ZSFG469711 Pyroelectric Sensor

Product Specification

PS040501-0122

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Revision History

Each instance in this document's revision history reflects a change from its previous edition. For more details, refer to the corresponding page(s) or appropriate links furnished in the table below.

Date	Revision Level	Description	Pages
Jan. 2022	01	Original issue.	All

Overview

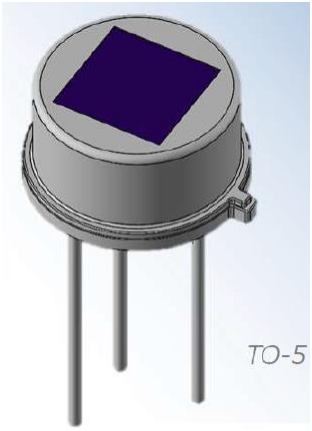
Zilog's Passive Infrared (PIR) sensors are designed to deliver high performance and excellent EMI immunity for the most demanding motion detection applications.

The ZFG469711 PIR sensor is used in combination with a PIR lens and consists of two sensing elements behind a spectral filter window tuned to 8-13um wavelength to help block out unwanted IR energy sources.

The element shape provides excellent omnidirectional coverage and improved detection of directly approaching targets.

Features

- Dual-element balanced differential (series opposed) PIR sensor
- Elements are uniquely shaped for Omni-directional coverage
- High PSRR
- Built in EMI compensation
- Standard metal TO-5 package
- Recommended operating voltage range of 1V to 15V
- Operating temperature range of -40°C to +70°C



Applications

- Ceiling/Wall-mounted Security/Occupancy Motion Detector
- Video Doorbell
- IP Camera
- Overhead Light Fixture-mounted Motion Detector
- Wall Switch with Motion Detection

Ordering Information

Part Number	Description
ZSFG469711	Circular Dual-Element Pyroelectric Sensor

Electrical Characteristics

1)	Signal output:	Min. 3.0 V_{P-P} (Typ. 5.0 V_{P-P})
2)	Noise output:	Max. 200 mV_{P-P} (Typ. 60 mV_{P-P})
3)	Balance output:	Max. 20% Bo = [SA-SB / SA+SB] x 100 Bo: Balance output SA: Absolute signal output on Element A SB: Absolute signal output on Element B
4)	Source voltage:	0.3 V to 1.4 V (Vd: 5V, Rs: 470K ohm)
5)	Operating voltage (Vd):	1 V to 15 V (Rs: 470K ohm)

Notes:

Test set-up block diagram see Figure 1 and Figure 2.
Test circuit configuration see Figure 3.
Items 1,2 ,3 and 4 are 100% tested.

Optical Characteristics

1)	Typical field of view:	132 degrees from center of element on axis X, Y 146 degrees from center of element on 45-degree angle (See Figure 4)
2)	Filter substrate:	Silicon
3)	Cut on (5%T ABS):	5.0 ±1.0 micron
4)	Transmissivity:	≥70% average 8 to 13 micron

Environmental Characteristics

1)	Operating temperature:	-40°C to +70°C
2)	Storage temperature:	-40°C to +80°C
3)	Operating humidity:	95% RH or less (at 30°C)
4)	Storage humidity:	95% RH or less (at 30°C)

RoHS Compliance

This product conforms to the RoHS Directive in force at the date of issuance of this Product Specification.

Test Conditions

The figures below show the configuration under which the PIR sensor electrical characteristics are tested.

