

DESCRIPTION

The EV1470-J-00B Evaluation Board is designed to demonstrate the capabilities of MPS' MP1470, A high-frequency, synchronous rectified, step-down, switch-mode converter with internal power MOSFETs. It offers a very compact solution to achieve a 2A continuous output current over a wide input supply range, with excellent load and line regulation. The MP1470 has synchronous-mode operation for higher efficiency over the output current-load range.

Current-mode operation provides fast transient response and eases loop stabilization.

Protection features include over-current protection and thermal shutdown.

The MP1470 requires a minimal number of readily-available, standard, external components and is available in a space-saving 6-pin TSOT23 package. Electrical Specification

| Parameter | Symbol | Value | Units |
|----------------|-----------|----------|-------|
| Input Voltage | V_{IN} | 4.7 – 16 | V |
| Output Voltage | V_{OUT} | 3.3 | V |
| Output Current | I_{OUT} | 2 | A |

FEATURES

- Wide 4.7V-to-16V Operating Input Range
- 163mΩ/86mΩ Low- $R_{DS(ON)}$ Internal Power MOSFETs
- Proprietary Switching-Loss-Reduction Technique
- High-Efficiency Synchronous-Mode Operation
- Fixed 500kHz Switching Frequency
- AAM Power-Save Mode for High Efficiency at Light Load
- Internal Soft-Start
- Over-Current Protection and Hiccup
- Thermal Shutdown
- Output Adjustable from 0.8V
- Available in 6-pin TSOT-23 package

APPLICATIONS

- Notebook Systems and I/O Power
- Digital Set-Top Boxes
- Flat-Panel Television and Monitors
- Distributed Power Systems

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

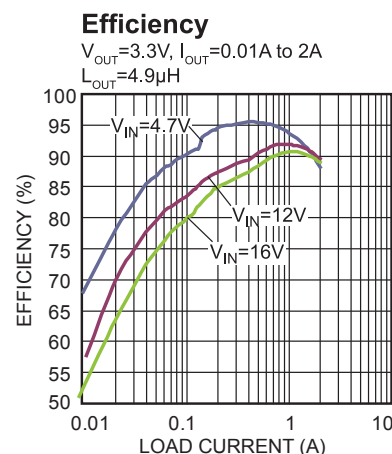
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EV1470-J-00B EVALUATION BOARD

