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**LUSTROUS**<sup>®</sup>

GREEN TECHNOLOGY OF LIGHTINGS

Technical Datasheet LS41

*High Power Solid-State LED Light Source*

# Golden X

## Introduction

For a brighter solid-state light source, **Golden X** is an energy-efficient building block generating enough light outputs suitable for most applications in lighting field. **Golden X** offers the best solid-state light source and you might realize your modern ideas of lightings.

**Golden X**, available in Star configuration, provides the best possible performance with lifetime longer than 30,000 hours\*. With a nominal correlated color temperature of 2500~3250K for Warm White, and 4750~10000K for Cool White, similar to conventional indoor and outdoor light source, **Golden X** is particularly designed for architects and commercial lighting designers.

\*Note1 : To optimize product performance and lifetime, constant DC at advised forward current and T<sub>b</sub> less than 50°C should be applied.

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## Golden X Part Number Matrix

Table.1

Color	P/N
Warm White	G110CLCNCA
	G110CLIGCA
Cool White	G110NWCNCA
	G110NWIGCA

## Golden X Material

Chip Material	GaN Base
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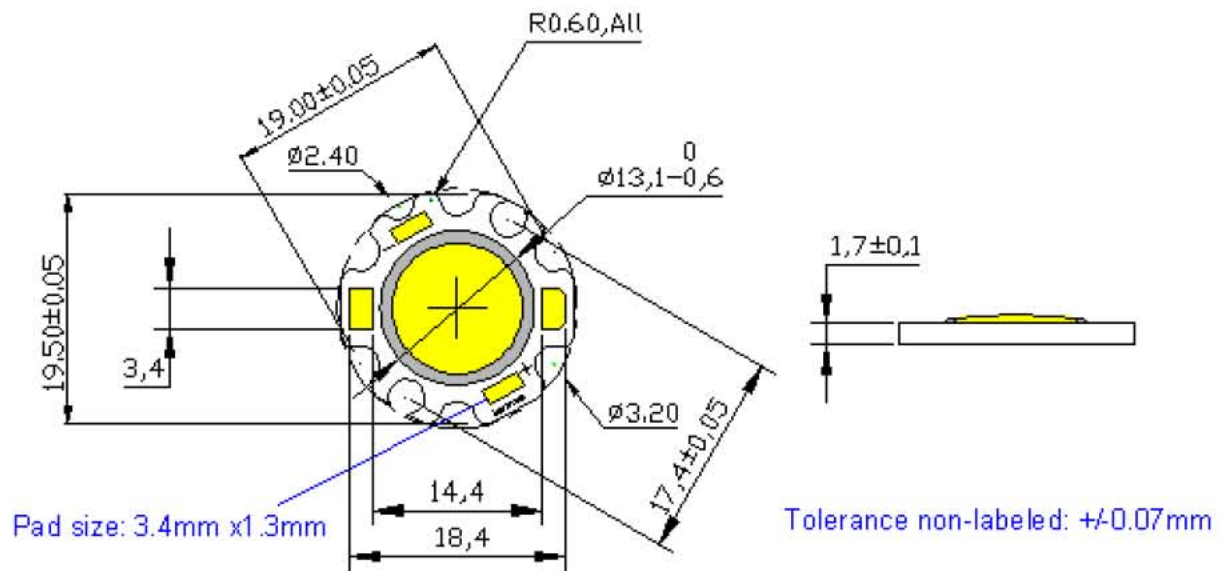
## Golden X Chips Array

9 Chips Array
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**Mechanical Dimensions**

**Golden X (G110)**



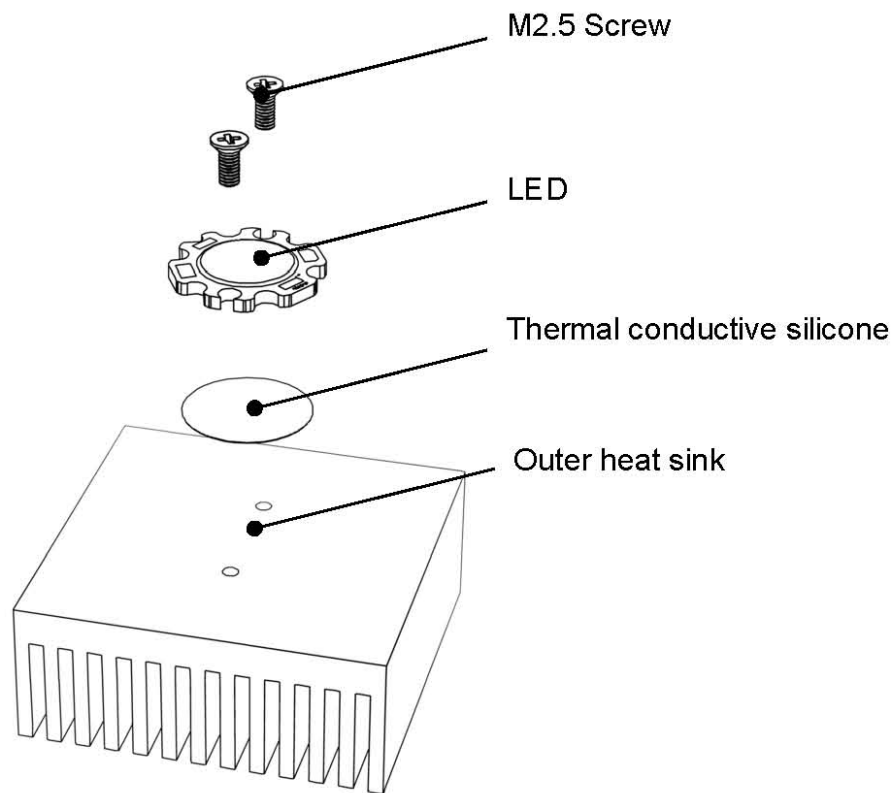
Note : Drawing not to scale. All dimensions are in millimeters.

