



# EVQ3326-R-00A

## 16 Channels, 50mA/Ch, LED Driver with Separated PWM Analog Dimming and I<sup>2</sup>C Interface Evaluation Board, AEC-Q100

### DESCRIPTION

The EVQ3326-R-00A is an evaluation board designed for the MPQ3326, a 16-channel WLED driver that can operate from a wide 4V to 16V input voltage range. The MP3326 applies 16 internal current sources in each LED string terminal. The LED current of each channel is set by an external current-setting resistor. The maximum current for each channel is 50mA ( $V_{IN} \geq 4.5V$ ).

The device integrates an I<sup>2</sup>C interface with up to 10 configurable I<sup>2</sup>C addresses via an external resistor. This means the MPQ3326 can support up to 10 cascaded ICs to drive the LED array. Each channel can be enabled or disabled through the I<sup>2</sup>C.

The MPQ3326 employs both separated PWM dimming and analog dimming for each LED channel, as well as 12-bit resolution PWM dimming and 6-bit analog dimming for each channel. To optimize EMI/EMC performance, the LED current ramp rate and phase shift can be configured.

The device can output a refresh signal from the RFSH/FLT pin, and the refresh signal frequency can be set by the register.

LED open and short protection, and over-temperature protection (OTP) are integrated into the device. The fault indicator pulls low if a protection is triggered, and then the corresponding fault register is set.

The MPQ3326 is AEC-Q100 qualified. It is available in a QFN-24 (4mmx4mm) package.

### ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Maximum input voltage	$V_{IN\_MAX}$	$\leq 16$	V
LED strings		16	
LED current/string	$I_{LED}$	25	mA

### FEATURES

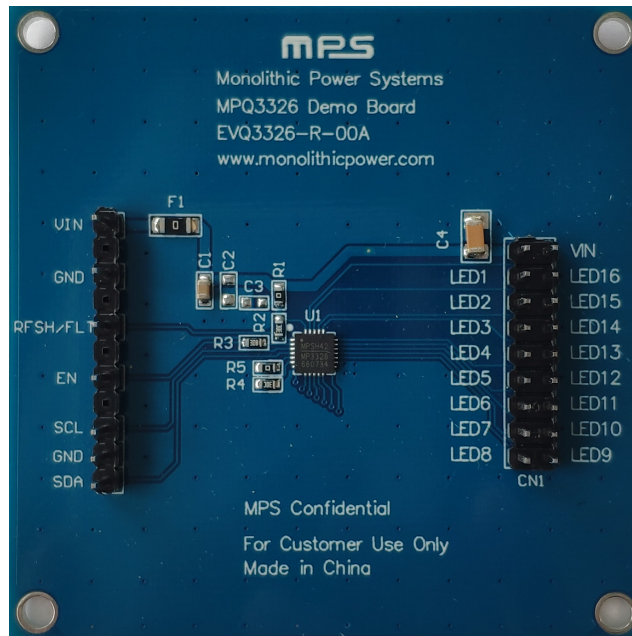
- Wide 4V to 16V Input Voltage Range
- 16 Channels, 50mA/Ch Maximum ( $V_{IN} \geq 4.5V$ )
- LED Current Configured by External Resistor
- 6-Bit Analog Dimming for Each Channel
- 12-Bit PWM Dimming for Each Channel
- Selectable 220Hz, 250Hz, 280Hz, or 330Hz PWM Dimming Frequency
- Refresh Signal Output
- I<sup>2</sup>C Interface
- 10 Addresses Configurable via External Resistor
- Configurable LED Current Slew Rate
- 40 $\mu$ s Phase Shift
- Fault Indicator
- LED Open Protection
- LED Short Protection with Configurable Threshold
- Under-Voltage Lockout (UVLO)
- Over-Temperature Protection (OTP)
- ELV Directive II Compliant
- Available in a QFN-24 (4mmx4mm) Package
- AEC-Q100 Grade 1

