



**NATIONSTAR**

STOCK CODE: 002449

**2013**

**NATIONSTAR**

LIGHTING UP THE WORLD

**LA** LEDs For Lighting Applications

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NATIONSTAR  
LIGHTING UP THE WORLD | **2013**

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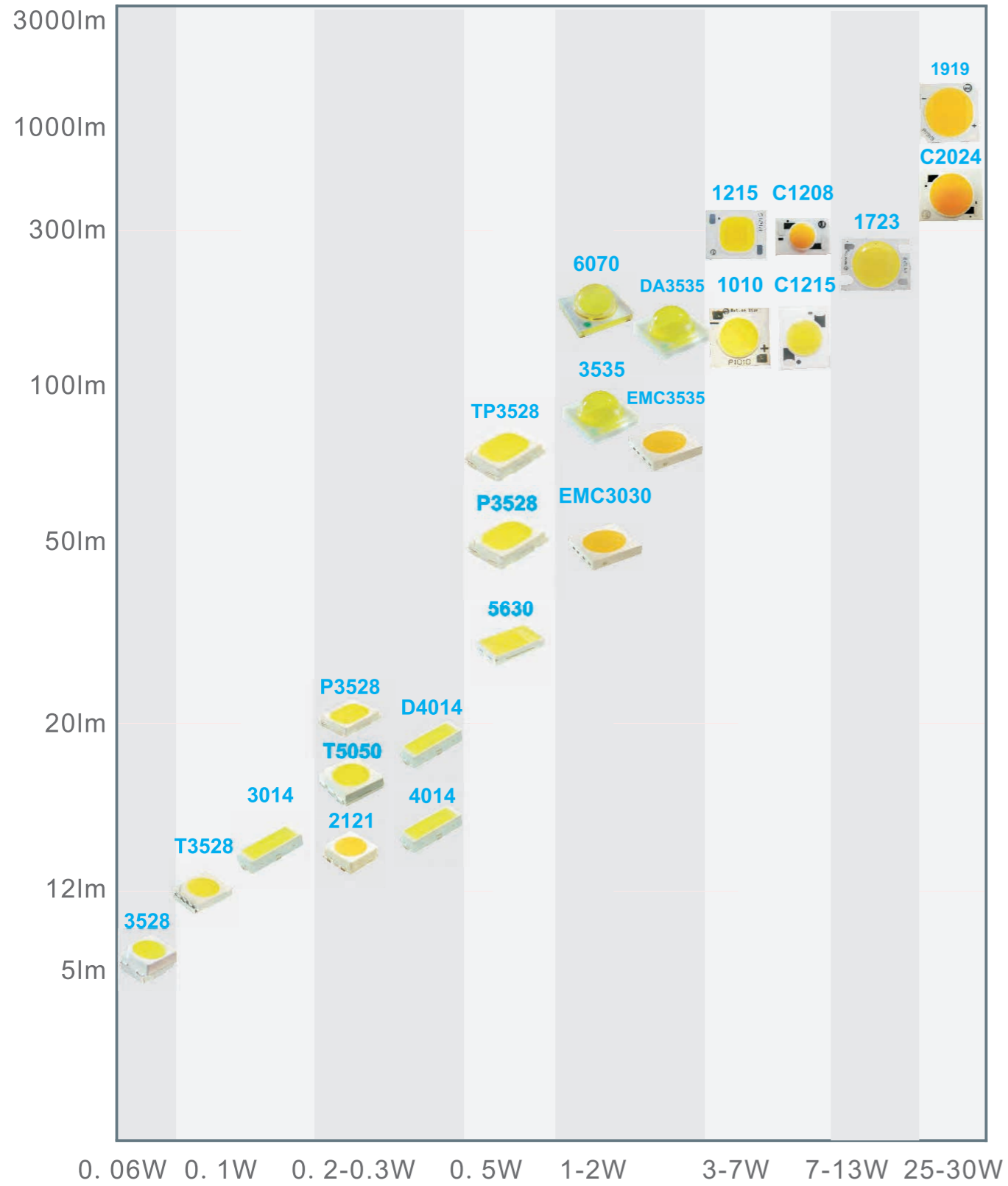
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# NationStar Lighting Components List



● Best Suitable ○ Suitable

TYPE		LIGHT TUBE	BULB	DOWNLIGHT	SPOT LIGHT	LIGHT PANEL	CABINET LIGHT	HIGH BAY LIGHT	CANDLE LIGHT	STRIPS	LIGHT MODULE	TUNNEL LIGHT	STREET LIGHT	BACK LIGHT
P3528		●	●	●		○	○							
TP3528			●	●										
3014		●	○	○		●								
T3528		●				●								
5630			●	●										●
D4014		●												
4014														●
3528		○								●	●			
5050										●	●			
2121			○	○		○	●							
3535					●			●	●			●	●	
6070					●			●				●	●	
EMC Series							●							●
COB Series			●	●	●									

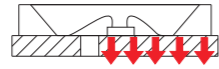
\*The above information is for reference only.

## TOP LED - Small size & High power white light P3528 Series

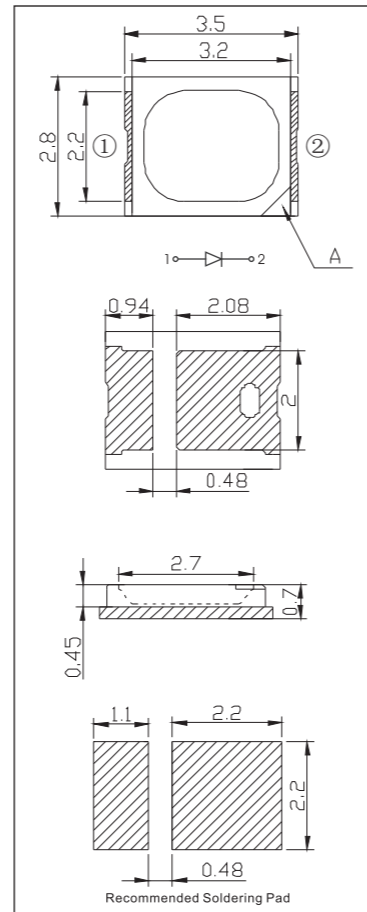


P3528 Series

Thermal Dissipating Structure : Outline Dimensions/Unit: mm



The chip is directly placed on the thermal dissipating pad, and the heat generated from the chip is directly conducted to the PCB.



Tolerance: ±0.1mm

### Features:

- Thin package with heat sink, high power, equivalent to 5630 power LED;
- Apply to LED bulb, LED downlight and other lighting products;
- Rated power: 0.5W / 0.2W;
- New 0.2W Plant-growth light for different plants.

### Absolute maximum parameters:

Parameter	Symbol	Rating	
		0.2W	0.5W
Forward Current	$I_F$	75mA	200mA
Pulse Forwards Current*2	$I_{FP}$	200mA	500mA
Reverse Voltage	$V_R$	5V	
Working Temperature	$T_{OPR}$	-30~+85°C	
Storage Temperature	$T_{STG}$	-40~+100°C	

### Parameter/ $T_a=25^\circ\text{C}$ :

Power	Color	Part Number	$\lambda_p$ (nm)	$I_F$ (mA) TEST	$P_o$ (mW) Typ.	$V_F$ (V) Typ.
0.2W Plant-growth light series	Infrared	FM-P3528IRS-730U	730	60	70	2.0
	DarkRed	FM-P3528HRS-660U	660	60	70	2.0
	Blue	FM-P3528BS-450Q	450	60	90	3.2
	Weak Red	FM-P3528WPS-450Q	(0.351, 0.274)	60	90	3.2
	Weak Blue	FM-P3528WBS-450Q	(0.25, 0.213)	60	90	3.2
	Weak White	FM-P3528WNS-450Q	(0.306, 0.29)	60	90	3.2

Power	Color	Part Number	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.	$I_R$ ( $\mu\text{A}$ ) Max*1
0.5W	Natural White	FM-P3528WNS-460W	5600-6500	70	150	54	3.2	10
	Neutral White	FM-P3528WDS-460W-R80	3700-4200	80	150	48	3.2	10
	Warm White	FM-P3528WLS-460W-R80	2800-3200	80	150	44	3.2	10
0.2W	Natural White	FM-P3528WNS-460Q	5600-6500	70	60	20	3.2	10
	Neutral White	FM-P3528WDS-460Q-R80	3700-4200	80	60	18	3.2	10
	Warm White	FM-P3528WLS-460Q-R80	2800-3200	80	60	16	3.2	10

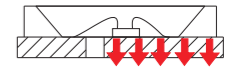
\* 1 Test condition of reverse current leakage:  $V_R=5V$  • 2 Pulse width  $\leq 0.1\text{ms}$ . Duty cycle  $\leq 1/10$

