



Infrared Materials

The Leader in High Performance IR Detectors

PbSe

MID-WAVE IR DETECTORS

1.0 TO 5.5 MICRONS

HIGHEST SENSITIVITY IN THE 1 - 5 MICRON BAND

OFF-THE-SHELF AND CUSTOM DESIGNS AVAILABLE

BEST COST TO PERFORMANCE VALUE

WWW.INFRARED MATERIALS.COM

707-620-0160



SCAN ME



PbSe (B-SERIES) PHOTOCONDUCTIVE IR DETECTORS

Applications:

- Gas Analysis and Detection
- Greenhouse Gas Monitoring
- Temperature & Flame Monitoring
- Fire and Spark Detection
- Emissions Monitoring
- Process and Quality Control

Markets:

- Medical (CO₂), Industrial (CO, HC)
- Environmental, Biotechnical
- Railway, Combustion Efficiency
- Industrial Safety
- Automotive, Tunnel Safety, Stack Emissions (NO_x)
- Glass, Plastic, Petrochemical, Coal, Steel Industries



	Model Number	Element Size (mm)	Wavelength Peak Signal (μm)	D* λ _{pk} , 1050Hz, 1Hz (cm Hz ^{1/2} W ⁻¹)	Responsivity λ _{pk} , 1050Hz (VW ⁻¹)		Dark Resistance (MΩ)	Time Constant (μsec)	Operating Temp (°C)	ΔT at Max Cool (°C)	Standard Package Options
					Minimum	Typical					
Ambient Detectors (Uncooled)	B1-5	1 x 1	3.8 typ	1.4x10 ¹⁰ min 2.0x10 ¹⁰ typ	22,000	44,000	0.1 - 3.5	2	+23	N/A	TO-5
	B2-5	2 x 2			11,250	22,500					TO-5
	B3-5	3 x 3			7,400	14,800					TO-5
2 Watt 2-Stage TE Cooled Detectors ¹	B1-7C3T	1 x 1	4.3 typ	1.6x10 ¹⁰ min 3.0x10 ¹⁰ typ	66,000	100,000	1.0 - 15.0	9	-35	55 min 60 typ	TO-37
	B2-7C3T	2 x 2			33,000	50,000					TO-37
	B3-7C3T	3 x 3			22,000	33,000					TO-37
3 Watt 2-Stage TE Cooled Detectors ²	B1-8C4T	1 x 1	4.5 typ	2.0x10 ¹⁰ min 3.5x10 ¹⁰ typ	126,000	190,000	1.0 - 20.0	12	-50	70 min 75 typ	TO-8, TO-66
	B2-8C4T	2 x 2			63,000	95,000					TO-8, TO-66
	B3-8C4T	3 x 3			38,000	56,000			-45		TO-8, TO-66

Ambient specifications apply using a 500°K blackbody and bias of 50 V/mm across the detector and a 1 Megohm load resistor in series.

TE Cooled specifications apply using a 500°K blackbody and bias of 35 V/mm across the detector and a 1 Megohm load resistor in series.

