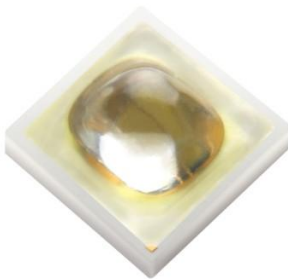


EAFL4039W20A0

Received
☒ MASS PRODUCTION
☐ PRELIMINARY
☐ CUSTOMER DESIGN
DEVICE NO. :
PAGE : 13

Revised record		
REV.	DESCRIPTION	RELEASE DATE
1	New Spec	Dec.18.2013

EAFL4039W20A0



Features

- Feature of the device : small package with high efficiency
- Typical color temperature : 6000 K
- Typical view angle : Horizontal 70°, Vertical 62°
- ESD protection up to 8KV
- Soldering methods : SMT
- Grouping parameter : total luminous flux, color coordinates
- Typical illuminance : 220lx @ 1000 mA
- The product itself will remain within RoHS compliant version

Applications

- Mobile Phone Flash
- Decorative and Entertainment Lighting
- System appliances, measuring instruments Signal and Symbol Luminaries for orientation marker lights (e.g. steps, exit ways, etc.)

Device Selection Guide

Chip Materials	Emitted Color
InGaN	White

Absolute Maximum Ratings ($T_{\text{solder pad}} = 25^{\circ}\text{C}$)

Parameter	Symbol	Rating	Unit
DC Forward Current (mA)	I_F	200	mA
Peak Pulse Current (mA)	I_{Pulse}	1200	mA
ESD Resistance	V_B	8000	V
Reverse Voltage	V_R	[1]	V
Junction Temperature	T_J	125	$^{\circ}\text{C}$
Operating Temperature	T_{Opr}	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	T_{Stg}	-40 ~ +110	$^{\circ}\text{C}$
Power Dissipation (Pulse Mode)	P_d	5.2	W

Note:

1. The YUAN series LEDs are not designed for reverse bias used.
2. Avoid operating YUAN series LEDs at maximum operating temperature exceed 1 hour.
3. All specification are assured by reliability test for 1000hr, IV degradation less than 30%.
4. All reliability items are tested under good thermal management with 1.0x 1.0 cm² MCPCB.

JEDEC Moisture Sensitivity

Level	Floor Life		Soak Requirements Standard	
	Time (hours)	Conditions	Time (hours)	Conditions
2	1 year	$\leq 30^{\circ}\text{C}$ / 60% RH	168 (+5/-0)	85°C / 60% RH

Electro-Optical Characteristics ($T_{\text{solder pad}} = 25^{\circ}\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux ₍₁₎	Φ_v	160	200	----	lm	$I_F = 1000\text{mA}$
Illuminance	----	----	220	----	lux	
Forward Voltage _{(2) (3)}	V_F	2.95	----	4.35	V	
View Angle	$2\theta_{1/2}$	----	70 / 62 (H / V)	----	deg	
Correlated Color Temperature	CCT	5000	----	7000	K	

Note:

1. Luminous Flux, illuminance measurement tolerance : $\pm 10\%$
2. Forward voltage measurement tolerance : $\pm 0.1\text{V}$
3. Electric and optical data is tested at 50 ms pulse condition.
4. Temperature of solder pad : 25°C
5. Illuminance is measured at 1 meter.

