

OP-X2-SFP+

X2 to SFP+ converter Module

Features

- ◆ Compatible with X2 MSA Rev.2.0b
- ◆ Case Temperature Range:
- ◆ Standard: 0°C ~70°C
- ◆ Duplex SC connector
- ◆ Hot pluggable 70 pin connector with XAUI electrical interface
- ◆ Management and control via MDIO 2 wire interface
- ◆ Complaint with the EU RoHS 6 Environmental Requirements



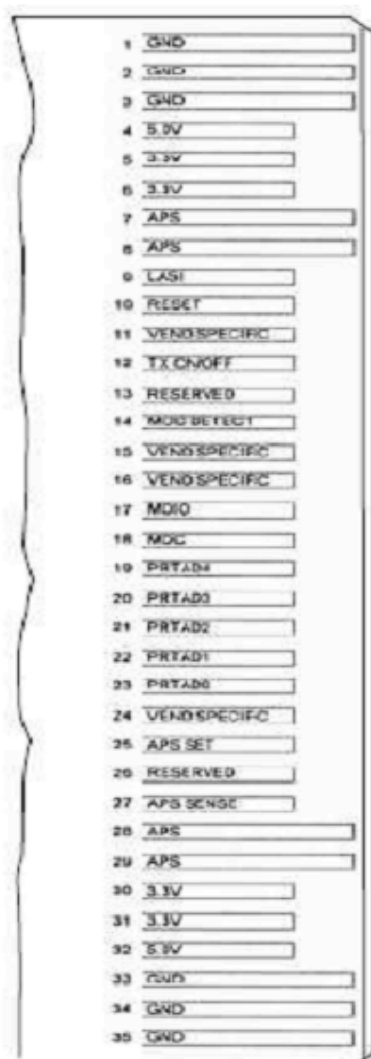
Table 1-lists the SFP+ transceiver modules that can be plugged into the Converter Module.

Product Name	Product Description
SR	850nm MM 10G SFP+
LR	1310nm SM 10G SFP+ 10KM
LRM	1310nm MM 10G SFP+ 2KM
ER	1550nm SM 10G SFP+ 40KM
ZR	1550nm SM 10G SFP+ 70KM
CWDM	CWDM SFP+ 10G
DWDM	CWDM SFP+ 10G
BIDI	SFP+ BIDI
All SFP+ Cables	SFP+ Cables, passive and active.

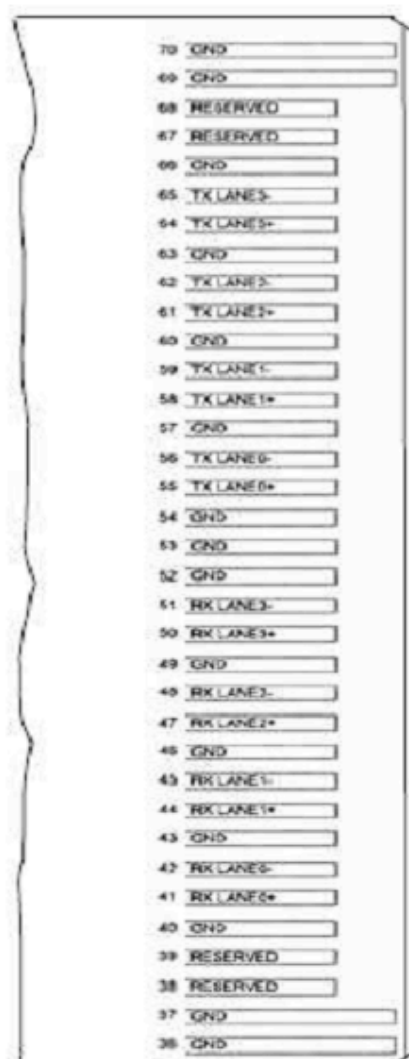
Description

The OP-X2-SFP+ a 10 Gigabit Ethernet X2 port into a 10 Gigabit Ethernet SFP+ port. With the converter module, customers have the flexibility to use the 10 Gigabit X2 interface port of a switch with X2 modules or SFP+ modules. This flexibility is critical when the specific type of interface is not available in one or the other form factor or when customers want to use the same form factor for interfaces across multiple platforms deployed in their network. It is a highly integrated, serial optical transponder module for high speed, 10Gbit/s data transmission applications. The module is fully compliant to IEEE 802.3ae standard for Ethernet, making it ideally suited for 10GbE datacom (rack to rack, client interconnection) applications. The transponder operates within a wide case temperature range of 0°C to +70°C and offers optimum heat dissipation and excellent electromagnetic shielding which enables high port densities for 10GbE systems. A 70 pin electrical connector and a duplex SC connector optical interface assure that connectivity is compliant to the X2 and XENPAK MSA.

