

CUSTOMER : _____

No. : CLD _____

EDIT : 0 (1/13) _____

DATE : 2008/03/20 _____

SPECIFICATIONS FOR APPROVAL

PRODUCT : Side-View Green SMD LED _____

MODEL NAME : ADLSV3-3812-C100-L1 _____

(CUSTOMER P/N : _____)

APPROVAL			REVISION
CHKD.		APPD.	08. 02. 23 CREATED
REMARK			

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DGND.	CHKD.	APPD.

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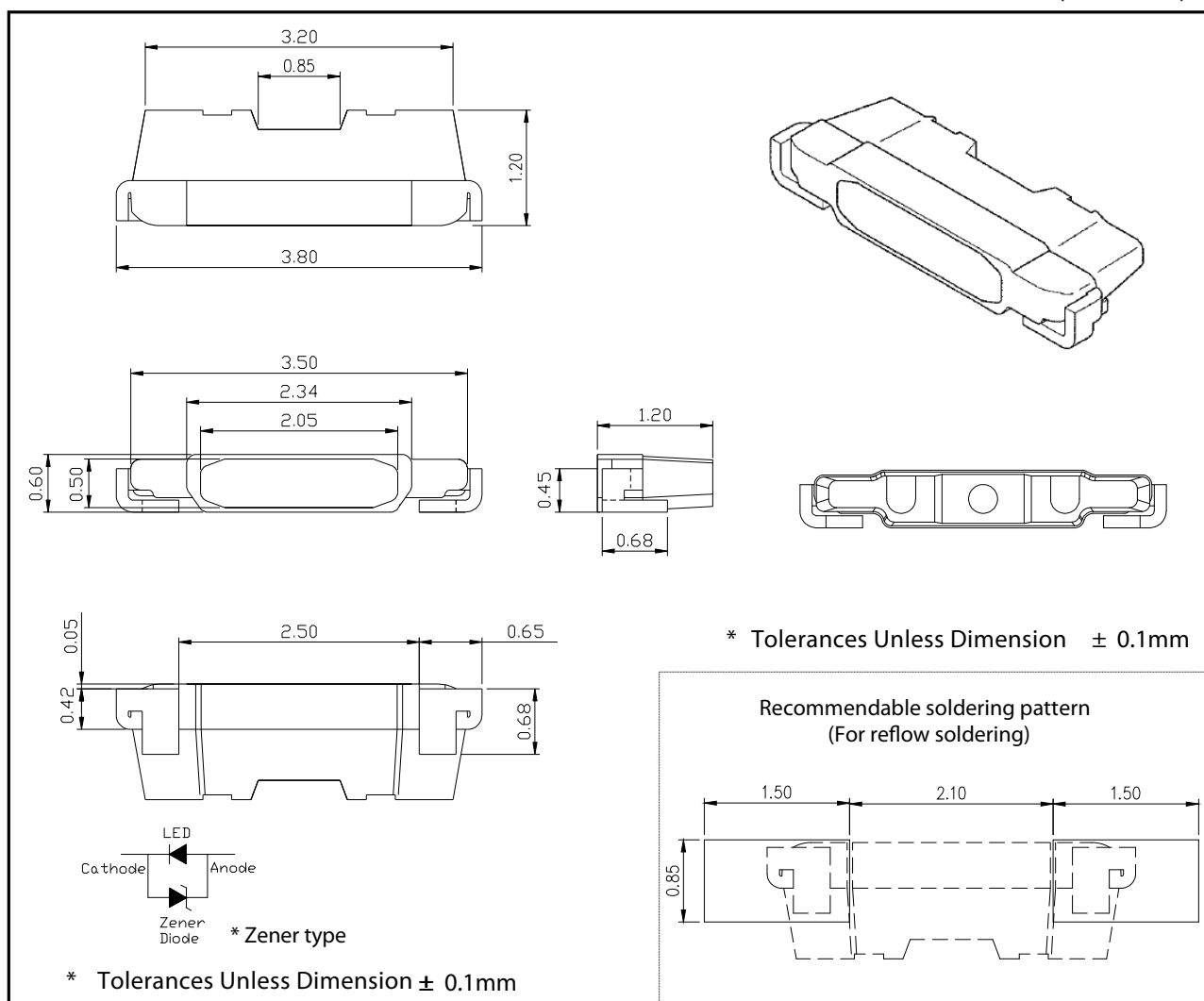
ADLSV3-3812-C100-L1

