

Lightsources

Lichtquellen
Sources lumineuses

SLOAN light sources 2006/07 1. Edition

The Sloan AG Company in Basle was founded in 1967 to design and develop industrial lighting products. In the late 1960's, Sloan AG was a pioneer in LED technology. Today Sloan remains a leader in the development and application of Light Emitting Diodes. By combining 40 years of lighting experience with ISO 9001 quality recognition and superior technical support and customer service, Sloan is dedicated to provide high brightness LED products to multiple industries at highest quality standards.

Sloan's product offering covers many different market areas:

- Discrete LED's
- PCB mounted LED's
- Panel Mount Indicator Lights
- LED Lamps (replacement for incandescent lamps)
- Customer specific lighting products (Sign and Illumination products)

Sloan AG is based in Switzerland with a distribution network in many parts of the world. Sloan is in position to support multiple market locations.

Customer service and quality are vital to Sloan's continuous improvement goals. The constant evolution of LED technology provides a dynamic environment for new product development and Sloan is dedicated to leading the way into the future with new and innovative products.

If your needs are for standard catalogue lighting products or special applications, Sloan is qualified to provide you with solutions based on sound engineering, quality manufacturing, competitive cost and 40 years of experience in the lighting industry.

The Sloan Catalogue **No.2** is presenting our standard range of discrete and PCB mounted LED's. Additional information of our products is available under www.sloan.ch.

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Please ask for our standard catalogue „Lampholders“

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ø 3mm white LED's

through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

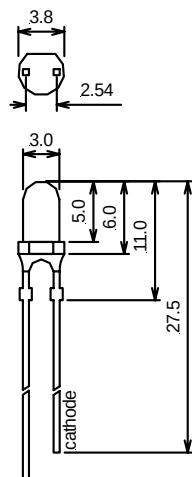
- high luminosity
- high quality for professional application
- RoHS compliant



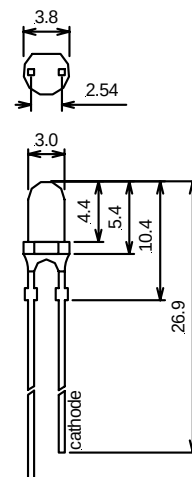
Part No.	Colour Temp. (°K)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage V _F (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L3-W33N-BS	5500-9000	3900	4600	5520	25°	3.6	4.0	waterclear	1
L3-W35N-BS	5500-9000	2600	3100	3700	35°	3.6	4.0	waterclear	2
L3-W35N-BT	5500-9000	3750	4400	5180	35°	3.6	4.0	waterclear	2
L3-W34N-BS	5500-9000	1750	2070	2530	60°	3.6	4.0	waterclear	2
L3-W30N-BS	5500-9000	920	1100	1260	70°	3.6	4.0	milky	2
L3-W30N-BT	5500-9000	1260	1560	1840	70°	3.6	4.0	milky	2

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

Typ 1



Typ 2



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice

ø 3mm blue LED`s

through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

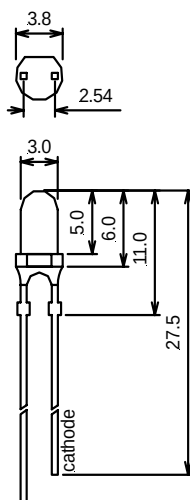
- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- RoHS compliant



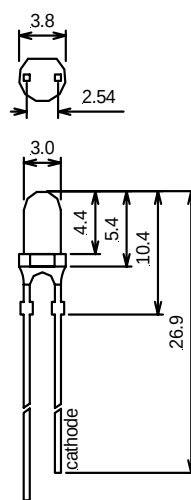
Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L3-B71G-WS	470	1940	2300	2760	15°	3.6	4.0	waterclear	1
L3-B71G-WT	470	2760	3200	3880	15°	3.6	4.0	waterclear	1
L3-B41G-WS	470	960	1160	1380	30°	3.6	4.0	waterclear	2
L3-B41G-WT	470	1380	1660	1920	30°	3.6	4.0	waterclear	2
L3-B51G-WS	470	580	700	820	45°	3.6	4.0	waterclear	3
L3-B51G-WT	470	820	960	1160	45°	3.6	4.0	waterclear	3

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

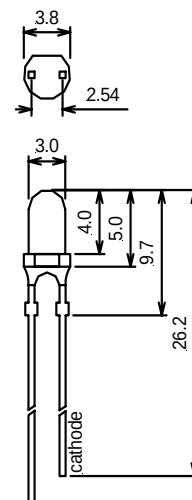
Typ 1



Typ 2



Typ 3



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Ø 3mm green LED`s

through-hole



ATTENTION
Observe Precautions
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Electrostatic Sensitive
Devices

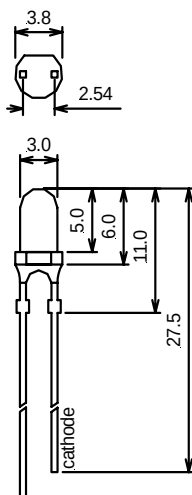
- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- RoHS compliant



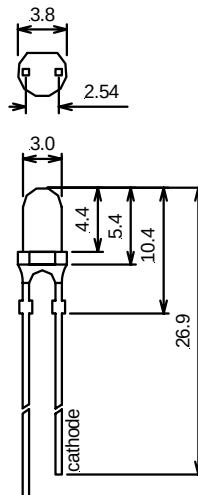
Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2Θ½ (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L3-G41N-GT	525	9200	11000	13200	15°	3.5	4.0	waterclear	1
L3-G41N-GS	525	6700	7800	9200	15°	3.5	4.0	waterclear	1
L3-G51N-GT	525	4600	5500	6600	30°	3.5	4.0	waterclear	2
L3-G51N-GS	525	3300	3900	4600	30°	3.5	4.0	waterclear	2
L3-G31N-GT	525	2760	3220	3920	45°	3.5	4.0	Waterclear	3

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

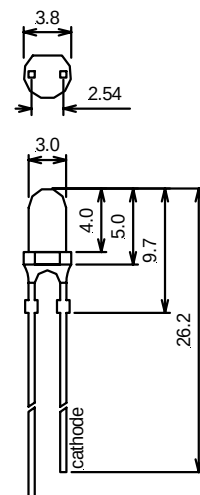
Typ 1



Typ 2



Typ 3



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ø 3mm yellow LED`s

through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- application: tv set, monitor, computer, pc-board
- RoHS compliant

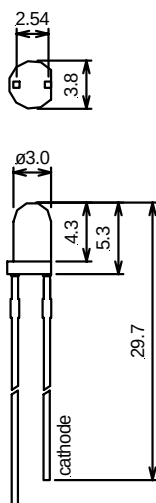


Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2Θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L3-Y33U	592	1600	3200	4480	14°	2.25	2.5	waterclear	1
L3-Y32U	592	1100	2200	3080	35°	2.25	2.5	waterclear	1
L3-Y41Q	592	1000	2500	4000	24°	2.0	2.6	waterclear	1
L3-Y35V	592	1000	2000	3600	35°	2.3	2.8	waterclear	2
L3-Y30U	592	600	1200	1680	40°	2.0	2.5	waterclear	3

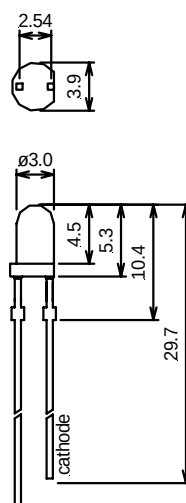
Electro-Optical-Characteristics Ta=25°C, IF=20mA

Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

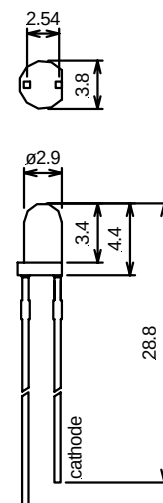
Typ 1



Typ 2



Typ 3



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice

ø 3mm red LED`s

through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

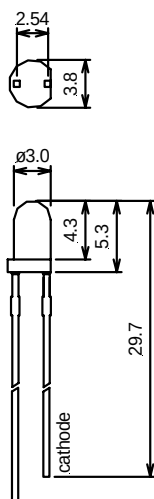
- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- application: TV set, Monitor, Computer, PC-Board
- RoHS compliant



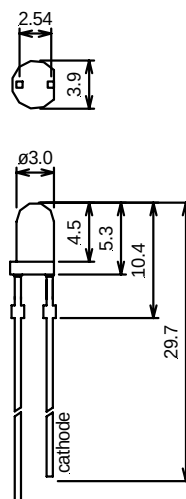
Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2Θ½ (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L3-R33U	638	2200	3200	4480	14°	2.25	2.5	waterclear	1
L3-R41Q	640	1500	2500	4000	24°	1.7	2.4	waterclear	1
L3-R35V	634	1000	2000	3600	35°	2.3	2.8	waterclear	2
L3-R32U	635	900	1600	2240	35°	2.0	2.5	waterclear	1
L3-R30U	635	700	1000	1400	40°	2.0	2.5	waterclear	3

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

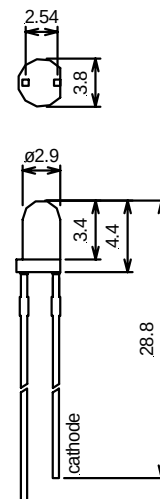
Typ 1



Typ 2



Typ 3



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2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice

ø 5mm white LED`s

through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

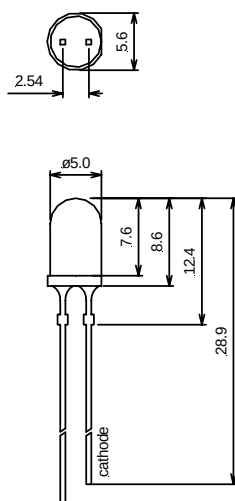
- high luminosity
- high quality for professional application
- RoHS compliant



