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# PXIe-2540

# Specifications

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# PXIe-2540 Specifications

## PXIe-2540 Specifications

This document lists specifications for the PXIe-2540. All specifications are subject to change without notice.

## About These Specifications

**Specifications** characterize the warranted performance of the instrument under the stated operating conditions. Data in this document are **Specifications** unless otherwise noted.

**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 PXIe-2540 can be impaired if it is used in a manner not described in this document.

## PXIe-2540 Pinout

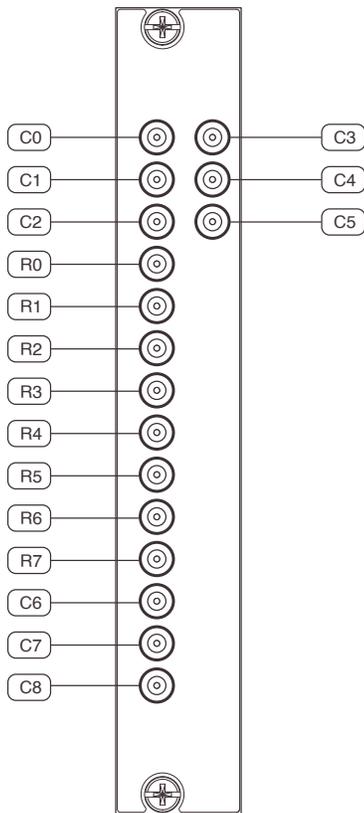


Table 1. Signal Descriptions

Signal	Description
CX	Column connection
RX	Row connection

### Related information:

- [PXIe-2540 Hardware Diagram](#)
- [NI Switches Cable and Accessory Compatibility](#)

## Topology

Topology	8 × 9 matrix
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## Input Characteristics

Maximum switching voltage	60 V DC (42.4 V <sub>pk</sub> )
Maximum switching or carry current (per channel)	0.5 A



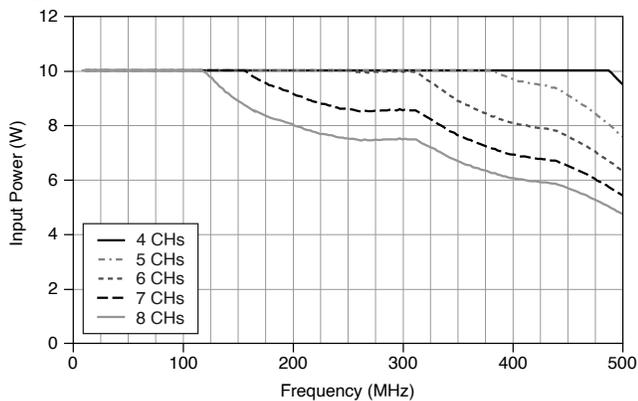
**Caution** The switching power is limited by the maximum switching current and the maximum voltage, and must not exceed 10 W.

Maximum DC switching or carry power (per channel)	10 W
Maximum RF power (per channel, 50 $\Omega$ system)	10 W
Simultaneous channels at maximum RF power (up to 350 MHz)	5



**Note** Maximum RF power derates as frequency and number of simultaneous channels increase and must not exceed the values shown in the following figures.

Figure 1. Maximum RF Input Power





**Note** NI recommends against switching active RF signals. As a relay actuates, the channel is momentarily unterminated. Some RF sources can be damaged by reflections if their outputs are not properly terminated. Consult your RF source documentation for more information.

