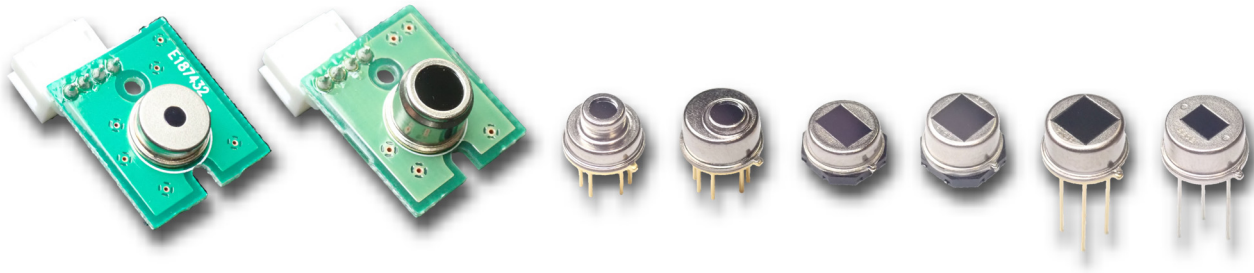


PYROELECTRIC IR SENSOR THERMOPILE SENSOR



We Make Good World with Sensor



Application Guide

Pyroelectric IR sensor

The pyroelectric infrared sensor is an infrared sensor that applies the pyroelectric effect of ferroelectric ceramic. It can detect human body movement and so on with sensing temperature changes.



Lighting

Automatic switch control.
Energy saving, Comfort & Convenience.



Security

Security & Safety.



Air-conditioner

Comfort & Energy saving.



IP camera IoT

Camera control. Energy saving & battery life extension. Security, Surveillance & Pet monitor.



Toilet

Automatic toilet lid open and close. Comfort, Convenience & Cleanliness.



TV

Automatic display control.
Energy saving & comfort.

Thermopile sensor Thermopile sensor unit

Thermopile sensor is an infrared sensor that applies the Seebeck effect. With detecting absolute thermal amount of the object, it measures temperature without contact.



Printer

Temperature monitor of inside parts. Printing quality and efficiency improvement.



Automotive

Temperature measurement of seat space, passenger, heat generation parts and etc..
Comfort and safety improvement.



Microwave oven

Food temperature measurement. Heat control to preset temperature.



Air-conditioner

Temperature monitor of floor and human body. Comfortability control & energy saving control.



IH cooker

Temperature monitor of pot bottom. Automatic control of cooking temperature.



Ear thermometer

Quick measure of body temperature.

0 Pyroelectric IR sensors

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| | Applications | | | | | | Object (Target temperature) | Part number | Number of element | FOV [°] | | Shape | Output method | Feature | Data Sheet | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------------------|-------------|-------------------|---------------------|--------|---------------|--------------------------|---|---|--------|
| | Lighting | Doorbell | IP Camera | HVAC | Home appliances | Security | | | | Gas/Flame Detection | X-axis | | | | | Y-axis |
| | | | | | | | | | | | | | | | | |
| 1 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | SW-ULP69-20 | 2 | 132 | 146 | TO-5 detector | analog | * Omni-directional dual sensor (both ceiling mount and wall mount) 69-Pyro * Amp build-in type | 5 | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D1-323-AA | 2 | 148 | 136 | TO-5 detector | Digital ON/OFF | * Wide-angle detection dual sensor * ASIC build-in type | D-Pyro | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D1-446-AA | 4 | 146 | 156 | TO-5 detector | Digital ON/OFF | * Omni-directional 4-element and 1-channel sensor (for ceiling mount) * ASIC build-in type | D-Pyro | |
| 2 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D1-469-AA | 2 | 146 | 156 | TO-5 detector | Digital ON/OFF | * Omni-directional dual sensor (both ceiling mount and wall mount) * ASIC build-in type | D-Pyro 69-Pyro | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D3-323-AA | 2 | 148 | 136 | TO-5 detector | Digital UART·ON/OFF | * Wide-angle detection dual sensor * ASIC build-in type | D-Pyro | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D3-446-AA | 4 | 146 | 156 | TO-5 detector | Digital UART·ON/OFF | * Omni-directional 4-element and 1-channel sensor (for ceiling mount) * ASIC build-in type | D-Pyro | |
| 3 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D3-469-AA | 2 | 146 | 156 | TO-5 detector | Digital UART·ON/OFF | * Omni-directional dual sensor (both ceiling mount and wall mount) * ASIC build-in type | D-Pyro 69-Pyro | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D4-323-AA | 2 | 148 | 136 | TO-5 detector | Digital I ² C | * Wide-angle detection dual sensor * ASIC build-in type | D-Pyro | |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D4-446-AA | 4 | 146 | 156 | TO-5 detector | Digital I ² C | * Omni-directional 4-element and 1-channel sensor (for ceiling mount) * ASIC build-in type | D-Pyro | |
| 4 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Human body, other | D4-469-AA | 2 | 146 | 156 | TO-5 detector | Digital I ² C | * Omni-directional dual sensor (both ceiling mount and wall mount) * ASIC build-in type | D-Pyro 69-Pyro | |