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### Recommended installation screw pitch



Warning : **Do not** touch the lighting area during handling and assembling

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## Flux Characteristics at Junction Temperature $T_j = 25^{\circ}C$

Table.2

Color	Minimum Luminous Flux (lm)	Typical Luminous Flux (lm)
Warm White (3000K)		
G105CLCNCA If=1050mA;	360 lm	400 lm
G110CLIGCA If=350mA;		
Cool White (5400K)		
G110NWCNCA If=1050mA;	480lm	550 lm
G110NWIGCA If=350mA;		

Note1 : Luminous flux is measured in total power with tolerable errors of 10%. Minimum luminous flux performance guaranteed within published operating conditions.

Note2 : Higher luminous flux will become available in the near future.

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## Optical Characteristics

Table.3

P / N	Color Temperature (K)			Viewing Angle (degrees)	Color Rendering Index (CRI)
	Min	Typ	Max	Typ	Typ
Warm White (3000K)					
G110CLCNCA If=1050mA;	2500K	3000K	3250K		
G110CLIGCA If=350mA;					
Cool White (5400K)				~120	~70
G110NWCNCA If=1050mA;	4750K	5400K	10000K		
G110Nwigca If=350mA;					

Note1 : CRI value is measured with tolerable errors of 10%

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**Electrical Characteristics****Table.4**

P / N	Forward Voltage (V)		
	Min	Typ	Max
G110CLCNCA < Warm White >			
G110NWCNCA < Cool White >	10	10.5	11
@ If=1050mA;			
G110CLIGCA < Warm White >			
G110Nwigca < Cool White >	31	31.5	32
@ If=350mA;			

Note 1 : Lustrous Technology allows a tolerance of each LED for voltage measurements.

Note 2 : Measurements are taken under each nominal forward current.

**Absolute Maximum Ratings**

Table.5

Parameters	G110XXXXCA	
DC Forward Current (mA)	G110CLCNCA / G110NWCNCA	1050
	G110CLIGCA / G110NwigCA	350
LED Junction Temperature (°C)	< 125	
ESD Sensitivity	+4kV -1.5KV (HBM)	
Thermal Resistance (°C/W)	2.1	
Operating Temperature (°C)	-25 ~ +85	
Storage Temperature (°C)	-40 ~ +100	
Soldering Temperature (°C)	260 (duration should be less than 5seconds)	

Note1 : Proper current operating must be observed to maintain junction temperature below the maximum.

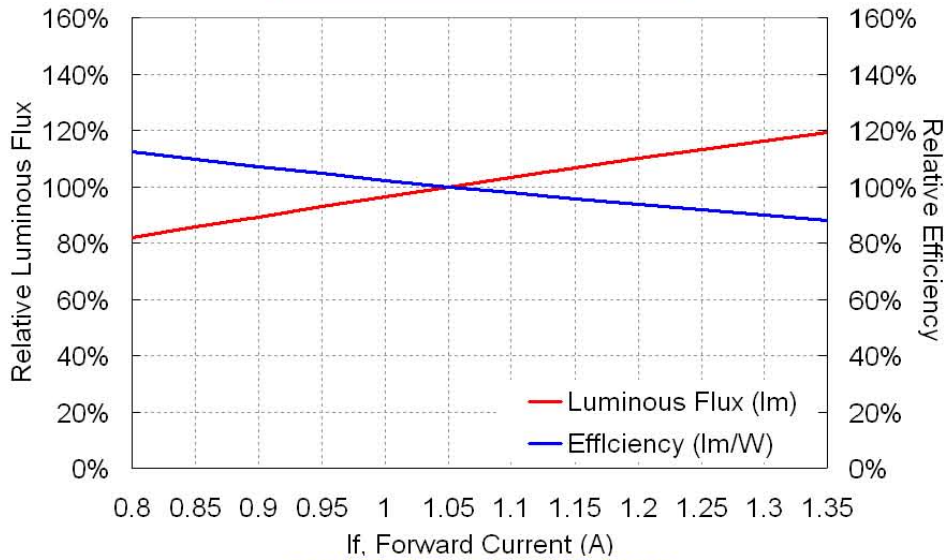


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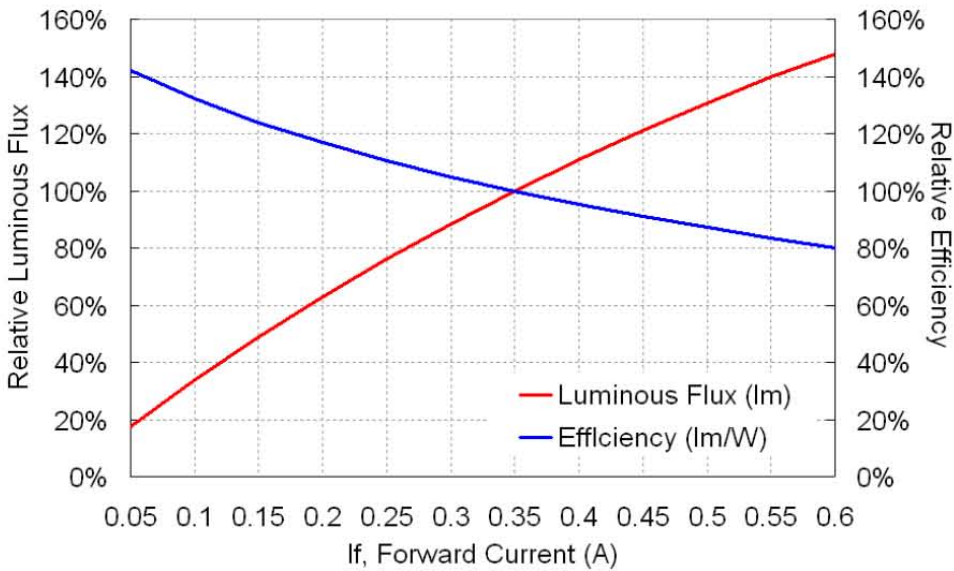
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## Relative Intensity vs. Current (T<sub>j</sub> = 25°C)

