

Product Specification

- MGB-LA10** 1000BASE-BX LC WDM SFP Module – 10km
- MGB-LB10** 1000BASE-BX LC WDM SFP Module – 10km
- MGB-LA20** 1000BASE-BX LC WDM SFP Module – 20km
- MGB-LB20** 1000BASE-BX LC WDM SFP Module – 20km
- MGB-LA40** 1000BASE-BX LC WDM SFP Module – 40km
- MGB-LB40** 1000BASE-BX LC WDM SFP Module – 40km
- MGB-LA80** 1000BASE-BX LC WDM SFP Module – 80km
- MGB-LB80** 1000BASE-BX LC WDM SFP Module – 80km
- MGB-TLA10** 1000BASE-BX LC WDM SFP Module – 10km
- MGB-TLB10** 1000BASE-BX LC WDM SFP Module – 10km
- MGB-TLA20** 1000BASE-BX LC WDM SFP Module – 20km
- MGB-TLB20** 1000BASE-BX LC WDM SFP Module – 20km
- MGB-TLA40** 1000BASE-BX LC WDM SFP Module – 40km
- MGB-TLB40** 1000BASE-BX LC WDM SFP Module – 40km
- MGB-TLA80** 1000BASE-BX LC WDM SFP Module – 80km
- MGB-TLB80** 1000BASE-BX LC WDM SFP Module – 80km
- MFB-FA20** 100BASE-BX LC WDM SFP Module – 20km
- MFB-FB20** 100BASE-BX LC WDM SFP Module – 20km
- MFB-TSA** 100BASE-BX LC WDM SFP Module – 2km
- MFB-TSB** 100BASE-BX LC WDM SFP Module – 2km
- MFB-TFA20** 100BASE-BX LC WDM SFP Module – 20km
- MFB-TFB20** 100BASE-BX LC WDM SFP Module – 20km
- MFB-TFA40** 100BASE-BX LC WDM SFP Module – 20km
- MFB-TFB40** 100BASE-BX LC WDM SFP Module – 20km

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Change History:

Revision:	Date:	Author:	Change List
1.1	2018/12/10	Bryant Wu	Add new Transceivers
1.0	2010/12/9	Marc Liao	Initial Release

Author:	Bryant Wu	Editor:	Bryant Wu
Reviewed By:	Kent Kang	Approved By:	Kent Kang

1. PRODUCT DESCRIPTION



The PLANET MGB/MFB family of Small Form Factor Pluggable (SFP, also known as mini-GBIC) transceiver module is specifically designed for the high performance integrated duplex data link over single mode optical fiber. These transceiver modules are compliant with the SFP Multisource 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 equipments operating online. The SFP Transceiver can install into PLANET Switch products with SFP interface. The SFP transceiver modules are hot-pluggable, and you can insert them into SFP module slots and remove them without interrupting the host system.

The PLANET MGB/MFB Transceiver family comes with one of the following models.

Fast Ethernet Transceiver (100BASE-BX, Single Fiber Bi-Directional SFP)

Model	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MFB-FA20	--	100	WDM(LC)	Single Mode	20km	1310nm	1550nm	0 ~ 60 °C
MFB-FB20	--	100	WDM(LC)	Single Mode	20km	1550nm	1310nm	0 ~ 60 °C
MFB-TSA	YES	100	WDM(LC)	Multi Mode	2km	1310nm	1550nm	-40 ~ 75 °C
MFB-TSB	YES	100	WDM(LC)	Multi Mode	2km	1550nm	1310nm	-40 ~ 75 °C
MFB-TFA20	--	100	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 75 °C
MFB-TFB20	--	100	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 75 °C
MFB-TFA40	--	100	WDM(LC)	Single Mode	40km	1310nm	1550nm	-40 ~ 75 °C
MFB-TFB40	--	100	WDM(LC)	Single Mode	40km	1550nm	1310nm	-40 ~ 75 °C

Gigabit Ethernet Transceiver (1000BASE-BX, Single Fiber Bi-Directional SFP)

