EVQ3326-R-00A



16 Channels, 50mA/Ch, LED Driver with Separated PWM Analog Dimming and I²C 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 ($V_{IN} \ge 4.5V$).

The device integrates an I^2C interface with up to 10 configurable I^2C 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^2C .

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 overtemperature 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	Vin_max	≤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 ($V_{IN} \ge 4.5V$)
- 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
- I²C Interface
- 10 Addresses Configurable via External Resistor
- Configurable LED Current Slew Rate
- 40µs 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. Postive (+): 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)

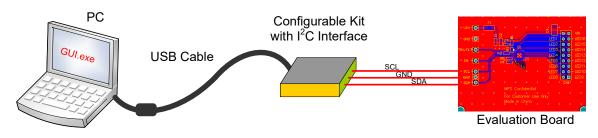


Figure 1: I²C Connection Diagram

- 5. The recommended start-up sequence is listed below:
 - a. VIN
 - b. EN
 - c. I²C setting
 - d. Set the EN bit (to lighten the LED load).



14 || - GND

13

GND

LED7

LED6

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LED5 LED4

13 15 17

4 16 18 CN1

C4

10µF/1206

EVALUATION BOARD SCHEMATIC F1 0Ω VIN 1 ŴŴ $\begin{cases} R1 \\ 0\Omega \end{cases}$ C2 C1 ĪЛС 10µF/0805 53 23 24 20 21 C3 NC/0603 GND RFSH/FLT RFSH/FLT LED15 LED14 LED13 R3 1 19 ΕN -⁄√⁄ 2kΩ LED12 2 18 SÇL ΕN LED11 17 1 - II GND 3 GŅD SCL LED10 ; ~ σ MPQ3326 4 16 SĐA SDA LED9 R5 0Ω 5 15 LED8 R4 20kΩ 6 ADDR N 4 Ś œ 9 12

GND

Figure 2: Evaluation Board Schematic

ISET

LED1

LED2 LED3

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EVQ3326-R-00A BILL OF MATERIALS

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



PCB LAYOUT

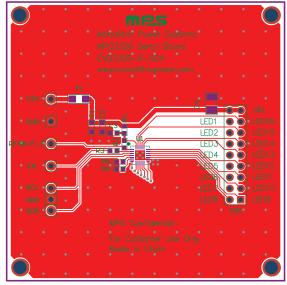


Figure 3: Top Layer

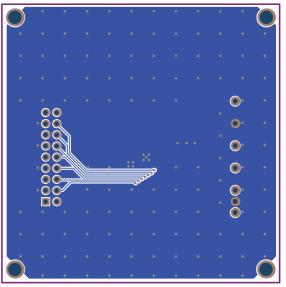


Figure 4: Bottom Layer



REVISION HISTORY

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

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