

Product Specifications

MFB-TSB

155Mbps Bi-directional 1550nm/1310nm SFP Multi-mode DDM Module – 2km (-40 to +75 degrees C)

Version 1.0

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Change History:

Revision:	Date:	Author:	Change List
Version 1.0	August 29, 2017	Norman Tsai	Initial release

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Reviewed By:		Approved By:	Kent Kang

1. PRODUCT Overview



High-performance Industrial Fast Ethernet Bi-Directional DDM Module

PLANET Fast Ethernet WDM Module is specifically designed for the high-performance integrated duplex data link over a single optical fiber. These transceiver modules are compliant with the small form-factor pluggable (SFP) multi-source agreement (MSA). With the hot plug ability, these modules offer an easy way to be installed into SFP MSA compliant ports at any time without the interruption of the host equipment operating online.

Digital Diagnosis Monitoring

PLANET MFB-TSA and MFB-TSB Modules support **SFP-DDM (Digital Diagnostic Monitor)** function that greatly helps network administrator to easily monitor real-time parameter of the SFP transceivers, such as optical output power, optical input power, temperature, laser bias current and transceiver supply voltage.

Digital Diagnostic Monitor (DDM)



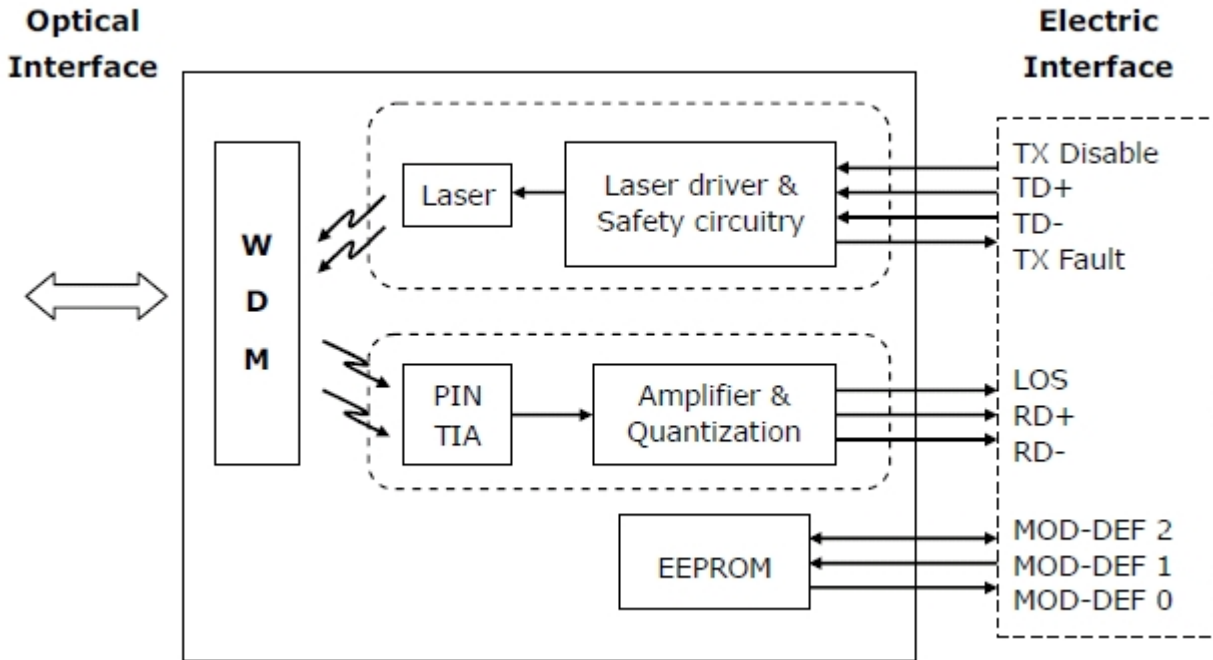
2. PRODUCT FEATURES

- Complies with the IEEE 802.3u Fast Ethernet standard
- 155Mbps bi-directional single LC fiber port
- 1550nm DFB transmitter
- 1310nm pin receiver
- SFF-8472 diagnostic monitoring (DDM)
- 2 kilo meters multi-mode fiber-optical point-to-point transmission
- SFP multi-source agreement compliant
- Serial ID functionality support
- Class 1 laser safety standard IEC 60825 compliant
- Low power dissipation
- Hot Pluggable
- Plug and Play Installation
- -40 to 75 degrees C operating temperature

3. PRODUCT SPECIFICATIONS

The transceiver fundamentally consists of two parts (transmitter and receiver). The transmitter features a TTL logic level disable signal and a fault indicator while the receiver features TTL logic loss of signal (LOS) detection. For access to serial identification information, an EEPROM is used to store the required data via the 2-wire serial CMOS EEPROM protocol. The detailed signal descriptions are listed in the following sections.

