

### DESCRIPTION

The EVM38111-R-00A Evaluation Board is designed to demonstrate the capabilities of MPS' MPM38111. The MPM38111 is a Dual Channels DC-DC Module. The module includes monolithic step-down switch mode converter with built-in internal power MOSFETs and inductors. It's designed to simplify power system design and provide ease of use.

The MPM38111 operates from a 2.7V-to-6V input, generates an output voltage as low as 0.608V, and has a 45µA quiescent current that makes it ideal for powering portable equipment that runs on a single cell lithium-ion (Li+) battery.

### ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	2.7 – 6	V
Output Voltage	$V_{OUT1}/V_{OUT2}$	1.8/1.2	V
Output Current	$I_{OUT1}/I_{OUT2}$	1/1	A

### FEATURES

- Dual 1A-Output Current
- >93% Peak Efficiency
- >80% Light-Load Efficiency
- Ultra Low IQ: 45µA
- 80mΩ and 40mΩ Internal Power MOSFET
- Wide 2.7V to 6V Operating Input Range
- Default 1MHz Switching Frequency
- 180° Phase-Shifted Operation
- 4mmx4mmx1.6mm QFN14 package
- 100% Duty Cycle Operation
- Cycle-by-Cycle Over-Current Protection
- Short Circuit Protection with Hiccup Mode
- Thermal Shutdown

### APPLICATIONS

- Small/Handhold Devices
- DVD Drivers
- Portable Instruments
- Smart Phones and Feature Phones
- Battery-Powered Devices

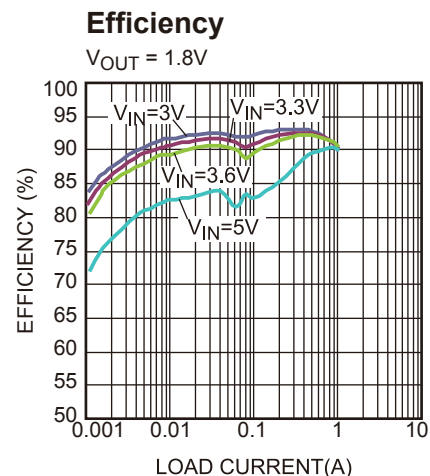
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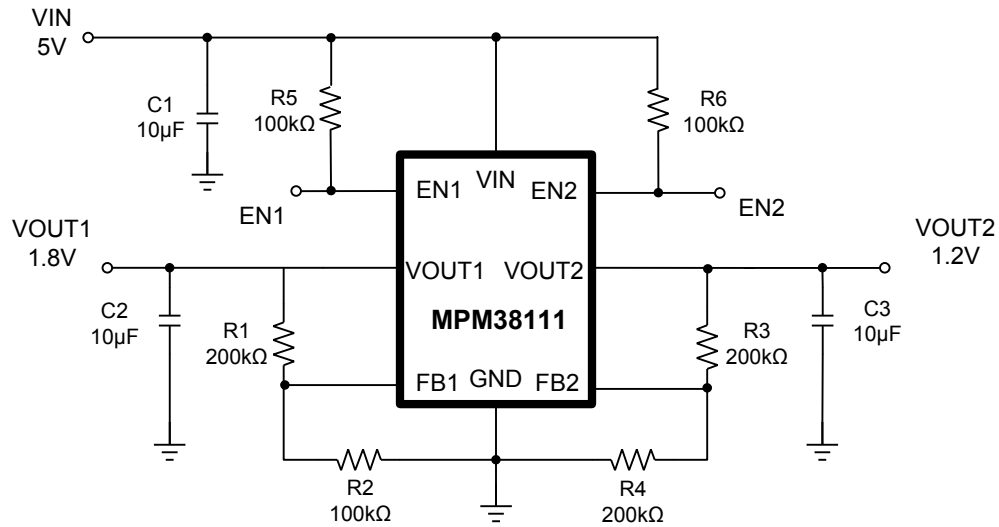
## EVM38111-R-00A EVALUATION BOARD



(L x W x H) 6.5cm x 6.5cm x 1.6cm

Board Number	MPS IC Number
EVM38111-R-00A	MPM38111



**EVALUATION BOARD SCHEMATIC**

**EVM38111-R-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
3	R1, R3, R4	200kΩ	Film Res,1%	0402	Any	
3	R2, R5, R6	100kΩ	Film Res,1%	0402	Any	
3	C1, C2, C3	10µF	Ceramic Cap,10V, X5R	0805	muRata	GRM21BR61A106KE19L

