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**SMD LED**

**LAMP LED**

**HIGH POWER**

Product Catalogue

**Taiwan Oasis Technology Co., Ltd.**  
李洲科技股份有限公司

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**About Oasistek**

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 Part Number Formation 3, 25  
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 Back Light LED Color Bins 9

**SMD LED**

**Back Light**

TO-3806 10  
 TO-3020 10  
 TO-5730 11

**Lighting**

TO-3228 11  
 TO-3528 11  
 TO-2835 12  
 TO-5050 13  
 TO-5730 14

**Side View**

PLCC 2808 Package  
 TO-2808 15  
 PLCC 3806 Package  
 TO-3806 15

**Top View**

PLCC 3228 Package  
 TO-3228 16  
 TO-3528 16  
 PLCC 5050 Package  
 TO-5050 18

**Chip**

PCB 1005 Package  
 TO-1005 19  
 PCB 1608 Package  
 TO-1608 19  
 TO-A1608 19  
 PCB 1706 Package  
 TO-1706 20  
 PCB 2013 Package  
 TO-2013 20  
 PCB 3010 Package  
 TO-3010 21  
 PCB 3216 Package  
 TO-3216 21  
 PCB 1615 Package  
 TO-1615 22  
 PCB 3227 Package  
 TO-3227 22

**HIGH POWER**

TOP  
 TOP-RED 23  
 TOP-GREEN 23  
 TOP-BLUE 23  
 TOP-WHITE 23

**Lamp LED**

**3mm Series**

3mm Round  
 TOL-30 26  
 3mm Concave & Oval  
 TOL-34 26  
 TOL-36 27

**5mm Series**

5mm Round  
 TOL-50 27  
 5mm Concave & Oval  
 TOL-56 28

**Special Models**

4.8mm  
 TOL-4B 29  
 8mm Round  
 TOL-80 29  
 10mm Round  
 TOL-A03 29  
 Rectangular  
 TOL-C9 30

# Oasistek® Taiwan Oasis Technology Co., Ltd.

## Introduction

Taiwan Oasis Technology Co., Ltd., was established by Mr. Ming-Shun Lee in 1974 with an ideal to provide the marketplace simplicity, integrity reliability, progress, precision, and innovation.

The company started its life initially as a dedicated downstream LED technology manufacturing service focused on items such as plastic molding, injection and packing.

As Oasistek expanded its business vertically and upgraded its competencies, it soon began to move into producing a complete range of products, such as High Power LEDs, LAMP LEDs, SMD LEDs, LED Displays and Lighting. Additionally, Oasistek also offers customization manufacturing services to help customers' meet their sales targets.

In recent years, Oasistek has proudly introduced its LED Video Display and Lumichain™ series to the marketplace. Oasistek has been applauded globally and is reputed as a pioneer in Taiwan for being the 1st Taiwanese LED manufacturer to consistently supply the Japanese market.

Today, Oasistek's complete product line-up is now well represented worldwide and is globally known for their quality and cutting-edge technology. Delivering a full range of services and meeting customers' need is its mission and Oasistek is sincerely inviting you to be a partner and step forward together.



Taipei Headquarter



Taoyuan Manufacturing Center



Dongguan Manufacturing Center

## Milestones

- 2016 The New headquarter has been relocated to U-Town Building in Xizhi Dist., New Taipei City.
- 2015 All new LED Spot Light product has been published.
- 2013 The winner of Transformation and Upgrading of the processing Trade Industry Award held in Dongguan China, power was confirmed.
- 2012 Increase the new production line, the production capacity increased by more than 40KK/M. Establishment of an independent R&D department, the main R&D direction of illumination and backlight. Set up offices in Shenzhen and Qingdao and build up a unique channel marketing model.
- 2011 Launched a series of interior commercial lighting products.
- 2010 Launched "Star Vessel" which is functional and designing outdoor street light.
- 2009 Adopted a new brand identity "Oasistek" and a renewed spirit.
- 2008 China Hwa-Tai Factory completed. Adopted Green Policy. Lumichain trademark registered
- 2007 Began offering full product range from LEDs components to LED Video Displays.
- 2005 Announced partnership with leading Japanese corporation, White LED Technology. Lumichain series launched.
- 2004 Publicly Listed on the Taiwan Stock Exchange. ISO/TS 16949 Certified.
- 2003 Inaugurated fully automated line for LED Display production.
- 2001 Renamed to Taiwan Oasis Technology Co., Ltd. QS 9000 Certificated.
- 1999 Began SMD LED mass production. China factories ISO 9002 certified.
- 1998 Approval of Stock Issuance. Patent awarded for LED Packaging technology. Taiwan factories ISO 9002 certified
- 1996 Kwei Shan, Taiwan factory completed. Completed LED products launched.
- 1994 Merged with Lihsin Co., Ltd. Patent awarded for advanced CD package design.
- 1990 Dong-Guan, China factory completed. Patent awarded for assembling exchangeable plastic injection mold structures.
- 1989 Chung-Ho, Taiwan factory completed. Manufacturing of LED Indicators and LED Displays.
- 1984 Nan-Kan, Taiwan No.2 completed. PCB Manufacturing.
- 1980 Nan-Kan, Taiwan Factory No.1 completed. Manufacturing of Plastic Molds, Plastic Injections and, Reflectors for LED.
- 1974 Taiwan Oasis Enterprise Co., Ltd founded.

## Product Line

- |                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                       |                                                                                                         |                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>1</b><br/><b>LED Component Group</b></p> <ul style="list-style-type: none"> <li>▶ LED Lamps</li> <li>▶ SMD LED</li> <li>▶ Holder Lamp</li> <li>▶ LED Display                             <ul style="list-style-type: none"> <li>▶ Seven Segment</li> <li>▶ Alphanumeric</li> <li>▶ Light Bar</li> <li>▶ Dot Matrix</li> </ul> </li> </ul> | <p><b>2</b><br/><b>Lighting Module Group</b></p> <ul style="list-style-type: none"> <li>▶ Lamp / Display Module</li> <li>▶ Backlight Module</li> <li>▶ Traffic Signal Module</li> <li>▶ Street Lamp Module</li> </ul> | <p><b>3</b><br/><b>System Group</b></p> <ul style="list-style-type: none"> <li>▶ LED Cluster</li> </ul> | <p><b>4</b><br/><b>Extended Customization Group</b></p> <ul style="list-style-type: none"> <li>▶ Mold</li> <li>▶ Plastic                             <ul style="list-style-type: none"> <li>▶ Reflector</li> <li>▶ Light-guide Plate</li> <li>▶ Backlight Board</li> <li>▶ LED Through Holder</li> <li>▶ LED Cover Part</li> </ul> </li> <li>▶ PCB</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## SMD LED

### TO-2835SWNQ-H1-E

1 2 3 4 5 6

#### 1 Taiwan Oasistek

#### 2 Illumination Color Code

SW ▶ 5000-9500K  
FW ▶ 3500-5000K  
TW ▶ 2600-3500K

#### 3 CRI Index

N ▶ Ra≥80  
M ▶ Ra≥75  
L ▶ Ra≥70

#### 4 Viewing Angel

N ▶ 20°  
O ▶ 60°  
P ▶ 90°  
Q ▶ 120°  
R ▶ 140°  
S ▶ 175°  
X ▶ None

#### 5 Packaging Lens Type

C ▶ Small Size Chip  
D ▶ Small Size Chip  
E ▶ Medium-sized Chip  
F ▶ Medium-sized Chip  
H ▶ Medium-power Chip

#### 6 Special Type (Option)

B ▶ Rubbing-up series (Black surface)  
BU ▶ Reverse Packaging series  
E ▶ Add antistatic Zener  
A ▶ Triple crystal white lightmaterial,  
Anode connected and Cathode seperated  
N ▶ Reversed polarity material (chip)

### Bi-Color

### TO-3228BC-MRMGFF

1 2 3 4 5 5 6 6

#### 1 Taiwan Oasistek

#### 2 Package Dimension and Type

Code	Dimension and Lens Type
3228	[3.2mm x 2.8mm] Frame Type
3020	[3.0mm x 2.0mm] Frame Type
5050	[5.0mm x 5.0mm] Frame Type
2808	[2.8mm x 0.8mm] Side Emitting
3806	[3.8mm x 0.6mm] Side Emitting

#### 3 Lens Type

Code	Lens Type
A	Dome
B	Plane
S	Side View
T	Thin Thickness (0.4mm for 1608 Package)
D	Special Thickness (0.65mm)
K	Black Plane

#### 4 Lens Color

Code	Lens Color
C	Water Clear
D	Color Diffused
R	Red Diffused (Fluorescent)
G	Green Diffused (Fluorescent)
Y	Yellow Diffused (Fluorescent)
W	White Diffused
T	Color Transparent
F	Use Phosphors

### Tri-Color

### TO-3228BC-MRPBFGF

1 2 3 4 5 5 6 6 6

#### 5 Emitting Color Code

##### Single chip

Code	Color & Material	Wavelength (nm)
V	Violet (GaN/SiC)	405
B	Blue (InGaN/GaN)	468
BG	Bluish Green(InGaN)	505
P	Pure Green (InGaN/GaN)	525
G	Yellow Green (GaP)	570
MG	High Bright Green (AlGaInP)	572
Y	Yellow (GaAsP/GaP)	585
MY	High Bright Yellow (AlGaInP)	592
MA	High Bright Amber (AlGaInP)	605
ME	High Bright Orange(AlGaInP)	623
E	Orange (GaAsP/GaP)	630
MR	High Bright Red (AlGaInP)	630
MRl	High Bright Red (AlGaInP)	640
R	Red (GaP)	700

Color Temperature : 3000-3500 (eg.TO-3228BY-MWaK)

Multi-Chip Combination of above chip code

#### 6 Brightness Code

Code	Typical Luminous Intensity (mcd)
A	0.1~2.2
B	2.2~6.5
C	6.5~18.0
D	18.0~51.0
E	51.0~146.0
F	146.0~417.0
G	417.0~917.0
H	917.0~2015.0
K	2015.0~3406.0
M	3406.0~5756.0



# TO-B0603BC-MR-E

- 1
- 2
- 3
- 4
- 5
- 6
- 7

## 1 Taiwan Oasistek

## 2 PCB Type Code Omitted if Normal

- A ▶ Slot from 0.35mm
- B ▶ Slot from 0.55mm
- D ▶ Slot from 1.10mm

## 3 Package Dimension and Type

Code	Dimension and Lens Type
3228	[3.2mm x 2.8mm] Frame Type
3020	[3.0mm x 2.0mm] Frame Type
5050	[5.0mm x 5.0mm] Frame Type
2808	[2.8mm x 0.8mm] Side Emitting
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## 4 Lens Type

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BG	Bluish Green(InGaN)	505
P	Pure Green (InGaN/GaN)	525
G	Yellow Green (GaP)	570
MG	High Bright Green (AlGaInP)	572
Y	Yellow (GaAsP/GaP)	585
MY	High Bright Yellow (AlGaInP)	592
MA	High Bright Amber (AlGaInP)	605
ME	High Bright Orange(AlGaInP)	623
E	Orange (GaAsP/GaP)	630
MR	High Bright Red (AlGaInP)	630
MRL	High Bright Red (AlGaInP)	640
R	Red (GaP)	700

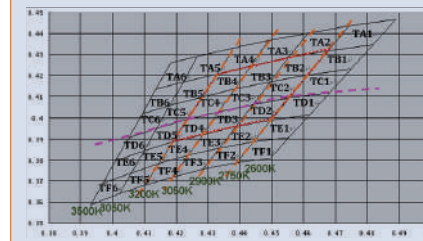
Color Temperature : 3000~3500 (eg.TO-3228BY-MWak)

### Multi-Chip Combination of above chip code

## 7 Brightness Code

Code	Typical Luminous Intensity (mcd)
A	0.1~2.2
B	2.2~6.5
C	6.5~18.0
D	18.0~51.0
E	51.0~146.0
F	146.0~417.0
G	417.0~917.0
H	917.0~2015.0
K	2015.0~3406.0
M	3406.0~5756.0

Color Temperature & TW

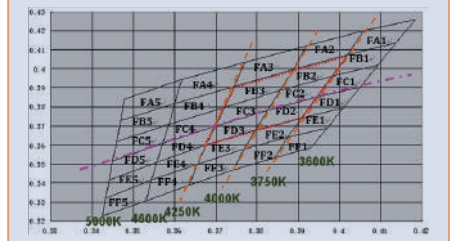


Note: [ ] is high bin

<b>TA1</b>	X 0.4889 0.4742 0.4677 0.4817 0.4889	Y 0.4466 0.4436 0.4319 0.4347 0.4466
<b>TA2</b>	X 0.4742 0.4613 0.4553 0.4677 0.4742	Y 0.4436 0.44 0.4284 0.4319 0.4436
<b>TA3</b>	X 0.4613 0.4489 0.4435 0.4553 0.4613	Y 0.44 0.4367 0.4246 0.4284 0.44
<b>TA4</b>	X 0.4489 0.438 0.433 0.4435 0.4489	Y 0.4367 0.433 0.4206 0.4246 0.4367
<b>TA5</b>	X 0.438 0.4267 0.4223 0.433 0.438	Y 0.433 0.4293 0.4171 0.4206 0.433
<b>TA6</b>	X 0.4267 0.4184 0.4137 0.4223 0.4267	Y 0.4293 0.4261 0.4138 0.4171 0.4293
<b>TB1</b>	X 0.4817 0.4677 0.4615 0.4749 0.4817	Y 0.4347 0.4319 0.4205 0.4232 0.4347
<b>TB2</b>	X 0.4677 0.4553 0.4496 0.4615 0.4677	Y 0.4319 0.4284 0.4171 0.4205 0.4319
<b>TB3</b>	X 0.4553 0.4435 0.4383 0.4496 0.4553	Y 0.4284 0.4246 0.4136 0.4171 0.4284
<b>TB4</b>	X 0.4435 0.433 0.4282 0.4383 0.4435	Y 0.4246 0.4206 0.4097 0.4136 0.4246
<b>TB5</b>	X 0.433 0.4223 0.418 0.4282 0.433	Y 0.4206 0.4171 0.4059 0.4097 0.4206
<b>TB6</b>	X 0.4223 0.4137 0.4093 0.418 0.4223	Y 0.4171 0.4138 0.402 0.4059 0.4171
<b>TC1</b>	X 0.4749 0.4615 0.4556 0.4682 0.4749	Y 0.4232 0.4205 0.4095 0.412 0.4232
<b>TC2</b>	X 0.4615 0.4496 0.444 0.4556 0.4615	Y 0.4205 0.4171 0.4063 0.4095 0.4205
<b>TC3</b>	X 0.4496 0.4383 0.4334 0.444 0.4496	Y 0.4171 0.4136 0.403 0.4063 0.4171
<b>TC4</b>	X 0.4383 0.4282 0.4235 0.4334 0.4383	Y 0.4136 0.4097 0.3993 0.403 0.4136
<b>TC5</b>	X 0.4282 0.418 0.4139 0.4235 0.4282	Y 0.4097 0.4059 0.395 0.3993 0.4097
<b>TC6</b>	X 0.418 0.4093 0.4051 0.4139 0.418	Y 0.4059 0.402 0.3906 0.395 0.4059
<b>TD1</b>	X 0.4682 0.4556 0.4498 0.4618 0.4682	Y 0.412 0.4095 0.3989 0.4013 0.412

