



The Future of Analog IC Technology®

# EV8845-C-02A

## 5A High Efficient Synchronous Step-Down Switcher with I<sup>2</sup>C Interface

### DESCRIPTION

The EV8845-C-02A is used for demonstrating the performance of MPS's MP8845. MP8845 is a highly integrated and high frequency synchronous step-down switcher with I<sup>2</sup>C control interface. It is optimized to support up to 5A load current over an input supply range from 2.7V to 6V with excellent load and line regulation.

Constant frequency hysteretic control mode provides extremely fast transient response and high efficiency. The output voltage level can be controlled, on-the fly through a 3.4Mbps I<sup>2</sup>C serial interface. Voltage range can be adjusted from 0.6V to 1.1V in 3.9mV steps. Voltage slew rate, switching frequency and power savings mode are also selectable through the I<sup>2</sup>C interface. Fully protection features includes internal soft start, over current protection and over temperature protection.

MP8845 is available in WLCSP20-1.6mmx2mm package.

### ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V <sub>IN</sub>	2.7– 6	V
Output Voltage	V <sub>OUT</sub>	0.9	V
Output Current	I <sub>OUT</sub>	5	A

### FEATURES

- Wide 2.7V to 6V Operating Input Range
- Up to 5A Load Current
- Internal 28mΩ High-Side, 17mΩ Low-Side Power MOSFETs
- Fixed Frequency Hysteretic Mode Control
- I<sup>2</sup>C Compatible Interface up to 3.4Mbps
- I<sup>2</sup>C Programmable Output Range from 0.6V to 1.1V in 3.9mV Steps
- Factory Adjustable Switching Frequency from 1MHz to 2.2MHz
- I<sup>2</sup>C Programmable Voltage Transition Slew Rate
- Power Saving Mode Selectable via I<sup>2</sup>C
- Internal Soft-Start
- Power Good Indicator
- Current Overload and Thermal Shutdown Protection
- Available in 20-ball WLCSP-1.6mmx2mm package

### APPLICATIONS

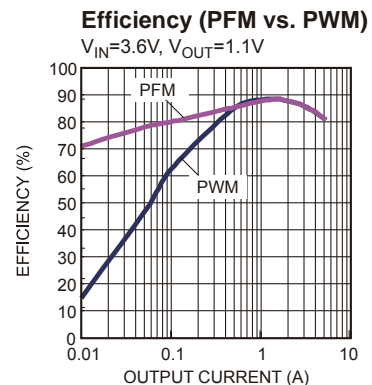
- Processor Core Supply
- Micro Converter

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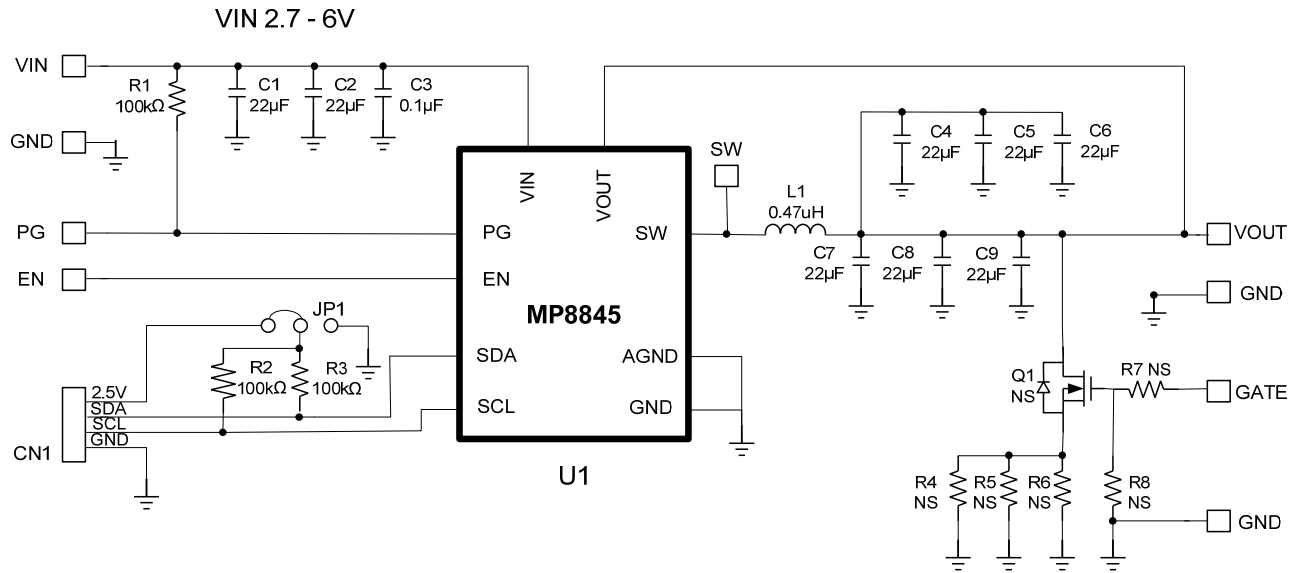
### EV8845-C-02A EVALUATION BOARD



