

**BTRS-5820G / BTRS-5820-SPG / BTRS-5820AG / BTRS-5820A-SPG**

**1310 nm TX / 1490 nm RX , 3.3V / 622 Mbps **RoHS Compliant** SFF Single-Fiber Transceiver**

**FEATURES**

- | 1-Fiber Bi-Directional SFF Transceiver
- | 1310 nm Transmitter
- | 1490 nm Receiver
- | 1550 nm Video Block
- | Distance Up to 20 km
- | Single +3.3 V Power Supply
- | RoHS Compliant
- | LVPECL Differential Inputs and Outputs
- | 0 to 70°C Operating : BTRS-5820G
- | -20 to 85°C Operating : BTRS-5820AG
- | Wave Solderable and Aqueous Washable
- | Class 1 Laser International Safety Standard IEC 825 Compliant

**APPLICATIONS**

- | WDM 622/155 Mb/s Links
- | SONET/SDH Equipment Interconnect
- | Fiber Channel 532 Mb/s Links

**DESCRIPTION**

The BTRS-5820G series is high performance module for single fiber communications by using 1310 nm transmitter and 1490 nm receiver. **This module is equipped with 3W-TRX™ OE device to reject 1.55 um high power video signal.** The transmitter section uses a multiple quantum well 1310 nm laser and is a class 1 laser compliant according to International Safety Standard IEC-825. The receiver section uses an integrated 1490 nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. A LVPECL logic interface simplifies interface to external circuitry.

**LASER SAFETY**

This single mode transceiver is a Class 1 laser product. It complies with IEC 825 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)	Voltage (V)	Package	Temp (°C)	TX Power (dBm)	RX Sens. (dBm)	RoHS Compliant
BTRS-5820G	622	20	1310	1490	3.3	2X5 SC	0 to 70	-8 to -14	-28	Yes
<b>BTRS-5820AG</b>	622	20	1310	1490	3.3	2X5 SC	<b>-20 to 85</b>	-8 to -14	-28	Yes

- Note: 1. BTRS-XXXXX: 2X5 SC receptacle type package. BTRL-XXXXX: 2X5 LC receptacle type package.  
 2. BTRX-XXXXX-APBBB is 2X5 pigtail type package with different connector, A=S is SC connector, A=F is FC connector, A=T is ST connector, A=L is LC connector, A=M is MU connector; BBB is the length of fiber in cm.  
 3. **3W-TRX™** is trade-mark co-owned by Zenko Technologies Inc. and Optoway Technology Inc.

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Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-40	85	°C	
Operating Temperature	Topr	0 -20	70 85	°C	BTRS-5820G BTRS-5820AG
Soldering Temperature	---		260	°C	10 seconds on leads only
Power Supply Voltage	Vcc	0	4.5	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	3.13	3.3	3.47	V
Operating Temperature	Topr	0 -20		70 85	°C / BTRS-5820G °C / BTRS-5820AG
Data Rate		50	622	650	Mb/s
Power Supply Current	Icc			260	mA

Transmitter Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
<b>Optical</b>						
Optical Transmit Power	Po	-14		-8	dBm	1
Output Center Wavelength	$\lambda$	1260	1310	1360	nm	
Output Spectrum Width	$\sigma_\lambda$			4	nm	RMS ( $\sigma$ )
Extinction Ratio	ER	8.2			dB	
Output Eye	Compliant with Bellcore TR-NWT-000253 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>	300		1600	mV	
Data Input Voltage – Low	V <sub>IL</sub> - V <sub>CC</sub>	-2.0		-1.58	V	3
Data Input Voltage -- High	V <sub>IH</sub> - V <sub>CC</sub>	-1.1		-0.74	V	3
Disable Input Voltage -- Low	V <sub>TDIS,L</sub>	0		0.8	V	TX Output Enabled
Disable Input Voltage -- High	V <sub>TDIS,H</sub>	Vcc - 1.3		Vcc	V	TX Output Disabled
Shut Off Time for TxDis	t <sub>DIS</sub>			1	ms	

- 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 with 72 ones and 72 zeros.  
 3. These inputs are compatible with 10K, 10KH and 100K ECL and LVPECL inputs.

