



NATIONSTAR
—SINCE 1969—



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LEDs
FOR LIGHTING APPLICATIONS

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Advanced LED Packaging Manufacturer



NATIONSTAR | **2017**
LIGHTING UP THE WORLD

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01 BRIEF INTRODUCTION



The Northern Area of The Headquarter

Land area: 26000 sqm.
The production base of LED components and devices

The Southern Area of The Headquarter

Land area: 34600 sqm
The production base of LED and lighting products



Foshan NationStar Semiconductor Co.,Ltd.

Land area: 32000 sqm.
The production base of GaN LED chips for lighting



02 INDUSTRIAL CHAIN



Wafer



Chip

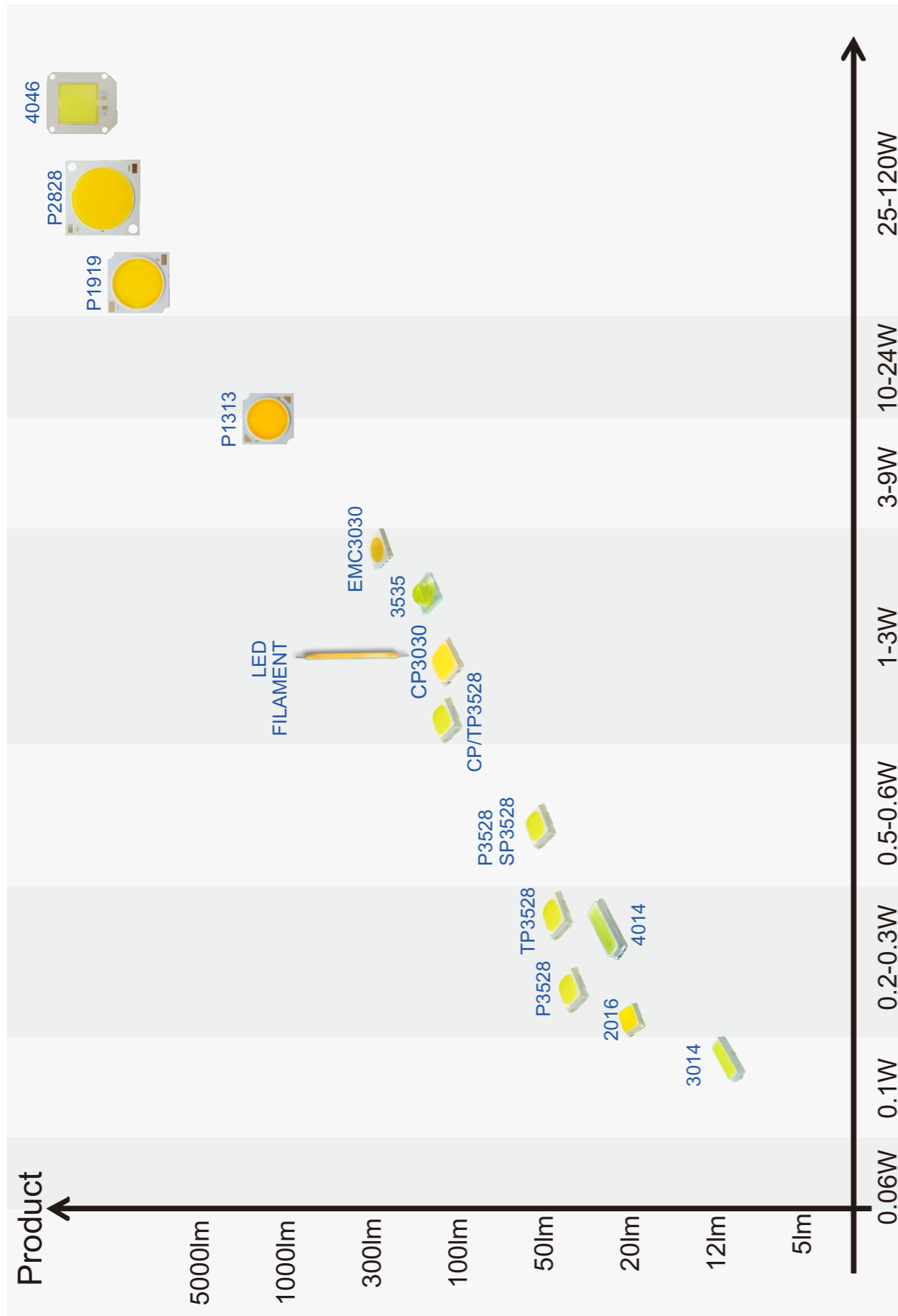


LED

02 HISTORY

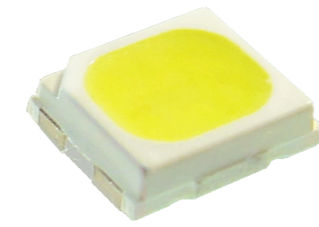


NationStar White LED Road Map

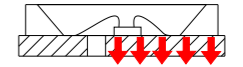


3V 0.2W TOP White LED

P3528 Series

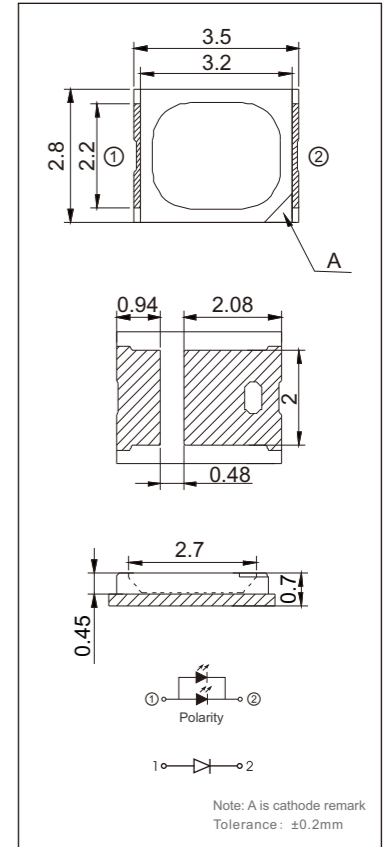


Thermal Dissipating Structure:



With a structure of the chip being placed on thermal pad the heat could be conducted to the PCB directly.

Dimensions/Unit:mm



Features:

- 2835 package.
- Thin encapsulation with heat sink, vertical dissipation, multiple power options.
- Mature technology, universal applicability.
- Applicable to LED tube, linear light, bulb, downlight, panel light etc. cost-effective.
- Rated power: 0.2W.

