



The Future of Analog IC Technology®

# EV8756-D-00A

## 26V, 6A High Current, Low I<sub>Q</sub> Synchronous Buck Converter

### DESCRIPTION

The EV8756-D-00A is used for demonstrating the performance of MP8756, a fully-integrated, high efficiency, synchronous step-down switch mode converter. MP8756 provides up to 6A continuous output current over a wide input supply range with constant-on-time control for fast loop response.

This part requires minimum number of external components and is available in QFN12 (2mmx3mm) package

### ELECTRICAL SPECIFICATION

| Parameter           | Symbol           | Value | Units |
|---------------------|------------------|-------|-------|
| Input Voltage       | V <sub>IN</sub>  | 12    | V     |
| Output Voltage      | V <sub>OUT</sub> | 1     | V     |
| Output Current      | I <sub>OUT</sub> | 6     | A     |
| Switching Frequency | f <sub>sw</sub>  | 700   | kHz   |

### FEATURES

- Wide 4.5V to 26V Operating Input Range
- Ultrasonic Mode
- 117µA low quiescent Current
- 6A Continuous Output Current
- Adaptive COT for Fast transient
- DC Auto Tune Loop
- Internal Soft Start
- Output Discharge
- 700kHz Switching Frequency
- OCP, OVP, UVP (Hiccup) Protection and Thermal Shutdown.
- Output Adjustable from 0.6V
- QFN-12 (2mm x 3mm) Package

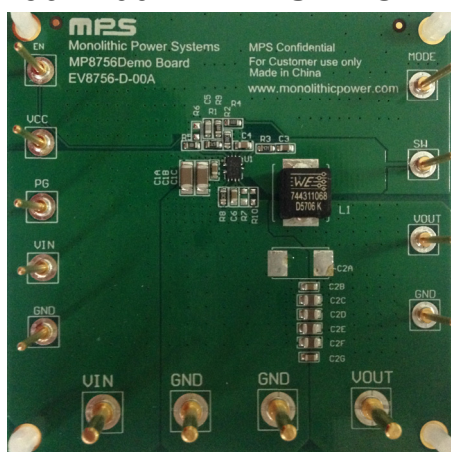
### APPLICATIONS

- Laptop Computer
- Tablet PC
- Networking Systems
- Personal Video Recorders
- 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.

"MPS" and "The Future of Analog IC Technology", are Registered Trademarks of Monolithic Power Systems, Inc.

### EV8756-D-00A EVALUATION BOARD

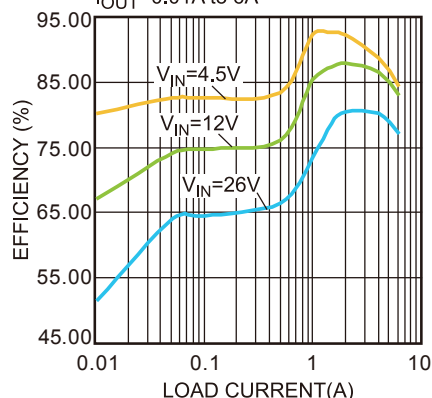


(L × W × H) 8.55cm × 8.55cm × 1.6cm

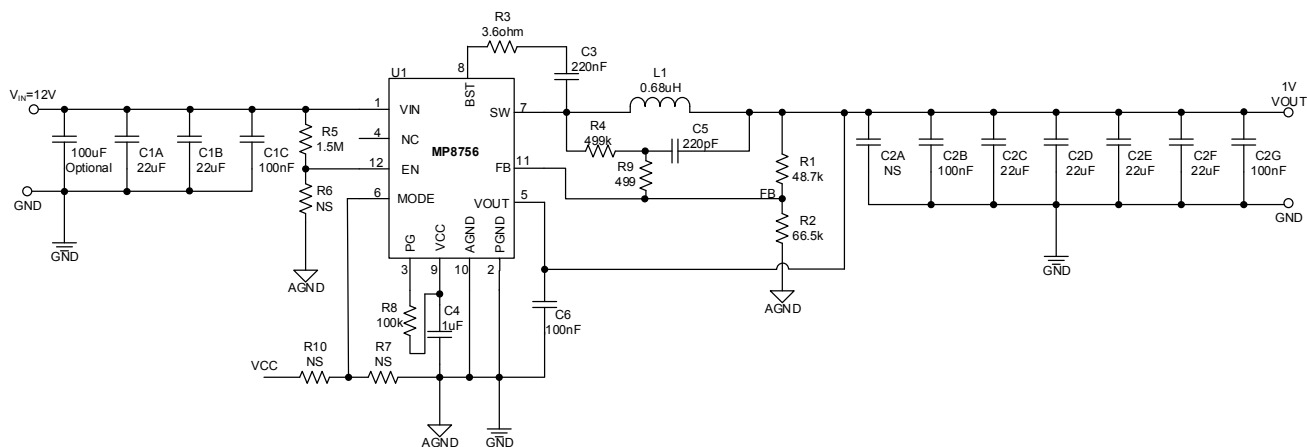
| Board Number | MPS IC Number |
|--------------|---------------|
| EV8756-D-00A | MP8756GD      |

