



The Future of Analog IC Technology

# EVM3515-QV-00A

## 36V/1.5A Mini- Module Regulator with Intergrated Inductor Evaluation Board

### DESCRIPTION

The EVM3515-QV-00A is an evaluation board for MPM3515, a synchronous rectified, step-down Mini-Module regulator with built-in power MOSFETS, inductor and two capacitors.

The Evaluation Board can deliver a 1.5A continuous output current with excellent load and line regulation over a wide input supply range.

Full protection features include over-current protection and thermal shut down.

The MPM3515 is available in a space-saving QFN-17 (3mmx5mmx1.6mm) package.

### ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V <sub>IN</sub>	4 -36	V
Output Voltage	V <sub>OUT</sub>	3.3	V
Output Current	I <sub>OUT</sub>	1.5	A

### FEATURES

- Complete Switch Mode Power Supply
- 4V-to-36V Wide Operating Input Range
- 1.5A Continuous Load Current
- Low R<sub>DS(ON)</sub> Internal Power MOSFETS
- Fixed 2.2MHz Switching Frequency
- 450kHz-2.2MHz Frequency Sync
- Forced CCM mode
- Power Good Indicator
- OCP Protection with Valley Current Detection and Hiccup
- Thermal Shutdown
- Output Adjustable from 0.8V
- Available in QFN-17 (3mmx5mmx1.6mm) Package
- Available in AEC-Q100 Grade 1

### APPLICATIONS

- Industrial Controls
- Automotive
- Medical and Imaging Equipment
- Telecom Applications
- Distributed Power Systems

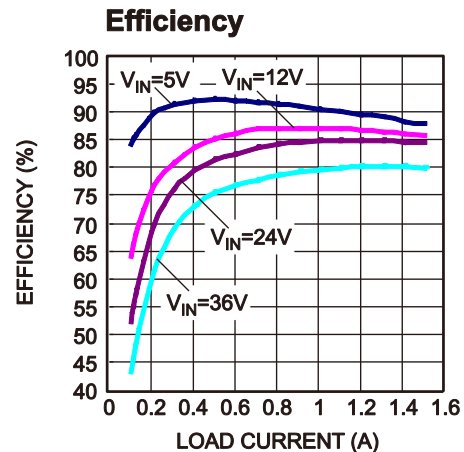
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### EVM3515-QV-00A EVALUTION BOARD

