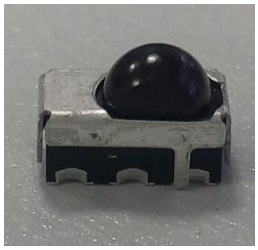
DATASHEET

Infrared Receiver Module
IRM-H5XXM/TR2 series

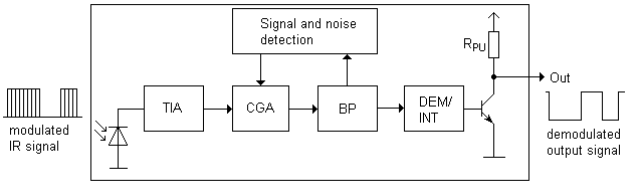


1 2 3

Pin Configuration

①: OUT
②: Vcc
③: GND

Block Diagram



Features

- High protection ability against EMI
- Available for various carrier frequencies
- Min burst length: 6 cycles
- Min gap length: 10 cycles
- Low operating voltage and low power consumption
- High immunity against ambient light
- Optimized immunity against TFT backlight interferences
- Long reception range
- High sensitivity
- Pb free and RoHS compliant
- Compliance with EU REACH
- Compliance Halogen Free (Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm)

Description

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

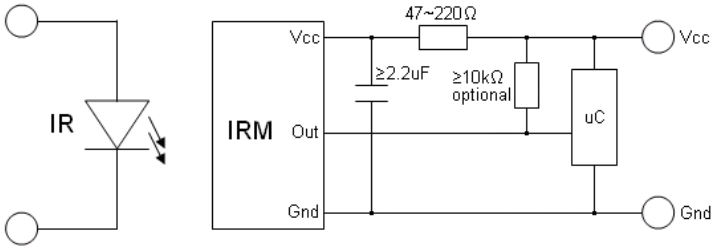
The PIN diode and preamplifier are assembled onto a lead frame and molded into an epoxy package which operates as an IR filter.

The demodulated output signal can directly be decoded by a microprocessor

Applications

- AV equipment such as TV, VCR, DVD, CD, MD, etc.
- Short pause time protocols
- Toy applications
- CATV set top boxes
- Multi-media Equipment
- Other devices using IR remote control

Application Circuit



Parts Table

Model No.	Carrier Frequency
IRM-H538M/TR2	38 kHz

Absolute Maximum Ratings (Ta=25˚C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V_{cc}	6	V
Operating Temperature	T_{opr}	-20 ~ +80	℃
Storage Temperature	T_{stg}	-40 ~ +85	℃
Soldering Temperature *1	T_{sol}	260	℃

*1Soldering time < 5 seconds

Electro-Optical Characteristics (T_a=25˚C, V_{cc}=3V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Current consumption	Icc	---	0.4	0.6	mA	No input signal
Supply voltage	V_{CC}	2.7	-	5.5	V	
Peak wavelength	λ_p	---	940	---	nm	
Reception range	L_0	8	---	---	m	See chapter ,Test method *2
	L_{45}	5	---	---		
Half angle(horizontal)	φ_h	---	±45	---	deg	
Half angle(vertical)	φ_v	---	±45	---	deg	
High level pulse width	T_H	450	---	700	μs	Test signal according to figure 1 *3
Low level pulse width	T_L	500	---	750	μs	
High level output voltage	V_{OH}	Vcc-0.4	---	---	V	$I_{SOURCE} \leqq 1\mu A$
Low level output voltage	V_{OL}	---	0.2	0.5	V	$I_{SINK} \leqq 2mA$

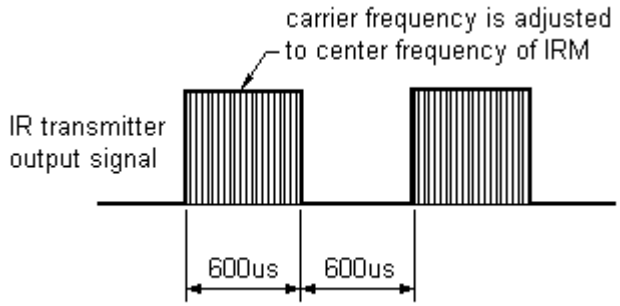
*2 The ray receiving surface at a vertex and relation to the ray axis in the range of θ=0° and θ=45°.
*3 A range from 30cm to the arrival distance. Average value of 50 pulses.

Test method

The specified electro-optical characteristics are valid under the following conditions.

