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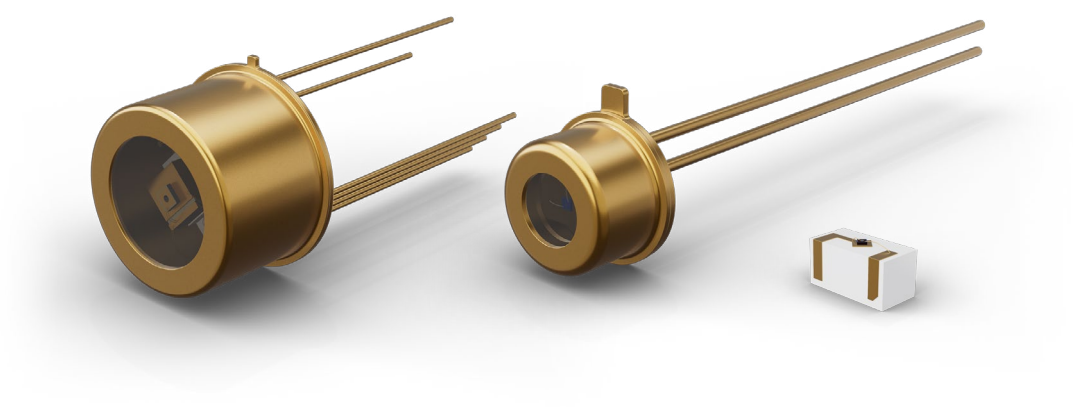
IAG-SERIES

InGaAs Avalanche Photodiode



The IAG-series avalanche photodiode is the largest commercially available InGaAs APD with high responsivity and extremely fast rise and fall times throughout the 1000 to 1630 nm wavelength range. The peak responsivity at 1550 nm is ideally suited to eye-safe rangefinding applications, free space optical communications, OTDR and high resolution Optical Coherence Tomography. The chip is hermetically sealed in a modified TO-46 package. SMD and pigtailed options are also available.

FEATURES

/ 80, 200 or 350 µm active area
/ Bandwidth up to 2.5 GHz
/ Over 70 % QE from 1000 to 1600 nm
/ Low dark current and noise
/ Modified TO-46 or ceramic submount
/ Fiber-coupled versions available

APPLICATIONS

/ Rangefinding
/ Optical communication systems
/ Optical coherence Tomography
/ Low-light-level detection

11/24 / V24 / WR-MaL / lc-apd/iag-series-ingaas-apd

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beyond borders

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SPECIFICATIONS

Generic Characteristics at T = 21 °C

	IAG-Series		
	Min	Typ	Max
Wavelength range [nm]	1000		1630
Peak sensitivity [nm]		1550	

Absolute Maximum Ratings

	IAG 080X / IAG 200X / IAG 350X		
	Min	Typ	Max
Storage temperature [°C]	-60		125
Operating temperature[1] [°C]	-40		85
Max. reverse current [mA]			1
Max. forward current [mA]	0		10
Optical input (10 ns pulse) [kW/cm²]			200
Optical input (average) [dBm]			0/0/2
Soldering (for 15 sec.) [°C]			260

[1] Extended operating temperature range possible for special design considerations

Electrical Characteristics at T_c = 25 °C, λ = 1550 nm

	IAG 080X			IAG 200X			IAG 350X		
Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
Active diameter [µm]	78	80	82	200	205	210	350	352	355
Responsivity @ M = 1 [A/W]	0.85	0.94	1.05	0.90	0.94	1.05	0.90	0.94	1.05
Dark current @ M = 10 [nA]	–	3	15	–	25	50	–	50	250
Operating voltage V_r @ M = 10 [V]	–	60	70	–	55	65	30	45	60
Breakdown voltage V_{br} (Id = 10 µA) [V]	45	66	75	45	60	75	35	55	70
Capacitance [pF]	0.32	0.35	0.40	–	1.7	2.1	–	4.1	4.6
Temperature coeff. of V_{br} [V/°C]	–	0.075	–	–	0.075	–	–	0.075	–
Bandwidth @ M = 5 [GHz]	2.0	2.5	3.0	0.5	1.0	1.5	–	0.6	–
Bandwidth @ M = 10 [GHz]	2.0	2.5	3.0	0.5	1.0	1.5	–	0.6	–
Bandwidth @ M = 20 [GHz]	1.5	2.2	2.5	0.5	0.8	1.2	–	0.6	–
Excess noise factor F @ M = 10	–	3.2	3.7	–	3.2	3.7	–	3.2	3.7
Excess noise factor F @ M = 20	–	5.5	6.0	–	5.5	6.0	–	5.5	6.0
Noise equivalent power NEP @ M = 10 [pW/Hz^{½}]	–	0.04	0.07	–	0.07	0.2	–	0.12	–

