DATASHEET

EL Multi Color
CH2525E-RGBW0401H-ELW-1T-AM



Features

- Package: Red, Green, Blue and White color LEDs on Ceramic Package
- Emitted Color: Red 628nm; Green 529nm; Blue 469nm
- Typ Luminous Intensity: Red 1050mcd; Green 2900mcd; Blue 610mcd; White 3300mcd @ 40mA
- Viewing angle: Red, Green, Blue and White 130°
- ESD: up to 8KV
- MSL: 2
- Qualifications : According to AEC-Q102
- Compliance with RoHS & REACH
- Compliance Halogen Free. (Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)
- Sulfur robustness

Applications

- Automotive Interior Lighting , Dashboard, Reading lamp, Audio and Car infotainment ….etc
- Color change Application for Automotive Ambient Lighting.

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1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current	R,G,B,W	I_F	10	40	80	mA	---
Luminous Intensity [1][3]	Red	Φ_v	900	1050	1400	mcd	I_F=40mA
	Green		2800	2900	3850		
	Blue		560	610	900		
	White		2800	3300	4500		
Forward Voltage[4][6]	Red	V_F	1.75	1.95	2.50	V	I_F=40mA
	Green		2.25	2.66	3.25		
	Blue		2.25	2.78	3.25		
	White		2.25	2.82	3.25		
Viewing Angle	Red	ϕ	---	130	---	deg	I_F=40mA
	Green		---	130	---		
	Blue		---	130	---		
	White		---	130	---		
Thermal Resistance (Junction to Solder)	Red	$R_{th\ JS\ real}$	---	29	37	K/W	I_F=40mA
		$R_{th\ JS\ el}$	---	22	27		
	Green	$R_{th\ JS\ real}$	---	42	58		
		$R_{th\ JS\ el}$	---	30	43		
	Blue	$R_{th\ JS\ real}$	---	28.5	40.5		
		$R_{th\ JS\ el}$	---	22.5	30.5		
	Cool White	$R_{th\ JS\ real}$	---	40	54		
		$R_{th\ JS\ el}$	---	32	42		

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Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Peak Wavelength	R	λp	---	640	---	nm	I_F=40mA
	G		---	524	---		
	B		---	466	---		
Dominant Wavelength[5]	R	λd	627	---	633	nm	I_F=40mA
	G		520	---	533		
	B		460	---	470		
Chromaticity coordinates[6]	R	x	0.6900	---	0.7150	NA	I_F=40mA
		y	0.2880	---	0.3000		
	G	x	0.0743	---	0.2400		
		y	0.6083	---	0.8338		
	B	x	0.1240	---	0.1560		
		y	0.0297	---	0.0770		
	W	x	0.3120	---	0.3300		
		y	0.3069	---	0.3450		

Notes:

1. Luminous intensity measurement tolerance: ±8%.
2. Luminous flux measurement tolerance: ±8%.
3. The data of luminous intensity and luminous flux measured at thermal pad=25°C.
4. Forward voltage measurement tolerance: ±0.05V.
5. Typical luminous flux or light output performance is operated within the condition guided by this datasheet.
6. The Vf range shown in the table above indicates 99% output.

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2. Absolute Maximum Ratings

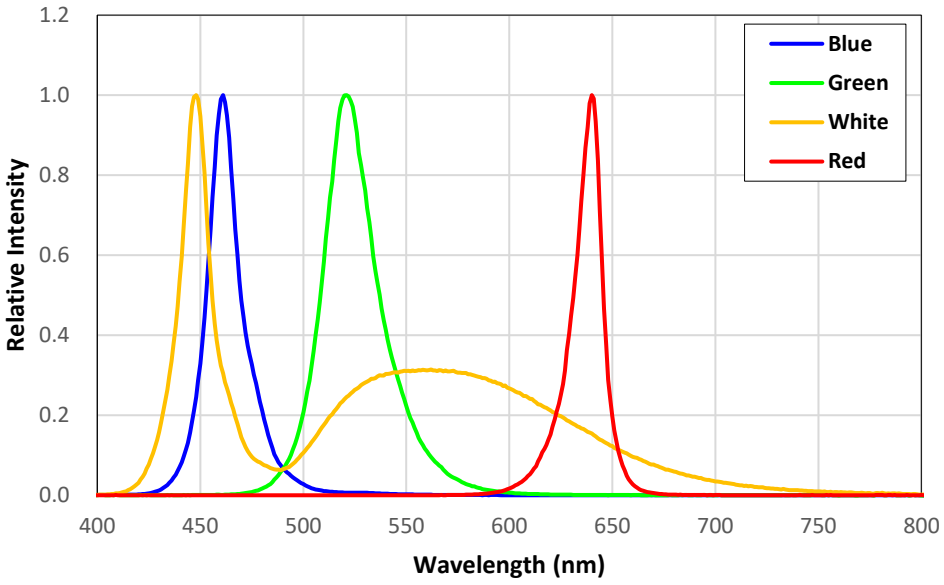
Parameter	Symbol	Ratings				Unit
		Red	Green	Blue	White	
Reverse Voltage	V_R	Not designed for reverse operation				V
Forward Current	I_F	80				mA
Surge Current (t<=10 μs; D=0.005; T_s=25 ℃)	I_{FM}	400				mA
Power Dissipation	P_d	200	260	280	280	mW
Junction Temperature	T_J	125				°C
Operating Temperature	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	T_{Sol}	260°C for 30sec				°C

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3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution @ Solder Pad Temperature = 25°C

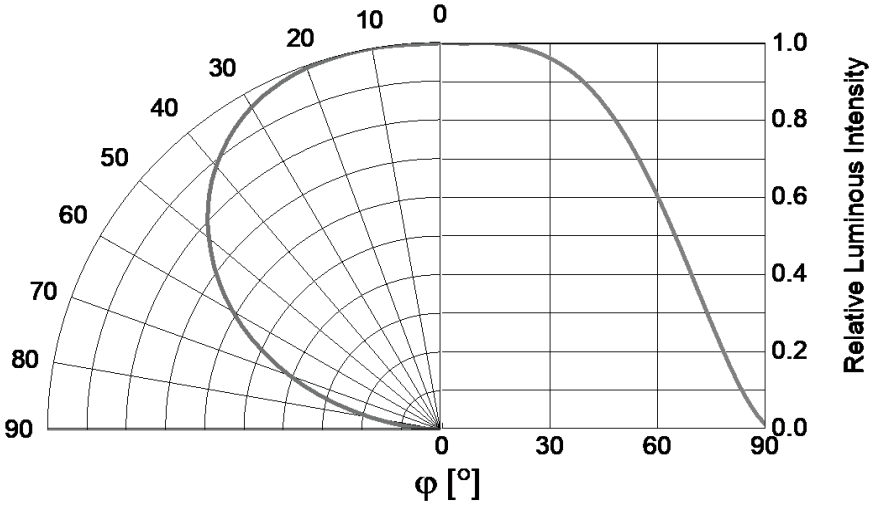
$$\Phi_V / \Phi_V\,(Max.) = f(\lambda)$$



