

C30619, C30641, C30642, C30665 and C30723 Series **Large Area InGaAs PIN Photodiodes**



Key Features

- Available in various packages
- 0.5 to 5mm diameters
- High responsivity at 1300 and 1550 nm
- Low capacitance
- High linearity
- RoHS Compliant

Applications

- Optical power meter
- Fiber optic test equipment
- Near-IR spectroscopy
- Laser profiling stations
- Instrumentation

This family of large-area InGaAs PIN photodiodes provides high responsivity from 800nm to 1700nm for applications including optical power meters, fiber optic test equipment, near-IR spectroscopy and instrumentation.

All devices are planar passivated and feature low capacitance for extended bandwidth, and high shunt resistance for maximum sensitivity. Typical devices feature well than 1 % non-linearity to optical powers of greater than +13dBm (20mW), and uniformity within 2% across the detector active area. Typical responsivity of 0.2A/W at 850nm for our large-area InGaAs devices allows use of a single detector in fiber optic test instrumentation designed to operate at 850, 1300 and 1550nm.

Devices are available with active areas from 0.5mm to 5.0mm in TO-type packages.

Recognizing that different applications have different performance requirements, Excelitas offers a wide range of customization of these photodiodes to meet your design challenges. Responsivity and noise screening, custom device testing, packaging with thermoelectric coolers for increased sensitivity, customized ceramic sub-mounts and other application-specific solutions are available.

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Table 1 – Mechanical Characteristics

Parameter	Symbol	C30619GH	C30641GH	C30642GH	C30665GH	C30723GH	Unit
Shape		Circular	Circular	Circular	Circular	Circular	
Photosensitive Surface:							
Useful area	A	0.2	0.8	3.1	7	19.6	mm ²
Useful diameter	d	0.5	1	2	3	5	mm
Package Type ¹		TO-18	TO-18	TO-5	TO-5	TO-8	
Window Type		Flat Glass	Flat Glass	Flat Glass	Flat Glass	Flat Glass	

¹ C30619, C30641 and C30642 types are available with TE coolers in TO-66 packages on custom basis.

Table 2 – Electro-Optical Characteristics (C30619GH, C30641GH)

Test conditions: Case temperature = 22°C

Parameter	Symbol	C30619GH			C30641GH			Units
		Minimum	Typical	Maximum	Minimum	Typical	Maximum	
Reverse operating voltage	V _{op}	0	5	V _{br} - 5V	0	5	V _{br} - 5V	V
Breakdown voltage	V _{br}	20	80		20	80		V
Responsivity								
at 850nm	R	0.10	0.20		0.10	0.20		A/W
at 1300nm		0.80	0.90		0.80	0.90		
at 1550nm		0.85	0.95		0.85	0.95		
Shunt Resistance ¹ (V _{op} =10mV)		10	250		5	50		MΩ
Dark Current ²	I _d		1	20		5	50	nA
Noise current (10KHz, 1.0 Hz)	i _n		0.02	0.10		0.04	0.15	pA/√Hz
Capacitance								
V _{op} = 0 V	C _d		20	30		100	125	pF
V _{op} = 5 V			8	10		40	50	
Bandwidth (-3dB, RL=50Ω, at V _{op} typical)			350			75		MHz
Maximum Forward Current	I _F			10			10	mA
Maximum Photocurrent	J _p			100			100	mA
Power Dissipation				100			100	mW
Storage Temperature	T _{stg}	-60		125	-60		125	°C
Operating Temperature	T _o	-40		85	-40		85	°C

¹ Selected devices with higher shunt resistance are available to special order.

² Dark current measurements made under the following conditions: C30619GH (V_{op} = 5V) ; C30641GH (V_{op} = 2V).

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Table 3 – Electro-Optical Characteristics (C30642GH, C30665GH)

Test conditions: Case temperature = 22°C

Parameter	Symbol	C30642GH			C30665GH			Units
		Minimum	Typical	Maximum	Minimum	Typical	Maximum	
Reverse operating voltage	V_{op}	0	5	$V_{br} - 5V$	0	5	$V_{br} - 5V$	V
Breakdown voltage	V_{br}	15	50		10	50		V
Responsivity 850nm 1300nm 1550nm	R	0.10 0.80 0.85	0.20 0.90 0.95		0.10 0.80 0.85	0.20 0.90 0.95		A/W
Shunt Resistance ¹ ($V_{op}=10mV$)		2	25		1	10		MΩ
Dark Current ($V_{op} = 10V$)	I_d		10			25		nA
Noise Current (10KHz, 1.0 Hz)	i_n		0.03	0.15		0.04	0.20	pA/√Hz
Capacitance at $V_{op}= 0V$ at $V_{op}= 5V$	C_d		450 150	500		1000 300	1250	pF
Bandwidth (-3dB, $R_L=50\Omega$, at V_{op} typical)			20			10		MHz
Maximum Forward Current	I_F			10			10	mA
Maximum Photocurrent	J_p			100			100	mA
Power Dissipation				100			100	mW
Storage Temperature	T_{stg}	-60		125	-60		125	°C
Operating Temperature	T_o	-40		85	-40		85	°C

¹ Selected devices with higher shunt resistance are available to special order.

