



# EV2499A-QB-00A

## High Efficiency, 3A Max, 36V Synchronous, Step-Down Converter Evaluation Board

### DESCRIPTION

The EV2499A-QB-00A is an evaluation board for MP2499A, a synchronous rectified, step-down module converter with built-in power MOSFETs.

The evaluation board can deliver a 3A max continuous output current with excellent load and line regulation over a wide input supply range.

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

Full protection features include over-current protection and thermal shut down.

The MP2499A requires a minimal number of readily-available standard external components, and is available in a space-saving QFN-13 (2.5mmx3mm) package.

### ELECTRICAL SPECIFICATION (1)

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	12	V
Output Voltage	$V_{OUT}$	5	V
Output Current	$I_{OUT}$	2.4	A

#### Notes:

1) For different input, output spec, please refer to APPLICATION and TYPICAL APPLICATION CIRCUITS section on datasheet to choose proper values

### FEATURES

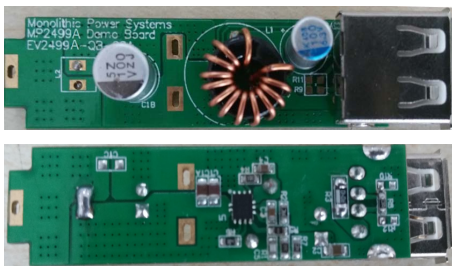
- Wide 5V to 36V Continuous Operating Input Range
- 85mΩ/55mΩ Low  $R_{DS(ON)}$  Internal Power MOSFETs
- High-Efficiency Synchronous Mode Operation
- Default 270kHz Switching Frequency
- Synchronizes to a 200kHz to 2.4MHz External Clock
- Internal Soft-Start
- Output Line Drop Compensation
- Accurate Continuous Output Current Limit with External Resistor
- OCP Protection and Hiccup
- Thermal Shutdown
- Output Adjustable from 0.8V
- Available in an QFN-13 (2.5mmx3mm)

### APPLICATIONS

- USB Dedicated Charging Ports (DCP)
- Automotive Cigarette Lighter Adapters
- USB Chargers
- USB PD Applications

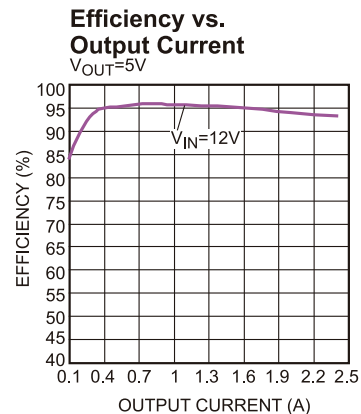
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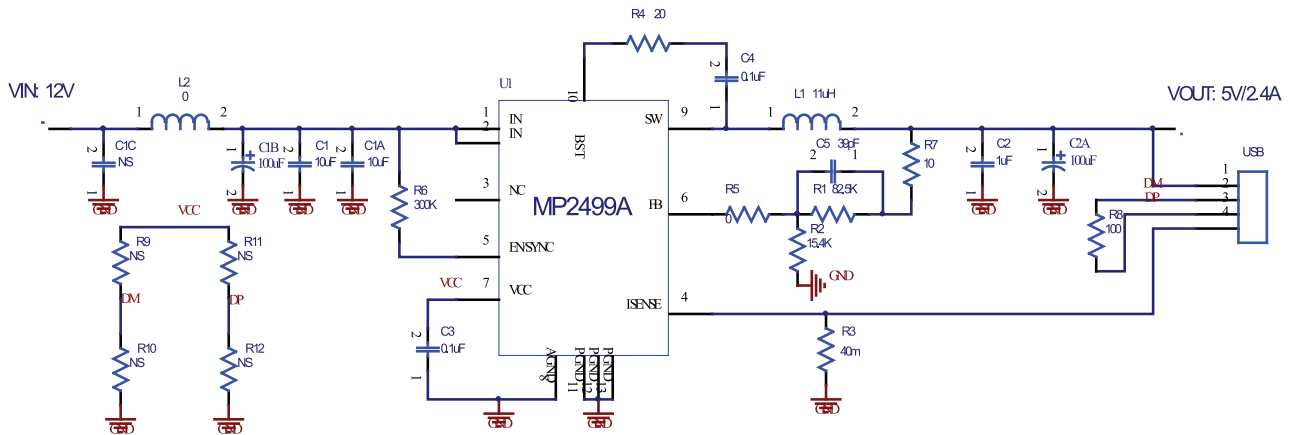
## EV2499A-QB-00A EVALUATION BOARD



