# ■Features

- Intelligent reverse connect protection, the power supply reverse connection does not damage the IC.
- The control circuit and the LED share the only power source.
- Control circuit and RGB chip are integrated in a package of 5050 components, form a complete control of pixel point.
- Built-in signal reshaping circuit, after wave reshaping to the next driver, ensure wave-form distortion not accumulate.
- Built-in electric reset circuit and power lost reset circuit.
- Each pixel of the three primary color can achieve 256 brightness display, completed 16777216 color full color display, and scan frequency not less than 400Hz/s.
- Cascading port transmission signal by single line.
- Any two point the distance more than 5m transmission signal without any increase circuit.
- When the refresh rate is 30fps, cascade number are not less than1024 points.
- Send data at speeds of 800Kbps.
- The color of the light were highly consistent,cost-effective..
- White Diffused Type

■Outline Dimension
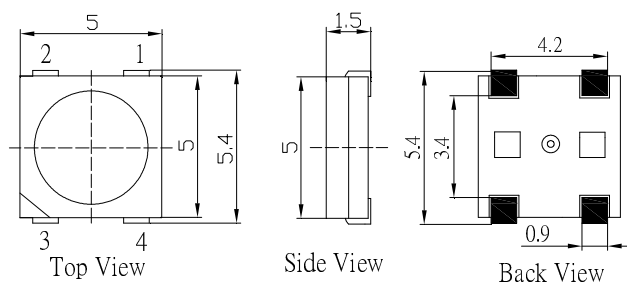
NO.	Symbol	Function description
1	VDD	Power supply LED
2	DOUT	Control data signal output
3	VSS	Ground
4	DIN	Control data signal input

Unite:mm
Tolerance:±0.20mm
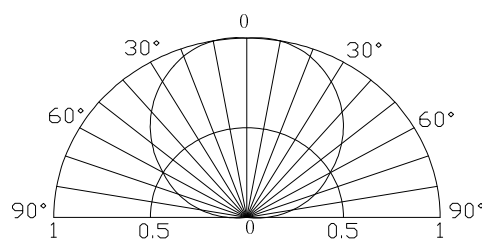unless otherwise noted

■Applications

- LED decorative lighting, Indoor/outdoor LED video irregular screen
- Full-color module, Full color soft lights a lamp strip.

■Absolute Maximum Rating   (Ta=25℃)

Item	Symbol	Value			Unit
Power supply voltage	V_{DD}	+3.5~+5.3			V
Input voltage	V_I	-0.5~VDD+0.5			V
Input Current (LED)	If	Red	Green	Blue	mA
		20	20	20	
Operation junction temperature	Topt	-25~+80			℃
Storage Temperature	Tstg	-40 ~ +105			℃
Lead Soldering Temperature	Tsol	260℃/10sec			-

■Directivity

■Electrical Characteristics (Ta= -20~+70℃, VDD=4.5~5.5V, Vss=0V unless otherwise specified）

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Input current	I_I	$V_I=V_{DD}/V$	-	-	±1	μA
Input voltage level	V_{IH}	D_{IN}，SET	0.7VDD	-	-	V
	V_{IL}	D_{IN}，SET	-	-	0.3 VDD	
Hysteresis voltage	V_H	D_{IN}，SET	-	0.35	-	

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■ Switching Characteristics（TA=-20～+70℃，VDD=4.5～5.5V,VSS=0V,IF=15mA,unless otherwise specified）

Prameter	Symbol	Condition	Min	Tpy	Max	Unit
Operation frequency	$Fosc2$	——	——	800	——	KHz
Transmission delay time	t_{PLZ}	CL=15pF,DIN→DOUT,RL=10KΩ	——	——	300	ns
Fall time	t_{THZ}	CL=300pF,OUTR/OUTG/OUTB	——	——	120	μs
Data transmission rate	F_{MAX}	Duty ratio50%	400	——	——	Kbps
Input capcity	C_I	——	——	——	15	pF

■ LED Characteristic Parameter

Emitting color	Wavelength (nm) I_F=15mA	Luminous intensity (mcd) I_F=15mA	Voltage(V) I_F=15mA
Red	620-625	390-420	2.0-2.2
Green	520-525	660-720	3.0-3.4
Blue	465-470	180-200	3.0-3.4

■Data Transfer Time (TH+TL=1.25μs±150ns)

T0H	0 code ,high voltage time	0.35us	±150ns
T1H	1 code ,high voltage time	0.9us	±150ns
T0L	0 code , low voltage time	0.9us	±150ns
T1L	1 code ,low voltage time	0.35us	±150ns
RES	low voltage time	Above 50μs	

■ Sequence Chart:

■ Cascade method:

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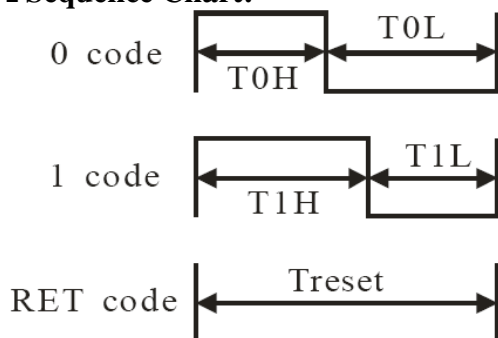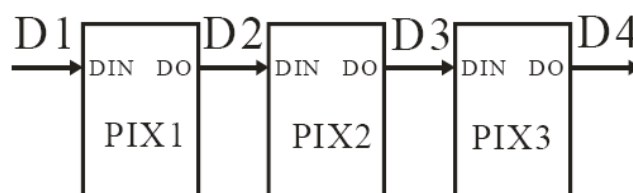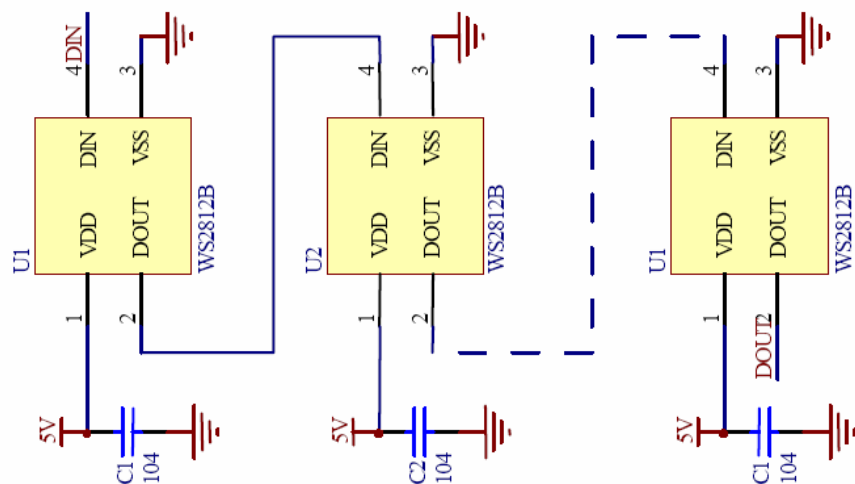
■**Data Transmission Method:**
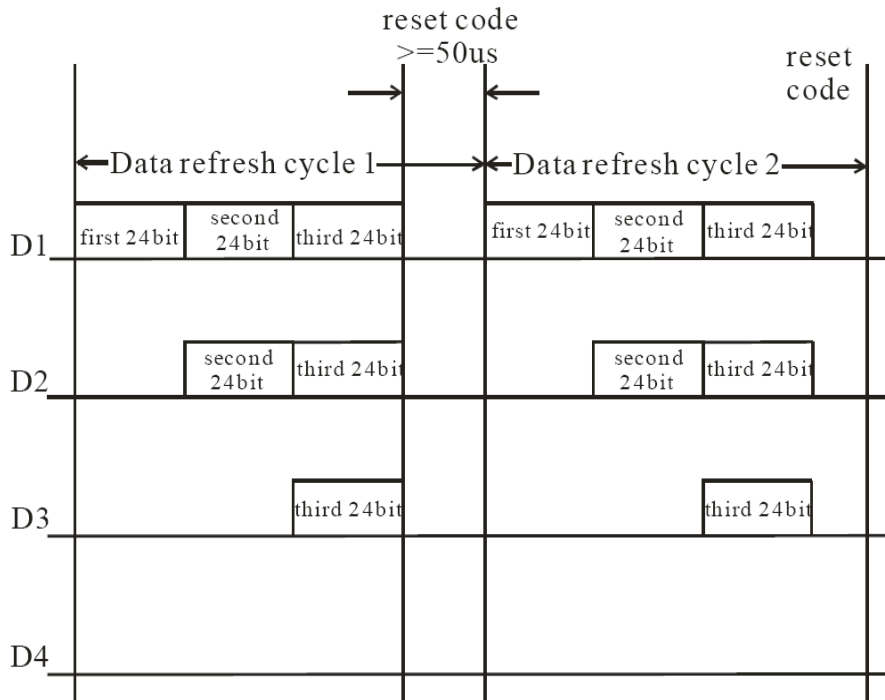
Note: The data of D1 is send by MCU,and D2, D3, D4 through pixel internal reshaping amplification to transmit.
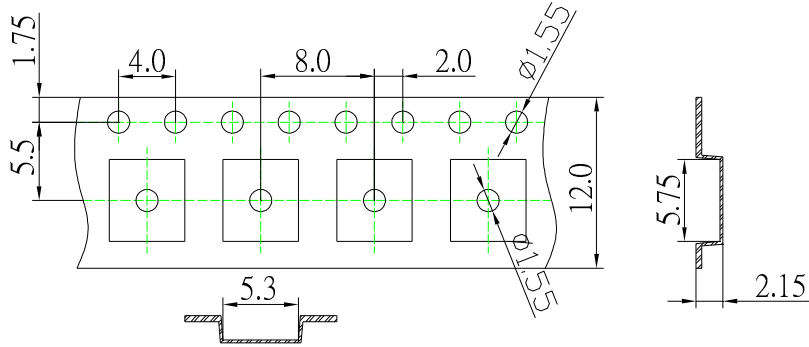
■**Composition of 24bit Data:**

