EV2322-D-00A

1A,22V,Low IQ
Step Down Converter Evaluation Board

The Future of Analog IC Technology

DESCRIPTION

The EV2322-D-00A Evaluation Board is designed to demonstrate the capabilities of MPS' MP2322, a high light load efficiency synchronous rectified step-down switch mode converter with built in internal power MOSFETs. It offers a very compact solution to achieve 1A continuous output current over a wide input supply range with excellent load and line regulation.

The MP2322 switching edge is optimized for EMI reducing. COT (Constant On Time) control provides seamless mode transition and fast load transient response.

Full protection features include OCP, OVP and thermal shut down.

The MP2322 requires 7 of readily available standard external components and is available in a space saving QFN-8(1.5mmx2mm) package.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	12	V
Output Voltage	V_{OUT}	3.3	V
Output Current	I_{OUT}	1	A

FEATURES

- Wide 3V to 22V Operating Input Range
- 5μA Low IQ
- 1A Load Current, 500mA trim version
- 260mΩ/120mΩ Rds(on) Internal Power MOSFETs
- High Efficiency from 100μA to 1A Load
- Power Save Mode in Light Load Condition
- 1.25MHz Switching Frequency
- T_{ON} Extension to Support Large Duty Cycle
- Power Good Indication
- EN shutdown discharge
- OCP and OVP Protection and Hiccup
- Fast Load Transient Response
- Stable with both large ESR capacitor and ceramic capacitor
- Output Adjustable from 0.6V
- Available in small QFN-8(1.5mmx2mm) package

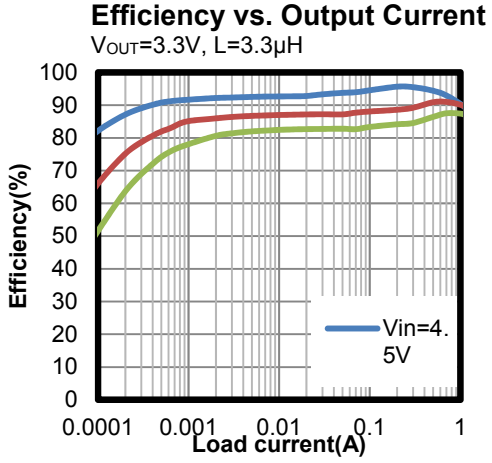
APPLICATIONS

- Home Automation, Home Security
- Single or Multi Cell Li-ion Battery System
- Multi Cell Dry Battery System
- 12V Input Power Rails
- White Goods

