Enpirion® Power Evaluation Board

EN6362 PowerSoC

Evaluation Board User Guide

Table of Contents

Silicon revision

The silicon presented in this User Guide is ES1.

Description

The EN6362QI is a Power System on a Chip (Power SoC) DC to DC converter with an integrated inductor, PWM controller, MOSFETs and compensation to provide the smallest solution size in an 8x8x3mm 56 pin QFN module.

Required Equipment

No.#	Equipment	Minimum Spec
1	DC power supply	10V/10A, adjustable
2	Electronic Load	10V/20 with dynamic load capabilities
3	DMM	-
4	Oscilloscope	-
5	Cables	>10A capability, banana terminal

Evaluation Board Overview

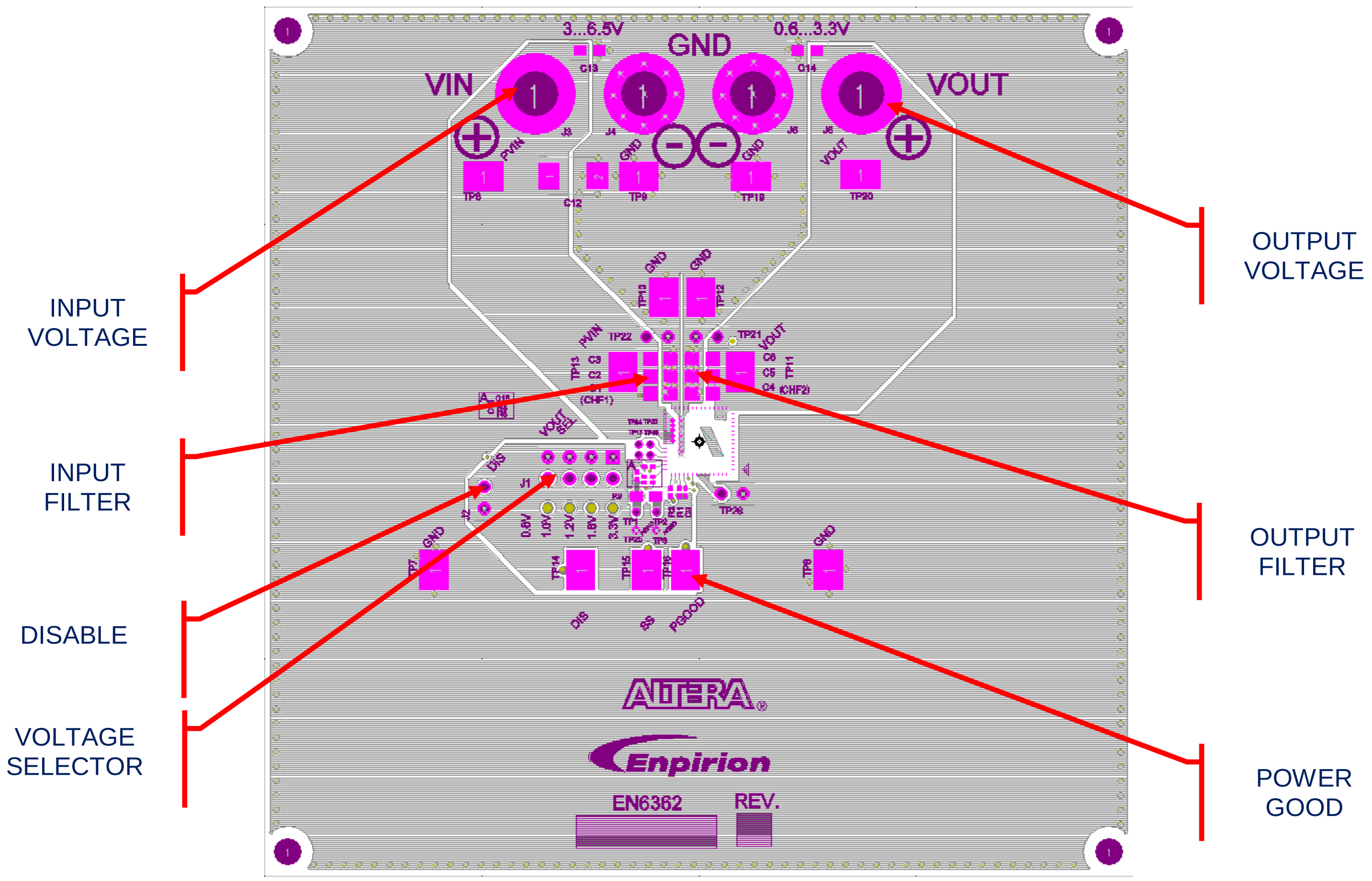


Figure 1: EN6362 Evaluation Board Illustration (Top Layer)

Instructions

Warning:

Incorrect polarity of the power supply may cause permanent damage!