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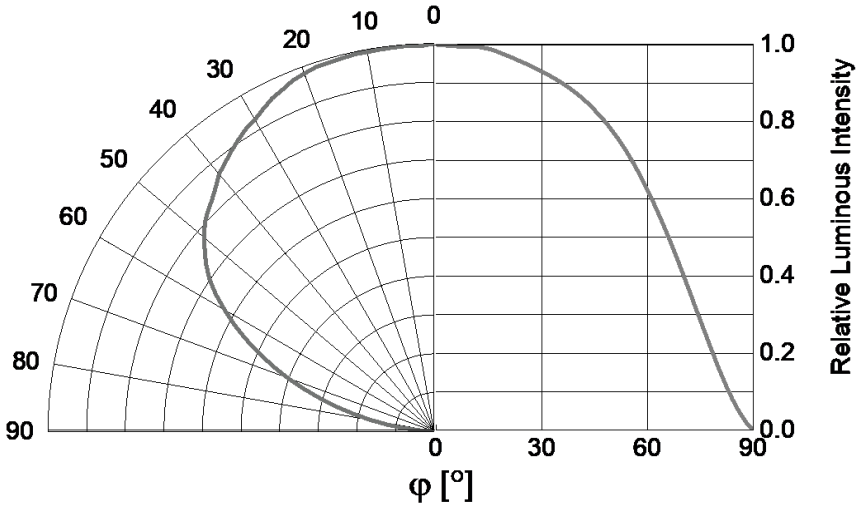
Typical Diagram Characteristics of Radiation (Red)

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



Typical Diagram Characteristics of Radiation (Green)

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



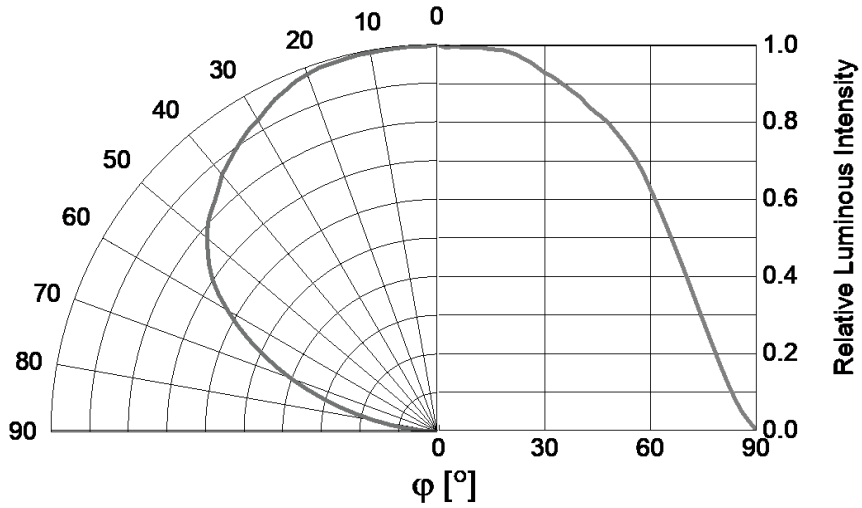
Notes:

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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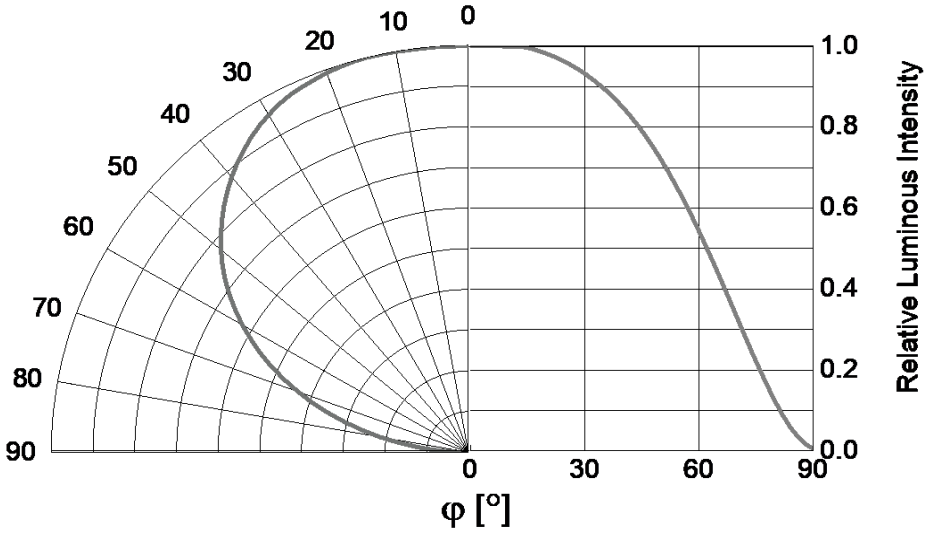
Typical Diagram Characteristics of Radiation (Blue)

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



Typical Diagram Characteristics of Radiation (White)

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



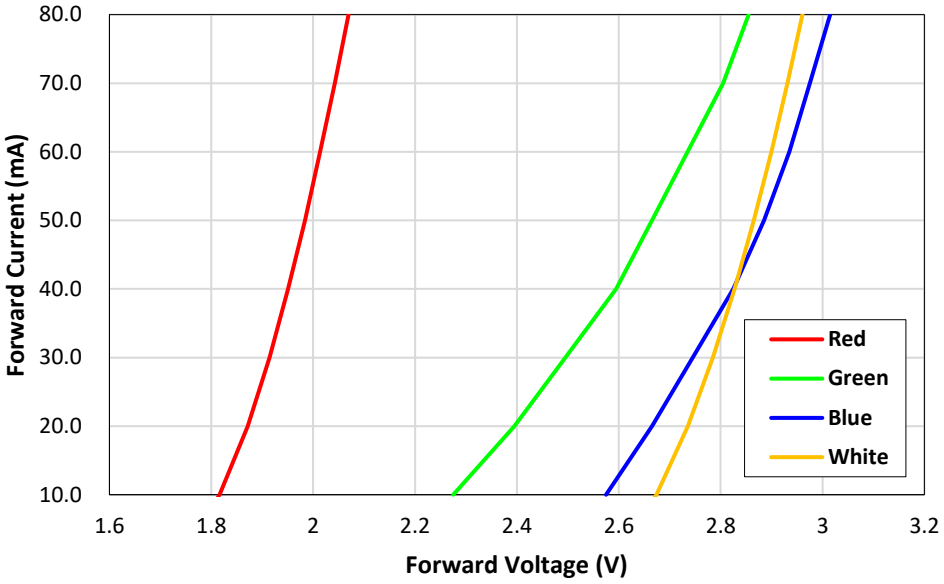
Notes:

