Technical Data Sheet

Side View LEDs (Height 0.6mm)

99-616LM2C/LXXXXXXX/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, 99-616 has wide viewing angle, low power consumption and white LEDs are devices which are materialized by combing blue chip and special phosphor. This feature makes the LED ideal for light guide application.

Applications

- LCD Back Light
- Mobile phones
- Indicators
- Illuminations
- Switch Lights

Device Selection Guide

Chip Material	Emitted Color	Resin Color
InGaN	Pure White	Water Clear

Coding:

99-616LM2C/LXX XX XX X/TR8-T

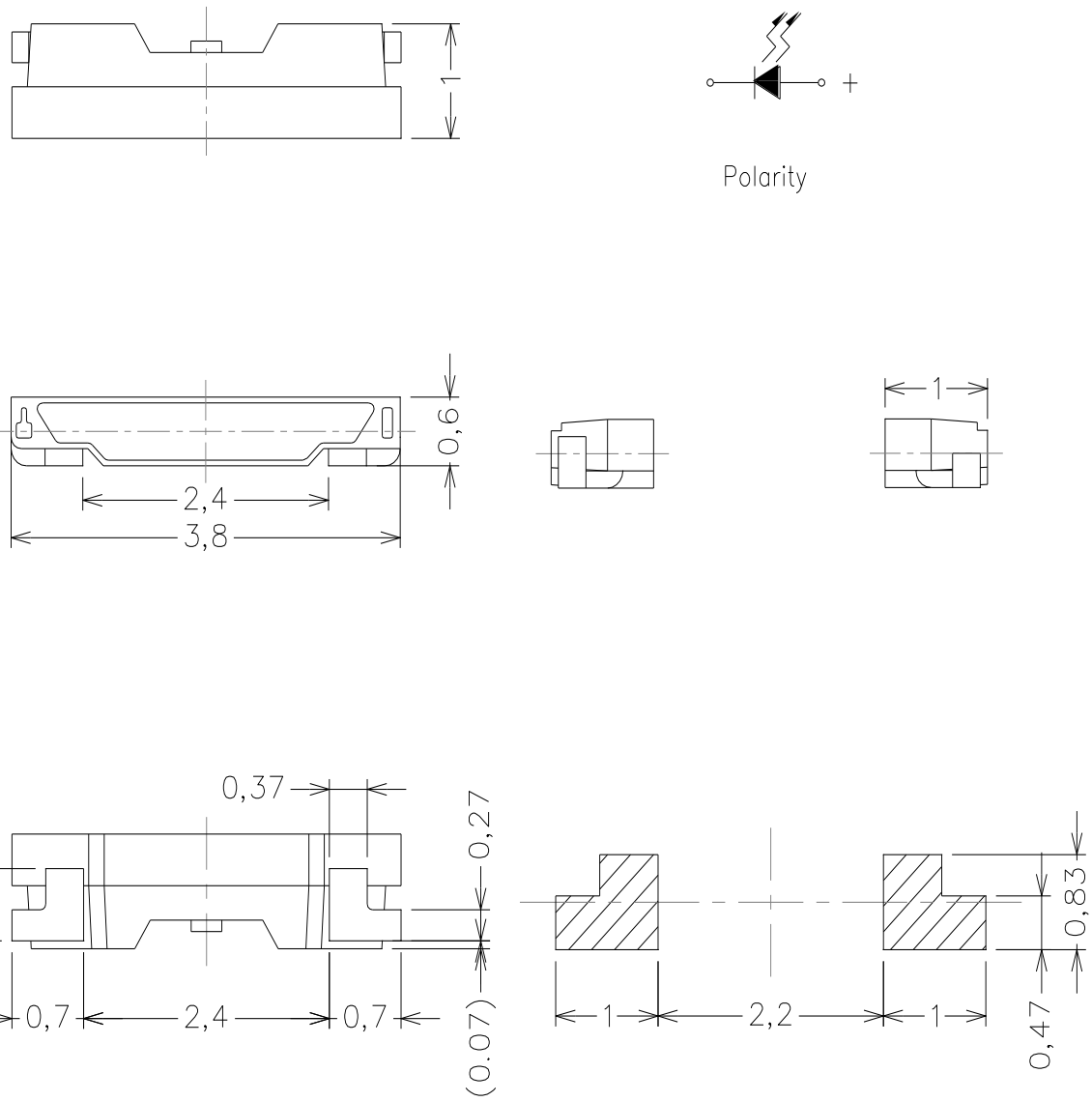
- XX: Bin Group of Forward Voltage
- XX: Bin Group of Chromaticity Coordinates
- XX: Bin Code of Max. Luminous Flux
- X: Bin Code of Min. Luminous Flux

Technical Data Sheet

Side View LEDs (Height 0.6mm)

99-616LM2C/LXXXXXXX/TR8-T

Package Outline Dimensions



Note: The tolerances unless mentioned are ±0.1mm, unit = mm.

Technical Data Sheet

Side View LEDs (Height 0.6mm)

99-616LM2C/LXXXXXXX/TR8-T

Absolute Maximum Ratings (Ta=25℃)

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	Pd	110	mW
Operating Temperature	Topr	-40 ~ +85	℃
Storage Temperature	Tstg	-40 ~ +90	℃
Soldering Temperature	Tsol	Reflow Soldering: 260 ℃ for 10 sec. Hand Soldering: 350 ℃ for 3 sec.	

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

Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux	Φ	5.00	-----	8.25	lm	I_F=20mA
Viewing Angle	2θ1/2	-----	120	-----	deg	
Forward Voltage	V_F	2.75	-----	3.45	V	
Reverse Current	I_R	-----	-----	50	μA	V_R=5V

Technical Data Sheet

Side View LEDs (Height 0.6mm)

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Bin Range of Luminous Flux

Bin Code	Lm		Condition	Mcd	
	Min.	Max.		Min.	Max.
50	5.00	5.25	I_F=20mA	1786	1875
52	5.25	5.50		1875	1964
55	5.50	5.75		1964	2054
57	5.75	6.00		2054	2143
60	6.00	6.25		2143	2232
62	6.25	6.50		2232	2321
65	6.50	6.75		2321	2411
67	6.75	7.00		2411	2500
70	7.00	7.25		2500	2589
72	7.25	7.50		2589	2678
75	7.50	7.75		2678	2768
77	7.75	8.00		2768	2857
80	8.00	8.25		2857	2946
82	8.25	8.50		2946	3035
85	8.50	8.75		3035	3124

Note: Measurement Tolerance of Luminous Flux: ±7%

Technical Data Sheet

Side View LEDs (Height 0.6mm)

99-616LM2C/LXXXXXXX/TR8-T

Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
5-1	2.75	2.85	volt	I_F=20mA
5-2	2.85	2.95		
6-1	2.95	3.05		
6-2	3.05	3.15		
7-1	3.15	3.25		
7-2	3.25	3.35		
8-1	3.35	3.45		

Note: Tolerance of Forward Voltage: ± 0.05V

Technical Data Sheet

Side View LEDs (Height 0.6mm)

99-616LM2C/LXXXXXXX/TR8-T

Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
NA0-3-1	0.2760	0.2530	NA0-3-2	0.2805	0.2600
	0.2720	0.2580		0.2770	0.2650
	0.2770	0.2650		0.2820	0.2720
	0.2805	0.2600		0.2850	0.2670
NA0-3-3	0.2800	0.2480	NA0-3-4	0.2840	0.2550
	0.2760	0.2530		0.2805	0.2600
	0.2805	0.2600		0.2850	0.2670
	0.2840	0.2550		0.2880	0.2620
A0-3b-1	0.2830	0.2440	A0-3b-2	0.2870	0.2510
	0.2800	0.2480		0.2840	0.2550
	0.2840	0.2550		0.2880	0.2620
	0.2870	0.2510		0.2910	0.2580
A0-4a-1	0.2820	0.2720	A0-4a-2	0.2865	0.2795
	0.2793	0.2755		0.2840	0.2836
	0.2840	0.2836		0.2887	0.2916
	0.2865	0.2795		0.2910	0.2870
A0-3a	0.2720	0.2580	----------		
	0.2793	0.2755			
	0.2820	0.2720			
	0.2720	0.2580			

Note: Tolerance of Chromaticity Coordinates: ±0.01

Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
NA0-4-1	0.2850	0.2670	NA0-4-2	0.2893	0.2743
	0.2820	0.2720		0.2865	0.2795
	0.2865	0.2795		0.2910	0.2870
	0.2893	0.2743		0.2935	0.2815
NA0-4-3	0.2880	0.2620	NA0-4-4	0.2920	0.2690
	0.2850	0.2670		0.2893	0.2743
	0.2893	0.2743		0.2935	0.2815
	0.2920	0.2690		0.2960	0.2760
A0-4b-1	0.2910	0.2580	A0-4b-2	0.2945	0.2645
	0.2880	0.2620		0.2920	0.2690
	0.2920	0.2690		0.2960	0.2760
	0.2945	0.2645		0.2980	0.2710
B5-3a-1	0.2910	0.2870	B5-3a-2	0.2950	0.2940
	0.2887	0.2916		0.2928	0.2987
	0.2928	0.2987		0.2968	0.3058
	0.2950	0.2940		0.2990	0.3010
NB5-3-1	0.2935	0.2815	NB5-3-2	0.2975	0.2885
	0.2910	0.2870		0.2950	0.2940
	0.2950	0.2940		0.2990	0.3010
	0.2975	0.2885		0.3015	0.2955

Note: Tolerance of Chromaticity Coordinates: ±0.01

Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
NB5-3-3	0.2960	0.2760	NB5-3-4	0.3000	0.2830
	0.2935	0.2815		0.2975	0.2885
	0.2975	0.2885		0.3015	0.2955
	0.3000	0.2830		0.3040	0.2900
B5-3b-1	0.2980	0.2710	B5-3b-2	0.3021	0.2782
	0.2960	0.2760		0.3000	0.2830
	0.3000	0.2830		0.3040	0.2900
	0.3021	0.2782		0.3062	0.2853
B5-4a-1	0.2990	0.3010	B5-4a-2	0.3030	0.3080
	0.2968	0.3058		0.3008	0.3128
	0.3008	0.3128		0.3048	0.3198
	0.3030	0.3080		0.3070	0.3150
NB5-4-1	0.3015	0.2955	NB5-4-2	0.3055	0.3025
	0.2990	0.3010		0.3030	0.3080
	0.3030	0.3080		0.3070	0.3150
	0.3055	0.3025		0.3095	0.3095
NB5-4-3	0.3040	0.2900	NB5-4-4	0.3080	0.2970
	0.3015	0.2955		0.3055	0.3025
	0.3055	0.3025		0.3095	0.3095
	0.3080	0.2970		0.3120	0.3040

Note: Tolerance of Chromaticity Coordinates: ±0.01

Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
B5-4b-1	0.3062	0.2853	B5-4b-2	0.3102	0.2923
	0.3040	0.2900		0.3080	0.2970
	0.3080	0.2970		0.3120	0.3040
	0.3102	0.2923		0.3142	0.2993
B6-3a-1	0.3070	0.3150	B6-3a-2	0.3110	0.3220
	0.3048	0.3198		0.3088	0.3268
	0.3088	0.3268		0.3128	0.3338
	0.3110	0.3220		0.3150	0.3290
NB6-3-1	0.3095	0.3095	NB6-3-2	0.3135	0.3165
	0.3070	0.3150		0.3110	0.3220
	0.3110	0.3220		0.3150	0.3290
	0.3135	0.3165		0.3175	0.3235
NB6-3-3	0.3120	0.3040	NB6-3-4	0.3160	0.3110
	0.3095	0.3095		0.3135	0.3165
	0.3135	0.3165		0.3175	0.3235
	0.3160	0.3110		0.3200	0.3180
B6-3b-1	0.3142	0.2993	B6-3b-2	0.3182	0.3063
	0.3120	0.3040		0.3160	0.3110
	0.3160	0.3110		0.3200	0.3180
	0.3182	0.3063		0.3222	0.3133

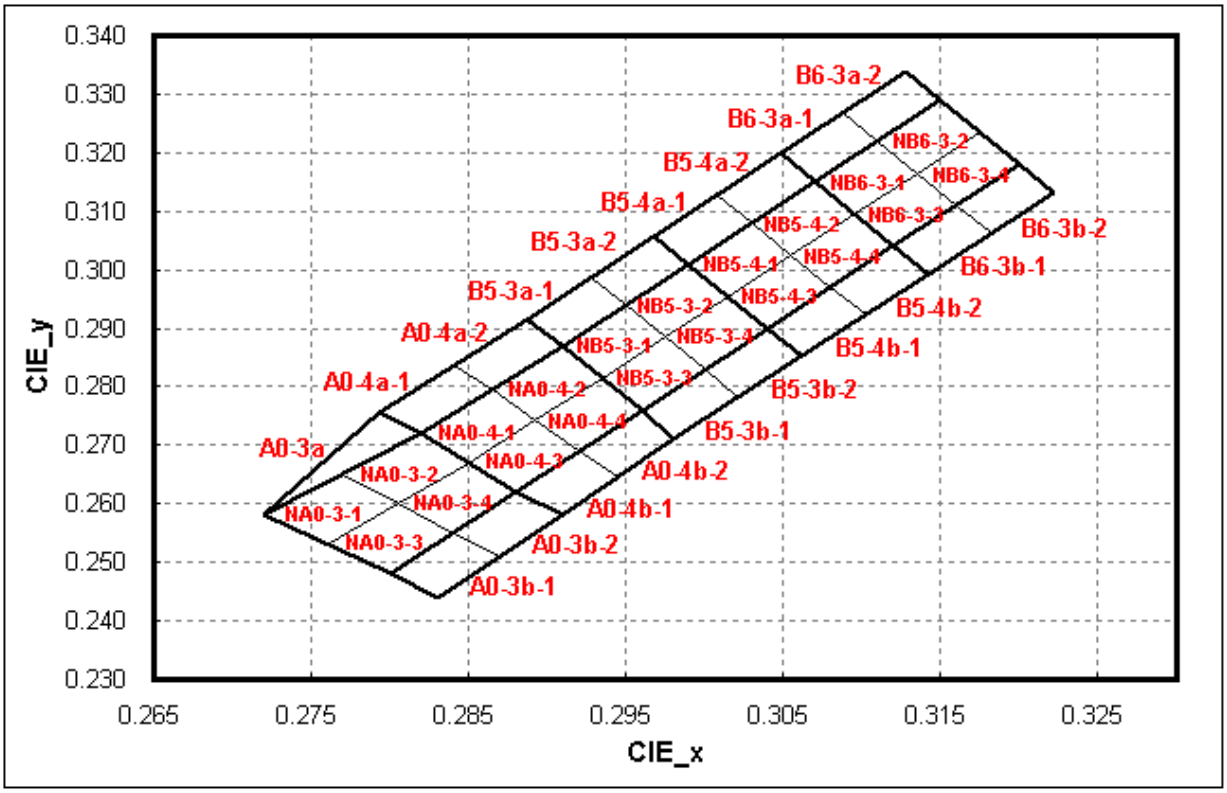
Note: Tolerance of Chromaticity Coordinates: ±0.01

Technical Data Sheet

Side View LEDs (Height 0.6mm)

99-616LM2C/LXXXXXXX/TR8-T

The C.I.E. 1931 Chromaticity Diagram



Technical Data Sheet

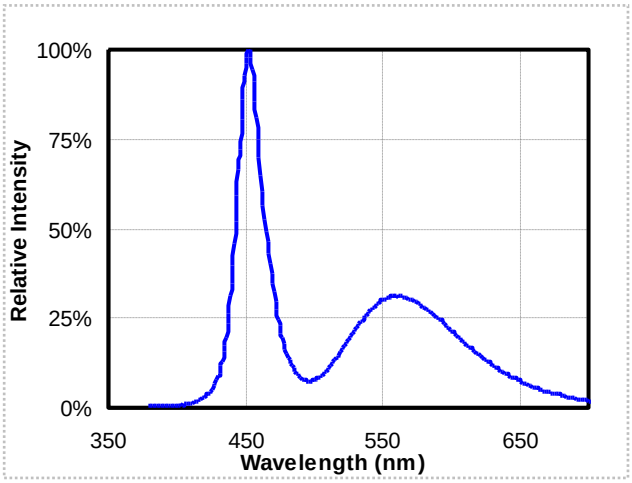
Side View LEDs (Height 0.6mm)

99-616LM2C/LXXXXXXX/TR8-T

Typical Electro-Optical Characteristics Curves

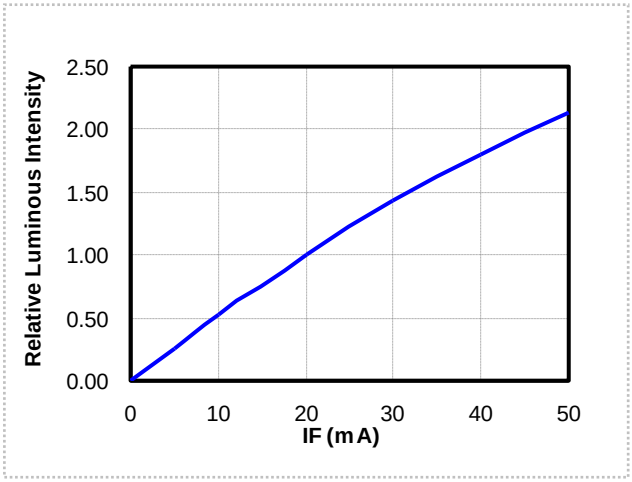
1. Spectrum Distribution

(T_S=25℃, I_F=20mA)



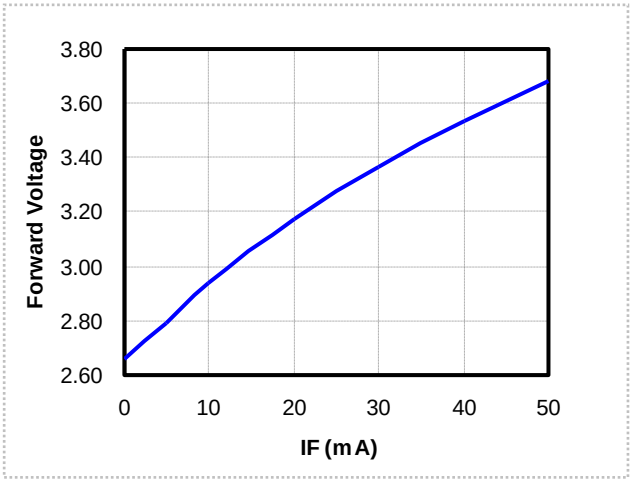
2. Relative Luminous Flux vs. Forward Current

(T_S=25℃)



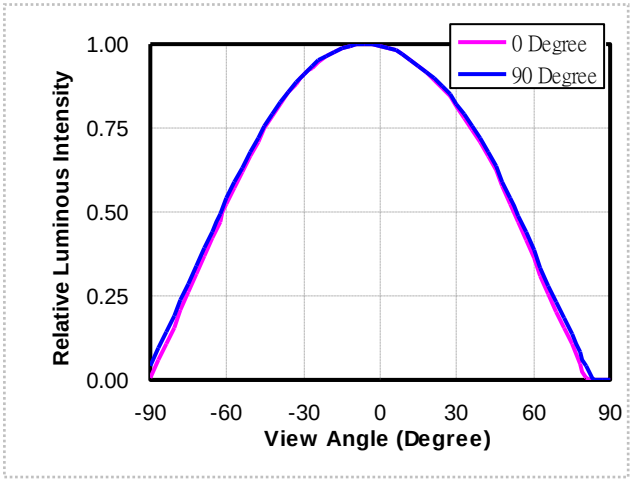
3. Relative Forward Voltage vs. Forward Current

(T_S=25℃)



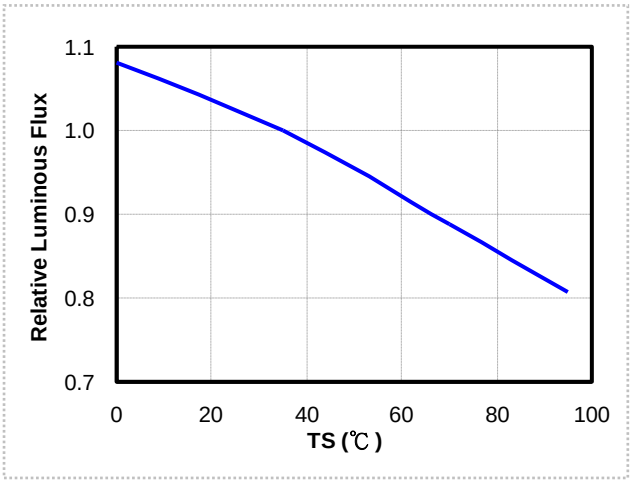
4. Radiation Diagram

(T_S=25℃, I_F=20mA)

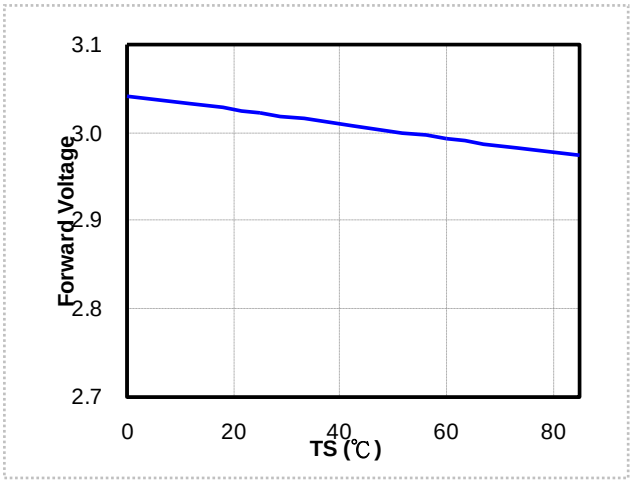


Typical Electro-Optical-Thermal Characteristics Curves

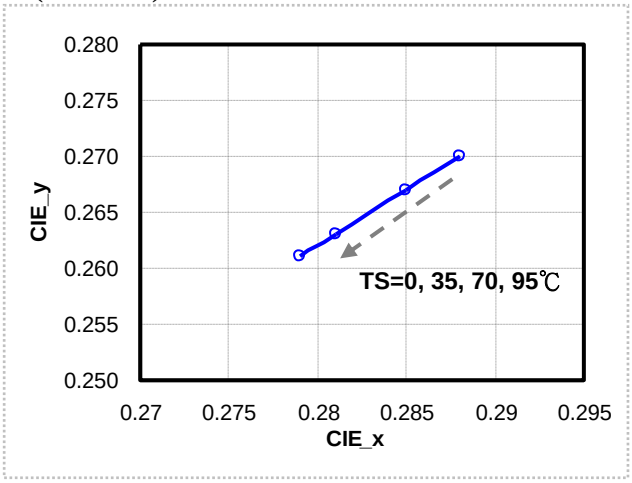
5. Relative Luminous Flux vs. Solder Temperature (I_F=20mA)



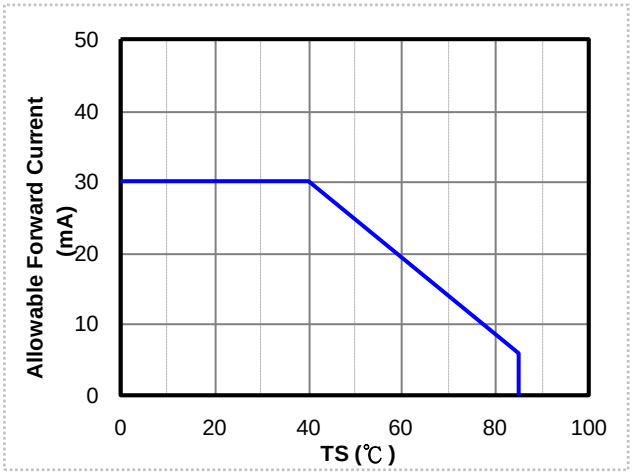
6. Forward Voltage vs. Solder Temperature (I_F=20mA)



7. Chromaticity Coordinates vs. Solder Temperature (I_F=20mA)



8. Forward Current De-rating Curve



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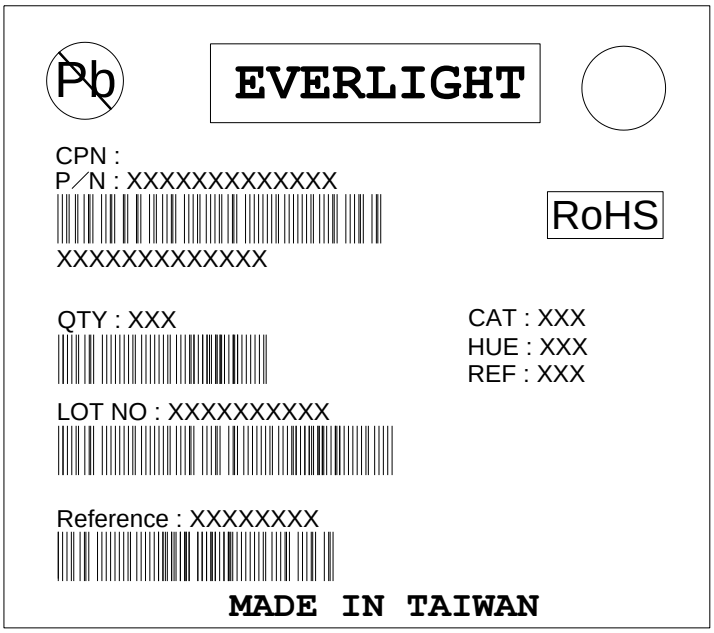
Side View LEDs (Height 0.6mm)

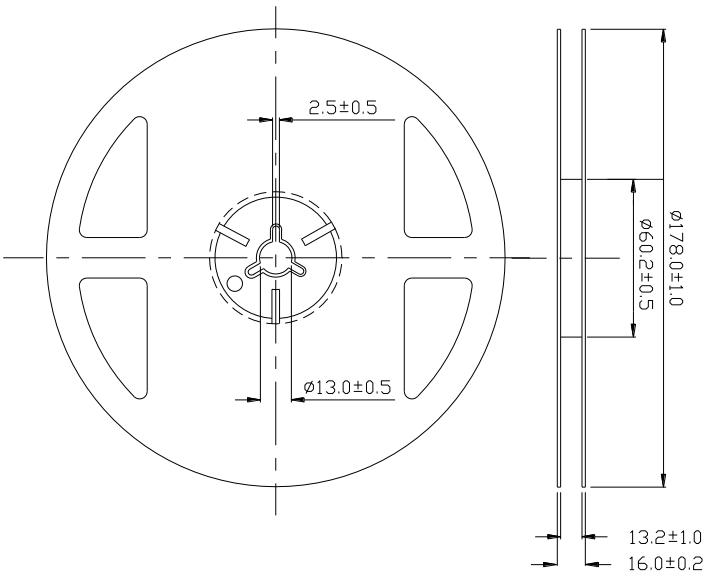
99-616LM2C/LXXXXXXX/TR8-T

Label Explanation

CAT: Luminous Flux Rank
HUE: Chromaticity Coordinates
REF: Forward Voltage Rank



Reel Dimensions



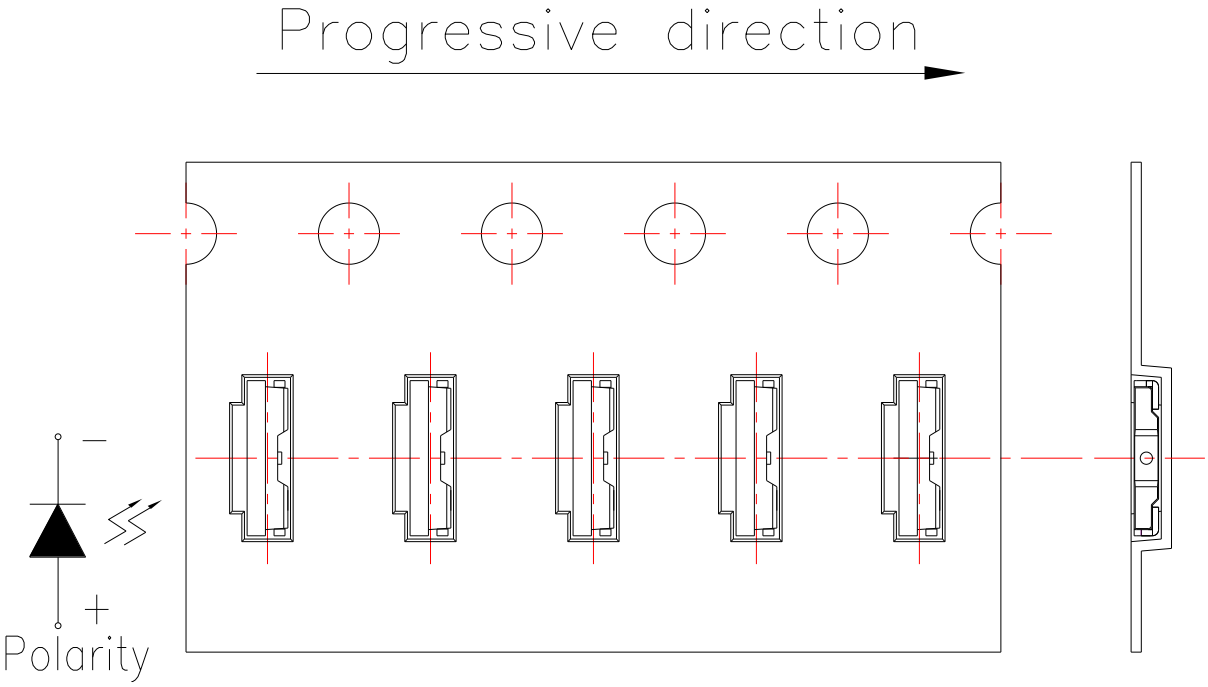
Note: The tolerance unless mentioned is ±0.1mm, unit = mm.

Technical Data Sheet

Side View LEDs (Height 0.6mm)

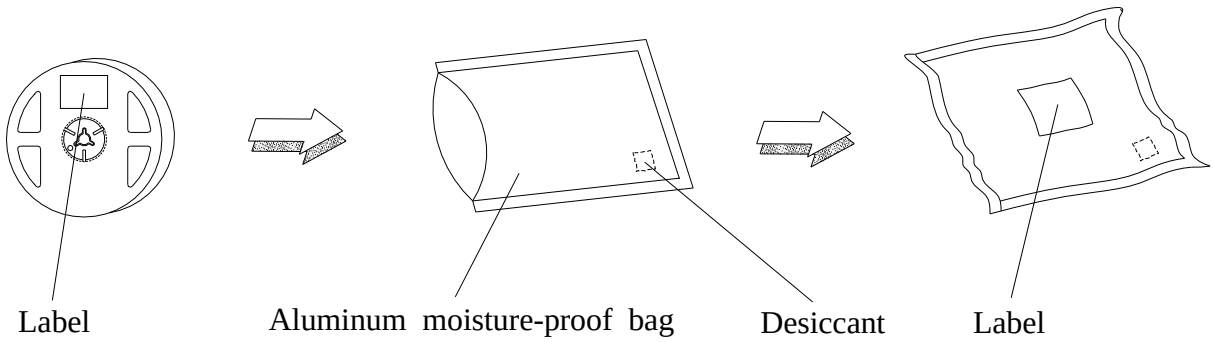
99-616LM2C/LXXXXXXX/TR8-T

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



Note: The tolerance unless mentioned is ±0.1mm, unit = mm.

Moisture Resistant Packaging



99-616LM2C/LXXXXXXX/TR8-T

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)		Iv @ 20mA	V_F @ 20mA
1	Reflow Soldering	TSld = 260℃, Max. 10sec.		2 times	<±10%	<±10%
2	Thermal Cycle	-40℃ ~ 100℃ 30min. (5min.) 30min.		200 cycles	Iv > 70%, VF < 110%,	
3	Thermal Shock	-10℃ ~ 100℃ 20min. (<15sec.) 20min.		200 cycles		
4	Low Temp. Storage	Ta= -40℃	--	1000 hrs		
5	High Temp. Storage	Ta= 100℃	--	1000 hrs		
6	Temp. Humidity Storage	Ta= 60℃/ 90%RH	--	1000 hrs		
7	Steady State Operating Life of Low Temp.	Ta= -40℃	20	1000 hrs		
8	Steady State Operating Life Condition 1	Ta= 25℃/ Room Humidity	20	1000 hrs		
9	Steady State Operating Life Condition 2	Ta= 60℃	20	1000 hrs		
10	Steady State Operating Life of High Temp.	Ta= 85℃	5	1000 hrs		
11	Steady State Operating Life of High Humidity Heat	Ta= 60℃/ 90%RH	20	1000 hrs		

Technical Data Sheet

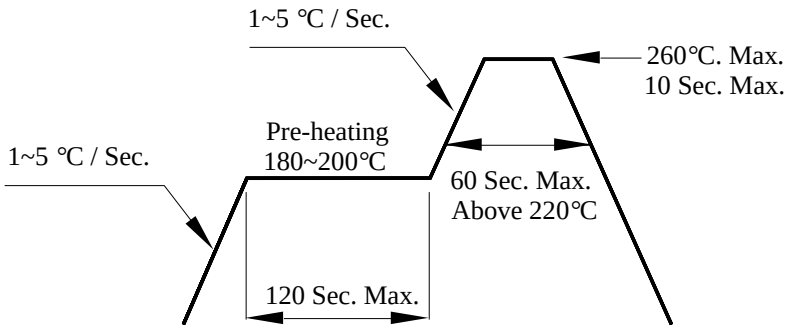
Side View LEDs (Height 0.6mm)

99-616LM2C/LXXXXXXX/TR8-T

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. Soldering Condition



2.1 Pb-free solder temperature profile
2.2 Reflow soldering should not be done more than two times.
2.3 When soldering, do not put stress on the LEDs during heating.
2.4 After soldering, do not warp the circuit board.

3. Soldering Iron
   Each terminal is to go to the tip of soldering iron temperature less than 350℃ 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.

4. 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.

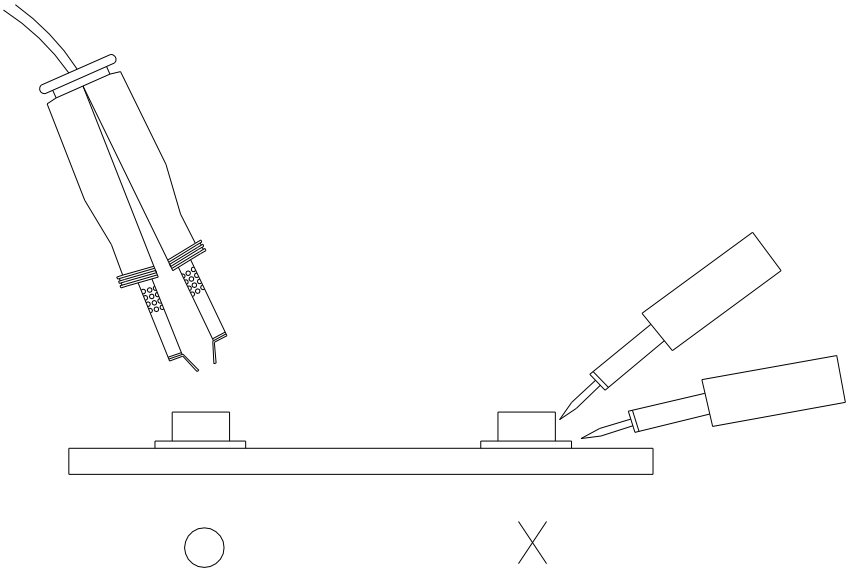
5. Storage

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

5.2 Before opening the package: The LEDs should be used within one year and kept at 30℃ or less and 70%RH or less.

5.3 After opening the package: We recommend that the LED should be soldered quickly (within 3 days). The soldering condition is 30℃ or less and 60%RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

5.4 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℃ for 24 hours. (One time only)



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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