Warning:

Power supply voltage above 7V may cause permanent damage!

Warning:

Do NOT hot-plug the board; the resulting overvoltage may cause permanent damage!

1) Connecting the power supply

- Set the Power Supply to 5V/10A
- Connect the power supply to the board (make sure that the power supply is OFF) with two patch cables, not longer than 12 inch (30cm). Using longer wires is possible, provided that additional bulk is added to the board and the input voltage is monitored at the board level. Please use INPUT GROUND and INPUT VOLTAGE jacks to connect the power.
- Please observe the correct polarity.

2) Connecting the load

- Connect the load to the OUTPUT GROUND and OUTPUT voltage with patch cables, no longer than 12 inches (30cm).
- Please observe the correct polarity.

3) Jumper Setting

- The board will arrive with NO jumper on the J2 and one jumper on J1, in the 1V0 position. Connecting more than one jumper on J1 will not damage the board – just drive the output voltage higher.

4) Power-up the board

- After all preparations above, the board should be ready to perform.

Note: **To measure the Bode Plot of the DC-DC converter, R9 must be replaced with 50Ω, while TP1, 2 and 3 should be used to connect the probes of the phase analyzer.**

Evaluation Board Schematic

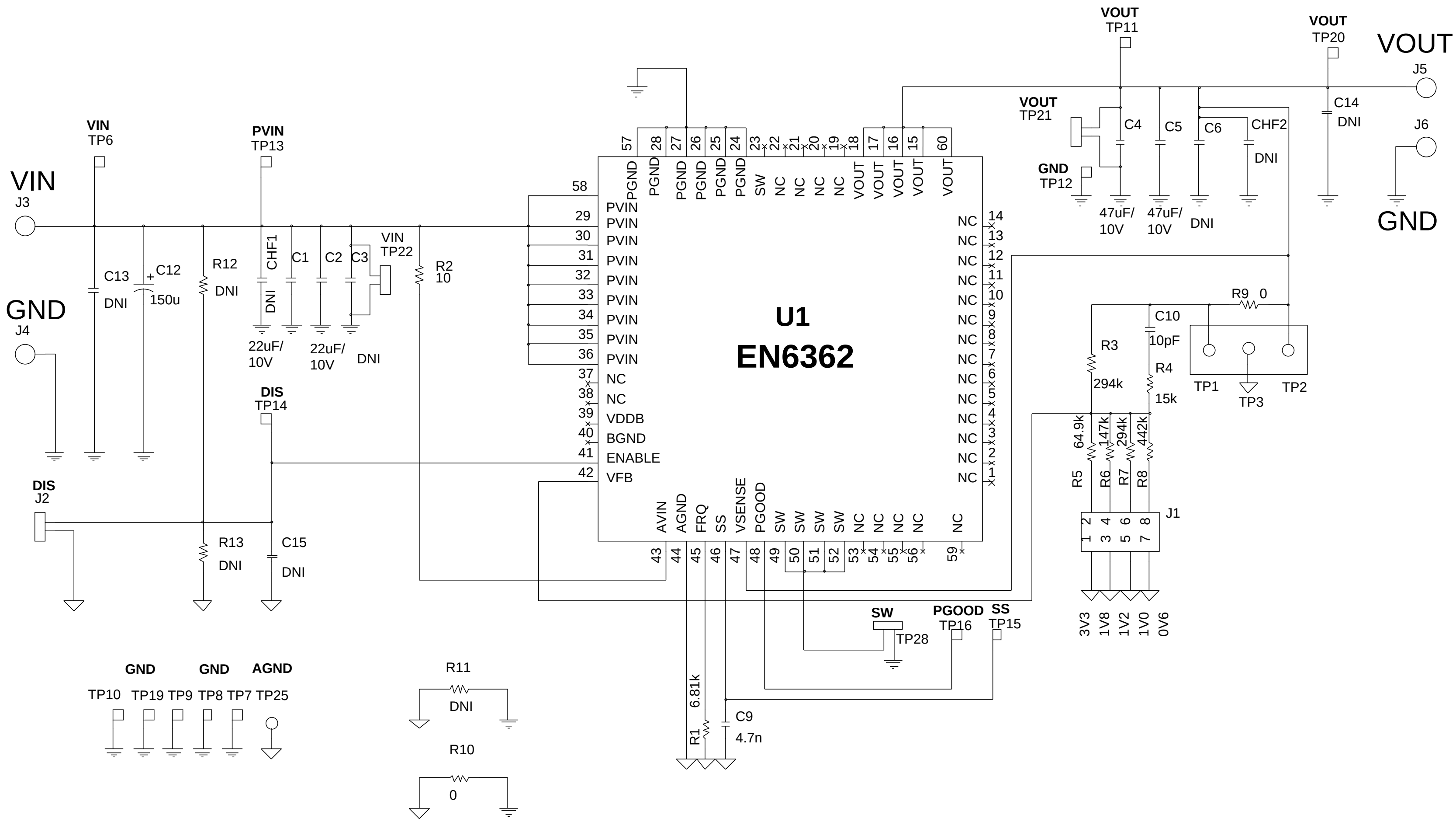


Figure 2: Evaluation Board Schematic

Bill of Materials

Designator	Qty	Description
C1,C2	2	22µF/10V
C9	1	4.7nF
C10	1	10pF
C4, C5	1	47µF/10V
C12	1	150µF
R1	1	6.81kΩ
R2	1	10Ω
R3,R7	2	294kΩ
R4	1	15kΩ
R5	1	64.9kΩ
R6	1	147kΩ
R8	1	442kΩ
R9, R10	2	0Ω
U1	1	EN6362QI

