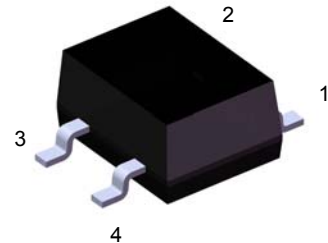


Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

Features

- High protection ability against EMI
- Available for various carrier frequencies
- Min burst length: 10 cycles
- Min gap length: 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

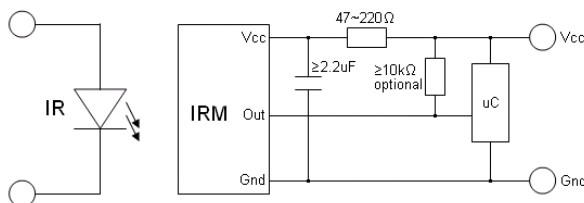
Pin Configuration

1. GND
2. GND
3. OUT
4. Vcc

Applications

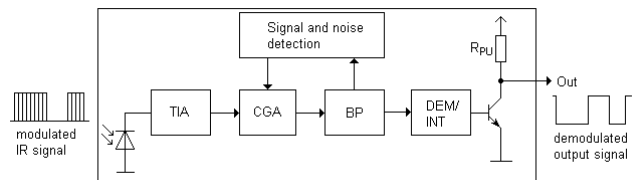
- Light detecting portion of remote control
- AV instruments such as Audio, TV, VCR, CD, MD, etc
- Home appliances such as Air-conditioner, Fan, etc
- Other devices using IR remote control
- CATV set top boxes
- Multi-media Equipment

Application Circuit



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

Block Diagram



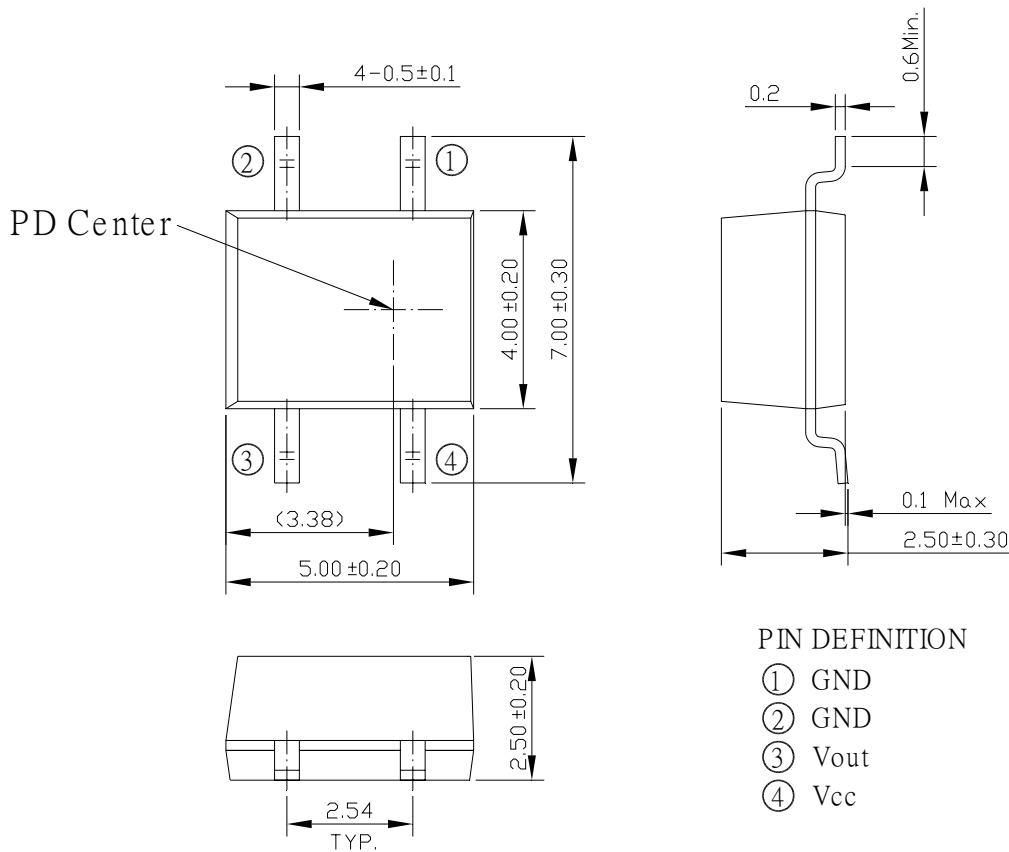
Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