Pyroelectric IR sensor

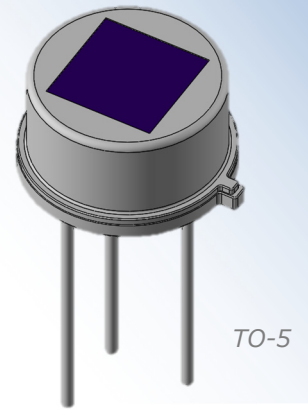


SW-ULP69-20

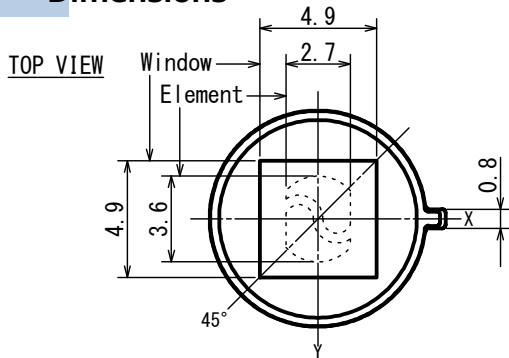
69-Pyro™

- Applications Doorbell, IP Camera, HVAC Home appliances

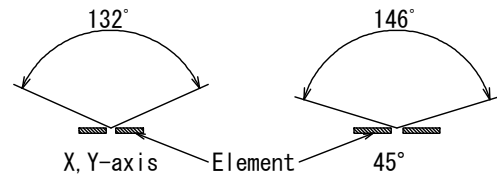
- Feature Omni-directional dual sensor (both ceiling mount and wall mount) Amp build-in type



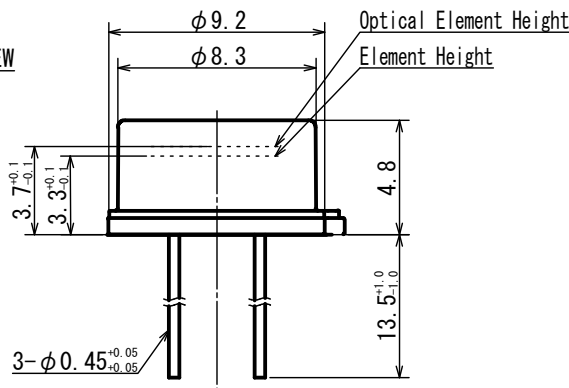
Dimensions



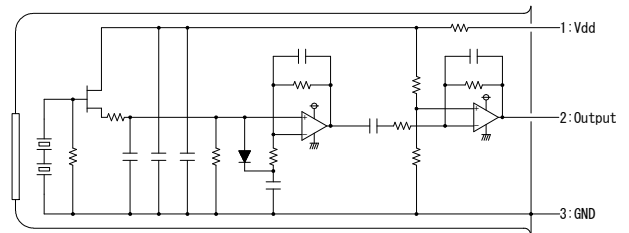
FOV



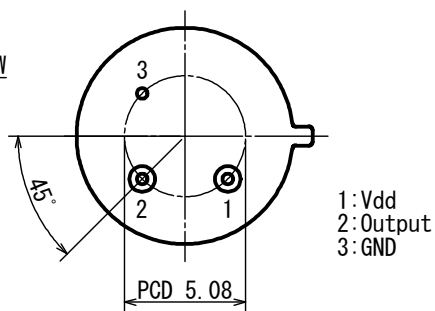
SIDE VIEW



Circuit diagram



BOTTOM VIEW



Tolerance with no specified : +/- 0.2

■ Main Parameter

| Parameter | Condition | Spec. | | | Unit |
|-----------------------|-----------|-------|-------|------|------|
| | | Min. | Typ. | Max. | |
| Operating Voltage | | 1.8 | | 3.6 | V |
| Offset Voltage | | | Vdd/2 | | V |
| Sensitivity Output | | 1 | 2 | | V |
| Noise Output | | | 60 | 200 | mV |
| Operating Temperature | | -40 | | 70 | °C |

