

DESCRIPTION

The EVM38222-R-01A Evaluation Board is designed to demonstrate the capabilities of MPS' MPM38222. The MPM38222 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 MPM38222 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}	2/2	A

FEATURES

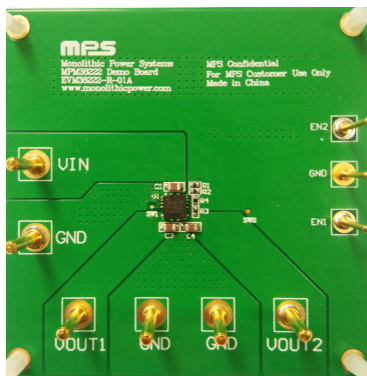
- Dual 2A-Output Current
- >93% Peak Efficiency
- >80% Light-Load Efficiency
- Ultra Low IQ: 45µA
- 80mΩ and 35mΩ Internal Power MOSFET
- Wide 2.7V to 6V Operating Input Range
- Default 1MHz Switching Frequency
- 180° Phase-Shifted Operation
- 4mmx4mmx1.6mm QFN14 package
- 100% Duty Cycle Operation
- 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

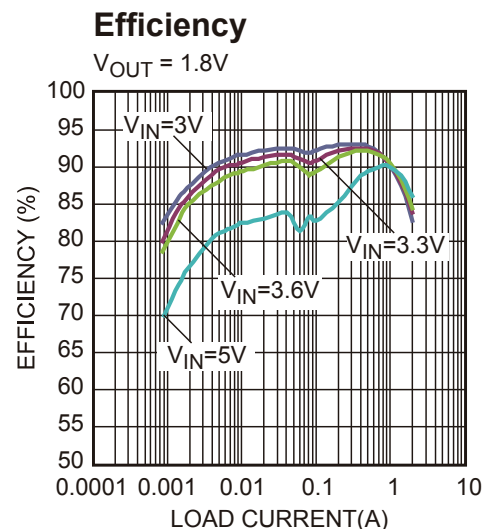
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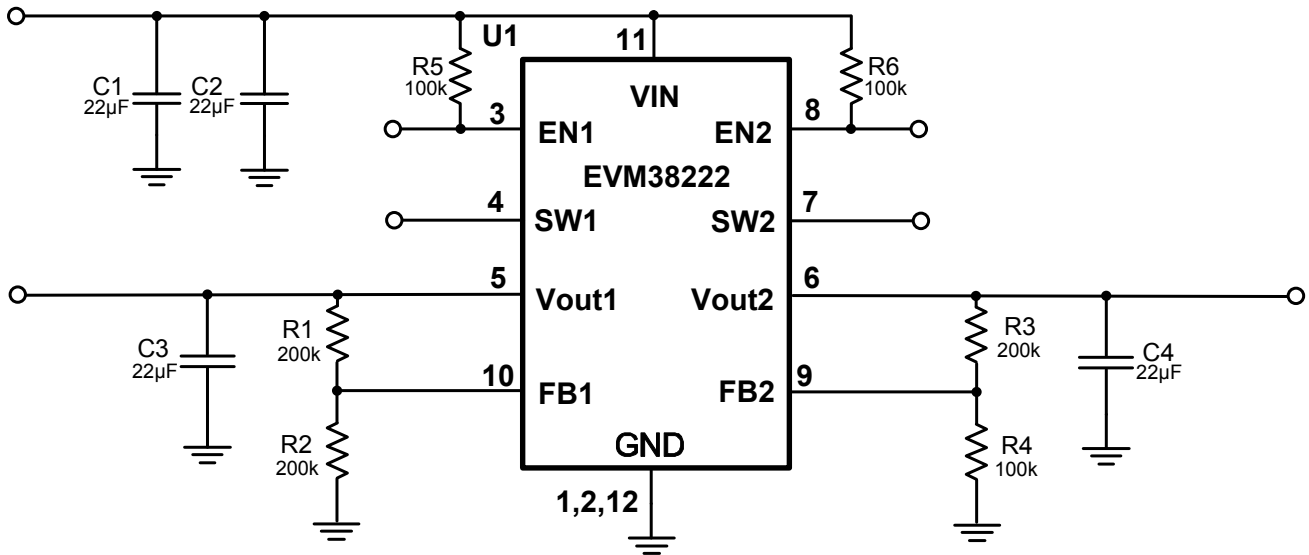
EVM38222-R-01A EVALUATION BOARD