DC path resistance	
Initial	<2.1 $\Omega$ , typical
End-of-life	$\geq$ 3.1 $\Omega$ , typical

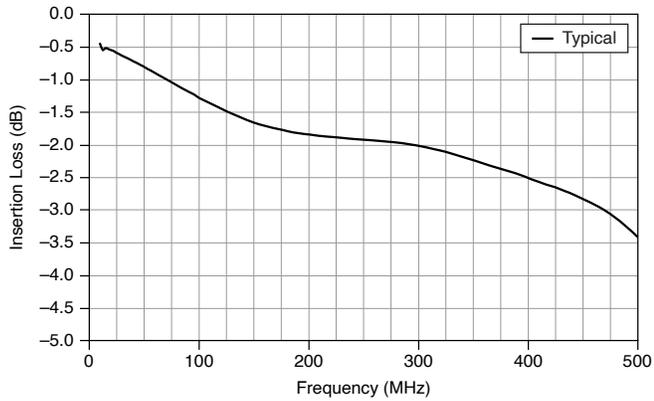
Path resistance is a combination of relay contact resistance and trace resistance. Contact resistance typically remains low for the life of a relay. At the end of relay life, the contact resistance rises rapidly above 3.1  $\Omega$ .

## RF Performance Characteristics

Characteristic impedance ( $Z_0$ )	50 $\Omega$ , nominal
Insertion loss	
$\leq$ 350 MHz	<3 dB (<2.3 dB, typical)

Refer to the following figure for the insertion loss of the PXIe-2540.

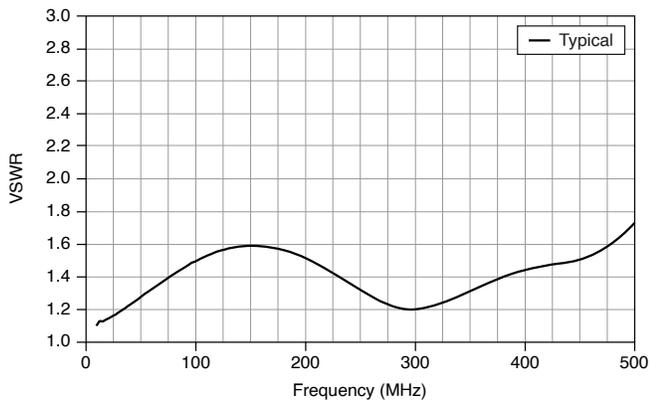
Figure 2. Insertion Loss, Typical



VSWR	
$\leq 350$ MHz	<2.2 (<1.6, typical)

Refer to the following figure for the VSWR of the PXIe-2540.

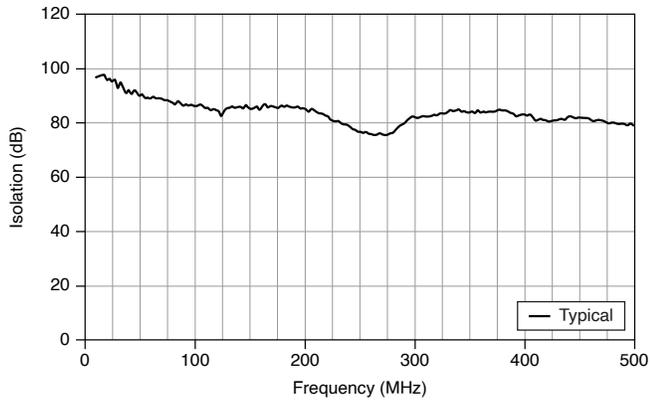
Figure 3. VSWR, Typical



Open CH isolation	
$\leq 350$ MHz	>75 dB, typical

Refer to the following figure for the channel-to-channel isolation of the PXIe-2540.

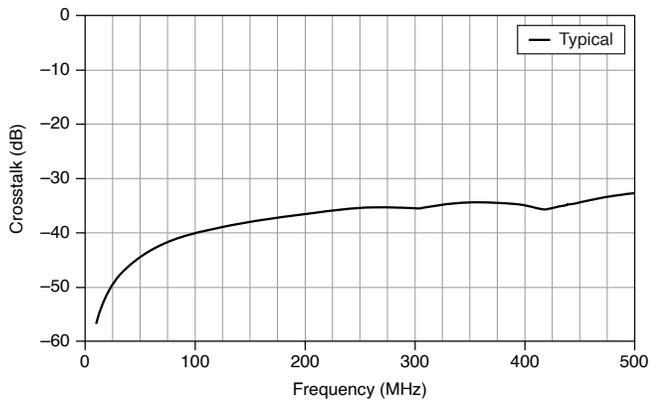
Figure 4. Open Channel Isolation, Typical



Crosstalk	
≤350 MHz	<-35 dB, typical

Refer to the following figure for the crosstalk of the PXIe-2540.

