EVM3606A-QV-00A

21V/0.6A Module Converter with Integrated Inductor Evaluation Board

The Future of Analog IC Technology

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.

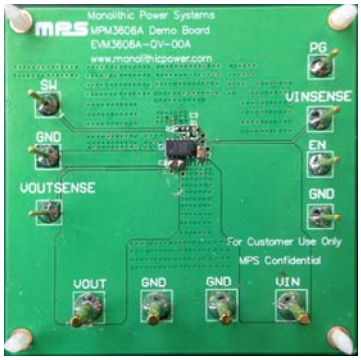
FEATURES

- 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

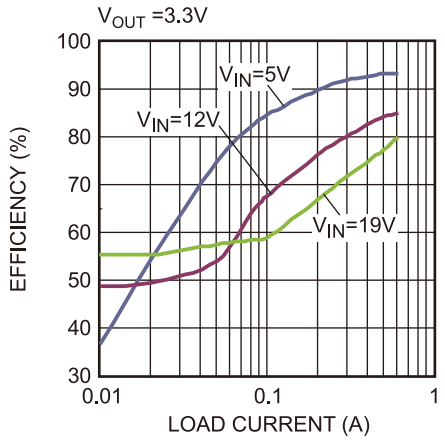
EVM3606A-QV-00A EVALUATION BOARD



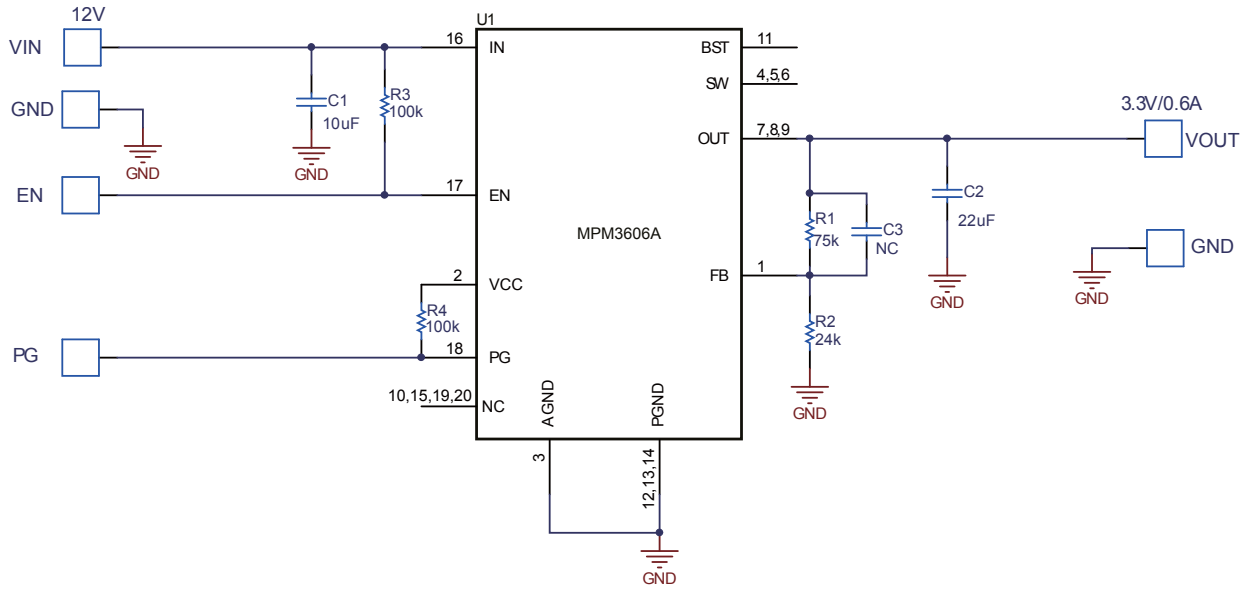
(L x W x H) 6.35cm x 6.35cm x 0.32cm

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

Efficiency vs. Load Current



EVALUATION BOARD SCHEMATIC



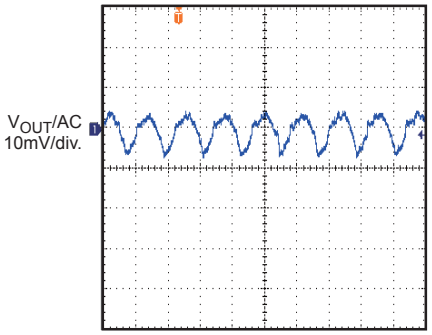
EVM3606A-QV-00A BILL OF MATERIALS

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

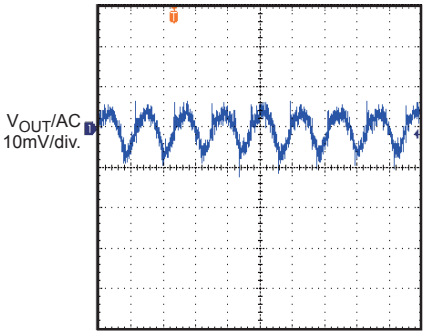
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.
V_{IN} = 12V, V_{OUT} = 3.3V, T_A=25°C, unless otherwise noted.