### APPLICATIONS

- Automotive Lights
- Automotive Displays
- Instruments Clusters
- General Industrial Displays

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## EVQ3326-R-00A EVALUATION BOARD

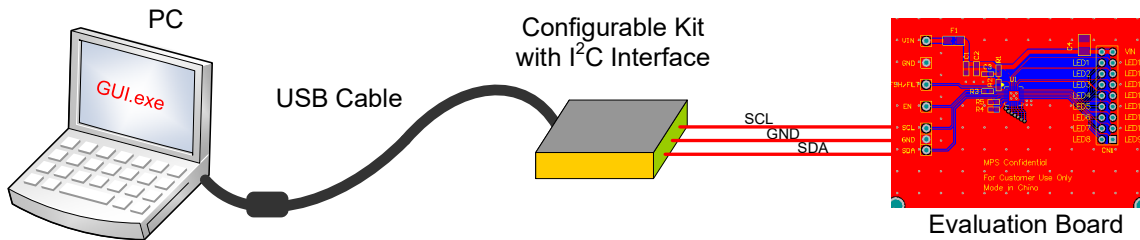


LxW (6.35cmx6.35cm)

Board Number	MPS IC Number
EVQ3326-R-00A	MPQ3326GR

## QUICK START GUIDE

1. Provide a voltage source that ranges between 4V and 16V between the VIN terminal and GND.
2. Connect the terminals of the LED load to:
  - a. Positive (+): LED+
  - b. Negative (-): LED1–16
3. Pull the EN pin to a high ( $\geq 2.1V$ ) to enable IC.
4. Connect the SCL, SDA, and GND pins on the evaluation board to their respective pins on the configuration kit (EVKT-USBI2C-02) (see Figure 1)



**Figure 1: I<sup>2</sup>C Connection Diagram**

5. The recommended start-up sequence is listed below:
  - a. VIN
  - b. EN
  - c. I<sup>2</sup>C setting
  - d. Set the EN bit (to lighten the LED load).

