

Specification Guide

Keysight M9506A 5-Slot AXIe Chassis



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How to use this document

This document contains technical specifications for all manufacturing versions of the M9506A High Performance 5-Slot AXIe Chassis. Specifications published in the data sheet apply only to the currently shipping version of the equipment.

If a specification applies only to a certain manufacturing version of the equipment, it is indicated in this document. Such changes are usually designated by a serial number break. For example, you might see a table indicating the specification for equipment with “**Serial Number TW51150212 and earlier**” accompanied with another column with “**Serial Number TW51160201 and later.**” indicating that the equipment with serial number TW51160201 and greater use the new specification.

Specification and Characteristics Defined

- **Specifications** describe the warranted performance and include guardbands to account for the expected statistical performance distribution, measurement uncertainties, and changes in performance due to environmental conditions. All specifications and characteristics apply over the operating environment outlined in the “Environmental and Regulatory” section of this data sheet. In addition, the following conditions must be met:
 - Instrument is within its calibration cycle if calibration is required.
 - Instrument has been stored for a minimum of 1 hour within the operating temperature range prior to turn-on and after a 30-minute warm-up period.
- **Characteristics** describe product performance that is useful in the application of the product, but that is not covered by the product warranty. Characteristics are often referred to as Typical or Nominal values.
- **Typical** describes expected performance of an average unit when operated over a 20 to 30 °C temperature range. Typical performance is not warranted. The instrument must be within its calibration cycle if calibration is required.
- **Nominal** describes representative performance that is useful in the application of the product when operated over a 20 °C to 30 °C temperature range. Nominal performance is not warranted.

Recommended best practices in use

- Use slot filler panels in empty module slots to ensure proper cooling. Keysight chassis and filler panels optimize module temperature performance.
- At environmental temperatures > 45 °C, chassis fans should be set to high.

Additional information

- Any graphs contain measured data from multiple units at room temperature and are representative of product performance within the controlled temperature range unless otherwise noted.
- The data contained in this document is subject to change.

Technical Specifications and Characteristics

General Chassis Characteristics			
Standards compliance			
AXIe-1 Revision 3.0			
Backplane			
Instrument Module slots	5		
AXIe System module	Embedded		
ESM Slot Configuration	x16		
AXIe Instrument Slot Configuration	x16		
Backplane Speed	PCIe Revision 3.0 (Gen 3)		
Mechanical			
Size	482 mm W x 195 mm H x 497 mm D (with bumpers)		
	449 mm W x 177 mm H x 497 mm D (with bumpers removed)		
	4U x 1 rack width		
Weight (without modules)	23.5 kg (51.8 lbs)		
Power Supply Characteristics			
AC input			
Operating voltage/power ¹	100/120 V, 1380 W (maximum)		
	220/240 V, 2000 W (maximum)		
Input frequency range	50/60 Hz		
Over current protection	Auto-recovery		
DC Output			
DC Output Voltage	52 V		
Maximum ripple and noise	500 mV pk-pk		
Instrument Module DC Output Power Characteristics		100/120 VAC	220/240 VAC
Maximum DC output Power		940 W	1500 W
Maximum DC Output Current		18.0 A	28.8 A
Power dissipation, instrument slot			
100/120V	300 W ^{2,3}		
220/240 V	300 W ³		
Chassis Cooling			
Slot airflow direction	Right to Left		
Chassis cooling intake	Right side of chassis		
Chassis cooling exhaust	Left side of chassis		
Chassis cooling fans	Six 90 cfm intake fans and six 90 cfm exhaust fans		

¹ Auto switching between 100/120 V and 200/240 V

² Limit total slot power dissipation to 940 W when using 100/120 VAC (a maximum of three slots dissipating 300 W each are supported).

³ A Maximum per slot dissipation of 300 W at 40 °C and 1500 m will result in a ≤15 °C module temperature rise. At 50 °C and 3000 M, module temperature rise will be ≤18 °C.