### Efficiency

L=0.68µH, V<sub>OUT</sub>=1V,  
I<sub>OUT</sub>=0.01A to 6A



## EVALUATION BOARD SCHEMATIC



### Note:

EN resistor divider value should be modified accordingly with different input voltage. Please refer to UVLO protection section on MP8756 datasheet for details.

## EV756-D-00A BILL OF MATERIALS

| Qty | Ref              | Value  | Description                 | Package        | Manufacturer | Manufacturer P/N |
|-----|------------------|--------|-----------------------------|----------------|--------------|------------------|
| 2   | C1A,C1B          | 22µF   | Ceramic Cap., 35V, X5R      | 1206           | TDK          | C3216X5R1V226M   |
| 4   | C1C,C2B, C2G,C6  | 0.1Mf  | Ceramic Cap., 50V, X7R      | 0603           | TDK          | C1608X7R1H104K   |
| 0   | C2A              | NS     |                             |                |              |                  |
| 4   | C2C,C2D, C2E,C2F | 22µF   | Ceramic Cap., 6.3V, X5R     | 0805           | TDK          | C2012X5R0J226M   |
| 1   | C3               | 0.22µF | Ceramic Cap., 25V, X7R      | 0603           | TDK          | C1068X7R1E224K   |
| 1   | C4               | 1µF    | Ceramic Cap., 16V, X5R      | 0603           | TDK          | C1608X5R1C105K   |
| 1   | C5               | 220pF  | Ceramic Cap., 50V, C0G      | 0603           | TDK          | C1608C0G1H221J   |
| 1   | R1               | 48.7k  | Film Res., 1%               | 0603           | ROYAL        | RC0603FR-0748K7L |
| 1   | R2               | 66.5k  | Film Res., 1%               | 0603           | ROYAL        | RC0603FR-0766K5L |
| 1   | R3               | 3.6Ω   | Film Res., 1%               | 0603           | ROYAL        | RL0603FR-073R6L  |
| 1   | R4               | 499k   | Film Res., 1%               | 0603           | ROYAL        | RL0603FR-07499KL |
| 1   | R5               | 1.5M   | Film Res., 1%               | 0603           | ROYAL        | RL0603FR-071M5L  |
| 1   | R8               | 100k   | Film Res., 1%               | 0603           | ROYAL        | RL0603FR-07100KL |
| 1   | R9               | 499Ω   | Film Res., 1%               | 0603           | ROYAL        | RL0603FR-07499RL |
| 0   | R6,R7,R10        | NS     |                             |                |              |                  |
| 1   | L1               | 0.68µH | Inductor, DRC=3.1mΩ, Is=20A | SMD            | Würth        | 744311068        |
| 1   | U1               | MP8756 | Step-Down Converter         | QFN-12 2mm×3mm | MPS          | MP8756GD         |

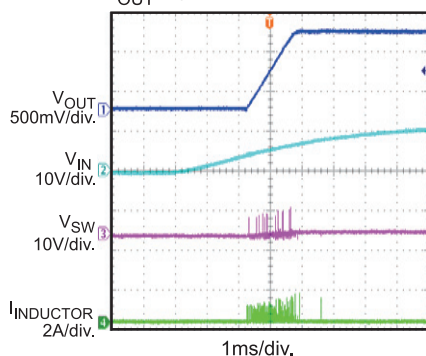
## EVB TEST RESULTS

Performance waveforms are tested on the EV8756-D-00A.

$V_{IN} = 12V$ ,  $V_{OUT} = 1V$ ,  $L = 0.68\mu H$ ,  $T_J = +25^\circ C$ , unless otherwise noted.

