

HC2912C-2020 LED Datasheet

Main Features

- IC control circuit and LED light source share a common power supply
- Power supply input voltage : 3.7V-5.5V.
- Each channel operating current 5mA.
- Control circuit and RGB chip are integrated in a 2020 package component, forms a complete external control pixel point.
- OUT R/G/B output gray level : 256 levels.
- OUT R/G/B power-up state: default off.
- Data serial transmission.
- DIN supports MCU 3.3V signal level input.
- Cascade data shaping and output to prevent data degradation.
- Data transmission rate : 800Kbps.

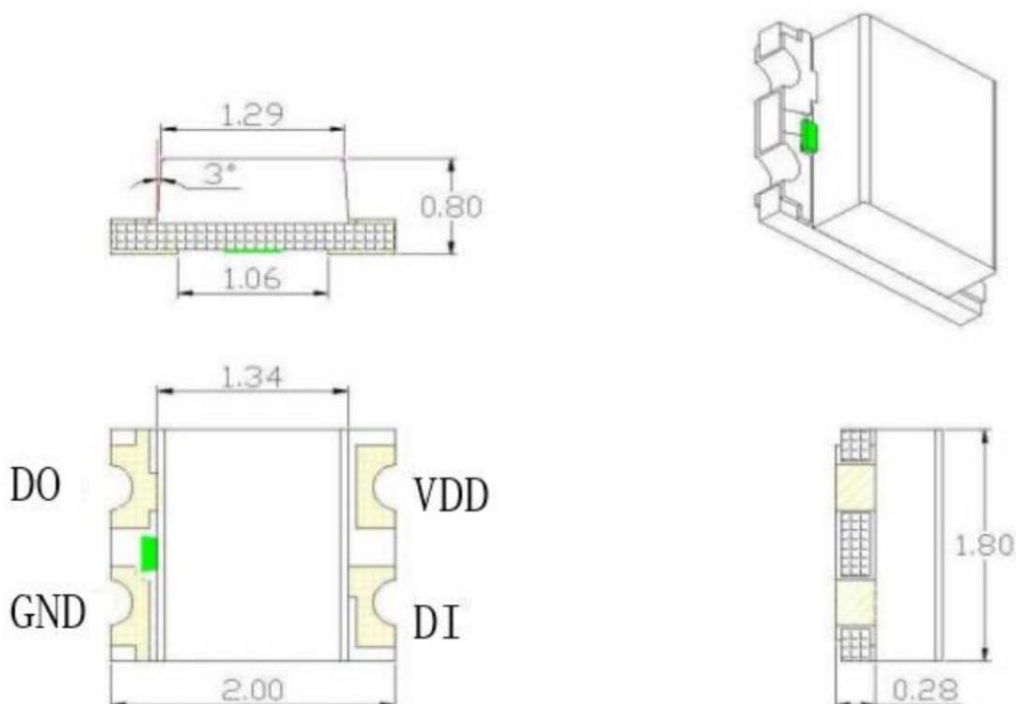
Applications

- Light strip, pixel screen, all kinds of electronic products, electrical equipment display light.
- Automobile ambient light, drone, Chassis fans, digital consumer products.

