



L11/21 Series Single Channel Current Mode Pyroelectric Detectors

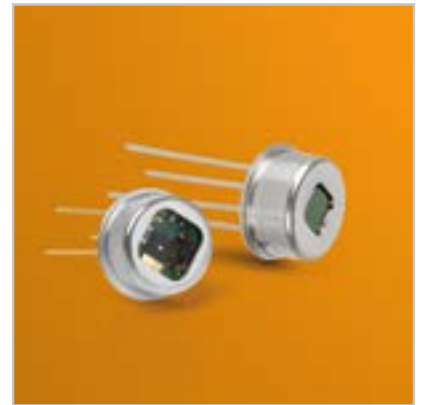
Description

Our L11/21 series of pyroelectric detectors are a collection of single channel LiTaO_3 devices operating in current mode with an integrated Op-Amp.

TFC (Temperature Fluxuation Compensation) is incorporated into all of our L21- series detectors via the use of an optically blind element.

Features

- Thermal based detector, any radiation absorbed produces a signal
- Wide spectral coverage from the UV to LWIR
- Modular design principle
- Microphonics reduction as standard
- Assembled in an ISO:9001 certified facility



Applications

- Non-dispersive infrared gas analysis
- Flame and fire detection
- Non-contact temperature measurement
- Flame control
- Moisture monitoring

Versions

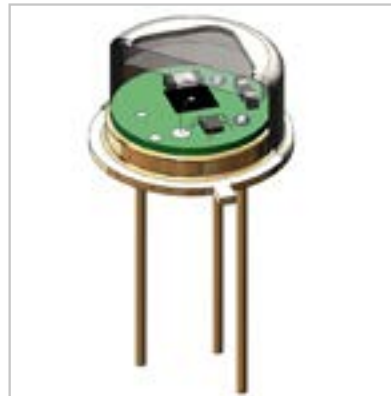
- Integrated Op-Amp (Split and Single Supply)
- Low and high speed devices available
- Wide range of window and filter options (including small and large apertures)
- A large aperture cap with $5 \times 5 \text{ mm}^2$ is available for applications such as flame detection that requires a wide field of view (FOV).
For applications where a smaller aperture is sufficient, example to keep stray light out in gas sensing, a $3.5 \times 3.5 \text{ mm}^2$ aperture is available.



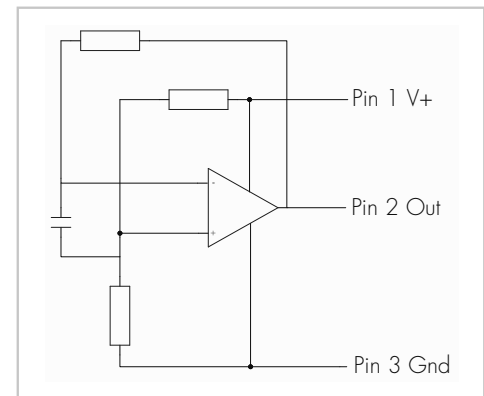
L1100D2020

- Single channel Pyroelectric detector
- Current mode
- Single supply
- Without TFC

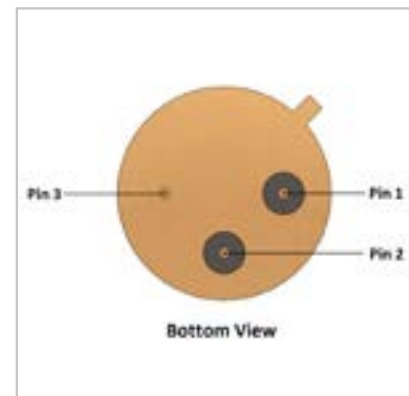
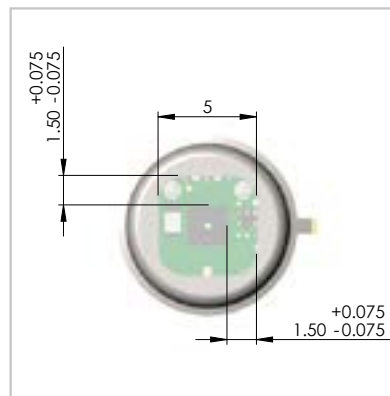
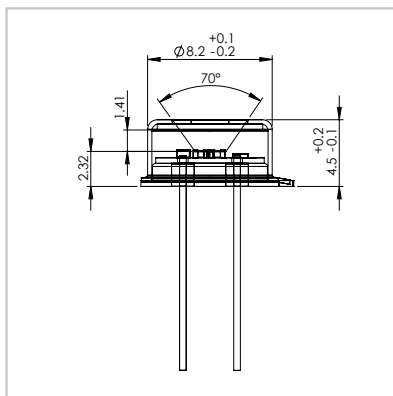
Isometric Drawing (with cutaway)



