

### EL Mini TOP VIEW LED 2214-C70301H-2T-AM

**Preliminary**



#### Features

- Package : PLCC 2 package
- Color : Cool White
- Typ. Luminance Intensity : 2800 mcd @ 30mA
- Viewing angle : 120°
- ESD : 8KV
- MSL : 2
- Typ.color coordinates : (0.185,0.165)
- Qualified AEC-Q102
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm).

#### Applications

- Automotive Interior Lighting, Exterior Lighting.
- Switches
- Cluster

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# 1. Chadacteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current	$I_F$	6	30	60	mA	---
Luminous Intensity	$I_v$	2400	2800	4000	mcd	$I_F=30\text{mA}$
Forward Voltage	$V_F$	2.75	3.0	3.75	V	$I_F=30\text{mA}$
Viewing Angle	$\phi$	---	120	---	deg	$I_F=30\text{mA}$
Color	CIE x	---	0.315	---		$I_F=30\text{mA}$
Color	CIE y	---	0.315	---	---	$I_F=30\text{mA}$
Thermal Resistance (Junction to Solder)	Real	$R_{th JS real}$	---	---	180	K/W $I_F=30\text{mA}$
	Electrical	$R_{th JS el}$	---	---	140	

## Notes:

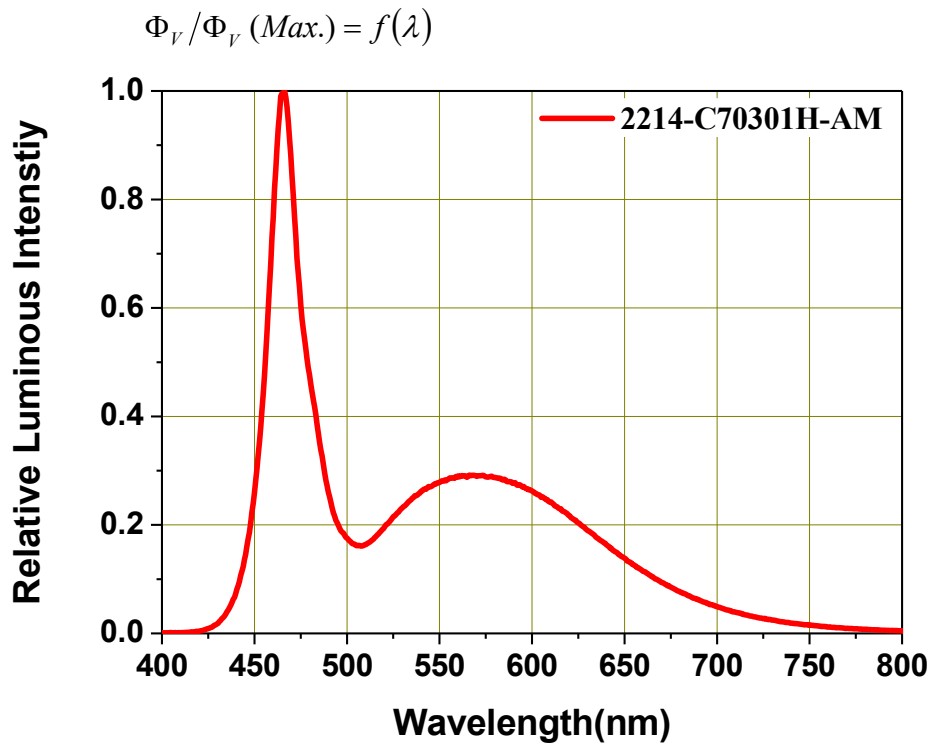
1. Luminous Flux measurement tolerance:  $\pm 8\%$ .
2. The data of Luminous Flux measured at thermal pad= $25^\circ\text{C}$
3. Forward voltage measurement tolerance:  $\pm 0.05\text{V}$
4. Tolerance of Chromaticity Coordinates x,y :  $\pm 0.005$

## 2. Absolute Maximum Ratings

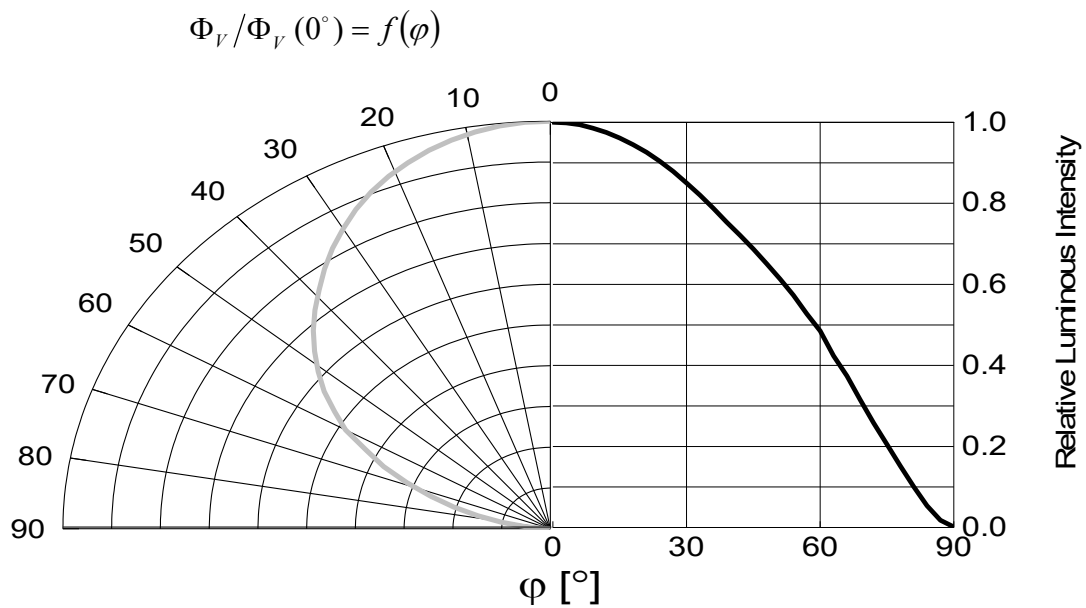
Parameter	Symbol	Ratings	Unit
Power Dissipation	$P_d$	225	mW
Forward Current	$I_F$	60	mA
Surge Current ( $t \leq 10 \mu s$ ; $D=0.005$ ; $T_s=25 \text{ }^\circ\text{C}$ )	$I_{FM}$	250	mA
Reverse Voltage	$V_R$	Not designed for reverse operation	V
Junction Temperature	$T_J$	125	$^\circ\text{C}$
Operating Temperature	$T_{opr}$	-40 ~ +110	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +110	$^\circ\text{C}$
ESD Sensitivity ( $R=1.5k\Omega$ , $C=100pF$ )	$ESD_{HBM}$	8	kV
Soldering Temperature	Reflow	260 $^\circ\text{C}$ for 30sec	$^\circ\text{C}$

