



IrDA

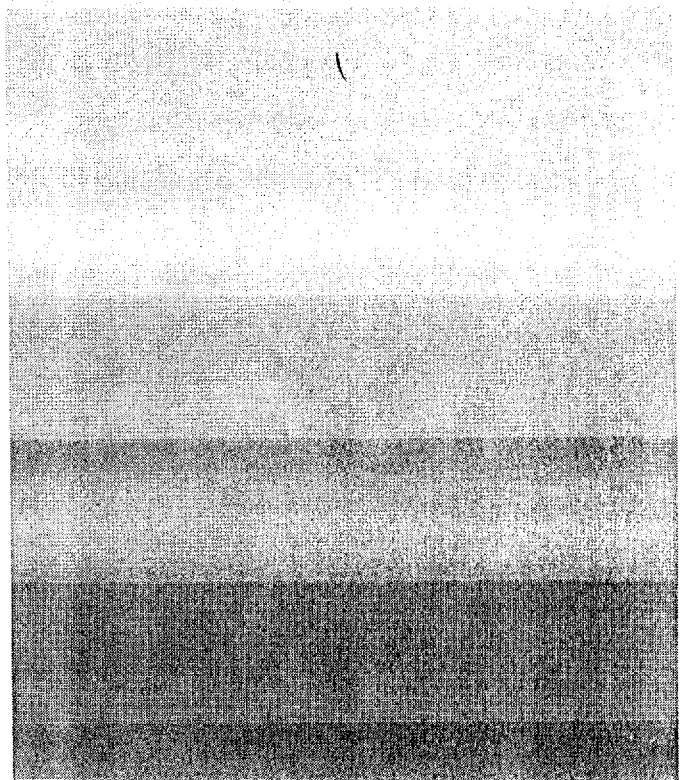
**OPTO-WIRELESS
TRANSCEIVER MODULE**

HRM12001

**MEMBER
IrDA**



STANLEY



HRM1200L Preliminary Data Sheet Rev1.0

HRM1200L is a one-piece wireless data transmission module which conforms to the IrDA standard (IrDA Ver1.2 Low Power Option).

With Stanley's Infrared LED, high sensitivity photodiode and newly developed driver IC, HRM1200L provides reliable wireless communication at a very low supply voltages.

HRM1200L's package size measures 2.2mm in height and 6.8mm in width with its metal shield case.

HRM1200L is designed to operate at low voltages from 2.7V to 3.6V.

HRM1200L is the best module for operating portable phones, PDA and portable equipment.

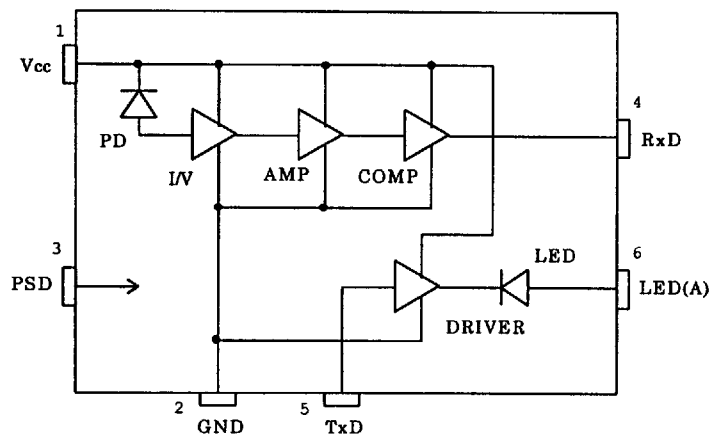
■FEATURES

- Compatible with IrDA Ver1.2 Low Power Option.
- Ultra Compact Package : Height 2.2mm×Width 6.8mm×Depth2.8mm.
- Weight : 0.088g
- With Metal Shield Case.
- LED current : 35mA ($V_{cc}=3.3V$, at 3.6mW/sr)
- Low Operating Current : 120 μ A Max.
- Low Power Supply Voltage : 2.7~3.6V
- Complete Power Down Feature.
Standby Current Consumption : 0.2 μ A Max.
- The Circuit Prevents the LED from Emitting at DC current→LED(on):20 μ Sec.TYP.
- Compatible with Reflow Soldering Process.
- Incorporates Daylight Blocking Filter.
- Quantity : 3,000pcs / reel.