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Table 4 – Electro-Optical Characteristics (C30723GH)

Test conditions: Case temperature = 22°C

Parameter	Symbol	C30723GH			Units
		Minimum	Typical	Maximum	
Reverse operating voltage	V_{op}	0	5	$V_{br} - 5V$	V
Breakdown voltage (V_{br})	V_{br}	10	50		V
Responsivity at 850nm at 1300nm at 1550nm	R	0.10 0.80 0.85	0.20 0.90 0.95		A/W
Shunt Resistance ¹ ($V_{op}=10mV$)			5		MΩ
Dark Current ($V_{op} = 10V$)	I_d		140		nA
Capacitance ($V_{op}= 2V$)	C_d		950		pF
Bandwidth (-3dB, $R_L=50\Omega$, at V_{op} typical)			3		MHz
Maximum Forward Current	I_F			10	mA
Maximum Photocurrent	J_p			100	mA
Power Dissipation				250	mW
Storage Temperature	T_{stg}	-60		125	°C
Operating Temperature	T_o	-40		85	°C

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Figure 1 - Typical Quantum Efficiency as a function of Wavelength

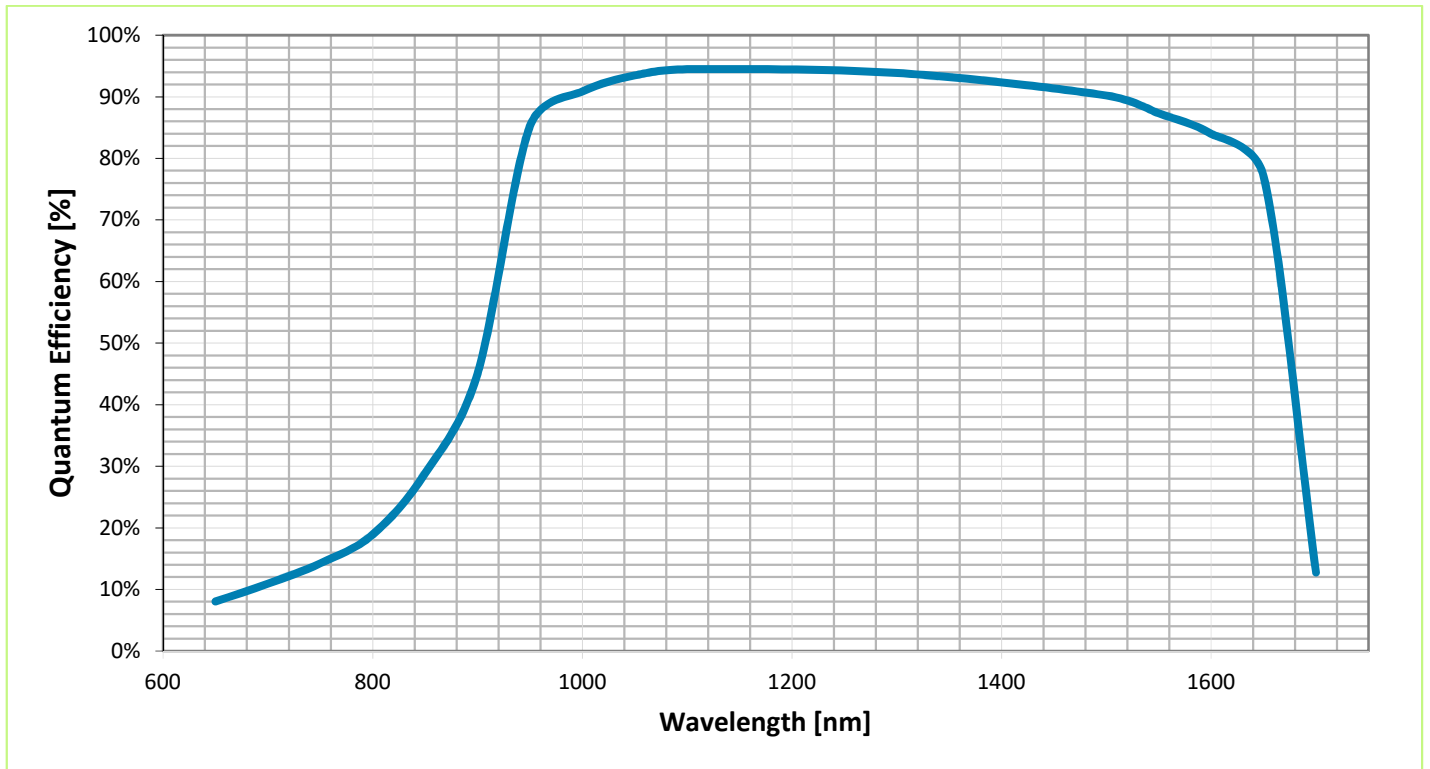
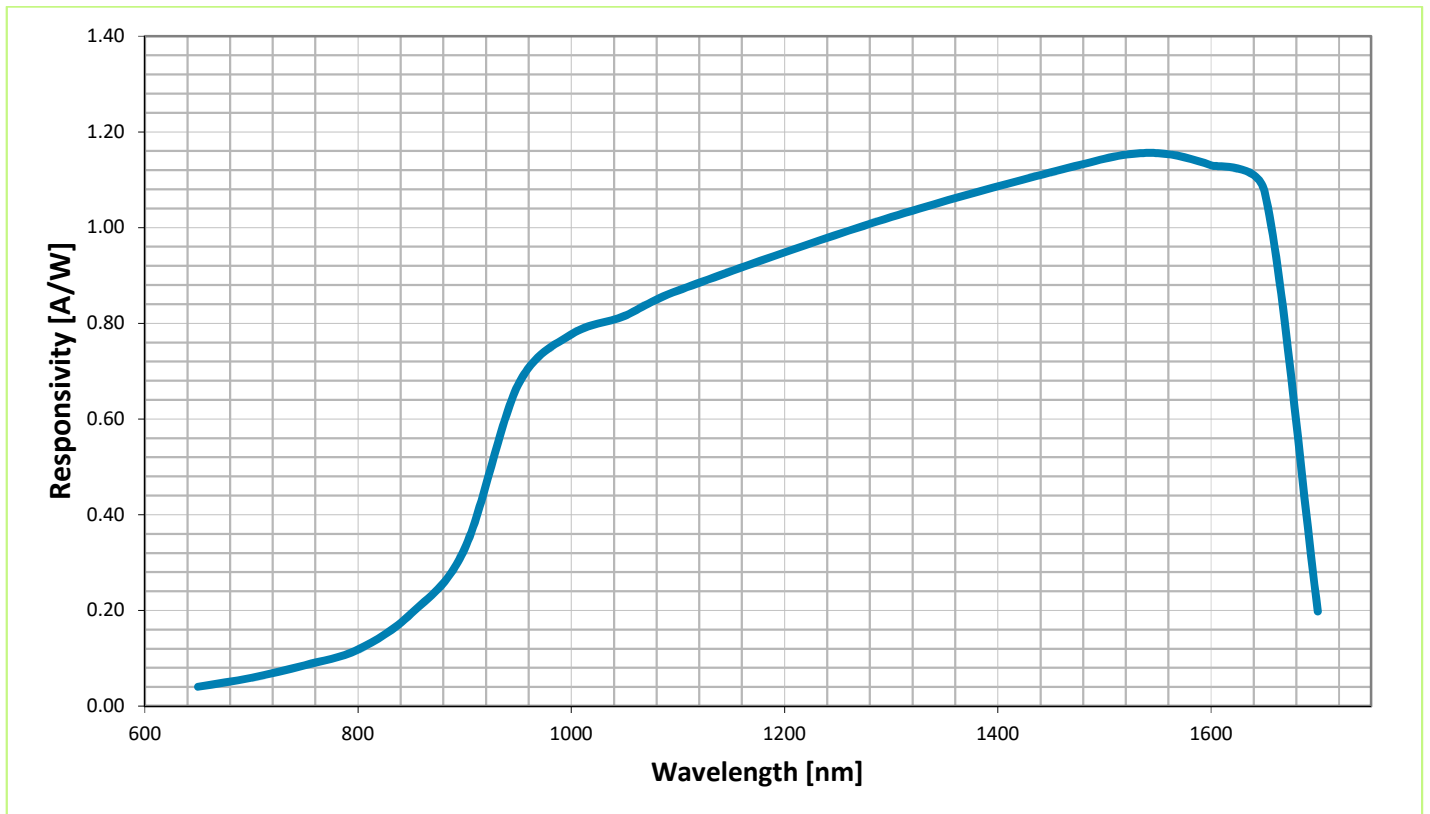
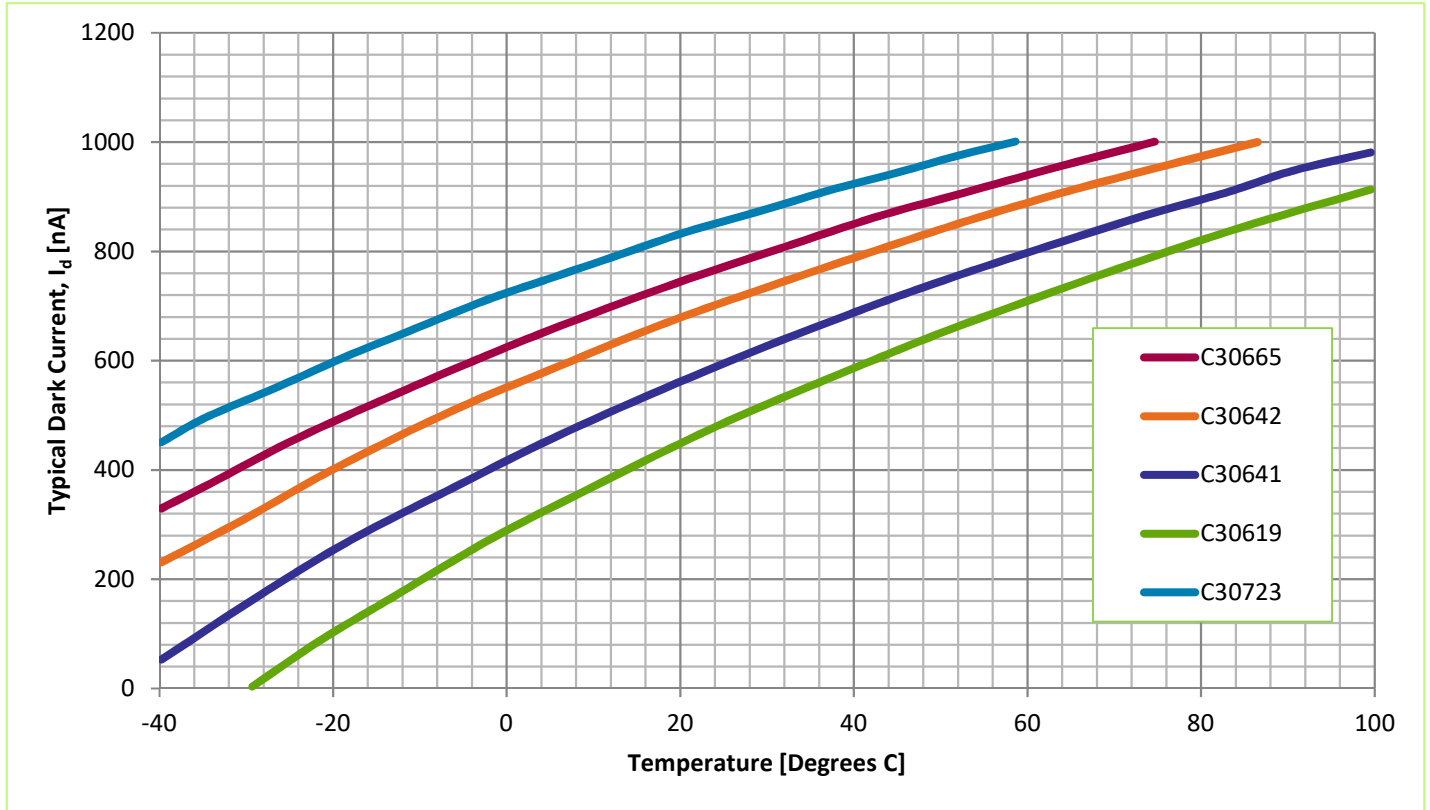


