

EL Mini TOP VIEW LED

Preliminary

2214-C70201H-AM



Features

- Package : PLCC 2 package
- Color : Cool White
- Typ. Luminance Intensity : 1200 mcd @ 20mA
- Viewing angle : 120°
- ESD : 8KV
- MSL : 2
- Type. color coordinates : CIE-X 0.3,CIE-Y 0.3
- 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
- Switches
- Cluster

Contents

1.Characteristics	3
2.Absolute Maximum Ratings	4
3.Characteristics Graph	5
4.Binning Information	10
5.Part Number	15
6. Ordering Information	16
7. Mechanical Dimension	17
8. Recommended Soldering Pad	18
9. Reflow Soldering Profile	18
10. Packaging Information.....	19
11. Precaution for Use	21

1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current		I_F	3	20	30	mA	---
Luminous Intensity		I_V	900	1200	1800	mcd	$I_F=20\text{mA}$
Forward Voltage		V_F	2.75	3.1	3.75	V	$I_F=20\text{mA}$
Viewing Angle		ϕ	---	120	---	deg	$I_F=20\text{mA}$
Color		CIE x	---	0.3	---		$I_F=20\text{mA}$
Color		CIE y	---	0.3	---	---	$I_F=20\text{mA}$
Thermal Resistance (Junction to Solder)	Real	$R_{th JS \text{ real}}$	---	---	186	K/W	$I_F=20\text{mA}$
	Electrical	$R_{th JS \text{ el}}$	---	---	146		

Notes:

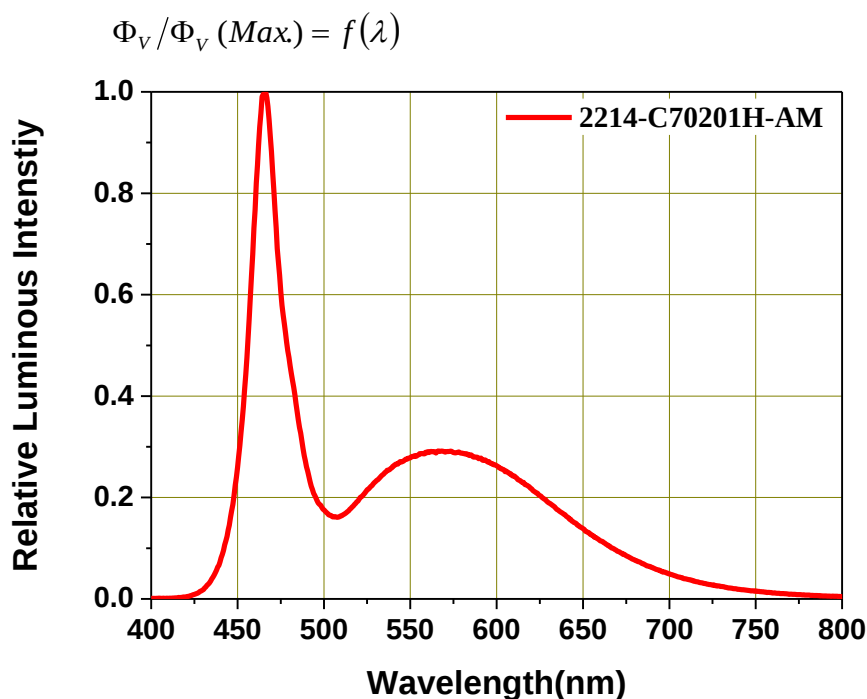
1. Luminous Intensity measurement tolerance: $\pm 8\%$.
2. The data of Luminous Intensity measured at thermal pad=25°C
3. Forward voltage measurement tolerance: $\pm 0.05\text{V}$
4. Tolerance of Chromaticity Coordinates x,y : ± 0.005

2. Absolute Maximum Ratings

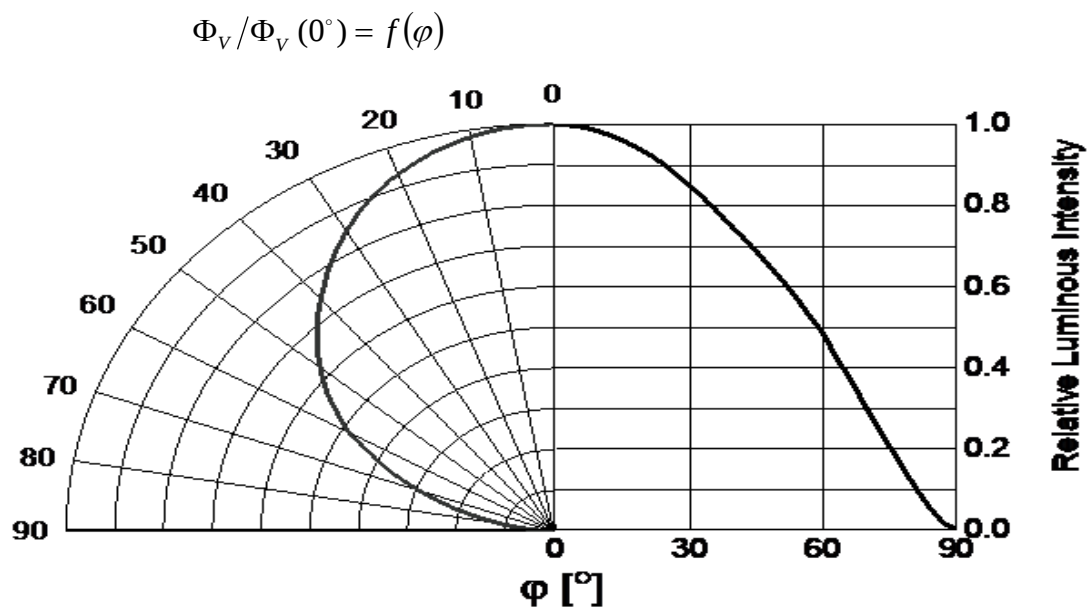
Parameter	Symbol	Ratings	Unit
Power Dissipation	P_d	112	mW
Forward Current	I_F	30	mA
Surge Current ($t \leq 10 \mu s$; $D=0.005$; $T_s=25^\circ C$)	I_{FM}	250	mA
Reverse Voltage	V_R	Not designed for reverse operation	V
Junction Temperature	T_J	125	$^\circ C$
Operating Temperature	T_{opr}	-40 ~ +110	$^\circ C$
Storage Temperature	T_{stg}	-40 ~ +110	$^\circ C$
ESD Sensitivity ($R=1.5k\Omega$, $C=100pF$)	ESD_{HBM}	8	kV
Soldering Temperature	Reflow	260 $^\circ C$ for 30sec	$^\circ C$

