2XCRL**-9XL*1W

Chip-on-Board (COB) Architecture:10G Single-Channel Aerospace Connector Coaxial Transceiver Module Series

Product Features

- Supports data rates from 1.25Gbps to 10Gbps
- 10Gbps single-channel aerospace circular connector (coaxial) package with dual LC fiber optic interface
- Single 3.3V power supply
- CML logic interface for signal input/output
- Exceptionally low EMI and excellent ESD protection
- High reliability, full-metal housing, and vibration-resistant design
- Fully localized (domestic) design solution
- Product Grade:
  Military Industrial Grade (J): -40°C to +85°C
  Extended Military Industrial Grade (M): -55°C to +85°C

Application

- Digital Radar Array
- High-Performance Countermeasure Suite
- Highly-Reliable, High-Datarate Point-to-Point Fiber Optic Communication
- Other Optical Links

Compliance Standards

- Complies with Laser Safety Class 1 standard IEC 60825
- Compliant with SFF-8472
- ROHS 2.0

Order Information

Part Number	Data Rate	Wavelength	Distance	Fiber	Temp.[Note1]
2XCRL45-9XLJ1W	10.3125Gbps	1310nm	10km	SMF	-40℃~+85℃
2XCRL45-9XLM1W	10.3125Gbps	1310nm	10km	SMF	-55℃~85℃
2XCRL46-9XLJ1W	10.3125Gbps	1550nm	10km	SMF	-40℃~+85℃
2XCRL46-9XLM1W	10.3125Gbps	1550nm	10km	SMF	-55℃~85℃

Note 1： Operating case temperature

Absolute Maximum Ratings

Table-2-Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply Voltage	VCC	-0.5	-	3.6	V	1
Storage Temperature	TS	-55	-	90	℃	1
Relative Humidity,Storage	RH	5	-	95	%	1
ESD Protection Value 1 (Excluding Differential Pins)	ESD1	-	-	1	KV	1
ESD Protection Value 2	ESD2	-	-	500	V	1

Note: Exceeding any value may result in permanent damage to the module.

Recommended Operating Environment

Table-3-Recommended operating conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply Voltage	VCC	3.14	3.3	3.46	V	-
Power Ripple	VSND	-	-	100	mV	-
Operating Case Temperature	TC	-40	-	+85	℃	J
	TC	-55	-	+85	℃	M
Data Rate	BR	-	10.3125	-	Gbps	-
Power Consumption	PD	-	-	1	W	-

Electrical Characteristics

Table-4-Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Transmitter							
TX Differential Input Voltage		VIN	200	-	1200	mVpp	-
TX Differential Input Impedance		ZIN	90	100	110	ohm	-
TX_DIS	Enable	VIL	0	-	0.8	V	-
	Disable	VIH	2.0	-	VCC+0.3	V	-
Receiver							
RX Differential Input Voltage		VOUT	300	-	1000	mVpp	-
RX Differential Input Impedance		ZOUT	90	100	110	ohm	-
SD Signal	Normal	VOL	2.4	-	VCC	V	-
	Loss	VOH	0	-	0.4	V	-

Optical characteristics

Table-5-Optical characteristics（2XCRL**-9XL*1W）

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Transmitter							
Center Wavelength		λc	λc-20	λc	λc+20	nm	-
Spectral width（-20dB）		Δλ	-	-	1	nm	-
Average Launch power Tx off		Poff	-	-	-30	dBm	-
Launch Optical Power		Pout	-5	-	0	dBm	1
Extinction Ratio		ER	3.5	-	-	dB	-
Receiver							
Wavelength Range		λc	1260	-	1620	nm	-
Receiver Sensitivity		Sens	-	-	-12	dBm	2
Saturated optical power		P_{SAT}	0.5	-	-	dBm	3
SD	SD Assert	SDA	-	-	-14	dBm	-
	SD De-Assert	SDD	-40	-	-	dBm	-
SD Hysteresis		SDH	0.5	-	-	dB	-

Note:

Coupled into 9/125 SMF

Test Conditions: 9/125 μm single-mode fiber, PRBS 2³¹-1, BER ⩽ 1 × 10⁻¹²

The actual received optical power at the receiver must be less than or equal to the overload optical power value. If the received optical power is excessively high, appropriate optical attenuation must be added to the link. Otherwise, transmission errors or damage to optical components may occur.