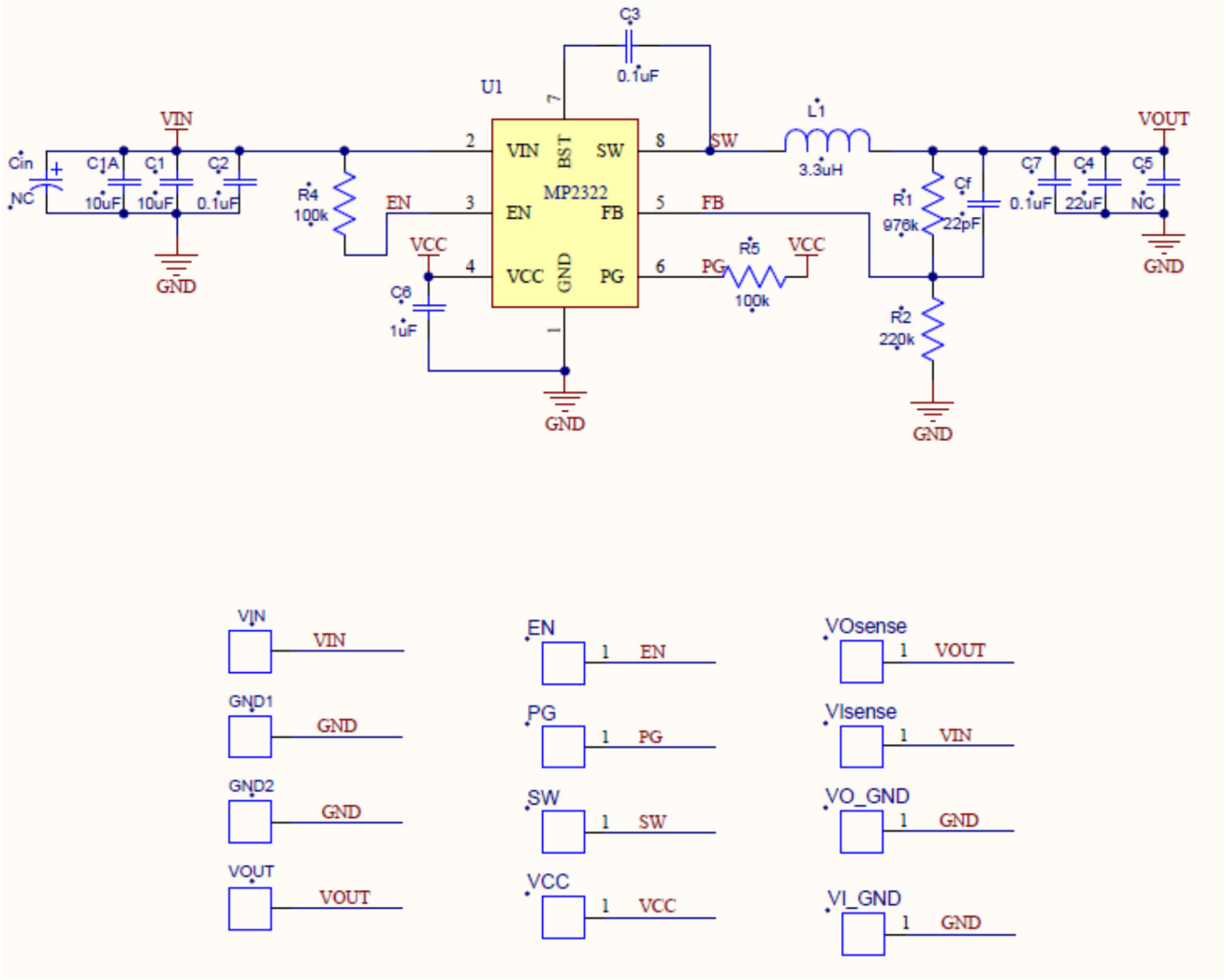
EV2322-D-00A EVALUATION BOARD

(L × W × H) 64mm × 48mm × 1.6mm

Board Number	MPS IC Number
EV2322-D-00A	MP2322GQH



EVALUATION BOARD SCHEMATIC



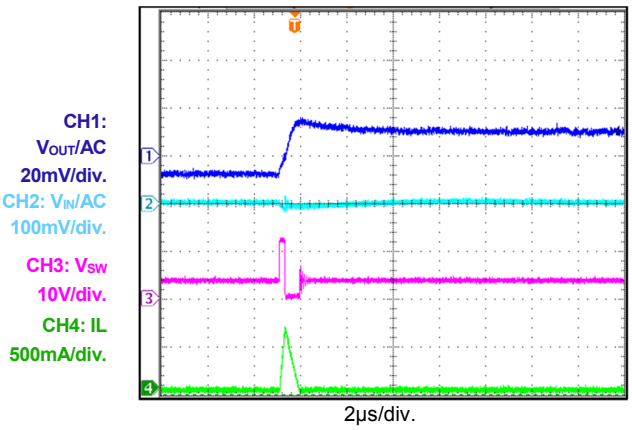
EV2322-D-00A BILL OF MATERIALS

Quantity	Designator	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C1A	10μF	Ceramic Cap.,25V,X5R	1206	Murata	GRM31CR61E106KA12L
3	C2, C3,C7	100nF	Ceramic Cap.,25V,X7R	0603	Murata	GRM188R71E104KA01D
1	C4	22μF	Ceramic Cap.,16V,X5R	1206	Murata	GRM31CR61C226ME15L
1	Cf	22pF	Ceramic Cap.,50V,COG	0603	Murata	GRM1885C1H220JA01D
1	C6	1μF	Ceramic Cap.,10V,X5R	0603	Murata	GRM188R61A105KA61D
