

### DESCRIPTION

The EVM3606A-QV-00A is an evaluation board for MPM3606A, a synchronous rectified, step-down module converter with built-in power MOSFETs, inductor and two capacitors.

The evaluation board can deliver a 0.6A continuous output current with excellent load and line regulation over a wide input supply range.

Current-mode operation provides fast transient response and eases loop stabilization.

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

The MPM3606A is available in a space-saving QFN20 (3mm x5mmx1.6mm) package.

### ELECTRICAL SPECIFICATION (1)

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	12	V
Output Voltage	$V_{OUT}$	3.3	V
Output Current	$I_{OUT}$	0.6	A

**Notes:**

1) For different input, output spec, please refer to APPLICATION and TYPICAL APPLICATION CIRCUITS section on datasheet to choose proper values.

### FEATURES

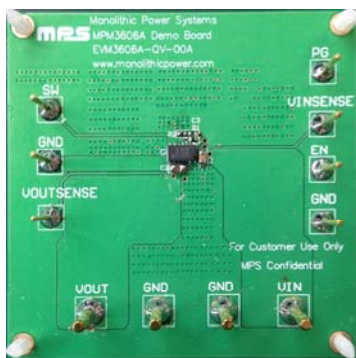
- 0.6A Continuous Load Current
- 100mΩ/50mΩ Low  $R_{DS(ON)}$  Internal Power MOSFETs
- Integrated Inductor
- Integrated VCC and Bootstrap Capacitors
- Power Save Mode at Light Load
- Power Good Indicator
- Over Current Protection and Hiccup
- Thermal Shutdown
- Output Adjustable from 0.8V
- Available in QFN20 (3x5x1.6mm) Package
- Total solution size 6.7mm x7.3mm

### APPLICATIONS

- Industrial Controls
- Medical and Imaging Equipment
- Telecom and Networking Applications
- LDO Replacement
- Space and Resource-limited Applications

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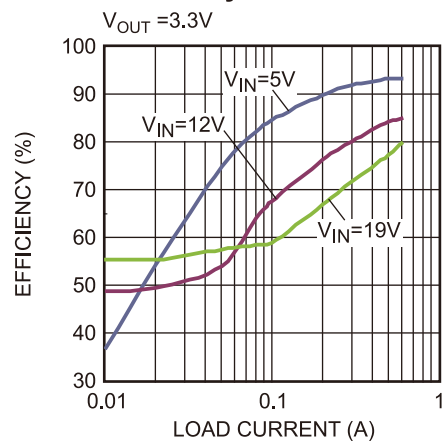
## EVM3606A-QV-00A EVALUATION BOARD

