# EV3418-J-00A

## 400mA, 1.2MHz Sychronous Boost Converter Evaluation Board

## DESCRIPTION

The EV3418-J-00A Evaluation Board is designed to demonstrate the capabilities of MPS' MP3418. With an input from 1.2V through 4V it can accommodate typical 0.1A continuous current to load.

The MP3418 is a high-efficiency, synchronous, current–mode, step-up converter with output disconnect. MP3418 can start up from an input voltage as low as 0.8V to provide a output voltage from 1.8V through 4V. It also integrates inrush current limiting, output short-circuit protection, DOWN mode operation, OTP and other necessary functions for excellent performances. The 1.2MHz switching frequency allows for smaller external components to achieve low cost.

MP3418 can be available in SOT23-8 package.

## ELECTRICAL SPECIFICATION

| Parameter | Symbol | Value | Units |
|---|---|---|---|
| Supply Voltage | $V_{IN}$ | 0.8 – 4 | V |
| Output Voltage | $V_{OUT}$ | 3.3 | V |

## FEATURES

- Up to 96% Efficiency
- 0.8V Low Voltage Start-Up, 0.6V-to-4V Input Range
- 1.8V-to-4V Output Range
- Internal Synchronous Rectifier
- Typical 38μA Quiescent Current
- Typical 0.1μA Shutdown Current
- True Output Disconnect from Input
- $V_{IN}$>$V_{OUT}$ Down Mode Operation
- High Efficiency under Light-Load Conditions
- Very Small External Components
- Inrush Current Limiting and Internal Soft-Start
- OVP, SCP, OTP
- TSOT23-8 Package

## APPLICATIONS

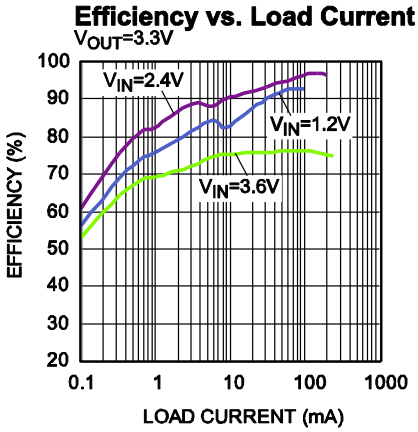
- Battery powered products
- Personal Medical devices
- Portable Media Players
- Wireless Peripherals
- Handheld Computers and Smartphones



