

# Product Datasheet

Model | AS-3528WxA2-C4HC2-A-X-YP

## Product Characteristics:

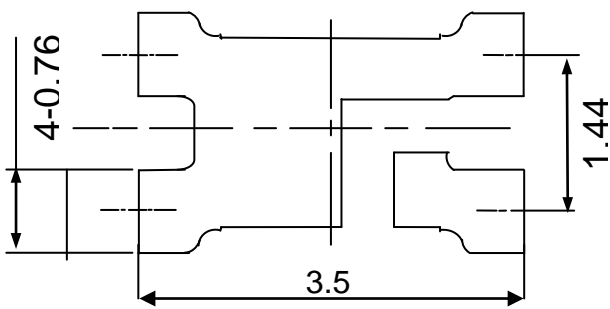
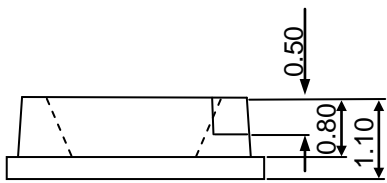
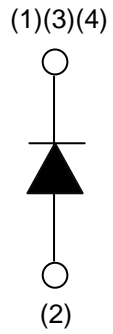
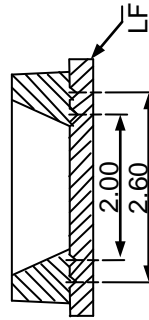
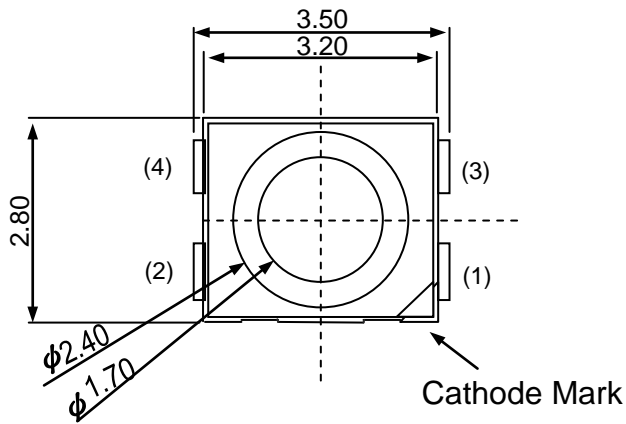
Absolute Maximum Ratings (Ta = 25 °C)

Items	Symbol	Absolute Maximum Rating	Unit
Power Dissipation	P <sub>D</sub>	0.54	W
Forward Current(DC)	I <sub>F</sub>	150	mA
Peak Forward Current*	I <sub>FP</sub>	300	mA
Thermal Resistance	R <sub>th</sub>	20	°C/W
Operation Temperature	T <sub>opr</sub>	-40 ~ + 100	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ + 100	°C
Reflow Soldering Temperature	T <sub>sol</sub>	260°C for 5 seconds	°C

\*Pulse width 0.1msec duty 1/10

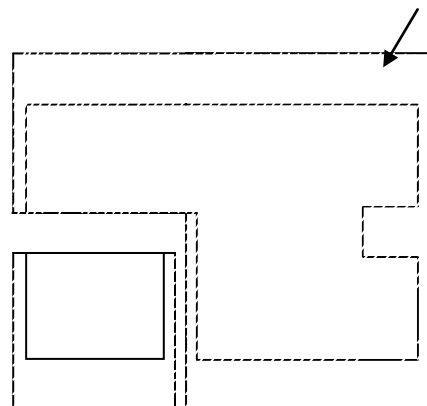
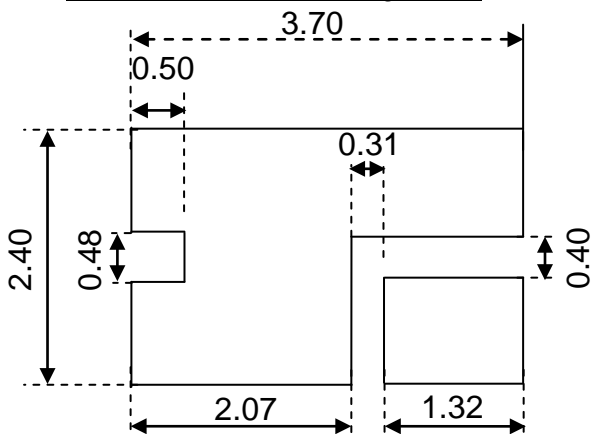
ATTENTION  
OBSERVE PRECAUTION  
ELECTROSTATIC  
SENSITIVE DEVICES

Package Dimensions :



Item	Material
Encapsulation	Silicone
Housing	White plastic
Lead Frame	Silver Plated Copper Alloy

Recommended Soldering Pad



Surface color / Diffused: White / YES

Notes:

All dimensions are in mm with tolerance  $\pm 0.25\text{mm}$  unless otherwise noted.