<b>TD2</b>	X 0.4552 0.444 0.4387 0.4498 0.4552	Y 0.4095 0.4063 0.3958 0.3989 0.4095
<b>TD3</b>	X 0.444 0.4334 0.4285 0.4387 0.444	Y 0.4063 0.403 0.3921 0.3958 0.4063
<b>TD4</b>	X 0.4334 0.4235 0.419 0.4285 0.4334	Y 0.403 0.3993 0.3886 0.3921 0.403
<b>TD5</b>	X 0.4235 0.4139 0.4099 0.419 0.4235	Y 0.3993 0.395 0.3843 0.3886 0.3993
<b>TD6</b>	X 0.4139 0.4051 0.4009 0.4099 0.4139	Y 0.395 0.3906 0.3796 0.3843 0.395
<b>TE1</b>	X 0.4618 0.4498 0.4442 0.4555 0.4618	Y 0.4013 0.3989 0.3886 0.3909 0.4013
<b>TE2</b>	X 0.4498 0.4387 0.4335 0.4442 0.4498	Y 0.3989 0.3958 0.3857 0.3886 0.3989
<b>TE3</b>	X 0.4387 0.4285 0.4238 0.4335 0.4387	Y 0.3958 0.3921 0.3822 0.3857 0.3958
<b>TE4</b>	X 0.4285 0.419 0.4146 0.4238 0.4285	Y 0.3921 0.3886 0.3785 0.3822 0.3921
<b>TE5</b>	X 0.419 0.4099 0.406 0.4146 0.419	Y 0.3886 0.3843 0.3739 0.3785 0.3886
<b>TE6</b>	X 0.4099 0.4009 0.397 0.406 0.4099	Y 0.3843 0.3796 0.3689 0.3739 0.3843
<b>TF1</b>	X 0.4555 0.4442 0.4388 0.4495 0.4555	Y 0.3909 0.3886 0.3787 0.3808 0.3909
<b>TF2</b>	X 0.4335 0.4285 0.4388 0.4442 0.4335	Y 0.3857 0.3758 0.3787 0.3886 0.3857
<b>TF3</b>	X 0.4335 0.4238 0.4193 0.4285 0.4335	Y 0.3857 0.3822 0.3721 0.3758 0.3857
<b>TF4</b>	X 0.4238 0.4146 0.4103 0.4193 0.4238	Y 0.3822 0.3785 0.3682 0.3721 0.3822
<b>TF5</b>	X 0.4146 0.406 0.4023 0.4103 0.4146	Y 0.3785 0.3739 0.3642 0.3682 0.3785
<b>TF6</b>	X 0.406 0.397 0.3931 0.4023 0.406	Y 0.3739 0.3689 0.3587 0.3642 0.3739

Color Temperature & FW

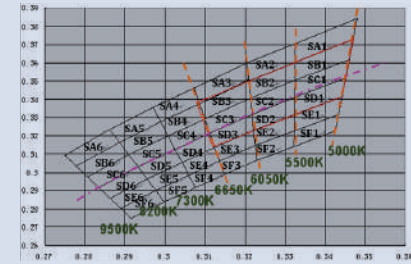


Note: [ ] is high bin

<b>FA1</b>	X 0.4184 0.4058 0.4019 0.4137 0.4184	Y 0.4261 0.42 0.4074 0.4138 0.4261
<b>FA2</b>	X 0.4058 0.392 0.3888 0.4019 0.4058	Y 0.42 0.4121 0.3996 0.4074 0.42
<b>FA3</b>	X 0.392 0.377 0.3745 0.3888 0.392	Y 0.4121 0.4035 0.3909 0.3996 0.4121
<b>FA4</b>	X 0.377 0.3618 0.3601 0.3745 0.377	Y 0.4035 0.3945 0.3818 0.3909 0.4035
<b>FA5</b>	X 0.3618 0.3479 0.3469 0.3601 0.3618	Y 0.3945 0.3841 0.3728 0.3818 0.3945
<b>FB1</b>	X 0.4137 0.4019 0.3981 0.4093 0.4137	Y 0.4138 0.4074 0.396 0.402 0.4138
<b>FB2</b>	X 0.4019 0.3888 0.3857 0.3981 0.4019	Y 0.4074 0.3996 0.3887 0.396 0.4074
<b>FB3</b>	X 0.3888 0.3745 0.3722 0.3857 0.3888	Y 0.3996 0.3909 0.3799 0.3887 0.3996
<b>FB4</b>	X 0.3745 0.3601 0.3586 0.3722 0.3745	Y 0.3909 0.3818 0.371 0.3799 0.3909
<b>FB5</b>	X 0.3601 0.3469 0.346 0.3586 0.3601	Y 0.3818 0.3728 0.362 0.371 0.3818
<b>FC1</b>	X 0.4093 0.3981 0.3944 0.4051 0.4093	Y 0.402 0.396 0.385 0.3906 0.402
<b>FC2</b>	X 0.3981 0.3857 0.3826 0.3944 0.3981	Y 0.396 0.3887 0.3781 0.385 0.396
<b>FC3</b>	X 0.3857 0.3722 0.3699 0.3826 0.3857	Y 0.3887 0.3799 0.3699 0.3781 0.3887
<b>FC4</b>	X 0.3722 0.3586 0.3572 0.3699 0.3722	Y 0.3799 0.371 0.3609 0.3699 0.3799
<b>FC5</b>	X 0.3586 0.346 0.345 0.3572 0.3586	Y 0.371 0.362 0.3516 0.3609 0.371
<b>FD1</b>	X 0.4051 0.3944 0.3909 0.4009 0.4051	Y 0.3906 0.385 0.3743 0.3796 0.3906
<b>FD2</b>	X 0.3944 0.3826 0.3797 0.3909 0.3944	Y 0.385 0.3781 0.3679 0.3743 0.385
<b>FD3</b>	X 0.3826 0.3699 0.3677 0.3797 0.3826	Y 0.3781 0.3699 0.3603 0.3679 0.3781
<b>FD4</b>	X 0.3699 0.3572 0.3558 0.3677 0.3699	Y 0.3699 0.3609 0.351 0.3603 0.3699

<b>FD5</b>					
X	0.3572	0.345	0.3442	0.3558	0.3572
Y	0.3609	0.3516	0.3415	0.351	0.3609
<b>FE1</b>					
X	0.4009	0.3909	0.3875	0.397	0.4009
Y	0.3796	0.3743	0.3641	0.3689	0.3796
<b>FE2</b>					
X	0.3909	0.3797	0.3769	0.3875	0.3909
Y	0.3743	0.3679	0.3579	0.3641	0.3743
<b>FE3</b>					
X	0.3797	0.3677	0.3656	0.3769	0.3797
Y	0.3679	0.3603	0.35	0.3579	0.3679
<b>FE4</b>					
X	0.3677	0.3558	0.3544	0.3656	0.3677
Y	0.3603	0.351	0.3416	0.35	0.3603
<b>FE5</b>					
X	0.3558	0.3442	0.3433	0.3544	0.3558
Y	0.351	0.3415	0.3318	0.3416	0.351
<b>FF1</b>					
X	0.397	0.3875	0.3843	0.3931	0.397
Y	0.3689	0.3641	0.3531	0.3587	0.3689
<b>FF2</b>					
X	0.3875	0.3769	0.3742	0.3843	0.3875
Y	0.3641	0.3579	0.3468	0.3531	0.3641
<b>FF3</b>					
X	0.3769	0.3656	0.3636	0.3742	0.3769
Y	0.3579	0.35	0.3388	0.3468	0.3579
<b>FF4</b>					
X	0.3656	0.3544	0.3531	0.3636	0.3656
Y	0.35	0.3416	0.3308	0.3388	0.35
<b>FF5</b>					
X	0.3544	0.3433	0.3425	0.3531	0.3544
Y	0.3416	0.3318	0.3225	0.3308	0.3416

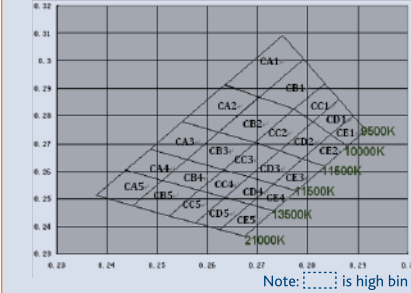
Color Temperature & SW



<b>SA1</b>					
X	0.3479	0.3325	0.3324	0.3469	0.3479
Y	0.3841	0.3706	0.3604	0.3728	0.3841
<b>SA2</b>					
X	0.3325	0.3204	0.3208	0.3324	0.3325
Y	0.3706	0.3597	0.3501	0.3604	0.3706
<b>SA3</b>					
X	0.3204	0.3073	0.3087	0.3208	0.3204
Y	0.3597	0.3463	0.3377	0.3501	0.3597
<b>SA4</b>					
X	0.3073	0.297	0.2989	0.3087	0.3073
Y	0.3463	0.3354	0.3276	0.3377	0.3463
<b>SA5</b>					
X	0.297	0.2862	0.2887	0.2989	0.297
Y	0.3354	0.3235	0.3165	0.3276	0.3354
<b>SA6</b>					
X	0.2862	0.2751	0.2779	0.2887	0.2862
Y	0.3235	0.3093	0.3034	0.3165	0.3235
<b>SB1</b>					
X	0.3469	0.3324	0.3324	0.346	0.3469
Y	0.3728	0.3604	0.3505	0.362	0.3728
<b>SB2</b>					
X	0.3324	0.3208	0.3213	0.3324	0.3324
Y	0.3604	0.3501	0.3408	0.3505	0.3604
<b>SB3</b>					
X	0.3208	0.3087	0.31	0.3213	0.3208
Y	0.351	0.3377	0.3294	0.3408	0.351
<b>SB4</b>					
X	0.3087	0.2989	0.3008	0.31	0.3087
Y	0.3377	0.3276	0.32	0.3294	0.3377
<b>SB5</b>					
X	0.2989	0.2887	0.291	0.3008	0.2989
Y	0.3276	0.3165	0.3096	0.32	0.3276
<b>SB6</b>					
X	0.2887	0.2779	0.2807	0.291	0.2887
Y	0.3165	0.3034	0.2976	0.3096	0.3165
<b>SC1</b>					
X	0.346	0.3324	0.3323	0.345	0.346
Y	0.362	0.3505	0.3409	0.3516	0.362
<b>SC2</b>					
X	0.3324	0.3213	0.3217	0.3323	0.3324
Y	0.3505	0.3408	0.3318	0.3409	0.3505
<b>SC3</b>					
X	0.3213	0.31	0.3112	0.3217	0.3213
Y	0.3408	0.3294	0.3214	0.3318	0.3408
<b>SC4</b>					
X	0.31	0.3008	0.3025	0.3112	0.31
Y	0.3294	0.32	0.3126	0.3214	0.3294
<b>SC5</b>					
X	0.3008	0.291	0.2933	0.3025	0.3008
Y	0.32	0.3096	0.3029	0.3126	0.32
<b>SC6</b>					
X	0.291	0.2807	0.2835	0.2933	0.291
Y	0.3096	0.2976	0.2917	0.3029	0.3096
<b>SD1</b>					
X	0.345	0.3323	0.3322	0.3442	0.345
Y	0.3516	0.3409	0.3317	0.3415	0.3516

