Model 442

IR-EYE™ INTEGRATED SENSOR
Parallel Opposed Dual IR Detector
With Integrated Signal Processing*

* Patent Pending. Manufactured under one or more of the following U.S. patents: 3,839,640 - 4,218,620 - 4,326,663 - 4,384,207 -4,437,003 - 4,441,023 - 4,523,095

The **Model 442 IR-EYE™** Integrated Sensor is a lithium tantalate pyroelectric parallel opposed dual element high gain detector with complete integral analog signal processing. This unit offers greatly improved detection capability over an extended temperature range of -40 to +70°C with no significant change in noise or sensitivity and significantly reduced temperature spiking.

Advantages

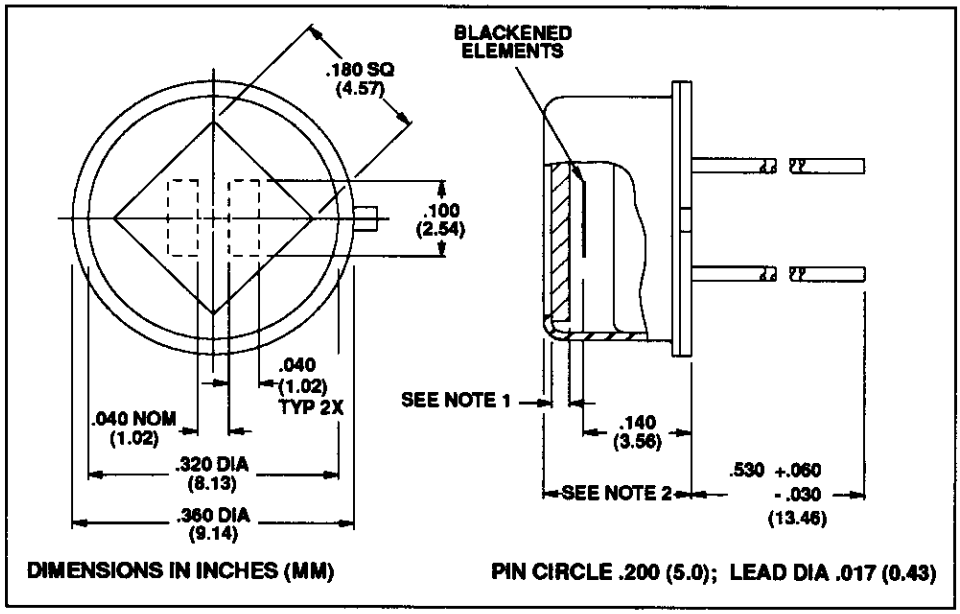
- **Eliminate Burn-In Tests**
- **Improve RF Immunity**
- **Eliminate False Alarms**
- **Simplify Circuitry**
- **Reduce Component Count**
- **Improve Reliability**

Features

- **100x Signal Amplification**
- **Stable, Accessable Internal Voltage Reference**
- **Wide Operating Temperature Range**

Applications

- **People / Object Detection**
- **Intrusion Detection**
- **Lighting Control**
- **Robotics**
- **Motion Sensing**
- **Automatic Door Control**
- **Safety Warning**
- **High Stability Industrial & Military Applications**



Characteristics		442	Unit	Test Conditions
Detector Type		Dual		
Element Size		1.0 x 2.5	mm, nominal (2x)	
D*		$2.2X10^{8}$	$cm\sqrt{Hz}/W$	1Hz BW
NEP		$7.3X10^{-10}$	$W/\sqrt{Hz}$	1Hz BW
Responsivity		$3.7X10^{5}$	V/W	
Common Mode Rejection	min	5/1		
	typ	15/1		
Noise		0.27	$mV\sqrt{Hz}$	
Thermal Breakpoint f_t	typ	0.15	Hz	
Electrical Breakpoint f_e	typ	5	Hz	
Incident Power	max	0.2	W	
Power Supply Voltage		5-15	VDC	
Power Supply Current	max	2.2	mA	
Output Voltage	max	V+ Rail-100 mV	V	
Output Offset Voltage (Referenced to Pin 3)		± 500	mV	
Output Load	min	10K	Ω	
Reference Voltage[1]		+2.500 ±80 mV	V	See Note 1
Storage Temperature		-55 to +125	°C	ΔT<50°C/minute
Operating Temperature		-40 to +70	°C	

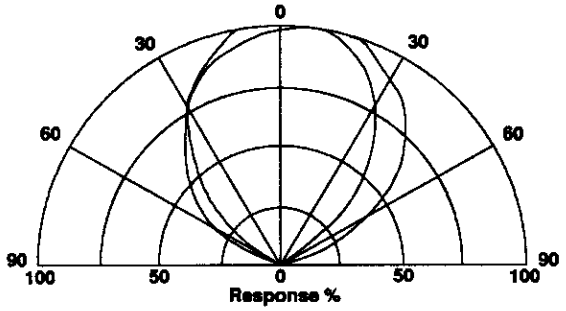
Characteristics are at 25°C, V+ = 5 VDC, f = 1Hz, 8 - 14 microns.

