DATE:

MESSRS.:

AGENT:

SPECIFICATION
OF
PYROELECTRIC PASSIVE
INFRARED SENSOR

MODEL NO. REP05B-P

PART NO.

PYROELECTRIC PASSIVE INFRARED SENSOR MODEL NO. REP05B-P	PAGE 1 ／ 8	DRAWING NO.	REV : A
	NIPPON CERAMIC CO.,LTD.		

APPROVED BY	CHECKED BY	DRAWN BY

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

2) ELEMENT GEOMETRY : FOUR SENSITIVE AREAS 1.375 mm LONG, 1.0 mm WIDE AND SPACED 0.8 mm APART.

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 WITH SOURCE FOLLOWER
SEE FIGURE 2

2) OPERATING VOLTAGE : 3 ～ 10 V DC (Rs: 47KΩ)

3) SOURCE VOLTAGE : 0.35 ～ 1.5 V (VD: 5V, Rs: 47KΩ)

4) SIGNAL OUTPUT : MIN. 2.0 Vp-p (TYP. 3.5 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 μW／cm^2 FROM 420 K BLACK BODY.
SEE FIGURE 3

5) NOISE OUTPUT : MAX. 250 mVp-p (TYP. 95 mVp-p)

NOISE OUTPUT SHALL BE MEASURED FOR 20 SECONDS WHEN CONNECTED TO THE AMPLIFIER OF GAIN 72.5 dB AND SHUT OUT FROM INFRARED ENERGY.
SEE FIGURE 3

6) BALANCE OUTPUT : MAX. 15 %

〔 BO1 ／ ｜SA+SB｜ 〕≦ 0.15　　〔 BO2 ／ ｜SC+SD｜ 〕≦ 0.15

BO1: BALANCE OUTPUT
SA : SIGNAL OUTPUT ON ELEMENT A
SB : SIGNAL OUTPUT ON ELEMENT B

BO2: BALANCE OUTPUT
SC : SIGNAL OUTPUT ON ELEMENT C
SD : SIGNAL OUTPUT ON ELEMENT 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 μW／cm^2 FROM 420 K BLACK BODY.
SEE FIGURE 3

7) FREQUENCY RESPONSE : 0.3 Hz TO 3.0 Hz ／ ± 10 dB

OPTICAL CHARACTERISTICS

1) FIELD OF VIEW : 64° FROM EDGE OF ELEMENT ON AXIS X
: 32° FROM EDGE OF ELEMENT ON AXIS Y
: SEE FIGURE 1-A

2) FILTER SUBSTRATE : SILICON

3) CUT ON (5 %T ABS) : 5.0 ± 0.5 μm

4) TRANSMISSION : ≧ 70 % AVERAGE 7 ～14 μm

ENVIRONMENTAL REQUIREMENTS

1) OPERATING TEMPERATURE : -20 ℃ TO +70 ℃

2) STORAGE TEMPERATURE : -30 ℃ TO +80 ℃

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

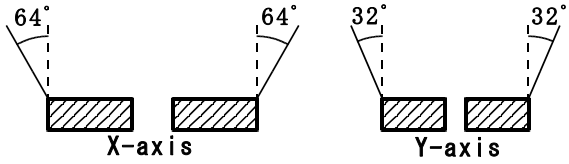
4) HERMETIC SEAL :
THE SENSOR SHALL BE SEALED TO WITHSTAND A VACUUM OF 21.28 kPa.

RoHS COMPLIANCE

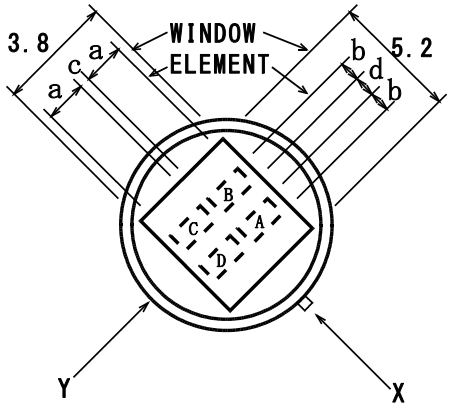
THIS PRODUCT CONFORMS TO THE RoHS DIRECTIVE IN FORCE AT THE DATE OF ISSUANCE OF THIS SPECIFICATION SHEET.