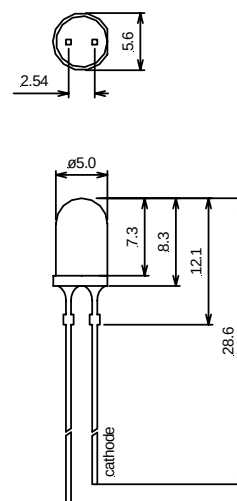
Part No.	Colour Temp. (°K)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L5-W54N-BU	5500-9000	15500	18500	22000	15°	3.6	4.0	waterclear	1
L5-W54N-BS	5500-9000	7800	9200	11000	20°	3.6	4.0	waterclear	1
L5-W52N-BS	5500-9000	2060	2500	3000	50°	3.6	4.0	waterclear	2
L5-W50N-BS	5500-9000	580	690	805	70°	3.6	4.0	milky	2
L5-W50N-BT	5500-9000	805	980	1160	70°	3.6	4.0	milky	2

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

Typ 1



Typ 2



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice

ø 5mm white/warm-white LED's (advanced lifetime) through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

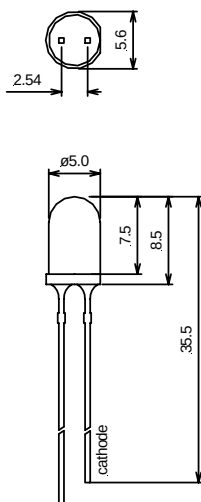
- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- RoHS compliant



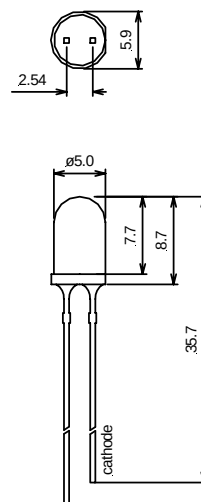
Part No.	Colour Temp. (°K)	Luminous Intensity (mcd)			Viewing Angle 2θ½ (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour	Typ
		min.	typ.	max.		min.	max.			
L5-W601 STBC	6500K	10000	14000	20000	22	3.2	3.8	waterclear	white	1
L5-W601 STD	5000K	10000	14000	20000	22	3.2	3.8	waterclear	white	1
L5-W602 PQBC	6500K	3500	5000	7000	40	3.2	3.8	waterclear	white	2
L5-W602 PQD	5000K	3500	5000	7000	40	3.2	3.8	waterclear	white	2
L5-N603 QREF	2900K	5000	7000	10000	20	3.2	3.8	waterclear	warm white	2
L5-N604 NOEF	2900K	1750	2500	3500	60	3.2	3.8	waterclear	warm white	2

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

Typ 1



Typ 2



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice

ø 5mm blue LED`s

through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

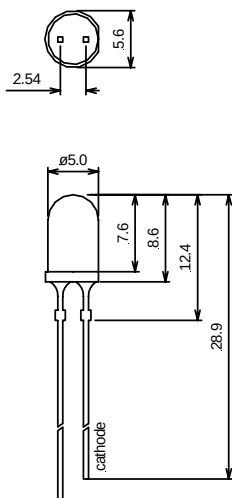
- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- RoHS compliant



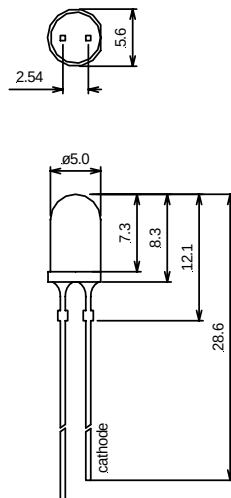
Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L5-B91G-WT	470	4120	4800	5760	15°	3.6	4.0	waterclear	1
L5-B91G-WU	470	5760	6700	7400	15°	3.6	4.0	waterclear	1
L5-B21G-WS	470	1230	1500	1780	30°	3.6	4.0	waterclear	2
L5-B21G-WT	470	1780	2120	2520	30°	3.6	4.0	waterclear	2
L5-B61G-WS	470	690	800	960	45°	3.6	4.0	waterclear	3
L5-B61G-WT	470	960	1160	1380	45°	3.6	4.0	waterclear	3
L5-B5SC	470	1000	2000	3000	30°	3.5	3.8	waterclear	4

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

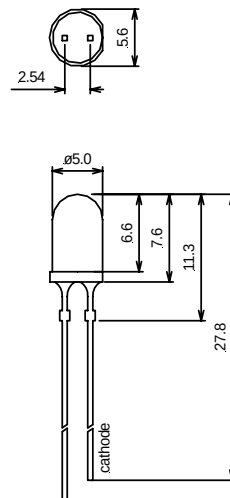
Typ 1



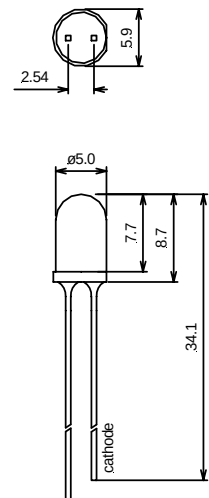
Typ 2



Typ 3



Typ 4



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice

ø 5mm green LED`s

through-hole



ATTENTION

Observe Precautions
for Handling

Electrostatic Sensitive
Devices

- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- RoHS compliant

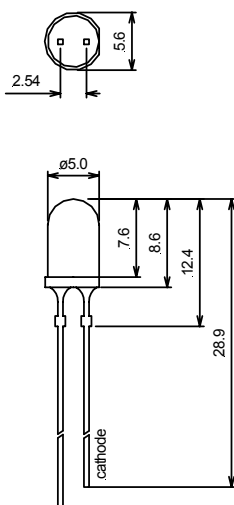


Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L5-G81N-GT	525	13800	16000	19500	15°	3.5	4.0	waterclear	1
L5-G81N-GS	525	9600	11600	13800	15°	3.5	4.0	waterclear	1
L5-G61N-GT	525	6000	7200	8400	30°	3.5	4.0	waterclear	2
L5-G61N-GS	525	4200	5000	6000	30°	3.5	4.0	waterclear	2
L5-G71N-GT	525	3320	3920	4600	45°	3.5	4.0	waterclear	3
L5-G71N-GS	525	2300	2760	3320	45°	3.5	4.0	waterclear	3

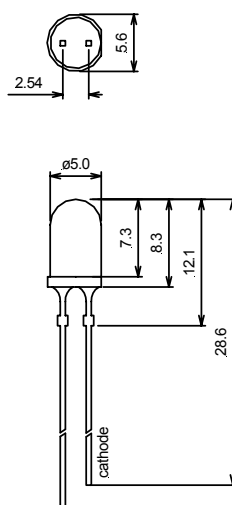
Electro-Optical-Characteristics Ta=25°C, IF=20mA

Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

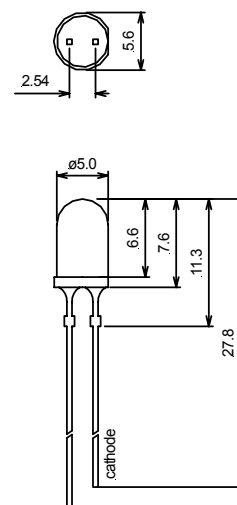
Typ 1



Typ 2



Typ 3



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3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice

Ø 5mm bluish-green LED`s

through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- RoHS compliant

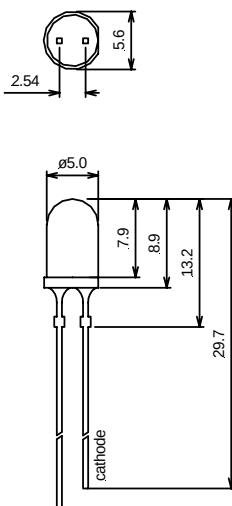


Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2Θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L5-BG1N	500	10000	12000	14200	10°	3.5	4.0	waterclear	1
L5-BG1G	500	3200	3920	4600	30°	3.5	4.0	waterclear	2

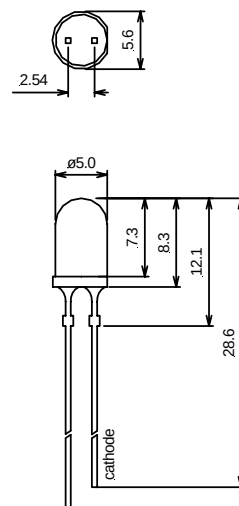
Electro-Optical-Characteristics Ta=25°C, IF=20mA

Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

Typ 1



Typ 2



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ø 5mm yellow LED`s

through-hole



ATTENTION

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Electrostatic Sensitive
Devices

- high luminosity
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- high quality for professional application
- application: TV set, Monitor, Computer, PC-Board
- RoHS compliant

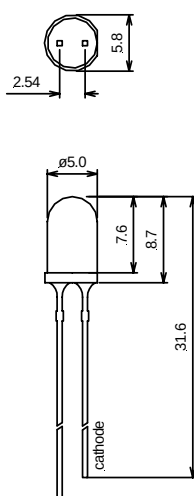


Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2Θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L5-Y91H	592	7200	---	21000	6°	1.98	2.4	waterclear	1
L5-Y54U	592	3500	7000	9800	12°	2.25	2.6	waterclear	2
L5-Y14ER	592	3600	---	10000	15°	2.3	2.8	waterclear	3
L5-Y71Q	589	2000	3000	4000	18°	1.8	2.5	waterclear	2
L5-Y40ER	592	1680	---	3600	40°	2.3	2.8	waterclear	3
L5-Y50U	592	1500	3000	4200	45°	2.25	2.6	waterclear	2
L5-Y52U	592	1200	3000	4200	30°	2.0	2.5	waterclear	2

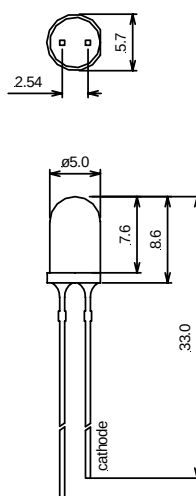
Electro-Optical-Characteristics Ta=25°C, IF=20mA

Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

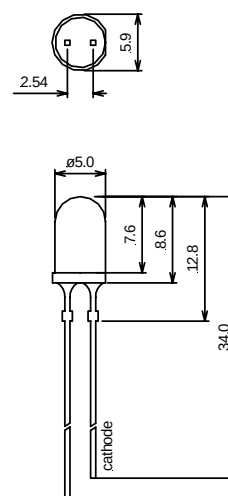
Typ 1



Typ 2



Typ 3



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice

Ø 5mm red LED`s

through-hole



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

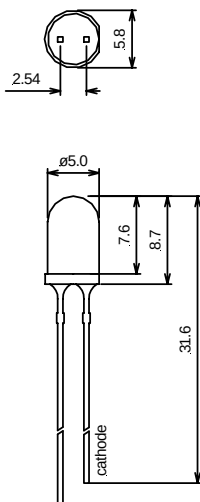
- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- application: TV set, Monitor, Computer, PC-Board
- RoHS compliant



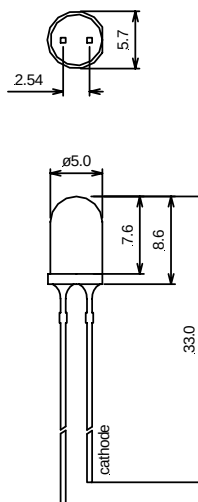
Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2Θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Typ
		min.	typ.	max.		typ.	max.		
L5-R91H	621	9300	---	21000	6°	1.94	2.4	waterclear	1
L5-R54U	638	3500	7000	9800	12°	2.25	2.6	waterclear	2
L5-R14ER	634	3600	---	10000	15°	2.3	2.8	waterclear	3
L5-R52U	638	2000	4000	5600	30°	2.25	2.6	waterclear	2
L5-R40ER	634	1680	---	3600	40°	2.3	2.8	waterclear	3
L5-R50U	638	1500	3000	4200	40°	2.25	2.6	waterclear	2

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

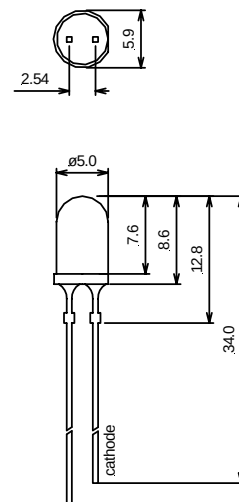
Typ 1



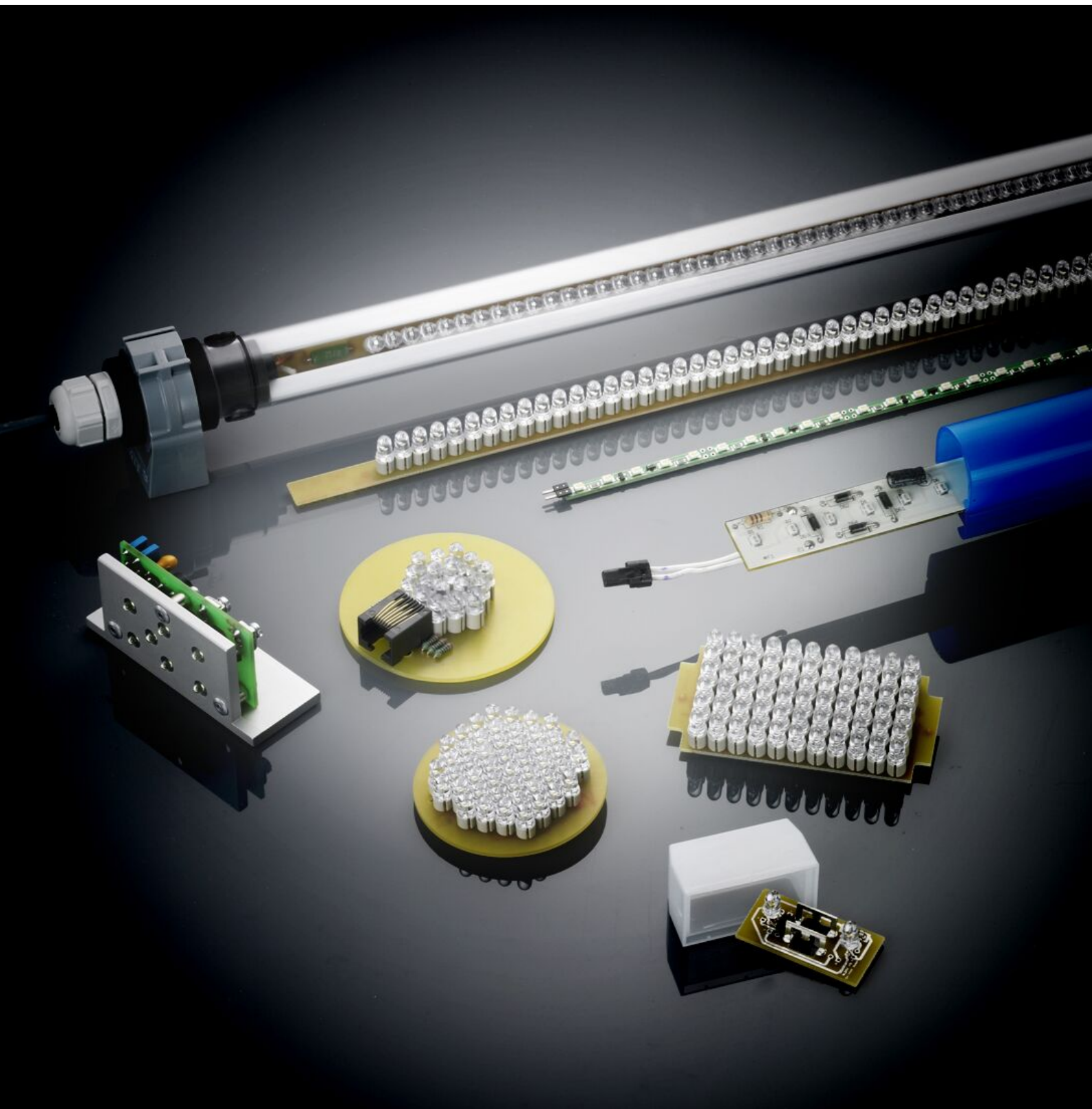
Typ 2



Typ 3



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Lead spacing is measured where the leads emerge from the package
5. Specifications are subject to change without notice



LED spacer ø3mm / ø5mm

accessories



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- temperatur resistance of approx. 140°C
- material: PC-GV (polycarbonat) grey
- tolerance for length $\pm 0.1\text{mm}$
- RoHS compliant

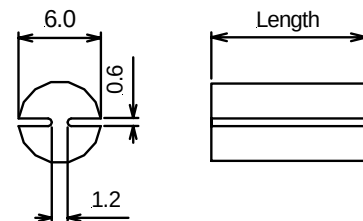
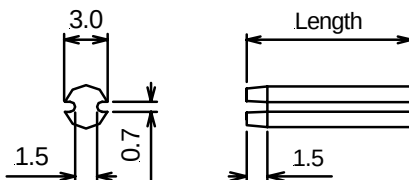


for 3mm LED`s

Length (mm)	Part No.
3.0mm	546.71.03
4.0mm	546.71.04
5.0mm	546.71.05
6.0mm	546.71.06
7.0mm	546.71.07
8.0mm	546.71.08
9.0mm	546.71.09
10.0mm	546.71.10
11.0mm	546.71.11
12.0mm	546.71.12
13.0mm	546.71.13
14.0mm	546.71.14
15.0mm	546.71.15
16.0mm	546.71.16
17.0mm	546.71.17
18.0mm	546.71.18
19.0mm	546.71.19
20.0mm	546.71.20
21.0mm	546.71.21
22.0mm	546.71.22
23.0mm	546.71.23
24.0mm	546.71.24
25.0mm	546.71.25

for 5mm LED`s

Length (mm)	Part No.
3.0mm	325.71.03
4.0mm	325.71.04
5.0mm	325.71.05
6.0mm	325.71.06
7.0mm	325.71.07
8.0mm	325.71.08
9.0mm	325.71.09
10.0mm	325.71.10
11.0mm	325.71.11
12.0mm	325.71.12
13.0mm	325.71.13
14.0mm	325.71.14
15.0mm	325.71.15
16.0mm	325.71.16
17.0mm	325.71.17
18.0mm	325.71.18
19.0mm	325.71.19
20.0mm	325.71.20
21.0mm	325.71.21
22.0mm	325.71.22
23.0mm	325.71.23
24.0mm	325.71.24
25.0mm	325.71.25

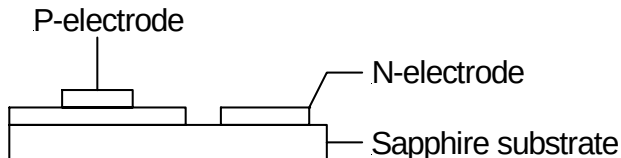


1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is $\pm 0.25\text{mm}$ unless otherwise specified
4. Specifications are subject to change without notice

ElectroStatic Damage ESD

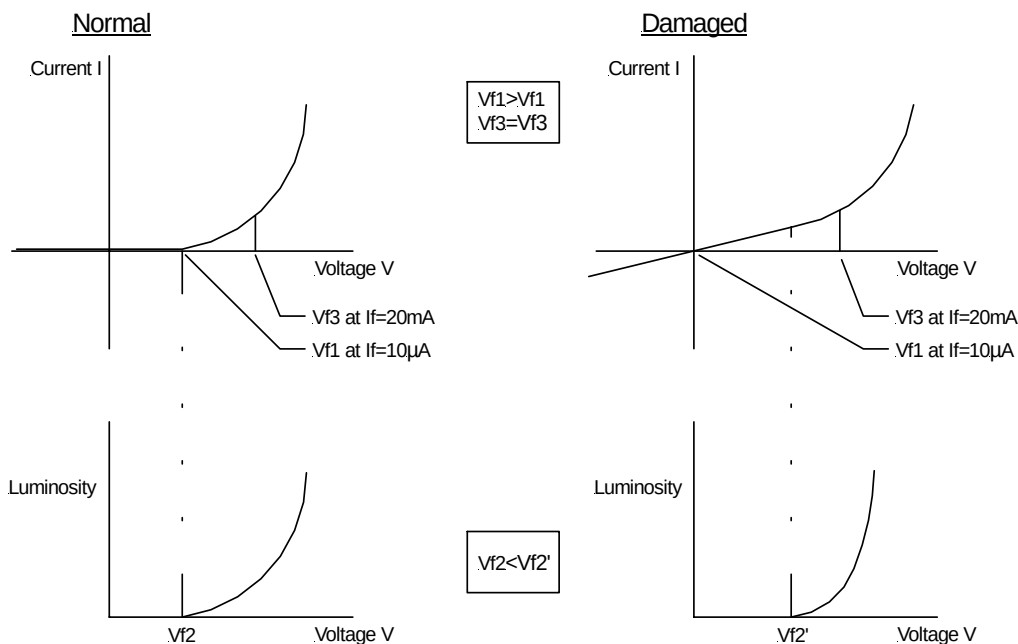
Indium Gallium Nitride (InGaN) LED's are sensitive for static electricity. The electric shock such as surge may deteriorate the quality of LED device. It is recommended to use a wristband or anti-electrostatic gloves when handling the LED's. All devices, equipment and machinery must be electrically grounded.

