Extended InGaAs Photodiodes IG22-Series

Description

The IG22-series is a panchromatic PIN photodiode with a nominal cut-off wavelength at 2.2 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 spectal range.

Features

- 50% cut-off wavelength: > 2.15 µm
- Typical peak responsivity: 1.40 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, chip only
- Cooled:
  TE1, TE2, TE3

Optical Characteristics, Specifications @ 25 °C [c]

Part Number	Diameter [µm]	50% Cut off Wavelength [a] [µm]	Peak Wavelength [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]	
			Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
IG22X250S4i	250	≥ 2.15	1.95 ± 0.1	1.15	1.40	TBD	0.1	0.74	0.92	0.87	1.09
IG22X500S4i	500										
IG22X1000S4i	1000										
IG22X1300S4i	1300										
IG22X2000G1i	2000										
IG22X3000G1i	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] [kOhm]		Dark Current @ V_R = 0.25 V [b] [µA]		Peak D* [a] f = 1 kHz [cm Hz ½/W]		Peak NEP [a] f = 1 kHz [W/Hz ½]	
		Min.	Typ.	Typ.	Max.	Min.	Typ.	Max.	Typ.
IG22X250S4i	250	500	1000	0.05	0.5	3.1 E+11	4.5 E+11	1.6 E-13	1.1 E-13
IG22X500S4i	500	200	600	0.1	1	2.8 E+11	4.9 E+11	2.5 E-13	1.4 E-13
IG22X1000S4i	1000	60	300	0.2	2.5	2.2 E+11	4.9 E+11	4.6 E-13	2.0 E-13
IG22X1300S4i	1300	25	150	0.5	5	1.6 E+11	4.0 E+11	7.1 E-13	2.9 E-13
IG22X2000G1i	2000	12	40	1	10	1.3 E+11	2.5 E+11	1.0 E-12	5.6 E-13
IG22X3000G1i	3000	4	12	5	50	9.8 E+10	1.7 E+11	1.8 E-12	1.0 E-12

Electrical Characteristics, Specifications @ 25 °C

Part Number	Diameter [µm]	Capacitance @ V_R= 0 V[a] [pF]	Forward Voltage [V]
		Typ.	Typ.
IG22X250S4i	250	40	0.56
IG22X500S4i	500	160	
IG22X1000S4i	1000	650	
IG22X1300S4i	1300	1100	
IG22X2000G1i	2000	1750	
IG22X3000G1i	3000	5200	

[a] Parameter tested on batch level
[b] Parameter 100% tested

Thermoelectrically Cooled InGaAs Detectors

Part Number	Diameter [µm]	Operating Temperature [°C]	Shunt Impedance @ V_R= 10 mV[b] [kOhm]		Peak D* [a] [cm Hz½/W]	Peak NEP[a] [W/Hz½]	Capacitance @ V_R= 0 V[a] [pF]
			Min.	Typ.	Typ.	Typ.	Typ.
IG22X250T7	250	-10	2500	5000	1.0E+12	5.0E-14	40
IG22X1000T7	1000		300	1500	1.1E+12	9.1E-14	650
IG22X2000T7	2000		60	200	5.7E+11	2.5E-13	1750
IG22X3000T7	3000		20	60	3.8E+11	4.6E-13	5200
IG22X250T9	250	-20	5000	10000	1.4E+12	3.5E-14	40
IG22X1000T9	1000		600	3000	1.5E+12	6.5E-14	650
IG22X2000T9	2000		120	400	8.0E+11	1.8E-13	1750
IG22X3000T9	3000		-	-	-	-	5200

Absolute Maximum Ratings

		Min.	Max.
Storage temperature [°C]		-55	+125
Operating temperature [°C]		-40	+85
Reverse bias, cw [V]			1
Forward current, cw [mA]			1
Soldering temperature, 5 sec. [°C]			260
ESD damage threshold, human body model class 0* [V]		0	<250
TE cooler allowable voltage [V]	T7 T9	- -	0.8 3.7
TE cooler allowable current [A]	T7 T9	- -	1.9 1.2

*ANSI/ ESD STM5. 1-2007
Valid with sufficient heat sinking only.

