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**SHC68-C68-S**

## SPECIFICATIONS

# NI PXI-2536

## 544-Crosspoint FET Matrix

This document lists specifications for the NI PXI-2536 544-crosspoint, FET matrix (NI 2536). All specifications are subject to change without notice. Visit [ni.com/manuals](http://ni.com/manuals) for the most current specifications.

Topology

1-wire  $8 \times 68$  matrix



**Caution** To ensure the specified EMC performance, operate this product only with shielded cables and accessories.



**Caution** Refer to the *Read Me First: Safety and Electromagnetic Compatibility* document for important safety and electromagnetic compatibility information. To obtain a copy of this document online, visit [ni.com/manuals](http://ni.com/manuals) and search for the document title.

### Related Information

[Refer to the NI Switches Help for detailed topology information.](#)

## About These Specifications

*Specifications* characterize the warranted performance of the instrument under the stated operating conditions.

*Typical Specifications* are specifications met by the majority of the instrument under the stated operating conditions and are tested at 23 °C ambient temperature. Typical specifications are not warranted.

All voltages are specified in DC, AC<sub>pk</sub>, or a combination unless otherwise specified.



**Caution** The protection provided by the NI 2536 can be impaired if it is used in a manner not described in this document.

# Input Characteristics

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Maximum switching voltage (channel-to-ground)	±12 VDC, 8 VAC
Maximum switching power (per channel, resistive)	1.2 W
Maximum switching current	100 mA
DC isolation resistance (between open terminals)	>1 GΩ, typical at 23° C >334 MΩ, typical at 55° C
Current leakage between column and ground (closed path)	10 nA, typical (12 VDC applied at 25 °C)
Offset voltage	10 μV, typical
Overvoltage protection	
Powered on	±36 VDC
Powered off	±40 VDC
Total path resistance, row-to-column	
Typical	10 Ω
Maximum	15.5 Ω

# RF Performance Characteristics

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Test setups for RF characteristics used two 1-meter cables and two NI TBX-68 connector blocks.

Single crosspoint bandwidth (50 Ω system, one row to one column)	>1 MHz, typical
Crosstalk (50 Ω system)	
10 kHz	<-53 dB, typical
100 kHz	<-33 dB, typical
1 MHz	<-30 dB , typical

# Dynamic Characteristics

## FET operate time<sup>1</sup>

Typical	12 $\mu\text{s}$
Maximum	16 ms



**Note** Certain applications may require additional time for proper settling.

Maximum scan rate	50,000 crosspoints/s
Simultaneous drive limit	544 switches
Expected relay life	Unlimited, when operated within specified limits

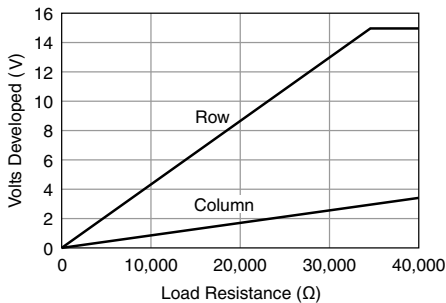


**Caution** During chassis power up, the row and column connections may produce a charge injection. Refer to the following figures for information about how this might affect loads that are connected to the front panel I/O connectors and referenced to earth ground.

## Chassis power-up charge injection

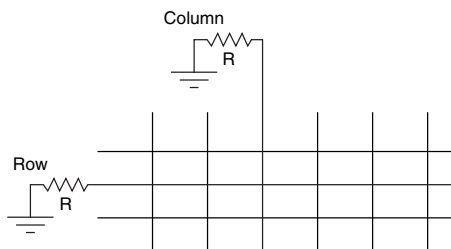
Row	7.5 $\mu\text{C}$ ( $<500 \mu\text{A}$ for a 20 ms time interval, typical)
Column	1.5 $\mu\text{C}$ ( $<40 \mu\text{A}$ for a 20 ms time interval, typical)

**Figure 1.** Impact of Charge Injection at Power Up: Typical Voltage Developed vs. Resistive Load (Using Test Setup in Figure 2)



<sup>1</sup> Operate time is the time from trigger received by hardware to switch output activation.

**Figure 2.** Test Setup for Row and Column Connections



### Related Information

[Refer to the NI Switches Help for information about including additional settling time.](#)

## Trigger Characteristics

### Input trigger

Sources	PXI trigger lines 0 to 7
Minimum pulse width	70 ns

### Output trigger

Destinations	PXI trigger lines 0 to 7
Pulse width	Programmable (1 $\mu$ s to 62 $\mu$ s)

## Physical Characteristics

Relay type	FET switch
I/O connector	Four 68-pin receptacle VHDCI
Power requirement	1.7 W at 3.3 V, typical, 1.3 W at 12 V, typical
Dimensions (L $\times$ W $\times$ H)	3U, one slot, PXI/cPCI module, 21.6 $\times$ 2.0 $\times$ 13.0 cm (8.5 $\times$ 0.8 $\times$ 5.1 in.)
Weight	159 g (5.6 oz)

## Environment

Operating temperature	0 $^{\circ}$ C to 55 $^{\circ}$ C
Storage temperature	-40 $^{\circ}$ C to 70 $^{\circ}$ C
Relative humidity	5% to 85%, noncondensing

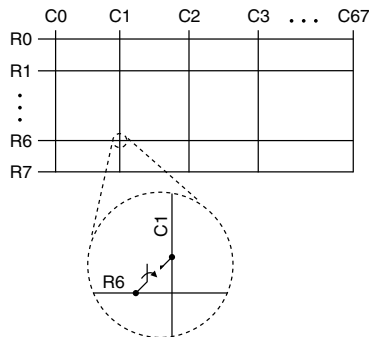
Pollution Degree	2
Maximum altitude	2,000 m
Indoor use only.	

