LITEON®
OPTOELECTRONICS

Light LED

Product Data Sheet

LTPA-CM036

Spec No.: DS25-2014-0229

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LITE-ON DCC

RELEASE

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Light LED
LTPA-CM036

1. Description

The LiteON CoB Product series is a revolutionary, energy efficient and ultra-compact new light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. It gives you total design freedom and unmatched brightness, creating a new opportunities for solid state lighting to displace conventional lighting technologies.

1.1 Features

- Compact high flux density light source
- Uniform high quality illumination
- Streamlined thermal path
- MacAdam compliant binning structure
  More energy efficient than incandescent, halogen and fluorescent lamps
- Instant light with unlimited dimming
- RoHS compliant and Pb free

1.2 Applications

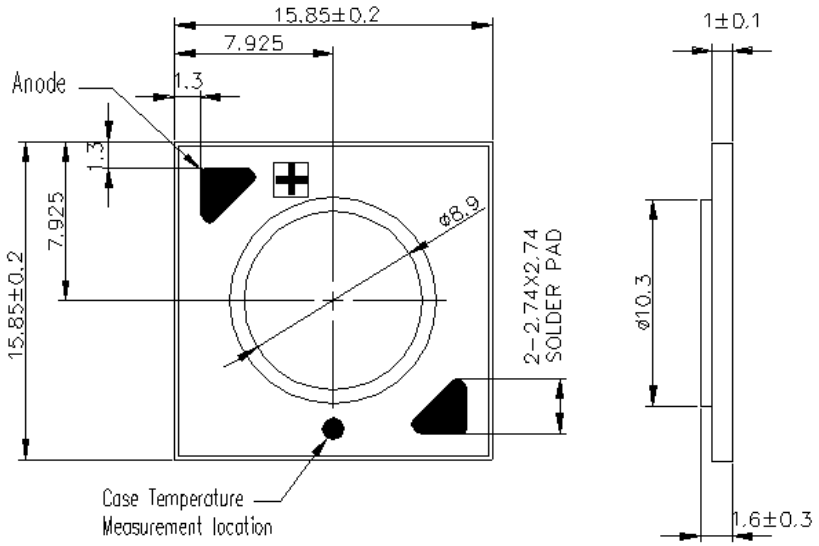
- Automotive aftermarket eg: DRL, Reading light

1.3 Product List

Product Series	Part Number	CCT	CRI	Color Bin	
				5SDCM	ANSI
14 Series	LTPA-CM036FZP27	2700K	80	☆	☆
	LTPA-CM036FZP30	3000K	80	☆	☆
	LTPA-CM036FZP40	4000K	80	☆	☆
	LTPA-CM036FZP50	5000K	80	☆	☆
	LTPA-CM036FZP57	5700K	80	☆	☆
22 Series	LTPA-CM036WZW27	2700K	80	☆	☆
	LTPA-CM036WZW30	3000K	80	☆	☆
	LTPA-CM036WZW40	4000K	80	☆	☆
	LTPA-CM036WZW50	5000K	80	☆	☆
	LTPA-CM036WZW57	5700K	80	☆	☆

2. Outline Dimensions

2.1 Form Factor of CM036 series CoB

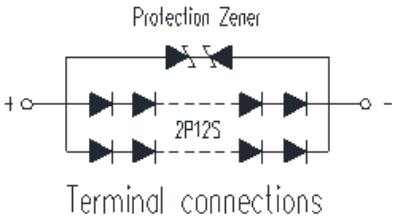


Notes

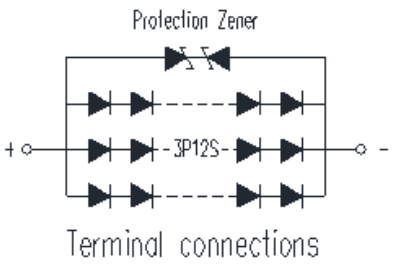
1. All dimensions are in millimeters.
2. Tolerance is ±0.3mm unless otherwise noted.
3. LED of equivalent circuit means all series/parallel in CoB package.

2.2 Internal Equivalent Circuit

14 Series Product



22 Series Product

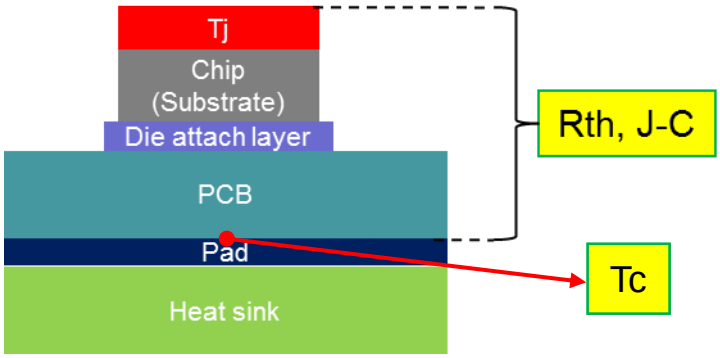


3. Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Product Series	Rating	Unit
Power Dissipation	P_O	14	14	W
		22	22	
Forward Current	I_F	14	350	mA
		22	500	
Junction Temperature	T_j		125	°C
Thermal Resistance, Junction-Case	$R_{th, J-C}$	14	1.7	°C/W
		22	1.2	
Operating Temperature Range	T_c		-40 to 85	°C
Storage Temperature Range	T_{stg}		-40 to 100	°C
Breakdown Voltage(DC)	V_B		2.25	KV
Electrostatic Discharge	ESD		2	KV

Notes

1. The pulse mode condition is 1/10 duty cycle with 100 msec pulse width.
2. Forbid to be operated at reverse voltage condition.
3. ESD spec is reference to AEC-Q101-001 HBM.
4. The unit of Rth is °C/W electrical.
5. The CM03 CoB is recommended soldering temperature under 350degC and could not over 3.5sec.



