5mm Straw hat LED lamp with Integrated Light Source Intelligent Control LED

Product Overview:

25-7526 is a smart LED control circuit and light emitting circuit in one controlled LED source, which has the shape of a 5mm Straw hat LED lamps. Each lighting element is a pixel, and the intensities of the pixels are contained within the intelligent digital interface input. The output is driven by patented PWM technology, which effectively guarantees high consistency of the colour of the pixels. The control circuit consists of a signal shaping amplification circuit, a built-in constant current circuit, and a high precision RC oscillator.

The data protocol being used is unipolar NRZ communication mode. The 24-bit data is transmitted from the controller to DIN of the first element, and if it is accepted it is extracted pixel to pixel. After an internal data latch, the remaining data is passed through the internal amplification circuit and sent out on the DO port to the remaining pixels. The pixel is reset after the end of DIN. Using automatic shaping forwarding technology makes the number of cascaded pixels without signal transmission only limited by signal transmission speed.

The LED has a low driving voltage (which allows for environmental protection and energy saving), high brightness, scattering angle, good consistency, low power, and long life. The control circuit is integrated in the LED above.

Main Application Field:

- Full colour LED string light, LED full colour module, LED guardrail tube, LED appearance / scene lighting, spot light for advertising
- LED point light, LED pixel screen, LED shaped screen, a variety of electronic products, electrical equipment etc.

Description:

- Lamps LED are internal integrated high quality external control line serial cascade constant current IC
- Control circuit and RGB chip in Lamps LED components is to form a complete control of pixel, colour mixing uniformity and consistency
- Built-in data shaping circuit, a pixel signal is received after wave shaping and output waveform distortion will not guarantee a line
- The built-in power on reset and reset circuit, the power does not work
- Grey level adjusting circuit (256 level grey scale adjustable)
- Red drive special treatment, colour balance
- Line data transmission
- Plastic forward strengthening technology, the transmission distance between two points over 10M
- Using a typical data transmission frequency of 800 kbps, when the refresh rate of 30 frames per sec.

Absolute Maximum Ratings (Ta = 25°C, VSS = 0V)

Parameter	Symbol	Range	Unit
Power supply voltage	VDD	+3.5 ~ +5.5	V
Logic input voltage	V_{IN}	-0.5 ~ VDD+0.5	V
Working Temperature	Topt	-40 ~ +85	°C
Storage temperature	Tstg	-50 ~ +150	°C
ESD pressure	V_{ESD}	4K	V

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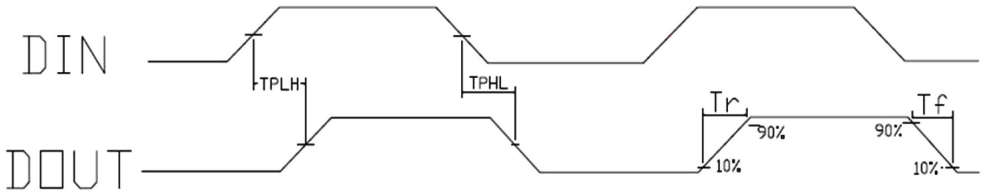
The electrical parameters (unless otherwise specified, T_A = -20°C ~ +70°C, VDD=4.5 ~ 5.5V, VSS=0V)

Parameter	Symbol	Min.	Typical	Max.	Unit	Test conditions
The chip supply voltage	VDD	-	5.2	-	V	-
R/G/B port pressure	VDS, Max.	-	-	26		-
DOUT drive capability	IDOH	-	49	-	mA	DOUT connect ground, the Max. drive current
	IDOL	-	-50	-		DOUT connect +, the largest current
The signal input flip threshold	VIH	3.4	-	-	V	VDD = 5V
	VIL	-	-	1.6		
The frequency of PWM	FPWM	-	1.2	-	kHz	-
Static power consumption	IDD	-	1	-	mA	

The dynamic parameters (T_A = 25°C)

Parameter	Symbol	Min.	Typical	Max.	Unit	Test conditions
The speed of data transmission	fDIN	-	800	-	kHz	The duty ratio of 67% (data 1)
DOUT transmission delay	TPLH	-	-	500	ns	DIN→DOUT
	TPHL	-	-	500		
IOUT Rise/Drop Time	Tr	-	100	-		VDS=1.5 IOUT=13mA
	Tf	-	100	-		

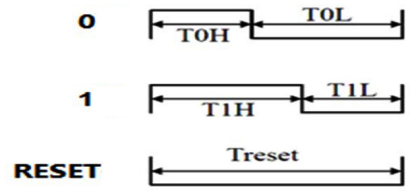


The data transmission time (TH+TL = 1.25μs±600ns)

