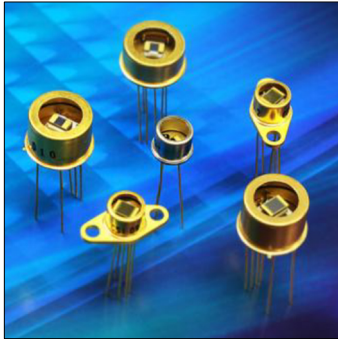


IR Detectors – B Series

High Performance Lead Selenide (PbSe) Single Channel

Uncooled and Cooled Devices



KEY FEATURES

- Fast high sensitivity in 1-5 Micron Region
- Provides High Signal to Noise Performance for Wide Measurement Dynamic Range
- Fastest Response Speed for Mid-IR Applications
- High Reliability for Long Life
- Best Overall Performance for the 1-5 Micron Spectrum

The B Series single channel infrared detectors offer the best balance of performance and attributes for analyzing materials in the one to five-micron spectrum. The combination of high sensitivity, fast response time, and industry leading reliability assure consistent performance where and when it is needed.

High sensitivity maximizes measurement dynamic range for applications with trace elements. Real-time measurements are easily supported with the B Series fast response time. High durability and long life minimize repair and maintenance costs. With the goal of optimizing your system's performance, Opto Diode is committed to providing high quality, reliable products.

Available in a variety of standard configurations, customers can choose an assortment of options such as element size, cooling alternatives, and package type to suit a variety of system and application requirements. Cooled units provide additional sensitivity for very low-level signal detection and enhanced stability for environments where temperatures are in constant flux.

Opto Diode has been manufacturing and selling high performance PbS and PbSe infrared detectors for over 25 years. Having established a reputation for highly controlled manufacturing processes, customers can rely on consistent, repeatable performance and superior customer service. Supporting all stages of development, from early prototyping to high volume production, Opto Diode is dedicated to helping customers develop market-leading instruments. Custom requirements can be addressed by contacting the Opto Diode sales team.

Applications

- Gas analysis
 - Medical
 - Industrial
- Emissions monitoring
- Spectroscopy
- Process control systems
- Thermal imaging
- Defense and security

