
P5563B/P5563C PCIe 6 Test Backplane Hardware Guide

Important Note: The P5563B Test Backplane model will be discontinued in June 2026 and replaced by the P5563C Test Backplane model.

Notices

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Safety Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Safety Summary

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings or operating instructions in the product manuals violates safety standards of design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements. Product manuals may be available on the Web. Go to www.keysight.com and type in your product number in the Search field at the top of the page.

General	Do not use this product in any manner not specified by the manufacturer. The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.
Environmental Conditions	<p>This instrument is intended for indoor use in overvoltage category 2, pollution degree 2 environment. It is designed to operate at a maximum relative humidity of 85%r.H. and at altitudes of up to 2000 meters.</p> <p>Refer to the specifications tables for the ac mains voltage requirements and ambient operating temperature range.</p>
Before Applying Power	Verify that all safety precautions are taken. Make all connections to the unit before applying power. Note the instrument's external markings described in "Safety Symbols".
Accessibility of Power Plug	In case of emergency, it must be possible to disconnect the instrument from the power line at any time. Make sure the power connector of the instrument can be easily reached and unplugged. Provide sufficient space behind the power socket of the instrument to unplug the cable.
Ground the Instrument	If your product is provided with a grounding type power plug, the instrument chassis and cover must be connected to an electrical ground to minimize shock hazard. The ground pin must be firmly connected to an electrical ground (safety ground) terminal at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.
Fuses	See the user's guide or operator's manual for information about line-fuse replacement. Some instruments contain an internal fuse, which is not user accessible.
Do Not Operate in an Explosive Atmosphere	Do not operate the instrument in the presence of flammable gases or fumes.
Do Not Remove the Instrument Cover	Only qualified, service-trained personnel who are aware of the hazards involved should remove instrument covers. Always disconnect the power cable and any external circuits before removing the instrument cover.
Cleaning	Clean the outside of the instrument with a soft, lint-free, slightly dampened cloth. Do not use detergent or chemical solvents.
Do Not Modify the Instrument	Do not install substitute parts or perform any unauthorized modification to the product. Return the product to a Keysight Sales and Service Office for service and repair to ensure that safety features are maintained.
In Case of Damage	Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

Safety Symbols

Table 1 **Safety Symbol**

Symbol	Description
	Indicates warning or caution. If you see this symbol on a product, you must refer to the manuals for specific Warning or Caution information to avoid personal injury or damage to the product.

Compliance and Environmental Information

Table 2 Compliance and Environmental Information

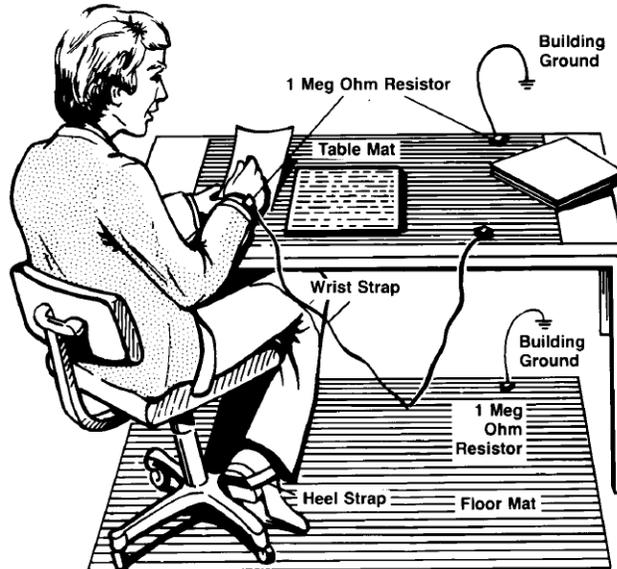
Safety Symbol	Description
	<p>CSA is the Canadian certification mark to demonstrate compliance with the Safety requirements.</p>
	<p>The C-tick mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.</p>
	<p>CE compliance marking to the EU Safety and EMC Directives. ISM GRP-1A classification according to the international EMC standard. ICES/NMB-001 compliance marking to the Canadian EMC standard.</p>
	<p>KC certification mark to demonstrate compliance with the South Korean EMC requirements.</p> <p>South Korean Class A EMC declaration This equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.</p>
	<p>The crossed out wheeled bin symbol indicates that separate collection for waste electric and electronic equipment (WEEE) is required, as obligated by the EU DIRECTIVE and other National legislation.</p> <p>Please refer to keysight.com/go/takeback to understand your Trade in options with Keysight in addition to product takeback instructions.</p>

