

ISL8010EVAL1

ISL8010 Monolithic DC/DC Evaluation Board Setup Procedure

AN1205
Rev 0.00
Sep 1, 2005

Description

This document describes the setup procedure for the ISL8010EVAL1 Rev A board.

The General Purpose market requires maximum flexibility in its power management solutions due to the large variety of applications produced each year. The ISL8010 services this need by offering a multitude of functionality, combined with features that allow it to work in many different application spaces.

From a functional standpoint, the ISL8010 is an ideal controller for designers that want a “plug and play” solution. It delivers a regulated output voltage from 0.8V to 5.5V at a maximum current of 600mA, with 10 or fewer total components. Its 10 Ld MSOP package, combined with integrated MOSFET switches and compensation, yield a solution size below 0.18in². This small form factor makes the ISL8010 a desirable solution for any application where board space is a premium (PDAs, cell phones, etc.).

Additional features include a power good (PG) indicator for output voltage monitoring, and a clock frequency synchronizing input (SYNC). The SYNC input allows the regulator to switch anywhere between the nominal 1.4MHz frequency and 12MHz. Synchronizing multiple switching devices on the same bus eliminates beat-frequency oscillations that can be detrimental to noise-sensitive applications.

In battery supplied applications, where efficiency is most important, the ISL8010 employs a pulse-frequency modulation (PFM) mode to boost light-load efficiency significantly over synchronous rectifiers. The controller will automatically switch between PFM and PWM mode depending on load conditions, or if PWM is always desired, the SYNC pin can be used as a logic input to select this state. Additional power saving is achieved when the ISL8010 is shut-down, sinking <math><1\mu\text{A}</math> of stand-by current.

Overall, the ISL8010 delivers a robust, highly integrated DC/DC buck converter for a variety of General Purpose applications. For a more detailed description of the ISL8010, refer to the data sheet [1].

The Intersil General Purpose family of monolithic switching power supplies continues to expand with new selections to better fit our customer's needs.

1. Refer to our website for updated information and the ISL8010 data sheet: www.intersil.com.

Ordering Information

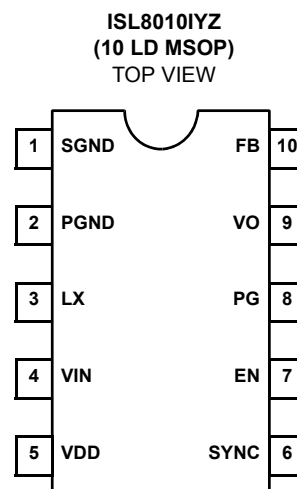
PART NUMBER	PACKAGE	TAPE & REEL	PKG. DWG. #
ISL8010IUZ	10 Ld MSOP	-	MDP0043
ISL8010IUZ-T7	10 Ld MSOP	7"	MDP0043
ISL8010IUZ-T13	10 Ld MSOP	13"	MDP0043

NOTE: Intersil Pb-free plus anneal products employ special Pb-free material sets; molding compounds/die attach materials and 100% matte tin plate termination finish, which are RoHS compliant and compatible with both SnPb and Pb-free soldering operations. Intersil Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J STD-020.

Features

- Less than 0.18in² Footprint for the Complete 600mA Converter
- Components on One Side of PCB
- Max Height 1.1mm MSOP10
- Power-Good (PG) Output
- Internally-Compensated Voltage Mode Controller
- Up to 95% Efficiency
- <math><1\mu\text{A}</math> Shut-Down Current
- 120μA Quiescent Current
- Hiccup Mode Overcurrent and Over-Temperature Protection
- External Synchronization up to 12MHz
- Pb-Free Plus Anneal Available (RoHS Compliant)

Pinout



What's Inside

The Evaluation Board Kit contains the following materials:

- The ISL8010EVAL1 Rev A Evaluation Board
- The ISL8010 Data Sheet
- The ISL8010 Evaluation Board Setup Procedure (this document)

What is Needed

The following materials will be needed to perform testing:

- 1 Electronic Load (See Note)
- 1 Power Supply: 0-6V @ 2A (See Note)
- Precision Digital Multimeters
- Oscilloscope

NOTE: amperage rating of power supplies and loads are determined by maximum expected loading plus a percentage margin of error.