CONFIGURATION (FIGURE 1)

FIELD OF VIEW
(FIGURE 1-A)

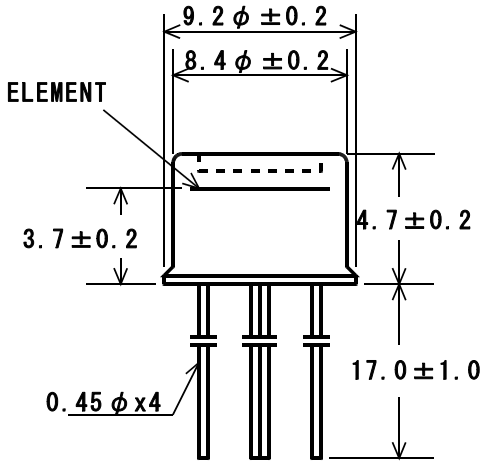


TOP VIEW
(FIGURE 1-B)

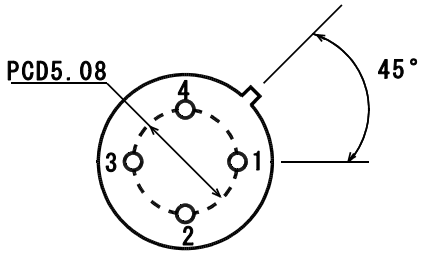


ELMENT
a=1.375
b=1.0
c=0.25
d=0.8

SIDE VIEW
(FIGURE 1-C)



BASE VIEW
(FIGURE 1-D)



1: SOURCE(1)
2: DRAIN
3: SOURCE(2)
4: GROUND

UNIT : mm

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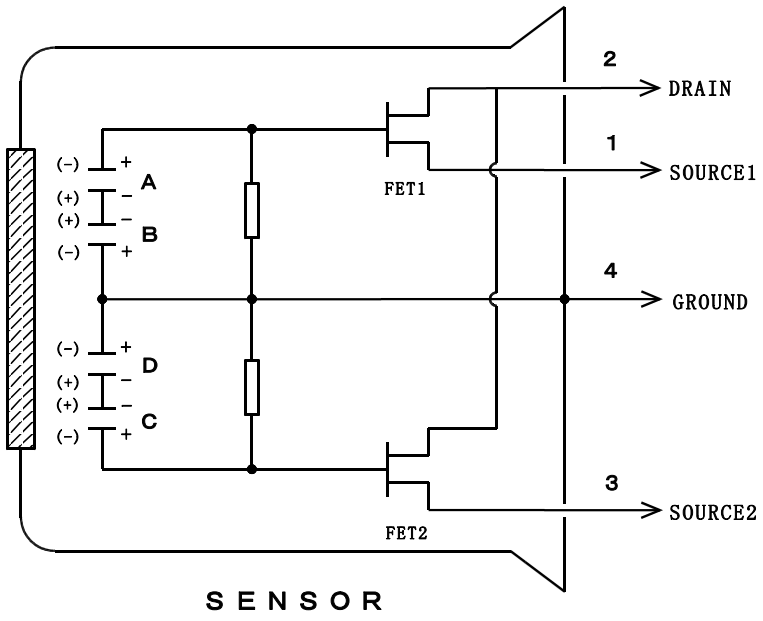
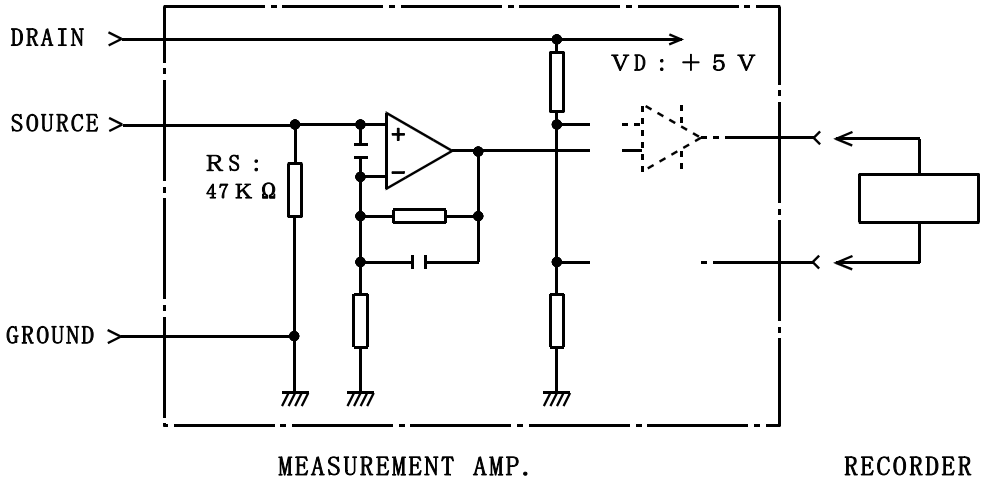
CIRCUIT CONFIGURATION (FIGURE 2)

