
PXle-5699

Specifications

2025-06-03



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PXIe-5699 Specifications

These specifications apply to the PXIe-5699.

Revision History

Version	Date changed	Description
2024 Q4	October 2024	Initial release.

Looking for Something Else?

For information not found in the specifications for your product, such as operating instructions, browse ***Related Information***.

Related information:

- [User Manual](#)
- [Software and Driver Downloads](#)
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- [Product Certifications](#)
- [Letter of Volatility](#)
- [Discussion Forums](#)
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Definitions

Warranted Specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- **Typical**—describes the performance met by a majority of models.
- **Typical-95**—describes the performance met by 95% ($\approx 2\sigma$) of models with a 95% confidence.

- **Nominal**—describes an attribute that is based on design, conformance testing, or supplemental testing.
- **Measured**—describes the measured performance of a representative model.

Values are ***Warranted Specifications*** unless otherwise noted.

Conditions

All specifications and characteristics are valid under the following conditions unless otherwise noted.

- Thirty minutes of warm-up time. Warm-up time begins when you power on the PXI Express chassis and the operating system has completely loaded.
- Empty chassis slots contain slot blockers and EMC filler panels to minimize temperature drift and reduce emissions.
- The NI-AATT driver is used with default driver settings unless otherwise noted.
- Over an ambient temperature range of $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$, unless otherwise noted.

Typical characteristics do not include measurement uncertainty.

PXle-5699 Pinout

Use the pinout to connect to terminals on the PXle-5699.

Figure 1. PXIe-5699 Connector Pinout

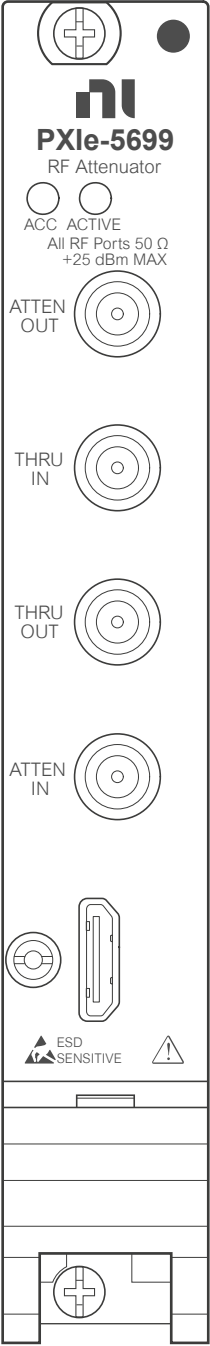


Table 1. PXIe-5699 RF Connector Descriptions

Connector	Connector Type	Description
ATTEN OUT	SMA (f)	Output terminal from the attenuator chain.
THRU IN	SMA (f)	Input terminal to the thru path.
THRU OUT	SMA (f)	Output terminal from the thru

Connector	Connector Type	Description
		path.
ATTEN IN	SMA (f)	Input terminal to the attenuator chain.
DIO	Mini HDMI (f)	Digital control.

Front Panel I/O

Table 2. All RF Ports

Connector	Impedance	Coupling	Absolute Maximum Reverse Power	Absolute Maximum DC Voltage
SMA (female)	50 Ω , nominal	AC	+25 dBm	± 40 V

Table 3. DIO Port

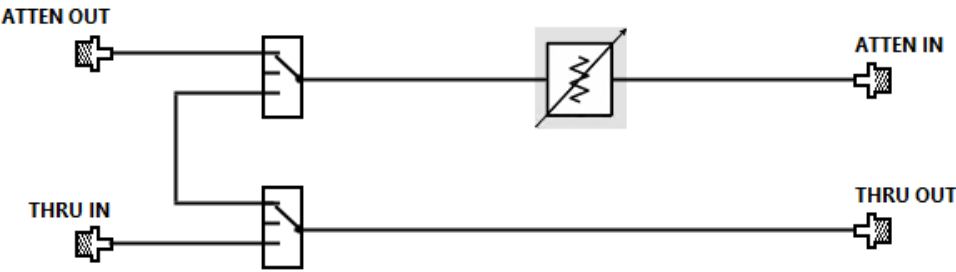
Connector	Number of Channels	Signal Type	Voltage Families	Absolute Maximum Input Range	Impedance
Mini HDMI	8	Single-ended	3.3 V	-0.5 V to 5 V	100 k Ω



Notice The mini HDMI DIO connector is not an HDMI interface. Do not connect the mini HDMI DIO connector on the PXle-5699 to the HDMI interface of another device. NI is not liable for any damage resulting from such signal connections.

