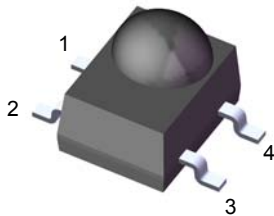


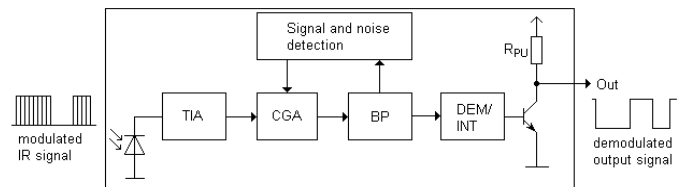
Infrared Receiver Module IRM-H6xxM3/TR2 Series



Pin Configuration

1. GND
2. GND
3. OUT
4. VCC

Block Diagram



Features

- High protection ability against EMI
- Available for various carrier frequencies
- min burst length (36/38 kHz): 8 cycles
- min burst length (56 kHz): 10 cycles
- min gap length (36/38 kHz): 12 cycles
- min gap length (56 kHz): 14 cycles
- Low operating voltage and low power consumption
- High immunity against ambient light
- Long reception range
- High sensitivity
- Pb free and RoHS compliant

Descriptions

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

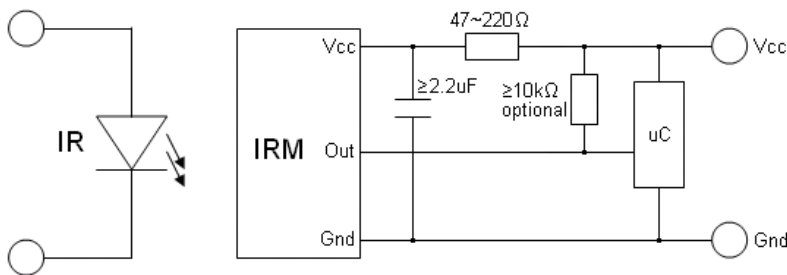
The PIN diode and preamplifier are assembled onto a lead frame and molded into a black epoxy package which operates as an IR filter.

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



RC Filter should be connected closely between Vcc pin and GND pin.

Parts Table

Model No.	Carrier Frequency
IRM-H636M3/TR2	36 kHz
IRM-H638M3/TR2	38 kHz

Absolute Maximum Ratings (T_a=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{CC}	6	V
Operating Temperature	T _{opr}	-20 ~ +80	°C
Storage Temperature	T _{stg}	-40 ~ +85	°C
Soldering Temperature *1	T _{sol}	260	°C

*1 4mm from mold body less than 5 seconds

Electro-Optical Characteristics (T_a=25°C and V_{CC}=3.0V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Current Consumption	I _{CC}	-	0.4	0.6	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	See chapter ,Test method'
	L ₄₅	5	-	-		
Half Angle (Horizontal)	Θ _h	-	45	-	deg	
Half Angle (Vertical)	Θ _v	-	45	-	deg	
High Level Pulse Width	T _{WH}	450	-	750	μs	Test signal according to figure 1
Low Level Pulse Width	T _{WL}	450	-	750	μs	
High Level Output Voltage	V _H	V _{CC} -0.4	-	-	V	
Low Level Output Voltage	V _L	-	0.2	0.5	V	I _{SINK} ≤ 2mA

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, $E_e \leq 10\text{Lux}$) 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