1	R1	976K	Film Res,1%,0603,976K	0603	YAGEO	RC0603FR-07976KL
1	R2	220K	Film Res,1%,0603,220K	0603	YAGEO	RC0603FR-07220KL
2	R4, R5	100K	Film Res,1%,0603,100K	0603	YAGEO	RC0603FR-07100KL
8	1mm golden pin	φ1.0	φ1copper pin	DIP	N/A	φ1.0 copper pin
4	2mm golden pin	φ2.0	φ2.0copper pin	DIP	N/A	φ2.0 copper pin
1	L1	3.3μH	Inductor, DCR=9mohm, Isat=9A	7.0*6.9	Wurth	744314330
1	U1	MP2322	Synchronous step down convertor	QFN-8 (1.5mmx2mm)	MPS	MP2322

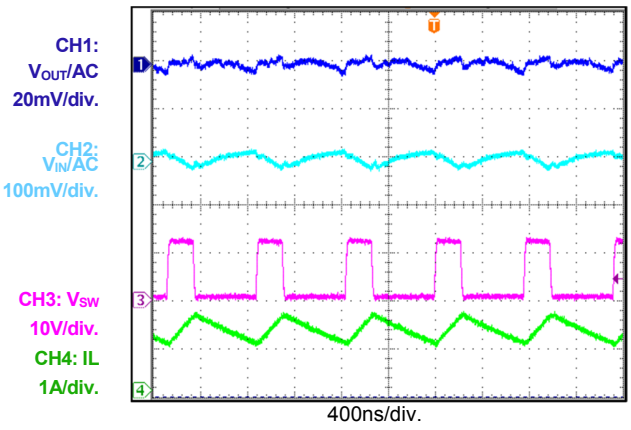
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.
V_{IN} = 12V, V_{OUT} = 3.3V, L = 3.3μH, T_A =25°C, unless otherwise noted.