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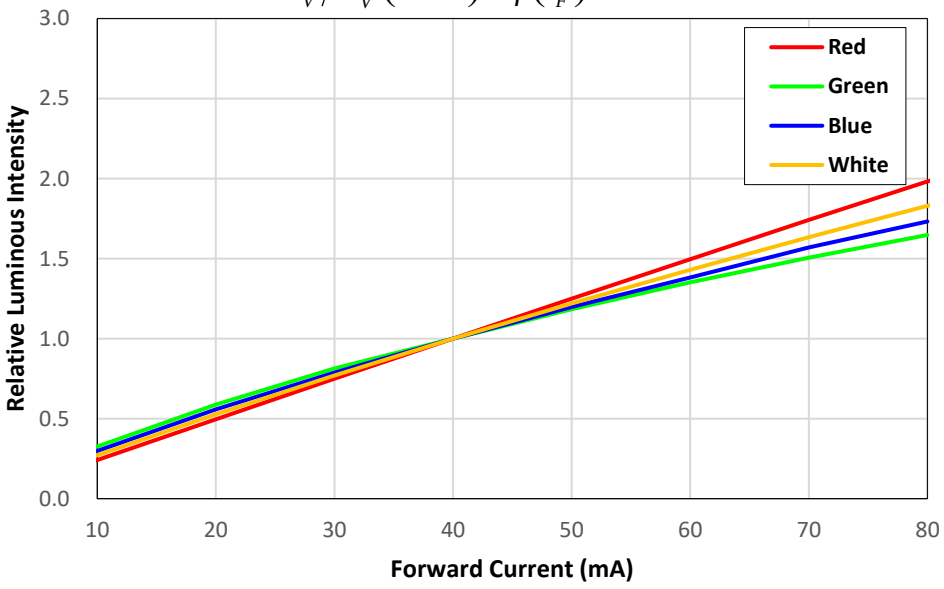
Forward Current vs. Forward Voltage
@ Ts = 25°C

$$I_F = f(V_F)$$



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

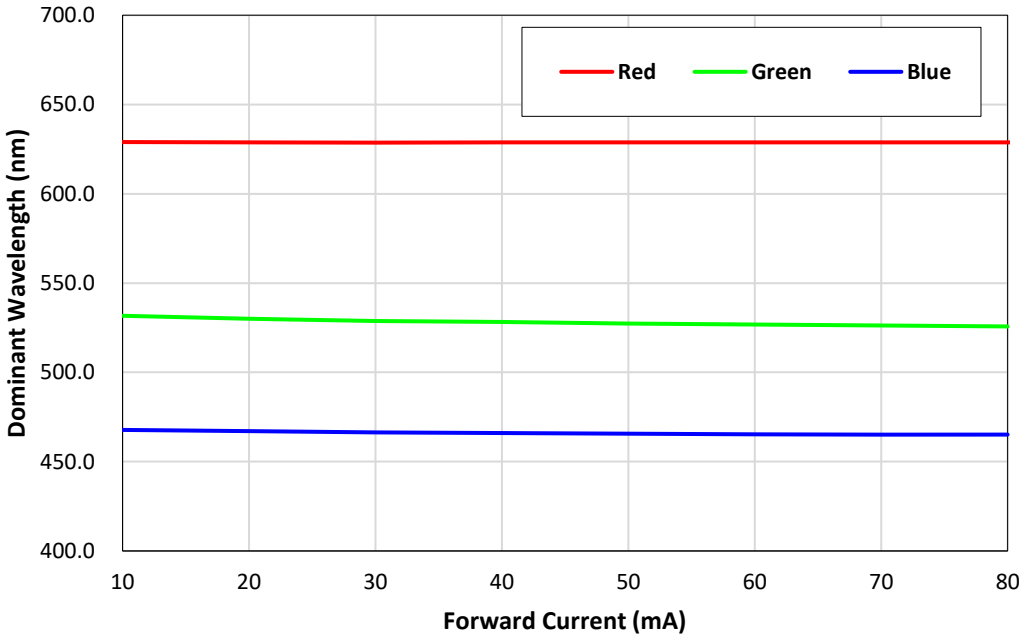
$$\Phi_V/\Phi_V(40mA) = f(I_F)$$



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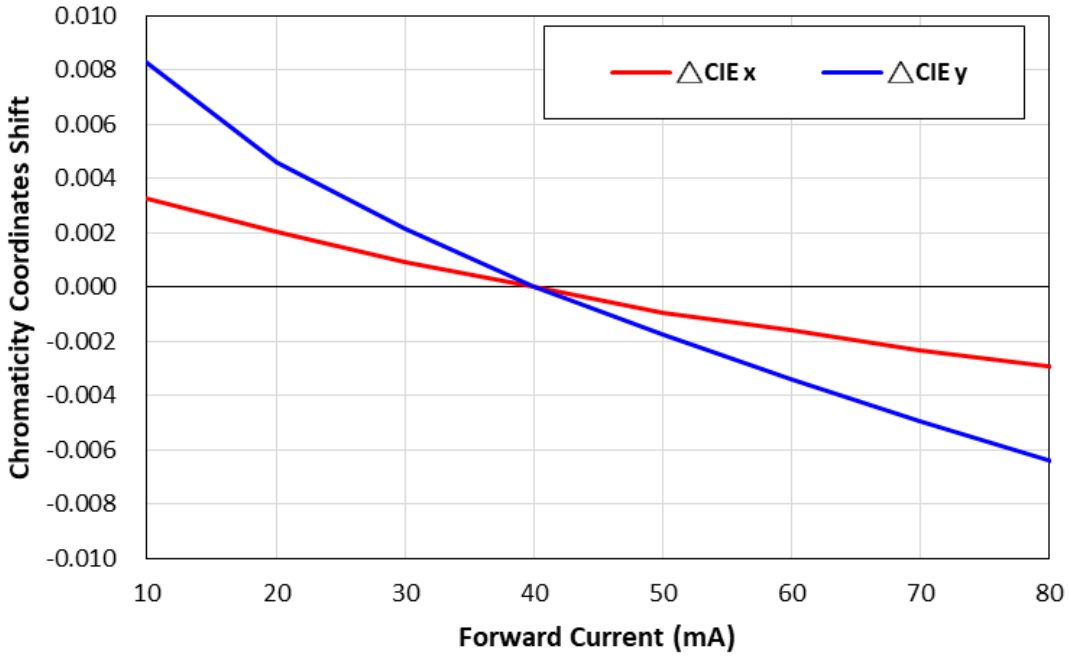
Wavelength Characteristics vs. Forward Current
@ Ts = 25°C

$\lambda_d = f(I_F)$



Chromaticity Coordinates vs. Forward Current
@ Ts = 25°C (White)

