주식회사 포트론

SPECIFICATION FOR APPRVAL

PRODUCT: 3W POWER WHITE LED LAMP

MODEL NO: Cool, Neutral, Warm White

Approved date , Signature

ISSUE DATA: 2012 년 04 월 23 일

PHOTRON. CO., LTD.
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DESIGN	CHECK	APPROVAL

1. POWER LED Series Feature

High power LED is a revolutionary, energy efficient and compact new light source, combining the Lifetime and reliability advantages of Light Emitting Diodes with brightness of conventional lighting.

2. Feature

- ▷ Super high Flux output and Luminance
- ▷ High current operation
- ▷ Low forward voltage operation
- ▷ Superior Thermal Stability.
- ▷ ESD Class(Mil Std-883d Method 3017.7)based on Human Body Model(HBM):Class1
- ▷ ROHS Compliant

3. Application.

- ▷ Automotive Lighting System
- ▷ Outdoor / Indoor Lighting System
- ▷ Sign Board
- ▷ Architectural Lighting
- ▷ Projector Light source
- ▷ Traffic Signals
- ▷ LCD TV Backlight
- ▷ Monitor Backlight

Power LED Products Designation method

Full Part Code : P P ◇◇◇ - ◇ ◇ ◇ ◇ - ◇◇ ◇ ◇ ◇

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

(1) P - Photron initial

(2) P - Photron Power LED LAMP

(3) ◇◇◇ - Wavelength (Dominant / peak)

*White = White initial color temperature

2580~2870	2870~3320	3320~3710	3710~4260	4260~4746	4746~5311	5311~6020	6020~7040
W27	W30	W35	W40	W45	W50	W55	W65

(4) ◇ - Size of lens

3.6 ~4.5	4.6 ~ 5.5	5.6 ~ 6.5	6.6 ~ 7.5	7.6 ~ 8.5	8.6 ~ 10.0
4	5	6	7	8	A

(5) ◇ - Shape of lens

Lambertian	Batwing	Sid Emitting	Flat type
L	B	S	F

(6) ◇ - Viewing angle(¢ 1/2)

21 ~ 30	31 ~ 40	41 ~ 50	51 ~ 60
3	4	5	6

(7) ◇ - Power Dissipation

1W	3W	5W	10W
1	3	5	A

* Internal Number

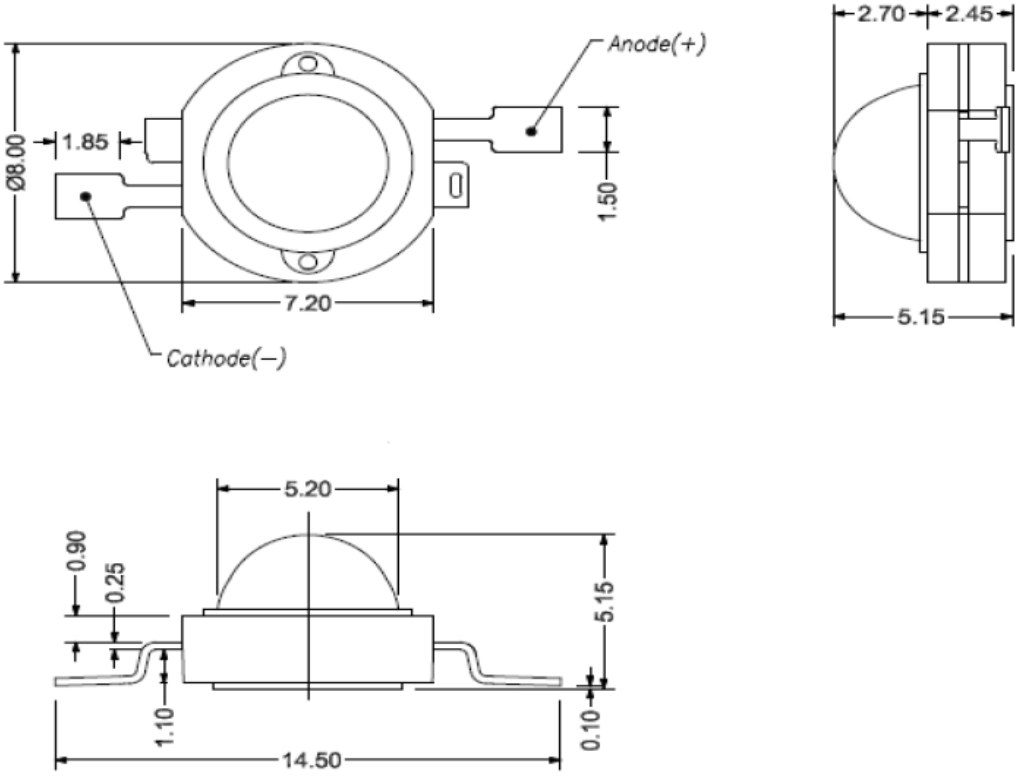
(8) ◇◇

(9) ◇

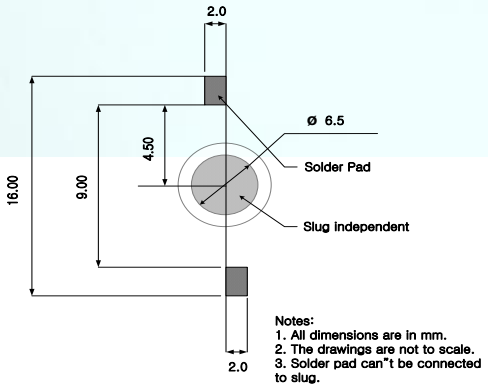
(10) ◇

(11) ◇

Silicon Lens	Star Pcb
I	T



■ Recommended soldering pad design



1. All dimensions are in millimeters
2. Tolerance is ±0.25mm

5. Absolute maximum ratings.

(Ta = 2 5℃)

