



The Future of Analog IC Technology®

EVM3811-G-00A

High Efficiency, 1A, 5.5V,
2.2 MHz Synchronous Step-down Switcher
with Integrated Inductor

DESCRIPTION

The MPM3811 is a monolithic step-down switch mode converter with built-in power MOSFETs and inductor. The DC-DC module has a small surface mount 2mm x 2mm QFN package. It achieves 1A continuous output current from a 2.3V to 5.5V input voltage with excellent load and line regulation. The MPM3811 is ideal for a wide range of applications including high performance DSPs, wireless power, portable and mobile Devices, and other low-power systems. The output voltage can be regulated as low as 0.6V. Only input, output capacitors and FB resistors are needed to complete the design.

The Constant-On-time (COT) control scheme provides fast transient response, high efficiency at light-load and easy loop compensation.

The MPM3811 features fault protection functions including cycle-by-cycle current limit and thermal shutdown.

The MPM3811 requires a minimum number of readily available standard external components and is available in an ultra-small QFN10 (2mmx2mmx1.6mm) package.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	2.3 – 5.5	V
Output Voltage	V_{OUT}	1.2	V
Output Current	I_{OUT}	1	A

Note: $V_{IN} < 3.3V$ may need more input capacitor.

FEATURES

- Up to 91% Peak Efficiency
- Wide 2.3V to 5.5V Operating Input Range
- Output Voltage as Low as 0.6V
- 100% Duty Cycle in Dropout
- 1A Output Current
- 120mΩ and 80mΩ Internal Power MOSFET.
- 2.2MHz Frequency
- EN for Power Sequencing
- Cycle-by-Cycle Over Current Protection
- 0.5ms Internal Soft-Start Time
- Output Discharge
- Short Circuit Protection with Hiccup Mode
- Thermal Shutdown
- Stable with Low ESR Output Ceramic Capacitors
- Available in a QFN10 (2mmx2mmx1.6mm) Package

APPLICATIONS

- Wireless/Networking Cards
- Portable and Mobile Devices
- Battery Powered Devices
- Low Voltage I/O System Power

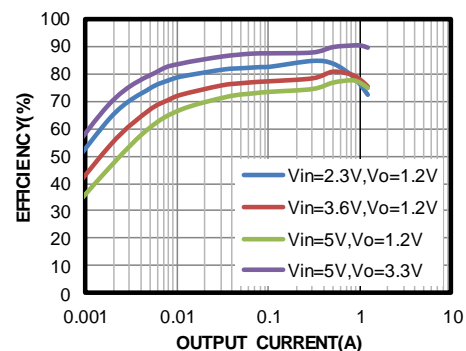
All MPS parts are lead-free, halogen free, and adhere to the RoHS directive. For MPS green status, please visit MPS website under Quality Assurance.

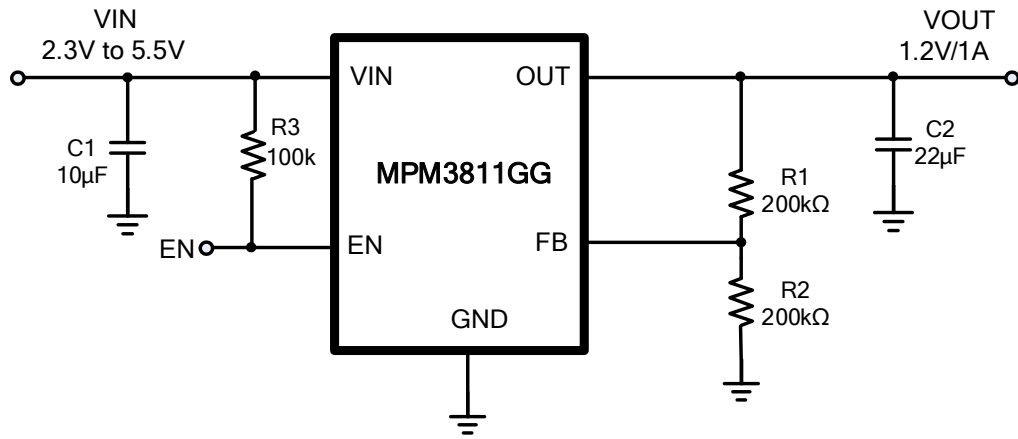
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EVM3811-G-00A EVALUATION BOARD



