

## DESCRIPTION

The MPM3630 is a synchronous rectified, step-down Module converter with built-in power MOSFETs, inductor and two capacitors.

The Evaluation Board can deliver a 3A continuous output current with excellent load and line regulation over a wide input supply range.

Full protection features include over-current protection and thermal shut down.

The MPM3630 is available in a space-saving QFN20 (3mm x5mmx1.6mm) package.

## ELECTRICAL SPECIFICATION

| Parameter      | Symbol    | Value  | Units |
|----------------|-----------|--------|-------|
| Input Voltage  | $V_{IN}$  | 5 – 18 | V     |
| Output Voltage | $V_{OUT}$ | 3.3    | V     |
| Output Current | $I_{OUT}$ | 3      | A     |

## FEATURES

- Complete Switch Mode Power Supply
- 4.5V-to-18V Wide Operating Input Range
- 3A Continuous Load Current
- 50mΩ/22mΩ Low RDS(ON) Internal Power MOSFETs
- Integrated Inductor
- Fixed 1.4MHz Switching Frequency
- 1MHz-2MHz Frequency Sync
- Power Save Mode for Light Load
- Power Good Indicator
- OCP Protection and Hiccup
- Thermal Shutdown
- Output Adjustable from 0.6V
- Available in QFN20 (3x5x1.6mm) Package

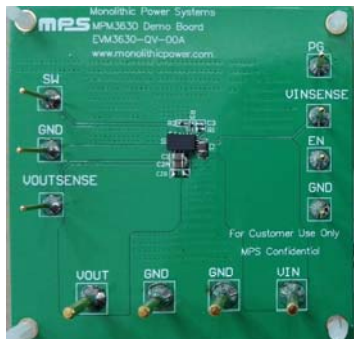
## APPLICATIONS

- Industrial Controls
- Medical and Imaging Equipment
- Telecom Applications
- LDO Replacement
- Space and Resource-Limited Application
- Distributed Power Systems

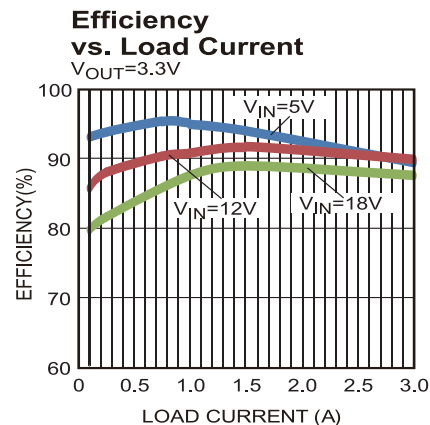
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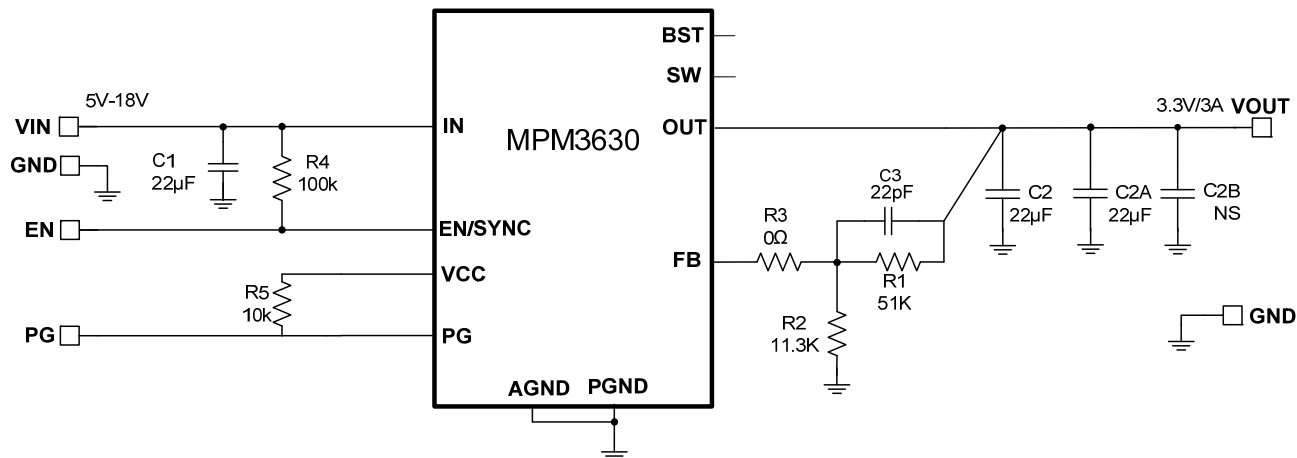
## EVM3630-QV-00A EVALUATION BOARD