■APPLICATION

- Portable Phone
- PDA
- Other Portable Equipment

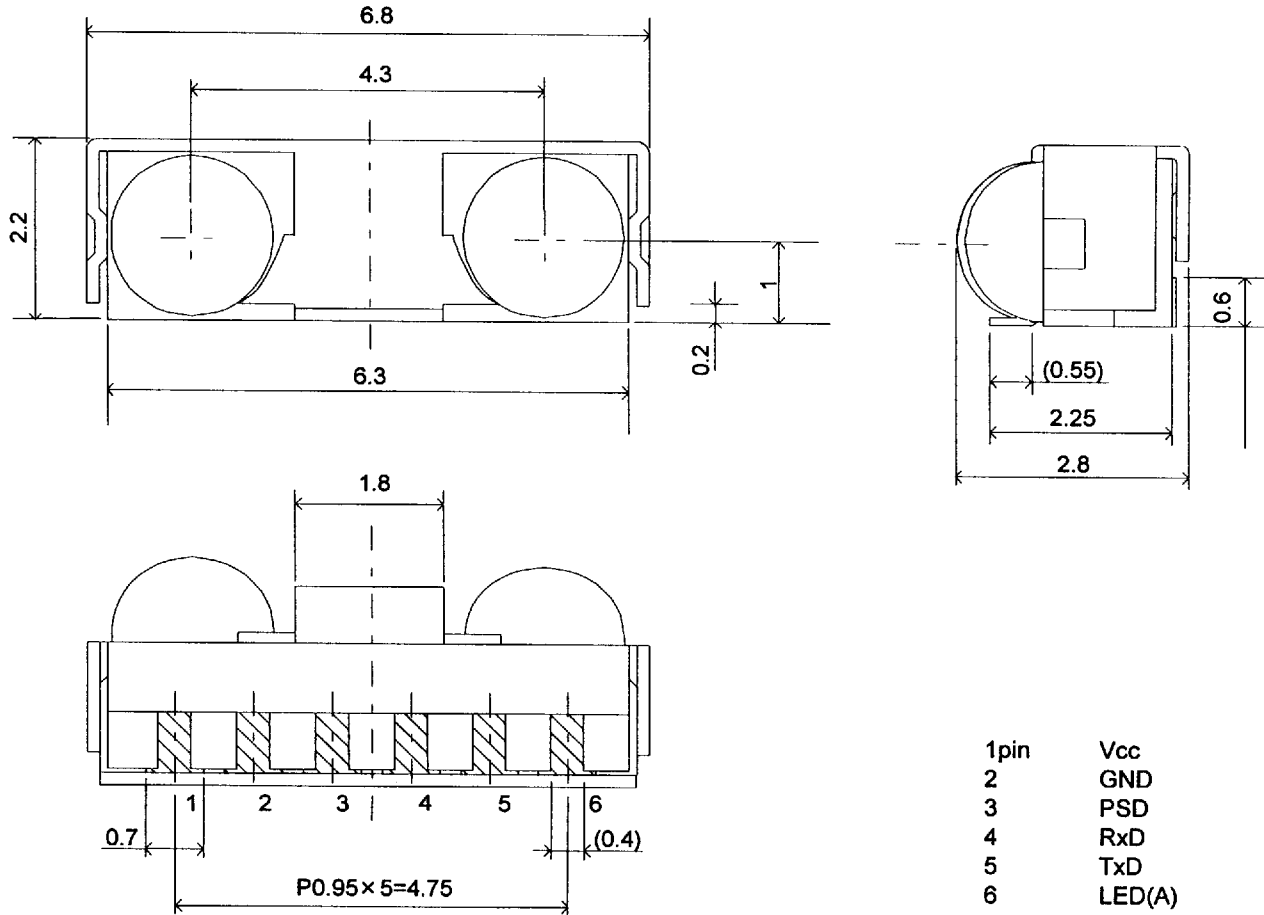
■CIRCUIT BLOCK DIAGRAM



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OUTER DIMENSIONS

Unit : mm



Mechanical Tolerance : ± 0.1

PIN FUNCTION

PIN	SYMBOL	FUNCTION
1	Vcc	Power supply.
2	GND	GND for power supply.
3	PSD	This terminal switches to the low current consumption mode (standby mode). All the capabilities will be shutdown by changing the terminal to "H".
4	RxD	Receiving data output.
5	TxD	Transmission data input.
6	LED(A)	LED anode. It is connected to Vcc.

