

Part Number: AAAF5051XQR412ZXS-W2

Warm White



**ATTENTION**  
OBSERVE PRECAUTIONS  
FOR HANDLING  
ELECTROSTATIC  
DISCHARGE  
SENSITIVE  
DEVICES

### Features

- Suitable for all SMT assembly and solder process.
- Available on tape and reel.
- White SMD package, silicone resin.
- Package: 500pcs / reel.
- Moisture sensitivity level : level 3.
- RoHS compliant.

### Description

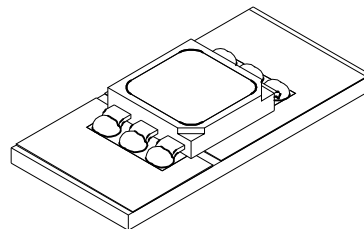
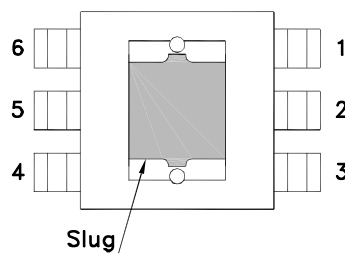
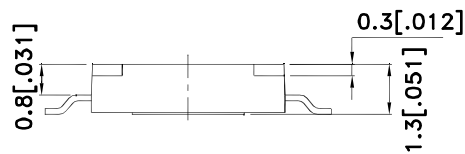
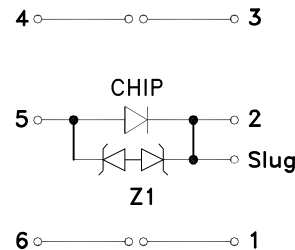
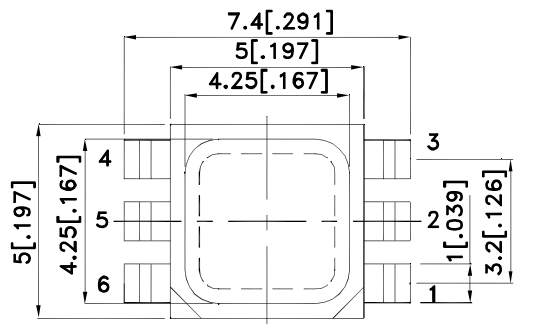
The source color devices are made with InGaN Vertical Light Emitting Diode.

Static electricity and surge damage the LEDs.

It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.

All devices, equipment and machinery must be electrically grounded.

### Package Dimensions



#### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.15[\pm 0.006]$  unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
4. The device has a single mounting surface. The device must be mounted according to the specifications.

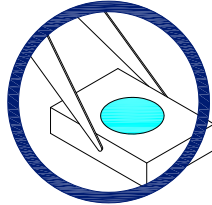


## Handling Precautions

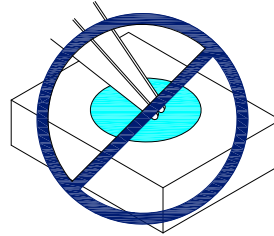
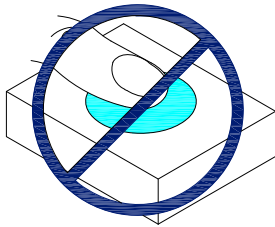
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.

As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

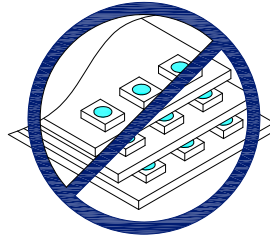
1. Handle the component along the side surfaces by using forceps or appropriate tools.



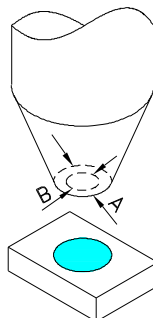
2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.



3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



4. The outer diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks. The inner diameter of the nozzle should be as large as possible.
5. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup.
6. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.



