



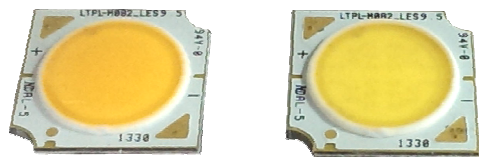
LED HIGH POWER

M08 CoB Product Series

Data Sheet

Created Date: 08 / 22 / 2013

Revision: 6.0, 12 / 10 / 2013



LED HIGH POWER M08 Product Series

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 Benefits Features

- Enhanced optical control
- Clean white light without pixilation
- Uniform consistent white light
- Significantly reduced thermal resistance and increased operating temperatures
- Lower operating costs
- Reduced maintenance costs
- ESD rating is 8KV in HBM

1.3 Naming Rule

L T PL - M 0 8 2 X X Z S X X - X X
Code1 Code2 Code3 Code4 Code5 Code6

Code 1: Product Line

PL: High Power LED.

Code 2: Package Type/Platform

M08: Metal substrate with 13.5x13.5mm square.

Code 3: Light Emitting Surface

2: 9.5mm excluding dam

Code 4: Product Series

10: 10 Series

18: 18 Series

Code5: Color Temperature

27: 2700K at 85degC

30: 3000K at 85degC

40: 4000K at 85degC

50: 5000K at 85degC

57: 5700K at 85degC

Note: The Color Temperature follow ANSI C78.377A Doc.

Code6: Hue Bin by MacAdam Ellipses Step

T0: 3-Step Mac Adam Ellipse+Main Lumen Bin (2700K~4000K)

S1: 5-Step Mac Adam Ellipse/ANSI+Full Lumen Bins (2700K~4000K)

F1: 5-Step Mac Adam Ellipse+Full Lumen Bins (5000K~5700K)

S1: ANSI+Full Lumen Bins (5000K~5700K)

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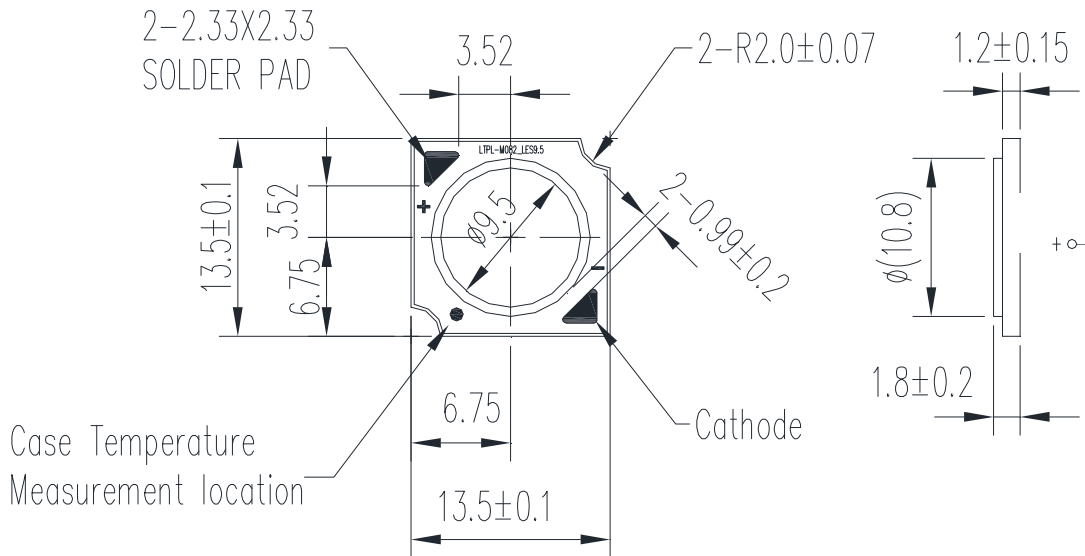
1.4 Product List

Part Number	Product Series	CCT	CRI	Color Bin			Lumen Bin	
				3SDCM	5SDCM	ANSI	-8%~+8%	-15%~+15%
LTPL-M08210ZS27-T0	10	2700K	80	☆			☆	
LTPL-M08210ZS27-S1	10	2700K	80		☆	☆		☆
LTPL-M08210ZS30-T0	10	3000K	80	☆			☆	
LTPL-M08210ZS30-S1	10	3000K	80		☆	☆		☆
LTPL-M08210ZS40-T0	10	4000K	80	☆			☆	
LTPL-M08210ZS40-S1	10	4000K	80		☆	☆		☆
LTPL-M08210ZS50-F1	10	5000K	80		☆			☆
LTPL-M08210ZS50-S1	10	5000K	80			☆		☆
LTPL-M08210ZS57-F1	10	5700K	80		☆			☆
LTPL-M08210ZS57-S1	10	5700K	80			☆		☆
LTPL-M08218ZS27-T0	18	2700K	80	☆			☆	
LTPL-M08218ZS27-S1	18	2700K	80		☆	☆		☆
LTPL-M08218ZS30-T0	18	3000K	80	☆			☆	
LTPL-M08218ZS30-S1	18	3000K	80		☆	☆		☆
LTPL-M08218ZS40-T0	18	4000K	80	☆			☆	
LTPL-M08218ZS40-S1	18	4000K	80		☆	☆		☆
LTPL-M08218ZS50-F1	18	5000K	80		☆			☆
LTPL-M08218ZS50-S1	18	5000K	80			☆		☆
LTPL-M08218ZS57-F1	18	5700K	80		☆			☆
LTPL-M08218ZS57-S1	18	5700K	80			☆		☆

LED HIGH POWER M08 Product Series

2. Outline Dimensions

2.1 Form Factor of M082 series CoB

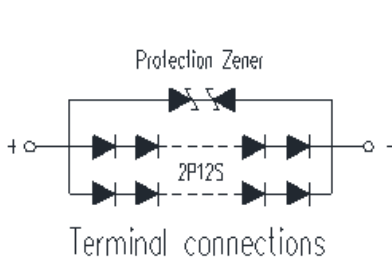


Notes

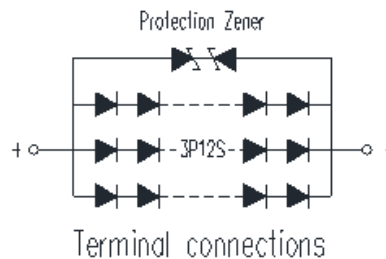
1. All dimensions are in millimeters.
2. Tolerance is ± 0.3 mm unless otherwise noted.
3. LED of equivalent circuit means all series/parallel in CoB package.

2.2 Internal Equivalent Circuit

10 Series Product



18 Series Product



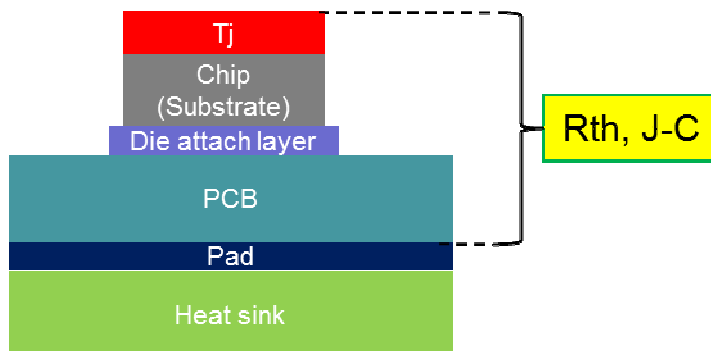
LED HIGH POWER M08 Product Series

3. Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Product Series	Rating	Unit
Power Dissipation	P _o	10	16.0	W
		18	24.0	
Forward Current	I _F	10	400	mA
		18	600	
Junction Temperature	T _j		125	°C
Thermal Resistance, Junction-Case	R _{th, J-C}	10	3.20	°C/W
		18	2.40	
Operating Temperature Range	T _{opr}		-40 to 85	°C
Storage Temperature Range	T _{stg}		-40 to 100	°C
Electrostatic Discharge	ESD		8	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 R_{th} is °C/W electrical.
5. The M08 CoB is recommended soldering temperature under 350degC and could not over 3.5sec.



