MESSRS :

AGENT :

SPECIFICATION
OF
THERMOPILE
INFARAED SENSOR

MODEL NO. : TS-S2NMB-2R

PART NO. :

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) PAKAGE : TO-18 METAL CAN WITH DIMENSIONS SHOWN IN FIGURE 1-C
2) ELEMENT GEOMETRY : SENSITIVE AREA 0.64 mm^2
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 : 2.43mV_{0-p} ± 25%
(REFERENCE)
(CONDITIONS) ENERGY : 20.6 mW/cm^2 (323K AT SHUTTER OPENING)
AMP. GAIN : WITHOUT AMP.
TEST SET-UP BLOCK DAGRAM : REFER TO FIGURE 2

3) RESISTANCE OF THERMOPILE (Pin1～Pin3) : 175kΩ ± 30kΩ (at 25℃)

4) THERMAL TIME CONSTANT (RISE TIME) : 25 msec. ～ 80 msec. (Typ. 50 msec.)

5) THERMISTOR RESISTOR (Pin2～Pin4) : 100kΩ ± 5% (at 25℃)

6) THERMISTOR B CONSTANT : 3955K ± 0.5% (T1/T2 : 0/50℃)

7) TEMPERATURE COEFFICIENT OF SIGNAL OUTPUT : +0.03 %/℃ ± 0.04 (10～50℃)
(AVERAGE VALUE OF TEMPERATURE COEFFICIENT PER 1℃, IN THE RANGE OF 10 ~ 50℃)
(CONDITIONS) SEE FIGURE 2
CALCULATING FORMULA [{(T2℃SENS.-T1℃SENS.)/T1℃SENS.}×100]/(T2-T1)
※ T2 - T1 = +1℃

OPTICAL CHARACTERISTICS

1) FIELD OF VIEW : 90° FROM CENTER OF SENSITIVE ELEMENT
: SEE FIGURE 1-A
2) FILTER SUBSTRATE : SILICON
3) CUT ON(5%TABS) : 5.0 ± 0.5 μm
4) TRANSMISSION : ≧70% AVERAGE 7.0～14μm (SEE FIGURE 4)

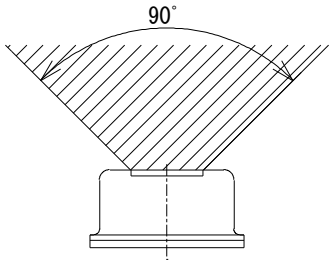
ENVIRONMENTAL REQUIREMENTS

1) OPERATING TEMPERATURE : -30℃ TO +80℃
2) STORAGE TEMPERATURE : -30℃ TO +100℃
3) RELATIVE HUMIDITY :

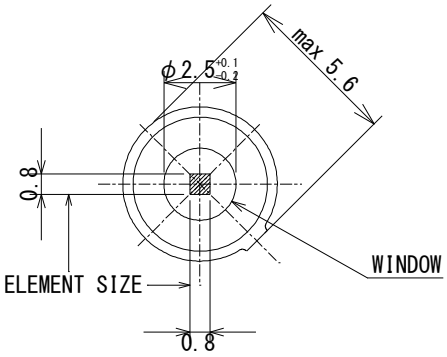
THE SENSOR SHALL OPERATE WITHOUT INCREASE IN NOISE OUTPUT WHEN EXPOSED TO 90 ～ 95 % RH AT 30 ℃ CONTINUOUSLY.

CONFIGURATION(FIGURE 1)

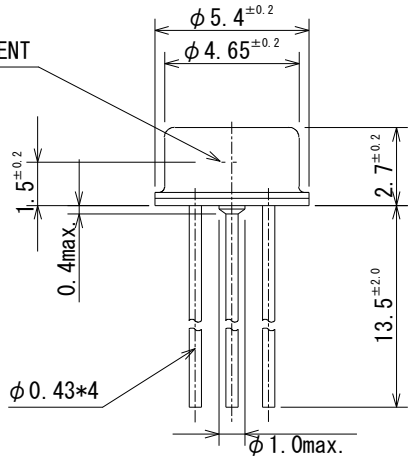
【FIELD OF VIEW】
(FIGURE 1-A)



