

INGAAS PIN PHOTODIODE



Description

OTRON IGA1000TEC is a type of active area size of 1mm diameter active area IR sensitive detectors which exhibit excellent responsivity from 1000nm to 1680nm, allowing high sensitivity to weak signals. These large active area devices are ideal for use in infrared instrumentation and monitoring applications.

Features

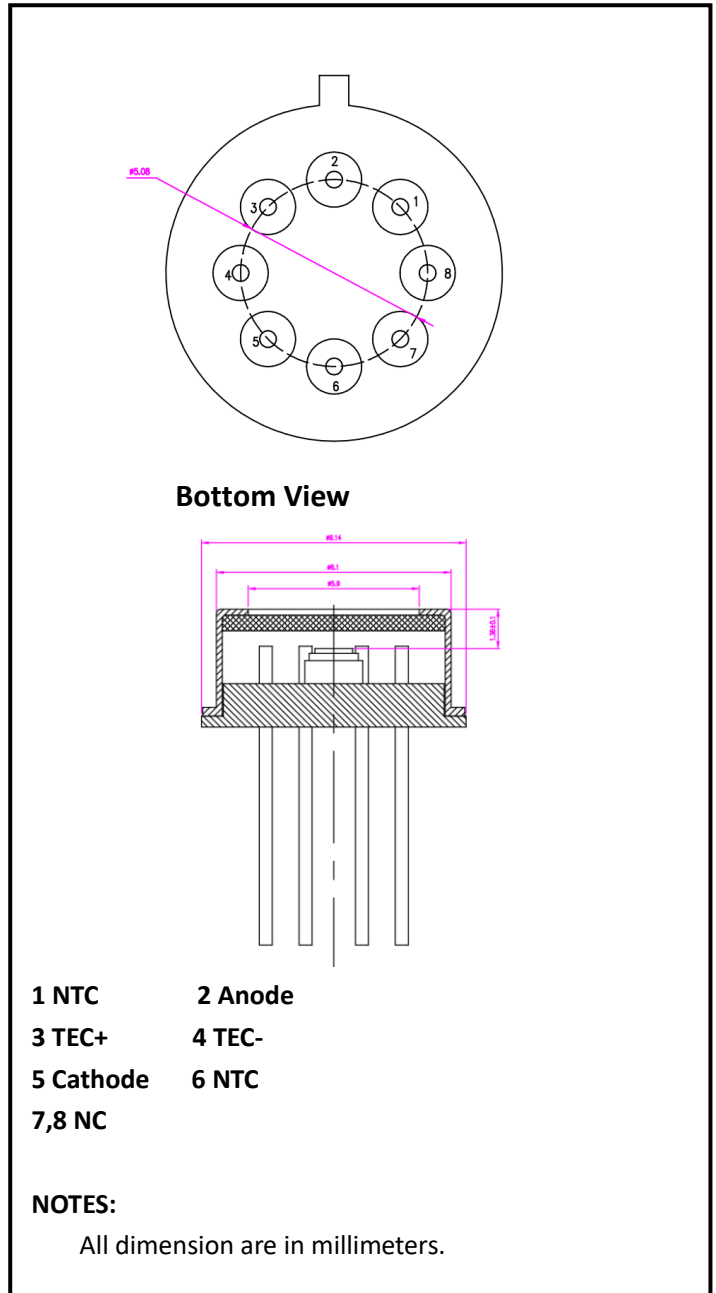
- * High QE for 1064nm
- * TEC for temperature control

Applications

- * Optical Instrumentation
- * Laser Power Measurement
- * NIR Sensing
- * Power meters

Thermoelectric Submount

Symbol	Characteristic	min	typ	max	Unit
Dtmax	Maximum temperature difference at I=Imax		40	78	k
Qmax	Maximum heat pumping capacity at I=Imax			1.7	W
Imax	Maximum current			1.2	A
Umax	Maximum voltage drop			2.35	V



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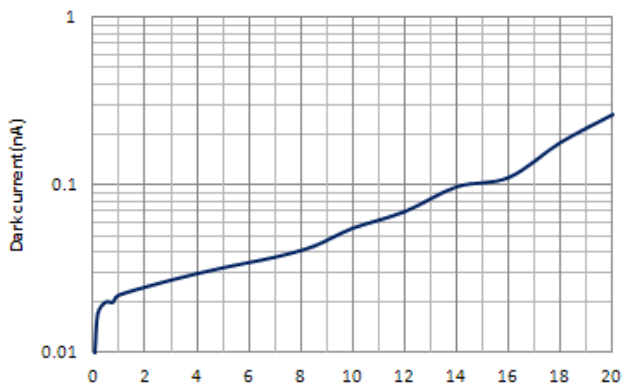


Absolute Maximum Ratings (Ta=25°C)