4. Electro-Optical Characteristics

4.1 Typical Performance

■ 14 Series Product

Dominant CCT	Product Series	Current (mA)	V_F (V) @25°C	Flux(lm) @25°C	V_F (V) @85°C	Flux(lm) @85°C	Eff.(lm/W) @25°C	Eff.(lm/W) @85°C
2700K	14	350	38.5	1546	37.7	1391	115	105
3000K	14	350	38.5	1610	37.7	1448	119	110
4000K	14	350	38.5	1707	37.7	1535	127	116
5000K	14	350	38.5	1723	37.7	1550	128	118
5700K	14	350	38.5	1691	37.7	1521	126	115

■ 22 Series Product

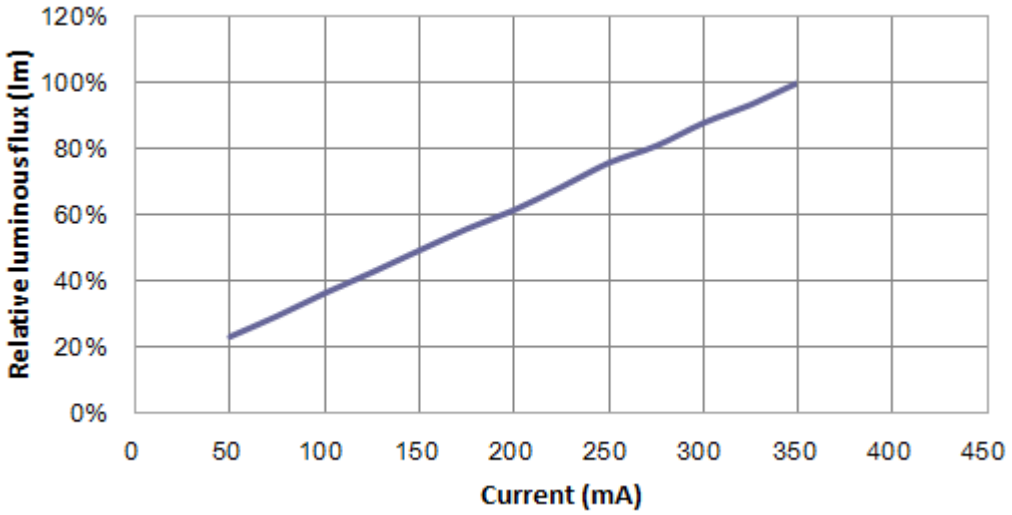
Dominant CCT	Product Series	Current (mA)	V_F (V) @25°C	Flux(lm) @25°C	V_F (V) @85°C	Flux(lm) @85°C	Eff.(lm/W) @25°C	Eff.(lm/W) @85°C
2700K	22	500	38.3	2284	37.5	2055	119	110
3000K	22	500	38.3	2360	37.5	2123	123	113
4000K	22	500	38.3	2500	37.5	2249	131	120
5000K	22	500	38.3	2541	37.5	2286	133	122
5700K	22	500	38.3	2492	37.5	2242	130	120

Notes

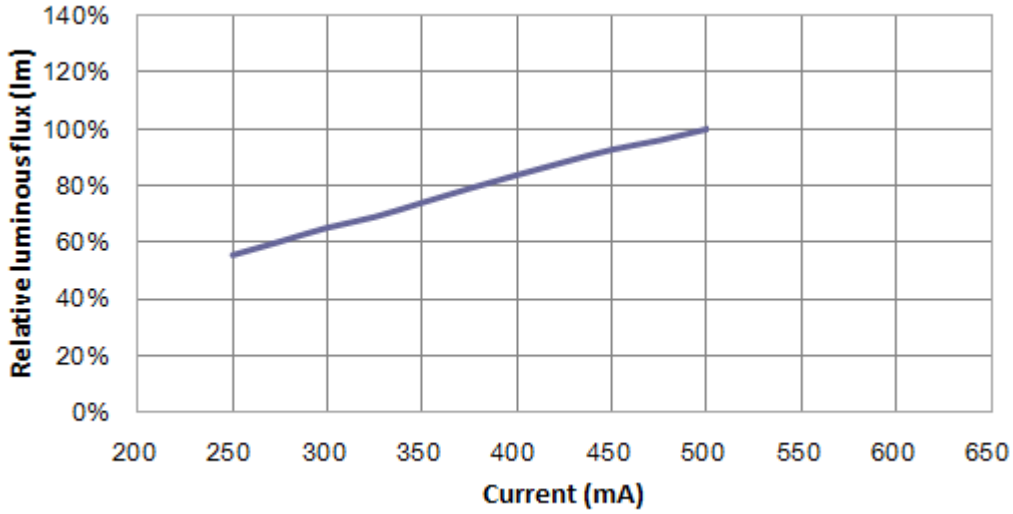
1. All of V_F value bin range please refer page 12 ” V_F Binning Parameter”.
2. All of flux value bin range please refer page 11, 12 ”Flux Binning Parameter”.
3. Tolerance of flux is ±10%, tolerance of CCX/CCY is ±0.01, tolerance of CRI is ±3, and tolerance of V_F is ±5%.
4. Typical viewing angle is 120deg.