Circuit Diagram



Technical Drawing



Element Size	Aperture Size*	Package	Absorber
2 mm x 2 mm	5.0 mm Sq. 3.5 mm Sq.	TO-39 3-pin	Organic Black
Feedback Resistor	Amplifier	-3dB Freq [Hz]	Supply Voltage [V]
27 GOhm	Op-Amp 7	TBD	1.8 – 5.5 V (3 V recommended)
Responsivity ** [V/W]	D* (Jones) ** @ 10 Hz	Noise Density [μV/sqrt(Hz)]	Output Polarity
Min: 30,000 Typ: 40,000	Min: 3 × 10 ⁸ Typ: 4 × 10 ⁸	Max: 30	Negative

* Please refer "Filters and Windows" datasheet for all available options
(aperture size depends on filter/window option chosen)

** Without filter / window



海纳光学

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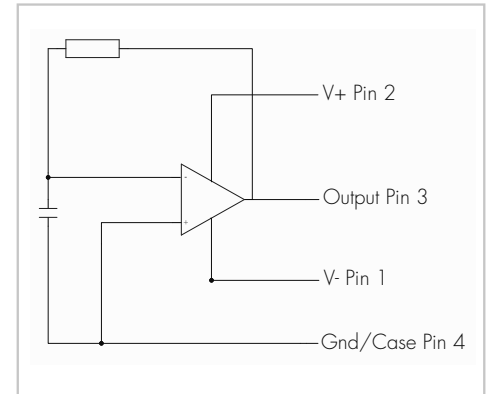
L1120D2020

- Single channel Pyroelectric detector
- Current mode
- Dual supply
- Without TFC
- High speed

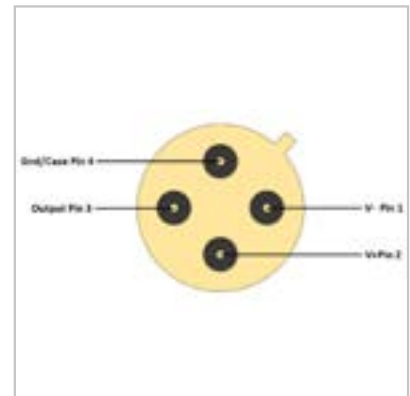
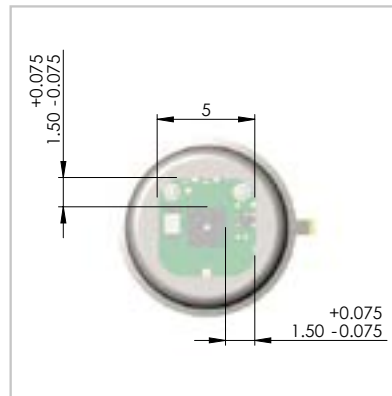
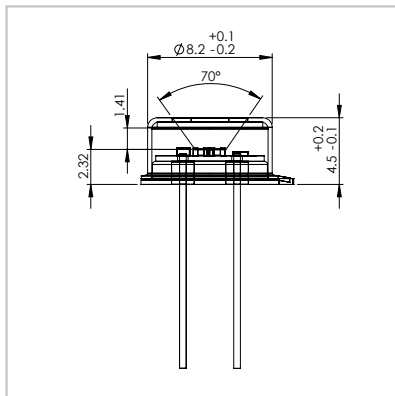
Isometric Drawing (with cutaway)



Circuit Diagram



Technical Drawing



Element Size	Aperture Size*	Package	Absorber
2 mm x 2 mm	5.0 mm Sq. 3.5 mm Sq.	TO-39 4-pin	Organic Black
Feedback Resistor	Amplifier	-3dB Freq [Hz]	Supply Voltage [V]
11 MOhm	Op-Amp 4	TBD	Dual Supply: $\pm 2.5 - \pm 13$ V (V+ = +6 V; V- = -6 V recommended)
Responsivity** [V/W]	D* (Jones)** @ 10 Hz	Noise Density [μ V/sqrt(Hz)]	Output Polarity
Min: 17 Typ: 22	Min: 6.8×10^6 Typ: 1×10^7	Max: 0.5	Negative