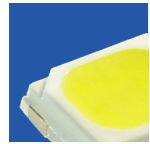


Parameter/Ta=25°C:

Power	Color	Part number	Color Temp (K)	CRI Ra Min	I _F (mA) TEST	Φ _v (lm) Typ.	V _F (V) Typ.	Max Forward Current(mA)
0.2W	Natural White	FM-P3528WNS-460QH-R80	5600-6500	80	60	28-30	3.1	120
	Neutral White	FM-P3528WDS-460QH-R80	3700-4200	80	60	28-30	3.1	120
	Warm White	FM-P3528WLS-460QH-R80	2800-3200	80	60	26-28	3.1	120
0.2W	Natural White	FM-P3528WNS-460Q-R80	5600-6500	80	60	26-28	3.1	75
	Neutral White	FM-P3528WDS-460Q-R80	3700-4200	80	60	26-28	3.1	75
	Warm White	FM-P3528WLS-460Q-R80	2800-3200	80	60	24-26	3.1	75
0.2W	Natural White	FM-P3528WNS-460Q1-R80	5600-6500	80	60	24-26	3.1	75
	Neutral White	FM-P3528WDS-460Q1-R80	3700-4200	80	60	24-26	3.1	75
	Warm White	FM-P3528WLS-460Q1-R80	2800-3200	80	60	22-24	3.1	75

3V 0.5W TOP White LED

P3528 Series

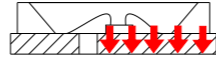


Features:

- 2835 package.
- Thin encapsulation with heat sink, efficient heat dissipation.
- Applicable to LED bulb, downlight, module etc. cost-effective.
- Rated power: 0.5W.

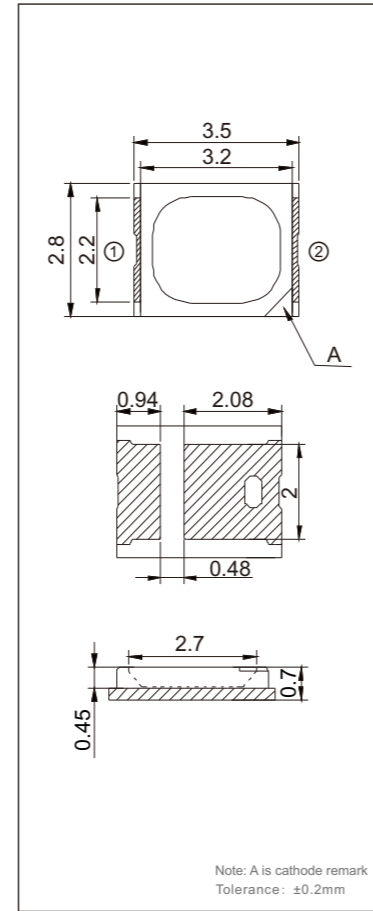


Thermal Dissipating Structure:

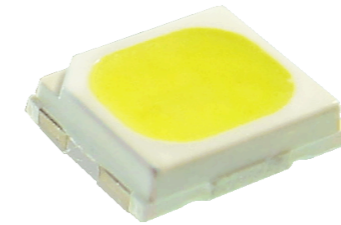
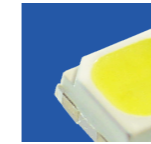


With a structure of the chip being placed on thermal pad the heat could be conducted to the PCB directly.

Dimensions/Unit:mm



Ultra Bright 2835 LED

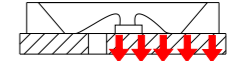


Features:

- 2835 package.
- Thin encapsulation with heat sink, efficient heat dissipation.
- Applicable to LED bulb, downlight etc. cost-effective.

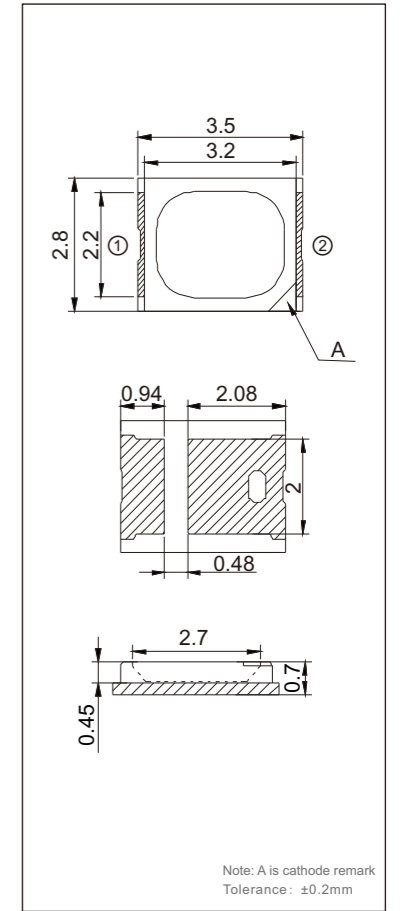


Thermal Dissipating Structure:



With a structure of the chip being placed on thermal pad the heat could be conducted to the PCB directly.

Dimensions/Unit:mm



Absolute Maximum Ratings:

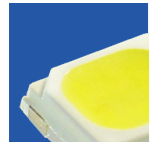
Parameter	Symbol	Rating
Pulse Forwards Current*2	I _{FP}	200mA/500mA
Reverse Voltage	V _R	5V
Working Temperature	T _{OPR}	-30~+85°C
Storage Temperature	T _{STG}	-40~+100°C

Parameter/Ta=25°C:

Power	Color	Part number	Color Temp (K)	CRI Ra Min	I _F (mA) TEST	Φ _v (lm) Typ.	V _F (V) Typ.	Max Forward Current(mA)
0.5W	Natural White	FM-P3528WNS-460WH-R80	5600-6500	80	150	65-70	3.1	200
	Neutral White	FM-P3528WDS-460WH-R80	3700-4200	80	150	65-70	3.1	200
	Warm White	FM-P3528WLS-460WH-R80	2800-3200	80	150	60-65	3.1	200
0.5W	Natural White	FM-P3528WNS-460W-R80	5600-6500	80	150	55-60	3.1	200
	Neutral White	FM-P3528WDS-460W-R80	3700-4200	80	150	55-60	3.1	200
	Warm White	FM-P3528WLS-460W-R80	2800-3200	80	150	50-55	3.1	200