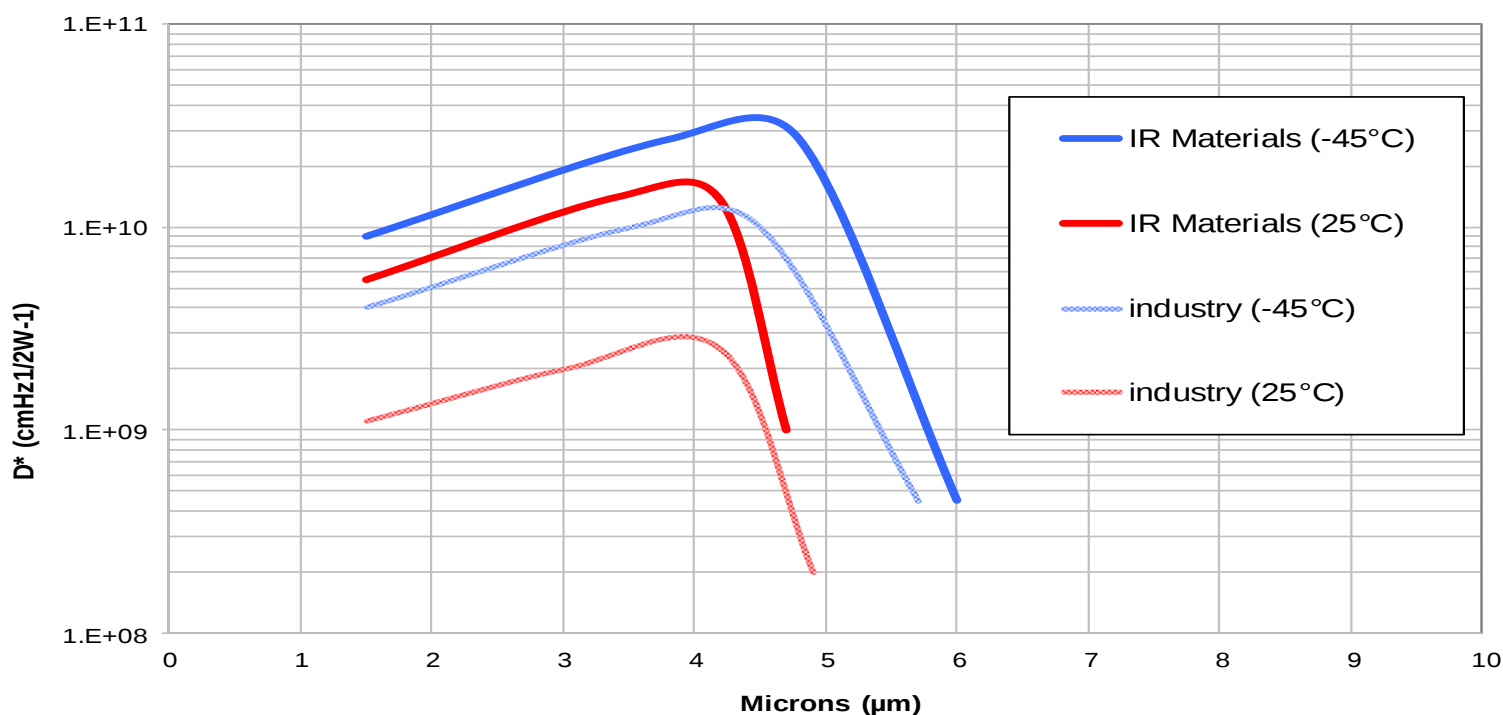
At or near max. cooling from a +25°C heatsink. Units are hermetically sealed with a sapphire or silicon window.

Max. rated element temperature is +85°C.