* Please refer "Filters and Windows" datasheet for all available options
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** Without filter / window



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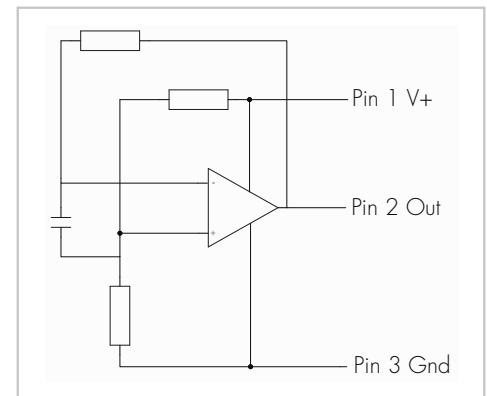
L1130D2020

- Single channel Pyroelectric detector
- Current mode
- Single supply
- Without TFC

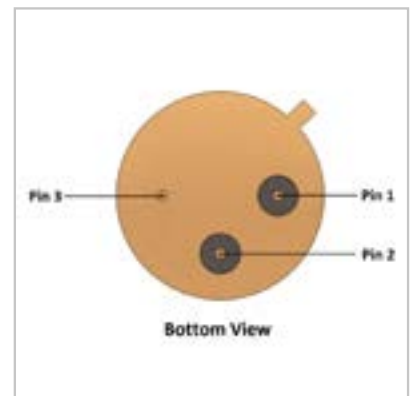
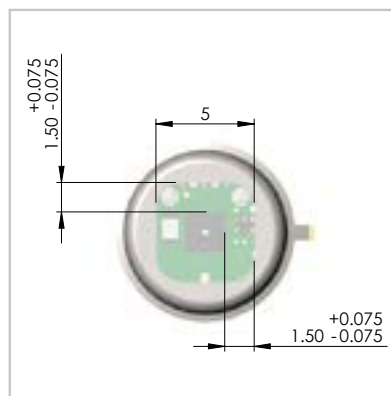
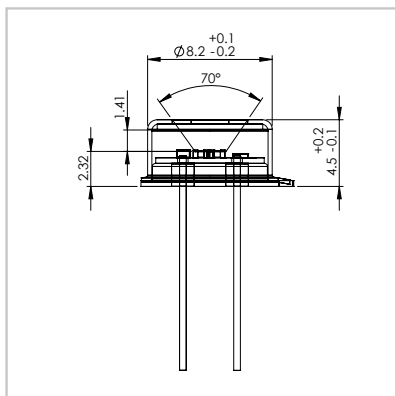
Isometric Drawing



Circuit Diagram



Technical Drawing



Element Size	Aperture Size*	Package	Absorber
2 mm x 2 mm	5.0 mm Sq. 3.5 mm Sq.	TO-39 3-pin	Organic Black
Feedback Resistor	Amplifier	-3dB Freq [Hz]	Supply Voltage [V]
5 GOhm	Op-Amp 7	TBD	1.8 – 5.5 V (3 V recommended)
Responsivity** [V/W]	D* (Jones)** @ 10 Hz	Noise Density [μV/sqrt(Hz)]	Output Polarity
Min: 6500 Typ: 7500	Min: 1.5×10^8 Typ: 2.5×10^8	Max: 12	Negative

* Please refer "Filters and Windows" datasheet for all available options
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** Without filter / window



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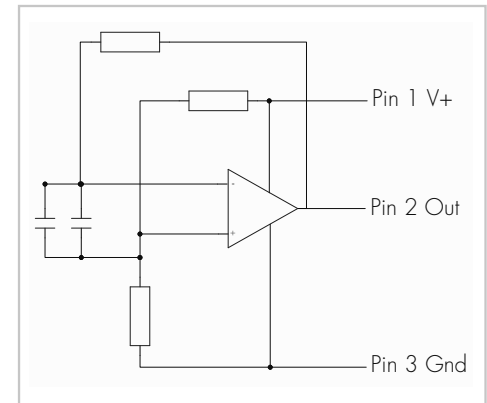
L2100D2020