Model	DDM	Speed (Mbps)	Connector Interface	Fiber Mode	Distance	Wavelength (TX)	Wavelength (RX)	Operating Temp.
MGB-LA10	YES	1000	WDM(LC)	Single Mode	10km	1310nm	1550nm	0 ~ 60 °C
MGB-LB10		1000	WDM(LC)	Single Mode	10km	1550nm	1310nm	0 ~ 60 °C
MGB-LA20	YES	1000	WDM(LC)	Single Mode	20km	1310nm	1550nm	0 ~ 60 °C
MGB-LB20		1000	WDM(LC)	Single Mode	20km	1550nm	1310nm	0 ~ 60 °C
MGB-LA40	YES	1000	WDM(LC)	Single Mode	40km	1310nm	1550nm	0 ~ 60 °C
MGB-LB40		1000	WDM(LC)	Single Mode	40km	1550nm	1310nm	0 ~ 60 °C
MGB-LA80	YES	1000	WDM(LC)	Single Mode	80km	1490nm	1550nm	0 ~ 60 °C
MGB-LB80		1000	WDM(LC)	Single Mode	80km	1550nm	1490nm	0 ~ 60 °C
MGB-TLA10	YES	1000	WDM(LC)	Single Mode	10km	1310nm	1550nm	-40 ~ 75 °C
MGB-TLB10		1000	WDM(LC)	Single Mode	10km	1550nm	1310nm	-40 ~ 75 °C
MGB-TLA20	YES	1000	WDM(LC)	Single Mode	20km	1310nm	1550nm	-40 ~ 75 °C

MGB-TLB20		1000	WDM(LC)	Single Mode	20km	1550nm	1310nm	-40 ~ 75 °C
MGB-TLA40	YES	1000	WDM(LC)	Single Mode	40km	1310nm	1550nm	-40 ~ 75 °C
MGB-TLB40		1000	WDM(LC)	Single Mode	40km	1550nm	1310nm	-40 ~ 75 °C
MGB-TLA80	YES	1000	WDM(LC)	Single Mode	80km	1490nm	1550nm	-40 ~ 75 °C
MGB-TLB80		1000	WDM(LC)	Single Mode	80km	1550nm	1490nm	-40 ~ 75 °C

2. PRODUCT FEATURES

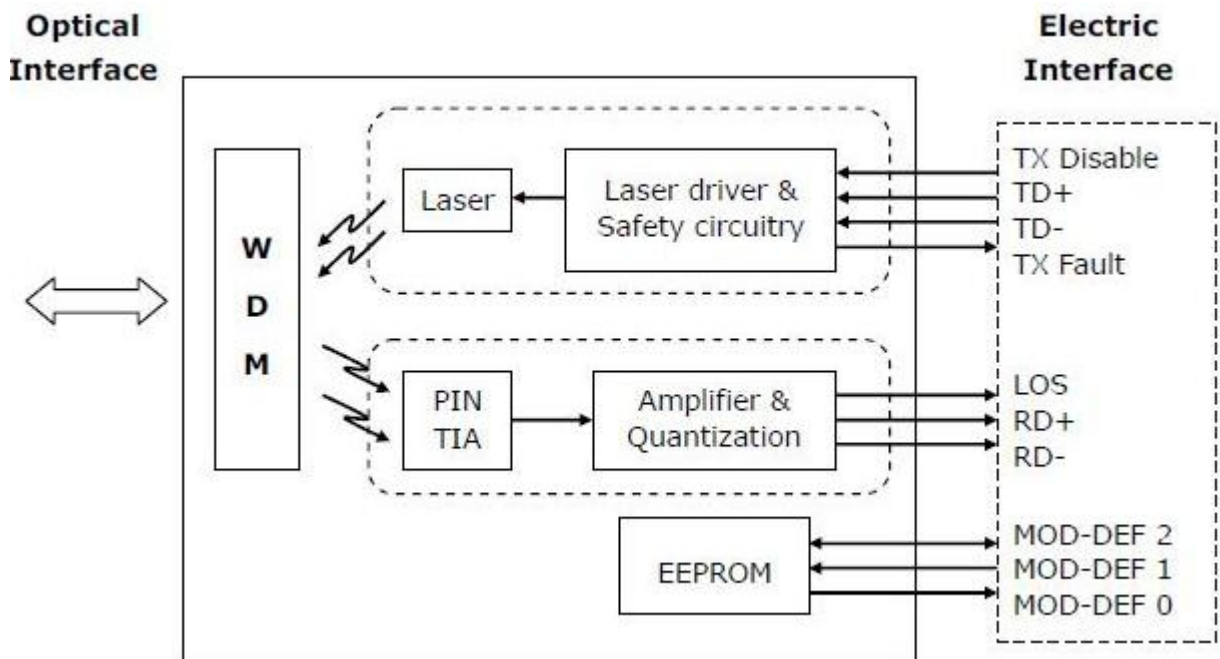
- SFP Multi-Source Agreement compliant
- Data rate 100Mbps to 1.25Gbps, vary on module
- SFP MSA SFF-8074i compliant
- Serial ID functionality support
- Class 1 laser safety standard IEC 60825 compliant
- Single LC receptacle
- Low power dissipation
- Plug and Play Installation

