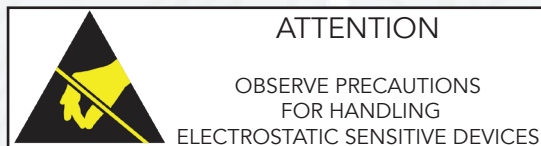


CHIP LED - 0603 - WHITE

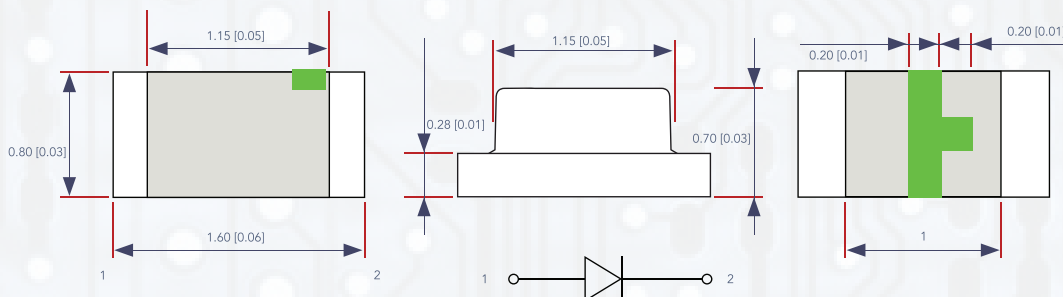
- CC - WUB0603DS - DD -

FEATURES

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



PACKAGE OUTLINE



NOTE: All dimensions are in millimeters (Inches)
Tolerances are $\pm 0.1\text{mm}$ (0.004 inch) unless otherwise noted

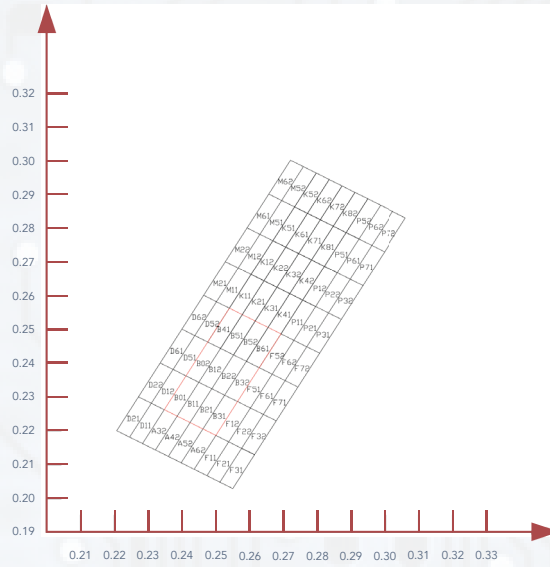
ABSOLUTE MAXIMUM RATINGS AT $T_a - 25^\circ\text{C}$

PARAMETER	SYMBOL	VALUE	UNIT
Forward Current	I_f	20	mA
Reverse Voltage	V_r	5	V
Operating Temperature Range	T_{op}	-20 ~ +85	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-35 ~ +85	$^\circ\text{C}$
Peak Pulsing Current	I_{fp}	100	mA
Electrostatic Discharge	ESD	1000(HBM)	V

ELECTRO-OPTICAL CHARACTERISTICS AT $T_a - 25^\circ\text{C}$

PARAMETER	TEST CONDITION	SYMBOL	VALUE			UNIT
			MIN	TYPE	MAX	
Forward Voltage	$I_f - 20\text{mA}$	V_f	2.6	-	2.7	V
			2.7	-	2.8	V
			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
			3.5	-	3.6	V
Luminous Intensity	$I_f - 20\text{mA}$	I_v	350	-	400	mcd
			400	-	450	mcd
			450	-	500	mcd
			500	-	550	mcd
			550	-	600	mcd
			600	-	650	mcd
			650	-	700	mcd
			700	-	750	mcd
			750	-	800	mcd
			800	-	850	mcd
Viewing Angle at 50% I_v	$I_f - 20\text{mA}$	2 θ 1/2	-	140	-	Deg
			-	-	10	μA
Reverse Current	$V_r - 5\text{V}$	I_r	-	-	10	μA

