

DATE: FEB., 09, 2000

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

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

SPECIFICATION  
OF  
THERMOPILE  
INFRARED SENSOR

MODEL NO. TS-1NAB

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

THERMOPILE INFRARED SENSOR MODEL NO. TS-1NAB	PAGE 1 / 6	DRAWING NO. 0902001	REV : A
	NIPPON CERAMIC CO., LTD.		
APPROVED BY	CHECKED BY	DRAWN BY	

**SCOPE**

THIS SPECIFICATION DESCRIBES A THERMOPILE INFRARED SENSOR SUPPLIED BY NIPPON CERAMIC CO.,LTD.

**TYPE OF SENSOR**

SINGLE ELEMENT TYPE.

**PHYSICAL CONFIGURATION**

- 1) PACKAGE : TO-5 METAL CAN WITH DIMENSIONS SHOWN IN FIGURE 1-C (GOLD-PLATED)
- 2) ELEMENT GEOMETRY : SENSITIVE AREA 0.5 mm<sup>2</sup>
- 3) ELEMENT ORIENTATION : SEE FIGURE 1-B
- 4) LEAD CONFIGURATION : SEE FIGURE 1-C,1-D

**ELECTRICAL CHARACTERISTICS** (AT 25 ± 5 )


- 1) CIRCUIT CONFIGURATION : FOUR-TERMINAL SENSOR  
SEE FIGURE 2
- 2) SIGNAL OUTPUT : 190 mVo-p ± 30%

SIGNAL OUTPUT IS MEASURED BY USING SHUTTER WHEN CONNECTED TO THE AMPLIFIER OF GAIN 74 dB (AT 1 Hz) AND SUBMITTED TO THE EMISSION OF INFRARED ENERGY OF 167 μW/cm<sup>2</sup> FROM 700K BLACK BODY.  
SEE FIGURE 3

- 3) RESISTANCE OF THERMOPILE (Pin 1 ~ Pin 2)  
: 50K ± 15 K (at 25° C)
- 4) REFERENCE RESISTOR (Pin 3 ~ Pin 4)  
: 100K ± 10% (at 25° C)

**OPTICAL CHARACTERISTICS**


- 1) FIELD OF VIEW : 111° FROM CENTER OF SENSITIVE ELEMENT  
: SEE FIGURE 1-A
- 2) FILTER SUBSTRATE : SILICON

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- 3) CUT ON (5% TABS) :  $5.0 \pm 0.5 \mu m$   
4) TRANSMISSION : 70 % AVERAGE 7.0 ~ 14  $\mu m$

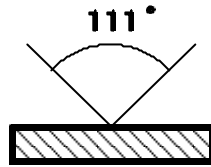
ENVIRONMENTAL REQUIREMENTS

- 1) OPERATING TEMPERATURE : -20 TO +50  
2) STORAGE TEMPERATURE : -30 TO +70  
3) RELATIVE HUMIDITY :  
THE SENSOR SHALL OPERATE WITHOUT INCREASE IN NOISE OUTPUT WHEN EXPOSED TO  
90 ~ 95 % RH AT 30 CONTINUOUSLY.

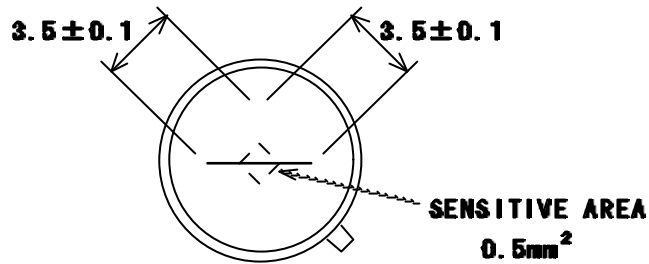
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CONFIGURATION (FIGURE 1)

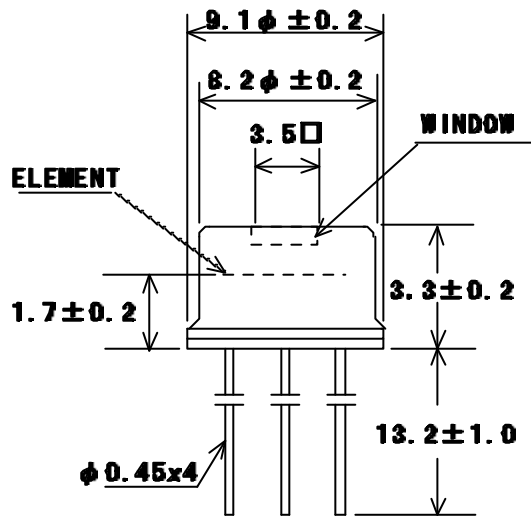
FIELD OF VIEW  
(FIGURE 1-A)



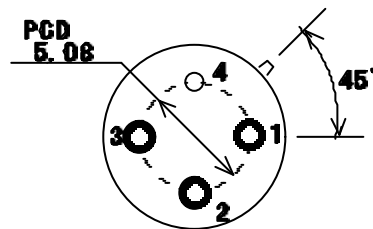
TOP VIEW  
(FIGURE 1-B)



SIDE VIEW  
(FIGURE 1-C)



BASE VIEW  
(FIGURE 1-D)