1. Features

- Lighting Color : Green
- Small size surface mount type: $3.8 \times 1.2 \times 0.6\text{mm}$ (L \times W \times H)
- Viewing angle : extremely wide (typically 110°)
- Based Material : InGaN
- Soldering methods : IR reflow soldering
- Taping : 12mm conductive black carrier tape & antistatic clear cover tape.
3500/pcs/reel $\Phi 178$ mm wheel

2. Outline Dimensions

(UNIT: mm)

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3. Applications

- Mobile Phone & PDA LCD Backlighting

4. Absolute Maximum Ratings

(Ta=25°C)

ITEMS	SYMBOL	RATINGS	UNIT
FORWARD CURRENT	IF	30	mA
PULSE FORWARD CURRENT*1	IFp	100	mA
POWER DISSIPATION	Pd	105	mW
REVERSE CURRENT	IR	25	mA
OPERATING TEMPERATURE	Topr	-30 ~ +85	°C
STORAGE TEMPERATURE	Tstg	-40 ~ +100	°C

*1) Pulse Width = 10ms, Duty ≤ 10%

5. Electro - Optical Characteristics

(Ta=25°C)

ITEMS	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
FORWARD VOLTAGE *2	V _F	I _F =20 mA	2.9	-	3.5	V
REVERSE VOLTAGE	V _R	I _R =5 mA	0.6	0.8	1.2	V
LUMINOUS INTENSITY RANK *3	I _V	I _F =20 mA	900	-	(1200)	mcd
DOMINANT WAVELENGTH	Wd	I _F =20 mA	520	525	530	nm
SPECTRUM RADIATION BANDWIDTH	Δλ	I _F =20 mA	-	30	-	nm
VIEWING ANGLE	2Θ 1/2	I _F =20 mA	-	110	-	deg

*2), *3) Refer to the Sorting Method (See page 5)

* These values measured by Optical Spectrum Analyzer of Adiva Technology Inc. and tolerances are followings as below

-Forward Voltage (V_F) : ± 0.1V

-Luminous Intensity (I_V) : ± 10%

-Dominant Wavelength (Wd) : ± 1nm

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6. Rank Sorting Method

* Luminous Intensity Ranks

I _V RANK	I _V (mcd, @ 20 mA)		
	MIN	TYP	MAX
M	900	-	1000
N1	1000	-	1100
N2	1100	-	1200
P	1200	-	

*ADIVA Luminous Intensity levels can be different from other companies.

* Dominant Wavelength Ranks

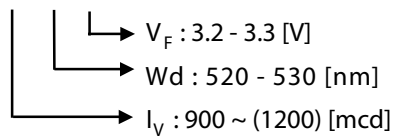
Wd RANK	Wd (nm,@ 20 mA)	
	MIN	MAX
F	520	525
G	525	530

* Forward Voltage Ranks

V _F RANK	V _F (V, @ 20 mA)		
	MIN	TYP	MAX
9	2.9	-	3.0
0	3.0	-	3.1
1	3.1	-	3.2
2	3.2	-	3.3
3	3.3	-	3.4
4	3.4	-	3.5

* Method of Rank No indication

A - A - 2



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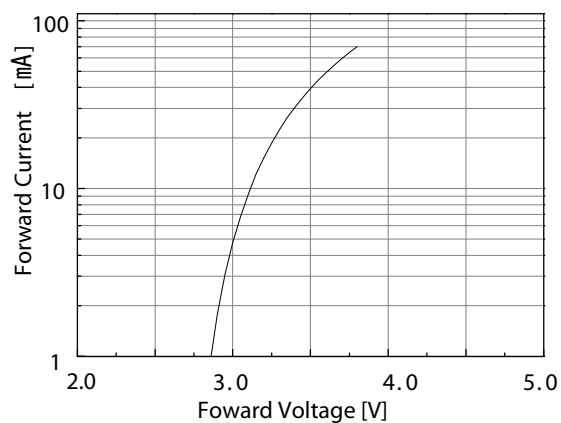
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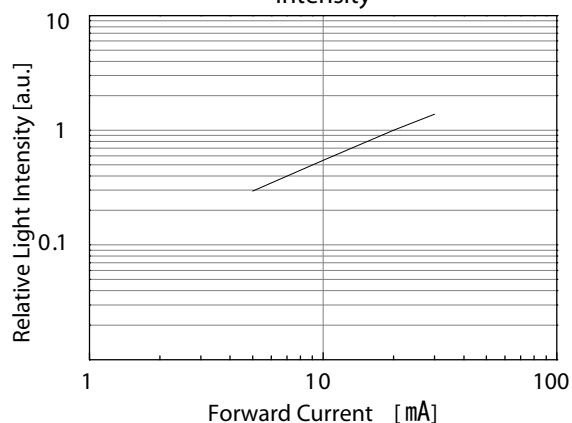
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7. Typical Characteristic Curves