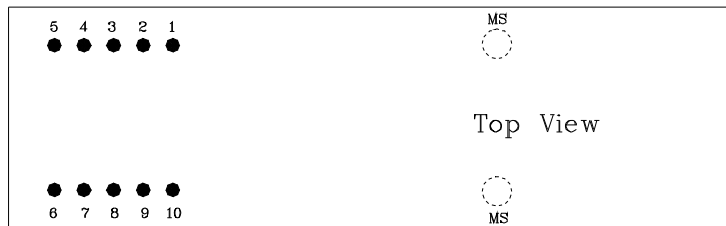
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Receiver Specifications (0°C < Topr < 70°C, 3.13 V < Vcc < 3.47V)  
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Parameter	Symbol	Min	Typ	Max	Units	Notes
<b>Optical</b>						
Sensitivity	---	---	---	-28	dBm	1
Maximum Input Power	Pin	-8	---	---	dBm	
Signal Detect -- Asserted	Pa	---	---	-28	dBm	Transition: low to high
Signal Detect -- Deasserted	Pd	-42	---	---	dBm	Transition: high to low
Signal detect -- Hysteresis		1.0	---	4.0	dB	
Wavelength of Operation		1450		1500	nm	2,3
Optical Return Loss	ORL	14			dB	
<b>Electrical</b>						
Data Output Voltage – Low	V <sub>OL</sub> - V <sub>CC</sub>	-2.0		-1.58	V	4
Data Output Voltage – High	V <sub>OH</sub> - V <sub>CC</sub>	-1.1		-0.74	V	4
SD Output Voltage -- Low	V <sub>OL</sub> - V <sub>CC</sub>	-2.0		-1.58	V	4
SD Output Voltage -- High	V <sub>OH</sub> - V <sub>CC</sub>	-1.1		-0.74	V	4
Signal Detect Assert Time	AS <sub>MAX</sub>			100	μs	OFF to ON
Signal Detect Deassert Time	ANS <sub>MAX</sub>			300	μs	ON to OFF

- Notes: 1. Minimum sensitivity and saturation levels at BER 1E-10 for a 2<sup>23</sup>-1 PRBS with 72 ones and 72 zeros.  
 2. At least 30 dB optical isolation for the wavelength 1260 to 1360 nm.  
 3. At least 30 dB optical isolation for the wavelength 1550 to 1600 nm  
 4. These outputs are compatible with 10K, 10KH and 100K ECL and LVPECL outputs.