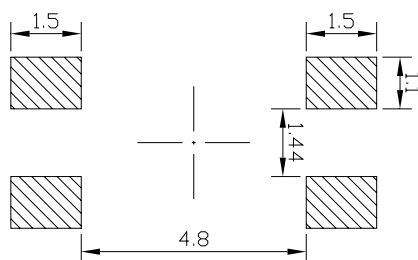
Parts Table

Model No.	Carrier Frequency
IRM-H936M3/TR2	36 kHz
IRM-H938M3/TR2	38 kHz

Package Dimenstions (Dimensions in mm)



Recommended pad layout for surface mount leadform



Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

Absolute Maximum Ratings (T_a=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V _s	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 10 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 _s	2.7	-	5.5	V	
Peak Wavelength	λ _p	-	940	-	nm	
Reception Distance	L ₀	8	-	-	m	See chapter ,Test method'
	L ₄₅	5	-	-		
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
Internal pull up resistor	R _{PU}	85	100	115	kΩ	

Infrared Remote Control Receiver Module

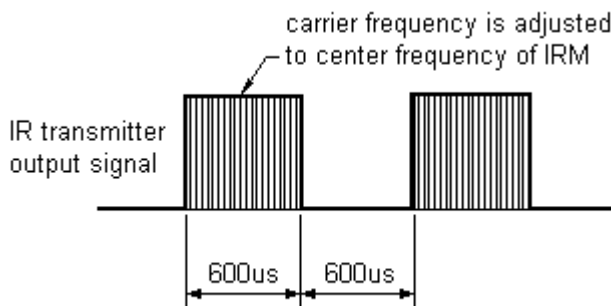
IRM-H9xxM3/TR2

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



D.U.T output Pulse

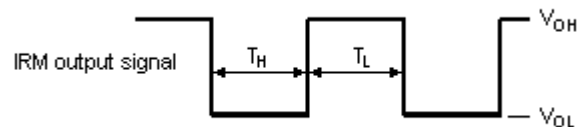


Fig.-2 Measuring Method

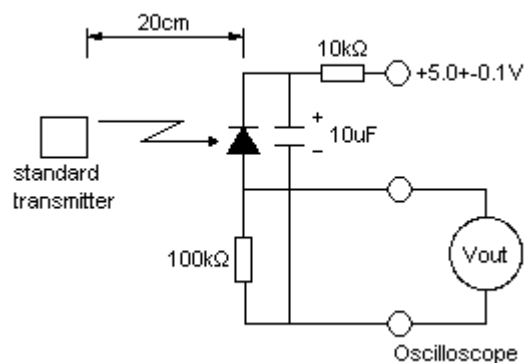
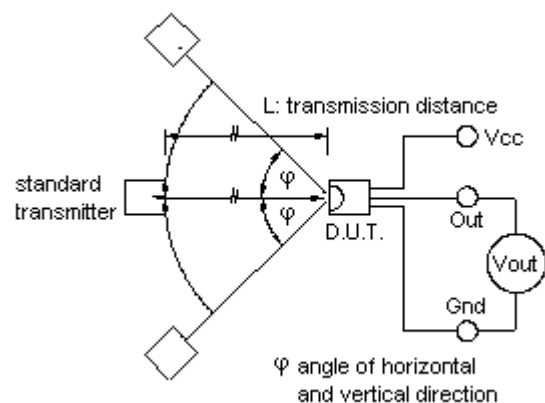


