PRODUCT SPECIFICATION

Part Number

PLH3535I4-WCRGB1

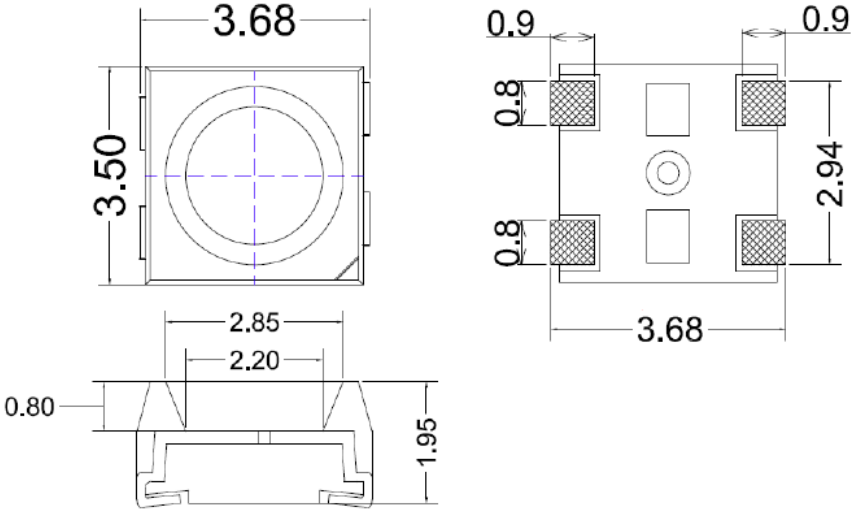
Details

- 3535 RGB LED with Integrated IC
- PLCC-4 – 3.5 x 3.5 x 1.95mm
- Emitting Color: RGB

Features

- 3535 with integrated high quality constant current IC and RGB LED chip
- Built-in IC, with high precision of constant current and internal RGB chips spectral processing in advance
- Single line data transmission (return to zero code)
- Specific Shaping Transmit Technology – number of LED stacked is not restricted
- Cascading Enhancement Technology – any 2 LED spacing can be up to 10 meters
- Data transfer rate of 800 kbp/s at 30 frames per second
- RGB output port PWM control can achieve 256 gray level adjustments
- Upon powering up, IC performs self-inspection the lights connection on the pin B lamp
- SA-I Anti-interference patent technology for single line data transmission
- Built-in power supply reverse connect protection module, reversed power input will not damage IC

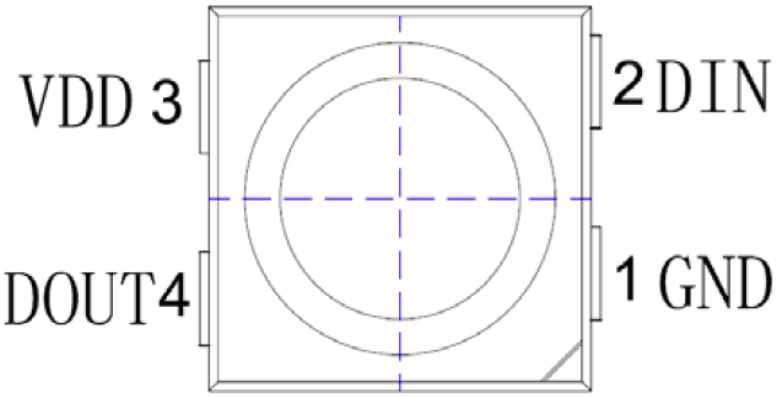
Mechanical Dimensions



Notes:

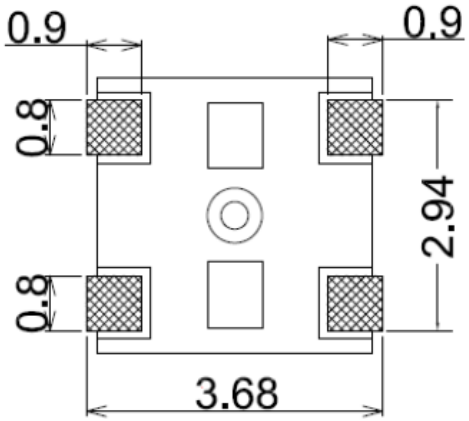
1. Dimensions in millimeters unless otherwise noted. Tolerance: +/-0.1mm
2. Specifications subject to change without notice

