

### Features:

- 100Mbps to 155Mbps duplex data links
- 1310nm LED transmitter and PIN receiver
- Class 1 Laser Int. Safety Std. IEC-60825-1 compliant
- Standard reach 2km on 62.5/125µm MMF
- 1 x 10 surface mount connector standard
- Metal LC connector receptacle with secure optical elements
- MIL STD 883 compliant, MIL 810/DO-160x tested
- -40°C to +85°C operating temperature standard
- RoHS compliant and lead free per Directive 2002/95/EC option
- Single +3.3V power supply
- AC-Coupled Transmitter & Receiver Data
- Conformal coated for harsh environment use
- Tested over the operating temperature range



The RJ-155M-FX-DPLX is ideal for harsh environment connectivity because of its low cost, availability, and wide operating parameters



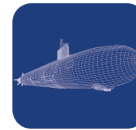
COMMERCIAL  
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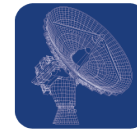
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MILITARY  
TACTICAL



SUBSEA  
NETWORKING



RADAR &  
SENSING



OIL &  
EXPLORATION

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Maximum Supply Voltage	V <sub>CC</sub>	-0.5	4.5	V	
Storage Temperature	T <sub>sto</sub>	-55	100	°C	
Case Operating Temperature	T <sub>OP</sub>	-40	85	°C	
Relative Humidity	RH	0	85	%	Based on conformal coating
Hand Lead Soldering Temperature			260	°C	10 seconds, leads only, (2)(3)
Hot Bar Soldering Temperature			260	°C	10 seconds, leads only, (2)(3)
Conformal Coating		0.8	1.2	mil	See ruggedization notes

#### NOTES:

- 1) RJ transceivers may be water washed. The process must be followed by an 80°C bake for one hour to ensure the drying of any water inside the shell.
- 2) For optional solder post version, solder posts are intended for mechanical retention only and do not have to comply fully to IPC J-STD-001 Class 3
- 3) The components should not undergo Reflow Soldering under any circumstances.

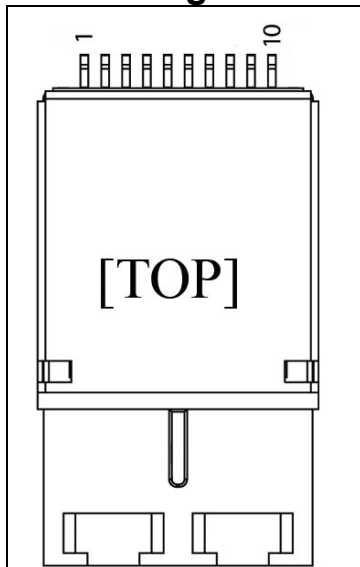
### General Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate	BR	100	155	160	Mbps	8b10b standard encoding

**Electrical Specifications** (TOP = -40 to 85°C, VCC = 3.14 to 3.47 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V	
Total Module Power Dissipation	P <sub>DISS</sub>		.650	1.1	W	
<b>Transmitter</b>						
Supply Current	I <sub>CC</sub>		180	200	mA	
Input Differential Impedance	R <sub>in</sub>		100		Ω	CML
Tx Differential Input Voltage	V <sub>DTX</sub>	200		1600	mV	CML
Transmit Disable Voltage	V <sub>D</sub>	2.0		V <sub>CC</sub>	V	LVTTTL
Transmit Enable Voltage	V <sub>EN</sub>	V <sub>EE</sub>		0.8	V	LVTTTL
<b>Receiver</b>						
Supply Current	I <sub>CC</sub>		80	120	mA	
Rx Differential Output Voltage	V <sub>DRX</sub>	600		1200	mV	CML
Signal Detect Assert	SD <sub>norm</sub>	2.0		V <sub>CC</sub>	V	LVTTTL
Signal Detect De-Assert	SD <sub>fault</sub>	V <sub>EE</sub>		V <sub>EE</sub> +0.5	V	LVTTTL