Board Number	MPS IC Number
EVM3811-G-00A	MPM3811GG



EVALUATION BOARD SCHEMATIC

Figure 1—Schematic of EVM3811GG

 Note: $V_{IN} < 3.3V$ may need more input capacitor.

EVM3811-G-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
2	R1, R2	200kΩ	Film Res,1%	0402	Any	Any
1	R3	100kΩ	Film Res,1%	0402	Any	Any
1	C1	10µF	Ceramic Cap,6.3V,X5R	0603	muRata	GRM188R60J475KE19D
1	C2	22µF	Ceramic Cap,6.3V,X5R	0603	TDK	C1608X5R0J226M
1	U1	MPM3811		2mmx2mm	MPS	MPM3811GG

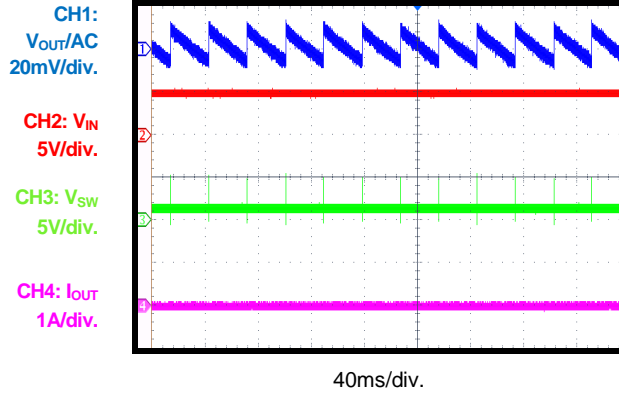
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$, $V_{OUT} = 1.2V$, $C_o = 22\mu F$, $T_A = +25^\circ C$, unless otherwise noted.

