- ✧ 1310nm FP laser transmitter
- ✧ Duplex LC connector
- ✧ RoHS compliant and Lead Free
- ✧ Up to 10 km on 9/125μm SMF
- ✧ Single +3.3V Power Supply
- ✧ Very low EMI and excellent ESD protection
- ✧ Operating case temperature: 0 to +70℃

Features:

- ✧ Built-in PHY supporting SGMII Interface
- ✧ Hot-Pluggable
- ✧ 100BASE-FX operation

Applications:

- ✧ Fast Ethernet
- ✧ Other Optical Links

Description:

Transceiver 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 1310 nm FP laser, up to 17dB link budge ensure this module Fast Ethernet 10Km application with PHY supporting SGMII interface make it support Fast Ethernet in Gigabit Ethernet port.

- **Absolute Maximum Ratings**

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T_S	-40		+85	℃
Supply Voltage	V_{CC}T, R	-0.5		4	V
Relative Humidity	RH	0		85	%
Case Operating Temperature	T_C	0		70	°C

- **Recommended Operating Environment:**

Parameter	Symbol	Min.	Typical	Max.	Unit
Case operating Temperature	T_C	0		+70	℃
Supply Voltage	$V_{CCT, R}$	3.0		3.6	V
Power Supply Rejection		100			mV_{P-P}
Data Rate	BR		125		Mb/s

- **Electrical Characteristics (T_{OP} = 0 to 70 °C, VCC = 3.135 to 3.465 Volts)**

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	Vcc	3.0	3.30	3.60	V	
Supply Current	Icc			360	mA	
Inrush Current	I_{surge}			Icc+30	mA	

Maximum Power	P_{max}			1.0	W	
Transmitter Section:						
Input differential impedance	R_{in}	90	100	110	Ω	1
Single ended data input swing	$V_{in\ PP}$	200		1200	mVp-p	
Transmit Disable Voltage	V_D	Vcc – 1.3		Vcc	V	2
Transmit Enable Voltage	V_{EN}	Vee		Vee+ 0.8	V	
Transmit Disable Assert Time	$T_{dessert}$			10	us	
Receiver Section:						
Single ended data output swing	Vout,pp	300		1000	mv	3
Data output rise time	t_r			150	ps	4
Data output fall time	t_f			150	ps	4
LOS Fault	$V_{losfault}$	Vcc – 0.5		V_{CC_host}	V	5
LOS Normal	$V_{los\ norm}$	V_{ee}		V_{ee}+0.5	V	5
Power Supply Rejection	PSR	100			mVpp	6

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.
6. All transceiver specifications are compliant with a power supply sinusoidal modulation of 20 Hz to 1.5MHz up to specified value applied through the power supply filtering network shown on page 23 of the Small Form-factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 14, 2000.

● Optical Characteristics (TOP = 0 to 70°C, VCC = 3.135 to 3.465 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λ_c	1270	1310	1360	nm	1
Spectral Width	σ			7	nm	
Optical Output Power	P_{out}	-9		-3	dBm	2
Optical Rise/Fall Time	t_r / t_f			160	ps	3
Extinction Ratio	ER	9			dB	
Eye Mask for Optical Output	Compliant with Eye Mask Defined in IEEE 802.3 standard					
Receiver Section:						
Optical Input Wavelength	λ	1100		1670	nm	
RX Sensitivity	Sen			-33	dBm	4.5
Receiver Reflectance		12			dB	
Receiver Overload	P_{ol}			-8	dBm	4.5
RX_LOS Assert	LOS_A	-45			dBm	
RX_LOS Deassert	LOS_D			-34	dBm	
RX_LOS Hysteresis	LOS_H		2	2.5	dB	
Total Jitter(SGMII Series Interface)	T_J			0.43	UI	

Note

1. Also specified to meet curves in FC-PI 13.0 Figures 18 and 19, which allow trade-off between wavelength spectral width.
2. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
3. Unfiltered, 20-80%. Complies with IEEE 802.3 (Gig. E), FC 1x and 2x eye masks when filtered.
4. Measured with conformance signals defined in FC-PI 13.0 specifications.

5. Measured with PRBS 2^{7-1} at 10^{-12} BER

● Pin Assignment:

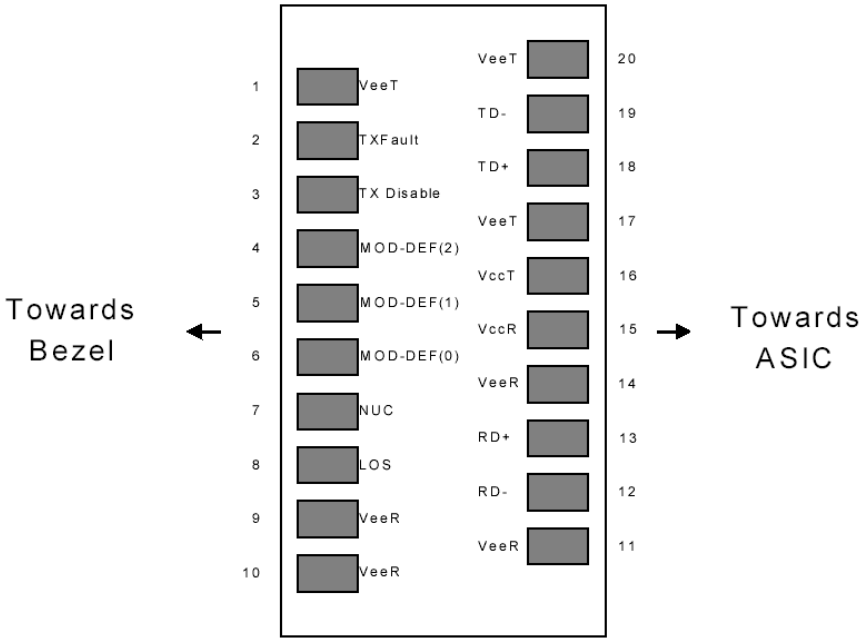


Diagram of Host Board Connector Block Pin Numbers and Names

● Pin Description:

Pin No	Name	Function	Plug Seq	Notes
1	VeeT	Transmitter Ground	**1**	**1**
2	TX Fault	Transmitter Fault Indication	**3**	
3	TX Disable	Transmitter Disable	**3**	2
4	MOD-DEF2	Module Definition	**2**	3
5	MOD-DEF1	Module Definition 1	**3**	3
6	MOD-DEF0	Module Definition 0	**3**	3
7	Rate Select	Not Connected	**3**	**4**
8	LOS	Loss of Signal	**3**	5
9	VeeR	Receiver Ground	**1**	**1**
10	VeeR	Receiver Ground	**1**	**1**
11	VeeR	Receiver Ground	**1**	**1**
12	RD-	Inv. Received Data Out	**3**	**6**
13	RD+	Received Data Out	**3**	**6**
14	VeeR	Receiver Ground	**3**	**1**
15	VccR	Receiver Power	**2**	**1**
16	VccT	Transmitter Power	**2**	
17	VeeT	Transmitter Ground	**1**	
18	TD+	Transmit Data In	**3**	6
19	TD-	Inv. Transmit In	**3**	6
20	VeeT	Transmitter Ground	**1**	

Notes:

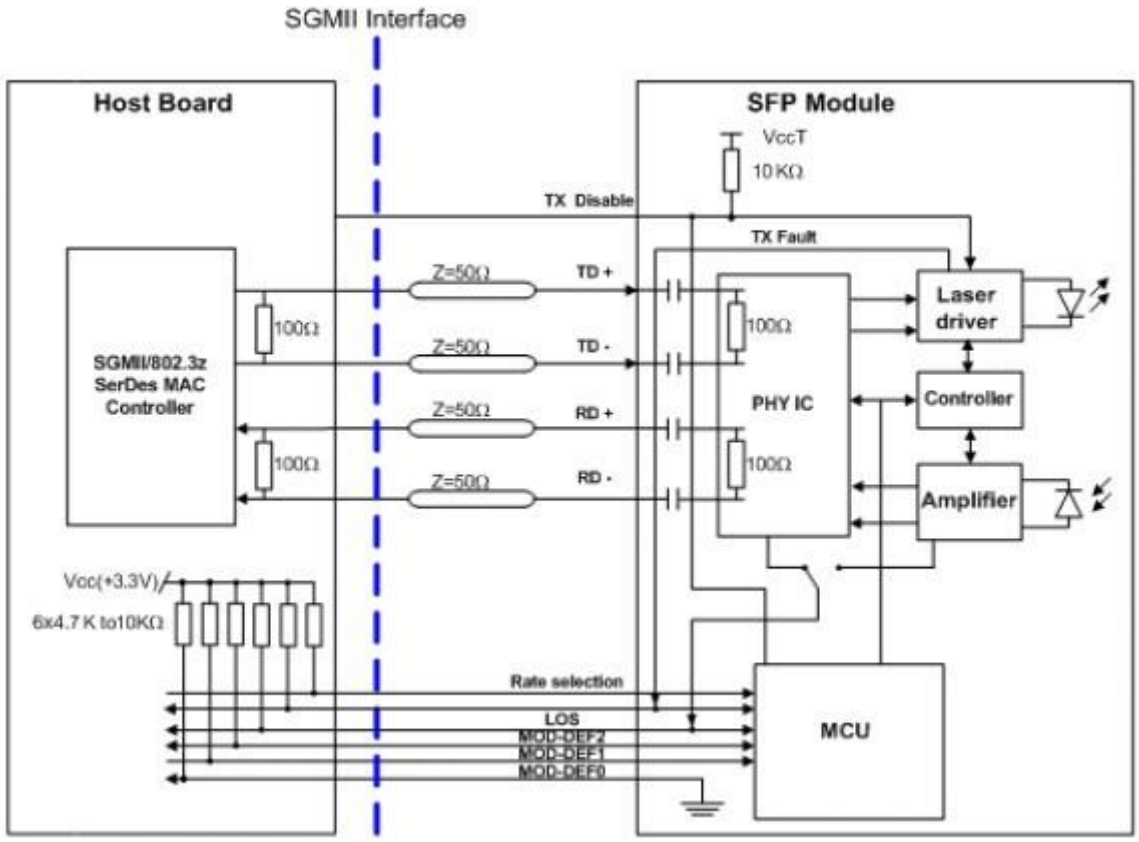
1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

3. Should be pulled up with 4.7k - 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.
4. Rate select is not used
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.
6. AC Coupled

● Serial ID Memory Contents:

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	100BASE-FX
11	1	Encoding	4B5B（02h）
12	1	BR,Nominal	Nominal baud rate, unit of 100Mbps
13	1	Reserved	(0000h)
14	1	Length(9um,km)	Link length supported for 9/125um fiber, units of km
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	KEWEI
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: “KWE210” (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-61	2	Wavelength	Laser wavelength
62	1	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented(001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	Vendor specific date, read only

Recommended Circuit:



SFP Host Recommended Circuit