### G110CLCNCA / G110NWCNCA



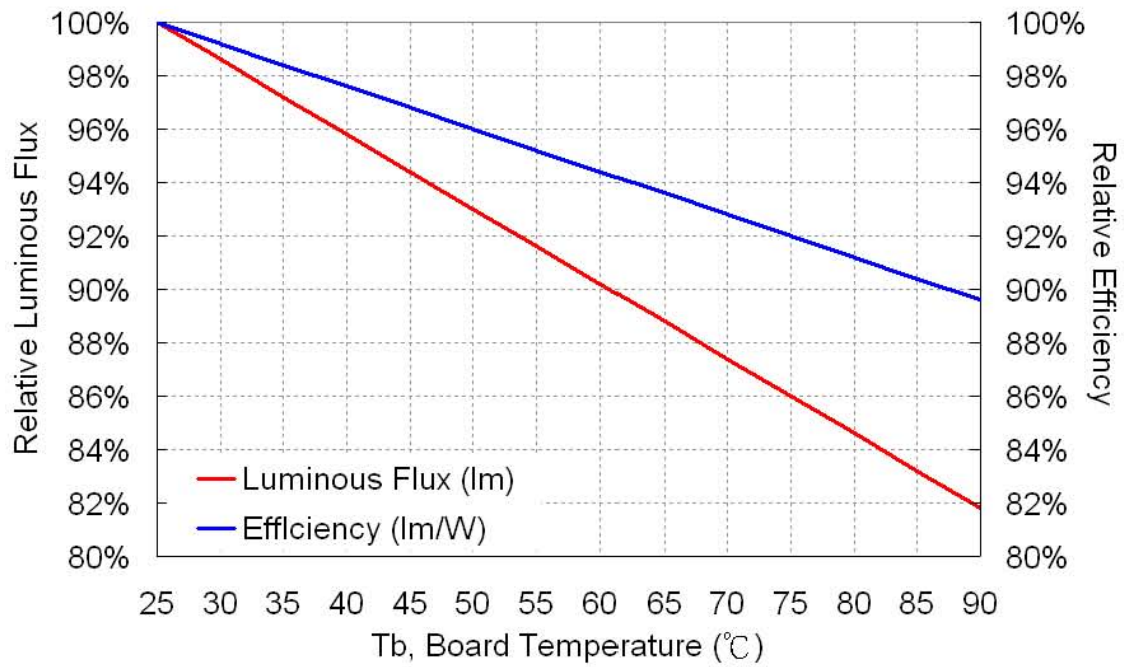
### G110CLIGCA / G110Nwigca



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## Photometric Output vs. Board Temperature

(If = Advised DC Forward Current)



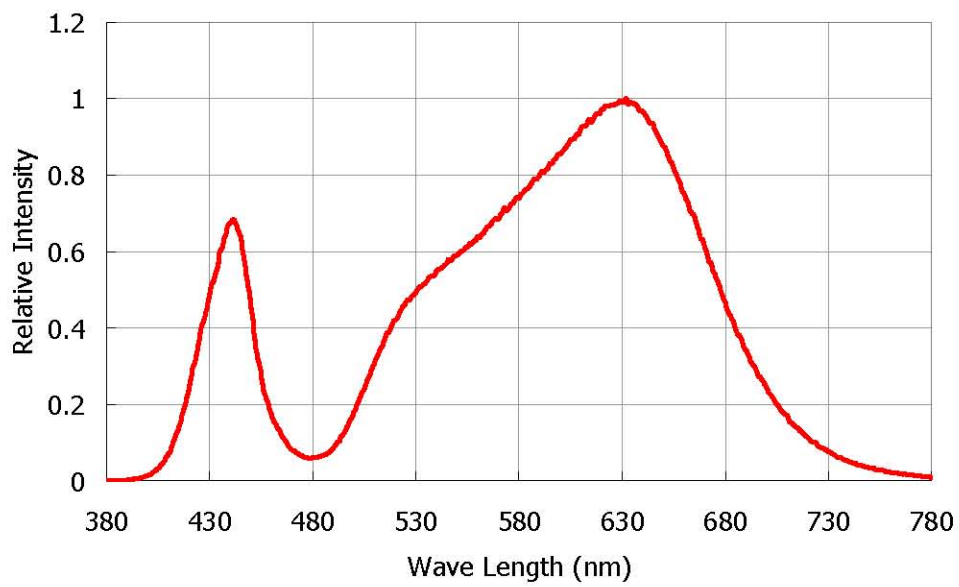
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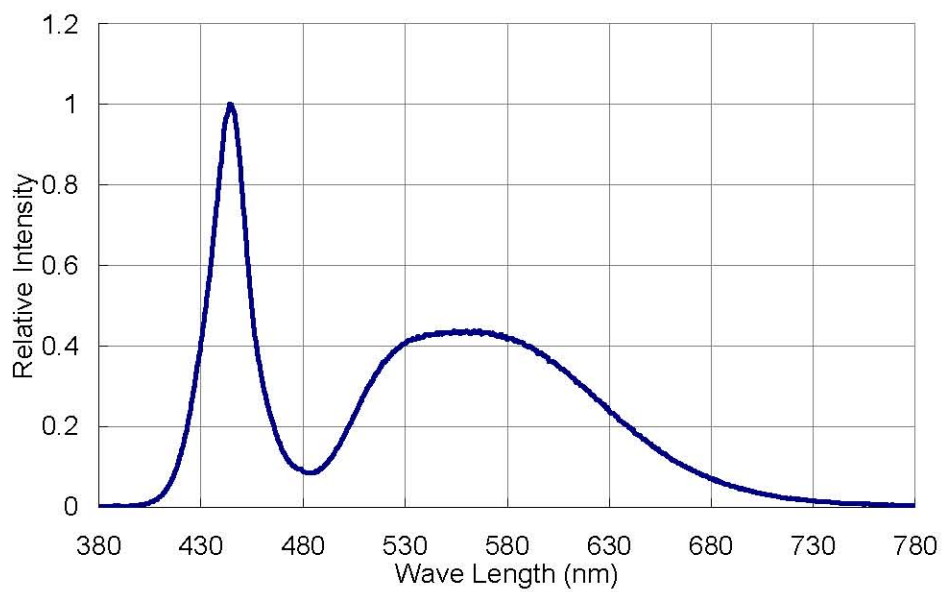
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## Relative Spectral Power