RF Attenuation Path

Figure 2. PXIe-5699 Block Diagram



ATTEN IN to ATTEN OUT

Table 4. RF Attenuation Path (ATTEN IN to ATTEN OUT)

Specification	Value
Frequency range	100 MHz to 26.5 GHz
Attenuation range	90 dB, nominal
Attenuation step size	2 dB, nominal
Maximum input power	+25 dBm average ¹
Insertion loss with 0 dB attenuation state (<10 GHz)	-10.5 dB, typical
Insertion loss with 0 dB attenuation state (10 GHz to 20 GHz)	-16.5 dB, typical
Insertion loss with 0 dB attenuation state (>20 GHz)	-21 dB, typical

1. Do not apply signals to the PXIe-5699 when it is unpowered.

Figure 3. Attenuation Path Insertion Loss, Measured

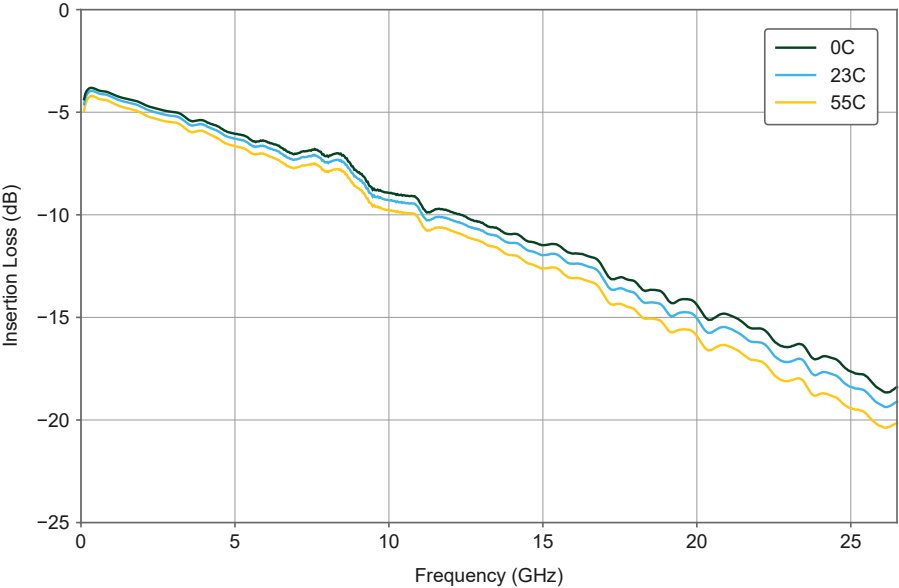


Figure 4. Attenuation State Response, Measured

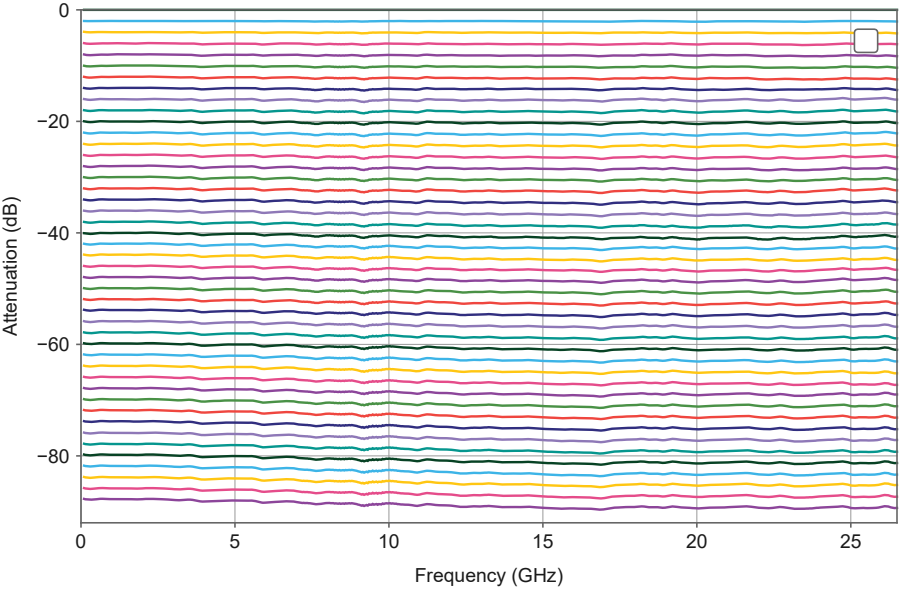


Figure 5. Maximum Attenuation, Measured

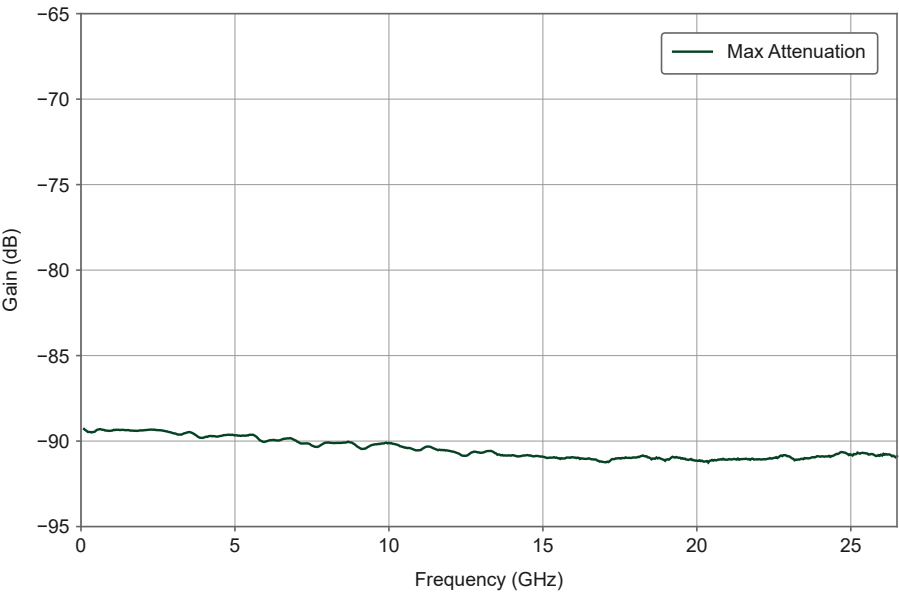


Table 5. Maximum Attenuation, Typical

Specification	Value
Maximum attenuation (<10 GHz)	>88.5 dB, typical
Maximum attenuation (>10 GHz)	>89.5 dB, typical

