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EV2452DD-00A

1A, 1MHz, 36V Step-Down Converter Evaluation Board

DESCRIPTION

The EV2452DD-00A is an evaluation board for the MP2452, a high frequency (1MHz) step-down regulator with an integrated power MOSFET.

The MP2452 integrates a 500mΩ MOSFET that provides 1A load current over a wide operating input voltage of 3.3V to 36V.

Current mode control provides fast transient response and reliable over current protection. An internal soft-start prevents inrush current at turn-on.

The EV2452DD-00A is a fully assembled and tested PCB. It generates a +3.3V output voltage at load current up to 1A from an 8V to 36V input range.

FEATURES

- 1A Output Current
- 1MHz Fixed Switching Frequency
- Wide 8V to 36V Operating Input Range
- Adjustable Output from 0.8V to 33V

APPLICATIONS

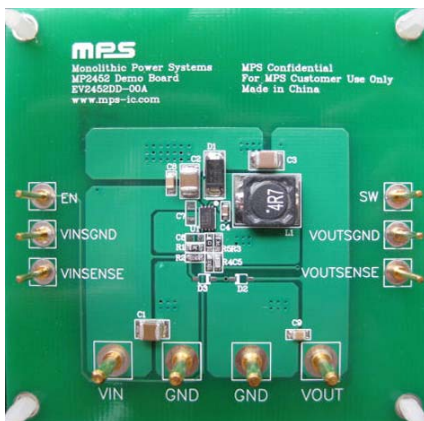
- High Voltage Power Conversion
- Automotive Systems
- Industrial Power Systems
- Distributed Power Systems
- Battery Powered Systems

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ELECTRICAL SPECIFICATIONS

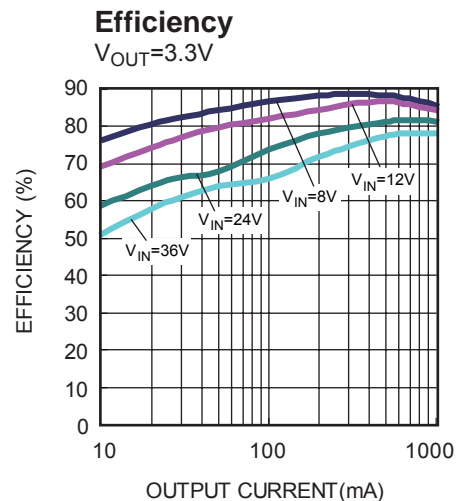
Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	8-36	V
Output Voltage	V_{OUT}	3.3	V
Output Current	I_{OUT}	0-1	A

