

## 2651A/2651E Broadband Photodiode



The 2651 provides the proven high performance of Emcore's photodiode technology in a very practical, cost-effective package. The 2651A features high linearity and low capacitance over a 1 GHz bandwidth. The extended bandwidth 2651E offers high linearity and low capacitance up to 3 GHz. These broadband photodiodes are housed in a small, environmentally rugged coaxial package.

The 2651 broadband photodetector is designed to provide the performance and flexibility needed to meet the expanding applications of two-way communications networks. This photodiode is used today in forward-and return-path applications, including AM-VSB CATV, QAM 64/256, PON, FTTC and FTTH receivers.

The 2651A and 2651E photodiodes are compliant with all criteria of the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) guidelines 2002/95/EC.

### Applications

- Forward-path and return-path broadband video transport
- FTTx receivers
- EDFA and network monitors

### Features

- Low cost package
- Low capacitance,  $\leq 0.4$  pF
- Low dark current,  $\leq 50$  nA at  $+85^\circ\text{C}$
- 1 GHz flat response,  $\pm 0.5$  dB
- Extended bandwidth option
- High responsivity
  - $\geq 0.90$  A/W at 1310 nm, typ.
  - $\geq 0.98$  A/W at 1550 nm, typ.
- RoHS compliant

### Performance Highlights

	Min	Typ	Max	Units
Operating Case Temperature	-40	25	+85	$^\circ\text{C}$
Wavelength	1100	-	1600	nm
Responsivity, 1310 nm	-	0.90	-	A/W
1550 nm	-	0.98	-	
Dark Current, $25^\circ\text{C}$	-	-	5	nA
$85^\circ\text{C}$	-	-	50	
Capacitance	-	0.35	0.4	pF
Bandwidth, 2651A	-	-	1000	MHz
2651E	-	-	3000	
Gain Flatness, $< 1$ GHz	-	-	1.0	$\text{dB}_{\text{p-p}}$
Gain Up-Tilt, 2651E, 1 GHz to 3 GHz	2	-	4	dB
DSO, 2651A/E, $< 1$ GHz	-	-	-75	dBc
2651E, 1 GHz – 3 GHz	-	-	-65	
DTB, 2651A/E, $< 1$ GHz	-	-	-85	dBc
2651E, 1 GHz – 3 GHz	-	-	-75	
Bias Voltage	10	12	15	V

See following pages for complete specifications and operating conditions.



**For more information on this and other products:**

Contact Sales at Emcore 626-293-3400, or visit [www.emcore.com](http://www.emcore.com).

### 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	$T_{op}$	-40	85	°C
Storage Temperature Range	$T_{stg}$	-40	85	°C
Input Power Saturation	$P_{IN}$	-	10	mW
Reverse Voltage	$V_R$	-	30	V
Forward Current	$I_F$	-	10	mA

### DC/Optical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Wavelength	-	1100	-	1600	nm
Responsivity	1310 nm	0.85	0.90	-	A/W
	1550 nm	0.95	0.98	-	
Dark Current	25°C	-	-	5	nA
	85°C	-	-	50	
Capacitance	-	-	0.35	0.4	pF
Optical Return Loss	-	-	-	-40	dB
Bias Voltage	-	10	12	15	V
Fiber Buffer	-	-	900	-	μm
Fiber Core / Cladding	-	-	9/125	-	μm

### RF Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range <sup>1</sup>	2651A	-	-	1000	MHz
	2651E	-	-	3000	
Frequency Response <sup>1</sup>	2651A/E, peak-to-valley, < 1 GHz	-	-	1	dB
Frequency Response <sup>1</sup>	2651E up-tilt gain <sup>2</sup>	2	-	4	dB
DSO <sup>1,3</sup>	2651A/E, 1310 nm, two tone test	-	-	-75	dBc
	2651E, 1310 nm, two tone test <sup>4</sup>	-	-	-65	
DTB <sup>1,3</sup>	2651A/E, 1310 nm, two tone test	-	-	-85	dBc
	2651E, 1310 nm, two tone test <sup>4</sup>	-	-	-75	