Pin Configuration & Description

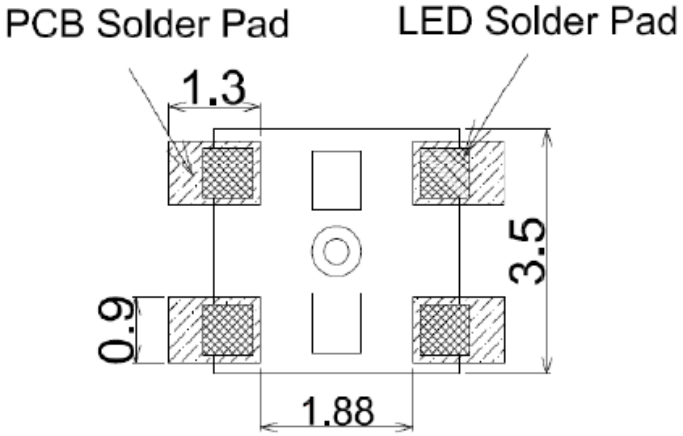


Number	Symbol	Function Description
1	GND	Ground
2	DIN	Control Data Signal Input
3	VDD	Power Supply LED
4	DOUT	Control Data Signal Output

Soldering Pad Size



Pad Size



Steel mesh size

Device Selection Guide

Model Number	Chip		Resin
	Material	Emitting Color	
PLH3535I4-WCRGB1	AlInGaP	Red	Water Clear
	InGaN	Green	
	InGaN	Blue	

Absolute Maximum Ratings

Parameter	Symbol	Range	Unit
Logic Supply Voltage	VDD	+3.5~+5.5	V
Logic Input Voltage	VIN	-0.5~VDD+0.5	V
Operating Temperature	TOPT	-45~+85	°C
Storage Temperature	TSTG	-50~+150	°C
ESD Pressure (HBM)	VESD	4k	V
ESD Pressure (DM)	VESD	200	V

LED Characteristics

Color	12ma	
	Wavelength (nm)	Light Intensity (mcd)
Red	620-630	600-700
Green	515-530	1000-1500
Blue	460-470	300-500

Recommended Operating Ranges *(unless otherwise specified, Ta= -20 ~ +70 ℃, VDD=4.5 ~ 5.5V,VSS=0V)*

Parameter	Symbol	Min.	Typ.	Max	Unit	Test conditions
Supply Voltage	VDD	--	5.2	--	V	--
R/G/B port pressure	VDS, MAX	--	--	26	V	--
DOUT drive capability	IDOH	--	49	--	mA	Maximum source current
DOUT drive capability	IDOL	-	-50	--	mA	Maximum sink current
High level input voltage	VIH	0.7*VDD	--	--	V	VDD=5.0V
Low level input voltage	VIL	--	--	0.3*VDD	V	VDD=5.0V

Parameter	Symbol	Min.	Typ.	Max	Unit	Test conditions
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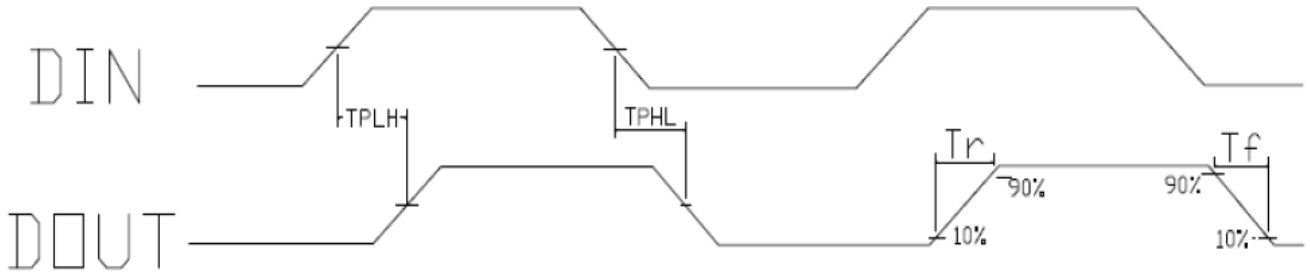
High level input voltage	VIH	0.7*VDD	--	--	V	VDD=5.0V
Low level input voltage	VIL	--	--	0.3*VDD	V	VDD=5.0V
Frequency of PWM	FPWM	--	1.2	--	KHZ	--
Static Power Consumption	IDD	--	1	--	mA	--

