Approval Sheet

MODEL NAME	**SMD LED**
PART NUMBER	DBL**-299SW-Z2-P**
CUSTOMER NAME	
CUSTOMER P/NO.	
APPROVED DATE	

Shenzhen DongBei Technology Co,.Ltd.
7F,NO.711,210 west,Tairan industrial park.,
Futian,Shenzhen
Tel:0755-23820456 Fax:0755-28156077
http://www.dongbei.com

Technical Data
ALLEDs

DBL-299SW-Z2-P

02/19/2008

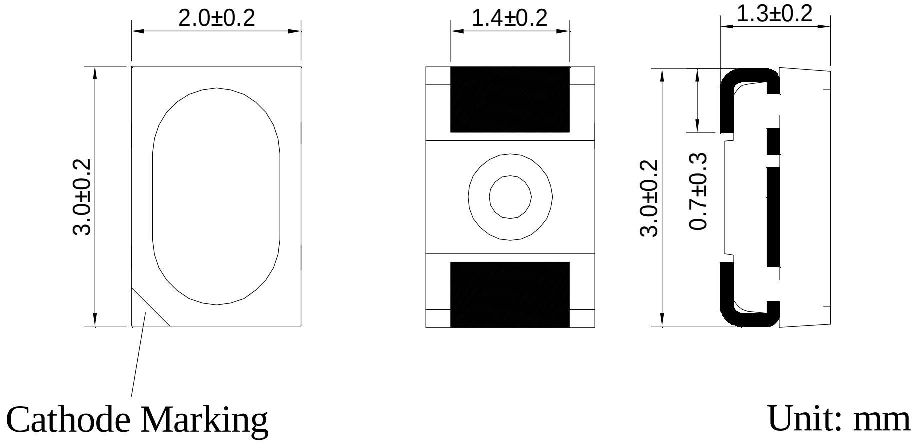
Features

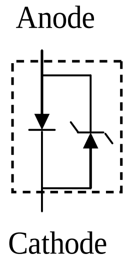
- **Package :** Rectangle white 3 * 2mm P-LCC-2 package with silicone resin.
- **Feature of the device :** Extremely wide viewing angle.
  Ideal for backlighting and coupling in light guides.
- **White color :** x / y coordinate is 0.28 / 0.28.
- **Viewing angle :** Lambertian Emitter (110^{o}).
- **Technology :** InGaN.
- **Grouping parameter :** Luminous Intensity.
- **Assembly methods :** Suitable for all SMT assembly methods.
- **Soldering methods :** Reflow soldering.
- **Taping :** 8-mm tape with 2000 pieces / reel, ϕ180mm.
- **Lead free product :** RoHS compliant.

Applications

- **Automotive :** Dashboards.
- **Backlighting :** LCDs, Key pads, Advertising.
- **Lighting :** Signal, symbol and marker lights;
  Substitution of micor incandescent lamps.
- **Displays :** Indoor and outdoor signboards, message boards.
- **Status indicators :** Industrial electronics.

Package Dimensions



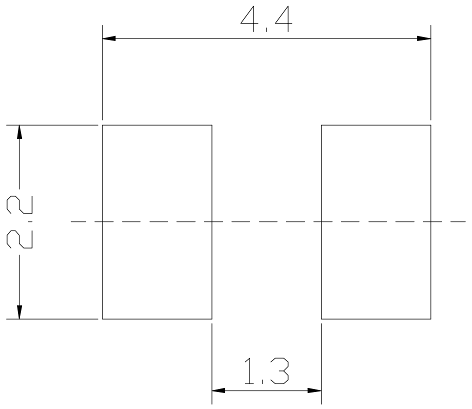


Notes :

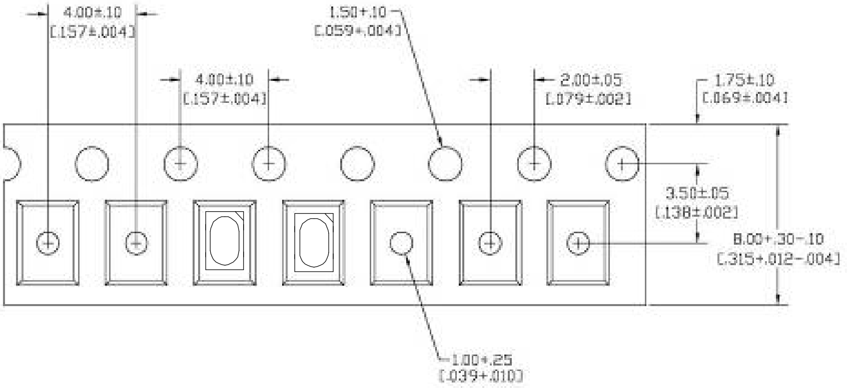
1.All dimensions are in millimeters.

