

## Regular InGaAs Photodiodes IG17-Series

### Description

The IG17-series is a panchromatic PIN photodiode with a nominal cut-off wavelength at 1.7  $\mu\text{m}$ . This series has been designed for demanding spectroscopic and radiometric applications. It offers excellent shunt resistance in combination with superior responsivity over a wide spectral range.

### Features

- 50 % cut-off wavelength > 1.65  $\mu\text{m}$
- Typical peak responsivity: 1.05 A/W
- Excellent temperature stability
- Reduced edge effect



### Applications

- Spectrophotometry
- Diode laser monitoring
- Non-contact temperature measurement
- Flame control
- Moisture monitoring

### Versions

- Uncooled:  
TO-can, SMD, chip only
- Cooled:  
TE1, TE2

Optical Characteristics, Specifications @ 25 °C <sup>c</sup>

Part Number	Diameter [μm]	50% Cut off Wavelength <sup>a</sup> [μm]	Peak Wavelength <sup>a</sup> [μm]	Peak Responsivity <sup>a,b</sup> [A/W]		Responsivity @ 520 nm <sup>a,b,d</sup> [A/W]		Responsivity @ 1300 nm <sup>a,b</sup> [A/W]		Responsivity @ 1500 nm <sup>a,b</sup> [A/W]	
			Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
IG17X080S4i	80	≥1.65 ± 0.1	1.55	0.9	1.05	TBD	0.1	0.77	0.91	0.8	1.0
IG17X250S4i	250										
IG17X500S4i	500										
IG17X1000S4i	1000										
IG17X1300S4i	1300										
IG17X2000G1i	2000										
IG17X3000G1i	3000										

<sup>a</sup> Parameter tested on batch level at T = 25°C.

<sup>b</sup> Responsivity measured at 0 V Bias.

<sup>c</sup> Data are prior to window integration

<sup>d</sup> Preliminary data

## Electro-Optical Characteristics, Specifications @ 25 °C

Part Number	Diameter [μm]	Shunt Impedance @ V <sub>R</sub> = 10 mV <sup>b</sup> [MΩ]		Dark Current @ V <sub>R</sub> = 5 V <sup>b</sup> [nA]		Peak D* <sup>a</sup> f = 1 kHz [cm Hz <sup>1/2</sup> /W]		Peak NEP <sup>a</sup> f = 1 kHz [W/Hz <sup>1/2</sup> ]	
		Min.	Typ.	Typ.	Max.	Min.	Typ.	Max.	Typ.
IG17X080S4i	80	400	1000	0.1	0.5	3.4 E+12	-	7.0 E-15	-
IG17X250S4i	250	200	830	0.1	1	5.0 E+12	1.0 E+13	1.0 E-14	5.0 E-15
IG17X500S4i	500	60	200	0.3	2	3.8 E+12	7.0 E+12	1.8 E-14	1.0 E-14
IG17X1000S4i	1000	20	100	1	8	3.1 E+12	7.0 E+12	3.2 E-14	1.4 E-14
IG17X1300S4i	1300	10	45	2	20	2.5 E+12	5.3 E+12	4.5 E-14	2.1 E-14
IG17X2000G1i	2000	6	20	3	30	2.4 E+12	4.4 E+12	5.8 E-14	3.2 E-14
IG17X3000G1i	3000	4	12	10	75	2.4 E+12	4.2 E+12	7.1 E-14	4.1 E-14

<sup>a</sup> Parameter tested on batch level

<sup>b</sup> Parameter 100% tested

## Electrical Characteristics, Specifications @ 25 °C

Part Number	Diameter [ $\mu\text{m}$ ]	Capacitance @ $V_R = 0 \text{ V}^a$ [pF]	Forward Voltage [V]
		Typ.	Typ.
IG17X080S4i	80	7	0.73
IG17X250S4i	250	15	
IG17X500S4i	500	60	
IG17X1000S4i	1000	215	
IG17X1300S4i	1300	305	
IG17X2000G1i	2000	700	
IG17X3000G1i	3000	1550	

## Thermoelectrically Cooled InGaAs Detectors

Part Number	Diameter [ $\mu\text{m}$ ]	Operating Temperature [°C]	Shunt Impedance @ $V_R = 10 \text{ mV}^b$ [MOhm]		Peak $D^*^a$ [ $\text{cm Hz}^{1/2}/\text{W}$ ]	Peak NEP <sup>a</sup> [ $\text{W}/\text{Hz}^{1/2}$ ]	Capacitance @ $V_R = 0 \text{ V}^a$ [pF]
			Min.	Typ.	Typ.	Typ.	Typ.
IG17X1000T7	1000	-10	100	500	1.6E+13	6.4E-15	215
IG17X1300T7	1300		50	250	1.2E+13	9.5E-15	305
IG17X2000T7	2000		30	100	9.9E+12	1.4E-14	700
IG17X3000T7	3000		20	60	9.4E+12	1.8E-14	1550
IG17X1000T9	1000	-20	200	1000	2.2E+13	4.5E-15	215
IG17X1300T9	1300		100	450	1.7E+13	6.7E-15	305
IG17X2000T9	2000		60	200	1.4E+13	1.0E-14	700
IG17X3000T9	3000		40	120	1.3E+13	1.3E-14	1550