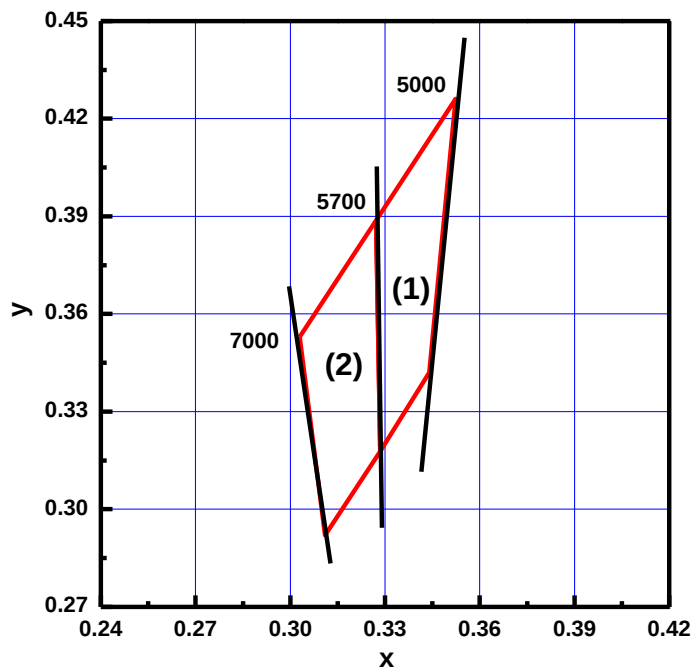
Bin Range of Forward Voltage Binning

Bin Code	Min.	Typ.	Max.	Unit	Condition
2932	2.95	----	3.25	V	$I_F = 1000\text{mA}$
3235	3.25	----	3.55		
3538	3.55	----	3.85		
3841	3.85	----	4.15		
4143	4.15	----	4.35		

Bin Range of Luminous Intensity

Bin Code	Min.	Typ.	Max.	Unit	Condition
J4	160	----	180	lm	$I_F = 1000\text{mA}$
J5	180	----	200		
J6	200	----	250		
J7	250	----	300		

White Bin Structure



Notes :