Pyroelectric IR sensor



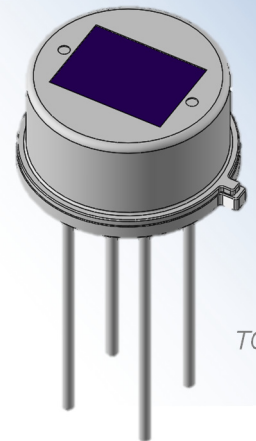
New

D3-323-AA

D-Pyro™

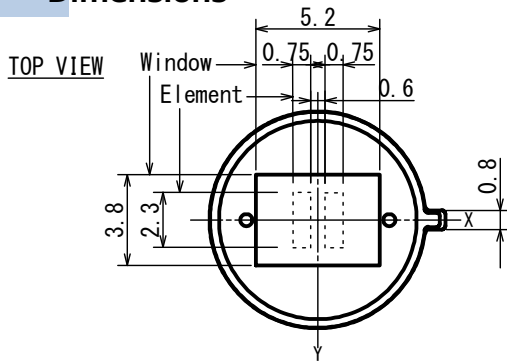
- Applications Doorbell, IP Camera, HVAC
Home appliances, Security

- Feature Wide-angle detection dual sensor
ASIC build-in type
(UART·ON/OFF output type)

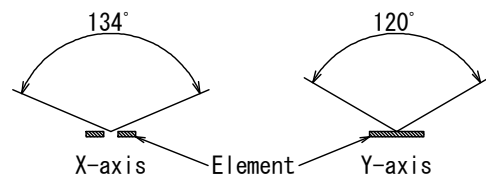


TO-5

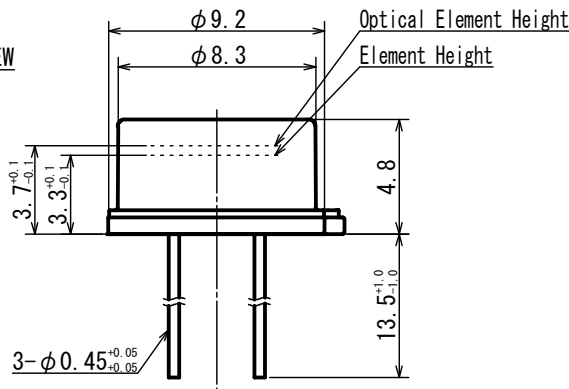
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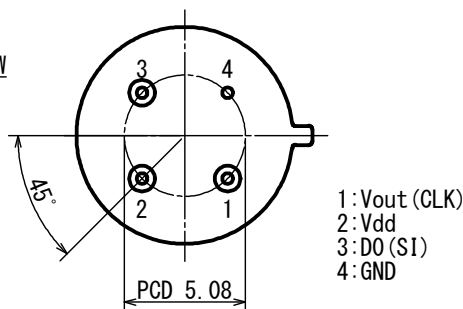
FOV



SIDE VIEW

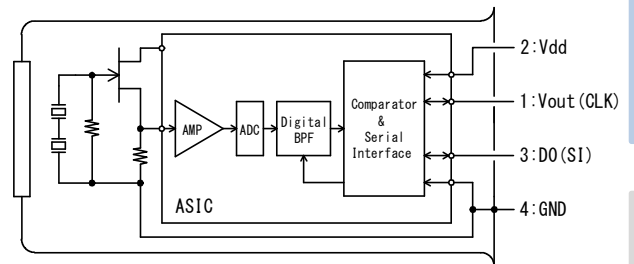


BOTTOM VIEW



Tolerance with no specified : +/- 0.2

Circuit diagram



■ Main Parameter

| Parameter | Condition | Spec. | | | Unit |
|--------------------------|-----------|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| Operating Voltage | | 1.8 | | 5.5 | V |
| Supply Current | Vdd=3.0V | | 3 | 5 | μA |
| Signal Output Bit Number | | | 12 | | bit |
| Baud Rate | | | 20 | | kbps |
| Operating Temperature | | -40 | | 80 | °C |