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■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT	REMARKS
Supply Voltage	VCC	0~7	V	VCC,GND
Input Voltage	VIN	GND-0.3~VCC+0.3	V	TxD,PSD
Input Voltage	VIN	0~7	V	LED(A)
Output Voltage (External Voltage)	VOUT	GND-0.3~VCC+0.3	V	RxD
LED Current (Pulse)	IPULSE	50 tON ≤ 90μSec Duty Cycle ≤ 20%	mA	LED(A) Ta=25°C
Soldering Temperature	TSOL	260	°C	
Operating Temperature	TOP	-30~+85	°C	
Storage Temperature	TST	-40~+100	°C	

*Absolute maximum ratings are the conditions to avoid degradation in reliability.

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C)

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	REMARKS
Supply Voltage	VCC		2.7		3.6	V	
High Level Input Voltage	VIH		VCC -0.4			V	TxD,PSD
Low Level Input Voltage	VIL				0.4	V	
High Level Output Voltage	VOH	IOH=20μA	VCC -0.3			V	RxD
Low Level Output Voltage	VOL	IOL=-400μA			0.3	V	
Receiving Current Consumption	Is	VCC=3.3V		95	120	μA	PSD=0V, TxD=0V
Current Consumption In Standby Mode	ISTB				0.2	μA	PSD=VCC, TxD=0V
RxD Output Rise Time	trr			40	200	nSec	
RxD Output Fall Time	trf			40	200	nSec	
RxD Pulse Width	tpWA	SIR=115.2Kbps	1	1.6	2.0	μSec	
Power Shut Down Time	*1	TSD			1	μSec	
Start Up Time	*2	TSTU			100	μSec	
Latency	*3	TRRT			60	μSec	

*1 : I_{LED} is LED operating current which can be adjusted by the external current limiting resistor connected to LED(A) pin.

*2 : The time it takes for the module to revert to an active mode after the PSD data is in "L" from the standby mode.

*3 : Switching time of the module status from transmission to receiving.

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OPTICAL CHARACTERISTICS

(Ta=25°C)

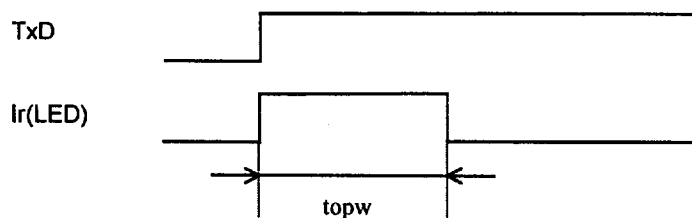
PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	REMARKS
Transmission Radiant Intensity *1	Ir	I _{LED} =35mA	3.6			mW/sr	θ _h ,θ _v ≤ ±15°
Minimum Receiver Input Irradiance *2	E _{emin}	V _{CC} =3.3V			8.1	μW/cm ²	θ _h ,θ _v ≤ ±15°
Maximum Receiver Input Irradiance	E _{emax}	V _{CC} =3.3V	500			mW/cm ²	θ _h ,θ _v ≤ ±15°
Transmission Half Angle							
Horizontal	θ _{th}			±20		deg.	
Vertical	θ _{tv}			±20		deg.	
Receiving Half Angle							
Horizontal	θ _{rh}			±20		deg.	
Vertical	θ _{rv}			±20		deg.	
Light Pulse Rise Time	tor				200	NSec	
Light Pulse Fall Time	tof				200	NSec	
Optical Pulse Width *3				20		μSec	TxD="H"
Light Pulse Overshoot	topo				25	%	
Peak Wavelength	λ _p			870		Nm	

*1 : Early characteristics.

*2 : Characteristics are subject to change depending upon noise influences.

*3 : The circuit prevents the LED from emitting at DC current. Note the following.

The Circuit Prevents the LED from Emitting at DC Current.



