

DESCRIPTION

The MP2153 is a monolithic, step-down, switch-mode converter with built-in internal power MOSFETs. It achieves 3A continuous output current from a 2.5V-to-5.5V input voltage with excellent load and line regulation. The output voltage can be regulated to as low as 0.6V.

The Constant-On-Time control scheme provides fast transient response and eases loop stabilization. Fault protections include cycle-by-cycle current limiting and thermal shutdown.

The MP2153 is available in an ultra-small SOT563 or 1.2mmx1.6mm UTQFN package and requires a minimal number of readily available standard external components.

The MP2153 is ideal for a wide range of applications including high performance DSPs, wireless power, portable and mobile devices, and other low-power systems.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	2.5 – 5.5	V
Output Voltage	V_{OUT}	1.2	V
Output Current	I_{OUT}	3	A

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

FEATURES

- Low IQ: 25µA
- 1.1MHz Switching Frequency
- EN for Power Sequencing
- 1% FB Accuracy
- Wide 2.5V-to-5.5V Operating Input Range
- Output Adjustable from 0.6V
- Up to 3A Output Current
- 65mΩ and 35mΩ Internal Power MOSFET Switches
- 100% Duty On
- Output Discharge
- Vo OVP
- Short-Circuit Protection with Hiccup Mode
- Power Good Only for Fixed Output Version
- Available in a SOT563 or 1.2mmx1.6mm UTQFN Package

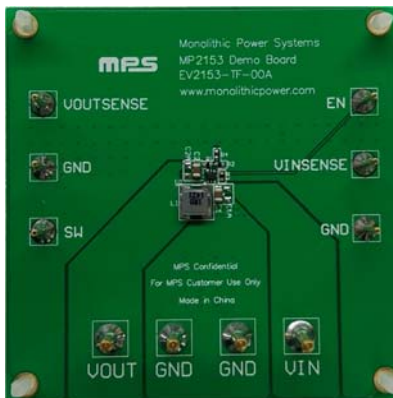
APPLICATIONS

- Wireless/Networking Cards
- Portable Instruments
- Battery Powered Devices
- Low Voltage I/O System Power
- Multi Function Printer

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.

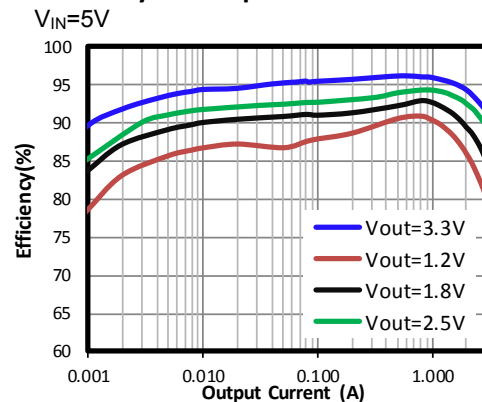
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EV2153-TF-00A EVALUATION BOARD