LED HIGH POWER M08 Product Series

4. Electro-Optical Characteristics

4.1 Typical Performance

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	10	240	36.5	981	35.2	883	112.0	104.5
	18	360	36.5	1472	35.2	1325	112.0	104.5
3000K	10	240	36.5	1033	35.2	930	117.9	110.0
	18	360	36.5	1549	35.2	1395	117.9	110.0
4000K	10	240	36.5	1095	35.2	985	125.0	116.6
	18	360	36.5	1642	35.2	1478	125.0	116.6
5000K	10	240	36.5	1126	35.2	1013	128.5	119.9
	18	360	36.5	1689	35.2	1520	128.5	119.9
5700K	10	240	36.5	1048	35.2	944	119.7	111.6
	18	360	36.5	1573	35.2	1415	119.7	111.6

Notes

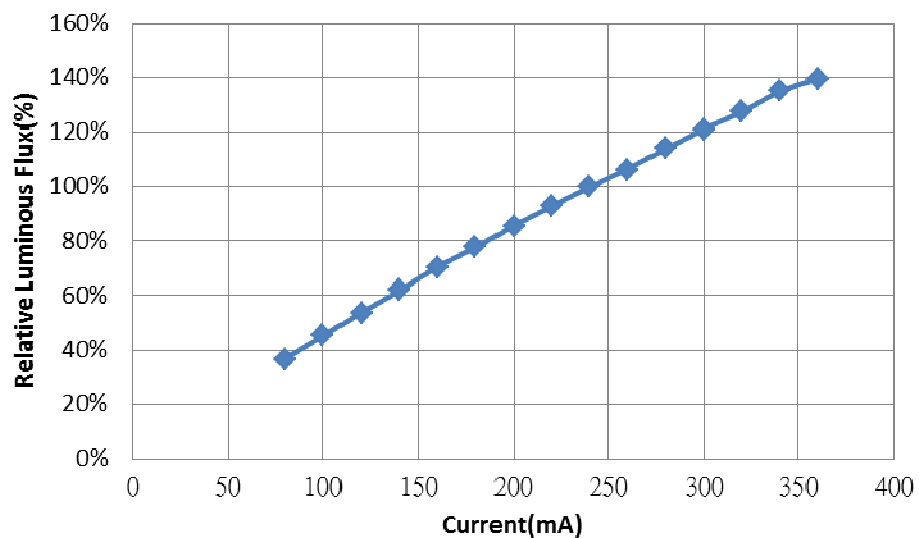
1. All of V_F value are typical, the real bin range please refer page 19 "V_F Binning Parameter".
2. All of flux value are typical, the real bin range please refer page 12 "Flux Binning Parameter".
3. Tolerance of flux is ±7%, tolerance of CCX/CCY is ±0.007, tolerance of CRI is ±2, and tolerance of V_F is ±3%.
4. Typical viewing angle is 120deg.

LED HIGH POWER M08 Product Series

4.2 Forward Current vs. Lumen and Voltage

■ 10 Series Product

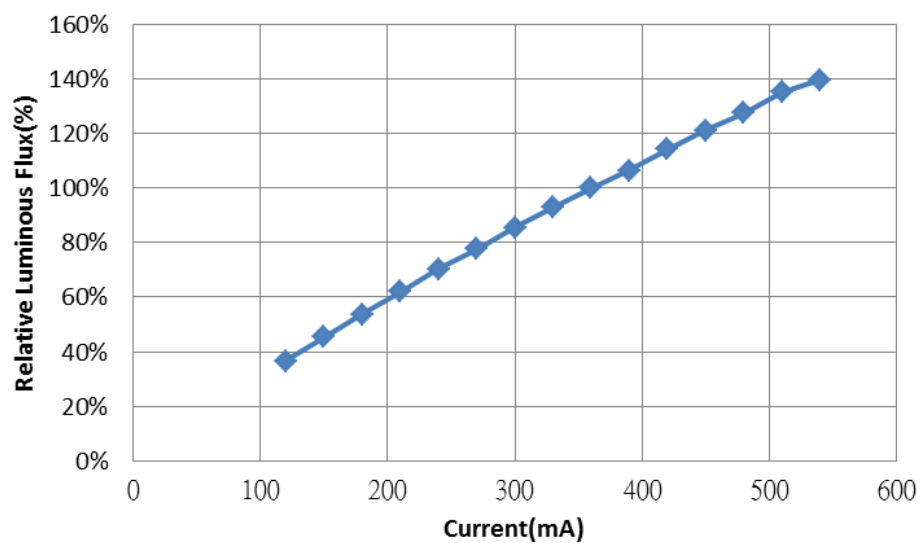
Current (mA)	V _F (V)	Lumen (lm)				
		2700K	3000K	4000K	5000K	5700K
80	33.4	358	377	399	411	383
100	33.9	445	468	496	510	475
120	34.3	527	554	587	604	563
140	34.7	609	641	679	699	651
160	35.1	689	725	768	790	736
180	35.4	762	802	850	874	814
200	35.8	838	882	935	962	896
220	36.2	910	957	1015	1044	972
240	36.5	981	1033	1095	1126	1048
260	36.8	1044	1099	1165	1198	1115
280	37.2	1121	1180	1250	1286	1197
300	37.5	1188	1251	1326	1364	1270
320	37.9	1250	1316	1394	1434	1335
340	38.2	1324	1394	1478	1520	1415
360	38.3	1368	1440	1527	1570	1462



LED HIGH POWER M08 Product Series

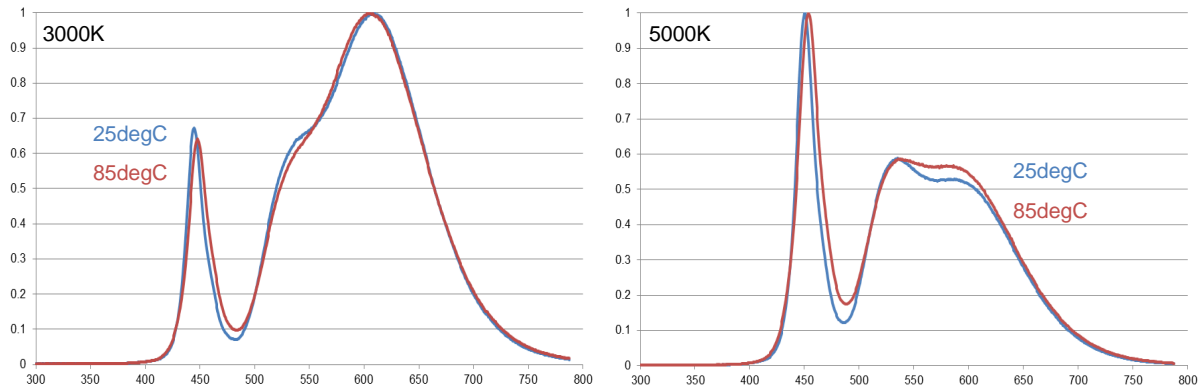
■ 18 Series Product

Current (mA)	V _F (V)	Lumen (lm)				
		2700K	3000K	4000K	5000K	5700K
120	33.4	537	565	599	616	574
150	33.9	667	702	744	765	712
180	34.3	790	831	881	906	844
210	34.7	913	961	1019	1048	976
240	35.1	1033	1087	1152	1185	1104
270	35.4	1142	1203	1275	1311	1221
300	35.8	1258	1324	1403	1443	1344
330	36.2	1364	1436	1522	1565	1458
360	36.5	1472	1549	1642	1689	1573
390	36.8	1566	1648	1747	1796	1673
420	37.2	1681	1770	1876	1929	1796
450	37.5	1783	1876	1989	2045	1905
480	37.9	1875	1973	2092	2151	2003
510	38.2	1987	2091	2217	2279	2123
540	38.4	2052	2160	2290	2355	2193

