



### DESCRIPTION

The EV3320A-Q-00A evaluation board is designed to demonstrate the capabilities of the MP3320A, a 4-channel, self-adaptive charge pump RGB LED driver that operates from a wide 1.8V to 5.5V input voltage ( $V_{IN}$ ) range. The maximum current of each channel is up to 51mA, and the maximum output voltage ( $V_{OUT}$ ) is up to 5.5V.

The MP3320A integrates an I<sup>2</sup>C interface and supports 16 different I<sup>2</sup>C addresses, which can be configured by an external resistor. Each channel can be enabled or disabled through the I<sup>2</sup>C.

The MP3320A employs both separated pulse-width modulation (PWM) dimming and analog

dimming for each LED channel. There is 10-bit PWM dimming and 8-bit analog dimming for each channel. To reduce inrush current and eliminate audible noise during PWM dimming, a phase-shift function is also integrated.

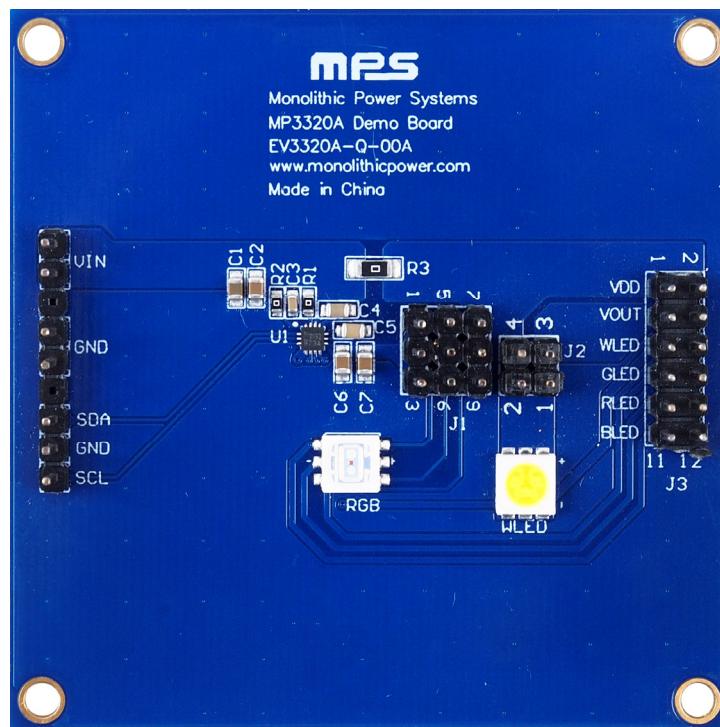
To ensure system reliability, the MP3320A integrates rich protection features, including open LED protection, short LED protection, over-voltage protection (OVP), and over-temperature protection (OTP).

The MP3320A is available in a QFN-14 (2mmx2mm) package. The EV3320A-Q-00A is a fully assembled evaluation board.

### PERFORMANCE SUMMARY

Specifications are at  $T_A = 25^\circ\text{C}$ , unless otherwise noted.

Parameters	Conditions	Value
Input voltage ( $V_{IN}$ ) range		1.8V to 5.5V
Output voltage ( $V_{OUT}$ )	The over-voltage protection (OVP) threshold is typically 5.5V	Maximum $V_{OUT} < 5.5\text{V}$
LED strings	Each LED channel can be enabled or disabled via the I <sup>2</sup> C interface	4 strings
Maximum LED current ( $I_{LED}$ )	Set ICHx 7:0 = FFh (where x = 1, 2, 3, or 4)	51mA/string

**EV3320A-Q-00A EVALUATION BOARD****LxWxH (6.35cmx6.35cmx2cm)**

Board Number	MPS IC Number
EV3320A-Q-00A	MP3320AGG

## QUICK START GUIDE

1. Connect the anodes of the RGBW LEDs to VOUT or VDD, respectively.
2. Connect the DC power (1.8V to 5.5V) terminals to:
  - a. Positive (+): VIN
  - b. Negative (-): GND
3. Connect the SCL, SDA, and GND pins of the evaluation board to the SCL, SDA, and GND pins of the I<sup>2</sup>C kit, respectively.
4. Configure the registers via the I<sup>2</sup>C interface <sup>(1)</sup>.