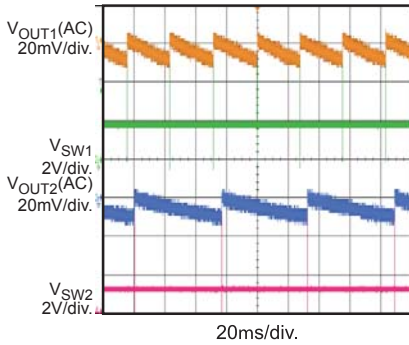
## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$ ,  $V_{OUT1} = 1.8V$ ,  $V_{OUT2} = 1.2V$ ,  $C_{OUT1} = C_{OUT2} = 10\mu F$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

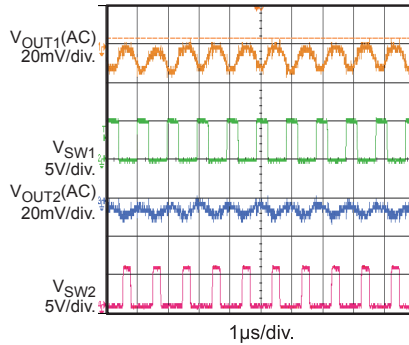
**Output Ripple**

$I_{OUT1} = I_{OUT2} = 0A$



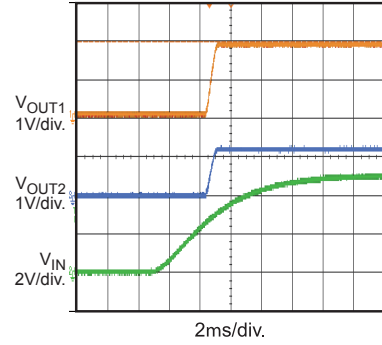
**Output Ripple**

$I_{OUT1} = I_{OUT2} = 1A$



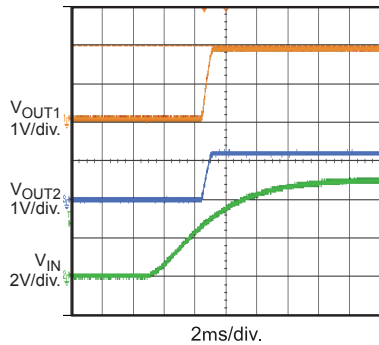
**$V_{IN}$  Power Up without Load**

$I_{OUT1} = I_{OUT2} = 0A$



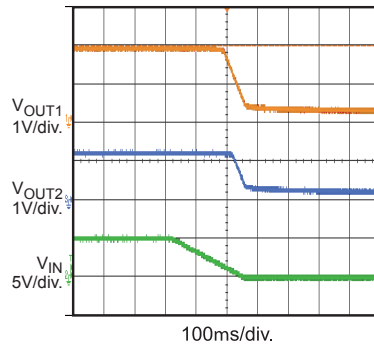
**$V_{IN}$  Power Up with 1A Load**

$I_{OUT1} = I_{OUT2} = 1A$



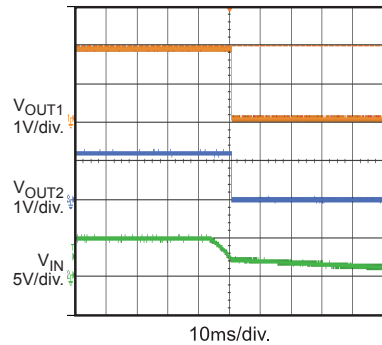
**$V_{IN}$  Power Down without Load**

$I_{OUT1} = I_{OUT2} = 0A$



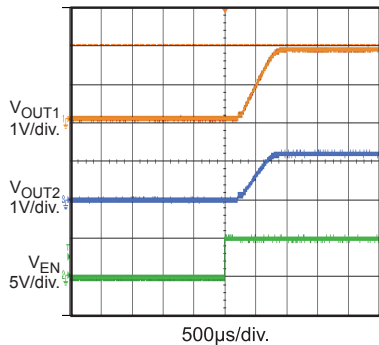
**$V_{IN}$  Power Down with 1A Load**

$I_{OUT1} = I_{OUT2} = 1A$



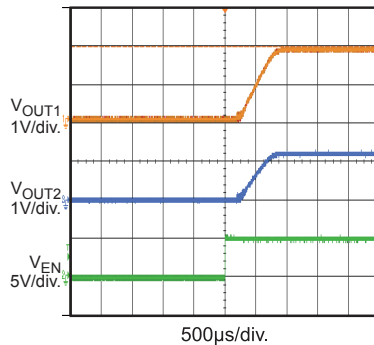
**EN On without Load**

$I_{OUT1} = I_{OUT2} = 0A$



