

MESSRS. : \_\_\_\_\_

AGENT : \_\_\_\_\_

**SPECIFICATION  
OF  
PYROELECTRIC PASSIVE  
INFRARED SENSOR**


MODEL NO. : SBG4L46-711

PART NO. : \_\_\_\_\_

 **NIPPON CERAMIC CO., LTD.**

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APPROVED BY	CHECKED BY	DRAWN BY

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Scope

This specification describes a pyroelectric passive infrared sensor supplied by NIPPON CERAMIC CO.,LTD.

Type of sensor

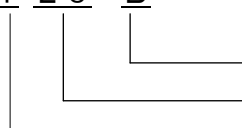
Balanced differential(series opposed type.)

Physical configuration


- 1) Package : TO-5 metal can with dimensions shown in Figure 1-c (Ni-plated)
- 2) Element geometry : Four sensitive areas 1.0 mm \* 1.0 mm and spaced 1.0 mm apart.
- 3) Element orientation : See Figure 1-b
- 4) Lead configuration : See Figure 1-c,1-d
- 5) Code :

Lot number is marked on top surface of detector.  
To show last one digit of the A.D. year and week of the year of a inspection completion, Nicera Identification code.

Example : 4 26 B



Nicera Identification code  
26<sup>th</sup> week  
Year 2014

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Electrical characteristics (at 25 (+/-) 5 degC)

1) Circuit configuration : Three-terminal sensor with source follower  
See Figure 2

2) Operating voltage : 1 ~ 15 V dc (Rs: 470kohm)

3) Element polarity : Element A,C:(+) B,D:(-) or A,C:(-) B,D:(+)

4) Source voltage : 0.3 ~ 1.4 V (Vd: 5V, Rs: 470kohm)

5) Signal output : Min. 5.5 Vp-p (Typ. 7.5 Vp-p)  
( S1, S2 )

Signal output is measured at chopper frequency of 1 Hz when connected to the amplifier of gain 72.5 dB (at 1 Hz) and submitted to the emission of Infrared energy of 13 microW/cm<sup>2</sup> from 420 K Black Body.

See Figure 3

6) Noise output : Max. 350 mVp-p (Typ. 170 mVp-p)

Noise output shall be measured for 20 seconds when connected to the amplifier of gain 72.5 dB (at 1 Hz) and shut out from Infrared energy.

See Figure 3

7) Balance output : Max. 15 %

$$\left[ \frac{|S1-S2|}{|S1+S2|} \right] \leq 0.15$$


S1 : Signal output on Element A + C

S2 : Signal output on Element B + D

Balance output is measured at chopper frequency of 1 Hz when connected to the amplifier of gain 72.5 dB (at 1 Hz) and submitted to the emission of Infrared energy of 13 microW/cm<sup>2</sup> from 420 K Black Body.

See Figure 3

8) Frequency response : 0.3 Hz to 3.0 Hz / (+/-) 10 dB

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### Optical characteristics


- 1) Field of view : 155 ° from center of element on axis x,y  
: 162 ° from center of element on 45 °  
: See Figure 1-a
- 2) Filter substrate : Silicon
- 3) Cut on (5 %T ABS) : 5 (+/-) 1 micron
- 4) Transmission :  $\geq$  70 % average 8 to 13 micron

### Environmental requirements

- 1) Operating temperature : -40 degC to +70 degC
- 2) Storage temperature : -40 degC to +80 degC
- 3) Relative humidity :  
The sensor shall operate without increase in noise output when exposed to 90 ~ 95 % RH at 30 degC continuously.
- 4) Hermetic seal :  
The sensor shall be sealed to withstand a vacuum of 21.28 kPa.

### RoHS compliance

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

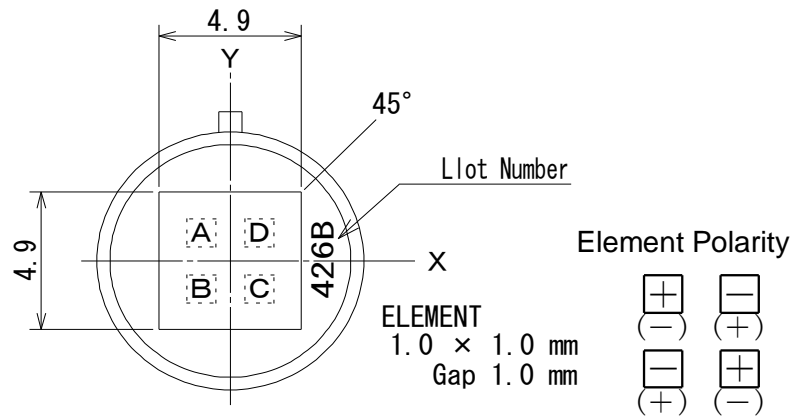
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**Configuration (Figure 1)**