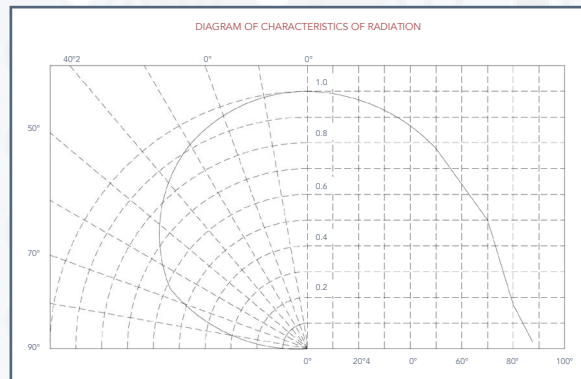
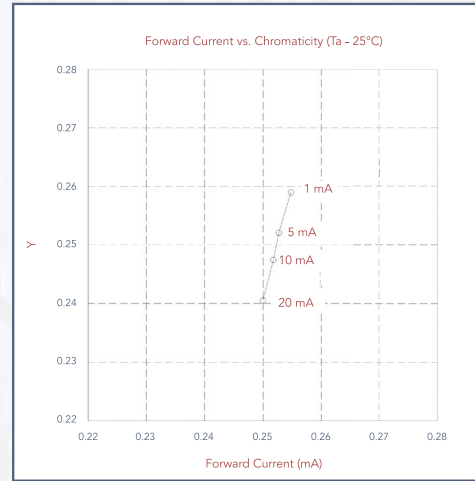
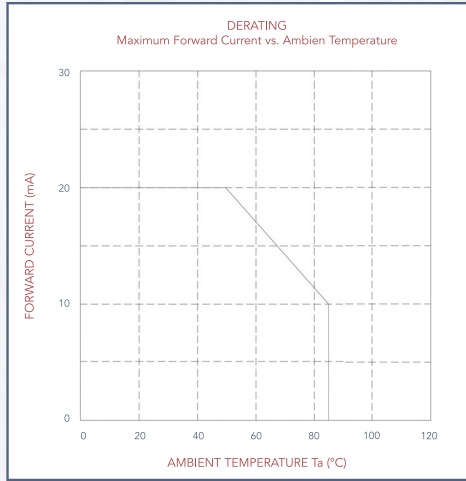
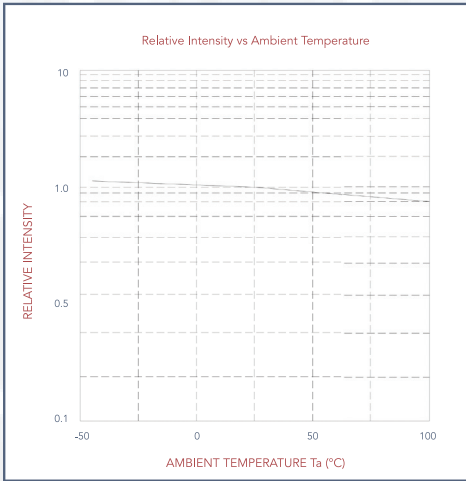
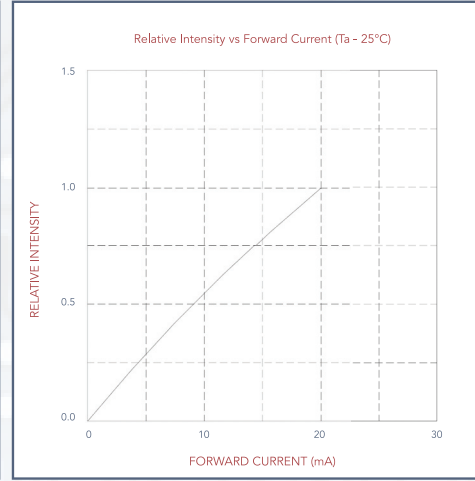
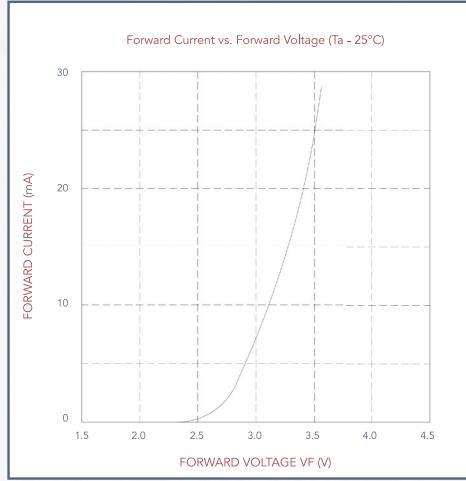
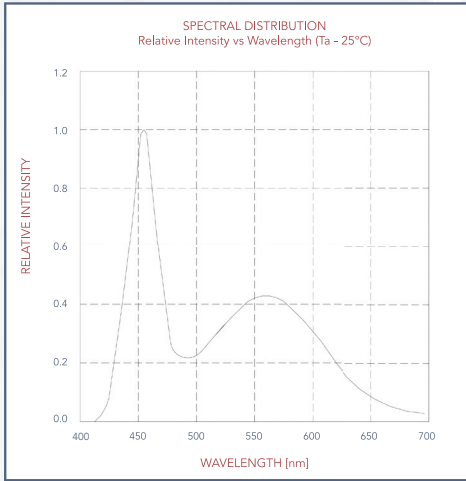
CHROMATICITY BIN



