

LD11/21 SERIES

Current Mode Differential Pyroelectric Detectors

Our LD11/21 series of pyroelectric detectors are a collection of single channel LiTaO₃ devices operating in current mode with an integrated Op-Amp and two outputs.

FEATURES

- / Revolutionary differential amplification scheme
- / Charge Harvesting from top and bottom of chip
- / 44 % improvement in SNR over non-differential version
- / Thermal based detector, any radiation absorbed produces a signal
- / Integrated Op-Amp, single supply
- / Wide spectral coverage from the UV to THz
- / Modular design principle
- / Assembled in an ISO:9001 certified facility
- / Microphonics reduction as standard
- / True differential with differential output for full flexibility in reduction of EMI or common mode rejection and ground noise

APPLICATIONS

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

VERSIONS

- / Wide range of window and filter options (including small and large aperture)
- / LWIR through THz options available

/ **Germany and Other Countries** LASER COMPONENTS Germany GmbH Tel +49 8142 2864-0 info@lasercomponents.com www.lasercomponents.com
/ **France** LASER COMPONENTS S.A.S. Tel +33 1 39 59 52 25 info@lasercomponents.fr www.lasercomponents.fr
/ **United Kingdom** LASER COMPONENTS (UK) Ltd. Tel +44 1245 491 499 info@lasercomponents.co.uk www.lasercomponents.co.uk
/ **Nordic Countries** LASER COMPONENTS Nordic AB Tel +46 31 703 71 73 info@lasercomponents.se www.lasercomponents.se
/ **USA** LASER COMPONENTS USA, Inc. Tel +1 603 821-7040 info@laser-components.com www.laser-components.com

CURRENT MODE DIFFERENTIAL PYROELECTRIC DETECTORS

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SPECIFICATIONS

Absolute Maximum Ratings

	Min	Max
Storage temperature [°C]	-25	+60 ¹
Operating temperature [°C]	-20	+85
Soldering temperature, 5 sec [°C]	+280	+300
ESD damage threshold, Human Body Model Class ... ² [V]	0	<250

1 Limited by packing materials

2 ANSI/ESD STN5. 1-2007

	LD1100X3000	LD2100X2020
Element size [mm]	Ø 3.0	2.0x2.0
Aperture size ¹ [mm]	Ø 5.3 standard	Ø 5.3 standard
Package	TO-39 isolated 4+1 pin	TO-39 isolated 4+1 pin
Absorber	Nichrome metal broadband absorber	Organic Black
Feedback Resistor [GOhm]	100	100
Amplifier	Op-Amp 5	Op-Amp 5
-3dB Freq [Hz]	< 1Hz - 18Hz (typical)	< 1Hz - 18Hz (typical)
Supply	2.7 - 10V (3V recommended) 1.7 - 2.5mA	2.7 - 10V (3V recommended) 1.7 - 2.5mA
Responsivity [V/W] @ 1kHz	Min: 5000 ² Typ: 5750 ²	Min: 240,000 Typ: 280,000
D* (Jones) @ 1 kHz	Min: 2x10 ⁸ Typ: 2.5x10 ⁸	Min: 8x10 ⁸ Typ: 1x10 ⁹
Noise Density [µV/sqrt(Hz)]	Max: 70	Max: 80
NEP [W/√Hz]		4.5 x 10 ⁻¹⁰

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

2 Without cap window

Handling

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

Use proper ESD handling precautions.

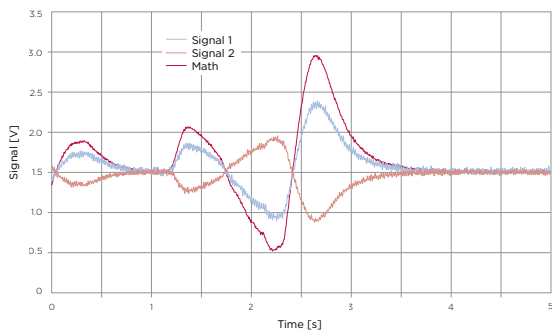
CURRENT MODE DIFFERENTIAL PYROELECTRIC DETECTORS

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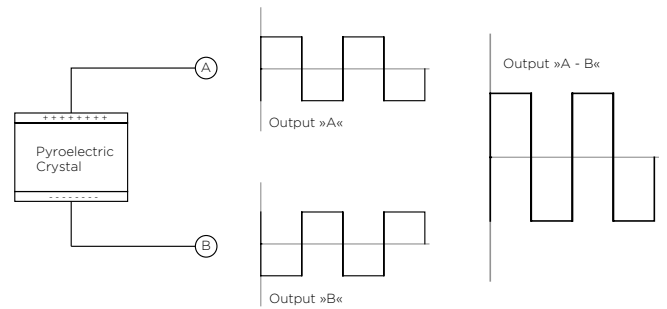


