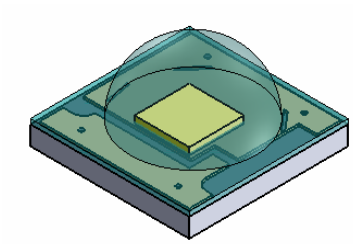
HELIO Optoelectronics Corp.

Helio 3535 – IR



Helio 3535, a high compact and surface mounted solid-state lighting device, provides high radiometric power output with high optical efficiency. The reduced packing size remarkably promotes the flexibility on engineering design. With capability on standard lead free solder reflow process, Helixeon 3535 infrared emitter is applied for high energy efficiency for infrared applications.

Features

- High compact size for more application flexibility
- Thermal resistance: 8℃/W
- Reflow solderable JEDEC J-STD-020D
- RoHS certification

Applications

- CCTV
- Wireless communication

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Product Nomenclature

XPE IFR - L1

X1 X2 X3

X1		X2		X3	
Series		Color		Sepcification	
Code	Type	Code	Type	Code	Type
XPE	XP-E	IFR	IR 850nm	L1	Lambertian
				L2	Lambertian 2

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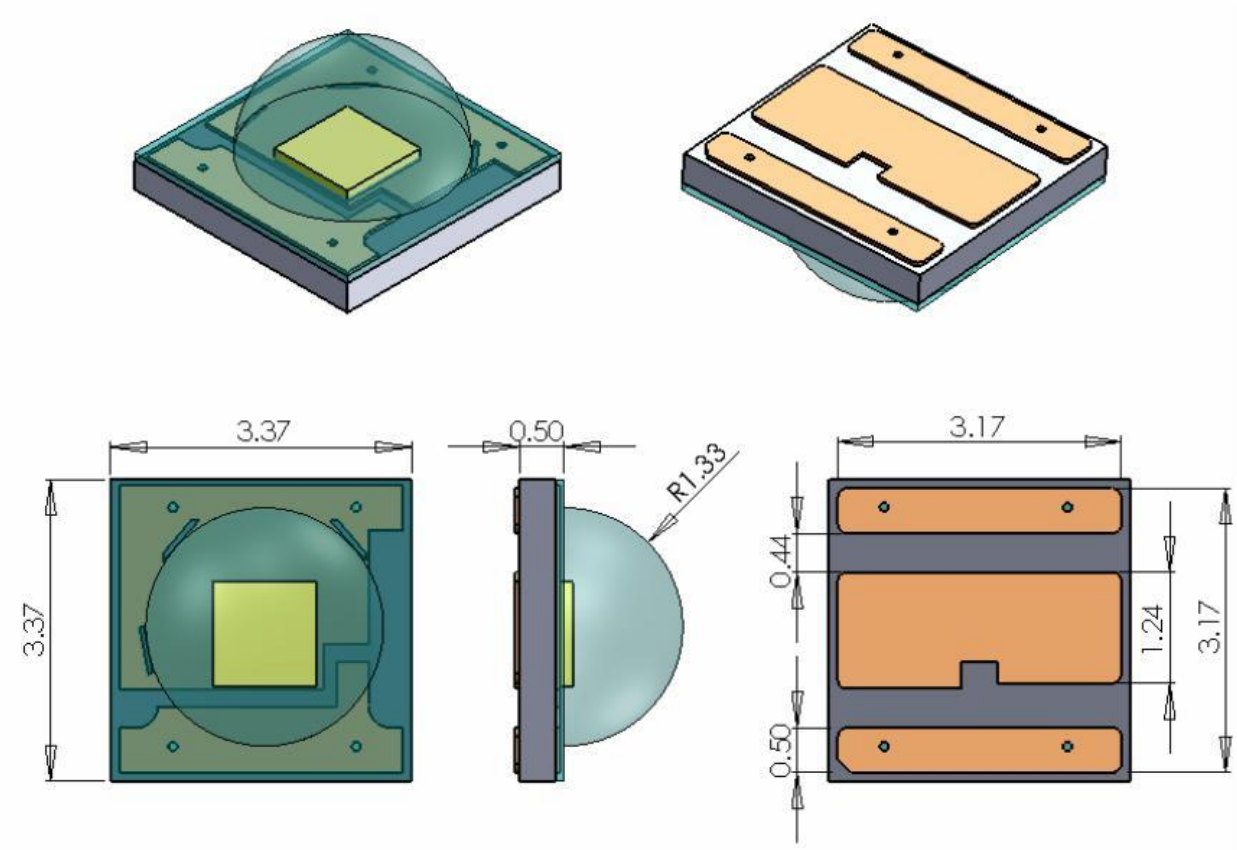
Mechanical Dimensions

XPE IFR - L1



Notes:

1. All dimensions are in millimeters.
2. Drawings not to scale.
3. General tolerance are ±0.13 mm unless otherwise indicated.

