Specification

Small Form Factor Pluggable

Transceiver (MSA)

LC Receptacle – SFP+

12 Gigabit SDI 1T/1R



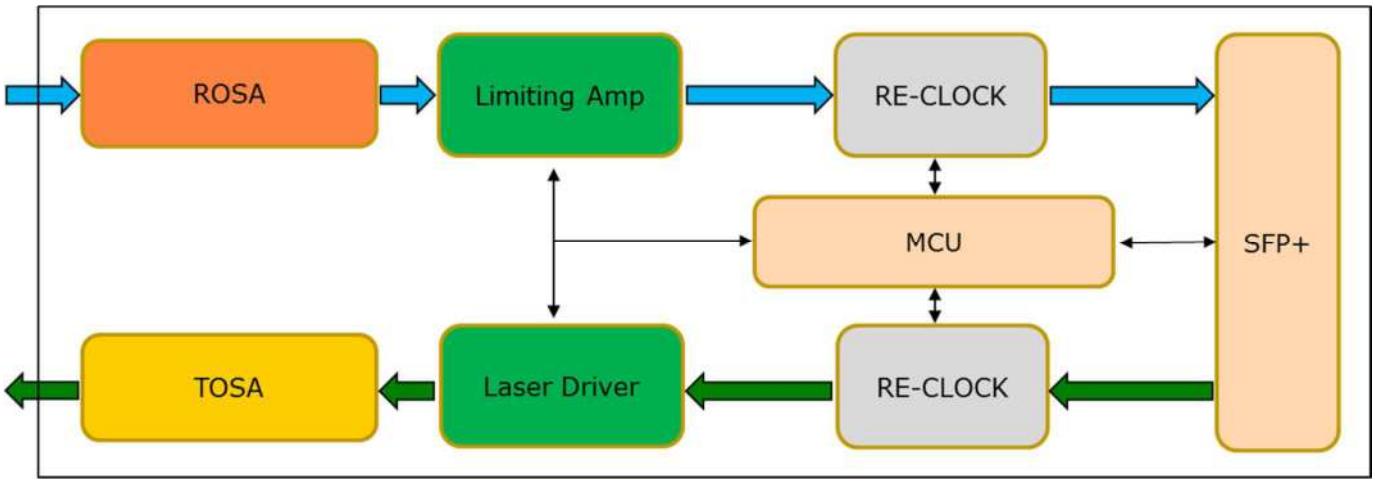
T I M – A 1 E B 1 – F 1 1

Model Name	Voltage	Category	Device type	Interface	Temperature	Distance	Latch Color
TIM-A1EB1-F11	3.3V	With DDMI	1310 nm DFB	AC -AC / TTL	0°C ~ 70°C	10km	Blue