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

Board Number	MPS IC Number
EVM38222-R-01A	MPM38222



EVALUATION BOARD SCHEMATIC

EVM38222-R-01A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
3	R1, R3, R2	200kΩ	Film Res,1%	0603	ROYAL	RL0603FR-07200KL
3	R4, R5, R6	100kΩ	Film Res,1%	0603	ROYAL	RL0603FR-07100KL
4	C1, C2, C3, C4	22µF	Ceramic Cap,10V, X5R	0805	muRata	GRM21BR61A226ME51L
1	U1	MPM38222	Dual Channel Step Down Switcher	QFN-14 4.0x4.0mm	MPS	MPM38222GR

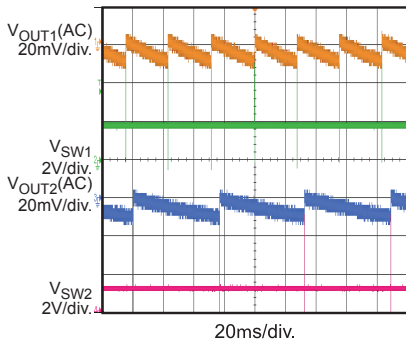
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$, $V_{OUT1} = 1.8V$, $V_{OUT2} = 1.2V$, $C_{OUT1} = C_{OUT2} = 22\mu F$, $T_A = 25^\circ C$, unless otherwise noted.

