OptoSupply

Light It Up

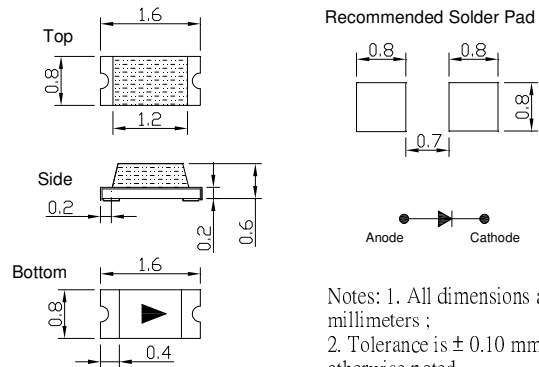## ■Features

- Single chip
- Super high brightness of surface mount LED
- Sorting for Iv and Vf @ 5mA of If
- Compact package outline
  (LxWxT) of 1.6mm x 0.8mm x 0.6mm
- Compatible to IR reflow soldering.

■Applications

- Backlighting (switches, keys, etc.)
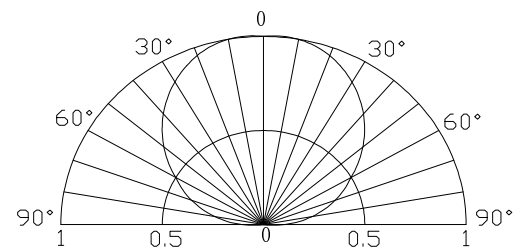- Marker lights (e.g. steps, exit ways, etc.)
-

■Outline Dimension

Top

Side

Bottom

Recommended Solder Pad

Anode   Cathode

Notes: 1. All dimensions are in millimeters ;
2. Tolerance is ± 0.10 mm unless otherwise noted.

■Absolute Maximum Rating   (Ta=25℃)

Item	Symbol	Value		Unit
		W5/M5/K4/VX/B5/B6G5	Y5/O5/R5/G8	
DC Forward Current	I_F	20	20	mA
Pulse Forward Current*	I_{FP}	100	100	mA
Reverse Voltage	V_R	5	5	V
Power Dissipation	P_D	68	48	mW
Operating Temperature	Topr	-40 ~ +85		℃
Storage Temperature	Tstg	-40~ +85		℃
Lead Soldering Temperature	Tsol	260℃/10sec		-

*Pulse width Max 0.1ms, Duty ratio max 1/10

■Directivity

■Electrical -Optical Characteristics   (Ta=25℃)

Part Number	Color		V_F (V)			$I_R(\mu A)$	I_v(mcd)			λD(nm)			2θ1/2(deg)
			Min.	Typ.	Max.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Typ.
			I_F=5mA			V_R=5V	I_F=5mA						
OSM50603C1E	Warm White	M5	2.5	2.8	3.4	10	60	-	160	X=0.44, Y=0.41			120
OSW50603C1E	White	W5	2.5	2.8	3.4	10	100	-	200	X=0.27, Y=0.28			120
OSK40603C1E	Pink	K4	2.5	2.8	3.4	10	50	-	100	X=0.31, Y=0.20			120
OSVX0603C1E	Violet	VX	2.5	2.8	3.4	10	70	-	130	X=0.20, Y=0.09			120
OSB50603C1E	Blue	B5	2.5	2.8	3.4	10	14	-	40	455	470	475	120
OSB60603C1E	Ice Blue	B6	2.5	2.8	3.4	10	80	-	200	X=0.18 Y=0.26			120
OSG50603C1E	True Green	G5	2.5	2.8	3.4	10	120	-	220	520	525	530	120
OSG80603C1E	Yellow Green	G8	1.6	1.8	2.4	10	5	-	15	565	570	575	120
OSY50603C1E	Yellow	Y5	1.6	1.8	2.4	10	15	-	50	585	590	595	120
OSO50603C1E	Orange	O5	1.6	1.8	2.4	10	15	-	50	600	605	610	120
OSR50603C1E	Red	R5	1.6	1.8	2.4	10	15	-	50	617	625	630	120

*1 Tolerance of measurements of chromaticity coordinate is ±10%
*2 Tolerance of measurements of dominant wavelength is ±1nm
*3 Tolerance of measurements of luminous intensity is ±15%
*4 Tolerance of measurements of forward voltage is±0.1V

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CNAS IAF
ISO 9001: 2008

RoHS Compliant
EU 2002/95/EC

REACH
The new EU chemicals legislation

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■ Optical and electrical characteristics