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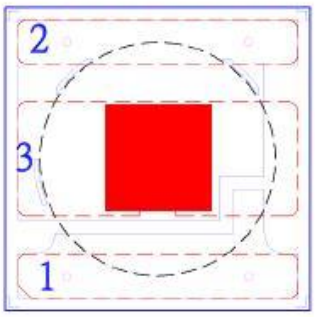
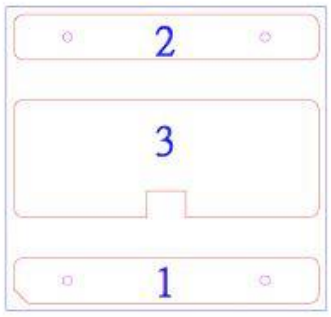
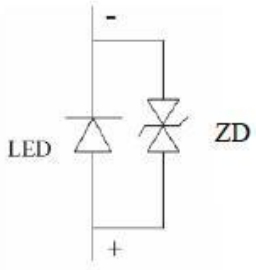


Top



Bottom

Circuit Type



Pad	Function
1	Cathode
2	Anode
3	Thermal

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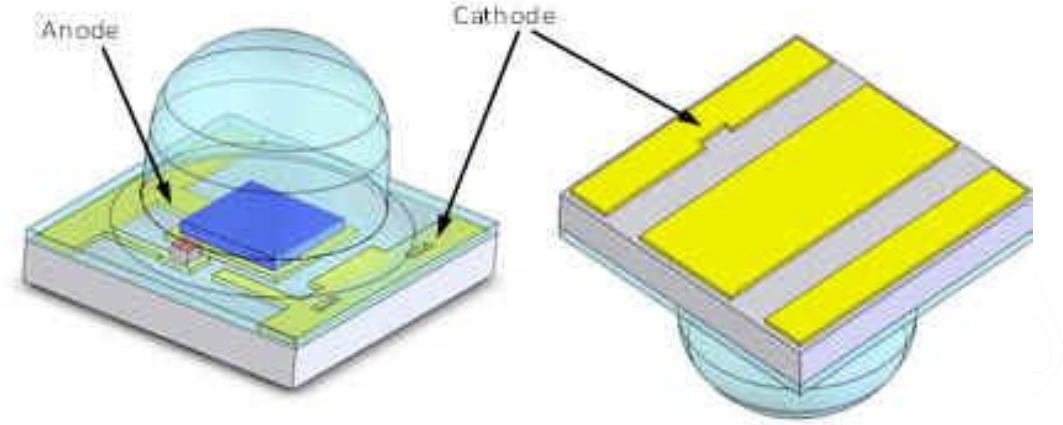
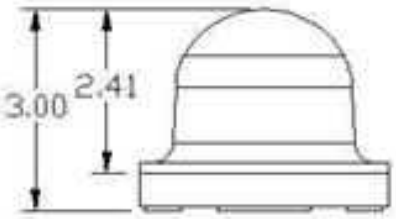
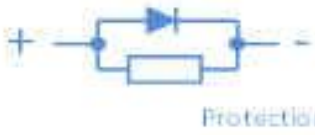
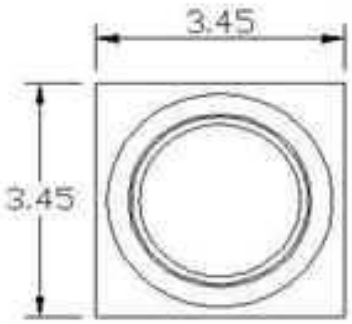
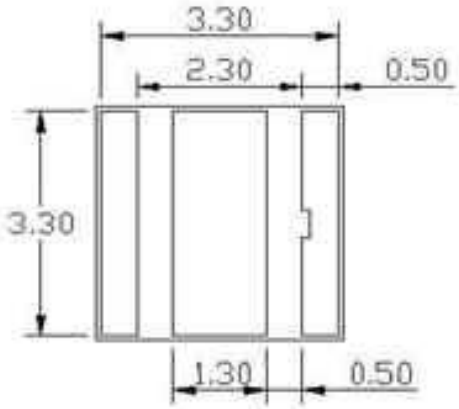
XPE IFR - L2











