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DATA SHEET

PART NO.: L-S11F1GRBWT-IC

REV: A / 1

CUSTOMER'S APPROVAL: _____

DCC: _____

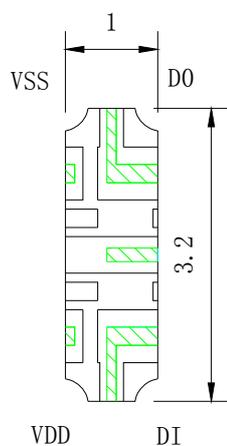
DRAWING NO.: DS-80-19-0005G

DATE: 2020-02-25

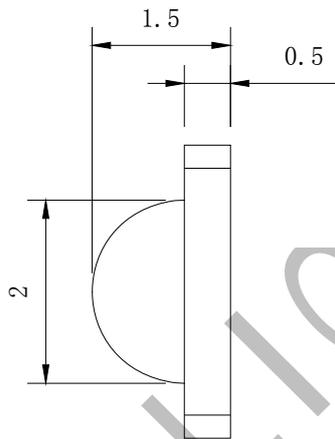
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● PACKAGE OUTLINE DIMENSIONS

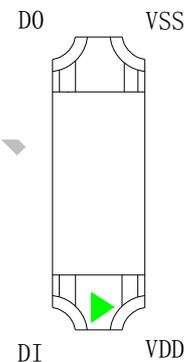
BACK VIEW



SIDE VIEW



TOP VIEW



Notes:

1. All dimensions are in millimeters.
2. Tolerance is $\pm 0.1\text{mm}$ (.004") unless otherwise noted.

● Features

- * Support signal reshaping to pass control waveforms to next adjacent driver
- * Cascading port transmission by a single data line
- * Built-in current regulator, three-way drive
- * Optional maximal drive current: 5mA
- * 256-step gray-scale output to allow 16,777,216 color display
- * Built-in oscillator 20MHz
- * LED driver port maximum withstand Voltage 6.5V
- * Built-in power-on-reset (2.6V) (@VDD=5V)
- * Operating voltage 4.5~5.5V

● Applications

- * LED point light source, LED pixel screen.
- * LED fantasy soft light bar, LED fantasy color hard light bar.
- * LED Phantom running Horse Lamp, LED Phantom Color guardrail Tube.
- * LED Phantom Module Lamp, LED Phantom Lamp string.

● Chip Materials

Light Color	Dice Material	Lens Color
IC	Si	White Diffused
R: Red	AlInGap	
G: Green	InGaN	
B: Blue	InGaN	

● Pin diagram and functions:



NO.	Symbol	Pin name	Function description
1	DO	Data output	Built-in Pull down resistance @ input mode
2	VSS	Ground	
3	VDD	Power	5V±10%
4	DI	Data input	Built-in Pull down resistance
/	R · G · B	Constant current output	



SURFACE MOUNT DEVICE LED

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● Absolute Maximum Ratings ($T_a = -20 \sim 70^\circ\text{C}$, $V_{DD} = 5.0\text{V}$, $V_{SS} = 0\text{V}$)

SYMBOL	PARAMETER	Rating	UNIT
P_D	Power Dissipatio	400	mW
V_{DD}	Voltage	-0.5~6.0	V
V_{In}	Logic input voltage	-0.5~ $V_{DD}+0.5$	V
I_o	R G B Output drive current	25	mA
ESD	Electrostatic Discharge Threshold (HBM) ^{Note A}	1000	V
Topr	Operating Temperature Range	-40 ~ +85	°C
Tstg	Storage Temperature Range	-40 ~ +85	°C

Note A:

HBM: Human Body Model. Seller gives no other assurances regarding the ability of to withstand ESD

● Electrical Characteristics ($T_a = -40 \sim 85^\circ\text{C}$, $V_{DD} = 4.5 \sim 5.5\text{V}$, $V_{SS} = 0\text{V}$)