Typical Performance

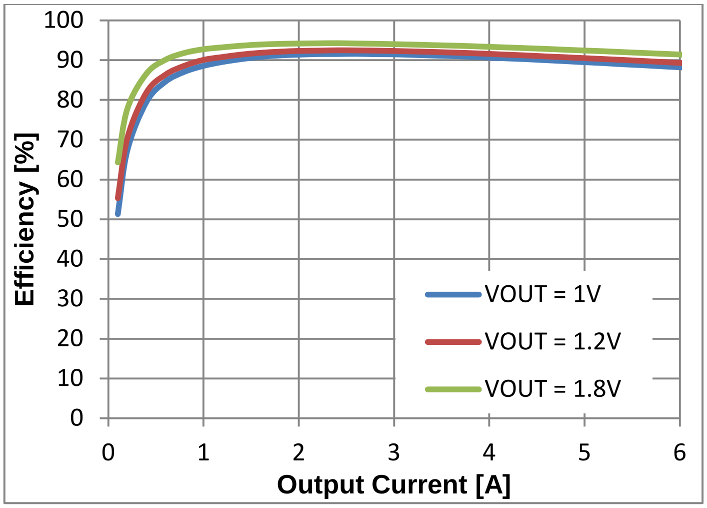


Figure 3: Efficiency – V_{IN} = 3.3V

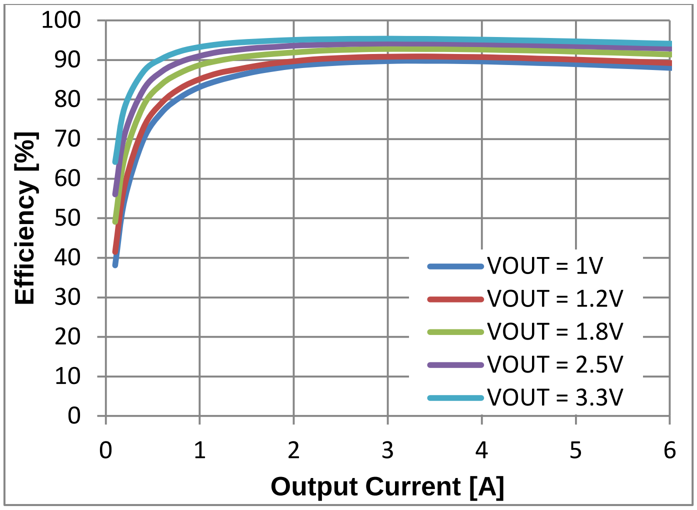


Figure 4: Efficiency – V_{IN} = 5V

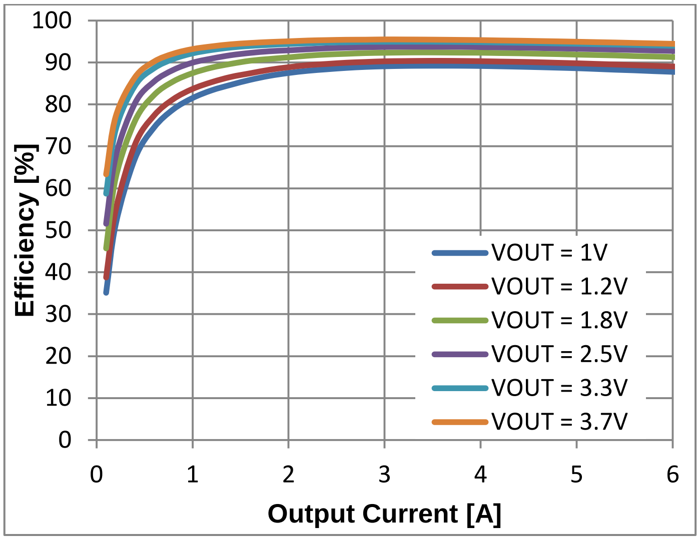