<sup>a</sup> Parameter tested on batch level

<sup>b</sup> Parameter 100% tested

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## Absolute Maximum Ratings

	Min.	Max.
Storage temperature [°C]	-55	+125
Operating temperature [°C]	-40	+85
Reverse bias, cw [V]	-	10
Forward current, cw [mA]	-	1
Soldering temperature, 5 sec. [°C]	-	260
ESD damage threshold, human body model class 1A*, [V]	250	<500
TE cooler voltage [V]		
T7	-	0.8
T9	-	3.7
TE cooler current [A]		
T7	-	1.9
T9	-	1.2

\*ANSI/ ESD STN5. 1-2007  
Valid with sufficient heat sinking only.

## ESD sensitive device.

High electrostatic discharge can damage or degrade the device.  
Use proper ESD handling precautions.



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Fig. 1: Spectral Response

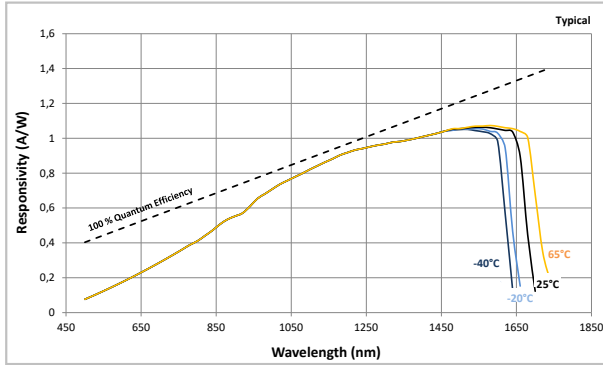


Fig. 2: Dark Current vs. Reverse Voltage

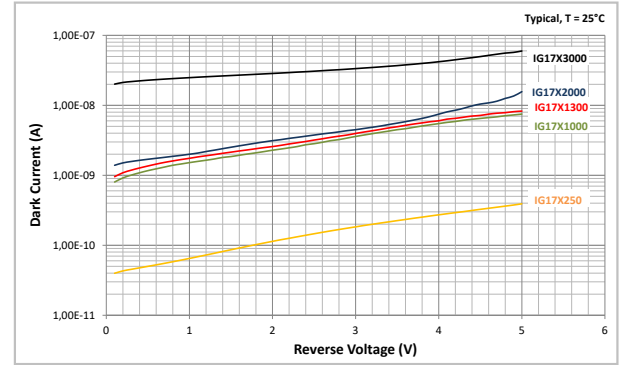


Fig. 3: Shunt Resistance vs. Temperature

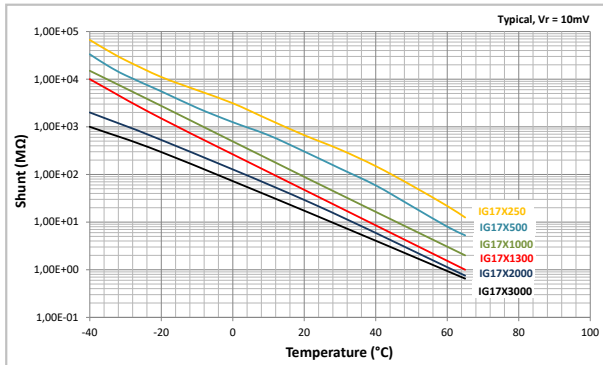


Fig. 4: Detectivity vs. Shunt x Area

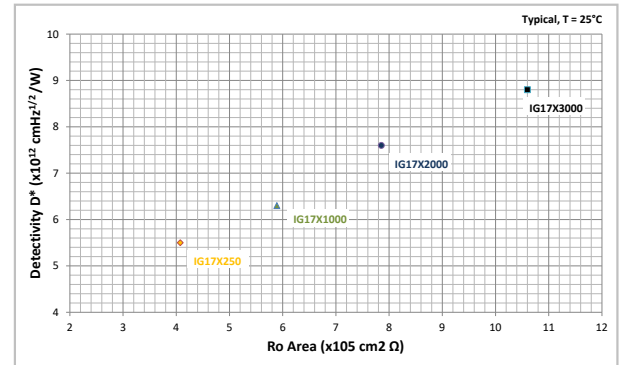


Fig. 5: Capacitance vs. Reverse Voltage

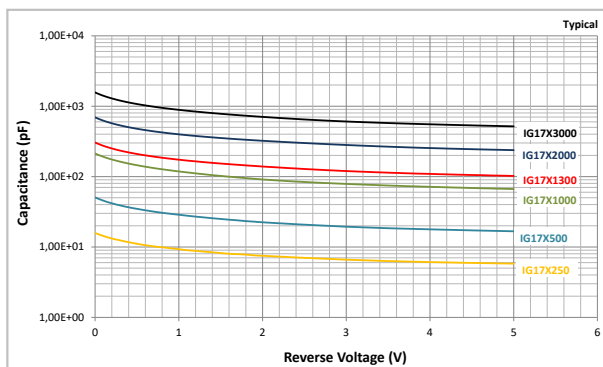


Fig. 6: Sample Pulse Response

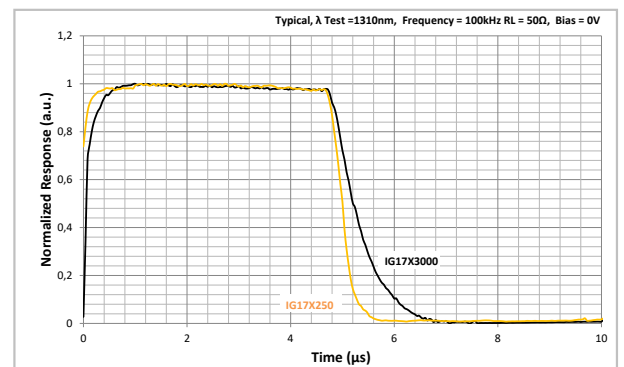


Fig. 7: Responsivity Temperature Coefficient I