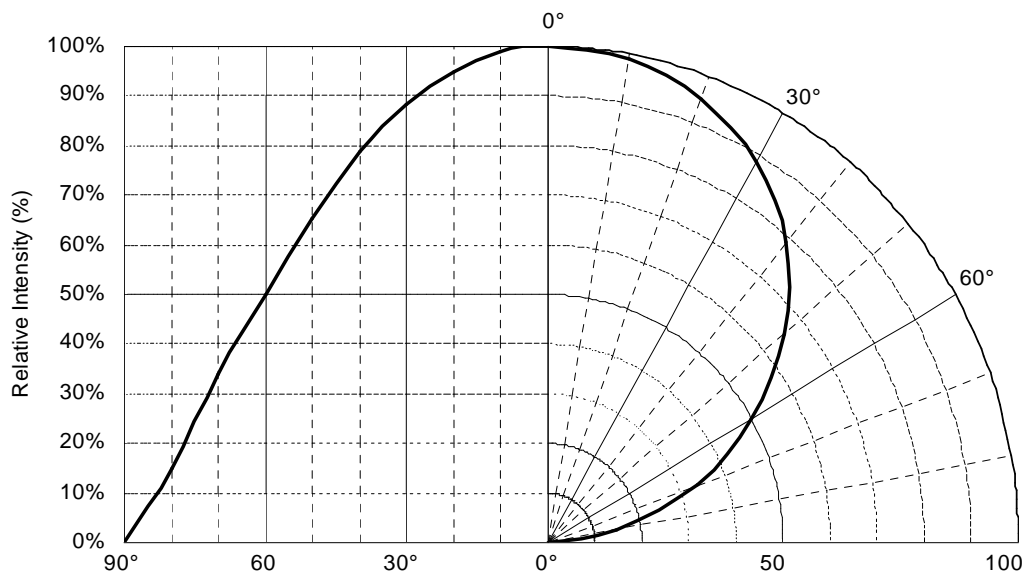


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4.3 Relative Spectral Power Distribution at Typical Current

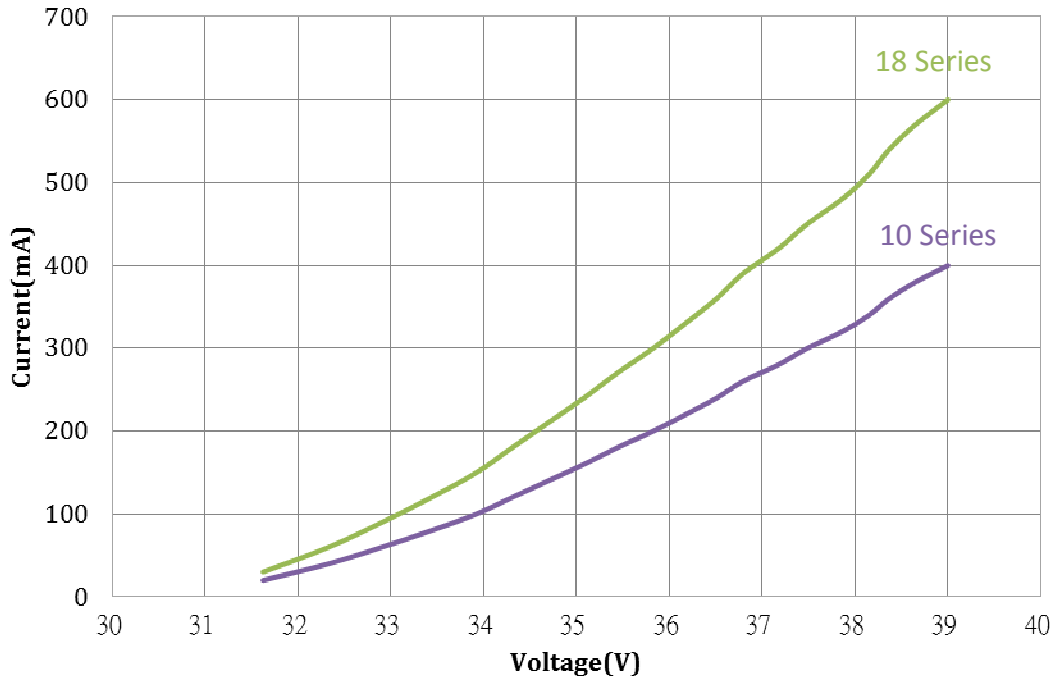


4.4 Radiation Characteristics

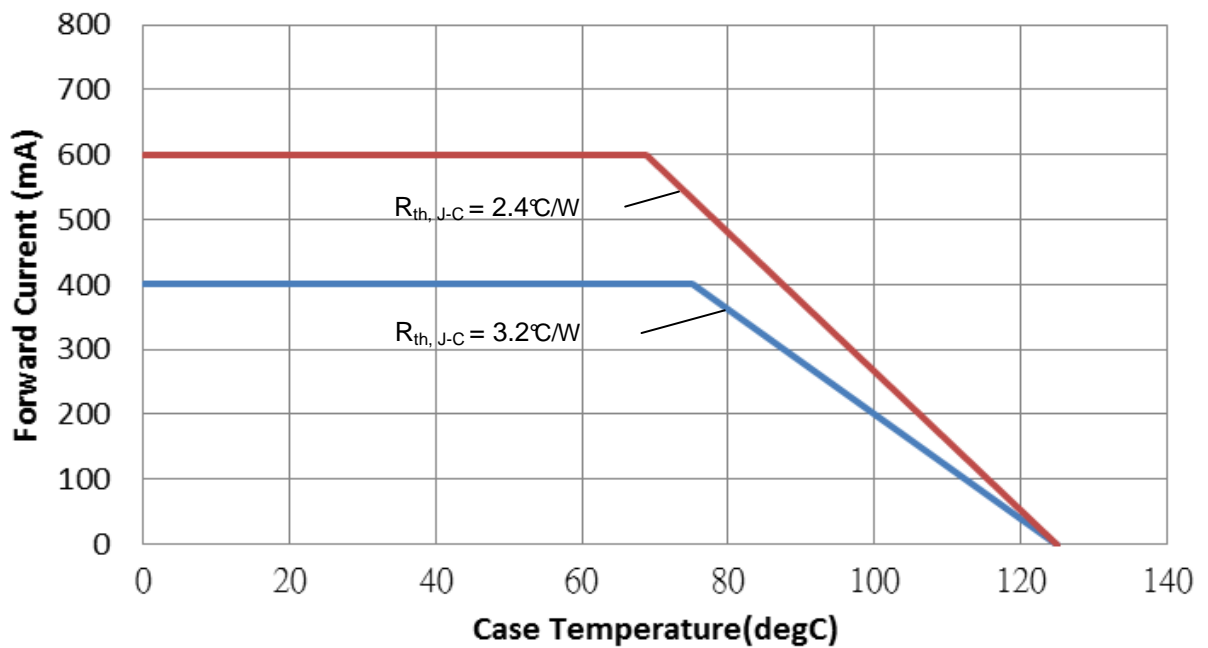


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4.5 Forward Current vs. Forward Voltage

