SanKen

Working Together for a Greener Society

Future of Power Electronics and the Earth

LED Selection Guide

◆General-purpose Chip LEDs

◆Through-hole LEDs

◆Food Lighting LEDs

◆Ultra-high CRI LEDs

◆Infrared LED

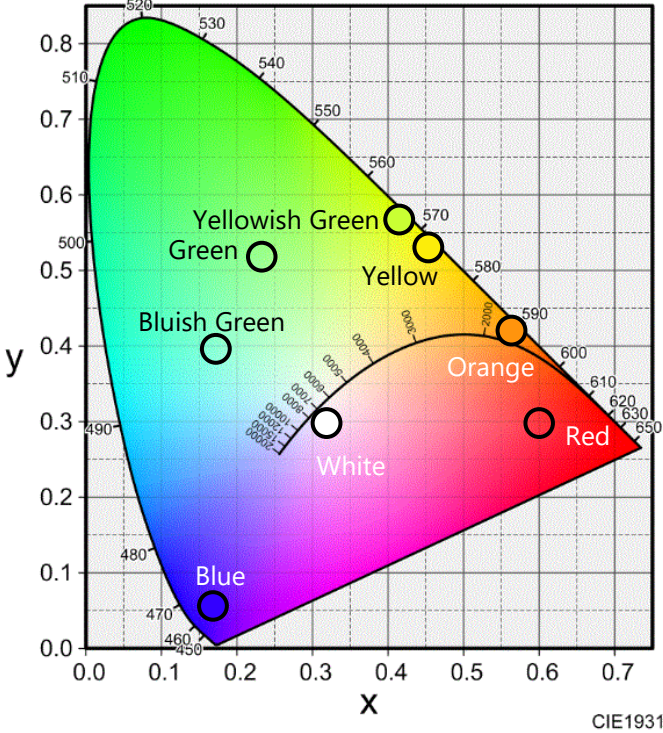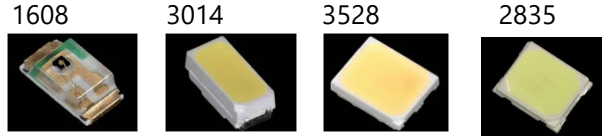# General-purpose Chip LEDs

Standard Products

We have a product lineup of LEDs with wide-range chromaticities.
The following tables help you select LEDs optimal for your application (e.g., indicators, switches, and automotive interiors).

CIE1931

Package Example

1608   3014   3528   2835

Selection Guide

| Color Range	Package	Page
Blue	3528 2835 1608	P.5
Bluish Green to Green to Yellow	3528 3014 1608	P.6
Orange to Red	3528 3014 1608	P.7
White	3528 2835 1608	P.8

Custom Products

If our standard products do not have the color you want, spectrum-level customization is available. Various approaches will be taken so that you can compare samples, such as color quantification or visual confirmation. We can offer you a "custom light" suitable for your application.

Orders are subject to certain conditions, including mass production quantities and specifications. Please do not hesitate to contact us for more information.
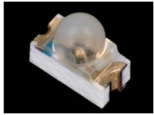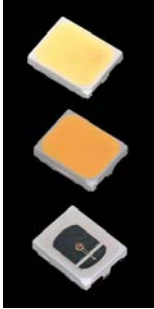
Inquiry Form: https://www.semicon.sanken-ele.co.jp/en/contact/form/

Example Customization: Redness Emphasized, Yellowness Suppressed
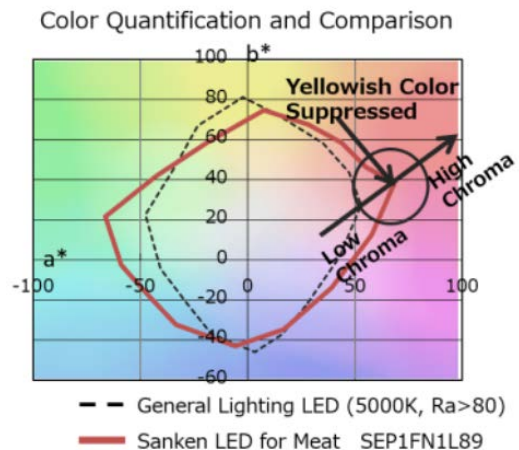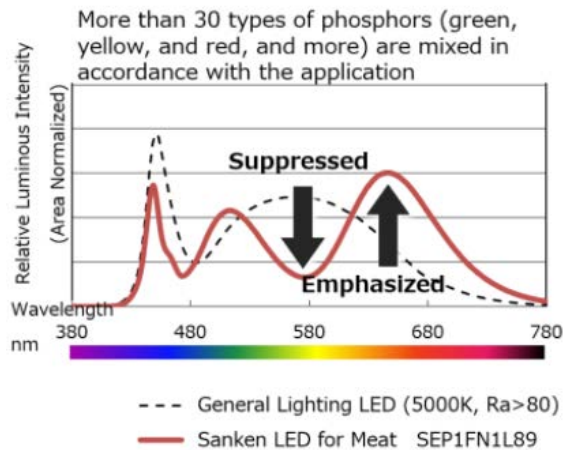
Color Chart for General-purpose Chip LEDs

You can select the product by package type and color.
Color tuning may also be available for the colors not listed in the color chart. If you have any questions or requests, please contact us on our website (Inquiry Form).

