

7830W CATV Optical Receiver

3 GHz

emcore®

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CATV



Applications

- Data and Video Distribution
- FTTH

Features

- Wide 40 MHz – 3000 MHz Bandwidth Supports Analog Channels or a Combination of Analog and Digital Channels.
- Excellent RF Frequency and Distortion Characteristics for High Linearity.
- RoHS Compliant
- Internal Proprietary Impedance Match Circuitry (50Ω)
- Robust Small Package with Single-Mode Fiber Pigtail and Connector Options
- Wide Operating Case Temp Range, -40° to + 85°C

The 7830W CATV optical receiver is a single-mode fiber pigtailed 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 signals up to 3GHz.

The 7830W exhibits good distortion performance with values well above standards over the entire bandwidth with case temperature range from -40°C to +85°C.

Moreover, the proprietary impedance-match circuitry between the photodetector and RF amplification stages resolves a number of OEM design obstacles with very low noise performance value.

The 7830W CATV optical receiver can be used in both 1310 nm and 1550 nm applications being useful at different points of a given network.

The 7830W is compliant with all criteria of the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) guidelines 2002/95/EC.

Performance Highlights

Parameter	Limits
Frequency Range	40 – 3000 MHz
Response Flatness	2 dB pk-pk (typ)
IP3	25 dBm (typ)
Optical Input Power	Up to +8 dBm
Wavelength	1260 – 1620 nm
Power Consumption	0.4 W



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 Case Temperature Range	T _{CASE}	-30	85	°C
Storage Temperature Range	T _{stg}	-40	85	°C
Humidity at 85 °C	RH	--	85	%

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

Electrical/Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Optical Power	P _{IN}	--	--	+8	dBm
Optical Return Loss	RL _{OPT}	40	--	--	dB
DC Power					
+5V Amp Bias, (Pin 3)	I _{CCA}	--	--	80	mA
+12V PD Bias, (Pin 2)	I _{CCP}	--	--	3	mA
Wavelength	λ	1260	1310/1550	1620	nm
Responsivity	--	--	>0.80 at 1310 nm >0.90 at 1550 nm	--	mA/mW mA/mW
PDI Monitor Voltage	V _{MON}	--	0.5	--	V/mA
Dissipation	P _{DISS}	--	--	0.4	W

RF Characteristic

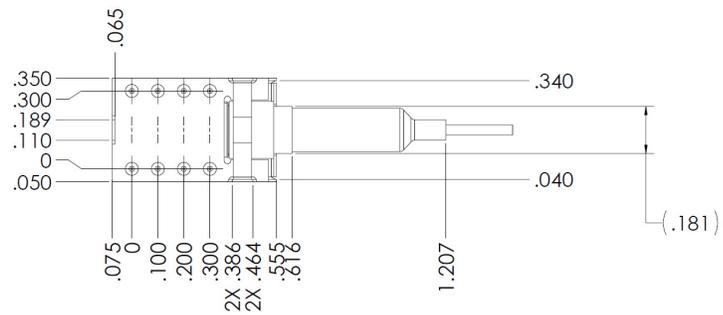
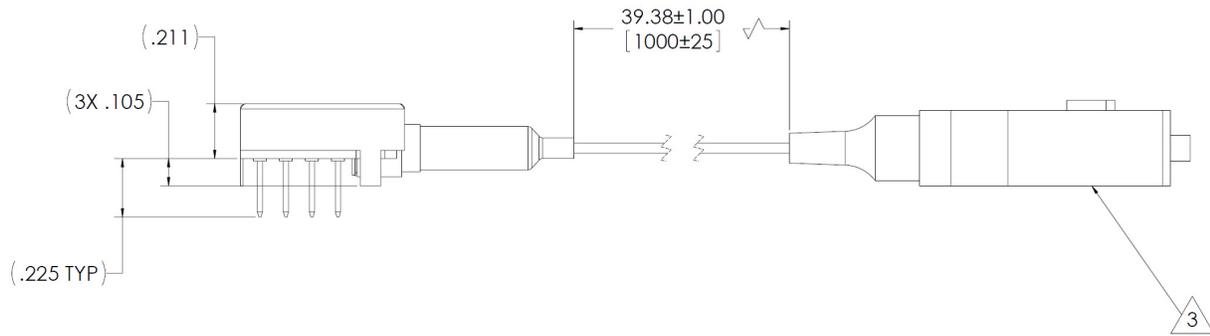
Parameter	Symbol	Min	Typ	Max	Unit
Frequency Response	BW	40	--	3000	MHz
Gain (Ref @ 40MHz)	G	12	--	15	dB
Gain Stability (-40°C to + 85°C)	G _{ST}	-0.75	--	+0.75	dB
Ripple (40 MHz – 3000 MHz)	--	--	2	3	dBpk-pk
Gain Tilt	--	-1.6	--	+1	dB
RF Output Level ⁽²⁾	RF _{OUT}	--	+34	--	dBmV/ch
Output Return Loss (40 – 1000 MHz)	RL	--	--	-14	dB
(1000 – 3000 MHz)	--	--	--	-10	
Equivalent Input Noise	EIN	--	--	8	pA/√Hz
Output IP3 @ 1.8 GHz	OIP3	+22	+25	--	dBm
Discrete Second-Order ⁽¹⁾	DSO	--	-53	-45	dBc
Discrete Third Order ^(1,3)	DTO	--	-85	-80	dBc

