



The Future of Analog IC Technology®

# EVM3506A-QV-00A

## 36V/600mA Mini- Module Regulator with Intergrated Inductor Evaluation Board

### DESCRIPTION

The EVM3506A-QV-00A is an evaluation board for MPM3506A, a synchronous rectified, step-down Mini-Module regulator with built-in power MOSFETS, inductor and two capacitors.

The Evaluation Board can deliver a 600mA 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 MPM3506A is available in a space-saving QFN-19 (3mmx5mmx1.6mm) package.

### ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	4.5-36	V
Output Voltage	$V_{OUT}$	3.3	V
Output Current	$I_{OUT}$	600	mA

### FEATURES

- Complete Switch Mode Power Supply
- 4.5V-to-36V Wide Operating Input Range
- 600mA Continuous Load Current
- Low  $R_{DS(ON)}$  Internal Power MOSFETS
- Fixed 1.15MHz Switching Frequency
- 800kHz-2MHz Frequency Sync
- Power Save Mode for Light Load
- Power Good Indicator
- OCP Protection with Valley Current detection and Hiccup
- Thermal Shutdown
- Output Adjustable from 0.8V
- Available in QFN-19 (3x5x1.6mm) Package

### APPLICATIONS

- Industrial Controls
- Automotive
- Medical and Imaging Equipment
- Telecom Applications
- LDO Replacement
- Space and Resource-limited Applications
- Distributed Power Systems

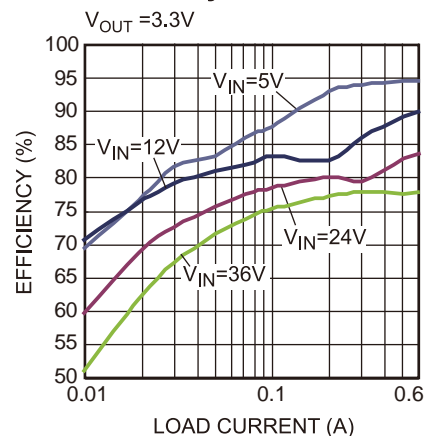
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## EVM3506A-QV-00A EVALUATION BOARD

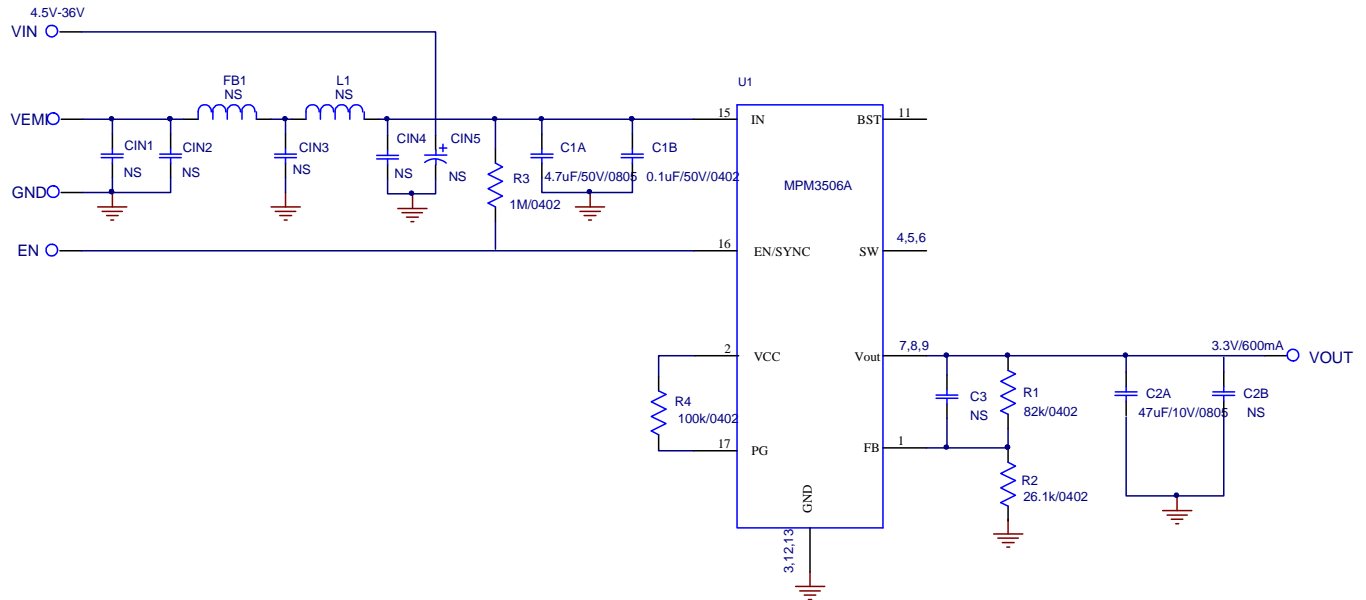
(L x W x H) 6.35cm x 6.35cm x 0.3cm

Board Number	MPS IC Number
EVM3506A-QV-00A	MPM3506AGQV

### Efficiency vs. Load Current



## EVALUATION BOARD SCHEMATIC



## EVM3506A-QV-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer_P/N
1	C1A	4.7uF	Ceramic Cap., 50V, X7R	0805	muRata	GRM21BC71H475KE1
1	C1B	0.1uF	Ceramic Cap., 50V, X7R	0402	TDK	C1005X7R1C104K
1	C2A	47uF	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	MPM3506A