4.2 Forward Current vs. Lumen and Voltage

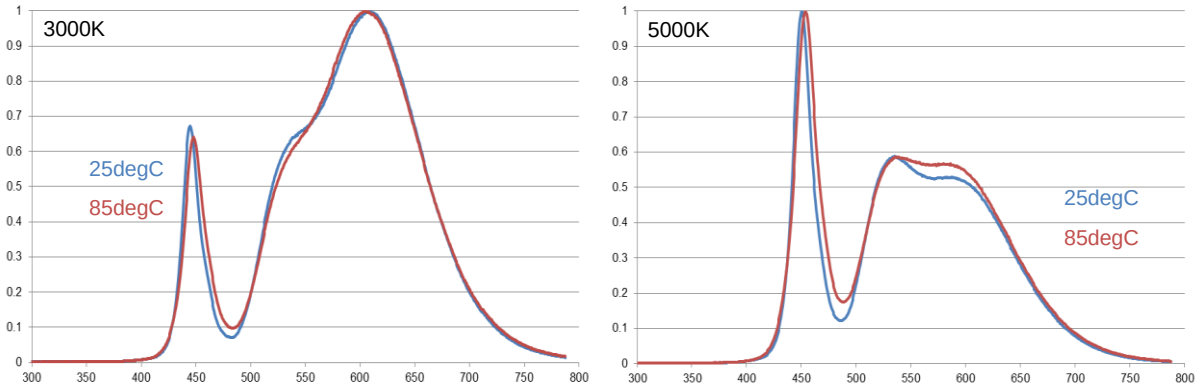
■ 14 Series Product



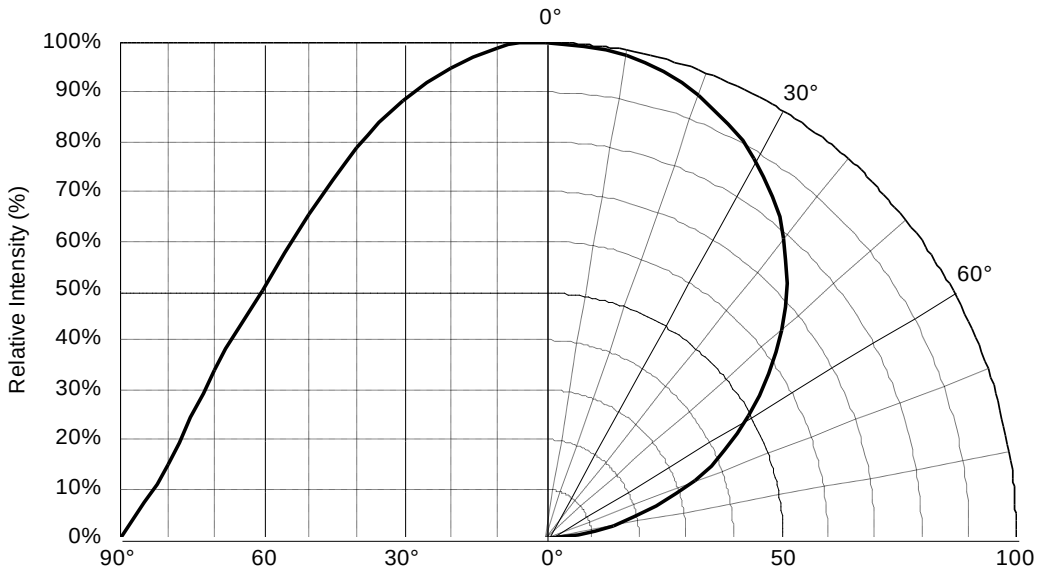
■ 22 Series Product



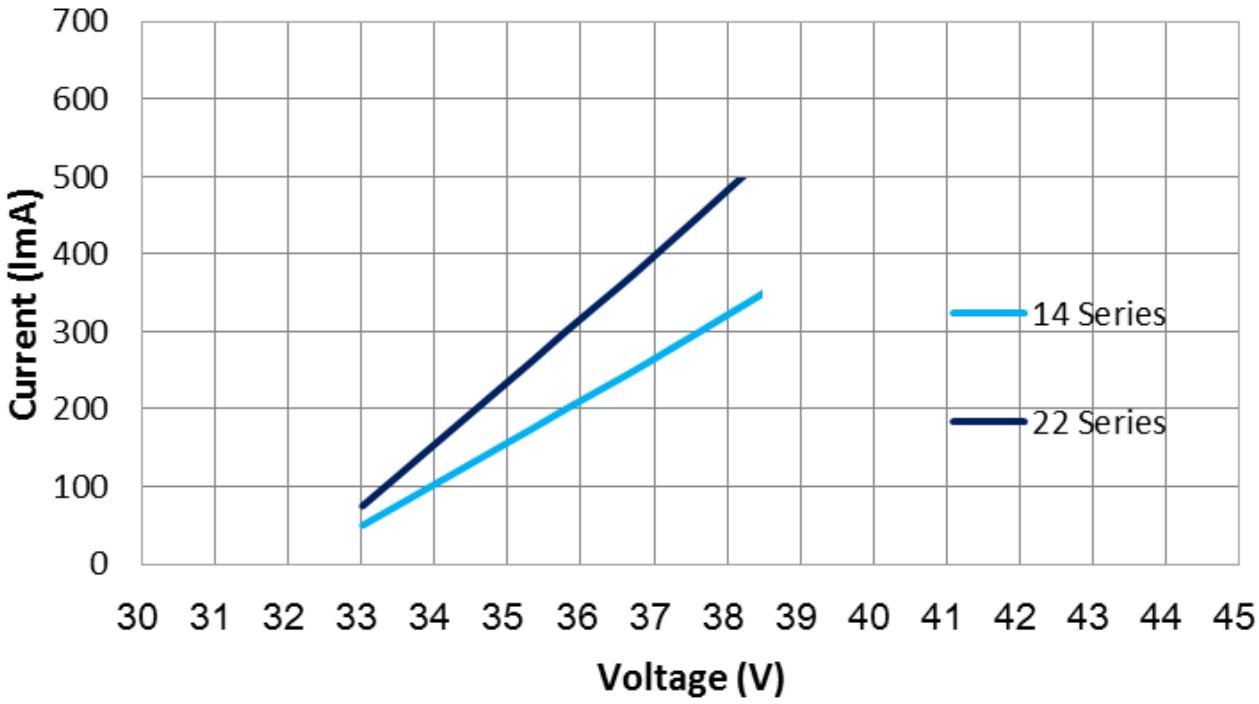
4.3 Relative Spectral Power Distribution at Typical Current