Data is established on a sample basis and is believed to be representative.

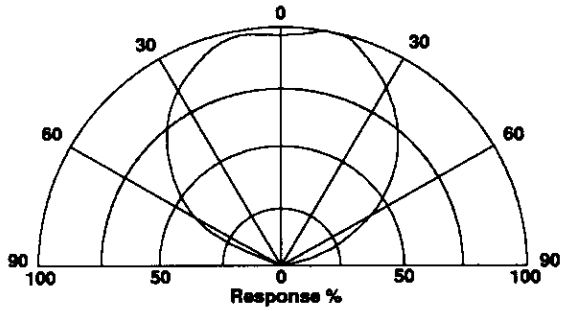
[1] At a maximum load current of 100μA. See reverse for additional information.

FIELD OF VIEW

Model 442 – Horizontal

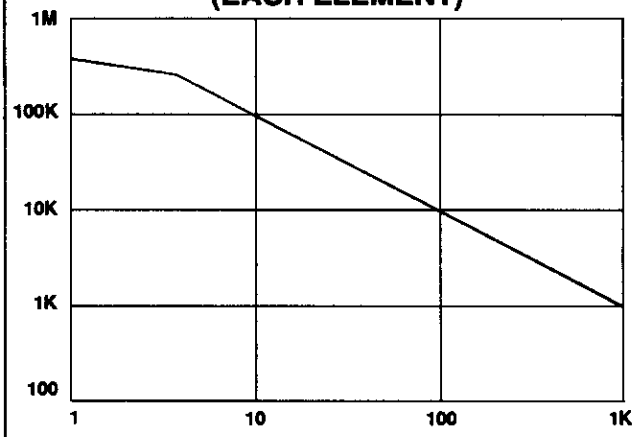


Model 442 – Vertical

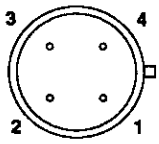


For –3 filter only, For other filters, consider refractive index and thickness.

FREQUENCY RESPONSE MODEL 442 (EACH ELEMENT)



FREQUENCY (Hz) – HORIZONTAL AXIS
RESPONSIVITY (V/W) – VERTICAL AXIS



BOTTOM VIEW (NO SCALE)

Pin	Designation
1	V+
2	OUTPUT
3	2.5 V REFERENCE
4	GROUND

Mounting, Soldering and Handling:

These sensors have been improved over previous Models and can withstand normal handling and automatic assembly as well as wave soldering at 280°C for 10 seconds, at 1/4" (6.3mm) from the case bottom.

Contamination and fingerprints on the filter surface should be cleaned with alcohol and a soft cloth.

Avoid mechanical stresses on case and leads.

Static Discharge

Additional safety features are used internally to make these sensors almost immune to electrostatic discharge.

Reference Voltage

The internal reference voltage is accessible on pin 3. This voltage is used to bias the internal amplifier. Offset voltage is referred to this point.

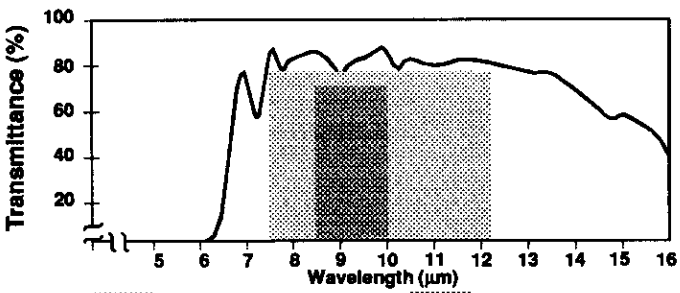
This provides a low drift differential reference to allow for direct DC coupling of a subsequent comparator or A/D converter.

The recommended maximum load on this pin is 100µA (source only) to maintain electrical and thermal stability. Current loads greater than 100µA may adversely affect performance; however, the output is short circuit proof.

Light Leakage

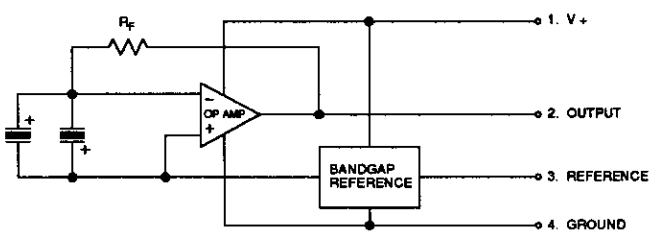
Slight sensitivity to visible light leaking through the glass-to-metal seal on the base may be observed.

Transmission Characteristics of –3 Filter (HP-7)



TRANSMISSION BELOW CUT-OFF IS <1% AVERAGE

BLOCK DIAGRAM



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