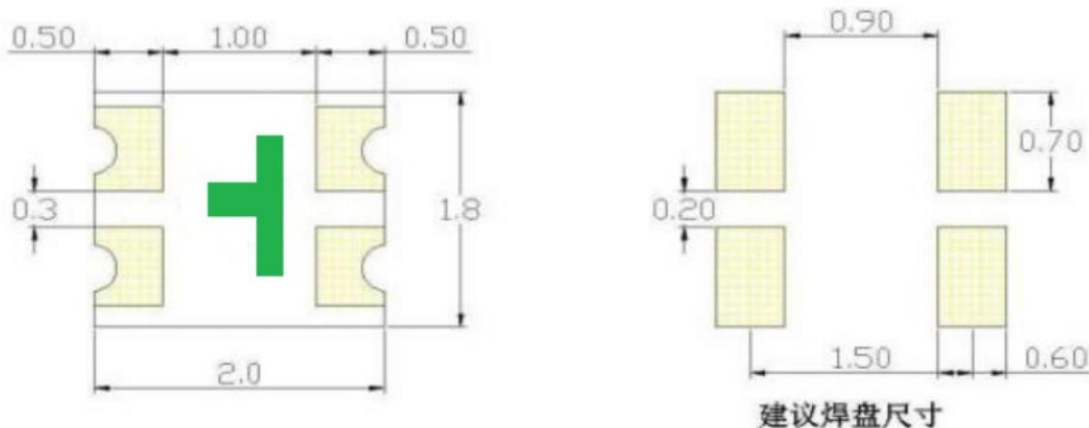
Description

- [HC2912C-2020](#) is a single-wire transmission 3-channel LED driver control chip with unipolar zeroing code data protocol.
- HC2912C-2020 internal contains power supply module, signal decoding module, oscillation module, data regeneration module, output current driver module and so on. Among them, the data regeneration module automatically shapes and forwards the cascade output data after accepting the data from this chip to ensure that there is no attenuation of data during serial transmission.
- HC2912C-2020 built-in output current setting module, OUT R/G/B port default output current 5mA.

Size (mm)



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Pin Function

No.	Symbolic	Name	Function Description
1	DO	Data output	Control data signal output
2	GND	GND	Signal and power grounding
3	DI	Data input	Control data signal input
4	VDD	Power	Power supply pin

Maximum Rating (if not specified, $T_A=25^{\circ}\text{C}$, $V_{SS}=0\text{V}$)

Parameter	Symbolic	Range	Unit
Power Voltage	V_{DD}	+3.7~+5.5	V
Logic Input Voltage	V_I	-0.3V~ $V_{DD}+0.7$	V
Working Temp.	T_{opt}	-25~+85	$^{\circ}\text{C}$
Storage Temp.	T_{stg}	-40~+105	$^{\circ}\text{C}$
HBM Human Discharge Mode	V_{ESD}	>2	KV

Electrical Parameter (if not specified, $T_A=25^{\circ}\text{C}$, $V_{DD}=5\text{V}$, $V_{SS}=0\text{V}$)

Parameter	Symbolic	Min.	Typical	Max.	Unit	Test Condition
Input Current	I_I	—	—	± 1	μA	$V_I=V_{DD}/V_{SS}$
High Level Input	V_{IH}	2.8V	—	$V_{DD}+0.7\text{V}$	V	D_{IN} , SET
Low Level Input	V_{IL}	-0.3V	—	1.6V	V	D_{IN} , SET

Switching Characteristic (if not specified, $T_A=25^{\circ}\text{C}$, $V_{DD}=5\text{V}$, $V_{SS}=0\text{V}$)

Parameter	Symbolic	Min.	Typical	Max.	Unit	Test Condition
Transmission Delay Time	t_{PLZ}	—	—	100	ns	$C_L=15\text{pF}$, $D_{IN} \rightarrow D_{OUT}$, $R_L=10\text{K}\Omega$
Descent Time	t_{THZ}	—	—	120	μs	$C_L=300\text{pF}$, $OUTR/OUTG/OUTB$
Input Capacitance	C_I	—	—	15	pF	—

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LED Characteristics

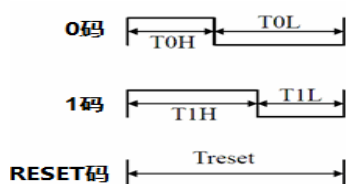
Parameter	Symbolic	Color	Static Current : <0.5mA				Test Condition : (working current)
			Min.	Typical	Max.	Unit	
Luminous Intensity	IV	Red	50	62	100	mcd	5mA
		Green	300	350	400		
		Blue	70	85	120		
Wavelength	λ d	Red	620	623	630	nm	5mA
		Green	515	526	525		
		Blue	455	460	465		

