

505015-FTWC-RGB-C64F

5.5 x 5.0mm, Intelligent Control LED
PLCC-6 Package Integrated Light Source

Technical Data Sheet

Features:

This is a two-wire transmission channel three (RGB) driving intelligent control circuit and the light emitting circuit in one of the LED light source control. Products containing a signal decoding module, data buffer, a built-in constant current circuit and RC oscillator; CMOS, low voltage, low power consumption; 256 level grayscale PWM adjustment and 32 brightness adjustment; use the double output, Data and synchronization of the CLK signal, connected in series each wafer output action synchronization.

Applications:

- Full color LED string light, LED full color module, LED super hard and soft lights, LED guardrail tube, LED appearance / scene lighting
- LED point light, LED pixel screen, LED shaped screen, a variety of electronic products, electrical equipment etc..

Description:

- Top SMD internal integrated high quality external control line serial cascade constant current IC; 5V application; default on electric lights;
- Control circuit and the RGB chip in SMD 5050 components, to form a complete control of pixel,
- color mixing uniformity and consistency;
- The two-wire synchronous control.
- The three RGB output control, 8Bit (256) color; 5Bit (32) to adjust the brightness;
- The three constant current drive, self detection function specific signal
- The maximum frequency of 30MHZ serial data input
- The double data transmission, built-in support uninterrupted oscillation PWM output, can maintain a static image.

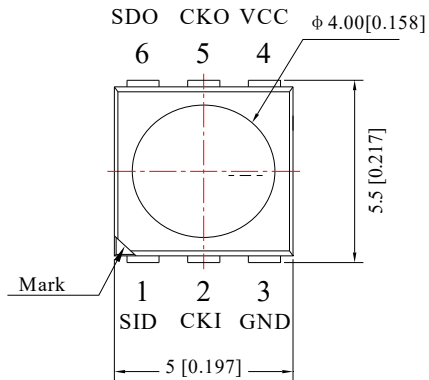
Part No.	Emitting Color	Lens Color
505015-FTWC-RGB-C64F	R Red	Water Clear
	G Pure Green	
	B Blue	

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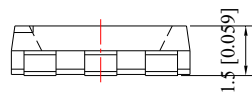
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Package Dimension:

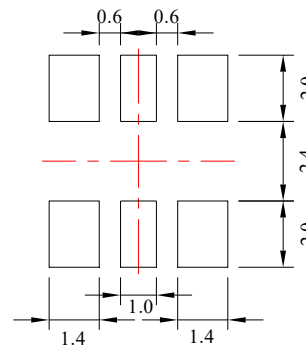
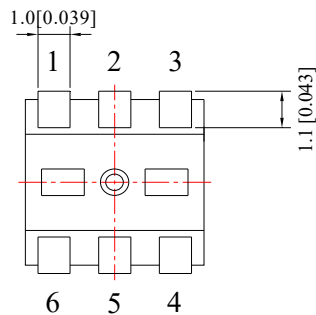


- 1 SID
- 2 CKI
- 3 GND
- 4 VCC
- 5 CKO
- 6 SDO

Polarity



Recommended Soldering Pad dimensions



NO	Symbol	Pin Name	Function description
1	SDI	Data Input	control signal Input data
2	CKI	CLK Input	control signal Input Clock data
3	GND	Ground	The signal and power supply and grounding
4	VCC	Power	power supply pin
5	CKO	CLK Output	control signal output Clock data
6	SDO	Data Input	control signal output data

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010") unless otherwise noted.
3. Protruded resin under flange is 1.00mm (.039") max.

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Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Ratings	Unit
Power supply voltage	VDD	+3.7~+5.5	V
Input voltage	VI	-0.3~+0.3	V
Operation junction temperature	Topt	-25~+80	°C
Storage temperature range	Tstg	-40~+105	°C

Electrical Characteristics: (TA=-20~+70°C, VDD=4.5~5.5V, VSS=0V, unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit
The biggest LED output current	I _{max}	—	—	20	mA
The clock low level width	TCLKL	—	17	—	ns
The clock high level width	TCLKH	—	17	—	ns
PWM	FPWM	—	4.6	—	KHZ
Data set up time	TSETUP	—	—	10	ns
Static power consumption	IDD	—	1.0	—	mA
Voltage of power supply in chip	VDD	3.7	5.0	5.5	V

RGB IC characteristic parameter:(18mA)

Emitting color	Wavelength(nm)	Luminous intensity (mcd) Typ
Red	620-630	400-700
Green	515-530	1000-1500
Blue	460-475	300-500

