

Features:

- Duplex transceiver module
- Supports data rates of 6Gbps to 10.3125Gbps
- 850nm VCSEL transmitter and PIN receiver
- Typical reach of 82m on OM2, 300m on OM3 and 400m on OM4
- Compliant to IEC-60825-1, Class 1 laser eye safe
- Solder-down 1x12 electrical interface
- Screw posts for securing module to host
- SFF-8472 compliant control and diagnostics monitor interface
- -40°C to +85°C operating temperature
- -55°C to +100°C storage temperature
- Parylene conformal coating option



The RJ-10G-SX Transceiver is ideal for harsh environment connectivity because of its low cost, availability, and wide operating parameters



Commercial
Aerospace



Military
Tactical



Military
Aerospace



Industrial and
Oil & Gas

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Maximum Supply Voltage	V _{CC}	-0.3	4.0	V	
Electrostatic Discharge, Data I/O pins	ESD		500	V	(1)
Storage Temperature	T _{sto}	-55	100	°C	
Operating Temperature	T _{op}	-40	95	°C	-40°C to +85°C standard
Relative Humidity	RH	0	95	%	(2)
Conformal Coating		0.8	1.2	mil	(3)

Notes:

- 1) Proper ESD conditions should be employed while attaching RJ to the host board
- 2) Non-condensing based on conformal coating
- 3) See ruggedization notes on pg. 3

General Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V _{CC}	3.14	3.3	3.47	V	+/- 5%
Data Rate	BR	8		10.3125	Gbps	Balanced NRZ data protocols

Electrical Specifications (T_{OP} = -40 to 85°C, V_{CC} = 3.14 to 3.47 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Total Module Power Dissipation	P _{DISS}			0.90	W	0°C to +85°C
Total Module Power Dissipation	P _{DISS}			1.32	W	-40°C to 0°C
Transmitter						
Supply Current	I _{CC}			120	mA	0°C to +85°C
Supply Current	I _{CC}			250	mA	-40°C to 0°C
Input Differential Impedance	R _{in}	90	100	110	Ω	
TX Single-Ended Input Voltage Swing	V _{in}	37.5		400	mV	
TX Disable Input Voltage	V _{DIS}	2.4			V	LVTTL
TX Enable Input Voltage	V _{EN}			0.4	V	LVTTL
Receiver						
Supply Current	I _{CC}			130	mA	
Rx Single-Ended Output Voltage Swing	V _O	125		225	mV	
Data Output Rise Time	t _r		35	45	ps	(1)
Data Output Fall Time	t _f		35	45	ps	(1)
Total Contributed Jitter	T _J			0.46	UI	
Signal Detect De-Assert	SD _D	2.4			V	(2)
Signal Detect Assert	SD _A			0.4	V	(2)
Signal Detect De-Assert Time	t _d	2.5	10	80	μs	
Signal Detect Assert Time	t _a	2.5	10	80	μs	
Serial Bus						
Data, Clock Input Low Voltage	V _{IL}	-0.3		0.3*V _{CC}	V	
Data, Clock Input High Voltage	V _{IH}	0.7*V _{CC}		V _{CC} +0.3	V	
Data, Clock Output Low Voltage	V _{OL}			0.4	V	
Data, Clock Output High Voltage	V _{OH}	V _{CC} -0.4			V	
Notes:						
1) 20% to 80%						
2) SD is LVTTL. Logic 1 indicates normal operation; logic 0 indicates no signal is detected.						

RJ-10G-SX Host Pin Assignment

Pin	Symbol	Description	Logic/Protocol
1	TX-	Transmitter Data Input, Negative	CML
2	TX+	Transmitter Data Input, Positive	CML
3	GND	Ground	0V
4	TX_VCC	Transmitter Supply	3.3V
5	TX_DIS	Transmitter Disable	LVTTL
6	SCL	I2C Clock	I2C
7	SDA	I2C Data	I2C
8	SD	Receiver Signal Detect	LVTTL
9	RX_VCC	Receiver Supply	3.3V
10	GND	Ground	0V
11	RX+	Receiver Data Output, Positive	CML
12	RX-	Receiver Data Output, Negative	CML