## CONNECTION DIAGRAM

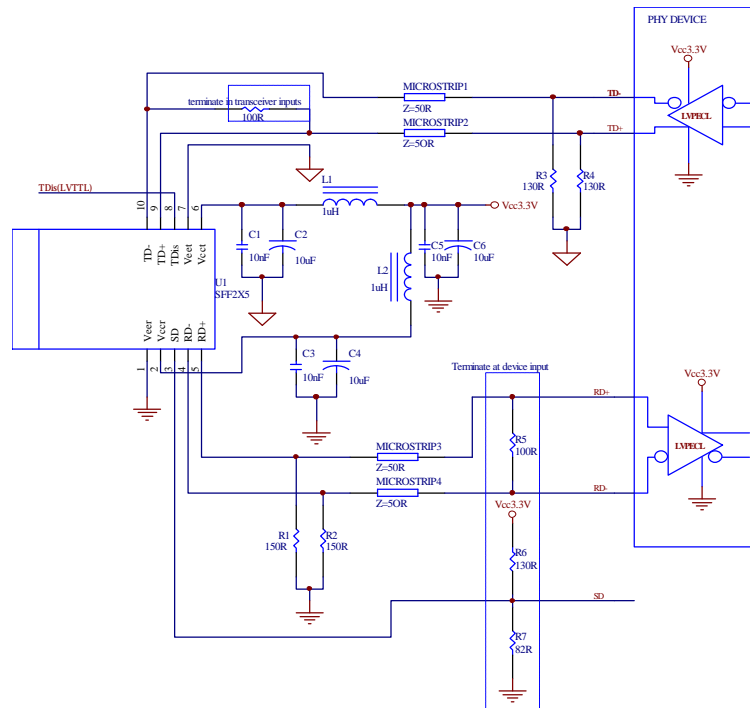


PIN	Symbol	Notes
1	V <sub>EE</sub> F	Directly connect this pin to the receiver ground plane
2	V <sub>CC</sub> F	+3.3V dc power for the receiver section
3	SD	Active high on this indicates a received optical signal.
4	RD-	Receiver Dataout Bar. See recommended circuit schematic
5	RD+	Receiver Dataout. See recommended circuit schematic
6	V <sub>CC</sub> t	+3.3V dc power for the transmitter section
7	V <sub>EE</sub> t	Directly connect this plan to the transmitter ground plane
8	TxDIS	Transmitter Disable. Connect this pin to +3.3V TTL logic "1" to disable module To enable module connect to TTL logic low "0"
9	TD+	Transmitter Data In. See recommended circuit schematic
10	TD-	Transmitter Data In Bar. See recommended circuit schematic
MS	MS	Mounting Studs. Connect to Chassis Ground

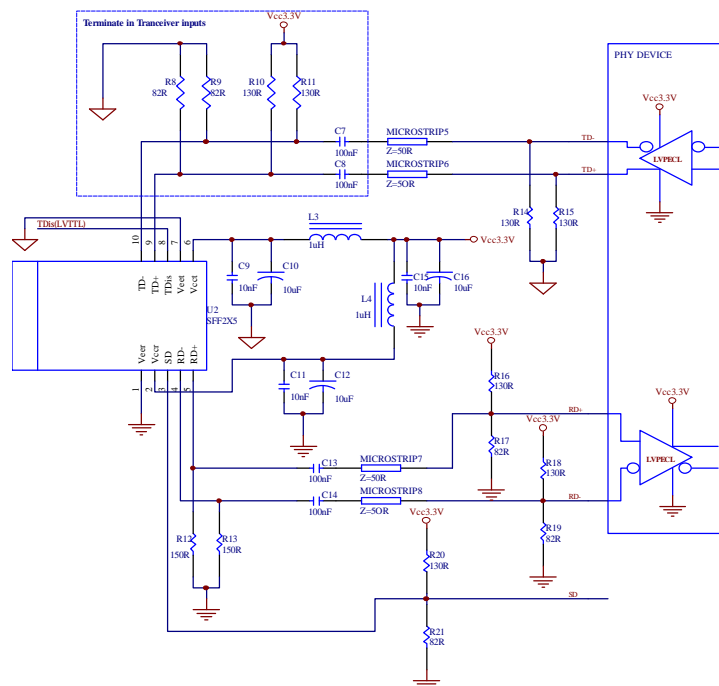
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RECOMMENDED CIRCUIT SCHEMATIC