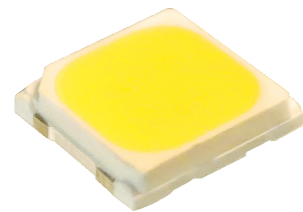
Parameter/Ta=25°C:

Power	Color	Part number	Color Temp (K)	CRI Ra Min	I _F (mA) TEST	Φ _v (lm) Typ.	V _F (V) Typ.	Max Forward Current(mA)
0.2W	Natural White	FM-P3528WNS-460QH3-R80	5600-6500	80	65	33-35	2.8	120
	Neutral White	FM-P3528WDS-460QH3-R80	3700-4200	80	65	33-35	2.8	120
	Warm White	FM-P3528WLS-460QH3-R80	2800-3200	80	65	30-33	2.8	120
0.5W	Natural White	FM-P3528WNS-460WH3-R80	5600-6500	80	150	70-75	3.1	240
	Neutral White	FM-P3528WDS-460WH3-R80	3700-4200	80	150	70-75	3.1	240
	Warm White	FM-P3528WLS-460WH3-R80	2800-3200	80	150	65-70	3.1	240



6V Easy-drive TOP White LED

CP3528 / CP3030 Series

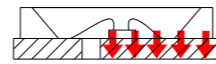


Features:

- Thin encapsulation with heat sink, efficient heat dissipation.
- Applicable to LED bulb, downlight etc, cost-effective.
- Rated power: 0.5W / 1W.

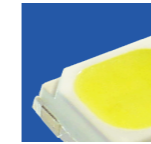
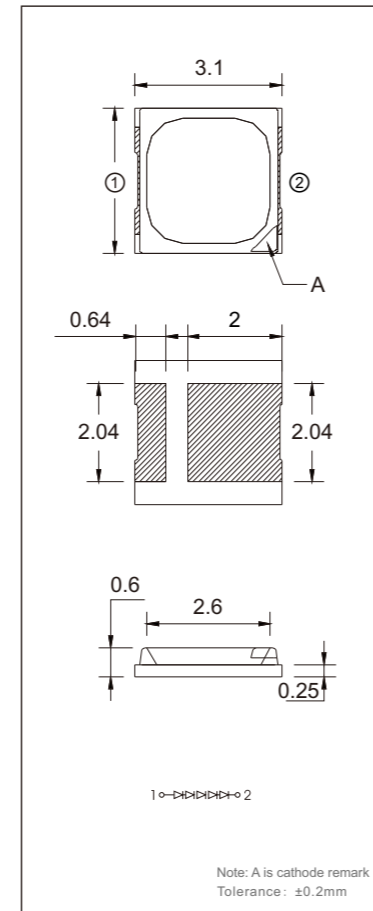


Thermal Dissipating Structure:



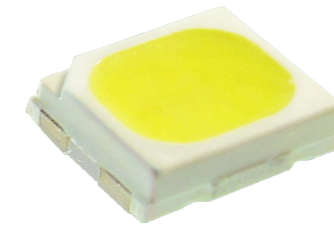
With a structure of the chip being placed on thermal pad the heat could be conducted to the PCB directly.

Dimensions/Unit:mm



9V Easy-drive TOP White LED

TP3528 Series

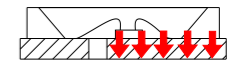


Features:

- 2835 package.
- 9V drive, low current, high power conversion efficiency.
- Thin encapsulation with heat sink, efficient heat dissipation.
- Applicable to LED bulb, downlight, module etc. cost-effective.
- Rated power: 0.3W / 1W.

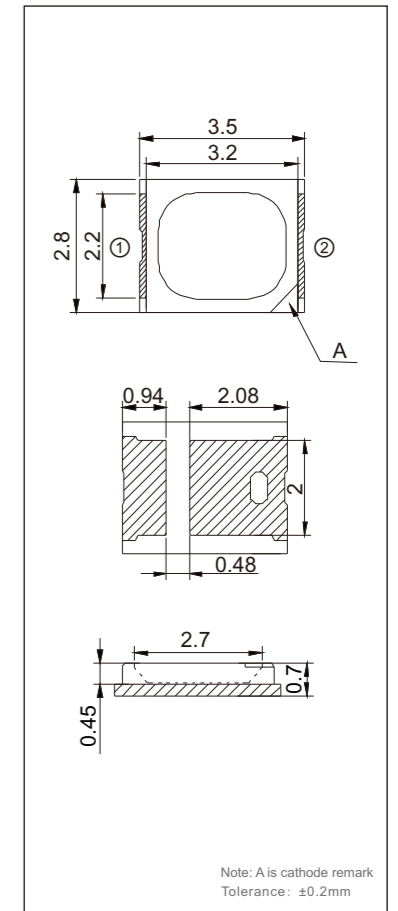


Thermal Dissipating Structure:



With a structure of the chip being placed on thermal pad the heat could be conducted to the PCB directly.

Dimensions/Unit:mm



Parameter/Ta=25°C:

Power	Color	Part number	Color Temp (K)	CRI Ra Min	I _F (mA) TEST	Φ _v (lm) Typ.	V _F (V) Typ.	Max Forward Current(mA)
0.5W	Natural White	FM-CP3528WNS-460Q-R80	5600-6500	80	80	60-65	6.7	100
	Neutral White	FM-CP3528WDS-460Q-R80	3700-4200	80	80	60-65	6.7	100
	Warm White	FM-CP3528WLS-460Q-R80	2800-3200	80	80	55-60	6.7	100
1W	Natural White	FM-CP3528WNS-460WH-R80	5600-6500	80	150	120-130	6.4	200
	Neutral White	FM-CP3528WDS-460WH-R80	3700-4200	80	150	120-130	6.4	200
	Warm White	FM-CP3528WLS-460WH-R80	2800-3200	80	150	110-120	6.4	200
1W	Natural White	FM-CP3030WNS-460W-R80	5600-6500	80	180	127-140	6.4	200
	Neutral White	FM-CP3030WDS-460W-R80	3700-4200	80	180	127-140	6.4	200
	Warm White	FM-CP3030WLS-460W-R80	2800-3200	80	180	120-130	6.4	200

Absolute Maximum Ratings:

Parameter	Symbol	0.3W Rating	1W Rating
Forward Current	I _F	35mA	120mA
Pulse Forwards Current*2	I _{FP}	100mA	200mA
Reverse Voltage	V _R	15V	15V
Working Temperature	T _{OPR}	-30~+85°C	-30~+85°C
Storage Temperature	T _{STG}	-40~+100°C	-40~+100°C

Parameter/Ta=25°C:

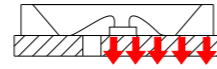
Power	Color	Part number	Color Temp (K)	CRI Ra Min	I _F (mA) TEST	Φ _v (lm) Typ.	V _F (V) Typ.
0.3W	Natural White	FM-TP3528WNS-460R-R80	5600-6500	80	30	33-36	9.6
	Neutral White	FM-TP3528WDS-460R-R80	3700-4200	80	30	33-36	9.6
	Warm White	FM-TP3528WLS-460R-R80	2800-3200	80	30	30-33	9.6
1W	Natural White	FM-TP3528WNS-460QH-R80	5600-6500	80	100	125-135	9.3
	Neutral White	FM-TP3528WDS-460QH-R80	3700-4200	80	100	125-135	9.3
	Warm White	FM-TP3528WLS-460QH-R80	2800-3200	80	100	120-130	9.3

18V Easy-drive TOP White LED

SP3528 Series

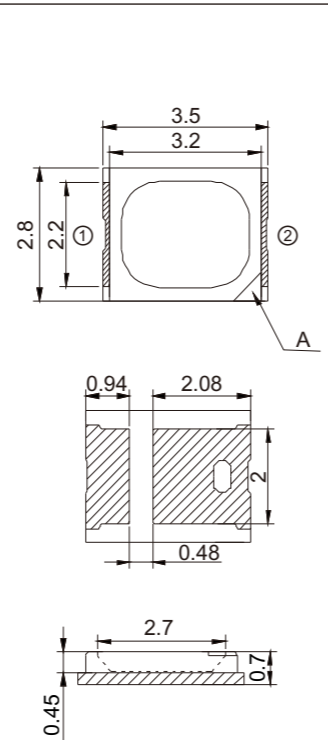


Thermal Dissipating Structure:



With a structure of the chip being placed on thermal pad the heat could be conducted to the PCB directly.

Dimensions/Unit:mm



Note: A is cathode remark
Tolerance: ±0.2mm

Features:

- 2835 package.
- 18V drive, low current, high power conversion efficiency.
- Thin encapsulation with heat sink, efficient heat dissipation.
- Applicable to LED bulb, downlight etc, cost-effective.
- Rated power: 0.6W.



Absolute Maximum Ratings:

Parameter	Symbol	Rating	
Forward Current	I _F	30mA	60mA
Pulse Forwards Current*2	I _{FP}	100mA	70mA
Working Temperature	T _{OPR}	-30~+85°C	-30~+85°C
Storage Temperature	T _{STG}	-40~+100°C	-40~+100°C

Parameter/Ta=25°C:

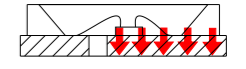
Power	Color	Part number	Color Temp (K)	CRI Ra Min	I _F (mA) TEST	Φ _v (lm) Typ.	V _F (V) Typ.
0.6W	Natural White	FM-SP3528WNS-460R-R80	5600-6500	80	30	70-75	19.0
	Neutral White	FM-SP3528WDS-460R-R80	3700-4200	80	30	70-75	19.0
	Warm White	FM-SP3528WLS-460R-R80	2800-3200	80	30	65-70	19.0
1W	Natural White	FM-SP3528WNS-460Q-R80	5600-6500	80	60	130-140	18.0
	Neutral White	FM-SP3528WDS-460Q-R80	3700-4200	80	60	130-140	18.0
	Warm White	FM-SP3528WLS-460Q-R80	2800-3200	80	60	125-135	18.0

High Brightness TOP White LED

2016 Series

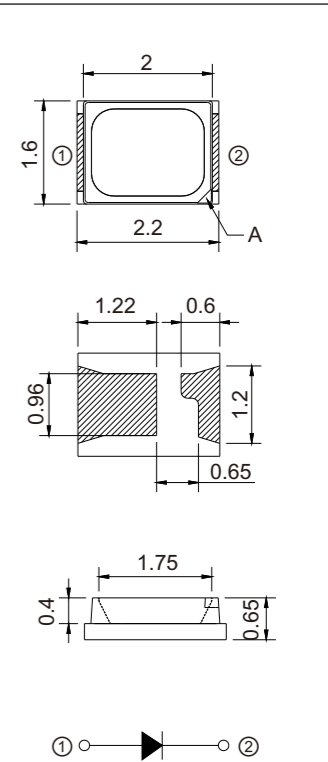


Thermal Dissipating Structure:



With a structure of the chip being placed on thermal pad the heat could be conducted to the PCB directly.

Dimensions/Unit:mm



Note: A is cathode remark
Tolerance: ±0.2mm

Features:

- High refringence, high brightness, anti-sulfur.
- Thin encapsulation with heat sink, efficient heat dissipation.
- High luminous efficiency, high-CRI, long lifespan.
- Eco-friendly, RoHS compliant.
- Rated power: 0.2W.

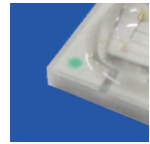


Absolute Maximum Ratings:

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

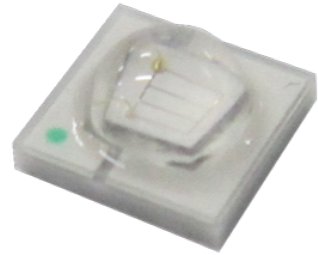
Parameter/Ta=25°C:

Color	Part number	Color Temp (K)	CRI Ra Min	I _F (mA) TEST	Φ _v (lm) Typ.	V _F (V) Typ.
Natural White	FM-2016WNS-460Q-R80	5600-6500	80	60	26-28	3.2
Neutral White	FM-2016WDS-460Q-R80	3700-4200	80	60	26-28	3.2
Warm White	FM-2016WLS-460Q-R80	2800-3200	80	60	24-26	3.2



3535 UV LED

3535 Series



Features:

- Ceramic PCB encapsulation, stable performance, high reliability.
- Low thermal resistance, good thermal dissipation.
- 365nm-405nm, can be used for curing, detecting and so on.
- Customized product available.
- Application: Nail lamp, 3D printer, Printing devices, Mothkilling lamp...
- Rated power: 1-3W