Analog

ASIC build-in

SMD

Air-conditioner

Microwave oven

IH cooker

Printer

thermometer

Non-contact thermometer

Pyroelectric IR sensor



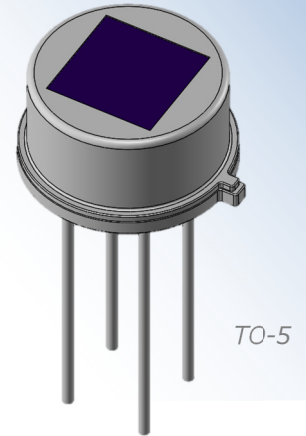
New

D3-446-AA

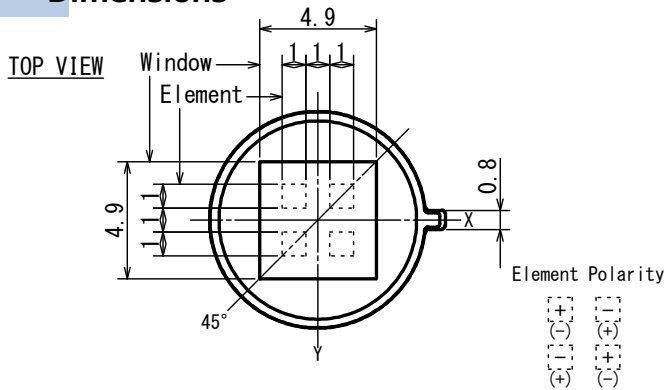
D-Pyro™

- Applications Doorbell, IP Camera, HVAC Home appliances, Security

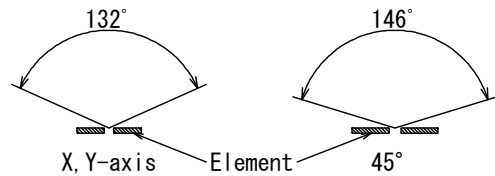
- Feature Omni-directional 4-element and 1-channel sensor (for ceiling mount) ASIC build-in type (UART·ON/OFF output type)



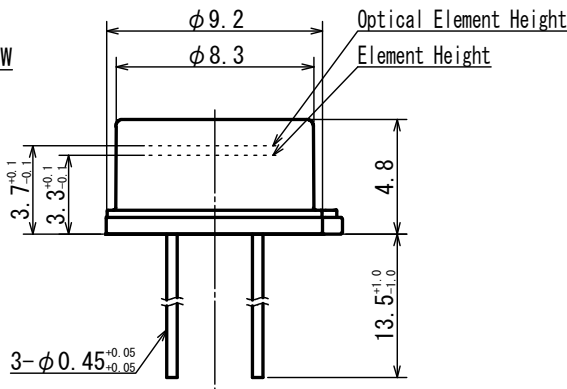
Dimensions



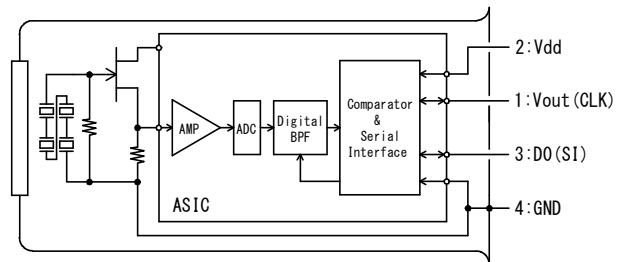
FOV



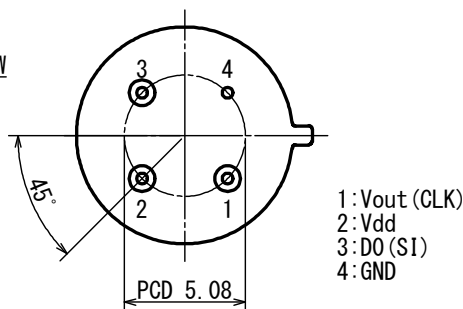
SIDE VIEW



Circuit diagram



BOTTOM VIEW



Tolerance with no specified : +/- 0.2

■ Main Parameter

| Parameter | Condition | Spec. | | | Unit |
|--------------------------|-----------|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| Operating Voltage | | 1.8 | | 5.5 | V |
| Supply Current | Vdd=3.0V | | 3 | 5 | μA |
| Signal Output Bit Number | | | 12 | | bit |
| Baud Rate | | | 20 | | kbps |
| Operating Temperature | | -40 | | 80 | °C |