Card-Edge-Connector-Pinning and Layout



Top view -Top side



Top view-Bottom row

Table4-Electrical Pin Definition

Symbol	Logic	PIN	Name/Description	Note
3.3V		5, 6, 30, 31	Power Supply of Optical Receiver and Transmitter and Control Circuits	2
5.0V		4, 32	Power Supply of Optical Receiver Frontend	2
APS		7, 8, 28, 29	Adaptive Power Supply, Supply of PHY XS and PCS Layer Devices	2
APS SENSE		27	APS Sense Output for APS Control Circuit	
APS SET		25	Feedback Input for APS, Input of APS Setting Resistor	
GND		1, 2, 3, 33,	Common Electrical Ground	1



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		34, 35, 36, 37, 40, 43, 46, 49, 52, 53, 54, 57, 60, 63, 66, 69, 70	
LASI	1.2V CMOS Open Drain Output	9	Link Alarm Status Interrupt, low active, Open Drain Output Supposed to operate with 10KL 22KL pull upon host. Logic High: Normal Operation Logic Low: Link Alarm is indicated
MDC		18	Management Clock Input 3
MDIO		17	Management Data 3
MOD DETECT		14	1kL to Ground for APS Circuit Environment
PRTADO	1.2V CMOS Input	23	Port Address Bit 0 (Low = 0), internally pulled up by 18kL
PRTAD1	1.2V CMOS Input	22	Port Address Bit 1 (Low = 0), internally pulled up by 18kL
PRTAD2	1.2V CMOS Input	21	Port Address Bit 2 (Low = 0), internally pulled up by 18kL
PRTAD3	1.2V CMOS Input	20	Port Address Bit 3 (Low = 0), internally pulled up by 18kL
PRTAD4	1.2V CMOS Input	19	Port Address Bit 4 (Low = 0), internally pulled up by 18kL
RESERVED		13, 38, 39, 67, 68	Reserved by MSA, internally not connected
RESERVED		26	Reserved for Avalanche Photodiode use, internally not connected 5
RESET	1.2V CMOS Input	10	Low active Reset Input 10KL pull up on Transceiver Logic high = Normal Operation Logic Low = Reset asserted
TX ON/OFF	1.2V CMOS Input	12	High active Transmitter Enable Input 10KL pull up on Transceiver Logic high = Transmitter active (normal Operation) And Register Bit 1.9.0 set to low as well Logic Low = shut down of Transmitter
VENDSPECIFIC		11, 15, 16, 24	Vendor Specific Pin,. for proper operation 5

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leave unconnected			
RX LANE0+	41	Module XAUI Output Lane 0+	4
RX LANE0	42	Module XAUI Output Lane 0	4
RX LANE1+	44	Module XAUI Output Lane 1+	4
RX LANE1-	45	Module XAUI Output Lane 1-	4
RX LANE2+	47	Module XAUI Output Lane 2+	4
RX LANE2-	48	Module XAUI Output Lane 2	4
RX LANE3+	50	Module XAUI Output Lane 3+	4
RX LANE3-	51	Module XAUI Output Lane 3	4
TX LANE0+	55	Module XAUI Input Lane 0+	4
TX LANE0-	56	Module XAUI Input Lane 0	4
TX LANE1+	58	Module XAUI Input Lane 1+	4
TX LANE1-	59	Module XAUI Input Lane 1	4
TX LANE2+	61	Module XAUI Input Lane 2+	4
TX LANE2-	62	Module XAUI Input Lane 2	4
TX LANE3+	64	Module XAUI Input Lane 3+	4
TX LANE3-	65	Module XAUI Input Lane 3	4

- 1) Ground connections are common for TX and RX.
- 2) Each connector contact is rated at 0.5A.
- 3) MDIO and MDC timing must comply with IEEE 802.3ae clause 45.3.
- 4) XAUI output characteristics comply with IEEE 802.3ae clause 47.
- 5) Transceivers will be MSA compliant when no signals are present on the vendor specific pins.

Thermal Management

The transponder is designed for an operation within a case temperature range between 0 to +70°C at an altitude of < 3km. The built in heatsink provides an optimized thermal performance. The user needs to guarantee per system design not to exceed this temperature range. It has to be considered that in case of usage of multiple modules on a single hostboard that there is a temperature rise among the modules hosted side by side. Airflow direction and air speed needs to be chosen accordingly. For further information it is referred to the MSA document.

Ordering information

Part Number	Product Description
OP-X2-SFP+	10G X2 to SFP+ Converter Module