1. Characterized with resistive load of 75Ω.

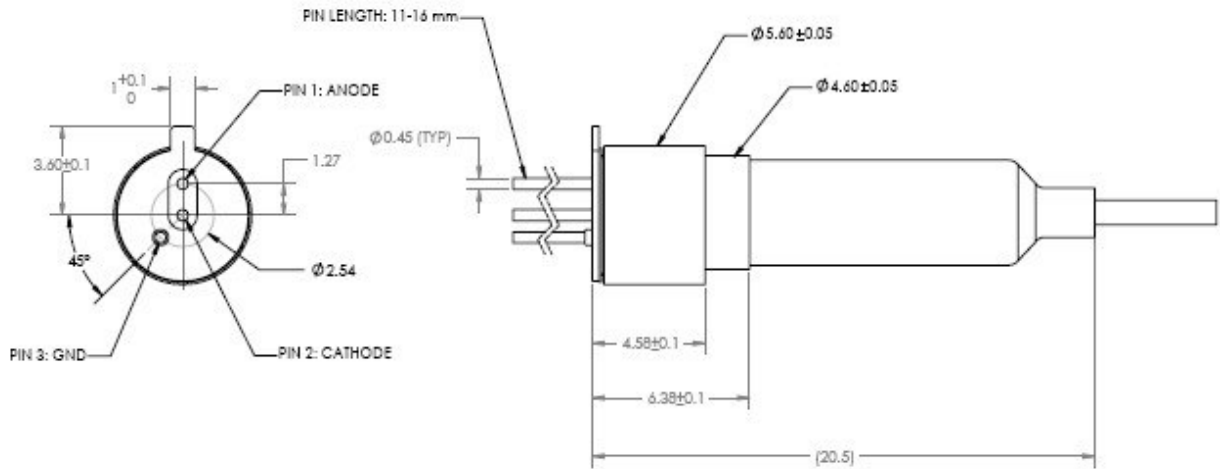
2. 1 GHz to 3 GHz.

3. Each test laser has 40% OMI. Distortion products are measured at 81, 449, 600, 850. Optical  $P_{in}$  = 0 dBm.  $V_{pd}$  = 12V.

4. Additional test frequencies of 1500, 2000, and 2500 MHz.

**Outline Drawing**

Dimensions are in mm.

