BROADCOM®

Data Sheet

AFBR-S6PY2214

Thin-Film Pyroelectric Single-Channel Sensor

Overview

The Broadcom® range of thin-film pyroelectric infrared (IR) detectors offers fast response and integrated electronics. The built-in transimpedance amplifier circuit produces exceptionally high responsivity, especially at the high IR source modulation frequencies needed for fast or low-energy consumption measurements. This current mode sensor has an excellent signal-to-noise ratio and a stable response over a wide operating temperature range. The sensor outputs a voltage signal centered around half the supply voltage.

Features

- Thin-film pyroelectric element
- Fast response: ~20-ms thermal time constant
- High responsivity: Integrated transimpedance amplifier
- TO-39 package, analog output
- RoHS and REACH compliant

Applications

- Broadband sensor for use with external narrowband application filter
- NDIR gas detection systems
- Low-power NDIR systems
- Fast-response NDIR systems
- Refrigerant gas detection
- Capnography and anesthetic gas monitoring
- Breath CO_2 measurement
- Methane, hydrocarbons, and flammable gas detection

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause damage to the devices. Limits apply to each parameter in isolation. Absolute maximum ratings are those values beyond which damage to the device can occur if these limits are exceeded for other than a short period of time.

Parameter	Min.	Max.	Unit
Supply Voltage (V+)	—	8.0	V
Operating Temperature	–40	+85	°C
Storage Temperature	–40	+85	°C

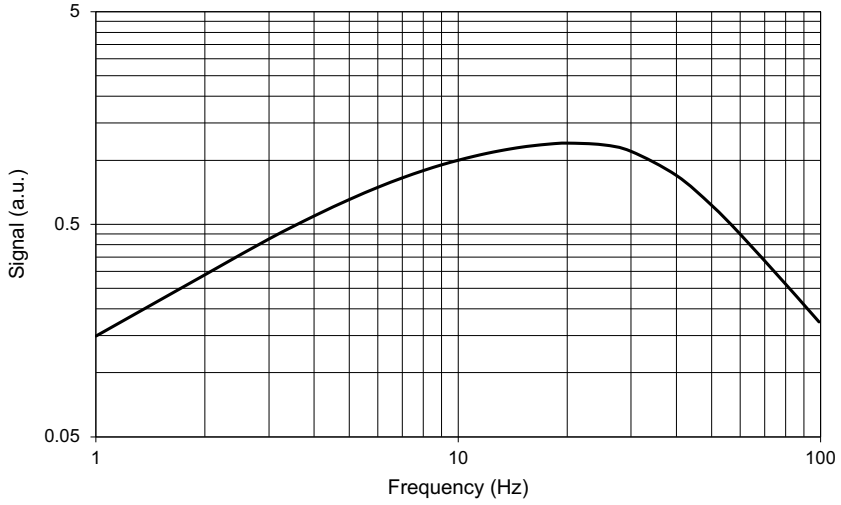
Sensor Characteristics

Characteristics are measured at room temperature unless otherwise specified.

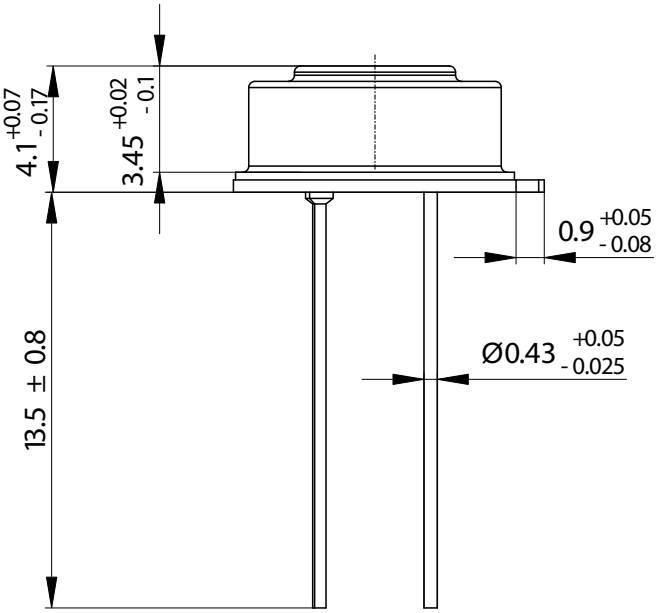
Parameter	Min.	Typ.	Max.	Unit
Filter Aperture Diameter	—	2.5	—	mm
Element Size	—	1.0 × 1.0	—	mm
Package	—	TO-39	—	—
Responsivity [a]	—	236,300	—	V/W
D* [a]	—	2.72×10^8	—	cm√Hz/W
Noise [a]	—	87	—	μV√Hz
Supply Voltage (V+)	2.7	—	8.0	V
Signal DC Offset	—	V+ / 2	—	V
Time Constant	—	20	—	ms
Optical Filters	See Table 1, Product Filter Configurations.			

a. 10 Hz, 500K, room temperature, without window and optics.

