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**SPB-5740WG / SPB-5720BWG / SPB-5740AWG (SC BIDI SFP) (RoHS Compliant)**

**SPB-5740LWG / SPB-5740BLWG / SPB-5740ALWG (LC BIDI SFP)**

**1550 nm TX / 1310 nm RX , 3.3V / 622 Mbps Digital Diagnostic Single-Fiber SFP Transceiver**  
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## FEATURES

- | 1-Fiber Bi-Directional SFP Optical Transceiver
- | Simplex **SC** Connector: **SPB-5740WG**
- | Simplex **LC** Connector: **SPB-5740LWG**
- | **SFF-8472 Digital Diagnostic Function**
- | 1550 nm DFB LD Transmitter
- | 1310 nm Receiver
- | Distance Up to 40 km
- | AC/AC Coupling according to MSA
- | Single +3.3 V Power Supply
- | RoHS Compliant
- | 0 to 70°C Operating: SPB-5740WG
- | -10 to 85°C Operating: SPB-5740BWG
- | -40 to 85°C Operating: SPB-5740AWG
- | Class 1 Laser International Safety Standard IEC 60825 Compliant

## APPLICATIONS

- | SONET/SDH Equipment Interconnect
- | Fibre Channel Links

## DESCRIPTION

The SPB-5740WG series is small form factor pluggable module for OC-12/STM-4 SONET/SDH and Fibre Channel single fiber communications by using 1550 nm transmitter and 1310 nm receiver. It is with the SFP 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I<sup>2</sup>C. The transmitter section uses a multiple quantum well 1550 nm laser and is a class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated 1310 nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

## LASER SAFETY

This single mode transceiver is a Class 1 laser product. It complies with IEC 60825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

## ORDER INFORMATION

P/No.	Bit Rate (Mb/s)	Distance (km)	TX (nm)	RX (nm)	Package	Temp (°C)	TX Power (dBm)	RX Sens. (dBm)	RoHS Compliant
SPB-5740WG	622	40	1550 DFB	1310	SC SFP with DMI	0 to 70	0 to -5	-28	Yes
SPB-5740BWG	622	40	1550 DFB	1310	SC SFP with DMI	-10 to 85	0 to -5	-28	Yes
SPB-5740AWG	622	40	1550 DFB	1310	SC SFP with DMI	-40 to 85	0 to -5	-28	Yes
<b>SPB-5740LWG</b>	622	40	1550 DFB	1310	<b>LC SFP with DMI</b>	0 to 70	0 to -5	-28	Yes
<b>SPB-5740BLWG</b>	622	40	1550 DFB	1310	<b>LC SFP with DMI</b>	-10 to 85	0 to -5	-28	Yes
<b>SPB-5740ALWG</b>	622	40	1550 DFB	1310	<b>LC SFP with DMI</b>	-40 to 85	0 to -5	-28	Yes

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Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-40	85	°C	
Operating Case Temperature	Topr	0 -10 -40	70 85 85	°C	SPB-5740WG SPB-5740BWG SPB-5740AWG
Power Supply Voltage	Vcc	0	3.6	V	
Input Voltage	---	GND	Vcc	V	
Output Current	Iout	0	30	mA	

Recommended Operating Conditions					
Parameter	Symbol	Min	Typ	Max	Units / Notes
Power Supply Voltage	Vcc	3.1	3.3	3.5	V
Power Supply Current	I <sub>CC(TX+RX)</sub>		200	300	mA
Operating Case Temperature	Topr	0 -10 -40		70 85 85	°C / SPB-5740WG °C / SPB-5740BWG °C / SPB-5740AWG
Data Rate			622	700	Mb/s