- 1.Color Bin (1) :5057K
- 2.Color Bin (2) :5770K

White Bin Coordinate

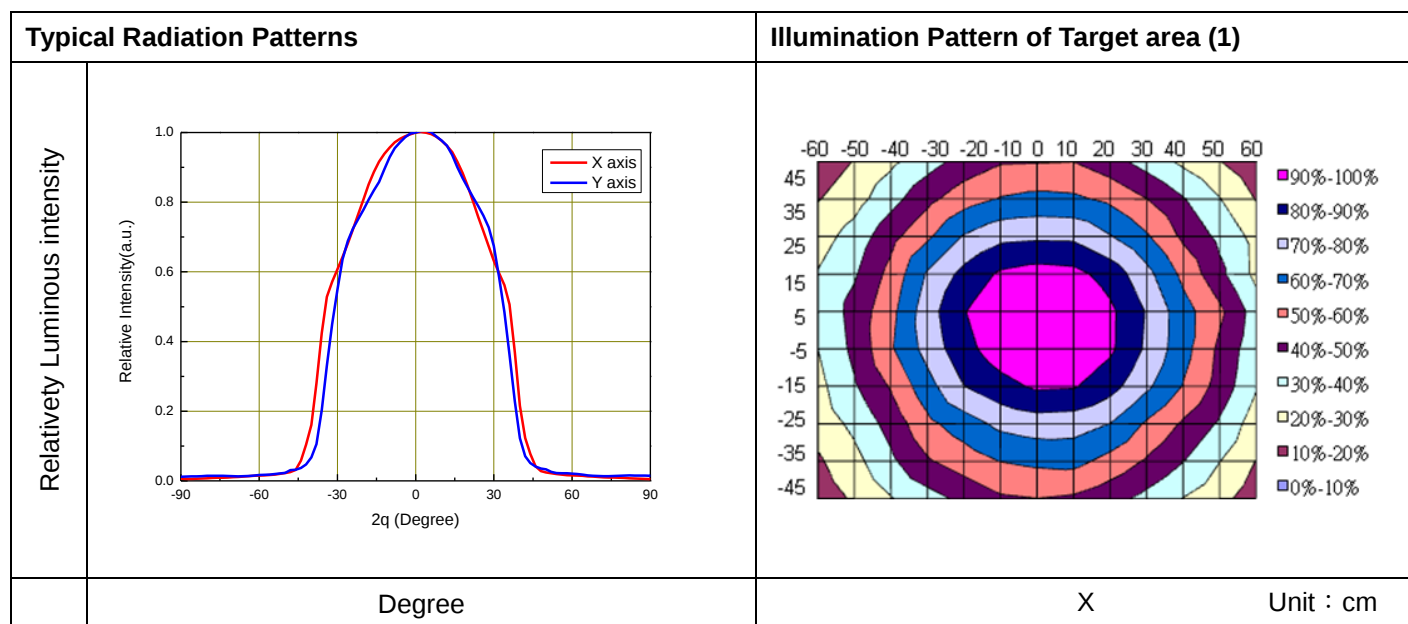
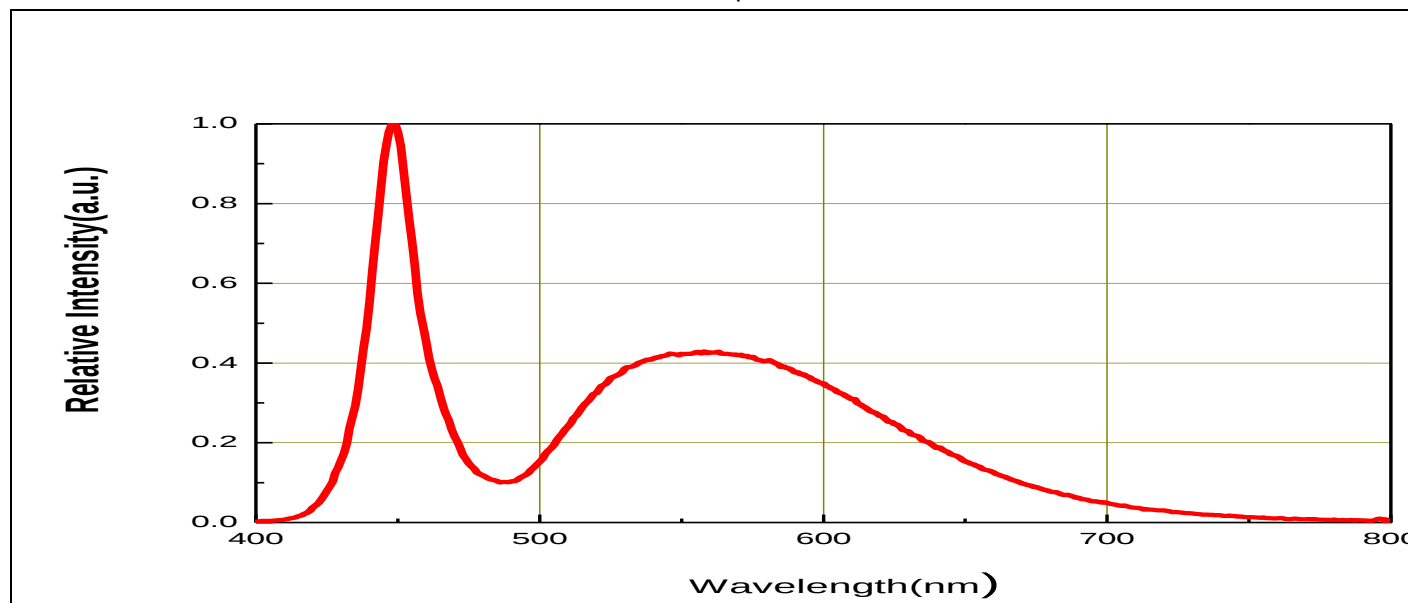
Bin	CIE-X	CIE-Y	CCT Reference Range
5057	0.3272	0.3888	5000K ~ 5700K
	0.3524	0.4261	
	0.3440	0.3420	
	0.3285	0.3178	
5770	0.3000	0.3486	5700K ~ 7000K
	0.3272	0.3888	
	0.3285	0.3178	
	0.3110	0.2920	

Note:

1. Color coordinates measurement allowance : ± 0.01
2. Color bins are defined at $I_F=1000\text{mA}$ and 50ms pulse operation condition.