### Warm White



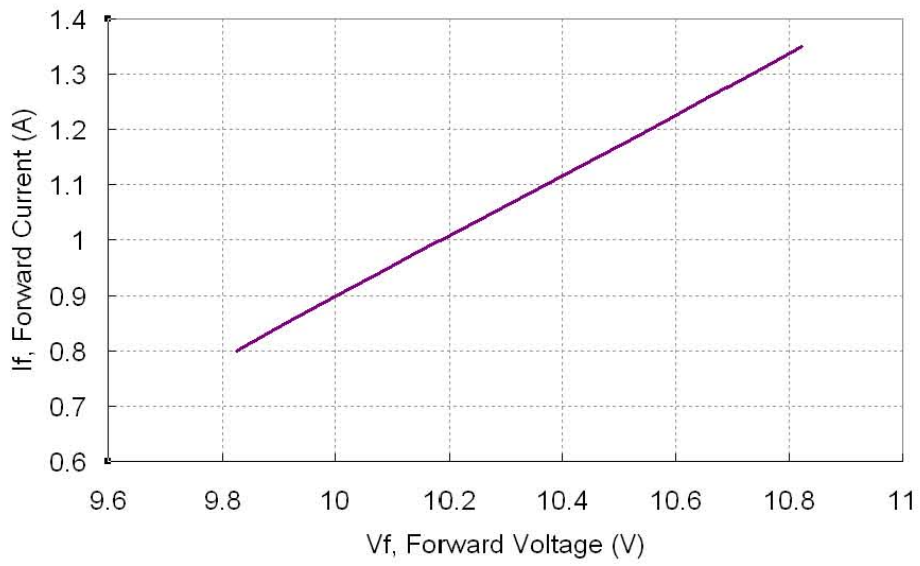
### Cool White



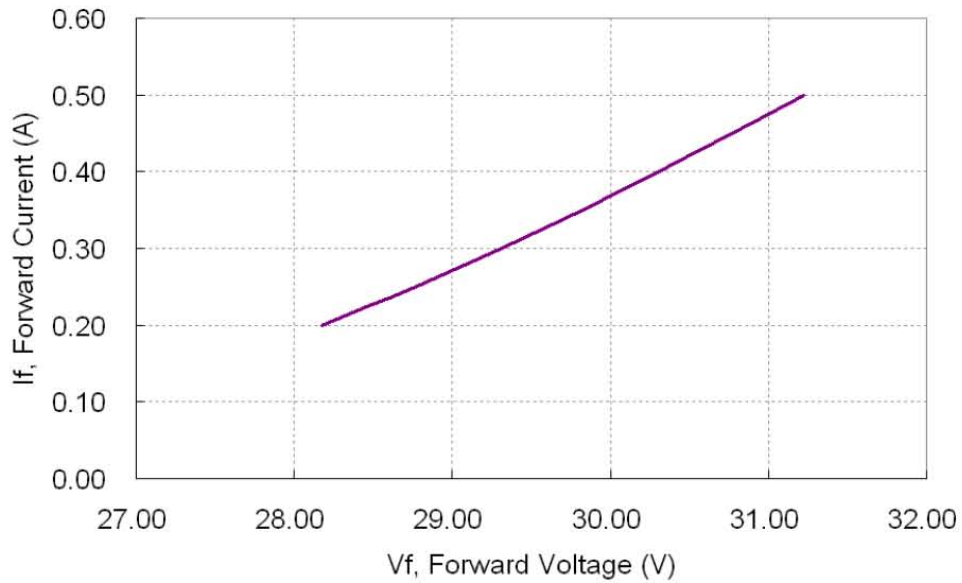
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**Forward Voltage vs. Current (T<sub>j</sub> = 25°C)**