3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution
@ Ts = 25°C, If=20mA



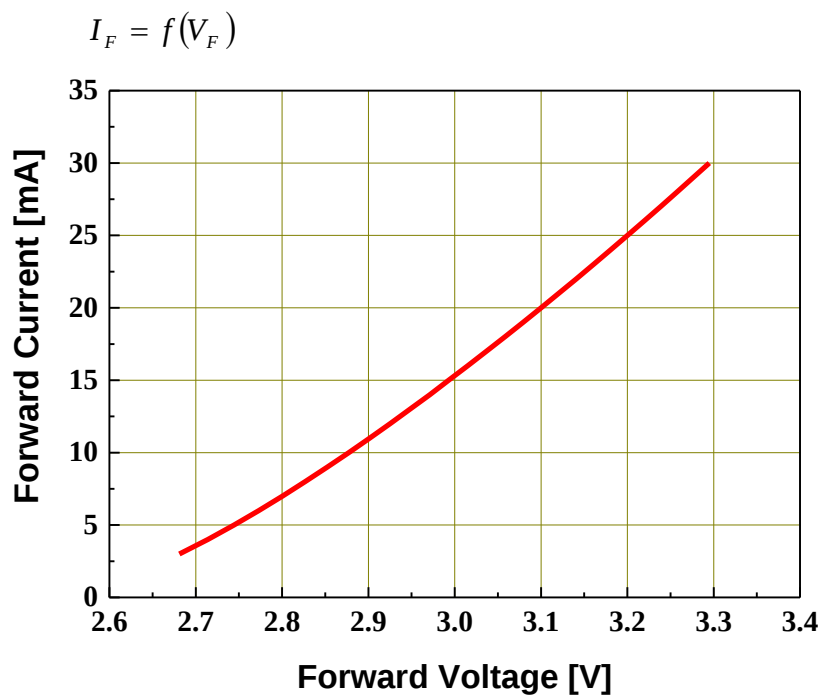
Typical Diagram Characteristics of Radiation



Notes:

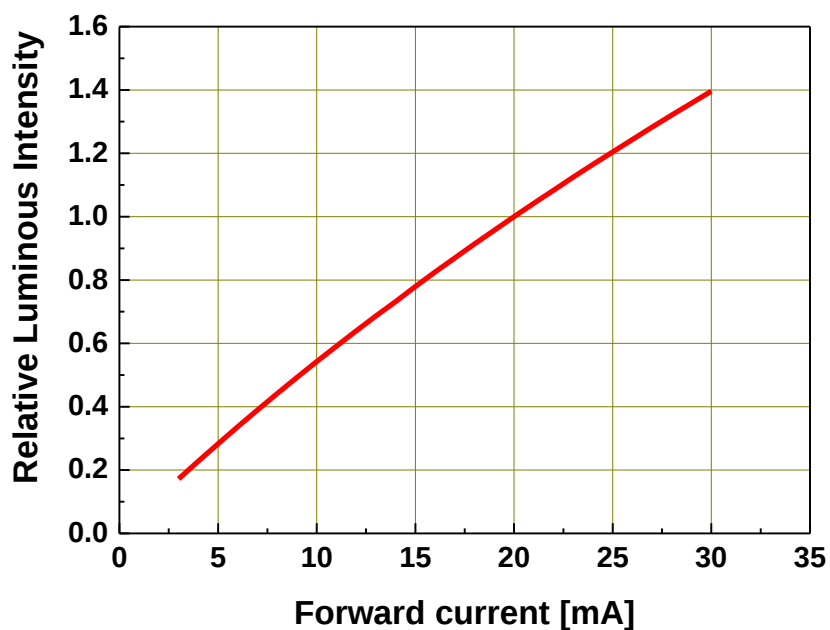
1. φ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is $\pm 5^\circ$.