## Selection Guide

Part No.	Dice	Lens Type	Base Order Codes Luminous Flux (lm) @ 350mA [1]			Typical Lumi- nous Flux (lm) [1]
			Code.	Min.	Max.	Typ.
AAAF5051XQR412ZXS-W2	Warm White (InGaN)	WATER CLEAR	B9	42	50	60
			B10	50	60	
			B11	60	70	
			B12	70	80	

Note:

1. Minimum luminous flux performance guaranteed within published operating conditions. Kingbright maintains tolerance of +/-15% on flux.

## Absolute Maximum Ratings at TA=25°C

Items	Symbol	Warm White	Unit
DC Forward Current	IF	350	mA
Peak Forward Current [1]	IFP	500	mA
Reverse Voltage	VR	5	V
Power Dissipation	PD	1400	mW
Operating Temperature	Topr	-40 To +100	°C
Storage Temperature	Tstg	-40 To +110	°C
Junction Temperature	TJ	130	°C

Note:

1. Pulse Width=10 msec, Duty Cycle=10%

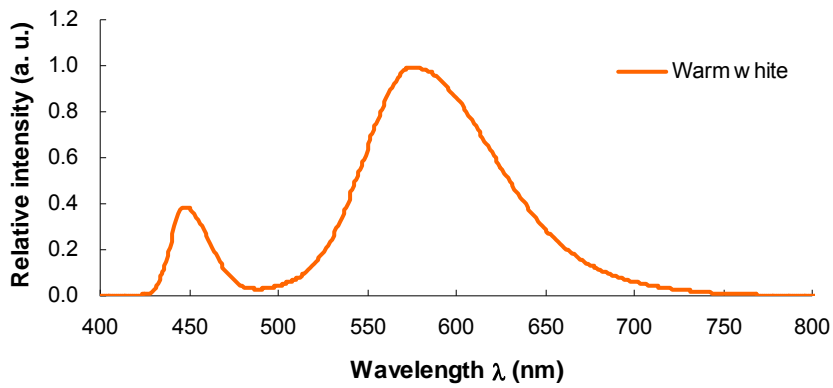
## Electrical / Optical Characteristics at Ta=25°C

Characteristics	Color	Symbol	Conditions	Unit	Minimum	Typical	Maximum
Forward Voltage [1]	Warm White	VF	IF=350mA	V	3.0	3.5	4.0
Reverse Voltage	Warm White	VR	VR = 5V	uA			10
Color Reproduction Index	Warm White	CRI	IF=350mA	-		50	
CCT Range	Warm White	CCT	IF=350mA	K	2870	3000	3220
Junction/ambient	Warm White	Rth j-a	IF=350mA	°C/W		70	
Junction/solder point	Warm White	Rth j-s	IF=350mA	°C/W		30	
50% Power Angle	Warm White	θ	IF=350mA	degrees		120	

Note:

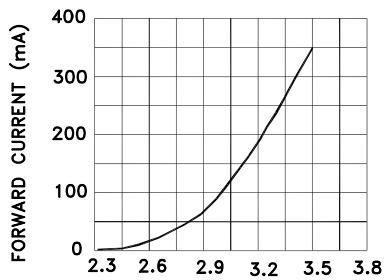
1. Forward Voltage: +/-0.1V.

Spectrum

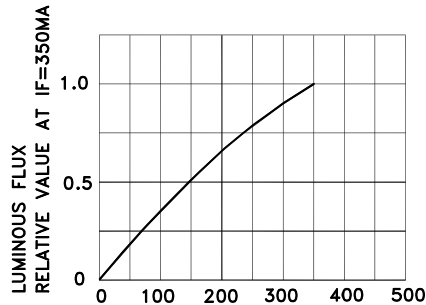


Warm White

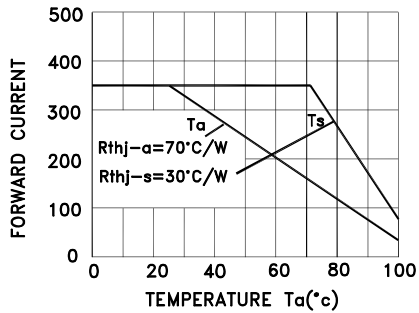
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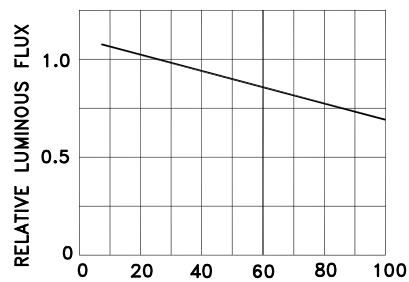
FORWARD CURRENT VS. FORWARD VOLTAGE.



