

FEATURES

- Compatible with IrDA Specifications
- Wide Dynamic Range
- Automatic Threshold Control
- Shutdown Feature Reduces Quiescent Current In Standby Mode
- Surface Mounted Package, Ideal For Automated Assembly

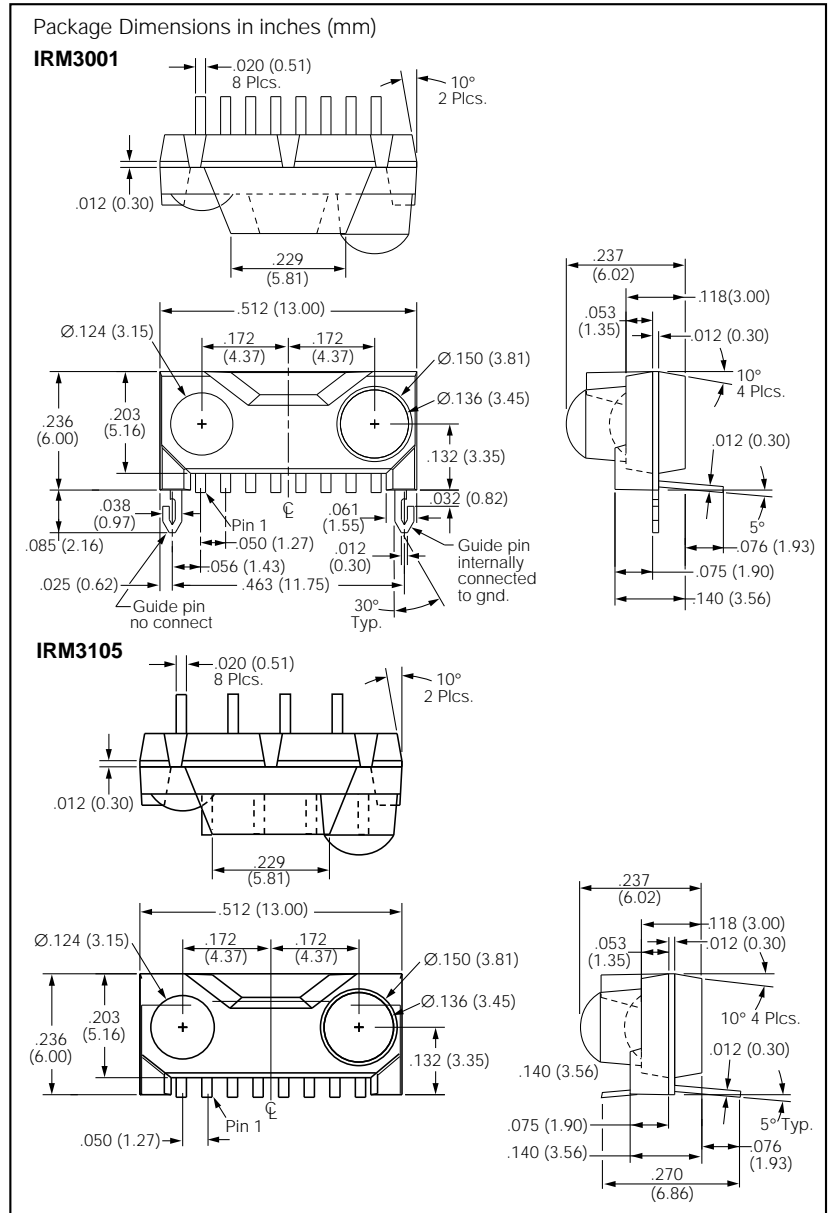
APPLICATIONS

- Wireless Computer and Peripheral Communications
- Wireless Computer and Telephone Communications
- Interactive TV and Remote Control

DESCRIPTION

The IRM 3001/3105 is an integrated Infrared transceiver that is compatible with the IrDA Serial Infrared (SIR) Physical Layer Link Specification. Housed in a single molded epoxy surface mount package this unique product lends itself easily to automated pick and place assembly.

State of the art BiCMOS circuitry coupled with Siemens optoelectronic expertise makes for a product that outperforms its closest rival. Siemens unique circuit configuration automatically compensates for the wide range of potential illumination prevalent in the usage of the transceiver as the distance between the communicating devices changes over the allowable range. Also incorporated in the module is a unique shutdown feature which allows for a power down mode. This will greatly aid in lowering the quiescent current when the module is not being used. In normal operation the shutdown pin could be held low.