Fig.-3 Measuring System



Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

Typical Performance Curves

Fig.4 Relative Responsibility vs. Wavelength

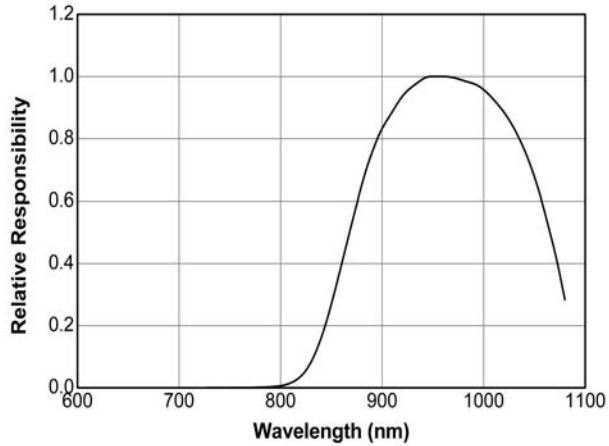


Fig.-5 Relative Transmission Distance vs. Direction

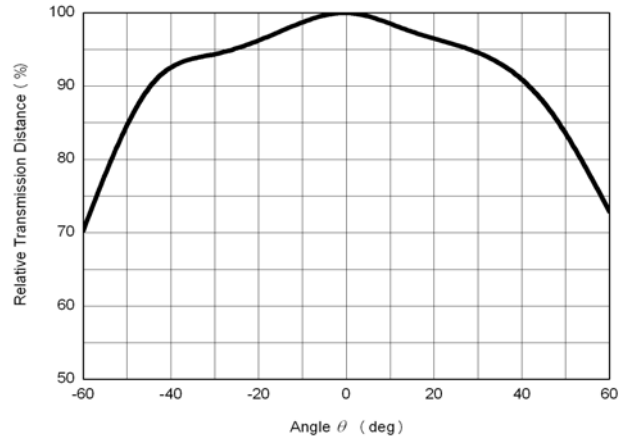


Fig.6 Variation Output Pulse Width vs. Distance

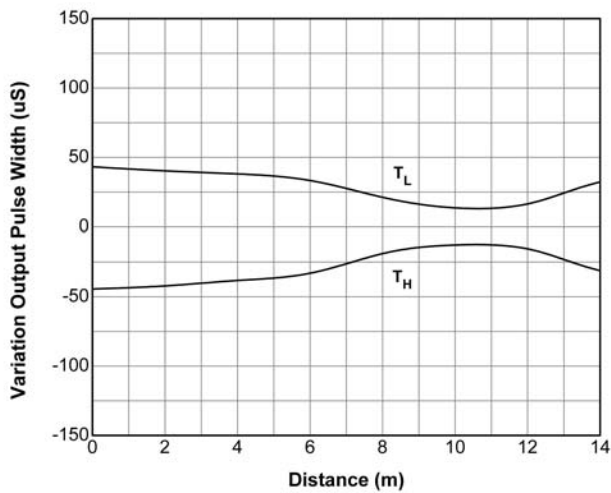


Fig.7 Relative Sensitivity vs. Supply Voltage

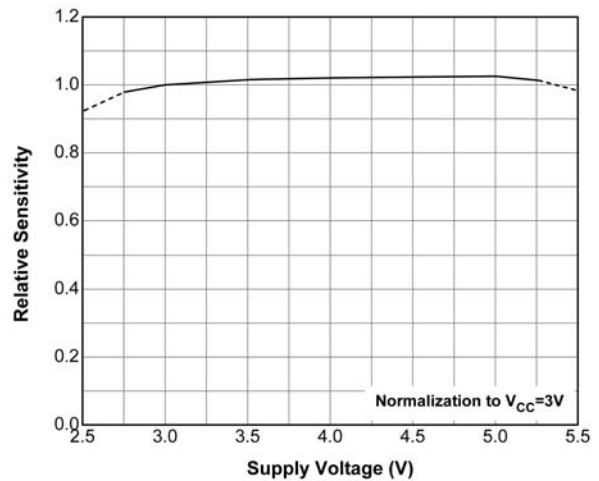
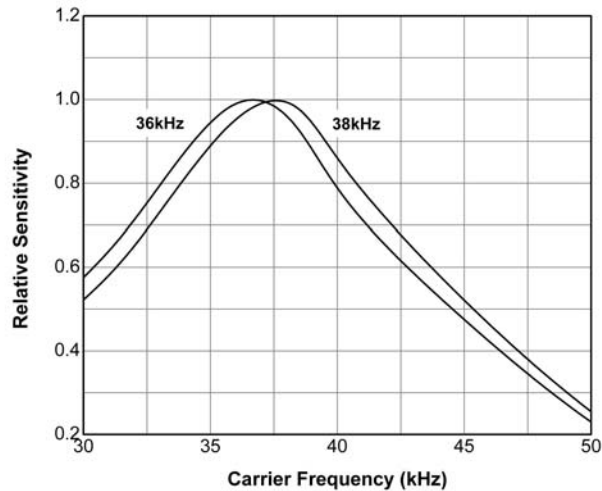


