

CUSTOMER :

No. : _____.

EDIT : 0 (1/15)

DATE : 2007/02/22

SPECIFICATIONS FOR APPROVAL

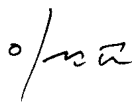
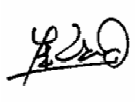
PRODUCT : 3528 SIZE WHITE ADLSM0 LED (TOP VIEW)

MODEL NAME : ADLSM0-3528-C200-L1

(CUSTOMER P/N)

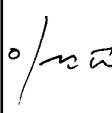
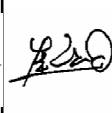
APPROVAL			REVISION
CHKD.		APPD.	0: 07. 02. 22 : a new establishment
REMARK			

ADIVA TECHNOLOGY INC.

DGND.	CHKD.	APPD.
		

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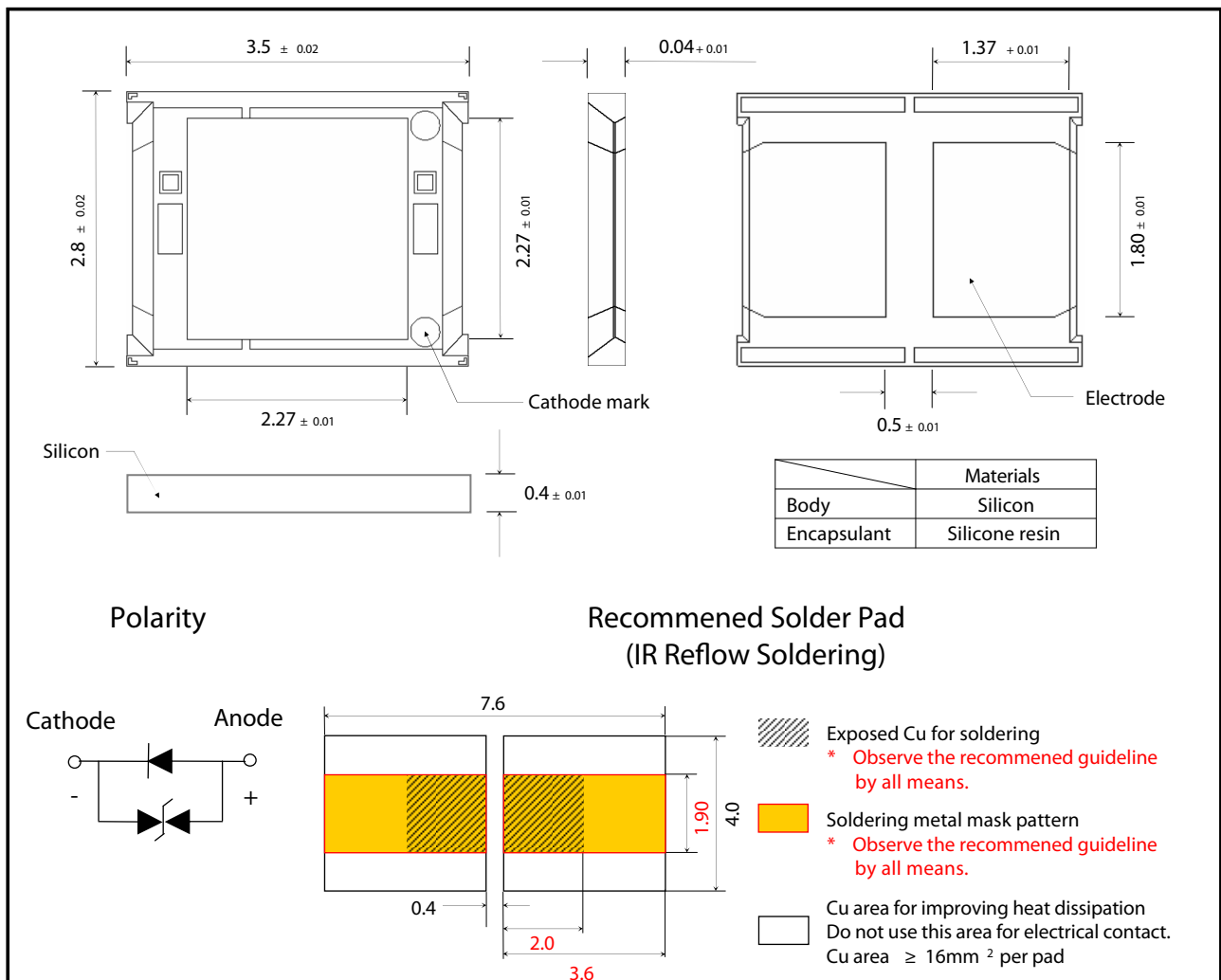
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1. FEATURES

