frequency, so it can be used in different power modes. The operating voltage of the chip ranges from 1.6V to 3.6V, and its operating modes include sleep mode, low voltage mode and normal mode.

Product feature

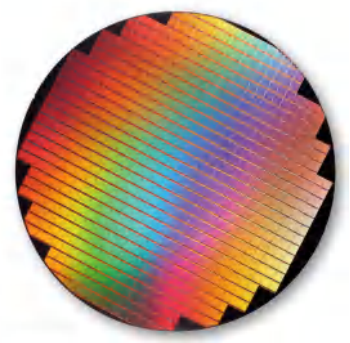
- Working voltage: 1.62V～3.6V
- Working mode: sleep mode, low voltage mode, and normal mode
- Current drain: 300μA @768kHz, 750uA@2.4MHz
- Equivalent input noise: 4.5μVrms（-107dBV）
- Gain adjustment (OTP): 9dB～17dBFS with 0.6dB/Step
- Bias voltage: 7.6V～15.9V with 1.18V/Step
- Working temperature: -40°C～85°C

Functional block diagram



Package

- KGD



Application

Laptop　　Cellphone　　Smart speaker

NSC6362: Digital PDM Output MEMS Microphone Signal Conditioning Chip

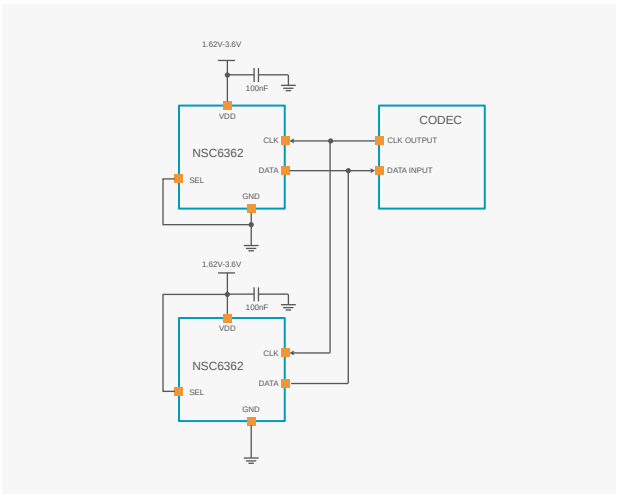
Product introduction

The NSC6362 is a PDM output preamplifier for MEMS digital microphones. The chip integrates a low noise bias circuit for MEMS microphones and a high-performance analog pre-amplifier circuit to provide high quality audio signal output and high flexibility for MEMS microphones. The built-in OTP is adjustable for bias voltage and gain, so the NSC6362 supports MEMS microphone sensors with different parameters for better sensitivity consistency. Customers can integrate the chip into the MEMS digital microphone chip for audio signal conditioning. The NSC6362 chip has an extremely low startup and wake time of 20ms, programmable gain, bias voltage and left and right channel polarity. The NSC6362 supports dynamic current adjustment based on the input clock frequency, so it can be used in different power modes. The operating voltage of the chip ranges from 1.62V to 3.6V, and its operating modes include sleep mode, low voltage mode and normal mode.

Product feature

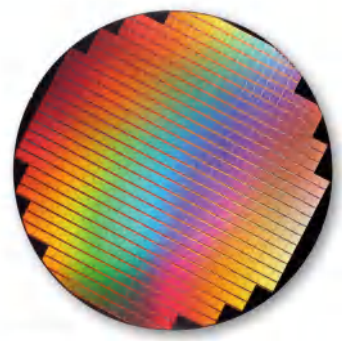
- Working voltage: 1.62V～3.6V
- Working mode: sleep mode, low voltage mode, and normal mode
- Current drain: 330μA @768kHz, 780uA@2.4MHz
- Equivalent input noise: 3μVrms（-110dBV）
- Gain adjustment (OTP): 0dB～23dBFS with 0.5dB/Step
- Bias voltage: 7.5V～19.2V with 1.3V/Step
- Working temperature: -40°C～85°C

Functional block diagram



Package

- KGD



Application

Laptop

Cellphone

Smart speaker

NSC6364: I2S Interface Digital MEMS Microphone Signal Conditioning Chip

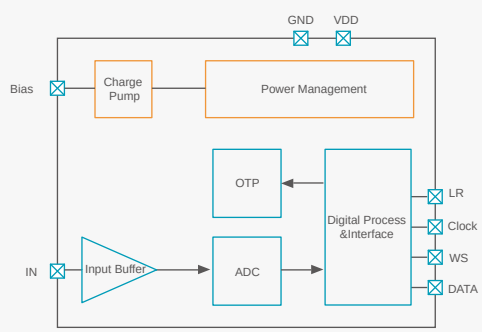
Product introduction

NSC6364 is an I2S interface silicon microphone conditioning chip for wearable devices, smart home appliances and the Internet of Things. Depending on specific MEMS microphones, the SNR can reach more than 63dB, and it has sleep, low power consumption and performance modes to meet the needs of Always Listening to the system in real time. Compared with the traditional PDM interface silicon microphone +ADC solution, this product can significantly reduce the system cost and power consumption of acoustic acquisition channel.

Product feature

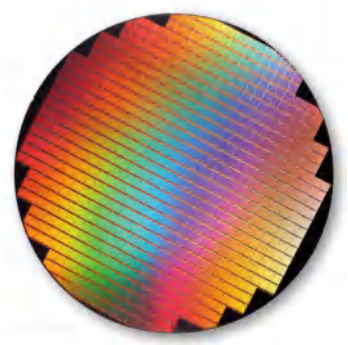
- I2S output, SNR up to 67dB
- Operating voltage range: 1.65V~3.6V
- Ultra-low power consumption
- BIAS adjustable, 4.7V~12.7V
- Analog gain adjustable, 4.9dB~+15.7dB
- Digital gain adjustable, -1.9dB~+3.8dB
- Grain size, 600um x 900um
- HBM ESD, ±4kV
- Operating temperature, -40°C~85°C
- Three working modes: Sleep, low power consumption and performance
- Good RF resistance

Functional block diagram



Package

- KGD



Application

Wearables

Remote control

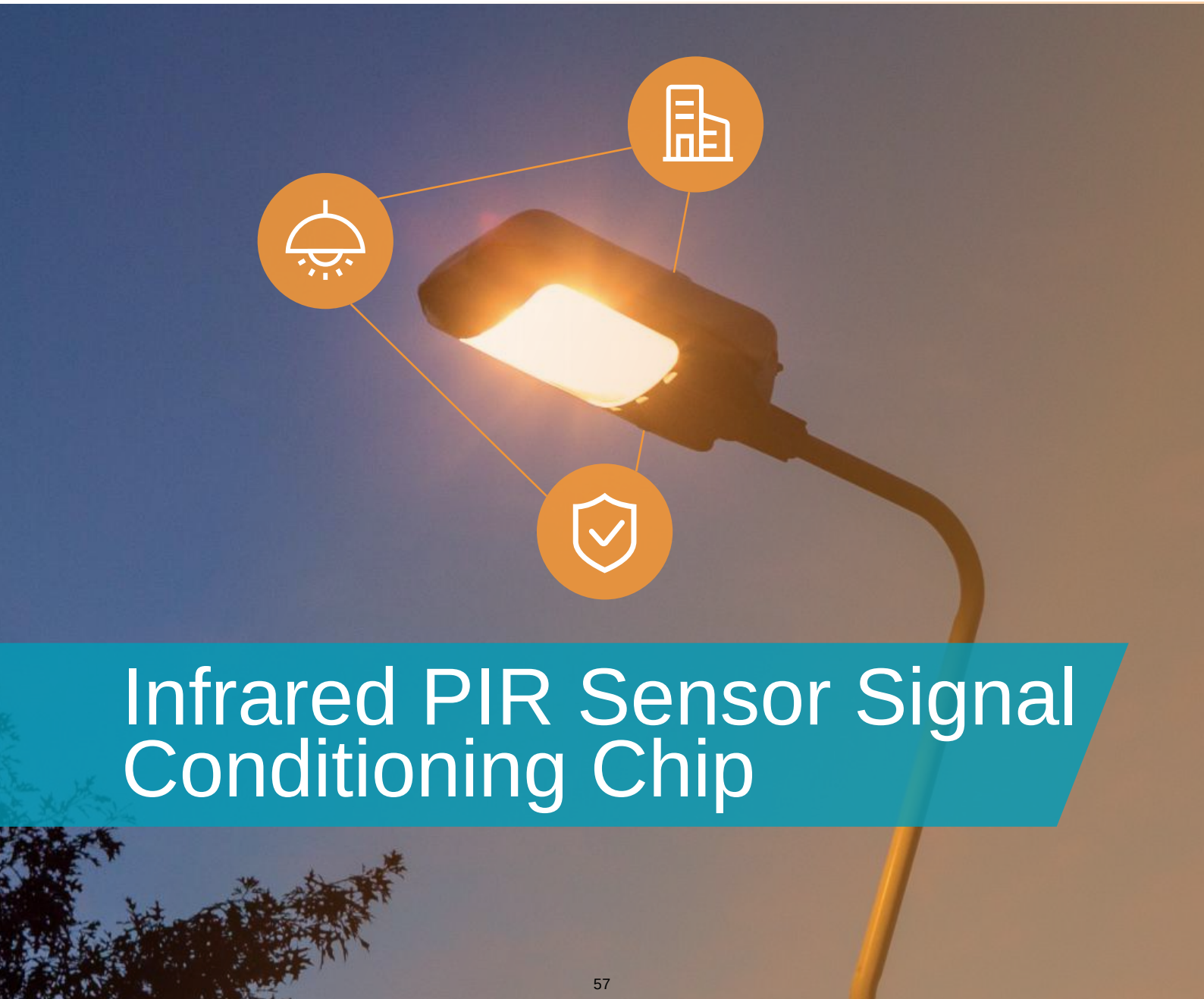
IoT

Intelligence appliance

Game machine

Infrared PIR Sensor Signal Conditioning Chip

Part number	Probe fitting mode	Output mode	Product feature	Package	Temperature range	Supply voltage/ current	Start (minimum) trigger threshold	Product sub-material No. / Order No.	Output mode	Typical application
NSC6272	External type	Switching value output	Resistance adjustment for judging the threshold and opening time	SOP8	-25~85°C	1.8V~4.5V/ 13μA	52μV	NSA3162T	Binary	Smart lighting/Smart doorbell Smart security (camera)
NSA3180	Internal type	Switching value output	Resistance adjustment for judging the threshold and opening time	DFN8	-40~85°C	1.5V~4.5V/ 10μA	50μV	NSA3180FT 520	Binary	Smart lighting/Smart doorbell Smart security (camera)
NSA3180T	Internal type	Switching value output	Resistance adjustment for judging the threshold and opening time	DFN8	-25~85°C	1.8V~4.5V /13μA	52μV	NSA3180TF T00	Binary	Smart lighting/Smart doorbell Smart security (camera)
NSA3182	External type	Switching value output	Resistance adjustment for judging the threshold and opening time, with built-in LDO	SOP8	-40~85°C	3.1V~12V /13μA	50μV	NSA3182FT 100	Binary	Smart lighting
NSA3166	External type	Digital out-put/switching output	Register configuration for judging the threshold and opening time	DFN8	-40~85°C	1.6V~4.5V /6μA	50μV	NSA3166_C DNR	Digital and Binary	Smart lighting/Smart doorbell Smart security (camera)



Infrared PIR Sensor Signal Conditioning Chip

NSA3162T: Common External PIR Sensor Signal Conditioning Chip

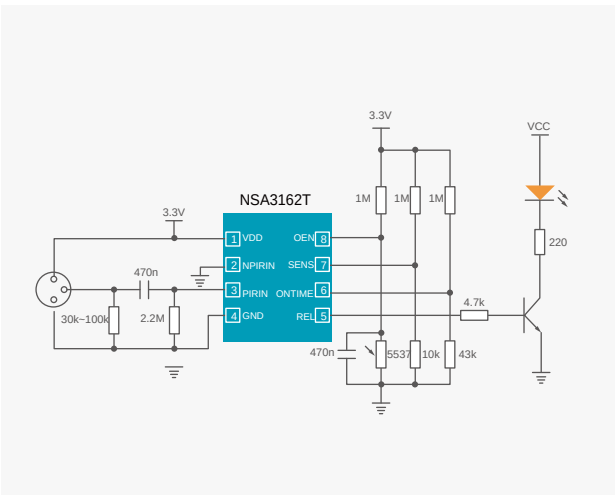
Product introduction

NSA3162T is a highly integrated signal processing chip for pyroelectric infrared sensor (PIR). A single NSA3162T integrates all the necessary components for pyroelectric passive infrared mobile detection, and the analog front end can be directly connected to the analog PIR detector via AC coupling. Built-in high-precision analog-to-digital converter can convert the detector signal into digital signal. The digital engine can detect the movement of human body, reduce the interference from external and support binary output. The sensor sensitivity threshold and alarm maintenance time can be adjusted by an external resistor.

Product feature

- Suitable for PIR external signal conditioning applications, with SOP8 package
- Sensitivity and response time adjustable through an external resistor
- Power supply ranges from 1.8V to 4.5V
- Binary output
- Low power consumption, static current 15μA

Functional block diagram



Package

- SOP8

Application

Smart lighting

Smart security

Building automation

NSA3180 (T): Built-in PIR Sensor Signal Conditioning Chip

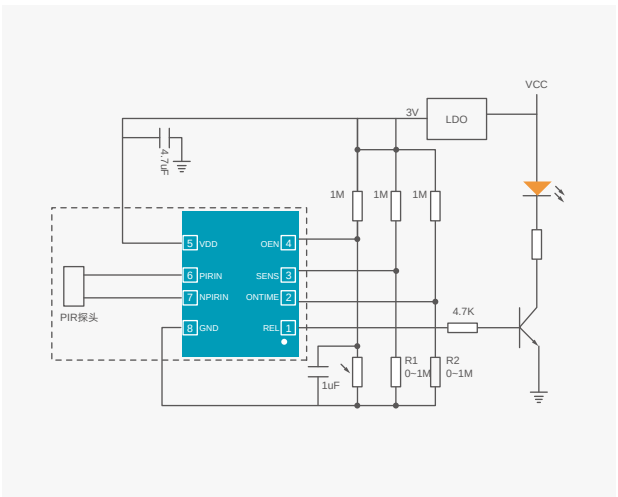
Product introduction

NSA3180/3180T is a highly integrated control chip for pyroelectric infrared sensor (PIR). A single NSA3180 integrates all the necessary components for pyroelectric passive infrared mobile detection, and the analog front end can be directly connected to the analog PIR detector. Built-in high-precision analog-to-digital converter can convert the detector signal into digital signal. The digital engine can detect the movement of human body, reduce the interference from external, and support binary output. The sensor sensitivity threshold and alarm maintenance time can be adjusted by an external resistor. Compared with NSA3180, NSA3180T has a slightly larger static current and a slightly higher minimum operating voltage, which is the low-cost version of NSA3180.

Product feature

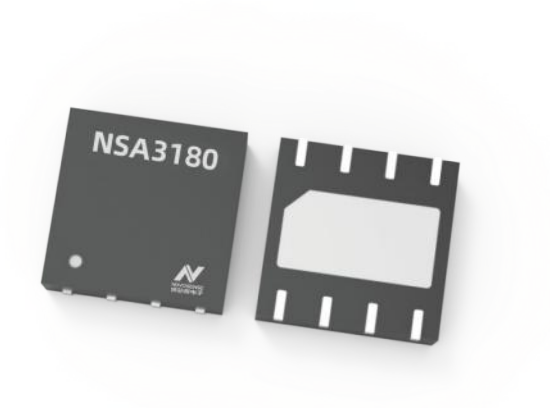
- Suitable for PIR internal signal conditioning applications, with DFN8 package
- Sensitivity and response time adjustable through an external resistor
- Binary output
- Low power consumption, static current 13μA (NSA3180T: 15μA)
- Power supply voltage range is 1.5V~4.5V (NSA3180T: 1.8V~4.5V)

Functional block diagram



Package

- DFN8



Application

Smart lighting

Smart security

Building automation

NSA3182: External PIR Sensor Signal Conditioning Chip Integrated with LDO

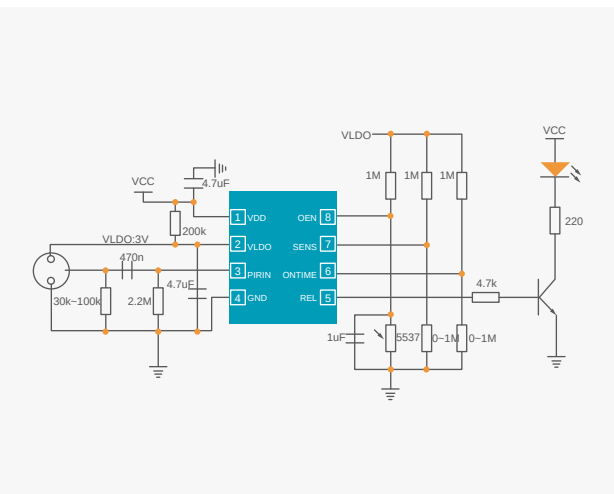
Product introduction

NSA3182 is a highly integrated control chip for pyroelectric infrared sensor (PIR). A single NSA3182 integrates all the necessary components for pyroelectric passive infrared mobile detection, and the analog front end can be directly connected to the analog PIR detector via AC coupling. Built-in 3V output LDO supplies power to the PIR detector. Built-in high-precision analog-to-digital converter can convert the detector signal into digital signal. The digital engine can detect the movement of human body, reduce the interference from external and support binary output. The sensor sensitivity threshold and alarm maintenance time can be adjusted by an external resistor.

Product feature

- Suitable for PIR external signal conditioning applications, with SOP8 package
- Sensitivity and response time adjustable through an external resistor
- Built-in LDO for direct power supply with high voltage of 12V for smart lighting
- applications
- Binary output
- Low power consumption, static current 13μA

Functional block diagram



Package

- SOP8

Application

Smart lighting

Smart security

Building automation

NSA3166: Digital Output PIR Sensor Signal Conditioning Chip

Product introduction

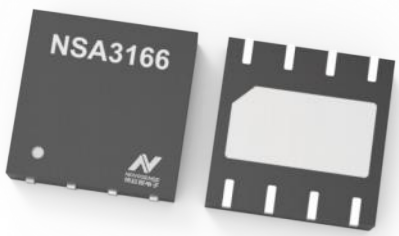
The NSA3166 is a highly integrated signal processing chip for pyroelectric infrared sensors (PIR) for smart security applications. A single NSA3166 integrates all the necessary components for pyroelectric passive infrared mobile detection, and the analog front end can be directly connected to the analog PIR detector via AC coupling. Built-in high-precision analog-to-digital converter can convert the detector signal into digital signal. The digital engine can detect the movement of human body, reduce the interference from external and support binary output and digital output. The sensor sensitivity threshold and alarm maintenance time can be dynamically adjusted by writing registers through the digital communication interface. In addition, users can also configure and adjust the logic judgment mode of human body recognition inside the chip.

Product feature

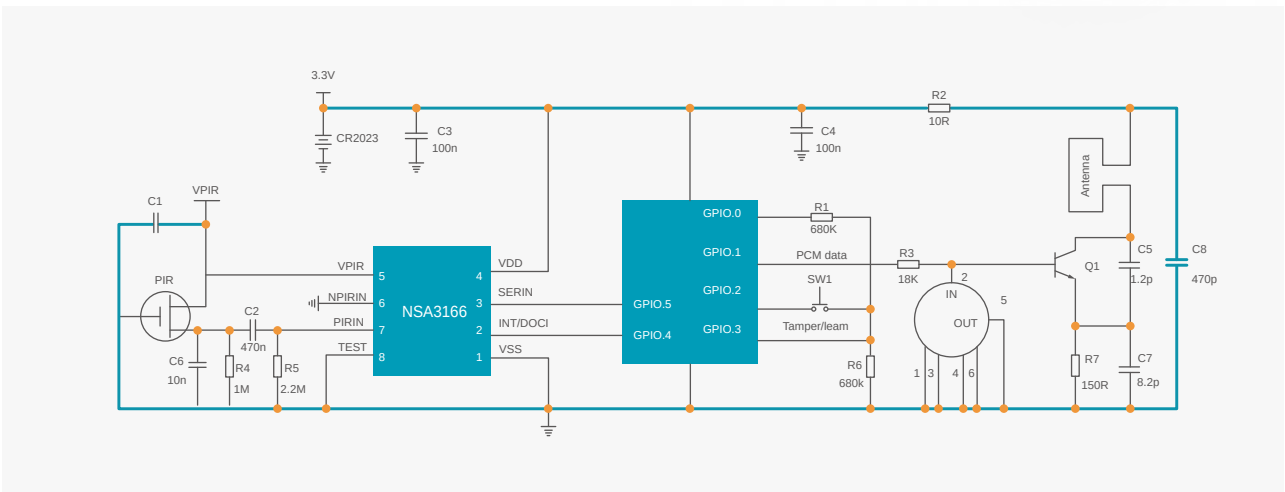
- Suitable for PIR external signal conditioning applications, with DFN8 package
- Sensitivity and response time are adjustable through digital interface
- Power supply ranges from 1.6V to 4.5V
- Support digital output and binary output
- Low-power consumption, low static current of 6μA
- Built-in temperature sensor to facilitate customers to adjust sensitivity according to temperature

Package

- DFN8



Functional block diagram



Application

Smart lighting

Smart security

Smart camera

Building automation and smart doorbell

Thermopile Sensor Signal Conditioning Chip

NSA3300: Thermopile Sensor Signal Conditioning Chip

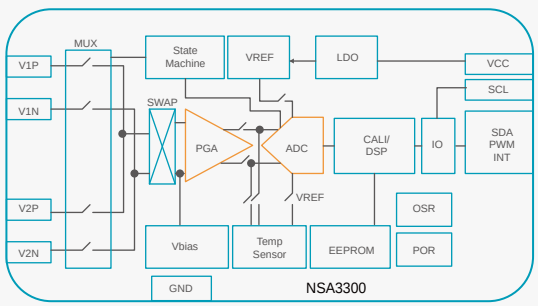
Product introduction

NSA3300 is a signal conditioning chip for thermopile sensor, which is mainly used to interface thermopile sensor and convert the sensor output into digital. The internal digital engine can automatically calculate the voltage output of the thermopile sensor into temperature value. Based on the data of the LUT which is programed by the user, the end customer can directly read the temperature value through the I²C interface from the IC. The chip has low-noise instrument amplifier PGA, 24bit Σ-Δ ADC and DSP calibration algorithm. It can measure the target temperature within the range of -70 °C to 380°C and meet the accuracy error of 1% in the whole temperature range, accuracy of ±0.2°C in the range of 35°C to 42°C for human body temperature measurement, and the highest resolution of 0.01°C/LSB. The chip also can support ADC raw data to be readout without any DSP processing. The internal ambient temperature sensor on the chip can offer a high precision temperature measurement within ±0.2°C error in the range between 0~40°C. The NSA3300 supports two differential signal inputs and has four working modes: continuous single-channel sensor and ambient temperature combined output, continuous dual-channel sensor and ambient temperature combined output, continuous dual-channel sensor output, and sleep mode. In the dual-channel application scenario, the application is mainly NDIR.

Product feature

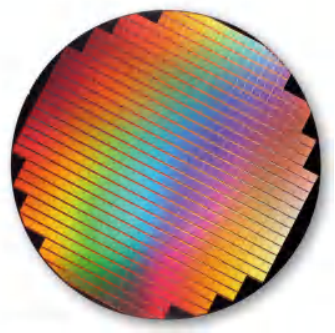
- High-precision signal amplification PGA, adjustable gain from 8x to 128x, and equivalent input noise less than 3μVrms
- Integrated high-precision temperature sensor, with accuracy up to +/-0.2°C in room temperature range from 0°C to 40°C
- Built-in EEPROM for 32-point LUT input, with digital linear interpolation between two points
- Support client sensor post-calibration, with sensitivity, offset and non-linearity compensation
- Support direct I²C reading of the target temperature, which can be configured as the temperature binary output mode
- Low power consumption, with sleep current of 5μA
- Wafer-level supply, with small die size: 1mm x 1.5mm

Functional block diagram



Package

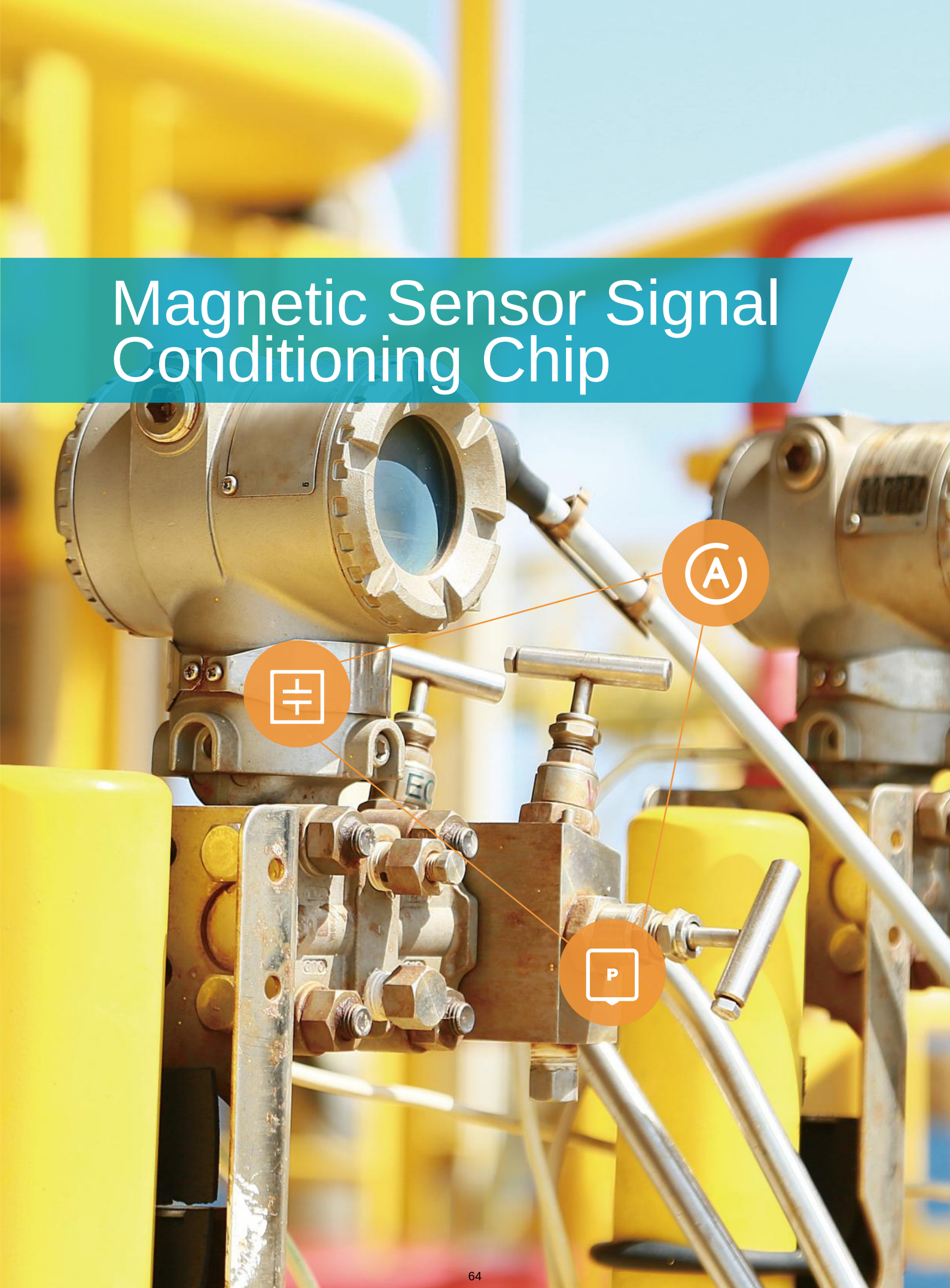
- KGD



Application

- Forehead thermometer/ear thermometer
- Industrial temperature measurement
- White household appliances
- Kitchen household appliances
- Security
- NDIR gas sensor

Magnetic Sensor Signal Conditioning Chip



NSA5312: Magnetic Sensor Signal Conditioning Chip/Programmable Instrumentation Amplifier

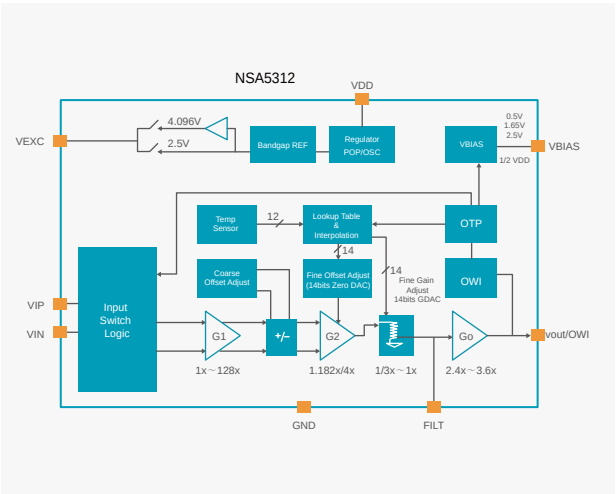
Product introduction

The NSA5312 is a user programmable instrumentation amplifier. It is mainly used to provide voltage type drive signal for Wheatstone bridge sensors (such as TMR sensors),and amplify, calibrate and compensate the output signal to ensure that the sensor can get high linear output accuracy in a wide temperature range.

