BROADCOM®

Data Sheet

AFBR-S6PY0234, AFBR-S6PY1466, AFBR-S6PY1943, AFBR-S6PY2486, AFBR-S6PY2572

Thin-Film Pyroelectric Dual-Channel Sensors

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

- NDIR gas detection systems
- Low-power NDIR systems
- Fast-response NDIR systems
- Capnography and anesthetic gas monitoring
- Breath CO_2 measurement
- Methane, hydrocarbons, and flammable gas detection
- Refrigerant 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

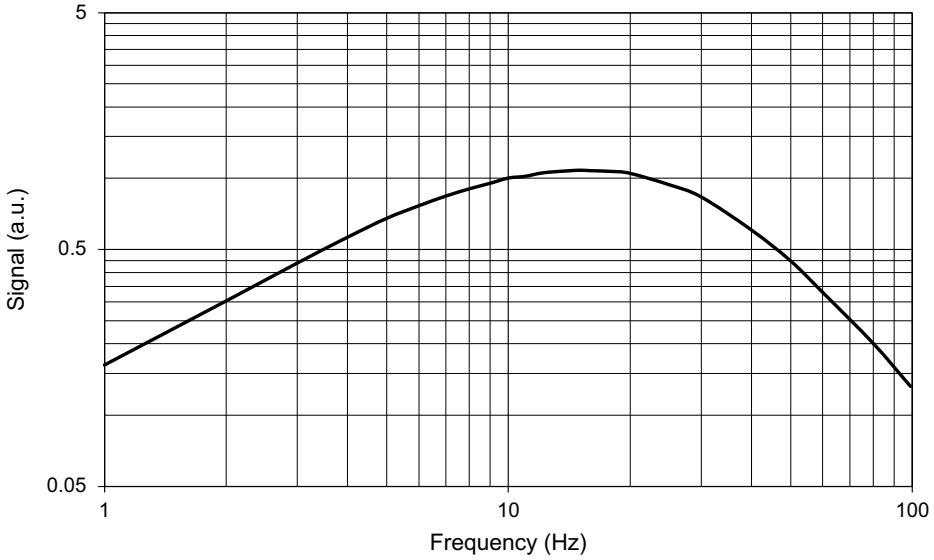
Sensor Characteristics

Characteristics are measured at room temperature unless otherwise specified.

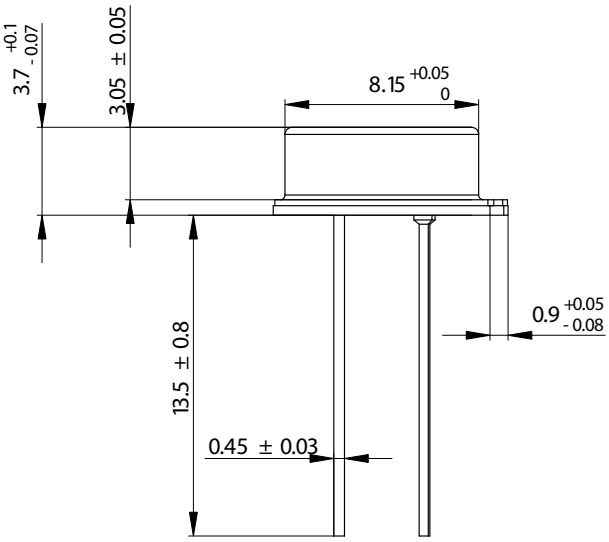
Parameter	Min.	Typ.	Max.	Unit
Filter Aperture	—	2× 2.6 × 2.6	—	mm
Element Size	—	2× 1.0 × 1.0	—	mm
Package	—	TO-39	—	—
Responsivity [a]	—	221,200	—	V/W
D* [a]	—	2.73×10^8	—	cm$\sqrt{}$Hz/W
Noise [a]	—	81	—	μV$\sqrt{}$Hz
Supply Voltage (V+)	2.7	—	8.0	V
Signal DC Offset	—	V+ / 2	—	V
Time Constant	—	20	—	ms
Optical Filters	See Table 1, Product Filter Configurations.			