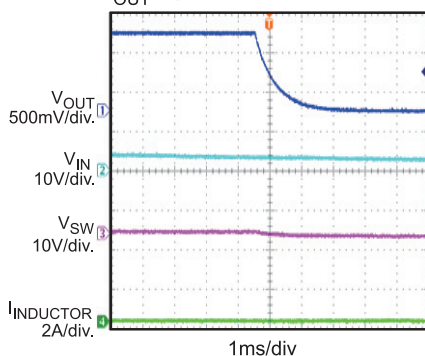
**Start-Up through  
Input Voltage**

$I_{OUT} = 0A$



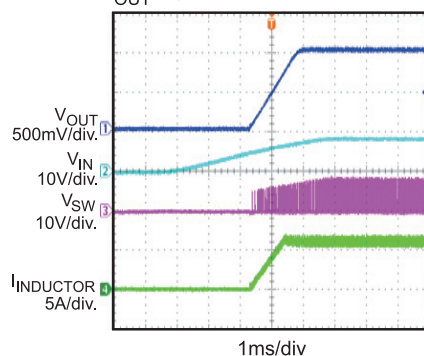
**Shutdown through  
Input Voltage**

$I_{OUT} = 0A$



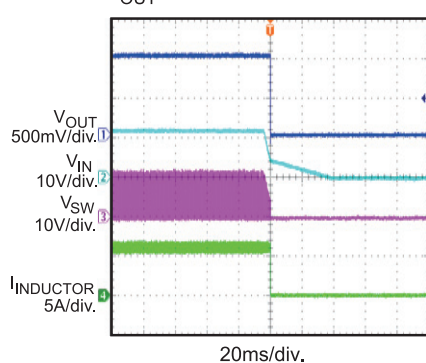
**Start-Up through  
Input Voltage**

$I_{OUT} = 6A$



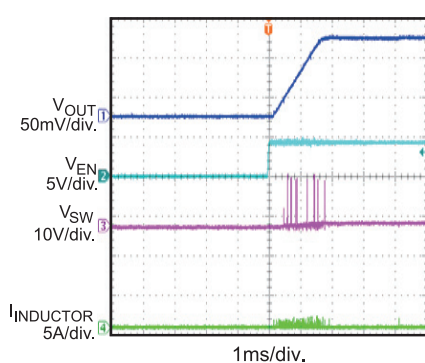
**Shutdown through  
Input Voltage**

$I_{OUT} = 6A$



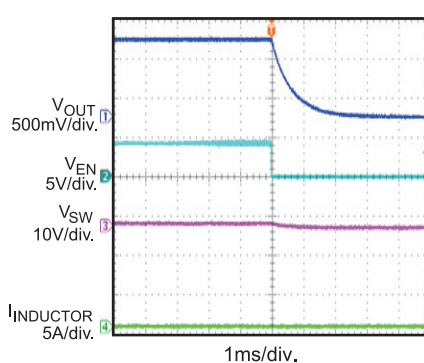
**Start-Up through Enable**

$I_{OUT} = 0A$



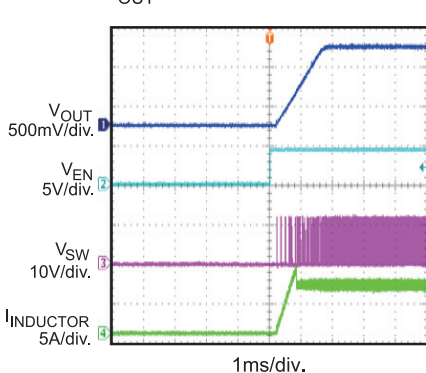