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

IF-VF

If_Ta

Dominant Wavelength vs Relative Intensity

Wavelength Characteristics Ta=25°C

Vf_Ta

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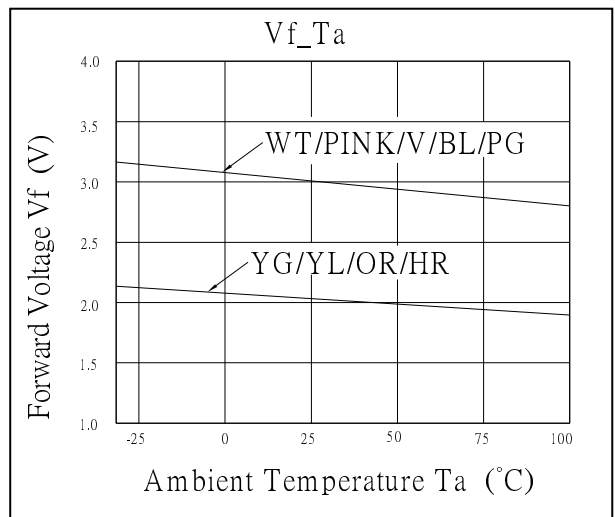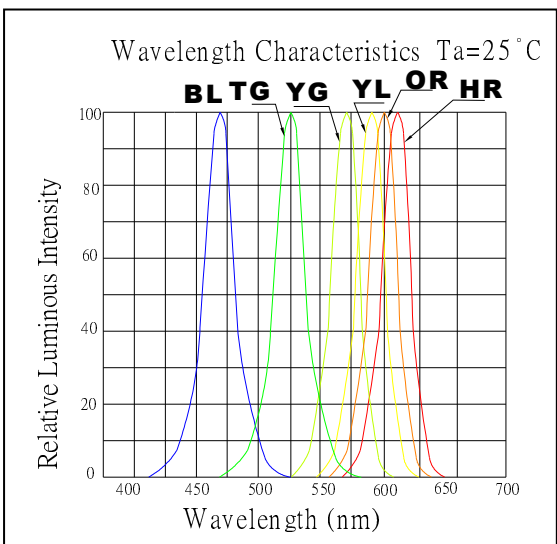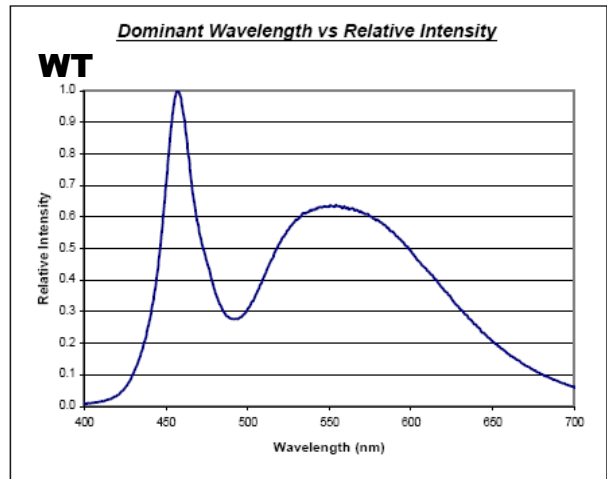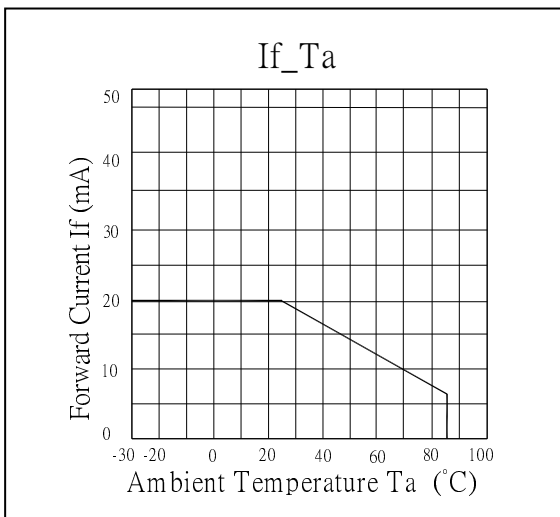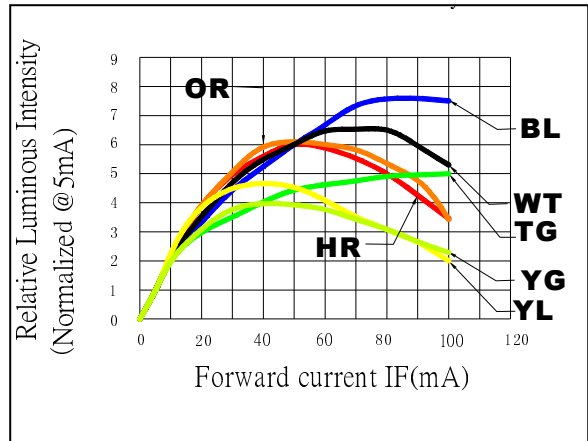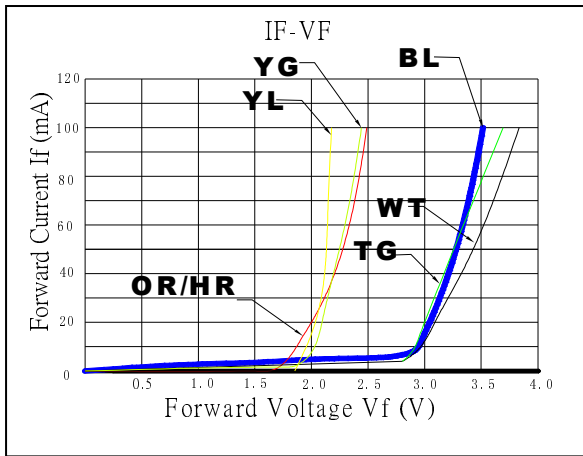
■ **OSM50603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	60	78
2	78	106
3	106	127
4	127	160

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	2.5	2.6
2	2.6	2.8
3	2.8	3.0
4	3.0	3.2
5	3.2	3.4

