SPT-P136G-10D

1310 nm 4.9G/6.144Gbps SFP+ Transceiver 10km 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 10km on 9/125μm 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

Applications

- Radio Base Station
- LTE optical repeater application
- OBSAI interface, such as 6.144/1.536/3.072/1.536Gbps and 768Mbps
- CPRI interface, such as 6.144/3.072/2.4576/1.228Gbps and 614Mbps

Description

SPT-P136G-10D is a high performance, cost effective modules, which is supporting Multi Rate 4.9G/6.144Gbps and transmission distance up to 10km 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.

Pin Assignment

The SFP+ modules are hot-pluggable. Hot pluggable refers to plugging in or unplugging a module while the host board is powered. The SFP+ host connector is a 0.8 mm pitch 20 position right angle improved connector specified by SFF-8083, or stacked connector with equivalent with equivalent electrical performance.
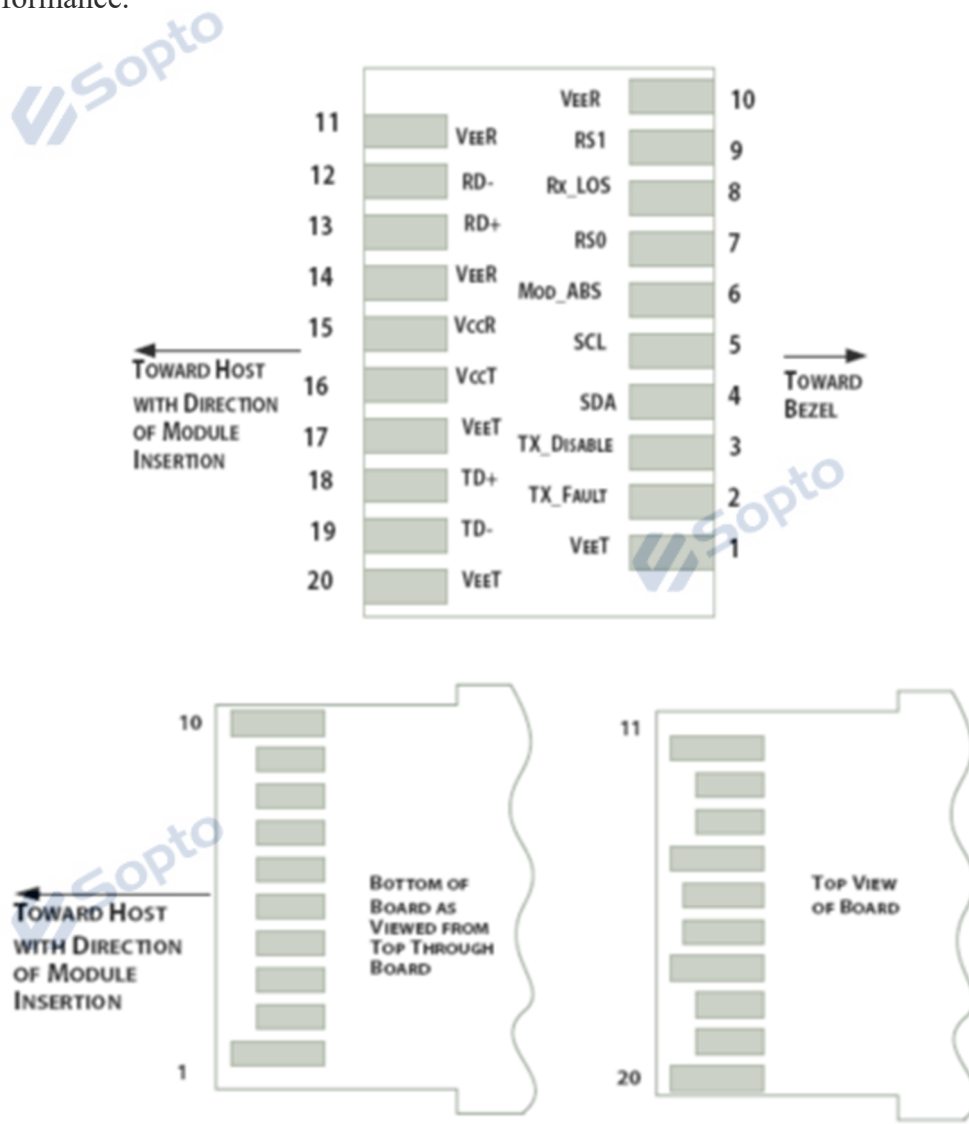
Module Contact Assignment