- Single channel Pyroelectric detector
- Current mode
- Single supply
- With TFC

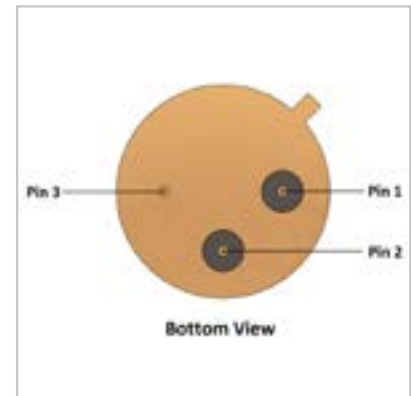
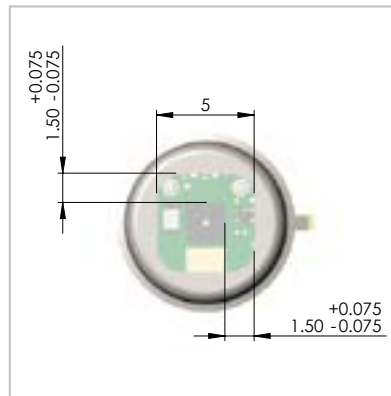
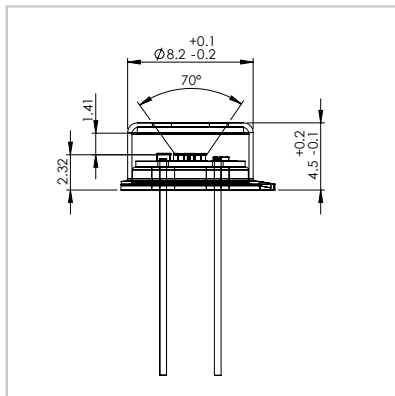
Isometric Drawing (with cutaway)



Circuit Diagram



Technical Drawing



Element Size	Aperture Size*	Package	Absorber
2 mm x 2 mm	5.0 mm Sq. 3.5 mm Sq.	TO-39 3-pin	Organic Black
Feedback Resistor	Amplifier	-3dB Freq [Hz]	Supply Voltage [V]
100 GOhm	Op-Amp 7	TBD	1.8 – 5.5 V (3 V recommended)
Responsivity** [V/W]	D* (Jones)** @ 10 Hz	Noise Density [μV/sqrt(Hz)]	Output Polarity
Min: 100,000 Typ: 150,000	Min: 4.5 x 10 ⁸ Typ: 6 x 10 ⁸	Max: 60	Negative

* Please refer "Filters and Windows" datasheet for all available options
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** Without filter / window



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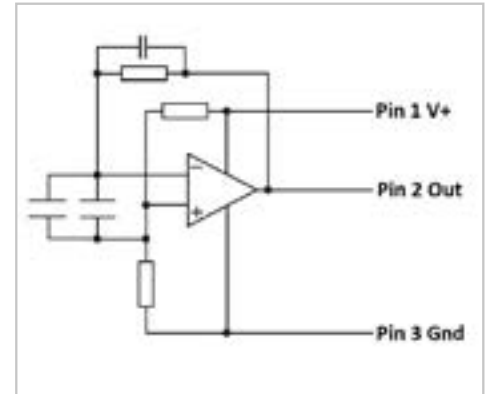
L2101D2020

- Single channel Pyroelectric detector
- Current mode
- Single supply
- With TFC
- Optimized for low frequency applications (~5 Hz)

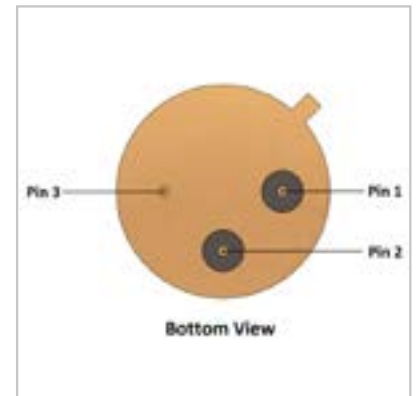
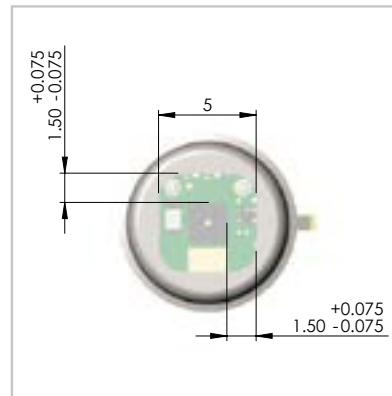
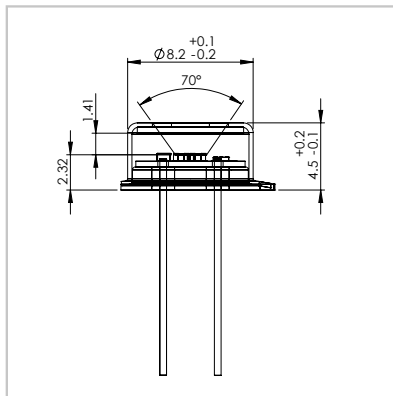
Isometric Drawing (with cutaway)



