

PbSe Detectors Cooled Standard PB50-Series

Description

The PB50 series is a collection of TE cooled polycrystalline biased single element PbSe detectors that operate at -20°C to -35°C with a 20% cut-off of $4.9\ \mu\text{m}$. This series has been designed for demanding analytic, medical and radiometric applications.

Features

- Spectral range from 1 to $4.9\ \mu\text{m}$
- State of the art performance
- 100% test data

Applications

- Non-dispersive infrared gas analysis
- Medical CO_2 detection
- Non-contact temperature measurement
- Flame detection
- Moisture monitoring

Versions

- TO-can (TO-37, TO-8 with flange (TO-66))
- Sapphire window as standard
- Custom versions available



Basic Characteristics

Part Number	Element Size [mm]	Aperture Size [mm]	Features	20% Cut-off Wavelength [μm] ^b	Peak Wavelength [μm] ^b	Peak Responsivity [V/W] ^{ac}		Time Constant [μs] ^b	
				Typ.	Typ.	Min.	Typ.	Typ.	Max.
PB50S1010T17M	1.0 x 1.0	6.35	1 stage cooling (max. 1.6 W), TO-37, medium cap	4.8	4.2	48000	72000	8	20
PB50S2020T17M	2.0 x 2.0	6.35	1 stage cooling (max. 1.6 W), TO-37, medium cap	4.8	4.2	24000	36000	8	20
PB50S3030T17M	3.0 x 3.0	6.35	1 stage cooling (max. 1.6 W), TO-37, medium cap	4.8	4.2	16000	24000	8	20
PB50S1010T26L	1.0 x 1.0	9.53	2 stage cooling (max. 1.4 W), TO-8 flange, large cap	4.9	4.3	79000	120000	10	25
PB50S2020T26L	2.0 x 2.0	9.53	2 stage cooling (max. 1.4 W), TO-8 flange, large cap	4.9	4.3	39500	60000	10	25
PB50S3030T26L	3.0 x 3.0	9.53	2 stage cooling (max. 1.4 W), TO-8 flange, large cap	4.9	4.3	26300	40000	10	25

Further Versions in progress

Notes:

- ^a Measured with 500 K blackbody. Bias is 30 V/mm with 1 MOhm load in series. Chopping frequency is 1 kHz.
- ^b Parameter not 100% tested.
- ^c Without filter/window

Cooling Characteristics

Part Number	Element Size [mm]	Typ. Detector Operating Temperature [°C] ^b	Max. Cooling	Delta T @ max. Cool [°C] ^a		Optional Package Versions
				Min.	Typ.	
PB50S1010T17M	1.0 x 1.0	-20	1.2 V @ 1.4 A	40	45	TO-8
PB50S2020T17M	2.0 x 2.0	-20	1.2 V @ 1.4 A	40	45	TO-8
PB50S3030T17M	3.0 x 3.0	-20	1.2 V @ 1.4 A	40	45	TO-8
PB50S1010T26L	1.0 x 1.0	-35	1.2 V @ 1.2 A	55	60	TO-8, TO-37
PB50S2020T26L	2.0 x 2.0	-35	1.2 V @ 1.2 A	55	60	TO-8, TO-37
PB50S3030T26L	3.0 x 3.0	-35	1.2 V @ 1.2 A	55	60	TO-8, TO-37

^a Values are valid for TO-66 and TO-8 packages. Delta T is typically reduced by 5 K for TO-37 packages.

^b Valid with sufficient heat sinking only!

Electro-Optical Characteristics

Part Number	Element Size [mm]	Noise Density (rms) [$\mu\text{V}/\text{Hz}^{1/2}$] ^a		Peak D* [$\text{cm Hz}^{1/2}/\text{W}$] ^{abc}		Peak D* [$\text{cm Hz}^{1/2}/\text{W}$] ^{ac}		Dark Resistance [MOhm/square]		
		@ 90 Hz ^b	@ 1 kHz	@ 90 Hz	@ 90 Hz	@ 1 kHz	@ 1 kHz	Min.	Typ.	Max.
		Typ.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Max.
PB50S1010T17M	1.0 x 1.0	TBD	TBD	5.3 E+9	1.1 E+10	1.6 E+10	3.2 E+10	0.5	4.0	10.0
PB50S2020T17M	2.0 x 2.0	TBD	TBD	5.3 E+9	1.1 E+10	1.6 E+10	3.2 E+10	0.5	4.0	10.0
PB50S3030T17M	3.0 x 3.0	TBD	TBD	5.3 E+9	1.1 E+10	1.6 E+10	3.2 E+10	0.5	4.0	10.0
PB50S1010T26L	1.0 x 1.0	TBD	TBD	5.5 E+9	1.1 E+10	1.7 E+10	3.2 E+10	1.0	5.0	15.0
PB50S2020T26L	2.0 x 2.0	TBD	TBD	5.5 E+9	1.1 E+10	1.7 E+10	3.2 E+10	1.0	5.0	15.0
PB50S3030T26L	3.0 x 3.0	TBD	TBD	5.5 E+9	1.1 E+10	1.7 E+10	3.2 E+10	1.0	5.0	15.0

