DATASHEET

EVERLIGHT AUTOMOTIVE

EL Mini TOP VIEW LED

Preliminary

2214-C70201H-AM(EMM)



Features

- Package：PLCC 2 package
- Color：Cool White
- Typ. Luminance Intensity：2240 mcd @ 20mA
- Viewing angle：120º
- ESD：8KV
- MSL：2
- Type. color coordinates : CIE-X 0.29,CIE-Y 0.27
- Qualified AEC-Q101
- 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

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1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current		I_F	3	20	30	mA	---
Luminous Intensity		I_V	1800	2240	3550	mcd	I_F=20mA
Forward Voltage		V_F	2.75	3.10	3.50	V	I_F=20mA
Viewing Angle		φ	---	120	---	deg	I_F=20mA
Color		CIE x	---	0.29	---		I_F=20mA
Color		CIE y	---	0.27	---	---	I_F=20mA
Thermal Resistance (Junction to Solder)	Real	$R_{th\ JS\ real}$	---	---	186	K/W	I_F=20mA
	Electrical	$R_{th\ JS\ el}$	---	---	146		

Notes:

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

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2. Absolute Maximum Ratings

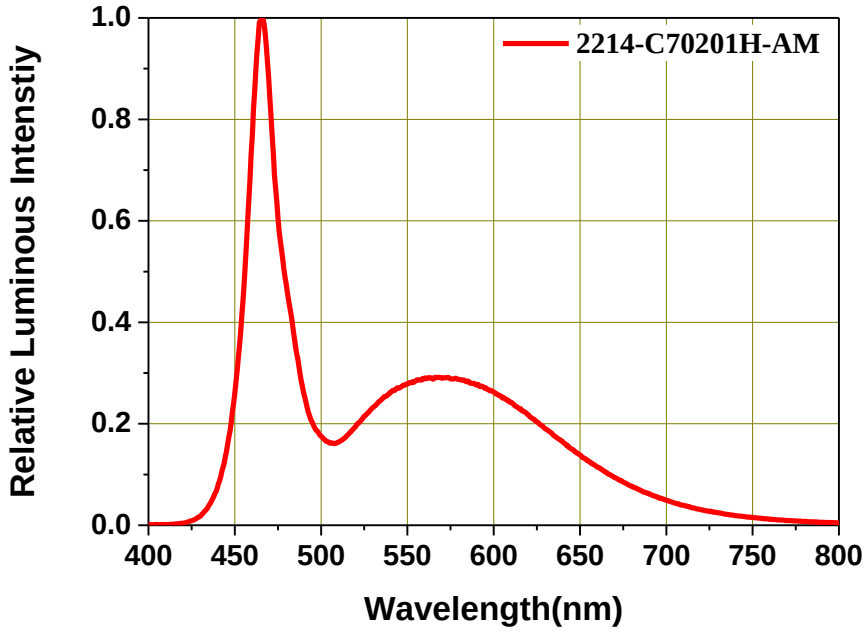
Parameter	Symbol	Ratings	Unit
Power Dissipation	P_d	105	mW
Forward Current	I_F	30	mA
Surge Current (t<=10 μs; D=0.005; T_s=25 ℃)	I_{FM}	250	mA
Reverse Voltage	V_R	Not designed for reverse operation	V
Junction Temperature	T_J	125	°C
Operating Temperature	T_{opr}	-40 ~ +110	°C
Storage Temperature	T_{stg}	-40 ~ +110	°C
ESD Sensitivity (R=1.5kΩ, C= 100pF)	ESD_{HBM}	8	kV
Soldering Temperature	Reflow	260°C for 30sec	°C

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3. Characteristics Graph

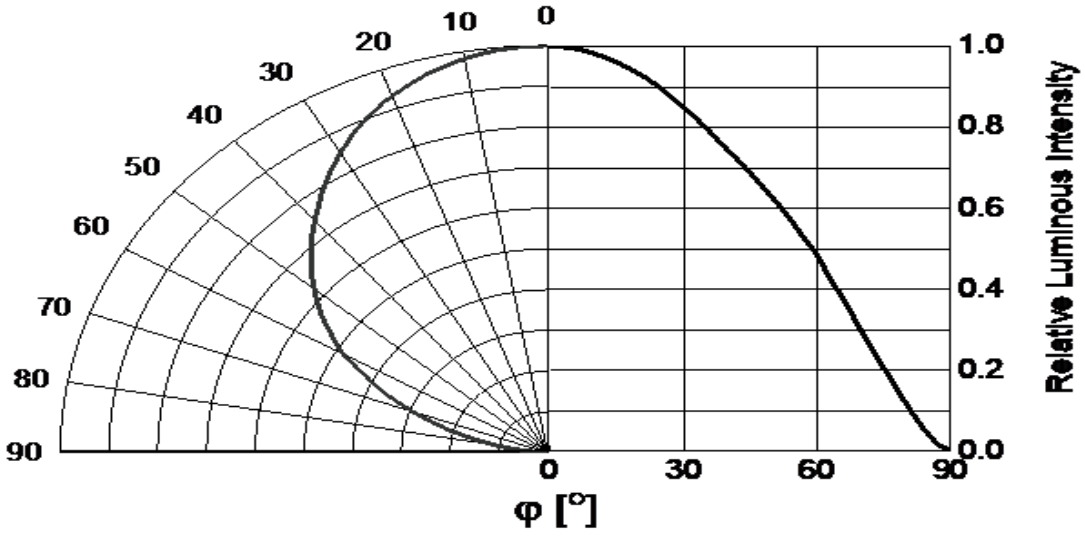
Wavelength Characteristics Relative Spectral Distribution
@ Ts = 25°C, I_F=20mA

