



**THE DATASHEET OF
IRM-V538T/TR1**



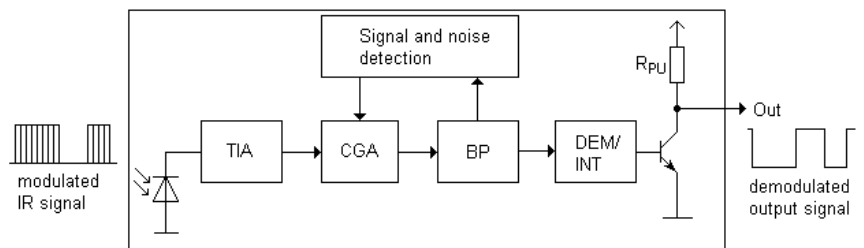
Infrared Receiver Control Receiver Module IRM-V5XXT/TR1 Series



Pin Configuration

1. OUT
2. Vcc
3. GND

Block Diagram



Features

- High shielding against electric field disturbance.
- Circular lens to improve the receive characteristic.
- Line-up for various center carrier frequencies.
- Low voltage and low power consumption.
- High immunity against ambient light.
- Photodiode with integrated circuit.
- TTL and CMOS compatibility.
- Side-received SMD.
- Suitable burst length 10 pulses/burst.
- This product itself will remain within RoHS compliant version.
- Pb free.

Descriptions

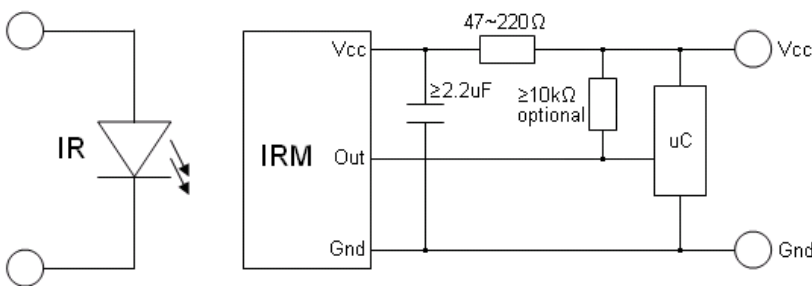
The device is miniature SMD type infrared receiver that has been developed and designed by utilizing the latest IC technology.

The PIN diode and preamplifier are assembled onto a lead frame and molded into an epoxy package which operates as an IR filter. The demodulated output signal can directly be decoded by a microprocessor

Applications

- Light detecting portion of remote control
- AV instruments such as Audio, TV, VCR, CD, MD, etc
- Home appliances such as Air-conditioner, Fan, etc
- Other devices using IR remote control
- CATV set top boxes
- Multi-media Equipment

Application Circuit



Parts Table

Model No.	Carrier Frequency
IRM-V538T/TR1	38 kHz

Absolute Maximum Ratings (T_a=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	0~6	V
Operating Temperature	Topr	-20 ~ +80	
Storage Temperature ^{*1}	Tstg	-40 ~ +85	

^{*1} 4mm from mold body less than 5 seconds

Electro-Optical Characteristics (Ta=25 and Vcc=3.0V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Current Consumption	I _{cc}	-	-	1.2	mA	No signal input
Supply Voltage	V _{cc}	2.7	-	5.5	V	
Peak Wavelength	λ_p	-	940	-	nm	
Reception Distance	L ₀	8	-	-	m	
	L ₄₅	5	-	-		
Half Angle(Horizontal)	Θ_h	---	45	---	deg	At the ray axis *1
Half Angle(Vertical)	Θ_v	---	45	---	deg	
High Level Pulse Width	T _{WH}	400	-	800	μ s	At the ray axis *2
Low Level Pulse Width	T _{WL}	400	-	800	μ s	
High Level Output Voltage	V _H	2.7	-	-	V	
Low Level Output Voltage	V _L	-	0.2	0.5	V	

Notes:

*1 : The ray receiving surface at a vertex and relation to the ray axis in the range of $\theta=0^\circ$ and $\theta=45^\circ$.

*2 : A range from 30cm to the arrival distance. Average value of 50 pulses.