### 3. Characteristics Graph

**Wavelength Characteristics Relative Spectral Distribution**  
@ Ts = 25°C, If=30mA



**Typical Diagram Characteristics of Radiation**

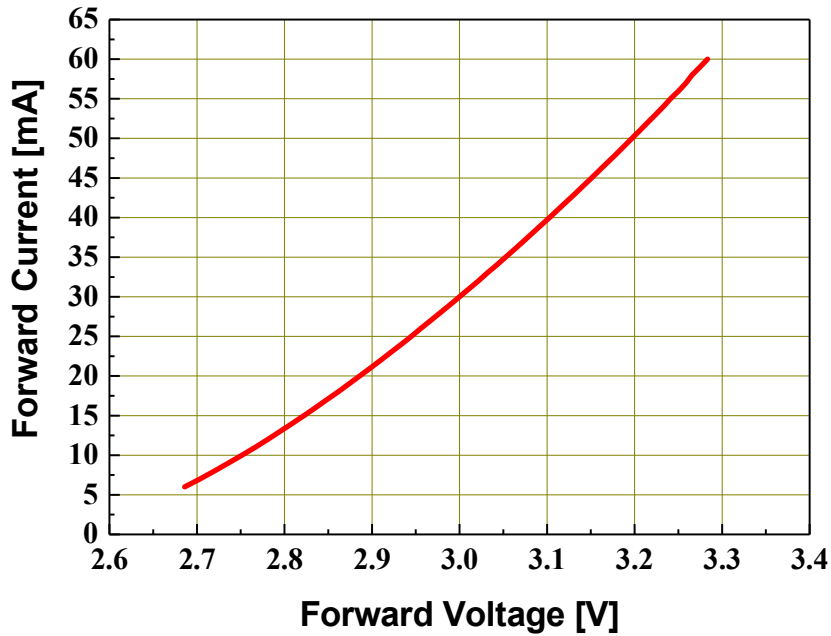


**Notes:**

1.  $\varphi$  is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is  $\pm 5^\circ$ .

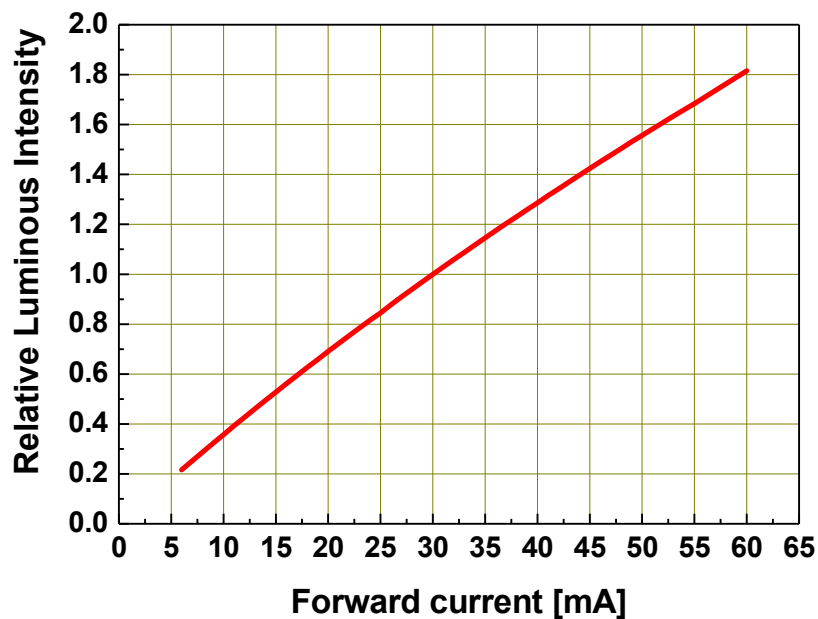
**Forward Current vs. Forward Voltage**  
@ Ts = 25°C