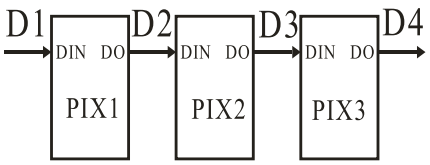
T0H	0 code, high level time	0.3μs	±0.15μs
T0L	0 code, low level time	0.9μs	±0.15μs
T1H	1 code, high level time	0.6μs	±0.15μs
T1L	1 code, low level time	0.6μs	±0.15μs
Trst	Reset code, low level time	80μs	-

Timing waveform:

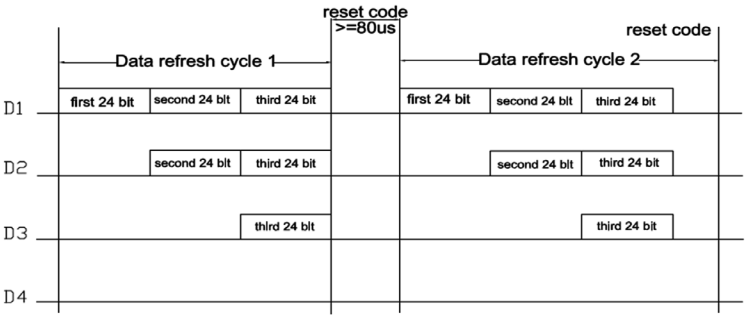
Input Code



Connection Mode



The method of data transmission:



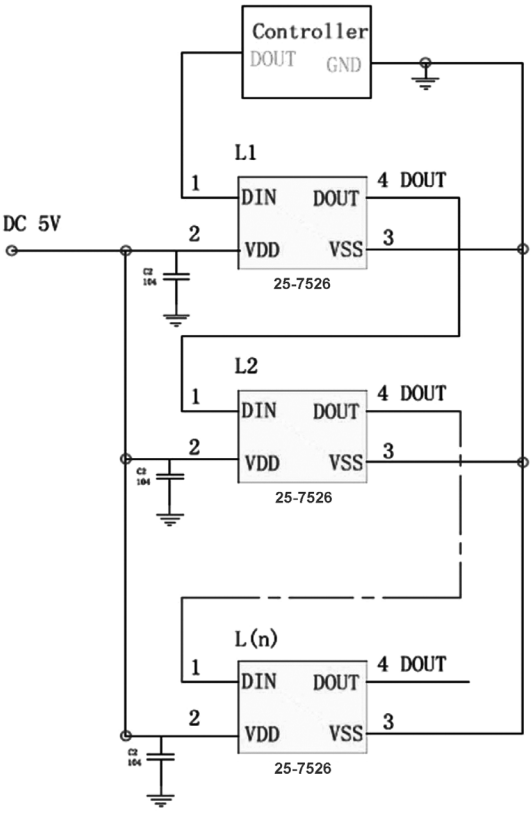
Note: the D1 sends data for MCU, D2, D3, D4 for data forwarding automatic shaping cascade circuit.

The data structure of 24bit

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)

The typical application circuit:



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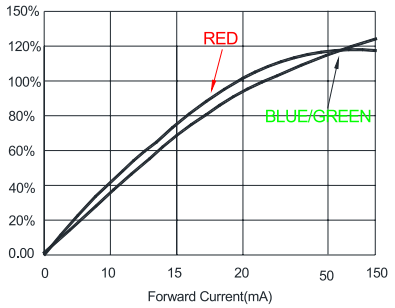
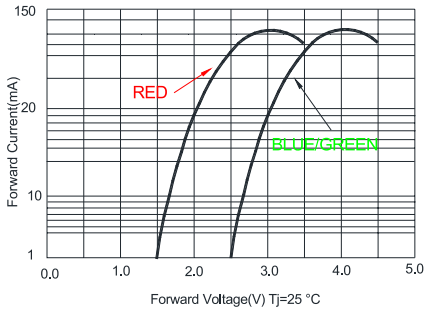
Standard LED Performance Graph:

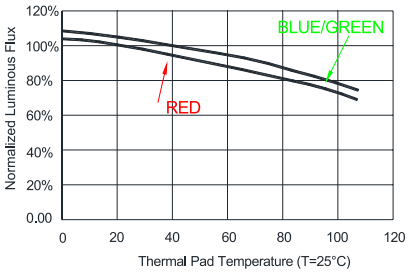
Typical Relative Luminous Flux vs. Forward Current