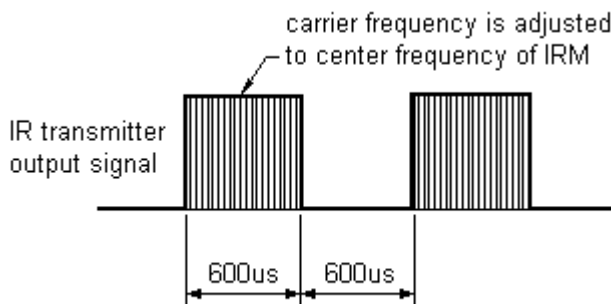
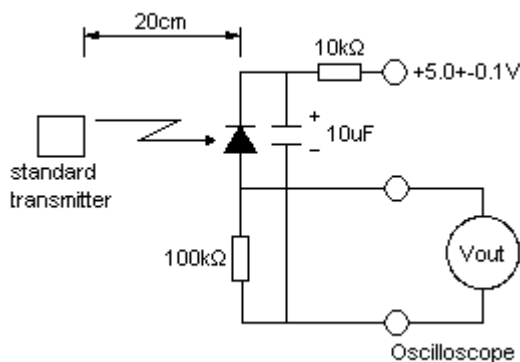


Fig.-2 Measuring Method



D.U.T output Pulse

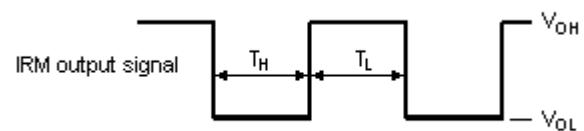
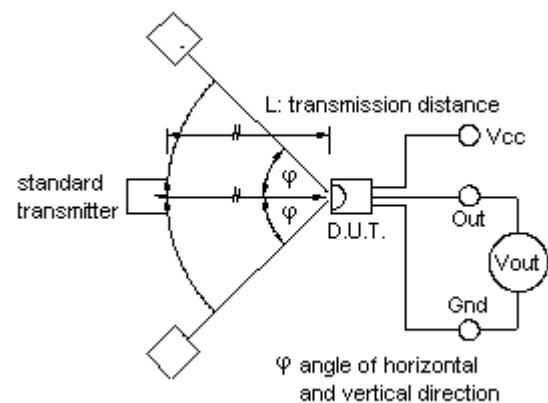


