RJ-3G-RX2

1Gbps to 3Gbps Rugged RJ Size Dual Fiber Optic Transceiver

Features:

- Compliant to ARINC 818 1.0625Gbps and 3.1875Gbps data rates
- Dual 850nm VCSEL PIN receiver
- Rugged LC connector housing including screw mounted OSAs
- 1x10 connector pinout
- MIL-STD-883 compliant
- –40 to +85°C operating temperature, wider options available
- Option for RoHS compliant and lead free per Directive 2002/95/EC
- Single +3.3V power supply
- Receivers AC-Coupled
- Low power dissipation

The RJ-3G-RX2 is ideal for harsh environment connectivity because of its low cost, availability, and wide operating parameters

General Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate	BR	1.0625	-	3.1875	Gbps	(1)
Optical Center Wavelength	λ_C	830	-	860	nm	
Receiver Sensitivity	RX_{SENS}	-	-	–15	dBm	

Notes:
1) ARINC 818.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Maximum Supply Voltage	V_{CC}	–0.3	4.0	V	
Storage Temperature	T_{sto}	–55	100	°C	
Case Operating Temperature	T_{OP}	–40	85	°C	
Relative Humidity	RH	-	95%	%	Based on conformal coating, (1)
Hot Bar Soldering Temperature	-	-	260	°C	10 seconds, leads only, (2)(3)
Hand Lead Soldering Temperature	-	-	260	°C	10 seconds, leads only, (2)(3)
Conformal Coating	-	0.8	1.2	mil	(4)

Notes:
1) RJ transceivers may be water washed. The process must be followed by an 80° bake for one hour to ensure the drying of any water inside the shell.
2) Solder Posts do not transmit data and do not need a complete solder fill.
3) The components should not undergo Reflow Soldering under any circumstances.
4) See ruggedization notes on page 5.

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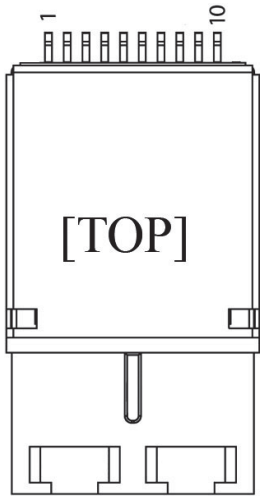
Electrical Specifications (T_{OP} = –40 to 85°C, V_{CC} = 3.135 to 3.465 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Total Module Power Dissipation	P_{DISS}	-	0.60	0.80	W	
Receiver						
Supply Current	I_{CC}	-	85	120	mA	(1)
Output Differential Impedance	R_{IN}	-	100	-	Ω	(2)
Differential Output Voltage Swing	V_{P-P}	0.60	0.75	0.94	mV	(3)
Data Output Rise / Fall Time	t_r	-	70	150	ps	(4)
Signal Detect Assert	SD_{norm}	2.4	-	V_{CC}	V	(5)
Signal Detect De-Assert	SD_{fault}	V_{EE}	-	V_{EE} + 0.5	V	(5)

Notes:
1) Per channel.
2) CML.
3) Differential output.
4) 20% – 80%.
5) LVTTL.

Pin Configuration



PIN #	Symbol	Description	Notes
1	RD2+	Receiver 2 Non-inverted DATA out. AC Coupled	CML
2	V_{EER2}	Receiver 2 Signal Ground	N/A
3	RD2–	Receiver 2 Inverted DATA out. AC Coupled	CML
4	V_{CCR2}	Receiver 2 Power Supply	N/A
5	SD1	Signal Detect 1 output Satisfactory Optical Input: Logic “1” Output Fault Condition: Logic “0” Output	LVTTL
6	SD2	Signal Detect 2 output Satisfactory Optical Input: Logic “1” Output Fault Condition: Logic “0” Output	LVTTL
7	RD1+	Receiver 1 Non-inverted DATA out. AC Coupled	CML
8	V_{CCR1}	Receiver 1 Power Supply	N/A
9	RD1–	Receiver 1 Inverted DATA out. AC Coupled	CML
10	V_{EER1}	Receiver 1 Signal Ground	N/A

Notes:
1) N/A.

