

SPT-P136G-20D

1310 nm 4.9G/6.144Gbps SFP+ Transceiver 20km for CPRI and OBSAI

Features

- Support Multi Rate up to 4.9G/6.144Gbps
- CPRI/OBSAI Compatible Optical Interface
- Hot Pluggable SFP+ footprint
- 1310nm DFB transmitter, PIN photo-detector
- Transmission distance up to 20km on 9/125 μ m SMF
- Digital Status monitoring Interface
- Duplex LC connector
- RoHS compliant and Lead Free
- Metal enclosure for lower EMI
- Single 3.3V power supply
- Power dissipation <1W
- Compliant with FC-PI-4 800-Mx-SN-I, SFF-8431 , SFF-8432 and SFF-8472
- Operating case temperature:
Standard: 0 to +70°C
Extend: -20 to 85°C
Industrial: -40 to +85°C

Applications

- Radio Base Station
- LTE optical repeater application
- OBSAI interface, such as 6.144 Gb/s, 3.072 Gb/s, 1.536 Gb/s, 0.768Gb/s
- CPRI interface, such as 6.144 Gb/s, 4.915 Gb/s, 2.458 Gb/s, 1.229 Gb/s, 0.614Gb/s

Description

SPT-P136G-20D is a high performance, cost effective modules, which is supporting Multi Rate 4.9G/6.144Gbps and transmission distance up to 20km on SM fiber. The transceiver consists of two sections: The transmitter section incorporates a 1310nm DFB driver and re-timer. The receiver section consists of a PIN photodiode integrated with a Trans impedance preamplifier (TIA). The module is

hot pluggable into the 20-pin connector. The high-speed electrical interface is based on low voltage logic, with nominal 100 Ohms differential impedance and AC coupled in the module.

Absolute Maximum Ratings

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Units
Supply Voltage	Vcc	0	+3.8	V
Storage Temperature	Tc	-40	+85	C
Operating Case Temperature	Tc	0	+70	C
Relative Humidity	RH	0	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc	3.0	3.3	3.6	V
Supply current	Icc			220	mA
Operating Case Temperature	Tc	0	25	70	°C
Module Power Dissipation	Pm		0.7	1.1	W

Notes:

1. Supply current is shared between VCCTX and VCCR_X.
2. In-rush is defined as current level above steady state current requirements.

LOW Speed Characteristics

Parameter	Symbol	Min	Typical	Max	Unit
Power Consumption				1	W
TX_Fault, RX_LOS	VOL	0		0.4	V
	VOH	Host_Vcc-0.5		Host_Vcc+0.3	V
TX-DIS	VIL	-0.3		0.8	V
	VIH	2.0		VCCT+0.3	V
RS0,RS1	VIL	-0.3		0.8	V
	VIH	2.0		VCCT+0.3	V

Optical Characteristics

Parameter	Symbol	Min.	Typical	Max	Unit	Ref
Transmitter						
Output Opt. Power,6.144 Gb/s	PO	-4		0	dBm	1

Optical Wavelength	λ	1285	-	1345	nm	2
Side Mode Suppression Ratio	SMSR _{min}	30	-		dB	2
Optical Modulation Amplitude	OMA	290	-		uW	2,3
Transmitter and Dispersion Penalty, 6.144Gb/s	TDP			0.2	dB	4
Receiver						
Unstressed Receiver OMA Sensitivity, 6.144 Gb/s	RSENS _r			0.042	mW	5
Average Received Power		-15		0	dBm	
Optical Center Wavelength	λ_C	1260		1360	nm	
Return Loss		12			dB	
LOS De-Assert	LOSD			-16	dBm	
LOS Assert	LOSA	-26	-		dBm	
LOS Hysteresis		0.5	-		dB	

Notes:

1. High Bandwidth Mode. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. Also specified to meet curves in FC-PI-4 Rev 8.001 Figures 21, 22, and 23, which allow trade-off between Wavelength, spectral width and OMA.
3. Equivalent extinction ratio specification for Fiber Channel. Allows smaller ER at higher average power.
4. For 6.144 Gb/s operation, Jitter values for gamma T and gamma R are controlled by TDP and stressed receiver sensitivity.
5. Measured with conformance signals defined in FC-PI-4 Rev. 8.00 specifications. Value in OMA. Measured with PRBS 2⁷-1 at 10⁻¹² BER.

