

Technical Data Sheet

Side View LEDs (Height 0.4 mm)

99-118UM2C/XXXXXXXX/TR8-T

Features

- Side view white LED.
- White SMT package.
- Lead frame package with individual 2 pins.
- Wide viewing angle.
- Soldering methods: IR reflow soldering.
- Pb-free.
- The product itself will remain within RoHS compliant version.



Descriptions

- Due to the package design, 99-118 has wide viewing angle , low power consumption and white LEDs are devices which are materialized by combing Blue LEDs and special phosphors . This feature makes the LED ideal for light guide application.

Applications

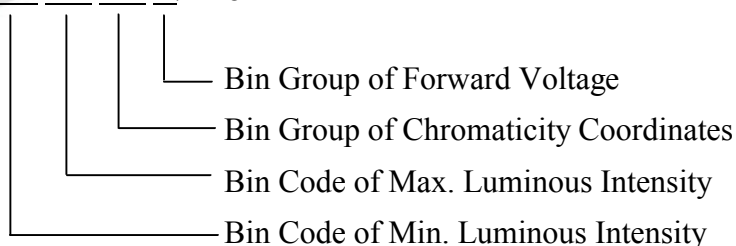
- Mobile phones .
- Indicators.
- Illuminations.
- Switch Lights.

Device Selection Guide

Chip	Emitted Color	Resin Color
Material		
InGaN	Pure White	Water Clear

Coding:

99-118UM2C/XX XX XX X/TR8-T

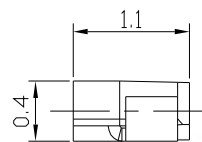
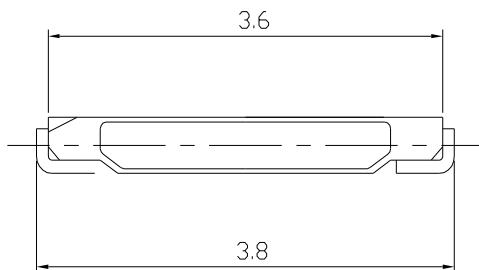
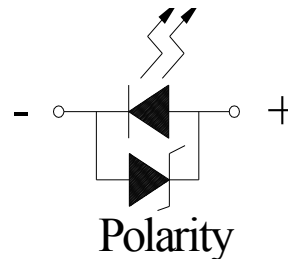
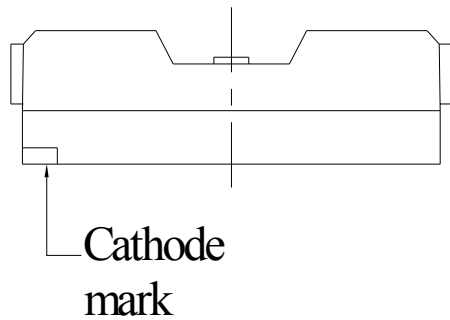


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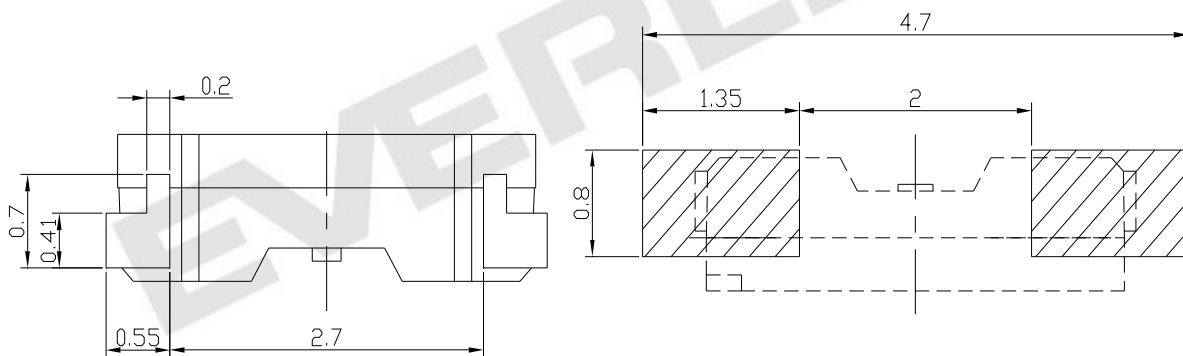
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Package Outline Dimensions



Recommended soldering pad design



Note:

The tolerances unless mentioned is ± 0.1 mm, Unit = mm.

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Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	I_F	30	mA
Peak Forward Current (Duty 1/10 @10ms)	I_{FP}	100	mA
Power Dissipation	P_d	110	mW
Electrostatic Discharge(HBM) ^{*1}	ESD	2000	V
Operating Temperature	T_{opr}	-40 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +90	°C
Soldering Temperature	T_{sol}	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

Note: 1. The products are sensitive to static electricity and must be carefully taken when handling products.

Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I_V	1300	-----	1900	mcd	$I_F=20mA$
Viewing Angle	2θ1/2	-----	118	-----	deg	
Forward Voltage	V_F	2.90	-----	3.75	V	
Reverse Current	I_R	-----	-----	50	μA	$V_R=5V$

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Bin Range of Luminous Intensity

Bin Code	Mcd(Min.)	Mcd(Max.)	Unit	Condition	Lm(Min.)	LM(Max.)
24	1300	1350	mcd	I _F =20mA	3.53	3.67
25	1350	1400			3.67	3.80
26	1400	1450			3.80	3.94
27	1450	1500			3.94	4.07
28	1500	1550			4.07	4.21
29	1550	1600			4.21	4.34
30	1600	1650			4.34	4.48
31	1650	1700			4.48	4.62
32	1700	1750			4.62	4.75
33	1750	1800			4.75	4.89
34	1800	1850			4.89	5.02
35	1850	1900			5.02	5.16

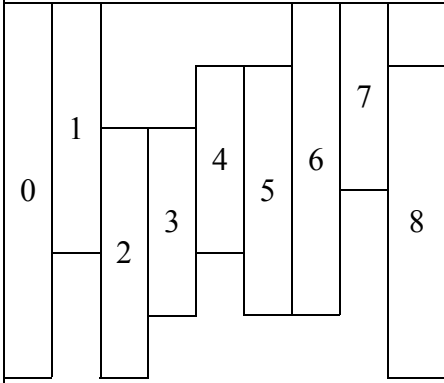
Note: Tolerance of Luminous Intensity : ±7%

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Bin Range of Forward Voltage

Group							Bin Code	Min.	Max.	Unit	Condition
	D	0	1	2	3	4	6-1	2.95	3.05	V	I _F =20mA
							6-2	3.05	3.15		
							7-1	3.15	3.25		
							7-2	3.25	3.35		
							8-1	3.35	3.45		
							8-2	3.45	3.55		
							9-1	3.55	3.65		
							9-2	3.65	3.75		

Group	Bin Code	Min.	Max.	Unit	Condition
9	6-11	3.00	3.05	V	I _F =20mA
	6-2	3.05	3.15		
	7-1	3.15	3.25		
	7-2	3.25	3.35		
	8-1	3.35	3.45		
	8-11	3.45	3.50		

Note: Tolerance of Forward Voltage: $\pm 0.05V$

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Bin Range of Forward Voltage

Group	Bin Code	Min.	Max.	Unit	Condition
A	6-1-1	2.95	3.00	V	I _F =20mA
	6-1-2	3.00	3.05		
	6-2-1	3.05	3.10		
	6-2-2	3.10	3.15		
	7-1-1	3.15	3.20		
	7-1-2	3.20	3.25		
	7-2-1	3.25	3.30		
	7-2-2	3.30	3.35		
	8-1-1	3.35	3.40		
	8-1-2	3.40	3.45		

Group				Bin Code	Min.	Max.	Unit	Condition
B	C	E	F	5-2-3	2.90	3.00	V	I _F =20mA
				6-1-3	3.00	3.10		
				6-2-3	3.10	3.20		
				7-1-3	3.20	3.30		
				7-2-3	3.30	3.40		
				8-1-3	3.40	3.50		

Note: Tolerance of Forward Voltage: $\pm 0.05V$

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Chromaticity Coordinates of Bin Code

Group	Range	I _v Rank*	Group	Range	I _v Rank*
01	B5-1,B5-2,B5-3,B5-4	K30	27	A0-2, A0-1, A0-3	K28
02	B5-1~B5-4,A0-2,A0-4	K28	28	A0-2, A0-4, A0-3	K28
07	B5-1,B5-3,A0-4	K30	29	A0-2, B5-1, B5-3	K28
08	A0-2,A0-3,A0-4	K28	30	A0-2, A0-4, B5-3	K28
09	A0-1,A0-3,A0+4	K26	31	B5-1, A0-2, A0-4	K28
10	A0+1, A0+2, A0-1	K26	32	B5-1, B5-3, A0-4	K28
11	A0+2, A0-1, A0-2	K26	33	B5-1, B5-2, B5-4	K30
12	A0-1, A0-2, B5-1	K28	34	B5-1, B5-3, B5-4	K30
13	A0-2, B5-1, B5-2	K28	35	B5-2, B5-1, B5-3	K30
14	A0+3, A0+4, A0-3	K26	36	B5-2, B5-4, B5-3	K30
15	A0+4, A0-3, A0-4	K26	37	B5-1, B5-2	K30
16	A0-3, A0-4, B5-3	K28	38	A0-1, A0-3	K28
17	A0-4, B5-3, B5-4	K28	39	A0-2,A0-4,B5-1,B5-3	K28
18	A0+1, A0+2, A0+4	K26	40	A0-3,A0-4	K28
19	A0+1, A0+3, A0+4	K26	41	A0-4,B5-1,B5-3,B5-4	K28
20	A0+2, A0+1, A0+3	K26	42	A0-4, B5-3	K28
21	A0+2, A0-1, A0-3	K26	43	B5-2,B5-4	K30
22	A0+2, A0+4, A0-3	K26	44	A0-1,A0-2,A-4,B5-3	K28
23	A0-1, A0+2, A0+4	K26	45	B5-1, B5-3	K30
24	A0-1, A0-3, A0+4	K26	46	A0+1, A0+2	K26
25	A0-1, A0-2, A0-4	K28	47	B6-1, B6-2, B6-3, B6-4	K33
26	A0-1, A0-3, A0-4	K28	48	B6-2,B6-4	K33