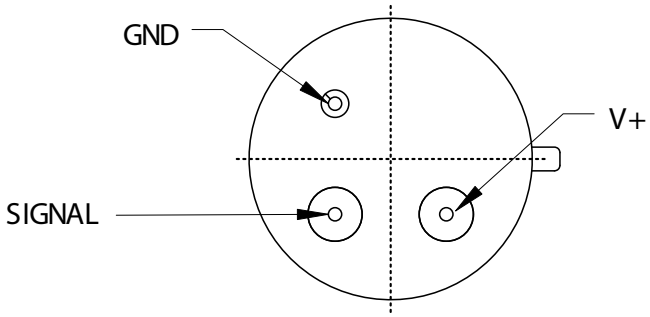
Frequency Characteristics



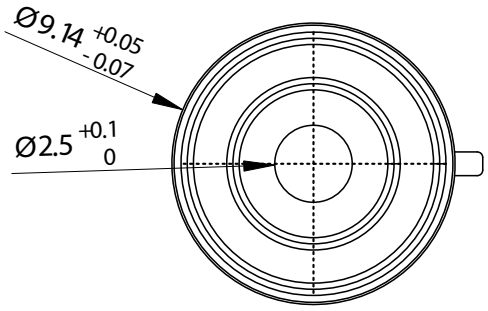
Package Information



Package Dimensions



Bottom View

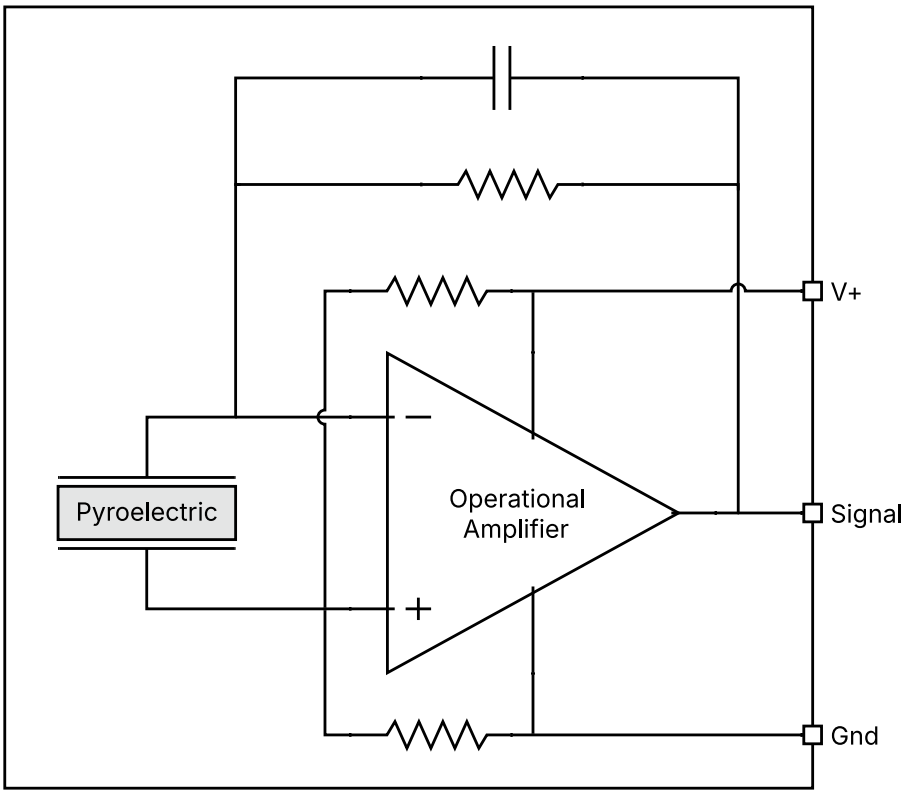


Top View

NOTE: To avoid shorts, ensure that the sensor base is not in contact with the PCB.

Internal Circuit Schematic

TO-39 Sensor



Optical Filters

Broadcom has the following standard filters available.

Table 1: Product Filter Configurations

Part Number	Package Marking	Channel 1 CWL µm/(HPB nm)	Use Example
AFBR-S6PY2214	PY2214	5-µm long-pass filter	Broadband; can be used with an external application-specific filter.

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