1. Measurement environment
   A place without extreme light reflections.
2. External light
   The environment contains an ordinary, white fluorescent lamp without high frequency modulation. The color temperature is 2856K and the illumination at the IR receiver is less than 10 Lux (Ev≦10Lux).
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 **Vo=400mVp-p.** Both, the test transmitter and the photo diode, have a peak wavelength of 940nm. The photo diode for calibration is PD438B (λp=940nm, Vr=5V).
4. The measurement system is shown in Fig.-3

Fig.-1 Transmitter Wave Form



D.U.T output Pulse

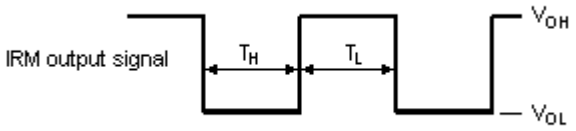


Fig.-2 standard transmitter calibration

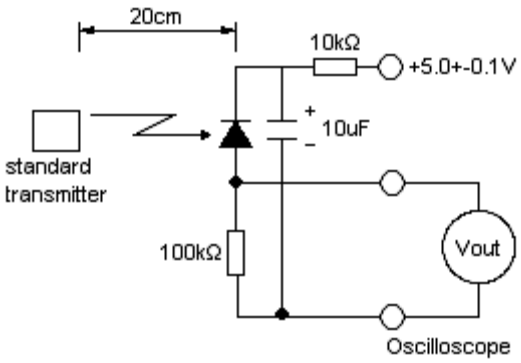
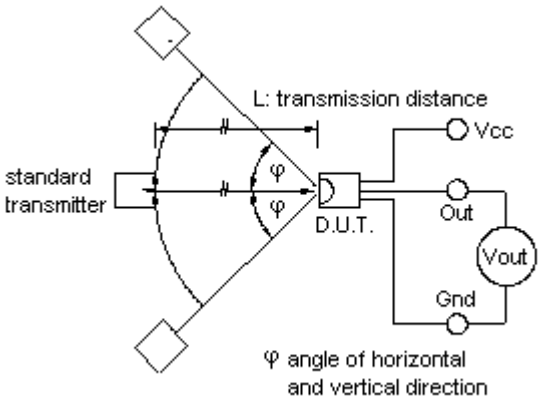


