

DESCRIPTION

The MP2152 is a monolithic, step-down, switch-mode converter with built-in internal power MOSFETs. It achieves 2A 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 MP2152 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 MP2152 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} | 2 | 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 2A Output Current
- 75mΩ and 45mΩ 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

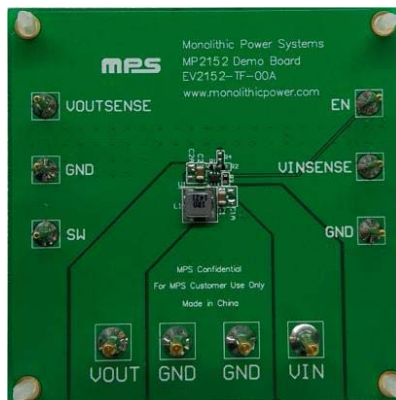
APPLICATIONS

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

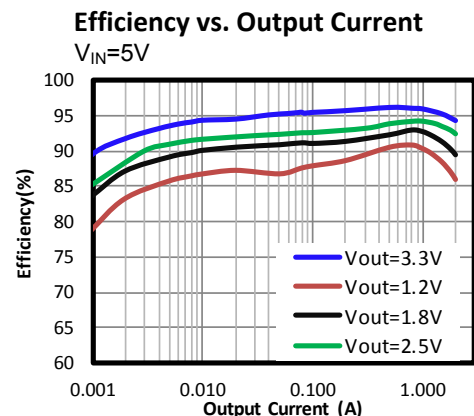
All MPS parts are lead-free, halogen free, and adhere to the RoHS directive. For MPS green status, please visit MPS website under Quality Assurance.

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EV2152-TF-00A EVALUATION BOARD



| Board Number | MPS IC Number |
|---------------|---------------|
| EV2152-TF-00A | MP2152GTF |



EVALUATION BOARD SCHEMATIC

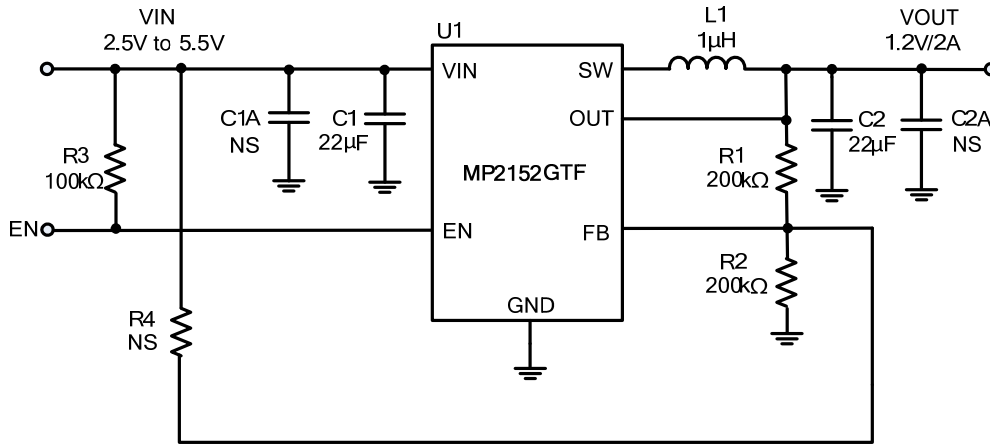


Figure 1—Typical Application Circuit for MP2152GTF

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

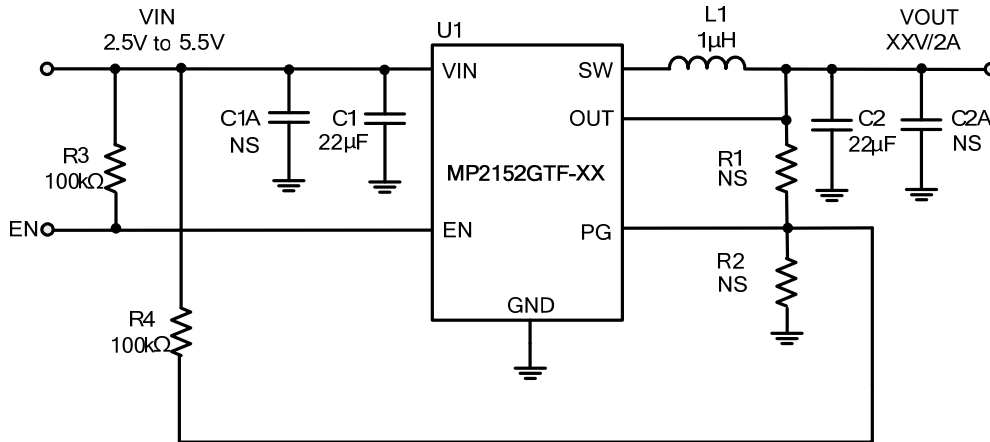


Figure 2—Typical Application Circuit for MP2152GTF-XX

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

EV2152-TF-00A BILL OF MATERIALS

TABLE 1. MP2152GTF 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 | MP2152GTF |
| 0 | C1A, C2A, R4 | NS | | | | |