3. PRODUCT SPECIFICATION

3.1 MAIN COMPONENT

The transceiver is fundamentally consisted by two parts: **transmitter** and **receiver**. The transmitter features a TTL logic level Disable signal and a Fault indicator. The receiver features a TTL logic Loss of Signal (LOS) detection. For the access of 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.

■ Block Diagram of Transceiver



3.2 FUNCTION SPECIFICATION

■ Absolute Maximum Ratings

Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature		Ts	-40		+85	°C	
Supply Voltage		Vcc	-0.5		4.5	V	
Storage Relative Humidity		RH	5		95	%	
Data Rate GbE	MGB-LA10	-	-		1250	Mbps	
	MGB-LB10						
	MGB-LA20						
	MGB-LB20						
	MGB-LA40						
	MGB-LB40						
	MGB-LA80						
	MGB-LB80						
	MGB-TLA10						
	MGB-TLB10						
	MGB-TLA20						
	MGB-TLB20						
	MGB-TLA40						
	MGB-TLB40						
	MGB-TLA80						
MGB-TLB80							
Data Rate Fast Ethernet	MFB-FA20	-	--		155	Mbps	
	MFB-FB20						
	MFB-TSA						
	MFB-TSB						
	MFB-TFA20						
	MFB-TFB20						
	MFB-TFA40						
	MFB-TFB40						

Recommended Operating Conditions

Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	MGB-LA10	T _c	0	-	60	°C	
	MGB-LB10						
	MGB-LA20						
	MGB-LB20						
	MGB-LA40						
	MGB-LB40						
	MGB-LA80						
	MGB-LB80						
	MGB-TLA10	T _c	-40	-	75	°C	
	MGB-TLB10						
	MGB-TLA20						
	MGB-TLB20						
	MGB-TLA40						
	MGB-TLB40						
	MGB-TLA80						
	MGB-TLB80						
	MFB-FA20	T _c	0	-	60	°C	
	MFB-FB20						
	MFB-TSA	T _c	-40	-	75	°C	
	MFB-TSB						
	MFB-TFA20						
	MFB-TFB20						
	MFB-TFA40						
	MFB-TFB40						
Supply Voltage		V _{cc}	3.1	3.3	3.5	V	
Supply Current	MGB-LA10	I _{cc}	-	-	250	mA	
	MGB-LB10				250		
	MGB-LA20				250		
	MGB-LB20				250		
	MGB-LA40				250		
	MGB-LB40				250		
	MGB-LA80				250		
	MGB-LB80				250		
	MGB-TLA10				280		
	MGB-TLB10				280		
	MGB-TLA20				280		
	MGB-TLB20				280		