Package	Color	Dominant Wavelength /Chromaticity	Part Number		
			Low Brightness	Medium Brightness	High Brightness
Flat Lens LED 1608	Deep Red	637 to 639 nm	SECU1605C-S	SECU1611C-N20	
	Red	624 to 625 nm	SECU1205C-S	SECU1205C-NK	
		622 nm		SECU1211C20	SECU1211C-NH20
		613 nm		SECU1R11C-S20	
	Amber	605 nm	SECU1805C-S	SECU1811C-S20	SECU1811C-N20
	Light Amber	597 nm	SECU1B07C		
	Orange	589 to 592 nm	SECU1905C-S	SECU1911C-S20	SECU1911C-N20
	Yellow	571 nm		SECU1711C-S20	
	Green	563 nm	SECU1407C-TG		
		564 nm	SECU1411C-TG20		
	Pure Green	525 nm		SECG1D07C-SD	
	Bluish Green	505 nm		SECG1UB07YPT	
	Blue	465 nm	SECG1E07C-SD	SECG1E07C-PD	
	White	x = 0.206 to 0.303 y = 0.244 to 0.380	SECG1WH07YSDT3	SECE1WA07YPT2 SECE1WC07YPDT SECG1WA07Y-SD SECG1WA07YSDT SECG1WD07YPD SECG1WV07YPD SECE1WCA1YSDT SECE1WBA1YPT	
Dome Lens LED 1608	Red	622 nm			SECU1213C-N20
	Orange	590 to 592 nm		SECU1913C-SE8	SECU1913C-N20
	Yellow	570 nm		SECU1713C-S	
	Green	564 nm	SECU1413C-TG20		
	Blue	461 nm		SECG1E13CP	
Flat LED 3528 3014	Red	622 nm (Peak Wavelength)			SEP161424T
		622 nm		SEP121404A	
		613 nm	SECU1R0EC-SA		
	Amber	611 nm		SECU180EC-SA	
		605 nm		SEP181406A	SEP181404TA
	Orange	589 to 591 nm	SECU190EC-ST3A	SEP191404A	SEP1P91407DTA
	Yellow	568 nm			SEP1P71407DTA
	Green	527 nm		SEP1D1402DT3A	SEP1D1419DTA
	Blue	471 nm			SEP1E1404 SEP1E1404D
		458 nm			SEP1E1L17
	White	x = 0.267 to 0.320 y = 0.282 to 0.451	SEP1WA1402-T3A	SEP1WP1446DTA	SEP1WB1410DA SEP1WB1433D SEP1WR1407DTA SEP1WB1433 SEP1WC1L19DTA SEP1WS1L72

High Brightness Chip LEDs

SanKen

The high brightness and high color rendering index (Ra ≥90) flat LEDs for lighting are available.

■ LEDs for Food Showcase Lighting, Wellness Lighting, Color Eval Light Source

* When the SEP1AQ1L92LL and the SEP1AQ1L92SS mounted in pairs.

Package	Part Number	Color	Color Temperature CCT (Typ.)	Luminous Flux Φv (Typ.)	Luminous Efficacy η (Typ.)	CRI (Typ.)	Remarks
Flat LED 2835	SEP1YL1L72	Warm White	3000 K	24.9 lm	137 lm/W	Ra = 93	Food lighting, food showcases (→P.13)
	SEP1FN1L89	White	4600 K	17.7 lm	97 lm/W	Ra = 55	
	SEP1YN1L72	White	5000 K	25.7 lm	141 lm/W	Ra = 93	
	SEP1AQ1L92LL	White	5000 K	19.6 lm	145 lm/W	Ra ≥95* Ri ≥90*	Ultra-high CRI, wellness lighting, color evaluation (→P.14)
	SEP1AQ1L92SS	White			140 lm/W		

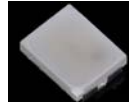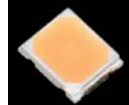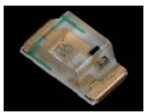Please visit our website and learn more about our LEDs.

Food Lighting LEDs
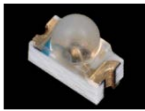https://www.semicon.sanken-ele.co.jp/en/guide/ledforfood.html

Ultra-high CRI LEDs
https://www.semicon.sanken-ele.co.jp/en/guide/high_color_rendering_led.html

■ LEDs for Industrial Equipment, Houses, and Facilities
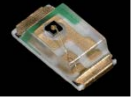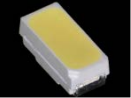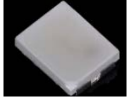
Package	Part Number	Color	Wavelength/ Chromaticity (Typ.)	Luminous Flux Φv (Typ.)	Luminous Efficacy η (Typ.)	Remarks
Flat LED 3528	SEP161424T	Deep Red	λ_P = 652 nm	3.3 lm	30 lm/W	Light sources for inspection, ornamental use
Frat LED 2835	SEP1E1L17	Blue	λ_D = 458 nm	2.7 lm	19.6 lm/W	
	SEP1WS1L72	White	x = 0.3070 y = 0.4510	28.0 lm	204 lm/W	
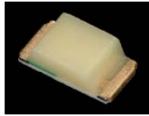
*Under development

Package L×W×H (mm)	Part Number	Color	Forward Voltage (V)	luminous Intensity (mcd)	Chromaticity X, Y	Measurement Condition (mA)	Light Dispersion Angle/ Viewing Angle (deg)	Power Dissipation (mW)
1.6×0.8×0.7	SECG1E07C-SD	Blue	3.1	50	—	10	150	108
	SECG1E07C-PD	Blue	3.1	88	—	10	140	105
1.6×0.8×1.5	SECG1E13CP*	Blue	2.9	329	—	10	50	99
3.5×2.8×1.2	SEP1E1404	Blue	3.3	550	—	20	120	120
3.5×2.8×1.2	SEP1E1404D	Blue	3.1	550	—	20	120	108
2.8×3.5×0.7	SEP1E1L17	Blue	2.75	—	—	—	120	465