Fig.-3 Measuring System



Typical Performance Curves

Fig.4 Relative Responsibility vs. Wavelength

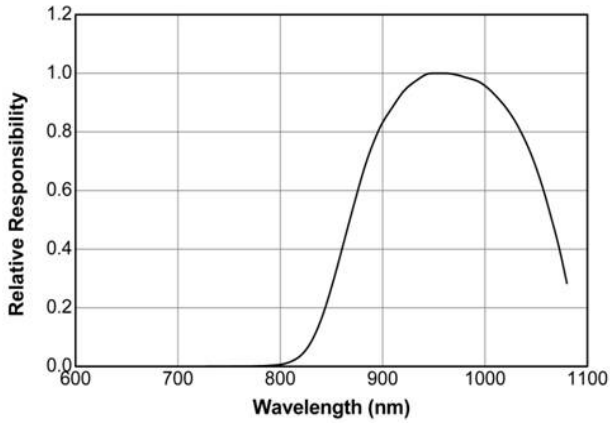


Fig.-5 Relative Sensitivity vs. Horizontal Angle

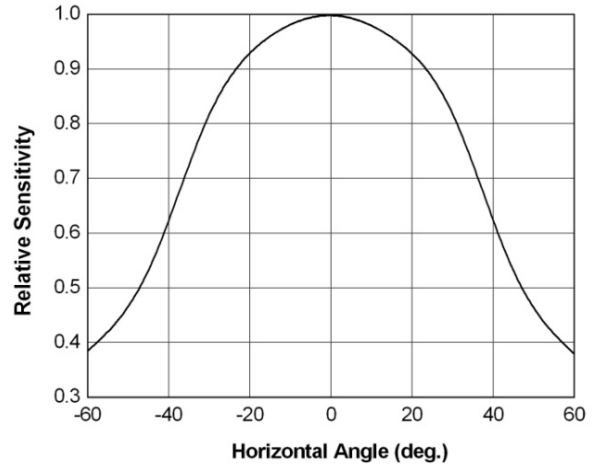


Fig.6 Variation Output Pulse Width vs. Distance

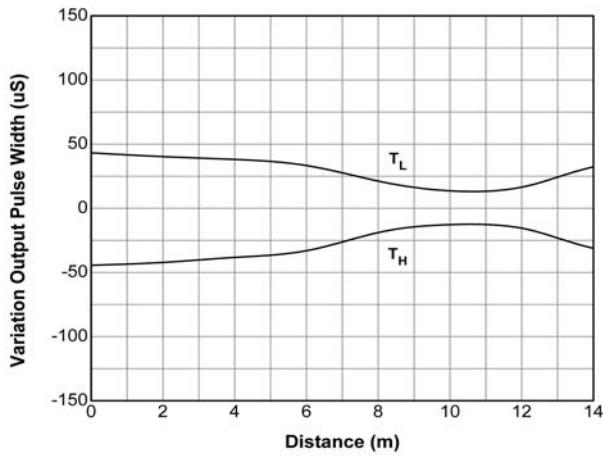


Fig.-7 Relative Transmission Distance vs. Supply Voltage

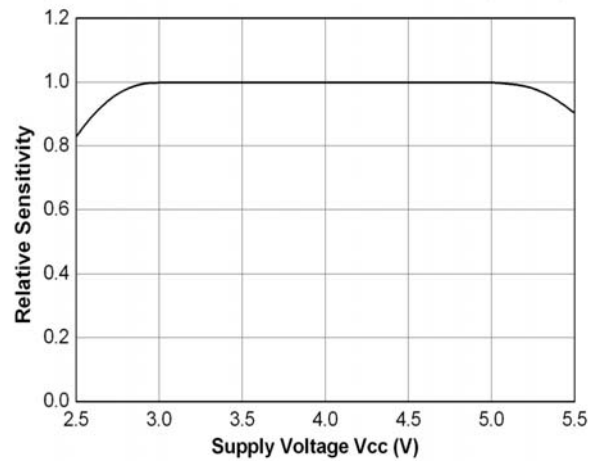
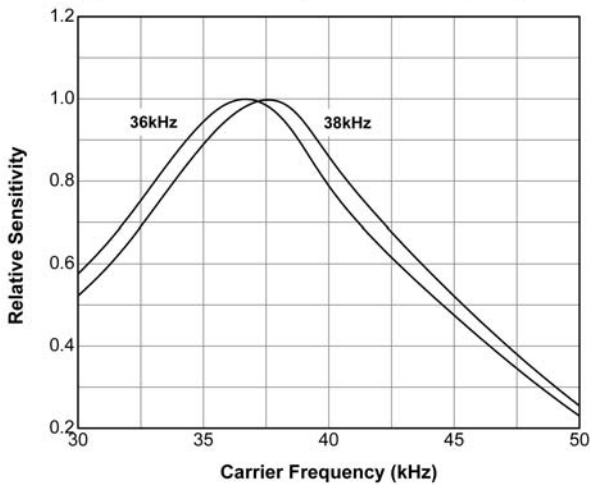
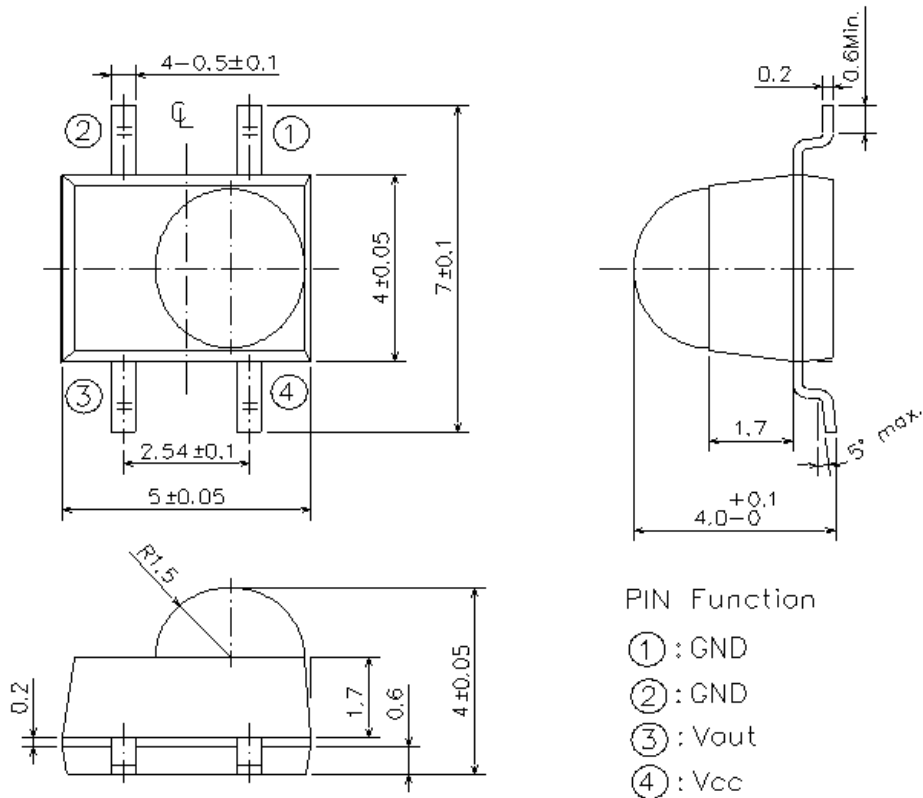