Figure 6. Attenuation Step Error, Measured

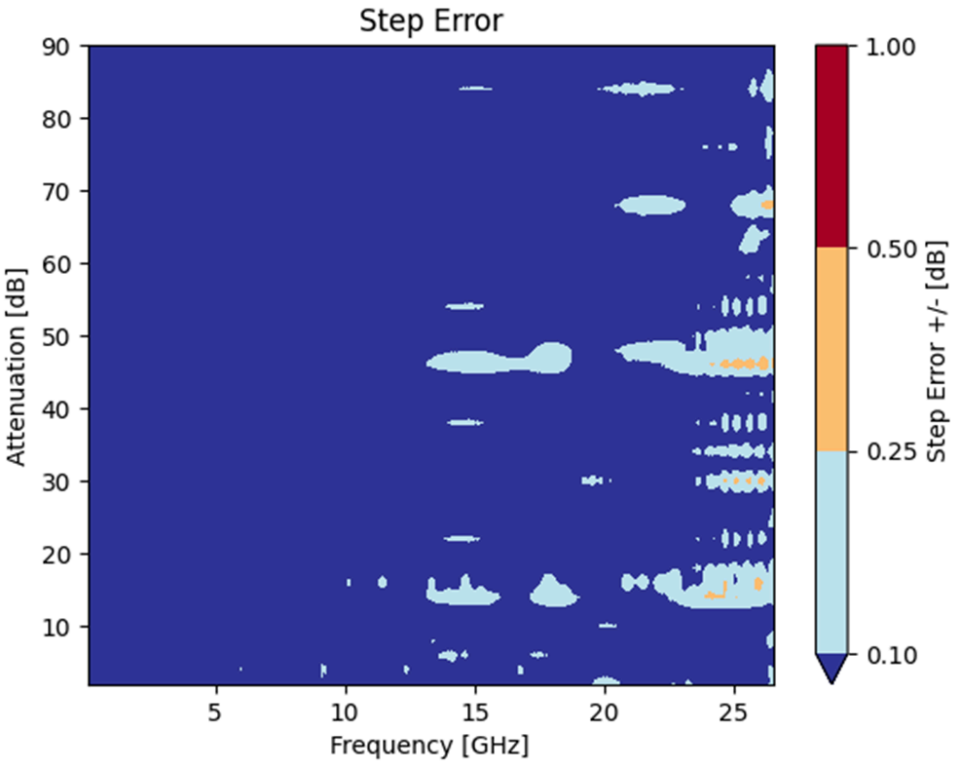


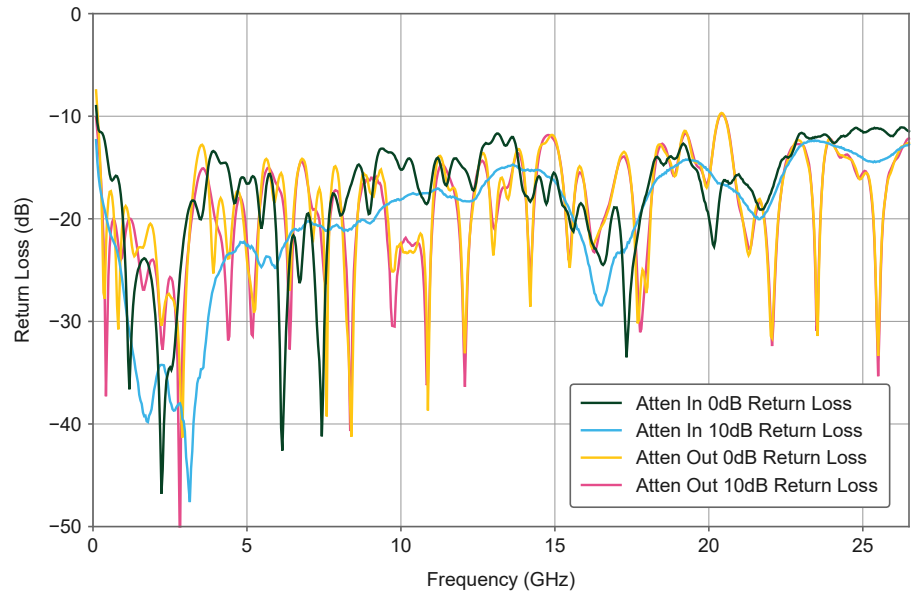
Table 6. Attenuation Step Error, Typical

Specification	Value
Attenuation step error (0.1 GHz to 20 GHz)	± 0.25 dB, typical
Attenuation step error (20 GHz to 26.5 GHz)	± 0.5 dB, typical
Repeatability	± 0.09 dB, measured

Table 7. Attenuation Path Return Loss

Specification	Value
Return loss (>10 dB attenuation state)	11 dB, typical
Return loss (<10 dB attenuation state)	9 dB, typical

Figure 7. Attenuation Path Return Loss, Measured (10 dB Attenuation State)



Reconfiguration Speed

Figure 8. Reconfiguration Trigger to RF Output Transition, Latency and Settling

