

QSFP+ 40G MPO MMF 850nm 150m Transceiver

AQOMNN85ADLN0688



Features

- ❑ QSFP MPO Type Transceiver
- ❑ 850nm VCSEL Laser
- ❑ 40Gb/s aggregated bidirectional data throughput
- ❑ Supports 40 Gbps data rate links of up to 150-m via OM3 MMF.
- ❑ 3.3V single power supply
- ❑ Power Level 1: Max power consumption < 1.5 W
- ❑ Hot pluggable electrical interface
- ❑ Standard 12/8 lane optical fiber with MPO optical connector
- ❑ Infiniband 4x QDR / 40G Base-SR4
- ❑ Serial ID information support
- ❑ Compliant with 40G Ethernet IEEE 802.3ba 40GBASE-SR4 standards
- ❑ Compliant with QSFP+ MSA SFF-8436
- ❑ Compliant with RoHS
- ❑ Compliant with UL & TUV
- ❑ Downward compatible to 10G

Applications

- ❑ 40Gb/s Ethernet 40GBASE- SR4
- ❑ Compliant with QDR/DDR Infiniband data rates
- ❑ Proprietary multi- channel links



Ordering Information

Form Factor	Date Rate	Media	Distance	Wavelength (nm)	Voltage (V)	Coupling	DDM (Y/N)	Temperature (°C)	Part Number
QSFP+ MPO	40G	MMF	150M	850	3.3	AC/AC	Y	0 ~ +70	AQOMNN85ADLN0688


QSFP+ 40G MPO MMF 850nm 150m Transceiver
AQOMNN85ADLN0688
Absolute Maximum Ratings

Parameter	Symbol	Conditions	Min	Max	Unit
Storage Temperature	T_S	--	-40	+85	°C
Power Case Temperature	T_C	--	0	70	°C
Storage Relative Humidity	RH	Non condensing	5	85	%
Supply Voltage	$V_{CC_I} / V_{CC_{Tx}} / V_{CC_{Rx}}$	--	-0.5	3.6	V

Electrical Characteristics ($T_c = 0$ to 70 °C, $V_{CC} = 3.135$ to 3.46 5Volts)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	$V_{CC_I} / V_{CC_{Tx}} / V_{CC_{Rx}}$	--	3.13	3.3	3.47	V
Supply Current	I_{CC}	--	--	--	420	mA
Transmitter (per Lane)						
Differential data input swing	$V_{in,pp}$	(Note 1)	200	--	1200	mVpp
LOS Assert Threshold	$V_{in,pp}$ LOS	(Note 2)	120	--	--	mVpp
Receiver (per Lane)						
Differential data output swing	$V_{out,pp}$	(Note 3)	340	--	650	mVpp

1. AC coupled internally.
2. Tx Data Input Differential Peak-to-Peak Voltage Swing
3. AC coupled with 100ohm differential output impedance.

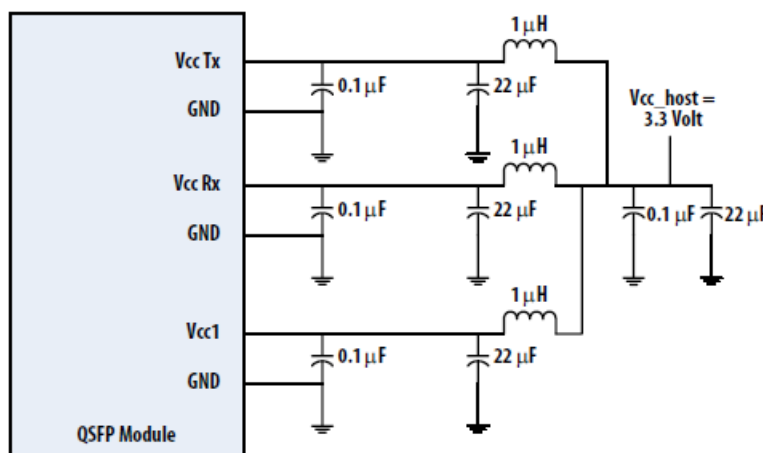
Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Transmitter Optical Characteristics						
Center Wavelength	λ	840		860	nm	
Spectral Width – RMS	$\Delta\lambda$			0.65	nm	
Output Optical Power: Average	PO_AVE	-7.6		-1	dBm	
Output Optical Modulation Amplitude, per lane		-4.3			dBm	
Extinction Ratio	ER	3			dB	
Output Optical Power: Disabled	PO_OFF			-30	dBm	
Eye Mask		Compliant with IEEE 802.3ba D3.2				
Receiver Optical Characteristics						
Center wavelength, each lane	λ	840	850	860	nm	
Damage Threshold		3.4			dBm	
Maximum Average power at receiver input, each lane				2.4	dBm	
Receiver Reflectance				-12	dB	
Stressed receiver sensitivity (OMA)				-5.4	dBm	1
Non-Stressed receiver sensitivity				-9.5	dBm	
LOS Assert	LOS Assert	-19			dB	
LOS De-Assert				-11	dB	
LOS Hysteresis		0.5			dB	