Typical Electrical & Optical Characteristics ( Ta = 25 °C):

Items	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	Cool White	$I_F = 120\text{mA}$	2.8	---	3.6	V
	Warm White		2.8	---	3.6	
Reverse Current	Cool White	$V_R = 5\text{V}$	---	---	10	$\mu\text{A}$
	Warm White		---	---	10	
Chromatic Coordinates	Cool White	(x, y)	$I_F = 120\text{mA}$	---	(0.33, 0.32)	---
	Warm White			---	(0.46, 0.38)	---
50% Power Angle	<del>20</del> $\frac{1}{2}$	$I_F = 120\text{mA}$	---	120	---	Deg

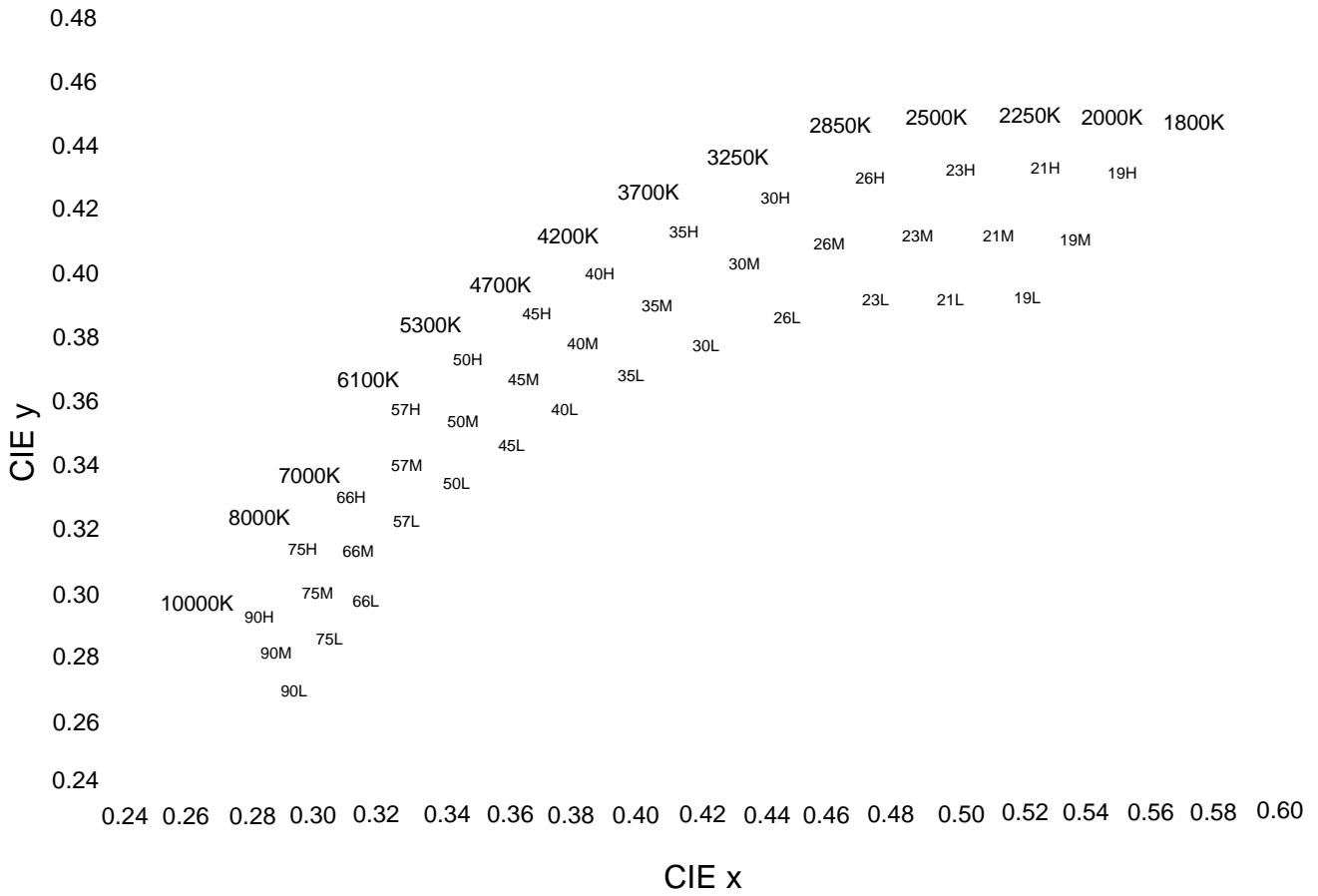
Intensity Ranks (  $I_F = 120\text{mA}$  )

