5100 Series

L-Band Fiber Optic Links

DATASHEET | OCTOBER 2012 SATCOM

Features

- 950 MHz – 2050 MHz
- Up to eight plug-in cards per 3u chassis
- Up to four flange-mount modules per 1u chassis
- 50 ohm SMA and 75 ohm Type Options
- Affordable replacement for coaxial systems

Applications

- TVRO
- Broadcast
- Earth Stations
- Headends
- VSAT
- GPS
- Radios

The 5100-Series fiber optic inter-facility links (IFLs) are a high performance, cost-effective alternative to coaxial cable for 950 MHz to 2050 MHz L-Band satellite communications applications.

EMCORE's fiber optic IFLs, function as transparent links between satellite antennas and Network Operations Centers (NOC). These IFLs eliminate the limitations of copper systems by enabling longer transmission distance while retaining the highest level of signal quality.

In addition, EMCORE's fiber optics provide several other significant network advantages, including simplified network design, ease of installation, and immunity from EMI/RFI and lightning. They are available either in a flange-mount package for outdoor applications or as a plug-in for integration with EMCORE's System 10000 rack-mount chassis.

Performance Highlights

	Minimum	Typical	Maximum	Units
Wavelength	-	1310	-	nm
Transmitter Optical Output Power	-	0	-	dBm
Receiver Optical Input Power	-	-12	-	dBm
Link Gain @ 1 dB optical loss Standard High	 - -	 -4 13	 - -	dB
Temperature Range Flange Mount Rack Mount	 -40 0	 - -	 +65 +50	 °C °C
Frequency Range	950	-	2050	MHz

See following pages for complete specifications and conditions.

Package Options

	Transmitter	Receiver
Rack Mount[1] 950 - 1450 MHz 950 - 1750 MHz 950 - 2150 MHz	 10346A 10346B 10347A	 10446A 10446B 10447A
Flange Mount 950 - 1450 MHz 950 - 1750 MHz 950 - 2150 MHz	 3110A 3111A 3112A	 4110A 4111A 4112A

1. Rack mount package for System 10000 platform only

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Condition	Min	Max	Units
Operating Temperature Range Flange-mount Rack-mount	T_{OP}	-	 -40 0	 +65 +50	 ˚C ˚C
Storage Temperature Flange-mount Rack-mount	T_{STG}	-	 -40 -40	 +85 +85	 ˚C ˚C
DC Voltage	-	-	-	24	VDC
DC Current (Transmitter)	-	+8VDC	250	-	mA
DC Current (Receiver)	-	+8 VDC	200	-	mA

Electrical / Optical Characteristics

Parameter	Symbol	Condition	Min	Type	Max	Units
Wavelength (Transmitter)	-	-	1290	-	1340	nm
Optical Output Power (Transmitter)	-	-	-	1	-	mW
dc Responsivity (Receiver)	-	-	0.75	-	-	A/W
Fiber	-	Corning SMF-28 or equivalent	-	-	-	-
Connector	-	FC/APC Tight Fit, (Seikoh Giken or equivalent)	-	-	-	-
Connector Return Loss	-	-	60	-	-	dB

Link Characteristics, 1 dB Optical

Parameter	L-Band Performance			
Link Gain	-	Std.	Low	High
50 Ohm (At 25° C), min.	-	-4.00 dB	-15.00 dB	+13.00 dB
75 Ohm (At 25° C), min.	-	-4.00 dB	-15.00 dB	+13.00 dB
Amplitude flatness any 500 MHz any 40 MHz			± 1.50 dB ± 0.35 dB	
Gain vs. temp. (typ.)	-	± 0.75 dB		0.03 dB/°C

