

Pyroelectric Passive Infrared Sensor

General Description

The RE 200B is a passive infrared sensor designed to pick up heat radiation of wave lengths in a band around 10 microns. It contains two active elements configured as balanced differential series opposed type. This results in good compensation of environmental temperature and excellent sensitivity for small changes of a spatial temperature pattern. Thermal signals far below one microwatt are sufficient to trigger a sufficient output voltage change.

Functional Description

If the active elements of the PIR sensor are exposed to a change in the surrounding temperature field, electrical charges are separated within the sensor elements. The voltage across the sensors controls a J-FET source follower impedance converter and thus modulates the output current of the PIR detector.

The spectral sensitivity of the sensor is controlled by the optical transfer characteristics of the window in the case and has been optimized to pick up radiation of the human body.

Applications

- ◆ alarm systems
- ◆ consumer electronics
- ◆ human body detection
- ◆ automatic switches

Operating Conditions

Operating Temperature	-20 °C to +70 °C	
Storage Temperature	-30 °C to +80 °C	
Operating Voltage	3 to 10 V	at $R_s = 47\text{ k}\Omega$

Electrical and Optical Characteristics at 25°C

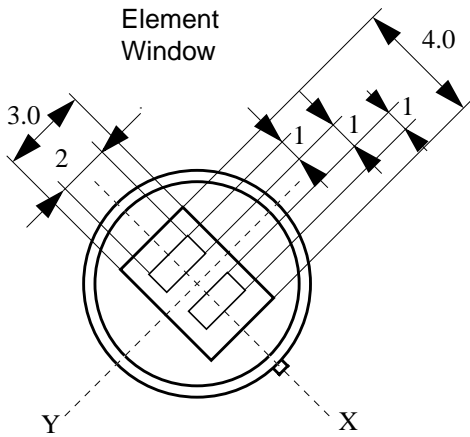
Circuit Configuration	Three-terminal sensor with source follower		
Appearance	TO-5 metal case with hermetic seal		
Output balance between elements	15% max	at 1 Hz	
Spectral Response		determined by filter	
Filter Substrate	Silicon		
Transmission	> 70%	average in 7 ... 14 μm range	
Cut on wavelength	$5.0 \pm 0.5\ \mu\text{m}$	at 5% T abs.	
Test Conditions: VDD = 5.0 V, Tamb = 25 °C, unless otherwise noted.			

Symbol	Min	Typ	Max	Unit	Note
I _{dd}		0.2	0.5	mA	supply current (1)
V _{SSA}	- 3.6	- 4	- 4.4	V	referenced to VDD
I _{VSSA}			2.0	mA	sink capability
V _{REF}	3.6	4	4.4	V	V _{REF} = VDD - V _{SSA}

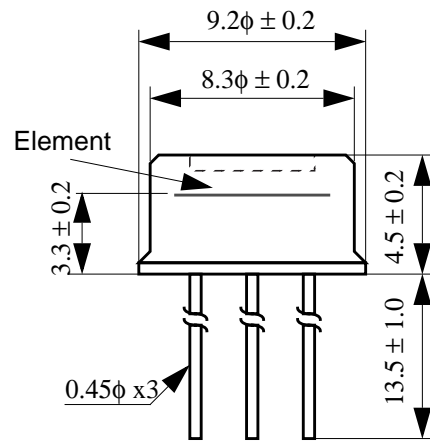
PIR SENSOR RE 200B

Dimensions [unit: mm]

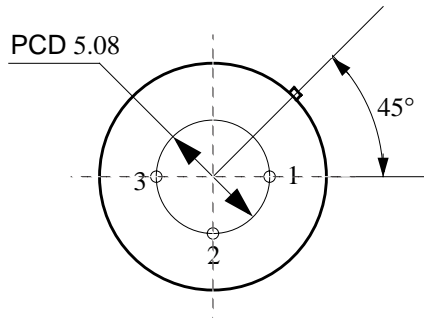
Top View



Side View

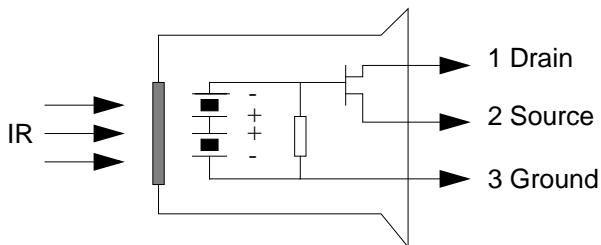


Base View



- 1: Drain
- 2: Source
- 3: Ground

Circuit Configuration



Field of View