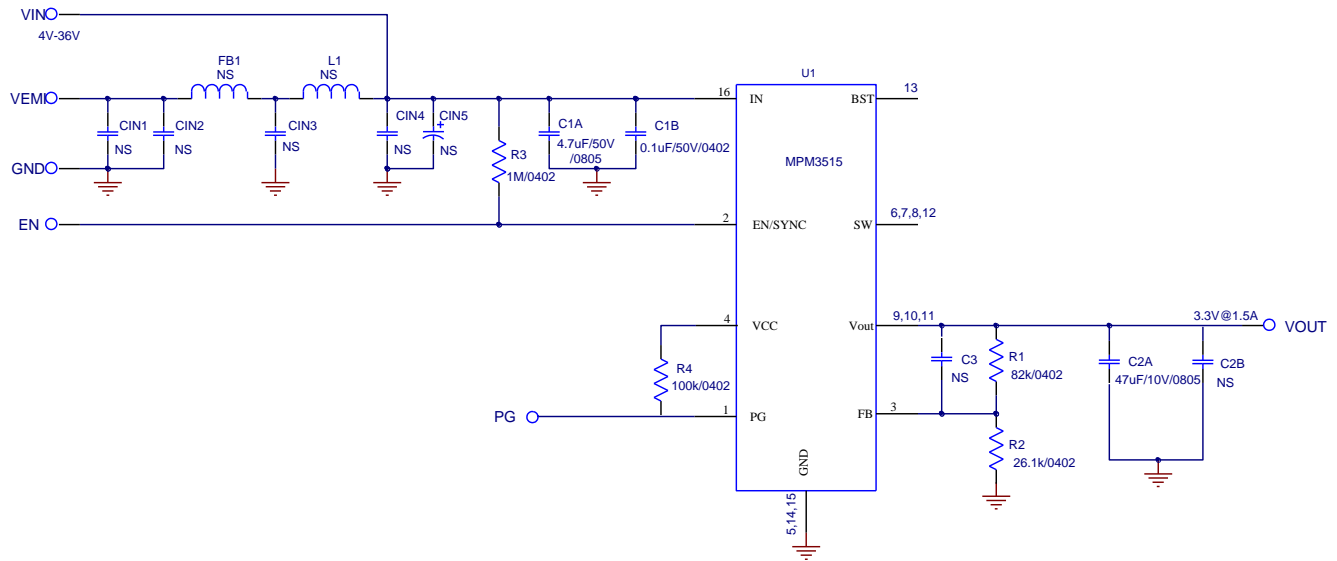


(L x W x H) 6.35cm x 6.35cm x 0.3cm

Board Number	MPS IC Number
EVM3515-QV-00A	MPM3515GQV



## EVALUATION BOARD SCHEMATIC



## EVM3515-QV-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer_P/N
1	C1A	4.7 $\mu$ F	Ceramic Cap., 50V, X7R	0805	muRata	GRM21BC71H475KE1
1	C1B	0.1 $\mu$ F	Ceramic Cap., 50V, X7R	0402	TDK	C1005X7R1C104K
1	C2A	47 $\mu$ F	Ceramic Cap., 10V, X5R	0805	muRata	GRM21BR61A476ME15L
7	C2B, CIN1, CIN2, CIN3, CIN4, CIN5, C3	NS				
1	R1	82k	Film Res., 1%	0402	Yageo	RC0402FR-0782KL
1	R2	26.1k	Film Res., 1%	0402	Yageo	RC0402FR-0726K1L
1	R3	1M	Film Res., 5%	0402	Yageo	RC0402JR-071ML
1	R4	100k	Film Res., 1%	0402	Yageo	RC0402FR-07100KL
1	FB1	NS				
1	L1	NS				
1	U1		module		MPS	MPM3515GQV

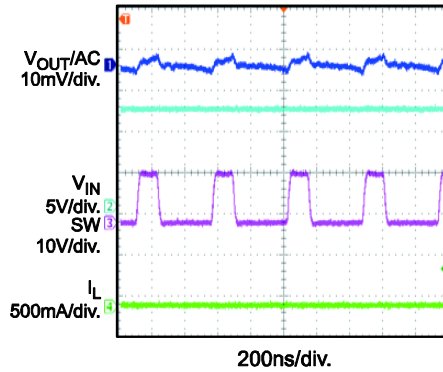
## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 12V$ ,  $V_{OUT} = 3.3V$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