Pyroelectric IR sensor



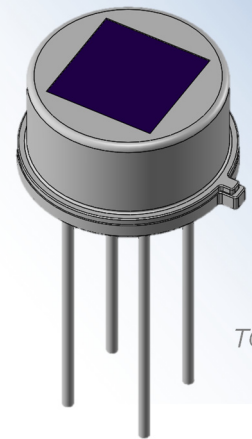
New

D3-469-AA

D-Pyro™
69-Pyro™

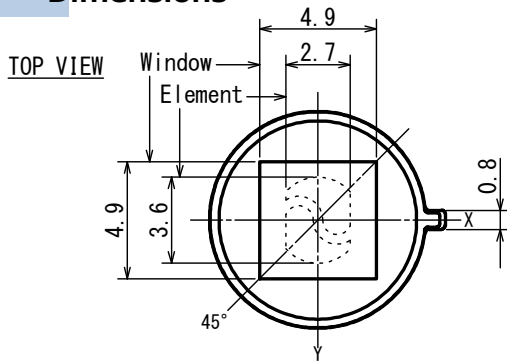
- Applications Doorbell, IP Camera, HVAC
Home appliances, Security

- Feature Omni-directional dual sensor
(both ceiling mount and wall mount)
ASIC build-in type
(UART·ON/OFF output type)

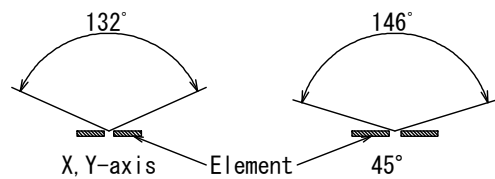


TO-5

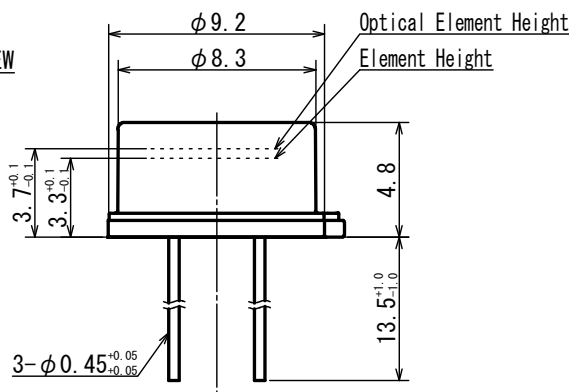
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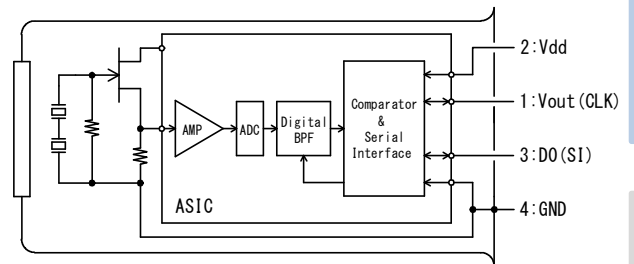
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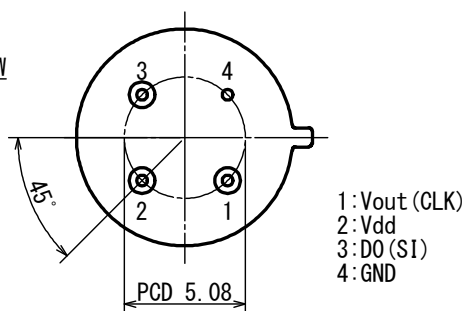
SIDE VIEW



Circuit diagram



BOTTOM VIEW



Tolerance with no specified : +/- 0.2

■ Main Parameter

| Parameter | Condition | Spec. | | | Unit |
|--------------------------|-----------|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| Operating Voltage | | 1.8 | | 5.5 | V |
| Supply Current | Vdd=3.0V | | 3 | 5 | μA |
| Signal Output Bit Number | | | 12 | | bit |
| Baud Rate | | | 20 | | kbps |
| Operating Temperature | | -40 | | 80 | °C |