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max	Unit	Ref
Supply Voltage	V _{cc}	3.00		3.60	V	1
Supply Voltage	I _{cc}			220	mA	1
Transmitter						
Input differential impedance	R _{in}		100		Ω	2
Single ended data input swing	V _{in,pp}	150	-	900	mV	
Transmit Disable Voltage	VD	2	-	VCC	V	
Transmit Enable Voltage	VEN	V _{ee}	-	V _{ee} +0.8	V	3
Receiver						
Single ended data output swing	V _{out, pp}	300		800	mV	4
Data output rise/fall time, 6.144 Gb/s	Tr, tf			60	ps	5

LOS Fault	$V_{\text{LOS fault}}$	2		VCCHOST	V	6
LOS Normal	$V_{\text{LOS norm}}$	Vee		Vee+0.8	V	6

Notes:

1. Module power consumption never exceeds 1W.
2. AC coupled.
3. Or open circuit.
4. Into 100 ohm differential termination.
5. 20 – 80 %.
6. LOS is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

General Specifications

Parameter	Symbol	Min.	Typical	Max	Unit	Ref
Data Rate	DR	2.125		6.144	Gb/s	1
Bit Error Rate	BER			10^{-12}		2
Max. Supported Link Length on 9/125 μm SMF	L		20		Km	3

Notes:

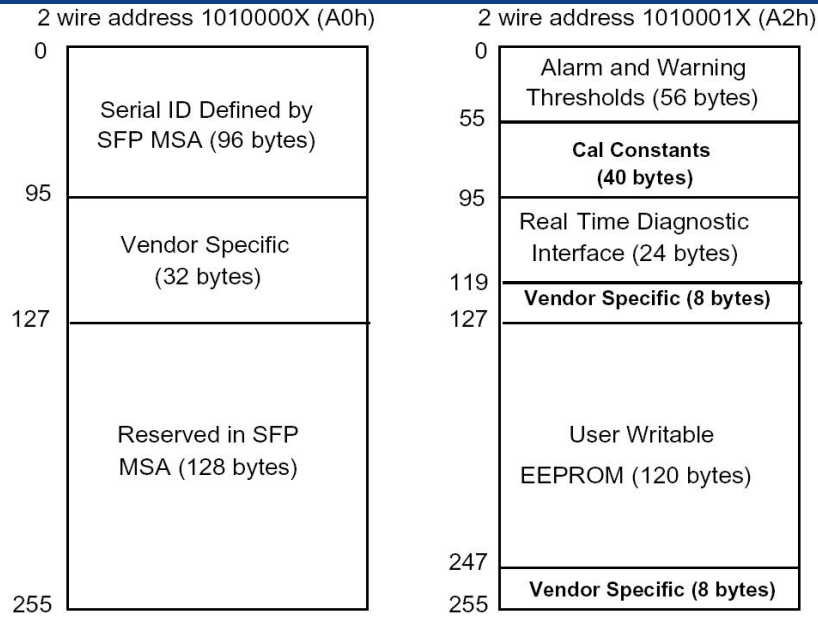
1. 2x/4x/8x Fiber Channel compliant.
2. Tested with a PRBS 2^7-1 test pattern.
3. Distances are based on FC-PI-4 Rev. 8.00¹ and IEEE 802.3 standards

Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

The digital diagnostic memory map specific data field defines as following.



