

2013

NATIONSTAR

LIGHTING UP THE WORLD

IA LEDs For Indication Applications

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NATIONSTAR

STOCK CODE: 002449

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NATIONSTAR | **2013**
LIGHTING UP THE WORLD

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Brief Introduction of CHIP LED

1. NationStar CHIP LED includes series of 1608(0603) , 2012(0805) , 3215(1206), etc. Each series has different colors such as red, orange, yellow, green, blue, white ,etc.

1608 Series

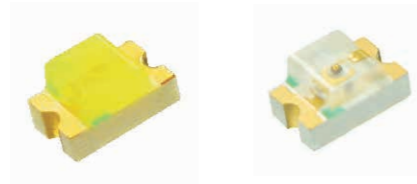
Thickness: 0.4mm, 0.6mm, 0.7mm, 0.8mm



1.6×0.8×0.8mm 1.6×0.8×0.6mm 1.6×0.8×0.4mm 1.6×0.8×0.7mm

2012 Series

Thickness: 1.1mm



2.0×1.2×1.1mm

3215 Series

Thickness: 1.1mm



single color Bi color full color

3.2×1.5×1.1mm

2. Mainly used for signal indication such as home appliance indicator, mobile phone backlight, and automobile dash board.



Home appliance indicator



Digital camera backlight



Automobile dash board backlight

3. Features: small size, high light intensity, wide viewing angle, good reliability and long lifespan.

CHIP LED

1005 Series



1005 Series

Features

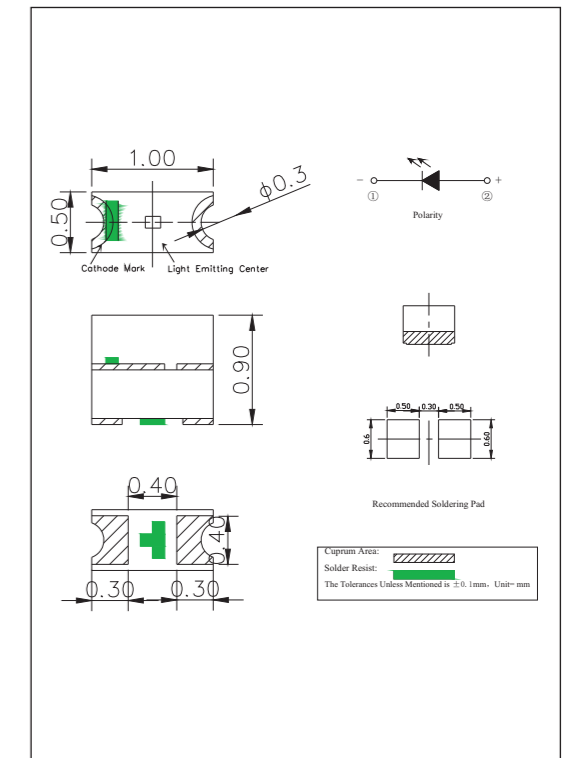
- Thickness: 0.9mm;
- Features: small size, high light intensity, wide viewing angle, good reliability, long lifespan;
- Suitable for unleaded reflow soldering process;
- Environment-friendly products, complied with RoHS;
- Mainly used for signal indication such as home appliance indicator, mobile phone backlight and automobile dash board.

Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I _F	20mA
Pulse Forwards Current	I _{FP}	100mA
Reverse Voltage	V _R	5V
Working Temperature	T _{OPR}	-30~+85°C
Storage Temperature	T _{STG}	-40~+100°C

• Pulse Width≤0.1ms, Duty Cycle≤1/10

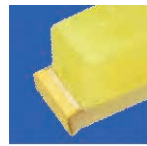
Outline Dimensions/ Unit: mm



Tolerance: ±0.1mm

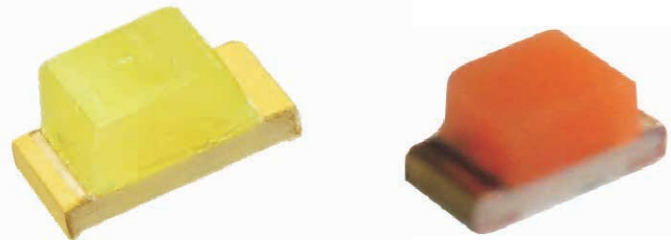
Parameter/Ta=25°C:

Part Number	Color	I _F (mA) TEST	λ _D (nm)/XY Typ.	I _V (mcd) Typ.	V _F (V)	
					Typ.	Max
FC-1005HRK-620D	Red	15	620	120	2.0	2.6
FC-1005HOK-600H	Orange	15	605	150	2.0	2.6
FC-1005HYK-588J	Yellow	15	588	150	2.0	2.6
FC-1005HGK-572C	Yellowish Green	15	572	30	2.0	2.6
FC-1005UGK-520D	Green	15	520	500	3.2	3.6
FC-1005BK-470D	Blue	15	470	100	3.2	3.6
FC-1005WD-460X	White	15	0.26	500	3.2	3.6



CHIP LED

1608(0603) Shiny-Color Series



1608 Series

Features

- Thickness: 0.8mm
- Features: small size, high light intensity, wide viewing angle, good reliability, long lifespan.
- Suitable for unleaded reflow soldering process.
- Environment-friendly products, complied with RoHS.
- Mainly used for signal indication such as home appliance indicator, mobile phone backlight and automobile dash board.