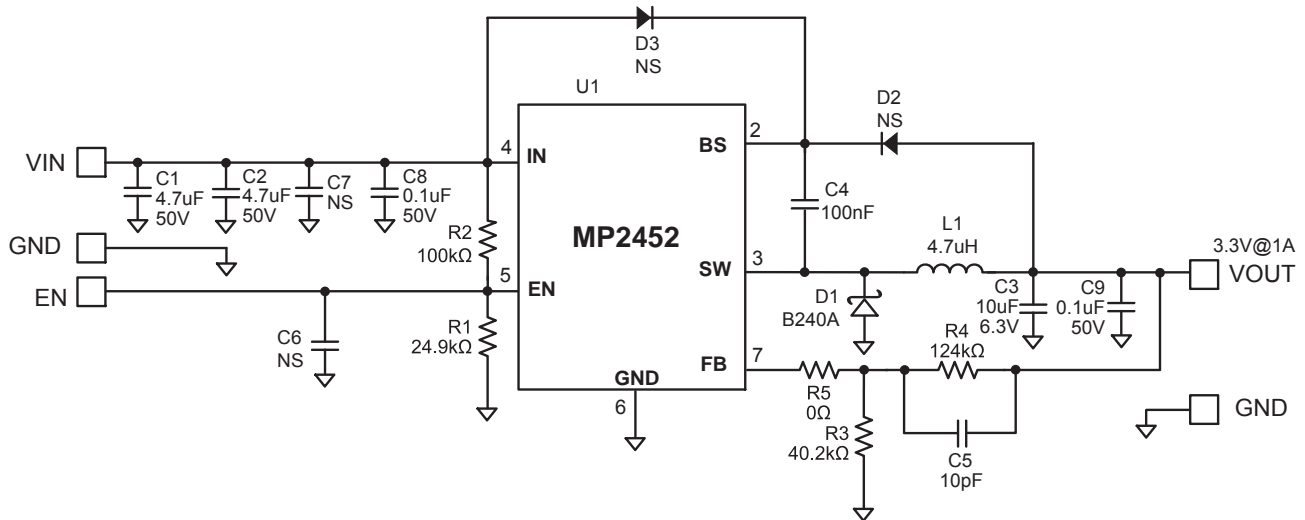
EV2452DD-00A EVALUATION BOARD



(L x W x H) 2.5" x 2.5" x 0.4"
6.35cm x 6.35cm x 1.0cm

Board Number	MPS IC Number
EV2452DD-00A	MP2452DD



EVALUATION BOARD SCHEMATIC

EV2452DD-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
2	C1, C2	4.7µF	Ceramic Cap., X7R, 50V	1210	Murata	GRM32ER71H475KA88L
1	C3	10µF	Ceramic Cap., X5R, 6.3V	1210	TDK	C3225X5R1A106K
1	C4	100nF	Ceramic Cap., X7R, 50V	0603	TDK	C1608X7R1H104K
1	C5	10pF	Ceramic Cap., X7R, 50V	0603	TDK	C1608X7R1H100K
2	C6, C7	NS	Not Stuffed			
2	C8, C9	0.1µF	Ceramic Cap., X7R, 50V	0805	TDK	C2012X7R1H104K
1	R1	24.9kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0724K9L
1	R2	100kΩ	Film Res., 1%	0603	Yageo	RC0603FR-07100KL
1	R3	40.2kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0740K2L
1	R4	124kΩ	Film Res., 1%	0603	Yageo	RC0603FR-07124KL
1	R5	0Ω	Film Res., 5%	0603	Yageo	RC0603FR-070RL
1	D1		Diode Schottky, 40V, 2A	SMA	Diodes Inc	B240A-13-F
			Diode Schottky, 40V, 2A	SMA	Vishay	SSA24
2	D2, D3	NS	Not Stuffed			
1	L1	4.7µH	Inductor, 2.9A	SMD	Würth	7447789004
			Inductor, 2.26A	SMD	TOKO	D73LF-#817FY-4R7M
			Inductor, 3.4A	SMD	TDK	RLF7030T-4R7M3R4
1	U1		Step-Down Regulator	QFN-8	MPS	MP2452DD

