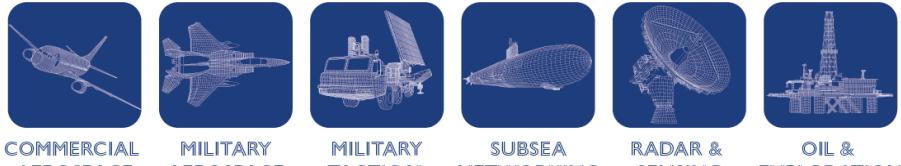


Features:

- 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 62.5/125 μ m 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 $+85^{\circ}\text{C}$ 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 AEROSPACE MILITARY AEROSPACE MILITARY TACTICAL SUBSEA NETWORKING RADAR & SENSING OIL & EXPLORATION

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Maximum Supply Voltage	V_{CC}	-0.5	4.5	V	
Storage Temperature	T_{sto}	-55	100	$^{\circ}\text{C}$	
Case Operating Temperature	T_{OP}	-40	85	$^{\circ}\text{C}$	
Relative Humidity	RH	0	85	%	Based on conformal coating
Hand Lead Soldering Temperature			260	$^{\circ}\text{C}$	10 seconds, leads only, (2)(3)
Hot Bar Soldering Temperature			260	$^{\circ}\text{C}$	10 seconds, leads only, (2)(3)
Conformal Coating		0.8	1.2	mil	See ruggedization notes

NOTES:

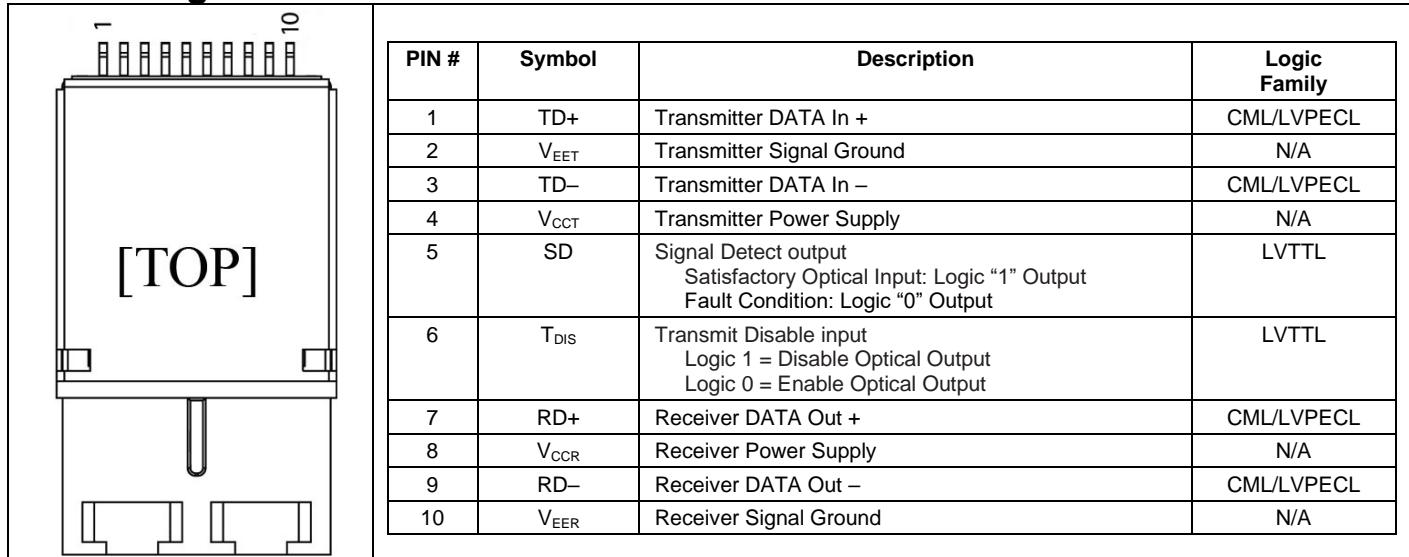
- 1) RJ transceivers may be water washed. The process must be followed by an 80°C bake for one hour to ensure the drying of any water inside the shell.
- 2) For optional solder post version, solder posts are intended for mechanical retention only and do not have to comply fully to IPC J-STD-001 Class 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 ($T_{OP} = -40$ to 85°C , $V_{CC} = 3.14$ to 3.47 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Total Module Power Dissipation	P_{DISS}		.650	1.1	W	
Transmitter						
Supply Current	I_{CC}		180	200	mA	
Input Differential Impedance	R_{in}		100		Ω	CML
Tx Differential Input Voltage	V_{DTX}	200		1600	mV	CML
Transmit Disable Voltage	V_D	2.0		V_{CC}	V	LVTTL
Transmit Enable Voltage	V_{EN}	V_{EE}		0.8	V	LVTTL
Receiver						
Supply Current	I_{CC}		80	120	mA	
Rx Single-Ended Output Voltage	V_{DRX}	600		1200	mV	CML
Signal Detect Assert	SD_{norm}	2.0		V_{CC}	V	LVTTL
Signal Detect De-Assert	SD_{fault}	V_{EE}		$V_{EE} + 0.5$	V	LVTTL