$$\Phi_V/\Phi_V\,(Max.) = f(\lambda)$$



Typical Diagram Characteristics of Radiation

$$\Phi_V/\Phi_V\,(0^\circ) = f(\varphi)$$



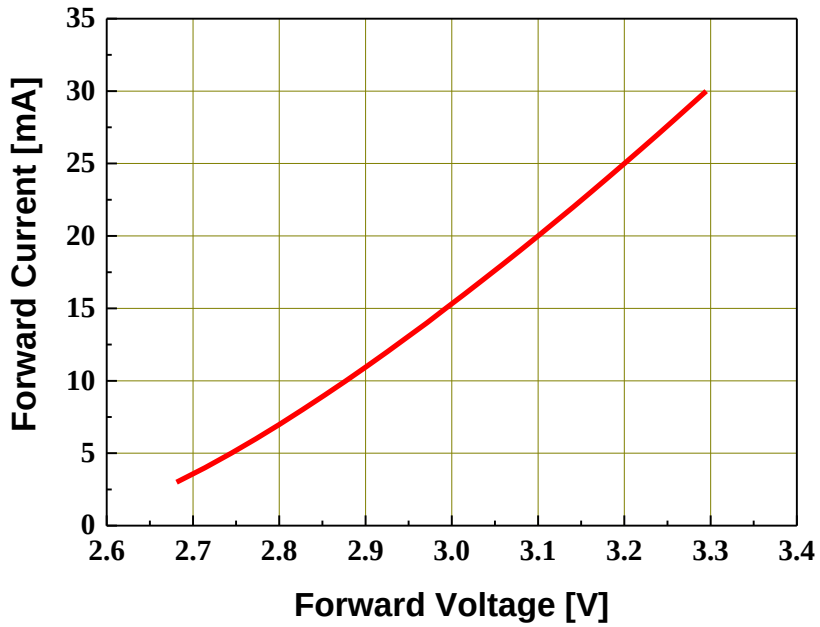
Notes:

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 ± 5°.

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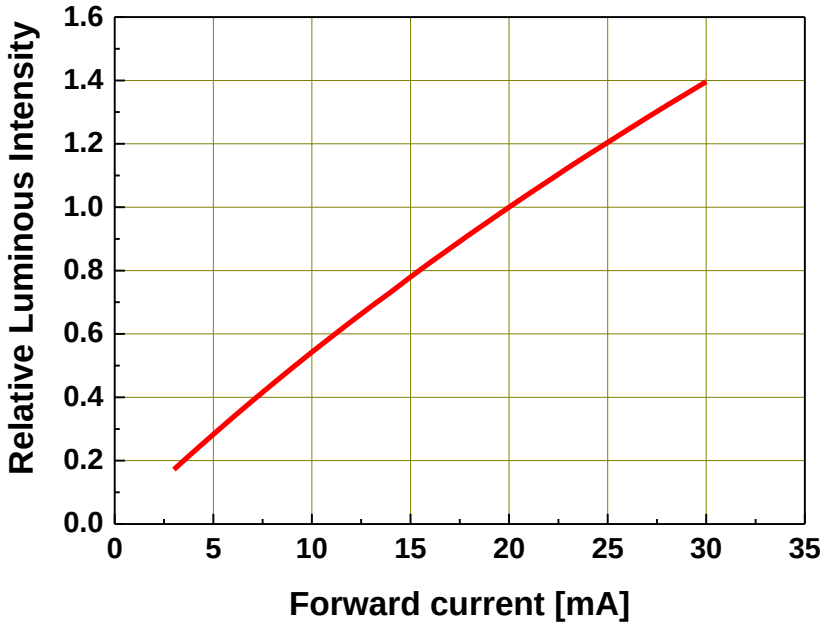
Forward Current vs. Forward Voltage
@ Ts = 25°C

