Data Sheet

AFBR-S6PY3200, AFBR-S6PY0575, AFBR-S6PY0573, AFBR-S6PY0574, AFBR-S6PY2341, AFBR-S6PY1601

Thin-Film Pyroelectric Flame 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. The flame detector format with a large optical filter has a wide field of view—typically 100° for broadband IR sources.

This current mode sensor has excellent signal-to-noise ratio at the signature flicker frequencies of a flame, and can provide accurate discrimination of flame sources in triple IR (3IR) optical flame detection systems. The sensor outputs a voltage signal centered around half the supply voltage.

Features

- Thin-film pyroelectric IR-sensitive element
- Fast response: ~20-ms thermal time constant
- High responsivity: Integrated transimpedance amplifier
- Wide field of view: 100°
- TO-39 package, analog output
- RoHS and REACH compliant

Applications

- Flame detection (3IR and similar optical systems)
- Fire suppression down to millisecond reaction time

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 may occur if these limits are exceeded for other than a short period of time.

Parameter	Min.	Max.	Unit
Supply Voltage (V+)	—	8	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	—	5.2 × 4.2	—	mm
Element Size	—	1.0 × 1.0	—	mm
Package	—	TO-39	—	—
Responsivity[a]	—	225,600	—	V/W
Specific Detectivity (D*)[a]	—	2.61×10^8	—	cm√Hz/W
Noise Spectral Density[a]	—	86	—	μV√Hz
Field of View	—	100[b]	—	°
Supply Voltage (V+)	2.7	—	8.0	V
Time Constant	—	20	—	ms
Signal DC Offset	—	V+/2	—	V
Optical Filters	See Table 1, Product Filter Configurations.			

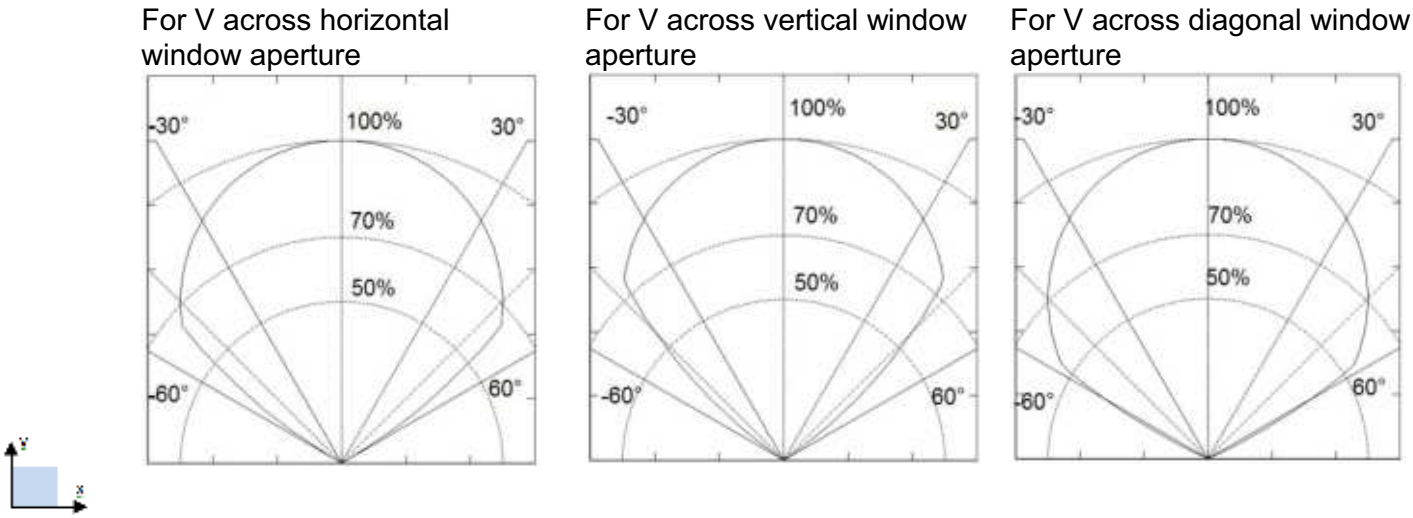
a. 10 Hz, 500K, room temperature, without window and optics.

b. With reference to filter used in AFBR-S6PY0573.