SPECIFICATIONS

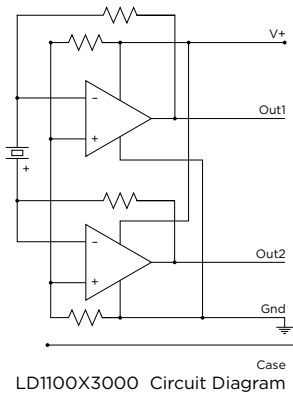
- / Single channel LTO Pyroelectric detector
- / True differential output
- / Current mode
- / Single supply
- / LD1100X3000: with HDPE window (-p1) standard for far IR (THZ) application
- / LD2100X2020; TFC



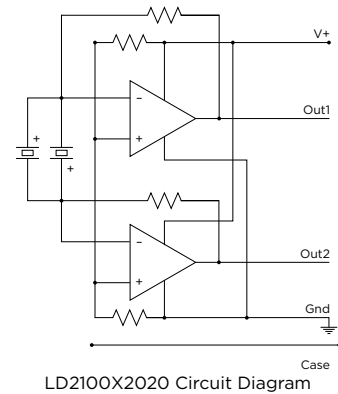
Common mode noise eliminated via differential detector



Demonstration of the effect on signal when both outputs are subtracted.



LD1100X3000 Circuit Diagram



LD2100X2020 Circuit Diagram

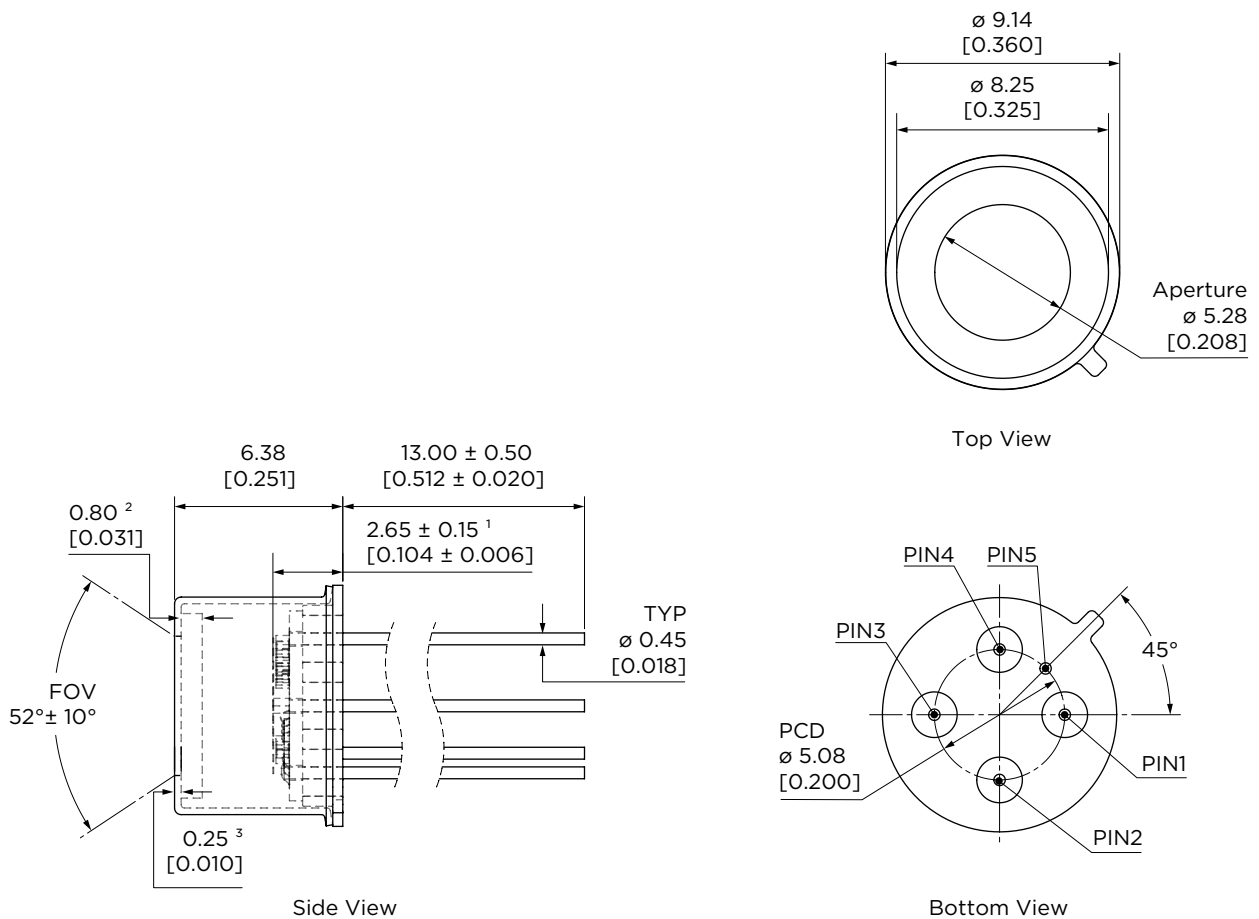
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TECHNICAL DRAWING

