

APPROVAL HEET

AOT MODEL NAME	0603S
AOT PART NUMBER	0603S-W304
CUSTOMER PART NUMBER	
CUSTOMER NAME	General
DATE	2021 / July.
VERSION	В

MAKER			CUST	OMER	
Prepared	Checked	Approved			
GB	Chris Huang	Sinfan Lo			

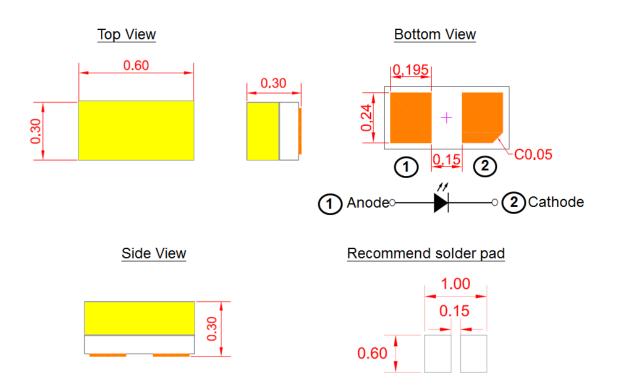
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Revision Note

Date	Revision	Page	Version
2020-08-07	Initiate Document	15	A
2021-07-06	Modify Reflow Soldering Modify To Modify Carrier Dimensions	4,11	В

Unit: mm



Item	Materials
Package	BT Substrate
Encapsulating Material	Epoxy Resin(with phosphor)
Electrode	Au Plating

- Single blue chip.
- High brightness SMD.
- Compact package outline (LxWxH) of 0.6 0mm x 0.30 mm x 0.30 mm.
- Compatible with reflow soldering.
- Complies with RoHS Directive.



ltem	Symbol	Condition	Value	Unit
Forward Voltage	V _F	I _F = 5mA	2.8~3.2	V
Luminous Intensity	I _V	I _F = 5mA	1.9~2.5	lm
Reverse Current	I _R	V _R =5V	≤2	μΑ

* Tolerance of measurements of the Forward Voltage is \pm 0.05 V.

* Tolerance of measurements of the Luminous Flux is \pm 5%.

* Tolerance of measurements of the Chromaticity Coordinate ± 0.005.

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Maximum Value	Unit
Forward Current	l _F	15	mA
Reverse Voltage.	V _R	5	V
LED Junction Temperature.	T _j	115	°C
Operating Temperature.	T _{opr}	-30 ~ +85	°C
Storage Temperature.	T _{Stg}	-40 ~ +85	°C
Power Dissipation	PD	48	mW
Soldering Temperature	T _{sld}	Reflow Soldering : 215°C for 10sec	

* Max condition is not guarantee for life time



Group Definition of Forward Voltage

Rank	Condition	VF(V)
V1		2.8~2.9
V2	Ta=25°C I _F =5mA	2.9~3.0
V3		3.0~3.1
V4		3.1~3.2

Group Definition of Brightness

Rank	Condition	Luminous Flux (Im)
T1		1.9~2.0
T2		2.0~2.1
Т3	Ta=25⁰C	2.1~2.2
T4	I _F =5mA	2.2~2.3
T5		2.3~2.4
T6		2.4~2.5

Group Definition of Wavelength

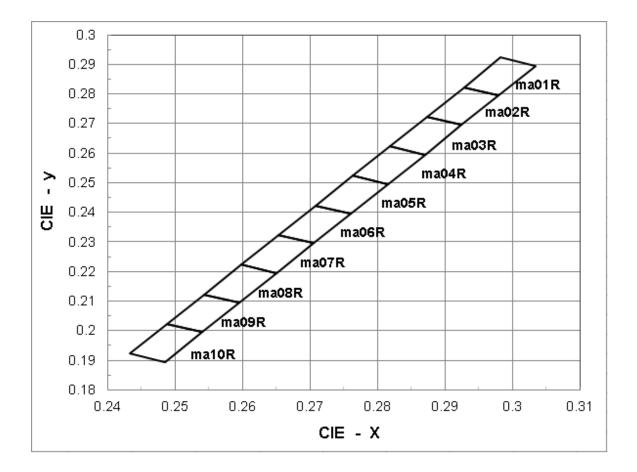
Rank	Condition	λ _D (nm)
W1		445~447.5
W2	Ta=25°C I _F =5mA	447.5~450
W3		450~452.5
W4		452.5~455