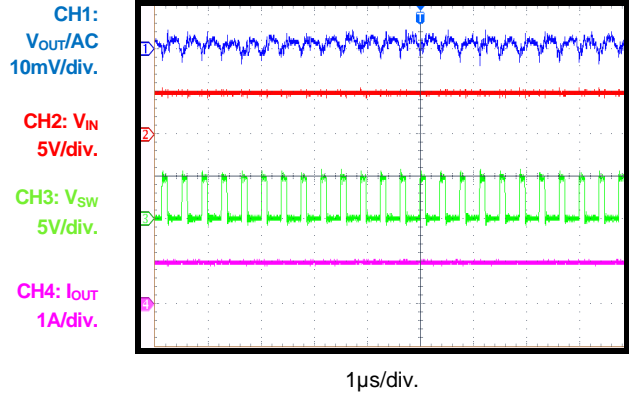
Steady State

$I_{OUT} = 0A$



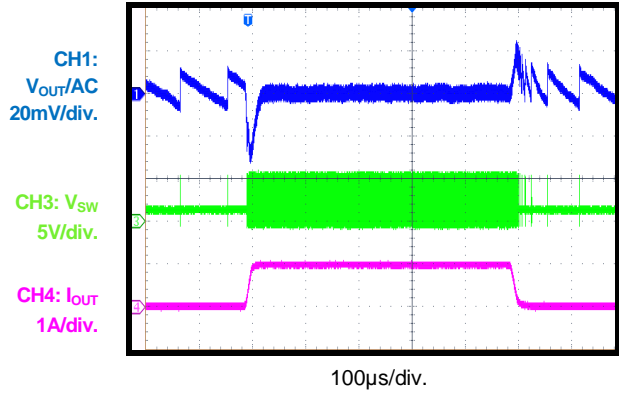
Steady State

$I_{OUT} = 1A$



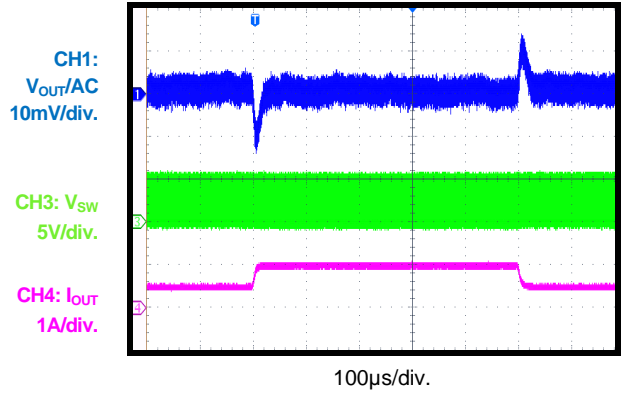
Transient

$I_{OUT} = 0A-1A$



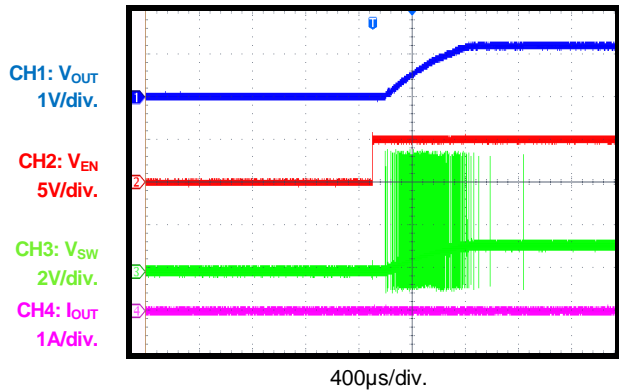
Transient

$I_{OUT} = 0.5A-1A$



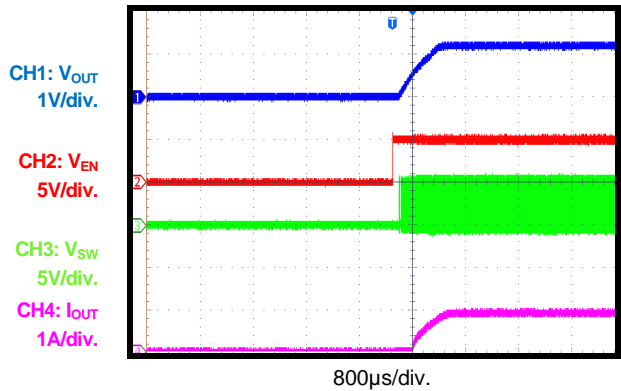