Pin Definitions

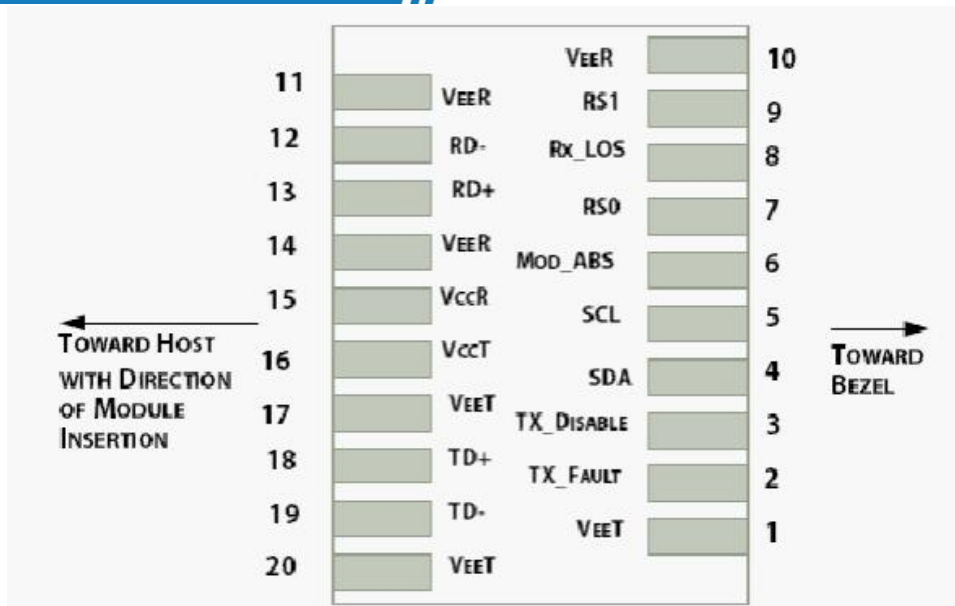


Figure 1: Interface to Host PCB

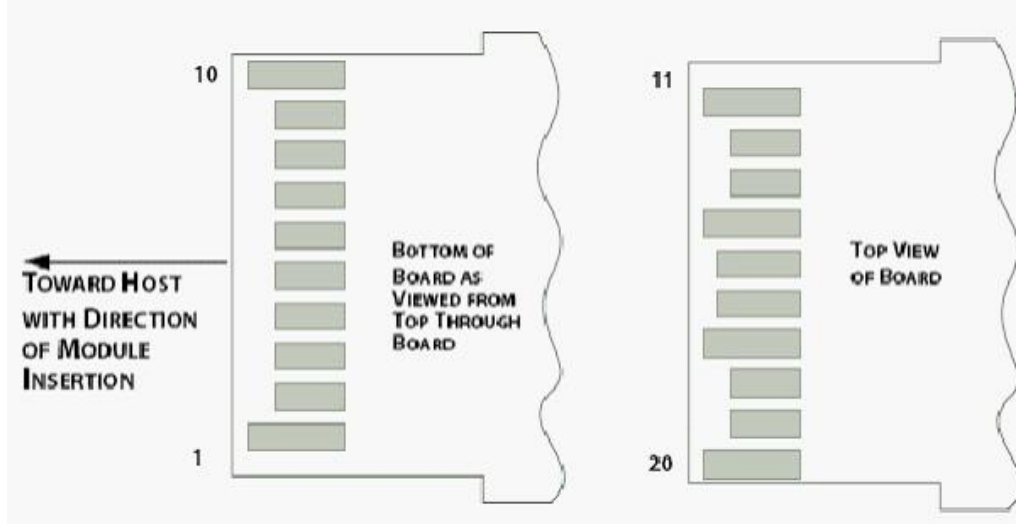


Figure 2: Module Contact Assignment

Pin Definition

Pin	Symbol	Name/Description
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

Notes:

[1] Module circuit ground is isolated from module chassis ground within the module.

- [2].should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.
- [3]Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pull-up to Vcc T inside the module.
- [4]Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to 10 kΩ. Mod_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.
- [5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.

