MTNetworks

Product Specification

2.488Gbps CWDM SFP Transceiver, 40km Reach

MT-SFP-ERxxxx

Features

- Data-rate of 2.488Gbps operation
- 18 CWDM DFB wavelengths laser and PIN photodetector for 40km transmission
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitoring: Internal Calibration or External Calibration
- Compatible with RoHS
- +3.3V single power supply
- Operating case temperature: Standard : 0 to +70°C

Applications

- SDH STM-16 and SONET OC-48 system
- 2X Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

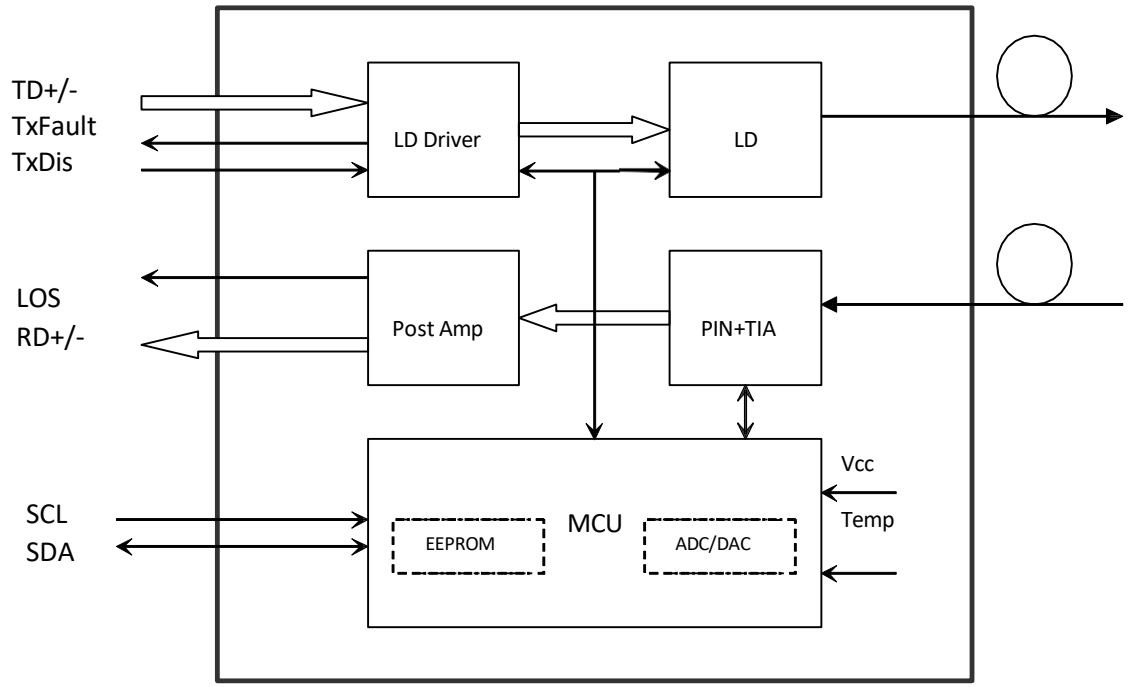
Description

The SFP transceivers are high performance, cost effective modules supporting dual data-rate of

2.488Gbps and 40km transmission distance with SMF.

The transceiver consists of three sections: a 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..



Absolute Maximum Ratings

Table 1 - 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	85	%

Recommended Operating Conditions

Table 2 - 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				2.488		Gbps

Table3 -λC Wavelength Guide

λC Wavelength Guide											
Code	λC	Unit	Code	λC	Unit	Code	λC	Unit	Code	λC	Unit
27	1270	nm	37	1370	nm	47	1470	nm	57	1570	nm
29	1290	nm	39	1390	nm	49	1490	nm	59	1590	nm
31	1310	nm	41	1410	nm	51	1510	nm	61	1610	nm
33	1330	nm	43	1430	nm	53	1530	nm			
35	1350	nm	45	1450	nm	55	1550	nm			

Optical and Electrical Characteristics

CWDM-2.5G-40: (CWDM and PIN, 1310nm, 40km Reach)

Table 3 - Optical and Electrical Characteristics

Parameter		Symbol	Min	Typical	Max	Unit	Notes
Transmitter							
Centre Wavelength		λc	λc-6.5	λc	λc+6.5	nm	
Spectral Width (-20dB)		σ			1	nm	
Side Mode Suppression Ratio		SMSR	30			dB	
Average Output Power		Pout	-5		2	dBm	1
Extinction Ratio		ER	9			dB	
Optical Rise/Fall Time (20%~80%)		tr/tf			0.16	ns	
Data Input Swing Differential		VIN	400		1800	mV	2
Input Differential Impedance		ZIN	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							
Centre Wavelength		λc	1260		1580	nm	
Receiver Sensitivity					-18	dBm	3
Receiver Overload			-3			dBm	3
LOS De-Assert		LOSD			-20	dBm	
LOS Assert		LOSA	-30			dBm	
LOS Hysteresis			1		4	dB	
Data Output Swing Differential		Vout	370		1800	mV	4
LOS		High	2.0		Vcc	V	
		Low			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 @2488Mbps, BER ≤1×10-12.
4.Internally AC-coupled.