## TOP LED - High Voltage & High brightness white TP3528 Series



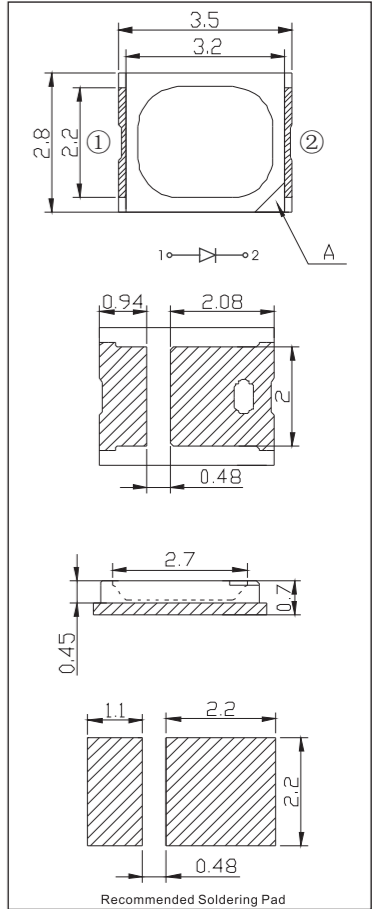
TP 3528Series

Thermal Dissipating Structure :



The chip is directly placed on the thermal dissipating pad, and the heat generated from the chip is directly conducted to the PCB.

Outline Dimensions/ Unit: mm



Tolerance: ±0.1mm

### Features:

- High Voltage, 9V/pcs:
- Thin packaged with heat sink, good heat dissipat:
- Application for LED bulb, downlight, cost-effective;
- Rated power: 0.3W.

### Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	$I_F$	35mA
Pulse Forwards Current*2	$I_{FP}$	100mA
Reverse Voltage	$V_R$	15V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

\* Plus Width  $\leq 0.1\text{ms}$ . Duty Cycle  $\leq 1/10$

### Parameter/ $T_a=25^\circ\text{C}$ :

Color	Part Number	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\Phi_v$ (lm) Typ.	$V_F$ (V) Typ.
Natural White	FM-TP3528WNS-460R	5600-6500	70	30	31	9.6
Neutral White	FM-TP3528WDS-460R-R70	3700-4200	70	30	31	9.6
Warm White	FM-TP3528WLS-460R-R70	2800-3200	70	30	29	9.6



## TOP LED - Small size & High brightness & White light 3014 Series



3014 Series

### Features:

- Small-size and thin-packing, apply to high-density configuration design;
- CRI R70 or R80 available, typical color temperature 6000K/4000K/3000K;
- Rated power: 0.1W;

### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	35mA
Pulse Forwards Current*2	$I_{FP}$	100mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

Color	Part Number	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.	$I_R$ ( $\mu\text{A}$ ) Max*1
Natural White	FM-3014WNS-460T	5600-6500	70	30	12	3.4	10
Neutral White	FM-3014WDS-460T-R70	3700-4200	70	30	11.5	3.4	10
	FM-3014WDS-460T-R80	3700-4200	80	30	10.5	3.4	10
Warm White	FM-3014WLS-460T-R70	2800-3200	70	30	11	3.4	10
	FM-3014WLS-460T-R80	2800-3200	80	30	10	3.4	10

\* 1 Test condition of reverse current leakage:  $V_R=5\text{V}$  • 2 Pulse width  $\leq 0.1\text{ms}$ , Duty cycle  $\leq 1/10$



## TOP LED - High brightness & Low cost white light T3528 Series



T3528 Series

### Features:

- Thin package, low cost, high illumination efficiency and 120° view angle;
- Various luminosity grades, CRI or color temperatures available;
- Rated power: 0.06W / 0.1W;

### Absolute maximum parameters:

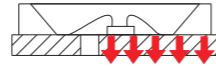
Parameter	Symbol	Rating
Forward Current	$I_F$	35mA
Pulse Forwards Current*2	$I_{FP}$	100mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

Rating	Color	Part Number	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.	$I_R$ ( $\mu\text{A}$ ) Max*
High Brightness	Natural White	FM-T3528WNS-460T	5600-6500	70	20	8.0	3.2	10
	Neutral White	FM-T3528WDS-460T-R70	3700-4200	70	20	7.8	3.2	10
		FM-T3528WDS-460T-R80	3700-4200	80	20	7.0	3.2	10
	Warm White	FM-T3528WLS-460T-R70	2800-3200	70	20	7.5	3.2	10
FM-T3528WLS-460T-R80		2800-3200	80	20	6.6	3.2	10	
Standard Brightness	Natural White	FM-T3528WNS-460R	5600-6500	70	20	7.0	3.2	10
	Neutral White	FM-T3528WDS-460R-R70	3700-4200	70	20	6.5	3.2	10
	Warm White	FM-T3528WLS-460R-R70	2800-3200	70	20	6.0	3.2	10

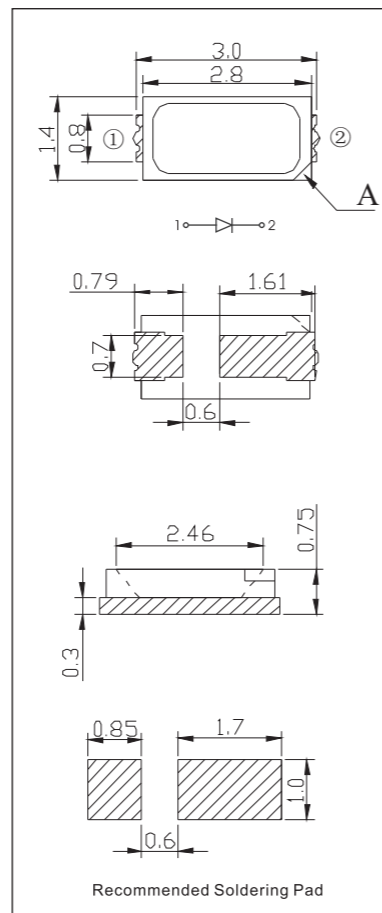
\* 1 Test condition of reverse current leakage:  $V_R=5\text{V}$  • 2 Pulse width  $\leq 0.1\text{ms}$ , Duty cycle  $\leq 1/10$

### Thermal Dissipating Structure :

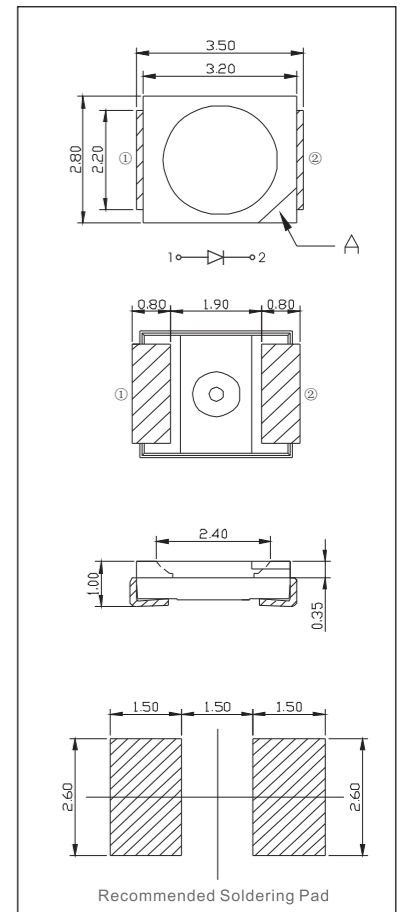


The chip is directly placed on the thermal dissipating pad, and the heat generated from the chip is directly conducted to the PCB.

### Outline Dimensions/ Unit: mm



### Outline Dimensions/ Unit: mm



Note: A marks the Cathode  
Tolerance unless specified:  $\pm 0.2\text{mm}$



# TOP LED - High power & High brightness white light 5630 Series



5630 Series

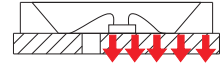
## Features:

- High power, high brightness, replaces some of the conventional high-power;
- LED with lower cost and smaller size;
- CRI R70 or R80 available, typical color temperature 6000K/4000K/3000K;
- Rated power: 0.5W;

## Absolute maximum parameters:

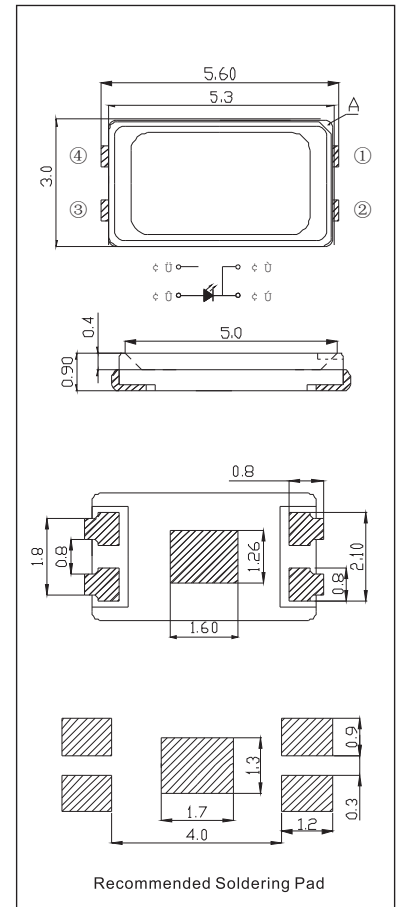
Parameter	Symbol	Rating
Forward Current	$I_F$	200mA
Pulse Forwards Current*2	$I_{FP}$	500mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

## Thermal Dissipating Structure :



The chip is directly placed on the thermal dissipating pad, and the heat generated from the chip is directly conducted to the PCB.

