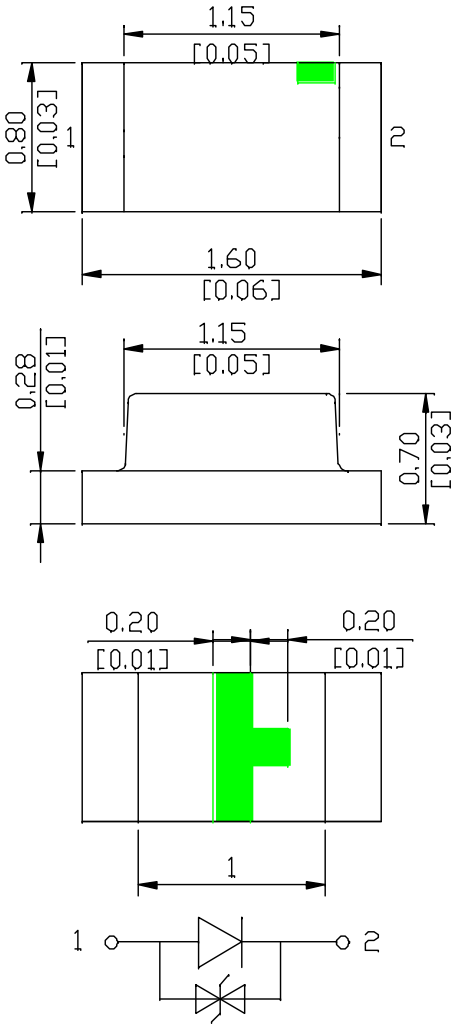
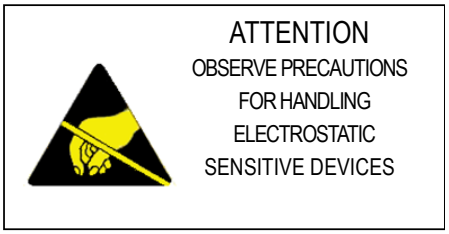
Feature

RF-BWB191DS-DD-Z

- Viewing angle:140 deg
- The materials of the LED dice is InGaN
- 1.60mm×0.80mm×0.70mm
- RoHS compliant lead-free soldering compatible

Package Outline





NOTES:

1. All dimensions are in millimeters (inches);
2. Tolerances are ±0.1mm (0.004inch) unless otherwise noted.

Absolute maximum ratings at Ta=25℃

Parameter	Symbol	Value	Unit
Forward current	If	20	mA
Reverse voltage	Vr	5	V
Operating temperature range	Top	-20 ~+85	℃
Storage temperature range	Tstg	-35 ~+85	℃
Peak pulsing current	Ifp	100	mA
Electrostatic Discharge	ESD	6000(HBM)	V