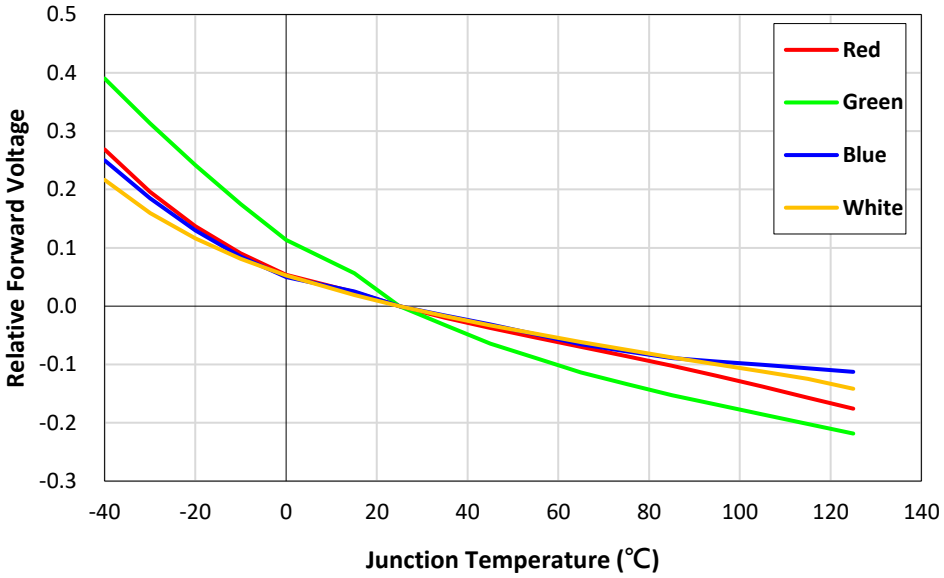
$\triangle CIE\ x, \triangle CIE\ y = f(I_F)$



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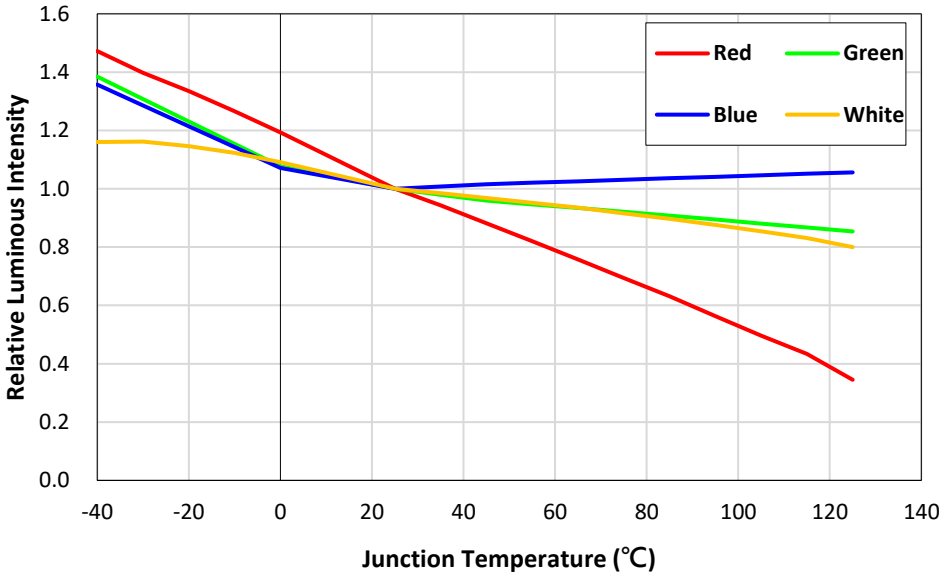
Relative Forward Voltage vs. Junction Temperature @Forward Current = 40mA

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



Relative Luminous Flux vs. Junction Temperature @Forward Current = 40mA

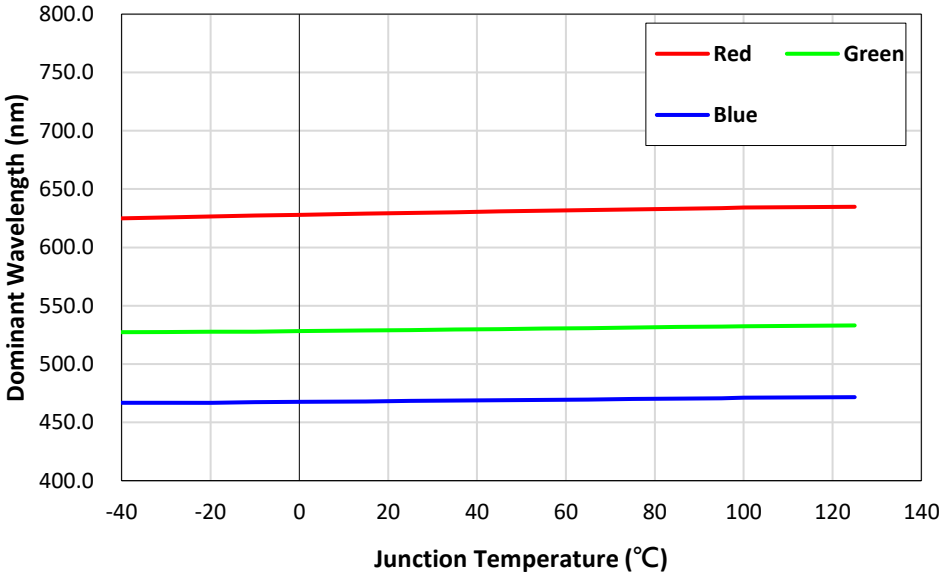
$$\Phi_V / \Phi_V(25^\circ C) = f(T_j)$$



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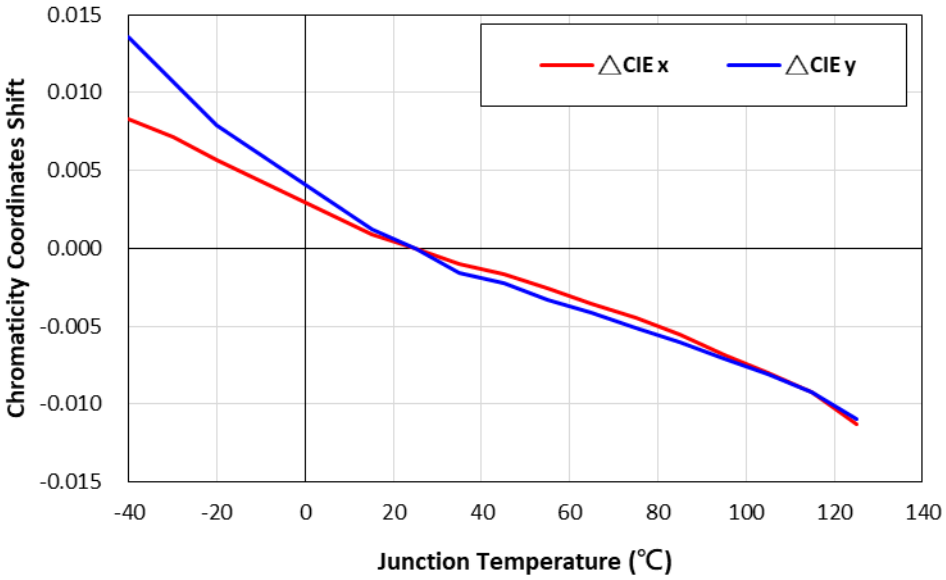
Wavelength Characteristics vs. Junction Temperature @Forward Current = 40mA

