

CN051 Building Entry Detector (ToF-based)

December 2019

Building Entry Detector (ToF-based)

■ Overview

Time of Flight (ToF) technology has become more popular because of its high performance features and has been widely adopted for various applications. This system incorporates the ISL29501 ToF IC to provide an efficient solution that is easy to design and control, while also achieving accurate wide range distance measurement.

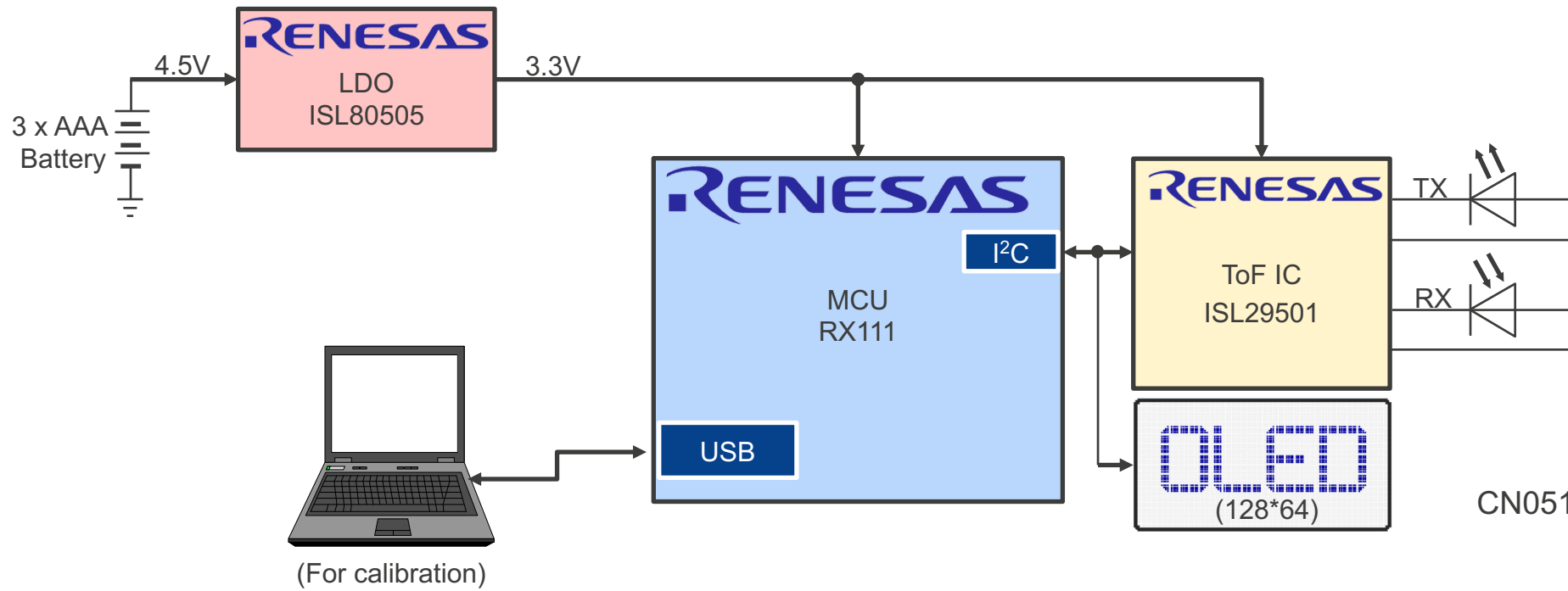
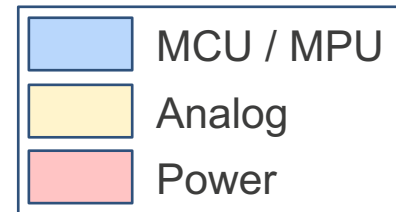
Optimized for handheld applications, this design incorporates the RX111 microcontroller, which includes USB 2.0 for calibration and communication with a PC. The high performance ISL80505 LDO powers the ToF IC and OLED from a battery source.

