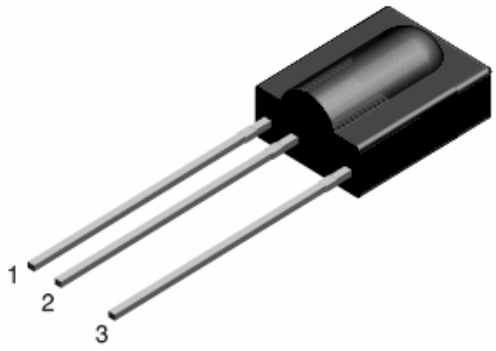
Luckylight

Infrared Remote-control Receiver Module
Technical Data Sheet

Part No.: LL-M5038



Features:

- ◇ Photo detector and preamplifier in one package.
- ◇ High photo sensitivity.
- ◇ Improved shielding against electrical field disturbance.
- ◇ Low voltage and low power consumption.
- ◇ Suitable burst length≧10 cycles/burst.
- ◇ TTL and CMOS compatibility.
- ◇ Output active low.
- ◇ High immunity against ambient light.
- ◇ High protection ability against EMI.
- ◇ Long reception distance.
- ◇ Photodiode with integrated circuit.
- ◇ Internal filter for PCM frequency.
- ◇ The product itself will remain within RoHS compliant version.

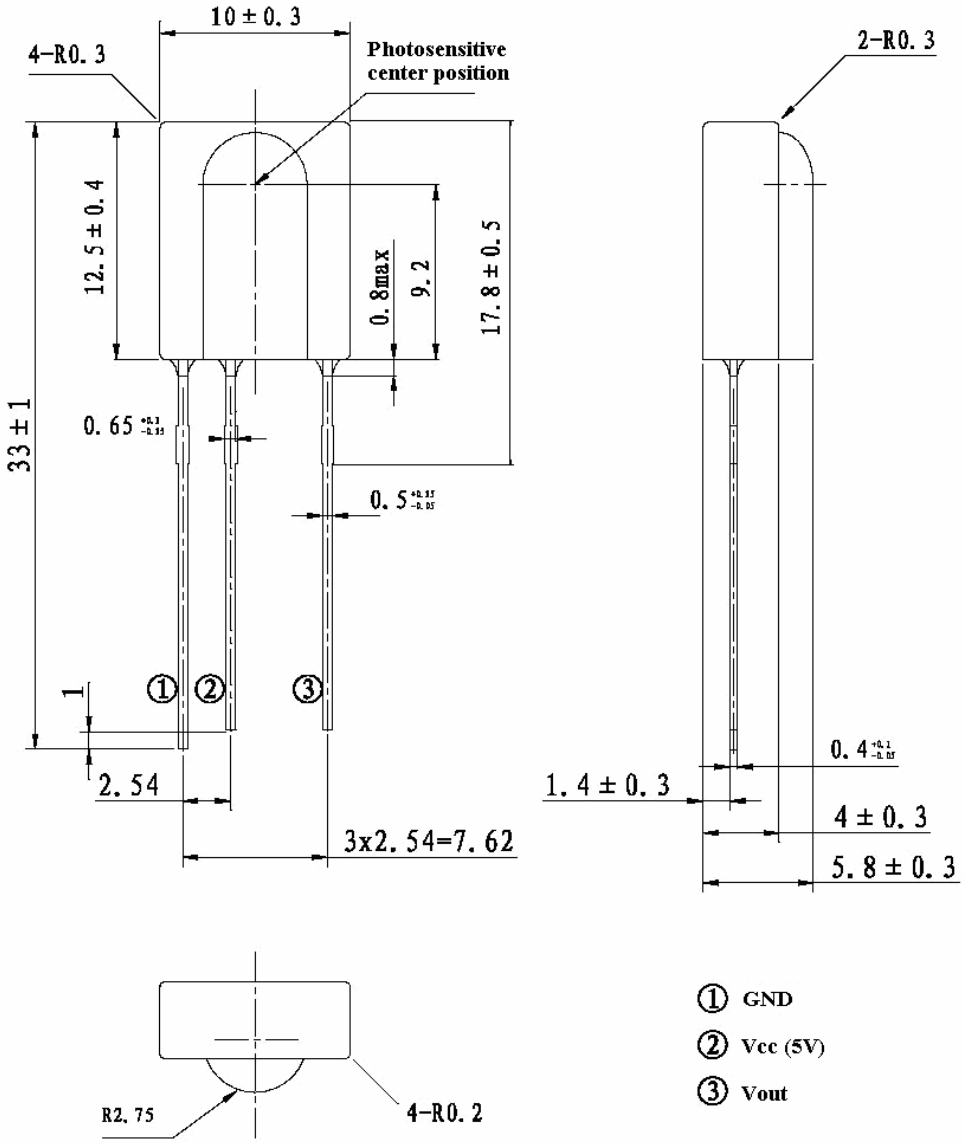
Descriptions:

- ◇ The LL-M5038 is miniaturized receivers for infrared remote control systems.
- ◇ The PIN diode and preamplifier are assembled on lead frame, the epoxy package is designed as an IR filter.
- ◇ The demodulated output signal can directly be decoded by a microprocessor.
- ◇ The LL-M5038 is the standard IR remote control receiver series, supporting all major transmission codes.

Applications:

- ◇ Infrared applied system.
- ◇ Light detecting portion of remote control.
- ◇ AV instruments such as Audio, TV, VCR, CD, MD, etc.
- ◇ CATV set top boxes.
- ◇ The other equipments with wireless remote control.
- ◇ Home appliances such as Air-conditioner, Fan, etc.
- ◇ Multi-media Equipment.

Package Dimension:



Part No.	Material		Lens Color	Source Color
LL-M5038	Chip	Silicon	---	Infrared Receiver
	Compound	Epoxy	Black	---

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010″) unless otherwise specified.
3. Specifications are subject to change without notice.

Absolute Maximum Ratings at Ta=25℃

Item	Symbol	Value	Unit	Notice
Power Dissipation	PD	50	mW	Tamb≤85℃
Supply Voltage	Vcc	0~7	V	Recommended Operating Condition: Supply Voltage Rating: Vcc 2.7V to 6V, TYP. 5V
Operating Current	Is	3	mA	
Operating Temperature	Topr	-25 ~ +85	℃	
Storage Temperature	Tstg	-40 ~ +125	℃	
Soldering Temperature	Tsol	260	℃	At the position of 4mm from mold body within 5 seconds.

Electrical Optical Characteristics at (Ta=25℃, Vcc=5V, fo=38KHz)

Parameters	Symbol	Min.	Typ.	Max.	Unit	Test condition
Supply Voltage	Vcc	2.7	5	6	V	
Consumption Current	Icc	---	0.8	1.0	mA	No Signal Input
Static State Current	Is	0.7	0.9	1.2	mA	Vcc=3V, Ev=0
		0.9	1.2	1.5		Vcc=5V, Ev=0
B.P.F Center Frequency	Fo	---	38	---	KHz	
Peak Wavelength	λp	---	940	---	nm	
Reception Distance	L_0	12	14	---	m	Vcc=5V, At the ray axis (Note 1)
	L_{30}	10	12	---		
	L_{45}	8	10	---		
Half Angle (Horizontal)	θh	---	45	---	deg	
Half Angle (Vertical)	θv	---	45	---		
High Level Pulse Width	T_{WH}	400	600	800	μs	Vcc=5V, At the ray axis (Note 2)
Low Level Pulse Width	T_{WL}	400	600	800		
High Level Output Voltage	V_H	Vcc-0.2	---	Vcc	V	T=1.2ms Duty=50%
Low Level Output Voltage	V_L	---	0.2	0.4		

Notes:

1. The ray receiving surface at a vertex and relation to the ray axis in the range of θ=0° and θ=45°.
2. A range from 30cm to the arrival distance. Average value of 50 pulses.

Test Method:

The specified electro-optical characteristics is satisfied under the following conditions at the controllable distance.

①Measurement place.

A place that is nothing of extreme light reflected in the room.

②External light.