Recommended Interface Circuit

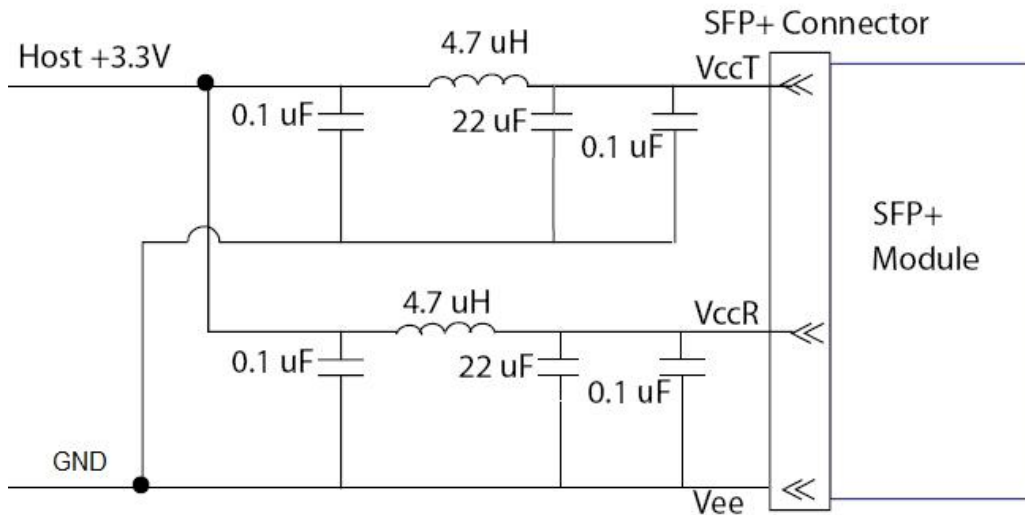


Figure3. Host Board Power Supply Filters Circuit

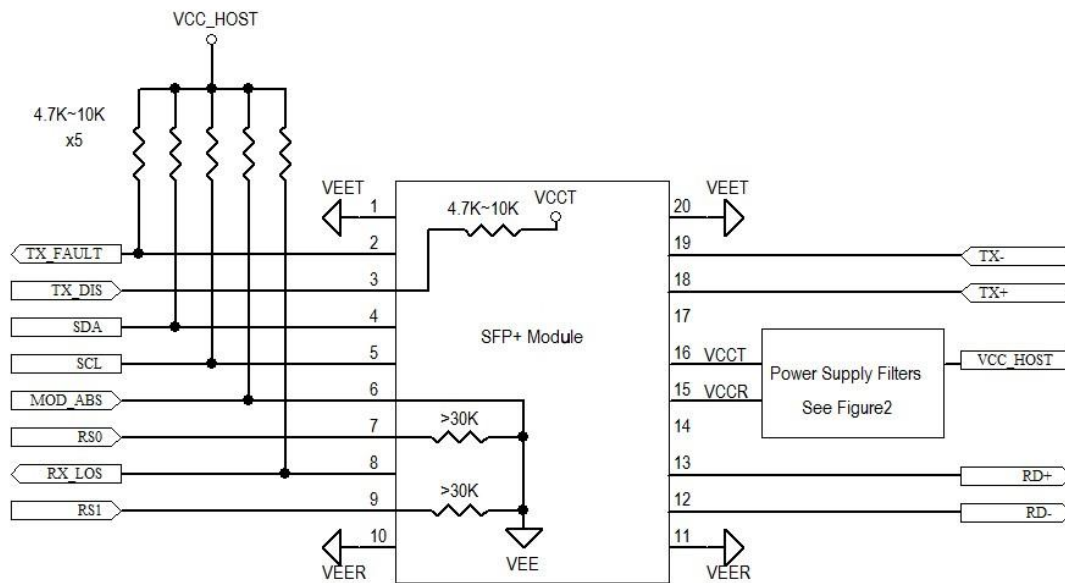
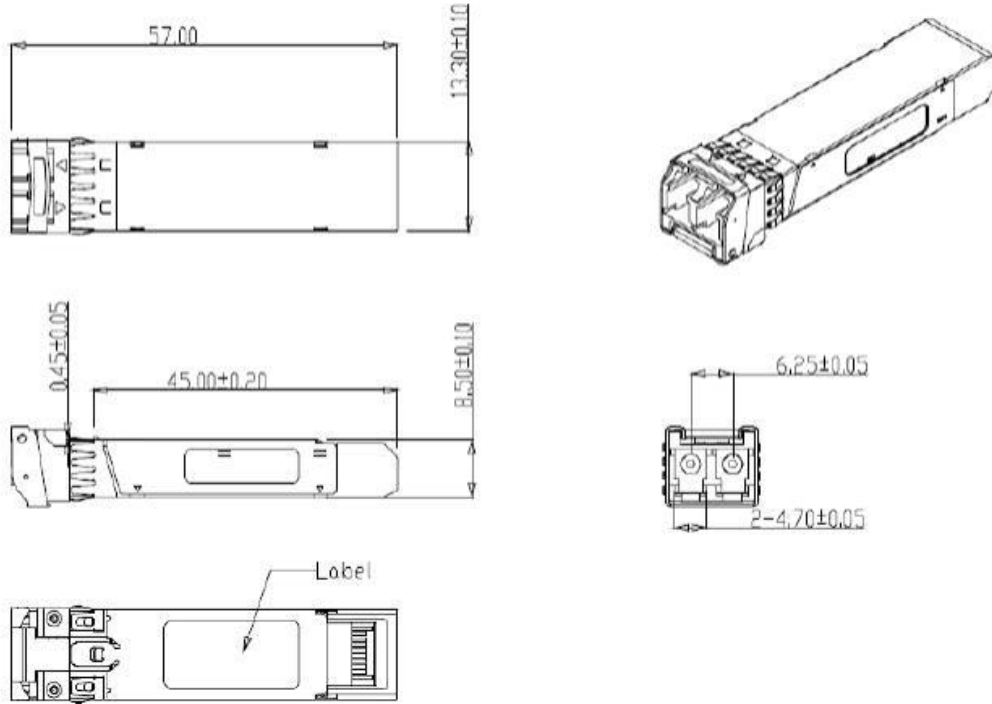


Figure4. Host-Module Interface

Mechanical Dimensions



Unit:mm

Ordering information

Part Number	Product Description
SPT-P136G-20D	1310nm, 4.9G/6.144Gbs, 20km, 0°C ~ +70°C,DDM

Note: If you need more customized services, please contact us.

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