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

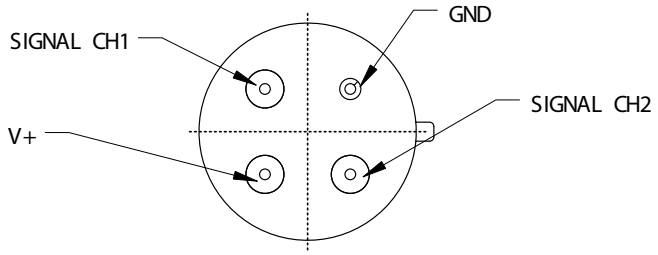
Frequency Characteristics



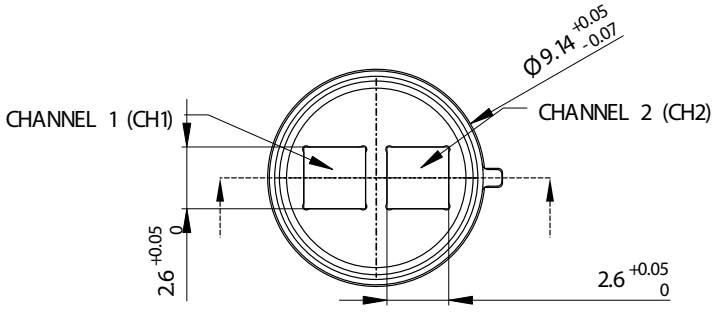
Package Information



Package Dimensions



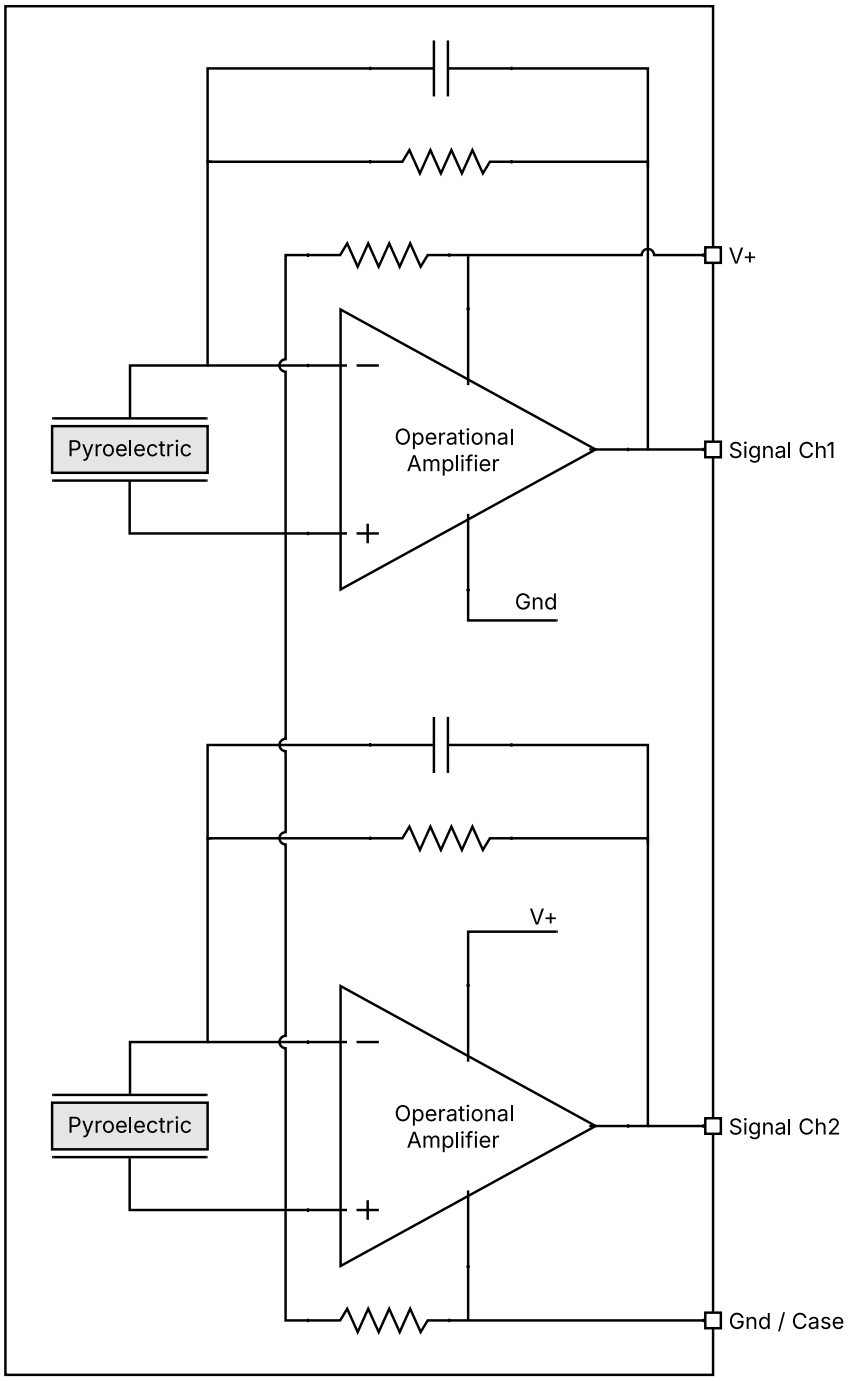
Bottom View



Top View

Internal Circuit Schematic

TO-39 Sensor



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

Optical Filters

Broadcom has a range of available standard filters.

Table 1: Product Filter Configurations

Part Number	Package Marking	Channel CWL µm/HPB nm	Use Example
AFBR-S6PY2486	PY2486		
Channel 1		3.91/90	Reference
Channel 2		3.33/160	H-C
AFBR-S6PY0234	PY0234		
Channel 1		3.91/90	Reference
Channel 2		4.26/180	CO_2
AFBR-S6PY2572	PY2572		
Channel 1		4.90/130	Reference
Channel 2		4.26/180	CO_2 (Medical)
AFBR-S6PY1466	PY1466		
Channel 1		8.42/205	Anesthetics
Channel 2		4.26/180	CO_2
AFBR-S6PY1943	PY1943		
Channel 1		3.91/90	Reference
Channel 2		4.30/110	CO_2 (Narrow)

NOTE: In some implementations, it may be necessary to add an external optical high-wavelength blocking filter to the sensor package.