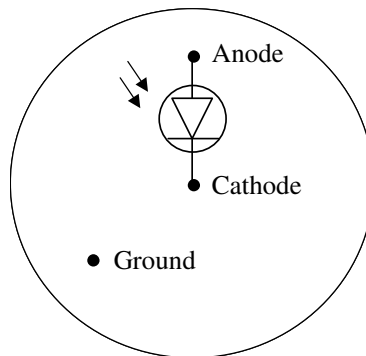


NOTES:  
1. UNIT: mm

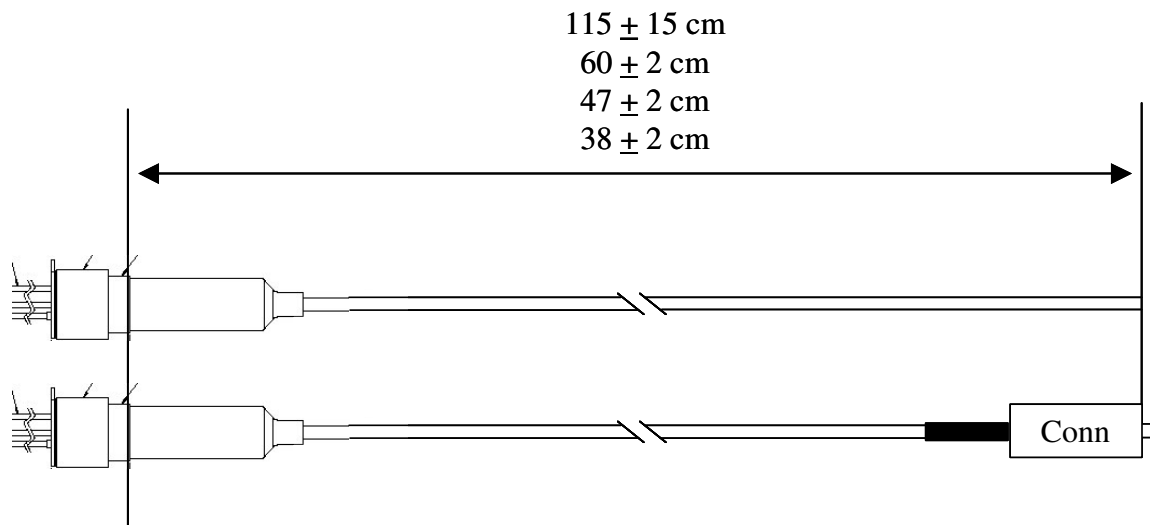
**Pinout**

Pin	Description
1	Anode
2	Cathode
3	Ground

**Block Diagram**

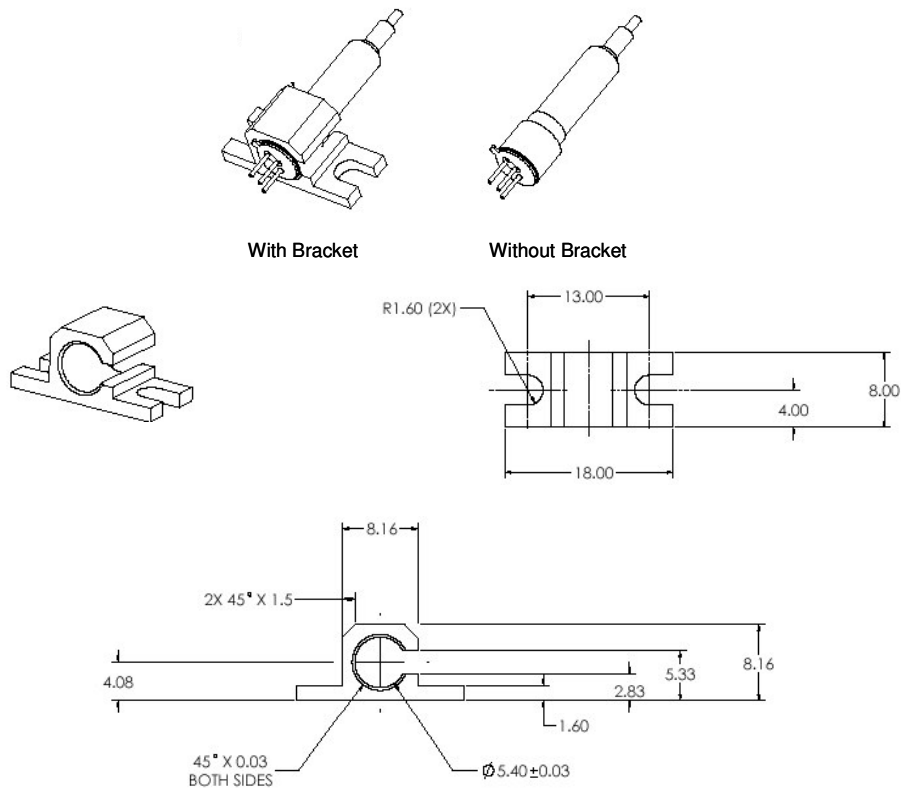


Fiber Length



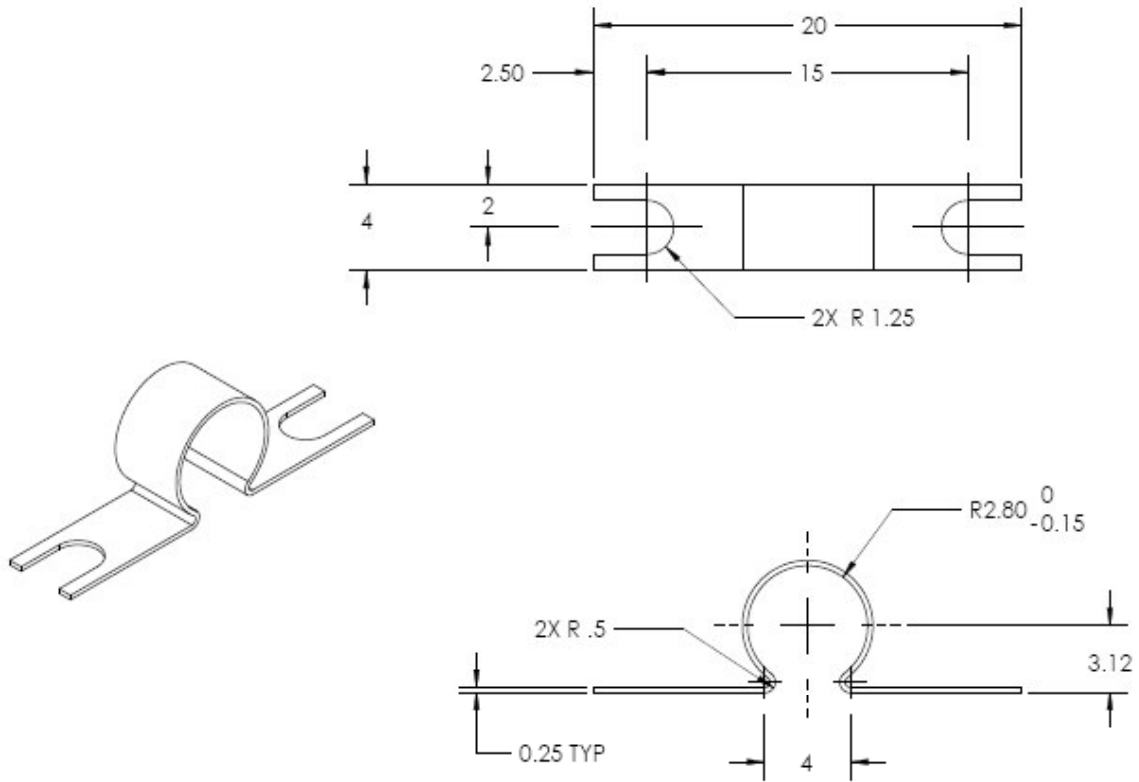