$I_F = f(V_F)$



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

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

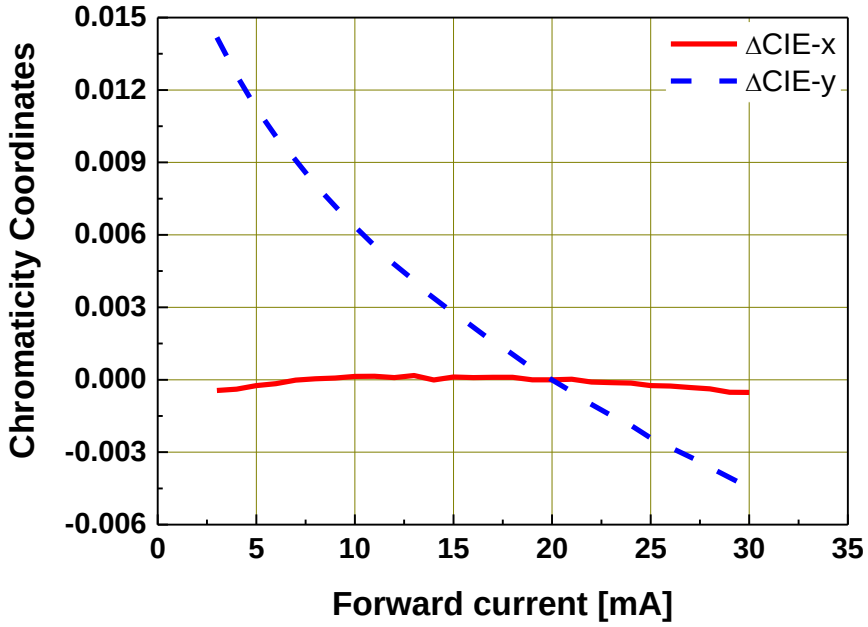


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Chromaticity Coordinates Shift vs. Forward Current

@ Ts = 25°C

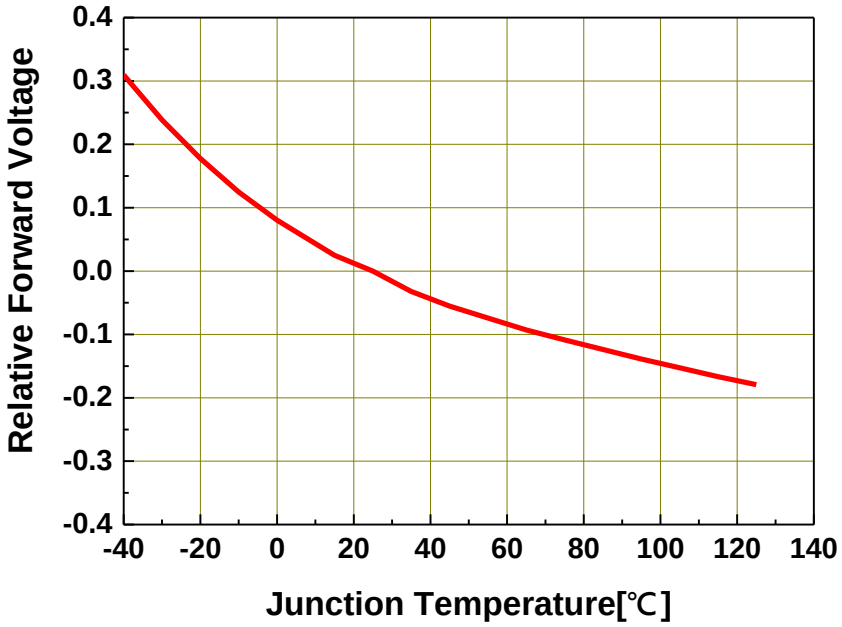
$$\triangle CIE\,x, \triangle CIE\,y = f(I_F)$$