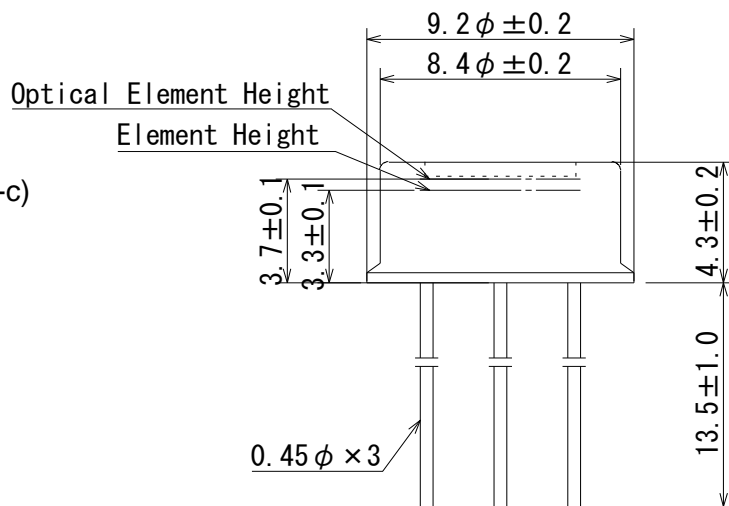
**Field of view**  
(Figure 1-a)



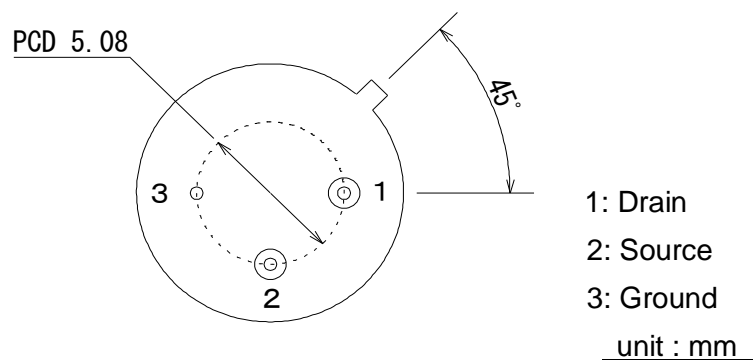
**Top view**  
(Figure 1-b)