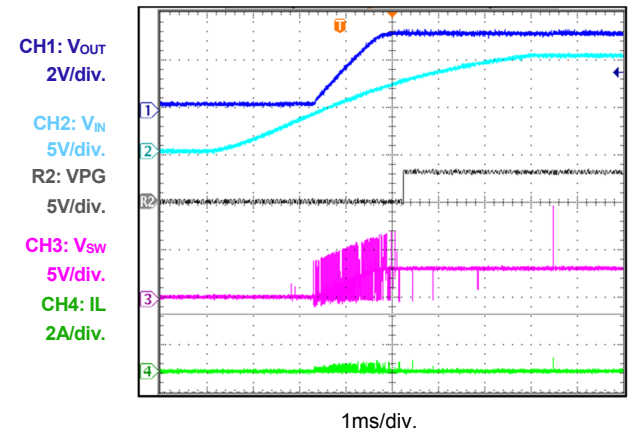
Input/Output Ripple
I_{OUT}=0A



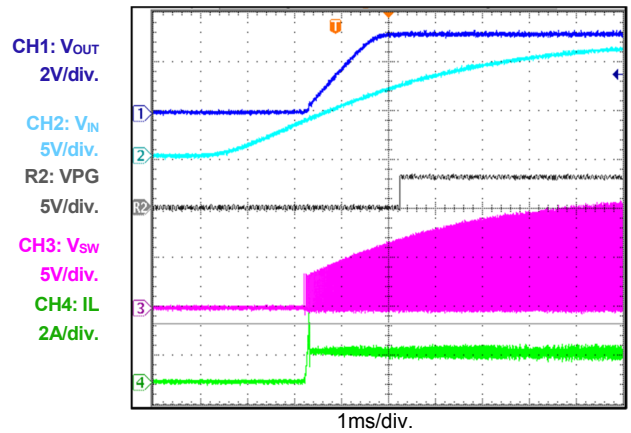
Input/Output Ripple
I_{OUT}=1A



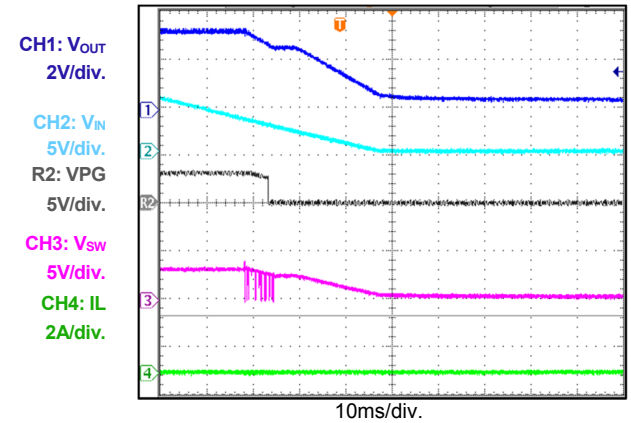
Start-up through Input Voltage
I_{OUT}=0A



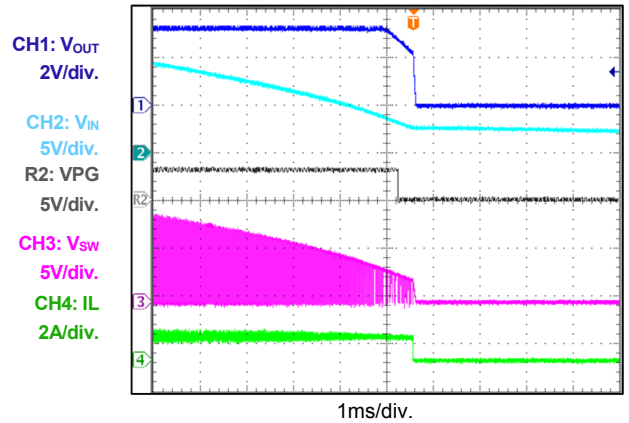
Start-up through Input Voltage
I_{OUT}=1A



Shutdown through Input Voltage
I_{OUT}=0A



Shutdown through Input Voltage
I_{OUT}=1A

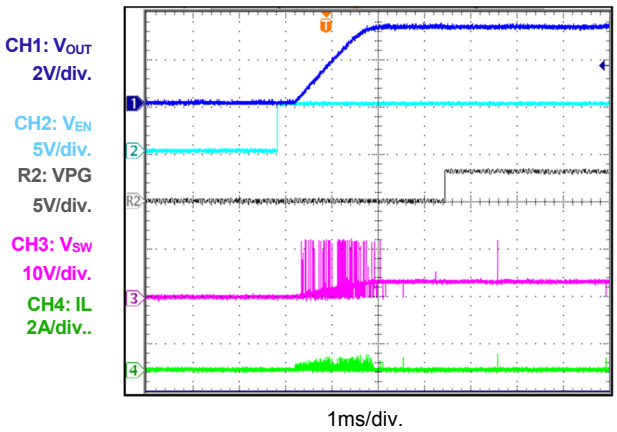


EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.
V_{IN} = 12V, V_{OUT} = 3.3V, L = 3.3µH, T_A =25°C, unless otherwise noted.

