

100BASE-FX SFP SGMII 1310nm 2km DOM LC MMF Transceiver

GLC-GE-100FX-LL



Applications

- SONET OC-3/SDH STM-1
- Fast Ethernet
- Other Optical Links

Features

- Up to 155M b/s Data Links
- Hot-Pluggable
- 1310nm FP Laser Transmitter
- Duplex LC Connector
- RoHS Compliant and Lead Free
- Up to 2 km on 50/125 μ m MMF
- Single +3.3V Power Supply
- Monitoring Interface Compliant with SFF-8472
- Industrial /Extended/ Commercial
Operating Temperature Range: -40°C to 85°C / -5°C to 85°C / 0°C to 70°C Version Available

Description

100BASE-FX SFP modules are based on the SFP Multi Source Agreement (MSA). This transceiver is compliant with IEEE 802.3 and the monitoring interface compliant with SFF-8472.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	TS	-40		+85	°C
Supply Voltage	V _{CC} T, R	-0.5		4	V
Relative Humidity	RH	0		85	%
Case Operating Temperature	Industrial	-40		85	°C
	Extended	-5		85	
	Commercial	0		70	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Case operating temperature	Industrial	-40		85	°C
	Extended	-5		85	°C
	Commercial	0		70	°C
Supply Voltage	V _{CC} T, R	3.0		3.6	V

III. Electrical Characteristics (TOP = 0 to 70°C, V_{CC} = 3.0 to 3.60 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	V _{CC}	3.0	3.30	3.60	V	
Supply Current	I _{CC}			300	mA	
Inrush Current	I _{surge}			I _{CC} +30	mA	
Maximum Power	P _{max}			1.0	W	
Transmitter Section						
Input Differential Impedance	R _{in}	90	100	110		
Single Ended Data Input Swing	V _{in PP}	200		1200	mVp-p	
Transmit Disable Voltage	V _D	V _{CC} - 1.3		V _{CC}	V	2
Transmit Enable Voltage	V _{EN}	V _{ee}		V _{ee} +0.8	V	
Transmit Disable Assert Time	T _{dassert}			10	us	
Receiver Section						
Single Ended Data Output Swing	V _{out,pp}	300		1000	mv	3
Data Output Rise Time	t _r			1300	ps	4
Data Output Fall Time	t _f			1300	ps	4

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
LOS Fault	$V_{losfault}$	$V_{cc} - 0.5$		V_{CC_host}	V	5
LOS Normal	$V_{losnorm}$	V_{ee}		$V_{ee}+0.5$	V	5
Power Supply Rejection	PSR	100			mVpp	6

Notes:

1. AC coupled.
2. Or open circuit.
3. Into 100 ohm differential termination.
4. 20 – 80%.
5. LOS is LVTTTL. 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.

IV. Optical Parameters (TOP = 0 to 70 °C, $V_{cc} = 3.00$ to 3.60 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section						
Center Wavelength	λ_c	1270	1310	1360	nm	1
Spectral Width	σ			3	nm	
Optical Output Power	P_{out}	-15		-8	dBm	2
Optical Rise/Fall Time	t_r / t_f			1300	ps	3
Extinction Ratio	ER	9.2			dB	

Eye Mask for Optical Output

Compliant with Eye Mask Defined in IEEE 802.3 standard

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
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Receiver Section

Optical Input Wavelength		1100		1670	nm	
Receiver Overload	Pol			-3	dBm	4.5
RX Sensitivity	Sen			-32	dBm	4.5
RX_LOS Assert	LOS A	-42			dBm	
RX_LOS Deassert	LOS D			-33	dBm	
RX_LOS Hysteresis	LOS H		2	2.5	dB	

General Specification

Data Rate	BR		155		Mb/s	
Bit Error Rate	BER			10 ⁻¹²		
Max Supported Link Length on 50/125µm MMF@155Mb/s	LMAX		2		km	6
Total System Budget	LB	13			dB	7

Notes:

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 231-1 at 10⁻¹² BER.
6. Dispersion limited per FC-PI Rev. 13.
7. Attenuation of 1dB/km is used for the link length calculations. Distances are indicative only. Please refer to the Optical Specifications in Table IV to calculate a more accurate link budget based on specific conditions in your application.

V. Digital Diagnostic Monitor Characteristics

The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF8472 Rev10.2 with internal calibration mode. For external calibration mode please contact our sales stuff.