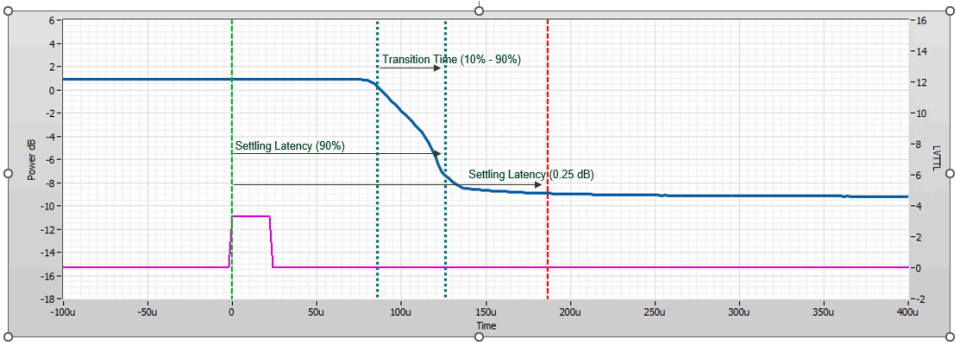


Table 8. Transition and Latency

Transition Time (10% to 90%)	Setting Latency (90%, all steps)	Setting Latency (90%, <10 dB step)	Settling Latency (0.25 dB, all steps) ²	Settling Latency (0.25 dB, <10 dB step) ³
<50 ns, typical	<200 ns, typical	<150 ns, typical	<300 ns, typical	<255 ns, typical

Table 9. Reconfiguration Speed Specifications

Minimum LE Pulse Spacing	Minimum LE Pulse Width	Minimum Control Hold Time
100 ns	50 ns	50 ns

2. Measured from maximum attenuation to minimum attenuation. Smaller transitions might be faster.
3. Measured from maximum attenuation to minimum attenuation. Smaller transitions might be faster.