Test Method

The specified electro-optical characteristic is satisfied under the following Conditions:

1. Measurement environment
A place without extreme light reflected
2. External light
Ordinary white fluorescent lamps (Light source temperature 2856°K, $E_e = 10\text{Lux}$) without high frequency modulation
3. Standard transmitter
The test transmitter is calibrated by using the circuit shown in figure 2. The radiation intensity of the transmitter is adjusted until $V_o=400\text{mVp-p}$. Both, the test transmitter and the photo diode, have a peak wavelength of 940nm. The photo diode for calibration is PD438B ($\lambda_p=940\text{nm}$, $V_r=5\text{V}$).
4. Measuring system According to the measuring system shown in Fig.-3

Fig.-1 Transmitter Wave Form

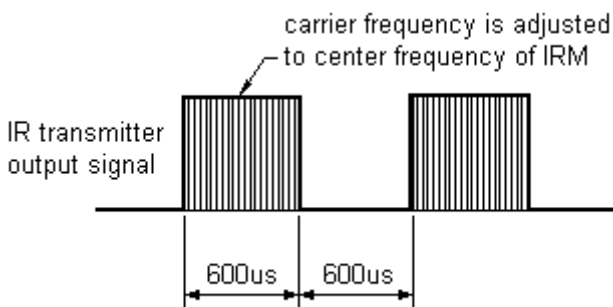
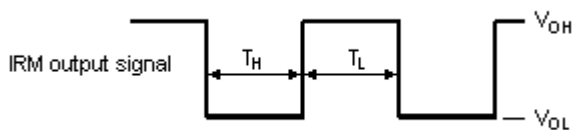


Fig.-2 Measuring Method



D.U.T output Pulse

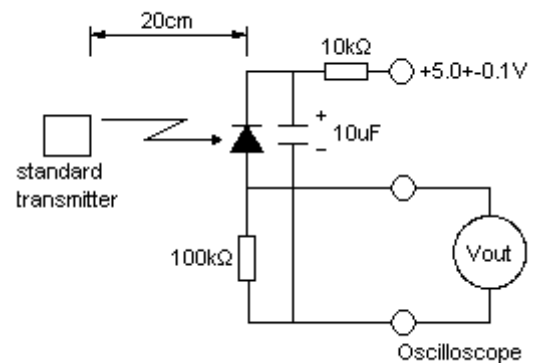
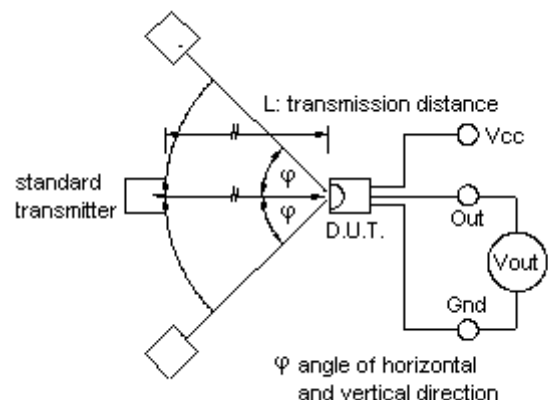


