ISL9113ERAZ-EVZ, ISL9113ER7Z-EVZ Evaluation Board User Guide

Evaluation Board Features

- ISL9113 is a low input voltage, high efficiency boost regulator with fixed 5.0V and adjustable output voltage options
- Input voltage rating from 0.8V to 4.7V
- Output Current: Up to 500mA (V_{BAT} = 3.0V, V_{OUT} = 5.0V)
- Up to 95% efficiency at typical operating conditions
- 1.8MHz switching frequency
- Jumper selectable EN (enabled/disabled)
- Jumper selectable for LED indication during FAULT conditions
- Connectors, test points and jumpers for easy evaluation

Required Equipment

- Power supply capable of delivering up to 5.5V and 2A
- Electronic load
- Multimeter to measure voltages and currents
- Oscilloscope
- Test points, connectors and jumpers

Quick Setup Guide

1. Connect power supply to J1, with voltage setting between 0.8V and 4.7V.
2. Connect electronic load to J3.
3. Place scope probes on VOUT test point (TP2), and other test points of interest.
4. Turn on the power supply.
5. At J2, assert EN pin HIGH to enable the device.
6. Monitor the output voltage start-up sequence on the scope. The waveforms will look similar to Figure 2.
7. Turn on the electronic load.
8. Measure the output voltage with the voltmeter. The voltage should regulate within data sheet specification limits (FN8313).

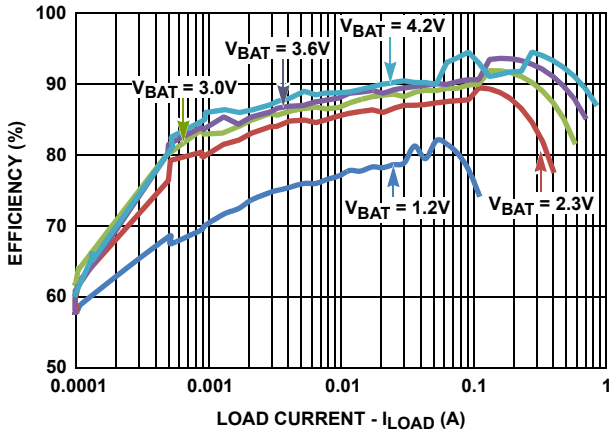

FIGURE 1. ISL9113ERAZ EFFICIENCY (V_{OUT} = 5.0V)

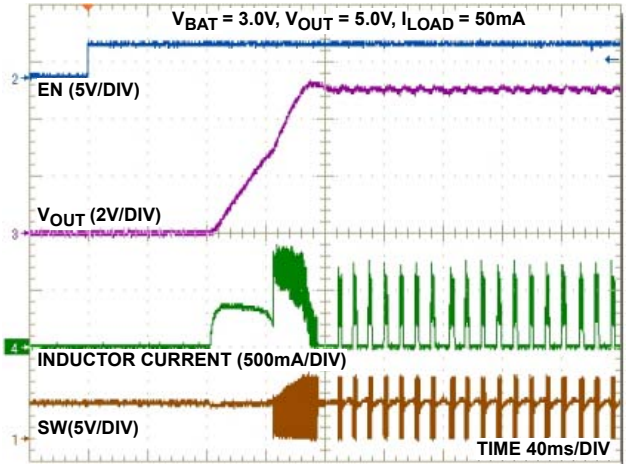

FIGURE 2. START-UP AFTER ENABLE (I_{LOAD} = 50mA)

TABLE 1. DESCRIPTION OF CONNECTORS

CONNECTOR	DESCRIPTION
J1	Input supply
J2	Enable/Disable device
J3	Output voltage

TABLE 2. DESCRIPTION OF TEST POINTS

TEST POINT	DESCRIPTION
TP1, TP6, TP8	GND
TP2	VOUT
TP4	VFAULT
TP5	EN
TP9	SW

Output Voltage Programming (ADJ Version)

Output Voltage Setting Resistor Selection

The voltage divider resistors, R1 and R2, as shown in the evaluation board schematic for the ADJ version, set the desired output voltage values. The output voltage can be calculated using Equation 1:

$$V_{OUT} = V_{FB} \bullet \left(1 + \frac{R1}{R2}\right) \quad \text{(EQ. 1)}$$

where V_{FB} is the internal feedback reference voltage (0.8V typical). The current flowing through the divider resistors is calculated as $V_O/(R1 + R2)$. Large resistance is recommended to minimize the current into the divider; thus improving the total efficiency of the converter.