Optical Characteristics (T_{OP} = –40 to 85°C, V_{CC} = 3.135 to 3.465 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver						
Receiver Sensitivity	RX_{SENS}	-	-	–15	dBm	(1)
Optical Center Wavelength	λ_C	830	-	860	nm	
Return Loss	RL	12	-	-	dB	
Signal Detect Assert	SD_A	-	-	–15	dBm	
Signal Detect De-Assert	SD_D	–30	-	-	dBm	
Signal Detect Hysteresis	SD_H	0.5	2.25	5	dB	

Notes:
1) Measured running 3.175Gbps, PRBS 2^7–1 at 10^{-12}, FC-PI-2-10.0 conformance.

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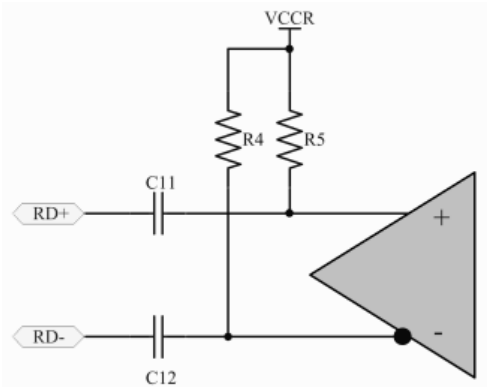
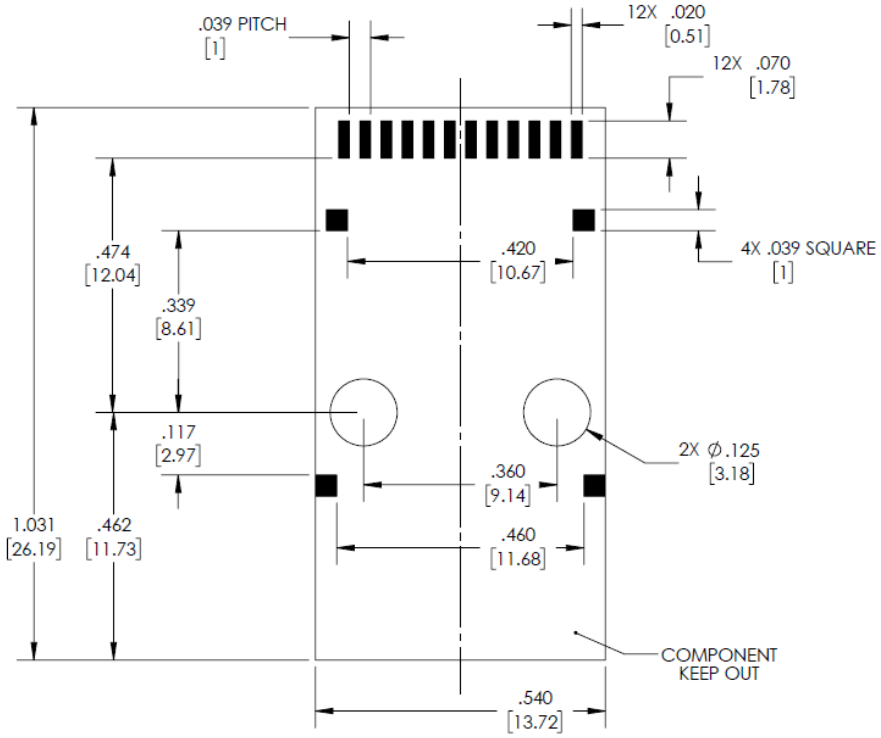
Equivalent Circuits



- C11 / C12 are 0.1µF output coupling capacitors.
- R4 / R5 are 50Ω pull-up resistors to V_{CC}.
- Receiver electrical output is CML compatible.