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



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

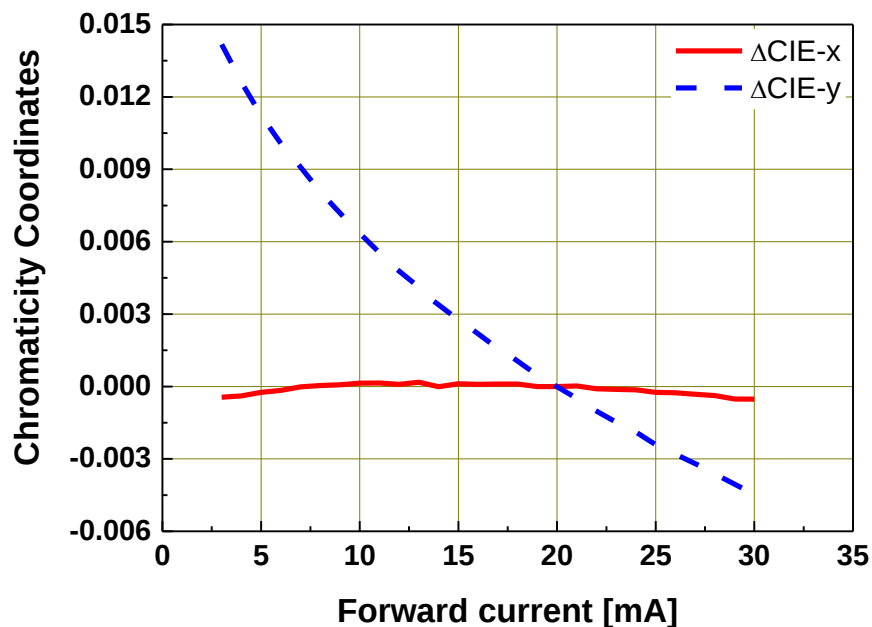
$\Phi_V / \Phi_V(20mA) = f(I_F)$



Chromaticity Coordinates Shift vs. Forward Current

@ Ts = 25°C

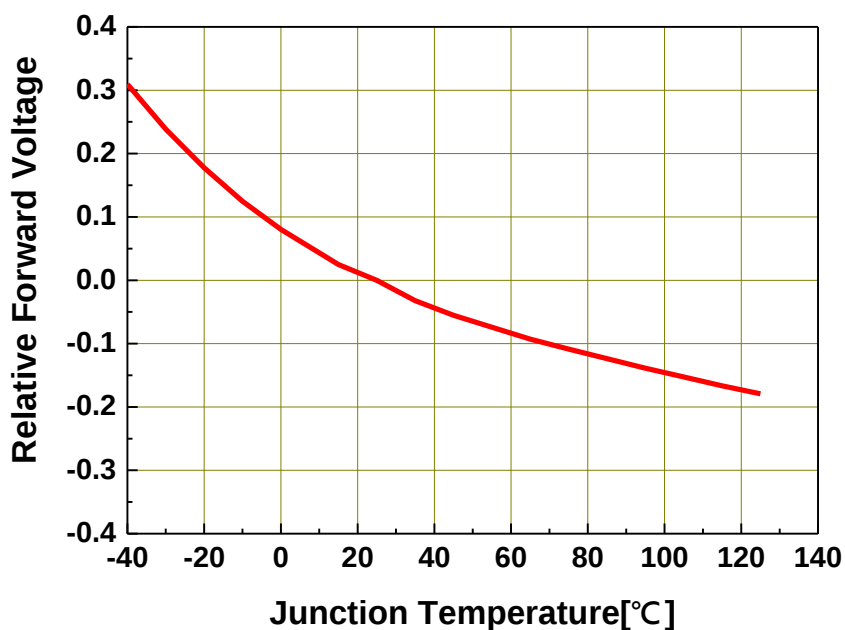
$$\Delta CIE\ x, \Delta CIE\ y = f(I_F)$$



Relative Forward Voltage vs. Junction Temperature

@ If=20mA

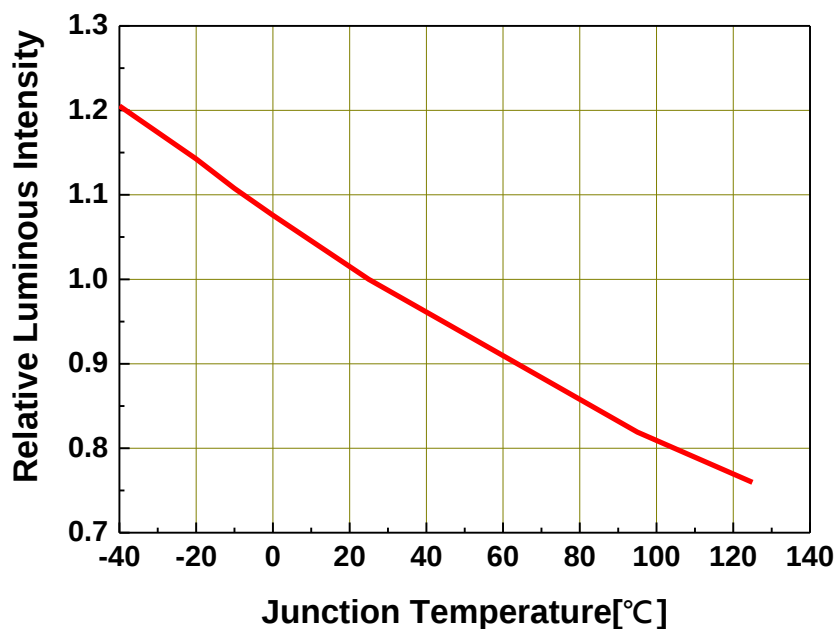
$$\Delta V_F = V_F - V_F(25^\circ C) = f(T_j)$$