Symbol	Parameter	Min.	Avg.	Max.	UNIT	Test conditions
V_{DD}	Chip internal supply voltage	4.5	5.0	5.5	V	
I_{DD}	Working current	-	-	2	mA	RGB non-loaded
V_{IH}	High level input voltage	2.7	-	V_{DD}	V	Din
V_{IL}	Low level input voltage	0	-	1.0	V	Din
V_{OH}	High level output voltage	4.5	-	-	V	$I_{OH} = 4\text{mA}$
V_{OL}	Low level output voltage	-	-	0.4	V	$I_{OL} = 4\text{mA}$
R_{PD}	Pull down resistance	-	500K	-	Ω	DI、DO ($V_{DD} = 5\text{V}$)
I_{sink}	R G B Maximum Sink current	4.75	5.0	5.25	mA	$V_o = V_{DD} - 3.0\text{V}$ ($V_{DD} = 5\text{V}$)
I_{off}	RGB leakage current (When closed)	-	-	1	μA	PWM off, R G B Port=5V

● RGB LED Photoelectric parameter

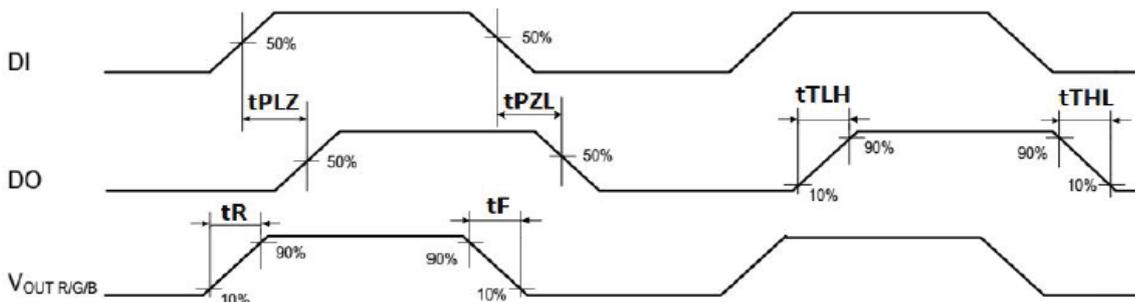
Color	IF=5mA	
	WD(nm)	IV(mcd)
Red	615-625	18-112
Green	525-535	28-280
Blue	465-475	7.1-45

Notes:

1. Luminous intensity is measured with a light sensor and filter combination that proximities the CIE eye-response curve.
2. The dominant wavelength WD is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
3. Caution in ESD :
Static Electricity and surge damages the LED. It is recommended use a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.
4. Major standard testing equipment by “Instrument System” Model : CAS140B Compact Array Spectrometer and “KEITHLEY” Source Meter Model : 2400.

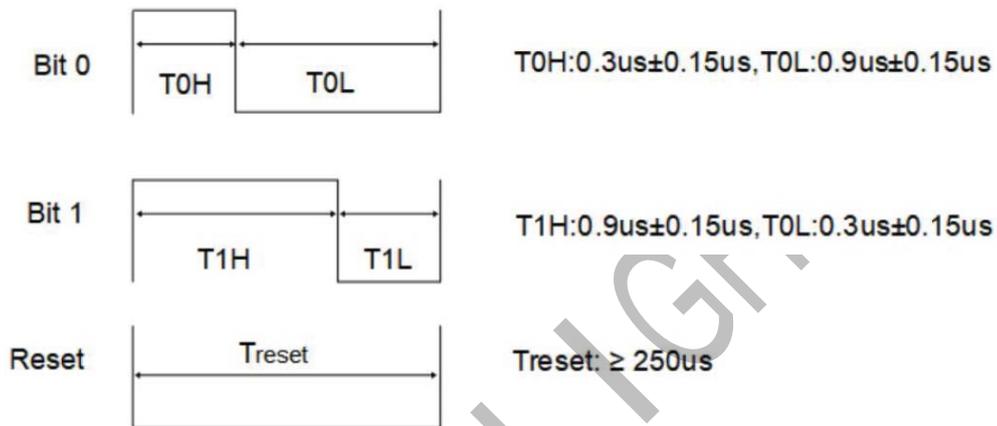
● Dynamic Parameter (Ta= 25°C, V_{DD}=5.0V, V_{SS}=0V)

