

ISL9104xxxxEVAL1Z, ISL9104AxxxxEVAL1Z **Evaluation Board Application Manual**

Description

The ISL9104 evaluation kit provides a test platform for the ISL9104 4.3MHz low quiescent current, high efficiency integrated step-down regulator. The ISL9104 is capable of delivering 500mA output current. For adjustable output option, the output voltage can be programmed through the external feedback resistors R1 and R2 on the board (on board the default output voltage is set to be 1.6V but it can be programmed for the range of 0.8V to V_{IN}). It is also offered in many fixed output voltage options including 1.2V, 1.5V, 1.8V, 2.0V, 2.5V, 2.8V and 3.3V.

The complete ISL9104 regulator is located at the center of the board. On the left side of the board are the connectors for the input power source (VIN and GND). The output connectors are located on the right side (VO and GND). Jumper JP1 allows the user to enable or disable the IC.

The evaluation board schematic, layout and bill of materials (BOM) can be found at the end of this application note.

Pinout

ISL9104 (6 LD 1.6x1.6 μTDFN) TOP VIEW

VIN	1	6	sw
EN	2	5	GND
NC	3	4	FB

Features

- A Complete Evaluation Platform for ISL9104, ISL9104A
- Convenient Jumpers for Enable/Disable Operation
- Pb-Free (RoHS Compliant)

Recommended Equipment

The following instruments are recommended for testing:

1

- Power supplies: DC 6.5V/1A Electronic load: 0mA to 500mA
- Multimeters
- Function generator
- Oscilloscope
- Cables and wires

Recommended Operating Conditions

- Input voltage: from 2.7V or (V_{OUT} + V_{DROP}) whichever is higher to 6.0V. Here VDROP = ILOAD*(rDSON PFET+RL). rDSON PFET is the ON-resistance of the high-side power P-MOSFET and R_I is the DCR of the inductor.
- Loading current: 0mA ~ 500mA
- Ambient temperature range: -40°C ~ +85°C

NOTE: For the fixed output options, the output voltage is pre-set in the factory. For the adjustable output options, the output voltage can be programmed through the external resistor network from VOUT to FB to GND, where VOUT = 0.8V*(1+R2/R1), please refer to ISL9104, ISL9104A data sheet FN6829 for recommended component values. On board, the default output voltage is set at 1.6V for the adjustable output options.

Setup Guide

- 1. Place shunt on JP1 at the position of "Enable" to enable the device. Put shunt on JP1 at the position of "Disable" will disable the device.
- 2. Connect the DC power supply between VIN and GND connectors. Make sure the power supply has enough supply current capability. Do not adjust the V_{IN} higher than the recommended maximum supply voltage (6.0V).
- 3. Connect the output to a load (resistor or electronic
- 4. Turn on the input power supply and evaluate the device.

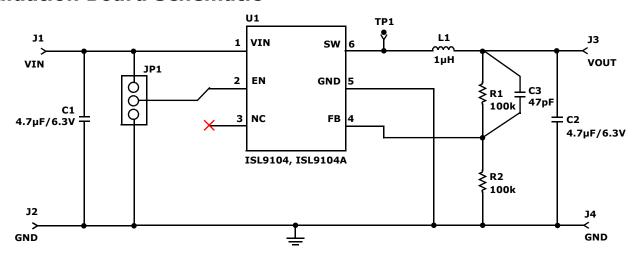
Ordering Information

PART NUMBER	DESCRIPTION			
ISL9104IRU N EVAL1Z	Evaluation Board for ISL9104IRUNZ-T (3.3V)			
ISL9104IRU J EVAL1Z	Evaluation Board for ISL9104IRUJZ-T (2.8V)			
ISL9104IRU F EVAL1Z	Evaluation Board for ISL9104IRUFZ-T (2.5V)			
ISL9104IRU D EVAL1Z	Evaluation Board for ISL9104IRUDZ-T (2.0V)			
ISL9104IRU C EVAL1Z	Evaluation Board for ISL9104IRUCZ-T (1.8V)			
ISL9104IRU B EVAL1Z	Evaluation Board for ISL9104IRUBZ-T (1.5V)			
ISL9104IRU W EVAL1Z	Evaluation Board for ISL9104IRUWZ-T (1.2V)			
ISL9104IRU A EVAL1Z	Evaluation Board for ISL9104IRUAZ-T (Adjustable)			