EN ON

$I_{OUT} = 0A$



EN ON

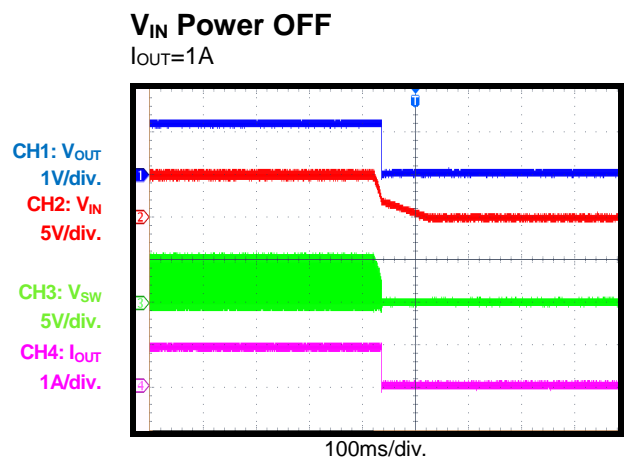
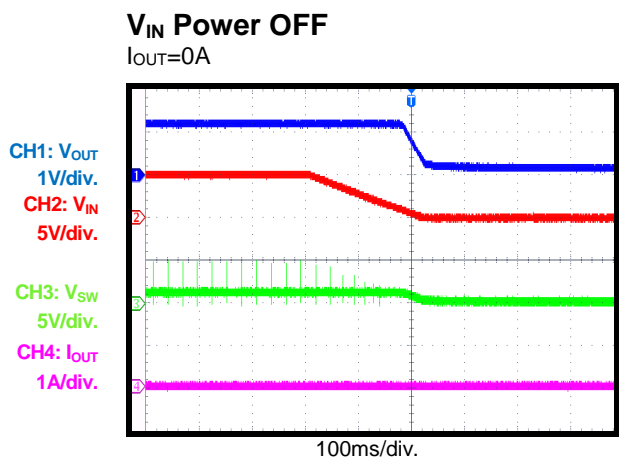
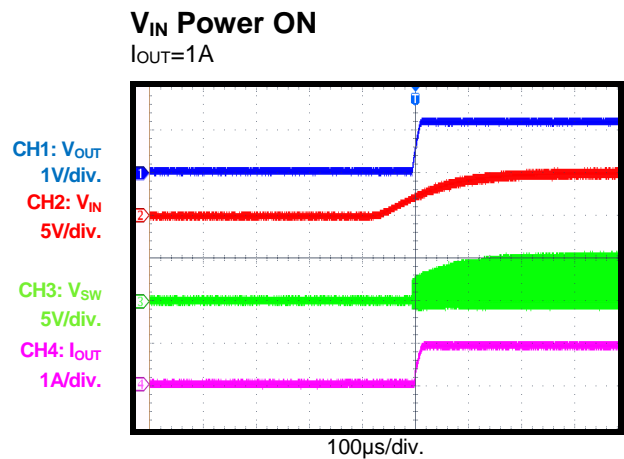
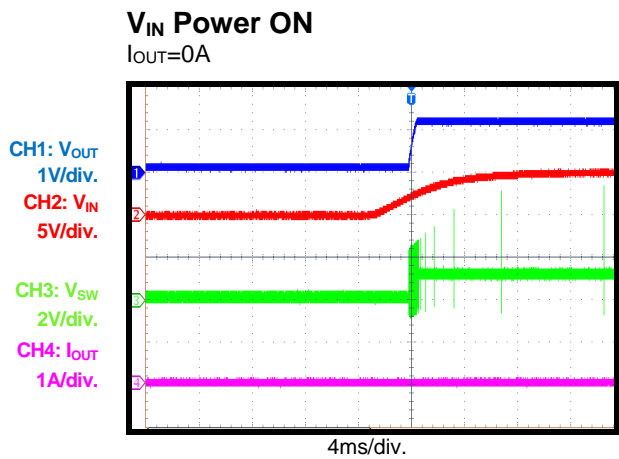
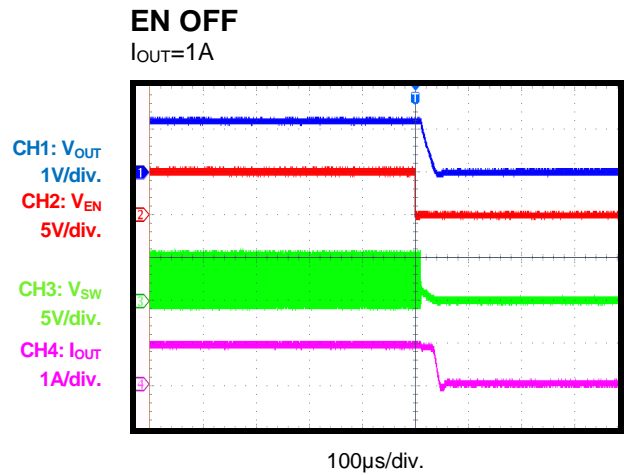
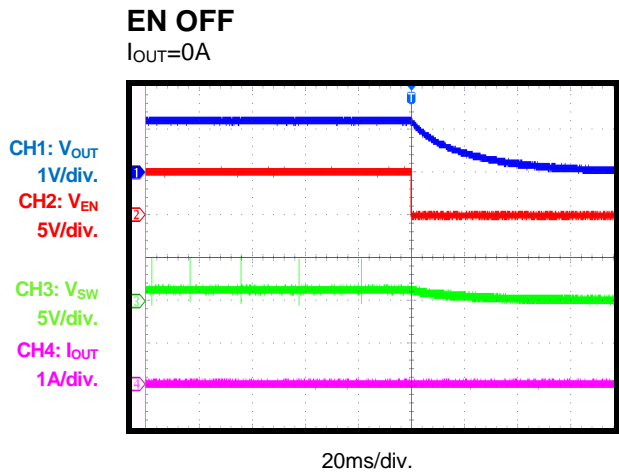
$I_{OUT} = 1A$