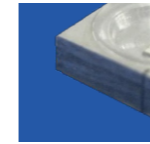
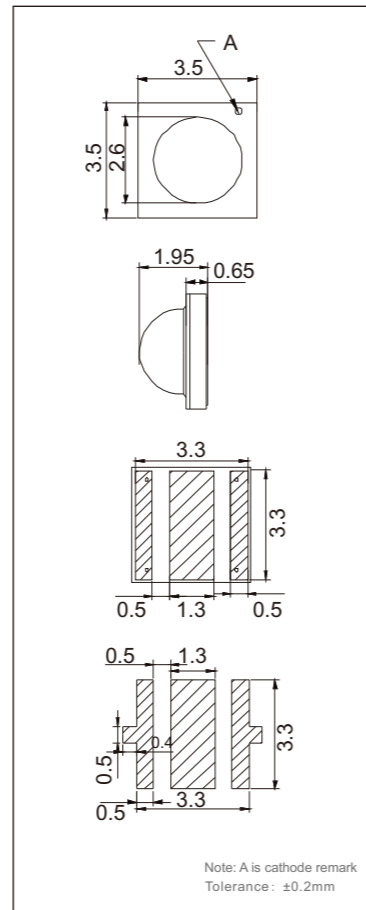
Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I_F	700mA
Pulse Forwards Current*2	I_{FP}	1000mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

Parameter/Ta=25°C:

Part number	λ_p (nm)	I_F (mA) TEST	P_o (mW) Typ.	V_F (V) Typ.
FP-3535UV-BC	395, 405	350	500	3.3
		350	650	3.45
		500	920	3.6
		700	1250	3.75
	385	350	580	3.45
		500	830	3.6
		700	1150	3.8
	375	350	450	3.6
		500	620	3.8
	365	350	450	3.6
		500	620	3.8

Dimensions/Unit:mm



6363 UV LED

6363 Series



Features:

- Metallic and inorganic packaged.
- Low thermal resistance, good thermal dissipation.
- 275-285nm, generally used as sterilization, disinfection and detection applications.
- Customized product available
- Application: Water purifying machine, Mothkilling lamp...
- Rated power: 0.1-0.2W.

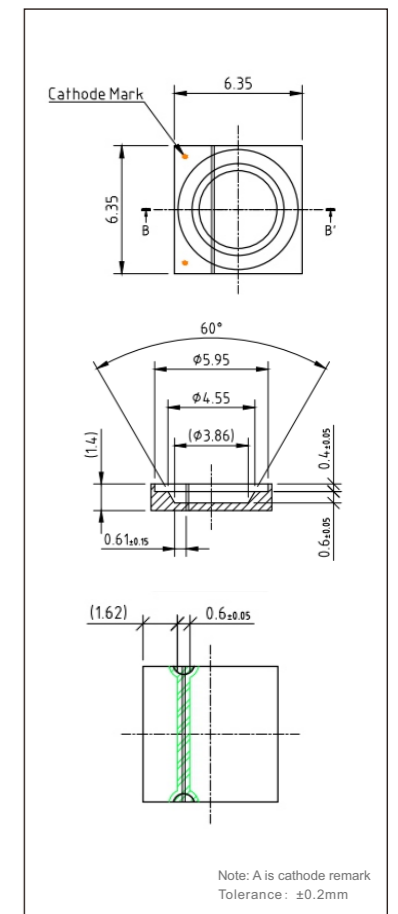
Absolute Maximum Ratings:

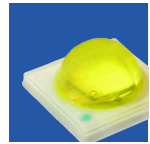
Parameter	Symbol	Rating
Forward Current	I_F	40mA
Pulse Forwards Current*2	I_{FP}	60mA
Reverse Voltage	V_R	7V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

Parameter/Ta=25°C:

Power	Part number	λ_p (nm)	I_F (mA) TEST	P_o (MW) Typ.	V_F (V) Typ.
0.1W	FP-6363UV-CM-BS	275-285	20	1.3-1.7	5-6

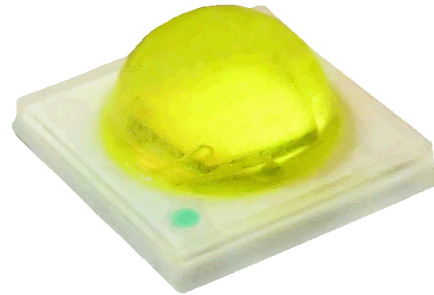
Dimensions/Unit:mm





Flip Chip Power LED

3535 Series



Features:

- Ceramic PCB encapsulation, low thermal resistance.
- Ultra bright, with a high luminous efficiency over 140 lm/w.
- Rated power: 1-3W.

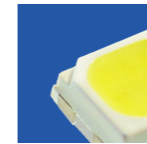


Absolute Maximum Ratings:

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

Parameter/Ta=25°C:

Type	Color	Part number	Color Temp (K)	CRI Ra Min	I_F (mA) TEST	Φ_V (lm) Typ.	V_F (V) Typ.
Flip Chip	Natural White	FP-3535CW-BCP-DS	5600-6500	70	350	140	3.0
Flip Chip	Neutral White	FP-3535NW-BCP-DS	3700-4200	70	350	140	3.0
Flip Chip	Warm White	FP-3535WW-BCP-DSR80	2800-3200	80	350	120	3.0



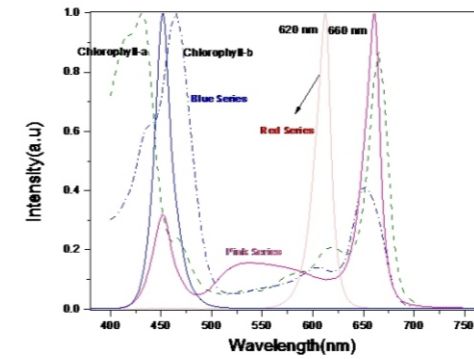
Grow-light TOP LED

P3528 Series



Features:

- 2835 package.
- Helpful in blossoming and fruiting, controlling the flower season.
- Rated power: 0.2W