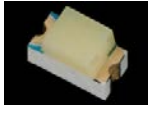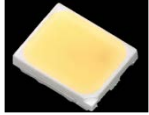| Package L×W×H (mm)		Part Number	Color	Forward Voltage (V)	Luminous Intensity (mcd)	Chromaticity X, Y	Measurement Condition (mA)	Light Dispersion Angle/ Viewing Angle (deg)	Power Dissipation (mW)
1.6×0.8×0.7		SECG1D07C-SD	Pure Green	2.9	170	—	10	150	111
1.6×0.8×0.7		SECG1UB07YPT	Bluish Green	2.7	120	—	5	160	99
1.6×0.8×0.7		SECU1407C-TG	Green	2.0	15	—	10	130	75
1.6×0.8×1.1		SECU1711C-S20	Yellow	2.1	96	—	20	130	72
		SECU1411C-TG20	Green	2.1	30	—	20	130	72
1.6×0.8×1.5		SECU1713C-S	Yellow	2.1	300	—	20	60	100
		SECU1413C-TG20	Green	2.1	75	—	20	60	100
3.5×2.8×1.2		SEP1P71407DTA	Yellow	3.1	800	0.430, 0.545	10	120	111
3.5×2.8×1.2		SEP1D1402DT3A	Green	3.0	325	—	10	120	105
		SEP1D1419DTA	Green	2.45	1000	—	10	120	90

Package L×W×H (mm)	Part Number	Color	Forward Voltage (V)	luminous Intensity (mcd)	Chromaticity X, Y	Measurement Condition (mA)	Light Dispersion Angle/ Viewing Angle (deg)	Power Dissipation (mW)
1.6×0.8×0.55	SECU1605C-S	Deep Red	1.9	25	—	10	130	75
	SECU1205C-NK	Red	2.0	150	—	10	130	75
	SECU1205C-S	Red	1.9	45	—	10	130	75
	SECU1805C-S	Amber	1.9	50	—	10	130	75
	SECU1905C-S	Orange	1.9	40	—	10	130	75
1.6×0.8×0.7	SECU1B07C	Light Amber	1.95	90	—	10	150	111
1.6×0.8×1.1	SECU1611C-N20	Deep Red	2.0	204	—	20	140	72
	SECU1211C-NH20	Red	2.0	450	—	20	140	84
	SECU1211C20	Red	2.0	181	—	20	120	84
	SECU1R11C-S20	Red	2.0	160	—	20	140	72
	SECU1811C-N20	Amber	2.0	430	—	20	140	72
	SECU1811C-S20	Amber	2.0	145	—	20	140	72
	SECU1911C-N20	Orange	2.0	401	—	20	140	72
	SECU1911C-S20	Orange	2.0	190	—	20	140	72
1.6×0.8×1.5	SECU1213C-N20	Red	2.1	1000	—	20	60	100
	SECU1913C-N20	Orange	2.1	1100	—	20	60	100
	SECU1913C-SE8	Orange	2.1	470	—	20	60	100
3.0×1.4×1.2	SECU1R0EC-SA	Red	2.0	200	—	20	120	75
	SECU180EC-SA	Amber	2.0	200	—	20	120	75
	SECU190EC-ST3A	Orange	2.0	45	—	20	120	75
3.5×2.8×1.2	SEP181404TA	Amber	2.0	600	—	20	120	81
3.5×2.8×1.2	SEP121404A	Red	2.1	600	—	20	120	78
	SEP181406A	Amber	2.0	245	—	20	120	75
	SEP191404A	Orange	2.0	630	—	20	120	75
3.5×2.8×1.2	SEP1P91407DTA	Orange	3.2	1500	0.562, 0.432	20	120	111

Package L×W×H (mm)	Part Number	Color	Forward Voltage (V)	luminous Intensity (mcd)	Chromaticity X, Y	Measurement Condition (mA)	Light Dispersion Angle/ Viewing Angle (deg)	Power Dissipation (mW)
1.6×0.8×0.7	SECE1WA07YPT2	White	2.8	49	0.273, 0.281	5	140	108
	SECE1WC07YPDT	White	2.8	150	0.3041, 0.3803	10	160	108
	SECG1WA07Y-SD	White	3.0	95	0.284, 0.269	5	160	108
	SECG1WA07YSDT	White	3.2	110	0.303, 0.318	10	160	111
	SECG1WD07YPD	White	2.8	120	0.280, 0.273	5	160	108
	SECG1WV07YPD	White	3.2	240	0.245, 0.244	10	160	108
	SECG1WH07YSDT3	White	2.8	28	0.2064, 0.3008	10	160	102
1.6×0.8×1.1	SECE1WCA1YSDT	White	3.2	110	0.250, 0.256	10	160	111
	SECE1WBA1YPT	White	2.8	200	0.267, 0.246	10	160	90
3.5×2.8×1.2	SEP1WA1402-T3A	White	3.0	190	0.275, 0.295	10	120	105
	SEP1WB1410DA	White	3.2	2500	0.315, 0.310	20	120	148
	SEP1WB1433	White	3.2	2400	0.301, 0.292	20	120	140
	SEP1WB1433D	White	3.0	2400	0.301, 0.292	20	120	140
	SEP1WP1446DTA	White	3.0	500	0.2900, 0.2815	10	120	108
	SEP1WR1407DTA	White	3.2	2400	0.3200, 0.3090	20	120	148
2.8×3.5×0.7	SEP1WC1L19DTA	White	2.90	—	0.2667, 0.2793	30	120	280
	SEP1WS1L72	White	2.75	—	0.3070, 0.4510	50	120	465

Through-hole LEDs

We have a wide range of through-hole LEDs in various colors.
You can select the product by package type (φ3 mm round, φ3 mm inverted cone type, and φ5 mm round) according to your application.

