Data Sheet

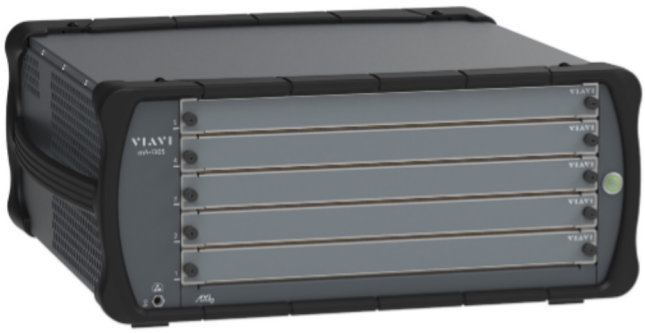
VIAVI
mA-1302 / 1305

Advanced High-Performance AXIe Chassis Module

VIAVI Solutions

Introduction

Introducing the VIAVI Solutions mA-1305, the foundation for the latest modular test solutions portfolio from VIAVI Solutions. The mA-1305 chassis is built upon the powerful AXIe instrumentation standard and is fully compliant to the AXIe-1 Revision 2.0 specification. Additionally, the mA-1305 is the first chassis to support the AXIe-1 Revision 3.0 Specification for Wide PCIe Express® Fabric Extensions. With five instrument slots, each with a fabric interface of x16 lanes Gen3 PCIe®, the mA-1305 is designed to provide the extreme bandwidth needed for the most demanding test applications. In addition to providing the industry's highest bandwidth modular interconnect, the mA-1305 comes with a rich set of additional features to simplify your deployment solution.



mA-1302 / mA-1305 Advantages

- AXIe form factor provides high functionality per slot
- 200 Watts per slot
- 2U configuration for small rack-mount and transportable applications
- 4U configuration for high-performance applications
- 32 GB/s slot-to-slot data throughput
- Supports AXIe-1 Revision 3.0 specification for PCI Express® Fabric Extensions
- Multi-shelf connection for multiple-chassis configurations

mA-1302 / mA-1305 Applications

- High-performance test deployments
  - Wireless communications
  - Semiconductor test
  - Aerospace and defense
  - Automotive
  - Industrial
  - Radar
  - Signal intelligence
- Emulation and simulation
- Complex signal and environment generation and analysis
- Heterogeneous and GP-GPU computing
- Real-time processing

Hardware

Open Standards for a Modular World

With 200 W power per slot, spacious board real-estate, and high-bandwidth backplane interfaces, the open AXIe modular instrument is the future for demanding applications. AXIe is a revolutionary, high-performance combination of the popular PXI and LXI standards. The mA-1305 is fully compliant to the AXIe-1, Revision 2.0 specification. In addition to the required four lanes per slot of PCIe, the mA-1305 provides another 12 lanes for a total of 16 fabric transceiver lanes per instrument slot, making it the first chassis compliant to the upcoming Wide PCIe Express Fabric Extension to the AXIe standard. And owing to AXIe's inheritance from the AdvanceTCA PICMG 3.0 R3.0 specification, the mA-1300 is compatible with a broad selection of standard ATCA modules.

Mechanical Simplicity to Your Test Setup

With its embedded system module, the mA-1305 provides five available instrument slots in a compact 4U rack height. Six powerful fans automatically managed by the embedded system module pull air uniformly right-to-left across the instrument slots to ensure that all 200 W of per slot power can be cooled. By placing external interfaces like Ethernet, PCIe iPass, and Reference Clock I/O on the rear panel of the unit, the front of the chassis remains uncluttered for simple and easy access to the ports that matter most - the ones that interface to your devices and systems. With the available rack mounting kit, the mA-1305 is ready to provide the foundation to simplify your system setup.