Symbol	Parameter	Min.	Avg.	Max.	UNIT	Test conditions
tPLZ	Propagation delay time			80	ns	Din → Dout, CL=30pF,
tPZL				80	ns	
tTHL	Rise time		15		ns	
tTLH	Falling time		15		ns	
tR	Rise time		50		ns	G · R · B=20mA, CL=30pF
tF	Falling time		50		ns	
Fdata	Data transmission speed		800		KHz	



● Coding description

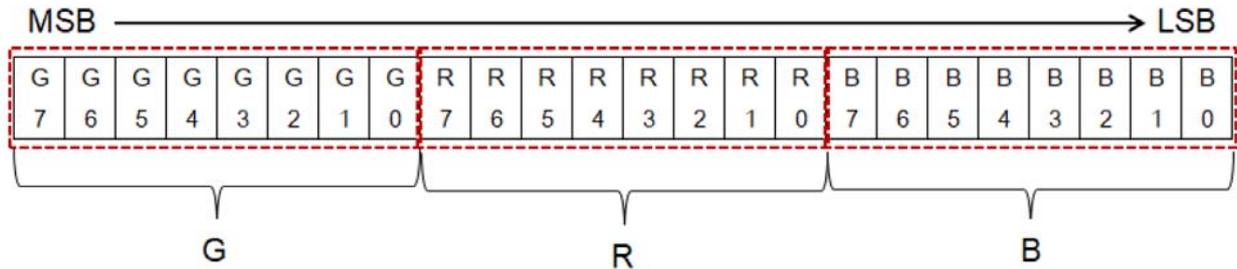
Coding sequence: The data of the microprocessor communicate with the chip through the single wire bus interface. The communication protocol is carried out in the form of polarity to zero, and each word symbol must have a low level. The starting level of each character of this protocol is high, and the time width of the high level is determined by "0" or "1" code. Input code type:



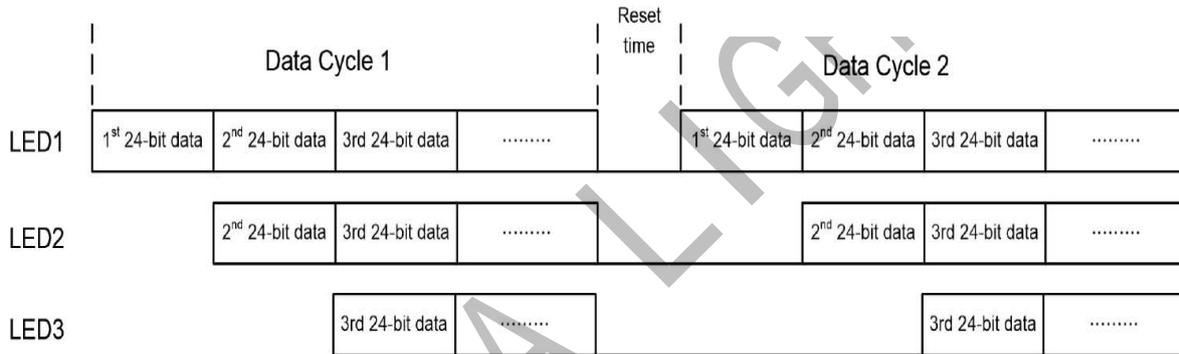
● Data Transfer Time (VDD=5.0V)

Name	Description	Min.	Avg.	Max.	Admissible error	Unit
T0H	0 code, high level time		0.3		±0.15	us
T1H	1 code, high level time		0.9		±0.15	us
T0L	0 code, low level time		0.9		±0.15	us
T1L	1 code, low level time		0.3		±0.15	us
Trst	Reset code, low level time	250				us

● Protocol data format:



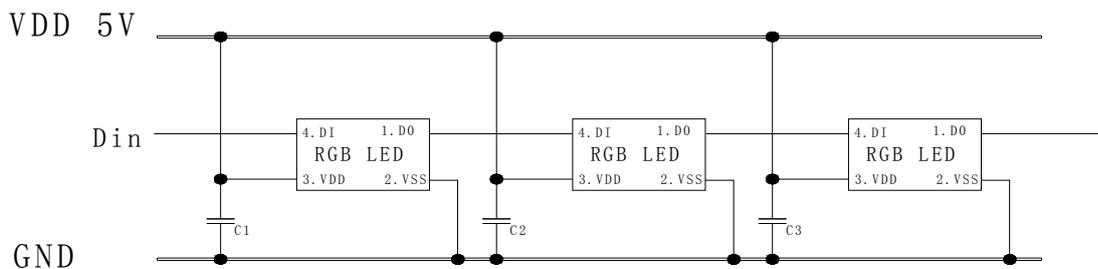
● Input data stream for each chip (take 3 chips as an example)



