EVQ20082-5-H-00A

40V, 300mA, Fixed 5V V_{OUT}, Low Quiescent Current Linear Regulator Evaluation Board

DESCRIPTION

The EVQ20082-5-H-00A is an evaluation board designed to demonstrate the capabilities of the MPQ20082-5, a low quiescent current (I_Q) linear regulator that supplies power to systems with high-voltage batteries.

The MPQ20082-5 features a wide 3V to 40V input voltage (V_{IN}) range, fixed 5V output voltage (V_{OUT}), a low dropout voltage, and a low I_Q. The low I_Q and low dropout voltage allow the device to operate at low power levels. This makes the MPQ20082-5 ideal for low-power microcontroller units (MCUs) and battery-powered equipment.

The MPQ20082-5's output current (I_{OUT}) is limited internally, and the device is protected against short-circuit (SC), overload, and over-temperature (OT) conditions.

Full protection features include thermal shutdown (TSD) and current-limiting fault protection.

The EVQ20082-5-H-00A is a fully assembled and tested evaluation board. It generates a 5V V_{OUT} at load currents up to 300mA from a 6V to 40V V_{IN} range.

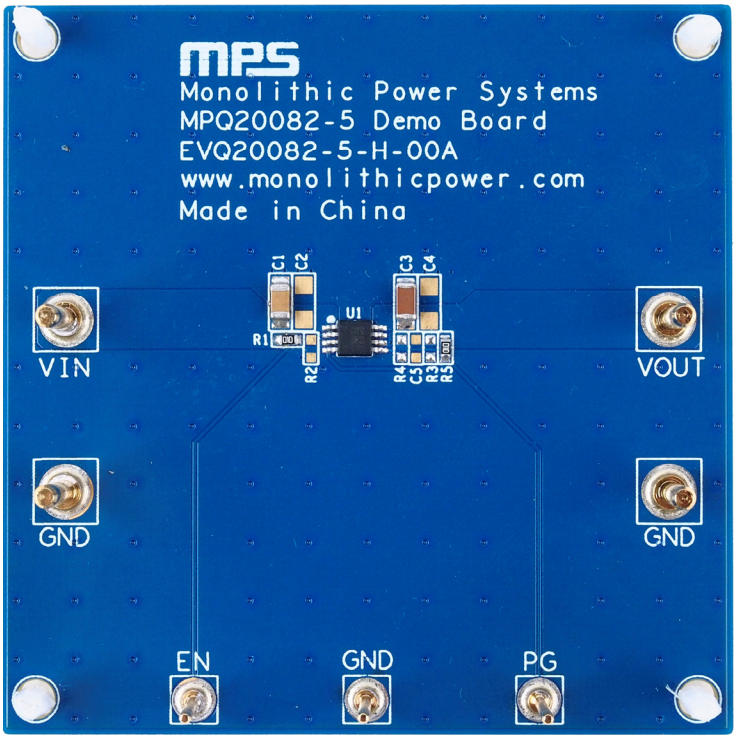
It is recommended to read the datasheet for the MPQ20082-5 prior to making any changes to the EVQ20082-5-H-00A.

PERFORMANCE SUMMARY

Parameter	Conditions	Value
Recommended input voltage (V_{IN}) range		6V to 40V
Output voltage (V_{OUT})	V_{IN} = 6V to 40V, I_{OUT} = 5mA to 300mA	5V
Maximum output current (I_{OUT})	V_{IN} = 6V to 40V	300mA

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

EVALUATION BOARD



LxWxH (6.35cmx6.35cmx1cm)

Board Number	MPS IC Number
EVQ20082-5-H-00A	MPQ20082GH-5-AEC1

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

QUICK START GUIDE

The EVQ20082-5-H-00A evaluation board is easy to set up and use to evaluate the performance of the MPQ20082-5. For proper measurement equipment set-up, refer to Figure 1 and follow the steps below.