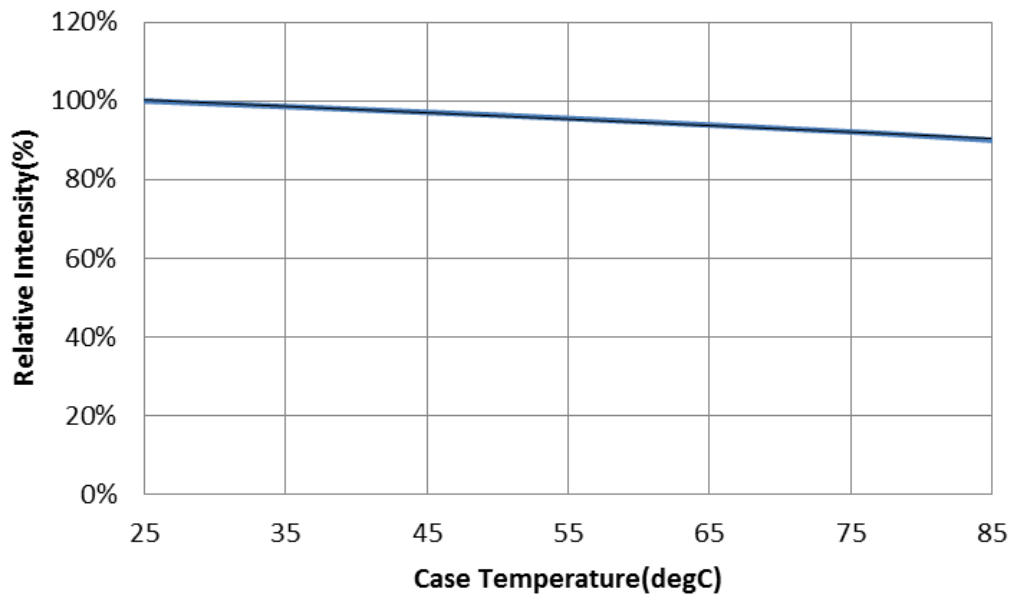


4.6 Forward Current Degrading Curve

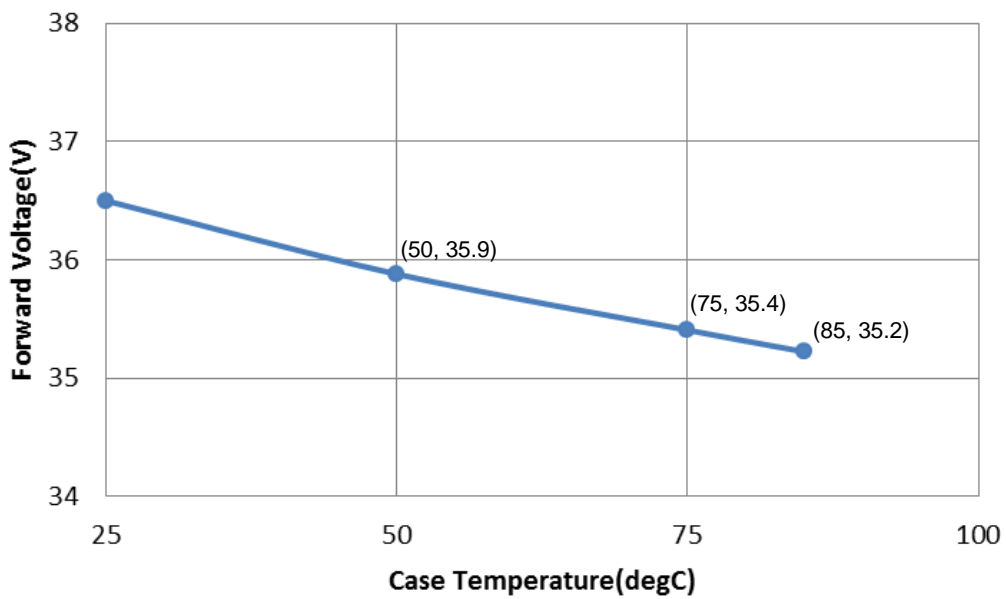


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4.7 Relative Intensity vs. Case Temperature



4.8 Forward Voltage vs. Case Temperature



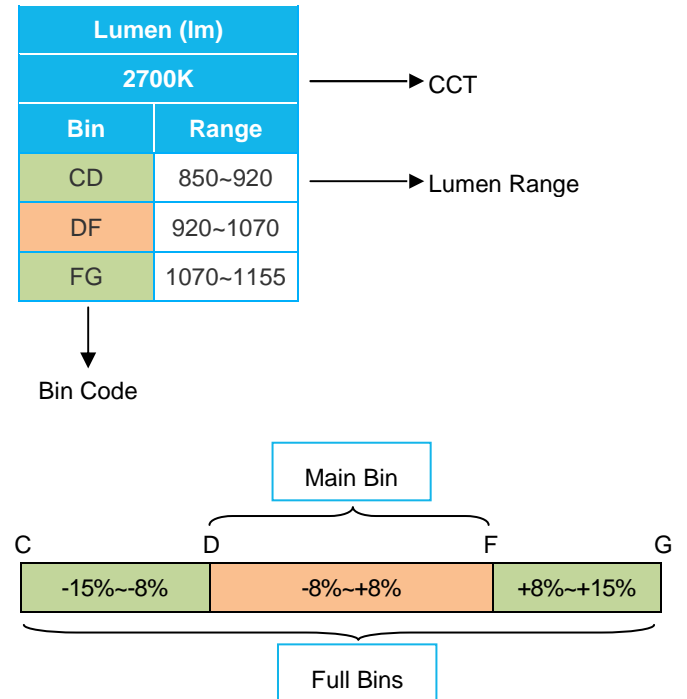
LED HIGH POWER M08 Product Series

5. CoB Binning Definition

Flux Binning Parameter (25degC)

Lumen CODE List of M08 Series Product			
Parameter	Code	Unit	Lumen
Luminous Flux	B	lm	790
	C		850
	D		920
	E		990
	F		1070
	G		1155
	H		1245
	I		1345
	J		1455
	K		1570
	L		1695
	M		1830
	N		1975

Example of M08 Series Product Bin (2700K 10 series)



10 Series Lumen Bin

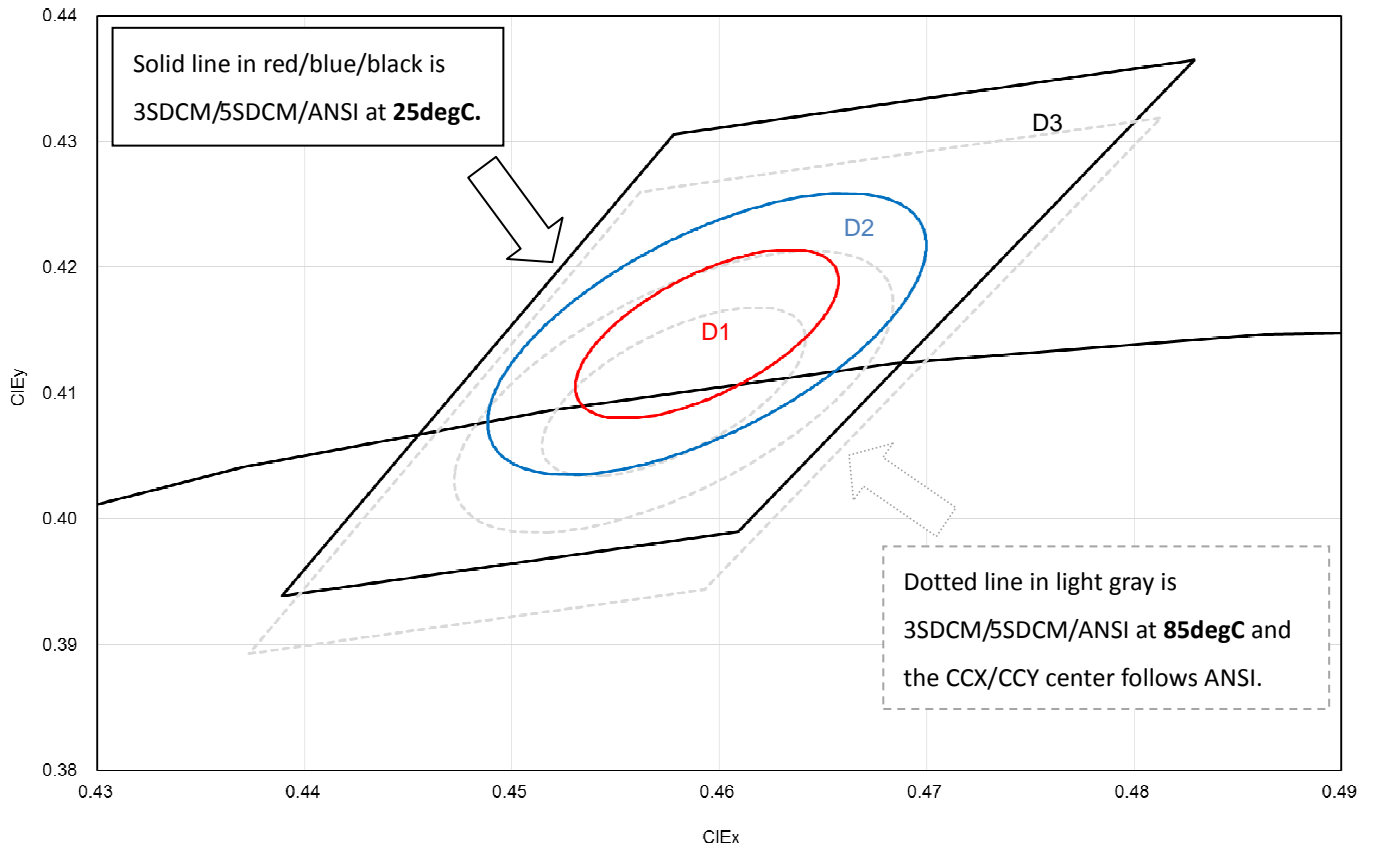
Lumen (lm)									
2700K		3000K		4000K		5000K		5700K	
Bin	Range	Bin	Range	Bin	Range	Bin	Range	Bin	Range
CD	850~920	DE	920~990	DE	920~990	EF	990~1070	DE	920~990
DF	920~1070	EG	990~1155	EG	990~1155	FH	1070~1245	EG	990~1155
FG	1070~1155	GH	1155~1245	GH	1155~1245	HI	1245~1345	GH	1155~1245