Relative Luminous Intensity vs. Junction Temperature

@ $I_F=20\text{mA}$

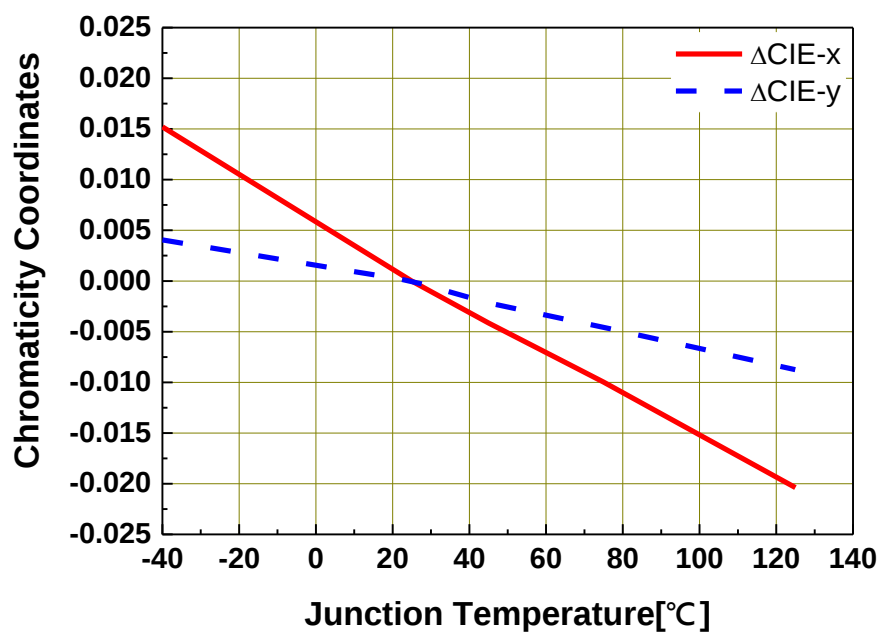
$$\Phi_V / \Phi_V(25^\circ\text{C}) = f(T_j)$$



