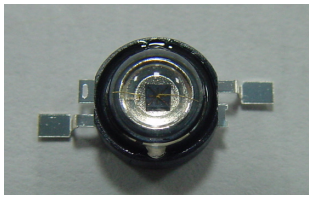
Technical Data Sheet
High Power Infrared LED

Features

HIR-AX08LS/L183-P01/TR



- Small package with high efficiency
- Peak wavelength λp=850nm
- Soldering methods:SMT
- Thermal resistance (junction to lead): 45℃/W.
- Pb free
- The product itself will remain within RoHS compliant version.

Descriptions

- HIR-AX08LS/L183-P01/TR series is an infrared emitting diode in miniature SMD package which is molded in a water clear silicone with spherical top view lens.
- The device is spectrally matched with silicon photodiode, Phototransistor.

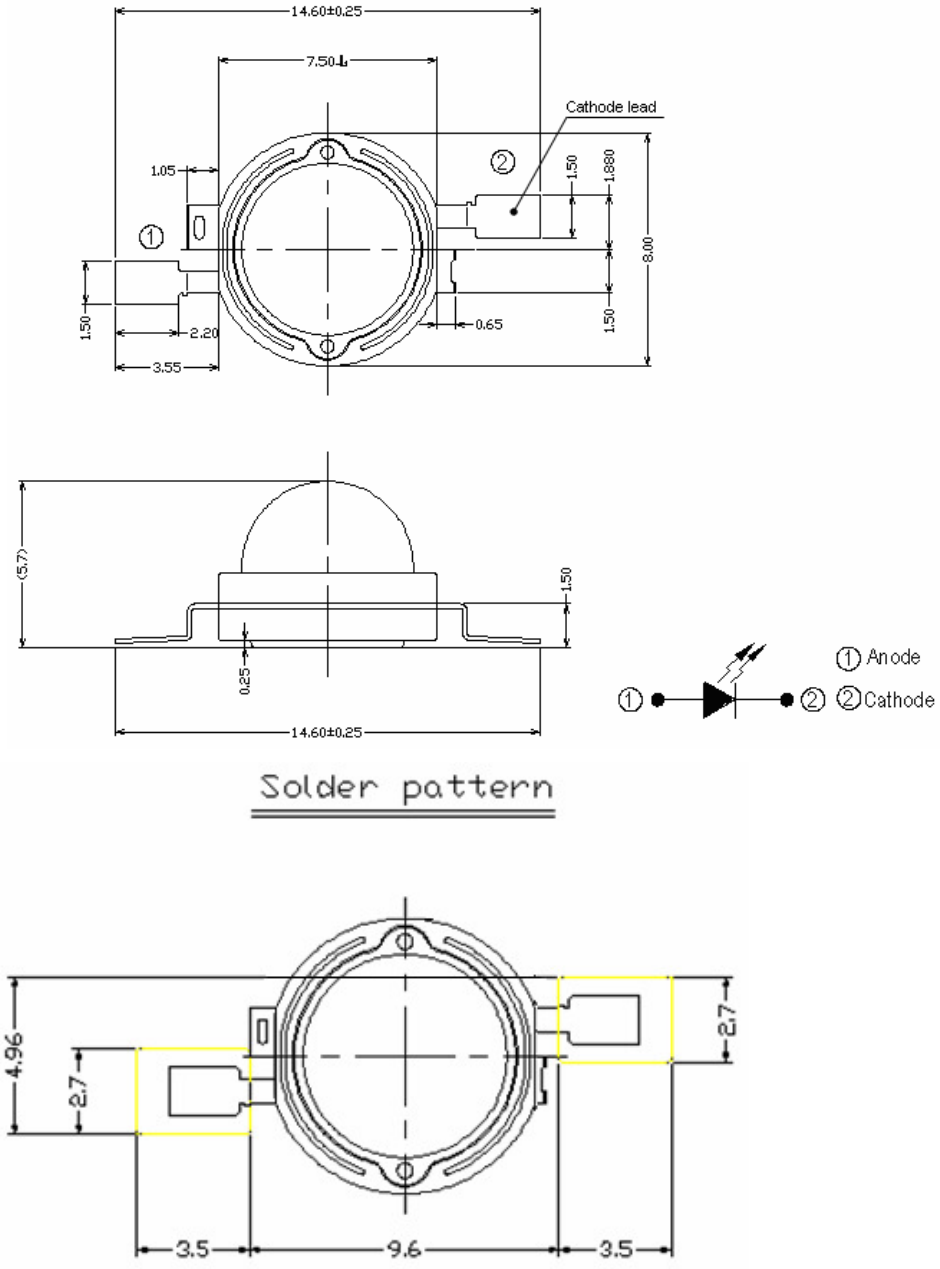
Applications

- CCD Camera
- Night Vision
- Infrared applied system

Materials

Items	Description
Housing black body	Heat resistant polymer
Encapsulating Resin	Silicone resin
Lens	Silicone
Electrodes	Ag plating copper alloy
Die attach	Silver paste
Chip	AlGaAs

Package Dimensions



Notes: 1.All dimensions are in millimeters
2.Tolerances unless dimensions ±0.25mm

HIR-AX08LS/L183-P01/TR

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Units
Forward Current	I_F	700	mA
Reverse Voltage	V_R	5	V
Operating Temperature	T_{opr}	-40 ~ +85	℃
Storage Temperature	T_{stg}	-40 ~ +85	℃
Junction temperature	T_j	125	℃
Power Dissipation @I_F=700mA	P_d	1	W

Note: We suggest that customer should add the heat sink with HIR-AX08LS/L183-P01/TR to exclude the heat.

Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Total Radiated Power	Po	I_F=350mA	80	135	--	mW
		I_F=700mA	150	270	--	
Radiant Intensity	I_E	I_F=350mA	10	30	--	mW/sr
		I_F=700mA	30	60	--	
Peak Wavelength	λ p	I_F=20mA	--	850	--	nm
Spectral Bandwidth	Δ λ	I_F=20mA	--	50	--	nm
Forward Voltage	V_F	I_F=350mA	1.0	1.6	2.5	V
		I_F=700mA	1.2	1.9	3.0	
Reverse Current	I_R	V_R=5V	--	--	10	μA
Optical Rise Time	Tr	I_F=20mA	--	11	--	ns
Optical Fall Time	Tf	I_F=20mA	--	7	--	ns
View Angle	2θ 1/2	I_F=20mA	--	140	--	deg
Thermal resistance, junction to heat-sink	Rth j-L	I_F=700mA	--	45	--	℃/W

Note. 1. Radiometric measurement tolerance : ±10%

2 .$2\theta_{1/2}$ is the off axis angle from lamp centerline where the radiant intensity is 1/2 of the peak value.