Notes:

1. Measured with 10.3125-Gbps of PRBS-31 at 10-12 BER.

Recommended Host Board Power Supply Circuit Filter

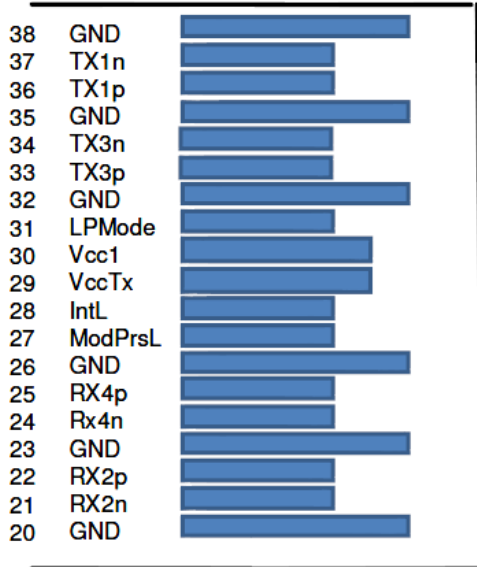




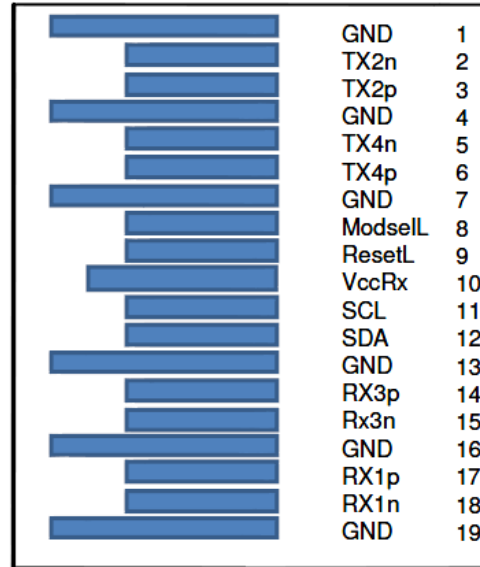
QSFP+ 40G MPO MMF 850nm 150m Transceiver

AQOMNN85ADLN0688

Pin Description



Module Card Edge



Top Side
Viewed From Top

Bottom Side
Viewed From Bottom

Pin Function Definitions

Pin	Logic	Symbol	Description	Plug Sequence	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3	
7		GND	Ground	1	1
8	LVTTL-I	ModSelL	Module Select	3	
9	LVTTL-I	ResetL	Module Reset	3	
10		Vcc Rx	+3.3V Power Supply Receiver	2	2
11	LVC MOS-I/O	SCL	2-wire serial interface clock	3	
12	LVC MOS-I/O	SDA	2-wire serial interface data	3	
13		GND	Ground	1	2
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	