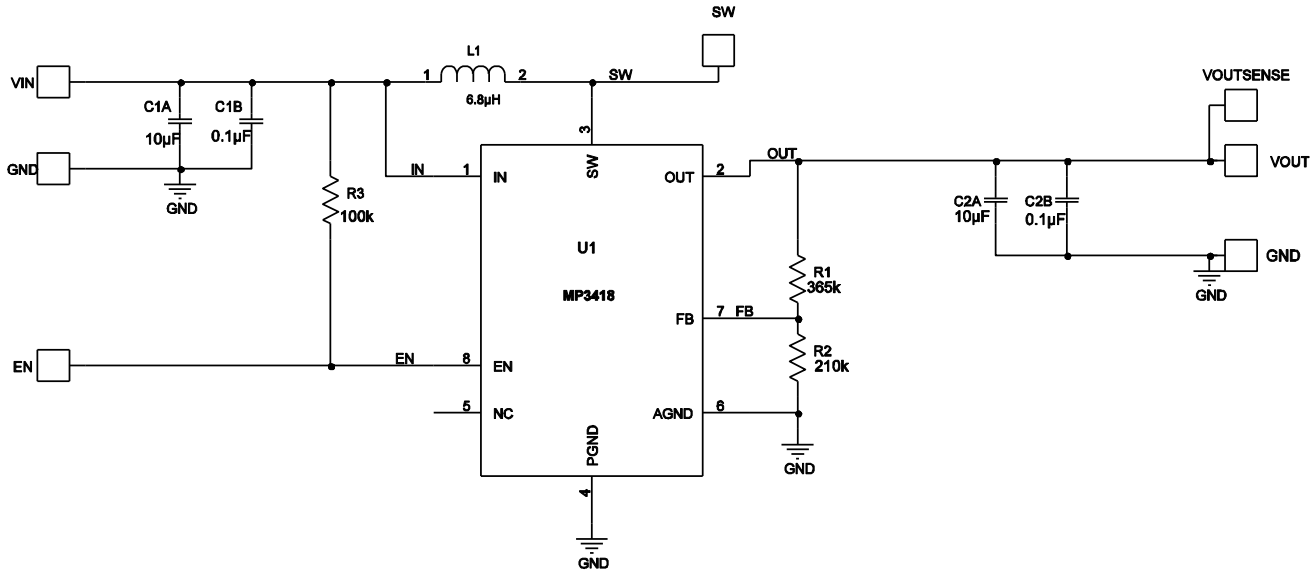
## EV3418-J-00A EVALUATION BOARD


**(L × W × H) 6.35cm × 6.35cm × 1.0cm**

| Board Number | MPS IC Number |
|---|---|
| EV3418-J-00A | MP3418GJ |



## EVALUATION BOARD SCHEMATIC



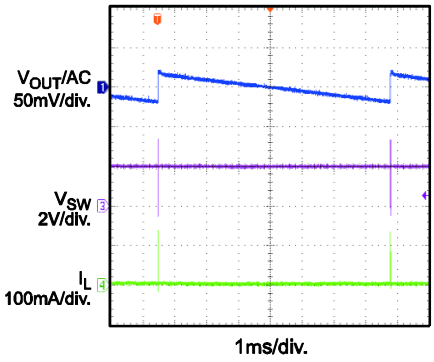

## EV3418-J-00A BILL OF MATERIALS

| Qty | RefDes | Value | Description | Package | Manufacturer | Manufactuer_P/N |
|---|---|---|---|---|---|---|
| 1 | C1A, C2A | 10µF | Ceramic Cap., 16V, X7R | 1210 | muRata | GRM32DR71C106KA01L |
| 2 | C1B,C2B | 0.1µF | Ceramic Cap., 16V, X7R | 0603 | muRata | GRM188R71C104KA01D |
| 1 | R1 | 365k | Film Res., 1% | 0603 | Yageo | RC0603FR-07365KL |
| 1 | R2 | 210k | Film Res., 1% | 0603 | Yageo | RC0603FR-07210KL |
| 1 | R3 | 100k | Film Res., 1% | 0603 | Yageo | RC0603FR-07100KL |
| 1 | L1 | 6.8µH | 80mOhm DCR, 1.25A Isat | SMD | Wurth | 744043006 |
| 1 | U1 | | Step-Up Converter | SOT23-8 | MPS | MP3418GJ |

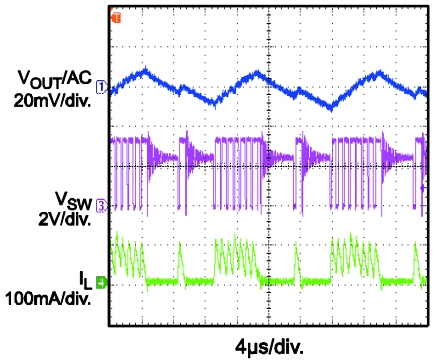
## EVB TEST RESULTS

**Performance waveforms are tested on the evaluation board.**
**$V_{IN}$ = 2.4V, $V_{OUT}$ = 3.3V, L = 6.8μH, $C_{OUT}$=10uF, $T_A$ = 25°C, unless otherwise noted.**

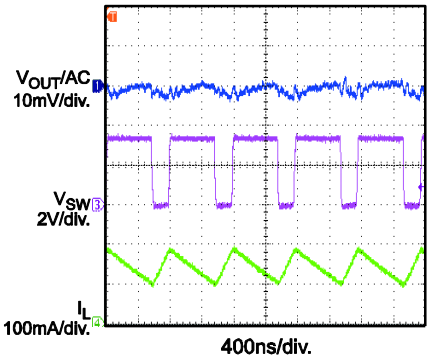
**Output Voltage Ripple**
$I_{OUT}$ = 0mA



