



The Future of Analog IC Technology™

EV2305DS-00A

4.75V to 23V IN, 2A OUT

Synchronous Buck Converter

EVALUATION BOARD

DESCRIPTION

The EV2305DS-00A is the evaluation board of MPS' MP2305 synchronous buck converter. It has a wide supply range from 4.75V to 23V and a continuous output current up to 2A. It features synchronous rectification for high efficiency with integrated high-side and low-side power MOSFETs. The output voltage is preset to 3.3V, but can be easily adjusted to other levels from 0.923V. Current mode control and integrated power MOSFETs minimize component counts, board area, and solution cost. Fault condition protections include cycle-by-cycle current limiting, thermal shutdown and under-voltage lockout. Programmable soft-start reduces turn-on stress. Small SO-8 package minimizes board area.

ELECTRICAL SPECIFICATIONS

| Parameter | Symbol | Value | Units |
|----------------|-----------|------------|-------|
| Supply Voltage | V_{IN} | 4.75 to 23 | V |
| Output Voltage | V_{OUT} | 3.3 | V |
| Output Current | I_{OUT} | 0 to 2 | A |

FEATURES

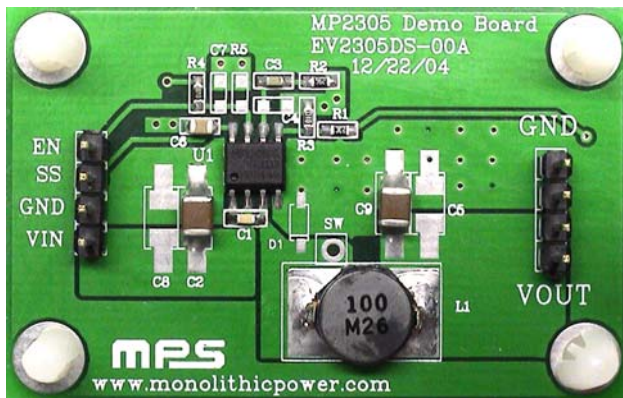
- Up to 2A Output Current
- Wide 4.75V to 23V Operating Input Range
- Monolithic Synchronous Buck with 130mΩ High-Side and Low-Side FETs
- Fixed 340KHz Frequency
- All Ceramic Input and Output Capacitors
- Programmable Soft-Start
- Programmable Input Under Voltage Lockout

APPLICATIONS

- Distributed Power Systems
- Networking Systems
- FPGA, DSP, ASIC Power Supplies
- Green Electronics/ Appliances
- Notebook Computers

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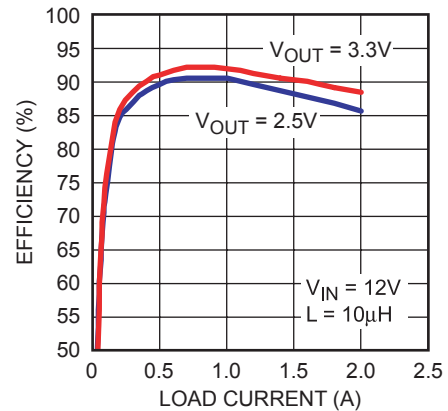
EV2305DS-00A EVALUATION BOARD

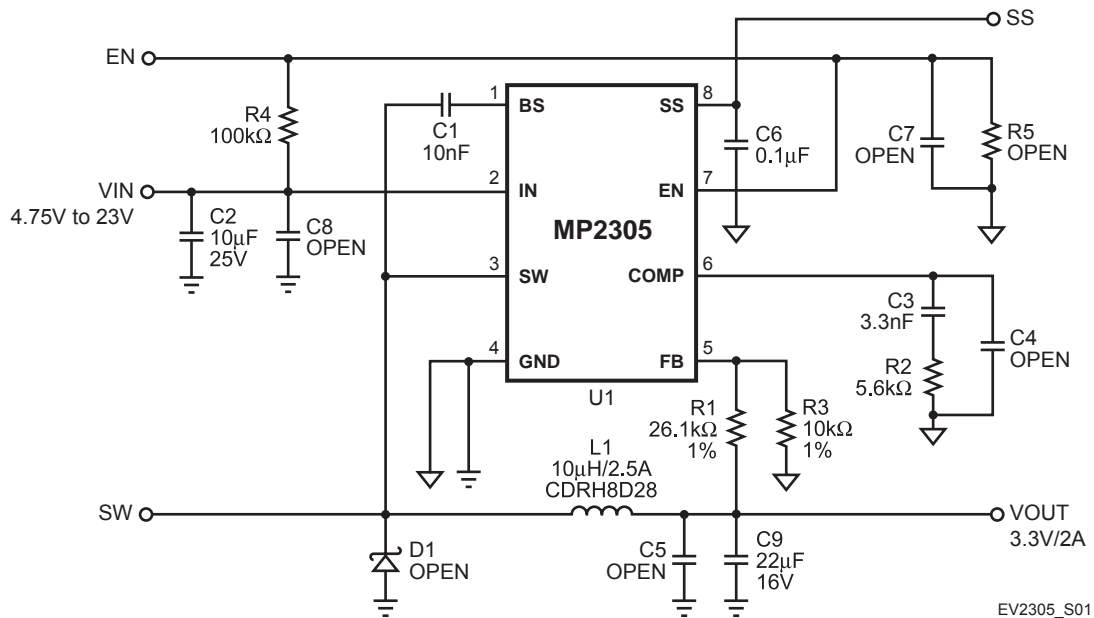


(L x W x H) 2.0" x 1.5" x 0.5"
(5.0cm x 3.8cm x 1.2cm)

| Board Number | MPS IC Number |
|--------------|---------------|
| EV2305DS-00A | MP2305DS |

