



Application Note

EN5310DC-E Evaluation Board

Turn On Procedure

The Enpirion evaluation board has convenient banana plug connections for input and output power. Follow the procedure below to power up the circuit.

1. Verify that the input power source is turned OFF.
2. Connect the input power to J1 (+) and J2 (-). See board layout drawings below.
3. Connect the load to J4 (+) and J3 (-). Verify that the load is set for 0A.
4. Verify the S1 DIP switch settings per your requirements using Table 1 and Table 2 below.

Enable

Switch S1 position 7 should be in the OFF position. This enables the device. Placing this switch in the ON position pulls the ENABLE pin low and disables the device.

Soft Start

Switch S1 position 8 should be in the OFF position. This allows the internal soft start circuit to charge the soft start capacitor. Placing this switch in the ON position puts a short across the soft start capacitor and disables the device.

5. Apply input power and load as required.

Note: ON = up position as per Board Layout drawings which follow.

Table 1: Output Voltage Programming

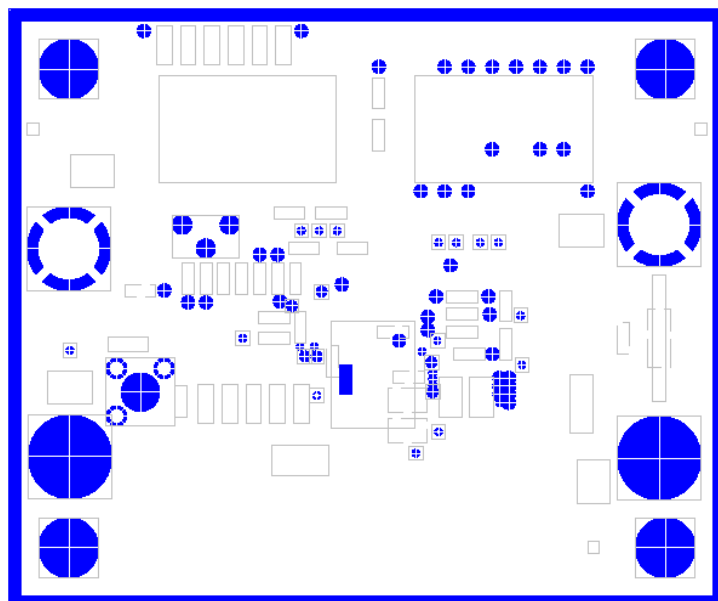
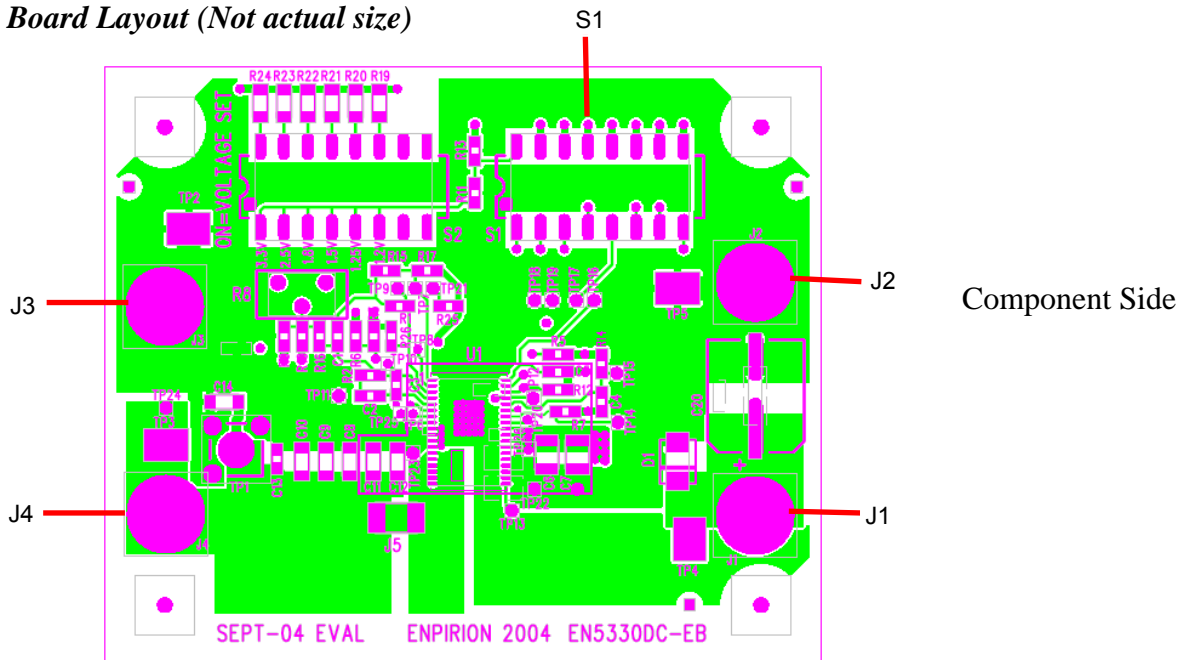
Voltage Programming Selection				
S1 Position	1 (VS0)	2 (VS1)	3 (VS2)	Output Voltage
	ON	ON	ON	3.3V
	OFF	ON	ON	2.5V
	ON	OFF	ON	1.8V
	OFF	OFF	ON	1.5V
	ON	ON	OFF	1.25V
	OFF	ON	OFF	1.2V
	ON	OFF	OFF	0.8V
	OFF	OFF	OFF	External Feedback

