

ISL8011EVAL1Z

1.2A Integrated FETs, High Efficiency Synchronous Buck Regulator

AN1329
Rev 0.00
June 7, 2007

ISL8011 is an integrated FET, 1.2A synchronous buck regulator for general purpose point-of load applications. It is optimized for generating low output voltages down to 0.8V. The supply voltage range of 2.7V to 5.5V allows the use of common 3.3V or 5V supply rails and Lithium ion battery inputs. It has a guaranteed minimum output current of 1.2A and a 1.5MHz pulse-width modulation (PWM) switching frequency which allows the use of small external components.

The ISL8011 includes a pair of low ON-resistance P-Channel and N-Channel internal MOSFETs to maximize efficiency and minimize external component count. 100% duty-cycle operation allows less than 200mV dropout voltage at 1.2A.

The ISL8011 offers a 200ms Power-On-Reset (POR) timer at power-up. When shut down, the ISL8011 discharges the output capacitor. Other features include internal digital soft-start, enable for power sequence, overcurrent protection, and thermal shut-down.

The ISL8011 is offered in a 10 Ld 3x3mm DFN package with 1mm maximum height. The complete converter occupies less than 1cm² area.

Ordering Information

PART NUMBER (Note)	PART MARKING	TEMP. RANGE (°C)	PACKAGE (Pb-Free)	PKG. DWG. #
ISL8011IRZ	011Z	-40 to +85	10 Ld 3x3 DFN	L10.3x3C
ISL8011IRZ-T	011Z	-40 to +85	10 Ld 3x3 DFN Tape and Reel	L10.3x3C
ISL8011EVAL1Z	Evaluation Board			

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

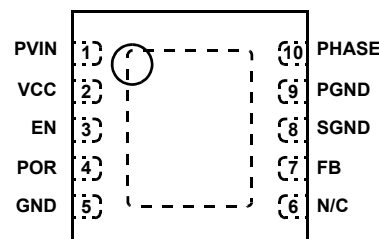
- High Efficiency Synchronous Buck Regulator with up to 95% Efficiency
- 2.7V to 5.5V Supply Voltage
- 1.2A Guaranteed Output Current
- 100% Maximum Duty Cycle
- Peak Current Limiting, Short Circuit Protection
- 200ms Power-On Reset
- 3% Output Accuracy Over Temperature/Load/Line
- Less than 1µA Logic Controlled Shut-down Current
- Internal Loop Compensation
- Internal Digital Soft-Start
- Over-Temperature Protection
- Enable
- Small 10 Ld 3x3mm DFN Package
- Pb-Free Plus Anneal Available (RoHS Compliant)

Applications

- DC/DC POL Modules
- µC/µP, FPGA and DSP Power
- Plug-in DC/DC Modules for Routers and Switchers
- Portable Instruments
- Test and Measurement Systems

Pinout

ISL8011
(10 LD 3x3 DFN)
TOP VIEW



What's inside

The Evaluation Board Kit contains the following materials:

- The ISL8011EVAL1Z Rev A board
- The ISL8011 datasheet
- This EVAL KIT document

Recommended Equipment

The following materials are recommended to perform testing:

- 0V to 10V power supply with at least 5A source current capability, battery, notebook AC adapter
- Two Electronic Loads capable of sinking current up to 5A
- Digital Multimeters (DMMs)
- 100MHz quad-trace Oscilloscope
- Signal generator

Quick Setup Guide

1. Ensure that the circuit is correctly connected to the supply and loads prior to applying any power.
2. Connect the bias supply to VIN. Plus terminal to (VIN) and negative return to (GND).
3. Verify that position is ON for JP1 jumper.
4. Turn on the power supply. $V_{IN} = 2.7V$ to $5.5V$.
5. Verify the output voltage is $1.6V$ for V_{OUT}

Evaluating the Other Output Voltage

The ISL8011EVAL1Z kit output is preset to $1.6V$; however, output voltages can be adjusted from $0.8V$ to $3.6V$ by the following equations:

$$V_{OUT} = 0.8 \left(1 + \frac{R_2}{R_1} \right) \quad (EQ. 1)$$

Let's set $R_2 = 100k\Omega$

$$R_1 = \frac{(R_2)}{\left(\frac{V_{OUT}}{0.8} \right) - 1} \quad (EQ. 2)$$

where the $0.8V$ is the reference voltage. To minimize the accuracy impact on the output voltage, select the R_1 and R_2 no larger than $100k\Omega$.

