



SFP-SM10-20

10 Gbps SFP+ Optical Transceiver, 20 km

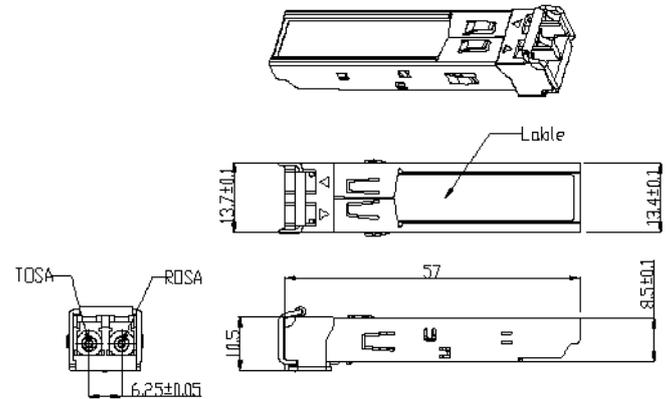
Applications:

- 10GBASE- LR at 10.3125 Gbps
- 10GBASE- LW at 9.953 Gbps
- Other optical links



Features

- Optical interface compliant to IEEE 802.3 ae 10GBASE-LR
- Hot Pluggable
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- Electrical interface compliant to SFF-8431
- 1310 nm DFB transmitter, PIN photo-detector
- Low power consumption
- Applicable for 10km/20km SMF connection
- All-metal housing for superior EMI performance
- Advanced firmware allow customer systemer encryption information to be stored in transceiver
- Operating case temperature: 0 to 70°C



Description

This 1310 nm DFB 10G SFP+ transceiver is designed to transmit and receive optical data ovr single mode optical fiber for link length 10km/20km.

The SFP+ LR module electrical interface is compliant to SFI electrical specifications. The transmitter input and receiver output impedance is 100 Ohms differential to common mode conversion for quality signal termination and low EMI. SFI typically operates over 200 mm of improved FR4 material or up to about 150mm of standard FR4 with one connector.

Pin Definition

The SFP+ modules are hot-pluggable. Hot pluggable refers to plugging in or unplugging a module while the host board is powered. The SFP+ host connector is a 0.8 m pitch 20 position right angle improved connector specified by SFF-8083, or stacked connector with equivalent electrical performance.

Pin	Symbol	Name/Description
1	VEET (1)	Transmitter Ground
2	Tx_FAULT (2)	Transmitter Fault
3	Tx_DIS (3)	Transmitter Disable. Laser output disabled on high or open
4	SDA (2)	2-wire Serial Interface Data Line
5	SCL (2)	2-wire Serial Interface Clock Line
6	MOD_ABS (4)	Module Adsent. Grounded within the module
7	RS0 (5)	RS0 for Rate Select: Open or Low = Module supports ≤4.25Gbps High = Module supports 9.95 Gb/s to 10.3125 Gb/s
8	RX_LOS (2)	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 (5)	No connection required
10	VEER (1)	Receiver Ground
11	VEER (1)	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER (1)	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET (1)	Transmitter Ground
18	TD+	Transmitter DATA inc. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET (1)	Transmitter Ground

Absolute Maximum Rating:

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	Vcc	0	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Operating Case Temperature	Tc	0	+70	°C
Relative Humidity	RH	5	95	%
RX Input Average Power	Pmax	-	0	dBm

Recommended Operating Environment:

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

Parameters	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	Vcc	3.135	3.300	3.465	V
Operating Case Temperature	Tc	0	25	70	°C

Optical Characteristics:

	Unit	Value (Hex)
Operating Reach	m	10K
Trasmit		
Center Wavelength (range)	nm	1260-1355
Side Mode Suppression Ratio (min)	dB	30
Launched power		
-Maximum	dBm	+0.5
-Minimum	dBm	-8.2
-OMA	dBm	-5.2
-OMA-TDP (min)	dBm	-6.2
Transmitter and dispersion penalty	dB	0
Average launch power of ODD transmitter (max)	dBm	-30
Extinction ratio (min)	dB	3.5
RIN12 OMA (max)	dB/Hz	-128
Optical Return Loss Tolerance (min)	dB	12
Receiver		
Center Wavelength (range)	nm	1260-1355
Receive overload (max) in average power	dBm	0.5
Receive sensitivity (min) in average power	dBm	-14.4 (10KM)
	dBm	-13.4 (20KM)
Receiver sensitivity (max) in OMA	dBm	-12.6 (10KM)
	dBm	-11.6 (20KM)
Receiver Reflectance (max)	dB	-12
Stressed receiver sensitivity (max) in OMA	dBm	-10.3
Vertical eye closure penalty (min)	dB	2.2
Stressed eye jitter (min)	Ulp-p	0.7
Receive electrical 3dB upper cutoff frequency (max)	GHz	12.3
Receiver power (damage, Max)	dBm	1.5

Electrical Characteristics:

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameters	Symbol	Min.	Typical	Max.	Unit
Data Rate		-	10.3125	-	Gbps
Power Consumption		-	1200	1500	mW
Trasnmitter					
Single Ended Output Voltage Tolerance		-0.3	-	4.0	V
C common mode voltage tolerance		15	-	-	mV
Tx Input Diff Voltage	VI	400		1600	mV
Tx Fault	VoL	-0.3		0.4	V
Data Dependent Input Jitter	DDJ			0.10	UI
Data Input Total Jitter	TJ			0.28	UI
Receiver					
Single Ended Output Voltage Tolerance		-0.3	-	4.0	V
Rx Output Diff Voltage	Vo	300		850	mV
Rx Output Rise and Fall Time	Tr/Tf	30			ps
Total Jitter	TJ			0.70	UI
Deterministic Jitter	DJ			0.42	UI