WT-SFP+ DWDM

10Gb/s DWDM 80KM SFP+ Transceiver

PRODUCT FEATURES

- Hot-pluggable SFP+ footprint
- Supports 9.5 to 10.3Gb/s bit rates
- Power dissipation < 1.5W
- Single 3.3V power supply
- Maximum link length of 80km
- DWDM wavelength EML transmitter, APD photo-detector
- Duplex LC connector
- Power dissipation < 1.5W
- Built-in digital diagnostic functions
- Case temperature range： -5°C to 70°C

APPLICATIONS

- 10GBASE-ZR/ZW 10G Ethernet

STANDARD

- Compliant with SFF-8472 SFP+ MSA.
- Compliant to SFP+ SFF-8431 and SFF-8432.
- Compliant to 802.3ae 10GBASE-ZR.
- RoHS Compliant.

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PRODUCT DESCRIPTION

WT-SFP+DWDM-XX-ZR is designed for use in 10-Gigabit Ethernet links up to 80km over single mode fiber. The module consists of DWDM EML Laser, APD and Preamplifier in a high-integrated optical sub-assembly. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF8472. The module data link up to 80km in 9/125um single mode fiber.

Channel #	Part Number	Frequency (THz)	Center Wave (nm)
21	WT-SFP+-DWDM-ER/ZR-21	192.1	1560.61
22	WT-SFP+-DWDM-ER/ZR-22	192.2	1559.79
23	WT-SFP+-DWDM-ER/ZR-23	192.3	1558.98
24	WT-SFP+-DWDM-ER/ZR-24	192.4	1558.17
25	WT-SFP+-DWDM-ER/ZR-25	192.5	1557.36
26	WT-SFP+-DWDM-ER/ZR-26	192.6	1556.55
27	WT-SFP+-DWDM-ER/ZR-27	192.7	1555.75
28	WT-SFP+-DWDM-ER/ZR-28	192.8	1554.94
29	WT-SFP+-DWDM-ER/ZR-29	192.9	1554.13
30	WT-SFP+-DWDM-ER/ZR-30	193.0	1553.33
31	WT-SFP+-DWDM-ER/ZR-31	193.1	1552.52
32	WT-SFP+-DWDM-ER/ZR-32	193.2	1551.72
33	WT-SFP+-DWDM-ER/ZR-33	193.3	1550.92
34	WT-SFP+-DWDM-ER/ZR-34	193.4	1550.12
35	WT-SFP+-DWDM-ER/ZR-35	193.5	1549.32
36	WT-SFP+-DWDM-ER/ZR-36	193.6	1548.51
37	WT-SFP+-DWDM-ER/ZR-37	193.7	1547.72
38	WT-SFP+-DWDM-ER/ZR-38	193.8	1546.92
39	WT-SFP+-DWDM-ER/ZR-39	193.9	1546.12
40	WT-SFP+-DWDM-ER/ZR-40	194.0	1545.32
41	WT-SFP+-DWDM-ER/ZR-41	194.1	1544.53
42	WT-SFP+-DWDM-ER/ZR-42	194.2	1543.73
43	WT-SFP+-DWDM-ER/ZR-43	194.3	1542.94
44	WT-SFP+-DWDM-ER/ZR-44	194.4	1542.14
45	WT-SFP+-DWDM-ER/ZR-45	194.5	1541.35
46	WT-SFP+-DWDM-ER/ZR-46	194.6	1540.56
47	WT-SFP+-DWDM-ER/ZR-47	194.7	1539.77
48	WT-SFP+-DWDM-ER/ZR-48	194.8	1538.98
49	WT-SFP+-DWDM-ER/ZR-49	194.9	1538.19
50	WT-SFP+-DWDM-ER/ZR-50	195.0	1537.40
51	WT-SFP+-DWDM-ER/ZR-51	195.1	1536.61
52	WT-SFP+-DWDM-ER/ZR-52	195.2	1535.82
53	WT-SFP+-DWDM-ER/ZR-53	195.3	1535.04
54	WT-SFP+-DWDM-ER/ZR-54	195.4	1534.25
55	WT-SFP+-DWDM-ER/ZR-55	195.5	1533.47
56	WT-SFP+-DWDM-ER/ZR-56	195.6	1532.68

57	WT-SFP+-DWDM-ER/ZR-57	195.7	1531.90
58	WT-SFP+-DWDM-ER/ZR-58	195.8	1531.12
59	WT-SFP+-DWDM-ER/ZR-59	195.9	1530.33

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40		85	ºC	
Storage Ambient Humidity	HA	5		85	%	
Power Supply Voltage	VCC	-0.5		4	V	
Signal Input Voltage		-0.3		Vcc+0.3	V	
Receiver Damage Threshold		+4			dBm	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	Tcase	-5		70	ºC	Note (1)
Ambient Humidity	HA	5		85	%	
Power Supply Voltage	VCC	3.14	3.3	3.46	V	
Power Supply Current	ICC			450	mA	
Power Supply Noise Rejection				100	mVp-p	100Hz to 1MHz
Transmission Distance				70	km	
Coupled fiber	Single mode fiber					ITU-T G.653