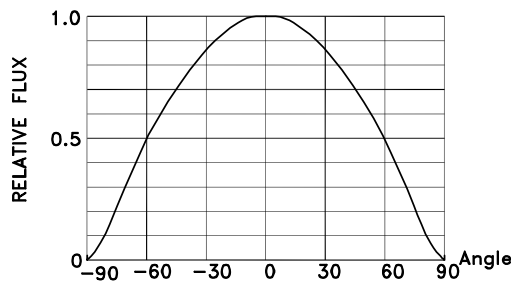
LUMINOUS FLUX Vs. FORWARD CURRENT



MAXIMUM FORWARD DC CURRENT VS. TEMPERATURE DERATING

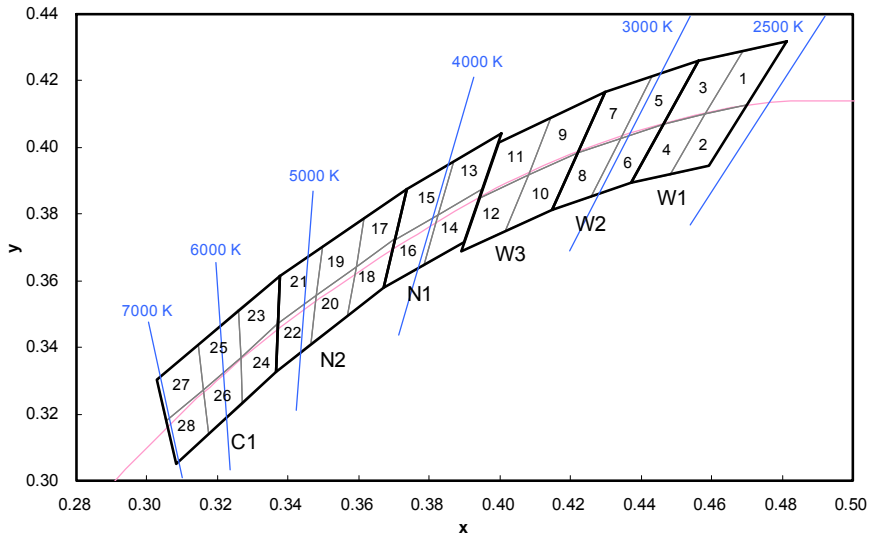


RELATIVE LUMINOUS FLUX VS. AMBIENT TEMPERATURE DERATING



FAR FIELD PATTERN

## CCT 2500-7000 K Bin Code



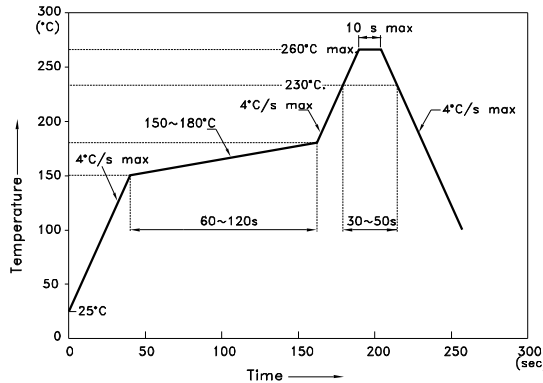
Color	Group	Chromaticity Regions	CCT (K)		
			Min.	Typ.	Max.
Warm White	W1	1, 2, 3, 4	2580	2700	2870
	W2	5, 6, 7, 8	2870	3000	3220
	W3	9, 10, 11, 12	3220	3500	3710
Neutral White	N1	13, 14, 15, 16	3710	4000	4260
	N2	17, 18, 19, 20, 21, 22	4260	4700	5310
Cool White	C1	23, 24, 25, 26, 27, 28	5310	6000	7040