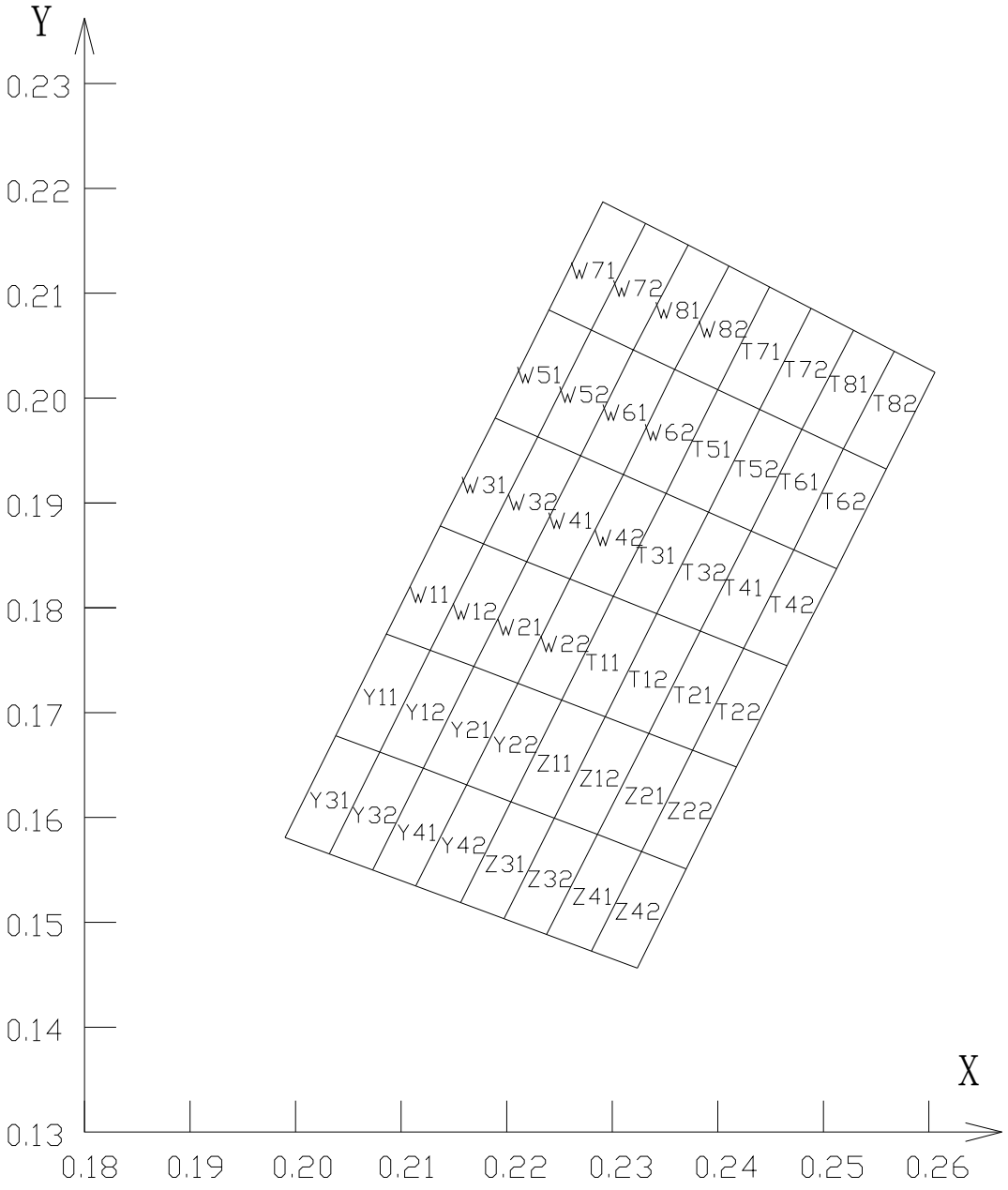
Electro-optical characteristics at Ta=25℃

Parameter	Test Condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Forward voltage	If=20mA	Vf	2.8	--	2.9	V
			2.9	--	3.0	V
			3.0	--	3.1	V
			3.1	--	3.2	V
			3.2	--	3.3	V
			3.3	--	3.4	V
			3.4	--	3.5	V
Luminous intensity	If=20mA	Iv	300	--	350	mcd
			350	--	400	mcd
			400	--	450	mcd
			450	--	500	mcd
			500	--	550	mcd
			550	--	600	mcd
			600	--	650	mcd
			650	--	700	mcd
Viewing angle at 50% Iv	If=20mA	2 θ1/2	--	140	--	Deg
Reverse current	Vr=5V	Ir	--	--	10	μA

NOTE: (Tolerance: Iv ±10%, Vf ±0.05V, X,Y ±0.01)

IFP Conditions: Pulse Width≦10msec. and Duty ≦1/10.