Parameter	Symbol	Ratings	Unit
Forward current	I_F	700	mA
Pulse Forward Current *1	I_{FP}	1000	mA
Reverse voltage	V_R	5	V
Power dissipation	P_D	2.66	w
LED junction Temperature	T_j	120	℃
Operation temperature	Topr.	-30 ~ + 85	℃
Storage temperature	Tstg.	-40 ~ + 100	℃
Manual Soldering Time at 260℃(MAX.)	Tsol.	260℃±20℃ For 3~5	seconds
ESD Sensitivity	ESD	2000V	HBM

(Ta = 2 5℃)

6. Electrical/optical characteristics.

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Forward voltage	V_F	I_F = 350 mA	2.80		3.80	V
Reverse current	I_R	V_R = 5 V	-	-	10	μA
*Luminous Flux	ΦV	I_F = 350 mA	68		140	lm
Color Temperature	CCT	I_F = 350 mA	2700		10000	k
Color Render Index	CRI	I_F = 350 mA	70			Ra
Viewing angle	2Θ½	I_F = 350 mA	130	140	150	Deg
Temperature Resistance Junction to Board	Rth_{J-B}	I_F = 350 mA		13		℃/W
Temperature Coefficient of Forward Voltage	ΔVf/ΔT	I_F = 350 mA		2		mV/℃

*Notes

*1 IFP Conditions : Pulse Width ≤10msec. And Duty Ration ≤1/10

* ESD Class based on Human Body Model(HBM):Class1.

* Photron maintains a tolerance of ±10% on power measurements.

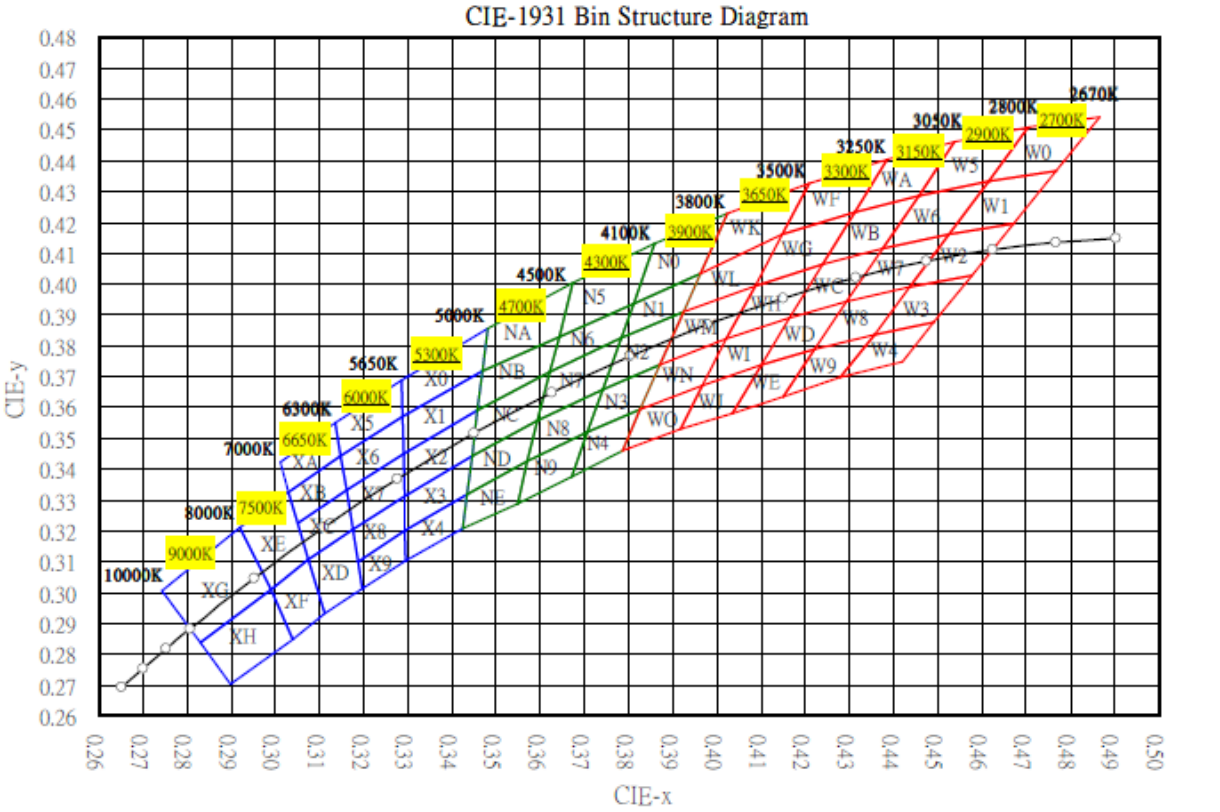
***Luminous Flux Ranks**

Part no	Flux Rank	Min(lm)	Max(lm)
White	A	5.6	5.7
	B	6.7	8.1
	C	8.1	10
	D	10	12
	E	12	14
	F	14	17
	G	17	20
	H	20	24
	I	24	28
	J	28	34
	K	34	40
	L	40	48
	M	48	57
	N	57	70
	O	70	80
	P	80	90
	Q	90	100
	R	100	110
	S	110	120
	T	120	140
	U	140	170
	V	170	200
	W	200	240
	X	240	290
	Y	290	350
	Z	350	420