$$\lambda d = f(T_j)$$



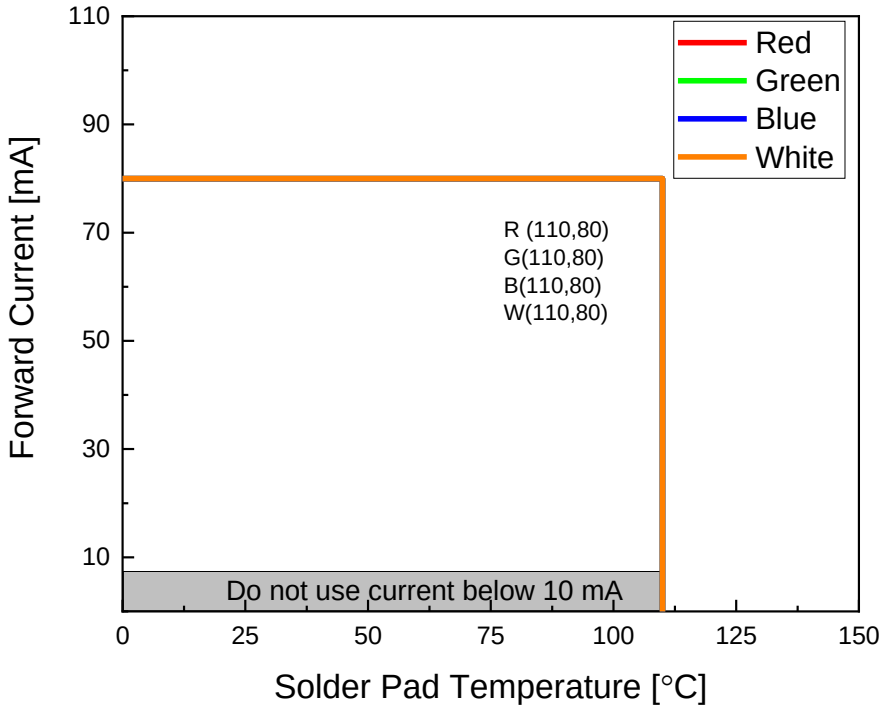
Chromaticity Coordinates Shift CIE X/Y vs. Junction Temperature @Forward Current = 40mA (White)

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



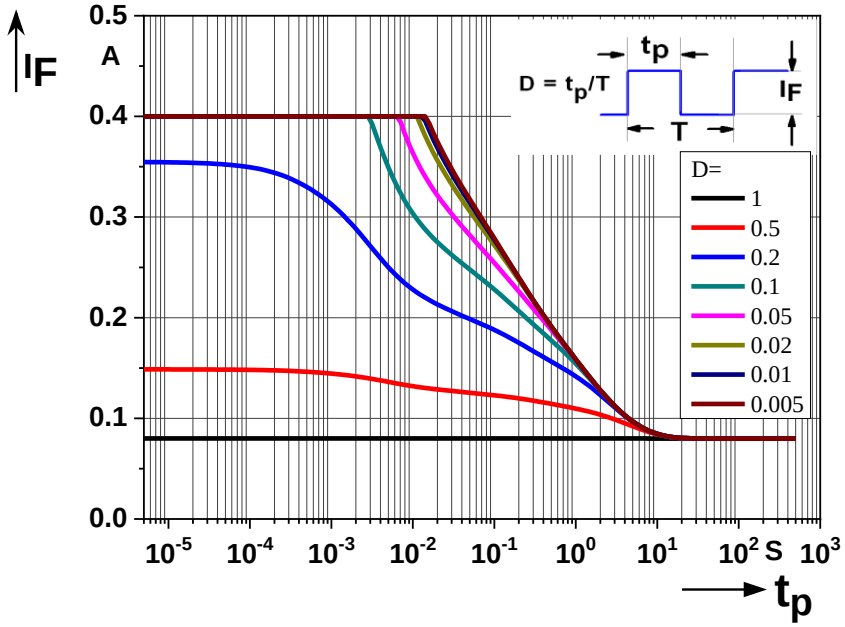
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Forward Current Derating Curve



Permissible Pulse Handling Capability

D=Duty cycle , T_s = 25℃



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4. Binning Information

Luminous Intensity Bins

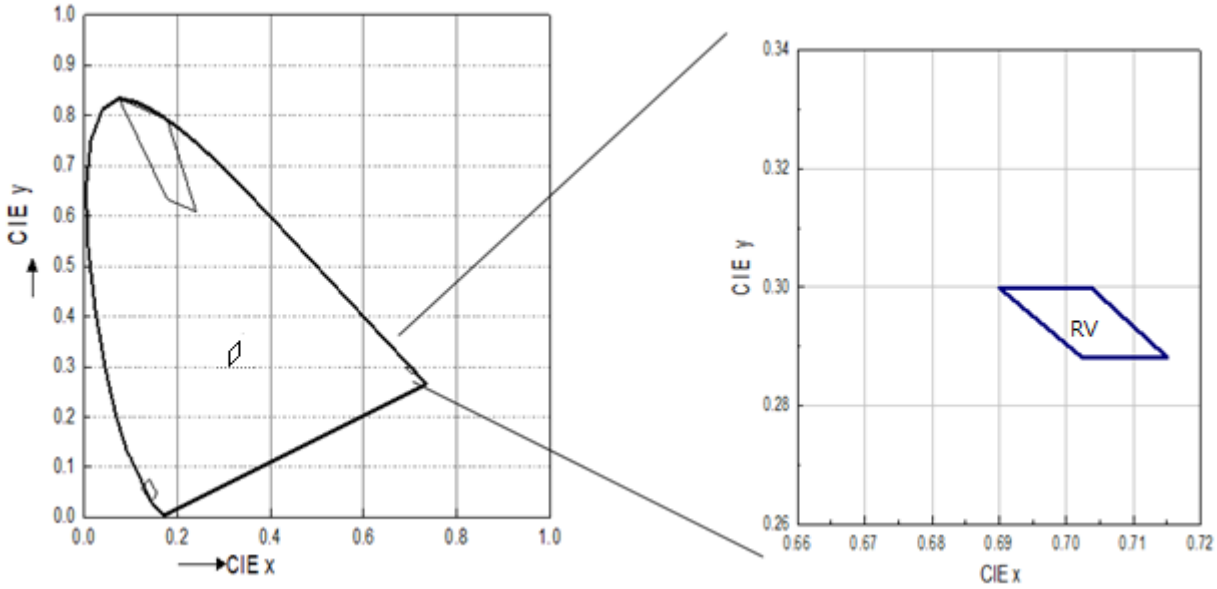
Color	Group Bin	Minimum Luminous Intensity [mcd]	Maximum Luminous Intensity [mcd]
R	VA	900	1400
G	CC	2800	3850
B	UV	560	900
W	CC	2800	4500