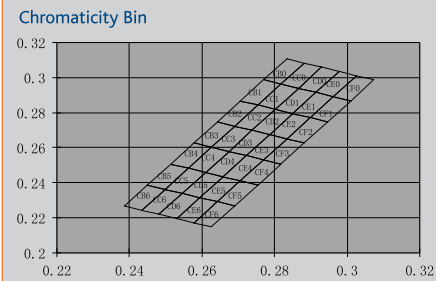
<b>SD2</b>					
X	0.3323	0.3217	0.3221	0.3322	0.3323
Y	0.3409	0.3318	0.3231	0.3317	0.3409
<b>SD3</b>					
X	0.3217	0.3112	0.3124	0.3221	0.3217
Y	0.3318	0.3214	0.3136	0.3231	0.3318
<b>SD4</b>					
X	0.3112	0.3025	0.3043	0.3124	0.3112
Y	0.3214	0.3126	0.3054	0.3136	0.3214
<b>SD5</b>					
X	0.3025	0.2933	0.2955	0.3043	0.3025
Y	0.3126	0.3029	0.2965	0.3054	0.3126
<b>SD6</b>					
X	0.2933	0.2835	0.2863	0.2955	0.2933
Y	0.3029	0.2917	0.286	0.2965	0.3029
<b>SE1</b>					
X	0.3442	0.3322	0.3322	0.3433	0.3442
Y	0.3415	0.3317	0.3228	0.3318	0.3415
<b>SE2</b>					
X	0.3322	0.3221	0.3225	0.3322	0.3322
Y	0.3317	0.3231	0.3147	0.3228	0.3317
<b>SE3</b>					
X	0.3221	0.3124	0.3136	0.3225	0.3221
Y	0.3231	0.3136	0.3061	0.3147	0.3231
<b>SE4</b>					
X	0.3124	0.3043	0.3059	0.3136	0.3124
Y	0.3136	0.3054	0.2985	0.3061	0.3136
<b>SE5</b>					
X	0.3043	0.2955	0.2977	0.3059	0.3043
Y	0.3054	0.2965	0.2901	0.2985	0.3054
<b>SE6</b>					
X	0.2955	0.2863	0.2891	0.2977	0.2955
Y	0.2965	0.286	0.2802	0.2901	0.2965
<b>SF1</b>					
X	0.3433	0.3322	0.3321	0.3425	0.3433
Y	0.3318	0.3228	0.3141	0.3225	0.3318
<b>SF2</b>					
X	0.3322	0.3225	0.3229	0.3321	0.3322
Y	0.3228	0.3147	0.3066	0.3141	0.3228
<b>SF3</b>					
X	0.3225	0.3136	0.3148	0.3229	0.3225
Y	0.3147	0.3061	0.2987	0.3066	0.3147
<b>SF4</b>					
X	0.3136	0.3059	0.3076	0.3148	0.3136
Y	0.3061	0.2985	0.2917	0.2987	0.3061
<b>SF5</b>					
X	0.3059	0.2977	0.2998	0.3076	0.3059
Y	0.2985	0.2901	0.284	0.2917	0.2985
<b>SF6</b>					
X	0.2977	0.2891	0.2916	0.2998	0.2977
Y	0.2901	0.2802	0.2749	0.284	0.2901

Color Temperature & CW



<b>CA1</b>					
X	0.2751	0.2792	0.2704	0.2635	0.2751
Y	0.3093	0.3007	0.2869	0.2912	0.3093
<b>CA2</b>					
X	0.2635	0.2702	0.2623	0.255	0.2635
Y	0.2915	0.2869	0.2742	0.2779	0.2915
<b>CA3</b>					
X	0.255	0.2623	0.2559	0.2486	0.255
Y	0.2779	0.2742	0.2642	0.2679	0.2779
<b>CA4</b>					
X	0.2486	0.2559	0.2511	0.2438	0.2486
Y	0.2679	0.2642	0.2568	0.2605	0.2679
<b>CAS</b>					
X	0.2379	0.2452	0.2511	0.2438	0.2379
Y	0.2512	0.2475	0.2568	0.2605	0.2512
<b>CB1</b>					
X	0.2792	0.2835	0.2773	0.2704	0.2792
Y	0.3007	0.2917	0.2826	0.2869	0.3007
<b>CB2</b>					
X	0.2704	0.2773	0.2696	0.2623	0.2704
Y	0.2869	0.2826	0.2705	0.2742	0.2869
<b>CB3</b>					
X	0.2623	0.2696	0.2632	0.2559	0.2623
Y	0.2742	0.2705	0.2605	0.2642	0.2742
<b>CB4</b>					
X	0.2559	0.2632	0.2584	0.2511	0.2559
Y	0.2642	0.2605	0.2531	0.2568	0.2642
<b>CB5</b>					
X	0.2511	0.2584	0.2525	0.2452	0.2511
Y	0.2568	0.2531	0.2438	0.2475	0.2568
<b>CC1</b>					
X	0.2835	0.2863	0.2811	0.2773	0.2835
Y	0.2917	0.286	0.2779	0.2826	0.2917
<b>CC2</b>					
X	0.2773	0.2811	0.2744	0.2696	0.2773
Y	0.2826	0.2779	0.2675	0.2705	0.2826
<b>CC3</b>					
X	0.2696	0.2744	0.2683	0.2632	0.2696
Y	0.2705	0.2675	0.2579	0.2605	0.2705
<b>CC4</b>					
X	0.2632	0.2683	0.2635	0.2584	0.2632
Y	0.2605	0.2579	0.2504	0.2531	0.2605
<b>CC5</b>					
X	0.2584	0.2635	0.2577	0.2525	0.2584
Y	0.2531	0.2504	0.2413	0.2438	0.2531
<b>CD1</b>					
X	0.2863	0.2891	0.2846	0.2811	0.2863
Y	0.286	0.2802	0.2733	0.2779	0.286
<b>CD2</b>					
X	0.2811	0.2846	0.279	0.2744	0.2811
Y	0.2779	0.2733	0.2646	0.2675	0.2779
<b>CD3</b>					
X	0.2744	0.279	0.2732	0.2683	0.2744
Y	0.2675	0.2646	0.2554	0.2579	0.2675
<b>CD4</b>					
X	0.2683	0.2732	0.2684	0.2635	0.2683
Y	0.2579	0.2554	0.248	0.2504	0.2579

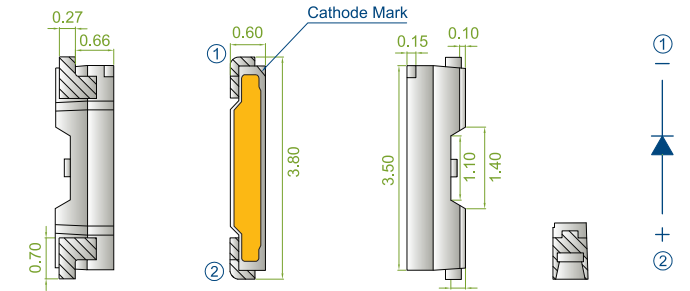
<b>CD5</b>					
X	0.2635	0.2684	0.2626	0.2577	0.2635
Y	0.2504	0.248	0.2388	0.2413	0.2504
<b>CE1</b>					
X	0.2891	0.2916	0.288	0.2846	0.2891
Y	0.2802	0.2749	0.2691	0.2733	0.2802
<b>CE2</b>					
X	0.2846	0.288	0.2834	0.279	0.2846
Y	0.2733	0.2691	0.2618	0.2646	0.2733
<b>CE3</b>					
X	0.279	0.2834	0.2779	0.2732	0.279
Y	0.2646	0.2618	0.253	0.2554	0.2646
<b>CE4</b>					
X	0.2732	0.2779	0.2732	0.2684	0.2732
Y	0.2554	0.253	0.2455	0.248	0.2554
<b>CE5</b>					
X	0.2684	0.2732	0.2675	0.2626	0.2684
Y	0.248	0.2455	0.2364	0.2388	0.248



<b>CB0</b>					
X	0.2834	0.2882	0.2818	0.277	0.2834
Y	0.3107	0.3083	0.2963	0.2987	0.3107
<b>CB1</b>					
X	0.277	0.2818	0.2754	0.2706	0.277
Y	0.2987	0.2963	0.2843	0.2867	0.2987
<b>CB2</b>					
X	0.2706	0.2754	0.269	0.2642	0.2706
Y	0.2867	0.2843	0.2723	0.2747	0.2867
<b>CB3</b>					
X	0.2642	0.269	0.2626	0.2578	0.2642
Y	0.2747	0.2723	0.2603	0.2627	0.2747
<b>CB4</b>					
X	0.2578	0.2626	0.2562	0.2514	0.2578
Y	0.2627	0.2603	0.2483	0.2507	0.2627
<b>CB5</b>					
X	0.2514	0.2562	0.2498	0.245	0.2514
Y	0.2507	0.2483	0.2363	0.2387	0.2507
<b>CB6</b>					
X	0.245	0.2498	0.2434	0.2386	0.245
Y	0.2387	0.2363	0.2243	0.2267	0.2387
<b>CC0</b>					
X	0.2882	0.293	0.2866	0.2818	0.2882
Y	0.3083	0.3059	0.2939	0.2963	0.3083
<b>CC1</b>					
X	0.2818	0.2866	0.2802	0.2754	0.2818
Y	0.2963	0.2939	0.2819	0.2843	0.2963
<b>CC2</b>					
X	0.2754	0.2802	0.2738	0.269	0.2754
Y	0.2843	0.2819	0.2699	0.2723	0.2843
<b>CC3</b>					
X	0.269	0.2738	0.2674	0.2626	0.269
Y	0.2723	0.2699	0.2579	0.2603	0.2723
<b>CC4</b>					
X	0.2626	0.2674	0.261	0.2562	0.2626
Y	0.2603	0.2579	0.2459	0.2483	0.2603
<b>CC5</b>					
X	0.2562	0.261	0.2546	0.2498	0.2562
Y	0.2483	0.2459	0.2339	0.2363	0.2483
<b>CC6</b>					
X	0.2498	0.2546	0.2482	0.2434	0.2498
Y	0.2363	0.2339	0.2219	0.2243	0.2363
<b>CD0</b>					
X	0.293	0.2978	0.2914	0.2866	0.293
Y	0.3059	0.3035	0.2915	0.2939	0.3059
<b>CD1</b>					
X	0.2866	0.2914	0.285	0.2802	0.2866
Y	0.2939	0.2915	0.2795	0.2819	0.2939
<b>CD2</b>					
X	0.2802	0.285	0.2786	0.2738	0.2802
Y	0.2819	0.2795	0.2675	0.2699	0.2819

<b>CD3</b>					
X	0.2738	0.2786	0.2722	0.2674	0.2738
Y	0.2699	0.2675	0.2555	0.2579	0.2699
<b>CD4</b>					
X	0.2674	0.2722	0.2658	0.261	0.2674
Y	0.2579	0.2555	0.2435	0.2459	0.2579
<b>CD5</b>					
X	0.261	0.2658	0.2594	0.2546	0.261
Y	0.2459	0.2435	0.2315	0.2339	0.2459
<b>CD6</b>					
X	0.2546	0.2594	0.253	0.2482	0.2546
Y	0.2339	0.2315	0.2195	0.2219	0.2339
<b>CE0</b>					
X	0.2978	0.3026	0.2962	0.2914	0.2978
Y	0.3035	0.3011	0.2891	0.2915	0.3035
<b>CE1</b>					
X	0.2914	0.2962	0.2898	0.285	0.2914
Y	0.2915	0.2891	0.2771	0.2795	0.2915
<b>CE2</b>					
X	0.285	0.2898	0.2834	0.2786	0.285
Y	0.2795	0.2771	0.2651	0.2675	0.2795
<b>CE3</b>					
X	0.2786	0.2834	0.277	0.2722	0.2786
Y	0.2675	0.2651	0.2531	0.2555	0.2675
<b>CE4</b>					
X	0.2722	0.277	0.2706	0.2658	0.2722
Y	0.2555	0.2531	0.2411	0.2435	0.2555
<b>CE5</b>					
X	0.2658	0.2706	0.2642	0.2594	0.2658
Y	0.2435	0.2411	0.2291	0.2315	0.2435
<b>CE6</b>					
X	0.2594	0.2642	0.2578	0.253	0.2594
Y	0.2315	0.2291	0.2171	0.2195	0.2315
<b>CF0</b>					
X	0.3026	0.3074	0.301	0.2962	0.3026
Y	0.3011	0.2987	0.2867	0.2891	0.3011
<b>CF1</b>					
X	0.2962	0.301	0.2946	0.2898	0.2962
Y	0.2891	0.2867	0.2747	0.2771	0.2891
<b>CF2</b>					
X	0.2898	0.2946	0.2882	0.2834	0.2898
Y	0.2771	0.2747	0.2627	0.2651	0.2771
<b>CF3</b>					
X	0.2834	0.2882	0.2818	0.277	0.2834
Y	0.2651	0.2627	0.2507	0.2531	0.2651
<b>CF4</b>					
X	0.277	0.2818	0.2754	0.2706	0.277
Y	0.2531	0.2507	0.2387	0.2411	0.2531
<b>CF5</b>					
X	0.2706	0.2754	0.269	0.2642	0.2706
Y	0.2411	0.2387	0.2267	0.2291	0.2411
<b>CF6</b>					
X	0.2642	0.269	0.2626	0.2578	0.2642
Y	0.2291	0.2267	0.2147	0.2171	0.2291

### TO-3806



**Features**

- 3.8mm x 0.6mm x 1.0mm
- High efficiency LED
- IC compatible
- Compatible with automatic placement equipment
- Compatible with infrared and vapor phase reflow solder process

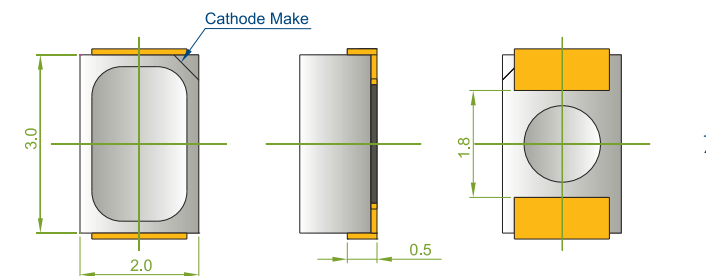
**Application**

- Backlight



Part Number	Wavelength $\lambda_c$ (nm) Cx/Cy	Emitting Color	Forward Voltage (V)	Test Condition (mA)	IV(mcd)	Viewing Angle 2 $\theta_{1/2}$ (°)
TO-3806CWLQ-D1	0.295/0.285	White	2.8-3.4	20	2400-2700	120
TO-3806CWLQ-D1	0.28/0.26				2200-2500	
TO-3806CWLQ-D1	0.263/0.235				2300-2000	
TO-3806CWLQ-E2	0.295/0.285				2500-2800	
TO-3806CWLQ-E2	0.28/0.26				2300-2600	
TO-3806CWLQ-E2	0.263/0.235				2100-2400	
TO-3806CWLQ-F4	0.295/0.285				2700-3000	
TO-3806CWLQ-F4	0.28/0.26				2500-2800	
TO-3806CWLQ-F4	0.263/0.235				2300-2600	