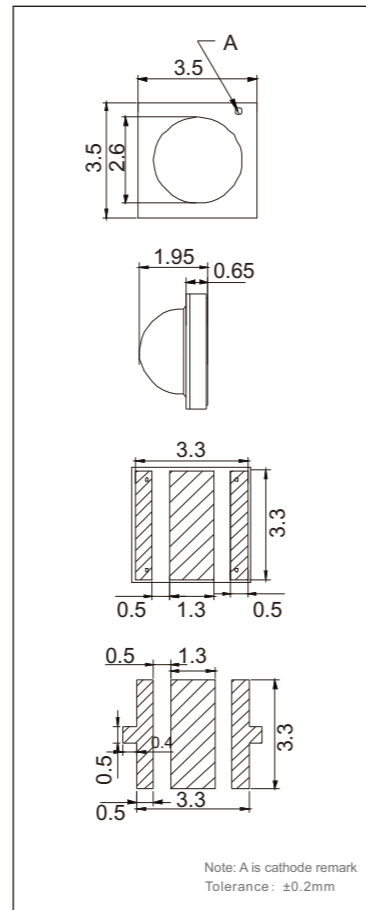


Chlorophyll-a and chlorophyll-b coefficient spectrum compare with luminescent spectrum of grow-light

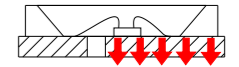
Parameter/Ta=25°C:

Power	Color	Part number	Wavelength / X, Y Coordinate	Φ (lm) / Po(mW)	I_F (mA)	Voltage (V)
0.2W	Blue	FM-P3528BS-460T	450nm	3 Lm	60	3.2
0.2W	Pink	FM-P3528WBRS-BS	(0.351,0.274)	22 Lm	60	5.4
0.2W	Red	FM-P3528RS-620Q	620 nm	8 Lm	60	2.3

Dimensions/Unit:mm

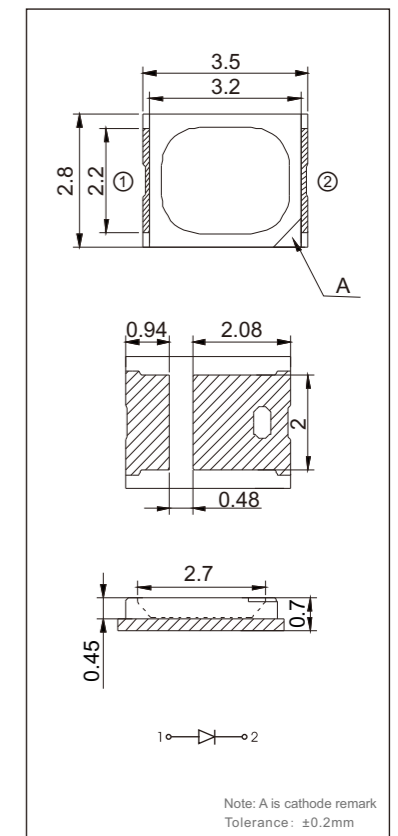


Thermal Dissipating Structure:



With a structure of the chip being placed on thermal pad the heat could be conducted to the PCB directly.

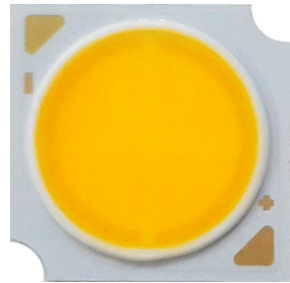
Dimensions/Unit:mm



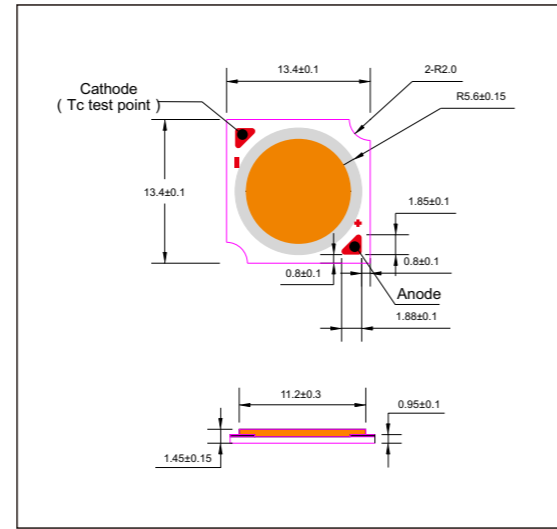


High-conductivity Metal PCB COB

P1313 Series



Dimensions/Unit:mm



Tolerance: ±0.2mm

Features:

- Use aluminum PCB with high reflective material.
- Applicable to downlight, spot light, ceiling light...
- Uniform high quality illumination, Erp/ANSI-compliant color binning structure with 3 / 4 SDCM options.
- Low-voltage and high-voltage DC options.
- Customized product available.
- Rated power: 7-24W.



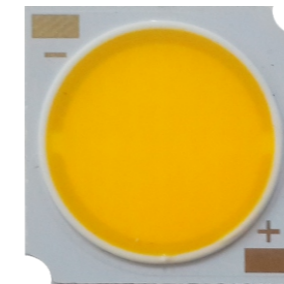
Parameter/Ta=25°C (7-24W):

Part number	Color Temp (K)	CRI Ra Min	Φv (lm) Typ.	I _F (mA) TEST	Voltage (V)	Power (W)
MC-P1313CW-5W0121201	5700	80	570-630	120	34.2-42.5	8.5
MC-P1313NW-5W0121201	4000	80	570-630	120	34.2-42.5	8.5
MC-P1313WW-5W0121201	3000	80	547-605	120	34.2-42.5	8.5
MC-P1313CW-12W0301202	5700	80	1260-1393	300	34.2-42.5	17
MC-P1313NW-12W0301202	4000	80	1260-1393	300	34.2-42.5	17
MC-P1313WW-12W0301202	3000	80	1206-1334	300	34.2-42.5	17
MC-P1313CW-18W0451203	5700	80	1907-2107	450	34.2-42.5	25.5
MC-P1313NW-18W0451203	4000	80	1907-2107	450	34.2-42.5	25.5
MC-P1313WW-18W0451203	3000	80	1826-2018	450	34.2-42.5	25.5