Analog

ASIC build-in

SMD

Air-conditioner

Microwave oven

IH cooker

Printer

Ear thermometer

Non-contact thermometer

Pyroelectric IR sensor



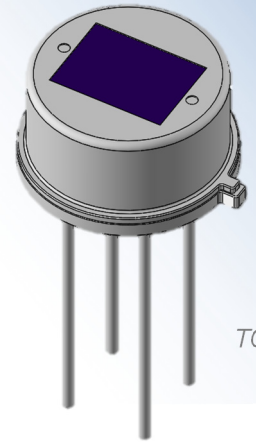
New

D4-323-AA

D-Pyro™

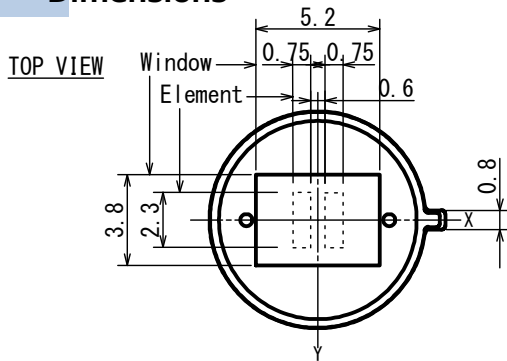
- Applications Doorbell, IP Camera, HVAC
Home appliances, Security

- Feature Wide-angle detection dual sensor
ASIC build-in type(I²C type)

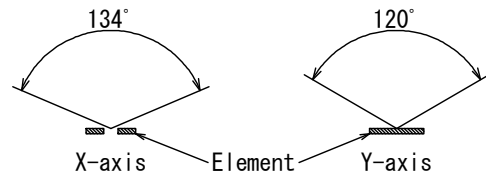


TO-5

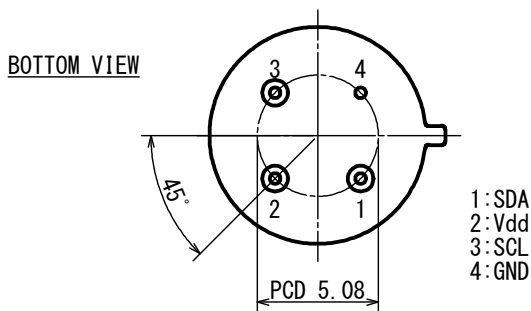
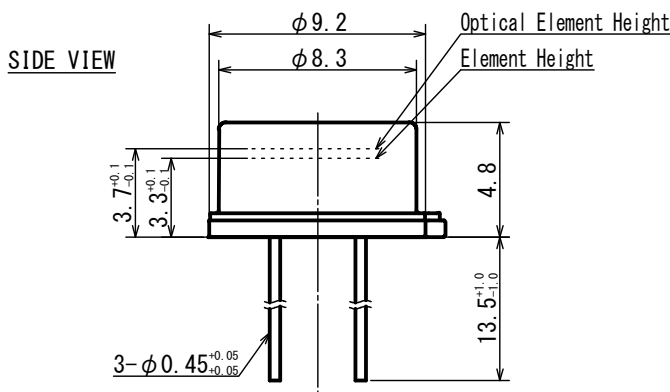
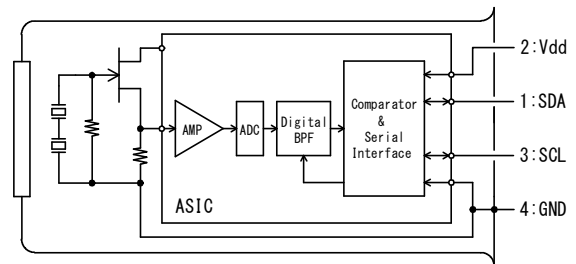
Dimensions



FOV



Circuit diagram



Tolerance with no specified : +/- 0.2

■ Main Parameter

| Parameter | Condition | Spec. | | | Unit |
|---------------------------|-----------|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| Operating Voltage | | 1.8 | | 5.5 | V |
| Supply Current | Vdd=3.0V | | 3 | 5 | μA |
| Signal Output Bit Number | | | 12 | | bit |
| I ² C Bus Mode | | | 100 | | kbps |
| Operating Temperature | | -40 | | 80 | °C |