$$I_F = f(V_F)$$



**Relative Luminous Intensity vs. Forward Current**  
@ Ts = 25°C

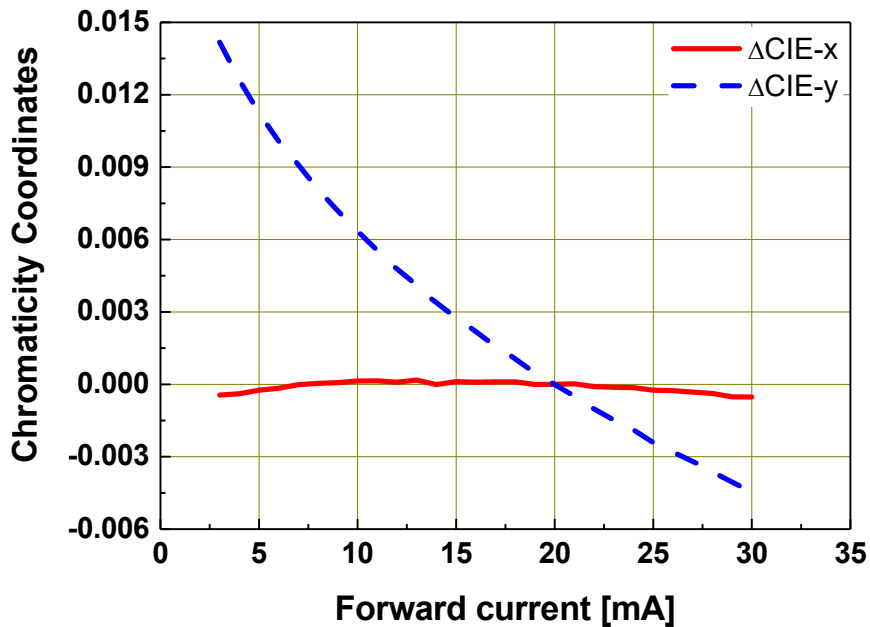
$$\Phi_V / \Phi_V(30mA) = f(I_F)$$



### Chromaticity Coordinates Shift vs. Forward Current

@  $T_s = 25^\circ\text{C}$

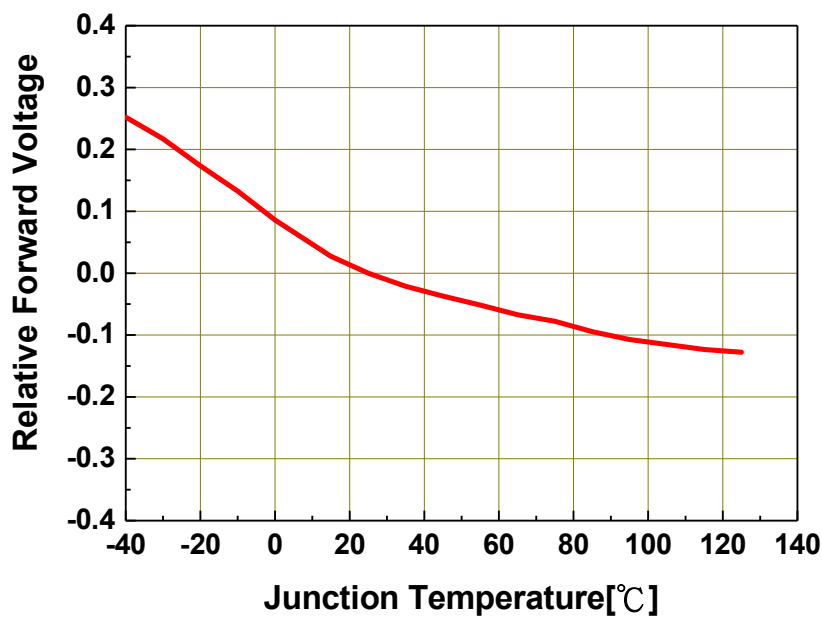
$$\Delta CIE\ x, \Delta CIE\ y = f(I_F)$$



### Relative Forward Voltage vs. Junction Temperature

@  $I_F=30\text{mA}$

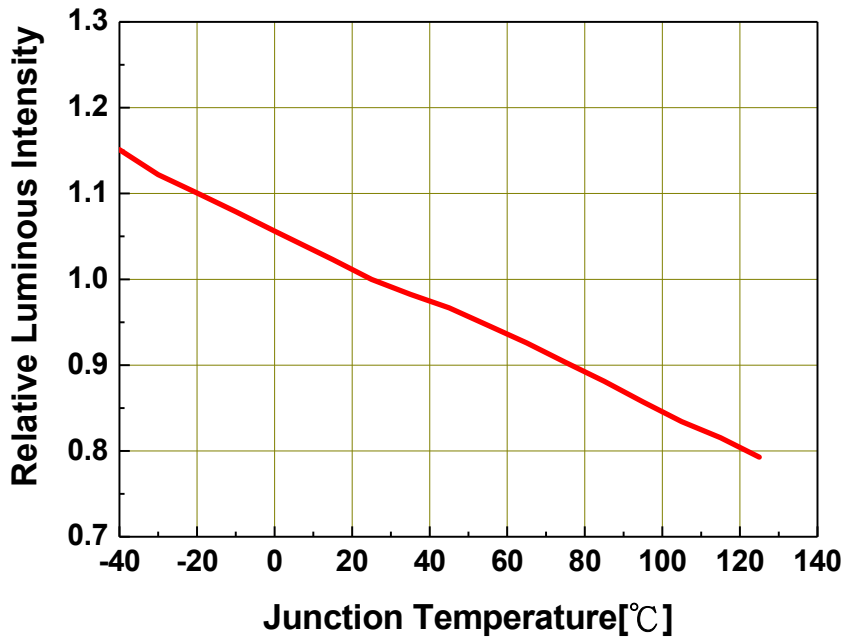
$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j)$$



