EV2451DT-01A

0.6A, 2MHz, 36V Step-Down Converter Evaluation Board

The Future of Analog IC Technology

DESCRIPTION

The EV2451DT-01A is an evaluation board for the MP2451, a fixed 2MHz frequency step-down switching regulator with an integrated high-side high voltage power MOSFET.

The board can provide the load current up to 0.6A. High power conversion efficiency over a wide load range is achieved by scaling down the switching frequency at light load condition. The 8V to 36V input range accommodates a variety of step-down applications.

The board provides compact arrangement of components. By switching at 2MHz, smaller value inductor and input/output capacitor can be used to lower down cost and save board space.

FEATURES

- Compact Arrangement of Components
- Wide Operating Input Range
- 0.6A Output Current
- Up to 90% Efficiency

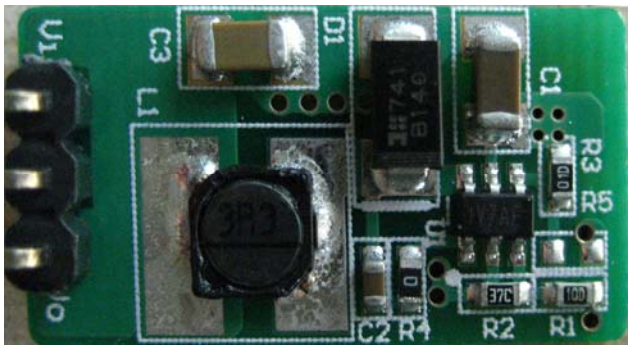
APPLICATIONS

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

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	8-36	V
Output Voltage	V_{OUT}	5	V
Output Current	I_{OUT}	0-0.6	A

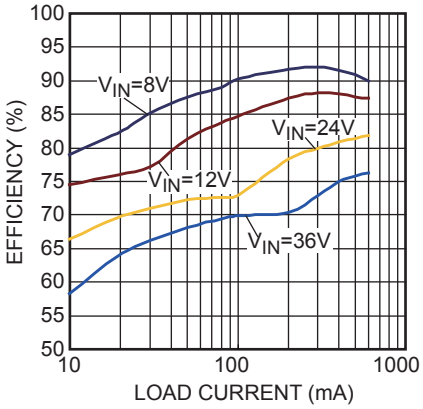
EV2451DT-01A EVALUATION BOARD



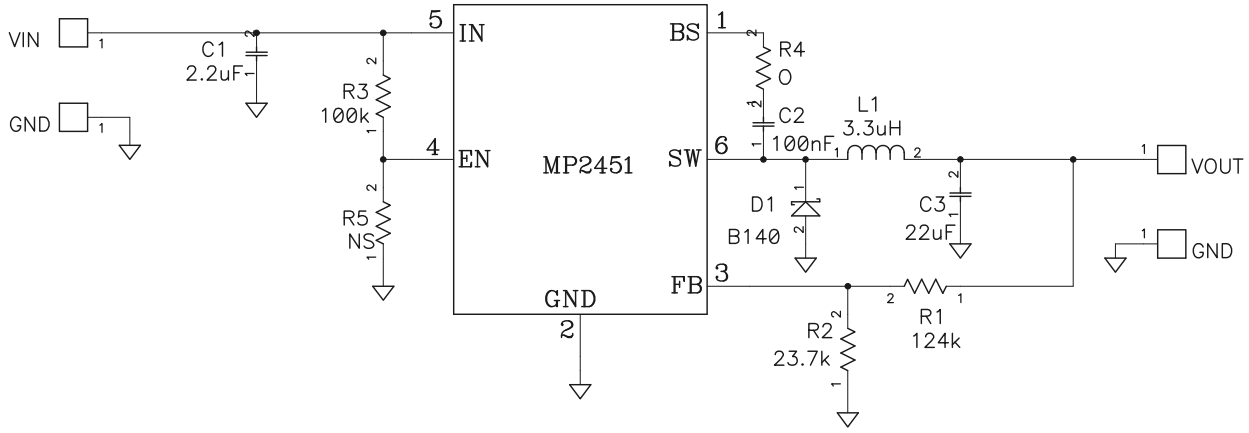
(L x W x H) 0.9" x 0.5" x 0.3"
2.3cm x 1.2cm x 0.8cm

