

# Technical Datasheet

## HFBR-5911ALZ-C

### Avago Broadcom® Compatible 2x5 SFF 1.25Gbps Transceiver

+3.3V, Duplex LC, Multi-Mode, 500m, Industrial Temperature

#### FEATURES

- 850nm VCSEL Transmitter
- Distance up to 500m at MM Fiber
- 500m links with OM3 MMF Cables
- 3.3V power supply
- LC duplex optical interface
- CML Differential Inputs , CML Outputs and (LV)TTL signal detect
- Class 1 Laser International Safety Standard IEC 825 Compliant
- Operating case temperature range (Standard: 0 to +70°C) or (Industrial: -40°C to +85°C)

#### APPLICATIONS

- Fiber Channel Switch Infrastructure
- Other optic links

#### DESCRIPTION

ATGBICS HFBR-5911ALZ-C transceiver module is the perfect solution for high -speed communication networks. This transceiver module supports data rates up to 1.25Gbps. The module is fully compliant with the 2X5 standard package defined by the Small Form Factor Multi-Sourcing Agreement (MSA).

This transceiver module provides the system designer with Telecom, Datacom, and other Fibre Channel applications.

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## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Note
Storage Temperature	TST	-40	+85	°C	-
Relative Humidity	RH	5	95	%	-
Supply Voltage	VCC	0	+3.6	V	-

## Recommended Operating Environment and Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Note
Supply Voltage	VCC	+3.1	+3.3	+3.5	V	-
Supply Current	Icc	-	-	260	mA	-
Operating Case Temperature	TOP	0	-	+70	°C	1
		-40	-	+85		2
Data Rate	B	-	-	1.25	Gbps	-
Soldering temperature	-	-	-	260	°C	3
Soldering duration	-	-	-	10	Sec	3

### Notes:

1. Standard level
2. Industrial level
3. Not recommended wave soldering

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## Optical Parameters

**Transceiver Optical Characteristics** (Ambient Operating Temperature  $T_a=+25\pm 5^\circ\text{C}$ ,  $V_{CC} = 3.3\pm 0.2\text{V}$ )

Parameter	Symbol	Min	Typ	Max	Units	Notes
Average Launch Power	Po, Avg	-12	-	-3	dBm	-
Output Center Wavelength	c	840	850	860	nm	-
Output Spectral width (RMS)	$\sigma$	-	-	0.85	nm	RMS( $\sigma$ )
Laser Off Power	Poff	-	-	-30	dBm	-
Extinction Ratio	ER	8.2	-	-	dB	-
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	12dB Reflection
Transmitter Dispersion Penalty	TDP	-	-	3.9	dB	-
Optical Return Loss Tolerance	-	-	-	12	dB	-

**Receiver Optical Specifications** ( $T_a=+25\pm 5^\circ\text{C}$ ,  $V_{CC} = 3.3\pm 0.2\text{V}$ )

Parameter	Symbol	Min	Typ	Max	Units	Notes
Input Center Wavelength	c	840	850	860	dBm	-
Receiver Sensitivity	Sen1	-	-	-18	dBm	-
Receiver Overload	Pmax	-3	-	-	dBm	-
LOS -- Deasserted	LOSD	-	-	-18	dBm	Transition: Low to high
LOS -- Asserted	LOSA	-30	-	-	dB	Transition: High to low
LOS Hysteresis	LOSH	0.5	-	-	dB	-
Receiver Reflectance	-	-	-	-12	dB	-

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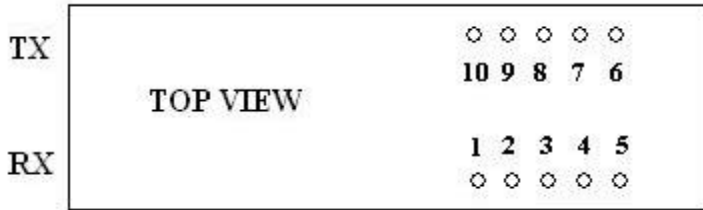
## Electrical Parameters

**Transceiver Electrical Characteristics** (Ambient Operating Temperature  $T_a = +25 \pm 5^\circ\text{C}$ ,  $V_{CC} = 3.3 \pm 0.2\text{V}$ )