Table 2: Miscellaneous Switch Settings

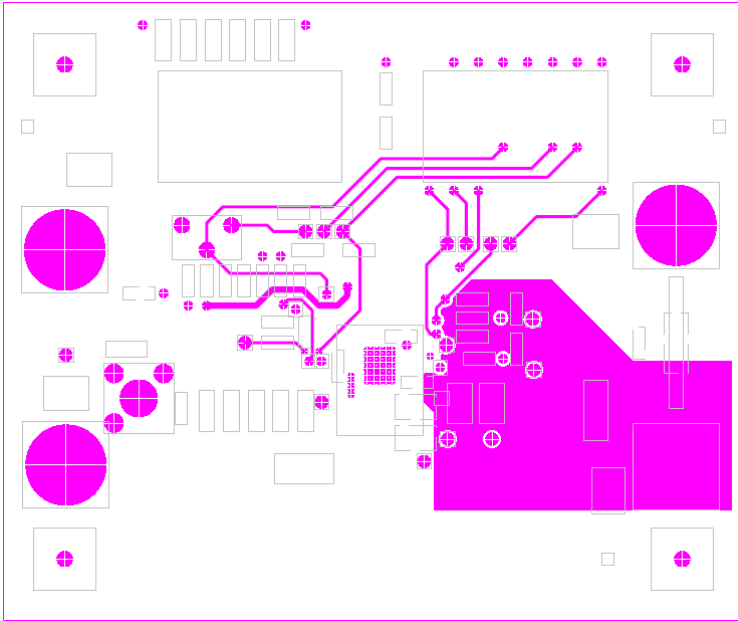
Switch S1 Position	Function	Switch Setting
1	VS0	See Table 1
2	VS1	See Table 1
3	VS2	See Table 1
4	RESERVED	OFF ¹
5	RESERVED	OFF ¹
6	RESERVED	OFF ¹
7	ENABLE	OFF ¹
8	Soft Start	OFF ¹

Note 1: For the converter to operate, these switches **MUST** be in the OFF position.

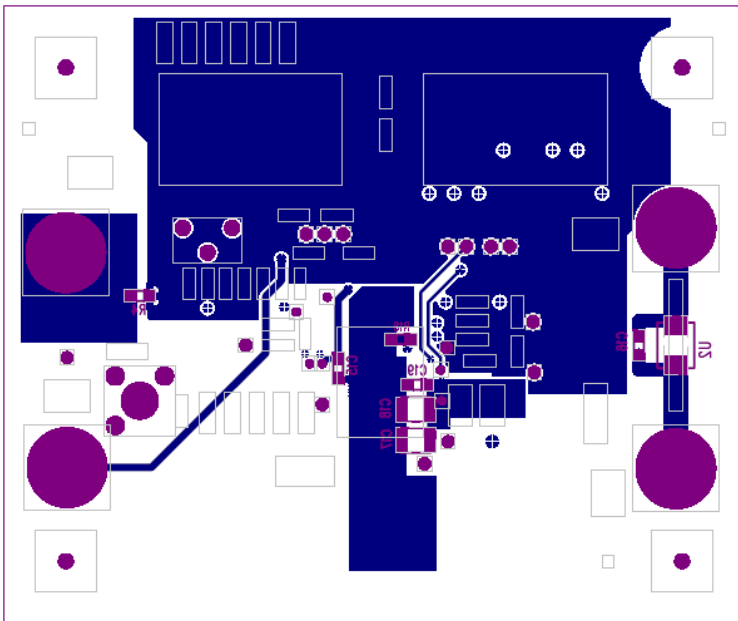
Board Layout (Not actual size)



Internal layer 1
Ground Plane
Note that this is a negative image:
White = Copper
Blue = Void