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]	RS0 for Rate Select: Open or Low = Module supports ≤4.25Gbps High = Module supports 9.95 Gb/s to 10.3125 Gb/s
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	No connection required
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

Absolute Maximum Rating

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
Power Supply Voltage	Vcc	0	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Relative Humidity	RH	5	95	%

Recommended operating environment

Recommended Operating Environment specifies parameters for which the electrical and optical Characteristics hold unless otherwise noted.

Parameter	Symbol	Min	Typical	Max	Unit
Power Supply Voltage	Vcc	3.315	3.300	3.465	V
	Icc			300	mA
Operating Case Temperature	Tc	0	25	70	°C
	Tc	-40	25	85	°C

Power Dissipation	PD			1	W
Data Rate	CPRI/OBSAI			6.25	Gbps
Transmission Distance				10	km

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	Notes
Transmitter						
Center Wavelength	λ_t	1284	1310	1345	nm	Note1
RMS spectral width	Pm	-	-	1	nm	
Average Optical Power	Pavg	-5	-	0	dBm	Note1
Laser OffPower	Poff		-	-30	dBm	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	Rin			-128	dB/Hz	
Optical Eye Mask	Compliant with IEEE 802.3ae					
Single Ended Output Voltage Tolerance		-0.3		4	V	
Common Mode Voltage Tolerance		15			mV	
Tx Input Diff Voltage	VI	180		700	mV	
Data Dependent Input Jitter	DDJ			0.1	UI	
Data Input Total Jitter	TJ			0.28	UI	
Receiver						
Center Wavelength	λ_r	1260	-	1360	nm	

Receiver Sensitivity	Psens	-	-	-15	dBm	
LOS Assert	Los	-26	-		dBm	
LOS De-assert	LosD			-16	dBm	
Los Hysteresis	LosH	0.5			dBm	
Overload	Pin	0-	-		dBm	
Stressed Eye Jitter		-0.3	-		UIp-p	
Receiver electrical 3dB upper cutoff frequency				12.3	GHz	
Vertical Eye Closure Penalty		2.2			Db	
Single Ended Output Voltage Tolerance		-0.3		4	v	
Rx Output Diff Voltage	Vo	450		850	Mv	
Rx Output Rise and Fall Time	Tr/Tf	30			PS	
Total Jitter	TJ			0.7	UI	
Deterministic Jitter	DJ			0.42	UI	
Stressed Receiver Sensitivity in OMA				-10.3	dBm	
Receiver Reflectance				-12	dB	Note3

Notes:

[1] Average optical power shall be measured using the methods specified in TIA/EIA-455-95.

[2] Vertical eye closure penalty and stressed eye jitter are the test conditions for measuring stressed receiver Sensitivity. They are not the required characteristic of the receiver.

Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF8472 Rev9.2 with internal calibration mode. For external calibration mode please contact our sales stuff.

Parameter	Symbol	Min.	Max	Unit	Notes
Accuracy					
Transceiver Temperature	DMI_Temp	-3	+3	degC	Over operating temp
TX Output optical power	DMI_TX	-3	+3	dB	
RX Input optical power	DMI_RX	-3	+3	dB	-3dBm to -12dBm range
Transceiver Supply voltage	DMI_VCC	-0.08	+0.08	V	Full operating range
Bias current monitor	DMI_Ibias	-10%	10%	mA	
Dynamic Range Accuracy					
Transceiver Temperature	DMI_Temp	0	70	degC	
TX Output optical power	DMI_TX	-5	0	dBm	
RX Input optical power	DMI_RX	-15	0	dBm	
Transceiver Supply voltage	DMI_VCC	3.0	3.6	V	
Bias current monitor	DMI_Ibias	0	16	mA	

Control and status I/O timing characteristics

Timing characteristics of control and status I/O are included in Table 8, which is also defined in SFF-8431.