Figure 1 - Test Set-up Configuration

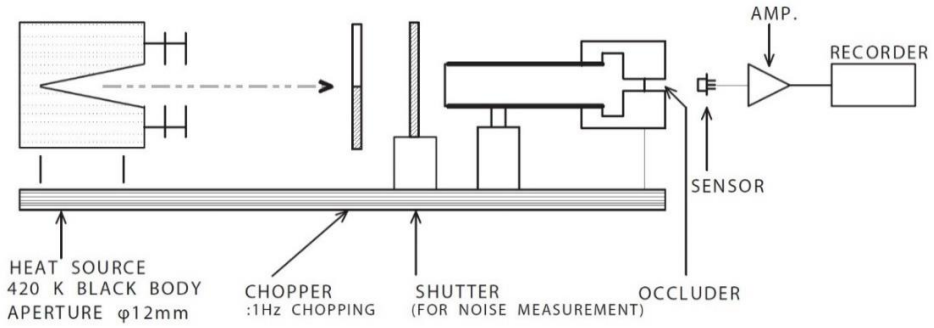


Figure 2 - Occluder Position

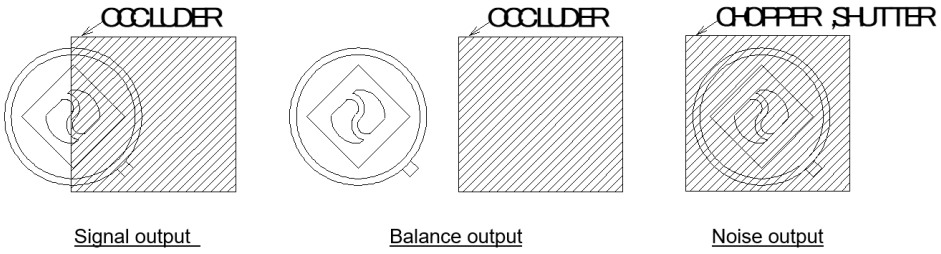
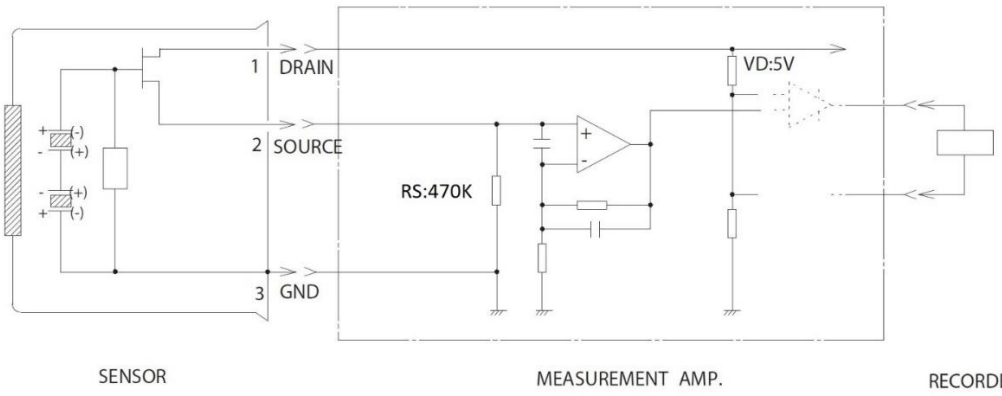


Figure 3 - Test Circuit Configuration



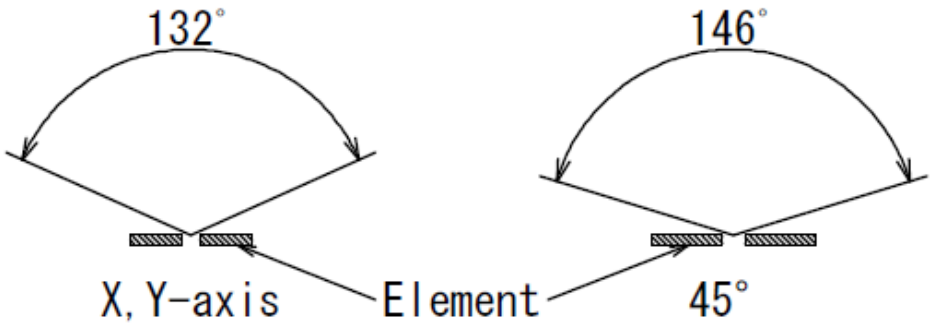
Measurement Amp. Characteristics:

Type: Non-inverting; Gain: 72.5 dB at 1 Hz; Bandwidth: 0.4 to 2.7 Hz / -3 dB

Field of View

The typical field of view of the ZSFG469711 PIR sensor is shown in Figure 4.