- Equivalent to 3528 Package Outline, 0.4mm Thickness Slim Type SMD
- Silicon Chip-Carrier (SiCC), Thermal Conductive Silicon Frame PKG
- Wafer Level Package (WLP) type : 3.5 x 2.8 x 0.4 mm (L x W x H)
- High Luminous Intensity (I_v) Luminous Flux (Φ_v) : 25 lm @ 150mA
50 lm @ 350mA
- Compatible to Pb-free IR reflow soldering
- ESD-withstand voltage : up to 2kV acc. to JESD22-A 114-B

2. Outline Dimensions

(unit : mm)



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3. Applications

- Mobile Phone Camera Flash
- Backlighting
- Interior and Exterior Illumination, Automotive Lighting

4. Absolute Maximum Ratings

(Ta=25°C)

Items	Symbols	Ratings		Unit
Forward Current	I_F	150 ^{*1)}	500 ^{*2)}	(mA)
Pulse Forward Current	I_{FP}	1000 ^{*3)}	750 ^{*4)}	(mA)
Power Dissipation	P_D	570	2000	(mW)
Reverse Voltage	V_R	5	5	(V)
Operating Temperature	T_{opr}	-40 ~ +100	-40 ~ +100	(°C)
Storage Temperature	T_{stg}	-40 ~ +100	-40 ~ +100	(°C)
Thermal Resistance	R_{thJA}	180 ^{*1)}	40 ^{*2)}	(K/W)
Junction Temperature	T_j	120		(°C)

*1) R_{thJA} results from mounting on PC board FR 4 (pad size $\geq 16\text{mm}^2$ per pad)

*2) R_{thJA} results from mounting on Metal Core PC (board size $\geq 1\text{ inch}^2$)

$R_{thJC} \sim 9.8\text{ K/W}$

*3) Pulse Width $\leq 10\text{ us}$ Duty $\leq 10\%$

*4) Pulse Width $\leq 10\text{ms}$, Duty $\leq 10\%$

5. Electro - Optical Characteristics

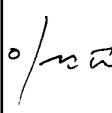
(Ta=25°C)

ITEMS	Symbol	Condition	Min	Typ	Max	Unit
Forward Voltage	V_F	$I_F=150[\text{mA}]$ $I_F=350[\text{mA}]$	2.70 3.00	3.15 3.45	3.45 3.75	V
Luminous Flux ^{*5)}	Φ_V	$I_F=150[\text{mA}]$ $I_F=350[\text{mA}]$	15 35	25 50	- -	lm
CIE Value	Y / X	$I_F=150[\text{mA}]$	Refer to '6. Rank Sorting Method'			-
Viewing Angle	$2\theta\ 1/2$	$I_F=150[\text{mA}]$	-	110	-	deg

*5) Color coordinate condition : $x = 0.31, y = 0.31$

* These value measured by Optical Spectrum Analyzer of ADIVA TECHNOLOGY INC. and tolerances are followings as below

- Luminous Intensity (I_v) $\pm 20\%$ Forward Voltage (V_F) ± 0.1 , CIE Value : ± 0.01

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6. Rank Sorting Method

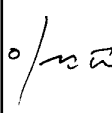
Luminous Intensity, CIE Value, Forward Voltage Rank