Product feature

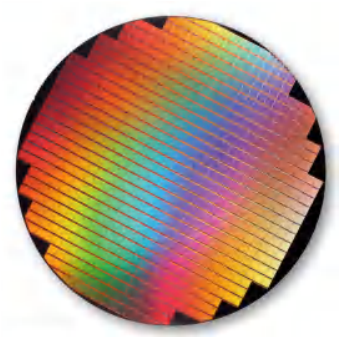
- Provide 2.5V / 4.096V voltage excitation
- Provide 0.9456~1843x programmable gain setting
- Provide 14-bit sensor sensitivity and offset calibration
- Provide sensor temperature calibration based on lookup table
- Programmable output signal bandwidth, with maximum signal bandwidth is about 600kHz
- Fast response time <1μs
- Proportional output and fixed output are available. The output reference voltage is available in 0.5V/1.65V/2.5V.
- Provide user programmable interface OWI, and support customer module level post-calibration

Functional block diagram



Package

- KGD



Application

Current sensor module

Pressure sensor module

Industrial transmitter

Isolated RS-485 Transceiver

NSi8038x Series Isolated RS-485 Transceiver									
	Part No.	Duplex	Iso Rating (kVrms)	ESD	Max DataRate (Mbps)	No. of Nodes	Isolation Grade	Operating Temperature Range (°C)	Package Type
RS-485	NSi83085E	Half	5	16	0.5	256	Reinforced	-40~105	SOW-16
	NSi83086E	Full	5	16	16	256	Reinforced	-40~105	SOW-16
	NIRS485	Half	3	8	1	256	Basic	-40~105	SSOP-16

NSi8308xE: Isolated Half-Duplex/Full-Duplex 485 Transceiver with High Reliability

Product introduction

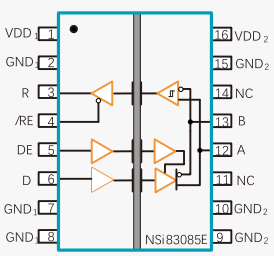
NSi8308xE is a family of isolated RS-485 transceivers based on NOVOSENSE digital isolated transceiver technology, where the NSi83085E is a half-duplex RS-485 transceiver and the NSi83086E is a full-duplex RS-485 transceiver. Both devices are safety certified by UL1577 support 5kVrms insulation withstand voltages, and feature low emission, low power consumption and high immunity to electromagnetic interference. The BUS pins on the BUS side of the NIRS485 is designed with ±10kV ESD protection to ground at system level. This product is designed with a fail-safe circuit that ensures the receiver output is logic high when the receiver input is disconnected or shorted. It features a receiver input impedance of 1/8 unit load, allowing up to 256 transceivers to be connected to the BUS.

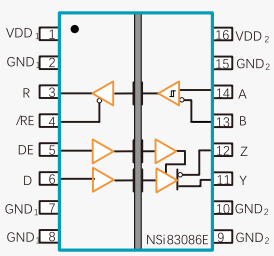
The data rate of NSi83085E is 12Mbps, and the data rate of NSi83086E is 16Mbps, and the products reduce EMI and reflection by optimizing the slew rate.

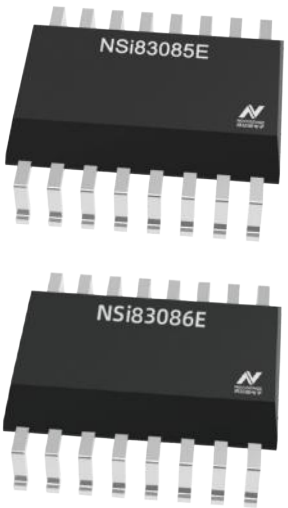
Product feature

- Dielectric strength 5000Vrms
- Up to 5000Vrms Insulation voltage
- VDD1 supply voltage: 2.5V to 5.5V
- High CMTI: ±150kV/μs
- High system level EMC performance:
  BUS pins conforming to IEC61000-4-2±10kV ESD
- Fail-safe receiver
- Supporting 256 transceivers
- Isolation Barrier Life: >60 years
- Operating temperature: -40°C to 105°C
- RoHS compliant package: SOW-16

Pinout & Package







Application

Industrial automation system

Isolated 485 communication system

Smart ammeters and water meters

Security and surveillance systems

NIRS485: Cost-optimized Isolated 485 Transceiver

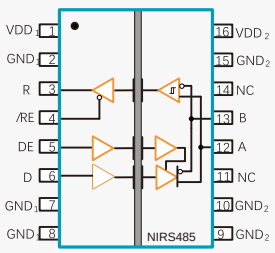
Product introduction

NIRS485 is an isolated half-duplex RS-485 based on NOVOSENSE digital isolated transceiver technology. It is safety certified by UL1577 support 3kVrms insulation withstand voltages, and features low emission, low power consumption and high immunity to electromagnetic interference. The BUS pins on the BUS side of the NIRS485 is designed with ±8kV ESD protection to ground at system level. This device is designed with a fail-safe circuit that ensures the receiver output is logic high when the receiver input is disconnected or shorted. It features a receiver input impedance of 1/8 unit load, allowing up to 256 transceivers to be connected to the BUS.
The data rate of NIRS485 is 1Mbps. The NIRS485 reduces EMI and reflections by optimizing the slew rate.

Product feature

- Up to 3000Vrms Insulation voltage
- BUS side supply voltage: 3.0V to 5.5V
- VDD1 supply voltage: 2.5V to 5.5V
- High CMTI: ±100kV/μs
- High system level EMC performance:
  BUS pins conforming to IEC61000-4-2±8kV ESD
- Fail-safe receiver
- Supporting 256 transceivers
- Isolation Barrier Life: >60 years
- Operating temperature: -40°C to 105°C
- RoHS compliant package: SSOP-16

Pinout & Package



Application

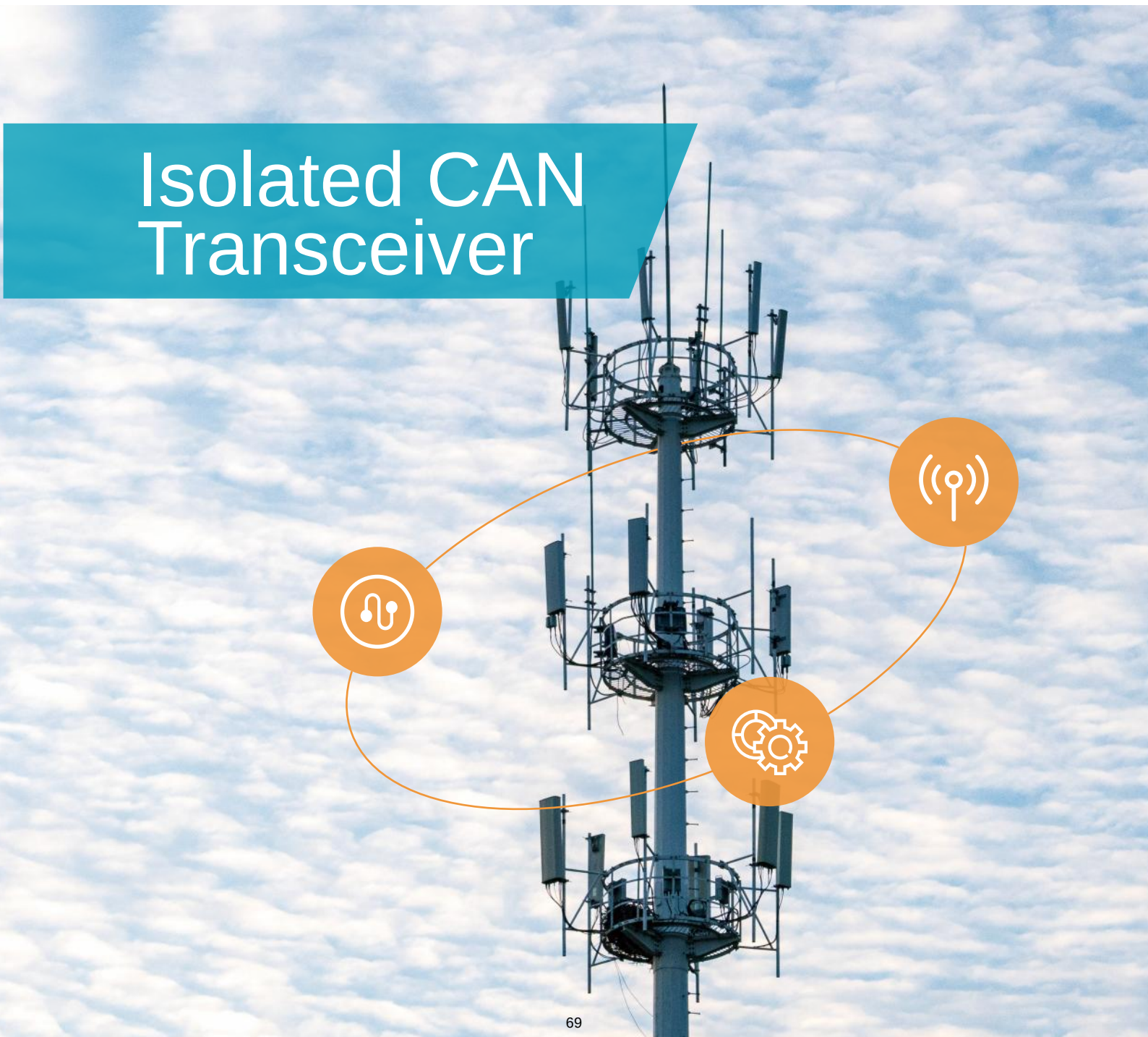
Battery management system

Isolated 485 communication system

Smart ammeters and water meters

Isolated CAN Transceiver

NSi1050 isolated CAN transceiver									
	Part No.	Part No.	Iso Rating (kVrms)	ESD(kV)	Max DataRate (Mbps)	No.of Nodes	Fail Safe	Operating Temperature Range (℃)	Package Type
CAN	NSi1050	NSi1050-DDBR	3	8	1	110	Idle, Open, Short	-40~125	DUB-8
	NSi1050	NSi1050-DSWR	5	8	1	110	Idle, Open, Short	-40~125	SOW-16
	NSi1042	NSi1042-DSWVR	5	8	5	110	Idle, Open, Short	-40~125	SOW-8
	NSi1042	NSi1042-DSWR	5	8	5	110	Idle, Open, Short	-40~125	SOW-16
	NSi1052	NSi1052-DSWR	5	8	5	110	Idle, Open, Short	-40~125	SOW-16



NSi1050: High-Performance Isolated CAN Transceiver

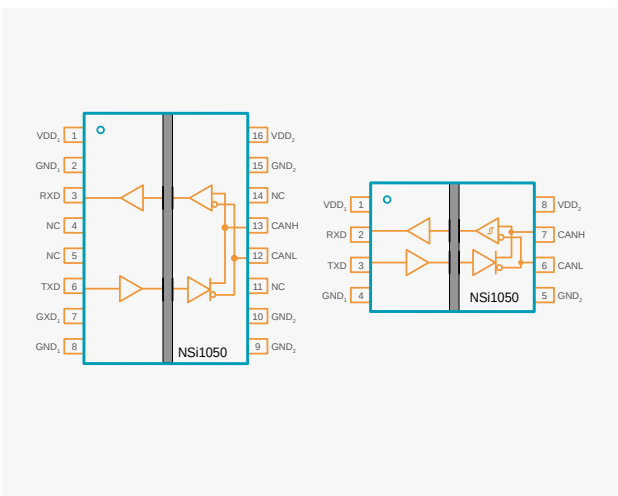
Product introduction

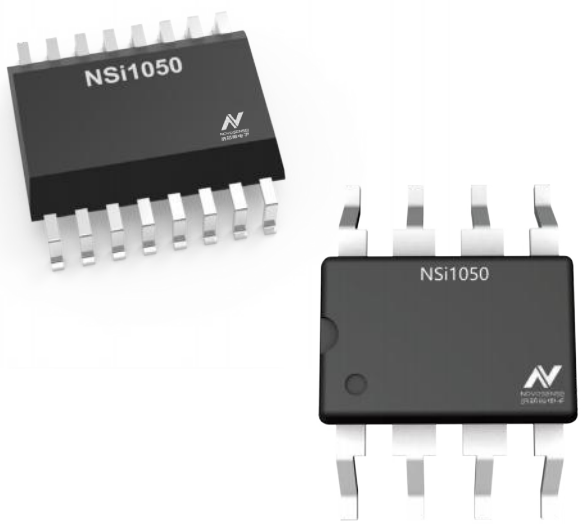
NSi1050 is an isolated CAN transceiver that is fully compatible with ISO11898-2. NSi1050 integrates a two-channel digital isolator and a high-performance CAN transceiver. The digital isolator uses silicon oxide isolation based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. NSi1050 device is safety certified by UL1577 support 5kVrms insulation withstand voltages, and feature high electromagnetic immunity and low emission. NSi1050 supports data transmission rates of up to 1Mbps and can support at least 110 CAN nodes. NSi1050 is designed with thermal protection and transmission data dominant timeout protection.

Product feature

- Fully compatible with ISO11898-2
- Up to 5000Vrms Insulation voltage
- Power supply voltage
  VDD1: 2.5V to 5.5V
  VDD2: 4.5V to 5.5V
- BUS protection voltage -40V to +40V
- Transmission data (TXD) dominant timeout protection
- Overcurrent and thermal protection
- Data transmission rates up to 1Mbps
- High CMTI: 100kV/μs
- Low loop delay: <220ns
- Enhanced system level ESD, EFT, surge immunity
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-16, DUB-8

Pinout & Package





Application

- Industrial automation system
- Isolated CAN BUS
- Communication

NSi1042/1052: High-Performance Isolated CAN Transceiver

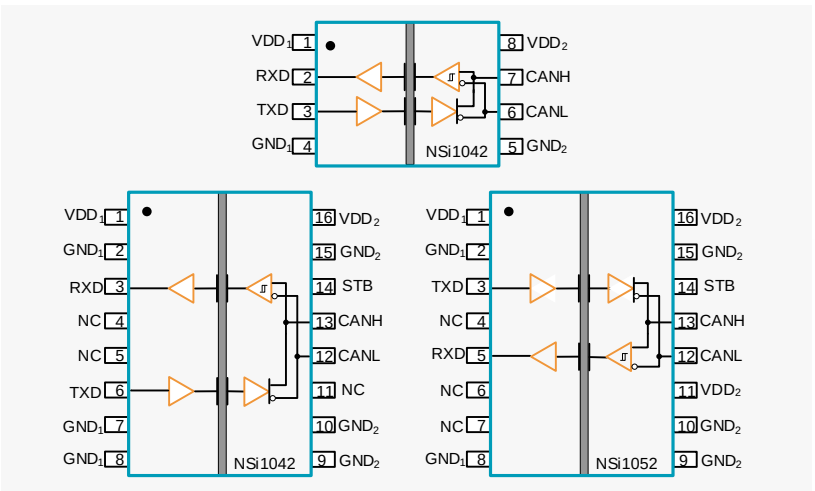
Product introduction

NSi1042 is an isolated CAN transceiver that is fully compatible with ISO11898-2. NSi1042 integrates a two-channel digital isolator and a high-performance CAN transceiver. The digital isolator uses silicon oxide isolation based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. NSi1042 device is safety certified by UL1577 support 5kVrms insulation withstand voltages, and feature high electromagnetic immunity and low emission. NSi1042 supports CAN FD with data rate up to 5Mbps and can support at least 110 CAN nodes. NSi1042 is designed with thermal protection and transmission data dominant timeout protection.

Product feature

- Fully compatible with ISO11898-2
- Up to 5000Vrms Insulation voltage
- Power supply voltage
- VDD1: 2.5V to 5.5V
- VDD2: 4.5V~5.5V
- BUS protection voltage -70V to +70V
- Overcurrent and thermal protection
- Communication rate up to 5Mbps
- High CMTI: 150kV / μs
- Low loop delay: <220ns
- Enhanced system level ESD, EFT, surge immunity
- Standby mode: NSi1052
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-8, SOW-16

Pinout & Package

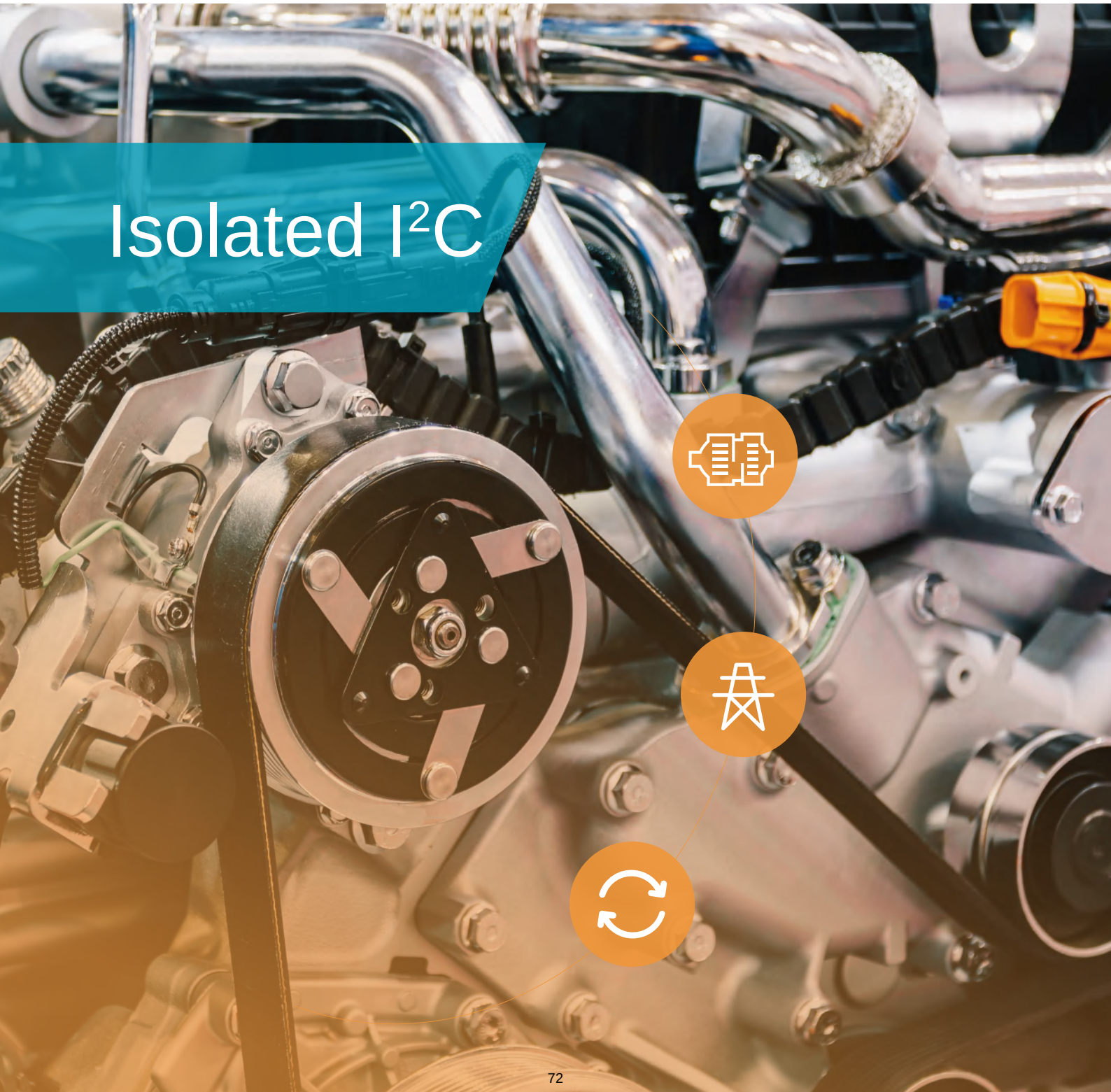


Application

- Industrial automation system
- Isolated CAN BUS
- Communication

Isolated I²C

NSi810x Isolated I²C								
	Part No.	Iso Rating (kVrms)	ESD(kV)	Bidirectional Channels	Max DataRate (Mbps)	AEC-Q100	Operating Temperature Range (°C)	Package Type
I²C	NSi8100N	3.75	6	2	2		-40~125	SOP-8
	NSi8100W	5	6	2	2		-40~125	SOW-16
	NSi8100NC	3.75	6	2	2		-40~125	SOP-8



NSi8100NC/NSi8100: High Reliability Bidirectional I²C Isolators

Product introduction

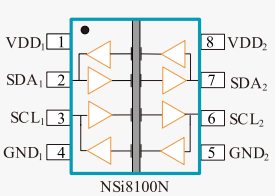
The NSi810x series are high reliability bidirectional 1²C digital isolators. The NSi810x devices are safety certified by UL1577 support several insulation withstand voltages (3.75kVrms, 5kVrms), and features high electromagnetic immunity and low emission characteristics. They Support I²C clock at a frequency up to 2MHZ, the common mode transient immunity (CMTI) is up to 150kV/μs. The wide power supply range allows them to be directly connected to digital interfaces such as most of the MCUs, and can easily provide bidirectional level conversion. Its excellent system-level electromagnetic compatibility (EMC) performance enhances its reliability and stability. NSi8100 provides dual-channel bidirectional isolation.

NSi8100NC is a bidirectional 1²C digital isolator that provides dual-channel bidirectional isolation with high reliability. It is safety certified by UL1577 support 5kVrms insulation withstand voltages, and features high electromagnetic immunity and low emission. They Support I²C clock at a frequency up to 2MHZ, the common mode transient immunity (CMTI) is up to 100kV/μs. The wide power supply range allows them to be directly connected to digital interfaces such as most of the MCUs, and can easily provide bidirectional level conversion. Its excellent system-level electromagnetic compatibility (EMC) performance enhances its reliability and stability.

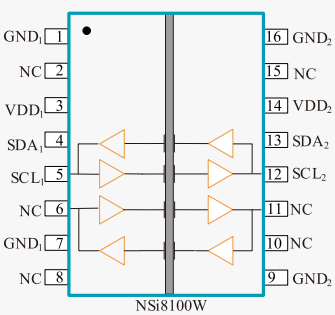
Product feature

- Up to 3750/5000Vrms Insulation voltage
- I²C clock rate: up to 2MHz
- Wide power supply range: 2.5V to 5.5V
- High common mode transient immunity (CMTI): ±150kV/μs
- High system level EMC performance: system level electrostatic discharge (ESD), burst immunity (EFT), surge protection
- Chip-level ESD performance: HBM: ±6kV
- Isolation Barrier Life: >60 years
- Wide operating temperature range: -40°C to 125°C
- RoHS compliant package: SOP-8, SOW-16

Pinout & Package



NSi8100N

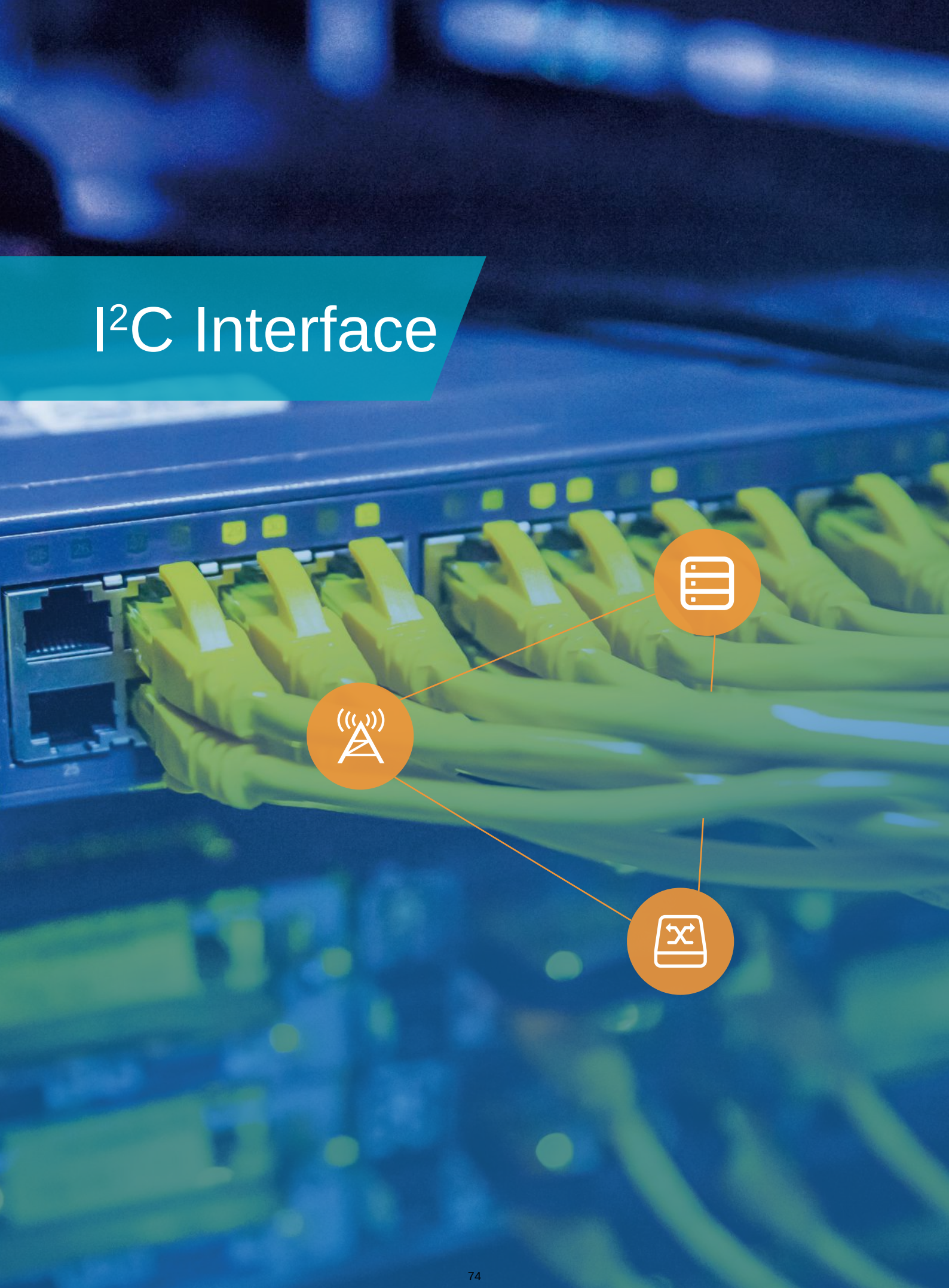


NSi8100W

Application

- I²C level converter
- Isolated I²C, PMBUS, SMBUS interface applications
- Power over Ethernet (POE)
- Motor control
- Power Supply System

I²C Interface



I²C Interface

I²C Hot-swappable NCA9511 Series								
	Part No.	VCC1(min)(V)	VCC1(max)(V)	VCC2(min)(V)	VCC2(max)(V)	Frequency (Max) (kHz)	Operating Temperature Range (°C)	Package Type
Hot Swappable Buffer	NCA9511	2.7	5.5	2.7	5.5	400	-40~105	MSOP-8
								SOP-8

I²C Level Converter NCA9306 Series								
	Part No.	VCC1(min)(V)	VCC1(max)(V)	VCC2(min)(V)	VCC2(max)(V)	Frequency (Max) (kHz)	Operating Temperature Range (°C)	Package Type
voltage-level shifter	NCA9306	1.2	3.3	1.8	5.5	400	-40~85	VSSOP-8
								TSSOP-8

I²C Buffer NCA9617 Series								
	Part No.	VCC1(min)(V)	VCC1(max)(V)	VCC2(min)(V)	VCC2(max)(V)	Frequency (Max) (kHz)	Operating Temperature Range (°C)	Package Type
Level-Translating Repeater	NCA9617	0.8	5.5	2.2	5.5	1000	-40~85	MSOP8

I²C switch NCA954x series									
	Part No.	Channel	VCC(min)(V)	VCC(max)(V)	Frequency (Max) (kHz)	Addresses	Features	Operating Temperature Range (°C)	Package Type
I²C-BUS switch	NCA9545	4	2.3	5.5	400	4	Interrupt Pin Reset Pin	-40~85	TSSOP-20
	NCA9546	4	2.3	5.5	400	8	Reset Pin	-40~85	TSSOP-16
	NCA9548	8	2.3	5.5	400	8	Reset Pin	-40~85	TSSOP-24

I²C GPIO expansion for NCA95xx series										
	Part No.	Channel	VCC(min)(V)	VCC(max)(V)	Frequency (Max) (kHz)	Addresses	Features	Operating Temperature Range (°C)	AEC-Q100	Package Type
I²C GPIO Expender	NCA9555	16	2.3	5.5	400	8	Interrupt Pin LED Driver	-40~85		TSSOP-24
	NCA9534	8	2.3	5.5	400	8	Interrupt Pin LED Driver	-40~85		TSSOP-16
										SOW-16
	NCA9539-Q1	16	1.65	5.5	400	4	Interrupt Pin LED Drive	-40~85	✓	TSSOP-24

NCA9511: I²C Hot-swappable BUS and SMBUS Buffer

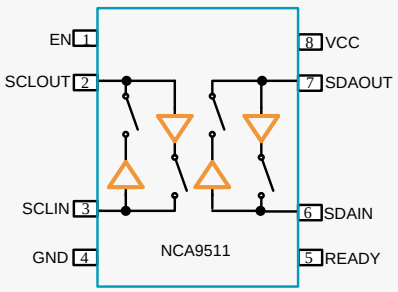
Product introduction

NCA9511 is a hot-swappable I²C BUS buffer that supports insertion of I/O cards into a powered backplane without damaging the data or the clock BUS. The control circuit prevents the backplane side I²C line (input) from connecting to the card side I²C line (output) until a stop command or BUS idle condition occurs on the backplane and there is no BUS contention on the card. After the connection is established, the device will provide bidirectional buffering, thus keeping the capacitance of the backplane and that of the card separate. During insertion, the SDA and SCL lines are pre-charged to 1V to minimize the current required to charge the parasitic capacitance of the device. When the I²C BUS is idle, the NCA9511 can be put into shutdown mode by setting the EN pin low, thereby reducing power consumption. When EN is pulled high, NCA9511 resumes normal operation. It also includes an open-drain READY output pin that indicates that the backplane is connected to the card side. When READY is high, SDAIN and SCLIN are connected to SDAOUT and SCLOUT. When both sides are disconnected, READY is low.