Fig.-3 Measuring System



Typical Performance Curves

Fig.-4 Relative Spectral Sensitivity vs. Wavelength

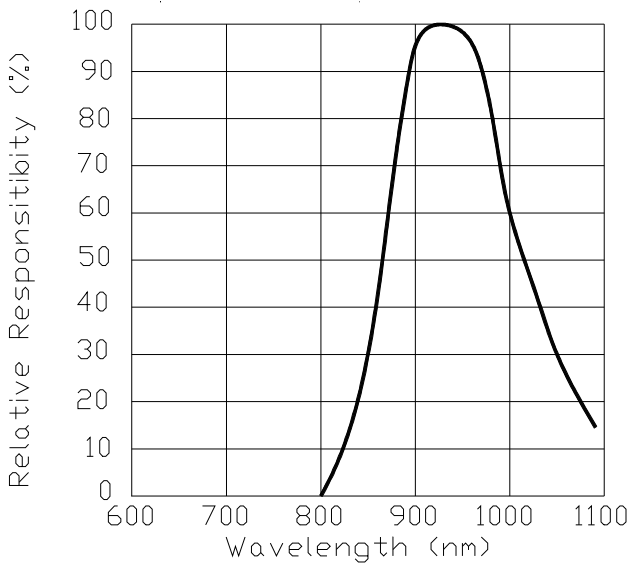


Fig.-5 Relative Transmission Distance vs. Direction

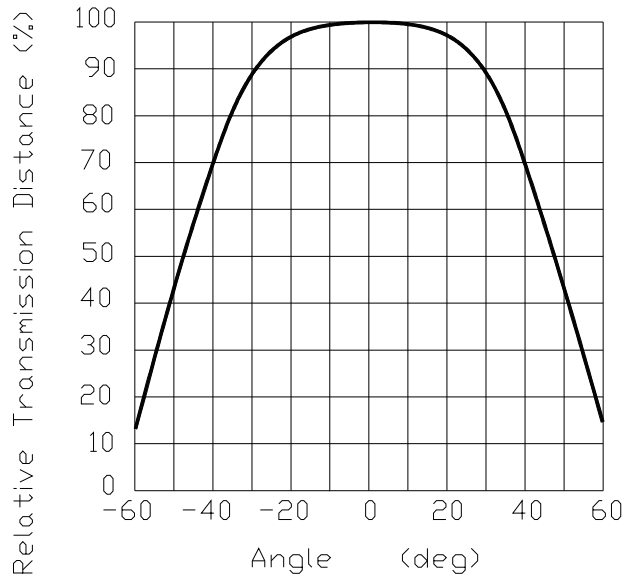


Fig.-6 Output Pulse Length vs. Arrival Distance

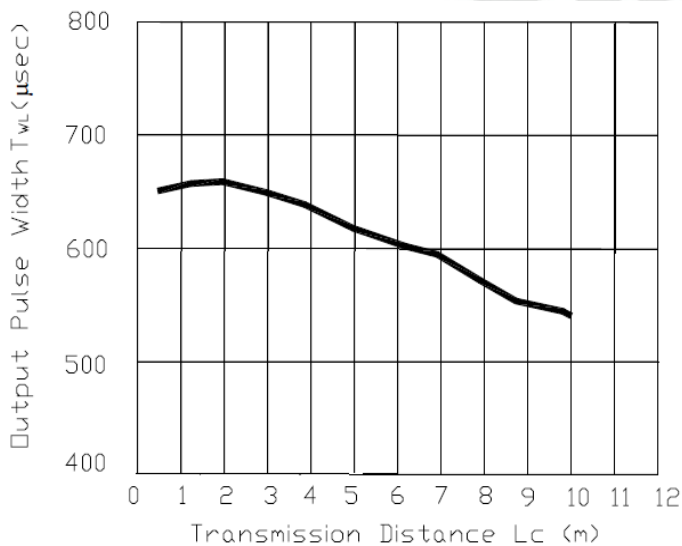


Fig.-7 Arrival Distance vs. Supply Voltage

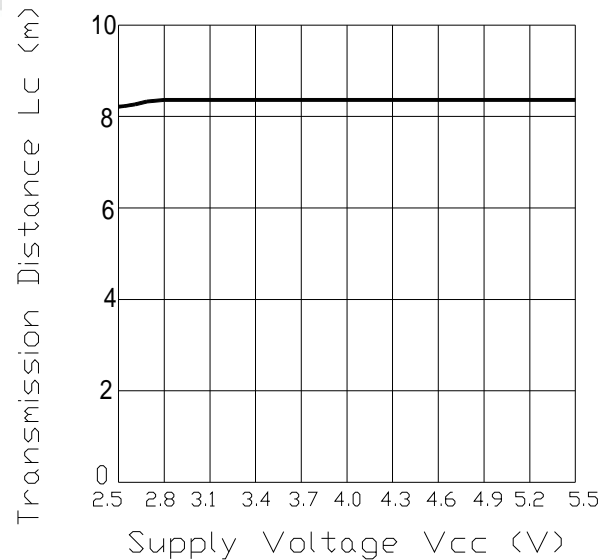
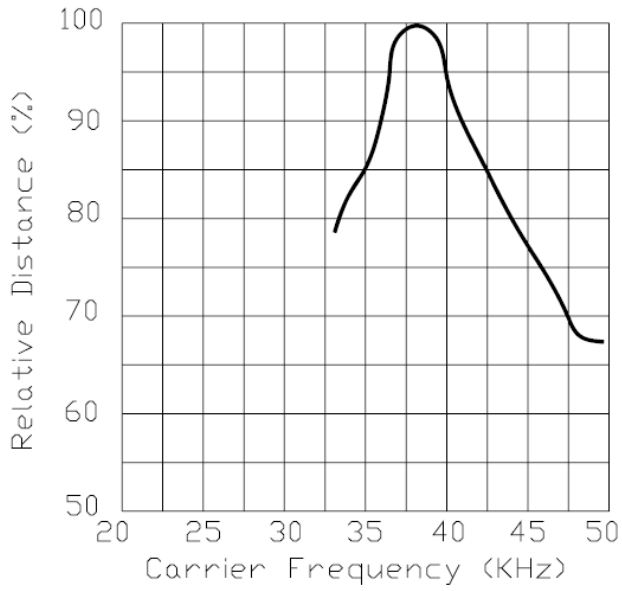


