
MPB25D1-DZC-XXXT

Features

- ◆ Hot-pluggable SFP28 cable ends
- ◆ Supports 25.78Gbps bit rate
- ◆ Maximum link length of 70m over OM3 MMF and 100m over OM4 MMF
- ◆ Operating environment temperature: 0 ~ +70°C
- ◆ Low power consumption: <1W per end
- ◆ SFP28 housing with enhanced EMI shielding
- ◆ Single 3.3V power supply
- ◆ Flat, rubberized, LSZH cable

Application

- ◆ 25GBASE-SR Ethernet

Standard

- ◆ Compliant with SFF-8472
- ◆ Compliant with IEEE802.3by
- ◆ Compliant with SFF-8431
- ◆ RoHS complaint

1. General Description

MNC SFP28 Active Optical Cables are direct-attach fiber assemblies with SFP28 connectors. They are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks. MNC SFP28 Active Optical Cable's length is up to 70 meters over OM3 MMF or 100 meters over OM4 MMF. This module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm.

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	Notes
Storage Temperature	Ts	-40	+85	°C	
Operating Case Temperature	Tc	0	+70	°C	
Operating Humidity	RH	0	85	%	
Supply Voltage	Vcc	0	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	Units
Operating Case Temperature	TC	0	25	+70	°C
Power Supply Voltage	Vcc	3.135	3.3	3.465	V
Data Rate, each Lane			25.78		Gb/s
Data Rate Accuracy		-100		100	ppm
Control Input Voltage High		2		Vcc	V
Control Input Voltage Low		0		0.8	V
Fiber Bend Radius	Rbend	3			cm
Fiber Length on 50/125µm high-bandwidth(OM3) MMF				70	m
Fiber Length on 50/125µm high-bandwidth(OM4) MMF				100	m

4. Electrical Characteristics

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

Parameter	Test Point	Min	Typical	Max	Units	Notes
Power Consumption				1	W	1
Supply Current	I _{cc}			300	mA	1
Transmitter(each lane)						
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (V _{cm})	TP1	-350		2850	mV	2
Differential Termination Resistance Mismatch	TP1			10	%	At 1MHz
Differential Return Loss (SDD11)	TP1			See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11)	TP1			See CEI-28G-VSR Equation 13-20	dB	
Stressed Input Test	TP1a	See CEI-28G-VSR Section 13.3.11.2.1				
Receiver(each lane)						
Differential Voltage, pk-pk	TP4			900	mV	
Common Mode Voltage (V _{cm})	TP4	-350		2850	mV	2
Common Mode Noise, RMS	TP4			17.5	mV	
Differential Termination Resistance Mismatch	TP4			10	%	At 1 MHz
Differential Return Loss (SDD22)	TP4			See CEI-28G-VSR Equation	dB	

				13-19		
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC22, SCD22)	TP4			See CEI-28G-VSR Equation 13-21	dB	
Common Mode Return Loss (SCC22)	TP4			-2	dB	3
Transition Time, 20 to 80%	TP4	9.5			ps	
Vertical Eye Closure (VEC)	TP4			5.5	dB	
Eye Width at 10 ⁻¹⁵ probability (EW15)	TP4	0.57			UI	
Eye Height at 10 ⁻¹⁵ probability (EH15)	TP4	228			mV	

Notes:

1 Per terminal.

2. Vcm is generated by the host. Specification includes effects of ground offset voltage.

3. From 250MHz to 30GHz..

5. Digital Diagnostic Monitoring Information

Parameter	Units	Min	Max	Accuracy	Calibration	Note
Temperature	°C	0	+70	±3°C	Internal	
Voltage	V	3.135	3.465	±3%	Internal	
Bias Current	mA	0	12	±10%	Internal	1
TX Power	dBm	-8.4	2.4	±3dB	Internal	
RX Power	dBm	-11	2.4	±3dB	Internal	

Notes:

1. Accuracy of Measured Tx Bias Current is 10% of the actual Bias Current from the laser driver to the laser.

6. Pin definition

The SFP28 modules are hot-pluggable. Hot pluggable refers to plugging in or unplugging a module while the host board is powered. The SFP28 host connector is a 0.8 mm pitch 20 position right angle improved connector specified by SFF-8431, or stacked connector with equivalent electrical performance. SFP28 module contacts mates with the host in the order of ground, power, followed by signal as illustrated by Figure 1 and the contact sequence order listed in Table 1.