Product feature

- Supporting bidirectional data transmission signal of I²C BUS
- The operating supply voltage range is from 2.7V to 5.5V
  The TA ambient temperature range is from -40°C to 105°C
- 1-V pre-charge on all SDA and SCL lines prevents corruption during live insertion
- Compatible with standard mode and fast mode I²C devices
- Supporting clock stretching, arbitration and synchronization
- I²C BUS high-impedance state when VCC is powered down
- Operating temperature: -40°C to 105°C
- RoHS compliant package: MSOP-8, SOP-8

Pinout & Package



Application

Telecom switching equipment

Server

Enterprise switch

Base station

Industrial automation equipment

NCA9306: I²C and SMBUS Voltage Level Converter

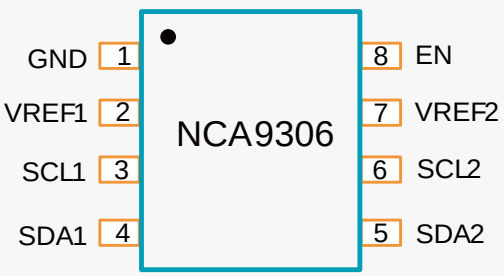
Product introduction

The NCA9306 device is a dual-channel bidirectional I²C and SMBUS voltage level converter with an enable (EN) input that enables bidirectional voltage conversion from 1.2V to 5V without the need of a direction pin. The switch is designed with a low on-state resistance (RON), allowing connections to be made with minimal propagation delay. When EN is high, the translator switch is ON, and the SCL1 and SDA1 I/O are connected to the SCL2 and SDA2 I/O, respectively, allowing bidirectional data flow between ports. When EN is low, the translator switch is off, and a high-impedance state exists between ports. the NCA9306 device can be used to isolate a 400kHz BUS from a 100kHz BUS by controlling the EN pin to disconnect the slower BUS during fast-mode communication.

Product feature

- 2-bit bidirectional converter for SDA and SCL lines in I²C applications
- Compatible with I²C and System Management BUS (SMBUS)
- Allowing level conversion between the following voltages
  1.2V VREF1 and 1.8V, 2.5V, 3.3V or 5V VREF2
  1.8V VREF1 and 2.5V, 3.3V or 5V VREF2
  2.5V VREF1 and 3.3V or 5V VREF2
  3.3V VREF1 and 5V VREF2
- Allowing bidirectional voltage conversion without direction pin
- Open drain I²C I/O ports (SCL1, SDA1, SCL2 and SDA2)
- Latch-up performance exceeds 100 mA per JESD 78, Class II
- ESD protection exceeds JESD 22
- 2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: VSSOP-8, TSSOP-8

Pinout & Package



Application

I²C, SMBUS, PMBUS, MDIO, UART, low-speed SDIO, GPIO and other bidirectional signal interfaces

Server

Router (telecom switching equipment)

Personal computer

Industrial automation

NCA9617: I²C and SMBUS Dual Bidirectional Buffer

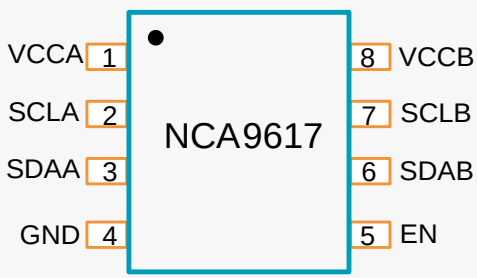
Product introduction

NCA9617 is a BiCMOS dual bidirectional buffer designed for I²C BUS and SMBUS systems. The device allows bidirectional voltage level conversion (up-conversion and down-conversion modes) between low voltages (as low as 0.8V) and higher voltages (2.2V to 5.5V) in hybrid applications. During level conversion, this device extends I²C and similar BUS systems without impairing system performance.

Product feature

- Dual-channel Bidirectional I²C Buffer
- Standard mode, fast mode (400kHz) and fast mode+ (1MHz) optional
- I²C operates voltage level conversion from 0.8V to 5.5V and from 2.5V to 5.5V
- Open-drain I²C I/O
- Clock stretching and multi-master arbitration supported on device
- Latch-up performance exceeds 100 mA per JESD 78, Class II
- ESD protection exceeds JESD 22
  5500V Human Body Model (A114-A)
  1500V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: MSOP-8

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Industrial equipment

Integrated with
a number of I²C
slave devices or products with long PCB wiring

NCA9545: 4-channel I²C-BUS Switch with Interrupt Logic and Reset

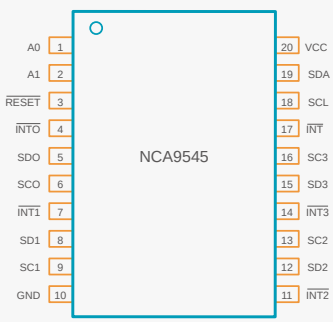
Product introduction

The NCA9545 is a quad bidirectional translating switch controlled via the I²C BUS. The SCL/SDA upstream pair fans out to four downstream pairs, or channels. Any individual SCN/SDN channel or combination of channels can be selected, depending on the contents of the program-mable control registers. Four interrupt inputs (INT3 to INT0) are provided, one for each of the downstream pairs. One interrupt (INT) output can be used as an AND operation of four interrupt inputs. A low-level on reset (RESET) input enables the NCA9545 to recover from a prolonged low state of any down-link I²C BUS. Pulling RESET low resets the I²C state machine and deselects all channels, as does the internal power-on reset function. With a on gate built into the switch, the VCC terminal can be used to limit the maximum voltage delivered by NCA9545. This allows each channel to use a different BUS voltage so that parts with voltage of 1.8V, 2.5V or 3.3V can communicate with parts with voltage of 5V without any additional protection. External pull-up resistors pull the BUS up to the desired voltage level for each channel. All I/O terminals can withstand 5.5 V.

Product feature

- 1-of-4 bidirectional translating switches
- Compatible with I²C BUS and SMBUS
- Active-low reset inputs
- 2 address pins, supporting 4 different addresses
- The operating supply voltage range is from 1.65V to 5.5V
- Low standby current
- Supports hot insertion
- Latch-up performance exceeds 100 mA per JESD 78
- ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: TSSOP-20

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Factory
automation

Products with I²C
slave address conflicts
(e.g. multiple, identical temp sensors)

NCA9546: 4-channel I²C Switch with Reset

Product introduction

NCA9546 is a quad-channel bidirectional switch controlled by I²C BUS. The SCL/SDA upstream pair fans out to four downstream pairs, or channels. Any single SCN/SDN channel or combination of channels can be selected, depending on the contents of the programmable control registers.

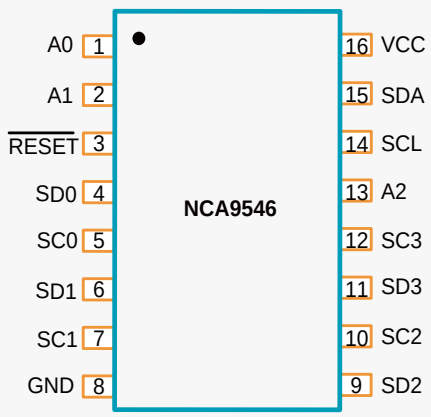
A low-level on reset (RESET) input enables the NCA9546 to recover from a prolonged low state of any down-link I²C BUS. Pulling RESET low resets the I²C state machine and deselects all channels, as does the internal power-on reset function.

The pass gates of the switches are constructed such that the VCC terminal can be used to limit the maximum high voltage, which will be passed by the NCA9546. This allows each channel to use a different BUS voltage so that parts with voltage of 1.8V, 2.5V or 3.3V can communicate with parts with voltage of 5V without any additional protection. External pull-up resistors pull the BUS up to the desired voltage level for each channel. All I/O terminals can withstand 5.5 V.

Product feature

- 1-of-4 bidirectional translating switches
- Compatible with I²C BUS and SMBUS
- Active-low reset input
- 3 address terminals, allowing up to 8 devices to be connected to the I²C BUS
- Channel selection via I²C BUS, any combination is OK
- Allowing voltage level conversion between 1.8V, 2.5V, 3.3V and 5V buses
- Operating supply voltage range is 1.7 V to 5.5 V
- Withstand voltage input of 5.5 V
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100 mA per JESD 78
  ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: TSSOP-16

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Factory
automation

Products with I²C
slave address conflicts
(e.g. multiple, identical temp sensors)

NCA9548: 8-channel I²C Switch with Reset

Product introduction

NCA9548 is an eight-channel bidirectional switch controlled by I²C BUS. The SCL/SDA upstream pair fans out to eight downstream pairs, or channels. Any single SCN/SDN channel or combination of channels can be selected, depending on the contents of the programmable control registers.

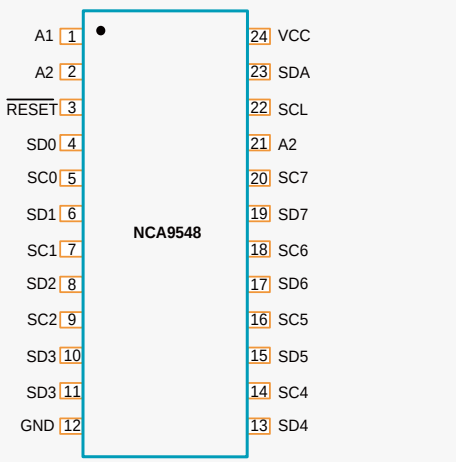
A low-level on reset (RESET) input enables the NCA9548 to recover from a prolonged low state of any down-link I²C BUS. Pulling RESET low resets the I²C state machine and deselects all channels, as does the internal power-on reset function.

The pass gates of the switches are constructed such that the VCC terminal can be used to limit the maximum high voltage, which will be passed by the NCA9548. This allows each channel to use a different BUS voltage so that parts with voltage of 1.8V, 2.5V or 3.3V can communicate with parts with voltage of 5V without any additional protection. External pull-up resistors pull the BUS up to the desired voltage level for each channel. All I/O terminals can withstand 5.5 V.

Product feature

- 1-of-8 bidirectional translating switches
- Compatible with I²C BUS and SMBUS
- Active-low reset input
- 3 address terminals, allowing up to 8 devices to be connected to the I²C BUS
- Channel selection via I²C BUS, any combination is OK
- Allowing voltage level conversion between 1.8V, 2.5V, 3.3V and 5V buses
- Operating supply voltage range is 1.65 V to 5.5 V
- Withstand voltage input of 5.5 V
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100mA per JESD 78
  ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: TSSOP-24

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Factory
automation

Products with I²C
slave address conflicts

NCA9555: I²C 16-bit GPIO Expansion

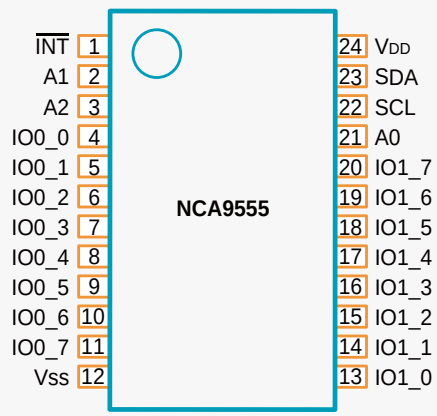
Product introduction

NCA9555 is a 24-pin CMOS device that provides 16-bit general purpose parallel I²C BUS number input/output GPIO expansion. It provides a simple solution to the additional I/O requirements of applications such as ACPI power switches, sensors, buttons, LEDs and fans. NCA9555 consists of two 8-bit configurations (input or output selection). Input, output and polarity inversion (high-level on or low-level on) registers. By writing to the I/O's configuration bits, the system host can enable I/O as input or output. The data of each input or output is stored in the corresponding input or output register. The polarity of the read register can be inverted with the Polarity inversion register. All registers can be read by the system host. NCA9555 open-drain interrupt output is activated when any input state differs from its corresponding input port register state and is used to indicate to the main equipment of the system that the output state has changed. A power-on reset sets the registers to their default values and initializes the state machine of the device. Three hardware pins (A0, A1, A2) change the fixed I²C BUS address and allow up to eight devices to share the same I²C BUS.

Product feature

- The operating supply voltage range is from 2.3V to 5.5V
- I²C to parallel port expander
- Polarity inversion register
- Active low interrupt output
- Compatible with most MCUs
- 16 I/O pins, 16 inputs by default
- Low standby current
- ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- 3 address pins, supporting 8 different addresses
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100mA
- Operating temperature: -40°C to 85°C
- RoHS compliant package: TSSOP-24

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Personal
computer

Personal
electronics

Factory
automation

Products with
GPIO-constrained
processors

NCA9534: I²C 8-bit GPIO Expansion

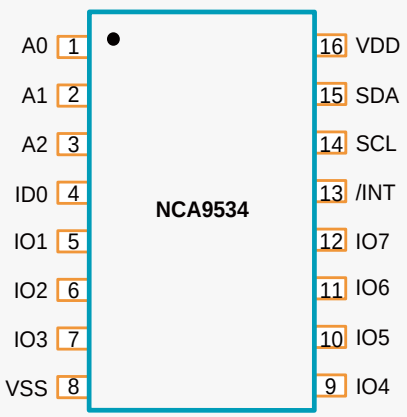
Product introduction

NCA9534 is a 16-pin CMOS device that provides 8-bit general purpose parallel I²C BUS number input/output GPIO expansion. It provides a simple solution to the additional I/O requirements of applications such as ACPI power switches, sensors, buttons, LEDs and fans. NCA9534 consists of one 8-bit configurations (input or output selection). Input, output and polarity inversion (high-level on or low-level on) registers. By writing to the I/O's configuration bits, the system host can enable I/O as input or output. The data of each input or output is stored in the corresponding input or output register. The polarity of the read register can be inverted with the Polarity Inversion register. All registers can be read by the system host. NCA9534 open-drain interrupt output is activated when any input state differs from its corresponding input port register state and is used to indicate to the main equipment of the system that the output state has changed. A power-on reset sets the registers to their default values and initializes the state machine of the device. Three hardware pins (A0, A1, A2) change the fixed I²C BUS address and allow up to eight devices to share the same I²C BUS.

Product feature

- he operating supply voltage range is from 2.3V to 5.5V
- I²C to parallel port expander
- Polarity inversion register
- Active low interrupt output
- Compatible with most MCUs
- 8 I/O pins, 8 inputs by default
- Low standby current
- ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- 3 address pins, supporting 8 different addresses
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100mA
- Operating temperature: -40°C to 85°C
- RoHS compliant package: SOW-16, TSSOP-16

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Personal
computer

Personal
electronics

Factory
automation

Products with
GPIO-constrained
processors

NCA9539-Q1: Automotive I²C 16-bit GPIO Expansion

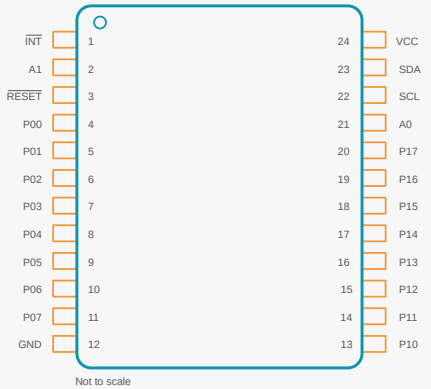
Product introduction

NCA9539-Q1 is a 16-pin CMOS device that provides 8-bit general purpose parallel I²C BUS number input/output GPIO expansion. It provides a simple solution to the additional I/O requirements of applications such as ACPI power switches, sensors, buttons, LEDs and fans. NCA9539-Q1 consists of two 8-bit configurations (input or output selection). Input, output and polarity inversion (high-level on or low-level on) registers. By writing to the I/O's configuration bits, the system host can enable I/O as input or output. The data of each input or output is stored in the corresponding input or output register. The polarity of the read register can be inverted with the Polarity Inversion register. All registers can be read by the system host. NCA9539-Q1 open-drain interrupt output is activated when any input state differs from its corresponding input port register state and is used to indicate to the main equipment of the system that the output state has changed. A power-on reset sets the registers to their default values and initializes the state machine of the device. Two hardware pins (A0, A1) change the fixed I²C BUS address and allow up to four devices to share the same I²C BUS.

Product feature

- The operating supply voltage range is from 1.65V to 5.5V
- I²C to parallel port expander
- Polarity inversion register
- Active low interrupt output
- Compatible with most MCUs
- 16 I/O pins, 16 inputs by default
- Low standby current
- ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- 2 address pins, supporting 4 different addresses
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100mA per JESD 78
- Operating temperature: -40°C to 125°C
- RoHS compliant package: TSSOP-24

Pinout & Package



Not to scale

Application

In-vehicle infotainment system,advanced driver assistance system (ADAS)

Automotive body electronics, hybrid electric vehicle (HEV), electric vehicle (EV) and powertrain

Industrial automation, factory automation, building automation, test & measurement, electronic point of sale (EPOS)

I²C GPIO expansion

CAN Transceiver

CAN Transceiver

CAN transceiver										
	Part No.	Part No.	Power Supply Voltage	ESD(kV)	Max DataRate (Mbps)	No. of Nodes	Low Power Mode	Operating Temperature Range (℃)	AEC-Q100	Package Type
CAN	NCA1042	NCA1042-DSPR	VIO: 3~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125		SOP-8
	NCA1042A-Q1	NCA1042A-Q1SPR	VIO: 3~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	SOP-8
		NCA1042A-Q1DNHR					Standby	-40~125	✓	DFN-8
	NCA1051	NCA1051-DSPR	VIO: 3~5.5V VCC: 4.5~5.5V	5	5	110	Silent	-40~125		SOIC-8W
	NCA1051N	NCA1051N-DSPR	VCC: 4.5~5.5V	5	5	110	Silent	-40~125		SOIC-16W
	NCA1043-Q1	NCA1043-Q1SPKR	VBAT: 4.5~40V VIO: 2.8~5.5V VCC: 4.5~5.5V	8	5	110	Standby Sleep	-40~125	✓	SOP-14
		NCA1043-Q1DNKR							✓	DFN-14
	NCA1145-Q1	NCA1145-Q1SPKR	VBAT: 4.5~28V VIO: 2.8~5.5V VCC: 4.5~5.5V	8	5	110	Standby Sleep	-40~125	✓	SOP-14
		NCA1145-Q1DNKR							✓	DFN-14

NCA1042: Fail-Safe CAN Transceiver Supporting CAN FD and BUS Wakeup

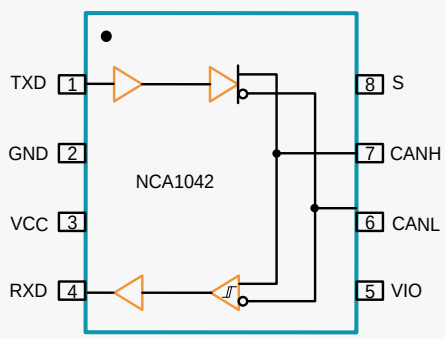
Product introduction

NCA1042 is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS, it can support at least 110 CAN nodes. NCA1042 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. Reliable communication is achieved in CAN FD fast phase networks with data rates up to 5 Mbps. NCA1042 is designed with thermal protection and transmission data explicit timeout protection.

Product feature

- Fully compatible with ISO11898-2
- I/O voltage range supports 3.3V and 5V MCU
- Power supply voltage
  VIO: 3V to 5.5V
  VDD: 4.5V~5.5V
- -70V to +70V BUS fault protection
- Transmission data (TXD) dominant timeout protection
- BUS dominant time out function in standby mode
- Ultra-low current standby mode with wake-up function
- Overcurrent and thermal protection
- Data rate: up to 5Mbps
- Low loop delay: <200ns
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOP-8

Pinout & Package



Application

Industrial automation, controls, sensors and drive systems

Building, security and climate control automations

Electric bicycle/ electric motorcycle system

CANopen

Standards for CAN BUS, such as CANopen, DeviceNet, NMEA2000, ARNIC825, ISO11783 and CANaerospace

NCA1042A-Q1: Automotive CAN BUS Transceiver Supporting CAN FD and BUS Wakeup

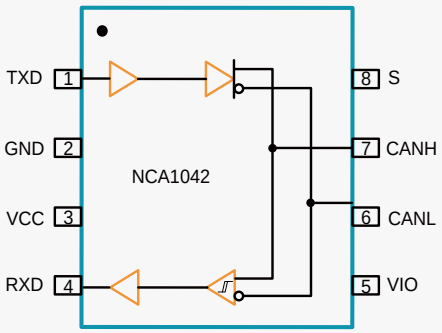
Product introduction

NCA1042A-Q1 is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS, it can support at least 110 CAN nodes. NCA1042A-Q1 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. Reliable communication is achieved in CAN FD fast phase networks with data rates up to 5 Mbps. NCA1042A-Q1 is designed with thermal protection and transmission data explicit timeout protection.

Product feature

- Fully compatible with ISO11898-2
- I/O voltage range supports 3.3V and 5V MCU
- Power supply voltage
  VIO: 3V to 5.5V
  VCC: 4.5V to 5.5V
- -58V to 58V BUS fault protection
- Transmission data (TXD) dominant timeout protection
- BUS dominant time out function in standby mode
- Ultra-low current standby mode with wake-up function
- Overcurrent and thermal protection
- Data rate: up to 5Mbps
- Low loop delay: <200ns
- Operating temperature: -40°C to 125°C
- AEC-Q100 certified
- RoHS compliant package: SOP-8, DFN-8

Pinout & Package



Application

Automotive
and Transportation

NCA1051/N: Fail-Safe CAN Transceiver Supporting CAN FD and BUS Wakeup

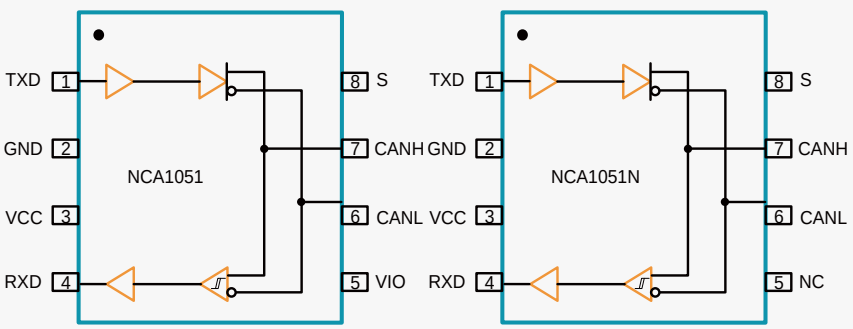
Product introduction

NCA1051/N is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS, it can support at least 110 CAN nodes. NCA1051 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. Reliable communication is achieved in CAN FD fast phase networks with data rates up to 5 Mbps. The NCA1051 provides thermal protection and transmit data dominant time out function. These features make the NCA1051 an excellent choice for all types of HS-CAN networks, in nodes that do not require a silent mode with wake-up capability via the BUS.

Product feature

- Fully compatible with ISO11898-2
- Ideal passive behavior to the CAN BUS when the supply voltage is off
- I/O voltage range supports 3.3V and 5V MCU
- Power supply voltage
- VIO (NCA1051): 3V to 5.5V
  VCC: 4.5V to 5.5V
- -45V to 45V BUS fault protection
- Transmission data (TXD) dominant timeout protection
- Overcurrent and thermal protection
- Data rate: up to 5Mbps
- Low loop delay: <200ns
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOP-8

Pinout & Package



Application

5Mbps operation in highly loaded CAN networks down to 10 kbps networks using TXD DTO

Industrial automation, controls, sensors and drive systems

Building, security and climate control automations

Standards for CAN BUS, such as CANopen, DeviceNet, NMEA2000, ARNIC825, ISO11783 and CANaerospace

NCA1043-Q1: Automotive CAN BUS Transceiver Supporting CAN FD and Battery Back-up

Product introduction

NCA1043-Q1 is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS, it can support at least 110 CAN nodes. NCA1043-Q1 is designed to meet the requirements of high-speed CAN applications in the automotive industry, providing differential transmit and receive capability to (a microcontroller with) a CAN protocol controller. The NCA1043-Q1 offers excellent Electro Magnetic Compatibility (EMC) and ElectroStatic Discharge (ESD) performance, ultra-low power consumption and passive performance when the power supply voltage is off. Further features include:

○ Low-power management controls the power supply throughout the node while supporting local and remote wake-up with wake-up source recognition

○ Various protection and diagnostic functions, including BUS short circuit detection and battery connection detection

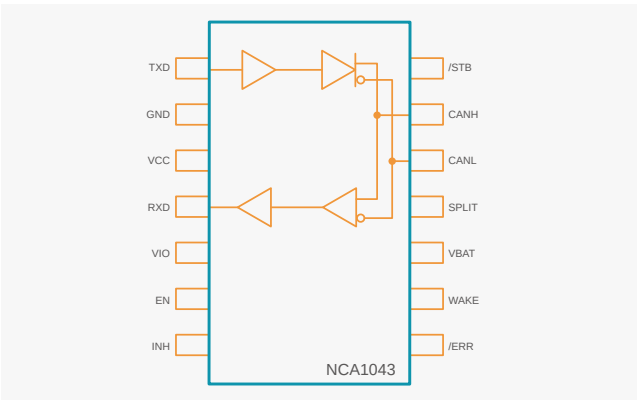
○ Supporting MCU of 3V to 5V

NCA1043-Q1 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. Reliable communication is achieved in CAN FD fast phase networks with data rates up to 5 Mbps. The NCA1043-Q1 provides thermal protection and transmit data dominant time out function. These features make the NCA1043-Q1 the ideal choice for high speed CAN networks containing nodes that need to be available all times, even when the internal VIO and VCC supplies are switched off.

Product feature

- ○ Fully compatible with ISO11898-2/-5
- ○ Standby and sleep modes
- ○ Even if the whole node loses power, the local and remote wake-up functions are still supported
- ○ Suitable for 12 V and 24 V systems
- ○ Data rate up to 5 Mbps
- ○ Power supply voltage
  VBAT: 4.5V to 40V
  VCC: 4.5V to 5.5V
  VIO: 2.8V~5.5V
- ○ -58V to 58V BUS fault protection
- ○ Common mode voltage range: ± 30V
- ○ Low loop delay: <250ns
- ○ BUS pins support 8kV HBM ESD, 4kV IEC
- ○ Low power consumption standby mode: 10μA
- ○ Undervoltage and overtemperature protection
- ○ Operating temperature: -40°C to 125°C
- ○ AEC-Q100 certified
- ○ RoHS compliant package: SOP-14, DFN-14

Pinout & Package



Application

Applicable to 12V/24V system

Vehicle and transportation

Advanced driver assistance system(ADAS)

Infotainment system

Instrument cluster

Body Electronics and Lighting

NCA1145-Q1: Automotive CAN BUS Transceiver Supporting CAN FD and Local Interconnect

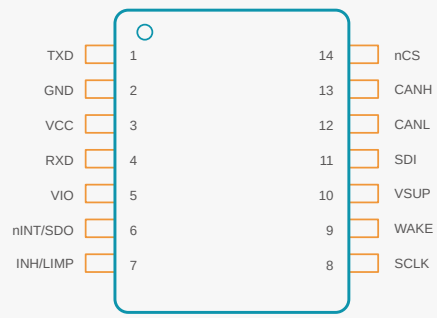
Product introduction

NCA1145-Q1 is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS. NCA1145-Q1 is designed to meet the requirements of high-speed CAN applications in the automotive industry, and can provide the function of sending and receiving differential signals for the CAN protocol controller (in the micro-controller). NCA1145-Q1 supports selective wake-up, which allows the system to realize local networking and run with fewer nodes in the active state, while the remaining nodes are in low-power sleep mode. NCA1145-Q1 is designed with VIO pins and support MCU of 3.3V/5V. The above mentioned features make NCA1145-Q1 a good choice for high-speed CAN networks. The nodes of these networks are always connected to the battery power lines, but in order to reduce power consumption as much as possible, they will only become active when required by the applications.

Product feature

- Fully compatible with ISO11898-2/-5
- Standby and sleep modes
- Remote wake-up can be realized through standard CAN wake-up mode or selective wake-up frame detection.
- Local wake-up can be realized through WAKE pin
- Data rate up to 5 Mbps
- Power supply voltage
  VBAT: 4.5V to 28V
  VCC: 4.5V to 5.5V
  VIO: 2.8V~5.5V
- -58V to 58V BUS fault protection
- Common mode voltage range: ± 30V
- Low loop delay: <250ns
- BUS pins support 8kV HBM ESD, 4kV IEC
- Low power consumption standby mode: 10μA
- Operating temperature: -40°C to 125°C
- AEC-Q100 certified
- RoHS compliant package: SOP-14, DFN-14

Pinout & Package



Application

- Body Electronics and Lighting
- Automotive Infotainment System and Instrument Cluster
- Hybrid, electric and powertrain systems
- Industrial transportation

LIN Transceiver

LIN transceiver										
	Part No.	Part No.	Power Supply Voltage	ESD(kV)	Max DataRate (kbps)	BUS Voltage Protection	Wake-up	Operating Temperature Range (℃)	AEC-Q100	Package Type
LIN	NCA1021 -Q1	NCA1021 -Q1SPR	VBAT: 5.5~27V	8	20	-40~+40	Local/Remote	-40~150	✓	SOP-8

NCA1021-Q1: Automotive LIN BUS Transceiver

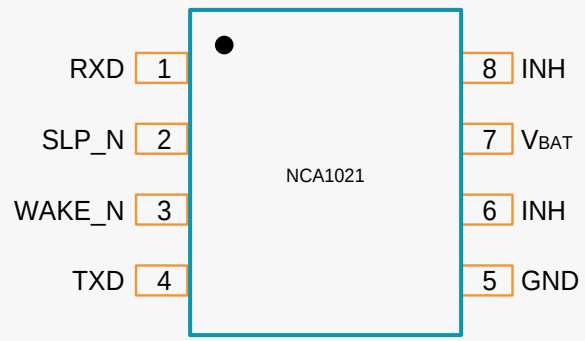
Product introduction

NCA1021-Q1 is a LIN transceiver that supports low power consumption and multiple wake-up functions, supporting up to 20kbps for sending and receiving communication.. NCA1021-Q1 is designed with a low power consumption sleep mode and supports remote and local wake-up functions via LIN BUS or other pins. The device can also use the INH output pin as a flag to control the working status of other devices in the local system to achieve low-power operation of the system. NCA1021-Q1 controls the status of the LIN BUS through the TXD pin and reports the status of the BUS through its open drain RXD output pin. The device converts the signal received by TXD into a LIN BUS signal through waveform shaping and slew rate adjustment to reduce Electro Magnetic Emission (EME).

Product feature

- Fully compatible with ISO17987-4
- Ultra-low electromagnetic emission (EME)
- Supporting 12V systems
- Input level compatible with 3.3V and 5 V devices
- -40V to 40V BUS fault protection
- Wake-up source identification (local or remote)
- Integrated with LIN pull-up resistor
- Transmit data (TXD) dominant time out function
- Date rate: up to 20Kbps
- AEC-Q100 certified
- Operating temperature: -40°C to 150°C
- RoHS compliant package: SOP-8

Pinout & Package



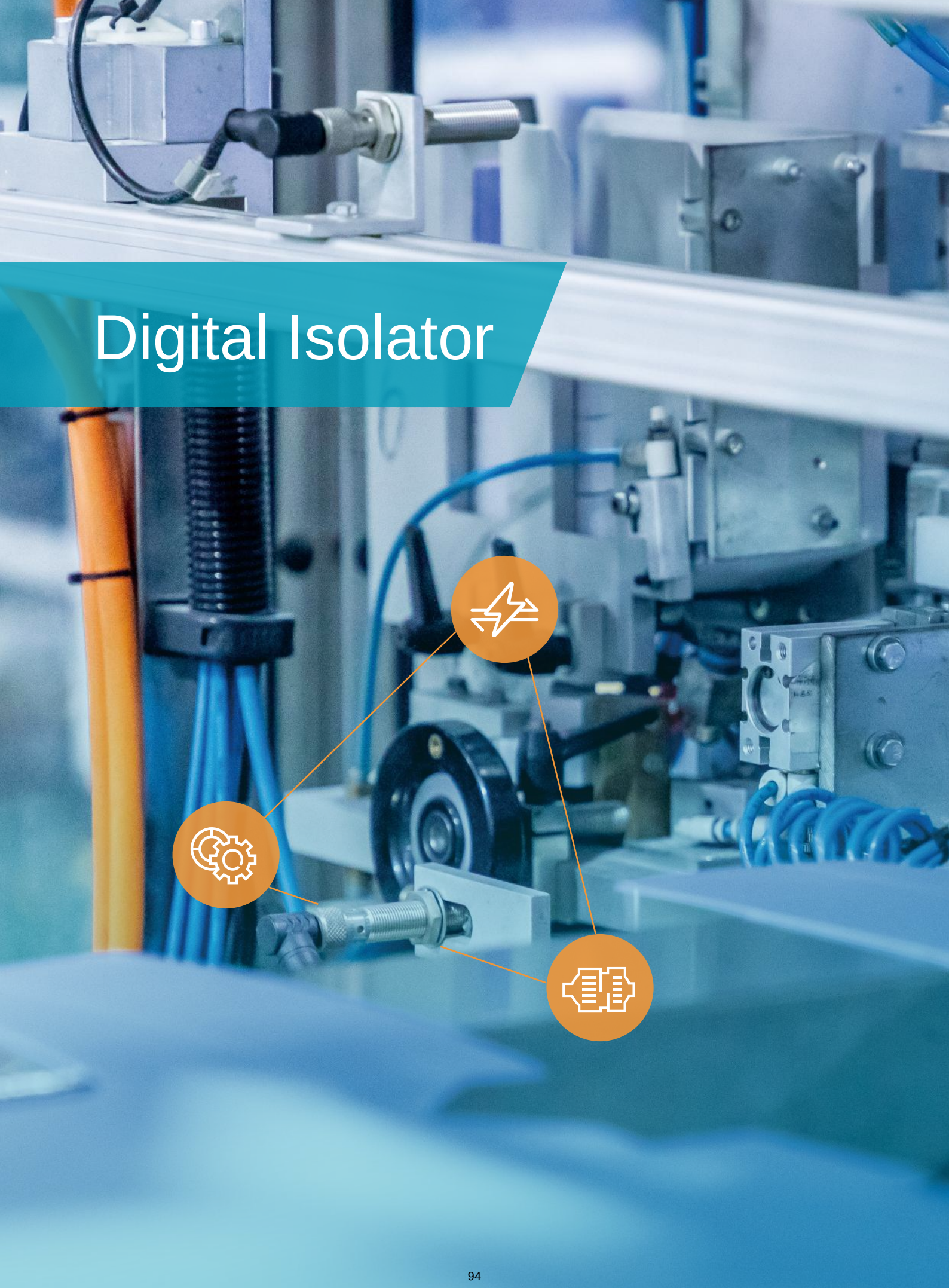
Application

Body Electronics and Lighting

Automotive Infotainment System and Instrument Cluster

Hybrid, electric and powertrain systems

Digital Isolator



Digital Isolator

NSi82xx Series High Performance Multi-Channel Digital Isolator Chip Speed 150Mbps; Propagation delay 10ns; Output and input voltage range 2.5 to 5.5V; Operating temperature range -40 to 125 °C, and it has passed UL1577 certification									
	Part No.	Part No.	Iso Rating (kVrms)	Forward/Reverse Channels	Max DataRate (Mbps)	Default Output		AEC-Q100	Package Type
						LOW	HIGH		
Single Channe	NSi8210	NSi8210Nx	3.75	1/0	150	✓	✓	✓	SOP-8
		NSi8210Dx	2	1/0	150	✓	✓		DFN-8
Dual Channel	NSi8220	NSi8220Nx	3.75	2/0	150	✓	✓	✓	SOP-8
		NSi8220Wx	5	2/0	150	✓	✓	✓	SOP-8
			5.7						SOW-16
									SOWW-16
	NSi8221	NSi8221Nx	3.75	2/1	150	✓	✓	✓	SOP-8
		NSi8221Wx	5	2/1	150	✓	✓	✓	SOW-8
			5.7						SOW-16
									SOWW-16
	NSi8222	NSi8222Nx	3.75	2/2	150	✓	✓	✓	SOP-8
		NSi8222Wx	5	2/2	150	✓	✓	✓	SOW-8
			5.7						SOW-16
									SOWW-16
Triple Channel	NSi8230	NSi8230Wx	5	3/0	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
	NSi8231	NSi8240Wx	5	3/1	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
Quad Channel	NSi8240	NSi8240Wx	5	4/0	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
		NSi8240Sx	3	4/0	150	✓	✓		SSOP-16
		NSi8240Nx	3.75	4/0	150	✓	✓	✓	SOP-16
	NSi8241	NSi8241Wx	5	4/1	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
		NSi8241Sx	3	4/1	150	✓	✓	✓	SSOP-16
		NSi8241Nx	3.75	4/1	150	✓	✓		SOP-16
	NSi8242	NSi8242Wx	5	4/2	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
		NSi8242Sx	3	4/2	150	✓	✓	✓	SSOP-16
		NSi8242Nx	3.75	4/2	150	✓	✓		SOP-16
Six Channel	NSi8260	NSi8260Wx	5	6/0	150	✓	✓	✓	SOW-16
		NSi8260Sx	3	6/0	150	✓	✓	✓	SSOP-16
	NSi8261	NSi8261Wx	5	6/1	150	✓	✓	✓	SOW-16
		NSi8261Sx	3	6/1	150	✓	✓	✓	SSOP-16
	NSi8262	NSi8262Wx	5	6/2	150	✓	✓	✓	SOW-16
		NSi8262Sx	3	6/2	150	✓	✓	✓	SSOP-16
	NSi8263	NSi8263Wx	5	6/3	150	✓	✓	✓	SOW-16
		NSi8263Sx	3	6/3	150	✓	✓	✓	SSOP-16
	NSi8266	NSi8266Wx	5	6/6	150	✓	✓		SOW-16
		NSi8266Sx	3	6/6	150	✓	✓	✓	SSOP-16

NSi82xxC Series Cost-effective Multi-Channel Digital Isolator Chip

Speed 150Mbps; Propagation delay 10ns; Output and input voltage range 2.5 to 5.5V; Operating temperature range -40 to 125 °C, and it has passed UL1577 certification

	Part No.	Part No.	Iso Rating (kVrms)	Forward /Reverse Channels	Max DataRate (Mbps)	Default Output		Package Type
						LOW	HIGH	
Single Channe	NSi8210	NSi8210Cx-DSPR	3.75	1/0	100	✓	✓	SOP-8
		NSi8210Cx-DSWVR	5	1/0	100	✓	✓	SOW-8
Dual Channel	NSi8220	NSi8220Cx-DSPR	3.75	2/0	100	✓	✓	SOP-8
		NSi8220Cx-DSWVR	5	2/0	100	✓	✓	SOW-8
		NSi8220Cx-DSWR	5	2/0	100	✓	✓	SOW-16
	NSi8221	NSi8221Cx-DSPR	3.75	2/1	100	✓	✓	SOP-8
		NSi8221Cx-DSWVR	5	2/1	100	✓	✓	SOW-8
		NSi8221Cx-DSWR	5	2/1	100	✓	✓	SOW-16
	NSi8222	NSi8222Cx-DSPR	3.75	2/1	100	✓	✓	SOP-8
		NSi8222Cx-DSWVR	5	2/1	100	✓	✓	SOW-8
		NSi8222Cx-DSWR	5	2/1	100	✓	✓	SOW-16
Triple Channel	NSi8230	NSi8230Cx-DSWR	5	3/0	100	✓	✓	SOW-16
	NSi8231	NSi8231Cx-DSWR	5	3/1	100	✓	✓	SOW-16
Quad Channel	NSi8240	NSi8240Cx-DSPR	3.75	4/0	100	✓	✓	SOIC-16N
		NSi8240Cx-DSWR	5	4/0	100	✓	✓	SOW-16
	NSi8241	NSi8241Cx-DSWR	5	4/1	100	✓	✓	SOW-16
	NSi8242	NSi8242Cx-DSWR	5	4/1	100	✓	✓	SOW-16
Six Channel	NSi8260	NSi8260Cx-DSWR	5	6/0	100	✓	✓	SOW-16
	NSi8261	NSi8261Cx-DSWR	5	6/1	100	✓	✓	SOW-16
	NSi8262	NSi8262Cx-DSWR	5	6/2	100	✓	✓	SOW-16
	NSi8263	NSi8263Cx-DSWR	5	6/3	100	✓	✓	SOW-16
	NSi8266	NSi8266Cx-DSWR	5	6/0	100	✓	✓	SOW-16

NIRSxx Series Low Cost Multi-Channel Digital Isolator Chip with Basic Insulation But High Reliability

Output and input voltage range 2.5 to 5.5V; Operating temperature range -40 to 125 °C, and it has passed UL1577 certification

	Part No.	Iso Rating (kVrms)	Forward/Reverse Channels	Max DataRate (Mbps)	CMTI(kV/us)	Default Output		Package Type
						LOW	HIGH	
Dual Channel	NIRS20N1-DSPR	3	2/0	1	100		✓	SOP-8
	NIRS21N1-DSPR	3	2/0	1	100		✓	SOP-8
	NIRS22N1-DSPR	3	2/1	1	100		✓	SOP-8
Triple Channel	NIRS31-DSSR	3	3/1	1	100		✓	SSOP-16

NSi822X/ NSi823X/NSi824X/NSi826X: Enhanced Dual/Triple/Quad/ Six-Channel Digital Isolators with High Reliability

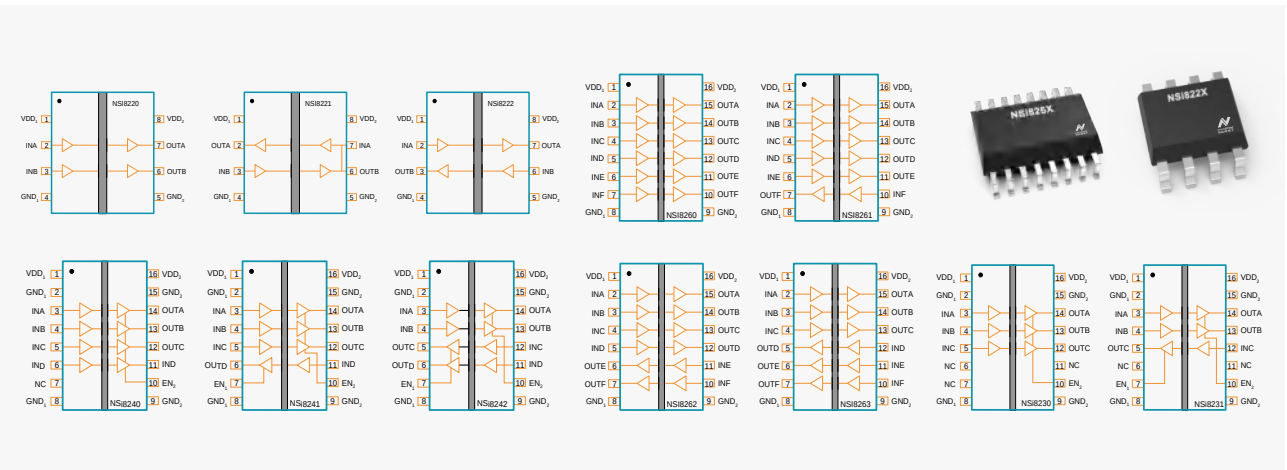
Product introduction

NSi822X/NSi823X/NSi824X/NSi826X are cost-effective dual/triple/quad/six-channel digital isolators with high reliability This series of products have passed UL1577 safety certification, support several insulation withstand voltage (3kVrms, 3.75kVrms, 5kVrms, 5.7kVrms), while providing high electromagnetic immunity and low emissions at low power consumption. The data rate of the product is up to 150Mbps, and the common mode transient immunity (CMTI) is up to 200kV/us. It provides digital channel direction configuration and the default output level configuration when the input power is lost. The wide power supply voltage range of this series of devices supports direct connection with most digital interfaces, making it easy for level conversion. Excellent system-level EMC performance improves operation reliability and stability. AEC-Q100 (level 1) options are available for all devices.

Product feature

- Isolation withstand voltage 3000Vrms, 3750Vrms, 5000Vrms, 5700Vrms
- VDE Reinforced Isolation Certification
- Date rate: DC to 150Mbps
- High CMTI: ±200kV/μs
- AEC Q100 (Grade 1) is applicable to all devices
- Chip-level ESD: HBM: ±8kV
- Enhanced ESD, EFT, surge protection at system level
- Lifetime of isolated gate: > 60 years
- Low propagation delay typical <15ns
- Low power consumption: 1.5mA/ch (1 Mbps)
- Operating temperature: -55 to 125°C
- RoHS-compliant packages: SOP-8, SOP-16, SSOP-16, SOW-8, SOW-16, and SOWW-16

Pinout & Package



Application

Industrial automation system

Isolation interface, such as SPI.RS232 RS485 CAN

General-purpose multichannel isolation

Motor control

Power transmission

Communication

NSi822XC/ NSi823XC/NSi824XC/NSi826XC: Cost-effective Enhanced Dual/Triple/Quad/Six-Channel Digital Isolators with High Reliability

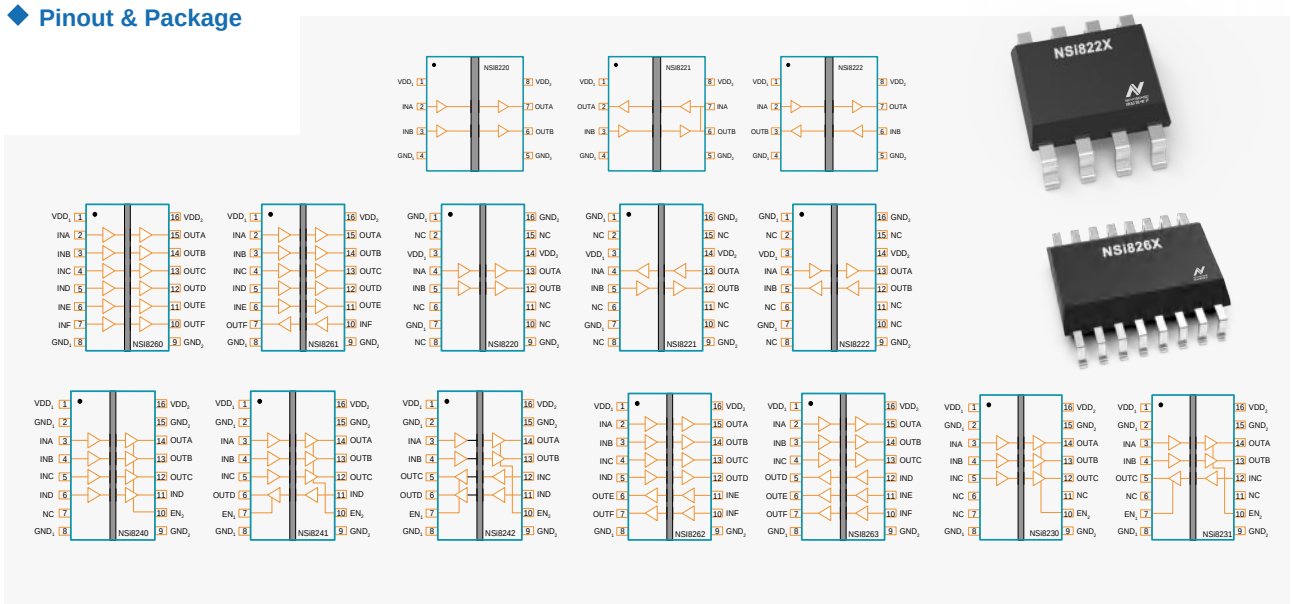
Product introduction

NSi822XC/NSi823XC/NSi824XC/NSi826XC are cost-effective dual/triple/quad/six-channel digital isolators with high reliability. This series of products have passed UL1577 safety certification, several insulation withstand voltage (3.75kVrms, 5kVrms), while providing high electromagnetic immunity and low emissions at low power consumption. The data rate of the product is up to 100Mbps, and the common mode transient immunity (CMTI) is up to 200kV/us. It provides digital channel direction configuration and the default output level configuration when the input power is lost. The wide power supply voltage range of this series of devices supports direct connection with most digital interfaces, making it easy for level conversion. Excellent system-level EMC performance improves operation reliability and stability. The MSL rating of the device is MSL 3.

Product feature

- Isolation withstand voltage 3750Vrms, 5000VRMs
- VDE Reinforced Isolation Certification
- Date rate: DC to 100Mbps
- High CMTI: ±150kV/μs
- Chip-level ESD: HBM: ±8kV
- Enhanced ESD, EFT, surge protection at system level
- Lifetime of isolated gate: > 60 years
- Low propagation delay typical <15ns
- Low power consumption: 1.5mA/ch(1 Mbps)
- Operating temperature: -40 to 125°C
- RoHS compliant package: SOP-8, SOW-8, SOW-16

Pinout & Package



Application

Industrial automation system

Isolation interface, such as SPI.RS232 RS485 CAN

General-purpose multichannel isolation

Motor control

Power transmission

Communication

NIRS2x: Cost-optimized Dual-channel Digital Isolator with High Reliability

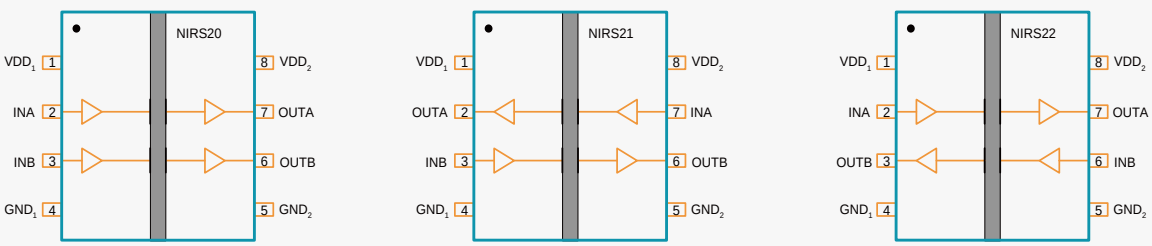
Product introduction

NIRS2x is a cost-optimized dual-channel digital isolator with high reliability. The NIRS2x device is safety certified by UL1577 support 3kVrms insulation withstand voltages, while providing high electromagnetic immunity and low emissions at low power consumption. The data rate of NIRS2x is up to 500kbps, and the common mode transient immunity (CMTI) is up to 100kV/us. NIRS2x allows digital channel direction configuration and provide a default output high level when input power is lost. The wide power supply voltage range of NIRS2x supports direct connection with most digital interfaces, making it easy for level conversion. Its high system-level EMC performance enhances its reliability and stability.

Product feature

- Up to 3000Vrms insulation voltage
- Date rate: DC to 500kbps
- Power supply voltage: 2.5V to 5.5V
- High CMTI: ±100kV/μs
- Chip-level EMC performance: HBM: ±6kV
- High system level EMC performance: Enhanced system level ESD, EFT, and surge immunity
- Maximum Surge Isolation Voltage VIOSM=6153Vpk
- Low power consumption: 1mA/ch (500kbps)
- Low transmission delay:<500ns
- Lifetime of isolated gate: > 60 years
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOP-8

Pinout & Package



Application

- Industrial automation system
- Communication via isolated SPI, RS-232, RS-485
- General-purpose multichannel isolation
- Motor control

NIRS31: Cost-optimized Triple-channel Digital Isolator with High Reliability

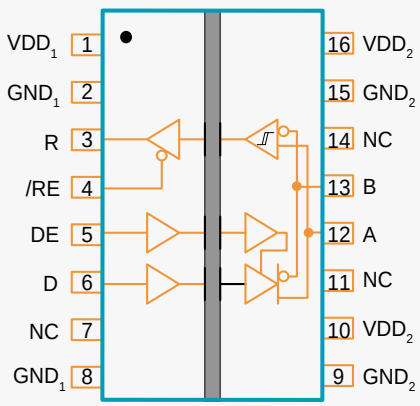
Product introduction

NIRS31 is a cost-optimized triple-channel digital isolator. The NIRS31 device is safety certified by UL1577 support several insulation withstand voltages (3.00kVrms), while providing high electromagnetic immunity and low emissions at low power consumption. The data rate of NIRS31 is up to 1Mbps, and the common mode transient immunity (CMTI) is up to 100kV/us. NIRS31 allows digital channel direction configuration and provide a default output high level when input power is lost. The wide power supply voltage range of NIRS31 supports direct connection with most digital interfaces, making it easy for level conversion. Its high system-level EMC performance enhances its reliability and stability.

Product feature

- Up to 3000Vrms insulation voltage
- Date rate: DC to 1Mbps
- Power supply voltage: 2.5V to 5.5V
- High CMTI: ±100kV/μs
- Chip-level ESD: HBM: ±6kV
- Isolation surge withstand voltage:>5kV
- Low power consumption: 1.5mA/ch (1Mbps)
- Low transmission delay:<500ns
- Lifetime of isolated gate: > 60 years
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SSOP-16

Pinout & Package



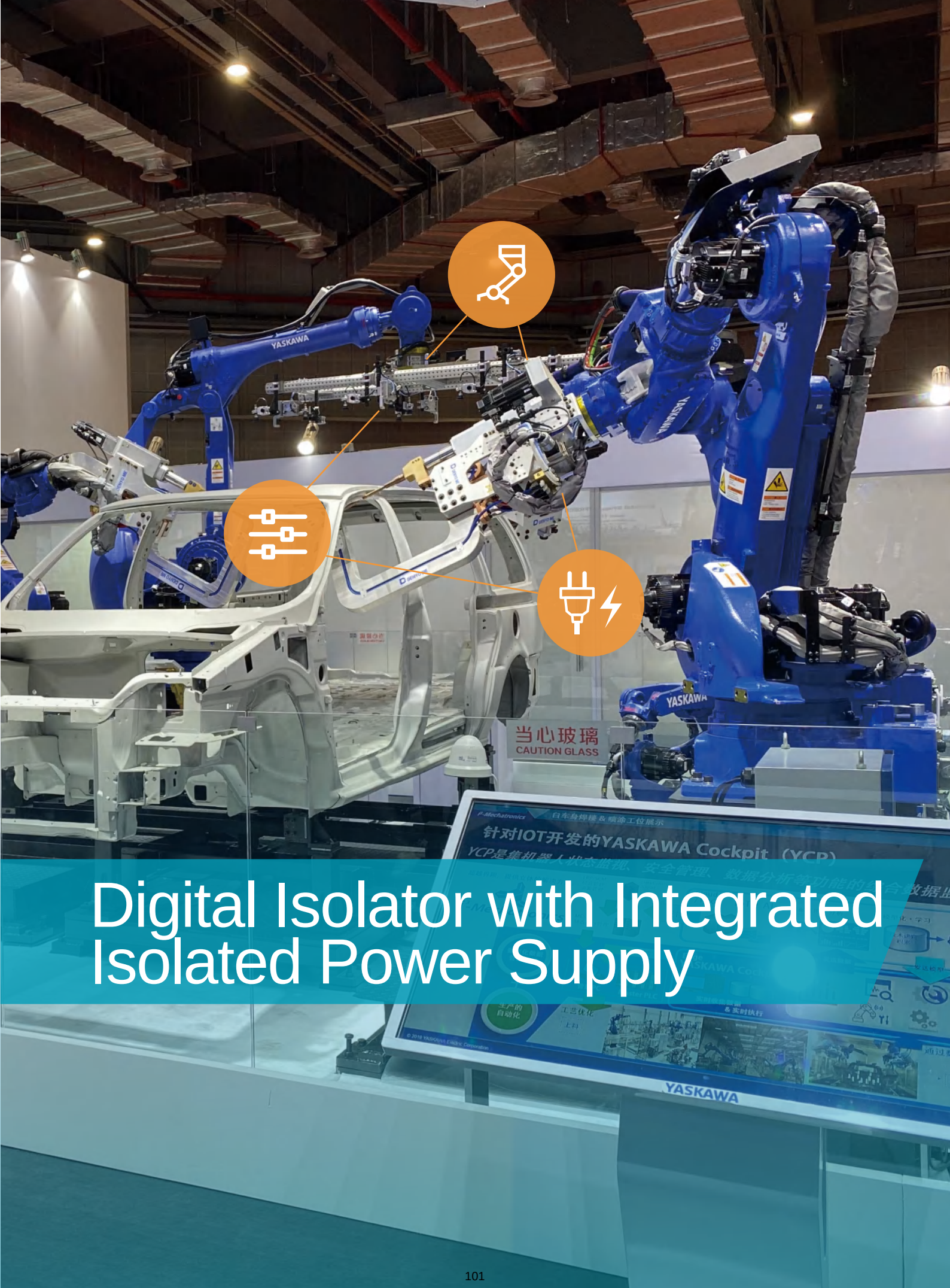
NIRS31

Application

Battery management system

Isolated 485/232 communication system

Smart ammeters and water meters



Digital Isolator with Integrated Isolated Power Supply

Digital Isolator with Integrated Isolated Power Supply

NSiP88xx/NSiP89xx Series Multi-Channel Digital Isolator Chip with Integrated Isolated Power Supply Speed 150Mbps; Propagation delay 10ns; Output and input voltage range 3.3 to 5.5V; Operating temperature range -40 to 125°C, and it has passed UL1577 certification										
	Part No.	Part No.	Iso Rating (kVrms)	Forward/Reverse Channels	Max DataRate (Mbps)	Default Output		AEC-Q100	Features	Package Type
						LOW	HIGH			
Dual Channel	NSiP8821	NSiP8821Wx	5	2/1	150	✓	✓	✓	Split Logic VDD	SOW-16
Quad Channel	NSiP8840	NSiP8840Wx	5	4/0	150	✓	✓		Split Logic VDD	SOW-16
	NSiP8841	NSiP8841Wx	5	4/1	150	✓	✓	✓	Split Logic VDD	SOW-16
	NSiP8842	NSiP8842Wx	5	4/2	150	✓	✓	✓	Split Logic VDD	SOW-16
Dual Channel	NSiP8921	NSiP8921Wx	5	2/1	150	✓	✓	✓	Power Disable	SOW-16
Quad Channel	NSiP8940	NSiP8840Wx	5	4/0	150	✓	✓		Power Disable	SOW-16
	NSiP8941	NSiP8841Wx	5	4/1	150	✓	✓	✓	Power Disable	SOW-16
	NSiP8942	NSiP8842Wx	5	4/2	150	✓	✓	✓	Power Disable	SOW-16

NIRSP31 Low Cost Triple-Channel Digital Isolator Chip with Integrated Isolated Power Supply									
	Part No.	Power Supply Voltage	Iso Rating (kVrms)	Forward/Reverse Channels	Max DataRate (Mbps)	CMTI(kV/us)	Default Output	Operating Temperature	Package Type
Isolated Power	NIRSP31	4.75V to 5.25V	2	2/1	20	50	High	-40~125°C	SOW-16

NSiP882x/NSiP892x/NSiP884x/NSiP894x: Dual/Quad-Channel Digital Isolator with Integrated Isolated DC-DC Power Supply

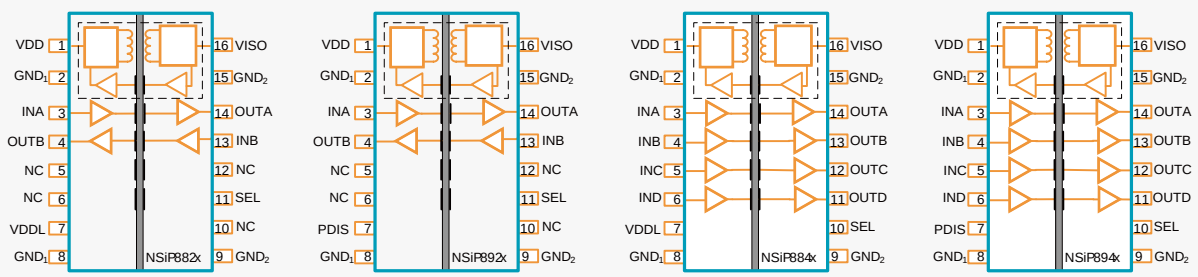
Product introduction

NSiP882x/NSiP892x/NSiP884x/NSiP894x is a dual/quad-channel digital isolator with integrated isolated DC-DC power supply. The isolation DC-DC power supply can provide up to 500mW of output power on the on-chip transformer. The feedback PWM signal is sent to the primary side by a digital isolator based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. The products are safety certified by UL1577 support 4.5kVrms withstand voltages, while providing high electromagnetic immunity and low emissions. The data rate of this series of products is up to 150Mbps, and the common mode transient immunity (CMTI) is up to 150kV/us. The NSiP882x devices provide 5V to 5V, 5V to 3.3V, 3.3V to 3.3V conversion mode, the output voltage can be set by SEL pin.The logical level of digital isolators on left side can be set by VDDL pin which can support the application when the supply voltage and I/O voltage level are different.