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B Series Specifications

Model #	Part #	Description - Size	Package Type	Active Element Area (mm ²)	Element Operating Temp. (°C)	Peak Sensitivity Wavelength λ_p (μm)		D* λ_p , 1000 Hz, 1 Hz (cm HZ ^{1/2} W ⁻¹)		Responsivity ¹ λ_p , 1000 Hz (V/W)		Resistance (MΩ)	Time Constant (μsec)		Window Type	Absolute Ratings Storage & Operating Temperature (°C) ^{2,3}
BXP Series - Uncooled PbSe Packaged IR Detectors				Typ.	Ambient 23	Min.	Typ.	Min.	Typ.	Min.	Typ.	Range	Typ.	Max.		Range
BXP-15E	40785	1 mm x 1 mm	TO5	1	+23	3.6	3.8	7.0x10 ⁹	2.0x10 ¹⁰	1.5x10 ⁴	3.0x10 ⁴	0.7 - 1.5	2	5	Flat Sapphire	-40 to +85
BXP-25E	40573	2 mm x 2 mm	TO5	4	+23	3.6	3.8	1.0x10 ¹⁰	2.0x10 ¹⁰	7.5x10 ³	1.5x10 ⁴	0.7 - 2.5	2	5	Flat Sapphire	-40 to +85
BXP-35E	40055	3 mm x 3 mm	TO5	9	+23	3.6	3.8	2.65x10 ⁹	1.5x10 ¹⁰	4.75x10 ³	1.5x10 ⁴	0.5 - 1.75	2	5	Flat Sapphire	-40 to +85
BXP-35F	40333	3 mm x 3 mm	TO5	9	+23	3.6	3.8	5.0x10 ⁹	1.5x10 ¹⁰	6.0x10 ³	1.0x10 ⁴	0.5 - 1.0	2	5	2.4 μm Longpass Ge Filter	-40 to +85
BXP Series - Uncooled PbSe Flat Plate IR Detectors				Typ.	Ambient 23	Min.	Typ.	Min.	Typ.	Min.	Typ.	Range	Typ.	Max.		Range
BXF-1E	40042	1 mm x 1 mm	Flat Plate	1	+23	3.6	3.8	1.0x10 ¹⁰	2.0x10 ¹⁰	2.0x10 ⁴	3.0x10 ⁴	0.5 - 1.5	2	5	n/a	-40 to +85
BXF-2	40044	2 mm x 2 mm	Flat Plate	4	+23	3.6	3.8	1.0x10 ¹⁰	2.0x10 ¹⁰	1.2x10 ⁴	1.5x10 ⁴	0.5 - 2.0	2	5	n/a	-40 to +85
BXF-4	40046	4 mm x 4 mm	Flat Plate	16	+23	3.6	3.8	1.0x10 ¹⁰	1.5x10 ¹⁰	5x10 ³	7.5x10 ³	0.2 - 2.5	2	5	n/a	-40 to +85
BXF-6	40206	6 mm x 6 mm	Flat Plate	36	+23	3.6	3.8	1.0x10 ¹⁰	1.5x10 ¹⁰	5x10 ³	-	0.4 - 1.5	2	5	n/a	-40 to +85
BXT1 Series - One Stage Cooled PbSe Packaged IR Detectors				Typ.	Ambient 25	Min.	Typ.	Min.	Typ.	Min.	Typ.	Range	Typ.	Max.		Range
BXT1-28TE	40521	2 mm x 2 mm	TO8	4	-25	4.0	4.2	1.4x10 ¹⁰	2.8x10 ¹⁰	2.0x10 ⁴	3.0x10 ⁴	0.5-10.0	6	12	Flat Sapphire	-40 to +85
BXT1-37T	40136	3 mm x 3 mm	TO37	9	-25	4.0	4.2	1.4x10 ¹⁰	2.8x10 ¹⁰	1.3x10 ⁴	2.0x10 ⁴	0.5-10.0	6	12	Flat Sapphire	-40 to +85
BXT2 Series - Two Stage Cooled PbSe Packaged IR Detectors				Typ.	Ambient 25	Min.	Typ.	Min.	Typ.	Min.	Typ.	Range	Typ.	Max.		Range
BXT2-17T	40174	1 mm x 1 mm	TO37	1	-35	4.1	4.3	1.6x10 ¹⁰	-	6.6x10 ⁴	-	1.0 - 15.0	8	14	Flat Sapphire	-40 to +85
BXT2-17TF	40065	1 mm x 1 mm	TO37	2	-30	4.1	4.3	2.4x10 ¹⁰	-	1.2x10 ⁵	-	1.5 - 7.0	8	14	4.7 μm Bandpass Si Filter	-40 to +85
BXT2-27	40587	2 mm x 2 mm	TO37	4	-30	4.1	4.3	1.8x10 ¹⁰	-	3.0x10 ⁴	-	1.0 - 4.5	8	14	Flat Sapphire	-40 to +85
BXT2-37T	40071	3 mm x 3 mm	TO37	9	-35	4.1	4.3	1.6x10 ¹⁰	-	2.2x10 ⁴	-	1.0 - 15.0	8	14	Flat Sapphire	-40 to +85
BXT2S-28T	40186	2 mm x 2 mm	TO8	4	-45	4.3	4.5	2.0x10 ¹⁰	3.5x10 ¹⁰	5.0x10 ⁴	7.5x10 ⁴	1.0 - 15.0	12	25	Flat Sapphire	-40 to +85
BXT2S-38T	40203	3 mm x 3 mm	TO8	9	-45	4.3	4.5	2.0x10 ¹⁰	3.5x10 ¹⁰	3.3x10 ⁴	5.0x10 ⁴	1.0 - 15.0	12	25	Flat Sapphire	-40 to +85
BXT2S-68TE	40076	6 mm x 6 mm	TO8	36	-25	4.3	4.5	1.5x10 ¹⁰	-	1.65x10 ⁴	2.5x10 ⁴	1.0 - 15.0	12	25	Flat Sapphire	-40 to +85

¹ Specifications apply at a bias voltage (V_{bias}) of 25 V/mm for cooled and 35 V/mm for uncooled detectors with either a 1 MΩ or 0.5 MΩ load resistor in series.

² Specifications apply at maximum cooling with a heat sink at +25 °C. Typical cooler power at max cooling: BXT1 0.8 V @ 1.5 A, BXT2 0.8 V @ 1.2 A, BXT2S 1.9 V @ 1.2 A.

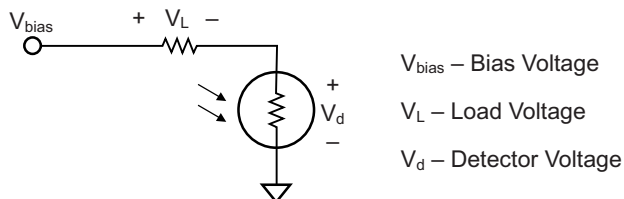
³ Max rated element temperature is 85 °C.