	MGB-TLA40				250		
	MGB-TLB40				250		
	MGB-TLA80				250		
	MGB-TLB80				250		
	MFB-FA20				160		
	MFB-FB20				160		
	MFB-TSA				300		
	MFB-TSB				300		
	MFB-TFA20				300		
	MFB-TFB20				300		
	MFB-TFA40				160		
	MFB-TFB40				160		

■ Transmitter Electro-Optical Interface (over Case Operating Temperature)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note	
Transmitter Differential Input Voltage	TD +/-	400		2400	mV		
Optical Output Power	MGB-LA10	-9		-3	dBm		
	MGB-LB10	-9		-3			
	MGB-LA20	-9		-3			
	MGB-LB20	-9		-3			
	MGB-LA40	-5		0			
	MGB-LB40	-5		0			
	MGB-LA80	-2		+5			
	MGB-LB80	-2		+5			
	MGB-TLA10	-9		-3			
	MGB-TLB10	-9		-3			
	MGB-TLA20	-9		-3			
	MGB-TLB20	P _o	-9	-			-3
	MGB-TLA40		-5				0
	MGB-TLB40		-5				0
	MGB-TLA80		-2				5
	MGB-TLB80		-2				5
	MFB-FA20		-14				-8
	MFB-FB20		-14				-8
	MFB-TSA		-14				-8
	MFB-TSB		-14				-8
MFB-TFA20		-14		-8			
MFB-TFB20		-14		-8			
MFB-TFA40		-8		-3			

	MFB-TFB40		-8		-3			
Optical Extinction Ratio	MGB-LA10	E _R	8					
	MGB-LB10		8					
	MGB-LA20		9					
	MGB-LB20		9					
	MGB-LA40		8					
	MGB-LB40		8					
	MGB-LA80		8					
	MGB-LB80		8					
	MGB-TLA10		8					
	MGB-TLB10		8					
	MGB-TLA20		9					
	MGB-TLB20		9					
	MGB-TLA40		8		-	-	dB	
	MGB-TLB40		8					
	MGB-TLA80		8					
	MGB-TLB80		8					
	MFB-FA20		10					
	MFB-FB20		10					
	MFB-TSA		8.2					
	MFB-TSB		8.2					
	MFB-TFA20		9					
	MFB-TFB20		9					
	MFB-TFA40		10					
MFB-TFB40	10							
Center Wavelength	MGB-LA10	λ _c	1260	1310	1360			
	MGB-LB10		1540	1550	1560			
	MGB-LA20		1260	1310	1350			
	MGB-LB20		1530	1550	1570			
	MGB-LA40		1260	1310	1360			
	MGB-LB40		1540	1550	1560			
	MGB-LA80		1480	1490	1510			
	MGB-LB80		1530	1550	1570	nm		
	MGB-TLA10		1260	1310	1360			
	MGB-TLB10		1540	1550	1560			
	MGB-TLA20		1270	1310	1360			
	MGB-TLB20		1480	1550	1580			
	MGB-TLA40		1300	1310	1320			
	MGB-TLB40		1540	1550	1560			
	MGB-TLA80		1490	1490	1510			

	MGB-TLB80		1530	1550	1570		
	MFB-FA20		1280	1310	1340		
	MFB-FB20		1530	1550	1570		
	MFB-TSA		1260	1310	1360		
	MFB-TSB		1480	1550	1580		
	MFB-TFA20		1260	1310	1360		
	MFB-TFB20		1480	1550	1580		
	MFB-TFA40		1280	1310	1340		
	MFB-TFB40		1530	1550	1570		
Spectral Width (RMS)	MGB-LA10	$\Delta\lambda$			4	nm	
	MGB-LB10				1		
	MGB-LA20				4		
	MGB-LB20				1		
	MGB-LA40				4		
	MGB-LB40				1		
	MGB-LA80				1		
	MGB-LB80				1		
	MGB-TLA10				4		
	MGB-TLB10				1		
	MGB-TLA20				3		
	MGB-TLB20			-	-		1
	MGB-TLA40						1
	MGB-TLB40						1
	MGB-TLA80						1
	MGB-TLB80						1
	MFB-FA20						2
	MFB-FB20						2
	MFB-TSA						10
	MFB-TSB						10
	MFB-TFA20						4
	MFB-TFB20						3
MFB-TFA40				2			
MFB-TFB40				1			
Optical Rise / Fall Time	MGB-LA10	t_r / t_f			300	ps	
	MGB-LB10				300		
	MGB-LA20				160		
	MGB-LB20			-	-		160
	MGB-LA40						300
	MGB-LB40						300
	MGB-LA80						260