Circuit Diagram



Technical Drawing



Element Size	Aperture Size*	Package	Absorber
2 mm x 2 mm	5.0 mm Sq. 3.5 mm Sq.	TO-39 3-pin	Organic Black
Feedback Resistor	Amplifier	-3dB Freq [Hz]	Supply Voltage [V]
100 GOhm	Op-Amp 7	TBD	2.7 – 10 V (3 V recommended)
Responsivity** [V/W]	D* (Jones)** @ 5 Hz	Noise Density [μV/sqrt(Hz)]	Output Polarity
Min: 40,000 Typ: 45,000	Min: 7.5 × 10 ⁸ Typ: 9.0 × 10 ⁸	Max: 14	Negative

* Please refer "Filters and Windows" datasheet for all available options
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** Without filter / window


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Absolute Maximum Ratings

	Min	Max
Storage temperature [°C]	- 25	+ 60 **
Operating temperature [°C]	- 20	+ 85
Soldering temperature, 5 sec [°C]	+ 280	+ 300
ESD damage threshold, Human Body Model Class* [V]	0	< 250

* ANSI/ESD STN5. 1-2007

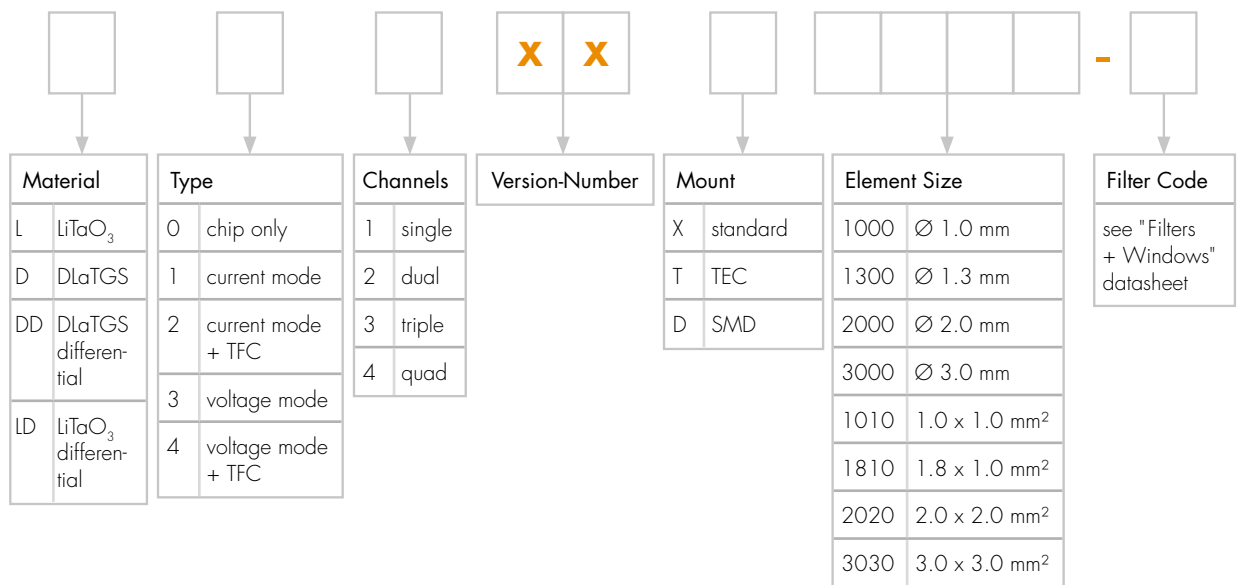
** Limited by packing materials.

Handling

ESD sensitive device. High electrostatic discharge can damage or degrade the device.

Use proper ESD handling precautions.