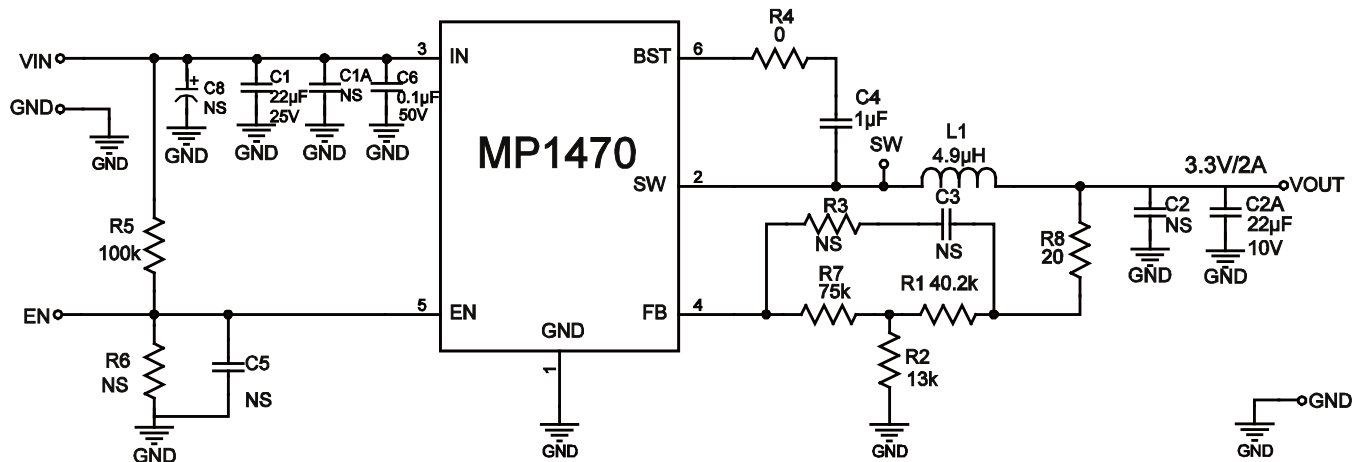


(L x W x H) 6.1cm x 5.1cm x 1.3cm

| Board Number | MPS IC Number |
|--------------|---------------|
| EV1470-J-00B | MP1470GJ |



EVALUATION BOARD SCHEMATIC



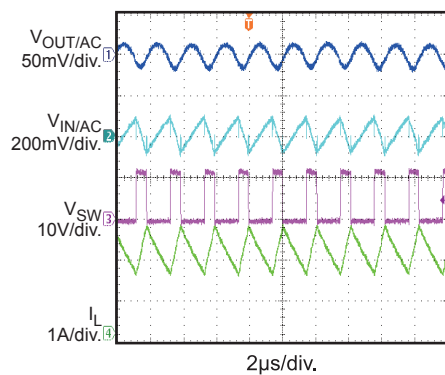
EV1470-J-00B BILL OF MATERIALS

| Qty | Ref | Value | Description | Package | Manufacturer | Part Number |
|-----|---------------------|--------|-------------------------------|----------|--------------|--------------------|
| 1 | C1 | 22µF | Ceramic Cap., 25V, X5R | 1206 | muRata | GRM31CR61E226KE15L |
| 0 | C2,C1A,C3 C5, C8 | NS | | | | |
| 1 | C2A | 22µF | Ceramic Cap., 10V, X7R | 1206 | muRata | GRM31CR71A226KE15L |
| 1 | C4 | 1µF | Ceramic Cap., 16V, X7R | 0603 | muRata | GRM188R71C105KA12D |
| 1 | C6 | 0.1µF | Ceramic Cap., 50V, X7R | 0603 | muRata | GRM188R71H104KA93D |
| 1 | R1 | 40.2k | Thick Film Res., 1% | 0603 | Yageo | 9C06031A4022FKHFT |
| 1 | R2 | 13k | Thick Film Res., 1% | 0603 | Yageo | 9C06031A132FKHFT |
| 0 | R3,R6 | NS | | | | |
| 1 | R4 | 0Ω | Thick Film Res., 5% | 0603 | Any | |
| 1 | R8 | 20Ω | Thick Film Res., 5% | 0603 | Yageo | 9C06031A20R0JLHFT |
| 1 | R5 | 100k | Thick Film Res., 1% | 0603 | Yageo | RC0603FR-07100KL |
| 1 | R7 | 75k | Thick Film Res., 1% | 0603 | Yageo | 9C06031A752FKHFT |
| 1 | L1 | 4.9µH | Inductor,DCR=17mΩ,Is=6.5A | SMD | Würth | 744314490 |
| 1 | U1 | MP1470 | Synchronous Step-Down Convert | TSOT23-6 | MPS | MP1470GJ |