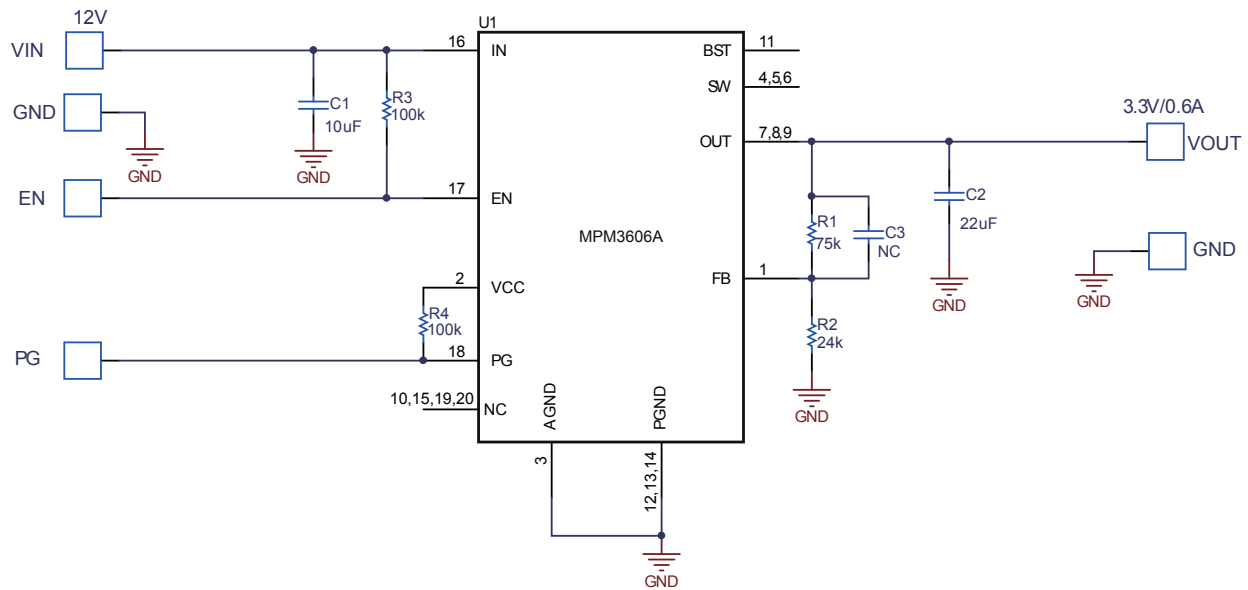


(L x W x H) 6.35cm x 6.35cm x 0.32cm

Board Number	MPS IC Number
EVM3606A-QV-00A	MPM3606AGQV

### Efficiency vs. Load Current



**EVALUATION BOARD SCHEMATIC**

**EVM3606A-QV-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	10µF	Ceramic Cap,25V,X5R	0805	muRata	GRM21BR61E106KA73L
1	C2	22µF	Ceramic Cap,16V,X5R	0805	muRata	GRM219R61C226ME15L
0	C3	NS				
1	R1	75k	Thick Film Res., 1%	0402	Any	
1	R2	24k	Thick Film Res., 1%	0402	Any	
1	R3	100k	Thick Film Res., 1%	0402	Any	
1	R4	100k	Thick Film Res., 1%	0402	Any	
1	U1	MPM3606A	Synchronous Step-Down Module Converter	QFN-20	MPS	MPM3606AGQV

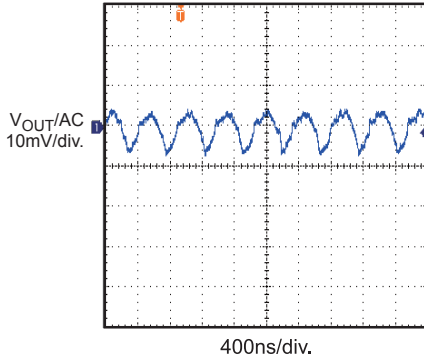
## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

