

LD11/21 Series Current Mode Differential Pyroelectric Detectors

Description

Our LD11/21 series of pyroelectric detectors are a collection of single channel LiTaO_3 devices operating in current mode with an integrated Op-Amp and two outputs.

Features

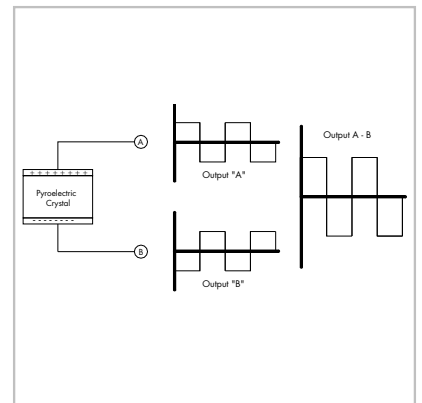
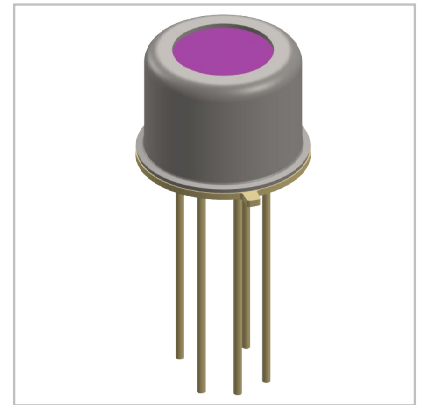
- Revolutionary differential amplification scheme
- Charge Harvesting from top and bottom of chip
- 44% improvement in SNR over non-differential version
- Thermal based detector, any radiation absorbed produces a signal
- Integrated Op-Amp, single supply
- Wide spectral coverage from the UV to THz
- 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

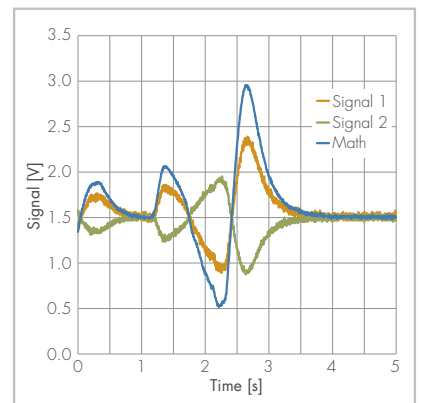
- Non-dispersive infrared gas analysis
- Flame and fire detection
- Non-contact temperature measurement
- Flame control
- Moisture monitoring
- Spectroscopy

Versions

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



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

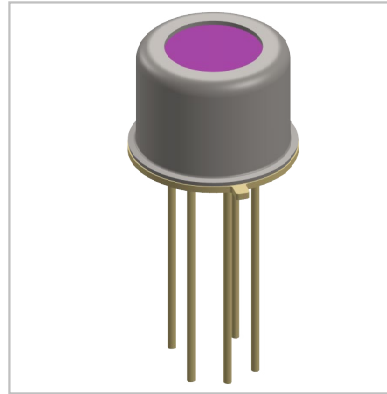


Common mode noise eliminated via differential detector

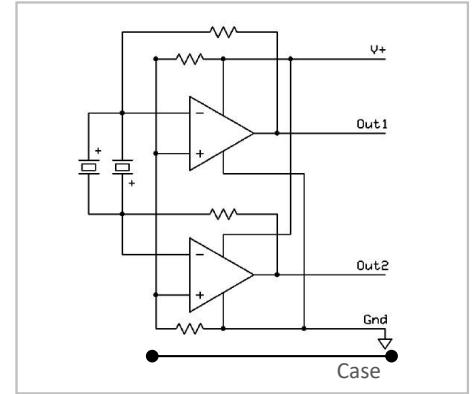
LD1100X3000

- Single channel ITO Pyroelectric detector
- True differential output
- Current mode
- Single supply
- with HDPE window (-p1) standard for far IR (THZ) application