When TxD is kept "H", the circuit has a function which shuts down LED emission automatically.

TRUTH TABLE

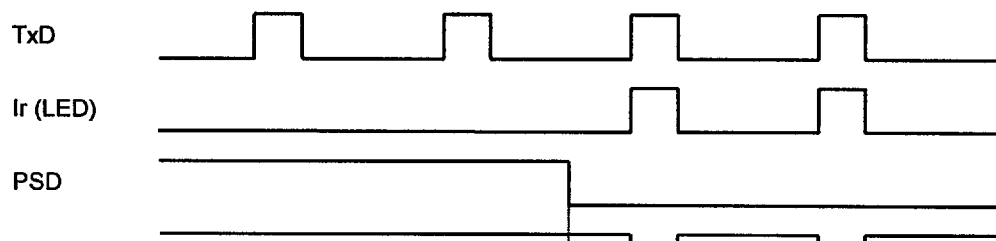
Input			Output	
PSD	TxD	Ee	Ir(LED)	RxD
V _{IL}	V _{IH}	X	High(On)	NV
V _{IL}	V _{IL}	E _{eIH}	Low(Off)	Low
V _{IH}	V _{IH}	X	Low(Off)	High
V _{IH}	V _{IL}	X	Low(Off)	High

X : Don't care.

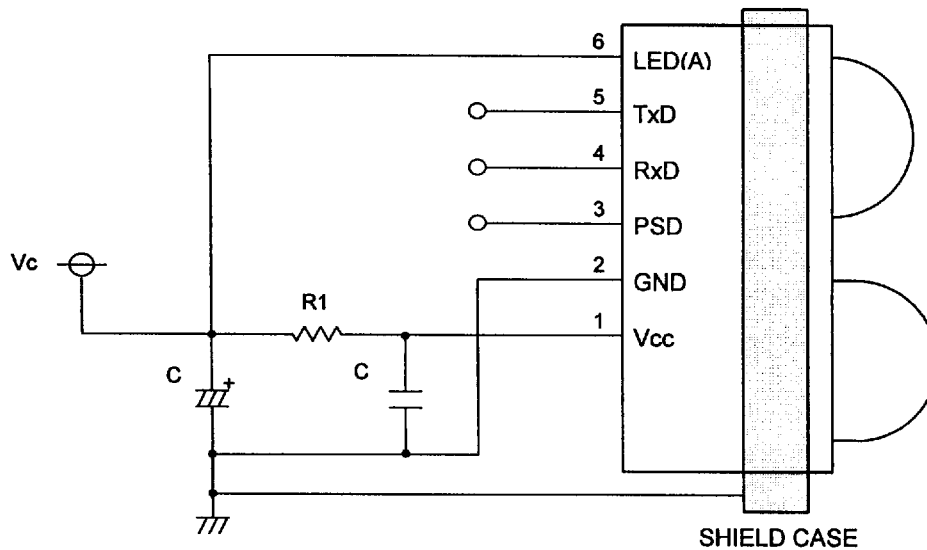
NV : Not Valid.

Ee : Input irradiance present at detector surface.

E_{eIH} : 8.1μW/cm² ≤ Ee ≤ 500mW/cm².



RECOMMENDED CIRCUIT DIAGRAM



Components	IrDA Ver1.2 Low Power Option (Ir=3.6mW/sr, ILED=35 mA, VCC=3.3V)
R1	10Ω, 1/16W
C1	10μF
C2	0.1μF

○Please choose a larger capacitor according to circumstances on Vcc line noise.

○Please choose a capacitor which has good frequency characteristics.

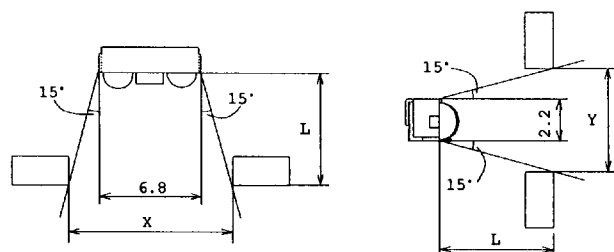
Recommended soldering Conditions

The formula for a minimum window size of Ir port is as follows:

L: The distance from the top of housing surface to the top of module case surface(not top of lens).