Interface Assignment

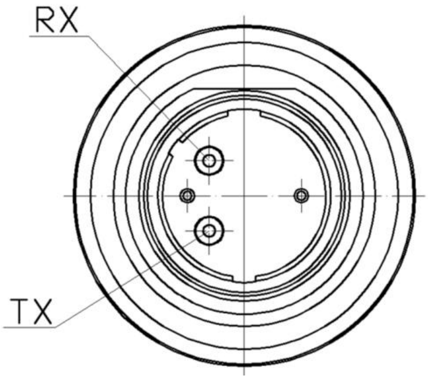


Figure 1 Interface Assignment

Mating Aviation Connector Model Number : J599FB/26KC04W

Pin Assignment

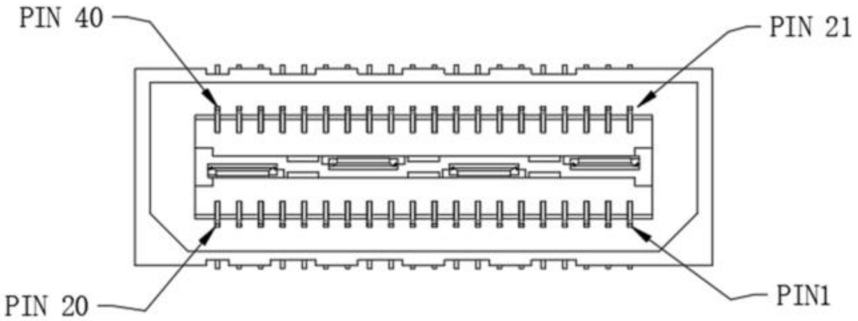


Figure 2 Pin Assignment (Top View, Viewed from Optical Port Side)

Table-6-Pin Assignment

Pin	Name	Level	Description	Note
1,2	VCC	Power	power， +3.3V	-
5	TX_DIS	LVTTL	TX_DISABLE, Active High	1
6	SCL		I2C Clock Signal Line, Standard	2
7	SDA		I2C Clock Signal Line, Standard	2
9	TD-	CML	Transmit Data Inverted Input, Internally AC-Coupled	-
10	TD+	CML	Transmit Data Non-Inverted Input, Internally AC-Coupled	-
13	RD+	CML	Receive Data Non-Inverted Output, Internally AC-Coupled	-
14	RD-	CML	Receive Data Inverted Output, Internally AC-Coupled	-
17	SD	LVTTL	Receive Loss-of-Signal Output， Active High when Signal is Present	-
3,4,8,11,12,15,16,18,19,20,21,22,23,24,25,26,257,28,29,30,31,32,33,34,35,36,37,38,39,40	GND	GND	Ground	-

Note:

1. This pin is pulled up to VCC with a 10kΩ resistor on the host board. TX_DIS is active high. If the TX_DISABLE function is not used, the TX_DIS pin must be pulled down to ground to hold it low; it must not be left floating. A floating pin may cause the module to malfunction. During normal operation, this pin is at a low logic level.
2. The digital monitoring functionality communicates via the I2C interface. The addresses for digital diagnostic monitoring (DDM) information comply with the SFF-8472 protocol.

