622Mbps SFP 40km Optical Transceiver

Product Features

- Up to 622Mb/s Data Links
- Hot-Pluggable
- 1550nm DFB laser transmitter
- PIN receiver
- Duplex LC connector
- RoHS compliant and Lead Free
- Up to 40 km on 9/125 μ m SMF
- Monitoring Interface Compliant with SFF-8472
- Low power dissipation <1W typically
- operating temperature range: 0° C to 70° C

Applications

- 622Mbps Optical systems
- Fast Ethernet
- SONET OC-12 LR1
- Other Optical links

The AC-B-SFPO12-LR1-xx is a high performance, cost effective module which have a Duplex LC optics interface. Standard AC coupled CML for high speed signal and LVTTL control and monitor signals. The receiver section uses a PIN receiver and the transmitter uses 1550nm DFB laser, ensure this module 622Mpbs 40km application.

Ordering Information

Part Number	Description
AC-B-SFPO12-LR1-xx	SFP 622Mbps 1550nm 40km optical transceiver extended temperature

Regulatory Compliance

Feature	Standard	Performance
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022:2010, Class B	Compatible with standards
Electromagnetic susceptibility (EMS)	EN 55024:2010	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2	Compatible with Class I laser product

Absolute Maximum Ratings

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

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	TS	-40	85	℃	
Operating Case Temperature	TOP	0	70	℃	
Relative Humidity (non-condensation)	RH	0	85	%	

Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Supply Voltage	VCC	3.135		3.465	V	
Supply Current	Icc			300	mA	
Inrush Current	Isurge			Icc+30	mA	
Maximum Power	Pmax			1	W	
Case operating Temperature	TC	-5		+85	°C	

Electrical Characteristics

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

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Supply Voltage	Vcc	3.135		3.465	V	
Supply Current	Icc			300	mA	
Inrush Current	Isurge			Icc+30	mA	
Maximum Power	Pmax			1.0	W	
Transmitter						
Input differential impedance	Rin	90	100	110	□	□
Single ended data input swing	Vin PP	250		1200	mVp-p	

Transmit Disable Voltage	VD	Vcc – 1.3		Vcc	V	2
Transmit Enable Voltage	VEN	Vee		Vee+ 0.8	V	
Transmit Disable Assert Time	Tdessert			10	us	
Receiver						
Single ended data output swing	Vout,pp	250		800	mv	3
Data output rise time	tr			260	ps	4
Data output fall time	tf			260	ps	4
LOS Fault	Vlosfault	Vcc – 0.5		VCC_host	V	5
LOS Normal	Vlos norm	Vee		Vee+0.5	V	5
Power Supply Rejection	PSR	100			mVpp	
Deterministic Jitter Contribution	RXΔDJ			51.7	ps	
Total Jitter Contribution	RXΔTJ			122.4	ps	

Note:

1. AC coupled.

2. Or open circuit.

3. Into 100 ohm differential termination.

4. 20 − 80 %

5. LOS is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Optical Characteristics

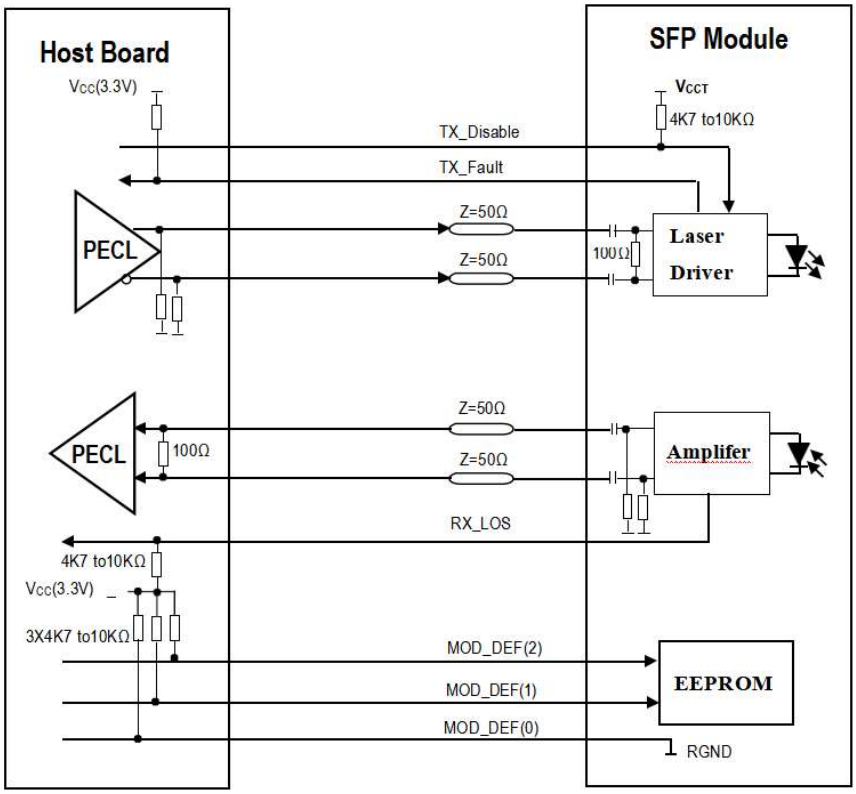
All parameters are specified under the recommended operating conditions unless otherwise specified..