Pyroelectric IR sensor



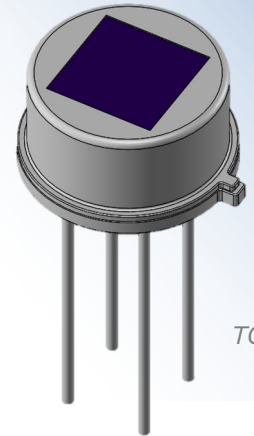
New

D4-446-AA

D-Pyro™

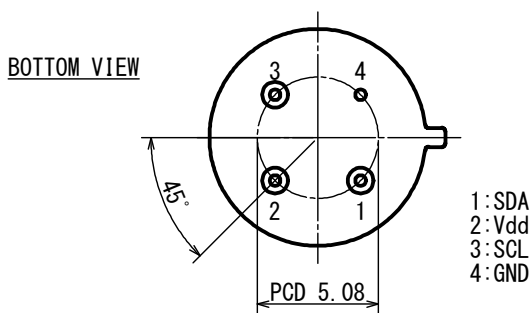
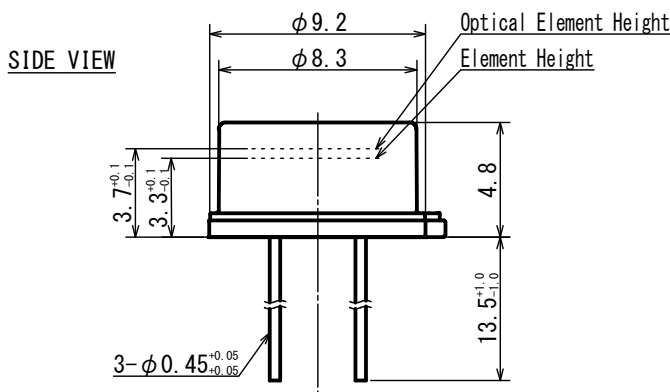
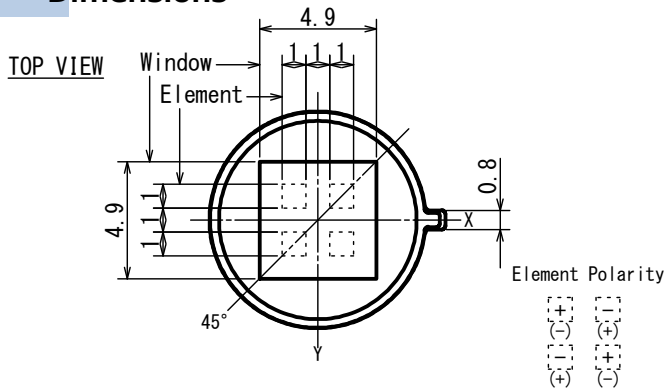
- Applications Doorbell, IP Camera, HVAC
Home appliances, Security

- Feature Omni-directional 4-element and
1-channel sensor (for ceiling mount)
ASIC build-in type(I²C type)



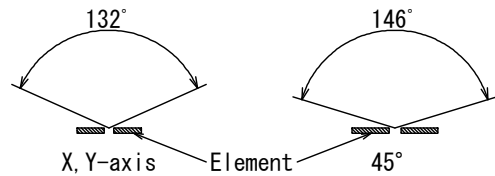
TO-5

Dimensions

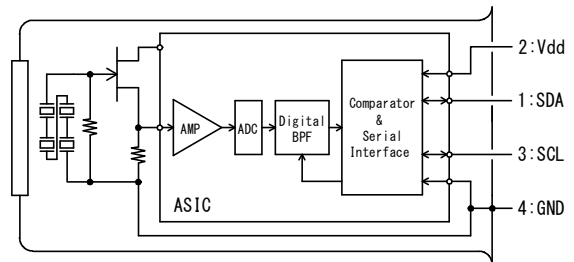


Tolerance with no specified : +/- 0.2

FOV



Circuit diagram



■ Main Parameter

| Parameter | Condition | Spec. | | | Unit |
|---------------------------|-----------|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| Operating Voltage | | 1.8 | | 5.5 | V |
| Supply Current | Vdd=3.0V | | 3 | 5 | μA |
| Signal Output Bit Number | | | 12 | | bit |
| I ² C Bus Mode | | | 100 | | kbps |
| Operating Temperature | | -40 | | 80 | °C |