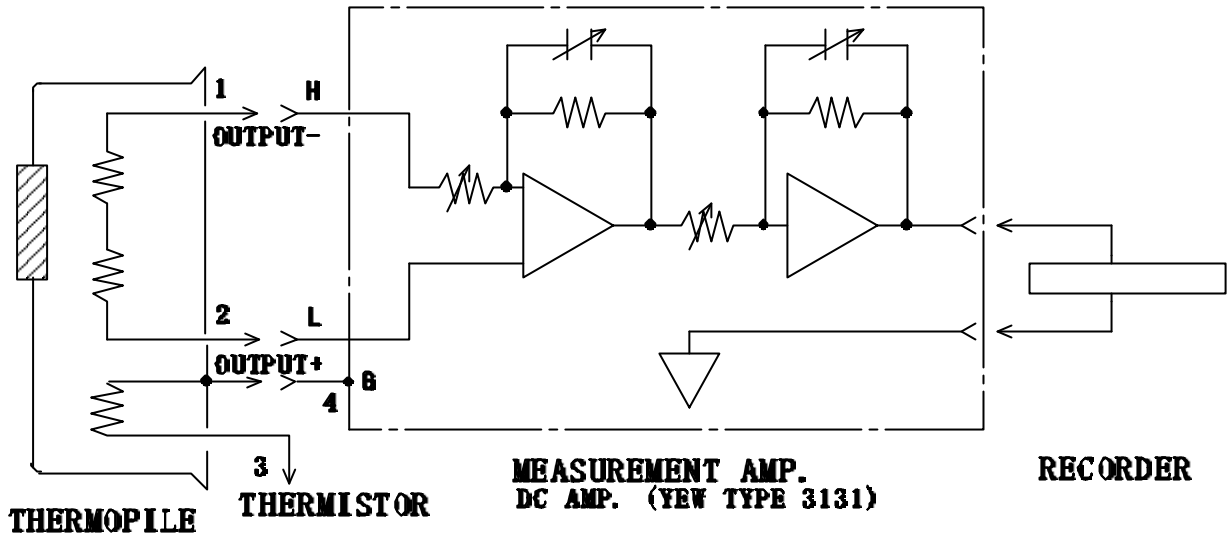


- 1: OUTPUT-
- 2: OUTPUT+
- 3: THERMISTOR
- 4: GROUND

UNIT : mm

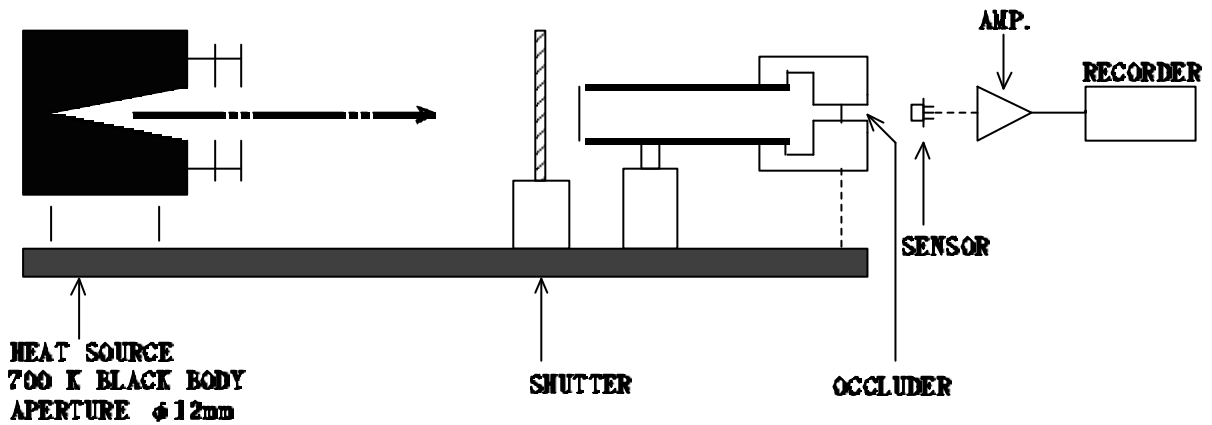
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**CIRCUIT CONFIGURATION (FIGURE 2)**

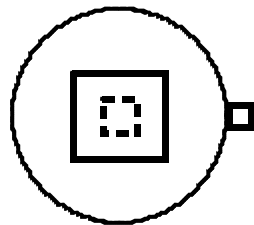


MEASUREMENT AMP.: DC AMP. YEW TYPE 3131, GAIN 74 dB AT 1 Hz.

**TEST SET-UP BLOCK DIAGRAM (FIGURE 3)**



OCCLUDER POSITION



SIGNAL OUTPUT

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NOTES

1.DESIGN RESTRICTIONS/PRECAUTIONS

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. IN FIELD OF STATIC ELECTRICITY OR STRONG ELECTROMAGNETIC WAVES.
- 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 10 SEC. AT 260 )

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.

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 & LOW TEMPERATURE AND HUMIDITY FOR A LONG TIME.
- E. CORROSIVE GASES OR SEA BREEZE.
- F. DIRTY AND DUSTY ENVIRONMENTS THAT MAY CONTAMINATE THE OPTICAL WINDOW.

SENSOR TROUBLES RESULTING FROM MISUSE, INAPPROPRIATE HANDLING OR STORAGE ARE NOT THE MANUFACTURER'S RESPONSIBILITY.

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