Raffar Technology Corp.

RT5966

16-channel Common-Cathode PWM Constant Current LED Driver IC for maximum 64 Time-Multiplexing LED Display

2021/10

Version: 0.7

Description

RT5966 is a common-cathode PWM constant current LED driver with built-in 32K-bit SRAM to support time-multiplexing up to 64 scans in high refresh rate program. The 16 constant current outputs of RT5966 are kept from influence of loading effect. The output current can be optimized by setting an external resistor and adjusted by 6-bit current gain.

By sending the complete frame data for the 32K-bit SRAM of RT5966, the display can be running on an efficiency of data transmission without increasing DCK clock frequency. By high refresh rate mode, it is easy to raise the visual refresh rate. In addition, RT5966 also builds in innovative functions of eliminating ghost issue and relieving LED cross bright line caused by LED defected. A built-in smart power saving technology is helpful to reduce the power consumption of LED display.

Applications

Fine pitch full color LED display
Mini LED, Miro full color LED display

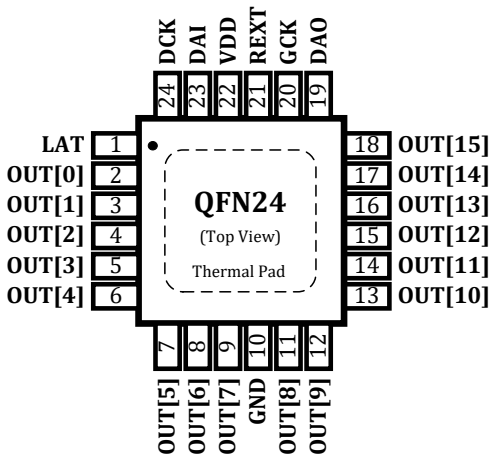
Package Information

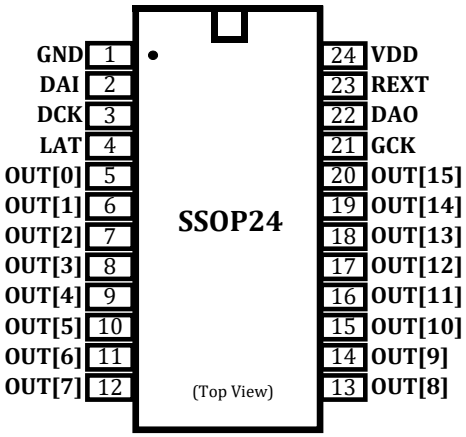
No.	Part No.	Package
1	RT5966SS	SSOP24-150 mil-0.635 mm
2	RT5966QN	QFN24-4*4mm

Features

- Supply voltage : 2.8V~ 5.0V
- Support time-multiplexing from 1~64 scans with built-in 32K-bit SRAM
- 16 constant current outputs
- Constant current output range :
  0.5~15mA@ VDD 3.8V
  0.5~12mA@ VDD 2.8V
- Selectable PWM control with spreading PWM pulse output mode to support HDR:
  -16/15 bits grayscale level
  -14/13 bits grayscale level to improve the visual refresh rate
- 64 steps current gain adjustment (40%~160%)
- High refresh rate mode
- Smart power saving technology
- Anti-ghosting circuit and 1st scan dim line compensation technology
- Eliminating bright line caused by defected LEDs
- LED open/short detection with threshold levels
- Low grayscale and brightness improvement function
- Accurate constant output current driving:
  -Channel to channel: ±1.0% (Typ.)
  -Chip to Chip: ±1.0% (Typ.)

