DC/DC Boost and Buzzer Driver Reference Design

Introduction

This user manual provides basic guidelines to help developers familiarize themselves with the SLG47105V DC/DC Boost and Buzzer Driver Reference Design. It includes functional descriptions of the board and the accompanying demo project.

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1. Terms and Definitions

DC	Direct Current
HV	High Voltage

2. References

[1] SLG47105, Datasheet, Renesas Electronics.

[2] Go Configure™ Software Hub, Software Download, and User Guide.

3. Overview

The SLG47105V DC/DC Boost and Buzzer Driver Demo Board (see Figure 1) allows users to get acquainted with the SLG47105's functionality. Designed for hands-on experience, the board visually demonstrates the SLG47105 chip's ability to integrate a boost DC/DC converter and a piezo driver into a single package with minimal external components.

The board comes pre-programmed with a demo project. However, users can modify the project to meet specific application requirements using the Go Configure™ Software Hub.

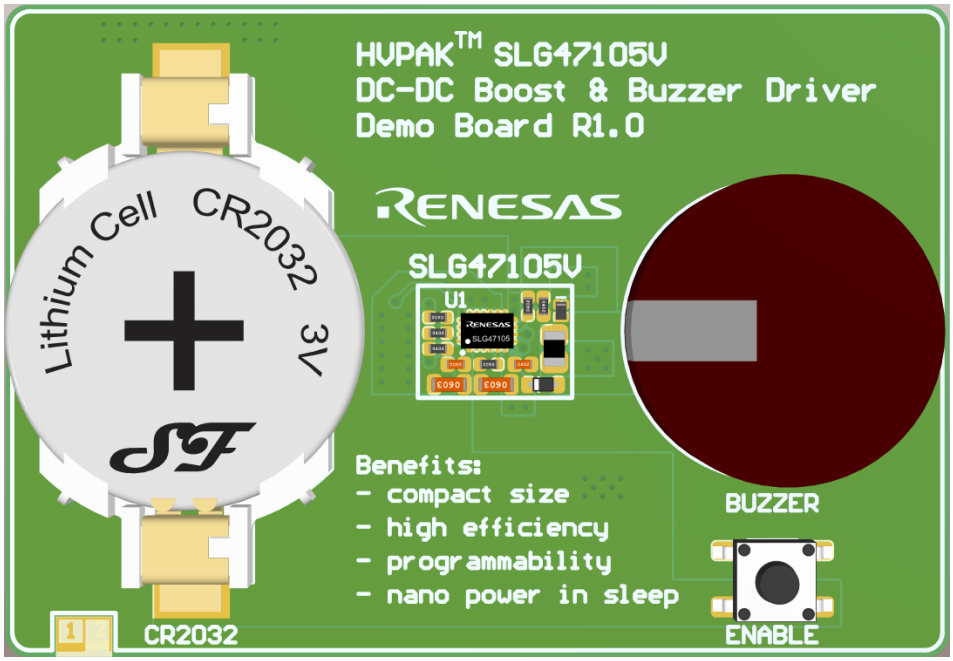

Figure 1. SLG47105V DC/DC Boost and Buzzer Driver Demo Board General View

The board shows that a single SLG47105 is capable of driving a Boost DC/DC converter, which increases the input voltage from 3 V to 9.5 V, as well as a 1 kHz piezo buzzer. The entire circuit is powered by a 3 V CR2032 coin cell battery. This schematic is suitable for devices that require short-term notifications, such as key finders and similar applications.

When the enable push button is pressed, the DC/DC converter boosts the voltage to 9.5 V, which then powers the piezo driver. Then the short sound pattern is played, and the circuit goes to sleep mode until the button is pressed again. While active, the circuit consumes approximately 8.5 mA RMS, and in sleep mode, it draws less than 50 nA.

4. Functional Description

4.1 Enable Button

The SLG47105V DC/DC Boost and Buzzer Driver Demo Board has an ENABLE button (Figure 2).