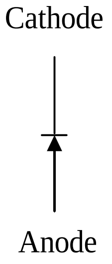
2.Tolerance is ± 0.20 mm unless otherwise noted.

Recommended Solder Patterns



Method of Taping / Polarity and Orientation : Packing unit 2000 pieces / reel





Notes :

1.All dimensions are in millimeters.

2.Tolerance is ± 0.20 mm unless otherwise noted.

Selection Guide

Part Number	**Color of Emission**	**Color of the Light Emitting Area**	**Luminous Intensity I_V (mcd) @ 20mA**	**Viewing $2q_{1/2}$ @ 20mA**
MSL-299SW-Z2-P	White	Yellowish silicone	1300	110

Luminous intensity is tested at a current pulse duration of 3 ms and an accuracy of +/- 10%.

Part Number	**Forward Voltage V_F (Volts) @I_F = 20mA**			**Reverse Current I_R (mA) @ V_R = 5V**	**Chromaticity Coordinates (Typ.)**	
					x	**y**
	Min.	**Typ.**	**Max.**	**Max.**	**Typ.**	**Typ.**
MSL-299SW-Z2-P	3.0	3.3	3.5	50	0.297	0.300

Voltage groups are tested at a current pulse duration of 3 ms and an accuracy of +/- 0.05V.

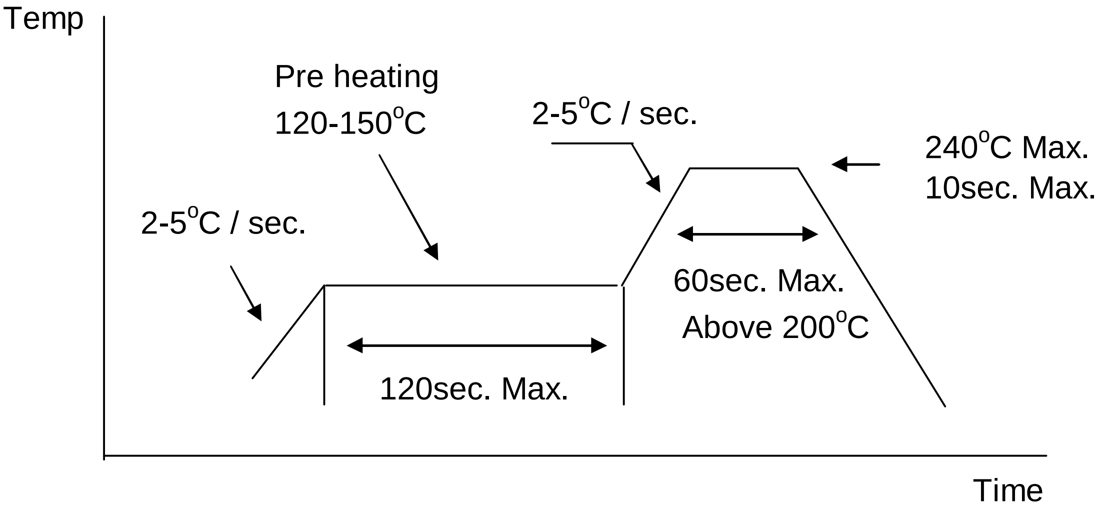
Chromaticity coordinate groups are tested at a current pulse duration of 100 ms and a tolerance of ±0.01.