Typical Electro-Optical Characteristics Curves

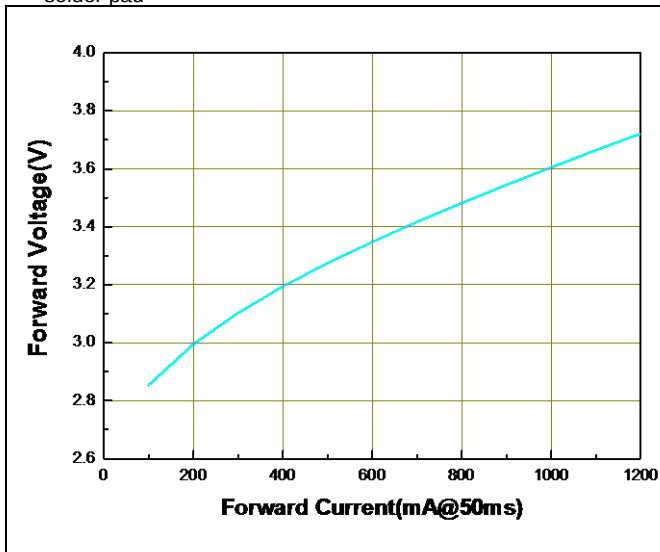
Relative Spectral Distribution, IF=1000mA@50ms, T_{solder pad}=25°C



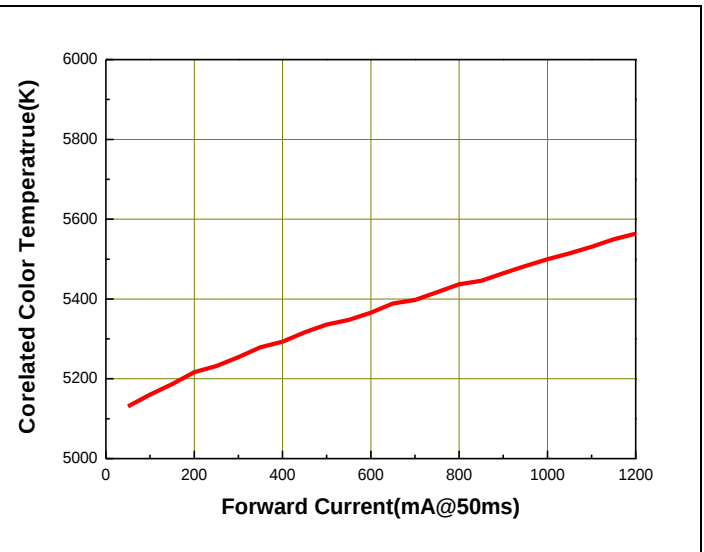
Note:

1. Distance = 1 meter (Illumination Pattern of Target area)
2. $2\theta_{1/2}$ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
3. View angle tolerance is $\pm 5^\circ$.

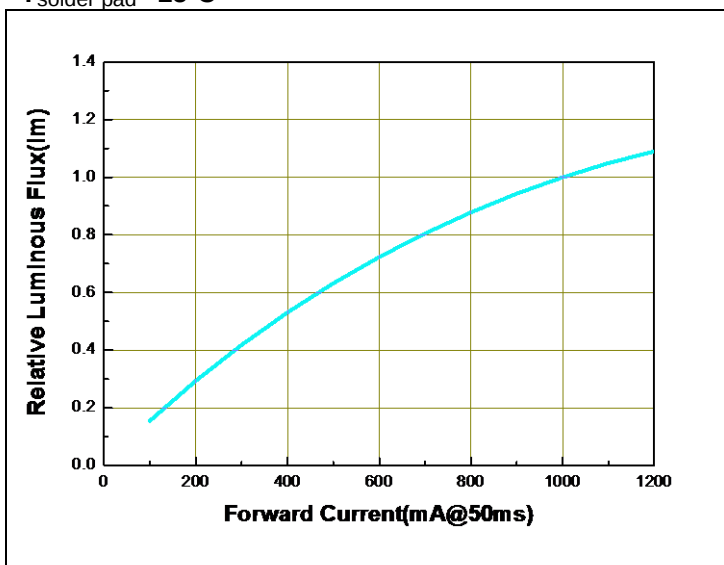
Forward Voltage vs Forward Current,
 $T_{\text{solder pad}} = 25^{\circ}\text{C}$