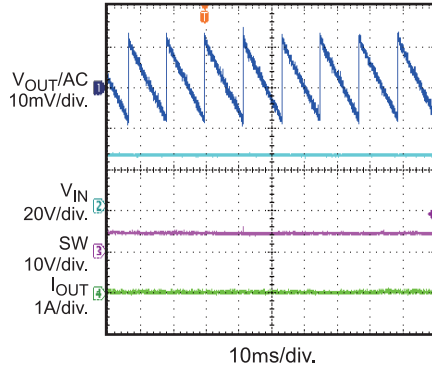
## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

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

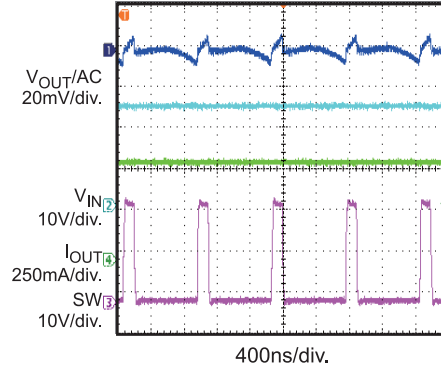
**Output Ripple**

$I_{OUT} = 0A$



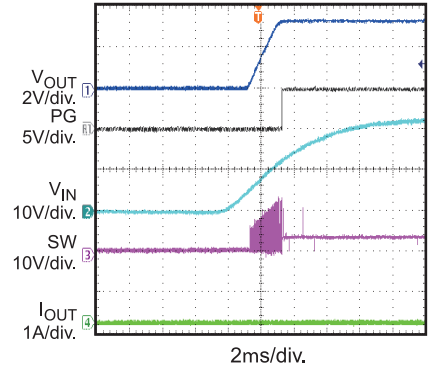
**Output Ripple**

$I_{OUT} = 600mA$



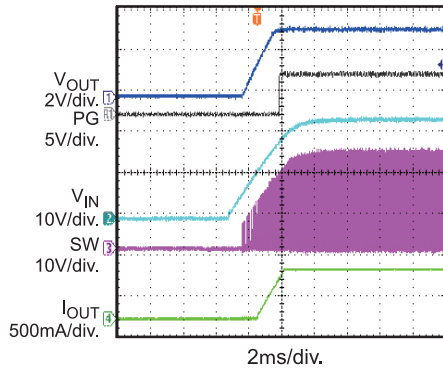
**$V_{IN}$  Startup**

$I_{OUT} = 0A$



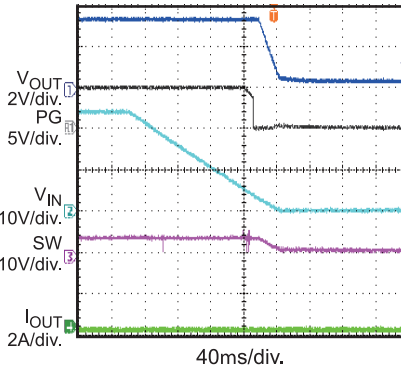
**$V_{IN}$  Startup**

$I_{OUT} = 600mA$