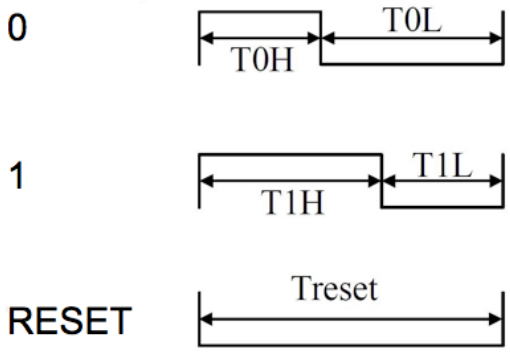
Switching Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Speed of data transmission	fDIN	--	800	--	KHZ	Duty ratio of 67% (data 1)
DOUT transmission delay	tPLH	--	--	500	ns	DIN→DOUT
	TPHL	--	--	500	Ns	
I*OUT* Rise/Drop Time	Tr	--	100	--	ns	V*DS*=1.5 I*OUT*=13mA
	Tf	--	100	--	Ns	



Timing Waveforms

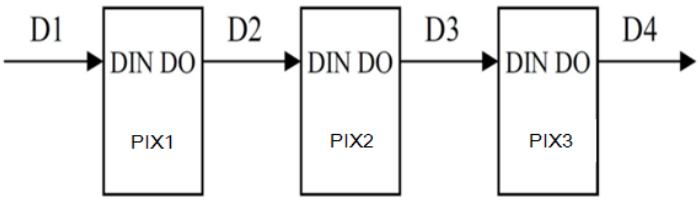
1. *Input Code*



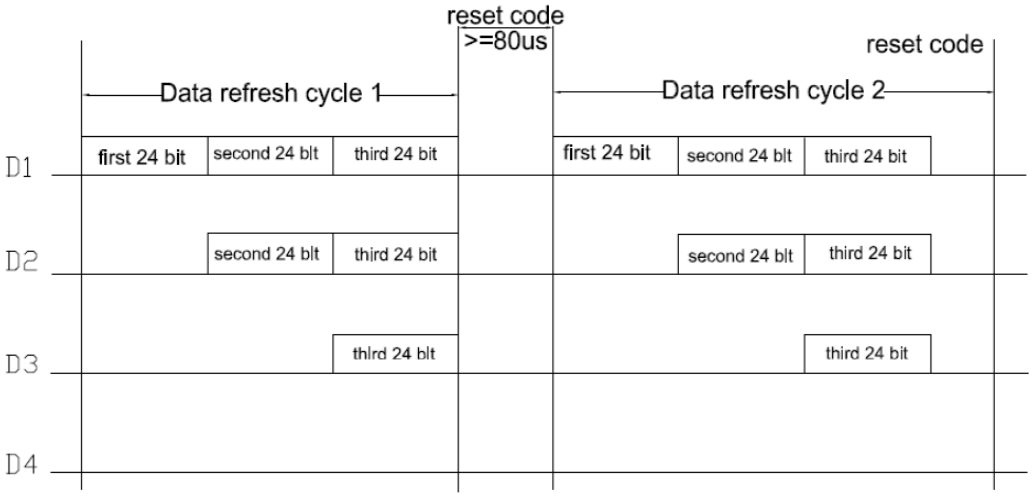
2. The data transmission time (TH+TL=1.25μs±600ns):

Name	Description	Typ. Value	Error
T0H	0 code, high level time	0.3μs	±0.15μs
T0l	0 code, low level time	0.9μs	±0.15μs
T1H	1 code, high level time	0.9μs	±0.15μs
T1L	1 code, low level time	0.3μs	±0.15μs
Trst	Reset code, low level time	80μs	--