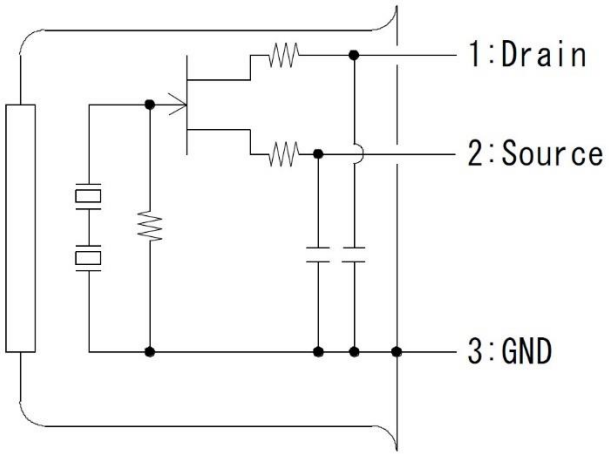
Figure 4 - Field of View



PIR Sensor Circuit Diagram

The ZSFG469711 circuit diagram is shown in Figure 5.

Figure 5 - Circuit Diagram



Mechanical Dimensions

The dimensions of the ZSFG469711 PIR sensor is shown in the following figures. All dimensions are ±0.2mm unless otherwise stated.

Figure 6 - Top View

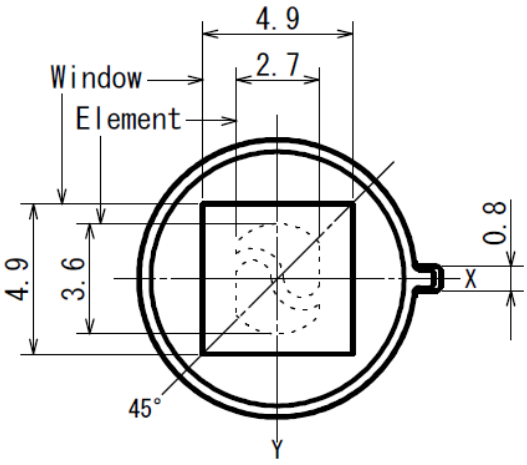


Figure 7 - Bottom View

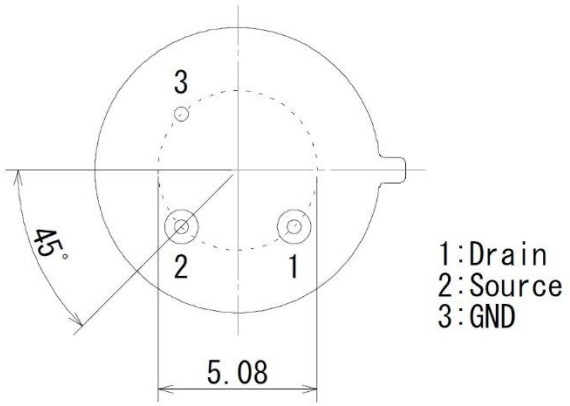
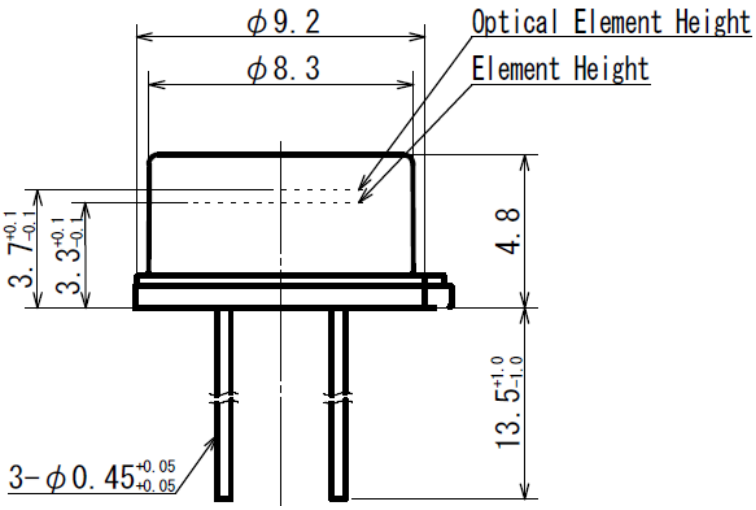