1. Connect the load terminals to:
   a. Positive (+): VOUT
   b. Negative (-): GND
2. Preset the power supply output to be between 6V and 40V, then turn it off. If longer cables (>0.5m total) are used between the source and the evaluation board, a damping capacitor should be installed at the input terminals, especially if the input voltage (V_{IN}) is 24V or greater.
3. Connect the power supply terminals to:
   a. Positive (+): VIN
   b. Negative (-): GND
4. Turn the power supply on. The EVQ20082-5-H-00A should start up automatically.

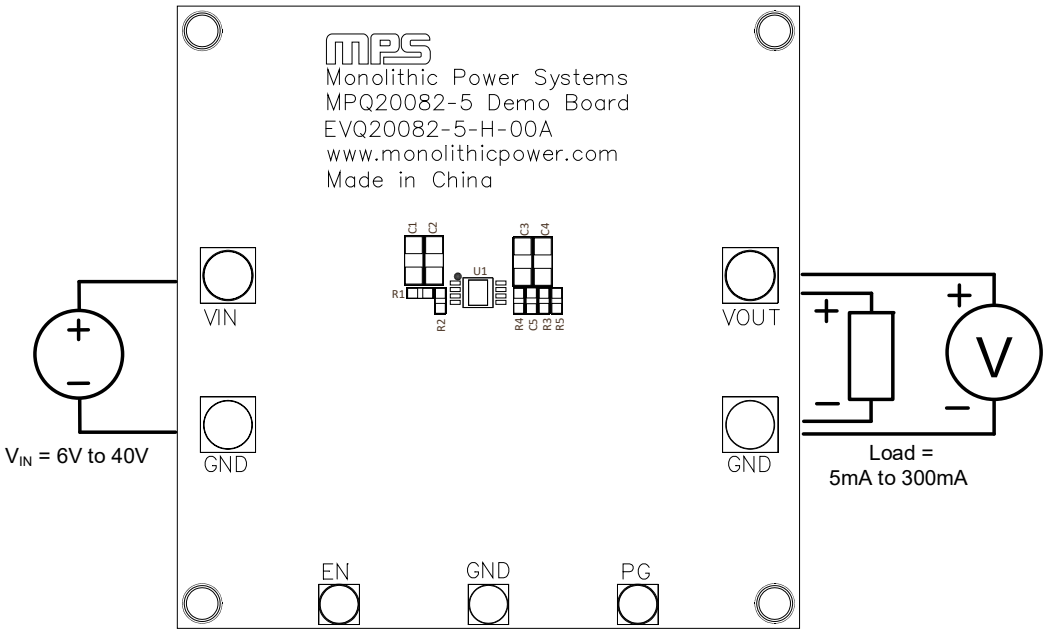


Figure 1: Measurement Equipment Set-Up

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

EVALUATION BOARD SCHEMATIC

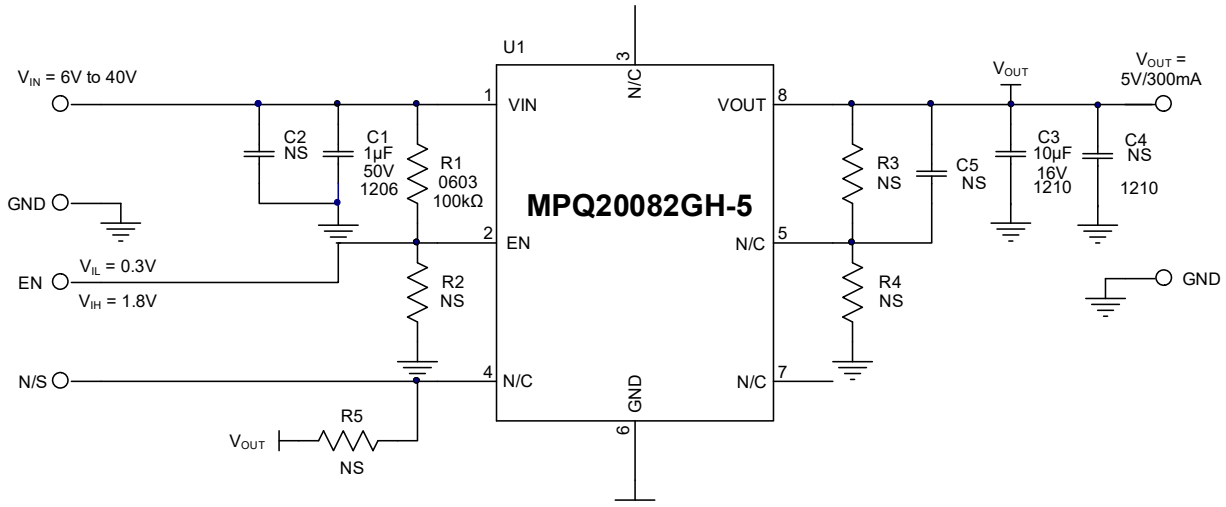
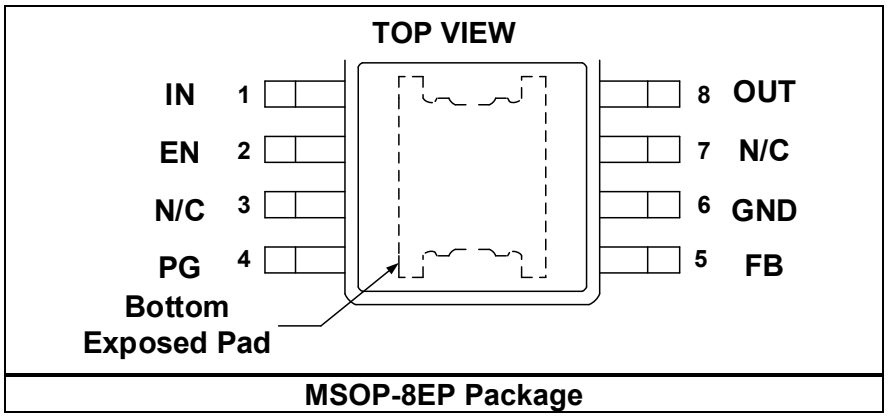


Figure 2: Evaluation Board Schematic