Product feature

- Up to 4500Vrms insulation voltage
- Supply voltage: 3.3V to 5.5V
- 5V to 5V,5V to 3.3V, 100mA load current supported
- Overcurrent and thermal protection
- Date rate: DC to 150Mbps
- High CMTI:150kV/us
- Propagation delay:<15ns
- High system level EMC performance: Enhanced system level ESD, EFT, and surge immunity
- Operating temperature: -40°C to 125°C

Pinout & Package



Application

Industrial automation system

Isolated SPI, RS232, RS485

Universal Multi-Channel Isolator

NIRSP31: Low Cost Triple-Channel Digital Isolator with Integrated Isolated DC-DC Power Supply

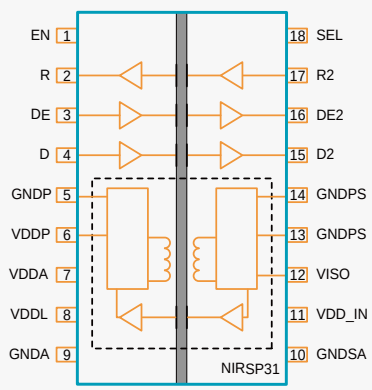
Product introduction

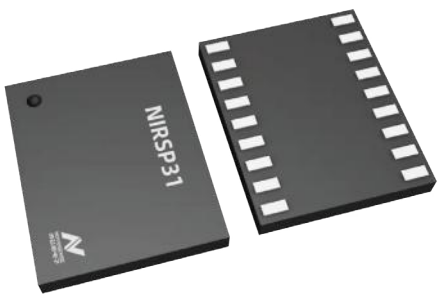
NIRSP31 is a low cost triple-channel digital isolator with integrated isolated DC-DC power supply. The isolated DC-DC converter provides stable output voltage and up to 400mW output power by closed-loop control and transformer on chip. The feedback PWM signal is transmitted to the primary side by a digital isolator based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. The NIRSP31 device is safety certified by UL1577 support 2kVrms insulations withstand voltages, and features improved electromagnetic immunity and low emission. The data rate of the NIRSP31 is up to 20Mbps, and the common-mode transient immunity (CMTI) is up to 50kV/us. For NIRSP31 device, 5V to 5V and 5V to 3.3V conversion modes are allowed, and the output voltage can be set through SEL pin.

Product feature

- Insulation voltage up to 2000Vrms
- Supply voltage: 4.75V to 5.25V
- Support 80mA load current
- Overcurrent and thermal protection
- Data transmission rate: DC to 20Mbps
- High CMTI:50kV/us
- High system level EMC performance: Enhanced system level ESD, EFT, and surge immunity
- Operating temperature: -40°C to 125°C
- RoHS compliant package: LGA18

Pinout & Package



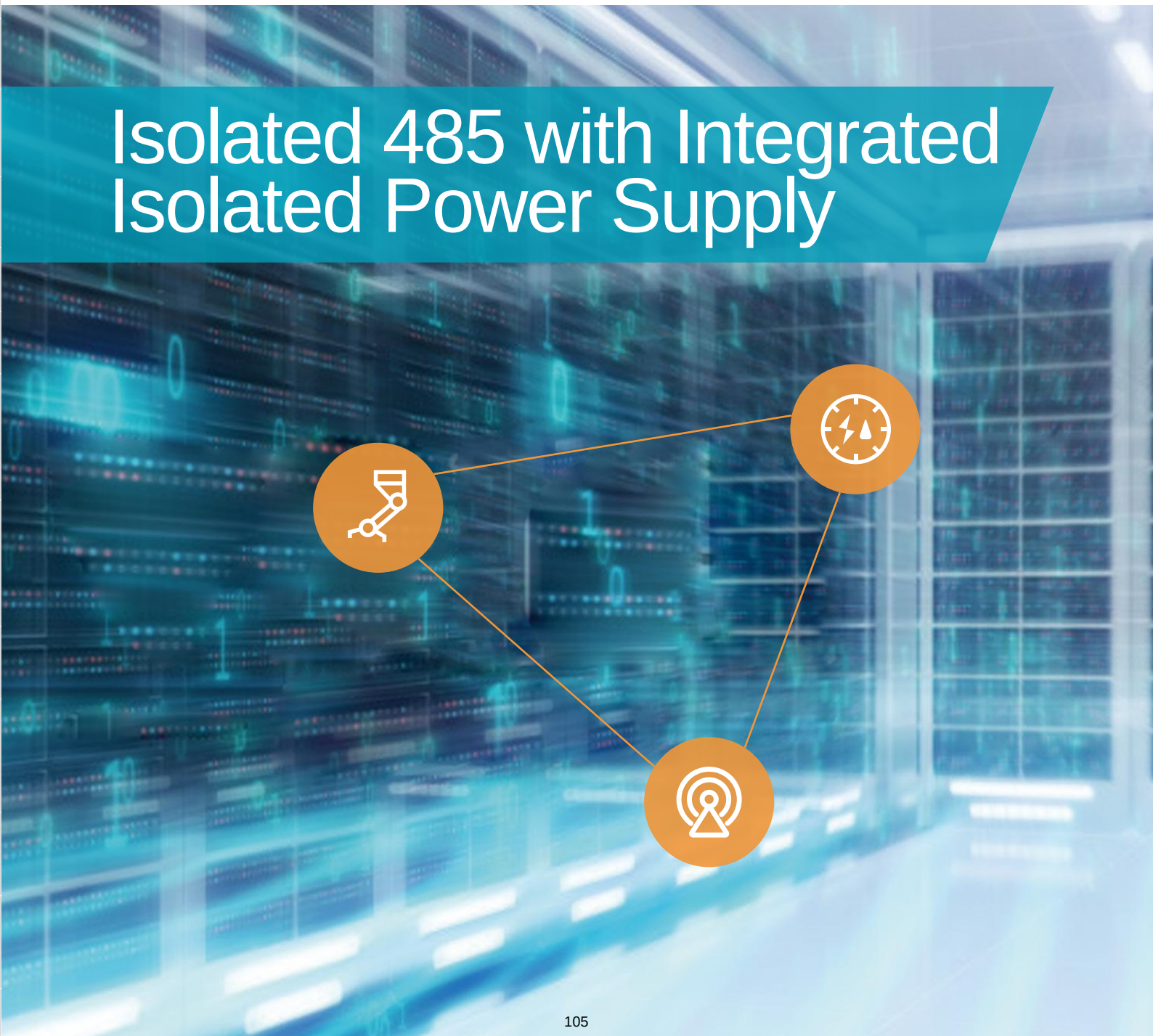


Application

- Industrial BMS System
- Industrial automation system
- Isolated SPI, RS232, RS485
- General-purpose multichannel isolation

Isolated 485 with Integrated Isolated Power Supply

NSiP83086: RS-485 Transceiver Chip with Integrated Isolated Power Supply									
	Part No.	Power Supply Voltage	Iso Rating (kVrms)	ESD(kV)	Max DataRate (Mbps)	CMTI (kV/us)	VISO Output(V)	Operating Temperature	Package Type
Isolated Power	NSiP83086	VDD: 4.5~5.5V VDDL: 1.8~5.5V	5	10	16	150	5	-40~105℃	SOW-16 SOW-20
	NSiP83086V	VDD: 3~5.5V VDDL: 1.8~5.5V	5	10	16	150	3.3	-40~105℃	SOW-20
	NSiP83086C	VDD: 3~5.5V VDDL: 1.8~5.5V	5	10	16	150	3.3 SEL=5V/Floating, VISO=5V SEL=GND2, VISO=3.3V	-40~105℃	SOW-20



NSiP83086/V/C: Isolated RS-485 Transceiver With Integrated Isolated DC-DC Power Supply

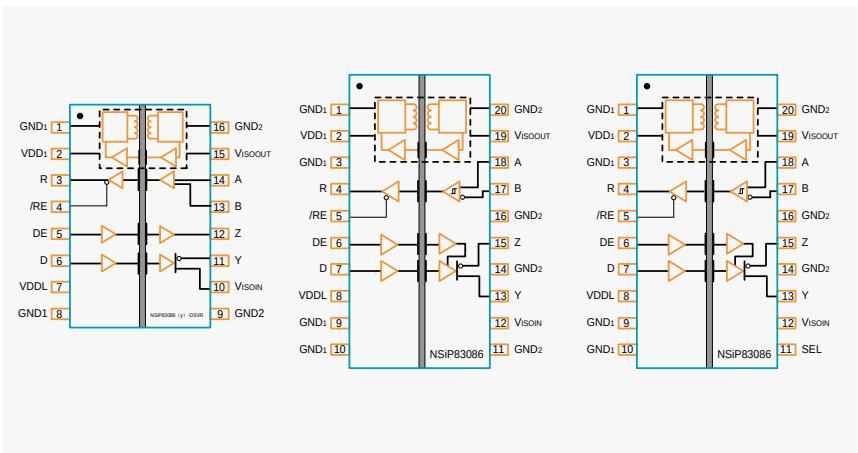
Product introduction

NSiP83086/V/C is a full duplex isolated RS-485 transceiver with integrated isolated DC-DC power supply with high reliability. Isolated DC-DC power supply can be based on on-chip transformer, the feedback PWM signal is transmitted to the primary side by a digital isolator based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. NSiP83086/V/C support 5kVrms insulation withstand voltages, while the high integrated solution can help to simplify system design and improve reliability. The bus pins on the bus side of the NSiP83086/V/C is designed with ±10kV ESD protection to GND2 at system level. This device is designed with a fail-safe circuit that ensures the receiver output is logic high when the receiver input is disconnected or shorted. It features a receiver input impedance of 1/8 unit load, allowing up to 256 transceivers to be connected to the bus.

Product feature

- Insulation voltage up to 5000Vrms
- It is with integrated isolated DC-DC power supply
- I/O voltage range supports 1.8V to 5V MCU
- Power supply voltage:
  VDD: 4.5V to 5.5V(NSiP83086)
  VDD: 3V to 5.5V(NSiP83086V/C)
  VDDL: 1.8V to 5.5V
- Overcurrent and thermal protection
- High CMTI:150kV/us
- Data transmission rate: 16Mbps
- Supporting 256 transceivers
- High system level EMC performance:
  BUS pins conforming to IEC61000-4-2±10kV ESD
- Lifetime of isolated gate: > 60 years
- Operating temperature: -40°C to 105°C
- RoHS compliant package: SOW16, SOW20

Pinout & Package

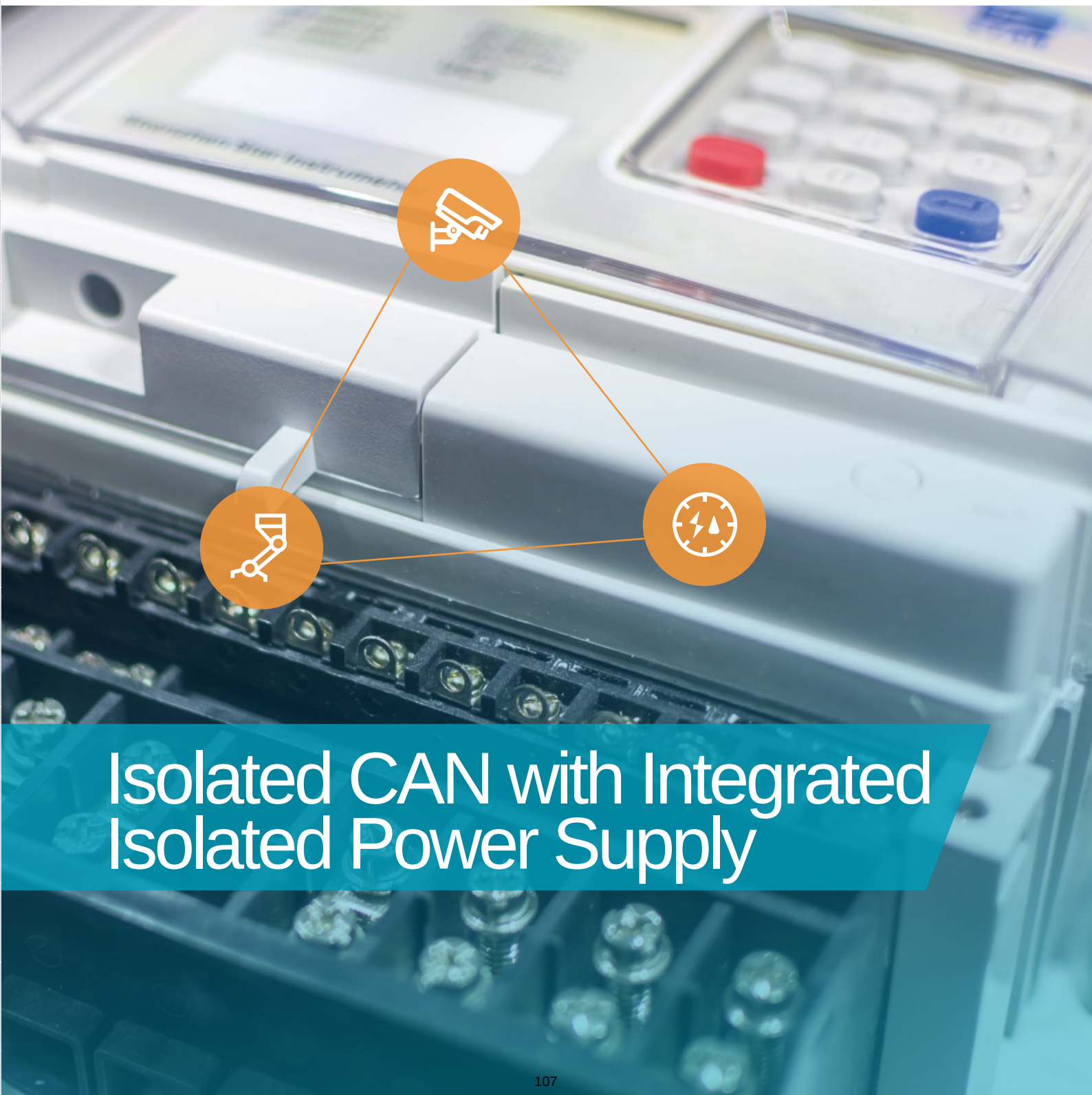


Application

- Industrial automation system
- Isolated RS-485 communication system
- Smart ammeters and water meters
- Security and surveillance systems

Isolated CAN with Integrated Isolated Power Supply

NSiP1042: CAN Transceiver Chip with Integrated Isolated Power Supply									
	Part No.	Power Supply Voltage	Iso Rating (kVrms)	ESD(kV)	Max DataRate (Mbps)	CMTI (kV/us)	No. of Nodes	Operating Temperature	Package Type
Isolated Power	NSiP1042	4.5V to 5.5V	5	5	5	150	110	-40~125°C	SOW-20



Isolated CAN with Integrated Isolated Power Supply

NSiP1042: Isolated CAN Transceiver With Integrated Isolated DC-DC Power Supply

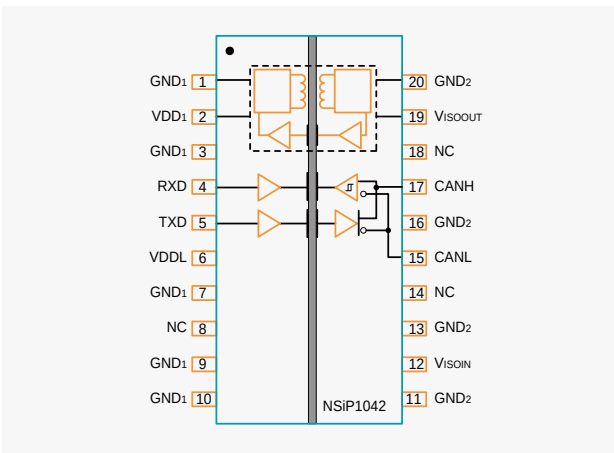
Product introduction

NSiP1042 is a CAN transceiver with integrated isolated DC-DC power supply with high reliability. The feedback PWM signal is transmitted to the primary side by a digital isolator based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. NSiP1042 is safety certified by UL1577 support 5kVrms insulation withstand voltages, while the high integrated solution can help to simplify system design and improve reliability. The BUS pins on the BUS side of the NSiP1042 is designed with ±5kV ESD protection to GND2 at system level. NSiP1042 can support data transmission rates of up to 5Mbps, allowing up to 110 transceivers to be connected to the BUS, while providing thermal protection and explicit timeout protection for transmission data.

Product feature

- Insulation voltage up to 5000Vrms
- Isopower integrated isolated dc-to-dc converter
- Supply voltage: 4.5V to 5.5V
- Overcurrent and thermal protection
- High CMTI:150kV/us
- Data transmission rate: 5Mbps
- Supporting 110 transceivers
- High system level EMC performance: BUS pins conforming to IEC61000-4-2±5kV ESD
- Lifetime of isolated gate: > 60 years
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW20

Pinout & Package



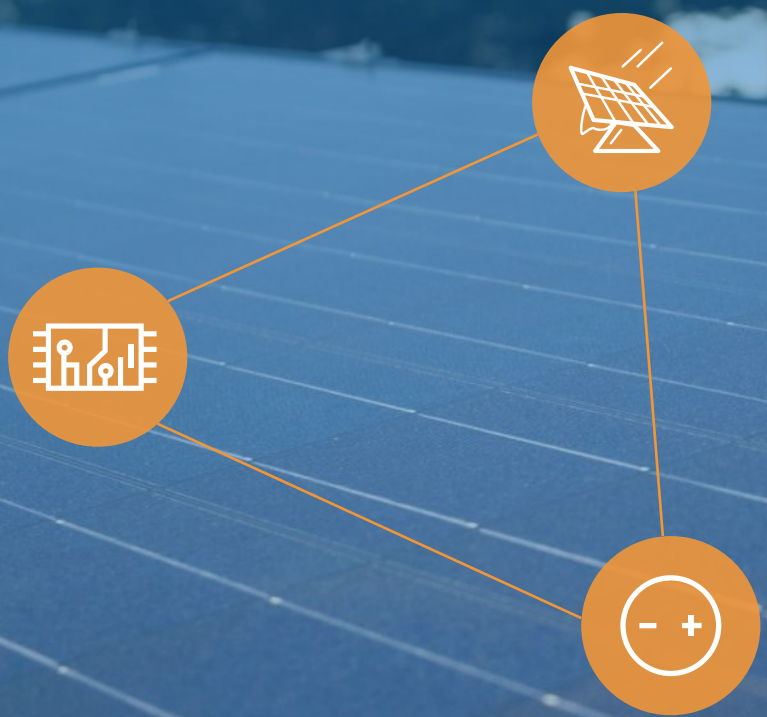
Application

Industrial automation system

Smart ammeters and water meters

Security and surveillance systems

Isolated ADC



Isolated ADC

NSi1305/6 Isolated ADC Series									
	Part No.	Part No.	Iso Rating (kVrms)	Linear Input Range(mV)	Input Type	Output Type	CMTI (kV/μs)	Operating Temperature Range (℃)	Package Type
Isolated Modulator	NSi1306	NSi1306M25	5	-250~250	Differential	Digital (clock rising edge effective)	150	-40~125	SOW-8
									SOW-16
		NSi1306M05	5	-250~250	Differential		150	-40~125	SOW-8
									SOW-16
	NSi1305	NSi1305M25	5	-250~250	Differential	Digital (clock rising edge effective)	150	-40~125	SOW-8
									SOW-16

NSi1303x Isolated ADC Series										
	Part No.	Part No.	Iso Rating (kVrms)	Linear Input Range(mV)	Input Type	Output Type	CMTI (kV/μs)	Differential Input Resistance kohm	Operating Temperature Range (℃)	Package Type
Isolated Modulator	NSi1303	NSi1303E0x	5	-50~50	Differential	Manchester	150	4.9	-40~125	SOW-8 SOW-16
		NSi1303E2x	5	-250~250	Differential	Manchester	150	22	-40~125	
		NSi1303M0x	5	-50~50	Differential	Uncoded (clock rising edge effective)	150	4.9	-40~125	
		NSi1303M2x	5	-250~250	Differential		150	22	-40~125	
		NSi1303D0x	5	-50~50	Differential	Uncoded (clock falling edge effective)	150	4.9	-40~125	
		NSi1303E0x	5	-50~50	Differential		150	22	-40~125	

NSi1306: Isolated Current Sampling ADC with High Reliability

Product introduction

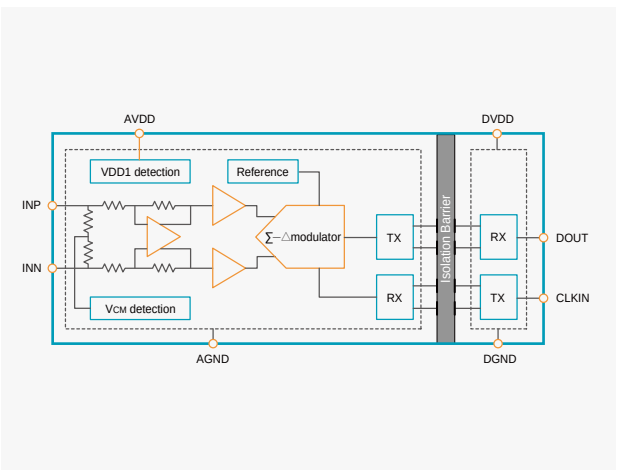
NSi1306 is a high-performance Σ-Δ modulator with output separated from input based on the NOVOSENSE capacitive isolation technology. The linear differential input signal range of the device is ± 50mV (full scale ± 64mV) or ± 250mV (full scale ± 320mV). Differential inputs are ideal for shunt resistance-based current detection in high voltage applications that require isolation.

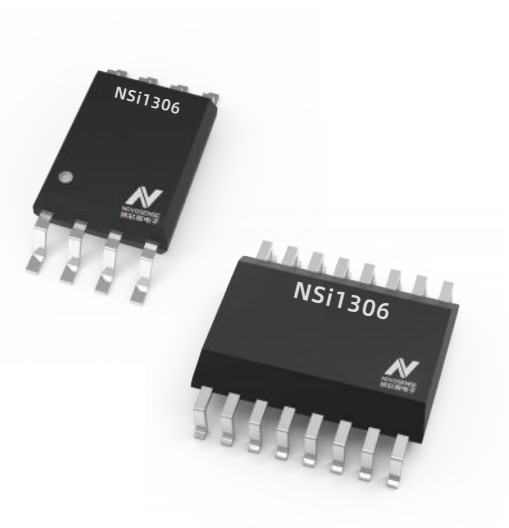
The analog input is amplified and continuously sampled by a second-order Σ-Δ modulator and then converted to a high-speed, single-bit data stream. The output data is synchronized with the external clock, the rising edge of the clock is valid, and the frequency range is 5MHz to 21MHz. By using an appropriate digital filter (such as a sinc3 filter) to extract the bit stream, the device can achieve 16-bit resolution and 86dB/82.5dB signal-to-noise ratio (SNR) with a 20MHz master clock under the condition of 78.125KPS. The fail-safe function includes input common mode overvoltage detection and VDD1 missing detection, simplifying system design and diagnosis.

Product feature

- Insulation voltage up to 5000Vrms
- Clock frequency: 5MHz to 21MHz
- Linear input range of ± 50mV or ± 250mV
- Excellent DC performance:
  - Offset error: ± 50 μV or ± 100 μV(Max)
  - Offset drift: -0.5 to 1.5 μV/°C(Max)
  - Gain error: 0.2%(Max)
  - Gain drift: ± 40ppm/°C(Max)
- SNR: 82.5dB or 86dB(Typ)
- High CMTI： 150kV/us(Typ)
- System-level diagnostic capabilities:
  - AVDD monitoring
  - Input common mode overvoltage detection
- Operating temperature: -40°C to 125°C

Pinout & Package





Application

- Shunt current monitoring
- AC motor control
- Power and solar inverters
- UPS
- Onboard charger

NSi1305: Isolated Current Sampling ADC with High Reliability

Product introduction

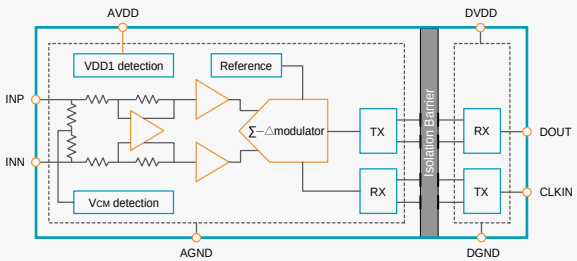
NSi1305 is a high-performance Σ-Δ modulator with output separated from input based on the NOVOSENSE capacitive isolation technology.The linear differential input signal range of the device is ± 50mV (full scale ± 64mV) or ± 250mV (full scale ± 320mV). Differential inputs are ideal for shunt resistance-based current detection in high voltage applications that require isolation.

The analog input is amplified and continuously sampled by a second-order Σ-Δ modulator and then converted to a high-speed, single-bit data stream. The output data is synchronized with the external clock, the falling edge of the clock is valid, and the frequency range is 5MHz to 21MHz. By using an appropriate digital filter (such as a sinc3 filter) to extract the bit stream, the device can achieve 16-bit resolution and 86dB/82.5dB signal-to-noise ratio (SNR) with a 20MHz master clock under the condition of 78.125KPS. The fail-safe function includes input common mode overvoltage detection and VDD1 missing detection, simplifying system design and diagnosis.