(L × W × H) 5.5cm x 1.4cm x 1.1cm  
(Two layer PCB)

Board Number	MPS IC Number
EV2499A-QB-00A	MP2499AGQB

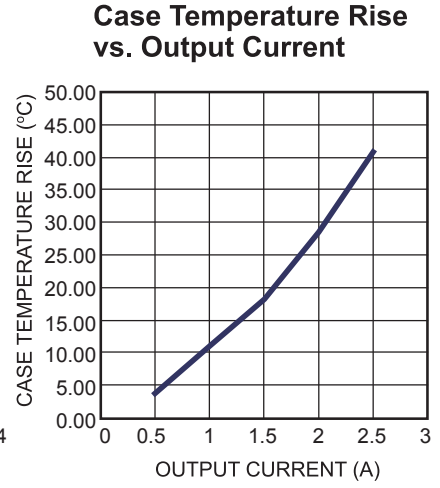
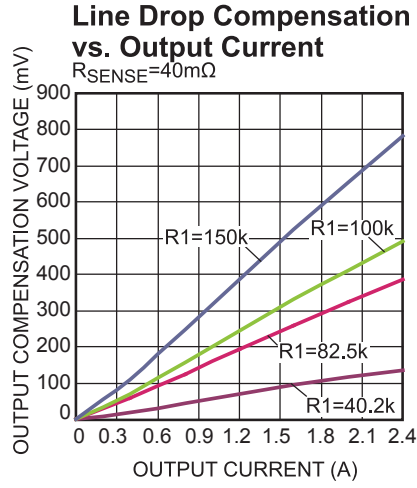
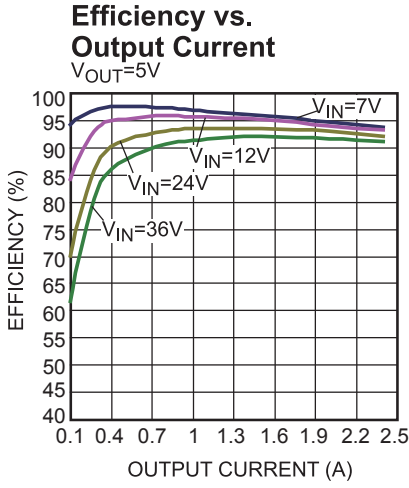