PACKAGE REFERENCE



MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

EVQ20082-5-H-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1	1µF	Ceramic capacitor, 50V, X7R	1206	Murata	885012208093
3	C2, C4, C5	NS				
1	C3	10µF	Ceramic capacitor, 16V, X7R	1206	Samsung	CL31B106MOHNNNE
2	R1, R5	100kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-07100KL
3	R2, R3, R4	NS				
4	VIN, GND, GND, VOUT	2mm male	Connector	DIP	Any	
3	PG, GND, EN	2.54mm	2.54mm test pin	2.54mm	Any	
1	U1	MPQ20082-5-AEC1	40V, 300mA, low-I_Q linear regulator	MSOP-8EP	MPS	MPQ20082GH-5-AEC1

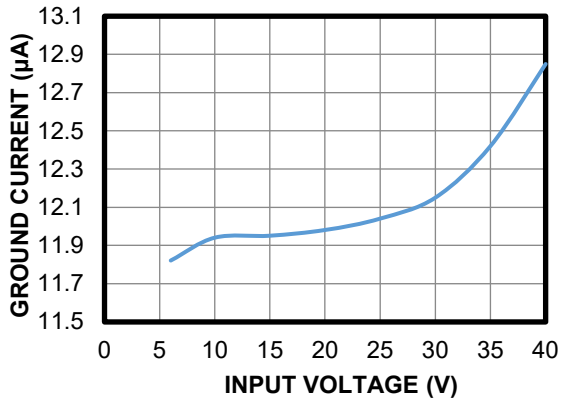
MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

EVB TEST RESULTS

Performance curves and waveforms are tested on the evaluation board. V_{OUT} = 5V, T_A = 25°C, unless otherwise noted.