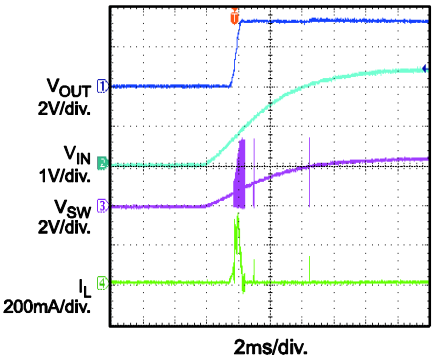

**Output Voltage Ripple**
$I_{OUT}$ = 20mA



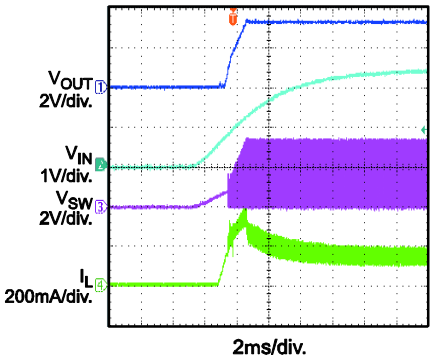

**Output Voltage Ripple**
$I_{OUT}$ = 100mA



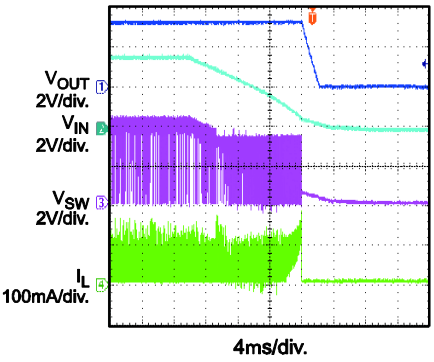

**$V_{IN}$ Startup**
$I_{OUT}$ = 0mA



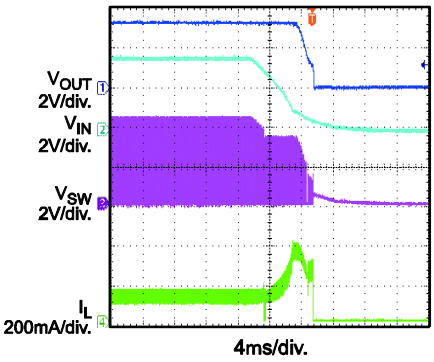

**$V_{IN}$ Startup**
$I_{OUT}$ = 100mA



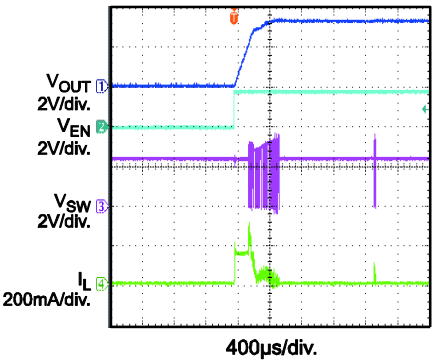

**$V_{IN}$ Shutdown**
$V_{IN}$ = 3.6V, $I_{OUT}$ = 20mA



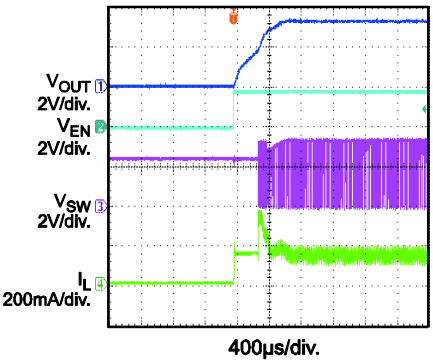

**$V_{IN}$ Shutdown**
$V_{IN}$ = 3.6V, $I_{OUT}$ = 100mA




**EN Startup**
$I_{OUT}$ = 0mA



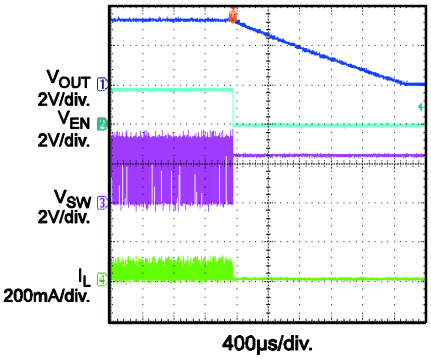

**EN Startup**
$I_{OUT}$ = 100mA