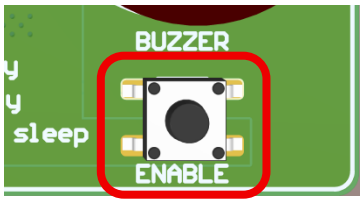

Figure 2. ENABLE Button

A short press of the ENABLE button activates the entire circuit. The boost converter begins operating and supplies power to the buzzer.

4.2 Power Supply

The board is entirely powered by the CR2032 battery. See Figure 3.

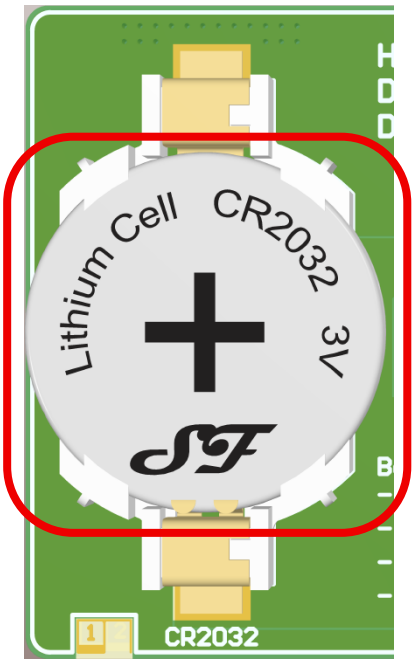

Figure 3. Board Power Supply

4.3 Buzzer

The 1 kHz piezo buzzer is installed on the board (Figure 4).

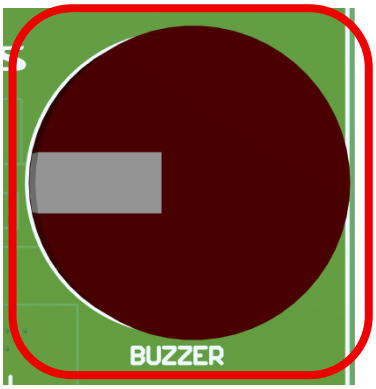

Figure 4. Piezo Buzzer

5. SLG47105 Demo Design Description

This demo design provides an in-depth overview of the SLG47105's DC/DC boost converter and buzzer driver capabilities. The block diagram of this project is shown in Figure 5.

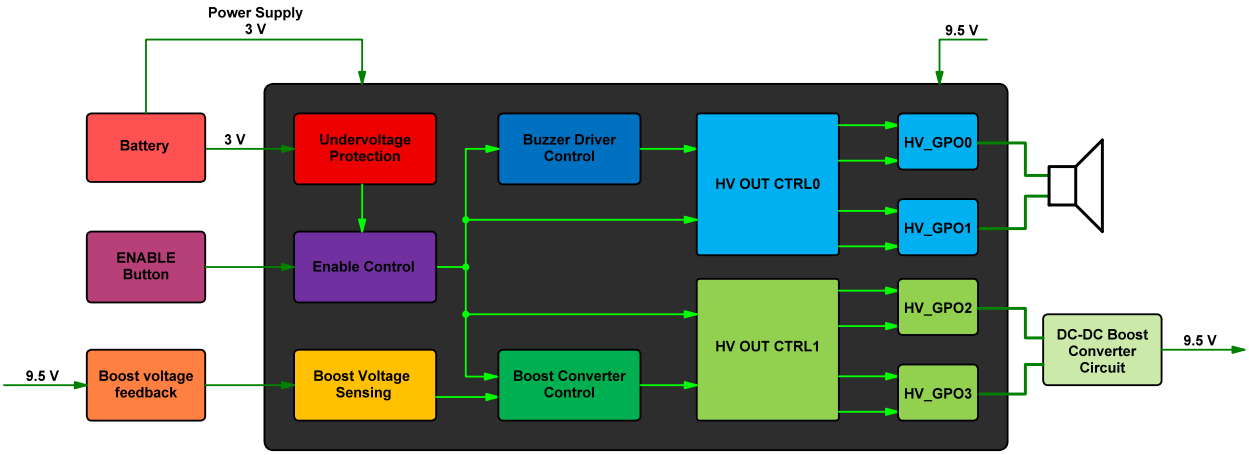

Figure 5. SLG47105V DC/DC Boost and Buzzer Driver Demo Board Block Diagram

The GreenPAK design of this project is shown in Figure 6.