Figure 2 Typical Responsivity as a function of Wavelength



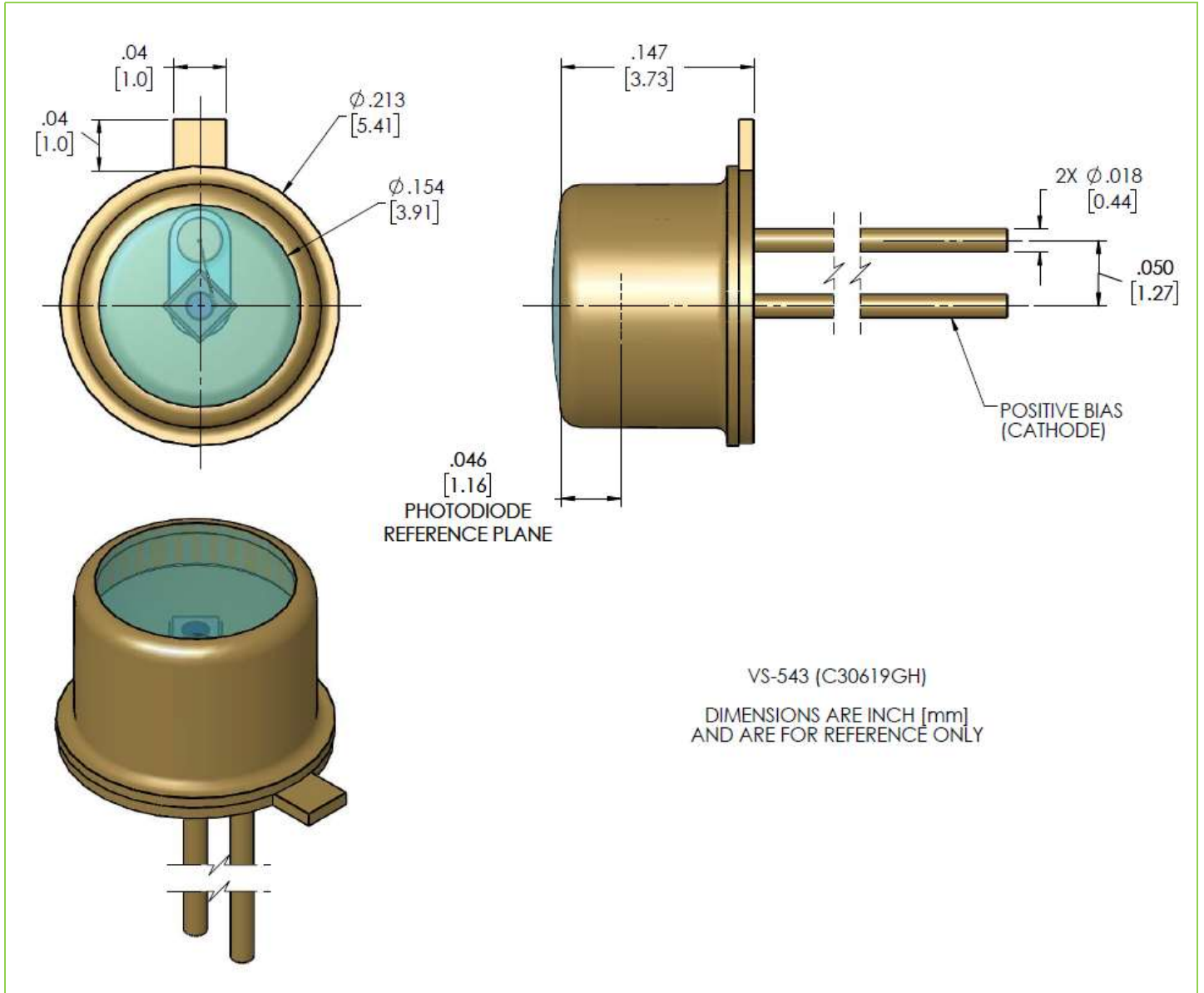
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Figure 3 - Typical Dark