Plastic Mounting Bracket

Dimensions are in mm.



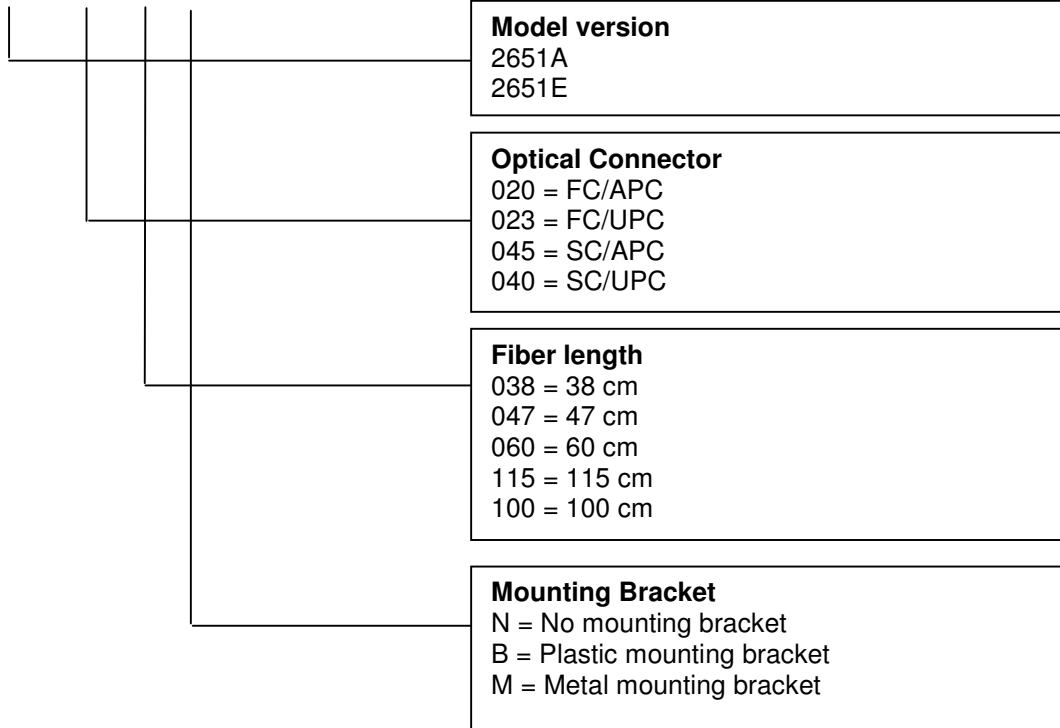
### Metal Mounting Bracket

Dimensions are in mm.



Ordering Information – Model Number Options

2651A-045-115-N



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