Notes:  
 Shipment may contain more than one chromaticity regions. Orders for single chromaticity region are generally not accepted.  
 Measurement tolerance of the chromaticity coordinates is  $\pm 0.01$ .

	x	y		x	y		x	y		x	y
1	0.4582	0.4099	8	0.4147	0.3814	15	0.3702	0.3722	22	0.3481	0.3557
	0.4687	0.4289		0.4221	0.3984		0.3736	0.3874		0.3370	0.3472
	0.4813	0.4319		0.4342	0.4028		0.3869	0.3958		0.3364	0.3328
	0.4700	0.4126		0.4259	0.3853		0.3825	0.3798		0.3466	0.3411
2	0.4483	0.3919	9	0.4080	0.3916	16	0.3670	0.3578	23	0.3376	0.3616
	0.4582	0.4099		0.4146	0.4089		0.3702	0.3722		0.3260	0.3512
	0.4700	0.4126		0.4299	0.4165		0.3825	0.3798		0.3265	0.3371
3	0.4593	0.3944	10	0.4221	0.3984	17	0.3783	0.3646	24	0.3370	0.3472
	0.4465	0.4071		0.4017	0.3751		0.3736	0.3874		0.3265	0.3371
	0.4562	0.4260		0.4080	0.3916		0.3616	0.3788		0.3270	0.3230
	0.4687	0.4289		0.4221	0.3984		0.3592	0.3641		0.3364	0.3328
4	0.4582	0.4099	11	0.4147	0.3814	18	0.3703	0.3726	25	0.3260	0.3512
	0.4483	0.3919		0.3941	0.3848		0.3703	0.3726		0.3144	0.3408
	0.4465	0.4071		0.3996	0.4015		0.3592	0.3641		0.3160	0.3274
	0.4582	0.4099		0.4146	0.4089		0.3568	0.3495		0.3265	0.3371
5	0.4483	0.3919	12	0.4080	0.3916	19	0.3670	0.3578	26	0.3265	0.3371
	0.4342	0.4028		0.3889	0.3690		0.3616	0.3788		0.3160	0.3274
	0.4430	0.4212		0.3941	0.3848		0.3496	0.3702		0.3175	0.3139
	0.4562	0.4260		0.4080	0.3916		0.3481	0.3557		0.3270	0.3230
6	0.4465	0.4071	13	0.4017	0.3751	20	0.3592	0.3641	27	0.3144	0.3408
	0.4259	0.3853		0.3825	0.3798		0.3592	0.3641		0.3028	0.3304
	0.4342	0.4028		0.3869	0.3958		0.3481	0.3557		0.3055	0.3177
	0.4465	0.4071		0.4006	0.4044		0.3466	0.3411		0.3160	0.3274
7	0.4373	0.3893	14	0.3950	0.3875	21	0.3568	0.3495	28	0.3160	0.3274
	0.4373	0.3893		0.3783	0.3646		0.3496	0.3702		0.3055	0.3177
	0.4221	0.3984		0.3825	0.3798		0.3376	0.3616		0.3081	0.3049
	0.4299	0.4165		0.3825	0.3798		0.3370	0.3472		0.3175	0.3139
7	0.4430	0.4212	14	0.3950	0.3875	21	0.3370	0.3472	28	0.3175	0.3139
	0.4342	0.4028		0.3898	0.3716		0.3481	0.3557			

Reflow soldering is recommended and the soldering profile is shown below. Other soldering methods are not recommended as they might cause damage to the product.

Reflow Soldering Profile For Lead-free SMT Process.



**NOTES:**

1. We recommend the reflow temperature 245°C(+/-5°C). The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

**Heat Generation:**

1. Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED when making the system design. The coefficient of 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. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

2. Please determine the operating current with consideration of the ambient temperature local to the LED and refer to the plot of Permissible Forward current vs. Ambient temperature on CHARACTERISTICS in this specification. Please also take measures to remove heat from the area near the LED to improve the operational characteristics on the LED.