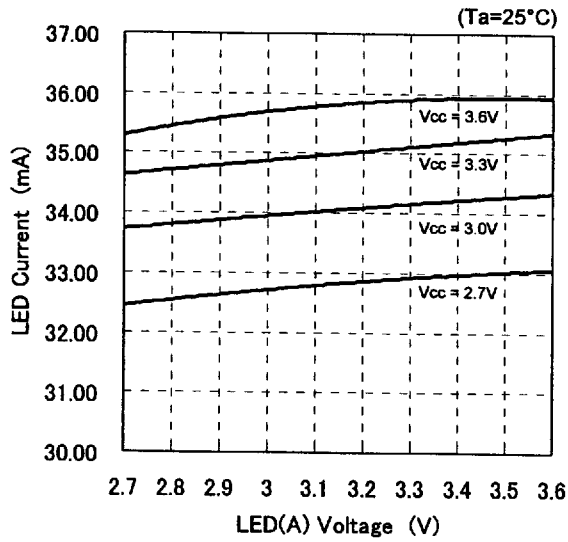
Horizontal(width): $X=6.8+L \times 0.54$ [mm]

Vertical(width): $Y=2.2+L \times 0.54$ [mm]

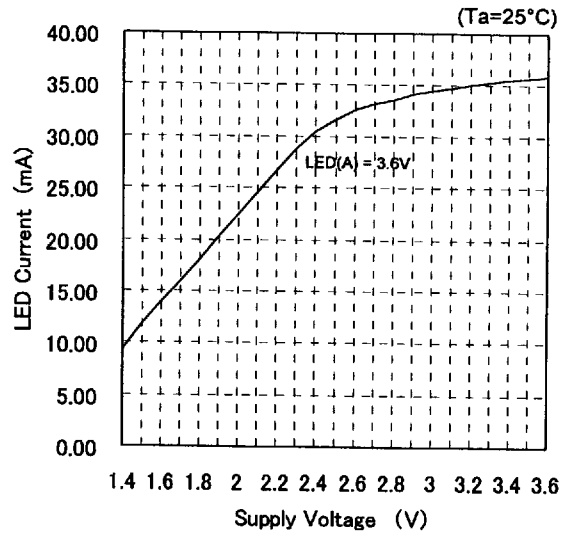


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■ fig.1 LED(A) Voltage - LED Current

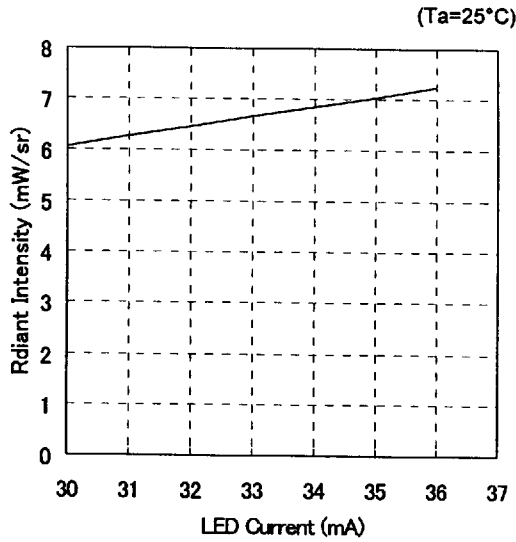


■ fig.2 Supply Voltage – LED Current

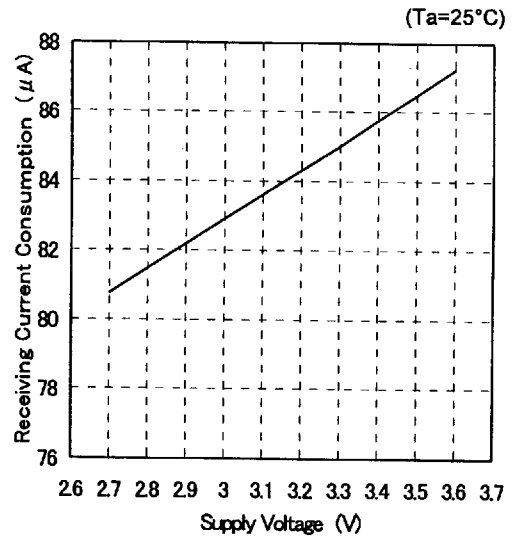


Notes : The graph from 1.4V to 2.7V is numerical value of reference.