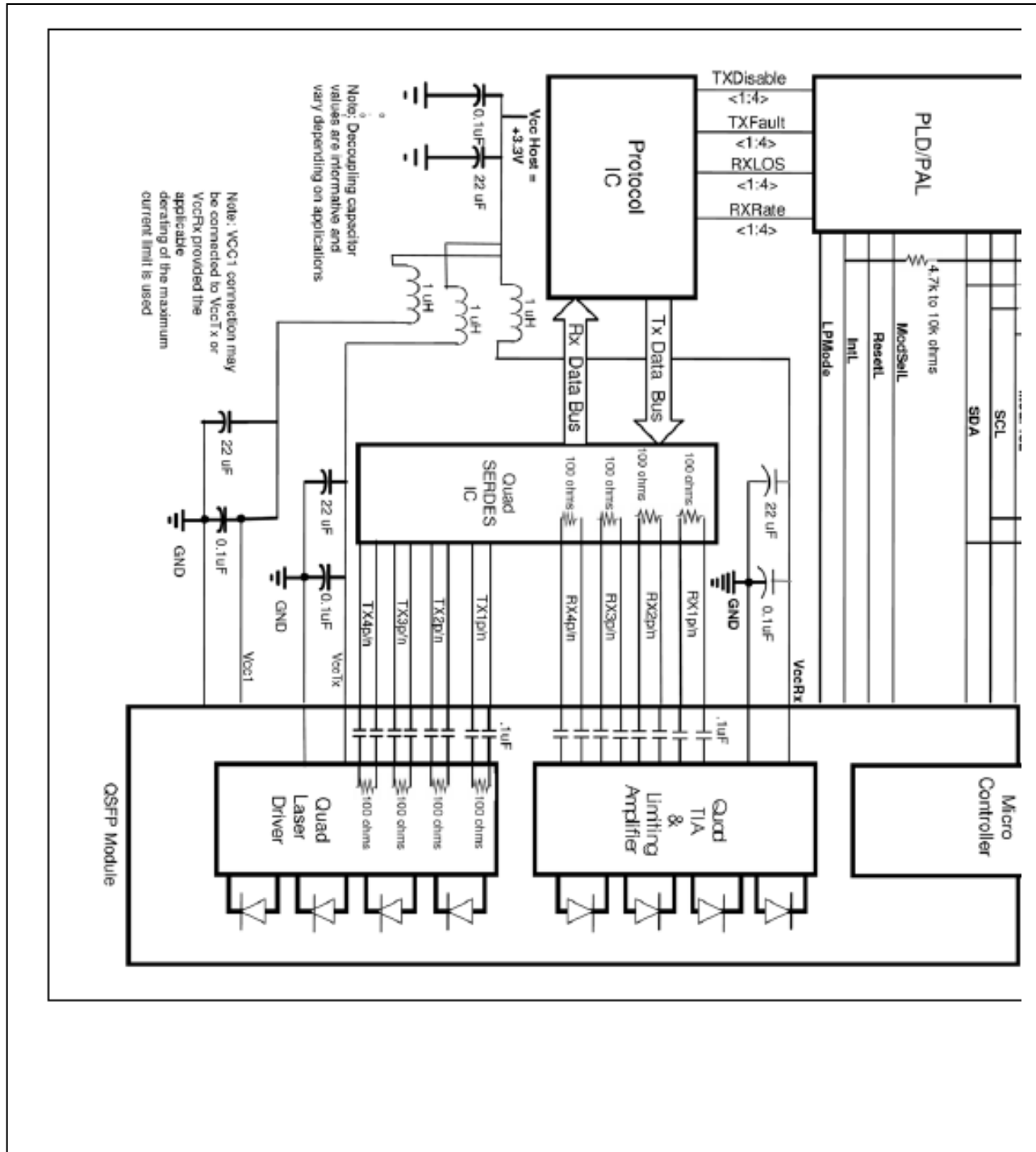
**QSFP+ 40G MPO MMF 850nm 150m Transceiver****AQOMNN85ADLN0688**

Pin	Logic	Symbol	Description	Plug Sequence	Notes
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		Vcc Tx	+3.3V Power supply transmitter	2	2
30		Vcc1	+3.3V Power supply	2	2
31	LVTTL-I	LPMode	Low Power Mode	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Input	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Input	3	
38		GND	Ground	1	1

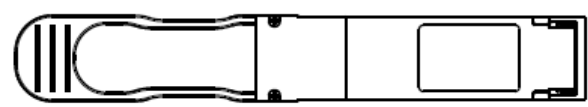
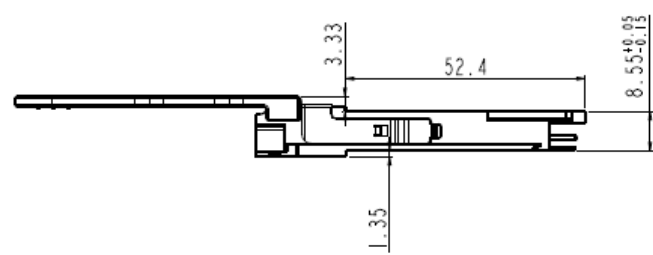
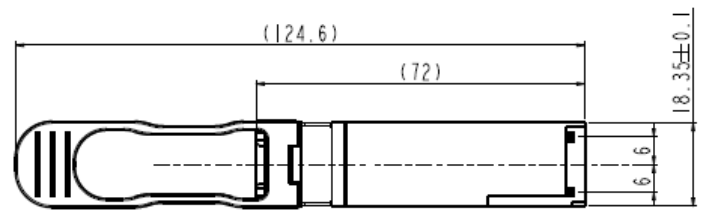
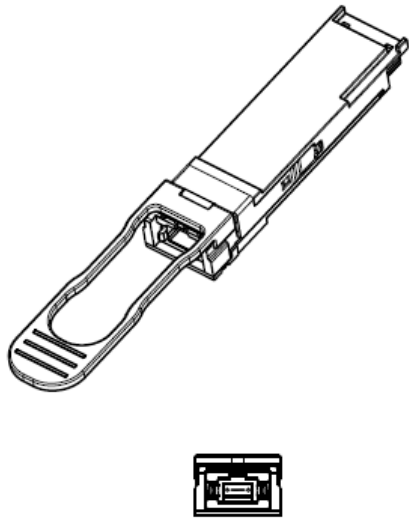
Note

1. GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in Table 6. Recommended host board power supply filtering is shown in Figure 4. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP+ module in any combination. The connector pins are each rated for a maximum current of 500 mA.