Absolute Maximum Ratings

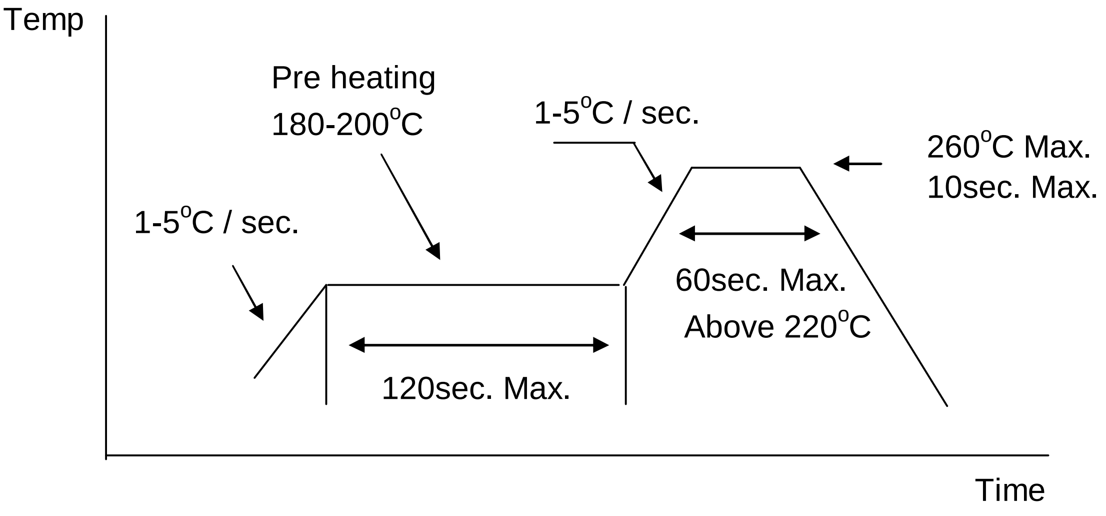
Parameter	**Symbol**	**Value**	**Unit**
Operating Temp. range	T_{OP}	-30 ~ +85	^oC
Storage Temp. range	T_{stg}	-40 ~ +100	^oC
Junction temperature	T_j	110	^oC
Forward current	I_F	30	mA
Reverse Voltage	V_R	5	V
Power dissipation	P_{tot}	120	mW
Electrostatic Discharge	*ESD*	(HBM)±2K	V

Reflow Soldering Profile

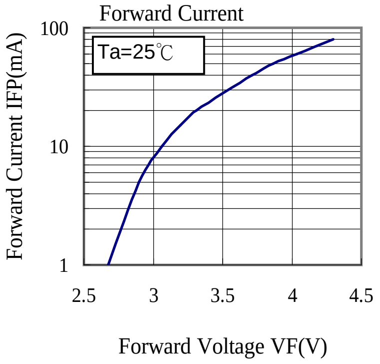
Lead Solder



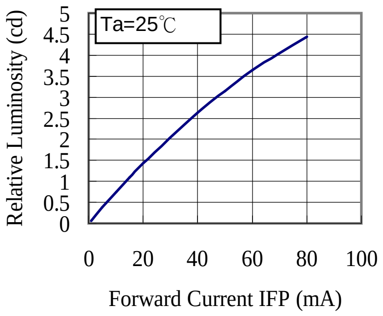
Lead Free Solder



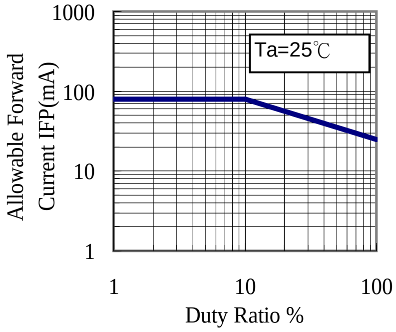
Forward Voltage vs. Forward Current



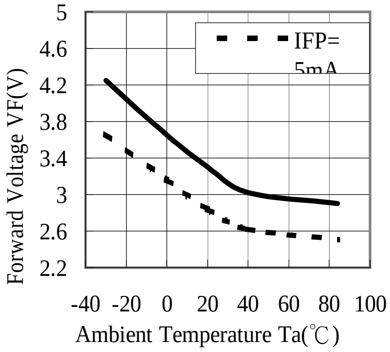
Forward Current vs. Relative Luminosity



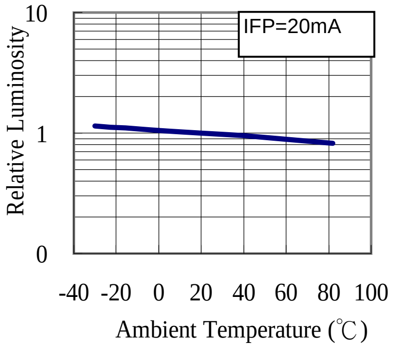
Duty Ratio vs. Allowable Forward Current



