

### DESCRIPTION

The EV2492DN-00A is an evaluation board for the MP2492. The MP2492 is a monolithic step-down switch mode converter with a programmable output current limit. It achieves 2A continuous output current over a wide input supply range with excellent load and line regulation.

The maximum output current can be programmed by sensing current through the inductor DC resistance (DCR) or an accurate sensor resistor. The current sensing of EV2492DN-00A is through the inductor DC resistance (DCR).

Fault condition protection includes cycle-by-cycle current limiting and thermal shutdown.

The MP2492 requires a minimum number of readily available standard external components.

### ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	8 - 55	V
Output Voltage	$V_{OUT}$	5	V
Output Current	$I_{LOAD}$	2	A

### FEATURES

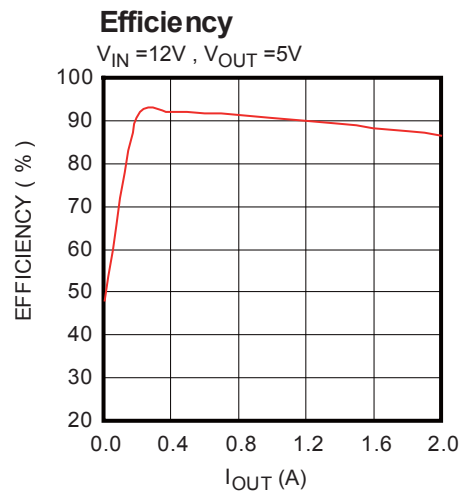
- Programmable up to 2A Output Current
- Output Adjustable from 0.8V to 15V
- Programmable Output Current Limit without Additional Power Loss
- 0.25Ω Internal Power MOSFET Switch
- Stable with Low ESR Output Ceramic Capacitors
- 95% Efficiency @ 500mA ( $V_o=5V$ )
- Fixed 100kHz Frequency
- Thermal Shutdown
- Cycle-by-Cycle Over Current Protection
- Good EMI Performance
- Wide 8V to 55V Operating Input Range

### APPLICATIONS

- USB Power Supplies
- Automotive Cigarette Lighter Adapters
- Linear Chargers

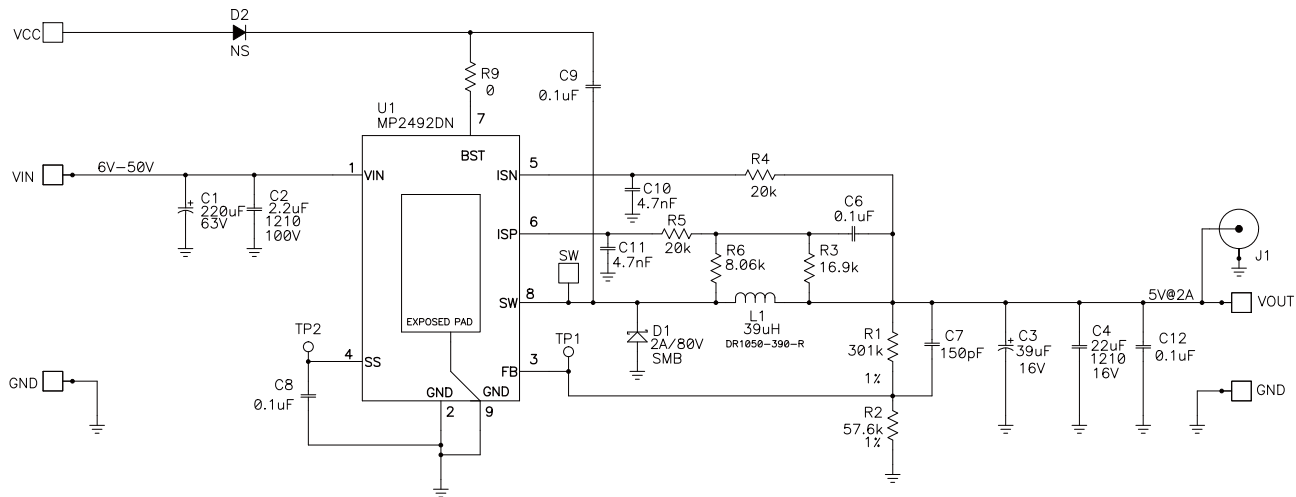
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## EV2492DN-00A EVALUATION BOARD



