# EV8756-D-00A

## 26V, 6A High Current, Low $I_Q$ Synchronous Buck Converter

The Future of Analog IC Technology

## 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 | $V_{IN}$ | 12 | V |
| Output Voltage | $V_{OUT}$ | 1 | V |
| Output Current | $I_{OUT}$ | 6 | A |
| Switching Frequency | $f_{SW}$ | 700 | kHz |

## FEATURES

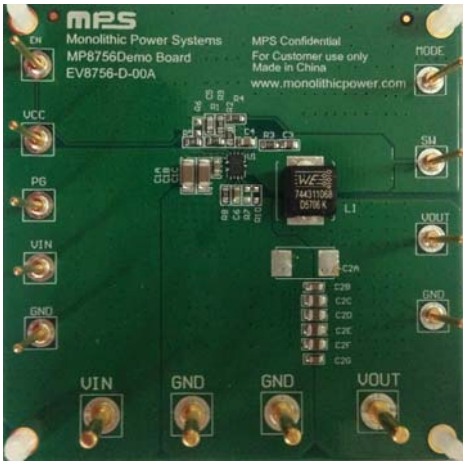
- Wide 4.5V to 26V Operating Input Range
- Ultrasonic Mode
- 117μA low quiescent Current
- 6A Continous Output Current
- Adaptive COT for Fast transient
- DC Auto Tune Loop
- Internal Soft Start
- Output Discharge
- 700kHZ Switching Frequency
- OCP, OVP, UVP (Hiccup) Protection and
- Thermal Shutdown.
- 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



## EV8756-D-00A EVALUATION BOARD

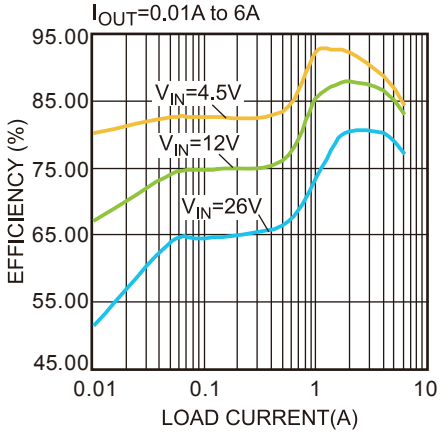



**(L × W × H) 8.55cm × 8.55cm × 1.6cm**

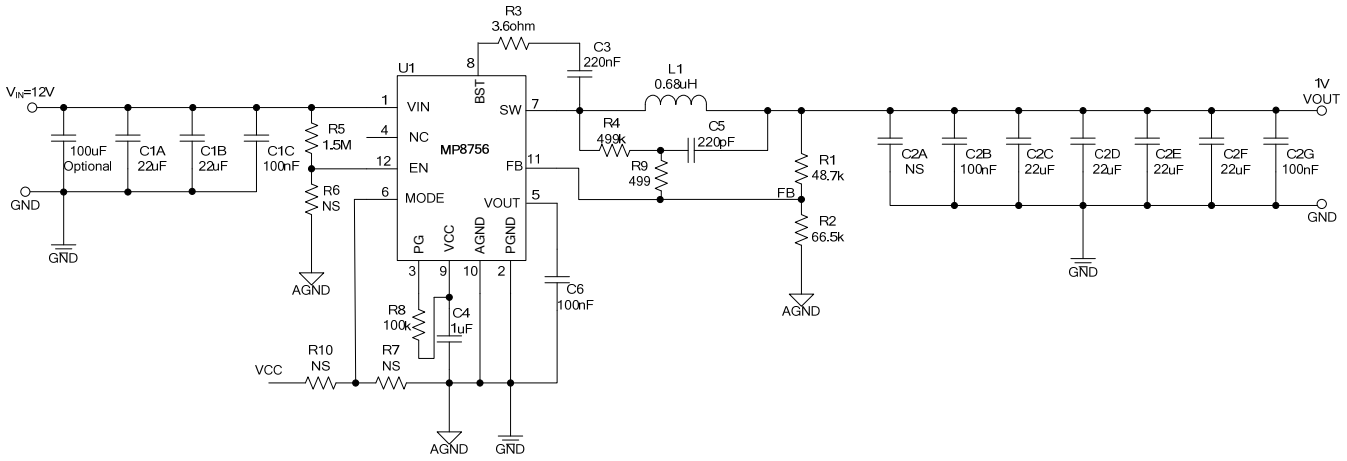
| Board Number | MPS IC Number |
|---|---|
| EV8756-D-00A | MP8756GD |

**Efficiency**

L=0.68μH, $V_{OUT}$=1V,
$I_{OUT}$=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.