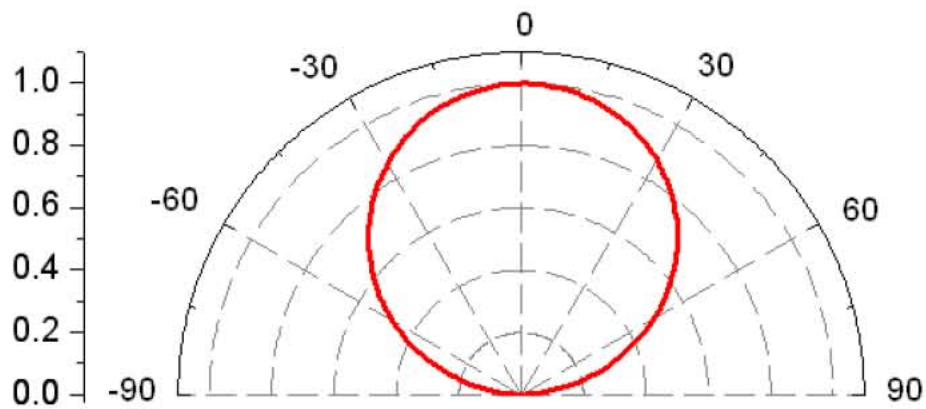
**G110CLCNCA / G110NWCNCA**



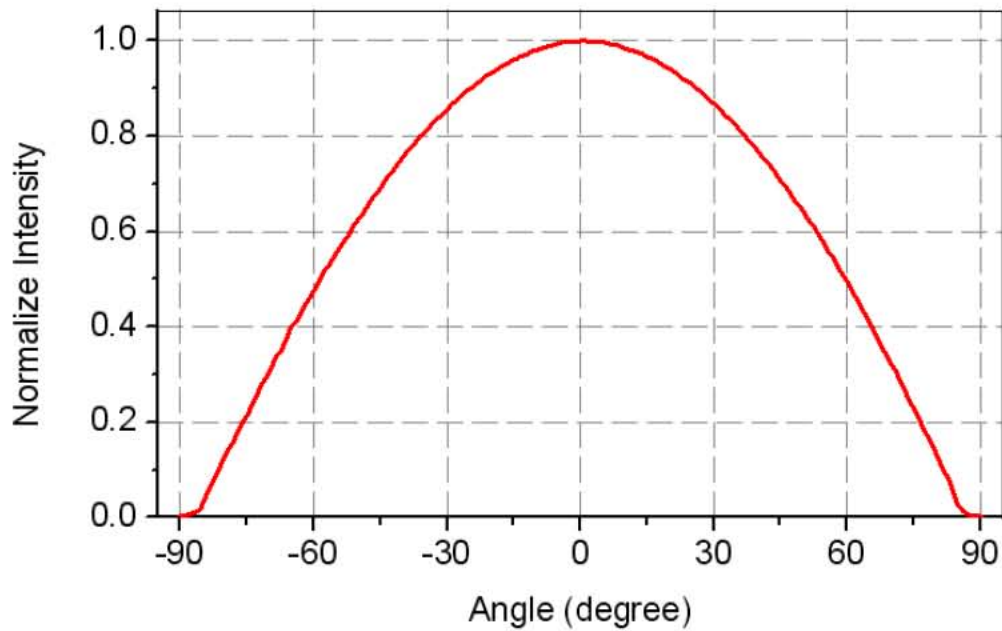
**G110CLIGCA / G110Nwigca**



**Typical Angular Beam Profile, T<sub>j</sub>=25°C \***



**View Angle: 120 degree**



\* Note1 : Detail beam profile data can be provided to certain qualified customers

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## Product Binning

Typical manufacturing processes of LED result in a variation in performance surrounding the typical data sheet values. In order to minimize variation in the end product of application, Lustrous bins its products for performance in Luminous Flux and chromaticity.

The tables below list the standard photometric bins for Lustrous LED ( tested and binned at the indicated test current ). **Product availability in a particular bin varies by product and production run. Please contact your Lustrous sales representative for further information regarding product availability.**

## Brightness Binning Information \*

Table.6

BIN Code	Lv (lm)		BIN Code	Lv (lm)	
	min.	max.		min.	max.
A	5	20	L	320	360
B	20	40	M	360	400
C	40	60	N	400	450
D	60	80	O	450	500
E	80	110	P	500	580
F	110	140	Q	580	660
G	140	170	R	660	740
H	170	200	S	740	860
I	200	240	T	860	980
J	240	280	U	980	1100
K	280	320	V	1100	1300

\*Note : Luminous Flux is measured in total luminous flux with tolerable errors of 10%.