■ System Benefits

- ToF with long range measurement distance (more than 10m)
- The RX111 MCU has a comprehensive small-capacity ROM/low pin count lineup and built-in USB 2.0

CN051

Building Entry Detector (ToF-based)



Building Entry Detector (ToF-based)

Device Category	P/N	Key Features
MCU	RX111	RX Core, DSP, 48pin, 512K Flash, Rich Communication.
Power	ISL80505	500mA output current and output voltage can be programmed from 0.8V to 5.5V. (TJ= -40°C to +125°C).
Analog	ISL29501	ToF sensor, Time of Flight based signal processing integrated circuit

CN051

RX111 – 32-bit MCU Small Package with USB

Cost Optimized and High Performance RX MCU 3.3V Operation Support

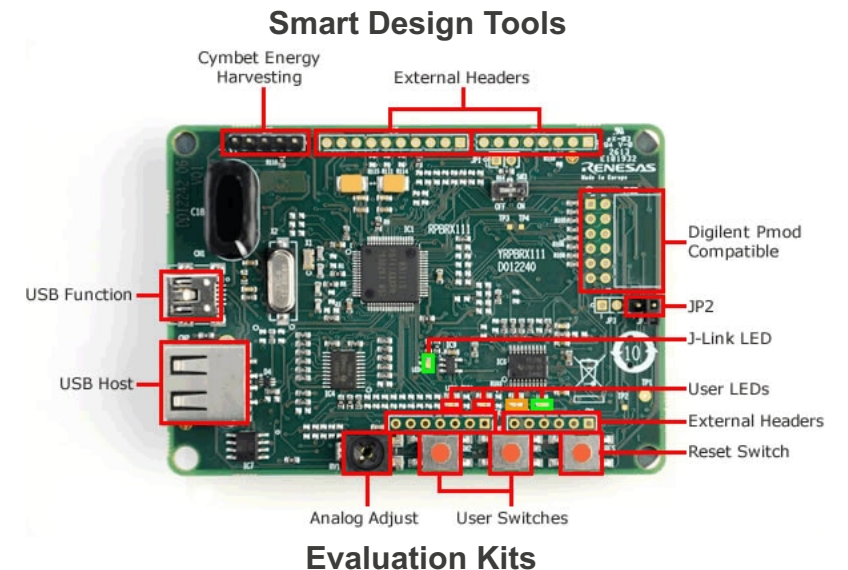
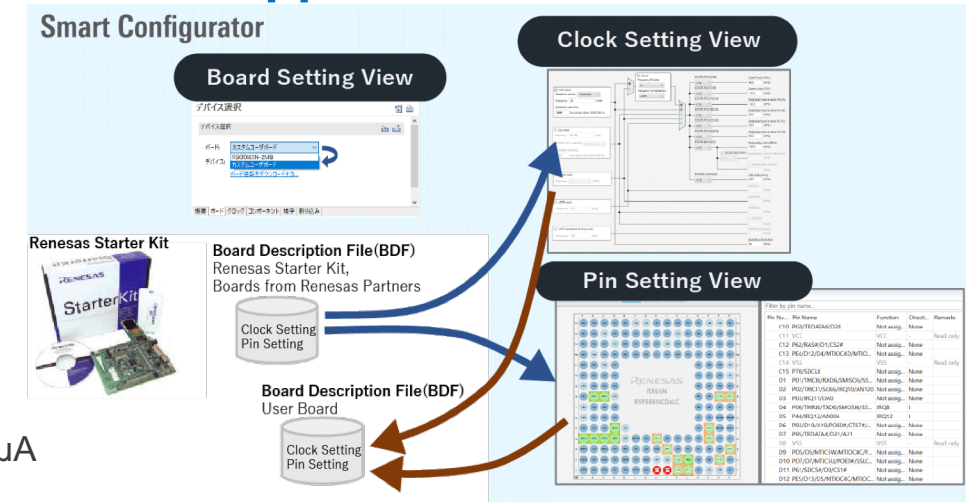
Cost Optimized and High Performance