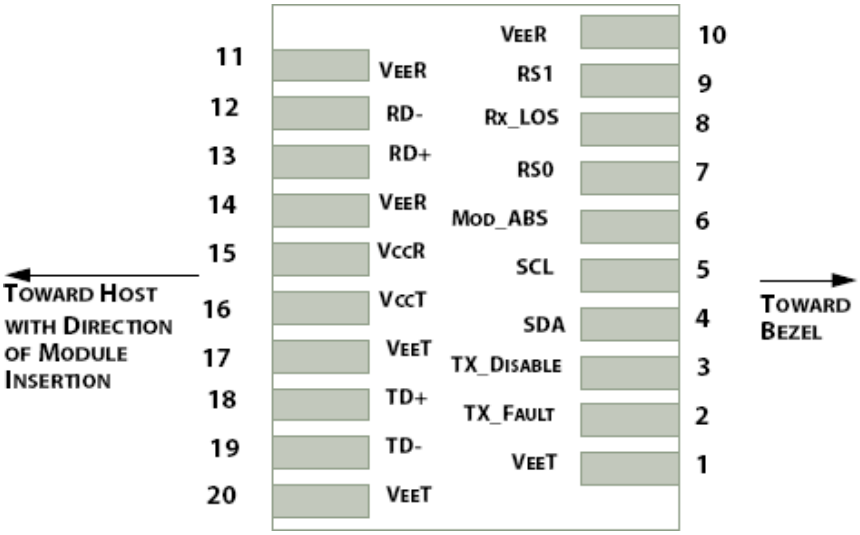
Features

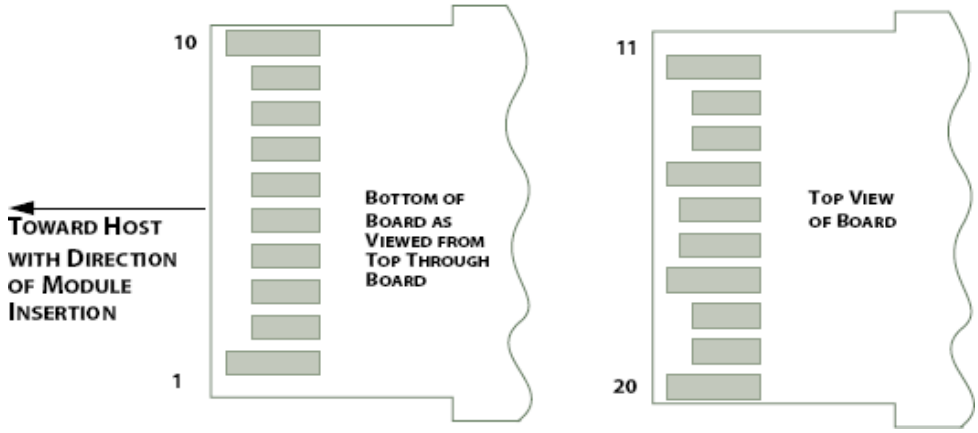
- Compliant with SFP+ MSA
- Data Rate up to 12 Gbps
- Re-Clock built-in
- SMPTE ST-2082, ST2081, 424M, 292M, 259M compliant
- Support video pathological patterns for 12G-SDI, 6G-SDI, 3G-SDI and HD-SDI, SD-SDI
- Applicable for 10 km SMF connection
- LC receptacle
- Hot Pluggable
- All-metal housing for superior EMI shielding performance
- SFF-8472 built in digital diagnostic Functions
- Operating case temperature range: Commercial Temperature 0°C~ 70°C
- Uncompressed video transmission over 10km distance

Transceiver Block Diagram



Pin Definition and Descriptions





PIN	Logic	Symbol	Name / Description	Note
1		VeeT	Module Transmitter Ground	1
2	LVTTL-O	TX_Fault	Module Transmitter Fault	2
3	LVTTL-I	TX_Dis	Transmitter Disable; Turns off transmitter laser output	3
4	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	
5	LVTTL-I	SCL	2-Wire Serial Interface Clock	
6		Mod_ABS	Module Absent, connected to VeeT or VeeR in the module	
7	LVTTL-I	RS0	Rate Select 0, optionally controls SFP+ module receiver. When high input signaling rate> 4.25 GBd and when low input signal rate≦ 4.25 GBd.	
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication	
9	LVTTL-I	RS1	Rate Select 1, optionally controls SFP+ module transmitter. When high input signaling rate> 4.25 GBd and when low input signal rate≦ 4.25 GBd.	
10		VeeR	Module Receiver Ground	1
11		VeeR	Module Receiver Ground	1
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Data Output	
14		VeeR	Module Receiver Ground	1
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Transmitter 3.3 V Supply	
17		VeeT	Module Transmitter Ground	1
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	1

Note:

1. **Module ground pins are isolated from the module case and chassis ground within the module.**
2. **Shall be pulled up with 4.7k to 10k ohm to Vcc Host in the host board.**
3. **Shall be pulled up with 4.7k to 10k ohm to VccT in the module.**

Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	V_{CC}	0	3.6	V
Storage Temperature	Ts	-40	85	℃
Relative Humidity	RH	5	95	%
Optical Receiver Power (Damage)	Pmax		1.5	dBm

Recommended Operating Environment

Parameters	Symbol	Min.	Typical	Max	Unit
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Operating Case Temperature	T_{op}	0		70	℃
Power Supply Current	Icc			600	mA
Power Consumption				2	W
Data rate			11.88		Gbps

Optical Characteristics

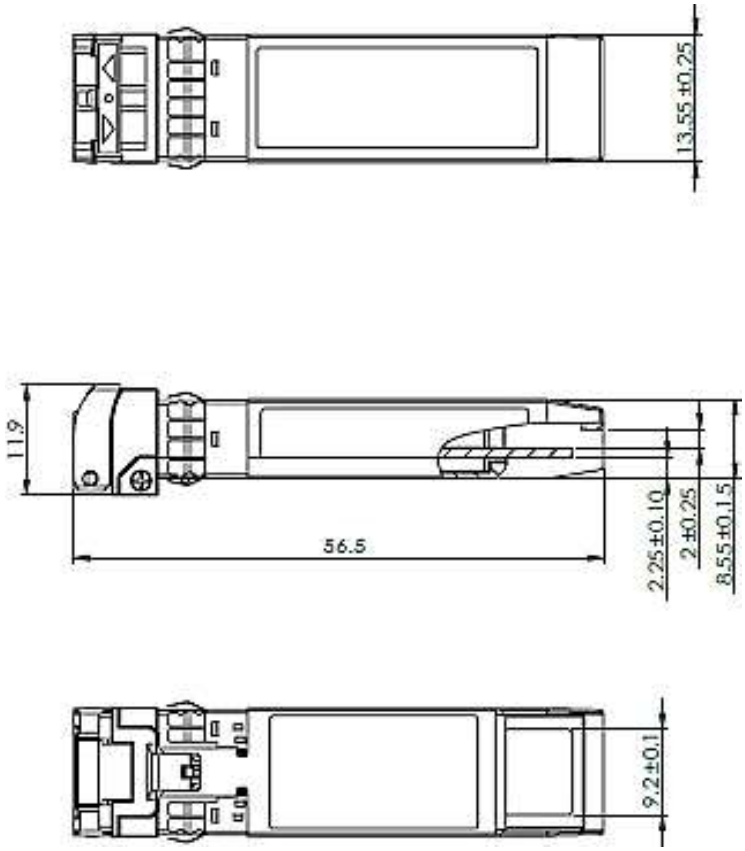
Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
Average Launch Power	Po	-5.0		1.0	dBm	
Center wavelength	λ	1300	1310	1320	nm	
Spectrum Width	σλ			1.0	nm	@-20dB
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction ratio	ER	3.5			dB	
Relative Intensity Noise	RIN		-130		dB/Hz	
Average launch power of OFF transmitted	Poff			-30	dBm	
Receiver						
Sensitivity@11.88Gbps				-11.0	dBm	1
Sensitivity@6Gbps				-12.0	dBm	1
Sensitivity@2.97Gbps				-12.0	dBm	1
Sensitivity@1.485Gbps				-12.0	dBm	1

Note-1: Measured with pathological pattern; BER < 10^{-12}

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
High-Speed Signal Interface Specification						
Input Data Rate			11.88		Gbps	
Differential Input Impedance	RIN		100		Ω	
Output Data Rate			11.88		Gbps	
Differential Output Impedance	Rout		100		Ω	

Mechanical (mm) : ± 0.5mm



ESD

Normal ESD precautions are required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

LASER Safety

This is a Class 1 Laser Product according to IEC/EN60825-1:2014 (Third Edition). This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

Contact Information

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Revision History

Date	Version	Description
07/17/2018	1.0	Initial release.
01/22/2019	2.0	1. Cover page update. 2. Electrical Characteristics update.
02/25/2019	2.1	1. Footer style change. 2. Contact information has been added on the last page.