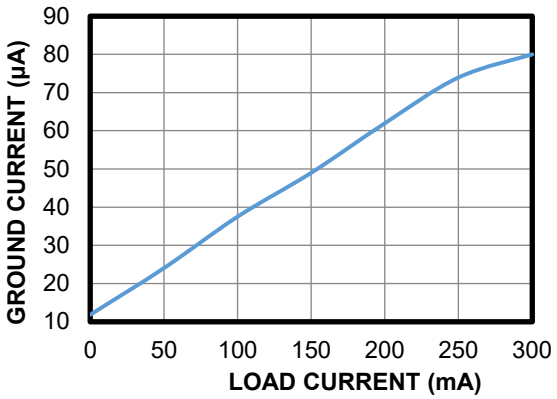
Ground Current vs. Input Voltage

I_{OUT} = 0mA



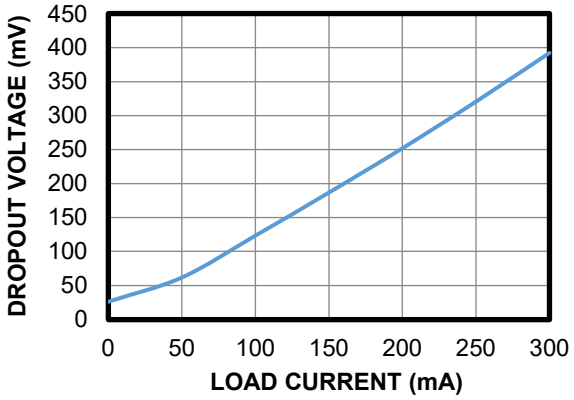
Ground Current vs. Load Current

V_{IN} = 6V



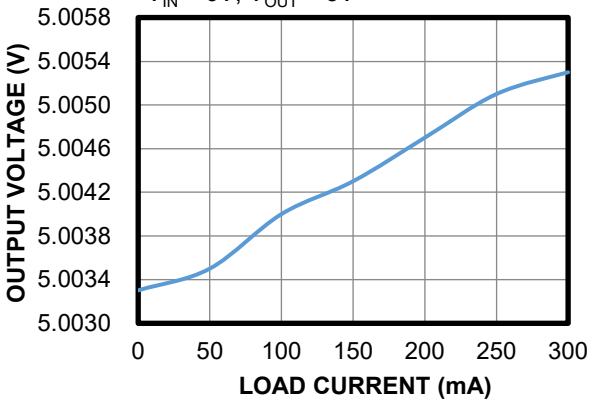
Dropout Voltage vs. Load Current

V_{OUT} = 5V



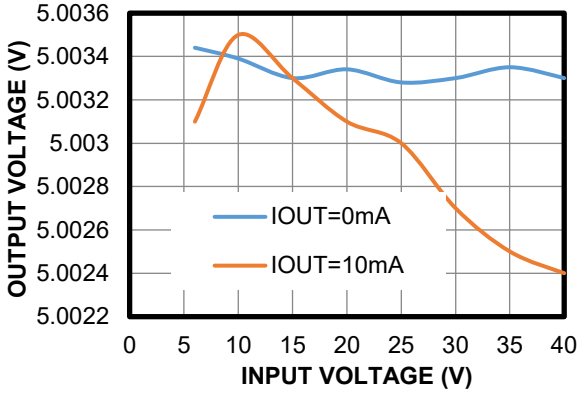
Output Voltage vs. Load Current

V_{IN} = 6V, V_{OUT} = 5V



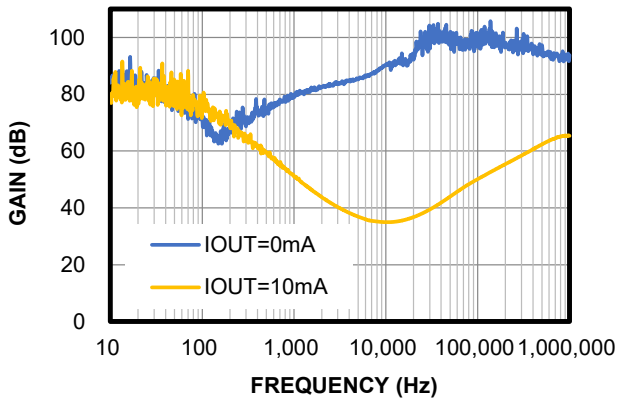
Output Voltage vs. Input Voltage

V_{OUT} = 5V