## Outline Dimensions/ Unit: mm



Note: A marks the Cathode  
Tolerance unless specified:±0.2mm

## Parameter/Ta=25°C:

Color	Part Number	Color Temperature T <sub>c</sub> (K)	CRI Ra Min.	I <sub>F</sub> (mA) TEST	Φ <sub>v</sub> (lm) Typ.	V <sub>F</sub> (V) Typ.	I <sub>R</sub> (μA) Max*1
Natural White	FM-5630WNS-460W	5600-6500	70	150	52	3.2	10
Neutral White	FM-5630WDS-460W-R70	3700-4200	70	150	50	3.2	10
Warm White	FM-5630WLS-460W-R70	2800-3200	70	150	48	3.2	10



## TOP LED - High voltage & White LED D4014 Series



D4014 Series

### Features:

- High Voltage 6V/pcs;
- Thin packaged with heat sink, good heat dissipation;
- Application for tube light, cost-effective;
- Rated power: 0.2W.

### Absolute maximum parameters:

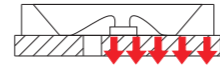
Parameter	Symbol	Rating
Forward Current	$I_F$	35mA
Pulse Forwards Current* <sup>2</sup>	$I_{FP}$	100mA
Reverse Voltage	$V_R$	10V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

Color	Part Number	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.
Natural White	FM-D4014WNS-460R	5600-6500	70	30	21	6.4
Neutral White	FM-D4014WDS-460R-R70	3700-4200	70	30	21	6.4
Warm White	FM-D4014WLS-460R-R70	2800-3200	70	30	19	6.4

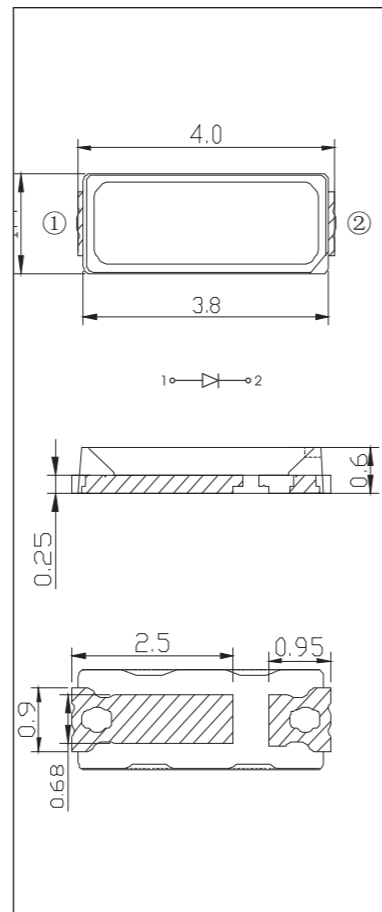
\* 1 Test condition of reverse current leakage: $V_R=5V$  • 2 Pulse width $\leq 0.1\text{ms}$ , Duty cycle $\leq 1/10$

### Thermal Dissipating Structure :

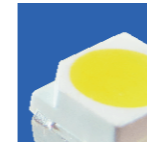


The chip is directly placed on the thermal dissipating pad, and the heat generated from the chip is directly conducted to the PCB.

### Outline Dimensions/ Unit: mm



Note: A marks the Cathode  
Tolerance unless specified: $\pm 0.2\text{mm}$



## TOP LED - High brightness & Low cost white light 3528 Series



3528 Series

### Features:

- General size, widely used in various kinds of lighting products;
- Various luminosity levels, CRI or color temperatures available;
- Rated power: 0.06W;

### Absolute maximum parameters:

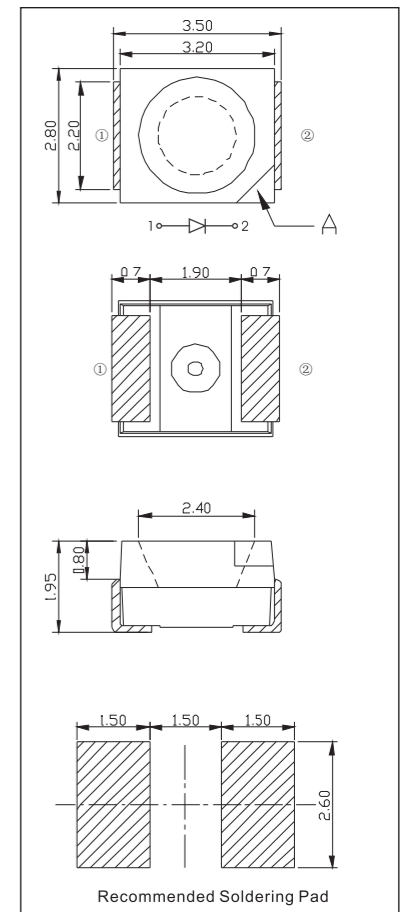
Parameter	Symbol	Rating
Forward Current	$I_F$	25mA
Pulse Forwards Current* <sup>2</sup>	$I_{FP}$	100mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

Color	Part Number	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.
Natural White	FM-3528WS-460L	7000	/	20	6.0	3.2
Warm White	FM-3528WLS-460L	3000	/	20	5.5	3.2

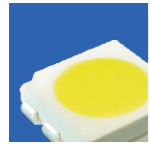
\* 1 Test condition of reverse current leakage: $V_R=5V$  • 2 Pulse width $\leq 0.1\text{ms}$ , Duty cycle $\leq 1/10$

### Outline Dimensions/ Unit: mm

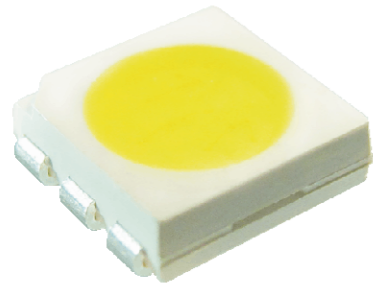


Recommended Soldering Pad

Note: A marks the Cathode  
Tolerance unless specified: $\pm 0.2\text{mm}$



## TOP LED - High brightness & High reliability white light 3-chip T5050 Series



T5050 Series

### Features:

- General size, good color-conformity, widely used in various kinds of lighting products;
- Rated power: 0.2W;

### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	3*25mA
Pulse Forwards Current*2	$I_{FP}$	3*100mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

Rating	Color	Part Number	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.	$I_R$ ( $\mu\text{A}$ ) Max*1
Standard Brightness	Natural White	FM-T5050WNS-460R	5600-6500	70	60	20	3.2	10
	Neutral White	FM-T5050WDS-460R-R70	3700-4200	70	60	18	3.2	10
	Warm White	FM-T5050WLS-460R-R70	2800-3200	70	60	17	3.2	10
Low Brightness	Natural White	FM-T5050WS-460L	7000	-	60	18	3.2	10
	Neutral White	FM-T5050WLS-460L	3000	-	60	17	3.2	10

\* 1 Test condition of reverse current leakage:  $V_R=5\text{V}$  • 2 Pulse width  $\leq 0.1\text{ms}$ , Duty cycle  $\leq 1/10$



## TOP LED - Small size & Power white light 2121 Series



2121 Series

### Features:

- Very small size, apply to high-density configuration design and 60mA forward current available;
- With heat sink, fast heat dissipation function and high reliability;
- Rated power: 0.2W;

### Absolute maximum parameters:

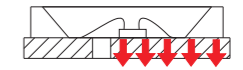
Parameter	Symbol	Rating
Forward Current	$I_F$	75mA
Pulse Forwards Current*2	$I_{FP}$	200mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

Color	Part Number	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.	$I_R$ ( $\mu\text{A}$ ) Max*1
Natural White	FM-2121WNS-460Q	5600-6500	70	60	21	3.2	10
Neutral White	FM-2121WDS-460Q-R80	3700-4200	80	60	18	3.2	10
Warm White	FM-2121WLS-460Q-R80	2800-3200	80	60	16	3.2	10