Notes:

^a Measured with 500 K blackbody. Bias is 30 V/mm with 1 MOhm load in series. Bandwidth of test setup is 1 Hz.

^b Parameter not 100% tested.

^c Without filter/window

All specifications apply at or near max. cooling temp. with heat sink at +25°C.

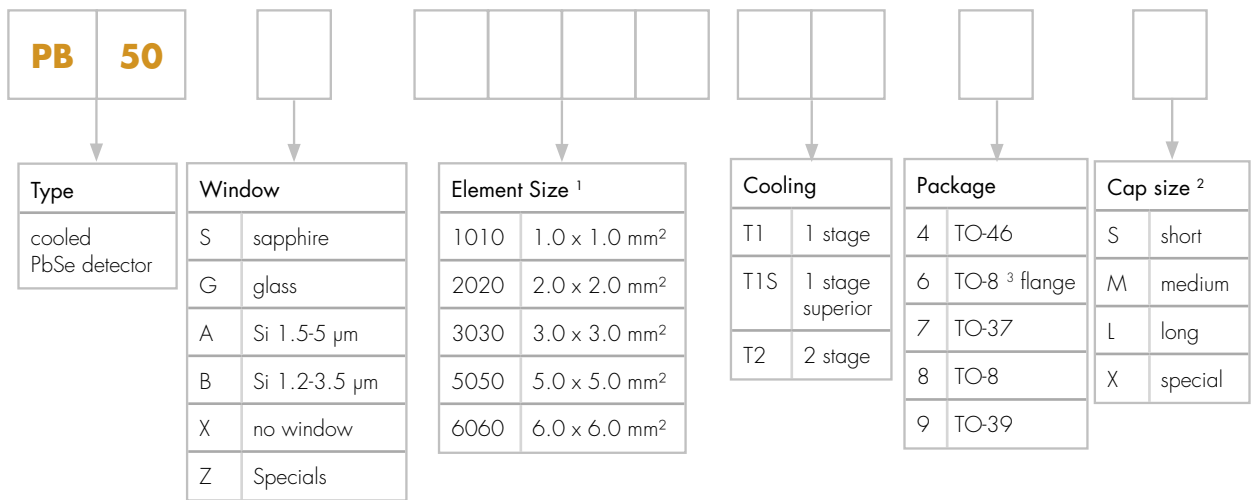
Absolute Maximum Ratings

		Min.	Max.	Units
Storage Temperature		- 70	+ 95	°C
Operating Temperature		- 65	+ 90	°C
Soldering Temperature (for 5 sec)			+ 250 (at pins only)	°C
ESD Damage Threshold (Human Body Model Class 3B ^a)		8000		V
TE-Cooler Voltage ^b	T1/T2	-	1.2	V
TE-Cooler Current ^b	T1	-	1.4	A
	T2		1.2	A

^a ANSI/ESD STN5. 1-2007

^b Valid with sufficient heat sinking only!

Part Number Designations



¹ For rectangular elements: space between electrodes first

² Please see supplementary dataset "PbS/PbSe-Detectors Package Drawings" for details

³ TO-8 with copper flange (equal TO-66)

Package Drawings

All standard packages, dimensions and tolerances are shown in our supplementary datasheet „PbS- / PbSe Detectors - Package Drawings & Cooling Specifications“.

Product Changes

LASER COMPONENTS reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed as a result of their use or application.

Ordering Information

Products can be ordered directly from LASER COMPONENTS or its representatives. For a complete listing of representatives, visit our website at www.lasercomponents.com