

DESCRIPTION

The MP2115 is a high frequency, current mode, PWM step-down converter with integrated input current limit switch. The step-down converter integrates a main switch and a synchronous rectifier for high efficiency without an external schottky diode. The input average current limit can be externally programmed. It is ideal for powering portable equipment that is powered by an USB port. The MP2115 can supply 2A of load current from a 2.8V to 6V input voltage. The output voltage can be regulated as low as 0.6V.

The MP2115 is available in a space-saving 3mm x 3mm 10-pin QFN package.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	4.5 - 6	V
Output Voltage	V_{OUT}	3.8	V
Output Current	I_{LOAD}	0 - 2	A

FEATURES

- High efficiency: Up to 92%
- Programmable Switching Frequency
- Programmable Input Current Limit
- 2A Available Load Current
- 2.8V to 6V Input Voltage Range
- Output Voltage as low as 0.6V
- Current Mode Control
- Power Good Indicator
- Short Circuit Protection
- <0.1uA Shutdown Current
- Space Saving 3mm x 3mm QFN10 Package

APPLICATIONS

- USB Power Devices
- GSM/GPRS/EDGE
- PCMCIA Interface
- Cellular and Smart Phones
- Portable Instruments
- PDAs
- Digital Still and Video Cameras

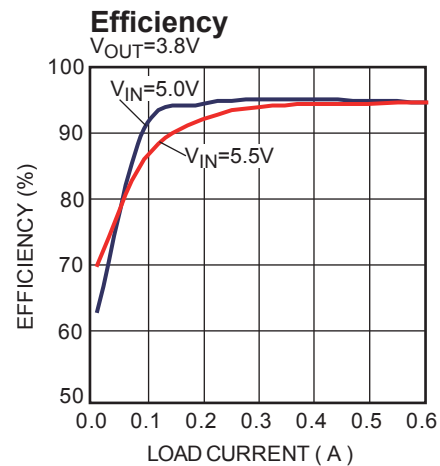
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EV2115DQ-00A EVALUATION BOARD

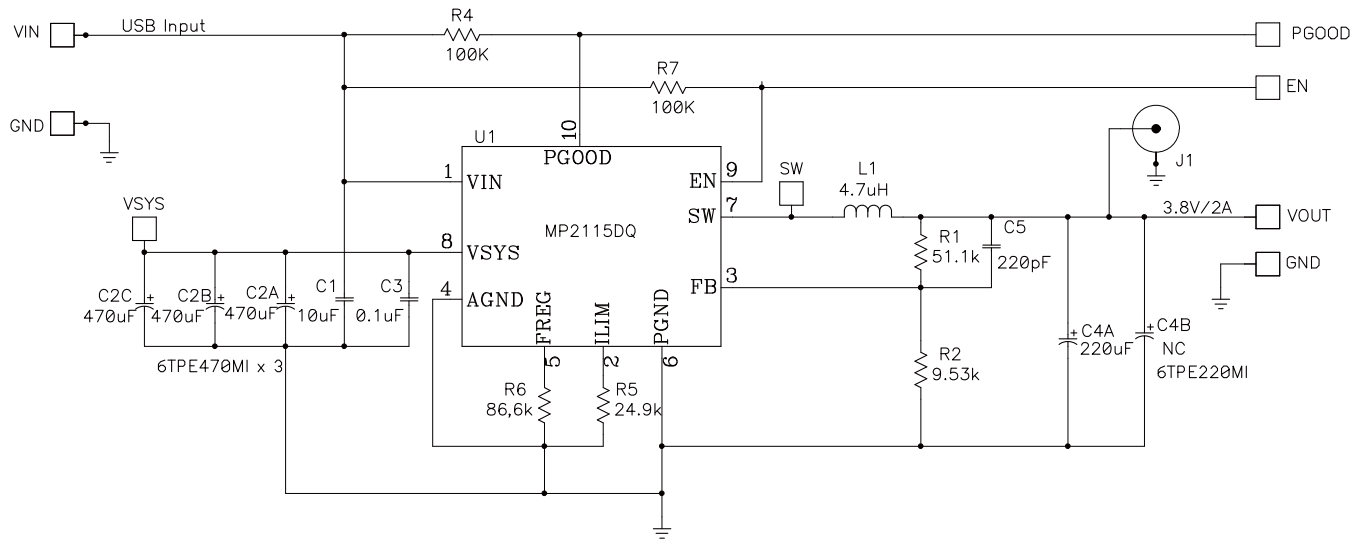


(L x W x H) 6.1cm x 5.1cm x 1.3cm

Board Number	MPS IC Number
EV2115DQ-00A	MP2115



EVALUATION BOARD SCHEMATIC



EV2115DQ-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	10µF	Ceramic Cap., 6.3V, X7R	1206	muRata	GRM31CR70J106KA01L
3	C2A,C2B,C2C	470µF	6.3V, POS-Cap.	D4	SANYO	6TPE470MI
1	C3	0.1µF	Ceramic Cap., 25V, X7R	0603	muRata	GRM188R71E104KA01D
1	C4A	220µF	6.3V, POS-Cap.	D3L	SANYO	6TPE220MI
	C4B	NS		D3L		
1	C5	220pF	Ceramic Cap., 50V, X7R	0603	muRata	GRM188R71H221KA01D
1	R1	51.1k	Film Res., 1%	0603	Yageo	9C06031A5112FKHFT
1	R2	9.53k	Film Res., 1%	0603	Yageo	9C06031A9531FKHFT
2	R4,R7	100k	Film Res., 5%	0603	Yageo	9C06031A1003JLHFT
1	R5	24.9k	Film Res., 1%	0603	Yageo	9C06031A2492FKHFT
1	R6	86.6k	Film Res., 1%	0603	Yageo	9C06031A8662FKHFT
1	L1	4.7µH	Inductor, DCR=20mΩ, Is=6A	7x7x4mm	wurth	We-744311470
1	J1	NS				
8	TP1~8		TP test point	TP1MM		China
4	VIN~VOUT		TP power pin	TP2MM		China
1	U1		DC-DC Converter	QFN10	MPS	MP2115DQ_R1