3.1 Block Diagram



3.2 FUNCTION SPECIFICATIONS

MFB WDM Multi-mode SFP Module	
PHY Type	IEEE 802.3u 100BASE-FX
Fiber Type	Multi-mode
Connector	LC
Speed	155Mbps (maximum)
Wavelength (TX/RX)	1550nm/1310nm
Maximum Distance	2km
Diagnostics Monitoring	SFF-8472 DDM

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Temperature	T_s	-40	+85	°C	N/A
Supply Voltage	V_{cc}	-0.5	+4.0	V	N/A
Storage Relative Humidity	RH	5	95	%	N/A

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	T_c	-40	N/A	+85	°C	
Supply Voltage	V_{ccT} V_{ccR}	3.1	3.3	3.5	V	N/A
Supply Current	$I_{TX} + I_{RX}$	N/A	150	300	mA	N/A

Transmitter Electro-optical Interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter Differential Input Voltage	TD +/-	400	N/A	2400	mV	N/A
Tx_Fault - High	V_{Fault_H}	2	N/A	V_{ccT}	V	N/A
Tx_Fault - Low	V_{Fault_L}	V_{eeT}	N/A	$V_{eeT}+0.8$	V	N/A
Tx_Disable - High	$V_{Disable_H}$	2	N/A	V_{ccT}	V	N/A
Tx_Disable - Low	$V_{Disable_L}$	V_{eeT}	N/A	$V_{eeT}+0.8$	V	N/A
Optical Output Power	P_o	-14	N/A	-8	dBm	1
Optical Extinction Ratio	E_R	8.2	N/A	N/A	dB	N/A
Center Wavelength	λ_c	1480	1550	1580	nm	N/A
Spectral Width (RMS)	$\Delta\lambda$	N/A	N/A	10	nm	N/A
Optical Rise / Fall Time	t_r / t_f	N/A	N/A	2/2	ps	N/A

 Notes: Coupling into a 50/125 μ m multi-mode fiber.

Receiver Electro-optical Interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver Differential Output Voltage	RD+/-	400	N/A	2000	mV	N/A
Receiver Overload	P _{IN} MAX	-8	N/A	N/A	dBm	1
Receiver Sensitivity	P _{IN} MIN	N/A	N/A	-30	dBm	1
Operating Center Wavelength	λ_c	1260	N/A	1360	nm	N/A
Return Loss	RL	12	N/A	N/A	dB	N/A
Receiver Loss of Signal - TTL Low	P _{LOSD}	N/A	N/A	-30	dBm	N/A
Receiver Loss of Signal - TTL High	P _{LOSA}	-45	N/A	N/A	dBm	N/A
Receiver Loss of Signal - Hysteresis	P _{LOSH}	0.5	N/A	N/A	dB	N/A

Notes: With BER better than or equal to 1×10^{-10} , measured in the center of the eye opening with 125Mbps ~ 155Mbps.

Digital Diagnostic Monitoring Characteristics

Parameter	Symbol	Accuracy	Unit	Note
Transceiver Temperature	T _{INT}	±3	°C	
Transceiver Supply Voltage	V _{INT}	±3	%	
TX Bias Current	I _{BIAS}	±10	%	
TX Output Power	P _{TX}	±3	dB	
RX Optical Power	P _{RX}	±3	dB	

3.3 PHYSICAL SPECIFICATIONS:

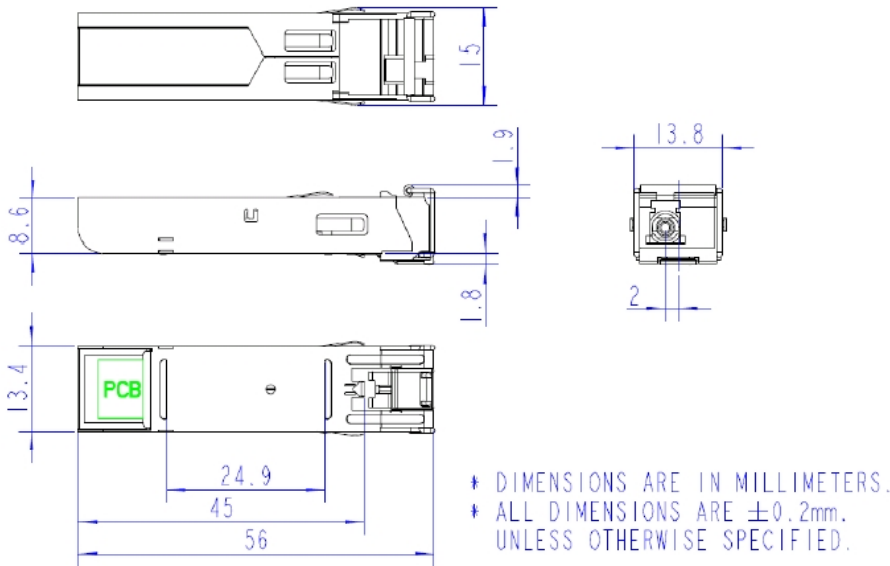
Dimensions:

56 x 15 x 13.4mm (W x D x H)

Weight:

16g

■ **Diagrams (unit: mm):**



3.4 ENVIRONMENTAL SPECIFICATION

Operating:

Temperature: -40°C ~ 75 degrees C

Relative Humidity: 5% ~ 90% (non-condensing)

Storage:

Temperature: -40°C ~ 85 degrees C

Relative Humidity: 5% ~ 90% (non-condensing)

3.5 ELECTRICAL SPECIFICATION

Input Voltage: 3.3V DC

3.6 REGULATORY COMPLIANCE

FCC Part 15 Class A, CE

3.7 RELIABILITY

MTBF > 100,000 hrs @ 25 degrees C

3.8 BASIC PACKAGING

- The MFB Bi-directional SFP Multi-mode 2km DDM Module x 1
- SFP Dust x 1
- This User's Manual x 1

3.9 PACKING DIMENSIONS

Dimensions: 143 x 100 x 46mm (W x D x H)

Weight: 1.8kg (gross weight)

Unit per carton: 112 pcs