Forward Voltage Rank

Part no	Rank	min	typ	max	Unit
White	0	1.80		2.00	V
	1	2.00		2.20	V
	2	2.20		2.40	V
	3	2.40		2.60	V
	4	2.60		2.80	V
	5	2.80		3.00	V
	6	3.00		3.20	V
	7	3.20		3.40	V
	8	3.40		3.60	V
	9	3.60		3.80	V
	A	3.80		4.00	V
	B	4.00		4.20	V
	C	4.20		4.40	V
	D	4.40		4.60	V
	E	4.60		4.80	V
	F	4.80		5.00	V
	G	5.00		5.20	V

White Color Rank Structure



Cold White Color Rank Structure

9000K			7500K			6650K			6000K			5300K		
8000K-10000K			7000K-8000K			6300K-7000K			5650K-6300K			5000K-5650K		
	X	Y		X	Y		X	Y		X	Y		X	Y
XG	0.29200	0.32100	XE	0.29900	0.30100	XA	0.30305	0.33271	X5	0.31479	0.34440	X0	0.34815	0.38563
	0.27424	0.30067		0.29200	0.32100		0.30109	0.34224		0.31362	0.35499		0.34690	0.37174
	0.28297	0.28377		0.30305	0.33271		0.31362	0.35499		0.32864	0.36895		0.32882	0.35692
	0.29900	0.30100		0.30755	0.31078		0.31479	0.34444		0.32882	0.35692		0.32864	0.36895
XH	0.30400	0.28500	XF	0.30400	0.28500	XB	0.30517	0.32239	X6	0.32901	0.34509	X1	0.34690	0.37174
	0.28992	0.27032		0.29900	0.30100		0.30305	0.33271		0.31604	0.33322		0.34578	0.35919
	0.28297	0.28377		0.30755	0.31078		0.31479	0.34444		0.31479	0.34444		0.32901	0.34509
	0.29900	0.30100		0.31116	0.29319		0.31604	0.33322		0.32882	0.35692		0.32882	0.35692
						XC	0.30755	0.31078	X7	0.32901	0.34509	X2	0.32922	0.33133
							0.30517	0.32239		0.32922	0.33133		0.32901	0.34509
							0.31604	0.33322		0.31747	0.32044		0.34578	0.35919
							0.31747	0.32044		0.31604	0.33322		0.34444	0.34423
						XD	0.30755	0.31078	X8	0.32922	0.33133	X3	0.32922	0.33133
							0.31745	0.32044		0.32939	0.32021		0.34444	0.34423
							0.31960	0.30130		0.31861	0.31020		0.34335	0.33203
							0.31116	0.29319		0.31747	0.32044		0.32939	0.32002
									X9	0.32939	0.32021	X4	0.34335	0.33203
										0.32954	0.31050		0.34250	0.32080
										0.31960	0.30130		0.32954	0.31050
										0.31861	0.31020		0.32939	0.32002