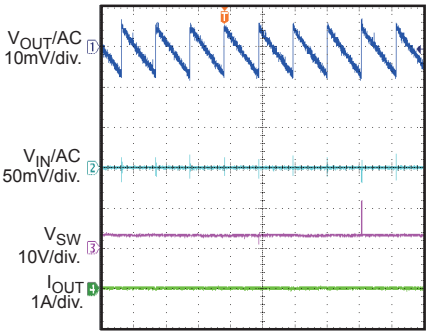
Output Ripple
Bandwidth=20MHz,
I_{OUT} = 0.6A



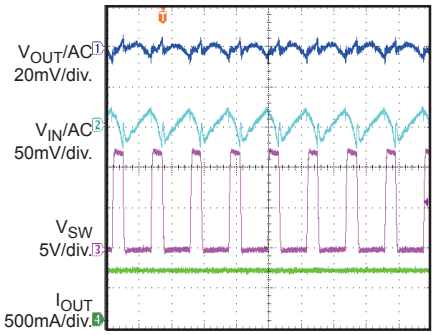
Output Ripple
Bandwidth=150MHz,
I_{OUT} = 0.6A



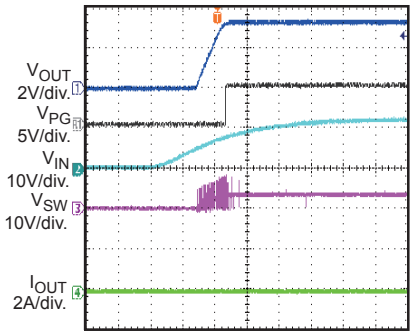
Input/Output Ripple
I_{OUT} = 0A



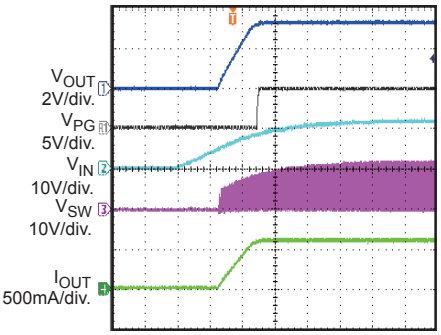
Input/Output Ripple
I_{OUT} = 0.6A



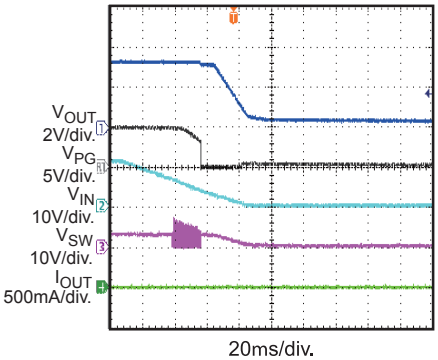
Start-Up through Input Voltage
I_{OUT} = 0A



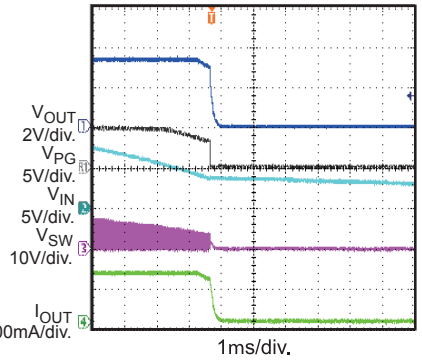
Start-Up through Input Voltage
I_{OUT} = 0.6A



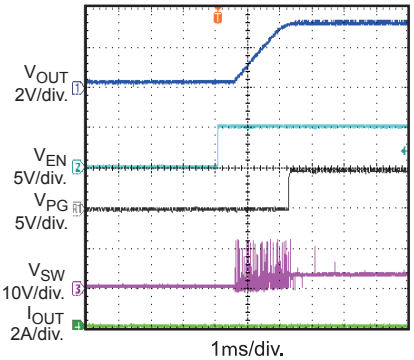
Shutdown through Input Voltage
I_{OUT} = 0A



