

## DESCRIPTION

The EV2005DD-01B evaluation board demonstrates the performance of MP2005, a monolithic low-current, low-dropout LDO linear regulator. It operates from a 2.5V to 5V input bias voltage and regulates the output voltage from as low as 0.5V.

The EVB can supply up to 500mA of load current with a typical dropout voltage of 75mV. It requires a bias supply (2.5V to 5.5V) separate from  $V_{IN}$  to run the internal reference and LDO drive circuitry. The output current comes directly from the input voltage supply for high efficiency regulation. The 0.5V internal reference voltage allows the output to be programmed to a range of 0.5V to 5V.

The EV2005DD-01B provides thermal overload and current limit protection, stability with ultra low ESR ceramic capacitors, and fast transient response. The MP2005 is available in a 8-pin QFN (2mm x 3mm) package and is also available in fixed output voltage versions.

## ELECTRICAL SPECIFICATIONS

| Parameter      | Symbol    | Value   | Units |
|----------------|-----------|---------|-------|
| Input Voltage  | $V_{IN}$  | 1.0 – 5 | V     |
| Bias Voltage   | $V_B$     | 5       | V     |
| Output Current | $I_{OUT}$ | 0.5     | A     |
| Output Voltage | $V_{OUT}$ | 1.8     | V     |

## FEATURES

- Wide 1.0V to 5V Input Voltage Range
- Stable with Very Small Ceramic Capacitors
- 75mV Dropout at 500mA Output
- 2% Accurate Output Voltage
- Adjustable Output Range from 0.5V to 5V
- Low Noise: 80 $\mu$ V<sub>RMS</sub> (10Hz to 100kHz)
- High PSRR: 40dB at 1MHz
- Stable With Low-ESR Output Capacitors
- Low 100 $\mu$ A Ground Current
- Internal Thermal Protection
- Current Limit Protection
- Fully Assembled and Tested

## APPLICATIONS

- Low Current Regulators
- Low Power Handheld Devices
- Battery Powered Systems
- Cellular Phones
- Portable Electronic Equipment
- Post Regulation for Switching Power Supplies
- Power Supplies

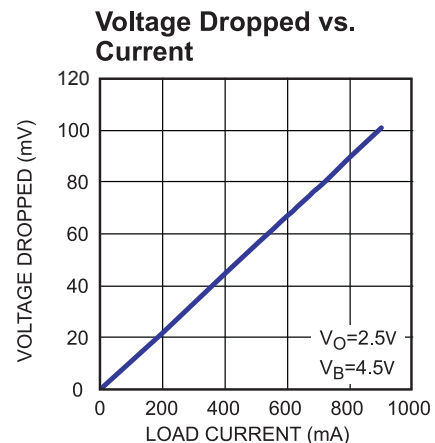
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## EV2005DD-01B EVALUATION BOARD

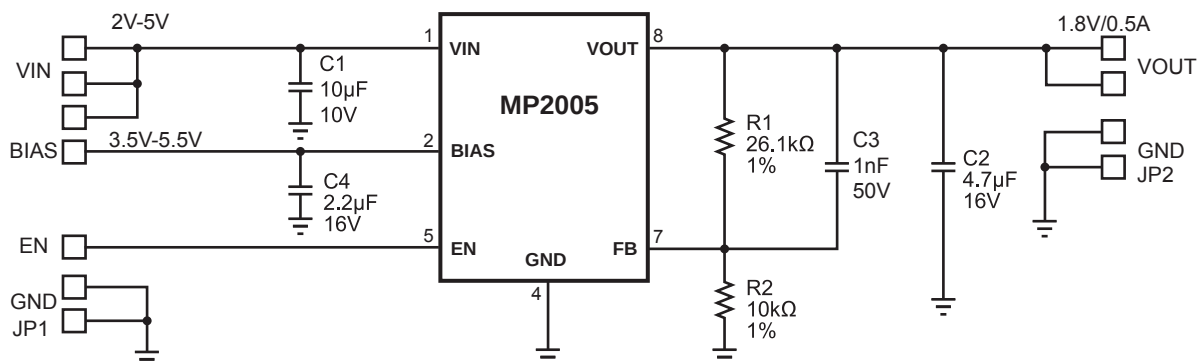


L x W x H) 2.9" x 2.9" x 0.5"  
(7.5cm x 7.5cm x 1.2cm)

| Board Number | MPS IC Number |
|--------------|---------------|
| EV2005DD-01B | MP2005        |



