EV2105DJ-00A

800mA Synchronous Buck Step-Down Converter

INITIAL RELEASE

GENERAL DESCRIPTION

The EV2105 evaluation board is designed for low dropout step down converter applications. It implements the MP2105 1MHz Fixed Frequency, Current Mode, PWM step-down converter. The device integrates a main switch and a synchronous rectifier for high efficiency without an external Schottky diode. It is ideal for powering portable equipments that runs from a single cell Lithium-Ion (Li+) Battery. It 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. In 100% Duty Cycle Dropout operation, it works with minimum input voltage as low as output voltage.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage Range	V_{IN}	2.5 to 6.0	V
Output Voltage	V_{OUT}	1.8	V
Load Max	I_{OUT}	800	mA

FEATURES

- High Efficiency: Up to 95%
- 800mA Available Load Current
- 2.5V to 6V Input Voltage Range
- Output Voltage as Low as 0.6V
- 100% Duty Cycle in Dropout
- Short Circuit Protection
- Thermal Fault Protection
- <0.1µA Shutdown Current
- Programmable Enable Control

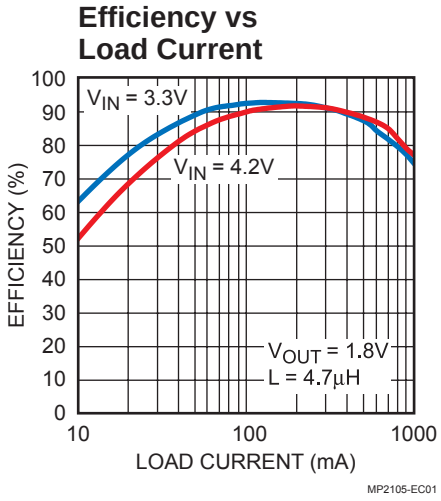
APPLICATIONS

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

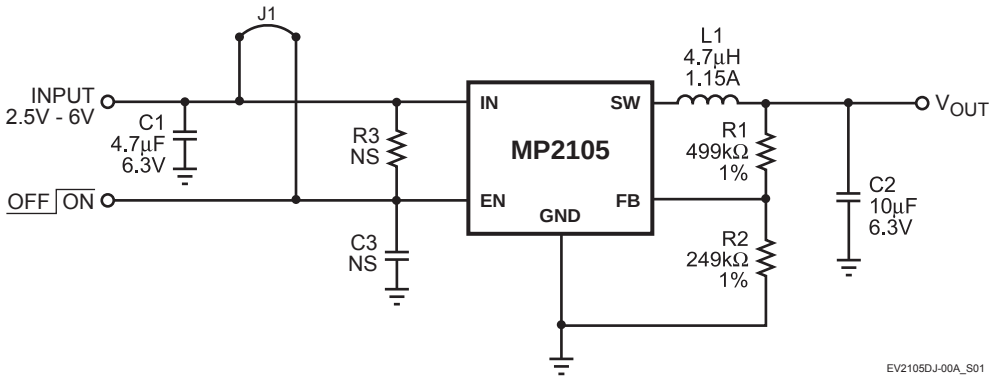
EV2105DJ-00A EVALUATION BOARD

Dimensions (2.0"X x 2.0"Y x 0.5"Z)

Board Number	MPS IC Number
EV2105DJ-00A	MP2105DJ



EVALUATION BOARD SCHEMATIC



EV2105DJ-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	4.7µF	Ceramic Cap, 6.3V, X5R	SM0805	AVX	08056D475KAT2A
1	C2	10µF	Ceramic Cap, 6.3V, X5R	SM0805	AVX	08056D106KAT2A
1	C3		Do Not Stuff			
1	J1		Jumper			
1	L1	4.7µH	1.15A	SMD	Sumida	CR43-4R7
1	R1	499kΩ	Film Res, 1%	SM0805	Yageo	9C08052A3003FK HFT
1	R2	249kΩ	Film Res, 1%	SM0805	Panasonic	ERJ-6ENF1503V
1	R3		Do Not Stuff			
1	U1		DC-DC Converter	SOT23-5	MPS	MP2105DJ