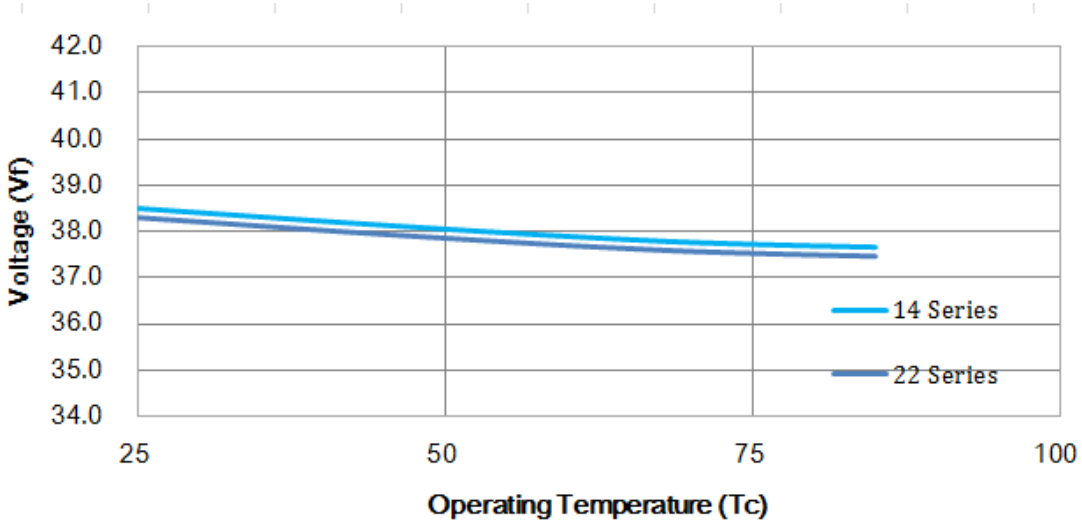
4.4 Radiation Characteristics



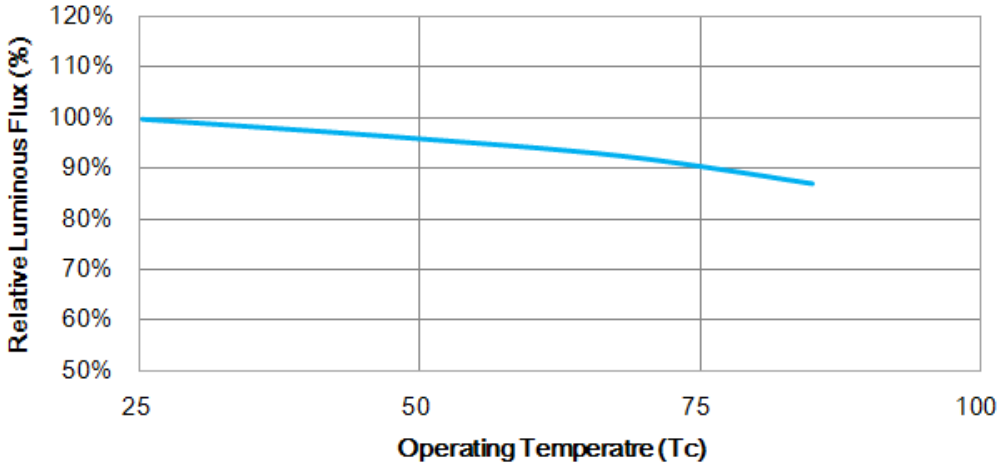
4.5 Forward Current vs. Forward Voltage



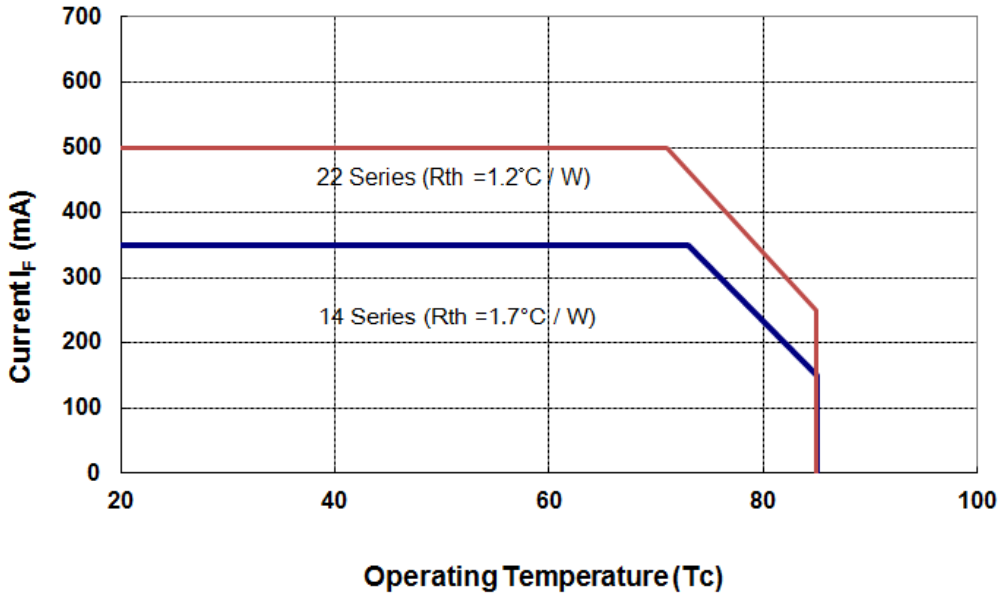
4.6 Forward Voltage vs. Operating Temperature



4.7 Relative Intensity vs. Operating Temperature



4.8 Forward Current Degrading Curve



5. CoB Binning Definition

■ Flux Binning Parameter (25degC)

Lumen **CODE** List of LTPA-CM036 Series Product			
Parameter	**Code**	**Unit**	**Lumen**
Luminous Flux	H	lm	1240
	I		1345
	J		1455
	K		1570
	L		1695
	M		1830
	N		1975
	O		2130
	P		2300
	Q		2485
	R		2680
	S		2890
	T		3120

■ 14 Series Lumen Bin

Lumen (lm)									
2700K		3000K		4000K		5000K		5700K	
Bin	Range	Bin	Range	Bin	Range	Bin	Range	Bin	Range
HJ	1240~1455	HJ	1240~1455	IK	1345~1570	IK	1345~1570	IK	1345~1570
JL	1455~1695	JL	1455~1695	KM	1570~1830	KM	1570~1830	KM	1570~1830
LN	1695~1975	LN	1695~1975	MO	1830~2130	MO	1830~2130	MO	1830~2130

