

5100-Series IF-Band and L-Band Fiber-Optic Links



Features

- 10 MHz to 200 MHz
- 950 MHz to 2050 MHz
- Up to eight plug-in cards per 3U chassis
- Up to four flange-mount modules per 1U chassis
- Redundant power supplies for 3U chassis
- Affordable replacement for coaxial systems

Applications

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

Description

The 5100-Series fiber-optic interfacility links (IFLs) are a high-performance, cost-effective alternative to coaxial cable for 10 MHz to 200 MHz IF-band and 950 MHz to 2050 MHz L-band satellite communications applications.

Agere Systems Inc. fiber-optic IFLs function as a transparent link between a satellite antenna and receiver equipment. These IFLs eliminate the limitations of copper systems by enabling longer transmission distances while retaining the highest level of signal quality.

In addition, Agere Systems' 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 as a flange-mount enclosure for outdoor applications or as a plug-in for integration with Agere Systems' System 10000 rack-mount chassis.

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	Min	Max	Unit
Operating Temperature Range:	TOP			
Flange-mount		-40	60	°C
Plug-in		0	50	°C
Storage Temperature Range:	Tstg			
Flange-mount		-45	85	°C
Plug-in		-45	85	°C

Characteristics

Table 1. Frequency and Package Options

Frequency Range	Transmitters		Receivers	
	Flange Mount	Plug-in	Flange Mount	Plug-in
IF-Band: 10 MHz—200 MHz	3120A	10357A	4120A	10457A
L-Band: 950 MHz—1450 MHz	3110A	10346A	4110A	10446A
950 MHz—1750 MHz	3111A	10346B	4111A	10446B
950 MHz—2050 MHz	3112A	10347A	4112A	10447A

Table 2. IF Band Performance (For complete link of Tx, Rx, 1 dB optical loss, and >60 dB optical return loss.)

Parameter	IF Band Performance				Unit
Tx Gain Option	Std.	-102 (low)	-102 (low)	Std.	—
Rx Gain Option	Std.	-102 (high)	Std.	-102 (high)	—
Gain (at 25 °C), Min	0	0	-15.0	15.0	dB
Amplitude Flatness:					
10 MHz—200 MHz	±0.5	±0.5	±0.5	±0.5	dB
Any 40 MHz	±0.25	±0.25	±0.25	±0.25	dB
Noise Figure, Max	28	43	43	28	dB
Output IP3, Min	0	9	0	9	dBm
Output 1 dB Compression, Min	-10	0	-10	0	dBm
VSWR, In and Out	1.5:1	1.5:1	1.5:1	1.5:1	—
Max. RF Input (Tx)	-8	7	7	-8	dBm
In/Out Impedance	75 BNC, female (50 BNC, option -101)				Ω

Characteristics (continued)

Table 3. L-Band Performance (For complete link of Tx, Rx, 1 dB optical loss, and >60 dB optical return loss.)

Parameter	L-Band Specification				Units
	Std.	-002 (high)	Std.	-002 (high)	
Tx Gain Option	Std.	-002 (high)	Std.	-002 (high)	—
Rx Gain Option	Std.	-002 (low)	-002 (low)	Std.	—
Gain (at 25 °C), Min	-4.0	-4.0	-21.0	13.0	dB
Amplitude Flatness:					
Any 500 MHz	±1.5	±1.5	±1.5	±1.5	dB
Any 40 MHz	±0.35	±0.35	±0.35	±0.35	dB
Noise Figure, Max	45	28	45	28	dB
Input IP3, Min:					
Tx to -20 °C	7.5	-9.5	7.5	-9.5	dBm
Tx to -40 °C	4.5	-12.5	4.5	-12.5	dBm
Input 1 dB Compression (typ):					
Tx to -20 °C	≥0	≥-17	≥0	≥-17	dBm
Tx to -40 °C	≥-3	≥-20	≥3	≥-20	dBm
Gain vs. Temp. (typ):					
Tx	0.09	0.12	0.09	0.12	dB/°C
Rx	0.06	0.03	0.03	0.06	dB/°C
VSWR:					
Tx (input)	2.0:1	2.0:1	2.0:1	2.0:1	—
Tx (output)	1.8:1	1.8:1	1.8:1	1.8:1	—
Max. RF Input (Tx)	3	-14	3	-14	dBm
In/Out Impedance	75 F-type, female (50 SMA, Option -001)				Ω Ω