Figure 5. Crosstalk, Typical



Propagation delay	<6 ns, typical
CH-CH skew	<2 ns, typical

## Dynamic Characteristics

Simultaneous drive limit	40 relays
Maximum operate time	0.25 ms
Maximum release time	0.25 ms



**Note** Certain applications may require additional time for proper settling. Refer to the **NI Switches Help** at [ni.com/manuals](http://ni.com/manuals) for information about including additional settling time.

<b>Relay life</b>	
Mechanical	$1 \times 10^9$ cycles, typical
<b>Electrical (resistive, &lt;10 pF load, DC or 50 <math>\Omega</math> RF systems)</b>	
10 V, 100 mA	$1 \times 10^7$ cycles, typical
20 V, 500 mA	$5 \times 10^6$ cycles, typical



**Note** Reed relays are highly susceptible to damage caused by switching capacitive and inductive loads. Capacitive loads can cause high inrush currents while inductive loads can cause high flyback voltages. The addition of appropriate protection can greatly improve contact lifetime. For more information about adding protection circuitry to a capacitive load, visit [ni.com/info](http://ni.com/info) and enter the Info Code `relaylifetime`. For information about inductive loads, enter the Info Code `relayflyback`.

## Trigger Characteristics

Input trigger	
Sources	PXI trigger lines <0...7>
Minimum pulse width <sup>1</sup>	150 ns
Output trigger	
Destinations	PXI trigger lines <0...7>
Default pulse width	2 $\mu$ s, typical

## Physical Characteristics

Relay type	Reed, non-latching
Relay contact material	Rhodium
I/O connectors	17 MCX jacks
Power requirement	
PXI	10 W at 5 V 2 W at 3.3 V

1. The PXIe-2540 recognizes trigger pulse widths less than 150 ns if digital filtering is disabled. Refer to the ***NI Switches Help*** for information about disabling digital filtering.

PXI Express	10 W at 12 V 2.5 W at 3.3 V
Dimensions (L × W × H)	3U, one slot, PXI/cPCI module, PXIe compatible 21.6 cm × 2.0 cm × 13.0 cm (8.5 in. × 0.8 in. × 5.1 in.)
Weight	380 g (13.40 oz)

## Environment

Table 2. Environment

Operating temperature	0 °C to 55 °C
Storage temperature	-20 °C to 70 °C
Relative humidity	5% to 85%, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m

Indoor use only.

## Shock and Vibration

Table 3. 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>
Random vibration, 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.)

# Compliance and Certifications

## Safety Compliance Standards

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 C22.2 No. 61010-1



**Note** For safety certifications, refer to the product label or the [Product Certifications and Declarations](#) section.

## Electromagnetic Compatibility

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

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: 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, certifications, and additional information, refer to ***Product Certifications and Declarations***.

## Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit [ni.com/product-certifications](https://ni.com/product-certifications), search by model number, and click the appropriate link.

## 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 ***Engineering a Healthy Planet*** 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.

### EU and UK Customers

-  **Waste Electrical and Electronic Equipment (WEEE)**—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).

### 电子信息产品污染控制管理办法（中国RoHS）

-  **中国RoHS**—NI符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。关于NI中国RoHS合规性信息，请登录 [ni.com/environment/rohs\\_china](https://ni.com/environment/rohs_china)。(For information about China RoHS compliance, go to [ni.com/environment/rohs\\_china](https://ni.com/environment/rohs_china).)