Board Number	MPS IC Number
EV2153-TF-00A	MP2153GTF

Efficiency vs. Output Current



EVALUATION BOARD SCHEMATIC

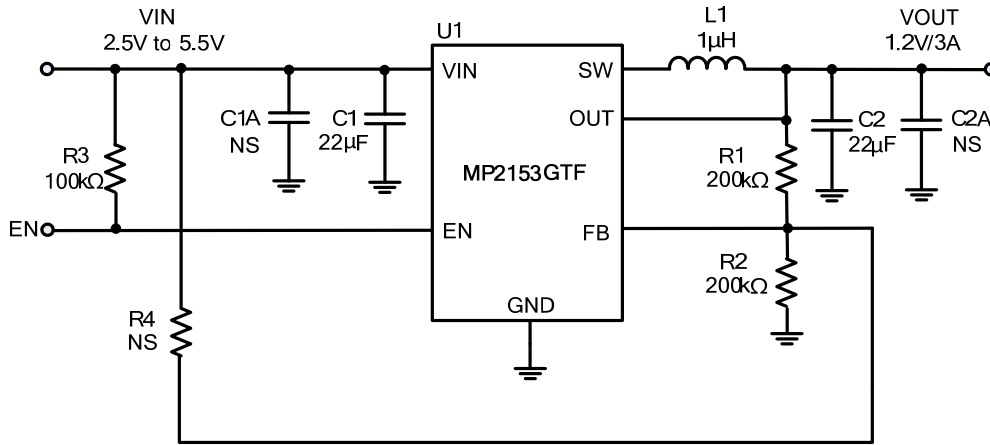


Figure 1—Typical Application Circuit for MP2153GTF

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

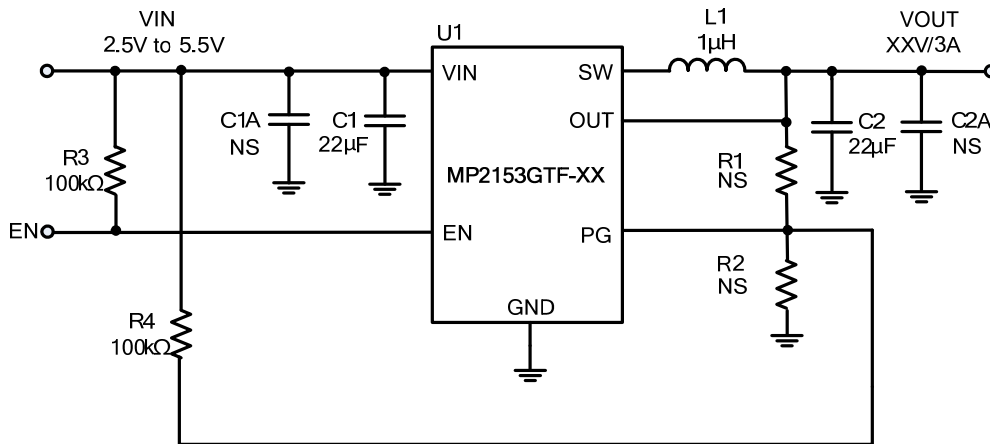


Figure 2—Typical Application Circuit for MP2153GTF-XX

Note: 1. $V_{IN} < 3.3V$ may need more input capacitor;
2. $V_{IN} > V_{OUT}$ for application.

EV2153-TF-00A BILL OF MATERIALS
TABLE 1. MP2153GTF BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	22 μ F	Ceramic Cap,10V,X5R	0805	muRata	GRM21BR61A226ME51L
2	R1,R2	200k	Film Res.1%,	0402	any	
1	R3	100k	Film Res.1%	0402	any	
1	L1	1.0 μ H	Inductor,I _S =9A, DCR=27m Ω	SMD	Würth	74437324010
1	U1		Step-down Switcher	SOT563	MPS	MP2153GTF
0	C1A, C2A, R4	NS				

TABLE 2. MP2153GTF-XX BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	22 μ F	Ceramic Cap,10V,X5R	0805	muRata	GRM21BR61A226ME51L
2	R3, R4	100k	Film Res.1%	0402	any	
1	L1	1.0 μ H	Inductor,I _S =9A, DCR=27m Ω	SMD	Würth	74437324010
1	U1		Step-down Switcher	SOT563	MPS	MP2153GTF-XX
0	C1A, C2A R1, R2	NS				

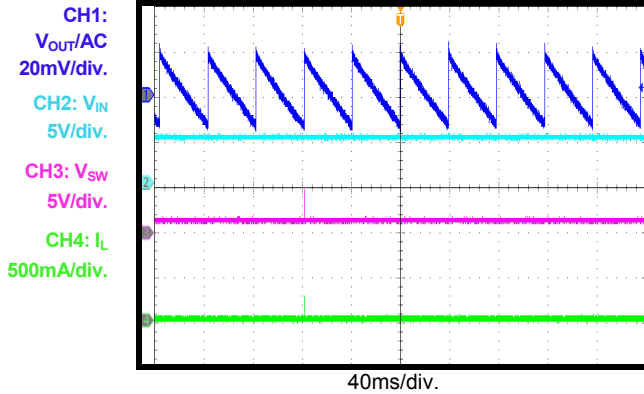
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

