SFP-10G-SR-PCT

10 Gb/s 850nm Multi-Mode SFP+ Transceiver

Description

PCT's SFP-10G-SR-PCT transceiver supports the 2 wire serial communication protocol as defined in the SFP MSA1. The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer and other information.

Additionally, PCT'S SFP+ transceiver provides a unique enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning lags alerting end-users when particular operating parameters are outside of a factory set normal range.

The SFP-10G-SR-PCT defines a 256 byte memory map in EEPROM that is accessible over a 2 wire serial interface at the 8 bit address 1010000X (A2h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through a 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into the SFP transceiver into those segments of the E2PROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

Hardware Features

- 10 Gb/s serial optical interface compliant to 802.3ae 10GBASE-SR
- 850 nm VCSEL transmitter, PIN photo-detector
- Duplex LC connector
- Metal enclosure, for lower EMI
- Electrical interface compliant to SFF-8431
- Specifications for 10 Gigabit SFP+
- 2 wire interface for management
- Specifications compliant with SFF 8472
- Single 3.3 V power supply
- Case operating temperature range: -5 to 70°C

Applications

- 10GBASE-SR/SW 10G Ethernet

Standards

- Conforms to SFF-8472 SFP+ MSA
- Conforms to SFP+ SFF-8431 and SFF-8432
- Conforms to 802.3ae 10GBASE-SR
- RoHS compliant

Ordering Information

SFP-10G-SR-PCT	Small Form Factor, Transceiver, Multi Mode, 10G

SFP-10G-SR-PCT

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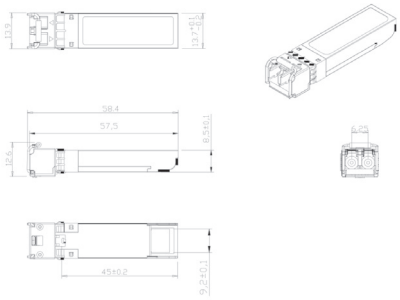
Specifications

Parameters	Symbol	Unit	SFP-10G-SR-PCT		
Absolute Maximum Ratings			Min	Typ	Max
Supply Voltage (Max)	Vcc	V	-0.5	- -	4.7
Storage Temperature	TS	°C	-40	- -	85
Case Operating Temperature	Tcase	°C	-5	- -	70
Electrical Characteristics (Tcase = -5 to 70 °C, VCC = 3.14 to 3.46Volts)					
Supply Voltage	Vcc	V	3.14	3.3	3.46
Supply Current	Icc	mA	- -	- -	250
Transmitter					
Input differential impedance [1]	Rin	Ohms		100	
Single ended data input swing	V in, pp	mV	180	- -	700
Transmit Disable Voltage	VD	V	Vcc-1.3	- -	Vcc
Transmit Enable Voltage [2]	VEN	V	Vee	- -	Vee +0.8
Transmit Disable Assert Time	- -	µs	- -	- -	10
Receiver					
Differential data output swing [3]	V out, pp	mV	300	- -	850
Data output rise time [4]	tr	ps	28	- -	- -
Data output fall time [4]	tf	ps	28	- -	- -
LOS Fault [5]	VLOS fault	V	Vcc–1.3	- -	VccHOST
LOS Normal [5]	VLOS norm	V	Vee	- -	Vee +0.8
Power Supply Rejection [6]	PSR	mVpp	100	- -	- -
Optical Characteristics (Tcase = -5 to 70 °C, VCC = 3.14 to 3.46 Volts)					
Transmitter					
Output Opt. Power [7]	Pout	dBM	-6		-1
Optical Wavelength	λ	nm	840	850	860
Optical Extinction Ratio	ER	dB	3.0		
RIN	RIN	dB / Hz			-128
Output Eye Mask	- -	- -	Compliant with IEEE 0802.3ae		
Receiver					
Rx Sensitivity [8]	Rsens	dBm			-10
Input Saturation Power (Overload)	Psat	dBM	0.5		
Wavelength Range	λ_C	nm	770	850	860
LOS De -Assert	LOSD	dBm			-14
LOS Assert	LOSA	dBm	-30		
LOS Hysteresis	- -		0.5		

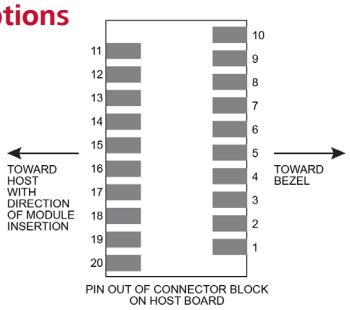
Notes:
1. Connected directly to TX data input pins. AC coupled thereafter.
2. Or open circuit.
3. Into 100 ohms differential termination.
4. These are unfiltered 20-80% values
5. Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
6. Receiver sensitivity is compliant with power supply sinusoidal modulation of 20 Hz to 1.5 MHz up to specified value applied through the recommended power supply filtering network.
7. Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.
8. With worst-case extinction ratio. Measured with a PRBS 2

Feature	Reference	Performance
Regulatory Compliance		
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	Symbol	Name / Description
1	V_{EET}	Transmitter Ground (Common with Receiver Ground) [1]
2	T_{FAULT}	Transmitter Fault. [2]
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open. [3]
4	SDA	2-wire Serial Interface Data Line [4]
5	SCL	2-wire Serial Interface Clock Line [4]
6	MOD_ABS	Module Absent. Grounded within the module [4]
7	RS0	Rate Select 0 [5]
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. [6]
9	RS1	No connection required [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)
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. T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7k to 10 k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8 V.
3. Laser output disabled on T_{DIS} >2.0 V or open, enabled on T_{DIS} <0.8 V.
4. Should be pulled up with 4.7k to 10k Ohms on host board to a voltage between 2.0 and 3.6 V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is open collector output. It should be pulled up with 4.7k – 10k Ohms on host board to a voltage between 2.0 and 3.6 V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Call +1.800.306.8948 for more information

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