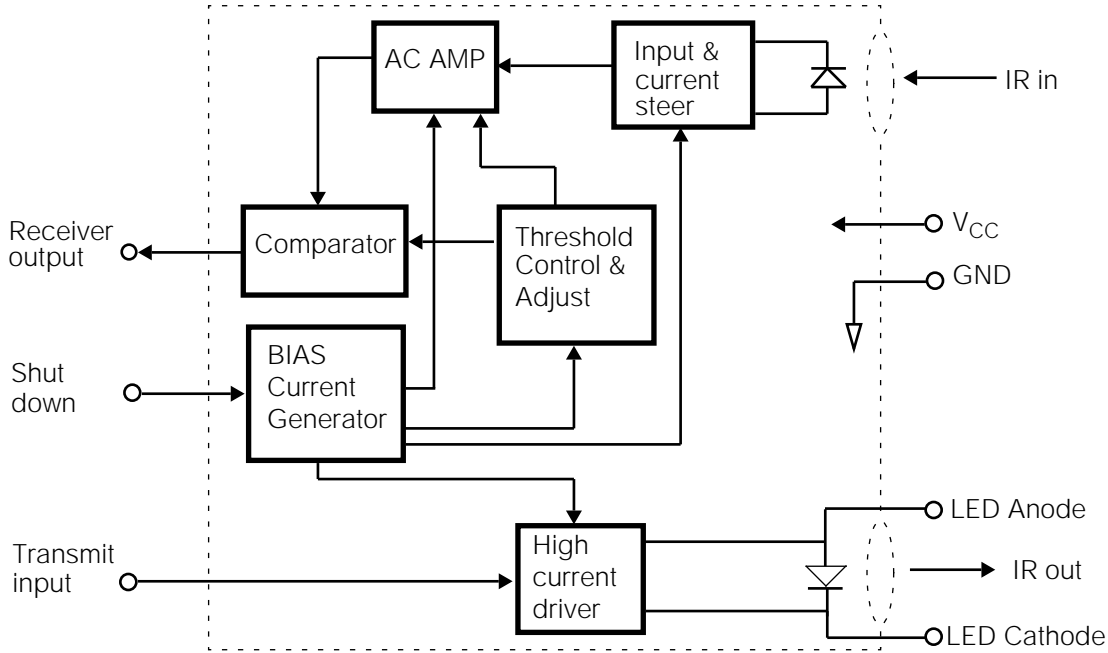
IRM3001 Pin Functions

| Pin no. | Function | Pin no. | Function | Pin no. | Function |
|---------|-------------|---------|-----------------|---------|----------|
| 1 | LED Anode | 4 | Receive | 7 | NC |
| 2 | LED Cathode | 5 | Shut down | 8 | GND |
| 3 | Transmit | 6 | V _{CC} | | |

IRM3105 Pin Functions

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|---------|-----------------|---------|-----------|---------|-----------|
| 1 | LED Cathode | 4 | GND | 7 | Transmit |
| 2 | Receive | 5 | NC | 8 | LED Anode |
| 3 | V _{CC} | 6 | Shut down | | |

Figure 1. Block diagram



Absolute Maximum Ratings (at 25°C)

| Parameter | Test Condition | Symbol | Value | Unit |
|-----------------------------|------------------------------|---------------|------------------------|------|
| Supply voltage range | | V_{CC} | -0.5 to +6 | V |
| Input currents | All pins | | 10 | mA |
| Output sinking current | | | 25 | mA |
| Storage temperature | | T_S | -25 to +85 | °C |
| Ambient temperature | Operating | T_A | 0 to 70 | °C |
| Junction temperature | Maximum | T_J | 125 | °C |
| Power dissipation | | P_{tot} | 200 | mW |
| Average IR LED current | DC | I_{LED} | 100 | mA |
| Rep pulsed IR LED current | <90 μ s, t_{on} , <20% | $I_{LED(RP)}$ | 500 | mA |
| Peak IR LED current | <2 μ s, t_{on} , <10% | $I_{LED(PK)}$ | 1.0 | A |
| IR LED anode voltage | | V_{LEDA} | -0.5 to $V_{CC}+0.5$ V | V |
| IR LED cathode voltage | | V_{LEDK} | -0.5 to $V_{CC}+0.5$ V | V |
| Transmit data input voltage | | V_{TXD} | -0.5 to $V_{CC}+0.5$ V | V |
| Receive data output voltage | | V_{RXD} | -0.5 to $V_{CC}+0.5$ V | V |

IR Convection Reflow Soldering

As with all optoelectronic devices, the IRM3001/3105 is sensitive to temperature rates of change and peak temperatures during the solder process. It is not designed for any application in which the component would be directly immersed in molten solder. Optimum performance will be achieved with convection IR reflow soldering.