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

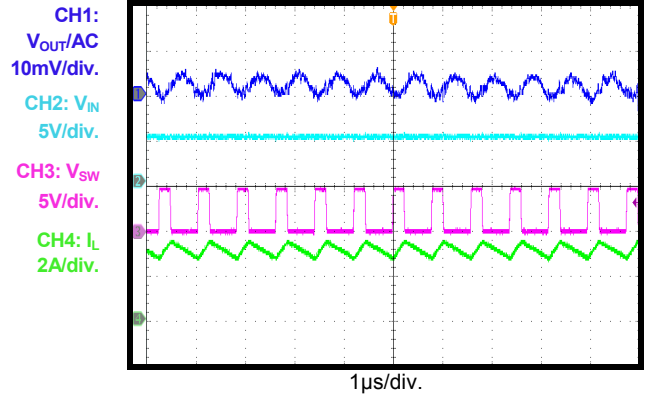
Steady State

I_{OUT}=0A



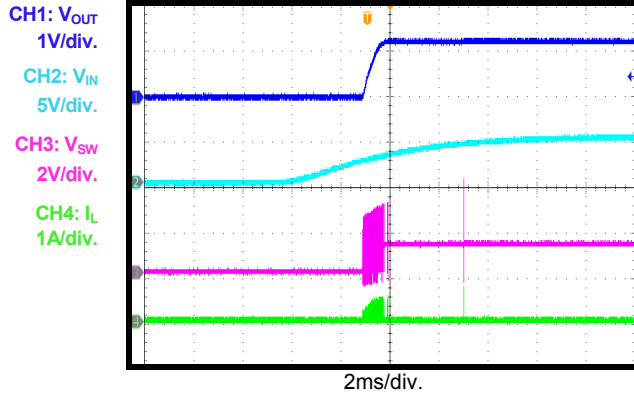
Steady State

I_{OUT}=3A



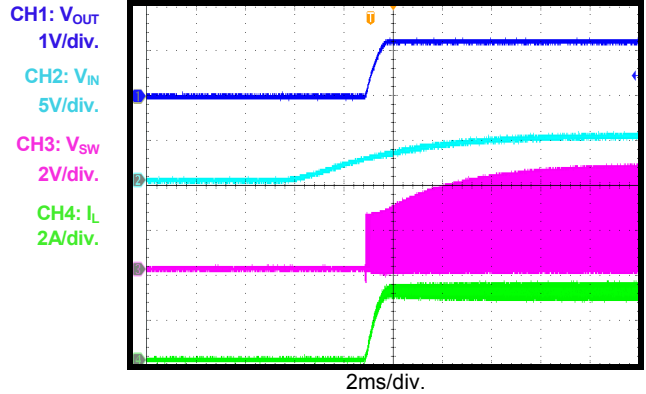