Project the light of ordinary white fluorescent lamps which are not high frequency lamps and must be less then 10 Lux at the module surface. (Ee≦10Lux)

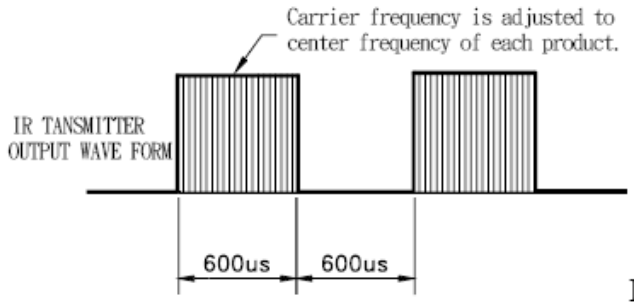
③Standard transmitter

A transmitter whose output is so adjusted as to **Vo=400mVp-p** and the output wave form shown in Fig.-1. According to the measurement method shown in Fig.-2 the standard transmitter is specified. However, the infrared photodiode to be used for the transmitter should be λp=940nm, Δλ=50nm. Also, photodiode is used of PD516AD (V_R=5V).

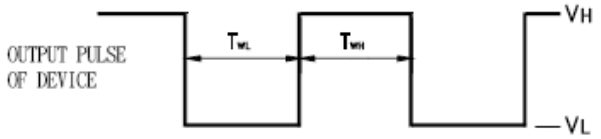
④Measuring system.

According to the measuring system shown in Fig.-3.

Fig.-1 Transmitter Wave Form



D.U.T output Pulse



Duty=0.5

Fig.-2 Measuring Method

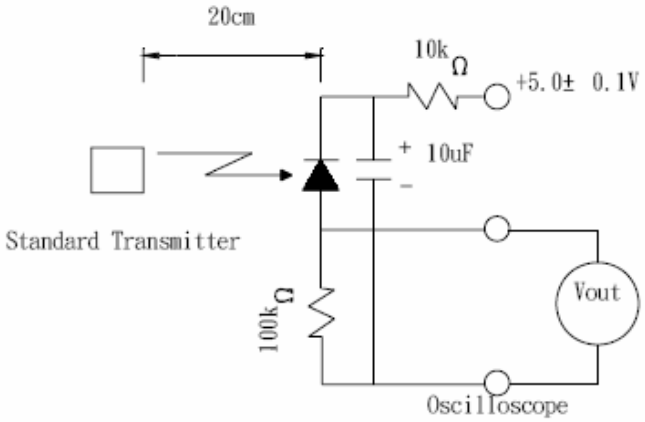
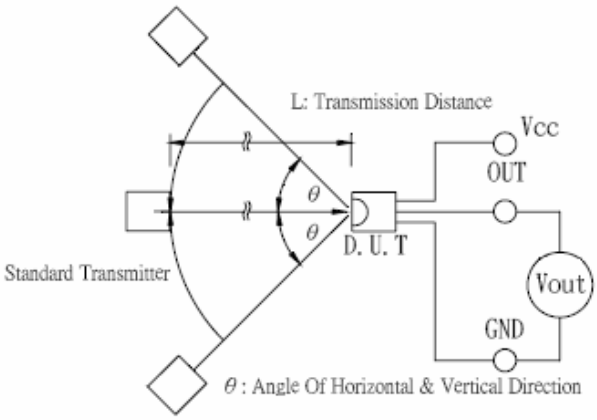
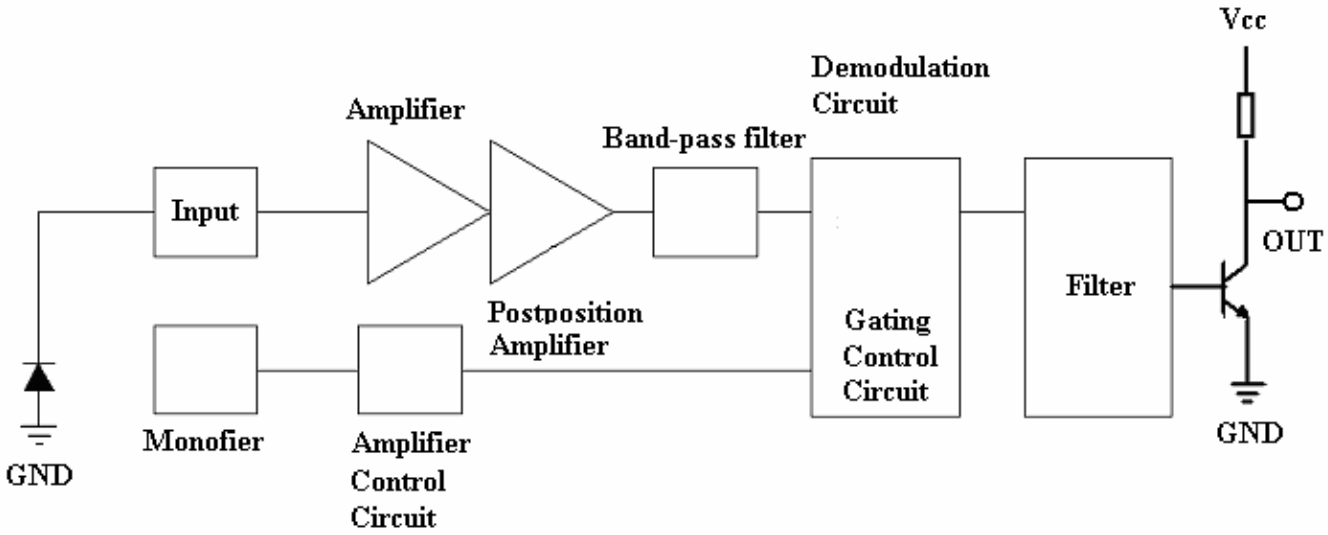