Rank				Bin
Φ (lm, @350mA)	CIE Value (@ 350mA)	Typical CCT (K)	V_F (V @350mA)	
K rank : 35 ~ 45 L rank : 45 ~ 55 M rank : 55 ~	A Rank (0.294 / 0.263) (0.286 / 0.278) (0.307 / 0.313) (0.311 / 0.292)	8000	3.00 ~ 3.25	K/L/M A1
			3.25 ~ 3.50	K/L/M A2
			3.50 ~ 3.75	K/L/M A3
	B Rank (0.286 / 0.278) (0.278 / 0.295) (0.303 / 0.333) (0.307 / 0.313)	8000	3.00 ~ 3.25	K/L/M B1
			3.25 ~ 3.50	K/L/M B2
			3.50 ~ 3.75	K/L/M B3
	C Rank (0.311 / 0.292) (0.307 / 0.313) (0.330 / 0.347) (0.330 / 0.320)	6200	3.00 ~ 3.25	K/L/M C1
			3.25 ~ 3.50	K/L/M C2
			3.50 ~ 3.75	K/L/M C3
	D Rank (0.307 / 0.313) (0.303 / 0.333) (0.330 / 0.373) (0.330 / 0.347)	6200	3.00 ~ 3.25	K/L/M D1
			3.25 ~ 3.50	K/L/M D2
			3.50 ~ 3.75	K/L/M D3
	E Rank (0.330 / 0.320) (0.330 / 0.347) (0.348 / 0.374) (0.344 / 0.342)	5300	3.00 ~ 3.25	K/L/M E1
			3.25 ~ 3.50	K/L/M E2
			3.50 ~ 3.75	K/L/M E3
	F Rank (0.330 / 0.347) (0.330 / 0.373) (0.350 / 0.388) (0.348 / 0.374)	5300	3.00 ~ 3.25	K/L/M F1
			3.25 ~ 3.50	K/L/M F2
			3.50 ~ 3.75	K/L/M F3
	G Rank (0.350 / 0.388) (0.367 / 0.400) (0.362 / 0.372) (0.344 / 0.342)	4750	3.00 ~ 3.25	K/L/M G1
			3.25 ~ 3.50	K/L/M G2
			3.50 ~ 3.75	K/L/M G3

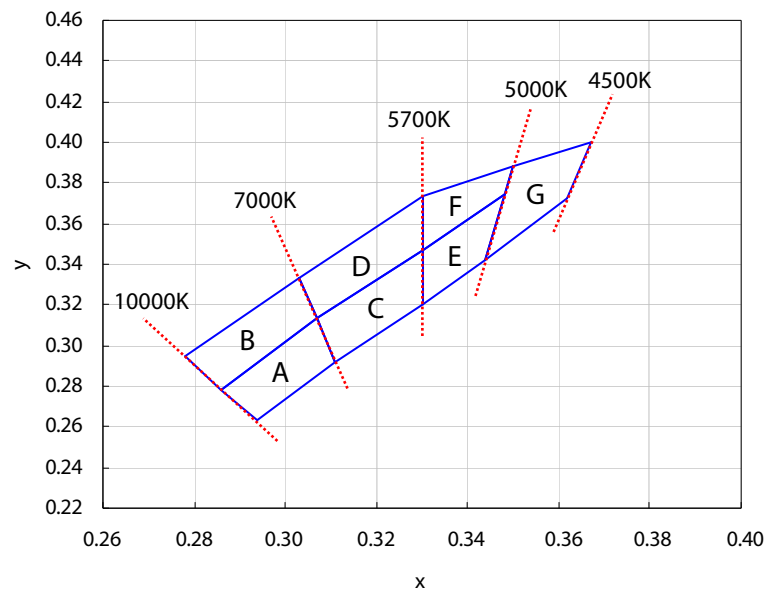
* Voltages are tested at a current pulse duration of 1 ms and an accuracy of $\pm 5.0\%$

* This categories are established for classification of products.

* V_F , I_V values are based on 1-die performance

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CHROMATICITY DIAGRAM



* Chromaticity coordinate groups are tested at a current pulse duration of 100 ms and a tolerance of ± 0.01 .

