

Product Features

- ✧ Duplex LC connector
- ✧ Hot-pluggable SFP28 footprint C-band cooled EML laser
- ✧ High performance PIN receiver
- ✧ RoHS compliant and Lead Free
- ✧ Distance up to 10km on 9/125um SMF
- ✧ Metal enclosure for lower EMI
- ✧ Power dissipation<2.3W
- ✧ Commercial and Extend operating temperature optional



Applications

- ✧ 25.78 Gb/s single lane
- ✧ Other optical links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
FH-SPDxx2TCDL10	-3~ 5 db	-11db	25G	C-band	10KM

General

FH-SPDxx2TCDL10 25G SFP28 DWDM transceiver is designed to transmit and receive optical data over single mode optical fiber for link length 10km.

single-mode transceiver is SFP28 module for duplex optical data communications support up to 25.78Gb/s. It is with the SFP+ 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I C. It has built-in clock and data recovery (CDR). This module is designed for single-mode fibre.

Product Selection

Channel#	Product Code	Frequency (THz)	Cent Wavelength (nm)
17	FH-SPD172TCDL10	191.7	1563.86
18	FH-SPD182TCDL10	191.8	1563.05
19	FH-SPD192TCDL10	191.9	1562.23
20	FH-SPD202TCDL10	192.0	1561.42
21	FH-SPD212TCDL10	192.1	1560.61
22	FH-SPD222TCDL10	192.2	1559.79
23	FH-SPD232TCDL10	192.3	1558.98
24	FH-SPD242TCDL10	192.4	1558.17
25	FH-SPD252TCDL10	192.5	1557.36
26	FH-SPD262TCDL10	192.6	1556.55
27	FH-SPD272TCDL10	192.7	1555.75
28	FH-SPD282TCDL10	192.8	1554.94
29	FH-SPD292TCDL10	192.9	1554.13
30	FH-SPD302TCDL10	193.0	1553.33
31	FH-SPD312TCDL10	193.1	1552.52
32	FH-SPD322TCDL10	193.2	1551.72
33	FH-SPD332TCDL10	193.3	1550.92
34	FH-SPD342TCDL10	193.4	1550.12
35	FH-SPD352TCDL10	193.5	1549.32
36	FH-SPD362TCDL10	193.6	1548.51
37	FH-SPD372TCDL10	193.7	1547.72
38	FH-SPD382TCDL10	193.8	1546.92
39	FH-SPD392TCDL10	193.9	1546.12
40	FH-SPD402TCDL10	194.0	1545.32
41	FH-SPD412TCDL10	194.1	1544.53
42	FH-SPD422TCDL10	194.2	1543.73
43	FH-SPD432TCDL10	194.3	1542.94

44	FH-SPD442TCDL10	194.4	1542.14
45	FH-SPD452TCDL10	194.5	1541.35
46	FH-SPD462TCDL10	194.6	1510.56
47	FH-SPD472TCDL10	194.7	1539.77
48	FH-SPD482TCDL10	194.8	1538.98
49	FH-SPD492TCDL10	194.9	1538.19
50	FH-SPD502TCDL10	195.0	1537.10
51	FH-SPD512TCDL10	195.1	1536.61
52	FH-SPD522TCDL10	195.2	1535.82
53	FH-SPD532TCDL10	195.3	1535.04
54	FH-SPD542TCDL10	195.4	1534.25
55	FH-SPD552TCDL10	195.5	1533.47
56	FH-SPD562TCDL10	195.6	1532.68
57	FH-SPD572TCDL10	195.7	1531.90
58	FH-SPD582TCDL10	195.8	1531.12
59	FH-SPD592TCDL10	195.9	1530.33
60	FH-SPD602TCDL10	196.0	1529.55
61	FH-SPD612TCDL10	196.1	1528.77

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Note
Storage Temperature	TS	-40	85	°C	
Relative Humidity	RH	0	85	%	
Supply Voltage	Vcc	-0.5	4.0	V	

General Operating Conditions

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	DR		25.78125		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc5			680	mA	
Operating Case Temp.	Tc	0		70	°C	
	Tl	-40		85		