| Board Number   | MPS IC Number |
|----------------|---------------|
| EVM3630-QV-00A | MPM3630GQV    |



## EVALUATION BOARD SCHEMATIC



Note: If  $V_{in}$  is lower than 5V, to avoid BST voltage insufficient, need add schottky diode from VCC to BST.

## EVM3630-QV-00A BILL OF MATERIALS

| Qty | RefDes | Value   | Description                  | Package | Manufacturer | Manufacturer P/N   |
|-----|--------|---------|------------------------------|---------|--------------|--------------------|
| 1   | C1     | 22μF    | Ceramic Cap, 25V,X5R         | 0805    | muRata       | GRM21BR61E226ME44L |
| 2   | C2,C2A | 22uF    | Ceramic Cap,16V,X5R          | 0805    | muRata       | GRM219R61C226ME15L |
| 1   | C2B    | NS      |                              |         |              |                    |
| 1   | C3     | 22pF    | Ceramic Cap,50V,C0G          | 0402    | muRata       | GRM1555C1H220JA01  |
| 1   | R2     | 11.3k   | Thick Film Res., 1%          | 0402    | Any          |                    |
| 1   | R1     | 51k     | Thick Film Res., 1%          | 0402    | Any          |                    |
| 1   | R3     | 0       | Thick Film Res., 1%          | 0402    | Any          |                    |
| 1   | R4     | 100k    | Thick Film Res., 1%          | 0402    | Any          |                    |
| 1   | R5     | 10k     | Thick Film Res., 1%          | 0402    | Any          |                    |
| 1   | U1     | MPM3630 | Synchronous Step-Down Module | QFN-20  | MPS          | MPM3630GQV         |

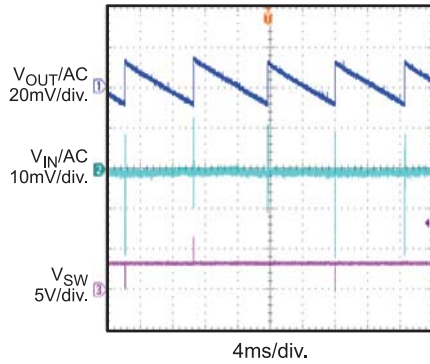
## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 12V$ ,  $V_{OUT} = 3.3V$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