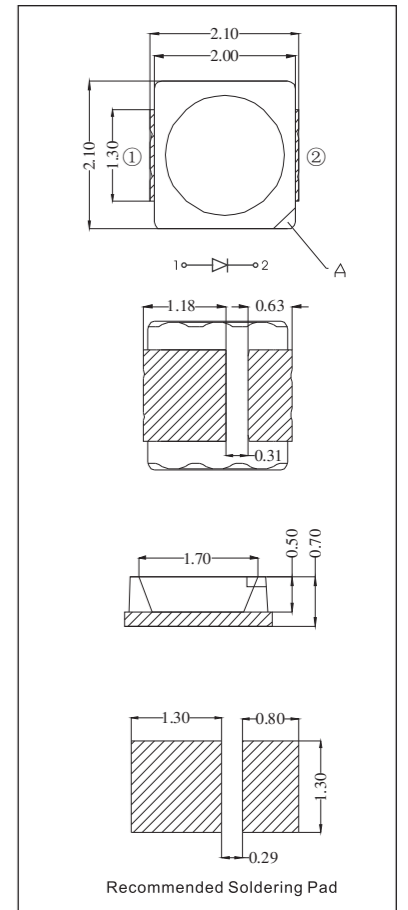
\* 1 Test condition of reverse current leakage:  $V_R=5\text{V}$  • 2 Pulse width  $\leq 0.1\text{ms}$ , Duty cycle  $\leq 1/10$

### Thermal Dissipating Structure :



The chip is directly placed on the thermal dissipating pad, and the heat generated from the chip is directly conducted to the PCB.

### Outline Dimensions/ Unit: mm



Note: A marks the Cathode  
Tolerance unless specified:  $\pm 0.2\text{mm}$



## High power LED - EMC Package power LED 3535 Series



3535 Series

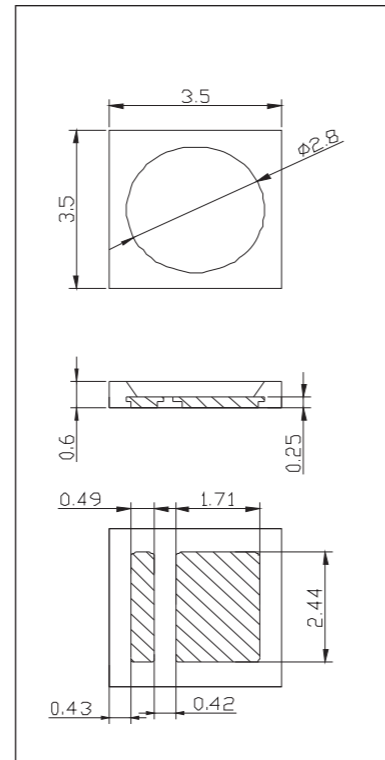
### Features:

- Good performance in Heat-resisting ,yellowing resistance;
- Good airtight performance;
- High brightness, high power;
- Rated power: 1~2W;

### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	400mA
Pulse Forwards Current* <sup>2</sup>	$I_{FP}$	1000mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

Outline Dimensions/ Unit: mm



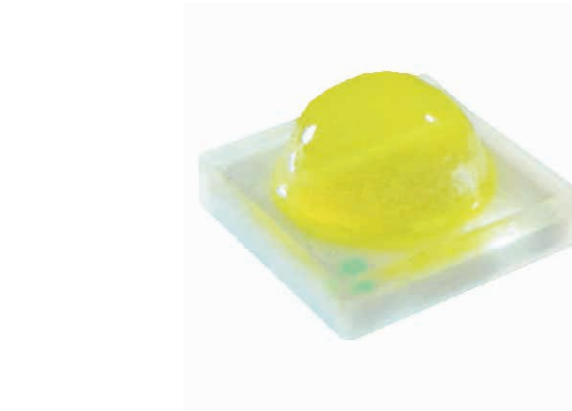
Note: A marks the Cathode  
Tolerance unless specified:  $\pm 0.2$ mm

### Parameter/ $T_a=25^\circ\text{C}$ :

Part Number	Color	Color Temperature $T_c$ (K)	$I_f$ (mA)TEST	$V_f$ (V) Typ.	$\phi_v$ (lm) Typ.	CRI Ra Min.
			Typ.	Typ.		
EMC 3535	Natural White	5600-6500	350	3.2	120	70
	Neutral White	3700-4200	350	3.2	115	70
	Warm White	2800-3200	350	3.2	110	80

\* 1 Test condition of reverse current leakage:  $V_R=5V$  • 2 Pulse width  $\leq 0.1$ ms, Duty cycle  $\leq 1/10$

## High power LED - Ceramic base reverse bonding LED 3535 Series



3535 Series

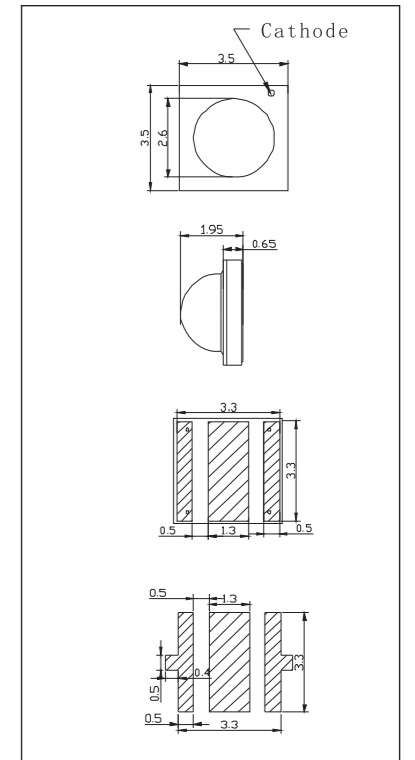
### Features:

- New eutectic die bonding, without golden wire package, high reliability;
- Ceramic PCB;
- High brightness, high luminous efficiency;
- Rated power: 1~3W

### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	1000mA
Pulse Forwards Current* <sup>2</sup>	$I_{FP}$	1500mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

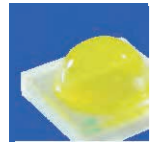
Outline Dimensions/ Unit: mm



Tolerance unless specified:  $\pm 0.2$ mm

### Parameter/ $T_a=25^\circ\text{C}$ :

Part Number	Color	Color Temperature $T_c$ (K)	$I_f$ (mA) TEST	$V_f$ (V) Typ.		$\phi_v$ (lm) Typ.	CRI Ra Min.
			Typ.	Typ.	Max		
Ceramic PCB 3535	Natural White	5600-6500	350	3.0	3.4	120-130	70
	Neutral White	3700-4200	350	3.0	3.4	110-120	70
	Warm White	2800-3200	350	3.0	3.4	90-100	80



## High power LED Ceramic base 3535 Series



3535 Series

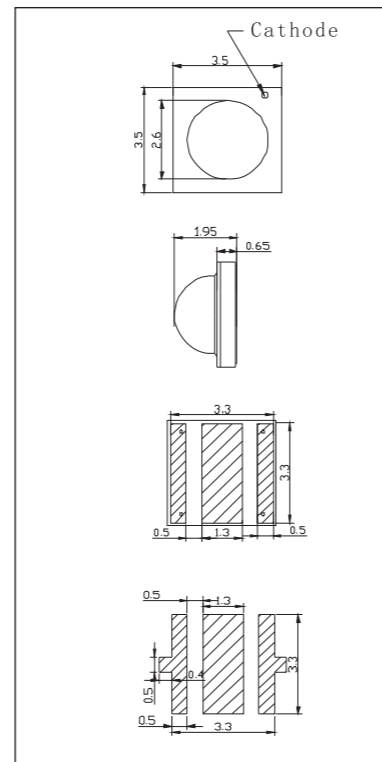
### Features:

- HTCC ceramic base with high reliability;
- Thermoelectric separated structure, easy to reflow soldering process;
- Excellent optics design, effectively reduced systematic luminosity loss;
- Rated power: 1~2W;

### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	400mA
Pulse Forwards Current*2	$I_{FP}$	1500mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-20~+85°C
Storage Temperature	$T_{STG}$	-30~+100°C

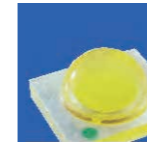
### Outline Dimensions/ Unit: mm



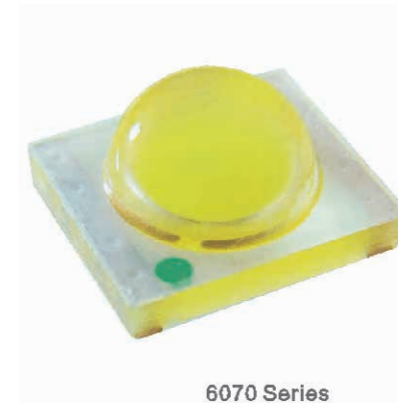
Tolerance unless specified: ±0.2mm

### Parameter/Ta=25°C:

Color	Part Number	Color Temperature Tc (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.
Natural White	FP-3535CW-BCW-LBM	5600-6500	70	350	100	3.2
Neutral White	FP-3535NW-BCW-LBM	3700-4200	70	350	90	3.2
Warm White	FP-3535WW-BCW-R70-LBM	2800-3200	70	350	85	3.2