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

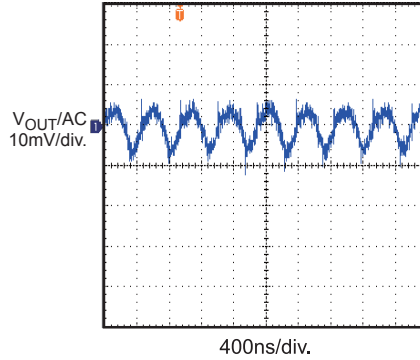
### Output Ripple

Bandwidth=20MHz,  
 $I_{OUT} = 0.6A$



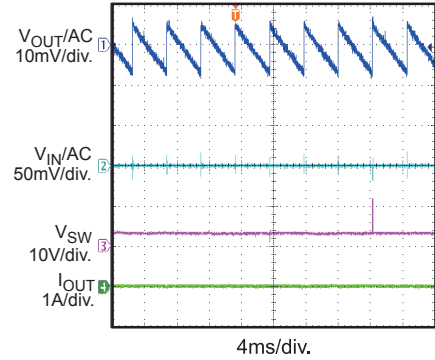
### Output Ripple

Bandwidth=150MHz,  
 $I_{OUT} = 0.6A$



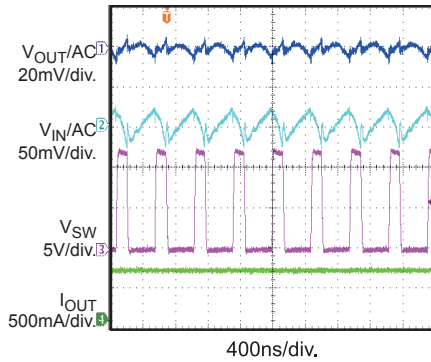
### Input/Output Ripple

$I_{OUT} = 0A$



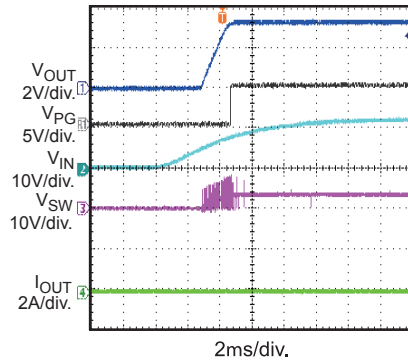
### Input/Output Ripple

$I_{OUT} = 0.6A$



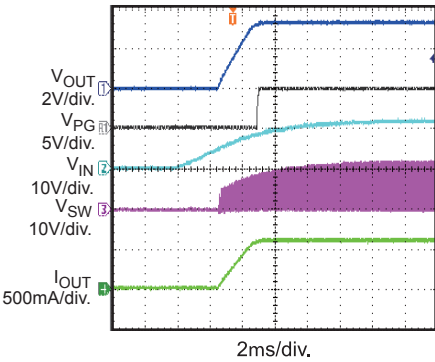
### Start-Up through Input Voltage

$I_{OUT} = 0A$



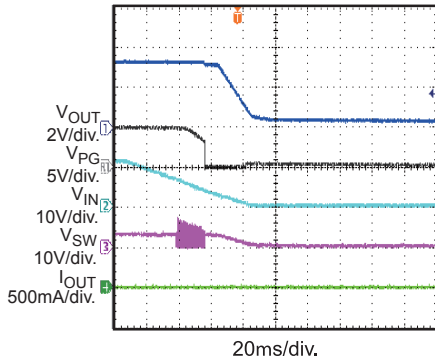
### Start-Up through Input Voltage

$I_{OUT} = 0.6A$



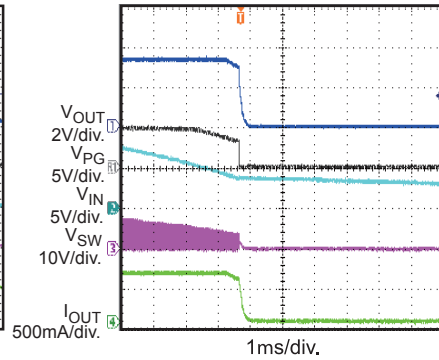
### Shutdown through Input Voltage

$I_{OUT} = 0A$



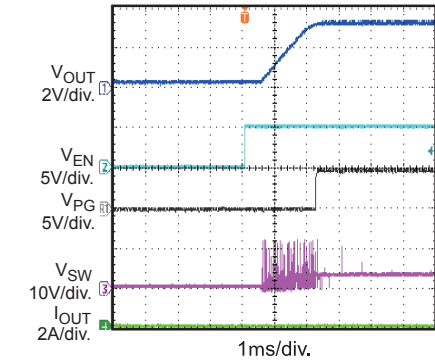
### Shutdown through Input Voltage

$I_{OUT} = 0.6A$



### Start-Up through Enable

$I_{OUT} = 0A$

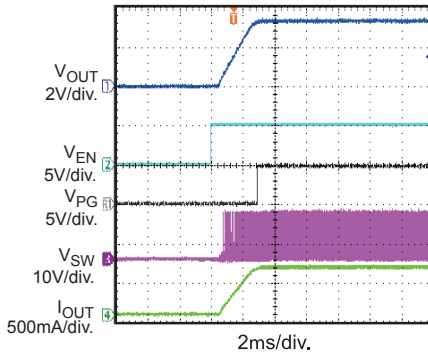


## EVB TEST RESULTS (continued)

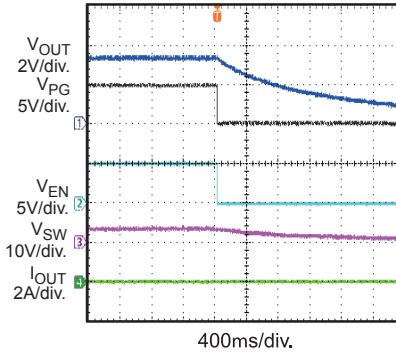
Performance waveforms are tested on the evaluation board.