Rank	B34	B36	B38	B40	B42	B44	B46	B48	B50	B52	B54
Radiant Intensity (lm)	32-34	34-36	36-38	38-40	40-42	42-44	44-46	46-48	48-50	50-52	52-54

Vf Ranks (  $I_F = 120\text{mA}$  )

Rank	P1	Q1	R1	S1	T1	U1	V1	W1
Forward Voltage (V)	2.8-2.9	2.9-3.0	3.0-3.1	3.1-3.2	3.2-3.3	3.3-3.4	3.4-3.5	3.5-3.6

CIE Chromaticity Diagram :



Notes:

1. Tolerance of measurement of luminous intensity : ±15%
2. Tolerance of measurement of Chromatic Coordinates : ±0.01
3. Tolerance of measurement of forward voltage : ±0.1V
4. Tolerance of measurement of CRI : ±2
5. All ranks will be included per normal delivery and rank rations will be determined by Alder.
6. Please confirm with us if your request is different from standard specification.

Cool White CIE Chromaticity Diagram :

Cool White Chromatic Coordinates Ranks

10000K-8000K		
Bin Code	x	y
90H	0.2785	0.2821
	0.2740	0.2910
	0.2911	0.3091
	0.2943	0.2985
90M	0.2854	0.2688
	0.2785	0.2821
	0.2943	0.2982
	0.2990	0.2823
90L	0.2900	0.2600
	0.2854	0.2688
	0.2990	0.2823
	0.3020	0.2710

8000K-7000K		
Bin Code	x	y
75H	0.2932	0.3021
	0.2900	0.3130
	0.3020	0.3285
	0.3044	0.3162
75M	0.2980	0.2857
	0.2932	0.3021
	0.3044	0.3162
	0.3080	0.2977
75L	0.3013	0.2749
	0.2980	0.2857
	0.3080	0.2977
	0.3106	0.2855

7000K-6100K		
Bin Code	x	y
66H	0.3044	0.3162
	0.3020	0.3285
	0.3191	0.3453
	0.3202	0.3317
66M	0.3080	0.2977
	0.3044	0.3162
	0.3200	0.3318
	0.3218	0.3116
66L	0.3106	0.2855
	0.3080	0.2977
	0.3216	0.3116
	0.3229	0.2982

6100K-5300K		
Bin Code	x	y
57H	0.3194	0.3418
	0.3184	0.3553
	0.3382	0.3732
	0.3374	0.3584
57M	0.3210	0.3216
	0.3194	0.3418
	0.3374	0.3584
	0.3369	0.3363
57L	0.3221	0.3082
	0.3210	0.3216
	0.3369	0.3363
	0.3361	0.3216

5300K-4700K		
Bin Code	x	y
50H	0.3374	0.3584
	0.3382	0.3732
	0.3602	0.3893
	0.3577	0.3731
50M	0.3369	0.3363
	0.3374	0.3584
	0.3577	0.3731
	0.3545	0.3490
50L	0.3361	0.3216
	0.3369	0.3363
	0.3545	0.3490
	0.3521	0.3330

Neutral White CIE Chromaticity Diagram :

Neutral White Chromatic Coordinates Ranks

4700K-4200K		
Bin Code	x	y
45H	0.3577	0.3731
	0.3602	0.3893
	0.3807	0.4020
	0.3769	0.3852
45M	0.3545	0.3490
	0.3577	0.3731
	0.3769	0.3852
	0.3712	0.3602
45L	0.3521	0.3330
	0.3545	0.3490
	0.3712	0.3602
	0.3675	0.3435

4200K-3700K		
Bin Code	x	y
40H	0.3769	0.3852
	0.3807	0.4020
	0.4047	0.4159
	0.3990	0.3983
40M	0.3712	0.3602
	0.3769	0.3852
	0.3990	0.3983
	0.3906	0.3719
40L	0.3675	0.3435
	0.3712	0.3602
	0.3906	0.3719
	0.3850	0.3544

