

Product Features

- Up to 11.3Gbps Data Links
- Up to 80km transmission on SMF
- EEPROM with Serial ID Functionality
- Hot-pluggable SFP+ footprint
- Compliant with SFP+ MSA with LC connector
- Single + 3.3V Power Supply
- 1550nm EML laser and APD receiver
- 2-wire interface with integrated Digital Diagnostic monitoring
- Industrial case operating temperature range: -40°C to 85°C
- Low power dissipation: 1.8W

Applications

- 10GBASE-BX
- 10G SONET/SDH, OTU2/2e

Standards

- Compliant with SFF-8472
- Compliant to SFF-8431
- RoHS Compliant.

Ordering Information

Table 1. Ordering Information

Part Number	Product Description
WM-10SP5580BDI00	10GBASE-BX SFP+ 1550T/1490R 80km IT

Description

WM-10SP5580BDI00 is hot pluggable 3.3V Small-Form-Factor transceiver module. It designed expressly for high-speed communication applications that require rates up to 11.3Gb/s, it designed to be compliant with SFF-8472 SFP+ MSA. The module data link up to 80km in 9/125um single mode fiber.

General Specifications

Table 2. Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T _s	-40	85	°C
Relative Humidity	RH	5	95	%
Power Supply Voltage	V _{cc}	-0.3	4	V
Signal Input Voltage		V _{cc} -0.3	V _{cc} +0.3	V

Table 3. Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _c	-40	25	85	°C
Supply Voltage	V _{cc}	3.14	3.3	3.47	V
Data Rate	-	-	10.3125	11.3	Gb/s

Optical Characteristics

Table 4. Transmitter Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power	P _o	-1	-	3	dBm	1
Center Wavelength Range	λ _c	λ-7.5	λ	λ+7.5	nm	2
Average Launched Power(Laser Off)	P _{off}	-	-	-30	dBm	Note (1)
Extinction Ratio	ER	7.5	-	-	dB	-
Spectral Width (RMS) at -20dB	Δλ	-	-	0.3	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Extinction Ratio	ER	7.5	-	-	dB	3
Pout @TX-Disable Asserted	P _{off}	-	-	-30	dBm	-
Eye Diagram	IEEE Std 802.3 10Gb Ethernet 10GBASE-ZR compatible					

Table 5. Receiver Optical Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Center Wavelength	λ _c	1480	1490	1500	nm	-
Receiver Sensitivity (P _{avg})	S	-	-	-23	dBm	4
Receiver Sensitivity (OMA)	S _{OMA}	-	-	-23	dBm	
Receiver Overload (P _{avg})	P _{OL}	-6	-	-	dBm	4
LOS De-Assert	LOS _D	-	-	-24	dBm	-
LOS Assert	LOS _A	-38	-	-	dBm	-
LOS Hysteresis	-	0.5	-	6	dB	-

Note:

1. The optical power is launched into SMF
2. λ is wavelength of room temperature
3. Measured with RPBS 2^31-1 test pattern @10.3125Gbs
4. Measured with RPBS 2^31-1 test pattern @10.3125Gbs BER= $\leq 10^{-12}$

Electrical Characteristics

Table 6. Transceiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Total power supply current	Icc	-		550	mA	Industrial
Transmitter						
Differential Data Input Voltage	VDT	180	-	1200	mVp-p	
Differential line input Impedance	RIN	80	100	120	Ohm	
Transmitter Fault Output-High	VFaultH	2.4	-	Vcc	V	
Transmitter Fault Output-Low	VfaultL	-0.3	-	0.8	V	
Transmitter Disable Voltage-High	VdisH	2	-	Vcc+0.3	V	
Transmitter Disable Voltage-low	VdisL	-0.3	-	0.8	V	
Receiver						
Differential Data Output Voltage	VDR	300	-	850	mVp-p	
Differential line Output Impedance	ROUT	80	100	120	Ohm	
Receiver LOS Pull up Resistor	RLOS	4.7	-	10	Kohm	
LOS Assert Level	VLOS fault	Vcc-1.3		VccHOST	V	
LOS De-assert Level	VLOS norm	Vee		Vee+0.8	V	

Pin Description

Table 7. Pin Description

Pin	Name	Function/Description	Notes
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault (LVTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable (LVTTL-I) – High or open disables the transmitter	3
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	4
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	5
7	RS0	Rate Select 0 – Not used, Presents high input impedance	-
8	RX_LOS	Receiver Loss of Signal (LVTTL-O)	2
9	RS1	Rate Select 1 – Not used, Presents high input impedance	-
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O)	-
13	RD+	Received Data out (CML-O)	-
14	VeeR	Receiver Ground	-
15	VccR	Receiver Power - +3.3V	-
16	VccT	Transmitter Power - +3.3 V	-
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Data In (CML-I)	-
19	TD-	Inverse Transmitter Data In (CML-I)	-
20	VeeT	Transmitter Ground	1

Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7K Ω to 10K Ω pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7K Ω to 10K Ω pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7K Ω to 10K Ω pull-up resistor to VccHost.

Digital Diagnostic Functions

PH-E8083BI transceivers support the 2-wire serial communication protocol as defined in the SFP+MSA. The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information.

Additionally, WINMAX SFP+ transceivers provide a unique enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

The SFP+ MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through a 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into the SFP transceiver into those segments of the E2PROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

Outline Dimensions

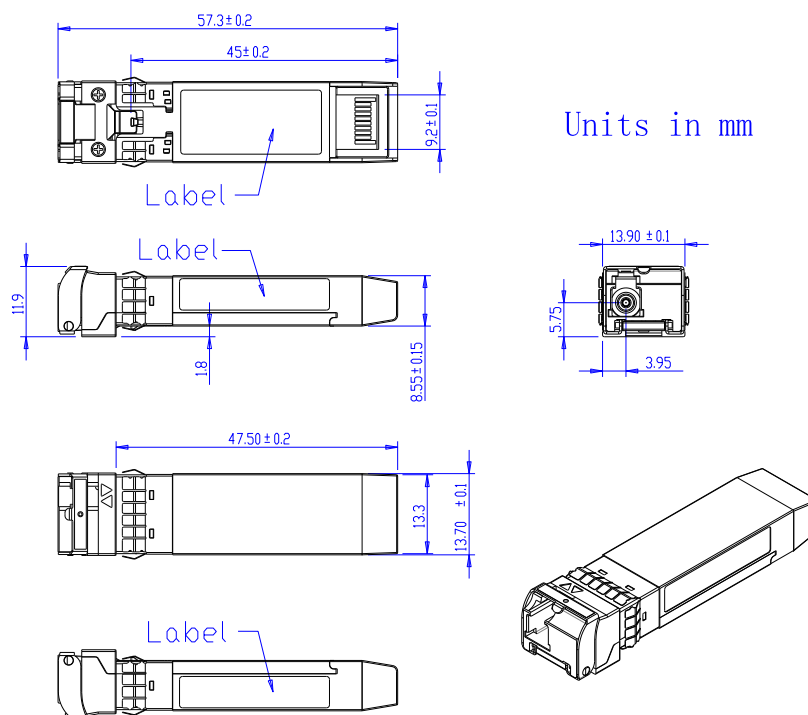


Figure 1. Outline Dimensions

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