Layers sandwiched by the electrodes. The distance between the electrodes is small and therefore the static electricity resistance of these LED's is not so high. If high voltage such as surge is applied on the LED, its semiconductor P/N junction may be damaged because of the electric discharge.



Characteristics

The damaged part generally indicate the same characteristics as the resistor's. It may show the characteristics of diode even after it was damaged depending on the level of the discharge. It is the same characteristics when the LED and the resistor are connected parallel. - Current vs. Voltage. Even though the current flows at low voltage, the LED becomes inefficient device because the current is lost before the emission starts. - Luminosity vs. Voltage. However it is difficult to find the damaged LED since the LED may emit the light at the normal condition such as $V_F = 3.6 \text{ V}$.



Reliability

The brightness of the LED becomes lower because of the extra current consumed at the damaged part. The reliability of the damaged LED cannot be estimated since it depends on the location and level of damage.

Inspection

It is recommended to inspect the products featuring InGaN LED's before shipment to realize if the LED's are not electrostatic damaged. The damaged LED is found if it indicates the characteristics above when the reverse current (I_R) and the forward voltage (V_F) are measured. In case this measurement cannot be made because of the application, we recommend the brightness inspection at lower current such as less than 1mA. The damaged LED is found easily since it is dark.

Precautions for LED's

It is well known that semiconductors are easily damaged by electrostatic charges. If the proper handling precautions are not taken, there is a possibility of damaging our LED's with static electricity. During final processing, packaging and delivery the following precautions should be taken in order to prevent damage to the LED's.

Countermeasures for electrostatic charges:

- a. If it is possible at all do not generate electrostatic charges. If this does occur, the size of the charge should be suppressed as much as possible.
- b. If it is possible at all do not hold an electrostatic charge. An attempt should be made to leak the generated charge away and avoid it to build up.

SLOAN recommends the following equipment:

- a. Conductive floor mats which are properly grounded.
- b. Conductive table mats which are properly grounded (these should have the same potential as the floor)
- c. Conductive shoes or slippers should be worn by persons handling the LED's.
- d. Conductive wrists bands for persons handling the LED's.
- e. Anti-electrostatic gloves for persons handling the LED's (these will also help to keep from contaminating the LED's with dirt and other substances).
- f. All equipment such as soldering irons, calibration equipment and tools should be properly grounded.
- g. Anti-electrostatic clothing for persons working around the LED's.
- h. Ionized air blower.
- i. Humidifier.

Delivery:

During carrying of LED's a conductive vessel in IC form, etc., should be used. This is recommended in order to keep the same potential between terminals.

Storage:

The LED's should be stored in a conductive vessel on a grounded surface. When handling, first touch the LED box and then touch the LED's themselves to eliminate any difference in potential.

Other precautions:

- a. In the winter special care must be taken when handling the LED's. It is extremely easy to generate electrostatic charges due to low humidity.
- b. Do not place LED's near other charged materials or substances. Even if your storage area is properly grounded, you cannot be sure that the LED's will not be damaged.
- c. The human body is an excellent conductor. It is easily possible to carry a charge of 3kV to 10kV. The LED's should not be handled with bare hands if possible at all.
- d. Please be sure to properly ground all machines and equipment involved in production with the LED's.
- f. Please consider that to ground is to make a good current circuit and please be careful not to touch the high voltage generating parts of your equipment.

SLOAN AG
CH-4009 Basel

1W POWER-LED'S

white & warmwhite up to 42lm
all colours from 465 - 635nm
RGB full colour
reflow solderable

**you can't find a standard solution?
we solve your problem!**

DEMO-KIT available!

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PowerLED's 1W, warm-white, white



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

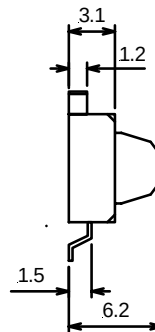
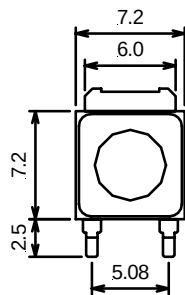
- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- RoHS compliant



Part No.	Colour Temp. (°K)	Luminous Intensity (lm)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		min.	max.		
PL-W001-35	6500°K	36.0	---	51.0	35°	3.6	4.0	waterclear	white
PL-N001-35	3000°K	30.3	---	42.8	35°	3.6	4.0	waterclear	warm white
PL-W001-70	6500°K	36.0	---	51.0	70°	3.6	4.0	waterclear	white
PL-N001-70	3000°K	30.3	---	42.8	70°	3.6	4.0	waterclear	warm white

Electro-Optical-Characteristics Ta=25°C, IF=350mA

Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

PowerLED's 1W, warm-white, white



ATTENTION

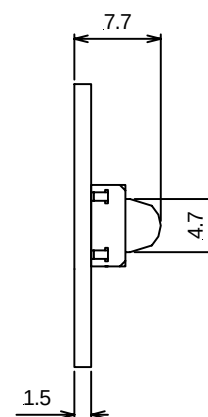
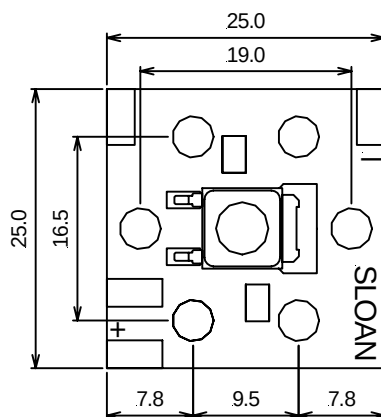
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- on board (with heatsink)
- RoHS compliant



Part No.	Colour Temp. (°K)	Luminous Intensity (lm)			Viewing Angle 2θ _{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		min.	max.		
PL-W011-35	6500°K	36.0	---	51.0	35°	3.6	4.0	waterclear	white
PL-N011-35	3000°K	30.3	---	42.8	35°	3.6	4.0	waterclear	warm white
PL-W011-70	6500°K	36.0	---	51.0	70°	3.6	4.0	waterclear	white
PL-N011-70	3000°K	30.3	---	42.8	70°	3.6	4.0	waterclear	warm white

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

PowerLED's 1W, warm-white, white, blue, cyan, green, red, yellow



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

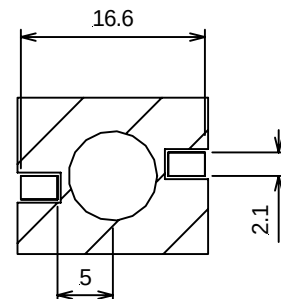
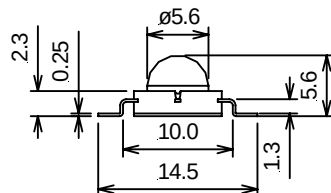
- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- RoHS compliant



Part No.	Dominant Wave-length (nm)	Luminous Intensity (lm)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		min.	max.		
PL3-NL01-00	3050°K	24.5	---	41.5	120°	3.0	4.0	waterclear	warm white
PL3-SL01-00	4000°K	32.0	---	54.0	135°	3.0	4.0	waterclear	natural white
PL3-WL01-1G	5000°K	32.0	---	54.0	120°	3.0	4.0	waterclear	white
PL3-WL01-1A	6500°K	32.0	---	54.0	120°	3.0	4.0	waterclear	white
PL3-BL01-00	455-475	6.0	---	11.0	130°	3.0	4.0	waterclear	blue
PL3-CL01-00	500-510	24.5	---	41.5	130°	3.0	4.0	waterclear	cyan
PL3-GL01-00	520-535	24.5	---	41.5	130°	3.0	4.0	waterclear	green
PL3-RL01-00	618-632	24.5	---	41.5	128°	2.0	3.0	waterclear	red
PL3-YL01-00	585-595	24.5	---	41.5	128°	2.0	3.0	waterclear	yellow

Electro-Optical-Characteristics Ta=25°C, IF=350mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

Solder Pad



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

PowerLED's 1W, warm-white, white, blue, cyan, green, red, yellow



ATTENTION

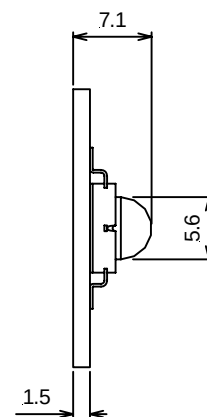
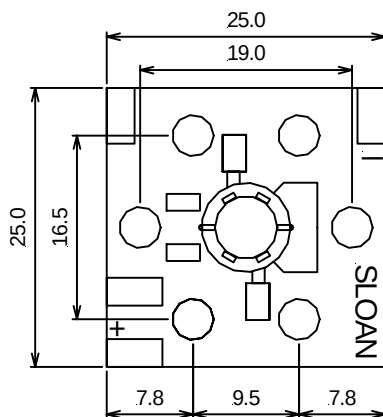
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- high luminosity
- long lifetime up to 50'000 hours
- high quality for professional application
- on board (with heatsink)
- RoHS compliant