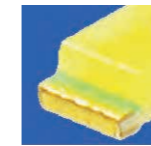
Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I_F	20mA
Pulse Forwards Current	I_{FP}	100mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

• Pulse Width ≤ 0.1ms, Duty Cycle ≤ 1/10

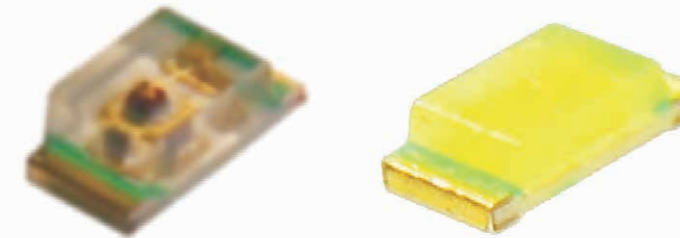
Parameter/ $T_a=25^\circ\text{C}$:

Part Number	Color	I_F (mA) TEST	λ_D (nm)/XY Typ.	I_V (mcd) Typ.	V_F (V)	
					Typ.	Max
FC-1608WBD-460M	Blue	20	X=0.16 Y=0.15	360	3.0	3.6
FC-1608WPD-462M	Pink	20	X=0.30 Y=0.16	130	3.0	3.6



CHIP LED

1608(0603) Ultrathin Series



T1608 Series

F1608 Series

Features

- Thickness: 0.4mm(F1608 series), 0.6mm (T1608 series);
- Color: red, orange, yellow, green, blue and white;
- Features: small size, high light intensity, wide viewing angle, good reliability and long lifespan;
- Suitable for unleaded reflow soldering process;
- Environment-friendly products and complied with RoHS;
- Mainly used for signal indication such as home appliance indicator, mobile phone backlight and automobile dash board.

Absolute Maximum Ratings:

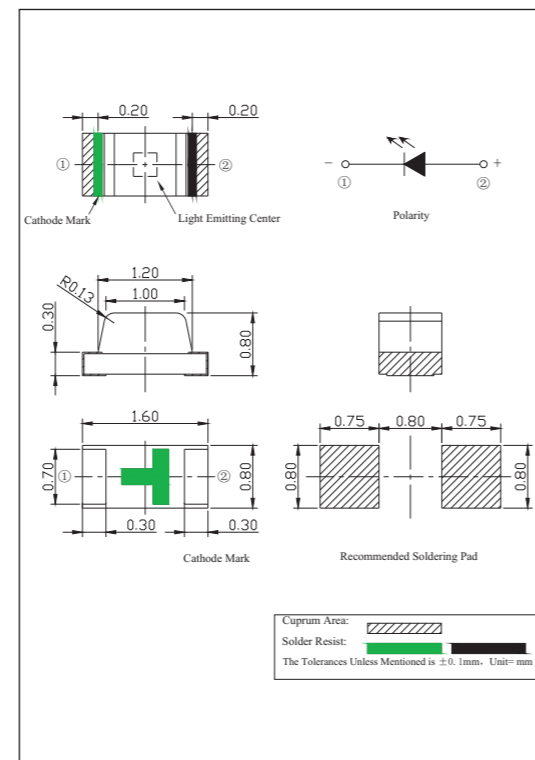
Parameter	Symbol	Rating
Forward Current	I_F	20mA
Pulse Forwards Current	I_{FP}	100mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

• Pulse Width ≤ 0.1ms, Duty Cycle ≤ 1/10

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

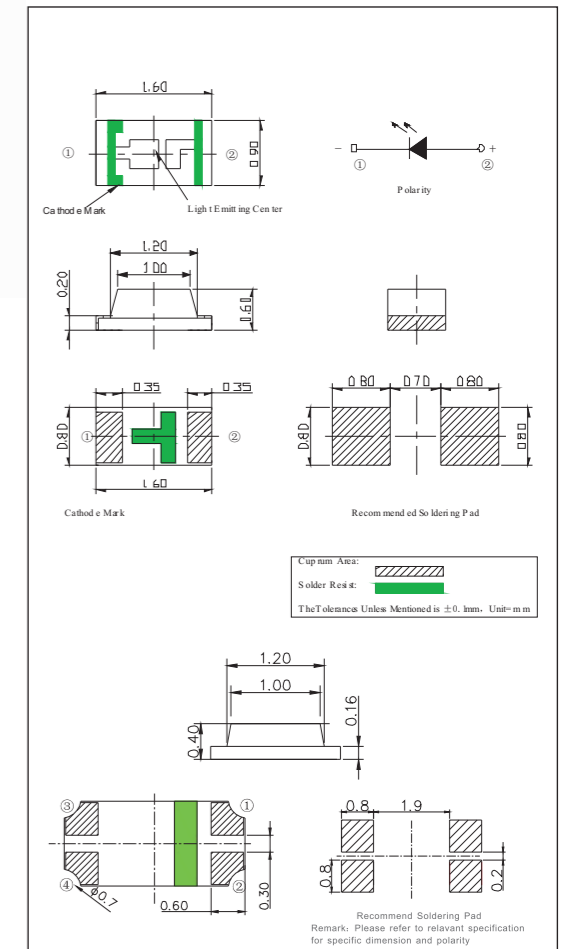
Part Number	Color	I_F (mA) TEST	λ_D (nm)/XY Typ.	I_V (mcd) Typ.	V_F (V)	
					Typ.	Max
FC-F1608WBX(5)-460D	white	5	X=0.26 Y=0.21	140	3.0	3.6
FC-F1608UGK-515D5	Green	5	525	200	3.0	3.6
FC-F1608BK-470H5	Blue	5	470	40	3.0	3.6
FC-T1608SXX-620H08	Red	20	620	150	2.0	2.6