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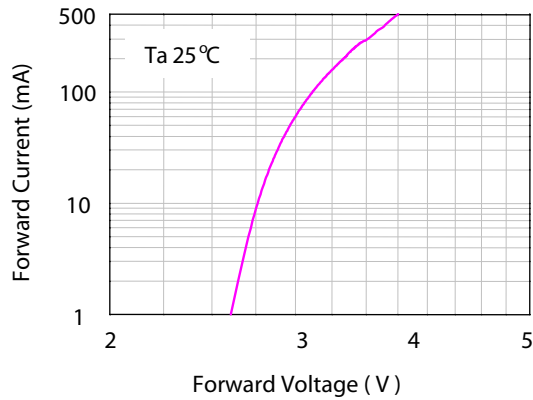
APPD

MODEL NAME

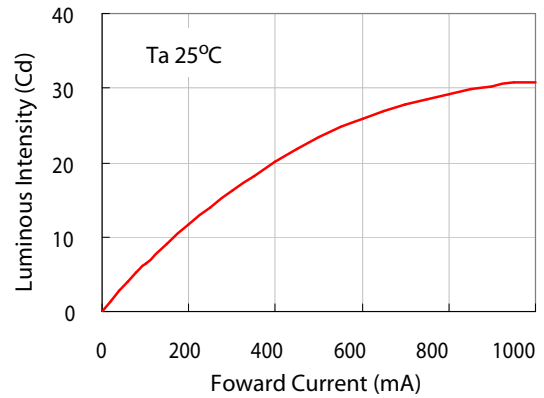
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7. Typical Characteristic Curves

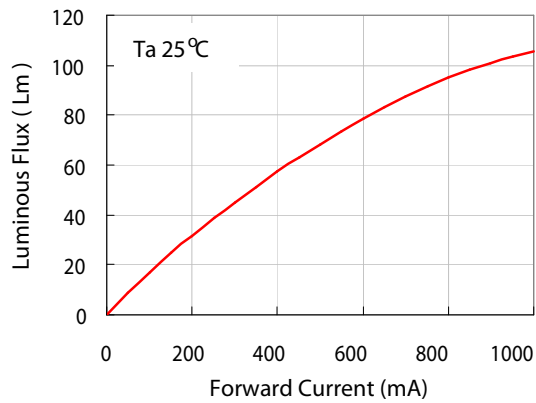
Forward Voltage vs. Forward Current



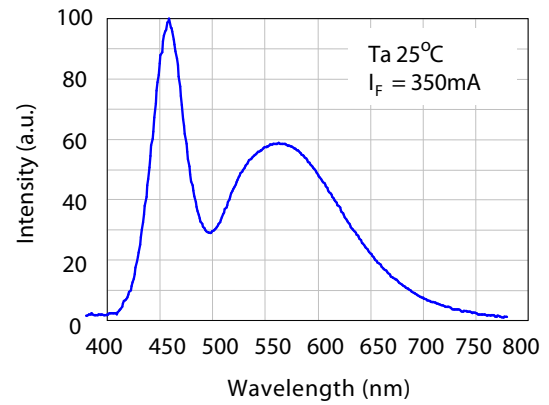
Forward Current vs. Luminous Intensity



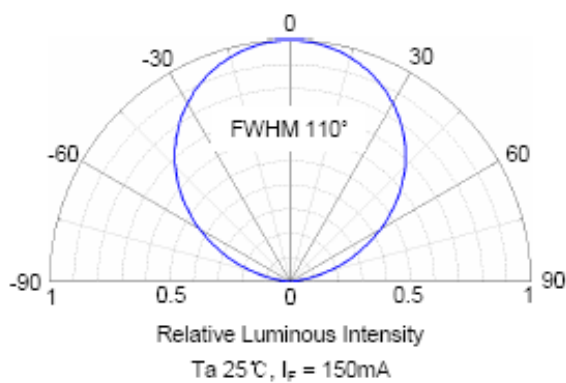
Forward Current vs. Luminous Flux



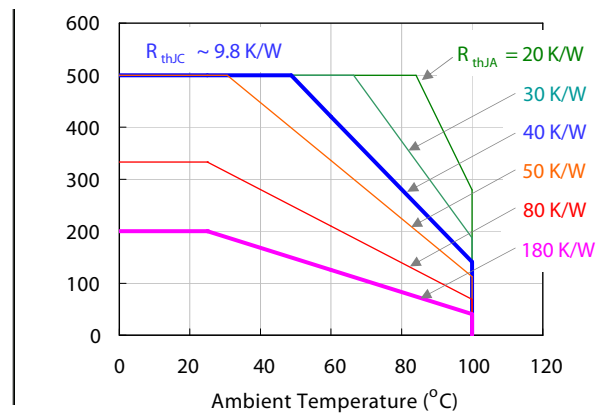
Spectrum



RADIATION CHARACTERISTICS



MAX. PERMISSIBLE FORWARD CURRENT

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8 . RELIABILITY TEST ITEMS AND CONDITIONS