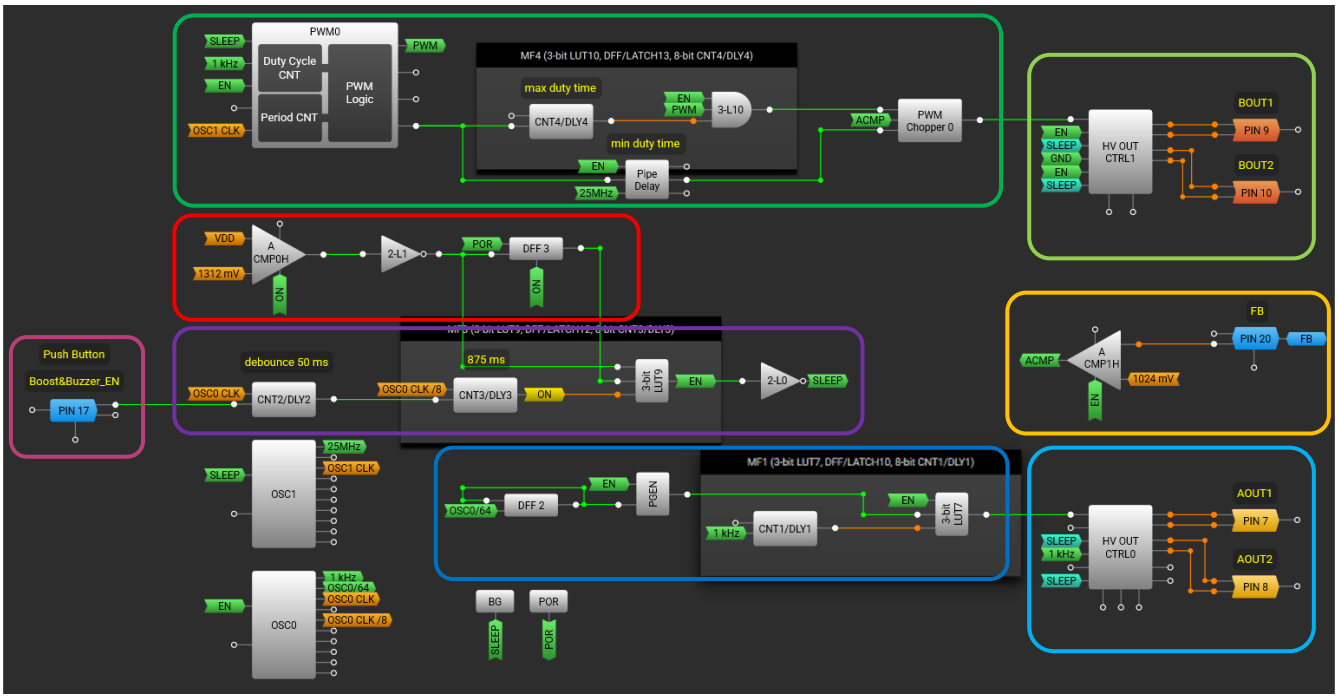

Figure 6. SLG47105V DC/DC Boost and Buzzer Driver Demo Board GreenPAK Design

The design consists of the two main structural blocks: the DC/DC boost converter and the piezo buzzer driver.

For the **DC/DC boost converter driver**, a signal with a frequency of approximately 197 kHz is generated to drive an external DC/DC boost converter circuit via PIN9 (HV OUT CTRL1). The duty cycle of this signal depends on the output voltage feedback received from the analog comparator ACMP1H. When the boosted output voltage exceeds 9.5 V, the duty cycle is chopped. The duty cycle is constrained within predefined minimum and maximum limits and can not go beyond these limits. In addition, the design provides a soft-start mechanism to reduce inrush current.

For the **piezo buzzer driver**, the design provides a short sound pattern using the PGEN macrocell and a resonant frequency of 1 kHz. The buzzer is connected to the full-bridge output (PIN7 and PIN8) of the SLG47105, which is powered by a boosted voltage of about 9.5 V.