V_{IN} Power-Up

I_{OUT}=0A



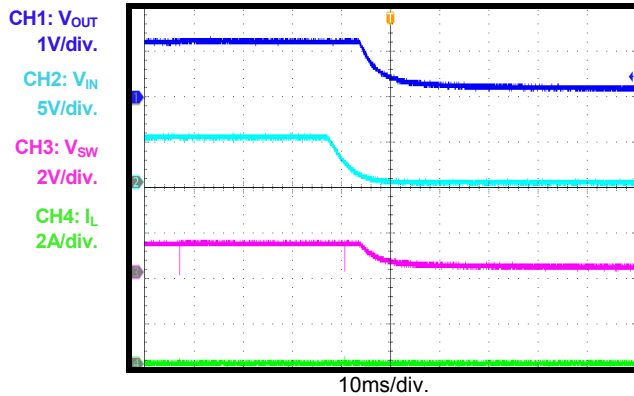
V_{IN} Power-Up

I_{OUT}=3A



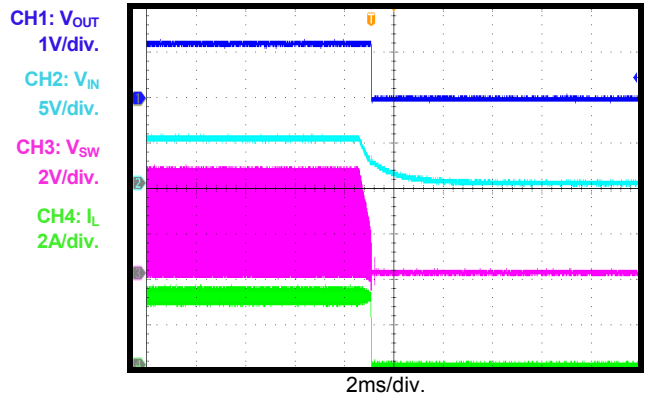
V_{IN} Shutdown

I_{OUT}=0A



V_{IN} Shutdown

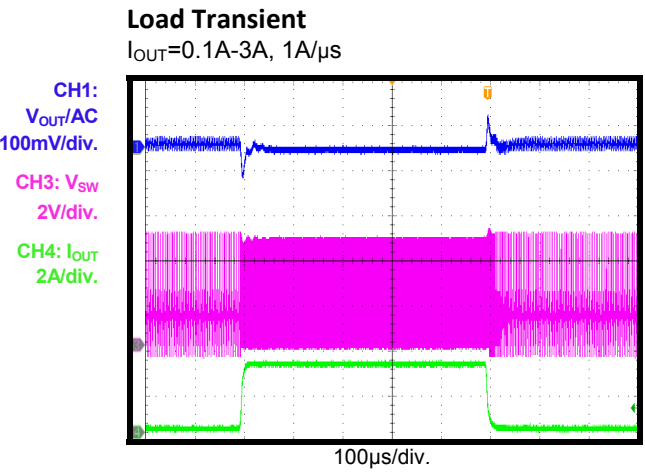