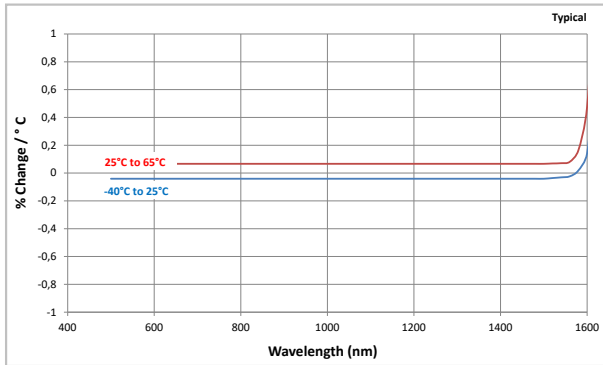


Fig. 8: Responsivity Temperature Coefficient II

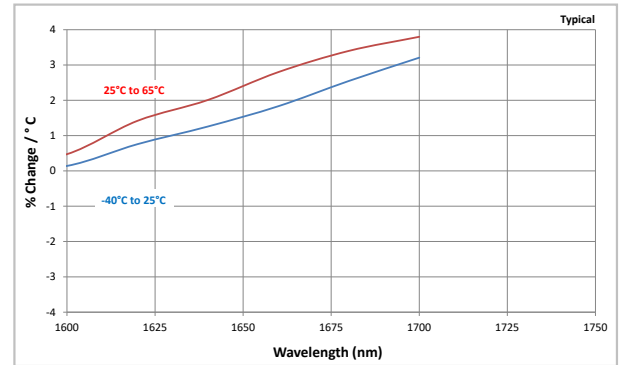
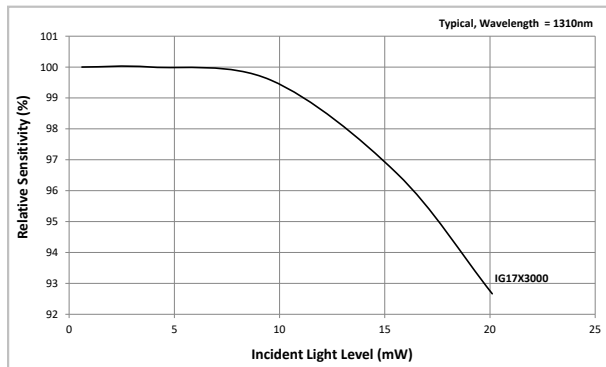


Fig. 9: Linearity



### Nomenclature

<b>C-</b>	<b>I</b>	<b>G</b>	<b>1</b>	<b>7</b>	<b>X</b>		<b>2</b>	<b>5</b>	<b>0</b>	<b>S</b>	<b>4</b>	<b>i</b>	
Chip only	Type					Diameter				Package Style			
	Regular InGaAs PIN Photodiode					080 = 80 µm				S4i - TO-46, isolated			
						250 = 250 µm				S4ix - TO-46, no window			
						500 = 500 µm				G1i - TO-39, isolated			
						1000 = 1 mm				G1ix - TO-39, no window			
						1300 = 1.3 mm				T7 - TO-37, single stage TEC			
						2000 = 2 mm				T9 - TO-66, dual stage TEC			
						3000 = 3 mm				M2 - 2 pad PCB SMD			
										L5 - TO-46 lens cap			

**Note:**

M2 package is high volume option for chip sizes up to 1 mm.  
Please contact factory for availability.

Standard window: Borosilicate glass

Package drawings, TEC and thermistor curves can be found on a separate datasheet.

### Product Changes

LASER COMPONENTS reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed as a result of their use or application.

### Ordering Information

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