### TO-3020



**Features**

- 3.0mm x 2.0mm x 2.0mm
- High efficiency LED
- IC compatible
- Compatible with automatic placement equipment
- Compatible with infrared and vapor phase reflow solder process

**Application**

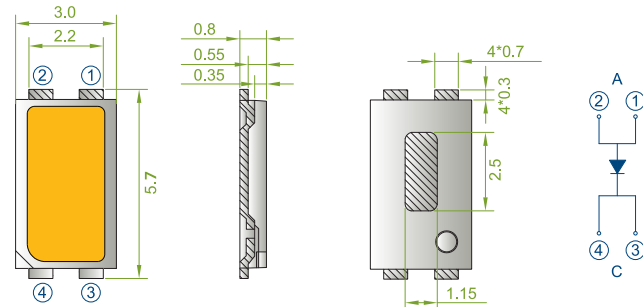
- Backlight



Part Number	Wavelength $\lambda_c$ (nm) Cx/Cy	Emitting Color	Forward Voltage (V)	Test Condition (mA)	IV(mcd)	Viewing Angle 2 $\theta_{1/2}$ (°)
TO-3020CWLQ-D1	0.295/0.285	White	2.8-3.4	20	2400-2800	120
TO-3020CWLQ-D1	0.28/0.26				2200-2600	
TO-3020CWLQ-D1	0.263/0.235				2000-2400	
TO-3020CWLQ-E2	0.295/0.285				2500-2900	
TO-3020CWLQ-E2	0.28/0.26				2300-2700	
TO-3020CWLQ-E2	0.263/0.235				2100-2500	
TO-3020CWLQ-F4	0.295/0.285				2700-3100	
TO-3020CWLQ-F4	0.28/0.26				2500-2900	
TO-3020CWLQ-F4	0.263/0.235				2300-2700	



# TO-5730



**Features**

- 5.7mm x 3.0mm x 0.8mm
- High efficiency LED
- IC compatible
- Compatible with automatic placement equipment
- Compatible with infrared and vapor phase reflow solder process

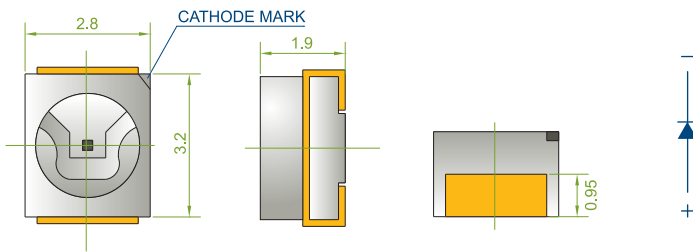
**Application**

- General lighting
- Backlight



Part Number	Wavelength $\lambda_c$ (nm) Cx/Cy	Emitting Color	Forward Voltage (V)	Test Condition (mA)	IV(mcd)	Viewing Angle 2 $\theta_{1/2}$ (°)
TO-5730CWLQ-H1	0.295/0.285	White	2.8-3.4	60	8750-10850	120
TO-5730CWLQ-H1	0.28/0.26				7000-9100	
TO-5730CWLQ-H1	0.263/0.235				5250-7350	
TO-5730CWLQ-H2	0.295/0.285				15050-17150	
TO-5730CWLQ-H2	0.28/0.26				13300-15400	
TO-5730CWLQ-H2	0.263/0.235				11550-13650	
TO-5730CWLQ-H3	0.295/0.285				15750-17850	
TO-5730CWLQ-H3	0.28/0.26				14000-16100	
TO-5730CWLQ-H3	0.263/0.235				12250-14350	

# TO-3228 TO-3528



**Features**

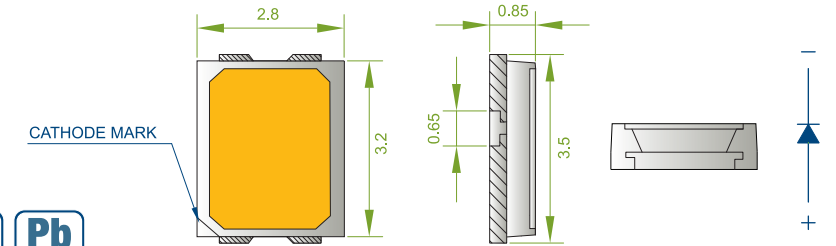
- 3.5mm x 2.8mm x 1.9mm
- High efficiency LED
- IC compatible
- Compatible with automatic placement equipment
- Compatible with infrared and vapor phase reflow solder process

**Application**

- General lighting

Part Number	Wavelength $\lambda_c$ (nm) Cx/Cy	Emitting Color	Color Temperature	Forward Voltage (V)	Test Condition (mA)	Typ Luminous Flux(LM) @20mA	CRI (Min)	Viewing Angle 2 $\theta_{1/2}$ (°)
<b>3528 0.06W/20mA</b>								
TO-3228TWLQ-E2	0.43/0.40	Warm White	2600K-3500K	2.8-3.4	20	6.5	70	120
TO-3228FWLQ-E2	0.37/0.37	Neutral White	3500K-5000K			7.5	70	
TO-3228SWLQ-E2	0.32/0.33	Cool White	5000K-9500K			7.5	70	
TO-3228TWNQ-E2	0.43/0.40	Warm White	2600K-3500K			6	80	
TO-3228FWNQ-E2	0.37/0.37	Neutral White	3500K-5000K			7	80	
TO-3228SWNQ-E2	0.32/0.33	Cool White	5000K-9500K			7	80	
TO-3228TWLQ-F2	0.43/0.40	Warm White	2600K-3500K			7.5	70	
TO-3228FWLQ-F2	0.37/0.37	Neutral White	3500K-5000K			8.5	70	
TO-3228SWLQ-F2	0.32/0.33	Cool White	5000K-9500K			8.5	70	
TO-3228TWNQ-F2	0.43/0.40	Warm White	2600K-3500K			7	80	
TO-3228FWNQ-F2	0.37/0.37	Neutral White	3500K-5000K			8	80	
TO-3228SWNQ-F2	0.32/0.33	Cool White	5000K-9500K			8	80	

# TO-2835



**Features**

- 3.5mm x 2.8mm x 0.85mm
- High efficiency LED
- IC compatible
- Compatible with automatic placement equipment
- Compatible with infrared and vapor phase reflow solder process

**Application**

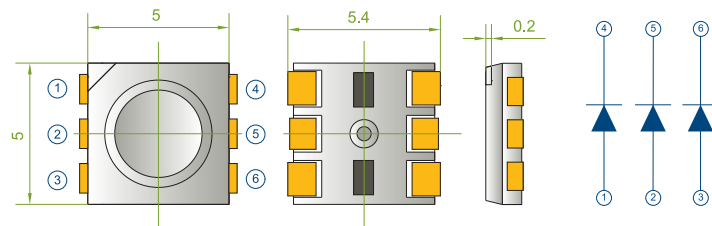
- General lighting

Part Number	Wavelength $\lambda_c$ (nm) Cx/Cy	Emitting Color	Color Temperature	Forward Voltage (V)	Test Condition (mA)	Typ Luminous Flux(LM)	CRI (Min)	Viewing Angle 2 $\theta_{1/2}$ (°)
<b>2835 0.2W/60mA @60mA</b>								
TO-2835TWLQ-H1	0.43/0.40	Warm White	2600K-3500K	2.8-3.4	60	25	70	120
TO-2835FWLQ-H1	0.37/0.37	Neutral White	3500K-5000K			27	70	
TO-2835SWLQ-H1	0.32/0.33	Cool White	5000K-9500K			27	70	
TO-2835TWNQ-H1	0.43/0.40	Warm White	2600K-3500K			24	80	
TO-2835FWNQ-H1	0.37/0.37	Neutral White	3500K-5000K			26	80	
TO-2835SWNQ-H1	0.32/0.33	Cool White	5000K-9500K			26	80	
<b>2835 0.4W/120mA @120mA</b>								
TO-2835TWLQ-H2	0.43/0.40	Warm White	2600K-3500K	2.8-3.4	120	45	70	120
TO-2835FWLQ-H2	0.37/0.37	Neutral White	3500K-5000K			47	70	
TO-2835SWLQ-H2	0.32/0.33	Cool White	5000K-9500K			47	70	
TO-2835TWNQ-H2	0.43/0.40	Warm White	2600K-3500K			42	80	
TO-2835FWNQ-H2	0.37/0.37	Neutral White	3500K-5000K			44	80	
TO-2835SWNQ-H2	0.32/0.33	Cool White	5000K-9500K			44	80	
<b>2835 0.5W/150mA @150mA</b>								
TO-2835TWLQ-H3	0.43/0.40	Warm White	2600K-3500K	2.8-3.4	150	50	70	120
TO-2835FWLQ-H3	0.37/0.37	Neutral White	3500K-5000K			53	70	
TO-2835SWLQ-H3	0.32/0.33	Cool White	5000K-9500K			53	70	
TO-2835TWNQ-H3	0.43/0.40	Warm White	2600K-3500K			46	80	
TO-2835FWNQ-H3	0.37/0.37	Neutral White	3500K-5000K			50	80	
TO-2835SWNQ-H3	0.32/0.33	Cool White	5000K-9500K			50	80	





# TO-5050



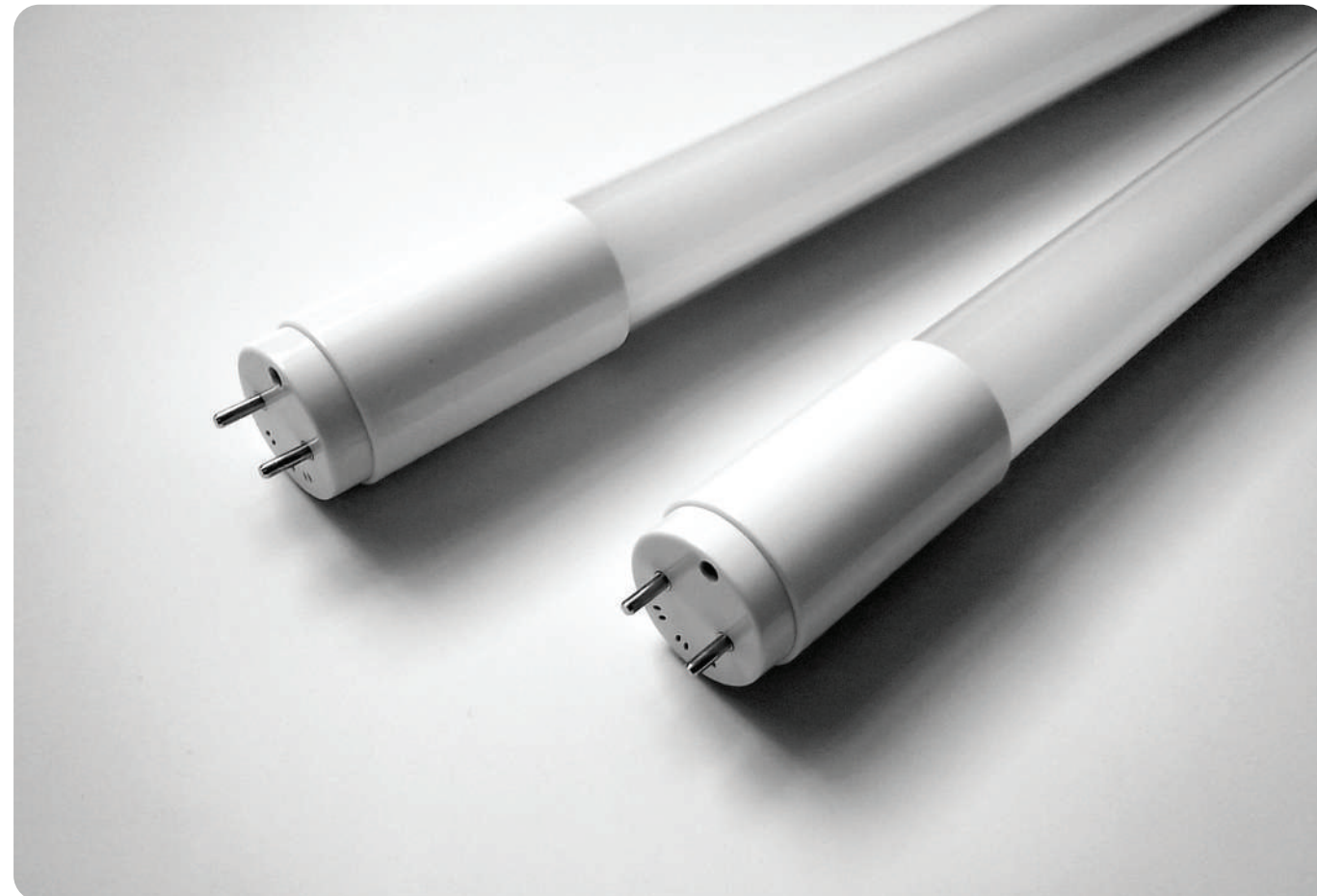
**Features**

- 5.0mm x 5.0mm x 1.55mm
- High efficiency LED
- IC compatible
- Compatible with automatic placement equipment
- Compatible with infrared and vapor phase reflow solder process