18 Series Lumen Bin

Lumen (lm)									
2700K		3000K		4000K		5000K		5700K	
Bin	Range	Bin	Range	Bin	Range	Bin	Range	Bin	Range
HI	1245~1345	IJ	1345~1455	IJ	1345~1455	JK	1455~1570	IJ	1345~1455
IK	1345~1570	JL	1455~1695	JL	1455~1695	KM	1570~1830	JL	1455~1695
KL	1570~1695	LM	1695~1830	LM	1695~1830	MN	1830~1975	LM	1695~1830

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■ Example of LiteOn CoB MacAdam Ellipse Color Definition (EX: 2700K)



CIE Center Point						
CCT	25degC (LiteOn Spec.)		85degC (ANSI)		Hot/Cold Factor	
	CCX	CCY	CCX	CCY	CCX	CCY
2700	0.4594	0.4147	0.4578	0.4101	-0.0016	-0.0046
3000	0.4369	0.4067	0.4338	0.4030	-0.0031	-0.0037
4000	0.3856	0.3844	0.3818	0.3797	-0.0038	-0.0047
5000	0.3489	0.3603	0.3447	0.3553	-0.0042	-0.0050
5700	0.3322	0.3471	0.3287	0.3417	-0.0035	-0.0054

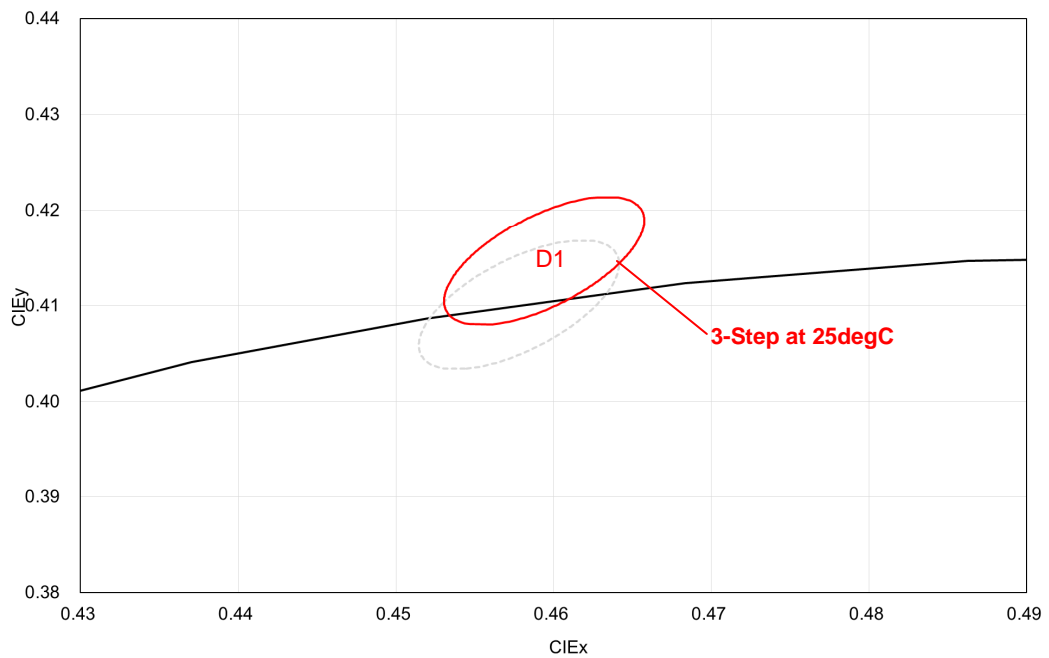
Notes

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