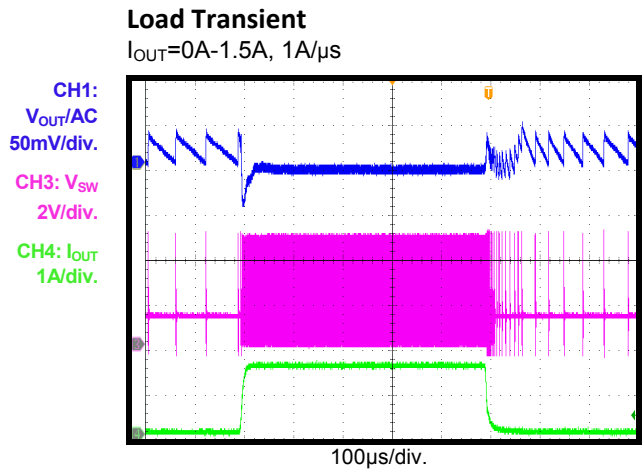
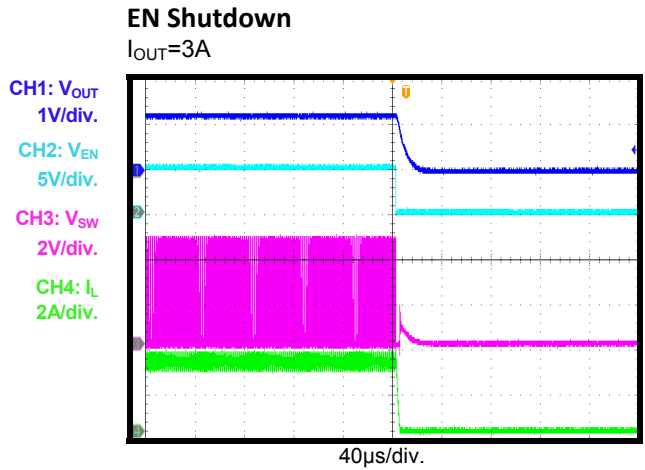
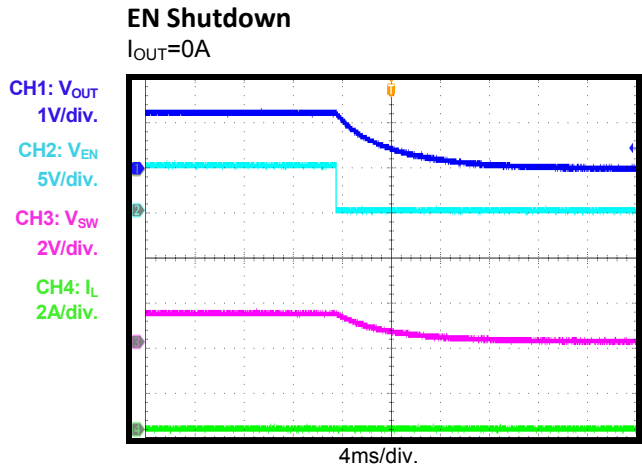
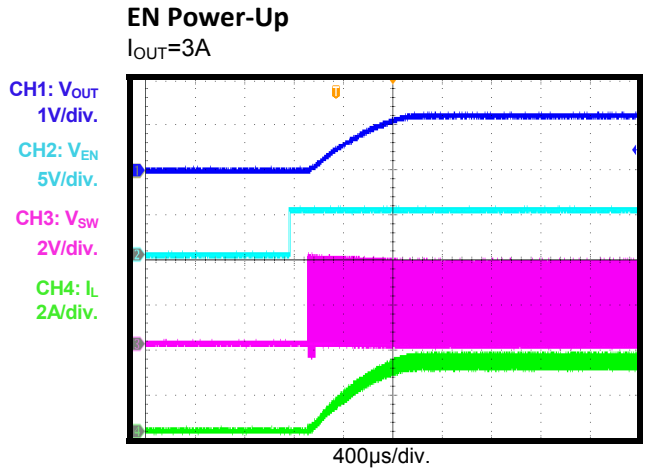
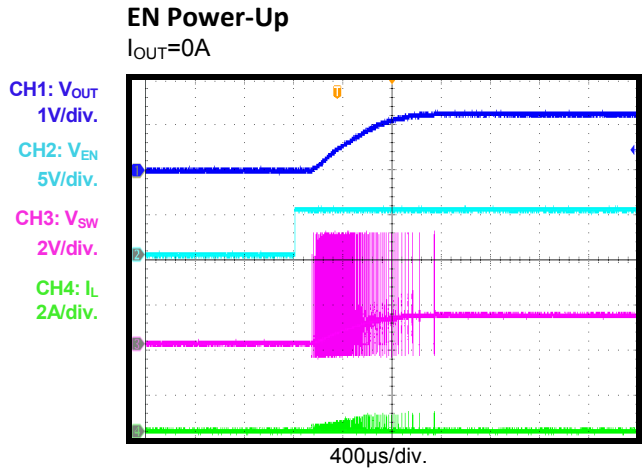
I_{OUT}=3A