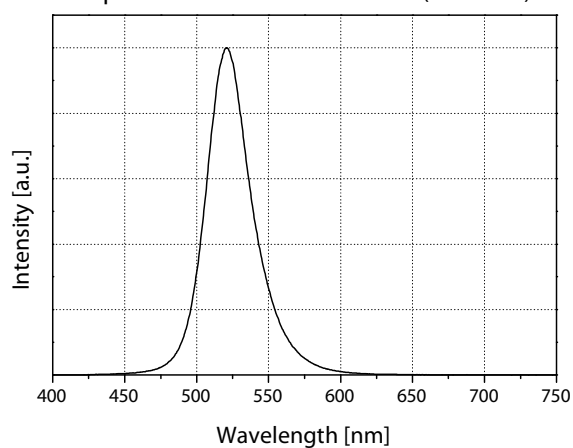
* Forward Voltage vs. Forward Current



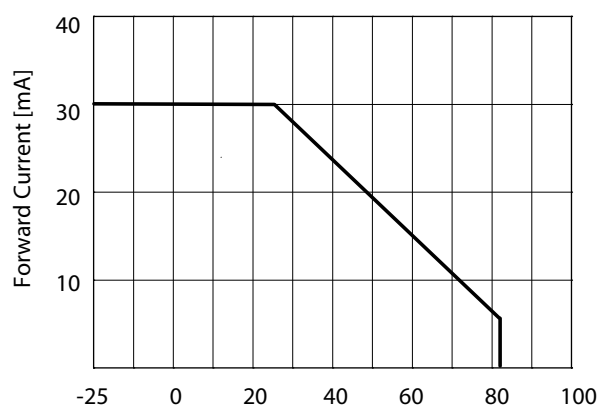
* Forward Current vs. Relative luminous Intensity



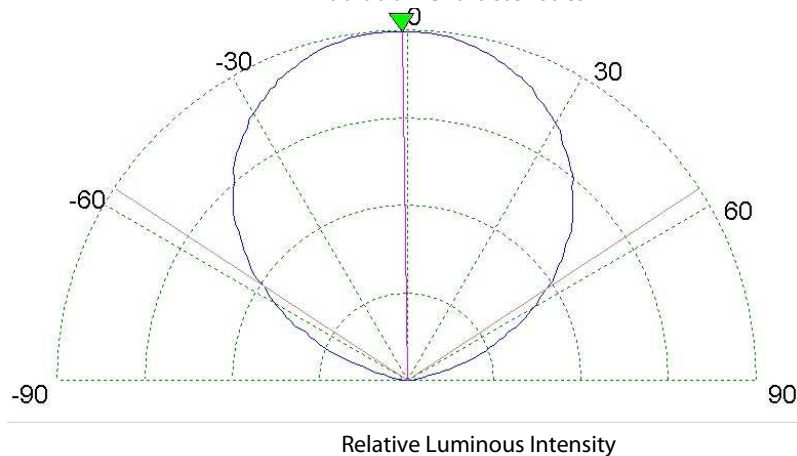
* Spectrum (If = 20 mA)



* Max. Permissible Forward Current



* Radiation Characteristics X - X



* Y - Y angle is typically 5 deg's smaller than X - X angle.