Board Number	MPS IC Number
EV8845-C-02A	MP8845GC



## EVALUATION BOARD SCHEMATIC



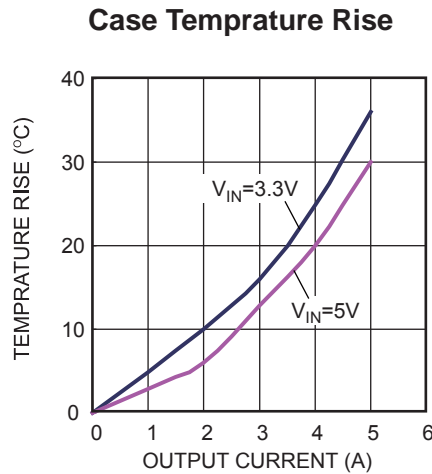
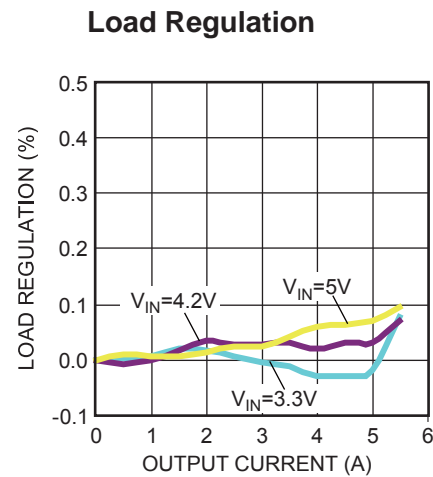
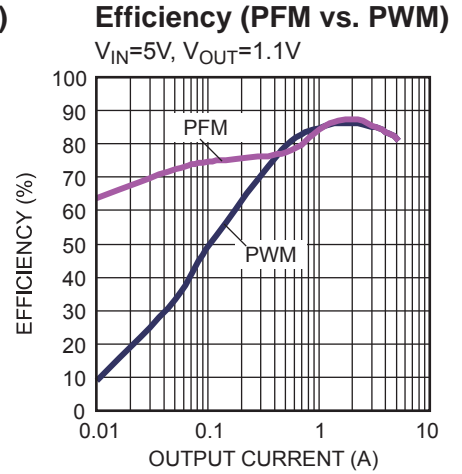
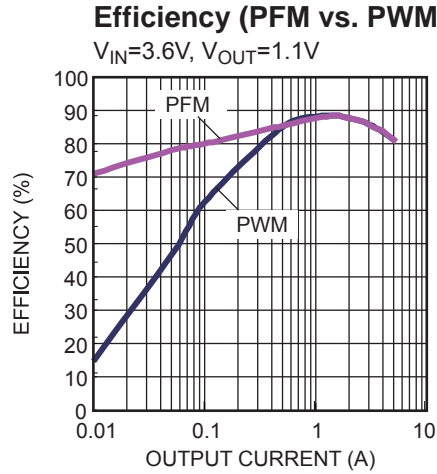
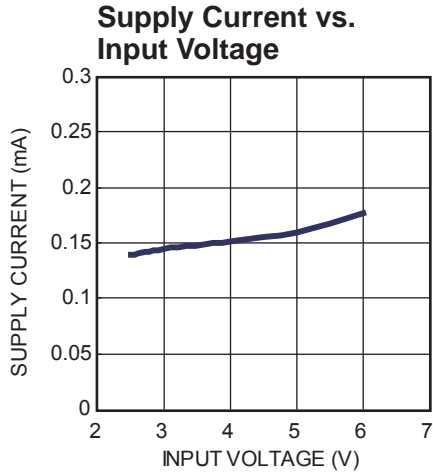
## EV8845-C-02A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2,	22μF	Ceramic Cap., 10V, X5R	SM0805	muRata	GRM21BR61A226ME51L
1	C3	0.1μF	Ceramic Cap, 16V, X7R	SM0603	muRata	GRM188R71C104KA01D
6	C4 C5 C6 C7 C8 C9	22μF	Ceramic Cap, 6.3V, X5R	SM0805	muRata	GRM21BR60J226ME39L
3	R1 R2 R3	100k	Film Res., 5%	SM0603	Any	
0	R4 R5 R6 R7 R8	NS				
0	Q1	NS				
1	L1	0.47μH	Inductor IR=6.8A, Isat=14.5A	SM 4.0X2.0mm	Würth	744 373 240 047
1	U1	MP8845	Step Down Switcher With I2C	WLCSP20- 1.6mmx2mm	MPS	MP8845GC

## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

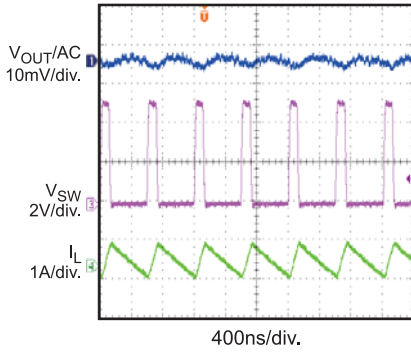
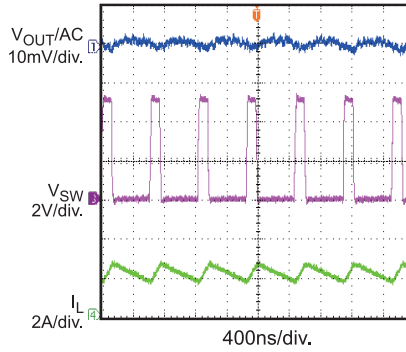
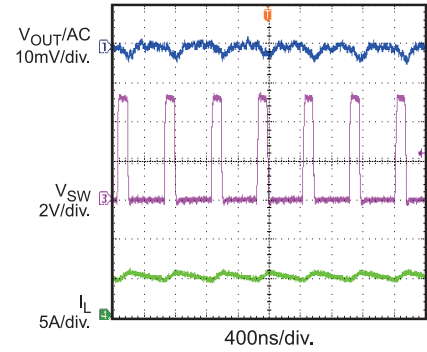
$V_{IN} = 5V$ ,  $V_{OUT} = 0.9V$ ,  $L = 0.47\mu H$ ,  $T_A = 25^\circ C$ , unless otherwise noted.



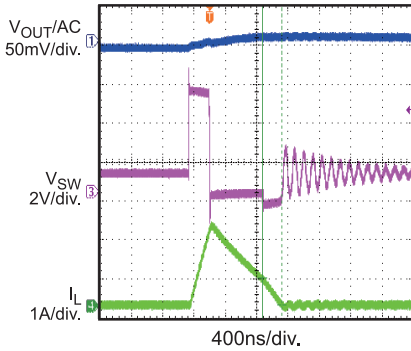
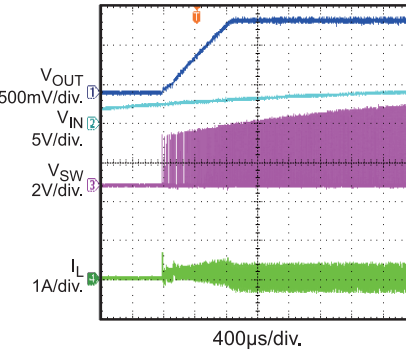
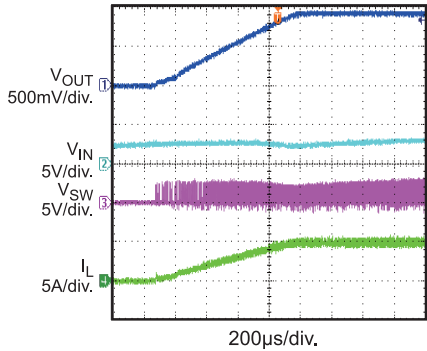
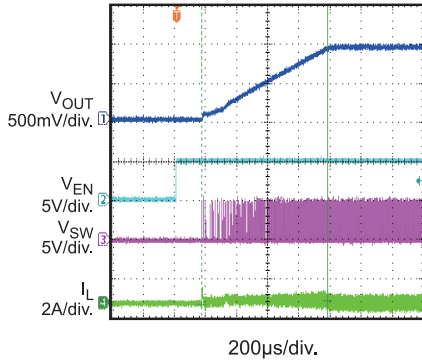
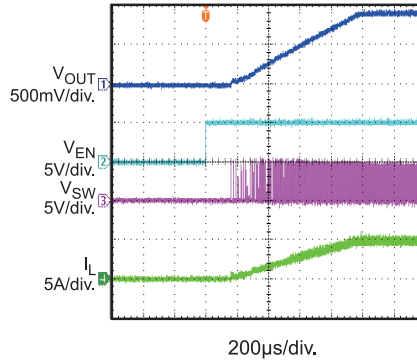
**EVB TEST RESULTS (continued)**

Performance waveforms are tested on the evaluation board.