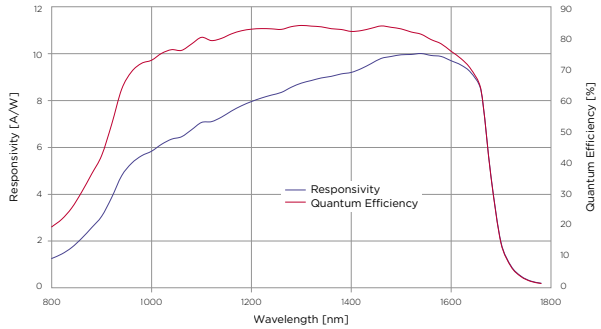

Figure 1: Spectral Response and Quantum Efficiency @ M = 10, 1550 nm

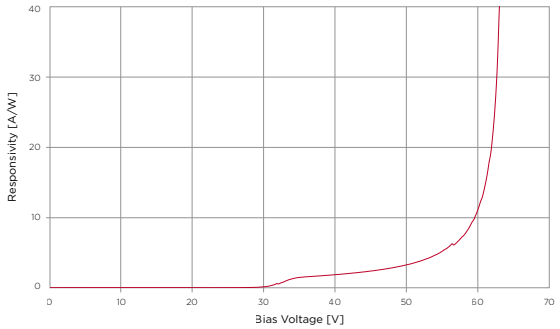

Figure 2: Responsivity Voltage Characteristics @ 25 °C

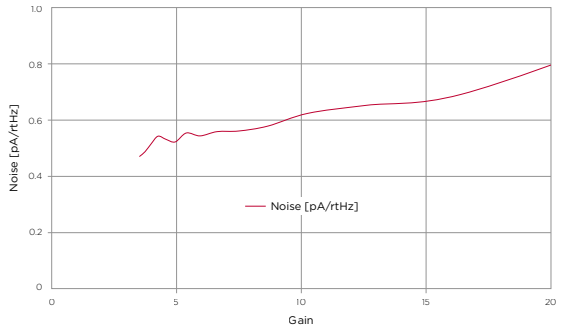

Figure 3: Typical APD Noise Desity as a Function of Gain
(only valid for IAG 200-Series)

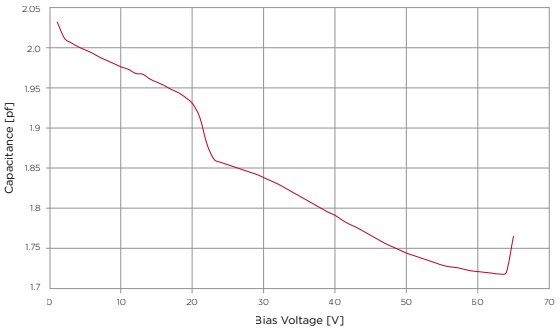

Figure 4: Capacitance vs. Reverse Voltage

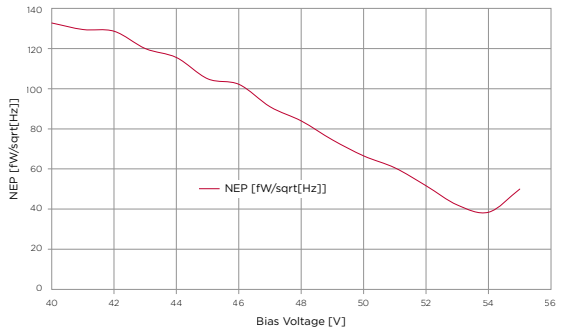

Figure 5: NEP vs. Bias Voltage (only valid for IAG 200-Series)