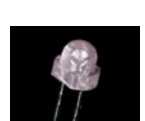| Package	Color	Dominant Wavelength/ Chromaticity	Lens Color	Part Number	Type
φ3 mm Round	Deep Red	639.0 nm	Clear	SELU2610C-S	
				SELU6614C-S	Wide viewing angle, no LED-to-PCB clearance required
	Red	624.0 nm	Clear	SELU2210C-S	
			Diffused, Red	SELU6214R-S	Wide viewing angle, no LED-to-PCB clearance required
	Amber	605.0 nm	Clear	SELU2810C-S	
		607.0 nm		SELU6814C-S	Wide viewing angle, no LED-to-PCB clearance required
	Orange	590.0 nm	Diffused, Orange	SELU2910D-S	
			Clear	SELU6914C-S	Wide viewing angle, no LED-to-PCB clearance required
	Green	563.5 nm	Clear	SELU2410C-TG	
		562.0 nm	Diffused, Green	SELU6414G-S	Wide viewing angle, no LED-to-PCB clearance required
	Pure Green	525.0 nm	Clear	SELG6D14C-SD	Wide viewing angle, no LED-to-PCB clearance required
	Blue	460.0 nm	Clear	SELS6E14C-D	Wide viewing angle, no LED-to-PCB clearance required
		465.0 nm	Clear	SELG2E10C-S	
				SELG6E10C-S20	No LED-to-PCB clearance required
	White	x = 0.310, y = 0.320	Clear	SELG2WA10C-S	
		x = 0.300, y = 0.295		SELS6WA10CT2	No LED-to-PCB clearance required
φ3 mm Inverted Cone Type	Red	624.0 nm	Clear	SELU6213C-S	No LED-to-PCB clearance required
φ5 mm Round	Orange	590.0 nm	Clear	SELU1910CXM-S	Wide viewing angle
	Yellow	573.0 nm	Clear	SELU1710CXM-S	Wide viewing angle
	Green	563.0 nm	Clear	SELU1410CXM-TG	Wide viewing angle
	White	x = 0.275, y = 0.265	Clear	SELS1WA62CMKTT2	

Package	Part Number	Color	Lens Color	Forward Voltage (V)	Luminous Intensity (mcd)	Dominant Wavelength (nm) Chromaticity X, Y	Measurement Condition (mA)	Type
φ3 mm Round	SELG2E10C-S	Blue	Clear	3.3	800	465.0	20	—
	SELG6E10C-S20	Blue	Clear	3.3	550	465.0	20	No LED-to-PCB clearance required
	SELS6E14C-D	Blue	Clear	2.9	600	460.0	20	Wide viewing angle, no LED-to-PCB clearance required
	SELG6D14C-SD	Pure Green	Clear	3.3	1800	525.0	20	Wide viewing angle, no LED-to-PCB clearance required
φ3 mm Round	SELU2410C-TG	Green	Clear	2.1	300	563.5	20	—
	SELU6414G-S	Green	Diffused, Green	2.1	30	562.0	20	Wide viewing angle, no LED-to-PCB clearance required
φ5 mm Round	SELU1410CXM-TG	Green	Clear	2.1	200	563.0	20	Wide viewing angle
	SELU1710CXM-S	Yellow	Clear	2.1	550	573.0	20	Wide viewing angle

Package	Part Number	Color	Lens Color	Forward Voltage (V)	Luminous Intensity (mcd)	Dominant Wavelength (nm) Chromaticity X, Y	Measure-ment Condition (mA)	Type
φ3 mm Round	SELU2610C-S	Deep Red	Clear	2.0	300	639.0	20	—
	SELU6614C-S	Deep Red	Clear	2.0	150	639.0	20	Wide viewing angle, no LED-to-PCB clearance required
	SELU2210C-S	Red	Clear	2.0	350	624.0	20	—
	SELU6214R-S	Red	Diffused, Red	2.0	150	624.0	20	Wide viewing angle, no LED-to-PCB clearance required
φ3 mm Inverted Cone	SELU6213C-S	Red	Clear	2.0	30	624.0	20	No LED-to-PCB clearance required
φ3 mm Round	SELU2810C-S	Amber	Clear	2.0	400	605.0	20	—
	SELU6814C-S	Amber	Clear	2.0	230	607.0	20	Wide viewing angle, no LED-to-PCB clearance required
	SELU2910D-S	Orange	Diffused, Orange	2.0	300	590.0	20	—
	SELU6914C-S	Orange	Clear	2.0	180	590.0	20	Wide viewing angle, no LED-to-PCB clearance required
φ5 mm Round	SELU1910CXM-S	Orange	Clear	2.0	450	590.0	20	Wide viewing angle

Package	Part Number	Color	Lens Color	Forward Voltage (V)	Luminous Intensity (mcd)	Chromaticity X, Y	Measure-ment Condition (mA)	Type
φ3 mm Round	SELG2WA10C-S	White	Clear	3.3	3000	0.310, 0.320	20	—
	SELS6WA10CT2	White	Clear	2.9	5000	0.300, 0.295	20	No LED-to-PCB clearance required
φ5 mm Round	SELS1WA62CMKTT2	White	Clear	2.9	7000	0.275, 0.265	20	—

Food Lighting LEDs

LEDs to Offer Natural Color Appearance of Foods More than Ever

To make various foods look appetizing, we have verified our LEDs' lights through optical and biochemical approaches.

Our LEDs will bring out visual attractiveness of the following foods without losing their true colors.