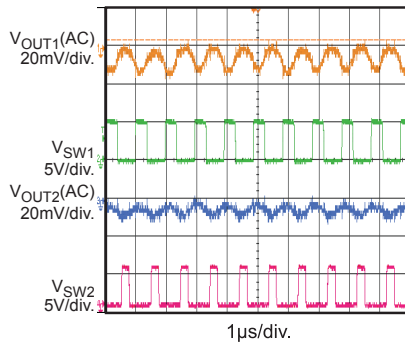
Output Ripple

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



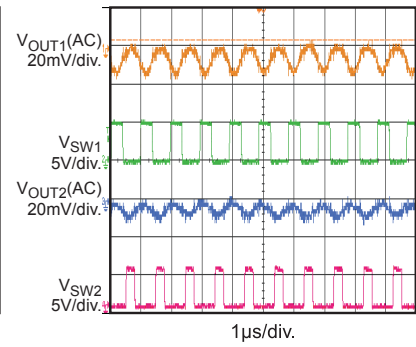
Output Ripple

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



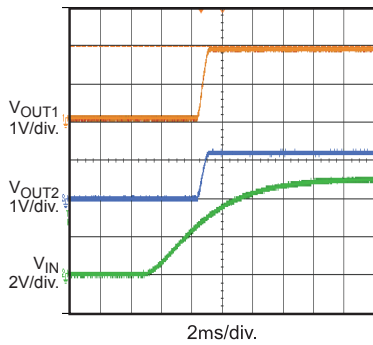
Output Ripple

$I_{OUT1} = I_{OUT2} = 2A$



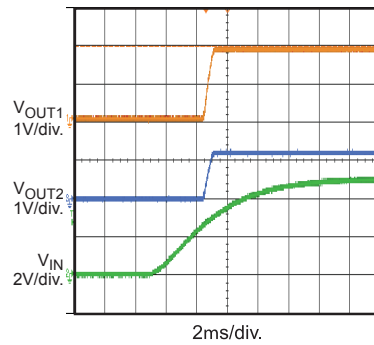
V_{IN} Power Up without Load

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



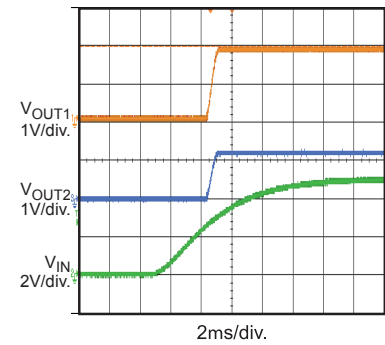
V_{IN} Power Up with 1A Load

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



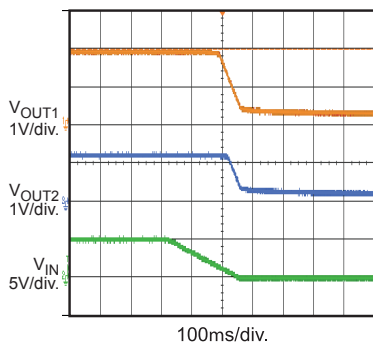
V_{IN} Power Up with 2A Load

$I_{OUT1} = I_{OUT2} = 2A$



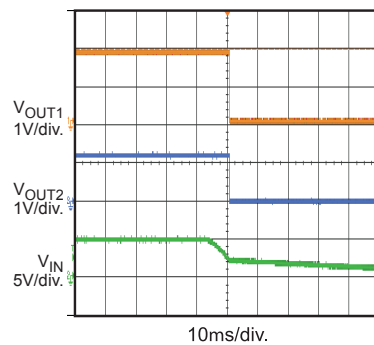
V_{IN} Power Down without Load

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



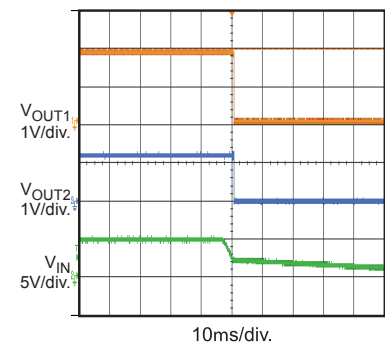
V_{IN} Power Down with 1A Load

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



V_{IN} Power Down with 2A Load

$I_{OUT1} = I_{OUT2} = 2A$



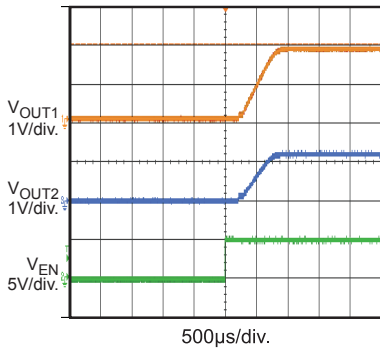
EVB TEST RESULTS (continued)

Performance waveforms are tested on the evaluation board.

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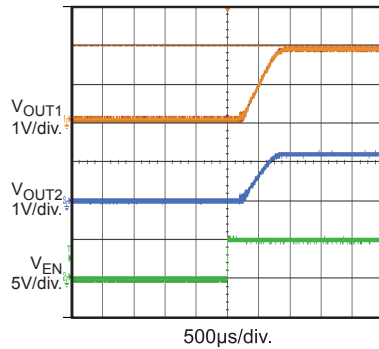
EN On without Load