Clocks and Triggers	
100 MHz system clock (CLK100)	
Maximum Slot-to-Slot Skew	100 ps
Accuracy	± 30 ppm
Input Impedance	50 Ω
AXIe Differential Star Trigger (STRIG)	
Maximum Slot-to-slot Skew	100 ps
External Clock Out (10M OUT)	
Connector	SMB
Output Frequency	10 MHz ± 30 ppm
Output level	3.3 V, AC Coupled
Output Impedance	50 Ω
External Clock In (10M IN)	
Connector	SMB
frequency Input	10 MHz ± 100 PPM
Input Level	5 V pk-pk, AC coupled
Minimum Swing	250 mV
Input Impedance	50 Ω
External Triggers (TRIG1 and TRIG2)	
Connector	SMB
Direction	Programmable
Output Level	3.3 V CMOS
Output Impedance (push-pull)	50 Ω
Output Impedance (open drain)	316 Ω pulled up to 3.3 V
Input Level	± 5 V adjustable threshold
Input Impedance	50 Ω or 3 k Ω (programmable)
Minimum Input Swing	250 mV
GPS Option	
Receiver	U-Blox LEA-M8F
Supported Systems	GPS (L1), GLONASS (L1), and BeiDou (B1)
PPS Accuracy	≤ 20 ns Clear sky
Tracking sensitivity	-165 dBm (GPS, GLONASS), -160 dBm (BeiDou)
Sensitivity (cold start)	-148 dBm (GPS), -145 dBm (GLONASS), -138 dBm (BeiDou)
Required antenna type	3.3 V Active Antenna
Active Antenna recommendations	Minimum gain: 15 dB Maximum gain: 30 dB Maximum noise figure: 1.5 dB
Antenna connector	SMB

Environmental Characteristics^{1,2}

Operating and Storage Conditions			
	Operating		Storage
Temperature	0 °C to 50 °C		-40 °C to 70 °C
Altitude	up to 3000 m		up to 4600 m
Maximum Relative Humidity (non condensing)	Type tested at 95% RH up to 40 °C decreases linearly to 45% RH up to 50 °C ³		
Vibration			
Operating random vibration: type tested at 5 to 500 Hz, 0.21 g rms			
Survival random vibration: type tested at 5 to 500 Hz, 2.09 g rms			
Acoustical Emissions (referenced to 1pW)	Typical emissions at Different Cooling Loads per Slot ⁴		
	200 W	250 W	300 W ⁵
Sound Pressure Level ⁶	60.8 dbA	64.5 dbA	71.0 dbA
Sound Power	68.0 dbA	70.9 dbA	72.5 dbA

1 Samples of this product have been type tested in accordance with the Keysight Environmental Test Manual and verified to be robust against the environmental stresses of storage, transportation, and end-use. Those stresses include but are not limited to temperature, humidity, shock, vibration, altitude, and power line conditions.

2 Test Methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3

3 From 40 °C to 50 °C, the maximum % Relative Humidity follows the line of constant dew point

4 At sea level and 25°C ambient temperature

5 At Maximum fan speed

6 At Operator Position

Regulatory Characteristics

Safety

Complies with the essential requirements of the European LVD Directive of the following standards (dates and editions are cited in the Declaration of Conformity):

- IEC/EN 61010-1
- Canada: CSA C22.2 No. 61010-1
- USA: UL std no. 61010-1

Acoustic Statement (European Machinery Directive)

Acoustic noise emission

LpA < 70 dB

Operator position

Normal operation mode Per ISO 7779

EMC

Complies with European EMC Directive of the following standards (dates and editions are cited in the Declaration of Conformity):

- IEC/EN 61326-1
- CISPR pub 11 group 1, class A
- AS/NZS CISPR 11
- ICES/NMB-001

This ISM device complies with Canadian ICES-001.

Cet appareil ISM est conforme a la norme NMB-001 du Canada

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