

7810 Video Receiver Module



The broadband 7810 video receiver module is a versatile, state-of-the-art solution for a variety of network applications.

Features

- Wide 40 MHz—1000 MHz bandwidth supports as many as 110 CATV analog channels or a combination of analog/digital channels (e.g., 80/30), including HDTV broadcast
- Excellent frequency and distortion characteristics for high linearity
- Low noise (4.5 pA/ $\sqrt{\text{Hz}}$, typ.), low power dissipation (1.35 W max.), as well as high RF output
- Internal impedance-match circuitry (75 Ω)
- Robust, small package with single-mode fiber pigtail and connector options
- Wide operating temperature range, $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$

Applications

- Video signal distribution in HFC and FTTH nodes
- Video overlay in passive optical networks (PON)

Description

The 7810 video receiver is a single-mode fiber pig-tailed module featuring a low-noise, impedance-matched broadband photodiode and RF amplification.

The device receives optical analog and/or digital signals for a range of video broadcast options, and delivers the corresponding RF electrical output. The wide bandwidth supports the delivery of up to 110 CATV analog signals or combination of analog and digital channels (80/30, for example), including HDTV broadcast.

The 7810 exhibits excellent distortion performance with values well above standards over the entire bandwidth and temperature specifications (40 MHz—1000 MHz, $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$).

Moreover, the advanced impedance-match circuitry between the photodetector and RF amplification stages resolves a number of OEM design obstacles with very low typical noise performance value, not exceeding 4.5 pA/ $\sqrt{\text{Hz}}$.

The 7810 video receiver can be used in both 1310 nm and 1550 applications, being useful at different points of a given network.

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 | Min | Max | Unit |
|--|--------|-----|------------|--------|
| Operating Temperature Range | TOP | -40 | 85 | °C |
| Storage Temperature Range | Tstg | -40 | 85 | °C |
| Humidity at 85 °C | RH | — | 95 | % |
| Shock (1 ms duration; half sine wave: X, Y, Z axis) | — | — | 100 | g |
| Vibration (Single Sine): 5 MHz—100 MHz, 0.10 Oct/Min. 100 MHz—500 MHz, 0.25 Oct/Min. | — | — | 0.5 3.0 | g g |

Note: For all tables, typical values are performed at 25 °C; min and max values are performance vs. temperature.

Characteristics

Table 1. Electrical/Optical Characteristics

| Parameter | Symbol | Min | Typ | Max | Unit |
|-----------------------------|-------------------|------|---------------------------------------|------|----------------|
| Optical Power | P _{IN} | -10* | 2 | 4* | dBm |
| Power Supply Bias, Pin 1 | V _{CC} | — | 15 | — | V |
| Bias, Pin 2 | V _{CC} | — | 12 | — | V |
| Wavelength | λ | 1200 | 1310/1550 | 1600 | nm |
| Responsivity | — | — | >0.85 at 1310 nm, >0.95 at 1550 nm | — | mA/mW mA/mW |
| Dissipation | P _{DISS} | — | 1.25 | 1.35 | W |

* Depends on channel loading. Refer to the *7810 Video Receiver Module Application Note (TN01-002OPTO)*.