Pin Assignment



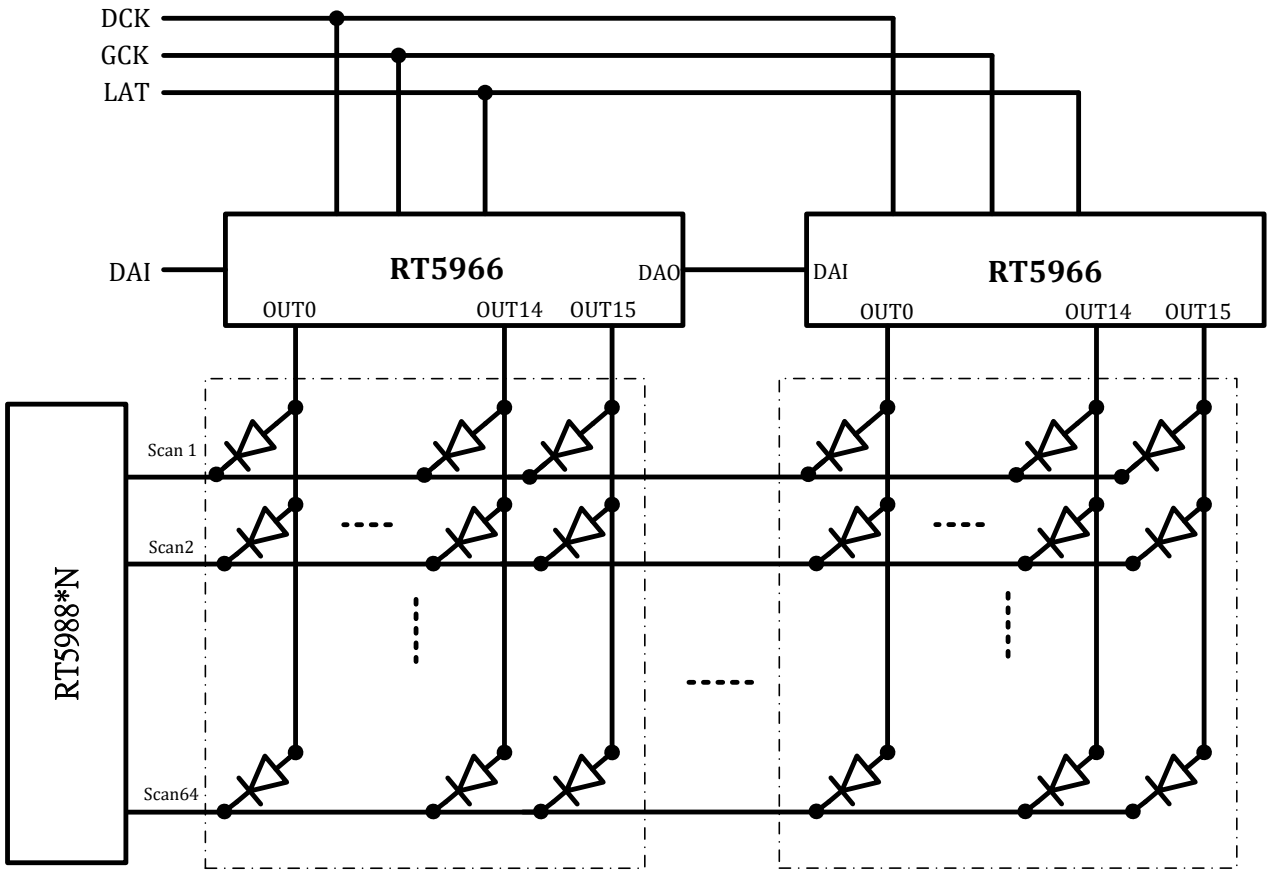


Pin Name	Description
GND	Ground terminal
DAI	Serial data input
DCK	Clock signal input for serial data
LAT	Input data strobe signal
OUT[0]- OUT[15]	Constant current output
GCK	Clock signal input for gray scale
DAO	Serial data output
REXT	External resistor terminal, to set the output current
VDD	Supply voltage terminal
Thermal pad	QFN24: Floating or Connect to GND