- Max. operating frequency: 32MHz
- Accumulator support DSP instructions
- Up to 512 Kbytes code flash and 48 Kbytes SRAM, no wait states
- Incorporating external components into MCU like POR/LVD, RTC, E2 data flash, temperature sensor and port

Rich Peripheral Functions and Low Power Design

- 3 low power consumption modes
- Low power timer(LPT) that operates during the software standby states
- Supply current: high-speed operating mode: 96 μ A/MHz software standby mode: 0.37 μ A
- Up to 6 communication functions, up to 12 extended-function timers, 12-bit ADC, 8-bit DAC, comparator, remote control signal reception,
- USB H/F & OTG support
- Small package to 4mm x 4mm

Part #	ROM (Kbytes)	RAM (Kbytes)	E2 DataFlash (Kbytes)	Package
R5F51113ADLM	64	10	8	36pin WFLGA, 4 x 4 mm, 0.5mm pitch
R5F51118ADNE	512	64	8	48pin HWQFN, 7 x 7 mm, 0.5 mm pitch
R5F51115ADFK	128	16	8	64pin LQFP, 14 x 14 mm, 0.8 mm pitch
R5F51118ADFK	512	64	8	



ISL80505/510 – High Performance 0.5A/1A LDO

High PSRR for Instrumentation, Industrial, and Medical Applications

Stable Output Voltage

- $\pm 1.8\%$ V_{OUT} accuracy guaranteed over line, load
- Stable with a $4.7\mu\text{F}$ output ceramic capacitor

High Efficiency

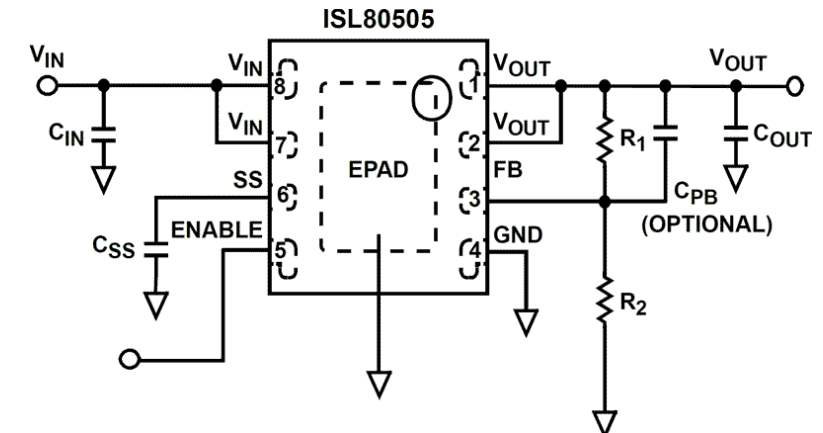
- Very low 45mV dropout voltage at $V_{OUT} = 2.5\text{V}$
- Very fast transient response

High Performance

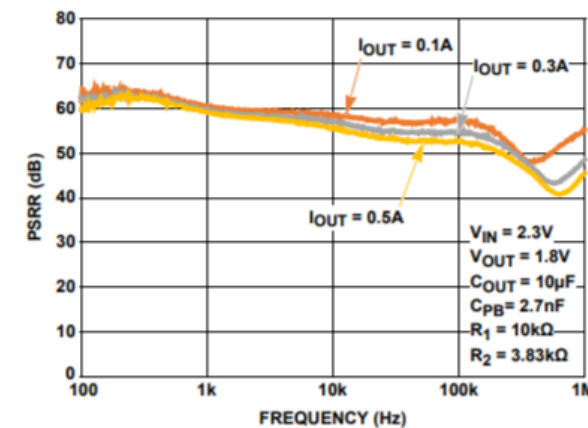
- Excellent PSRR over wide frequency range
- Programmable output soft-start time