3. The equation ① indicates correlation between  $T_j$  and  $T_a$ , and the equation ② indicates correlation between  $T_j$  and  $T_s$

$$T_j = T_a + R_{thj-a} * W \dots\dots\dots \textcircled{1}$$

$$T_j = T_s + R_{thj-s} * W \dots\dots\dots \textcircled{2}$$

$T_j$  = dice junction temperature: °C

$T_a$  = ambient temperature: °C

$T_s$  = solder point temperature: °C

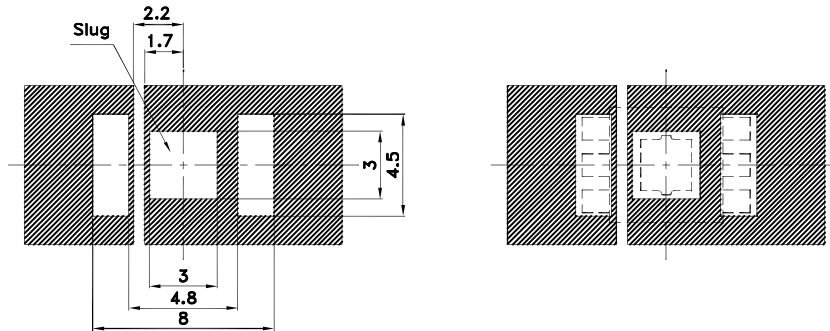
$R_{thj-a}$  = heat resistance from dice junction temperature to ambient temperature : °C /W

$R_{thj-s}$  = heat resistance from dice junction temperature to  $T_s$  measuring point : °C /W