Transmitter Specifications (0°C < Topr < 70°C, 3.1V < Vcc < 3.5V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
<b>Optical</b>						
Optical Transmit Power	Po	-5	---	0	dBm	1
Output Center Wavelength	λ	1480		1580	nm	
Output Spectrum Width	Δλ	---	---	1	nm	-20 dB width
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	10	---	---	dB	
Output Eye	Compliant with Bellcore GR-253-CORE and ITU recommendation G.957					
Optical Rise Time	t <sub>r</sub>			1.2	ns	10% to 90% Values
Optical Fall Time	t <sub>f</sub>			1.2	ns	10% to 90% Values
Relative Intensity Noise	RIN			-116	dB/Hz	
Total Jitter	TJ			0.55	ns	2
<b>Electrical</b>						
Data Input Current – Low	I <sub>IL</sub>	-350			μA	
Data Input Current – High	I <sub>IH</sub>			350	μA	
Differential Input Voltage	V <sub>IH</sub> - V <sub>IL</sub>	0.5		2.4	V	Peak-to-Peak
TX Disable Input Voltage – Low	T <sub>DIS, L</sub>	0		0.5	V	3
TX Disable Input Voltage – High	T <sub>DIS, H</sub>	2.0		Vcc	V	3
TX Disable Assert Time	T <sub>ASSERT</sub>			10	μs	
TX Disable Deassert Time	T <sub>DEASSERT</sub>			1	ms	
TX Fault Output Voltage -- Low	T <sub>FaultL</sub>	0		0.5	V	4
TX Fault Output Voltage -- High	T <sub>FaultH</sub>	2.0		Vcc+0.3	V	4

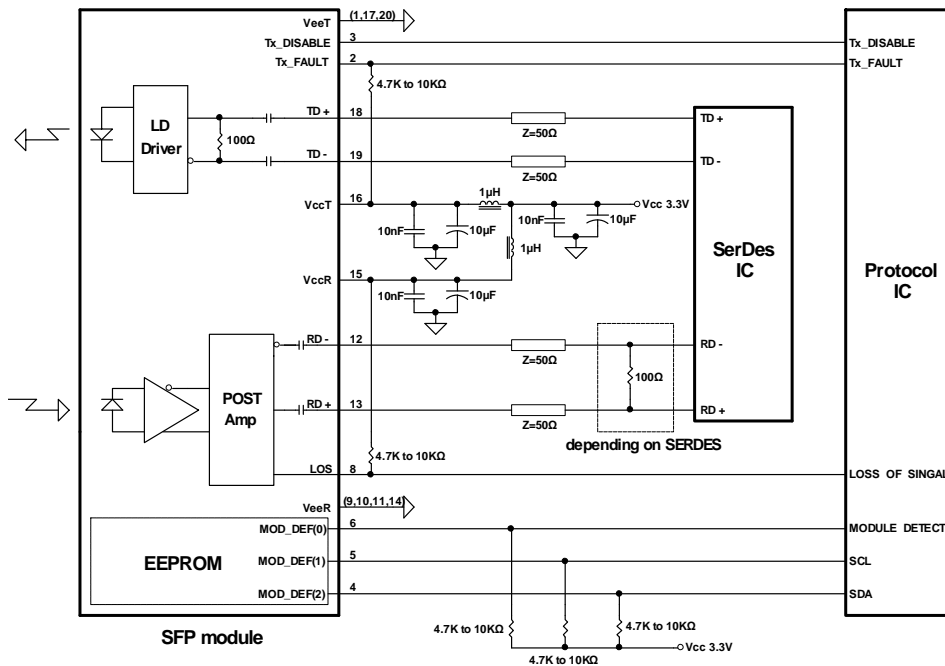
- Notes: 1. Output power is power coupled into a 9/125 μm single mode fiber.  
 2. Measured with a 2<sup>23</sup>-1 PRBS.  
 3. There is an internal 4.7K to 10K ohm pull-up resistor to VccTX.  
 4. Open collector compatible, 4.7K to 10K ohm pull-up to Vcc (Host Supply Voltage).

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Receiver Specifications (0°C < Topr < 70°C, 3.1 V < Vcc < 3.5V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
<b>Optical</b>						
Sensitivity	---	---	---	-28	dBm	5
Maximum Input Power	P <sub>in</sub>	-8	---	---	dBm	
Signal Detect -- Asserted	P <sub>a</sub>	---	---	-28	dBm	Transition: low to high
Signal Detect -- Deasserted	P <sub>d</sub>	-40	---	---	dBm	Transition: high to low
Signal detect -- Hysteresis		1.0	---		dB	
Wavelength of Operation		1260		1360	nm	6
Optical Return Loss	ORL	14			dB	
<b>Electrical</b>						
Differential Output Voltage	V <sub>OH</sub> - V <sub>OL</sub>	0.6		2.0	V	
Output LOS Voltage -- Low	V <sub>OL</sub>	0		0.5	V	7
Output LOS Voltage -- High	V <sub>OH</sub>	2.0		V <sub>cc</sub> +0.3	V	7
Signal Detect Assert Time	A <sub>S</sub> MAX			100	μs	OFF to ON
Signal Detect Deassert Time	A <sub>N</sub> SMAX			300	μs	ON to OFF

Notes: 5. Minimum sensitivity and saturation levels at BER 1E-10 for a 2<sup>23</sup>-1 PRBS.  
 6. At least 30 dB optical isolation for the wavelength 1480 to 1580 nm.  
 7. Open collector compatible, 4.7K to 10K ohm pull-up to Vcc (Host Supply Voltage).