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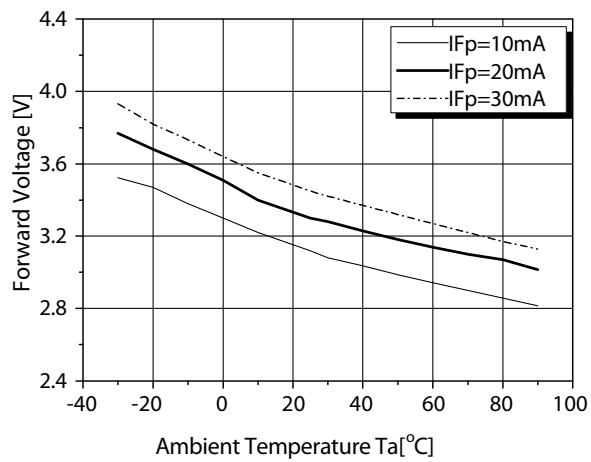
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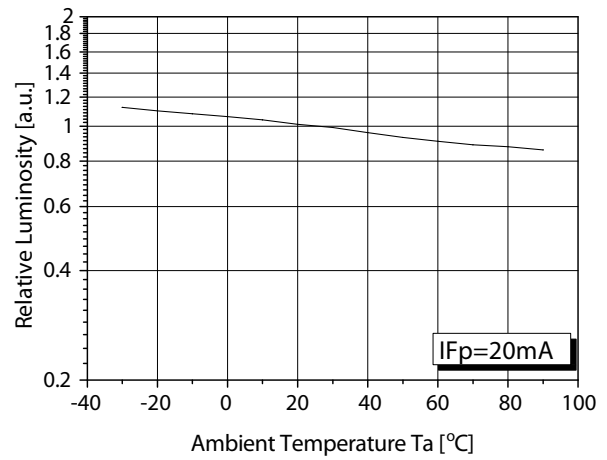
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* Ambient Temp [°C] vs. Forward Voltage



* Ambient Temp [°C] vs Relative Luminosity

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8. Reliability Test Items and Conditions

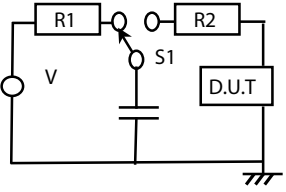
8-1. The Reliability criteria of SMD LED

ITEM	SYMBOL	TEST CONDITION	LIMIT	
			MIN	MAX
FORWARD VOLTAGE	V _F	I _F = 20 mA	—	U.S.L. x 1.2
LUMINOUS INTENSITY	mcd	I _F = 20 mA	S x 0.5	—

*U.S.L. : Upper Spec Limit, *L.S.L. : Lower Spec Limit *S : Initial Value

* The Reliability criteria of ESD Test is judged by VF shift ($\pm 0.2V@2mA$) or impedance Ω check data.

8-2 Results of Reliability Test

NO	ITEM	TEST CONDITION	TEST HOURS/CYCLES	SAMPLE NO	Ac/Re
1	DC OPERATING LIFE-A	I _F : 20 mA	500 HRS	11 PCS	0/1
2	TEMPERATURE CYCLE	H : +100°C 30 MIN └ 5 MIN L : -40°C 30 MIN	100 CYCLES	11 PCS	0/1
3	HIGH TEMPE. STORAGE	100°C	500 HRS	11 PCS	0/1
4	LOW TEMPE. STORAGE	-40°C	500 HRS	11 PCS	0/1
5	TEMPE/HUMIDITY STORAGE	60°C / 90% RH	500 HRS	11 PCS	0/1
6	ESD (HBM) MIN - 1kV	 <p>R1 : 10M Ω R2:1.5K Ω C : 100pF</p>	3 TIMES	22 PCS	0/1