## High power LED - PCB Base 6070 Series



6070 Series

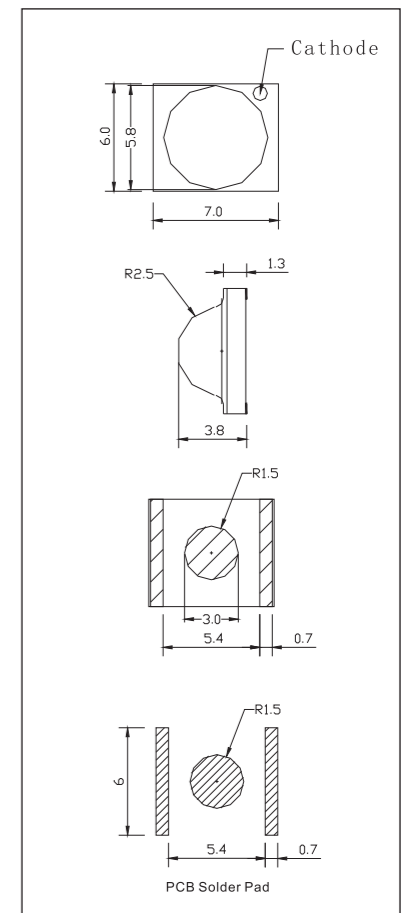
### Features:

- Patented PCB base structure, fast thermal dissipation function with low thermal resistance;
- Available for outdoor white light illumination;
- Rated power: 1~2W;

### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	FP-6070XW-AFZ-LBM 400mA
		FP-6070XW-AFZ-ED1M 500mA
Pulse Forwards Current*2	$I_{FP}$	700mA
Reverse Voltage	$V_R$	5V
Working Temperature	$T_{OPR}$	-30~+85°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Outline Dimensions/ Unit: mm



Tolerance unless specified: ±0.2mm

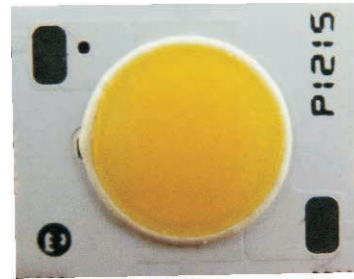
### Parameter/Ta=25°C:

Rating	Color	Part Number	Color Temperature Tc (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.
High Brightness	Natural White	FP-6070CW-AFZ-ED1M	5600-6500	70	350	135	3.2
	Neutral White	FP-6070NW-AFZ-ED1M	3700-4200	70	350	120	3.2
	Warm White	FP-6070WW-AFZ-R80-ED1M	2800-3200	80	350	110	3.2
Standard Brightness	Natural White	FP-6070CW-AFZ-LBM	5600-6500	70	350	110	3.2
	Neutral White	FP-6070NW-AFZ-LBM	3700-4200	70	350	100	3.2
	Warm White	FP-6070WW-AFZ-R70-LBM	2800-3200	70	350	90	3.2

\* 1 Test condition of reverse current leakage:  $V_R=5V$  \* 2 Pulse width ≤ 0.1ms, Duty cycle ≤ 1/10

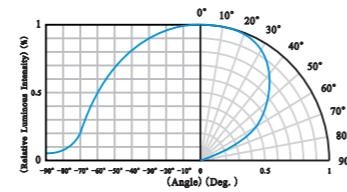


## COB LED-Metal PCB 1215 Series

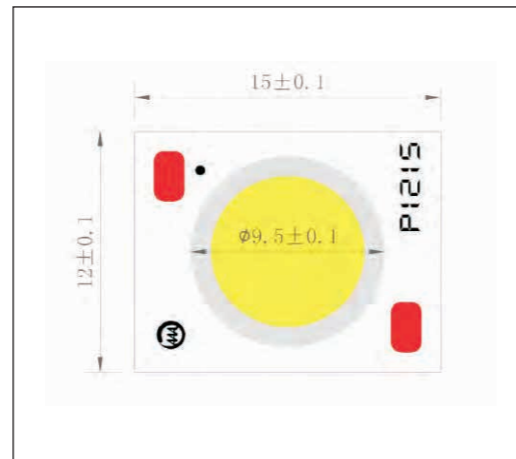


1215 Series

Light Distribution Curve:



Outline Dimensions/ Unit: mm



### Features:

- Patented PCB structure, good heat conductive function and high reliability;
- Simplifying indoor LED illumination design and manufacturing process;
- Single uniform optics system, good optics conformity;
- Rated power: 3~7W;

Absolute maximum parameters:

Parameter	Symbol	Rating
Working Temperature	T <sub>OPR</sub>	-30~+100°C
Storage Temperature	T <sub>STG</sub>	-40~+100°C

Parameter/Ta=25°C:

Part Number	Rating	Color	Color Temperature T <sub>c</sub> (K)	CRI Ra Min.	I <sub>F</sub> (mA) TEST	φ <sub>v</sub> (lm) Typ.	V <sub>F</sub> (V) Typ.
Metal PCB 1215	3W	Natural White	6000	70	350	365	9.3
		Neutral White	4000	75	350	342	9.3
		Warm White	3000	80	350	320	9.3
	5W	Natural White	6000	70	500	455	9.3
		Neutral White	4000	75	500	474	9.3
		Warm White	3000	80	500	635	9.3
	7W	Natural White	6000	70	350	740	18.9
		Neutral White	4000	75	350	659	18.9
		Warm White	3000	80	350	635	18.9

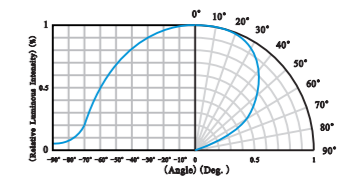


## COB LED-Metal PCB 1723 Series

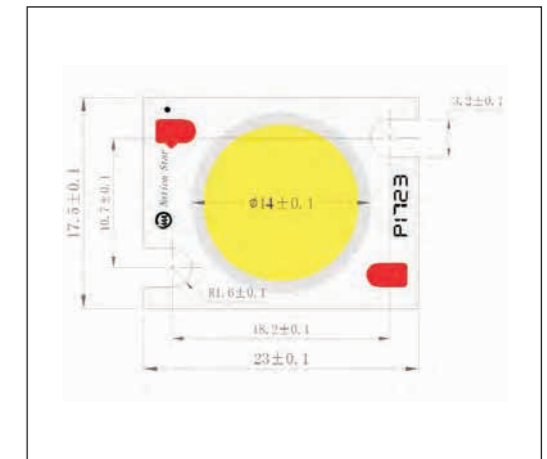


1723 Series

Light Distribution Curve:



Outline Dimensions/ Unit: mm



### Features:

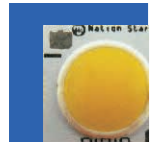
- Patented PCB structure, fast thermal dissipation function and low thermal resistance;
- Using less LED and other accessories, lower down total system cost;
- Good optics conformity and high reliability;
- Rated power: 7-20W;

Absolute maximum parameters:

Parameter	Symbol	Rating
Working Temperature	T <sub>OPR</sub>	-30~+100°C
Storage Temperature	T <sub>STG</sub>	-40~+100°C

Parameter/Ta=25°C:

Part Number	Rating	Color	Color Temperature T <sub>c</sub> (K)	CRI Ra Min.	I <sub>F</sub> (mA) TEST	φ <sub>v</sub> (lm) Typ.	V <sub>F</sub> (V) Typ.
Metal PCB 1723	7W	Natural White	6000	70	350	717	/
		Neutral White	4000	75	350	673	/
		Warm White	3000	80	350	624	/
	10W	Natural White	6000	70	500	1120	/
		Neutral White	4000	75	500	1050	/
		Warm White	3000	80	500	979	/
	13W	Natural White	6000	70	350	1410	36
		Neutral White	4000	75	350	1320	36
		Warm White	3000	80	350	1228	36
	20W	Natural White	6000	70	700	2150	27.5
		Neutral White	4000	75	700	2020	27.5
		Warm White	3000	80	700	1877	27.5