Shutdown through Input Voltage
I_{OUT} = 0.6A



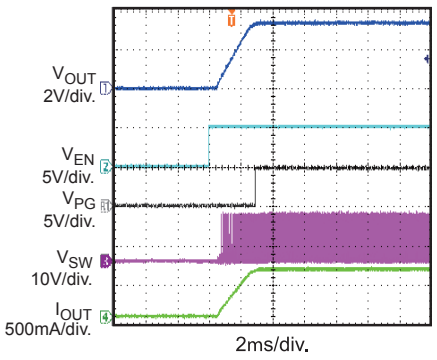
Start-Up through Enable
I_{OUT} = 0A



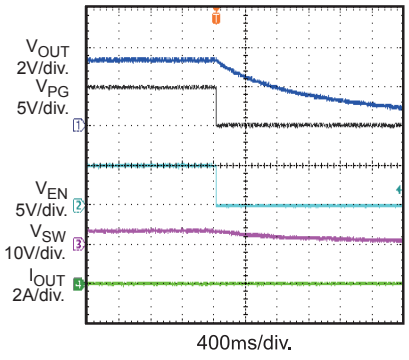
EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.
V_{IN} = 12V, V_{OUT} = 3.3V, T_A=25°C, unless otherwise noted.

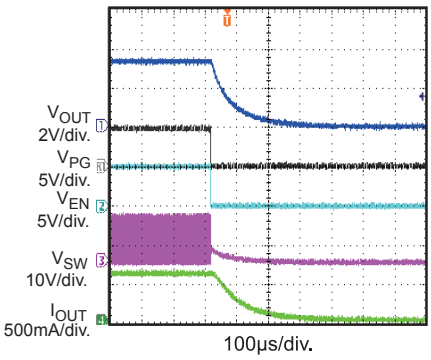
Start-Up through Enable
I_{OUT} = 0.6A



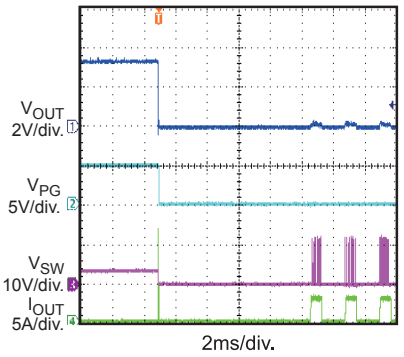
Shutdown through Enable
I_{OUT} = 0A



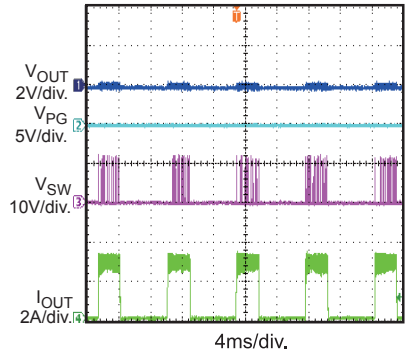
Shutdown through Enable
I_{OUT} = 0.6A