Note: -10 to 60degC with 1.5m/s airflow

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III. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Average Launched Power	PO	0		+5	dBm	Note (1)
Extinction Ratio	ER	6			dB	
Center Wavelength—End of Life	λc	X-100	X	X+100	pm	
Center Wavelength—Beginning of Life	λc	X-25	X	X+25	pm	
Center Wavelength Space			100		GHz	
Spectrum Band Width (RMS)	σ			1.0	nm	
SMSR		30			dB	
Transmitter OFF Output Power	POff			-40	dBm	
TX Jitter (peak-peak)	Txj			0.1	UI	
TX Jitter (RMS)	Txjrms			0.01	UI	
Transmitter and Dispersion Penalty	TDP			3.0	dB	
Output Eye Mask	Compliant with IEEE 0802.3ae					
Receiver						
Input Optical Wavelength	λ	1270		1610	nm	
Receiver Sensitivity				-23	dBm	Note (2)
Input Saturation Power (Overload)	Psat	-8			dBm	
LOS Detect -Assert Power	PA	-32			dBm	
LOS Detect - Deassert Power	PD			-30	dBm	
LOS Detect Hysteresis	PHYS	2			dB	

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Note：

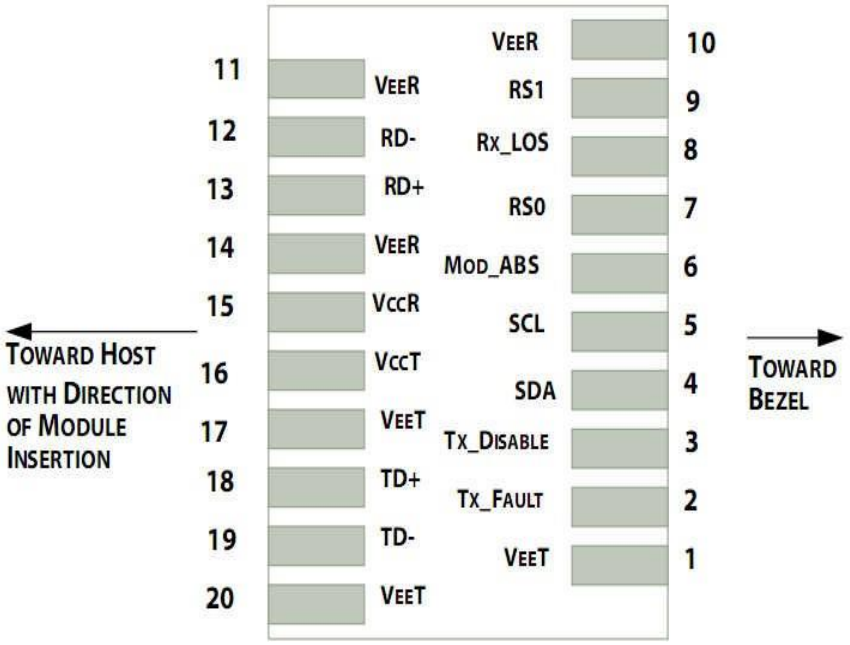
1. Launched power (avg.) is power coupled into a single mode fiber with master connector.（Before of Life）
2. Measured with conformance test signal for BER = 10^–12.@10.3125Gbps, PRBS=2^31-1,NRZ

IV. Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Differential line input Impedance	RIN		100		Ohm	
Differential Data Input Swing	VDT	300		700	mVp-p	
Transmit Disable Voltage	Vdis	2		Vcc	V	LVTTL
Transmit Enable Voltage	Ven	Vee		Vee+0.8	V	
Receiver						
Differential Data Output Swing	VDR	400		850	mVp-p	Note (1)
LOS Output Voltage-High	VLOSH	Vee		Vee+0.8	V	LVTTL
LOS Output Voltage-Low	VLOSL	2		VccHOST	V	

Note: Into 100Ω differential termination.