Ordering Information (Continued)

PART NUMBER	DESCRIPTION
ISL9104 A IRU N EVAL1Z	Evaluation Board for ISL9104AIRUNZ-T (3.3V)
ISL9104 A IRU J EVAL1Z	Evaluation Board for ISL9104AIRUJZ-T (2.8V)
ISL9104 A IRU F EVAL1Z	Evaluation Board for ISL9104AIRUFZ-T (2.5V)
ISL9104 A IRU D EVAL1Z	Evaluation Board for ISL9104AIRUDZ-T (2.0V)
ISL9104 A IRU C EVAL1Z	Evaluation Board for ISL9104AIRUCZ-T (1.8V)
ISL9104 A IRU B EVAL1Z	Evaluation Board for ISL9104AIRUBZ-T (1.5V)
ISL9104 A IRU W EVAL1Z	Evaluation Board for ISL9104AIRUWZ-T (1.2V)
ISL9104 A IRU A EVAL1Z	Evaluation Board for ISL9104AIRUAZ-T (Adjustable)

Evaluation Board Schematic



NOTE: FOR THE FIXED OUTPUT VOLTAGE OPTIONS, R1 = 0, C3 AND R2 NOT POPULATED

FIGURE 1. ISL9104, ISL9104A EVALUATION BOARD SCHEMATIC

Application Note 1522

Bill of Materials (BOM)

ITEM	QTY	REFERENCE	PART DESCRIPTION	PCB FOOTPRINT	PART NUMBER	VENDOR	NOTE
1	1	U1	ISL9104 or ISL9104A	1.6x1.6 6 Ld µTDFN		Intersil	
2	2	C1, C2	Capacitor, SMD, 4.7μF, 10%, X5R	0603	GRM188R60J475KE19D	Murata	
3	1	C3	Capacitor, SMD 47pF, 5%, X7R	0402	GRM36COG470J050AQ	Murata	Only populated for boards with part numbers ISL9104IRUAEVAL1Z and ISL9104AIRUAEVAL1Z. For boards with other part numbers, it is unpopulated.
4	1	R1	Resistor, SMD, 100kΩ, 1%, 0.1W	0402	ERJ2RKF1003	Panasonic	
5	1	R1	Resistor, SMD, 0Ω	0402	Generic	Generic	Populated for all boards with other part numbers EXCEPT ISL9104IRUAEVAL1Z and ISL9104AIRUAEVAL1Z
6	1	R2	Resistor, SMD, 100kΩ, 1%	0402	ERJ2RKF1003	Panasonic	Only populated for boards with part numbers ISL9104IRUAEVAL1Z and ISL9104AIRUAEVAL1Z. For boards with other part numbers, it is unpopulated.
7	1	L1	Inductor, 1µH		L1207C1R0MPWS	KEMET	
8	4	VIN, VO, GND(x2)	Connector	-	3156-1-00-15-00-00-08-0	Mill-Max	
9	1	TP1	Scope Probe Test Point	-	131503100	Tektronix	Not populated
10	1	JP1	Connect Header, 1X3	-	68000-236-1X3	BERG/FCI	