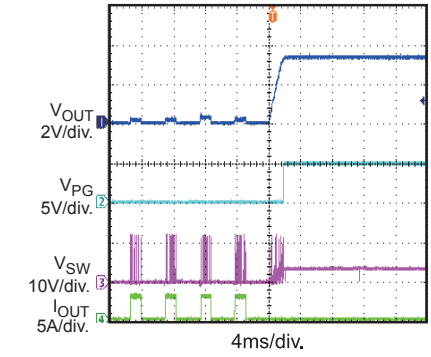
Short-Circuit Entry



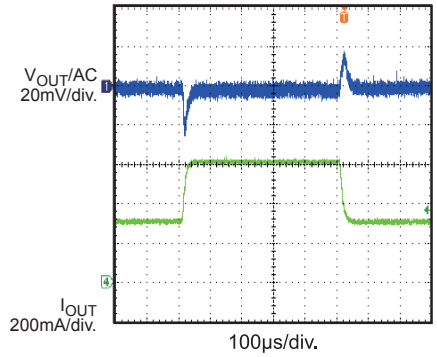
Short-Circuit Steady State



Short-Circuit Recovery



Load Transient Response
I_{OUT} = 0.3A to 0.6A



PRINTED CIRCUIT BOARD LAYOUT

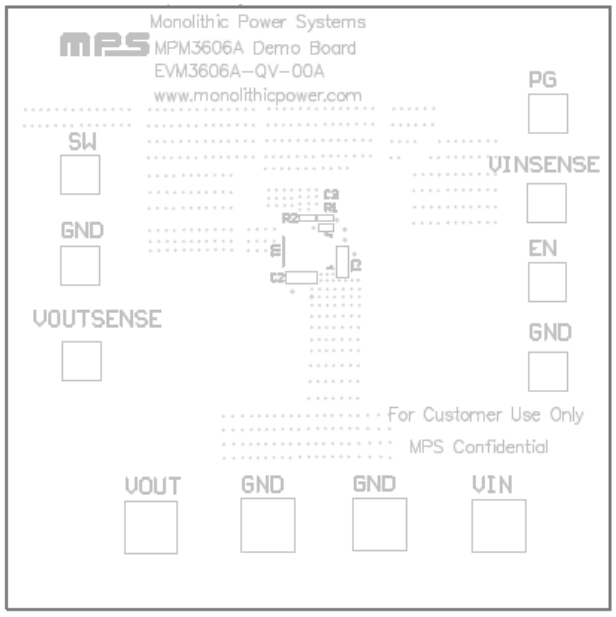


Figure 1—Top Silk Layer

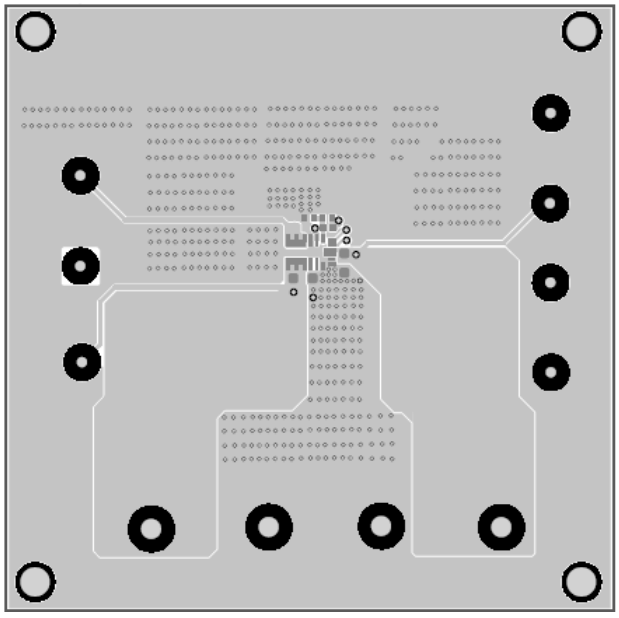


Figure 2—Top Layer

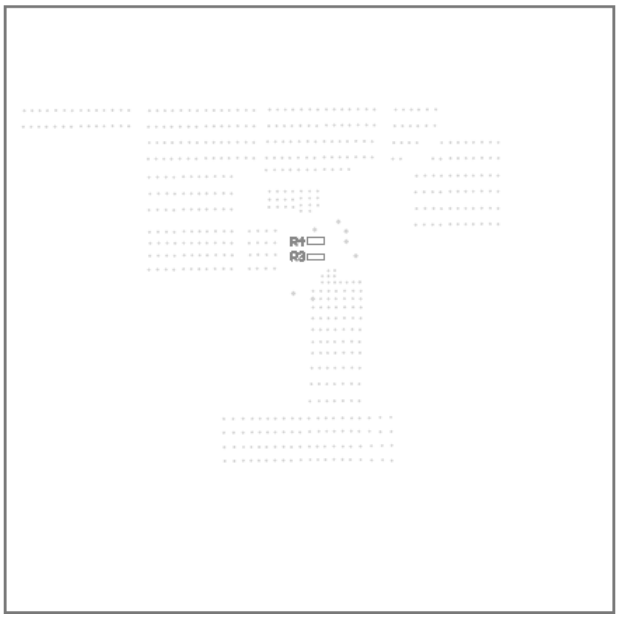


Figure 3—Bottom Silk Layer

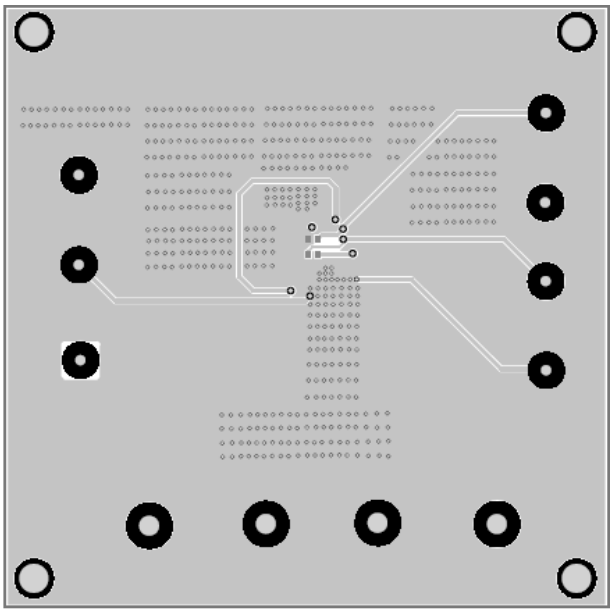


Figure 4—Bottom Layer

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.