3. X, Y (IF=5mA)
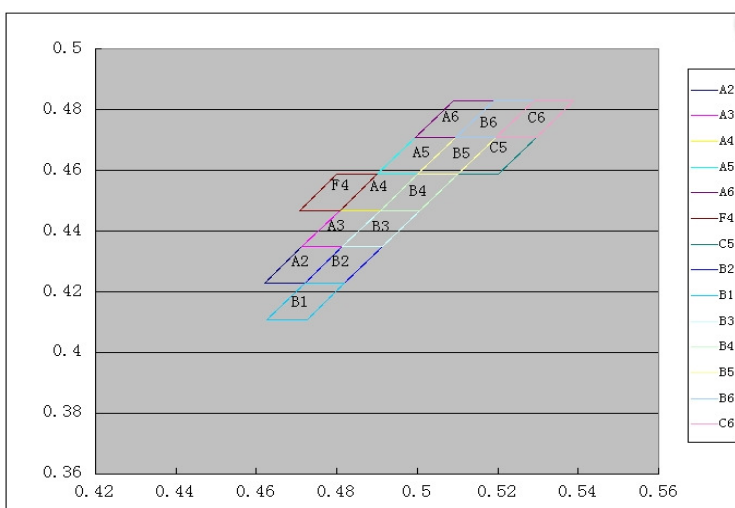
Rank	X1	X2	X3	X4	Y1	Y2	Y3	Y4
A2	0.462	0.4714	0.4814	0.472	0.4227	0.4347	0.4347	0.4227
A3	0.4714	0.4807	0.4907	0.4814	0.4347	0.4467	0.4467	0.4347
A4	0.4807	0.4901	0.5001	0.4907	0.4467	0.4587	0.4587	0.4467
A5	0.4901	0.4995	0.5095	0.5001	0.4587	0.4707	0.4707	0.4587
A6	0.4995	0.5089	0.5189	0.5095	0.4707	0.4827	0.4827	0.4707
B1	0.4626	0.472	0.482	0.4726	0.4107	0.4227	0.4227	0.4107
B2	0.472	0.4814	0.4914	0.482	0.4227	0.4347	0.4347	0.4227
B3	0.4814	0.4907	0.5007	0.4914	0.4347	0.4467	0.4467	0.4347
B4	0.4907	0.5001	0.5101	0.5007	0.4467	0.4587	0.4587	0.4467
B5	0.5001	0.5095	0.5195	0.5101	0.4587	0.4707	0.4707	0.4587
B6	0.5095	0.5189	0.5289	0.5195	0.4707	0.4827	0.4827	0.4707
C5	0.5101	0.5195	0.5295	0.5201	0.4587	0.4707	0.4707	0.4587
C6	0.5195	0.5289	0.5389	0.5295	0.4707	0.4827	0.4827	0.4707
F4	0.4707	0.4801	0.4901	0.4807	0.4467	0.4587	0.4587	0.4467

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■ **OSW50603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	100	120
2	120	144
3	144	160
4	160	200

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	2.5	2.6
2	2.6	2.8
3	2.8	3.0
4	3.0	3.2
5	3.2	3.4

3. X, Y (IF=5mA)
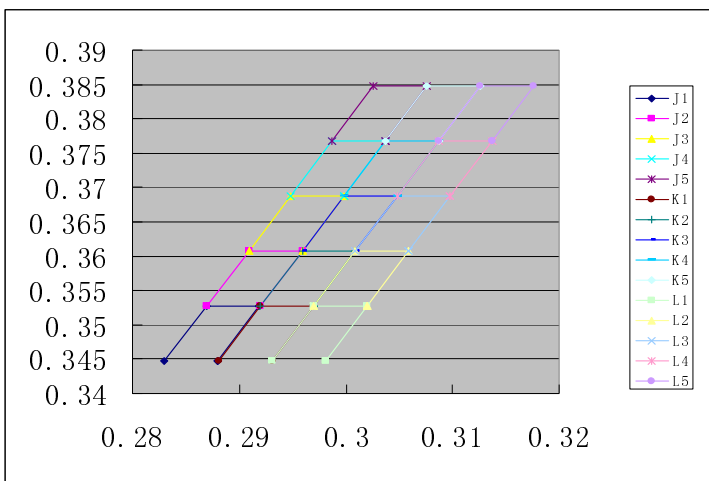
Rank	X1	X2	X3	X4	Y1	Y2	Y3	Y4
L1	0.2931	0.297	0.302	0.2981	0.3447	0.3527	0.3527	0.3447
L2	0.2970	0.3009	0.3059	0.302	0.3527	0.3607	0.3607	0.3527
L3	0.3009	0.3048	0.3098	0.3059	0.3607	0.3687	0.3687	0.3607
L4	0.3048	0.3087	0.3137	0.3098	0.3687	0.3767	0.3767	0.3687
L5	0.3087	0.3126	0.3176	0.3137	0.3767	0.3847	0.3847	0.3767
K1	0.2881	0.2920	0.2970	0.2931	0.3447	0.3527	0.3527	0.3447
K2	0.2920	0.2959	0.3009	0.297	0.3527	0.3607	0.3607	0.3527
K3	0.2959	0.2998	0.3048	0.3009	0.3607	0.3687	0.3687	0.3607
K4	0.2998	0.3037	0.3087	0.3048	0.3687	0.3767	0.3767	0.3687
K5	0.3037	0.3076	0.3126	0.3087	0.3767	0.3847	0.3847	0.3767
J1	0.2830	0.2869	0.2919	0.288	0.3447	0.3527	0.3527	0.3447
J2	0.2870	0.2909	0.2959	0.292	0.3527	0.3607	0.3607	0.3527
J3	0.2909	0.2948	0.2998	0.2959	0.3607	0.3687	0.3687	0.3607
J4	0.2948	0.2987	0.3037	0.2998	0.3687	0.3767	0.3767	0.3687
J5	0.2987	0.3026	0.3076	0.3037	0.3767	0.3847	0.3847	0.3767

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■ OSK40603C1E Rank

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	50	60
2	60	72
3	72	85
4	85	100

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	2.5	2.6
2	2.6	2.8
3	2.8	3.0
4	3.0	3.2
5	3.2	3.4