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

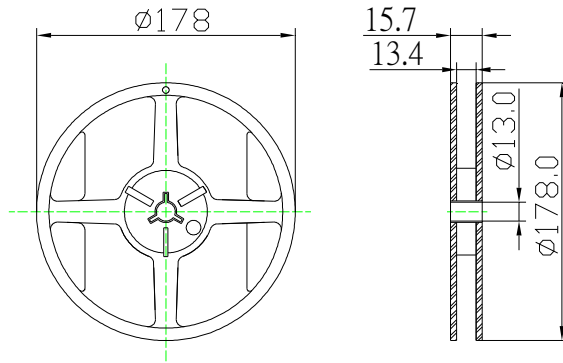Note: Follow the order of GRB to sent data and the high bit sent at first.

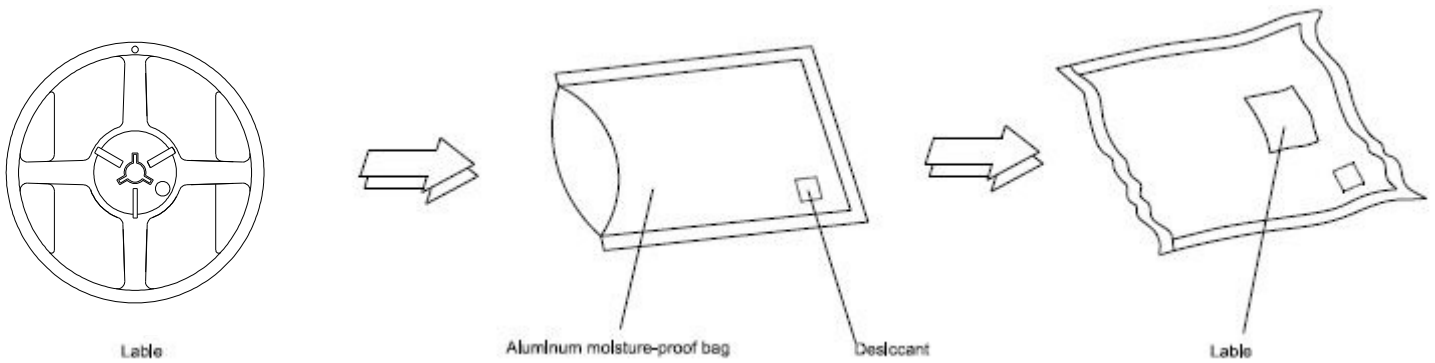■**Typical Application Circuit:**

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Carrier Tape (Unit: mm)

■ Reel Size (Unit: mm)

■ Moisture-proof Bag

Lable

Aluminum moisture-proof bag   Desiccant

Lable

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■How to control OSTW5050C1A(WS281X) with Arduino:

The arduino to control all the lights bead mainly use a named "Adafruit_NeoPixel - master" file package, you can click this web https://github.com/adafruit/Adafruit_NeoPixel download it. and you can also click this web http://www.tuicool.com/articles/IbaAJbE download. If you have to download this file, Unzip each library, remove the "-master" from the name of the folder then put the files in here!(Ps:Ok, explain here I think it's so easy, but for the arduino fresh user, this is very necessary and important!!)

This file is a sealed the function library and mainly use in module has the follow functions.Then i will be an example to explain its used several functions.

#include "Adafruit_NeoPixel.h"

//   First you should include the header file in the beginning of the program!

#define PIN 6

#define led_numbers   8

// This define the pin number connected of pixels in strip and you control the pixels number

// Parameter 1 = number of pixels in strip

// Parameter 2 = pin number (most are valid)

// Parameter 3 = pixel type flags, add together as needed:

//   NEO_KHZ800   800 KHz bitstream (most NeoPixel products w/WS2812 LEDs)

//   NEO_KHZ400   400 KHz (classic 'v1' (not v2) FLORA pixels, WS2811 drivers)

//   NEO_GRB   Pixels are wired for GRB bitstream (most NeoPixel products)

//   NEO_RGB   Pixels are wired for RGB bitstream (v1 FLORA pixels, not v2)

Adafruit_NeoPixel strip = Adafruit_NeoPixel(led_numbers, PIN, NEO_GRB + NEO_KHZ800);

//   1.In this functions the led_numbers is number of sequential NeoPixels in the strip, if you want //modify number can change it then actual using.