Correlated Color Temperature(CCT) vs. Forward Current

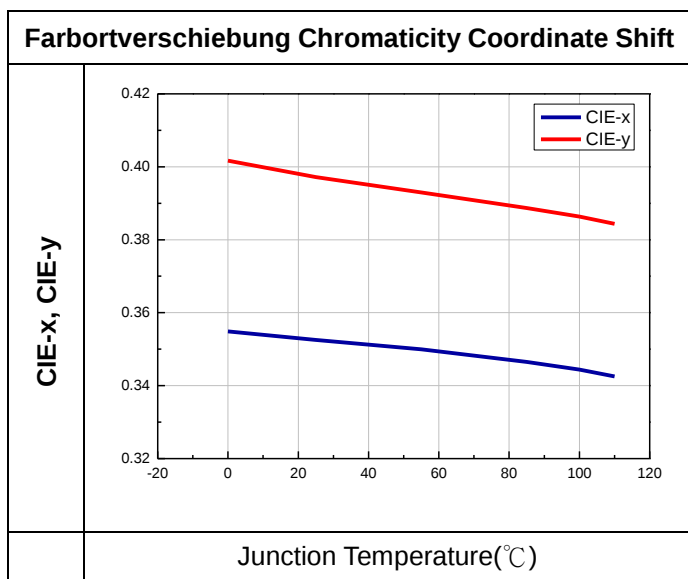
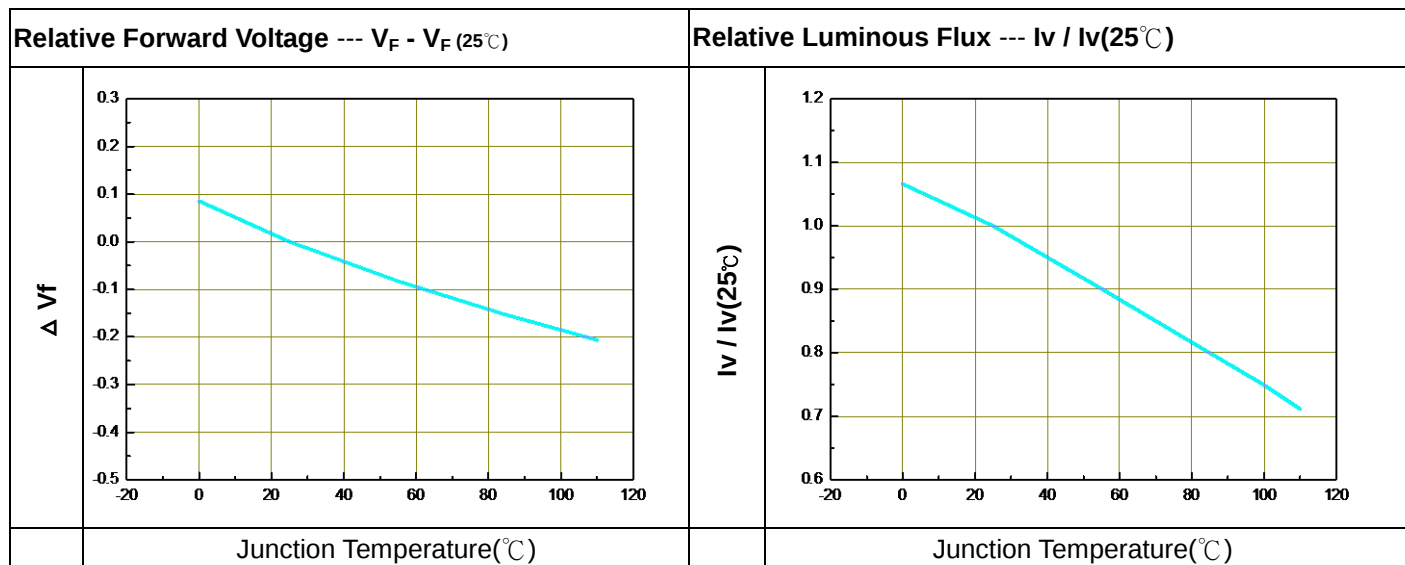


Luminous Flux vs Forward Current,
 $T_{\text{solder pad}} = 25^{\circ}\text{C}$



Note:

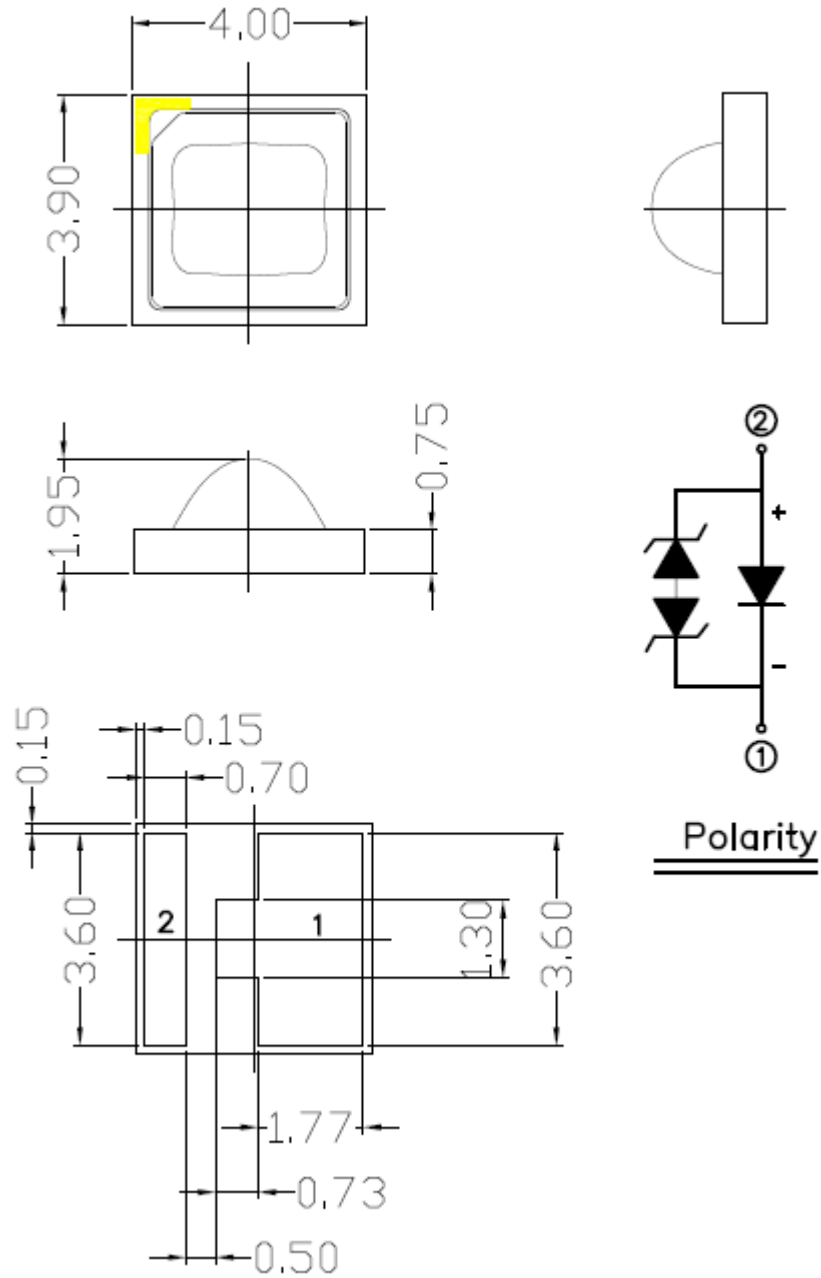
1. All correlation data is tested under superior thermal management with 1.0x 1.0 cm² MCPCB



Note:

1. All correlation data is tested under superior thermal management with $1.0 \times 1.0 \text{ cm}^2$ MCPCB

Package Dimension



Note:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$.