TABLE 1. SWITCH 1 SETTINGS

J1	ENABLE	
1	Center post to top	Enable V_{OUT}
2	Center post to bottom	Disable V_{OUT}

Schematic

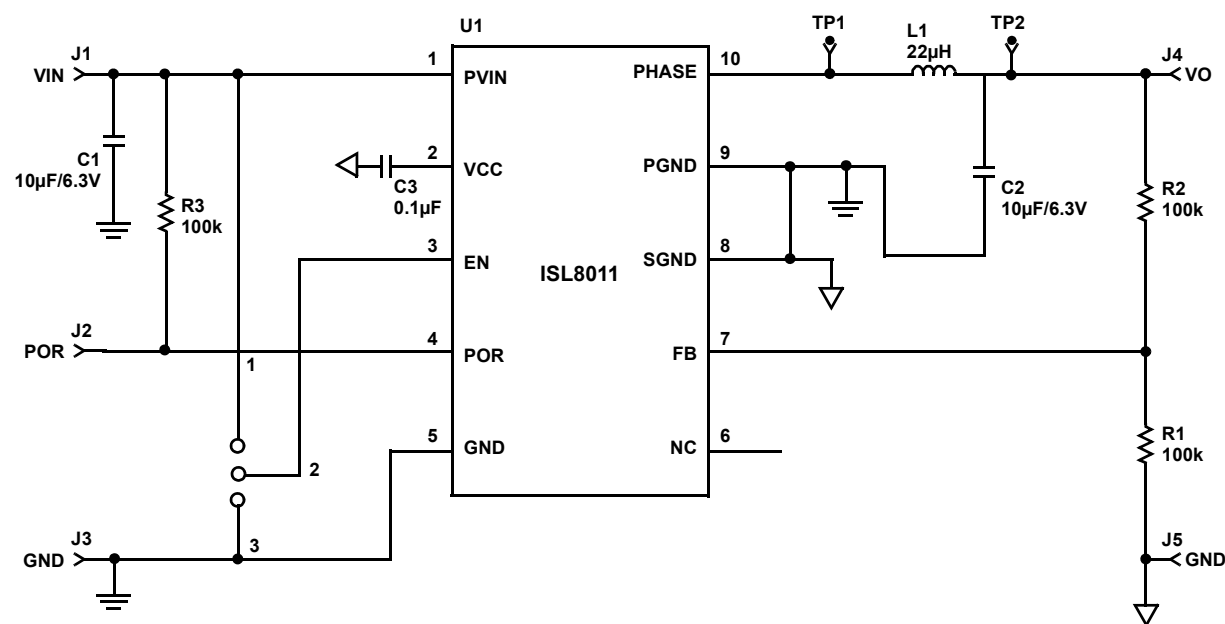


TABLE 2. COMPONENT LIST

REF DES	QTY	VALUE	TOL.	VOLTAGE	PACKAGE	PART NUMBER	MANUFACTURER	DESCRIPTION
C3	1	0.1µF			603	EMK107BJ104MA	Taiyo Yuden	Capacitor
L1	1	2.2µH			4028	CDRH2D14-2R2	Sumida	Inductor
C1	1	10µF	20%	6.3V	805	C1608X5R0J106M	Panasonic	CAP, SMD, 0603, 10µF, 6.3V, 20%, X5R, ROHS
C2	1	10µF	20%	6.3V	805	C1608X5R0J106M	Panasonic	CAP, SMD, 0603, 10µF, 6.3V, 20%, X5R, ROHS
R2	1	100k	1%	100V	603	various		RES, SMD, 0603, 100k, 1/10W, 1%, TF, ROHS
R3	1	100k	1%	100V	603	various		RES, SMD, 0603, 100k, 1/10W, 1%, TF, ROHS
R1	1	100k	1%	100V	603	various		RES, SMD, 0603, 100k, 1/10W, 1%, TF, ROHS
U1	1	ISL8011			DFN-10	ISL8011	Intersil	

