MURATA MANUFACTURING CO.,LTD

CUSTOMER : _____ DATE 3- April- 1996

SPECIFICATION FOR INFRARED SENSOR

MODEL NAME : IRA- E700ST0

PRODUCT ENGINEERING SECTION 2
SENSOR MODULE DEPARTMENT
NEW BUSINESS DEVELOPMENT DIVISION
MURATA MANUFACTURING CO.,LTD.

Approved by	Checked by	Issued by	Issue Date	Drawing No.
K.Watanabe	Y.Atsuta	T.Kodama	3- April- 1996	JEGI1-0019A

1. Scope

This specification relates to infrared sensor.

2. Customer

2-1 Customer's Part Number :

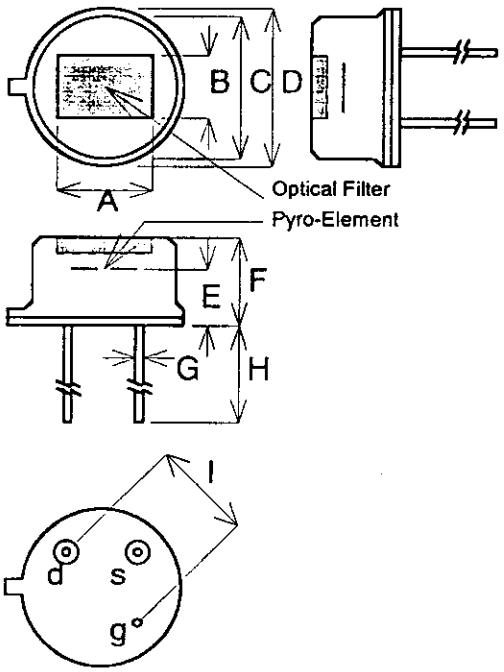
2-2 Customer's Drawing Number :

3. Model Name

IRA-E700ST0

4. Outline Drawing and Dimensions

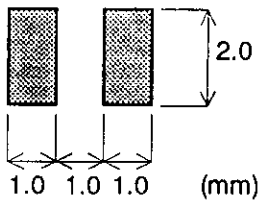
4-1 Outline Dimensions



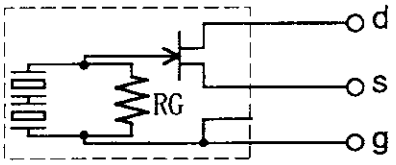
Symbol	Dimension
A	4.7±0.1mm
B	3.7±0.1mm
C	8.2±0.1mm
D	9.1±0.2mm
E	3.6±0.2mm
F	4.7±0.2mm
G	0.45mm
H	11±2mm
I	5.0mm

Symbol	Description
d (Drain)	Supply voltage
s (Source)	Output
g (Ground)	Ground

4-2 Pyroelectric Element



4-3 Equivalent Circuit



5. Numbering

5-1 Model Name

The first letter in B indicate P/N IRA-E700ST0.

5-2 Production Month

Printed on the top or the side of sensor in EIAJ code.

Year \ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	n	ｐ	q	r	s	t	u	v	w	x	y	z
1997	A	B	C	D	E	F	G	H	J	K	L	M
1998	N	P	Q	R	S	T	U	V	W	X	Y	Z
1999	a	b	c	d	e	f	g	h	i	j	k	m
2000	n	ｐ	q	r	s	t	u	v	w	x	y	z

EX1) In case of printing on the top of sensor which made in July 1996; B u
©

EX2) In case of printing on the side of sensor which made in July 1996; B©u

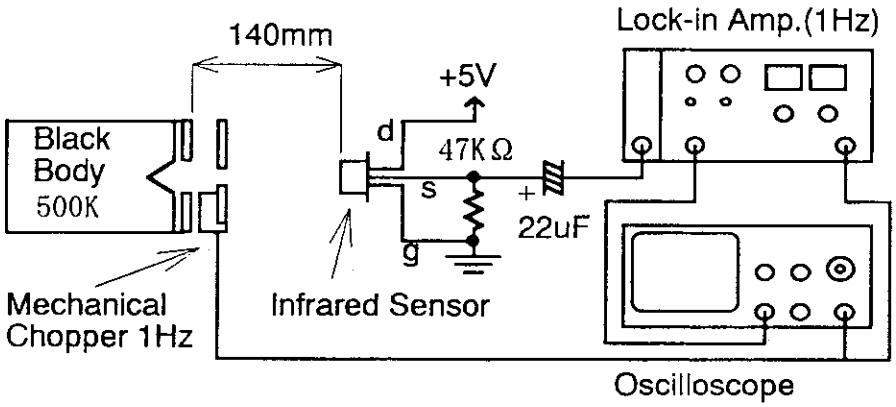
6. Ratings and Characteristics (25°C, 50%RH)

6- 1 Responsivity (Rv)

	MIN	TYP	MAX
500K,1Hz,1Hz	3870V/W	4510V/W	5040V/W

Value of Responsivity is calculated by the Vread (read in the Lock-in Amp.) and the following equation.