Meat

General-purpose white LED

LED for meat

- ✓ Makes redness more vivid
- ✓ Provides more natural-looking colors; emphasizes redness in meat but yields natural whiteness in fat

Fresh Fish and Produce

General-purpose white LED

LED for fresh fish and produce

- ✓ Makes bluefish scales (silver white) look more vivid as well as red-fleshed fish
- ✓ Provides whiteness in packing trays and showcases
- ✓ Makes fruits and vegetables look more vibrant and fresh

Delicatessen Food

General-purpose white LED
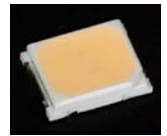
LED for delicatessen food

- ✓ Makes breads look more fluffy and fried foods look more crispy
- ✓ Contains many color components from yellow to red, thus enhancing the contrasts of browned portions

Selection Guide to Food Lighting LEDs

Package
L×W×H: 2.8×3.5×0.7 mm

Part Number	Application	Forward Voltage V_F (Typ.)	Luminous Flux Φv (Typ.)	Luminous Efficacy η (Typ.)	Color Temperature CCT (Typ.)	Average Color Rendering Index Ra (Typ.)
SEP1FN1L89	Meat	2.8 V	17.7 lm	97 lm/W	4600 K	55
SEP1YN1L72	Fresh fish/produce	2.8 V	25.7 lm	141 lm/W	5000 K	93
SEP1YL1L72	Delicatessen food	2.8 V	24.9 lm	137 lm/W	3000 K	93

Please visit our website to learn more about our food lighting LEDs.
https://www.semicon.sanken-ele.co.jp/en/guide/ledforfood.html

Ultra-high CRI LEDs

LEDs to Deliver High Quality Lighting

The SEP1A series are high color rendering LED devices that have performance quality defined by not only the average color rendering index, Ra, but also the special color rendering index, Ri. By using our LED devices, you can realize lighting equipment with the same performance as color rendering AAA fluorescent lamps commonly used for color evaluation.

Features

- ・High color rendering to faithfully reproduce true colors
  Ra = 95 (typ.), Ri = 90 (typ.)
- ・High luminous efficacy
- ・Unique technology to improve the trade-off between color rendering and luminous efficacy
- ・Near-natural but discoloration-proof light
- ・Ideal color rendering for color evaluation
- ・Ultra-high color rendering but high efficiency

General White LED

SEP1A Series
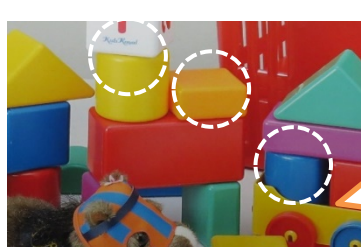
Unlike general white LED lighting, colors such as yellow, orange, and light blue appear in the same manner as AAA fluorescent lamp lighting.

Applications

- ・Household lighting, office lighting, commercial lighting
  (e.g., ceiling lights, downlights, indirect lighting)
- ・Inspection lighting, evaluation lighting
  (e.g., textile, printing, and manufacturing industries)
- ・Shooting light sources (e.g., floodlights, ring lights)

Package

L×W×H: 2.8×3.5×0.7 mm
Bare lead frame: Pb-free
Highly heat-dissipating: $\theta_{(J-S)}$ = 25 °C/W

Selection Guide to Ultra-high CRI LEDs

Part Number	Forward Voltage V_F (Typ.)	Luminous Flux Φv (Typ.)	Luminous Efficacy η (Typ.)	Color Temperature CCT (Typ.)	Average Color Rendering Index Ra (Typ.)	Special Color Rendering Index Ri (Typ.)
SEP1AQ1L92LL	2.71 V	19.6 lm	145 lm/W	5000 K*	≥95*	≥90*
SEP1AQ1L92SS	2.81 V		140 lm/W			

* When the SEP1AQ1L92LL and the SEP1AQ1L92SS mounted in pairs.

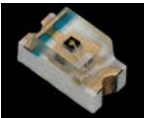Please visit our website to learn more about our ultra-high CRI LEDs.
https://www.semicon.sanken-ele.co.jp/en/guide/high_color_rendering_led.html

Infrared LED

We offer the infrared LED with a peak wavelength of 850 nm.

The surface mount type package is available.

Our infrared LED is suitable for sensors, infrared light sources, and infrared communication.
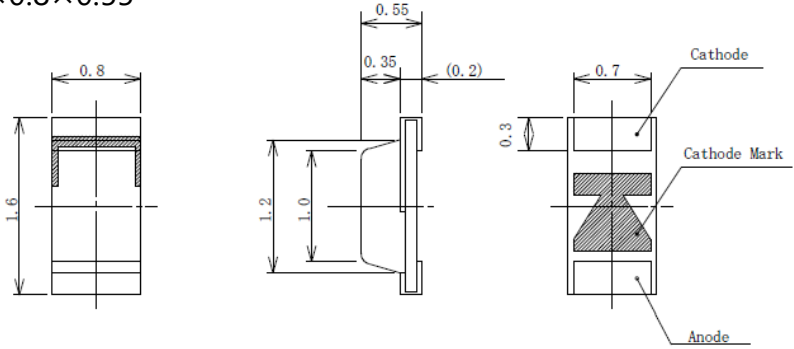
■ Infrared LED

Package	Part Number	Forward Voltage (V)	Radiation Intensity I_e (mW/sr)	Peak Wavelength λ_P (nm)	Measurement Condition	Type
L×W×H: 1.6×0.8×1.1 mm	SECU1G11C-N	1.6	4.2	850	I_F = 50 mA	—

