



### Applications

- Video Signal Distribution in HFC and FTTH nodes

### Features

- 5 MHz – 200 MHz Bandwidth Supports the Return Path CATV Application.
- Excellent RF Frequency and Distortion Characteristics for High Linearity.
- Low Noise (2 pA/√Hz typ.) Low Power Dissipation (0.85 W max.) as well as High RF Output.
- RoHS Compliant
- Internal Proprietary Impedance Match Circuitry (75Ω)
- Robust Small Package with Single-Mode Fiber Pigtail and Connector Options
- Wide Operating Case Temp Range, -30° to +85°C

The 7820C 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 in the 200 MHz HFC return path bandwidth.

The 7820C exhibits excellent distortion performance with values well above standards over the entire bandwidth and case temperature specifications (5 MHz – 200 MHz, -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, typically less than 2 pA/√Hz.

The 7820C Return Path HFC CATV optical receiver can be used in both 1310 nm and 1550 nm applications being useful at different points of a given network.

The 7820C 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	5 – 200 MHz
Noise	2 pA/√Hz (typ)
DTO	-70 dBc (typ)
DSO	-65 dBc (typ)
Optical Input Power	Up to +1dBm
Wavelength	1260 – 1620 nm
Power Consumption	0.85 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	$P_{IN}$	--	--	+1	dBm
Optical Return Loss	$RL_{OPT}$	40	--	--	dB
DC Power					
+5V Amp Bias, (Pin 2)	$I_{CCA}$	--	--	160	mA
+12V PD Bias, (Pin 6)	$I_{CCP}$	--	--	3	mA
Wavelength	$\lambda$	1260	1310/1550	1620	nm
Responsivity	--	--	>0.8 at 1310 nm >0.9 at 1550 nm	--	mA/mW mA/mW
PDI Monitor Voltage	$V_{MON}$	--	1.0	--	V/mA
Dissipation	$P_{DISS}$	--	--	0.85	W