Table 4. Optical Characteristics

Parameter	Transmitter	Receiver	Unit
Wavelength	1310 ± 30	—	nm
Power	1.10 ± 0.3	—	mW
Laser dc Modulation Gain	≥0.02	—	W/A
dc Responsivity	—	≥0.75	A/W
Fiber	Single-mode, 9 μm/125 μm, (SMF-28™ or equivalent)		μm
Connector	FC/APC Tight Fit (Seikoh Giken or equivalent),		—
Optical Return Loss	≥ 60		dB

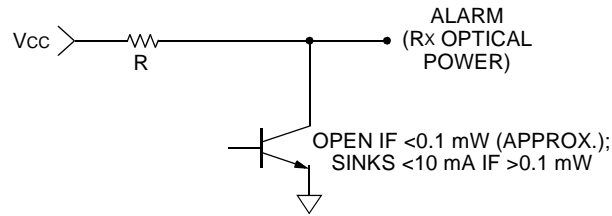
Table 5. Mounting Options

Part/Model Number	Description	Capacity
1260-001-001	NEMA Enclosure (12 in. x 12 in. x 4 in.)	Up to two flange-mount modules
1261-001-001	1U, 19 in. Rack-mount Chassis (1.75 in. x 19 in. x 18 in.)	Up to four flange-mount modules
1261-002-001	1U, 19 in. Rack-mount Chassis and Internal Power Supply	Up to four flange-mount modules
10990A	3U, 19 in. Rack Mount Chassis	Up to eight plug-in modules
10901A	3U, Plug-in Power Supply (90 Vac—260 Vac input)	—
10901B	3U, Auxiliary Plug-in Power Supply (90 Vac—260 Vac input)	—

Characteristics (continued)

Table 6. Device Resistance and Voltage

Parameter	Specification	Unit
Resistance:		
L-band Tx/Rx	1000	Ω
IF Rx	825	Ω
IF Tx	432	Ω
Voltage (Vcc):		
L-band Tx/Rx	5	V
IF Rx	10	V
IF Tx	6.5	V



1-1188(F)

Figure 1. Receiver Electrical Schematic

Options

Table 7. IF-Band Options

Option	Option Availability		Description	Standard Configuration
	Flange Mount	Plug-in		
-101	x	x	50 Ω BNC, Female.	75 Ω BNC, Female.
-102	x	x	For Higher Signal Input. Tx: Single-stage Amp. Rx: Two-stage Amp.	— Tx: Two-stage Amp. Rx: Single-stage Amp.

Table 8. L -Band Options

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	For Lower Signal Input. Tx: Two-stage Amplifier. Rx: Single-stage Amplifier.	Tx: Single-stage Amplifier. Rx: Two-stage Amplifier.
-003	x	—	Unit to Run from 5.0 V \pm 0.2 V. No Internal dc Regulator.	Internal dc Regulator Operates from 8 V to 24 V Input.
-004	x	—	RF Connector Is ac Coupled, with No dc on Center Pin.	Flange-mount Tx and Rx: RF Connects to dc Input, so dc on RF Connector Is ac (caution is needed to avoid shorting). Tx Plug-in: dc Voltage Can Be Coupled on RF Connector with Field-config- urable Jumper. Rx Plug-in: RF Connector Is ac Coupled.
-006	—	x	75 Ω CANARE BNC, Female.	75 Ω F-Type Connector, Female.