IR Detectors – B Series

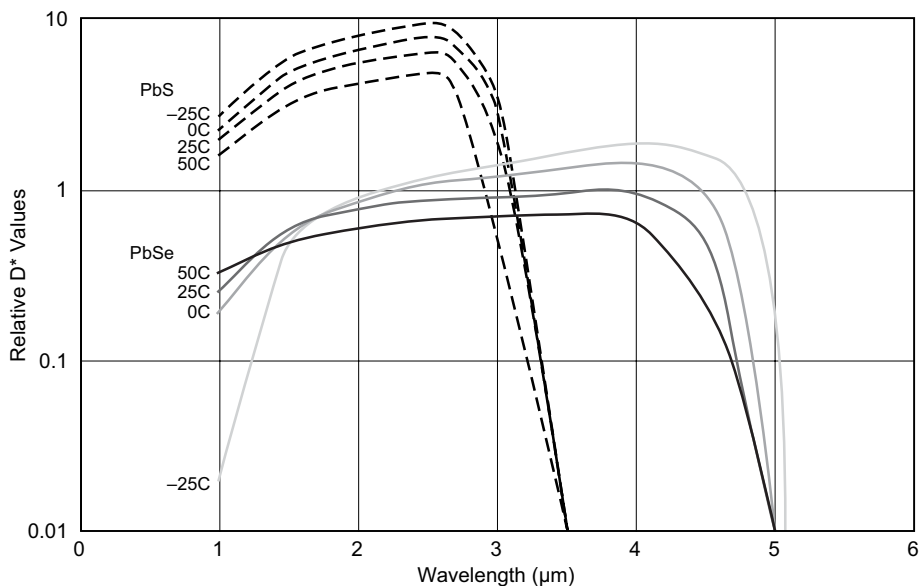
High Performance Lead Selenide (PbSe) Single Channel

Uncooled and Cooled Devices

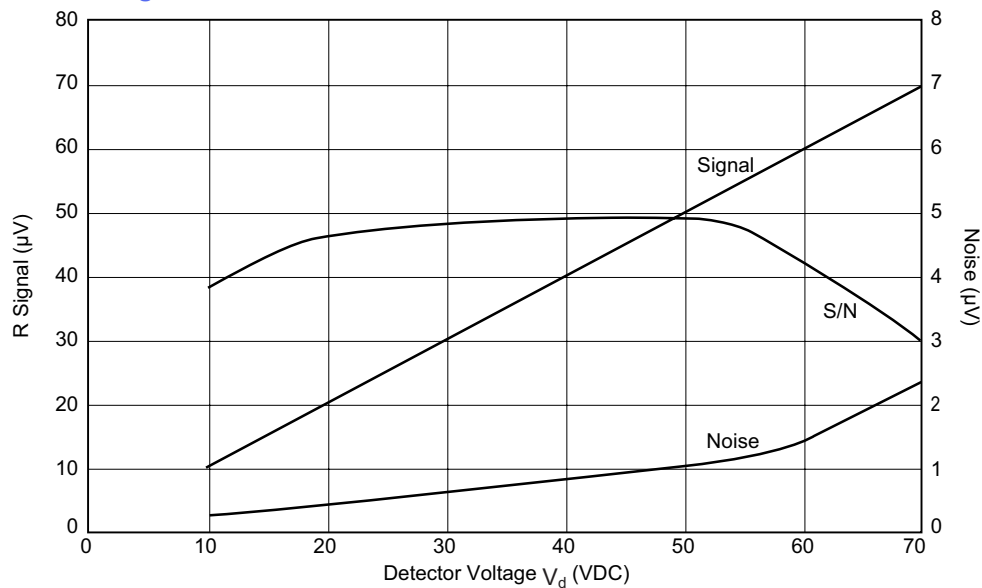
Detector Biasing



Detector Spectral Response



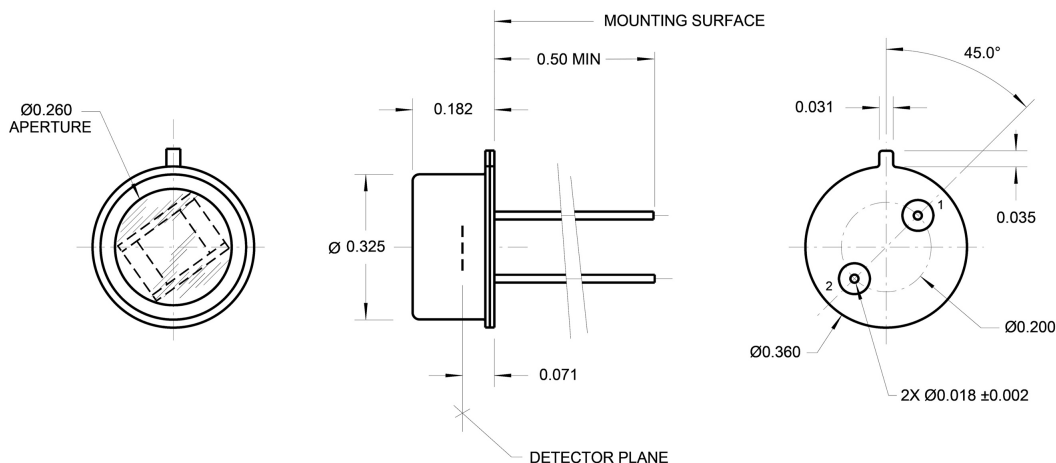
Typical S/N vs Detector Voltage at 25 °C for a 2 mm x 2 mm Detector