Quick Setup Guide

- Step 1:** Set the +VIN power supply to +3.3V and place in the "STANDBY" or "OFF" position. Connect the positive terminal (+) of the supply to the VIN terminal P5 and the negative terminal (-) of the supply to GND P4.
- Step 2:** Connect the positive terminal (+) of a DMM to the VIN terminal P5 and the negative terminal (-) to the GND terminal P4.
- Step 3:** Connect the positive terminal (+) of the electronic load to the VOUT terminal P7. Connect the negative terminal (-) of the electronic load to the GND terminal P8. Make sure the electronic load is set to the 0A condition.
- Step 4:** Connect the positive terminal (+) of a DMM to the VOUT terminal P7 and the negative terminal (-) to the GND terminal P8.
- Step 5:** Check to ensure all jumpers and switches are in their default positions prior to application of power (refer to Table 1: "DETAILED DESCRIPTION OF SWITCH SETTINGS").
- Step 6:** Set all power supplies to the "ON" position. LED D1 should be off. Check all DMM displays for correct voltage levels. Adjust if necessary.
- Step 7:** Turn the ENABLE switch S1 to the "ON" position. LED D1 should glow red. The VOUT DMM should read 1.80V ($\pm 5\%$).

At this point the board has been properly powered up. Normal testing can begin.

NOTE: If you need technical assistance, or other assistance, with the ISL8010 Evaluation Board, call 1-888-INTERSIL (468-3774).

TABLE 1. DETAILED DESCRIPTION OF SWITCH SETTINGS

SWITCH	POSITION	FUNCTION
S1	ON	ENABLE ISL8010
	OFF (default)	DISABLE ISL8010

TABLE 2. DETAILED DESCRIPTION OF TEST POINTS

REF DES	TYPE	FUNCTION
P1	Test Point	SYNC Input: HIGH = Force PWM LOW = Auto PFM/PWM Switching = Clock Sync
P2	Test Point	GND
P3	Test Point	PGOOD Voltage
P6	Test Point	External Enable NOT. S1 is required to be in the ON position.
J1	Oscilloscope	Kelvin LX Measurement
J2	Oscilloscope	Kelvin VOUT Measurement
P4	Binding Post	GND
P5	Binding Post	VIN
P7	Binding Post	VOUT
P8	Binding Post	GND