Pin Configuration


PIN #	Symbol	Description	Logic Family
1	TD+	Transmitter DATA In +	CML/LVPECL
2	V_{EET}	Transmitter Signal Ground	N/A
3	TD-	Transmitter DATA In -	CML/LVPECL
4	V_{CCT}	Transmitter Power Supply	N/A
5	SD	Signal Detect output Satisfactory Optical Input: Logic "1" Output Fault Condition: Logic "0" Output	LVTTL
6	T_{DIS}	Transmit Disable input Logic 1 = Disable Optical Output Logic 0 = Enable Optical Output	LVTTL
7	RD+	Receiver DATA Out +	CML/LVPECL
8	V_{CCR}	Receiver Power Supply	N/A
9	RD-	Receiver DATA Out -	CML/LVPECL
10	V_{EER}	Receiver Signal Ground	N/A

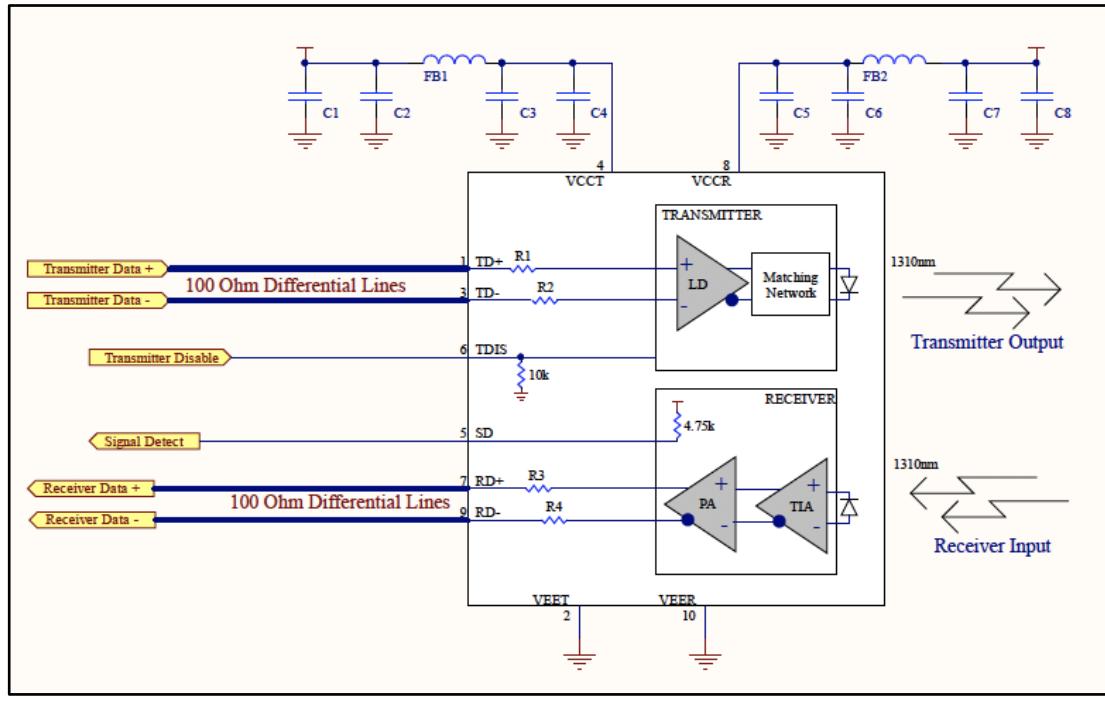
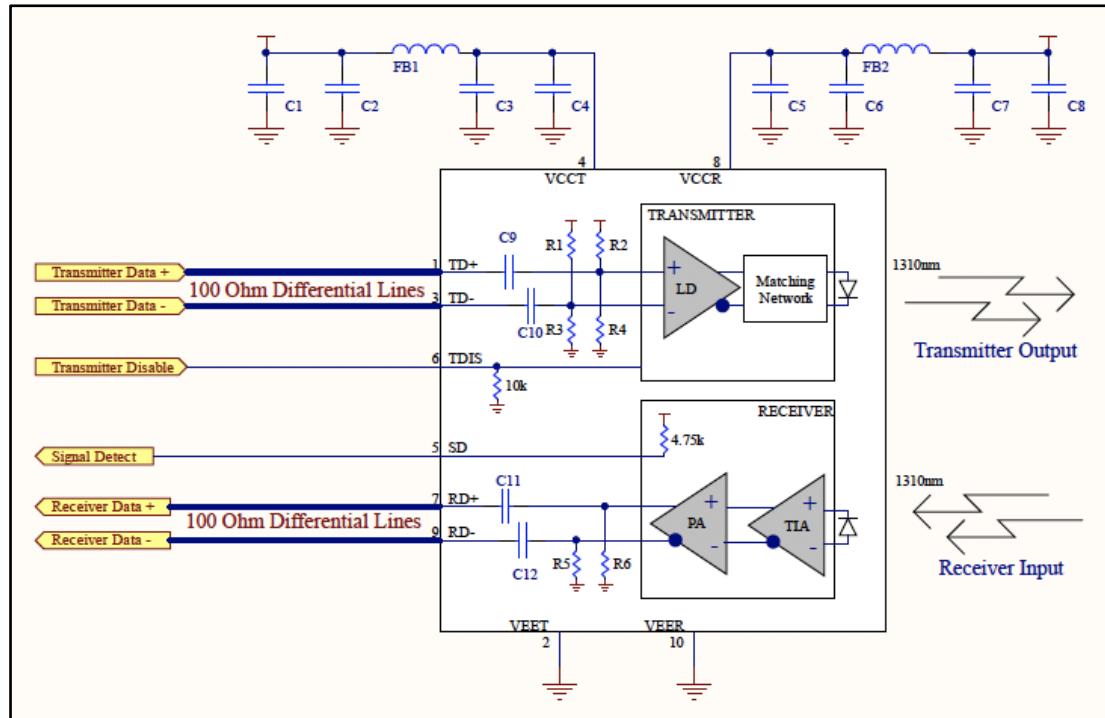
Optical Characteristics ($T_{OP} = -40$ to 85°C , $V_{CC} = 3.14$ to 3.47 Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Optical Output Power	P_{OUT}	-20		-14	dBm	62.5 MMF
Optical Center Wavelength	λ	1270	1310	1380	nm	
Spectral Width	$\Delta\lambda_{FWHM}$			170	nm	
Extinction Ratio:	ER	9			dB	
Optical Rise/Fall Time	t_r/t_f			3.5	ns	10%-90%
Receiver						
Receiver Sensitivity	RX_{SENS}			-33	dBm	PRBS 2 ⁷ -1, BER = $1E^{-10}$
Receiver Overload	P_{OL}	-7.5				
Receiver Wavelength Range	λ	1100	1310	1650	nm	1310nm center wavelength
Return Loss	RL	12			dB	
Signal Detect Assert	P_A			-29	dBm	
Signal Detect De-Assert	P_D	-39			dBm	
Signal Detect Hysteresis	SD_{HYS}	1		5	dB	

