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## 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, TE3



# Regular InGaAs Photodiodes IG17-Series

## 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.	Min.
IG17X250S4i	250	≥1.65 ± 0.1	1.55	0.9	1.05	TBD	0.1	0.77	0.91	0.8	1.0	
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.
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

## Regular InGaAs Photodiodes IG17-Series

### Electrical Characteristics, Specifications @ 25 °C

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

### Thermoelectrically Cooled InGaAs Detectors

Part Number	Diameter [μm]	Operating Temperature [°C]	Shunt Impedance @ $V_R = 10\text{ mV}^b$ [MΩ]		Peak $D^*^a$ [cm Hz <sup>1/2</sup> /W]	Peak NEP <sup>a</sup> [W/Hz <sup>1/2</sup> ]	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

# Regular InGaAs Photodiodes IG17-Series

## 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.

# Regular InGaAs Photodiodes IG17-Series

Fig. 1: Spectral Response

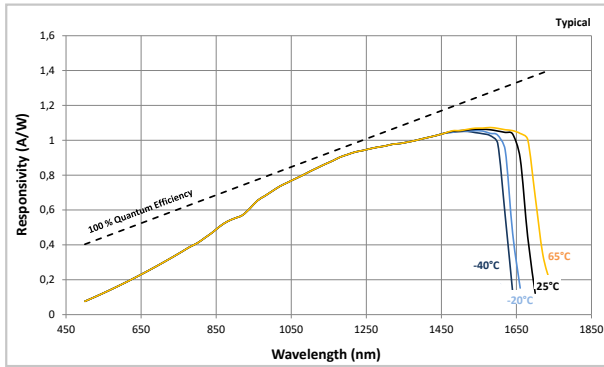


Fig. 2: Dark Current vs. Reverse Voltage

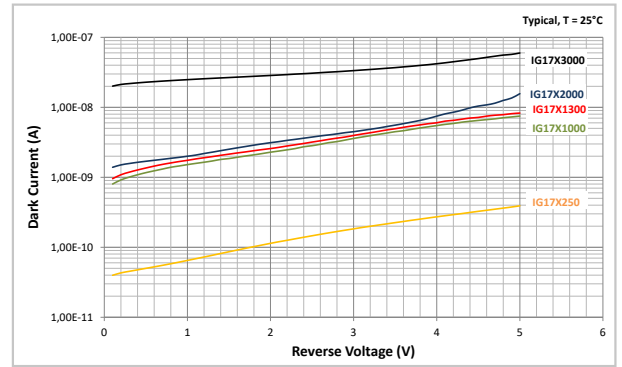


Fig. 3: Shunt Resistance vs. Temperature

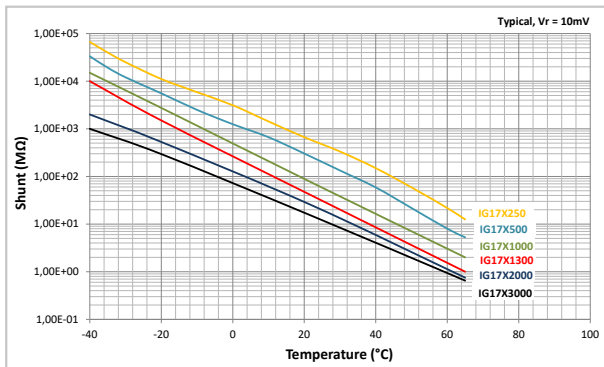


Fig. 4: Detectivity vs. Shunt x Area

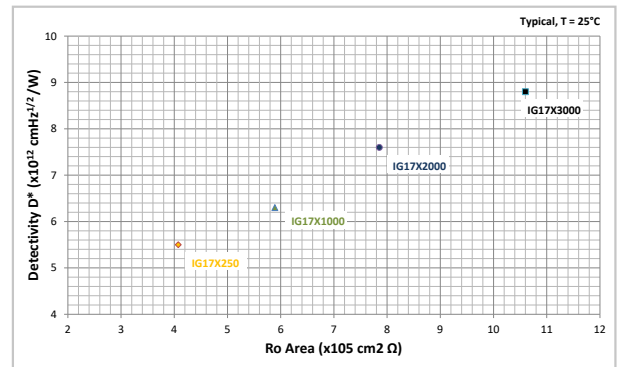


Fig. 5: Capacitance vs. Reverse Voltage

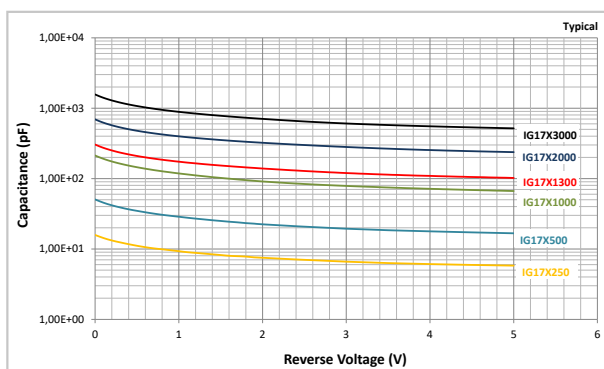
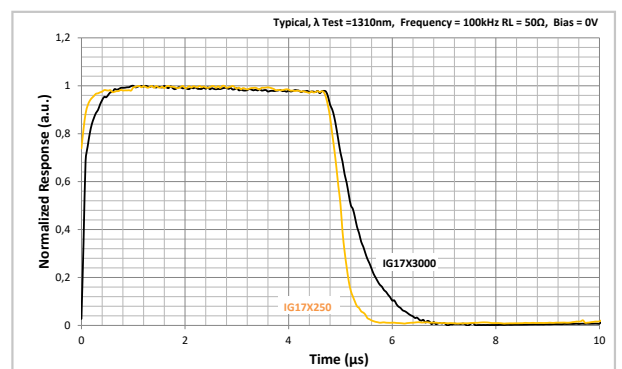


Fig. 6: Sample Pulse Response



# Regular InGaAs Photodiodes IG17-Series

Fig. 7: Responsivity Temperature Coefficient I

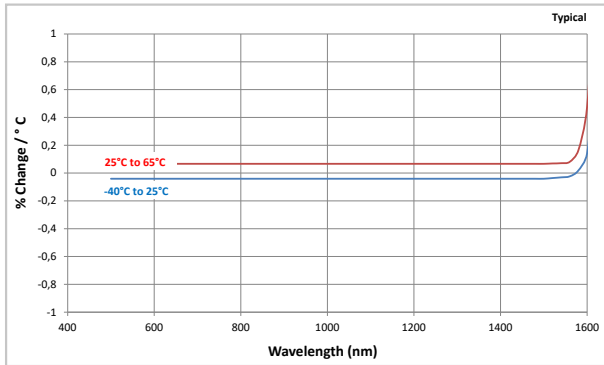


Fig. 8: Responsivity Temperature Coefficient II

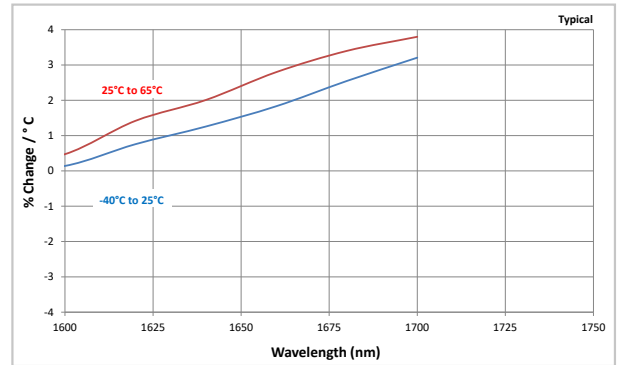
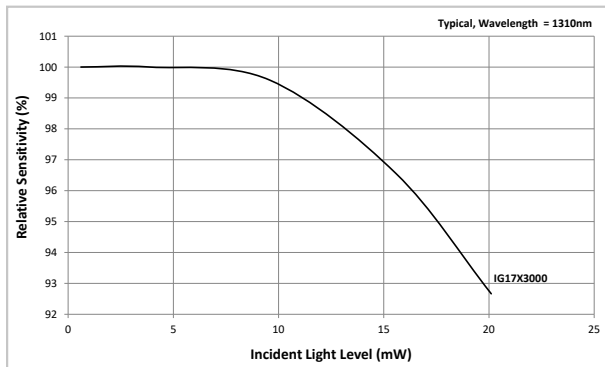


Fig. 9: Linearity



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