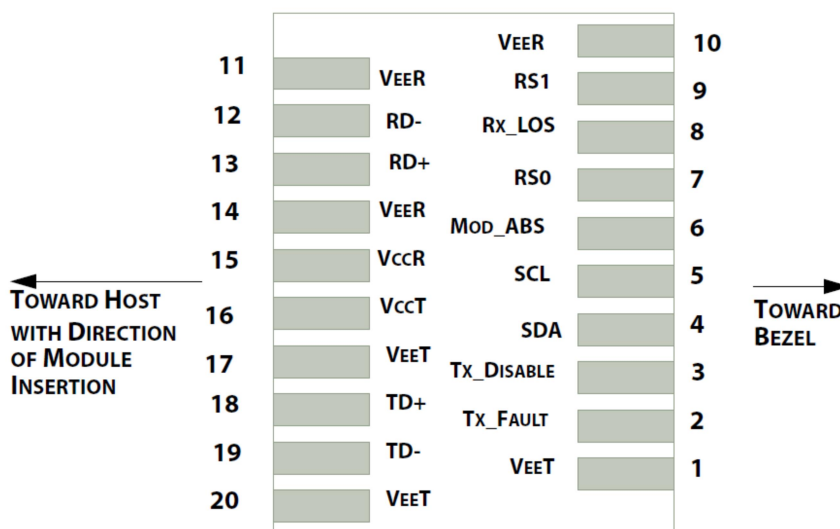


Figure1 SFP28 Pad assignment Top View

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

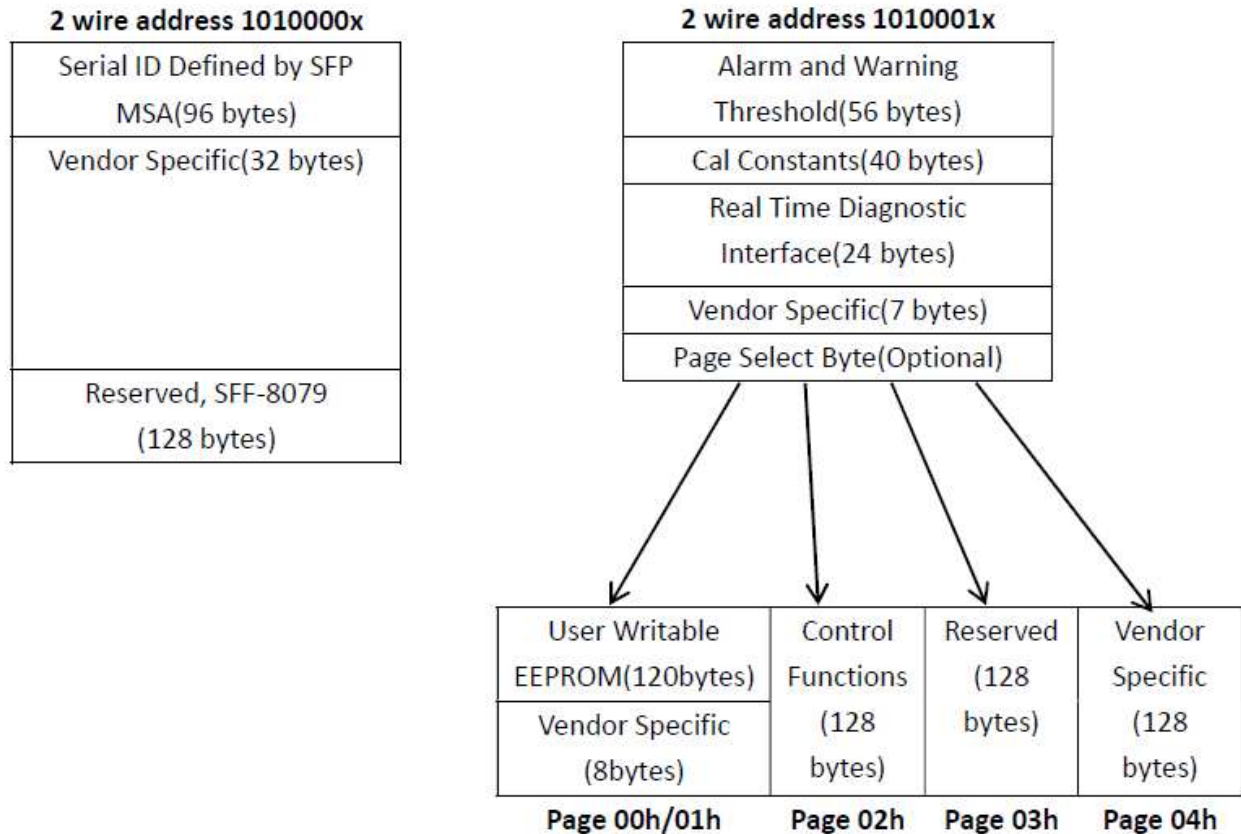
SFP28 Module PIN Definition

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.

7. EEPROM Memory Map



SFP28 Memory Map

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

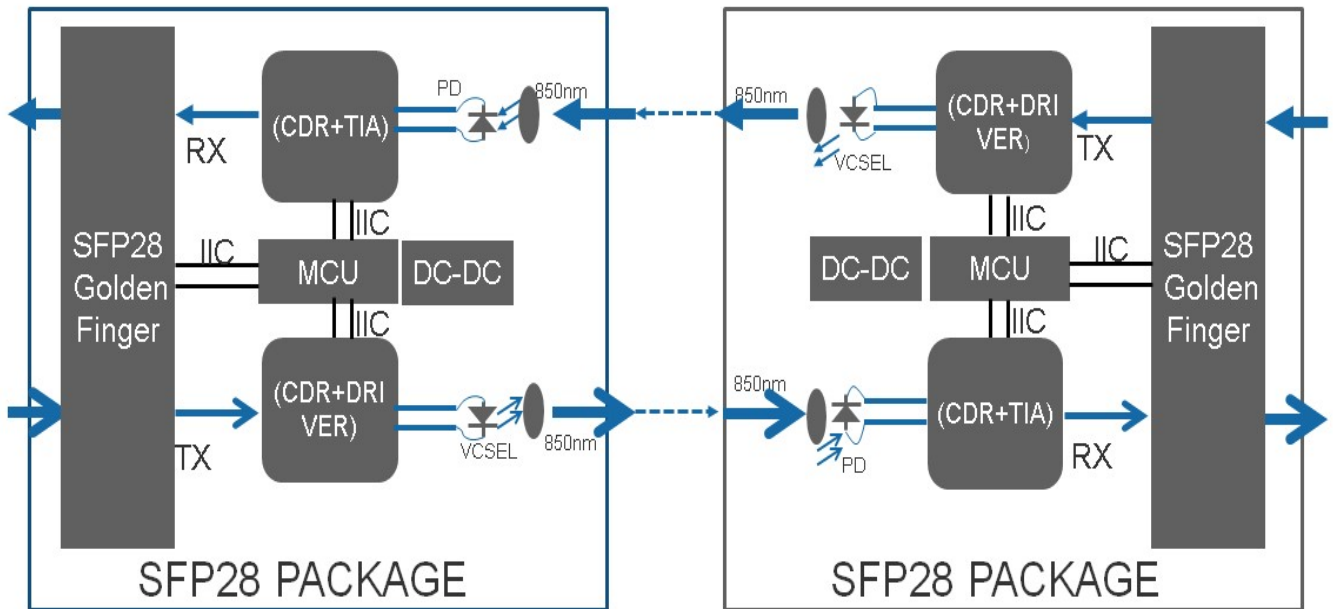
Address	Name of field	Hex	Description
BASE ID Fields			
0	Identifier	03	SFP transceiver
1	Ext. Identifier	04	GBIC/SFP function is defined by two-wire interface ID only
2	Connector	0B	Optical Pigtail
'3-10	Transceiver	00 00 00 00 00 00 00 00	Not defined
11	Encoding	03	NRZ
12	BR, Nominal	FF	25.78125Gbps
13	Rate Identifier	00	Not defined
14	Length(SMF)-km	00	Not Supported
15	Length(SMF)-100m	00	Not Supported
16	Length (50µm OM2)-10m	00	Not Supported