Moisture Resistant Packing Materials

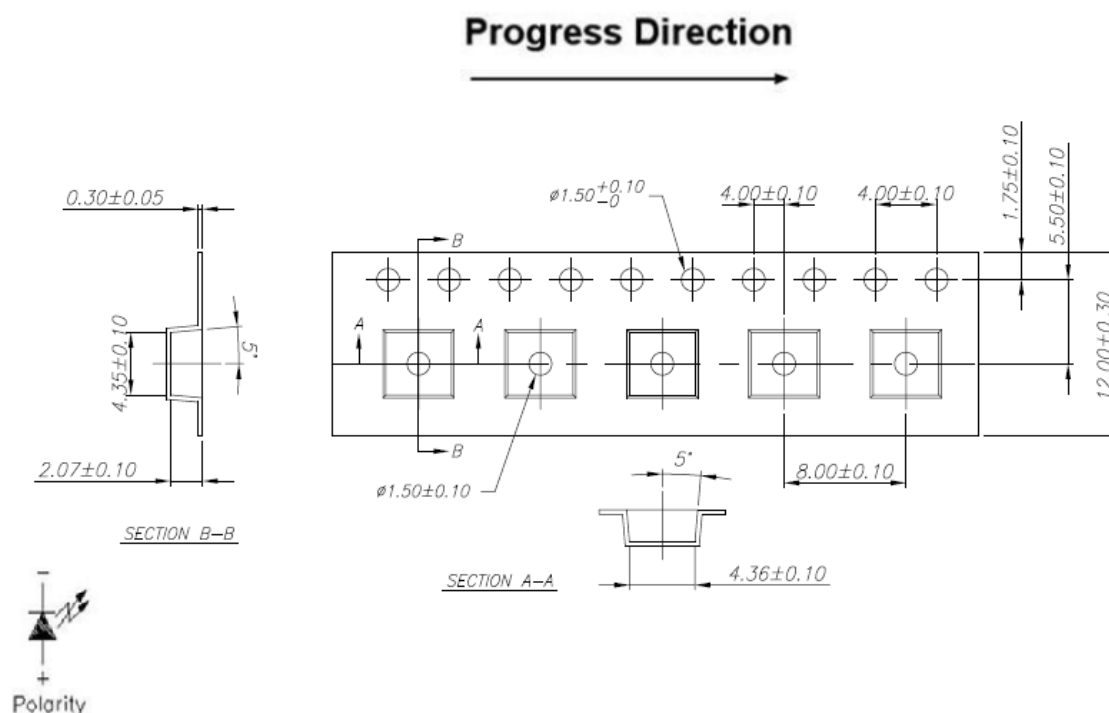
Label Explanation



- CPN: Customer Specification (when required)
- P/N: Everlight Americas Production Number
- QTY: Packing Quantity
- CAT: Luminous Flux (Brightness) Bin
- HUE: Color Bin
- REF: Forward Voltage Bin
- LOT No: Lot Number

Carrier Tape Dimensions: Loaded Quantity 800 pcs Per Reel

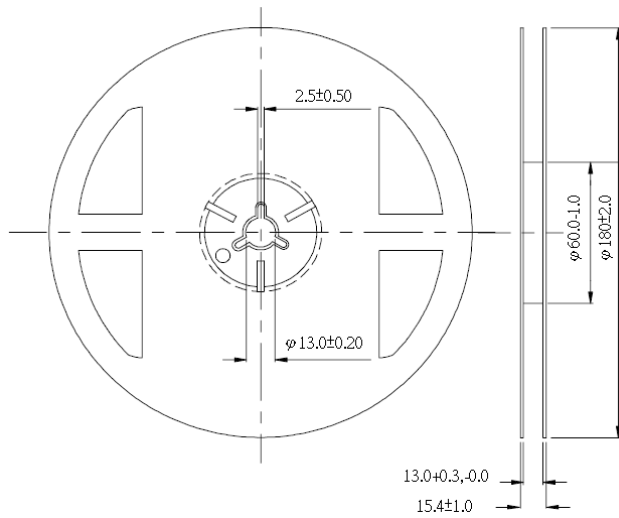
(Minimum Package Quantity : 200 PCS)



Note:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$.