● System topology graph:



● Typical application circuit:





SURFACE MOUNT DEVICE LED

Part No.: L-S11F1GRBWT-IC

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● Label Explanation



ITEM CODE:PARRA LIGHT

PART NO: L-S11F1GRBWT-IC

IV --- Luminous Intensity Code

LOT NO: EM S L 12 09 0110
 A B C D E F

A---EM: Emos Code

B---S:SMD

L---Local

D---Year

E---Month

F---SPEC.

PACKING QUANTITY OF BAG :

3000pcs for 150、170、110、155、115、11Fseries

4000pcs for 191 series

5000pcs for 192 series

DATE CODE: 2012 09 10
 G H I

G--- Year

H--- Month

I --- Day

● Typical Electro-Optical Characteristics Curves

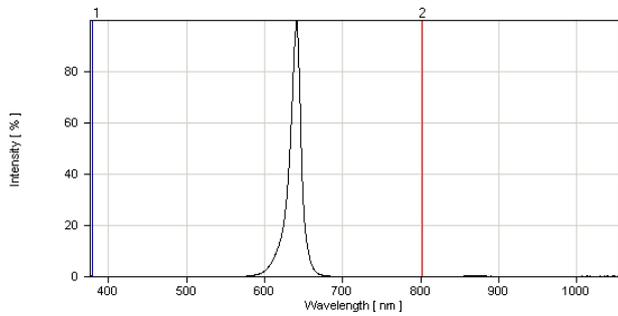


Fig.1 Red Relative Intensity vs. Wavelength

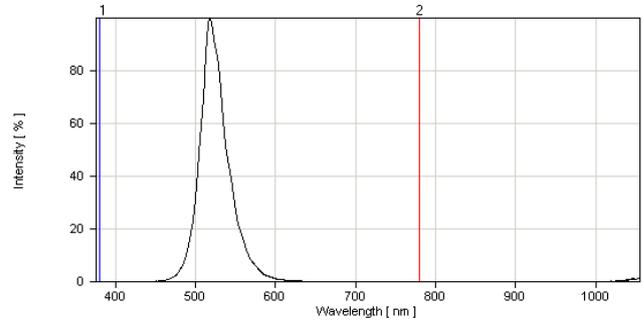


Fig.1 Green Relative Intensity vs. Wavelength

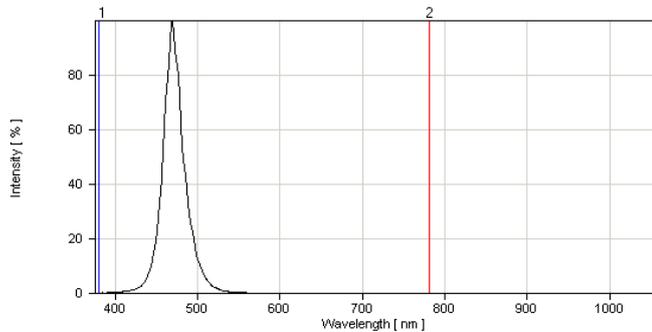
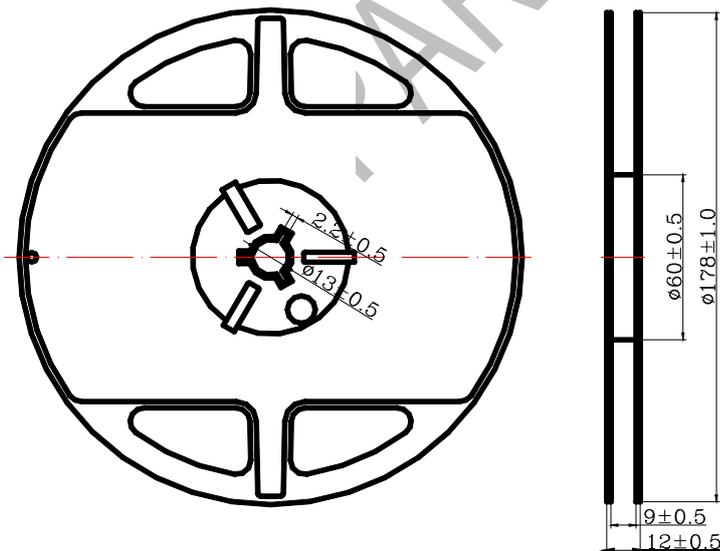


