EV2109DK/DQ-00A

Dual 800mA, 6V, 1MHz Synchronous Step-Down Converter

The Future of Analog IC Technology®

DESCRIPTION

The MP2109 contains two independent 1MHz constant frequency, current mode, PWM step-down converters. Each converter integrates a main switch and a synchronous rectifier for high efficiency without an external Schottky diode. It is ideal for powering portable equipment that runs from a single cell Lithium-Ion (Li+) battery. Each converter can supply 800mA of load current from a 2.5V to 6V input voltage. The output voltage can be regulated as low as 0.6V. The MP2109 can also run at 100% duty cycle for low dropout applications.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN1/IN2}$	2.5 to 6	V
Output Voltage	$V_{OUT1/OUT2}$	1.8	V
Load Max	$I_{OUT1/OUT2}$	800	mA

FEATURES

- Up to 95% Efficiency
- 1MHz Constant Switching Frequency
- 800mA Load Current on Each Channel
- 2.5V to 6V Input Voltage Range
- Output Voltage as Low as 0.6V
- 100% Duty Cycle in Dropout
- Current Mode Control
- Short Circuit Protection
- Thermal Fault Protection
- <0.1µA Shutdown Current
- Space Saving 10-Pin MSOP and QFN Packages

APPLICATIONS

- Cellular and Smart Phones
- Microprocessors and DSP Core Supplies
- PDAs
- MP3 Players
- Digital Still and Video Cameras
- Portable Instruments

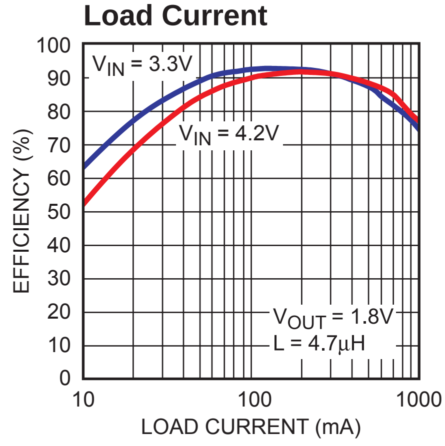
EV2109DK/DQ-00A EVALUATION BOARD

Dimensions (2.0"X x 1.6"Y x 0.4"Z)

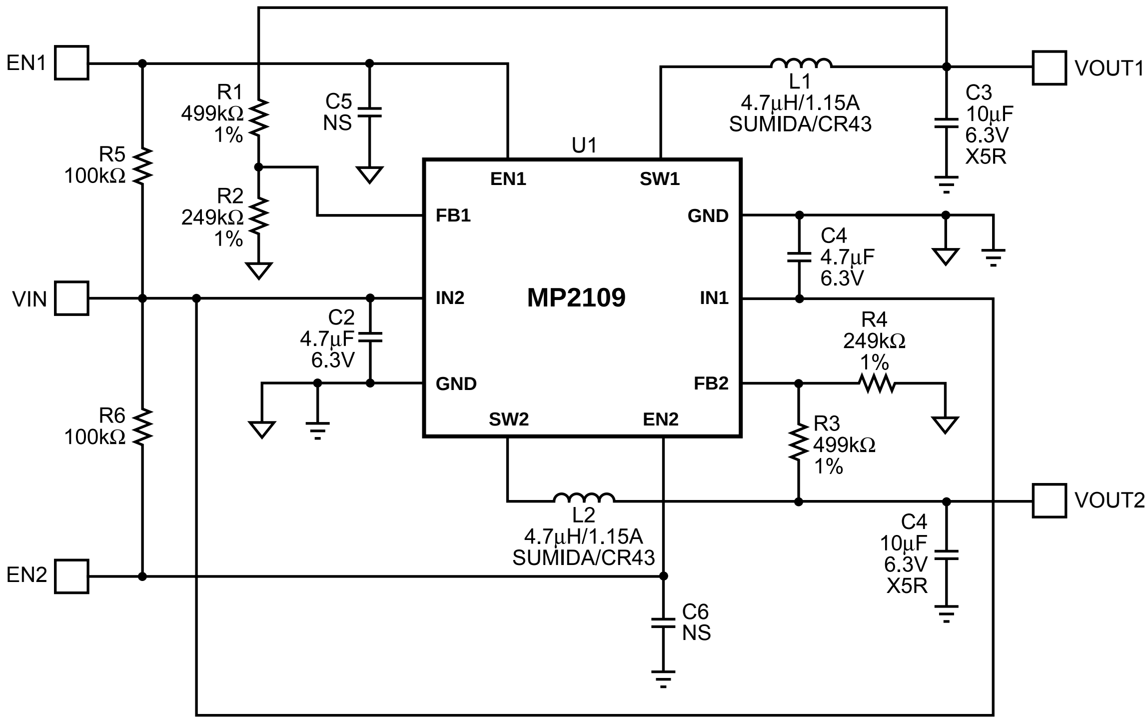
Board Number	Package*	MPS IC Number
EV2109DK/DQ-00A	MSOP10	MP2109DK
	QFN10 (3mm x 3mm)	MP2109DQ

* Specify Package and IC Number when ordering

Efficiency vs Load Current



EVALUATION BOARD SCHEMATIC



EV2109_S01

EV2109DK/DQ-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	4.7µF	Ceramic Capacitor, 6.3V, X5R	SM1210	Any	Any
2	C3, C4	10µF	Ceramic Capacitor, 6.3V, X5R	SM1210	Any	Any
2	C5, C6	NS	Do Not Stuff			
2	L1, L2	4.7µH	Inductor, 1.15A	SMD	Sumida	CR43
2	R1, R3	499kΩ	Film Resistor, 1%	SM0805	Panasonic	ERJ-6ENF4993V
2	R2, R4	249kΩ	Film Resistor, 1%	SM0805	Panasonic	ERJ-6ENF2493V
2	R5, R6	100kΩ	Film Resistor, 5%	SM0805	Panasonic	ERJ-6GEYJ104V
1	U1		DC-DC Converter(1)	MSOP10	MPS	MP2109DK
				QFN10 (3mm x 3mm)		MP2109DQ