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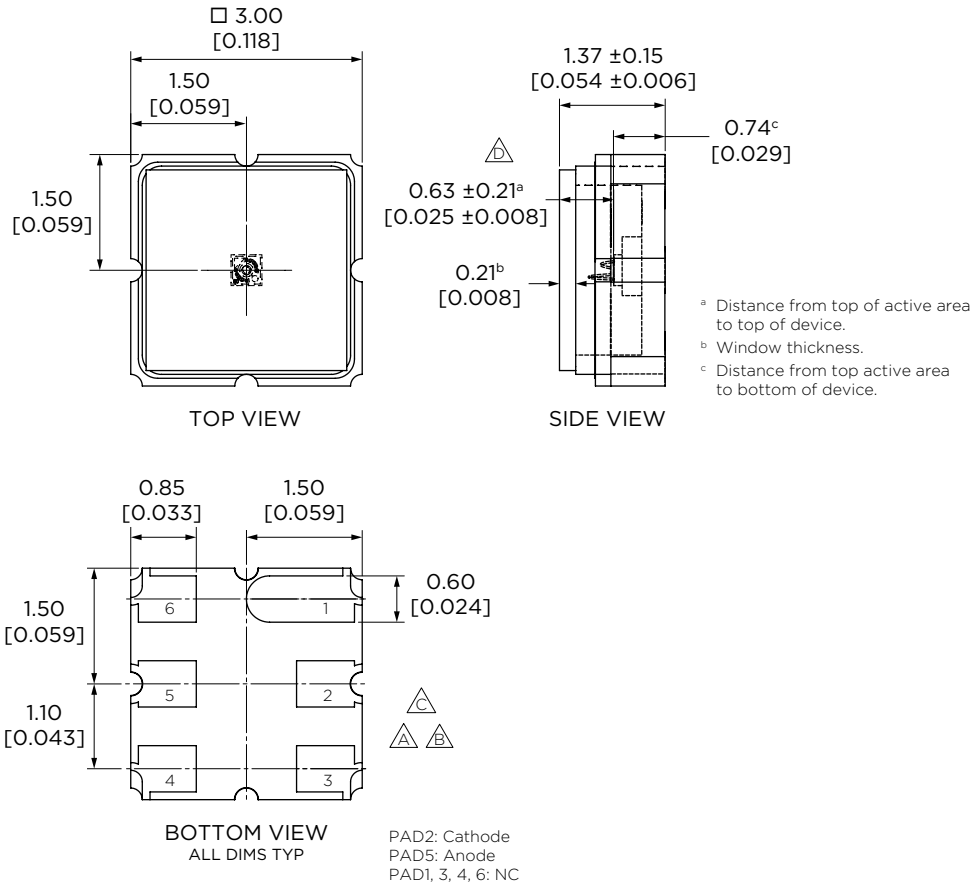
TECHNICAL DRAWING

Package M6



M6

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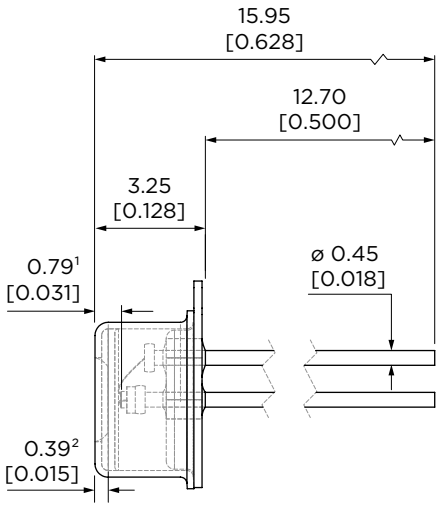
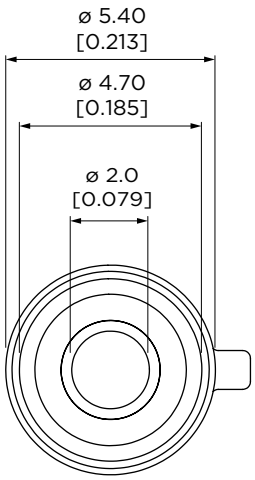
Package S5 TO-46 (2 pin)



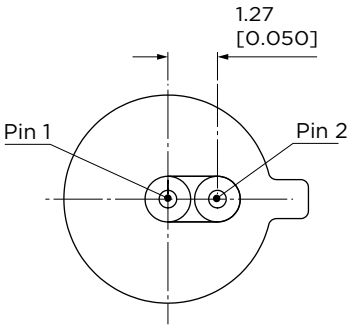
Side View



Top View

¹ Distance from top of device to top of detector.