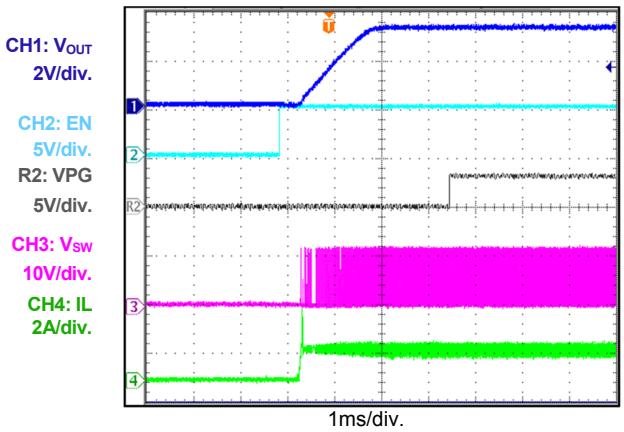
Start-up through EN

I_{OUT}=0A



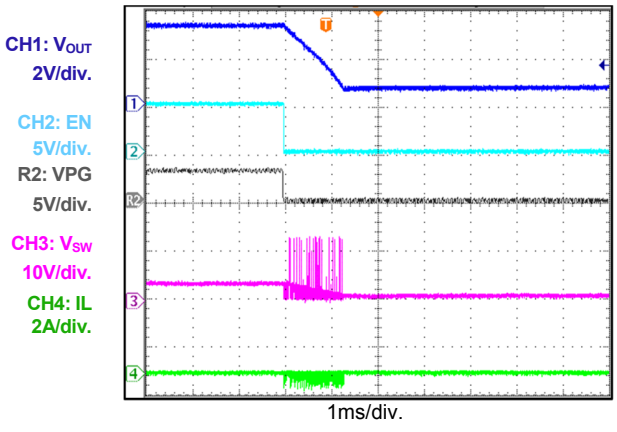
Start-up through EN

I_{OUT}=1A



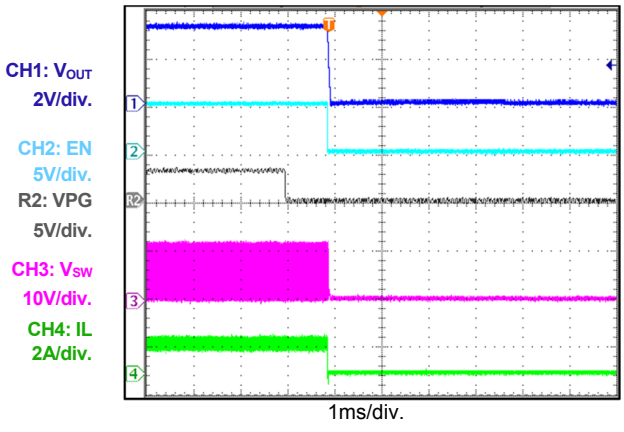
Shutdown through EN

I_{OUT}=0A

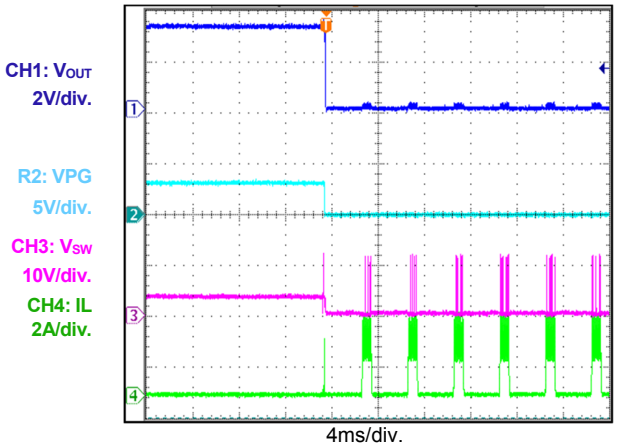


Shutdown through EN

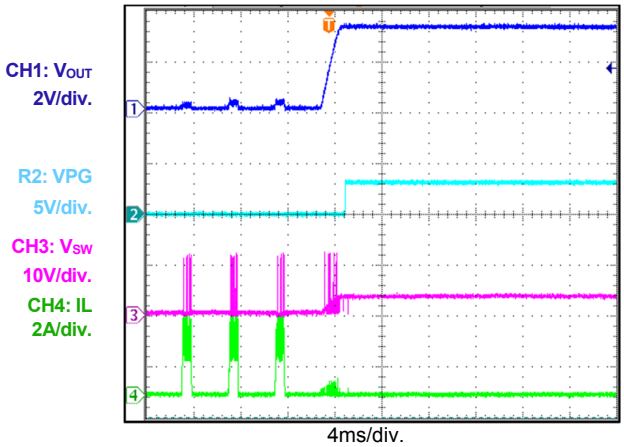
I_{OUT}=1A



Short Circuit Protection Entry



Short Circuit Protection Recovery

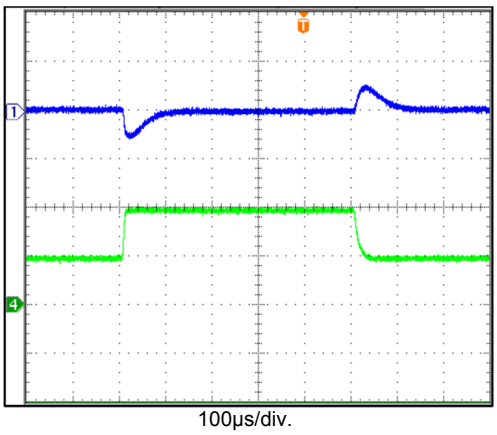


EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.
V_{IN} = 12V, V_{OUT} = 3.3V, L = 3.3µH, T_A =25°C, unless otherwise noted.

Load Transient Response