BIN CODE	CIE-X1	CIE-Y1	CIE-X2	CIE-Y2	CIE-X3	CIE-Y3	CIE-X4	CIE-Y4
B01	0.2385	0.2244	0.2347	0.2263	0.2411	0.2363	0.2449	0.2344
B11	0.2423	0.2225	0.2385	0.2244	0.2449	0.2344	0.2487	0.2325
B21	0.2461	0.2206	0.2423	0.2225	0.2487	0.2325	0.2525	0.2306
B31	0.2499	0.2187	0.2461	0.2206	0.2525	0.2306	0.2563	0.2287
B02	0.2449	0.2344	0.2411	0.2363	0.2475	0.2463	0.2513	0.2444
B12	0.2487	0.2325	0.2449	0.2344	0.2513	0.2444	0.2551	0.2425
B22	0.2525	0.2306	0.2487	0.2325	0.2551	0.2425	0.2589	0.2406
B32	0.2563	0.2287	0.2525	0.2306	0.2589	0.2406	0.2627	0.2387
B41	0.2513	0.2444	0.2475	0.2463	0.2539	0.2563	0.2577	0.2544
B51	0.2551	0.2425	0.2513	0.2444	0.2577	0.2544	0.2615	0.2525
B52	0.2589	0.2406	0.2551	0.2425	0.2615	0.2525	0.2653	0.2506
B61	0.2627	0.2387	0.2589	0.2406	0.2653	0.2506	0.2691	0.2487



TYPICAL OPTICAL CHARACTERISTICS CURVES



REFLOW PROFILE

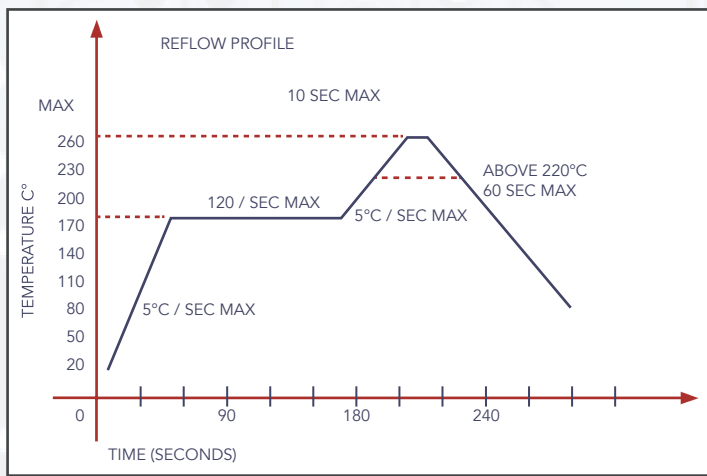
- Soldering Condition

Recommended Soldering
After reflow soldering rapid cooling should be avoided

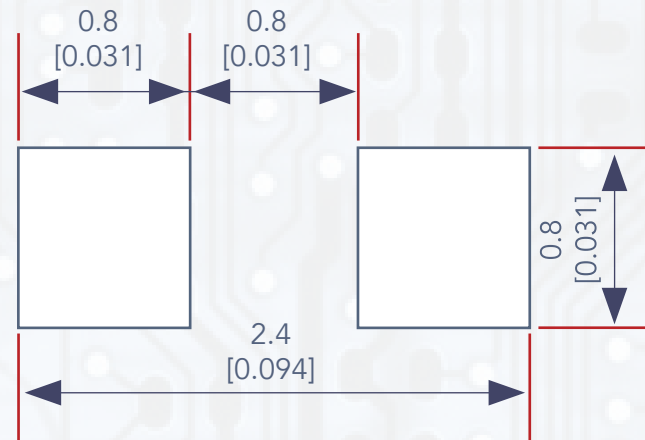
REFLOW SOLDERING		HAND SOLDERING	
Pre-Heat	160 °C ~ 180°C	Temperature	300°C Max
Pre-Heat Time	120 Seconds Max.	Soldering Time	3 Second Max - One Time Only
Peak Temperature	260°C Max		
Soldering Time	10 Seconds Max		
Condition	Refer to Temperature		