CAUTION

Electrostatic discharge (ESD) can damage the circuits of the components on the hardware. Avoid applying static discharges to the front-panel connectors. Before connecting any coaxial cable to the connectors, momentarily short the center and outer conductors of the cable together. Avoid touching the front-panel connectors without first touching the frame of the instrument. Be sure the instrument and all connected devices (DUT, etc.) are properly earth-grounded (to a common ground) to prevent buildup of static charge and electrical over-stress. Take necessary anti-static precautions, such as wearing a grounded wrist strap, to minimize the possibility of electrostatic damage.

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe work station. The following list and figure shows an example of a static-safe work station using two types of ESD protection. Purchase acceptable ESD accessories from your local supplier.

- Conductive table-mat and wrist-strap combination.
- Conductive floor-mat and heel-strap combination.



Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone. To ensure user safety, the static-safe accessories must provide at least 1 MW of isolation from ground.

WARNING

These techniques for a static-safe work station should not be used when working on circuitry with a voltage potential greater than 500 volts.

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Specifications and Characteristics

The following are the specifications and characteristics of the Keysight P5563B/P5563C PCIe 6 Test Backplane.

NOTE

Please note that the P5563B Test Backplane model will be discontinued and replaced by the P5563C Test Backplane model in the future.

P5563B/P5563C PCIe 6 Test Backplane

P5563B PCIe 6 Test Backplane

The P5563B PCIe 6 Test Backplane is a test platform that supports two x16 slots for PCIe add-in cards. It provides a mechanical fixture to support the add-in cards. The slots support a PCIe 6 x 16 interface and can be used for PCIe 2.5 GT/s - 64.0 GT/s testing.

Each slot provides power and clock to add-in cards. The test platform supports PCIe 6 clock source to support a common clock architecture.

A reset button resets each of the slots at the same time.

P5563C PCIe 6 Test Backplane

The P5563C PCIe 6 Test Backplane is a test platform that supports three x16 CEM slots for PCIe add-in cards and one x16 EDSFF slot for EDSFF/OCP devices. The slots support a PCIe 6 x16 interface and can be used for testing across data rates ranging from 2.5 GT/s to 64.0 GT/s.

Each slot provides power and clock to add-in cards. The test platform supports PCIe 6 clock source to support a common clock architecture.

A reset button resets each of the slots at the same time.

For more information on the Keysight EDSFF/OCP Device Mounting Kit for Test Backplane, please refer to the [Keysight EDSFF/OCP Device Mounting Kit for Test Backplane Quick Start Guide](#), available on the Keysight website.

The following images show the front and rear views of the P5563B and P5563C PCIe 6 Test Backplanes.