Board Number	MPS IC Number
EV2451DT-01A	MP2451DT

Efficiency @ V_{OUT}=5V



EVALUATION BOARD SCHEMATIC



EV2451DT-01A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
1	C1	2.2µF	Ceramic Cap, X7R, 50V	1206	MuRata	GRM31CR71H225KA88L
1	C2	100nF	Ceramic Cap, X7R, 50V	603	MuRata	GRM188R71H104KA93D
1	C3	22µF	Ceramic Cap, X7R, 16V	1206	MuRata	GRM31CR61C226KE15
1	R1	124kΩ	Film Res, 1%	603	Yageo	RC0603FR-07124KL
1	R2	23.7kΩ	Film Res, 1%	603	Yageo	RC0603FR-0723K7L
1	R3	100kΩ	Film Res, 1%	603	Yageo	RC0603FR-07100KL
1	R4	0	Film Res, 5%	603	Yageo	RC0603JR-070RL
1	R5		Do Not Stuff			
1	D1	B140	Diode Schottky, 40V, 1A	SMA	Diodes Inc	B140-13-F
1	L1	3.3µH	Inductor, 3.3uH, 1A, 120mΩ	SMD	TOKO	D412C-1002AS-3R3M
1	U1		Step-Down Regulator	SOT23-6	MPS	MP2451DT

PRINTED CIRCUIT BOARD LAYOUT

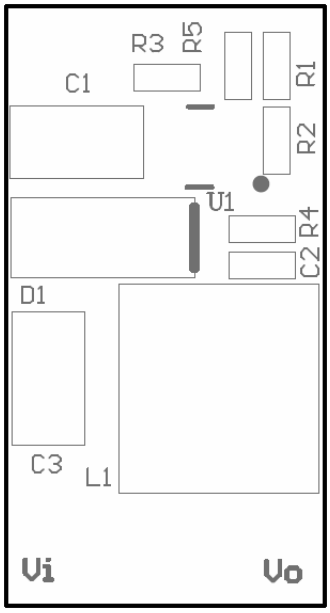


Figure 1—Top Silk Layer

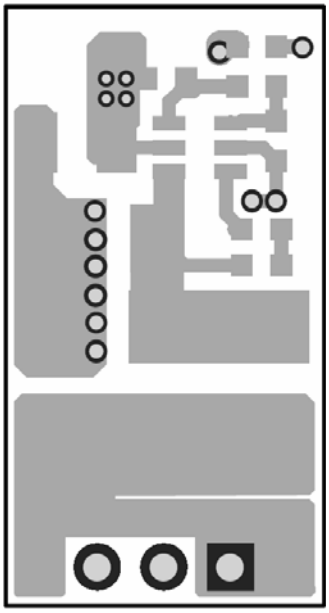


Figure 2—Top Layer

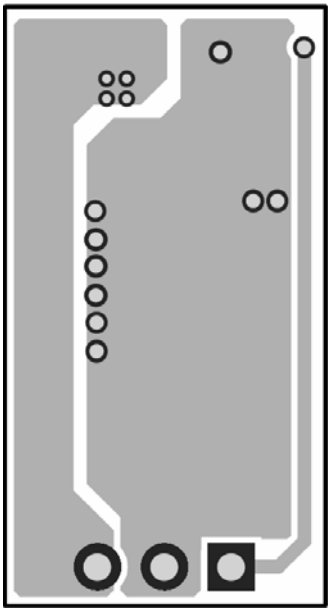


Figure 3—Bottom Layer

Figure 4—Bottom Silk Layer

QUICK START GUIDE

1. Connect the positive terminal of the load to VOUT pin, and the negative terminal of the load to GND pins.
2. Preset the power supply output to 8~36V 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 board will automatically start up.
5. To adjust the output voltage, change the values of R1 and R2. Generally, Choose R1 around 124kΩ for optimal transient response. For V_{FB}=0.8V, R1=124kΩ, R2 can be determined by:

$$R2 = \frac{99.2k\Omega}{VOUT - 0.8V}$$

Please follow the application information on the MP2451 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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Monolithic Power Systems (MPS):

EV2451DT-01A