- Temperature - profile (surface of circuit board)

Use the following Conditions Shown in Figure



- Recommend Pad Design (Units: mm)



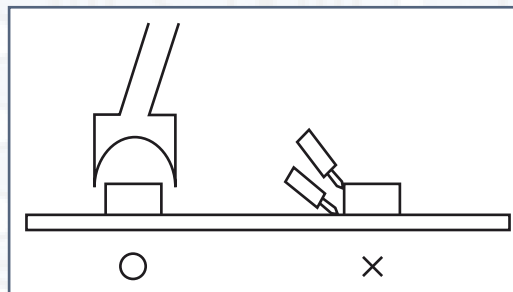
Reflow soldering should not be done more than two times
When soldering, do not put stress on the LEDs during heating

- Soldering Iron

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

- Rework

Customer must finish rework within 5 sec under 260°C
The head of iron can not touch the resin
Twin-head type is preferred



RELIABILITY

- 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	T _{sld} - 260°C, 10 sec	2 times	0/22
	Temperature Cycle	JESD22 - A104	-40°C 30 min 25°C ↑↓ 5min 100°C 30 min	300 cycle	0/22
	Thermal Shock	JESD22 - A106	-35°C 15min ↑↓ 85°C 15 min	300 cycle	0/22
	High Temperature Storage	JESD22 - A103	T _a - 100°C	1000 hrs	0/22
	Low Temperature Storage	JESD22 - A119	T _a - 40°C	1000 hrs	0/22
Operation Sequence	Life Test	JESD22 - A108	T _a - 25°C I _f - 20mA	1000 hrs	0/22

- CRITERIA FOR JUDGING THE DAMAGE

ITEM	SYMBOL	TEST CONDITIONS	CRITERIA FOR JUDGEMENT	
			MIN.	MAX.
Forward Voltage	VF	IF - 20mA	-	U.S.L*) x 1.1
Reverse Current	IR	VR - 5V	-	U.S.L*) x 2.0
Luminous Intensity	IV	IF - 20mA	L.S.L**) x 0.5	-

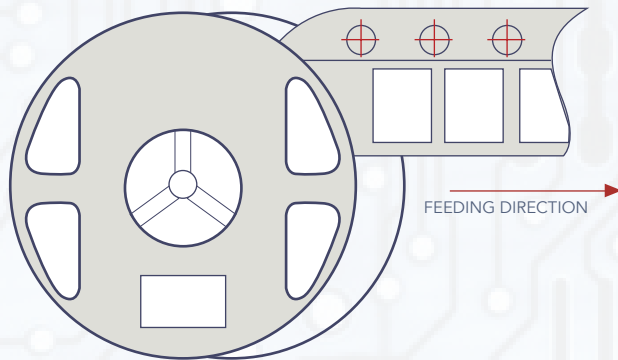
- U.S.L.: Upper Standard Level

- L.S.L.: Lower Standard Level

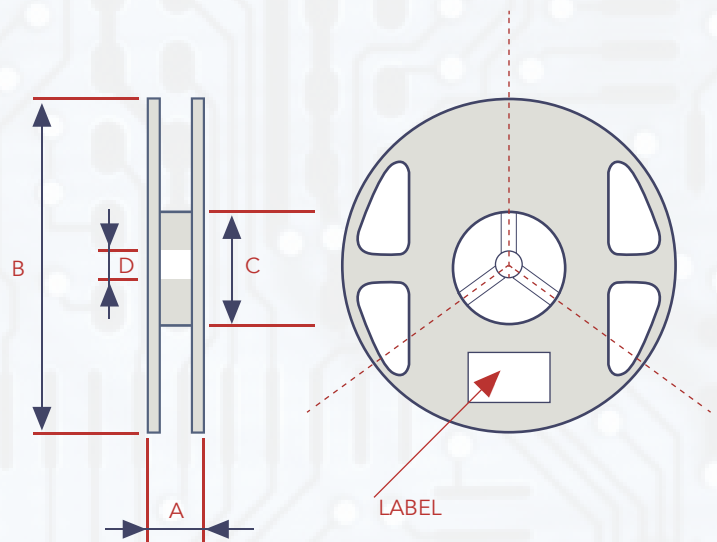
NOTE: Any reliability test standard change is confidential