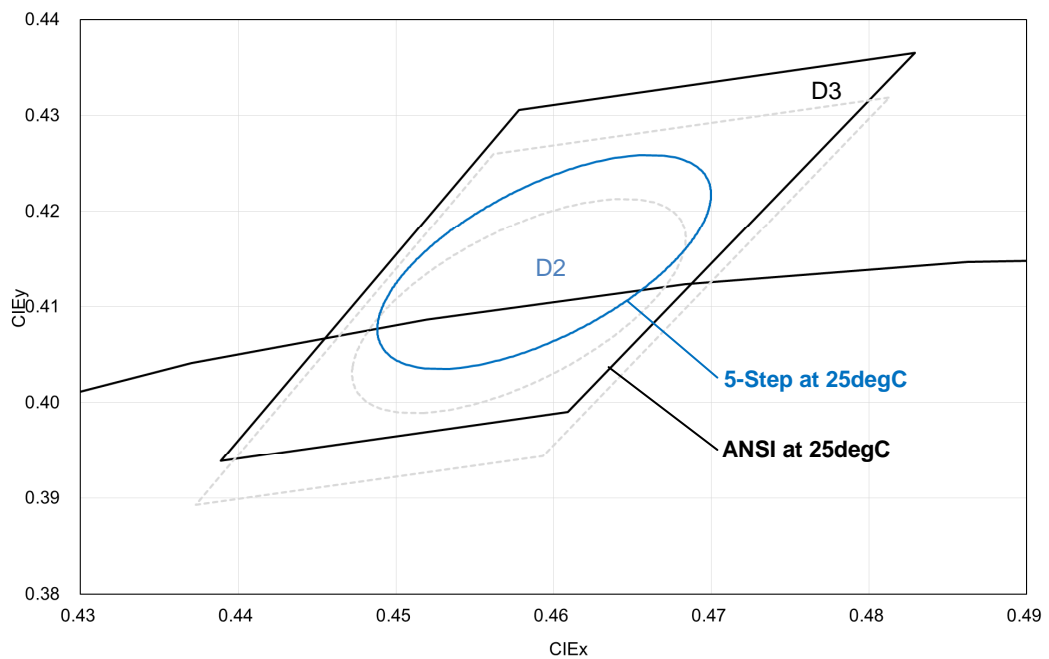
**LED HIGH POWER
M08 Product Series**

■ M08 CRI80 2700K

PN: LTPL-M082XXZS27-T0



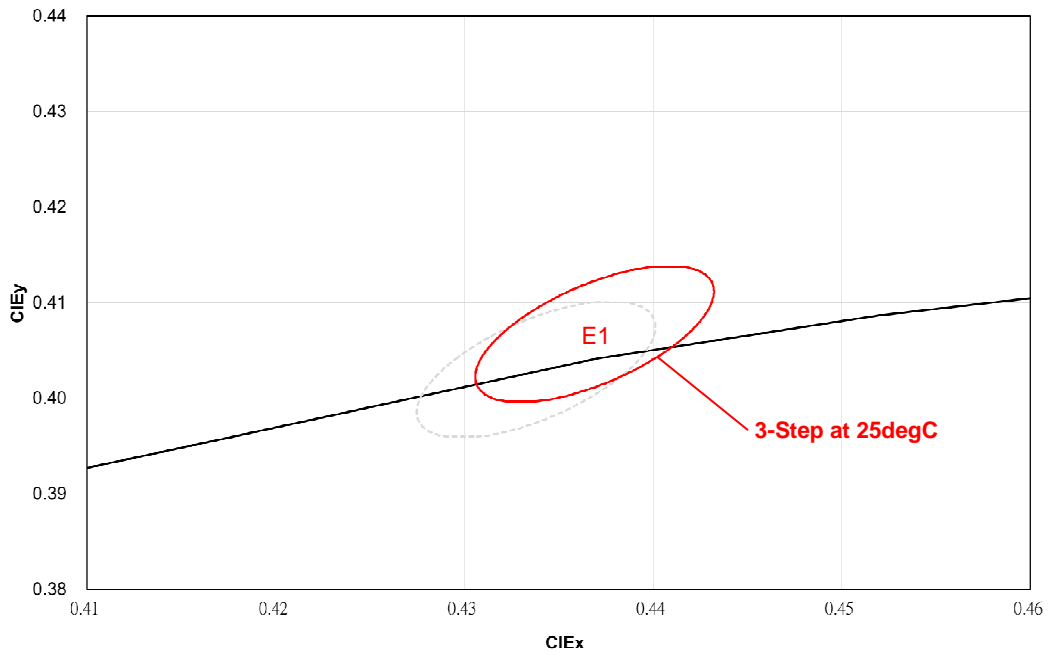
PN: LTPL-M082XXZS27-S1



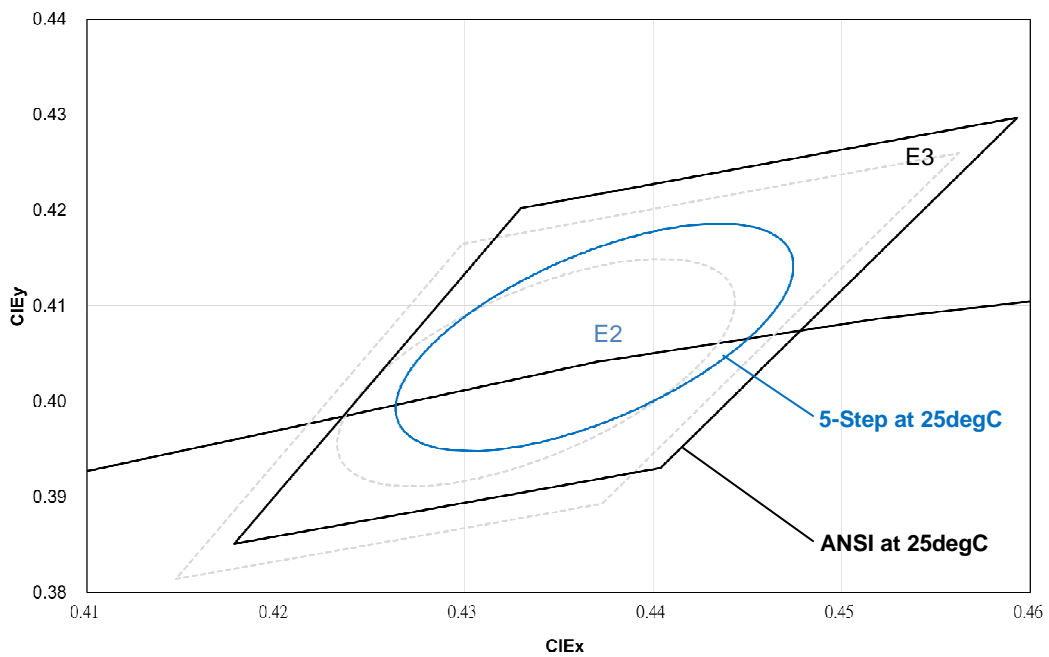
**LED HIGH POWER
M08 Product Series**

■ M08 CRI80 3000K

PN: LTPL-M082XXZS30-T0



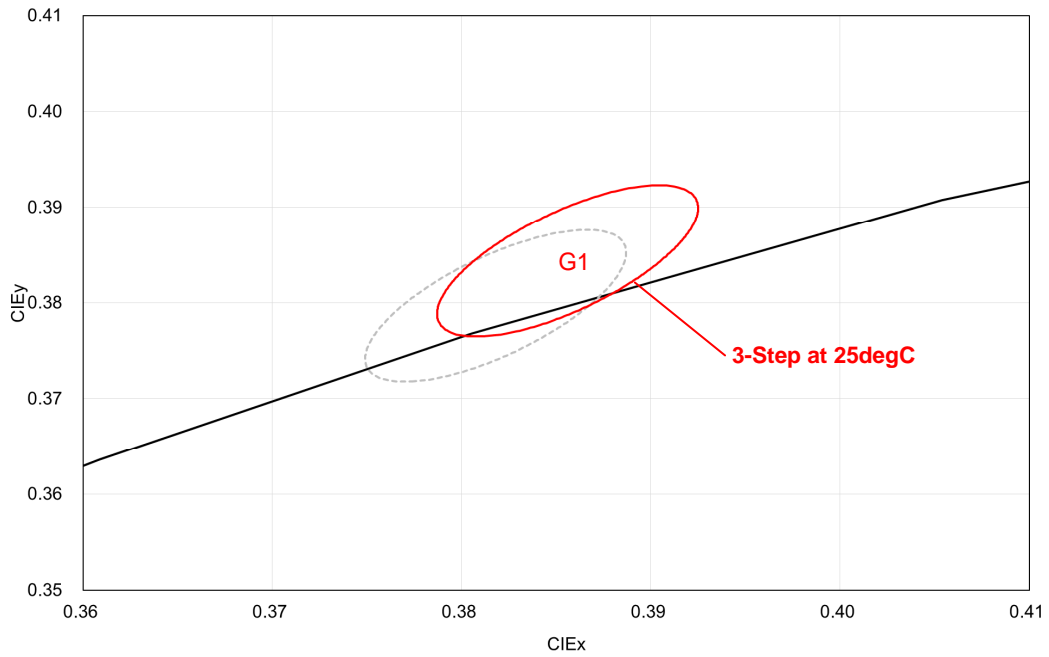
PN: LTPL-M082XXZS30-S1



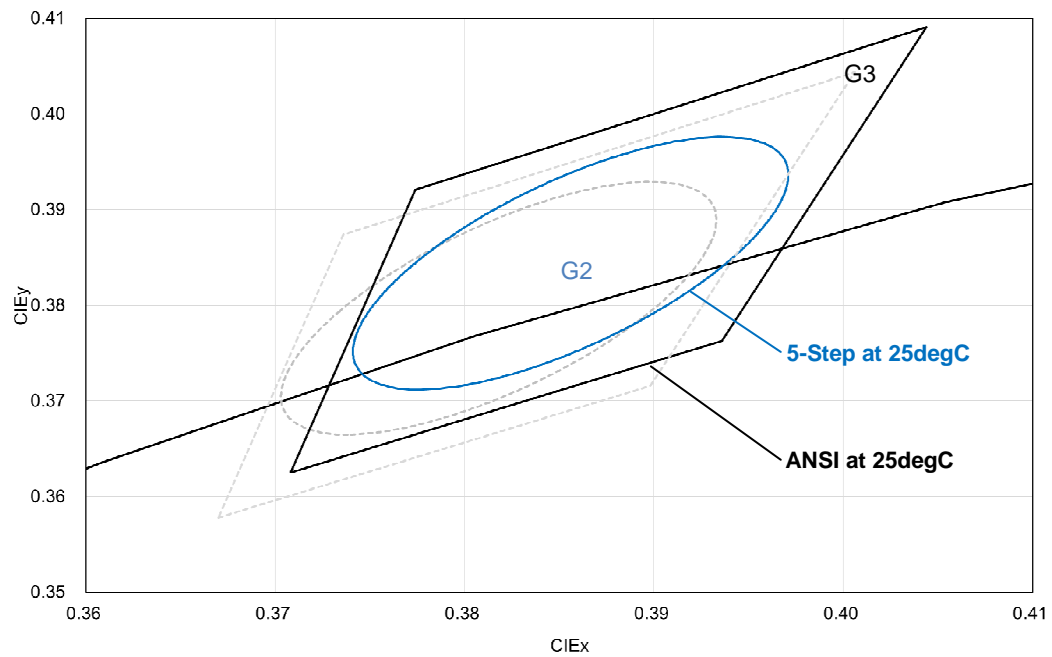
**LED HIGH POWER
M08 Product Series**

■ M08 CRI80 4000K

PN: LTPL-M082XXZS40-T0



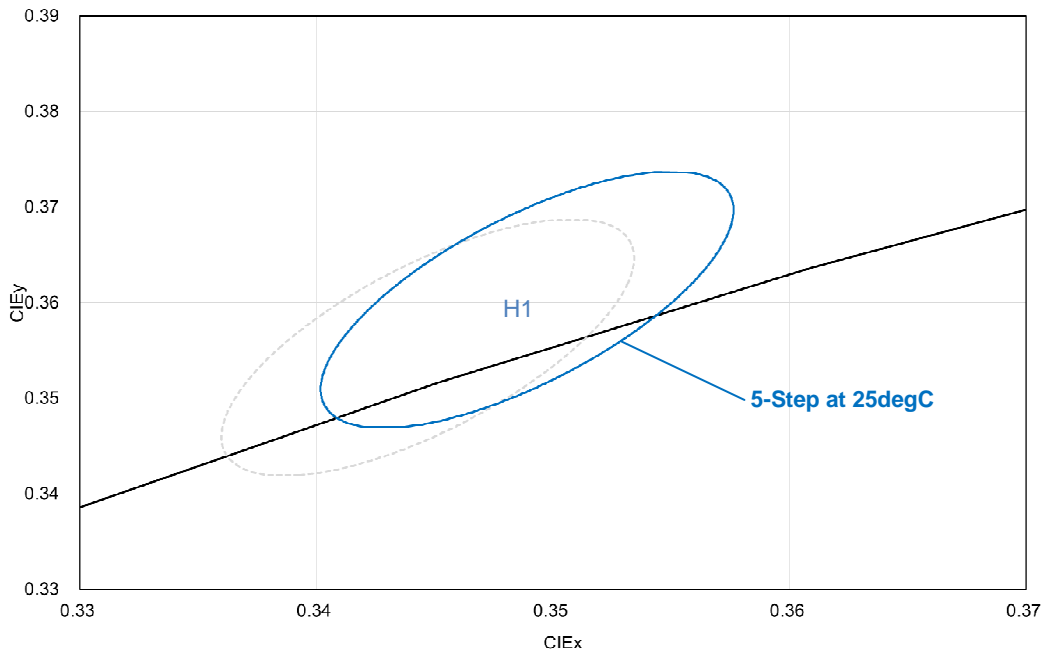
PN: LTPL-M082XXZS40-S1



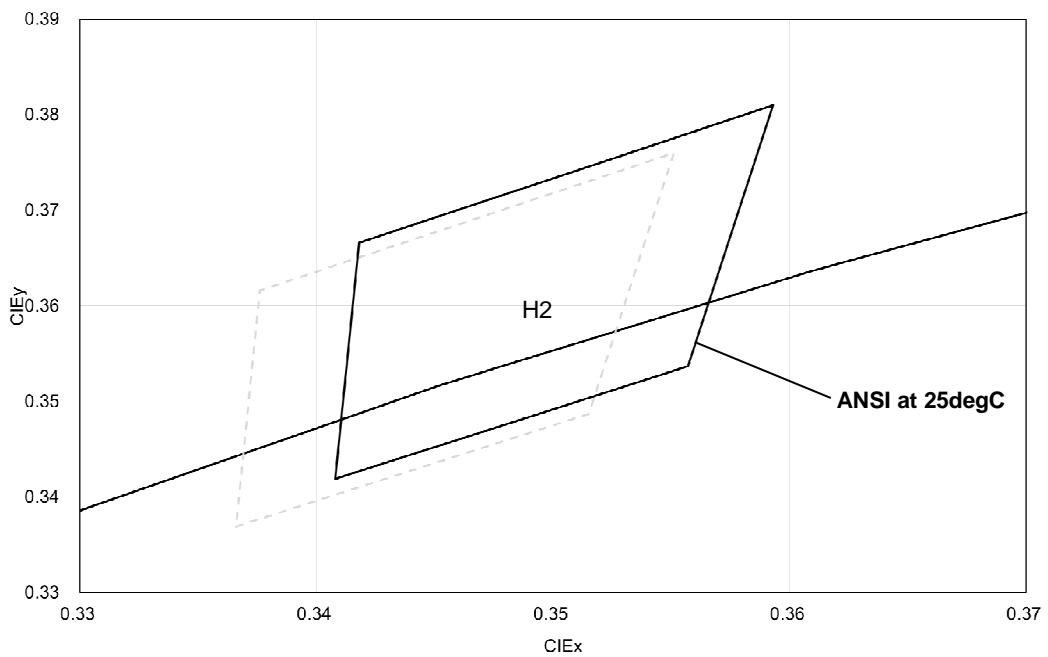
**LED HIGH POWER
M08 Product Series**

■ M08 CRI80 5000K

PN: LTPL-M082XXZS50-F1



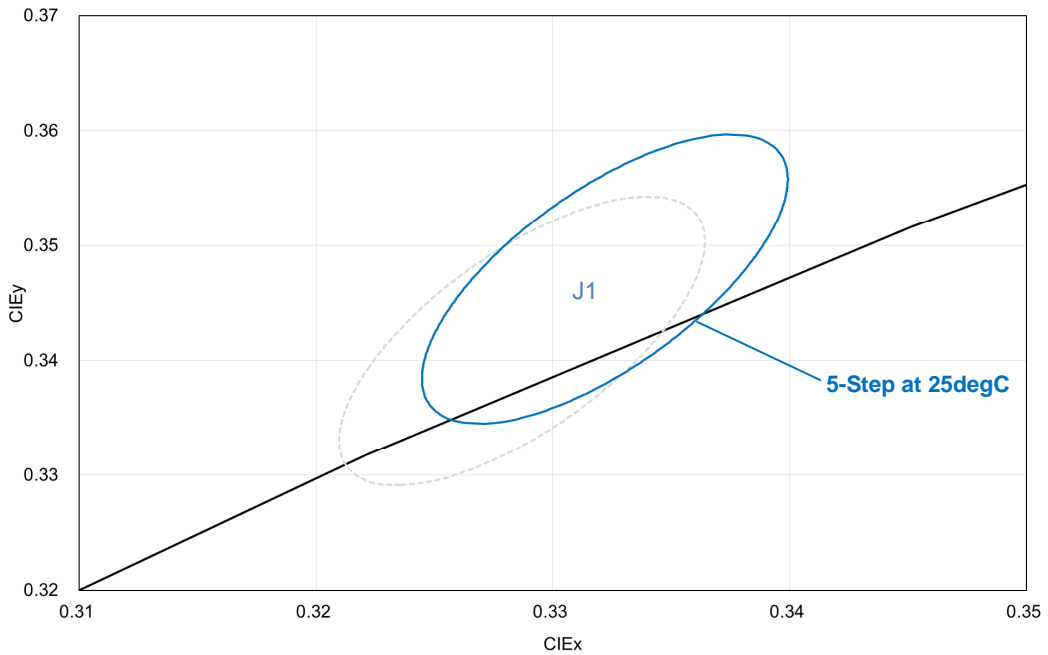
PN: LTPL-M082XXZS50-S1



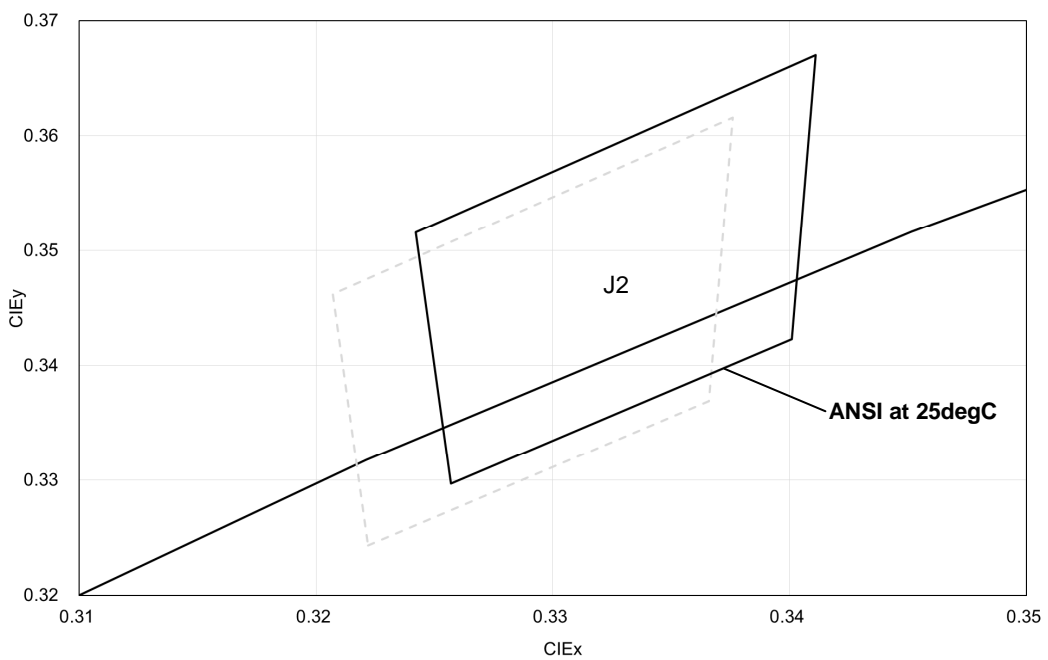
LED HIGH POWER M08 Product Series

■ M08 CRI80 5700K

PN: LTPL-M082XXZS57-F1



PN: LTPL-M082XXZS57-S1



LED HIGH POWER M08 Product Series