17	Length (62.5µm OM1)-10m	00	Not Supported
18	Length (50µm OM4)-10m Length (Active Cable or Copper)- m	XX	Reserved
19	Length(OM3)	00	Reserved
20-35	Vendor Name	4D 45 4E 54 45 43 48 4F 50 54 4F 20 20 20 20 20	"MENTECHOPTO"(ASCII character)
36	Reserved	00	Not defined
37-39	Vendor OUI	xx xx xx	Not defined
40-55	Vendor P/N	4D 50 42 32 35 44 31 2D 44 5A 43 2D xx xx xx 54	"MPB25D1-DZC-XXXT"(ASCII character)
56-59	Vendor P/N Rev.	41 30 20 20	"A0"(ASCII character)
60-61	Laser Wavelength	03 52	850nm
62	Reserved	00	Not defined
63	CC_BASE	Programmed by Factory	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,20%
67	BR, min	00	Lower bit rate margin,20%
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	Internal Calibrated; Received power measurement type: Average Power
93	Enhanced options	F0	Optional Alarm/warning implemented; Solf TX_DISABLE, TX_FAULT, RX_LOS implemented
94	SFF-8472 compliant	08	Revision Implemented
95	CC-EXT	Programmed by Factory	Check sum of bytes 64-94
Vendor Specific ID Field			
96-127	Vendor Specific	xx.....xx	Vendor specific EEPROM
128-255	Reserved	FF	Reserved for future use

Digital Diagnostic Monitoring Interface: Alarm and Warning Thresholds (2-Wire Address A2h)

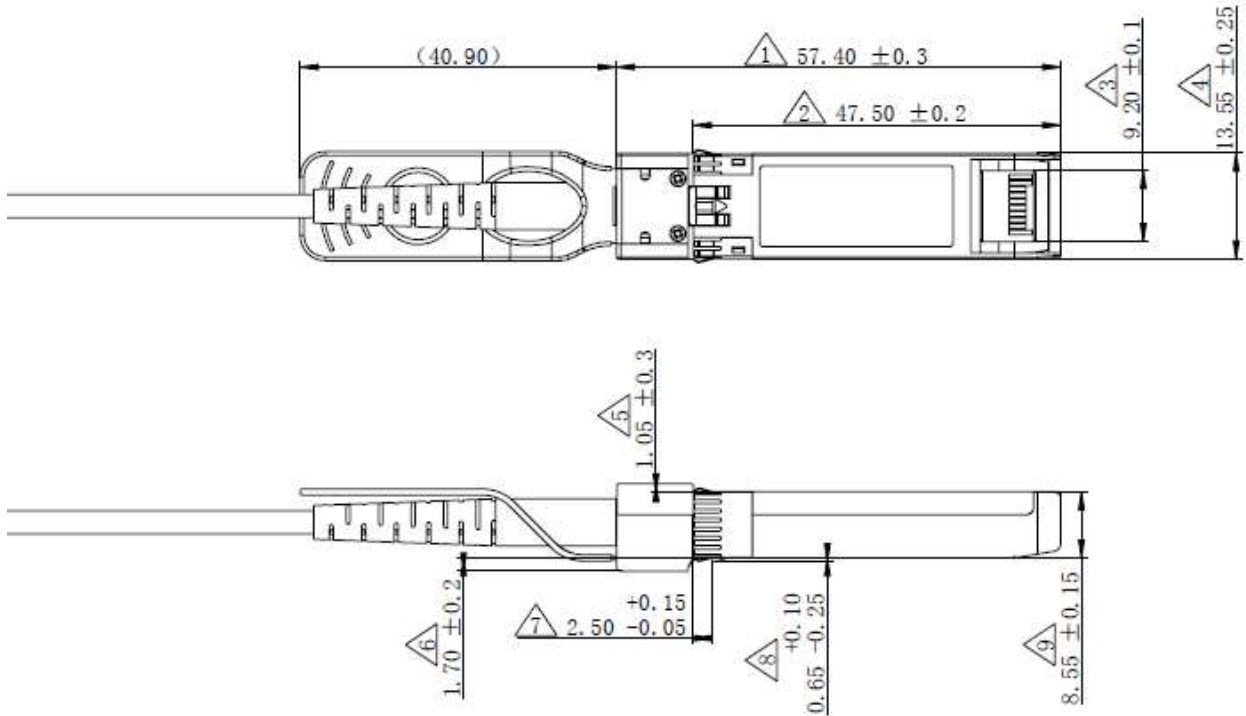
Address	#Bytes	Name	Real Value	Unit	Hex
00-01	2	Temp High Alarm	75	°C	
02-03	2	Temp Low Alarm	-5	°C	
04-05	2	Temp High Warning	73	°C	
06-07	2	Temp Low Warning	-3	°C	
08-09	2	Voltage High Alarm	3.6	V	
10-11	2	Voltage Low Alarm	3	V	
12-13	2	Voltage High Warning	3.5	V	
14-15	2	Voltage Low Warning	3.1	V	
16-17	2	Bias High Alarm	12	mA	
18-19	2	Bias Low Alarm	1	mA	
20-21	2	Bias High Warning	11.5	mA	
22-23	2	Bias Low Warning	1.5	mA	
24-25	2	TX Power High Alarm	3.4	dBm	
26-27	2	TX Power Low Alarm	-10.4	dBm	
28-29	2	TX Power High Warning	2.4	dBm	
30-31	2	TX Power Low Warning	-8.4	dBm	
32-33	2	RX Power High Alarm	3.4	dBm	
34-35	2	RX Power Low Alarm	-12.04	dBm	
36-37	2	RX Power High Warning	2.4	dBm	
38-39	2	RX Power Low Warning	-11	dBm	
40-55	16	Reserved	Reserved		

