

### DESCRIPTION

The MP2498 is a monolithic step-down buck switch mode converter with integrated internal input over voltage protection switch. It provides 2A output with current mode control for fast loop response and easy compensation.

The wide 5V to 24V input range of the buck regulator accommodates a variety of step-down applications, including those in automotive input environment.

The MP2498 can survive high-voltage transients such as those found in automotive and industrial applications.

The MP2498 is available in a 28-pin QFN 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

- 100V Switch for load dump protection
- Wide 12V to 24V Operating Input Range
- Input Surge Protection Up to 80V
- Programmable up to 2A Output Current
- Output Adjustable from 0.8V to 15V
- 0.25Ω buck regulator MOSFET Switch
- Stable with Low ESR Output Ceramic Capacitors
- 95% Efficiency
- 150kHz to 2MHz Frequency to Reduce Radio Interference
- Thermal Shutdown
- Cycle-by-Cycle Over Current Protection
- Available in a QFN4x5 28-Pin Package

### APPLICATIONS

- Automotive Electronics
- Automotive Cigarette Lighter Adapters
- Power Supply for Linear Chargers

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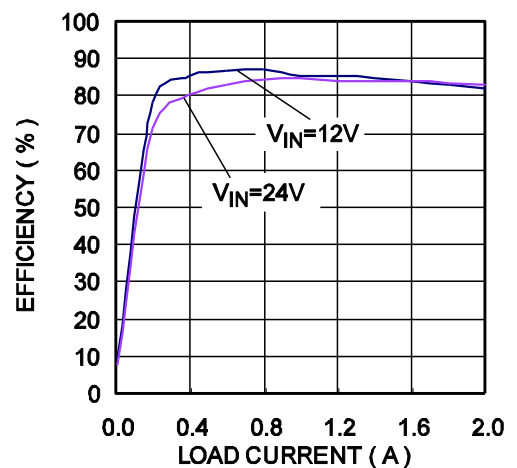
## EV2498EV-00A EVALUATION BOARD



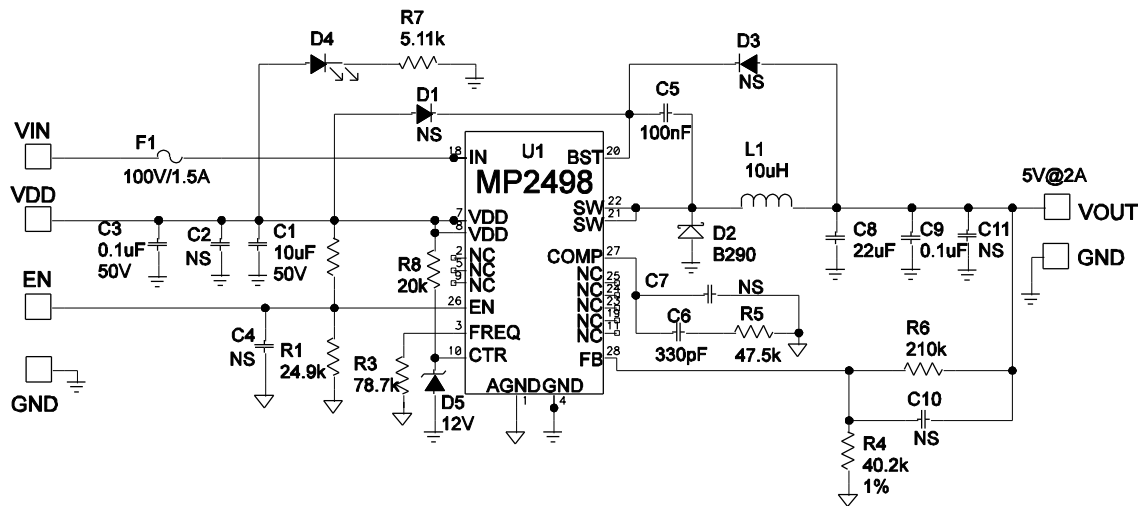
(L x W x H) 2.5" x 2.5" x 0.5"