Figure 1 P5563B PCIe 6 Test Backplane: Front View



Figure 2 P5563B PCIe 6 Test Backplane: Rear View

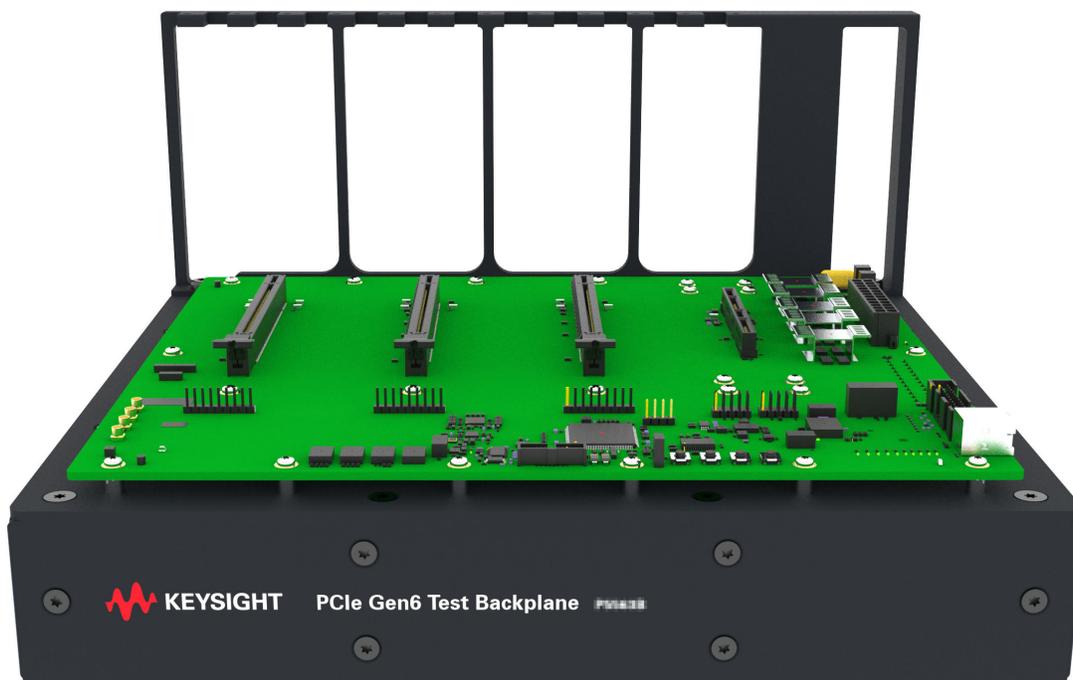


Figure 3 P5563C PCIe 6 Test Backplane: Front View



Figure 4 P5563C PCIe 6 Test Backplane: Rear View

Components on the P5563B/P5563C PCIe 6 Test Backplane

The following images show the top views of the P5563B and P5563C PCIe 6 Test Backplanes, with key components labeled using numbered markers. Each image is followed by a table that provides detailed descriptions of what each numbered label represents.

CAUTION

All external inputs connected to ports shall provide reinforced or double insulation for protection against electric shock and shall have voltages below 30 Vrms and 42.4 Vpeak or 60 Vdc.