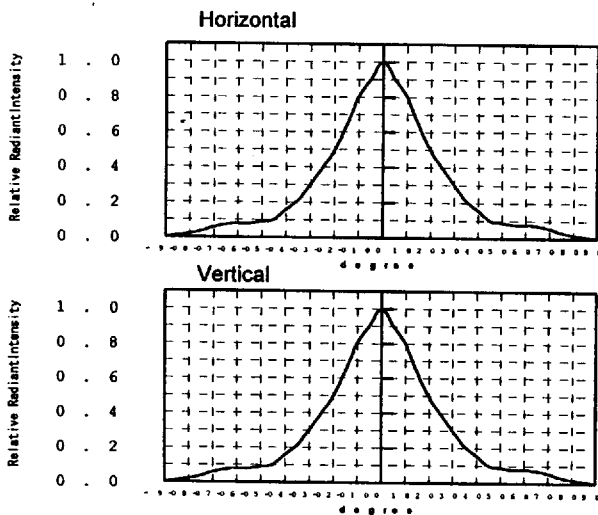
■ fig. 3 LED Current – Radiant Intensity



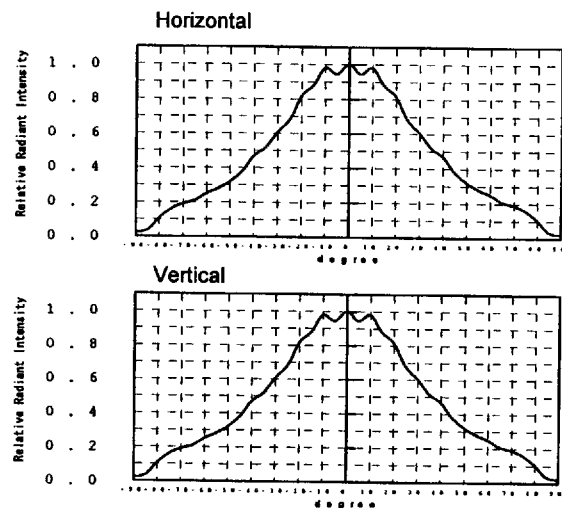
■ fig.4 Supply Voltage – Receiving Current Consumption



■ fig.5 Transmission Spatial Distribution



■ fig.6 Receiving Spatial Distribution



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■ RECOMMENDED SOLDERING CONDITIONS

○ With Soldering Iron

Temperature at tip: no more than 280°C

Time: 3 sec. MAX.

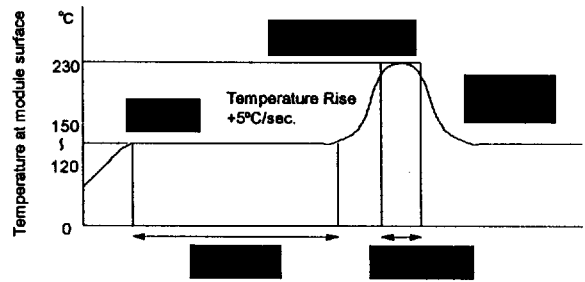
○ Reflow

Preheat: 120 to 150°C, 60 to 120 sec.

Soldering: 230°C, within 10 sec.

Heating up and cooling down: 5°C/sec.

Number of soldering: 2 times MAX.



■ BAKING CONDITION

Please get rid of wet in case of the follows.

- (a) The indicator of dry tablet in the aluminum dry bag did not indicate blue.
- (b) It took 1 week after opening the aluminum dry bag.

Recommended baking condition: $60 \pm 5^\circ\text{C}$, 10~20 hours

■NOTES

- Information is updated up to July 1999.