Part Number Designation



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

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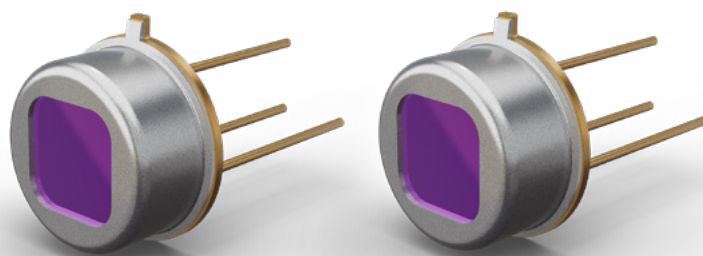
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**LASER
COMPONENTS®**

L31/41 SERIES

Single Channel Voltage Mode Pyroelectric Detectors



Our L31/41 series of pyroelectric detectors are a collection of single channel LiTaO_3 devices operating in voltage mode with an integrated JFET.

FEATURES

- / Thermal based detector, any radiation absorbed produces a signal
- / Wide spectral coverage from the UV to LWIR
- / Modular design principle
- / Assembled in an ISO:9001 facility
- / Microphonics reduction as standard

APPLICATIONS

- / FTIR spectroscopy
- / Non-dispersive infrared spectroscopy
- / THz detection
- / Non-dispersive infrared gas analysis
- / Flame and fire detection
- / Non-contact temperature measurement
- / Flame control
- / Moisture monitoring

VERSIONS

- / Low and high speed devices available
- / Wide range of filter and window option

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L31/41 SERIES

Single Channel Voltage Mode Pyroelectric Detectors



SPECIFICATIONS



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Absolute Maximum Ratings

Maximum Ratings	Min	Max
Storage Temperature [°C]	-25	+60**
Operating Temperature [°C]	-20	+85
Soldering Temperature, 5 sec. [°C]	+280	+300
ESD Damage Threshold, Human Body Model Class* [V]	200	

* ANSI/ESD STN5.1-2007

** Limited by packing materials

Version	L3100X2020	L4100X2020
	Single channel Pyroelectric detector	
	Voltage mode	
	Without TFC	With TFC
Element Size [mm]	2x2	
Aperture Size [mm²]*	3.5 / 5.0	
Package	TO-39 3-pin	
Absorber	Organic Black	
Load Resistor [GOhm]	100	
Amplifier	JFET 3	
-3dB Frequency [Hz]	TBD	
Supply Voltage [V]	Max. +30 (9 recommended)	
Responsivity [V/W]	Min: 340 / Typ: 400	Min: 160 / Typ: 200
D* (Jones) @ 10 Hz	Min: 6×10^8 / Typ: 9×10^8	Min: 4×10^8 / Typ: 5×10^8
Noise Density [$\mu\text{V}/\sqrt{\text{Hz}}$]	Max: 0.15	Max: 0.13
NEP [W/ $\sqrt{\text{Hz}}$]	Max: 3.4×10^{-10}	Max: 6×10^{-10}
Polarity	Positive	
Circuit Diagram		

* Please refer to »Filters and Windows« datasheet for all available options (aperture size depends on filter/window option chosen)

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Single Channel Voltage Mode Pyroelectric Detectors