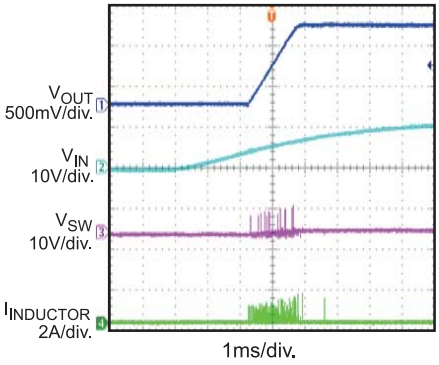
## EV8756-D-00A BILL OF MATERIALS

| 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 | Wurth | 744311068 |
| 1 | U1 | MP8756 | Step-Down Converter | QFN-12 2mm×3mm | MPS | MP8756GD |

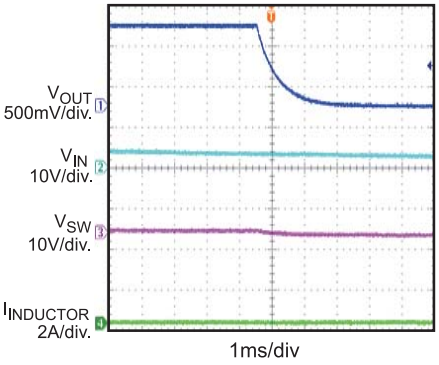
## EVB TEST RESULTS

**Performance waveforms are tested on the EV8756-D-00A.**
**$V_{IN}$ =12V, $V_{OUT}$ =1V, L=0.68µH, $T_J$=+25°C, unless otherwise noted.**

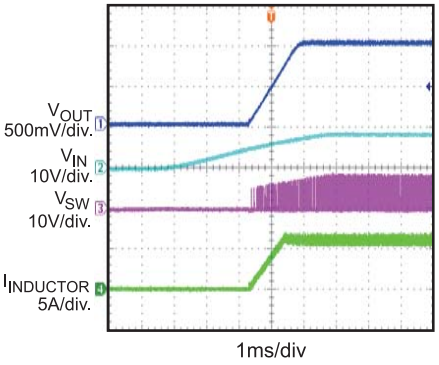
### Start-Up through Input Voltage
$I_{OUT}$ = 0A



