T-SFP+-CWDM-80KM

10Gbps SFP+ CWDM Transceiver80KM

Features

Compliant with SFF-8431, SFF-8432 and IEE802.3ae
10GBASE-ZR, and 2G/4G/8G/10G Fiber Channel Applications.
Wavelengths selectable to ITU-T standards covering CWDM grid wavelengths
Cooled EML transmitter and APD receiver
Link length up to 80km (with amplifier)
Low Power Dissipation 1.4W Typical (Maximum:2W)
-5℃ to 70℃ Operating Case Temperature
Single 3.3V power supply
Diagnostic Performance Monitoring of module Temperature, Supply Voltages, Laser Bias Current, Transmit Optical Power, Receive Optical Power
RoHS compliant

Applications

10G Fiber Channel (with/without FEC)
80KM 10G Ethernet

Description

The T-SFP+-CWDM-80KM series single-mode transceiver is a “Limiting module”, designed for 10GBASE-ER, and 2G/4G/8G/10G Fiber- Channel applications

The transceiver consists of two sections: The transmitter section incorporates EML laser. And the receiver section consists of a APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, 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.

Regulatory Compliance

Feature	Agency	Standard	Certificate / Comments
Laser Safety	FDA	CDRH 21 CFR 1040 and Laser Notice No.50	1120292-000
Product Safety	UL	UL and CUL EN60950-2:2007	E347511
Environmental Protection	SGS	RoHS Directive 2002/95/EC	GZ1001008918/CHEM
EMC	WALTEK	EN55022:2006+A1:20077 EN55024:1998+A1+A2:2003	WT10093759-D-E-E

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Tc	-40	+85	°C
Supply Voltage	Vin	-0.5	+3.8	V
Relative Humidity	RH	0	85	%

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.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	V_{cc}	3.13	3.3	3.46	V
Supply Current	I_{cc}		420	610	mA
Operating Case Temperature	Tca	-5		70	°C
Module Power Dissipation	Pm		1.4	2	W

Notes:

1. Supply current is shared between VCCTX and VCCRX.

Transmitter Specifications-Optical

Parameter	Symbol	Min.	Typical	Max.	Unit
Center Wavelength	λ_c	1464.5		1617.5	nm
Center Wavelength Stability	$\Delta\lambda_D$	-6.5	λ_c	6.5	nm
Spectral Width(-20dB)	$\Delta\lambda 20$			0.3	nm
Average Optical Power	Po	0		+3	dBm
Side Mode Suppression Ratio	SMSR	30			dB
Optical Transmit Power(disable)	PTX_DISABLE			-30	dBm
Extinction Ratio	ER	9			dB
Dispersion Penalty(2400ps/nm) (2)	DP			2	dB
Relative Intensity Noise	RIN			-128	dB/Hz
Optical Return Loss Tolerance	Orl			21	dB

Notes:

1. Wavelength stability is achieved within 60 seconds (max) of power up.

Receiver Specifications-Optical

Parameter	Symbol	Min.	Typical	Max.	Unit
Input Operating Wavelength	λ_c	1260		1600	nm
Receiver Sensitivity (Average) (1)	Rsen			-24	nm
Maximum Input Power	RX-overload			-7	nm
LOS of Signal Asserted	Lsa	-34			dBm
LOS De-Asserted	Lda			-24	dB
LOS Hysteresis	Lh	0.5			dB/Hz

Notes:

[1] Measured with conformance test signal for BER = 10^{-12}. The stressed sensitivity values in the table are for system level BER measurements which include the effects of CDR circuits. It is recommended that at least 0.4 dB additional margin be allocated if component level measurements are made without the effects of CDR circuits.