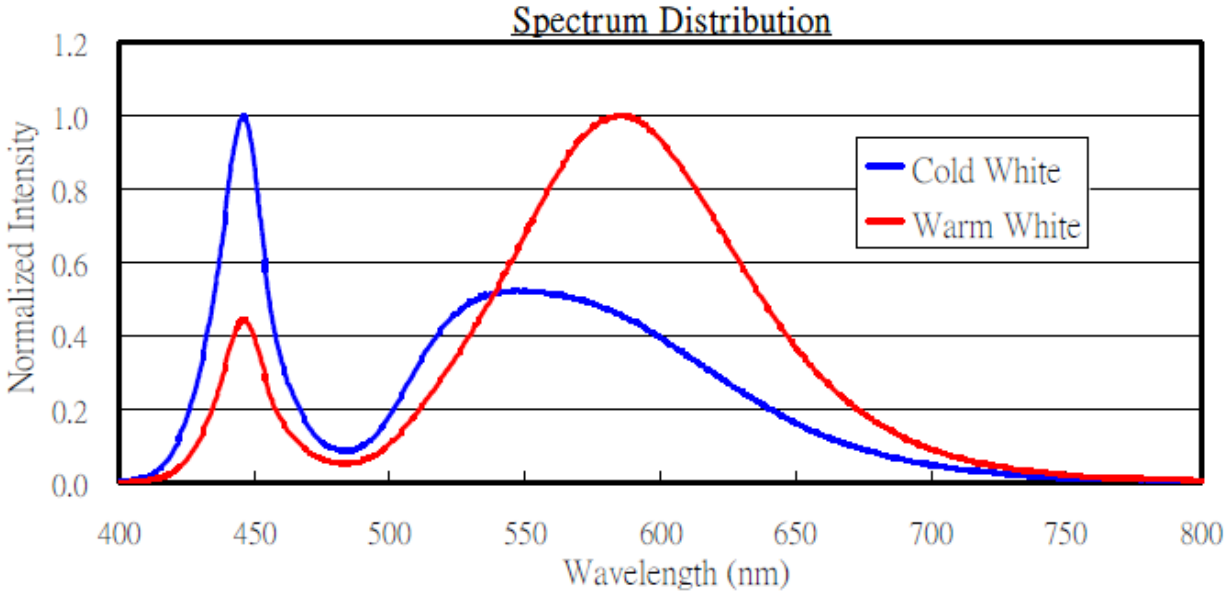
Neutral White Color Rank Structure

4700K			4300K			3900K		
4500K-5000K			4100K-4500K			3800K-4100K		
	X	Y		X	Y		X	Y
NA	0.36421	0.38288	N5	0.36729	0.40029	N0	0.38595	0.41300
	0.36729	0.40029		0.38595	0.41300		0.40227	0.42278
	0.34815	0.38563		0.38111	0.39375		0.39628	0.40351
	0.34690	0.37174		0.36421	0.38288		0.38111	0.39375
NB	0.36421	0.38288	N6	0.36421	0.38288	N1	0.37826	0.38246
	0.36222	0.37162		0.38111	0.39375		0.38111	0.39375
	0.34578	0.35919		0.37826	0.38246		0.39628	0.40351
	0.34690	0.37174		0.36222	0.37162		0.39237	0.39093
NC	0.36222	0.37162	N7	0.36222	0.37162	N2	0.37826	0.38246
	0.35940	0.35570		0.37826	0.38246		0.39237	0.39093
	0.34444	0.34423		0.37408	0.36582		0.38707	0.37390
	0.34578	0.35919		0.35940	0.35570		0.37408	0.36582
ND	0.34444	0.34423	N8	0.35940	0.35570	N3	0.37408	0.36582
	0.34335	0.33203		0.35708	0.34258		0.38707	0.37390
	0.35708	0.34258		0.37058	0.35195		0.38260	0.35952
	0.35940	0.35570		0.37408	0.36582		0.37058	0.35195
NE	0.35708	0.34258	N9	0.37058	0.35195	N4	0.38260	0.35952
	0.35480	0.32900		0.36700	0.33770		0.37850	0.34600
	0.34250	0.32080		0.35480	0.32900		0.36700	0.33770
	0.34335	0.33203		0.35708	0.34258		0.37058	0.35195