Excellent Safety

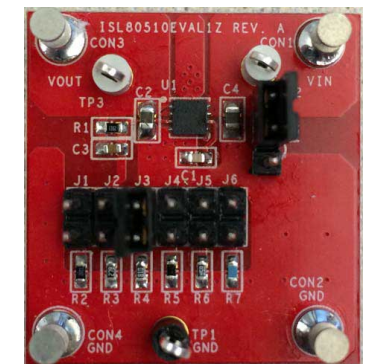
- Current limit protection
- Thermal shutdown function



Typical Application Circuit



PSRR (power supply rejection ratio)



ISL80510EVAL1Z 1A LDO Evaluation Board

Part #	Vin (V)	Iout (A)	Package
ISL80505IRAJZ	1.8V to 6V	0.5	3x3 DFN
ISL80510IRAJZ	2.2V to 6V	1	3x3 DFN

ISL29501-Time of Flight (ToF) Signal Processing IC

Low cost, Low power, and Long Range Optical Distance Sensing

Application Level Integrated

- On-chip Digital Signal Processor calculates the time of flight
- Built-in current DAC circuit that drives LED or laser
- On-chip active ambient light rejection

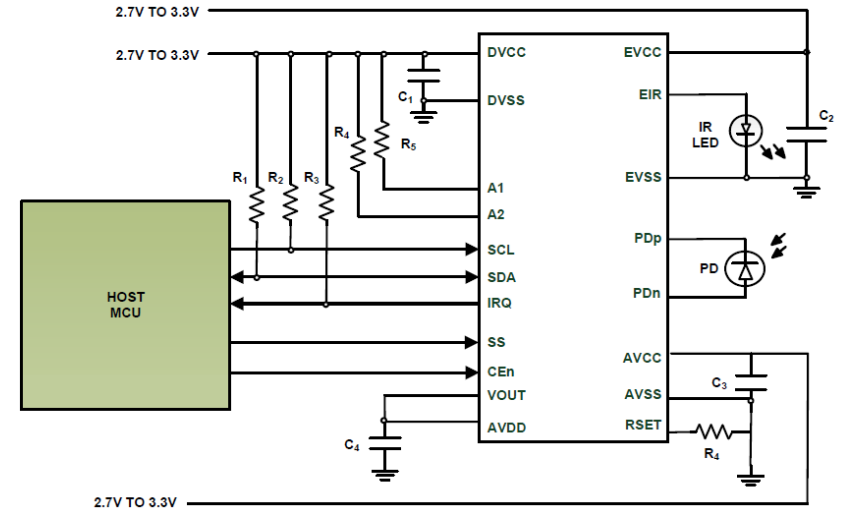
Easy Control

- I²C interface for configuration and control
- Operates in Continuous and Single Shot mode
- Auto gain control mechanism
- Interrupt controller
- Modulation frequency of 4.5MHz

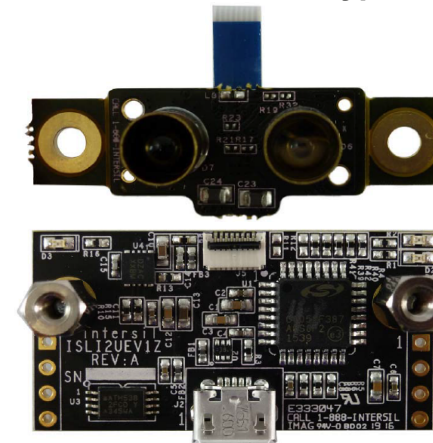
Suitable for Different Designs

- Enables proximity detection and distance measurement
- Optimized for performance/ power/ distance, etc
- Wavelength agnostic
- Emitter DAC with programmable current up to 255mA
- I²C interface supporting 1.8V and 3.3V bus
- Low profile 24 Ld 4x5 QFN package

Part #	VDD RANGE (V)	TEMP RANGE (°C)	Package
ISL29501IRZ-T7	2.7V to 3.3V	-40 to +85	24 Ld QFN
ISL29501IRZ-T7A	2.7V to 3.3V	-40 to +85	24 Ld QFN



Typical Application Circuit



ISL29501-CS-EVKIT1Z Cat Shark



ISL29501-ST-EV1Z Sand Tiger

[Renesas.com](https://www.renesas.com)