I_{OUT}=0.5A to 1A, 2.5A/µs



PRINTED CIRCUIT BOARD LAYOUT

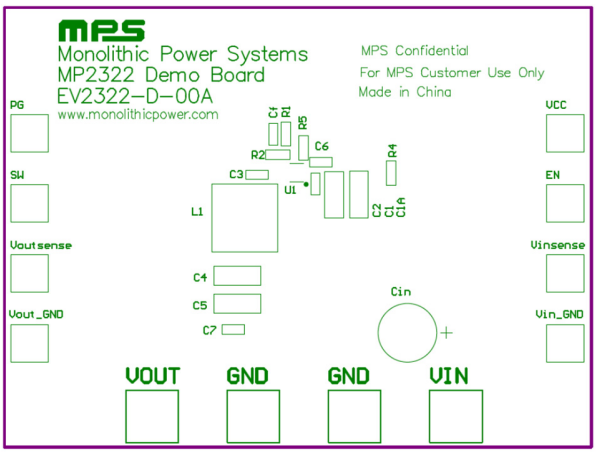


Figure 1: Top Silk Layer

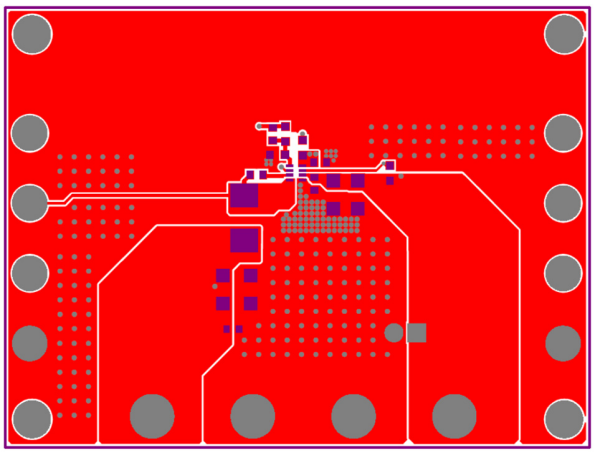


Figure 2: Top Layer

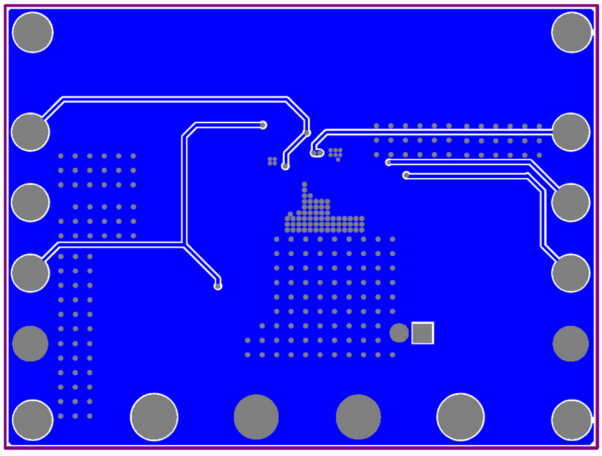


Figure 3: Bottom Layer

QUICK START GUIDE

1. Preset Power Supply to V_{IN} = 12V.
2. Turn Power Supply off.
3. Connect Power Supply terminals to:
    a. Positive (+): VIN
    b. Negative (–): GND
4. Connect Load to:
    a. Positive (+): VOUT
    b. Negative (–): GND
5. Turn Power Supply on after making connections. The board will automatically start up.