Recommended Interface Circuit

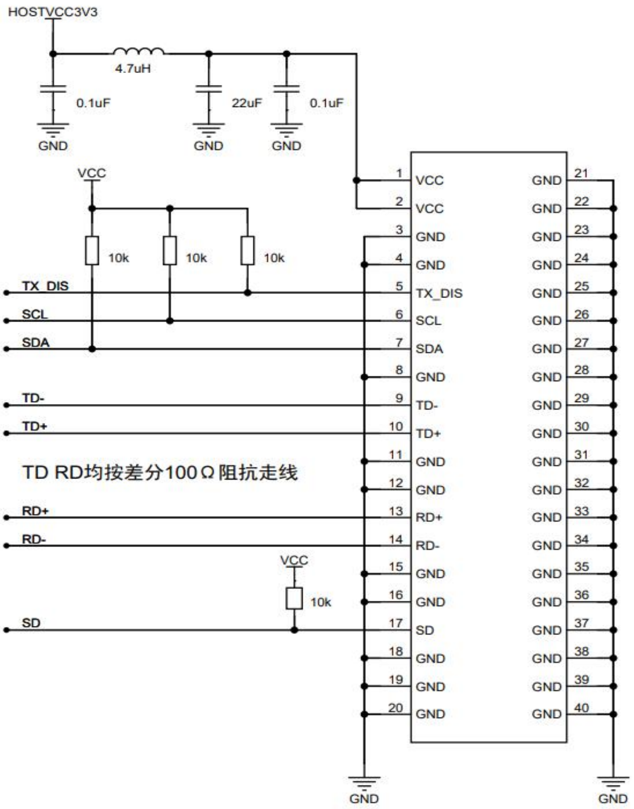


Figure 3 Recommended Interface Circuit

Product Dimensions and Mounting

(Units in millimeters. Unless otherwise specified, tolerance is ±0.2mm)

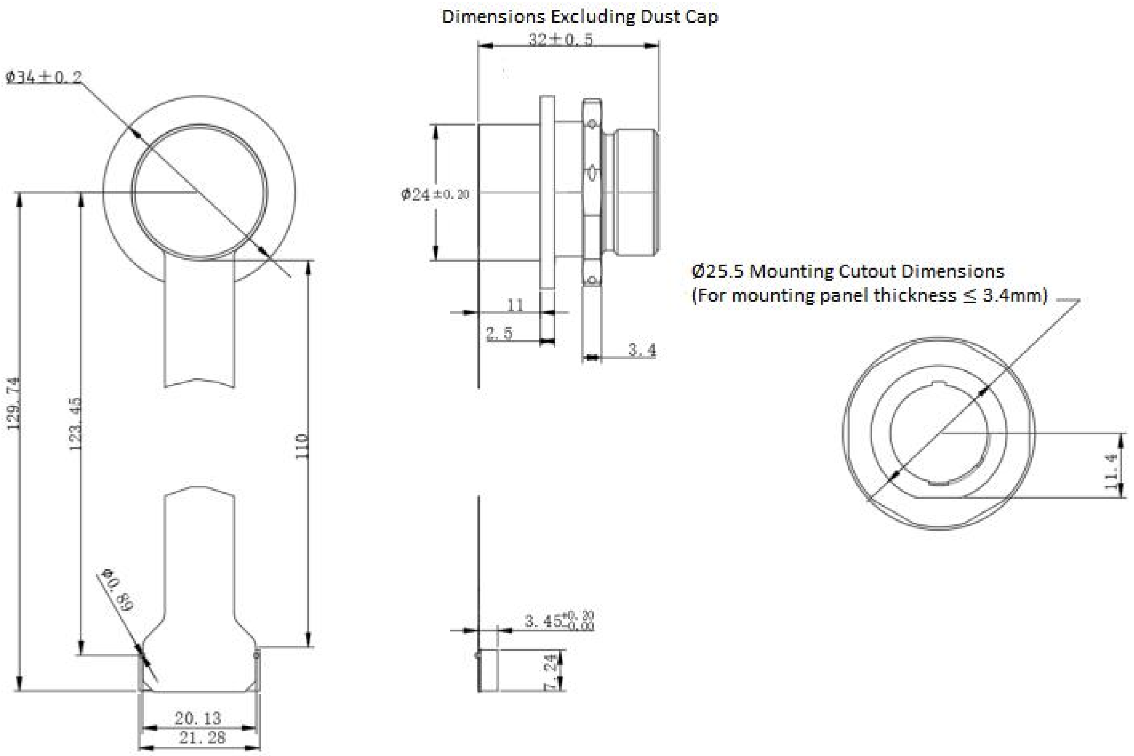
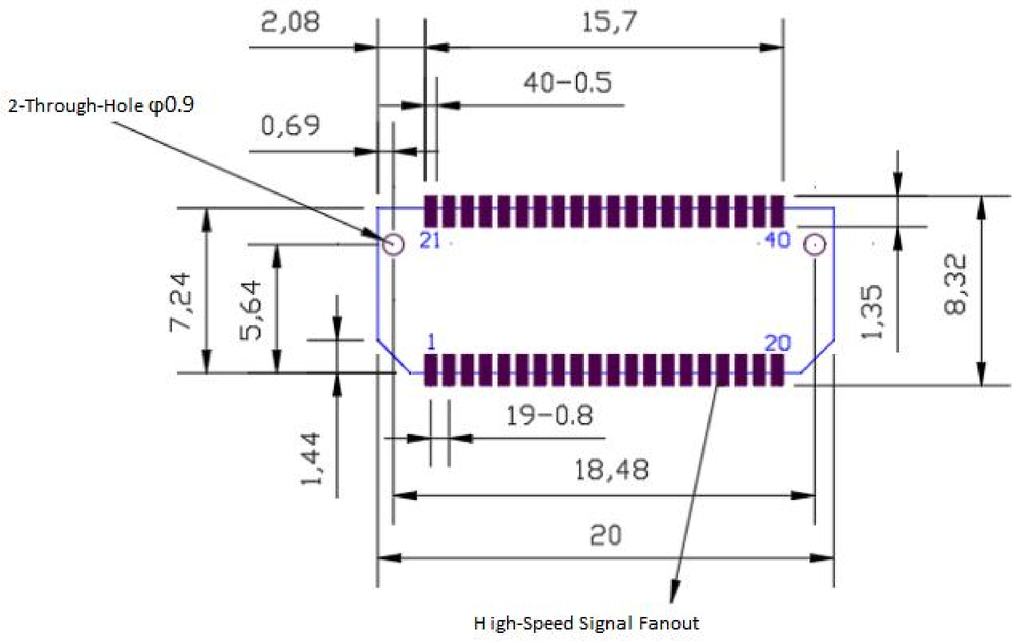


