

ISL6273EVAL1

Evaluation Board Application Manual

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The ISL6273EVAL1 board provides a convenient platform to evaluate the performance of the ISL6273 low-quiescent high-efficiency step-down switching regulator. The ISL6273 is a 1.5MHz, 1.2A adjustable output voltage regulator. The output voltage is set by a resistor divider consisting of R1 and R2 on the board. The output voltage is set to 1.6V in the evaluation board but can be modified by changing the R2 value. The evaluation board also allows users to evaluate the forced PWM or PFM operation mode at light load and the behavior of the POR signal.

ISL6273EVAL1 Evaluation Board

A photo of the ISL6273EVAL1 board is shown in Figure 1. The schematic, layout and bill-of-materials (BOM) are given at the end of this application note. The complete regulator is located at the center of the board. Various connectors and jumpers are provided for the convenience of the evaluation. On the left side of the board are the connectors for the input power source (Red: VIN; Black: GND). The output connectors are located on the right side (Red: VO; Black: GND). The two yellow test points are for the RSI and POR signals respectively, as labelled on the board. The RSI input needs either be driven to a low or a high logic input. **Do not leave the RSI input signal floating.** The open-drain POR signal is pulled up to VIN through a 100kΩ resistor (R3), as shown in the schematics. Jumper H1 allows the user to enable or disable the IC. Jumper H2 is the mode selection input. **Do not leave the EN or the MODE signal floating.** The settings for the two jumpers are shown in Figure 2. The evaluation board also offers two oscilloscope probe tip connectors to minimize the switching noise on the waveforms. TP1 is the connector for the output voltage and TP2 is the PHASE signal.

Specifications

Table 1 shows the electrical specification of the regulator in the evaluation board.

TABLE 1. ELECTRICAL SPECIFICATIONS.

| PARAMETER | MIN | TYP | MAX | UNIT |
|-----------------------|-----|-----|-----|------|
| Input Voltage | 2.7 | - | 5.5 | V |
| Output Voltage (Note) | - | 1.6 | - | V |
| Output Current | 1.2 | - | - | A |

NOTE: The output voltage can be set to other values by changing the R2 value.

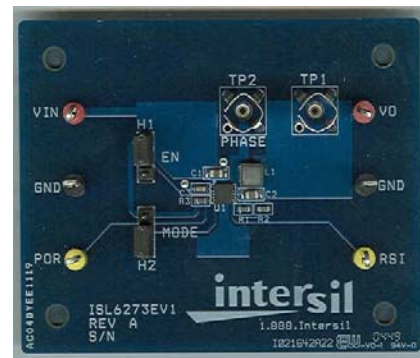


FIGURE 1. PHOTO OF THE ISL6273EVAL1 BOARD

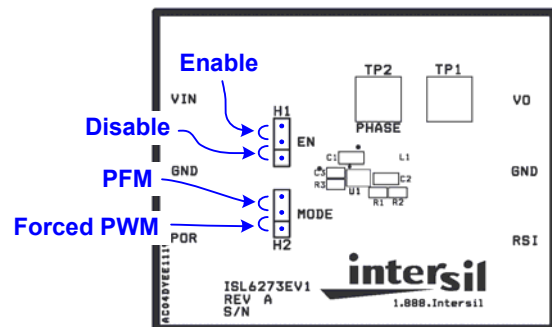


FIGURE 2. SETTINGS FOR JUMPERS H1 AND H2

Evaluation Board Setup

The following are steps for setting up the evaluation board:

1. Connect Jumper H1 at the position of Enable.
2. Connect Jumper H2 either at the position of PFM or Forced PWM, but do not leave it floating.
3. Connect the RSI input to either ground or VIN. Do not leave it floating.
4. Connect a power supply with an output voltage between 2.7V to 5.5V to VIN and GND connectors. Make sure the power supply has enough current capability (1A recommended).
5. Connect the output to a load (resistor or electronic load).
6. Turn on the input power supply.

Typical Operating Characteristics

This section shows typical waveforms and performance captured from the evaluation board.

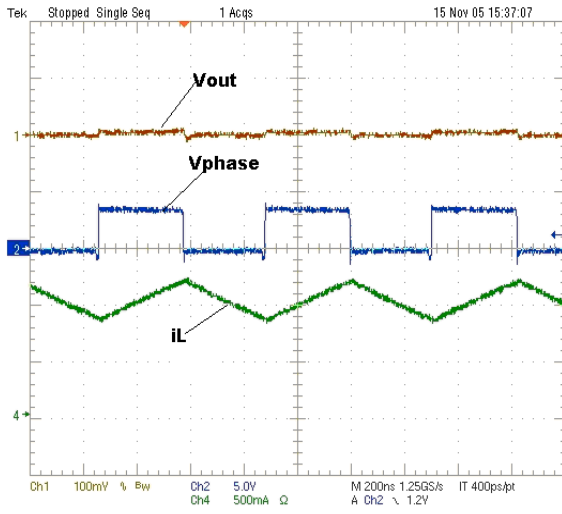


FIGURE 3. STEADY-STATE IN PWM MODE
($V_{IN} = 3.6V$; $V_O = 1.6V$; $I_O = 1A$)