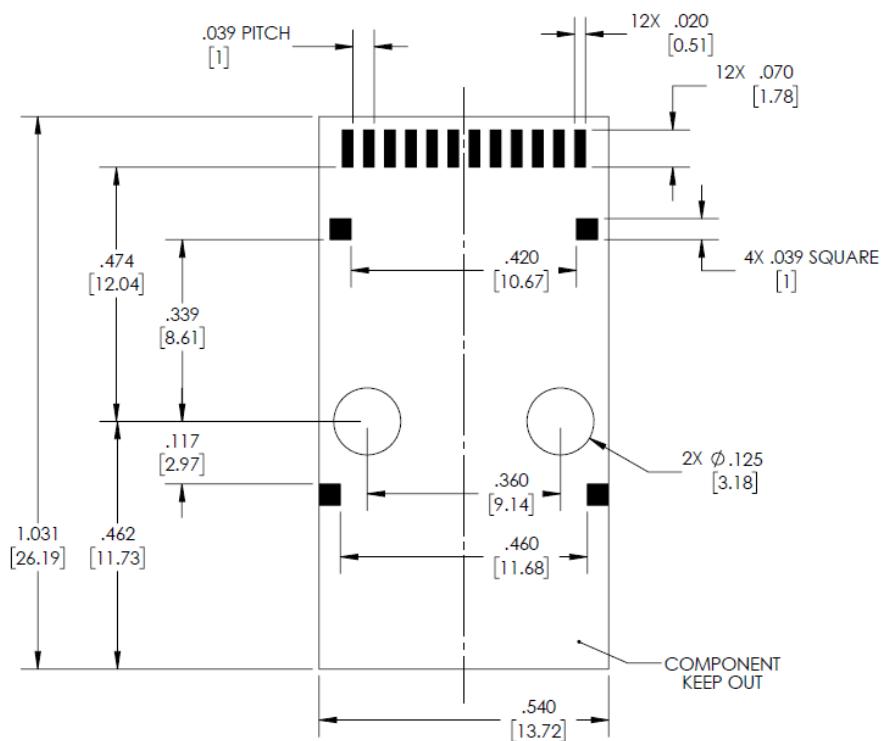


Application Schematics

Host Board Application Schematic



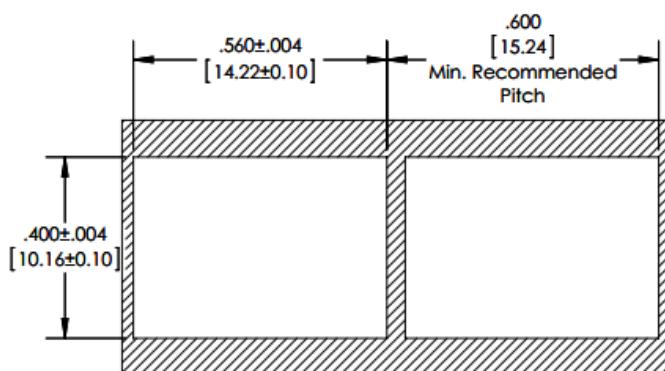
PCB Design Guidelines



Notes:

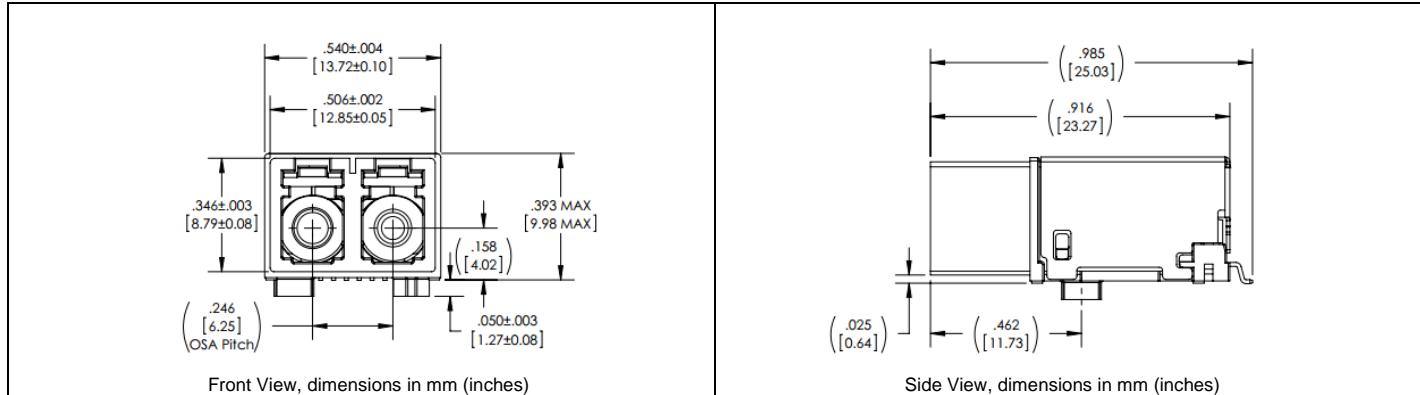
- 1) Pads 0 and 11 are optional pins but are not available on the RJ-155M-FX-DPLX.
- 2) Pads 1–10 need to be designed in for every COTSWORKS RJ transceiver.

Panel Cutout

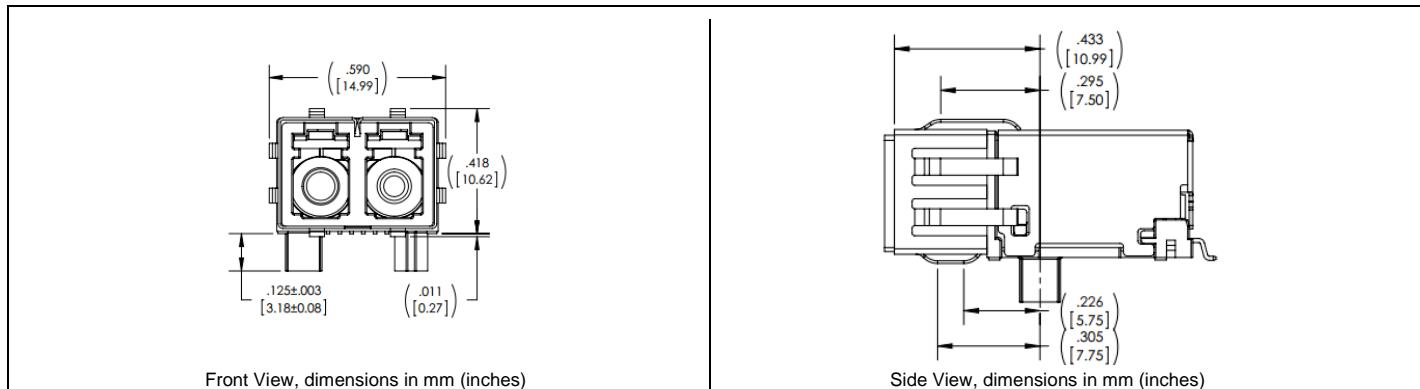


Minimum recommended pitch is 0.600"