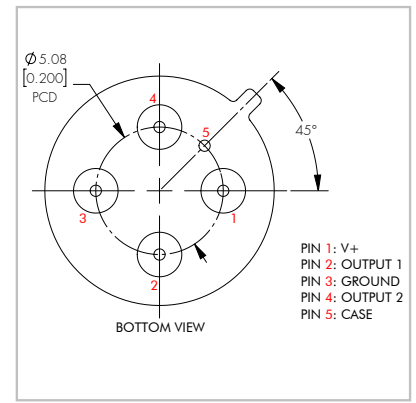
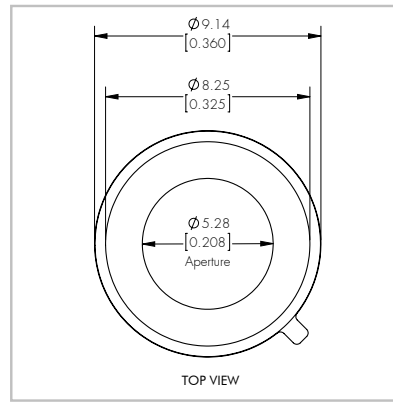
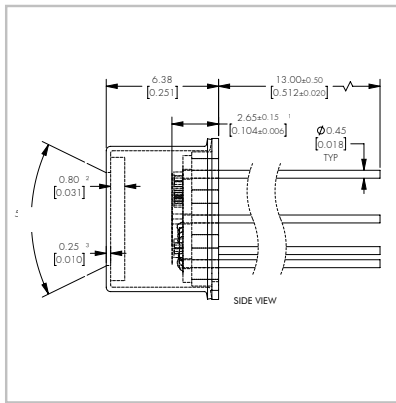
Isometric Drawing (with cutaway)



Circuit Diagram



Technical Drawing



Element Size	Aperture Size*	Package	Absorber
Dia. 3.0 mm	Dia. 5.3 mm standard	TO-39 isolated 4 + 1 pin	Nichrome metal broadband absorber
Feedback Resistor	Amplifier	-3dB Freq [Hz]	Supply
100 GOhm	Op-Amp 5	< 1 Hz – 18 Hz (typical)	2.7 – 10 V (3 V recommended) 1.7 – 2.5 mA
Responsivity ** [V/W] @ 1 kHz	D* (Jones) @ 1 kHz	Noise Density [µV/sqrt(Hz)]	
Min: 5000 Typ: 5750	Min: 2 x 10 ⁸ Typ: 2.5 x 10 ⁸	Max: 70	

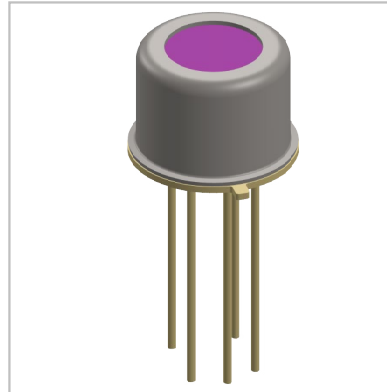
* Please refer "Filters and Windows" datasheet for all available options (aperture size depends on filter/window option chosen)

** Without cap window

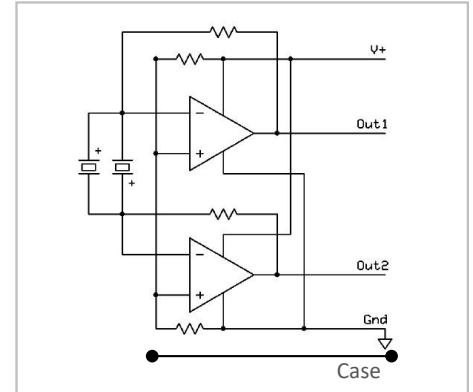
LD2100X2020

- Single channel ITO Pyroelectric detector
- True differential output
- Current mode
- Single supply
- TFC

