

ISL9107EVAL1Z, ISL9108EVAL1Z

Evaluation Board Application Manual

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Description

The ISL9107EVAL1Z and ISL9108EVAL1Z provide the complete evaluation kit for the ISL9107 and ISL9108, which are 1.6MHz switching frequency, low quiescent current, high efficiency integrated step-down regulators. They are capable of delivering up to 1.5A output current with an output voltage range from 0.8V to $\sim V_{IN}$. The output voltage is set by two voltage divider resistors of R_2 and R_3 on the board. The default output voltage is set to be 1.6V on the evaluation board. In addition to ISL9108, ISL9107 offers a typical 215ms Power-Good (PG) timer when powered up. This timer output can be reset by RSI.

The complete ISL9107, ISL9108 regulator is located at the center of the board. On the left side of the board are the connectors for the input power source (V_{IN} and GND). The output connectors are located on the right side (V_O and GND). The other two test points are for the PG and RSI signals respectively (for ISL9107 only), as labelled on the board. The RSI input needs either be driven to a low or a high logic input (Please refer to the ISL9107, ISL9108 datasheet, FN6612, for more details regarding the RSI function). On the board, the open-drain PG signal is pulled up to the V_{IN} through a 100k Ω resistor (R_1). Jumper JP1 allows the user to enable or disable the IC. Jumper JP2 is the mode selection input. **Do not leave the EN and the MODE signal floating.** The evaluation board also offers one oscilloscope probe tip connector connected to SW pin to minimize the switching noise during the evaluation. The evaluation board schematic, layout and bill-of-materials (BOM) can be found at the end of this application note.

Ordering Information

- ISL9107EVAL1Z - Evaluation Board for ISL9107
- ISL9108EVAL1Z - Evaluation Board for ISL9108

Features

- A Complete Evaluation Platform for ISL9107 and ISL9108
- Convenient Jumpers for Enable/Disable, Operation Mode Selection
- Integrated Synchronous Buck Regulator with High Efficiency
- 2.7V to 5.5V Supply Voltage
- 1.5A Output Current
- 17 μ A Quiescent Current in Skip (Low I_Q) Mode

Specifications

Table 1 below shows the recommended operating conditions for using ISL9107EVAL1Z, ISL9108EVAL1Z.

TABLE 1. RECOMMENDED OPERATING CONDITIONS

| PARAMETER | MIN | TYP | MAX | UNIT |
|------------------------|-----|-----|-----|------|
| Input Voltage | 2.7 | - | 5.5 | V |
| Output Voltage (Note) | - | 1.6 | - | V |
| Maximum Output Current | 1.5 | - | - | A |

NOTE: The output voltage can be set to other values by changing the R_2 , R_3 values, $V_{OUT} = 0.8V \cdot (1 + R_2/R_3)$. Refer to ISL9107, ISL9108 datasheet for some recommended R_2 , R_3 and C_3 values for different output voltages.

Recommended Equipment

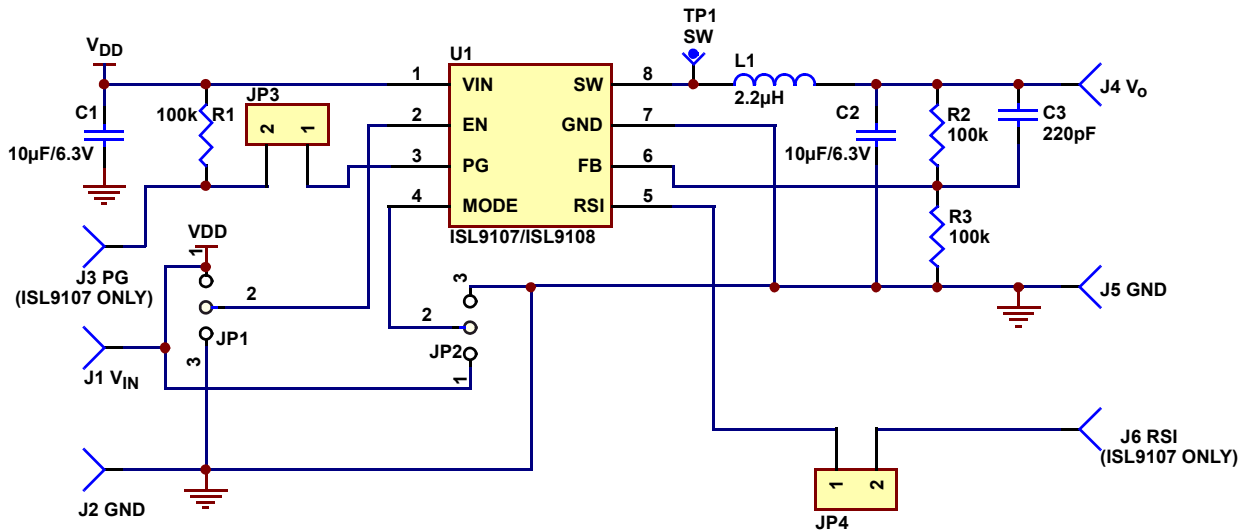
The following instruments are recommended for testing:

- DC Power Supply, 5V/3A
- Electronic loads capable of sinking current up to 4A
- Multimeters
- Function generator
- Oscilloscope

Evaluation Board Setup

The following are recommended steps for setting up the ISL9107EVAL1Z and ISL9108EVAL1Z evaluation boards:

1. Connect Jumper JP1 at the position of "Enable" to enable the device. Connect JP1 at the position of "Disable" to disable the device.
2. Connect Jumper JP2 either at the position of "SKIP" or "PWM". With JP2 connected at the position of "SKIP", the device enters skip mode under light load condition; with JP2 connected at the position of "PWM", the device always operates under PWM mode regardless of the load condition.
3. For ISL9107EVAL1Z, connect the RSI input to either ground or V_{IN} . Please refer to the ISL9107, ISL9108 datasheet, FN6612, for more details regarding the function of RSI.
4. Connect DC power supply between V_{IN} and GND connectors on board. Make sure the power supply has enough supply current capability. The absolute maximum rating for V_{IN} pin is 6.5V and the recommended maximum input voltage applied on V_{IN} is up to 5.5V.
5. Connect the output to a load (resistor or electronic load).
6. Turn on the input power supply and start the evaluation.