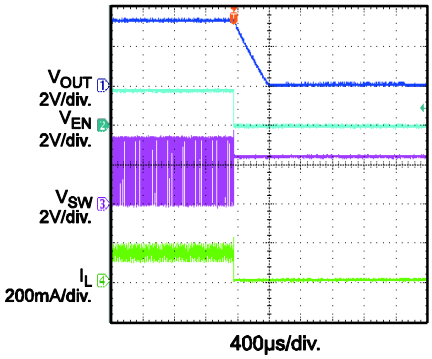
## EVB TEST RESULTS *(continued)*

**Performance waveforms are tested on the evaluation board.**
**$V_{IN}$ = 2.4V, $V_{OUT}$ = 3.3V, L = 6.8µH, $C_{OUT}$=10uF, $T_A$ = 25°C, unless otherwise noted.**

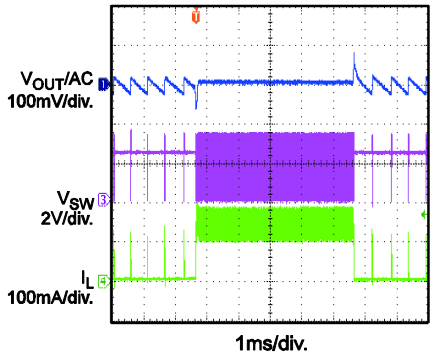
**EN Shutdown**
$I_{OUT}$ = 20mA




**EN Shutdown**
$I_{OUT}$ = 100mA




**Load Transient**
$V_{IN}$=2.4V, $I_{OUT}$=0 to 100mA@250mA/µs

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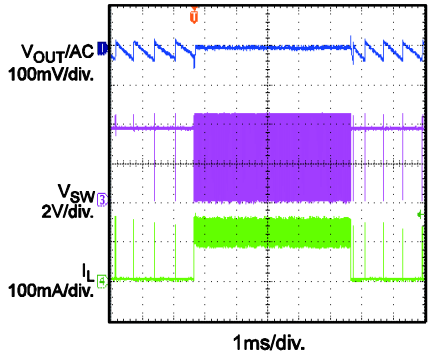
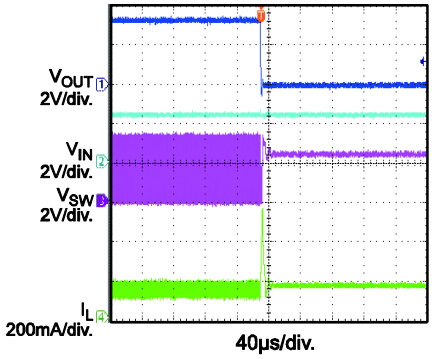
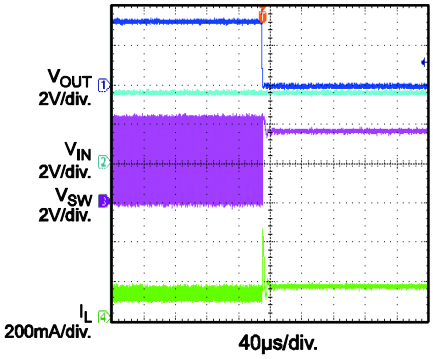
$V_{IN}$=3.6V, $I_{OUT}$=0 to 100mA@250mA/µs