**Side view**  
(Figure 1-c)

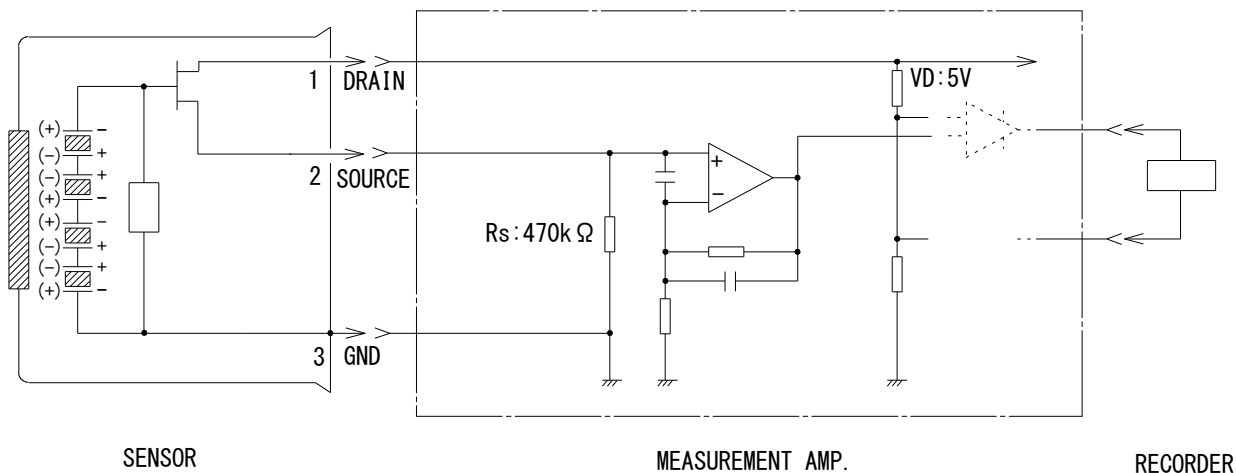


**Base view**  
(Figure 1-d)



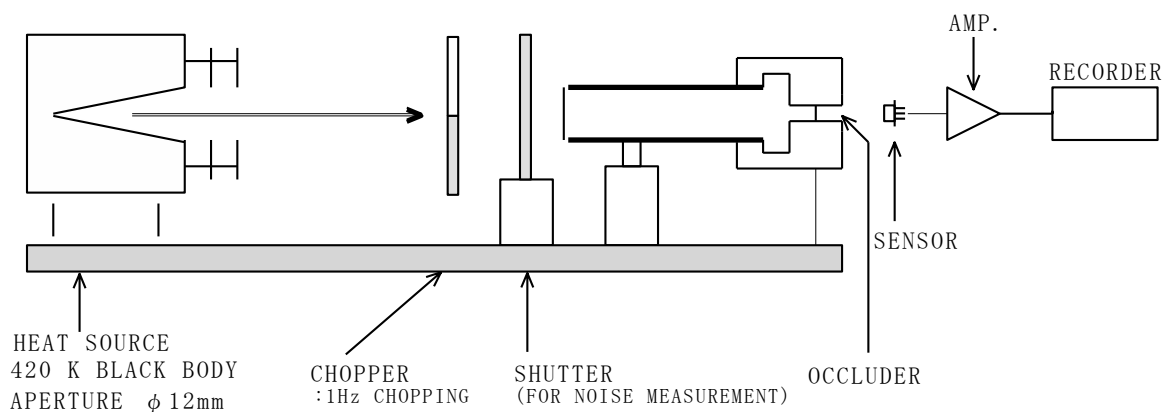
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**Circuit configuration (Figure 2)**

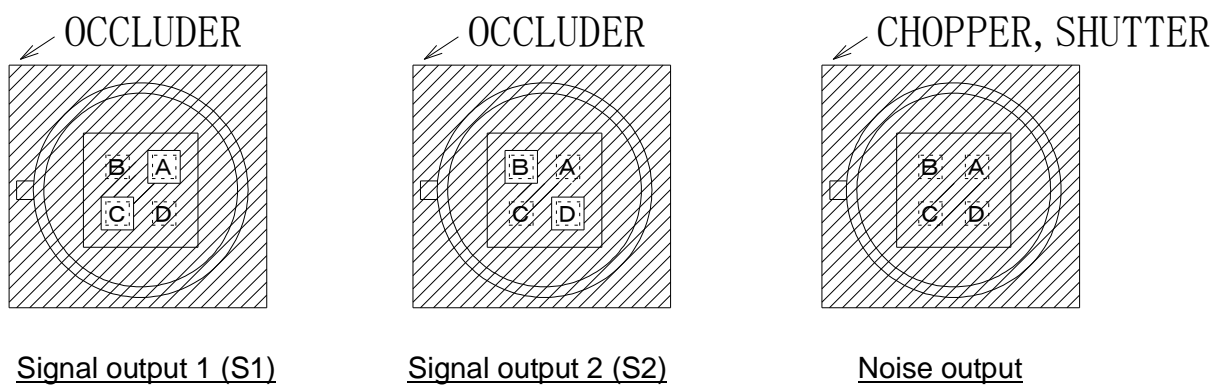


※ Measurement Amp.: Non-inverted type, gain 72.5 dB at 1 Hz , 0.4 to 2.7 Hz / -3 dB