TABLE 2. MP2152GTF-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 | MP2152GTF-XX |
| 0 | C1A, C2A R1, R2 | NS | | | | |

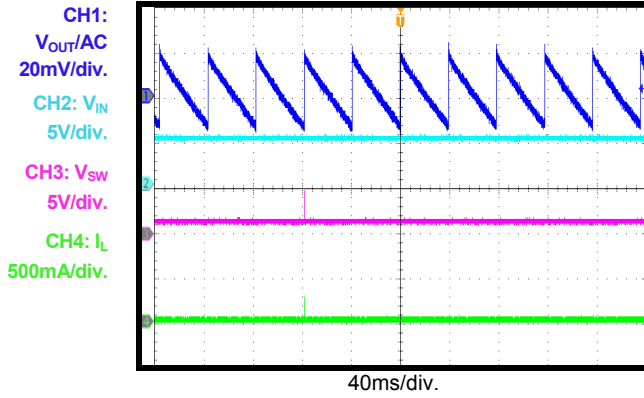
EVB TEST RESULTS

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°C, unless otherwise noted.

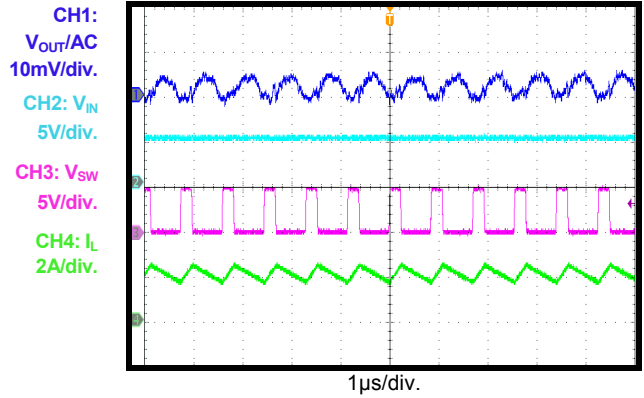
Steady State

I_{OUT}=0A