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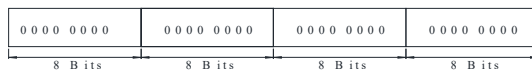
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Feature Descriptions:

1. Series data structure



Start Frame 32 Bits



Start Frame 32 Bits



Start Frame 32 Bits



Product structure: GRB order output light, optimize the product blending effect (adjusted IC default RGB order wafer position)

2.256 level gray level:

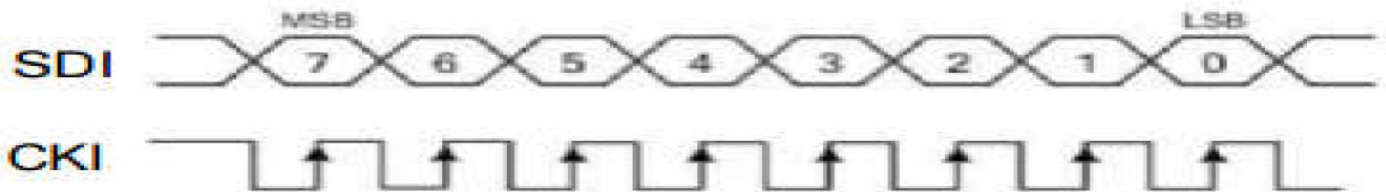
Data	Duty Cycle
MSB. LSB	
0000 0000	0/256
0000 0001	1/256
0000 0010	2/256
--- ---	---
---	---
---	---
1111 1101	253/256
1111 1110	254/256
1111 1111	255/256

3. PWM input / output signal relationship:

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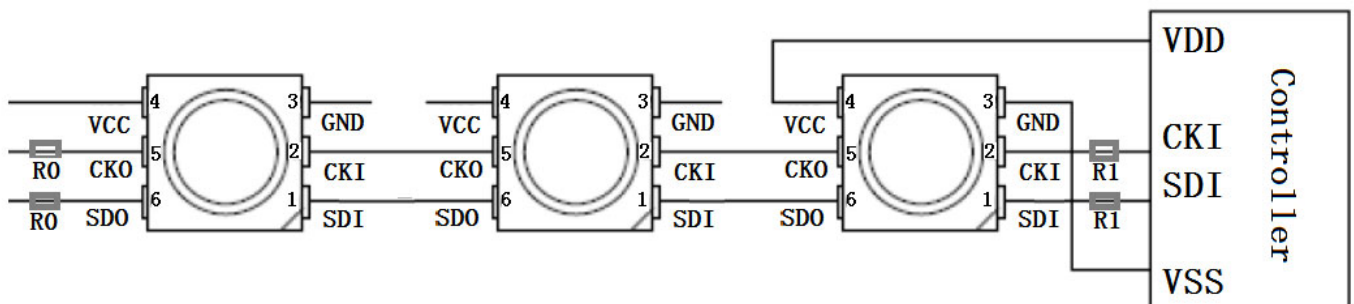
4. 5-Bit (level 32) brightness adjustment (simultaneous control of OUTR\OUTG\OUTB three port current):

Data	Driving Current
MSB.....LSB	
00000	0/31
00001	1/31
00010	2/31
-	-
-	-
-	-
-	-
11101	29/31
11110	30/31
11111	31/31

5. Refresh Rate

Frame rate (=1/ (64+ (32* points)) *CKI (cycle) unit: frames per second)
 Such as: 1024 points, CKI frequency is 1MHZ, is =30 frames per second frame rate.

Typical application circuit:

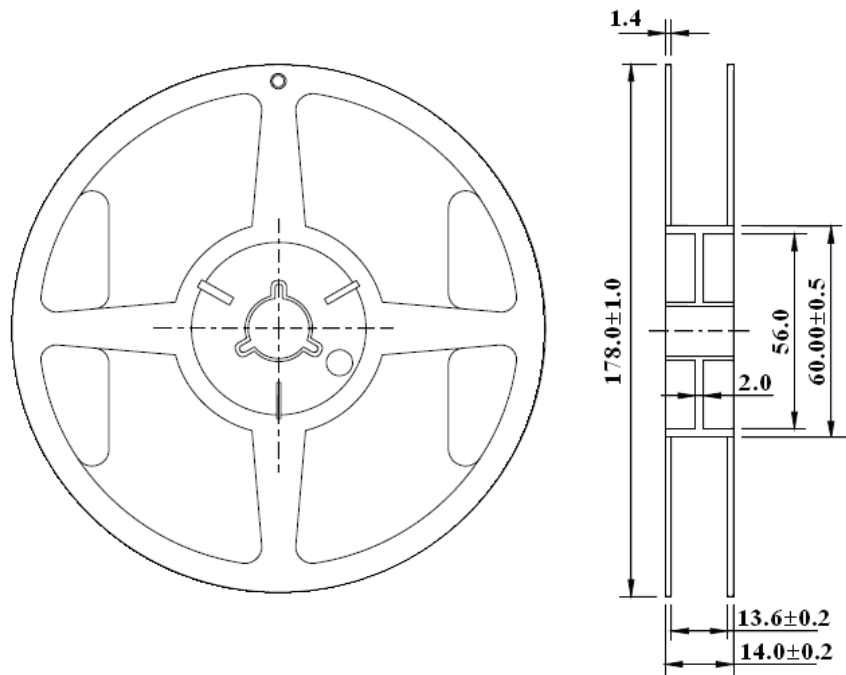


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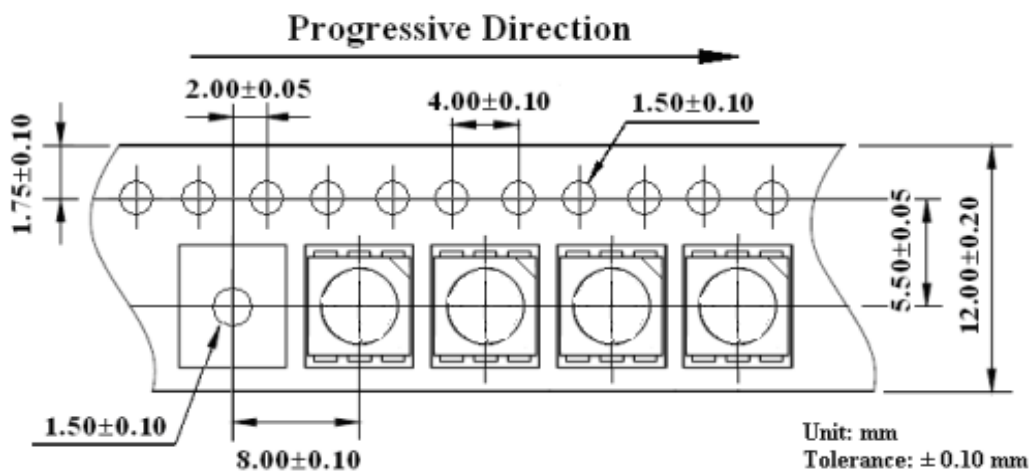
Reel Dimensions:



Unit: mm
Tolerance: ± 0.25mm

Carrier Tape Dimensions:

Loaded quantity 1000 pcs per reel.



Unit: mm
Tolerance: ± 0.10 mm

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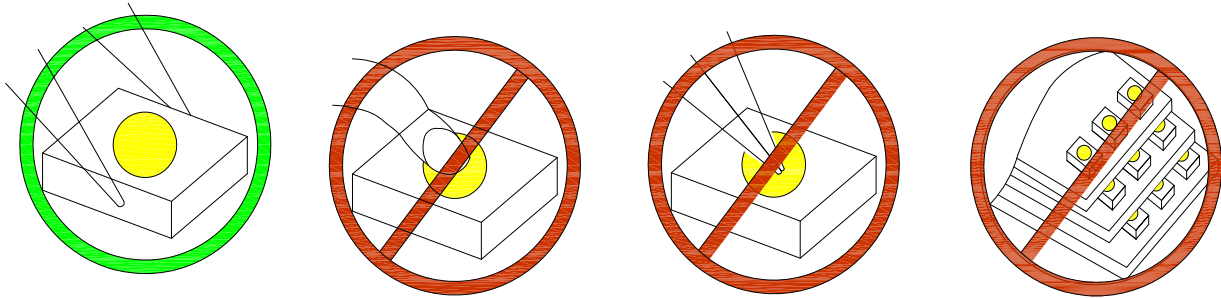
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CAUTIONS

1. Handling Precautions:

- 1.1. Handle the component along the side surfaces by using forceps or appropriate tools.
- 1.2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.
- 1.3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



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.

2. Storage

- 2.1. Do not open moisture proof bag before the products are ready to use. □
- 2.2. Before opening the package, the LEDs should be kept at 30°C or less and 60%RH or less. □
- 2.3. The LEDs should be used within a year. □
- 2.4. After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.
- 2.5. The LEDs should be used within 24 hours after opening the package. □
- 2.6. If the moisture adsorbent material has fabled away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 65±5°C for 24 hours.