**Pin Configuration**

 <p>[TOP]</p>	PIN #	Symbol	Description	Logic Family
	1	TD+	Transmitter DATA In +	CML/LVPECL
	2	V <sub>EET</sub>	Transmitter Signal Ground	N/A
	3	TD-	Transmitter DATA In -	CML/LVPECL
	4	V <sub>CCT</sub>	Transmitter Power Supply	N/A
	5	SD	Signal Detect output Satisfactory Optical Input: Logic "1" Output Fault Condition: Logic "0" Output	LVTTTL
	6	T <sub>DIS</sub>	Transmit Disable input Logic 1 = Disable Optical Output Logic 0 = Enable Optical Output	LVTTTL
	7	RD+	Receiver DATA Out +	CML/LVPECL
	8	V <sub>CCR</sub>	Receiver Power Supply	N/A
	9	RD-	Receiver DATA Out -	CML/LVPECL
10	V <sub>EER</sub>	Receiver Signal Ground	N/A	

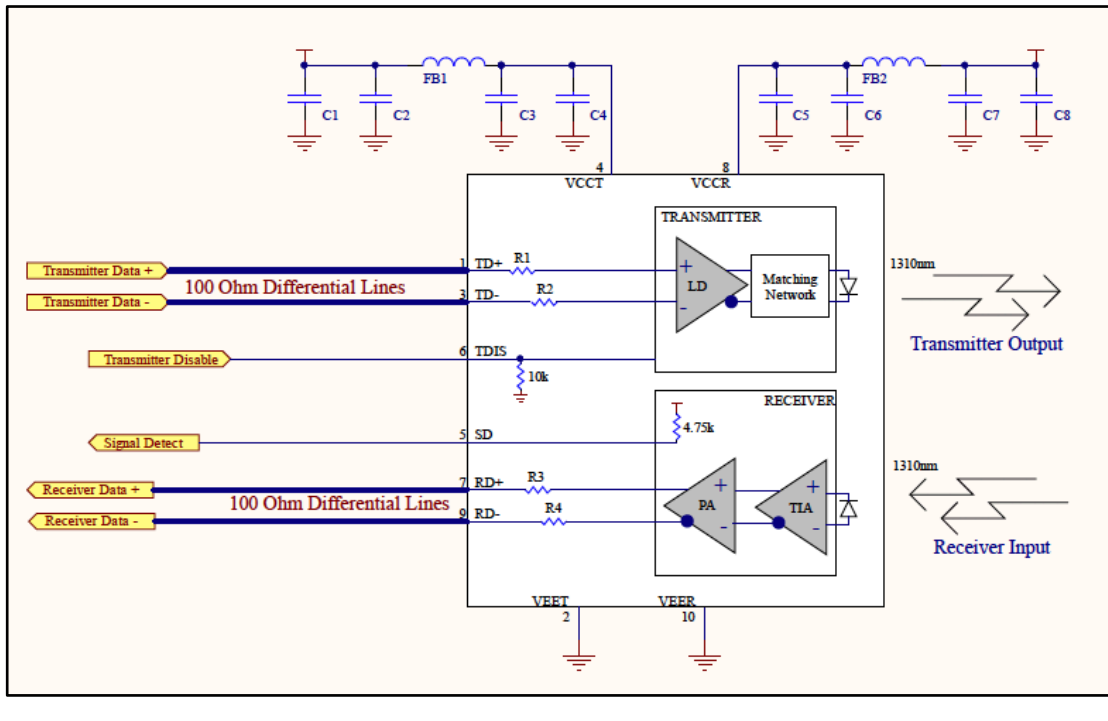
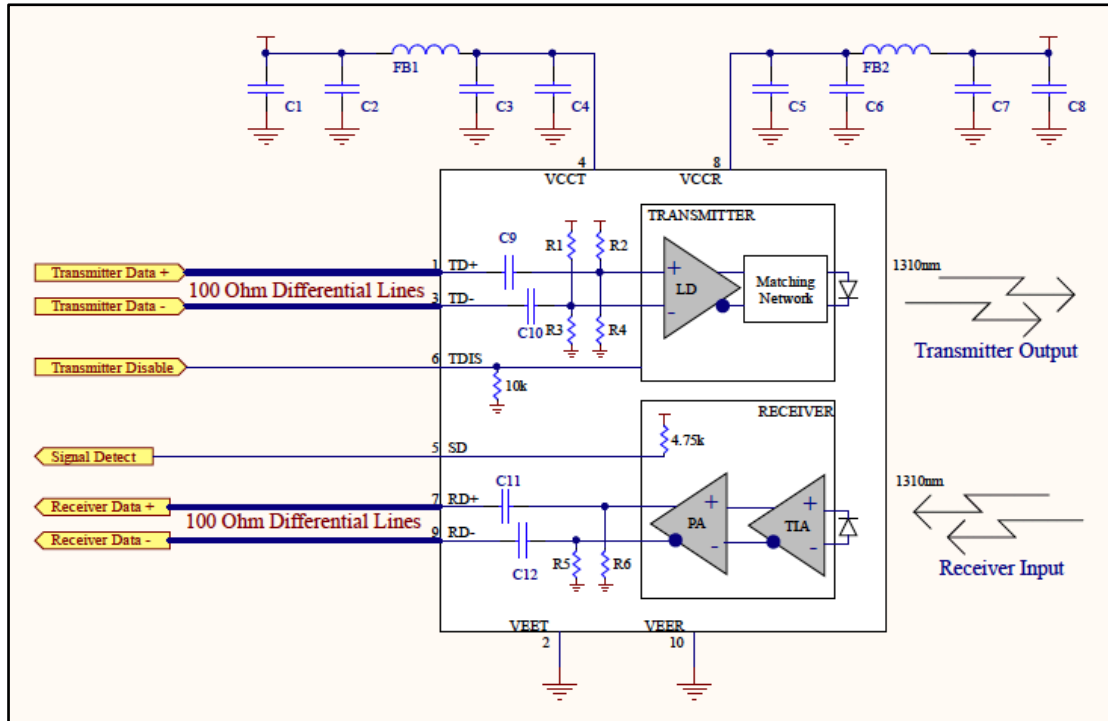
**Optical Characteristics** (TOP = -40 to 85°C, VCC = 3.14 to 3.47 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Optical Output Power	P <sub>OUT</sub>	-20		-14	dBm	62.5 MMF
Optical Center Wavelength	λ	1270	1310	1380	nm	
Spectral Width	Δλ <sub>FWHM</sub>			170	nm	
Extinction Ratio:	ER	9			dB	
Optical Rise/Fall Time	t <sub>r</sub> /t <sub>f</sub>			3.5	ns	10%-90%
<b>Receiver</b>						
Receiver Sensitivity	RX <sub>SENS</sub>			-33	dBm	PRBS 2 <sup>7</sup> -1, BER = 1E <sup>-10</sup>
Receiver Overload	P <sub>OL</sub>	-7.5				
Receiver Wavelength Range	λ	1100	1310	1650	nm	1310nm center wavelength
Return Loss	RL	12			dB	
Signal Detect Assert	P <sub>A</sub>			-29	dBm	
Signal Detect De-Assert	P <sub>D</sub>	-39			dBm	
Signal Detect Hysteresis	SD <sub>HYS</sub>	1		5	dB	