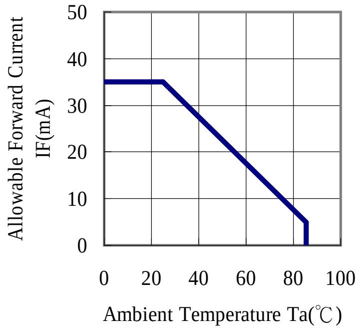
Ambient Temperature vs. Forward Voltage



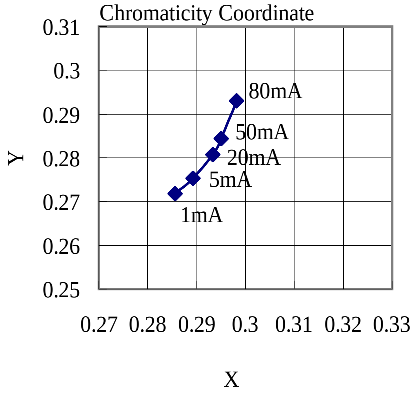
Ambient Temperature vs. Relative Luminosity



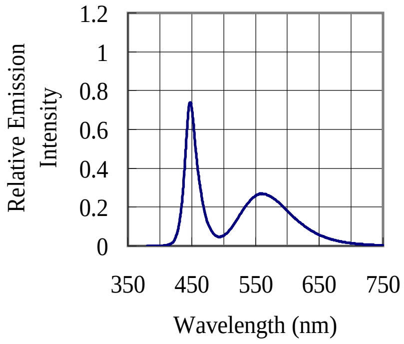
Ambient Temperature vs. Allowable Forward Current



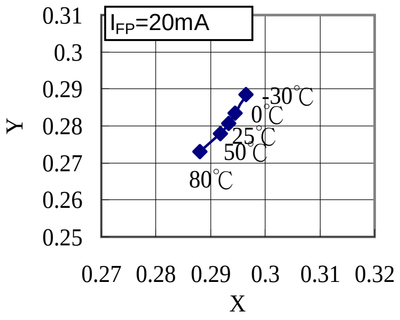
Forward Current vs. Chromaticity Coordinate



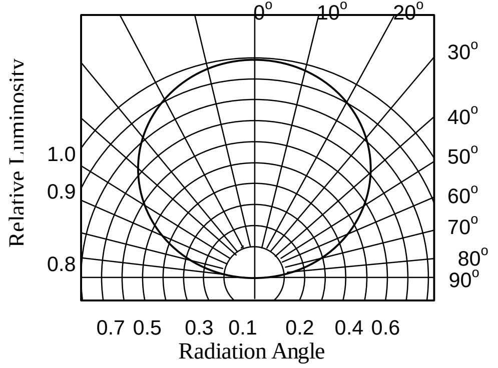
Spectrum



Ambient Temperature vs. Chromaticity Coordinate



Radiation Pattern



Unity Bin Codes

MSL-299SW-Z2-P		
AAC	**C**	**4**

Luminous Intensity Group (mcd) @ I_F=20mA		
Bin	Min	Max
V1	710	900
V2A	900	1000
V2B	1000	1120
AAA	1120	1200
AAB	1200	1300
AAC	1300	1400
ABA	1400	1500
ABB	1500	1600
ABC	1600	1700
ABD	1700	1800
BA	1800	2240