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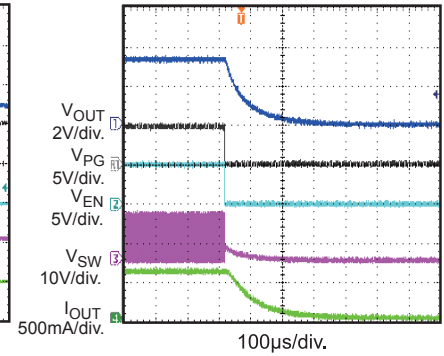
**Start-Up through Enable**  
 $I_{OUT} = 0.6A$



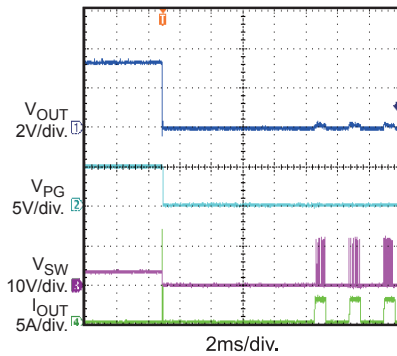
**Shutdown through Enable**  
 $I_{OUT} = 0A$



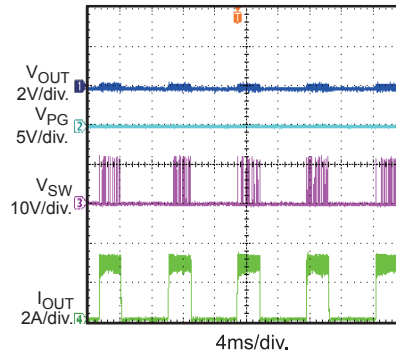
**Shutdown through Enable**  
 $I_{OUT} = 0.6A$