EVB TEST RESULTS (continued)

Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$, $V_{OUT} = 1.2V$, $C_o = 22\mu F$, $T_A = +25^\circ C$, unless otherwise noted.

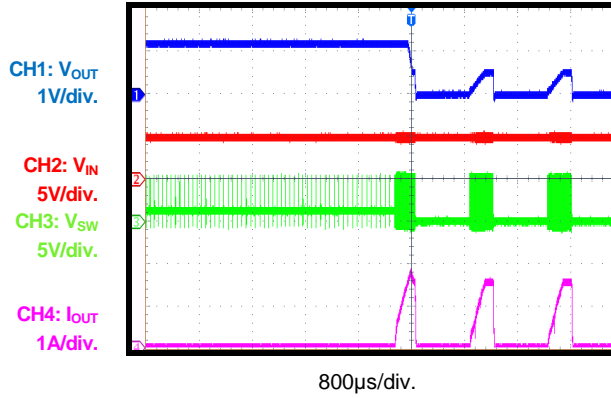


EVB TEST RESULTS (continued)

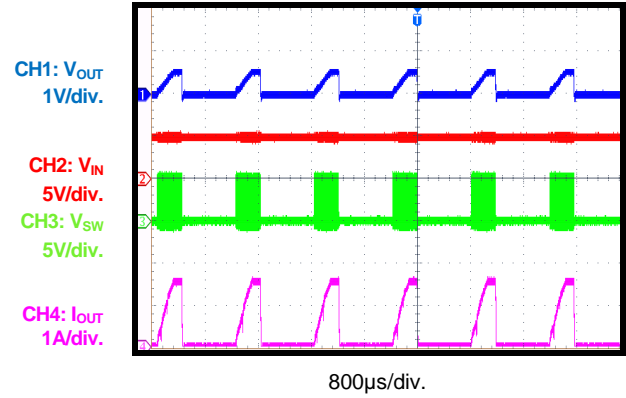
Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$, $V_{OUT} = 1.2V$, $L = 1.0\mu H$, $C_o = 22\mu F$, $T_A = +25^\circ C$, unless otherwise noted.

