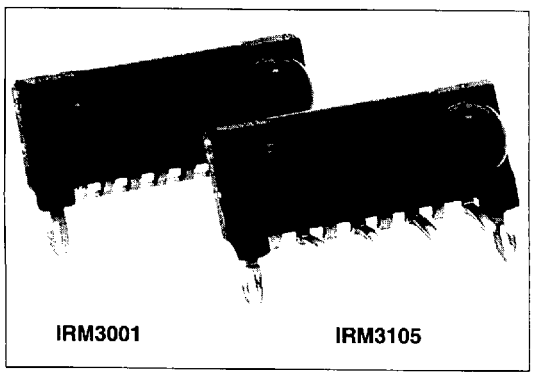
IRM3001/3002/3105

5 V INFRARED DATA TRANSCEIVER



IRM3001 IRM3105

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 IRM3001/3105 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 sould be held low.

IRM3001/3002 Pin Functions

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

IRM3105 Pin Functions

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

IR Convection Reflow Soldering

As with all optoelectronic devices, the IRM3001/3002/3105 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 ramp-up 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.

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 µs, t_{on}, <20%	$I_{LED\ (RP)}$	500	mA
Peak IR LED current	<2 µs, 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

Basic Module Parameters

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Supported data rates		D_{TR}	2.4		115.2	Kb/s
Supply voltage range		V_{CC}	3.3	5	5.5	V
Supply current receive	SD=low or NC receive mode	I_{SR}		0.6	1.0	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 mA	V_{OL}		0.5	0.8	V
Output voltage high	I_{OH}=–2 mA	V_{OH}	V_{CC}–0.5			V
Output current					4	mA
Logic high input irradiance	Bit error rate=10^{-8}	E_{IHmin}	4			µW/cm²
Logic high input irradiance	In band irradiance maximum	E_{IHmax}			500	mW/cm²
Maximum DC irradiance	Ambient interference DC	E_{ADC}	490			µW/cm²
Minimum detection threshold irradiance		E_{Emin}		3.0		µW/cm²
Logic low input irradiance	Ambient interference pulsed	E_{IL}			0.4	µW/cm²
Rise time, fall time	C=15 pf	t_r, t_f	20		200	ns
Output pulse width	115.2 Kb/s		1	1.6	6	µs
Output delay leading edge	Output level=0.5 x V_{CC}, E_{IH}=4 µW/cm²				2	µs
Contributed systematic jitter		CSJ			0.2	µs
Output delay trailing edge	Output level=0.5 x V_{CC}, E_{IH}=4 µW/cm²			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, α=15°	R_I	40	80	500	mW/Sr
Half angle		a		22		Deg.
Peak wavelength, emission		λ_P		880		nm
Spectral bandwidth	I_F=100 mA	Δl		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}.