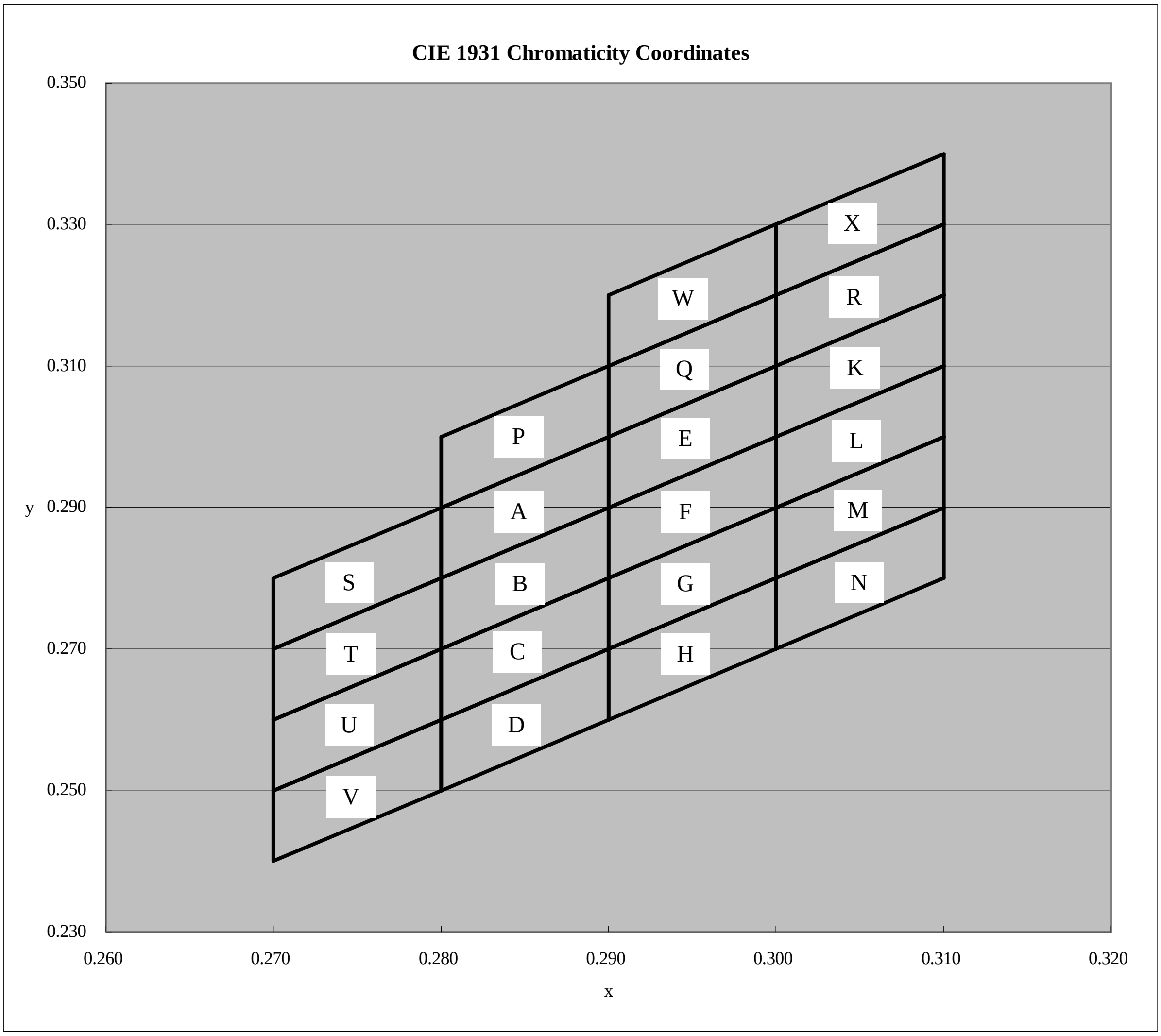
Luminous intensity is tested at a current pulse duration of 3 ms and an accuracy of +/- 10%.