Package Information

Table 9. Flange-Mount dc Leads

Lead Color	IF-Band		L-Band	
	Tx	Rx	Tx	Rx
Red	dc Input 12 V—24 V	dc Input 12 V—24 V	8 V—24 V Connects to RF Center Pin	8 V—24 V Connects to RF Center Pin
Brown	Not Used	Low Optical Power Alarm	Not Used	Low Optical Power Alarm
Orange	dc Power Monitor for LED, etc.	dc Power Monitor for LED, etc.	dc Power Monitor	dc Power Monitor
Yellow	Not Used	Photodiode Current Monitor 1 V/mA	Not Used	Photodiode Current Monitor
Black	GND	GND	GND	GND

Table 10. Model 10990A 3U Chassis and Plug-In

Plug-in D-sub	Tx Plug-In, IF-Band	Tx Plug-In, L-Band	Rx Plug-In, IF or L-Band
1 ¹ dc Input	Typ. 15 V	Typ. 15 V	Typ. 15 V
2 ¹	NC	NC	NC
3 ¹	NC	NC	NC
4 ¹	GND	GND	GND
5 ²	GND	GND	GND
6 ²	NC	NC	Photodiode Current Monitor (1 V/mA)
7 ²	NC	NC	Low Optical Power Alarm
8 ²	NC	Same as Pin 1. Can be Jum- pered to Pin 9.	NC
9 ²	NC	Connects to RF Center Pin for Powering LNB.	NC

1. Powered from 10901A, 10901B, or equivalent power supply.

2. Accessible via connector on back panel of 10990A chassis.

Table 11. Maximum Current¹ (Applies to All Versions Except -003)

Input Voltage	8 V (L-Band)	12 V	15 V ²	18 V	24 V	Unit
Tx	250	170	135	115	85	mA
Rx	200	150	120	100	75	mA

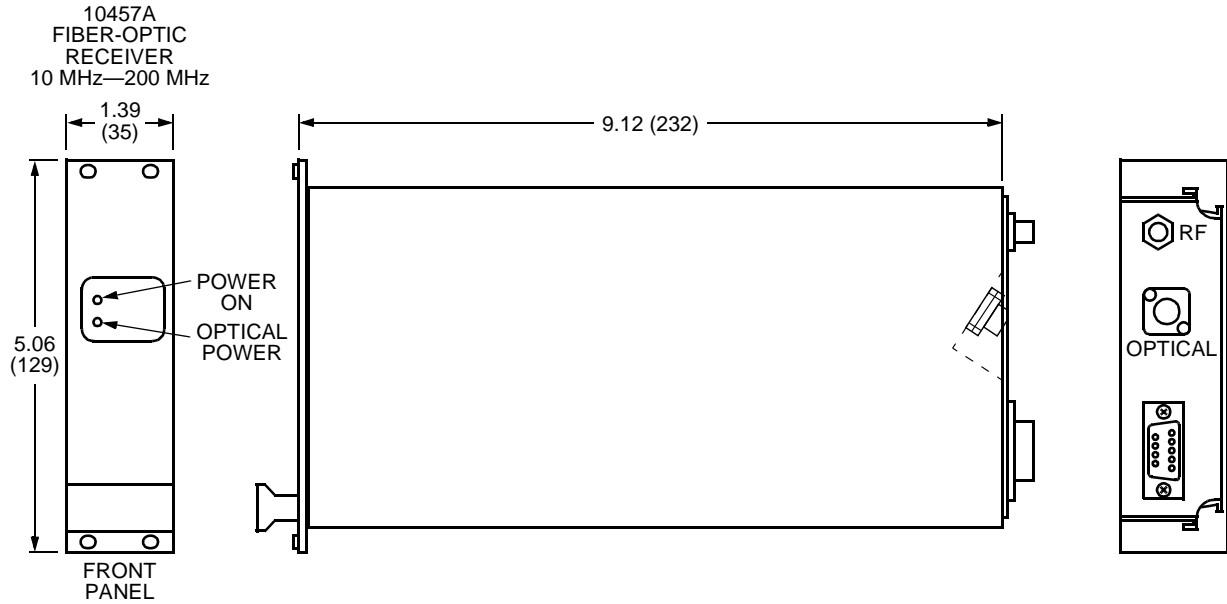
1. Ripple and noise: 100 mVp-p >100 kHz; 20 mVp-p <100 kHz.

2. 15 V may be from model 10901A or B power supplies.

