

# 深圳市普恩科技有限公司

## SHENZHEN SALENS TECHNOLOGY CO., LTD

### REP05P 紅外探测器使用說明書

#### SPECIFICATION OF PYROELECTRIC PASSIVE INFRARED SENSOR

MODEL NO. REP05B  
PART NO. \_\_\_\_\_

#### 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 $25 \pm 5$ °C)

- 1) CIRCUIT CONFIGURATION : FOUR-TERMINAL SENSOR WITH SOURCE FOLLOWER  
SEE FIGURE 2
- 2) OPERATING VOLTAGE : 3 ~ 10 V DC ( $R_s: 47K\Omega$ )
- 3) SOURCE VOLTAGE : 0.35 ~ 1.5 V ( $V_D: 5V, R_s: 47K\Omega$ )
- 4) SIGNAL OUTPUT : MIN. 2.0 V<sub>p-p</sub> (TYP. 3.0 V<sub>p-p</sub>)  
(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  $13 \mu W/cm^2$  FROM 420 K BLACK BODY.  
SEE FIGURE 3
- 5) NOISE OUTPUT : MAX. 250 mV<sub>p-p</sub> (TYP. 95 mV<sub>p-p</sub>)  
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 | ]  $\leq$  0.15 [ BO2 / | SC+SD | ]  $\leq$  0.15  
BO1 : BALANCE OUTPUT BO2 : BALANCE OUTPUT  
SA : SIGNAL OUTPUT ON ELEMENT A SC : SIGNAL OUTPUT ON ELEMENT C  
SB : SIGNAL OUTPUT ON ELEMENT B 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  $13 \mu W/cm^2$  FROM 420 K BLACK BODY.  
SEE FIGURE 3

- 7) FREQUENCY RESPONSE : 0.3 Hz TO 3.0 Hz /  $\pm 10$  dB

#### OPTICAL CHARACTERISTICS

- 1) FIELD OF VIEW : 50° FROM EDGE OF ELEMENT ON AXIS X  
: 21° FROM EDGE OF ELEMENT ON AXIS Y  
: SEE FIGURE 1-A
- 2) FILTER SUBSTRATE : SILICON
- 3) CUT ON (5 %T ABS) :  $5.0 \pm 0.5 \mu m$
- 4) TRANSMISSION :  $\geq 70$  % AVERAGE  $7 \sim 14 \mu m$

#### ENVIRONMENTAL REQUIREMENTS

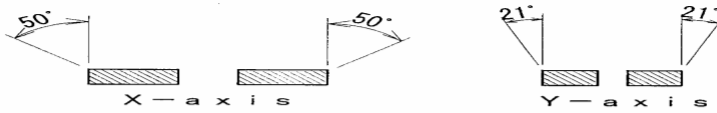
- 1) OPERATING TEMPERATURE : -20 °C TO +70 °C
- 2) STORAGE TEMPERATURE : -30 °C TO +80 °C
- 3) RELATIVE HUMIDITY :  
THE SENSOR SHALL OPERATE WITHOUT INCREASE IN NOISE OUTPUT WHEN EXPOSED TO 90 ~ 95 % RH AT 30 °C CONTINUOUSLY.
- 4) HERMETIC SEAL :  
THE SENSOR SHALL BE SEALED TO WITHSTAND A VACUUM OF 21.28 kPa.

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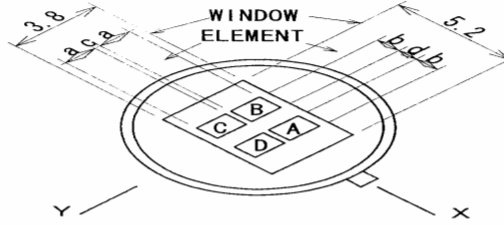
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CONFIGURATION (FIGURE 1)

FIELD OF VIEW  
(FIGURE 1-A)

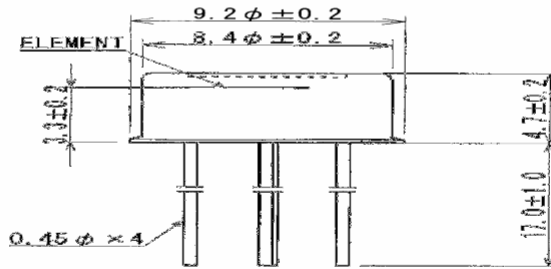


TOP VIEW  
(FIGURE 1-B)



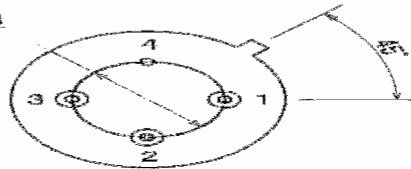
ELEMENT  
a=1.375  
b=1.0  
c=0.25  
d=0.8

SIDE VIEW  
(FIGURE 1-C)



