

DESCRIPTION

The EV2149-J-00A is used for demonstrating the performance of MPS's MP2149, an internally compensated 1MHz fixed-frequency dual PWM synchronous step-down regulator.

MP2149 is ideal for powering portable equipment that runs from a single cell Lithium-Ion (Li+) Battery due to 45µA low quiescent current. The output voltage can be regulated as low as 0.608V.

With peak current mode control and internal compensation, the MP2149 requires a minimum number of readily available standard external components and is available in an 8-pin TSOT23 package.

ELECTRICAL SPECIFICATION

| Parameter | Symbol | Value | Units |
|------------------------------|-------------------|-------|-------|
| Input Voltage ⁽¹⁾ | V _{IN} | 2.7-6 | V |
| Output Voltage | V _{OUT1} | 1.8 | V |
| | V _{OUT2} | 1.2 | V |
| Output Current | I _{OUT1} | 1 | A |
| | I _{OUT2} | 1 | A |

Notes:

1) V_{IN} < 3V application may need more input capacitors.

FEATURES

- Dual 1A Output Current
- >93% Peak Efficiency
- >80% Light Load Efficiency
- Wide 2.7V to 6V Operating Input Range
- 100mΩ and 40mΩ Internal Power MOSFET
- 1MHz Fixed Switching Frequency
- Adjustable Output from 0.608V to V_{IN}
- 180° Phase-Shifted Operation
- 100% Duty Cycle Operation
- 45µA Quiescent Current
- Cycle-by-cycle Over Current Protection
- Short Circuit Protection with Hiccup Mode
- Thermal Shutdown
- Available in an 8-pin TSOT23 Package

APPLICATIONS

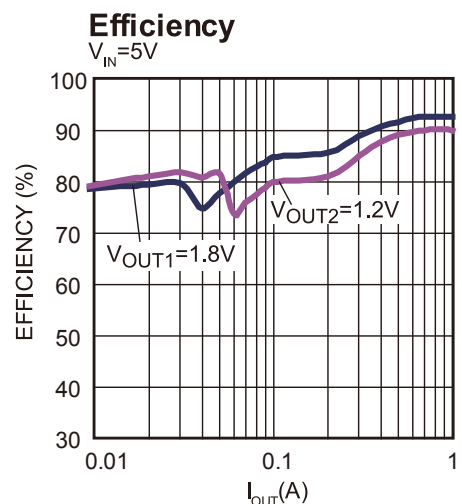
- Small/Handhold Devices
- DVD Drivers
- Portable Instruments
- Smartphone and Feature Phones
- Battery-Powered Devices

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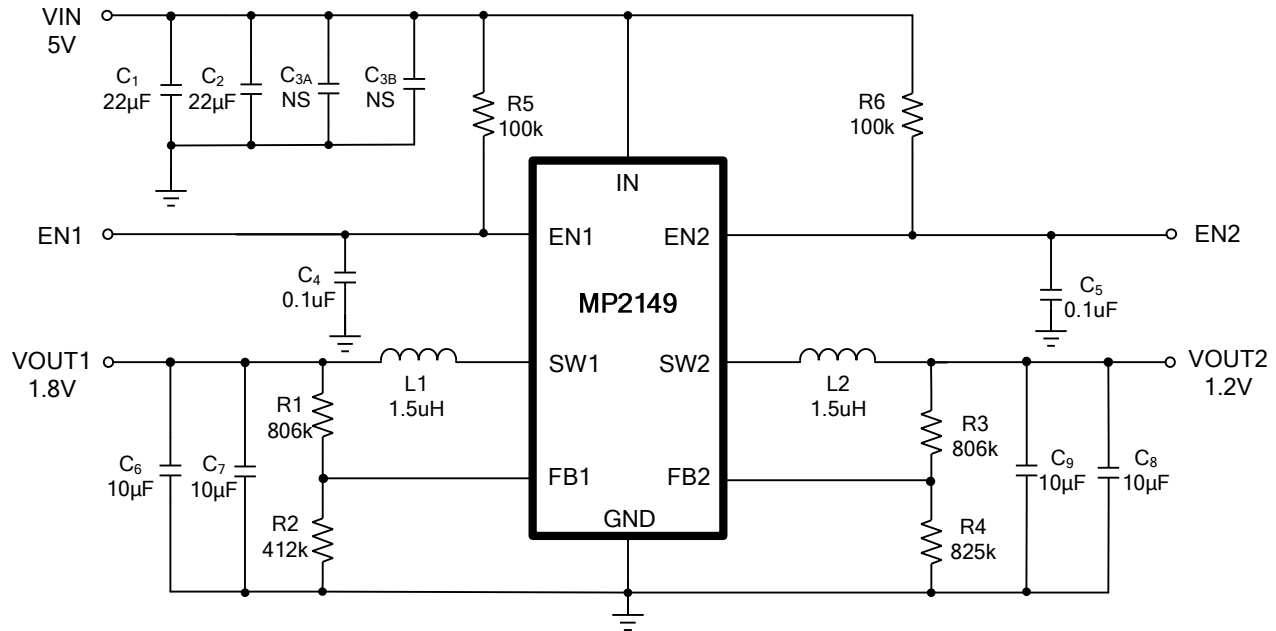
TYPICAL APPLICATION