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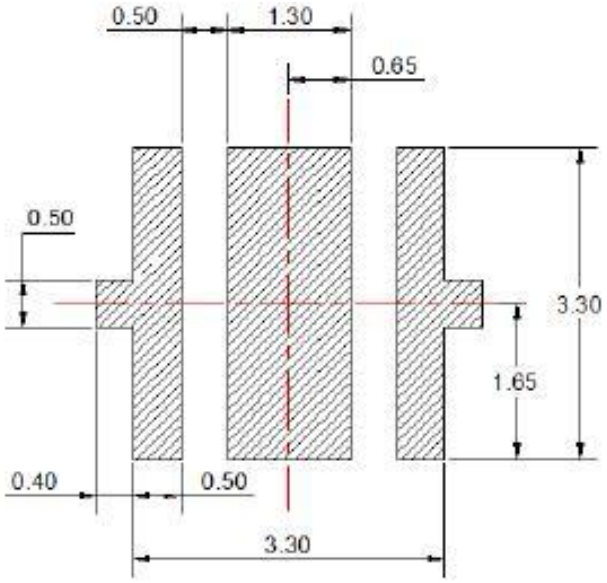
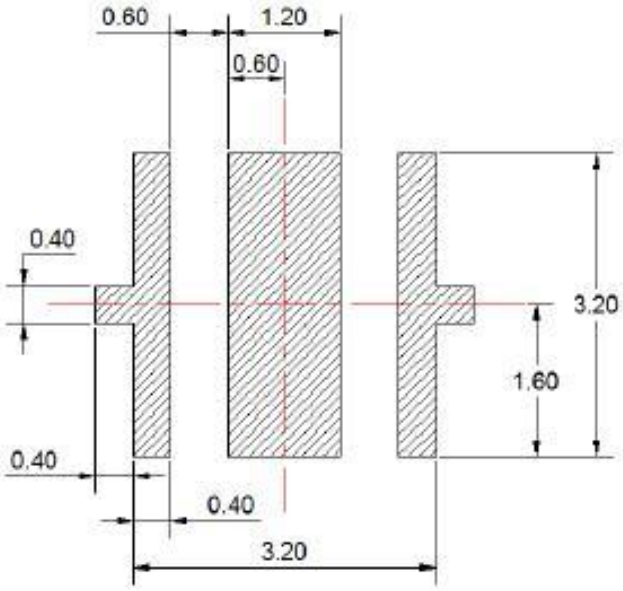


Recommended Stencil Pattern Design (Marked Area is Opening)



Notes :

1. Drawing is not to scale
2. All dimensions are in millimeter

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Absolute Maximum Ratings

Parameters		Symbol	Rating	Unit
Continuous Forward current		IF	700	mA
Peak Forward current(1/10 duty cycle @1khz)		Ipeak	1000	mA
Reverse voltage		VR	5	V
Operating temperature		Topr	-40 ~ 105	℃
LED Storage temperature		Tstgl	-40 ~ 85	℃
LED Junction temperature		Tj	125	℃
Soldering temperature at tp (JEDEC-020-D)		Tsol	20-40	Second
ESD classification	MIL-STD-883G	HBM	8000 (Class 3B)	V
	JESD22-A115-B	MM	400 (Class C)	V

Note:

1. Proper current derating must be observed to maintain junction temperature below the maximum.

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Characteristics of Helixeon 3535 Ir Series

XPEIFR-L1

Characteristics at If = 700mA (Ta=25℃):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Radiometric power (1)	Φ_v (2)	355	500	--	mW
Peak Wavelength (3)	Wd	840	850	870	nm
View angle	$2\Theta_{1/2}$	--	130	--	degree
Forward Voltage (4)	V_F	1.4	--	2.6	V

XPEIFR-L2

Characteristics at If = 700mA (Ta=25℃):

Parameter	Symbol	Value			Unit
		Min	Typical	Max	
Radiometric power (1)	Φ_v (2)	355	500	--	mW
Peak Wavelength (3)	Wd	840	850	870	nm
View angle	$2\Theta_{1/2}$	--	60	--	degree
Forward Voltage (4)	V_F	1.4	--	2.6	V

Note:

1. The typical radiometric power of Helixeon will be upgraded per season.
2. Minimum radiometric power performance guaranteed within published operating conditions. HELIO maintains a tolerance of ±10% on radiometric power measurements.
3. HELIO maintains a tolerance of ±1 nm for peak wavelength measurement.
4. HELIO maintains a tolerance of±0.1 V on forward voltage measurement.

■ Product Binning(Tj = 25℃)

Helixeon emitters are labeled using 6-digit alphanumeric bin code. The formats are explained as follows:

AB CD EF

Where:

AB - designates Photometric Luminous Flux bin.

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CD - designates peak wavelength bin.

EF - designates forward voltage bin.

Photometric Luminous Flux binning information (AB)

Bin Code	Min.	Max.	Unit
P1	355	395	mW
P2	395	435	
Q1	435	475	
Q2	475	515	
R1	515	575	
R2	575	635	
S1	635	695	

Peak wavelength binning information (CD)

Bin Code	Min.	Max.	Unit
J1	830	870	nm
J2	930	960	

Forward voltage binning information (EF)

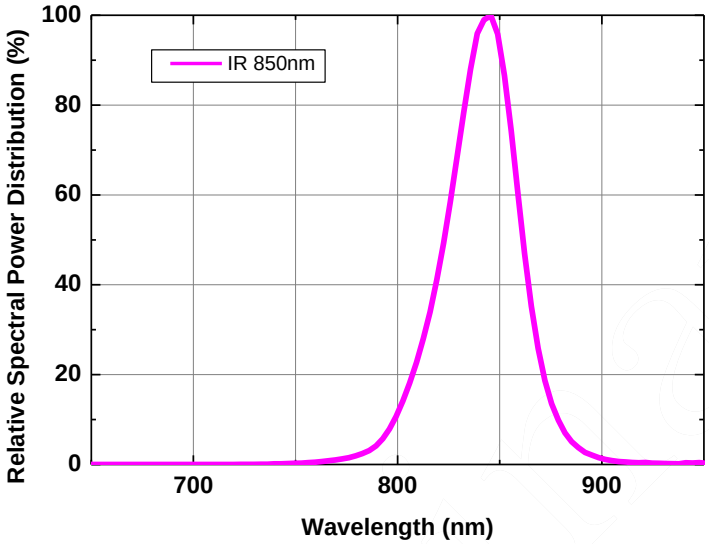
Bin Code	Min.	Max.	Unit
A0	1.4	1.6	V
B0	1.6	1.8	
C0	1.8	2.0	
D0	2.0	2.2	
E0	2.2	2.4	
F0	2.4	2.6	