Notes:

1. Luminous intensity measurement tolerance: 8%.

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Color Bin Structure
Red Bin Structure

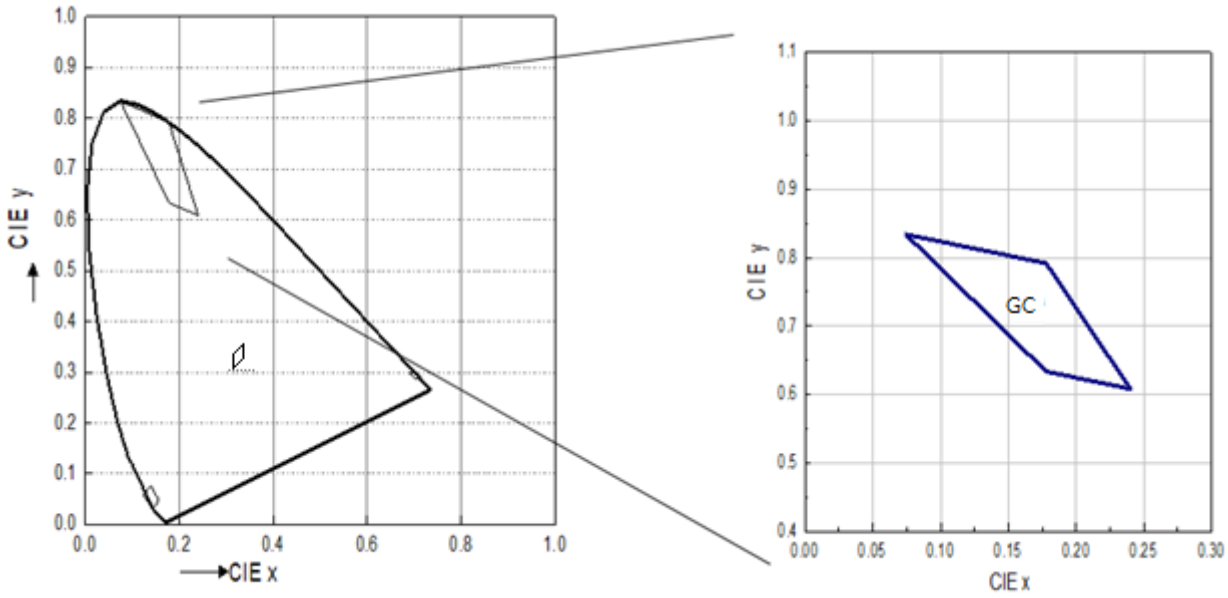


Red Bin Coordinates

Bin	CIE x	CIE y
RV	0.7020	0.2880
	0.7150	0.2880
	0.7040	0.3000
	0.6900	0.3000

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Green Bin Structure

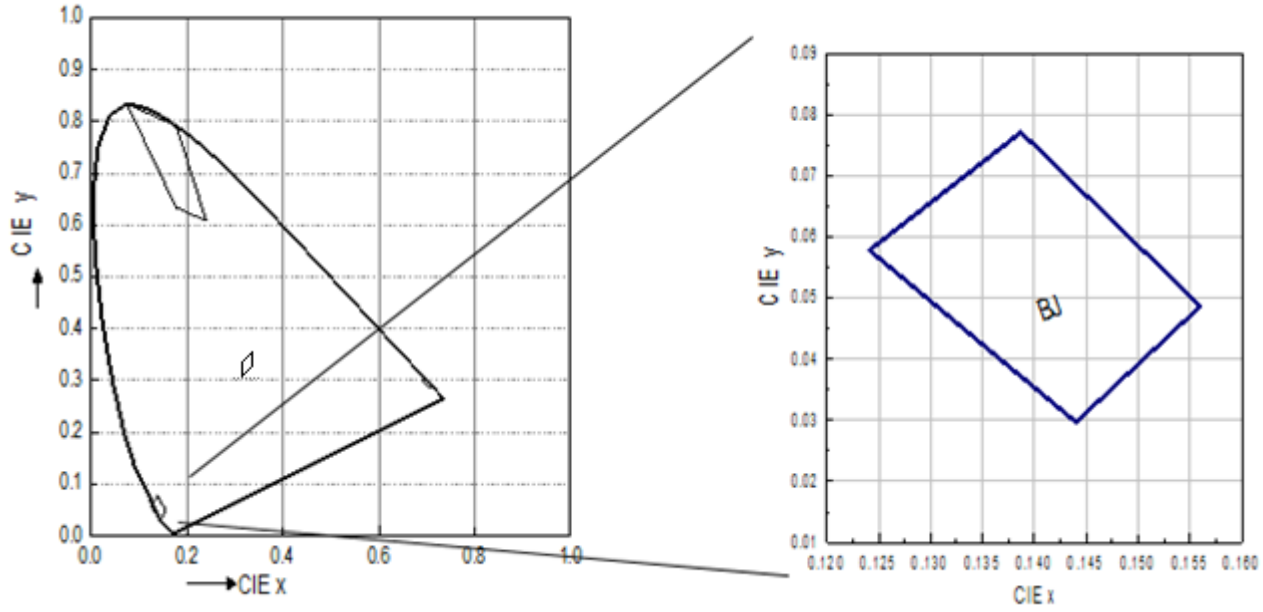


Green Bin Coordinates

Bin	CIE x	CIE y
GC	0.0743	0.8338
	0.1779	0.6336
	0.2400	0.6083
	0.1779	0.7916

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Blue Bin Structure

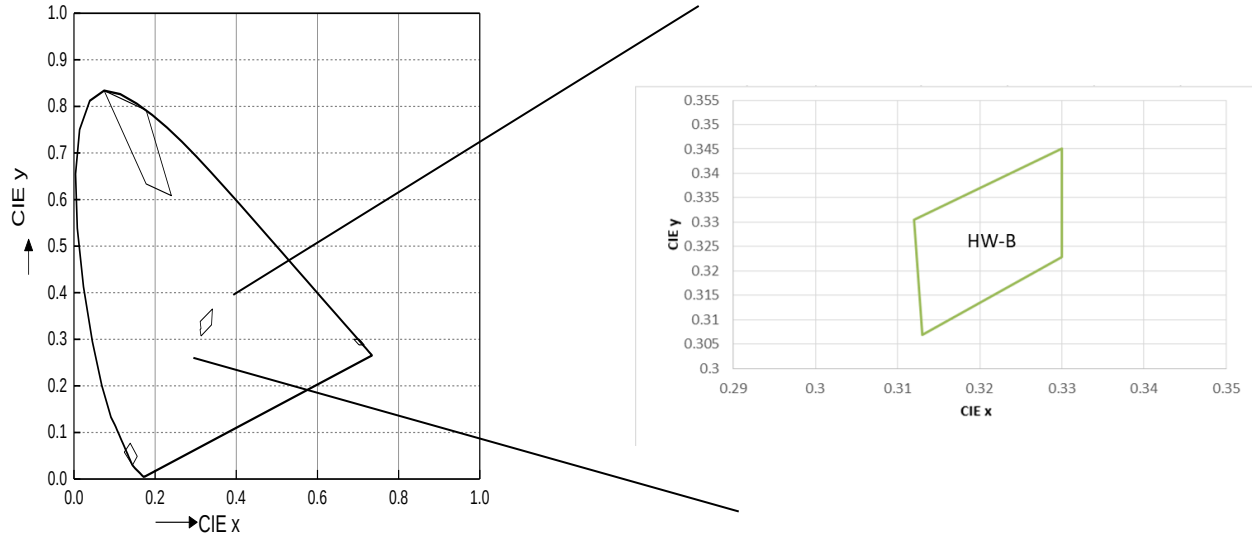


Blue Bin Coordinates

Bin	CIE x	CIE y
BJ	0.1440	0.0297
	0.1560	0.0490
	0.1390	0.0770
	0.1240	0.0580

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Cool White Color Bin Structure
ECE Bin Structure



Cool White Bin Coordinates

Bin	CIE x	CIE y
HW-B	0.3300	0.3450
	0.3300	0.3229
	0.3130	0.3069
	0.3120	0.3305
Reference Range: 5600~6600K		

Notes:

1.Tolerance of Chromaticity Coordinates x,y：±0.005

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Forward Voltage Bins

Color	Bin	Minimum Forward Voltage [V]	Maximum Forward Voltage [V]
R	17	1.75	2.50
G	22	2.25	3.25
B	22	2.25	3.25
W	22	2.25	3.25

Notes:

1. Forward voltage measurement tolerance: ±0.05V.
2. Forward voltage bins are defined at IF = 40mA operation.