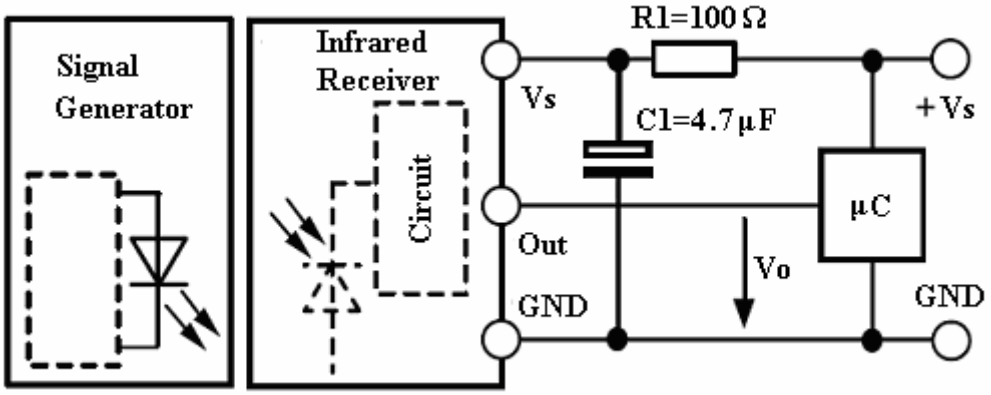
Fig.-3 Measuring System



Elements Circuit:



Recommended Applications Circuit:



Reliability Test Items And Conditions:

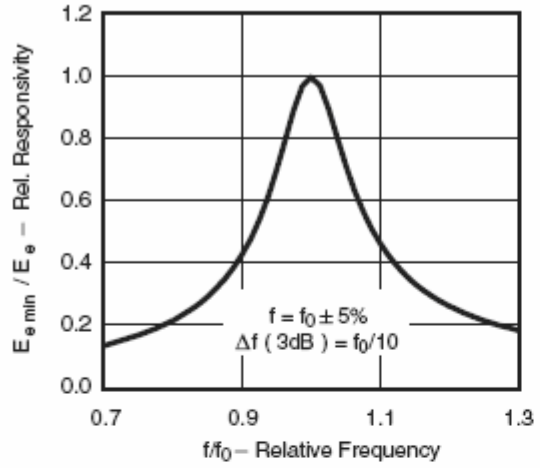
The reliability of products shall be satisfied with items listed below:

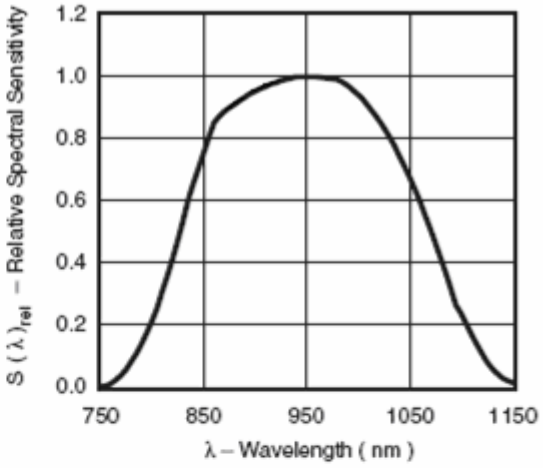
Confidence level: 90%.