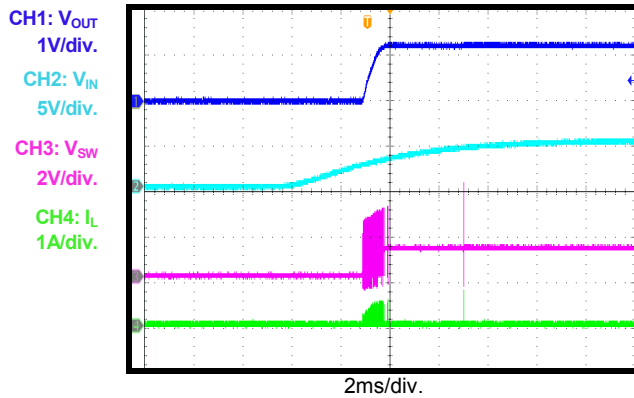
Steady State

I_{OUT}=2A



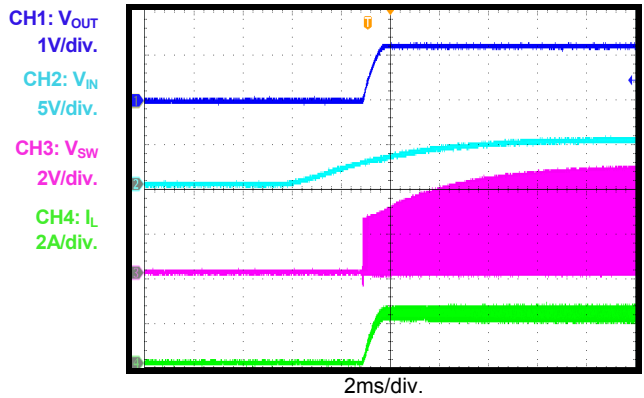
V_{IN} Power-Up

I_{OUT}=0A



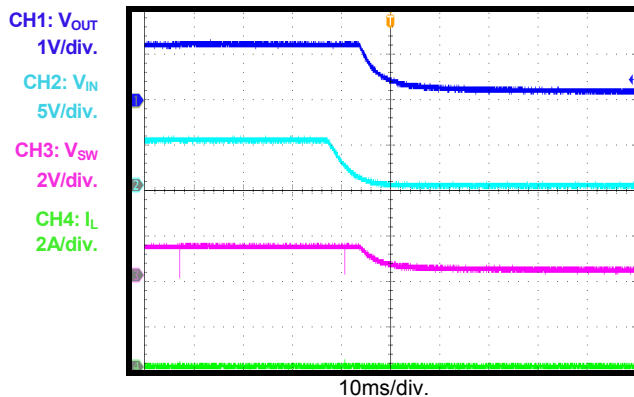
V_{IN} Power-Up

I_{OUT}=2A



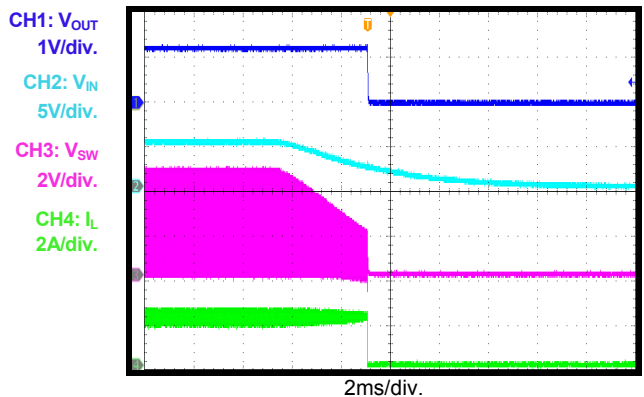
V_{IN} Shutdown

I_{OUT}=0A



V_{IN} Shutdown

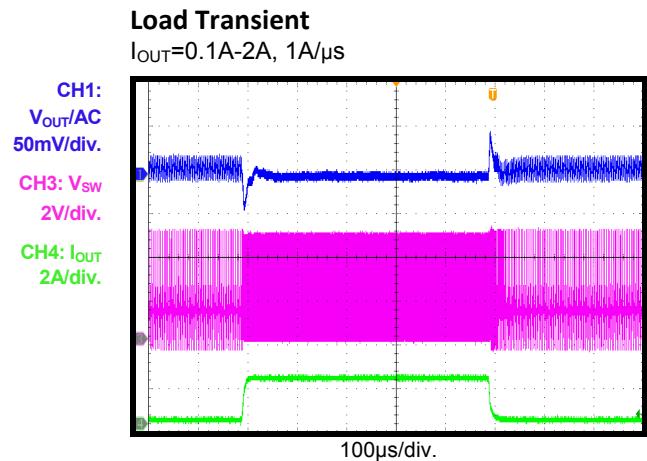