Outline Dimensions/Unit: mm

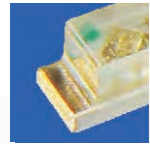


Tolerance: ±0.1mm

Outline Dimensions/ Unit: mm

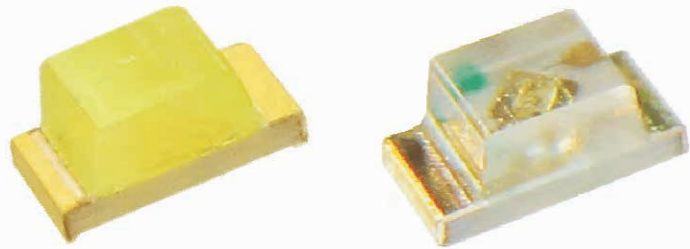


Tolerance: ±0.1mm



CHIP LED

1608 (0603) General Size Series



1608 Series

Features

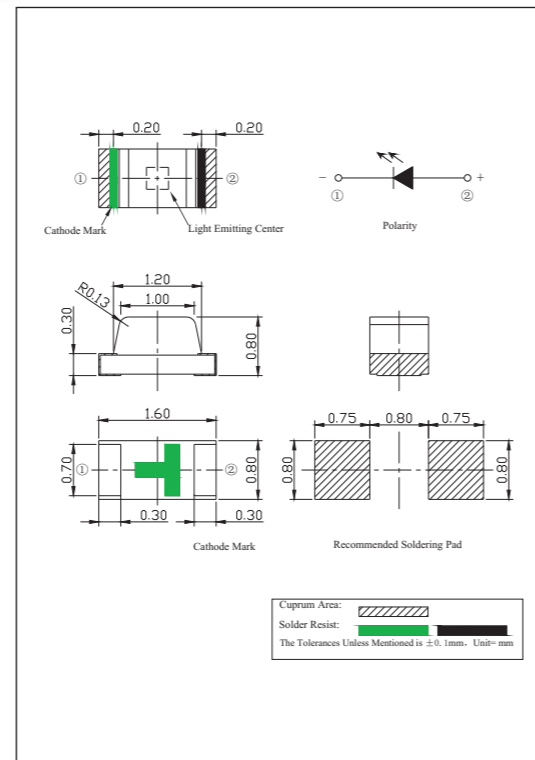
- Thickness: 0.8mm;
- Color: red, orange, yellow, green, blue, infrared and white;
- Features: small size, high light intensity, wide viewing angle, good reliability and long lifespan.
- Suitable for unleaded reflow soldering process;
- Environment-friendly products and complied with RoHS;
- Mainly used for signal indication such as home appliance indicator and automobile dash board.

Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I _F	20mA
Pulse Forwards Current	I _{FP}	100mA
Reverse Voltage	V _R	5V
Working Temperature	T _{OPR}	-30~+85°C
Storage Temperature	T _{STG}	-40~+100°C

• Pulse Width≤0.1ms, Duty Cycle≤1/10

Outline Dimensions/ Unit: mm



Tolerance: ±0.1mm



CHIP LED

DA1608系列



DA1608 Series

Features

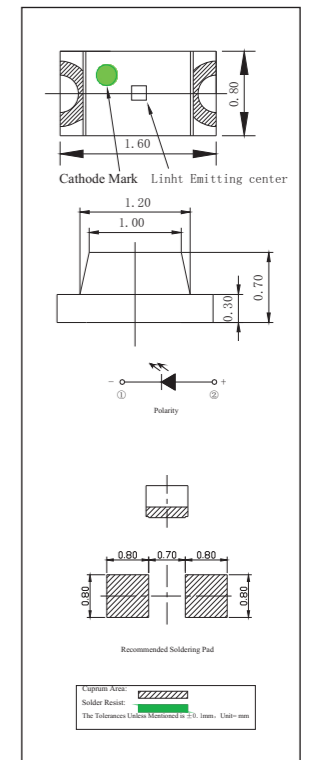
- Thickness: 0.7mm;
- Color: red, orange, yellow, green, blue, infrared and white;
- Features: small size, high light intensity, wide viewing angle, good reliability and long lifespan.
- Suitable for unleaded reflow soldering process;
- Environment-friendly products and complied with RoHS;
- Mainly used for signal indication such as home appliance indicator and automobile dash board.

Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I _F	20mA
Pulse Forwards Current	I _{FP}	100mA
Reverse Voltage	V _R	5V
Working Temperature	T _{OPR}	-30~+85°C
Storage Temperature	T _{STG}	-40~+100°C

• Pulse Width≤0.1ms, Duty Cycle≤1/10

Outline Dimensions/ Unit: mm



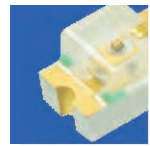
Tolerance: ±0.1mm

Parameter/Ta=25°C:

Part Number	Color	I _F (mA) TEST	λ _D (nm)/XY Typ.	I _v (mcd) Typ.	V _F (V)	
					Typ.	Max
FC-1608WD3-457XE	White	20	X=0.23 Y=0.20	500	3.0	3.6
FC-1608SXX-620D08	Red	20	620	115	2.0	2.6
FC-1608YOEK-605C	Orange	20	605	100	2.0	2.6
FC-1608YXX-585H08	Yellow	15	590	100	2.0	2.6
FC-1608GEK-572E	Yellowish Green	15	572	45	2.0	2.6
FC-1608UGK-520D	Green	20	520	500	3.0	3.6
FC-1608BK-470ME-XF	Blue	20	470	200	3.2	4.0

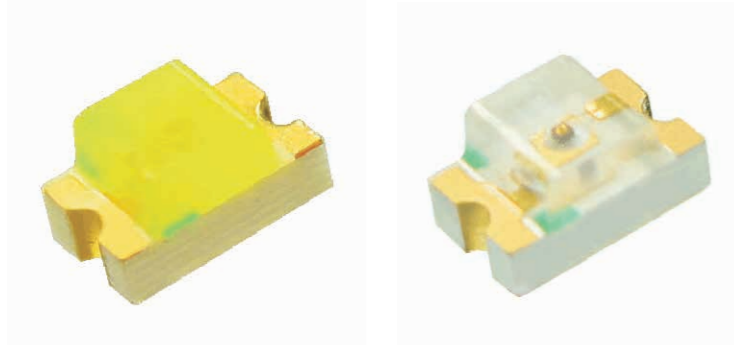
Parameter/Ta=25°C:

Part Number	Color	I _F (mA) TEST	λ _D (nm)/XY Typ.	I _v (mcd) Typ.	V _F (V)	
					Typ.	Max
FC-DA1608HRK-620D	Red	20	620	100	2.0	2.6
FC-DA1608HOK-600H	Orange	20	605	150	2.0	2.6
FC-DA1608HYK-588J	Yellow	20	588	100	2.0	2.6
FC-DA1608HGK-572C	Yellowish Green	20	572	30	2.0	2.6
FC-DA1608UGK-520D10	Green	10	520	500	3.2	3.6
FC-DA1608BK-470H10	Blue	10	470	100	3.2	3.6
FC-DA1608WD-460H5	White	5	0.28	200	3.0	3.6



CHIP LED

2012(0805) Series



2012 Series

Features

- Thickness: 1.1mm;
- Color: red, orange, yellow, green, blue and white;
- Features: small size, high light intensity, wide viewing angle, good reliability and long lifespan;
- Suitable for unleaded reflow soldering process;
- Environment-friendly products and complied with RoHS;
- Mainly used for display and signal indication such as home appliance indicator, mobile phone backlight and automobile dash board.

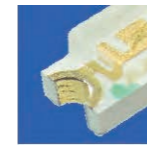
Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I_F	20mA
Pulse Forwards Current	I_{FP}	100mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

• Pulse Width \leq 0.1ms, Duty Cycle \leq 1/10

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

Part Number	Color	I_F (mA) TEST	λ_D (nm)/XY Typ.	I_V (mcd) Typ.	V_F (V)	
					Typ.	Max
FC-2012WBY-460G	white	20	X=0.28 Y=0.28	700	3.0	3.6
FC-2012HRK-620D	Red	20	620	100	2.0	2.6
FC-2012YOXK-600H08	Orange	20	602	160	2.0	2.6
FC-2012HYK-588J	Yellow	20	588	125	2.0	2.6
FC-2012GHK-570A08	Yellowish Green	20	572	35	2.0	2.6
FC-2012UGK-520D5	Green	5	525	250	3.0	3.6
FC-A2012BK-470H12	Blue	12	470	124	2.8	3.4



CHIP LED

3215(1206) Series



3215 Series

Features

- Color: red, orange, yellow, green, blue and white;
- Features: small size, high light intensity, wide viewing angle, good reliability and long lifespan;
- Suitable for unleaded reflow soldering process;
- Environment-friendly products and complied with RoHS;
- Mainly used for display and sign indication.