Chromaticity Coordinates Shift vs. Junction Temperature

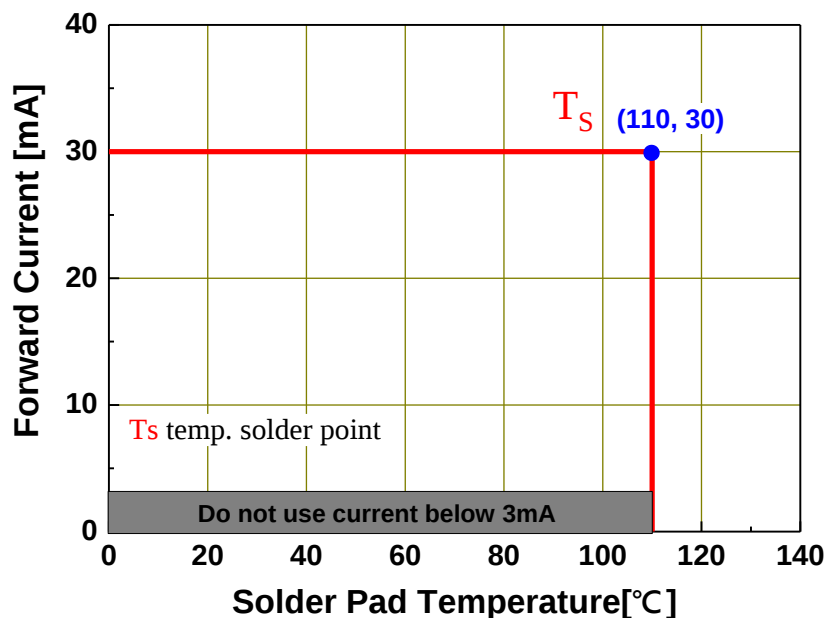
@ $I_F=20\text{mA}$

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



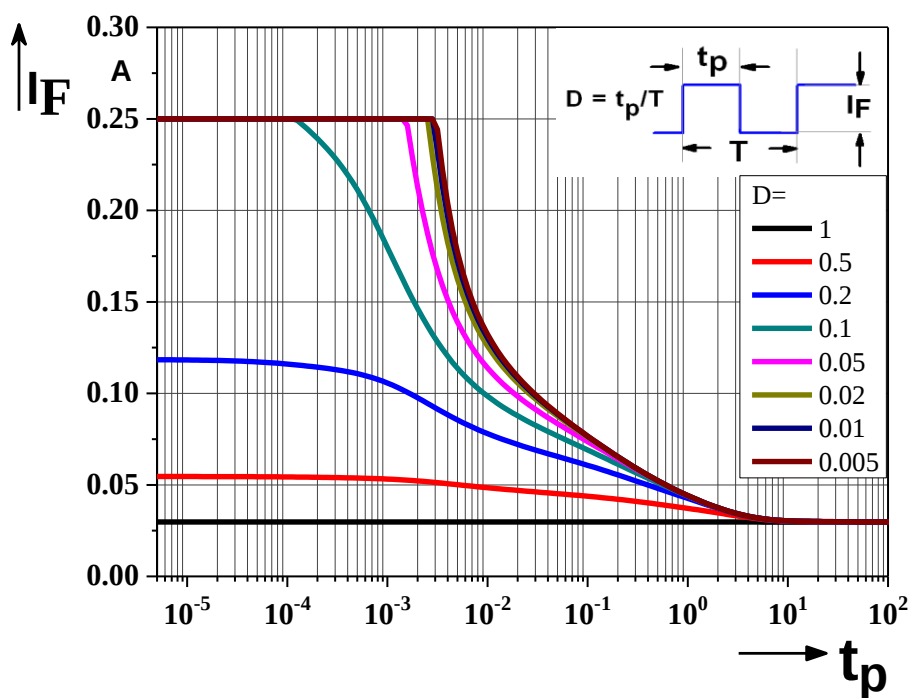
Forward Current Derating Curve

$$I_F = f(T_S)$$



Permissible Pulse Handling Capability

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



4. Binning Information

Luminous Intensity Bins

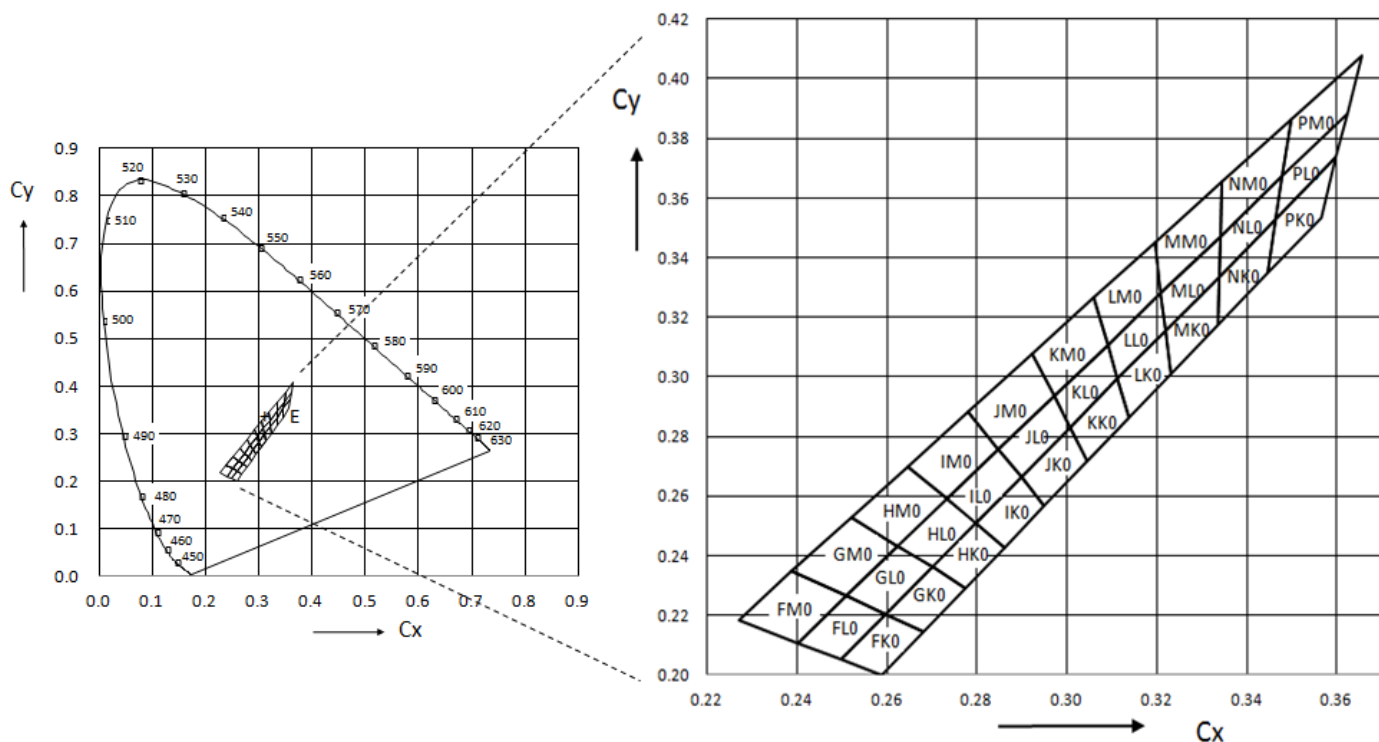
in code	Min Luminous Intensity [mcd]	Max Luminous Intensity [mcd]
V2	900	1120
AA	1120	1400
AB	1400	1800

Notes:

1. Luminous Intensity measurement tolerance: $\pm 8\%$.

Product Binning

Cool White Color Bin Structure



Cool White Bin Coordinates

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
FK0	0.2589	0.2000	NK0	0.3339	0.3336
	0.2498	0.2053		0.3335	0.3172
	0.2597	0.2204		0.3447	0.3347
	0.2682	0.2146		0.3465	0.3530
GK0	0.2682	0.2146	PK0	0.3465	0.3530
	0.2597	0.2204		0.3447	0.3347
	0.2700	0.2361		0.3567	0.3535
	0.2775	0.2292		0.3599	0.3735
HK0	0.2775	0.2292	FL0	0.2498	0.2053
	0.2700	0.2361		0.2402	0.2108
	0.2797	0.2509		0.2509	0.2264
	0.2861	0.2427		0.2597	0.2204
IK0	0.2861	0.2427	GL0	0.2597	0.2204
	0.2797	0.2509		0.2509	0.2264
	0.2898	0.2664		0.2624	0.2431
	0.2950	0.2568		0.2700	0.2361

JK0	0.2950	0.2568	HLO	0.2700	0.2361
	0.2898	0.2664		0.2624	0.2431
	0.3007	0.2830		0.2733	0.2590
	0.3045	0.2717		0.2797	0.2509
KK0	0.3045	0.2717	ILO	0.2797	0.2509
	0.3007	0.2830		0.2733	0.2590
	0.3113	0.2992		0.2848	0.2757
	0.3138	0.2862		0.2898	0.2664
LK0	0.3138	0.2862	JLO	0.2898	0.2664
	0.3113	0.2992		0.2848	0.2757
	0.3219	0.3154		0.2971	0.2935
	0.3231	0.3008		0.3007	0.2830
MK0	0.3339	0.3336	KLO	0.3007	0.2830
	0.3219	0.3154		0.2971	0.2935
	0.3231	0.3008		0.3090	0.3108
	0.3335	0.3172		0.3113	0.2992
LLO	0.3113	0.2992	IMO	0.2733	0.2590
	0.3090	0.3108		0.2646	0.2700
	0.3209	0.3281		0.2780	0.2883
	0.3219	0.3154		0.2848	0.2757
MLO	0.3341	0.3472	JMO	0.2848	0.2757
	0.3209	0.3281		0.2780	0.2883
	0.3219	0.3154		0.2922	0.3077
	0.3339	0.3336		0.2971	0.2935
NLO	0.3341	0.3472	KMO	0.2971	0.2935
	0.3339	0.3336		0.2922	0.3077
	0.3465	0.3530		0.3060	0.3266
	0.3479	0.3673		0.3090	0.3108
PLO	0.3479	0.3673	LMO	0.3090	0.3108
	0.3465	0.3530		0.3060	0.3266
	0.3599	0.3735		0.3196	0.3451
	0.3623	0.3882		0.3209	0.3281
FM0	0.2388	0.2348	MM0	0.3345	0.3654
	0.2269	0.2185		0.3196	0.3451
	0.2402	0.2108		0.3209	0.3281
	0.2509	0.2264		0.3341	0.3472
GM0	0.2509	0.2264	NM0	0.3345	0.3654
	0.2388	0.2348		0.3341	0.3472

	0.2520	0.2527		0.3479	0.3673
	0.2624	0.2431		0.3498	0.3863
HM0	0.2624	0.2431	PM0	0.3498	0.3863
	0.2520	0.2527		0.3479	0.3673
	0.2646	0.2700		0.3623	0.3882
	0.2733	0.2590		0.3655	0.4079

Notes:

1. Color coordinates measurement allowance: ± 0.005

Forward Voltage Bins

Bin	Minimum Forward Voltage [V]	Maximum Forward Voltage [V]
2730	2.75	3.00
3032	3.00	3.25
3235	3.25	3.50
3537	3.50	3.75

Notes:

1. Forward voltage measurement tolerance: $\pm 0.05\text{V}$.
2. Forward voltage bins are defined at $I_F = 20\text{mA}$ operation.

5. Part Number

2214-C70201H-AM

Part number is designated with below details.

2214 = Product family name.

C = Color ^[1]

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

020 = Test current [mA]

1 = internal code

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-C70201H- ABCDEFGHIJKLMNOP-QR-AM

Part Number of the 2214	Order Code
2214-C70201H-AM	2214-C70201H-ABCDEFGHIJKLMNOP-QR-AM

Order code contains information with below details :