RF Characteristics, Tx

Parameter		Performance	
Tx Gain Option	-	Std.	-002 (high)
Tx Gain (TG) - 50 Ohm	-	-19.50 dB	-2.50 dB
Tx Gain (TG) - 75 Ohm	-	-17.75 dB	-0.75 dB
Noise figure, max	-	45 dB	28 dB
Input IP3, min.	-20° C -40° C	+7.5 dBm +4.5 dBm	-9.5 dBm -12.5 dBm
Input 1 dB compression, typical	–20° C -40° C	≥ 0 dBm ≥ -3 dBm	≥ -17 dBm ≥ -20 dBm
Gain vs. temp. (typ.)	-	0.09 dB/°C	0.12 dB/°C
Max RF input (Tx)	-	+3 dBm	-14 dBm
Amplitude flatness any 500 MHz any 40 MHz		± 0.75 dB ± 0.20 dB	
VSWR	Input	2.0:1	
Input Impedance	-	75 Ohm F, (50 Ohm SMA, option –001)	

RF Characteristics, Rx

Parameter		Performance	
Rx gain option	-	Std.	-002 (low)
Rx Gain (RG) - 50Ohm	-	+21.00 dB	+4.00 dB
Rx Gain (RG) - 75 Ohm	-	+19.25 dB	+2.25 dB
Gain vs. temp. (typ.)	-	0.06 dB/°C	0.03 dB/°C
Amplitude flatness any 500 MHz any 40 MHz		± 0.75 dB ± 0.15 dB	
VSWR	Output	1.8:1	
Output Impedance	-	75 Ohm F, (50 Ohm SMA, option –001)	

Device Resistance and Voltage for Rx Optical Power and DC Electrical Power Monitor Outputs

(See Figures 1 and 2)

Version	Voltage	Resistance
Tx/Rx	5V	333 Ω

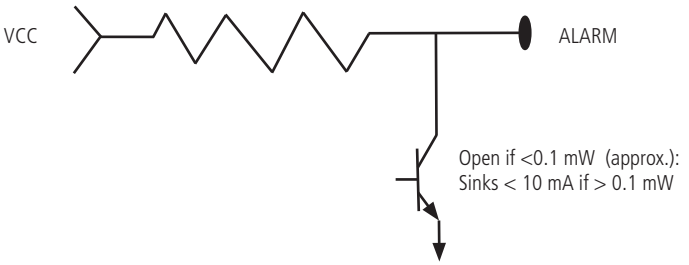

Figure 1. Receiver Electrical Schematic for Power Alarm

Figure 2. Schematic for DC Power Monitor (Flange Mount Units Only)

DC Voltage

Flange Mount Package

Input Voltage	12 V [1,2]	15 V [1,2]	18 V [1,2]	24 V [1,2]
Tx	170 mA	135 mA	115 mA	85 mA
Rx	150 mA	120 mA	100 mA	75 mA

1. Applies to All Versions Except –003)
2. Ripple and noise: 100 mVp-p >100 kHz; 200 mVp-p <100 kHz

Flange Mount Package

Lead Color	Tx	Rx
Red	+8 to +24 volts	+8 to +24 volts
Brown	Not used	Low optical power alarm
Orange	DC power monitor	DC power monitor
Yellow	Not Used	Photodiode current monitor 1 V/mA
Black	GND	GND

Pin Information

Rack Mount Package: Used with the 10990A 3u Rack Mount Chassis)

Plug-in D-Sub	Tx Plug-in	Rx Plug-in
1[3]	+15 volts	+15 volts
2	nc	nc
3	nc	nc
4	GND	GND
5	GND	GND
6[4]	nc	Photodiode current Monitor. (1 V/mA)
7[4]	nc	Low optical power alarm
8[4]	LNB DC Output	nc
9[4]	Connects to RF center pin for powering LNB	nc

3. Powered from 10901G, or equivalent power supply
4. Accessible via connector on back panel of 10990A chassis

Ordering Code Definitions - Transmitters

Option	Option Availability		Option Description	Standard Configuration
	Flange Mount	Plug-in		
-001	X	X	50 Ω SMA, female	75 Ω F-type connector, female
-002	X	X	Two-stage RF Pre-amp	Single stage RF Pre-amp
-003	X		Unit to run from + 5.0 V ± 0.2V No internal DC regulator	Internal DC regulator operates from +8V to +24 V input
-004	X		No LNB voltage on center pin	DC voltage on center pin for LNB powering
-006		X	75 Ω CANARE BNC, female	75 Ω F-type connector, female