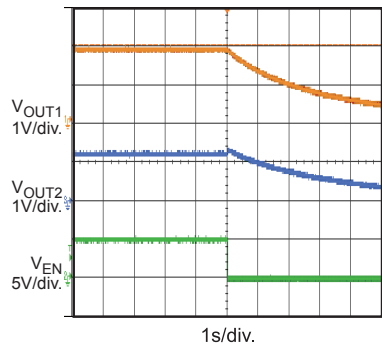
**EN On with 1A Load**

$I_{OUT1} = I_{OUT2} = 1A$



**EN Down without Load**

$I_{OUT1} = I_{OUT2} = 0A$

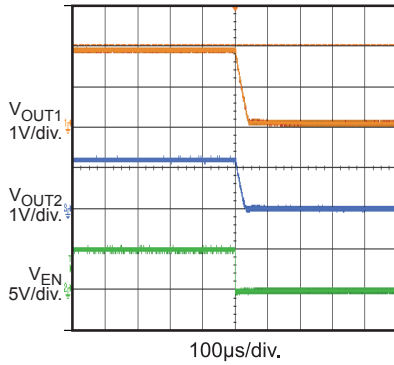


## EVB TEST RESULTS (continued)

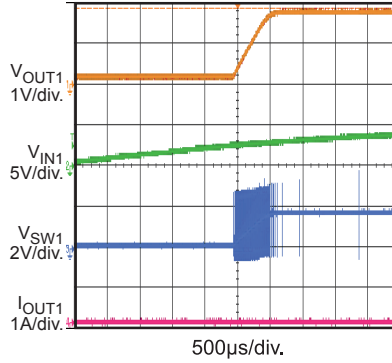
Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$ ,  $V_{OUT1} = 1.8V$ ,  $V_{OUT2} = 1.2V$ ,  $C_{OUT1} = C_{OUT2} = 10\mu F$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

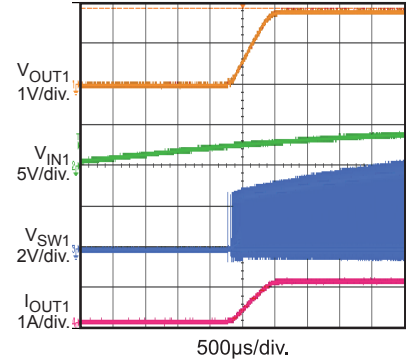
**EN Down with 1A Load**  
 $I_{OUT1} = I_{OUT2} = 1A$



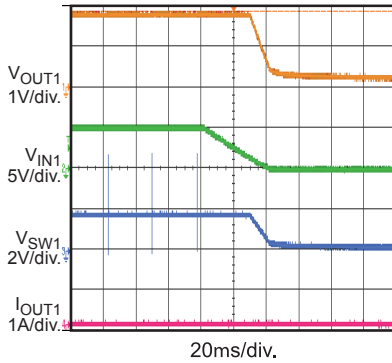
**V<sub>IN</sub> Power On without Load**  
 $I_{OUT1} = I_{OUT2} = 0A$



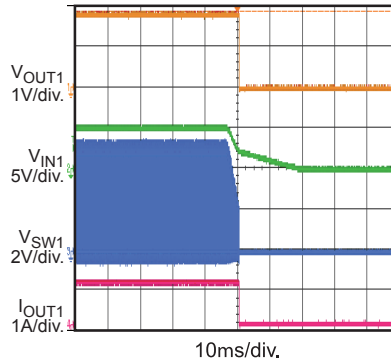
**V<sub>IN</sub> Power On with 1A Load**  
 $I_{OUT1} = 1A, I_{OUT2} = 0A$



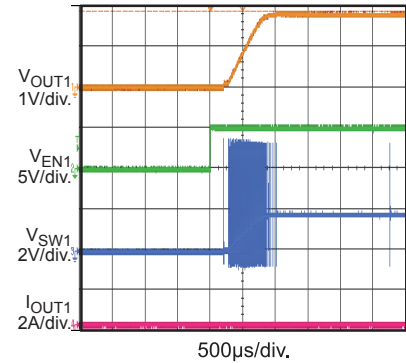
**V<sub>IN</sub> Power Down without Load**  
 $I_{OUT1} = I_{OUT2} = 0A$