**Test set-up block diagram (Figure 3)**



**Occluder position**

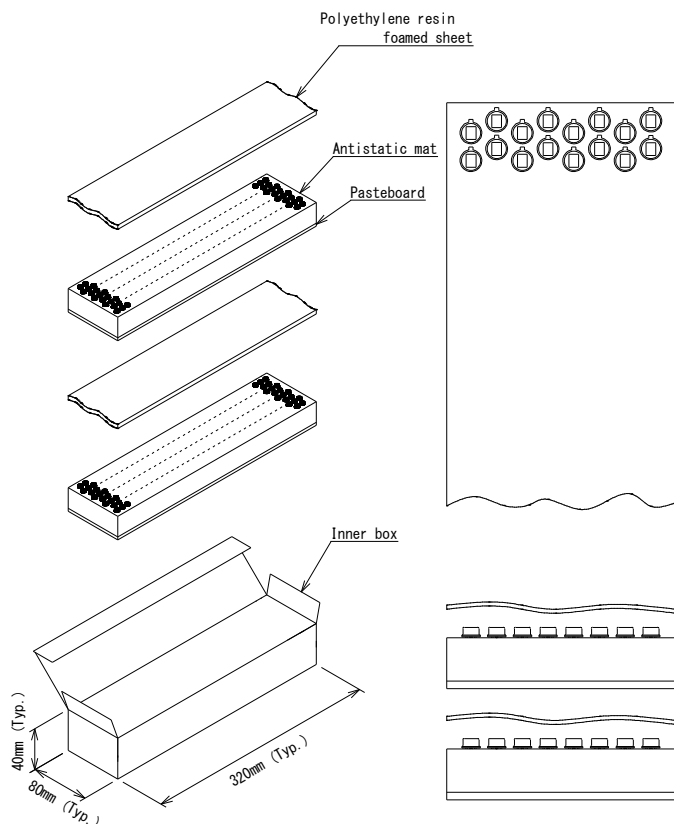


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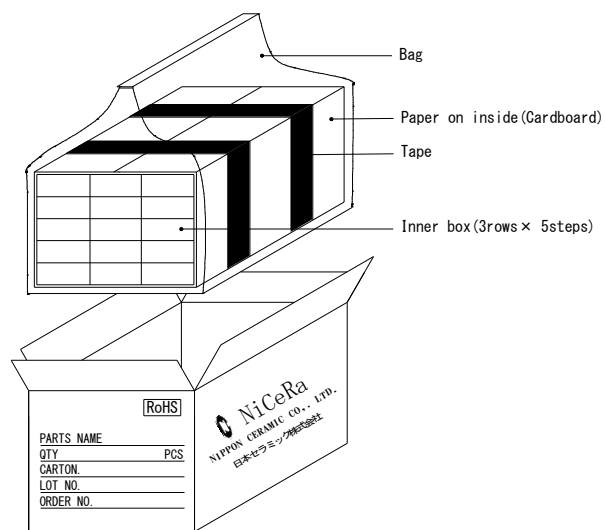
## Packing Specification

The products are packaged in inner box, and the boxes are piled up as shown on the following sketch.

1. Product arrangement    200 pcs./Sheet  
400 pcs./Box

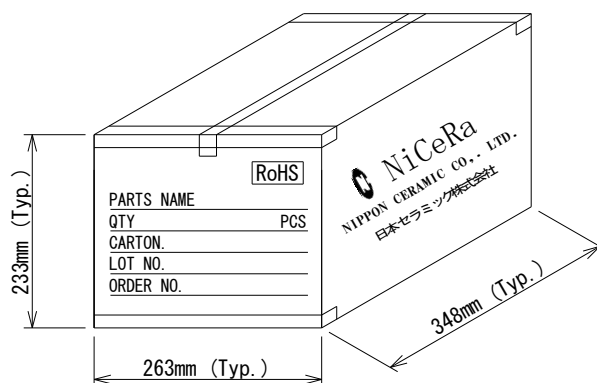


2. Packing



3. Packing in a box

The outer box is sealed with stick tape.



4. Standard Package Quantity : 6,000 pcs.

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## ※ Notes

### 1.Design restrictions/precautions

If used for outdoor applications, be sure to apply suitable supplementary optical filter and drip-proof, anti-dew construction. This sensor is designed for indoor use.

in cases where secondary accidents due to operation failure or malfunctions can be anticipated, add a fail safe function to the design.

### 2.Usage restrictions/precautions

To prevent sensor malfunctions, operational failure or any deterioration of its characteristics, do not use this sensor in the following, or similar, conditions.

- a. In rapid environmental temperature changes.
- b. In strong shock or vibration.
- c. In a place where there are obstructing materials (glass,fog,etc.) Through which Infrared rays cannot pass within detection area.
- d. In fluid, corrosive gases and sea breeze.
- e. Continual use in high humidity atmosphere.
- f. Exposed to direct sun light or headlights of automobiles.
- g. Exposed to direct wind from a heater or air conditioner.


### 3.Assembly restrictions/precautions

Soldering \_\_\_\_\_

- a. Use soldering irons when soldering.
- b. Avoid keeping pins of this sensor hot for a long time as excessive heat may cause deterioration of its quality.(e.g. within 5 sec. at 350 degC)

Washing \_\_\_\_\_

- a. Be sure to wash out all flux after soldering as remainder may cause malfunctions.
- b. Use a brush when washing. Washing with an ultrasonic cleaner may cause operational failure.

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#### 4. Handling and storage restrictions / precautions


To prevent sensor malfunctions, operational failure, appearance damage or any deterioration of its characteristics, do not expose this sensor to the following or similar, handling and storage conditions.

- a. Vibration for a long time.
- b. Strong shock.
- c. Static electricity or strong electromagnetic waves.
- d. High temperature and humidity for a long time.
- e. Corrosive gases or sea breeze.
- f. Dirty and dusty environments that may contaminate the optical window.

#### 5. Restrictions on product use

The product described in this document shall not be used or embedded to any downstream products of which manufacture, use and/or sales are prohibited under any applicable laws and regulations.

Sensor troubles resulting from misuse, inappropriate handling or storage are not the manufacturer's responsibility.

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