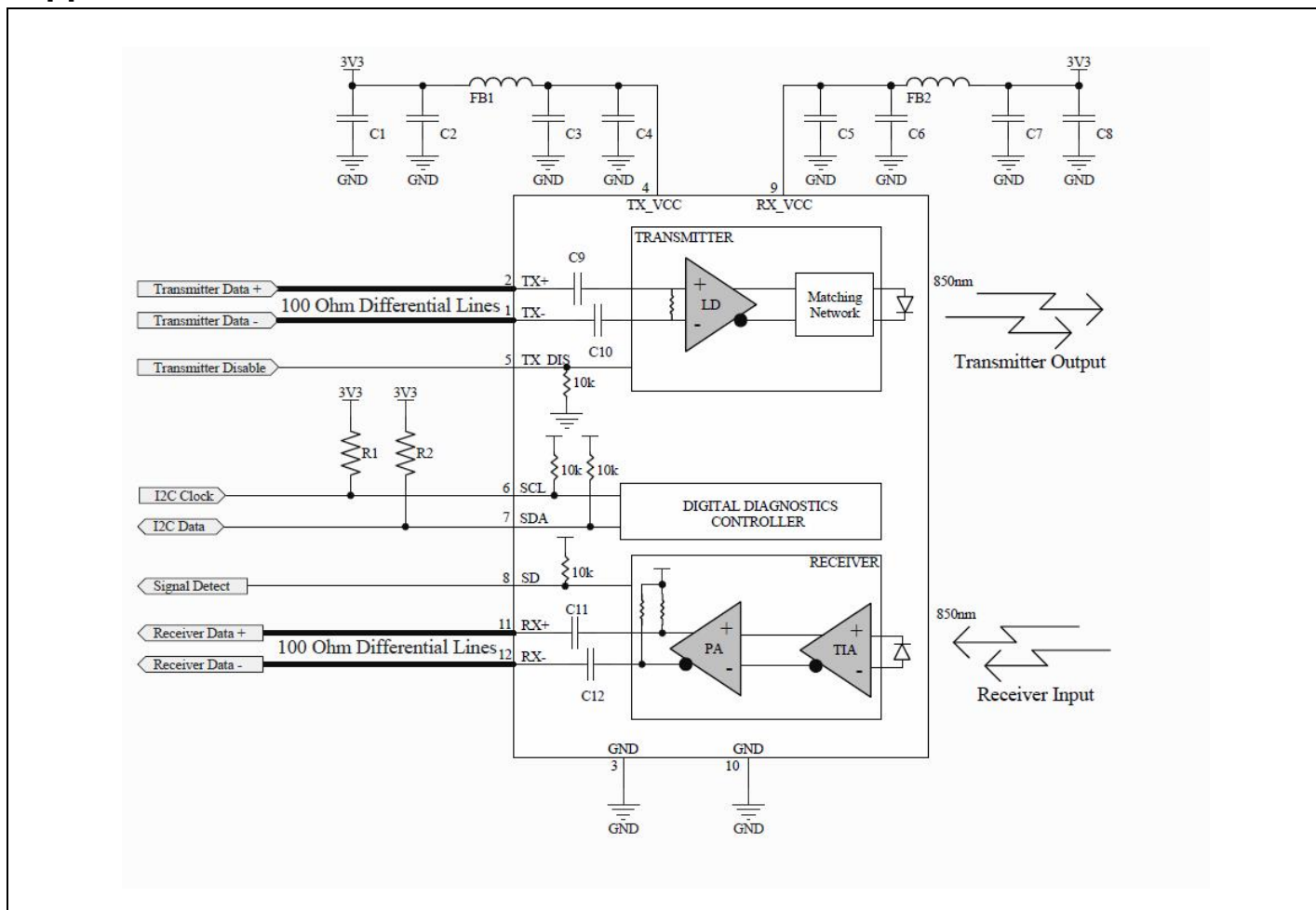
Optical Characteristics (T_{OP} = -40 to 85°C, V_{CC} = 3.14 to 3.47 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Output Optical Power	P _{OUT}	-5		-1	dBm	(1,2)
Optical Wavelength	λ		850		nm	
Extinction ratio	ER	3	5		dB	
Relative Intensity Noise	RIN			-130	dB/Hz	
TX Mask Compliance	See TX Compliance Mask			(3)		
Receiver						
Receiver Sensitivity	RX _{SENS}		-13	-11.1	dBm	(3) , BER = 1E-12
Receiver Saturation	RX _{SAT}	0			dBm	
Optical Center Wavelength	λ _C		850		nm	
Return Loss	RL	12			dB	
Signal Detect Assert	SD _A			-9	dBm	
Signal Detect De-Assert	SD _D	-22			dBm	
Signal Detect Hysteresis	SD _H	1		5	dB	