Relative Forward Voltage vs. Junction Temperature

@ IF=20mA

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

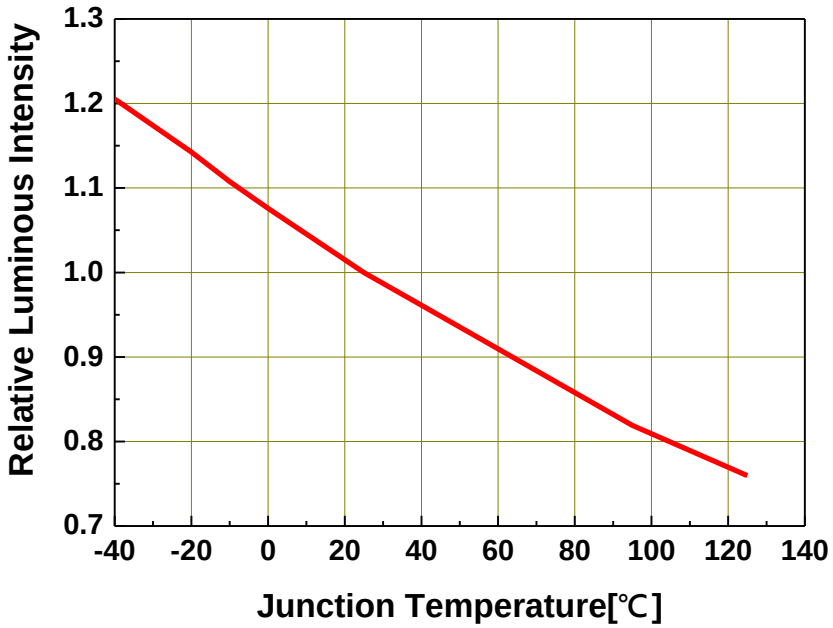


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Relative Luminous Intensity vs. Junction Temperature

@ I_F=20mA

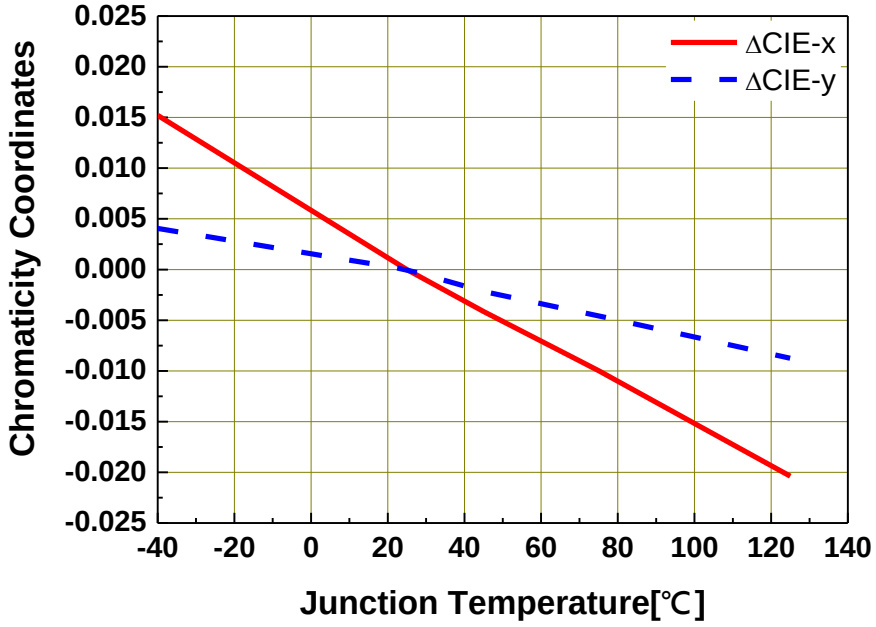
$$\Phi_V / \Phi_V(25^\circ C) = f(T_j)$$



Chromaticity Coordinates Shift vs. Junction Temperature

@ I_F=20mA

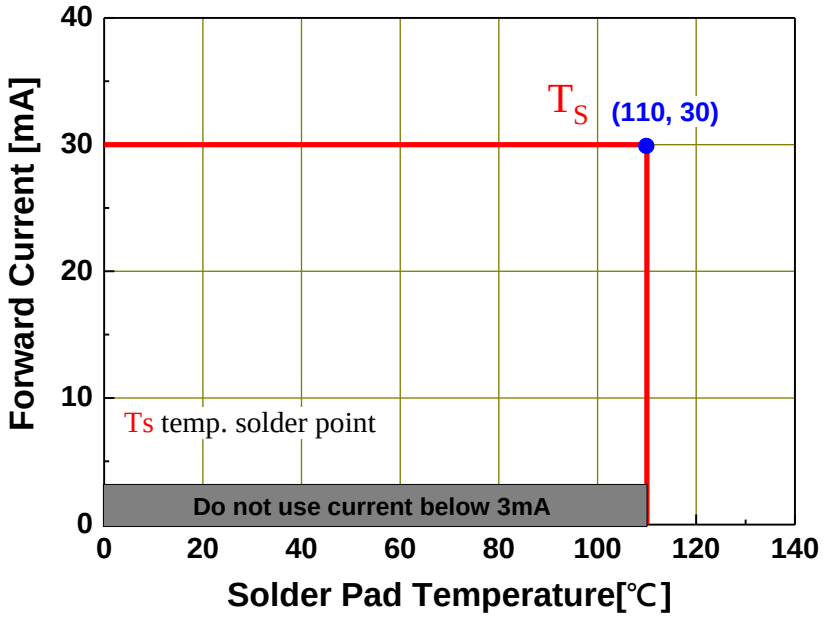
$$\triangle CIE\ x, \triangle CIE\ y = f(T_j)$$