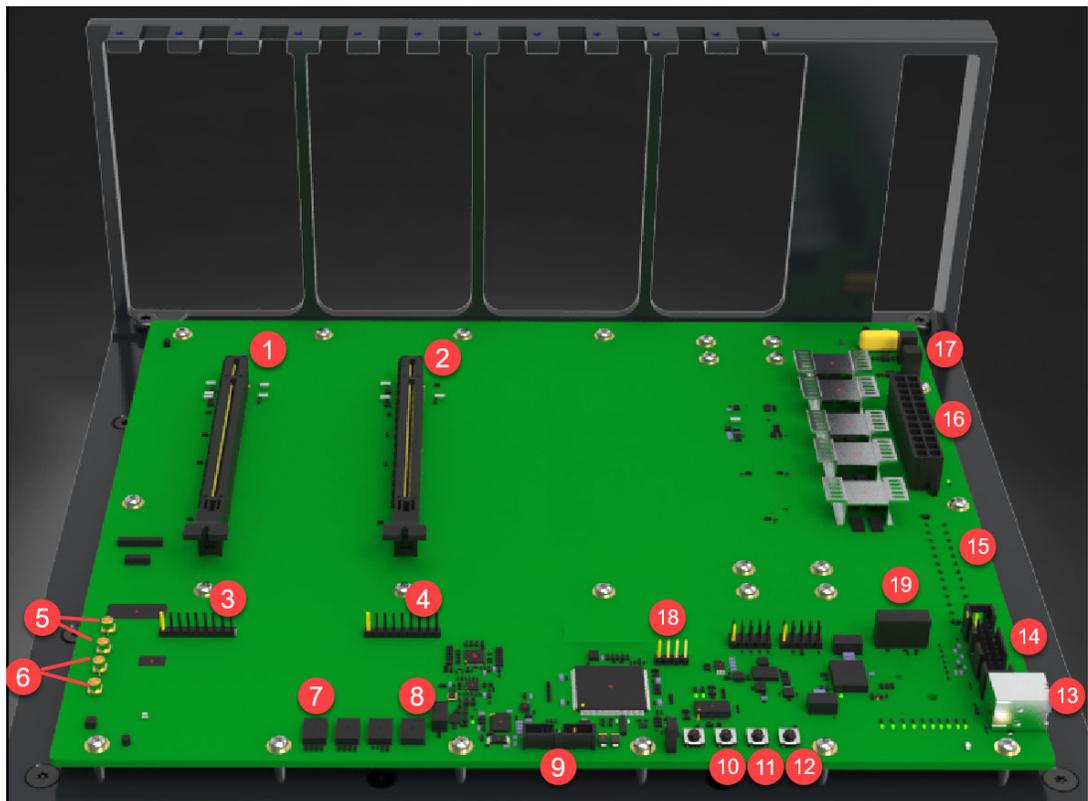


Figure 5 Components of the P5563B PCIe 6 Test Backplane

Table 1 Components of the P5563B PCIe 6 Test Backplane

Component #	Description												
	Slot 1												
	Slot 2												
	Slot 1 JTAG Note: For internal use only												
	Slot 2 JTAG Note: For internal use only												
	Mini SMP CLK OUT												
	Mini SMP CLK IN												
	SW15 IN/EXT Clk Selection OFF => Internal Clock ON => External Clock												
	Dip Switch for SSC Clock Selection This switch is used for clock spread spectrum purposes. SSC can be enabled either through software or hardware. Following are the switch settings: * Pin 1 = ON => Software control * Pin 1 = OFF => Hardware control * For hardware control, refer to the following table: <table border="1" data-bbox="641 1474 891 1591"> <thead> <tr> <th>Pin 2</th> <th>Pin 3</th> <th>SSC (%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>-0.25</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>-0.5</td> </tr> </tbody> </table> * Pin 4 - Currently not defined	Pin 2	Pin 3	SSC (%)	0	0	-0.25	0	1	0	1	0	-0.5
Pin 2	Pin 3	SSC (%)											
0	0	-0.25											
0	1	0											
1	0	-0.5											
	UPI Connector Note: For internal use only												
	MIC RESET												

Component #	Description
	PWR RESET
	PCIe RESET
	MIC USB
	MIC JTAG This connector is for Keysight Service only.
	Main Power Input Connector 24 Pin ATX Connector
	Auxiliary Power Input Connector 24 Pin ATX Connector
	12V DC Fan Connectors
	I2C Header Required for direct external I2C connection to MCU, Clock Generator, Clock Buffer, and UPI data/clock. Only relevant for internal debugging and monitoring. Note: For internal use only
	MIC UART