Note:

5. The typical radiometric power of Helixeon will be upgraded per season.
6. Minimum radiometric power performance guaranteed within published operating conditions. HELIO maintains a tolerance of ±10% on radiometric power measurements.
7. HELIO maintains a tolerance of ±1 nm for peak wavelength measurement.
8. HELIO maintains a tolerance of±0.1 V on forward voltage measurement.

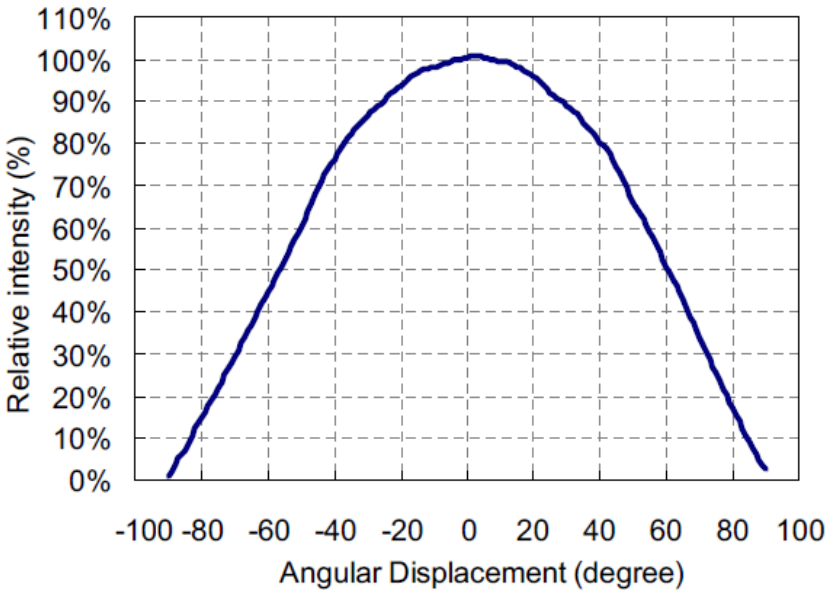
Optical characteristics

Emission spectrum



Radiation Pattern

XPEIFR-L1



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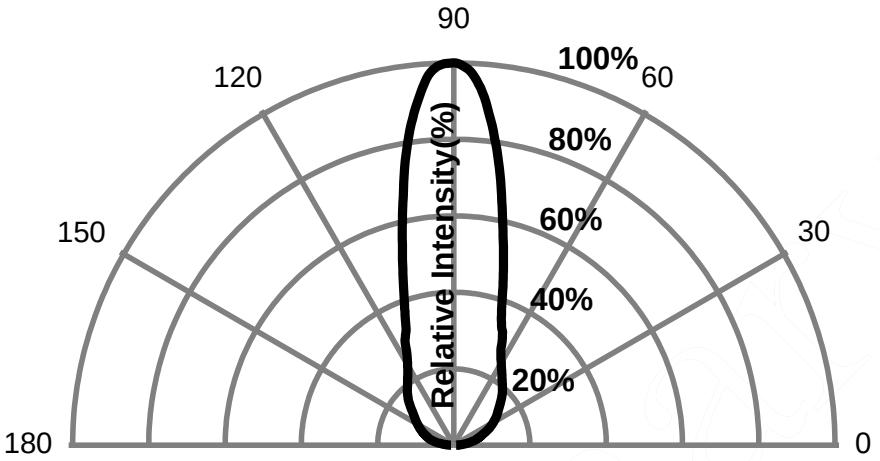
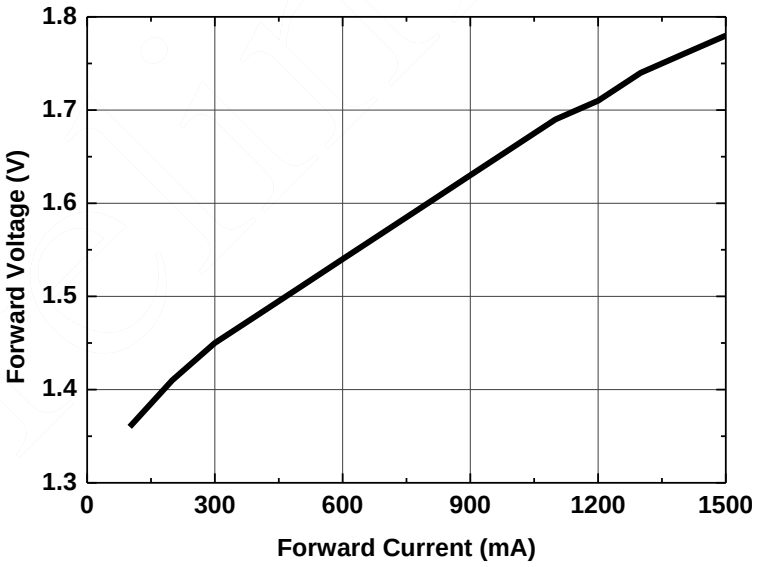
XPEIFR-L2