Data Transmission Time

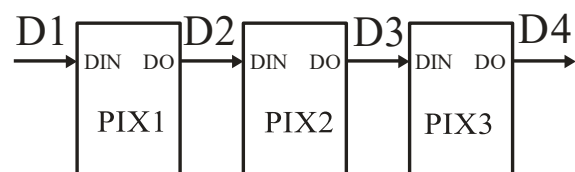
T	Code Cycle	1200 μ s or more
T0H	0 code, high level time	200 μ s~400 μ s
T1H	1 code, high level time	800 μ s~1 μ s
T0L	0 code, low level time	800 μ s~1 μ s
T1L	1 code, low level time	200 μ s~400 μ s
RES	Frame unit, low level time	200 μ s or more

Timing Waveforms

Input code type:

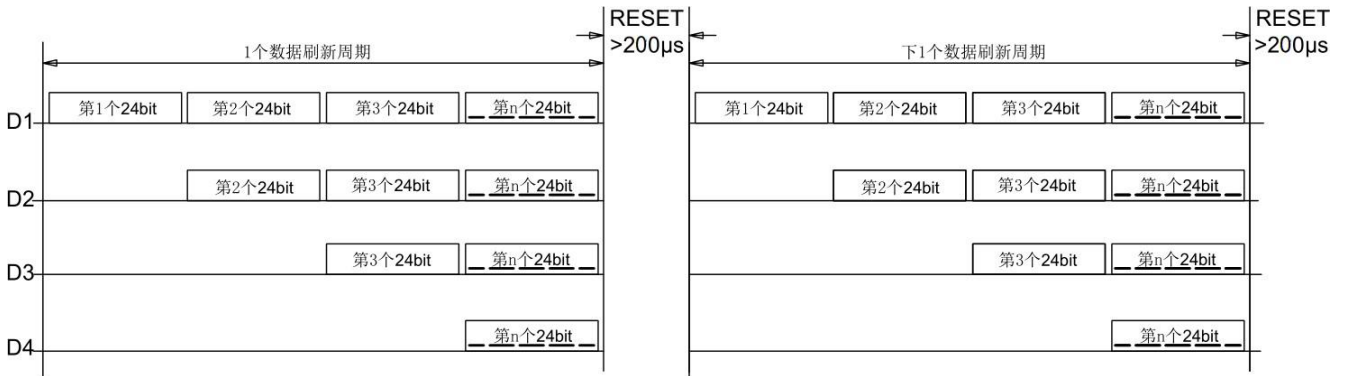


Connection method :



Data Transmission Method

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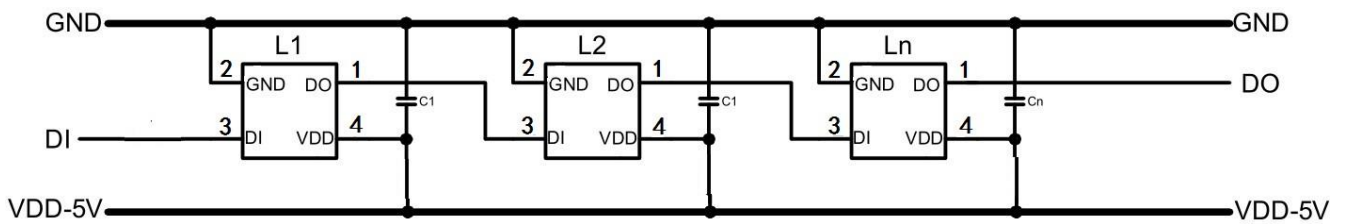
Note: D1 is the data sent from the MCU side, and D2, D3 and D4 are the data automatically shaped and forwarded by the cascade circuit.

24bit Data Structure

G7	G6	G5	G4	G3	G2	G1	G0	R7	R6	R5	R4	R3	R2	R1	R0	B7	B6	B5	B4	B3	B2	B1	B0
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Note: High first, sends data in the order of GRBs.

Typical Application Circuit



C1 is the filter capacitor of VDD pin of the lamp bead, which is normally 100NF.