Current as a function of Temperature



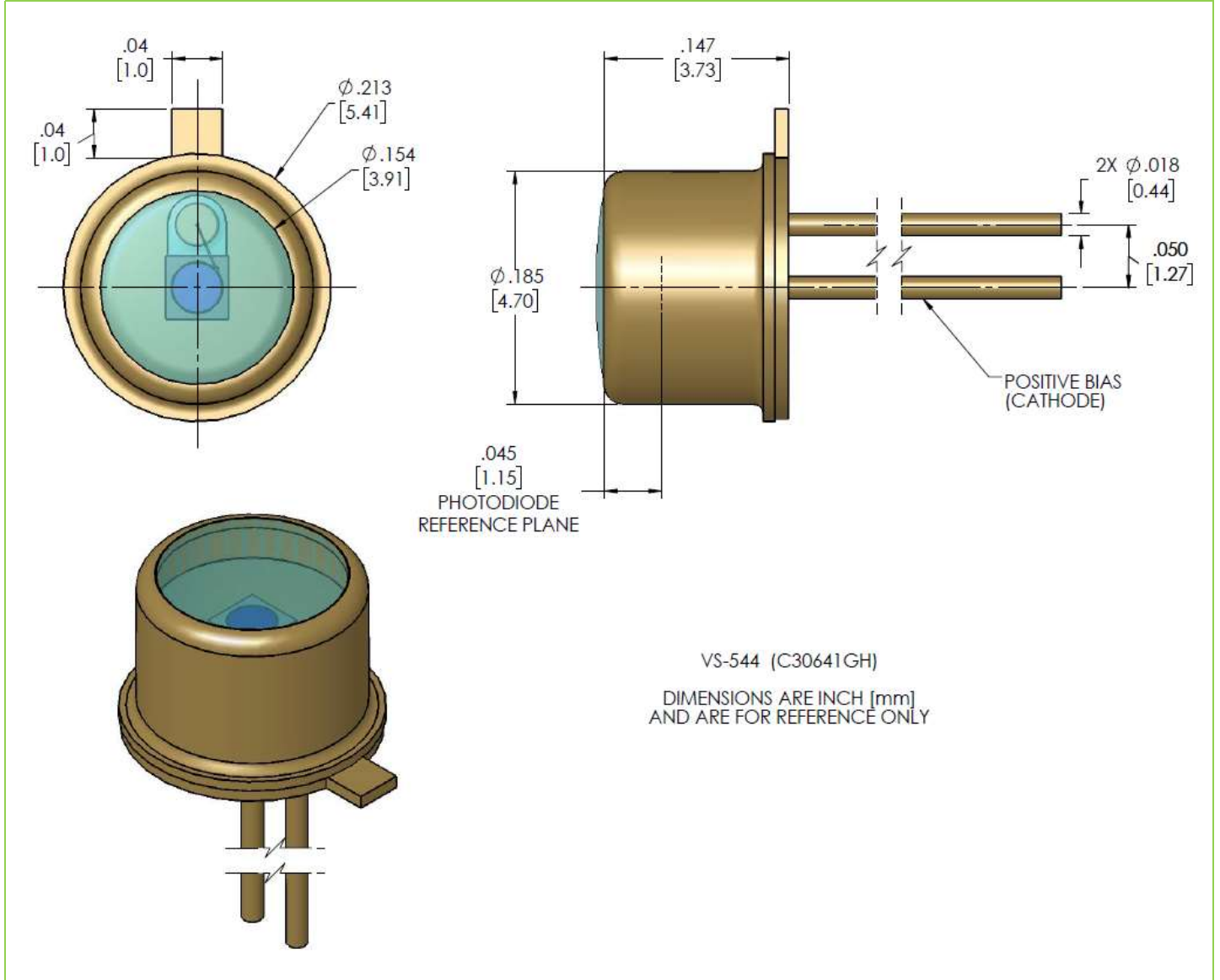
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Figure 5 – Package information for C30619GH