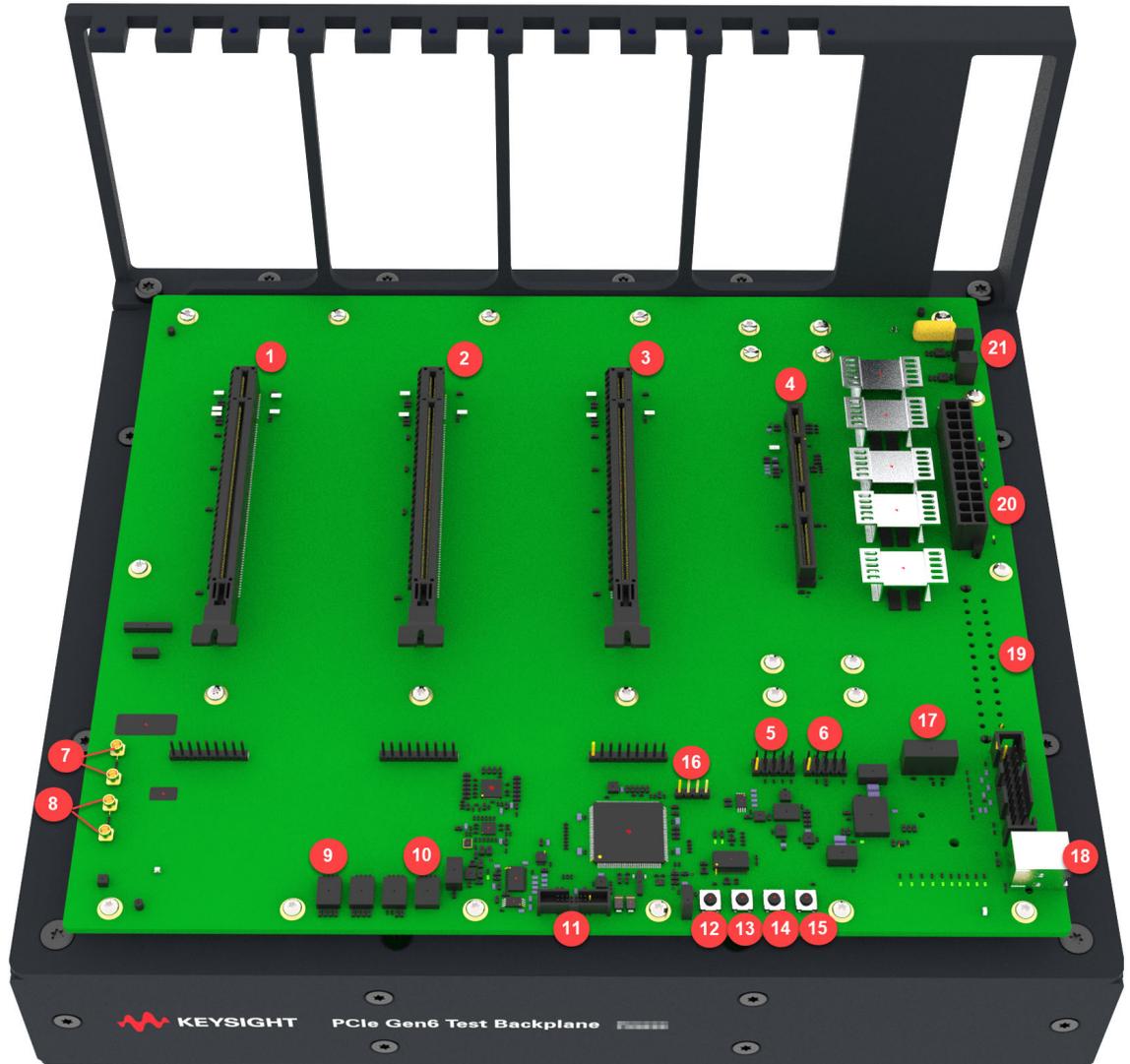


Figure 6 Components of the P5563C PCIe 6 Test Backplane

Table 2 Components on the P5563C PCIe 6 Test Backplane

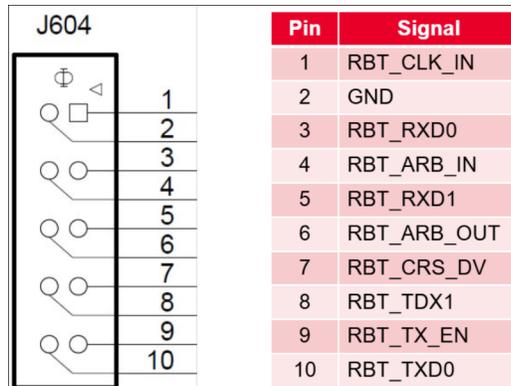
Component #	Description
	Slot 1
	Slot 2
	Slot 3 CEM
	Slot 4 EDSFF