8-1. Items and Results of Reliability Test

No	ITEM	TEST CONDITION	TEST HOURS/ CYCLES	SAMPLE No	Ac/Re
1	Steady State Operating Life ^{*1)}	Ta 25°C, I _F =350 mA (Tested with LG's std. circuit board ^{*2)})	1000hr	11 pcs	0 / 1
2	High Temp. Humidity Life ^{*1)}	Ta 60, 90% RH, I _F =300mA (Tested with LG's std. circuit board ^{*2)})	500hr	11 pcs	0 / 1
3	Steady State Operating Life of High Temperature ^{*1)}	Ta 85°C, I _F =120mA (Tested with LG's std. circuit board ^{*2)})	1000hr	11 pcs	0 / 1
4	Steady State Operating Life of Low Temperature ^{*1)}	Ta -30°C I _F =350mA (Tested with LG's std. circuit board ^{*2)})	1000hr	11 pcs	0 / 1
5	High Temp. Storage	100°C	1000hr	11 pcs	0 / 1
6	Low Temp. Storage	-40°C	1000hr	11 pcs	0 / 1
7	Temperature Cycle	-40°C (30min) ~ 25°C (5min) ~100°C (30min) ~25°C (5min)	100cycle	11 pcs	0 / 1
8	Thermal Shock	100°C (15min) ~ -40°C (15min)	100cycle	11 pcs	0 / 1
9	Resistance to Soldering Heat (Reflow Soldering)	Tsld = 260°C, 10 sec (pre treat. 30°C, 70%, 168hr)	1 times ^{*3)}	11 pcs	0 / 1
10	Vibration	200m/s ² , 100~200Hz (sweep 4 min) 48 min, 3 directions	4 times	11 pcs	0 / 1
11	Electrostatic Discharge	R=1.5k Ω C=100pF, Test Voltage 2k V	3 times Negative/ Positive	11 pcs	0 / 1

*1) These test items are judged by the criteria of Luminous Flux II .

*2) Thermal resistance R_{THJA} ~ 50 K/W

*3) Soldering heat test time is restricted to one time

8-2. Criteria for Judging the Damage

(U.S.L : Upper Spec. Limit, S : Initial Value)

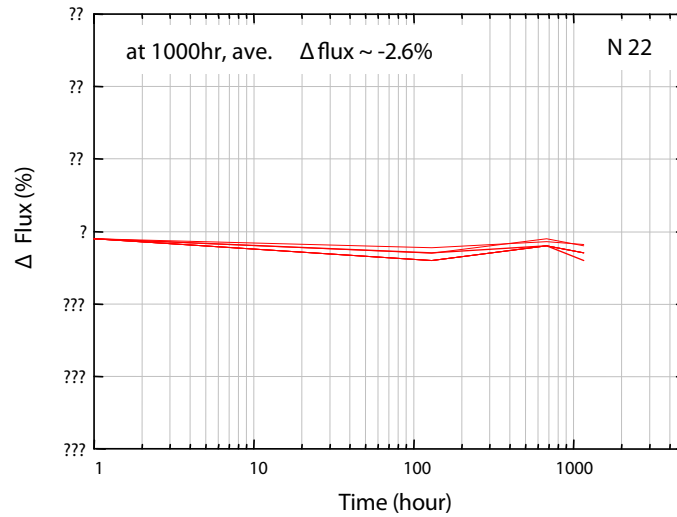
Item	Symbol	Test Condition	Limit	
			Min.	Max.
Forward Voltage	V _F	I _F = 350 mA	-	U.S.L. x 1.2
Luminous Flux I	P _O	I _F = 350 mA	S x 0.7	-
Luminous Flux II	P _O	I _F = 350 mA	S X 0.5	-