EVAL Board Information

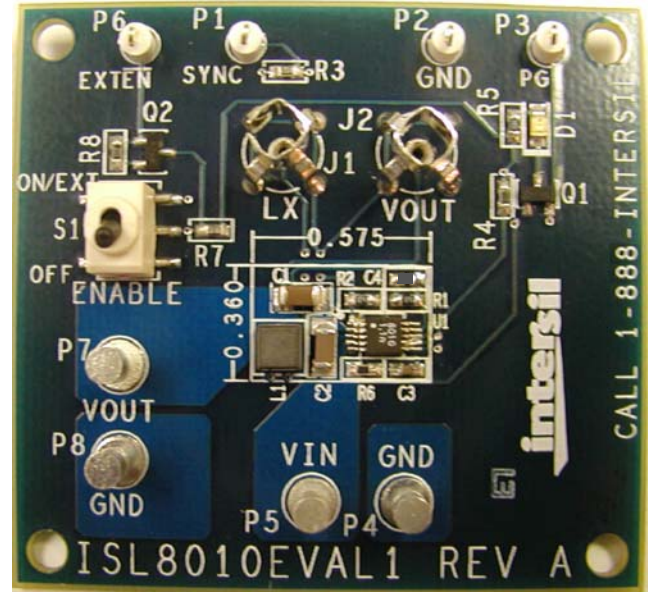
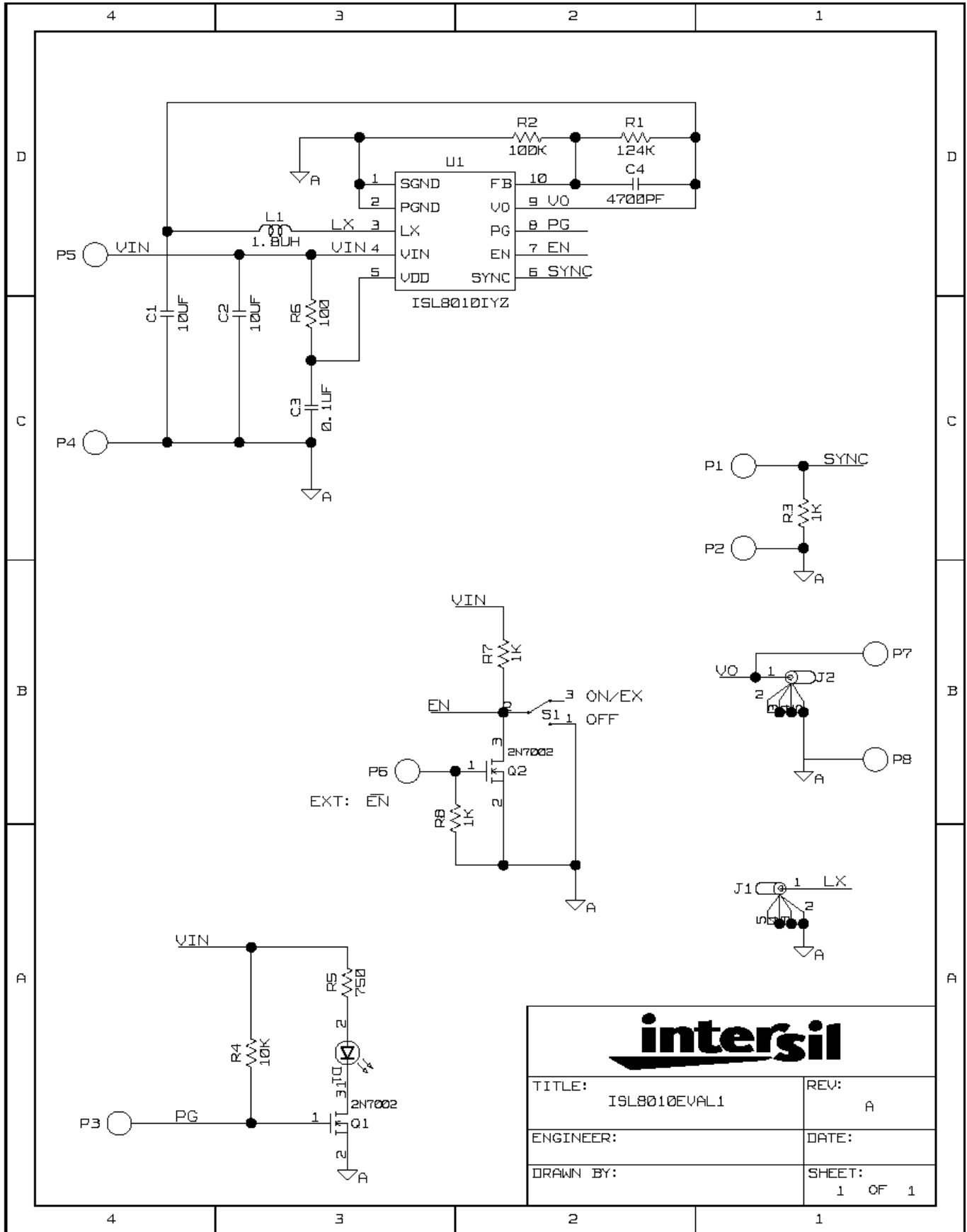