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5. Part Number

CH2525E-RGBW0401H-AM

Part number is designated with below details.

CH2525E = product family name.

RGBW = color [1]

040 = test current [mA]

1 = Metallic Plating Type (0=Ag ; 1=Au : 2=MLP)

H = Brightness Level (H=High ; M=Medium ; L=Low)

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
UA	Amber
UR	Red
SR	Super Red
RGB	RGB – Color
RGBW	RGBW – Color

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6. Ordering Information

CH2525E-RGBW0401H- ABC-DE-AM

Part Number of the EL Multi Color	Order Code
CH2525E-RGBW0401H-AM	CH2525E-RGBW0401H-ELW-DE-AM

Order code contains information with below details:

ABC = Please refer to the chart to the right.

D = Standard packing quantity

E = Packing method (T for tape & reel)

AM = Automotive Application Note

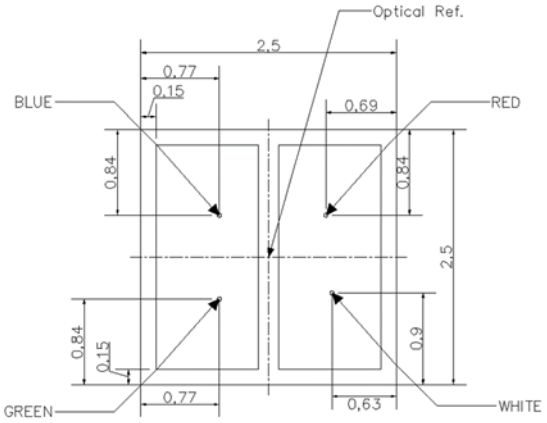
Note

[1] Group Bin chart

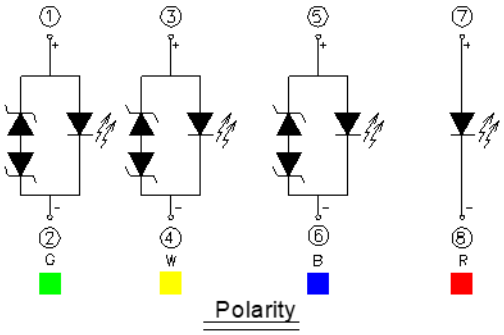
Group Bin	Color Bin		Φ_v	V_F
ELW	R	RV	VA	17
	G	GC	CC	22
	B	BJ	UV	22
	W	HW-B	CC	22

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7. Mechanical Dimension

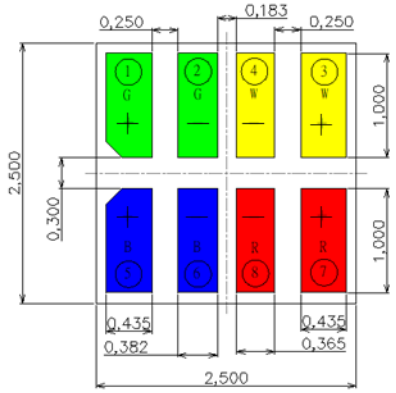


TOP View





Side View



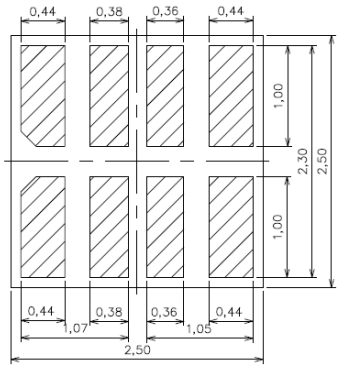
Bottom View

Notes:

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

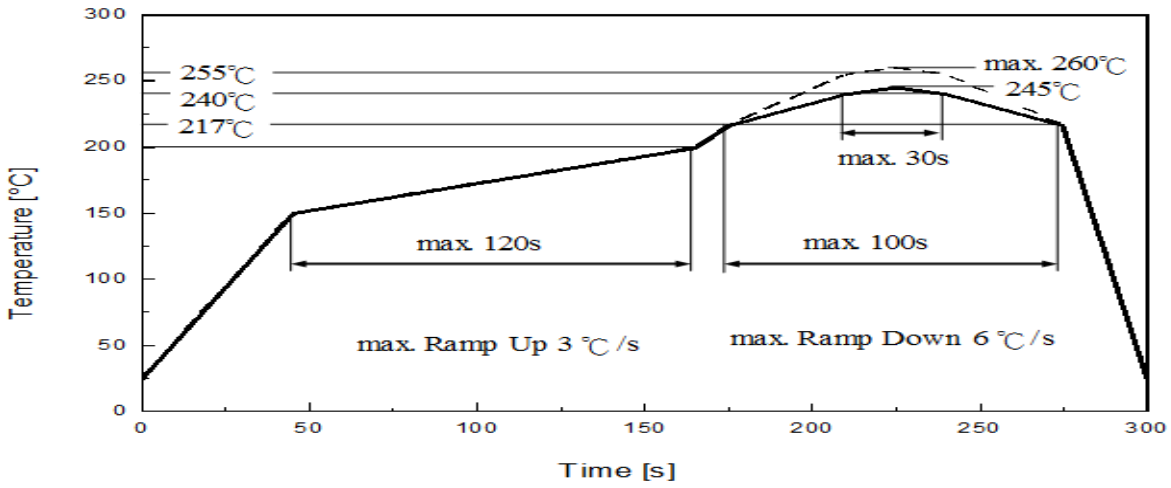
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8. Recommend Soldering Pad