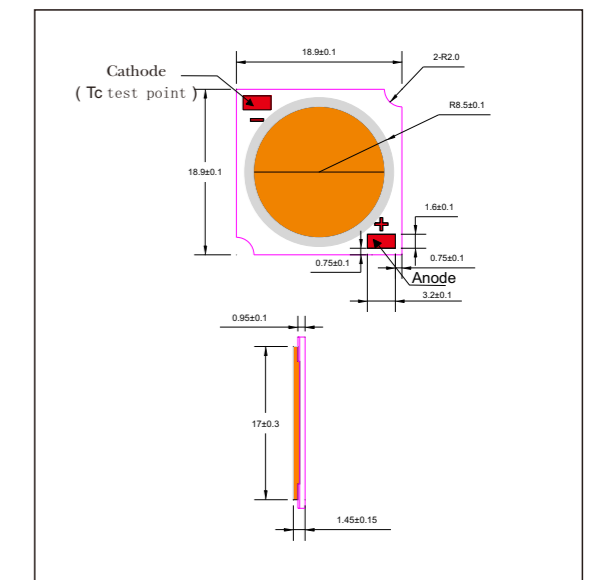


High-conductivity Metal PCB COB

P1919 Series



Dimensions/Unit:mm



Tolerance: ±0.2mm

Features:

- Use aluminum PCB with high reflective material.
- Applicable to track light, flood light, street light...
- Uniform high quality illumination, Erp/ANSI-compliant color binning structure with 3 / 4 SDCM options.
- Low-voltage and high-voltage DC options.
- Customized product available
- Rated power: 18-35W



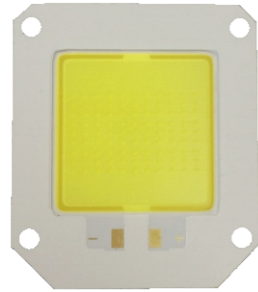
Parameter/Ta=25°C (18-35W):

Part number	Color Temp (K)	CRI Ra Min	Φv (lm) Typ.	I _F (mA) TEST	Voltage (V)	Power (W)
MC-P1919CW-24W0601204	5700	80	2520-2786	600	34.2-42.5	31.8
MC-P1919NW-24W0601204	4000	80	2520-2786	600	34.2-42.5	31.8
MC-P1919WW-24W0601204	3000	80	2413-2667	600	34.2-42.5	31.8
MC-P1919CW-30W0751205	5700	80	3146-3478	750	34.2-42.5	42.5
MC-P1919NW-30W0751205	4000	80	3146-3478	750	34.2-42.5	42.5
MC-P1919WW-30W0751205	3000	80	3063-3386	750	34.2-42.5	42.5
MC-P1919CW-35W0901206	5700	80	3775-4173	900	34.2-42.5	42.2
MC-P1919NW-35W0901206	4000	80	3775-4173	900	34.2-42.5	42.2
MC-P1919WW-35W0901206	3000	80	3677-4064	900	34.2-42.5	42.2



High-conductivity Metal PCB COB

P4046 Series

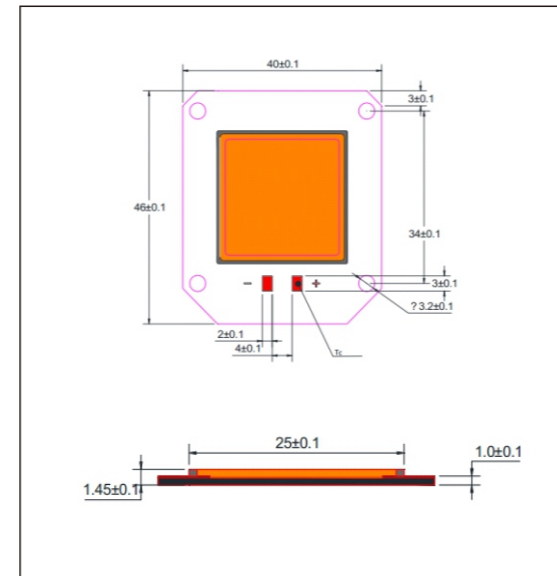


Features:

- Use aluminum PCB with high reflective material.
- Applicable to high bay light, flood light, street light...
- Low-voltage and high-voltage DC options.
- Customized product available.
- Rated power: 20-100W.



Dimensions/Unit:mm



Tolerance: ±0.2mm



LED Filament

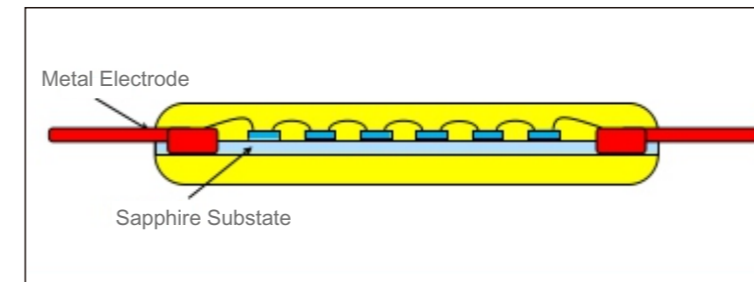


Features:

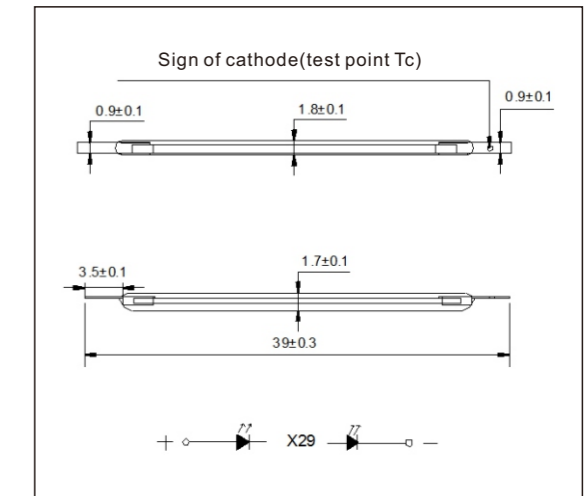
- 360° view angle.
- High CRI, high efficiency.
- High voltage and low current drive, with low power consumption and low light decay.
- As substitution to incandescent bulb.