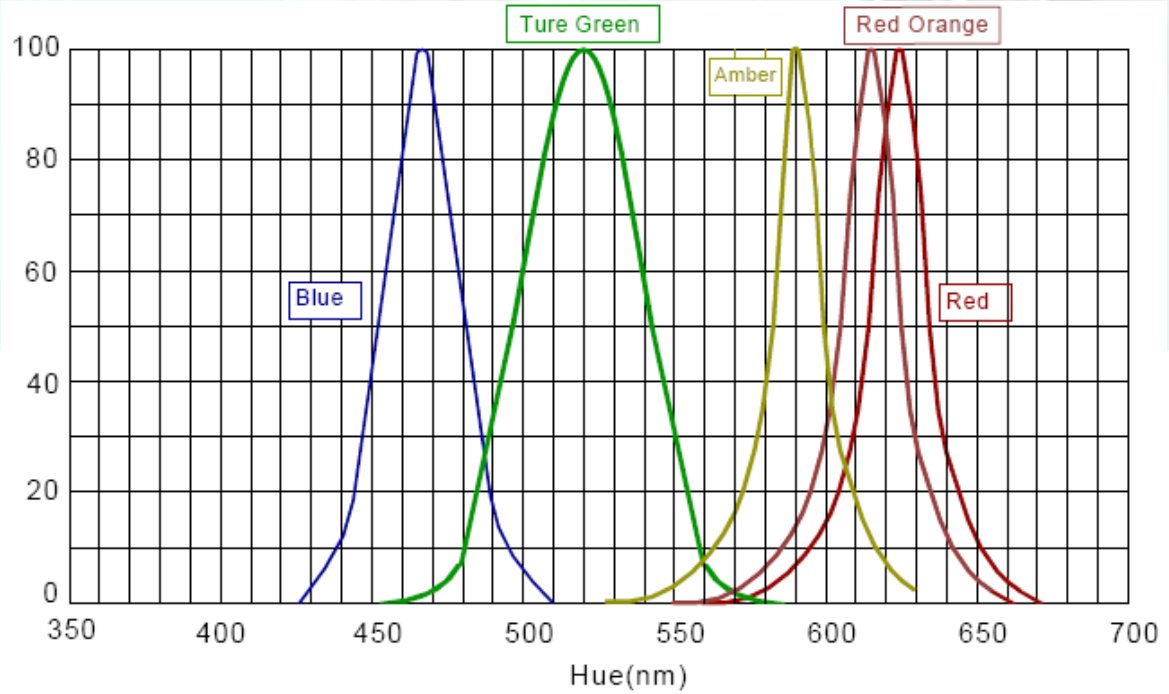
Warm White Color Rank Structure

3650K			3300K			3150K			2900K			2700K		
3500K-3800K			3250K-3500K			3050K-3250K			2800K-3050K			2600K-2800K		
	X	Y		X	Y		X	Y		X	Y		X	Y
WK	0.40227	0.42278	WF	0.43846	0.44040	WA	0.43846	0.44040	W5	0.45382	0.44598	W0	0.47051	0.45083
	0.42094	0.43262		0.43119	0.42339		0.45382	0.44598		0.47051	0.45083		0.48665	0.45419
	0.41478	0.41610		0.41478	0.41610		0.44564	0.42868		0.46140	0.43333		0.47673	0.43663
	0.39628	0.40351		0.42094	0.43262		0.43119	0.42339		0.44564	0.42868		0.46140	0.43333
WL	0.40859	0.39953	WG	0.40859	0.39953	WB	0.43119	0.42339	W6	0.46140	0.43333	W1	0.46140	0.43333
	0.39237	0.39093		0.41478	0.41610		0.44564	0.42868		0.45251	0.41624		0.47673	0.43663
	0.39628	0.40351		0.43119	0.42339		0.43758	0.41163		0.43758	0.41163		0.46713	0.41963
	0.41478	0.41610		0.42396	0.40647		0.42396	0.40647		0.44564	0.42868		0.45251	0.41624
WM	0.39237	0.39093	WH	0.40859	0.39953	WC	0.42396	0.40647	W7	0.43758	0.41163	W2	0.45251	0.41624
	0.38707	0.37390		0.42396	0.40647		0.43758	0.41163		0.42937	0.39428		0.46713	0.41963
	0.40211	0.38216		0.41649	0.38900		0.42937	0.39428		0.44360	0.39911		0.45766	0.40287
	0.40859	0.39953		0.40211	0.38216		0.41649	0.38900		0.45251	0.41624		0.44360	0.39911
WN	0.38707	0.37390	WI	0.41649	0.38900	WD	0.42937	0.39428	W8	0.42937	0.39428	W3	0.44360	0.39911
	0.40211	0.38216		0.41000	0.37381		0.42212	0.37895		0.44360	0.39911		0.45766	0.40287
	0.39656	0.36728		0.39656	0.36728		0.41000	0.37381		0.43559	0.38371		0.44899	0.38752
	0.38260	0.35952		0.40211	0.38216		0.41649	0.38900		0.42212	0.37895		0.43559	0.38371
WO	0.39656	0.36728	WJ	0.41000	0.37400	WE	0.42200	0.37900	W9	0.43559	0.38371	W4	0.43559	0.38371
	0.39165	0.35300		0.40350	0.35800		0.41500	0.36350		0.42800	0.37000		0.44899	0.38752
	0.37850	0.34600		0.39165	0.35300		0.40350	0.35800		0.41500	0.36350		0.44200	0.37500
	0.38260	0.35952		0.39656	0.36728		0.41000	0.37400		0.42200	0.37900		0.42800	0.37000

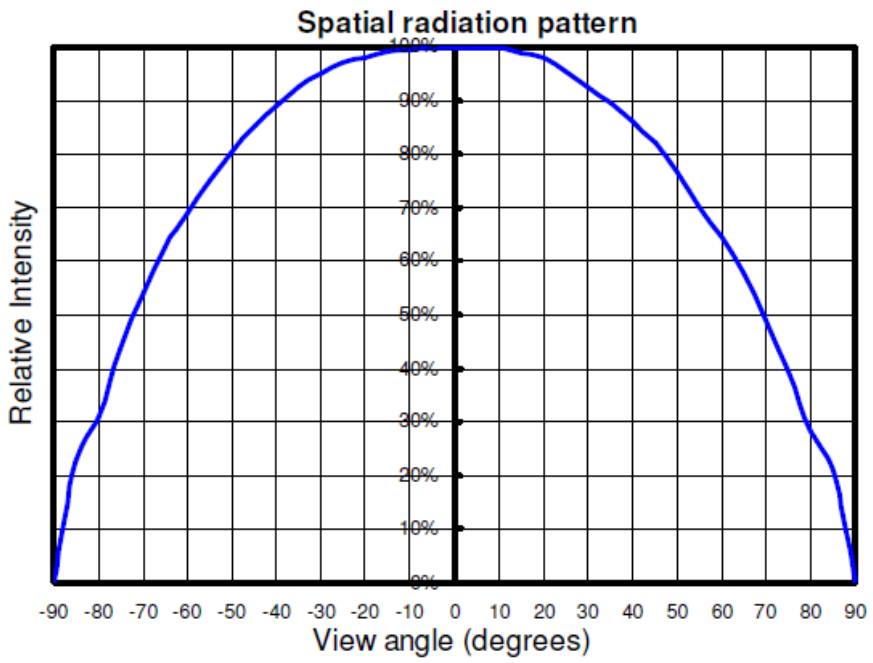
Color Spectrum Curves



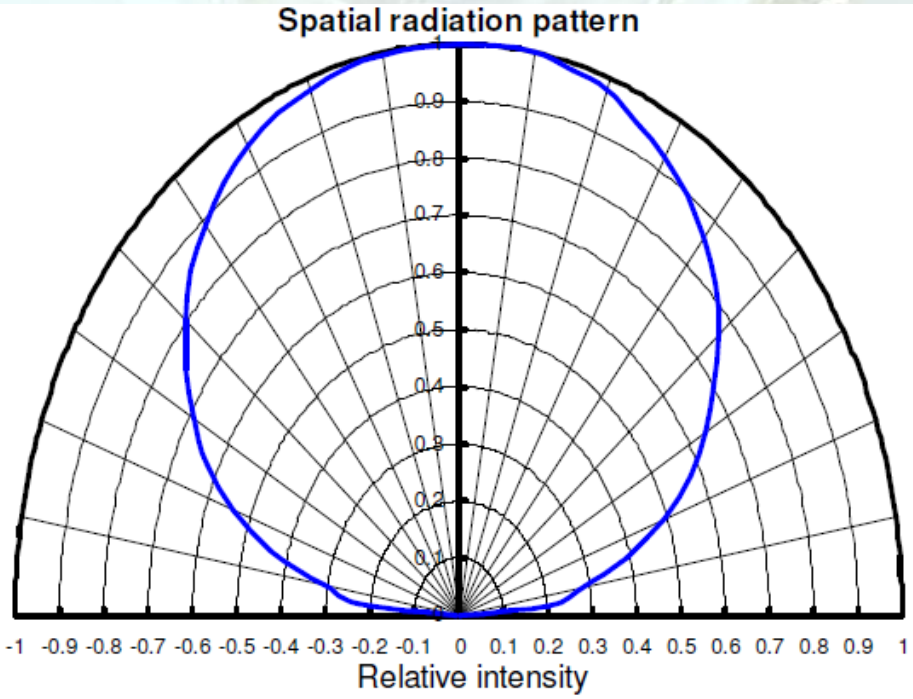
Wavelength spectrum.