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



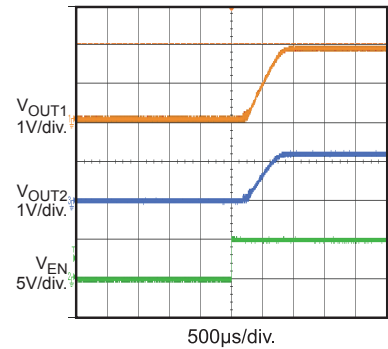
EN On with 1A Load

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



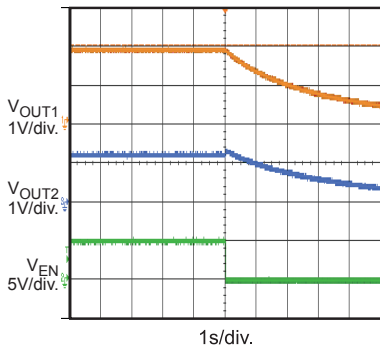
EN On with 2A Load

$I_{OUT1} = I_{OUT2} = 2A$



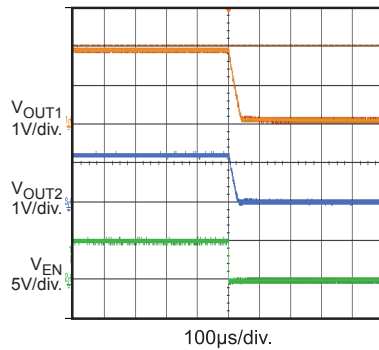
EN Down without Load

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



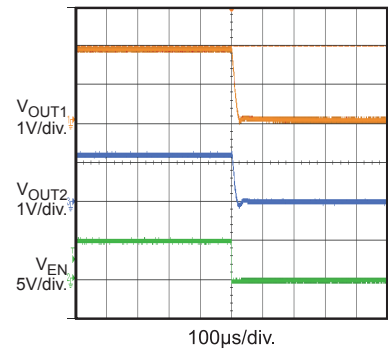
EN Down with 1A Load

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



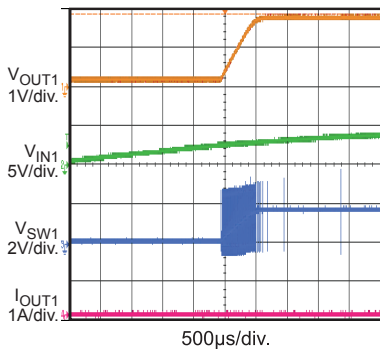
EN Down with 2A Load

$I_{OUT1} = I_{OUT2} = 2A$



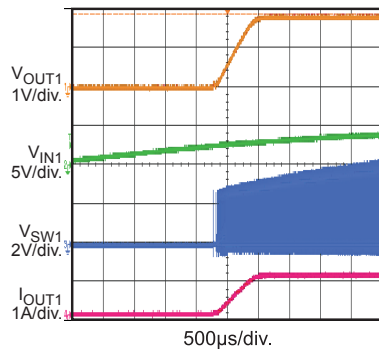
VIN Power On without Load

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



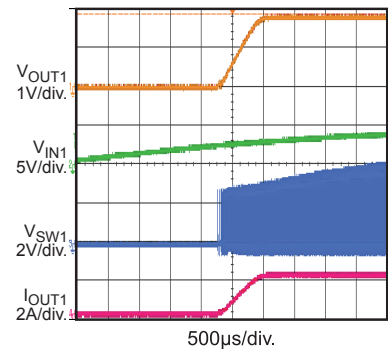
VIN Power On with 1A Load

$I_{OUT1} = 1A$, $I_{OUT2} = 0A$



VIN Power On with 2A Load

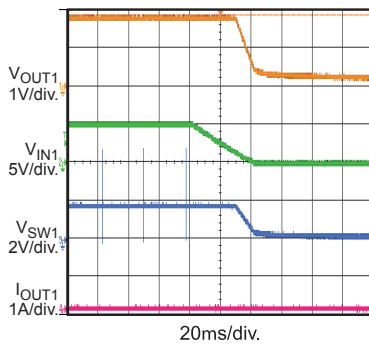
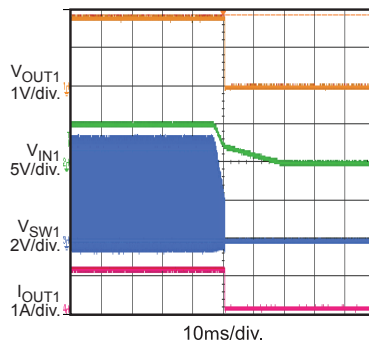
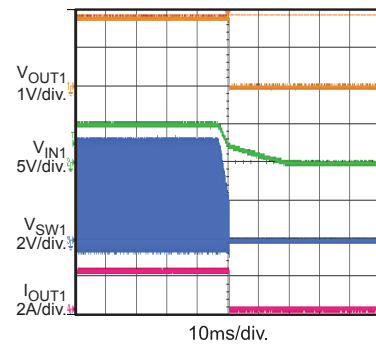
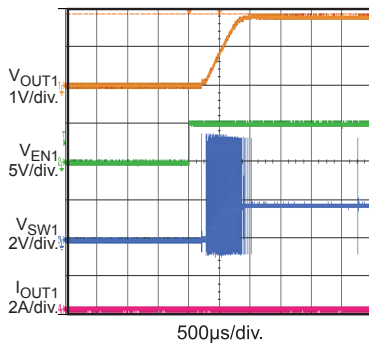
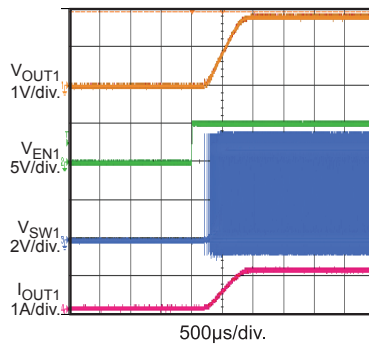
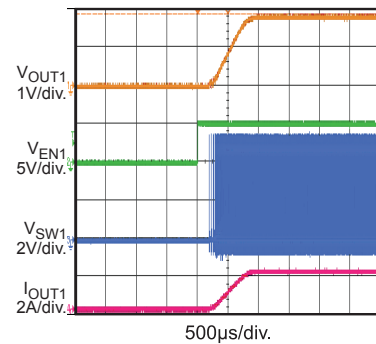
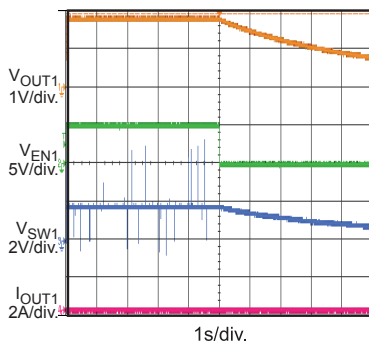
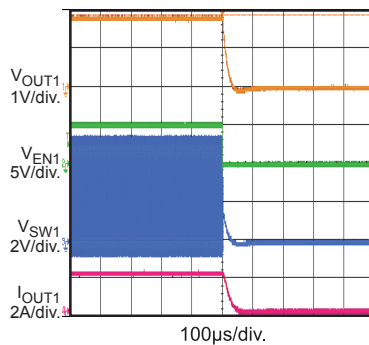
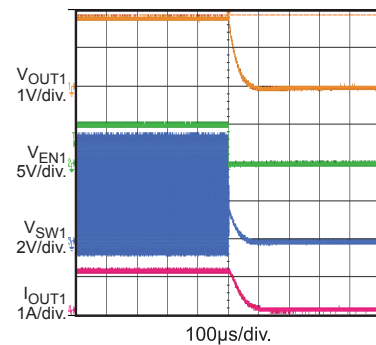
$I_{OUT1} = 2A$, $I_{OUT2} = 0A$



