ESS311203-3LCD20

GE-100FX Spring-Latch SFP Transceiver, 20KM Reach

Features

- Double LC type pluggable optical interface
- 1310nm FP laser transmitter and PIN receiver
- Up to 20km on 9/125μm SMF
- Hot-pluggable SFP footprint
- Low power consumption<1W typical
- The metal shell shielding electromagnetic interference
- RoHS compliant and lead-free
- Single +3.3V power supply
- Built-in PHY supporting SGMII Interface
- 100 BASE-LX operation
- Ambient operating temperature: 0 to +70°C

Applications

- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Ordering information

Product part Number	Data Rate (Mbps)	Media	Wavelength (nm)	Transmission Distance(km)	PHY IC
ESS311203-3LC(D)201	125	SMF	1310	20	Marvell
ESS311203-3LC(D)202	125	SMF	1310	20	Broadcom

Description

ETU-LINK's GEFE Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA), and are designed for SGMII MAC interface to 100BASE-LX (The SGMII MAC Interface implements a modified 1000BASE-X Auto-Negotiation to indicate link, duplex, and peed to the MAC). The transceiver consists of four sections: the standard SFP part, the PHY part build with SGMII interface, the 1310nm FP laser and the PIN photo-detector. The module data link up to 20km in 9/125um single mode fiber.

Figure 1. MAC to Fiber Connection

Pin Descriptions

Pin	Symbol	Name/Description	NOTE
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault.	
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	4
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	5
9	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
10	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1) Circuit ground is internally isolated from chassis ground.
2) Laser output disabled on T_{DIS} >2.0V or open, enabled on T_{DIS} <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) This is an optional input used to control the receiver bandwidth for compatibility with multiple data rates (most likely Fiber Channel 1x and 2x Rates).If implemented, the input will be internally pulled down with > 30kΩ resistor. The input states are:
   Low (0 – 0.8V): Reduced Bandwidth
   (>0.8, < 2.0V): Undefined
   High (2.0 – 3.465V): Full Bandwidth
   Open: Reduced Bandwidth
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.

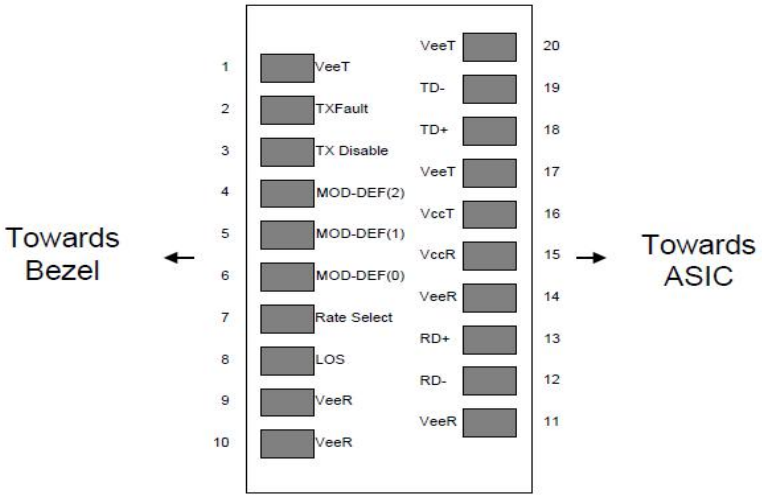


Figure2. Pin out of Connector Block on Host Board

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40		85	ºC	
Relative Humidity	RH	5		95	%	
Power Supply Voltage	VCC	-0.5		4	V	
Signal Input Voltage		-0.3		Vcc+0.3	V	
Receiver Damage Threshold		+5			dBm	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0		70	ºC	
Power Supply Voltage	VCC	3.13	3.3	3.47	V	

Power Supply Current	ICC			400	mA	
Power Supply Noise Rejection				100	mVp-p	100Hz to 1MHz
Data Rate			125/125		Mbps	TX Rate/RX Rate
Transmission Distance				20	KM	
Coupled Fiber	Single mode fiber					9/125um SMF