PRINTED CIRCUIT BOARD LAYOUT

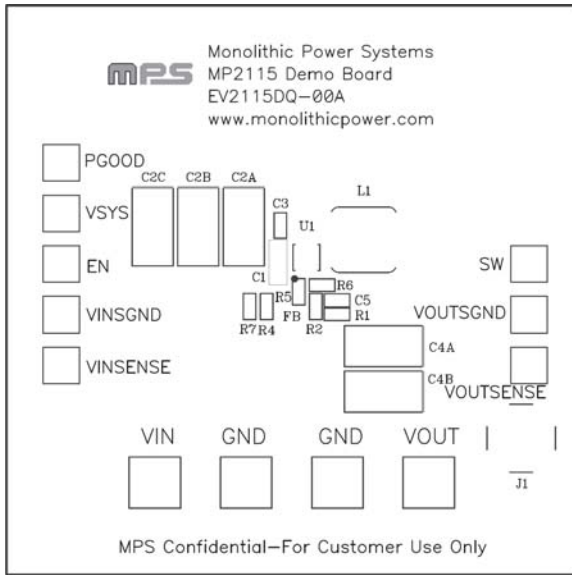


Figure 1—Top Silk Layer

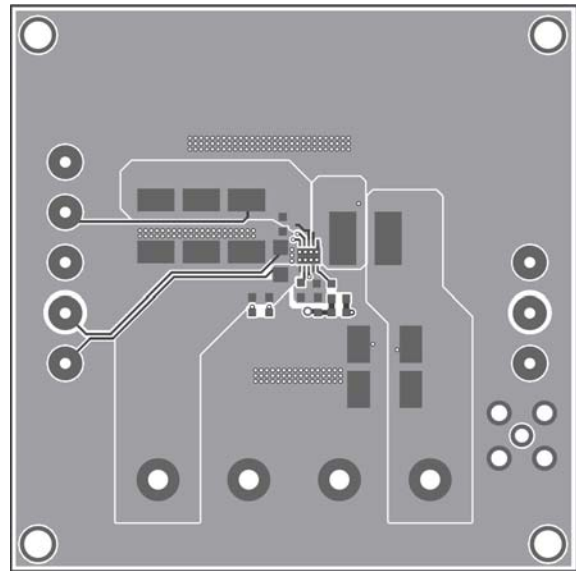


Figure 2—Top Layer

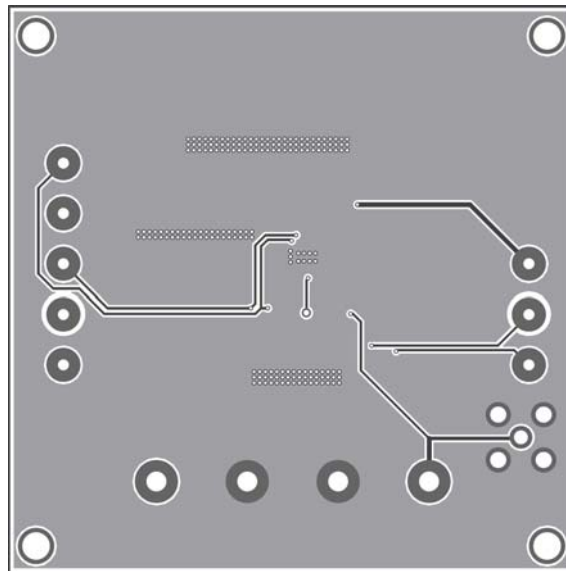


Figure 3—Bottom Layer

QUICK START GUIDE

- 1) The output voltage of this board is set to 3.8V. The board layout accommodates most commonly used inductors and output capacitors.
- 2) Attach the positive and negative ends of the load to the VOUT and GND pins, respectively.
- 3) Attach the input voltage ($4.5V \leq V_{IN} \leq 6V$) and input ground to the IN and GND pins, respectively.
- 4) The MP2115 will startup automatically without applying an external voltage to the EN pin.
The output voltage VOUT can be changed by varying R2. Calculate the new value using the formula:

$$R2=R1 \times (V_{FB}/V_{OUT}-V_{FB})$$

Where the $V_{FB}=0.6V$ and $R1=51k\Omega$.

- 5) The Switching frequency of this board is set to 1.5MHz, which is R6.

R6 (k Ω)	Freq (MHz)
380	0.4
300	0.5
245	0.6
207	0.7
178	0.8
155	0.9
103	1.3
87.8	1.5
58.7	2

Table 1—Resistor Selection vs. switching frequency

- 6) The Input current limit of this board is set to 500mA, which is R5.

I _{IN} (A)	R5 (k Ω)
0.2	60
0.3	40.4
0.4	30.24
0.5	24.6
0.6	20.93

Table 2—Resistor Selection vs. input current limit

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