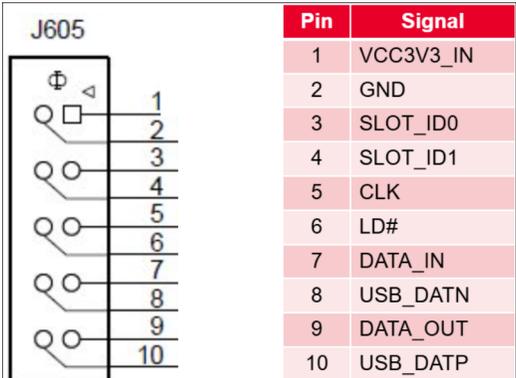
J604, EDSFF- RBT sideband management Interface (NIC Implementation)

The RMII-Based Transport (RBT) interface is an optional sideband management interface. It's a nine-wire interface through which the NIC device can communicate with the rest of the system. Refer to the DSP0222 NC-SI Specification for more details.

The following figure shows the RMII pinout for J604 connector:



Note: To enable the RBT interface on NICs, please contact Keysight Support for assistance, as enabling this interface modifies the hardware configuration.

Component #	Description																						
6	<p>J605, Scan Chain interface (NIC Implementation)</p> <p>The Scan Chain Interface provides status indication between host and device. Refer to the OCP NIC 3.0 Design Specification for more details on functional and timing requirements. The following figure shows the Scan Chain pinout for J605 connector:</p> <div style="display: flex; align-items: center; justify-content: center;">  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="background-color: #cccccc;">Pin</th> <th style="background-color: #cccccc;">Signal</th> </tr> </thead> <tbody> <tr><td>1</td><td>VCC3V3_IN</td></tr> <tr><td>2</td><td>GND</td></tr> <tr><td>3</td><td>SLOT_ID0</td></tr> <tr><td>4</td><td>SLOT_ID1</td></tr> <tr><td>5</td><td>CLK</td></tr> <tr><td>6</td><td>LD#</td></tr> <tr><td>7</td><td>DATA_IN</td></tr> <tr><td>8</td><td>USB_DATN</td></tr> <tr><td>9</td><td>DATA_OUT</td></tr> <tr><td>10</td><td>USB_DATP</td></tr> </tbody> </table> </div> <p>Note: To enable the Scan Chain Interface on NICs, please contact Keysight Support for assistance, as enabling this interface modifies the hardware configuration.</p>	Pin	Signal	1	VCC3V3_IN	2	GND	3	SLOT_ID0	4	SLOT_ID1	5	CLK	6	LD#	7	DATA_IN	8	USB_DATN	9	DATA_OUT	10	USB_DATP
Pin	Signal																						
1	VCC3V3_IN																						
2	GND																						
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9	DATA_OUT																						
10	USB_DATP																						
7	Mini SMP CLK OUT																						
8	Mini SMP CLK IN																						
9	<p>SW15 IN/EXT Clk Selection</p> <p>OFF => Internal Clock</p> <p>ON => External Clock</p>																						
10	<p>Dip Switch for SSC Clock Selection</p> <p>This switch is used for clock spread spectrum purposes. SSC can be enabled either through software or hardware. Following are the switch settings:</p> <ul style="list-style-type: none"> * Pin 1 = ON => Software control * Pin 1 = OFF => Hardware control * For hardware control, refer to the following table: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="background-color: #cccccc;">Pin 2</th> <th style="background-color: #cccccc;">Pin 3</th> <th style="background-color: #cccccc;">SSC (%)</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>-0.25</td></tr> <tr><td>0</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>-0.5</td></tr> </tbody> </table> <p>* Pin 4 - Currently not defined</p>	Pin 2	Pin 3	SSC (%)	0	0	-0.25	0	1	0	1	0	-0.5										
Pin 2	Pin 3	SSC (%)																					
0	0	-0.25																					
0	1	0																					
1	0	-0.5																					
11	<p>UPI Connector</p> <p>Note: For internal use only</p>																						