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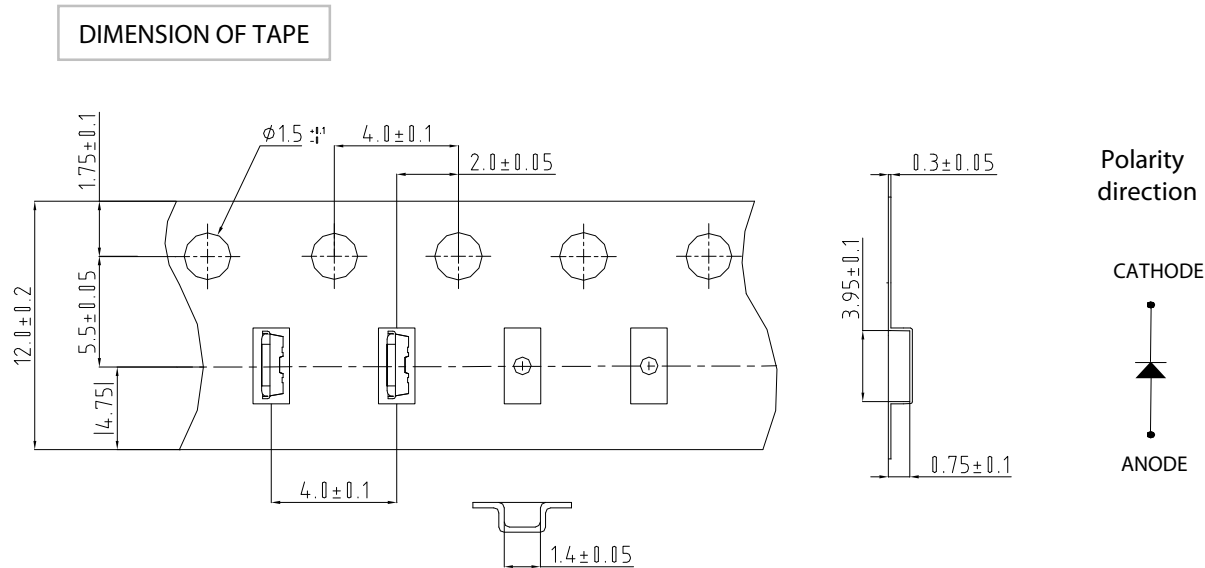
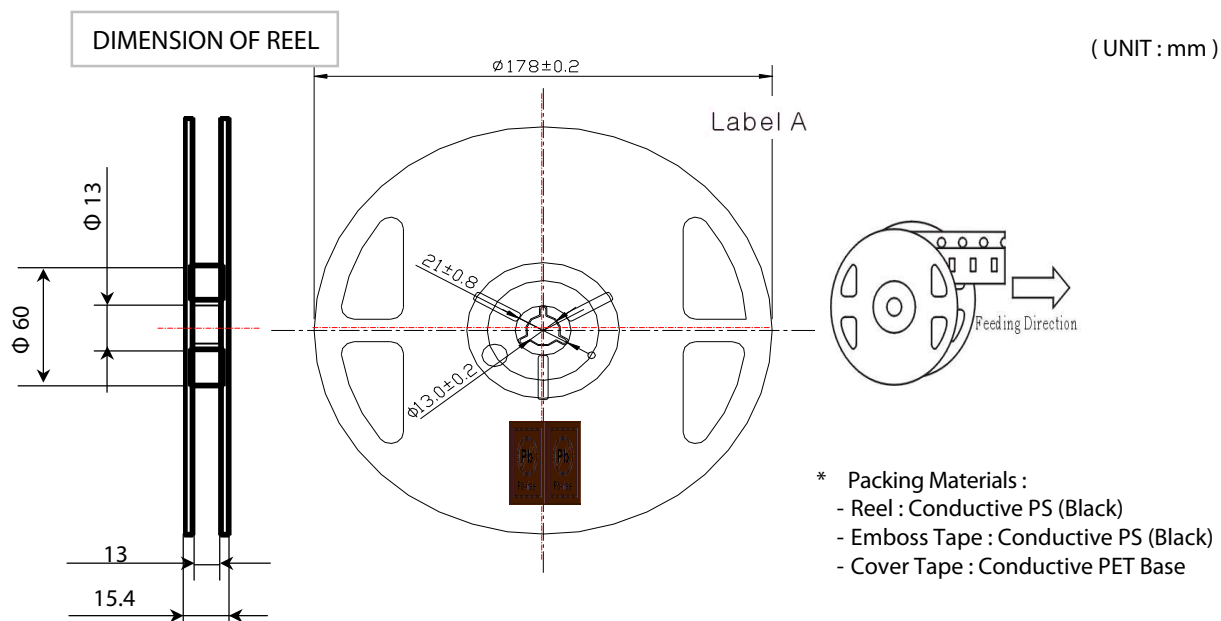
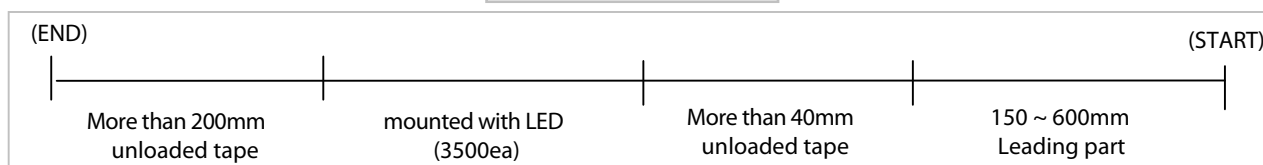
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9. Package

9-1. Taping Outline Dimension

**ARRANGEMENT OF TAPE**R
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10. Cautions on use

10-1. Circuit Layout

In general, the LEDs have a variation of forward voltage. Using LEDs with different forward voltages in a circuit with one resistor for the complete circuit causes different forward currents for each LED. This may lead to a variation in brightness. To avoid brightness variation of LEDs, the use of matrix circuit with one resistor for each LED is recommended.