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8-3. RELIABILITY DATA

Long Term Reliability Data

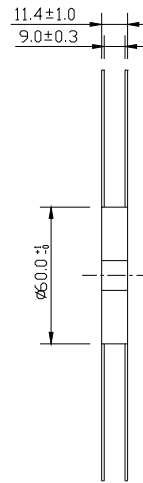
- RT , 400mA , 1000 hours @ R_{THJC} 9.8 K/W , R_{THJA} 50 K/W (LG standard circuit board)
- Assumed $T_j \sim 97^\circ\text{C}$



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9-1 Taping Outline Dimension

(Unit : mm)



- Packing Materials :
 - Reel : Conductive PS (black)
 - Emboss Tape : Conductive PS (black)
 - Cover Tap : Conductive PET base

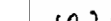
Technical drawing of a tape with dimensions and a detail view.

Main Dimensions:

- Top edge width: 4.00 ± 0.10
- Bottom edge width: 4.00 ± 0.10
- Top edge thickness: 1.55 ± 0.05
- Bottom edge thickness: 1.5 ± 0.1
- Top edge height: 1.75 ± 0.1
- Bottom edge height: 8.0 ± 0.1
- Top edge width (detail): 3.1 ± 0.1
- Top edge angle: $\text{MAX } 4^\circ$
- Top edge height (detail): 0.2 ± 0.05
- Top edge width (detail): 0.7 ± 0.1
- Top edge height (detail): 3.8 ± 0.1
- Top edge angle (detail): $\text{MAX } 3^\circ$

Diagram illustrating the layout of the LED tape segments:

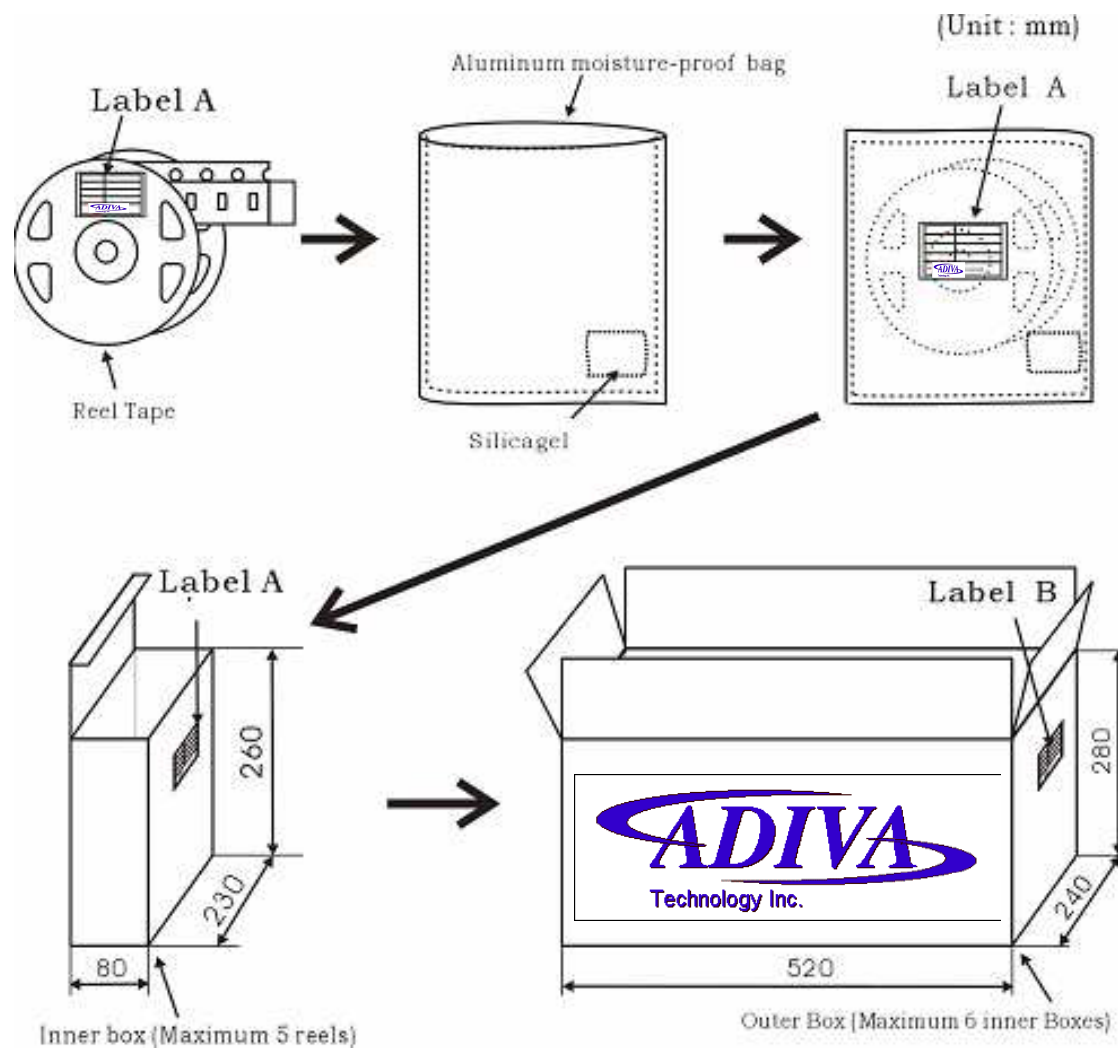
- (End)
- More than 40mm unloaded tape
- Mounted with LED (2,000ea)
- More than 40mm unload tape
- 150 ~ 380mm Leading part
- (Start)

