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# MPB25D3-D0I-T1

## Features

- ◆ Hot-pluggable SFP28 form factor
- ◆ Supports 24.33Gb/s~28.05Gb/s bit rate
- ◆ 1310nm uncooled DML Laser and PIN photo detector
- ◆ Maximum link length of 300m SMF
- ◆ Duplex LC receptacle
- ◆ Operating case temperature range: -40°C ~ +85°C
- ◆ Low power dissipation: <1.5W
- ◆ Single 3.3V power supply

## Applications

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

## Standards

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

## General Description

MPB25D3-D0I-T1 is a single-Channel, Pluggable, Fiber-Optic SFP28 for 25G Ethernet and Wireless Applications. It is a high performance module which operates at typical 25.78Gbps up to 2km by single mode fiber. This module uses the duplex LC receptacle, which use 1310nm uncooled DML Laser and PIN photo detector.

## 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	°C
Operating Humidity	RH	5	95	%
Supply Voltage	Vcc	-0.5	3.6	V

## 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	Notes
Operating Case Temperature	Tc	-40	-	+85	°C	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc	-	330	420	mA	
Bit Rate	BR	24.33	25.78125	28.05	Gb/s	±100ppm
Link Distance with ITU-T G.652.D rated fiber		2	-	300	m	

## 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)	$\lambda_c$	1295	1310	1325	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	Spectral Width (-20dB)
Average Launch Power	Pout	-7		2	dBm	
Transmit OMA per Lane	TxOMA	-4		2.2	dBm	
Extinction Ratio	ER	3			dB	
Sidemode Suppression ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-130	dB/Hz	
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)		1295	1310	1325	nm	
Receive Saturation (OMA)	Rmax	3				
Receiver Sensitivity (OMA)	Rxsen			-11.3	dBm	3,4,5
Receiver Reflectance				-26	dB	
LOS	Optical De-assert	Pd		-14	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 PRBS 2<sup>31</sup>-1 test pattern, @25.78Gb/s, BER<5E-5, for each channel.
5. Power value and power accuracy are with all channels on.

## Electrical Characteristics

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

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc		330	420	mA	
<b>Transmitter</b>						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin,pp	200		900	mV	
Transmit Fault Assert Voltage		2.4		Vcc+0.3	V	LVTTL
Transmit Fault Deassert Voltage		-0.3		+0.4	V	LVTTL
Transmit Disable Voltage		2		Vcc+0.3	V	
Transmit Enable Voltage		0		0.8	V	
<b>Receiver</b>						
Differential data output swing	Vout,pp	300		1000	mV	2
LOS Assert Voltage		2.4		Vcc+0.3	V	
LOS Deassert Voltage		-0.3		+0.4	V	

Notes:

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

## 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	-7~2dBm
RX Power	±2dB	Internal	-12~3dBm

## Pin Assignment

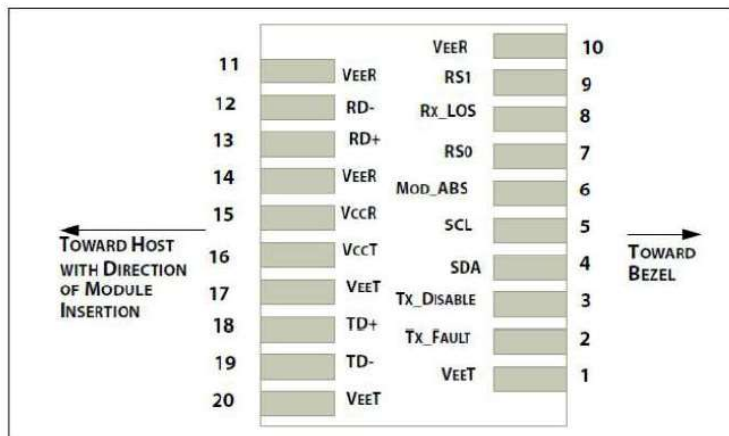


Figure1 SFP28 Pad assignment Top View

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

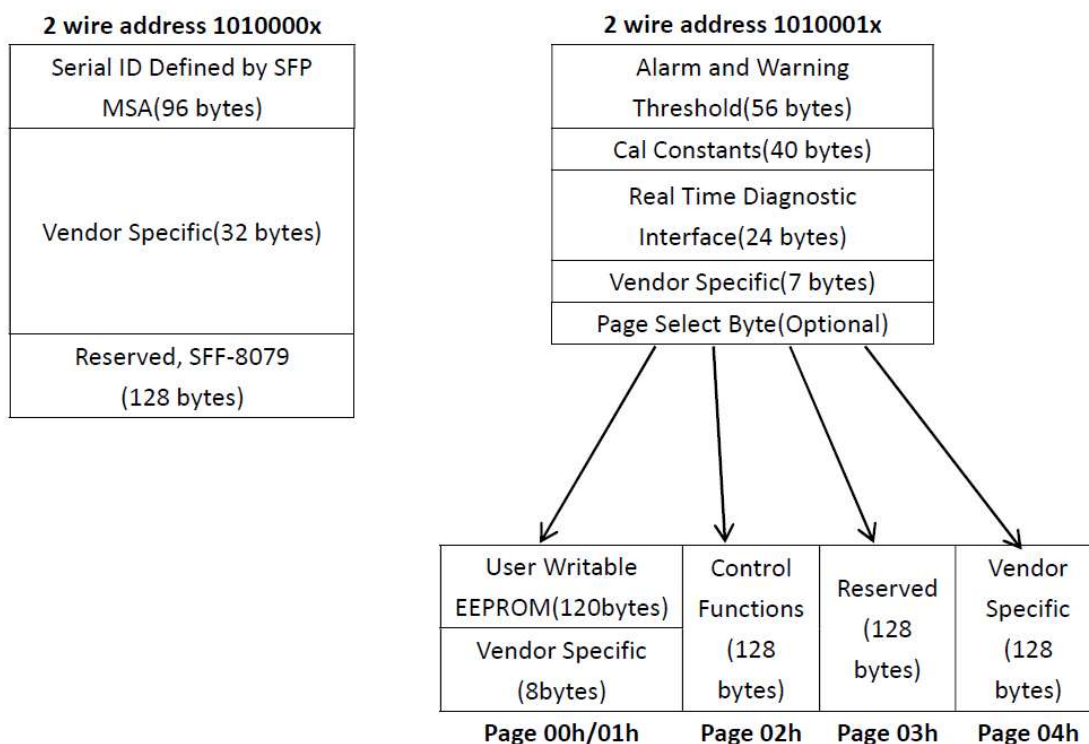
### SFP28 Module PIN Definition

**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.

## EEPROM Memory Map



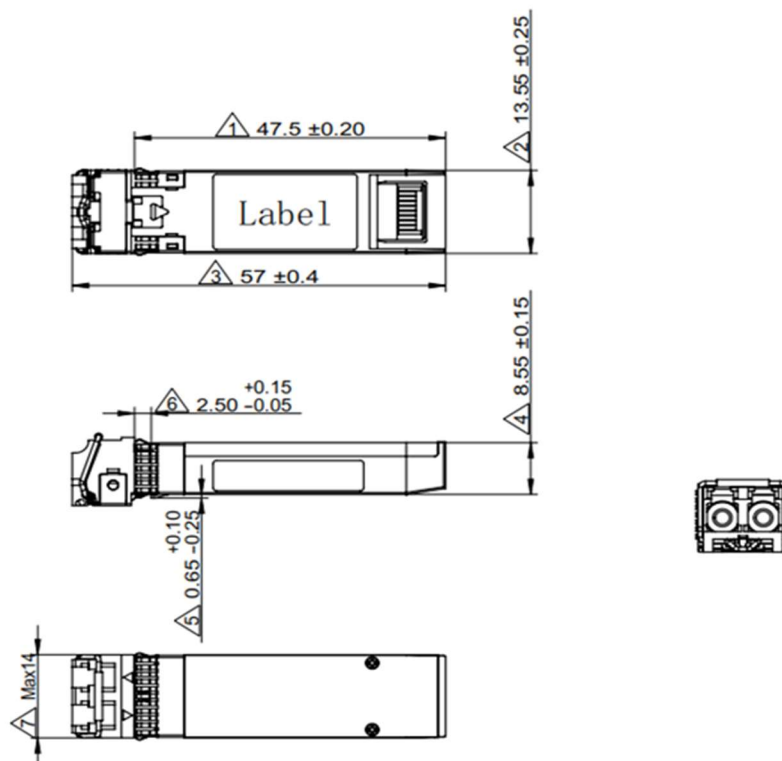
**Figure 1 SFP+ Memory Map**

## 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.

## Mechanical Drawing

Dimensions are in millimeters. (Unit: mm)



**NOTE: Dimensions in the pictures are compliant with MSA.**

**The design above is only for Reference. Please contact MNC for more detail.**

## Ordering information

Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	Rx	Temp (°C)	Reach (m)	Pull Tab Color	DDM
MPB25D3-D0I-T1	SFP28	25.78125	1310nm	-7~2	PIN	-40~+85	300	Blue	Y

\*Note:

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