Electrical characteristics

Typical Forward Current Characteristics



Typical Light Output Characteristics over Forward Current

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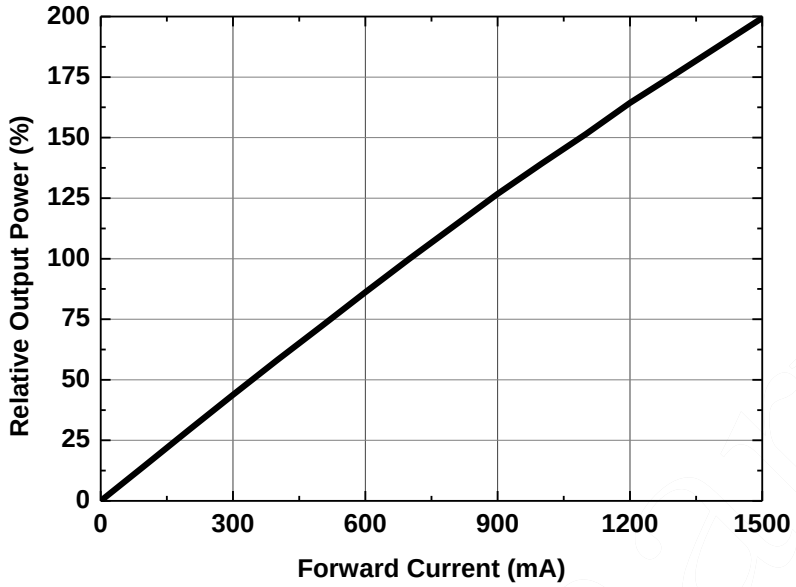

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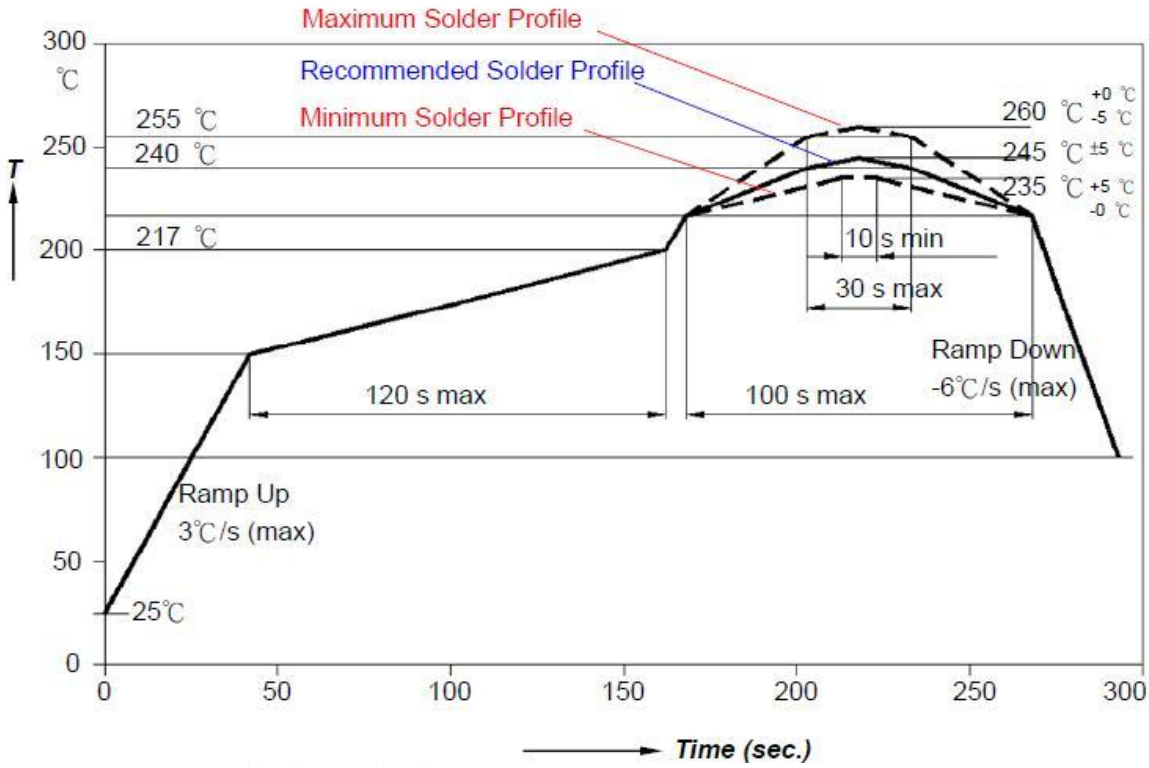
Reflow soldering conditions

Recommended Soldering Profile

The LEDs can be soldered using the parameters listed below. As a general guideline, the users are suggested to follow the recommended soldering profile provided by the manufacturer of the solder paste. Although the recommended soldering conditions are specified in the list, reflow soldering at the lowest possible temperature is advised for the LEDs.



