

ISL705XRH Evaluation Board User's Guide

Introduction

The ISL705XRHEVAL1Z evaluation board is a design platform featuring all three versions of the 5V supervisory circuit. It includes all the circuitry needed to characterize critical performance parameters and enables evaluation of basic functional operation and common application implementations. Figure 1 shows the ISL705XRHEVAL1Z schematic.

Evaluation Board Key Features

The ISL705XRHEVAL1Z is divided into three sections; each section having one of the three available reset output versions. The left position has the ISL705ARH and is set-up as a +12V and +5V UV monitor with reset signal. The middle position features the ISL705BRH set up as 5V window detector. The right section contains the ISL705CRH in a bipolar voltage sensing application.

Section 1

In the first section, the ISL705ARH is configured to monitor under voltage conditions on a +5V supply through the V_{DD} pin and on a +12V supply through the PFI pin. The PFI allows monitoring of any voltage above the 1.25V PFI reference, and, with a resistor divider, this is used to monitor the +12V. The rising threshold for the +12V auxiliary voltage is set to 10.84V via the R1, R2 divider. When this condition is met, PFO will be high driving on a green LED. When the +12V auxiliary voltage falls below 10.84V, PFO is pulled low and a red LED will be turned on. The active low reset signal may be monitored through the \overline{RST} test point. There is also a \overline{MR} test point in order to drive the MR low to test its functionality.

Section 2

The middle position has the ISL705BRH installed and is set-up as a 5V window detector. The V_{DD} monitors for UV and the PFI for OV via the R5, R6 divider. The PFO output is inverted and connected to the manual reset input (MR) via U4. Hence, a reset signal is generated when $4.64V < V_{DD} > 5.38V$. Without U4, the PFO will be an OV indicator but no reset signal will be generated. There is also a LED indicator for an overvoltage condition, when $V_{DD} > 5.38V$ PFO is a high and a LED will turn on indicating an OV condition. The active high reset signal for a UV condition may be monitored through the RST test point.

Section 3

The right position features the ISL705CRH in a negative voltage sensing application. A +5V supply is monitored through the V_{DD} pin and a -5V supply is monitored on the PFI pin with use of the R7, R8 resistor divider network. Both pins are sensing for an undervoltage condition. When the -5V supply rail drops below -4.5V, PFO will be high driving on the N3904 NPN transistor. As the NPN turns on, the manual reset (\overline{MR}) pin will be pulled low, initiating a reset. A UV condition may be monitored on the $\overline{RST_OD}$ pin, which has a 5.1k Ω pull-up resistor to V_{DD} .

Watchdog Timer Functionality

All of these positions have independent Watchdog input (WDI) and Watchdog output (WDO) test points to evaluate the functionality of the watchdog timer. A waveform generator may be used to apply a square wave signal to the WDI test points and the output monitored through the WDO test points. The WDI may also be left open and WDO is now a low line indicator of the voltage on V_{DD} .

Power Supplies

External power connections are made through the VDD, 12V, -5V and Ground connections on the evaluation board. All three sections share a common VDD test point with a decoupling capacitor C1. The PFI pins in section 1 and 2 have a unpopulated component pad to add decoupling capacitors C2 and C3 if needed.

Reference Documents

- ISL705ARH, ISL705BRH, ISL705CRH, ISL706ARH, ISL706BRH, ISL706CRH Datasheet, [FN7662](#)