Part No.	Dominant Wave-length (nm)	Luminous Intensity (lm)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		min.	max.		
PL3-NL11-00	3050°K	24.5	---	41.5	120°	3.0	4.0	waterclear	warm white
PL3-SL11-00	4000°K	32.0	---	54.0	135°	3.0	4.0	waterclear	natural white
PL3-WL11-1G	5000°K	32.0	---	54.0	120°	3.0	4.0	waterclear	white
PL3-WL11-1A	6500°K	32.0	---	54.0	120°	3.0	4.0	waterclear	white
PL3-BL11-00	455-475	6.0	---	11.0	130°	3.0	4.0	waterclear	blue
PL3-CL11-00	500-510	24.5	---	41.5	130°	3.0	4.0	waterclear	cyan
PL3-GL11-00	520-535	24.5	---	41.5	130°	3.0	4.0	waterclear	green
PL3-RL11-00	618-632	24.5	---	41.5	128°	2.0	3.0	waterclear	red
PL3-YL11-00	585-595	24.5	---	41.5	128°	2.0	3.0	waterclear	yellow

Electro-Optical-Characteristics Ta=25°C, IF=350mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

Lenses for PowerLED's Series PL3

accessories



ATTENTION

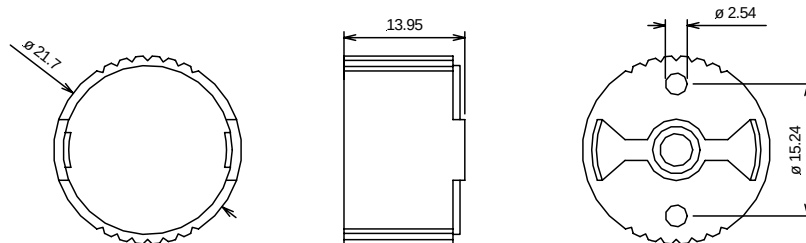
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- low profile
- high efficiency
- thermal stable
- RoHS compliant

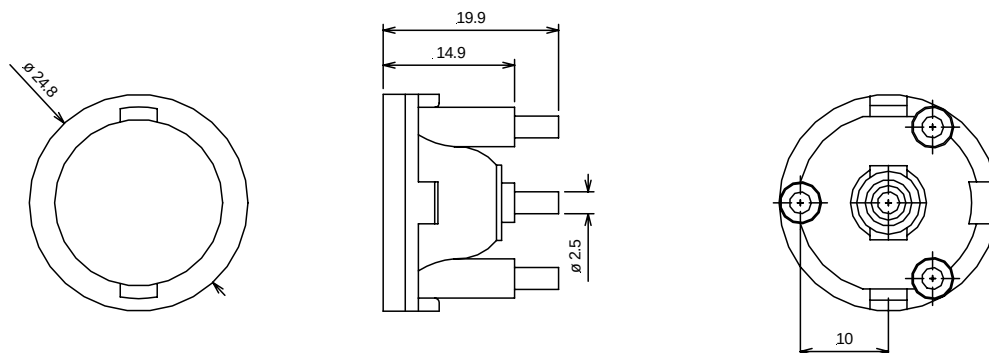


Part No.	Viewing Angle $2\theta^{1/2}$ (deg.)	Description	Material	Case Colour	Typ
PL3-LENS01-10	10°	narrow beam	polycarbonate (PC)	white	1
PL3-LENS01-25	25°	medium beam	polycarbonate (PC)	white	1
PL3-LENS02-10	10°	narrow beam	polycarbonate (PC)	white	2
PL3-LENS02-25	25°	medium beam	polycarbonate (PC)	white	2

Typ 1



Typ 2



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is $\pm 0.25\text{mm}$ unless otherwise specified
4. Specifications are subject to change without notice

0603, white, blue, green, yellow, red

SMD



ATTENTION

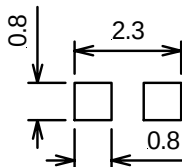
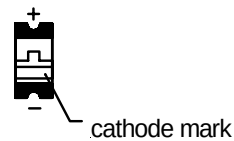
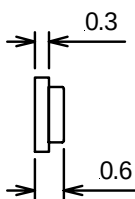
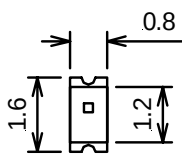
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- chip LED
- dimension: 1.6 x 0.8 x 0.6mm
- viewing angle: 160°
- application: display, moving sign, backlight panel
- RoHS compliant



Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		typ.	max.		
SMD-W0603-01	X=0.29 Y=0.27	150	200	250	160°	3.2	4.0	waterclear	white
SMD-B0603-01	475	80	115	150	160°	3.2	4.0	waterclear	blue
SMD-G0603-01	525	120	135	150	160°	3.2	4.0	waterclear	green
SMD-Y0603-01	595	70	75	80	160°	2.0	2.4	waterclear	yellow
SMD-R0603-01	630	70	75	80	160°	2.0	2.4	waterclear	red

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)
Packaging: 4000pcs./reel



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

0805, white, blue, green, yellow, red

SMD



ATTENTION

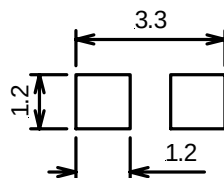
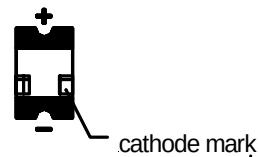
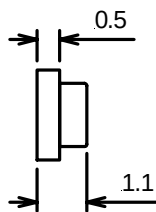
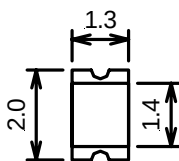
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- chip LED
- dimension: 2.0 x 1.3 x 1.1mm
- viewing angle: 160°
- application: display, moving sign, backlight panel
- RoHS compliant



Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		typ.	max.		
SMD-W0805-01	X=0.29 Y=0.27	200	250	300	160°	3.2	4.0	waterclear	white
SMD-B0805-01	470	60	65	70	160°	3.2	4.0	waterclear	blue
SMD-G0805-01	520	120	135	150	160°	3.2	4.0	waterclear	green
SMD-Y0805-01	590	40	60	80	160°	2.0	2.4	waterclear	yellow
SMD-R0805-01	630	50	65	80	160°	2.0	2.4	waterclear	red

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)
Packaging: 3000pcs./reel



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

1206, white, blue, green, yellow, red

SMD



ATTENTION

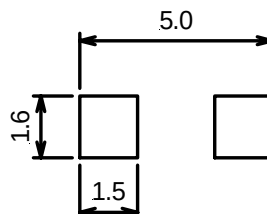
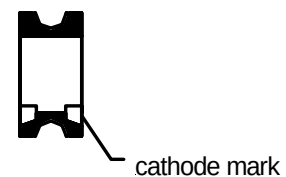
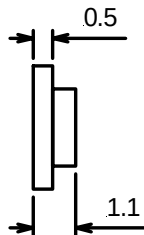
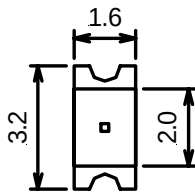
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- top LED
- dimension: 3.2 x 1.6 x 1.1mm
- viewing angle: 140°
- application: display, moving sign, backlight panel
- RoHS compliant



Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2Θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	Max.		typ.	Max.		
SMD-W1206-01	X=0.29 Y=0.27	150	200	250	140°	3.2	4.0	waterclear	white
SMD-B1206-01	475	60	65	70	140°	3.2	4.0	waterclear	blue
SMD-G1206-01	525	120	135	150	140°	3.2	4.0	waterclear	green
SMD-Y1206-01	595	40	50	60	140°	2.0	2.4	waterclear	yellow
SMD-R1206-01	630	40	50	60	140°	2.0	2.4	waterclear	red

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)
Packaging: 3000pcs./reel



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

Ceramic type, blue, green, red, white

SMD



ATTENTION

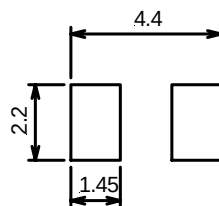
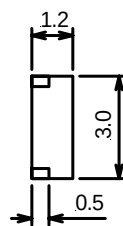
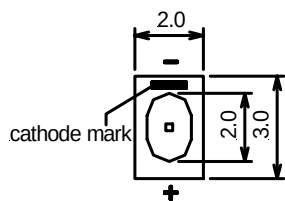
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- top LED
- dimension: 3.0 x 2.0 x 1.2mm
- viewing angle: 120°
- application: display, moving sign, backlight panel
- RoHS compliant



Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		typ.	max.		
SMD-B01N-WS	470	88	104	124	120°	3.6	4.0	waterclear	blue
SMD-B01N-BT	470	124	148	178	120°	3.6	4.0	waterclear	blue
SMD-G01N-GS	525	390	460	560	120°	3.5	4.0	waterclear	green
SMD-R01N-RS	630	160	196	232	120°	2.2	2.4	waterclear	red
SMD-W01N-BS	X=0.31 Y=0.32	310	370	440	110°	3.6	4.0	waterclear	white
SMD-W01N-BT	X=0.31 Y=0.32	440	520	620	110°	3.6	4.0	waterclear	white

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)
Packaging: 2500pcs./reel



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

PLCC2, white, red, green, blue, yellow, amber

SMD



ATTENTION

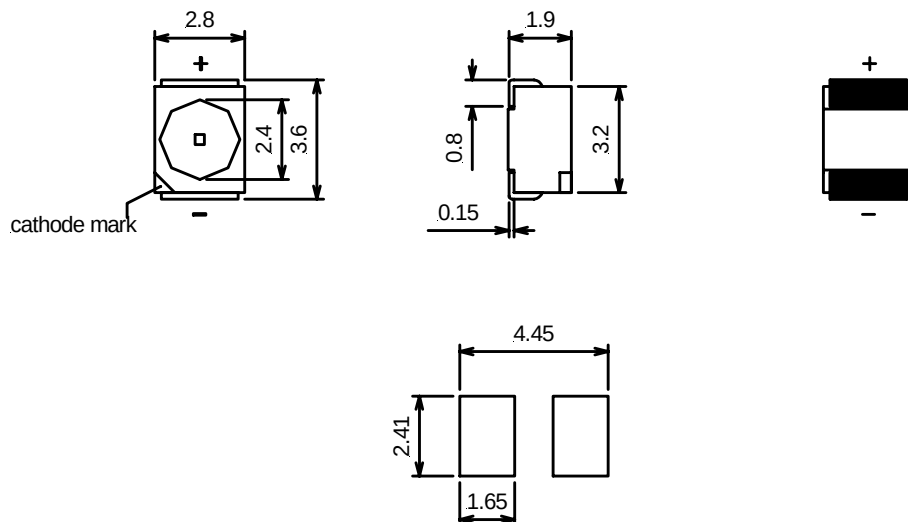
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- top LED
- dimension: 3.2 x 2.8 x 1.9mm
- viewing angle: 110°
- application: display, moving sign, backlight panel
- RoHS compliant



Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		typ.	max.		
SMD-Wplcc-01	X=0.31 Y=0.33	1000	1300	1680	110°	3.5	4.2	waterclear	white
SMD-Rplcc-01	634	218	360	465	110°	2.3	2.8	waterclear	red
SMD-Gplcc-01	518	360	600	780	110°	3.8	4.4	waterclear	green
SMD-Bplcc-01	468	100	168	218	110°	3.7	4.4	waterclear	blue
SMD-Yplcc-01	592	168	280	360	110°	2.3	2.8	waterclear	yellow
SMD-Aplcc-01	611	100	168	218	110°	2.0	2.6	waterclear	amber

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)
Packaging: 1500pcs./reel



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

PLCC2, warm-white, white, red, green, blue, yellow

SMD



ATTENTION

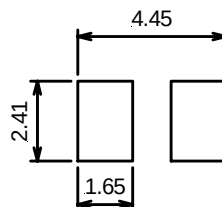
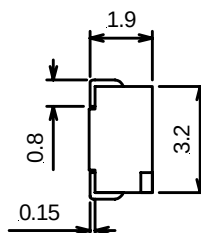
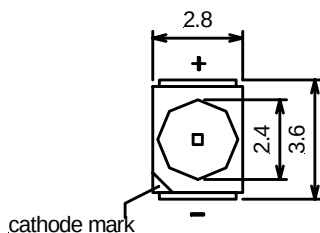
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- top LED
- dimension: 3.2 x 2.8 x 1.9mm
- viewing angle: 120°
- application: display, moving sign, backlight panel
- RoHS compliant



Part No.	Peak Wave-length (nm)	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)		Lens Colour	Emitted Colour
		min.	typ.	max.		typ.	max.		
SMD-Wplcc-10	6500K	700	900	1200	120°	3.3	4.0	waterclear	white
SMD-Nplcc-10	3000K	500	900	900	120°	3.2	4.0	waterclear	warm-white
SMD-Rplcc-10	640	260	320	500	120°	2.2	2.6	waterclear	red
SMD-Gplcc-10	518	300	450	600	120°	3.6	4.1	waterclear	green
SMD-Bplcc-10	465	170	450	600	120°	3.3	4.1	waterclear	blue
SMD-Yplcc-10	595	150	250	350	120°	2.0	2.5	waterclear	yellow

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)
Packaging: 2000pcs./reel



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice



BA9S

white based 5mm LED's



ATTENTION

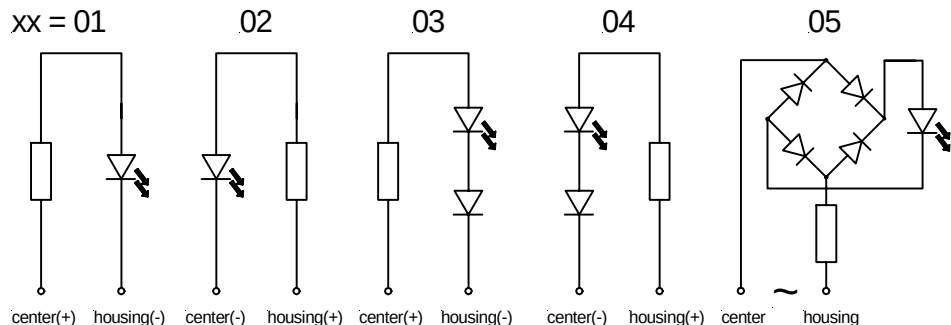
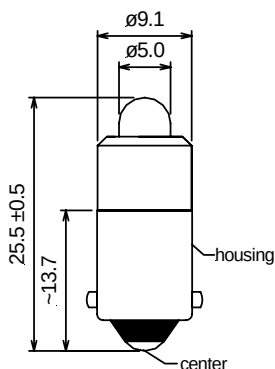
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- easy replacement of filament bulbs
- other colours and voltages on request
- high luminosity
- without cap
- RoHS compliant



Part No.	Chromacity Coordinates	Luminous Intensity (mcd)			Viewing Angle $2\theta_{1/2}$ (deg.)	Forward Voltage VF (V)	Lens Colour	Emitted Colour
		min.	typ.	Max.				
BA9S-L5W50NBSAxx	X=0.32 Y=0.31	580	690	805	70°	5.0	milky	white
BA9S-L5W52NBSAxx	X=0.32 Y=0.31	2060	2500	3000	50°	5.0	waterclear	white
BA9S-L5W54NBSAxx	X=0.32 Y=0.31	7800	9200	11000	20°	5.0	waterclear	white
BA9S-L5W50NBSBxx	X=0.32 Y=0.31	580	690	805	70°	12.0	milky	white
BA9S-L5W52NBSBxx	X=0.32 Y=0.31	2060	2500	3000	50°	12.0	waterclear	white
BA9S-L5W54NBSBxx	X=0.32 Y=0.31	7800	9200	11000	20°	12.0	waterclear	white
BA9S-L5W50NBSDxx	X=0.32 Y=0.31	580	690	805	70°	24.0	milky	white
BA9S-L5W52NBSDxx	X=0.32 Y=0.31	2060	2500	3000	50°	24.0	waterclear	white
BA9S-L5W54NBSDxx	X=0.32 Y=0.31	7800	9200	11000	20°	24.0	waterclear	white

Electro-Optical-Characteristics $T_a=25^\circ\text{C}$, $I_F=20\text{mA}$
Storage Temp. $-40 \sim +100\ (^{\circ}\text{C})$ Operating Temp. $-30 \sim +80\ (^{\circ}\text{C})$



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is $\pm 0.25\text{mm}$ unless otherwise specified
4. Specifications are subject to change without notice

BA9S

white based 5mm LED's



ATTENTION

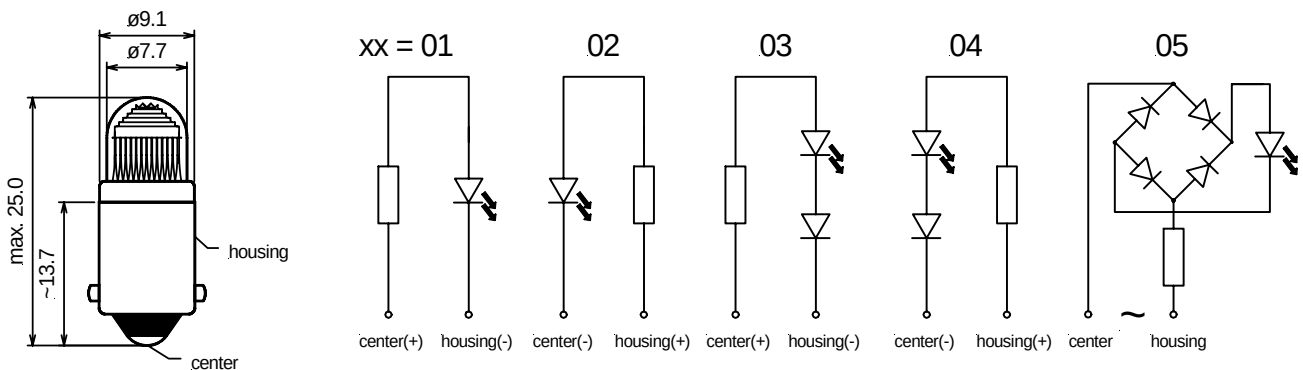
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- easy replacement of filament bulbs
- other colours and voltages on request
- high luminosity
- with domed cap
- RoHS compliant



Part No.	Chromacity Coordinates	Luminous Intensity (mcd)			Viewing Angle $2\theta_{1/2}$ (deg.)	Forward Voltage VF (V)	Cap Colour	Emitted Colour
		min.	typ.	Max.				
BA9S-C1W50NBSAxx	X=0.32/Y=0.31	580	690	805	70°	5.0	waterclear	white
BA9S-C1W52NBSAxx	X=0.32/Y=0.31	2060	2500	3000	50°	5.0	Waterclear	white
BA9S-C1W54NBSAxx	X=0.32/Y=0.31	7800	9200	11000	20°	5.0	waterclear	white
BA9S-C1W50NBSBxx	X=0.32/Y=0.31	580	690	805	70°	12.0	waterclear	white
BA9S-C1W52NBSBxx	X=0.32/Y=0.31	2060	2500	3000	50°	12.0	waterclear	white
BA9S-C1W54NBSBxx	X=0.32/Y=0.31	7800	9200	11000	20°	12.0	waterclear	white
BA9S-C1W50NBSDxx	X=0.32/Y=0.31	580	690	805	70°	24.0	waterclear	white
BA9S-C1W52NBSDxx	X=0.32/Y=0.31	2060	2500	3000	50°	24.0	waterclear	white
BA9S-C1W54NBSDxx	X=0.32/Y=0.31	7800	9200	11000	20°	24.0	waterclear	white
BA9S-C2W50NBSAxx	X=0.32/Y=0.31	580	690	805	70°	5.0	milky	white
BA9S-C2W52NBSAxx	X=0.32/Y=0.31	2060	2500	3000	50°	5.0	milky	white
BA9S-C2W54NBSAxx	X=0.32/Y=0.31	7800	9200	11000	20°	5.0	milky	white
BA9S-C2W50NBSBxx	X=0.32/Y=0.31	580	690	805	70°	12.0	milky	white
BA9S-C2W52NBSBxx	X=0.32/Y=0.31	2060	2500	3000	50°	12.0	milky	white
BA9S-C2W54NBSBxx	X=0.32/Y=0.31	7800	9200	11000	20°	12.0	milky	white
BA9S-C2W50NBSDxx	X=0.32/Y=0.31	580	690	805	70°	24.0	milky	white
BA9S-C2W52NBSDxx	X=0.32/Y=0.31	2060	2500	3000	50°	24.0	milky	white
BA9S-C2W54NBSDxx	X=0.32/Y=0.31	7800	9200	11000	20°	24.0	milky	white