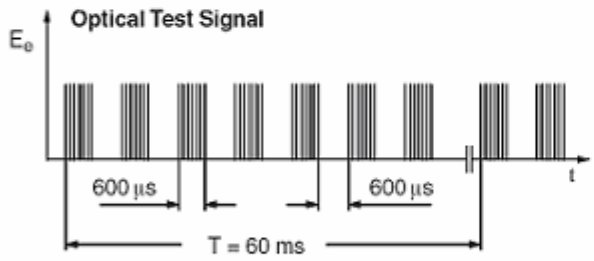
LTPD: 10%.

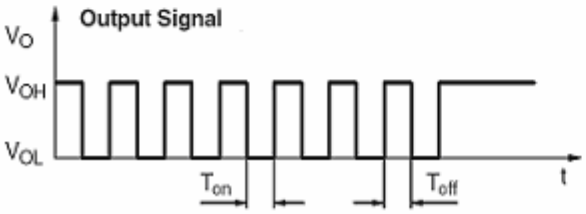
No.	Test Items	Test Conditions	Failure Judgement Criteria	Samples(n) Defective(c)
1	Temperature cycle	1 cycle -25℃ ∫ +85℃ (30min) (5min) (30min) 300 cycle test	L0≦L×0.8 L45≦L×0.8 L: Lower specification limit	n=22, c=0
2	High temperature test	Temp: +85℃ Vcc: 5V 1000hrs		n=22, c=0
3	Low temperature storage	Temp: -25℃ 1000hrs		n=22, c=0
4	High temperature High humidity	Ta: 85℃, RH:85% 1000hrs		n=22, c=0
5	Solder heat	Temp: 260±5℃ 10sec 4mm From the bottom of the package.		n=22, c=0

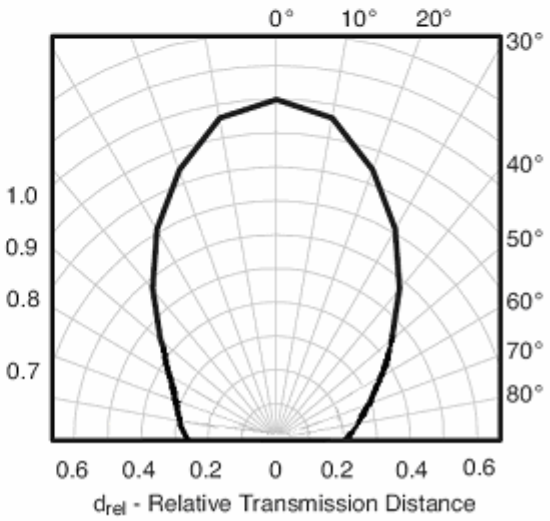
Typical Electrical / Optical Characteristics Curves
(25℃ Ambient Temperature Unless Otherwise Noted)

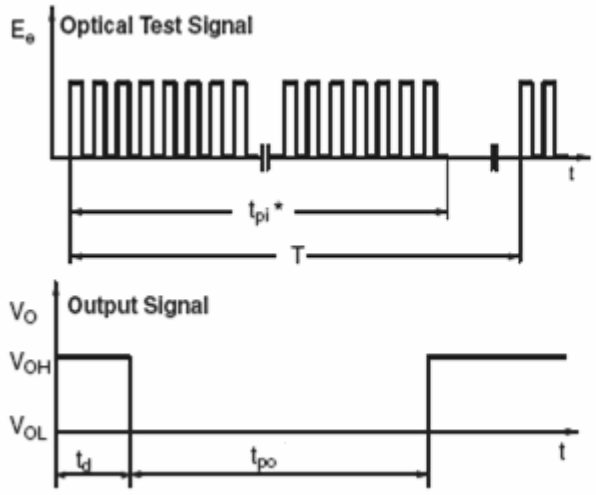












f_0=38KHz
T=1.2ms
$10/f_0 \leq t_{pi} \leq 50/f_0$

$7/f_0 < t_d < 15/f_0$
$t_{pi}-5/f_0 < t_{po} < t_{pi}+6/f_0$

Please read the following notes before using the datasheets:

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the Inframed Receiver Module should be kept at 30℃ or less and 90%RH or less.