Fig.1 Blue Relative Intensity vs. Wavelength

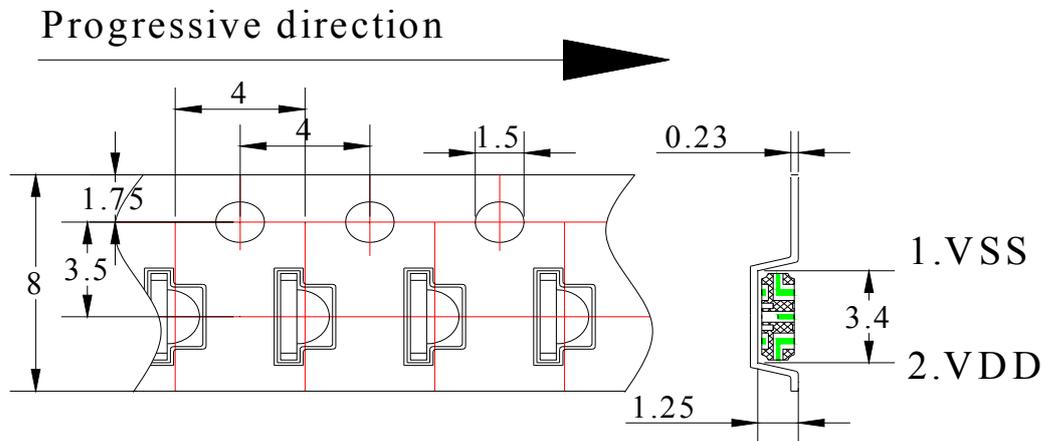
● Reel Dimensions



Notes:

1. Taping Quantity: 3000pcs
2. The tolerances unless mentioned is $\pm 0.1\text{mm}$, Angle $\pm 0.5^\circ$, Unit: mm.

● Package Dimensions Of Tape And Reel

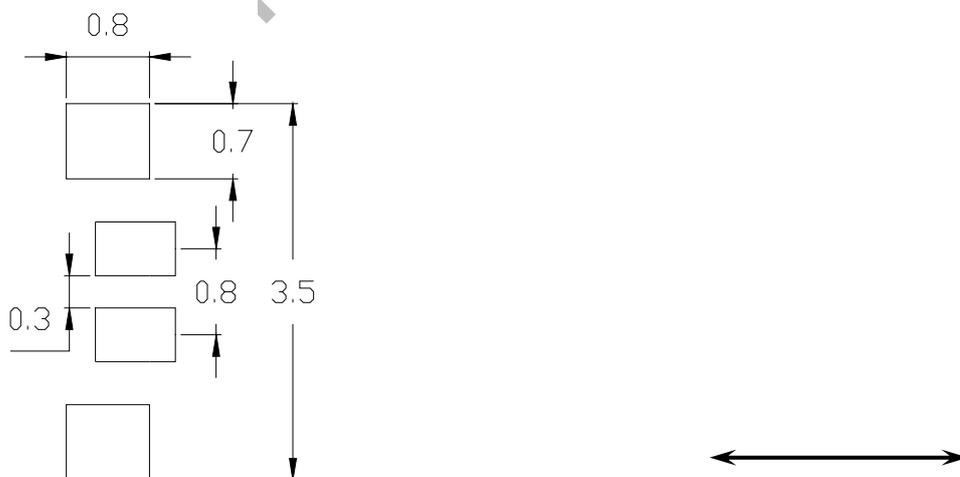


Notes: All dimensions are in millimeters.