PSRR vs. Frequency

V_{OUT} = 5V



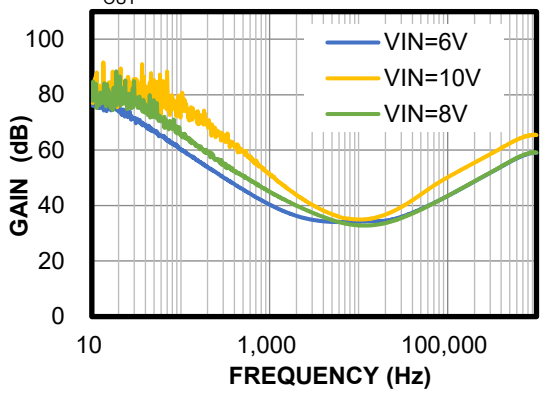
MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. V_{OUT} = 5V, T_A = 25°C, unless otherwise noted.

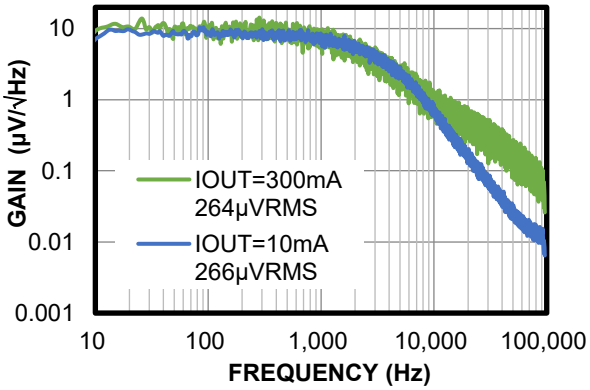
PSRR vs. Frequency

I_{OUT} = 10mA



Noise vs. Frequency

V_{OUT} = 5V, C_{OUT} = 10µF



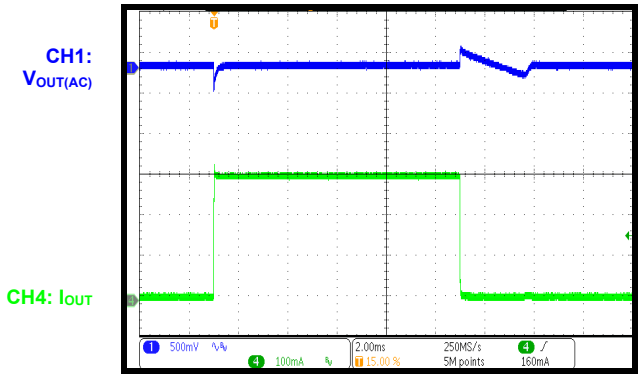
MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. V_{OUT} = 5V, T_A = 25°C, unless otherwise noted.

