

Analog OptoLock® FC300T

DATA SHEET

650 nm Analog Fiber Optic Transceiver with Termination for Bare POF



FEATURES

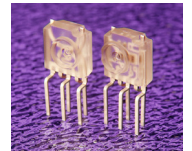
- Suitable for operation from DC to over 250 MBaud
- Simple low-cost termination solution for bare POF
- Suitable for standard 2.2 mm jacketed POF cables
- Optionally sorted into 1 dB bins for power matching
- High-speed Resonant Cavity LED (RCLED) at red 650 nm with small emission aperture suitable for POF
- Resonant Cavity LED reliability tested to over 400,000 hours lifetime
- High sensitivity PIN diode for detection of received light
- Integrated optics to efficiently focus and direct light
- RoHS compliant

APPLICATIONS

- Analog components suitable for sensor applications
- Proprietary LANs
- Board to board galvanically isolated links
- Industrial controls
- Medical instruments

DESCRIPTION

Firecomms Analog OptoLock® transceiver combines a pair of Firecomms high-speed analog fiber optic components within a miniature housing to provide instant termination for bare Plastic Optical Fiber (POF). This POF port significantly quickens and simplifies the connection of devices in communications and sensor networks.



The design of OptoLock enables the fiber to be cut and terminated to the exact required length on site, minimizing the costs of manufacture, installation and maintenance.

OptoLock is a RCLED-based 650 nm fiber optic solution designed to provide advanced



communication links and sensor implementations over POF. Firecomms' unique RCLEDs provide high levels of light coupling into the fiber, with short rise and fall times, for the use of standard, large core POF.

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TERMINATION STEPS

To terminate the POF cable into OptoLock, the end of the cable is cut cleanly, and the two strands are separated. One strand is inserted into each of two holes in the termination housing, which is then pressed closed to hold the POF in place. These steps are shown here.

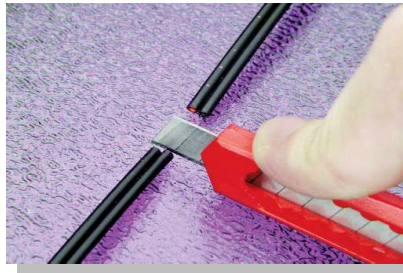


FIGURE 1
Slice the POF cable.



FIGURE 2
Split the POF strands.



FIGURE 3
Insert POF into OptoLock.

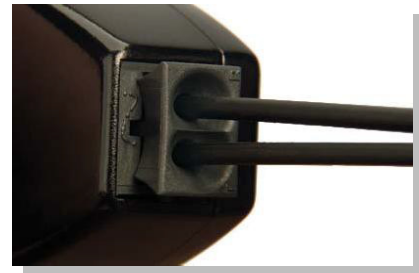


FIGURE 4
Press OptoLock to hold POF into place.

EQUIVALENT CIRCUIT

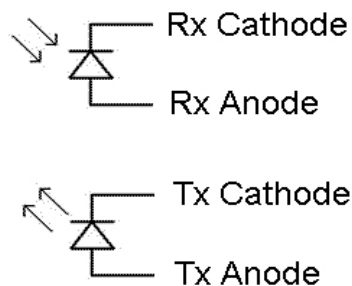


FIGURE 5
Internal circuit of transceiver FC300T.

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SPECIFICATIONS

Table 1
TRANSMITTER ABSOLUTE MAXIMUM RATINGS

These are the absolute maximum ratings at or beyond which the FOT can be expected to be damaged.

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T_{stg}	-40	+100	°C
Operating Temperature	T_{op}	-20	+85	°C
Soldering Temperature ^[1]	T_{sld}		+260	°C
Continuous Forward Current	I_f		100	mA
Reverse Voltage	V_R		5	V

Notes:

1. 260°C, 5s 3 times, at least 2.2 mm away from lead root.

Table 2
TRANSMITTER OPTICAL AND ELECTRICAL CHARACTERISTICS

Unless otherwise stated, $T_A = +25^\circ\text{C}$.

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Test Condition
Peak Wavelength	λ	640	660	670	nm	10 mA, -20 to 85°C
Spectral FWHM	$\Delta\lambda$	15		30	nm	10 mA, -20 to 85°C
Peak Wavelength Temperature Coefficient	$d\lambda/dT$		-0.13		nm/°C	
Optical Power ^[1]	P_{OP}	-10		0	dBm	10 mA, -20 to 85°C
Forward Voltage	V_f	1.7		2.3	V	10 mA, -20 to 85°C
Cutoff Frequency 10 mA Bias	f_c		80		MHz	-3dB Optical Power
Cutoff Frequency 20 mA Bias	f_c		100		MHz	-3dB Optical Power
Capacitance	C_o		5		pFV	$f_i=0V, f=1MHz$

Notes:

1. Optical power coupled into 1 mm diameter plastic fiber.

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SPECIFICATIONS (Continued)

**Table 3
RECEIVER ABSOLUTE MAXIMUM RATINGS**

These are the absolute maximum ratings at or beyond which the FOT can be expected to be damaged.

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T_{stg}	-40	+100	°C
Operating Temperature	T_{op}	-20	+85	°C
Electrical Power Dissipation	P_{tot}		100	mW
Reverse Voltage	V_R		25	V
Soldering Temperature ^[1]	T_{sld}		+260	°C

Notes:

1. 260°C, 5s 3 times, at least 2.2 mm away from lead root.