EVB TEST RESULTS (continued)

Performance waveforms are tested on the evaluation board.

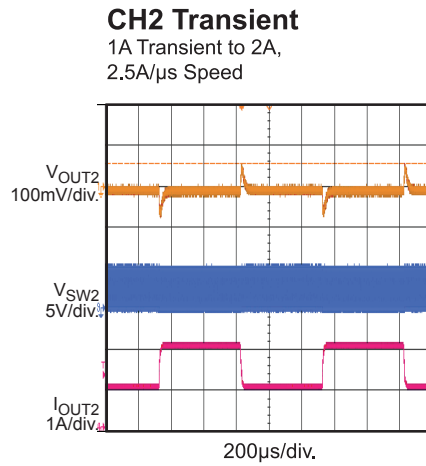
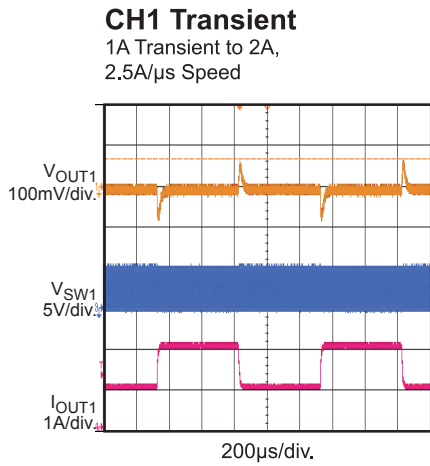
 $V_{IN} = 5V$, $V_{OUT1} = 1.8V$, $V_{OUT2} = 1.2V$, $C_{OUT1} = C_{OUT2} = 22\mu F$, $T_A = 25^\circ C$, unless otherwise noted.

 **V_{IN} Power Down
without Load**
 $I_{OUT1} = I_{OUT2} = 0A$

 **V_{IN} Power Down
with 1A Load**
 $I_{OUT1} = 1A$, $I_{OUT2} = 0A$

 **V_{IN} Power Down
with 2A Load**
 $I_{OUT1} = 2A$, $I_{OUT2} = 0A$

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

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

Enable On with 2A Load
 $I_{OUT1} = 2A$, $I_{OUT2} = 0A$

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

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

Enable Down with 2A Load
 $I_{OUT1} = 2A$, $I_{OUT2} = 0A$


EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$, $V_{OUT1} = 1.8V$, $V_{OUT2} = 1.2V$, $C_{OUT1} = C_{OUT2} = 22\mu F$, $T_A = 25^\circ C$, unless otherwise noted.