IR Detectors – B Series High Performance Lead Selenide (PbSe) Single Channel Uncooled and Cooled Devices

TO5 Packages

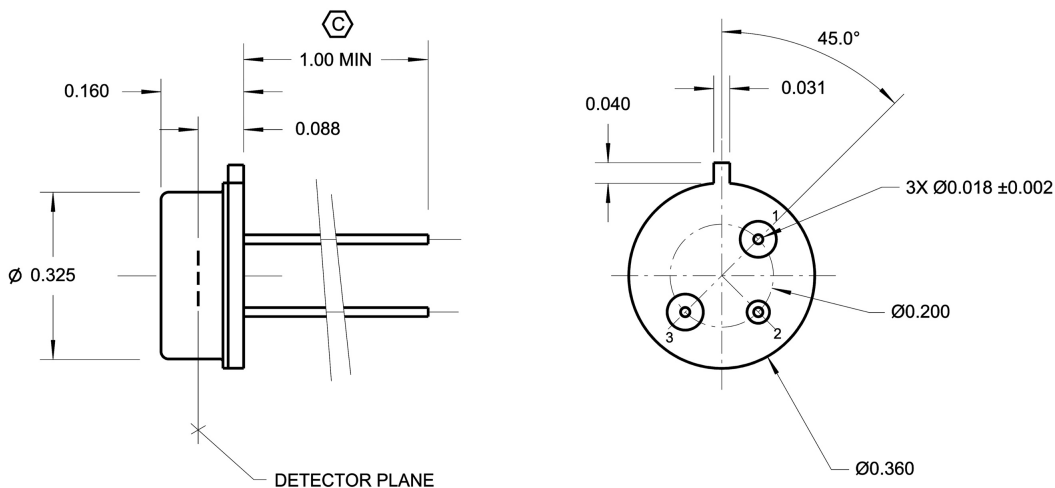
40333



Package and Pin Out Information

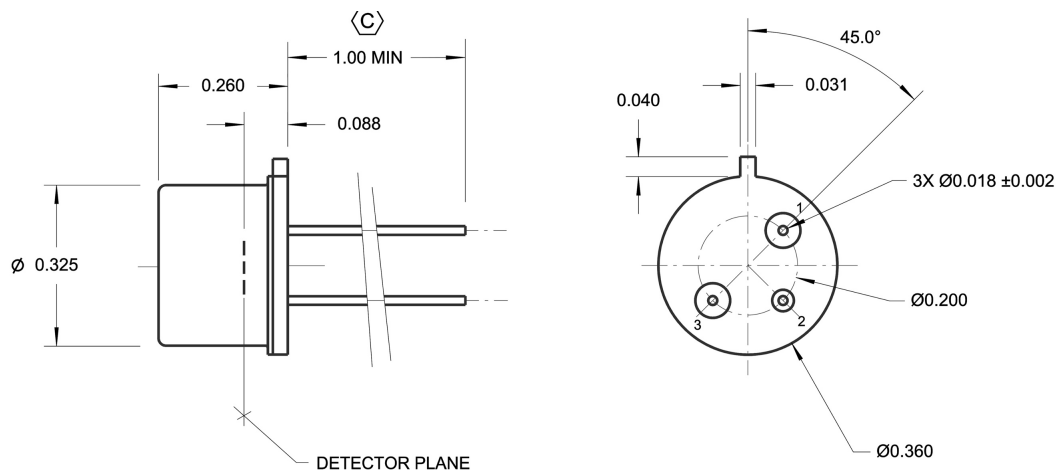
Pin No.	Function
1	Detector
2	Detector/Gnd