### Relative Luminous Intensity vs. Junction Temperature

@ I<sub>F</sub>=30mA

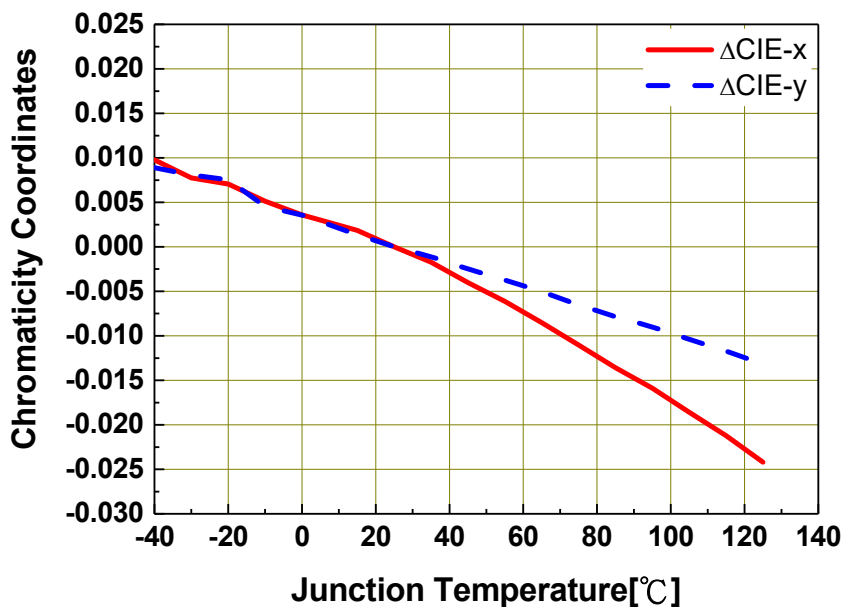
$$\Phi_V / \Phi_V(25^\circ C) = f(T_j)$$