Board Number	MPS IC Number
EV2498EV-00A	MP2498EV

### 1.2MHz Efficiency



## EVALUATION BOARD SCHEMATIC



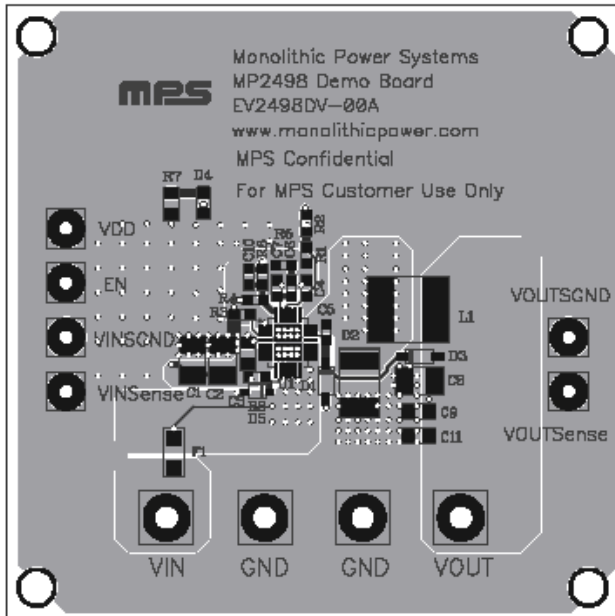
### NOTE:

- 1) VIN IS NORMALLY 12V.
- 2) THE SURGE VOLTAGE ON VIN NOTE CAN BE 80V FOR 100MS.

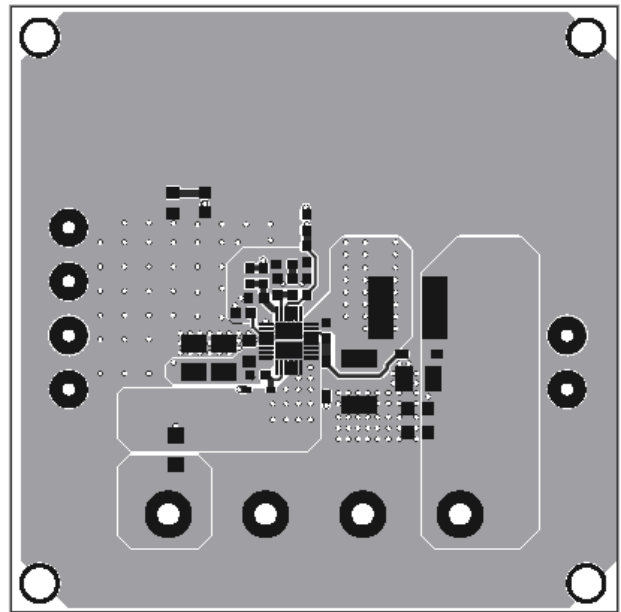
**EV2498EV-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	10 $\mu$ F	Ceramic Cap., 50V, X7R	1210	Taiyo Yuden	UMK325BJ106KM-T
2	C3,C9	0.1 $\mu$ F	Ceramic Cap., 50V, X7R	0805	Murata	GRM21BR71H104KA01L
5	C2,C4,C7, C10,C11		Not Stuffed			
1	C5	0.1 $\mu$ F	Ceramic Cap., 50V, X7R	0603	Murata	GRM188R71H104KA93D
1	C6	330pF	Ceramic Cap., 50V, X7R	0603	Murata	GRM188R71H331KA01D
1	C8	22 $\mu$ F	Ceramic Cap, 16V, X7R	1210	Murata	GRM32ER71C226ME18L
1	R1	24.9k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-0724K9L
1	R2	100k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-07100KL
1	R3	78.7k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-0778K7L
1	R4	40.2k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-0740K2L
1	R5	47.5k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-0747K5L
1	R6	210k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-07210KL
1	R7	5.11k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-075K11L
1	R8	20k $\Omega$	Film Res., 1%	0603	Yageo	RC0603FR-0720K0L
2	D1, D3		Not Stuffed			
1	D2		Diode Schottky, 90V, 2A	SMB	Diodes Inc	B290-F
1	D4	Green LED	2.6mCD,10mA/2.0V,Diff	0805	Panasonic	LNJ306G5URA
1	D5	12V	Zener,200mW,	SOD323	Diodes Inc	DDZ12CS-7
1	F1	1.5A	Fuse, 125V,	1206	Copper Bussmann	3216LV1.5-R
1	L1	10 $\mu$ H	Inductor, 4.3A	SMD	Toko	D104C-919AS-100M
			Inductor, 4A	SMD	Cooper	SD8350-100-R
			Inductor,4A	SMD	Würth	744066100
1	U1		Step-Down Regulator	QFN28 4x5mm	MPS	MP2498EV