THRU IN to THRU OUT

Table 10. RF Attenuation Path (THRU IN to THRU OUT)

Specification	Value
Frequency range	100 MHz to 26.5 GHz
Insertion loss (10 GHz)	3 dB, typical
Insertion loss (26.5 GHz)	7.2 dB, typical

Figure 9. THRU Path Insertion Loss, Measured

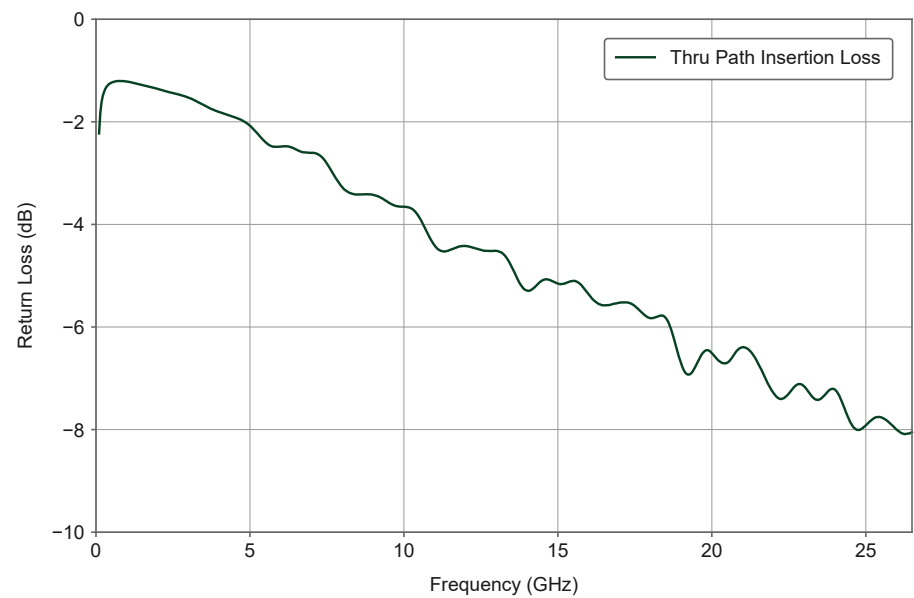
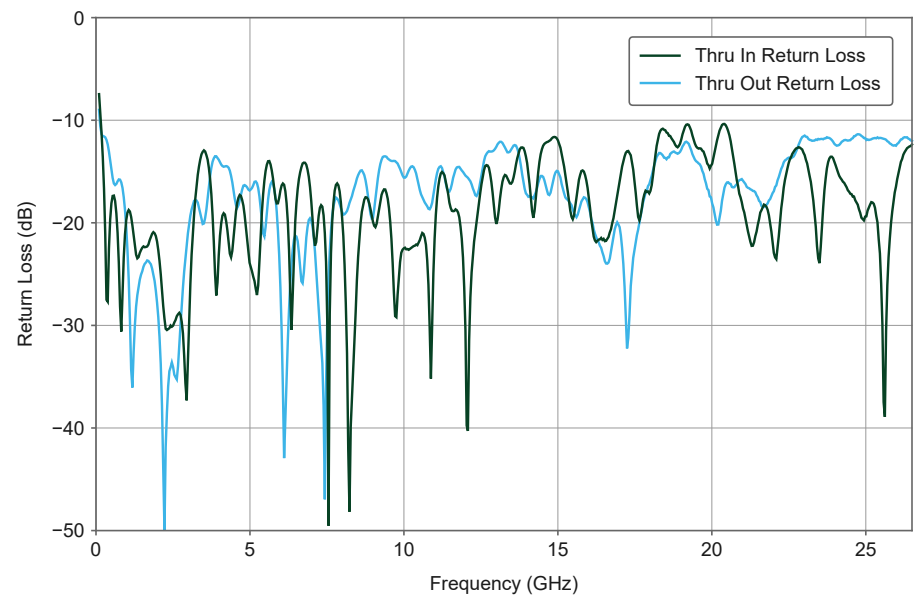