**Short Circuit Protection**
$V_{IN}$=2.4V, $I_{OUT}$=100mA before Short




**Short Circuit Protection**
$V_{IN}$=3.6V, $I_{OUT}$=100mA before Short



## PRINTED CIRCUIT BOARD LAYOUT

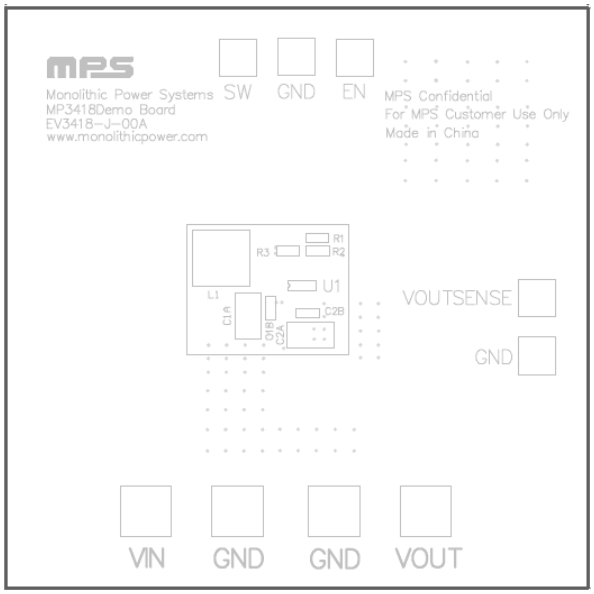



**Figure 1: Top Silkscreen Layer**

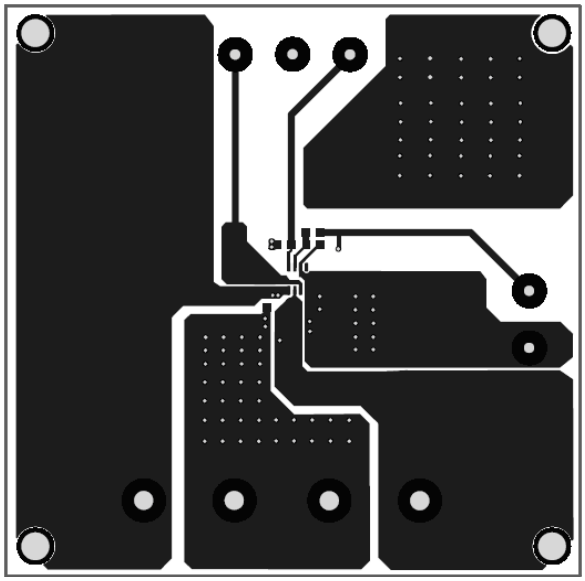


**Figure 2: Top Layer**

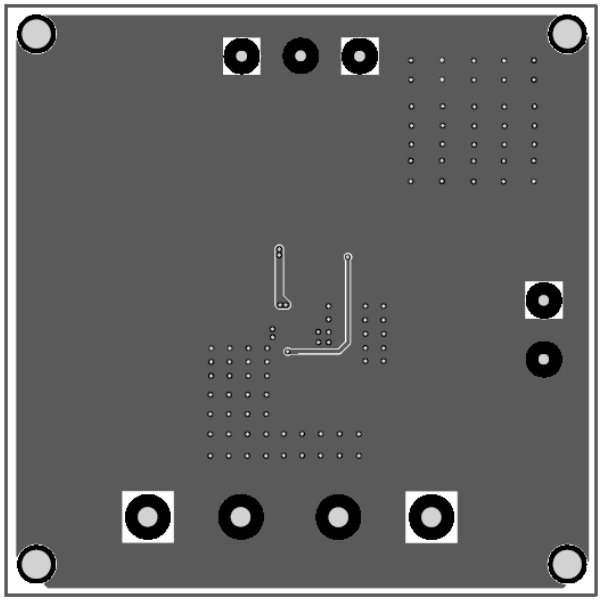


**Figure 3: Bottom Layer**

## QUICK START GUIDE

The output voltage of this board is set to 3.3V. The board layout accommodates most commonly used inductors and output capacitors. To use this EVB for evaluation, you can do as below:

1. Preset Power Supply to $0.8V \le V_{IN} \le 4V$.
2. Turn Power Supply off.
3. Preset Load to a value, note that over load will lead to SCP or insufficient output voltage.
4. Connect Power Supply terminals to:
    a. Positive (+): VIN
    b. Negative (–): GND
5. Connect Load to:
    a. Positive (+): VOUT
    b. Negative (–): GND
6. Turn Power Supply on after making connections. The MP3418 will automatically startup to work.
7. The output voltage $V_{OUT}$ can be programmed by changing R2. And the value of R2 can be calculated by the following formula: $R2 = R1 \times \frac{V_{FB}}{V_{OUT} - V_{FB}}$

   Where $V_{FB} = 1.21V$ and R1=365kΩ.
8. If EN functions is preferred, apply a high level ($V_{EN} > 0.7V$) turns on MP3418, low level ($V_{EN} < 0.1V$) turns off MP3418. after turns off, output voltage will be discharged to 0 due to load.