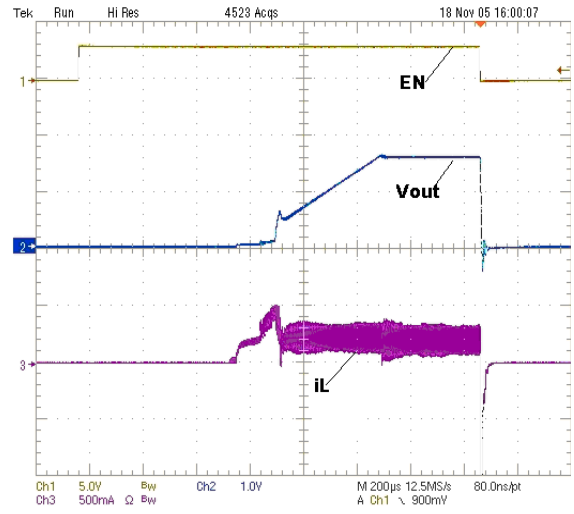


FIGURE 4. SOFT-START

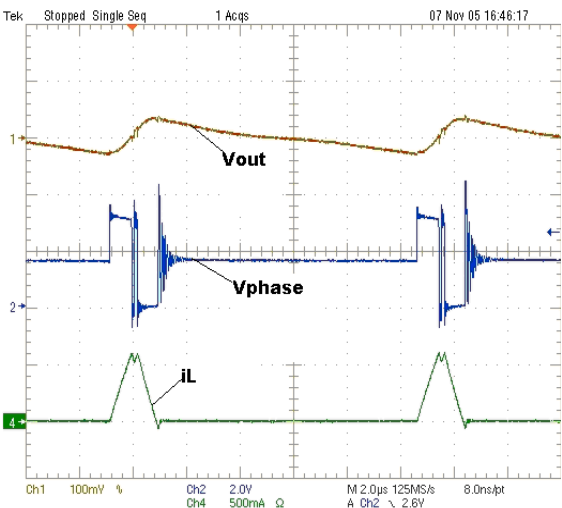


FIGURE 5. PFM MODE ($V_{IN} = 3V$; $V_O = 1.6V$; $I_O = 50mA$)