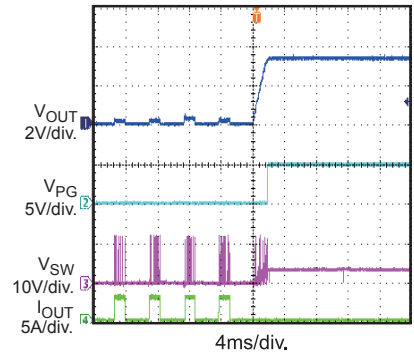
**Short-Circuit Entry**



**Short-Circuit Steady State**

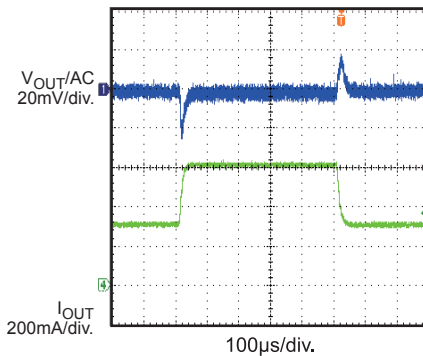


**Short-Circuit Recovery**



**Load Transient Response**

$I_{OUT} = 0.3A$  to  $0.6A$



### PRINTED CIRCUIT BOARD LAYOUT

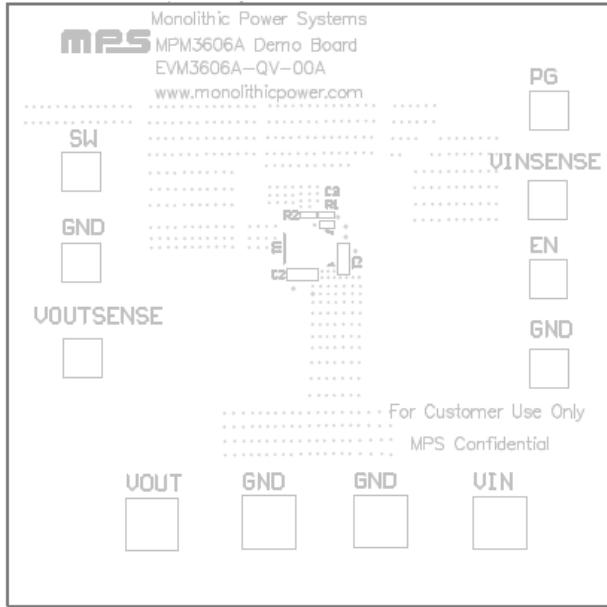


Figure 1—Top Silk Layer

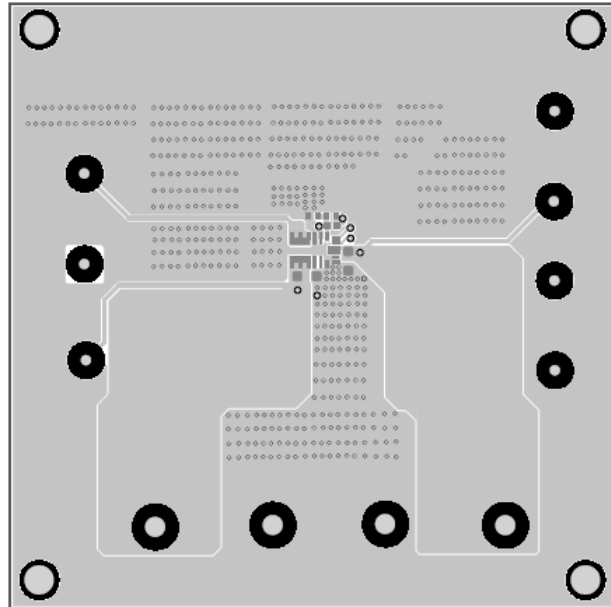


Figure 2—Top Layer

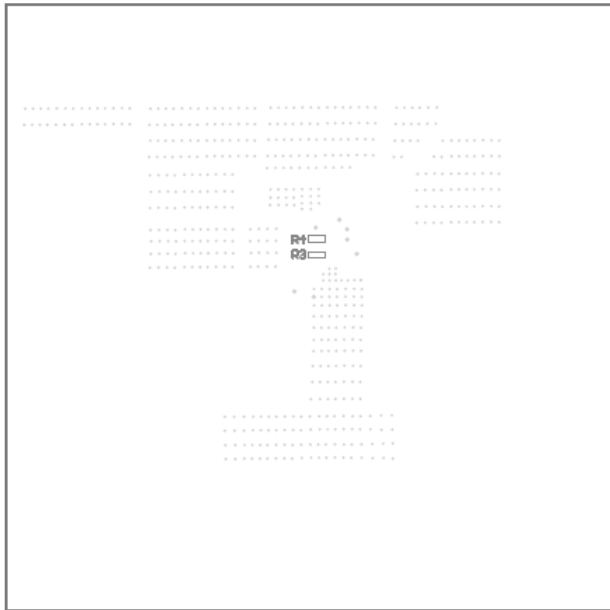


Figure 3—Bottom Silk Layer

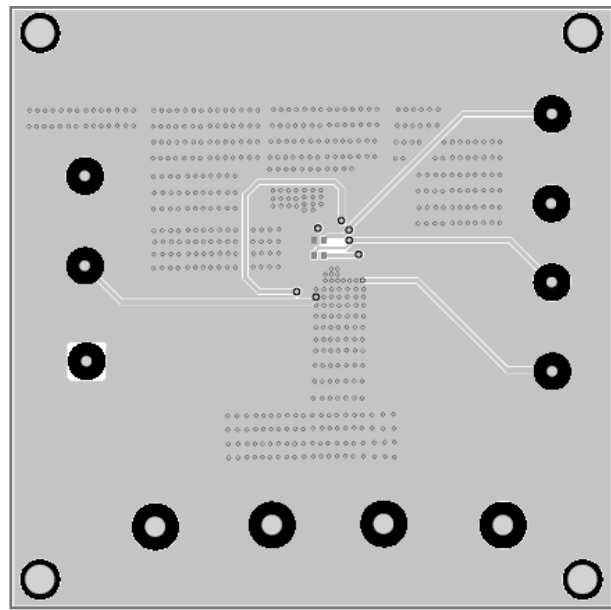


Figure 4—Bottom Layer

## QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the  $V_{OUT}$  and GND pins, respectively.
2. Preset the power supply output between 4.5V and 21V, and then turn off the power supply.
3. Connect the positive and negative terminals of the power supply output to the  $V_{IN}$  and GND pins, respectively.
4. Turn the power supply on. The board will automatically start up.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 1.4V to turn on the converter, or less than 1.25V to turn it off.

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