3. Connection Scheme



4. Data Transfer Format



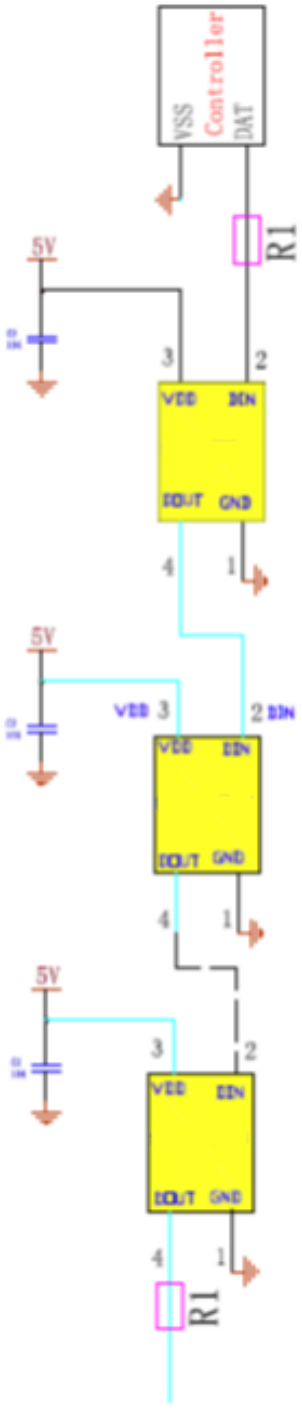
Note: the D1 sends data for MCU, D2, D3, D4 for data forwarding automatic shaping cascade circuit.

5. 24-bit data format

G7	G6	G5	G4	G3	G2	G1	G0	R7	R6	R5	R4
R3	R2	R1	R0	B7	B6	B5	B4	B3	B2	B1	B0

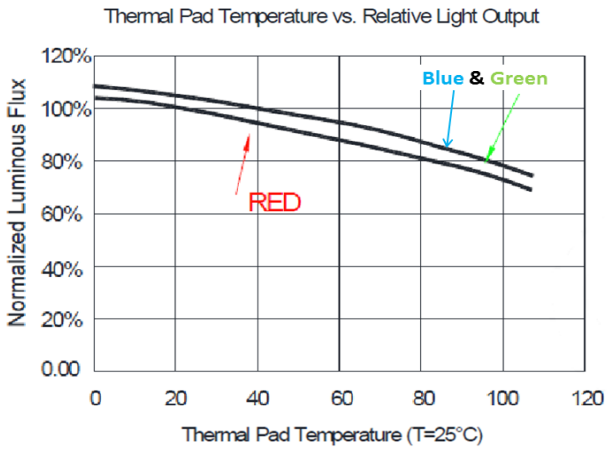
Note: high starting, in order to send data (G7 - G6 - ....B0)

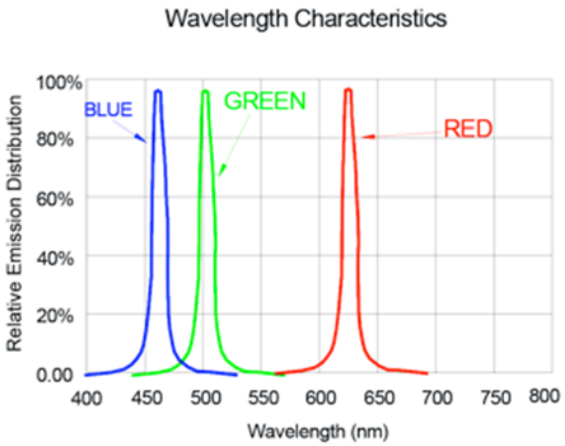
Typical Application Circuit

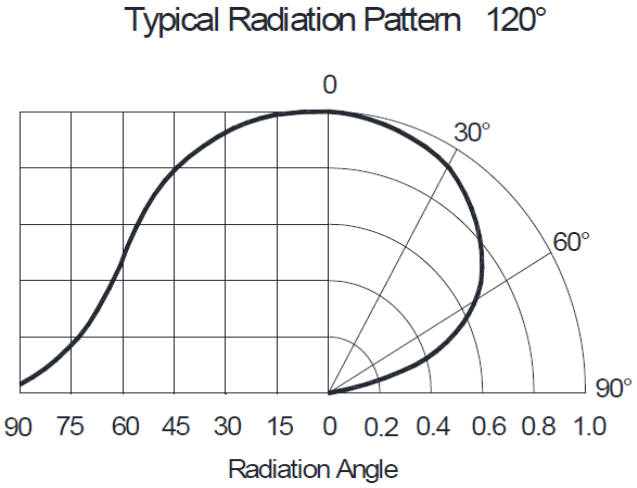


Note: Product signal input and output must be connected in series with protection resistor R1. R1 depends on the size of the cascade amount, the greater the number of cascade, the smaller R1. The general recommended value is between 200-2KΩ, usually the recommended value is typical 500Ω.