A preheat of up to 120°C for 2.5 minutes is recommended with a rampup to soldering heat of a maximum of 4°C/sec.

The maximum peak temperature is 240°C and should not exceed 10 seconds at that temperature.

Cool down rate should not exceed 3°C/sec.

Basic Module Parameters

| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|------------------------|------------------------------|-----------|------|------|-------|--------|
| Supported data rates | | D_{TR} | 2.4 | | 115.2 | Kbit/s |
| Supply voltage range | | V_{CC} | 4.5 | 5 | 5.5 | V |
| Supply current receive | SD=low or NC Receive mode | I_{SR} | | 1 | | mA |
| Supply current | SD high, standby mode | I_{SSB} | | | 0.25 | mA |

Receive Parameters

| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|--|---|-------------|-------------|------|------|---------------------------|
| Output voltage low | $I_{OL}=4\text{ mA}$ | V_{OL} | | 0.5 | 0.8 | V |
| Output voltage high | $I_{OH}=-2\text{ mA}$ | V_{OH} | $V_{CC}-.5$ | | | V |
| Output current | | | | | 4 | mA |
| Logic high input irradiance | Bit error rate= 10^{-8} | E_{IHmin} | 4 | | | $\mu\text{W}/\text{cm}^2$ |
| Logic high input irradiance | In band irradiance maximum | E_{IHmax} | | | 500 | mW/cm^2 |
| Maximum DC irradiance | Ambient interference DC | E_{ADC} | 490 | | | $\mu\text{W}/\text{cm}^2$ |
| Minimum detection threshold irradiance | | E_{Emin} | | 3.0 | | $\mu\text{W}/\text{cm}^2$ |
| Logic low input irradiance | Ambient interference pulsed | E_{IL} | | | 0.4 | $\mu\text{W}/\text{cm}^2$ |
| Rise time, fall time | $C=15\text{ pf}$ | t_r, t_f | 20 | | 200 | ns |
| Output pulse width | 115.2 Kbits/sec. | | 1 | 1.6 | 6 | μs |
| Output delay leading edge | Output level= $0.5 \times V_{CC}$, $E_{IH}=4\text{ }\mu\text{W}/\text{cm}^2$ | | | | 2 | μs |
| Contributed systematic jitter | | CSJ | | | 0.2 | μs |
| Output delay trailing edge | Output level= $0.5 \times V_{CC}$, $E_{IH}=4\text{ }\mu\text{W}/\text{cm}^2$ | | | 1 | 5 | μs |
| Latency | Recovery of last transmitted pulse to 1.1 x threshold sensitivity | IL | | 100 | 600 | μs |

Transmit Parameters

| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|-------------------------------|------------------------|-----------------|------|------|----------|-----------------------|
| Driver current IR LED | 5 V ⁽¹⁾ | I_{LED} | 250 | 350 | 500 | mA |
| Logic low input voltage | | V_{IL} | 0 | | 0.3 | V |
| Logic high input voltage | | V_{IH} | 2.5 | | V_{CC} | V |
| Output radiant intensity | 5 V, $\alpha=15^\circ$ | R_I | 40 | 60 | 500 | mW/Sr |
| Half angle | | a | | 22 | | Deg. |
| Peak wavelength, emission | | λ_p | | 880 | | nm |
| Spectral bandwidth | $I_F=100\text{ mA}$ | $\Delta\lambda$ | | 80 | | nm |
| Optical rise/fall time | 10% to 90%, 90% to 10% | t_r, t_f | | 200 | 600 | ns |
| Optical overshoot | | | | | 25 | % |
| Contributed systematic jitter | | | | | 0.2 | μs |

Notes:

1. Internal current regulation. Do not use a current limiting resistor.
2. For proper operation, the LED anode should be connected to V_{CC} .