
MPB2510-D4I-23/32T1

Features

- ◆ Hot-pluggable SFP28 form factor
- ◆ Supports 25.78Gb/s bit rate
- ◆ 1270nm DFB Laser and 1330nm PIN receiver for MPB2510-D4I-23T1
- ◆ 1330nm DFB Laser and 1270nm PIN receiver for MPB2510-D4I-32T1
- ◆ Maximum link length of 10km SMF
- ◆ Simplex LC receptacle
- ◆ Operating case temperature range: -40 ~ +85°C
- ◆ Low power dissipation: <1.5W
- ◆ Single 3.3V power supply

Application

- ◆ 25G Ethernet
- ◆ eCPRI/CPRI-10
- ◆ Data center

Standard

- ◆ Compliant to SFP28 MSA
- ◆ Compliant with IEEE 802.3cc
- ◆ Compliant with SFF-8432, SFF-8472
- ◆ RoHS complaint

1. General Description

MPB2510-D4I-23/32T1 is a single-Channel, Pluggable, Fiber-Optic SFP28 for 25G Ethernet and 5G Wireless Applications. It is a high performance module which operates at 25.78Gb/s up to 10km by single mode fiber. This module uses the simplex LC receptacle, which use 1270nm/1330nm DFB Laser and 1330nm/1270nm PIN receiver.

2. Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Ts	-40	+85	℃
Operating Humidity	RH	5	85	%
Supply Voltage	Vcc	-0.5	3.6	V

3. Recommended Operating Environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	-40		+85	℃
Supply Voltage	Vcc	3.13	3.3	3.47	V
Supply Current	Icc		290		mA
Bit Rate	BR	25.78 ± 100ppm			Gb/s
Fiber Length 9/125μm core SMF		-	-	10	km

4. Optical Characteristics

The following Optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Optical Transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Lane center wavelengths(range)	λ_c	1260		1280	nm	MPB2510-D4I-23T1
		1320		1340		MPB2510-D4I-32T1
Average Launch Power	Pout	-2		4	dBm	
Transmit OMA per Lane	TxOMA	-3		4.5	dBm	
Extinction Ratio	ER	3.5			dB	
Sidemode Suppression ratio	SMSR	30			dB	
Transmitter Reflectance				-26	dB	
Transmitter and Dispersion Penalty	TDP			2.7	dB	
Transmitter Eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				1,2
Optical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Lane center wavelengths(range)		1320		1340	nm	MPB2510-D4I-23T1
		1260		1280		MPB2510-D4I-32T1
Receive Saturation (OMA)	Rmax	2.2				
Receiver Average power	Pavg	-14		2	dBm	
Receiver Sensitivity (OMA)	Rxsen			-14	dBm	3,4,5
Receiver Reflectance				-26	dB	
LOS	Optical De-assert	Pd		-15	dBm	
	Optical Assert	Pa	-30			
LOS hysteresis		0.5		5	dB	

Notes:

1. Transmitter hit Ratio 5E-5 hits/sample.
2. Compliant with IEEE 802.3cc
3. Minimum value is informative, equals min Tx OMA with infinite ER and max channel insertion loss
4. Measured with a PRBS2³¹-1 test pattern, @25.78Gb/s, BER<5E-5, for each channel.
5. Power value and power accuracy are with all channels on.

5. Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Transmitter						
Input differential impedance	Rin	80	100	120	Ω	1
Differential data input swing	Vin,pp	200		900	mV	
Transmit Fault Assert Voltage		2.4		Vcc+0.3	V	LVTTTL
Transmit Fault Deassert Voltage		-0.3		+0.4	V	LVTTTL
Transmit Disable Voltage		2		Vcc+0.3	V	LVTTTL
Transmit Enable Voltage		0		0.8	V	LVTTTL
Receiver						
Differential data output swing	Vout,pp	300		1000	mV	2
LOS Assert Voltage		2.0		Vcc+0.3	V	LVTTTL
LOS Deassert Voltage		-0.3		+0.4	V	LVTTTL

Notes:

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Into 100 ohms differential termination.