1) Specify Package and Part Number when ordering

PRINTED CIRCUIT BOARD LAYOUT

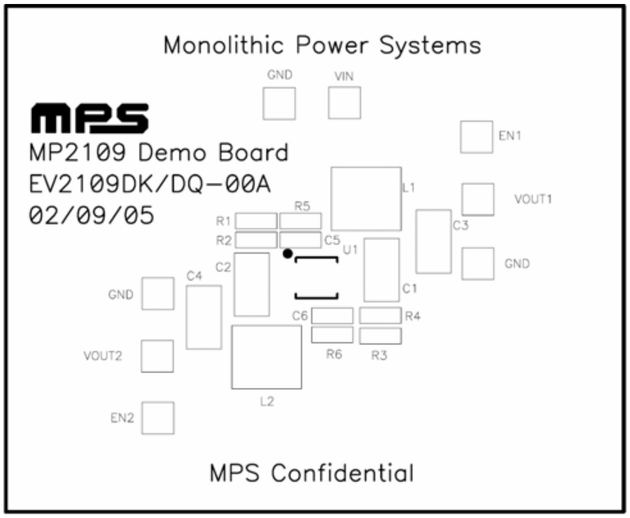


Figure 1—Top Silk Layer

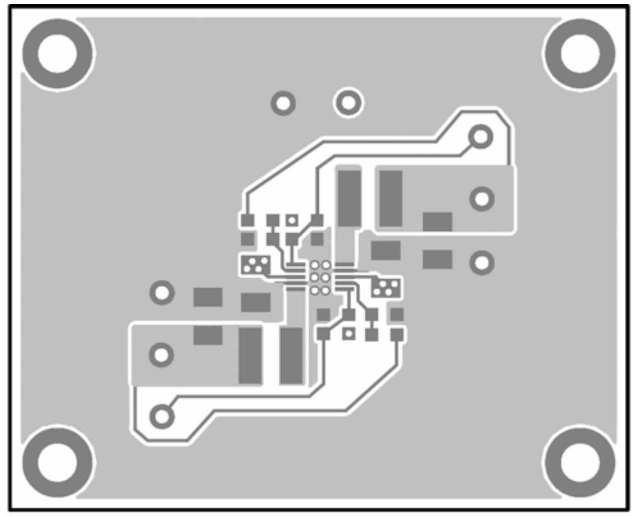


Figure 2—Top Layer

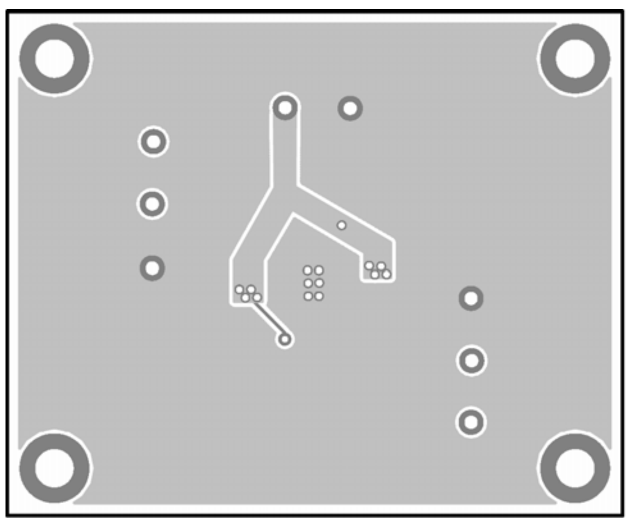


Figure 3—Bottom Layer

QUICK START GUIDE

The output voltages of this board are set to 1.8V. The board layout accommodates most commonly used inductors and output capacitors.

1. Attach the positive and negative ends of the first load to the VOUT1 and GND pins, respectively. If using both outputs, attach the positive and negative ends of the second load to the VOUT2 and GND pins, respectively.
2. Attach Input Voltage $2.5V \leq V_{IN} \leq 6V$ and Input Ground to VIN and GND pins respectively.
3. A 100kΩ pull-up resistor has been connected to both the EN1 and EN2 pins, so both VOUT1 and VOUT2 will turn on without applying any external voltage to the EN1 and EN2 pins.
4. To turn on VOUT1/VOUT2 by using the EN1/EN2 functions, apply a voltage, $1.5V \leq V_{EN1/EN2} \leq 6V$, to the EN1/EN2 pin. To disable VOUT1/VOUT2, apply a voltage, $V_{EN1/EN2} < 0.3V$, to the EN1/EN2 pin.
5. The Output Voltage $V_{OUT1/OUT2}$ can be changed by varying R2 and R4, respectively. Calculate the new values by the following formulae:

   $$R2 = \frac{R1}{\left(\frac{V_{OUT1}}{V_{FB}}\right) - 1}$$

   $$R4 = \frac{R3}{\left(\frac{V_{OUT2}}{V_{FB}}\right) - 1}$$

   Where V_{FB} = 0.6V, R1 = 499kΩ and R3 = 499kΩ.

   Example:

   For V_{OUT1} = 2.5V:

   $$R2 = \frac{499k\Omega}{\left(\frac{2.5V}{0.6V}\right) - 1} = 174k\Omega$$

   Therefore, use a 174kΩ standard 1% value.