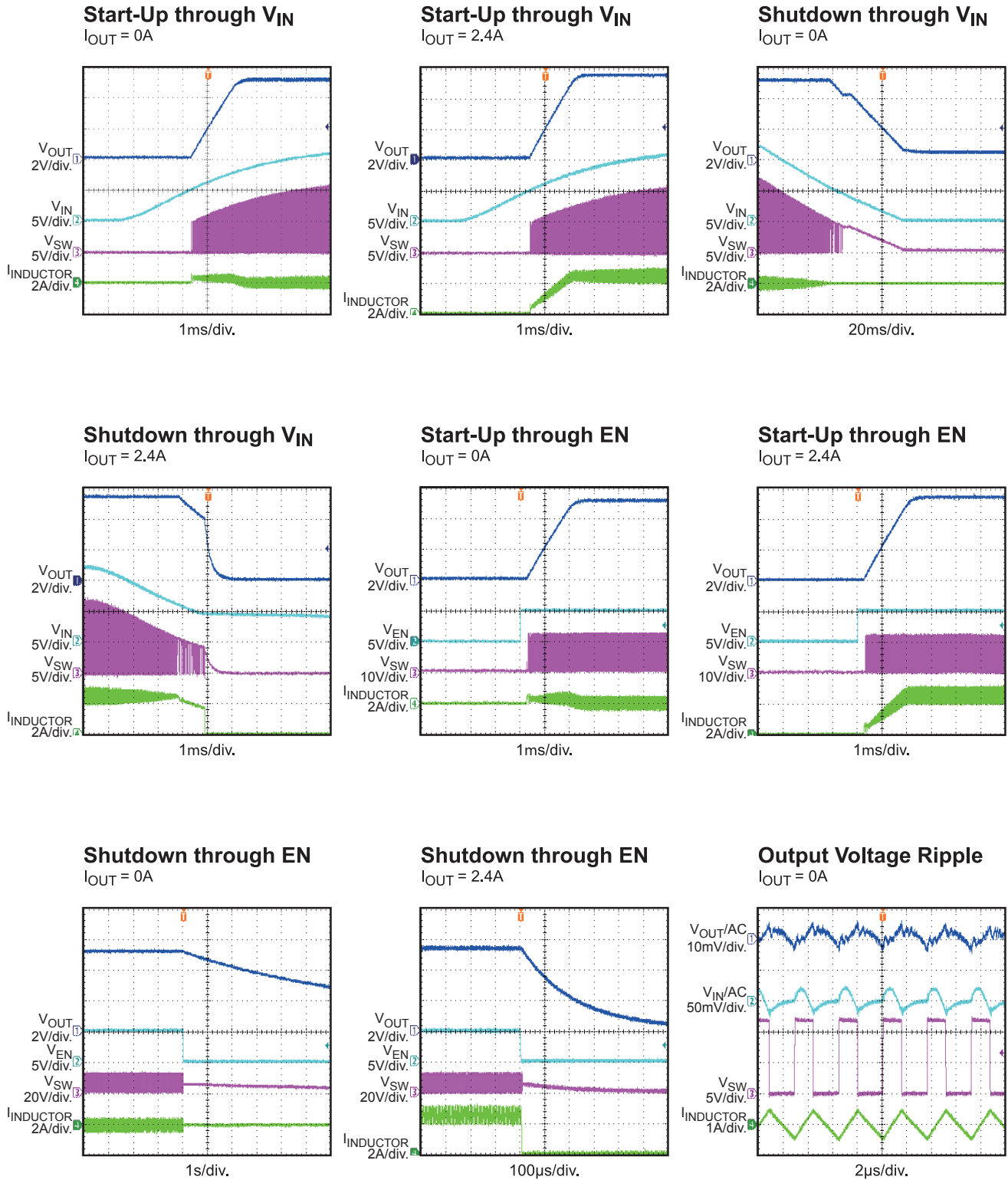
**EVALUATION BOARD SCHEMATIC**

**EV2499A-QB-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C1A	10µF	Ceramic Cap, 50V,X5R	0805	muRata	GRM21BR61H106KE43L
1	C1B	100µF	Electrolytic capacitor, 35V, 160mΩ ESR.	DIP	Chemi-Con	EMZJ35ADA101MF80G
1	C2	1µF	Ceramic Cap,6.3V,X7R	0805	muRata	GRM21BR71A105KA01L
1	C2A	100µF	Polymer capacitor, 6.3V, 10mΩ ESR.	DIP	Chemi-Con	APSK6R3ELL101ME08S
2	C3, C4	0.1µF	Ceramic Cap, 50V,Y5V	0603	TDK	C1608Y5V1H104Z
1	C5	39pF	Ceramic Cap, 50V,X7R	0603	muRata	GRM1885C1H390JA01D
0	C1C	NS				
1	R1	82.5k	Thick Film Res, 1%	0603	Any	
1	R2	15.4k	Thick Film Res, 1%	0603	Any	
1	R3	40m		1206	Any	
1	R4	20	Thick Film Res, 1%	0603	Any	
1	R5	0	Thick Film Res, 1%	0603	Any	
1	R6	300k	Thick Film Res, 5%	0603	Any	
1	R7	10	Thick Film Res, 1%	0603	Any	
1	R8	100	Thick Film Res, 1%	0603	Any	
0	R9,R10, R11,R12	NS	Thick Film Res, 1%	0603	Any	
1	L1	11µH	Toroidal Inductor	DIP	UEC	WL-801
0	L2	0	Shorted by wire			
1	U1	MPS	Step-Down Converter	QFN-13 (2.5mmx3mm)	MPS	MP2499AGQB
1	USB	USB	Single USB port	Tray	Würth	61400416021

### TYPICAL PERFORMANCE CHARACTERISTICS

$V_{IN} = 12V$ ,  $V_{OUT} = 5V$ ,  $L = 11\mu H$ ,  $T_A = +25^\circ C$ , unless otherwise noted.