40055, 40573



Pin No.	Function	Color
1	Detector	Bare
2	Case Gnd	Bare
3	Detector	Bare

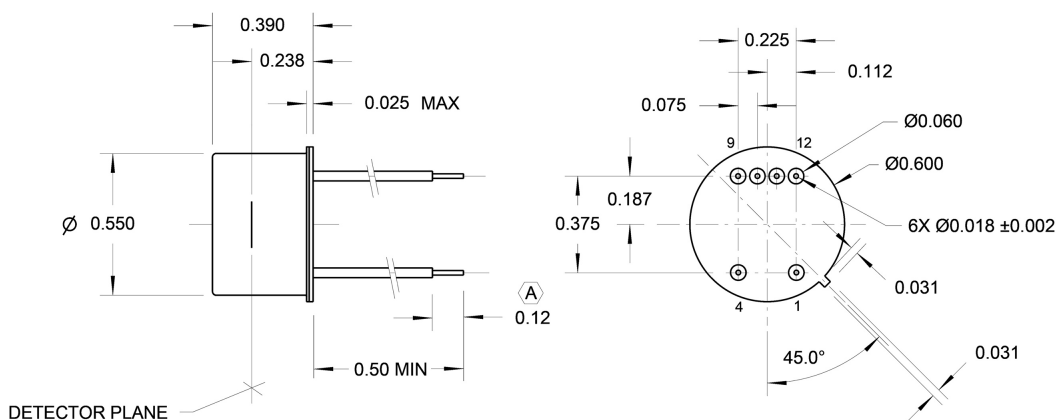
40785



Pin No.	Function
1	Detector
2	Case/Gnd
3	Detector

TO8 Packages

40070



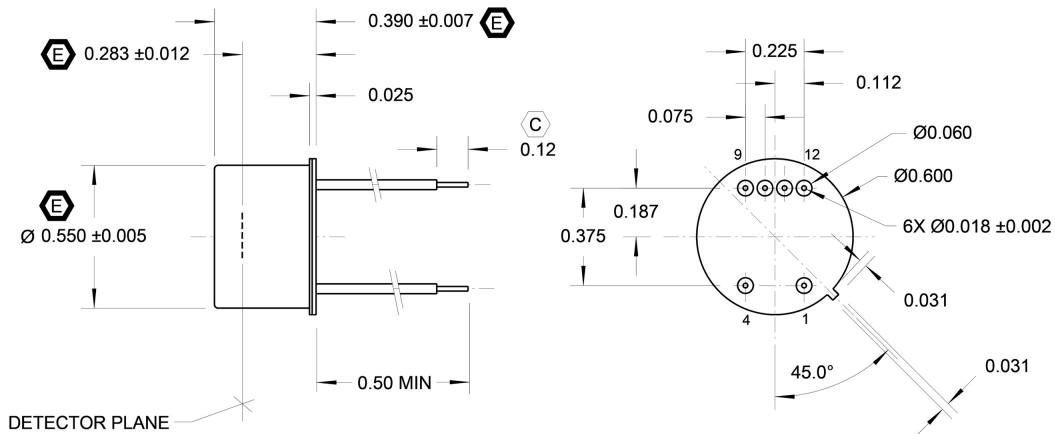
Pin No.	Function
1	Cooler (–)
4	Cooler (+)
9	Detector
10	Thermistor
11	Thermistor
12	Detector

IR Detectors – B Series

High Performance Lead Selenide (PbSe) Single Channel

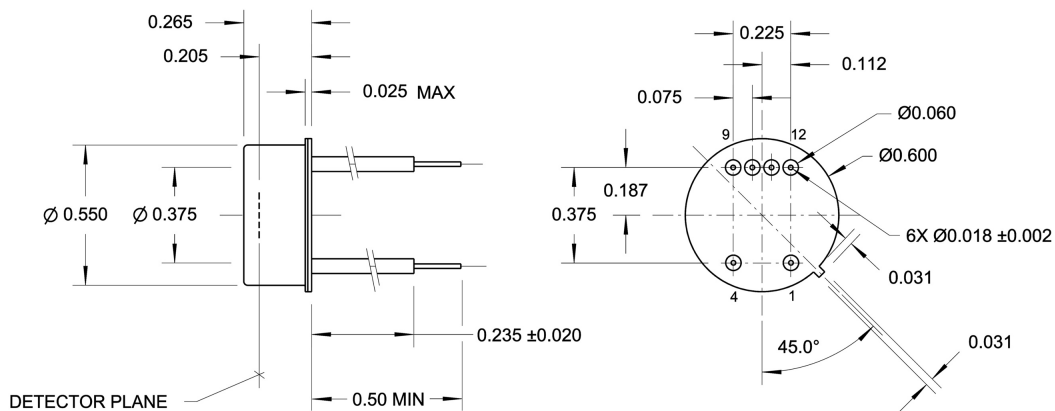
Uncooled and Cooled Devices

40076, 40186, 40203



Pin No.	Function
1	Cooler (–)
4	Cooler (+)
9	Detector
10	Thermistor
11	Thermistor
12	Detector

40521



Pin No.	Function
1	Cooler (–)
4	Cooler (+)
9	Detector
10	Thermistor
11	Thermistor
12	Detector