Transmitter Specification-Electrical

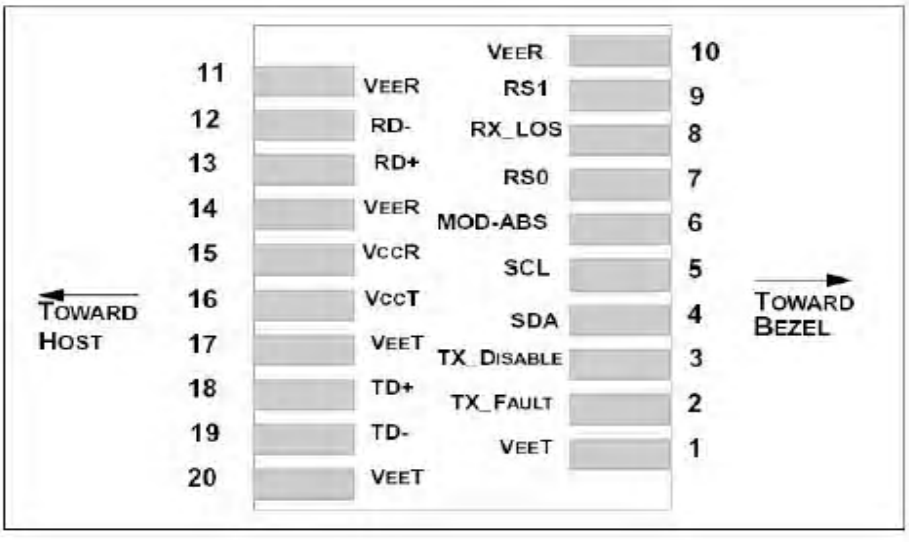
Parameter	Symbol	Min.	Typ.	Max	Unit
Data Rate	Mra		10.3	11.3	Gbps
Input Differential Impendance	Rim		100		Ω
Differential Data Input	VtxDIFF	120		850	mV
Transmit Disable Voltage	VD	2.0		Vcc3+0.3	V
Transmit Enable Voltage	Ven	0		+0.8	V
Transmit Disable Assert Time	Vn			100	us

Receiver Specification-Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit
Data Rate	Mra		10.3	11.3	Gbps
Differential Output Swing	Vout P-P	350		850	mV
Rise/Fall Time	Tr/Tf	24			ps
Loss of Signal-Asserted	VOH	2		Vcc3+0.3	V
Loss of Signal-Negated	VOL	0		+0.4	V

Digital Diagnostic Functions

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	-5	70	degC	
TX Output Optical Power	DMI_TX	-1	+2	dB	
RX Input Optical Power	DMI_RX	-26	7	dB	
Transceiver Supply Voltage	DMI_VCC	3.0	3.6	V	
Bias Current Monitor	DMI_Ibias	0	100	mA	



Pin Definition

Parameter	Unit	Values
1	VEET (1)	Transmitter Ground
2	Tx_Fault (2)	Transmitter Fault
3	Tx_DIS (3)	Transmitter Disable. Laser output disable on high or open
4	SDA (2)	2-wire serial interface data line
5	SCL (2)	2-wire serial interface data line
6	MOD_ABS (4)	Module Absent. Grounded within the module
7	RSO (5)	Rate Select 0
8	RX_LOS (2)	Loss of Singal Indication. Logic 0 indicates operation
9	RS1 (5)	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	Receiver Ground
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.

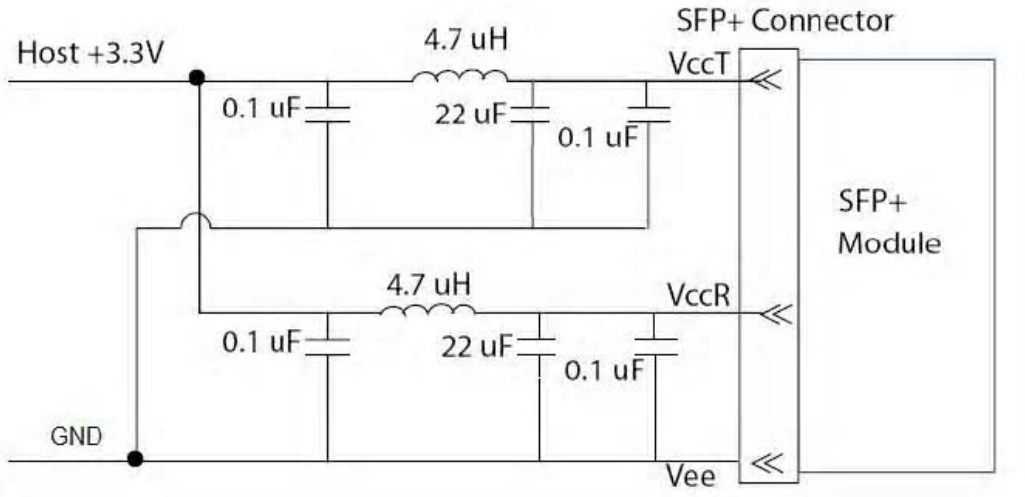
[2].Should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.

[3] Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pull-up to VccT inside the module.