6. Digital Diagnostic Monitoring Information

Parameter	Accuracy	Calibration	Note
Temperature	±3 °C	Internal	-40 °C ~ +85 °C
Voltage	±3%	Internal	3.13 ~ 3.47V
Bias Current	±10%	Internal	Specified by normal value
TX Power	±2dB	Internal	-2 ~ +4dBm
RX Power	±2dB	Internal	-14 ~ +2dBm

7. Pin Assignment

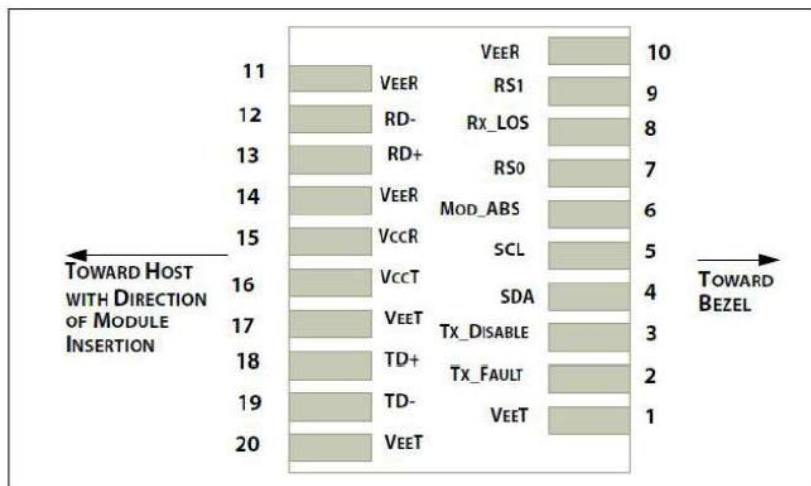


Figure1 SFP28 Pad assignment Top View

Table 1

Pin	Symbol	Name/Description	Power Seq.	Ref.
1	VeeT	Transmitter Ground	1st	1
2	TX_Fault	Transmitter Fault	3rd	2
3	TX_Disable	Transmitter Disable	3rd	3
4	SDA	2-Wire Serial Interface Data Line	3rd	4
5	SCL	2-Wire Serial Interface Data Line	3rd	4
6	Mod_ABS	Module Absent, Connect to VeeT or VeeR in Module	3rd	5
7	RS0	No connection required	3rd	6
8	RX_LOS	Receiver Loss of Signal indication	3rd	7
9	RS1	No connection required	3rd	8
10	VeeR	Receiver Ground	1st	1
11	VeeR	Receiver Ground	1st	1
12	RD-	Receiver Inverted DATA out. AC Coupled. CML-O	3rd	9
13	RD+	Receiver Non-inverted DATA out. AC Coupled. CML-O	3rd	9
14	VeeR	Receiver Ground	1st	1
15	VccR	Receiver Power Supply	2nd	10
16	VccT	Transmitter Power Supply	2nd	10
17	VeeT	Transmitter Ground	1st	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML-I	3rd	11

19	TD-	Transmitter Inverted DATA in. AC Coupled. CML-I	3rd	11
20	VeeT	Transmitter Ground	1st	1

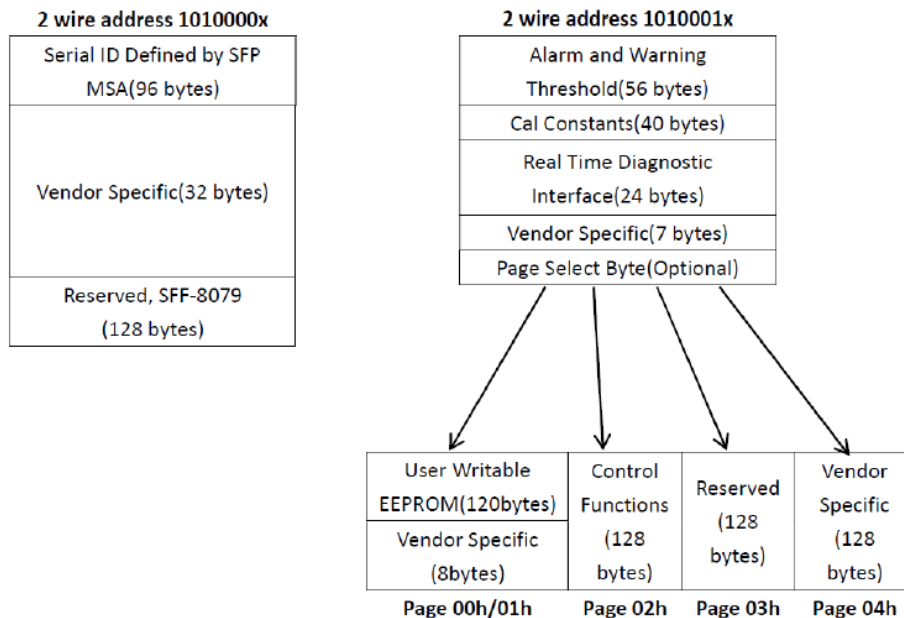
SFP28 Module PIN Definition

Power Seq.: Pin engagement sequence during hot plugging.