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9-3. PACKING SPECIFICATIONS

Reeled products (number of products are 2,000 pcs) packed in a seal off aluminum moisture-proof bag along with desiccants (silica gel).

Five aluminum bags (total maximum number of products are 10,000 pcs) packed in an inner box and Six inner boxes are put into an outer box.



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LABEL B

Specifying Customer, Model, Customer part no, Lot No, Quantity



Lot No. indication

1	2	3	4	—	5	6
QA Inspection Year (Last number)	QA Inspection month	QA Inspection date			Serial No	
" 5 "	" 7 "	" 14 "			" 01 "	
(2005)	(1, 2, 3, 4, 5, 6 7, 8, 9, x, y, z)	(1 ~ 31)			(01 ~ 99)	

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10. CAUTIONS ON USE

10-1. For the Handling

- Over-current-proof

Customer must apply resistors for protection, others slight voltage shift will cause big current charge (Burn out will happen).

- Fragile

During processing, mechanical stress on the surface should be minimized as much as possible. Our product consists of ductile silicon. During SMT processing there are basically no restrictions regarding the form of the pick and place nozzles, except that overload mechanical pressure on the package must be prevented.

- Solvent

This device should not be used in any type of fluid such as water, oil, organic solvent ect. When washing is required, IPA should be used.

10-2. For the Storage

- Proper temperature and RH conditions for storage are : 5 °C ~ 35 °C, RH 60%.

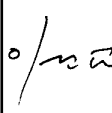
- Do not open moisture-proof bag untill the products are ready to be used.

- Store products in a moisture-proof bag with a desiccant (silica gel) after opening.

- These products should be used within 168 hours after opening the bag based upon storage condition.

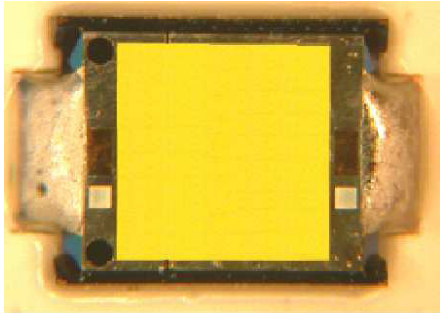
- These products must be baked to remove moisture before using them if the Silica gel loses its blue color. Conditions for baking are $60 \pm 5^{\circ}\text{C}$, 20% (RH) and 24 hours maximum. (For reeled status without bag)

- Considering the tape life, we suggest our customers to use our products within a year (from production date)

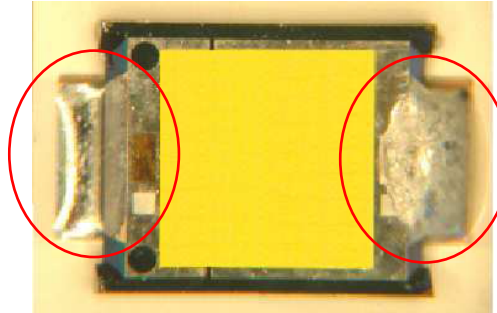
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		DSGN	CHK	APPD	MODEL NAME
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10-3. Soldering Status

- According to recommended solder pad rules, Customer must observe the recommended guidelines by all means, especially soldering metal mask pattern, exposed Cu for soldering, etc.
- Check the below status, if you followed the recommended solder pad rules.