Electro-Optical-Characteristics Ta=25°C, IF=20mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ± 0.25 mm unless otherwise specified
4. Specifications are subject to change without notice

E10

white based 5mm LED's



ATTENTION

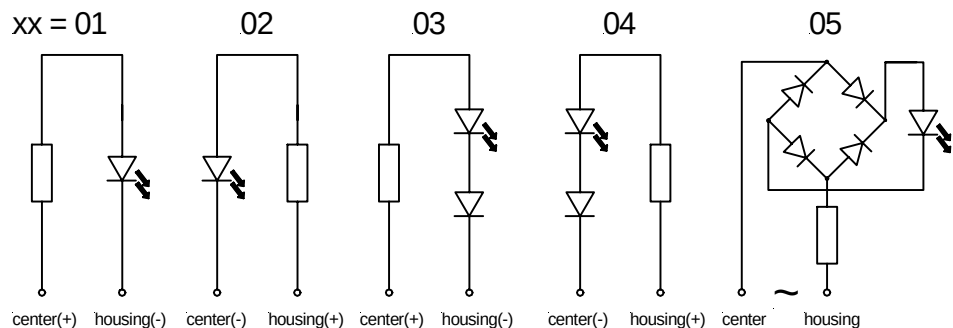
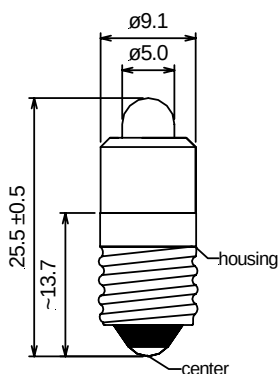
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- easy replacement of filament bulbs
- other colours and voltages on request
- high luminosity
- without cap
- RoHS compliant



Part No.	Chromacity Coordinates	Luminous Intensity (mcd)			Viewing Angle $2\theta^{1/2}$ (deg.)	Forward Voltage VF (V)	Lens Colour	Emitted Colour
		min.	typ.	max.				
E10-L5W50NBSAxx	X=0.32 Y=0.31	580	690	805	70°	5.0	milky	white
E10-L5W52NBSAxx	X=0.32 Y=0.31	2060	2500	3000	50°	5.0	waterclear	white
E10-L5W54NBSAxx	X=0.32 Y=0.31	7800	9200	11000	20°	5.0	waterclear	white
E10-L5W50NBSBxx	X=0.32 Y=0.31	580	690	805	70°	12.0	milky	white
E10-L5W52NBSBxx	X=0.32 Y=0.31	2060	2500	3000	50°	12.0	waterclear	white
E10-L5W54NBSBxx	X=0.32 Y=0.31	7800	9200	11000	20°	12.0	waterclear	white
E10-L5W50NBSDxx	X=0.32 Y=0.31	580	690	805	70°	24.0	milky	white
E10-L5W52NBSDxx	X=0.32 Y=0.31	2060	2500	3000	50°	24.0	waterclear	white
E10-L5W54NBSDxx	X=0.32 Y=0.31	7800	9200	11000	20°	24.0	waterclear	white

Electro-Optical-Characteristics $T_a=25^\circ\text{C}$, $I_F=20\text{mA}$
Storage Temp. $-40 \sim +100\ (^{\circ}\text{C})$ Operating Temp. $-30 \sim +80\ (^{\circ}\text{C})$



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is $\pm 0.25\text{mm}$ unless otherwise specified
4. Specifications are subject to change without notice

E10

white based 5mm LED's



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

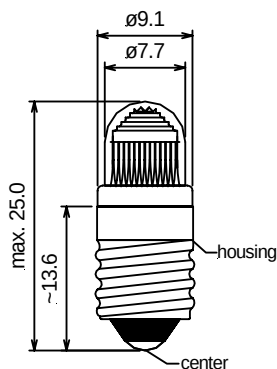
- easy replacement of filament bulbs
- other colours and voltages on request
- high luminosity
- with domed cap
- RoHS compliant



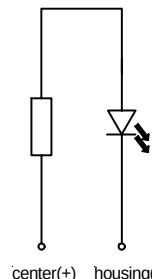
Part No.	Chromacity Coordinates	Luminous Intensity (mcd)			Viewing Angle 2Θ½ (deg.)	Forward Voltage VF (V)	Cap Colour	Emitted Colour
		min.	typ.	Max.				
E10-C1W50NBSAxx	X=0.32/Y=0.31	580	690	805	70°	5.0	waterclear	white
E10-C1W52NBSAxx	X=0.32/Y=0.31	2060	2500	3000	50°	5.0	waterclear	white
E10-C1W54NBSAxx	X=0.32/Y=0.31	7800	9200	11000	20°	5.0	waterclear	white
E10-C1W50NBSBxx	X=0.32/Y=0.31	580	690	805	70°	12.0	waterclear	white
E10-C1W52NBSBxx	X=0.32/Y=0.31	2060	2500	3000	50°	12.0	waterclear	white
E10-C1W54NBSBxx	X=0.32/Y=0.31	7800	9200	11000	20°	12.0	waterclear	white
E10-C1W50NBSDxx	X=0.32/Y=0.31	580	690	805	70°	24.0	waterclear	white
E10-C1W52NBSDxx	X=0.32/Y=0.31	2060	2500	3000	50°	24.0	waterclear	white
E10-C1W54NBSDxx	X=0.32/Y=0.31	7800	9200	11000	20°	24.0	waterclear	white
E10-C2W50NBSAxx	X=0.32/Y=0.31	580	690	805	70°	5.0	milky	white
E10-C2W52NBSAxx	X=0.32/Y=0.31	2060	2500	3000	50°	5.0	milky	white
E10-C2W54NBSAxx	X=0.32/Y=0.31	7800	9200	11000	20°	5.0	milky	white
E10-C2W50NBSBxx	X=0.32/Y=0.31	580	690	805	70°	12.0	milky	white
E10-C2W52NBSBxx	X=0.32/Y=0.31	2060	2500	3000	50°	12.0	milky	white
E10-C2W54NBSBxx	X=0.32/Y=0.31	7800	9200	11000	20°	12.0	milky	white
E10-C2W50NBSDxx	X=0.32/Y=0.31	580	690	805	70°	24.0	milky	white
E10-C2W52NBSDxx	X=0.32/Y=0.31	2060	2500	3000	50°	24.0	milky	white
E10-C2W54NBSDxx	X=0.32/Y=0.31	7800	9200	11000	20°	24.0	milky	white

Electro-Optical-Characteristics Ta=25°C, IF=20mA

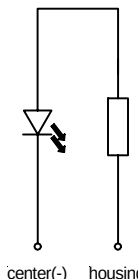
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)



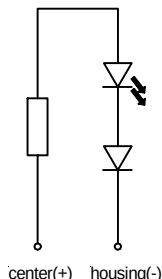
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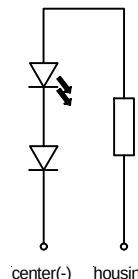
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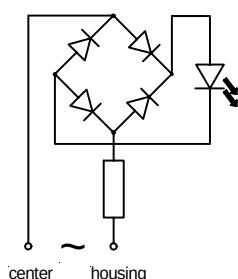
03



04



05



1. All specifications according to information from our manufacturers, without additional guarantee on our part
2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

Midget Flange T1^{3/4}

white based 3mm LED's



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- easy replacement of filament bulbs
- other colours and voltages on request
- high luminosity
- RoHS compliant



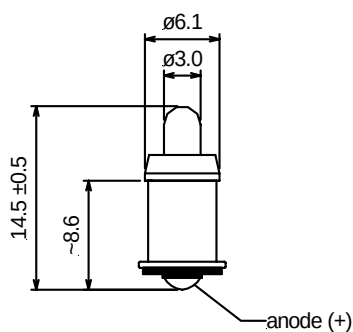
Part No.	Chromacity Coordinates	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)	Lens Colour	Emitted Colour
		min.	typ.	max.				
MF-W33NBSB01	X=0.32/Y=0.31	3900	4600	5520	25°	12.0	waterclear	white
MF-W35NBSB01	X=0.32/Y=0.31	2600	3100	3700	35°	12.0	waterclear	white
MF-W34NBSB01	X=0.32/Y=0.31	1750	2070	2530	60°	12.0	waterclear	white
MF-W30NBSB01	X=0.32/Y=0.31	920	1100	1260	70°	12.0	milky	white
MF-W33NBSM01	X=0.32/Y=0.31	3900	4600	5520	25°	24.0*	waterclear	white
MF-W35NBSM01	X=0.32/Y=0.31	2600	3100	3700	35°	24.0*	waterclear	white
MF-W34NBSM01	X=0.32/Y=0.31	1750	2070	2530	60°	24.0*	waterclear	white
MF-W30NBSM01	X=0.32/Y=0.31	920	1100	1260	70°	24.0*	milky	white
MF-W33NBSB02	X=0.32/Y=0.31	3900	4600	5520	25°	12.0	waterclear	white
MF-W35NBSB02	X=0.32/Y=0.31	2600	3100	3700	35°	12.0	waterclear	white
MF-W34NBSB02	X=0.32/Y=0.31	1750	2070	2530	60°	12.0	waterclear	white
MF-W30NBSB02	X=0.32/Y=0.31	920	1100	1260	70°	12.0	milky	white
MF-W33NBSM02	X=0.32/Y=0.31	3900	4600	5520	25°	24.0*	waterclear	white
MF-W35NBSM02	X=0.32/Y=0.31	2600	3100	3700	35°	24.0*	waterclear	white
MF-W34NBSM02	X=0.32/Y=0.31	1750	2070	2530	60°	24.0*	waterclear	white
MF-W30NBSM02	X=0.32/Y=0.31	920	1100	1260	70°	24.0*	milky	white