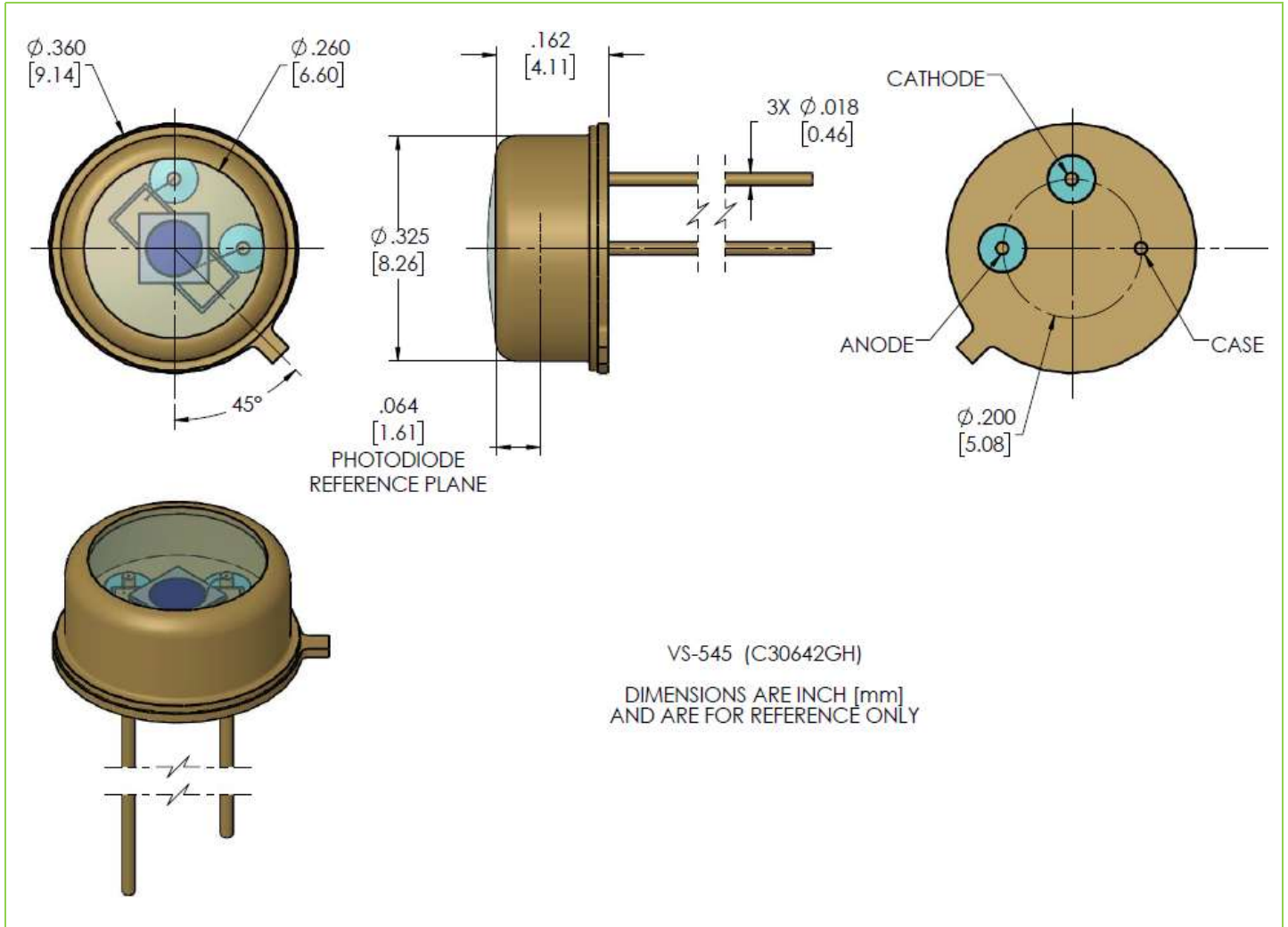
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Figure 6 – Package information for C30641GH



