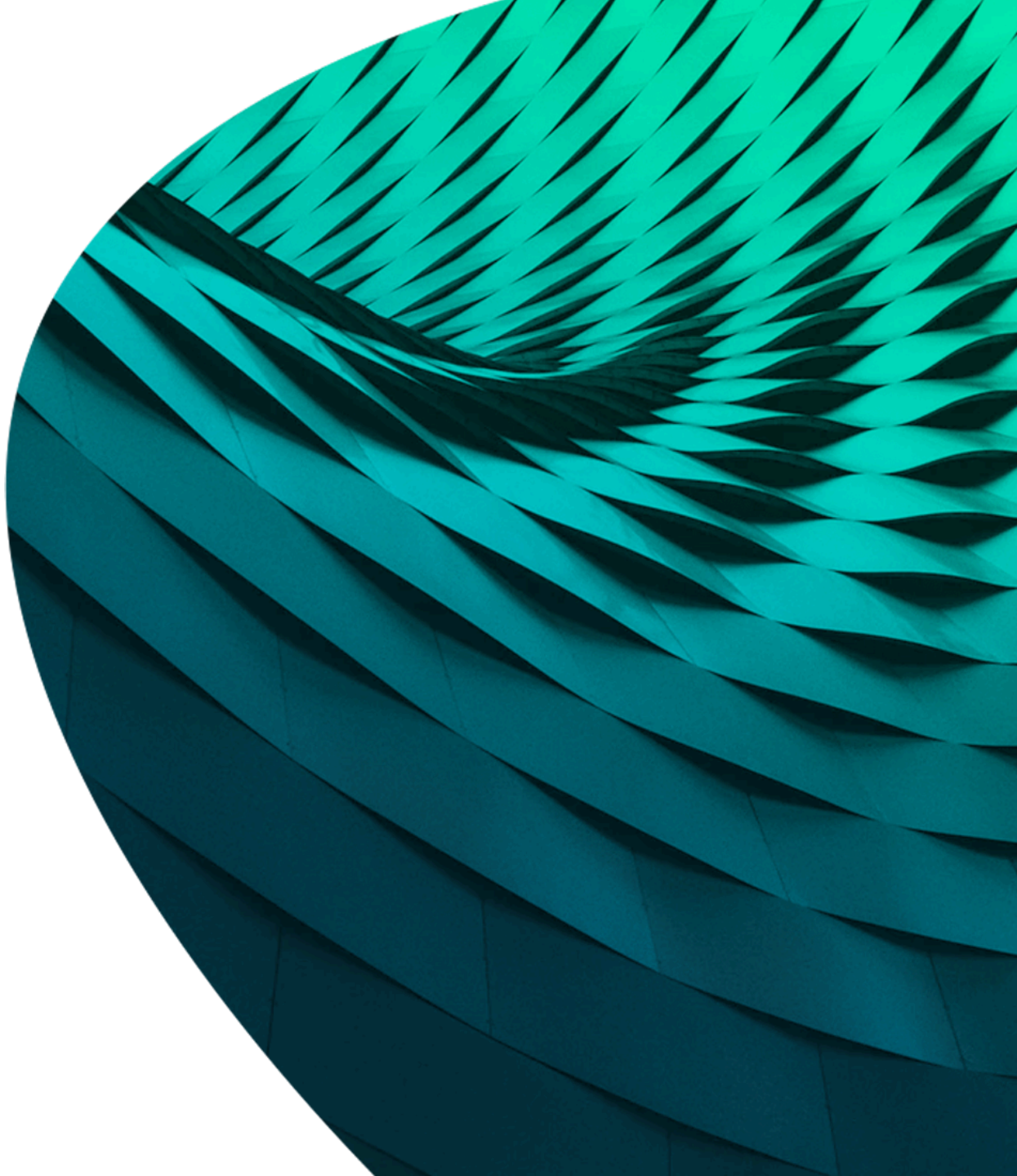
pureoptics

Datasheet

SFP+-10G-ER-XXXX-PO (CWDM)



01

Product features

- Hot pluggable
- 10Gb/s serial optical interface
- Wavelength selectable to ITU-T standards covering CWDM grid wavelengths
- Up to 40km on 9/125um SMF
- SFP+ MSA package with Duplex LC Connector
- 2-wire interface for management and diagnostic monitor
- SFI High Speed Electrical Interface
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Power consumption less than 1.5W
- Operating case temperature: -5~+70˚C