² Distance from top of device to top of window.



Bottom View

Package S5 TO-46 2 Pin
Pin out:

1. Cathode (-)
2. Anode (+)

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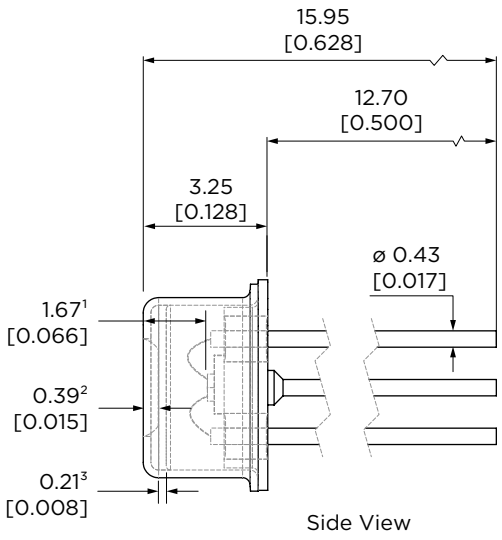
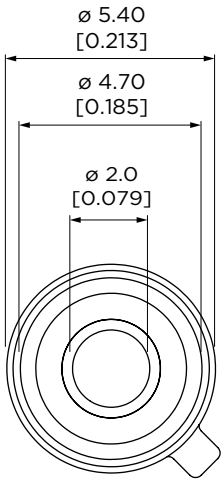
Package S6 TO-46 (3 pin)



Side View

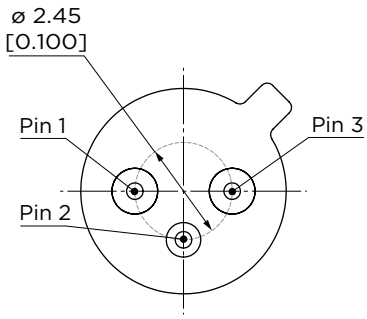


Top View

[1] Distance from top of device to top of detector.

[2] Distance from top of device to top of window.

[3] Window thickness.



Bottom View

Package S6 TO-46 3 Pin
Pin out:

1. Cathode (-)
2. Case/Ground
3. Anode (+)

Units: mm [inch]
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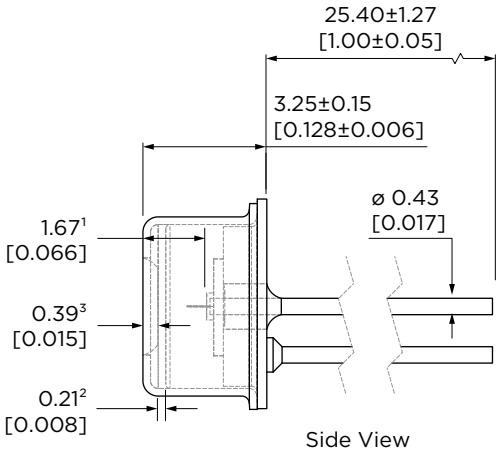
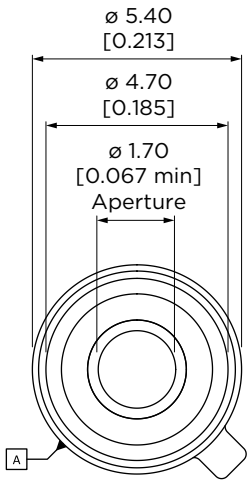
TECHNICAL DRAWING

Package S6L TO-46 (3 pin 1“ lead)



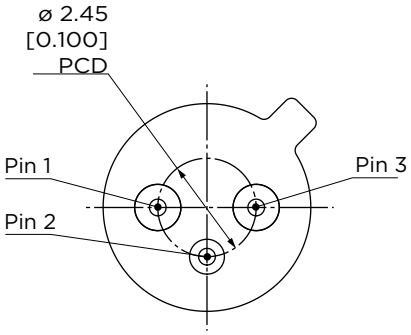
Side View



Top View

Note:
Active area concentric to Datum A within 50µm.