Color Coordinate @ I_F=20mA								
Bin Code	1		2		3		4	
	x	y	x	y	x	y	x	y
A	0.280	0.280	0.280	0.290	0.290	0.300	0.290	0.290
B	0.280	0.270	0.280	0.280	0.290	0.290	0.290	0.280
C	0.280	0.260	0.280	0.270	0.290	0.280	0.290	0.270
D	0.280	0.250	0.280	0.260	0.290	0.270	0.290	0.260
E	0.290	0.290	0.290	0.300	0.300	0.310	0.300	0.300
F	0.290	0.280	0.290	0.290	0.300	0.300	0.300	0.290
G	0.290	0.270	0.290	0.280	0.300	0.290	0.300	0.280
H	0.290	0.260	0.290	0.270	0.300	0.280	0.300	0.270
K	0.300	0.300	0.300	0.310	0.310	0.320	0.310	0.310
L	0.300	0.290	0.300	0.300	0.310	0.310	0.310	0.300
M	0.300	0.280	0.300	0.290	0.310	0.300	0.310	0.290
N	0.300	0.270	0.300	0.280	0.310	0.290	0.310	0.280
P	0.280	0.290	0.280	0.300	0.290	0.310	0.290	0.300
Q	0.290	0.300	0.290	0.310	0.300	0.320	0.300	0.310
R	0.300	0.310	0.300	0.320	0.310	0.330	0.310	0.320
S	0.270	0.270	0.270	0.280	0.280	0.290	0.280	0.280
T	0.270	0.260	0.270	0.270	0.280	0.280	0.280	0.270
U	0.270	0.250	0.270	0.260	0.280	0.270	0.280	0.260
V	0.270	0.240	0.270	0.250	0.280	0.260	0.280	0.250
W	0.290	0.310	0.290	0.320	0.300	0.330	0.300	0.320
X	0.300	0.320	0.300	0.330	0.310	0.340	0.310	0.330

Chromaticity coordinate groups are tested at a current pulse duration of 100 ms and a tolerance of ±0.01.

Forward Voltage (V) @ I_F=20mA		
Bin	Min	Max
0	2.9	3.0
1	3.0	3.1
2	3.1	3.2
3	3.2	3.3
4	3.3	3.4
5	3.4	3.5
6	3.5	3.6
7	3.6	3.7
8	3.7	3.8
9	3.8	4.0

Voltage groups are tested at a current pulse duration of 3 ms and an accuracy of +/- 0.05V.



Bin Code	Color Coordinate @ I_F=20mA							
	1		2		3		4	
	x	y	x	y	x	y	x	y
A	0.280	0.280	0.280	0.290	0.290	0.300	0.290	0.290
B	0.280	0.270	0.280	0.280	0.290	0.290	0.290	0.280
C	0.280	0.260	0.280	0.270	0.290	0.280	0.290	0.270
D	0.280	0.250	0.280	0.260	0.290	0.270	0.290	0.260
E	0.290	0.290	0.290	0.300	0.300	0.310	0.300	0.300
F	0.290	0.280	0.290	0.290	0.300	0.300	0.300	0.290
G	0.290	0.270	0.290	0.280	0.300	0.290	0.300	0.280
H	0.290	0.260	0.290	0.270	0.300	0.280	0.300	0.270
K	0.300	0.300	0.300	0.310	0.310	0.320	0.310	0.310
L	0.300	0.290	0.300	0.300	0.310	0.310	0.310	0.300
M	0.300	0.280	0.300	0.290	0.310	0.300	0.310	0.290
N	0.300	0.270	0.300	0.280	0.310	0.290	0.310	0.280
P	0.280	0.290	0.280	0.300	0.290	0.310	0.290	0.300
Q	0.290	0.300	0.290	0.310	0.300	0.320	0.300	0.310
R	0.300	0.310	0.300	0.320	0.310	0.330	0.310	0.320
S	0.270	0.270	0.270	0.280	0.280	0.290	0.280	0.280
T	0.270	0.260	0.270	0.270	0.280	0.280	0.280	0.270
U	0.270	0.250	0.270	0.260	0.280	0.270	0.280	0.260
V	0.270	0.240	0.270	0.250	0.280	0.260	0.280	0.250
W	0.290	0.310	0.290	0.320	0.300	0.330	0.300	0.320
X	0.300	0.320	0.300	0.330	0.310	0.340	0.310	0.330