### Chromaticity Coordinates Shift vs. Junction Temperature

@ I<sub>F</sub>=30mA

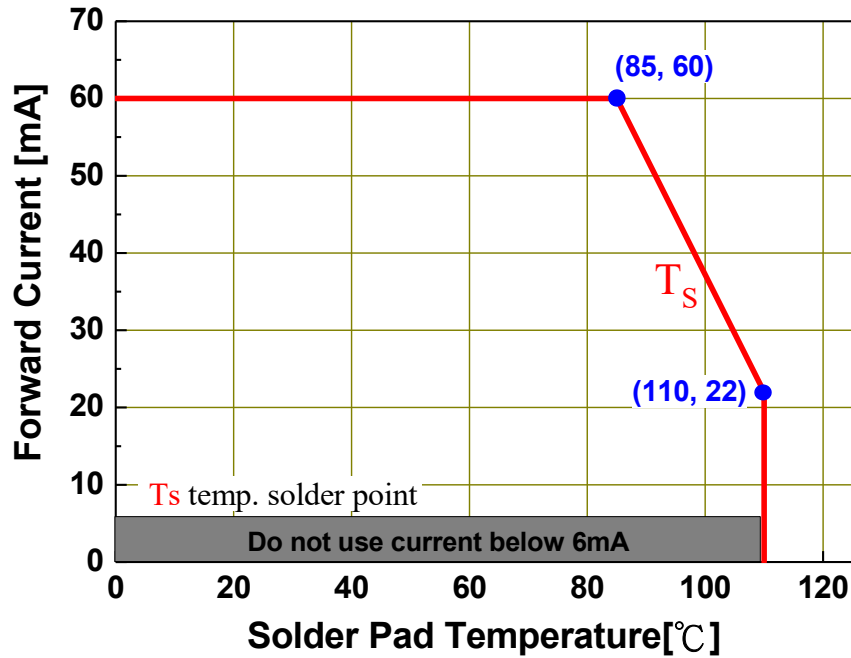
$$\Delta CIE x, \Delta CIE y = f(T_j)$$





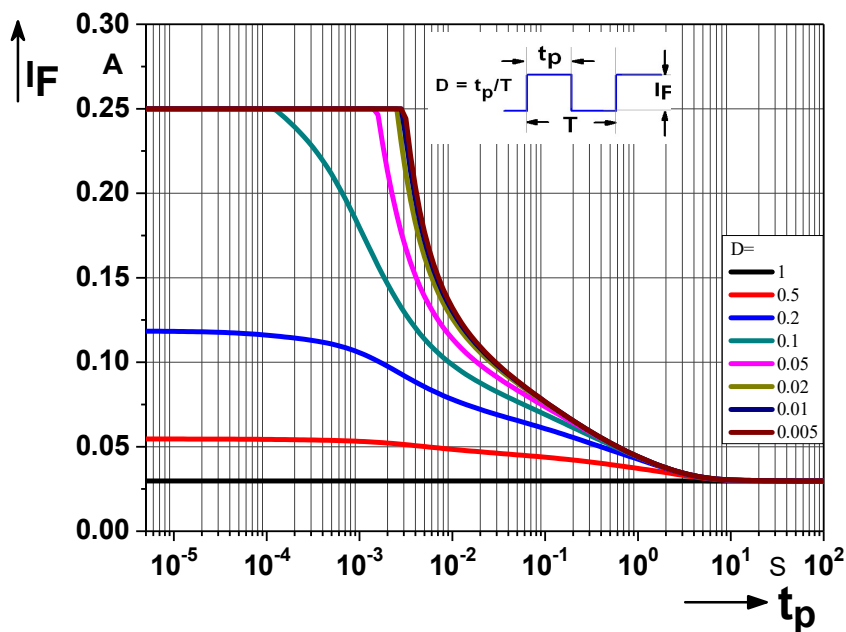
### Forward Current Derating Curve

$$I_F = f(T_S)$$



### Permissible Pulse Handling Capability

D=Duty cycle ,  $T_s = 25^\circ\text{C}$



## 4. Binning Information

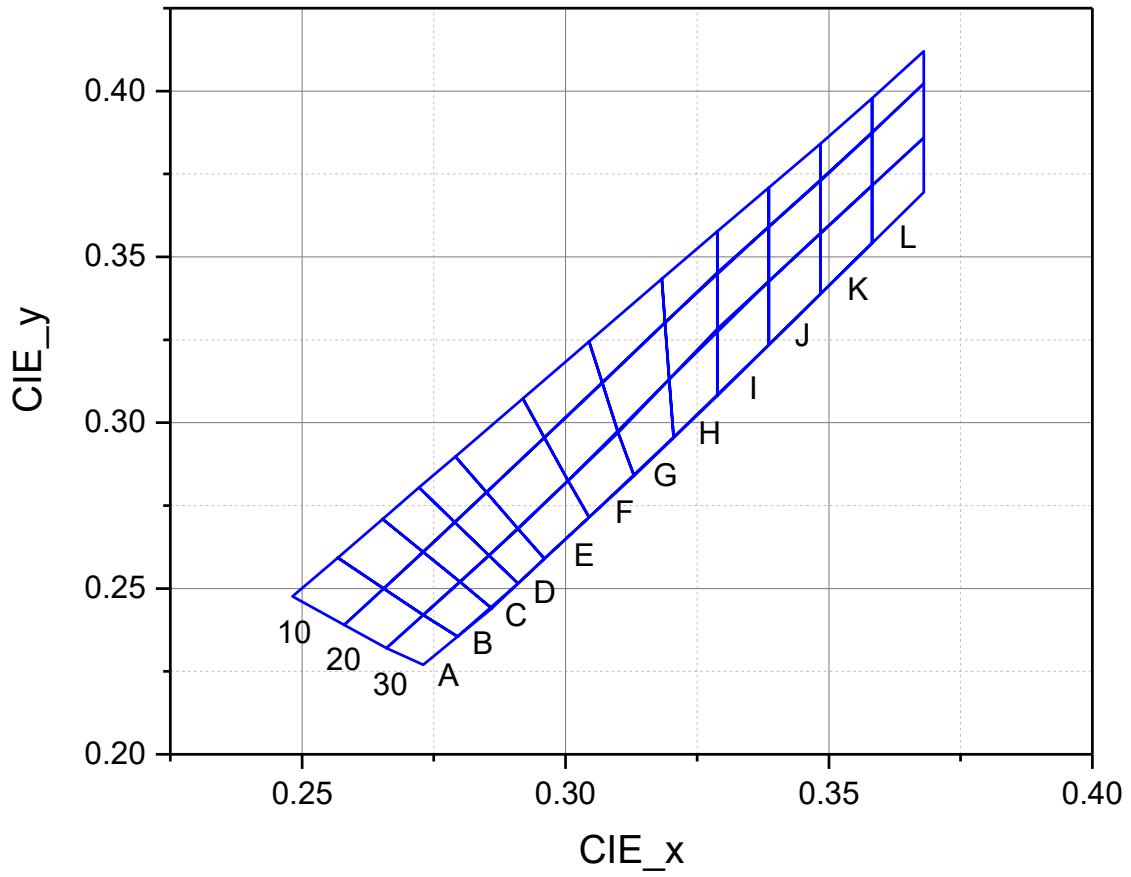
### Luminous Intensity Bins

Group Bin	Minimum Luminous Intensity (mcd)	Maximum Luminous Intensity (mcd)
019	19	23
023	23	27
027	27	32
032	32	38
038	38	45
045	45	53
053	53	63
063	63	75
075	75	90
090	90	105
105	105	125
125	125	150
150	150	180
180	180	210
210	210	250
250	250	300
300	300	360
360	360	430
430	430	500
500	500	600
600	600	720
720	720	860
860	860	1000
1000	1000	1200
1200	1200	1440
1440	1440	1720
1720	1720	2000
2000	2000	2400
2400	2400	2880
2880	2880	3440
3440	3440	4000
4000	4000	4800
4800	4800	5760