EVB TEST RESULTS (continued)

Performance waveforms are tested on the evaluation board.

V_{IN} = 5V, V_{OUT} = 1.2V, L = 1.0µH, C_{OUT}=22µF, T_A = +25°C, unless otherwise noted.

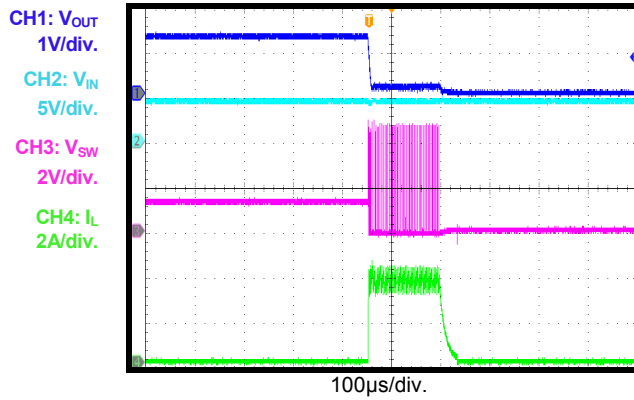


EVB TEST RESULTS (continued)

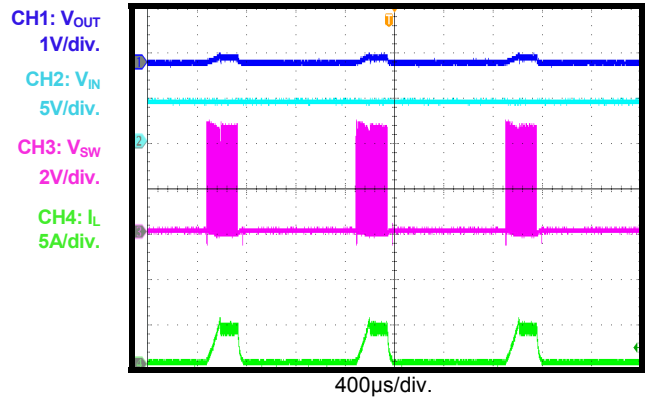
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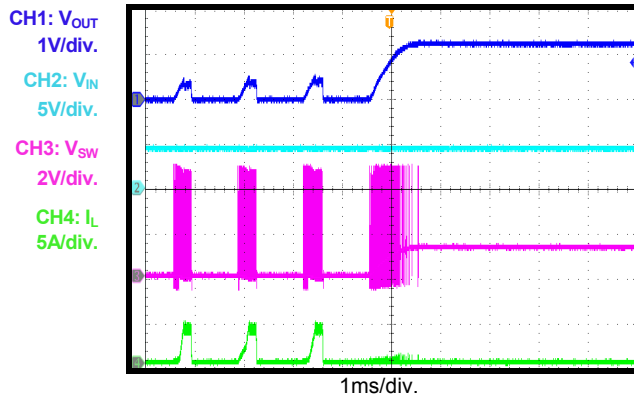
Short-Circuit Entry



Short-Circuit State



Short-Circuit Recovery



PRINTED CIRCUIT BOARD LAYOUT

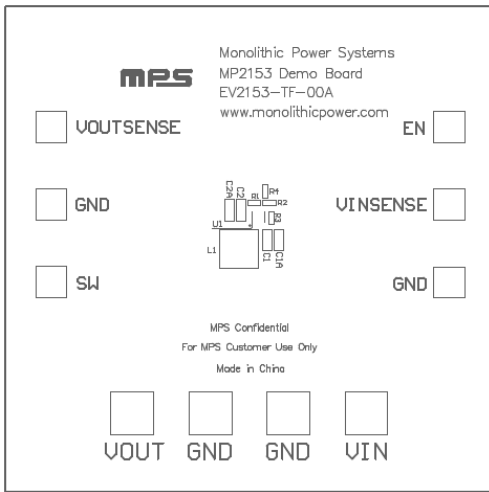


Figure 3—Top Silk Layer

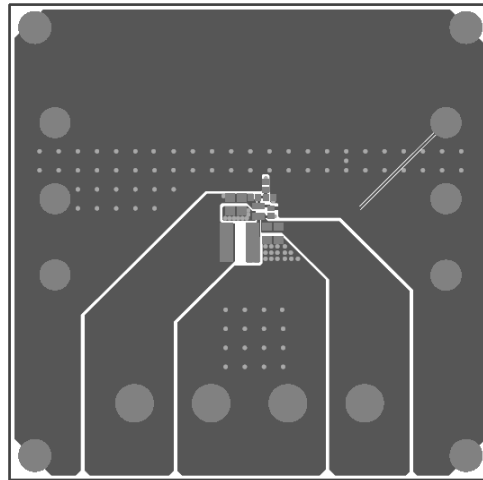


Figure 4—Top Layer

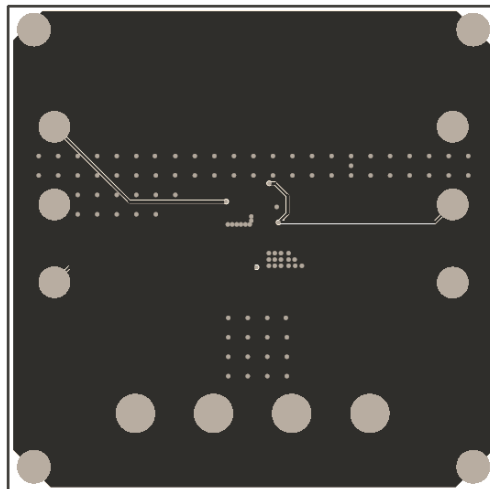


Figure 5—Bottom Layer