PCB Design Guidelines



Dimensions in inches [mm]

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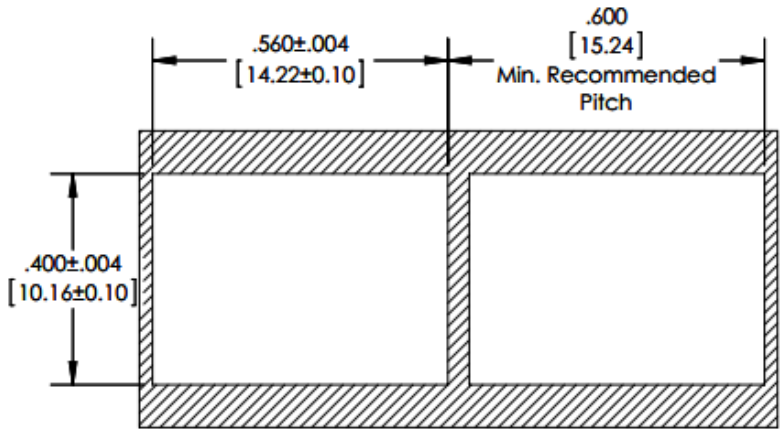
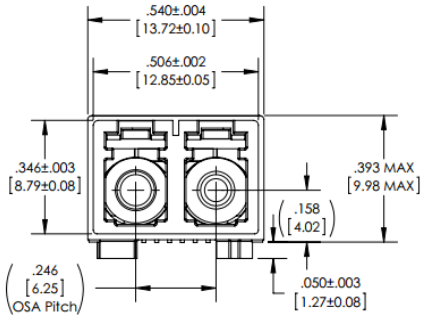
Panel Cutout

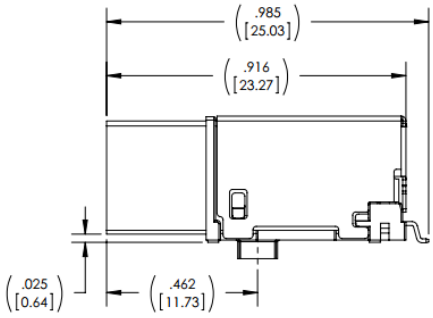


Dimensions in inches [mm]

LC Connector [Screw Post] Mechanical Dimensions

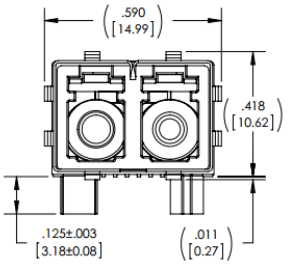


Front View, dimensions in inches [mm]

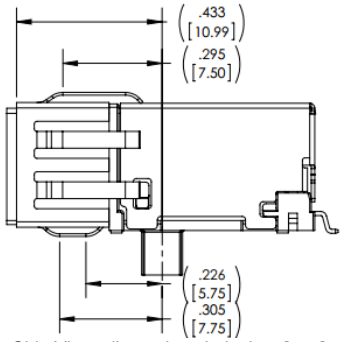


Side View, dimensions in inches [mm]

LC Connector [Solder Post] With Optional EMI Shield Mechanical Dimensions



Front View, dimensions in inches [mm]



Side View, dimensions in inches [mm]

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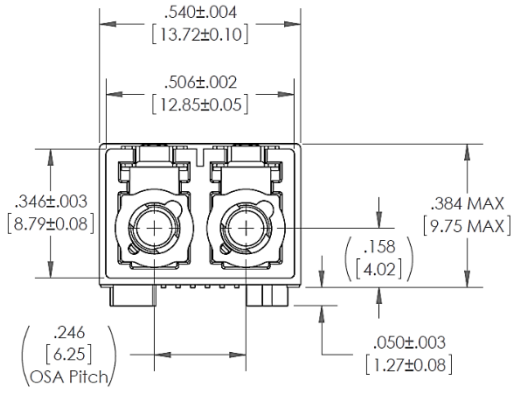
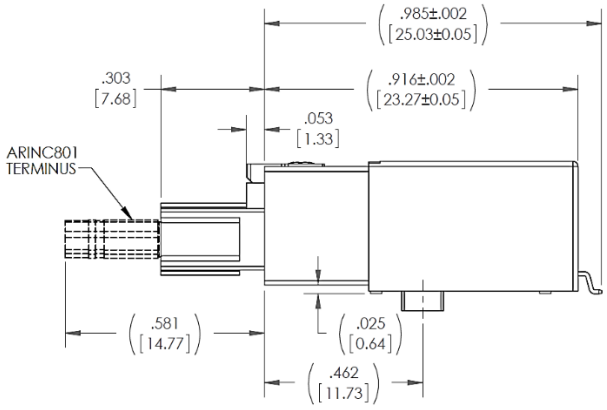
ARINC-801 Connector [Screw Post] Mechanical Dimensions