Outline Drawings

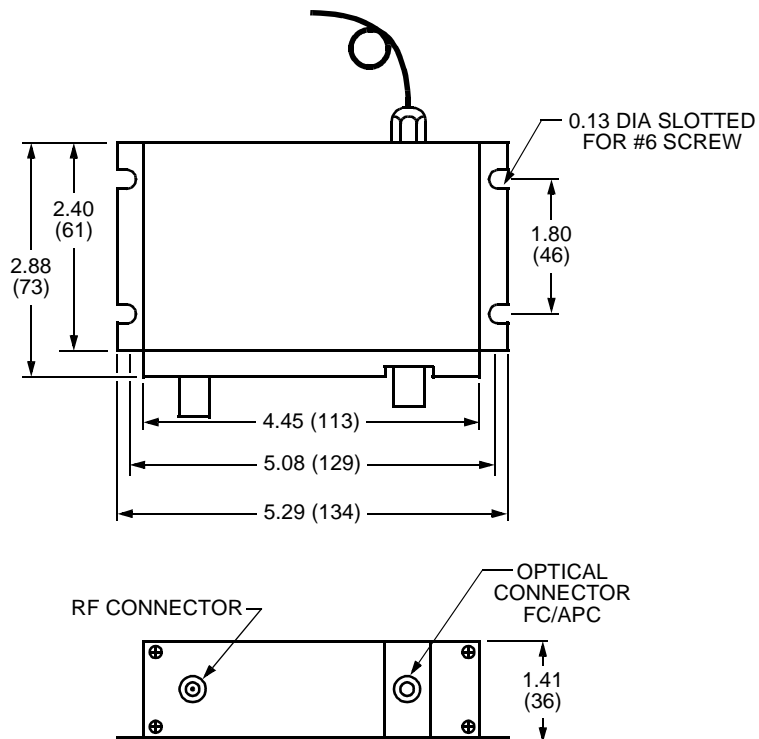
Dimension are in inches and (millimeters).

10457A Fiber-Optic Receiver



1-1189(F)

Flange-Mount Package



1-1190(F)

Laser Safety Information

Class IIIb Laser Product

FDA/CDRH Class IIIb laser product. All 5100 Series transmitter versions are Class IIIb laser products per CDRH, 21 CFR 1040 Laser Safety requirements. All versions are Class 3B laser products per *IEC*[®] 60825-1:1993. The device has been classified with an FDA under accession number to be determined.

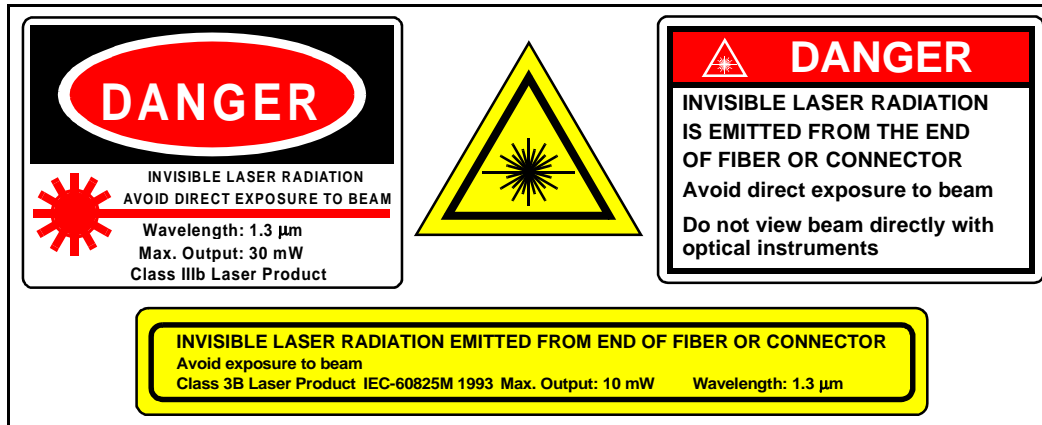
This product complies with 21 CFR 1040.10 and 1040.11.

Wavelength = 1300 nm

Maximum power = 30 mW

Product is not shipped with power supply.

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



Ordering Information

Table 12. Ordering Information*

Device Code	Description	Comcode
5100 Series	IF-Band and L-band Fiber-Optic Links	TBD

* For additional ordering information, please contact an account manager at Agere Systems, OPTO West, 1-800-362-3891 (for sales staff, please press option 2).

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