$Rv=Vread/(9.52\times10^{-7})$ V/W



6-2 Balance of Sensitivity

Balance	10% Max.

Balance(%) = | (Rr-Rl)/(Rr+Rl) | × 100

Rr : Response from right element

Rl : Response from left element

6-3 White Noise Level

White Noise	200mVpp Max.

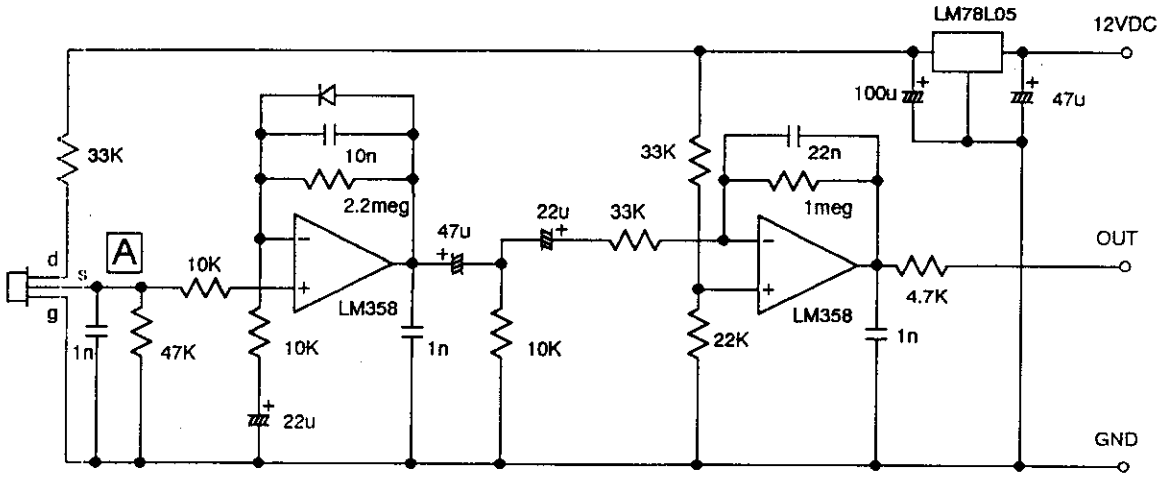
Conditions for measurement

· Test circuit : With the following circuit.

· Measure Point : Across OUT and GND.

· Record : With Pen-recorder.

· Environment : In the electrically and optically shielded box kept at 25°C.



Circuit for Measurement Gain:76dB (x6700)

6-4 Source Voltage

Source voltage(Vs)	0.2~2.5V

Conditions for measurement

· Test circuit : With previous circuit.

· Measure Point : Across A and GND.

· Environment : In the electrically and optically shielded and temperature controlled box.

6-5 Warm-up Time

Warm-up time	30sec Max.

Conditions for measurement

· Test circuit : With previous circuit.

· Environment : In the electrically and optically shielded box kept at 25°C.

Warm-up time is defined as time for Source Voltage to reach to specified value from turning on.

6-6 Supply Voltage Range

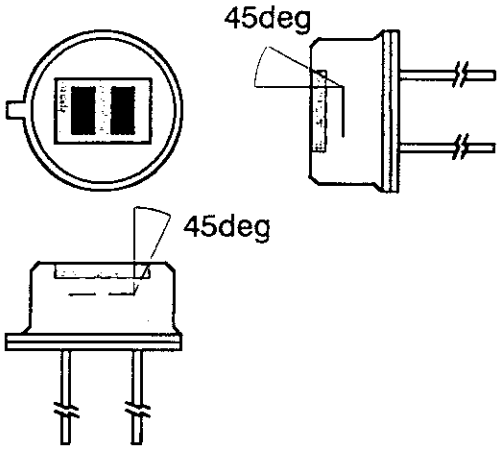
2.0 ～ 15.0VDC

6-7 Recommendable Rs Value

47KΩ ≤ Rs ≤ 200KΩ

Resistance Rs is inserted across terminal-S and GND.