■ Forward Voltage Binning Parameter (25degC)

Parameter	Bin	Symbol	Min	Max	Unit	Condition
Forward Voltage	V1	V _F	33.0	39.8	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

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6. Reliability Test Plan

No	Test item	Condition	Duration	Number of Failed	Result
1	High Temperature Operating Life	$T_c=85^{\circ}\text{C}$, I_F =Typical Current	1K hours	0/10	Pass
2	Wet High Temperature Operating Life	$60^{\circ}\text{C}/90\%\text{RH}$, I_F =Typical Current(DC) 30 mins ON/OFF	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
4	Fast Switch Cycling Test	40000cycles, 2 mins On/Off, Room temperature($25^{\circ}\text{C}\pm 5^{\circ}\text{C}$), measurement in every 5000 cycles	40K cycles	0/10	Pass
5	High Temperature Storage Life	$T_a=120^{\circ}\text{C}$	1K hours	0/10	Pass
6	Low Temperature Storage Life	$T_a=-55^{\circ}\text{C}$	1K hours	0/10	Pass
7	Mechanical Shock	1500G, 0.5ms pulse, 5 shocks each 6 axis	30 Times (5 shocks each 6 axis)	0/10	Pass
8	Variable Vibration Frequency	10-2000-10 Hz, log or linear sweep rate, 20G for approximately minute 1.5mm, each applied three times per axis over 6 hrs.	18 hrs (3 times per axis over 6 hrs)	0/10	Pass

■ Criteria for Judging the Damage

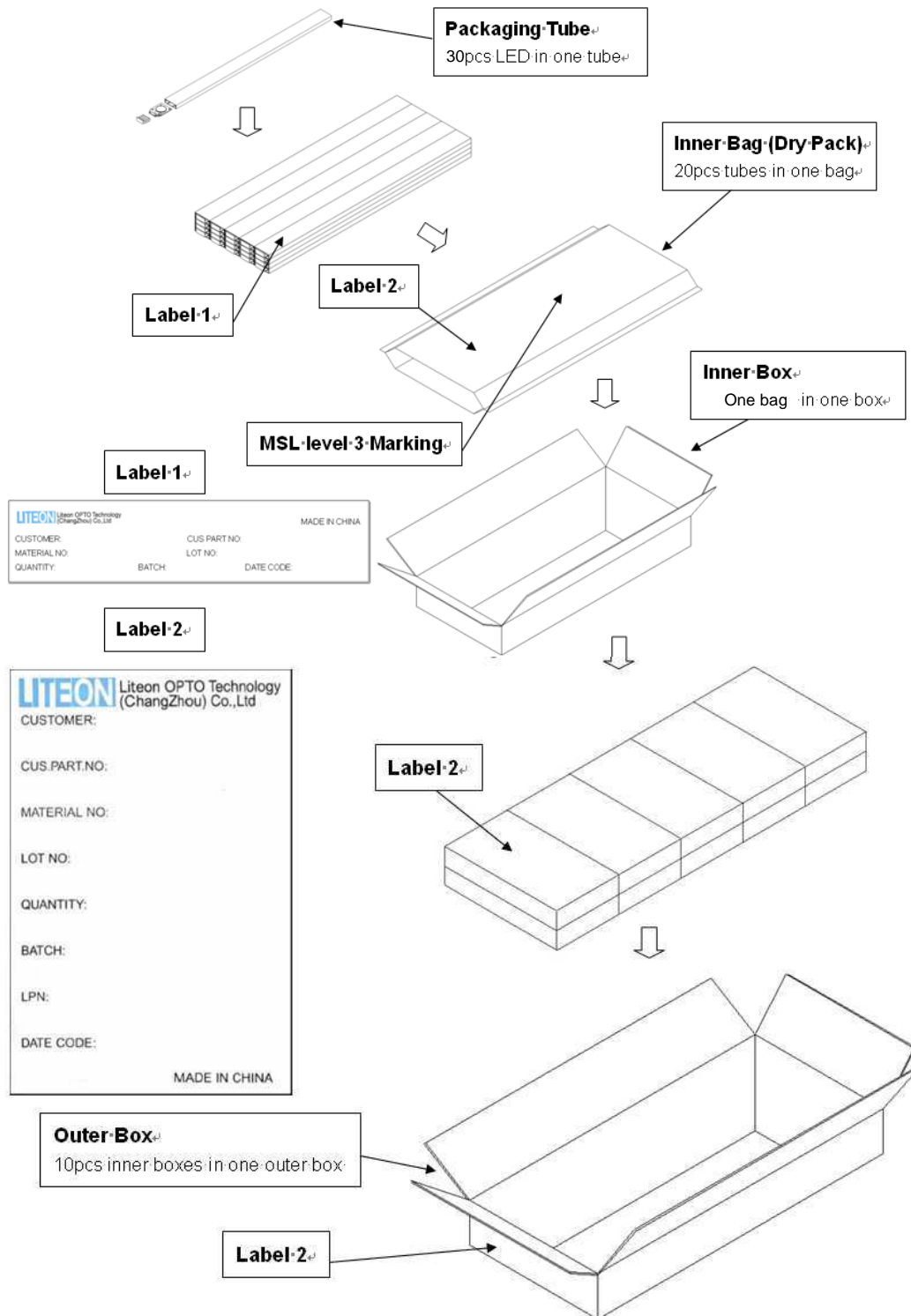
Item	Symbol	Test Condition	Criteria for Judgment	
			Min.	Max.
Forward Voltage	V_F	I_F =Typical Current		U.S.L. x 1.1
Luminous Flux	Lm	I_F =Typical Current	L.S.L. x 0.7	
CCX & CCY	X,Y	I_F =Typical Current		Shift<0.02

Notes:

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

LED HIGH POWER M08 Product Series

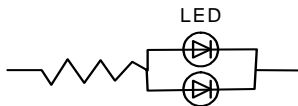
7. Packing Specifications



LED HIGH POWER M08 Product Series

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, NO_x, 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.