Field of View Characteristics

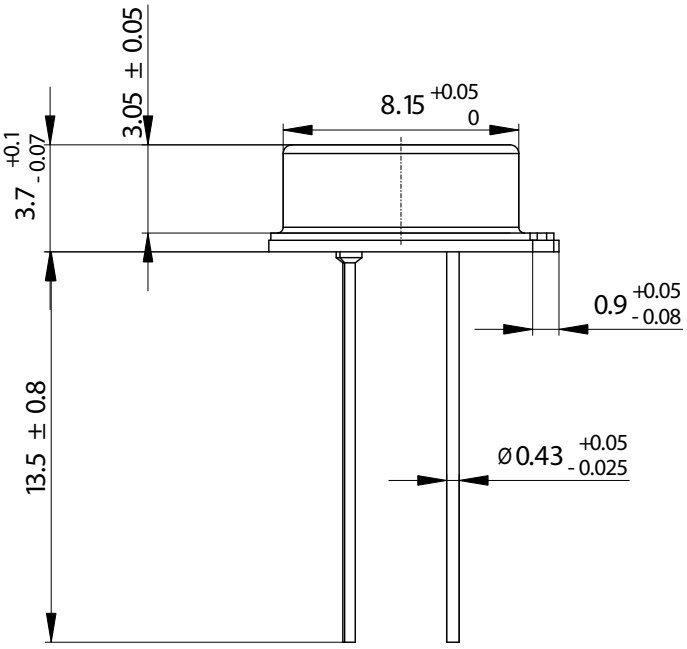
The following normalized polar plots show the maximum FoV achievable along the x,y axis and diagonal without any filter applied.

Figure 1: Field of View Diagrams

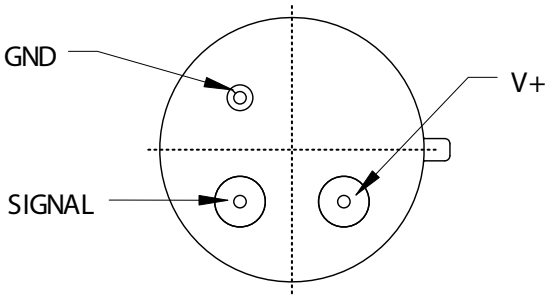


Package Information

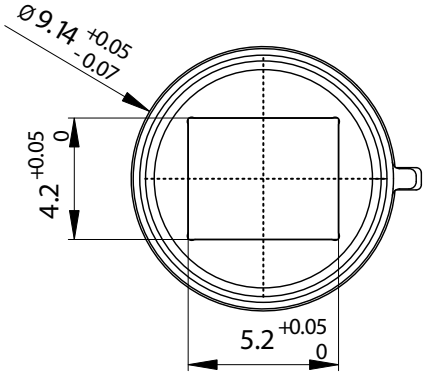
Figure 2: Package Diagrams



Package Dimensions



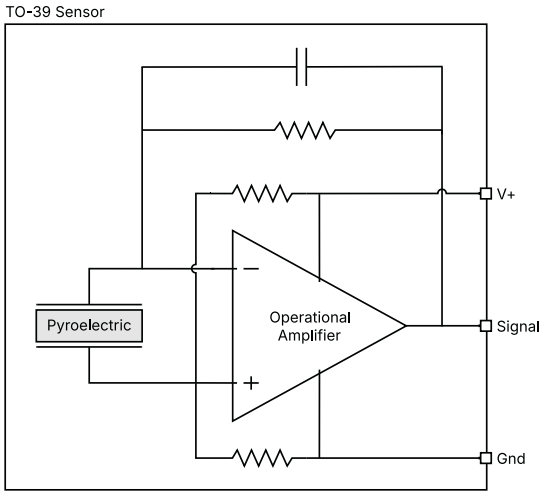
Bottom View



Top View

NOTE: Ensure that solder joints do not short circuit the pin connection to the package case.

Figure 3: Internal Circuit Schematic



Optical Filters

Broadcom has the following standard filters available.

Table 1: Product Filter Configurations

Part Number	Package Marking	Filter Name CWL / FWHM[a]	Cuton Wavelength Typical (µm)	Cutoff Wavelength Typical (µm)
AFBR-S6PY3200	PY3200	2.77 µm / 690 nm	2.425	3.115
AFBR-S6PY0575	PY0575	3.91 µm / 90 nm	3.865	3.955
AFBR-S6PY0573	PY0573	4.35 µm / 600 nm	4.05	4.65
AFBR-S6PY0574	PY0574	4.55 µm / 420 nm	4.34	4.76
AFBR-S6PY2341	PY2341	4.64 µm / 180 nm	4.55	4.73
AFBR-S6PY1601	PY1601	5.0 µm, long pass	5.0	~14

a. CWL = center wavelength, FWHM = full width half maximum.

NOTE: An additional window is required to provide high wavelength blocking (above 8.0 µm) and thermal shielding.

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