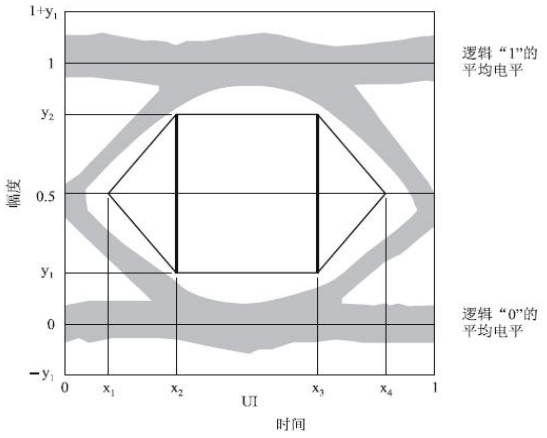
Specification of Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Average Output Power	POUT	-15		-8	dBm	Note (1)
Extinction Ratio	ER	9			dB	
Center Wavelength	λC	1270	1310	1360	nm	FP Laser
Spectrum Bandwidth(RMS)	σ			3.5	nm	
Transmitter OFF Output Power	POff			-45	dBm	
Differential Line Input Impedance	RIN	90	100	110	Ohm	
Output Eye Mask	Compliant with G.957(class 1 laser safety)					Note (2)

Note:

6) Measure at 2^23-1 NRZ PRBS pattern

7) Transmitter eye mask definition



	STM-1	STM-4
x_1/x_4	0.15/0.85	0.25/0.75
x_2/x_3	0.35/0.65	0.40/0.60
y_1/y_2	0.20/0.80	0.20/0.80

Specification of Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Input Optical Wavelength	λIN	1270		1610	nm	PIN-TIA
Receiver Sensitivity	PIN			-31	dBm	Note (1)
Input Saturation Power (Overload)	PSAT	-8			dBm	
Los Of Signal Assert	PA	-40		-	dBm	

Los Of Signal De-assert	PD			-32	dBm	Note (2)
LOS Hysteresis	PA-PD	0.5	2	6	dB	

8) Measured with Light source 1310nm, ER=9dB; BER =<10^-12 @PRBS=2^23-1 NRZ

9) When LOS de-asserted, the RX data+/- output is High-level (fixed)

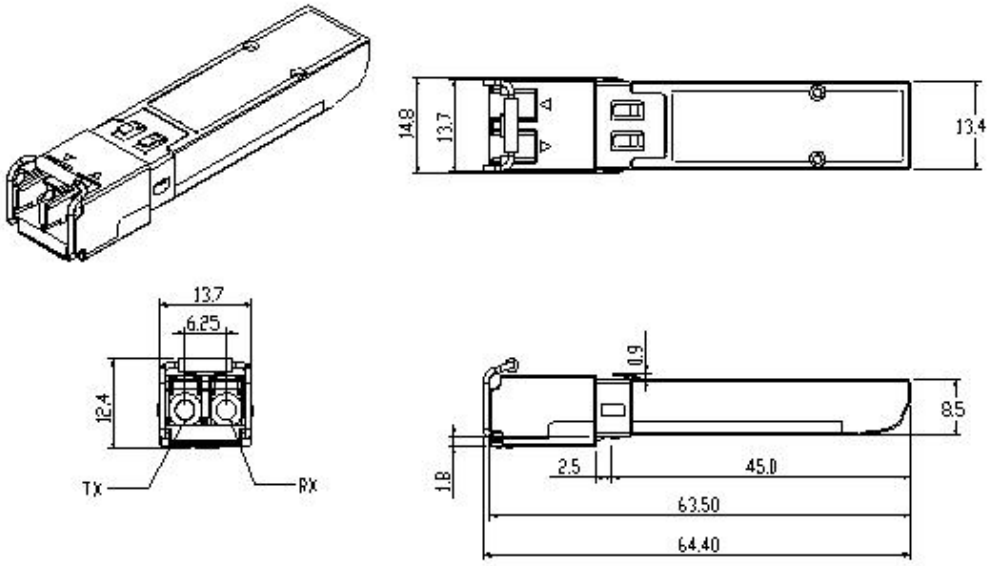
Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Total Supply Current	ICC			A	mA	Note (1)
Transmitter Disable Input-High	VDISH	2		Vcc+0.3	V	
Transmitter Disable Input-Low	VDISL	0		0.8	V	
Transmitter Fault Input-High	VDISL	2		Vcc+0.3	V	
Transmitter Fault Input-Low	VTxFH	0		0.8	V	
Receiver						
Total Supply Current	ICC			B	mA	Note (1)
LOSS Output Voltage-High	VLOSH	2		Vcc+0.3	V	LVTTL
LOSS Output Voltage-Low	VLOSL	0		0.8	V	

Note:

10) A (TX) + B (RX) = 400mA (Not include termination circuit)

Mechanical Specifications (Unit: mm)



Regulatory Compliance

Feature	Reference	Performance
Electrostatic discharge（ESD）	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, 2	Class 1 laser product
Component Recognition	IEC/EN 60950, UL	Compatible with standards
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards