

ISL85402EVAL2Z Evaluation Board Setup Procedure

The ISL85402EVAL2Z board is used to demonstrate the compact size and operations of synchronous buck using ISL85402.

The ISL85402 supports an input voltage range of 3V to 36V. Note that the input voltage of this board is limited by the input capacitor C2(25V rating). When an input voltage higher than 20V is desired, replace C2 with capacitors with higher voltage ratings.

The output voltage is set to 5V and can be changed by voltage feedback resistors. Note that in order to change to a higher output voltage, the output capacitors' voltage ratings have to be checked.

The board output current is 2A typical. The board is set to a default overcurrent threshold of 3.6A. the OC threshold can be programmed by a resistor at the ILIMIT pin.

The ISL85402EVAL2Z board has configuration options of forced PWM mode or PFM mode.

The board is set to a default frequency of 500kHz. The frequency can be programmed by a resistor at R1.

The board can be synchronized to external clock. Multiple ISL85402EVAL2Z boards can be synchronized simply by connecting their SYNC pins together.

Recommended Equipment

- 0V to 36V power supply with at least 5A source current capability
- Load capable of sinking current up to 3A
- Multimeters
- Oscilloscope

Quick Startup

1. Connect test point MODE to ground when forced PWM mode (no PFM) is desired; leave MODE floating if PFM mode is desired.
2. Connect the power source to the input terminals VIN+ and VIN-. Connect the load terminals to the buck outputs VO+ and VO-. Make sure the setup is correct prior to applying any power or load to the board.
3. Adjust the power source to 12V and turn it on.
4. Verify the output voltage is 5V and use oscilloscope to monitor the phase node waveforms.

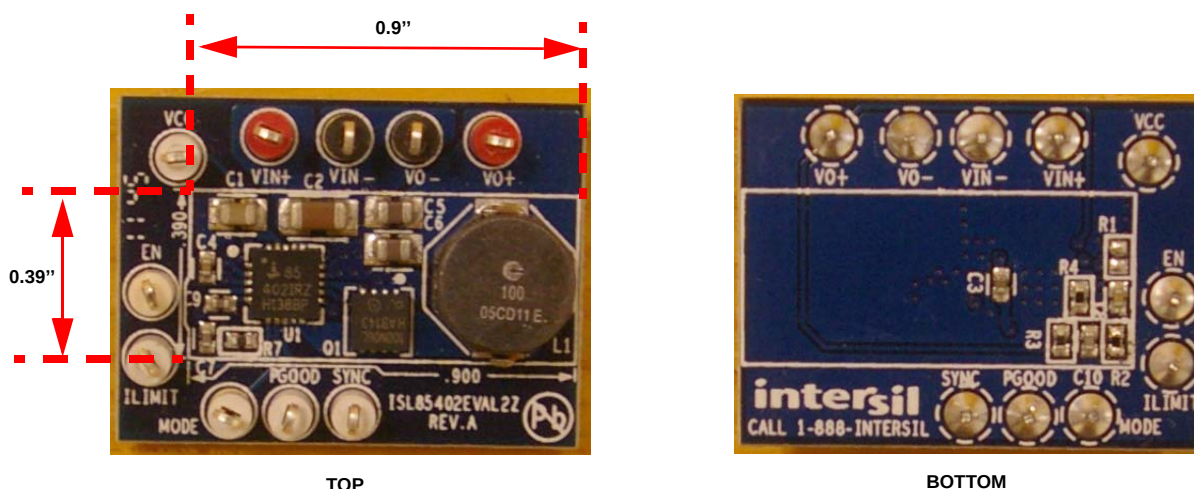


FIGURE 1. ISL85402EVAL2Z BOARD IMAGE

Application Note 1766

TABLE 1. CONNECTORS/TEST POINTS DESCRIPTIONS

TEST POINT	DESCRIPTION
VIN+	Positive terminal of buck inputs.
VIN-	Ground terminal of buck inputs.
VO+	Positive terminal of buck outputs.
VO-	Ground terminal of buck outputs.
VCC	Test point to monitor the VCC.
EN	Use this connector to control IC ON/OFF.
ILIMIT	Use it to set up the overcurrent limit threshold. With the ILIMIT pin connected to VCC or GND, or left open, the IC has a default 3.6A OC threshold. The OC threshold can be programmed by a resistor from the ILIMIT pin to ground.
MODE	Mode setup connector. Connecting the MODE pin to GND will set the IC in forced PWM mode; leaving the MODE pin open or connected to VCC will set the IC to have PFM available under light load conditions. The IC's default PFM current threshold is 0.7A. R16 is a placeholder for a resistor to program the PFM current threshold.
PGOOD	Test point to monitor PGOOD.
SYNC	Used for synchronization configuration. Option 1: to apply external clock for the IC to be synchronized with. Option 2: to synchronize multiple ISL85402s, simply connect the SYNC pins together.

ISL85402EVAL2Z Board Schematic

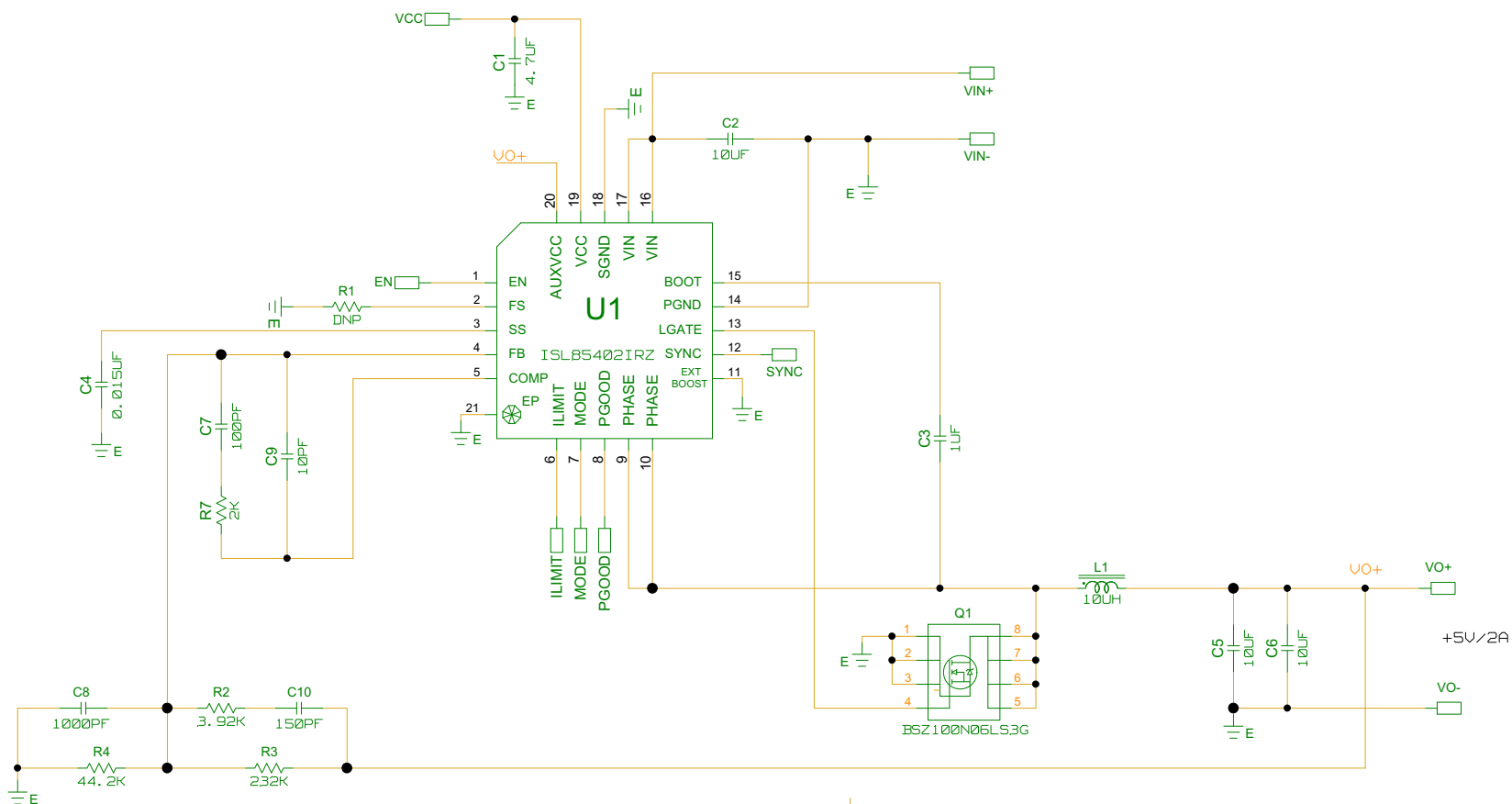


FIGURE 2. ISL85402EVAL2Z BOARD SCHEMATIC

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TABLE 1. BILL OF MATERIALS

REF DES	PART NUMBER	QTY	DESCRIPTION	MANUFACTURER
C9	C0402COG500-100JNE	1	CAP, SMD, 0402, 10pF, 50V, 5%, NP0, ROHS	VENKEL
C7	VARIOUS	1	CAP, SMD, 0402, 100pF, 25V, 10%, COG, ROHS	VARIOUS
C3	ECJ-OEB0J105M	1	CAP, SMD, 0402, 1μF, 6.3V, 20%, X5R, ROHS	PANASONIC
C10	VARIOUS	1	CAP, SMD, 0402, 150pF, 50V, 5%, NP0, ROHS	VARIOUS
C4	VARIOUS	1	CAP, SMD, 0402, 0.015μF, 16V, 10%, X7R, ROHS	VARIOUS
C8	VARIOUS	1	CAP, SMD, 0402, 1nF, 25V, 10%, X7R, ROHS	VARIOUS
C5,C6	VARIOUS	2	CAP, SMD, 0805, 10μF, 6.3V, 10%, X5R, ROHS	VARIOUS
C1	0805ZD475KAT2A	1	CAP, SMD, 0805, 4.7μF, 10V, 10%, X5R, ROHS	AVX
C2	TMK316B7106KL-TD	1	CAP, SMD, 1206, 10μF, 25V, 10%, X7R, ROHS	TAIYO YUDEN
L1	SD8350-100-R	1	COIL-PWR INDUCTOR, SMD, 9.5X8.3, 10μH, 20%, 4A, 31.4mΩ, ROHS	COILTRONICS
U1	ISL85402IRZ	1	IC-SWITCHING REGULATOR, 20P, QFN, 4X4, ROHS	INTERSIL
Q1	BSZ100N06LS3G	1	TRANSIST-MOS, N-CHANNEL, 8P, PG-TSDSON-8, 60V, 20A, ROHS	INFINEON TECHNOLOGY
R2	VARIOUS	1	RES, SMD, 0402, 3.92k, 1/16W, 1%, TF, ROHS	VARIOUS
R3	VARIOUS	1	RES, SMD, 0402, 232k, 1/16W, 1%, TF, ROHS	VARIOUS
R7	VARIOUS	1	RES, SMD, 0402, 2k, 1/16W, 1%, TF, ROHS	VARIOUS
R4	ERJ-2RKF4422X	1	RES, SMD, 0402, 44.2k, 1/16W, 1%, TF, ROHS	VARIOUS
R1	N/A	0	RES, SMD, 0402, DNP, DNP, DNP, TF, ROHS	N/A

Board Layouts

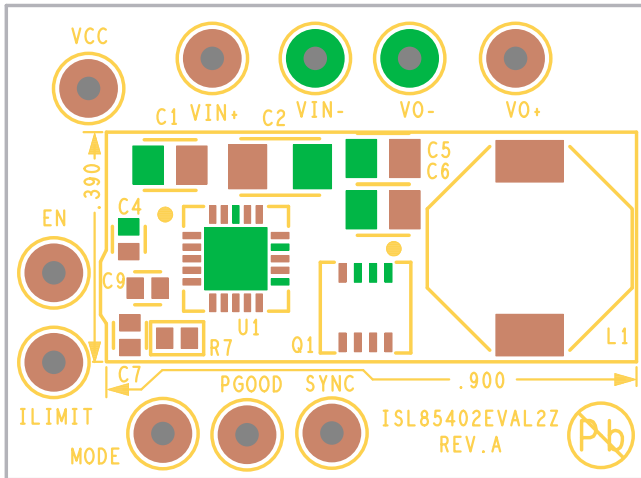


FIGURE 3. SILKSCREEN TOP COMPONENTS

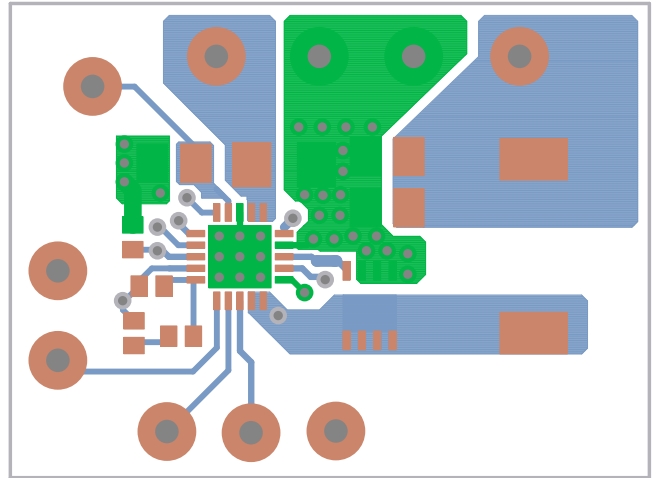


FIGURE 4. TOP LAYER

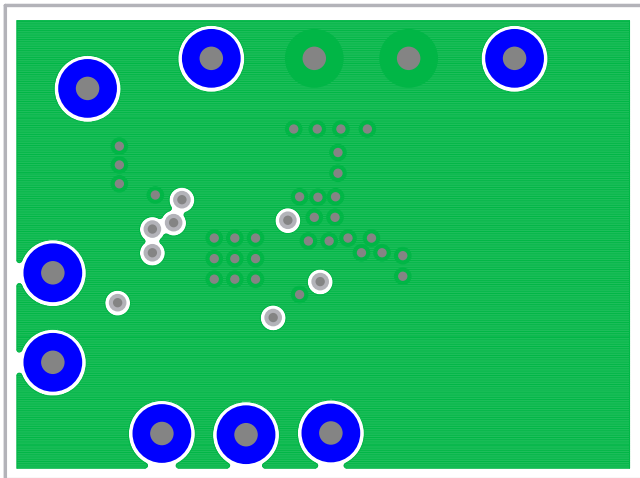


FIGURE 5. 2nd LAYER

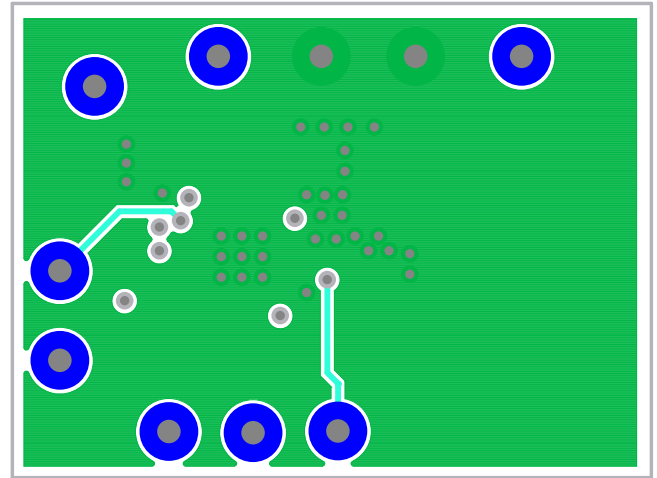


FIGURE 6. 3rd LAYER

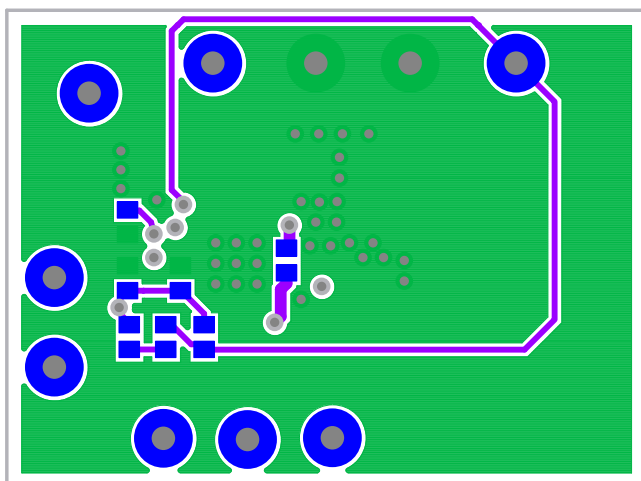


FIGURE 7. BOTTOM LAYER