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average Ramp-up Rate (Ts_{max} to Tp)	3°C/second max.	3°C/second max.
Preheat - Temperature Min(Ts_{min}) - Temperature Max(Ts_{max}) - Time(ts_{min} to ts_{max})	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: - Temperature(T_L) - Time(t_L)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak/classification Temperature(Tp)	215°C	260°C
Time within 5°C of actual Peak Temperature(tp)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6°C/second max.	6°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

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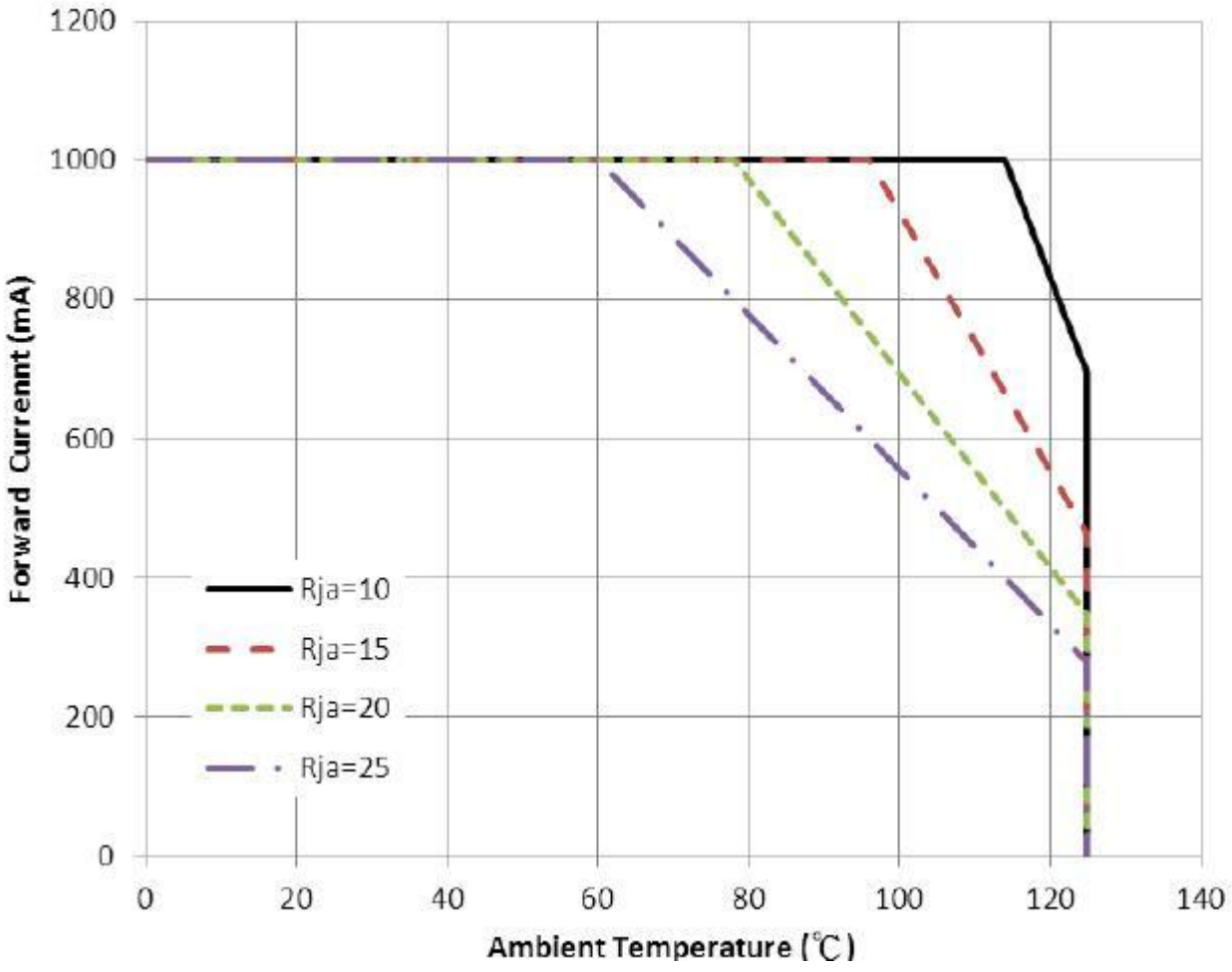
Current Derating Curves

Thermal Design

Thermal design of the end product is important. The thermal resistance between the junction and the solder point ($R\Theta_{J\text{-}P}$) is 8°C/W, and the end product should be designed to minimize the thermal resistance from the solder point to ambient in order to optimize the emitter life and optical characteristics. The maximum operation current is determined by the plot of Allowable Forward Current vs. Ambient Temperature.



