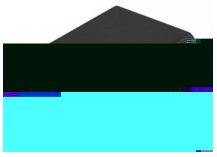
High Speed Dual-Channel, Bi-Directional Ceramic Digital Isolator

NCID9210 / NCID9216



SOIC16 W
CASE 751EN

Description

The NCID9210 and NCID9216 are galvanically isolated full duplex, bi−directional, high−speed dual−channel digital isolators. These devices support isolated communications thereby allowing digital signals to communicate between systems without conducting ground loops or hazardous voltages.

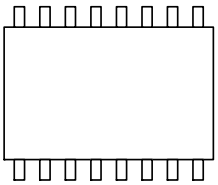
They utilize **onsemi's** patented galvanic off−chip capacitor isolation technology and optimized IC design to achieve high insulation and high noise immunity, characterized by high common mode rejection and power supply rejection specifications. The thick ceramic substrate yields capacitors with ~25 times the thickness of thin film on−chip capacitors and coreless transformers. The result is a combination of the electrical performance benefits that digital isolators offer with the safety reliability of a >0.5 mm insulator barrier similar to what has historically been offered by optocouplers.

The device is housed in a 16−pin wide body small outline package.

Features

- Off−Chip Capacitive Isolation to Achieve Reliable High Voltage Insulation
  - DTI (Distance Through Insulation): 0.5 mm
  - Maximum Working Insulation Voltage: 2000 V_{peak}
- Full Duplex, Bi−directional Communication
- 100 kV/μs Minimum Common Mode Rejection
- High Speed:
  - 50 Mbit/s Data Rate (NRZ)
  - 25 ns Maximum Propagation Delay
  - 10 ns Maximum Pulse Width Distortion
- 8 mm Creepage and Clearance Distance to Achieve Reliable High Voltage Insulation.
- Specifications Guaranteed Over 2.5 V to 5.5 V Supply Voltage and −40 C to 125 C Extended Temperature Range
- Over Temperature Detection
- NCIV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q100 Qualified and PPAP Capable (Pending)
- Safety and Regulatory Approvals
  - UL1577, 5000 V_{RMS} for 1 Minute
  - DIN EN/IEC 60747−17 (Pending)

MARKING DIAGRAM



ORDERING INFORMATION

Typical Applications

- Isolated PWM Control
- Industrial Fieldbus Communications
- Microprocessor System Interface (SPI, I^2C, etc.)
- Programmable Logic Control
- Isolated Data Acquisition System
- Voltage Level Translator

PIN CONFIGURATION

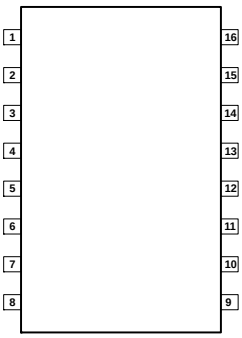


Figure 1. Pin and Channel Configuration

PIN DEFINITIONS

TRUTH TABLE

V_{INX}	V_{DDI}	V_{DDO}	V_{OX}	Comment

SAFETY AND INSULATION RATINGS

Symbol	Parameter	Min	Typ	Max	Unit

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
		–	
		–	
		–	
		–	
		–	

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
		–		
–				
		–	–	
		–		

μ μ

SUPPLY CURRENT CHARACTERISTICS

–

SWITCHING CHARACTERISTICS

TEST CIRCUITS

Figure 9. V_{IN} to V_O Propagation Delay Test Circuit and Waveform

ORDERING INFORMATION

Part Number	Grade	Package	Shipping

SOIC16 W