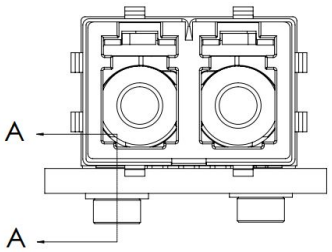


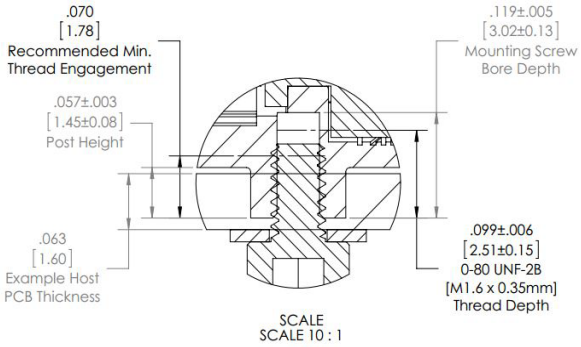
Front View, dimensions in inches [mm]



Side View, dimensions in inches [mm]

Mounting Hardware Guidelines





Notes:

1) An example illustrating a possible hardware combination to secure RJ-3G-RX2 to host PCB.
2) For further mounting hardware options and support contact COTSWORKS Application Engineering.
3) When installing the RJ module:
   a. Install the washers and partially tighten the screws.
   b. Solder the leads.
   c. Tighten the screws to 12 in-oz.
4) The pins are phosphor bronze 510 spring temper with 10 micro-inches of gold.

Ruggedization Notes

- Parylene Type C coating can be used for conformal coating with a 1.0 mil ± 0.2 mil thickness through a deposition process.
- Parylene Type C has a 5600 VPM rating, withstands high temperatures, and is extremely resistant to oil, dirt, and object impact.
- Contact COTSWORKS for all MSDS and case composition information.

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Reference Information

1) FC-PI-2-10.0.
2) Directive 2011/65/EU of the European Parliament and of the Council, “on the restriction of use of certain hazardous substances in electrical and electronic equipment.” June 8th, 2011.

Regulatory Compliance

- This part has an option for compliance with Directive 2011/65/EU covering restriction on certain hazardous substances (RoHS).

Warnings:

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation

Ordering Information

RJ-3G-RX2	-xx	-x	-x	-x	-x	-x
RJ Form Factor	**Receptacle Type**	**Ruggedized Coating**	**Operating Temp Range**	**EMI Shield**	**RoHS Level**	**Mounting**
3 Gbps Max Data Rate	LC: *LC Receptacle*	(): *Non-coated*	A: *–40 to 85*	(): *No Shield*	(): *Lvl 5*	(): *Imperial*
Dual Receivers (MMF)	LX: *ARINC-801 Receptacle*	R: *Parylene*	M: *–40 to 95*	E: *Shield*	6: *Lvl 6*	U: *Metric.* P: *Solder Posts*

Example part number: RJ-3G-RX2-LC-R-A-U
[Rugged Jack Surface Mount, 3Gbps Short Reach, Dual Receive, Standard LC Receptacle, Conformal Coated, –40 to 85°C, No EMI Shield, RoHS 5/6, Metric Screw Thread]

Contact COTSWORKS for mechanical dimensional information, lead times and other configuration options.

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