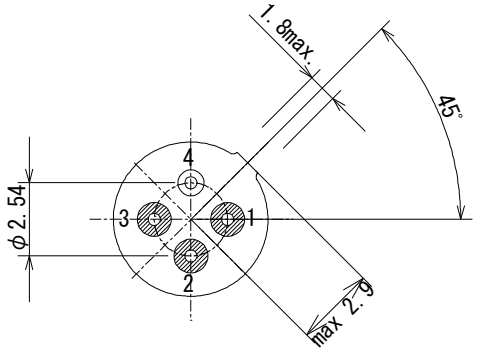
【TOP VIEW】
(FIGURE 1-B)



【SIDE VIEW】
(FIGURE 1-C)



【BOTTOM VIEW】
(FIGURE 1-D)



1. THERMOPILE(+)
2. THERMISTOR
3. THERMOPILE(−)
4. GROUND

UNIT : mm

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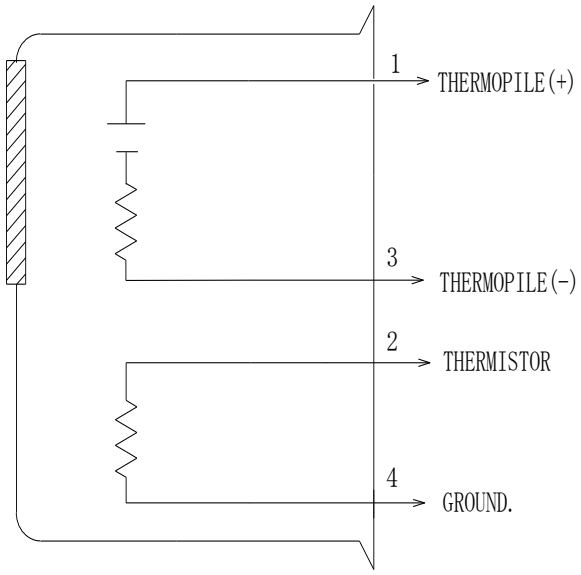
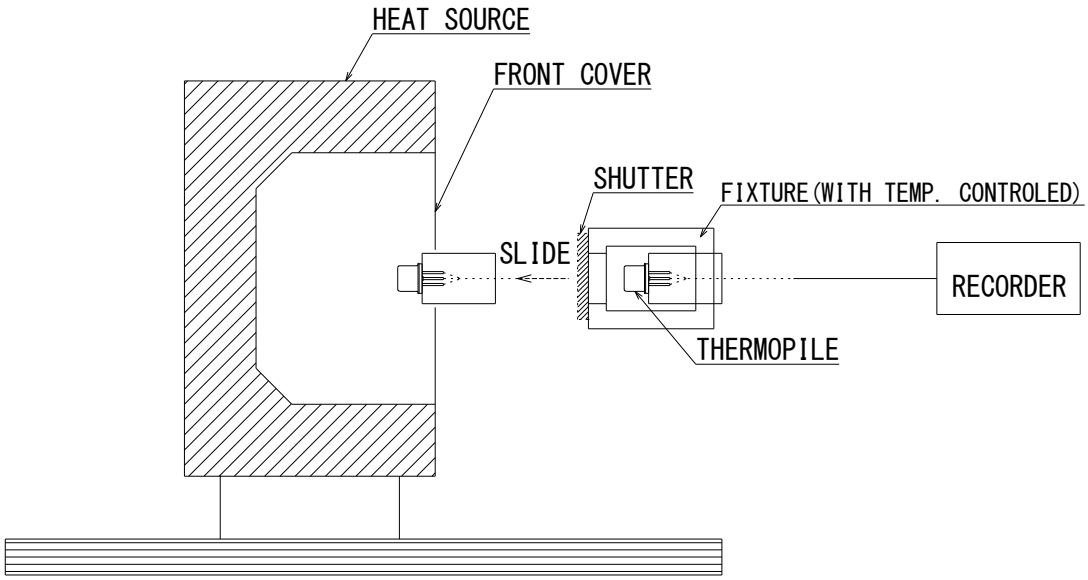
CIRCUIT CONFIGURATION(FIGURE 2)