Fig.8 Relative Sensitivity vs. Carrier Frequency



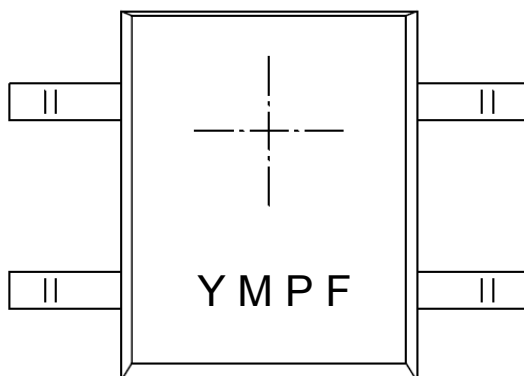
Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

Code information

Protocol	Suitable	Protocol	Suitable
JVC	Yes	RCA	No
Matsushita	Yes	Sharp	Yes
Mitsubishi	No	Sony 12 Bit	Yes
NEC	Yes	Sony 15 Bit	No
RC5	Yes	Sony 20Bit	No
RC6	Yes	Toshiba	Yes
RCMM	No	Zenith	Yes
RCS-80	No	Continuous Code	No

Device Marking



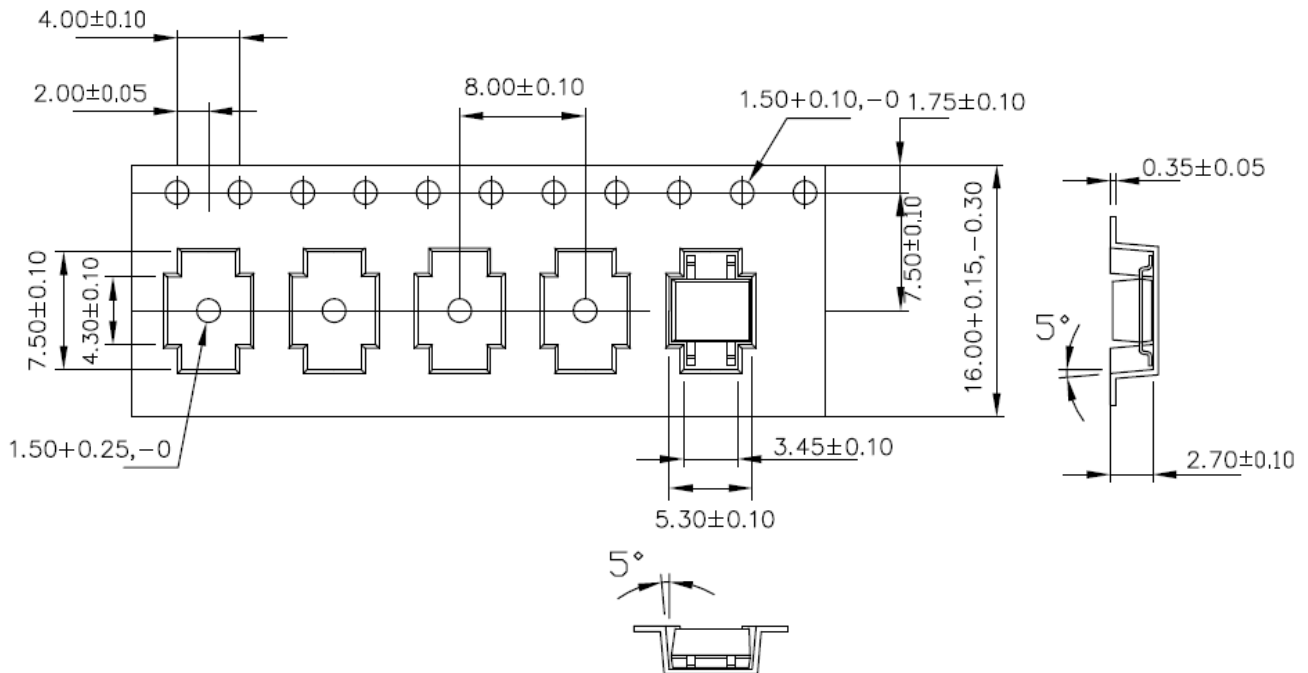
Notes

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

Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

Tape & Reel Packing Specifications



Packing Quantity

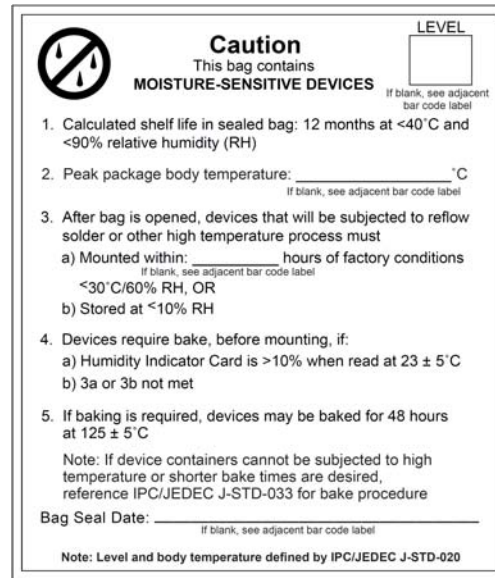
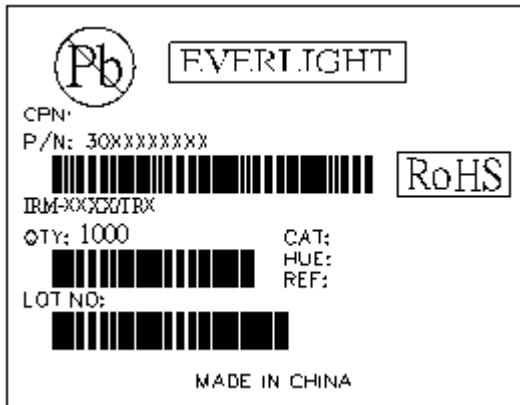
1000 pcs / Reel

5 Reels / Carton

Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

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 °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 be mounted within 72 hours of factory conditions < 30 °C/60%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±5°C for 96 hours.

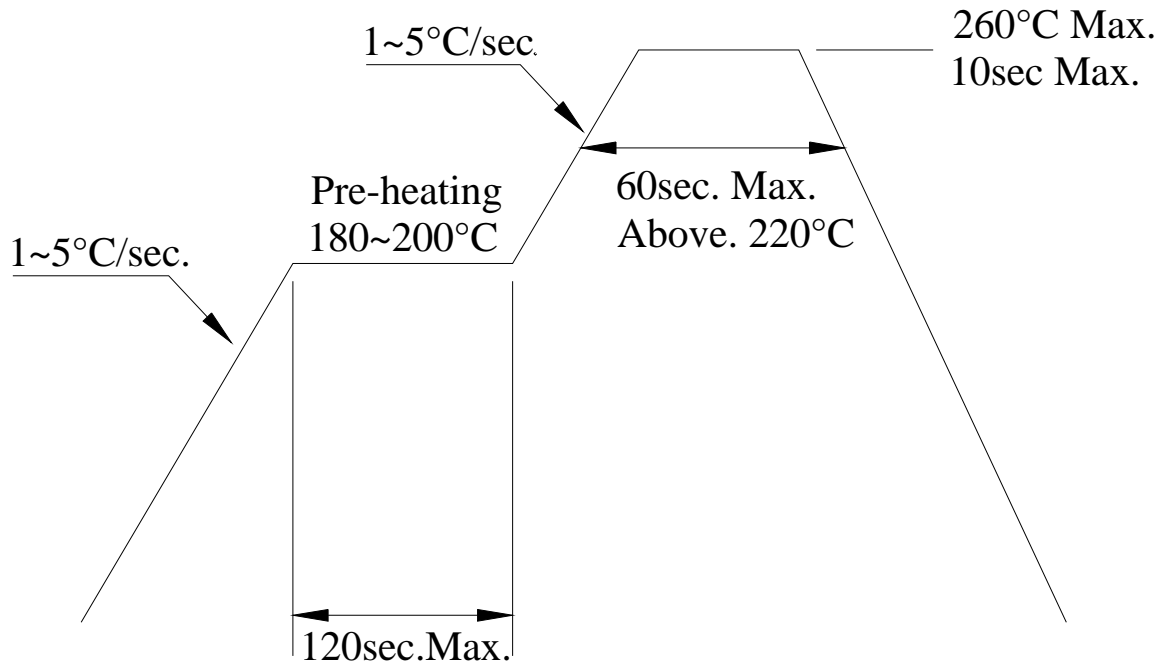
ESD Precaution

Proper storage and handling 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.

Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

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.

Infrared Remote Control Receiver Module

IRM-H9xxM3/TR2

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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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