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λc	1480	1550	1580	nm	
Spectral Width(-20dB)	σ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Output Power	Pout	-2		3	dBm	
Optical Rise/Fall Time	tr / tf			260	ps	
Extinction Ratio	ER	9			dB	
Deterministic Jitter Contribution	TXΔDJ			56.5	ps	
Total Jitter Contribution	TXΔTJ			119	ps	
Receiver						
Optical Input Wavelength	·	1260		1580	nm	
Optical Input Power	Pin	-24		-3	dBm	
Receiver Reflectance		12			dB	
Receiver Overload	Pol			-3	dBm	
RX Sensitivity	Sen			-24	dBm	
RX_LOS Assert	LOS A	-45			dBm	
RX_LOS Deassert	LOS D			-33	dBm	
RX_LOS Hysteresis	LOS H	0.5			dB	
General Specifications						
Data Rate	BR		622		Mb/s	
Bit Error Rate	BER			10^{-12}		
Max. Supported Link Length on 9/125 μ m SMF@1.25Gb/s	LMAX		40		km	

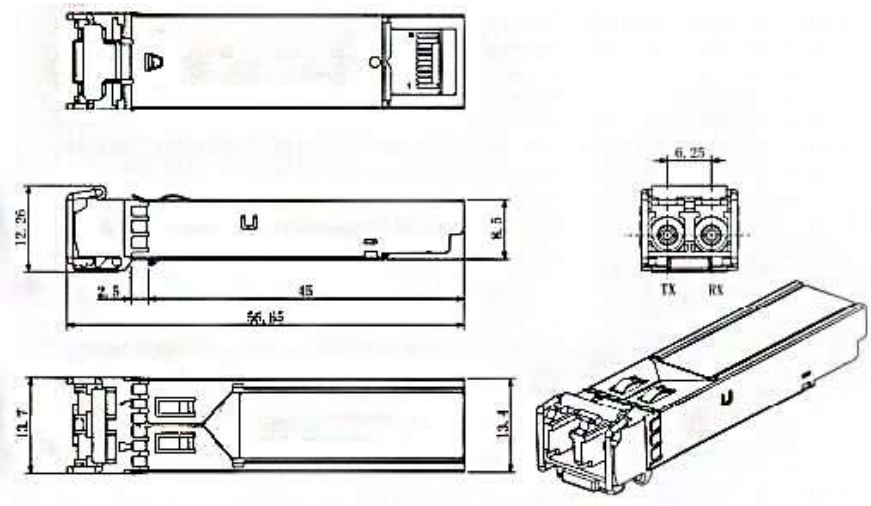
Digital Diagnostic Functions

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	+3	℃	
Supply voltage monitor absolute error	DMI_VCC	-0.1	+0.1	V	
TX power monitor absolute error	DMI_RX	-3	+3	dB	
RX power monitor absolute error	DMI_RX	-3	+3	dB	
Bias current monitor	DMI_Ibias	-10%	+10%	mA	

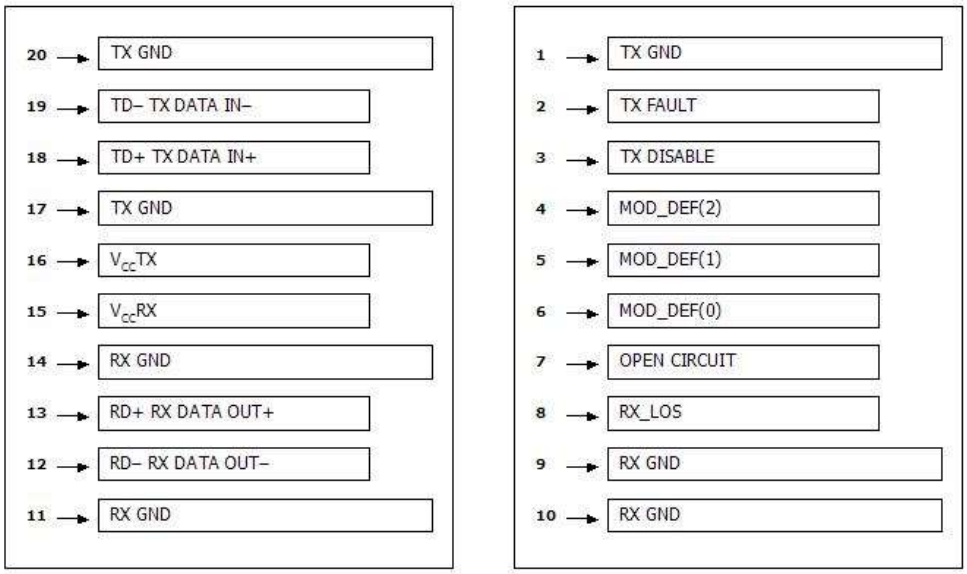
Recommended Circuit



Mechanical Dimensions



Pin Assignment and Description



Top of Board

Bottom of Board

Pin Assignment

PIN #	Symbol	Description	Notes
1	VeeT	Transmitter Ground	1
2	TX Fault	Transmitter Fault Indication	
3	TX Disable	Transmitter Disable	2
4	MOD-DEF2	Module Definition	3
5	MOD-DEF1	Module Definition 1	3
6	MOD-DEF0	Module Definition 0	3
7	Rate Select	Not Connected	4
8	LOS	Loss of Signal	5
9	VeeR	Receiver Ground	1

10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inv. Received Data Out	6
13	RD+	Received Data Out	6
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power	1
16	VccT	Transmitter Power	
17	VeeT	Transmitter Ground	
18	TD+	Transmit Data In	6
19	TD-	Inv. Transmit In	6
20	VeeT	Transmitter Ground	

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V.MOD_DEF(0) pulls line low to indicate module is plugged in.
4. Rate select is not used.
5. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
6. AC Coupled.