**Notes:**

- 1) Download the MP3320A configuration tool from the MPS website for more details on configuring the registers during evaluation.

## EVALUATION BOARD SCHEMATIC

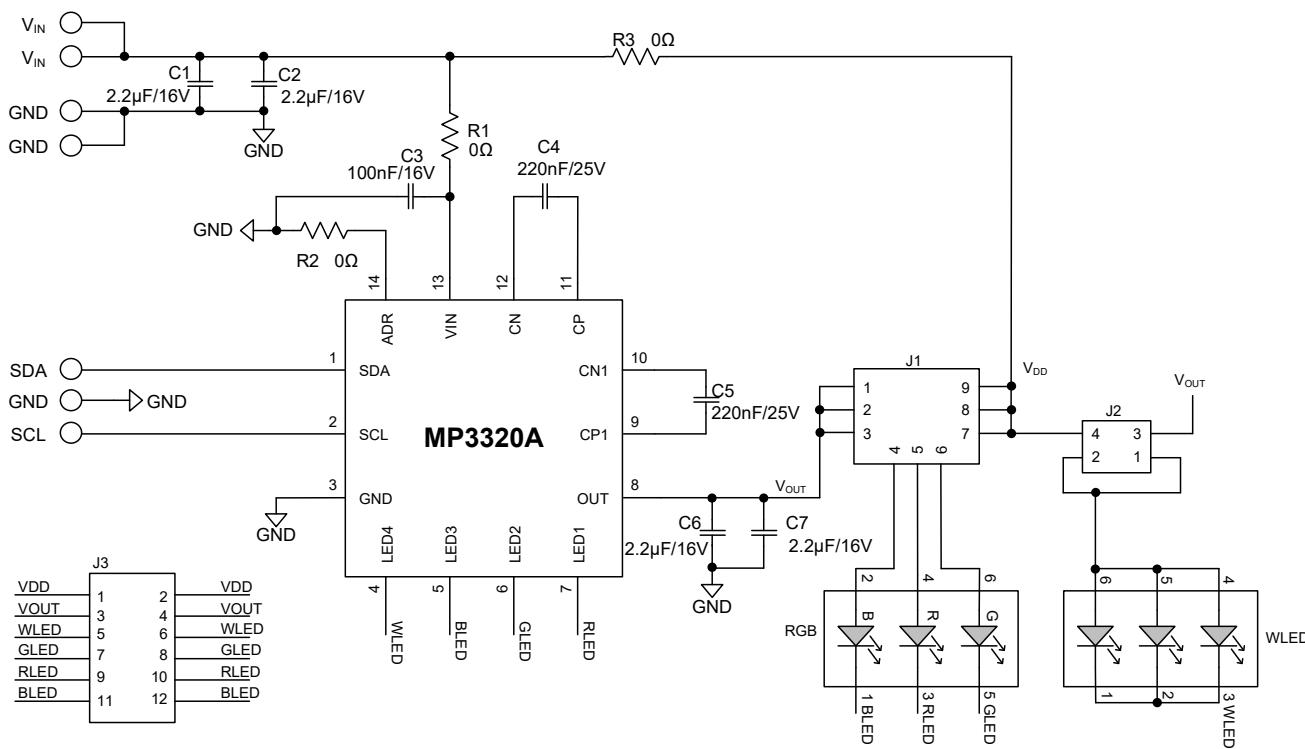


Figure 1: Evaluation Board Schematic

**EV3320A-Q-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
4	C1, C2, C6, C7	2.2 $\mu$ F	Ceramic capacitor, 16V, X7R	CAP/0805	Murata	GRM21BR71C225KA12L
1	C3	100nF	Ceramic capacitor, 16V, X7R	CAP/0603	Murata	GRM188R71C104KA01D
2	C4, C5	220nF	Ceramic capacitor, 25V, X7R	CAP/0805	Lion	0805B224K250T
1	R1, R2	0 $\Omega$	Film resistor, 1%	RES/0603	Yageo	RC0603FR-070RL
1	R3	0 $\Omega$	Film resistor, 1%	RES/1206	Yageo	RC1206FR-070RL