EVB TEST RESULTS

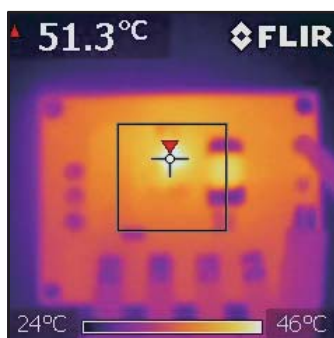
Input/Output Ripple

$I_{OUT} = 2A$



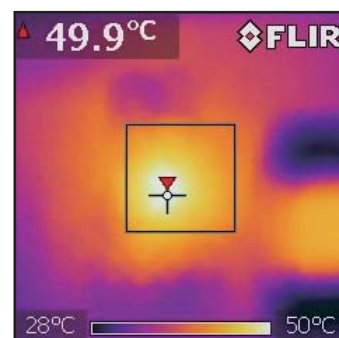
Infrared Thermal Image

$I_{OUT} = 2A$



Infrared Thermal Image

$I_{OUT} = 2A$



PRINTED CIRCUIT BOARD LAYOUT

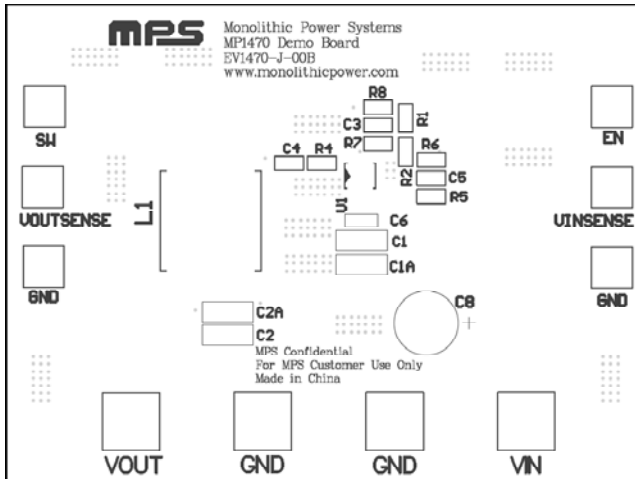


Figure 1: Top Silkscreen Layer

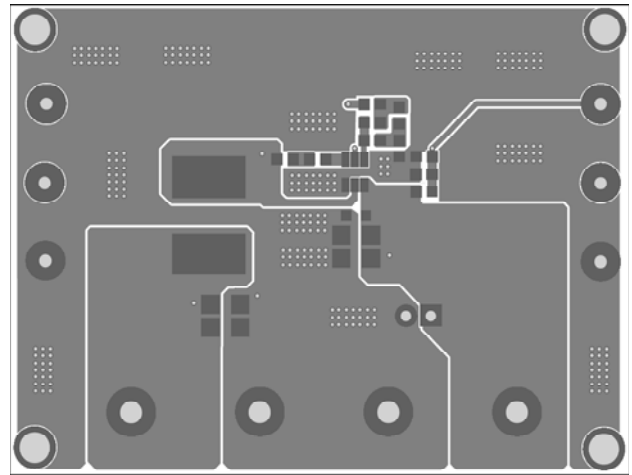


Figure 2: Top Layer

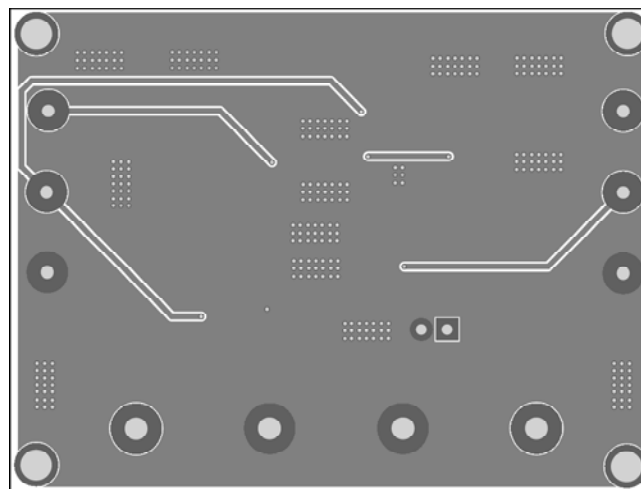


Figure 3: Bottom Layer

QUICK START GUIDE

1. Preset Power Supply to $4.7V \leq V_{IN} \leq 16V$.
2. Turn Power Supply off.
3. Connect Power Supply terminals to:
 - a. Positive (+): VIN
 - b. Negative (–): GND
4. Connect Load to:
 - a. Positive (+): VOUT
 - b. Negative (–): GND
5. Turn Power Supply on after making connections. The board will automatically start up.
6. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 1.6V to turn on the regulator, or less than 1.25V to turn it off.

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