Fig.8 Relative Sensitivity vs. Carrier Frequency



Package Dimensions
 (Dimensions in mm)

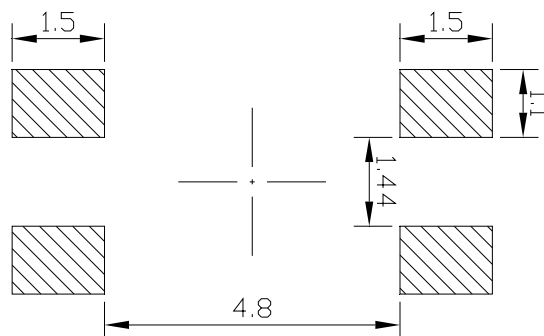


Notes:

Tolerances unless mentioned ± 0.2 mm. Unit: mm

Recommend soldering patterns

The following soldering patterns are recommended for reflow-soldering



Notice: Suggested pad dimension is just for reference only.
 Please modify the pad dimension based on individual need.

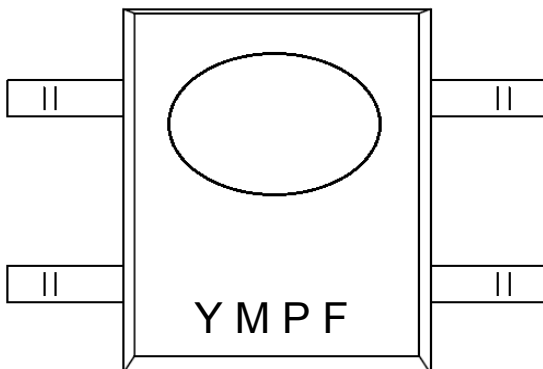
Code information

Protocol	Suitable	Protocol	Suitable
JVC	Yes	RCA	No
Matsushita	Yes	Sharp	Yes
Mitsubishi	No	Sony 12 bit ²⁾	Yes
NEC	Yes	Sony 15 bit	No
RC5	Yes	Sony 20 bit	No
RC6 ¹⁾	Yes	Toshiba	Yes
RCMM	No	Continuous Code	No

1) Best choice depends on RC6 mode. If data low time is below 22ms, M2 is the best choice, otherwise M3.

2) If only Sony 12 bit version is used, M3 is recommended otherwise M2 is the best choice.