*A shipment shall consist of the LEDs of a combination of different ranks of luminous flux, wavelength and forward voltage. The percentage of each rank in the shipment shall be determined by AOT

*The ranking information of LEDs can be found on the reel label.



Group Definition of Chromaticity Coordinate (25°C)



Color Rank

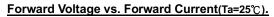
CIE	X1	Y1	X2	Y2	Х3	Y3	X4	Y4
ma01R	0.2928	0.2823	0.2983	0.2923	0.3035	0.2895	0.2980	0.2795
ma02R	0.2873	0.2723	0.2928	0.2823	0.2980	0.2795	0.2925	0.2695
ma03R	0.2818	0.2623	0.2873	0.2723	0.2925	0.2695	0.2870	0.2595
ma04R	0.2763	0.2523	0.2818	0.2623	0.2870	0.2595	0.2815	0.2495
ma05R	0.2708	0.2423	0.2763	0.2523	0.2815	0.2495	0.2760	0.2395
ma06R	0.2653	0.2323	0.2708	0.2423	0.2760	0.2395	0.2705	0.2295
ma07R	0.2598	0.2223	0.2653	0.2323	0.2705	0.2295	0.2650	0.2195
ma08R	0.2543	0.2123	0.2598	0.2223	0.2650	0.2195	0.2595	0.2095
ma09R	0.2488	0.2023	0.2543	0.2123	0.2595	0.2095	0.2540	0.1995
ma10R	0.2433	0.1923	0.2488	0.2023	0.2540	0.1995	0.2485	0.1895

Note:

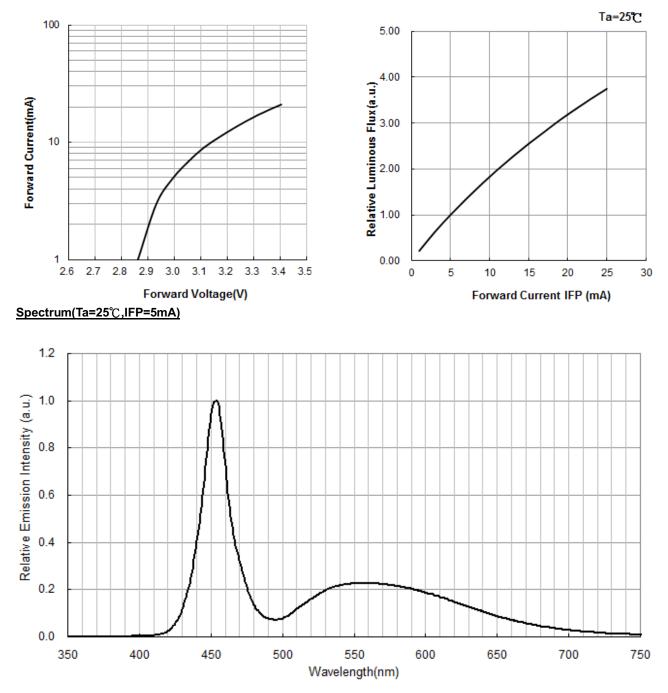
Chromaticity coordinate groups are measured with an accuracy of ±0.005



Optical and electrical characteristics

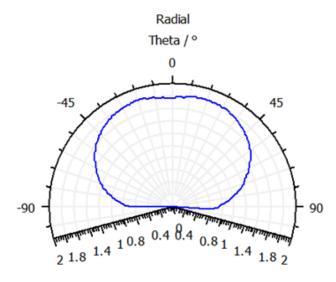


Forward Current vs. Relative Luminous Intensity(Ta=25°C)