Figure 5: Efficiency – V_{IN} = 5.5V

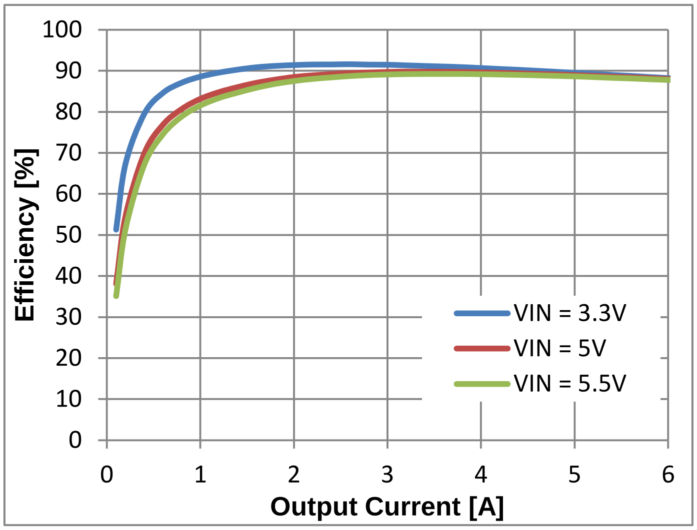


Figure 6: Efficiency – V_{OUT} = 1V

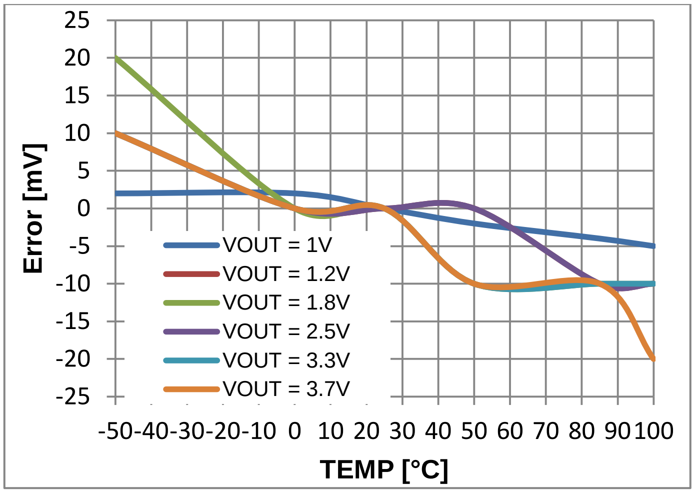


Figure 7 V_{OUT} vs.Temperature (NO load)