**Table 4
RECEIVER OPTICAL AND ELECTRICAL CHARACTERISTICS**

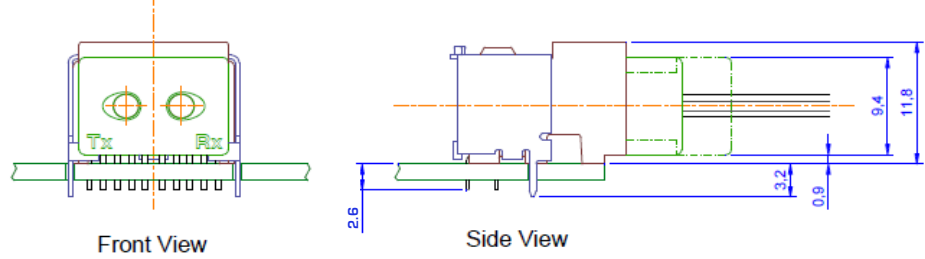
Unless otherwise stated, $T_A = +25^\circ\text{C}$.

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Test Condition
Responsivity, $\lambda=660\text{ nm}$	R		0.3		A/W	
Dark Current	I_R		0.2	1.0	nA	10 mA, -20 to 85°C
Rise Time (20% to 80%)	t_r		1		ns	
Fall Time (80% to 20%)	t_f		1		ns	
Dark Noise Density			10		fA/ $\sqrt{\text{Hz}}$	
Capacitance	C_o		3		pF	Bias=8v, f=1MHz

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MECHANICAL DATA



Mechanical Tolerances: +/- 0.2 mm

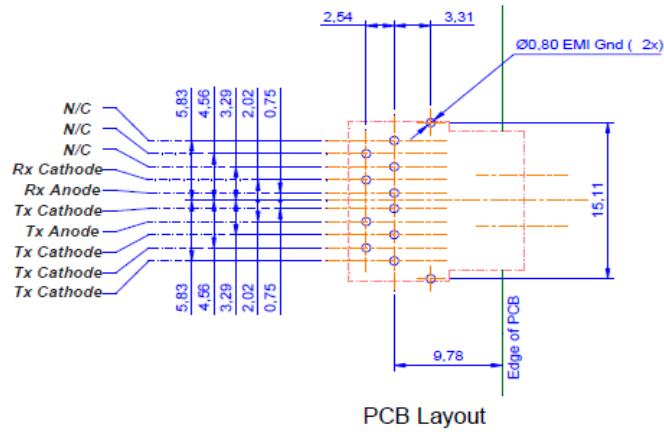
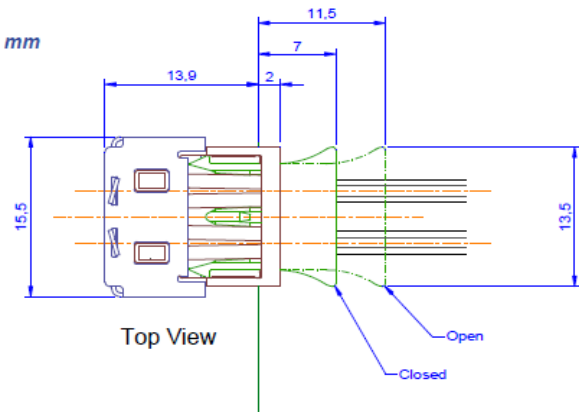


FIGURE 5
PCB layout (top view, looking down) for the Firecomms transceiver FC300T

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PACKING INFORMATION

Components are packed in PVC anti-static tubes in moisture barrier bags. Bags should be opened only in static-controlled locations, and standard procedures should be followed for handling moisture sensitive components. Each tube and each inner carton is labeled with part number, lot number, date code and quantity.

Table 5 PACKING INFORMATION	
Components per Tube	24
Tube Length	440 mm
Tube Height	20 mm
Tube Depth	31 mm
Tubes per Bag	10
Bags per Inner Carton	1
Inner Carton Length	590 mm
Inner Carton Height	85 mm
Inner Carton Depth	145 mm
Weight per Inner Carton, Complete	1.75 Kg
Components per Inner Carton	240
Inner Cartons per Outer Carton	4
Outer Carton Length	600-640 mm
Outer Carton Height	300 mm
Outer Carton Depth	200-285 mm
Weight per Outer Carton, Complete	8.4 Kg
Components per Outer Carton	960

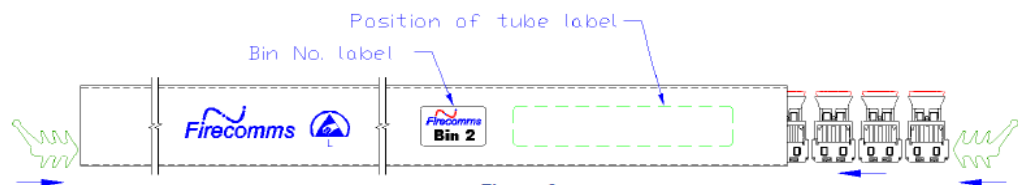


FIGURE 6
Packing tube for the Firecomms transceiver FC300T

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ORDERING INFORMATION

Table 6
ORDERING INFORMATION

Part Number	Name	Description
FC300T-111	Analog OptoLock Transceiver, 2.2 mm POF, Black	650 nm RCLED-Based Transceiver, Color Black, with Termination for Bare POF Cable 2.2 mm Diameter

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