3. X, Y (IF=5mA)
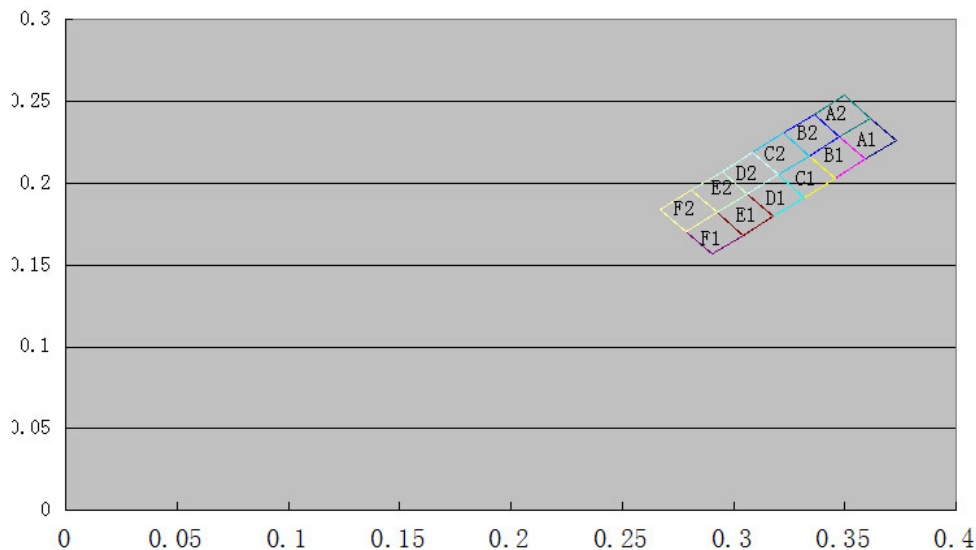
Rank	X1	X2	X3	X4	Y1	Y2	Y3	Y4
F2	0.2672	0.281	0.2926	0.2788	0.1845	0.1961	0.1823	0.1707
E2	0.281	0.2948	0.3063	0.2926	0.1961	0.2076	0.1939	0.1823
D2	0.2948	0.3086	0.3201	0.3063	0.2076	0.2192	0.2054	0.1939
C2	0.3086	0.3224	0.3339	0.3201	0.2192	0.2308	0.217	0.2054
B2	0.3224	0.3361	0.3477	0.3339	0.2308	0.2424	0.2286	0.217
A2	0.3361	0.3499	0.3615	0.3477	0.2424	0.2539	0.2401	0.2286
F1	0.2788	0.2926	0.3041	0.2903	0.1707	0.1823	0.1685	0.1569
E1	0.2926	0.3063	0.3179	0.3041	0.1823	0.1939	0.1801	0.1685
D1	0.3063	0.3201	0.3317	0.3179	0.1939	0.2054	0.1916	0.1801
C1	0.3201	0.3339	0.3455	0.3317	0.2054	0.217	0.2032	0.1916
B1	0.3339	0.3477	0.3593	0.3455	0.217	0.2286	0.2148	0.2032
A1	0.3477	0.3615	0.3731	0.3593	0.2286	0.2401	0.2263	0.2148

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■ **OSVX0603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	70	84
2	84	100
3	100	115
4	115	130

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	2.5	2.6
2	2.6	2.8
3	2.8	3.0
4	3.0	3.2
5	3.2	3.4

3. X, Y (IF=5mA)
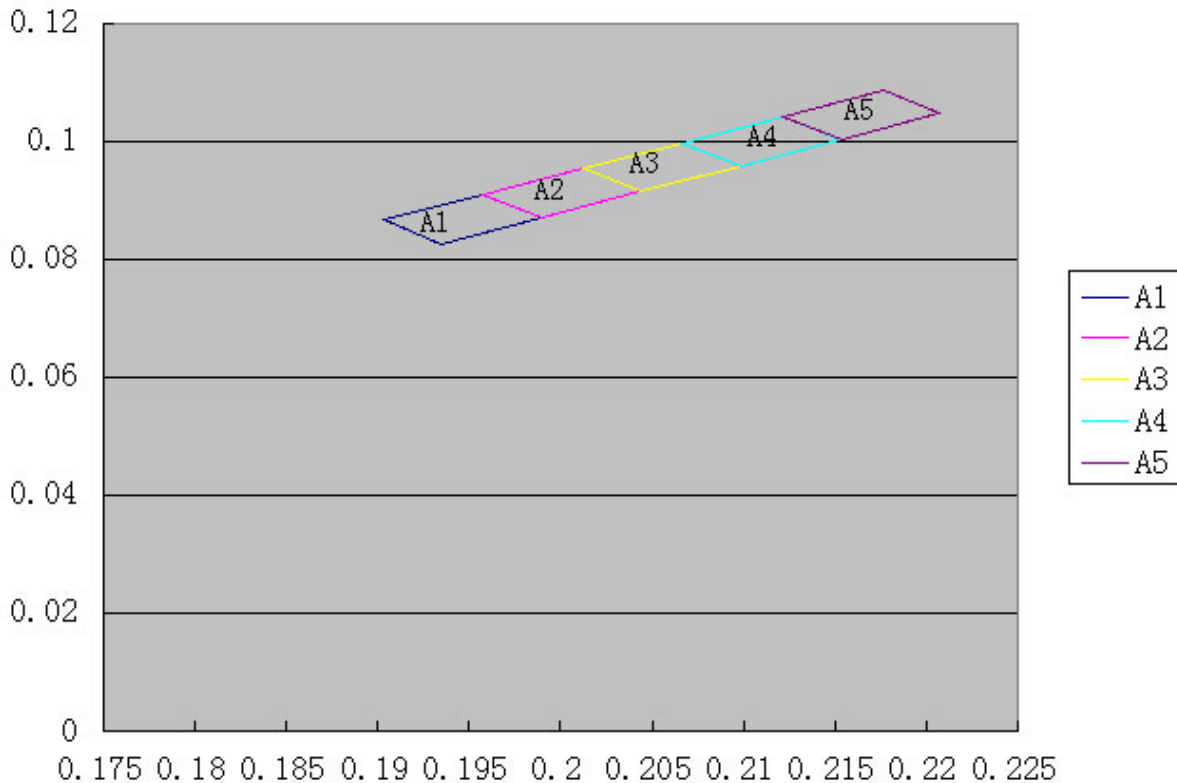
Rank	X1	X2	X3	X4	Y1	Y2	Y3	Y4
A1	0.1904	0.1958	0.199	0.1935	0.0866	0.091	0.0871	0.0827
A2	0.1958	0.2013	0.2044	0.199	0.091	0.0954	0.0915	0.0871
A3	0.2013	0.2067	0.2099	0.2044	0.0954	0.0998	0.0959	0.0915
A4	0.2067	0.2122	0.2153	0.2099	0.0998	0.1042	0.1003	0.0959
A5	0.2122	0.2177	0.2208	0.2154	0.1043	0.1087	0.1048	0.1004