Radiation Pattern(Ta=25°C,IFP=5mA)



Photometric / lx



Recommended Reflow Soldering Conditions

Surface Mounting Condition

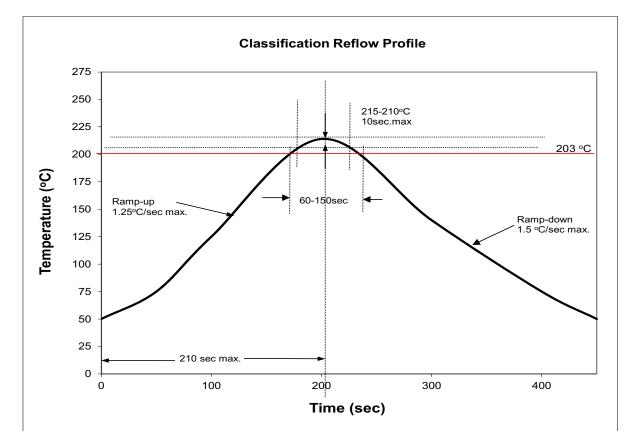
In automatic mounting of the SMD LEDs on printed circuit boards, any bending, expanding and pulling forces or shock against the SMD LEDs should be kept min. to prevent them from electrical failures and mechanical damages of the devices.

Soldering Reflow

-Soldering of the SMD LEDs should conform to the soldering condition in the individual specifications. -SMD LEDs are designed for Reflow Soldering.

-In the reflow soldering, too high temperature and too large temperature gradient such as rapid heating/cooling may cause electrical & optical failures and damages of the devices.

-AOT cannot guarantee the LEDs after they have been assembled using the solder dipping method.



(1) SMT Profile

(2) Manual Soldering Conditions

Use Low Temperature, 215°C for max. 3sec, and only one time



- There is 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, repair should not be done. As 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.

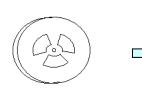


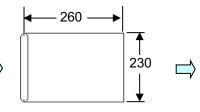
Quantity: 3500 Pcs/reel

Spec.	Tolerance(mm)	ltem	Spec.	Tolerance(mm)
8.00	±0.20	P1	2.00	±0.05
1.75	±0.10	P2	2.00	±0.05
3.50	±0.05	t	0.20	±0.02
1.50	±0.05	A0	0.38	±0.03
0.20	±0.10	B0	0.68	±0.03
4.00	±0.10	K0	0.41	±0.03
	8.00 1.75 3.50 1.50 0.20	8.00 ± 0.20 1.75 ± 0.10 3.50 ± 0.05 1.50 ± 0.05 0.20 ± 0.10	8.00 ±0.20 P1 1.75 ±0.10 P2 3.50 ±0.05 t 1.50 ±0.05 A0 0.20 ±0.10 B0	8.00 ± 0.20 P1 2.00 1.75 ± 0.10 P2 2.00 3.50 ± 0.05 t 0.20 1.50 ± 0.05 A0 0.38 0.20 ± 0.10 B0 0.68