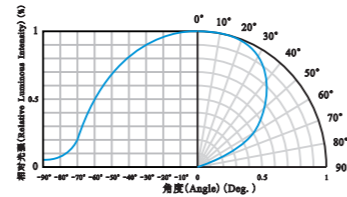


## COB LED-Metal PCB 1010 Series

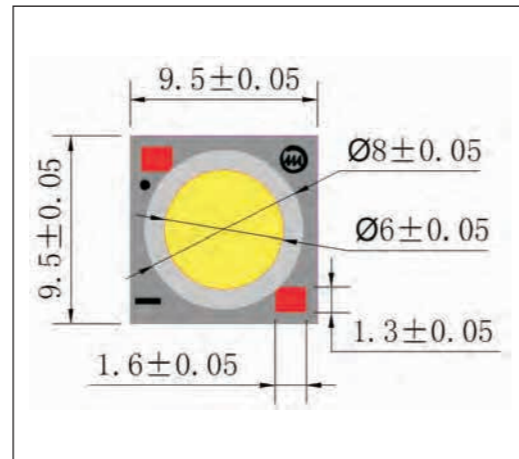


1010 Series

### Light Distribution Curve:



### Outline Dimensions/ Unit: mm



### Features:

- Patented PCB structure, good heat conductivity and high reliability;
- Simplifying indoor LED illumination design and manufacturing process;
- Single uniform optics system, good optics conformity;
- Rated power: 3~5W;

### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	450mA
Reverse Voltage	$V_{RMAX}$	15V
Working Temperature	$T_{OPR}$	-30~+100°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

Part Number	Rating	Color	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.
Metal PCB 1010	3W	Natural White	6000	70	350	365	9.3
		Neutral White	4000	75	350	342	9.3
		Warm White	3000	80	350	320	9.3

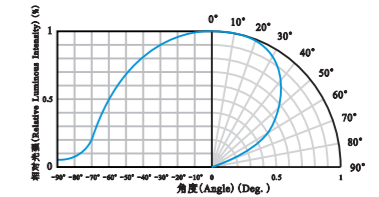


## COB LED-Metal PCB 1919 Series

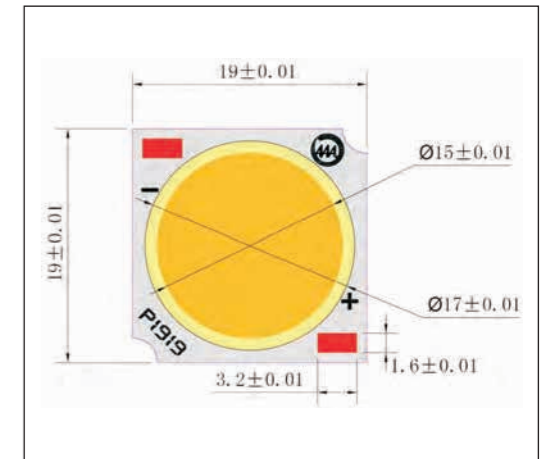


1919 Series

### Light Distribution Curve:



### Outline Dimensions/ Unit: mm



### Features:

- Patented PCB structure, fast thermal dissipation function and low thermal resistance;
- Using less LED and other accessories, lower down total system cost;
- Good optics conformity and high reliability;
- Rated power: 20-40W;

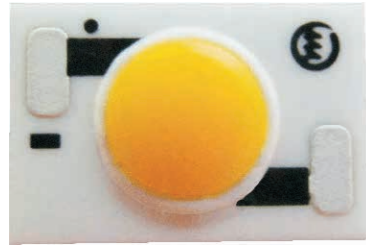
### Absolute maximum parameters:

Parameter	Symbol	Rating
		25W
Forward Current	$I_F$	850mA
Reverse Voltage	$V_{RMAX}$	60V
Working Temperature	$T_{OPR}$	-30~+100°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

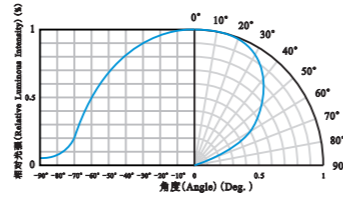
Part Number	Rating	Color	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.
Metal PCB 1919	25W	Natural White	6000	70	700	2950	37.8
		Neutral White	4000	70	700	2770	37.8
		Warm White	3000	80	700	2500	37.8

## COB LED-Ceramic PCB 1208 Series

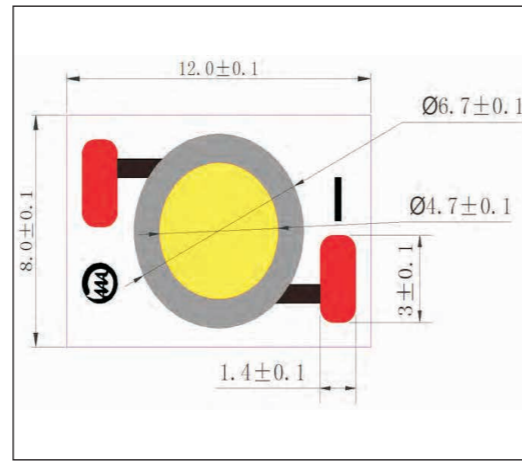


1208 Series

### Light Distribution Curve:



### Outline Dimensions/ Unit: mm



### Features:

- Ceramic PCB, high reliability;
- Optimizing the design and manufacturing of LED lighting;
- Rated power: 3W.

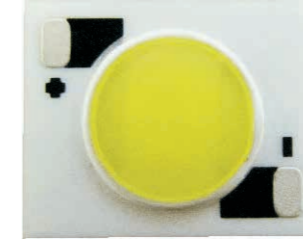
### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	450mA
Reverse Voltage	$V_{RMAX}$	15V
Working Temperature	$T_{OPR}$	-30~+100°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

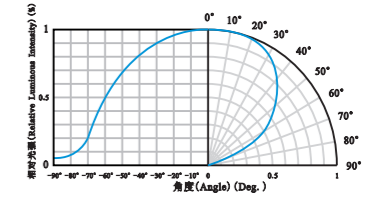
Part Number	Rating	Color	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.
Ceramic PCB 1208	3W	Natural White	6000	70	350	365	9.3
		Neutral White	4000	75	350	342	9.3
		Warm White	3000	80	350	320	9.3

## COB LED-Ceramic PCB 1215 Series

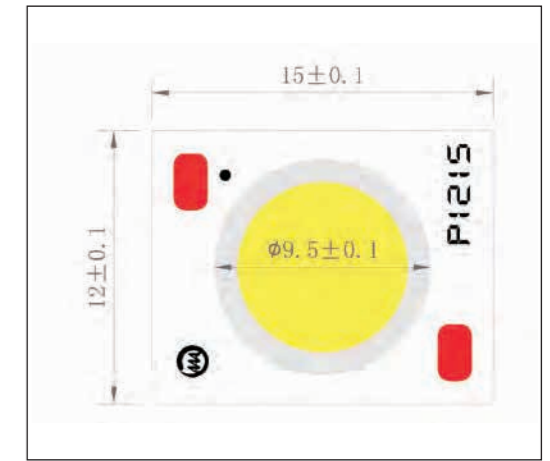


1215 Series

### Light Distribution Curve:



### Outline Dimensions/ Unit: mm



### Features:

- Ceramic PCB, high reliability;
- Optimizing the design and manufacturing of LED lighting;
- Rated power: 7W.

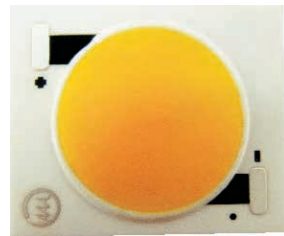
### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	$I_F$	420mA
Reverse Voltage	$V_{RMAX}$	30V
Working Temperature	$T_{OPR}$	-30~+100°C
Storage Temperature	$T_{STG}$	-40~+100°C

### Parameter/ $T_a=25^\circ\text{C}$ :

Part Number	Rating	Color	Color Temperature $T_c$ (K)	CRI Ra Min.	$I_F$ (mA) TEST	$\phi_v$ (lm) Typ.	$V_F$ (V) Typ.
Ceramic PCB 1215	7W	正白	6000	70	350	740	18.9
		中白	4000	75	350	695	18.9
		暖白	3000	80	350	635	18.9

# COB LED-Ceramic PCB 2024 Series



2024 Series

### Features:

- Ceramic PCB, high reliability;
- Optimizing the design and manufacturing of LED lighting;
- Rated power: 25W.