Electrical Input/Output Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Differential data input swing	VIN,PP	100		800	mVpp	
Transmit Disable Voltage	VD	VCC-0.8		Vcc	V	
Transmit Enable Voltage	VEN	Vee		Vee+0.8	V	
Input differential impedance	Rin		100		Ω	
Receiver						
Differential data output swing	Vout,pp	185		425	mVpp	
Output rise time and fall time	Tr, Tf	28			Ps	1
LOS asserted	VLOS_F	VCC-0.8		Vcc	V	2
LOS de-asserted	VLOS_N	Vee		Vee+0.8	V	2

Notes:

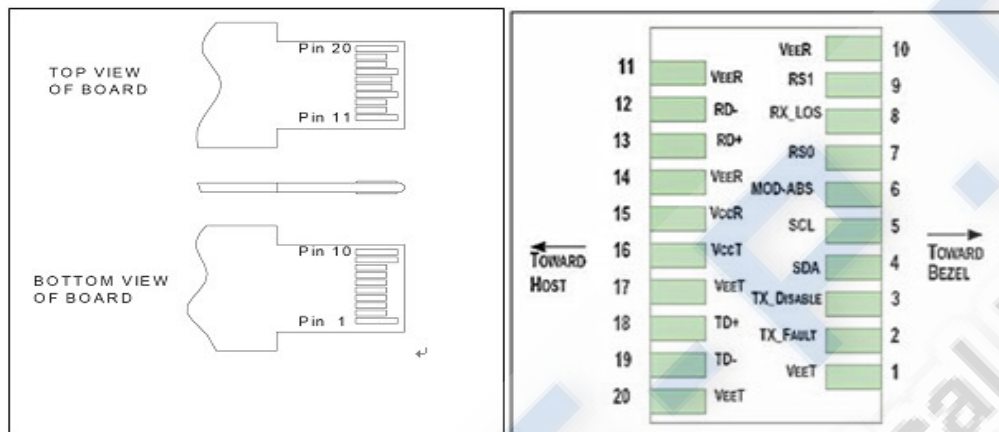
1. 20 – 80%. Measured with Module Compliance Test Board and OMA test pattern. Use of four 1's and four 0's sequence in the PRBS 9 is an acceptable alternative.
2. LOS is an open collector output. Should be pulled up with 4.7kΩ – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1.

Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Center Wavelength	λ_c	As per ITU-T 694.1			nm	
Center Wavelength (End of Life)	λ_{c_EOL}		$\lambda_c \pm 100\text{pm}$			
Ave. output power (Enabled)	P_{AVE}	-3		5	dBm	1
Side-Mode Suppression Ratio	SMSR	35			dB	
Extinction Ratio	ER	3.5			dB	
RMS spectral width	$\Delta\lambda$			0.4	nm	
Rise/Fall time (20%~80%)	T_r/T_f			50	ps	
Relative Intensity Noise	RIN			-128	dB/Hz	
Receiver						
Operating Wavelength	λ	1529		1565	nm	
Receiver Sensitivity	P_{SEN}			-11	dBm	2
Overload	P_{AVE}	-2			dBm	
LOS Assert	P_a	-30			dBm	
LOS De-assert	P_d			-12	dBm	
LOS Hysteresis	$P_d - P_a$	0.5			dB	

Notes1) 1.Measured with data rate at 25.78Gb/s,ER=7dB, $T_c=25\text{degC}$, BER less than $5E-5$ with PRBS2³¹-1.