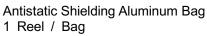
0603S-W304

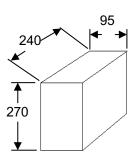




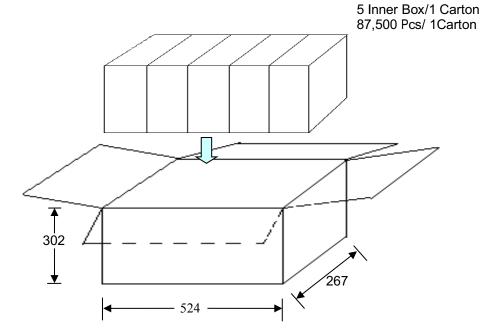


Diameter : 178 mm Width : 8 mm 3500 pcs/Reel Antistatic Black Reel

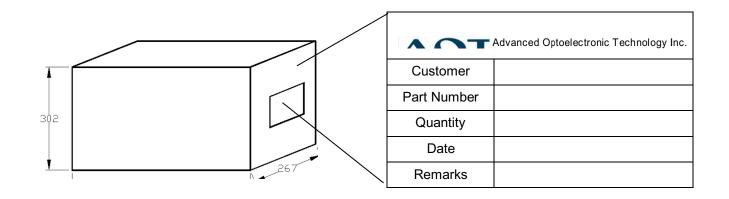




5 Bags / 1Inner Box 17,500 pcs/ 1 Inner Box



Package Outlook





SMD LED		
Model Name	e : 0603S-W304	
Brightness	: A	
CIE	: B	
Vf	: C	ES PASS PAGE
Quantity	: nn ea	(ROHS E)
Serial No	: SHyymmddxxx	STVI SSVI SSVA

- A : lv value noted, (T1~T6) B : CIE value noted, (ma01R~ma10R)
- C : Voltage value noted, (V1~V4)
- nn : Quantity of LED

SHyymmddxxx : yy : year, mm : month, dd : day, xxx : reel no

*Reel Label to fill in practice data of all LED characteristic



(1) Moisture Proof Package

The moisture proof package should be used to prevent moisture in the package as the moisture may Cause damage to optical characteristics of the LEDs.

The aluminum bag with zipper is used for moisture proof package. And, the moisture absorbent Material, Silica gel, is inserted into aluminum bag.

(2) Storage:

Storage Conditions

Before opening the package:

The LEDs should be kept at 30°C or less than 90%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:

After open the package, the LED should be kept at 30°C, 60%RH or less. The LED should be soldered within 168 hours (7 days) after opening the package. If unused LEDs remain, it should be stored in moisture proof condition.

(3) Heat Generation

Thermal design of the end products is of paramount importance. The heat generation must be taken into design consideration when using the LED. The coefficient of the temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components.

(4) Static Electricity

Static electricity or surge voltage damages the LEDs. All equipment and machinery must be properly grounded. It is recommended to use a wristband or anti-electrostatic glove when handing the LEDs. When inspecting the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. It is easy to find static-damaged LEDs by a light-on test or a Vf test at a lower current. (Below 1mA is recommended). Criteria: Vf >2.0V at If=0.01mA

(5) Cleaning

Use isopropyl alcohol as a solvent for cleaning the LEDs. The other solvent may dissolve the LEDs package and the epoxy.

Ultrasonic cleaning should not be done.

(6) Electrostatic Discharge (ESD)

The products are sensitive to static electricity or surge voltage, An ESD event may damage its die or reduce its reliability performance. When handling the products, measures against electro static discharge, including the followings, are strongly recommended.

Eliminating the charge;

Wrist strap, ESD footwear and garments, ESD floors

Grounding the equipment and tools at workstation

ESD table / shelf mat (conductive materials)

Proper grounding techniques are required for all devices, equipment and machinery used in the assembly of the products, Also note that surge protection should be considered in the design of customer products.

If tools or equipment contain insulating materials, such as glass or plastic, proper measures against electro static discharge, including the followings are strongly recommended.

0603S-W304



Dissipating the charge with conductive materials

Preventing the charge generation with moisture

Neutralizing the charge with ionizer

When performing the characteristics inspection of the LEDs in your application, customer is advised to check on the LEDs whether or not they are damaged by ESD, Such damage can be detected during forward voltage measurement or light up test at low current. (the recommended current is 1mA or lower)

ESD-damaged LEDs may have a current flow at low voltage, or no longer light up at low current, Failure Criteria: VF <2.0V at IF=0.5mA

(7) Others

When using the LEDs, it must care that the reverse voltage will not exceed the absolute maximum rating. The LED light is enough to injure human eyes, so it should avoid looking at LED light directly.

NOTE.

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