Figure 8 – Side View



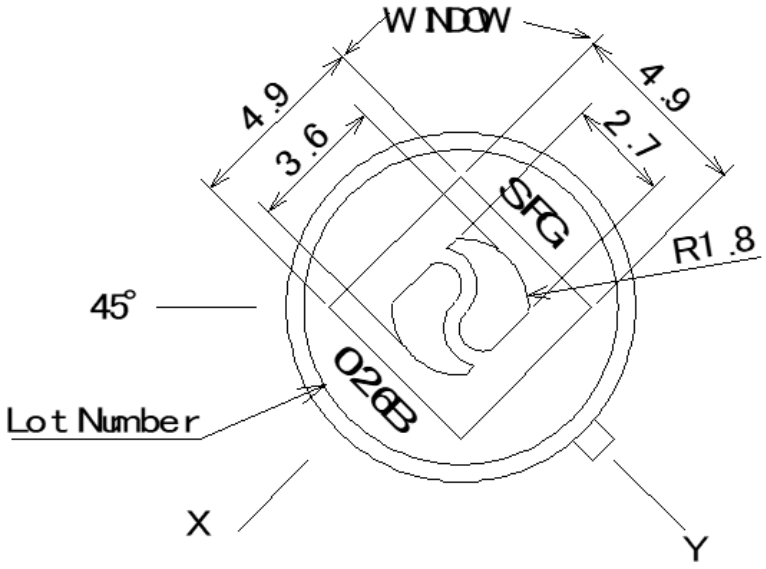
Device Markings

Lot number information is marked on the top surface of the PIR sensor.