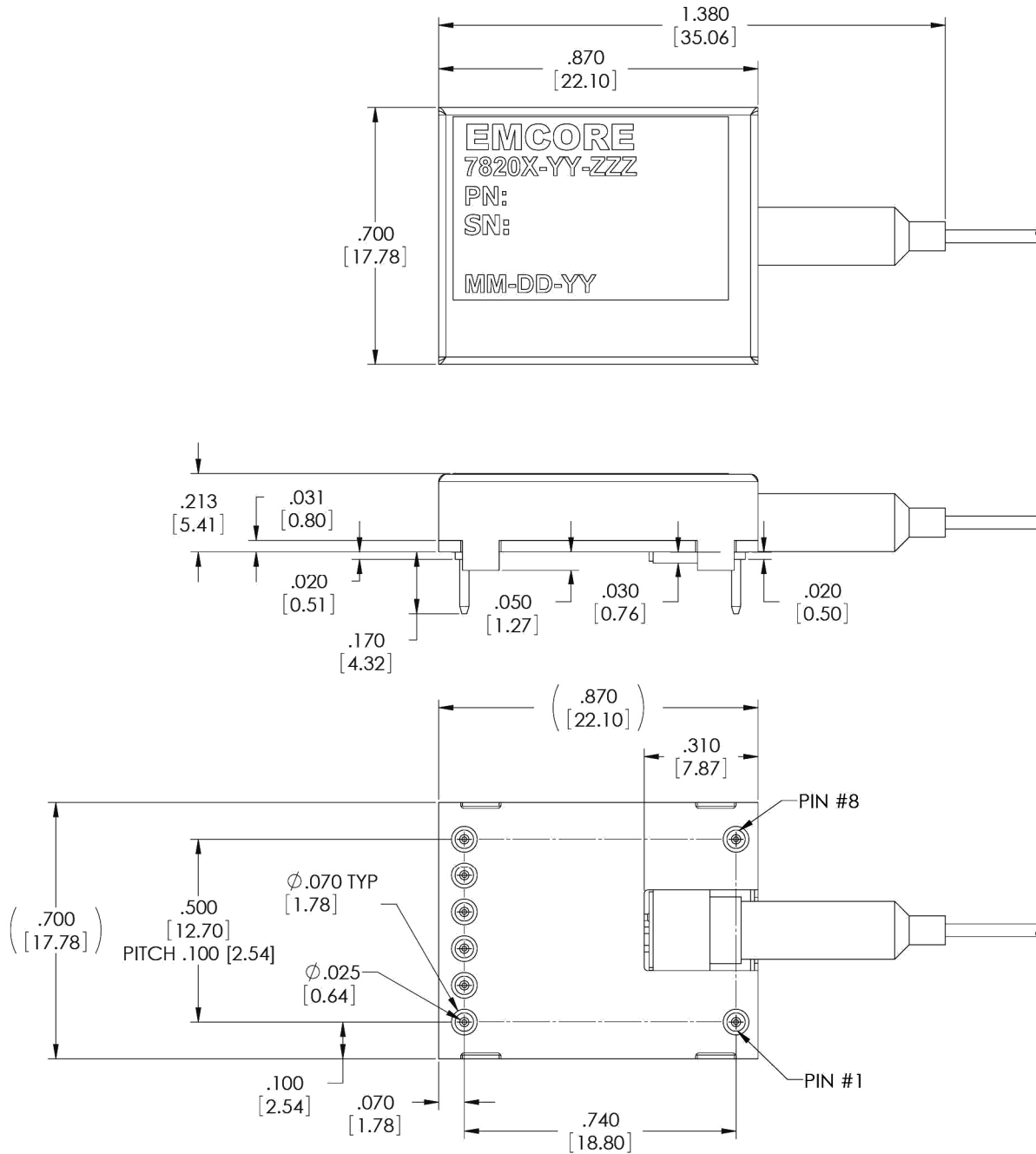
### RF Characteristic

Parameter	Symbol	Min	Typ	Max	Unit
Frequency Response	BW	5	--	200	MHz
Gain (Ref @ 40MHz)	G	28	--	30	dB
Gain Stability (-30°C to + 85°C)	$G_{ST}$	-0.5	--	+0.5	dB
Ripple (5-200MHz)	--	--	1	1.2	dBpk-pk
Gain Tilt	--	--	0	1	dB
RF Output Level <sup>(2)</sup>	$RF_{OUT}$	47	--	49	dBmV/ch
Output Return Loss (5-200 MHz)	RL	--	--	-16	dB
Equivalent Input Noise	EIN	--	--	2	pA/√Hz
Discrete Second-Order <sup>(1)</sup>	DSO	--	-65	-55	dBc
Discrete Third Order <sup>(1,2)</sup>	DTO	--	-70	-60	dBc

(1) Two laser test at 1310 nm/1550 nm. 40% OMI/tone. Total received optical power = 0 dBm. Distortion products measured at 40 and 200 MHz.