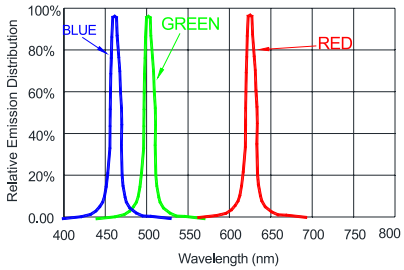
Forward Voltage vs. Forward Current



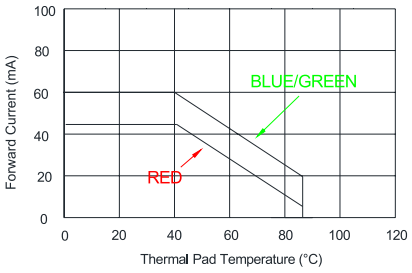
Thermal Pad Temperature vs. Relative Light Output



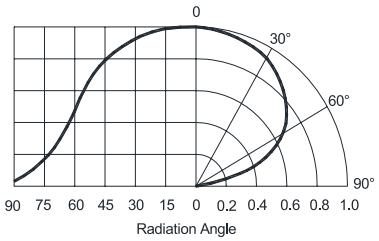
Wavelength Characteristics



Thermal Pad Temperature vs. Forward Current



Typical Radiation Pattern 120°



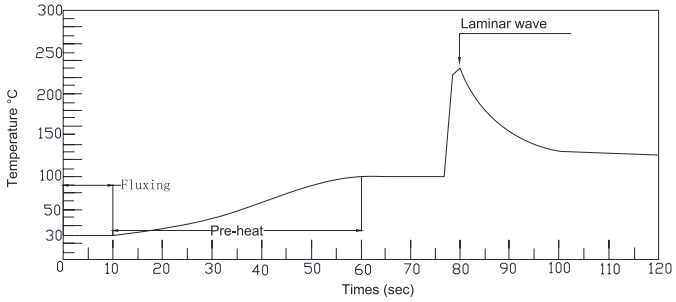
Soldering Information:

A minimal cathode pad area of 0.18" × 0.18" squared is recommended for Lamps LEDs.
Soldering LEDs at not less than 3mm from the base of the package and below the tie-bar is recommended.
The LED soldering specification is shown below (suitable for both leaded & lead-free solder).

Manual Soldering		Solder Dipping	
Soldering Iron	35W max.	Preheat	110°C max.
Temperature	300°C max.	Preheat Time	60 seconds max.
		Solder-bath temperature	260°C max.
Soldering Time	3 seconds max.	Dipping time	3 seconds max.
Position	Not less than 3 mm from the base of the package.	Position	Not less than 3mm from the base of the package.

Manual soldering onto the PBC is not recommended because soldering time is uncontrollable.

The recommended wave soldering is as below:



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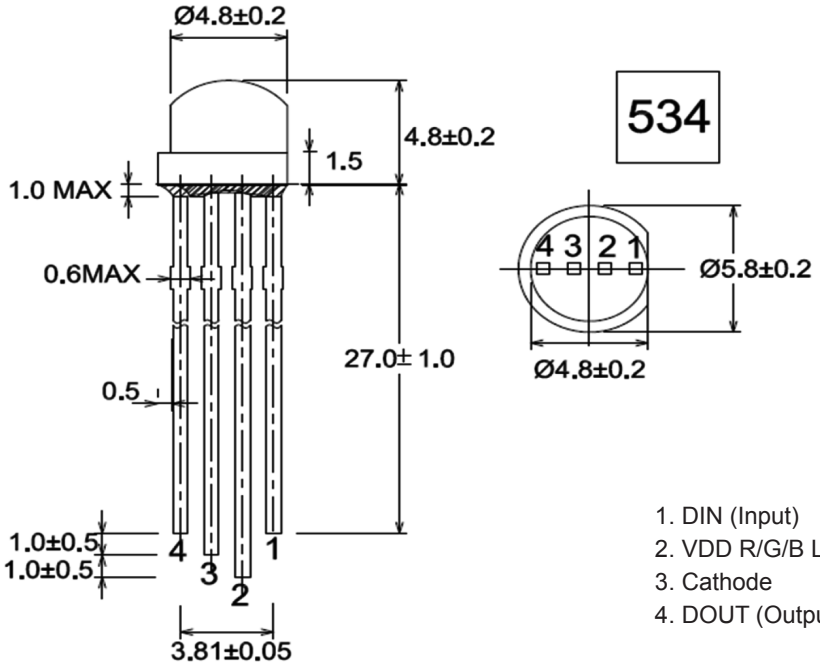
Solder	
Peak preheat temperature	100 ~ 110°C
Total preheat time	50 ~ 60 seconds
Peak profile temperature	260°C (Max.)
Dwell time above 200°C	Do not exceed 3 seconds

Mechanical Dimensions:



1. DIN (Input)
2. VDD R/G/B LED (Anode)
3. Cathode
4. DOUT (Output)

Dimensions : Millimetres
Tolerance is ±0.1mm

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

Part Number Table

Description	Part Number
5mm Straw hat LED lamp with Integrated Light Source Intelligent Control LED	25-7526