Evaluation Board Schematics

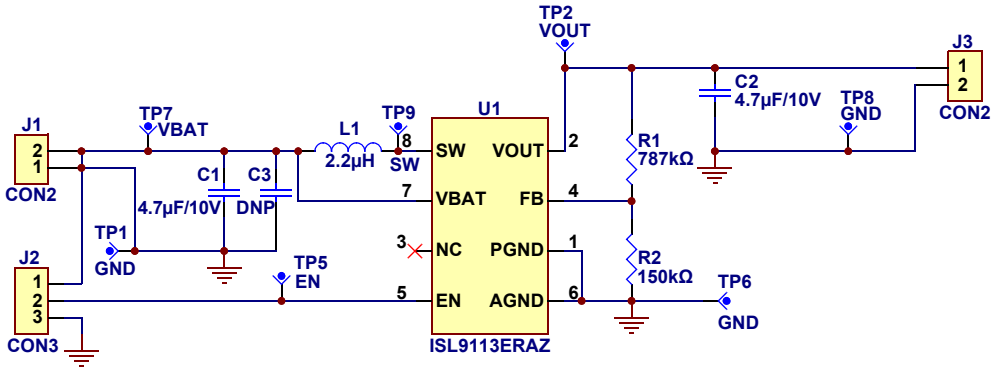

FIGURE 3. ISL9113ERAZ-EVZ EVALUATION BOARD SCHEMATIC

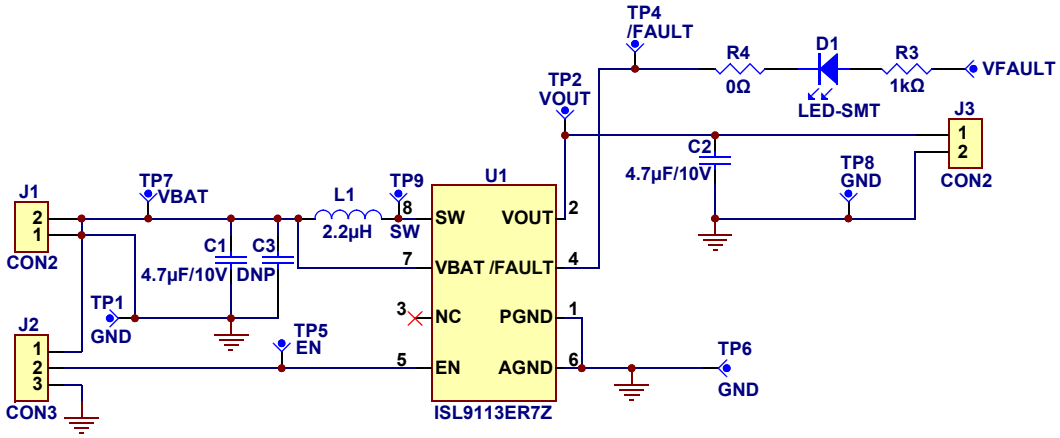

FIGURE 4. ISL9113ER7Z-EVZ EVALUATION BOARD SCHEMATIC

TABLE 3. ISL9113ERAZ-EVZ EVALUATION BOARD BILL OF MATERIALS

ITEM#	QTY	DESIGNATORS	VALUE	PART NUMBER	FOOTPRINT	DESCRIPTION	VENDORS
1	1	U1	-	ISL9113ERAZ	8-Ld DFN	Boost Regulator	Intersil
2	1	L1	2.2µH	LQH32PN2R2NN0	1210	Inductor, 1600mA, ±30%	Murata
3	2	C1, C2	4.7µF	C1608X5R1A475K	0603	Capacitor Ceramic, X5R, 10V, ±10%	Murata
4	1	C3	Place Holder	-	0805	-	-
5	1	R1	787kΩ	CRCW0402787KFKTD	0402	Resistor, 1/16W, 1%	Vishay Dale
6	1	R2	150kΩ	RC0402FR-07150KL	0402	Resistor, 1/16W, 1%	Yageo
7	6	TP1, TP2, TP5, TP6, TP8, TP9	Power Post	-	-	Connectors	Any
8	2	JP1, JP2, JP3	Jumper	-	HDR-3	-	Any

TABLE 4. ISL9113ER7Z-EVZ EVALUATION BOARD BILL OF MATERIALS

ITEM#	QTY	DESIGNATORS	VALUE	PART NUMBER	FOOTPRINT	DESCRIPTION	VENDORS
1	1	U1	-	ISL9113ER7Z	8-Ld DFN	Boost Regulator	Intersil
2	1	L1	2.2µH	LQH32PN2R2NN0	1210	Inductor, 1600mA, ±30%	Murata
3	2	C1, C2	4.7µF	C1608X5R1A475K	0603	Capacitor Ceramic, X5R, 10V, ±10%	Murata
4	1	C3	Place Holder	-	0805	-	-
5	2	R3	1kΩ	CR0603-16W-1001FT	0603	Resistor, Generic	Venkel
6	1	R4	0Ω	ERJ-2GE0R00X	0603	Resistor, Generic	Panasonic
7	1	D1	LED	160-1181-1-ND	0603	LED, RED, SMD	Lite-On
8	6	TP1, TP2, TP4, TP5, TP6, TP8, TP9	Power Post	-	-	Connectors	Any
9	2	JP1, JP2, JP3	Jumper	-	HDR-3	-	Any