Typical Radiation Pattern.



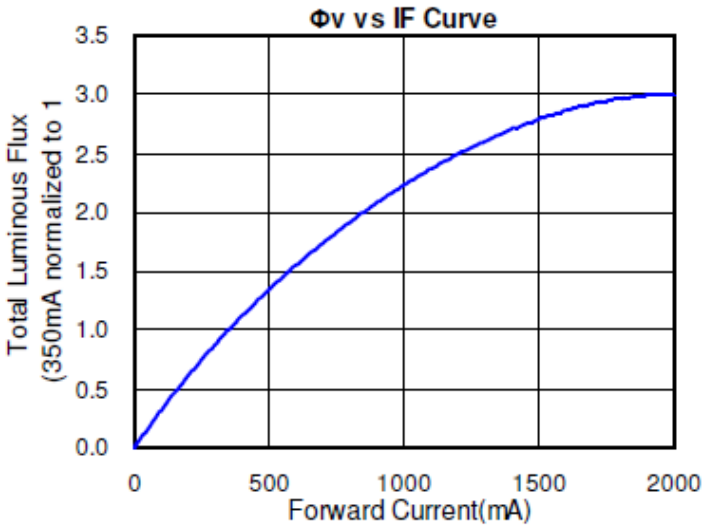
Typical Radiation Pattern



Electrical Characteristics

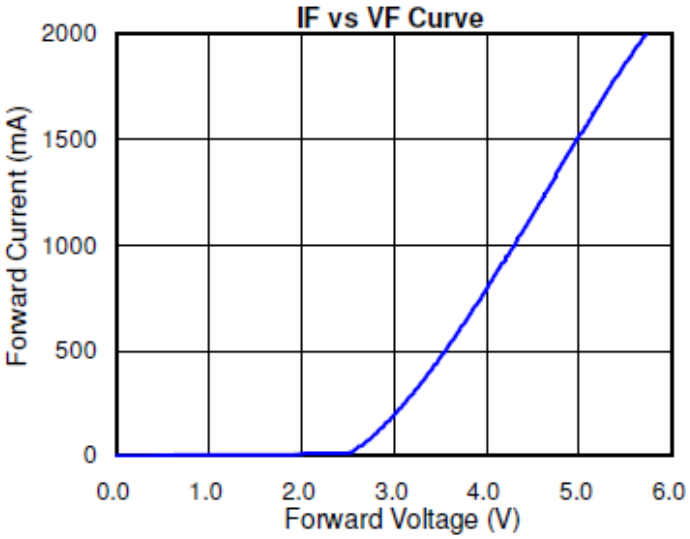
Forward Current & Forward Current.

Luminous flux (Φv) vs Current(IF)

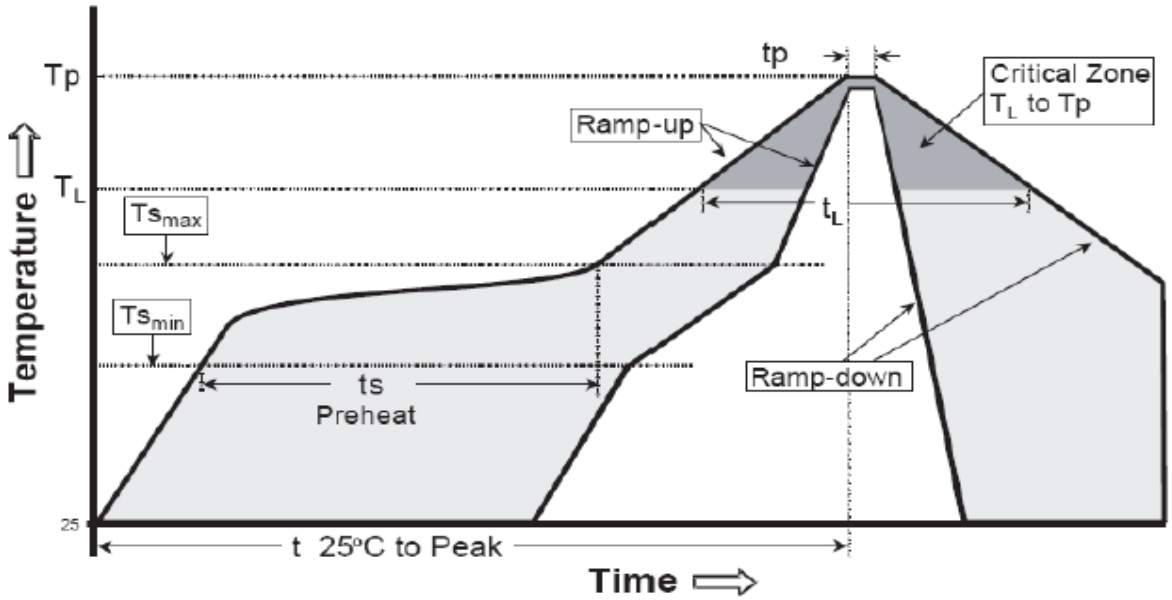


Relative Luminous Flux & Forward Current.