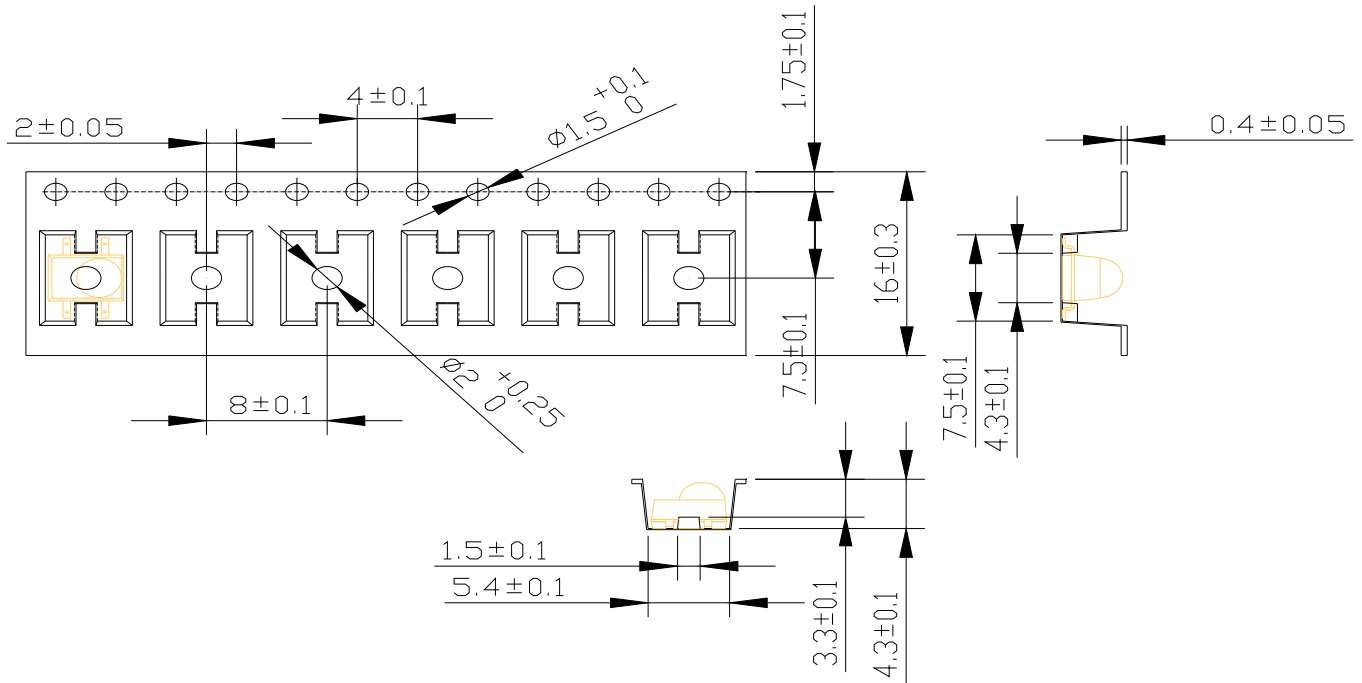
Device Marking



Notes

- Y denotes Years code
- M denotes Month code
- P denotes Device number
- F denotes Carrier frequency (2: 36 kHz, 4: 38 kHz)

