T-155M-CWDM-80KM

155Mbps CWDM SFP Single Mode Transceiver 80km

Features

Data rate of 155Mbps operation
9 CWDM DFB wavelength laser and PIN photodetector for 80km transmission
Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
Digital Diagnostic Monitoring
Internal Calibration or External Calibration
Compatible with RoHS
No reference clock required
+3.3V Single Power Supply
0~70 ℃ Operating Case Temperature

Applications

Gigabit Ethernet
Fiber Channel
Switch to Switch interface
Switched backplane applications
Router/Server Interface and other Optical Transmission Systems

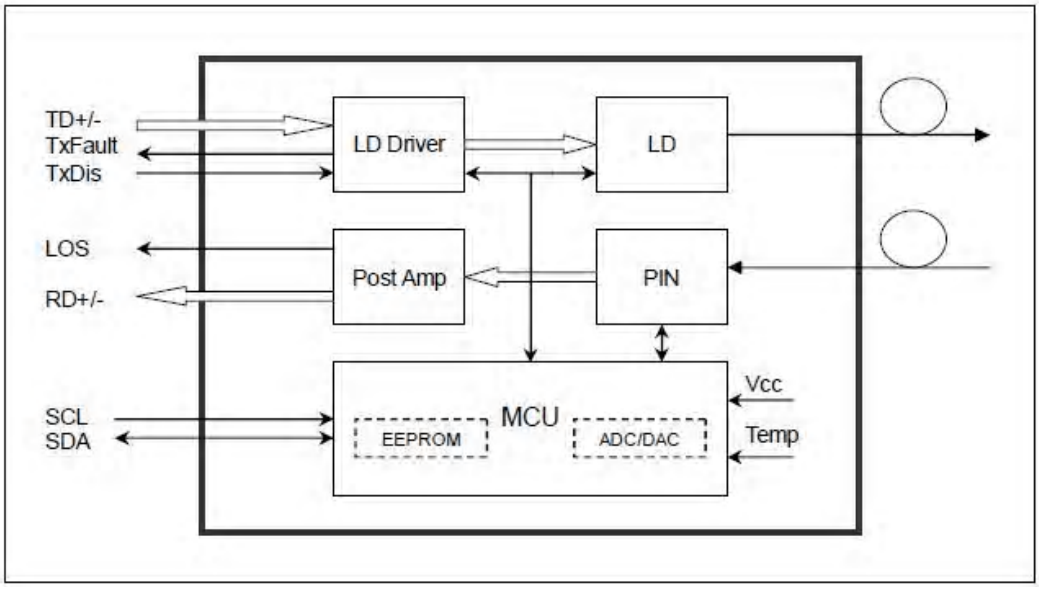
Description

The SFP transceivers are high performance, cost effective modules supporting data-rate of 155Mbps and 80km transmission distance with SMF.

The transceiver consists of three sections: an uncooled CWDM DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements.

The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA

Module Block Diagram



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	WT10093766-D-E-E
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
Supply Voltage	Vcc	-0.5	4.5	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity		5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature (Standard)	Tc	0		+70	°C
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	Icc			300	mA
Data Rate			155		mbps

Optical and Electrical Characteristics

Parameter		Symbol	Min.	Typical	Max.	Unit	Note
Transmitter							
Centre Wavelength		λC	λC -6.5	λC	λC +6.5	nm	
Spectral Width (-20dB)		△λ			1	nm	
Optical Extinction Ratio		ER	10			dB	
Side Mode Suppression Ratio		SMSR	30			dB	
Average Output Power		Pout	-5		0	dBm	1
Jitter Generation (RMS)					0.01	UI	
Jitter Generation (PK-PK)					0.1	UI	
Output Optical Eye		Compliant Telcordia GR-253-CORE and ITU-T G.957					
Optical Rise/Fall Time (20~80%)		Tr/tf			0.26	ns	
Data Input Swing Differential		V_{IN}	300		1860	mV	2
Input Differential Impedance		Z_{IN}	90	100	110	Ω	
TX Disable	Disable		2.0		Vcc	V	
	Enable		0		0.8	V	
TX Fault	Fault		2.0		Vcc	V	
	Normal		0		0.8	V	
Receiver							
Center Wavelength		λC	1260		1620	nm	
Receive Sensitivity					-34	dBm	3
Receiver Overload			-3			dBm	3
LOS De-Assert		LOS_D			-38	dBm	
LOS Assert		LOS_A	-45			dBm	
LOS Hysteresis			1		4	dB	
Data Output Swing Differential		Vout	370		1800	mV	4
LOS		High	2.0		Vcc	V	
		Low	0		0.8	V	

Notes:

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 223-1 test pattern @155Mbps, BER ≤1×10-12.
4. Internally AC-coupled.