Chromaticity Bin



Bin data:

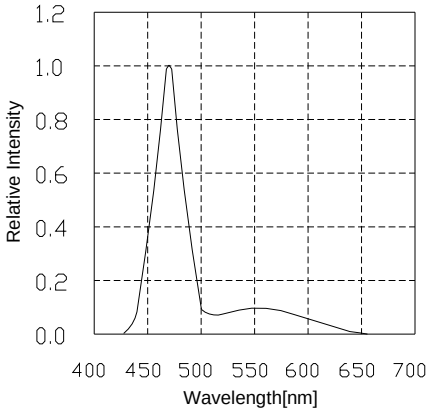
BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
W11	0.2128	0.1760	0.2086	0.1775	0.2137	0.1878	0.2178	0.1861
W12	0.2169	0.1744	0.2128	0.1760	0.2178	0.1861	0.2219	0.1844
W21	0.2211	0.1728	0.2169	0.1744	0.2219	0.1844	0.2260	0.1828
W22	0.2252	0.1712	0.2211	0.1728	0.2260	0.1828	0.2301	0.1811
W31	0.2178	0.1861	0.2137	0.1878	0.2189	0.1981	0.2230	0.1963
W32	0.2219	0.1844	0.2178	0.1861	0.2230	0.1963	0.2270	0.1945

W41	0.2260	0.1828	0.2219	0.1844	0.2270	0.1945	0.2311	0.1927
W42	0.2301	0.1811	0.2260	0.1828	0.2311	0.1927	0.2351	0.1909
W51	0.2230	0.1963	0.2189	0.1981	0.2240	0.2084	0.2280	0.2065
W52	0.2270	0.1945	0.2230	0.1963	0.2280	0.2065	0.2320	0.2046
W61	0.2311	0.1927	0.2270	0.1945	0.2320	0.2046	0.2360	0.2027
W62	0.2351	0.1909	0.2311	0.1927	0.2360	0.2027	0.2400	0.2008
W71	0.2280	0.2065	0.2240	0.2084	0.2291	0.2187	0.2332	0.2167
W72	0.2320	0.2046	0.2280	0.2065	0.2332	0.2167	0.2372	0.2146
W81	0.2360	0.2027	0.2320	0.2046	0.2372	0.2146	0.2411	0.2126
W82	0.2400	0.2008	0.2360	0.2027	0.2411	0.2126	0.2449	0.2106
Z11	0.2204	0.1615	0.2252	0.1712	0.2293	0.1696	0.2245	0.1599
Z12	0.2286	0.1584	0.2204	0.1615	0.2293	0.1696	0.2335	0.1680
Z21	0.2328	0.1568	0.2286	0.1584	0.2335	0.1680	0.2376	0.1664
Z22	0.2370	0.1551	0.2328	0.1568	0.2376	0.1664	0.2418	0.1648
Z31	0.2197	0.1504	0.2156	0.1519	0.2204	0.1615	0.2245	0.1599
Z32	0.2238	0.1438	0.2197	0.1504	0.2245	0.1599	0.2286	0.1584
Z41	0.2280	0.1473	0.2238	0.1438	0.2286	0.1584	0.2328	0.1568
Z42	0.2324	0.1456	0.2280	0.1473	0.2328	0.1568	0.2370	0.1551
T11	0.2293	0.1696	0.2252	0.1712	0.2301	0.1811	0.2342	0.1794
T12	0.2335	0.1680	0.2293	0.1696	0.2342	0.1794	0.2383	0.1778
T21	0.2376	0.1664	0.2335	0.1680	0.2383	0.1778	0.2424	0.1761
T22	0.2418	0.1648	0.2376	0.1664	0.2424	0.1761	0.2465	0.1745
T31	0.2342	0.1794	0.2301	0.1811	0.2351	0.1909	0.2391	0.1891
T32	0.2383	0.1778	0.2342	0.1794	0.2391	0.1891	0.2432	0.1873
T41	0.2424	0.1761	0.2383	0.1778	0.2432	0.1873	0.2472	0.1855
T42	0.2465	0.1745	0.2424	0.1761	0.2472	0.1855	0.2513	0.1837
T51	0.2391	0.1891	0.2351	0.1909	0.2400	0.2008	0.2440	0.1989
T52	0.2432	0.1873	0.2391	0.1891	0.2440	0.1989	0.2480	0.1970
T61	0.2472	0.1855	0.2432	0.1873	0.2480	0.1970	0.2519	0.1952
T62	0.2513	0.1837	0.2472	0.1855	0.2519	0.1952	0.2560	0.1932
T71	0.2440	0.1989	0.2400	0.2008	0.2449	0.2106	0.2488	0.2086
T72	0.2480	0.1970	0.2440	0.1989	0.2488	0.2086	0.2529	0.2065
T81	0.2519	0.1952	0.2480	0.1970	0.2529	0.2065	0.2567	0.2045
T82	0.2560	0.1932	0.2519	0.1952	0.2567	0.2045	0.2606	0.2025
Y11	0.2080	0.1662	0.2038	0.1678	0.2086	0.1775	0.2128	0.1760
Y12	0.2121	0.1647	0.2080	0.1662	0.2128	0.1760	0.2169	0.1744
Y21	0.2162	0.1631	0.2121	0.1647	0.2169	0.1744	0.2211	0.1728
Y22	0.2204	0.1615	0.2162	0.1631	0.2211	0.1728	0.2252	0.1712
Y31	0.2032	0.1565	0.1990	0.1581	0.2038	0.1678	0.2080	0.1662
Y32	0.2073	0.1550	0.2032	0.1565	0.2080	0.1662	0.2121	0.1647
Y41	0.2114	0.1535	0.2073	0.1550	0.2121	0.1647	0.2162	0.1631
Y42	0.2156	0.1519	0.2114	0.1535	0.2162	0.1631	0.2204	0.1615