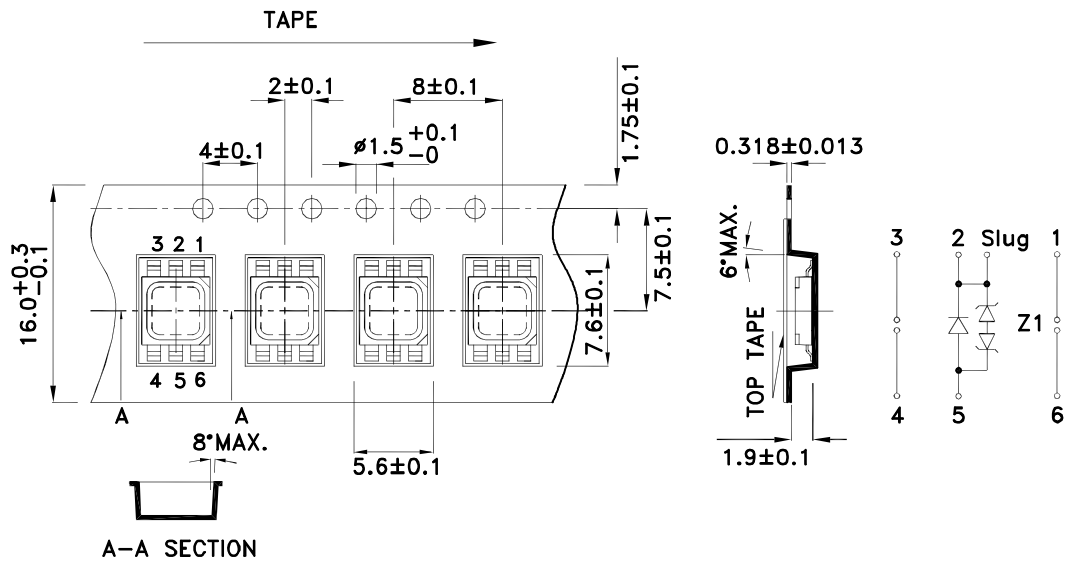
$W$  = inputting power (IFx VF) : W

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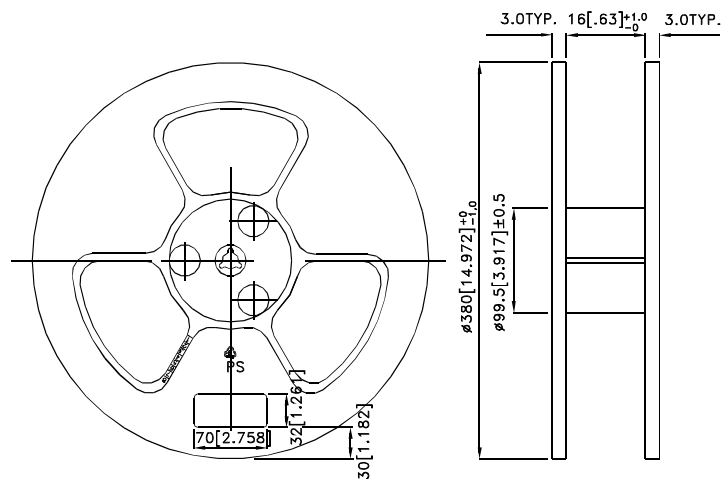
Recommended Soldering Pattern  
(Units : mm; Tolerance:  $\pm 0.1$ )



Tape Specifications  
(Units : mm)



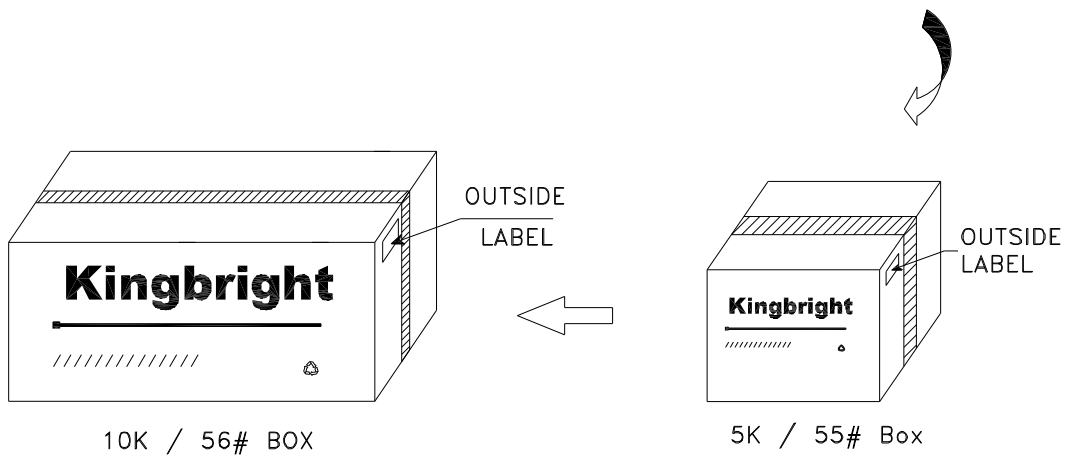
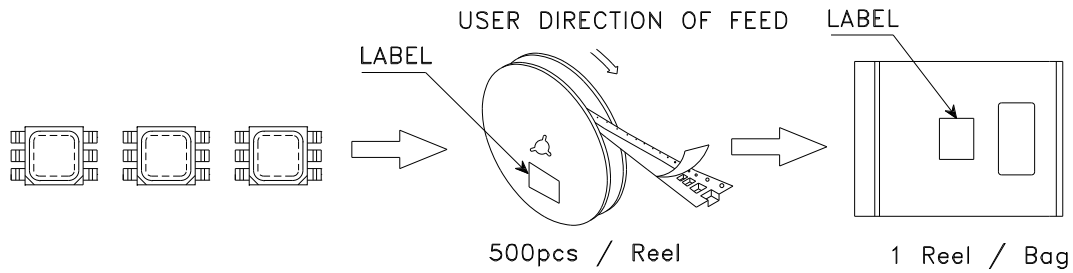
Reel Dimension




# Kingbright

## PACKING & LABEL SPECIFICATIONS

AAAF5051XQR412ZXS-W2



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QTY: 500 pcs	Q.C. <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Q C xx xx xxxx PASSED</span>
S/N: XXXX	
CODE: XXX	
LOT NO:	
 <small>XXXXXXXXXXXXXXXXXXXXXXXXXX</small>	
RoHS Compliant	