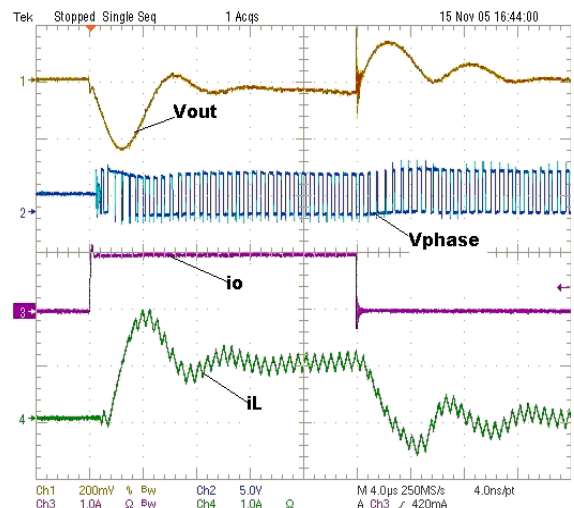


FIGURE 6. TRANSIENT LOAD TEST (PFM AND PWM)
 $V_{IN} = 3.6V$; $V_O = 1.6V$; $I_O = 0A-1A$

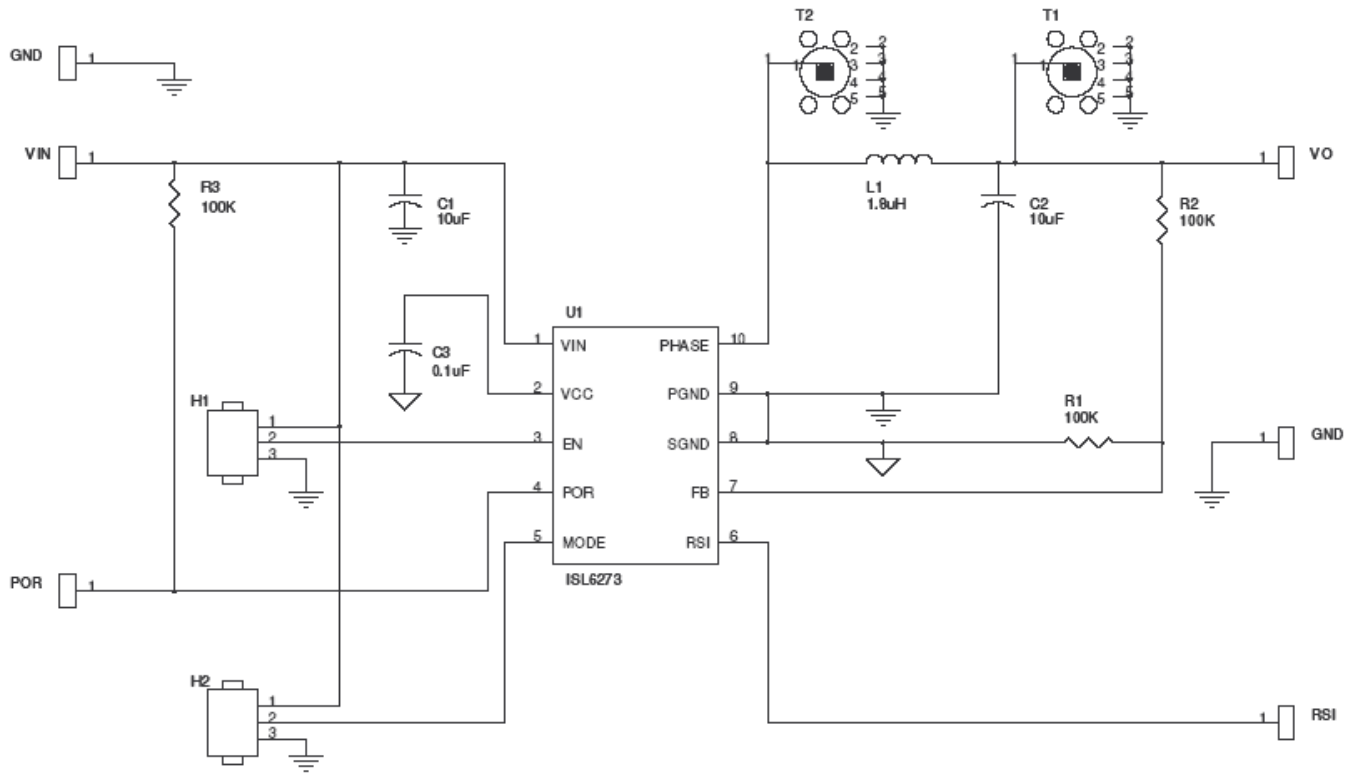
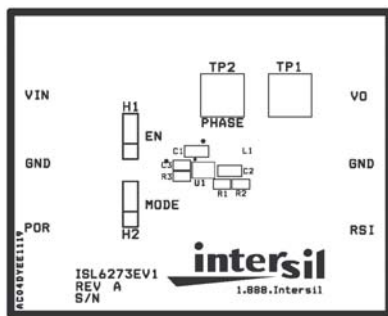
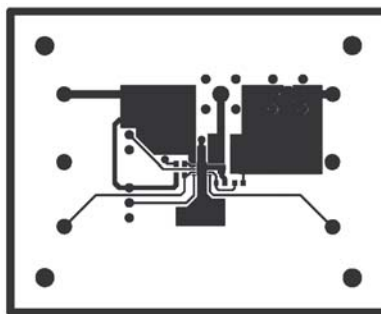


FIGURE 7. SCHEMATIC OF THE ISL6273EVAL1 EVALUATION BOARD

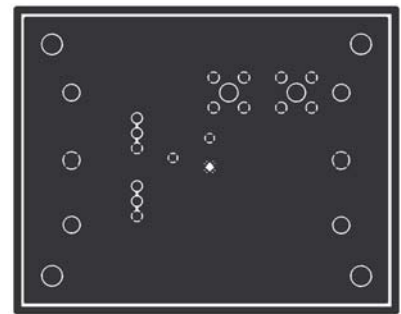
PCB Layout



SILK SCREEN



TOP LAYER



BOTTOM LAYER

FIGURE 8. LAYOUT OF THE ISL6273EVAL1 BOARD

TABLE 2. BILL OF MATERIALS

| ITEM | QTY | REF | DESCRIPTION | VENDOR | PART NUMBER | PACKAGE |
|------|-----|------------|--|------------|-------------------------|------------|
| 1 | 2 | C1, C2 | Capacitor, SMD, 10 μ F, 6.3V, 10%, X5R | Any | | 0805 |
| 2 | 1 | C3 | Capacitor, SMD, 0.1 μ F, 6.3V, 10%, X5R | Any | | 0603 |
| 3 | 1 | L1 | Inductor, 1.8 μ H, Coilcraft 1008PS Series | Coicraft | 1008PS-182K | |
| 4 | 3 | R1, R2, R3 | Resistor, SMD, 100k, 1% | Any | | 0603 |
| 5 | 6 | T1-T6 | Circuit Pin Prntd 0.050"D 0.082"L | Mill-Max | 3156-2-00-21-00-00-08-0 | |
| 6 | 2 | TP1, TP2 | Conn-Gen, Scope Probe Test PT, Compact | TEKTRONICS | 131-5031-00 | |
| 7 | 2 | H1, H2 | Conn-Header, 1x3, Brkawy 1X36, 2.54mm, ST | BERG/FCI | 68000-236-1X3 | |
| 8 | 1 | U1 | ISL6273 DFN-10 Package | Intersil | ISL6273 | 3X3 DFN-10 |

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