## RECOMMENDED CIRCUIT SCHEMATIC



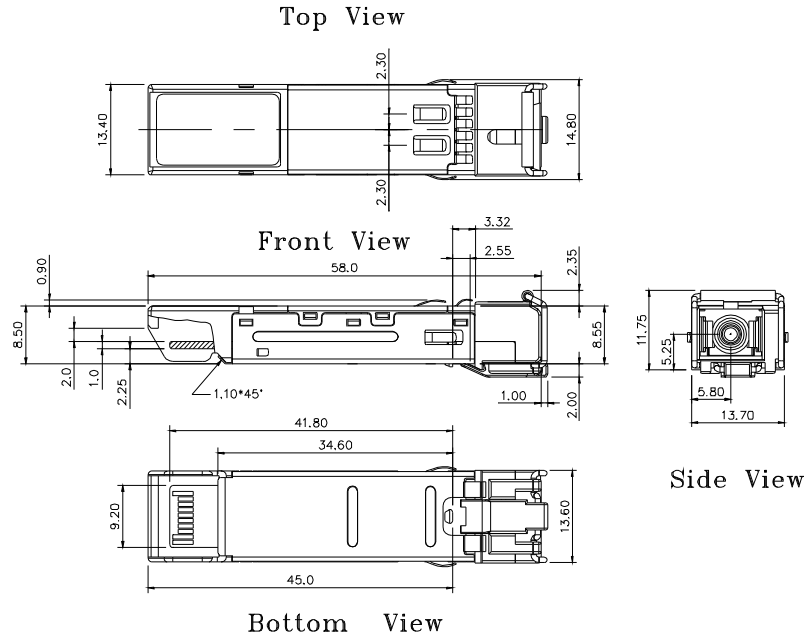
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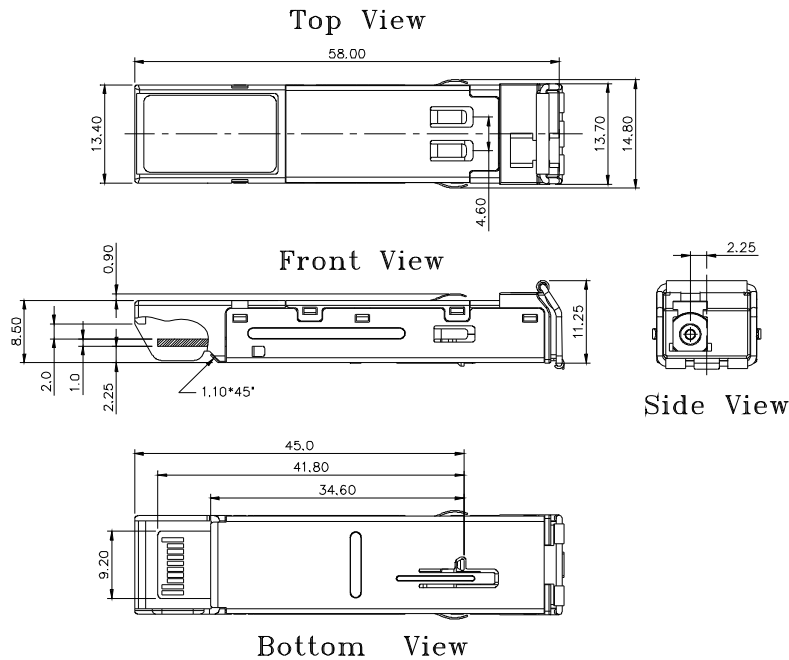
PACKAGE DIAGRAM

Units in mm

A) SC SFP



A) LC SFP



Note: Specifications subject to change without notice.

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Revision History

Version	Subject	Release Date
1.0	Initial datasheet	2005/12/1
2.0	Combine datasheet of SC BIDI SFP and LC BIDI SFP	2006/3/1
3.0	Revise SC BIDI SFP package diagram for high port density use	2008/1/1