Recommended Interface Circuit



Mechanical Diagram

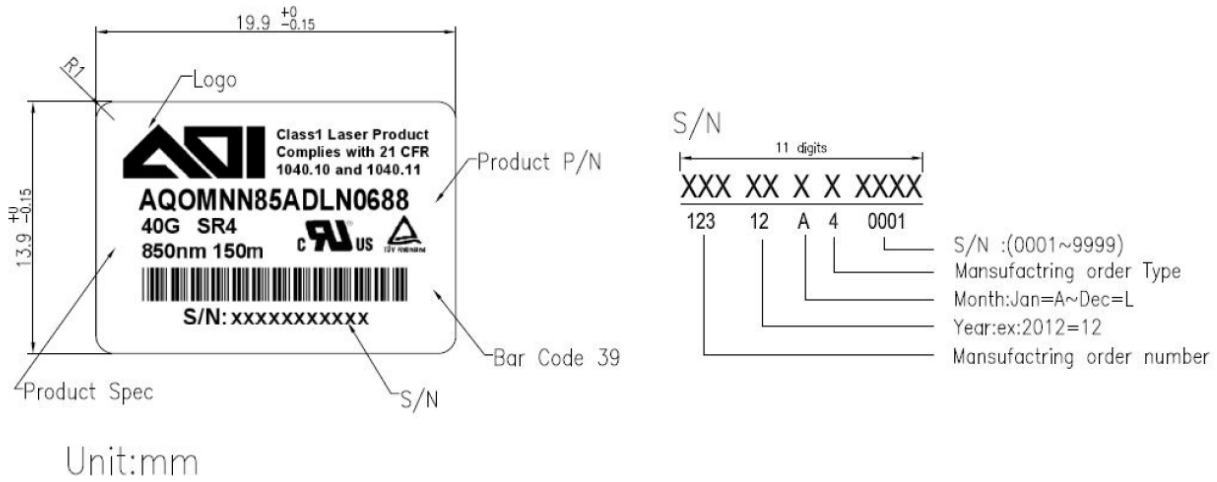


UNIT: mm
TOLERANCE: ±0.2

QSFP+ 40G MPO MMF 850nm 150m Transceiver

AQOMNN85ADLN0688

Module Label Diagram





EEPROM Memory A0h contents Address

	AOI	AQOMNN85ADLN0688	E130	150
Add	Name of field	Description	ACSII	HEX
128	Identifier	0D:QSFP+		0D
129	Ext. Identifier	QSFP Transceiver ,00: Power Max 1.5W		00
130	Connector	0C:MPO		0C
131	Transceiver	10G/40G Ethernet 04: 40G BASE-SR4		04
132		SONET Compliance codes		00
133		SAS/SATA compliance codes		00
134		Gigabit Ethernet compliance codes		00
135		Fiber Channel Compliant codes		00
136		Fiber Channel link length		00
137		Fiber Channel transmission media		00
138		Fiber Channel Speed		00
139	Encoding	05: 64B/66B,		05
140	BR, Nominal	100Mbps/unit -> HEX 67: 10.3125G / each channel		67
141	Ext. RateSelect	bit7-1:0 reserved bit0:0 no QSFP+ Rate Select (see Table 35)		00
142	Length(9um, SMF)	1km /unit -> HEX		00
143	Length (50um, OM3)	2m /unit -> HEX 4B:150m		4B
144	Length (50um, OM2)	1m /unit -> HEX		00
145	Length (62.5um, OM1)	1m /unit -> HEX		00
146	Length (Copper)	1m /unit -> HEX		00
147	Device Tech	Device technology (see Table 36,37)		00
148	Vendor name	QSFP Vendor Name (ASCII)	A	41
149			O	4F
150			I	49
151				20
152				20
153				20
154				20
155				20
156				20
157				20
158				20
159				20