02

Applications

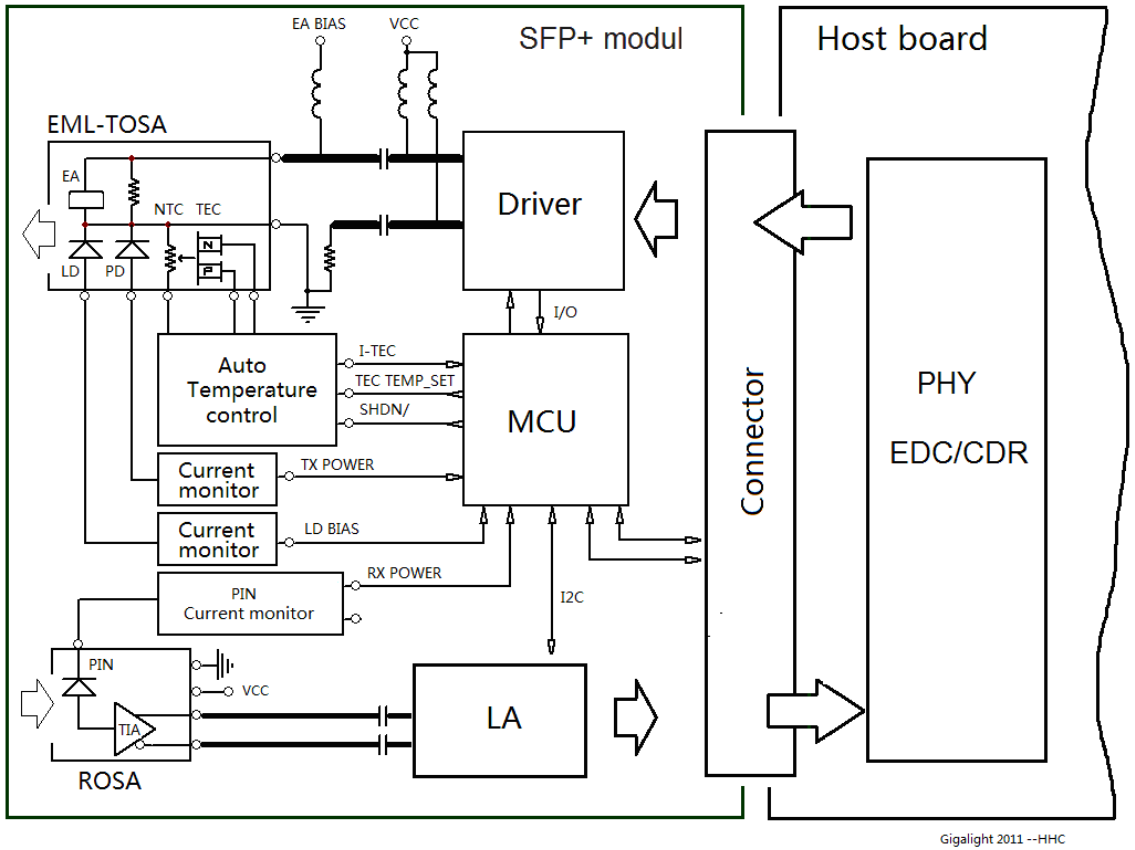
- 10G Base-ER/EW
- 10G Fiber Channel
- CWDM Networks
- Other optical links

03

Description

SFP+-10G-ER-XXXX-PO Transceiver is a “Limiting module”, designed for 10GBASE-ER, and 2G/4G/ 8G/10G Fiber- Channel applications.

The transceiver consists of two sections: The transmitter section incorporates a colded EML laser. And the receiver section consists of a PIN photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.



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Absolute Maximum Ratings

The operation in excess of any absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	TS	-40	85	degC	
Operating Case Temperature	TOP	0	70	degC	
Power Supply Voltage	VCC	0.5	3.8	V	
Relative Humidity (non-condensation)	RH	0	85	%	
Supply Current	ICC		450	mA	
Power Dissipation	PD		1.5	W	

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Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Transmitter						
Data Rate	Mra	-	10.3	11.3	Gbps	
Input differential impedance	Rim	-	100	-	Ω	
Differential data Input	VtxDIFF	120	-	850	mV	
Transmit Disable Voltage	VD	2.0	-	Vcc3+0.3	V	
Transmit Enable Voltage	Ven	0	-	+0.8	V	
Transmit Disable Assert Time	Vn	-	-	100	us	
Receiver						
Data Rate	Mra	-	10.3	11.3	Gbps	
Differential Output Swing	Vout P-P	350	-	850	mV	
Rise/Fall Time	Tr / Tf	24	-	-	ps	
Loss of Signal –Asserted	VOH	2	-	Vcc3+0.3-	V	
Loss of Signal –Negated	VOL	0	-	+0.4	V	