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## Binning Condition

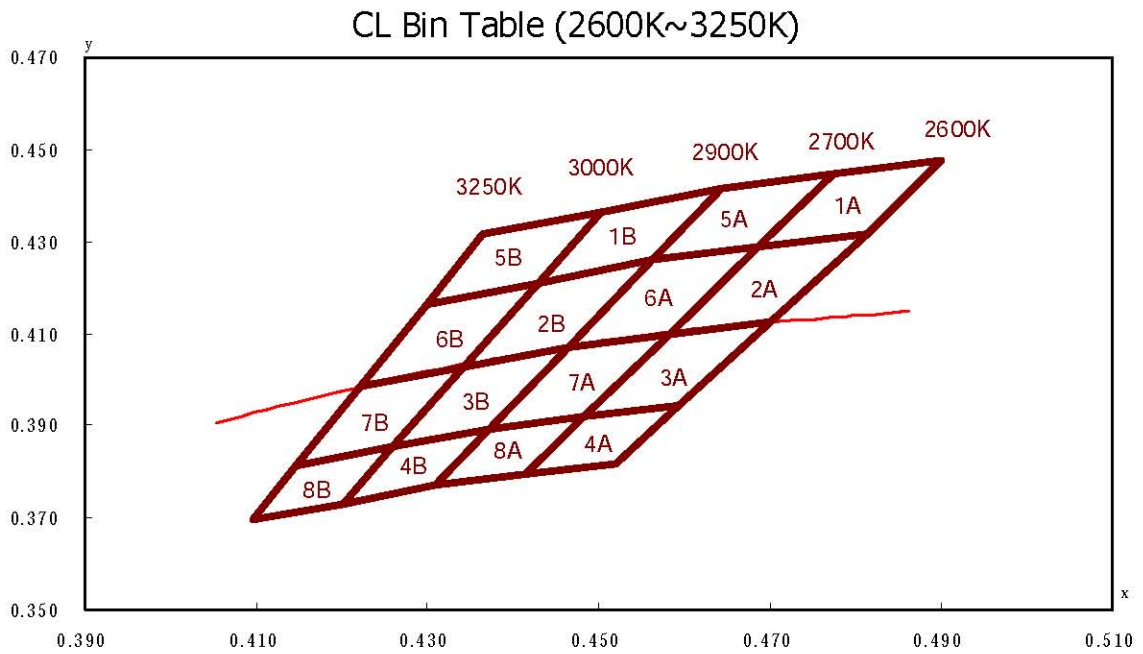
Table.7

P/N	Forward Current (mA)
G110CLCNCA < Warm White > G110NWCNCA < Cool White >	1050
G110CLIGCA < Warm White > G110NWIGCA < Cool White >	350

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**Chromaticity Binning Information \*\***

**Warm White**



\*\*Note : Chromaticity is measured in Chromaticity Coordinate (CIE 1931-xy) with tolerable errors of +/-0.005.



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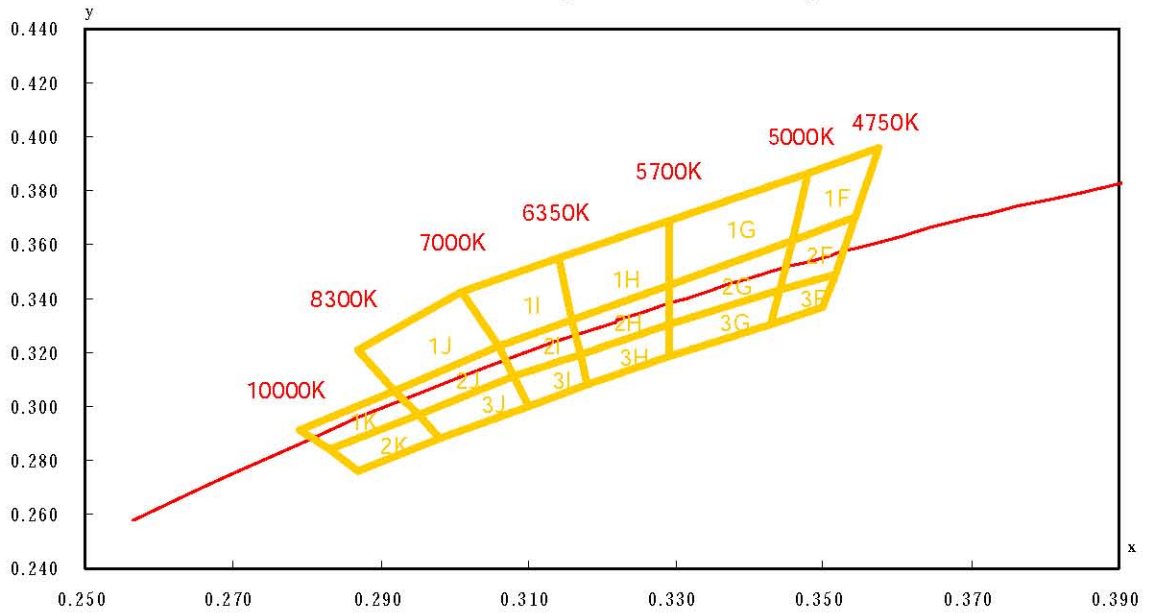
Table.8

Warm-White Bin Coordinates												
CCT (K)			BIN CODE	Chromaticity Coordinate (CIE 1931-xy)								
Min	Typ.	Max		x1	y1	x2	y2	x3	y3	x4	y4	
2600	2700	2900	A	1A	0.4687	0.4289	0.4774	0.4447	0.4900	0.4477	0.4813	0.4319
				2A	0.4582	0.4099	0.4687	0.4289	0.4813	0.4319	0.4700	0.4126
				3A	0.4483	0.3919	0.4582	0.4099	0.4700	0.4126	0.4593	0.3944
				4A	0.4414	0.3794	0.4483	0.3919	0.4593	0.3944	0.4519	0.3818
				5A	0.4562	0.4260	0.4642	0.4416	0.4774	0.4447	0.4687	0.4289
				6A	0.4465	0.4071	0.4562	0.4260	0.4687	0.4289	0.4582	0.4099
				7A	0.4373	0.3893	0.4465	0.4071	0.4582	0.4099	0.4483	0.3919
				8A	0.4309	0.3769	0.4373	0.3893	0.4483	0.3919	0.4414	0.3794
2900	3000	3250	B	1B	0.4430	0.4212	0.4503	0.4366	0.4642	0.4416	0.4562	0.4260
				2B	0.4342	0.4028	0.4430	0.4212	0.4562	0.4260	0.4465	0.4071
				3B	0.4259	0.3853	0.4342	0.4028	0.4465	0.4071	0.4373	0.3893
				4B	0.4201	0.3731	0.4259	0.3853	0.4373	0.3893	0.4309	0.3769
				5B	0.4299	0.4165	0.4364	0.4316	0.4503	0.4366	0.4430	0.4212
				6B	0.4221	0.3984	0.4299	0.4165	0.4430	0.4212	0.4342	0.4028
				7B	0.4147	0.3814	0.4221	0.3984	0.4342	0.4028	0.4259	0.3853
				8B	0.4095	0.3694	0.4147	0.3814	0.4259	0.3853	0.4201	0.3731