3. Forward Voltage measurement tolerance : ±0.1V

Typical Electro-Optical Characteristics Curves

Fig.1 Forward Current vs. Ambient Temperature

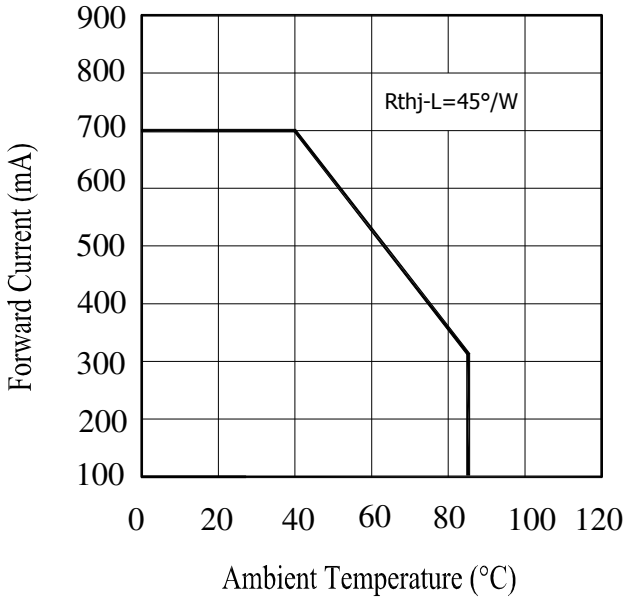


Fig.2 Spectral Distribution