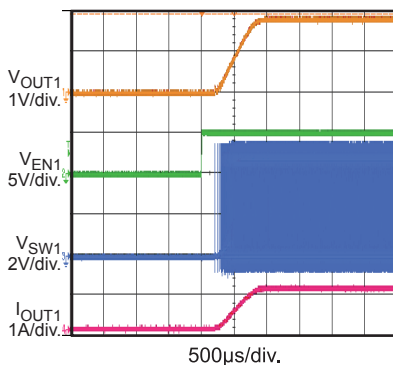
**V<sub>IN</sub> Power Down with 1A Load**  
 $I_{OUT1} = 1A, I_{OUT2} = 0A$



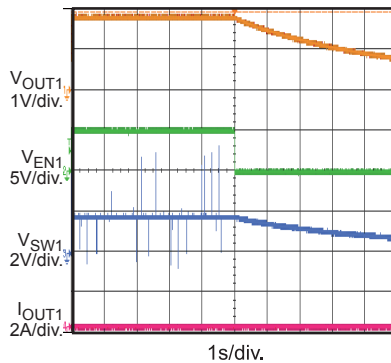
**Enable On without Load**  
 $I_{OUT1} = I_{OUT2} = 0A$



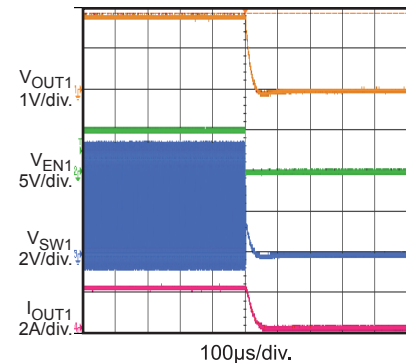
**Enable On with 1A Load**  
 $I_{OUT1} = 1A, I_{OUT2} = 0A$



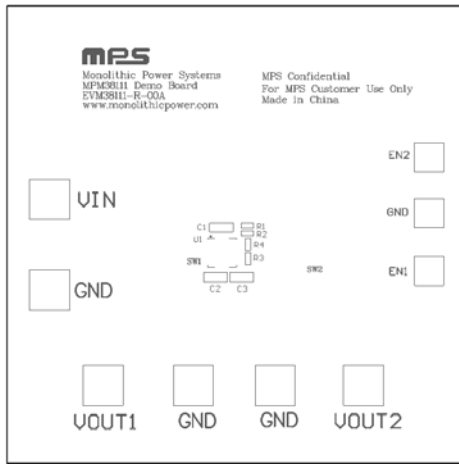
**Enable Down without Load**  
 $I_{OUT1} = I_{OUT2} = 0A$



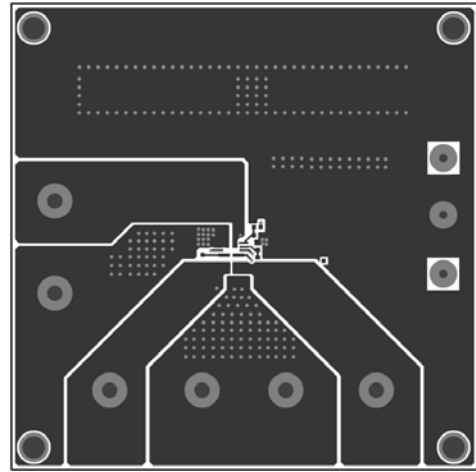
**Enable Down with 1A Load**  
 $I_{OUT1} = 1A, I_{OUT2} = 0A$



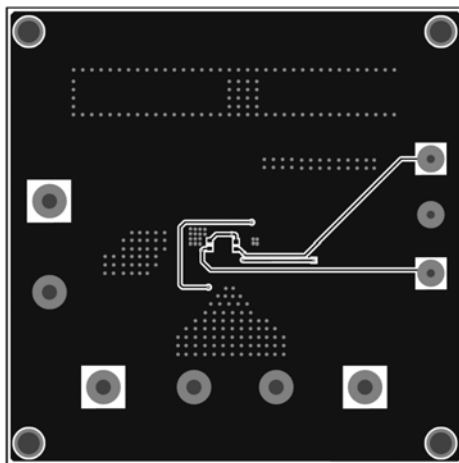
**PRINTED CIRCUIT BOARD LAYOUT**



**Figure 1—Top Silk Layer**



**Figure 2—Top Layer**



**Figure 3—Bottom Layer**