Analog

ASIC build-in

SMD

Air-conditioner

Microwave oven

IH cooker

Printer

Ear thermometer

Non-contact thermometer

Pyroelectric IR sensor



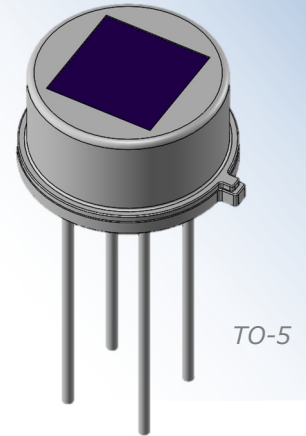
New

D4-469-AA

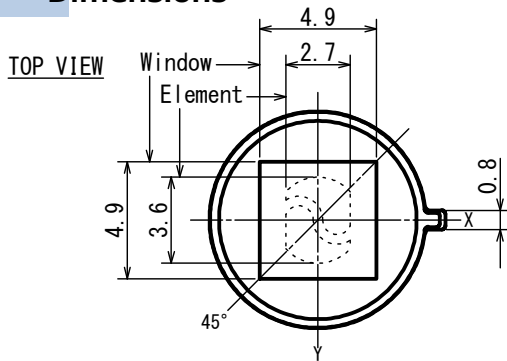
D-Pyro™
69-Pyro™

- Applications Doorbell, IP Camera, HVAC
Home appliances, Security

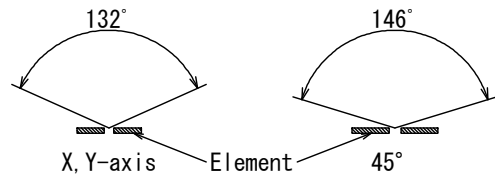
- Feature Omni-directional dual sensor
(both ceiling mount and wall mount)
ASIC build-in type(I²C type)



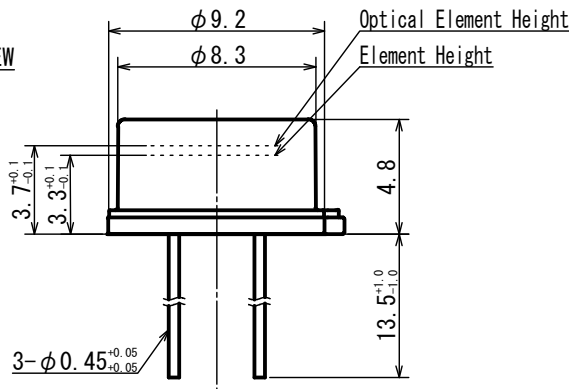
Dimensions



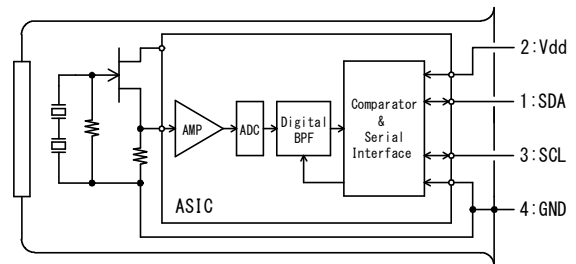
FOV



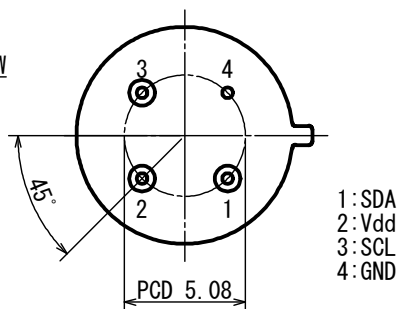
SIDE VIEW



Circuit diagram



BOTTOM VIEW



Tolerance with no specified : +/- 0.2

■ Main Parameter

| Parameter | Condition | Spec. | | | Unit |
|---------------------------|-----------------------|-------|------|------|------|
| | | Min. | Typ. | Max. | |
| Operating Voltage | | 1.8 | | 5.5 | V |
| Supply Current | V _{dd} =3.0V | | 3 | 5 | μA |
| Signal Output Bit Number | | | 12 | | bit |
| I ² C Bus Mode | | | 100 | | kbps |
| Operating Temperature | | -40 | | 80 | °C |

1. Design restrictions/precautions

These sensors are designed for indoor use. If used for outdoor applications, please be sure to apply proper supplementary optical filter, drip-proof and anti-dew construction.

In cases where secondary accidents caused by operation failure or malfunction of the sensor could be expected, please include a fail safe function into the design.

2. Remarks

These sensors are not suitable for applications that require extremely high reliability, such as related to human life (life supporting devices and etc.).

These sensors must not be used for products that are prohibited to manufacture, use and sell by Japanese domestic and foreign laws and orders.

The contents described in this catalog are as of January 2021.

The described contents may be changed or suspended without notice.

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