J3, J6, JP3 AND JP4 ARE ONLY POPULATED FOR ISL9107EVAL1Z. FOR ISL9108EVAL1Z, THESE SHOULD BE UN-POPULATED ON THE BOARD.

FIGURE 1. ISL9107EVAL1Z, ISL9108EVAL1Z SCHEMATIC

ISL9107EVAL1Z and ISL9108EVAL1Z Bill of Materials (BOM)

| ITEM | QTY | REFERENCE | PART DESCRIPTION | PCB FOOTPRINT | PART NUMBER | VENDOR |
|------|-----|----------------------------|---|----------------|-------------------------|-----------|
| 1 | 1 | U1 | ISL9107 for ISL9107EVAL1Z and ISL9108 for ISL9108EVAL1Z | 8 Ld (2x3) DFN | ISL9107 or ISL9108 | Intersil |
| 2 | 1 | C1 | Capacitor, SMD, 10µF/6.3V, 10%, X5R | 0805 | GRM21BR60J106KE19L | Murata |
| 3 | 1 | C2 | Capacitor, SMD, 10µF/6.3V, 10%, X5R | 0805 | GRM21BR60J106KE19L | Murata |
| 4 | 1 | C3 | Capacitor, SMD, 220pF/50V, 10%, X7R | 0603 | GRM188R71H221KA01D | Murata |
| 5 | 3 | R1, R2, R3 | Resistor, SMD, 100kΩ, 1%, 0.1W | 0603 | RC0603FR-07100KL | Yageo |
| 6 | 1 | L1 | Inductor, 2.2µH | 3.8x3.8 | CDRH3D17/SNP-2R2 | Sumida |
| 7 | 6 | VIN, VO, PG, RSI, GND (x2) | Turrent Terminal Pin. J3 (PG) and J6 (RSI) are only populated on ISL9107EVAL1Z. | - | 3156-1-00-15-00-00-08-0 | Mill-Max |
| 8 | 1 | TP1 | Scope Probe Test Point | - | 131503100 | Tektronix |
| 9 | 2 | JP1, JP2 | Connect Header, 1X3 | - | 68000-236-1X3 | BERG/FCI |
| 10 | 2 | JP3, JP4 | Connect Header, 1X2. Only populated for ISL9107EVAL1Z. | - | 68000-236-1x2 | BERG/FCI |

PCB Layout

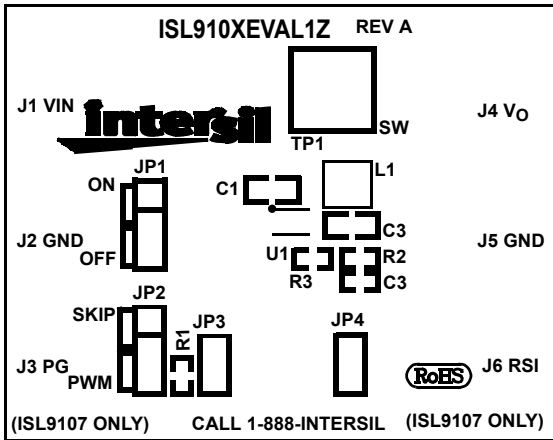


FIGURE 2. SILK LAYER

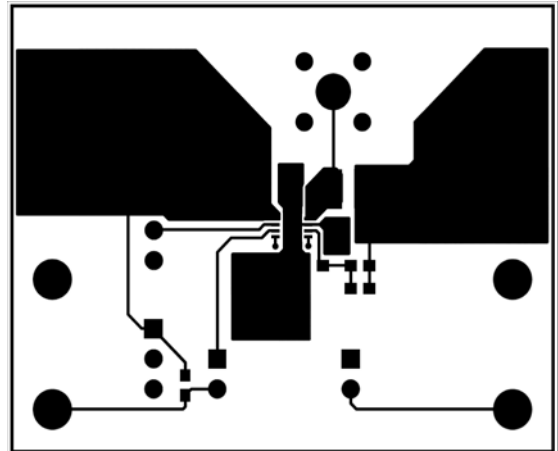


FIGURE 3. TOP LAYER

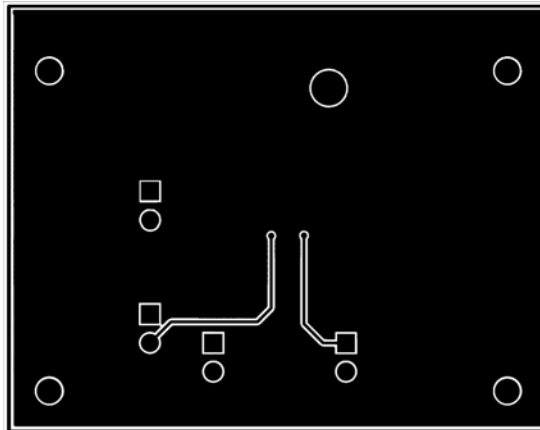


FIGURE 4. BOTTOM LAYER (Mirrored)

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