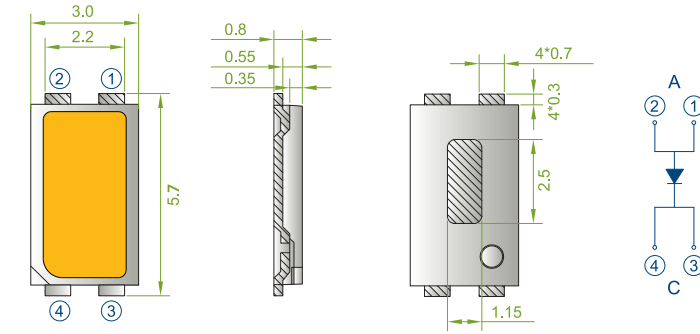
**Application**

- General lighting

Part Number	Wavelength $\lambda_c$ (nm) Cx/Cy	Emitting Color	Color Temperature	Forward Voltage (V)	Test Condition (mA)	Typ Luminous Flux(LM) @60mA	CRI (Min)	Viewing Angle 2 $\theta$ 1/2 (°)
<b>5050 0.2W/60mA</b>								
TO-5050TWLQ-E2	0.43/0.40	Warm White	2600K-3500K	2.8-3.4	60	22	70	120
TO-5050FWLQ-E2	0.37/0.37	Neutral White	3500K-5000K			24	70	
TO-5050SWLQ-E2	0.32/0.33	Cool White	5000K-9500K			24	70	
TO-5050TWNQ-E2	0.43/0.40	Warm White	2600K-3500K			20	80	
TO-5050FWNQ-E2	0.37/0.37	Neutral White	3500K-5000K			22	80	
TO-5050SWNQ-E2	0.32/0.33	Cool White	5000K-9500K			22	80	
TO-5050TWLQ-F2	0.43/0.40	Warm White	2600K-3500K			24	70	
TO-5050FWLQ-F2	0.37/0.37	Neutral White	3500K-5000K			26	70	
TO-5050SWLQ-F2	0.32/0.33	Cool White	5000K-9500K			26	70	
TO-5050TWNQ-F2	0.43/0.40	Warm White	2600K-3500K			22	80	
TO-5050FWNQ-F2	0.37/0.37	Neutral White	3500K-5000K			24	80	
TO-5050SWNQ-F2	0.32/0.33	Cool White	5000K-9500K			24	80	



# TO-5730



**Features**

- 5.7mm x 3.0mm x 0.8mm
- High efficiency LED
- IC compatible
- Compatible with automatic placement equipment
- Compatible with infrared and vapor phase reflow solder process

**Application**

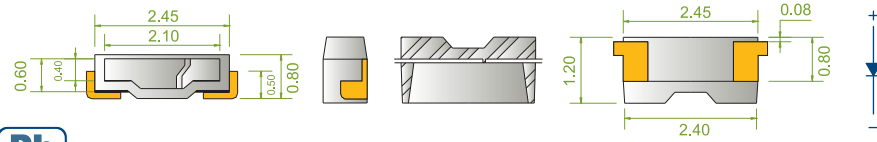
- General lighting
- Backlight

Part Number	Wavelength $\lambda_c$ (nm) Cx/Cy	Emitting Color	Color Temperature	Forward Voltage (V)	Test Condition (mA)	Typ Luminous Flux(LM) @60mA	CRI (Min)	Viewing Angle 2 $\theta$ 1/2 (°)
<b>5730 0.2W/60mA</b>								
TO-5730TWLQ-H1	0.43/0.40	Warm White	2600K-3500K	2.8-3.4	60	25	70	120
TO-5730FWLQ-H1	0.37/0.37	Neutral White	3500K-5000K			27	70	
TO-5730SWLQ-H1	0.32/0.33	Cool White	5000K-9500K			27	70	
TO-5730TWNQ-H1	0.43/0.40	Warm White	2600K-3500K			24	80	
TO-5730FWNQ-H1	0.37/0.37	Neutral White	3500K-5000K			26	80	
TO-5730SWNQ-H1	0.32/0.33	Cool White	5000K-9500K			26	80	
<b>5730 0.4W/120mA</b>								
TO-5730TWLQ-H2	0.43/0.40	Warm White	2600K-3500K	2.8-3.4	120	46	70	120
TO-5730FWLQ-H2	0.37/0.37	Neutral White	3500K-5000K			48	70	
TO-5730SWLQ-H2	0.32/0.33	Cool White	5000K-9500K			48	70	
TO-5730TWNQ-H2	0.43/0.40	Warm White	2600K-3500K			43	80	
TO-5730FWNQ-H2	0.37/0.37	Neutral White	3500K-5000K			45	80	
TO-5730SWNQ-H2	0.32/0.33	Cool White	5000K-9500K			45	80	
<b>5730 0.5W/150mA</b>								
TO-5730TWLQ-H3	0.43/0.40	Warm White	2600K-3500K	2.8-3.6	150	52	70	120
TO-5730FWLQ-H3	0.37/0.37	Neutral White	3500K-5000K			55	70	
TO-5730SWLQ-H3	0.32/0.33	Cool White	5000K-9500K			55	70	
TO-5730TWNQ-H3	0.43/0.40	Warm White	2600K-3500K			48	80	
TO-5730FWNQ-H3	0.37/0.37	Neutral White	3500K-5000K			52	80	
TO-5730SWNQ-H3	0.32/0.33	Cool White	5000K-9500K			52	80	



# TO-2808

PLCC 2808 Package



**Features**

- 2.8mm x 0.8mm x 1.2mm
- High efficiency LED
- Low power consumption
- Wide viewing angle
- Various color available

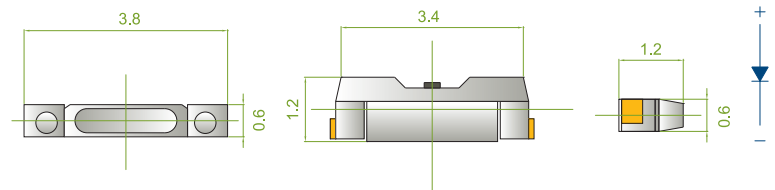
**Application**

- LCD backlight
- Indicator light

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TO-2808SC-BF	InGaN	Blue	468	Water Clear	3.2	3.6	146	281	120
TO-2808SC-PF	InGaN	Pure Green	525		3.2	3.6	146	281	
TO-2808SC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	51	98	
TO-2808SC-MYF	AlGaInP	High Bright Yellow	590		2.0	2.4	146	281	
TO-2808SC-MRE	AlGaInP	High Bright Red	630		1.9	2.4	51	98	

# TO-3806

PLCC 3806 Package



**Features**

- 3.8mm x 0.6mm x 1.2mm
- High efficiency LED
- Low power consumption
- Wide viewing angle
- Various color available

**Application**

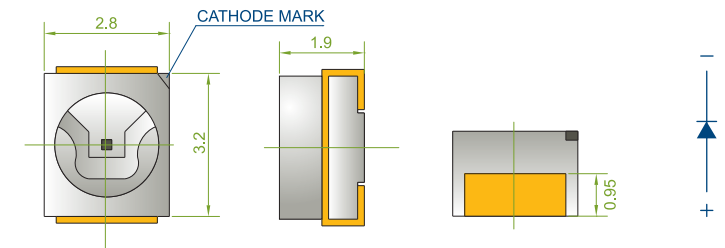
- LCD backlight
- Indicator light

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA	Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	TYP.	
TO-3806SC-BF	InGaN	Blue	468	Water Clear	3.2	3.6	200	120
TO-3806SC-PG	InGaN	Pure Green	525		3.2	3.6	450	
TO-3806SC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	60	
TO-3806SC-MAF	AlGaInP	High Bright Amber	605		2.0	2.4	155	
TO-3806SC-MRF	AlGaInP	High Bright Red	630		1.9	2.4	150	

# TO-3228 TO-3528

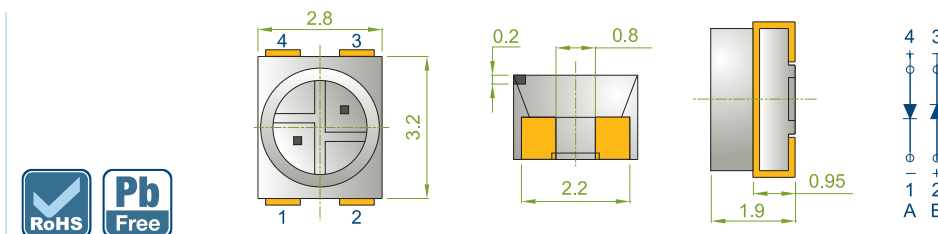
PLCC 3228 Package

Single Color



Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TO-3228BC-BF	InGaN	Blue	468	Water Clear	3.3	3.6	146	281	120
TO-3228BC-PG	InGaN	Pure Green	525		3.3	3.6	417	805	
TO-3228BC-MGE	AlGaInP	High Bright Green	572		2.2	2.4	51	98	
TO-3228BC-MYG	AlGaInP	High Bright Yellow	592		2.0	2.4	417	805	
TO-3228BC-MAF	AlGaInP	High Bright Amber	605		2.0	2.4	542	1046	
TO-3228BC-ED	GaAsP	Orange	621		2.0	2.4	10.5	20	
TO-3228BC-MEG	AlGaInP	High Bright Orange	623		2.0	2.4	417	805	
TO-3228BC-MRG	AlGaInP	High Bright Red	630		1.9	2.4	417	667	

Double Color



**Features**

- 3.2mm x 2.8mm x 1.9mm
- High efficiency LED
- Low power consumption
- Wide viewing angle
- Dual color
- Various color available

**Application**

- Backlight
- Sign display
- General lighting
- Wall wash lighting
- Residential lighting

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TO-3228BC-PBFF	InGaN	Pure Green	525	Water Clear	3.3	3.6	51	98	120
	InGaN	Blue	468		3.3	3.6	51	98	
TO-3228BC-MGMGEE	AlGaInP	High Bright Green	572		2.0	2.4	51	98	
	AlGaInP	High Bright Green	572		2.0	2.4	51	98	
TO-3228BC-MYPFF	AlGaInP	High Bright Yellow	590		2.0	2.4	146	281	
	InGaN	Pure Green	525		3.3	3.6	146	281	
TO-3228BC-MYMGFE	AlGaInP	High Bright Yellow	590		2.0	2.4	146	281	
	AlGaInP	High Bright Green	572		2.0	2.4	51	98	
TO-3228BC-MAMAFF	AlGaInP	High Bright Amber	605		2.0	2.4	146	281	
	AlGaInP	High Bright Amber	605		2.0	2.4	146	281	
TO-3228BC-MEPFG	AlGaInP	High Bright Orange	623		2.0	2.4	51	98	
	InGaN	Pure Green	525		2.0	2.4	146	281	
TO-3228BC-MEMYFF	AlGaInP	High Bright Orange	623		2.0	2.4	146	281	
	AlGaInP	High Bright Yellow	590		2.0	2.4	146	281	
TO-3228BC-MRBEF	AlGaInP	High Bright Red	630		1.9	2.4	51	98	
	InGaN	Blue	468		3.3	3.6	146	281	
TO-3228BC-MRPFG	AlGaInP	High Bright Red	630		1.9	2.4	146	281	
	InGaN	Pure Green	525		3.3	3.6	417	805	
TO-3228BC-MRMGEE	AlGaInP	High Bright Red	630		1.9	2.4	51	98	
	AlGaInP	High Bright Green	572		2.0	2.4	51	98	

SMD

Full Color

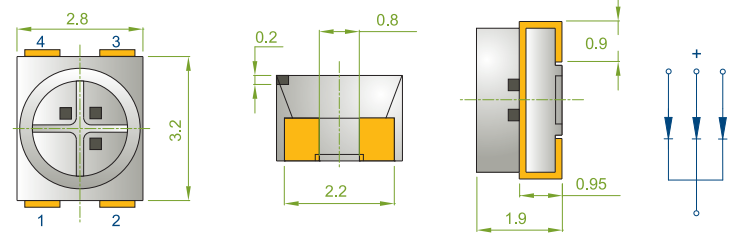


Features

- 3.2mm x 2.8mm x 1.9mm
- High efficiency LED
- Low power consumption
- Wide viewing angle

Application

- Backlight
- Sign display
- General lighting
- Wall wash lighting
- Residential lighting



Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TO-3228BC-3MYH	AlGaInP	High Bright Yellow	590	Water	2.0	2.4	917	1997	120
TO-3228BC-3MAK	AlGaInP	High Bright Amber	605	Clear	2.0	2.4	1150	2278	

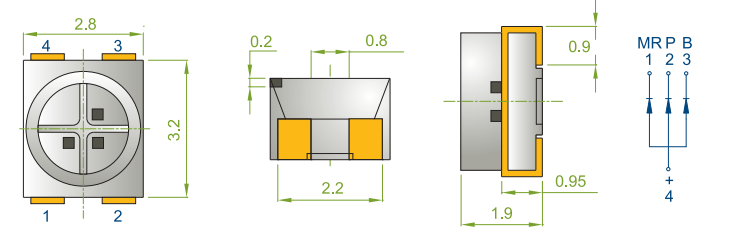


Features

- 3.2mm x 2.8mm x 1.9mm
- High efficiency LED
- Low power consumption
- Wide viewing angle
- RGB full color

Application

- Backlight
- Sign display
- General lighting
- Wall wash lighting
- Residential lighting



Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TO-3228BC-MRPBFGF	AlGaInP	High Bright Red	630	Water	2.0	2.4	146	281	120
	InGaN	Pure Green	525		3.2	3.6	417	667	
	InGaN	Blue	468		3.2	3.6	146	281	
TO-3228BC-MEPBFGF	AlGaInP	High Bright Orange	623	Clear	2.0	2.4	146	281	
	InGaN	Pure Green	525		3.2	3.6	417	667	
	InGaN	Blue	468		3.2	3.6	146	281	