PACKAGING SPECIFICATIONS

- Feeding Direction



- Dimensions of Reel (Unit: mm)

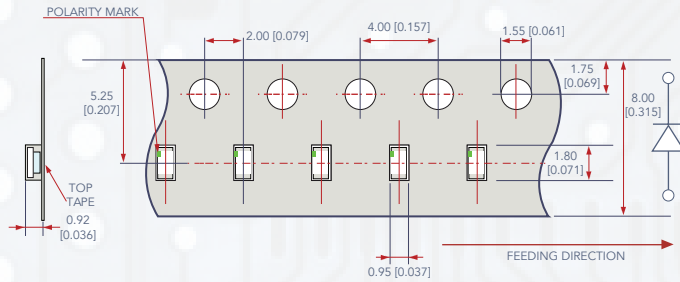


A	8.0 ± 0.1mm
B	178 ± 1mm
C	60 ± 1mm
D	13.0 ± 0.5mm

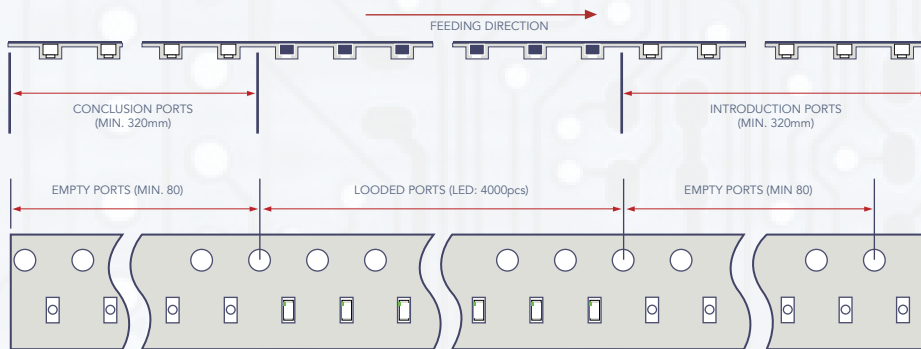


PACKAGING SPECIFICATIONS

- Dimensions of Tape (Unit: mm)

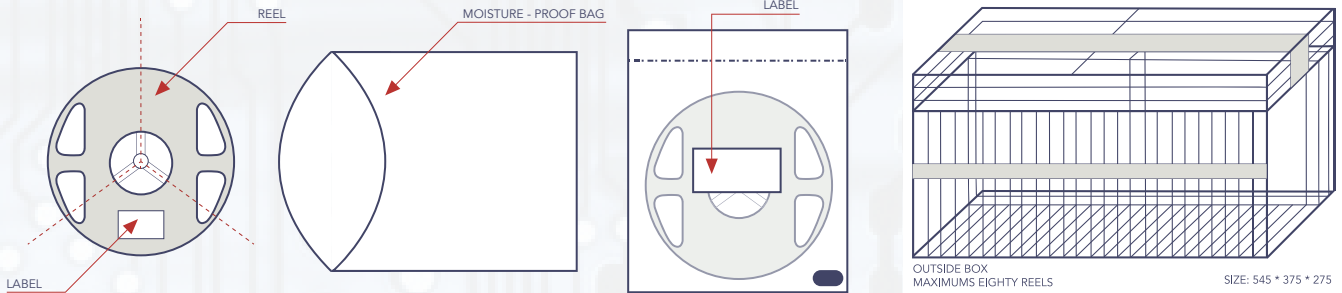


- Arrangement of Tape



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

PACKAGING SPECIFICATIONS



- Label

- Cautions

- Packaging Specification

- Reel products (numbers of products are 4,000 pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, Eighty moisture-proof bag of maximum are put the outside box (size: about 545mm x about 375mm x about 275mm) Together with buffer material, and it is packed. (Part No., quantity should appear on the label on the moisture-proof bag, part No. And wuatitiy 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 Packaging** - The LEDs should be kept at 30°C or less and 70% RH or less. The LEDs should be used within a hyear. When storing the LEDs, moisture proof packaging with absorbant material is recommended.

- **After Opening the Packge** - The LEDs should be kept at 30°C or less and 50% RH or less. THE LEDs should be soldered withing 168 hours (7 days) 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.