The Design Structure of Common-Cathode LED Display

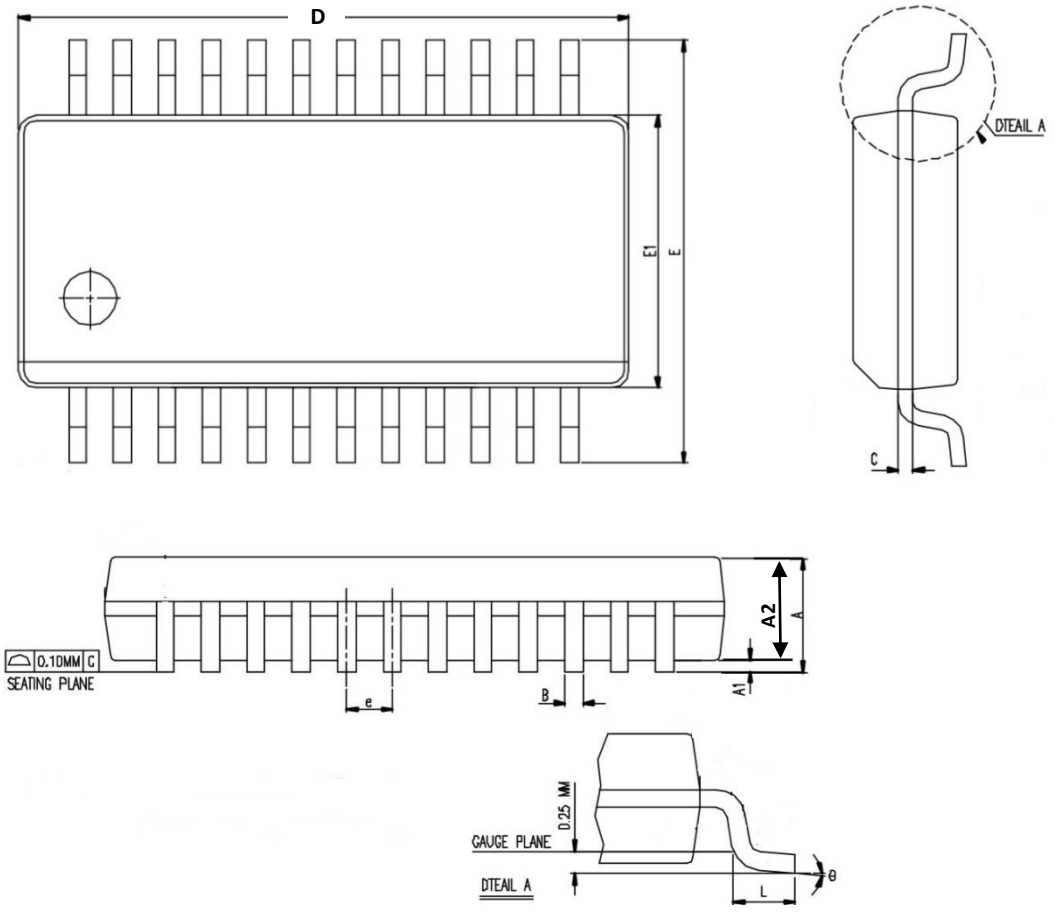
The structure below shows the N-row multiplexing common-cathode LED display application with RT5966. RT5966 is controlled by the command data composing of DCK and LAT as well as DAI and DAO for PWM data. In the meanwhile, OUT0~OUT15 switch to different scan by RT5988 for displaying the image data.

Note: The REXT resistor of RT5966 must be pulled down to GND.



Package Outline Drawing

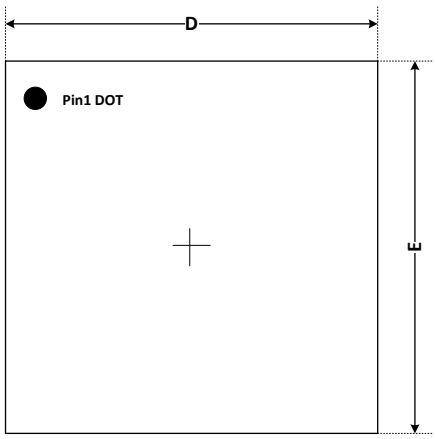
SSOP24 Dimension (150 mil-0.635 mm)



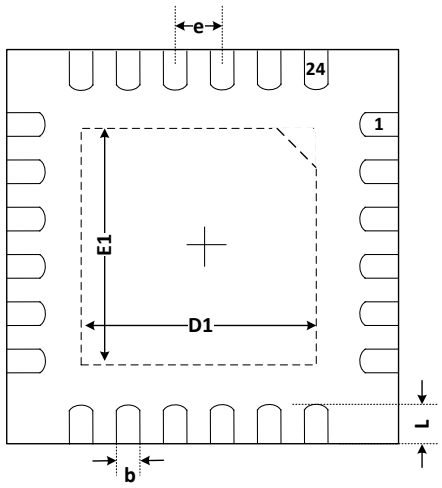
Symbol	Millimeters (mm)		Inches (in)	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	---	1.50	---	0.059
B	0.20	0.30	0.008	0.012
C	0.18	0.25	0.007	0.010
D	8.56	8.74	0.337	0.344
E	5.79	6.20	0.228	0.244
E1	3.81	3.99	0.150	0.157
e	0.635 (BSC)		0.025 (BSC)	
L	0.41	1.27	0.016	0.050
θ°	0	8	0	8

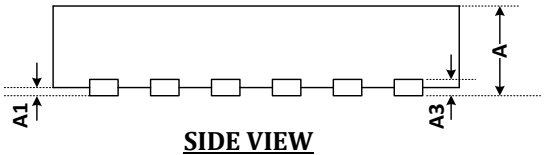
QFN24 Dimension (4*4mm)

TOP VIEW



BOTTOM VIEW





SIDE VIEW

Symbol	Millimeters (mm)		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
A1	0	---	0.05
A3	0.203 Ref.		
b	0.18	0.25	0.30
D	3.90	4.00	4.10
E	3.90	4.00	4.10
D1	2.50	2.60	2.70
E1	2.50	2.60	2.70
e	0.50 BSC		
L	0.30	0.40	0.50

Note

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