Note: Tolerance of Chromaticity Coordinates: ± 0.01

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Group	Range	I _v Rank*	Group	Range	I _v Rank*
49	A0-2, B5-1, B5-3, B5-4	K28	69	B5-1,B5-2,B5-3,B5-4 sub-division	K30
50	A0-1~A0-4, B5-1~B5-4	K28	70	A0+4-2, A0+4-4, A0-3 (sub-division), A0-4-1, A0-4-3	K26
51	A0-1, A0-3, A0-4-1, A0-4-3	K28	71	A0-3, A0-4 sub-division	K28
52	A0+3, A0+4	K26	72	A0+1 ~ +4, A0-1 ~ -4, B5-1 ~ -4, B6-1 ~ -4	K26
53	B6-1, B6-2, B6-3	K33	73	A0-4, B5-1, B5-3 sub-division	K28
54	B6-1, B6-3	K33	74	A0-4	K28
55	B5-2, B5-4, B6-1, B6-3	K30	75	B5-2	K30
56	B5-2, B6-1	K30	76	A0-1~A0-4;B5-1~B5-4	K28
57	A0-2, B5-1	K28	77	B5-3, B5-4 sub-division	K30
58	A0-1, A0-2	K28	78	A0-3,A0+4	K26
59	A0-1, A0-2, A0-3, A0-4, B5-1	K28	79	B5-1,2,3,4 & B6-3 sub-division	K30
60	A0+2, A0+4, A0-1, A0-3	K26	80	A0-3, A0-4, B5-3 sub-division	K28
61	B5-2-1~B5-2-4, 6-1-1~B6-1-4	K30	81	A0-3,A0-4,B5-3	K28
62	B5-3, B5-4	K30	82	A0-1~A0-4,A0+2,A0+4	K26
63	A0-1~A0-4, B5-1, B5-3	K28	83	B5-4,B6-3	K30
64	A0-2, A0-4	K28	84	B6-1,B6-2	K33
65	A0-2, A0-3, A0-4, B5-3 ^{*3}	K28	85	A0-4, B5-2, B5-3, B5-4	K28
66	A0-3-1~A0-3-4, A0-4-1~A0-4-4	K28	86	B5-1~5-4 & B6-1~ B6-4 sub-division	K30
67	A0-1, A0-3,A0-4,A0+2	K26	87	B5-3	K30
68	A0+4-R, A0-3, A0-4-L	K26	88	B5-2-3, B5-2-4, B6-4-1, B6-1-2, B5-4(sub-division), B6-1-3, B6-3(sub-division), B6-1-4,	K30

Note: Tolerance of Chromaticity Coordinates: ± 0.01

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Group	Range	I _v Rank*	Group	Range	I _v Rank*
89	A0-4, B5-3 sub-division	K28	A2	B6-2,B6-3,B6-4	K33
90	A0-4-R, B5-3 sub-division	K28	A3	B5-2, B5-4, B6-3	K30
91	A0-3-2, A0-3-4, A0-4(sub-division), B5-3-1,B5-3-3	K28	A4	A0-1,A0-2,A0-4 subdivision	K28
92	B5-2 , B6-1-1, B6-4-1, B5-3-2, B6-1-3, B6-4-3, B6-1-4, B6-4-4, B5-4, B6-3	K30	A5	A0-2,A0-4,B5-3 subdivision	K28
93	A0+4, A0-3(sub-division)	K26	A6	A0-4-R, B5-3, B5-4-L	K28
94	A0-4-R, B5-3, B5-4 subdivision	K28	A8	B5-1,B5-3,B5-4 subdivision	K30
95	B5-4, B6-3 subdivision	K30	A9	A0-1, A0-2, A0-3, A0-4 subdivision	K28
96	A0-4, B5-3, B5-4 subdivision	K28	B2	A0-4, B5-3, B5-4-L	K28
97	B6-1,B6-3,B6-4	K33	A	A0+1, A0+2, A0+3, A0+4	K26
98	A0+1~A0+4;A0-1~A0-4;B5-1~B5-4; B6-1~B6-4; NA0-3~NB6-3(Entire district)	K26	B	A0+4, A-3, A0-4	K26
99	B5-2,B5-4,B6-1,B6-3 subdivision	K28	C	A0-1, A0-2, A0-3, A0-4	K28
A1	A0+1,A0+2 subdivision	K26			

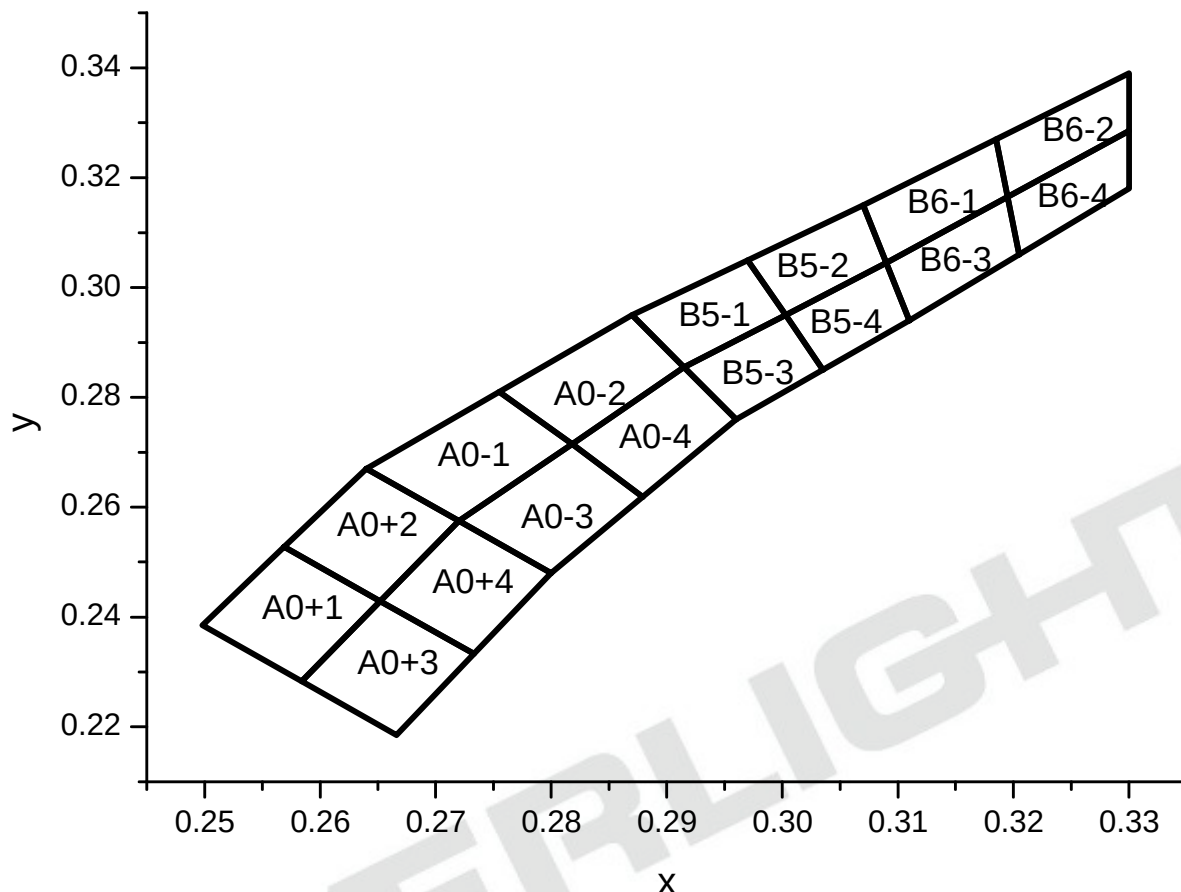
Note: Tolerance of Chromaticity Coordinates: ± 0.01

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The C.I.E. 1931 Chromaticity Diagram



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Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
A0+1	0.2569	0.2528	A0+3	0.2652	0.2429
	0.2498	0.2385		0.2584	0.2283
	0.2584	0.2283		0.2666	0.2185
	0.2652	0.2429		0.2733	0.2333
A0+2	0.2640	0.2670	A0+4	0.2720	0.2575
	0.2569	0.2528		0.2652	0.2429
	0.2652	0.2429		0.2733	0.2333
	0.2720	0.2575		0.2800	0.2480
A0-1	0.2720	0.2575	A0-3	0.2800	0.2480
	0.2640	0.2670		0.2720	0.2575
	0.2755	0.2810		0.2818	0.2715
	0.2818	0.2715		0.2879	0.2619
A0-2	0.2818	0.2715	A0-4	0.2879	0.2619
	0.2755	0.2810		0.2818	0.2715
	0.2870	0.2950		0.2915	0.2855
	0.2915	0.2855		0.2960	0.2760

Note: Tolerance of Chromaticity Coordinates: ± 0.01

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Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
B5-1	0.2915	0.2855	B5-3	0.2960	0.2760
	0.2870	0.2950		0.2915	0.2855
	0.2970	0.3050		0.3003	0.2950
	0.3003	0.2950		0.3035	0.2850
B5-2	0.3003	0.2950	B5-4	0.3035	0.2850
	0.2970	0.3050		0.3003	0.2950
	0.3070	0.3150		0.3090	0.3045
	0.3090	0.3045		0.3110	0.2940
B6-1	0.3090	0.3045	B6-3	0.3110	0.2940
	0.3070	0.3150		0.3090	0.3045
	0.3185	0.3270		0.3195	0.3165
	0.3195	0.3165		0.3205	0.3060
B6-2	0.3195	0.3165	B6-4	0.3205	0.3060
	0.3185	0.3270		0.3195	0.3165
	0.3300	0.3390		0.3300	0.3285
	0.3300	0.3285		0.3300	0.3180

Note: Tolerance of Chromaticity Coordinates: ± 0.01

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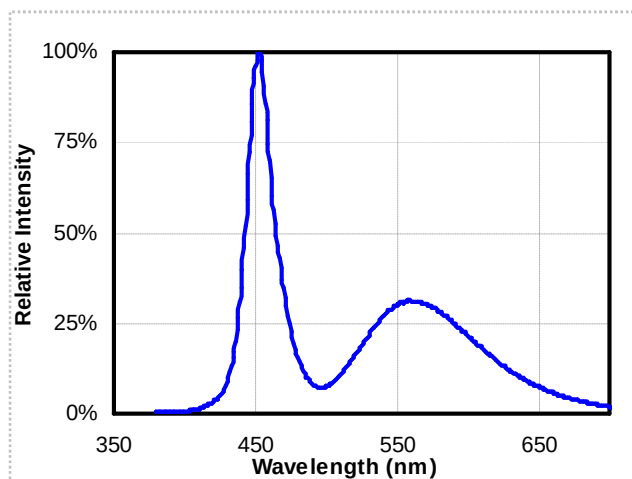
Side View LEDs (Height 0.4 mm)

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Typical Electro-Optical-Thermal Characteristics Curves

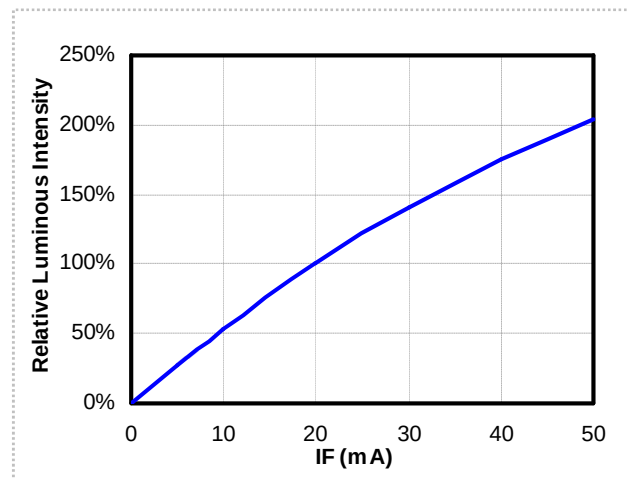
1. Spectrum Distribution

($T_A=25^{\circ}\text{C}$, $I_F=20\text{mA}$)



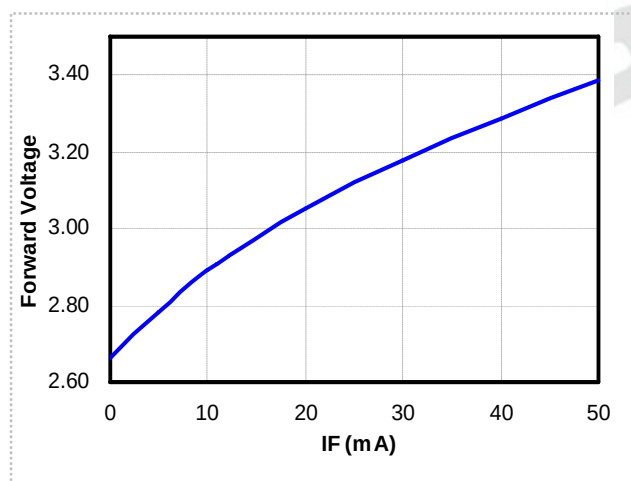
2. Relative Luminous Flux vs. Forward Current

($T_A=25^{\circ}\text{C}$)



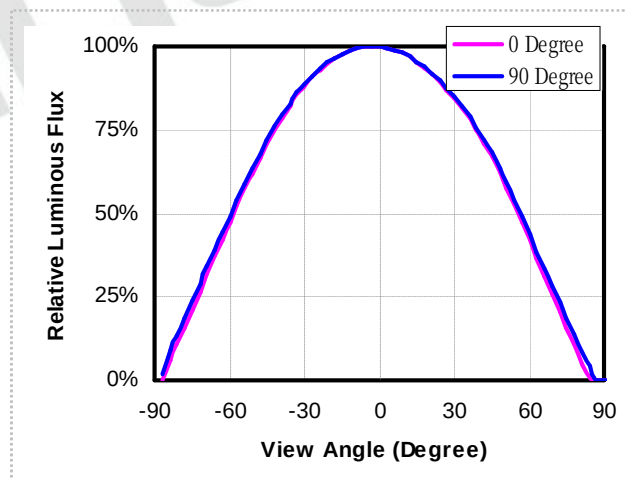
3. Relative Forward Voltage vs. Forward Current

($T_A=25^{\circ}\text{C}$)



4. Radiation Diagram

($T_A=25^{\circ}\text{C}$, $I_F=20\text{mA}$)



Technical Data Sheet

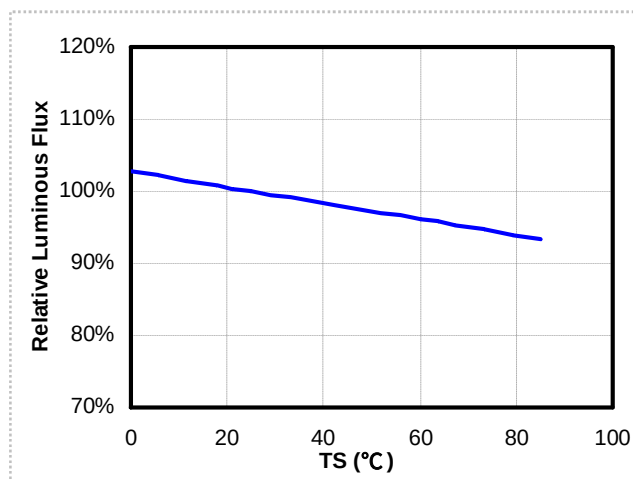
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Typical Electro-Optical-Thermal Characteristics Curves

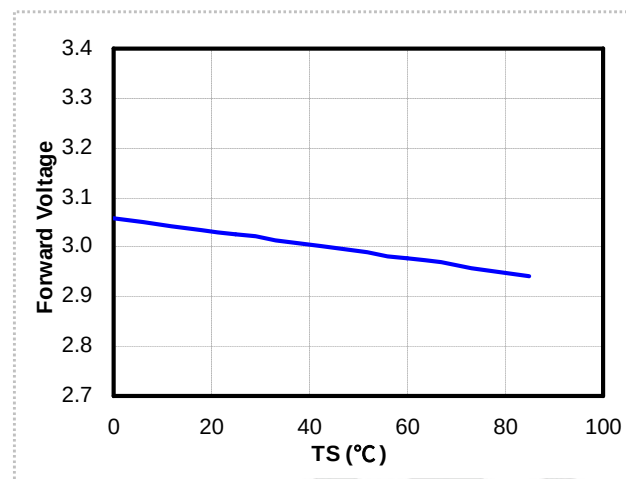
5. Relative Luminous Flux vs. Ambient Temperature

($I_F=20\text{mA}$)



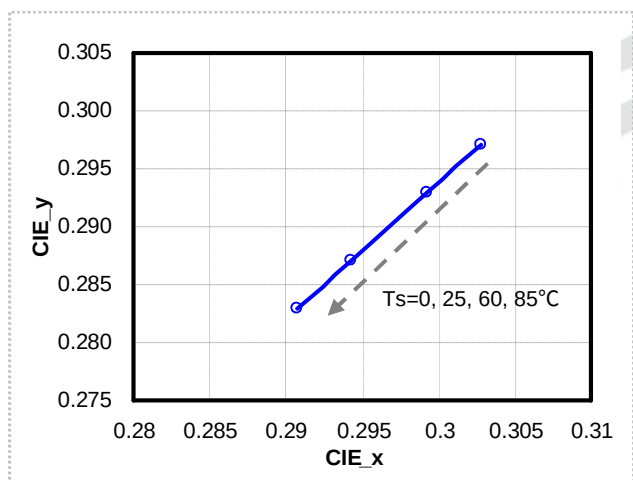
6. Forward Voltage vs. Ambient Temperature

($I_F=20\text{mA}$)

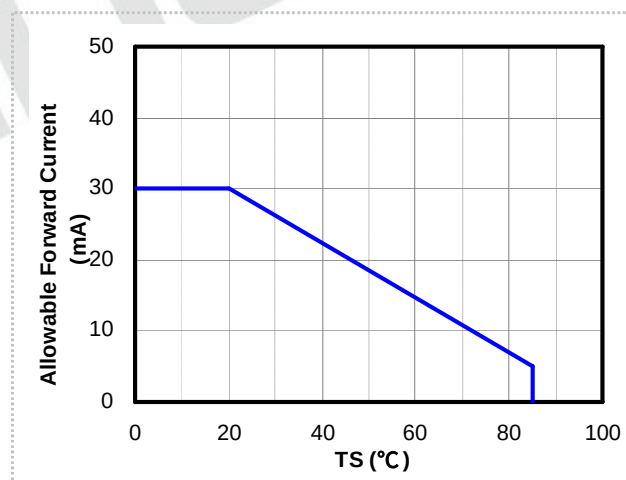


7. Chromaticity Coordinates vs. Ambient Temperature

($I_F=20\text{mA}$)



8. Forward Current De-rating Curve



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Label Explanation

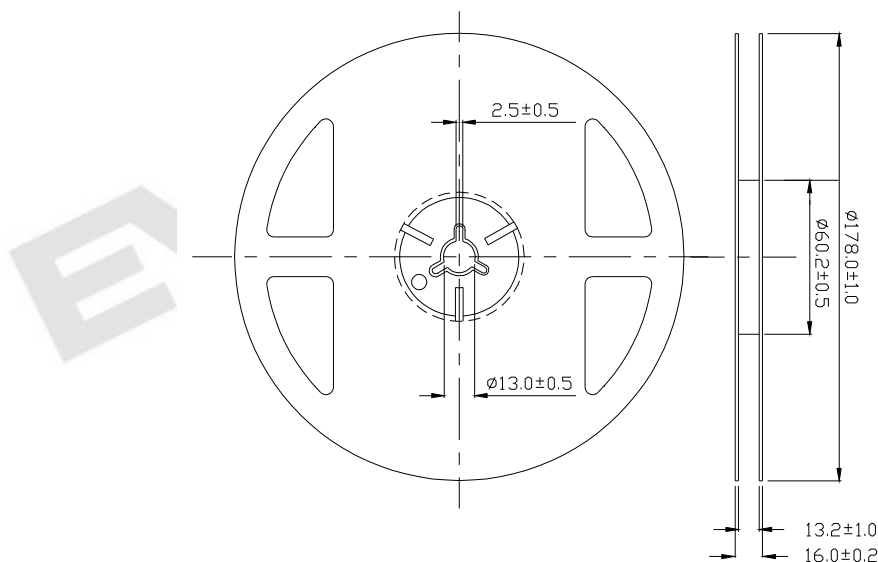
CAT: Luminous Intensity Rank

HUE: Chromaticity Coordinates

REF: Forward Voltage Rank



Reel Dimensions



Note:

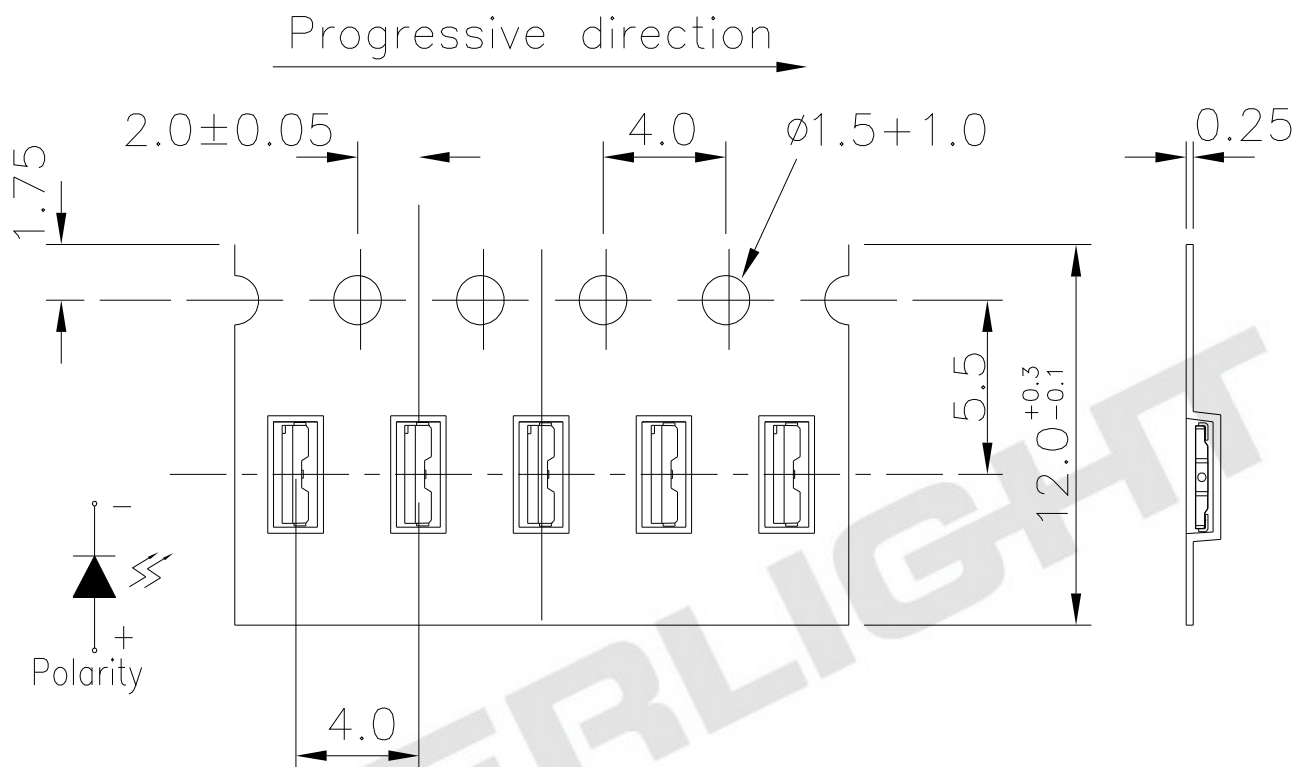
The tolerances unless mentioned is $\pm 0.1\text{mm}$, Unit = mm.

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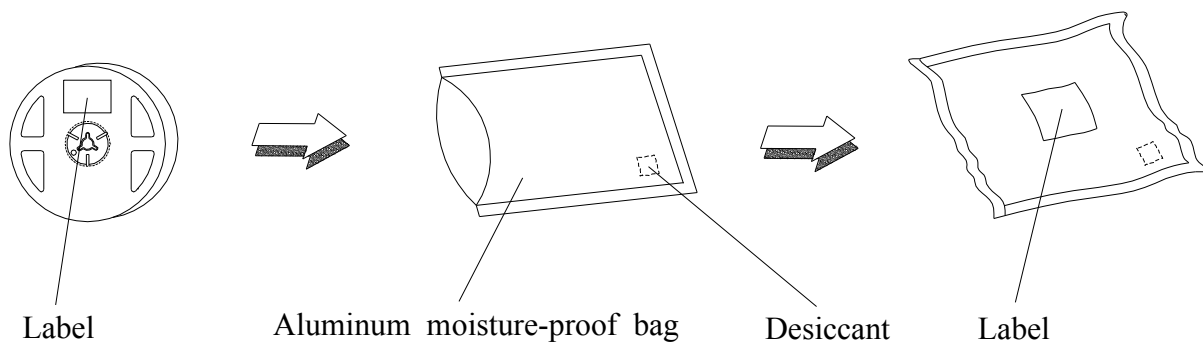
Carrier Tape Dimensions: Loaded Quantity 250 up/500/1000/2000 pcs. Per Reel



Note:

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Moisture Resistant Packaging



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Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

NO	Item	Test Condition		Test Hours / Times	Criteria	
		Temp./ Humidity	I _F (mA)		I _v @ 20mA	V _F @ 20mA
1	Reflow Soldering	TSld = 260°C, Max. 10sec.		2 times	<±5%	<±5%
2	Thermal Cycle	-40°C ~ 100°C 30min. (5min.) 30min.		200 cycles	I _v > 70%, V _F < 110%,	
3	Thermal Shock	-10°C ~ 100°C 20min. (<15sec.) 20min.		200 cycles		
4	Low Temp. Storage	Ta= -40°C	--	1000 hrs		
5	High Temp. Storage	Ta= 100°C	--	1000 hrs		
6	Temp. Humidity Storage	Ta= 60°C/ 90%RH	--	1000 hrs		
7	Steady State Operating Life of Low Temp.	Ta= -40°C	20	1000 hrs		
8	Steady State Operating Life Condition 1	Ta= 25°C/ Room Humidity	20	1000 hrs		
9	Steady State Operating Life Condition 2	Ta= 60°C	20	1000 hrs		
10	Steady State Operating Life of High Temp.	Ta= 85°C	5	1000 hrs		
11	Steady State Operating Life of High Humidity Heat	Ta= 60°C/ 90%RH	20	1000 hrs		

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Precautions for Use

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

2.3 After opening the package: The LED's floor life is 1 year under 30°C or less and 60% RH or less.

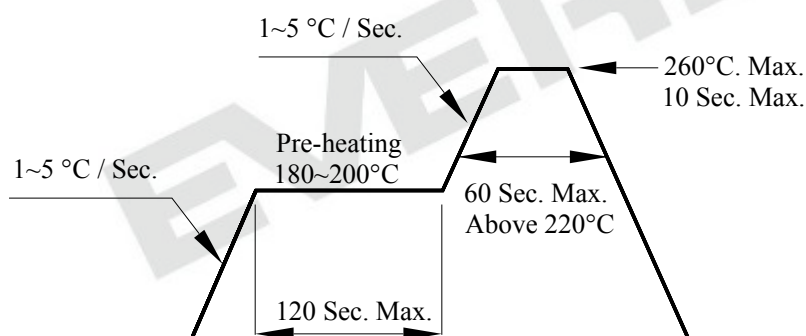
If unused LEDs remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment : 60±5°C for 24 hours.

3. Soldering Condition

3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

3.4 After soldering, do not warp the circuit board.

Technical Data Sheet

Side View LEDs (Height 0.4 mm)

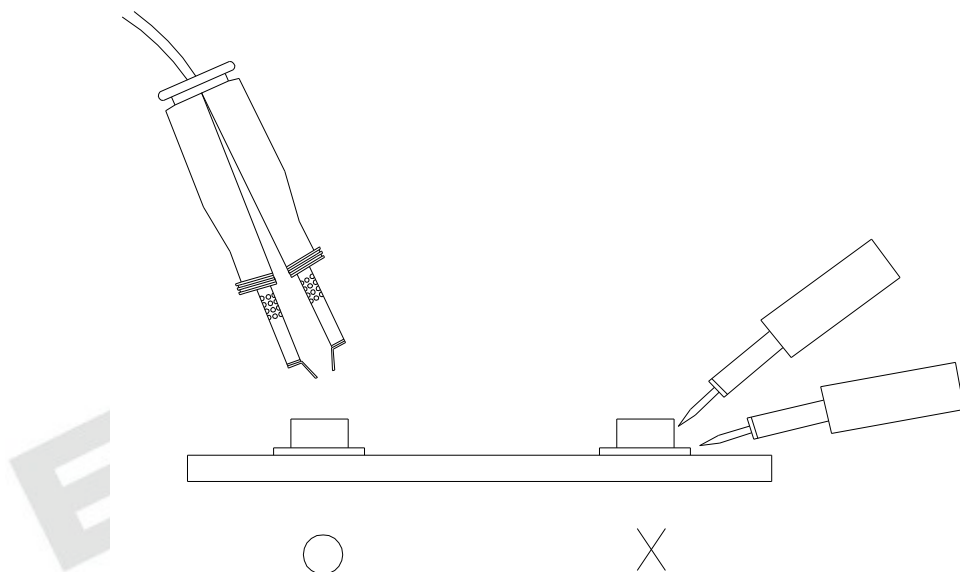
99-118UM2C/XXXXXXXX/TR8-T

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



6. Handling Indications

During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound

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