Parameter	Symbol	Min.	Max.	Unit
Temperature Monitor Absolute Error	DMI_Temp	-3	3	degC
Laser Power Monitor Absolute Error	DMI_TX	-3	3	dB
RX Power Monitor Absolute Error	DMI_RX	-3	3	dB
Supply Voltage Monitor Absolute Error	DMI_Vcc	-0.1	0.1	V
Bias Current Monitor Absolute Error	DMI_Ibias	-10%	10%	mA

Block Diagram of Transceiver

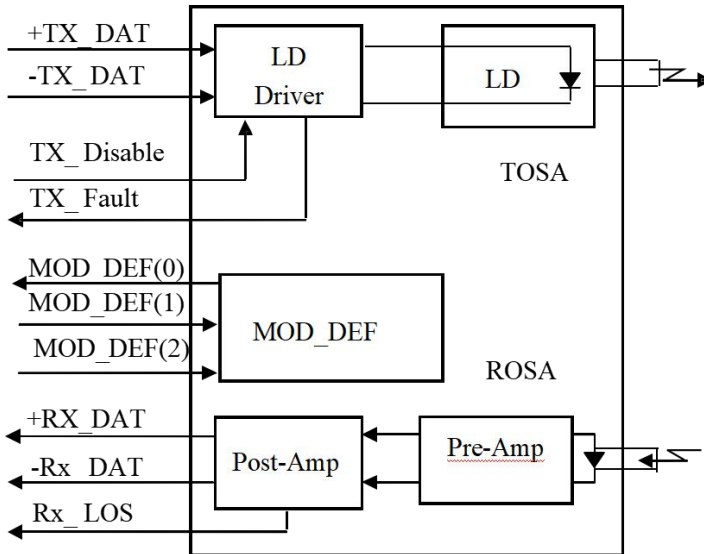


Figure1: Block Diagram

VI. Pin Description

Pin No	Name	Function	Plug Seg	Notes
1	V_{eeT}	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	V_{eeR}	Receiver Ground	1	1
10	V_{eeR}	Receiver Ground	1	1
11	V_{eeR}	Receiver Ground		1
12	RD-	Inv. Received Data Out	3	6
13	RD+	Received Data Out	3	6
14	V_{eeR}	Receiver Ground	3	1
15	V_{ccR}	Receiver Power	2	1
16	V_{ccT}	Transmitter Power	2	

Pin No	Name	Function	Plug Seg	Notes
17	V _{ee} T	Transmitter Ground	1	
18	TD+	Transmit Data In	3	6
19	TD-	Inv. Transmit In	3	6
20	V _{ee} T	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.

Pin Assignment

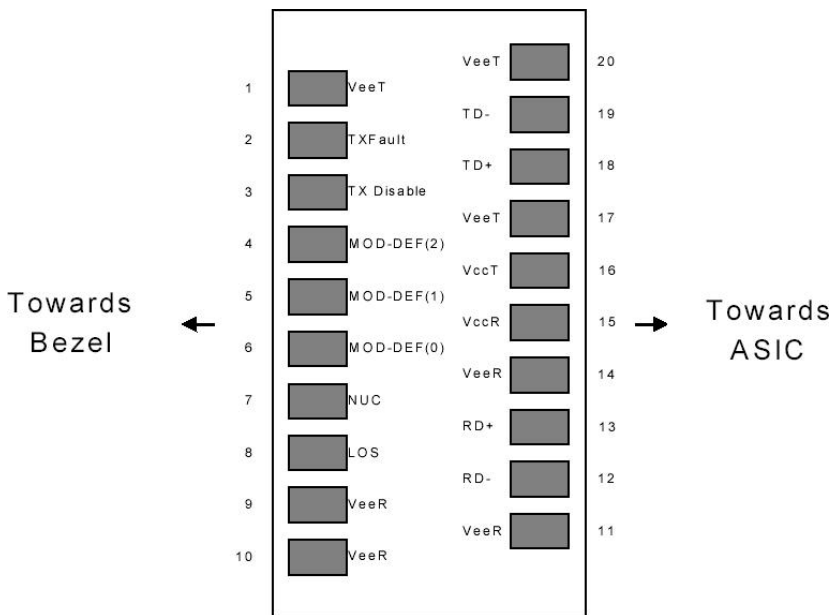


Figure2: Diagram of Host Board Connector Block Pin Numbers and Names