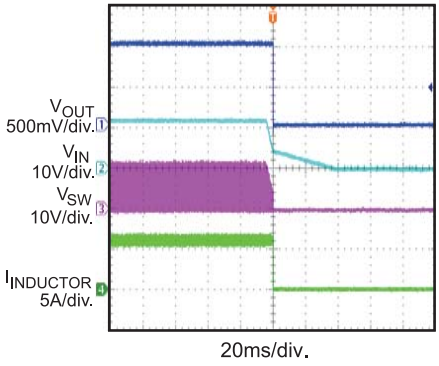

### Shutdown through Input Voltage
$I_{OUT}$ = 0A



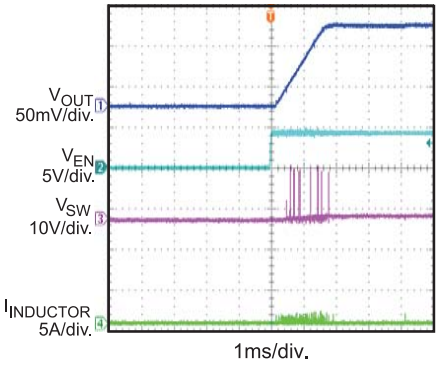

### Start-Up through Input Voltage
$I_{OUT}$ = 6A



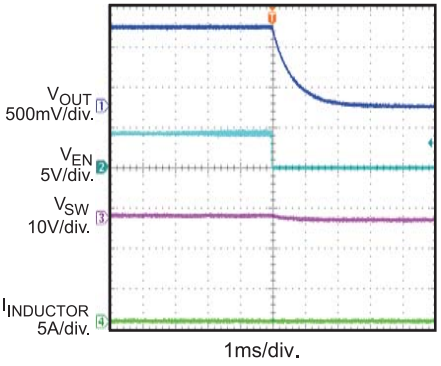

### Shutdown through Input Voltage
$I_{OUT}$ = 6A



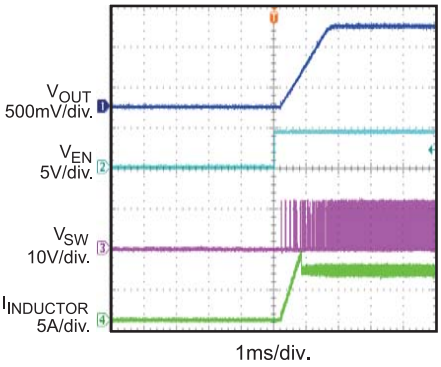

### Start-Up through Enable
$I_{OUT}$ = 0A



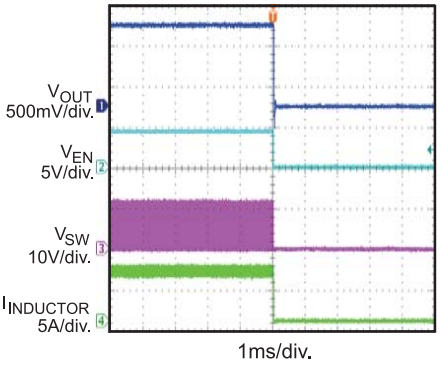

### Shutdown through Enable
$I_{OUT}$ = 0A



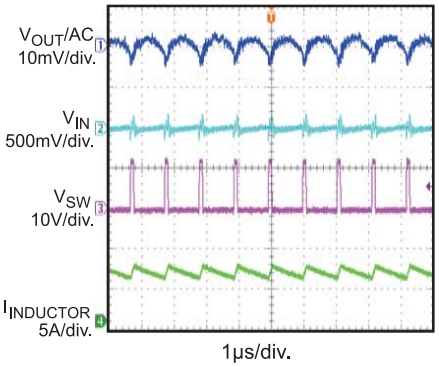

### Start-Up through Enable
$I_{OUT}$ = 6A




### Shutdown through Enable
$I_{OUT}$ = 6A




### Input/Output Ripple
$I_{OUT}$ = 6A

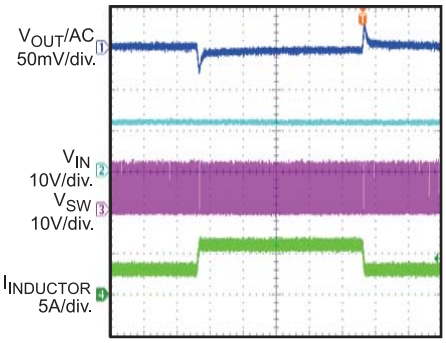


## EVB TEST RESULTS *(continued)*

**Performance waveforms are tested on the EV8756-D-00A.**
**$V_{IN}$ =12V, $V_{OUT}$ =1V, L=0.68µH, $T_J$=+25°C, unless otherwise noted.**