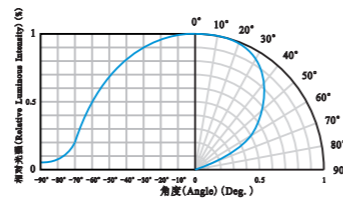
### Absolute maximum parameters:

Parameter	Symbol	Rating
Forward Current	I <sub>F</sub>	850mA
Reverse Voltage	V <sub>RMAX</sub>	60V
Working Temperature	T <sub>OPR</sub>	-30~+100°C
Storage Temperature	T <sub>STG</sub>	-40~+100°C

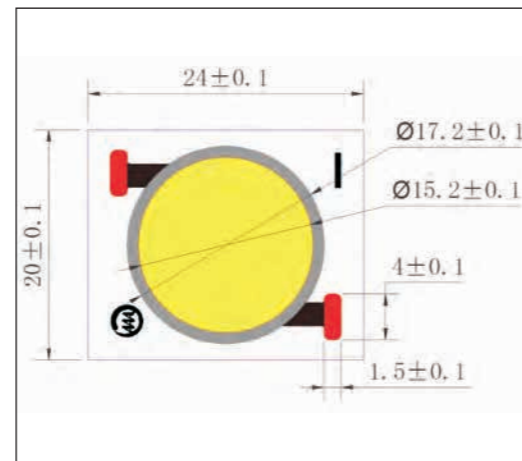
### Parameter/Ta=25°C:

Part Number	Rating	Color	Color Temperature T <sub>c</sub> (K)	CRI Ra Min.	I <sub>F</sub> (mA) TEST	φ <sub>v</sub> (lm) Typ.	V <sub>F</sub> (V) Typ.
Ceramic PCB 2024	25W	Natural White	6000	70	750	2950	37.8
		Neutral White	4000	75	750	2770	37.8
		Warm White	3000	80	750	2500	37.8

### Light Distribution Curve:



### Outline Dimensions/ Unit: mm



10000K      6000K      4000K      3000K

### Luminous Intensity /Luminous Flux Bins Table

High Power LED Bins are Sorted by Luminous Flux

Code	Luminous Flux (lm)	
	Minimum	Maximum
F1	60	70
F2	70	80
G1	80	90
G2	90	100
H1	100	110
H2	110	120
J1	120	130
J2	130	140

TOP LED Bins are Sorted by Luminous Intensity

Code	Luminous Intensity (cd)	Code	Luminous Intensity (cd)
A0	1.2 ~ 1.5	N0	5.8 ~ 6.4
B0	1.5 ~ 1.8	O0	6.4 ~ 7.7
C0	1.8 ~ 2.1	P0	7.7 ~ 8.5
D0	2.1 ~ 2.4	Q0	8.5 ~ 9.3
E0	2.4 ~ 2.7	R0	9.3 ~ 10.2
F0	2.7 ~ 3.0	S0	10.2 ~ 11.2
G0	3.0 ~ 3.3	T0	11.2-12.3
H0	3.3 ~ 3.6	U0	12.3-13.5
I0	3.6 ~ 4.0	V0	13.5-15.0
J0	4.0 ~ 4.4	W0	15.0-16.5
K0	4.4 ~ 4.8	X0	16.8-18.0
L0	4.8 ~ 5.3	Y0	18-20
M0	5.3 ~ 5.8	Z0	20-22

### Voltage Bins

Each TOP LED Voltage Bin Range is 0.1V

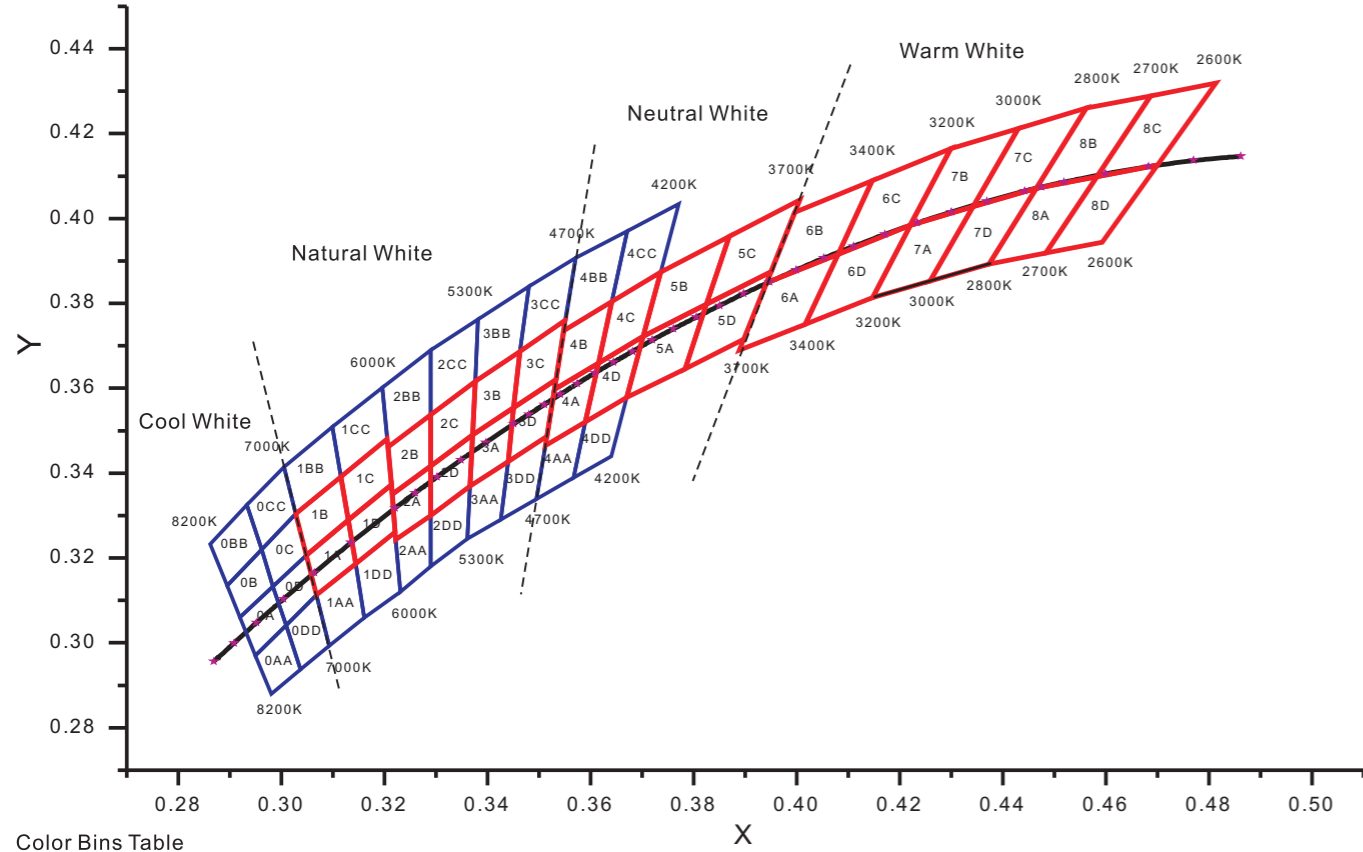
Each High Power LED Voltage Bin Range is 0.2V

0.2V Bins Table		0.1V Bins Table	
Code	Voltage(V)	Code	Voltage(V)
I0	2.8-3.0	I1	2.8-2.9
J0	3.0-3.2	I2	2.9-3.0
K0	3.2-3.4	J1	3.0-3.1
		J2	3.1-3.2
L0	3.4-3.6	K1	3.2-3.3
		K2	3.3-3.4
M0	3.6-3.8	L1	3.4-3.5
		L2	3.5-3.6
N0	3.8-4.0	M1	3.6-3.7
		M2	3.7-3.8
O0	4.0-4.2	N1	3.8-3.9
		N2	3.9-4.0
		O1	4.0-4.1
		O2	4.1-4.2