Fig. 1: Spectral Response

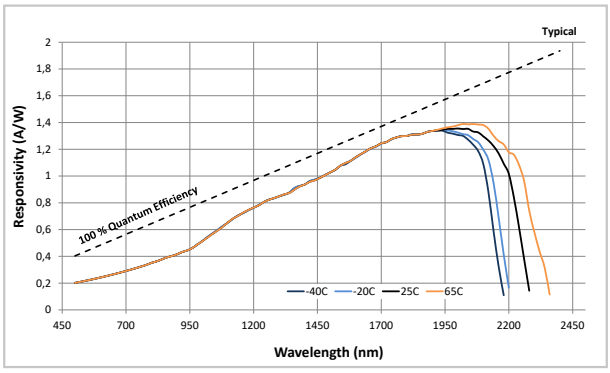


Fig. 2: Dark Current vs. Reverse Voltage

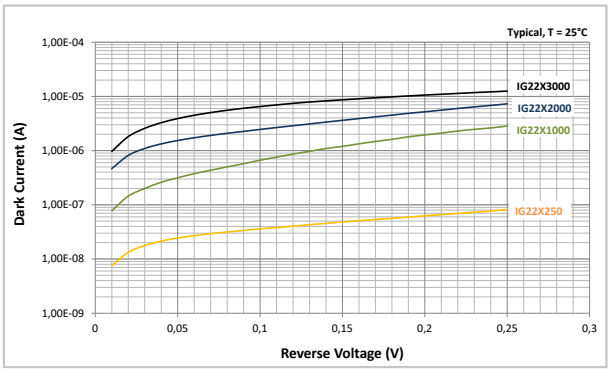


Fig. 3: Shunt Resistance vs. Temperature

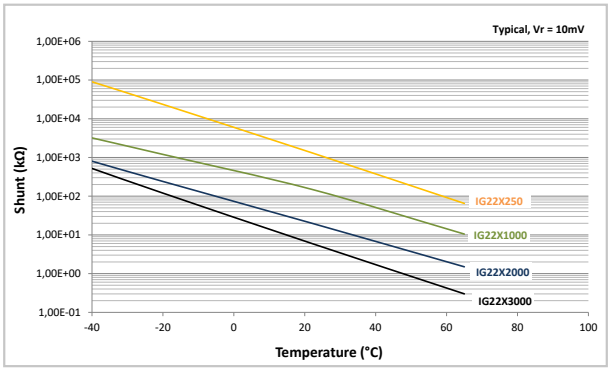


Fig. 4: Shunt Resistance vs. Detectivity

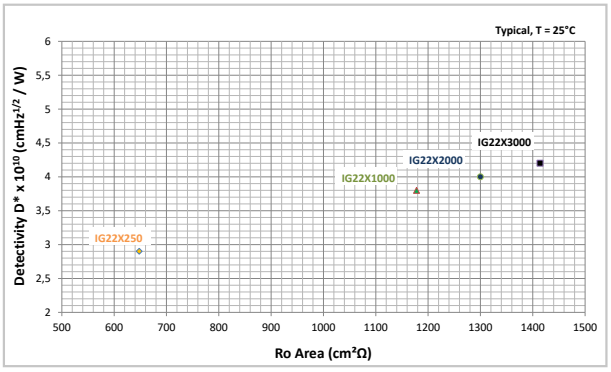


Fig. 5: Capacitance vs. Reverse Voltage

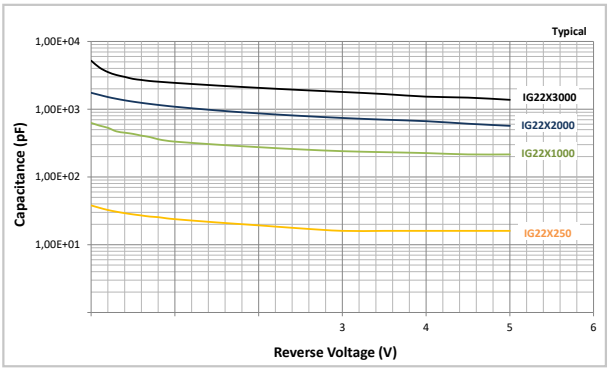


Fig. 6: Responsivity Temperature Coefficient

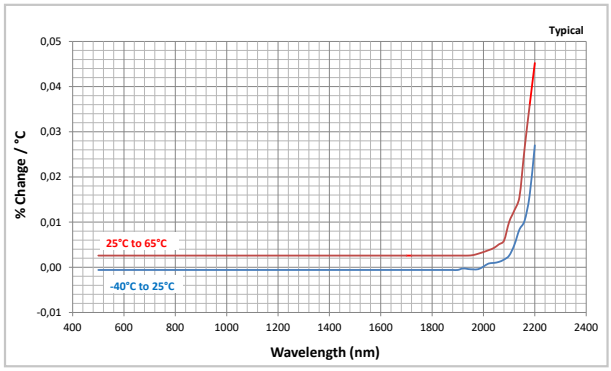


Fig. 7: Sample Pulse Response

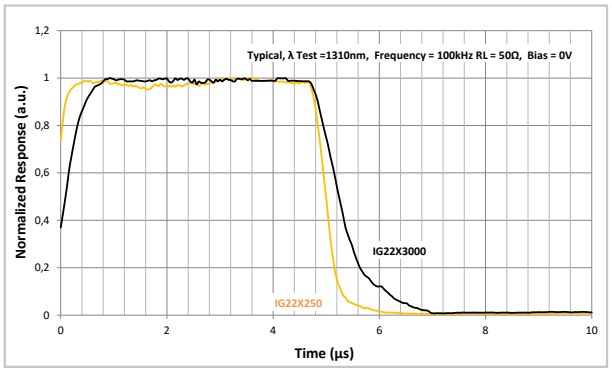
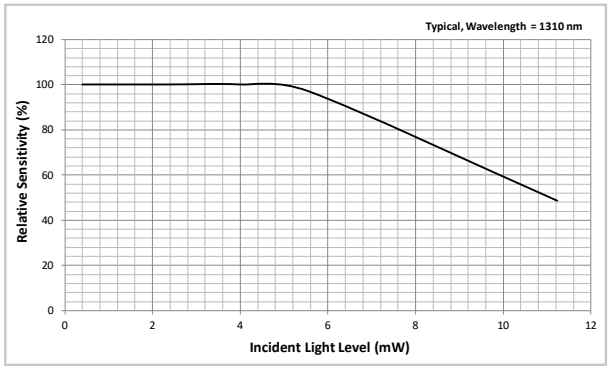


Fig. 8: Linearity



Nomenclature

Extended InGaAs Photodiodes
IG22 Series

C-	IG	22	X		250	S4i	

Type	
Chip only	Extended 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
L5	-	TO-46 lens cap

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