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# EV2364DF-00A

1.5A, 23V, 1.4MHz Dual Step-Down Converter Evaluation Board

## GENERAL DESCRIPTION

The EV2364DF-00A is an evaluation board for the MP2364, a dual output, monolithic step-down switch mode converter with built-in internal power MOSFETs. It achieves 1.5A continuous output current for each output over a wide input supply range with excellent load and line regulation.

Current mode operation provides fast transient response and eases loop stabilization.

Fault condition protection includes cycle-by-cycle current limiting and thermal shutdown. In shutdown mode the regulator draws 40µA of supply current.

The MP2364 requires a minimum number of readily available standard external components.

## ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	4.75 to 23	V
Output Voltage A	$V_{OUTA}$	3.3	V
Output Voltage B	$V_{OUTB}$	2.5	V

## FEATURES

- 1.5A Current for Each Output
- Ceramic Input and Output Capacitors
- Up to 90% Efficiency
- 40µA Shutdown Mode
- Fixed 1.4MHz Frequency
- Wide 4.75V to 23V Operating Input Range
- Programmable Under Voltage Lockout
- Programmable Soft-Start

## APPLICATIONS

- Distributed Power Systems
- I/O and Core Supplies
- DSL Modems
- Set Top Boxes
- Cable Modems

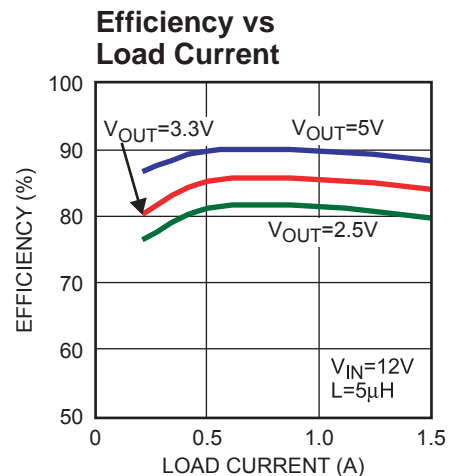
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## EV2364DF-00A EVALUATION BOARD

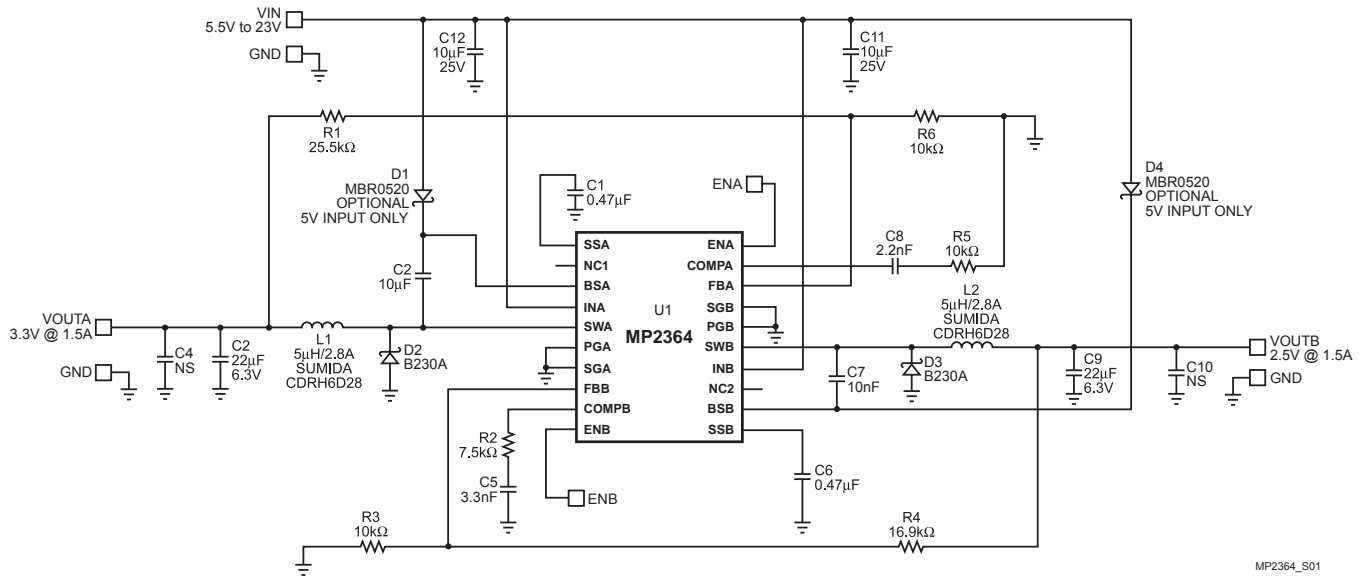


(L x W x H) 2.2" x 1.6" x 0.4"  
(5.5cm x 4.1cm x 1.0cm)