Timing and Electrical

Table 4 - 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	VH	2		Vcc	V
MOD_DEF (0:2)-Low	VL			0.8	V

Diagnostics

Table 5 – Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	0 to 100	mA	±10%	Internal / External
TX Power	-5 to 2	dBm	±3dB	Internal / External
RX Power	-23 to -3	dBm	±3dB	Internal / External

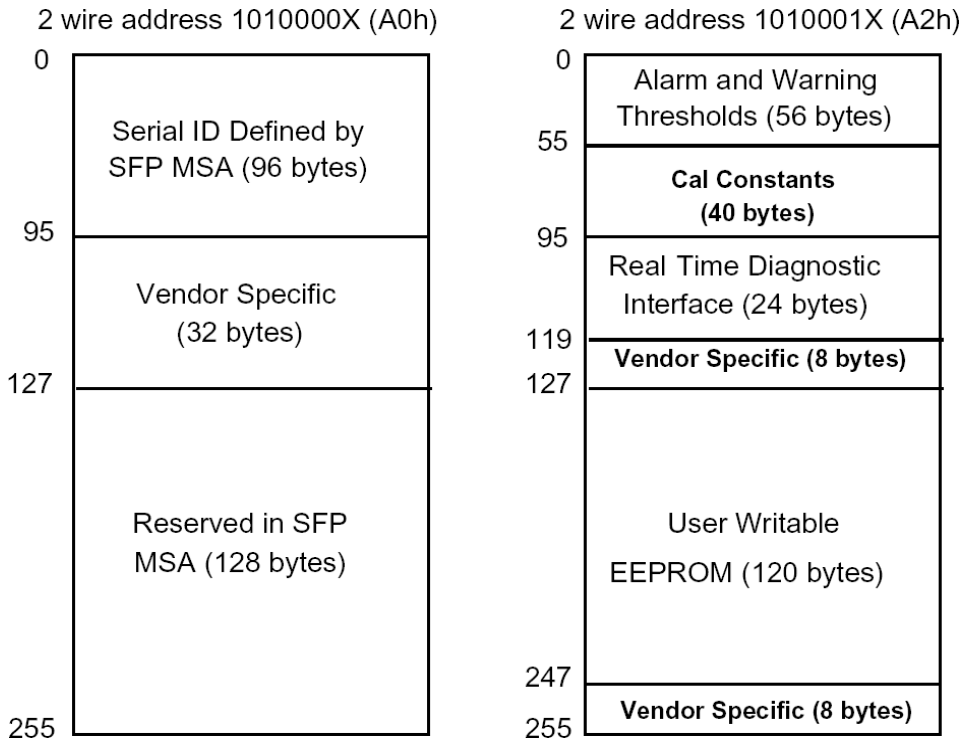
Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias

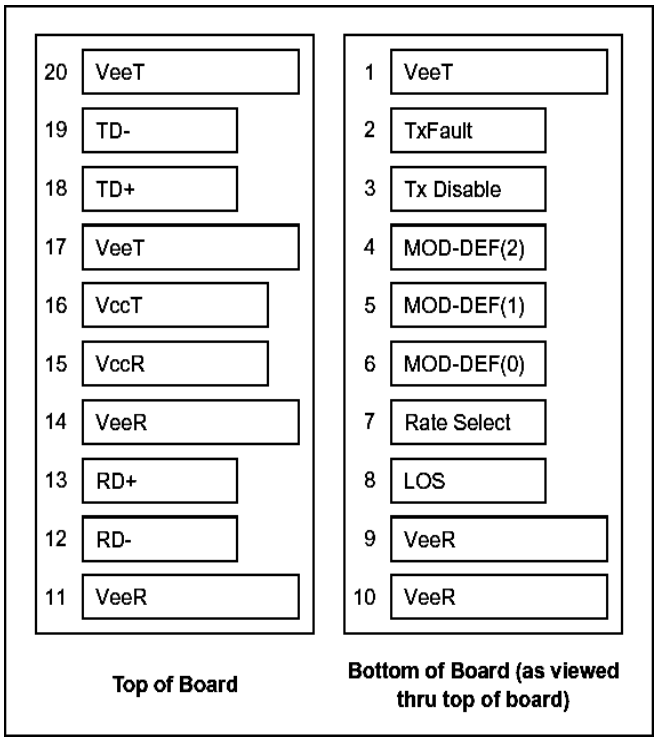
current monitoring, supply voltage monitoring and temperature monitoring.