TECHNICAL DRAWING

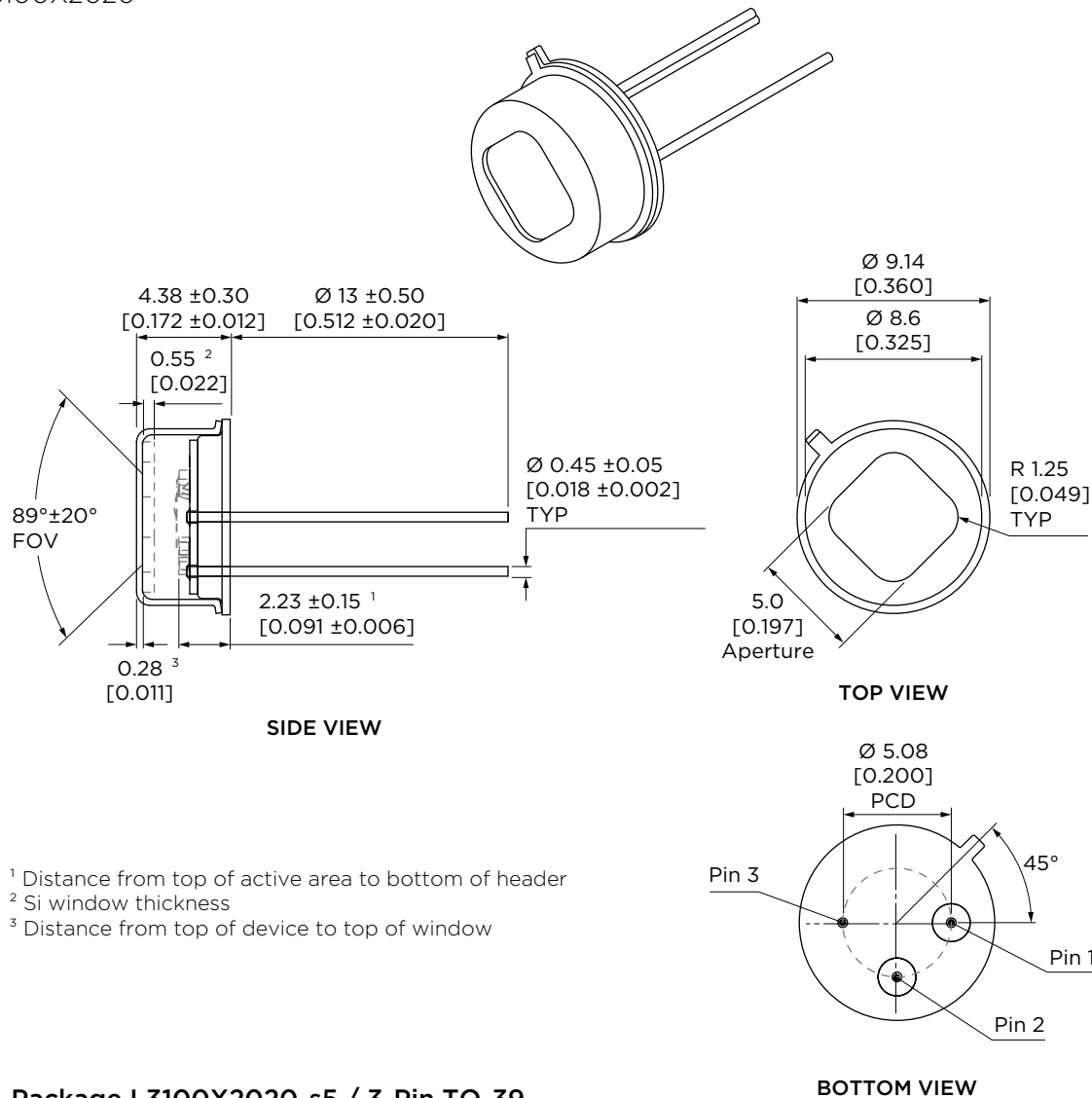
L3100X2020



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¹ Distance from top of active area to bottom of header

² Si window thickness

³ Distance from top of device to top of window

Package L3100X2020-s5 / 3-Pin TO-39

Pin out:

1. Drain
2. Source
3. Ground/Case

Units: mm [inch]

Dimensions are in millimeters - [inches] and are for reference only.