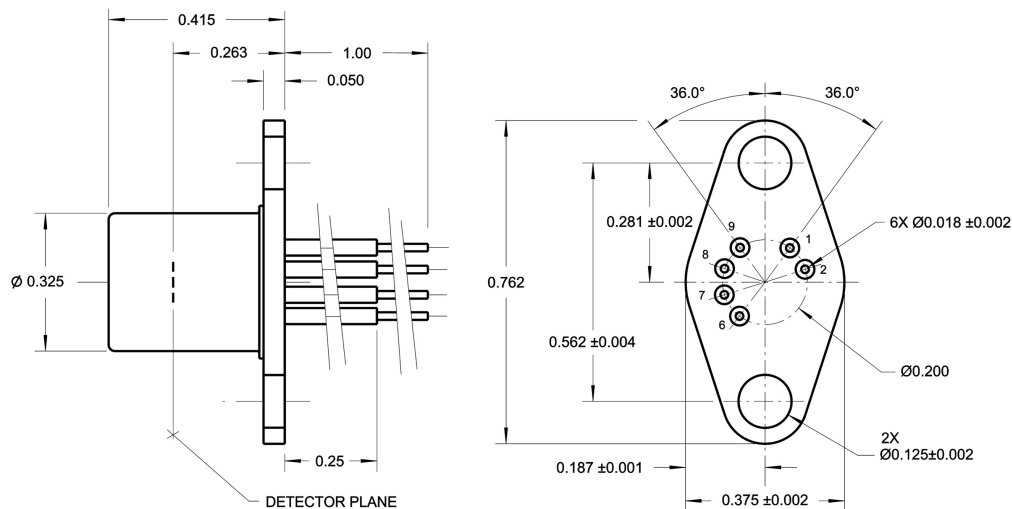
IR Detectors – B Series

High Performance Lead Selenide (PbSe) Single Channel

Uncooled and Cooled Devices

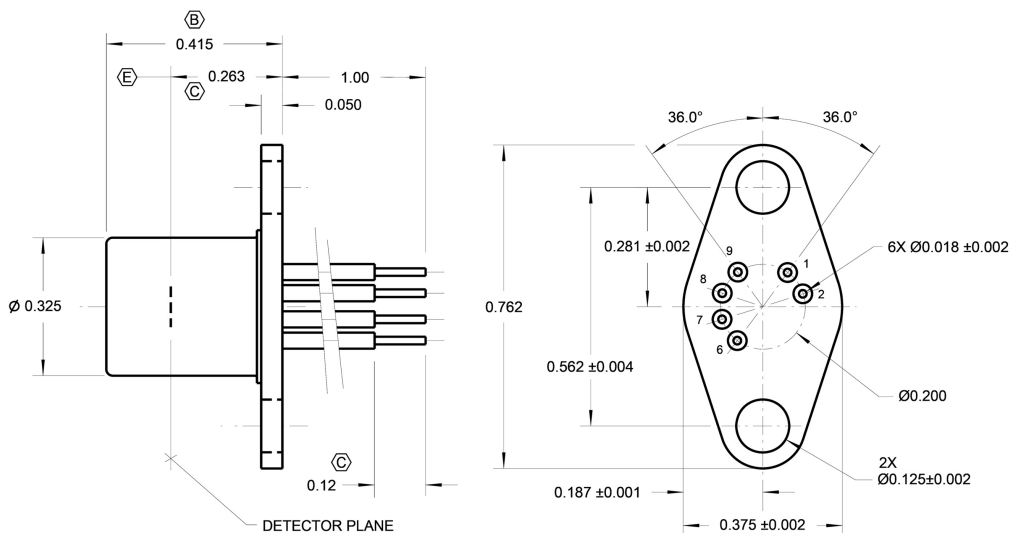
TO37 Packages

40065



Pin No.	Function
1	Thermistor
2	Thermistor
6	Detector
7	Detector
8	Cooler (-)
9	Cooler (+)

40071, 40174



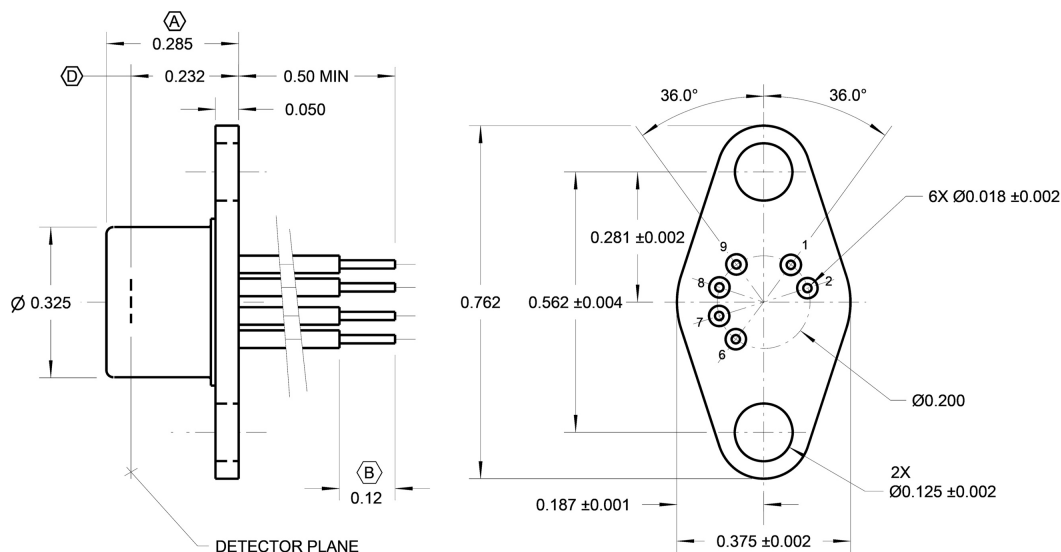
Pin No.	Function
1	Thermistor
2	Thermistor
6	Detector
7	Detector
8	Cooler (-)
9	Cooler (+)