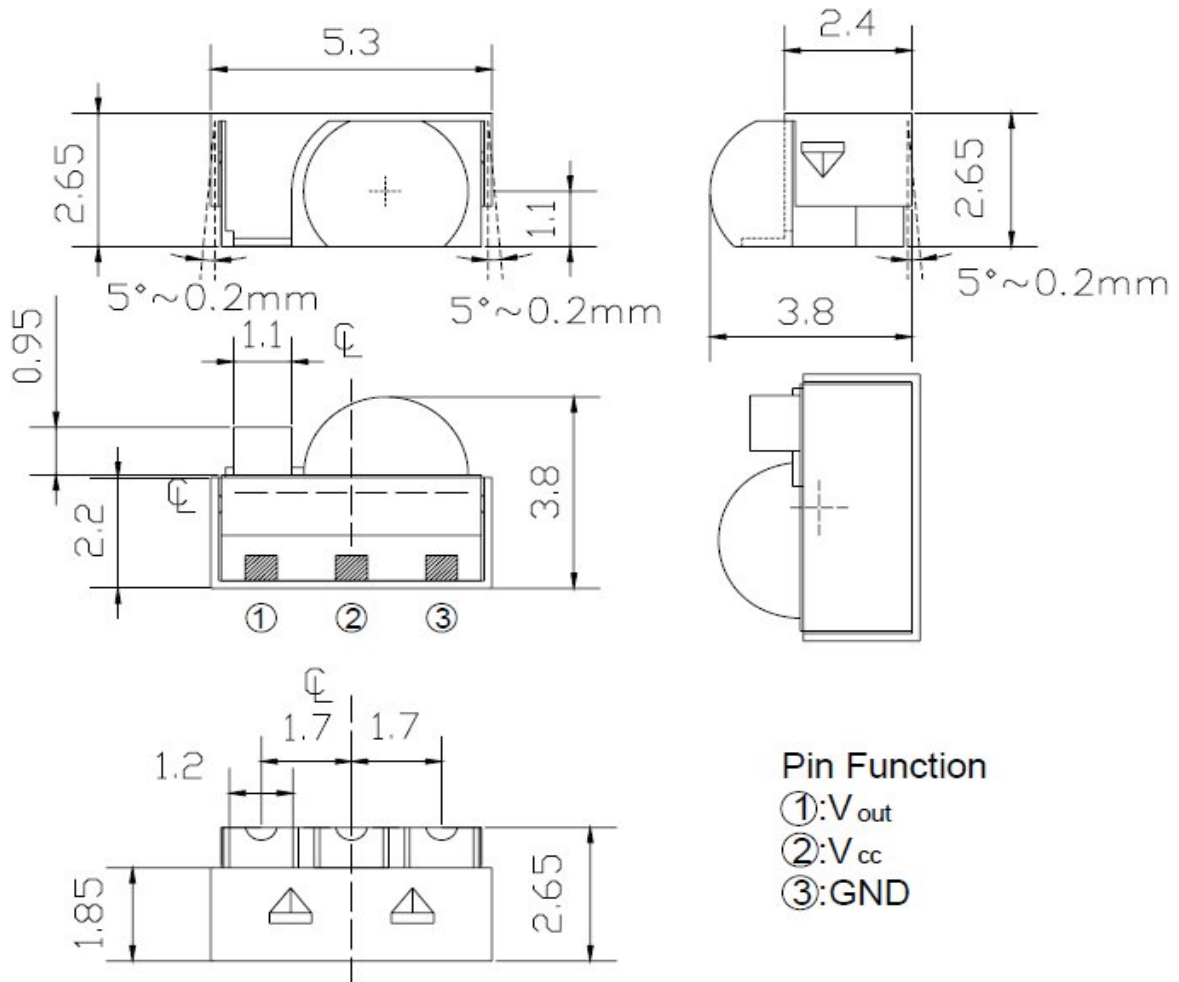
Fig.-8 Relative Transmission Distance vs. Center Carrier Frequency