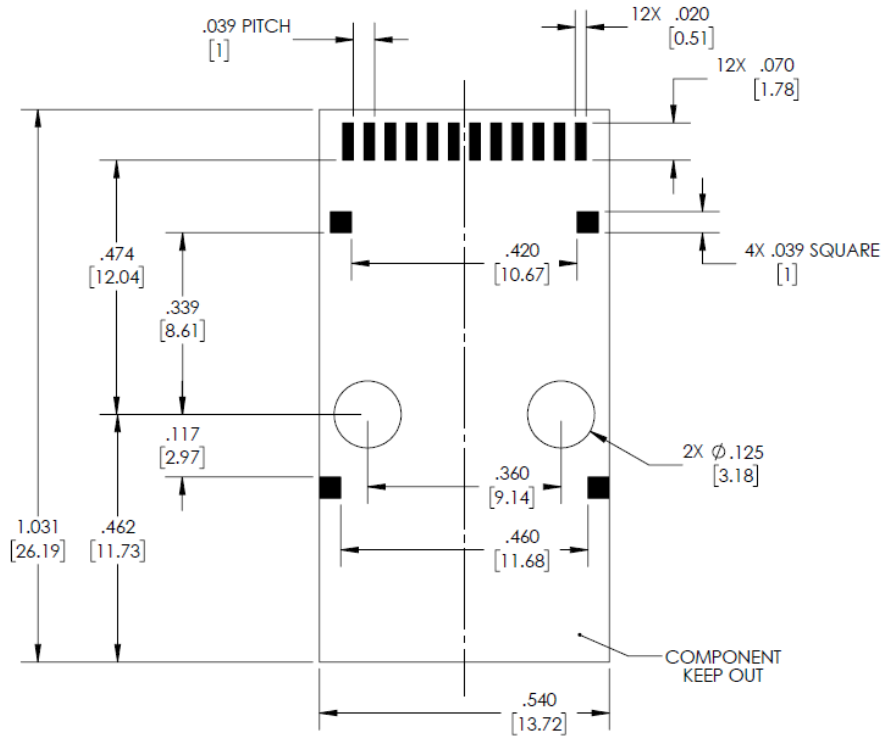
### Application Schematics

#### Host Board Application Schematic





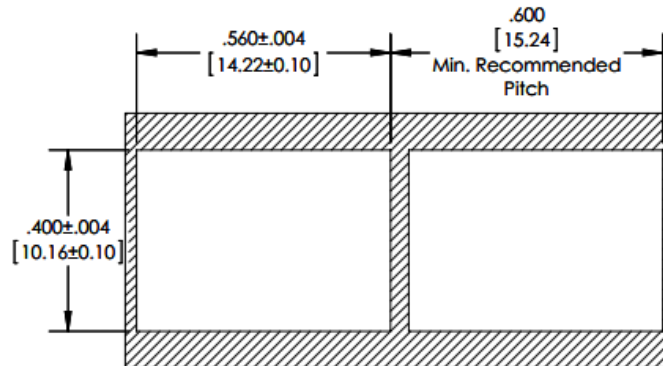
### PCB Design Guidelines



#### Notes:

- 1) Pads 0 and 11 are optional pins but are not available on the RJ-155M-FX-DPLX.
- 2) Pads 1–10 need to be designed in for every COTSWORKS RJ transceiver.