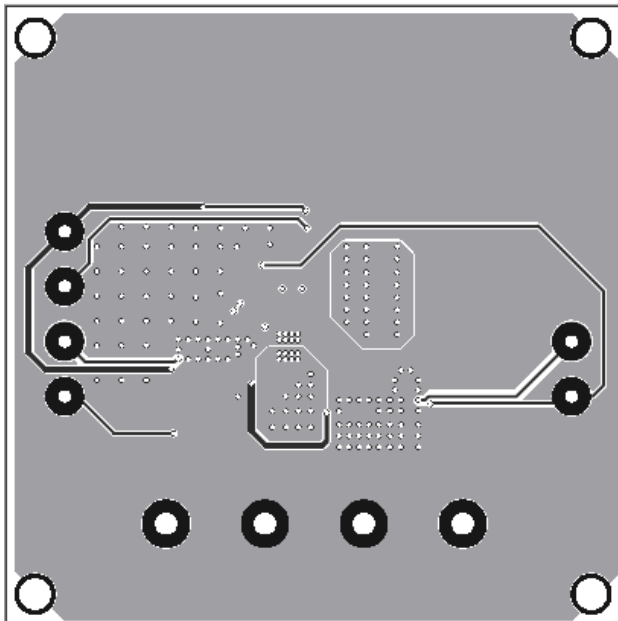
**PRINTED CIRCUIT BOARD LAYOUT**



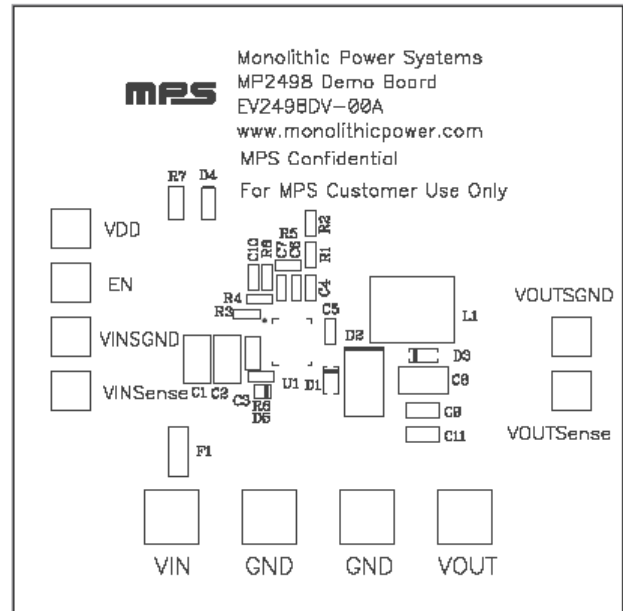
**Figure 1—Top Silk Layer**



**Figure 2—Top Layer With Silk Screen**



**Figure 3—Bottom Layer**



**Figure 4—Silk Layer**

## QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
2. Preset the power supply output to 12V, and then turn it off.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Turn the power supply on. The EV2498EV will automatically startup.
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, drive EN less than 1.2V to 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 VIN UVLO threshold is

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

It is preset to 6V on this board.

7. Use R4 and R6 to set the output voltage with VFB = 0.8V. For R4 = 40.2kΩ, R6 can be determined by:

$$R6 = 50.25 \times (V_{OUT} - 0.8)(k\Omega)$$

Follow the Application Information section in the device data sheet to recalculate the compensation, inductor and output capacitor values when output voltage is changed.

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