

Regular InGaAs Photodiodes IG17-Series

Description

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

Features

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

Applications

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

Versions

- Uncooled
TO-can, SMD, chip only, ceramic substrate, digital module
- Cooled
TE1, TE2, TE3



Optical Characteristics, Specifications @ 25°C ^c

Part Number	Diameter [μm]	50% Cut off Wavelength ^a [μm]	Peak Wave- length ^a [μm]	Peak Responsivity ^{a,b} [A/W]		Responsivity @ 520 nm ^{a,b,d} [A/W]		Responsivity @ 1300 nm ^{a,b} [A/W]		Responsivity @ 1500 nm ^{a,b} [A/W]	
				Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
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										

^a Parameter tested on batch level at T = 25°C.^b Responsivity measured at 0 V Bias.^c Data are prior to window integration^d Preliminary data

Electro-Optical Characteristics, Specifications @ 25°C

Part Number	Diameter [μm]	Shunt Impedance @ V _R = 10 mV ^b [MΩ]		Dark Current @ V _R = 5 V ^b [nA]		Peak D* ^a f = 1 kHz [cm Hz ^{1/2} /W]		Peak NEP ^a f = 1 kHz [W/Hz ^{1/2}]	
		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

^a Parameter tested on batch level^b Parameter 100% tested

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 ^{1/2} /W]	Peak NEP ^a [W/Hz ^{1/2}]	Capacitance @ $V_R = 0\text{ V}^a$ [pF]
			Min.	Typ.	Typ.	Typ.	Typ.
IG17X1000T7	1000	-20	750	2750	4.1E+13	2.1E-15	215
IG17X1300T7	1300		360	1500	4.0E+13	2.9E-15	305
IG17X2000T7	2000		180	530	3.6E+13	4.9E-15	700
IG17X3000T7	3000		65	295	4.1E+13	6.6E-15	1550
IG17X1000T9	1000	-40	5000	19000	1.1E+14	7.9E-16	215
IG17X1300T9	1300		2000	10000	1.1E+13	1.1E-15	305
IG17X2000T9	2000		1100	4000	1.0E+13	1.7E-15	700
IG17X3000T9	3000		200	400	4.9E+13	5.5E-15	1550