9. Reflow Soldering Profile

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

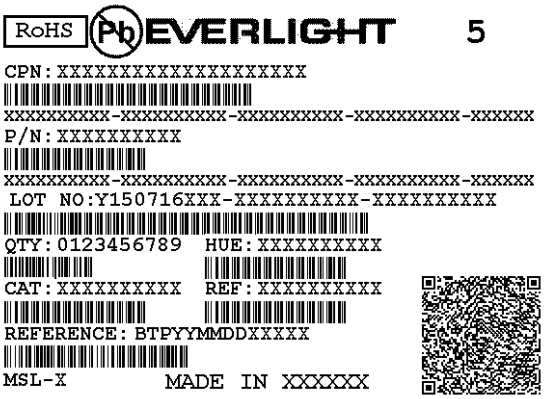


Profile Feature	Pb-Free Assembly	Unit Einheit
	Recommendation	
Ramp-up rate to preheat 25 °C to 150 °C	3	°C /sec
Time of soaking zone 150 °C to 200 °C	120	sec
Ramp-up rate to peak	3	°C /sec
Liquidus temperature	217	°C
Time above liquidus temperature	100	sec
Peak temperature (max.)	260	°C
Time within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

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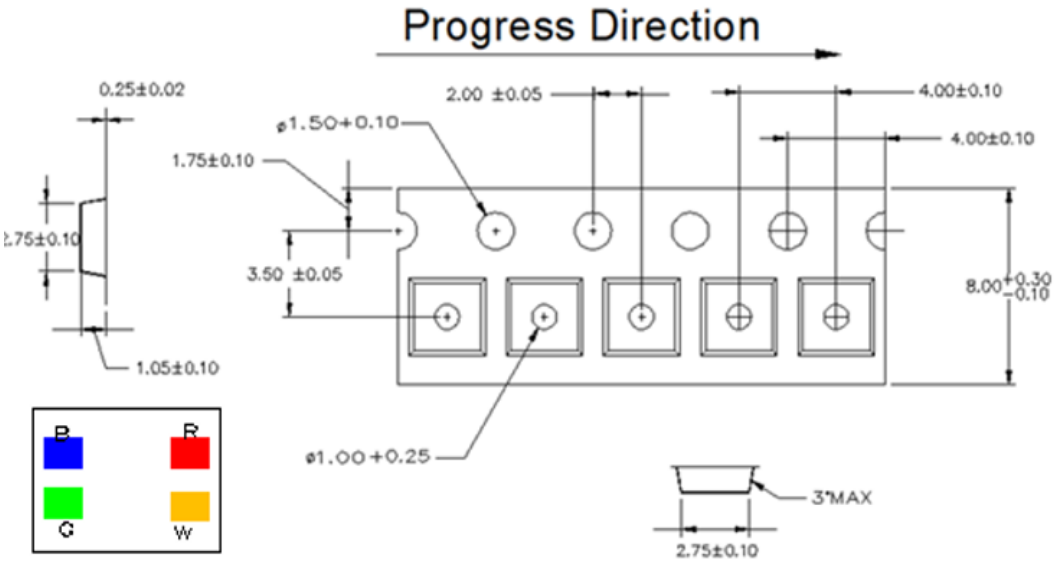
10. Packaging Information

• 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 1000 pcs Per Reel

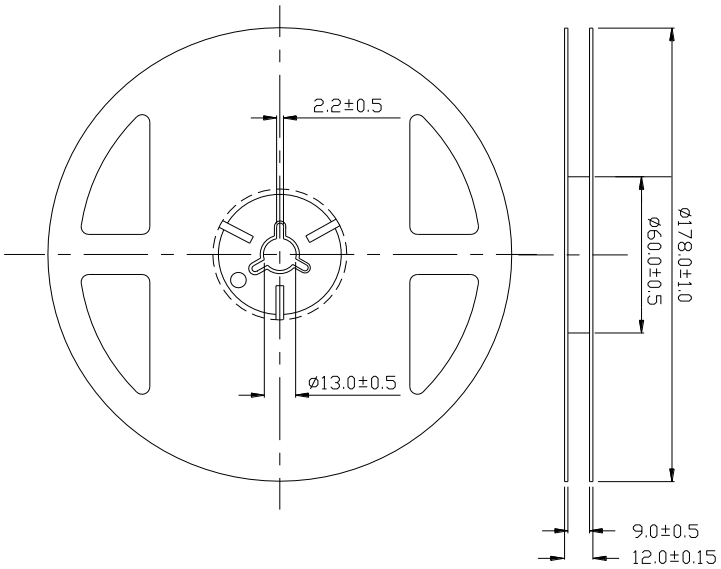


Notes:

1. Dimensions are in millimeters.
2. Tolerances for fixed dimensions are ±0.2mm.

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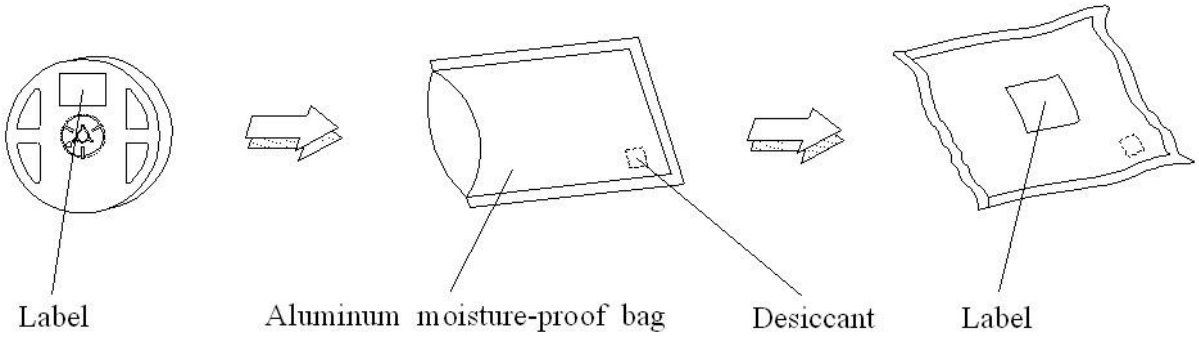
• Reel Dimensions



Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ±0.2mm.

• Moisture Resistant Packing Process



Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ±0.2mm.

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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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