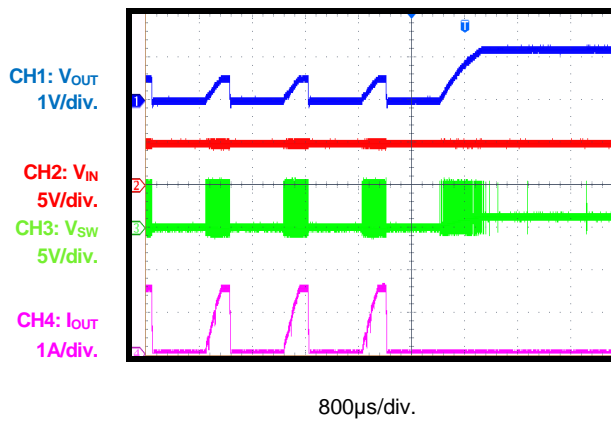
Short Circuit Entry



Short Circuit Steady



Short Circuit Recovery



PRINTED CIRCUIT BOARD LAYOUT

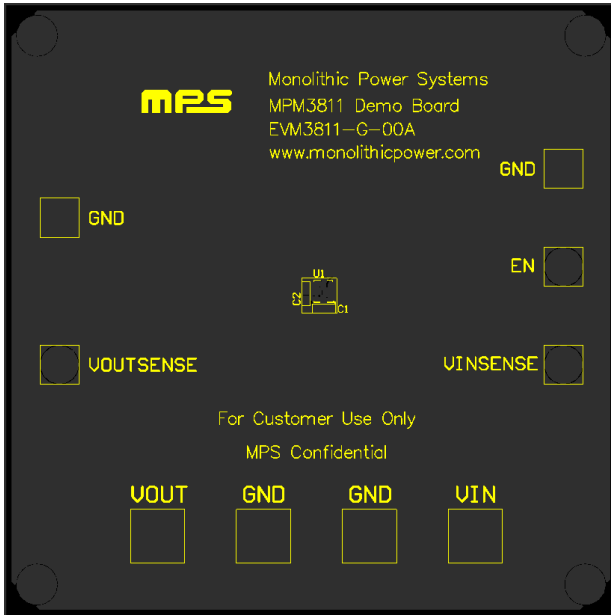


Figure 2—Top Silk Layer

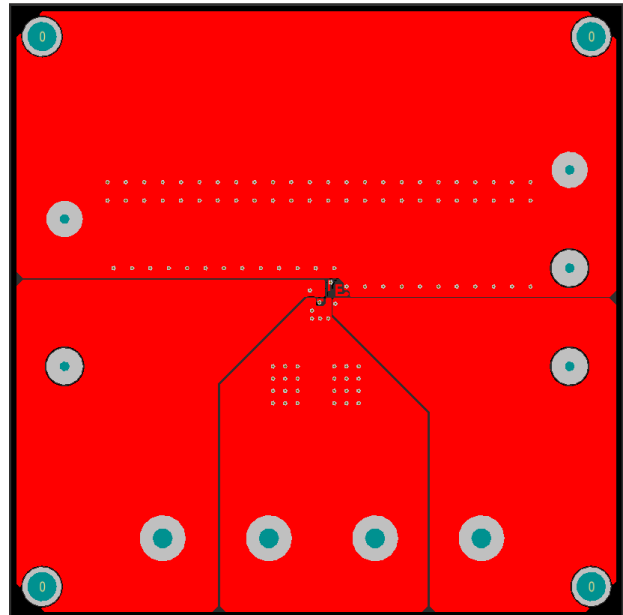


Figure 3—Top Layer

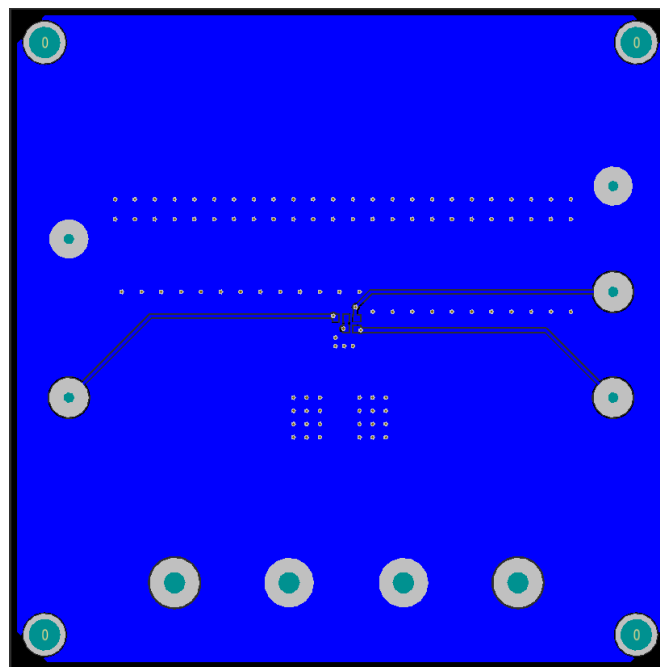


Figure 4—Bottom Layer