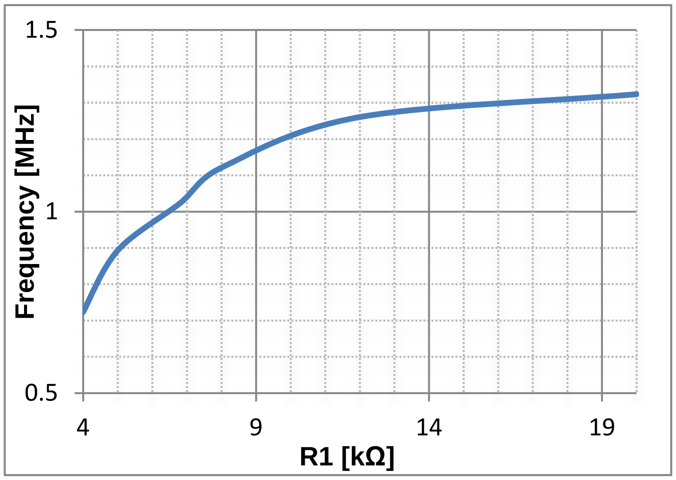


Figure 8: Frequency vs. R1

Typical Performance Curves (Continued)

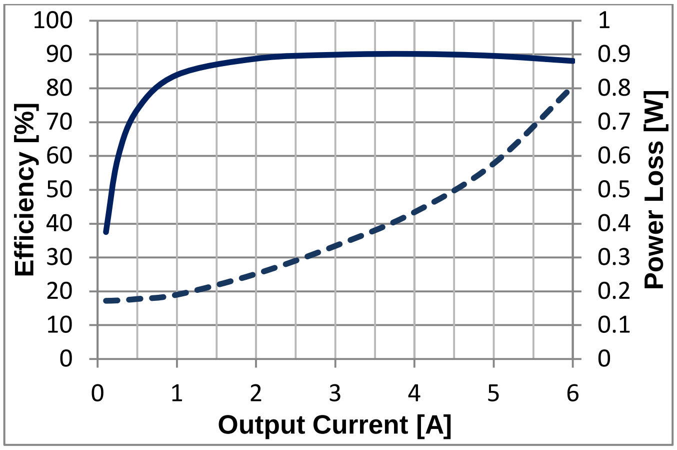


Figure 9: Efficiency for $V_{IN} = 6V$, $V_{OUT} = 1V$, f = 0.7MHz

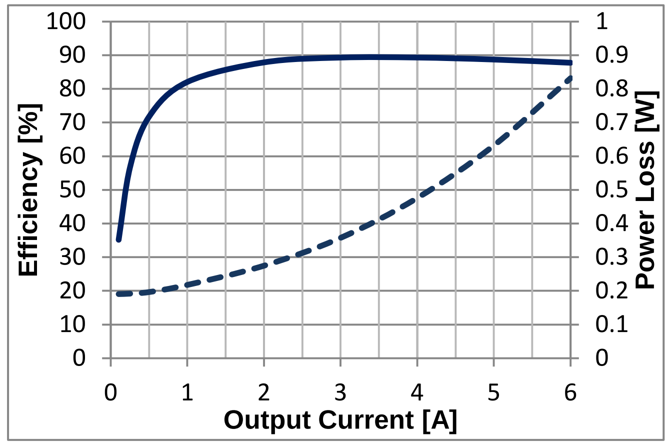


Figure 10: Efficiency for $V_{IN} = 6V$, $V_{OUT} = 1V$, f = 1MHz

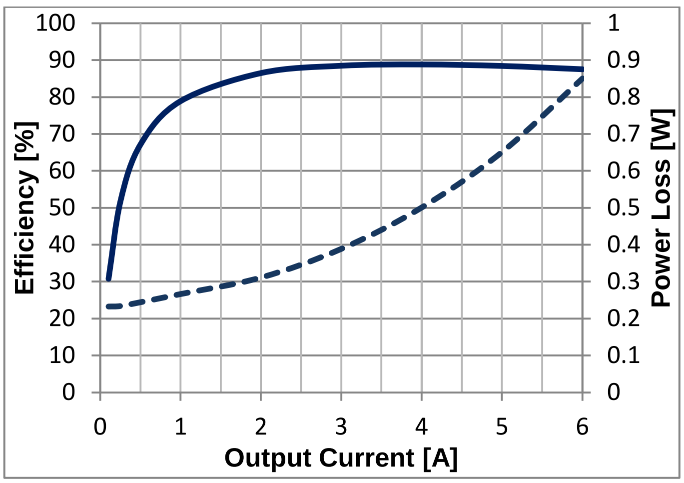


Figure 11: Efficiency for $V_{IN} = 6V$, $V_{OUT} = 1V$, f = 1.4MHz

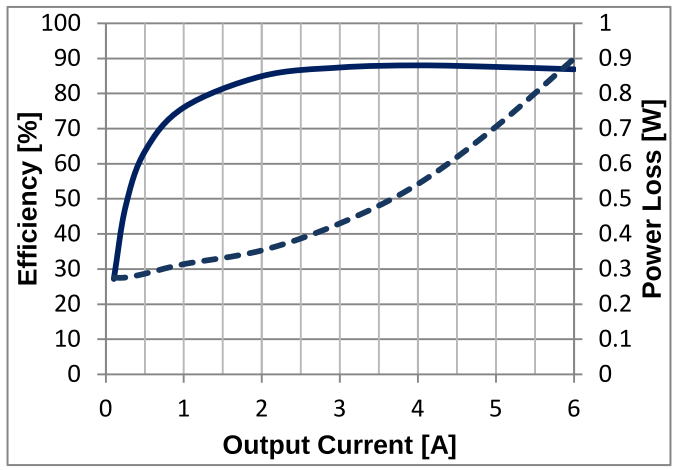