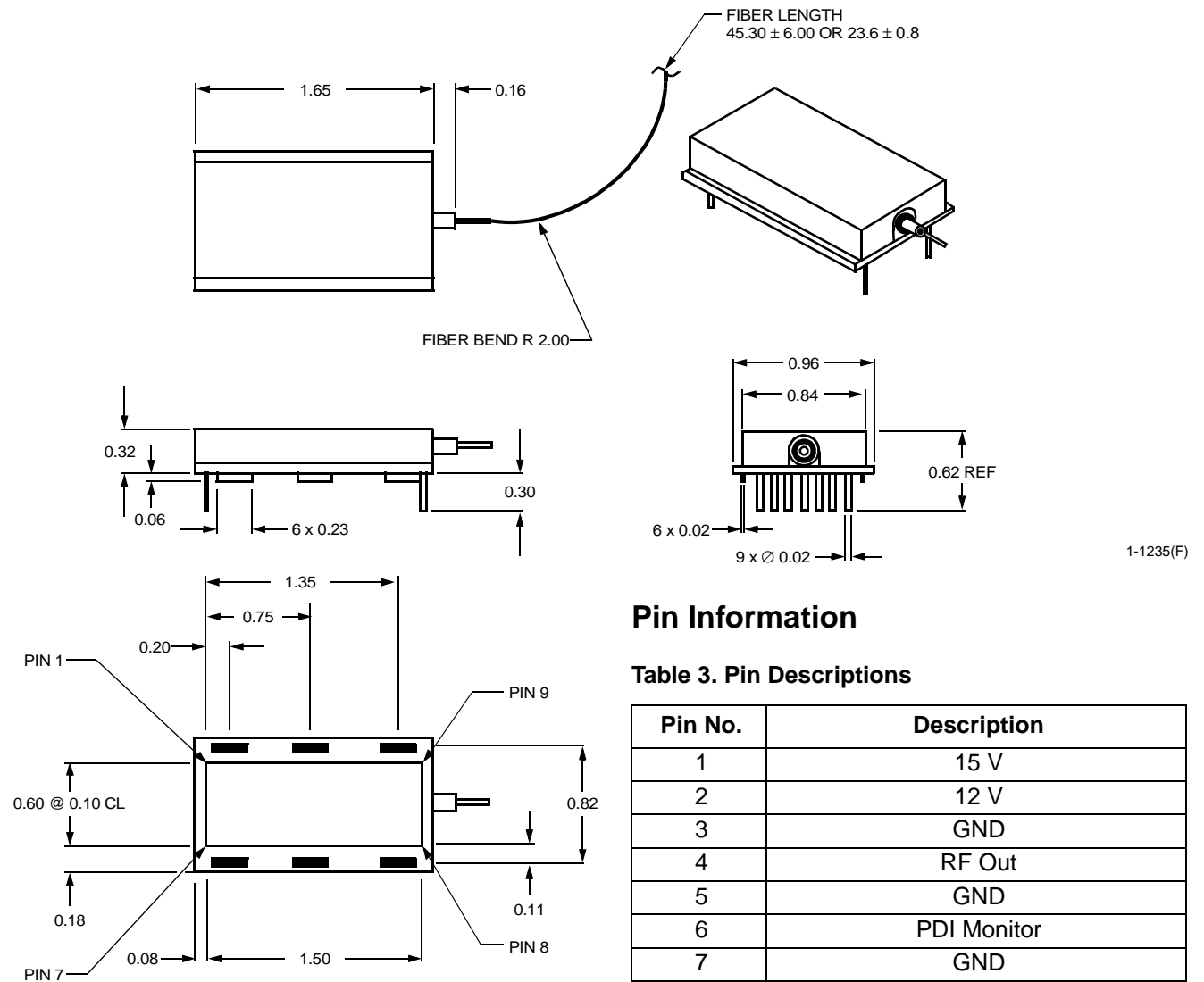
Table 2. RF Characteristics

| Parameter | Symbol | Min | Typ | Max | Unit |
|--|----------------|----------------|----------------|---------------|-------------------|
| Frequency Response | F | 40 | — | 1000 | MHz |
| Gain | G | 16 | 17 | 18 | dB |
| Ripple: 40 MHz—859 MHz 860 MHz—1 Ghz | — | — | ±0.5 ±0.75 | ±0.6 ±0.85 | dB dB |
| Output Return Loss | RL | -13 | -11 | -10 | dB |
| Noise | — | 4.0 | 4.5 | 5.0 | pA/√Hz |
| Distortion (absolute value): ¹ Composite Second-Order: 40 MHz—749 MHz 750 mHz—1 GHz Composite Triple Beat | CSO CTB | 67 65 82 | 70 67 85 | — — — | dBc dBc dBc |

1. Two laser test at 1310 nm/1550 nm. Each laser has 40% modulation index. Total received optical power is 2 dBm. Distortion products measured at 80 MHz, 450 MHz, 600 MHz, 745 MHz, and 850 MHz.

Outline Diagram

Dimensions are in inches and (millimeters).



Pin Information

Table 3. Pin Descriptions

| Pin No. | Description |
|---------|-------------|
| 1 | 15 V |
| 2 | 12 V |
| 3 | GND |
| 4 | RF Out |
| 5 | GND |
| 6 | PDI Monitor |
| 7 | GND |
| 8 | GND |
| 9 | GND |

Ordering Information

Table 4. Ordering Information*

| Device Code | Description | Comcode |
|-------------|--------------------------------------|-----------|
| 7810N060 | 7810A no connector, 0.60 m fiber | 108952698 |
| 7810N115 | 7810A no connector, 1.15 m fiber | 108952706 |
| 7810S060 | 7810A SC/APC connector, 0.60 m fiber | 108952714 |
| 7810S115 | 7810A SC/APC connector, 1.15 m fiber | 108952730 |
| 7810F060 | 7810A FC/APC connector, 0.60 m fiber | 108952664 |
| 7810F115 | 7810A FC/APC connector, 1.15 m fiber | 108952680 |

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

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