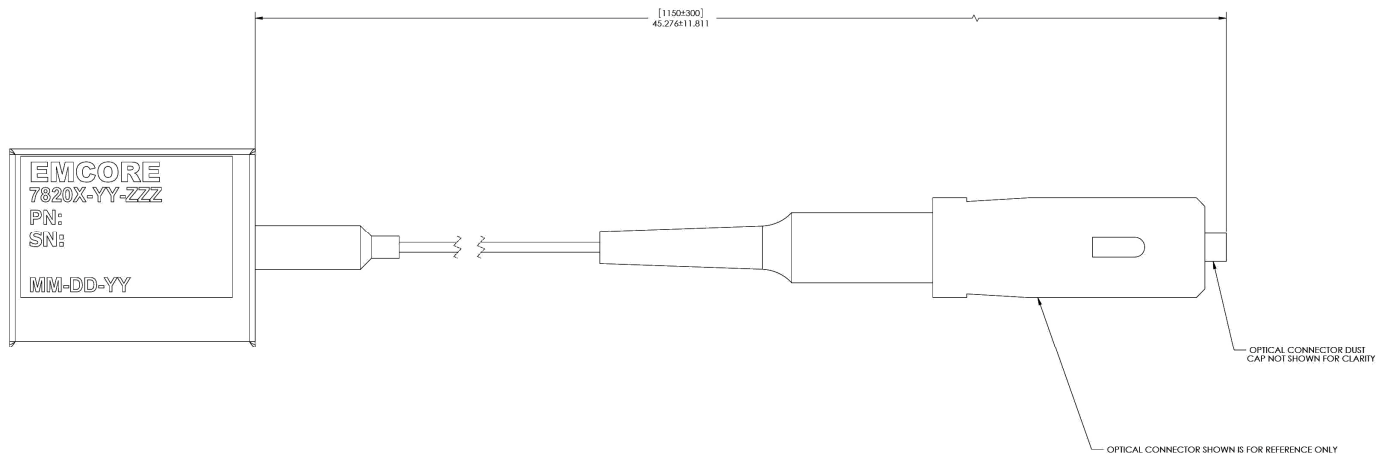
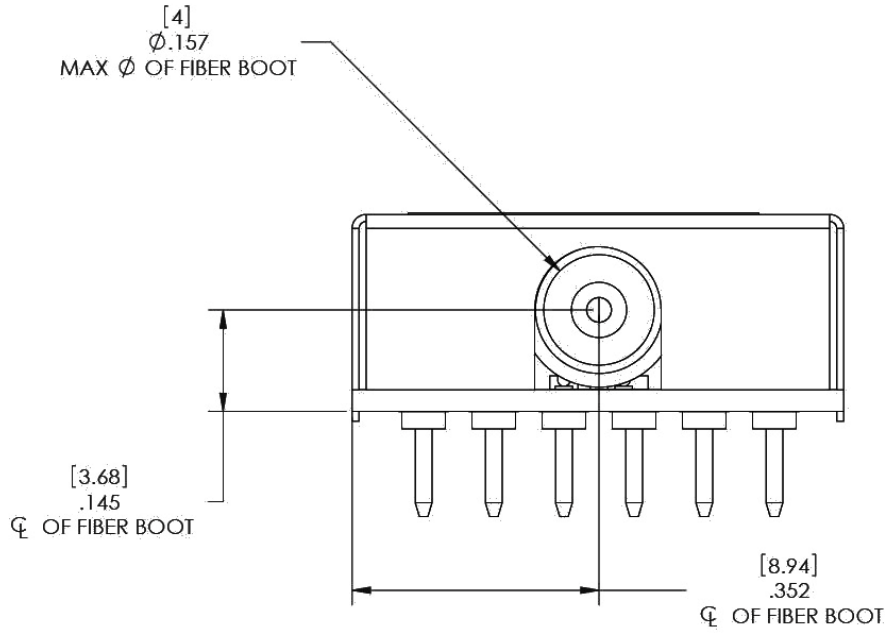
(2) Optical Input = 0 dBm, OMI = 20%

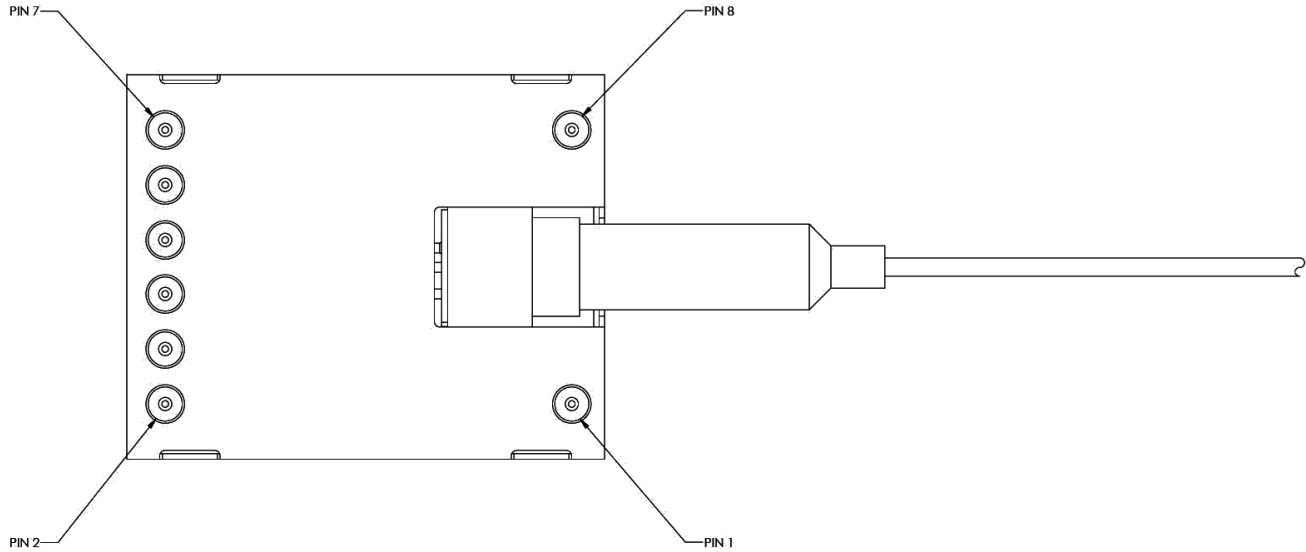
**Outline Drawing (dimensions are in inches & mm)**