**Shutdown through Enable**

$I_{OUT} = 0A$



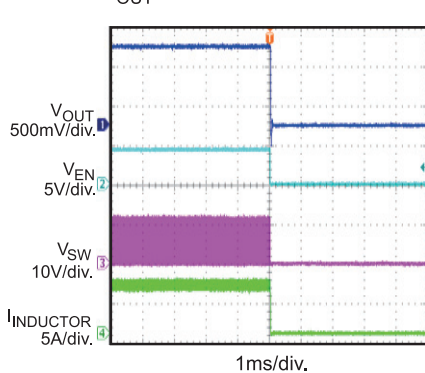
**Start-Up through Enable**

$I_{OUT} = 6A$



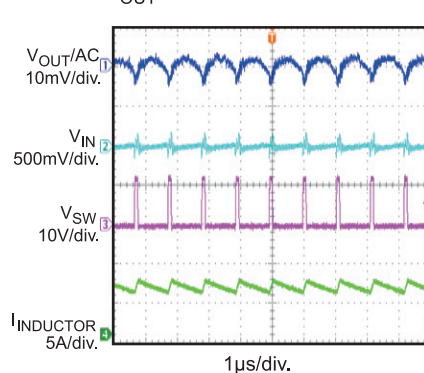
**Shutdown through Enable**

$I_{OUT} = 6A$



**Input/Output Ripple**

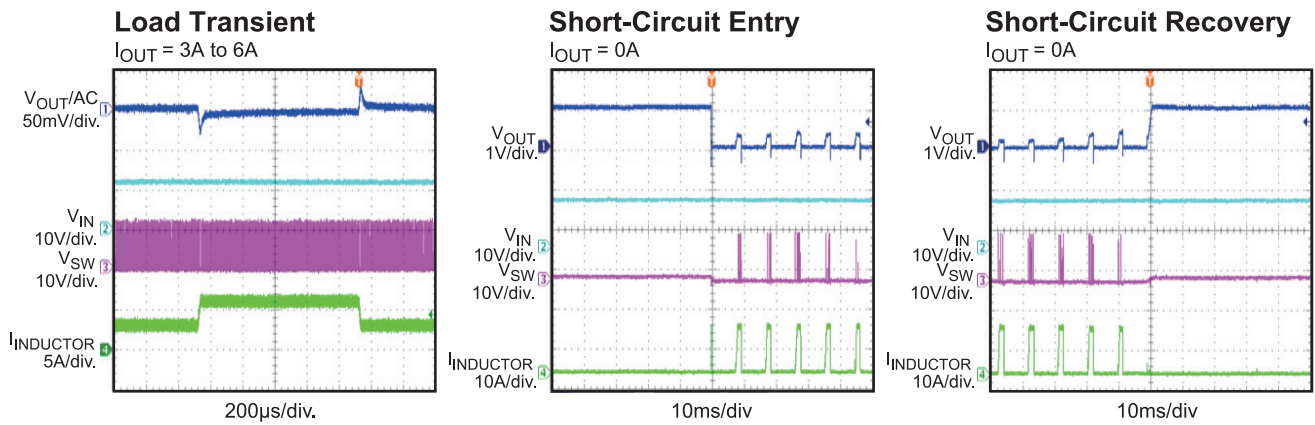
$I_{OUT} = 6A$



## EV8756-D-00A TEST RESULTS (continued)

Performance waveforms are tested on the EV8756-D-00A.

$V_{IN} = 12V$ ,  $V_{OUT} = 1V$ ,  $L = 0.68\mu H$ ,  $T_J = +25^\circ C$ , unless otherwise noted.