Figure 12: Efficiency for $V_{IN} = 6V$, $V_{OUT} = 1V$, f = 1.7MHz

Typical Performance Characteristics

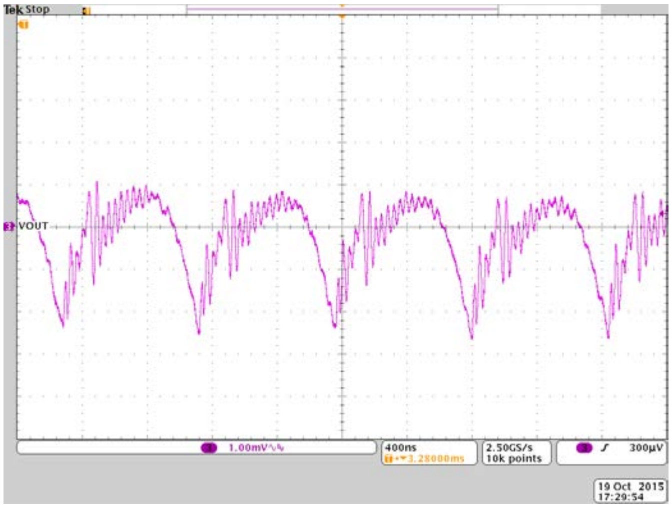


Figure 13: Output ripple V_{IN} = 5V, V_{OUT} = 1V

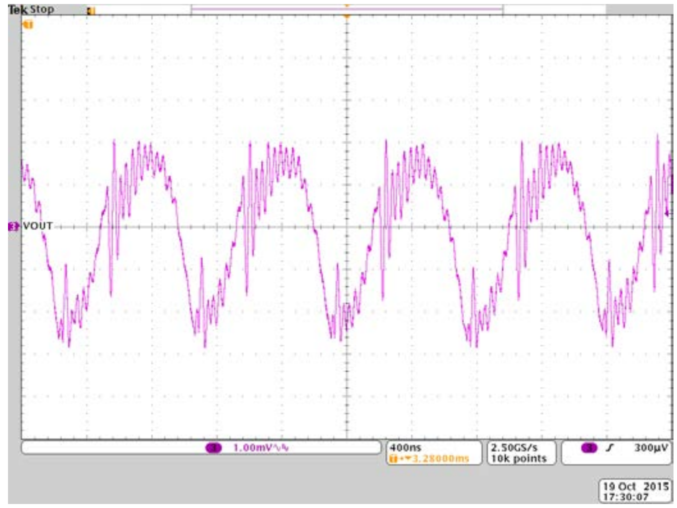


Figure 14: Output ripple V_{IN} = 5V, V_{OUT} = 1.8V

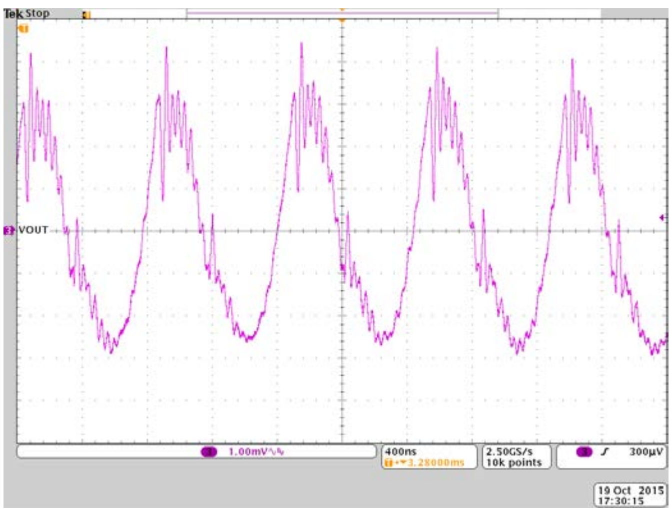


Figure 15: Output ripple V_{IN} = 5V, V_{OUT} = 3.3V

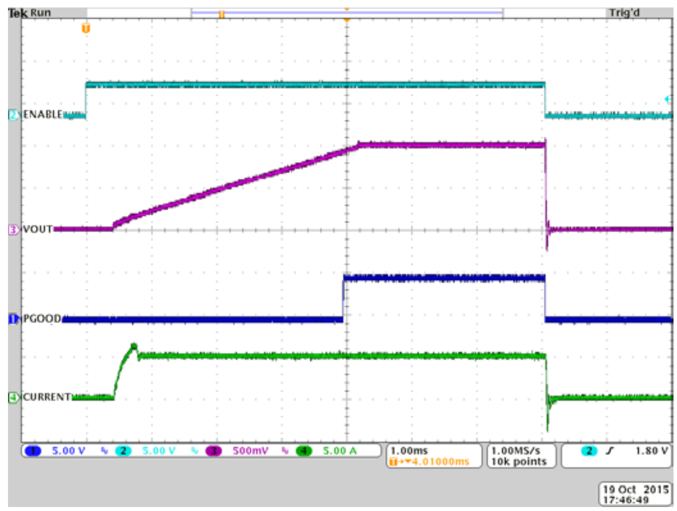


Figure 16: Startup V_{IN} = 5V, V_{OUT} = 1V, I_L = 6A