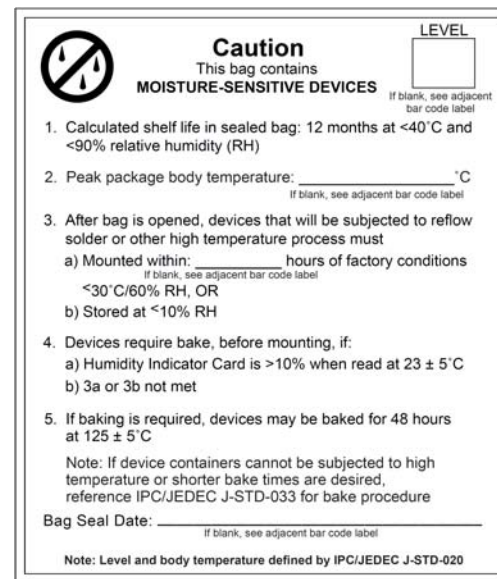
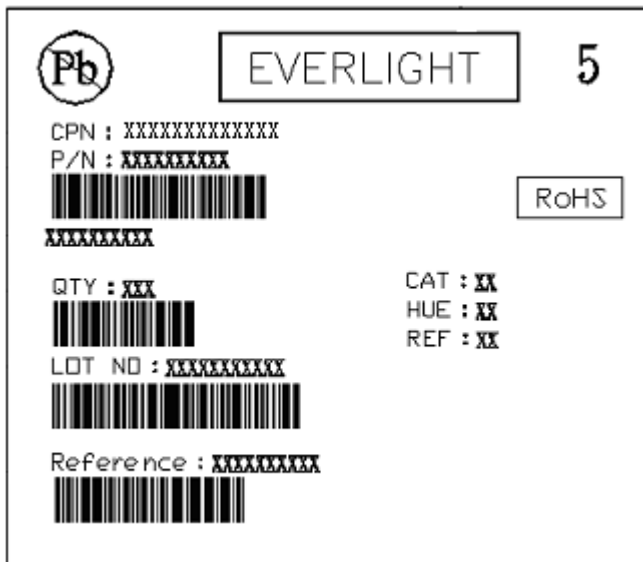
Tape & Reel Packing Specifications



Packing Quantity

1000 pcs / Reel
5 Reels / Carton

Label format



Moisture Classification-storage and used condition label

Recommended method of storage

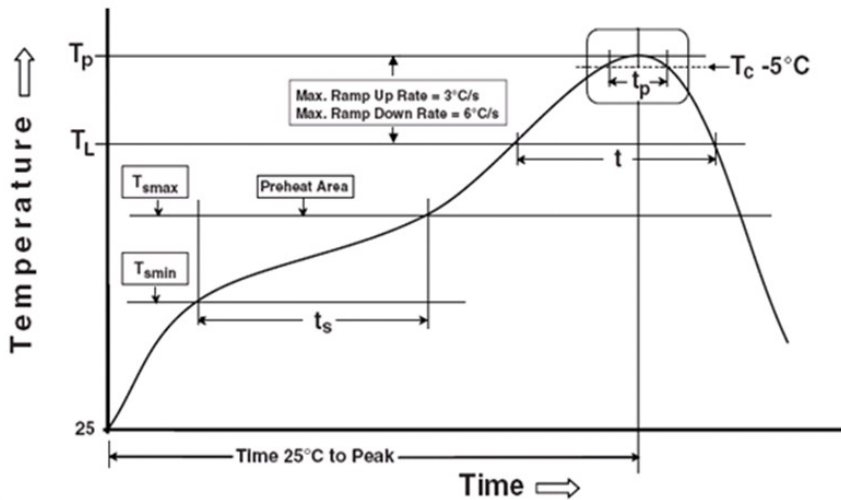
The following are general recommendations for moisture sensitive level (MSL) 4 storage and use:

1. Do not open moisture proof bag before devices are ready to use.
2. Shelf life in sealed bag from the bag seal date: 12 months at $10^{\circ}\text{C}\sim 30^{\circ}\text{C}$ and $< 90\%</math> RH.$
3. After opening the package, the devices must be stored at $10^{\circ}\text{C}\sim 30^{\circ}\text{C}$ and $\leq 60\%</math>RH, and used within 72 hours (floor life).$
4. If the moisture absorbent material (desiccant material) has faded or unopened bag has exceeded the shelf life or devices (out of bag) have exceeded the floor life, baking treatment is required.
5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure or recommend the following conditions: 96 hours at $60^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and $< 5\%</math> RH.$

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:

Reference: IPC/JEDEC J-STD-020D

Preheat

Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max

Other

Liquidus Temperature (T_L)	217 °C
Time above Liquidus Temperature (t_L)	60-100 sec
Peak Temperature (T_p)	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	2 times

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. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
3. 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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