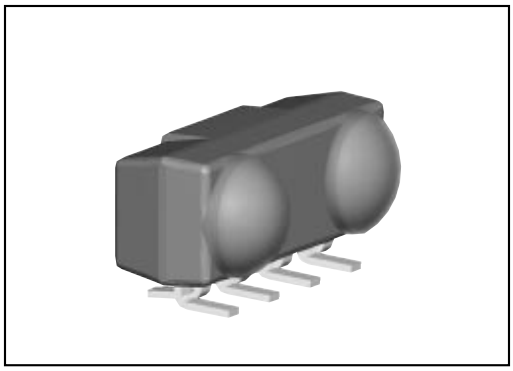
SIEMENS

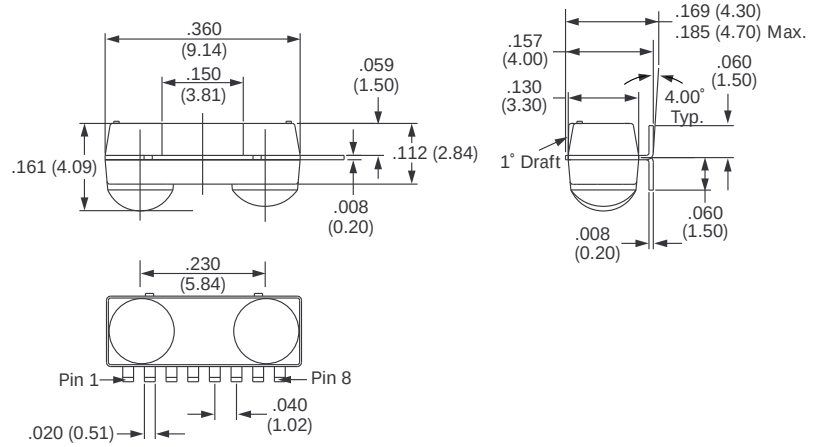
IRM 6000

INFRARED DATA TRANSCEIVER

Preliminary



Package Dimensions in inches (mm)



FEATURES

- **Small Package Size: 4.3 mm x 4.1 mm x 9.4 mm**
- **Compatible with IrDA Specifications**
- **IrDA Data Rates up to 115.2 Kbps**
- **Wide Dynamic Range**
- **Slim Package for Telephonic Applications**
- **Shutdown Feature Reduces Quiescent Current in Standby Mode**
- **Surface Mounted Package Ideal for Automated Assembly**

APPLICATIONS

- **Portable Computers**
- **Printers**
- **Telephony**
- **Industrial Hand-Held Devices**
- **Personal Data Assistants (PDA)**
- **Pagers**
- **Consumer Electronics**

DESCRIPTION

The IRM 6000 is a slim package, fully contained Infrared transceiver that is compatible with the IrDA 115.2 Kb/s 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.

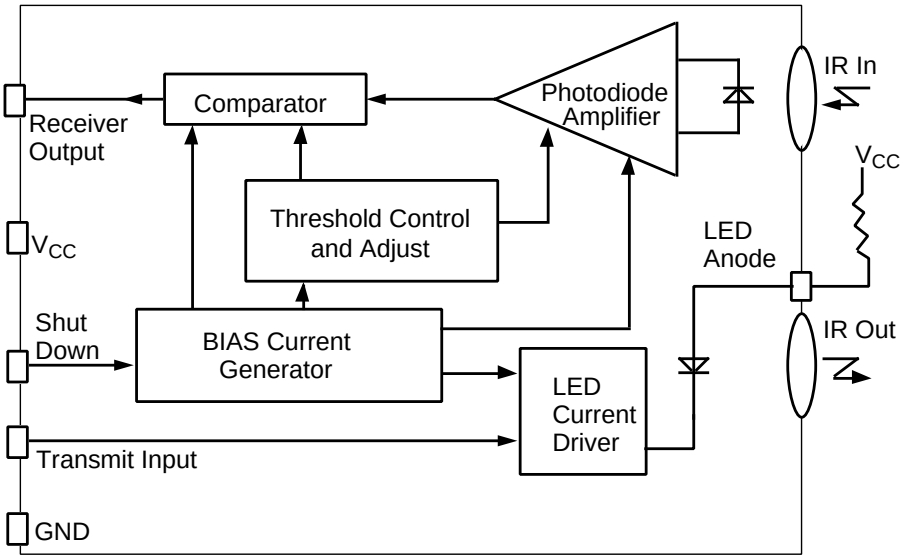
The state of the art BiCMOS circuitry coupled with the optoelectronic expertise of Siemens makes for a product that outperforms its closest rival. Also incorporated in the module is a unique shutdown feature which allows for a power down mode. This will greatly aid in lowering the quiescent current when the module is not being used. In normal operation the shutdown pin should be held low.

The slim package makes this device ideal for cellular telephone and PDA applications.

Pin Functions

Pin no.	Function	Pin no.	Function
1	NC	5	GND
2	NC	6	RHX
3	V_{CC}	7	THX
4	SD	8	LED Anode

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
Lead solder temperature	230°C		<10	sec.
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}, <25%	$I_{LED\ (RP)}$	500	mA
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 IRM 6000 is sensitive to temperature rates of change a nd 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/second.

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

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

Basic Module Parameters

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Supported data rates		D_{TR}	9.6		115.2	Kbit/s
Supply voltage range		V_{CC}	3.0		5.5	V
Supply current receive	SD=low or NC receive mode	I_{SR}		1.0	1.5	mA
Supply current	SD high, standby mode	I_{SSB}			10	µA

Receive Parameters

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Output voltage low		V_{OL}		0.5	0.8	V
Output voltage high		V_{OH}	V_{CC}–.5			V
Output current					4	mA
Logic high input irradiance	Bit error rate=10^{-8}	E_{IHmin}	4			µW/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			µW/cm^2
Minimum detection threshold irradiance		E_{Emin}		3.0		µW/cm^2
Logic low input irradiance	Ambient interference pulsed	E_{IL}			0.4	µW/cm^2
Rise time, fall time	C=15 pF	t_R	20		200	ns
Output pulse width	115.2 Kb/sec.		1	1.6	6	µs
Output delay leading edge	Output level=0.5xV_{CC}, E_{IH}=4 µW/ cm^2				2	µs
Contributed systematic jitter		CSJ			0.2	µs
Output delay trailing edge	Output level=0.5xV_{CC}			1	5	µs
Latency		IL		100	600	µs

Transmit Parameters

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Driver current IR LED	Current limiting resistor in series with LED	I_{LED}	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°, current limiting resistor in series with LED	R_I	40	60	<500	mW/Sr
Half angle		α		22		Deg.
Peak wavelength, emission		λ_P		880		nm
Spectral bandwidth	I_F=100 mA	$\Delta\lambda$		80		nm
Optical rise/fall time	10% to 90%, 90% to 10%	t_R, t_F		200	600	nsec
Optical overshoot					25	%
Contributed systematic jitter					0.2	µs