SENSOR CIRCUIT (FIGURE 2-A)



MEASUREMENT AMP. CIRCUIT (FIGURE 2-B)



※ MEASUREMENT AMP.: NON-INVERTED TYPE, GAIN 72.5 dB AT 1 Hz 0.4～2.7 Hz／-3 dB

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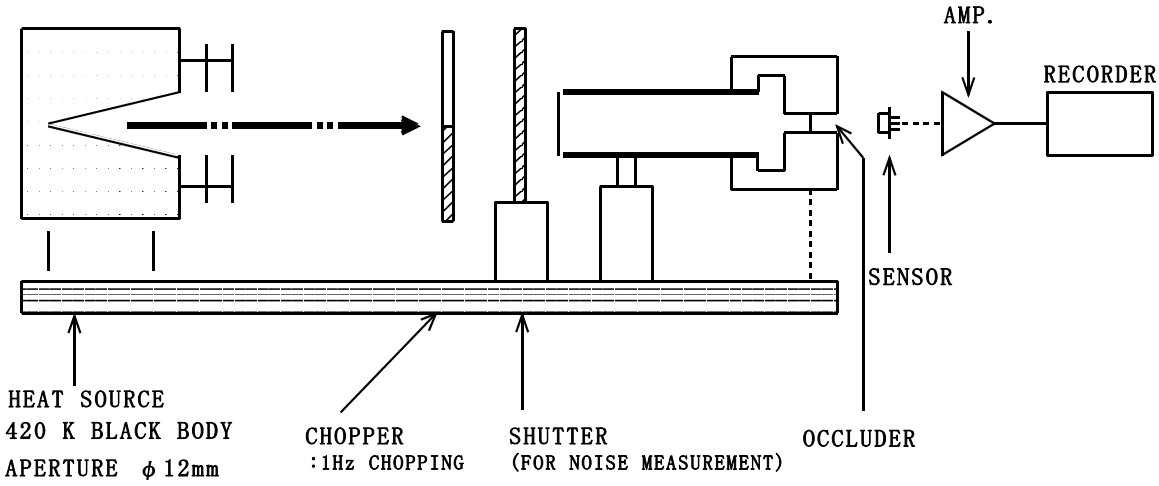
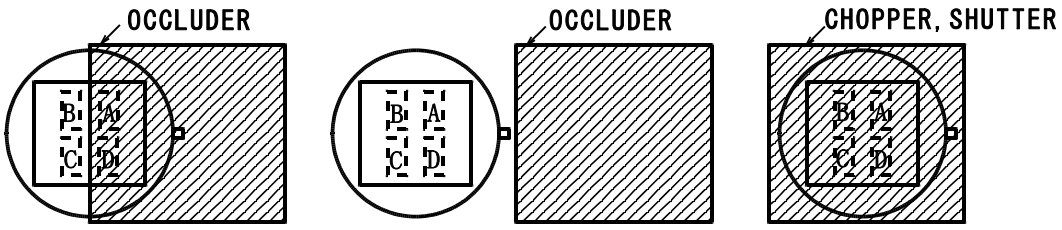
TEST SET-UP BLOCK DIAGRAM (FIGURE 3)



OCCLUDER POSITION



SIGNAL OUTPUT　　BALANCE OUTPUT　　NOISE OUTPUT

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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 ℃)

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 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.