Tolerance on each Hue bin (x,y) is +/- 0.01

■ 22 Series Lumen Bin

Lumen (lm)									
2700K		3000K		4000K		5000K		5700K	
Bin	Range	Bin	Range	Bin	Range	Bin	Range	Bin	Range
MO	1830~2130	MO	1830~2130	NP	1975~2300	NP	1975~2300	NP	1975~2300
OQ	2130~2485	OQ	2130~2485	PR	2300~2680	PR	2300~2680	PR	2300~2680
QS	2485~2890	QS	2485~2890	RT	2680~3120	RT	2680~3120	RT	2680~3120

Tolerance on each Hue bin (x,y) is +/- 0.01

■ Forward Voltage Binning Parameter (25decgC)

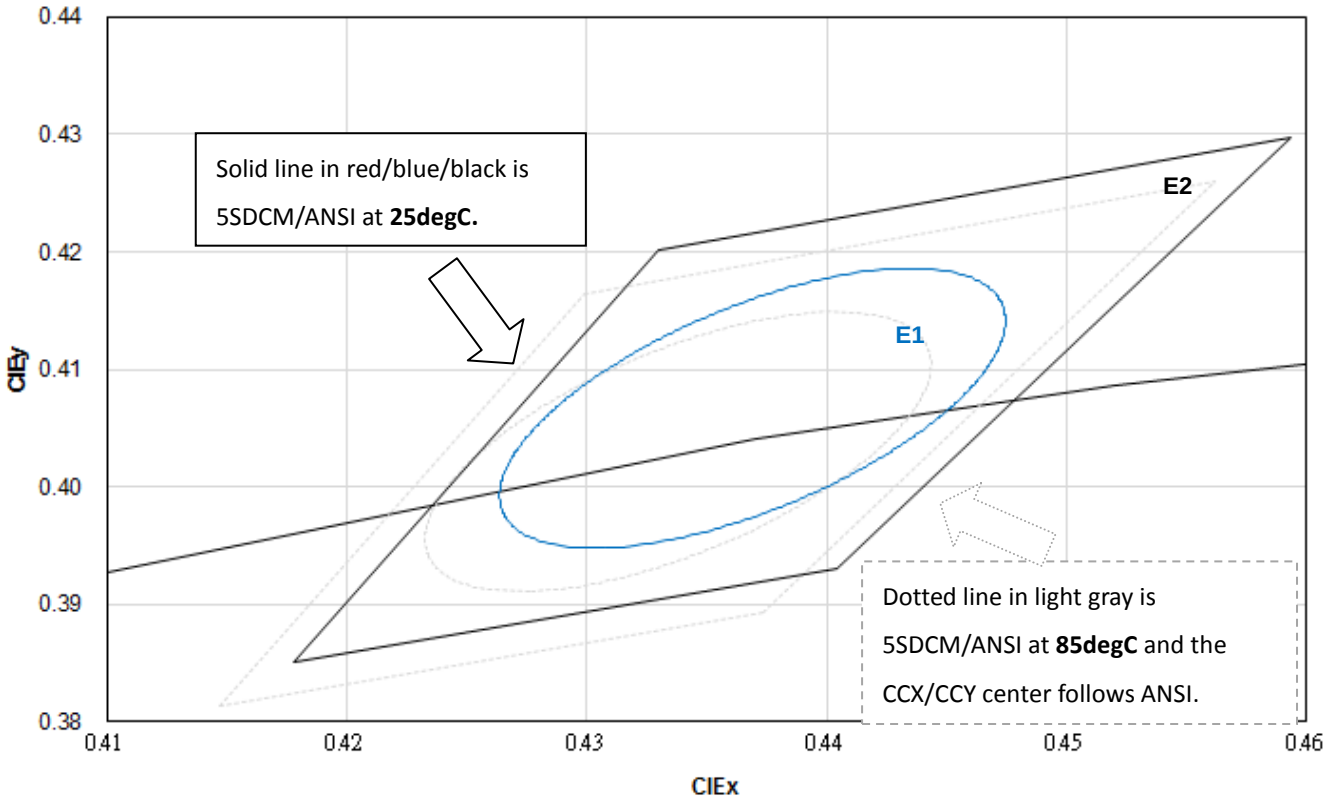
Parameter	Bin	Symbol	Min	Max	Unit	Condition
Forward Voltage	V1	V_F	33.6	42	V	I_F=Typical current

Note: Full Rank on Label

Example: V1/DF/D1

Forward Voltage Rank	Luminous Flux Rank	Color Rank
V1	DF	D1

■ Example of LiteOn CoB MacAdam Ellipse Color Definition (Ex: 3000K)



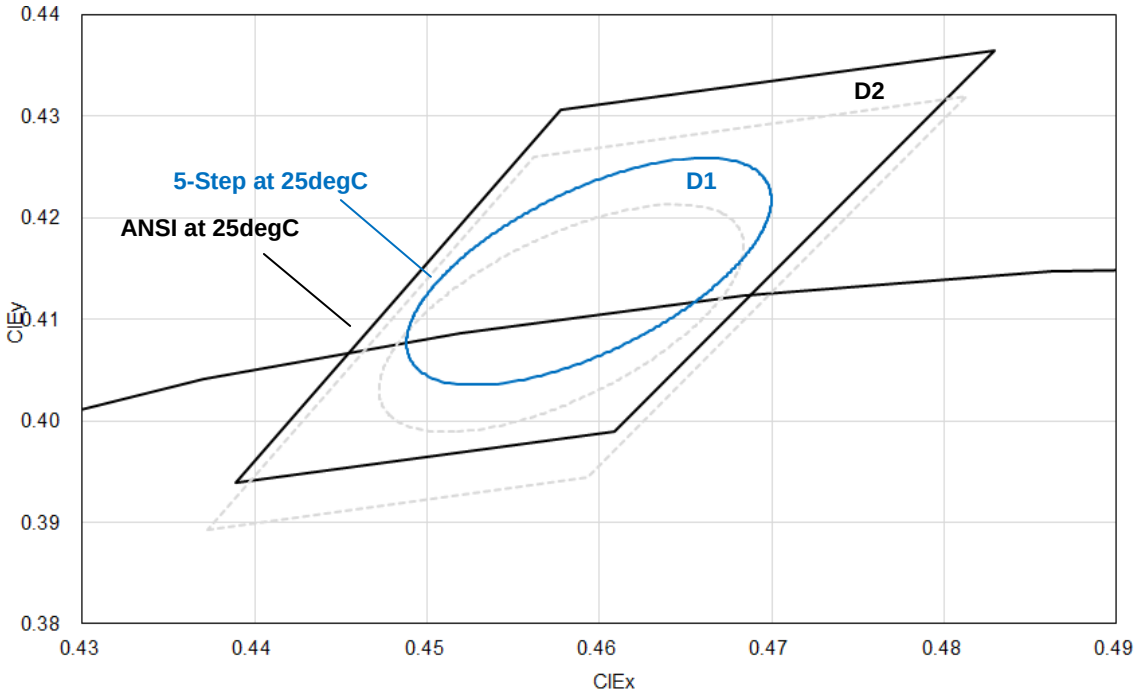
CIE Center Point						
CCT	25degC (LiteOn Spec.)		85degC (ANSI)		Hot/Cold Factor	
	CCX	CCY	CCX	CCY	CCX	CCY
2700	0.4582	0.4150	0.4578	0.4101	-0.0004	-0.0049
3000	0.4352	0.4083	0.4338	0.403	-0.0014	-0.0053
4000	0.3849	0.3856	0.3818	0.3797	-0.0031	-0.0059
5000	0.3486	0.3670	0.3447	0.3553	-0.0039	-0.0117
5700	0.3319	0.3513	0.3287	0.3417	-0.0032	-0.0096