Pin Definitions And Functions



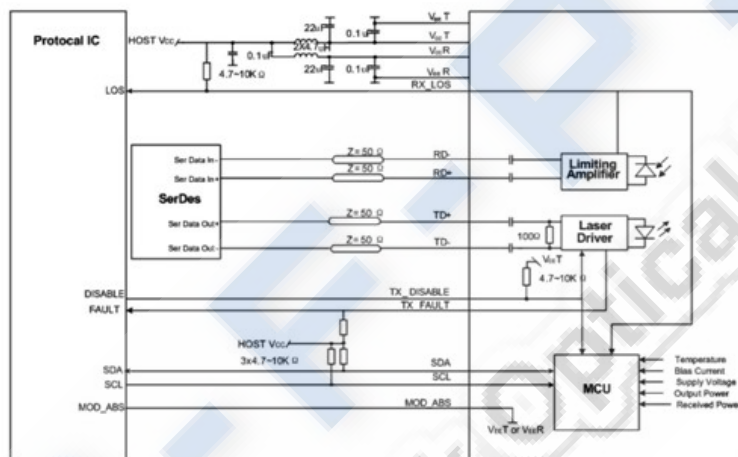
Pin	Symbol	Name/Description
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1	Rate Select 1
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:

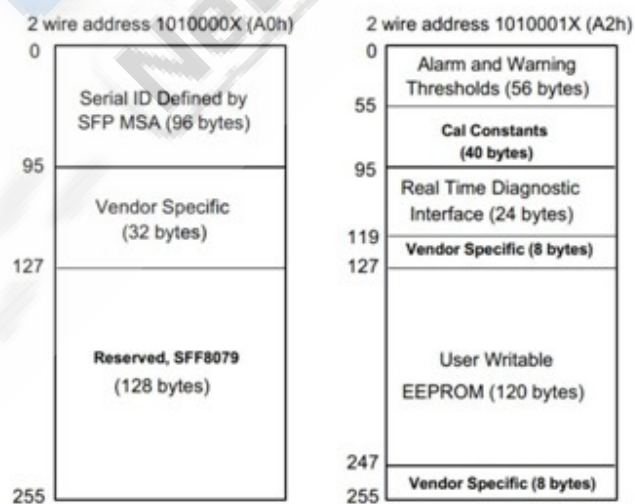
1. Module circuit ground is isolated from module chassis ground within the module.
2. should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.
3. Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.

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.

Functional Diagram



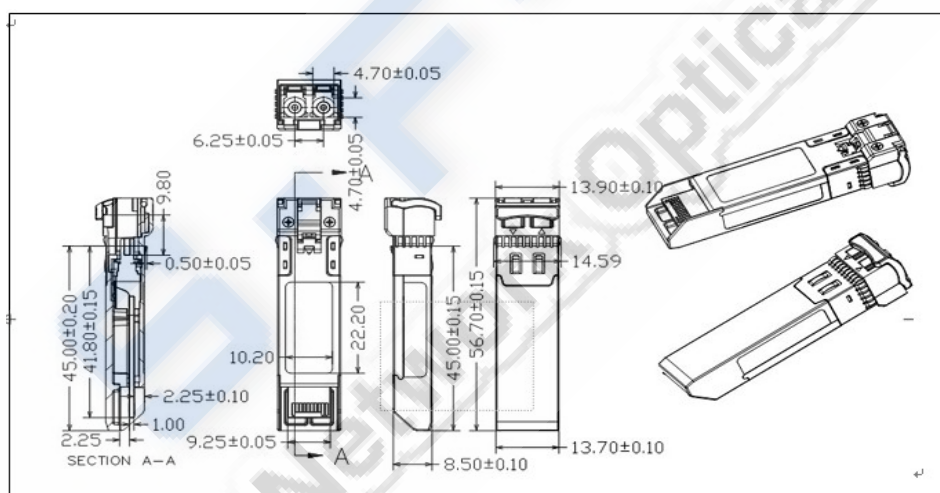
EEPROM Information



Digital Diagnostic Specifications

Parameter	Symbol	Units	Min.	Max.	Accuracy	Note
Transceiver temperature	DTemp-E	°C	-45	+90	±5°C	1,2
Transceiver supply voltage	DVoltage	V	2.8	4.0	±3%	
Transmitter bias current	DBias	mA	0	127	±10%	3
Transmitter output power	DTx-Power	dBm	-5	+7	±2dB	
Receiver average input power	DRx-Power	dBm	-14	3	±3dB	

Package Dimensions



For More Information

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