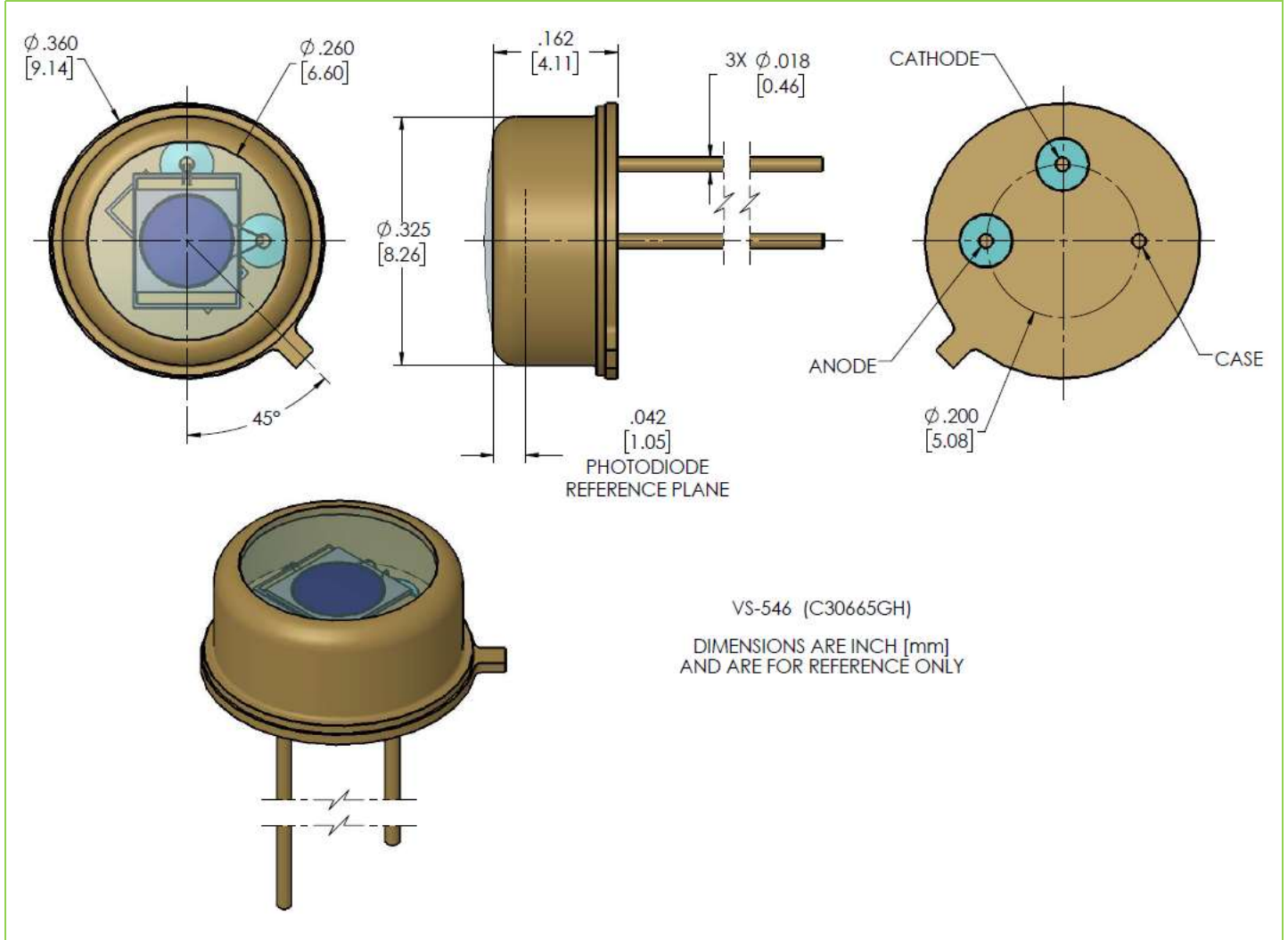
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Figure 7 – Package information for C30642GH