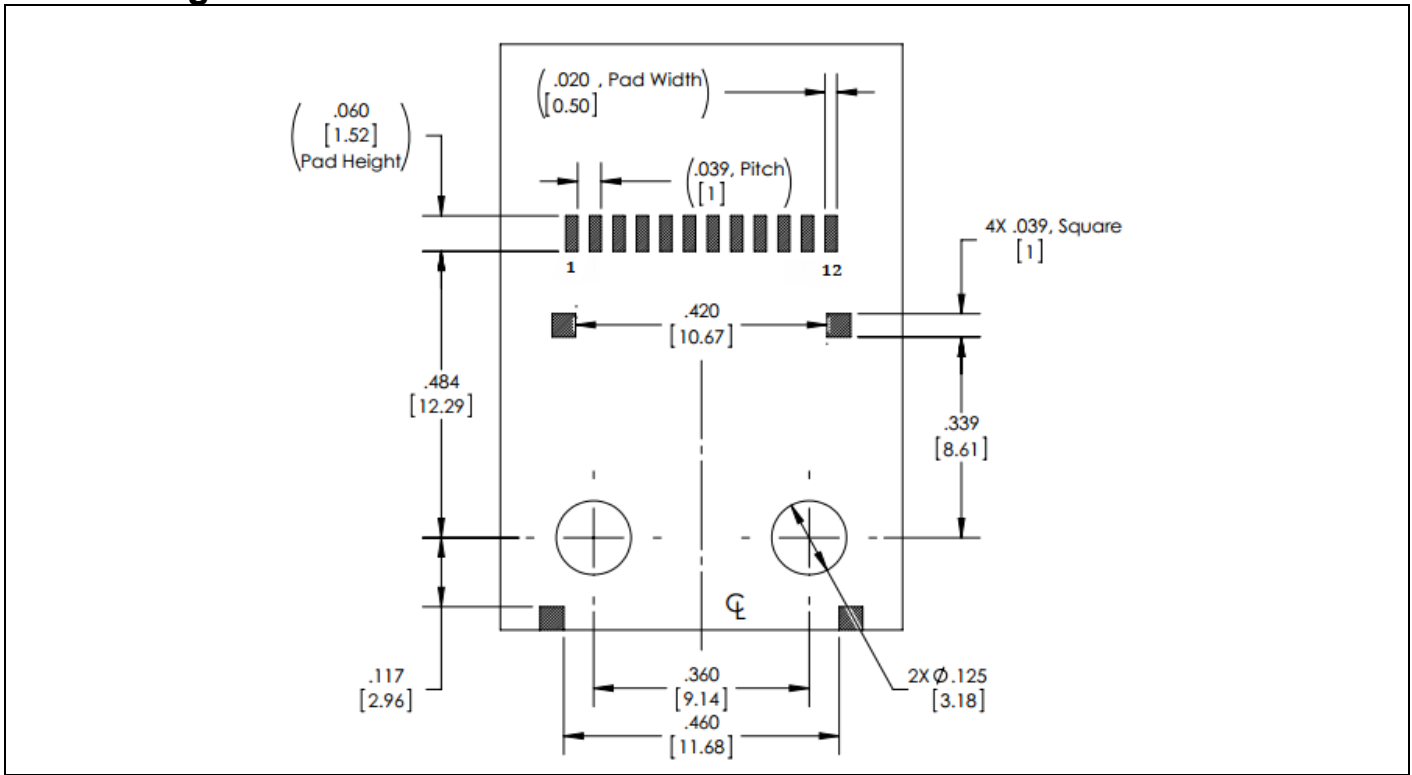
Notes:

- 1) Class 1 Laser Safety per IEC-60825-1 regulations
- 2) Measured with 2-5 meter patch cord consisting of laser optimized OM3 or OM4 fiber
- 3) Measured using PRBS 2³¹-1 pattern