Notes:

1. The module signal ground contacts.
2. This pin is an open drain/collector and should be pulled up to Vcc-host in the host with a 4.7k~10k Ohm resistor.
3. This pin should be pulled up to Vcct with a 4.7k~10k Ohm resistor in modules.
4. SDA&SCL (IIC) are needed pull up 4.7k~10k Ohm resistors on host board.
5. Mod_ABS is connected to VeeT or VeeR in the SFP+ module.
6. Rate Select 0, no connection required.
7. Module RX_Los of signal indication need pull up 4.7k~10k Ohm resistor on host board.
8. Rate Select 1, no connection required.
9. RD -/+: These are the differential receiver outputs. They are CML AC-coupled with 100 Ohm terminal resistor matching internal.
10. VccR and VccT are the receiver and transmitter power supplies.
11. TD-/+: These are the differential transmitter inputs. They are CML AC-coupled with 100 Ohm terminal resistor matching internal.

8. EEPROM Memory Map



EEPROM Serial ID Memory Contents (2-Wire Address A0h)

Address	Name of field	Hex	Description
BASE ID Fields			
00	Identifier	03	SFP/SFP+/SFP28 transceiver
01	Ext. Identifier	04	Serial ID module supported
02	Connector	07	LC (Lucent Connector)
03-05	Transceiver Codes	00 00 00	Not defined
06	Transceiver Codes	00	Not defined
07-10	Transceiver Codes	00 00 00	Not defined
11	Encoding	03	NRZ
12	BR, Nominal	FF	25.0Gb/s
13	Rate Identifier	00	Not defined
14	Length(9um)-km	0A	10(km)
15	Length(9um)-m	64	10000(m)
16	Length(50um)	00	Transceiver transmit distance
17	Length(62.5um)	00	
18	Length(cable)	00	Not support cable
19	Length(OM3)	00	Not support OM3
20-35	Vendor Name	4D 45 4E 54 45 43 48 4F 50 54 4F	“MENTECHOPTO”
36	Reserved	00	Not defined
37-39	Vendor OUI	00 00 00	Not defined
40-55	Vendor P/N	ASCII character	“MPB2510-D4I-23T1”/ “MPB2510-D4I-32T1”
56-59	Vendor P/N Rev.	31 2E 30 20	“1.0”
60-61	Laser Wavelength	04 F6/05 32	1270nm/1330nm
62	Reserved	00	Not defined
63	CC_BASE	xx	Check sum of bytes 0-62
Extended ID Fields			
64-65	Options	00 1A	TX_Disable, TX_Fault and RX_LOS are implemented
66	BR, max	67	Upper bit rate margin, 0%
67	BR, min	00	Lower bit rate margin, 0%
68-83	Vendor SN	xx.....xx	Vendor Serial Number in ASCII character
84-91	Date Code	Data Code	Vendor Date Code in ASCII character
92	Diagnostic Monitoring Type	68	Internally calibrated, RX DDM represents average input optical power

93	Enhanced options	F0	Optional Alarm/warning flags, soft Tx_Disable control and monitoring, soft Tx_Fault and soft RX_LOS monitoring are implemented
94	SFF-8472 compliant	08	SFF-8472 compliant with revision 12.0
95	CC-EXT	xx	Check sum of bytes 64-94
Vendor Specific ID Field			
96-127	Vendor Specific	00	Vendor specific EEPROM
128-255	Reserved	00	Reserved for future use

Digital Diagnostic Monitoring Interface: Alarm and Warning Thresholds

(2-Wire Address A2h)