(OK)



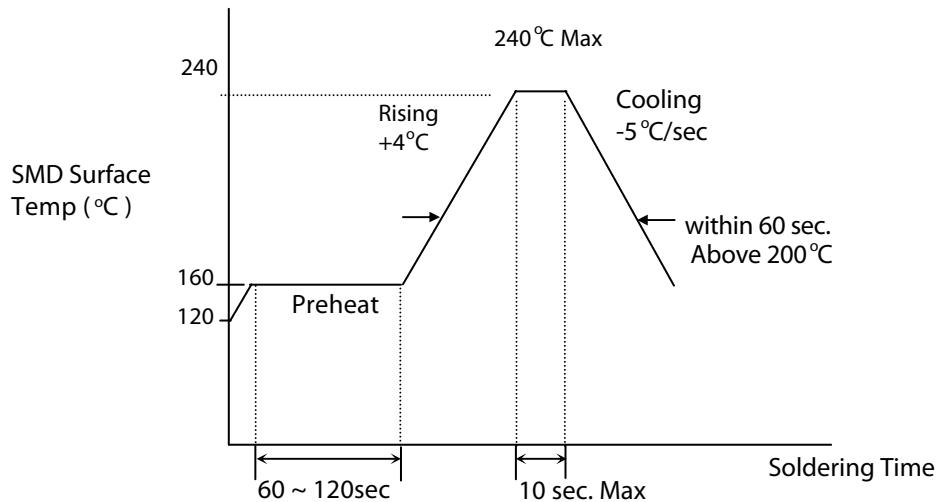
(NG)

10-4. Adiva Technology will not be held responsible for any damage to the user that may result from accidents or any other reasons during operation of the user's unit if use to exceed the absolute maximum ratings, or not keep the matters that demand special attention.

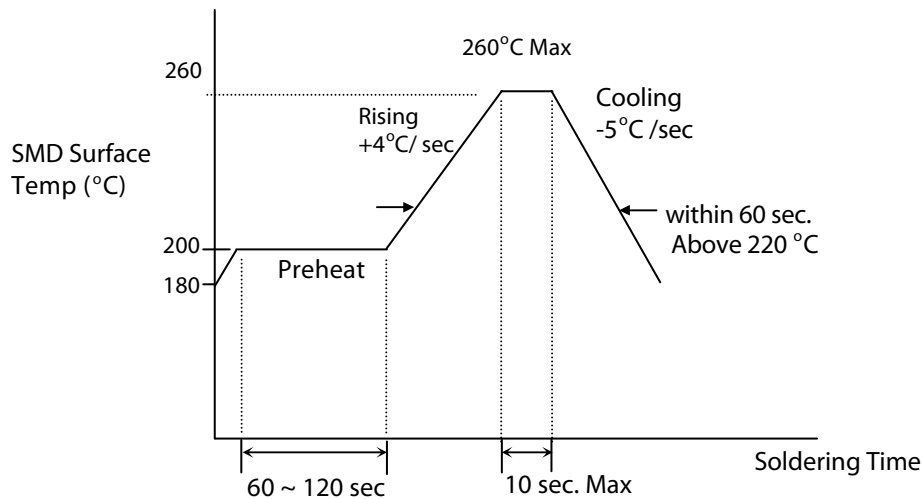
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11. OTHERS

11-1. Pb Solder



11-2 Pb - Free Solder



11-3. Soldering Iron

Basic spec is ≤ 3 sec when 350°C. If temperature is higher, time shorter (+10°C ~ -1 sec). Power dissipation of Iron should be smaller than 15W, and temperature should be controllable. Surface temperature of the device should be under 230°C.

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