Figure 4 Product Dimensions and Mounting

Recommended System PCB Connector Layout



Recommended Connector Model：FBB08004-M40S3XX3K6M

Figure 5 Recommended System PCB Connector Layout

Important Notes

1. Eye Safety Protection

Avoid direct eye exposure to the fiber optic port, as laser radiation may cause eye injury.

While observing diffuse reflections is generally safe, the use of optical instruments (e.g., microscopes or telescopes) to observe the laser beam may concentrate the radiation and result in severe eye damage.

2. ESD Protection

(1) Module ESD Protection Level Requirements：

ESD Models	Explanation	Max	Unit
ESDHB	Human Body Model (HBM)	1000	V
ESDMM	Machine Model (MM)	500	V

(2) ESD -safe containers must be used for module handling and transit. Alternatively, the original module packaging may be used for this purpose.

(3) Personnel must wear a properly grounded ESD wrist strap and finger cots when handling modules.

(4) Direct bare-hand contact with the module is prohibited.

3. Module Transportation and Storage

(1) Cushioning materials must be used inside the packaging to prevent squeezing, impact, and damage during transit.

(2) Modules must be stored in a clean, dry, and contamination-free environment.

Recommended conditions: Temperature of 20–30°C, humidity of 40–60% RH, with an absence of acidic, alkaline, or other corrosive gases.

For modules stored long-term (exceeding 6 months), pre -baking is recommended before use. The baking temperature must not exceed the module's maximum storage temperature.

(3) ESD -protective measures are required for storage. Modules should be placed in ESD foam or stored in ESD -safe containers.

4. Module Protection Requirements

(1) Optical Port Protection

A. For optical modules not in use, dust plugs must be promptly installed on the module connectors to prevent end-face contamination.

B. Avoid inserting or removing fibers in dusty environments. Ensure the fiber connector is clean before mating to prevent dust from transferring to the module end-face during connection.

C. If the module end-face is contaminated, clean it with a specialized cleaning tool or a lint-free swab moistened with alcohol using the following method:

- Use a clean, lint-free swab dipped in an appropriate amount of alcohol.
- Wipe in one direction only, while gently rotating the swab.
- Do not use the same swab for more than three cleaning strokes.
- Allow the alcohol to evaporate completely before mating.
- Clean the mating fiber connector end-face in the same manner before connection.

(2) Electrical Port Protection

A. The electrical connector of the module is a sensitive component. Do not remove the protective cover when the module is not inserted into its cage.

B. Before use, inspect the module connector socket for foreign objects or contamination. Clean if necessary.

C. Before use, check for bent or broken pins in the connector. Discontinue use if any damage is found.

D. Always remove the fiber before inserting or removing the module. Insert and remove the module gently along the mating direction to avoid damaging the electrical connector.

E. Frequent insertion and removal may degrade performance and reduce the lifespan of the module. Avoid unplugging or replugging unless necessary.