In addition, this design provides undervoltage protection using ACMP0H. When the battery voltage drops to less than ~2.5 V, the entire circuit powers down until. It remains off until the next button press and the battery voltage recovers to at least 2.7 V.

6. Board Design

6.1 Top View

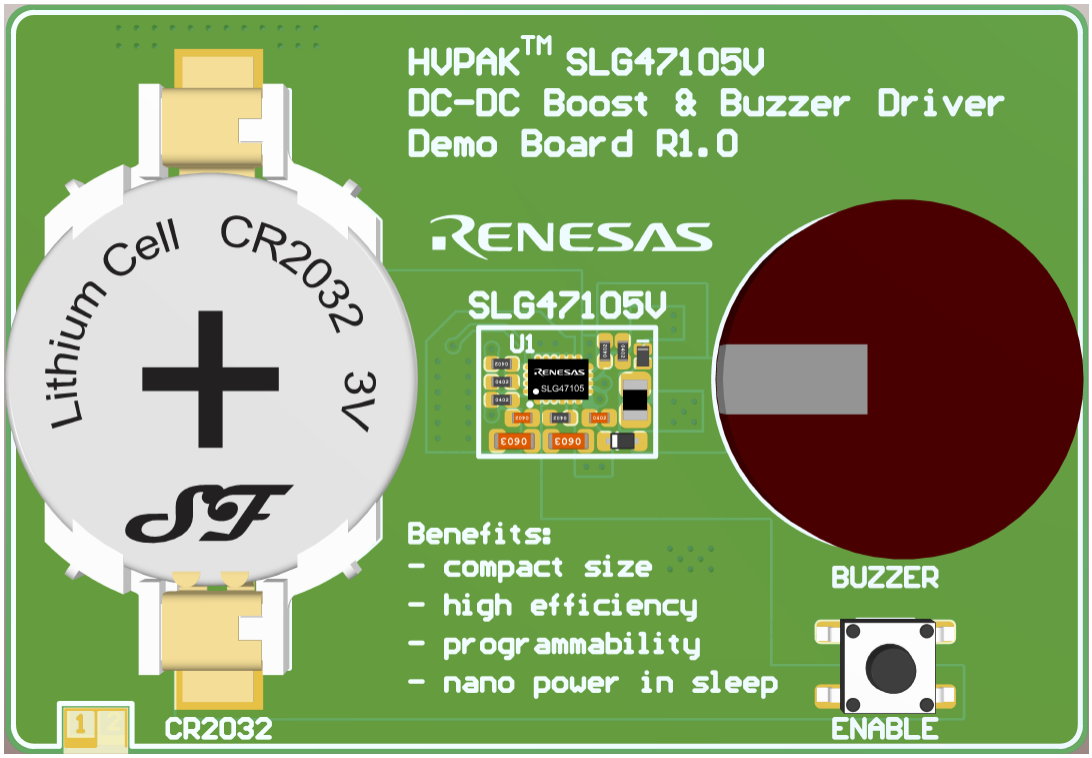

Figure 7. Board Top View

6.2 Bottom View

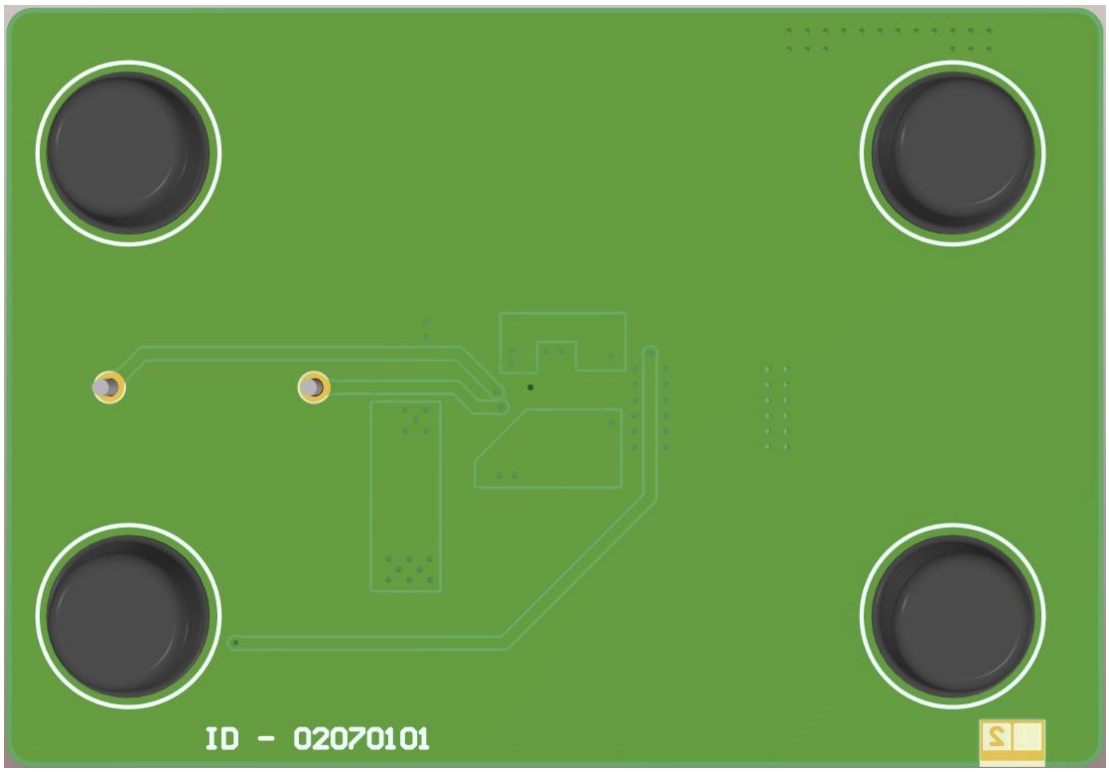

Figure 8. Board Bottom View

7. Board Schematics

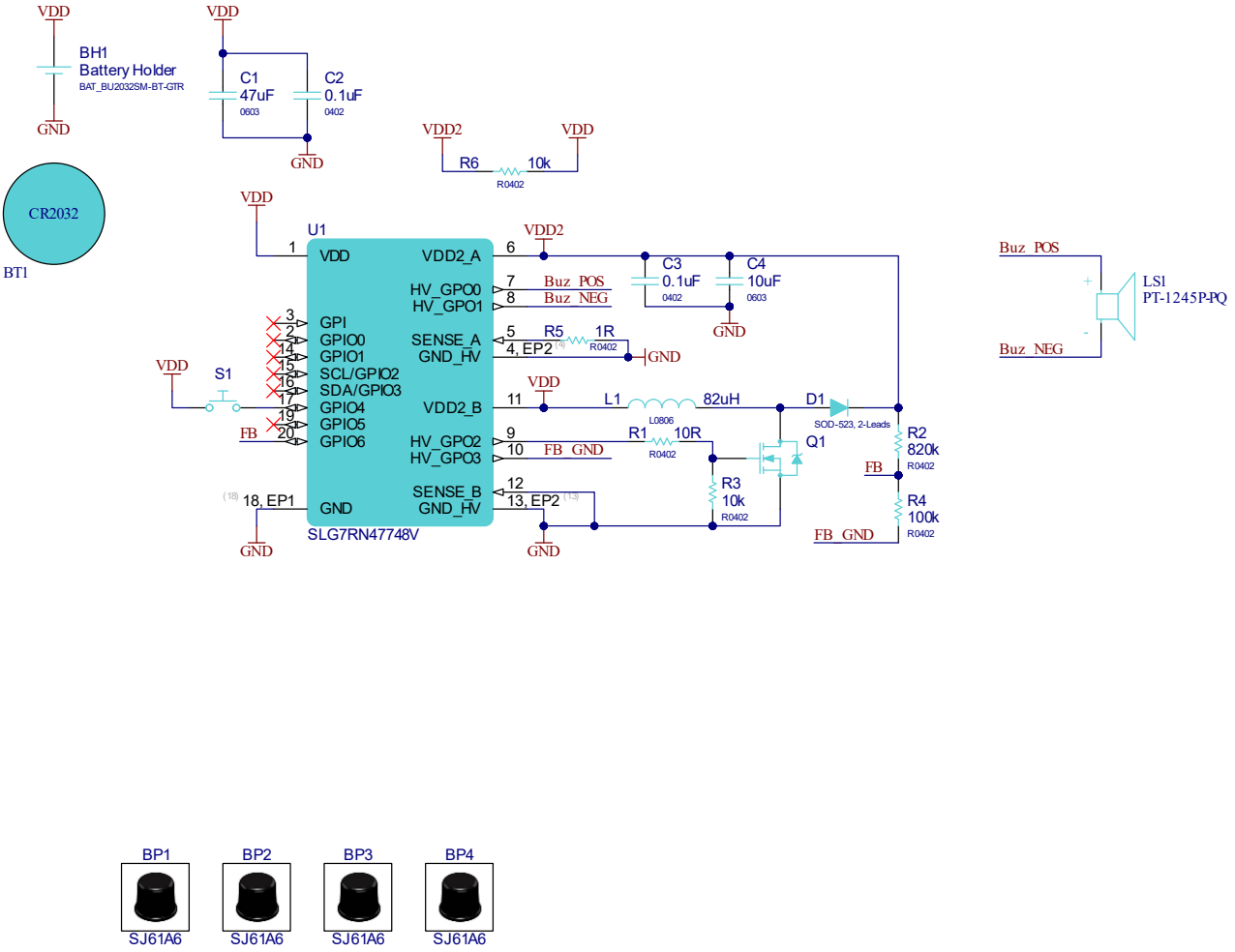

Figure 9. Board Schematic

8. Bill of Materials

#	Designator	Name	Manufacturer Part Number	Manufacturer	Quantity
1	BH1	Battery Holder	BU2032SM-BT-GTR	Memory Protection Devices	1
2	BP1- BP4	SJ61A6	7010334512	3M	4
3	BT1	CR2032	CR-2032L/BN	Panasonic	1