LED Performance Graph







Precautions

1. Storage

1.1 Do not open moisture poof bag before the products are ready to use

1.2 Before opening the package, the LEDs should be kept at 30℃ or less and 80%RH or less.

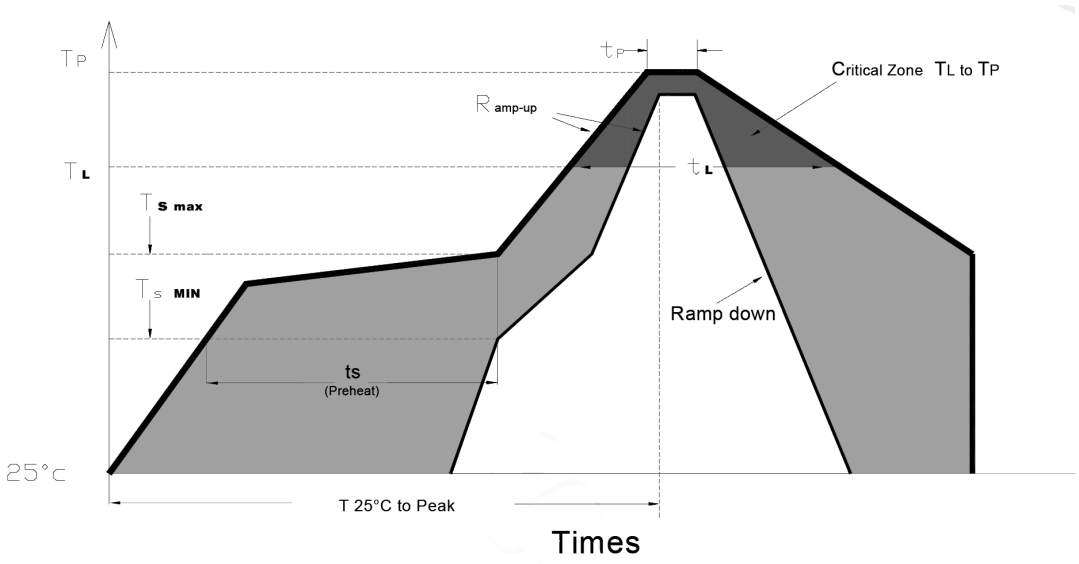
1.3 The LEDs should be used within a year

1.4 After opening the package, the LEDs should be kept at 30℃ or less and 60%RH or less.

1.5 The LEDs should be used within 24 hours after opening the package

1.6 If the moisture absorbent material has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 60±5℃ for 24 hours

2. Soldering Condition



Profile Feature	Lead-Free Solder
Average Ramp-Up Rate (Ts $_{max}$ to Tp)	3℃/second max.
Preheat: Temperature Min (Ts $_{min}$)	150℃
Preheat: Temperature Min (Ts $_{max}$)	200℃
Preheat: Time (ts $_{min\ to}$ ts $_{max}$)	60-180 seconds
Time Maintained Above: Temperature (T_L)	217 ℃
Time Maintained Above: Time (t_L)	60-150 seconds
Peak/Classification Temperature (T_P)	240 ℃
Time Within 5℃ of Actual Peak Temperature (tp)	<10 seconds
Ramp-Down Rate	6℃/second max.
Time 25 ℃ to Peak Temperature	<6 minutes max.

Note: Excessive soldering temperature and / or time might result in deformation of the LED lens or catastrophic failure of the LED.

3. Soldering Iron
    3.1 Each terminal is to go to the tip of soldering iron temperature less than 260℃ for 5 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.
4. Repairing
    5.1 Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
5. Caution in ESD
    5.2 Static Electricity and surge damages the LED. It is recommended to use a wristband or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.

PLH3535I4-WCRB1 Customer Approval Signatures	Approved Part Number	Approved By	Notes/Remarks

Record Of Revisions			
Rev.	**Comments**	**Page**	**Date**
0	Released Spec	--	05/21/2019