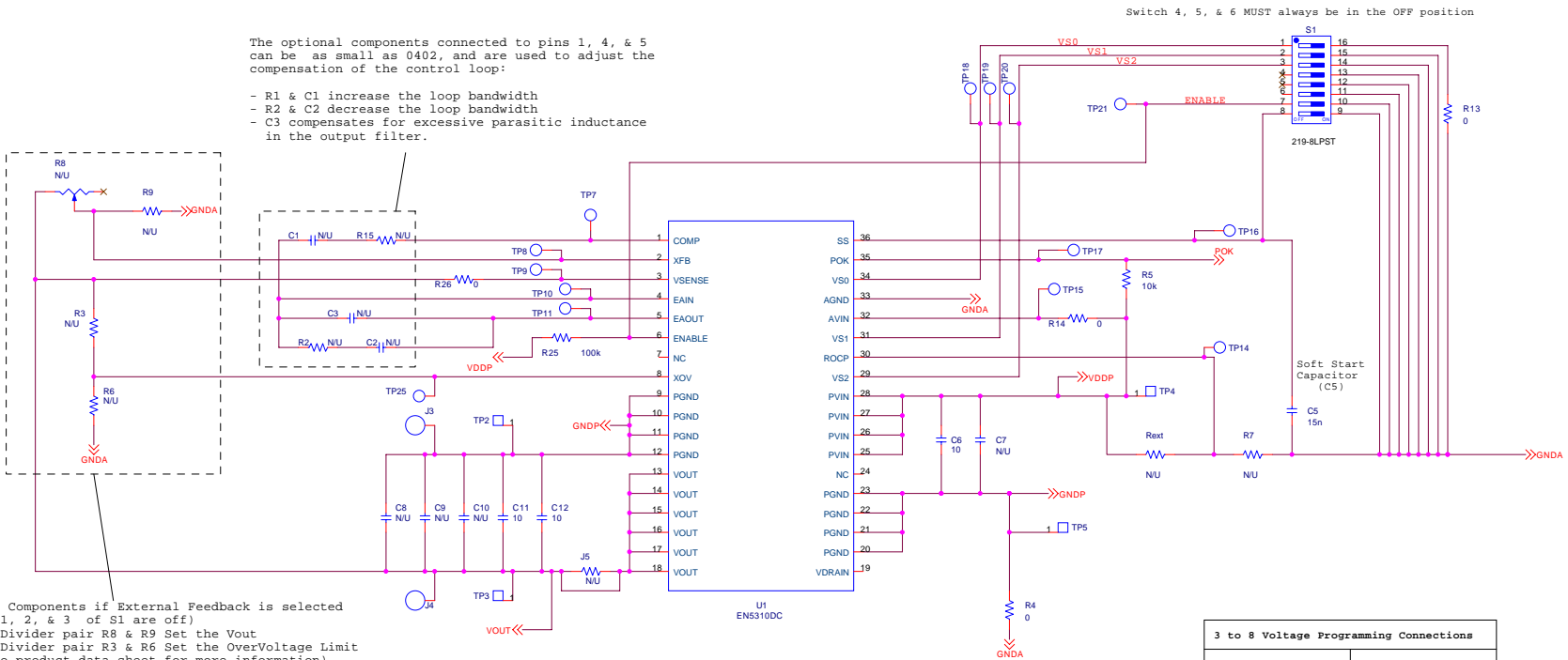
Internal Layer 2



Solder Side

The optional components connected to pins 1, 4, & 5 can be as small as 0402, and are used to adjust the compensation of the control loop:

- R1 & C1 increase the loop bandwidth
- R2 & C2 decrease the loop bandwidth
- C3 compensates for excessive parasitic inductance in the output filter.



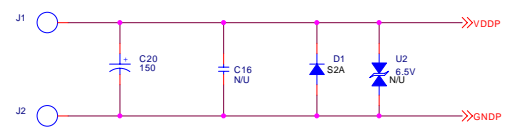
Optional Components if External Feedback is selected (Switch 1, 2, & 3 of S1 are off)
 Voltage Divider pair R8 & R9 Set the Vout
 Voltage Divider pair R3 & R6 Set the OverVoltage Limit
 (Refer to product data sheet for more information)

Switch 4, 5, & 6 MUST always be in the OFF position

3 to 8 Voltage Programming Connections	
S1 Switch Position	Output Voltage
U U U	3.3V
D U U	2.5V
U D U	1.8V
D D U	1.5V
U U D	1.25V
D U D	1.2V
U D D	0.8V
D D D	External Divider*

U = Up = Switch Closed, Signal Connect to GND
 D = Down = Switch Open
 * Requires installation of external resistor divider (R8&R9)

INPUT PROTECTION



Recommendations

To guarantee measurement accuracy, the following precautions should be observed:

1. Make all input and output voltage measurements at the board using the test points provided. This will eliminate voltage drop across the line and load cables that can produce false readings.
2. Measure input and output current with series ammeters or accurate shunt resistors. This is especially important when measuring efficiency.
3. Use a balanced impedance probe tip to measure switching signals to avoid noise coupling into the probe ground lead. A footprint for a connector of this type is included on the board for output ripple and noise measurement. The footprint is for Tektronix test jack part number 131-4353-00.
4. Verify that the input source is capable of providing the necessary input current. Remote sensing may be necessary to maintain the input voltage at the board.
5. When testing low voltage outputs ($\leq 1.5V$) the load may have to be configured to sense the output voltage at the board instead of at the load. High currents can cause significant voltage drop across load cables, and many electronic loads behave poorly when the load terminal voltage goes too low.



When using an electronic load set to constant current mode, the load current may overshoot significantly at turn on, potentially activating protection circuitry in the EN5330DC and causing output voltage glitches. If this situation is encountered, set the load to resistive mode and try it again. Better yet, use a discrete load resistor if possible.

Contact Information

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