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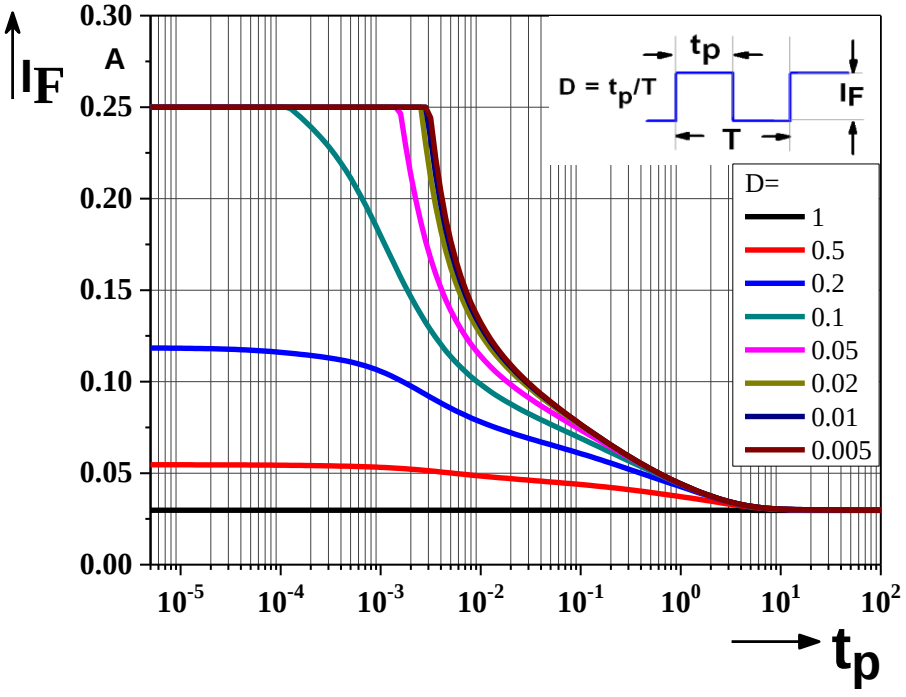
Forward Current Derating Curve