6-8 Field of View

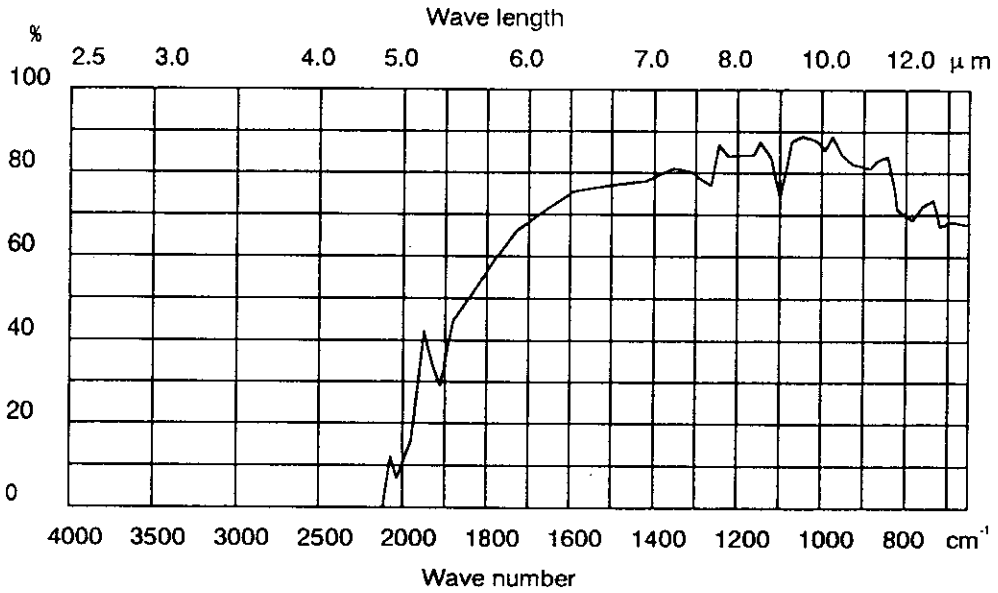


6-9 Optical Filter

Transmittance : See following figure.

Material : Single Crystal Silicon

Thickness : 0.50±0.05mm



7. Operating Temperature

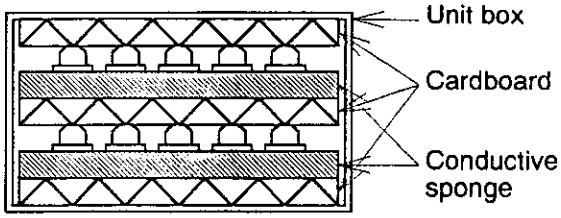
- 40 ～ 70℃

8. Storage Temperature

- 40 ～ 85℃

9. Package and Marking

100 pieces sensors are packed in a unit box as shown in (A).
Marking is on the box as per (B).



(A)

IRA-E700ST0	
Inspection lot No.	100pcs

(B)

10. Reliability

Judgment criteria for 10-1 to 10-7.
After each one of the test, the sensor is kept for three hours at room temperature, then it is evaluated with the following criteria.

Items	Judgment criteria
External appearance	No significant damage
Sensitivity	Within 20% shift from initial value
White noise	within initial value + 100mV
Source voltage	within rated value

10-1 High temperature
100°C for 500hours

10-2 Low temperature
-30 °C for 500hours

10-3 Humidity
60°C, 95%RH for 500hours

10-4 Heat cycle
20 times of the following cycle
-25 °C, 30min.⇒ Room temp., 30min.⇒ 55°C, 30min.⇒ Room temp.

10-5 Vibration
Apply vibration of amplitude of 1.5mm with 10 to 55Hz band to each of 3 perpendicular directions for an hour.

10-6 Shock
Apply shock of 100G sinewave by standard shock tester to each 2 perpendicular directions (x, y).

10-7 Soldering heat
Immerse up to 3.0mm from can case in solder bath of 265 ±5°C for 10± 1sec.

10-8 Hermetic sealing
Conform to MIL-STD-202F chapter 112D, condition D.
Immerse in fluorocarbon bath (FC-40) of 125 ±5°C for 20sec.
There should be no generation of bubbles.

10-9 Solderability
Conform to MIL-STD-202F chapter 208B.
Immerse in rosin flux and immerse up to 2.0~2.5mm from can case in solder bath of 230±5°C for 5±0.5sec.
More than 95% of the terminal surface should be covered by solder.

I. Caution in mounting

1) Soldering

i) Hand soldering should be applied.

ii) Soldering should be done quickly as following.

Temperature of soldering iron : 350°C	
Distance from can case	Period of time
1 ~ 3mm	Within 3sec per point
Over 3mm	Within 10sec per point

iii) Soldering flux should be water-washable and not contain more than 0.2% chlorine.
Soldering flux should be removed after soldering.

2) Cleaning
Brush cleaning should be applied.

II. Caution in handling and storage

1) Optical filter of sensor should not be scratched.
2) Strong shock should be avoided.
3) Electrostatics and strong electromagnetic field should be avoided.
4) Sensor should be kept on conductive sponge.
5) High temperature, high humidity, corrosive gas (SO_2, Cl_2, NO_X etc.) and sea breeze should be avoided.

III. Notice

1) Please test the performance of sensor when it is mounted to your products.
2) Your products should be fail-safe to be protected from malfunction of sensor.
3) In the case of outdoor use, suitable optical filter and water and humidity proof structure should be applied.
4) Please avoid using the sensor in the following conditions because it may cause failure or malfunction ;
   a) in such a fluid as water, alcohol etc. corrosive gas (SO_2, Cl_2, NO_X etc.) or sea breeze.
   b) in high humidity.
   c) in a place exposed directly to sun light or head light of automobile.
   d) in a place exposed to rapid ambient temperature change.
   e) in a place exposed directly to blow from air-conditioner or heater.
   f) in a place exposed to strong vibration.
   g) in such a place where infrared ray is shaded.
   h) in any other place similar to the above (a) through (g).
5) We can not warrant against defects caused by any use of a sensor which deviates from the intend use as described in this specification.