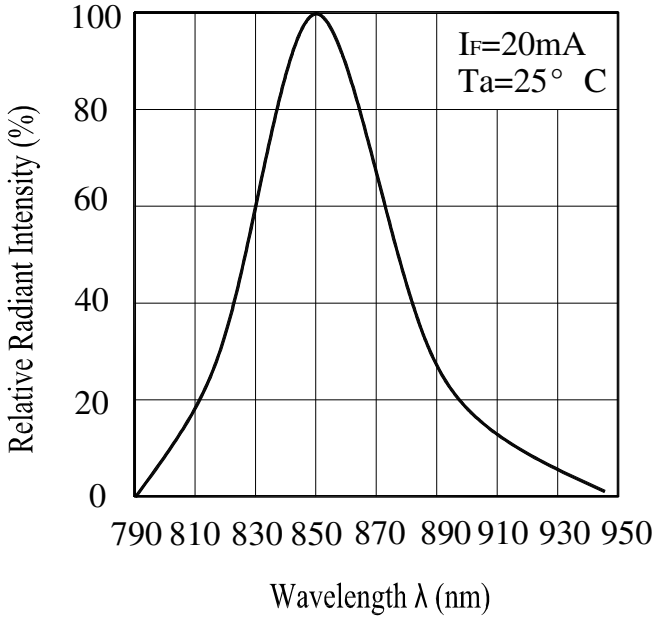


Fig.3 Peak Emission Wavelength Ambient Temperature

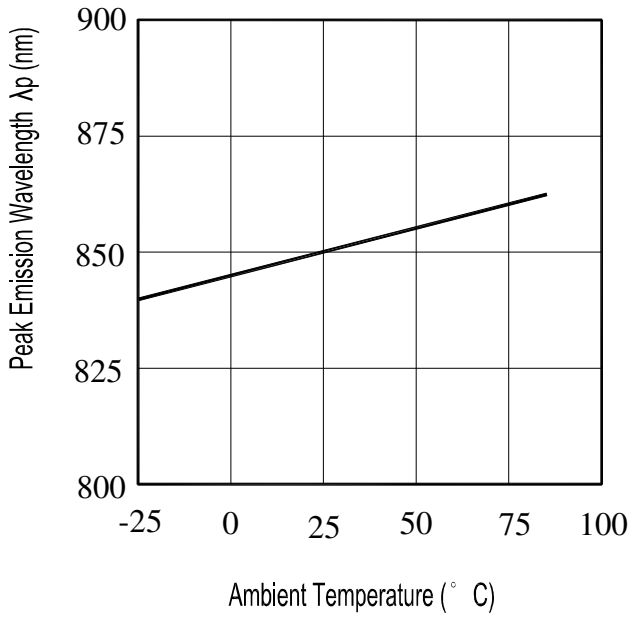
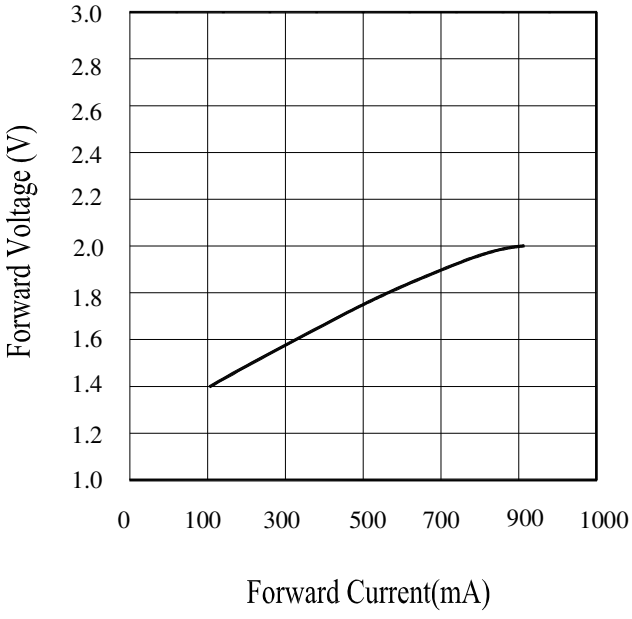
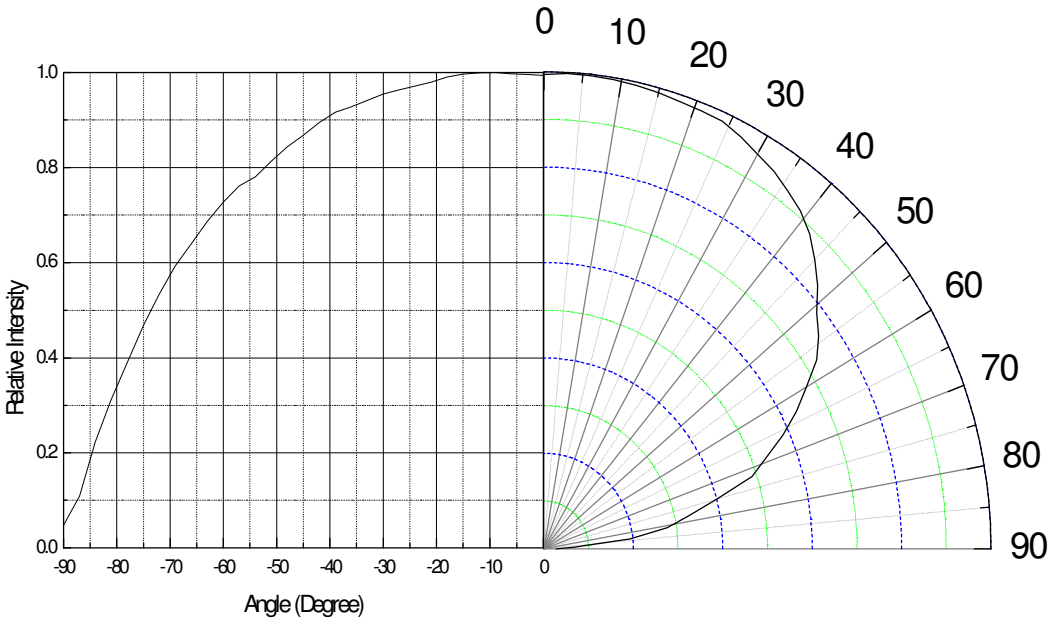