Component #	Description
	EDSFF RESET
	MIC RESET
	PWR RESET
	PCIe RESET
	I2C Header Required for direct external I2C connection to MCU, Clock Generator, Clock Buffer, and UPI data/clock. Only relevant for internal debugging and monitoring. Note: For internal use only
	MIC UART
	MIC USB
	Main Power Input Connector 24 Pin ATX Connector
	Auxiliary Power Input Connector 24 Pin ATX Connector
	12V DC Fan Connectors

Specifications

P5563B Specifications	
General	Provides power and clock to DUT
	Test fixture for add-in card testing with exerciser
Power	Supports 12V and 3.3V power input required for PCIe x16 slots.
	Power reset button for all PCIe slot supply voltages 12V and 3.3V
	3.3V AUX (stand by) power for add-in card available if required
	Each slot supports 75W max output power for add-in card.
Link width	All link widths (x1, x2, x4, x8, x16) are supported with x16 PCIe edge connectors
Speed	32 GBaud PAM4 per lane
Clocks	Clock generation with/without SSC
	Jitter specification: <0.1ps RMS
	Clock output (e.g. for oscilloscope measurements) Provision for the differential output clock on 2 Mini SMP connectors for the measurement.
Connectors	Bus 1 <ul style="list-style-type: none"> ▪ One pair of x16 PCIe connectors

Environmental Specifications	
Temperature (AT-ETM757)	Operating: +5 °C to +35 °C Storage: -40 °C to +70 °C
Humidity (AT-ETM758)	Operating: 15 to 85% non-condensing (Relative humidity) Storage: 15 to 95% non-condensing (Relative humidity)
Safety standards	Overvoltage category: EN ISO/IEC 17025, IEC 61010-1/EN61010-1, IEC 61326-1, II
	Pollution degree: 2
	Environmental rating: Standard
	Main supply voltage fluctuations are not to exceed 10% of the nominal supply voltage

General Characteristics	
Power requirements	100 to 240 Vac
	500W MAX
	50-60 Hz
Weight	4.7 Kg

General Characteristics	
Dimensions	Length: 273.0 mm
	Width: 310.0 mm
	Height: 181.0 mm
Electrical Characteristics	
Slot supply voltages	Maximum power rating <ul style="list-style-type: none"> +12 V/5.5 A per PCI slot +3.3 V/3.0 A per PCI slot +3.3 V_AUX / 0.375 A per PCI slot P5563C: There may be max. 4 add-in cards inserted (3 x16 PCIe add-in cards and 1 EDSFF add-in card). P5563B: There may be max. 2 add-in cards inserted.
Connectors	Power connectors for external fans <ul style="list-style-type: none"> 12 V / 0.5 A maximum per connector
Clocks	Mini SMP clock output (differential) <ul style="list-style-type: none"> Terminate into 100 Ω differential Level: typically 800 mVpp
	Reference clock at PCI connectors <ul style="list-style-type: none"> According PCI Express[®] Base Specification Revision 6.0 Frequency 100 MHz \pm 100 ppm
	SSC supported <ul style="list-style-type: none"> 30 kHz triangle waveform is used with 0.5% and 0.25% downspread

CAUTION

During normal operations, P5563B/P5563C operates safely. Nevertheless, the circuits of 3.3V and 12V on PCI Express connectors are not limited and may provide currents higher than 8A. In case of failure, for example short circuit, such a circuit presents the risk of causing fire. Therefore, to limit the energy and avoid damage, we urgently recommend implementing one of the following preventive measures:

1. Limit the circuits of your product under test with a 4A IEC 60127 fuse (5A ANSI/UL 248/14) at the input.
2. Operate the P5563B/P5563C in a fire enclosure.

CAUTION

The detachable mains supply cords must not be replaced with inadequately rated power cords.

The following table lists electrical specification:

U Output	I _{max} Output
+3.3V	14A
+12V	41A