IR Detectors – B Series

High Performance Lead Selenide (PbSe) Single Channel

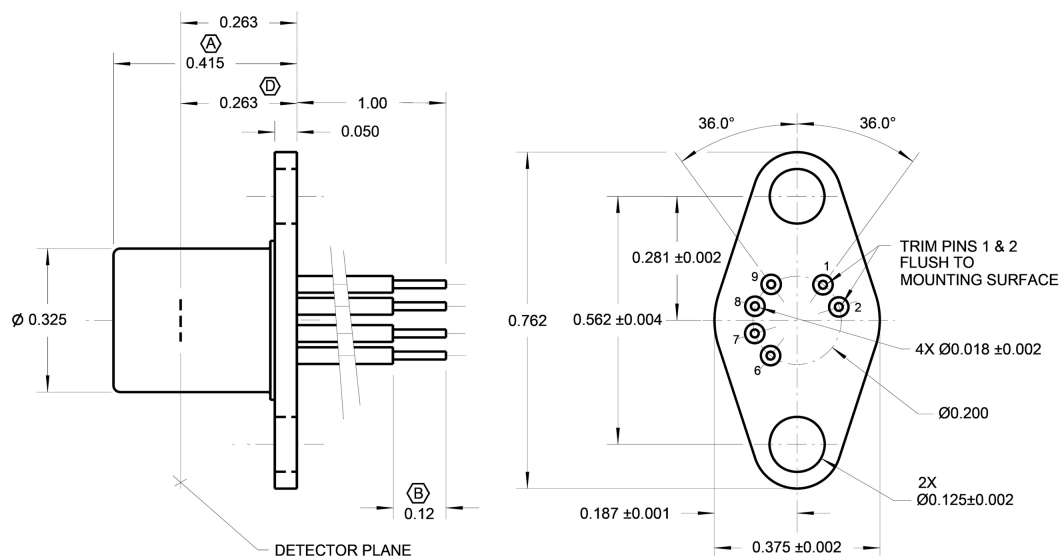
Uncooled and Cooled Devices

40136



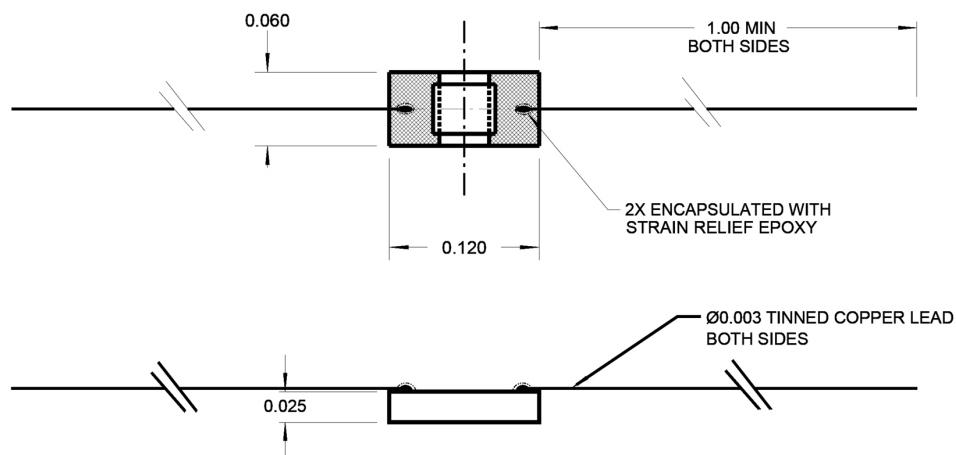
Pin No.	Function
1	Thermistor
2	Thermistor
6	Detector
7	Detector
8	Cooler (-)
9	Cooler (+)

40587



Pin No.	Function
1	(Removed)
2	(Removed)
6	Detector
7	Detector
8	Cooler (-)
9	Cooler (+)

40042



Technical drawing of a rectangular component with dimensions and tolerances. The drawing includes a top view and a side view.