//   2.PIN represents and development board which one port, even by arduino board should be as //same as the above the port you can set it to your chosen port.

//   3.A value indicating the type of NeoPixels that are connected,this example just being extra //descriptive.If you have a supply of classic "V1" Flora pixels, those require NEO_KHZ400 + NEO_RGB to be //passed here.

void setup()

{

strip.begin(); '

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```
strip.show();
  }

 // This function only perform step, the strip.begin() to prepare the for NeoPixels output. About //strip.show() is not necessary,
that function mainly pushes data out to the pixels, in this station the //pixels no color. This is to initialize all pixels for "off" .
 void loop()
 {
    uint8_t i=0,a=0;
    uint32_t color = strip.Color(R, G, B);
    while(a<10)
    {
        for(i=0;i<9;i++)
        {
          if(i==a) strip.setPixelColor(i, color);
          else strip.setPixelColor(i, 0);
        }
         strip.show();
         delay(50);
         a++;
    }
 }
```

1. strip.Color(R, G, B) in this function is set up the pixels color,you can set up the number 0-255, the 255 is pixels maximum brightness, for example we can set strip.Color(255, 255, 0) the main is set red and blue color maximum brightness .

2. strip.setPixelColor(i, color) in this function the 'i' is the pixels numbers along the strip, in this examples the 'i' numbered 0 through 8. If you want the ninth pixels lit you shout set the 'i' number is 8, this color is set of in the strip. Color(R, G, B),it is a 32-bit that merges the red ,green and blue values. If you want change the color you can change the R,G,B values.

3. strip.show(), this function is output once you set up the color, if not have time delay the color   appear jumpy station. So suggest if you want the pixels output smooth you can give the function are delayed.

To this the function is used by the example is introduced, this program will appear color flow effect. If you change the program a little the result will be change. For the above explanation is insufficient, please reference https://learn.adafruit.com/adafruit-neopixel-uberguide/arduino-library

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■ General Description

OSTW5050C1A is an intelligent control LED light source that the control circuit and RGB chip are integrated in a package of 5050 components. It internal include intelligent digital port data latch and signal reshaping amplification drive circuit.

Also include a precision internal oscillator and a 12V voltage programmable constant current control part, effectively ensuring the pixel point light color height consistent.

The data transfer protocol use single NZR communication mode. After the pixel power-on reset, the DIN port receive data from controller, the first pixel collect initial 24bit data then sent to the internal data latch, the other data which reshaping by the internal signal reshaping amplification circuit sent to the next cascade pixel through the DO port.

After transmission for each pixel, the signal to reduce 24bit. pixel adopt auto resha-ping transmit technology, making the pixel cascade number is not limited the signal transmission, only depend on the speed of signal transmission. LED with low driving voltage, environmental protection and energy saving, high brightness, scattering angle is large, good consistency, low power, long life and other advantages.

The control chip integrated in LED above becoming more simple circuit, small volume, convenient installation.

■Storage

· Storage Conditions

Before opening the package:

The LEDs should be kept at 30°C or less and 60%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material (silica gel) is recommended.

· After opening the package:

Soldering should be done right after opening the package (within 24hrs).

Keeping of a fraction, sealing and Temperature: 5~30℃ Humidity: Less than 30%.

If the package has been opened more than 24Hours, components should be dried for 12hrs, at 60±5℃.

· Optosupply LED electrode sections are comprised of a silver plated copper alloy. The silver surface may be affected by environments which contain corrosive gases and so on. Please avoid conditions which may cause the LED to corrode, tarnish or discolor. This corrosion or discoloration may cause difficulty during soldering operations. It is recommended that the User use the LEDs as soon as possible.

· Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

■Soldering Heat Reliability

Reflow soldering Profile

· Reflow soldering should not be done more than two times.

· When soldering, do not put stress on the LEDs during heating.

· After soldering, do not warp the circuit board.

· Repairing should not be done after the LEDs have been soldered.　　When repairing is unavoidable,

a double-head soldering iron should be used.　　It should be confirmed beforehand whether the

characteristics of the LEDs will or will not be damaged by repairing.

Solder=Low Lead Free
Average ramp-up rate = 3ºC/sec. max.
Preheat temperature: 160º~200ºC
Preheat time = 120 sec. max.
Ramp-down rate = 6ºC/sec. max.
Peak temperature = 245ºC max.
Time within 3ºC of actual peak temperature = 25 sec. max.
Duration above 220ºC is 40 sec. max.

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