Current(IF) vs Voltage(VF)

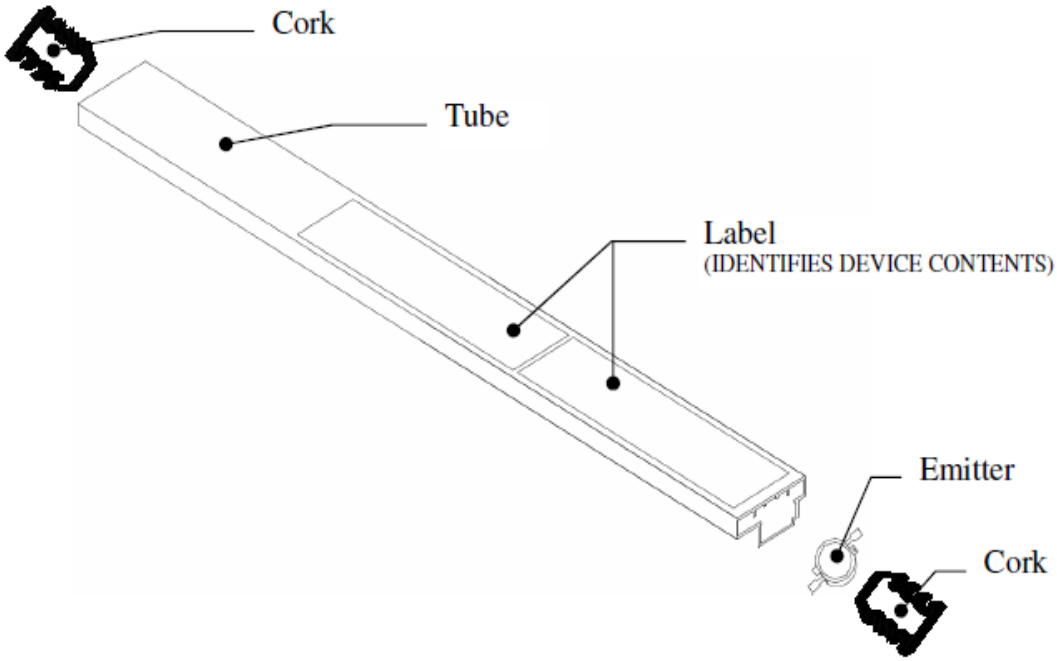


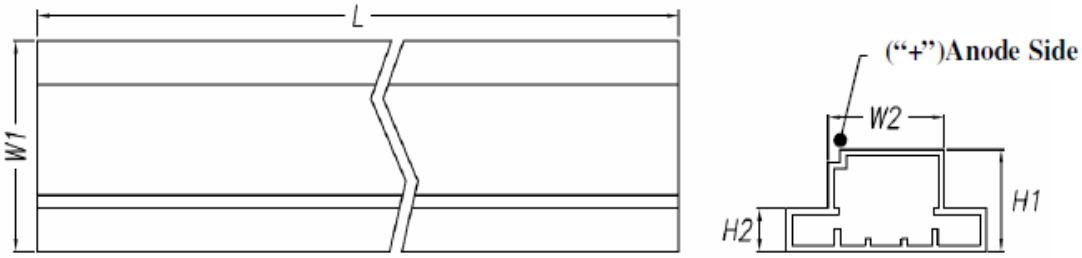
Reflow soldering temperature profile



Profile Feature	Typical parameters
Average Ramp-Up Rate (Ts_{max} to Tp)	3 ℃/second max.
Preheat Temperature Min (Ts_{min})	150 ℃
Preheat Temperature Max (Ts_{max})	200 ℃
Time (ts_{min} to ts_{max})	60-180 seconds
Time maintained above Temperature (TL)	217 ℃
Time maintained above Time (tL)	60-150 seconds
Peak/Classification Temperature (Tp)	260 ℃
Time within 5 ℃ of Actual Peak Temperature (tp)	5 seconds
Ramp-Down Rate	6 ℃/second max.
Time 25 ℃ to Peak Temperature	8 minutes max.