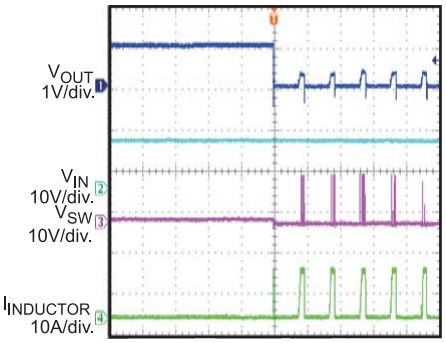
### Load Transient

$I_{OUT}$ = 3A to 6A



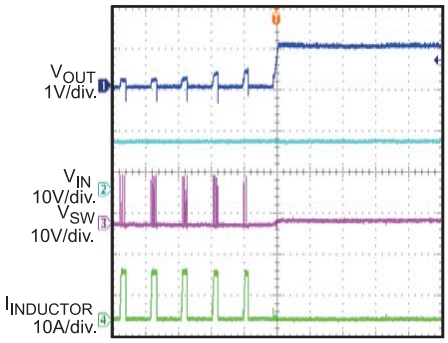

### Short-Circuit Entry

$I_{OUT}$ = 0A




### Short-Circuit Recovery

$I_{OUT}$ = 0A



## PRINTED CIRCUIT BOARD LAYOUT

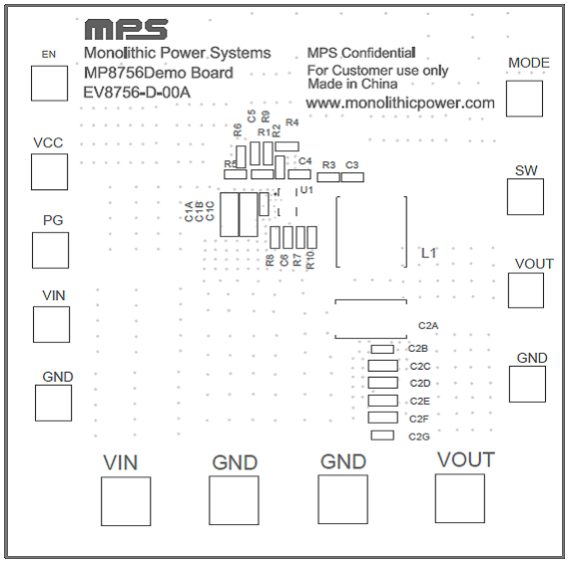



**Figure 1: Top Silk Layer**

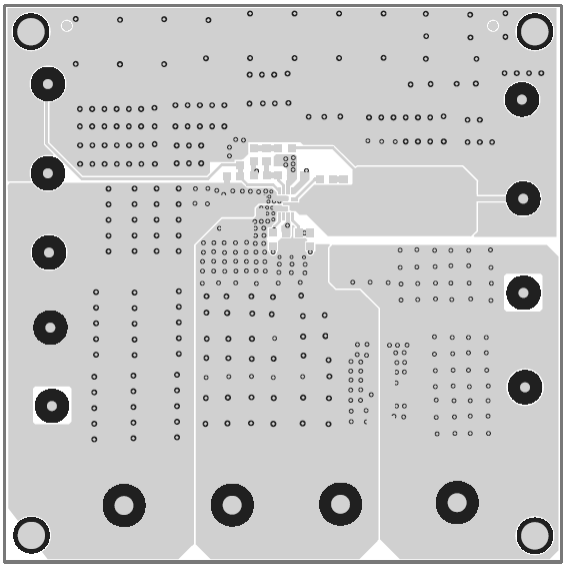


**Figure 2: Top Layer**

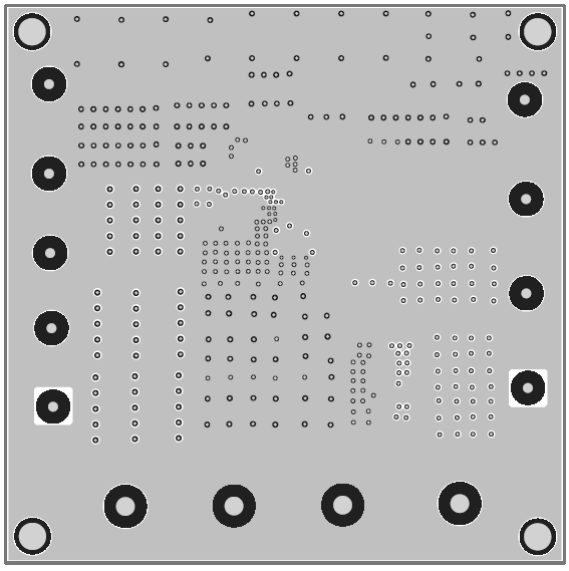


**Figure 3: Inner Layer1**

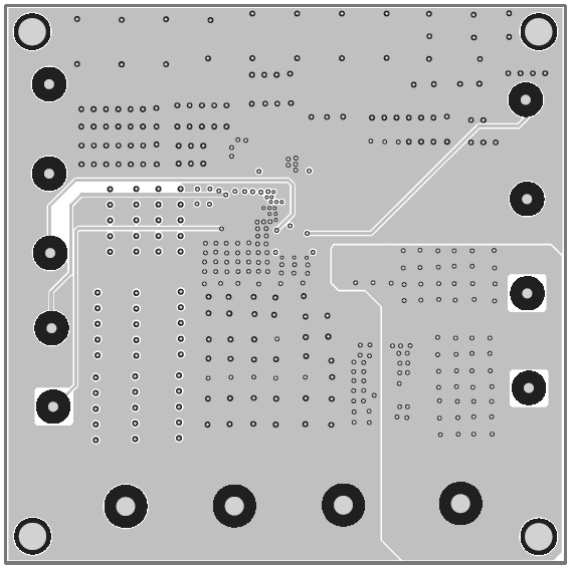


**Figure 4: Inner Layer2**

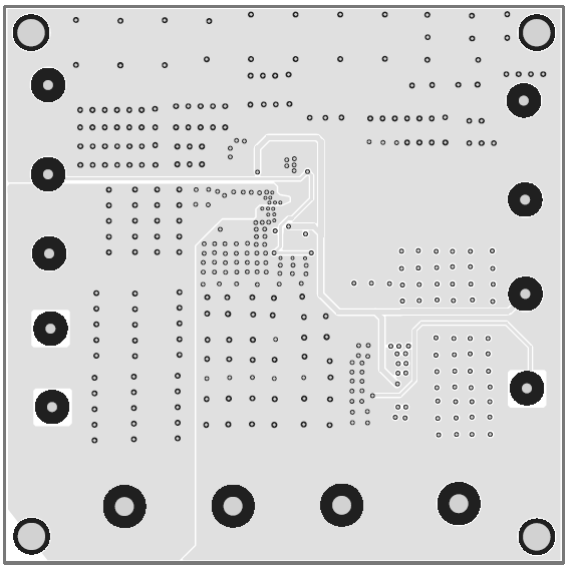


**Figure 5: Bottom Layer**

## 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.