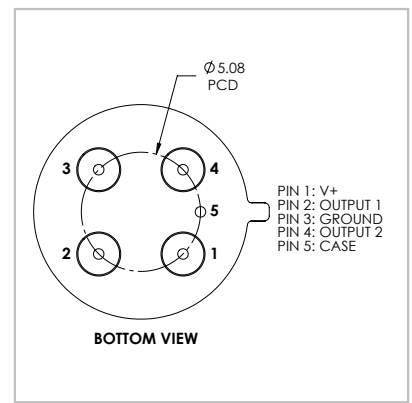
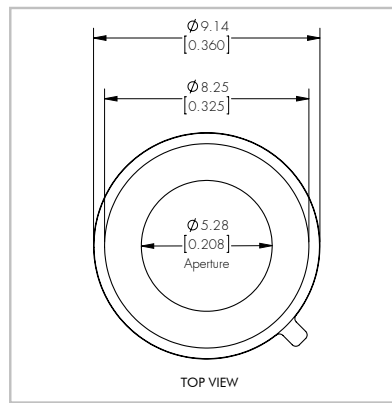
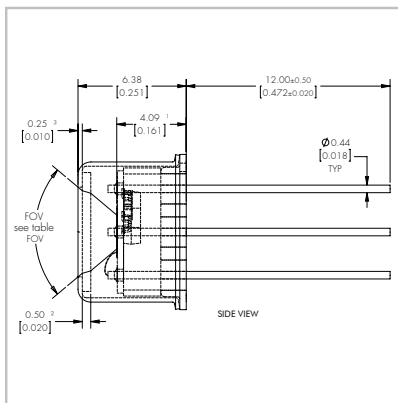
Isometric Drawing (with cutaway)



Circuit Diagram



Technical Drawing



Element Size	Aperture Size*	Package	Absorber
2 mm x 2 mm	Dia. 5.3 mm standard	TO-39 isolated 4 + 1 pin	Organic Black
Feedback Resistor	Amplifier	-3dB Freq [Hz]	Supply
100 GOhm	Op-Amp 5	< 1 Hz – 18 Hz (typical)	2.7 – 10 V (3 V recommended) 1.7 – 2.5 mA
Responsivity [V/W]	D* (Jones) @ 10 Hz	Noise Density [$\mu\text{V}/\sqrt{\text{Hz}}$]	NEP [W/ $\sqrt{\text{Hz}}$]
Min: 240,000 Typ: 280,000	Min: 8×10^8 Typ: 1×10^9	Max: 80	4.5×10^{-10}

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

Absolute Maximum Ratings

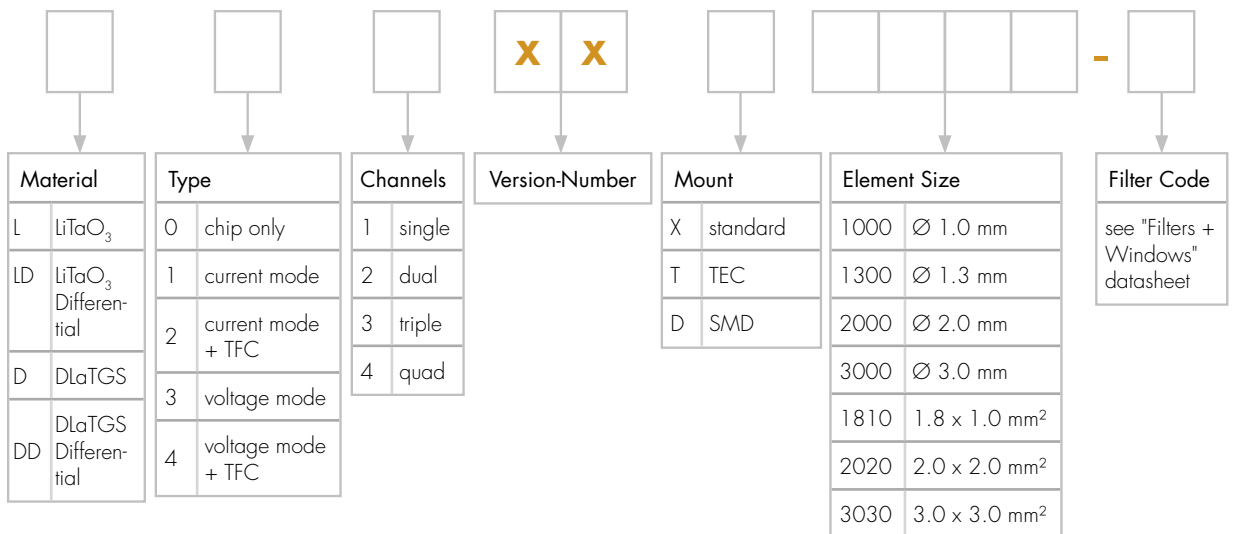
	Min	Max
Storage temperature [°C]	- 25	+ 60 **
Operating temperature [°C]	- 20	+ 85
Soldering temperature, 5 sec [°C]	+ 280	+ 300
ESD damage threshold, Human Body Model Class ...* [V]	0	< 250

* 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

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