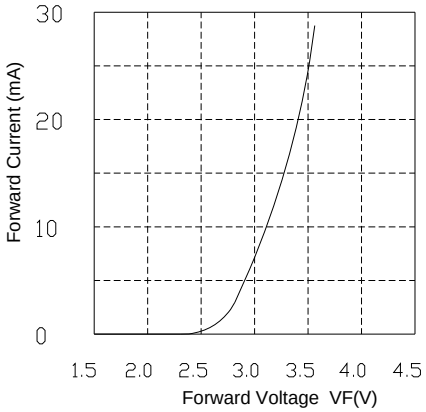
Typical optical characteristics curves

Spectral Distribution

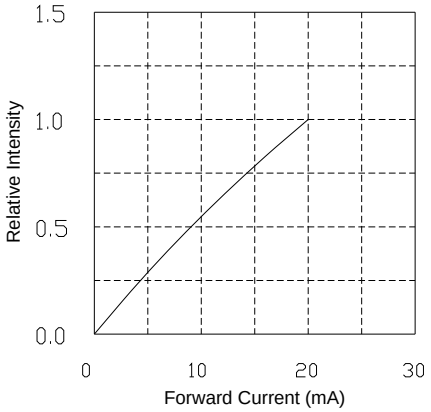
Relative Intensity vs. Wavelength (Ta=25°C)



Forward Current vs. Forward Voltage (Ta=25°C)

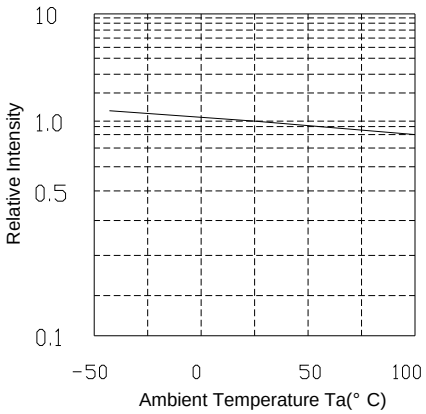


Relative Intensity vs. Forward Current (Ta=25°C)