1) Recommended DC Coupled Interface Circuit



2) Recommended AC Coupled Interface Circuit

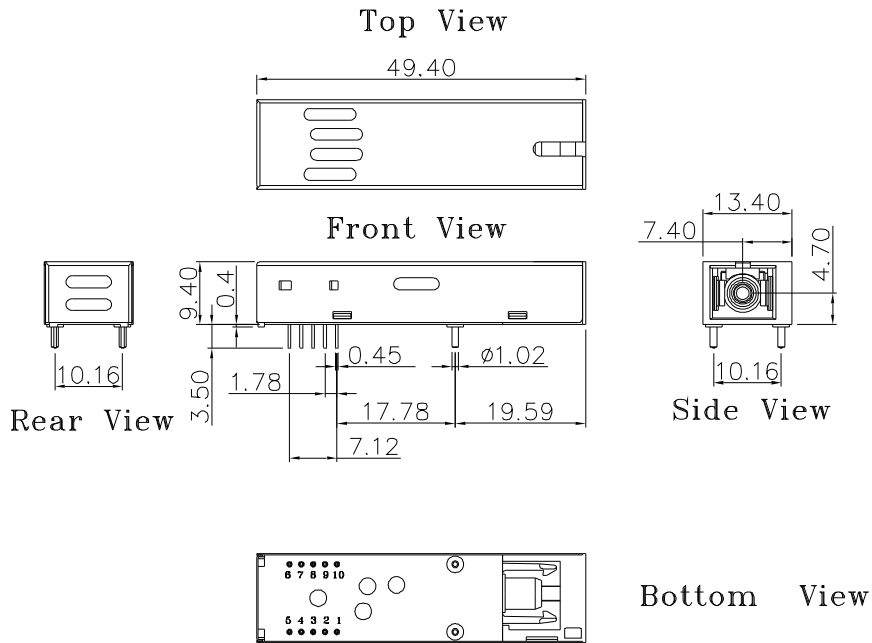


PACKAGE DIAGRAM

Units in mm

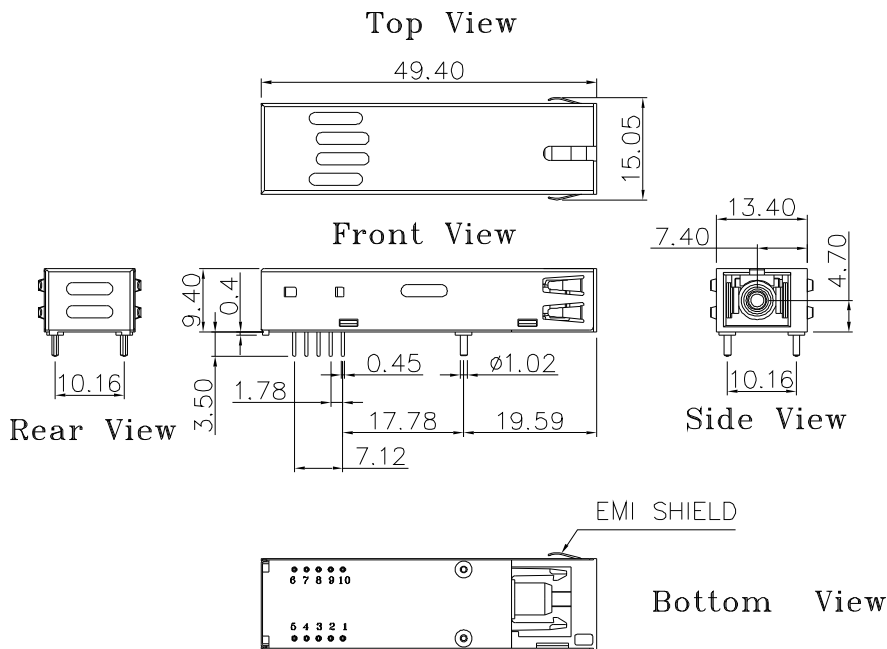
1) SC Receptacle

A) Standard Case



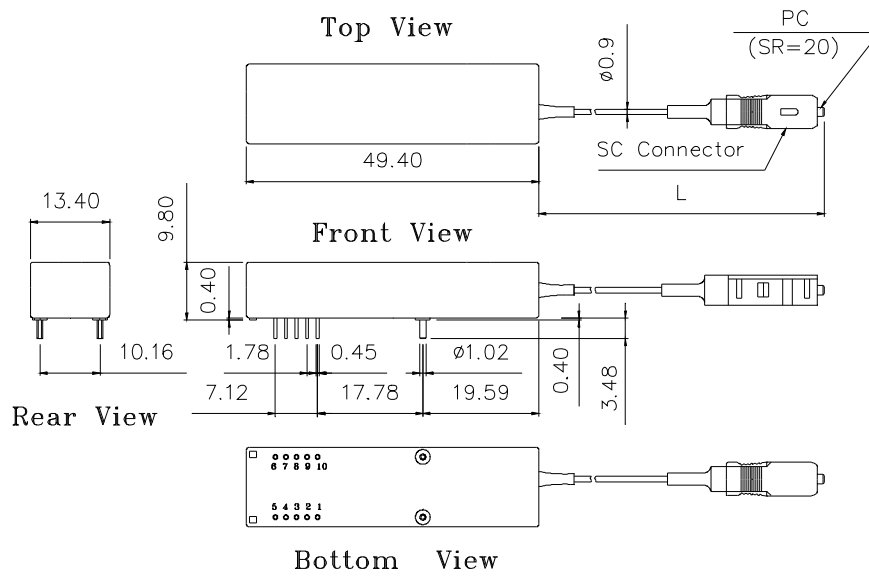
BTRS-5820G / BTRS-5820AG

B) Extended Case



BTRS-5820EG / BTRS-5820AEG

## 2) Pigtail



BTRS-5820-SP50G / BTRS-5820A-SP50G

Note: Length L is  $50 \pm 3$  cm. Other pigtail's length is available upon request.

**Note:** Specifications subject to change without notice.