Backplane Fabric for Tomorrow's Needs

The benefits of AXIe go beyond simply more power and larger board space. With the newly announced Wide PCIe Express Extension to the AXIe-1 specification, the mA-1305 provides x 16 lanes of Gen3 PCIe to each slot. With 32 GB/s of non-blocking, slot-to-slot bandwidth, the mA-1305 provides 8x the throughput of competing solutions. The mA-1305 does more than supply raw speed. It also provides extreme flexibility to configure the backplane connections for different widths and number of ports. Possible configurations are: x16; x8 x8; x8 x4 x4; x4 x4 x4 x4.

Along with the industry's most advanced backplane fabric, the mA-1305 also provides Gigabit Ethernet, IPMB management bus, and timing and trigger signals to each slot. The trigger bus consists of 12 shared differential lines along with a 100 MHz reference clock, SYNC, and STRIG signal. Additionally, the mA-1305 provides all 62 local bus signals for the utmost in slot-to-slot connectivity.

External Interfaces that Think Outside the Box

The advanced connectivity of the mA-1305 doesn't just reside inside the chassis. With external downstream x8 PCIe, Gigabit Ethernet, USB 3.0 host ports, flexible reference clock and trigger I/O, GPS capability, and optional WiFi, the mA-1305 provides the connection options you need to control your hardware solution.

A downstream x8 PCIe port is available for controlling the chassis peripherals from an external computer in the absence of a host controller module. Additionally, Gigabit Ethernet is provided for connection to the chassis base fabric and to the embedded webserver for chassis configuration. Wake-on-LAN functionality is also provided to simplify maintenance and software upgrades of deployed mA-1305 chassis.

The reference clock input can be configured to lock to either 10 MHz, 12.5 MHz, 25 MHz, or 100 MHz standards. But if a standard isn't available, the mA-1305 can also synchronize to GPS for extreme accuracy. The mA-1305 can also synchronize it's internal reference to IEEE-1588v2 PTP or Synchronous Ethernet using the external LAN connection. Similarly, the mA-1305 can also source either 10 MHz or 100 MHz reference on the clock output. Flexibility also extends to the trigger input and output. Trigger threshold level is programmable over a 10 V range and both input and output can be mapped onto any of the backplane trigger bus signals.

If you have to share the mA-1305 with your cubicle neighbor, you shouldn't also have to hunt for an Ethernet drop and cable, so WiFi is provided to allow you to connect quickly and seamlessly. USB 3.0 ports are available as well.

Software Features

Embedded Chassis Management

The mA-1305 embedded system module contains a powerful dual-core processor that performs all chassis management including hosting the IPMI Shelf Management Controller and providing a webserver interface to allow the user to monitor and control the mA-1305.

The embedded webserver contains simple, intuitive interfaces to configure the chassis functions such as trigger bus routing, reference clock configuration, and fabric configuration.

mA-1302 / 1305 Chassis Product Specifications

Standard Compliance	
AXIe Base Architecture Specification, Revision 3.0	
AdvanceTCA PICMG 3.0 R3.0 Specification	
Backplane	
Instrument slots	mA-1302: 2 slots mA-1305: 5 slots
System module	Embedded
Extended backplane routing	Fabric channels 1, 2, 3, 4
Power Supply - AC Input	
Operating voltage range	100 - 300 VAC
Input frequency range	47 - 66 Hz
Efficiency (typical)	91 - 95%
Power factor (typical)	0.98
Ride through (typical)	1 cycle
Holdup time	20 ms
Power Supply - DC Output	
Output voltage	-48 VDC
Available instrument slot power	1000 W
Load regulation	±1%
RMS output ripple (20 MHz BW)	250 mV
Standby power	5 VDC, 3.75 W
Cooling and Power Dissipation	
Instrument slot airflow direction	Right to left
Air intake	Chassis right side
Air exhaust	Chassis left side
Cooling fans	6 x 93 cfm (max), 22 cfm (min)
Power dissipation / instrument slot	200 W
Reference Clock (CLK100)	
Frequency	100 MHz
Accuracy	±0.1 ppm OCXO (OCXO is standard)
Duty cycle	45 - 55%
SSB phase noise at 10 kHz offset	-155 dBc/Hz
External Reference Clock Input (BNC)	
Input frequencies (selectable)	10 MHz / 12.5 MHz / 25 MHz / 100 MHz
Frequency lock range	±75 ppm
Input level swing	5 V (max), 250 mV (min)
Input impedance	50 ohm
External Reference Lock Output (BNC)	
Output frequencies (selectable)	10 MHz / 100 MHz
Output level	3.3 V CMOS
Output load	50 ohm