Top View Dimensions:

- Overall width: 0.180 (-B-)
- Overall height: 0.100 (-A-)
- Active area width: 0.089 (top) / 0.069 (bottom)
- Active area height: 0.089 (right) / 0.069 (left)
- Feature control frame: $\oplus \varnothing 0.010 \text{ A B}$
- Feature: 2 CHARS (indicated by a feature control frame with a 'D' symbol)

Side View Dimensions:

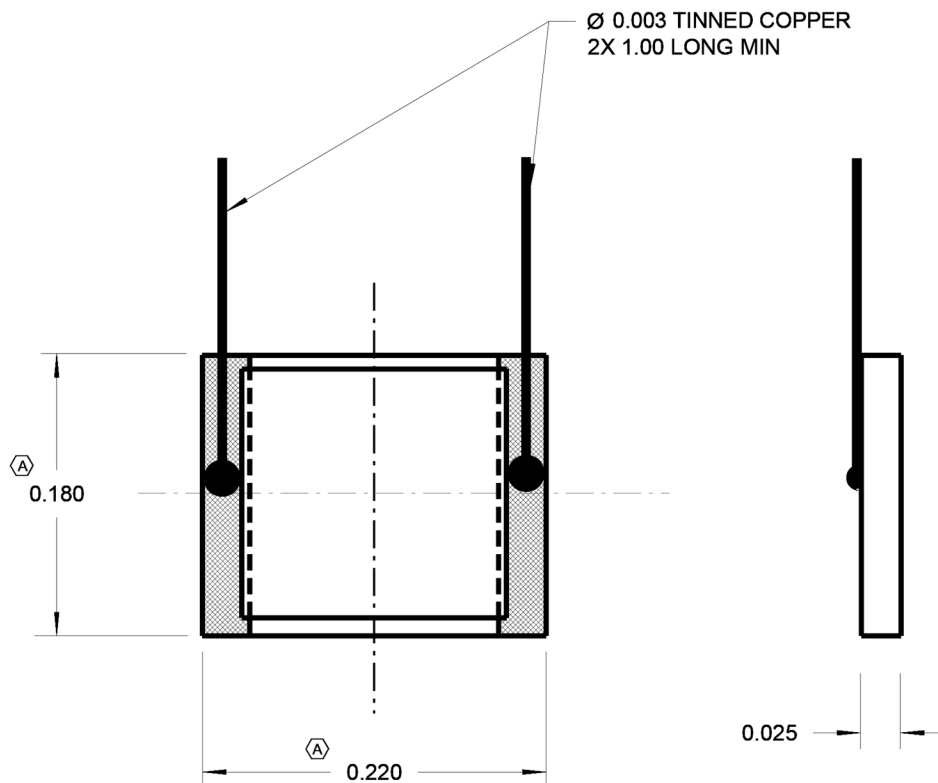
- Overall thickness: 0.033 (top) / 0.020 (bottom)

IR Detectors – B Series

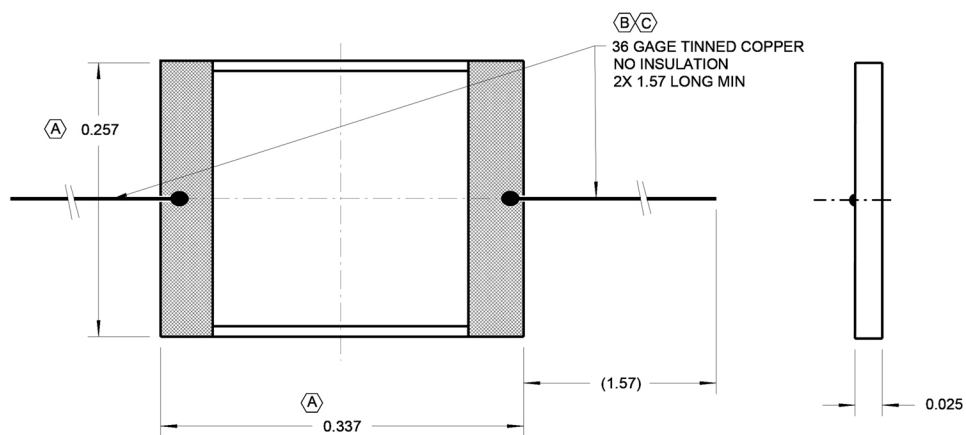
High Performance Lead Selenide (PbSe) Single Channel

Uncooled and Cooled Devices

40046



40206





From Deep UV to Mid-IR

OPTO DIODE
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IR Detectors – B Series
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Uncooled and Cooled Devices