3700K-3250K		
Bin Code	x	y
35H	0.3990	0.3983
	0.4047	0.4159
	0.4330	0.4280
	0.4254	0.4101
35M	0.3906	0.3719
	0.3990	0.3983
	0.4254	0.4101
	0.4141	0.3833
35L	0.3850	0.3544
	0.3906	0.3719
	0.4141	0.3833
	0.4066	0.3655

Warm White CIE Chromaticity Diagram :

## Warm White Chromatic Coordinates Ranks

3250K-2850K		
Bin Code	x	y
30H	0.4254	0.4101
	0.4330	0.4280
	0.4626	0.4362
	0.4535	0.4187
30M	0.4141	0.3833
	0.4254	0.4101
	0.4535	0.4187
	0.4398	0.3924
30L	0.4066	0.3655
	0.4141	0.3833
	0.4398	0.3924
	0.4308	0.3750

2850K-2500K		
Bin Code	x	y
26H	0.4535	0.4187
	0.4626	0.4362
	0.4930	0.4405
	0.4826	0.4238
26M	0.4398	0.3924
	0.4535	0.4187
	0.4826	0.4238
	0.4670	0.3988
26L	0.4308	0.3750
	0.4398	0.3924
	0.4670	0.3988
	0.4567	0.3822

2500K-2250K		
Bin Code	x	y
23H	0.4826	0.4238
	0.4930	0.4405
	0.5210	0.4410
	0.5098	0.4248
23M	0.4670	0.3988
	0.4826	0.4238
	0.5098	0.4248
	0.4932	0.4005
23L	0.4567	0.3822
	0.4670	0.3988
	0.4932	0.4005
	0.4821	0.3844



2250K-2000K		
Bin Code	x	y
21H	0.5098	0.4248
	0.5210	0.4410
	0.5467	0.4400
	0.5352	0.4242
21M	0.4932	0.4005
	0.5098	0.4248
	0.5352	0.4242
	0.5172	0.4007
21L	0.4821	0.3844
	0.4932	0.4005
	0.5172	0.4007
	0.5056	0.3850

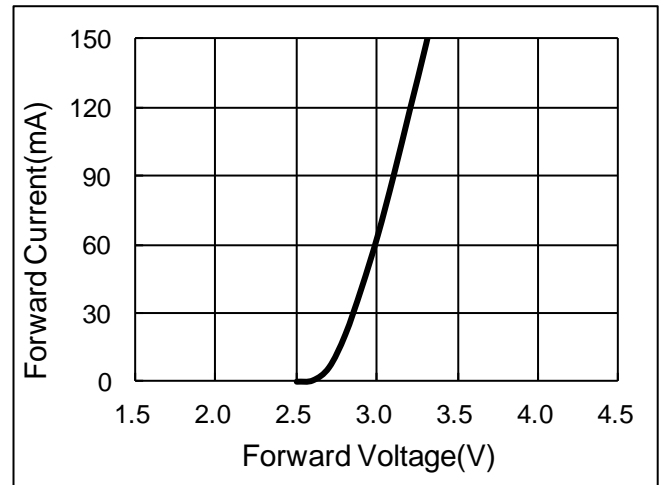
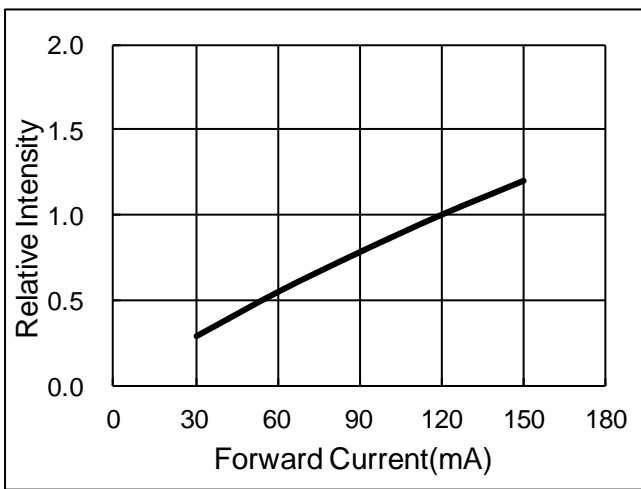
2000K-1800K		
Bin Code	x	y
19H	0.5352	0.4242
	0.5467	0.4400
	0.5707	0.4380
	0.5582	0.4225
19M	0.5172	0.4007
	0.5352	0.4242
	0.5582	0.4225
	0.5394	0.3994
19L	0.5056	0.3850
	0.5172	0.4007
	0.5394	0.3994
	0.5270	0.3840

