

DESCRIPTION

The MP2495 is a monolithic step-down switch mode converter with a programmable output current limit and an input over-voltage protection switch. 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 sense resistor.

Fault condition protection includes cycle-by-cycle current limiting and thermal shutdown. The MP2495 can survive high-voltage transients such as those found in automotive and industrial applications.

The MP2495 requires a minimum number of readily available standard external components.

The MP2495 is available in a 16-pin SOIC package.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Surge Voltage		80	V
Input Voltage	V_{IN}	12	V
Output Voltage	V_{OUT}	5	V
Output Current	I_{LOAD}	2	A

FEATURES

- Wide 4.5V to 36V Operating Input Range
- Input Surge Protection Up to 70V
- Programmable up to 2A Output Current
- Output Adjustable from 0.8V to 15V
- Programmable Output Current Limit without power loss
- 0.25Ω Internal Power MOSFET Switch
- Stable with Low ESR Output Ceramic Capacitors
- 95% Efficiency @ 500mA ($V_o=5V$)
- Fixed 700KHz Frequency
- Thermal Shutdown
- Cycle-by-Cycle Over Current Protection
- Available in a 16-Pin SOIC Package

APPLICATIONS

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

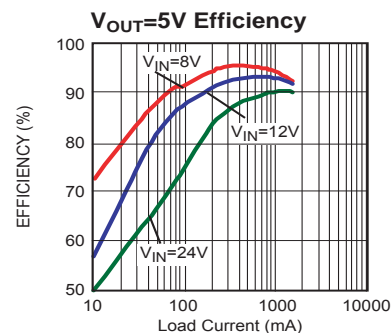
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EV2495DS-00A EVALUATION BOARD

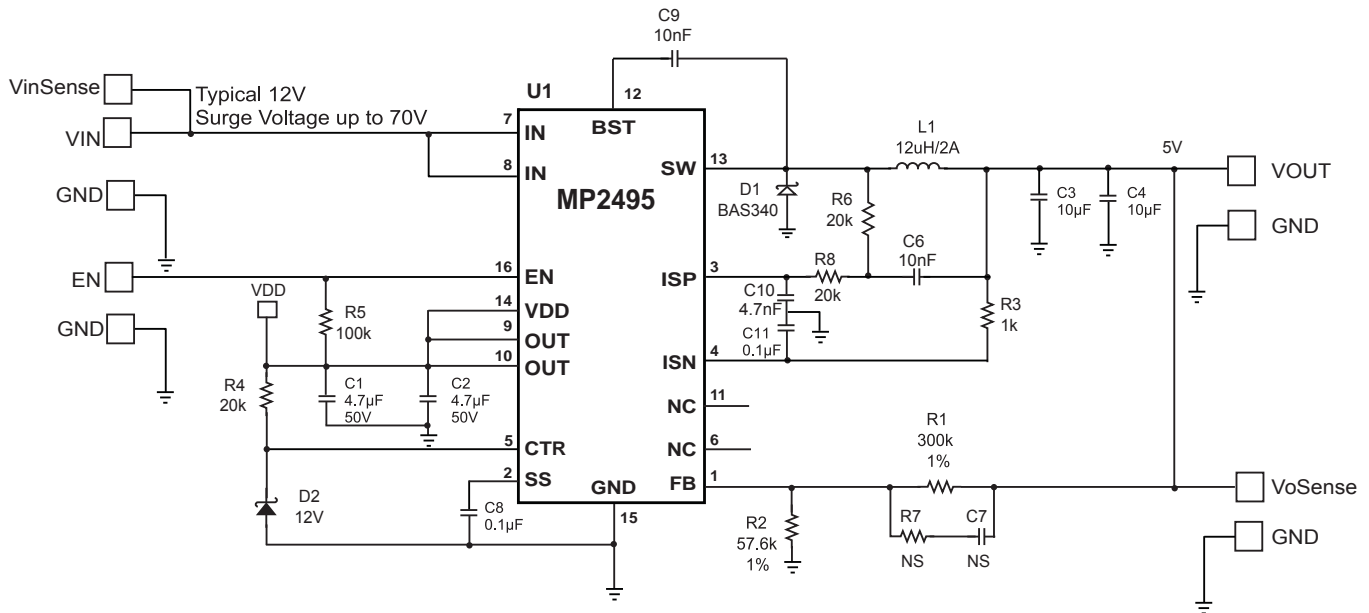


(L x W x H) 2.5" x 2.5" x 0.5"

Board Number	MPS IC Number
EV2495DS-00A	MP2495DS



EVALUATION BOARD SCHEMATIC



EV2495DS-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	4.7uF	Ceramic Cap., 50V, X7R	1210	muRata	GRM32ER71H475K
2	C3, C4	10uF	Ceramic Cap., 25V, X7R	1210	muRata	GRM32DR71E106K
2	C6, C9	10nF	Ceramic Cap., 50V, X7R	0805	muRata	GRM216R71H103K
	C7	NS		0805		
2	C8,C11	0.1uF	Ceramic Cap., 16V, X7R	0805	muRata	GRM219R71C104K
1	C10	4.7nF	Ceramic Cap., 16V, X7R	0805	muRata	GRM216R71H472K
1	D1	3A	Schottky Diode, SMD, 40V, 3A	SMA	ON Semiconductor	MBRA340T3GOSCT
1	D2	12V	Diode, SMD,	SOD-123	Central Sem.	CMHZ5242B
1	L1	12uH	DS85LC Inductor, 2.3A/60mΩ	SMD	TOKO	B1000AS-120M
1	R1	300kΩ	Film Res., 1%	0805	Yageo	RT0805DRE07300KL
1	R2	57.6KΩ	Film Res., 1%	0805	Yageo	RT0805FRE0757K6L
1	R3	1kΩ	Film Res., 1%	0805	Yageo	RT0805FRE071KL
3	R4,R6,R8	20kΩ	Film Res., 1%	0805	Yageo	RT0805FRE0720KL
1	R5	100kΩ	Film Res., 5%	0805	Yageo	RC0805JR-07100KL
	R7	NS		0805		
1	U1		Step-Down Converter	SOIC-16	MPS	MP2495DS