BASE VIEW  
(FIGURE 1-D)

PCR 5.08

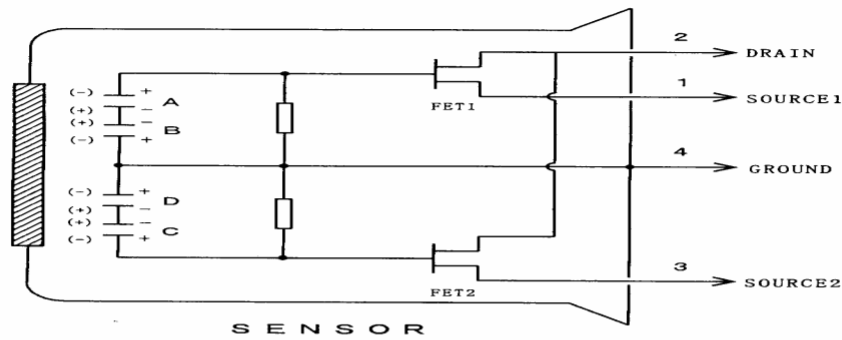


1: SOURCE (1)  
2: DRAIN  
3: SOURCE (2)  
4: GROUND

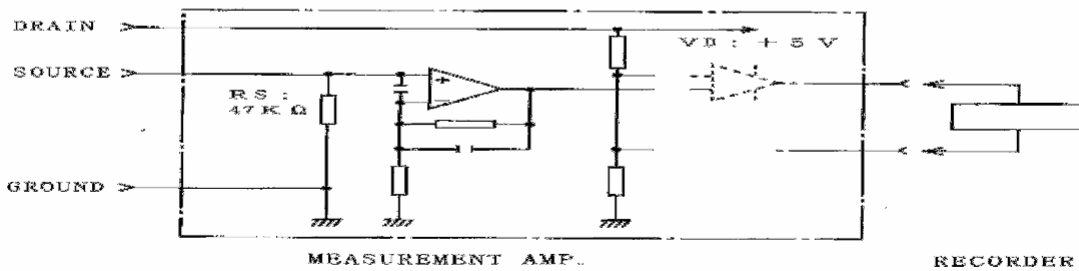
UNIT : mm

CIRCUIT CONFIGURATION (FIGURE 2)

SENSOR CIRCUIT (FIGURE 2-A)



MEASUREMENT AMP. CIRCUIT (FIGURE 2-B)

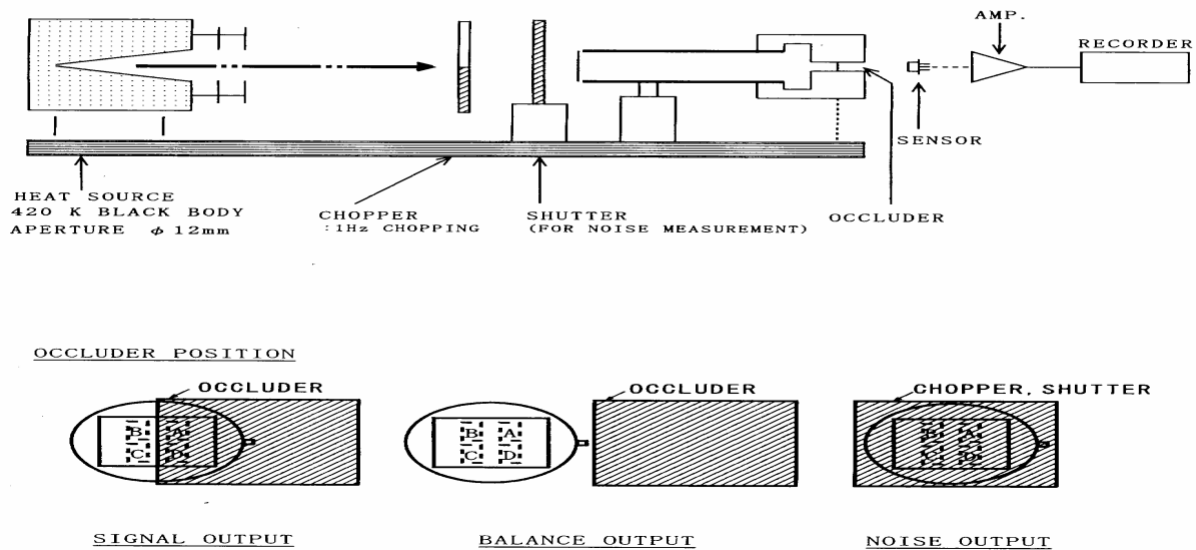


※ MEASUREMENT AMP. : NON-INVERTED TYPE, GAIN 72.5 dB AT 1 Hz 0.4~2.7 Hz / -3 dB

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TEST SET-UP BLOCK DIAGRAM (FIGURE 3)



### ※ 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. 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 °C)

##### 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.

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