GNSS Timing (SMA)	
Constellation standards	GPS (L1), GLONASS (L1, FDMA), Gailieo (E1)
1 PPS accuracy	UTC ±10 ns (1-sigma, 1 satellite in track 24 hours)
Acquisition sensitivity	-146 dBm
Tracking sensitivity	-162 dBm
External Trigger Input (BNC)	
Max input level	±10 V
Max toggle rate	10 ns
Input impedance	1 kohm
Minimum threshold (programmable)	250 mV
External Trigger Output (BNC)	
Output level	3.3 V CMOS
Max toggle rate	10 ns
Output load	50 ohm
Backplane Interfaces - Timing and Trigger (Inter-Pair Skew)	
Local bus	62 LVDS pairs, 20 ps max
SYNC	100 ps slot-to-slot, 500 ps to CLK100
CLK100	100 ps slot-to-slot
STRIG	20 ps slot-to-slot
Backplane Interfaces - Ethernet Base Fabric Channel	
Link speed	10 / 100 / 1000 Mbps
VLAN support	Per instrument slot or port
Timing	Synchronous Ethernet and / or IEEE 1588v2 (CLK100 lockable to external GM or Sync-E)
External LAN interface	IEEE 802.3ab (RJ45), IEEE 802.11b/g/n (RP-SMA)
Remote wakeup	Wake-on-LAN, Wake-on-Frame
External interface	IEEE 802.3ab (RJ45), IEEE 802.1 b/g/n (RP-SMA)
Backplane Interfaces - PCI Express Fabric Channels	
Link width	x16 per instrument slot
Link speed	8 GT/s
Ports per instrument slot	4
Multicast support	Yes
Multihost support	Yes (4 virtual switch ports)
Remote wakeup	Host wakeup (CWAKE#), wake-on-PCIe (CPRSNT#)
External downstream interface	x8 iPass™ Cabled PCIe

Additional Chassis Data Interfaces	
USB	Dual USB 3.0 Type-A, selectively hosted by system module CPU or the Chassis Host Processor
MultiShelf In / Out	Intelligent multi-chassis networking interface (GbE, x8 PCIe, CLK100, SYNC, serialized trigger bus)
Front Panel Pushbutton	
Depressed functionality	Momentary push on / off (ordered shutdown) 5 second hold (forced shutdown)
LED status indication	Solid green - on with healthy status Flashing green - booting Solid amber - off Flashing amber - powering down Solid red - off with error condition Flashing red - on with chassis attention required
Environmental	
Operating temperature	0° - 50° C
Storage temperature	-40° - 71° C
Humidity	50% at 40° C (in accordance with MIL-PRF-28800F)
Altitude	3000 m
Functional shock	30 G (in accordance with MIL-PRF-28800F)
Random vibration	5 Hz - 500 Hz (in accordance with MIL-PRF-28800F)
Regulatory	
Safety compliance	IEC / EN 61010-1
EMC compliance	IEC / EN 61326-1 IEC / EN 61000-3-2 IEC / EN 61000-3-3 MIL-PRF-28800F
Mechanical	
Rack units	mA-1302: 2U x 19" mA-1305: 4U x 19"
Dimensions	mA-1302: 432 mm (W) x 88 mm (H) x 435 mm (D) mA-1305: 432 mm (W) x 177 mm (H) x 435 mm (D)
Weight	mA-1302: 10.5 kg (23.1 lbs) mA-1305: 12 kg (26.5 lbs)
Acoustic emissions	78 LWA dB (max), 63 LWA dB (typical)

VIAVI Solutions

Contact Us **+1 316 522 4981**
AvComm.Sales@viavisolutions.com

To reach the VIAVI office nearest you, visit viavisolutions.com/contact

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