Notes

- LiteOn tester and shipping spec follow the color bin with 25degC CCX/CCY center.
- The Hot/Cold factor means the CCX/CCY shift from 25degC to 85degC.
- The Hot/Cold shift is measured by LiteOn CAS 140B instrument system.
- The ellipse equation expression: $SDCM = (g11*(x-x_0)^2 + 2*g12*(x-x_0)*(y-y_0) + g22*(y-y_0)^2)^{0.5}$

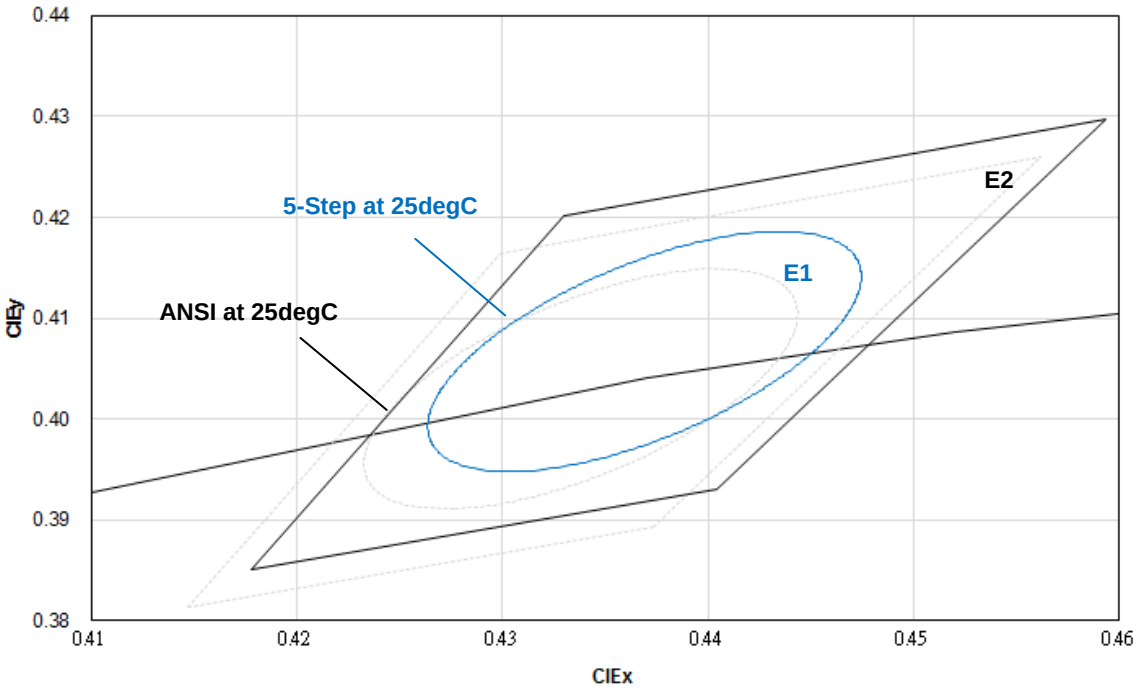
CM03 CRI80 2700K

PN: LTPA-CM036xZx27



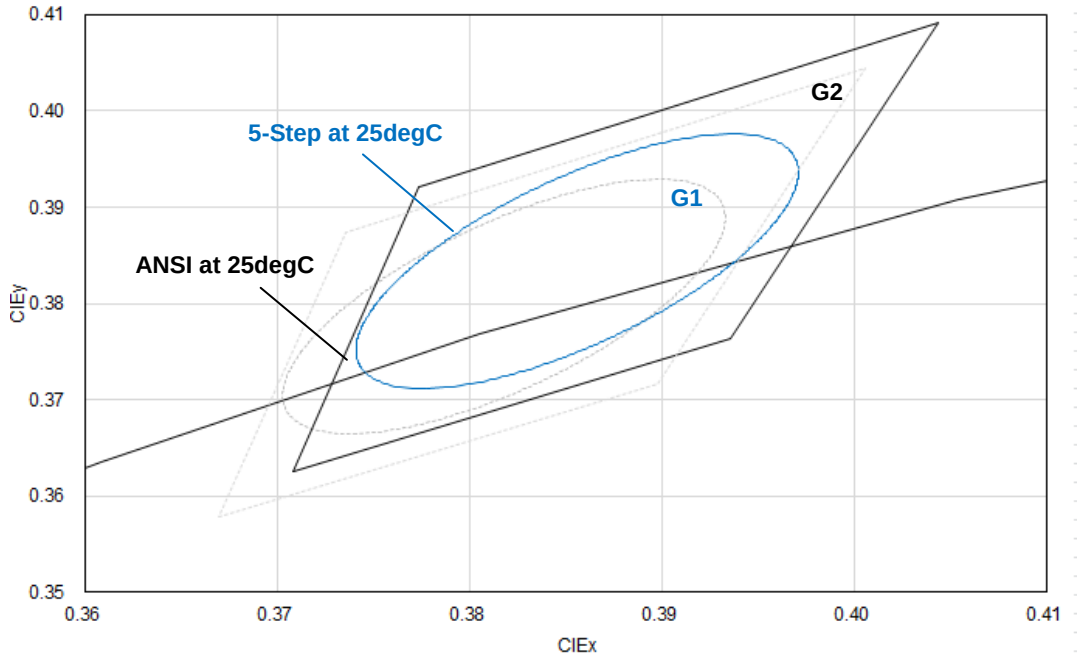
CM03 CRI80 3000K

PN: LTPA-CM036xZx30



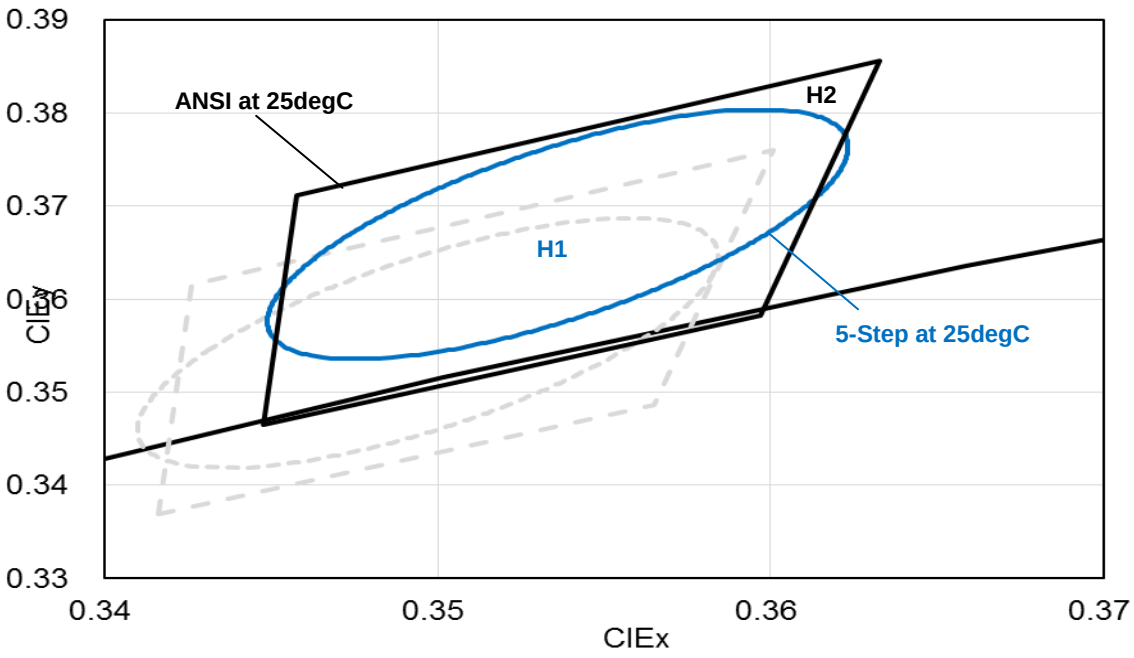
CM03 CRI80 4000K

PN: LTPA-CM036xZx40



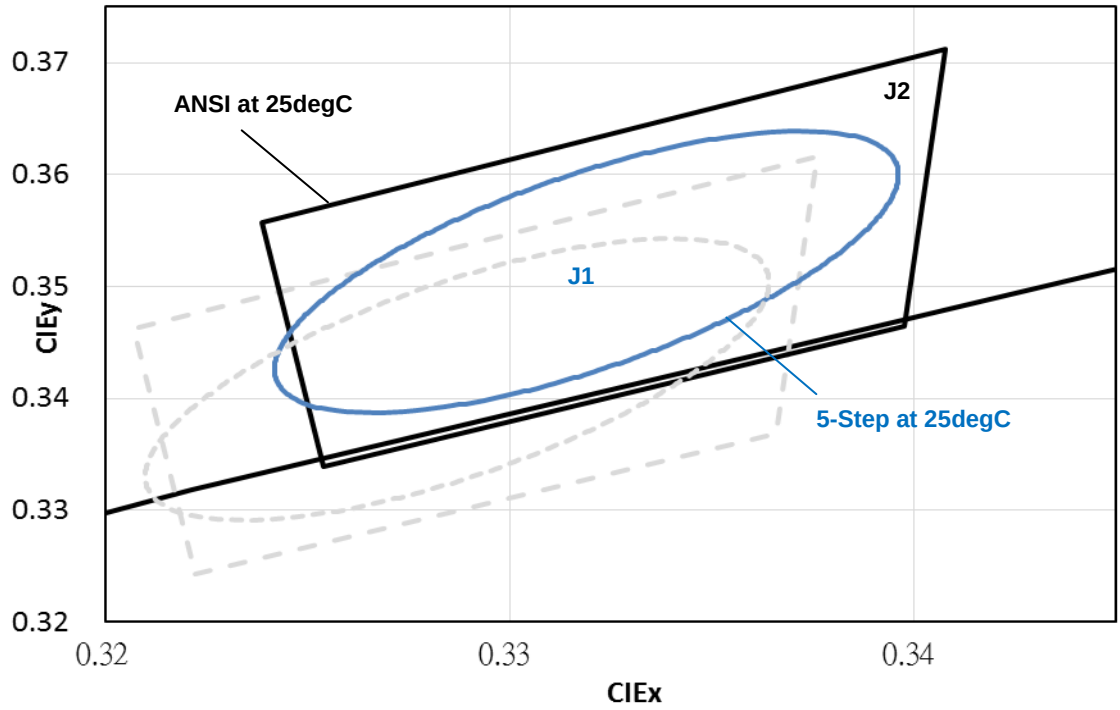
CM03 CRI80 5000K

PN: LTPA-CM036xZx50



CM03 CRI80 5700K

PN: LTPA-CM036xZx57



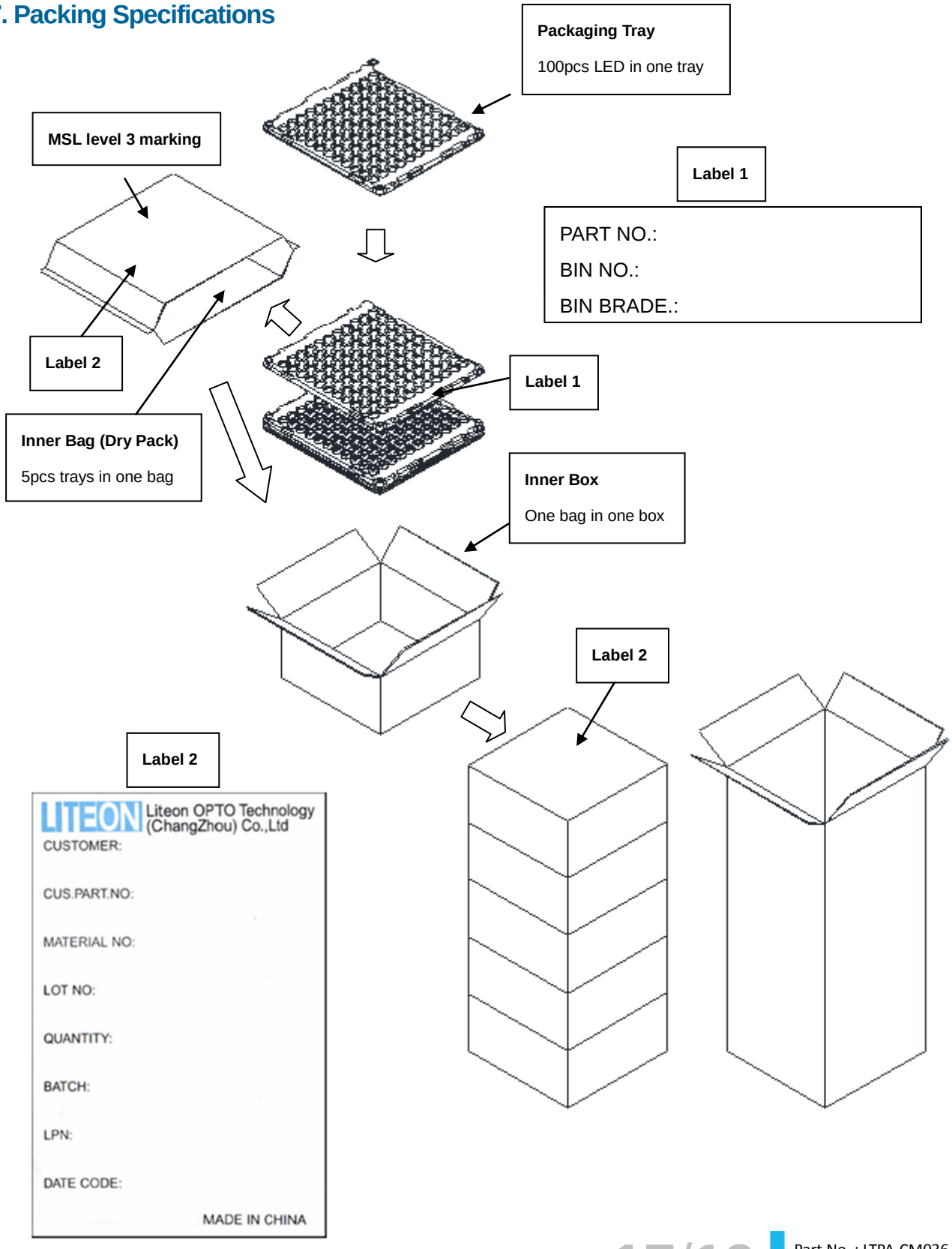
6. Reliability Test Plan

No	Test item	Condition	Duration	Number of Failed	Result
1	High Temperature Operating Life	Tc=85°C, I_F =Typical Current	1K hours	0/10	Pass
2	Wet High Temperature Operating Life	60°C/90%RH, I_F =Typical Current	1K hours	0/10	Pass
3	Thermal Shock	-40°C to 125°C, 15minutes dwell, <10 seconds transfer, measurement in every 250 cycles	500 cycles	0/10	Pass