LD1100X3000



LD1100X3000

Pin out:

1. V+
2. OUTPUT 1
3. GROUND
4. OUTPUT 2
5. CASE

Units: mm [inch]

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

¹ Distance from top of active area to bottom of header

² HDPE window thickness

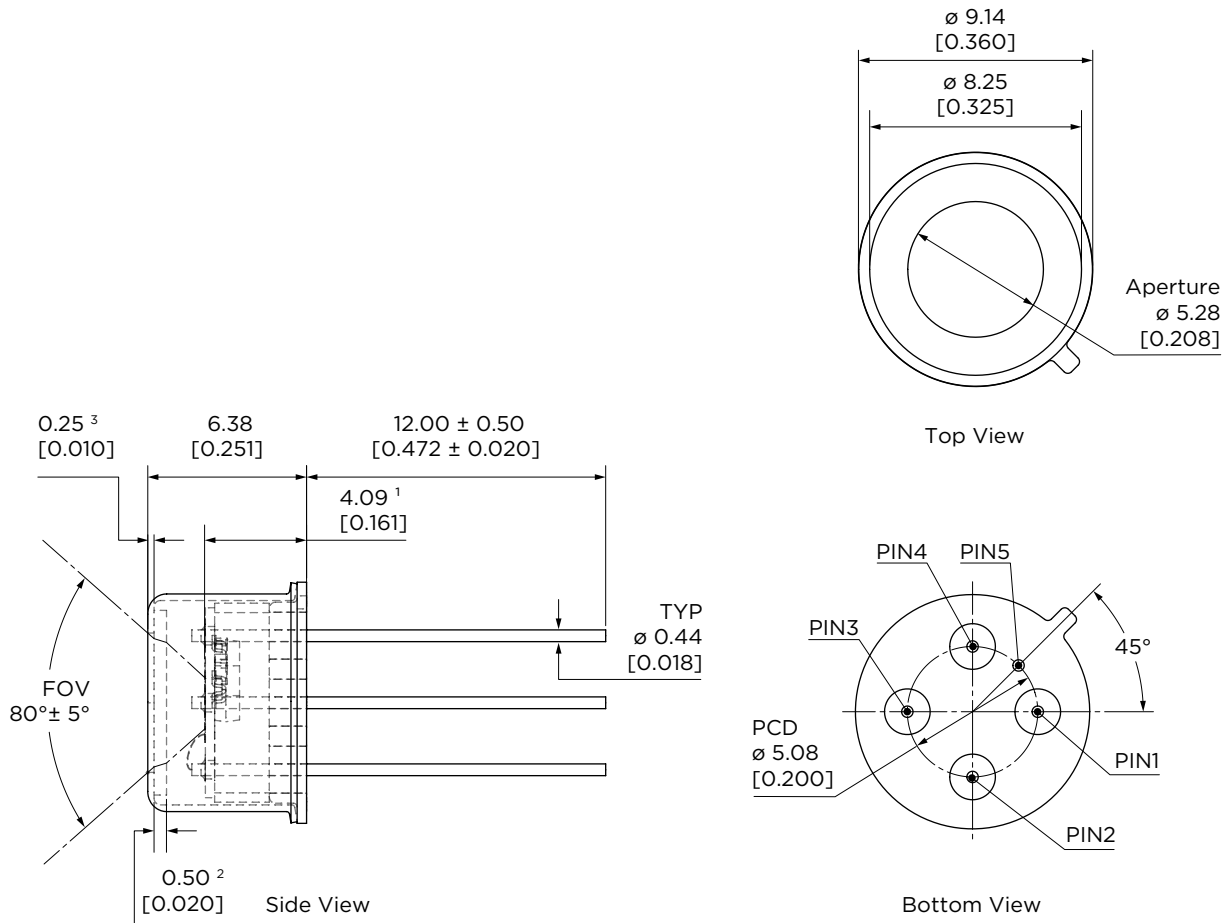
³ Distance from top of device to top of window

CURRENT MODE DIFFERENTIAL PYROELECTRIC DETECTORS

LD11/21 Series

TECHNICAL DRAWING

LD2100X2020



LD2100X2020

Pin out:

1. V+
2. OUTPUT 1
3. GROUND
4. OUTPUT 2
5. CASE

¹ Distance from top of active area to bottom of header

² HDPE window thickness

³ Distance from top of device to top of window

Units: mm [inch]

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ORDERING CODE

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

PRODUCT CHANGES

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ORDERING INFORMATION

Products can be ordered directly from LASER COMPONENTS or its representatives.

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Custom designed products are available on request.