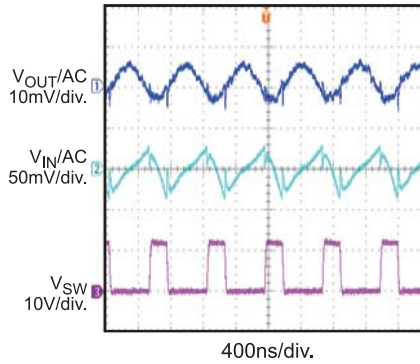
**Output Ripple**

$I_{OUT} = 0A$



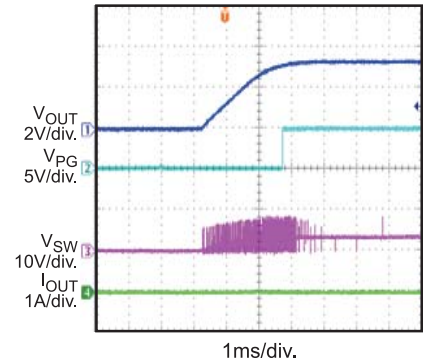
**Output Ripple**

$I_{OUT} = 3A$



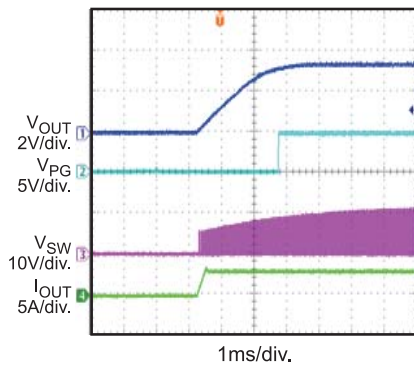
**Start-Up through Input Voltage**

$I_{OUT} = 0A$



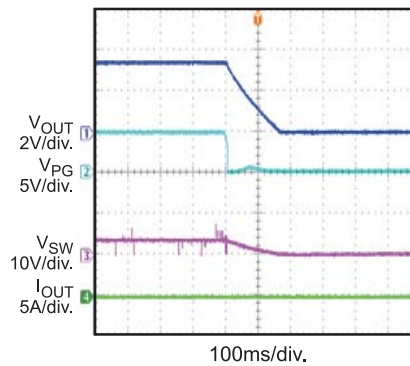
**Start-Up through Input Voltage**

$I_{OUT} = 3A$



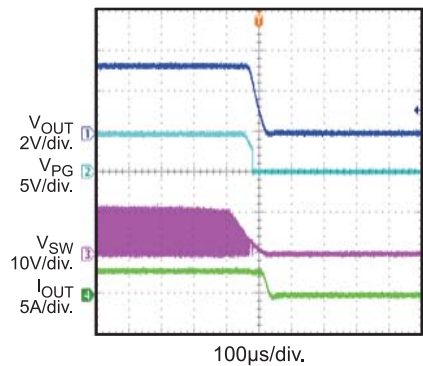
**Shutdown through Input Voltage**

$I_{OUT} = 0A$



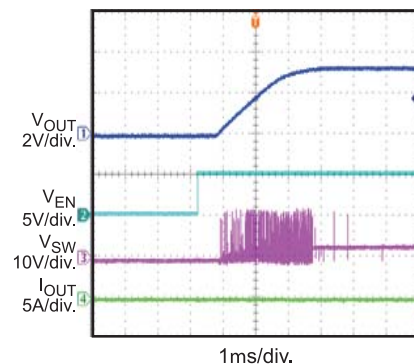
**Shutdown through Input Voltage**

$I_{OUT} = 3A$



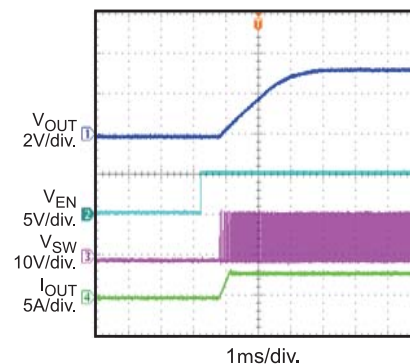
**Start-Up through Enable**

$I_{OUT} = 0A$



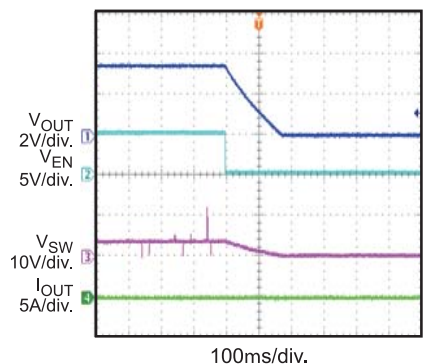
**Start-Up through Enable**

$I_{OUT} = 3A$



**Shutdown through Enable**

$I_{OUT} = 0A$



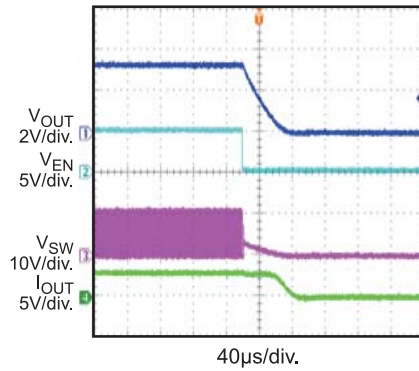
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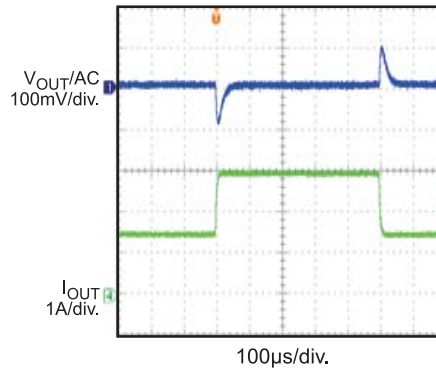
**Shutdown through Enable**