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Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Date Rate			10.3125		Gb/s	
Optical Wavelength	λc	λc-6.5	λc	λc+6.5	nm	
Average output power	Po	-2		+4	dBm	
Optical Extinction Ratio	ER	8.2			dB	
RMS spectral width	Δλ			0.3	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	
Optical Return Loss Tolerance	Orl	-	-	21	dB	

Parameter	Symbol	Min	Typical	Max	Unit	Ref.
Receiver						
Input Operating Wavelength	λ	1260	-	1620	nm	
Average receive power	Pavg	-16	-	0.5	dBm	
Receiver sensitivity in 10.3Gbps(OMA)	Rsen1	-	-	-16	dBm	
Reflectance	Rrx	-	-	-27	dB	
LOS Asserted	Lsa	-25	-	-	dBm	
LOS De-Asserted	Lda	-	-	-18	dBm	
LOS Hysteresis	Lh	0.5	-	-	dB	

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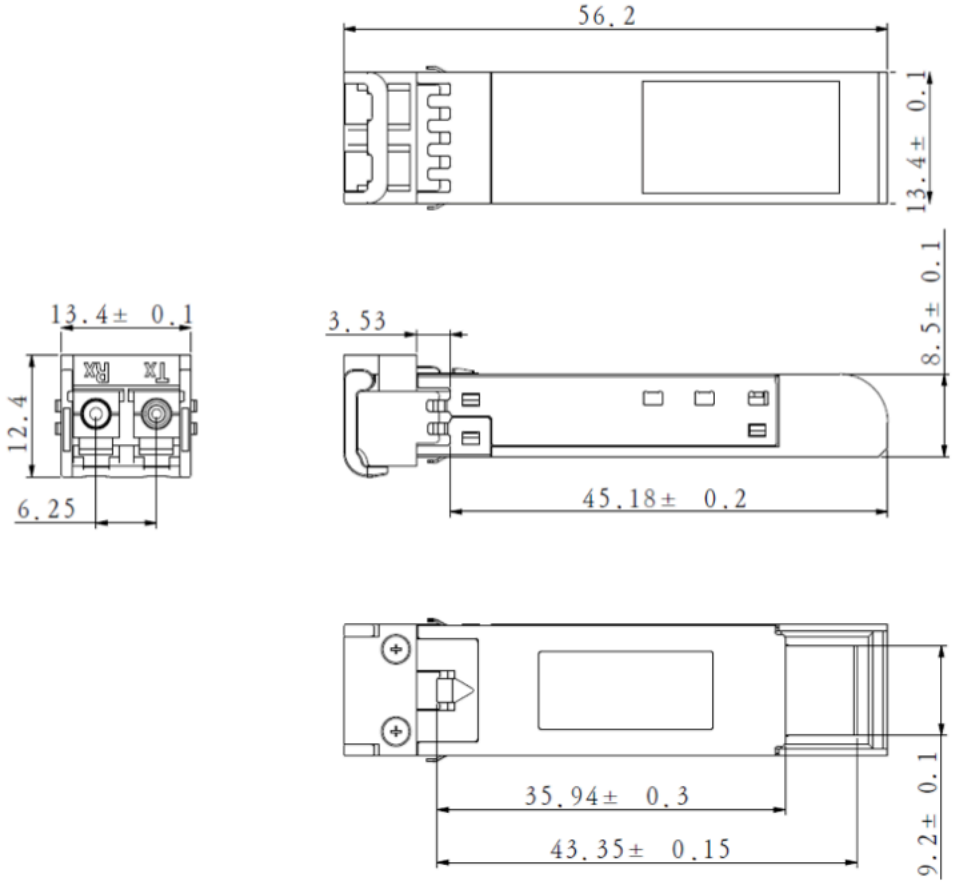
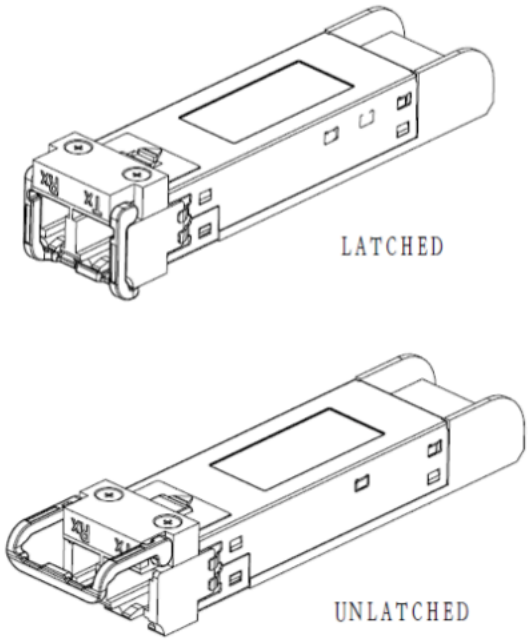
Mechanical Dimension