Product feature

- Insulation voltage up to 5000Vrms
- Clock frequency: 5MHz to 21MHz
- Linear input range of ± 50mV or ± 250mV
- Excellent DC performance:
  Offset error: ± 50 μV or ± 100 μV(Max)
  Offset drift: -0.5 to 1.5 μV/°C(Max)
  Gain error: 0.2%(Max)
  Gain drift: ± 40ppm/°C(Max)
- SNR: 82.5dB or 86dB(Typ)
- High CMTI： 150kV/us(Typ)
- System-level diagnostic capabilities:
  AVDD monitoring
  Input common mode overvoltage detection
- Operating temperature: -40°C to 125°C

Pinout & Package



Application

- Shunt current monitoring
- AC motor control
- Power and solar inverters
- UPS
- Onboard charger

NSi1303: Isolated ADC with Integrated Internal Clock with High Reliability

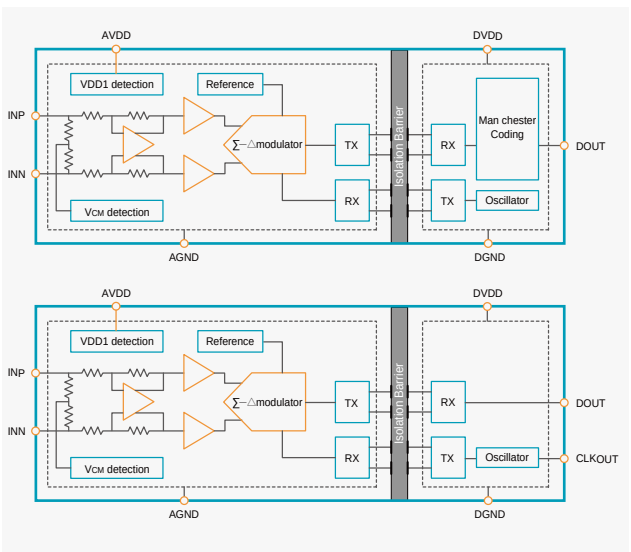
Product introduction

NSi1303 is a high-performance Σ-Δ modulator with output separated from input based on the NOVOSENSE capacitive isolation technology. The linear differential input signal range of the device is ± 50mV (full scale ± 64mV) or ± 250mV (full scale ± 320mV). The analog input is continuously sampled by a second-order Σ-Δ modulator and then converted to a high-speed, single-bit data stream. The output bit data stream of NSi1303 is synchronized with its internal clock, in this process, Manchester encoding (NSi1303Ex) is used or the data is leaving as unencoded (NSi1303M/Dx). By using an appropriate digital filter (such as a sinc3 filter) to extract the bit stream, the device can achieve 16-bit resolution and 86dB/82.5dB signal-to-noise ratio (SNR) under the condition of 78.125KPS. The output of Manchester coded NSi1303Ex supports single-wire data and clock transmission, regardless of the setting and holding time requirements of the receiving device.

Product feature

- Insulation voltage up to 5000Vrms
- Options of 10MHz and 20MHz internal clocks
- Linear input range of ± 50mV or ± 250mV
- Excellent DC performance:
  Offset error and drift: ±50μV or ±100μV (Max) , ±1μV/℃(Max)
  Gain error and drift: ±0.2%(Max), ±40ppm/°C(Max)
- SNR: 85dB(Typ)
- High CMTI: 150kV/us(Typ)
- System-level diagnostic capabilities:
  AVDD monitoring
  Input common mode overvoltage detection
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-8(300mil), SOW-16(300mil)

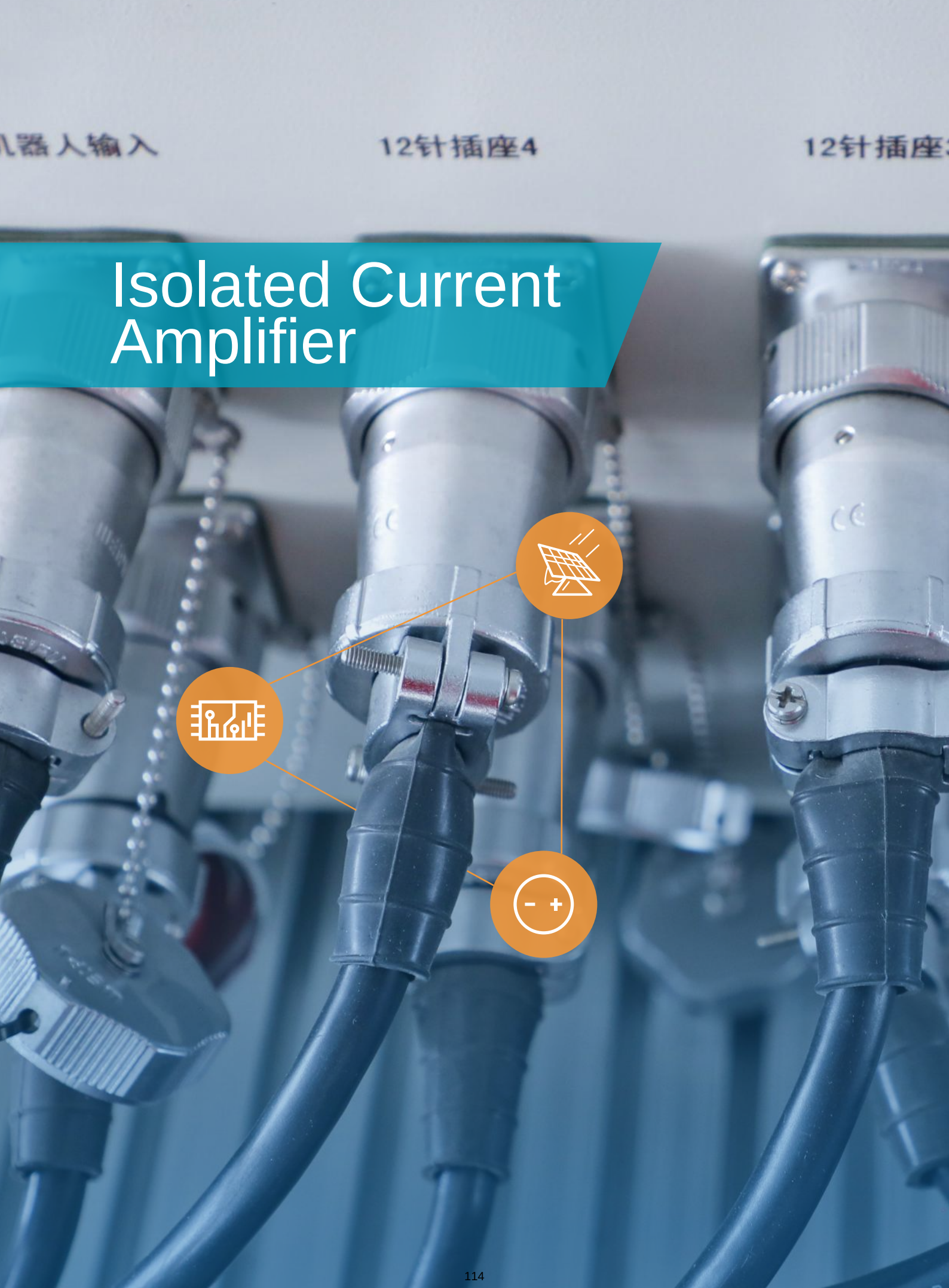
Pinout & Package



Application

- Shunt current monitoring
- AC motor control
- UPS
- Onboard charger

Isolated Current Amplifier



Isolated Current Amplifier

Isolated Current Amplifier Series										
	Part No.	Part No.	Iso Rating (kVrms)	Linear Input Range(mV)	Input Type	Output Type	CMTI (kV/μs)	AEC-Q100	Operating Temperature Range (℃)	Package Type
Isolated Current Amplifier	NSi1300	NSi1300D05	5	-50~50	Differential	Differential	150	✓	-40~125	SOW-8
		NSi1300D25	5	-250~250	Differential	Differential	150	✓	-40~125	SOW-8
	NSi1200	NSi1200	5	-250~250	Differential	Differential	150		-40~125	SOW-8
		NSi1200	5	-250~250	Differential	Differential	150		-40~125	DUB-8
	NSi1400	NSi1400	5	-250~250	Differential	Differential	150	✓	-40~125	SOW-8
										SOP-8
										DUB-8

NSi1200/NSi1300: Isolated Current Sampling Amplifier with High Reliability

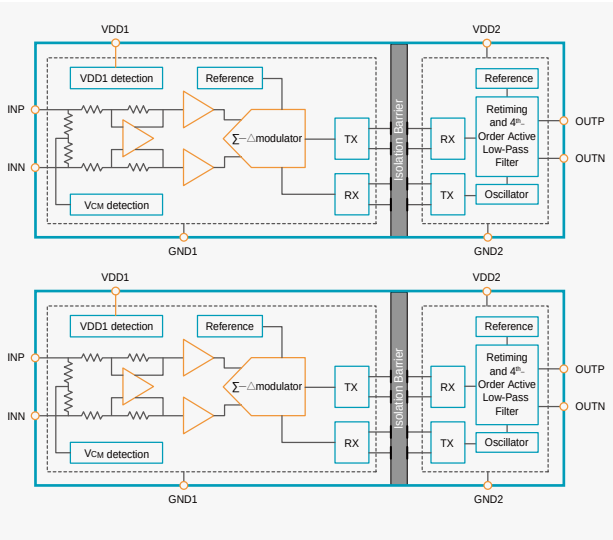
Product introduction

NSi1200/NSi1300 is a high-performance isolated amplifier with output separated from input based on the NOVOSENSE capacitive isolation technology.This series of products are designed with linear differential input signal of ± 50mV (full scale ± 64mV) or ± 250mV (full scale ± 320mV). The fail-safe function includes input common mode overvoltage detection and VDD1 missing detection, simplifying system design and diagnosis. The fixed gain of the NSi1200/NSi1300 is 8/8.2 and provides a differential analog output. Low offset and gain drift ensure accuracy over the entire temperature range. High common-mode transient immunity ensures that the device is able to provide accurate and reliable measurements even in the presence of high-power switching such as in motor control applications.

Product feature

- Linear input range of ± 50mV or ± 250mV
- Fixed gain: 8 for NSi1200, and 8.2 for NSi1300
- Ultralow offset error and drift：±0.2mV(Max), ±3μV/°C(Max)
- Ultralow gain error and drift：±0.3%(Max), ±50ppm/°C(Max)
- SNR：86dB(Typ)
- Wide bandwidth: 310kHz
- High CMTI:150kV/us
- Operating temperature: -40°C to 125°C

Pinout & Package



Application

- Shunt current monitoring
- AC motor control
- Power and solar inverters
- UPS
- Onboard charger

NSi1400: Cost-effective Isolated Current Sampling Amplifier with High Reliability

Product introduction

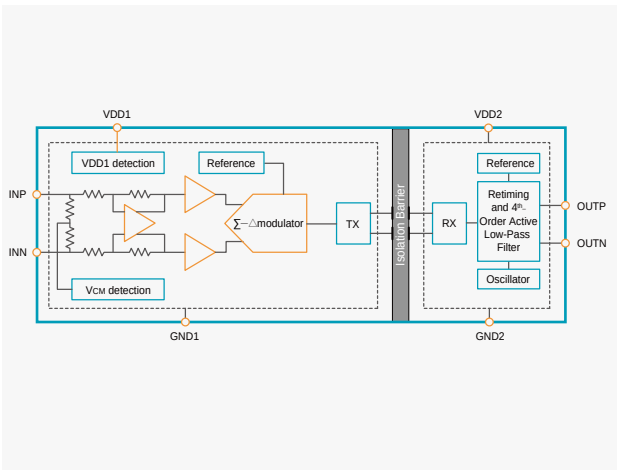
NSi1400 is an cost-effective isolated amplifier with output separated from input based on the NOVOSENSE capacitive isolation technology. This product is designed with linear differential input signal of ± 250mV (full scale ± 320mV). Differential inputs are ideal for shunt resistance-based current detection in high voltage applications that require isolation.

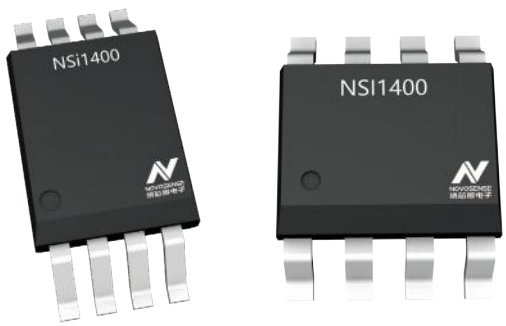
The fixed gain of the NSi1400 is 8/8.2 and differential analog input is made available as well. Low offset and gain drift ensure accuracy over the entire temperature range. High common-mode transient immunity ensures that the device is able to provide accurate and reliable measurements even in the presence of high-power switching such as in motor control applications. The fail-safe function includes input common mode overvoltage detection and VDD1 missing detection, simplifying system design and diagnosis.

Product feature

- Insulation voltage up to 5000Vrms
- Linear input range of ± 250mV
- Low offset error and drift：±2mV(Max), -4 to 4μV/°C(Max)
- Low gain error and drift：±0.3%(Max), ±50ppm/°C(Max)
- Low non-linearity and drift：±0.05%(Max), ±1ppm/°C(Typ)
- SNR: 70dB(Typ, BW=100kHz)
- Bandwidth: 220kHz(Typ)
- High CMTI：150kV/us(Typ)
- System-level diagnostic capabilities:
  VDD1 monitoring
  Input common mode overvoltage detection
- Operating temperature: -40°C to 125°C

Functional block diagram



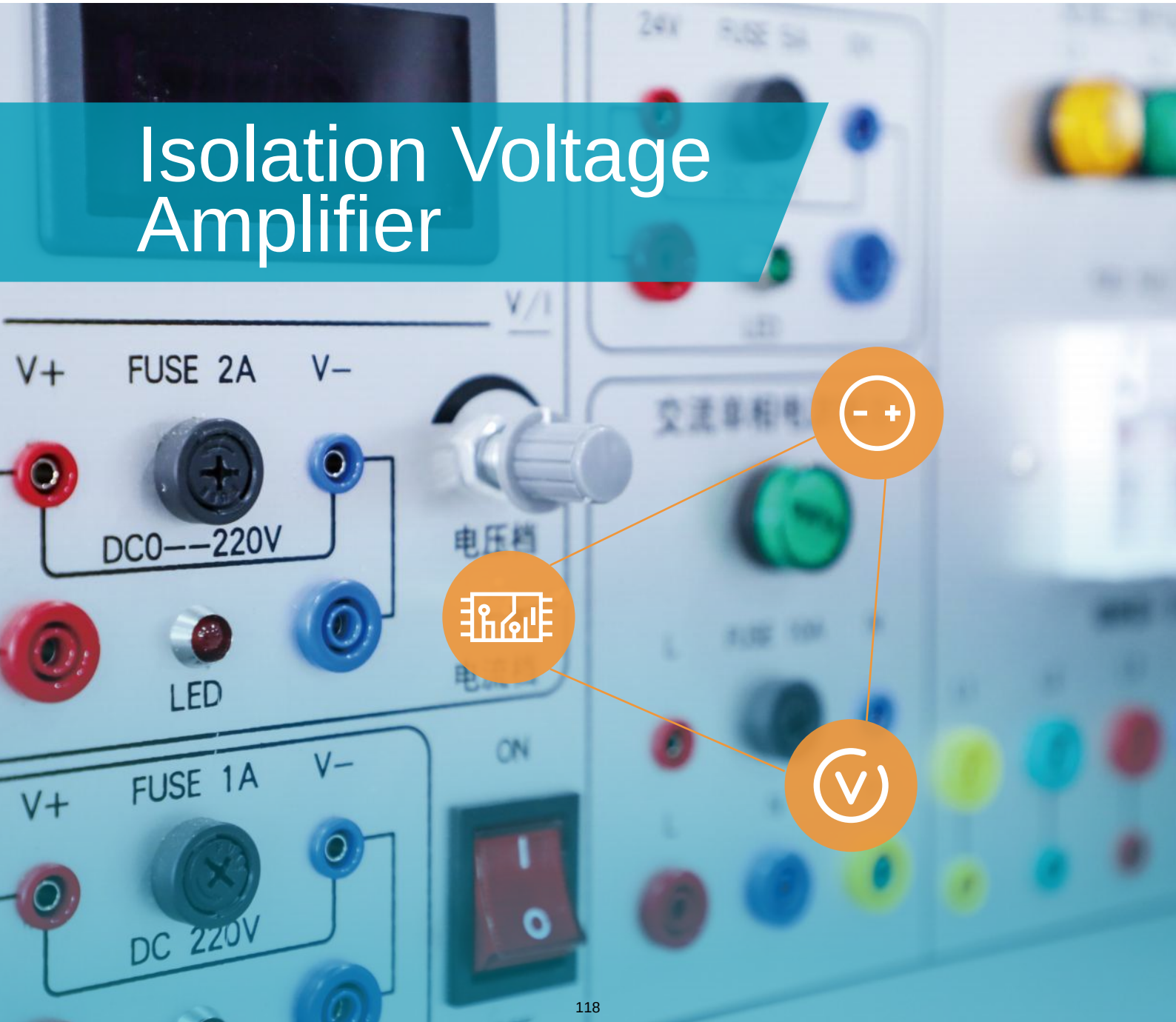


Application

- Shunt current monitoring
- AC motor control
- Power and solar inverters
- UPS
- Onboard charger

Isolation Voltage Amplifier

Isolation Voltage Amplifier Series										
	Part No.	Part No.	Iso Rating (kVrms)	Linear Input Range(mV)	Input Type	Output Type	CMTI (kV/μs)	AEC-Q100	Operating Temperature Range (°C)	Package Type
Isolated Amplifier	NSi1311	NSi1311	5	100~2000	Single-ended	Differential	150	✓	-40~125	SOW-8
	NSi1312	NSi1312D	5	-1200-1200	Single-ended	Differential	150		-40~125	SOW-8
										SOP-8
		NSi1312S	5	-1200-1200	Single-ended	Single-ended	150		-40~125	SOW-8
										SOP-8



NSi1311: Isolated Voltage Sampling Amplifier with High Reliability

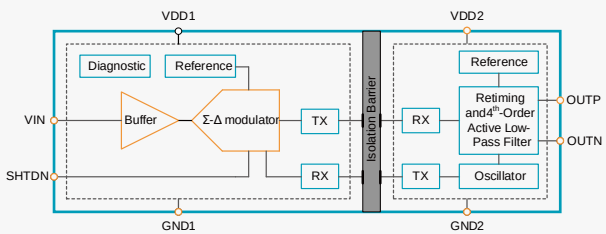
Product introduction

NSi1311 is a high-performance isolated amplifier with output separated from input based on the NOVOSENSE capacitive isolation technology. The device is designed with a single-ended input signal range of 0.1V to 2V. The high input impedance of the NSi1311 makes it ideal for connection to high voltage resistive dividers or other voltage signal sources with high output impedance. The fixed gain of the device is 1, and differential analog input is made available as well. Low offset and gain drift ensure accuracy over the entire temperature range. High common-mode transient immunity ensures that the device is able to provide accurate and reliable measurements even in the presence of high-power switching such as in motor control applications.The fail-safe function (high-side supply voltage loss detection) simplifies the design and diagnostics of the system.

Product feature

- Insulation voltage up to 5000Vrms
- Linear input range of 0.1 to 2V
- Fixed gain: 1
- Ultralow offset error and drift: ±1.5mV(Max), -5 to 30μV/°C(Max)
- Ultralow gain error and drift: ±0.3%(Max), ±45ppm/°C(Max)
- Ultralow non-linearity and drift: ±0.04%(Max), ±1ppm/°C(Max)
- SNR: 82dB(Typ, BW=10kHz) or 70dB(Typ, BW=100kHz)
- Wide bandwidth: 400kHz(Typ)
- High CMTI: 150kV/us(Typ)
- System-level diagnostic capabilities: VDD1 monitoring
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOP-8(300mil)

Functional block diagram



Application

BUS voltage monitoring

AC motor control

Power and solar inverters

UPS

Onboard charger

NSi1312: Isolated Voltage Sampling Amplifier with High Reliability

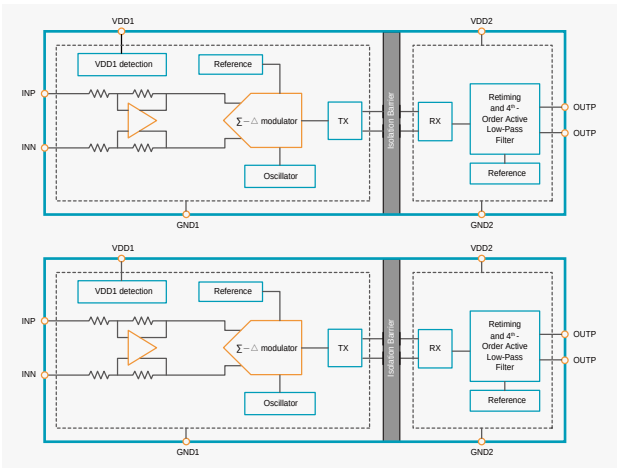
Product introduction

NSi1312 is a cost-effective isolated amplifier with output separated from input based on the NOVOSENSE capacitive isolation technology. The linear differential input signal range of the device is 1.2V (full scale ± 1.5V). The high input impedance of the NSi1311 makes it ideal for connection to high voltage resistive dividers or other voltage signal sources with high output impedance. The fixed gain of the device is 1, and two versions are available: one is with differential analog output (NSi1312D), and the other is with single-ended analog output (NSi1312S). Low offset and gain drift ensure accuracy over the entire temperature range. High common-mode transient immunity ensures that the device is able to provide accurate and reliable measurements even in the presence of high-power switching such as in motor control applications. The fail-safe function (high-side supply voltage loss detection) simplifies the design and diagnostics of the system.

Product feature

- Insulation voltage up to 5000Vrms
- Linear input range of ± 1.2V
- Fixed gain: 1
- Excellent DC performance:
  Offset error and drift: ±5mV(Max) , ±20μV/°C(Typ)
  Gain error and drift: ±1%(Max), ±30ppm/°C(Typ)
  Non-linearity and drift: ±0.3%(Max), ±10ppm/°C(Typ)
- SNR: 72dB(Typ)
- High CMTI: 100kV/us(Typ)
- System-level diagnostic capabilities:
  VDD1 monitoring
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-8 (300mil), SOP-8 (150mil)

Functional block diagram



Application

- BUS voltage monitoring
- AC motor control
- Power and solar inverters
- UPS
- Onboard charger

Isolated Error Amplifier

NSi319x Isolated Error Amplifier								
	Part No.	Iso Rating (kVrms)	Bandwidth (kHz)	Initial Accuracy (%)	Reference Voltage (V)	CMTI (kV/μs)	Operating Temperature Range (°C)	Package Type
Isolated Error Amplifier	NSi3190	3	400	0.5	1.225	150	-40~125	SSOP16

Isolated Error Amplifier

NSi3190: Isolated Error Amplifier with High Reliability

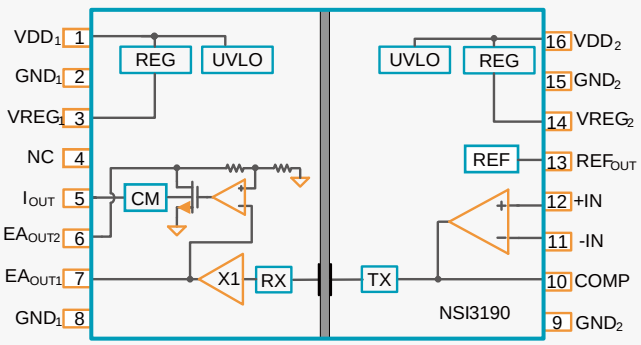
Product introduction

The NSI3190 is a high reliability isolated error amplifier based on NOVOSENSE capacitive isolation technology. NSi3190 is ideal for linear feedback power supplies. The primary side controller of the NSi3190 improves transient response, power density and stability compared to schemes using optocouplers and shunt regulators. The output of NSi3190 can support voltage output and current output, which is compatible with optocouplers. The current transmission coefficient can be set by an external resistor between EAOUT2 and VDD1 or VREG1.

Product feature

- 0.5% initial accuracy
- Insulation voltage up to 3000Vrms
- Wide bandwidth: 400kHz
- Power supply voltage:
  VDD1: 4V to 20V
  VDD2: 4V to 20V
- Reference voltage: 1.225V
- Compatible with voltage type output and current type output
- Ultra low power consumption
- Operating temperature: -40°C to 125°C

Functional block diagram

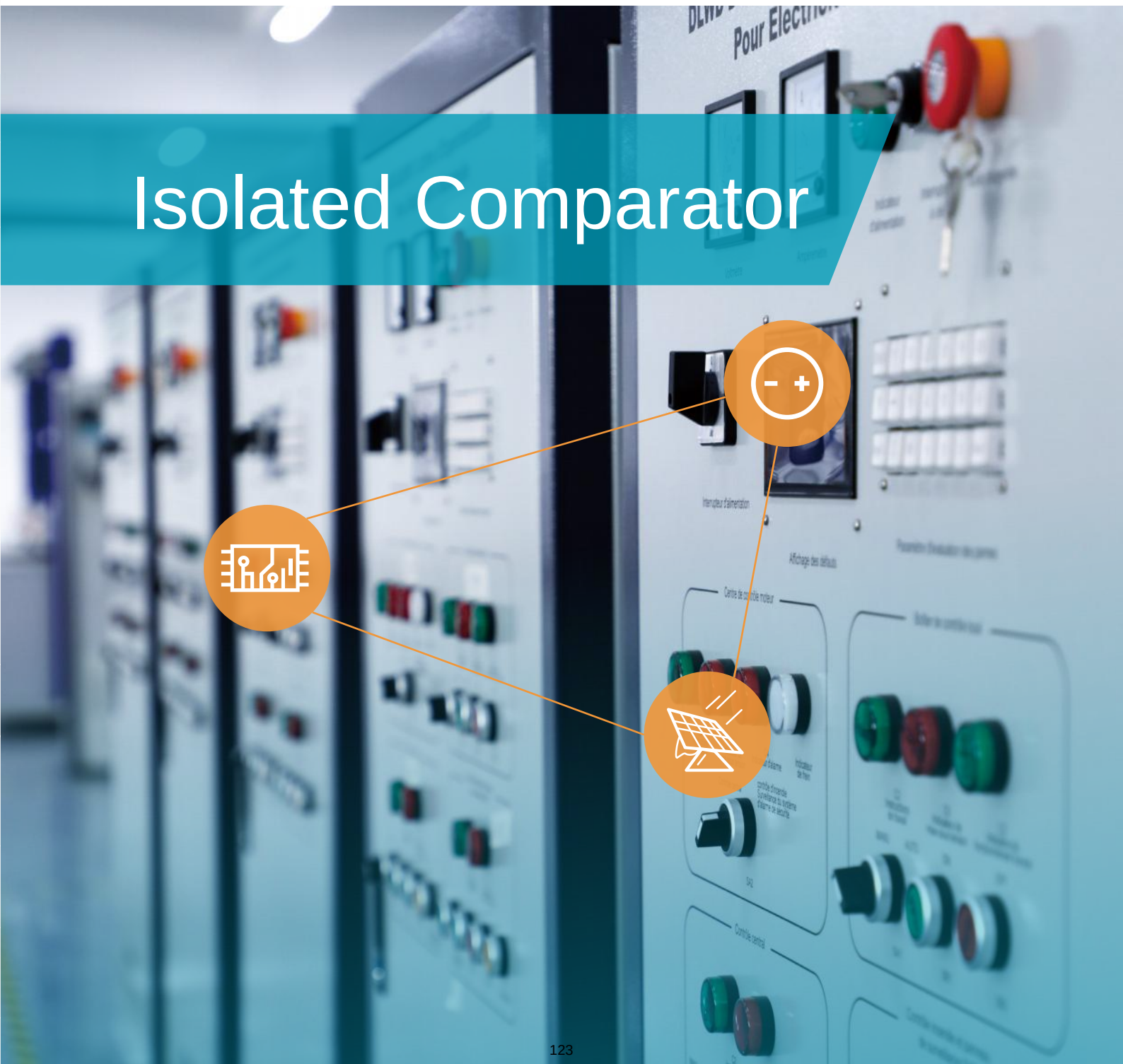


Application

- DOSA compliant modules
- Inverter
- UPS
- Voltage monitor
- Power supply system

Isolated Comparator

NSi22C1x Isolated Comparator Family										
	Part No.	Part No.	Iso Rating (kVrms)	Input Side Power Supply (V)	Reference Threshold (mV)	Output Type	CMTI (kV/μs)	Latch Function	Operating Temperature Range (°C)	Package Type
Isolated Comparator	NSi22C1x	NSi22C11	5	3-25	500-2000	Push-pull Open-drain	150		-40~125	SOW-8
										SOP-8
		NSi22C11	5	3-25	0-320	Open-drain	150	✓	-40~125	SOW-8
										SOP-8



NSi22C1x: High-speed isolated comparators

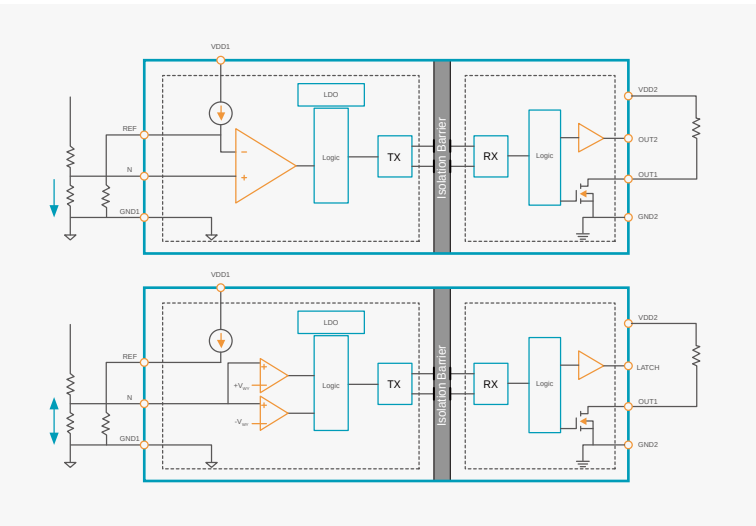
Product introduction

NSI22C1x is a high speed isolated comparator with output separated from input based on the NOVOSENSE capacitive isolation technology. NSi22C11 is an isolated comparator with open-drain and push-pull outputs, and the NSi22C12 is a window comparator with open-drain output and latch function. The fast response characteristics of the NSi22C1x make it ideal for overvoltage and overcurrent protection applications. The protection threshold of the NSi22C1x can be adjusted by external resistors. NSi22C11 is designed with an adjustable threshold from 0.5V to 2V, and NSi22C12 is designed with a window threshold adjustment range from 0 to ±320mV. Two packages are available for NSi22C1x, one is SOP-8 narrow-body package with basic isolation and the other is SOW-8 wide-body package with reinforced isolation.