The junction temperature can be correlated to the thermal resistance between the junction and ambient (Rja) by the following equation.

$$Tj=Ta + Rja*W$$

Tj: LED junction temperature

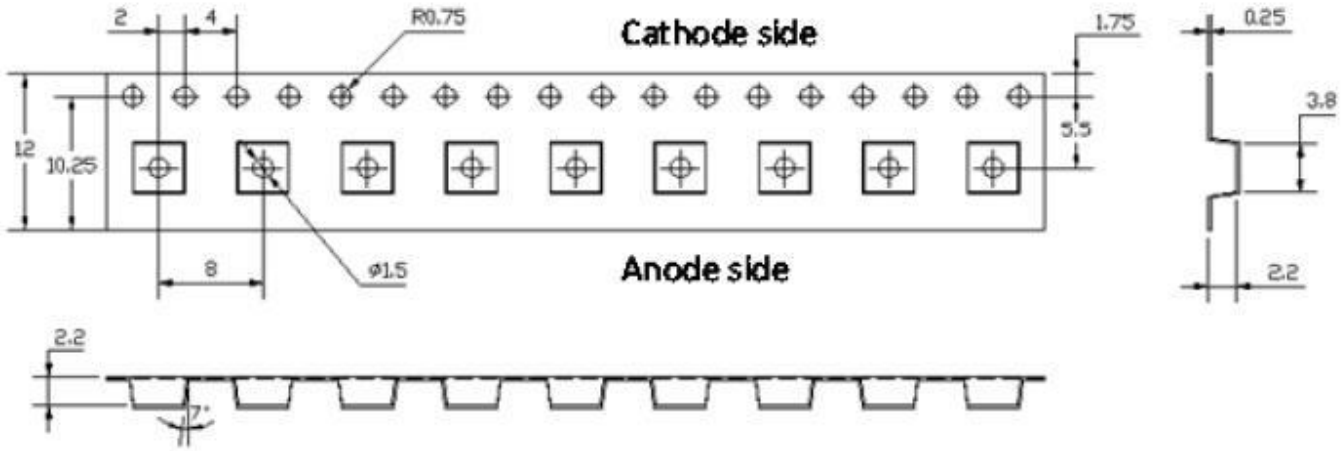
Ta: Ambient temperature

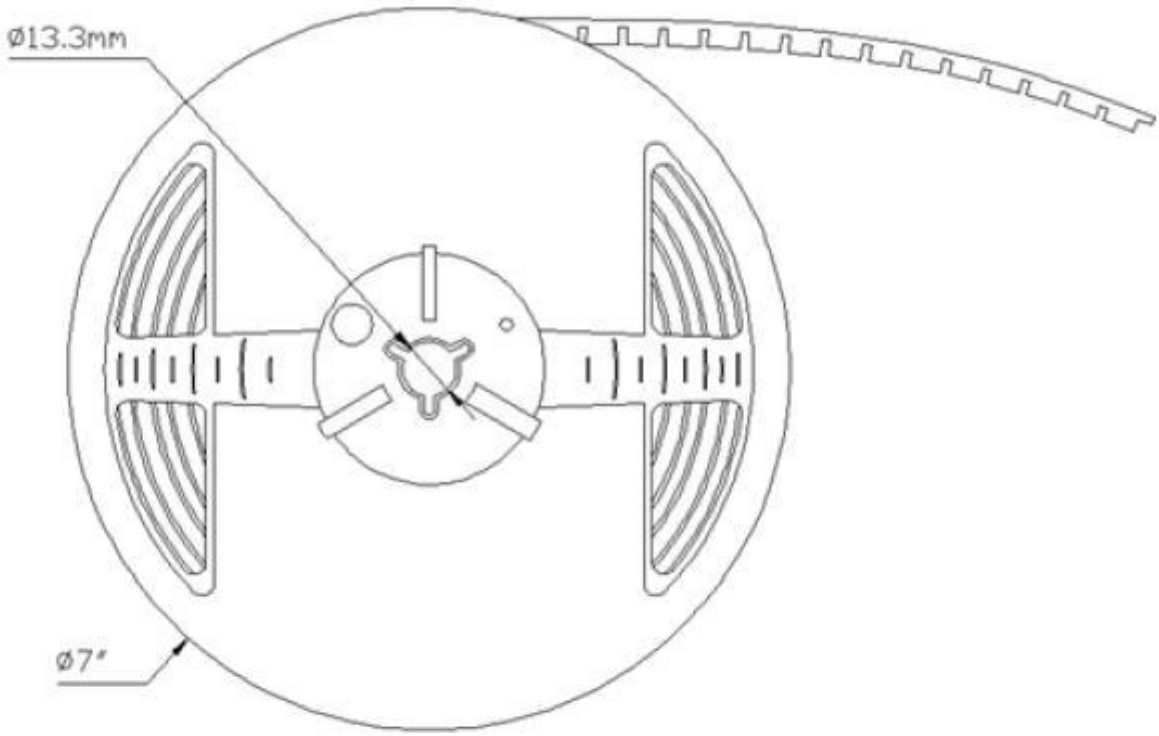
Rja: Thermal resistance between the junction and ambient