1 Typical max. cooling power 0.9W at 1.2A

2 Typical max. cooling power 1.8W at 1.2A

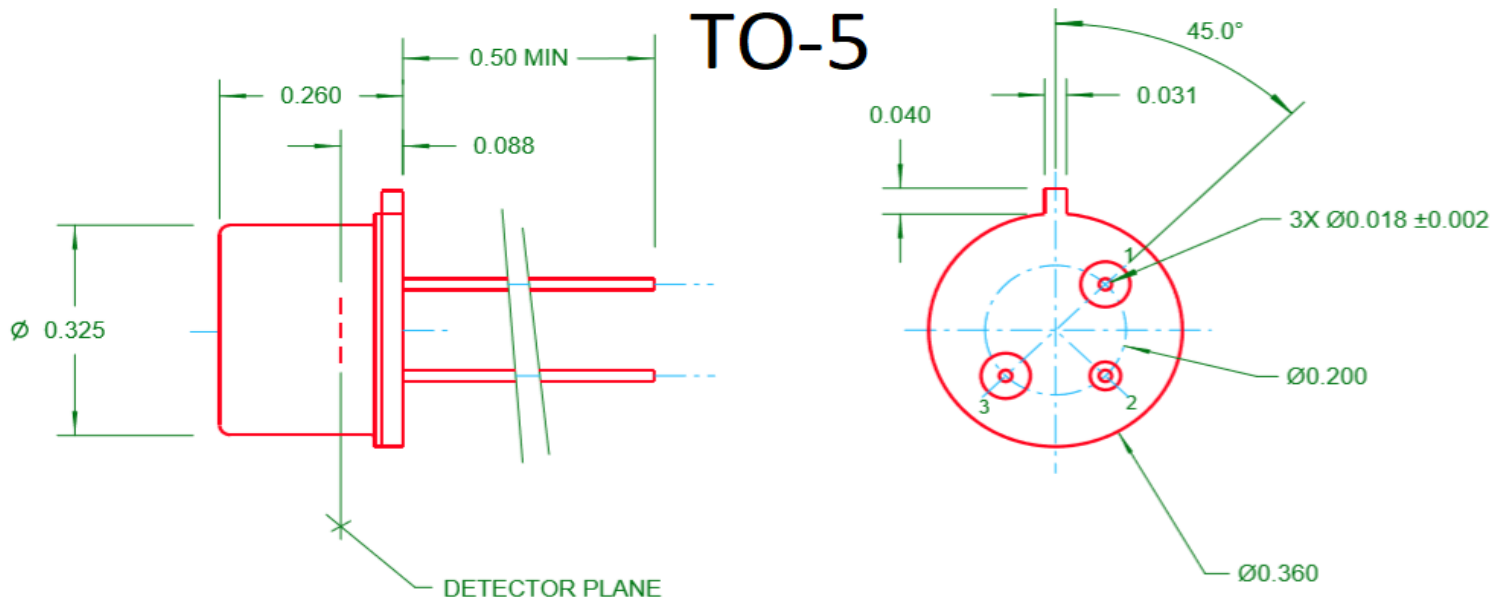
Typical Industry vs. Infrared Materials Performance