	MGB-LB80				260		
	MGB-TLA10				300		
	MGB-TLB10				300		
	MGB-TLA20				260		
	MGB-TLB20				260		
	MGB-TLA40				300		
	MGB-TLB40				300		
	MGB-TLA80				260		
	MGB-TLB80				260		
	MFB-FA20				200		
	MFB-FB20				200		
	MFB-TSA				200		
	MFB-TSB				200		
	MFB-TFA20				200		
	MFB-TFB20				200		
	MFB-TFA40				200		
	MFB-TFB40				200		

■ Receiver Electro-Optical Characteristics (over Case Operating Temperature)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note	
Receiver Differential Output Voltage	RD +/-	400	-	2000	mV		
Receiver Overload (Maximum)	MGB-LA10		-3				
	MGB-LB10		-3				
	MGB-LA20		-3				
	MGB-LB20		-3				
	MGB-LA40		-3				
	MGB-LB40		-3				
	MGB-LA80		-3				
	MGB-LB80		-3				
	MGB-TLA10	P _{IN} MAX	-3	-	-	dBm	
	MGB-TLB10		-3				
	MGB-TLA20		-3				
	MGB-TLB20		-3				
	MGB-TLA40		-3				
	MGB-TLB40		-3				
	MGB-TLA80		-3				
	MGB-TLB80		-3				
	MFB-FA20		-3				
MFB-FB20		-3					

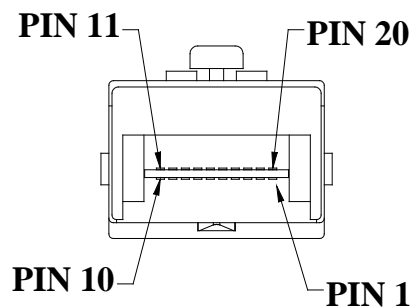
	MFB-TSA		-8				
	MFB-TSB		-8				
	MFB-TFA20		-3				
	MFB-TFB20		-3				
	MFB-TFA40		-3				
	MFB-TFB40		-3				
Receiver Sensitivity (Minimum)	MGB-LA10	P _{IN} MIN				-22	dBm
	MGB-LB10					-22	
	MGB-LA20					-23	
	MGB-LB20					-23	
	MGB-LA40					-24	
	MGB-LB40					-24	
	MGB-LA80					-24	
	MGB-LB80					-24	
	MGB-TLA10					-22	
	MGB-TLB10					-22	
	MGB-TLA20					-23	
	MGB-TLB20			-	-	-23	
	MGB-TLA40					-24	
	MGB-TLB40					-24	
	MGB-TLA80					-24	
	MGB-TLB80					-24	
	MFB-FA20					-34	
	MFB-FB20					-34	
	MFB-TSA					-30	
	MFB-TSB					-30	
	MFB-TFA20					-32	
	MFB-TFB20					-32	
MFB-TFA40				-34			
MFB-TFB40				-34			
Operating Center Wavelength	MGB-LA10	λ_c	1550	1550	1600	nm	
	MGB-LB10		1260	1310	1360		
	MGB-LA20		1530	1550	1570		
	MGB-LB20		1290	1310	1330		
	MGB-LA40		1500	1550	1600		
	MGB-LB40		1260	1310	1360		
	MGB-LA80		1510	1550	1590		
	MGB-LB80		1450	1490	1530		
	MGB-TLA10		1550	1550	1600		
	MGB-TLB10		1260	1310	1360		