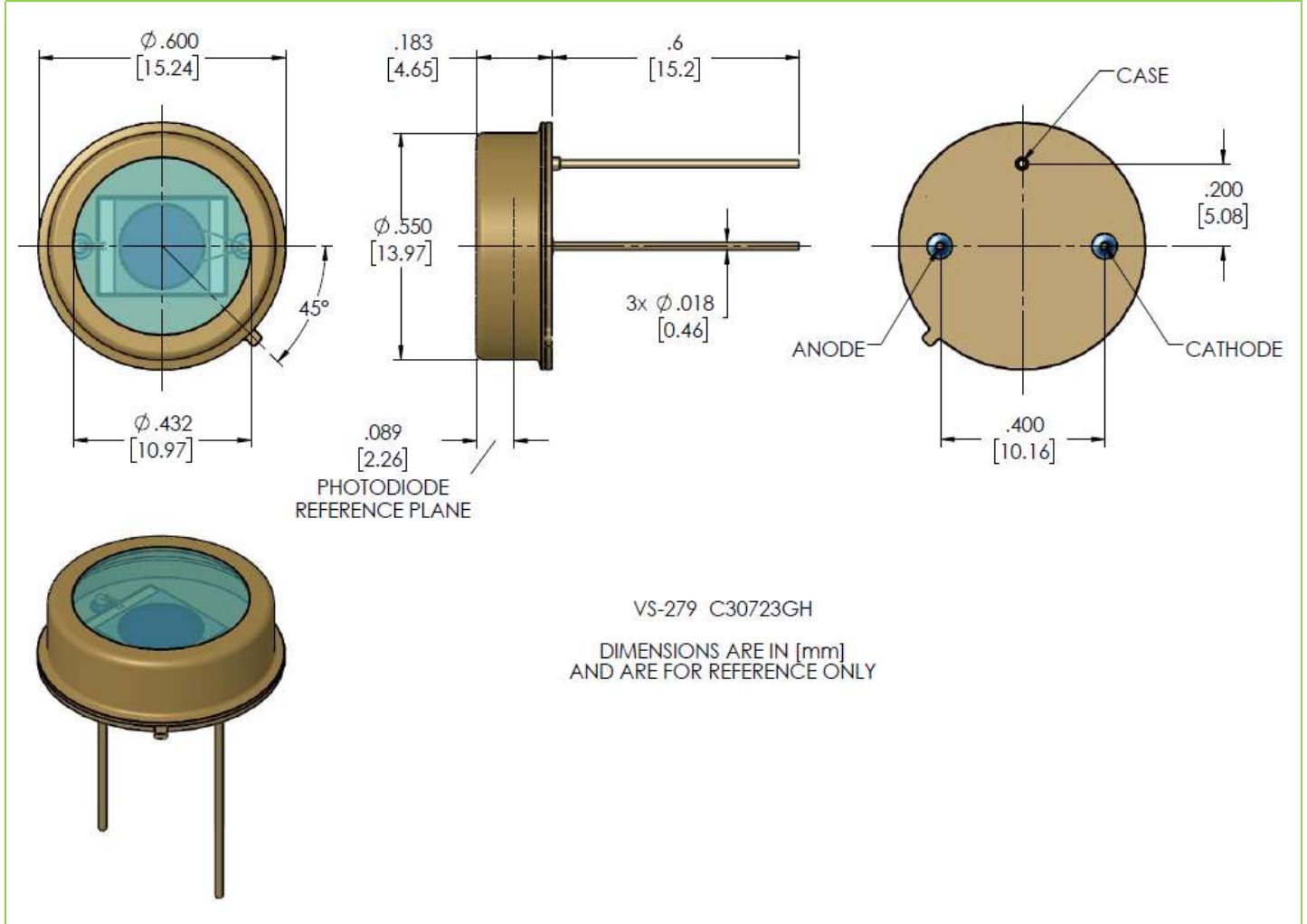
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Figure 8 – Package information for C30665GH



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Figure 9 – Package information for C30723GH



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ESD warning

InGaAs PINs should only be handled at an ESD-safe work station.

RoHS Compliance

This series of InGaAs PINs are designed and built to be fully compliant with the European Union Directive 2002/95/EEC – Restriction of the use of certain Hazardous Substances in Electrical and Electronic equipment.



Warranty

A standard 12-month warranty following shipment applies for all hermetically sealed devices. Any warranty is null and void if the photodiode window has been opened.

About Excelitas Technologies

Excelitas Technologies is a global technology leader focused on delivering innovative, customized solutions to meet the lighting, detection and other high-performance technology needs of OEM customers.

Excelitas has a long and rich history of serving our OEM customer base with optoelectronic sensors and modules for more than 45 years beginning with PerkinElmer, EG&G, and RCA. The constant throughout has been our innovation and commitment to delivering the highest quality solutions to our customers worldwide.

From analytical instrumentation to clinical diagnostics, medical, industrial, safety and security, and aerospace and defense applications, Excelitas Technologies is committed to enabling our customers' success in their specialty end-markets. Excelitas Technologies has approximately 5,000 employees in North America, Europe and Asia, serving customers across the world.

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