SMD

TO-5050

PLCC 5050 Package

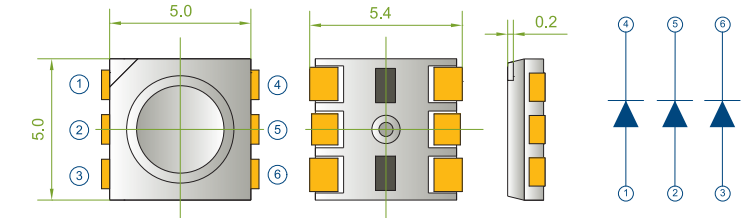


Features

- 5.0mm x 5.0mm x 1.5mm
- High efficiency LED
- Low power consumption
- Wide viewing angle
- Various color available

Application

- Office lighting
- Indoor display
- Residential lighting
- General lighting
- Backlight and indicator



Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TO-5050BC-143PK	InGaN	Pure Green	525	Water Clear	3.2	3.6	2015	2711	120
TO-5050BC-123MYH	AlGaInP	High Bright Yellow	590		2.0	2.4	917	1466	
TO-5050BC-3MAG	AlGaInP	High Bright Amber	605		2.0	2.4	417	805	
TO-5050BC-143MEH-N	AlGaInP	High Bright Orange	623		2.0	2.4	917	1466	
TO-5050BC-123MRG	AlGaInP	High Bright Red	630		1.9	2.4	419	667	

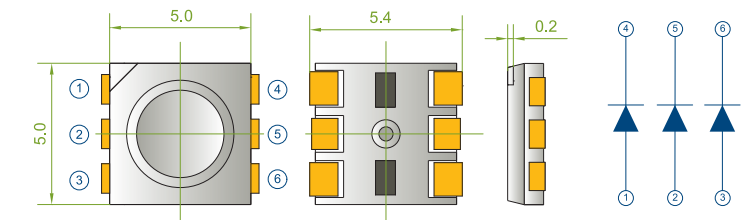


Features

- 5.0mm x 5.0mm x 1.5mm
- High efficiency LED
- Low power consumption
- Wide viewing angle
- RGB full color

Application

- Office lighting
- Indoor display
- Residential lighting
- General lighting
- Backlight and indicator

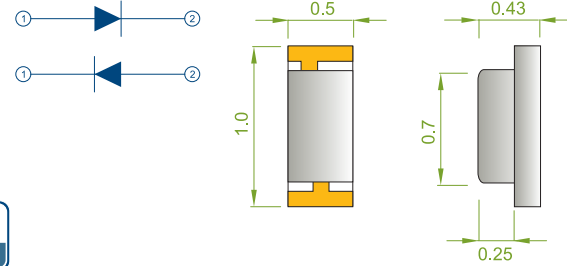


Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½	
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.		
TO-5050BC-MEPBGFH	AlGaInP	High Bright Orange	623	Water Clear	2.0	2.4	417	667	120	
	InGaN	Pure Green	525		3.2	3.6	417	667		
	InGaN	Blue	468		3.2	3.6	146	281		
TO-5050BC-MRPBFGF	AlGaInP	High Bright Red	630		Clear	1.9	2.4	146		281
	InGaN	Pure Green	525			3.2	3.6	417		667
	InGaN	Blue	468			3.2	3.6	146		281



## TO-1005

PCB 1005 Package



### Features

- 1.0mm x 0.5mm x 0.43mm
- Low power consumption
- Wide viewing angle
- Various color available

### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$				$I_v$ (mcd) at $I_f=20\text{mA}$	Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.		
TO-1005BC-BE	InGaP	Blue	468	Water Clear	3.2	3.6	51	112	120	
TO-1005BC-PF	InGaP	Pure Green	525		3.2	3.6	146	247		
TO-1005BC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	51	112		
TO-1005BC-MYF	AlGaInP	High Bright Yellow	592		2.0	2.4	146	247		
TO-1005BC-MAE	AlGaInP	High Bright Amber	605		2.0	2.4	51	112		
TO-1005BC-MEE	AlGaInP	High Bright Orange	623		2.0	2.4	51	112		
TO-1005BC-MRE	AlGaInP	High Bright Red	630	2.0	2.4	51	112			

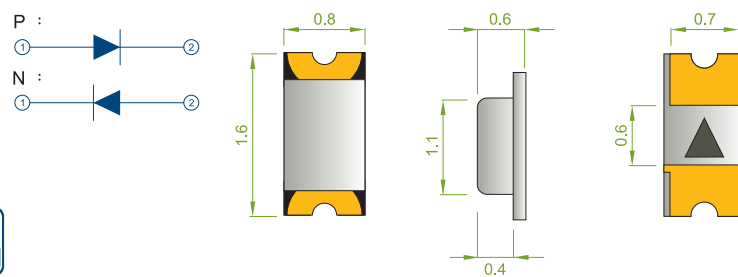
### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$		$I_v$ (mcd) at $I_f=20\text{mA}$		Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TO-A1608BC-BF	InGaP	Blue	468	Water Clear	3.2	3.6	112	247	120
TO-A1608BC-PG	InGaP	Pure Green	525		3.2	3.6	321	705	
TO-A1608BC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-A1608BC-MYF	AlGaInP	High Bright Yellow	592		2.0	2.4	146	247	
TO-A1608BC-MAE	AlGaInP	High Bright Amber	605		2.0	2.4	51	112	
TO-A1608BC-MEE	AlGaInP	High Bright Orange	623		2.0	2.4	51	112	
TO-A1608BC-MRE	AlGaInP	High Bright Red	630	2.0	2.4	51	112		

## TO-1608

PCB 1608 Package



### Features

- 1.6mm x 0.8mm x 0.6mm
- Low power consumption
- Wide viewing angle
- Various color available

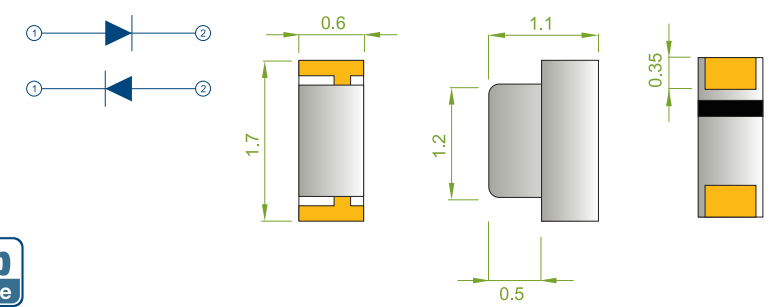
### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$				$I_v$ (mcd) at $I_f=20\text{mA}$	Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.		
TO-1608BC-BF	InGaP	Blue	468	Water Clear	3.2	3.6	112	247	120	
TO-1608BC-PG	InGaP	Pure Green	525		3.2	3.6	321	705		
TO-1608BC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	51	112		
TO-1608BC-MYF	AlGaInP	High Bright Yellow	592		2.0	2.4	146	247		
TO-1608BC-MAE	AlGaInP	High Bright Amber	605		2.0	2.4	51	112		
TO-1608BC-MEE	AlGaInP	High Bright Orange	623		2.0	2.4	51	112		
TO-1608BC-MRE	AlGaInP	High Bright Red	630	2.0	2.4	51	112			

## TO-1706

PCB 1706 Package



### Features

- 1.7mm x 0.6mm x 1.1mm
- Low power consumption
- Wide viewing angle
- Various color available

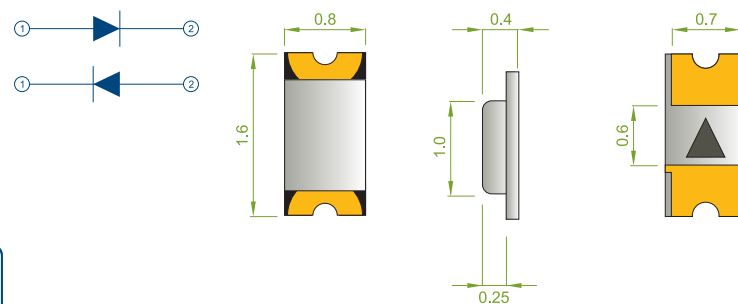
### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$		$I_v$ (mcd) at $I_f=20\text{mA}$		Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TO-1706BC-BF	InGaP	Blue	468	Water Clear	3.2	3.6	112	247	120
TO-1706BC-PG	InGaP	Pure Green	525		3.2	3.6	321	705	
TO-1706BC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-1706BC-MYF	AlGaInP	High Bright Yellow	592		2.0	2.4	146	247	
TO-1706BC-MAF	AlGaInP	High Bright Amber	605		2.0	2.4	146	247	
TO-1706BC-MEF	AlGaInP	High Bright Orange	623		2.0	2.4	146	247	
TO-1706BC-MRE	AlGaInP	High Bright Red	630	2.0	2.4	51	112		

## TO-A1608

PCB 1608 Package

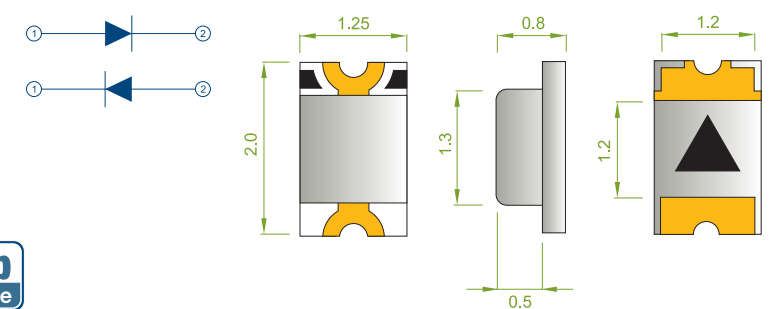


### Features

- 1.6mm x 0.8mm x 0.4mm
- Low power consumption
- Wide viewing angle
- Various color available

## TO-2013

PCB 2013 Package



### Features

- 2.0mm x 1.25mm x 0.8mm
- Low power consumption
- Wide viewing angle
- Various color available

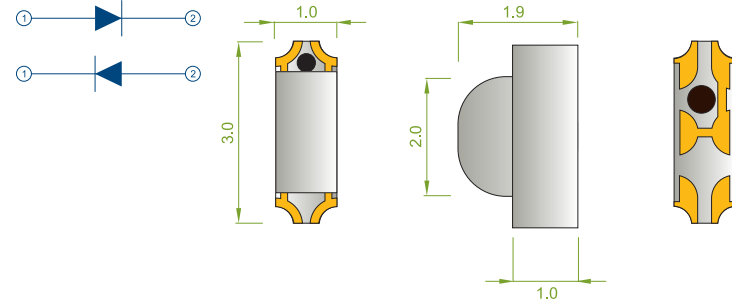
### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$		$I_v$ (mcd) at $I_f=20\text{mA}$		Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TO-2013BC-BF	InGaP	Blue	468	Water Clear	3.2	3.6	112	247	120
TO-2013BC-PG	InGaP	Pure Green	525		3.2	3.6	321	705	
TO-2013BC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-2013BC-MYF	AlGaInP	High Bright Yellow	592		2.0	2.4	146	247	
TO-2013BC-MAF	AlGaInP	High Bright Amber	605		2.0	2.4	146	247	
TO-2013BC-MEF	AlGaInP	High Bright Orange	623		2.0	2.4	146	247	
TO-2013BC-MRE	AlGaInP	High Bright Red	630	2.0	2.4	51	112		

## TO-3010

PCB 3010 Package



### Features

- 3.0mm x 1.0mm x 1.9mm
- Low power consumption
- Wide viewing angle
- Various color available

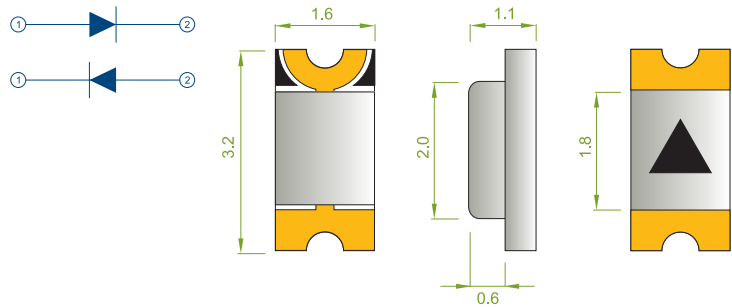
### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$				Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TO-3010AC-BE	InGaP	Blue	468	Water Clear	3.2	3.6	51	112	120
TO-3010AC-PF	InGaP	Pure Green	525		3.2	3.6	146	247	
TO-3010AC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-3010AC-MYF	AlGaInP	High Bright Yellow	592		2.0	2.4	146	247	
TO-3010AC-MAE	AlGaInP	High Bright Amber	605		2.0	2.4	51	112	
TO-3010AC-MEE	AlGaInP	Super Bright Orange	623		2.0	2.4	51	112	
TO-3010AC-MRE	AlGaInP	Ultra Bright Red	630		2.0	2.4	51	112	

## TO-3216

PCB 3216 Package



### Features

- 3.2mm x 1.6mm x 1.1mm
- Low power consumption
- Wide viewing angle
- Various color available

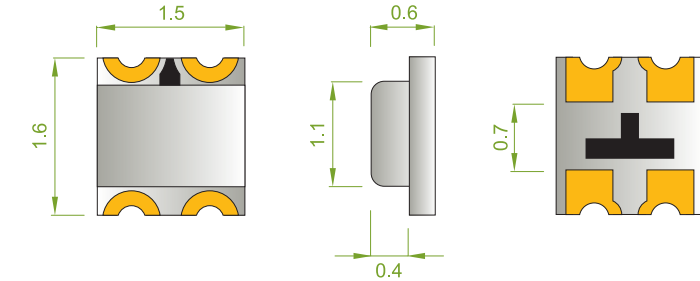
### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$				Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TO-3216BC-BF	InGaP	Blue	468	Water Clear	3.2	3.6	112	247	120
TO-3216BC-PG	InGaP	Pure Green	525		3.2	3.6	321	705	
TO-3216BC-MGE	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-3216BC-MYF	AlGaInP	High Bright Yellow	592		2.0	2.4	146	247	
TO-3216BC-MAF	AlGaInP	High Bright Amber	605		2.0	2.4	146	247	
TO-3216BC-MEF	AlGaInP	Super Bright Orange	623		2.0	2.4	146	247	
TO-3216BC-MRE	AlGaInP	Ultra Bright Red	630		2.0	2.4	51	112	