## Shock and Vibration

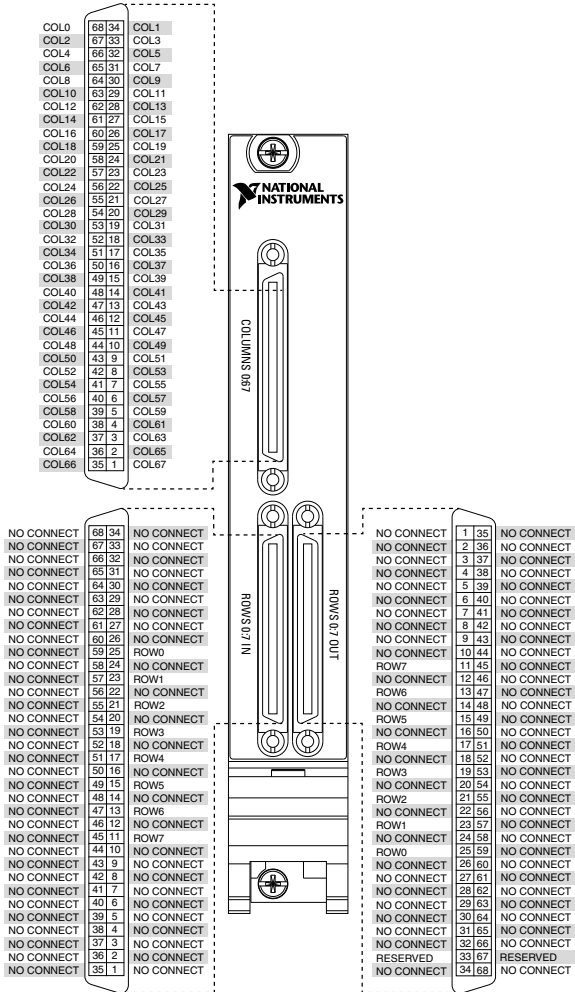
Operational Shock	30 g peak, half-sine, 11 ms pulse (Tested in accordance with IEC 60068-2-27. Test profile developed in accordance with MIL-PRF-28800F.)
Random Vibration	
Operating	5 Hz to 500 Hz, 0.3 g <sub>rms</sub>
Nonoperating	5 Hz to 500 Hz, 2.4 g <sub>rms</sub> (Tested in accordance with IEC 60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

## Diagrams

**Figure 3. NI 2536 Hardware Diagram**



**Figure 4. NI 2536 Connector Pinout**



## Related Information

For topology-specific connection information, refer to your device in the [NI Switches Help](#).

## Accessories

Visit [ni.com](http://ni.com) for more information about the following accessories.



**Caution** NI products typically must be operated with shielded cables and accessories to ensure compliance with Electromagnetic Compatibility (EMC)

requirements. To determine if shielded cables or accessories are required for this product, refer to the EMC specifications in the *Electromagnetic Compatibility* section of this document. If shielded cables or accessories are required for EMC compliance, do not use unshielded cables or accessories unless they are installed in a shielded enclosure with properly designed and shielded input/output ports, and are connected to the NI product using a shielded cable. If unshielded cables or accessories are not properly installed and shielded, the EMC specifications for the product are no longer guaranteed.

**Table 1.** NI Accessories for the NI 2536

Accessory	Part Number
CB-68LP/R unshielded, 68-pin I/O connector block	777145-01, 777145-02
NI TBX-68 unshielded, I/O connector block with DIN-rail mounting	777141-01
SH68-68, 68 pin VHDCI to 68 pin SCSI, twisted pair cable with basic shielding for use with connector blocks (1 m, 2 m)	191945-01, 191945-02
SHC68-C68-S, 68 pin VHDCI to 68 pin VHDCI, shielded cable (0.5 m, 2 m)	186380-0R5, 186380-02

## Compliance and Certifications

### Safety

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1



**Note** For UL and other safety certifications, refer to the product label or the [Online Product Certification](#) section.

### Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for sensitive electrical equipment for measurement, control, and laboratory use:

- EN 61326-2-1 (IEC 61326-2-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions



- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



**Note** In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.



**Note** Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.



**Note** For EMC declarations and certifications, and additional information, refer to the *Online Product Certification* section.

## CE Compliance

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

## Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit [ni.com/certification](https://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

## Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at [ni.com/environment](https://ni.com/environment). This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

## Waste Electrical and Electronic Equipment (WEEE)



**EU Customers** At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit [ni.com/environment/weee](https://ni.com/environment/weee).

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374625D-01 Sep15