Fig.-3 Measuring System



Typical Electro-Optical Characteristics Curves

Fig.4 Relative Responsibility vs. Wavelength

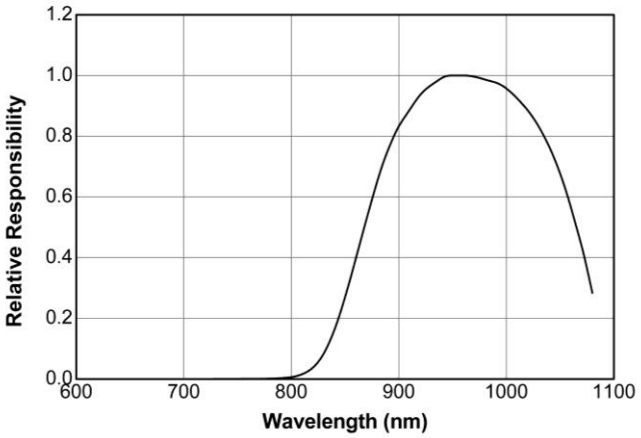


Fig.-5 Relative Sensitivity vs. Angle

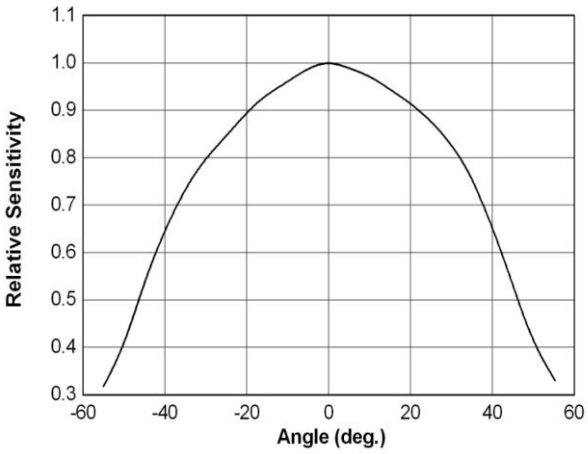


Fig.6 Variation Output Pulse Width vs. Distance

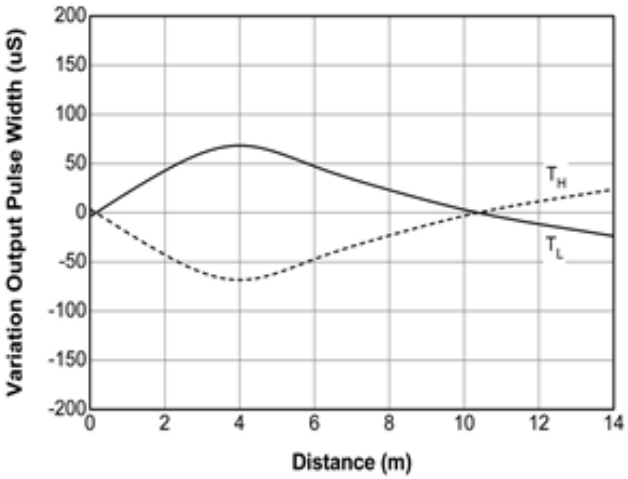


Fig.7 Relative Sensitivity vs. Supply Voltage

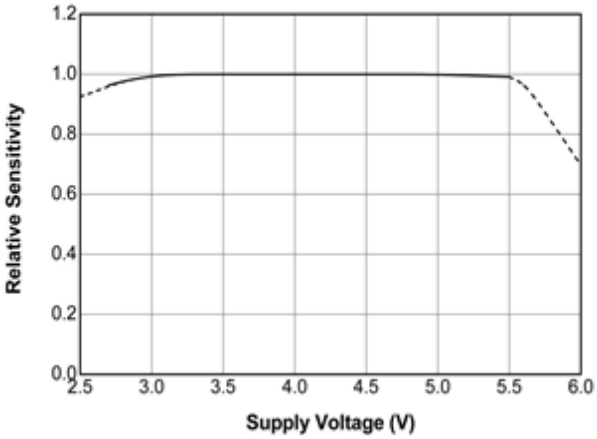
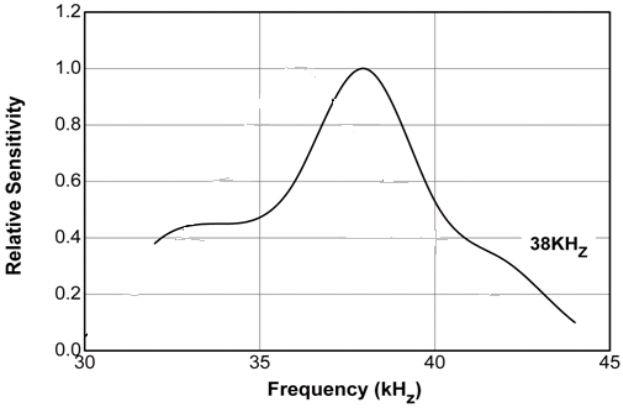
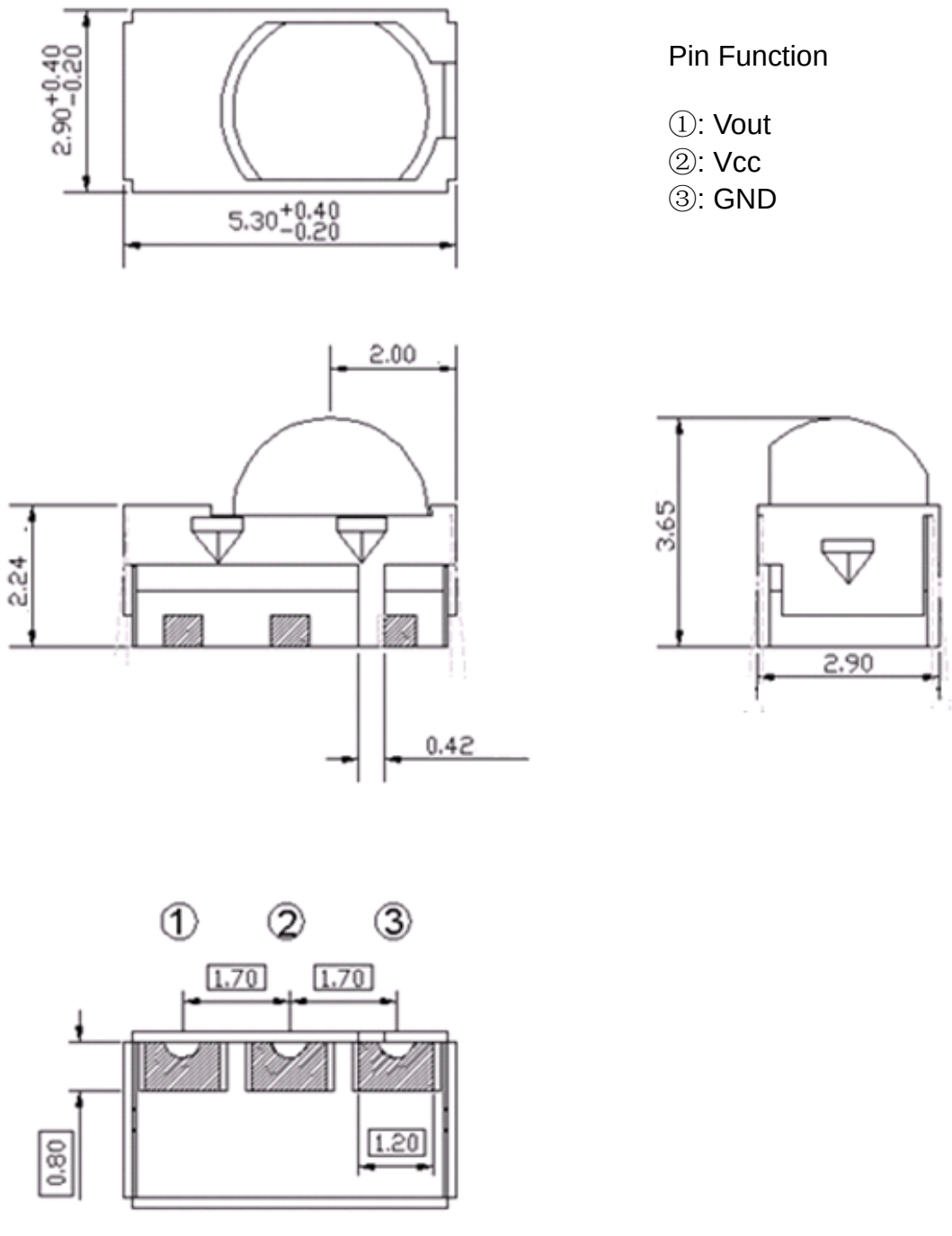