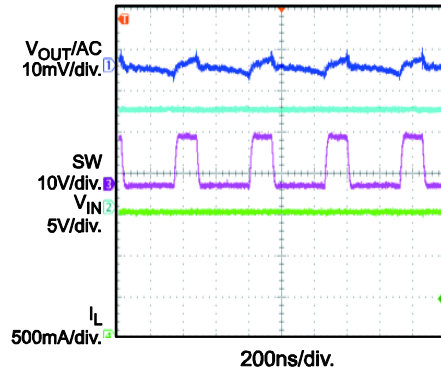
### Output Ripple

$I_{OUT} = 0A$



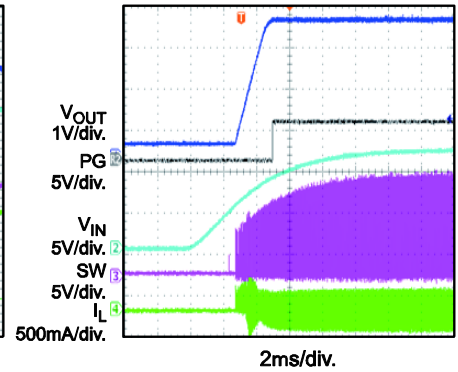
### Output Ripple

$I_{OUT} = 1.5A$



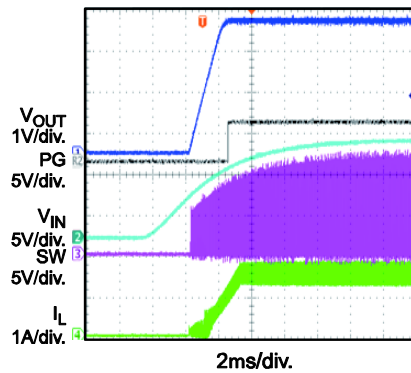
### $V_{IN}$ Start-Up

$I_{OUT} = 0A$



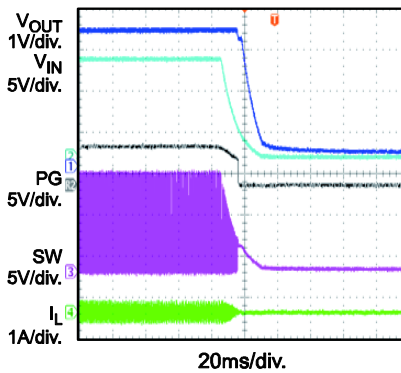
### $V_{IN}$ Start-Up

$I_{OUT} = 1.5A$



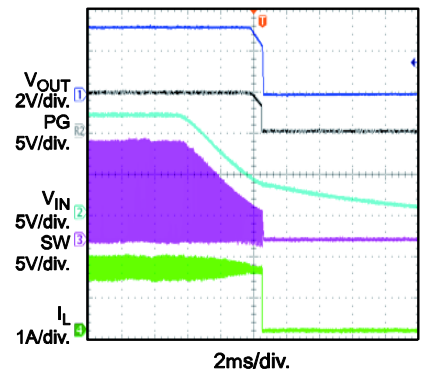
### $V_{IN}$ Shutdown

$I_{OUT} = 0A$



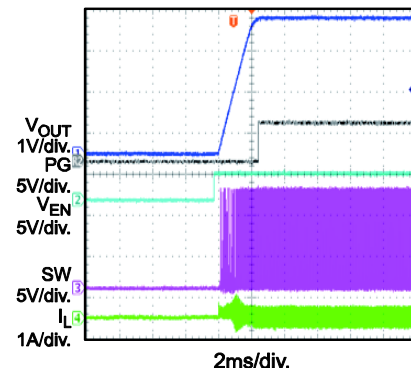
### $V_{IN}$ Shutdown

$I_{OUT} = 1.5A$



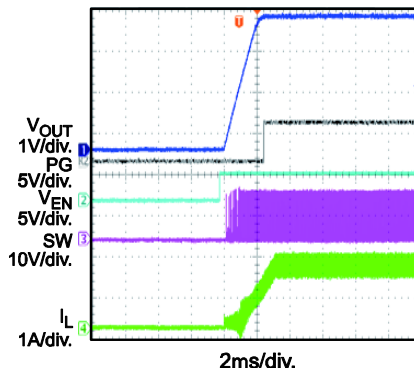
### EN Start-Up

$I_{OUT} = 0A$



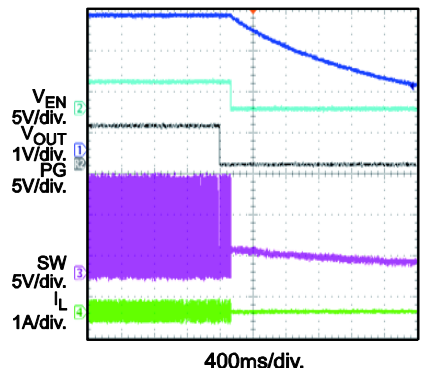
### EN Start-Up

$I_{OUT} = 1.5A$



### EN Shutdown

$I_{OUT} = 0A$



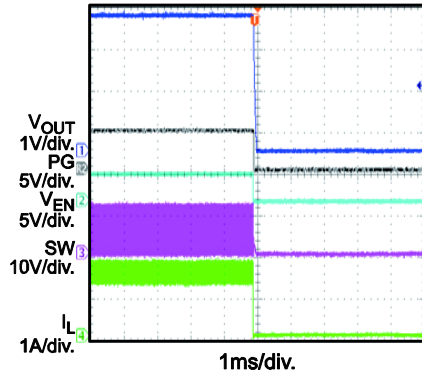
## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 24V$ ,  $V_{OUT} = 3.3V$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