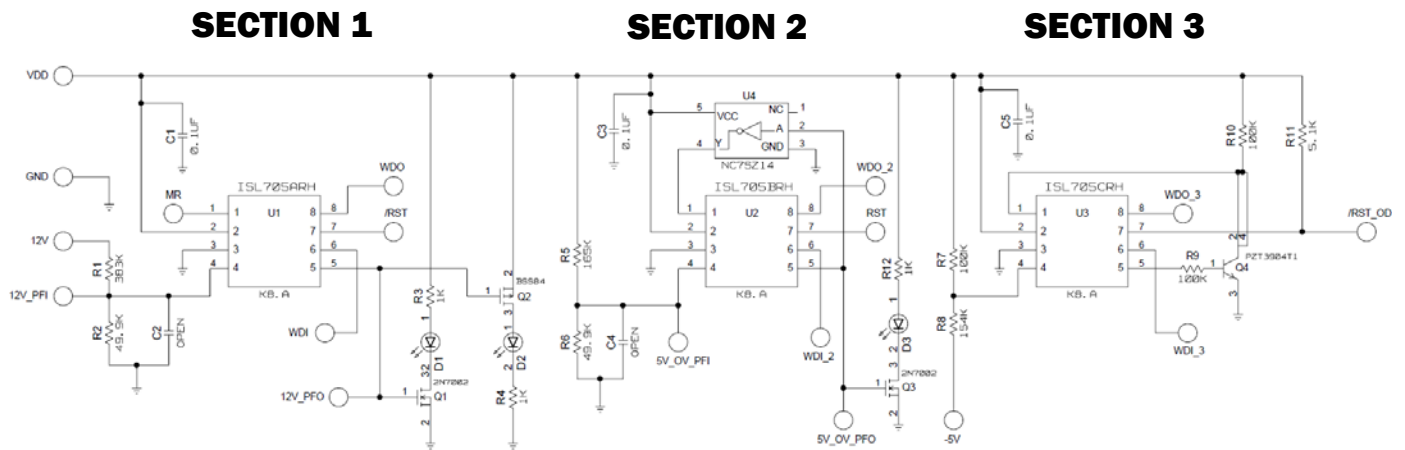


FIGURE 1. ISL705XRHEVAL1Z SCHEMATIC

Bill of Materials

TABLE 1. ISL705XRHEVAL1Z COMPONENTS PARTS LIST

DEVICE #	DESCRIPTION	COMMENTS
C1, C3, C5	CAP, SMD, 0603, 0.1 μ F, 50V, 10%, X7R, ROHS	Power Supply Decoupling
C2, C4	CAP, SMD, 0603, DNP, ROHS	User selectable capacitors - not populated
D1, D2, D3	LED, SMD, ROHS	Power Fail Indicator
Q1, Q3	N-Channel EMF Effect Transistor, SMD, SOT-23,ROHS	Power Fail Detector
Q2	P-Channel EMF Effect Transistor, SMD, SOT-23,ROHS	Power Fail Detector
Q4	NPN General Purpose Transistor, SMD, SOT-223, ROHS	
R1	RES, SMD, 0603, 383k Ω , 1/16W, 1%, ROHS	PFI Voltage Divider Network
R2, R6	RES, SMD, 0603, 49.9k Ω , 1/10W, 1%, ROHS	PFI Voltage Divider Network
R3, R4, R12	RES, SMD, 0603, 1k Ω , 1/10W, 1%, ROHS	LED Current Limiting Resistor
R5	RES, SMD, 0603, 165k Ω , 1/16W, 1%, ROHS	PFI Voltage Divider Network
R7, R9, R10	RES, SMD, 0603, 100k Ω , 1/16W, 1%, ROHS	PFI Voltage Divider Network
R11	RES, SMD, 0603, 5.1k Ω , 1/16W, 1%, ROHS	ISL705CRH Reset Pull-up Resistor
U1	ISL705ARH, 8 Ld Flatpack, 5V Supervisory Circuit	
U2	ISL705BRH, 8 Ld Flatpack, 5V Supervisory Circuit	
U3	ISL705CRH, 8 Ld Flatpack, 5V Supervisory Circuit	
U4	UHS Inverter with Schmitt Trigger Input, SC70, ROHS	