[1] Distance from top of active area to top of device.
[2] Window thickness.
[3] Distance from top of device to top of window.



Bottom View

Package S6L TO-46 3 Pin
Pin out:

1. Cathode (-)
2. Ground/Case
3. Anode (+)

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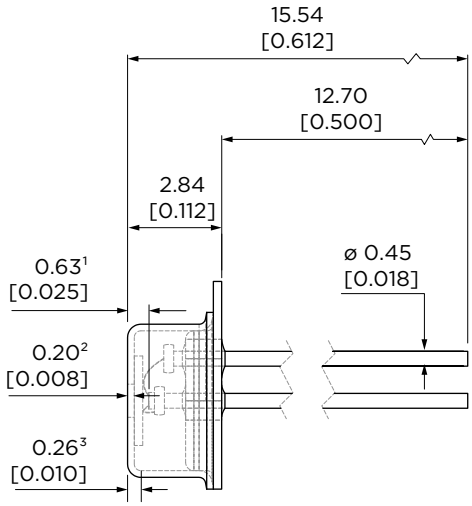
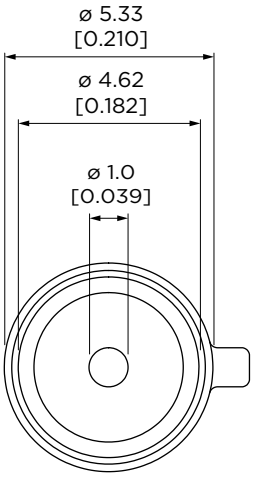
Package S7 TO-46 (low profile)



Side View

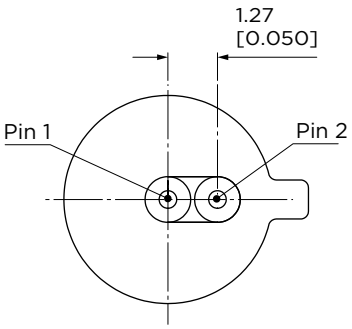


Top View

[1] Distance from top of device to top of active area.

[2] Distance from top of device to top of window.

[3] Window thickness.



Bottom View

Package S7 TO-46
Pin out:

1. Cathode (-)
2. Anode (+)

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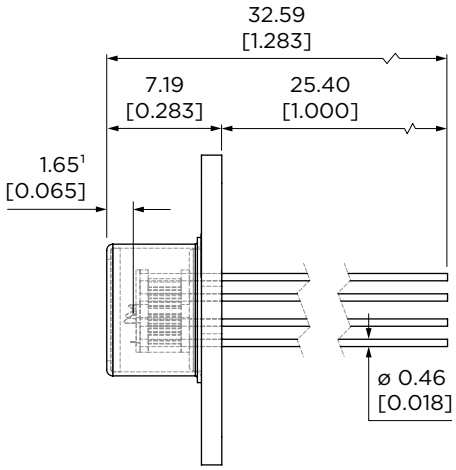
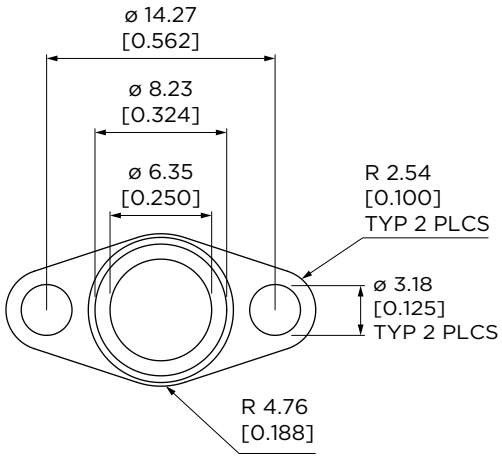
Package T6 TO-37 (with TEC)

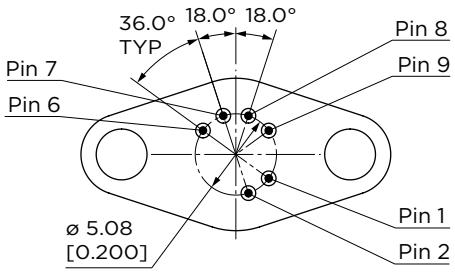


Side View



Top View

[1] Distance from top of device to top of detector.