8. Optical Module Block Diagram



9. Mechanical Dimensions

Dimensions are in millimeters. All dimensions are ± 0.1 mm unless otherwise specified. (Unit: mm)



10. Ordering information

Part. No	Specifications						
	Pack	Rate (Gbps)	Tx (nm)	Rx	Temp (°C)	Reach (m)	Others
MPB25D1-DZC-001T	SFP28	25.78	850 VCSEL	PIN	0~+70	1	RoHS
MPB25D1-DZC-003T	SFP28	25.78	850 VCSEL	PIN	0~+70	3	RoHS
MPB25D1-DZC-005T	SFP28	25.78	850 VCSEL	PIN	0~+70	5	RoHS
MPB25D1-DZC-007T	SFP28	25.78	850 VCSEL	PIN	0~+70	7	RoHS
MPB25D1-DZC-010T	SFP28	25.78	850 VCSEL	PIN	0~+70	10	RoHS
MPB25D1-DZC-015T	SFP28	25.78	850 VCSEL	PIN	0~+70	15	RoHS
MPB25D1-DZC-020T	SFP28	25.78	850 VCSEL	PIN	0~+70	20	RoHS
MPB25D1-DZC-025T	SFP28	25.78	850 VCSEL	PIN	0~+70	25	RoHS
MPB25D1-DZC-030T	SFP28	25.78	850 VCSEL	PIN	0~+70	30	RoHS
MPB25D1-DZC-040T	SFP28	25.78	850 VCSEL	PIN	0~+70	40	RoHS
MPB25D1-DZC-050T	SFP28	25.78	850 VCSEL	PIN	0~+70	50	RoHS
MPB25D1-DZC-070T	SFP28	25.78	850 VCSEL	PIN	0~+70	70	RoHS
MPB25D1-DZC-100T	SFP28	25.78	850 VCSEL	PIN	0~+70	100	RoHS

*Note:

1. OM3 Cable length =<70m or OM4 Cable length =<100m
2. More detail product selection and cable lengths, please contact MNC
3. Measured with a PRBS 2³¹-1 test pattern, @25.78Gb/s, BER<5E-5, for each channel.