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Cool White

NW Bin Table (4750K~10000K)



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Table.9

<b>Cool White Bin Table</b>												
<b>CCT (K)</b>			<b>BIN</b>	<b>Chromaticity Coordinate (CIE 1931-xy)</b>								
<b>Min</b>	<b>Typ.</b>	<b>Max</b>		<b>CODE</b>	<b>x1</b>	<b>y1</b>	<b>x2</b>	<b>y2</b>	<b>x3</b>	<b>y3</b>	<b>x4</b>	<b>y4</b>
<b>4750</b>	<b>4850</b>	<b>5000</b>	<b>F</b>	<b>1F</b>	<b>0.3479</b>	<b>0.3867</b>	<b>0.3457</b>	<b>0.3617</b>	<b>0.3544</b>	<b>0.3704</b>	<b>0.3576</b>	<b>0.3957</b>
				<b>2F</b>	<b>0.3457</b>	<b>0.3617</b>	<b>0.3440</b>	<b>0.3429</b>	<b>0.3515</b>	<b>0.3487</b>	<b>0.3544</b>	<b>0.3704</b>
				<b>3F</b>	<b>0.3440</b>	<b>0.3429</b>	<b>0.3429</b>	<b>0.3307</b>	<b>0.3500</b>	<b>0.3371</b>	<b>0.3515</b>	<b>0.3487</b>
<b>5000</b>	<b>5300</b>	<b>5700</b>	<b>G</b>	<b>1G</b>	<b>0.3290</b>	<b>0.3690</b>	<b>0.3290</b>	<b>0.3450</b>	<b>0.3457</b>	<b>0.3617</b>	<b>0.3479</b>	<b>0.3867</b>
				<b>2G</b>	<b>0.3457</b>	<b>0.3617</b>	<b>0.3440</b>	<b>0.3429</b>	<b>0.3290</b>	<b>0.3300</b>	<b>0.3290</b>	<b>0.3450</b>
				<b>3G</b>	<b>0.3290</b>	<b>0.3300</b>	<b>0.3290</b>	<b>0.3180</b>	<b>0.3429</b>	<b>0.3307</b>	<b>0.3440</b>	<b>0.3429</b>
<b>5700</b>	<b>6000</b>	<b>6350</b>	<b>H</b>	<b>1H</b>	<b>0.3290</b>	<b>0.3690</b>	<b>0.3290</b>	<b>0.3450</b>	<b>0.3160</b>	<b>0.3320</b>	<b>0.3140</b>	<b>0.3550</b>
				<b>2H</b>	<b>0.3290</b>	<b>0.3450</b>	<b>0.3290</b>	<b>0.3300</b>	<b>0.3170</b>	<b>0.3190</b>	<b>0.3160</b>	<b>0.3320</b>
				<b>3H</b>	<b>0.3170</b>	<b>0.3190</b>	<b>0.3290</b>	<b>0.3300</b>	<b>0.3290</b>	<b>0.3180</b>	<b>0.3180</b>	<b>0.3080</b>
<b>6350</b>	<b>6500</b>	<b>7000</b>	<b>I</b>	<b>1I</b>	<b>0.3140</b>	<b>0.3550</b>	<b>0.3160</b>	<b>0.3320</b>	<b>0.3060</b>	<b>0.3220</b>	<b>0.3010</b>	<b>0.3420</b>
				<b>2I</b>	<b>0.3160</b>	<b>0.3320</b>	<b>0.3170</b>	<b>0.3190</b>	<b>0.3080</b>	<b>0.3110</b>	<b>0.3060</b>	<b>0.3220</b>
				<b>3I</b>	<b>0.3080</b>	<b>0.3110</b>	<b>0.3170</b>	<b>0.3190</b>	<b>0.3180</b>	<b>0.3080</b>	<b>0.3100</b>	<b>0.3000</b>
<b>7000</b>	<b>7650</b>	<b>8300</b>	<b>J</b>	<b>1J</b>	<b>0.3010</b>	<b>0.3420</b>	<b>0.3060</b>	<b>0.3220</b>	<b>0.2920</b>	<b>0.3060</b>	<b>0.2870</b>	<b>0.3210</b>
				<b>2J</b>	<b>0.3060</b>	<b>0.3220</b>	<b>0.3080</b>	<b>0.3110</b>	<b>0.2950</b>	<b>0.2970</b>	<b>0.2920</b>	<b>0.3060</b>
				<b>3J</b>	<b>0.2950</b>	<b>0.2970</b>	<b>0.3080</b>	<b>0.3110</b>	<b>0.3100</b>	<b>0.3000</b>	<b>0.2980</b>	<b>0.2880</b>
<b>8300</b>	<b>9000</b>	<b>10000</b>	<b>K</b>	<b>1K</b>	<b>0.2920</b>	<b>0.3060</b>	<b>0.2950</b>	<b>0.2970</b>	<b>0.2830</b>	<b>0.2840</b>	<b>0.2790</b>	<b>0.2910</b>
				<b>2K</b>	<b>0.2830</b>	<b>0.2840</b>	<b>0.2950</b>	<b>0.2970</b>	<b>0.2980</b>	<b>0.2880</b>	<b>0.2870</b>	<b>0.2760</b>

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## Print Code Guideline

<u>A</u>	<u>CL</u>	<u>V0</u> - <u>M</u>	<u>3</u>	<u>B</u>
1	2	3	4	5
<u>X</u>	<u>X</u>	<u>09</u>	<u>34</u>	<u>XXXX</u>
6	7	8	9	10