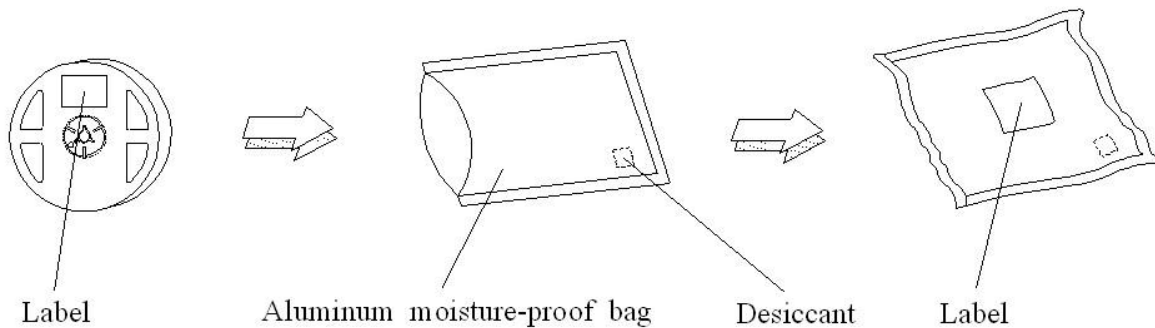
Reel Dimensions



Note:

1. Dimensions are in millimeters.
2. Tolerances for fixed dimensions are $\pm 0.1\text{mm}$.

Moisture Resistant Packing Process



Note:

1. Dimensions are in millimeters.
2. Tolerances for fixed dimensions are $\pm 0.1\text{mm}$.

Reflow Soldering Characteristics

Soldering and Handling

1. Over-current-proof

Though EAFL4039W20A0 series has conducted ESD protection mechanism, customers must not use the device in reverse and should apply resistors for extra protection. Otherwise, slight voltage shift may cause enormous current shift and burn out failure would happen.

2. Storage

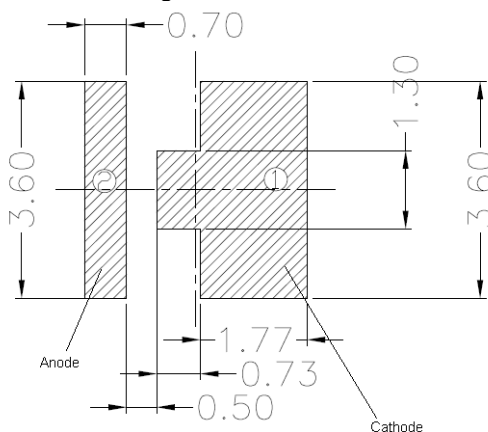
- i. Do not open the moisture proof bag before the products are ready to use.
- ii. Before opening the package, the LEDs should be stored at temperature less than 30°C and less and relative humidity less than 90%.
- iii. After opening the package, the LEDs should be stored at temperature less than 30°C and relative humidity less than 85%.
- iv. If the moisture absorbent material (silicone gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be implemented based on the following conditions: Pre-curing at 60±5°C for 24 hours.

3. Thermal Management

- i. For maintaining the high flux output and achieving reliability, EAFL4039W20A0 series LEDs should be mounted on a metal core printed circuit board (MCPCB), with proper thermal connection to dissipate approximately 1W to 5W of thermal energy under normal operation.
- ii. Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LEDs lifetime will decrease critically
- iii. When operating, the solder pad temperature (or the board temperature nearby the LED) must be controlled under 70°C

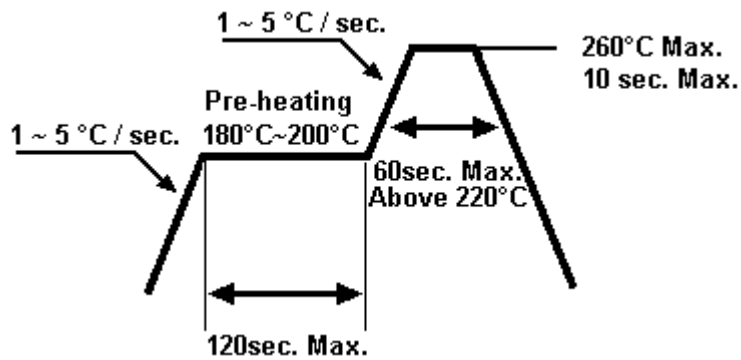
4. Soldering Condition

4.1 Soldering Pad



4.2 For Reflow Process

i. Lead reflow soldering temperature profile



- ii. Reflow soldering should not be done more than two times.
- iii. While soldering, do not put stress on the LEDs during heating.
- iv. After soldering, do not warp the circuit board.