Tube packing



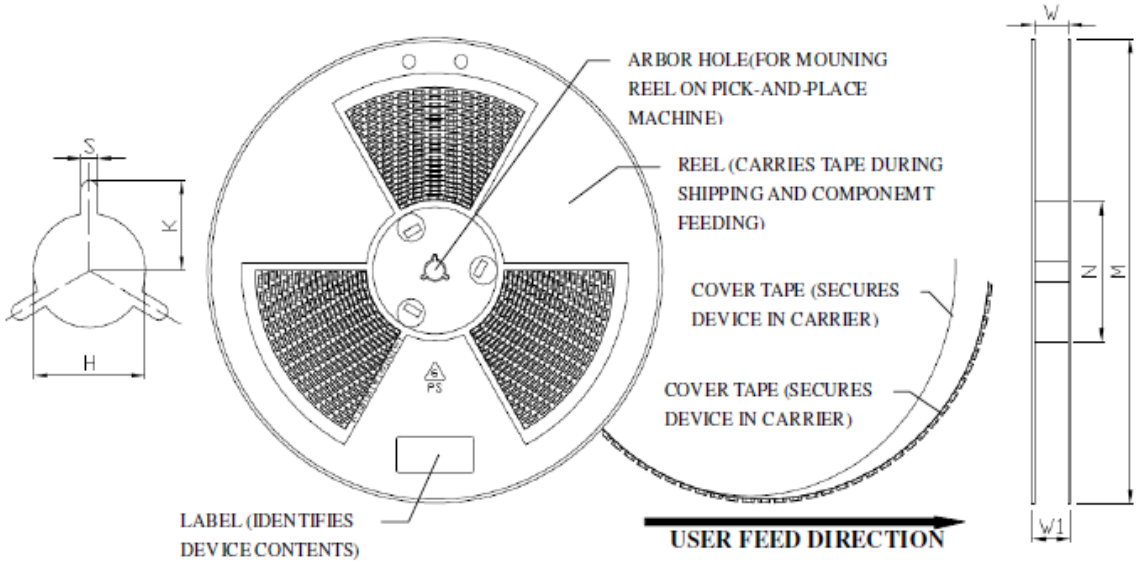


Unit : mm

W1	W2	H1	H2	L
16.5 ±0.2	9.6 ±0.2	8.0 ±0.2	3.4 ±0.2	424.0 ±2.0

Reel packing

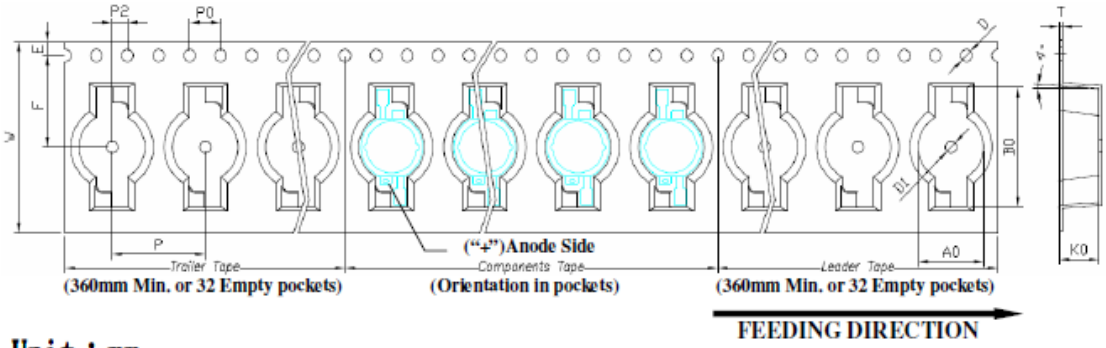
- **Reel dimensions**



Unit : mm

M	N	W	W1	H	K	S
Φ330.0 ±1.0	Φ99.5 ±1.0	24.4 ±1.0	29.0 ±1.0	Φ13.5 ±0.5	10.75 ±0.5	2.5 ±0.5

- **Carrier tape dimensions**



Unit : mm

W	P	E	F	P2	D	D1	P0	A0	B0	K0	T
24.0 ±0.3	12.0 ±0.1	1.75 ±0.1	11.5 ±0.1	2.0 ±0.1	1.5 +0.1	1.5 ±0.25	4.0 ±0.1	8.45 ±0.1	15.0 ±0.1	5.10 ±0.1	0.37 ±0.02

◆ Soldering conditions

- When soldering leave minimum clearance between the resin and soldering point
- Maximum allowable soldering conditions

  Soldering dipping: 260 degrees C max., 5 seconds max.,

  Soldering iron: 340 degrees C max., 3 seconds max., 1 time 40w max.
- Contact between molten solder and the resin must be avoided.
- In soldering, do not apply any stress to the lead frame, particularly heated.

◆ storage

- Storage Conditions

  Before opening the package

  The LEDs should be kept below 30℃ and 70%RH. When storing the LEDs, try to unpack the moisture proof package and store them in a dry place. If the LEDs are stored for 3months or more after being from PHOTRON, a sealed container with a nitrogen atmosphere is recommended for storing.

  After opening the package

  The LEDs should be kept below 30℃ and 70%RH. The LEDs should be soldered within 24hours after opening the package. If there is leftover, they should be stored in moisture proof package with moisture absorbent material(e.g. silica gel) inside.

- It is strongly recommended that the user use the LEDs as soon as possible since there Exist a possibility that unfavorable environmental factors could deteriorate the properties of the LEDs.

◆ Static Electricity

- Static electricity or surge voltage damages the LEDs.

  It is recommended that a wrist bond or an anti-electrostatic glove be used when handling the LEDs.

- All devices, equipment and machinery must be properly grounded.

  It is recommended that measures be taken against surge voltage to the equipment that mounts the LEDs.
- When inspecyimg the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. It is easy to find static-damaged LEDs by a light-on test or a VF test at a lower current (below 1mA is recommended).
- Damaged LEDs will show some unusual characteristics such as the forward voltage becomes lower. Or the LEDs do not light at the low current.

개정	변경 전	변경 후	변경사유	적용 일자	Page
	품명/규격	품명/규격			
1.0	Cool ,Neutral, Warm White	Cool ,Neutral, Warm White	신규	2012-04-23	18