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■ **OSB50603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	14	20
2	20	25
3	25	30
4	30	40
−	−	−

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	2.5	2.6
2	2.6	2.8
3	2.8	3.0
4	3.0	3.2
5	3.2	3.4

3.WD(IF=5mA)

Rank	Min（nm）	Max（nm）
1	455	460
2	460	463
3	463	466
4	466	469
5	469	472
6	472	475

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■ **OSB60603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd)	Max（mcd)
1	80	90
2	90	108
3	108	150
4	150	200

2. VF(IF=5mA)

Rank	Min（V)	Max（V)
1	2.5	2.6
2	2.6	2.8
3	2.8	3.0
4	3.0	3.2
5	3.2	3.4

3. X, Y (IF=5mA)
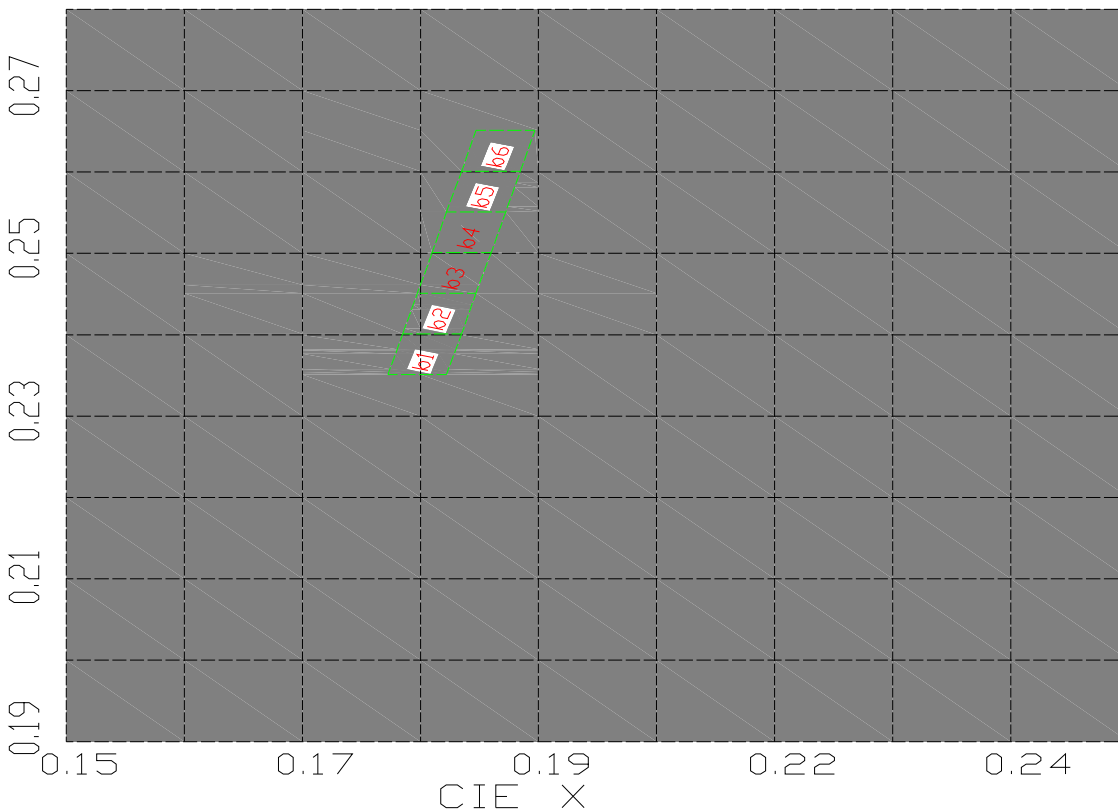
Rank	X1	X2	X3	X4	Y1	Y2	Y3	Y4
b1	0.1772	0.1785	0.1835	0.1822	0.2351	0.2401	0.2401	0.2351
b2	0.1785	0.1797	0.1847	0.1835	0.2401	0.2451	0.2451	0.2401
b3	0.1797	0.181	0.186	0.1847	0.2451	0.2501	0.2501	0.2401
b4	0.181	0.1822	0.1872	0.186	0.2501	0.2551	0.2551	0.2501
b5	0.1822	0.1835	0.1855	0.1872	0.2551	0.2601	0.2601	0.2551
b6	0.1835	0.1847	0.1897	0.1885	0.2601	0.2651	0.2651	0.2551