Table.11

1 Power	2 Color	3 Bin Vf	4 Luminous Flux	5 Chromaticity
A: 10W	CL: Warm White NW: Cool White	V0: Without Binned	See Bin Code Definition	See Bin Code Definition

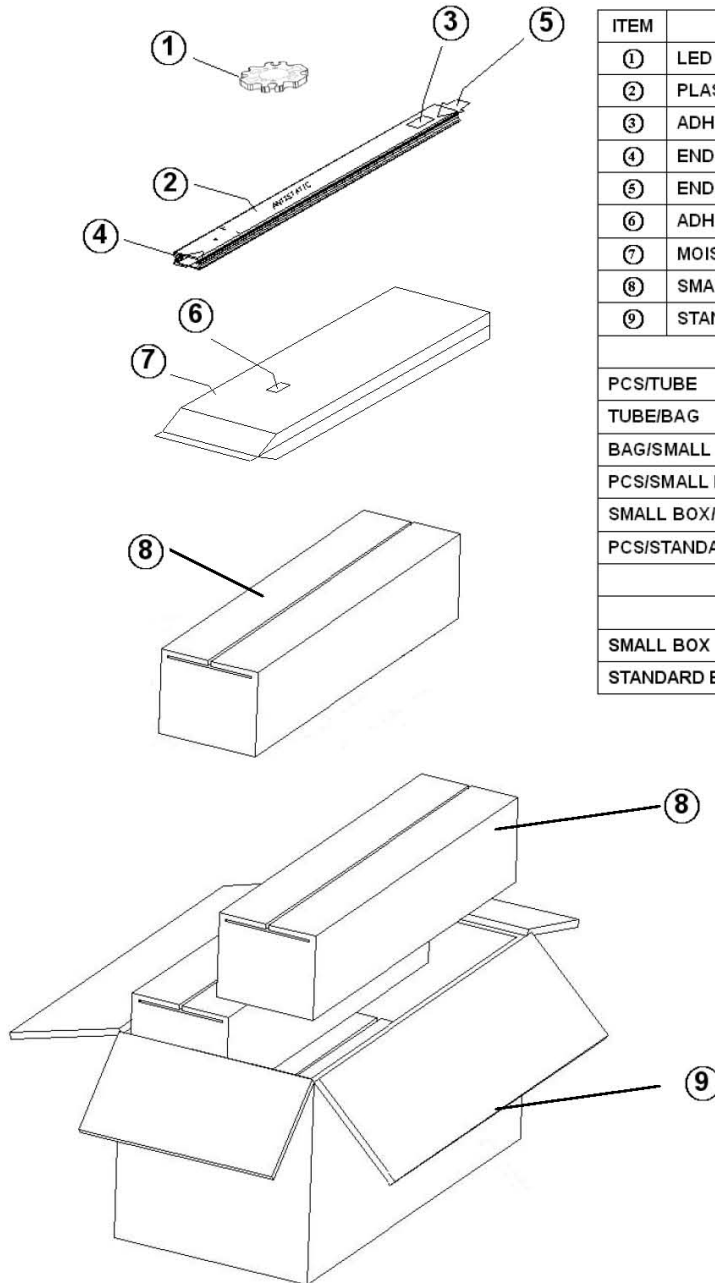
6 Vf	7 Current	8 Year	9 Week	10 Internal Code
C : 10.5 V I : 31.5 V	G : 350mA N : 1050mA	09 : 2009 10 : 2010 11 : 2011	01 : 01 <sup>st</sup> Week 20 : 20 <sup>th</sup> Week 45 : 45 <sup>th</sup> Week	

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## Standard Packaging



ITEM	DESCRIPTION	
①	LED	
②	PLASTIC TUBE	
③	ADHESIVE MAIN LABEL	
④	END-PLUG WHITE	
⑤	END-PLUG BLACK	
⑥	ADHESIVE MAIN LABEL	
⑦	MOISTURE BARRIER BAG	
⑧	SMALL BOX	
⑨	STANDARD BOX	
STACKING METHOD		
PCS/TUBE		20
TUBE/BAG		25
BAG/SMALL BOX		2
PCS/SMALL BOX		1000
SMALL BOX/STANDARD BOX		4
PCS/STANDARD BOX		4000
SIZE AND WEIGHT		
	SIZE(mm <sup>3</sup> )	WEIGHT(kg)
SMALL BOX	560×130×130	2.8±0.5
STANDARD BOX	580×280×280	11.9±0.5

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## Precaution for Use

### Over-current Proof

1. Customer must not drive the LEDs with reverse current and should apply resistors for extra protection.
2. The maximum overshoot of driving current should be limited under normal driving current \* 1.3 times.
3. The ripple of driving current should not be over +/-10% of normal driving current.
4. When driving the products, the clamp voltage must be set at **12V (for G110XXCNCA) / 32V (for G110XXIGCA)** in driver.

### Storage

1. Do not open the moisture barrier bag ( MBB ) before the products are ready to be used.
2. Storage Condition ( before opening the MBB ) :
  - Storage Temperature : -40~90°C
  - Relative Humidity < 90% RH
  - Please re-seal the MBB when storing longer than 3 weeks.
  - The products should be used within half of a year.
3. Storage Condition ( after opening the MBB ) :
  - Storage Temperature : -40~90°C
  - Relative Humidity < 90% RH
  - The products should be used ( assembled ) as soon as possible after opening the MBB. Otherwise, LED must be baked at 80+/-5°C, 24 hours before handling and assembling.

### Handling

1. Do not touch the lighting area during handling and assembling.