Evaluation Board Layout

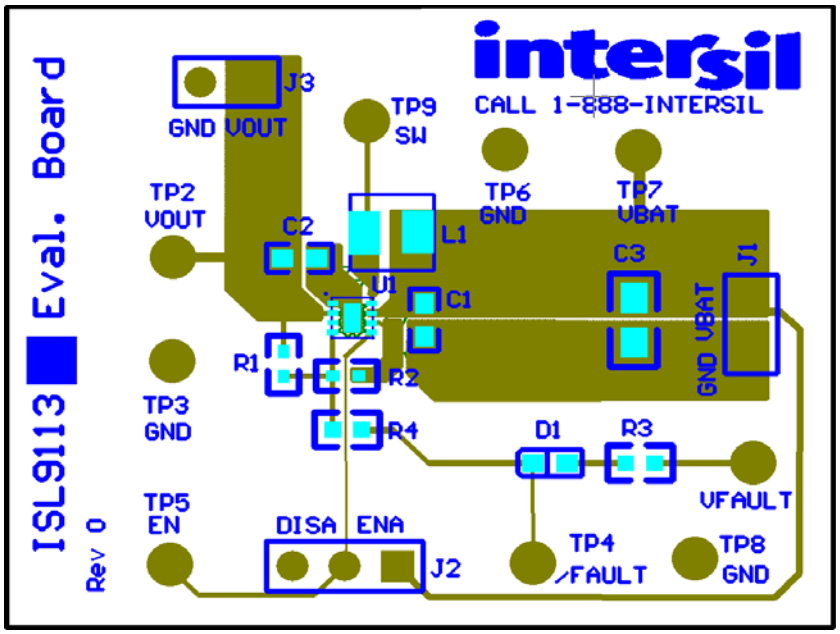

FIGURE 5. SILKSCREEN TOP

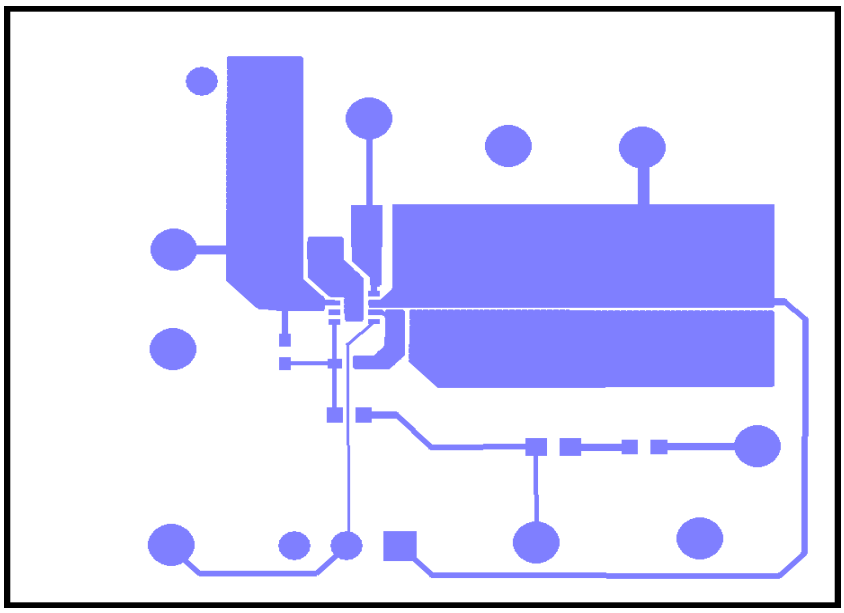

FIGURE 6. TOP COPPER

Evaluation Board Layout (Continued)

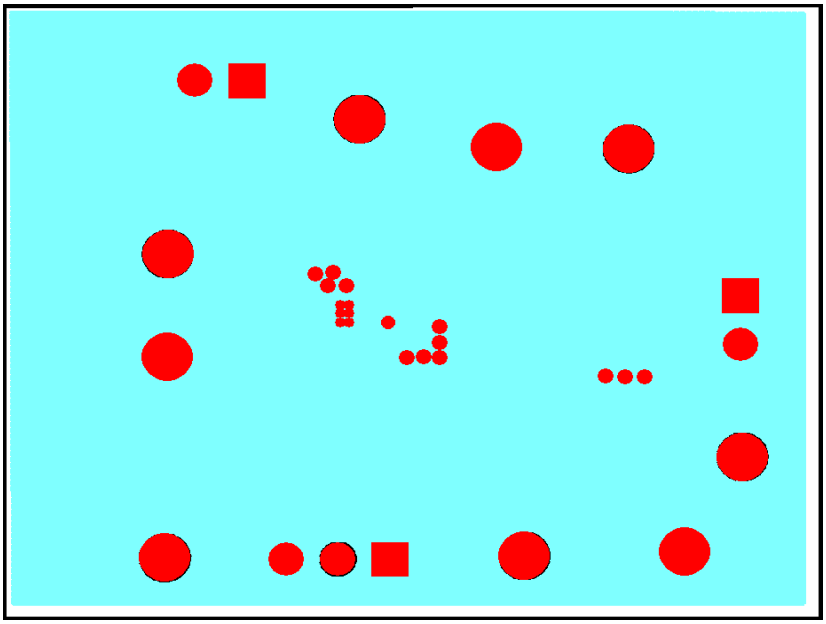

FIGURE 7. BOTTOM COPPER