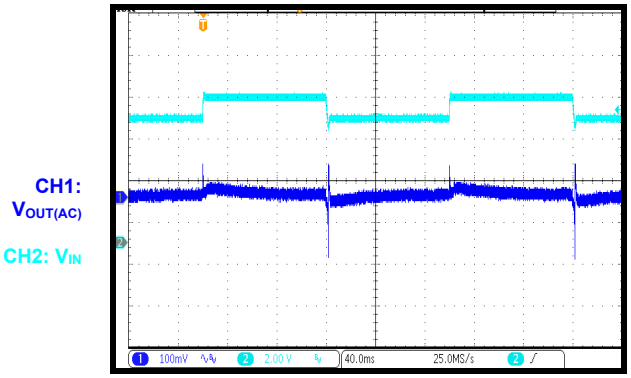
Load Transient Response

V_{IN} = 12V, I_{OUT} = 0mA to 300mA



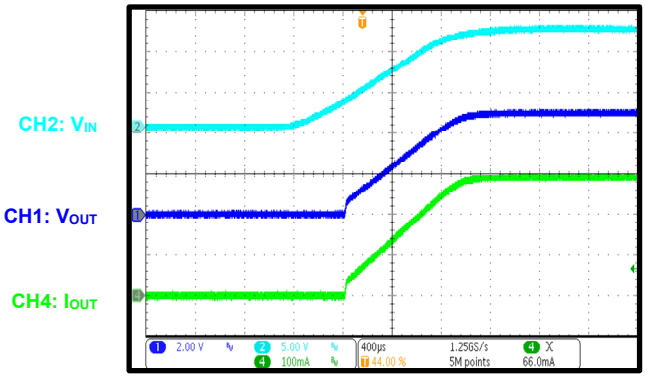
Line Transient Response

V_{IN} = 6V to 7V, I_{OUT} = 300mA



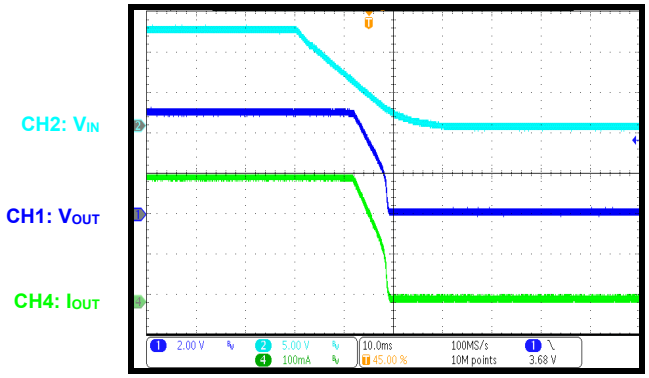
Start-Up through VIN

V_{IN} = 12V, I_{OUT} = 300mA



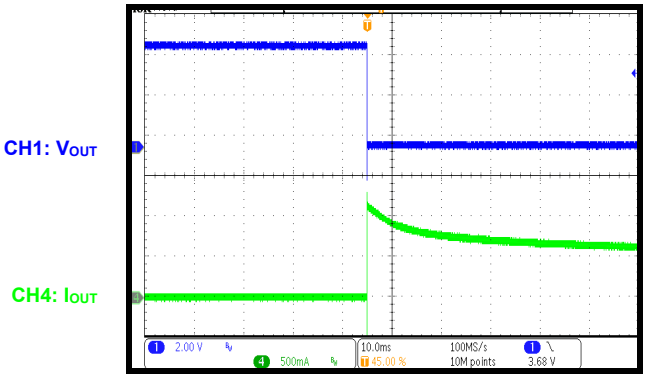
Shutdown through VIN

V_{IN} = 12V, I_{OUT} = 300mA



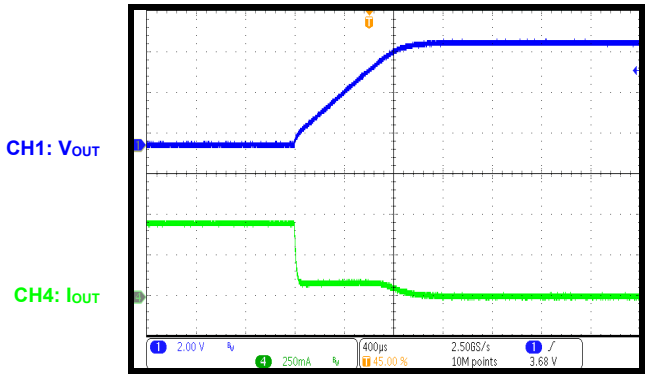
Short-Circuit Entry

V_{IN} = 12V, I_{OUT} = 0mA to short circuit



Short-Circuit Recovery

V_{IN} = 12V, short circuit to I_{OUT} = 0mA



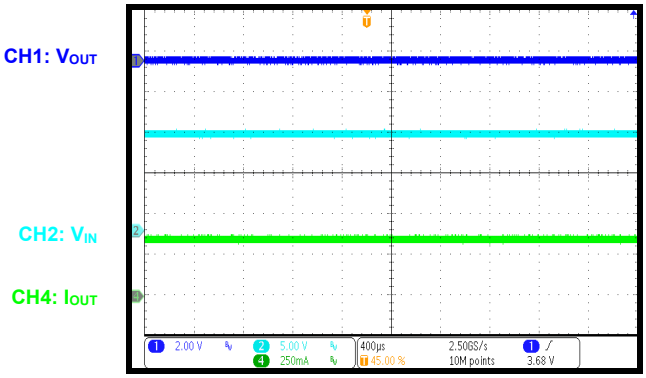
MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. V_{OUT} = 5V, T_A = 25°C, unless otherwise noted.