V. Pin Description



Pin out of Connector Block on Host Board

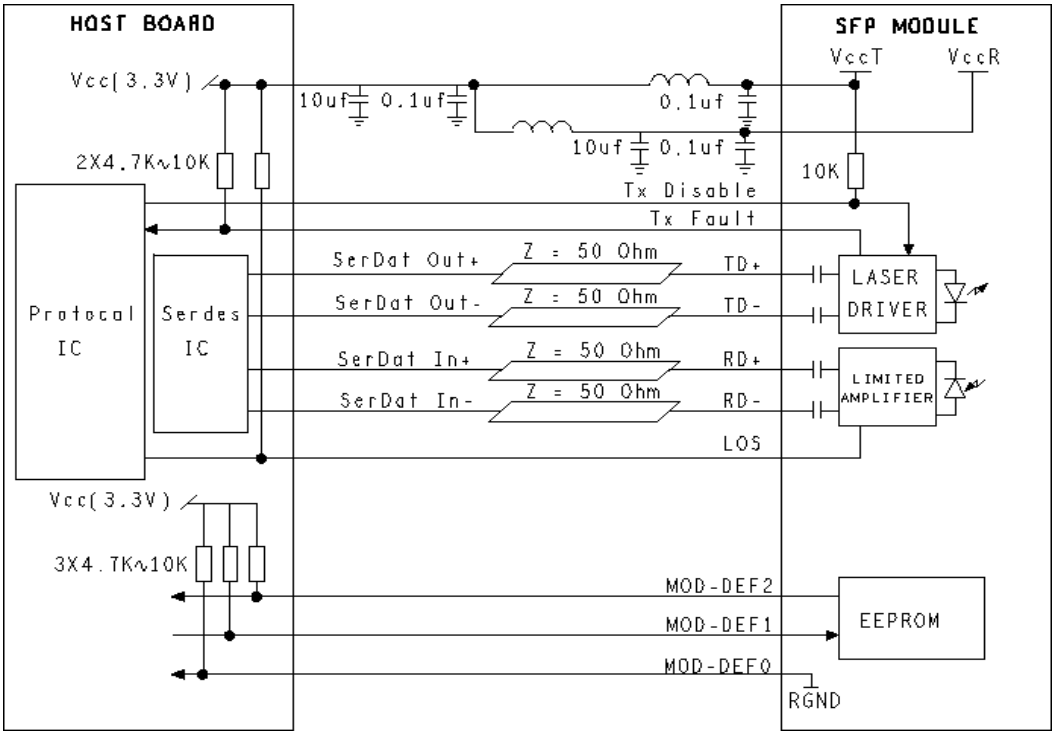
Pin	Symbol	Name/Description	Ref.
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault.	2
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module 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)	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. T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7k – 10k 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 <0.8V.
3. Laser output disabled on T_{DIS} >2.0V or open, enabled on T_{DIS} <0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. 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 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

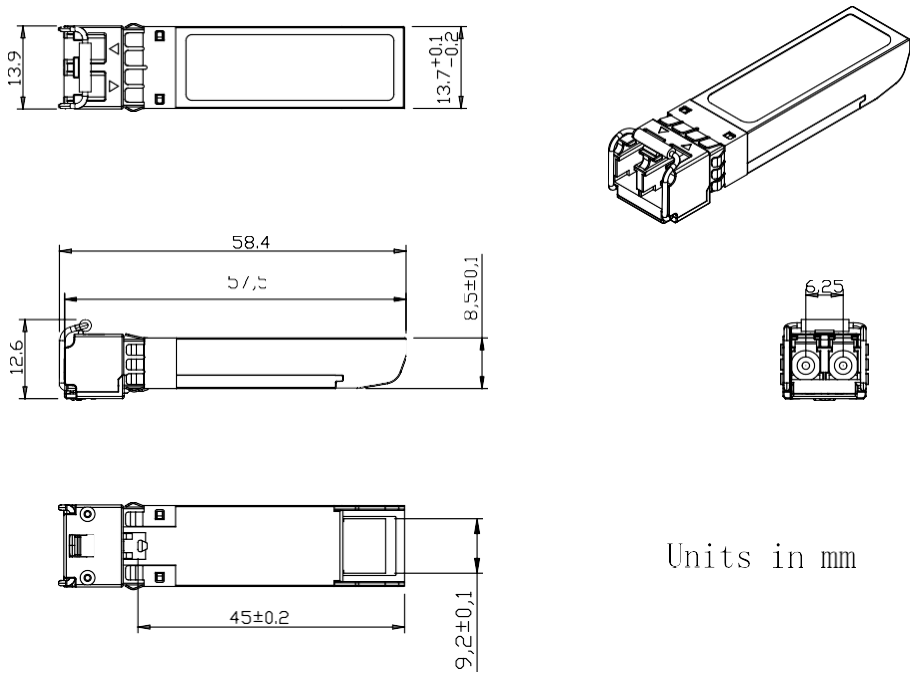
VI. Recommended Interface Circuit



VIII. 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 laser product
Component Recognition	IEC/EN 60950, UL	Compatible with standards
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards

VII. Outline Dimensions



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