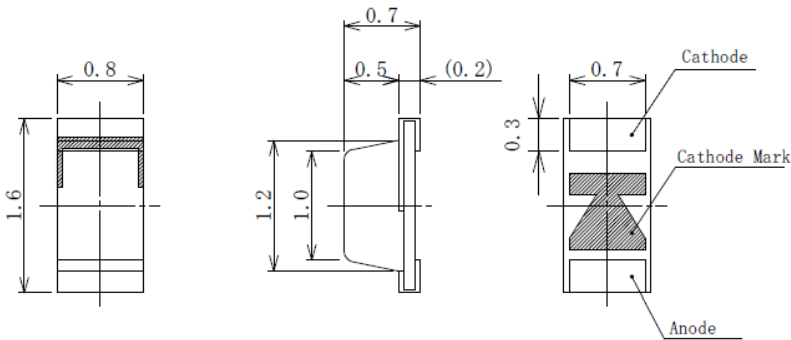The physical dimensions listed below are typical examples.
For the physical dimensions of each product, please refer to the corresponding data sheet.
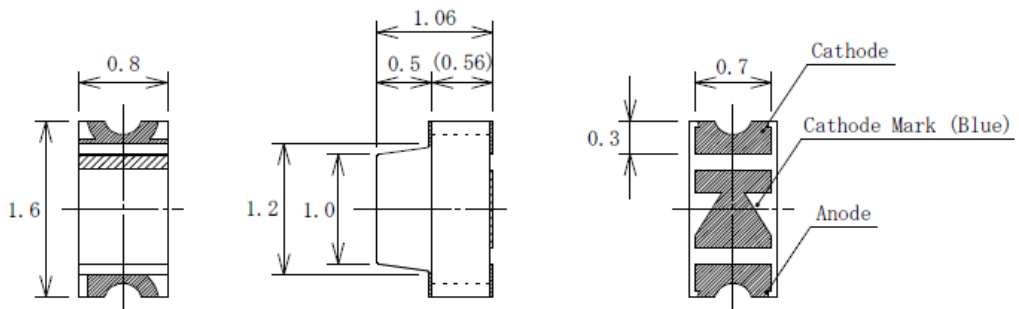
L×W×H: 1.6×0.8×0.55
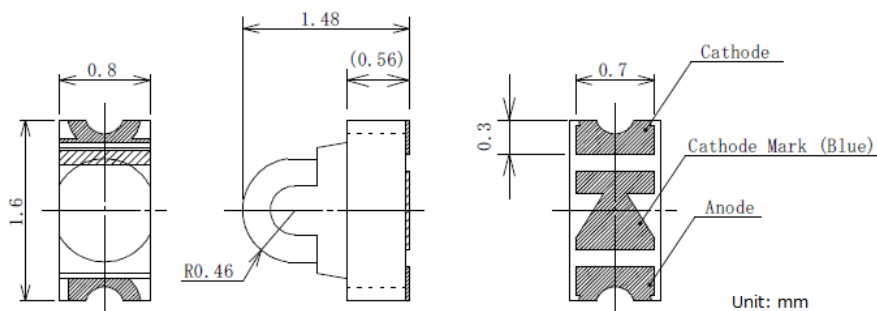

Unit: mm

L×W×H: 1.6×0.8×0.7

Unit: mm

L×W×H: 1.6×0.8×1.1

Unit: mm

L×W×H: 1.6×0.8×1.5 (Dome-shaped)

Unit: mm

SanKen

The physical dimensions listed below are typical examples.
For the physical dimensions of each product, please refer to the corresponding data sheet.

L×W×H: 3.0×1.4×1.2

L×W×H: 3.5×2.8×1.2

L×W×H: 2.8×3.5×0.7

The physical dimensions listed below are typical examples.
For the physical dimensions of each product, please refer to the corresponding data sheet.

φ3 mm Round

Unit: mm

φ3 mm Round, Wide/Narrow Viewing Angle, No LED-to-PCB Clearance Required

Unit: mm

φ3 mm Round, No LED-to-PCB Clearance Required

Unit: mm

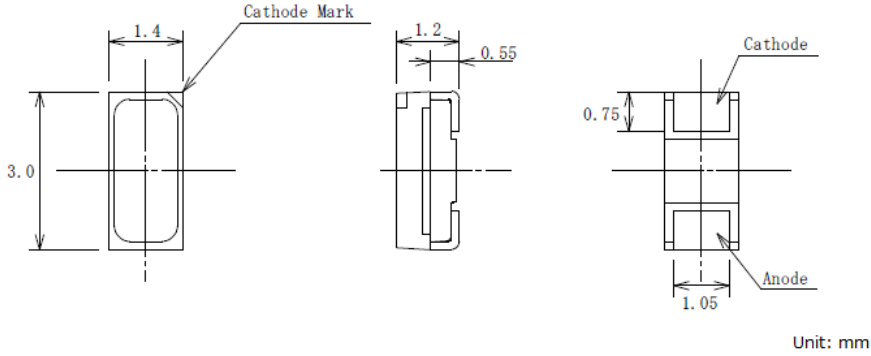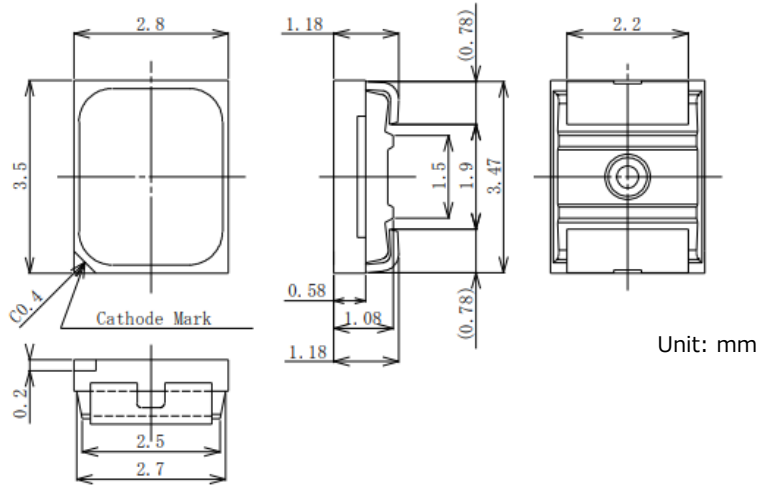### φ3 mm Inverted Cone Type, No LED-to-PCB Clearance Required