W: Input power (I_F*V_F)

■ Package Specifications

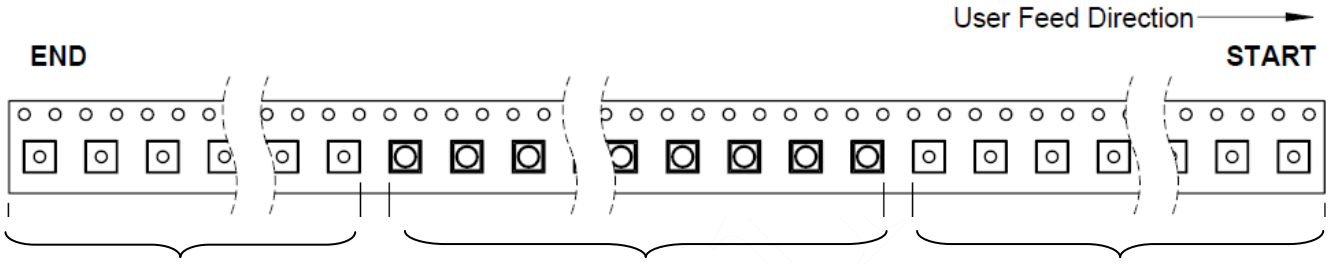
Tape and Reel





Note:

All dimensions are in millimeter.



Trailer 20 pockets (min) of empty pockets sealed with tape

Loaded Pockets (500 Lamps)

Leader 20 pockets (min) of empty pockets sealed with tape

Packing

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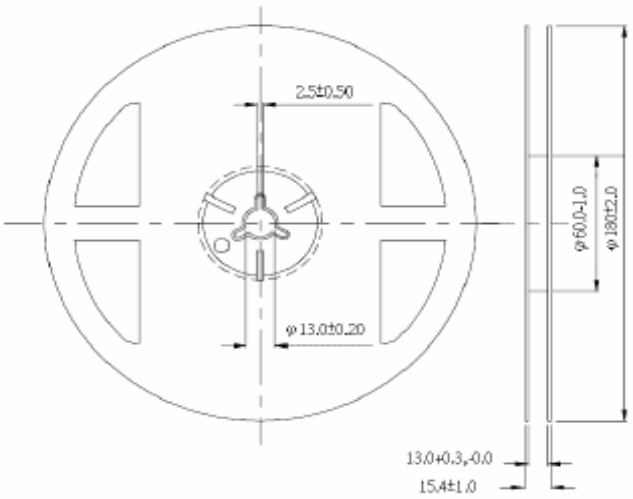
Reel Dimensions



Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ±0.1mm.

■ Label

■ Label for Tape-and-Reel

■ 1. For Reel

海立爾股份有限公司	
品號: XXXX-XXXX	單號:
品名: XXXXXX-XX	QC
數量: 500 PCS	
Bin Code: XXXXX	
日期: XXXX-XX-XX	

■ Storage

- **Do not open the moisture proof bag before the devices are ready to use.**
- **Before the package is opened, LEDs should be stored at temperatures less than 30℃ and humidity less than 50%.**
- **After the package is opened, LEDs should be stored at temperatures less than 30℃ and humidity less than 30%.**
- **LEDs should be used within 168 hours (7 days) after the package is opened.**

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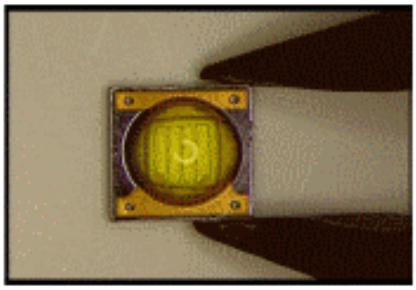
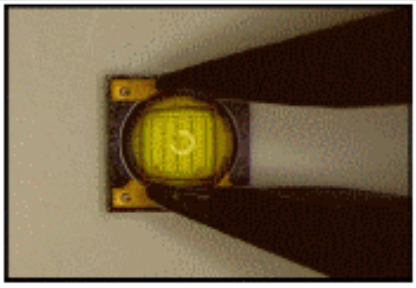
Please follow the guideline to grab LEDs

- **Use tweezers to grab LEDs**
- **Do not touch lens with the tweezers**
- **Do not touch lens with fingers**
- **Do not apply more than 4N of lens (400g) directly onto the lens**

Correct (√)	Wrong (X)
	

Lens cleaning

In the case where a minimal level of dirt and dust particles can not be guaranteed, a suitable cleaning solution can be applied to the lens surface

- **Try a gentle swabbing using a lint-free swab**
- **If needed, the use of lint-free swab and isopropyl alcohol used gently removes dirt from the lens surface**
- **Do not use other solvents as they may directly react with the LED assembly**
- **Do not use ultrasonic cleaning that the LED will be damaged**

Carrier Tape Handling

The following items are recommended when handling the Carrier tape of LEDs

- Do not twist the carrier tape
- The inward bending diameter should not smaller than 6cm for carrier tape.
- Do not bend the tape outward.
- Storage temperature should not exceed 60℃ .
-