FIGURE 1. ISL8010EVAL1 REV A EVALUATION BOARD

Eval Board Schematic



intersil	
TITLE: ISL8010EVAL1	REV: A
ENGINEER:	DATE:
DRAWN BY:	SHEET: 1 OF 1

TABLE 3. BILL OF MATERIALS

ITEM	QTY	REFERENCE	VALUE	TYPE	FOOTPRINT	VOLTAGE
1	1	U1		Intersil ISL8010	MSOP10	
2	2	J1, J2		Tektronix Scope Jack		
3	2	Q1, Q2		N-Channel MOSFET: 2N7002	SOT-23	
4	1	C1, C2	10 μ F	Generic ceramic capacitor	1206	6.3V
5	2	C3	1 μ F	Generic ceramic capacitor	0603	6.3V
6	1	C4	4700pF	Generic ceramic capacitor	0603	6.3V
7	1	L1	1.8 μ H	Coilcraft: 1008PS-182M		
8	1	S1		SPDT Switch: GT11MSCKE		
9	1	R1	124k Ω	Generic thick film chip resistor	0603	
10	1	R2	100k Ω	Generic thick film chip resistor	0603	
11	3	R3, R7, R8	1k Ω	Generic thick film chip resistor	0603	
12	1	R4	10k Ω	Generic thick film chip resistor	0603	
13	1	R5	750 Ω	Generic thick film chip resistor	0603	
14	1	R6	100 Ω	Generic thick film chip resistor	0603	
15	1	D1		Liteon: LTST-C170CKT	0603	
16	4	P1, P2, P3, P6		Test Points		
17	4	P4, P5, P7, P8		Binding Posts		

Eval Board Layout

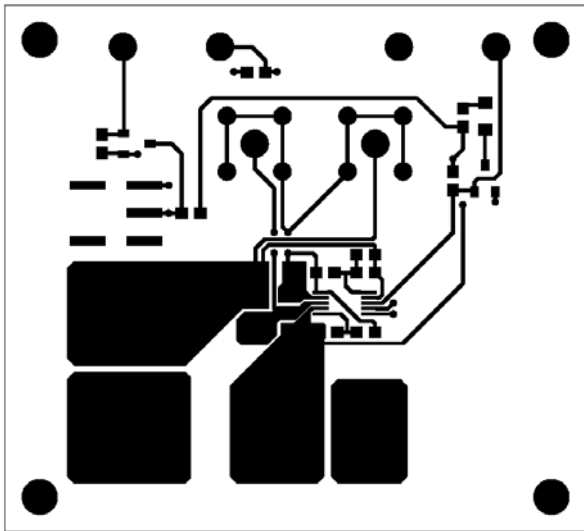


FIGURE 2. EVAL BOARD TOP LAYER ROUTING (ETCH)

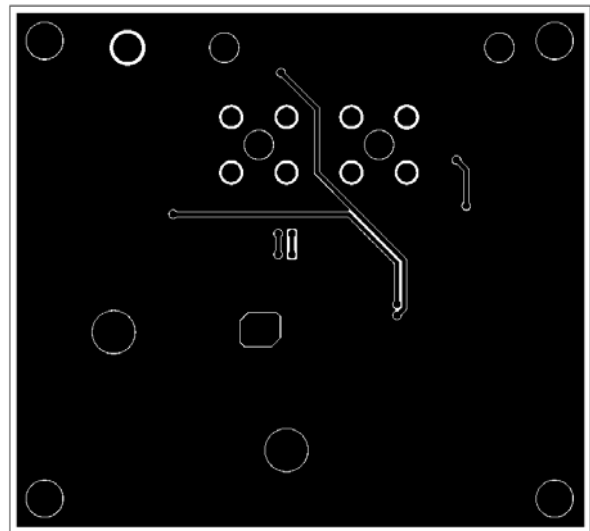


FIGURE 3. EVAL BOARD BOTTOM LAYER ROUTING (ETCH)

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