Parameter	Symbol	Min	Typ	Max	Units	Notes
High-Speed Signal (CML) Interface Specification						
Input Data Rate	-	-	-	1.25	Gbps	-
Differential Input Impedance	$R_{in}$	-	100	-	$\Omega$	Internally AC Coupled
Single Ended Output Voltage Tolerance		-0.3		4	V	-
Common mode voltage tolerance		15	-	-	V	-
Tx Input Diff Voltage	$V_i$	90	-	350	mV	-
Tx Fault	$V_{oL}$	-0.3	-	4	mV	At 0.7mA
Output Data Rate	-	-	-	1.25	Gbps	-
Differential Output Impedance	$R_{out}$	-	100	-	$\Omega$	
Single Ended Output Voltage Tolerance	-	-0.3	-	4	V	-
Rx Output Diff Voltage	$V_o$	150	-	425	mV	-
Rx Output Rise and Fall Time	$T_r/T_f$	30	-	-	ps	20% to 80%
Low-Speed Signal (LVTTTL) Interface Specification						
Input High Voltage		2	-	$V_{CC} + 0.3$	V	
Input Low Voltage	-	GND	-	0.8	V	
Output High Voltage	-	2.4	-	$V_{CC}$	V	
Output Low Voltage	-	GND	-	0.5	V	

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## Pin Definitions



## Pin Function Definitions

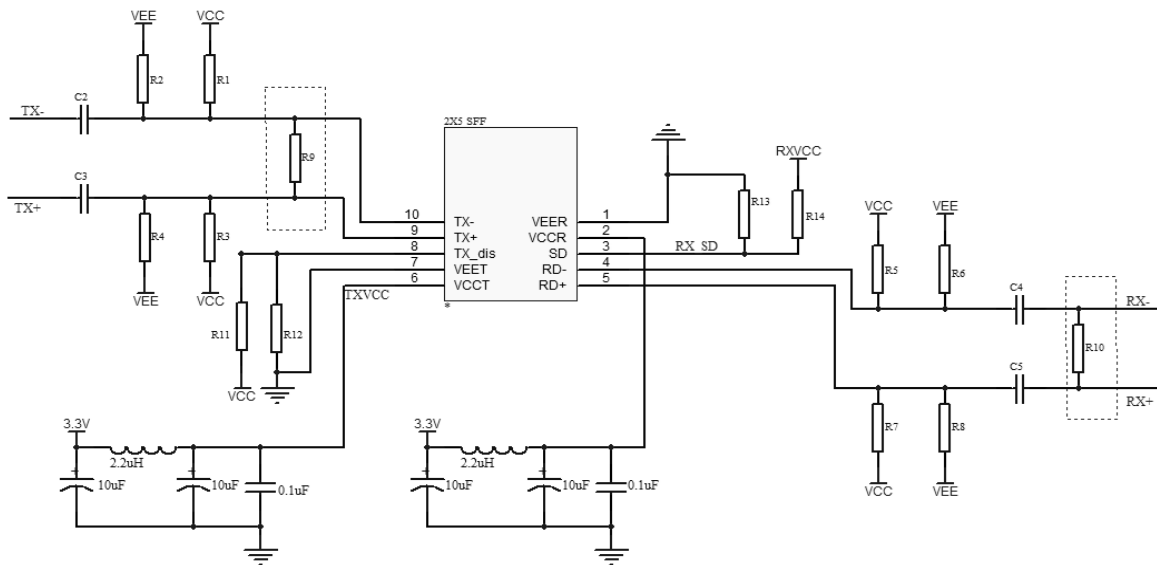
Pin #	Pin Name	Description	Notes
1	VEER	Receiver Ground	-
2	VCCR	Receiver Power Supply	-
3	SD	Signal Detect. (LV)PECL or (LV)TTL output	1
4	RD-	Inv. Received Data Out	-
5	RD+	Received Data Out	-
6	VCCT	Transmitter Power Supply	-
7	VEET	Transmitter Ground	-
8	TDIS	Transmitter Disable	2
9	TD+	Transmit Data In	-
10	TD-	Inv. Transmit Data In	-

### Notes:

- (LV)PECL-Normal optical input levels to the receiver result in logic “1” output, pull-down 130Ω or 270Ω resistor; (LV)TTL-Normal optical input levels to the receiver result in logic “0” output, pull-up 10kΩ resistor.
- The is an input that is used to shut down the transmitter optical output. Transmitter on in logic “0”.

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## Recommended Circuit



$R1=R3=R5=R7=130\Omega$ ,  $R2=R4=R6=R8=82\Omega$ ,  $C2=C3=C4=C5=104p$ ,  $R5=R10=100\Omega=NC$ ,  
 $R11=R12=10K$ ,

$SD=LVPECL$ : $R14=10K=NC$ ,  $R13=130\Omega$ , $SD=LVTTTL$ : $R14=10K$ ,  $R12=130\Omega=NC$ .

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## Mechanical Dimensions (units: mm)