Fig.4 Forward Current vs. Forward Voltage



Typical Electro-Optical Characteristics Curves

Fig.5 Relative Radiant Intensity vs. Angular Displacement



Precautions For Use

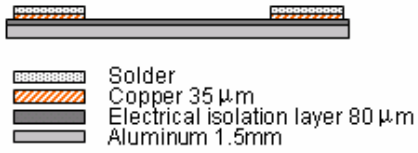
1. Over-current-proof

Though HIR-AX08LS/L183-P01/TR has conducted ESD protection mechanism, customer must not use the device in reverse and should apply resistors for extra protection. Otherwise slight voltage shift may cause enormous current change and burn out failure would happen.

2. Thermal Management

1.For maintaining the high flux output and achieving reliability, HIR-AX08LS/L183-P01/TR series LED package should be mounted on a metal core printed circuit board (MCPCB) with proper thermal connection to dissipate approximately 1W of thermal energy under 350mA operation.

MCPCB structure

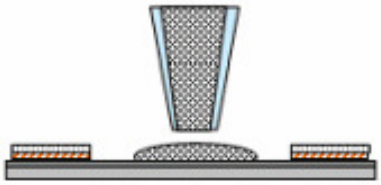


Recommended supplier:
- Kavano Industrial Co., Ltd
- TT Electronics

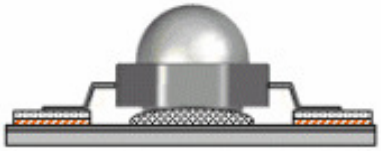
2.Special thermal designs are also recommended to take in outer heat sink design, such as FR4 PCB on Aluminum with thermal vias or FPC on Aluminum with thermal conductive adhesive, etc.

3.Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LED lifetime will decrease critically.

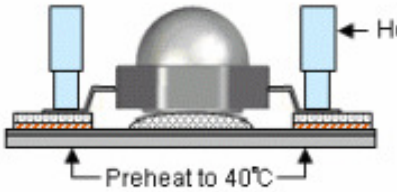
3. Assembly process flow



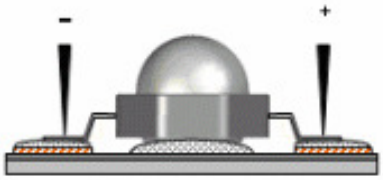
Thermal conductive glue dispensing
Recommended material and its supplier: EpoTek T7109 from Epoxy Technology



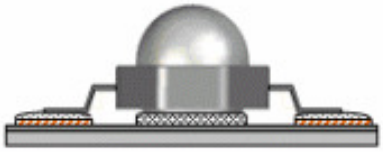
HIR-AX08LS/L183-P01 LED emitter placement



Hot bar soldering of LED emitter
Note: The MCPCB should be preheated up to 40°C for increasing the solderability