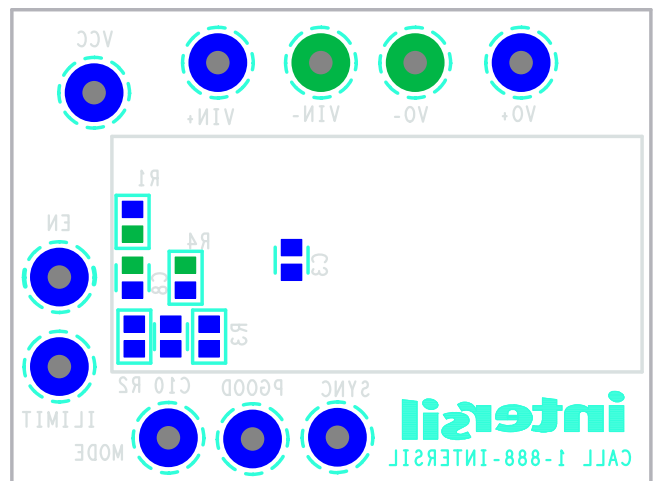


FIGURE 8. SILKSCREEN BOTTOM COMPONENTS

Board Layouts (Continued)

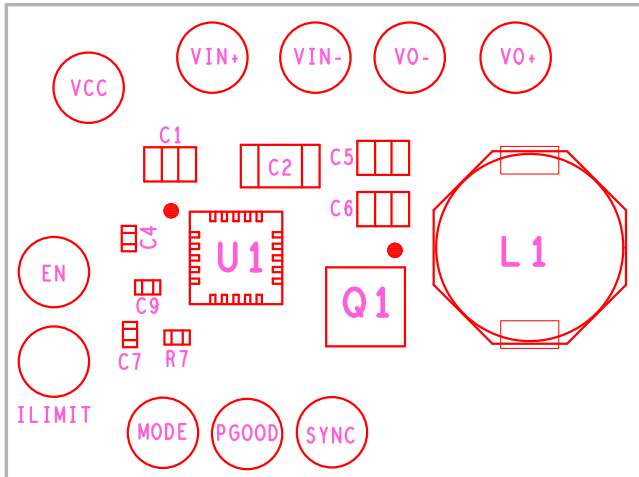


FIGURE 9. TOP COMPONENT ASSEMBLY

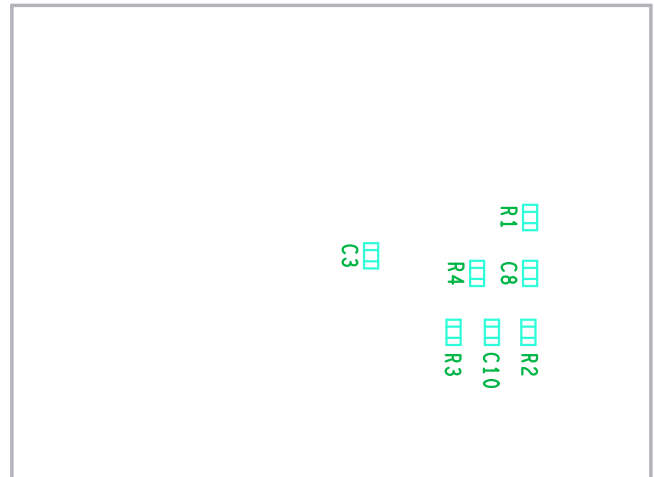


FIGURE 10. BOTTOM COMPONENT ASSEMBLY (MIRRORED)

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