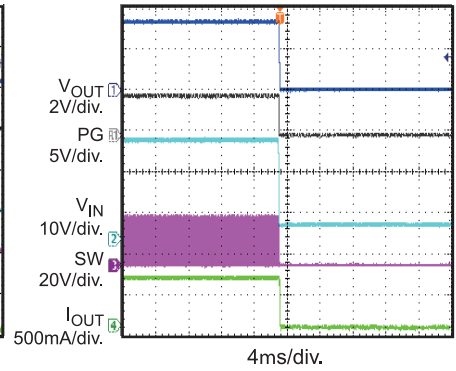
**$V_{IN}$  Shutdown**

$I_{OUT} = 0A$



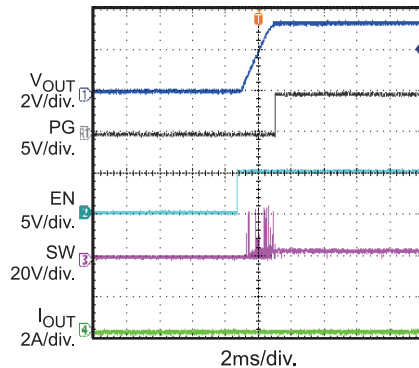
**$V_{IN}$  Shutdown**

$I_{OUT} = 600mA$



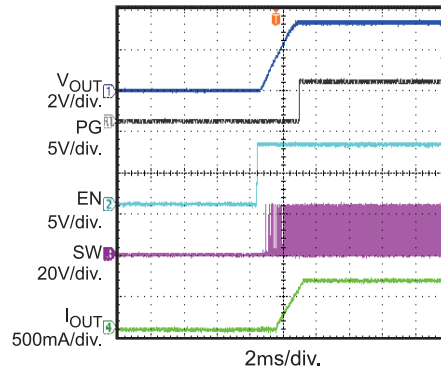
**EN Startup**

$I_{OUT} = 0A$



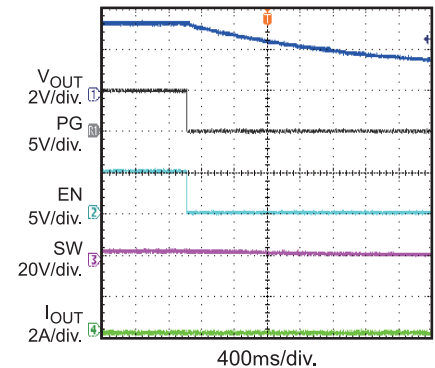
**EN Startup**

$I_{OUT} = 600mA$



**EN Shutdown**

$I_{OUT} = 0A$



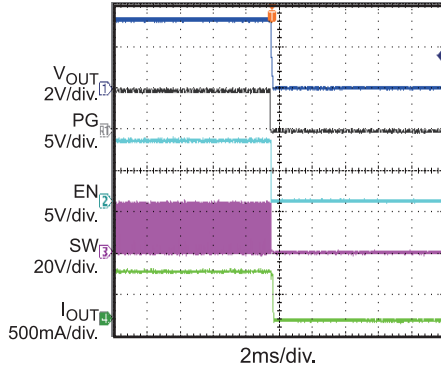
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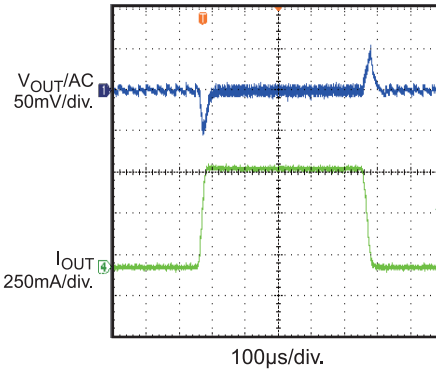
### EN Shutdown