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Package Dimensions

(Dimensions in mm)

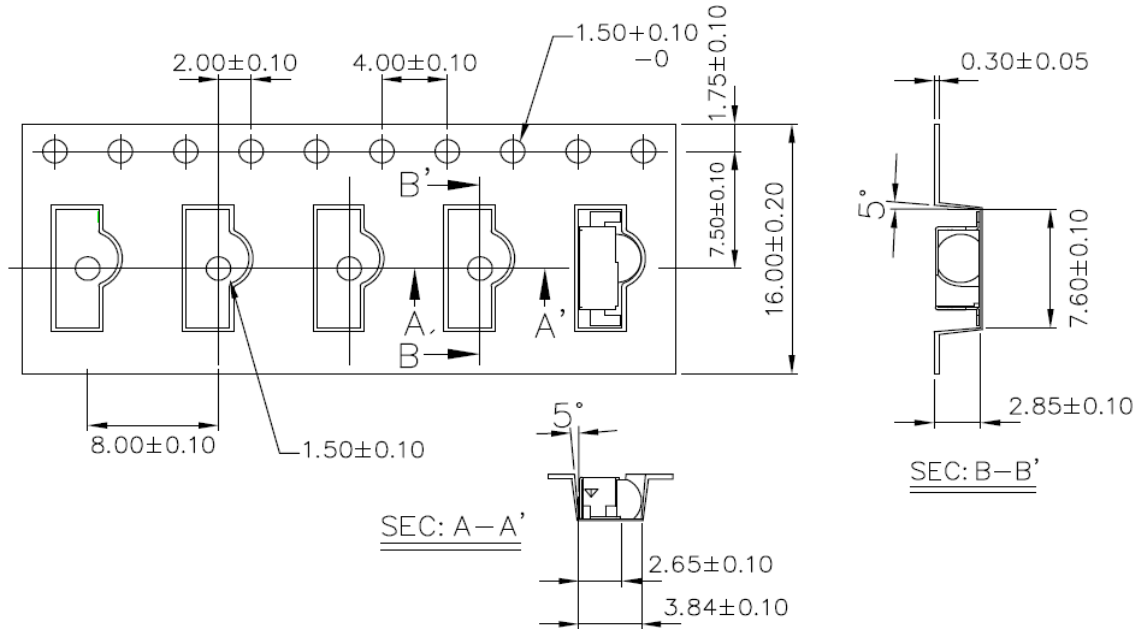


Pin Function

- ①: V_{out}
- ②: V_{cc}
- ③: GND

- Notes :**
1. All dimensions are in millimeters.
 2. Tolerances unless dimensions ± 0.3 mm.

Tape & Reel Packing Specifications

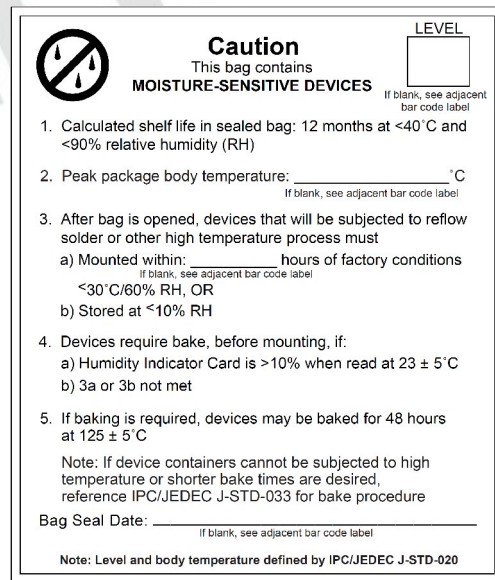
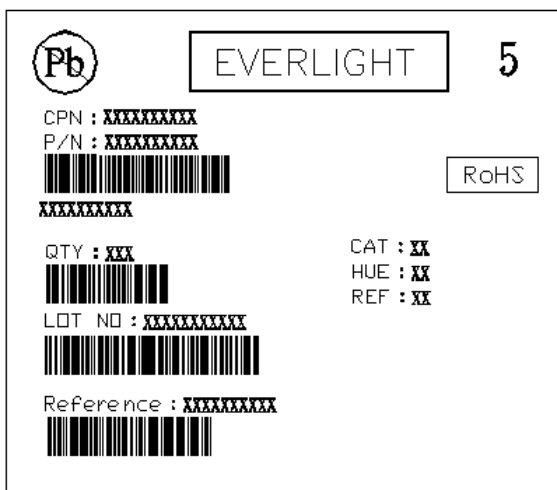