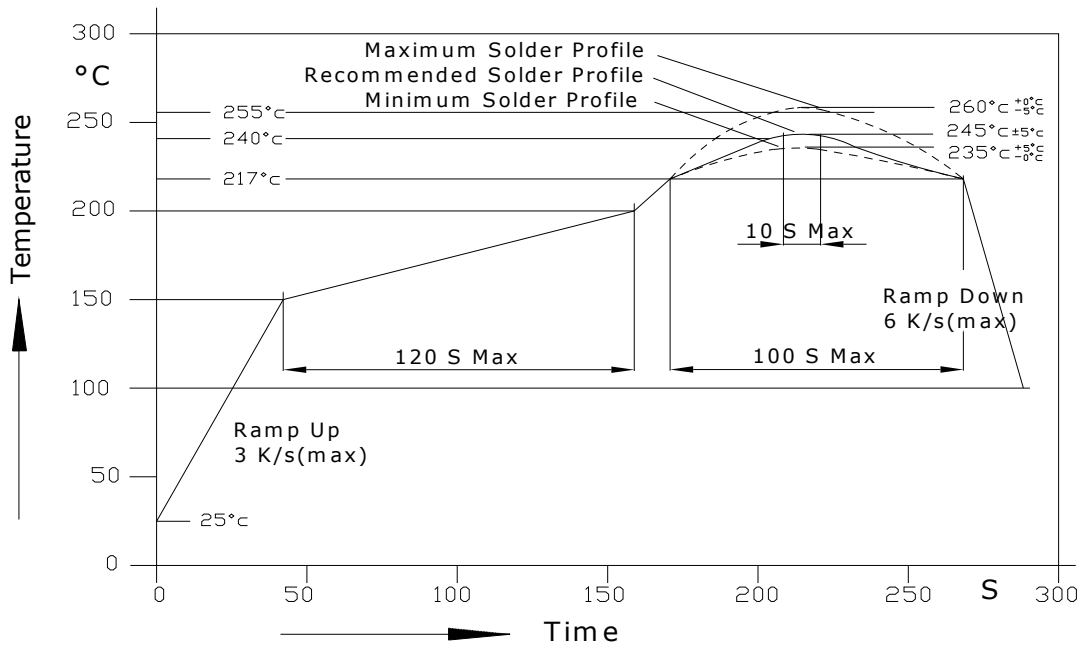
3. Soldering Condition

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3.1. Pb-free solder temperature profile



- 3.2. Reflow soldering should not be done more than two times.
- 3.3. When soldering, do not put stress on the LEDs during heating.
- 3.4. After soldering, do not warp the circuit board.
- 3.5. Recommended soldering conditions:

Reflow soldering		Soldering iron	
Pre-heat	150~200°C	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	250°C Max.		(one time only)
Soldering time	10 sec. Max.(Max. two times)		

3.6. Because different board designs use different number and types of devices, solder pastes, reflow ovens, and circuit boards, no single temperature profile works for all possible combinations.

However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific

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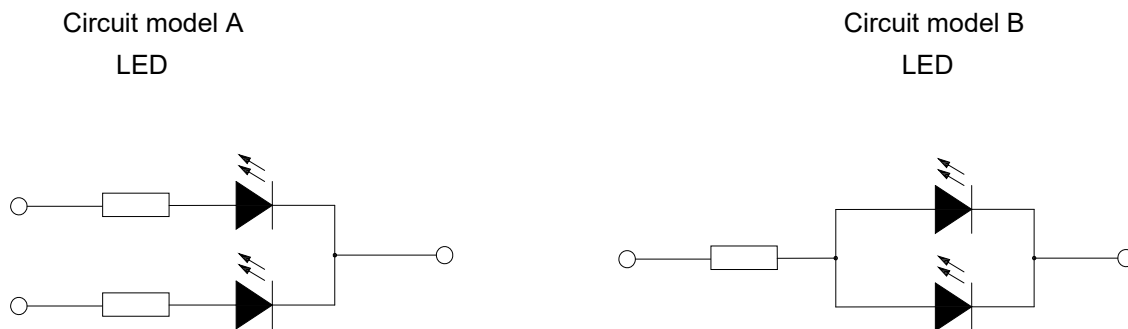
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characterization.

4. Drive Method

4.1. An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.



a. Recommended circuit.

b. The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

5. ESD (Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no lightup" at low currents. To verify for ESD damage, check for "lightup" and V_f of the suspect LEDs at low currents. The V_f of "good" LEDs should be $>2.0V@0.1mA$ for InGaN product and $>1.4V@0.1mA$ for AlInGaP product.

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