● Cleaning

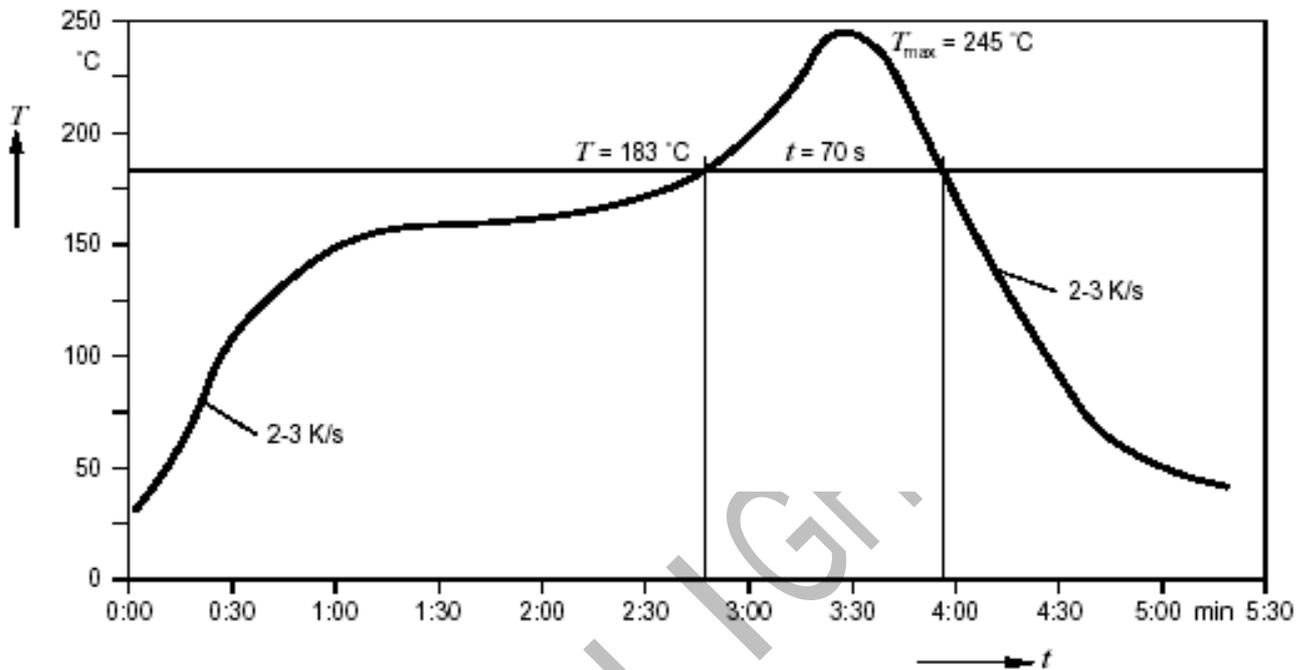
- * If cleaning is required , use the following solutions for less than 1 minute and less than 40°C.
- * Appropriate chemicals: Ethyl alcohol and isopropyl alcohol.
- * Effect of ultrasonic cleaning on the LED resin body differs depending on such factors as the oscillator output, size of PCB and LED mounting method. The use of ultrasonic cleaning should be enforced at proper output after confirming there is no problem.