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■ **OSG50603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	120	144
2	144	170
3	170	220
−	−	−

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	2.5	2.6
2	2.6	2.8
3	2.8	3.0
4	3.0	3.2
5	3.2	3.4

3.WD(IF=5mA)

Rank	Min（nm）	Max（nm）
1	520	522.5
2	522.5	525
3	525	527.5
4	527.5	530
−	−	−

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■ **OSG80603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	5	7
2	7	9
3	9	12
4	12	15
−	−	−

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	1.6	1.8
2	1.8	2.0
3	2.0	2.2
4	2.2	2.4

3.WD(IF=5mA)

Rank	Min（（nm）	Max（nm）
1	565	567.5
2	567.5	570
3	570	572.5
4	572.5	575
−	−	−

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■ **OSY50603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	15	25
2	25	30
3	30	40
4	40	50
–	–	–

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	1.6	1.8
2	1.8	2.0
3	2.0	2.2
4	2.2	2.4

3.WD(IF=5mA)

Rank	Min（（nm）	Max（nm）
1	585	587.5
2	587.5	590
3	590	592.5
4	592.5	595
–	–	–

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■ **OSO50603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	15	25
2	25	30
3	30	40
4	40	50
−	−	−

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	1.6	1.8
2	1.8	2.0
3	2.0	2.2
4	2.2	2.4

3.WD(IF=5mA)

Rank	Min（ （nm）	Max（nm）
1	600	602.5
2	602.5	605
3	605	607.5
4	607.5	610
−	-	-

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■ **OSR50603C1E Rank**

1. IV(IF=5mA)

Rank	Min（mcd）	Max（mcd）
1	15	25
2	25	30
3	30	40
4	40	50
–	–	–

2. VF(IF=5mA)

Rank	Min（V）	Max（V）
1	1.6	1.8
2	1.8	2.0
3	2.0	2.2
4	2.2	2.4

3.WD(IF=5mA)

Rank	Min（（nm）	Max（nm）
1	617	620
2	620	625
3	625	630
–	–	–
–	–	–
–	–	–

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RELIABILITY   TEST   REPORT

| CLASSIFICATION	TEST ITEM	TEST CONDTION
ENDURANCE TEST	ROOM TEMPERATURE OPERATION LIFE	If: 5mA Ta:25±5 ℃ TEST TIME=1000HRS
	HIGH TEMPERTURE HIGH HUMIDITY STORAGE	R.H:90~95% Ta:65±5℃ TEST TIME=240HRS(+2HRS)
	HIGH TEMPERTURE STORAGE	Ta:85℃ TEST TIME=500HRS(-24HRS,+48HRS)
	LOW TEMPERTURE STORAGE	Ta:-40℃ TEST TIME=500HRS(-24HRS,+48HRS)
ENVIRONMENTAL TEST	TEMPERTURE CYCLING	-40℃~25℃~85℃~25℃ 30min 5min 30min 5min 100cycles
	RESISTANCE TO SOLDERING HEAT	Ta:260±5℃ TEST TIME=10±1sec
	SOLDERABILITY	Ta:245±5℃ TEST TIME=5±1sec

JUDGMENT CRITERIA OF FAILURE FOR THE RELIABILITY

MEASURING ITME	SYMBOL	CONDITIONS	FAILURE CRITERIA
LUMINOUS INTENSITY	IV	IF=5mA	IV<0.5*L.S.L
FORWARD VOLTAGE	VF	IF=5mA	VF>1.2*U.S.L
REVERSE CURRENT	IR	Vr=5V	IR>2*U.S.L
SOLDERABILITY	-	-	LESS THAN 95% SOLDER COVERAGE