PRINTED CIRCUIT BOARD LAYOUT

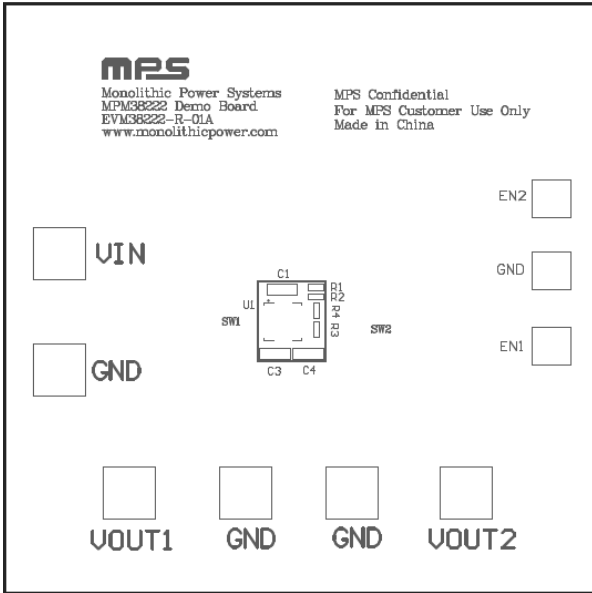


Figure 1: Top Silk Layer

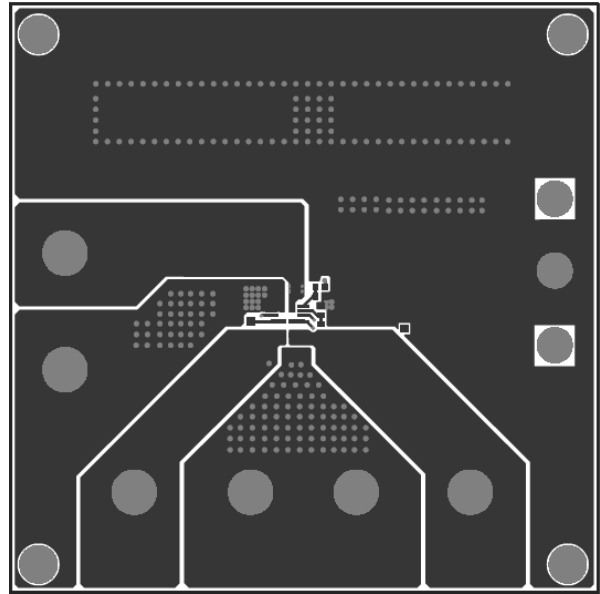


Figure 2: Top Layer

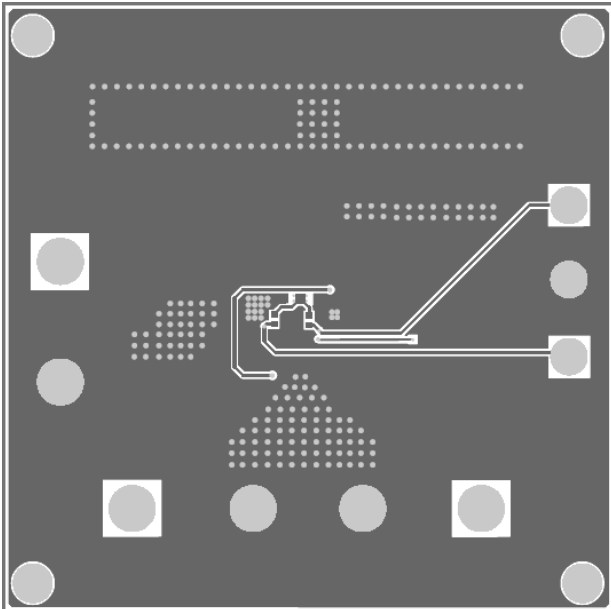


Figure 3: Bottom Layer

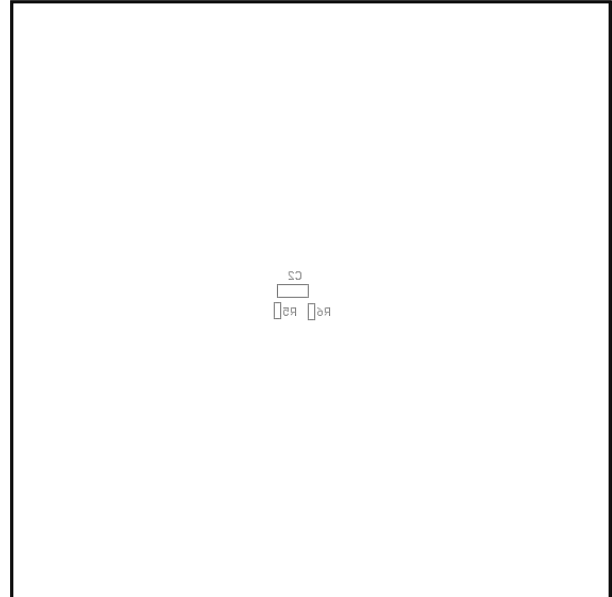


Figure 4: Bottom Silk Layer