QSFP+ 40G MPO MMF 850nm 150m Transceiver

AQOMNN85ADLN0688

160				20
161				20
162				20
163				20
164	Ext. Transceiver	Ext. Transceiver (see Table 38) 06:QDR / DDR		06
165	Vendor OUI	SFP Vendor IEEE company ID, No ID set "00"		00
166				00
167				00
168	Vendor PN	SFP Vendor Part Number (ASCII)	A	41
169			Q	51
170			O	4F
171			M	4D
172			N	4E
173			N	4E
174			8	38
175			5	35
176			A	41
177			D	44
178			L	4C
179			N	4E
180			0	30
181			6	36
182			8	38
183			8	38
184	Vendor rev	Vendor revision (ASCII)	A	41
185				20
186	Wavelength	Nominal laser wavelength (Wavelength = value / 20 in nm) 4268:850nm		42
187				68
188	Wavelength Tolerance	Guaranteed range of laser wavelength (+/- value) from Nominal wavelength. (Wavelength Tol. = value/200 in nm) 07D0:10nm		07
189				D0
190	Max Case Temp	Maximum Case Temperature 46:70°C		46
191	CC_BASE	Check Sum (128-190)		A7
192	Options (see Table 39)	Reserved		00
193		Reserved bit0:0 no RX Output amplitude programming		00



QSFP+ 40G MPO MMF 850nm 150m Transceiver

AQOMNN85ADLN0688

194		bit7-4:0 reserved bit3:0 no Rx Squelch Disable implemented bit2:0 no Rx Output Disable implemented bit1:0 no Tx Squelch Disable implemented bit0:0 no Tx Squelch implemented		00
195		bit7:1 memory page02 bit6:0 no memory page01 bit5:0 no RATE_SELECT bit4:1 TX_DISABLE bit3:1 TX_FAULT bit2:0 no TX Squelch bit1:0 no TX Loss bit0:0 reserved		98
196	Vendor SN	Vendor SN (ASCII)		XX
197				XX
198				XX
199				XX
200				XX
201				XX
202				XX
203				XX
204				XX
205				XX
206				XX
207				XX
208				XX
209				XX
210		XX		
211		XX		
212	Date code	Year (ASCII)		XX
213				XX
214		Month (ASCII)		XX
215				XX
216		Day (ASCII)		XX
217				XX
218		Blank		20
219			20	
220	Diagnostic Monitoring Type	bit3:1 = Average power / 0 = OMA others:0 reserve (see Table 41)		08



QSFP+ 40G MPO MMF 850nm 150m Transceiver

AQOMNN85ADLN0688

221	Enhanced Options	bit7-4:0 reserved bit3:0 no Rate Select bit2:0 no Application select bit1-0:0 reserved (see Table 42)		00
222	Reserved	Reserved		00
223	CC_EXT	Check Sum 64 to 94 byte		XX
224	Read-only	Read-only		00
225				00
226				00
227				00
228				00
229				00
230				00
231				00
232				00
233				00
234				00
235				00
236				00
237				00
238				00
239				00
240				00
241				00
242				00
243				00
244				00
245				00
246				00
247				00
248		00		
249		00		
250		00		
251		00		
252		00		
253		00		
254	FW Version	01 00 = V1.00		01
255				00

Regulatory Compliance

Item	Standard
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B
Electrostatic Discharge to the Electrical Pins (ESD)	MIL-STD-883E Method 3015.7
Electrostatic Discharge to the Receptacle (ESD)	IEC 61000-4-2
RoHS	2011/65/EU
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11
Component Recognition	UL and TUV

Laser Safety Information

All versions of this laser are Class 1 laser products per IEC1/EN2 60825-1. Users should observe safety precautions such as those recommended by ANSI³ Z136.1, ANSI Z36.2 and IEC 60825-1.

This product conforms to FDA (CDRH) 21 CFR 1040.10 and 1040.11 except for deviations of laser safety class designation pursuant to ['Laser Notice No.50'](#)

Product labeling:

Class 1 Laser Product
Compliance with 21 CFR
1040.10 and 1040.11

If labeling is not affixed to the module due to size constraints; then rather, labeling is placed on the outside of the shipping box.

This product is not shipped with a power supply.

Caution: use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Certifications

UL	60950-1 (E243407)
TUV	EN60950-1, EN 60825-1, EN 60825-2

Documentation is available upon request.

(1) IEC is a registered trademark of the International Electrotechnical Commission

(2) Within Europe the IEC standard has been adopted as a European Normative standard known as EN 60825, and each European country will have its own version of this standard, for example, the British Standards version known as BS EN 60825. There can be small differences between the different countries versions of EN 60825, and these are in part caused by the process of translating the standard into the native language of that country.

(3) ANSI is a registered trademark of the American National Standards Institute

Note : All information contained in this document is subject to change without notice.