^a Parameter tested on batch level^b Parameter 100% tested

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

Fig. 1: Spectral Response

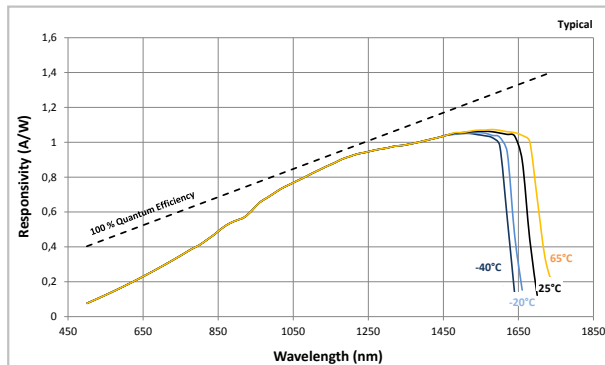


Fig. 2: Dark Current vs. Reverse Voltage

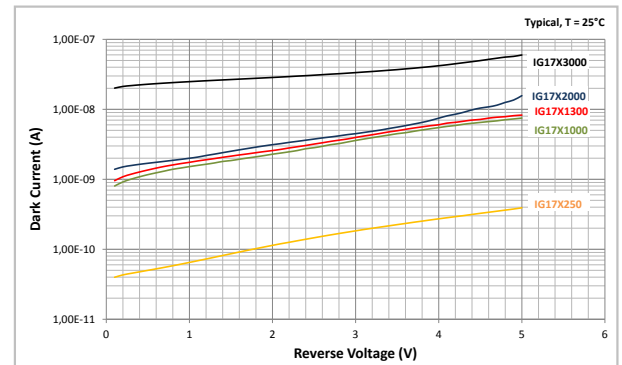


Fig. 3: Shunt vs. Temperature

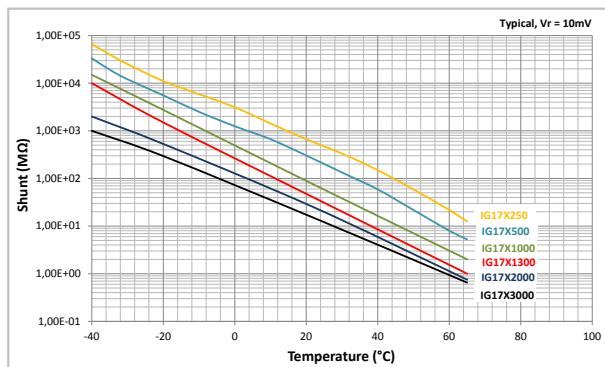


Fig. 4: Detectivity vs. Shunt x Area

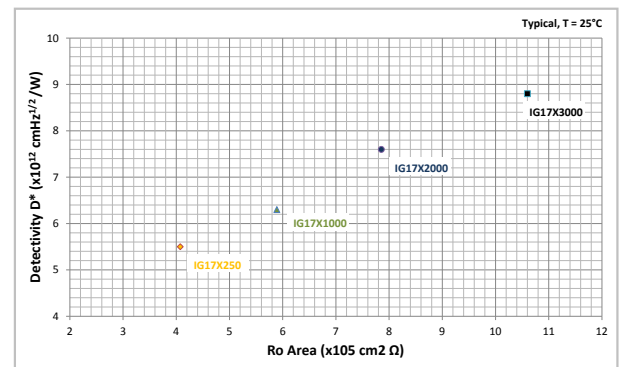


Fig. 5: Capacitance vs. Reverse Voltage

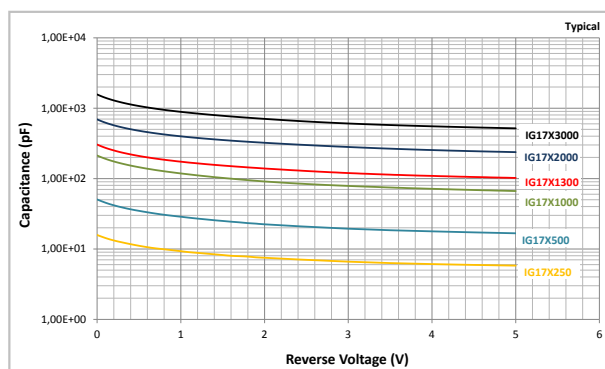


Fig. 6: Responsivity Temperature Coefficient I

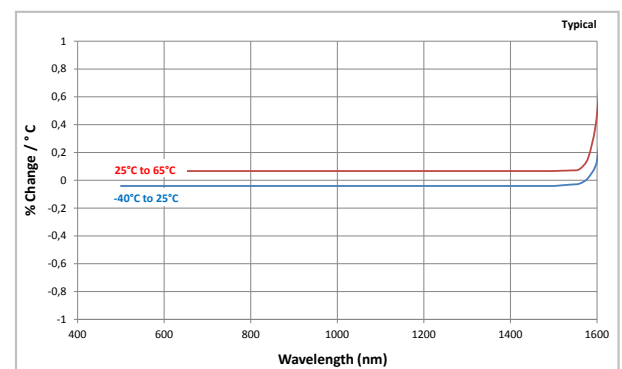


Fig. 7: Responsivity Temperature Coefficient II

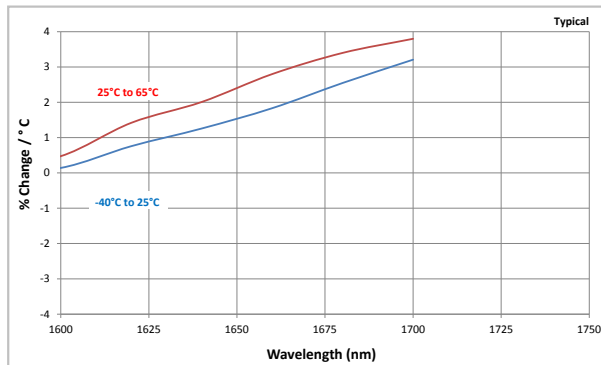


Fig. 8: Sample Pulse Response

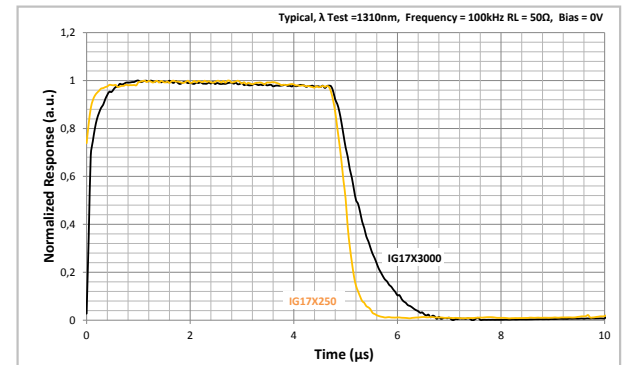
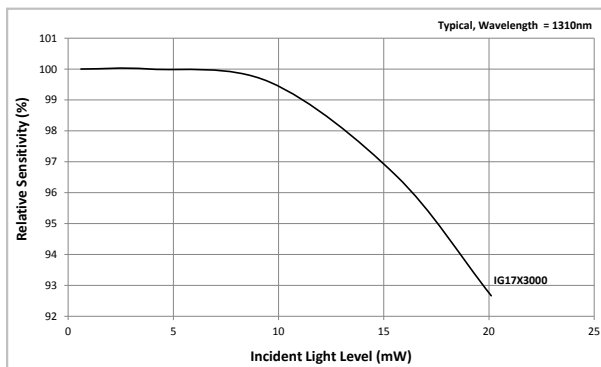


Fig. 9: Linearity



Nomenclature

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

Products can be ordered directly from LASER COMPONENTS or its representatives. For a complete listing of representatives, visit our website at www.lasercomponents.com