

10Gbps SFP+ Optical Transceiver 20Km LC DDM

Features:

- Support 10GBASE-LR/10GBASE-LW/10G Fiber Channel application Compliant to SFP+ Electrical MSA SFF-8431
- Compliant to SFP+ Mechanical MSA SFF-8432 Multi rate of up to 11.3Gbps
- Transmission distance up to 20km (SMF)
- +3.3V single power supply Low power consumption
- Operating case temp: -5~+85°C RoHS 6/6 compliant

Absolute Maximum Ratings:

- Table 1- Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	Vcc3	-0.5	-	+3.6	V	
Storage Temperature	Ts	-5	-	+85	°C	
Operating Humidity	RH	+5	-	+95	%	

Recommended Operating Conditions:

- Table 2- Recommended operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	TC	0	-	+70	°C	
Power Supply Voltage	Vcc	3.1	3.3	3.47	V	
Power Supply Current	Icc	-	-	300	mA	
Power Dissipation	Pd	-	-	1.0	W	
Bit Rate	BR	-	10.312	-	Gbp	

Electrical Characteristics:

- Table 3- Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Transmitter						
Differential Data Input Swing	Vin,P-P	120	-	850	mVP	
Input Differential Impedance	ZIN	80	100	120	Ω	
Tx_Fault	Normal Operation	VOL	0	0.8	V	
	Transmitter Fault	VOH	2.0	VCC	V	
Tx_Disable	Normal Operation	VIL	0	0.8	V	
	Laser Disable	VIH	2.0	VCC+0.3	V	
Receiver						
Differential Data Output	Vout	100	-	800	mV	
Output Differential Impedance	ZD	80	100	120	Ω	
Output Rise Time(20-80%)	TR	24	-	-	ps	
Output Fall Time (20-80%)	TF	24	-	-	ps	
Rx_LOS	Normal Operation	VOL	0	0.8	V	
	Lose Signal	VoH	2.0	VCC	V	

Transmitter Performance:

- Table 4- optical TX Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
-----------	--------	------	-----	-----	-----	-------



Optical transmitter Characteristics						
Bit Rate	BR	Gbp	9.953	10.312	11.3	
Center Wavelength Range	λ_c	nm	1290	1310	1330	
Average Launch power Tx_off	P _{off}	dB	-	-	-45	
Launch Optical Power	P ₀	dB	-7.5	-	0	1
Extinction Ratio	ER	dB	3.8	-	-	
Jitter P-P	JP	ps	-	-	27	

Note:

Jitter RMS	JR	ps	-	-	5	
Optical Rise/Fall time	Tr/tf	ps	-	-	100	
Eye Diagram	Compliant With IEEE 802.3-2005					

Optical receiver Characteristics						
Bit Rate	BR	Gbp	9.953	10.312	11.3	
Receiver Sensitivity	RS	dB	-	-	-14.7	2
Overload Input Optical Power	PIN	dB	0	-	-	2
Center Wavelength Range	λ_c	nm	1290	1310	1330	
LOS	LOSD	dB	-	-	-15.5	
	LOSA		-24.5	-	-	
LOS Hysteresis		dB	0.5	-	-	

1. Coupled into 9/125 SMF
2. Measured with PRBS 2 -1 test pattern @10.3125Gbps.BER=10E-12

Recommended Interface Circuit:

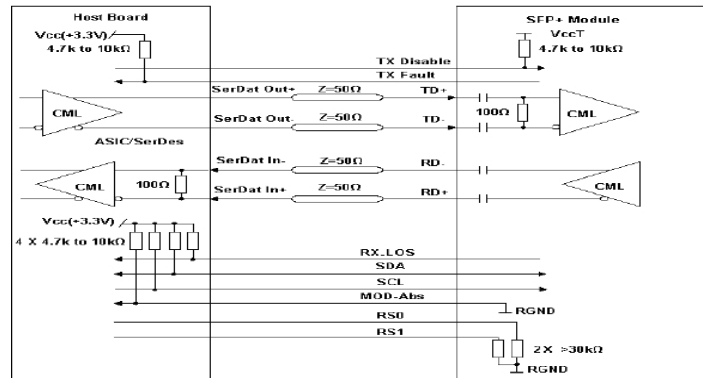


Figure 1, Recommended Interface

Recommended Host Board Power Supply Circuit:

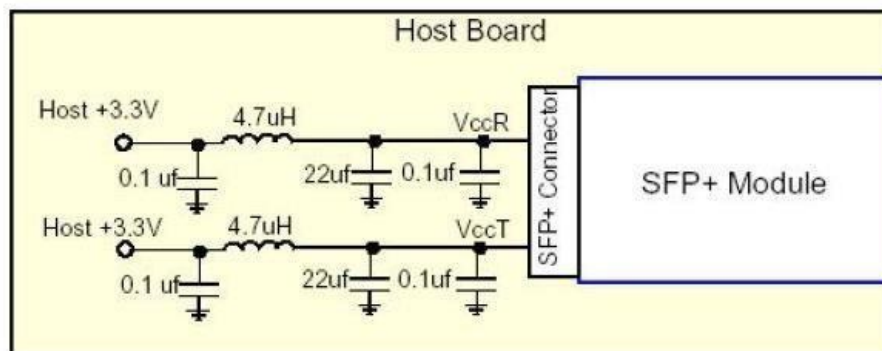


Figure 1, Recommended Host Board Power Supply Circuit



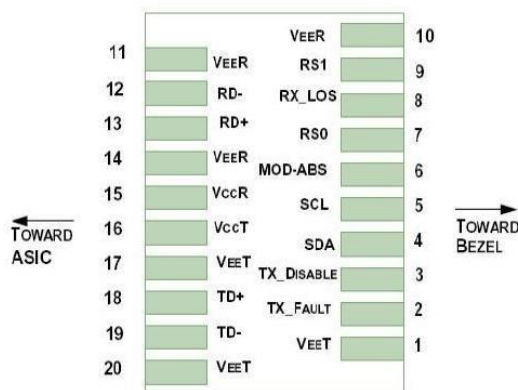
Pin arrangement:

Figure 3, Pin View

Table 5-Pin Function Definitions:

Pin	Symbol	Name/Description	Note
1	VEET	Module Transmitter Ground	1
2	TX_FAULT	Module Transmitter Fault	2
3	TX_DISABLE	Transmitter Disable; Turns off transmitter laser output	3
4	SDA	2-Wire Serial Interface Data Line (MOD-DEF2)	
5	SCL	2-Wire Serial Interface Clock (MOD-DEF1)	
6	MOD_ABS	Module Absent, connected to VEET or VEER in the	2
7	RS0	module Rate Select 0, optionally controls SFP+ module receiver as the following when HIGH input Bit Rate > 4.25 Gbps	
8	RX_LOS	and when LOW input Bit Rate < 4.25 Gbps. Receiver Loss of Signal Indication (in FC designated as RX_LOS, in SONET designated as LOS,	2
9	RS1	and in Ethernet designated as NOT Signal Detect) Rate Select 1, optionally controls SFP+ module transmitter as the following when HIGH input Bit Rate > 4.25 Gbps and when LOW input Bit Rate ≤ 4.25 Gbps.	
10	VEER	Module Receiver Ground	1
11	VEER	Module Receiver Ground	1
12	RD-	Receiver Inverted Data Output	
13	RD+	Receiver Non-Inverted 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	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	VEET	Module Transmitter Ground	1

Note:

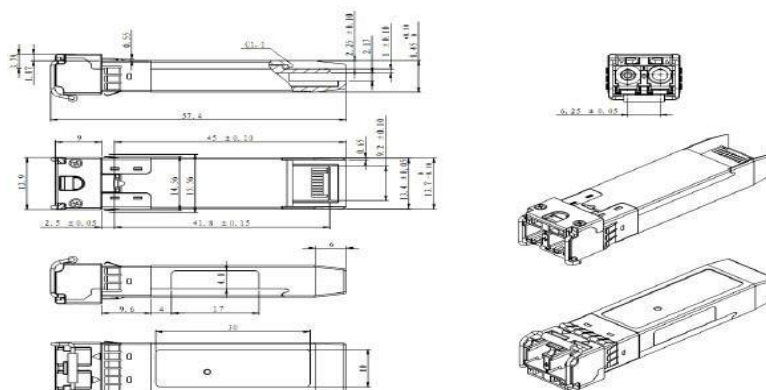
1. The module ground pins are isolated from the module case.
2. The pins shall be pulled up with 4.7K-10Kohms to a voltage between 3.14V and 3.46V on host board.
3. The pin is pulled up to VCCT with a 4.7K-10KΩ resistor in the module.



Digital Diagnostic Memory Map:

2 wire address 1010000X (A0h)	2 wire address 1010001X (A2h)
0	0
Serial ID Defined by SFP MSA (96 bytes)	Alarm and Warning Thresholds (56 bytes)
95	55
Vendor Specific (32 bytes)	Cal Constants (40 bytes)
127	95
Reserved (128 bytes)	Real Time Diagnostic Interface (24 bytes)
255	119
	127
	Vendor Specific (8 bytes)
	User Writable EEPROM (120 bytes)
	247
	Vendor Specific (8 bytes)
	255

Mechanical:



Order Information:

Part Number	Product Description
10GDF1310-20LAT	SFP+ 1310 nm 20km LC DDM