Short-Circuit Steady State

V_{IN} = 12V



MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

PCB LAYOUT

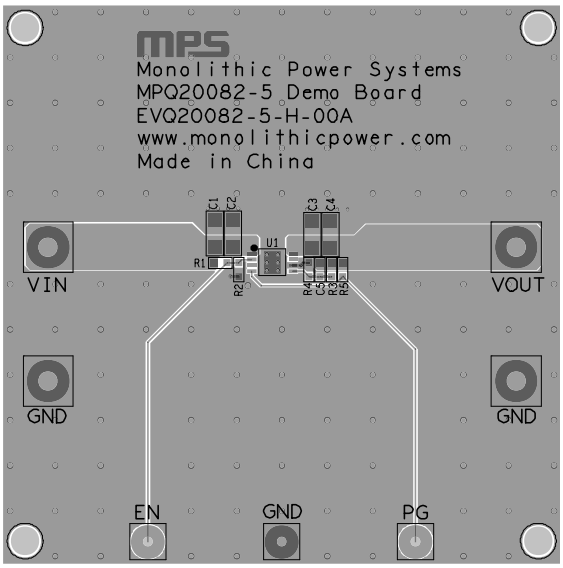


Figure 3: Top Layer

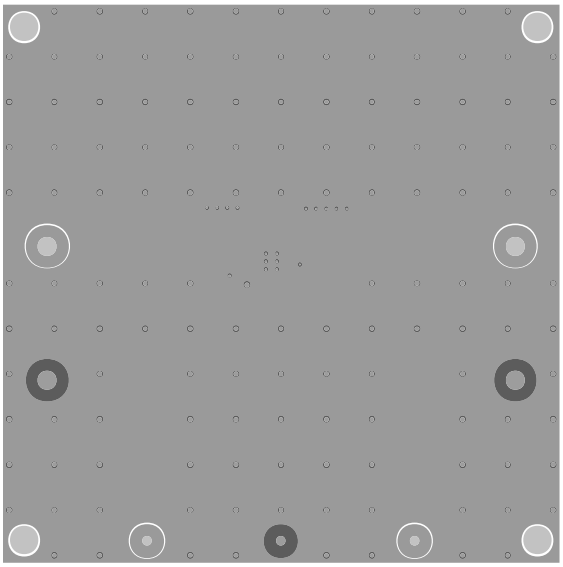


Figure 4: Bottom Layer

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	1/21/2025	Initial Release	-

Notice: The information in this document is subject to change without notice. Please contact MPS for current specifications. Users should warrant and guarantee that third-party Intellectual Property rights are not infringed upon when integrating MPS products into any application. MPS will not assume any legal responsibility for any said applications.

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.