Timing and Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit
Tx Disable Negate Time	t_on			1	ms
Tx Disable Assert Time	t_off			10	μs
Time To Initialize, including Reset of Tx Fault	t_init			300	ms
Tx Fault Assert Time	t_fault			100	μs
Tx Disable to Reset	t_reset	10			μs
LOS Assert Time	t_loss_on			100	μs
LOS De-assert Time	t_loss_off			100	μs
Serial ID Clock Rate	f_serial_clock			400	KHz
MOD_DEF (0:2)-High	V_H	2		Vcc	V
MOD_DEF(0:2)-Low	Z_L			0.8	V

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0~+70	°C	±3°C	Internal / External
Voltage	3.0~3.6	V	±3%	Internal / External
Bias Current	0~100	mV	±10%	Internal / External
Tx Power	-5~0	dBm	±3dB	Internal / External
Rx Power	-23~-9	dBm	±3dB	Internal / External

Pin Definition

Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note 3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note 3
6	MOD_DEF(0)	TTL Low	3	Note 3
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Note 4
9	V_{EER}	Receiver Ground	1	
10	V_{EER}	Receiver Ground	1	
11	V_{EER}	Receiver Ground	1	
12	RD-	Inv. Received Data Out	3	Note 5
13	RD+	Received Data Out	3	Note 5
14	V_{EER}	Receiver Ground	1	
15	V_{CCR}	Receiver Power Supply	2	
16	V_{CCT}	Transmitter Power Supply	2	
17	V_{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3t	Note 6
19	TD-	Inv. Transmit Data In	3	Note 6
20	V_{EET}	Transmit Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

2) TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:

Low (0 to 0.8V): Transmitter on

(>0.8V, < 2.0V): Undefined

High (2.0 to 3.465V): Transmitter Disabled

Open: Transmitter Disabled

3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board.

The pull-up voltage shall be VccT or VccR.

Mod-Def 0 is grounded by the module to indicate that the module is present

Mod-Def 1 is the clock line of two wire serial interface for serial ID

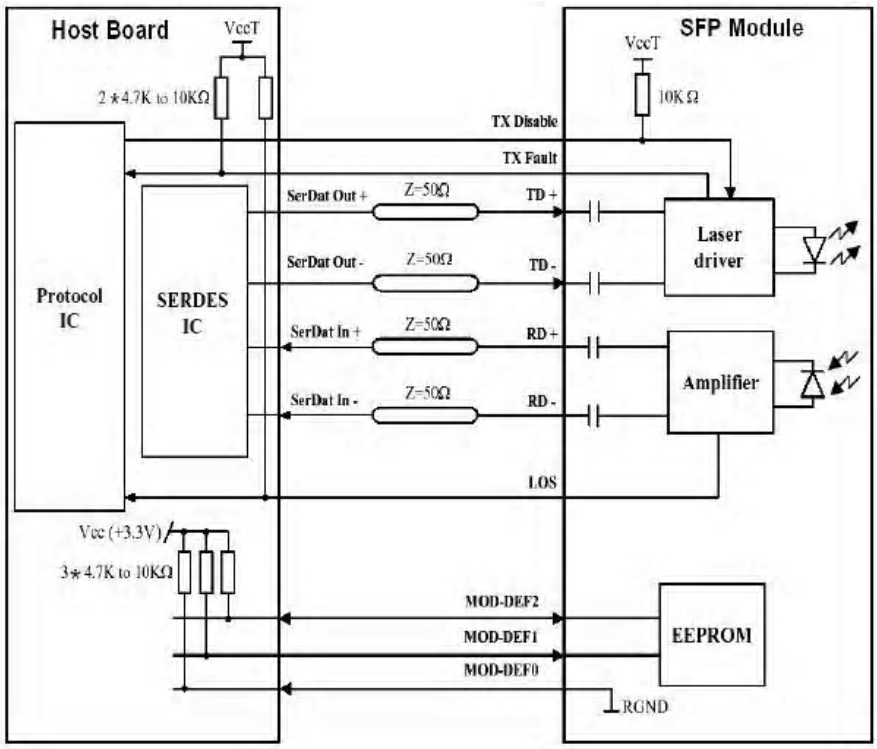
Mod-Def 2 is the data line of two wire serial interface for serial ID

4) LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor. Pull up voltage between 2.0V and Vcc+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.

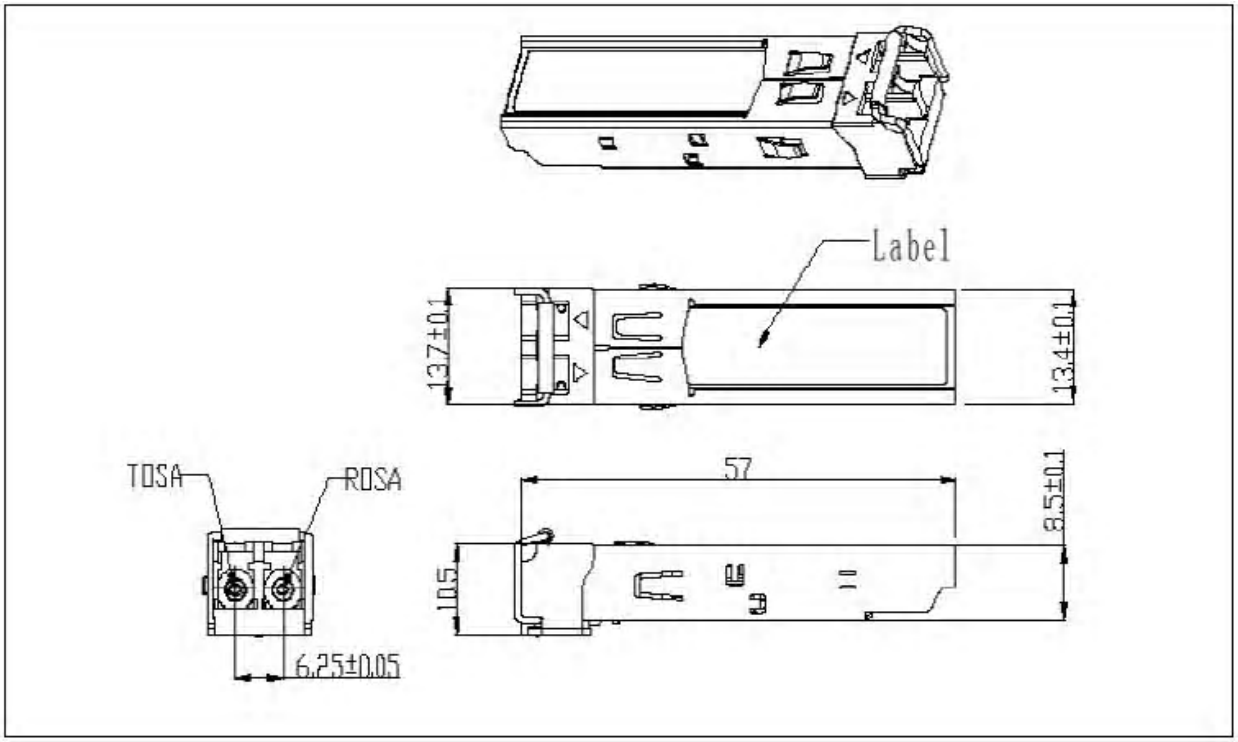
5) RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.

6) TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Interface Circuit



Mechanical Specifications



Ordering information

Part Number	Product Description
T-155M-CWDM-80KM	**155Mbps CWDM SFP 80km -5℃~+70℃ (1450~1610nm)**

Notice:

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Contact

E-mail:sales@t-techvip.com
http://www.t-techvip.com