U.S.L ：Upper Specification   Limit   L.S.L ： Lower Specification Limit

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OPERATION LIFE TEST LUMINANCE RATE CURVE
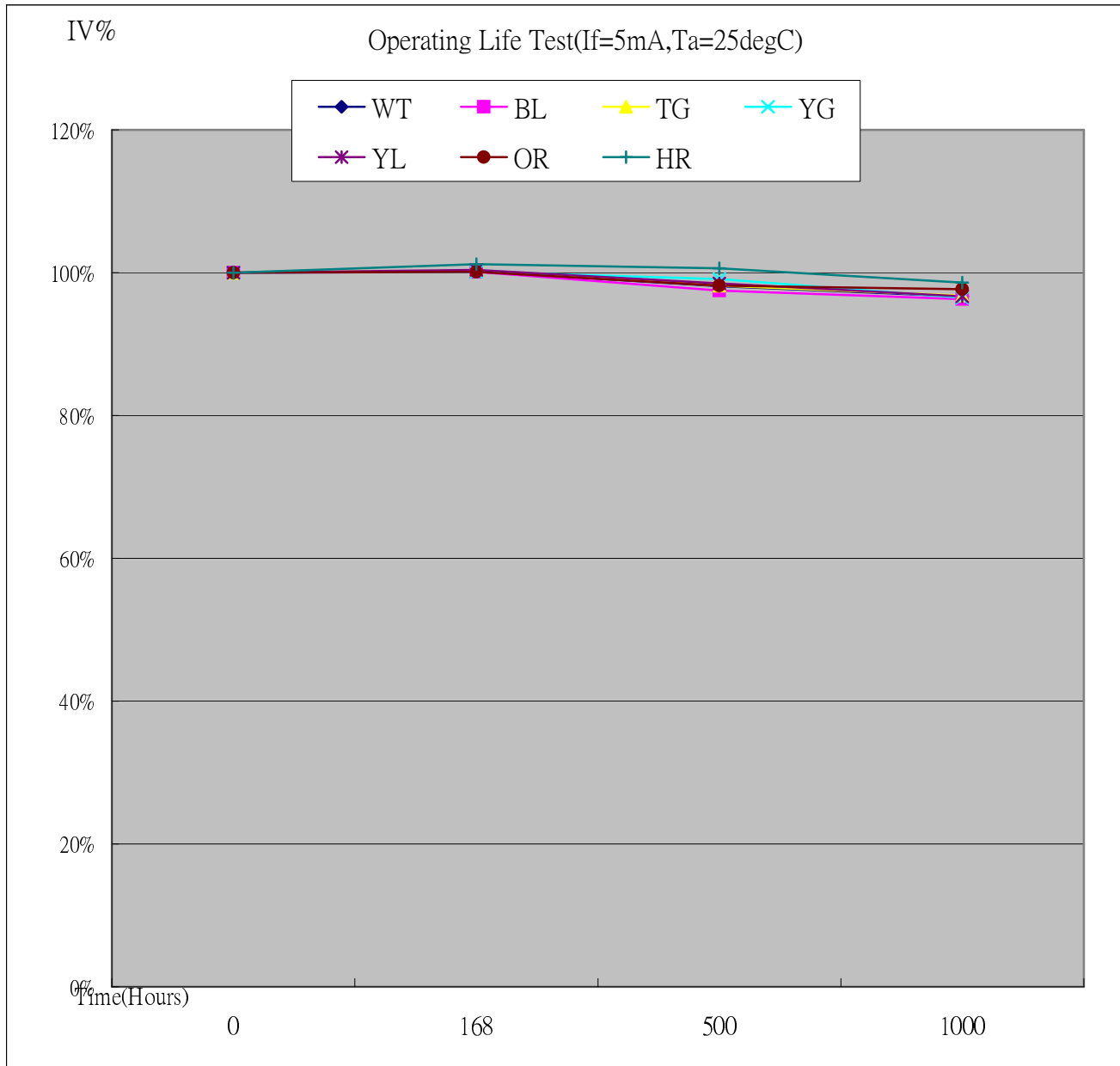
*Burn-in condition: 5mA

*Projection of Statistical Average Light Output Degradation Performance for LED Technology
  Extrapolated from OptoSupply QA Dept. Test Data.

*According to OptoSupply outgoing Packaged Products Specification

*MTBF:50,000hrs, 90% Confidence (A Failure is Any LED Which is Open, shorted or fails to
   Emit Light)

*The Projected Data is Base on The Feature of LED Itself Under Normal Operation Conditions.

*Any Improper Circuit Design or External Factors Might Cause a Different Result.

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■ **Soldering Conditions**

Reflow Soldering		Hand Soldering	
Pre-Heat	180 ~ 200°C	Temperature Soldering time	350°C Max. 3 sec. Max. (one time only)
Pre-Heat Time	120 sec. Max.		
Peak temperature	260°C Max.		
Dipping Time	**10 sec. Max.**		
Condition	Refer to Temperature-profile		

• **Reflow Soldering Condition(Lead-free Solder)**
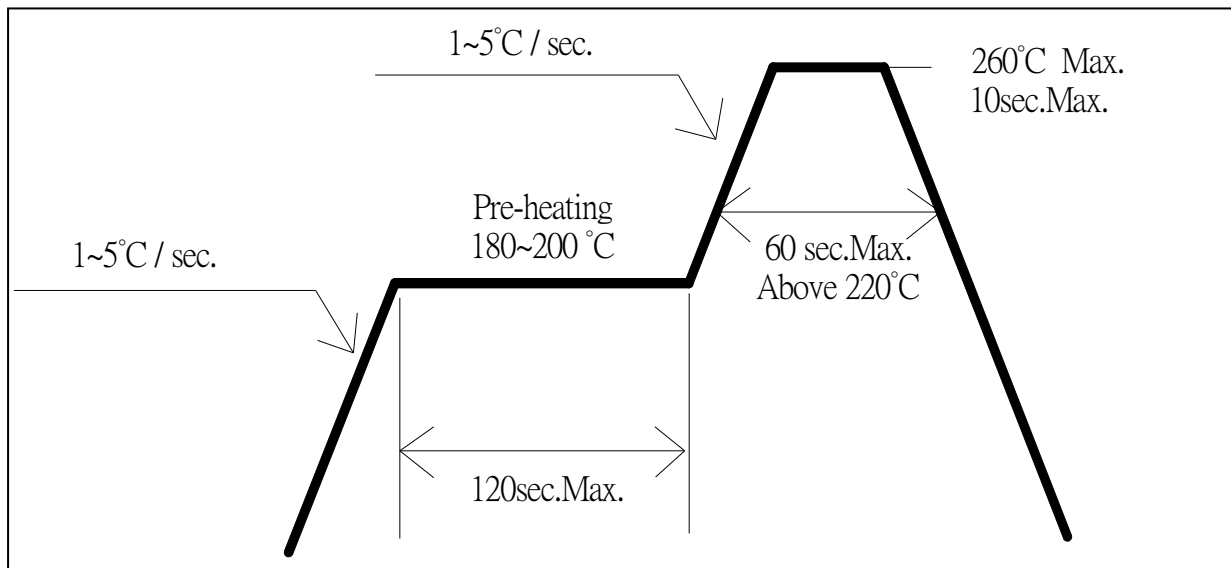
*Recommended soldering conditions vary according to the type of LED

*Although the recommended soldering conditions are specified in the above table, reflow, or hand soldering at the lowest possible temperature is desirable for the LEDs.

*A rapid-rate process is not recommended for cooling the LEDs down from the peak temperature.

•All SMD LED products are pb-free soldering available.