ABCDEF = min/max wavelength or CCT

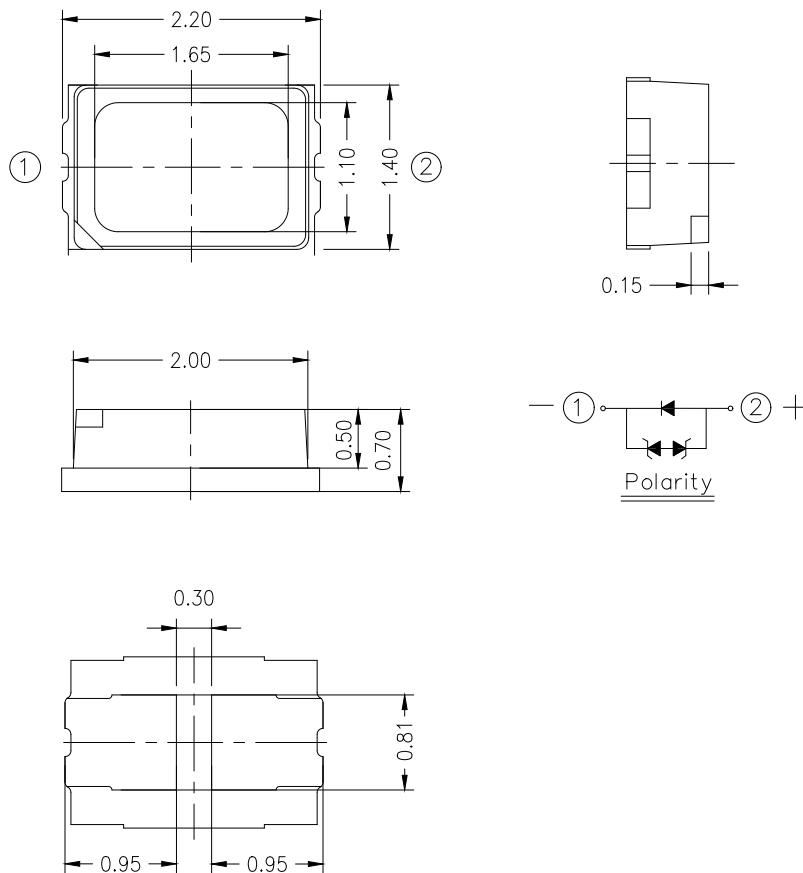
GHIJKL = min./max. luminous flux in [lm] or luminous intensity in [mcd]

MNOP = min./max. forward voltage

QR = internal code

AM = Automotive Application

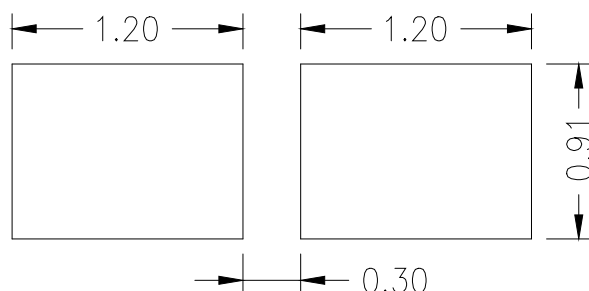
7. Mechanical Dimension



Notes:

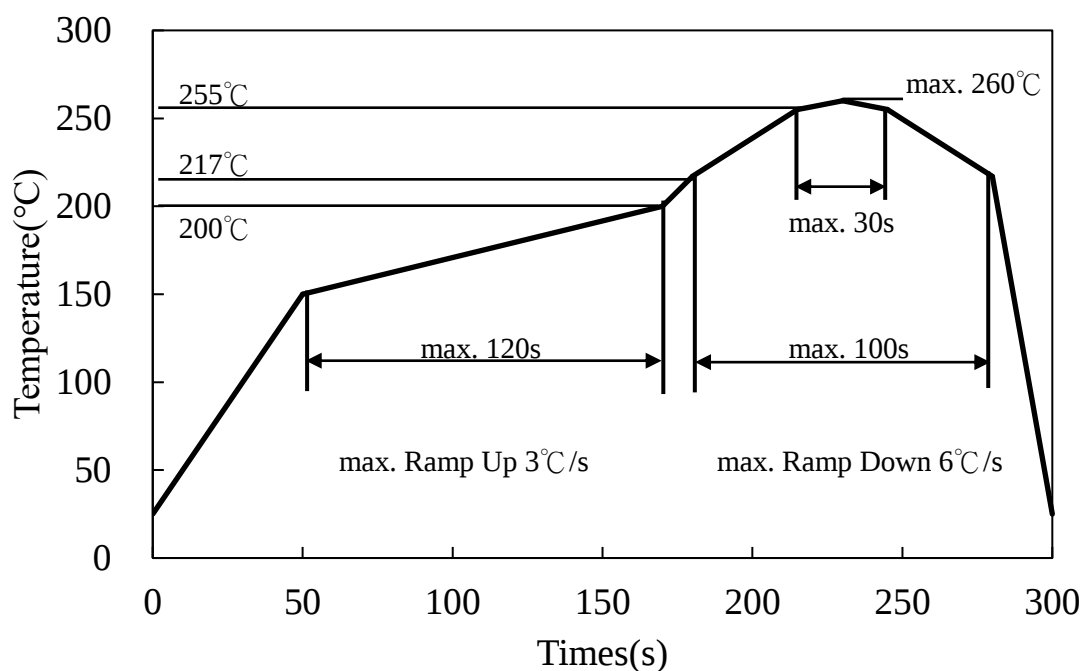
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$.