Board Number	MPS IC Number
EV2492DN-00A	MP2492

## EVALUATION BOARD SCHEMATIC



## EV2492DN-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	220 $\mu$ F	CAP., ELECT, 63V	10x25mm	Panasonic	EEUFC1J221
1	C2	2.2 $\mu$ F	Ceramic Cap., 100V, 10%, X7R	1210	muRata	GRM32ER72A225K
1	C3	39 $\mu$ F	CAP., Alum., 16V	B6	Sanyo	16SVPC39MV
1	C4	22 $\mu$ F	Ceramic Cap., 16V, 10%, X7R	1210	muRata	GRM32ER71C226K
4	C6,C8, C9, C12	0.1 $\mu$ F	Ceramic Cap., 50V, 10%, X7R	0603	muRata	GRM188R71H104K
1	C7	150pF	Ceramic Cap., 50V, 5%, C0G	0603	muRata	GRM1885C1H151J
2	C10, C11	4.7nF	Ceramic Cap., 50V, 10%, X7R	0603	muRata	GRM188R71H472K
1	D1	2A/80V	Schottky Diode, SMD, 80V, 2A	SMB	Diode	B280-13-F
0	D2	NS		SOD-323		
1	L1	39 $\mu$ H	Inductor, DR1050, 60.7m $\Omega$	SMD	COOPER	DR1050-390-R
0	J1	NS				
1	R1	301k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-07301KL
1	R2	57.6k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-0757K6L
1	R3	16.9k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-0716K9L
2	R4,R5	20k $\Omega$	Film Res., 5%	0603	Yageo	RC0603JR-0720KL
1	R6	8.06k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-078K06L
1	R9	0 $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-070RL
1	U1		DC-DC Converter	SO8E	MPS	MP2492DN

## PRINTED CIRCUIT BOARD LAYOUT

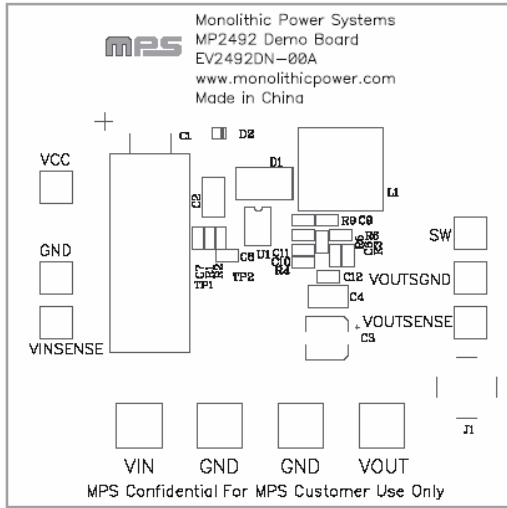


Figure 1—Top Silk Layer

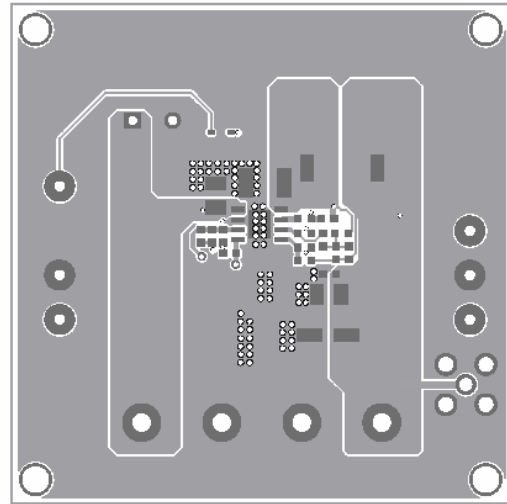


Figure 2—Top Layer

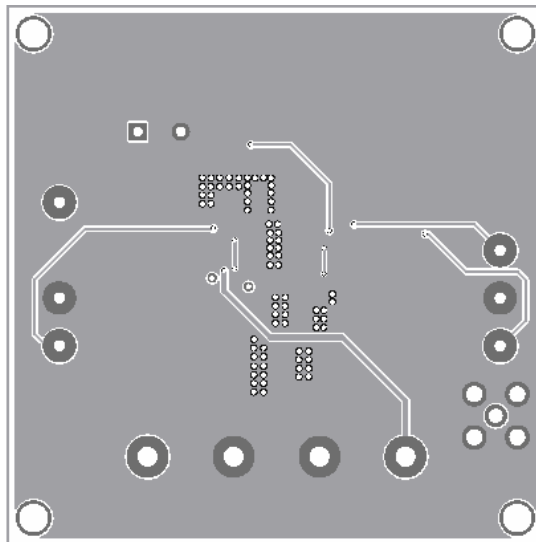


Figure 3—Bottom Layer

## QUICK START GUIDE

1. The output voltage of this board is set to 5V. The board layout accommodates most commonly used inductors and output capacitors.
2. Attach the positive and negative ends of the load to the V<sub>OUT</sub> and GND pins, respectively.
3. Attach the input voltage ( $8V \leq V_{IN} \leq 55V$ ) and input ground to the IN and GND pins, respectively.
4. The MP2492 will startup automatically without applying an external voltage to the EN pin. The output voltage  $V_{OUT}$  can be changed by varying R2. Calculate the new value using the formula:

$$R2 = R1 \times \frac{V_{FB}}{V_{OUT} - V_{FB}}$$

Where  $V_{FB} = 0.8V$  and  $R1 = 300k\Omega$ .

For example, for  $V_{OUT} = 5V$ :

$$R2 = R1 \times \frac{V_{FB}}{V_{OUT} - V_{FB}} = 300k\Omega \times \frac{0.8V}{5V - 0.8V} = 57.6k\Omega$$

For the closest standard 1% value.

5. The output current limit is set as:

$$I_{OUT} = \frac{100mV}{DCR} \times \frac{R6 + R3}{R3}$$

For DCR current sense, it is desirable to keep:

$$\frac{R6 \times R3}{R6 + R3} \times C6 = \frac{L1}{DCR}$$

DCR is the DC resistance of the inductor winding.

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