### Panel Cutout

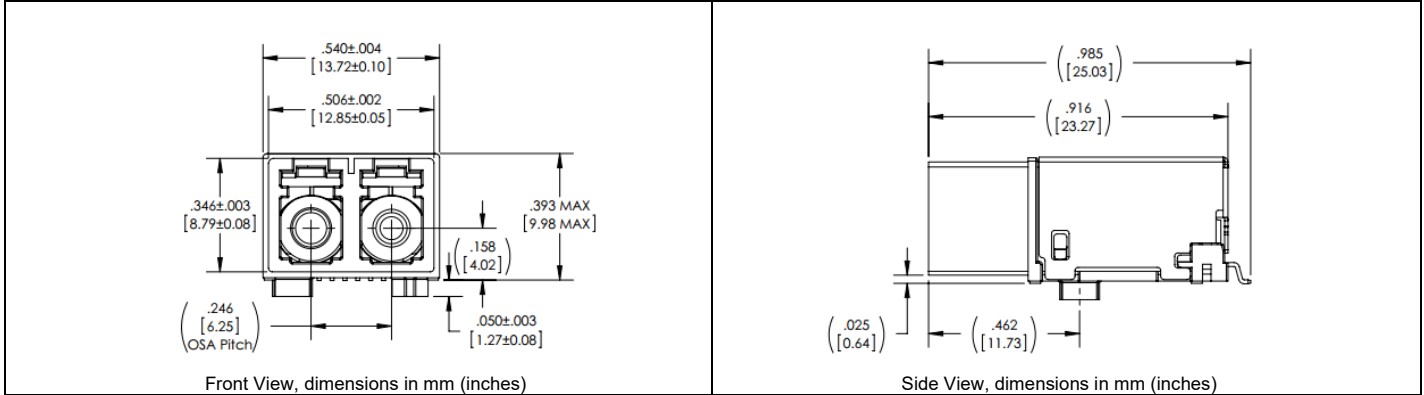


Minimum recommended pitch is 0.600"