	MGB-TLA20		1480	1550	1580			
	MGB-TLB20		1270	1310	1360			
	MGB-TLA40		1500	1550	1600			
	MGB-TLB40		1260	1310	1360			
	MGB-TLA80		1510	1550	1590			
	MGB-TLB80		1450	1490	1530			
	MFB-FA20		1480	1550	1600			
	MFB-FB20		1250	1310	1350			
	MFB-TSA		1480	1550	1580			
	MFB-TSB		1260	1310	1360			
	MFB-TFA20		1480	1550	1580			
	MFB-TFB20		1260	1310	1360			
	MFB-TFA40		1480	1550	1600			
	MFB-TFB40		1250	1310	1350			
Receiver Loss of Signal -TTL Low (Assert)	MGB-LA10	P _A			-36	dBm		
	MGB-LB10				-36			
	MGB-LA20				-40			
	MGB-LB20				-40			
	MGB-LA40				-36			
	MGB-LB40				-36			
	MGB-LA80				-36			
	MGB-LB80				-36			
	MGB-TLA10				-36			
	MGB-TLB10				-36			
	MGB-TLA20				-34			
	MGB-TLB20			-	-		-34	
	MGB-TLA40				-36			
	MGB-TLB40				-36			
	MGB-TLA80				-36			
	MGB-TLB80				-36			
	MFB-FA20				-34			
	MFB-FB20				-34			
	MFB-TSA				-30			
	MFB-TSB				-30			
MFB-TFA20			-32					
MFB-TFB20			-32					
MFB-TFA40			-34					
MFB-TFB40			-34					

Receiver Loss of Signal -TTL High (De-assert)	MGB-LA10	P _D	-23	-	-	dBm
	MGB-LB10		-23			
	MGB-LA20		-24			
	MGB-LB20		-24			
	MGB-LA40		-25			
	MGB-LB40		-25			
	MGB-LA80		-25			
	MGB-LB80		-25			
	MGB-TLA10		-23			
	MGB-TLB10		-23			
	MGB-TLA20		-24			
	MGB-TLB20		-24			
	MGB-TLA40		-25			
	MGB-TLB40		-25			
	MGB-TLA80		-25			
	MGB-TLB80		-25			
	MFB-FA20		-46			
	MFB-FB20		-46			
	MFB-TSA		-45			
	MFB-TSB		-45			
	MFB-TFA20		-45			
	MFB-TFB20		-45			
	MFB-TFA40		-46			
	MFB-TFB40		-46			
Receiver Loss of Signal Hysteresis	MGB-LA10	P _A -P _D	0.5	-	-	dB
	MGB-LB10		0.5			
	MGB-LA20		0.5			
	MGB-LB20		0.5			
	MGB-LA40		0.5			
	MGB-LB40		0.5			
	MGB-LA80		0.5			
	MGB-LB80		0.5			
	MGB-TLA10		0.5			
	MGB-TLB10		0.5			
	MGB-TLA20		1			
	MGB-TLB20		1			
	MGB-TLA40		0.5			
	MGB-TLB40		0.5			
	MGB-TLA80		0.5			
	MGB-TLB80		0.5			

MFB-FA20			0.5				
MFB-FB20			0.5				
MFB-TSA			0.5				
MFB-TSB			0.5				
MFB-TFA20			0.5				
MFB-TFB20			0.5				
MFB-TFA40			0.5				
MFB-TFB40			0.5				