Product feature

- Insulation voltage up to 5000Vrms
- Power supply at input side: 3V to 25V
- Adjustable input reference range:
  NSi22C11：0.5V to 2V
  NSi22C12: 0 to ±320mV
- High-precision input threshold: ±1% error (Max)
- Low propagation delay:
  NSi22C11：1us(Max)
  NSi22C12：250ns (Max)
- High CMTI：150kV/us(Typ)
- System-level diagnostic capabilities:
  VDD1 monitoring
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-8 (300mil), SOP-8 (150mil)

Functional block diagram



Application

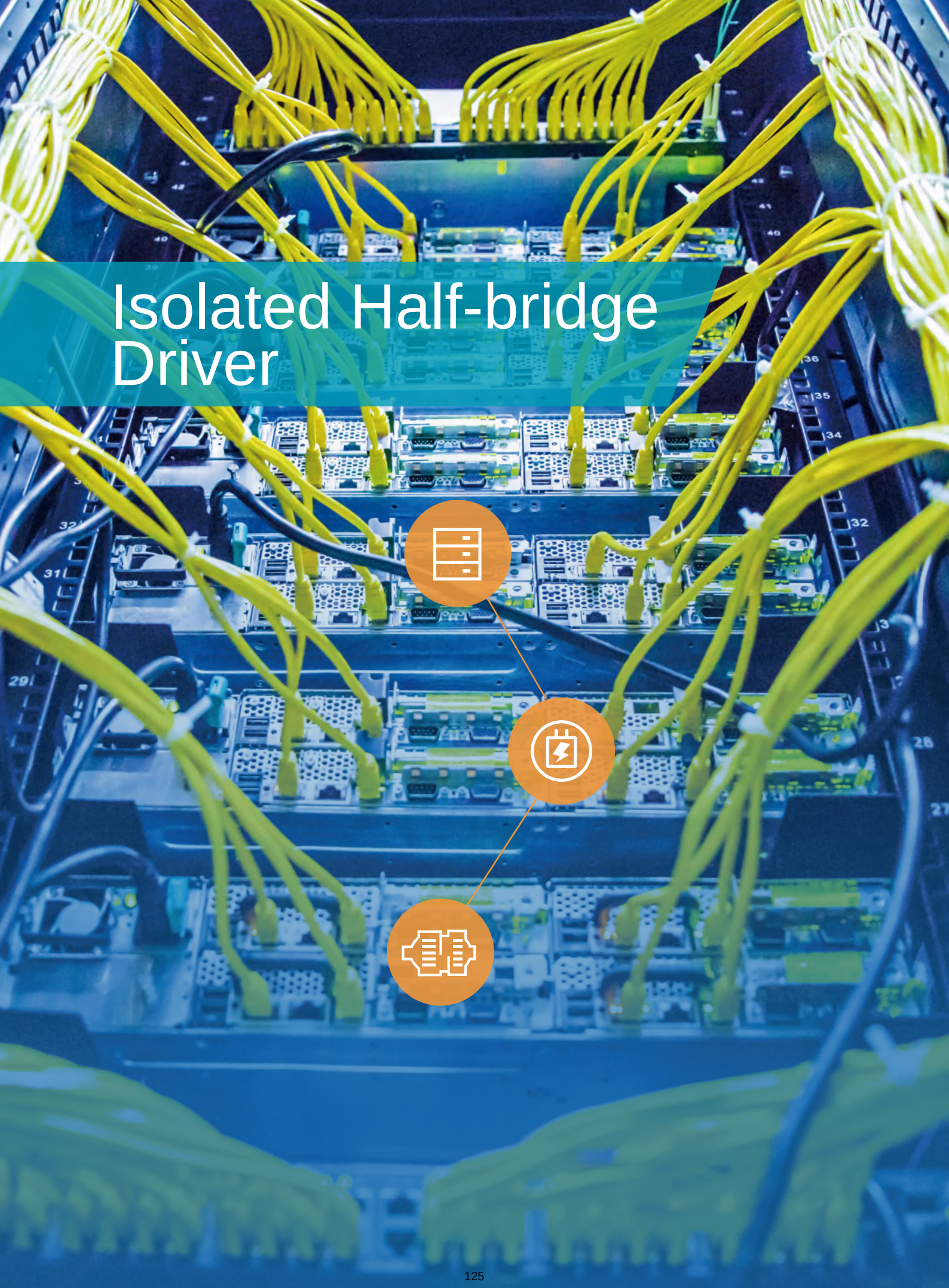
AC motor control

Power and solar inverters

UPS

Onboard charger

Isolated Half-bridge Driver



Isolated Half-bridge Driver

Part Number	Peak output current (a)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (Min) (kV/us)	Feature	Isolation Withstand	Insulation grade	Operating temperature (°C)	Qualification	Package
NSi6602A-DLAR	4/-6	6	6	30	100	Disable, Programmable dead time	2.5	Basic insulation	-40~125	Industrial	LGA13
NSi6602B-DLAR	4/-6	8	6	30	100	Disable, Programmable dead time	2.5	Basic insulation	-40~125	Industrial	LGA13
NSi6602C-DLAR	4/-6	13	6	30	100	Disable, Programmable dead time	2.5	Basic insulation	-40~125	Industrial	LGA13
NSi6602HA-DLAR	6/-8	6	6	30	100	Disable, Programmable dead time	2.5	Basic insulation	-40~125	Industrial	LGA13
NSi6602A-DSPNR	4/-6	6	6	30	100	Disable, Programmable dead time	3	Basic insulation	-40~125	Industrial	SOP16
NSi6602B-DSPNR	4/-6	8	6	30	100	Disable, Programmable dead time	3	Basic insulation	-40~125	Industrial	SOP16
NSi6602C-DSPNR	4/-6	13	6	30	100	Disable, Programmable dead time	3	Basic insulation	-40~125	Industrial	SOP16
NSi6602A-DSWR	4/-6	6	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6602B-DSWR	4/-6	8	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6602C-DSWR	4/-6	13	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6602HB-DSWR	6/-8	8	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6602A-DSWKR	4/-6	6	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSi6602B-DSWKR	4/-6	8	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSi6602C-DSWKR	4/-6	13	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSi6602A-Q1SWR	4/-6	6	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6602B-Q1SWR	4/-6	8	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6602C-Q1SWR	4/-6	13	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6602A-Q1SWKR	4/-6	6	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSi6602B-Q1SWKR	4/-6	8	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSi6602C-Q1SWKR	4/-6	13	6	30	100	Disable, Programmable dead time	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSi6602A-Q1SPNR	4/-6	6	6	30	100	Disable, Programmable dead time	3	Basic insulation	-40~125	Automotive	SOP16
NSi6602B-Q1SPNR	4/-6	8	6	30	100	Disable, Programmable dead time	3	Basic insulation	-40~125	Automotive	SOP16
NSi6602C-Q1SPNR	4/-6	13	6	30	100	Disable, Programmable dead time	3	Basic insulation	-40~125	Automotive	SOP16
NSi6622A-DLAR	4/-6	6	6	30	100	Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSi6622B-DLAR	4/-6	8	6	30	100	Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSi6622C-DLAR	4/-6	13	6	30	100	Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSi6622A-DSPNR	4/-6	6	6	30	100	Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSi6622B-DSPNR	4/-6	8	6	30	100	Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSi6622C-DSPNR	4/-6	13	6	30	100	Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSi6622A-DSWR	4/-6	6	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6622B-DSWR	4/-6	8	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6622C-DSWR	4/-6	13	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6622A-DSWKR	4/-6	6	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSi6622B-DSWKR	4/-6	8	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSi6622C-DSWKR	4/-6	13	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSi6622A-Q1SWR	4/-6	6	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6622B-Q1SWR	4/-6	8	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6622C-Q1SWR	4/-6	13	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6622A-Q1SWKR	4/-6	6	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSi6622B-Q1SWKR	4/-6	8	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSi6622C-Q1SWKR	4/-6	13	6	30	100	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSi6622A-Q1SPNR	4/-6	6	6	30	100	Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSi6622B-Q1SPNR	4/-6	8	6	30	100	Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSi6622C-Q1SPNR	4/-6	13	6	30	100	Disable	3	Basic insulation	-40~125	Automotive	SOP16

NSi66x2: Dual-channel Isolated Gate Driver

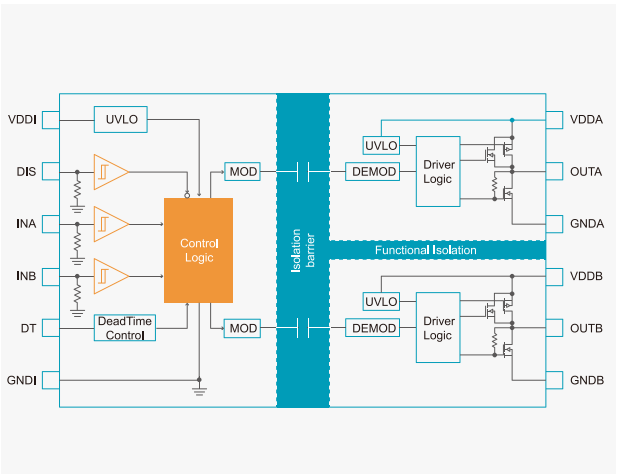
Product introduction

NSi66x2 is a series of highly reliable isolated dual channel gate driver ICs, which can be designed to drive power transistors with switching frequency up to 2MHz. Each output can source and sink up to 4A/6A with fast propagation delay of 25ns and the maximum delay matching of 5ns. NSi66x2 provides 2500Vrms isolation in 5*5mm LGA13 package according to UL1577, 3000Vrms isolation in SOIC16 (150mil) narrow-body package, and 5700Vrms isolation in SOIC16 (300mil) and SOIC14 (300mil) wide-body packages. The minimum common mode transient immunity (CMTI) of 100kV/us improves system robustness. The maximum supply voltage of the driver is 30V, and the input side accepts supply voltages from 2.7V to 5V. All supply voltage pins support undervoltage lockout (UVLO). With all these outstanding features, NSi66x2 is suitable for switching power supply systems which require high reliability, high power density and high efficiency.

Product feature

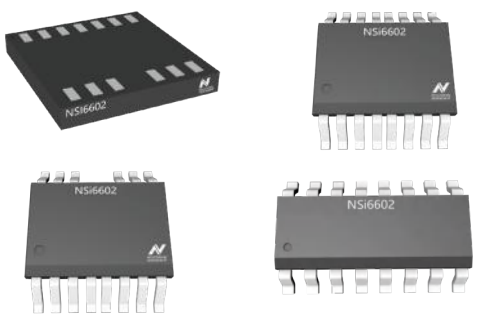
- Isolated dual channel driver
- Input side power supply voltage: 3V~5.5V
- Driver side power supply voltage: With UVLO, up to 30V
- Peak source and sink current 4A/6A
- High CMTI: 150kV/us
- Typical propagation delay: 25ns
- Maximum delay matching: 5ns
- Maximum pulse width distortion: 6ns
- Programmable dead time (NSi6602)
- No dead time (NSi6622)
- Minimum receivable input pulse width: 15ns
- Operating temperature: -40°C~125°C
- Package type: LGA13, SOIC14(300mil), SOIC16(300mil), SOIC16(150mil)

Functional block diagram



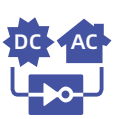
Safety certification

- UL1577 certification:
  LGA13: 2.5kVrms
  SOIC14(300mil): 5.7kVrms for 1 minute
  SOIC16(300mil): 5.7kVrms for 1 minute
  SOIC16(150mil): 3kVrms for 1 minute
- CQC certification: GB4943.1-2011
- CSA certification: 5A
- VDE certification: DIN V VDE V 0884-11:2017-1



Application

Isolated DC-DC and AC-DC power supplies in servers, telecommunications and Industrial



DC-AC solar inverter

Motor drive and EV charging

UPS and battery charger

Isolated Single Driver

Isolated Single Driver

Part Number	Peak drive current (A)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (Min) (kV/us)	Feature	Isolation Withstand Voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSi6801B-DSPR	5/-5	9	N/A	35	150	Opto-compatible input	3	Basic insulation	-40~125	Industrial	SOP8
NSi6801C-DSPR	5/-5	13	N/A	35	150	Opto-compatible input	3	Basic insulation	-40~125	Industrial	SOP8
NSi6801B-DSWFR	5/-5	9	N/A	35	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW6
NSi6801C-DSWFR	5/-5	13	N/A	35	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW6
NSi6801TB-DDBR	5/-5	9	N/A	35	150	Opto-compatible input	5	Basic insulation	-40~125	Industrial	DUB8
NSi6801TC-DDBR	5/-5	13	N/A	35	150	Opto-compatible input	5	Basic insulation	-40~125	Industrial	DUB8
NSi6801LC-DDBR	5/-5	13	N/A	35	150	Opto-compatible input	5	Basic insulation	-40~125	Industrial	DUB8
NSi68010B-DSWAR	0.7/-0.8	9	N/A	32	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW6
NSi68011C-DSWAR	1.5/-2	13	N/A	32	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW6
NSi6601B-DSPR	5/-5	9	17	35	150	Split output	3	Basic insulation	-40~125	Industrial	SOP8
NSi6601C-DSPR	5/-5	13	17	35	150	Split output	3	Basic insulation	-40~125	Industrial	SOP8
NSi6601B-DSWVR	5/-5	9	17	35	150	Split output	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSi6601C-DSWVR	5/-5	13	17	35	150	Split output	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSi6601MB-DSPR	5/-5	9	17	35	150	Miller clamp	3	Basic insulation	-40~125	Industrial	SOP8
NSi6601MC-DSPR	5/-5	13	17	35	150	Miller clamp	3	Basic insulation	-40~125	Industrial	SOP8
NSi6601MB-DSWVR	5/-5	9	17	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSi6601MC-DSWVR	5/-5	13	17	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSi6601WC-DSWVR	5/-5	13	17	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSi6601MC-Q1SPR	5/-5	13	17	35	150	Miller clamp	3	Basic insulation	-40~125	Automotive	SOP8
NSi6601MC-Q1SWVR	5/-5	13	17	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Automotive	SOW8

NSi6801: Optocoupler Compatible Single-Channel Isolated Gate Driver

Product introduction

NSi6801 is a single-channel isolated gate driver, which is pin-compatible with popular optically coupled gate drivers. It can provide a peak source/sink current of 5A. It supports the minimum common mode transient immunity (CMTI) of 150kV/μs, which ensures the robustness of the system. The maximum power supply voltage of the driver is 32V. When the input circuit is used in optocoupler compatible systems, it has performance advantages over optocoupler gate drivers, including better reliability and aging performance, higher operating temperature, shorter propagation delay and less pulse width distortion. Therefore, NSi6801 is more suitable than photoelectric isolation driver in switching power supply systems which requires high reliability, high power density and high efficiency.

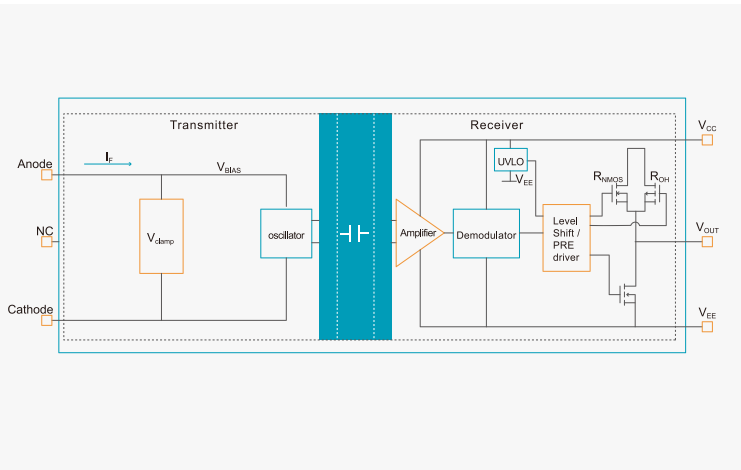
Product feature

- P2P compatible with optocoupler drivers, but upgraded performance
- Driver side power supply voltage: up to 35V, UVLO is available
- Peak source/sink current of 5A/5A
- High CMTI:150kV / μs
- Typical propagation delay: 75ns
- Maximum pulse width distortion: 30ns
- Operation ambient temperature: -40°C~125°C

Safety certification

- UL certification:
  SOW6: 5700Vrms for 1 minute
  DUB8: 5000Vrms for 1 minute
- VDE certification: DIN VDE V 0884-11:2017-01
- CSA certification: CSA components has passed 5A approval
- CQC certification: GB4943.1-2011

Functional block diagram



Package

- SOIC-6 wide body (SOW6)
- DUB-8

Application

Photovoltaic inverter

Motor driver

UPS power supply and battery charger

Isolation DC/DC and AC/DC power supplies

NSi6801x: Cost-effective Optocoupler Compatible Single-Channel Isolated Gate Driver

Product introduction

NSi6801x series is the second generation product based on NSi6801, including NSi68010B and NSi68011C. NSi6801x is more cost-effective compared with the first generation in order to assist customers to reduce system costs and increase efficiency. NSi6801x single-channel isolated gate driver can be pin compatible with optically coupled gate drivers. It can provide up to 2A drive current. The minimum common mode transient immunity (CMTI) of 150kV/μs ensures system robustness. The maximum supply voltage of the driver is 32 V. When the input circuit is applied in an optocoupler-compatible system, it offers better performance compared with optocoupler gate drivers, including better reliability, longer working life, higher operating temperature, shorter propagation delay and less pulse width distortion. Therefore, NSi6801x is suitable for replacing opto-isolated drivers in switching power supply systems which require high reliability, power density and efficiency.

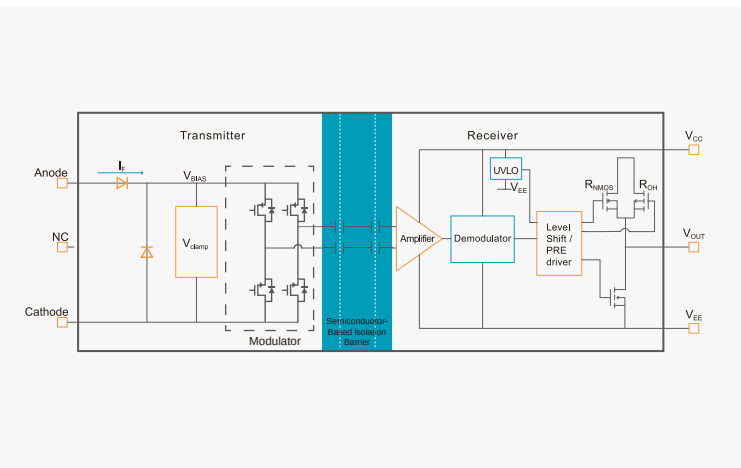
Product feature

- P2P compatible with optocoupler drivers, but upgraded performance
- Driver side power supply voltage: up to 35V, UVLO is available
- High CMTI:150kV/μs
- NSi68010 drive current: +0.7A/-0.8A
- NSi68011 drive current: +1.5A/-2A
- Typical propagation delay: 63ns
- Maximum pulse width distortion: 30ns
- Operation ambient temperature: -40℃~125℃

Safety certification

- UL certification: 5700Vrms for 1 minute (SOW6)
- VDE certification: DIN VDE V 0884-11:2017-01
- CSA certification: CSA components has passed 5A approval
- CQC certification: GB4943.1-2011

Functional block diagram



Package

- SOIC-6 wide body (SOW6)

Application

Photovoltaic inverter

Motor driver

UPS power supply and battery charger

Isolation DC/DC and AC/DC power supplies

NSi6601/NSi6601M: Single-Channel Isolated Gate Driver

Product introduction

NSi6601/6601M is a single-channel isolated gate driver suitable for driving IGBT, power MOSFET and SiC MOSFET in many applications. Separate outputs are provided to control the rising and falling duration respectively. It can provide peak source/sink current of 5A/5A. The minimum 150kV / μs common mode transient immunity (CMTI) ensures the robustness of the system. The maximum power supply voltage of the driver is 32V, and the input side is supplied with a power supply voltage of 3.1V to 17V. All power pins support undervoltage lockout (UVLO) protection. NSi6601 is designed with high drive current, excellent durability, wide power supply voltage range and fast signal propagation, and is suitable for switching power supply systems which require high reliability, high power density and high efficiency.

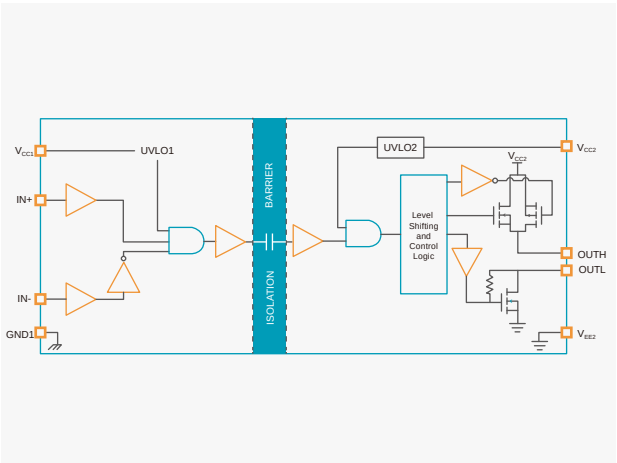
Product feature

- Single-channel isolated driver
- Input side supply voltage: 3.1V to 17V
- Driver side supply voltage: UVLO options up to 32V, 9V and 13
- Version M supports Miller Clamp function (NSi6601M) with current up to 5A
- Peak source/sink current of 5A/5A
- High CMTI:150kV / μs
- Typical propagation delay: 78ns
- Operation ambient temperature: -40°C to 125°C
- AEC-Q100

Safety certification

- UL certification:
  SOP8: 3000Vrms for 1 minute
  SOW8: 5700Vrms for 1 minute
- VDE certification: DIN VDE V 0884-11:2017-01
- CSA certification: CSA components has passed 5A approval
- CQC certification: GB4943.1-2011

Functional block diagram



Package

- SOP8
- SOIC-8 wide body (SOW8)

Application

Photovoltaic inverter

Motor driver

UPS power supply and battery charger

Isolation DC/DC and AC/DC power supplies

Smart Isolated Driver

Part Number	Peak drive current (A)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (Min) (kV/us)	Feature	Isolation Withstand Voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSi6611ASC-DSWR	10/-10	13	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, ASC function, Split output and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6651ASC-DSWR	10/-10	13	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, Split output and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6651ALC-DSWR	10/-10	13	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6631ASC-DSWR	10/-10	13	6	35	150	OCP short circuit protection, soft shutdown, Miller clamp, ASC function, Split output and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSi6611ASC-Q1SWR	10/-10	13	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, ASC function, separate output and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6651ASC-Q1SWR	10/-10	13	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, Split output and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6651ALC-Q1SWR	10/-10	13	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSi6631ASC-Q1SWR	10/-10	13	6	35	150	OCP short circuit protection, soft shutdown, Miller clamp, ASC function, Split output and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16

NSi6611/NSi6651: Smart Isolated Gate Driver

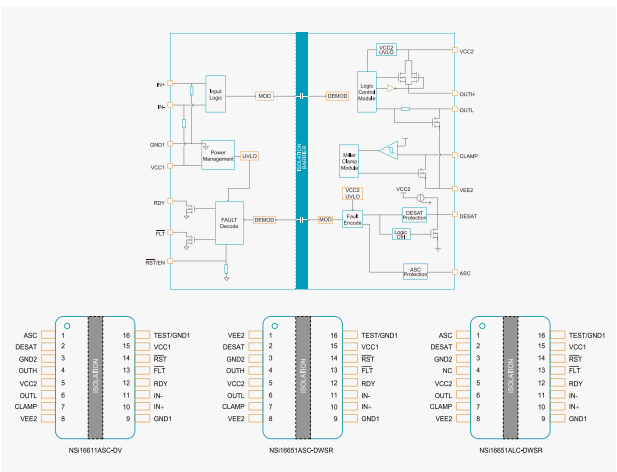
Product introduction

NSi6611/NSi6651 is a single-channel smart isolated gate driver designed to drive IGBT, power MOSFET and SiC MOSFET and other power transistors in many applications and provide protection for their safe operation. It can provide separate output to control the rising and falling duration respectively, it supports rail-to-rail output, and can provide a maximum 10A/10A source and sink current capability. NSi6611/NSi6651 can provide protection functions, such as UVLO, Miller clamp, DESAT protection, soft shutdown, and when short circuit fault or undervoltage occurs, the fault can be indicated through a separate pin. NSi6611 supports ASC function and can be used to force the output to be high in emergency situations. It supports minimum common mode transient immunity (CMTI) of 150kV/μs to improve system robustness. The maximum supply voltage of driver side is 32V, and the input side accepts supply voltages from 3V to 5.5V. NSi6611/NSi6651 features large drive current, wide power supply voltage range, and high CMTI, and is designed with excellent protection. It is suitable for switching power supply systems and inverters which require high reliability, high power density and high efficiency.

Product feature

- Smart Single-channel isolated Driver
- Input side power supply voltage: 3V~5.5V
- Driver side power supply voltage: With UVLO, up to 32V
- Peak source and sink current 10A/10A
- High CMTI: 150kV/us
- Typical propagation delay: 80ns
- Maximum pulse width distortion: 30ns
- Minimum receivable input pulse width: 40ns
- Rail-to-rail output, with separate output as an option
- Protection mode
- Miller Clamp 4.5A
- DESAT protection with a threshold of 9V
- Supporting soft shutdown at a current of 400mA
- Supporting alarm feedback, reset or enable
- Operating temperature: -40°C~125°C

Functional block diagram



Safety certification

- UL1577 certification: 5.7KVrms (certification in progress)
- CQC certification: GB4943.1-2011 (certification in progress)
- CSA certification: components conform to 5A (certification in progress)
- VDE certification: DIN V VDE V 0884-11:2017-1 (certification in progress)

Application

EV electric drive system

Air conditioning compressor

DC-AC solar inverter

Motor driver

UPS and battery charger

Non-isolated Gate Driver _Low-side Driver

Non-isolated Gate Driver_Low-side Driver

Part Number	Drive object	Peak drive current (A)	Output channel	BUS voltage (v)	VCC (V)	Propagation delay (Max) ton/off(ns)	Delay matching (ns)	Feature	Operating temperature (°C)	Qualification	Package
NSD1025-DSPR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	27/27	4	Enable,Negative Voltage Handling on Input(-10V)	-40~125	Industrial	SOP8
NSD1025-DHMSR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	27/27	4	Enable,Negative Voltage Handling on Input(-10V)	-40~125	Industrial	EP-MSOP8
NSD1025-Q1HSPR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	27/27	4	Enable,Negative Voltage Handling on Input(-10V)	-40~125	Automotive	EP-SOP8
NSD1025-Q1HMSR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	27/27	4	Enable,Negative Voltage Handling on Input(-10V)	-40~125	Automotive	EP-MSOP8
NSD1025E-DSPR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	70/70	4	Input Deglitch, Enable,Negative Voltage Handling on Input(-10V)	-40~125	Industrial	SOP8
NSD1025E-DHMSR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	70/70	4	Input Deglitch, Enable,Negative Voltage Handling on Input(-10V)	-40~125	Industrial	EP-MSOP8
NSD1025E-DDNR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	70/70	4	Input Deglitch, Enable,Negative Voltage Handling on Input(-10V)	-40~125	Industrial	DFN8
NSD1025E-Q1HSPR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	70/70	4	Input Deglitch, Enable,Negative Voltage Handling on Input(-10V)	-40~125	Automotive	EP-SOP8
NSD1025E-Q1HMSR	GaNFET/MOSFET /IGBT	5/-5	2	N/A	4.5-20	70/70	4	Input Deglitch, Enable,Negative Voltage Handling on Input(-10V)	-40~125	Automotive	EP-MSOP8

NSD1025: High Speed Dual Low-side Gate Driver

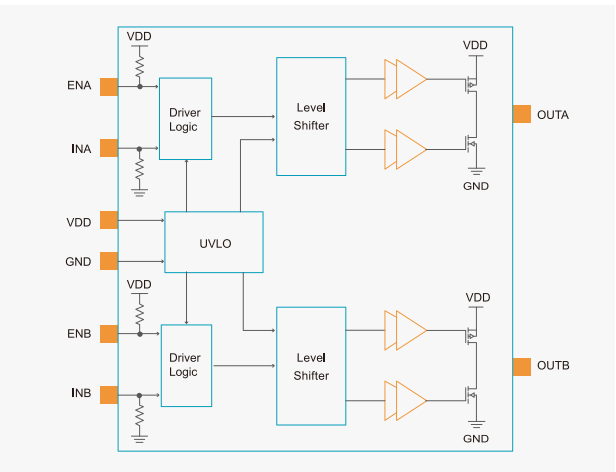
Product introduction

NSD1025 is an in-phase dual-channel high-speed gate driver suitable for driving MOSFET, IGBT and GaN power devices. It can provide 5A source current and sink current to drive capacitive loads, as well as rail-to-rail voltage swing in Miller platform area, which helps to reduce the Miller effect during MOSFET switching. In addition, the short rising and falling duration and the matching propagation delay of the two output channels make the NSD1025 series suitable for ideal high frequency and dual-gate drive power applications, such as synchronous rectifiers. Both the input pin and the enable pin support -10V input, thus increasing robustness, while the enable pin can help users realize control functions in different applications. Moreover, the internal circuit allows under-voltage lockout (UVLO), which keeps the output low until the power supply voltage returns to the operating range. The hysteresis function between high and low thresholds provides excellent immunity.