PbSe (B-SERIES) PHOTOCONDUCTIVE IR DETECTORS

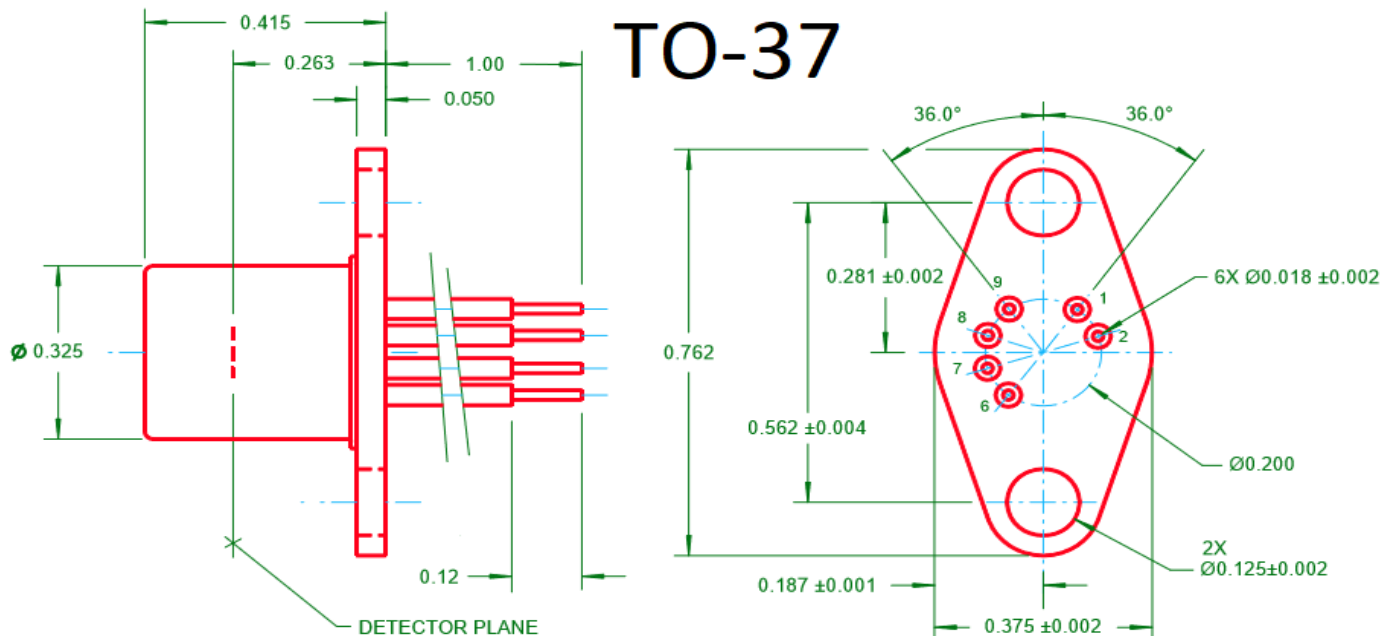


TO-5



PIN NO.	PIN FUNCTIONS		COLOR
	FUNCTION		
1	DETECTOR		BARE
2	CASE GND		BARE
3	DETECTOR		BARE

TO-37



PIN NO.	PIN FUNCTIONS		COLOR
	FUNCTION		
1	THERMISTOR		YELLOW
2	THERMISTOR		YELLOW
6	DETECTOR		WHITE
7	DETECTOR		WHITE
8	COOLER (-)		BLACK
9	COOLER (+)		RED

The technical drawing illustrates the detector assembly from two perspectives: a side view on the left and a top view on the right.

Side View Dimensions:

- Overall width: 0.283 ± 0.012
- Top flange thickness: 0.390 ± 0.007
- Flange gap: 0.025
- Pin length: 0.12
- Main body diameter: $\varnothing 0.550 \pm 0.005$
- Pin mounting distance: 0.50 MIN

Top View Dimensions:

- Pin pitch: 0.225
- Pin offset: 0.112
- Pin diameter: $\varnothing 0.060$
- Mounting hole diameter: $\varnothing 0.600$
- Mounting holes: $6 \times \varnothing 0.018 \pm 0.002$
- Pin 9 position: 0.075
- Pin 12 position: 0.187
- Pin 4 position: 0.375
- Pin 1 position: 0.031
- Angle: 45.0°
- Pin 12 length: 0.031

PIN FUNCTIONS TABLE:

PIN NO.	PIN FUNCTIONS FUNCTION	COLOR
1	COOLER (-)	BLACK
4	COOLER (+)	RED
9	DETECTOR	WHITE
10	THERMISTOR	YELLOW
11	THERMISTOR	YELLOW
12	DETECTOR	WHITE

A dashed red line indicates the DETECTOR PLANE.

OPTIONAL

CHOPPING FREQUENCY RANGES:
PbS = 1 - 630 Hz
PbSe = 1 - 1000 Hz
(higher frequency reduces 1/f noise)

IR SOURCE → CHOPPER WHEEL (if Source not modulated)

V_b PbS: 50V/mm between electrodes
PbSe (uncooled): 50V/mm between electrodes
PbSe (cooled): 35V/mm between electrodes

(match R_b with R_d - Dark Resistance - for maximum signal)

R_b 1 MΩ nominal

C_{in} 15 nF

R_d PbS or PbSe

Thermistor

TEC

R_{in} 10 MΩ

R_f 1 MΩ

R_g 100 kΩ

C_f 220 pF

$V_{in} = (V_b) \cdot \frac{(R_b \cdot R_d) \cdot \Delta R_d}{(R_b + R_d)^2 \cdot R_d}$ VAC
where ΔR_d = the change in detector resistance due to the incident IR radiation.

LT 1055

C_1 0.1 μ F

C_2 0.1 μ F

V_o

GND TEC+ TEC- THERM GND CASE