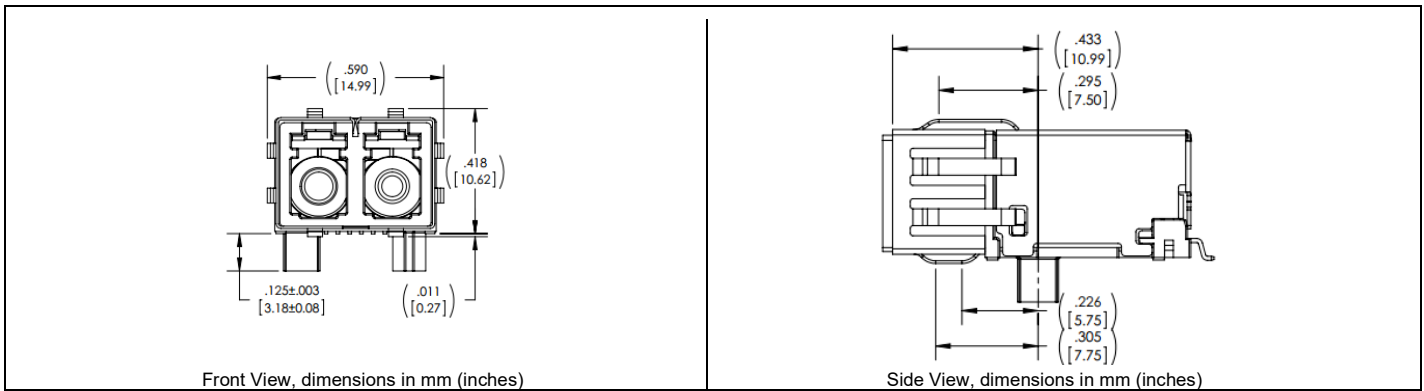




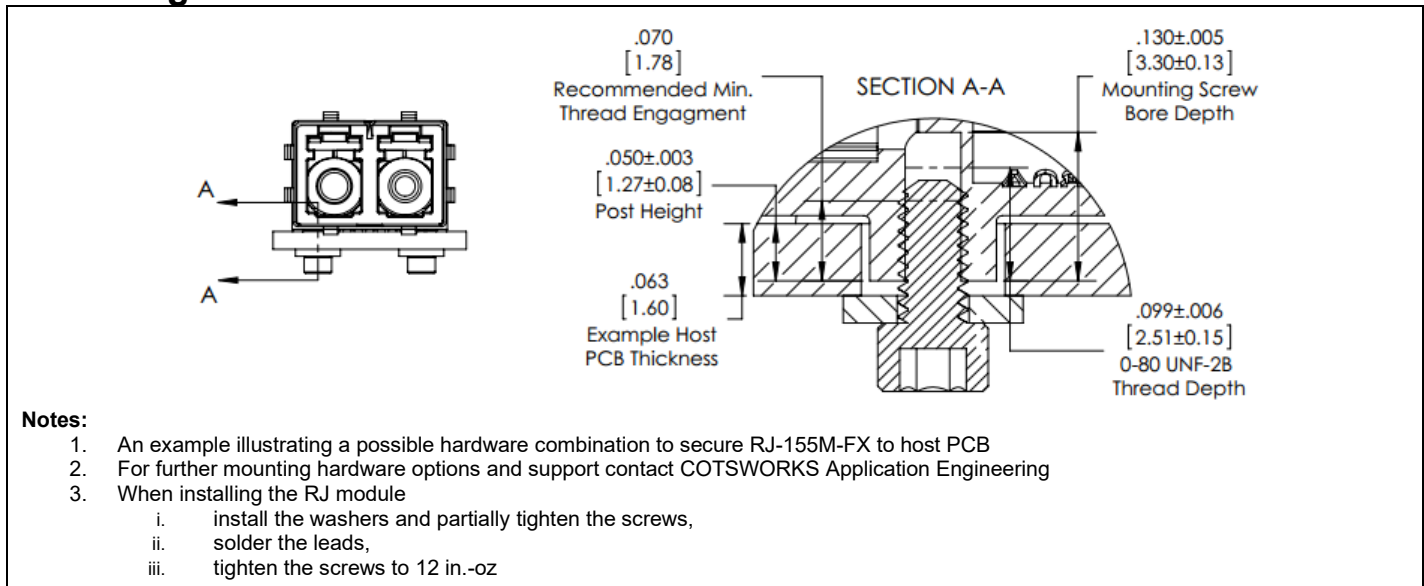
### Screw Post Mechanical Dimensions



### Solder Post Mechanical Dimensions



### Mounting Hardware Guidelines



### Ruggedization Notes

- Parylene C coating can be used for conformal coating with a 1.0mil ± 0.2mil thickness through a deposition process. It has a 5600VPM rating, withstands temperatures of 350°F, and is extremely resistant to oil/dirt, and object impact.
- This part can come in a pigtail fiber optic version.
- Contact COTSWORKS for all MSDS, case composition, and burn analysis.

### Reference Information

- 1) IEEE Standard 802.3, 2002 Edition
- 2) Directive 2002/95/EC of the European Council Parliament and of the Council, “on the restriction of the use of certain hazardous substances in electrical and electronic equipment.” January 27, 2003

### Regulatory Compliance

- COTSWORKS transceivers are Class 1 Laser Products and comply with US FDA regulations.
- These products are designed to comply with TÜV and 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 2002/95/EC covering restriction on certain hazardous substances (RoHS). It invokes item 5 of the Annex which allows “Pb in the glass of cathode ray tubes, electronic components, and fluorescent tubes.” This part may contain Pb for components such as lenses, windows, isolators, and other electronic components.
- ATEX / Ex Protection Provided: op is, [Ex op is T4 Ga] IIC

### Warnings:

**Handling Precautions:** This device is susceptible to damage from 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-155M-FX-	DPLX	-LC-	x	- x -	x	- x -	x	-x
RJ Form Factor	Duplex LC Connector		<b>Ruggedized Coating</b>	<b>Operating Temp Range</b>	<b>EMI Shield</b>	<b>RoHS Level</b>	<b>Mounting</b>	<b>ATEX &amp; IECEx Certification</b>
155Mbps Max Data Rate			(): Non-coated	A: -40 to 85°C	(): No Shield	(): Lvl 5	(): Imperial Screw	(): Not Certified
1310nm LED			R: Parylene	E: Shield	6: Lvl 6	P: Posts	T: Certified	

**Example part number:** RJ-155M-FX-DPLX-LC-R-A  
[100BASE-FX RJ Transceiver, 1310nm LED, Duplex LC connectors, Parylene-coated, Industrial operating temp. range, Imperial screw posts]

Contact COTSWORKS for mechanical dimensional information and other configuration options.

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