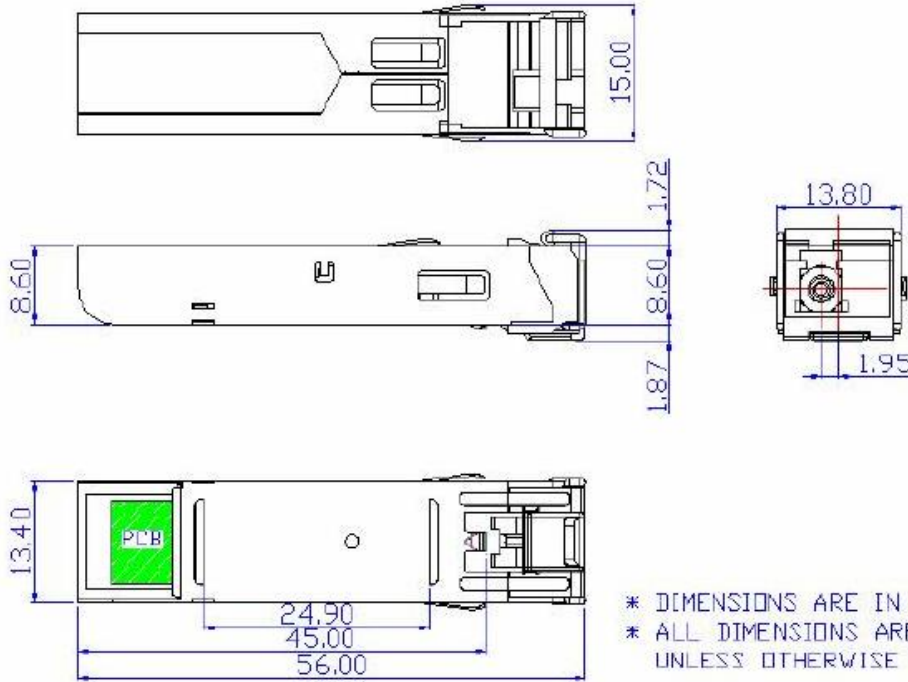
■ Pin Assignment



Pin	Signal Name	Description	Plug Seq.	Notes
1	<i>VeeT</i>	Transmit Ground	1	
2	<i>TX_FAULT</i>	Transmit Fault Indication	3	1
3	<i>TX_DISABLE</i>	Transmit Disable	3	2
4	<i>MOD_DEF (2)</i>	SDA Serial Data Signal	3	3
5	<i>MOD_DEF (1)</i>	SCL Serial Clock Signal	3	3
6	<i>MOD_DEF (0)</i>	TTL Low	3	3
7	<i>RATE_SELECT</i>	Open Circuit	3	4
8	<i>LOS</i>	Receiver Loss of Signal, TTL High, open collector	3	5
9	<i>VeeR</i>	Receiver Ground	1	6
10	<i>VeeR</i>	Receiver Ground	1	6
11	<i>VeeR</i>	Receiver Ground	1	6
12	<i>RD-</i>	Receive Data Bar, Differential PECL, ac coupled	3	7
13	<i>RD+</i>	Receive Data, Differential PECL, ac coupled	3	7
14	<i>VeeR</i>	Receiver Ground	1	6
15	<i>VCCR</i>	Receiver Power Supply	2	8
16	<i>VcCT</i>	Transmitter Power Supply	2	8
17	<i>VeeT</i>	Transmitter Ground	1	6
18	<i>TD+</i>	Transmit Data, Differential PCEL, ac coupled	3	9
19	<i>TD-</i>	Transmit Data Bar, Differential PCEL, ac coupled	3	9
20	<i>VeeT</i>	Transmitter Ground	1	6

3.3 PHYSICAL SPECIFICATIONS:

- **Dimensions(W x D x H):**
2.20" x0.59" x 0.49" / 56 x 15 x 12.4mm
- **Weight:**
0.6 oz / 18g
- **Diagrams:**



3.4 ENVIRONMENTAL SPECIFICATION

Operating:

- Temperature:** 0 ~60 degrees C
- Relative Humidity:** 5% ~ 95% (non-condensing)

Storage:

- Temperature:** -40 ~ 85 degrees C
- Relative Humidity:** 5% ~ 95% (non-condensing)

3.5 ELECTRICAL SPECIFICATION

Input Voltage: 3.3V DC

3.6 REGULATORY COMPLIANCE

FCC Class A, CE

3.7 REALIABILITY

MGB-LA/LB and MFB-FA/FB Series MTBF > 50,000 hrs @ 25 degrees C

MGB-TLA/TLB and MFB-TFA/TFB Series MTBF > 100,000 hrs @ 25 degrees C

3.8 BASIC PACKAGING

- The SFP Transceiver X1
- User's Manual X1
- SFP Dust Cap X1