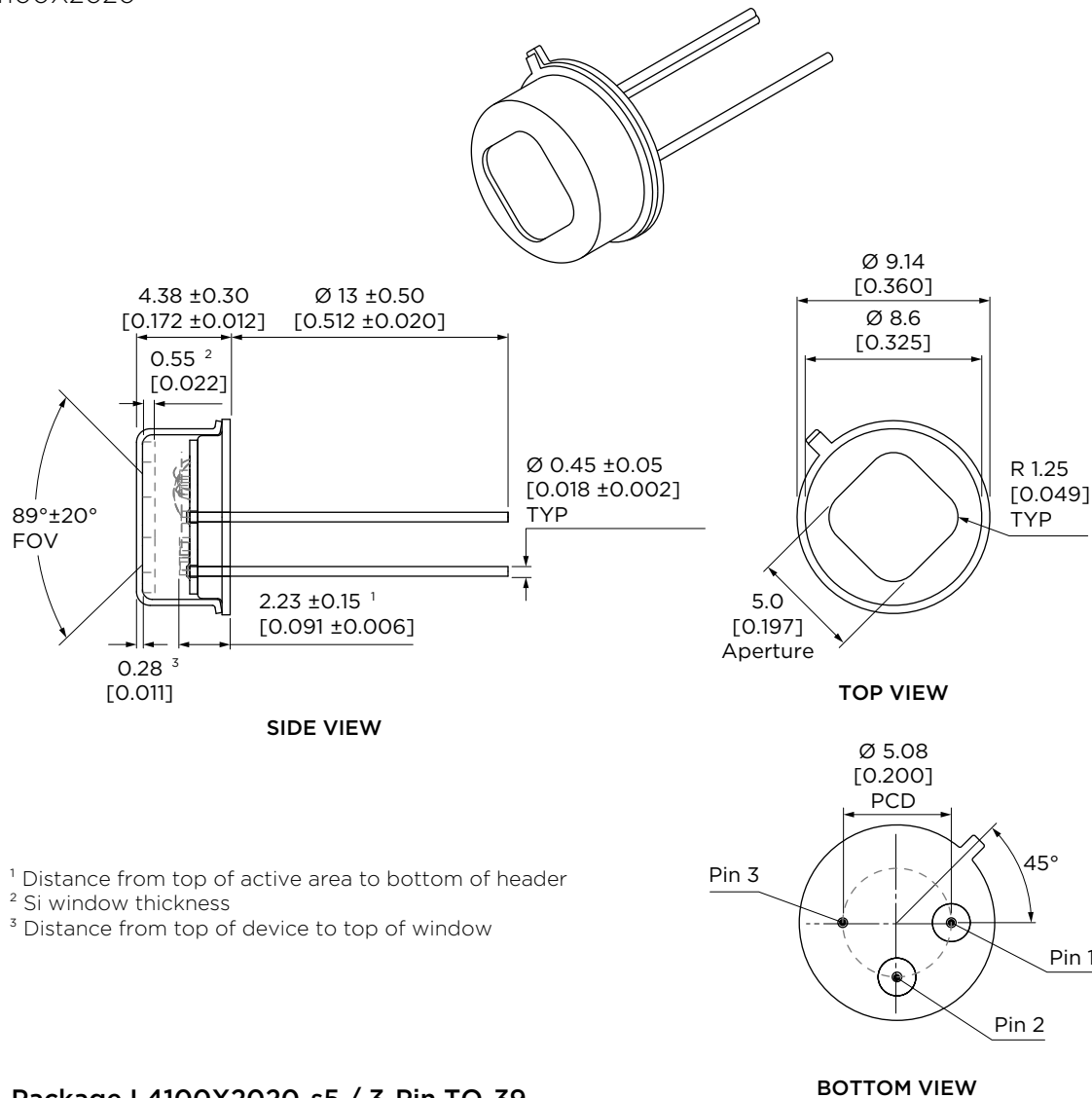
L31/41 SERIES

Single Channel Voltage Mode Pyroelectric Detectors



TECHNICAL DRAWING

L4100X2020



¹ Distance from top of active area to bottom of header

² Si window thickness

³ Distance from top of device to top of window

Package L4100X2020-s5 / 3-Pin TO-39

Pin out:

1. Drain
2. Source
3. Ground/Case

Units: mm [inch]

Dimensions are in millimeters - [inches] and are for reference only.

L31/41 SERIES

Single Channel Voltage Mode Pyroelectric Detectors



ORDERING CODE



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Material ¹	Type	Channels	Version-Number	Mount	Element Size	Filter Code
X	X	X	XX	X	X	X
L	0 Chip only	1 Single		X Standard	1000 Ø1.0 mm	see »Filters and Windows« datasheet
LD	1 Current mode	2 Dual		T TEC	1300 Ø1.3 mm	
D	2 Current mode + TFC	3 Triple		D SMD	2000 Ø2.0 mm	
DD	3 Voltage mode	4 Quad			3000 Ø3.0 mm	
LT	4 Voltage mode + TFC				1010 1.0x1.0 mm ²	
					1810 1.8x1.0 mm ²	
					2020 2.0x2.0 mm ²	
					3030 3.0x3.0 mm ²	

¹ Foot Note / Abbreviations

L = LiTaO₃

LD = LiTaO₃ Differential

D = DLaTGS

DD = DLaTGS Differential

LT = LiTaO₃ Thin chip

Example: L3100X2020

PRODUCT CHANGES AND LIABILITY

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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

Custom designed products are available on request.

SAFETY AND HANDLING INFORMATION

Handling Precautions

Products are subject to the risks normally associated with sensitive electronic devices including static discharge, transients, and overload.

ESD sensitive device. High electrostatic discharge can damage or degrade the device. Use proper ESD handling precautions.



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