1	RGB	LED	RGB, SMD, 1.5W	SMD	Guangyuan	GL-5050RGB 1.5W
1	WLED	LED	WLED, SMD	SMD	Guangyuan	GL-5050QWC
4	VIN, GND, SDA, SCL	2.54mm	Header	180° 2.54mm	Any	
2	J1, J2	2.54mm	Header	180° 2.54mm	Any	
1	J3	2.54mm	Dual-header	180° 2.54mm	Any	
1	U1	MP3320A	4-channel, charge pump RGB LED driver with I <sup>2</sup> C interface, R2	QFN-14 (2mmx2mm)	MPS	MP3320AGG

## PCB LAYOUT

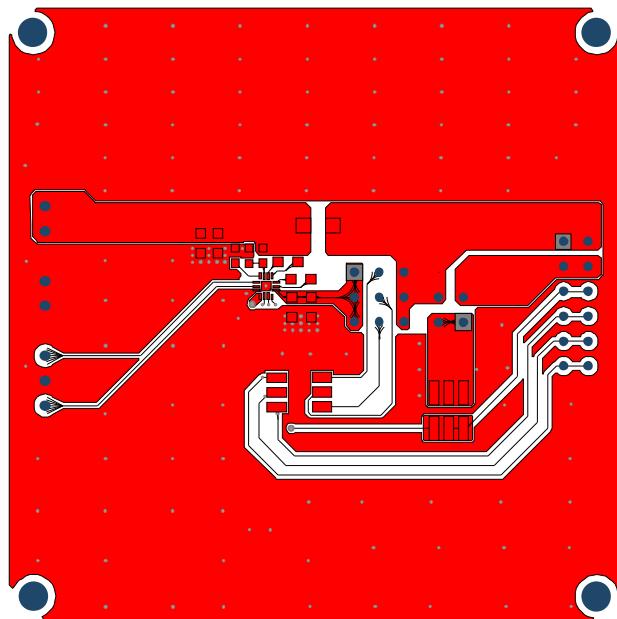


Figure 2: Top Layer

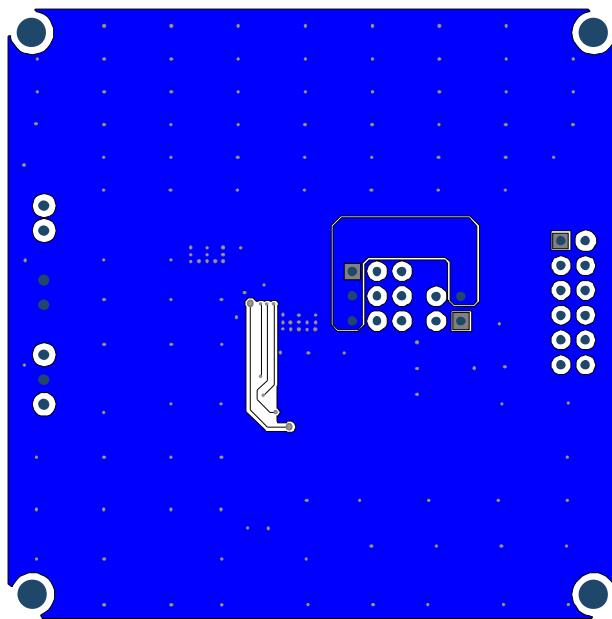


Figure 3: Bottom Layer

## REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	8/26/2022	Initial Release	-

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