2.3 The Inframed Receiver Module should be used within a year.

2.4 After opening the package, the Inframed Receiver Module should be kept at 30℃ or less and 70%RH or less.

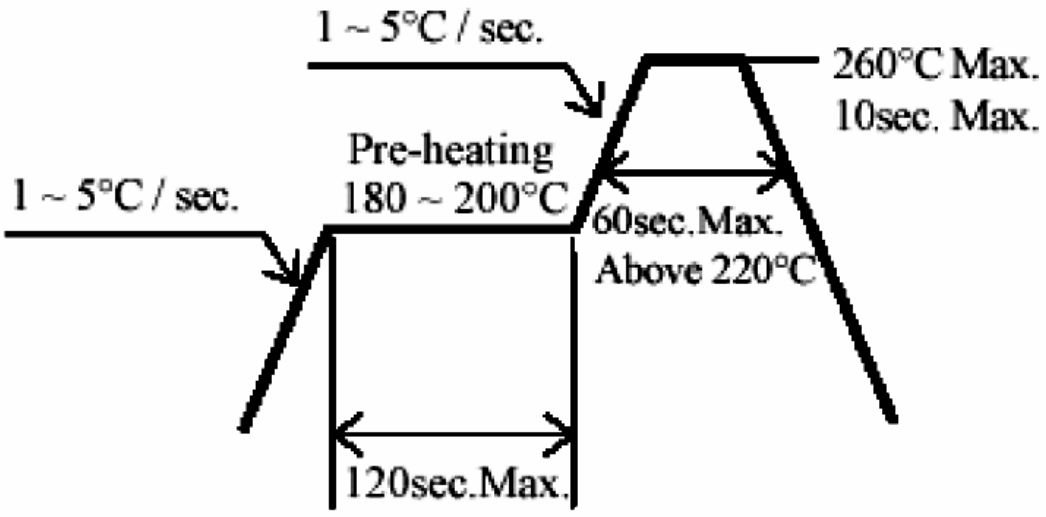
2.5 The Inframed Receiver Module should be used within 168 hours (7 days) after opening the package.

2.6 If the moisture adsorbent material (silica gel) has fabed away or the Inframed Receiver Module have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment: 60±5℃ for 24 hours.

3. Soldering Condition

3.1 Pb-free solder temperature profile.



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the Inframed Receiver Module during heating.

3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

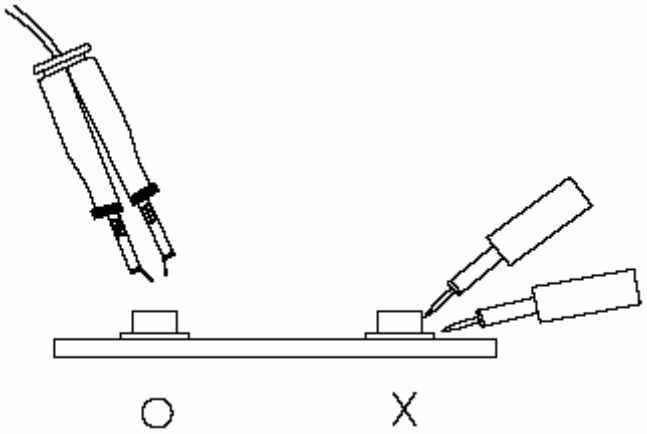
Each terminal is to go to the tip of soldering iron temperature less than 260℃ for 5 seconds within

once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the Inframed Receiver Module have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand

whether the characteristics of the Inframed Receiver Module will or will not be damaged by repairing.



6. Caution in ESD

Static Electricity and surge damages the Inframed Receiver Module. It is recommend to use a wrist band or anti-electrostatic glove when handling the Inframed Receiver Module. All devices, equipment and machinery must be properly grounded.