● Suggest Soldering Pad Dimensions

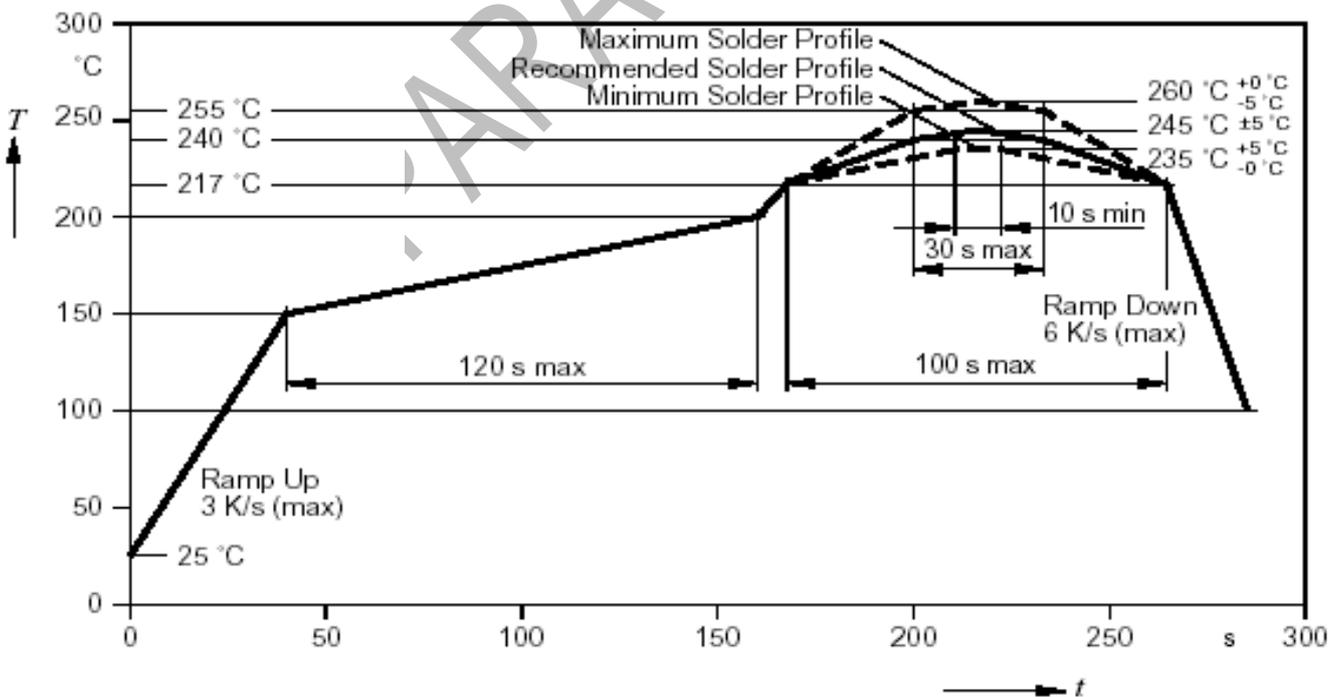


Direction of PWB camber
and go to reflow furnace

● Suggest Sn/Pb IR Reflow Soldering Profile Condition:



● Suggest Pb-Free IR Reflow Soldering Profile Condition:





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CAUTIONS

1.Application Limitation:

The LED's described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household application). Consult PARA's sales in advance for information on application in which exceptional quality and reliability are required, particularly when the failure or malfunction of the LED's may directly jeopardize life or health (such as airplanes, automobiles, traffic control equipment, life support system and safety devices).

2.Storage:

Do not open moisture proof bag before the products are ready to use.

Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

After opening the package: The LED's floor life is 1 year under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment: 60±5°C for 24 hours.

3.Soldering

Do not apply any stress to the lead frame during soldering while the LED is at high temperature.

Recommended soldering condition.

Reflow Soldering:

Pre-heat 120~150°C, 120sec. MAX., Peak temperature : 240°C Max. Soldering time: 10 sec Max.

Soldering Iron: (Not recommended)

Temperature 300°C Max., Soldering time : 3 sec. Max.(one time only), power dissipation of iron : 20W Max. use SN60 solder of solder with silver content and don't to touch LED lens when soldering.

Wave soldering:

Pre-heat 100°C Max, Pre-heat time 60 sec. Max, Solder wave 260°C Max, Soldering time 5 sec. Max. performed consecutively cooling process is required between 1st and 2nd soldering processes.

4. Lead-Free Soldering

For Reflow Soldering:

- 1、Pre-Heat Temp:150-180°C,120sec.Max.
- 2、Soldering Temp: Temperature Of Soldering Pot Over 230°C,40sec.Max.
- 3、Peak Temperature:260°C , 5sec.
- 4、Reflow Repetition:2 Times Max.
- 5、Suggest Solder Paste Formula 93.3 Sn/3.1 Ag/3.1 Bi /0.5 Cu

For Soldering Iron (Not Recommended):

- 1、Iron Tip Temp:350°C Max.
- 2、Soldering Iron:30w Max.
- 3、Soldering Time:3 Sec. Max. One Time.

For Dip Soldering:

- 1、Pre-Heat Temp:150°C Max. 120 Sec. Max.
- 2、Bath Temp:265°C Max.
- 3、Dip Time:5 Sec. Max.