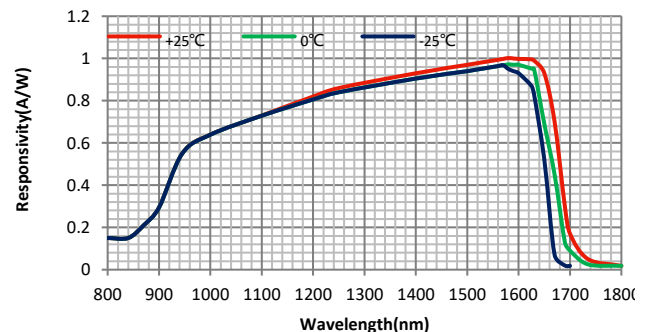
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Chip size	s	1290 × 1290 × 175				um
Active area	A	φ 1000				um
Forward current	I _F	10				mA
Reverse current	I _R	10				mA
Dark current	I _D	V _R =0V		10		pA
		V _R =5V		32		
Rise time	t _R	V _R =5V; R _L =50Ω, f=1MHz		3	5	ns
Forward Voltage	V _F	I _F =1mA			0.6	V
Reverse breakdown voltage	V _{(BR)R}	I _R =10μA Ev=0lx	40			V
Junction Capacitance	C _J	V _R =0V f=1MHz		14		pF
		V _R =5V f=1MHz		2.67		pF
Photo sensitivity	S _R	1310nm	0.95	0.97		A/W
		1550nm	0.98	1.10		
Spectral Application Range	λ _{range}		1000		1680	nm
Spectral Response-Peak	λ _p			1600		nm
Shunt resistance	R _{sh}	V _R =10mV		75		MΩ
Saturation power	L	V _R =0V; λ=1.55μm	1	1.6		mW
		V _R =2V; λ=1.55μm	2	5.3		
		V _R =5V; λ=1.55μm	6	12.1		
Angular Resp 50% Resp Pt	θ _{1/2}			±55		Degrees
Noise Equivalent Power	NEP	V _R =5V λ=1550nm		8.16×10 ⁻¹³		W/Hz ^{1/2}
Specific Detectivity	D*	V _R =5V λ=1550nm		2.17×10 ¹²		cm(Hz/W) ^{1/2}

*please note that depending on operation voltage , The operation at temperatures below -15°C may require sophisticated control circuit.

■ Dark current vs. reverse voltage

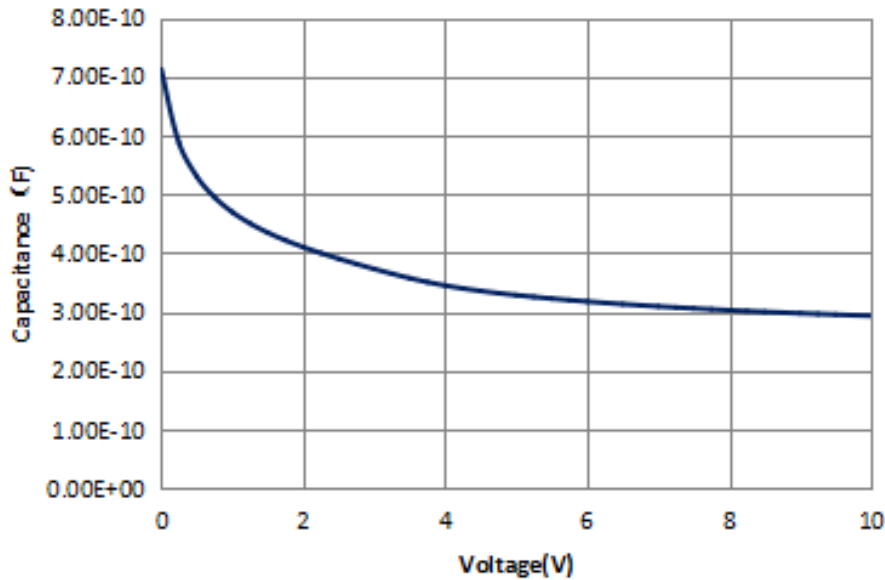


■ Spectral response



■Relative Junction Capacitance

VS. Voltage



Temperature Sensor (NTC)

Temp		Resistance(kohm)		
K	°C	min	typ	max
233.15	-40	321.904	336.795	352.339
238.15	-35	233.56	243.573	253.99
243.15	-30	171.306	178.091	185.127
248.15	-25	126.93	131.559	136.343
253.15	-20	94.955	98.129	101.4
258.15	-15	71.424	73.6	75.835
263.15	-10	54.238	55.735	57.268
268.15	-5	41.558	42.59	43.644
273.15	0	32.114	32.826	33.551
278.15	5	24.988	25.478	25.974
283.15	10	19.603	19.938	20.277
288.15	15	15.498	15.726	15.955
293.15	20	12.344	12.496	12.649
298.15	25	9.9	10	10.1
303.15	30	7.959	8.056	8.155
308.15	35	6.439	6.532	6.626
313.15	40	5.242	5.328	5.416



IGA1000TEC

Temp		Resistance(kohm)		
K	°C	min	typ	max
318.15	45	4.292	4.372	4.452
323.15	50	3.535	3.607	3.68
328.15	55	2.929	2.995	3.061
333.15	60	2.441	2.5	2.56
338.15	65	2.045	2.098	2.152
343.15	70	1.721	1.769	1.818
348.15	75	1.456	1.499	1.543
353.15	80	1.237	1.275	1.315
358.15	85	1.057	1.092	1.127
363.15	90	0.908	0.939	0.971
368.15	95	0.783	0.811	0.84
373.15	100	0.678	0.703	0.729
378.15	105	0.589	0.612	0.635
383.15	110	0.514	0.534	0.556
388.15	115	0.45	0.468	0.488
393.15	120	0.395	0.412	0.43
398.15	125	0.348	0.364	0.38

B(K)	3969.3	3930	3890.7
T _N (K)	298.15		

$$T = \frac{B \times T_n}{B + \ln\left(\frac{R_T}{R_N}\right) \times T_N}$$

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