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 Rs = 47 kΩ

Electrical and Optical Characteristics at 25C
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 determined by filter
Spectral Response Silicon average in 7 ... 14 μm range
Filter Substrate Transmission > 70% at 5% T abs.
Transmission Cut on wavelength 5.0 ± 0.5 μm average in 7 ... 14 μm range

Test Conditions: VDD = 5.0 V, Tamb = 25 °C, unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
<th>Note</th>
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<td>0.5</td>
<td>mA</td>
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<td>VSSA</td>
<td>- 3.6</td>
<td>- 4</td>
<td>- 4.4</td>
<td>V</td>
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<td>2.0</td>
<td>mA</td>
<td></td>
<td></td>
<td>sink capability</td>
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<tr>
<td>VREF</td>
<td>3.6</td>
<td>4</td>
<td>4.4</td>
<td>V</td>
<td>VREF = VDD - VSSA</td>
</tr>
</tbody>
</table>
**PIR SENSOR RE 200B**

**Dimensions [unit: mm]**

**Top View**

**Side View**

**Base View**

**Circuit Configuration**

**Field of View**

1: Drain  
2: Source  
3: Ground

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