The digital diagnostic memory map specific data field defines as following.



Pin Definitions

Pin Diagram

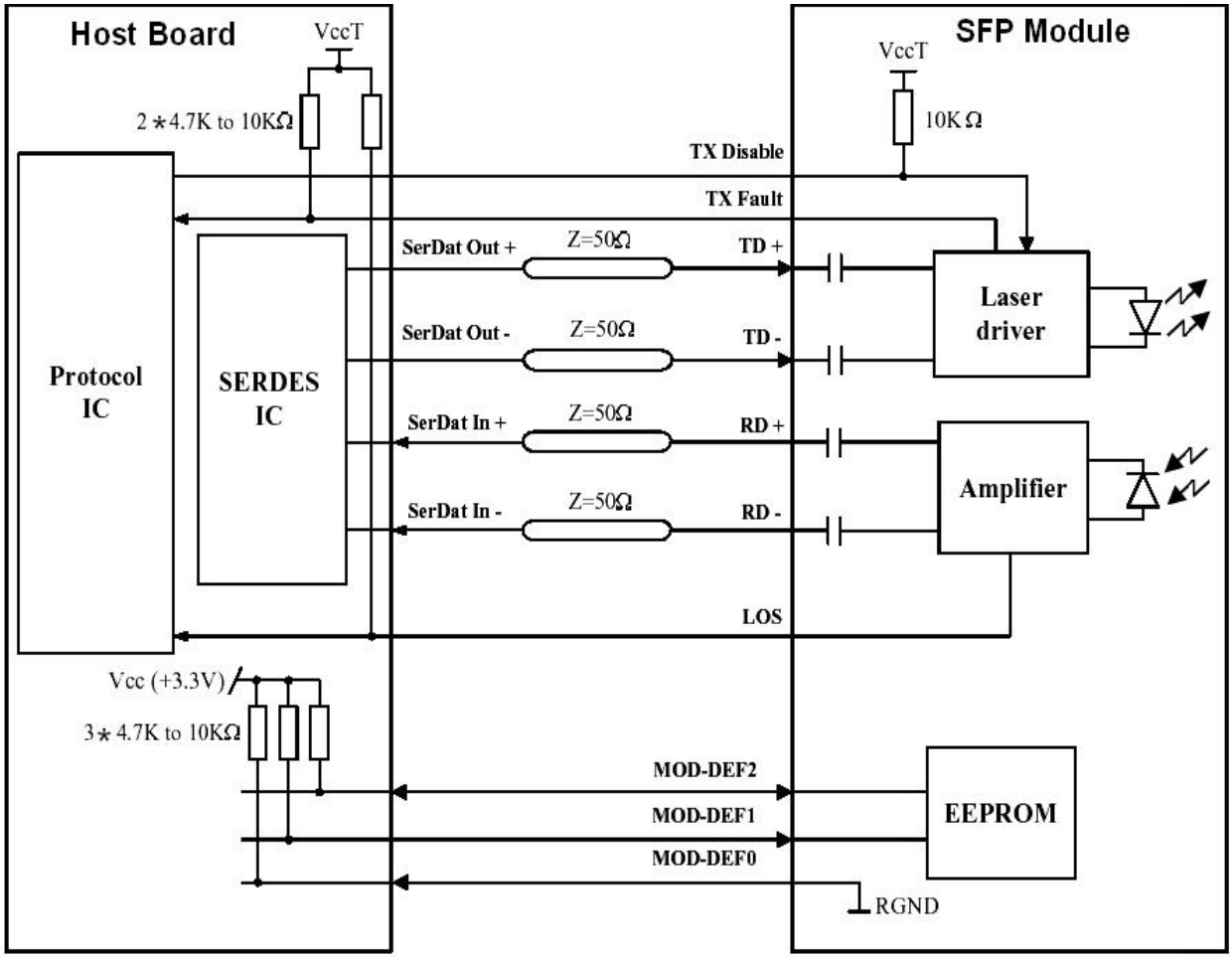


Pin Descriptions

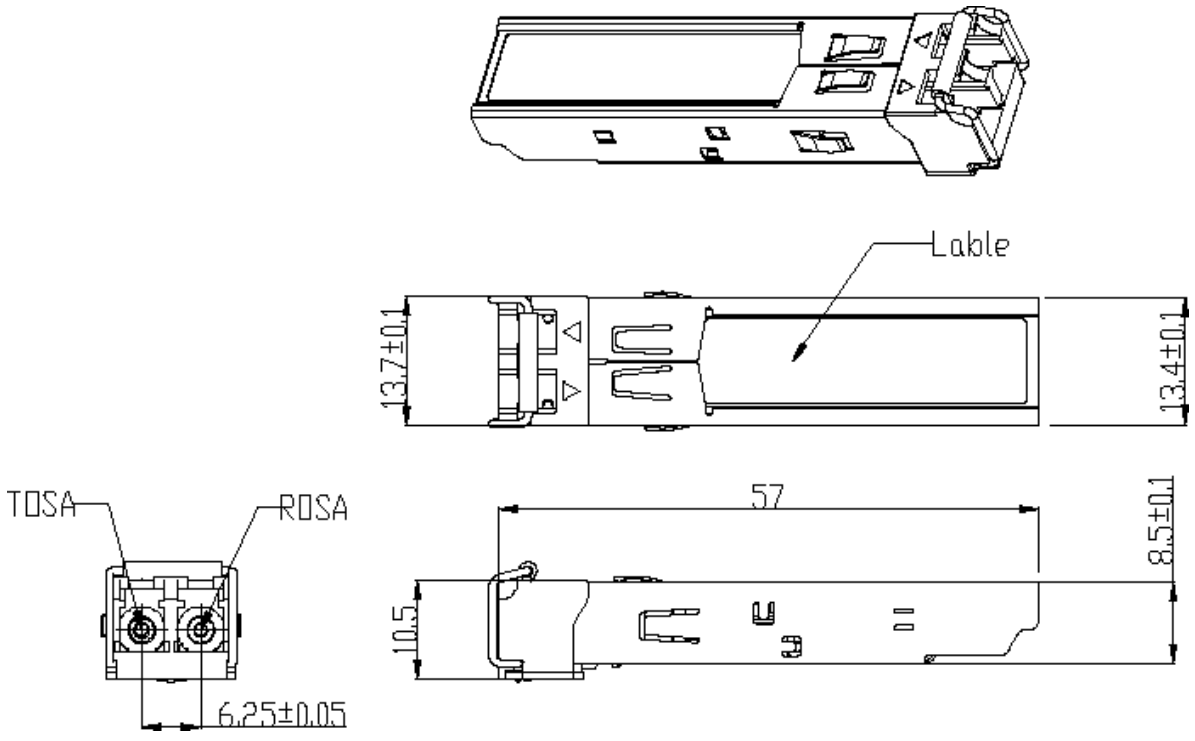
Pin	Signal Name	Description	Plug Seq.	Notes
1	VEET	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note 3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note 3
6	MOD_DEF(0)	TTL Low	3	Note 3
7	Rate Select	Not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



Ordering information

Part Number	Product Description
MT-SFP-ER1270	Single mode dual fiber, 2.5G,40km, CWDM 1270nm, LC interface
MT-SFP-ER1290	Single mode dual fiber, 2.5G,40km, CWDM 1290nm, LC interface
MT-SFP-ER1310	Single mode dual fiber, 2.5G,40km, CWDM 1310nm, LC interface
MT-SFP-ER1330	Single mode dual fiber, 2.5G,40km, CWDM 1330nm, LC interface
MT-SFP-ER1350	Single mode dual fiber, 2.5G,40km, CWDM 1350nm, LC interface
MT-SFP-ER1370	Single mode dual fiber, 2.5G,40km, CWDM 1370nm, LC interface