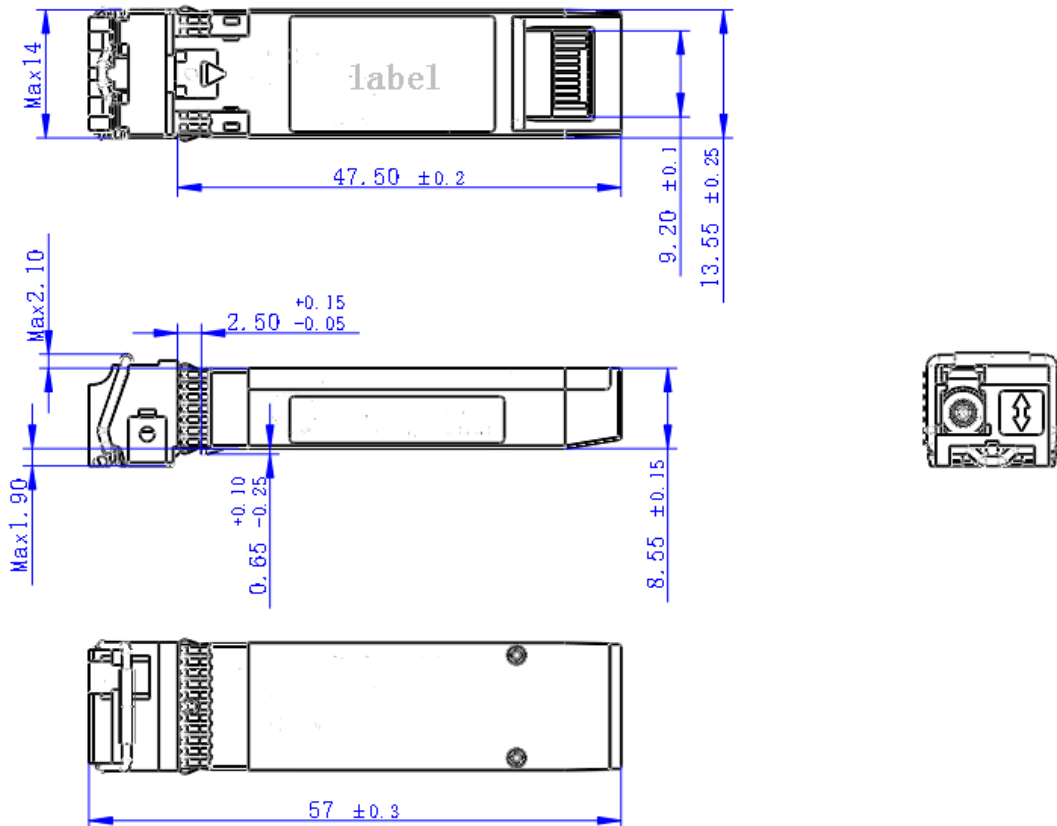
Address	#Bytes	Name	Real Value	Unit	Hex
			Industrial		
00-01	2	Temp High Alarm	95	℃	
02-03	2	Temp Low Alarm	-50	℃	
04-05	2	Temp High Warning	85	℃	
06-07	2	Temp Low Warning	-40	℃	
08-09	2	Voltage High Alarm	3.6	V	
10-11	2	Voltage Low Alarm	3	V	
12-13	2	Voltage High Warning	3.5	V	
14-15	2	Voltage Low Warning	3.1	V	
16-17	2	Bias High Alarm	100	mA	
18-19	2	Bias Low Alarm	5	mA	
20-21	2	Bias High Warning	80	mA	
22-23	2	Bias Low Warning	10	mA	
24-25	2	TX Power High Alarm	6	dBm	
26-27	2	TX Power Low Alarm	-4	dBm	
28-29	2	TX Power High Warning	4	dBm	
30-31	2	TX Power Low Warning	-2	dBm	
32-33	2	RX Power High Alarm	4	dBm	
34-35	2	RX Power Low Alarm	-16	dBm	
36-37	2	RX Power High Warning	2	dBm	
38-39	2	RX Power Low Warning	-14	dBm	
40-55	16	Reserved	Reserved		

9. Product Security requirements

Items	Contents
Virus scanning	Don't contain malicious code or code vulnerabilities such as Trojans, viruses, worms, backdoors, etc.
Source code static scanning	Don't contain dead pointers, divide by 0, integer overflow, invalid shift operations, memory management, null pointer indirect references, boundary overflow checks, uninitialized variables, write constants, etc.
Source code security scanning	Don't contain memory leaks, out of bounds errors, arithmetic errors, suspicious code, logic errors, etc.

10. Mechanical Drawing

Dimensions are in millimeters. (Unit: mm)



11. Ordering information

Part. No	Specifications							
	Pack	Rate (Gb/s)	Tx (nm)	Rx	Temp (°C)	Reach (km)	Pull Tab Color	Others
MPB2510-D4I-23T1	SFP28	25.78	1270nm DML	PIN	-40~+85	10	Purple	RoHS
MPB2510-D4I-32T1	SFP28	25.78	1330nm DML	PIN	-40~+85	10	Blue	RoHS

*Note:

1. More detail product selection and cable lengths, please contact MNC