Absolute Maximum Ratings:

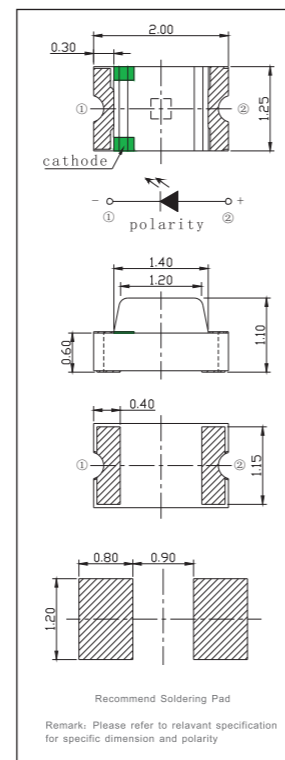
Parameter	Symbol	Rating
Forward Current	I_F	20mA
Pulse Forwards Current	I_{FP}	100mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

• Pulse Width \leq 0.1ms, Duty Cycle \leq 1/10

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

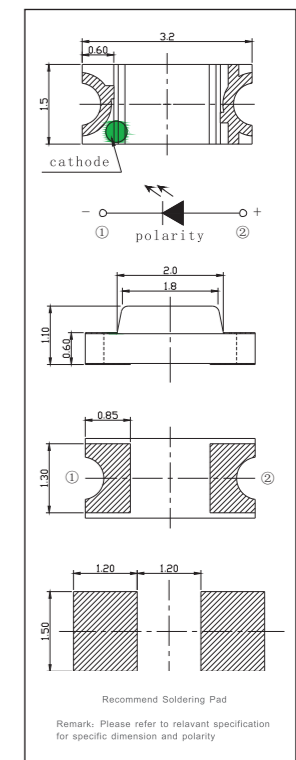
Part Number	Color	I_F (mA) TEST	λ_D (nm)/XY Typ.	I_V (mcd) Typ.	V_F (V)	
					Typ.	Max
FC-3215HRK-620D	Red	20	620	115	2.0	2.6
FC-3215YOXK-600H08	Orange	20	602	150	2.0	2.6
FC-3215YXK-585F08	Yellow	20	590	100	2.0	2.6
FC-3215GHK-570A08	Yellowish Green	20	572	35	2.0	2.6

Outline Dimensions/ Unit: mm

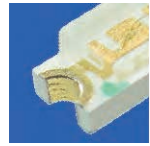


Tolerance: $\pm 0.1\text{mm}$

Outline Dimensions/ Unit: mm



Tolerance: $\pm 0.1\text{mm}$



CHIP LED

3215(1206) Series



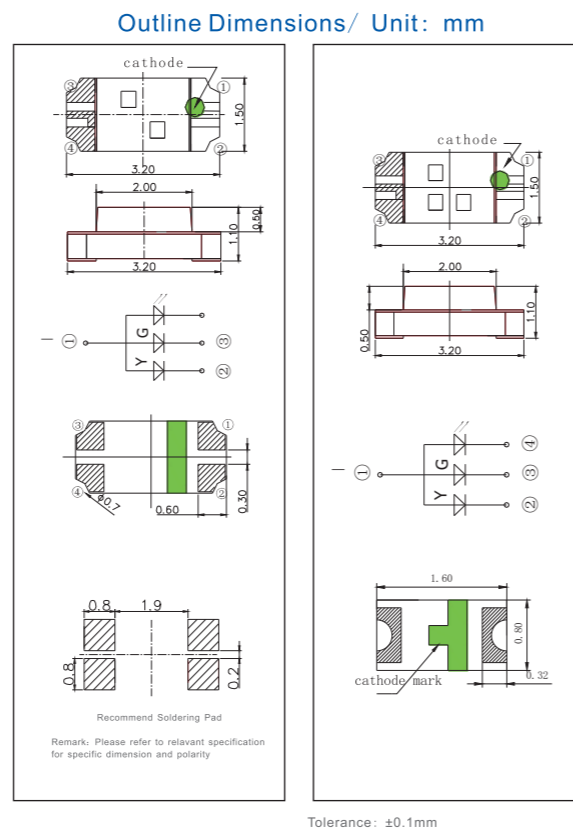
Features

- Color: red, orange, yellow, green, blue and white;
- Features: small size, high light intensity, wide viewing angle, good reliability and long lifespan;
- Suitable for unleaded reflow soldering process;
- Environment-friendly products and complied with RoHS;
- Mainly used for display and sign indication.

Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I_F	20mA
Pulse Forwards Current	I_{FP}	100mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

• Pulse Width ≤ 0.1ms, Duty Cycle ≤ 1/10



Brief Introduction of TOP LED

1. TOP LEDs includes 3020 series, 3528 series, 5050 series, with colors such as red, orange, yellow, green, blue, and etc.



