

# PYROELECTRIC INFRARED DETECTOR

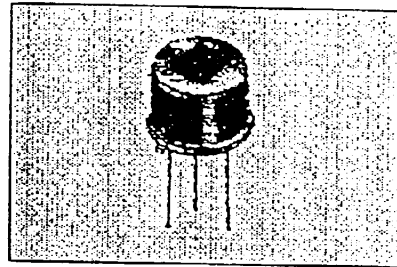
Pro-Wave is now providing a series of pyroelectric infrared detectors utilizing the advanced technology of polymer thin film of polyvinylidene fluoride (PVDF) sandwiched between evaporated metal electrodes. A layer of "IR black" material of high emissivity in the spectral region of 9-10  $\mu\text{m}$  deposited on the front surface to absorb the incident radiation efficiently. A low noise JFET and a high giga ohm gate resistor as a impedance bridge housed in a well sealed metal TO-5 can containing dry nitrogen gas for operating in a humid atmosphere.

All pyroelectric infrared detectors are supplied with variety of wavelength cut-on AR coated windows. The standard geometries are listed in the specifications. Other windows or element geometries are available upon request.

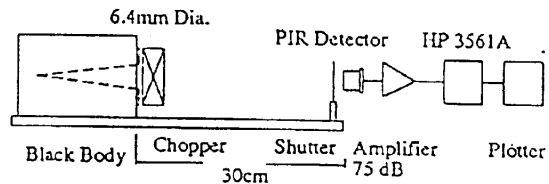
Our production line covers three types of pyroelectric infrared detectors: single element type, compensated single element type as well as dual element type. Besides these three standard models we are also available in supplying quad element type and array please contact factory for detail information.

## Applications:

- Automatic light-switching
- Access control
- Intrusion detection
- Motion sensing
- Counting of persons



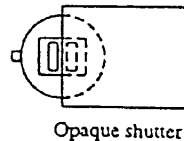
Measuring circuit: *AK \$ J-*



HP3561A: Hewlett-Packard Dynamic Signal Analyzer  
Black Body: 500°K Chopping frequency: 1 Hz

## Measuring Parameters:

### A) Responsivity



Shield one element with opaque shutter for responsivity measurement

### B) Matching



Apply input simultaneously to both elements for common mode rejection ( $RV_1 - RV_2$ ) measurement

### C) Noise



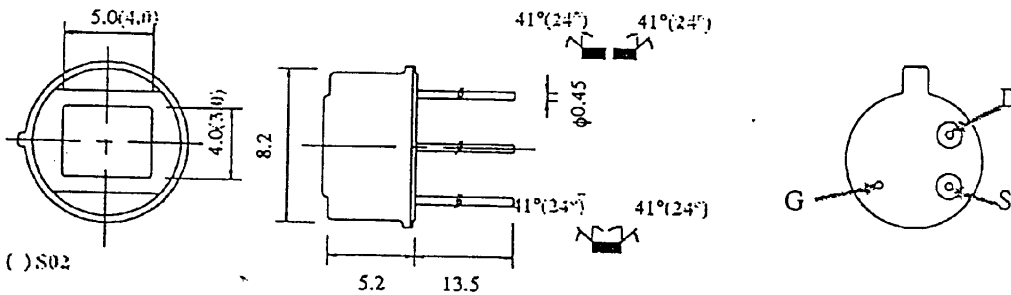
Shield both element with opaque shutter under electromagnetic shielding for noise measurement

Specifications:

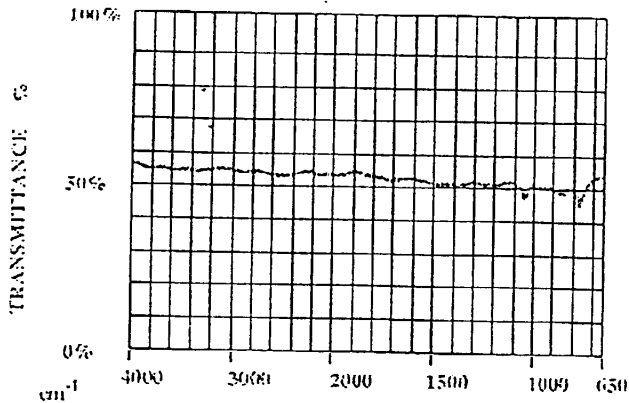
Model Number	S02	S04	Unit	Test Conditions
Detector Type	Dual	Dual		
Package	TO-5	TO-5		
Size of Element	2 x 1	2 x 1	mm x mm	
Spacing	1	1	mm	
Signal Sensitivity Typ.	7200	7600	mVp-p	500°K, 1Hz, 1Hz, 30cm, 75dB Amplified
Noise Typ.	70	70	mVp-p	1Hz, 1Hz, 27°C, 75dB Amplified
Responsivity Typ.	3500	3700	V/V	500°K, 1Hz, 1Hz
NEP Typ.	$1.3 \times 10^{-9}$	$1.2 \times 10^{-9}$	W/Hz <sup>1/2</sup>	500°K, 1Hz, 1Hz
D* Typ.	$1.0 \times 10^8$	$1.1 \times 10^8$	cmHz <sup>1/2</sup> /W	
S/N Ratio Typ.	40	41	dB	
Operating Voltage	2-15	2-15	V	
Operating Current	13	13	mA	$R_s=47K\Omega$ , $V_D=5V$
Offset Voltage Typ.	0.6	0.6	V	$R_s=47K\Omega$ , $V_D=5V$
Operating Temperature	-30+70	-30+70	°C	
Storage Temperature	-40+80	-40+80	°C	
Element Matching	<10	<10	%	1Hz
Spectral Response of Window	2.5-15 >50%	7-14 >50%	$\mu m$	Uncoated Silicone Filter

Dimensions and Field of Views:

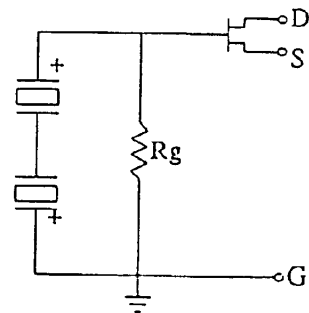
Pin Assignment:



Transmittance of AR Coated Silicone Window:



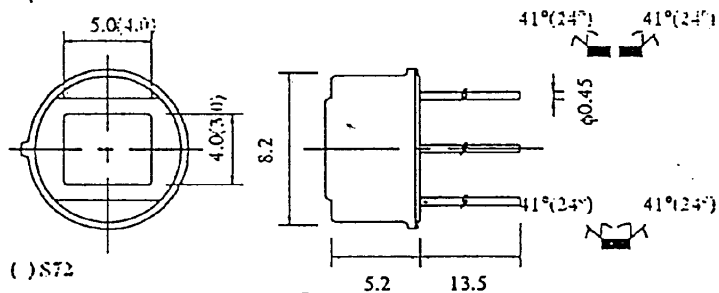
Equivalent Circuit:



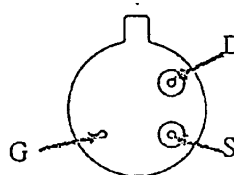
Specifications:

Model Number	S72	S74	Unit	Test Conditions
Detector Type	Dual	Dual		
Package	TO-5	TO-5		
Size of Element	2 x 1	2 x 1	mm x mm	
Spacing	1	1	mm	
Signal Sensitivity Typ.	6700	7200	mVp-p	500°K, 1Hz, 1Hz, 30cm, 75dB Amplified
Noise Typ.	70	70	mVp-p	1Hz, 1Hz, 27°C, 75dB Amplified
Responsivity Typ.	3200	3500	V/W	500°K, 1Hz, 1Hz
NEP Typ.	$1.3 \times 10^{-9}$	$1.2 \times 10^{-9}$	W/Hz <sup>1/2</sup>	500°K, 1Hz, 1Hz
D* Typ.	$1.0 \times 10^8$	$1.1 \times 10^8$	cmHz <sup>1/2</sup> /W	
S/N Ratio Typ.	40	40	dB	
Operating Voltage	2-15	2-15	V	
Operating Current	13	13	mA	R <sub>s</sub> =47KΩ, V <sub>D</sub> =5V
Offset Voltage Typ.	0.6	0.6	V	R <sub>s</sub> =47KΩ, V <sub>D</sub> =5V
Operating Temperature	-30-+70	-30-+70	°C	
Storage Temperature	-40-+80	-40-+80	°C	
Element Matching	<10	<10	%	1Hz
Spectral Response of Window	7-14 >70%	7-14 >70%	μm	6.5mm cut on filter

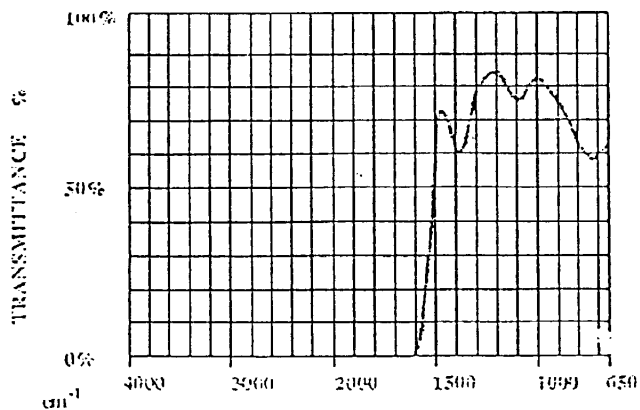
Dimensions and Field of Views:



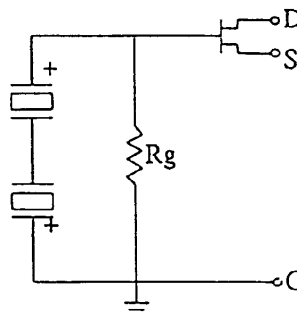
Pin Assignment:



Transmittance of AR Coated Silicene Window:



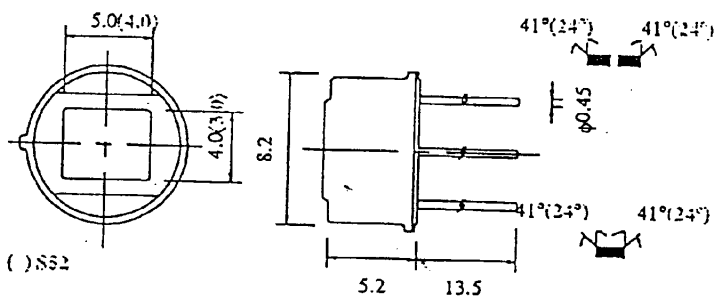
Equivalent Circuit:



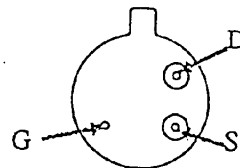
Specifications:

Model Number	S52	S54	Unit	Test Conditions
Detector Type	Dual	Dual		
Package	TO-5	TO-5		
Size of Element	2 x 1	2 x 1	mm x mm	
Spacing	1	1	mm	
Signal Sensitivity Typ.	7600	8000	mVp-p	500°K, 1Hz, 1Hz, 30cm, 75dB Amplified
Noise Typ.	70	70	mVp-p	1Hz, 1Hz, 27°C, 75dB Amplified
Responsivity Typ.	3700	3900	V/V	500°K, 1Hz, 1Hz
NEP Typ.	$1.3 \times 10^{-9}$	$1.2 \times 10^{-9}$	W/Hz <sup>1/2</sup>	500°K, 1Hz, 1Hz
D* Typ.	$1.0 \times 10^8$	$1.1 \times 10^8$	cmHz <sup>1/2</sup> /W	
S/N Ratio Typ.	41	41	dB	
Operating Voltage	2-15	2-15	V	
Operating Current	13	13	mA	
Offset Voltage Typ.	0.6	0.6	V	$R_s=47K\Omega$ , $V_D=5V$
Operating Temperature	-30+70	-30+70	°C	$R_s=47K\Omega$ , $V_D=5V$
Storage Temperature	-40+80	-40+80	°C	
Element Matching	<10	<10	%	1Hz
Spectral Response of Window	7-14 >70%	7-14 >70%	$\mu m$	5.0 $\mu m$ cut on filter

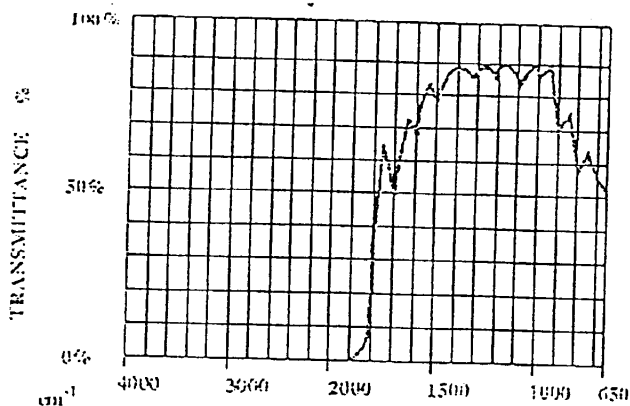
Dimensions and Field of Views:



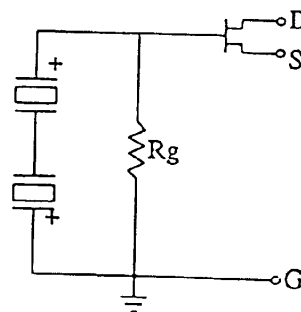
Pin Assignment:

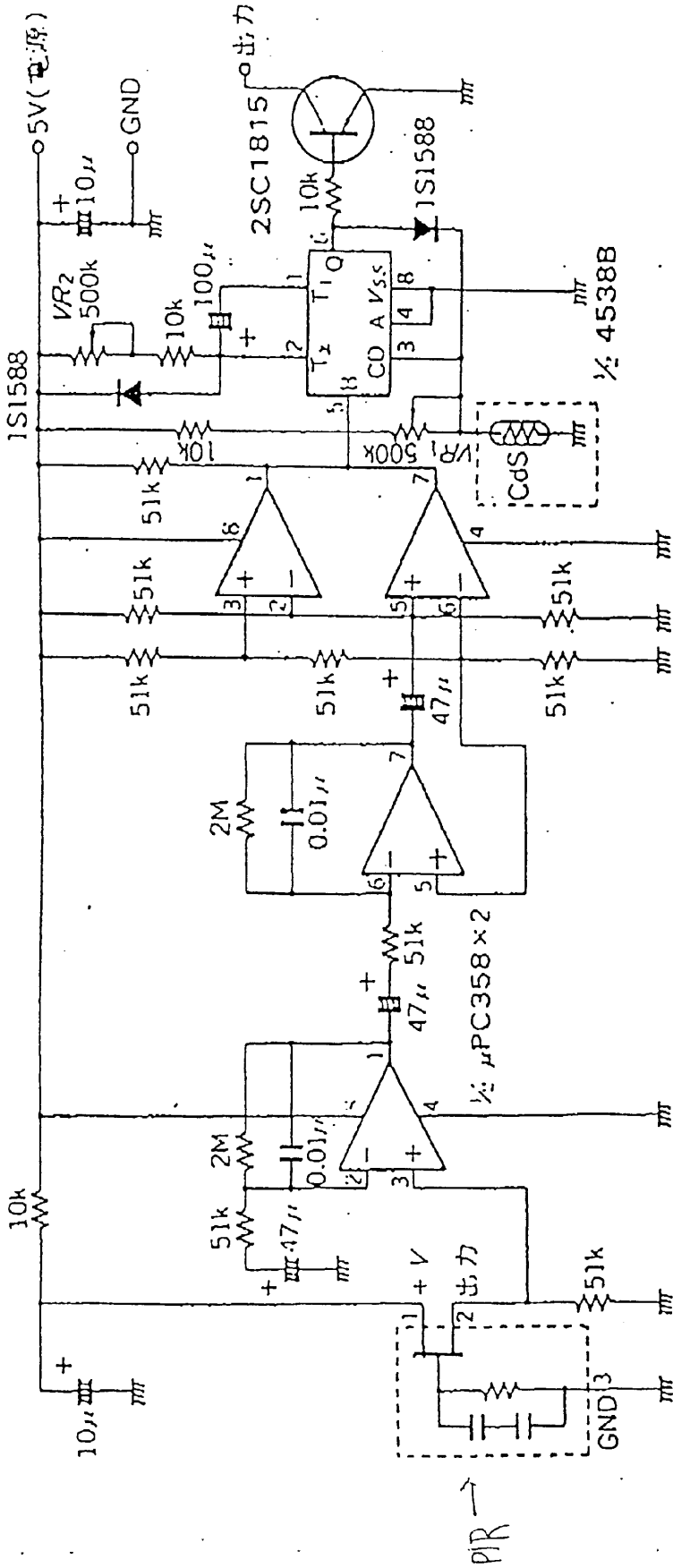


Transmittance of AR Coated Silicone Window:



Equivalent Circuit:





VR1: 自動照明開始照度の調整用  
 VR2: タイマ時間の調整用

1/2 µPC393 × 2

1/2 µPC358 × 2

1/2 4538B

S04 indoor use

S52 outdoor use

NO.	DIMENSION	FOCUS	ANGLE	LENGTH
7601 -1		21.7 m/m	110°	27M
7601 -2		21.7 m/m	110°	27M
7601 -3		21.7 m/m	110°	27M
7601 -4		21.7 m/m	110°	27M
7601 -5		21.7 m/m	110°	27M

NO.	DIMENSION	FOCUS	ANGLE	LENGTH
7701		21.7 m/m	83.2°	10M
7702 -1		32.0 m/m		
7702 -2		32.0 m/m		
7703		30.5 m/m	83°	24M
7704		23.0 m/m	110°	12M

NO.	DIMENSION	FOCUS	ANGLE	LENGTH
7708		29.7 m/m	79.8°	10M
7709		7.6 m/m	90°	5M
7801		30.4 m/m	84°	16M
7802 -1		32.0 m/m	140°	12M
7802 -2		32.0 m/m	140°	12M