 $V_{IN} = 5V$ ,  $V_{OUT} = 0.9V$ ,  $L = 0.47\mu H$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

**Output Ripple**
 $I_{OUT} = 0A$ 

**Output Ripple**
 $I_{OUT} = 2A$ 

**Output Ripple**
 $I_{OUT} = 5A$ 

**Output Ripple**

PFM Mode


**VIN Power Up without Load**
 $I_{OUT} = 0A$ 

**VIN Power Up with 5A Load**
 $I_{OUT} = 5A$ 

**EN Start Up without Load**
 $I_{OUT} = 0A$ 

**EN Start Up with 5A Load**
 $I_{OUT} = 5A$ 


### PRINTED CIRCUIT BOARD LAYER

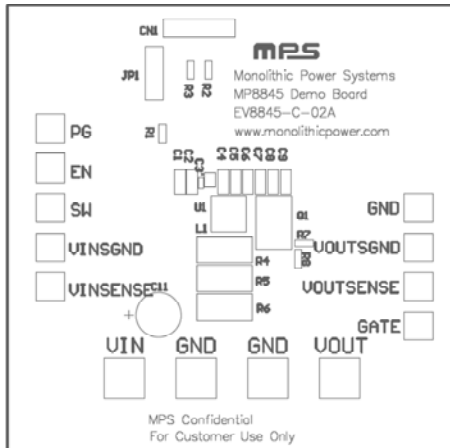


Figure 1: Top Silk Layer

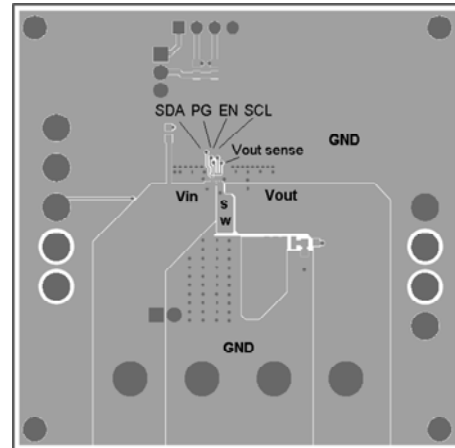


Figure 2: Top Layer

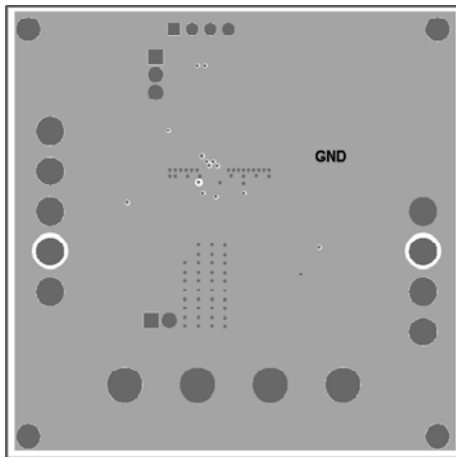


Figure 3: Inner 1 Layer

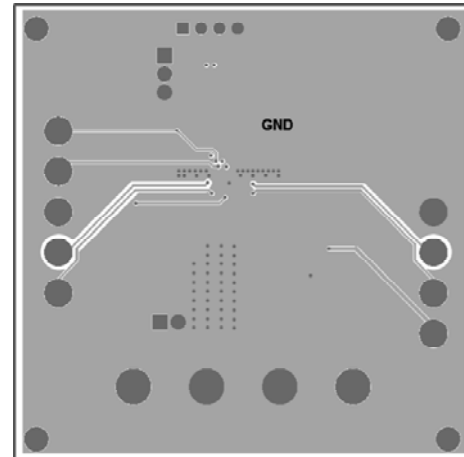


Figure 4: Inner 2 Layer

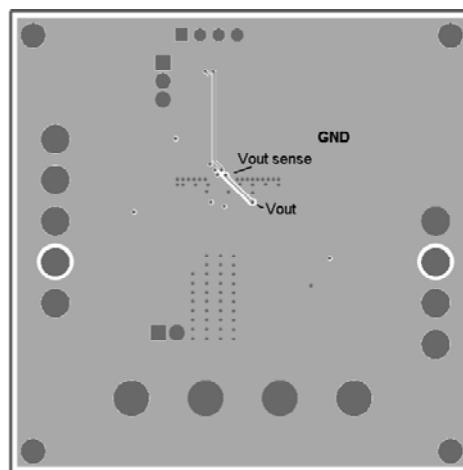


Figure 5: Bottom Layer

## QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
2. Preset the power supply output between 2.7V and 6V, 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 board will automatically start up.

## LAYOUT RECOMMENDATION OF MP8845

Proper layout of the switching power supplies is very important, and sometimes critical to make it work properly. Especially, for the high switching frequency converter, if the layout is not carefully done, the regulator could show poor line or load regulation, stability issues.

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