10-2. Over-current-proof

Customer must apply resistor for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

10-3. For the Storage

- Proper temperature and RH conditions for storage are : 5°C ~ 35°C, RH 60%
- Do not open moisture-proof bag before the products are ready to use.
- Store products in a moisture-proof bag with a desiccant (Silica gel) after open.
- 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 color. Conditions for baking are 60 ± 5°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 the production date)

10-4. Adiva Technology Inc. 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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10-5. Static Electricity

- If over-voltage, which exceeds the absolute maximum rating, is applied to the LEDs, it will damage the LEDs and result in destruction. Since the LEDs are sensitive to the static electricity and surge, it is strongly recommended to use a wristband or anti-electricity glove when handling the LEDs and all devices, equipment and machinery must be properly grounded.
- Damaged LEDs will show some unusual characteristics such as the leak current remarkably increases, the turn-on voltage becomes lower, or the LEDs do not light at the low current.
- When examining the final product, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. Static-damage LEDs can easily be found by light-on test or the VF test at a low current.

10-6. Application limits of LED Driver IC controller

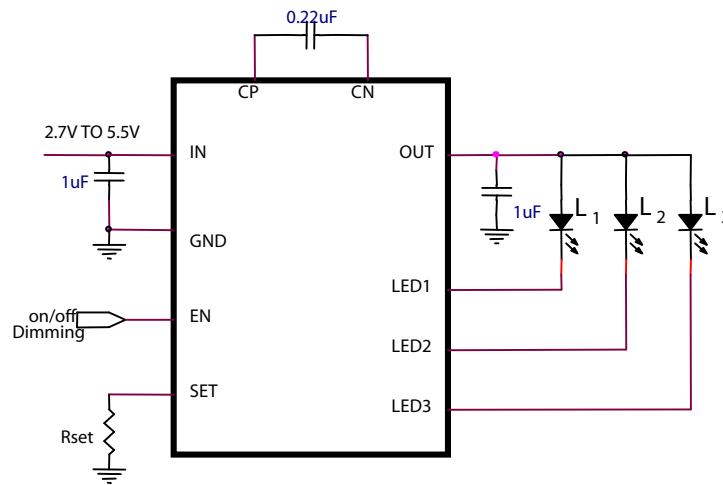
- GaN based LED is relatively weak to electrical damage (such as static electricity and over current stress). Forward leakage of LED occurred by such damage in the forward low current region may result in turn-on-delay of LCD back light, which is dependant on a specific function of driver IC.

For reasons mentioned above, minimum current level (source start-up current) of LED driver IC must be more than 0.3mA. Adiva can not make a guarantee on the LED using in Driver IC with start up current level of < 0.3mA.

- When parallel circuit LED driver IC is applied in BLU, hot spot may occur in low current LCD operation region (dimming mode) by difference of LED voltage in low current region. So, driver IC with Individual LED controller is recommended.

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10-7. Recommended Circuit Conditions (schematic)

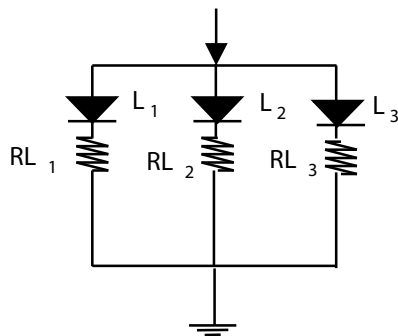


[Pic.1 Strongly Recommended Circuit]
(Driver IC with Individual LED controller is recommended)