PRINTED CIRCUIT BOARD LAYOUT

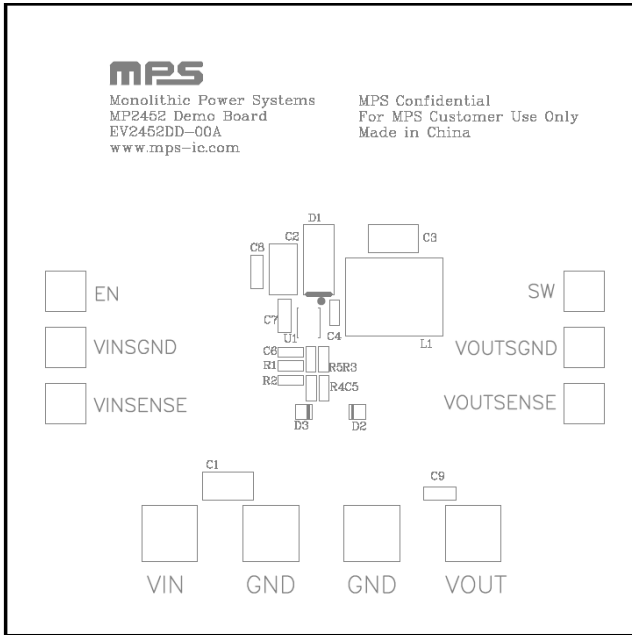


Figure 1—Top Silk Layer

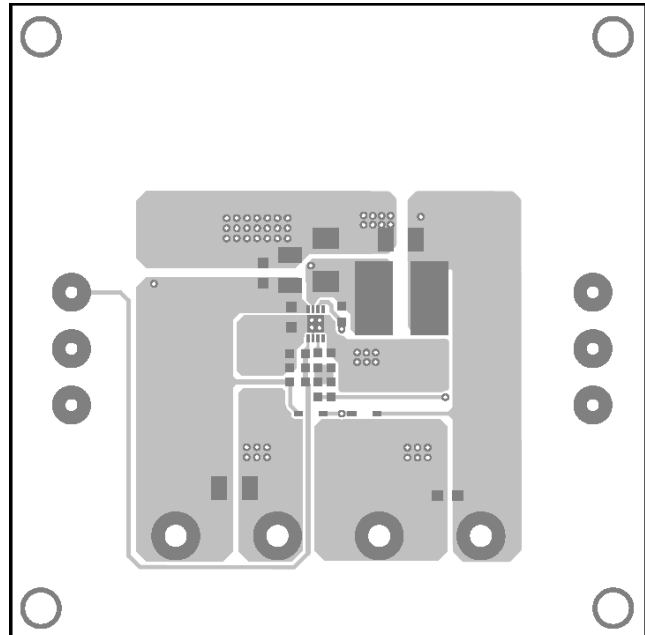


Figure 2—Top Layer

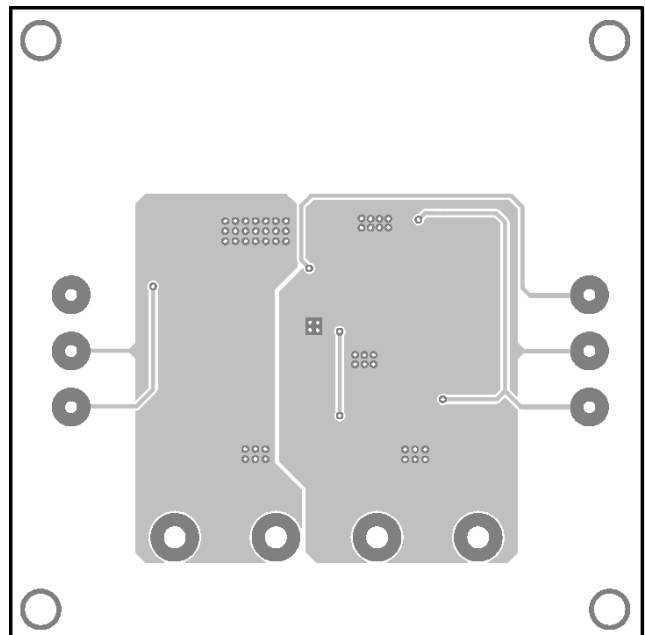


Figure 3—Bottom Layer

QUICK START GUIDE

1. Connect the positive terminal of the load to VOUT pin, and the negative terminal of the load to GND pin.
2. Preset the power supply output to 12V and turn off the power supply.
3. Connect the positive terminal of the power supply output to the VIN pin and the negative terminal of the power supply output to the GND pin.
4. Turn on the power supply. The EV2452DD will automatically start up.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 1.6V to turn on the regulator or less than 1.2V to turn it off. Note that floating the EN pin will turn it off.
6. An input under-voltage lockout (UVLO) function is implemented by the addition of a resistor divider (R1 and R2). The EN threshold is 1.2V (falling edge), so the input UVLO threshold is:

$$UVLO = 1.2V \times \left(1 + \frac{R2}{R1}\right)$$

The UVLO threshold is preset to 6V on this board.

7. To adjust the output voltage, change the values of R3 and R4. Generally, Choose R4 around 124kΩ for optimal transient response. For $V_{FB}=0.8V$, $R4=124k\Omega$, R3 can be determined by:

$$R1 = \frac{99.2k\Omega}{V_{OUT}-0.8V}$$

Please follow the application information on the MP2452 datasheet to recalculate/select compensation values, the inductor value and the output capacitor value if the output voltage needs to be reprogrammed.

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