

## PbSe Detectors Cooled Ultimate PB55-Series

### Description

The PB55 series is a collection of TE cooled photoconductive single element PbSe detectors that operate at -45 °C to -55 °C with a 20% cut-off of 5.2  $\mu\text{m}$ . This series has been designed for demanding analytic, medical and radiometric applications.

### Features

- Spectral range from 1 to 5.2  $\mu\text{m}$
- State of the art performance
- 100% test data

### Applications

- Non-dispersive infrared gas analysis
- Medical CO<sub>2</sub> detection
- Non-contact temperature measurement
- Flame detection
- Moisture monitoring

### Versions

- TO-can (TO-8, 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] <sup>b</sup> | Peak Wavelength [μm] <sup>b</sup> | Peak Responsivity [V/W] <sup>a,c</sup> |        | Time Constant [μs] <sup>b</sup> |      |
|----------------|-------------------|--------------------|--|--|-----------------------------------|--|--------|---------------------------------|------|
|                |                   |                    |  | Typ.                                     | Typ.                              | Min.                                   | Typ.   | Typ.                            | Max. |
| PB55S1010T2S6L | 1.0 x 1.0         | dia. 9.53          | 2 stage (max. 3.0 W) cooling, TO-8 flange, large cap | 5.2                                      | 4.6                               | 120000                                 | 180000 | 12                              | 30   |
| PB55S2020T2S6L | 2.0 x 2.0         | dia. 9.53          | 2 stage (max. 3.0 W) cooling, TO-8 flange, large cap | 5.2                                      | 4.6                               | 60000                                  | 90000  | 12                              | 30   |
| PB55S3030T2S6L | 3.0 x 3.0         | dia. 9.53          | 2 stage (max. 3.0 W) cooling, TO-8 flange, large cap | 5.2                                      | 4.6                               | 40000                                  | 60000  | 12                              | 30   |
| PB55S5050T2S6L | 5.0 x 5.0         | dia. 9.53          | 2 stage (max. 3.0 W) cooling, TO-8 flange, large cap | 5.2                                      | 4.6                               | 24000                                  | 36000  | 12                              | 30   |
| PB55S6060T2S6L | 6.0 x 6.0         | dia. 9.53          | 2 stage (max. 3.0 W) cooling, TO-8 flange, large cap | 5.2                                      | 4.6                               | 20000                                  | 30000  | 12                              | 30   |

Further Versions in progress

### Notes:

<sup>a</sup> Measured with 500 K blackbody. Bias is 30 V/mm with 1 MOhm load in series.

Chopping frequency is 1 kHz.

<sup>b</sup> Parameter not 100% tested.

<sup>c</sup> Without filter/window

## Cooling Characteristics

| Part Number    | Element Size [mm] | Typ. Detector Operating Temperature [°C] <sup>c</sup> | Delta T @ max. Cool [°C] <sup>a,b</sup> |      | Optional Package Versions |
|----------------|-------------------|---|---|------|---------------------------|
|                |                   |   | Min.                                    | Typ. |                           |
| PB55S1010T2S6L | 1.0 x 1.0         | -50   | 70                                      | 75   | TO-8                      |
| PB55S2020T2S6L | 2.0 x 2.0         | -50   | 70                                      | 75   | TO-8                      |
| PB55S3030T2S6L | 3.0 x 3.0         | -45   | 65                                      | 70   | TO-8                      |
| PB55S5050T2S6L | 5.0 x 5.0         | -45   | 65                                      | 70   | TO-8                      |
| PB55S6060T2S6L | 6.0 x 6.0         | -40   | 65                                      | 70   | TO-8                      |

<sup>a</sup> Values are valid for TO-66 and TO-8 packages.

<sup>b</sup> Max. cooling: 2.2 V @ 1.4 Amps (typical).

<sup>c</sup> Valid with sufficient heat sinking only!

## Electro-Optical Characteristics

| Part Number    | Element Size [mm] | Noise Density (rms) [ $\mu\text{V}/\text{Hz}^{1/2}$ ] <sup>a</sup> |         | Peak D* [ $\text{cm Hz}^{1/2}/\text{W}$ ] <sup>a,b,c</sup> |          | Peak D* [ $\text{cm Hz}^{1/2}/\text{W}$ ] <sup>a,c</sup> |          | Dark Resistance [MOhm/square] |      |      |
|----------------|-------------------|--|---------|--|----------|--|----------|-------------------------------|------|------|
|                |                   | @ 90 Hz <sup>b</sup>   | @ 1 kHz | @ 90 Hz  | @ 90 Hz  | @ 1 kHz  | @ 1 kHz  | Min.                          | Typ. | Max. |
|                |                   | Typ.   | Typ.    | Min.   | Typ.     | Min.   | Typ.     |                               |      |      |
| PB55S1010T2S6L | 1.0 x 1.0         | TBD  | TBD     | 7.0 E+9  | 1.2 E+10 | 2.2 E+10   | 3.6 E+10 | 1.0                           | 6.0  | 20   |
| PB55S2020T2S6L | 2.0 x 2.0         | TBD  | TBD     | 7.0 E+9  | 1.2 E+10 | 2.2 E+10   | 3.6 E+10 | 1.0                           | 6.0  | 20   |
| PB55S3030T2S6L | 3.0 x 3.0         | TBD  | TBD     | 7.0 E+9  | 1.2 E+10 | 2.2 E+10   | 3.6 E+10 | 1.0                           | 6.0  | 20   |
| PB55S5050T2S6L | 5.0 x 5.0         | TBD  | TBD     | 6.8 E+9  | 1.0 E+10 | 1.8 E+10   | 3.2 E+10 | 1.0                           | 6.0  | 20   |
| PB55S6060T2S6L | 6.0 x 6.0         | TBD  | TBD     | 6.8 E+9  | 1.0 E+10 | 1.8 E+10   | 3.2 E+10 | 1.0                           | 6.0  | 20   |

### Notes:

<sup>a</sup> Measured with 500 K blackbody. Bias is 30 V/mm with 1 MOhm load in series.

Bandwidth of test setup is 1 Hz.

<sup>b</sup> Parameter not 100% tested.

<sup>c</sup> Without filter/window

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



## 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](http://www.lasercomponents.com)

**Germany & Other Countries**

Laser Components Germany GmbH  
Tel: +49 8142 2864 - 0  
Fax: +49 8142 2864 - 11  
[info@lasercomponents.com](mailto:info@lasercomponents.com)  
[www.lasercomponents.com](http://www.lasercomponents.com)

**France**

Laser Components S.A.S.  
Tel: +33 1 39 59 52 25  
Fax: +33 1 39 59 53 50  
[info@lasercomponents.fr](mailto:info@lasercomponents.fr)  
[www.lasercomponents.fr](http://www.lasercomponents.fr)

**United Kingdom**

Laser Components (UK) Ltd.  
Tel: +44 1245 491 499  
Fax: +44 1245 491 801  
[info@lasercomponents.co.uk](mailto:info@lasercomponents.co.uk)  
[www.lasercomponents.co.uk](http://www.lasercomponents.co.uk)

**Nordic Countries**

Laser Components Nordic AB  
Tel: +46 31 703 71 73  
Fax: +46 31 703 71 01  
[info@lasercomponents.se](mailto:info@lasercomponents.se)  
[www.lasercomponents.se](http://www.lasercomponents.se)

**USA**

Laser Components USA, Inc.  
Tel: +1 603 821 - 7040  
Fax: +1 603 821 - 7041  
[info@laser-components.com](mailto:info@laser-components.com)  
[www.laser-components.com](http://www.laser-components.com)