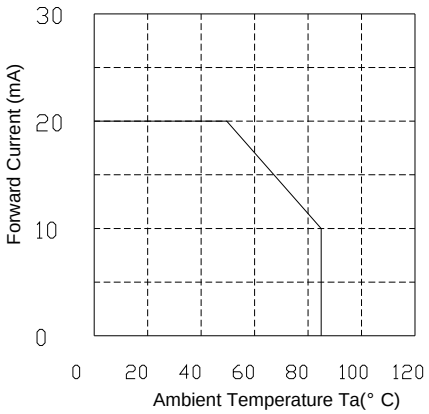


Derating

Relative Intensity vs. Ambient Temperature



Maximum Forward Current vs Ambient Temperature



Forward Current vs. Chromaticity (Ta=25°C)

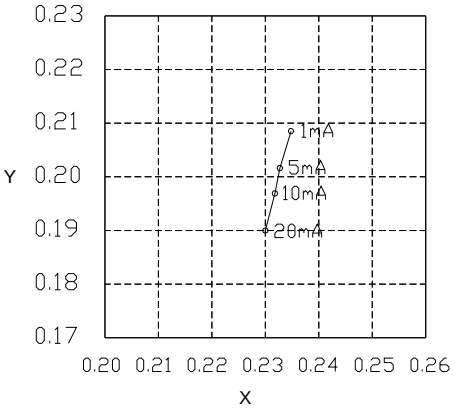
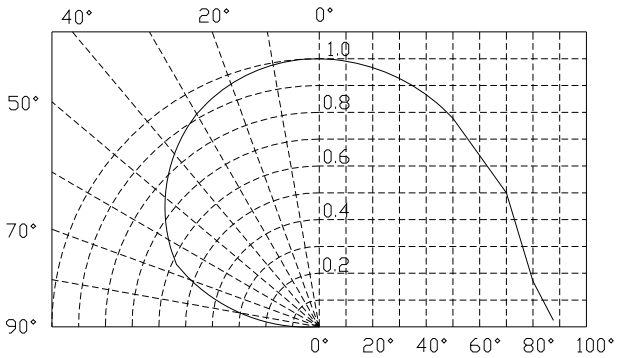


Diagram characteristics of radiation



Reflow profile

■ Soldering condition

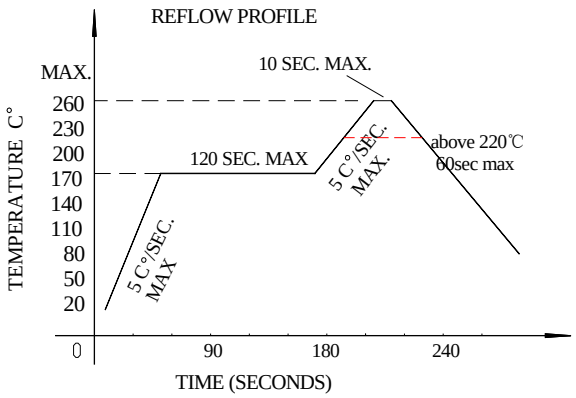
• Recommended soldering conditions

Reflow Soldering		Hand Soldering	
Pre-heat	160～180℃	Temperature	300℃ Max.
Pre-heat time	120 seconds Max.		
Peak temperature	260℃ Max.	Soldering time	3 second Max.
Soldering time	10 seconds Max.		(one time only)
Condition	Refer to Temperature-profile		