$$I_F = f(T_S)$$



Permissible Pulse Handling Capability

D=Duty cycle , T_s = 25℃



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4. Binning Information

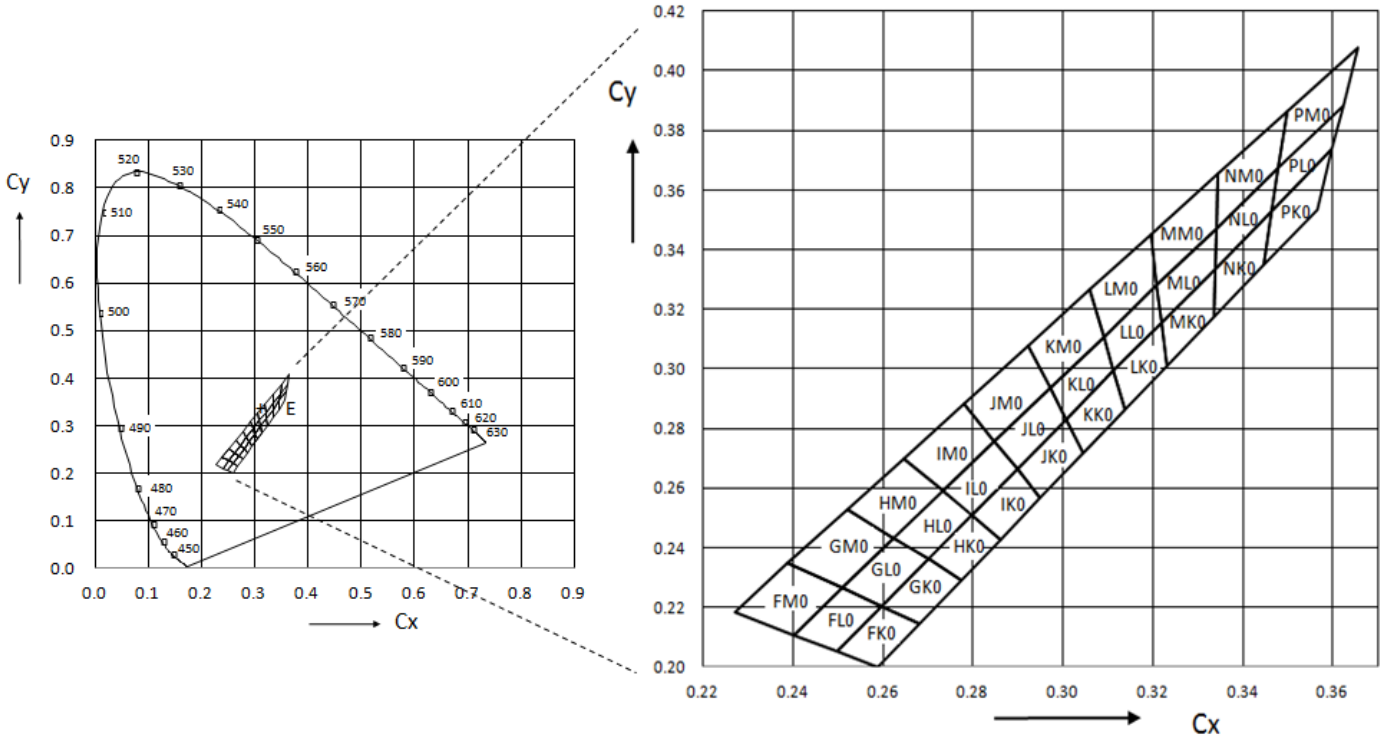
Luminous Intensity Bins

in code	Min Luminous Intensity [mcd]	Max Luminous Intensity [mcd]
BA	1800	2240
BB	2240	2800
CA	2800	3550

Notes:

1. Luminous Intensity measurement tolerance: ±8%.

Product Binning
Cool White Color Bin Structure



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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	HL0	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	IL0	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	JL0	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	KL0	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
LL0	0.3113	0.2992	IM0	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

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ML0	0.3341	0.3472	JM0	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
NL0	0.3341	0.3472	KM0	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
PL0	0.3479	0.3673	LM0	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

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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

Notes:

1. Forward voltage measurement tolerance: ±0.05V.
2. Forward voltage bins are defined at I_F = 20mA operation.

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5. Part Number

2214-C70201H-AM(EMM)

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

EMM = Customer Code

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

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6. Ordering Information

2214-C70201H- ABCDEFGHIJKLMNOP-QR-AM(EMM)

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

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

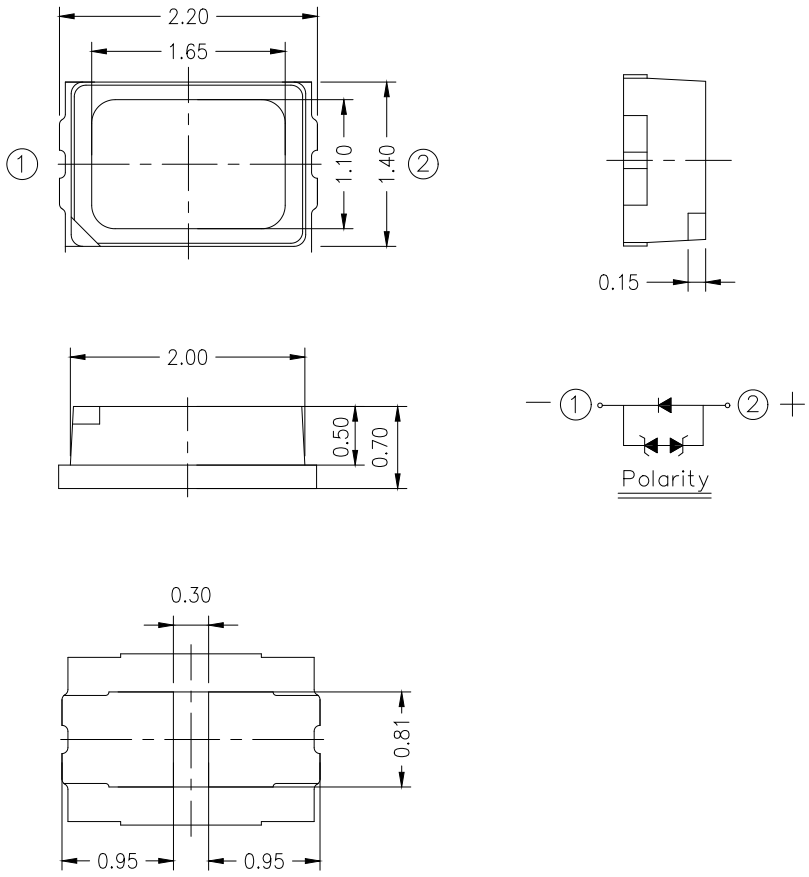
QR = internal code

AM = Automotive Application

EMM = Customer Code

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7. Mechanical Dimension

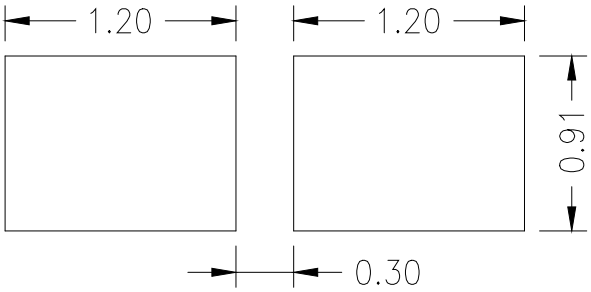


Notes:

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

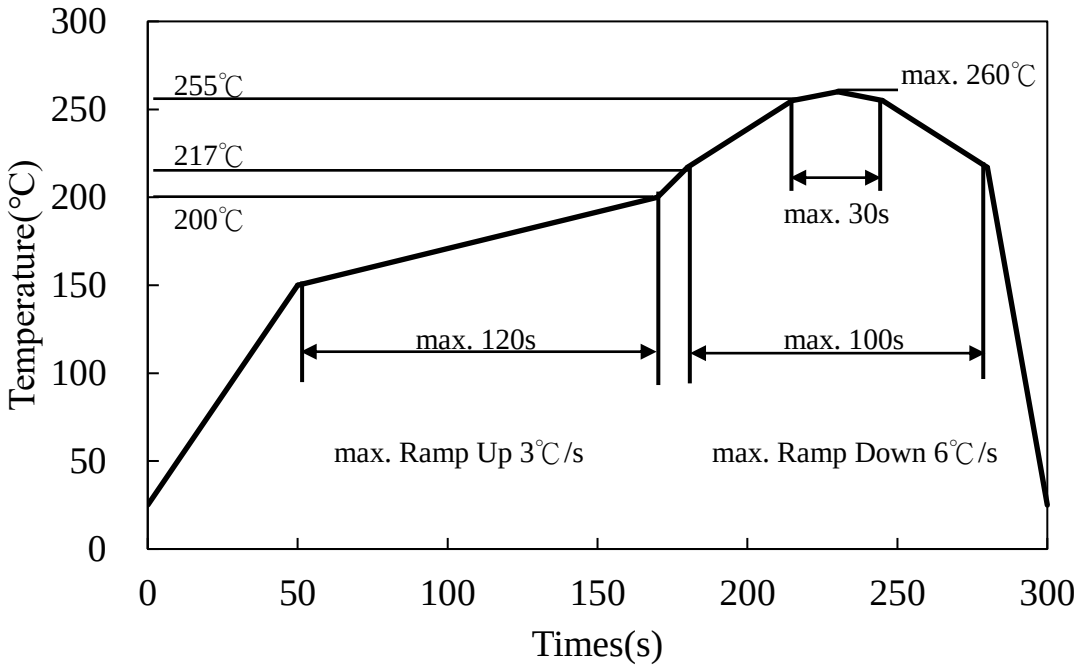
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8. Recommended Soldering Pad



9. Reflow Soldering Profile

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

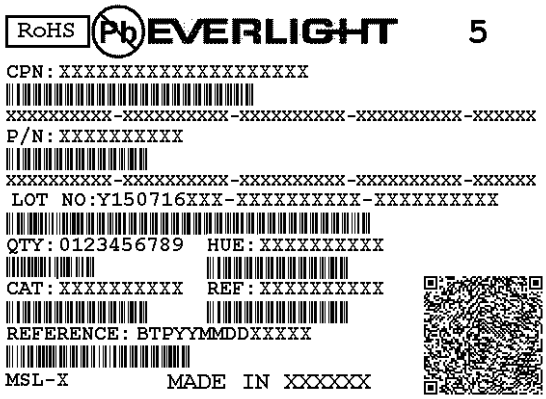


Profile Feature	Pb-Free Assembly Recommendation	Unit
Ramp-up rate to preheat 25 °C to 150 °C	3	°C /sec
Time of soaking zone 150 °C to 200 °C	120	sec
Ramp-up rate to peak	3	°C /sec
Liquidus temperature	217	°C
Time above liquidus temperature	100	sec
Peak temperature (max.)	260	°C
Time within 5°C of the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

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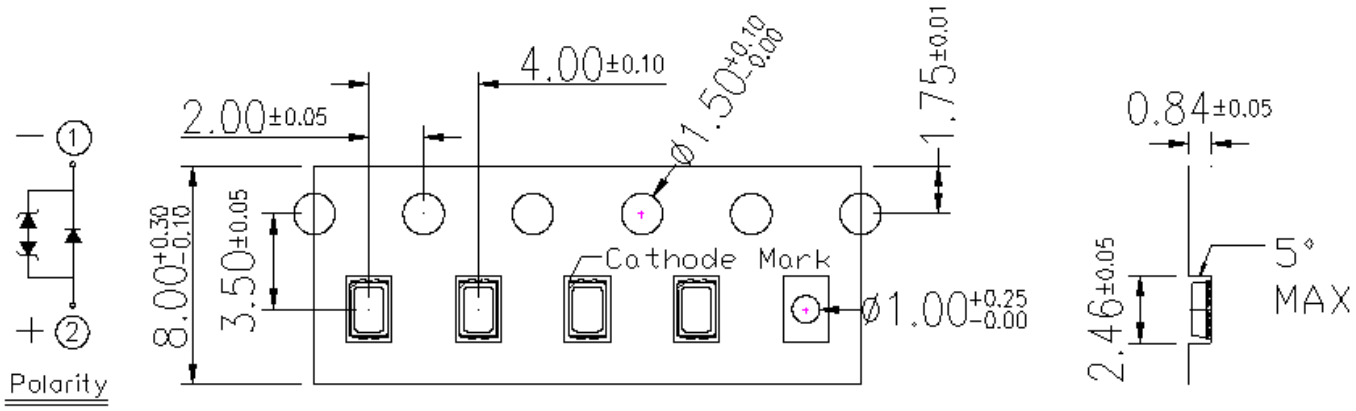
10. Packaging Information

