



# New Product Announcement

## AL5958Q

# Intelligent 48-Channel LED Driver with Scan Matrix Leads the Automotive Dynamic Lighting Revolution

The AL5958Q is a 48-channel constant current source LED driver with 16-built-in NMOS scan switches for automotive matrix display and illumination applications. Its rich feature set brings improved safety, personalization, and aesthetics to new vehicle platforms.

The command functions of the AL5958Q's built-in intelligent matrix display significantly reduces the processing overhead on the local microcontroller. These include automatic black-frame insertion to efficiently abate the influence of blurs and other system compensation schemes. Further system performance features include open-LED fail lines and staggered current output delay to minimize inrush current.

The device's high 16-bit resolution dimming, coupled with its RGB support, provides highly precise brightness control and color mixing. Furthermore, the distinctive multiplex-pulse density modulation (M-PDM) technology enhances the refresh rate of dynamic scanning systems without increasing the frequency of the grayscale (GCK) clock, thereby effectively mitigating EMI due to high clock frequencies.

The device is available in the wettable W-QFN9090-76/SWP package.

A standard compliance version, AL5958, is available and is suitable for industrial and commercial applications.

*Automotive-compliant - AEC qualified, manufactured in sites certified to IATF 16949 supporting PPAP documents.*

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## The DIODES Advantage

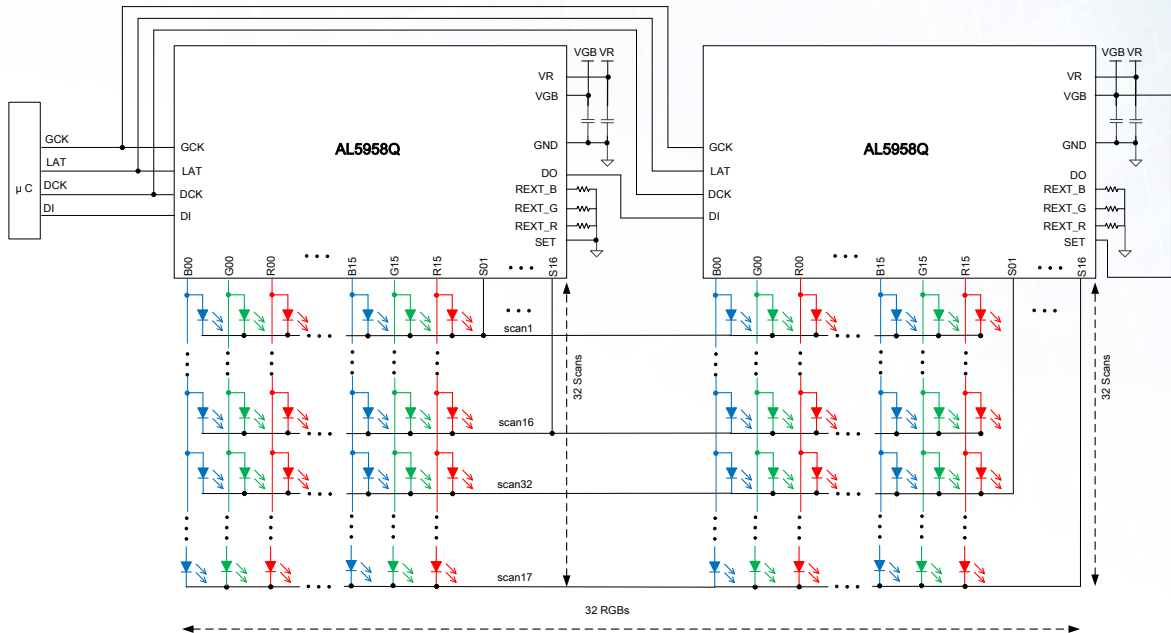
**The AL5958Q provides precise dimming control and diagnosis for each pixel of matrix LEDs through the MCU with a digital serial interface.**

- **Built-In Intelligent Command Functions**  
Reduces local MCU overheads due to its automatic black-frame insertion, ghost elimination, short LED caterpillar, open fail-line abatement, current output staggering, grayscale enhancement, and watchdog timer
- **48-Channel Linear Source LED Driver with 16 Built-In Scan NMOS Switches**  
Delivers a compact daisy-chain solution for animated or matrix LED displays and supports cascaded devices without limitation
- **16-Bit PWM and 3 Independent 6-Bit Global for Each RGB Group**  
Provides high-resolution color and brightness control
- **Error Flag Registers Applied for LED Open/Short to Read Out Each Channel Using Open/Short Detection, as well as UVLO Protection and a Watchdog Timer**  
Reports individual pixels, improving robustness

## Automotive Applications

- Central information displays
- Cluster displays
- Head-up displays
- Grill lights
- Body mini-LED panels
- Interior lights
- Rear lights

## 96 Channels (32 RGB LEDs) by 32 Scan Applications



## Adjustable-Current Linear LED Driver Overview

Part Number	Supply Voltage Range	Type	Max. V <sub>OUT</sub>	Number of Channels	Max Scans	Max. Channel Output Current	Accuracy	Memory	Interface	Global ADIM	PWMDIM	Ambient Temperature Range	Package
	V		V			mA	%	Bits		Bits	Bits	°C	
<a href="#">AL5958Q</a>	3 to 5	Source	5.0	48	32	20	±1.5	3x16K SRAM	SSI-4*	3 x 6	16	-40 to +125	W-QFN9090-76/SWP (Type A1)
<a href="#">AL5887Q</a>	2.7 to 5.5	Sink	5.5	36	0	70	±3	0	I2C/SPI	6	12	-40 to +125	W-QFN6060-52/SWP (Type A1)

\* SSI-4: Serial Synchronous Interface—4 wires

## Ordering Information

Orderable Part Number	Compliance (Only Automotive Supports PPAP)	Package	Moisture Sensitivity	Packing	
				Quantity	Carrier
<a href="#">AL5958QJCZW76-13</a>	<a href="#">Automotive</a>	W-QFN9090-76/SWP (Type A1)	MSL-3	2,500	13" Tape & Reel