**Typical Electrical / Optical Characteristics Curves :**

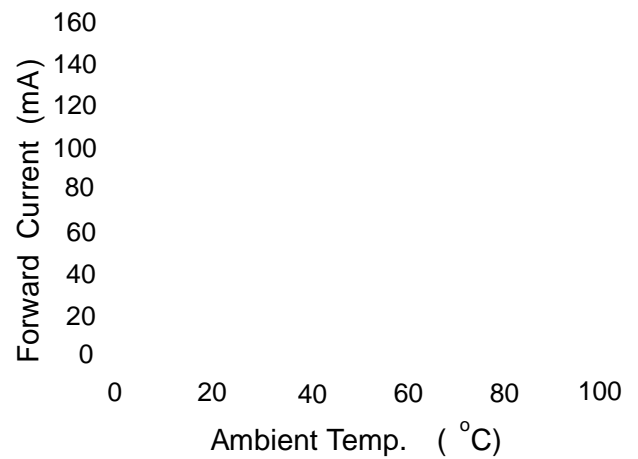
(Ta=25°C Unless Otherwise Noted)

Dominant Wavelength vs. Relative Intensity

Forward Current vs. Forward Voltage



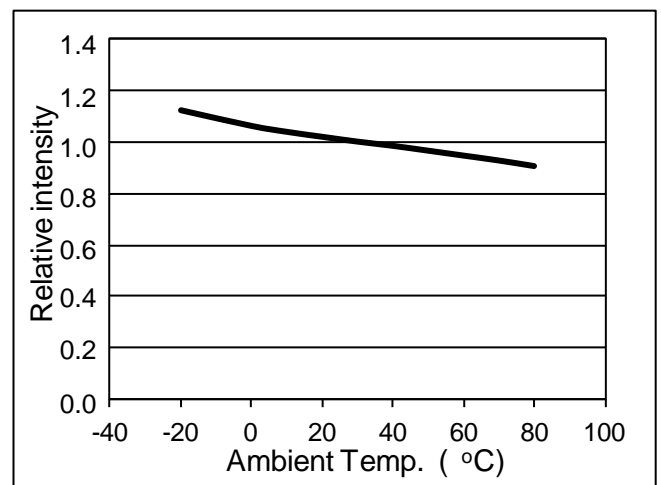
Forward Current vs. Temperature



Radiation Pattern

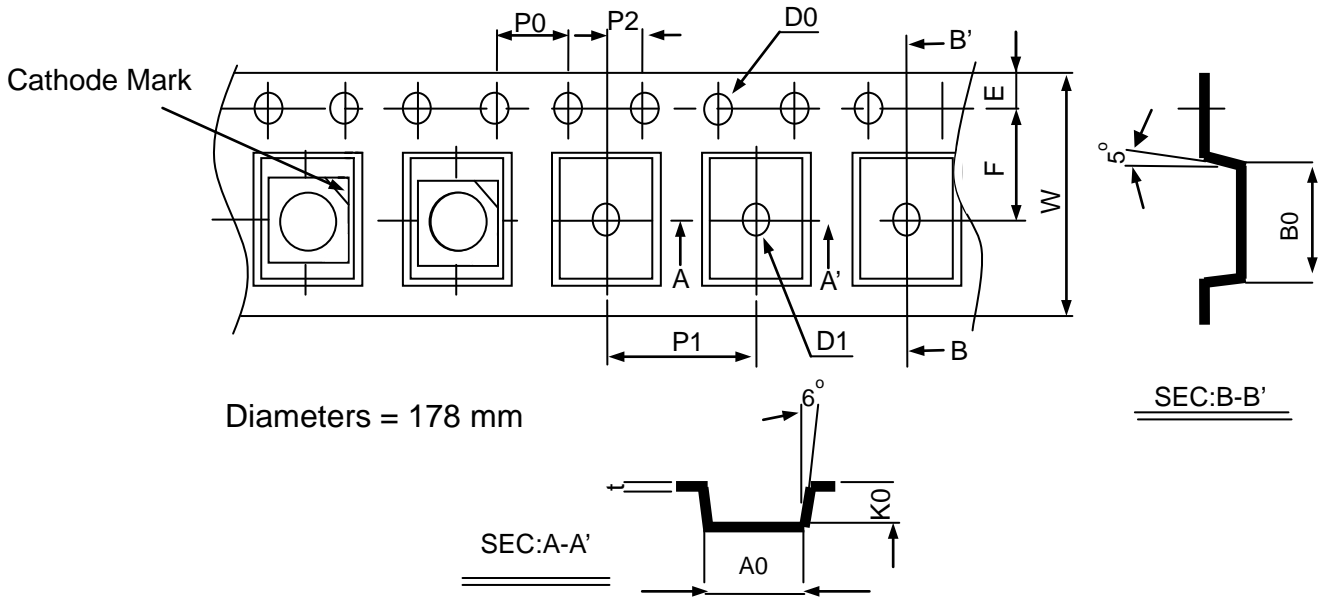
30°	20°	10°	0°
			1.0
40°			0.8
50°			0.6
60°			0.4
70°			0.2
80°			0
90°			0