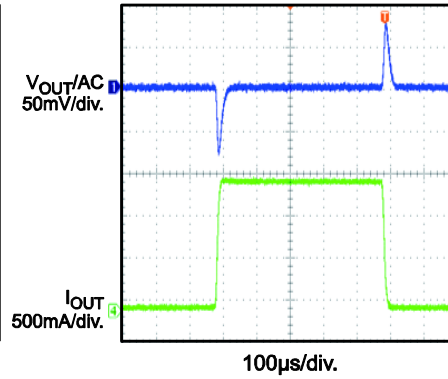
### EN Shutdown

$I_{OUT} = 1.5A$



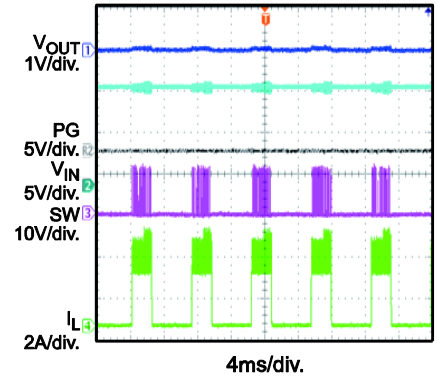
### Load Transient

$I_{OUT} = 0A-1.5A$



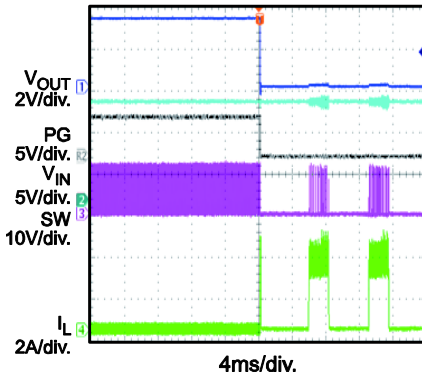
### SCP Steady State

$I_{OUT} = 0A$



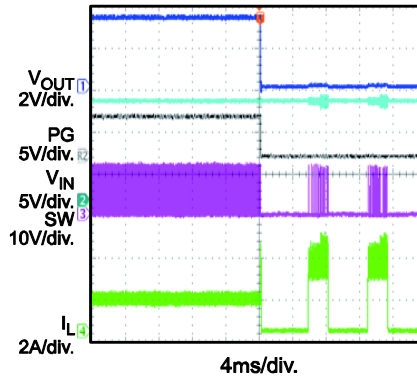
### SCP Entry

$I_{OUT} = 0A$



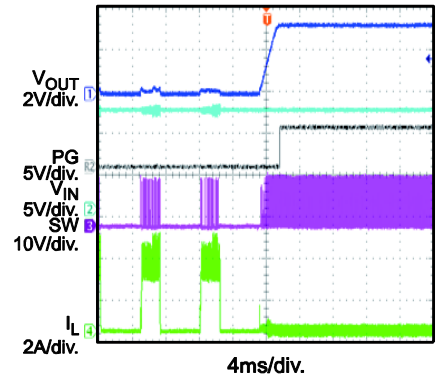
### SCP Entry

$I_{OUT} = 1.5A$



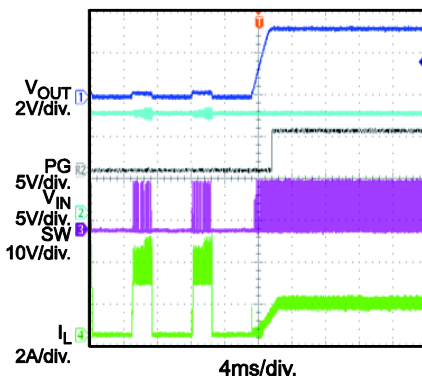
### SCP Recovery

$I_{OUT} = 0A$



### SCP Recovery

$I_{OUT} = 1.5A$



PRINTED CIRCUIT BOARD LAYOUT

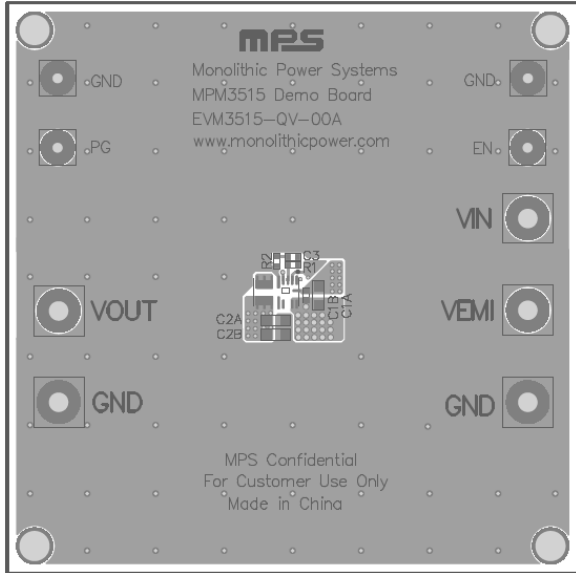


Figure 1-Top Silk Layer & Top layer

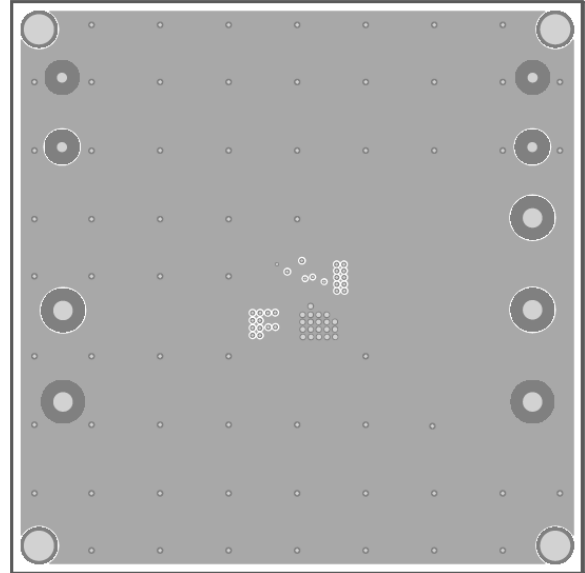


Figure 2-IN1 Layer

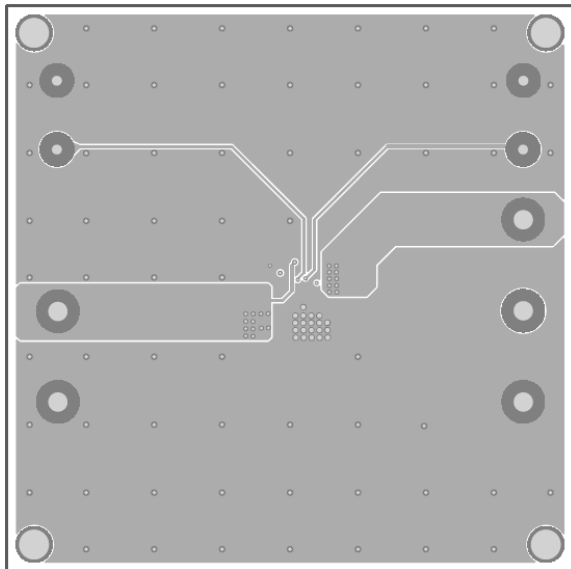