PRINTED CIRCUIT BOARD LAYOUT

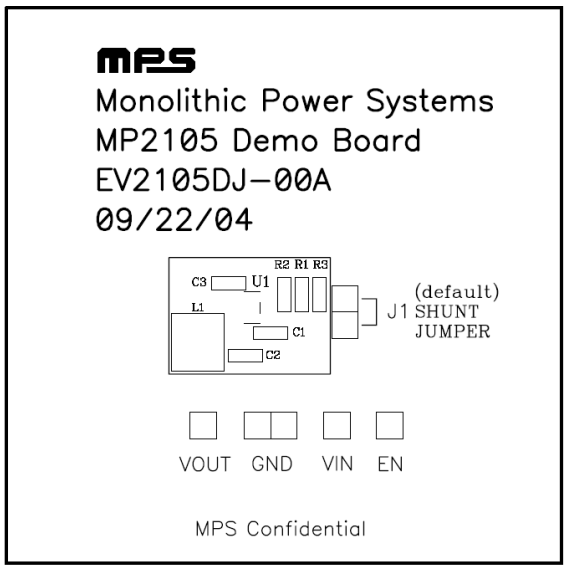


Figure 1—Top Silk Layer

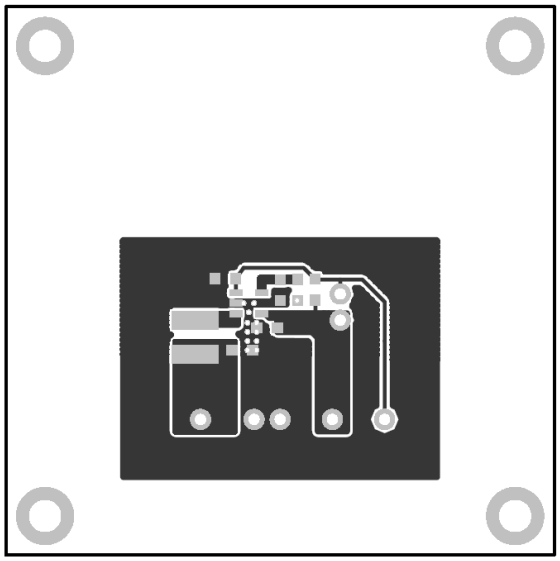


Figure 2—Top Layer

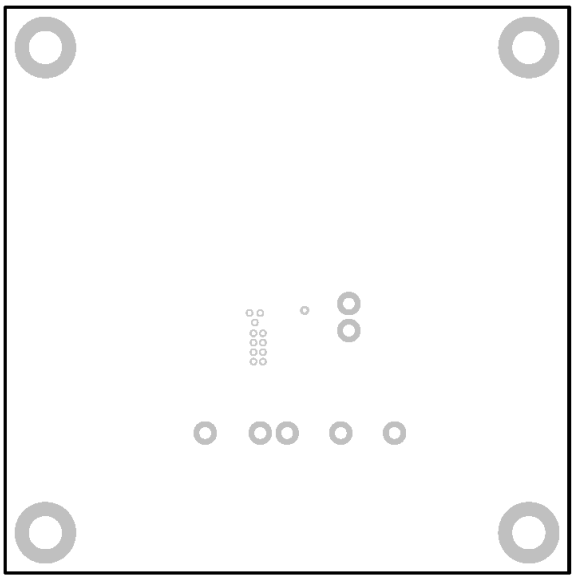


Figure 3—Bottom Silk Layer

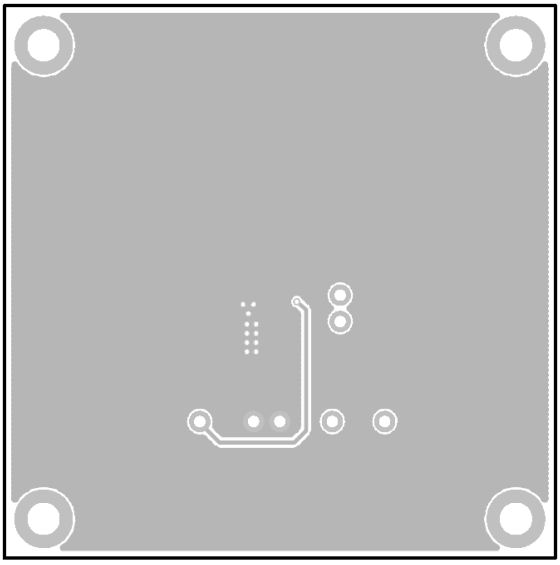


Figure 4—Bottom Layer

QUICK START GUIDE

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

1. Attach Positive end and Negative end of Load to VOUT and GND pins respectively.
2. Attach Input Voltage 2.5V ≤ V_{IN} ≤ 6V and Input Ground to VIN and GND pins respectively.
3. To enable the MP2105 apply a voltage, 1.5V ≤ V_{EN} ≤ 6V, to the EN pin. To disable the MP2105 apply a voltage, V_{EN} < 0.3V, to the EN pin. The default setting for the jumper J1 on the board connects V_{IN} to the EN pin. With this configuration, the part will operate without applying any external voltage to the EN pin.
4. The Output Voltage V_{OUT} can be changed by varying R2. Calculate the new value by formula:

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

Where V_{FB} = 0.6V and R1 = 499kΩ.

Example:

For V_{OUT} = 2.5V:

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

Therefore, use a 174kΩ standard 1% value.