## EVALUATION BOARD SCHEMATIC

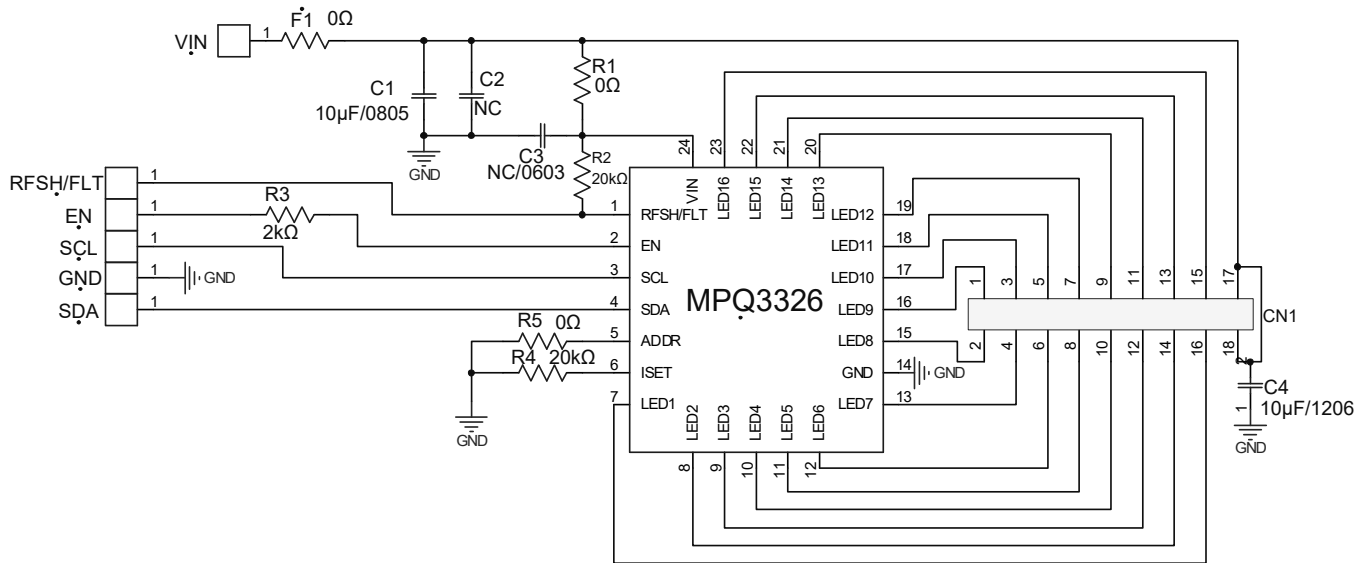


Figure 2: Evaluation Board Schematic

**EVQ3326-R-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1	10 $\mu$ F/0805	Capacitor, 25V, X5R	0805	Murata	GRM21BR61E106KA73
1	C2	NC		0805		
1	C3	NC		0603		
1	C4	10 $\mu$ F/1206	Capacitor, 25V, X7R	1206	Murata	GRM31CR71E106KA12
1	F1	0 $\Omega$	Resistor, 1%, 1/4W	1206	Yageo	RC1206FR-070RL
2	R1, R5	0 $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-070RL
1	R3	2k $\Omega$	Film resistor, 1%	0603	Yageo	RC0603FR-072KL
2	R2, R4	20k $\Omega$	Resistor, 1%, 1/10W	0603	Royalohm	0603F2002T5E
1	U1	MPQ3326	16-channel, white LED controller	QFN-24 (4mmx4mm)	MPS	MPQ3326GR

## PCB LAYOUT

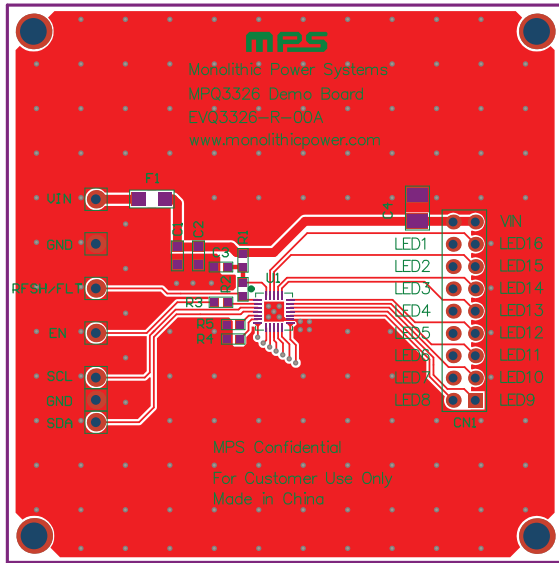


Figure 3: Top Layer

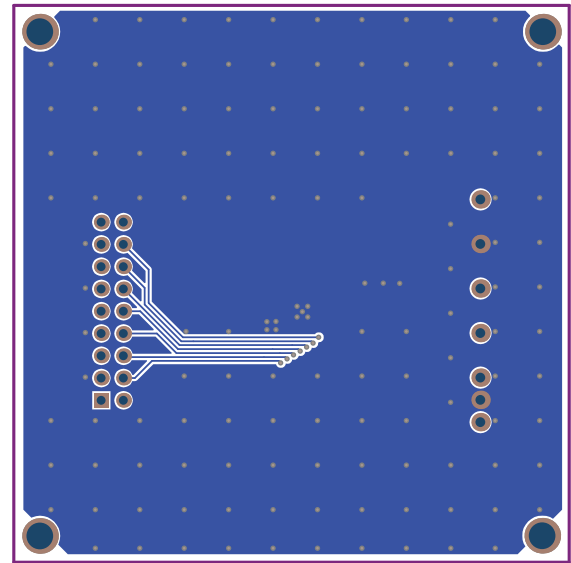


Figure 4: Bottom Layer

## REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	5/7/2021	Initial Release	-

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