01=anode (+) on centercontact DC (standard)

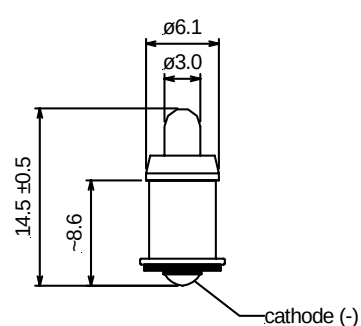
02=cathode (-) on centercontact DC

Electro-Optical-Characteristics Ta=25°C, IF=20mA, *IF=16mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

MF-Wxxxxxx01



MF-Wxxxxxx02



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2. All dimensions are in millimetres
3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

Midget Groove T1^{3/4}

white based 3mm LED's



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- easy replacement of filament bulbs
- other colours and voltages on request
- high luminosity
- RoHS compliant



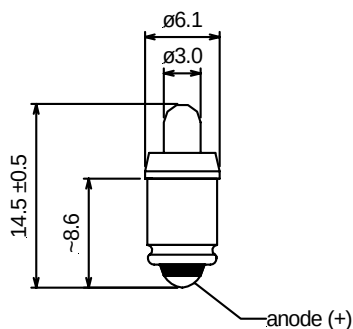
Part No.	Chromacity Coordinates	Luminous Intensity (mcd)			Viewing Angle 2Θ ^{1/2} (deg.)	Forward Voltage VF (V)	Lens Colour	Emitted Colour
		min.	typ.	max.				
MG-W33NBSB01	X=0.32/Y=0.31	3900	4600	5520	25°	12.0	waterclear	white
MG-W35NBSB01	X=0.32/Y=0.31	2600	3100	3700	35°	12.0	waterclear	white
MG-W34NBSB01	X=0.32/Y=0.31	1750	2070	2530	60°	12.0	waterclear	white
MG-W30NBSB01	X=0.32/Y=0.31	920	1100	1260	70°	12.0	milky	white
MG-W33NBSM01	X=0.32/Y=0.31	3900	4600	5520	25°	24.0*	waterclear	white
MG-W35NBSM01	X=0.32/Y=0.31	2600	3100	3700	35°	24.0*	waterclear	white
MG-W34NBSM01	X=0.32/Y=0.31	1750	2070	2530	60°	24.0*	waterclear	white
MG-W30NBSM01	X=0.32/Y=0.31	920	1100	1260	70°	24.0*	milky	white
MG-W33NBSB02	X=0.32/Y=0.31	3900	4600	5520	25°	12.0	waterclear	white
MG-W35NBSB02	X=0.32/Y=0.31	2600	3100	3700	35°	12.0	waterclear	white
MG-W34NBSB02	X=0.32/Y=0.31	1750	2070	2530	60°	12.0	waterclear	white
MG-W30NBSB02	X=0.32/Y=0.31	920	1100	1260	70°	12.0	milky	white
MG-W33NBSM02	X=0.32/Y=0.31	3900	4600	5520	25°	24.0*	waterclear	white
MG-W35NBSM02	X=0.32/Y=0.31	2600	3100	3700	35°	24.0*	waterclear	white
MG-W34NBSM02	X=0.32/Y=0.31	1750	2070	2530	60°	24.0*	waterclear	white
MG-W30NBSM02	X=0.32/Y=0.31	920	1100	1260	70°	24.0*	milky	white

01=anode (+) on centercontact DC (standard)

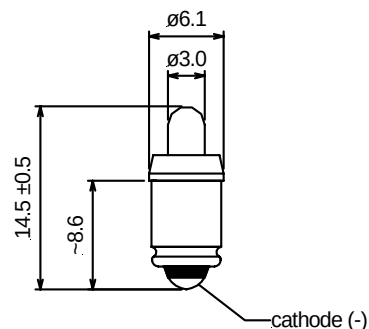
02=cathode (-) on centercontact DC

Electro-Optical-Characteristics Ta=25°C, IF=20mA, *IF=16mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)

MG-Wxxxxxx01



MG-Wxxxxxx02



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3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

Wedge Base

white based 3mm LED's



ATTENTION

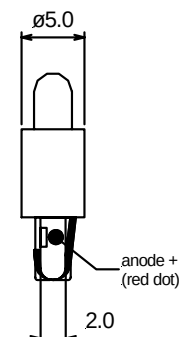
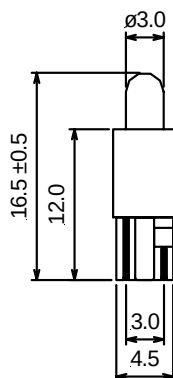
Observe Precautions
for Handling
Electrostatic Sensitive
Devices

- W2.0 x 4.6d
- easy replacement of filament bulbs
- other colours and voltages on request
- high luminosity
- RoHS compliant



Part No.	Chromacity Coordinates	Luminous Intensity (mcd)			Viewing Angle 2θ½ (deg.)	Forward Voltage VF (V)	Lens Colour	Emitted Colour
		min.	typ.	max.				
WB4.6-W33NBSA	X=0.32/Y=0.31	3900	4600	5520	25°	5.0	waterclear	white
WB4.6-W35NBSA	X=0.32/Y=0.31	2600	3100	3700	35°	5.0	waterclear	white
WB4.6-W34NBSA	X=0.32/Y=0.31	1750	2070	2530	60°	5.0	waterclear	white
WB4.6-W30NBSA	X=0.32/Y=0.31	920	1100	1260	70°	5.0	milky	white
WB4.6-W33NBSB	X=0.32/Y=0.31	3900	4600	5520	25°	12.0	waterclear	white
WB4.6-W35NBSB	X=0.32/Y=0.31	2600	3100	3700	35°	12.0	waterclear	white
WB4.6-W34NBSB	X=0.32/Y=0.31	1750	2070	2530	60°	12.0	waterclear	white
WB4.6-W30NBSB	X=0.32/Y=0.31	920	1100	1260	70°	12.0	milky	white
WB4.6-W33NBSM	X=0.32/Y=0.31	3900	4600	5520	25°	24.0*	waterclear	white
WB4.6-W35NBSM	X=0.32/Y=0.31	2600	3100	3700	35°	24.0*	waterclear	white
WB4.6-W34NBSM	X=0.32/Y=0.31	1750	2070	2530	60°	24.0*	waterclear	white
WB4.6-W30NBSM	X=0.32/Y=0.31	920	1100	1260	70°	24.0*	milky	white

Electro-Optical-Characteristics Ta=25°C, IF=20mA, *IF=16mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -30 ~+80 (°C)



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3. Tolerance is ±0.25mm unless otherwise specified
4. Specifications are subject to change without notice

T5,5K/T5,5L

white based 3mm LED's



ATTENTION

Observe Precautions
for Handling
Electrostatic Sensitive
Devices

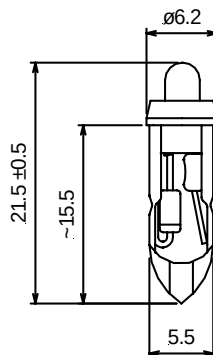
- easy replacement of filament bulbs
- other colours and voltages on request
- high luminosity
- AC/DC built-in diode for protection
- RoHS compliant



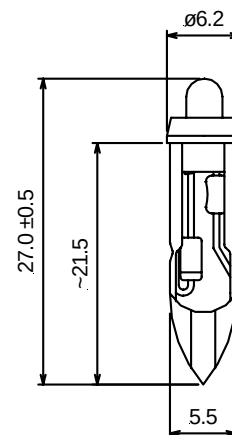
Part No.	Chromacity Coordinates	Luminous Intensity (mcd)			Viewing Angle 2θ ^{1/2} (deg.)	Forward Voltage VF (V)	Lens Colour	Emitted Colour
		min.	typ.	max.				
T5,5K-W33NBSB03	X=0.32/Y=0.31	3900	4600	5520	25°	12.0	waterclear	white
T5,5K-W35NBSB03	X=0.32/Y=0.31	2600	3100	3700	35°	12.0	Waterclear	white
T5,5K-W34NBSB03	X=0.32/Y=0.31	1750	2070	2530	60°	12.0	waterclear	white
T5,5K-W30NBSB03	X=0.32/Y=0.31	920	1100	1260	70°	12.0	milky	white
T5,5K-W33NBSM03	X=0.32/Y=0.31	3900	4600	5520	25°	24.0*	waterclear	white
T5,5K-W35NBSM03	X=0.32/Y=0.31	2600	3100	3700	35°	24.0*	waterclear	white
T5,5K-W34NBSM03	X=0.32/Y=0.31	1750	2070	2530	60°	24.0*	waterclear	white
T5,5K-W30NBSM03	X=0.32/Y=0.31	920	1100	1260	70°	24.0*	milky	white
T5,5L-W33NBSB03	X=0.32/Y=0.31	3900	4600	5520	25°	12.0	waterclear	white
T5,5L-W35NBSB03	X=0.32/Y=0.31	2600	3100	3700	35°	12.0	waterclear	white
T5,5L-W34NBSB03	X=0.32/Y=0.31	1750	2070	2530	60°	12.0	waterclear	white
T5,5L-W30NBSB03	X=0.32/Y=0.31	920	1100	1260	70°	12.0	milky	white
T5,5L-W33NBSM03	X=0.32/Y=0.31	3900	4600	5520	25°	24.0*	waterclear	white
T5,5L-W35NBSM03	X=0.32/Y=0.31	2600	3100	3700	35°	24.0*	waterclear	white
T5,5L-W34NBSM03	X=0.32/Y=0.31	1750	2070	2530	60°	24.0*	waterclear	white
T5,5L-W30NBSM03	X=0.32/Y=0.31	920	1100	1260	70°	24.0*	milky	white

Electro-Optical-Characteristics Ta=25°C, IF=20mA, *IF=16mA
Storage Temp. -40 ~+100 (°C) Operating Temp. -40 ~+100 (°C)

T5,5K



T5,5L



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4. Specifications are subject to change without notice