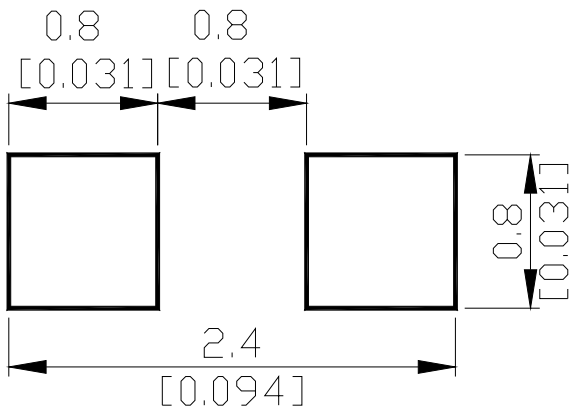
• After reflow soldering rapid cooling should be avoided

■ Temperature-profile (Surface of circuit board)

Use the following conditions shown in the figure.



RECOMMEND PAD DESIGN (Units: mm)



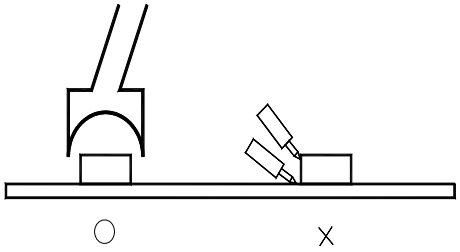
1. Reflow soldering should not be done more than two times
2. When soldering ,do not put stress on the LEDs during heating

■ Soldering iron

1. When hand soldering, keep the temperature of the iron under 300℃, and at that temperature keep the time under 3 sec.
2. The hand soldering should be done only a time
3. The basic spec is ≤5 sec. when the temperature of 260℃, do not contact the resin when hand soldering

■ Rework

1. Customer must finish rework within 5 sec under 260℃
2. The head of iron can not touch the resin
3. Twin-head type is preferred.



Reliability

(1)TEST ITEMS AND RESULTS

Type	Test Item	Ref. Standard	Test Conditions	Note	Number of Damaged
Environmental Sequence	Resistance to Soldering Heat(Reflow Soldering)	JESD22-B106	Tsld=260℃,10sec	2 times	0/22
	Temperature Cycle	JESD22-A104	-40℃ 30min 25℃↑↓5min 100℃ 30min	300 cycle	0/22
	Thermal Shock	JESD22-A106	-35℃ 15min ↑↓ 85℃ 15min	300 cycle	0/22
	High Temperature Storage	JESD22-A103	T_a=100℃	1000 hrs	0/22
	Low Temperature Storage	JESD22-A119	T_a=-40℃	1000 hrs	0/22
Operation Sequence	Life Test	JESD22-A108	T_a=25℃ I_F=20mA	1000 hrs	0/22

(2)CRITERIA FOR JUDGING THE DAMAGE

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	VF	IF=20mA	_	U.S.L*)×1.1
Reverse Current	IR	VR=5V	_	U.S.L*)×2.0
Luminous Intensity	IV	IF=20mA	L.S.L**)×0.5	_

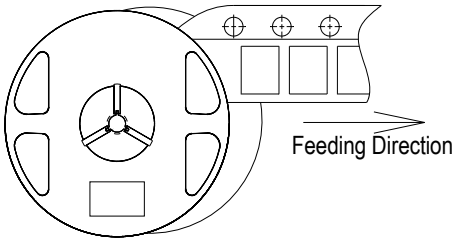
U.S.L.: Upper Standard Level **L.S.L.: Lower Standard Level**

NOTES:

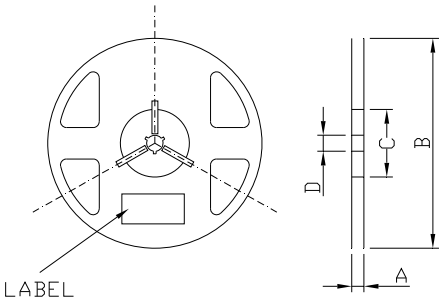
1. Any reliability test standard change is confidential.