3020 Series
3.0×2.0×1.3



3528 Series
3.5×2.8×1.9



5050 Series
5.0×5.0×1.6

2. Mainly used for sign indicator, backlight and decorative lighting.



LED Strips



LED Tubes



LED Signs and Channel Letters

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

Part Number	Color	I_F (mA) TEST	λ_D (nm)/XY Typ.	I_V (mcd) Typ.	V_F (V)	
					Typ.	Max
FC-3215UGK-520D	Green	20	520	600	3.0	3.6
FC-3215BXX-465D	Blue	20	470	120	3.0	3.6
FC-3215SQGEK(Bi-color)	Red	20	620	180	2.0	2.6
	Yellowish Green	20	572	50	2.0	2.6

3. Features: small size, high light intensity, wide viewing angle, good reliability and long lifespan.



TOP LED

3528 Series



3528 Series

Features

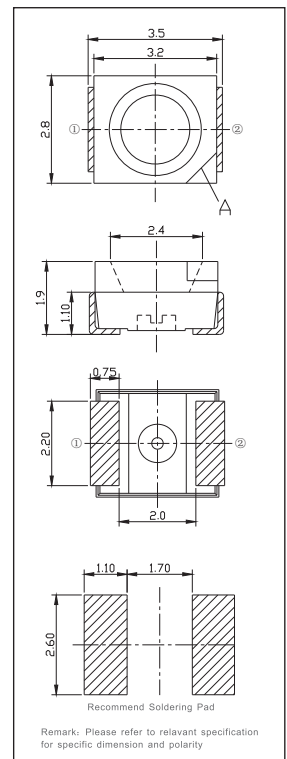
- Color: red, orange, yellow, green, blue and etc.
- Suitable for unleaded reflow soldering process.
- Environment-friendly products and complied with RoHS.
- Mainly used for backlight automobile dash board , displays and various kinds of decorative lighting.

Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I_F	20mA
Pulse Forwards Current	I_{FP}	100mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

• Pulse Width ≤ 0.1 ms, Duty Cycle $\leq 1/10$

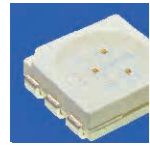
Outline Dimensions/ Unit: mm



Remark: A is Cathode
Tolerance: ± 0.1 mm

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

Part Number	Color	I_F (mA) TEST	λ_D (nm)/XY Typ.	I_V (mcd) Typ.	V_F (V)	
					Typ.	Max
FM-3528SXX-620H08	Red	20	625	300	2.0	2.4
FM-3528HOK-605QC	Orange	20	605	350	2.0	2.6
FM-3528HYK-589N	Yellow	20	590	800	2.0	2.4
FM-3528GEK-572G	Yellowish Green	20	572	150	2.0	2.4
FM-3528UGK-520D	Green	20	525	1600	3.0	3.6
FM-3528BK-470D	Blue	20	470	350	3.0	3.6
FM-3528SEGEK-1	Red	20	624	120	2.0	2.6
	Yellowish Green	20	572	120	2.0	2.6



TOP LED

5050 Series



5050 Series

Features

- Color: red, orange, yellow, green, blue and etc.;
- Suitable for unleaded reflow soldering process;
- Environment-friendly products and complied with RoHS;
- Mainly used for backlight automobile dash board, displays, strips and various kinds of decorative lighting.

Absolute Maximum Ratings:

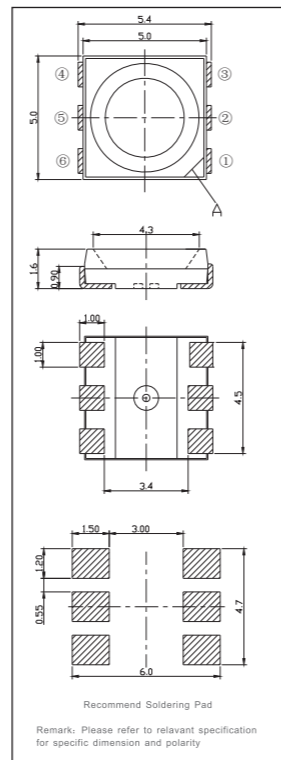
Parameter	Symbol	Rating
Forward Current	I_F	60mA
Pulse Forwards Current	I_{FP}	100mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+85°C
Storage Temperature	T_{STG}	-40~+100°C

• Pulse Width≤0.1ms, Duty Cycle≤1/10

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

Part Number	Color	$I_F(\text{mA})$ TEST	$\lambda_D(\text{nm})/XY$ Typ.	$I_V(\text{mcd})$ Typ.	$V_F(V)$	
					Typ.	Max
FM-T5050HRK-624N	Red	60	624	2400	2.0	2.4
FM-T5050HYK-589N	Yellow	60	592	2500	2.0	2.4
FM-T5050UGK-520D	Green	60	525	4300	3.0	3.6
FM-T5050BK-470M	Blue	60	470	1400	3.0	3.6

Outline Dimensions/ Unit: mm



Remark: A is Cathode Tolerance: ±0.1mm

Brief Introduction of LAMP LED

1. Lamp LED includes various specifications such as $\Phi 3, \Phi 5$, with different colors such as red, orange, yellow, green, blue, white, and infrared.