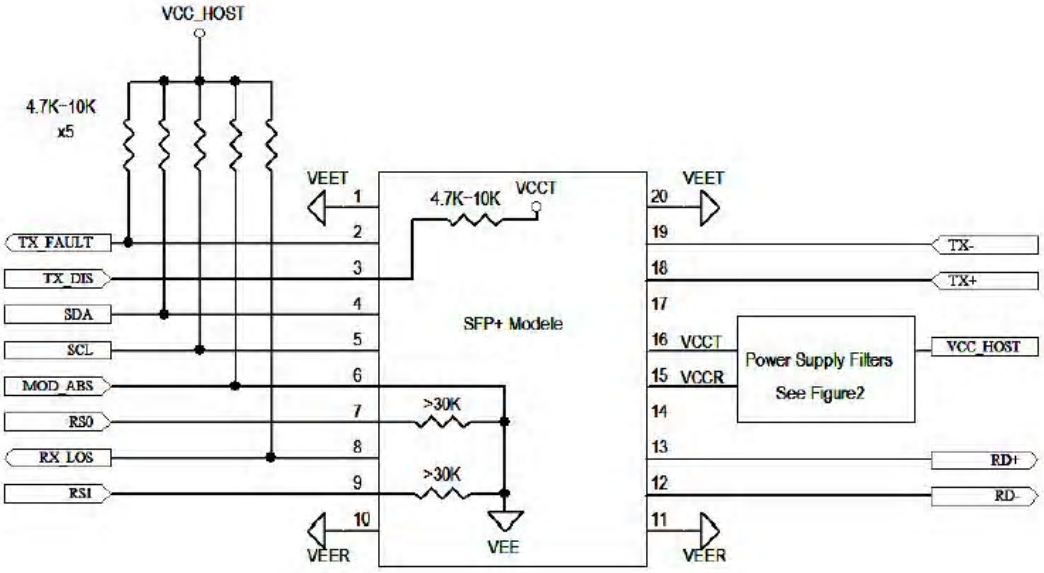
[4]Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to10 kΩ.Mod_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.

[5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.value cannot be compliant.

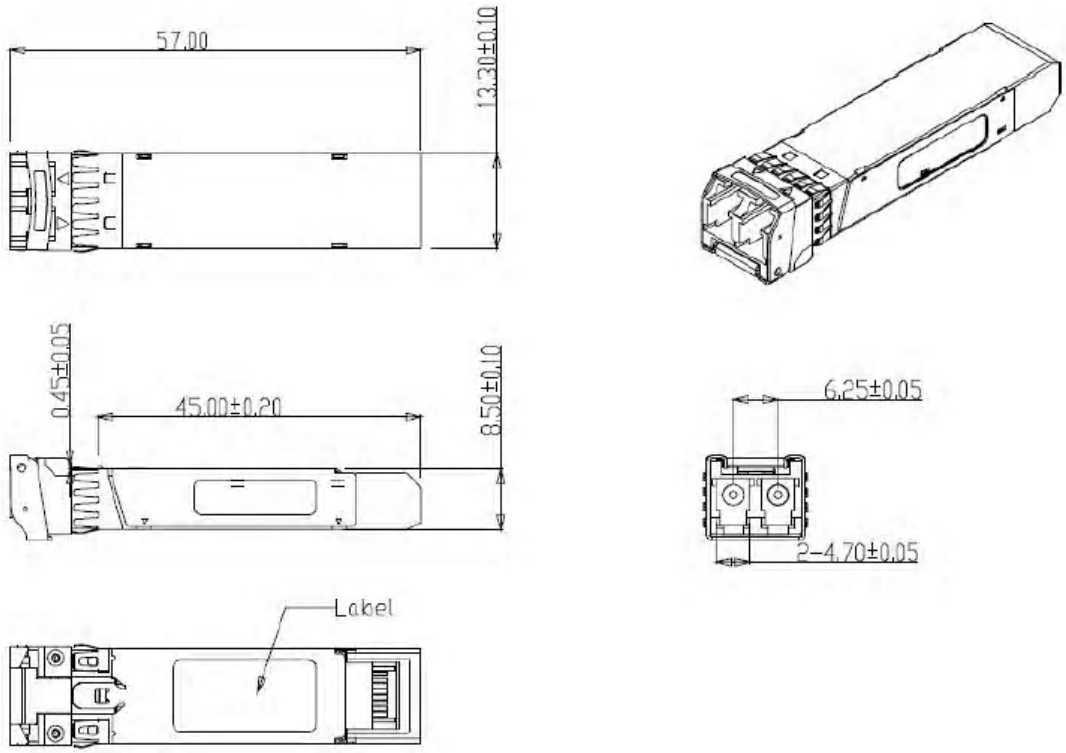
Host Board Power Supply Filters Circuit



Host-Module Interface



Mechanical Specifications



Ordering information

Part Number	Product Description
T-SFP+-CWDM-80KM	**9.95~10.3Gbps CWDM SFP+ 80km -5℃~+70℃ (1470~1610nm)**

Notice:

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