• Occasionally there is a brightness decrease caused by the influence of heat or ambient atmosphere during air reflow. It is recommended that the User use the nitrogen reflow method.

• Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable   a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

• Reflow soldering should not be done more than two times.

• When soldering, do not put stress on the LEDs during heating.

• After soldering, do not warp the circuit board.

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■ **Reel And Tape Dimensions：**

Quantity: **4,000** units/reel
Diameter: 178 mm

Notes: 1. All dimensions are in millimeters ;
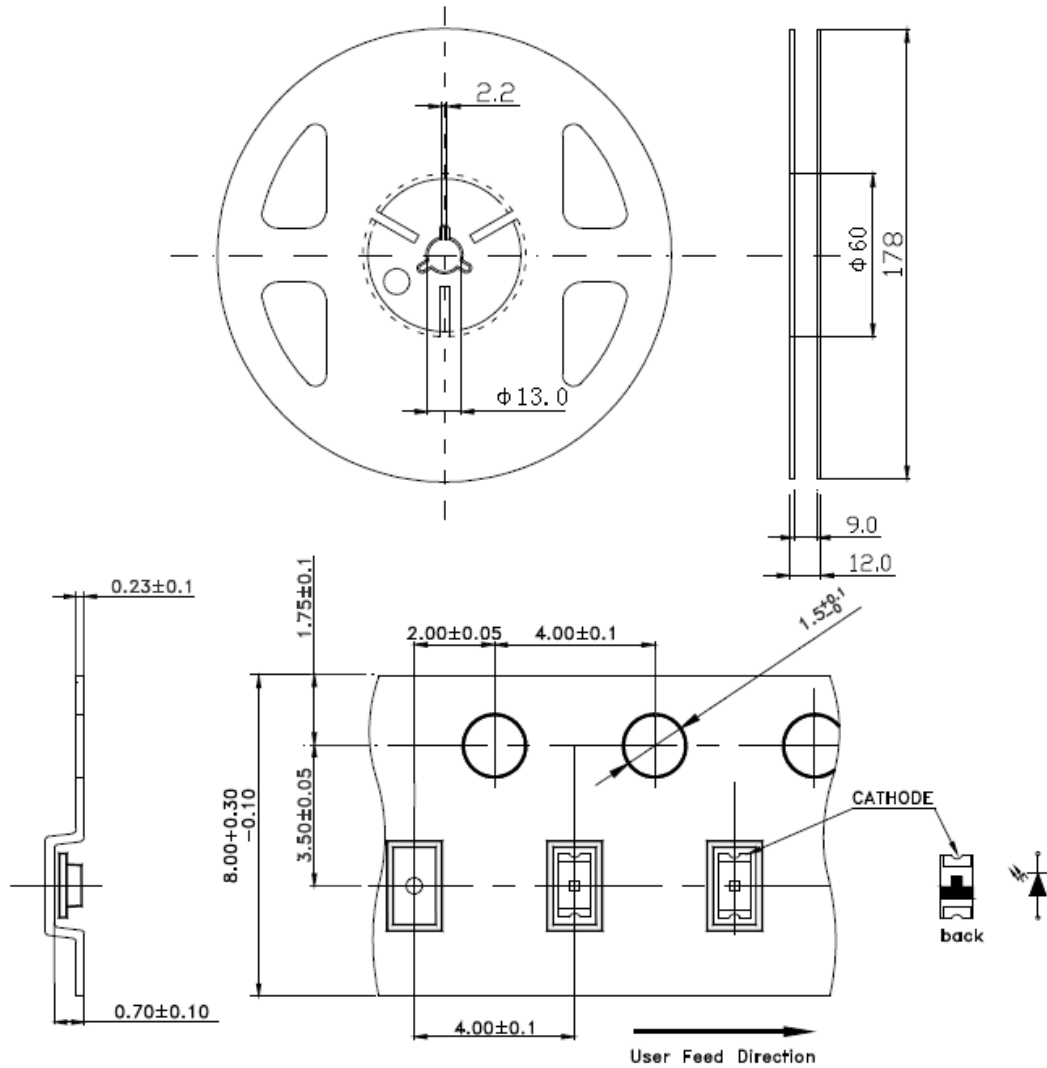
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■ **Label**

RoHS   **LED LAMPS**

Part NO. : OSXX0603C1E
Lot NO. : JEXXXXXXX
Vf: X.X-X.X V   V.A. : 120deg
Typ: XX-XX mcd@5Ma
Color: XXX   WD : XXX-XXX nm
QTY: XXXXpcs
I-XXXX

■ **Cautions:**

1. After open the package, the LED should be kept at 30°C, 30%RH or less. The LED should be soldered within 24 hours (1 day) after opening the package.

2. Heat generation must be taken into design consideration when using the LED.

3. Power must be applied resistors for protection, over current would be caused the optic damage to the devices and wavelength shift.

4. Manual tip solder may cause the damage to Chip devices, so advised that heat of iron should be lower than 15W with temperature control under 5 seconds at 230-260 deg. C.
(The device would be got damage in re working process, recommended under 5 seconds at 230-260 deg. C)

5. All equipment and machinery must be properly grounded. It is recommended to use a wristband or anti-electrostatic glove when handing the LED.

6. Use IPA as a solvent for cleaning the LED. The other solvent may dissolve the LED package and the epoxy, Ultrasonic cleaning should not be done.

7. Damaged LED will show unusual characteristics such as leak current remarkably increase, turn-on voltage becomes lower and the LED get unlight at low current.

8. OPTOSUPPLY will not do 4M change without advance consultation.

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ATTENTION
OBSERVE PRECAUTIONS
ELECTROSTATIC
SENSITIVE DEVICES