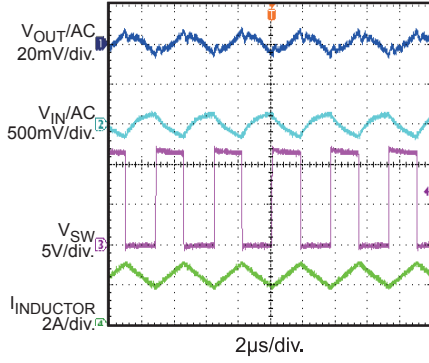
**TYPICAL PERFORMANCE CHARACTERISTICS (continued)**
 $V_{IN} = 12V$ ,  $V_{OUT} = 5V$ ,  $L = 11\mu H$ ,  $T_A = +25^\circ C$ , unless otherwise noted.


**TYPICAL PERFORMANCE CHARACTERISTICS** *(continued)*

$V_{IN} = 12V$ ,  $V_{OUT} = 5V$ ,  $L = 11\mu H$ ,  $T_A = +25^\circ C$ , unless otherwise noted.

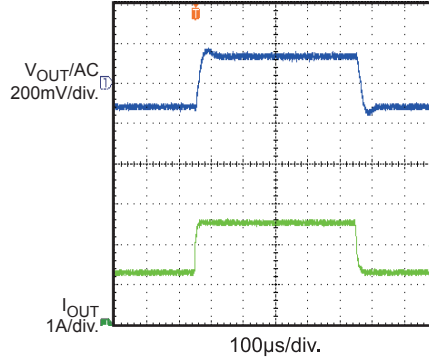
**Output Voltage Ripple**

$I_{OUT} = 2.4A$



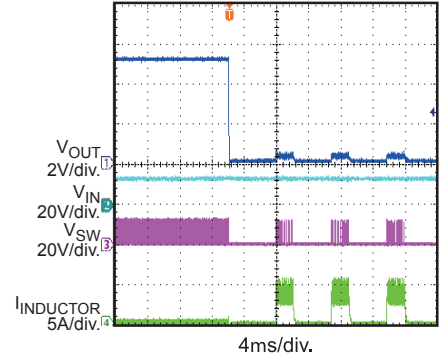
**Load Transient Response**

$I_{OUT} = 1.2A-2.4A$



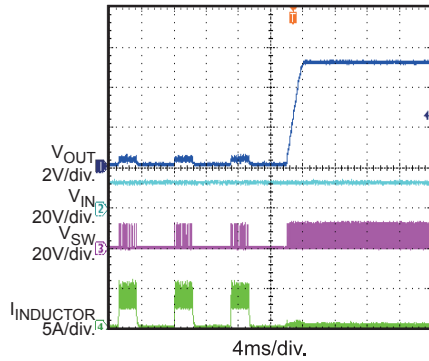
**Short Circuit Entry**

$I_{OUT} = 0A$



**Short Circuit Recovery**

$I_{OUT} = 0A$



PRINTED CIRCUIT BOARD LAYOUT

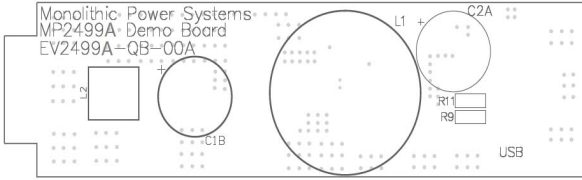


Figure 1: Top Silk Layer

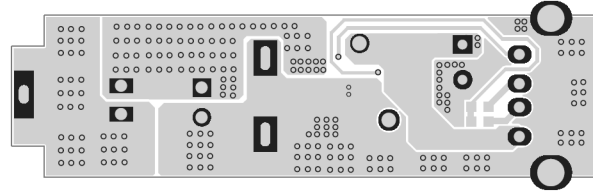


Figure 2: Top Layer

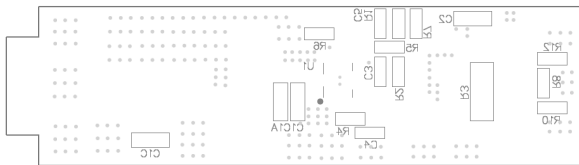


Figure 3: Bottom Silk Layer

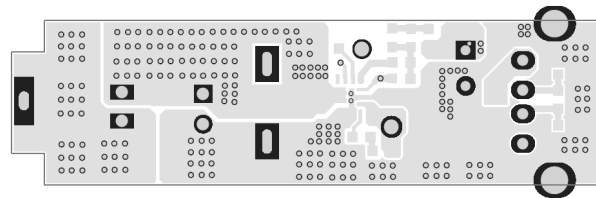


Figure 4: Bottom Layer