| Board Number | MPS IC Number |
|--------------|---------------|
| EV2149-J-00A | MP2149GJ |



EVALUATION BOARD SCHEMATIC



EV2149-J-00A BILL OF MATERIALS

| Qty | Ref | Value | Description | Package | Manufacturer | Manufacturer P/N |
|-----|----------------|-------|-----------------------------|----------|--------------|--------------------|
| 1 | C1 | 22uF | Ceramic Cap., 16V, 20%, X5R | 0805 | muRata | GRM21BR60J226ME39L |
| 1 | C2 | 22uF | Ceramic Cap., 16V, 20%, X5R | 0805 | muRata | GRM21BR60J226ME39L |
| 0 | C3A | NS | | | | |
| 0 | C3B | NS | | | | |
| 2 | C4, C5 | 0.1uF | Ceramic Cap, 16V,X7R | 0603 | muRata | GRM188R71C104KA01D |
| 4 | C6, C7, C8, C9 | 10uF | Ceramic Cap, 16V, 20%, X5R | 0805 | muRata | GRM21BR61A106KE19L |
| 2 | R1, R3 | 806k | Thick Film, 1/10W, 1% | 0603 | royal | RL0603FR-07806KL |
| 1 | R2 | 412k | Thick Film, 1/10W, 1% | 0603 | royal | RL0603FR-07412KL |
| 1 | R4 | 825k | Thick Film, 1/10W, 1% | 0603 | royal | RL0603FR-07825KL |
| 2 | R5, R6 | 100k | Thick Film, 1/10W, 1% | 0603 | royal | RL0603FR-07100KL |
| 2 | L1, L2 | 1.5uH | Inductor, 9.57mohm, 11.5A | | Würth | 744312150 |
| 1 | U1 | | DC-DC module | TSOT23-8 | MPS | MP2149GJ |