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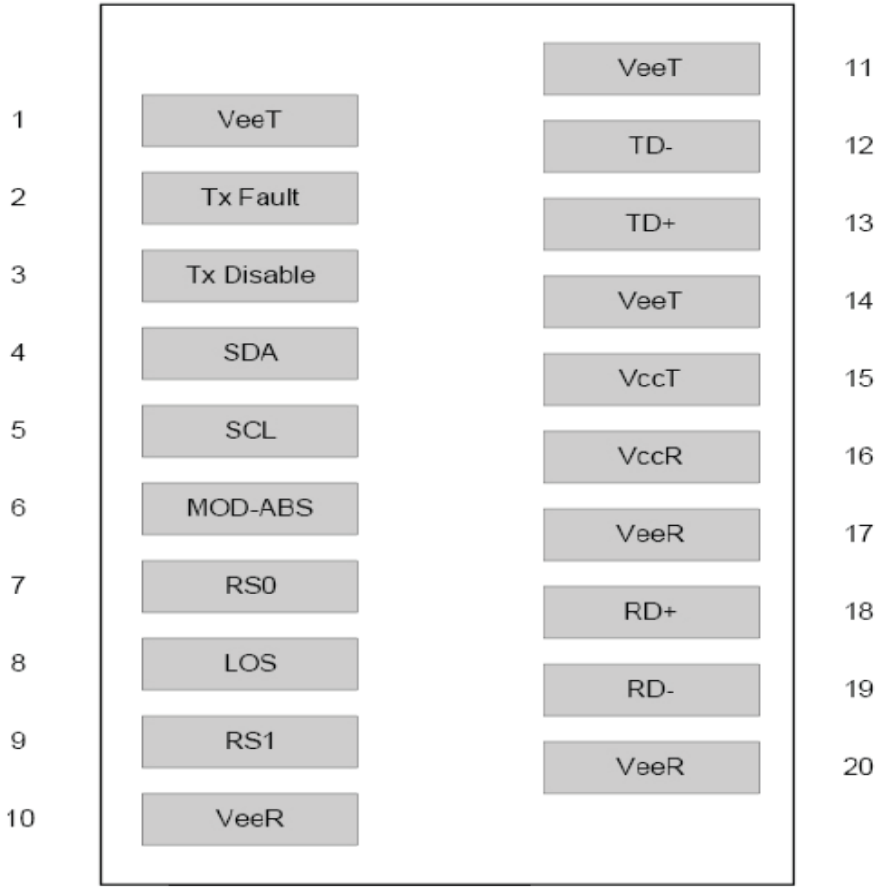
Pin Assignment and Description



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PIN Assignment

PIN #	Symbol	Description	Notes
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TFAULT	Transmitter Fault.	2
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	3
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	4
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	4
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	4
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	5
9	VEER	Receiver Ground (Common with Transmitter Ground)	1
10	VEER	Receiver Ground (Common with Transmitter Ground)	1
11	VEER	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	

PIN #	Symbol	Description	Notes
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VEER	Receiver Ground (Common with Transmitter Ground)	1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	1

NOTES

1. Circuit ground is internally isolated from chassis ground.
2. TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
4. Should be pulled up with 4.7k - 10 kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.
5. LOS is open collector output. Should be pulled up with 4.7k – 10 kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

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Ordering Informations

Part No.	Wavelength (nm)	Latch color	Channel
SFP+-10G-ER-1470-PO	1470nm	Grey	Channel 47
SFP+-10G-ER-1490-PO	1490nm	Violet	Channel 49
SFP+-10G-ER-1510-PO	1510nm	Blue	Channel 51
SFP+-10G-ER-1530-PO	1530nm	Green	Channel 53
SFP+-10G-ER-1550-PO	1550nm	Yellow	Channel 55
SFP+-10G-ER-1570-PO	1570nm	Orange	Channel 57
SFP+-10G-ER-1590-PO	1590nm	Red	Channel 59
SFP+-10G-ER-1610-PO	1610nm	Brown	Channel 61

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