Functional test of LED emitter

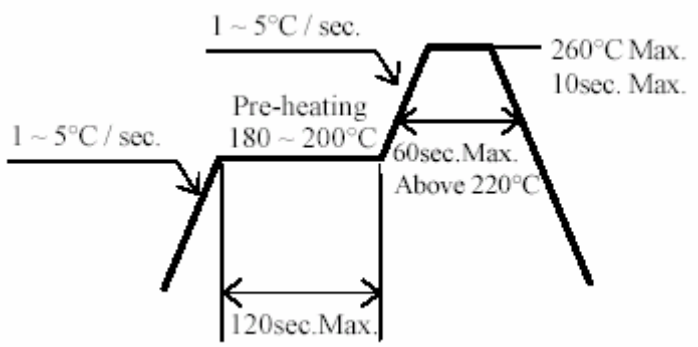


Curing of thermal conductive glue

Handling Indications：Do not handle the HIR-AX08LS/L183-P01/TR by the lens at any time during the assembly process. This can cause damage to the optical surfaces or may dislocate the lens if excessive force is applied.

4. Soldering Condition

1.Lead reflow soldering temperature profile



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

3.While soldering, do not put stress on the LEDs during heating.

4.After soldering, do not warp the circuit board

5. Soldering Iron

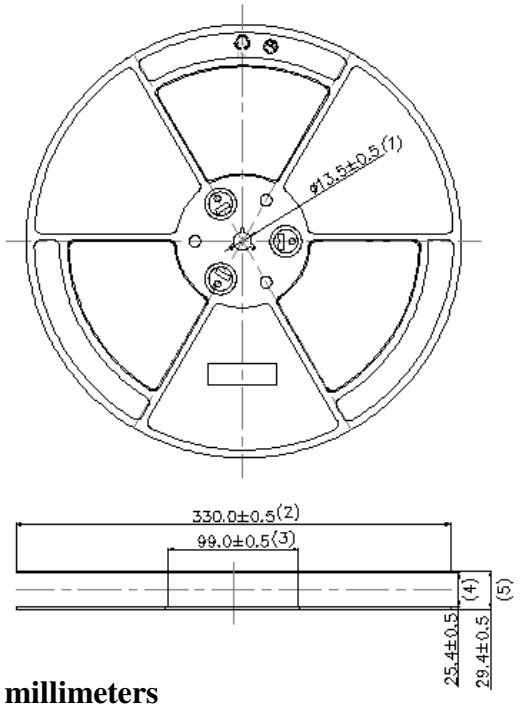
1.For prototype builds or small series production runs it is possible to place and solder the LED by hand.

2.Dispensing thermal conductive glue or grease on the substrates and follow its curing spec. Press LED housing to closely connect LED and substrate.

3.It is recommended to hand solder the leads with a solder tip temperature of 280°C for less than 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal.

4.Be careful because the damage of the product is often started at the time of the hand solder.