• 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

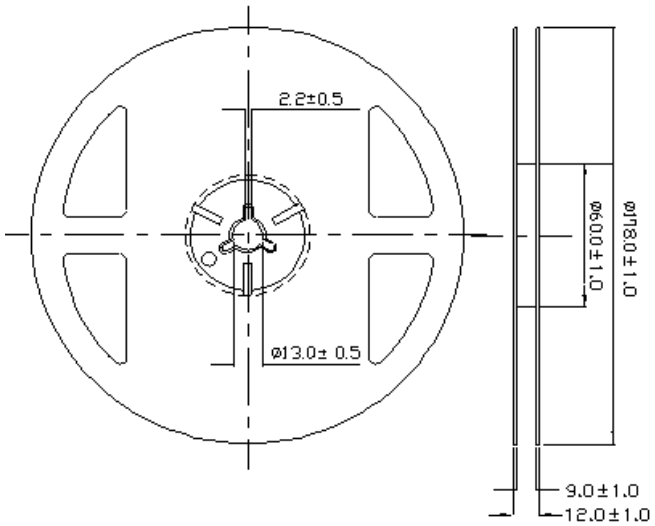


Notes:

1. Dimensions are in millimeters.

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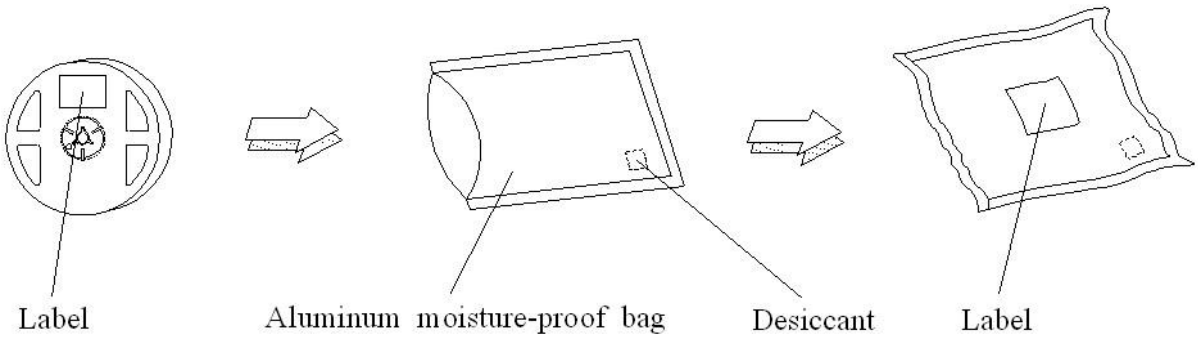
• Reel Dimensions



Notes:

1. Dimensions are in millimeters.

• Moisture Resistant Packing Process



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11. Precaution for Use

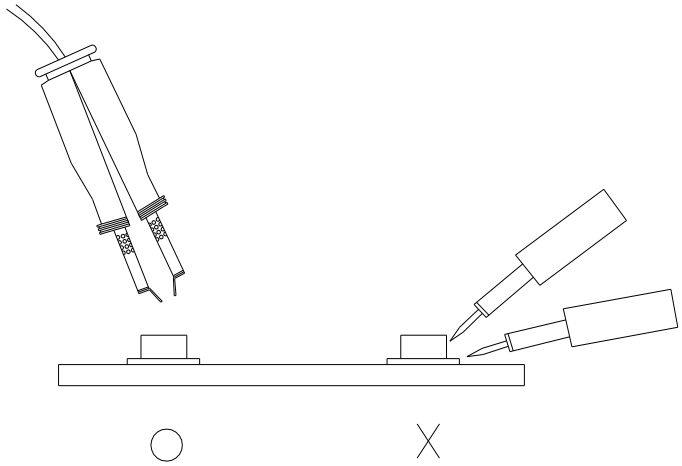
1. Over-current-proof
   Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (burn out will happen).

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℃ 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.



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