**Notes:**

1. Luminous flux measurement tolerance:  $\pm 8\%$ .
2. Highlighted Black Box is possible output bins.

### Standard White Color Bin Structure



### Cool White Color Bin Coordinates

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
10L	0.3582	0.3874	20L	0.3582	0.3715	30L	0.3582	0.3542
	0.3582	0.3978		0.3582	0.3874		0.3582	0.3715
	0.3680	0.4120		0.3680	0.4023		0.3680	0.3859
	0.3680	0.4023		0.3680	0.3859		0.3680	0.3695
10K	0.3484	0.3730	20K	0.3484	0.3571	30K	0.3484	0.3388
	0.3484	0.3841		0.3484	0.3730		0.3484	0.3571
	0.3582	0.3978		0.3582	0.3874		0.3582	0.3715
	0.3582	0.3874		0.3582	0.3715		0.3582	0.3542
10J	0.3386	0.3591	20J	0.3386	0.3426	30J	0.3386	0.3235
	0.3386	0.3709		0.3386	0.3591		0.3386	0.3426
	0.3484	0.3841		0.3484	0.3730		0.3484	0.3571
	0.3484	0.3730		0.3484	0.3571		0.3484	0.3388
10I	0.3288	0.3452	20I	0.3288	0.3282	30I	0.3288	0.3081
	0.3288	0.3577		0.3288	0.3452		0.3288	0.3282
	0.3386	0.3709		0.3386	0.3591		0.3386	0.3426
	0.3386	0.3591		0.3386	0.3426		0.3386	0.3235
10H	0.3189	0.3302	20H	0.3197	0.3131	30H	0.3205	0.2956
	0.3183	0.3434		0.3189	0.3302		0.3197	0.3131
	0.3288	0.3577		0.3288	0.3452		0.3288	0.3282
	0.3288	0.3452		0.3288	0.3282		0.3288	0.3081
10G	0.3070	0.3120	20G	0.3100	0.2970	30G	0.3130	0.2840
	0.3045	0.3245		0.3070	0.3120		0.3100	0.2970
	0.3183	0.3434		0.3189	0.3302		0.3197	0.3131
	0.3189	0.3302		0.3197	0.3131		0.3205	0.2956
10F	0.2960	0.2955	20F	0.3005	0.2825	30F	0.3045	0.2715
	0.2919	0.3073		0.2960	0.2955		0.3005	0.2825
	0.3045	0.3245		0.3070	0.3120		0.3100	0.2970
	0.3070	0.3120		0.3100	0.2970		0.3130	0.2840
10E	0.2850	0.2790	20E	0.2910	0.2680	30E	0.2960	0.2590
	0.2791	0.2898		0.2850	0.2790		0.2910	0.2680
	0.2919	0.3073		0.2960	0.2955		0.3005	0.2825
	0.2960	0.2955		0.3005	0.2825		0.3045	0.2715

**Cool White Color Bin Coordinates**

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	0.3582	0.3978		0.3582	0.3874		0.3582	0.3715
	0.3680	0.4120		0.3680	0.4023		0.3680	0.3859
	0.3680	0.4023		0.3680	0.3859		0.3680	0.3695
10K	0.3484	0.3730	20K	0.3484	0.3571	30K	0.3484	0.3388
	0.3484	0.3841		0.3484	0.3730		0.3484	0.3571
	0.3582	0.3978		0.3582	0.3874		0.3582	0.3715
	0.3582	0.3874		0.3582	0.3715		0.3582	0.3542
10J	0.3386	0.3591	20J	0.3386	0.3426	30J	0.3386	0.3235
	0.3386	0.3709		0.3386	0.3591		0.3386	0.3426
	0.3484	0.3841		0.3484	0.3730		0.3484	0.3571
	0.3484	0.3730		0.3484	0.3571		0.3484	0.3388
10I	0.3288	0.3452	20I	0.3288	0.3282	30I	0.3288	0.3081
	0.3288	0.3577		0.3288	0.3452		0.3288	0.3282
	0.3386	0.3709		0.3386	0.3591		0.3386	0.3426
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10H	0.3189	0.3302	20H	0.3197	0.3131	30H	0.3205	0.2956
	0.3183	0.3434		0.3189	0.3302		0.3197	0.3131
	0.3288	0.3577		0.3288	0.3452		0.3288	0.3282
	0.3288	0.3452		0.3288	0.3282		0.3288	0.3081
10G	0.3070	0.3120	20G	0.3100	0.2970	30G	0.3130	0.2840
	0.3045	0.3245		0.3070	0.3120		0.3100	0.2970
	0.3183	0.3434		0.3189	0.3302		0.3197	0.3131
	0.3189	0.3302		0.3197	0.3131		0.3205	0.2956
10F	0.2960	0.2955	20F	0.3005	0.2825	30F	0.3045	0.2715
	0.2919	0.3073		0.2960	0.2955		0.3005	0.2825
	0.3045	0.3245		0.3070	0.3120		0.3100	0.2970
	0.3070	0.3120		0.3100	0.2970		0.3130	0.2840
10E	0.2850	0.2790	20E	0.2910	0.2680	30E	0.2960	0.2590
	0.2791	0.2898		0.2850	0.2790		0.2910	0.2680
	0.2919	0.3073		0.2960	0.2955		0.3005	0.2825
	0.2960	0.2955		0.3005	0.2825		0.3045	0.2715

## 5. Part Number

### 2214-C70301H-AM

Part number is designated with below details.

2214 = Product family name.

C = Color <sup>[1]</sup>

7 = CRI (0=N/A; >70=7; >80=8; >90=9)

030 = Test current [mA]

1 = Lead Frame Type ( 0=Ag ; 1=Au )

H = Chip Code

AM = Automotive application

Note

[1] Color :

Symbol	Description
C	Cool White
N	Neutral White
W	Warm White
PA	Phosphor Converted Amber
PR	Phosphor Converted Red
UB	Blue
IB	Ice Blue
SB	Sky Blue
UP	Purple
UG	Green
UY	Yellow
UYG	Brilliant Yellow Green
UPG	Pale Green
UA	Amber
UR	Red
SR	Super Red
RGB	RGB-Color
PYG	Phosphor Converted Yellow Green

## 6. Ordering Information

### 2214-C70301H-**ABCDEFGHIJKLMNOPQ**-2T-AM

Part Number of the 2214	Order Code
2214-C70301H-AM	2214-C70301H-ABCDEFGHIJKLMNOPQ-2T-AM

Order code contains information with below details :