$I_{OUT} = 3A$

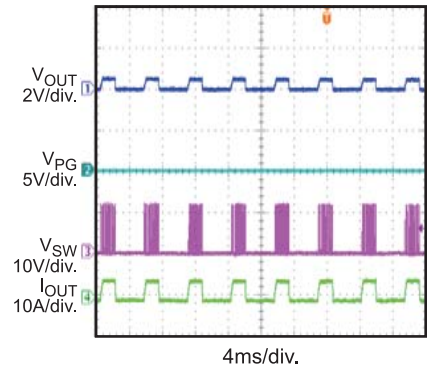


**Load Transient Response**

$I_{OUT}$  transient from 1.5A to 3A

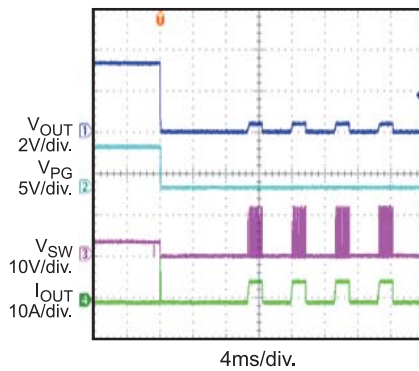


**Short-Circuit Steady State**



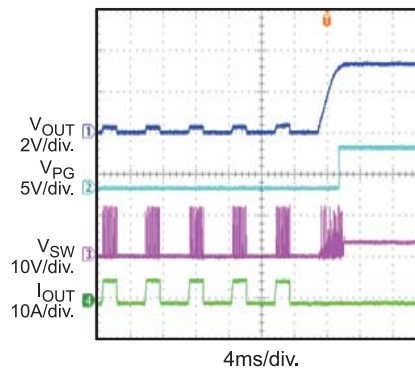
**Short-Circuit Entry**

$I_{OUT} = 0A$

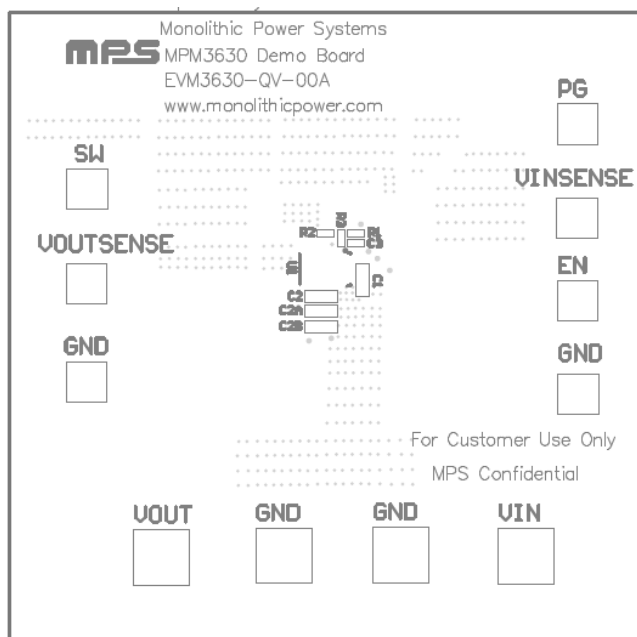


**Short-Circuit Recovery**

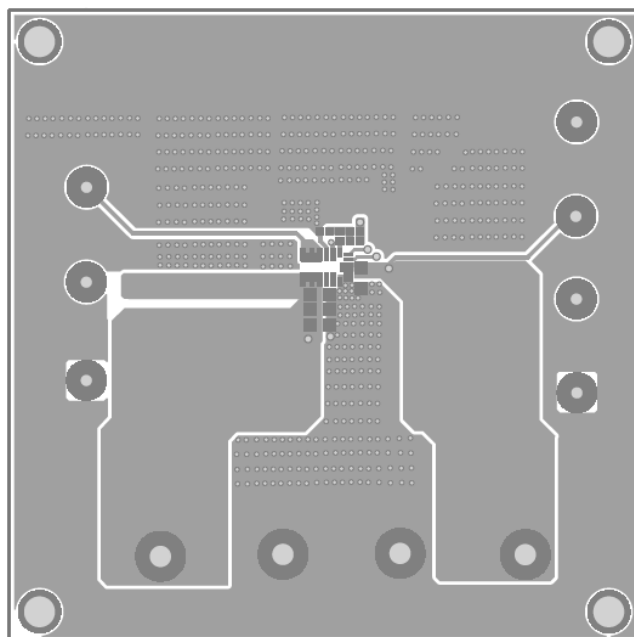
$I_{OUT} = 0A$



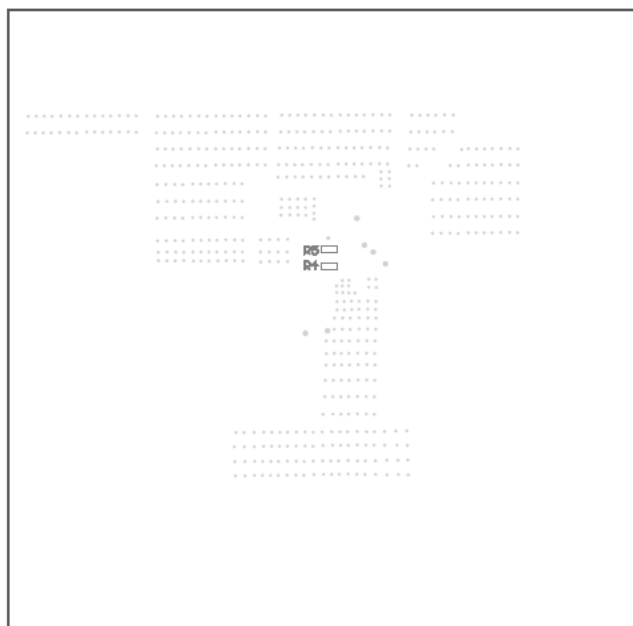
## PRINTED CIRCUIT BOARD LAYOUT



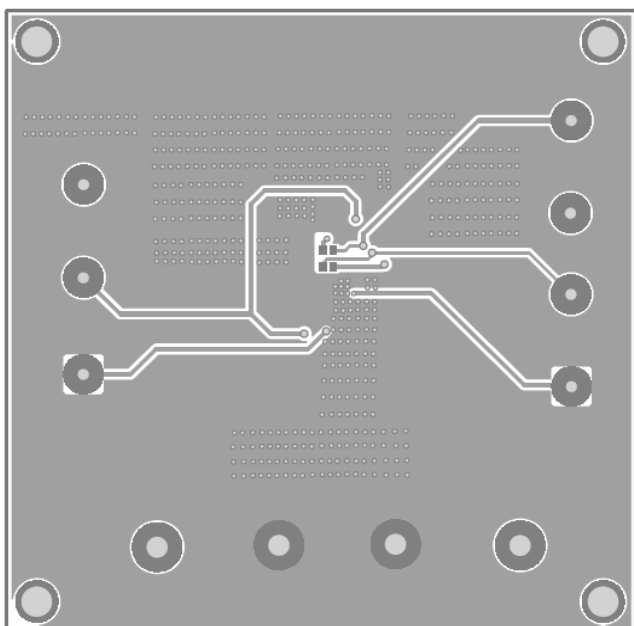
**Figure 1—Top Silk Layer**



**Figure 2—Top Layer**



**Figure 3—Bottom Silk Layer**



**Figure 4—Bottom Layer**

## QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
2. Preset the power supply output between 5V and 18V, and then turn off the power supply.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Turn the power supply on. The board will automatically start up.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 1.4V to turn on the converter, or less than 1.25V to turn it off.

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