Parameter	Symbol	Min.	Max.	Unit	Conditions
TX_Disable assert time	t_off		100	µs	rising edge of TX_Disable to fall of output signal below 10% of nominal
TX_Disable negate time	t_on		2	ms	Falling edge of Tx_Disable to rise of output signal above 90% of nominal. This only applies in normal operation, not during start up or fault recovery.
Time to initialize 2-wire interface	t_2w_start_up		300	ms	From power on or hot plug after the supply meeting Table 8.
Time to initialize	t_start_up		300	ms	From power supplies meeting Table 8 or hot plug or Tx disable negated during power up, or Tx_Fault recovery, until non-cooled power level I part (or non-cooled power level II part already enabled at power level II for Tx_Fault recovery) is fully operational.
Time to initialize cooled module	t_start_up_cooled		90	s	From power supplies meeting Table 8 or hot plug, or Tx disable negated during power up or Tx_Fault recovery, until cooled power level I part (or cooled power level II part during fault recovery) is fully operational.
Time to Power Up to Level II	t_power_level2		300	ms	From falling edge of stop bit enabling power level II until non-cooled module is fully operational
Time to Power Down from Level II	t_power_down		300	ms	From falling edge of stop bit disabling power level II until module is within power level I requirements
TX_Fault assert	TX_Fault_on		1	ms	From occurrence of fault to assertion of TX_Fault
TX_Fault assert for cooled module	TX_Fault_on_cooled		50	ms	From occurrence of fault to assertion of TX_Fault
TX_Fault Reset	t_reset	10		µs	Time TX_Disable must be held high to reset TX_Fault
RS0, RS1 rate select timing for FC	t_RS0_FC, RS1_FC		500	µs	From assertion till stable output
RS0, RS1 rate select timing non FC	t_RS0, t_RS1		10	ms	From assertion till stable output
Rx_LOS assert delay	t_los_on		100	µs	From occurrence of loss of signal to assertion of Rx_LOS
Rx_LOS negate delay	t_los_off		100	µs	From occurrence of presence of signal to negation of Rx_LOS

Mechanical Dimensions
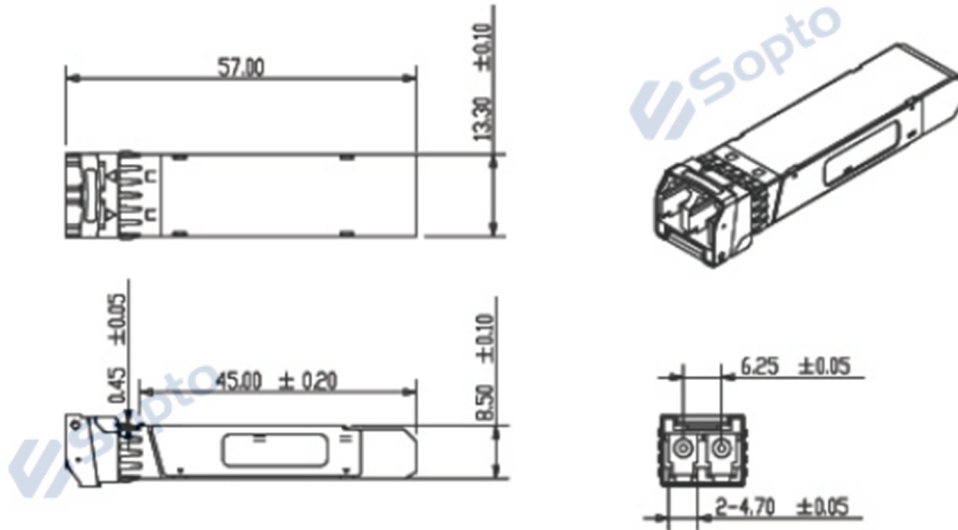
Unit:mm

Ordering information

Part Number	Product Description
SPT-P136G-10D	1310nm, 4.9G/6.144Gbs, 10km, 0ºC ~ +70ºC,DDM

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

E-mail: info@sopto.com.cn

Web   :   http://www.sopto.com.cn