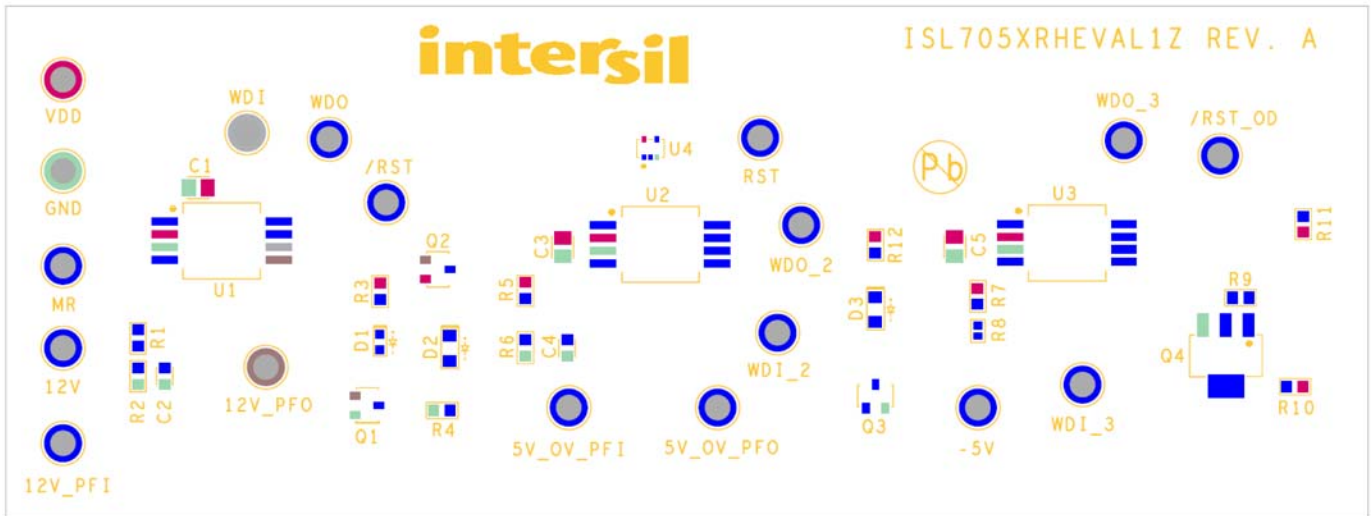


FIGURE 2A. ISL705XRHEVAL1Z TOP SILK SCREEN

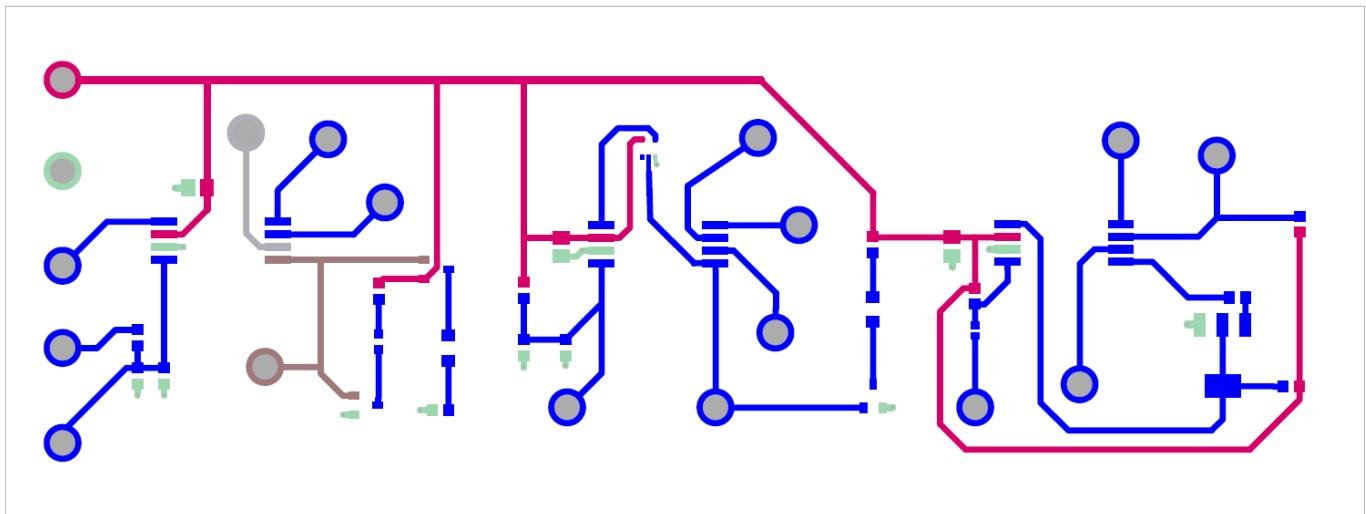


FIGURE 3A. ISL705XRHEVAL1Z TOP VIEW

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