Structure:



Dimensions/Unit:mm



1. An excellent structural strength with sapphire coated by phosphor
2. excellent stability is achieved by seamless jointing of electrodes at two ends
3. encapsulated with heat-resisting material to ensure high reliability and low light failure
4. encapsulation with multi-chips, completely contact with air, good dissipation

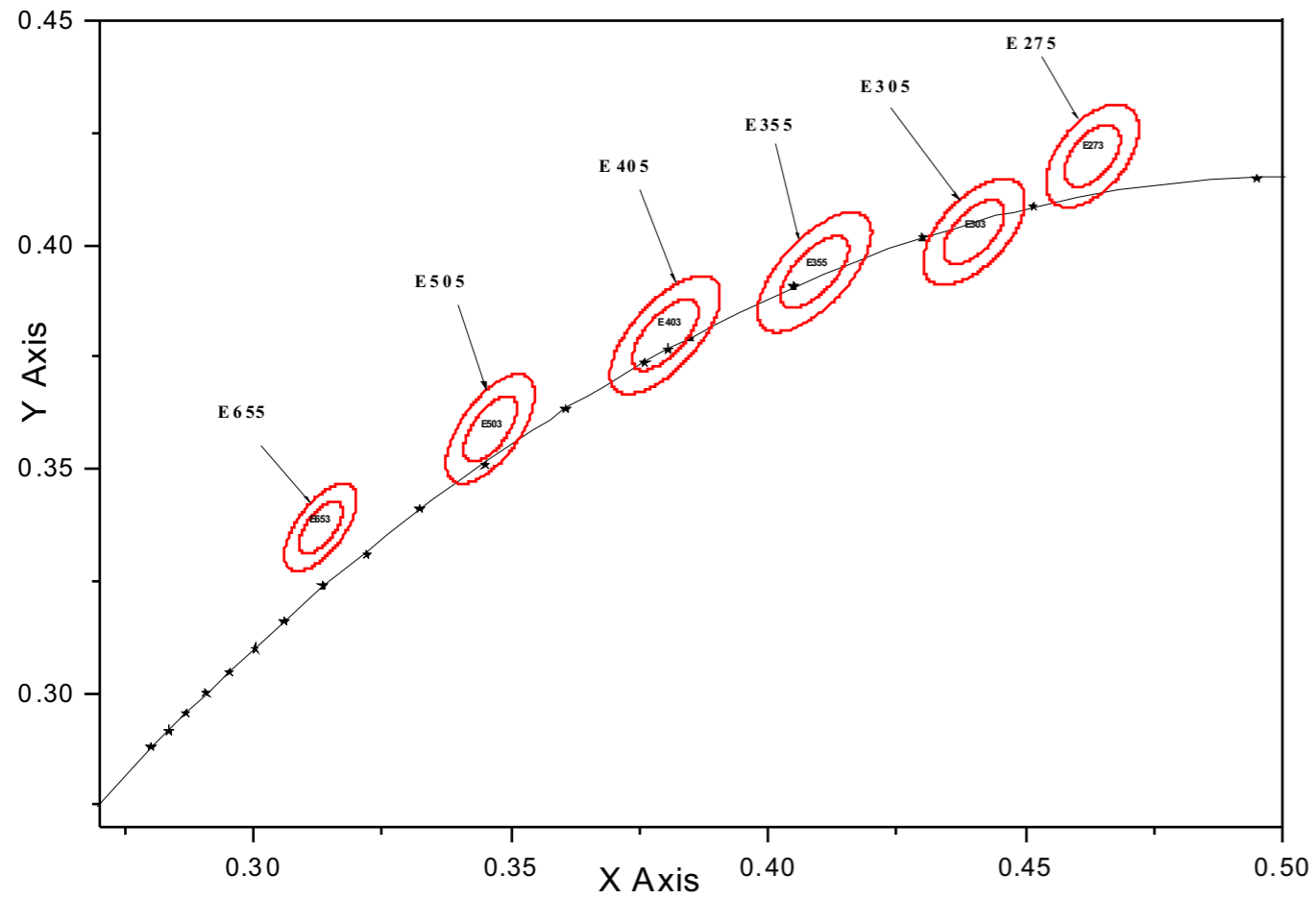
Parameter/Ta=25°C:

Part number	Color Temp (K)	CRI Ra Min	Φv (lm) Typ.	I _F (mA) TEST	Voltage (V)	Max Power (W)
MC-P4046CW-50W0453303	6000	80	5200-6100	450	94-115	62
MC-P4046NW-50W0453303	4000	80	5000-5900	450	94-115	62
MC-P4046WW-50W0453303	3000	80	4850-5750	450	94-115	62
MC-P4046WW-100W1202308	3000	70	9500-11000	1200	68-75	110

Parameter/Ta=25°C:

Part number	Color Temp (K)	CRI Ra Min	Φv (lm) Typ.	I _F (mA) TEST	Voltage (V)	Max Power (W)
MC-C0840RW-0.8W0012901	2700	80	130	10	78-82	0.8
MC-C0840CW-1W0012601	6500	80	110	10	70-80	1
MC-C0840RW-1.2W0015901	2700	80	205	15	78-82	1.2

ErP



1、(1) E655

	CCT	X	Y	a	b	θ	Step
E655	6050-6900	0.3130	0.3370	0.002206	0.000952	58.57	5

(2) E653

	CCT	X	Y	a	b	θ	Step
E653	6200-6700	0.3130	0.3370	0.002206	0.000952	58.57	3

2、(1) E505

	CCT	X	Y	a	b	θ	Step
E505	4700-5300	0.3460	0.3590	0.002737	0.001190	59.62	5

(2) E503

	CCT	X	Y	a	b	θ	Step
E503	4800-5150	0.3460	0.3590	0.002737	0.001190	59.62	3

3、(1) E405

	CCT	X	Y	a	b	θ	Step
E405	3800-4300	0.3800	0.3800	0.003129	0.001345	53.71	5

(2) E403

	CCT	X	Y	a	b	θ	Step
E403	3900-4200	0.3800	0.3800	0.003129	0.001345	53.71	3

4、(1) E355

	CCT	X	Y	a	b	θ	Step
E355	3280-3640	0.4090	0.3940	0.003090	0.001380	54.00	5

(2) E353

	CCT	X	Y	a	b	θ	Step
E353	3360-3530	0.4090	0.3940	0.003090	0.001380	54.00	3

5、(1) E305

	CCT	X	Y	a	b	θ	Step
E305	2820-3080	0.440	0.403	0.002782	0.00136	53.21	5

(2) E303

	CCT	X	Y	a	b	θ	Step
E303	2860-3020	0.440	0.403	0.002782	0.00136	53.21	3

6、(1) E275

	CCT	X	Y	a	b	θ	Step
E275	2630-2840	0.4630	0.4200	0.002578	0.001337	57.28	5

(2) E273

	CCT	X	Y	a	b	θ	Step
E273	2670-2790	0.4630	0.4200	0.002578	0.001337	57.28	3