## EVALUATION BOARD SCHEMATIC



## EV2005DD-01B BILL OF MATERIALS

| Qty | Ref | Value  | Description            | Package | Manufacturer | Manufacturer P/N   |
|-----|-----|--------|------------------------|---------|--------------|--------------------|
| 1   | C1  | 10µF   | Ceramic Cap., X7R, 10V | 1206    | TDK          | C3216X7R1C106K     |
| 1   | C4  | 2.2µF  | Ceramic Cap., X7R, 16V | 0805    | TDK          | C2012X7R1C225K     |
| 1   | C2  | 4.7µF  | Ceramic Cap., X7R, 16V | 1206    | TDK          | C3216X7R1C475K     |
| 1   | C3  | 1nF    | Ceramic Cap X7R, 50V   | 0603    | muRata       | GRM188R71H102KA01D |
| 1   | R1  | 26.1kΩ | Film Res., 1%          | 603     | Panasonic    | ERJ-3EKF2612V      |
| 1   | R2  | 10kΩ   | Film Res., 1%          | 603     | Panasonic    | ERJ-3EKF1002V      |
| 1   | JP  |        | 10-Pin Header, 0.1"    |         | Sullins      | PTC08SAAN          |
| 1   | JP  |        | 5-Pin Header, 0.1"     |         | Sullins      | PTC08SAAN          |
| 1   | U1  |        | Linear Regulator       | QFN-8   | MPS          | MP2005DD           |

## PRINTED CIRCUIT BOARD LAYOUT

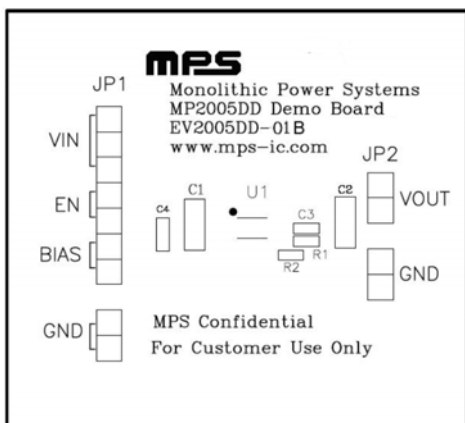


Figure 1—Top Silk Layer

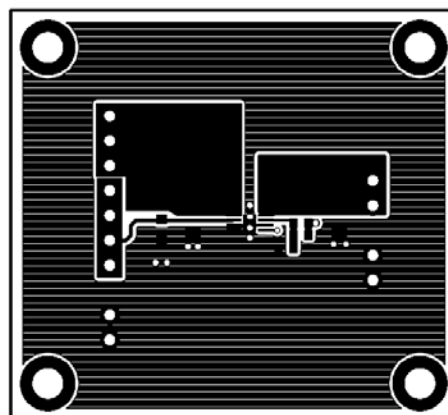


Figure 2—Top Layer

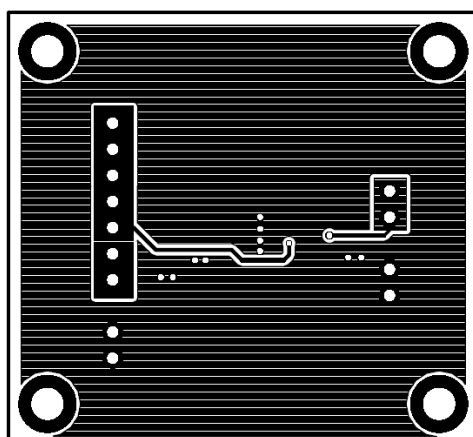


Figure 3—Bottom Layer

## QUICK START GUIDE

The output voltage of this board is set to 1.8V. The EN pin is connected to BIAS with a jumper for automatic startup. You can connect EN to GND to disable the MP2005

1. Attach the positive and negative ends of the load to the VOUT and GND pins, respectively.
2. Attach the input voltage ( $2V \leq V_{IN} \leq 5V$ ) and input ground to the VIN and GND pins, respectively.
3. Attach the BIAS voltage ( $3.5V \leq V_{BIAS} \leq 5.5V$ ) and BIAS ground to the BIAS and GND pins, respectively.
4. The VIN voltage and BIAS voltage can be set up to same voltage but it has to meet :

$$V_{IN}=V_{BIAS}>(1.8V + V_{OUT}) \text{ and } V_{BIAS}>2.7V$$

5. The default resistor values on the board are  $R1=26.1k\Omega$  and  $R2=10k\Omega$ . Changing these resistor values will change the output voltage. Use the following equation to determine resistor values for different output voltages:

$$V_{OUT} = 0.5V \times \left(1 + \frac{R1}{R2}\right)$$

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