PRINTED CIRCUIT BOARD LAYOUT

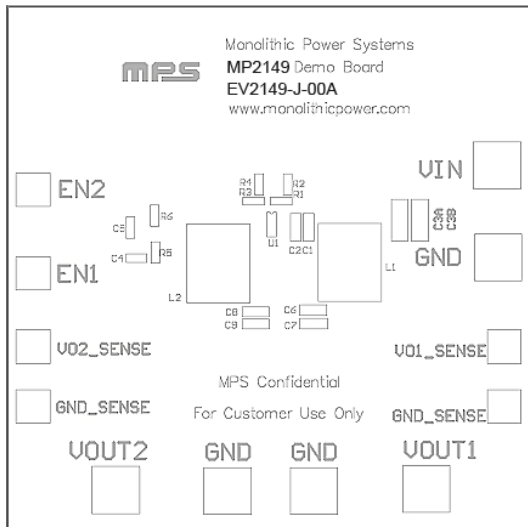


Figure 1—Top Silk Layer

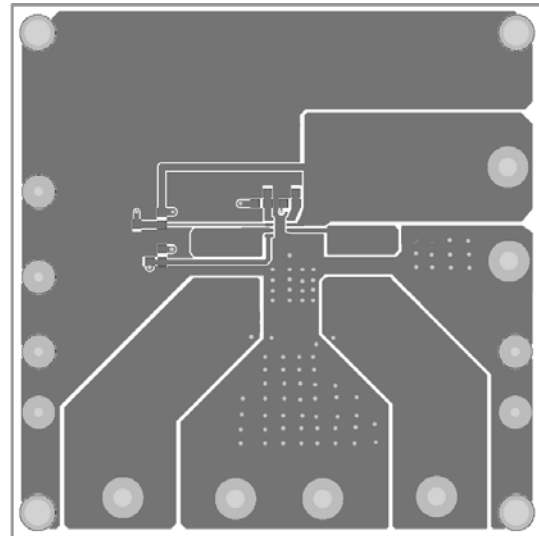


Figure 2—Top Layer

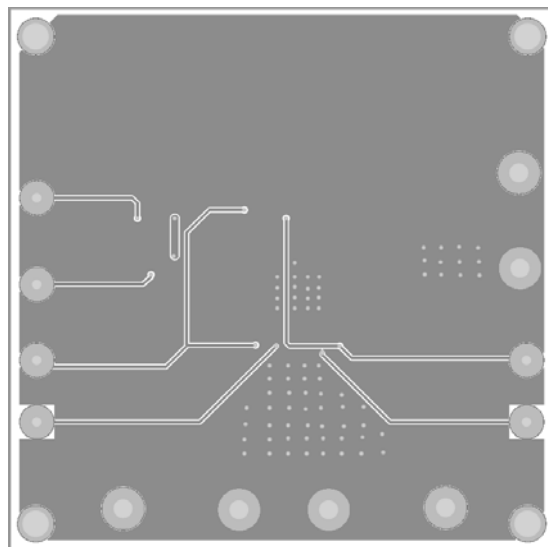


Figure 3—Bottom Layer

QUICK START GUIDE

The board layout accommodates most commonly used components.

1. Connect the positive and negative terminals of the load to VOUT1, VOUT2 and GND pins, respectively.
2. Preset Power Supply output between 2.7V and 6V, and turn off the power supply.
3. Connect Power Supply terminals to:
 - a. Positive (+): VIN
 - b. Negative (-): GND
4. Turn Power Supply on after making connections. The board will automatically start-up.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 1.2V to turn on the regulator or less than 0.4V to turn it off.

LAYOUT RECOMMENDATION OF MP2149

Proper layout of the switching power supplies is very important, and sometimes critical to make it work properly. Especially, for the high switching converter, if the layout is not carefully done, the regulator could show poor line or load regulation, stability issues.

For MP2149, the input capacitor and feedback resistors should be placed as close as possible to the IC pins. As shown in Figure 4. The 0805 size ceramic capacitors (C1 and C2) are used for the input capacitor, please make sure the two ends of the ceramic capacitor be directly connected to PIN7 (the Power Input Pin) and PIN5 (the Power GND Pin). The R1, R2 and R3, R4 are the feedback resistors, please make sure they are as close as possible to the feedback pins (PIN8 and PIN1).

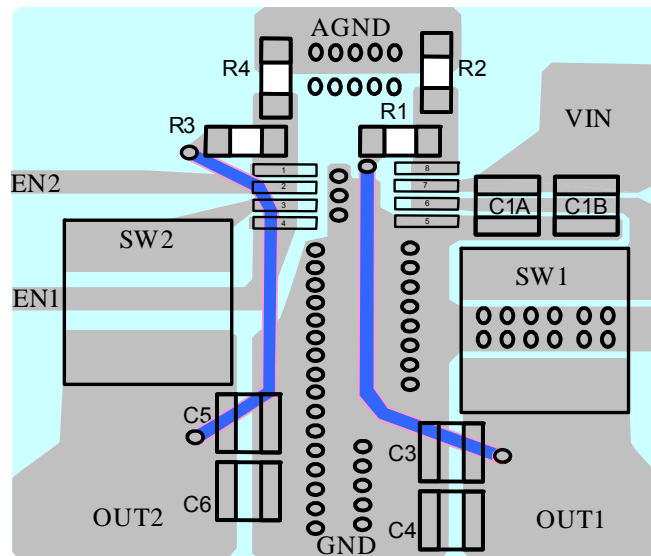


Figure 4

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