SFP-SF1312-40D-PCT

1.25 Gb/s 1310nm Single-Mode SFP Transceiver

Description

PCT's PCT-1312-10D Small Form Factor Pluggable (SFP) transceivers are compatible with the SFP Multi-Sourcing Agreement (MSA). The transceiver consists of five sections:

- LD driver
- Limiting amplifier
- Digital diagnostic monitor
- 1310 nm FP laser
- PIN photo detector

The module data links up to 10 km in 9/125 µm single mode fiber.

The optical output can be disabled by a TTL logic high level input of Tx Disable, and the system also can disable the module via I2C. Tx Fault is provided to indicate that degradation of the laser. Loss of Signal (LOS) output is provided to indicate the loss of an input optical signal of receiver or the link status with partner. The system can also get the LOS (or Link) / Disable / Fault information via I2C register access.

Hardware Features

- Up to 1.25 Gb/s data links
- Dfb laser transmitter and PIN photo detector
- Up to 40 km on 9/125 µm SMF
- Hot pluggable SFP footprint
- 850 nm VCSEL transmitter, PIN photo-detector
- Duplex LC / UPC type pluggable optical interface
- Low power dissipation
- Metal enclosure, for lower EMI
- Supports digital diagnostic monitoring interface
- Single 3.3 V power supply
- Case operating temperature range:
  - Commercial -0 to 70 °C
  - Extended -10 to 80 °C
  - Industrial -40 to 85 °C

Applications

- Switch to Switch interface
- Gigabit Ethernet
- Switched backplane applications
- Router / Server interface
- Other optical links

Standards

- Conforms to SFF-8472 SFP+ MSA
- RoHS compliant and lead free

Ordering Information

SFP Tansceiver, Single Mode

SFP-1312-10D	1.25 Gb/s 1310 nm Wavelength, 40 m Transmission Distance, Commercial
SFP-1312-40DE	1.25 Gb/s 1310 nm Wavelength, 40 m Transmission Distance, Extended
SFP-1312-40DA	1.25 Gb/s 1310 nm Wavelength, 10 m Transmission Distance, Industrial

RoHS

SFP-SF1312-40D-PCT

1.25 Gb/s 1310nm Single-Mode SFP Transceiver

Specifications

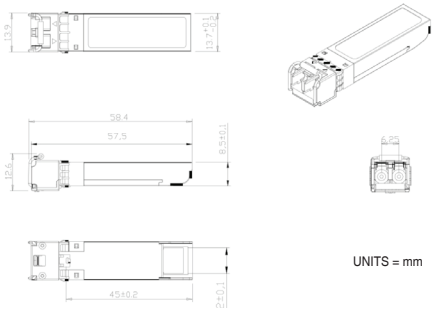
Parameters	Symbol	Unit	SFP-10G-SR-QNC		
Absolute Maximum Ratings			Min	Typ	Max
Storage Temperature	Ts	°C	-40	- -	85
Storage Ambient Humidity	HA	%	5	- -	95
Power Supply Voltage (Max)	Vcc	V	-0.5	- -	4
Signal Input Voltage	- -	V	-0.3	- -	Vcc +0.3
Receiver Damage Threshold	- -	dBm	+5	- -	- -
Recommended Operating Conditions					
Case Operating Temperature					
QNC1312-10D	Tcase	°C	0	- -	70
QNC1312-10DE			-10	- -	80
QNC1312-10DA			-40	- -	85
Ambient Humidity (non condensing)	HA	%	5	- -	70
Power Supply Voltage	Vcc	V	3.13	3.3	3.47
Power Supply Current	Icc	mA	- -	- -	280
Power Supply Noise Rejection 100 Hz to 1 MHz	- -	mVp-p	- -	- -	100
Data Rate (TX Rate / RX Rate)	- -	Mbps	- -	1250 / 1250	- -
Transmission Distance	- -	KM	- -	- -	10
Supply Current	- -	Single mode fiber			9/125 µm SMF
Transmitter					
Average Output Power	POUT	dBm	-5	- -	0
Extinction Ratio	ER	dB	9	- -	- -
Center Wavelength	λC	nm	1270	1310	1360
Side Mode Suppression Ratio	SMSR	dB	30	- -	- -
Spectrum Bandwidth (-20 dB)	σ	nm	- -	- -	1
Transmitter OFF Output Power	POff	dBm	- -	- -	-45
Differential Line Input Impedance	RIN	Ohm	90	100	110
Jitter P-P [1]	tJ	UI	- -	- -	0.1
Output Eye Mask [2]	Compliant with IEEE802.3 z (class 1 laser safety)				- -
Receiver					
Input Optical Wavelength	λIN	nm	1270	- -	1610
Receiver Sensitivity [3]	PIN	dBm	- -	- -	-24
Input Saturation Power (Overload)	PSAT	dBm	-1	- -	- -
Loss Of Signal Assert	PA	dBm	-38	- -	- -
Loss Of Signal De-assert [4]	PD	dBm	- -	- -	-25
LOS Hysteresis	PA-PD	dB	0.5	2	6
Electrical Interface Characteristics					
Transmitter					
Total Supply Current [5]	Icc	mA	- -	- -	A
Transmitter Disable Input-High	VDISH	V	2	- -	Vcc +0.3
Transmitter Disable Input-Low	VDISL	V	0	- -	0.8
Transmitter Fault Input-High	VDISL	V	2	- -	Vcc +0.3
Transmitter Fault Input-Low	VTxFH	V	0		0.8
Receiver					
Total Supply Current [5]	Icc	mA	- -	- -	B
LOSS Output Voltage-High	VLOSH	V	2	- -	Vcc +0.3
LOSS Output Voltage-Low	VLOSL	V	0	- -	0.8

Notes:
1. Measure at 2 ^ 7 - 1 NRZ PRBS pattern.
2. Transmitter eye mask definition.
3. Measured with light source 1310 nm, ER = 9 dB; BER = <10 ^ -12 @PRBS = 2 ^ 7-1 NRZ.
4. When SD de-assert, the RX-LOS output is signal output.
5. A (TX) + B (RX) = 280 mA (not included in the termination circuit)

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 laster product
Component Recognition	IEC/EN 60950, UL	Compatible with standards
RoHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards

Diagrams



Pin Descriptions

PIN OUT OF CONNECTOR BLOCK ON HOST BOARD

Pin	Symbol	Name / Description
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)	2-wire Serial Interface Data Line [4]
5	MOD_DEF(1)	2-wire Serial Interface Clock Line [3]
6	MOD_DEF(0)	Module Absent. 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 TDIS >2.0 V or open, enabled on TDIS <0.8 V.
3. Should be pulled up with 4.7 to 10 kOhms on host board to a voltage between 2.0 and 3.6 V.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 > 30 kOhm resistor. The input states are:
   - Low (0 – 0.8 V) Reduced bandwidth
   - (> 0.8, < 2.0 V) Undefined
   - High (2.0 – 3.465 V) Full bandwidth
   - Open Reduced bandwidth
5. LOS is open collector output. It should be pulled up with 4.7 to 10 KOhms on host board to a voltage between 2.0 and 3.6 V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

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Pub DS.SFP Transceiver.SFP-SF1312-40D-PCT.20151216