Packaging Specifications

● Feeding Direction

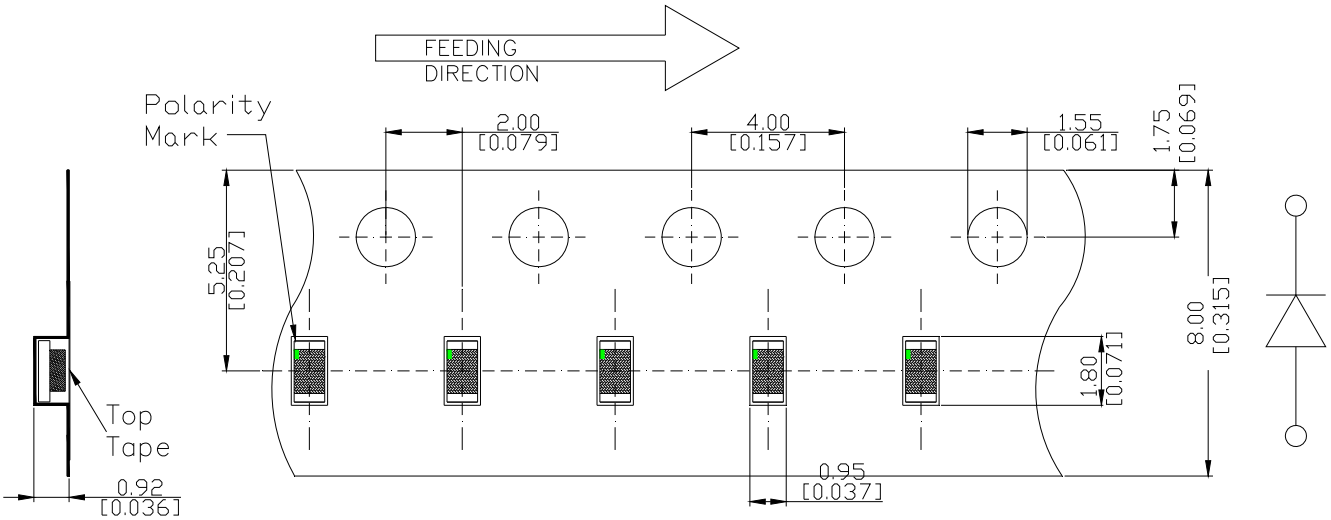


● Dimensions of Reel (Unit: mm)

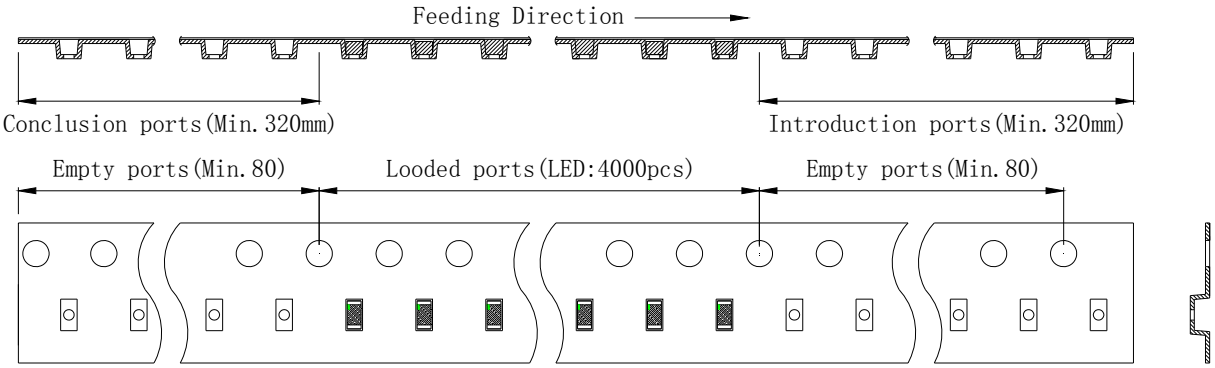


A	8.0±0.1mm
B	178±1mm
C	60±1mm
D	13.0±0.5mm

● Dimensions of Tape (Unit: mm)