Notes

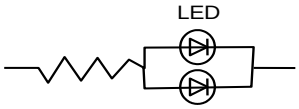
1. Operating life tests are mounted on thermal heat sink
2. Storage items are only component, not put on heat sink.

7. Packing Specifications



8. Cautions

8.1 An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in circuit below.



(A) Recommended circuit.

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

8.2 Do not put any pressure on the light emitting surface either by finger or any hand tool and do not stack the COB products. Stress or pressure may cause damage to the wires of the LED array.

8.3 This product is not designed for the use under any of the following conditions, please confirm the performance and reliability are well enough if you use it under any of the following conditions

・Do not use sulfur-containing materials in commercial products including the materials such as seals and adhesives that may contain sulfur.

・Do not put this product in a place with a lot of moisture (over 85% relative humidity), dew condensation, briny air, and corrosive gas (Cl, H2S, NH3, SO2, NOX, etc.), exposure to a corrosive environment may affect silver plating.

ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no light up" at low currents.

To verify for ESD damage, check for "light up" and V_F of the suspect LEDs at low currents.

Storage

This product is qualified as Moisture sensitive Level 3 per JEDEC J-STD-020 Precaution when handing this moisture sensitive product is important to ensure the reliability of the product.

The package is sealed:

The LEDs should be stored at 30°C or less and 90%RH or less. And the LEDs are limited to use within one year, while the LEDs is packed in moisture-proof package with the desiccants inside.

The package is opened:

The LEDs should be stored at 30°C or less and 60%RH or less. Moreover, the LEDs are limited to solder process within 168hrs. If exceeding the storage limiting time since opened, that we recommended to baking LEDs at 60°C at least 48hrs. To seal the remainder LEDs return to package, it's recommended to be with workable desiccants in original package.