ABCDEF = min/max wavelength or CCT

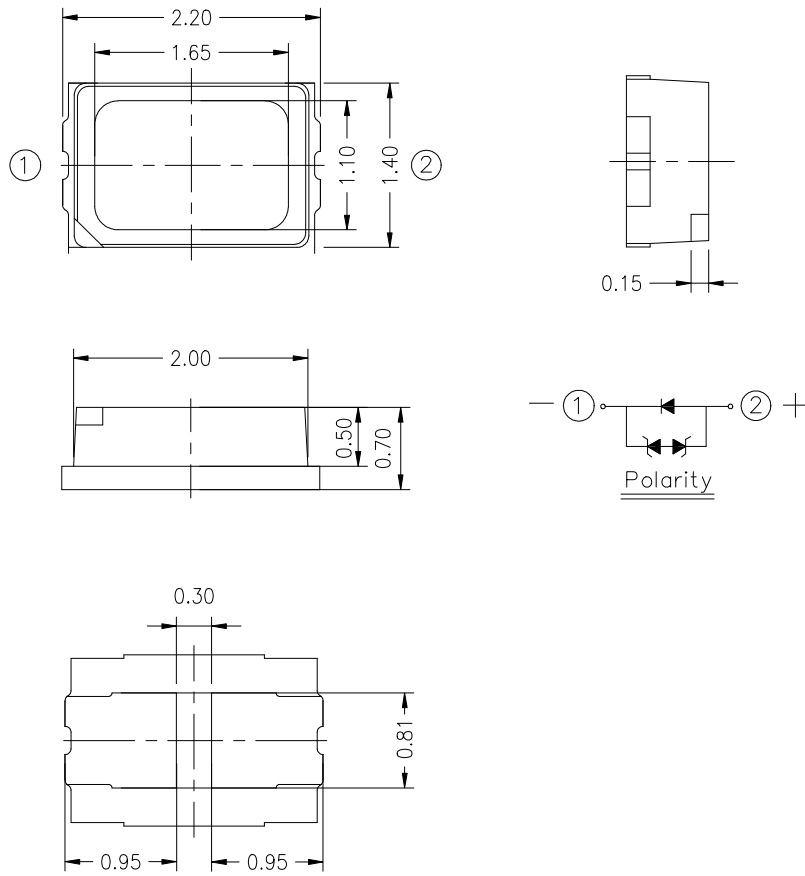
GHJKLM = min./max. luminous flux in [lm] or luminous intensity in [mcd]

NOPQ = min./max. forward voltage

2T = internal code

AM = Automotive Application

## 7. Mechanical Dimension

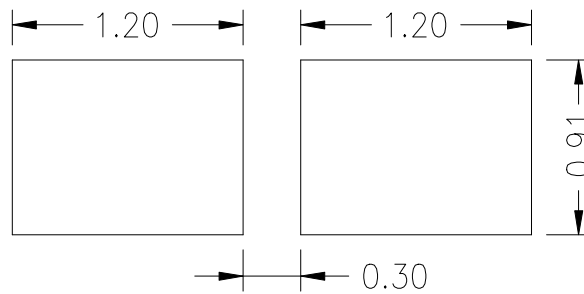


### Notes:

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

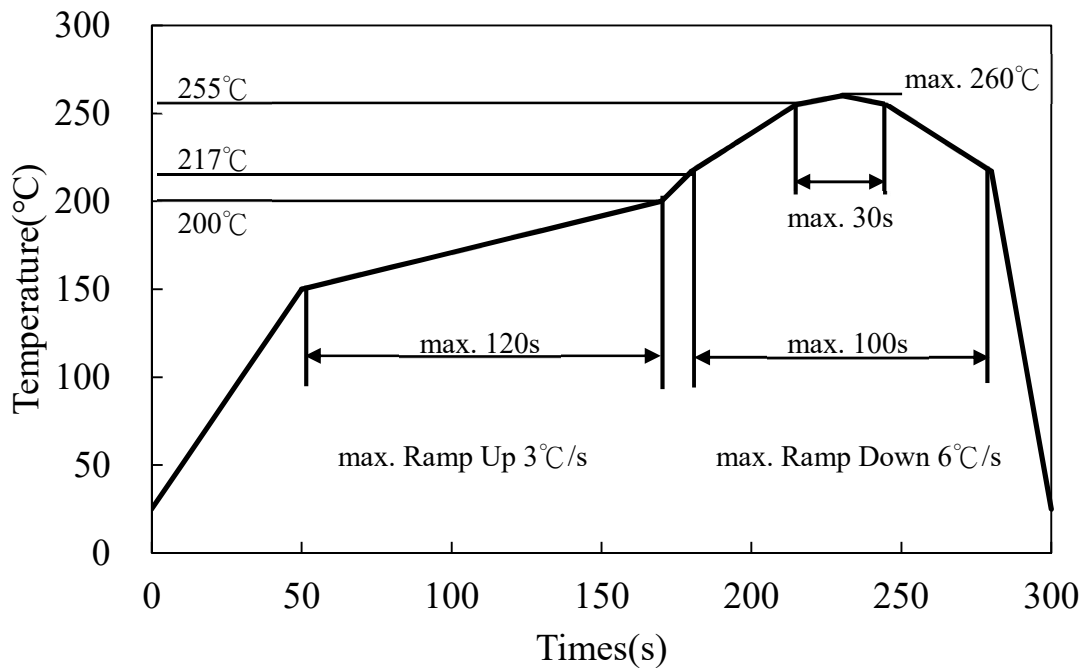


## 8. Recommended Soldering Pad



## 9. Reflow Soldering Profile

Soldering Condition (Reference: IPC/JEDEC J-STD-020D)



Profile Feature	Pb-Free Assembly	Unit
	Recommendation	
Ramp-up rate to preheat 25 °C to 150 °C	3	°C /sec
Time of soaking zone 150 °C to 200 °C	120	sec
Ramp-up rate to peak	3	°C /sec
Liquidus temperature	217	°C
Time above liquidus temperature	100	sec
Peak temperature (max.)	260	°C
Time within 5°C of the specified peak temperature	30	sec
Ramp-down Rate (max.)	6	°C /sec