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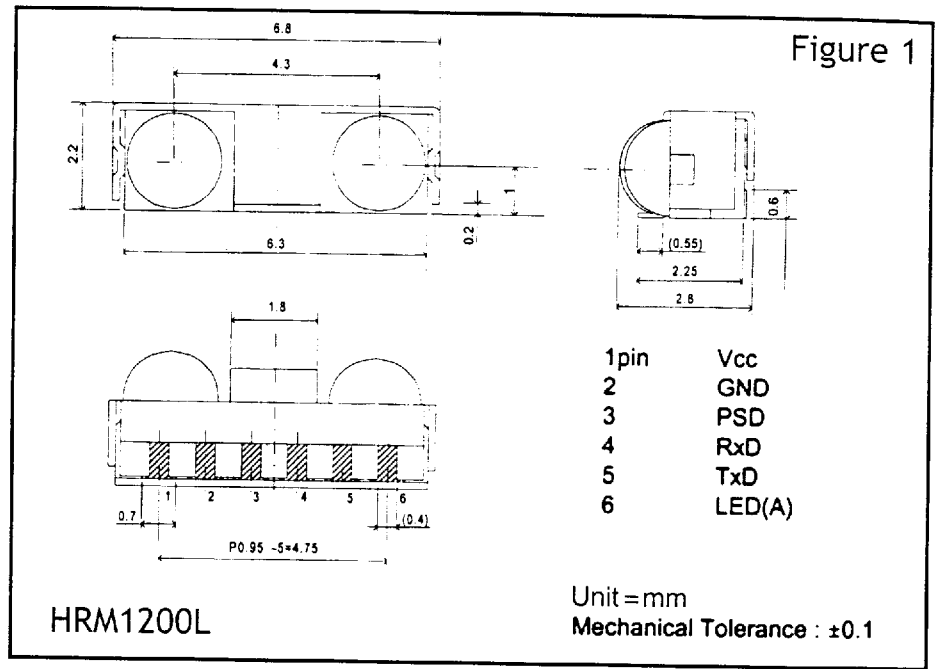
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STANLEY OFFERS NEW IRDA-LOW-POWER MODULE


With a supported data rate of 2.4K-115.2K bps and an operating distance of 0-30cm, the HRM 1200L expands Stanley Electric's IrDA-FIR product line with a transceiver module ideal for portable wireless communication devices.

The HRM 1200L shows Stanley's expertise in molding and opto-electronic technology, featuring a driver IC, highly sensitive photodiode, and infrared LED. One of the smallest in the industry, its operating current is only 80µA. Stanley's new HRM 1200L has an internal resistor and pin-to-pin compatibility with HP IrDA module HSDL-32X1. Typical applications will include cellular phones, pagers, PDAs, and other portable communication devices.



IrDA-Low-Power Option Compatible Module (IrDA Ver 1.2)

Supported Data Rates: 2.4K-115.2K bps
Operating Distance: 0-30cm

 H2.2XW6.8 XD2.8mm	Parameter	Condition	MIN.	TYP.	MAX.	Unit	Dimensions	
	Operating Voltage			(2.7)		3.6	V	fig.1
	Receiving Current Consumption	Vcc=3.3V			(80)	100	µA	
	Current Consumption in Standby Mode					(0.2)	µA	
	Transmission Radiant Intensity	(ILED=35mA)		4		28.8	mW/sr	
	Light Pulse Rise/Fall Time					200	nSec.	
	Operating Temperature			-30		+85	°C	
	Mounting							
				Side View				

HRM 1200L Special Features

- Ultra-compact: 2.2mm H x 6.8mm W x 2.8mm D
- Low operating current: 80µA
- Low power supply: 2.7 to 3.6V
- Complete power-down feature: standby current consumption of (0.2)µA Max.
- No DC current emitted by LED-LED (on): 20µ sec. TYP
- Metal shield case
- Daylight blocking filter
- Compatible with reflow soldering process
- Compatible with IrDA Ver. 1.2 low-power option
- Pin-to-pin compatible with HP HSDL-32X1

THE HRM 1200L OFFERS NEW FEATURES AS HRM 150V IS DISCONTINUED

In a move to better accommodate the changing needs of manufacturers using LEDs and increase the efficiency of our IrDA product line, the HRM 150V has been discontinued.

We offer this data as primary information. Mass production is scheduled to begin in June 1999, at which time technical samples will be available. Stanley will continue to update you regarding the latest product specifications and training sessions.



PROFESSOR STANLEY WILL BE BACK NEXT MONTH.