$\Phi 3$ Series



$\Phi 5$ Series

2. Mainly used for signal indication and decorative lighting.



Traffic light



Flashlight

3. Features: high light intensity, good reliability, waterproof, long lifespan.

LAMP LED

LAMP LED Series



Φ3 Series



Φ5 Series

Features

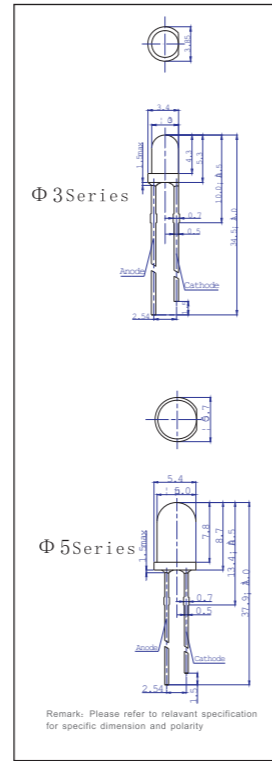
- Diameter: 3mm (Φ3), 5mm (Φ5), with various viewing angles;
- Color: red, yellow, green, blue, white and infrared;
- Environment-friendly products and complied with RoHS;
- Mainly used for signal indication and decorative lighting.

Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I _F	75mA
Pulse Forwards Current	I _{FP}	100mA
Reverse Voltage	V _R	5V
Working Temperature	T _{OPR}	-30~+85°C
Storage Temperature	T _{STG}	-40~+100°C

• Pulse Width≤0.1ms, Duty Cycle≤1/10

Outline Dimensions/ Unit: mm



Tolerance: ±0.1mm

Brief Introduction of LED Module

1. LED applied products include display modules, backlight devices, and other customized products.



Display Module Series



Backlight Series

2. Mainly used for household appliances such as air-conditioner, water heater, digital player and etc.



Air-conditioner

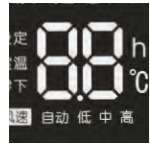


Mobile phone

Parameter/Ta=25°C:

Part Number	Color	I _F (mA) TEST	λ _d (nm)/XY Typ.	I _v (mcd) Typ.	θ (°) Typ.	V _F (V)	
						Typ.	Max
BT-202SEK-31-624H	Red	20	624	800	50	2.0	2.6
BT-102GEK-31-572D	Yellowish Green	20	572	200	30	2.0	2.6
BT-904BEK-31-460M-A6	white	20	X=0.3 Y=0.3	17000	12	3.2	4.5

3. Features: bright colors, novel structure (appearance patented), low power, good reliability and long lifespan.



LED Module

Display Module Series



Display Module Series

Features

- Features: bright colors, novel structure, low power and long lifespan;
- Color: white, red, orange, yellow, green, blue and white;
- Mainly used for household appliances such as air-conditioner water heater, digital player and etc.

Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I _F	20mA
Pulse Forwards Current	I _{FP}	80mA
Reverse Voltage	V _R	5V
Working Temperature	T _{OPR}	-20~+60°C
Storage Temperature	T _{STG}	-25~+75°C

• Pulse Width≤0.1ms, Duty Cycle≤1/10

Parameter/Ta=25°C:

Part Number	Color	I _F (mA) TEST	λ _D (nm)/XY Typ.	I _V (mcd) Typ.	V _F (V)	
					Typ.	Max
D310F33	Red	20	624	80	2.0	2.6
	white	20	X=0.275 Y=0.295	400	3.0	3.6



LED Module

LED Backlight Modules Series



LEDBacklight Series

Features

- Customized design is acceptable;
- Mainly used for backlight of LED display such as mobile phone, game machine, MP4 and etc.

Absolute Maximum Ratings:

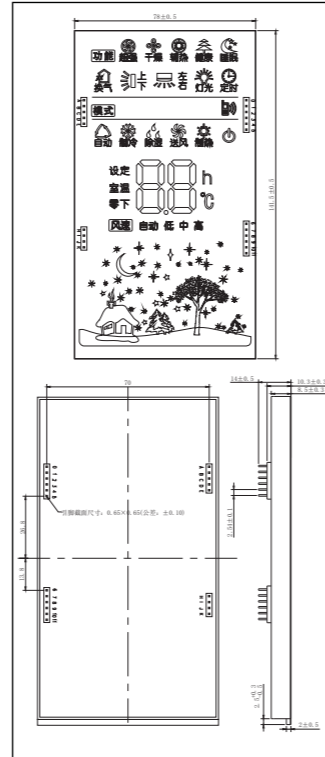
Parameter	Symbol	Rating
Forward Current	I _F	20×3 mA
Pulse Forwards Current	I _{FP}	60×3 mA
Reverse Voltage	V _R	5V
Working Temperature	T _{OPR}	-20~+70°C
Storage Temperature	T _{STG}	-30~+80°C