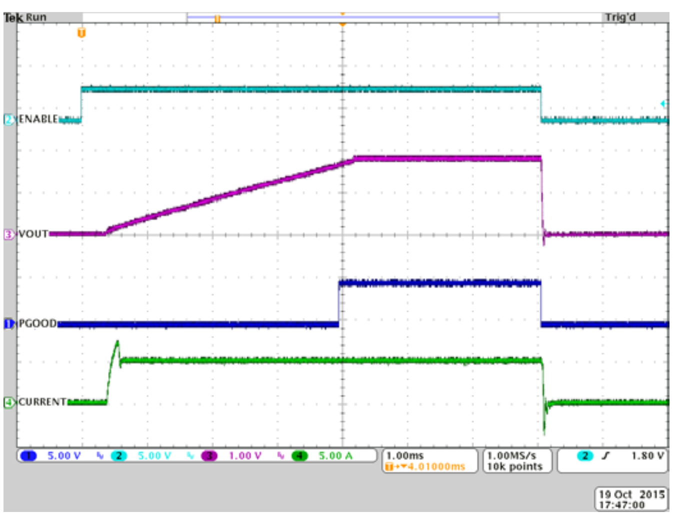


Figure 17: Startup V_{IN} = 5V, V_{OUT} = 1.8V, I_{LOAD} = 6A

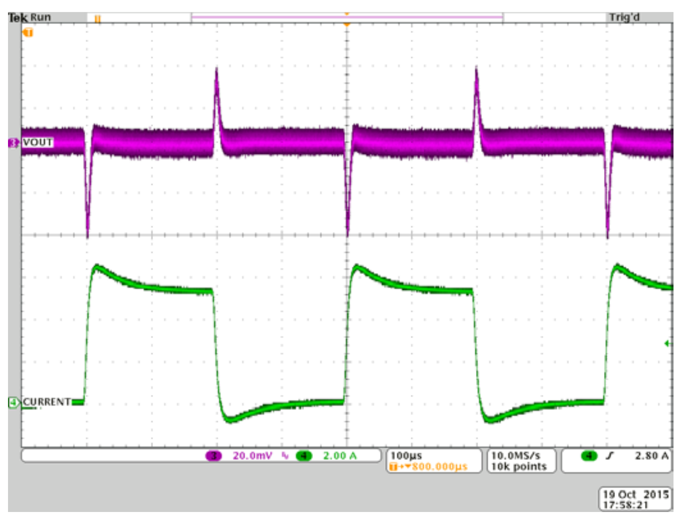


Figure 18:0/6A load transient

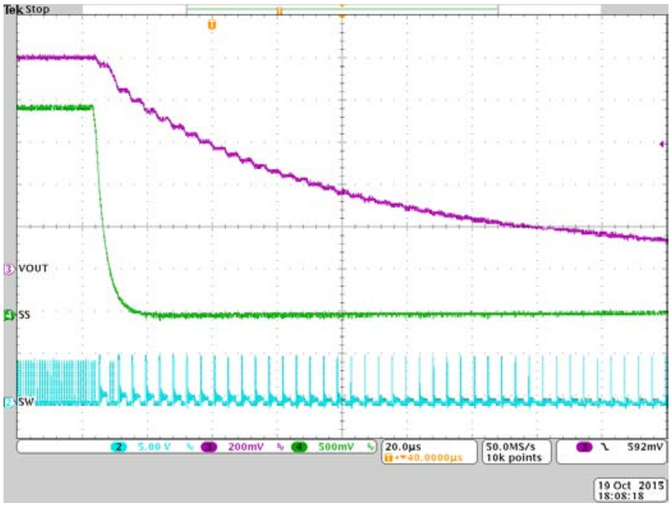


Figure 19: RCL protection activated by forcing the SS pin

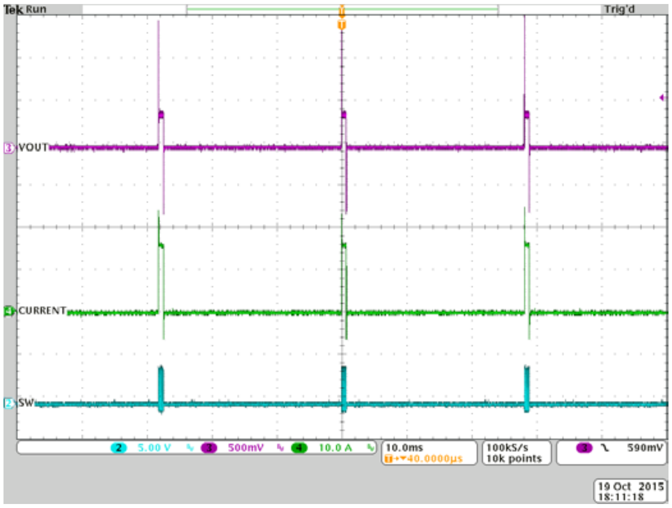
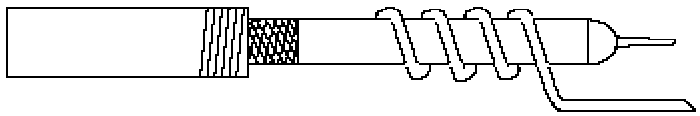


Figure 20: Hiccup mode during short-circuit protection

Test Recommendations

In order to get accurate measurements for sensitive nodes, small loop area (small antennae) are recommended. Besides the built-in low inductance of the ground, the small loop area will collect less EMI than the standard oscilloscope ground cables.



The EVAL board provides ***3 test-points suitable*** for connecting the oscilloscope probe as described above; these are:

- **TP28** – for the Switch Node (SW)
- **TP21** – for the Output Voltage (V_{OUT})
- **TP22** – for the Input Voltage (V_{IN}).

Contact Information

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