PRINTED CIRCUIT BOARD LAYOUT

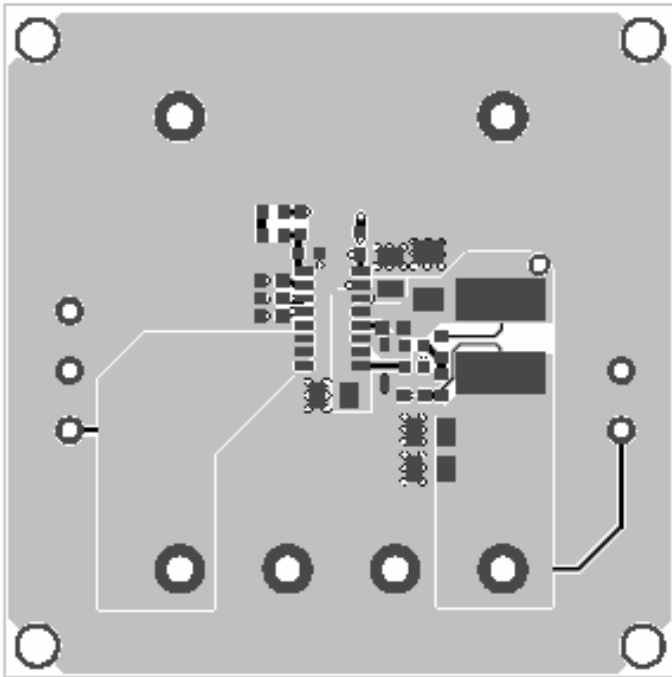


Figure 1—Top Silk Layer

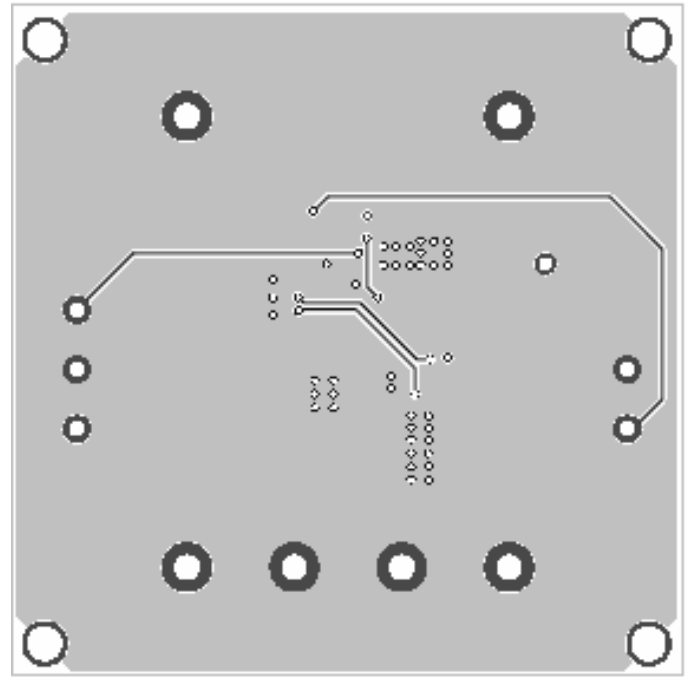
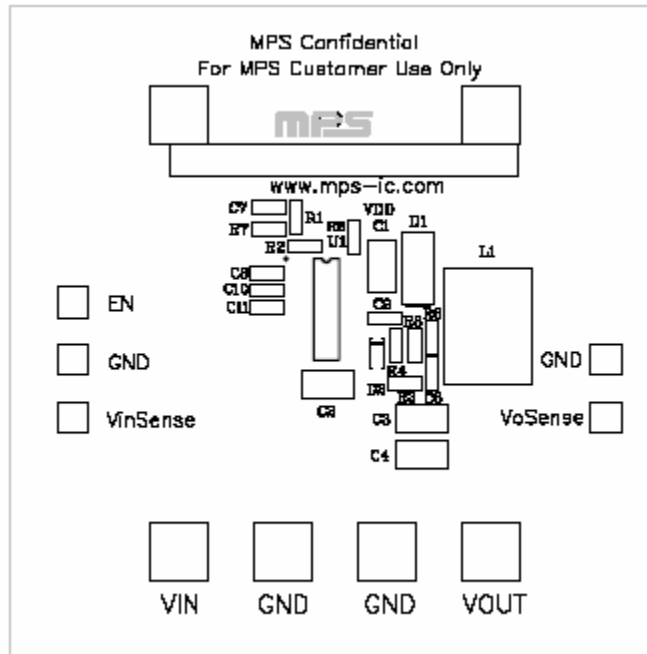


Figure 2—Top Layer

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 VOUT and GND pins, respectively.
3. Attach the input voltage (12V) and input ground to the IN and GND pins, respectively.
4. The MP2495 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:

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

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

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

$$R2 = R1 \times V_{FB} / (V_{OUT} - V_{FB}) = 300K\Omega \times (0.8/5 - 0.8) = 57.1K\Omega$$

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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