PCB Layout

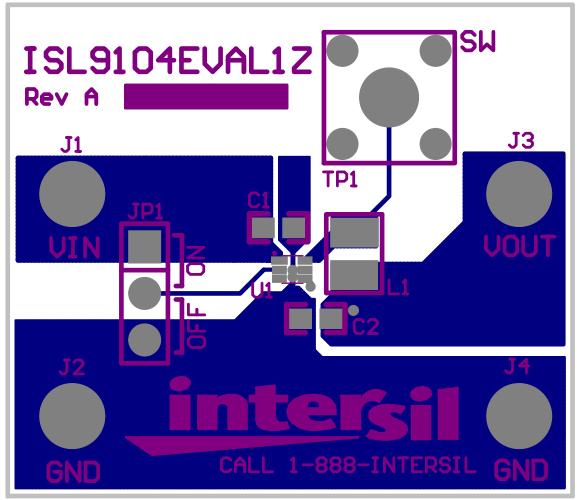


FIGURE 2. TOP SILK LAYER

PCB Layout (Continued)

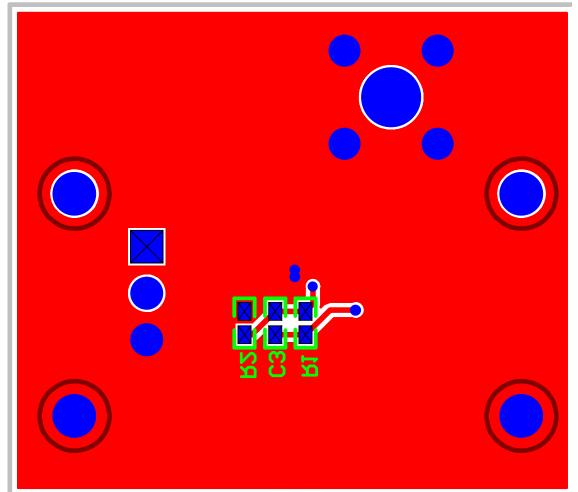


FIGURE 3. BOTTOM SILK LAYER

PCB Layout (Continued)

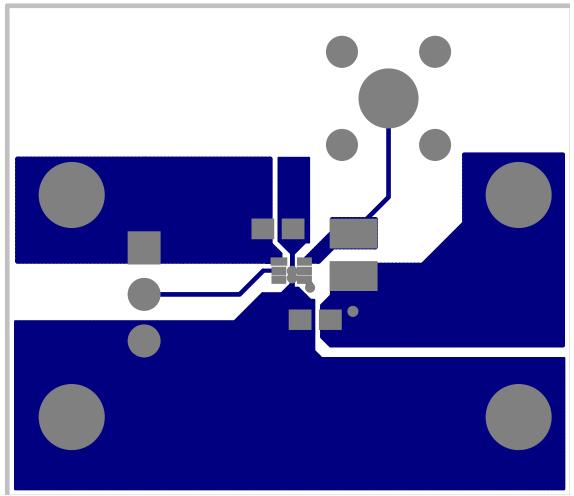


FIGURE 4. TOP LAYER

PCB Layout (Continued)

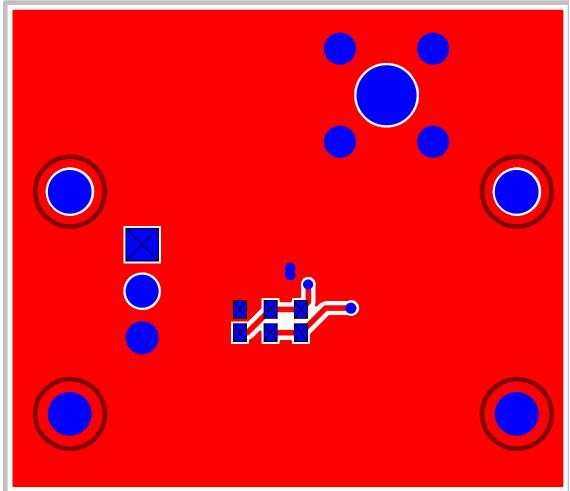


FIGURE 5. BOTTOM LAYER

Intersil Corporation reserves the right to make changes in circuit design, software and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that the Application Note or Technical Brief is current before proceeding.