

Features

- High dynamic range
- Long distance communications
- 100 MHz to 15 GHz bandwidth
- Dual 1310 nm or 1550 nm window
- CE certified

Applications

- Antenna remoting
- Cellular and PCS networks
- Military triband communications
- Tracking, telemetry, and control (TT&C)

Emcore's family of microwave photodiode receivers is ideally suited for use in analog fiber-optic communications. With their wide bandwidth and flat response, these devices are used in a wide array of applications, including antenna remoting, timing and reference signal distribution, measurement, delay lines, and two-way communications. Of particular note is the high optical return loss, which enables high-quality noise performance for sensitive optical links.

A complete receiver, packaged either as a flange-mount for extreme environments, or as a plug-in for integration with Emcore's System 10000 rack-mountable chassis and power supplies. Electronics within flange mount and plug-in receivers bias the photodiodes and monitor the dc level of the optical input power, thus providing a fully integrated microwave product.

Performance Highlights

| | Minimum | Typical | Maximum | Units |
|-------------------------|---------|---------|---------|-------|
| Available wavelengths | 1290 | - | 1580 | nm |
| Optical Output Power | - | - | 2 | mW |
| Total Operating Current | - | - | 5 | mA |
| Temperature Range | -40 | - | +65 | °C |
| Frequency Range | 0.1 | | 15.00 | GHz |

See following pages for complete specifications and conditions.

Ordering Information

| Option | Connector Pigtail | Package Type | |
|--------|-----------------------------------|--------------|---------|
| | | Flange | Plug-in |
| -020 | FC/APC Bulkhead Optical Connector | X | X |

DC (Flange-mount / Rack-

| Pin Number | Min | Type | Max | Max Ripple | Current |
|------------|-----|------|-----|------------|-----------|
| 1 | 4 | 15V | 16 | 100 mV p-p | 0.2 A max |



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 of Baseplate: Flange-mount Plug-in | T _{OP} | continuous | -40 0 | +65 +50 | °C °C |
| Storage Temperature Flange-mount Plug-in | T _{STG} | - | -40 -40 | +85 +85 | °C °C |
| Delay | | | 4 | 10 | ns |

Optical Characteristics

| Parameter | Specifications |
|--|--|
| Model Number Flange-mount Rx Plug-in Rx | 4516C 10456C |
| dc Responsivity at 1310 nm, 25°C at 1550 nm, 25°C | >0.65 A/W >0.75 A/W |
| Delay | 8 ns, max |
| RF Receiver Efficiency (typ) at 1 GHz ² at 1310 nm at 1550 nm | >0.33 >0.38 |
| Optical Return Loss ³ | >45 dB |
| Optical Input Power | 2 mW |
| Pigtail Fiber Type (where applicable) | > 1 m, 9 μm/125 μm single-mode SMF-28 ³ or equivalent |

RF Characteristics

1. Relative to value at 1 GHz

| Parameter | Specifications |
|---|---------------------------|
| Model Number Flange-mount Rx Plug-in Rx | 4516C 10456C |
| Maximum Frequency | 15 GHz |
| Minimum Frequency | 1 GHz |
| Output Coupling | AC |
| Amplitude Flatness ¹ | ± 2.0 dB |
| Output VSWR 2.0:1 2.5:1 | 1 – 10 GHz 10 – 20 GHz |
| Output Impedance | 50 Ω |

Connector Options

| Parameter | Specifications |
|---|--------------------|
| Model Number Flange-mount Rx Plug-in Rx | 4516C 10456C |
| RF Connector Flange Mount Plug-in | SMA (f) SMA (f) |

1. The photodiode RF current splits evenly between the internal matching resistor and the external load. (See Emcore's, System Designer's Guide to RF and Microwave Fiber Optics)

2. Optical return loss specified for APC connectors or fusion splices only. Other connection methods can degrade optical return loss.

3. SMF-28 is a trademark of Corning Incorporated.

Pin/Package Information

Nine-Pin D-sub Connector 4516C and 10456C

| Pin | Description |
|-----|--------------------------------------|
| 1 | +15 Vdc |
| 2 | NC |
| 3 | NC |
| 4 | Power Ground |
| 5 | Reference Ground |
| 6 | Optical Current Monitor |
| 7 | Low Optical Power Alarm ¹ |
| 8 | NC |
| 9 | NC |

1. Open collector outputs

Front Panel LEDs

- Power on
- Optical Power Received (plug-ins only)

Alarm Circuits

- The alarms are open-collector outputs capable 20 mA when active and withstanding 15V when off.
- Low optical Power, pin-7
- Sinks current when power drops below approximately 100 μW.

dc Monitor Voltages

- dc Photocurrent, pin6
- 1V/mA ±2% accuracy (into 1 MΩ load). Proportional to photodiode input power

4516C, 10456C PIN Photodiode Receivers



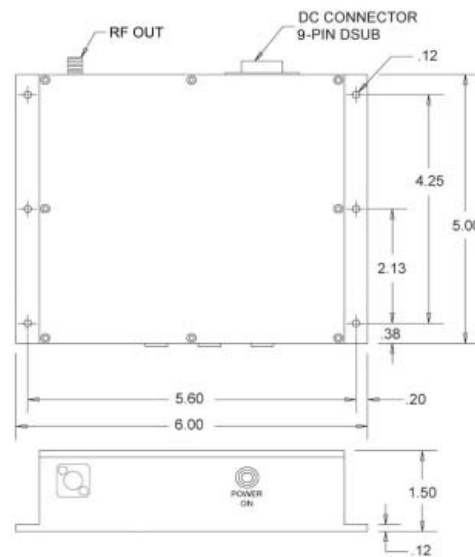
MICROWAVE

Mechanical Dimensions

10456C Receiver



4516C Receiver



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