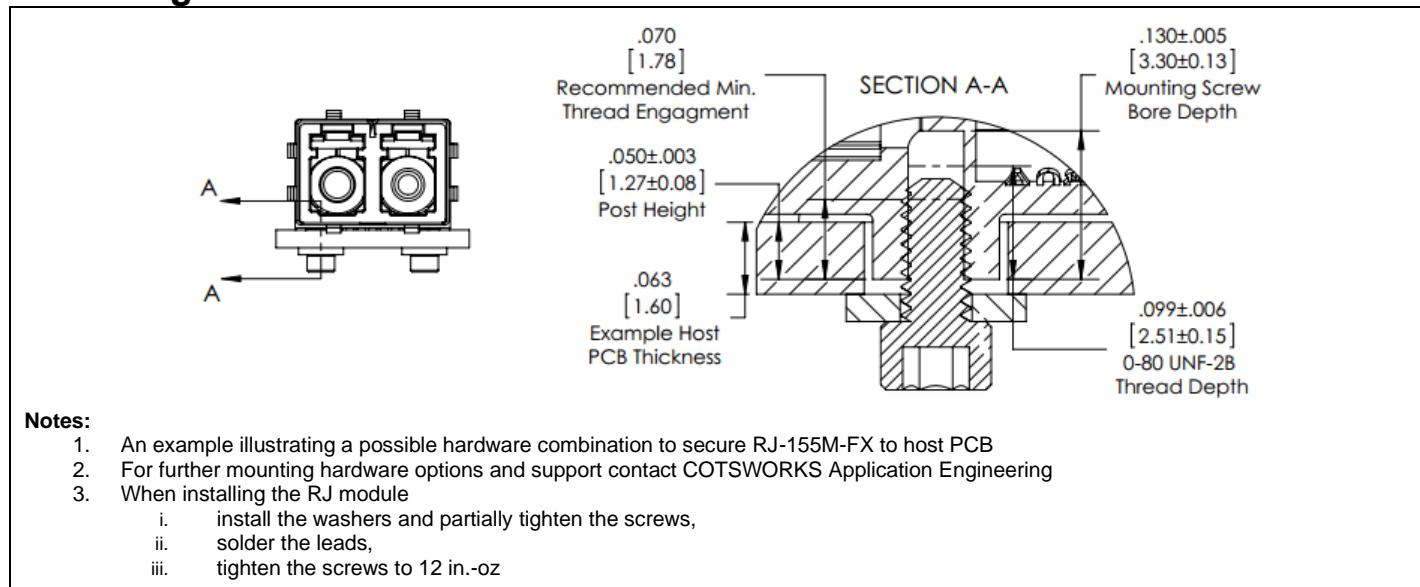
Screw Post Mechanical Dimensions



Solder Post Mechanical Dimensions



Mounting Hardware Guidelines



Ruggedization Notes

- Parylene C coating can be used for conformal coating with a $1.0\text{mil} \pm 0.2\text{mil}$ 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 IIC T4 Ga] - Special conditions for safe use:

Connecting the transceiver to a non-certified transceiver may cause the destruction of the receiver. The damaging of a receiver of the certified transceiver does not influence the optical output power level of the laser diode. The optical connection of the laser diode to a non-certified receiver in the safe area does not influence this certification. The transceiver shall be supplied by a driving circuit powered from an SELV or PELV system or via a safety isolating transformer complying with the requirements of IEC 61558-2-6 or technically equivalent standard, or directly connected to apparatus complying with IEC 60950, IEC 61010-1, or a technically equivalent standard, or fed directly from cells or batteries. The temperature range is -40°C to $+85^\circ\text{C}$.

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			Ruggedized Coating	Operating Temp Range	EMI Shield	RoHS Level	Mounting	ATEX & IECEx Certification
155Mbps Max Data Rate	Duplex	LC Connector	(<i>None</i>): Non-coated R: Parylene	A: -40 to 85°C	(<i>None</i>): No Shield E: Shield	(<i>None</i>): Lvl 5 6: Lvl 6	(<i>None</i>): U: Metric Screw P: Posts	(<i>None</i>): T: Certified
1310nm LED								

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.

COTSWORKS and the COTSWORKS logo are registered trademarks of COTSWORKS, INC.
COTSWORKS reserves the right to change, alter, or revise this document without notice unless otherwise agreed to.