Efficiency vs Load Current



EVALUATION BOARD SCHEMATIC


EV2305_S01

EV2305DS-00A BILL OF MATERIALS

| Item | Qty | Ref | Value | Description | Package | Manufacturer | Part Number |
|------|-----|------------------|--------|-----------------------|---------|--------------|----------------|
| 1 | 1 | C1 | 10nF | Ceramic Cap, 50V, X7R | SM0805 | AVX | 08055C103KAT2A |
| 2 | 1 | C2 | 10μF | Ceramic Cap, 25V, X5R | SM1210 | AVX | 12103D106KAT2A |
| 3 | 1 | C3 | 3.3nF | Ceramic Cap, 50V, X7R | SM0805 | AVX | 08055C332KAT2A |
| 4 | 4 | C4, C5 C7, C8 | OPEN | Not Stuffed | | | |
| 5 | 1 | C6 | 0.1μF | Ceramic Cap, 50V, X7R | SM0805 | AVX | 08055C104KAT2A |
| 6 | 1 | C9 | 22μF | Ceramic Cap, 16V, X5R | SM1210 | AVX | 1210YD226KAT2A |
| 7 | 1 | D1 | | Do Not Stuff | | | |
| 8 | 1 | L1 | 10μH | Inductor, 2.5A | SMD | Sumida | CDRH8D28 |
| 9 | 1 | R1 | 26.1kΩ | Resistor, 1% | SM0805 | Panasonic | ERJ-6ENF2612V |
| 10 | 1 | R2 | 5.6kΩ | Resistor, 5% | SM0805 | Panasonic | ERJ-6GEYJ562V |
| 11 | 1 | R3 | 10kΩ | Resistor, 1% | SM0805 | Panasonic | ERJ-6ENF1002V |
| 12 | 1 | R4 | 100kΩ | Resistor, 5% | SM0805 | Panasonic | ERJ-6GEYJ104V |
| 13 | 1 | R5 | OPEN | Not Stuffed | SM0805 | | |
| 14 | 1 | U1 | | DC-DC Converter | SO8 | MPS | MP2305DS |

PRINTED CIRCUIT BOARD LAYOUT

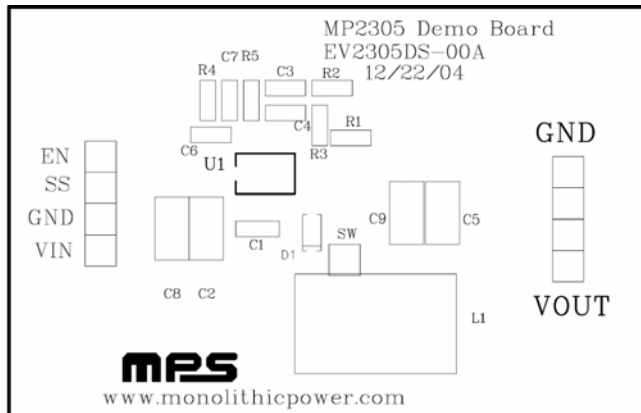


Figure 1—Top Silk Layer

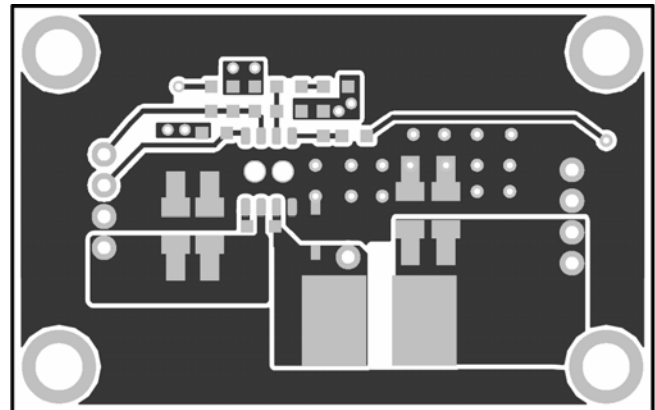


Figure 2—Top Layer

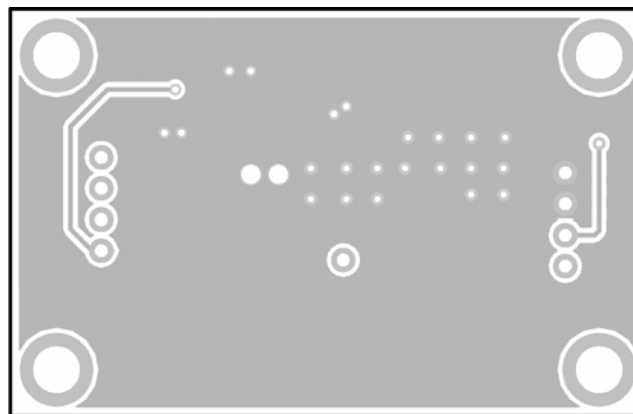


Figure 3—Bottom Layer

QUICK START GUIDE

1. Connect the positive terminals of the load to the VOUT pins and the negative terminals to the GND pins.
2. Preset the power supply output to 4.75V to 23V and turn it off.
3. Connect the positive terminal of the power supply output to the VIN pin and the negative terminal to the GND pin
4. Turn on the power supply; the MP2305 will automatically startup.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 2.5V to turn on the regulator or less than 0.7V to turn it off.
6. An under voltage lockout (UVLO) function can be implemented by the addition of a resistor divider (R4 and R5). The EN threshold is 1.3V, so VIN UVLO threshold is: $\left(1 + \frac{R4}{R5}\right) \times 1.3V$.

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