Board Number	MPS IC Number
EV2364DF-00A	MP2364DF



## EVALUATION BOARD SCHEMATIC



MP2364\_S01

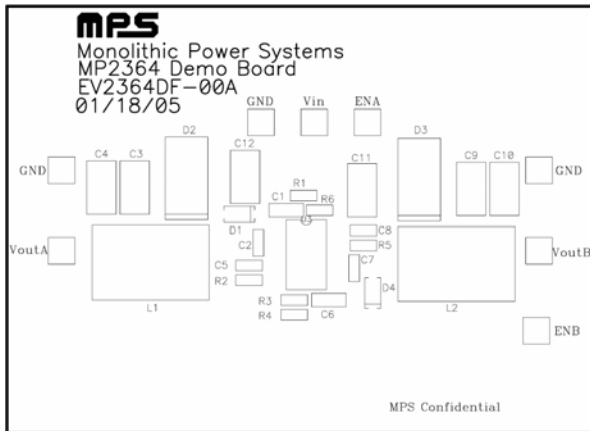
## EV2364DF-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Manufacturer Part No.	Distributor Part No.
2	D1, D4		Schottky Diode, 20V, 0.5A, SOD-123	ON Semiconductor: MBR0520LT1	Digikey: MBR0520LT1OSCT-ND
2	D2, D3		Schottky Diode, 30V, 2A, SMA	Diodes Inc: B230A-13	Digikey: B230ADICT-ND
1	C8	2.2nF	Ceramic Capacitor, 50V, 0603, X7R	TDK: C1608X7R1H222K	Digikey: 445-1309-1-ND
1	C5	3.3nF	Ceramic Capacitor, 50V, 0603, X7R	Panasonic: ECJ-1VB1H332K	Digikey: PCC1778CT-ND
2	C2, C7	10nF	Ceramic Capacitor, 50V, 0603, X7R	TDK: C1608X7R1H103K	Digikey: 445-1311-1-ND
2	C1, C6	0.47µF	Ceramic Capacitor, 16V, 0805, X7R	TDK: C2012X7R1C474K	Digikey: 445-1357-1-ND
2	C11, C12	10µF	Ceramic Capacitor, 25V, 1210, X7R	TDK: C3225X7R1E106M	Digikey: 445-1434-1-ND
2	C3, C9	22µF	Ceramic Capacitor, 6.3V, 1210, X5R	TDK: C3225X5R0J226M	Digikey: 445-1404-1-ND
2	C4, C10		Do Not Stuff		
2	L1, L2	5µH	Inductor, 2.8A, SMD, Unshielded	Sumida: CDRH6D28	
1	R1	25.5kΩ	Resistor, 0603, 1%	Panasonic: ERJ-3EKF2552V	Digikey: P25.5KHCT-ND
1	R2	7.5kΩ	Resistor, 0603, 5%	Panasonic: ERJ-3GEYJ752V	Digikey: P7.5KGCT-ND
3	R3, R5, R6	10kΩ	Resistor, 0603, 1%	Panasonic: ERJ-3EKF1002V	Digikey: P10.0KHCT-ND

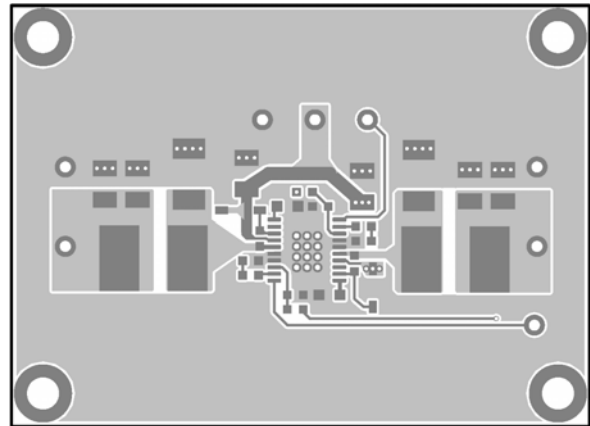
**EV2364DF-00A BILL OF MATERIALS** *(continued)*

Qty	Ref	Value	Description	Manufacturer Part No.	Distributor Part No.
1	R4	16.9kΩ	Resistor, 0603, 1%	Panasonic: ERJ-3EKF1692V	Digikey: P16.9KHCT-ND
1		U1	DC/DC Converter, TSSOP20F	MPS: MP2364DF	

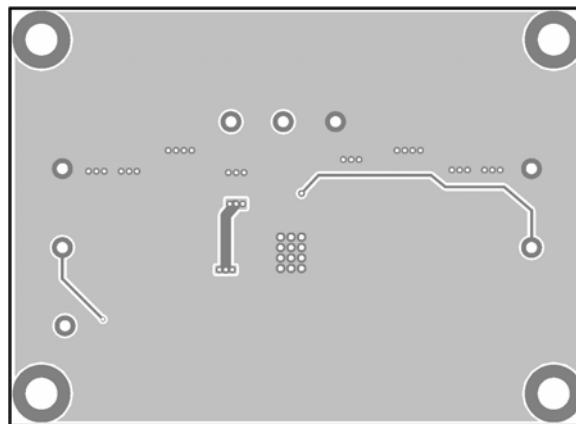
**PRINTED CIRCUIT BOARD LAYOUT**



**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 3.3V (V<sub>OUTA</sub>) and 2.5V (V<sub>OUTB</sub>). The board layout accommodates most commonly used inductors and output capacitors.

1. Attach the positive and negative ends of the first load to the V<sub>OUTA</sub> and GND pins, respectively. If using both outputs, attach the positive and negative ends of the second load to the V<sub>OUTB</sub> and GND pins, respectively.
2. Preset the power supply output to 4.75V to 23V 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 the power supply on. The MP2364 will automatically startup.
5. To use the Enable function, apply a digital input to EN pin. Drive EN higher than 2.5V to turn on the regulator and less than 0.7V to turn it off.
6. The Output Voltages V<sub>OUTA</sub> and V<sub>OUTB</sub> can be changed by varying R1 and R4, respectively. Calculate the new values by the following formulae:

$$R1 = R6 \times \left( \frac{V_{OUTA}}{0.92} - 1 \right)$$

$$R4 = R3 \times \left( \frac{V_{OUTB}}{0.92} - 1 \right)$$

Where R6 = 10kΩ and R3 = 10kΩ

Example:

For V<sub>OUTA</sub> = 3.3V:

$$R1 = 10k\Omega \times \left( \frac{3.3}{0.92} - 1 \right) = 25.9k\Omega$$

Therefore, use a 25.5kΩ standard 1% value resistor.

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