Fig.8 Relative Sensitivity vs. Frequency



Package Dimension



Pin Function

①: Vout
②: Vcc
③: GND

Notes:

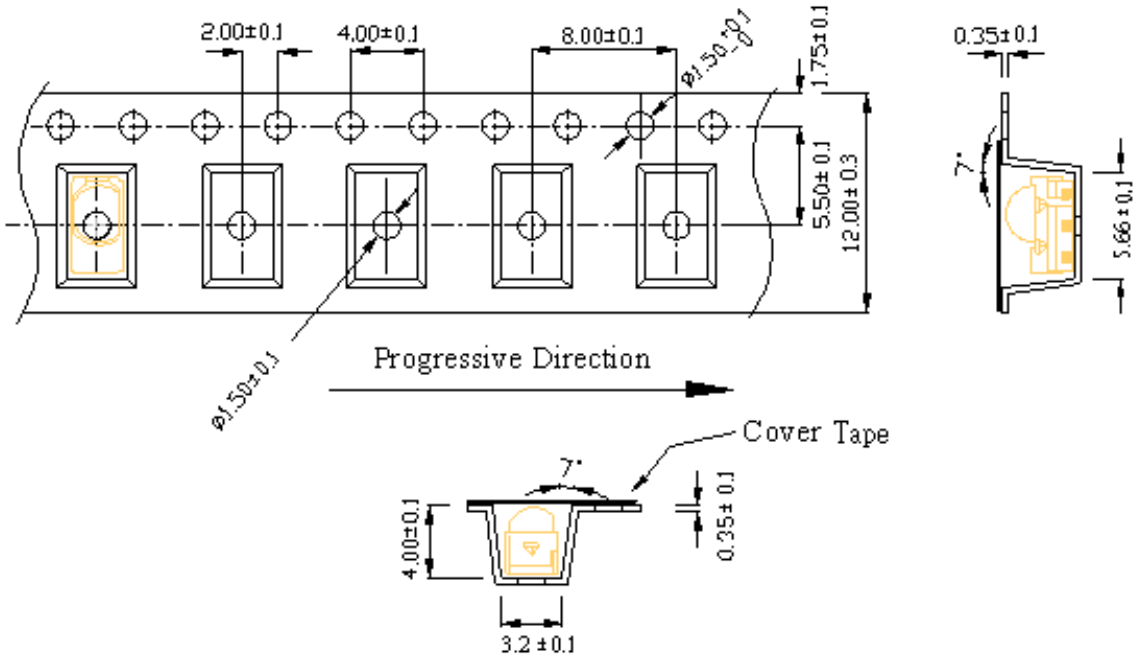
1. All dimensions are in millimeters.
2. Tolerances unless dimensions ±0.5mm.