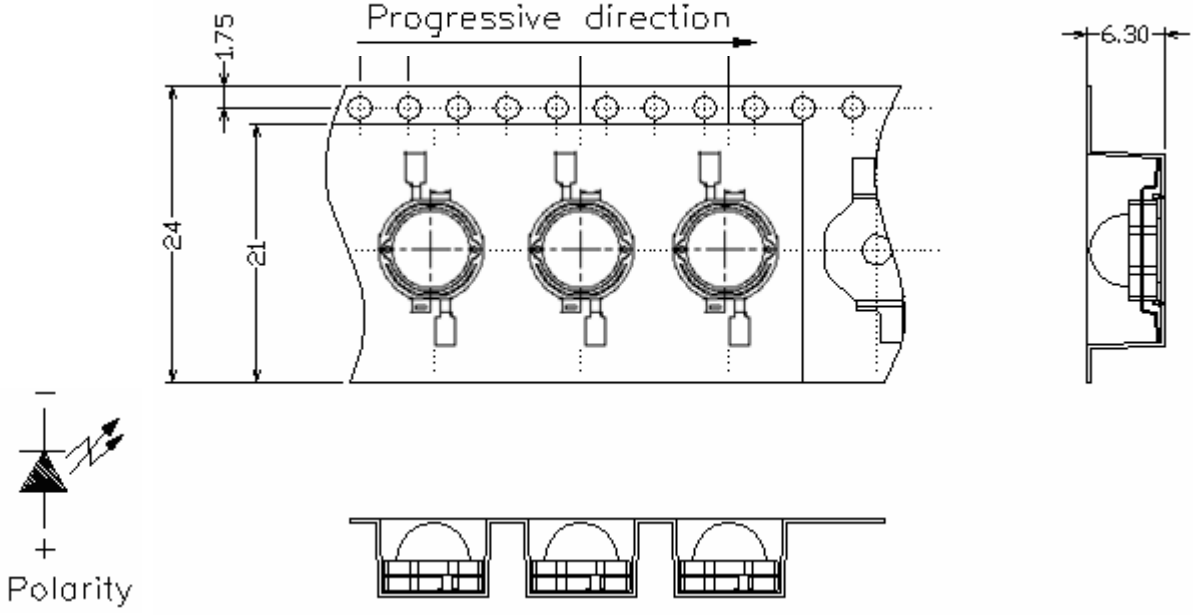
Package Dimensions



Note: 1. Dimensions are in millimeters

2. The tolerances unless mentioned is ±0.1mm

Carrier Tape Dimensions: Loaded quantity 800 PCS per reel.



Note: 1. Dimensions are in millimeters

2. The tolerances unless mentioned is ±0.1mm

Reliability Test Item And Condition

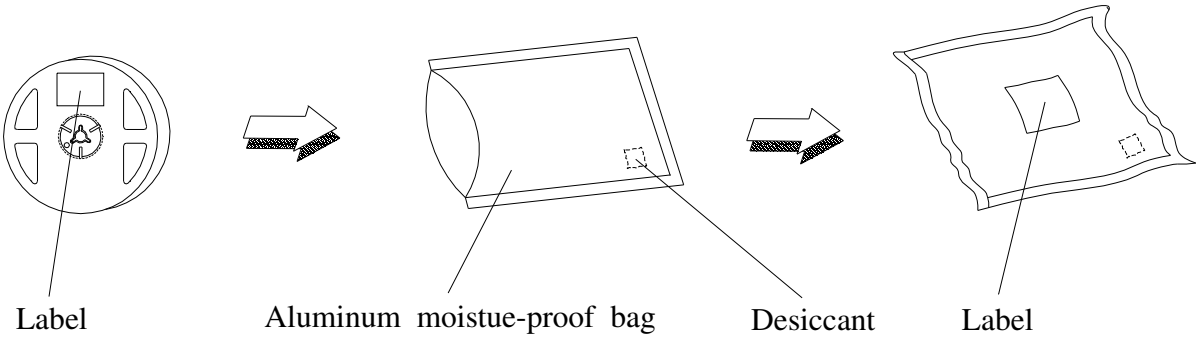
The reliability of products shall be satisfied with items listed below.

Confidence level：90%

LTPD：10%

NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	REFLOW Soldering	TEMP.：260℃±5℃ 10secs	6Mins	22pcs	$I_R \geqq U \times 2$ $Ie \leqq L \times 0.8$ $V_F \geqq U \times 1.2$ U：Upper Specification Limit L：Lower Specification Limit	0/1
2	Temperature Cycle	H : +100℃ 15mins ↕ 5mins L : -40℃ 15mins	300Cycles	22pcs		0/1
3	Thermal Shock	H :+100℃ 5mins ↕ 10secs L :-10℃ 5mins	300Cycles	22pcs		0/1
4	High Temperature Storage	TEMP.：+100℃	1000hrs	22pcs		0/1
5	Low Temperature Storage	TEMP.：-40℃	1000hrs	22pcs		0/1
6	DC Operating Life	I_F=700mA	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	85℃ / 85% R.H	1000hrs	22pcs		0/1

Moisture Resistant Packaging



Label Form Specification

CPN: Customer's Production Number
P/N : Production Number
QTY: Packing Quantity
CAT: Ranks
HUE: Peak Wavelength
REF: Reference
LOT No: Lot Number
MADE IN TAIWAN: Production Place

Notes

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 using 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.
3. These specification sheets include materials protected under copyright of EVERLIGHT corporation. Please don't reproduce or cause anyone to reproduce them without EVERLIGHT's consent.

EVERLIGHT ELECTRONICS CO., LTD.
Office: No 25, Lane 76, Sec 3, Chung Yang Rd,
Tucheng, Taipei 236, Taiwan, R.O.C
Tel: 886-2-2267-2000, 2267-9936
Fax: 886-2267-6244, 2267-6189, 2267-6306
http://www.everlight.com