Packing Quantity

2000 pcs / Reel

5 Reels / Carto

Label format



Moisture Classification-storage and used condition label

Recommended method of storage

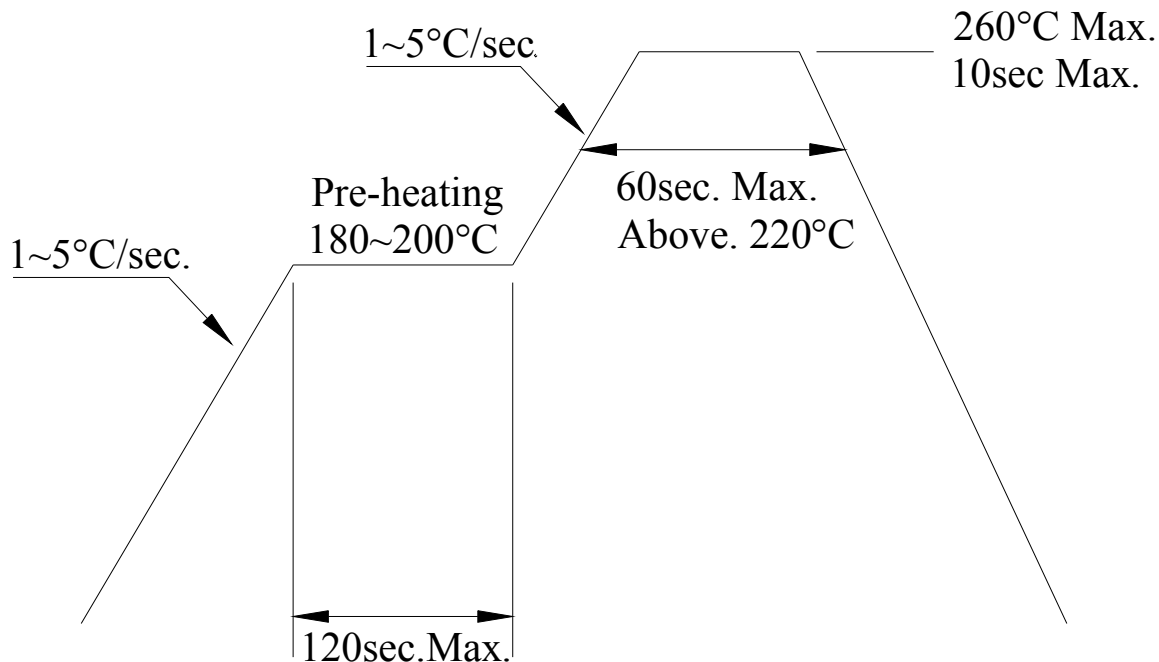
The following are general recommendations for moisture sensitive level (MSL) 4 storage and use:

1. Shelf life in sealed bag from the bag seal date: 12 months at $< 40\text{ }^{\circ}\text{C}$ and $< 90\%$ relative humidity (RH)
2. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must mounted within 72 hours of factory conditions $< 30\text{ }^{\circ}\text{C}/60\%\text{RH}$.
3. If the moisture absorbent material (silica gel) has faded away or the IRM has exceeded the storage time. Baking treatment is required, refer to IPC/JEDEC J-STD-033 for bake procedure or recommend the conditions: $60\pm 5\text{ }^{\circ}\text{C}$ for 96 hours.

ESD Precaution

Proper storage and handing procedures should be followed to prevent ESD damage to the devices especially when they are removed from the Anti-static bag. Electro-Static Sensitive Devices warning labels are on the packing.

Solder Reflow Temperature Profile



Note:

1. Reflow soldering should not be done more than two times.
2. When soldering, do not put stress on the IRM device during heating.
3. After soldering, do not warp the circuit board.

DISCLAIMER

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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- ✓ Cost Control Management
- ✓ Shortage Management
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