Unit: mm

The physical dimensions listed below are typical examples.
For the physical dimensions of each product, please refer to the corresponding data sheet.
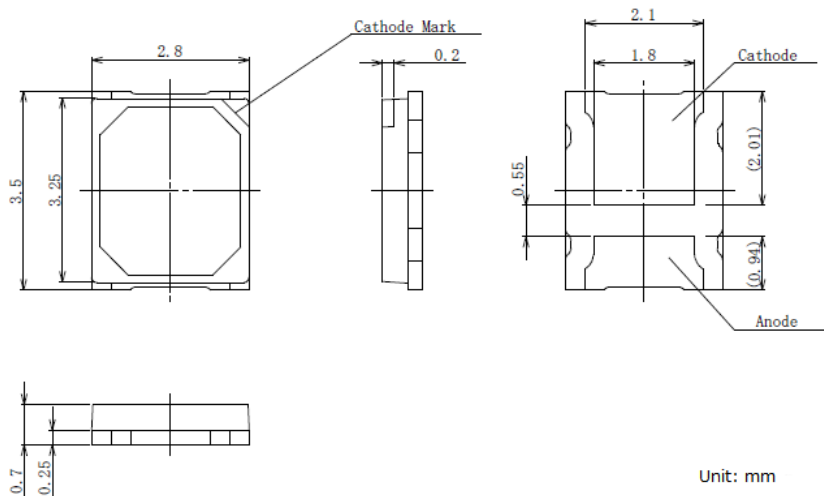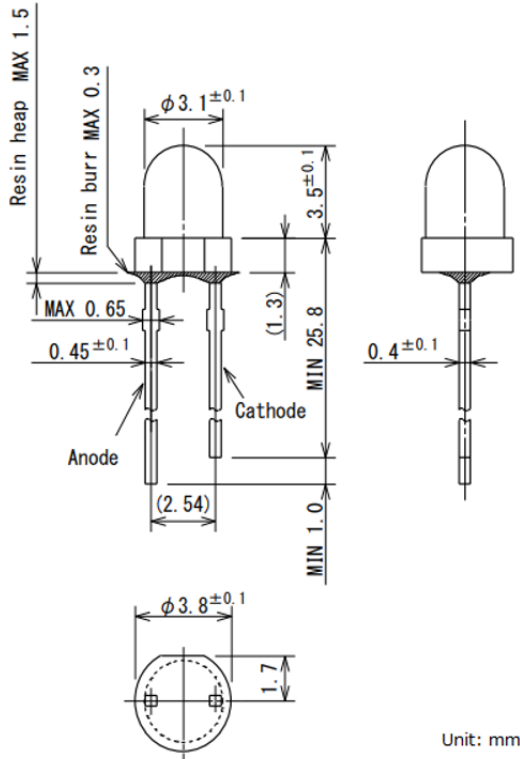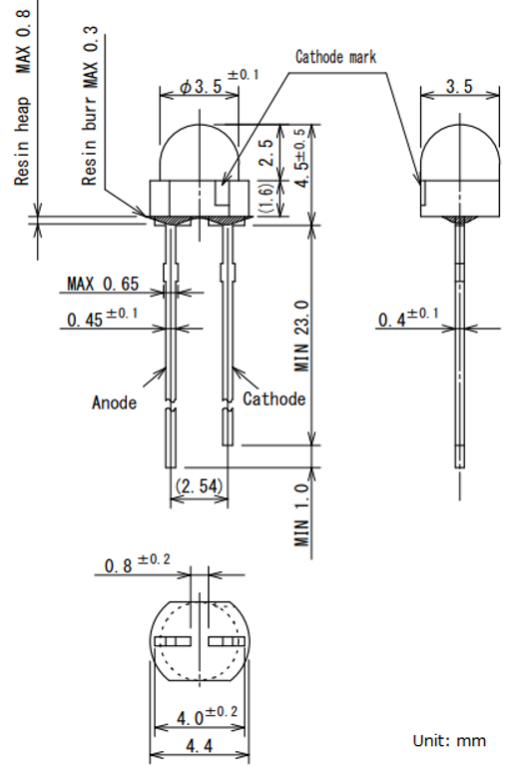