Reliability

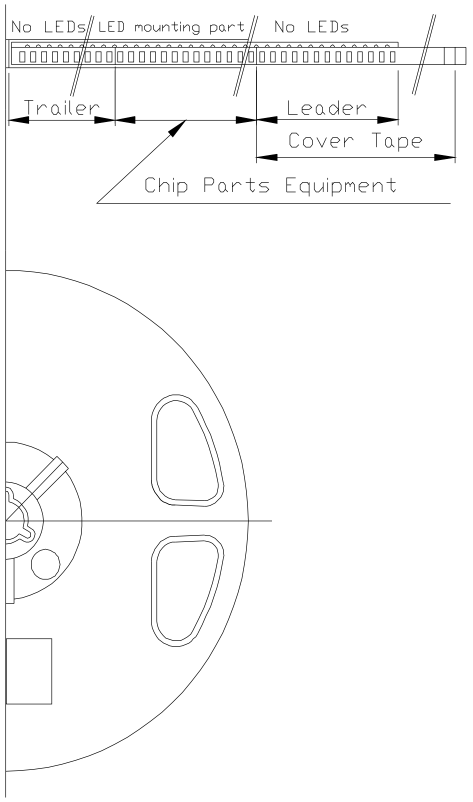
Test Item	Test Condition	Time / Cycle	Number of Damaged
1.Solder Resistance	Ta = 260℃±5℃	Dwell Time = 10sec±1sec	0/30
2.High Temp. Storage	Ta = 100℃	Test Time = 1000hrs	0/30
3.Low Temp. Storage	Ta = -40℃	Test Time = 1000hrs	0/30
4.High Temp. and High Humidity Storage	Ta = 60℃ Humidity = 90%RH	Test Time = 1000hrs	0/30
5.Room Temp. Operation Test	Ta= 25℃ I_F = 20mA	Test Time = 1000hrs	0/30
6.High Temp. Operation Test	Ta = 85℃ I_F = 5mA	Test Time = 1000hrs	0/30
7.Thermal Shock Test	-55℃(15mins)~100℃(15mins) Transfer Time ≦ 5mins	100cycles	0/30
8.Temp. Cycling Test	-40℃ ~ 25℃ ~ 85℃ ~ 25℃ 30mins 5mins 30mins 5mins	100cycles	0/30

Judgment Criteria

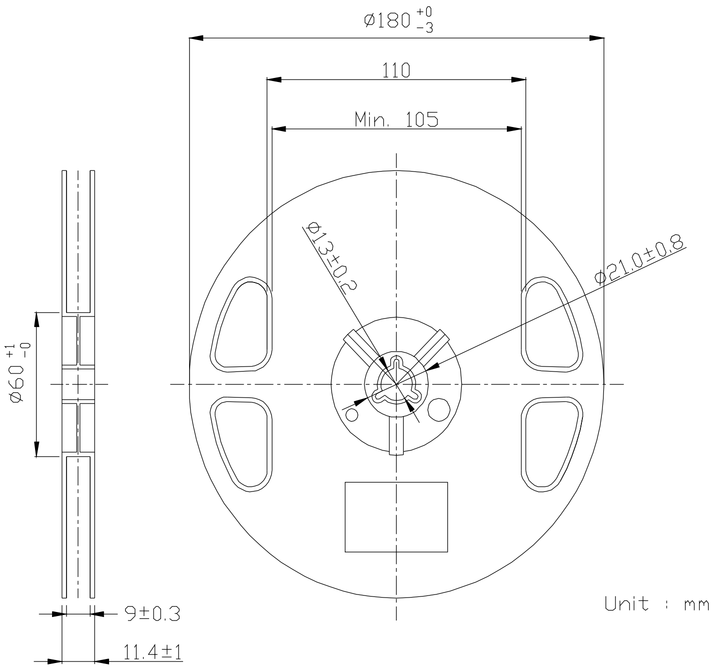
Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	20mA	△% ＜ 10%
Luminous Intensity	Iv	20mA	△% ＜ 30%

Confidence Level	90%
LTPD	8%

Tape Dimensions



REEL Dimensions



Items		Specifications	Remarks
Leader	Cover Tape	Cover tape shall be longer than 400mm without carrier tape	The end of the carrier tape shall be adhered on the cover tape
	Carrier Tape	There shall be more than 40 empties	The orientation of tape shall be as shown
Trailer		There shall be more than 40 empties	The end of the tape shall be inserted into a slit of the hub

Surface Mount Moisture Sensitivity Specifications

1. Controlling Moisture

Unity Opto Technology, in its design of packing materials and packing methods, takes into consideration the susceptibility of some Unity packages to moisture induced damage. The risk of this damage is caused when the LED lens plastic encapsulation material is exposed to increases or decreases in the Relative Humidity of the surrounding environment.

Such damage may include delamination between the die and the LED lens plastic encapsulation material, which may result in open connections due to broken wire bonds. Moisture in the package having reached a critical level will fracture the package in order to escape when exposed to peak temperature conditions, typical in soldering practices.