## TO-1615

PCB 1615 Package



### Features

- 1.6mm x 1.5mm x 0.6mm
- Dual color
- Low power consumption
- Wide viewing angle
- Various color available

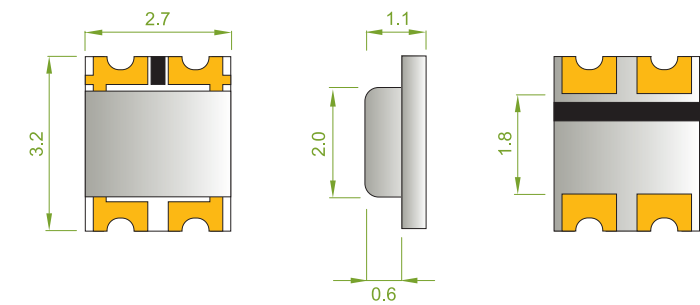
### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$				Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TO-1615BC-MAMGEE	AlGaInP	High Bright Amber	605	Water Clear	2.0	2.4	51	112	120
	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-1615BC-MEBEE	AlGaInP	High Bright Orange	623		2.0	2.4	51	112	
	InGaP	Blue	468		3.2	3.6	51	112	
TO-1615BC-MEPEF	AlGaInP	High Bright Orange	623		2.0	2.4	51	112	
	InGaP	Pure Green	525		3.2	3.6	146	247	
TO-1615BC-MEMGEE	AlGaInP	High Bright Orange	623		2.0	2.4	51	112	
	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-1615BC-MRBFF	AlGaInP	High Bright Red	630		2.0	2.4	146	247	
	InGaP	Blue	468		3.2	3.6	146	247	
TO-1615BC-MRMAEE	AlGaInP	High Bright Red	630		2.0	2.4	51	112	
	AlGaInP	High Bright Amber	605		2.0	2.4	51	112	
TO-1615BC-MRMGEE	AlGaInP	High Bright Red	630		2.0	2.4	51	112	
	AlGaInP	High Bright Green	572		2.0	2.4	51	112	

## TO-3227

PCB 3227 Package



### Features

- 3.2mm x 2.7mm x 1.1mm
- Dual color
- Low power consumption
- Wide viewing angle
- Various color available

### Application

- Indicator light
- Backlight
- Automotive interior light
- Indoor display board

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$				Viewing Angle $2\theta_{1/2}$
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TO-3227BC-MYBEE	AlGaInP	High Bright Yellow	590	Water Clear	2.0	2.4	51	112	120
	InGaP	Blue	468		3.2	3.6	51	112	
TO-3227BC-MYMGEE	AlGaInP	High Bright Yellow	590		2.0	2.4	51	112	
	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-3227BC-MABFF	AlGaInP	High Bright Amber	605		2.0	2.4	146	247	
	InGaP	Blue	468		3.2	3.6	146	247	
TO-3227BC-MAMGEE	AlGaInP	High Bright Amber	605		2.0	2.4	51	112	
	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-3227BC-MEMGEE	AlGaInP	High Bright Orange	623		2.0	2.4	51	112	
	AlGaInP	High Bright Green	572		2.0	2.4	51	112	
TO-3227BC-MRBEE	AlGaInP	High Bright Red	630		2.0	2.4	51	112	
	InGaP	Blue	468		3.2	3.6	51	112	
TO-3227BC-MRPEF	AlGaInP	High Bright Red	630		2.0	2.4	51	112	
	InGaP	Pure Green	525		3.2	3.6	146	247	
TO-3227BC-MRMGEE	AlGaInP	High Bright Red	630		2.0	2.4	51	112	
	AlGaInP	High Bright Green	572		2.0	2.4	51	112	

### TOP (1W/3W)

RED (AlGaInP)



Part Number	Forward Voltage (V)			Luminous Flux (Lm)			Dominant wavelength (nm)			Test Condition
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
TOP-1RD1	2.0	2.2	2.4	30	40	50	620.0	622.5	625.0	IF=350mA
TOP-3RG1	2.1	2.3	2.5	70	80	90	620.0	622.5	625.0	IF=700mA

**Features**

- High brightness, high performance
- High color purity, good uniformity
- Low light decline, long working life

**Application**

- General Lighting

### TOP (1W/3W)

GREEN (InGaN)



Part Number	Forward Voltage (V)			Luminous Flux (Lm)			Dominant wavelength (nm)			Test Condition
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
TOP-1GF2	3.0	3.2	3.4	50	60	70	520.0	522.5	525.0	IF=350mA
TOP-3GM1	3.1	3.3	3.5	100	120	140	520.0	522.5	525.0	IF=700mA

**Features**

- High brightness, high performance
- High color purity, good uniformity
- Low light decline, long working life

**Application**

- General Lighting

### TOP (1W/3W)

BLUE (InGaN)



Part Number	Forward Voltage (V)			Luminous Flux (Lm)			Dominant wavelength (nm)			Test Condition
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
TOP-1BD1	3.0	3.2	3.4	10	17	25	460.0	462.5	465.0	IF=350mA
TOP-3BE3	3.1	3.3	3.5	20	35	50	460.0	462.5	465.0	IF=700mA

**Features**

- High brightness, high performance
- High color purity, good uniformity
- Low light decline, long working life

**Application**

- General Lighting

### TOP (1W/3W)

WHITE (InGaN)



Part Number	Forward Voltage (V)			Luminous Flux (Lm)			Dominant wavelength (nm)			Test Condition
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
TOP-1BD1	3.0	3.2	3.4	100	120	140	6000	7000	8000	IF=350mA
TOP-3BE3	3.1	3.3	3.5	200	220	240	6000	7000	8000	IF=700mA

**Features**

- High brightness, high performance
- High color purity, good uniformity
- Low light decline, long working life

**Application**

- General Lighting

Coming soon

Coming soon



# Lamp LED

**Color**

Code	Emitting Color and Material	Wavelength (nm)
UR	Ultra Red (AlGaInP)	635
UE	Ultra Orange (AlGaInP)	625
SE	Super Orange (AlGaInP)	615
UA	Ultra Amber (AlGaInP)	605
UY	Ultra Yellow (AlGaInP) (AlGaInP)	588
UG	Ultra Yellow Green (AlGaInP)	572
PG	Pure Green (InGaN)	515-530
BG	Bluish Green (InGaN)	500-515
UB	Blue (InGaN)	470
PR	Pure Red (GaAsP/GaP)	700(λp)
SR	Super Red (GaAsP/GaP)	640
HE	High Orange (GaAsP/GaP)	620
HA	High Amber (GaAsP/GaP)	610
HY	High Yellow (GaAsP/GaP)	585
HG	High Yellow Green (GaAsP/GaP)	565
SG	Super Yellow Green	560
HR	High Red	660

**Dual Color**

Code	Emitting Colors
RB	Red and Blue
RG	Red and Green
RY	Red and Yellow
OB	Orange and Blue
OG	Orange and Green
YG	Yellow and Green
YB	Yellow and Blue
GR	Green and Red
GO	Green and Orange
GY	Green and Yellow
BR	Blue and Red
BG	Blue and Green
BY	Blue and Yellow
3A	Red Green Blue
3B	Red green Yellow

**Drive Mode**

Code	Meaning	Sign
A	Common Anode	NP/NP
C	Common Cathode	PN/PN
R	Reverse Electrode	PN/NP

**Meaning**

Code	Meaning	Notes
None	Normal cutting and package	
A	Stopper type	
B	Normal tape package	Tape to bottom of component is 9mm
C	Normal tape package	Tape to bottom of component is 11mm
D	Normal tape package	Tape to bottom of component is 12mm
E	Normal tape package	Tape to bottom of component is 13mm
F	Normal tape package	Tape to bottom of component is 15mm
G	Right-angle bend tape	Tape to bottom of component is 11mm, Bend to bottom of component is 4mm
H	Right-angle bend tape	Tape to bottom of component is 11mm, Bend to bottom of component is 5mm
K	Right-angle bend tape	Tape to bottom of component is 10mm, Bend to bottom of component is 5mm
L	Append negative Zener	applies to P/N LED chips
M	Append bidirectional Zener	applies to P/N or N/P LED chips
N	Append positive Zener	applies to N/P LED chips
P	Append LED Blinking IC	Blinking frequency: 2.4Hz, 1/4 duty cycle
Q	Append LED Blinking IC	Blinking frequency: 1.2Hz, 1/4 duty cycle
R	Tape & Reel	

**Example**

**T O L - 5 0 2 S W V C - A**

**View Angle**

Code	View Angle
1	8-12
2	12-25
3	25-35
4	35-45
5	45-55
6	55-65
7	65-75
9	75-85
A	85-95
B	95-105
C	105-115
D	115-145
E	145-180
T	110/45(Oval)
R	50/30(Oval)

**Typical Luminous Intensity**

Code	Typical Luminous Intensity (mcd)
1	1-7
2	7-15
3	15-25
4	25-35
5	35-50
6	50-65
7	65-85
8	85-110
9	110-145
A	145-190
B	190-250
C	250-330
D	330-430
E	430-560
F	560-730
G	730-950
H	950-1250
J	1250-1625
K	1625-2100
L	2100-2750
M	2750-3575
N	3575-4650
O	4650-6050
P	6050-7900
Q	7900-10300
R	10300-13400
S	13400-17500
T	17500-22800
U	22800-30000
V	30000-39000

**Lens Color**

Code	Lens Color
C	Water Clear
W	White Diffused
T	Color Transparent
D	Color Diffused
B	Dark Blue
K	Special Package Color

**Lens Dimension**

Code	Dimension
1	Ø 1.8 mm
2	Ø 2.0 mm
3	Ø 3.0 mm
4	Ø 4.0 mm
5	Ø 5.0 mm
8	Ø 8.0 mm
A	Ø 10 mm
B	2 x 3 mm
C	2 x 5 mm
D	2.1 x 6.9 mm

**Lens Shape**

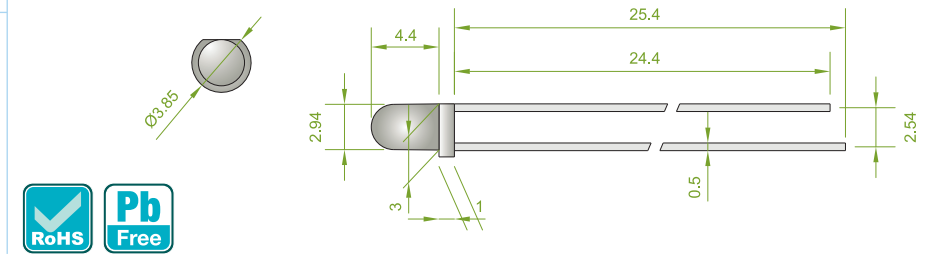
Code	Lens Shape
0	Round convex Indicator with Flange
1	Round convex Indicator without Flange
2	Round flat Indicator with Flange
3	Round flat Indicator without Flange
4	Round concave Indicator with Flange
5	Round concave Indicator without Flange
6	Horizontal oval Indicator
7	Vertical oval Indicator
8	Square Indicator with Flange
9	Square Indicator without Flange
A	Triangle Indicator
B	Straw Hat

**Lamp Type**

Code	Lamp Type
L	LED Lamp
LF	Flash LED Lamp
IR	IR LED Lamp
PS	Photo Diode

## TOL-30

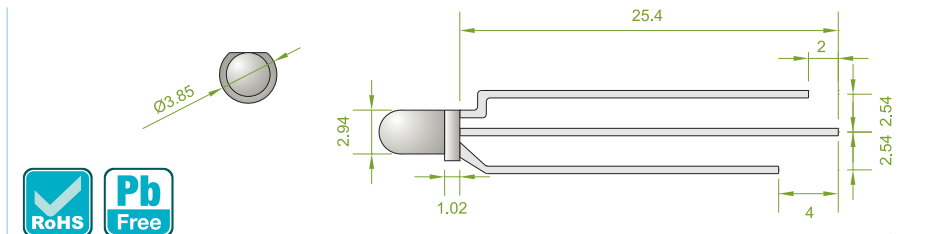
3mm Round



- Features**
- Superior brightness
  - Low power consumption
  - Reliability life test confirmed
  - 2kV ESD withstanding
- Application**
- Residential lighting
  - Automotive interior lighting
  - Highway variable message signs
  - Medical and industrial equipments
  - Consumer and gaming application
  - Home appliance lighting application

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-302URKC	AlGaInP	Red	630	Water Clear	1.9	2.5	1000	2000	18
TOL-302UEKC	AlGaInP	Orange	623		2.0	2.4	1000	2000	
TOL-302UANC	AlGaInP	Amber	605		2.0	2.4	2000	4000	
TOL-302UYMC	AlGaInP	Yellow	590		2.0	2.3	1500	3000	
TOL-302UGFC	AlGaInP	Green	573		2.0	2.4	350	700	

3mm Round (Bi-Color)



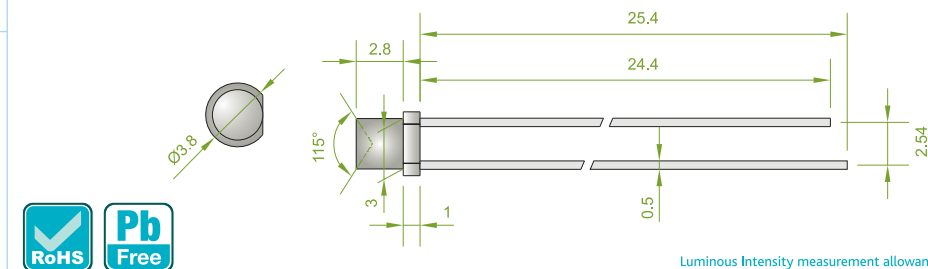
- Features**
- Superior brightness
  - Low power consumption
  - Reliability life test confirmed
  - 2kV ESD withstanding
- Application**
- Residential lighting
  - Automotive interior lighting
  - Highway variable message signs
  - Medical and industrial equipments
  - Consumer and gaming application
  - Home appliance lighting application