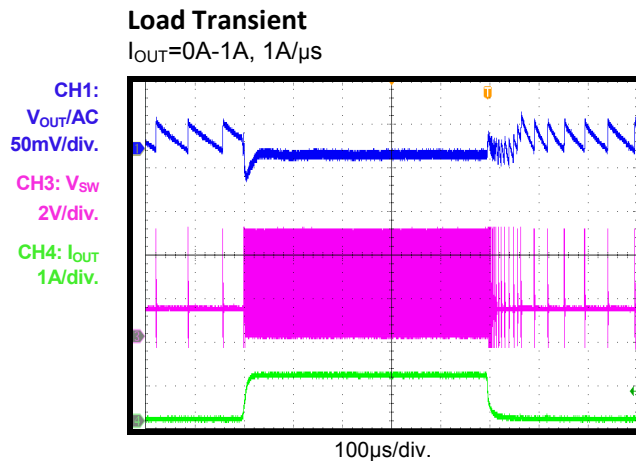
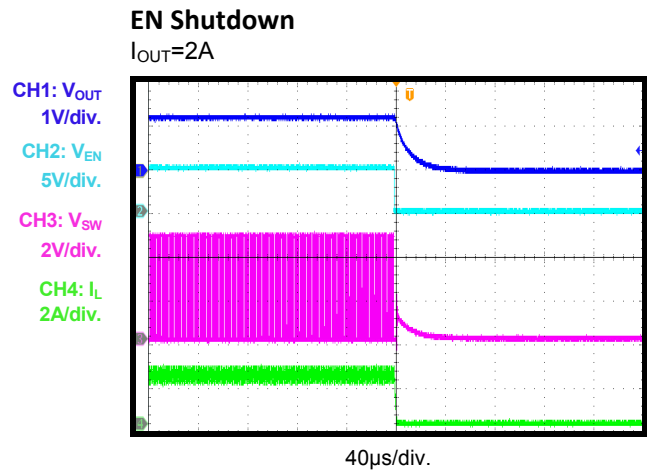
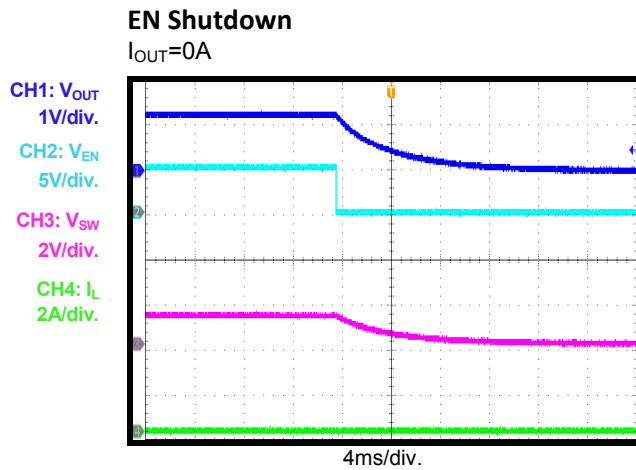
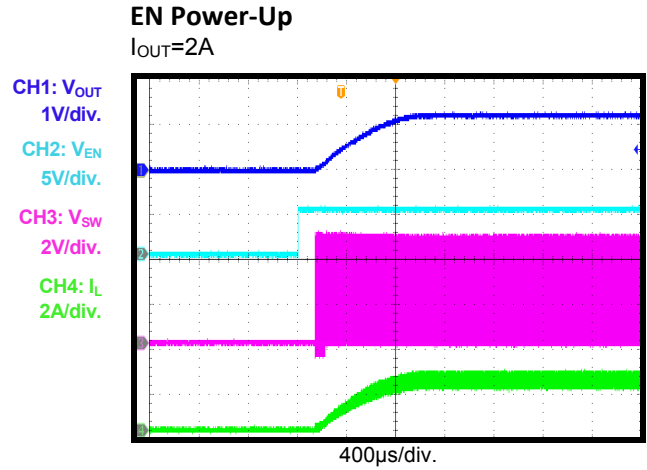
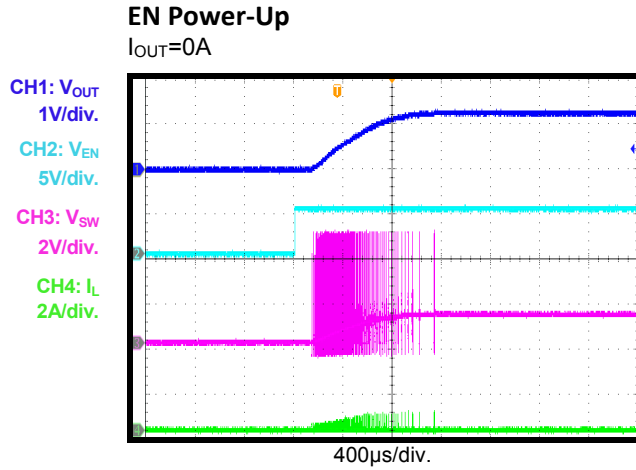
I_{OUT}=2A



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.

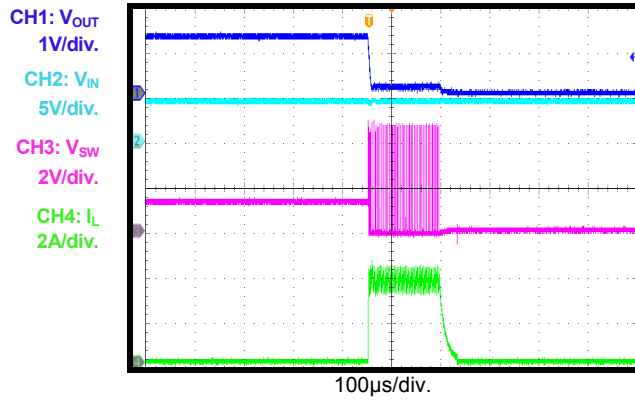


EVB TEST RESULTS (continued)