Example: 0 26 B

- B — Lot Identification code
- 26 — 26th week
- 0 — Year 2020

Figure 9 - Device Markings



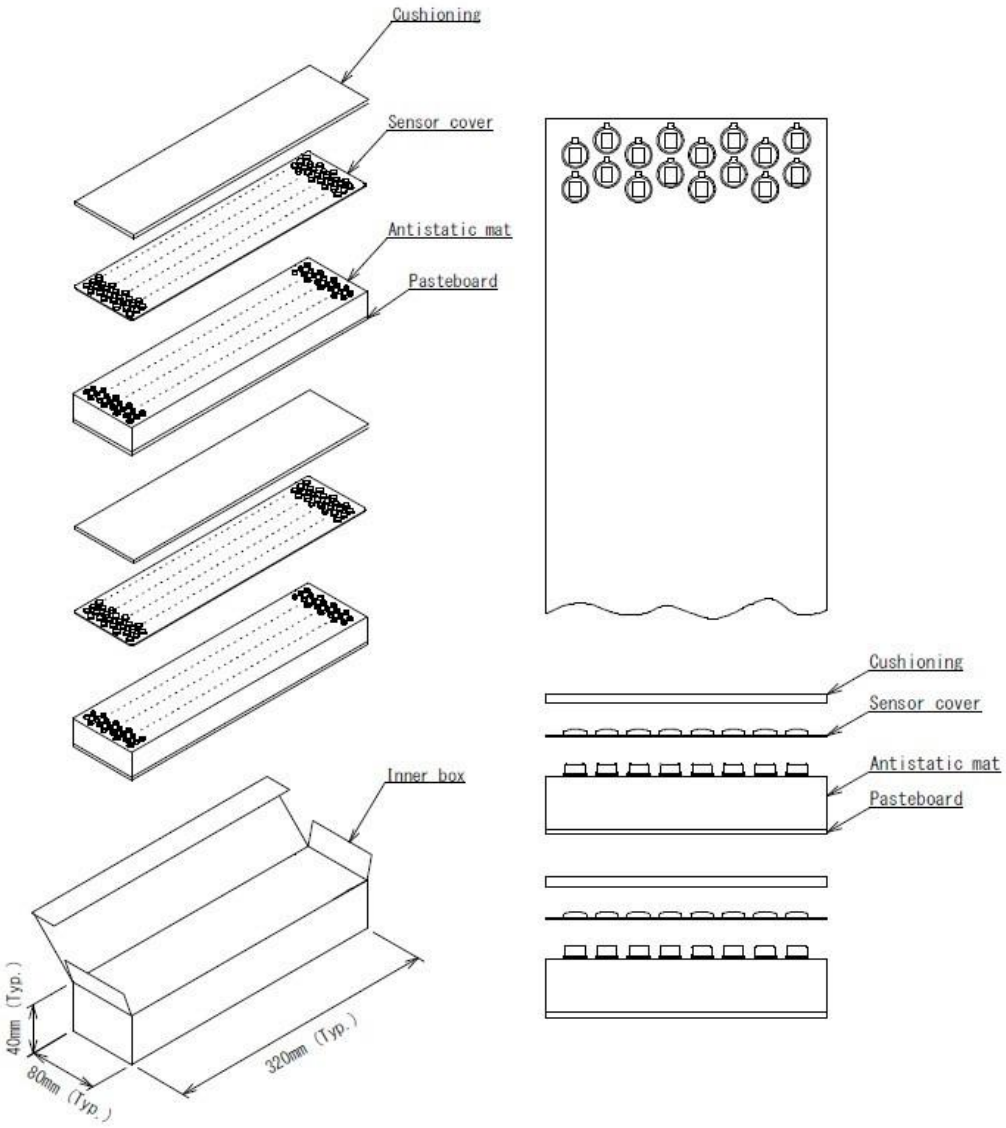
Packaging

The ZSFG469711 PIR sensor is shipped in sheets of 200 pieces, packed in boxes as shown in Figure 10 through Figure 12. The sheets are packed in an inner-box (2 sheets/box = 400 pieces) and 15 inner-boxes are packed in an outer-box for a total of 6,000 pieces per box.

Sheet and Inner-Box Packaging

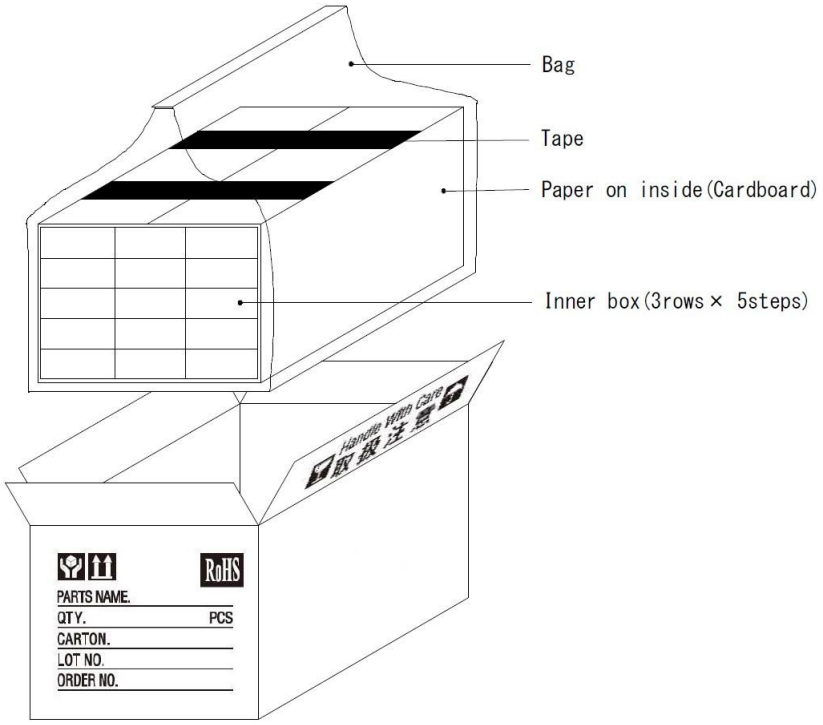
1) Standard sheet quantity: 200 pieces
2) Standard inner-box quantity: 2 Sheets (400 pieces