4	C1	47uF 20% 6.3V X5R 0603	GRM188R60J476ME15D	Murata Electronics	1
5	C2, C3	0.1uF 10% 25V X5R 0402	CL05A104KA5NNNC	Samsung Electro-Mechanics	2
6	C4	10uF 20% 25V X5R 0603	CL10A106MA8NRNC	Samsung Electro-Mechanics	1
7	D1	RB521S30T1G	RB521S30T1G	ON Semiconductor	1
8	L1	82uH 150mA	LQH2MPN820MGRL	Murata Electronics	1
9	LS1	SFN-17-B	SFN-17-B	Global Tone	1
10	Q1	MOSFET-N	DMN2400UFB-7	Diodes	1
11	R1	10R 1% 0402	RC0402FR-0710RL	YAGEO	1
12	R2	820k 1% 0402	RC0402FR-07820KL	YAGEO	1
13	R3, R6	10k 1% 0402	RC0402FR-0710KL	YAGEO	2
14	R4	100k 1% 0402	RC0402FR-07100KL	YAGEO	1
15	S1	Sw Tactile NO	PTS647SK38SMTR2LFS	ITT C&K	1
16	U1	SLG47105V	SLG47105V	Renesas Electronics America Inc	1

9. Conclusions

The DC/DC Boost and Buzzer Driver demonstration board showcases how the SLG47105 mixed-signal IC can efficiently generate a high-voltage output from a low-voltage battery to drive a piezo buzzer. The design integrates a DC/DC boost converter and a full bridge buzzer driver into a single, compact chip, requiring only a few external components. It demonstrates low power consumption, fast startup, and reliable sound generation, making it ideal for small, battery-powered alert or notification devices. Overall, the board highlights the SLG47105's flexibility and efficiency in combining power conversion and signal driving functions in a minimal footprint.

10. Revision History

Revision	Date	Description
1.01	Feb 25, 2026	Fixed typo
1.00	Nov 17, 2025	Initial release.