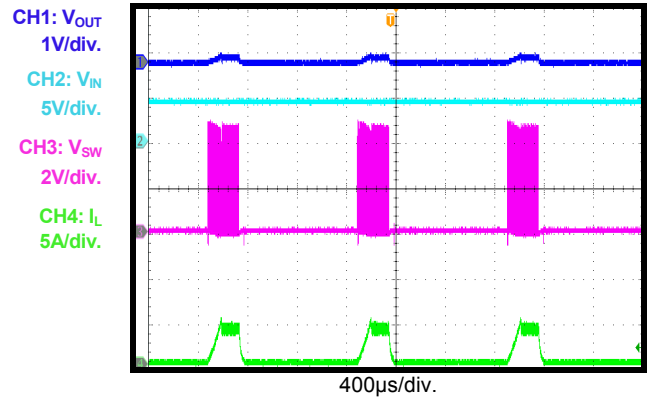
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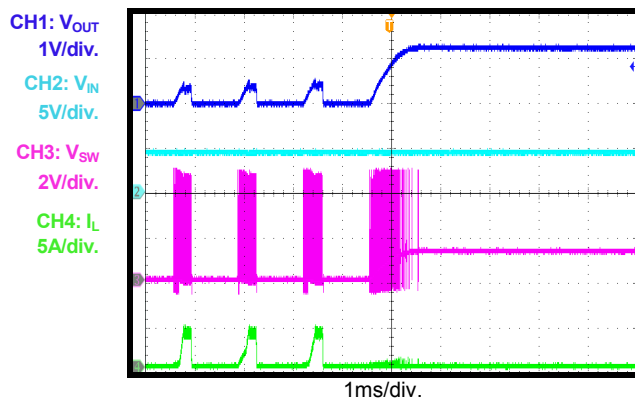
Short-Circuit Entry



Short-Circuit State



Short-Circuit Recovery



CIRCUIT BOARD LAYOUT

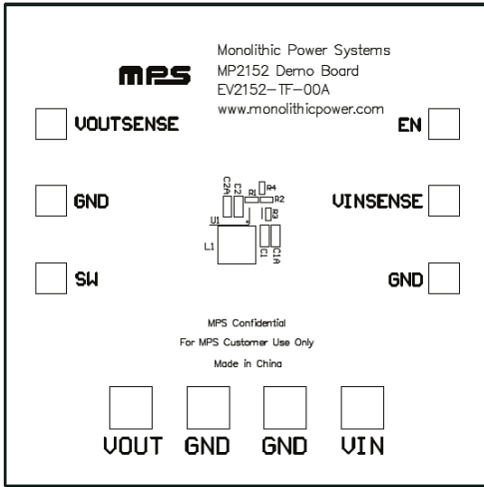


Figure 3—Top Silk Layer

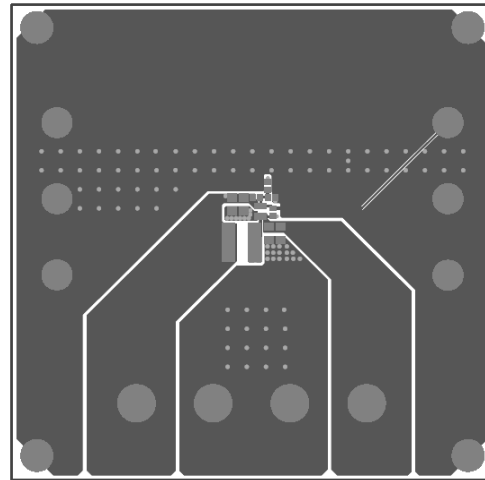


Figure 4—Top Layer

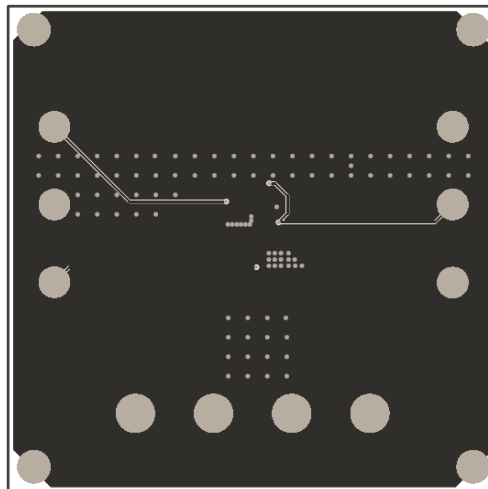


Figure 5—Bottom Layer