Figure 10 – Sheet & Inner-Box Packaging



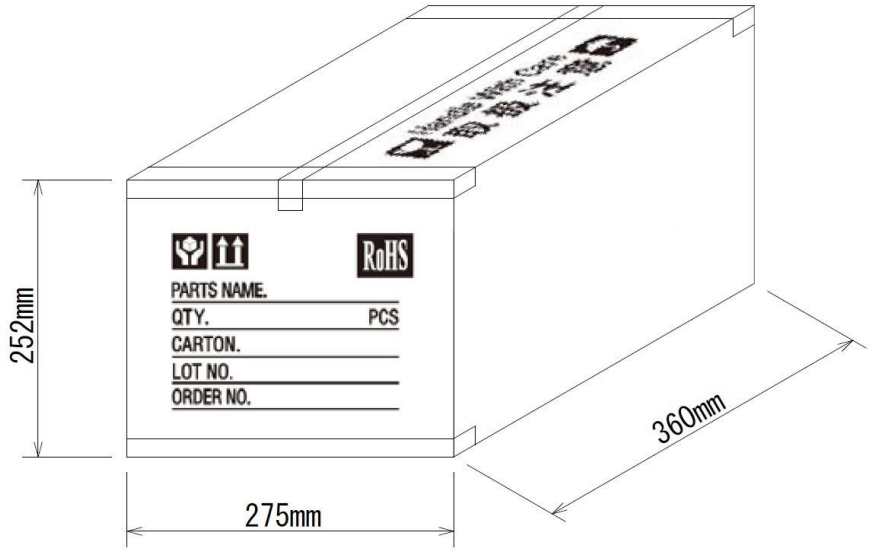
3) Standard Box Quantity: 6,000 pieces (15 Inner-Boxes)

Figure 11 – Outer-Box Packaging



4) The Standard Outer-Box dimensions are shown in Figure 12

Figure 12 - Standard Outer-Box Dimensions



Usage Restrictions and Precautions

This section presents restrictions and precautions that apply to Zilog pyroelectric sensors.

Design Restrictions and Precautions

This sensor is designed for indoor purposes in which secondary accidents due to operation failure or malfunctions can be anticipated; therefore, add appropriate fail-safe functionality to your design. If these sensors are intended for outdoor applications, be sure to apply suitable supplementary optical filters and use a waterproof enclosure.

Usage Restrictions and Precautions

To prevent sensor malfunctions, operational failure, or any deterioration of their characteristics, do not operate these PIR sensors under the following, or similar, conditions:

- Rapid environmental temperature changes
- Strong shocks or vibrations
- In places where there are obstructing materials (glass, fog, etc.) through which infrared rays cannot pass within the detection area
- In fluids, corrosive gases, and sea breezes
- Under continual high-humidity atmospheric conditions
- Exposed to direct sunlight or automobile headlights
- Exposed to directly to forced-air currents from a heater or air conditioner

Handling and Storage Restrictions and Precautions

To prevent sensor malfunctions, operational failure, appearance damage, or any deterioration of their characteristics, do not expose these sensors to the following, or similar, handling and storage conditions:

- Vibrations over extended periods
- Strong shocks
- Static electricity or strong electromagnetic waves
- High temperature and humidity over extended periods
- Corrosive gases or sea breezes
- Dirty and dusty environments that may contaminate the optical window

Assembly Restrictions and Precautions

Soldering:

- Use soldering irons when soldering
- Avoid extended durations of heat on the sensors' pins, because excessive heat may cause deterioration of the sensor (e.g., durations beyond 5 seconds at 350°C)

Washing:

- Be sure to wash out all flux after soldering. Residual soldering materials may cause malfunctions.
- Use a brush when washing; washing with an ultrasonic cleaner may cause operational failure

Related Documents

The documents associated with the ZFG223611 PIR sensor are listed below. Each of these documents, and others can be obtained from the ZMOTION Product Page on the Zilog website: http://www.zilog.com.

Document Number	Description
PB0263	PIR Sensor Product Brief
PB0258	ZMOTION MCU Product Brief
PS0264	PIR Lens Product Brief

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