NationStar LED Has American Energy Star Certificate

Color Binning

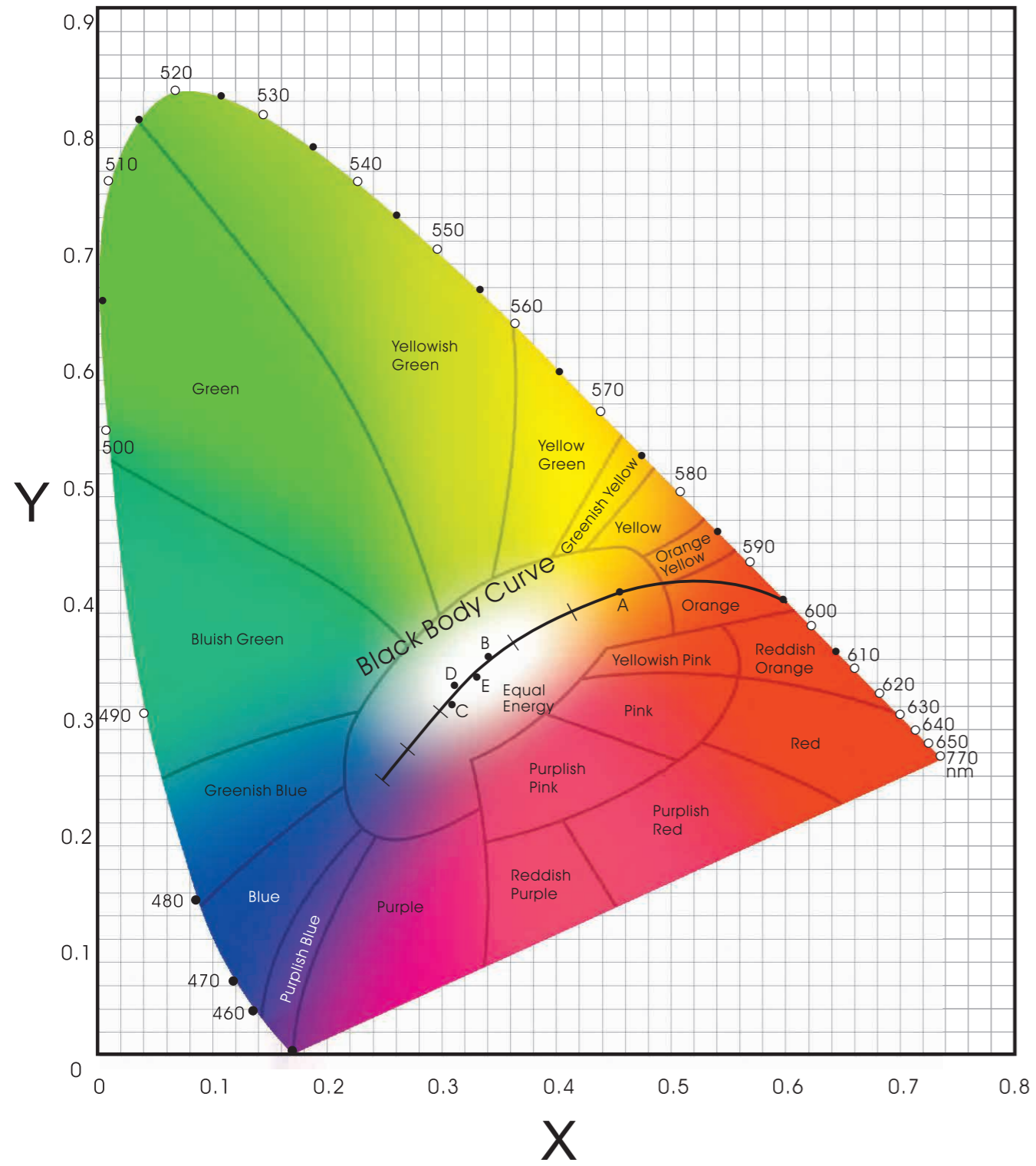


Color Bins Table

COLOR BIN	X	Y	COLOR BIN	X	Y	COLOR BIN	X	Y	COLOR BIN	X	Y
0A	0.295	0.297	0B	0.292	0.306	0C	0.2984	0.3133	0D	0.2984	0.3133
	0.292	0.306		0.2895	0.3135		0.2962	0.322		0.3048	0.3207
	0.2984	0.3133		0.2962	0.322		0.3028	0.3304		0.3068	0.3113
	0.3009	0.3042		0.2984	0.3133		0.3048	0.3207		0.3009	0.3042
0AA	0.298	0.288	0BB	0.2895	0.3135	0CC	0.2962	0.322	0DD	0.3037	0.2937
	0.295	0.297		0.2862	0.3233		0.2933	0.3325		0.3009	0.3042
	0.3009	0.3042		0.2933	0.3325		0.3005	0.3415		0.3068	0.3113
	0.3037	0.2937		0.2962	0.322		0.3028	0.3304		0.3093	0.2993
1A	0.3048	0.3207	1B	0.3028	0.3304	1C	0.3115	0.3391	1D	0.313	0.329
	0.313	0.329		0.3115	0.3391		0.3205	0.3481		0.3213	0.3373
	0.3144	0.3186		0.313	0.329		0.3213	0.3373		0.3221	0.3261
	0.3068	0.3113		0.3048	0.3207		0.313	0.329		0.3144	0.3186
1AA	0.3093	0.2993	1BB	0.3005	0.3415	1CC	0.3099	0.3509	1DD	0.3161	0.3059
	0.3068	0.3113		0.3099	0.3509		0.3196	0.3602		0.3144	0.3186
	0.3144	0.3186		0.3115	0.3391		0.3205	0.3481		0.3221	0.3261
	0.3161	0.3059		0.3028	0.3304		0.3115	0.3391		0.3231	0.312
2A	0.3215	0.335	2B	0.3206	0.3461	2C	0.329	0.3538	2D	0.329	0.3417
	0.329	0.3417		0.329	0.3538		0.3376	0.3616		0.3371	0.349
	0.329	0.33		0.329	0.3417		0.3371	0.349		0.3366	0.3369
	0.3222	0.3243		0.3215	0.335		0.329	0.3417		0.329	0.33

COLOR BIN	X	Y	COLOR BIN	X	Y	COLOR BIN	X	Y	COLOR BIN	X	Y
2AA	0.3231	0.312	2BB	0.3196	0.3602	2CC	0.329	0.369	2DD	0.329	0.318
	0.3222	0.3243		0.329	0.369		0.3381	0.3762		0.329	0.33
	0.329	0.33		0.329	0.3538		0.3376	0.3616		0.3366	0.3369
	0.329	0.318		0.3206	0.3461		0.329	0.3538		0.3361	0.3245
3A	0.3371	0.349	3B	0.3376	0.3616	3C	0.3463	0.3687	3D	0.3451	0.3554
	0.3451	0.3554		0.3463	0.3687		0.3551	0.376		0.3533	0.362
	0.344	0.3427		0.3451	0.3554		0.3533	0.362		0.3515	0.3487
	0.3366	0.3369		0.3371	0.349		0.3451	0.3554		0.344	0.3427
3AA	0.3361	0.3245	3BB	0.3381	0.3762	3CC	0.348	0.384	3DD	0.3426	0.3291
	0.3366	0.3369		0.348	0.384		0.3571	0.3907		0.344	0.3428
	0.344	0.3428		0.3463	0.3687		0.3551	0.376		0.3515	0.3487
	0.3426	0.3291		0.3376	0.3616		0.3463	0.3687		0.3495	0.3339
4A	0.353	0.3597	4B	0.3548	0.3736	4C	0.3641	0.3804	4D	0.3615	0.3659
	0.3615	0.3659		0.3641	0.3804		0.3736	0.3874		0.3702	0.3722
	0.359	0.3521		0.3615	0.3659		0.3702	0.3722		0.367	0.3578
	0.3512	0.3465		0.353	0.3597		0.3615	0.3659		0.359	0.3521
4AA	0.3495	0.3339	4BB	0.3571	0.3907	4CC	0.3671	0.397	4DD	0.3567	0.3389
	0.3512	0.3465		0.3671	0.397		0.3771	0.4034		0.359	0.3521
	0.359	0.3521		0.3641	0.3804		0.3736	0.3874		0.367	0.3578
	0.3567	0.3389		0.3548	0.3736		0.3641	0.3804		0.364	0.344
5A	0.367	0.3578	5B	0.3702	0.3722	5C	0.3825	0.3798	5D	0.3783	0.3646
	0.3702	0.3722		0.3736	0.3874		0.3869	0.3958		0.3825	0.3798
	0.3825	0.3798		0.3869	0.3958		0.4006	0.4044		0.395	0.3875
	0.3783	0.3646		0.3825	0.3798		0.395	0.3875		0.3898	0.3716
6A	0.3889	0.369	6B	0.3941	0.3848	6C	0.408	0.3916	6D	0.4017	0.3751
	0.3941	0.3848		0.3996	0.4015		0.4146	0.4089		0.408	0.3916
	0.408	0.3916		0.4146	0.4089		0.4299	0.4165		0.4221	0.3984
	0.4017	0.3751		0.408	0.3916		0.4221	0.3984		0.4147	0.3814
7A	0.4147	0.3814	7B	0.4221	0.3984	7C	0.4342	0.4028	7D	0.4259	0.3851
	0.4221	0.3984		0.4299	0.4165		0.443	0.4212		0.4342	0.4028
	0.4342	0.4028		0.443	0.4212		0.4562	0.426		0.4465	0.4071
	0.4259	0.3853		0.4342	0.4028		0.4465	0.4071		0.4373	0.3893
8A	0.4373	0.3893	8B	0.4465	0.4071	8C	0.4582	0.4099	8D	0.4483	0.3919
	0.4465	0.4071		0.4562	0.426		0.4687	0.4289		0.4582	0.4099
	0.4582	0.4099		0.4687	0.4289		0.4813	0.4319		0.47	0.4126
	0.4483	0.3919		0.4582	0.4099		0.47	0.4126		0.4593	0.3944

# CIE1931 chromaticity diagram



All possible color coordinates(x,y) are on or inside horseshoe curve  
 Pure colors line on the curve, where as the white point has the coordinates(1/3, 1/3)