Figure 3-IN2 Layer

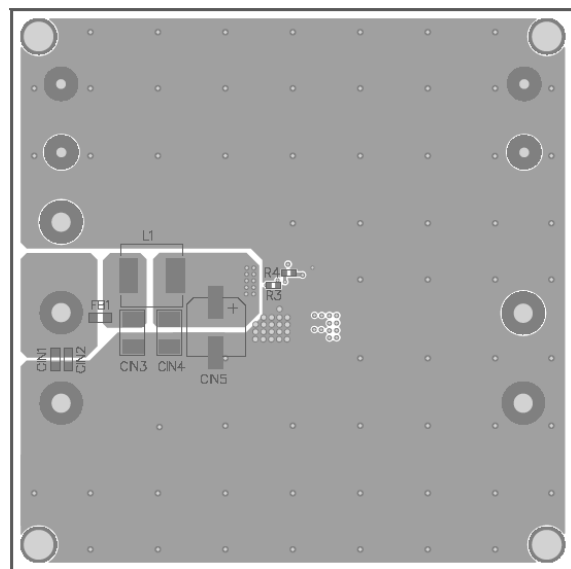


Figure 4-Bottom Silk Layer & Bottom Layer

## QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
2. Preset the power supply output between 4V and 36V, and then turn off the power supply.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Turn the power supply on. The board will automatically start up.
5. To get better EMI performance, add the EMI components at bottom layer of the board and connect the input power supply between VEMI and GND.
6. To use the SYNC function, connect an external clock with a range of 450kHz to 2.2MHz to synchronize the internal clock rising edge to the external clock rising edge.

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