• Pulse Width≤0.1ms, Duty Cycle≤1/10

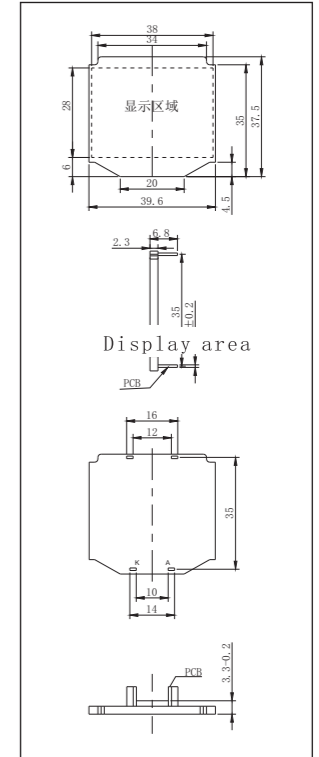
Parameter/Ta=25°C:

Part Number	Color	I _F (mA) TEST	λ _D (nm) Typ.	L _V (cd/m ²) Typ.	V _F (V)	
					Typ.	Max
FBL-1608YEK3AV (MD)	Yellow	10×3	590	20	2.0	2.6

Outline Dimensions/ Unit: mm

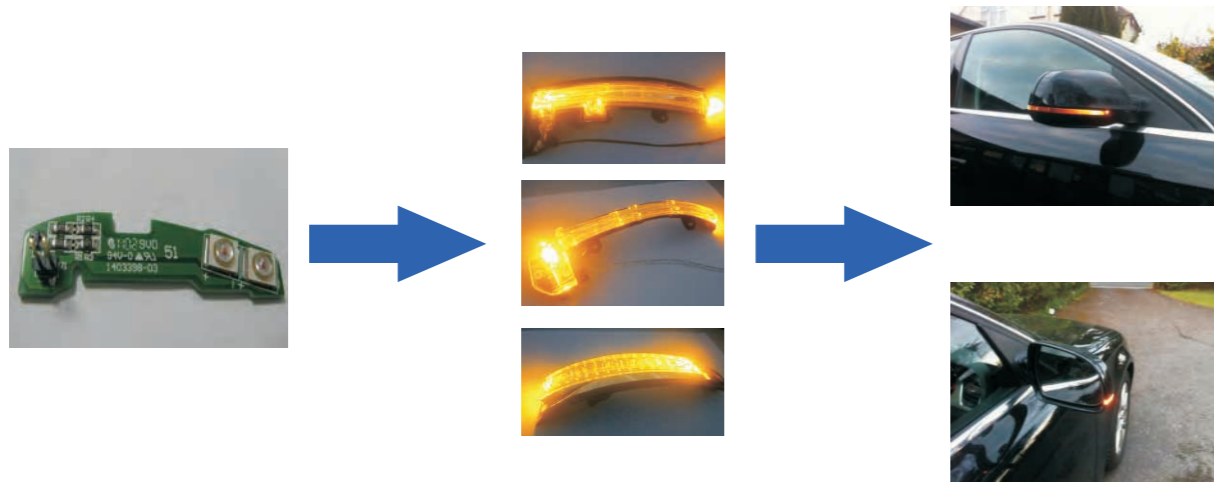


Outline Dimensions/ Unit: mm



LED Module

Auto light Series



Features

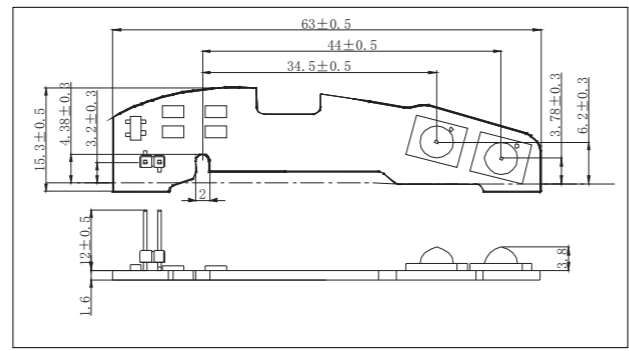
- color uniformity, low power consumption ,high reliability , long life-span;
- Mainly used for indication of instruments, dashboard, decorative lightings, indoor display, etc..

Absolute Maximum Ratings:

Parameter	Symbol	Rating
Forward Current	I_F	150mA
Pulse Forwards Current	I_{FP}	350mA
Reverse Voltage	V_R	5V
Working Temperature	T_{OPR}	-30~+50°C
Storage Temperature	T_{STG}	-30~+80°C

• Pulse Width≤0.1ms, Duty Cycle≤1/10

Outline Dimensions/ Unit: mm



Tolerance : ±0.1mm

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

Part Number	Color	$I_F(\text{mA})$ TEST	$\lambda_D(\text{nm})$ Typ.	Flux(lm) Typ.	$V_F(\text{V})$ Typ.
L538-R	Yellow	110	590	23	13.5