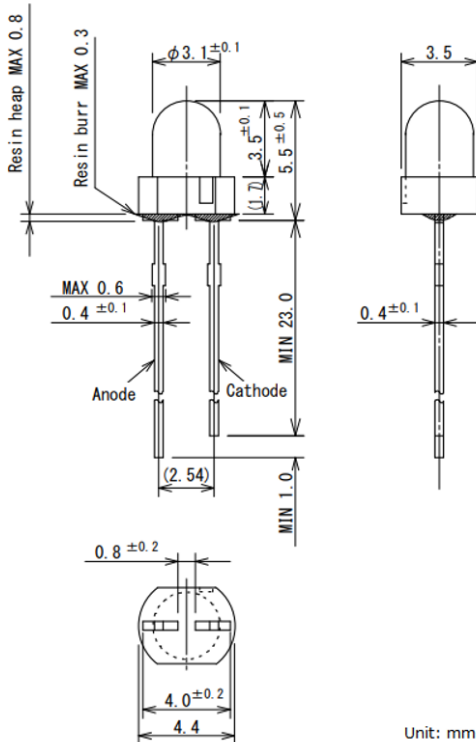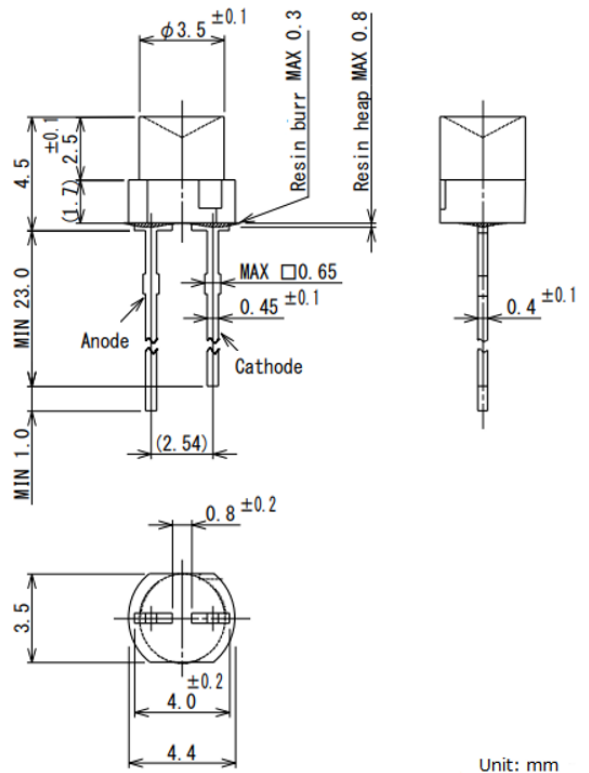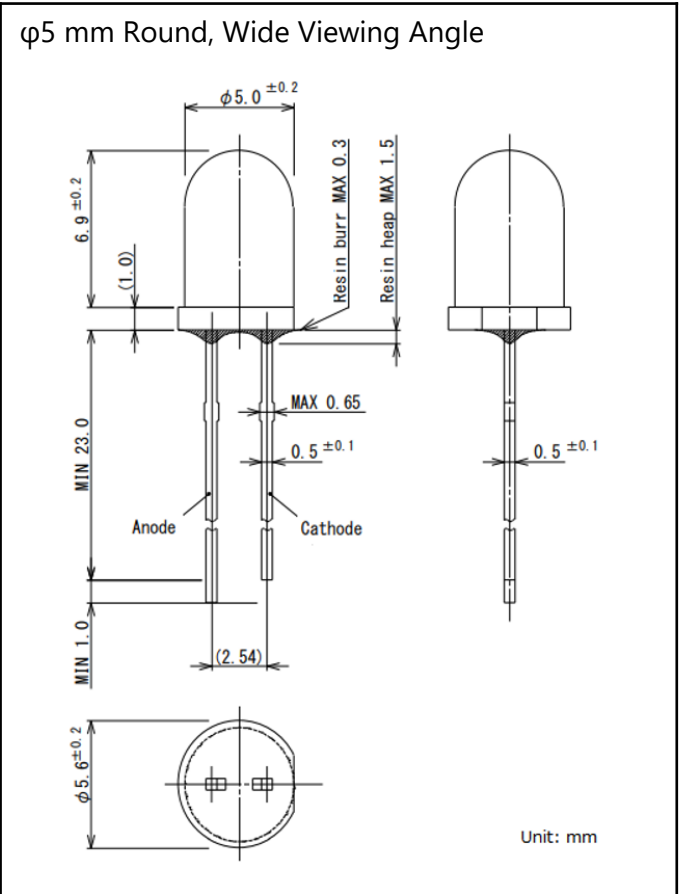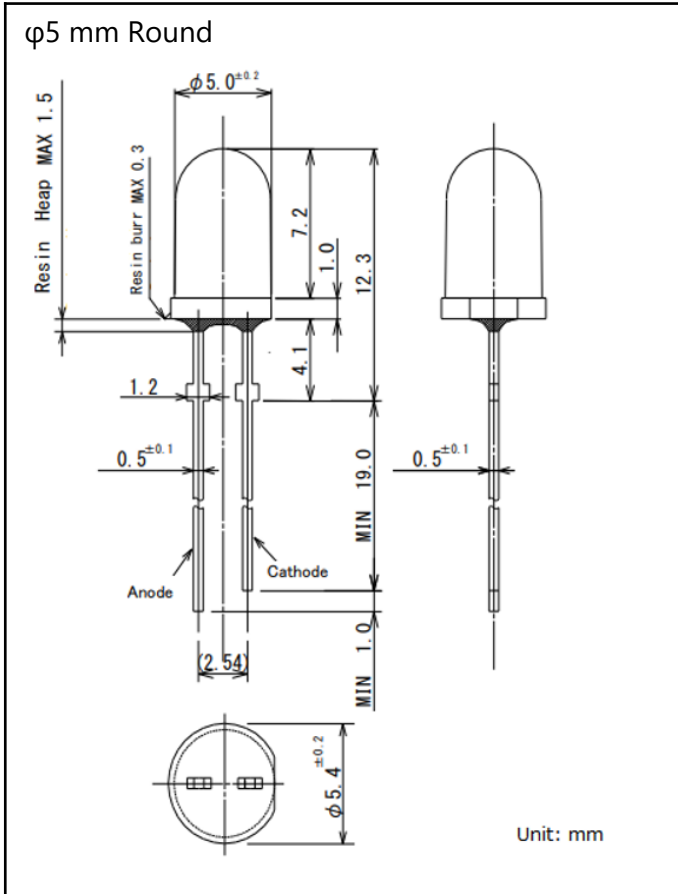
φ5 mm Round

Unit: mm

φ5 mm Round, Wide Viewing Angle

Unit: mm

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