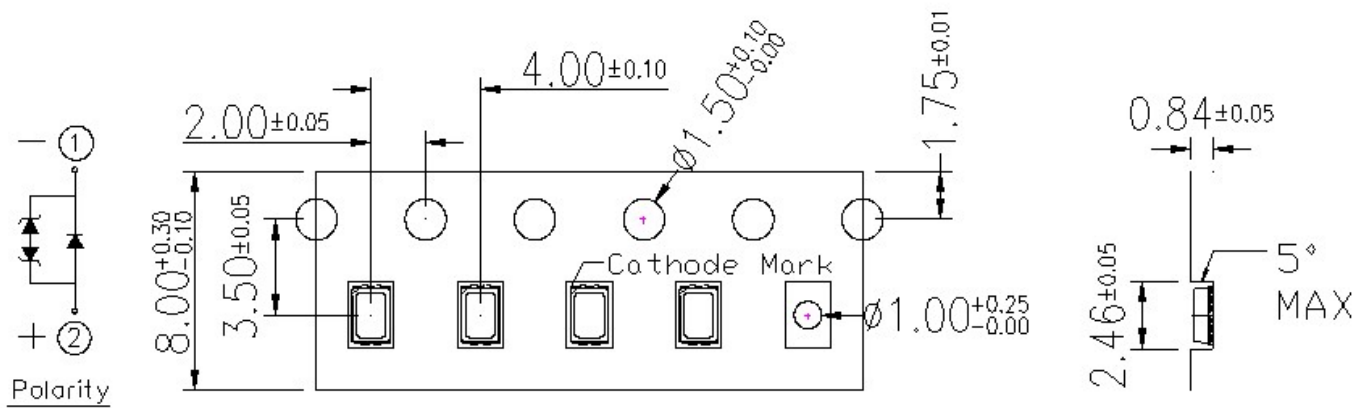
## 10. Packaging Information

### • Product Labeling



- CPN : Customer's Product Number
- P/N : Everlight Part Number
- QTY : Packing Quantity
- CAT : Luminous Flux (Brightness) Bin
- HUE : Color Bin
- REF : Forward Voltage Bin
- LOT No : Lot Number

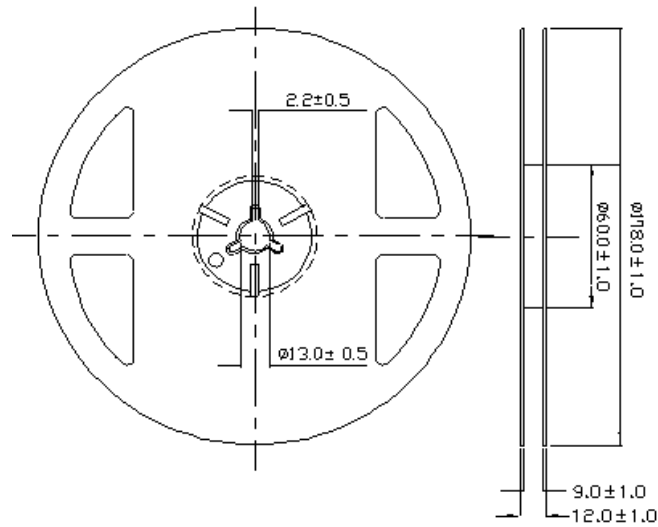
### • Packing: Loaded Quantity 2000 pcs Per Reel



#### Notes:

1. Dimensions are in millimeters.

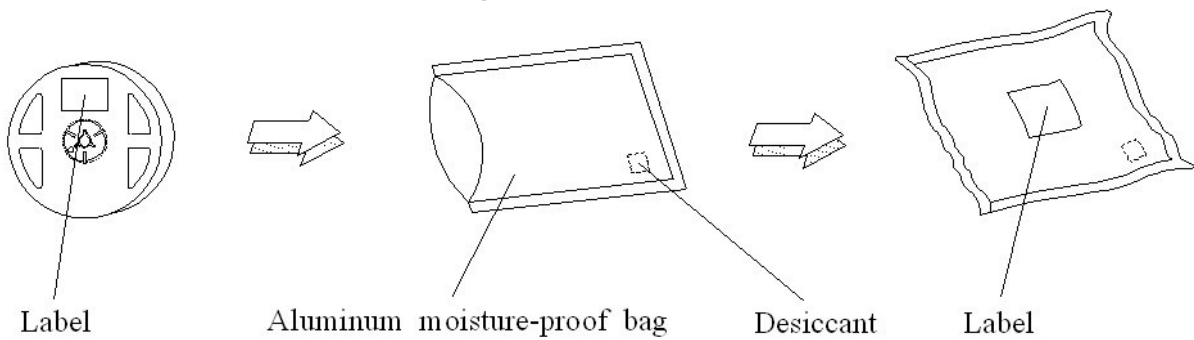
● **Reel Dimensions**



**Notes:**

1. Dimensions are in millimeters.

● **Moisture Resistant Packing Process**



## 11. Precaution for Use

### 1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (burn out will happen).

### 2. Assemblies

Do not stack assemblies containing LEDs to prevent damage to the optical surface of LEDs. Forces applied to the optical surface may result in the surface being damaged.

### 3. Soldering Condition

3.1 When soldering, do not put stress on the LEDs during heating.

3.2 After soldering, do not warp the circuit board.

### 4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

### 5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