Therefore, the control of moisture levels in the LED package is critical to reduce the risk of moisture-induced failures. Please follow JEDEC-STD-033A standards for handling moisture sensitive devices.

2. Packaging SMD devices:

Unity packages all SMD devices into dry pack bags (moisture barrier bags).

Unity includes a desiccant pouch in each bag. Testing confirms that the desiccant pouch greatly reduces the presence of moisture by maintaining the environment in the bag, thus protecting the devices during shipment and storage.

3. Handling Dry Packed Parts

Upon receipt, the bags should be inspected for damage to ensure that the bag's integrity has been maintained. Inspection should verify that there are no holes, gouges, tears, or punctures of any kind that may expose the contents of the bag.

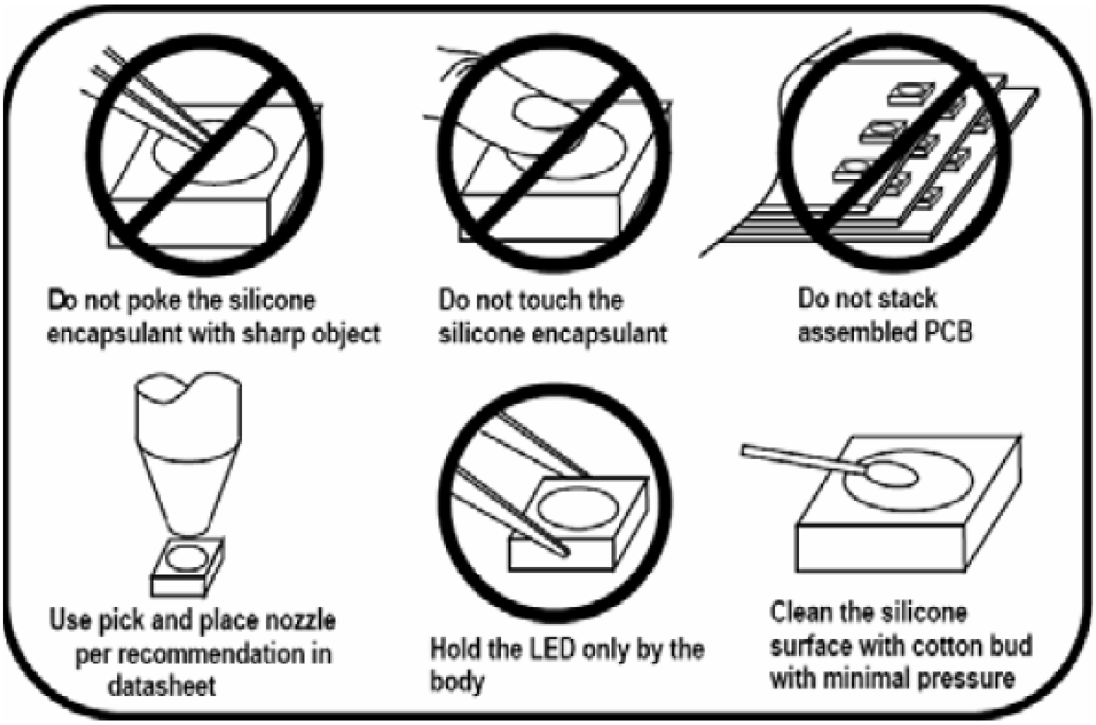
To open the bag, simply cut across the top of the bag as close to the original seal as possible being careful not to damage the contents. Once open the desired quantity of units should be removed and the bag resealed. If the bag is left open longer than 2 hours, the desiccant pouch should be replaced with a dry desiccant and the bag should be sealed immediately to avoid moisture damage.

Package Label

CUSTOMER :
CUSTOMER P/N :
DEVICE TYPE : MSL-299SW-Z2-P
BIN : AAC-C-4
LOT NO :
Q'TY : 2000
BATCH :
MADE IN TAIWAN

Silicone Product Surface Mount Technology Note

Handling Precaution



Do not poke the silicone encapsulant with sharp object

Do not touch the silicone encapsulant

Do not stack assembled PCB

Use pick and place nozzle per recommendation in datasheet

Hold the LED only by the body

Clean the silicone surface with cotton bud with minimal pressure