Bottom View

Package T6 TO-37
Pin out:

1. Thermistor
2. Thermistor
6. Anode (+)
7. Cathode (-)
8. TEC-
9. TEC+

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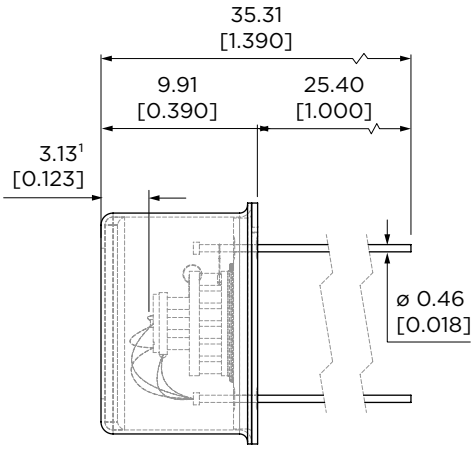
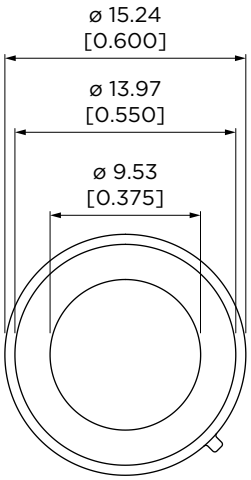
TECHNICAL DRAWING

Package T8 TO-8 (with TEC)

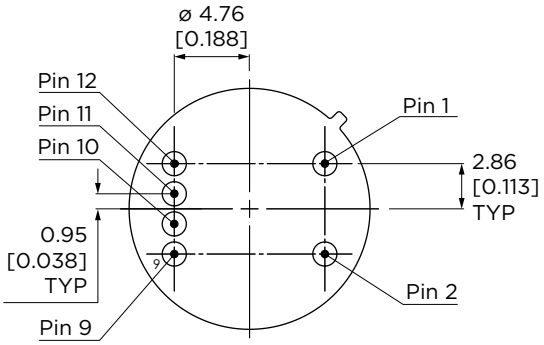


Side View



Top View

[1] Distance from top of device to top of detector.



Bottom View

Package T8 TO-8
Pin out:

1. TEC -
2. TEC +
9. Anode (+)
10. Thermistor
11. Thermistor
12. Cathode (-)

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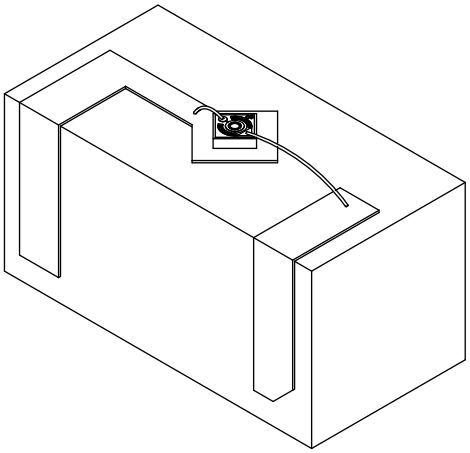
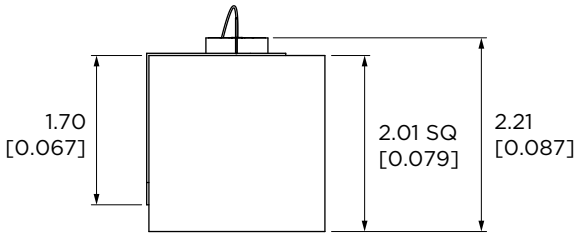
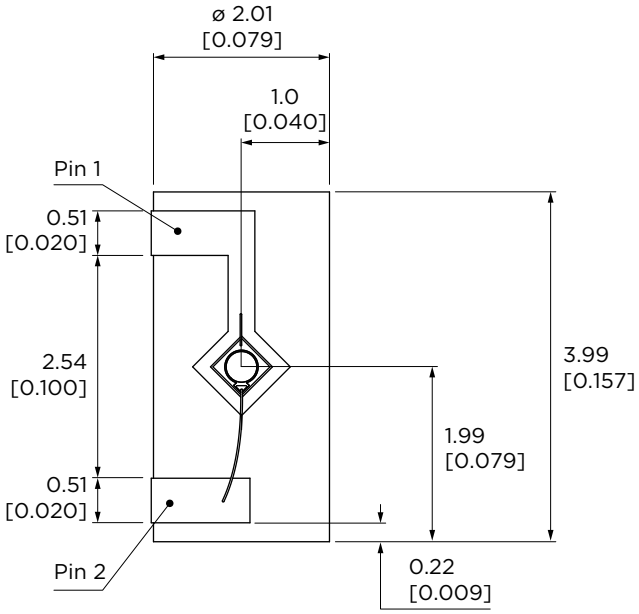
Package Y1 Ceramic Submount





Side View



Top View

Package Y1 Ceramic Submount
Pin out:

1. Cathode (-)
2. Anode (+)

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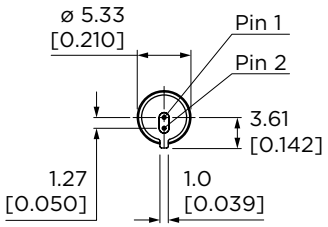
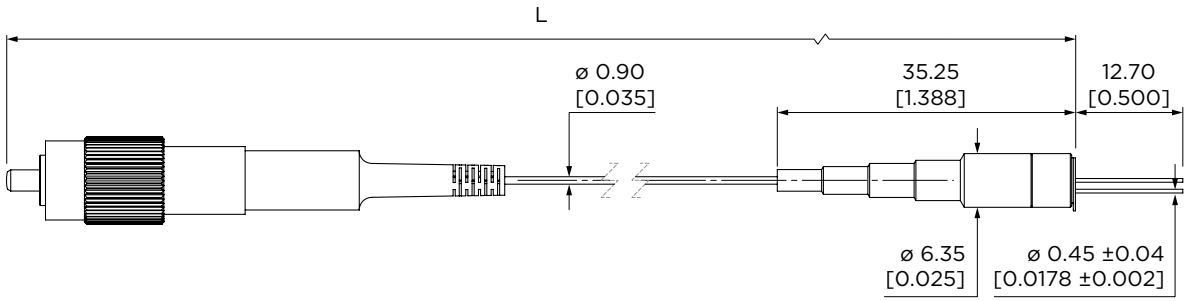
TECHNICAL DRAWING

Package FP Fiber Pigtail



Bottom View



Side View

Package FP Fiber Pigtail
Pin out:

1. Cathode (-)
2. Anode (+)

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ORDERING CODE

	Diameter [µm]	Package Style	Fiber (FP only)	Connector (FP only)	Fiber length [m] (FP only)
IAG	X	X	X	X	X
	080 **200** **350**	**M6** = 3 x 3 mm SMD **S5** = TO-46 (2 pin) **S6** = TO-46 (3 pin) **S6L** = TO-46 (3 pin 1“ lead) **S7** = TO-46 (low profile) **T6** = TO-37 (with TEC) **T8** = TO-8 (with TEC) **Y1** = ceramic submount **FP** = fiber pigtail	**1/15** = 9 µm core, NA 0.15 **5/20** = 50 µm core, NA 0.20 **6/27** = 62.5 µm core, NA 0.27 **10/22** = 105 µm core, NA 0.22	**0** = none **SM** = SMA **FC** = FC/PC **FA** = FC/APC	

Note: other fibers and connectors are available on request.

PRODUCT CHANGES

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ORDERING INFORMATION

Products can be ordered directly from LASER COMPONENTS or its representatives.
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Custom designed products are available on request.

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