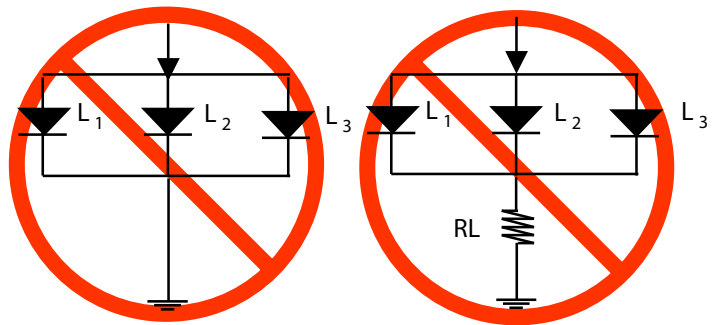
* Caution on designing in PCB & Parallel Circuit board

Using more than 3 pcs of LED per a phone, it is strongly recommended to use separate resistors per each LED. (Pic. 2)

Please do notice that it is needed total 3 ea of separate resistor, if one is connected to more than 2 pcs of LED (Pic. 3), it can cause serious problem on brightness).



[PIC. 2 Recommended Circuit in parallel mode]
: Separate resistor must use in each LED



[PIC.3. Abnormal Circuit]
: hot spot may occur
especially in low current LCD operation region
(dimming mode) by difference of LED voltage.

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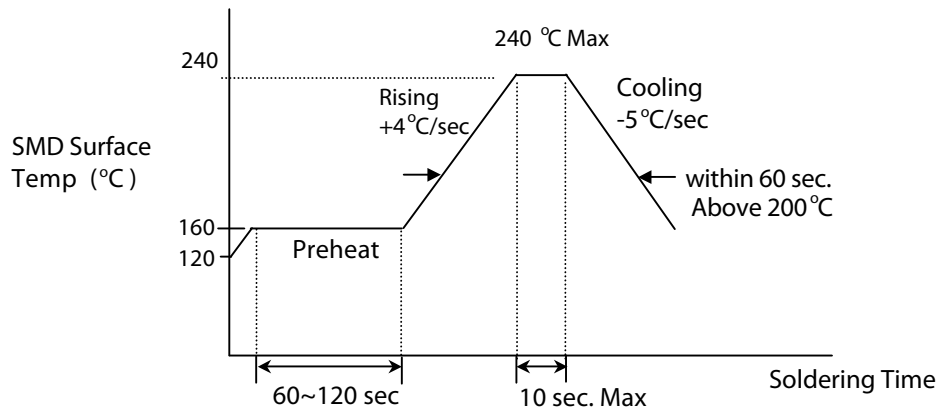
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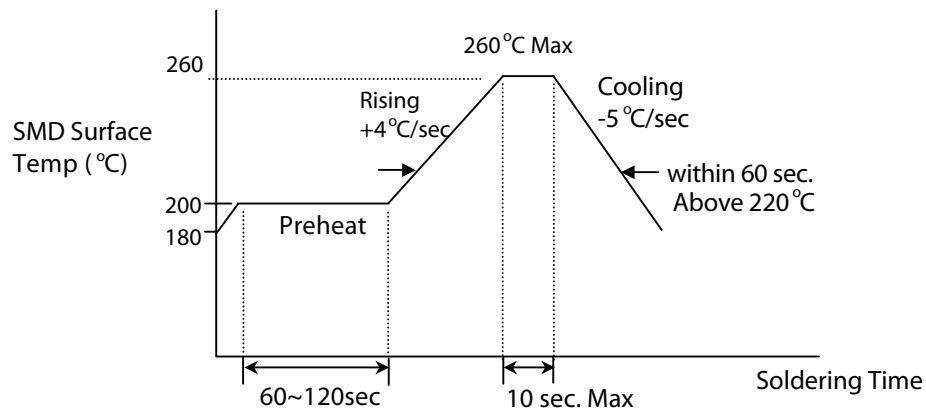
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11. Others

11-1. Lead Solder



11-2. Lead-free Solder

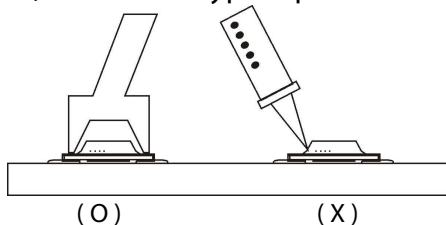


11-3. Soldering Iron

Basic spec is ≤ 5 sec when 260 °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.

11-4. Rework

- 1) Customer must finish rework within 5sec under 245 °C.
- 2) The head of Iron can not touch copper foil.
- 3) Twin-head type is preferred.

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