MT-SFP-ER1390	Single mode dual fiber, 2.5G,40km, CWDM 1390nm, LC interface
MT-SFP-ER1410	Single mode dual fiber, 2.5G,40km, CWDM 1410nm, LC interface
MT-SFP-ER1430	Single mode dual fiber, 2.5G,40km, CWDM 1430nm, LC interface
MT-SFP-ER1450	Single mode dual fiber, 2.5G,40km, CWDM 1450nm, LC interface
MT-SFP-ER1470	Single mode dual fiber, 2.5G,40km, CWDM 1470nm, LC interface
MT-SFP-ER1490	Single mode dual fiber, 2.5G,40km, CWDM 1490nm, LC interface
MT-SFP-ER1510	Single mode dual fiber, 2.5G,40km, CWDM 1510nm, LC interface
MT-SFP-ER1530	Single mode dual fiber, 2.5G,40km, CWDM 1530nm, LC interface
MT-SFP-ER1550	Single mode dual fiber, 2.5G,40km, CWDM 1550nm, LC interface
MT-SFP-ER1570	Single mode dual fiber, 2.5G,40km, CWDM 1570nm, LC interface
MT-SFP-ER1590	Single mode dual fiber, 2.5G,40km, CWDM 1590nm, LC interface
MT-SFP-ER1610	Single mode dual fiber, 2.5G,40km, CWDM 1610nm, LC interface

Revision History

Revision	Date	Description
Rev A0	01/03/2019	initial release

For More Information

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