ISL8011EVAL1Z Board Layout

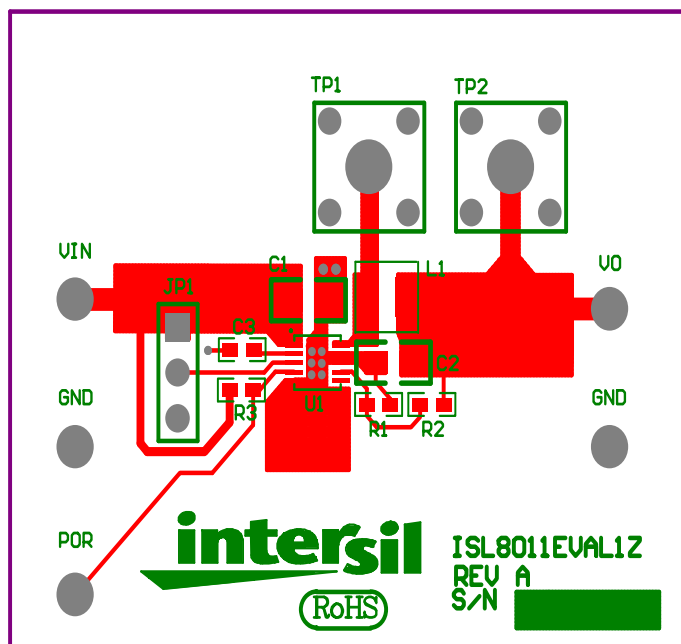


FIGURE 1. TOP COMPONENTS

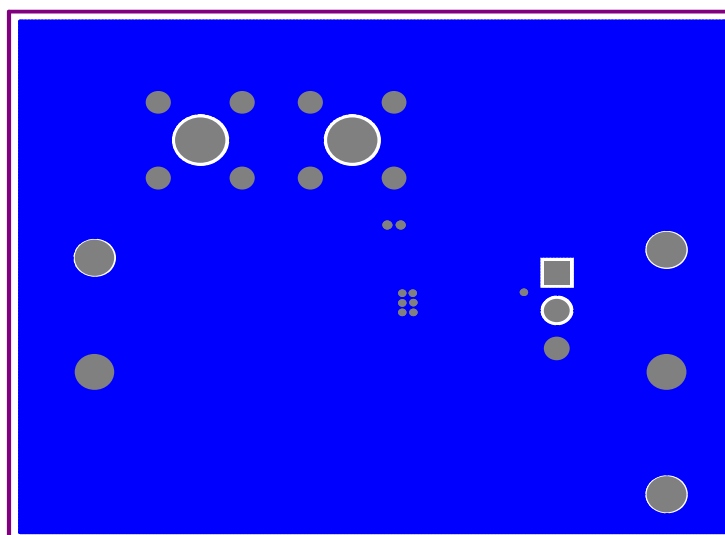


FIGURE 2. BOTTOM LAYER

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
 2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
 3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
 4. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
 5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.

"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.

"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.
 6. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
 7. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
 8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
 9. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
 10. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
 11. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
 12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.
- (Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.
- (Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

(Rev.4.0-1 November 2017)



SALES OFFICES

Renesas Electronics Corporation

<http://www.renesas.com>

Refer to "<http://www.renesas.com/>" for the latest and detailed information.

Renesas Electronics America Inc.
1001 Murphy Ranch Road, Milpitas, CA 95035, U.S.A.
Tel: +1-408-432-8888, Fax: +1-408-434-5351

Renesas Electronics Canada Limited
9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3
Tel: +1-905-237-2004

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-651-700, Fax: +44-1628-651-804

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
Room 1709 Quantum Plaza, No.27 ZhichunLu, Haidian District, Beijing, 100191 P. R. China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, 200333 P. R. China
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

Renesas Electronics Hong Kong Limited
Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-6688, Fax: +852-2886-9022

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886-2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 1207, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics India Pvt. Ltd.
No.777C, 100 Feet Road, HAL 2nd Stage, Indiranagar, Bangalore 560 038, India
Tel: +91-80-67208700, Fax: +91-80-67208777

Renesas Electronics Korea Co., Ltd.
17F, KAMCO Yangjae Tower, 262, Gangnam-daero, Gangnam-gu, Seoul, 06265 Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5338



**Стандарт
Электрон
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331