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

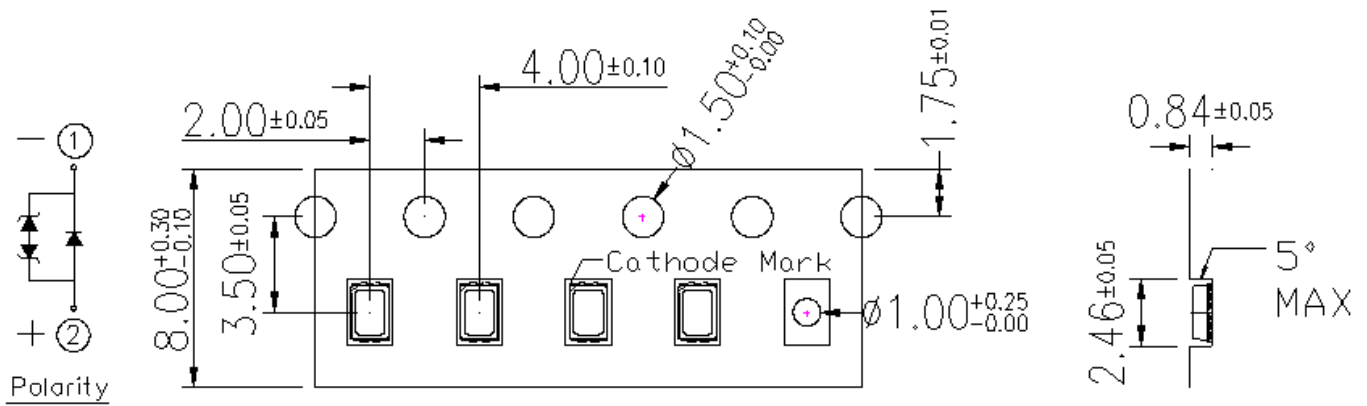
10. Packaging Information

• 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

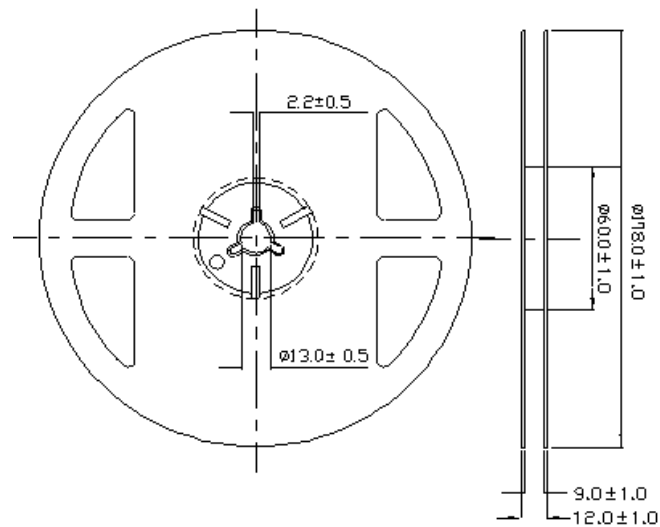
• Packing: Loaded Quantity 2000 pcs Per Reel



Notes:

1. Dimensions are in millimeters.

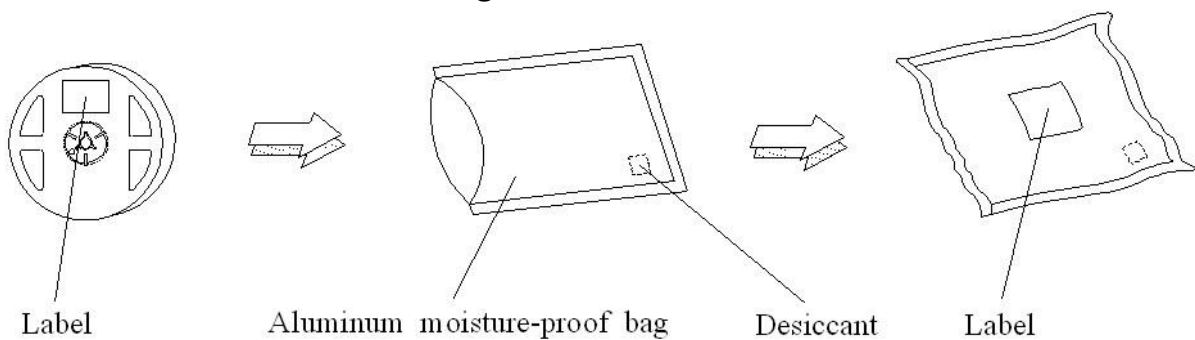
- Reel Dimensions



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.

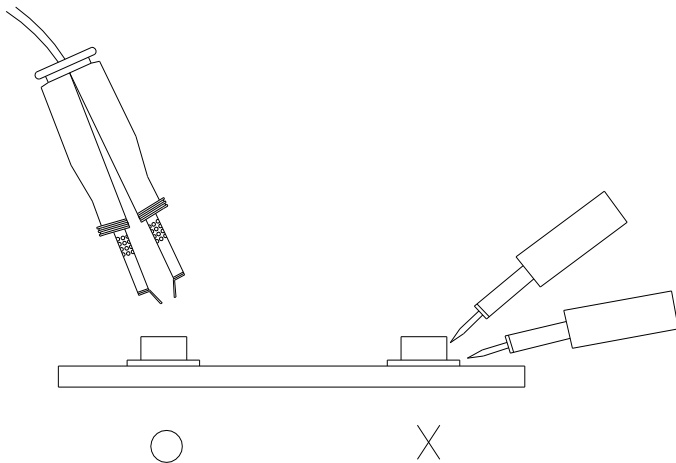
3.2 After soldering, do not warp the circuit board.

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.



Revision History

Current version: 17.Feb.2023

Issue No: DSE-00XXXXX

Version: 1

Rev.	Subjects (major change in previous version)	Modified date
0.1	Preliminary	2023/02/17