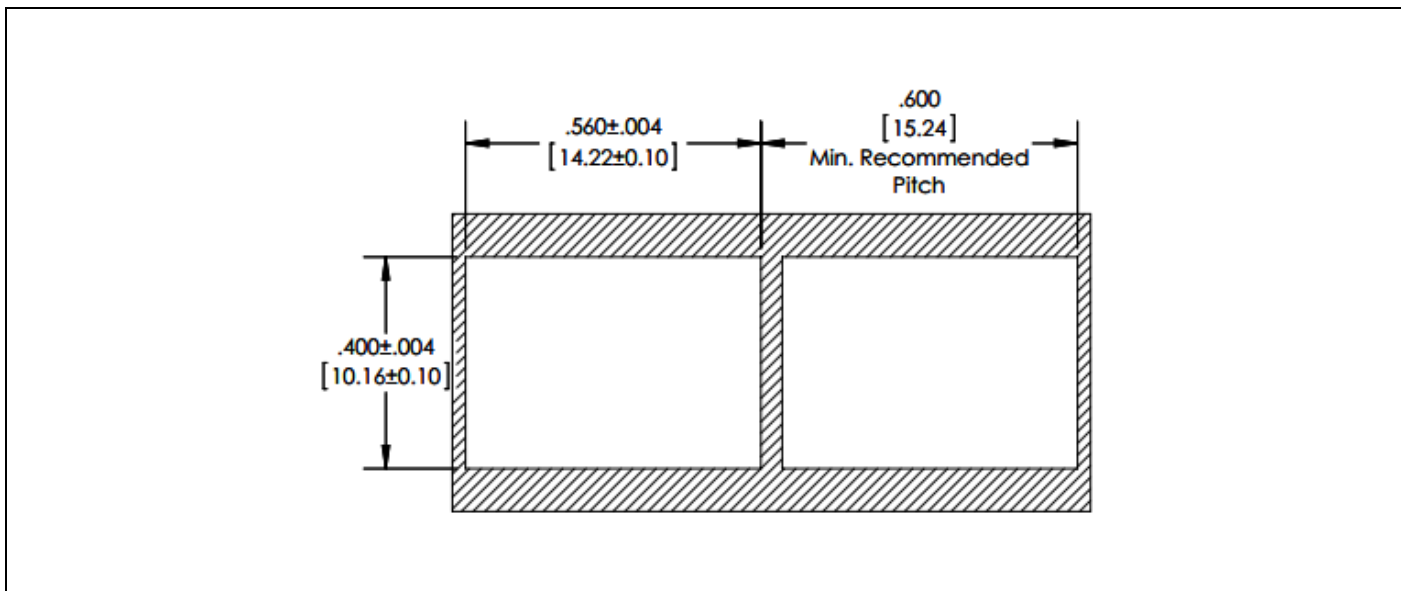
Application Schematics



PCB Design Guidelines



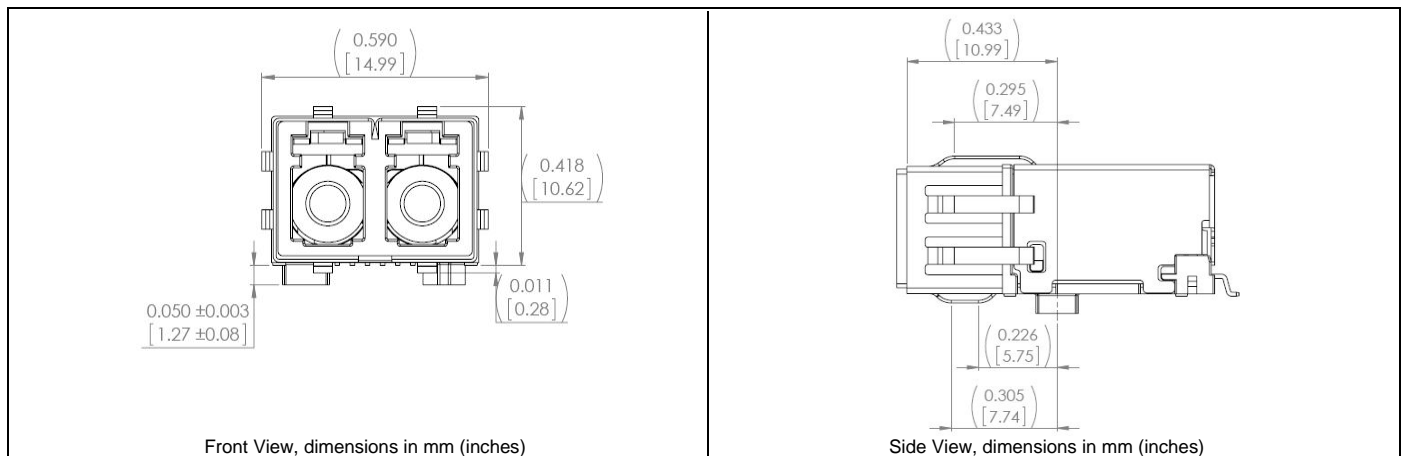
Panel Cutout



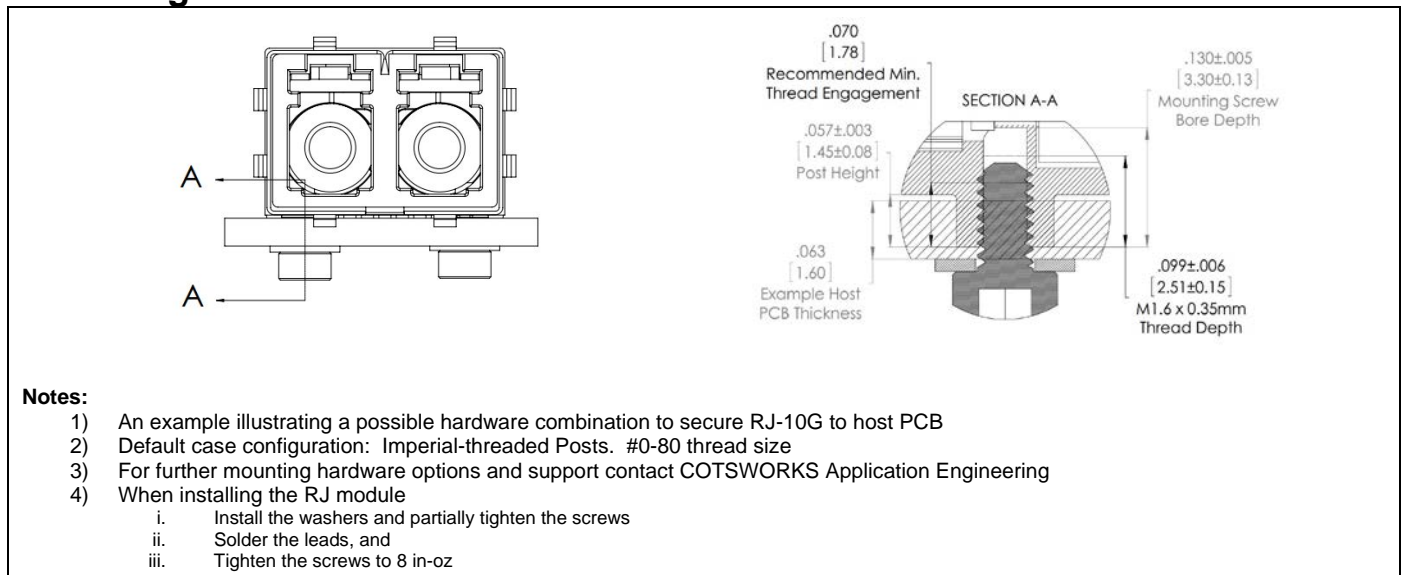
Standard Mechanical Dimensions



Mechanical Dimensions with EMI Shield



Mounting Hardware Guidelines



Ruggedization Notes

- Parylene 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.

Reference Information

1) IEEE Standard 802.3-2008, Section 6

Regulatory Compliance

- COTSWORKS transceivers are Class 1 Laser Products and comply with US FDA regulations.
- These products are designed to comply with the Class 1 eye safety requirements of EN (IEC) 60825 and the electrical safety requirements of EN (IEC) 60950.
- This part has an option for compliance with Directive 2011/65/EU covering restriction on certain hazardous substances (RoHS)
 - Contact COTSWORKS support for a product compliance matrix

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-10G-SX	-XX-	X	-X-	X	-X-	X
RJ Form Factor	Connector Type	Ruggedized Coating	Operating Temp Range	EMI Shield	RoHS Level	Mounting
10Gbps Max Data Rate	(): Standard LC	(): Non-coated	A: -40 to 85°C	(): No Shield	(): Lvl 5	(): Imperial Screw
Short Reach (MMF)	LX: ARINC-801	R: Parylene	M: -40 to 95°C	E: Shield	6: Lvl 6	U: Metric Screw
			Z: -55 to 95°C			P: Posts

Example part number: RJ-10G-SX-R-A

[10 Gbps RJ Transceiver, 850nm, short-reach , Duplex LC connectors, Parylene-coated, Industrial operating temperature range]

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