Product feature

- Supply voltage range: 4.5V to 24V
- Source/sink drive current: 5A (peak)
- Each channel output is designed with two independent enable pins
- Supporting inputs as low as -10V
- Supporting parallel output to allow higher drive current
- CMOS / TTL compatible logic input
- The 5A reverse current function eliminates the need for output protection
- Operating temperature range: -40°C~150°C
- Propagation delay: 21 ns (typical)
- AEC-Q100 certification passed for automotive applications

Functional block diagram



Package

- SOP8, EP-MSOP8, DFN8
- EP-SOP8(Q1), EP-MSOP8(Q1)

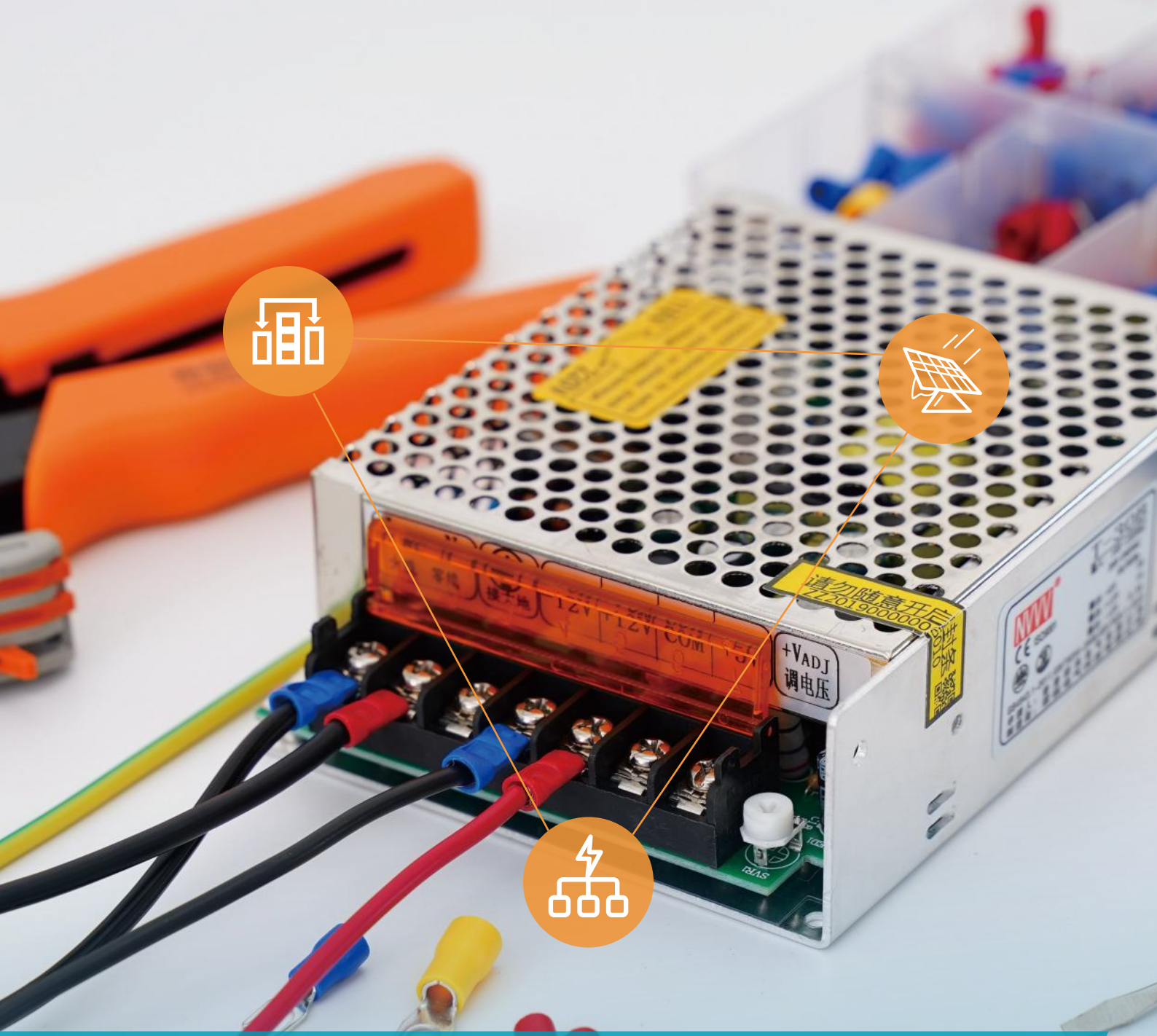
Application

PFC, LLC, SR power supply topology

Power system (OBC/DCDC, industrial power, photovoltaic, communication, server)

Motor controller

Linear driver



Non-isolated Gate Driver _>600V Half-bridge Driver

Non-isolated Gate Driver_> 600V Half-bridge Driver

Part Number	Drive object	Peak drive current (A)	Output channel	BUS voltage (v)	VCC (V)	Propagation delay (Max) ton/off(ns)	Delay matching (ns)	Feature	Operating temperature (°C)	Qualification	Package
NSD1624-DLAJR	MOSFET/IGBT	4/-6	2	700	10-17	35/35	7	UVLO、Interlock	-40~125	Industrial	LGA10
NSD1624-DSPR	MOSFET/IGBT	4/-6	2	700	10-17	35/35	7	UVLO、Interlock	-40~125	Industrial	SOP8
NSD1624-DSPKR	MOSFET/IGBT	4/-6	2	1200	10-17	35/35	7	UVLO、Interlock	-40~125	Industrial	SOP14
NSD1624-Q1SPR	MOSFET/IGBT	4/-6	2	700	10-17	35/35	7	UVLO、Interlock	-40~125	Automotive	SOP8
NSD1624-Q1SPKR	MOSFET/IGBT	4/-6	2	1200	10-17	35/35	7	UVLO、Interlock	-40~125	Automotive	SOP14
NSD2621	GaNFET	2/-4	2	700	9-15	60/60	10	UVLO, Interlock, Miller Clamp and Enable,Integrated LDO	-40~125	Industrial	LGA

NSD1624 High Voltage Half-bridge Gate Driver

Product introduction

NSD1624 is a high-voltage half-bridge driver IC launched by NOVOSENSE lately. It is designed with 4/-6A drive current and can be used to drive various power devices such as MOSfet/IGBT.

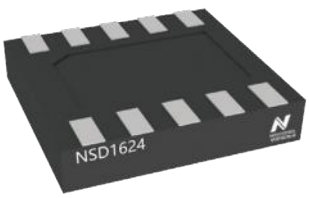
The isolation technology scheme is applied to high-voltage half-bridge driver by NOVOSENSE innovatively, so that the high-voltage output side can withstand up to 1200V DC voltage, while SW can meet the requirements of high dv/dt and can withstand negative spike. It can be applied to high-voltage half-bridges, full-bridges and LLC power supply topologies.

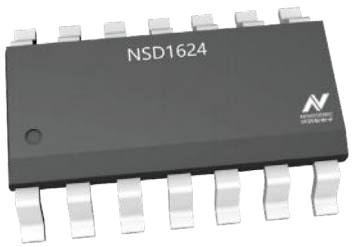
NSD1624 input logic is compatible with 3.3V TTL/CMOS for easy control. Both the high-voltage side and the low-voltage side are designed with independent power supply undervoltage protections (UVLO), which operate in the voltage range of 10~20V.

NSD1624 can be delivered in SOP14,SOP8 or LGA 4*4mm packages.

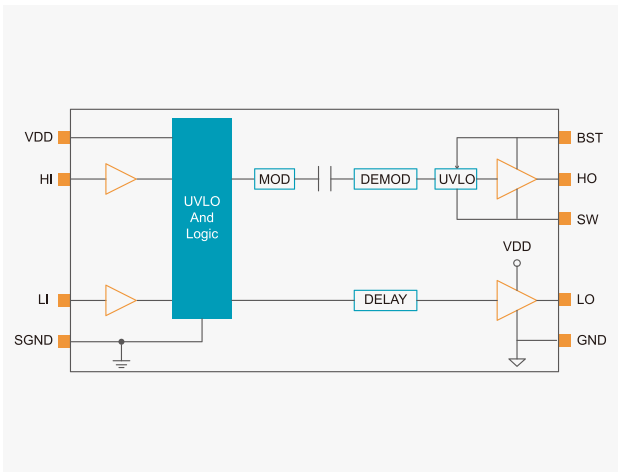
Product feature

- Voltage range on high voltage side: +/-1200V(SOP14 package); +/-700V(SOP8 & LGA package)
- Less than 35ns propagation delay, less than 7ns delay matching
- 4/-6A drive current capability
- Independent Logic Ground Pin (SOP14 package)
- Anti-interference of dV/dt on high voltage side up to 150kV/us





Functional block diagram



Application

Half-bridge, full-bridge, and LLC power supply topology

Power supply for industrial, communication and server applications which requires high efficiency and high density

Solar energy, motor driver and new energy fields

NSD2621 High Voltage Half-bridge GaN Driver IC

Product introduction

NSD2621 is a high-voltage half-bridge driver IC launched by NOVOSENSE lately, which is specially designed for GaN. The IC adopts the mature capacitance isolation technology of NOVOSENSE. The high-side driver can support common-mode voltage of -700V to 700V, SW voltage change slope of 200V/ns, and is designed with the Feature of low transmission delay and low delay between channels. Both channels can provide 1A/-2A driving capability.

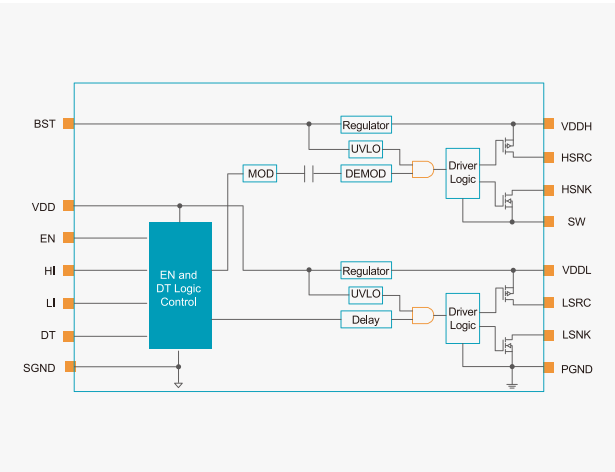
Both high-side drive stage and low-side drive stage are equipped with special voltage regulators to ensure that the driving voltage is in a stable range acceptable to GaN gate, so that GaN can work properly under any conditions. At the same time, it is designed with UVLO protection to protect the operation safety of the power supply system.

NSD2621 is designed with a highly integrated LGA (4*4mm) package.

Product feature

- Voltage range on high voltage side: +/-700V
- Independent UVLO protection for high and low sides
- 6V drive voltage output, 2/-4A drive current capability
- Built-in LDO makes the driving voltage more stable and reliable
- Integrated Miller Clamp with a current capability of 2A
- Less than 60ns propagation delay, less than 10ns delay matching between high and low side
- +5/-5V logic ground bias
- Anti-interference of dV/dt on high voltage side: 200kV/us
- Operation ambient temperature:-40°C ~125°C
- Package: LGA (4*4mm)

Functional block diagram



Application

Half-bridge, full-bridge, and LLC power supply topology

Adapter high density power supply

Solar energy, motor driver and new energy fields


Brushed DC Motor
Interface

Brushed DC Motor

Part Number	Load type	Rds (on) (HS+LS) mΩ	Peak current (A)	Number of half-bridge channels	VPower (Max)(V)	Integrated current detector	Interface	Load diagnosis	Feature	Operating temperature (°C)	Qualification	Package
NSD7310 -DHSPR	Brushed DC motor	520	3.6	2	5-40	No	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection	-40~125	Industrial	HSOP8
NSD7310A -DHSPR	Brushed DC motor	520	3.6	2	5-40	Yes	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection	-40~125	Industrial	HSOP8
NSD7312 -DHSPR	Brushed DC motor	520	3.6	2	5-40	No	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, fault repor	-40~125	Industrial	HSOP8
NSD7312A -DHSPR	Brushed DC motor	520	3.6	2	5-40	Yes	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~125	Industrial	HSOP8
NSD7312 -Q1HSPR	Brushed DC motor	520	3.6	2	5-40	No	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~125	Automobile	HSOP8
NSD7312A -Q1HSPR	Brushed DC motor	520	3.6	2	5-40	Yes	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~125	Automobile	HSOP8
NSD8308 -Q1HTSXR	Brushed DC motor/Stepping /LED	1500	1.3/1.7	8	4.5-40	-	SPI	Yes	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~125	Automobile	HTSSOP24
NSD8306 -Q1HTSXR	Brushed DC motor/Stepping /LED	1500	1.3/1.7	6	4.5-40	-	SPI	Yes	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~125	Automobile	HTSSOP24

NSD731x/NSD731x-Q1 40V Peak Current 3.6A Brushed DC Motor Driver IC

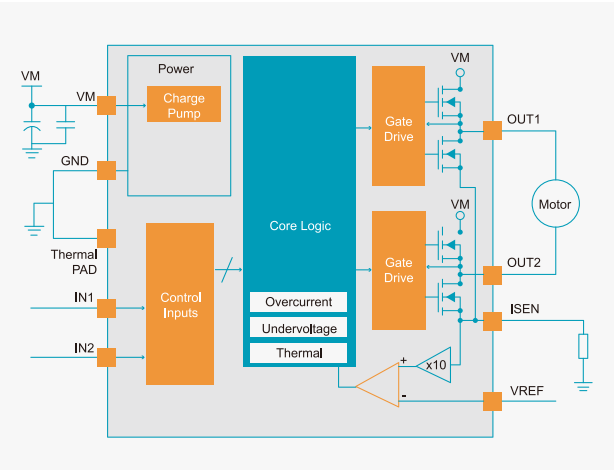
Product introduction

NSD7310/NSD7312/NSD7310A/NSD7312A/NSD7312-Q1 is a brushed DC motor driver IC. The IC has built-in N-MOSFET and provides full protection for the power level, including power supply undervoltage protection, overcurrent protection and overtemperature protection. This product can provide 3.6A peak current and supports PWM current regulation. In version A product, the internal power path current mirror function is added, and the external ADC/MCU can directly obtain the current value from the pin of the product, saving power sampling resistor and optimizing the layout. The Automotive version has passed the AEC-Q100 qualification to meet the requirements in terms of quality and reliability of vehicles.

Product feature

- Wide operating voltage range: 5V-36V (withstand voltage of 40V)
- On-resistance (HS + LS) 520m Ω
- Peak current 3.6A
- AEC-Q100 qualified
- Supporting current modulation
- Undervoltage protection
- Overcurrent protection
- Over-temperature protection
- Operating temperature: -40°C to 125°C

Functional block diagram



Package

- HSOP8

Application

Home appliances

New energy vehicles

Brushed DC motor module

NSD8308/NSD8306 – Q1 40V 8/6-channel Half-bridge Driver IC

Product introduction

NSD8308/NSD8306-Q1 is a multi-channel half-bridge driver IC with 8-channel or 6-channel half-bridge structures. Through flexible configuration, the IC can support different load types including brushed DC motors, stepping motors, relays, LEDs, etc. The IC is designed with a built-in PWM generator, which can configure PWM frequency and duty cycle to control load only through SPI, and can be applied to soft start of brush DC motor and LED dimming, etc. At the same time, the product is designed with intelligent diagnosis function to help the vehicle system judge load connection status. In case of disconnection or short circuit, the external MCU can obtain fault reporting information from register built in the IC for each channel.

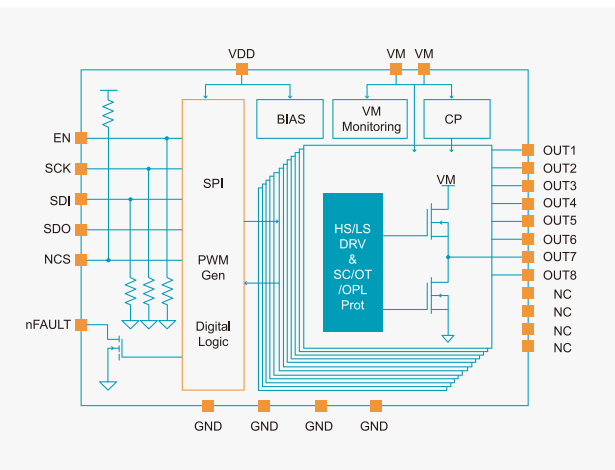
Product feature

- Wide operating voltage range: 4.5V –36V (withstand voltage of 40V)
- On-resistance（HS + LS）1.5 Ω
- Peak current 1.3A
- PWM generator supports configurable frequency and duty cycle
- Open circuit diagnosis
- Undervoltage protection and overvoltage protection
- Operating temperature: -40°C to 125°C
- AEC-Q100 qualified

Package

- HTSSOP24

Functional Block Diagram



Application

Vehicle body controller

Vehicle domain controller

Vehicle air conditioning controller

Multi-channel Low-side Driver

Part Number	Load type	Rds (on) (LS) mΩ	Peak current (A)	Number of low side channels	VPower (Max)(V)	Interface	LDO	Feature	Operating temperature (°C)	Qualification	Package
NSD5604E -DHTSTR	Relay/solenoid	260	3	4	8-55	Parallel	Yes	Over-current protection, over-temperature protection, under-voltage protection, clamp and configurable current limiting point	-40~125	Industrial	HTSSOP20
NSD5604 -DHTSPR	Relay/solenoid	260	3	4	8-55	Parallel	Yes	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~125	Industrial	HTSSOP16
NSD5604NE -DHTSTR	Relay/solenoid	260	3	4	8-55	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, clamp and configurable current limiting point	-40~125	Industrial	HTSSOP20
NSD5604N -DHTSPR	Relay/solenoid	260	3	4	8-55	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~125	Industrial	HTSSOP16

Multi-channel Low-side Driver

NSD5604E/NSD5604/NSD5604NE/NSD5604N
55V Four-channel Low-side Relay and Solenoid Driver IC

Product introduction

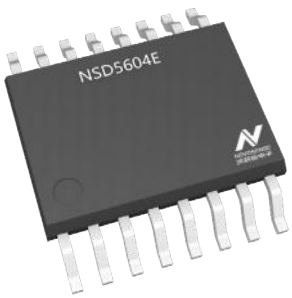
NSD5604E/NSD5604 is a 4-channel low-side driver IC. The product integrates 4-channel low-side NMOSFET to drive resistive, capacitive or inductive loads. The 4 channels can be turned on at the same time and each channel can support a load current of greater than 500mA. Each channel of the product supports independent overcurrent protection and the overcurrent points can be configured through external resistors. The IC also integrates active clamp and freewheeling diodes, by working with external TVS, different current attenuation modes including slow attenuation and fast shutdown can be realized for inductive load.

Product feature

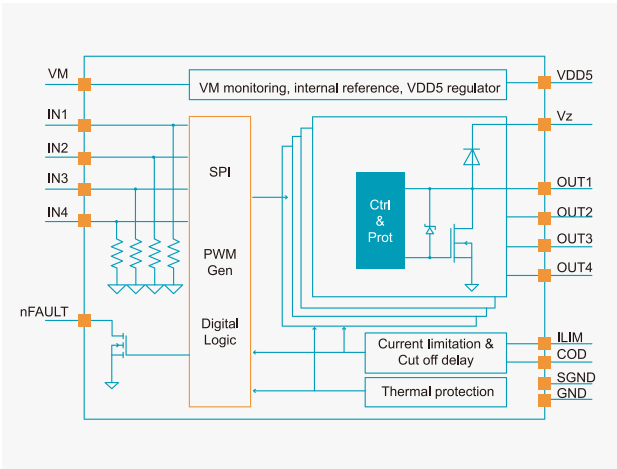
- Wide operating voltage range: 8V – 50V (withstand voltage of 55V)
- On-resistance of 260m Ω
- Peak current 3.0A
- Supporting EFT frequency
- LDO supports transmission voltage of 5V-20mA
- Integrated active clamp and freewheeling diode
- Configurable current limit point and overcurrent protection
- Undervoltage protection
- Operating temperature: -40°C to 125°C

Package:

- HTSSOP16
- HTSSOP20



Functional Block Diagram



Application

Industrial automation

Industrial machinery

Digital machine tools

General resistive /capacitive/inductive loads

LDO Linear Regulator

Part Number	Ambient temperature	Minimum input voltage	Maximum input voltage	Output Current	Output voltage	Iq-Quiescent Current	Other feature	Package	Typical application
NSR31xxx	-40°C~125°C	3V	40V	150mA	Fixed output 2.5V, 3.3V and 5V	5uA	Current limit protection, Over-temperature protection	SOT23(5), SOT223(4), DFN-8	In-vehicle entertainment and autopilot Body electronics and lighting Inverter and motor control OBC/DCDC and BMS
NSR33xxx	-40°C~125°C	3V	40V	300mA	Fixed output 2.5V, 3.3V and 5V Adjustable output 0.65V~18V	5uA	Enable, Power good indication PG, Current limit protection, Over-temperature protection	MSOP-8 EP, SOP-8 EP	
NSR35xxx	-40°C~125°C	3V	40V	500mA	Fixed output 2.5V, 3.3V and 5V Adjustable output 0.65V~18V	5uA	Enable, Current limit protection, Over-temperature protection	TO252-3 TO252-5 TO263-5	

LDO Linear Regulator

Automotive 40V 150/300/500mA LDO NSR31/33/35 Series with Ultra Low Quiescent Curren

Product introduction

The latest NSR31/33/35 series LDO chips launched by NOVOSENSE are designed for the applications where the automobile battery supplies power to the system. With a wide input voltage of 3V to 40V, it supports transient voltage up to 45V, which can meet the normal operating requirements of automobile under cold crank and start-stop conditions. Its ultra-low quiescent current of 5uA and low dropout voltage is very suitable for automotive applications with low standby power consumption required. It supplies power to MCU and CAN/LIN transceivers in standby systems to save power and extend battery life.

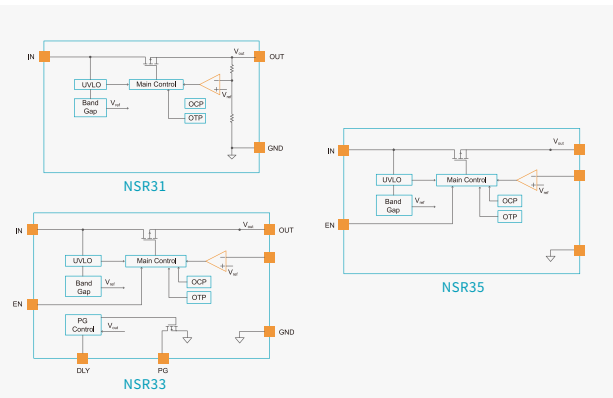
The NSR31/33/35 series provides sufficient solutions for hardware designers, with various fixed voltage versions: 2.5V, 3.3V and 5.0V, and also provides adjustable output options (0.65V to 18V). In addition, different series are designed with output currents of 150mA, 300mA and 500mA respectively. This low-power linear regulator also integrates short-circuit protection and over-temperature protection.

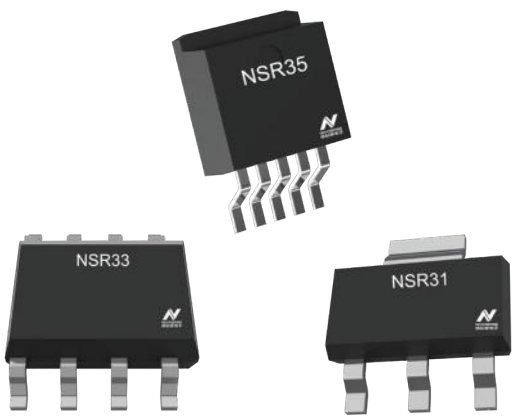
These devices can operate at ambient temperatures from -40°C to 125°C. SOT223, SOT23DFN-8, MSOP-8 EP, SOP-8EP, TO252, TO263 and other packages are made available to meet different design requirements.

Product feature

- AEC-Q100 automotive qualified
- Operation ambient temperature: -40°C to 125°C
- Operating voltage range: 3V-40V, supporting transient voltage up to 45V
- Output current range:
  NSR31 series: 150mA; NSR33 series: 300mA; NSR35 series: 500mA
- Output voltage range:
  Fixed output: 2.5V,3.3V, and 5V, Adjustable output: 0.65V to 18V
- Ultra lowquiescent current Iq
  Iq: 270nA in shutdown mode
  Typical value under light load is: 5uA
- Maximum voltage drop:
  NSR31 Series: 650mV at 150mA load current
  NSR33 Series: 263mV at 300mA load current
  NSR35 Series: 426mV at 500mA load current
- Excellent output transient response, supporting 1uF-200uF low ESR ceramic capacitor
- Enable signal, PG signal, delay programmable function:
  NSR331 series
- Integrated output short circuit protection, over-temperature protection
- Package:
  NSR31 series: SOT223, SOT23, DFN-8
  NSR33 series: MSOP-8 EP, SOP-8 EP
  NSR35 series: TO252-3, TO252-5, TO263-5

Functional Block Diagram





Application

- In-vehicle entertainment and autopilot
- Body electronics and lighting
- Inverter and motor control
- OBC/DCDC and BMS

Smart High and Low Side Switch

Part Number	Ambient temperature	Type	Number of channels	ON-state resistance Ron	Overcurrent value	Protection	Feature	Package	Typical application
NSE11409	-40°C~125°C	Low side switch	1CH	90mohm	8A	Open circuit diagnosis Overcurrent protection Over-temperature protection	Ultra low power consumption Diagnostic output VDD clamp	SO-8 SOT-223	Body electronic controller Vehicle controller Air conditioning controller BMS

Smart High and Low Side Switch

Automotive 40V Single Channel 90mΩ Intelligent Low Side Switch NSE11409 Series

Product introduction

NSE11409 is a single-channel smart low-side switch developed for automotive and industrial applications, featuring a withstand voltage of > 40V, and an internal resistance of about 90mΩ, it allows various diagnostic functions and different protections, and has passed AEC Q100 certification.

The IC is designed with a built-in VDD clamp of> 45V, which is especially suitable for driving inductive loads such as relays and valves to help them realize rapid demagnetization/deenergization.

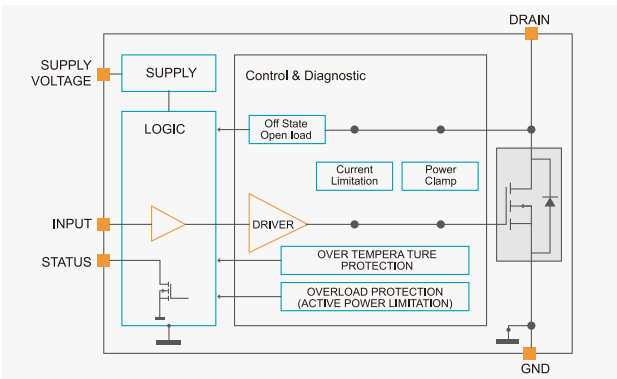
The IC is designed with an internal output current limiting function for overload protection and short circuit protection. Built-in absolute over-temperature protection and relative over-temperature protection to prevent the IC from overheating in multiple ways, slow down power accumulation, and improve IC reliability. At the same time, the IC supports open circuit detection, over-temperature detection and other diagnostic outputs.

The IC can operate at ambient temperatures from -40°C to 125°C. SOT223 and SO-8 packages are made available to meet different design requirements.

Product feature

- AEC-Q100 automotive qualified
- Operation ambient temperature: -40°C to 125°C
- The operating voltage is up to 40V
- VDD clamp to support the connection to inductive load
- Overcurrent protection: current limit value> 8A
- Over-temperature protection: absolute over-temperature protection, relative over-temperature protection
- Error status diagnostic output (SO-8 Package): open circuit detection, over temperature detection
- Ultra-low static power consumption Iq < 5uA
- Package:
  NSE11409 series: SOT223,SO-8

Functional Block Diagram



Application

BMS

Body electronic controller

Vehicle controller

Air conditioning panel controller

LED Driver

Part Number	Ambient temperature	Number of channels	Input voltage	Output current	Diagnosis and protection	Heat dissipation enhancement	Feature	Package	Typical application
NSL21610	-40°C~125°C	1CH	5-40V	300mA	Open circuit diagnosis Short circuit diagnosis Over-temperature protection	External resistor Automatic current sharing	PWM dimming Multiple diagnostic cascades Independent enable	MSOP-8 EP	Tail light Interior lights Other body lighting
NSL21611	-40°C~125°C	1CH	5-40V	450mA	Open circuit diagnosis Short circuit diagnosis Over-temperature protection	None	PWM dimming Multiple diagnostic cascades Independent enable	MSOP-8 EP	
NSL21630	-40°C~125°C	3CH	5-40V	200mA	Open circuit diagnosis Short circuit diagnosis Over-temperature protection	External resistor Automatic current sharing	PWM dimming Multiple diagnostic cascades	HTSSOP-16	
NSL21631	-40°C~125°C	3CH	5-40V	200mA	Open circuit diagnosis Short circuit diagnosis Over-temperature protection	External resistor Automatic current sharing	PWM dimming Multiple diagnostic cascades Independent enable	HTSSOP-16	

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