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-307RGAW	GaAlAs/GaAs	Red	640	White	1.8	2.1	34	80	60
	GaP/GaP	Green	570		2.2	2.5	15	30	
TOL-307RBAW	AlGaAs/AlGaAs	Red	643	Diffused	2.0	2.4	65	130	60
	InGaN/GaN	Blue	470		3.0	4.0	110	220	

Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

## TOL-34

3mm Concave



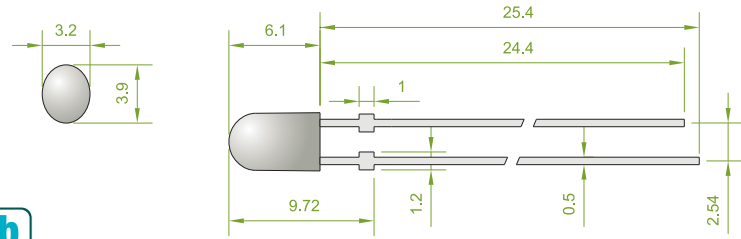
- Features**
- Superior brightness
  - Low power consumption
  - Reliability life test confirmed
  - 2kV ESD withstanding
- Application**
- Home appliance & lighting
  - Automotive interior lighting
  - Highway variable message signs
  - Medical and industrial equipments
  - Consumer and gaming electronics application

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-34BSR4C	AlGaInP	Red	640	Water Clear	2.0	2.5	17	35	105
TOL-34EUYBC	AlGaInP	Yellow	590		2.0	2.5	125	250	
TOL-34BUY4C	AlGaInP	Green	574		2.0	2.4	20	40	

Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

### TOL-36

3mm Oval



Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

#### Features

- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

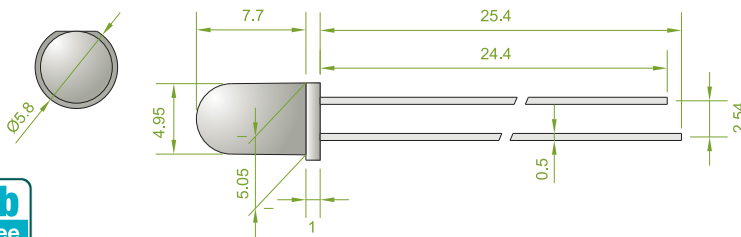
#### Application

- Full colour video screens
- Variable Message Sign (VMS)
- Outdoor advertising boards

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$				$I_v$ (mcd) at $I_f=20\text{mA}$	Viewing Angle 2θ½
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.		
TOL-36TUEHK-A	AlGaInP	Orange	625	Color	1.6	2.8	600	1200	110/50	
TOL-36TUYJK-A	AlGaInP	Yellow	592		1.6	2.8	750	1500		
TOL-36TUGJK-A	InGaN	Pure Green	525	Diffused	3.2	3.8	1000	1500		
TOL-36TUBEK-A	InGaN	Blue	470		3.2	3.8	225	450		

### TOL-50

5mm Round



#### Features

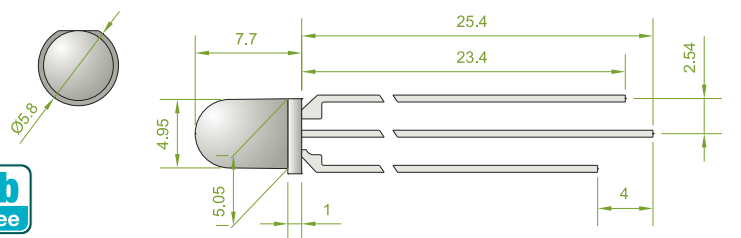
- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

#### Application

- Traffic signs
- Residential lighting
- Automotive interior lighting
- Highway variable message signs
- Medical and industrial equipments
- Consumer and gaming application
- Home appliance lighting application

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$				$I_v$ (mcd) at $I_f=20\text{mA}$	Viewing Angle 2θ½
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.		
TOL-502URN	AlGaInP	Red	630	Water	2.0	2.4	2000	4000	15	
TOL-502UEL	AlGaInP	Orange	623		2.0	2.5	1200	2400		
TOL-502UAN	AlGaInP	Amber	605		2.0	2.5	2400	4500		
TOL-502UYM	AlGaInP	Yellow	590		2.0	2.3	1550	3000		
TOL-502UGJ	AlGaInP	Green	572		2.0	2.5	750	1500		
TOL-503URE	AlGaInP	Red	630		Clear	2.0	2.4	250		500
TOL-503UEH	AlGaInP	Orange	623	2.0		2.4	600	1200		
TOL-503UAH	AlGaInP	Amber	605	2.0		2.5	500	1000		
TOL-503UYF	AlGaInP	Yellow	590	2.0		2.5	360	730		
TOL-504URB	AlGaInP	Red	630	2.0		2.4	100	200		
TOL-504UYH	AlGaInP	Yellow	590	2.0		2.4	500	1000		

5mm Round (Bi-Color)



#### Features

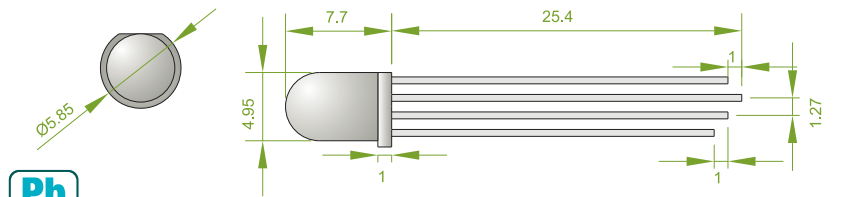
- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

#### Application

- Traffic Signs
- Home appliance & lighting
- Automotive interior lighting
- Highway Variable Message Signs
- Medical and Industrial Equipments
- Consumer and Gaming Electronics application

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$		$I_v$ (mcd) at $I_f=20\text{mA}$		Viewing Angle 2θ½
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-506RGAW	GaAlAs/GaAs	Red	640	White	1.8	2.1	42	95	60
	GaP/GaP	Green	570		2.2	2.5	14	30	
TOL-509RBAW	AlGaAs/AlGaAs	Red	643	Diffused	2.0	2.4	60	120	70
	InGaN/GaN	Blue	470		3.0	4.0	100	200	

5mm Round (RGB)



Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

#### Features

- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

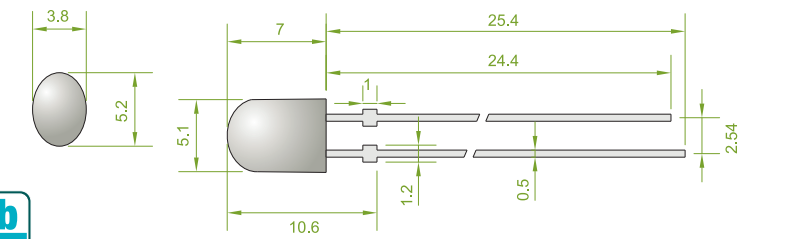
#### Application

- Traffic signs
- Residential lighting
- Automotive interior lighting
- Highway variable message signs
- Medical and industrial equipments
- Consumer and gaming application
- Home appliance lighting application

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$		$I_v$ (mcd) at $I_f=20\text{mA}$		Viewing Angle 2θ½
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-5043ACC	AlGaInP	Orange	624	Water	2.0	2.6	200	400	50
	InGaN	Green	525		3.5	4.0	1250	2500	
	InGaN	Blue	465		3.5	4.0	500	1000	
TOL-5043AAC	GaAlAs/GaAs	Red	640	Clear	2.0	2.4	103	190	55
	InGaN/Sic	Green	525		3.5	4.0	980	2000	
	InGaN/GaN	Blue	470		3.5	4.0	390	750	

### TOL-56

5mm Oval



Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

#### Features

- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

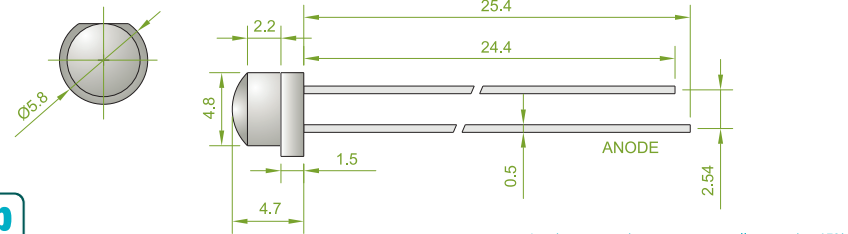
#### Application

- Full colour video screens
- Variable Message Sign (VMS)
- Outdoor advertising boards

Part Number	Chip			Lens Color	$V_f$ (V) at $I_f=20\text{mA}$		$I_v$ (mcd) at $I_f=20\text{mA}$		Viewing Angle 2θ½
	Material	Emitted Color	$\lambda_d$ (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-56TUEJK-A	AlGaInP	Orange	625	Color	1.6	2.8	700	1400	110/45
TOL-56TUYHK-A	InAlGaP	Yellow	592		1.9	2.5	600	1200	
TOL-56TPGKK-A	InGaN	Pure Green	525	Diffused	2.6	3.8	900	1800	
TOL-56TUBFK-A	InGaN	Blue	470		2.6	3.8	350	700	

### TOL-4B

4.8mm



Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

#### Features

- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

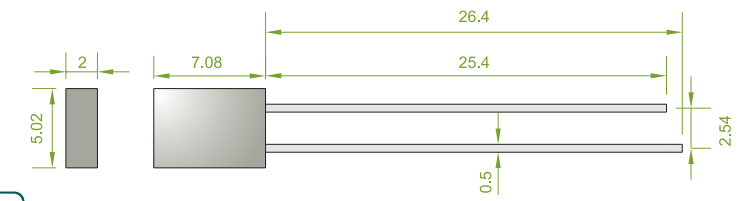
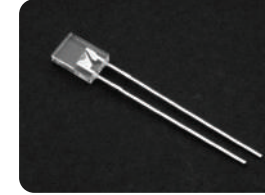
#### Application

- Full colour video screens
- Variable Message Sign (VMS)
- Outdoor advertising boards

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-4BEUE9C	AlGaInP	Orange	623	Water	2.0	2.4	65	130	150
TOL-4BDUYEC	AlGaInP	Yellow	590		2.0	2.3	225	450	120
TOL-4B7UG9C	AlGaInP	Green	572		2.0	2.6	70	140	70
TOL-4B7UBCC	InGaN	Blue	470		3.0	3.5	160	300	70

### TOL-C9

Rectangular (2.05mm x 5.02mm)



Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

#### Features

- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

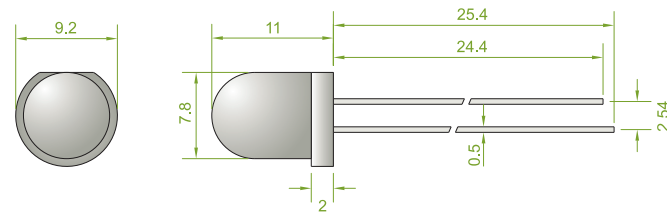
#### Application

- Automotive interior lighting
- Medical and industrial equipments
- Consumer and gaming application
- Home appliance lighting application

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-C9EUR3K	AlGaInP	Red	640	Water	2.0	2.5	7.0	15	170
TOL-C9EUE3K	AlGaInP	Orange	623		2.0	2.4	10	20	165
TOL-C9EHY1D	GaAsP/GaP	Yellow	590		2.0	2.4	3.0	6.0	160
TOL-C9BHG2K	GaP/GaP	Green	568		2.2	2.5	5.0	10	100

### TOL-80

8.0mm Round



Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

#### Features

- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

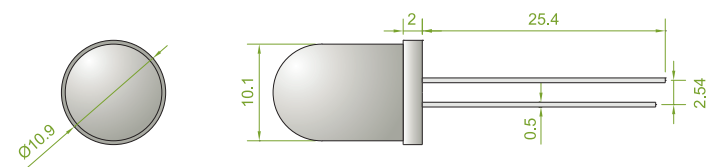
#### Application

- Indicator light
- Medical and industrial equipments
- Consumer and gaming application

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-803URDC	AlGaInP	Red	640	Water	2.0	2.4	200	400	30
TOL-803HYBC	GaAsP	Yellow	590		2.1	2.4	100	200	
TOL-803HGBC	GaP/GaP	Green	525		2.2	2.5	100	200	
TOL-803UBNC	InGaN	Blue	470		3.5	4.0	1700	3600	

### TOL-A03

10mm Round



Luminous Intensity measurement allowance is ±15%.  
Wave length: the typical accuracy is ±2nm.

#### Features

- Superior brightness
- Low power consumption
- Reliability life test confirmed
- 2kV ESD withstanding

#### Application

- Indicator light
- Medical and industrial equipments
- Consumer and gaming application

Part Number	Chip			Lens Color	V <sub>f</sub> (V) at I <sub>f</sub> =20mA		I <sub>v</sub> (mcd) at I <sub>f</sub> =20mA		Viewing Angle 2θ½
	Material	Emitted Color	λ <sub>d</sub> (nm)		TYP.	MAX.	MIN.	TYP.	
TOL-A03URHC	AlGaInP	Red	630	Water	2.0	2.5	500	1100	30
TOL-A03UEOC	AlGaInP	Orange	623		2.1	2.6	2500	5000	
TOL-A03UYOC	AlGaInP	Yellow	590		2.2	2.5	2600	5200	
TOL-A03UBNC	InGaN/SiC	Blue	470		3.5	4.0	2000	4000	



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