Luminous Intensity vs. Ambient Temperature

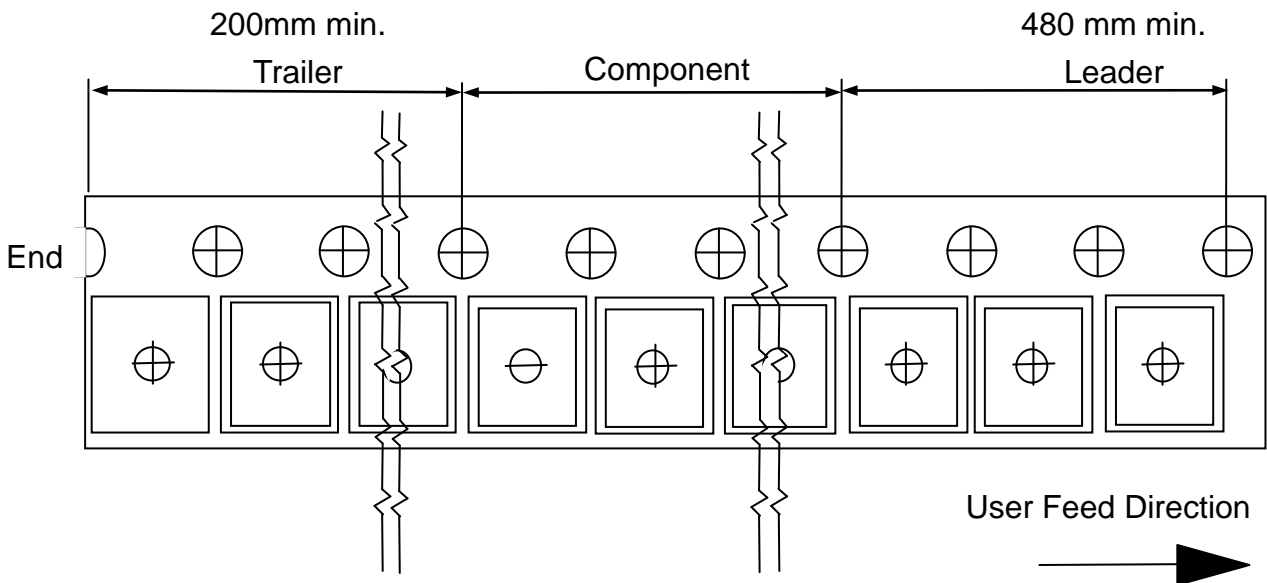


**Packing Specifications :**

**Taping And Orientation.**

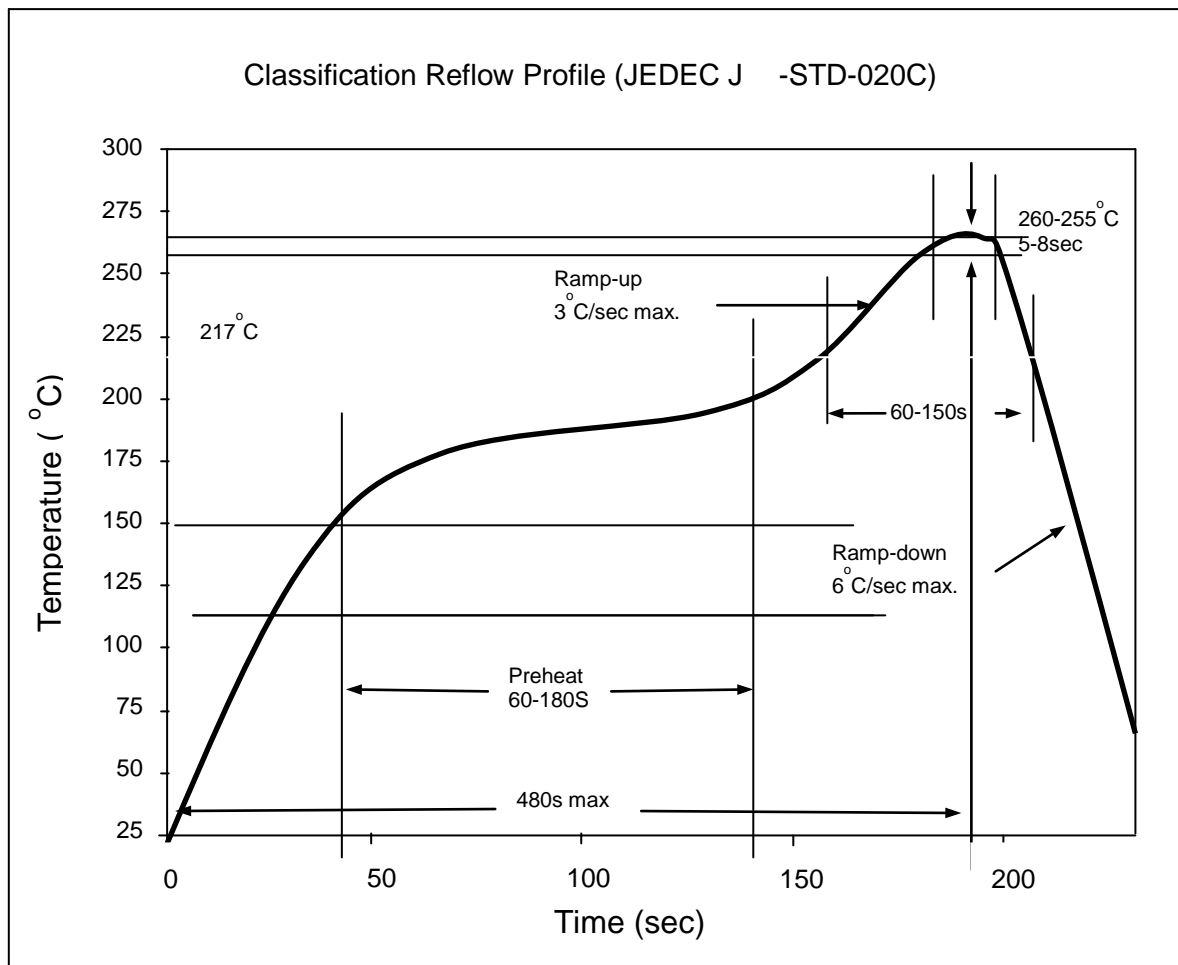


Item	Spec	Tol.( / )	Item	Spec	Tol.( / )
W	12.00	+0.30 -0.10	P2	2.00	±0.05
E	1.75	±0.10	P0 x 10	40.00	±0.10
F	5.50	±0.05	B0	3.80	±0.10
D0	1.50	+0.10	K0	1.60	±0.10
D1	1.50	+0.25	A0	3.10	±0.10
P0	4.00	±0.10	t	0.25	±0.02
Unit: mm					



## Soldering Heat Reliability :

Lead-Free Solder (JEDEC J-STD-020C)



### Manual Soldering.

#### - Lead Solder

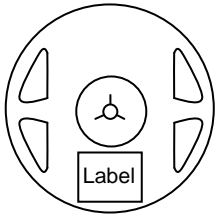
Max. 300°C for Max. 3sec, and only one time.

#### - Lead-free Solder

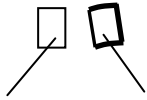
Max. 350°C for Max. 3sec, and only one time.

- There is a possibility that the brightness of LEDs is decreased, which is influenced by heat or ambient atmosphere during reflow. It is recommended to use the nitrogen reflow method.
- After LEDs have been soldered, repairs should not be done. When repair is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will be damaged by repairing or not.
- Reflow soldering should not be done more than two times.