$I_{OUT} = 600mA$



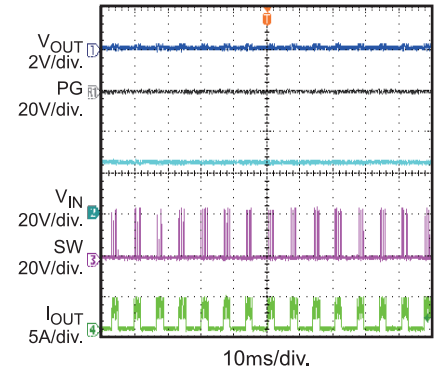
### Load Transient

$I_{OUT} = 0A-600mA$



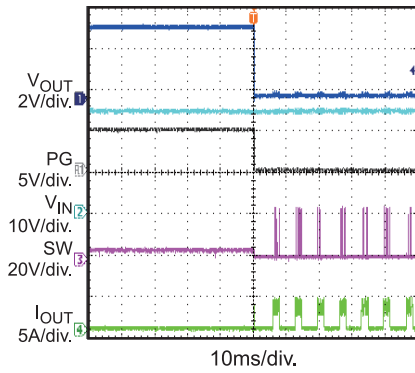
### SCP Steady State

$I_{OUT} = 0A$



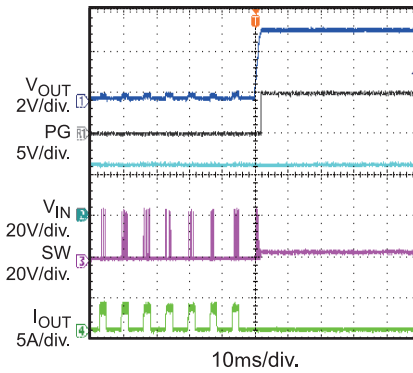
### SCP Entry

$I_{OUT} = 0A$



### SCP Recovery

$I_{OUT} = 0A$



### PRINTED CIRCUIT BOARD LAYOUT

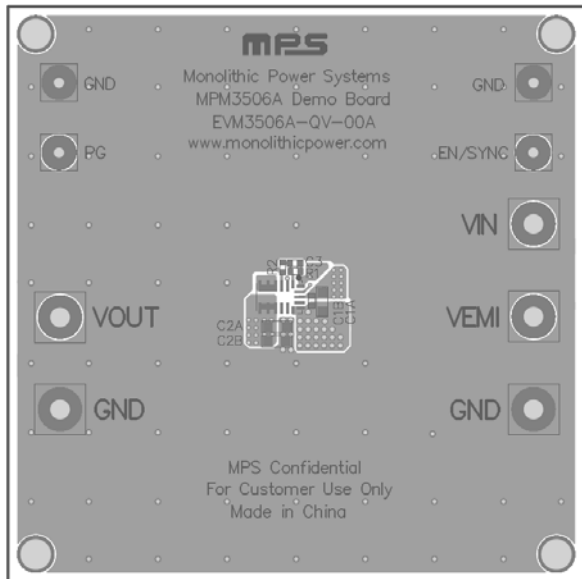


Figure 1-Top Silk Layer & Top layer

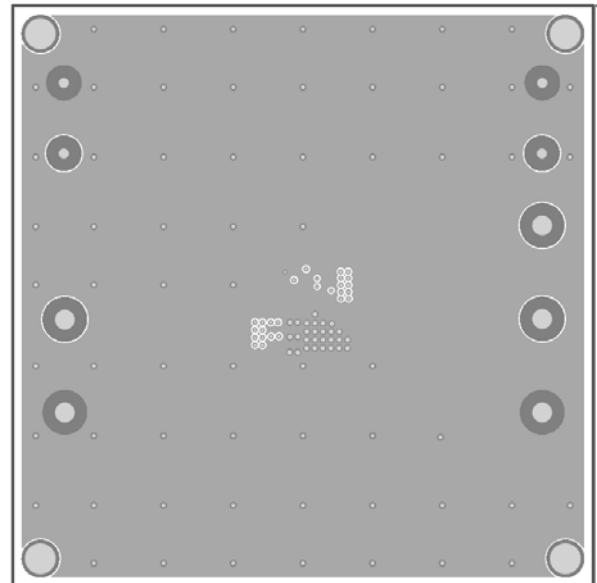


Figure 2-IN1 Layer

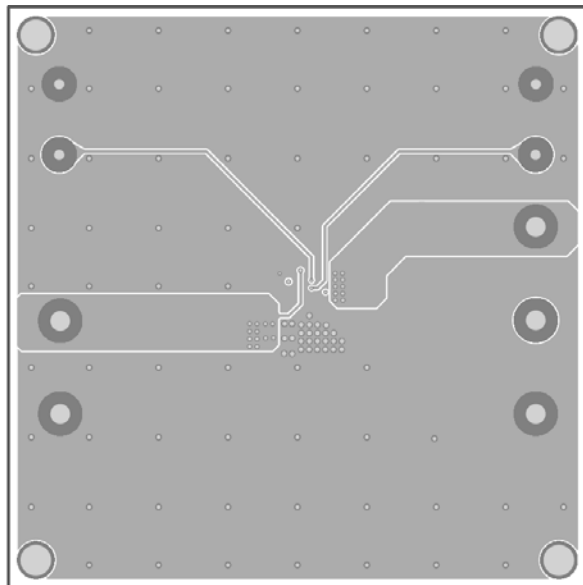


Figure 3-IN2 Layer

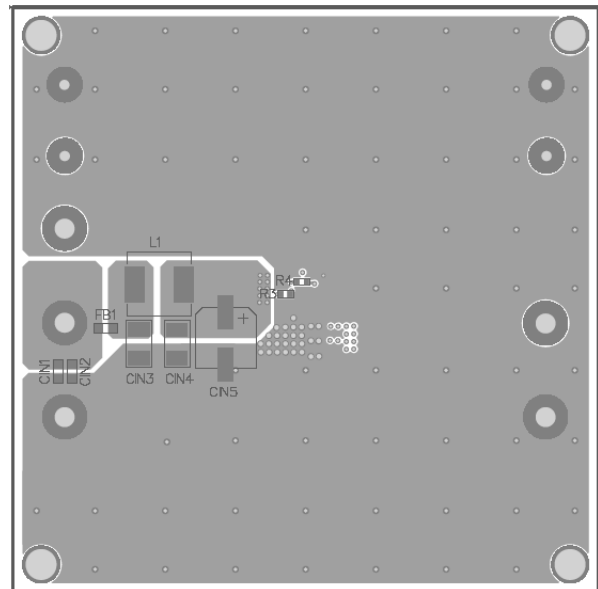


Figure 4-Bottom Silk Layer & Bottom Layer