Ordering Code Definitions - Receivers

Option	Option Availability		Option Description	Standard Configuration
	Flange Mount	Plug-in		
-001	X	X	50 Ω SMA, female	75 Ω F-type connector, female
-002	X	X	Single stage RF Post-amp	Two-stage RF Post-amp.
-003	X		Unit to run from + 5.0 V ± 0.2V No internal DC regulator	Internal DC regulator operates from +8V to +24 V input
-004	X		No DC voltage on center pin	DC voltage on center pin
-006		X	75 Ω CANARE BNC, female	75 Ω F-type connector, female

Mounting Options

Part / Number Model	Description	Capacity
1260-001-001	NEMA enclosure (12" x 12" x4")	Up to 2 flange-mount modules
1260-001-001	1U 19" rack mount chassis (1.75" x19" x 18")	Up to 4 flange-mount modules
1261-002-001	1U 19" rack mount chassis & internal power supply	Up to 4 flange-mount modules
10990A 10901G 10901G	3U 19" rack mount chassis 3U, plug-in power supply (90-260 VAC input) 3U, auxiliary plug-in power supply (90-260 VAC input)	Up to 8 plug-in modules

Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1 laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1 laser product, tested according to IEC 60825-1:2007 / EN 60825-1:2007.

Wavelength = 1.3 µm.
Maximum power = 30 mW.

Caution: Use of controls, adjustments and procedures other than those specified herein may result in hazardous laser radiation exposure.

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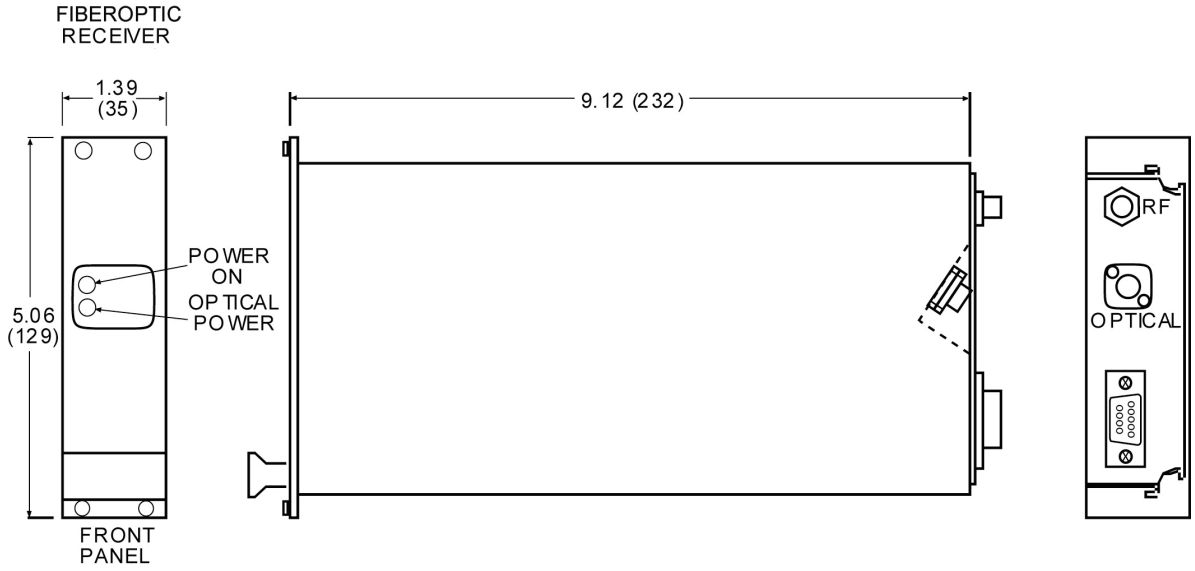
Rack Mount Package

Receiver package depicted below. Transmitter plug-in has only "Power On" indicator LED.



Flange Mount Package