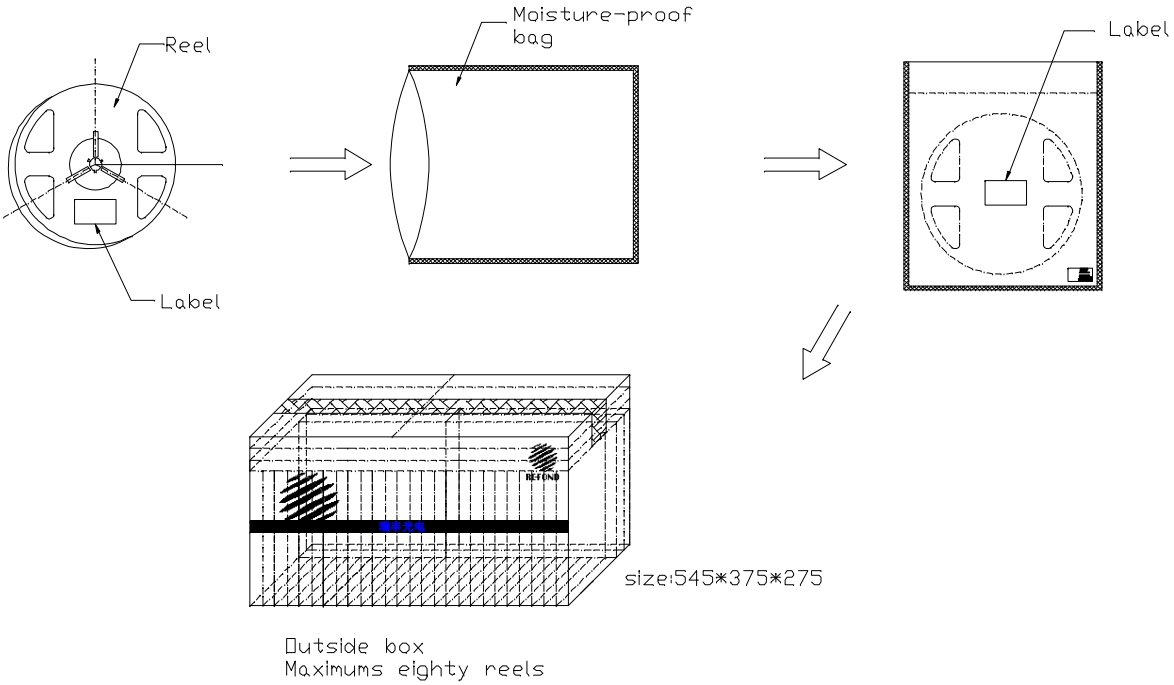
● Arrangement of Tape



NOTES

1. Empty component pockets are sealed with top cover tape;
2. The maximum number of missing lamps is two;
3. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications.
4. 4,000 pcs/ Reel.

Packaging specifications



■ Label

PART NO:
SPEC NO:
LOT NO:
BIN CODE:
IV:
VF:
X/Y:
QTY: PCS
DATE:

CAUTIONS

Package specifications

Reeled products (numbers of products are 4,000pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, Eighty moisture-proof bag of maximums are put the outside box (size: about 545mm x about 375mm x about 275mm) Together with buffer material, and it is packed. (Pare No., Lot No., quantity should appear on the label on the moisture-proof bag, part No. And quantity should appear on the label on the cardboard box.) The number of the loading steps of outside box (cardboard box) has two steps.

Storage conditions

Before opening the package:

The LEDs should be kept at 30℃ or less and 70%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material is recommended.

After opening the package:

The LEDs should be kept at 30℃ or less and 50%RH or less. The LEDs should be soldered within 168 hours (7days) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material. It is also recommended to return the LEDs to the original moisture proof bag and to reseal the moisture proof bag again.