Code information

Protocol	Suitable	Protocol	Suitable
JVC	Yes	Sharp	Yes
Matsushita	Yes	Sony 12 Bit	Yes
Mitsubishi	Yes	Sony 15 Bit	No
NEC	Yes	Sony 20 Bit	No
RC5	Yes	Toshiba	Yes
RC6	Yes	XMP-1	Yes
RCA	Yes	r-step[1)]	Yes

1) For r-step 38kHz version M3 is the best choice, for r-step 56kHz version only M is recommended.

Tape & Reel Packing Specifications
(Dimensions in mm)

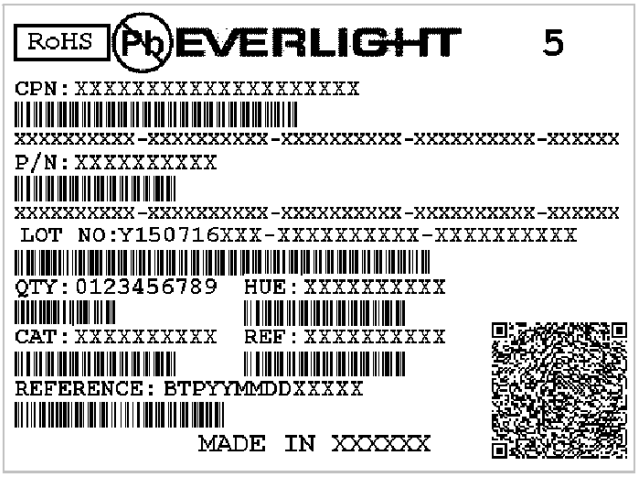


Packing Quantity

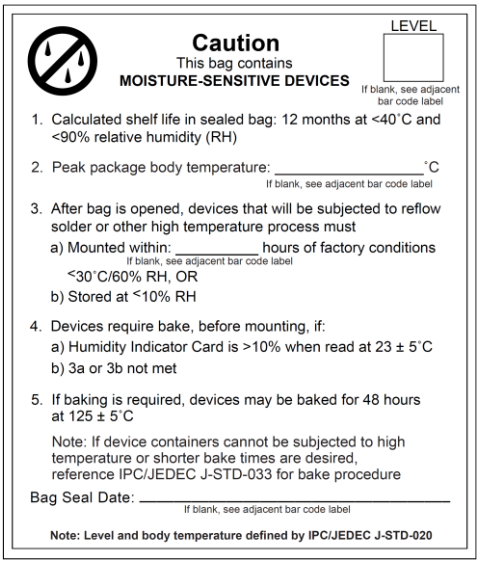
2000 pcs / Reel

5 Reels / Carton

Label format



Moisture Classification-storage and used condition label



Notes: These labels are only the examples and please be according to the actual shipping labels.

Recommended method of storage

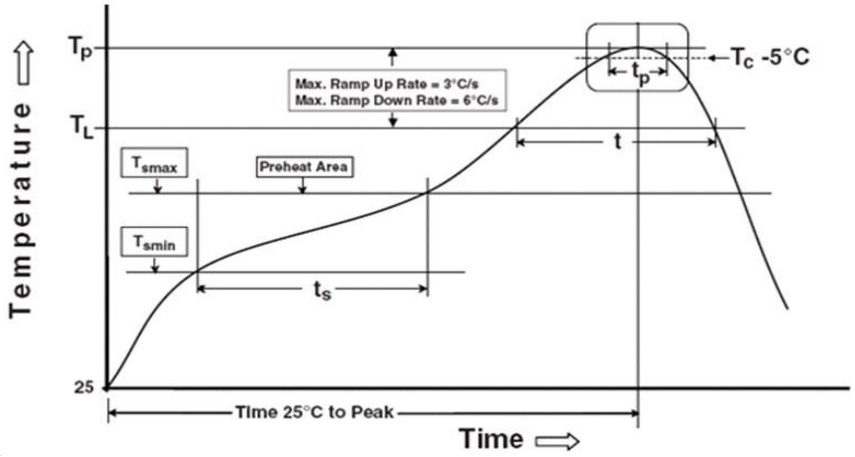
The following are general recommendations for moisture sensitive level (MSL) 4 storage and use:

1. Shelf life in sealed bag from the bag seal date: 12 months at 10℃~30℃ 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 at 10°C~30°C and 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: 96 hours at 60°C ± 5°C and < 5 % 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°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. Suggest that 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.

Application Restrictions

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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