(1) Two laser test at 1310 nm/1550 nm. 40% OMI/tone. Total received optical power = 0 dBm. Distortion products measured at 80, 450, 600, 745 and 850 MHz.

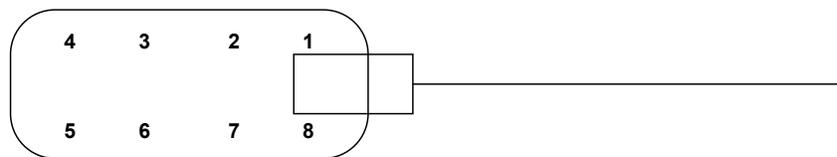
(2) Optical Input = 0 dBm, 79ch analog, OMI = 3.5%

(3) DTO may degrade to -77 dBc above 800 MHz

Outline Drawing (dimensions are in inches & mm)



Top View

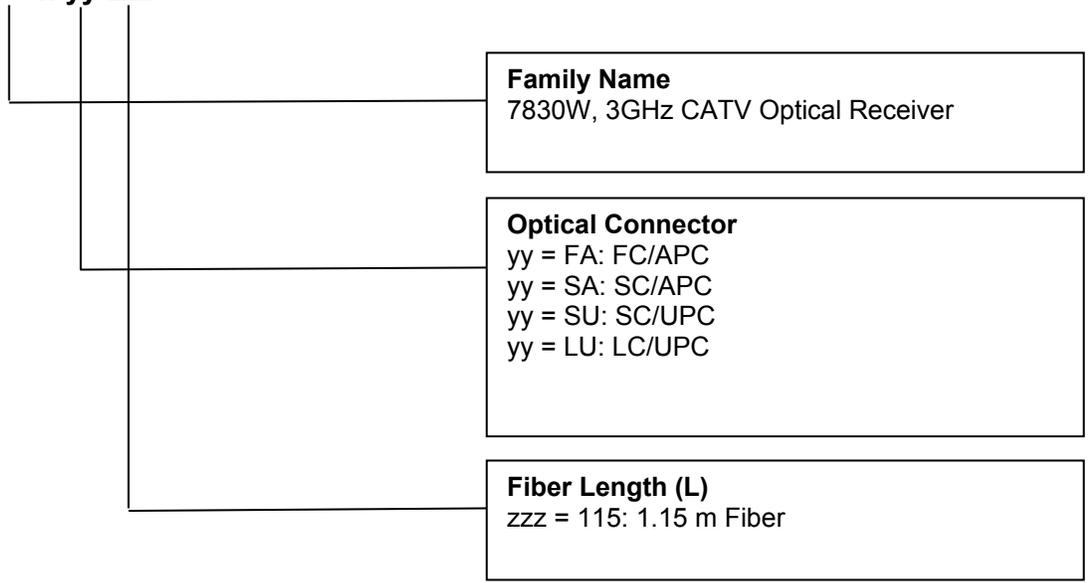


Pin Definitions

Pin	Function
1	GND
2	+12V
3	+5V
4	GND
5	GND
6	RF OUT
7	GND
8	PD MONITOR

Ordering Code Definitions

7830x-yy-zzz



Example:

7830W-SA-115: 3 GHz Video Receiver, SC/APC Connector, 1.15m Fiber