# 7820C CATV Optical Receiver

200 MHz HFC Return Path



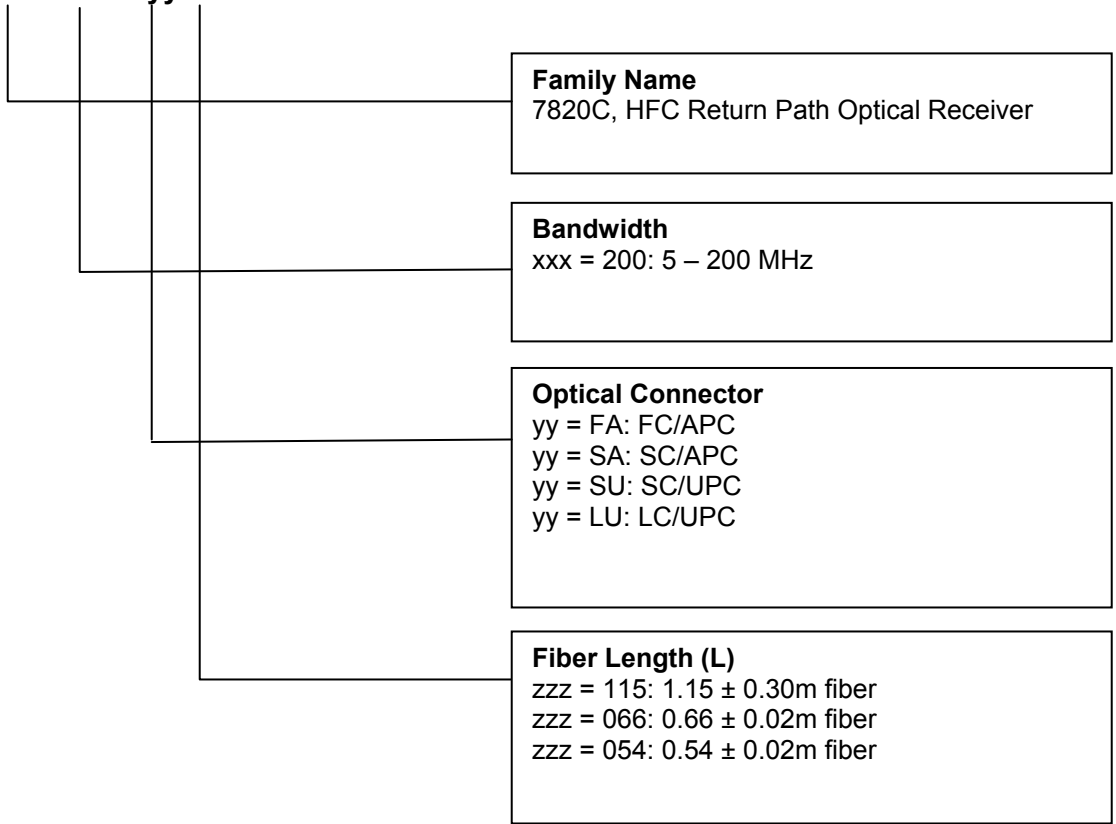


### Pin Definitions

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

### Ordering Code Definitions

#### 7820c-xxx-yy-zzz



#### Example:

**7820C-200-SA-115:** 200 MHz Return Path HFC Receiver, SC/APC, 1.15m Fiber