Table 11. Return Loss

Specification	Value
Return loss	9 dB, typical

Figure 10. THRU Path Return Loss, Measured



Crosstalk

Figure 11. ATTEN IN to THRU OUT Isolation, Measured

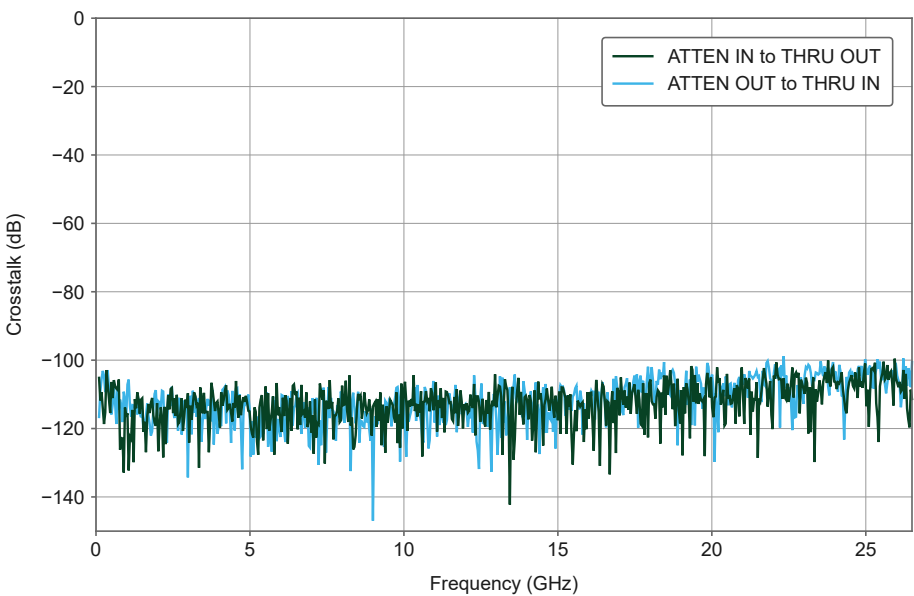


Table 12. Crosstalk

Specification	Value
ATTEN IN to THRU OUT isolation (0.1 GHz to 0.25 GHz)	90 dB, typical
ATTEN IN to THRU OUT isolation (0.25 GHz to 26.5 GHz)	98 dB, typical

Specification	Value
THRU IN to ATTEN OUT isolation (0.1 GHz to 0.25 GHz)	90 dB, typical
THRU IN to ATTEN OUT isolation (0.25 GHz to 26.5 GHz)	98 dB, typical

Power Requirements



Caution The protection provided by the PXle-5699 can be impaired if it is used in a manner not described in the ***PXle-5699 User Manual***.

Table 13. Power Requirements

Specification	Value
+3.3 V DC	1 (A), nominal
+12 V DC	0.5 (A), nominal
Total power	10 W, nominal

Note Power consumption comes from the 12 V and 3.3 V PXI Express chassis backplane power supplies.

Physical Characteristics

Table 14. Physical Characteristics

Specification	Value
Dimensions	213.4 mm (8.4 in.) x 130.6 mm (5.1 in.) x 20.0 mm (0.8 in.) (3U, 1 slot) For more information, visit ni.com/dimensions and search by module number.
Weight	570 g (20.1 oz)

Environmental Guidelines



Notice Failure to follow the mounting instructions in the product documentation can cause temperature derating.



Notice This product is intended for use in indoor applications only.



Notice Strain-relieve all cabling near input connectors. Take care not to directionally bias cable connectors within input connectors when applying strain relief.



Notice Cover all empty slots using filler panels.

Environmental Characteristics

Table 15. Temperature

Operating	0 °C to 55 °C
Storage	-41 °C to 71 °C

Table 16. Humidity

Operating	10% to 90%, noncondensing
Storage	5% to 95%, noncondensing

Table 17. Pollution Degree

Pollution degree	2
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Table 18. Maximum Altitude

Maximum altitude	2,000 m, 800 mbar (at 25 °C ambient temperature)
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Table 19. Shock and Vibration

Operating vibration	5 Hz to 500 Hz, 0.3 g RMS
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Non-operating vibration	5 Hz to 500 Hz, 2.4 g RMS
Operating shock	30 g, half-sine, 11 ms pulse

Characterizing the PXIe-5699

NI stores factory-characterized gain data in non-volatile memory on the PXIe-5699 that you can query through the NI-AATT API. The insertion loss for each gain index is stored in the PXIe-5699. Refer to the niAATT Getting Started Example and the niAATT Characterized Gain Example to learn more about querying attenuation state gains at a particular frequency.

NI recommends characterizing the insertion loss after installing the PXIe-5699 in your system to account for cable loss and drift over time or temperature.