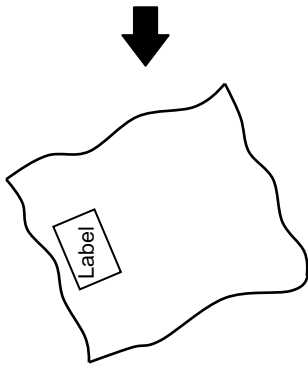
Product Shipment & Package Related:



Item	Diameter	Width	Quantity / Reel
Anti -Static Shielding Black Reel	178 mm	12mm	2000pcs MAX



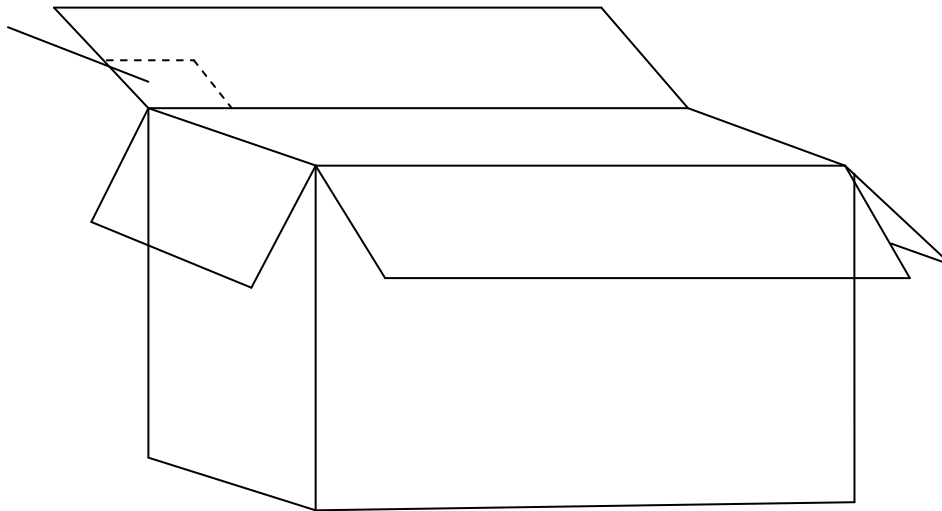
Moisture indicator      Desiccant



Item	Dimensions	Quantity / Bag
Anti -Static Shielding	250x210x0.15mm	1 Reel / 2000pcs MAX



Label



Item	Dimensions	Quantity / Box
Carton	420x240x230mm	20 Bags (Reels)

Notes:

1. Dimensions are in mm.
2. Normal packing quantity: 2,000pcs / Reel.

**Reliability :****Test Items And Results**

No.	Test Items	Standard Test Method	Test Conditions	Note	Ac/Re
1	Steady State Operating Life	Internal Ref.	$I_F = 120\text{mA}$	1000 Hr	0/1
2	Soldering Test	JESD22-B102-C	260°C max	2 Times	0/1
3	Reflow Test	JESD22-B102-C	260°C max	2 Times	0/1
4	Thermal Shock	JESD22-A106-A	-40°C ~ 100°C	100 Cycles	0/1
5	Temperature Cycle	JESD22-A104-A	-35°C ~ 75°C	168 Cycles	0/1
6	High Temperature Storage	JESD22-A103-A	100°C	1000 Hr	0/1
7	Low Temperature Storage	Internal Ref.	-40°C	1000 Hr	0/1
8	High Temperature High Humidity	JESD22-A101-B	85°C,85%RH	1000 Hr	0/1

**Notes š**

1. Measurement shall be taken after the tested samples have been returned to normal ambient conditions (generally after two hours) <sup>TM</sup>Sample Q'ty is 20 pcs.
2. The LED is made of silicone encapsulation which is soft and prone to mechanical damage. Care must be taken to avoid direct contact pressure to the silicone otherwise the die and bonding wires may subject to damage, or the reliability will be affected. Suitable pick and place nozzle should be used for SMT operation.
3. Appropriate material for coating over LED for any purpose, such as waterproof, must be tested by the customer. Incompatible material may result in color change, or even premature LED failure. Alder will not be held responsible for any such misuse.

**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 The LEDs MSL is level 5a.
  - 2.2 Before opening the package, the storage condition of temperature and R.H. are š 40°C, 90%R.H. Max.
  - 2.3 After bag is opened, devices that will be subjected to reflow solder or other high temperature process must(a) Mounted within:8 hours<30°C/60%RH or (b) Stored at <10%RH.
  - 2.4 If baking is required, devices may be baked for 48hrs at 65°C±5°C.

Notes: These data can only reflect statistical figures and don't necessarily correspond to the actual parameters of each single LED. Product specifications may be modified for improvement without notice.