## PRINTED CIRCUIT BOARD LAYOUT

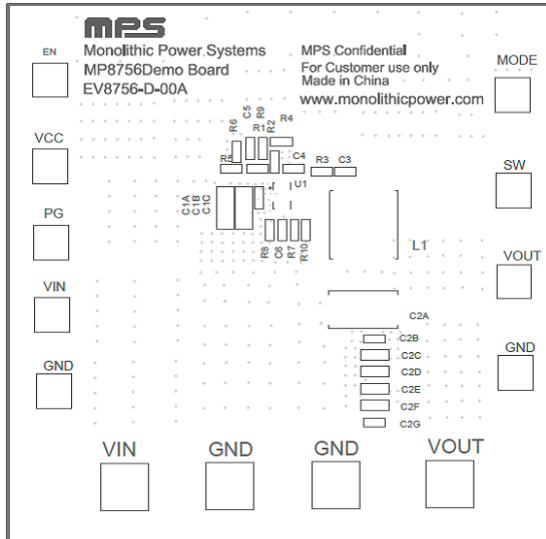


Figure 1: Top Silk Layer

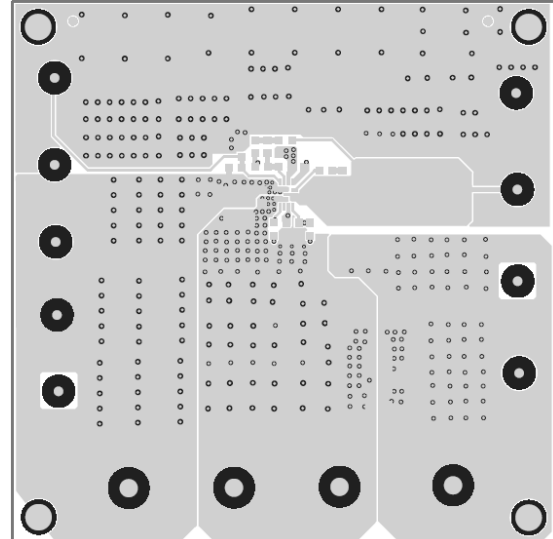


Figure 2: Top Layer

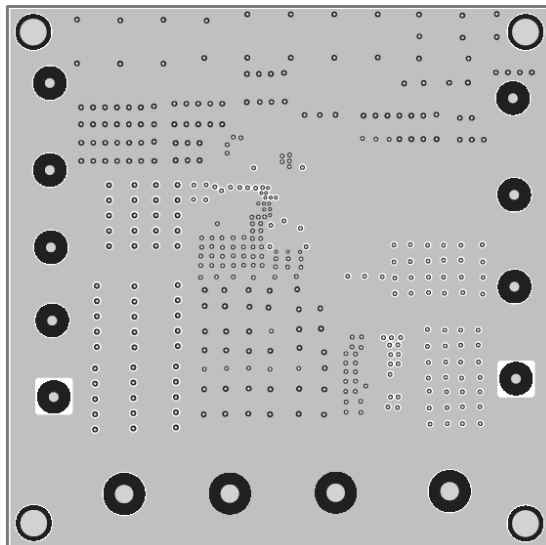


Figure 3: Inner Layer1

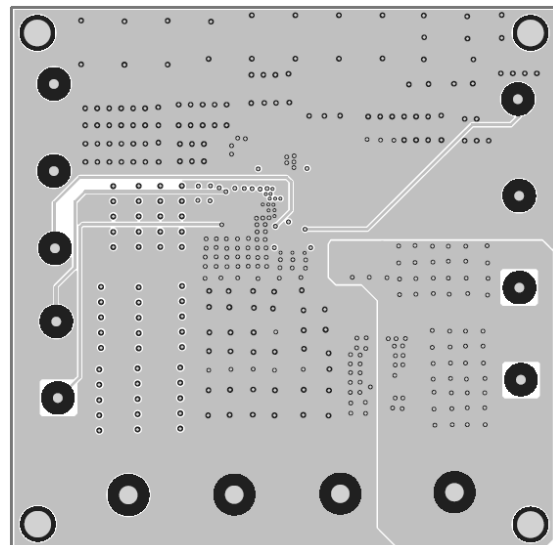
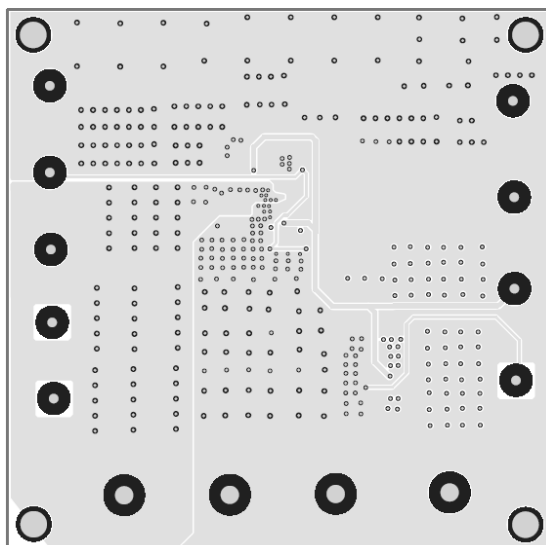


Figure 4: Inner Layer2



**Figure 5: Bottom Layer**

## QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins respectively.
2. Preset the output of power supply at 12V, and then turn off the power supply.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins respectively.
4. Turn the power supply on. The MP8756 will automatically start up.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN high to turn on the regulator or low to turn it off.
6. Use R1 and R2 to set the output voltage. Follow the Application information section in the device datasheet to select the proper value of R1, R2, inductor and output capacitor values when output voltage is changed.

**NOTICE:** The information in this document is subject to change without notice. Please contact MPS for current specifications. Users should warrant and guarantee that third party Intellectual Property rights are not infringed upon when integrating MPS products into any application. MPS will not assume any legal responsibility for any said applications.