TEST SET-UP (BLACKBODY) COMPOSITION (FIGURE 3)



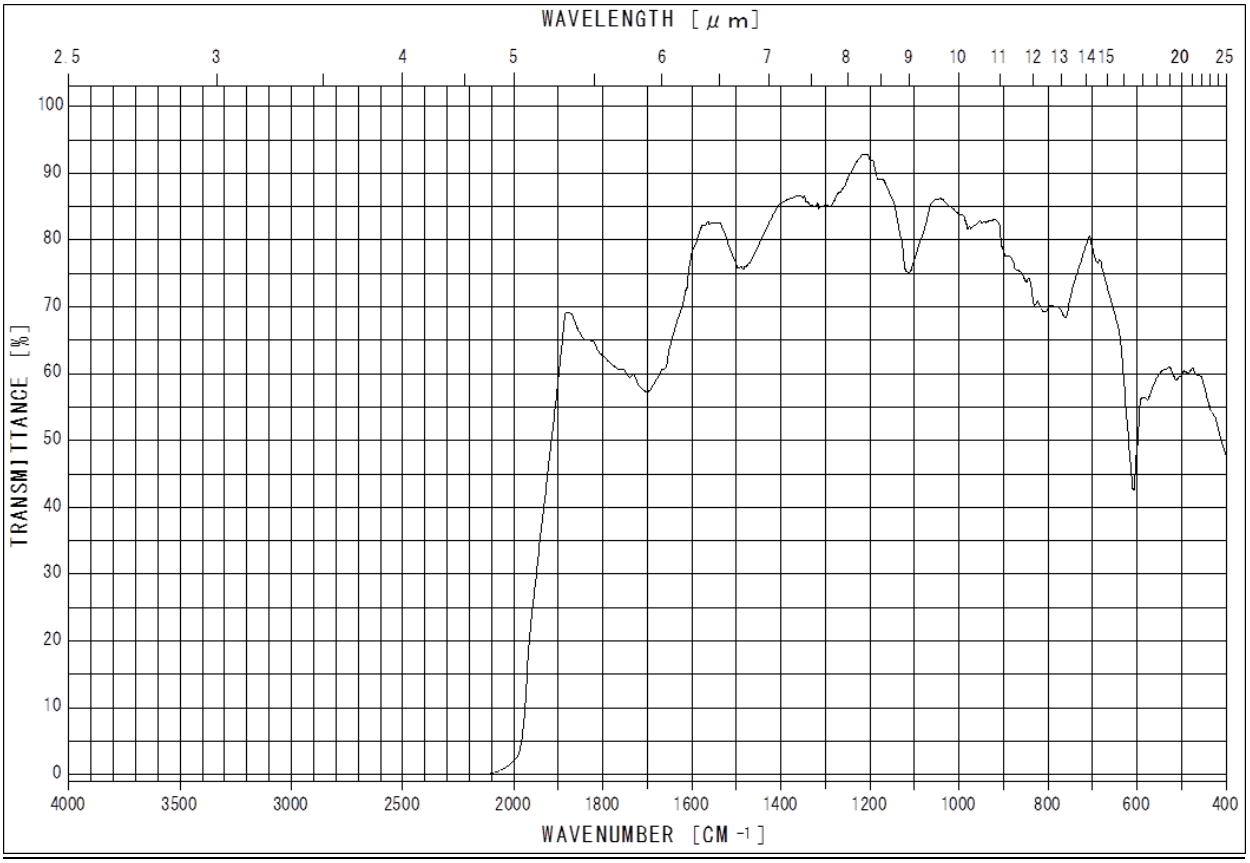
※ BLACK BODY(FLAT) : 323K(50℃)

AMP. : WITHOUT AMP.

DISTANCE : 50 mm

TEMP. INSIDE FRONT COVER : 298K(25℃)

TRANAMISSION(FIGURE 4)



※ 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. 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. STORONG 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.

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 LOWS AND REGULATIONS.

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