

J035

Edge Keyword Detection

October 2019

Edge Keyword Detection

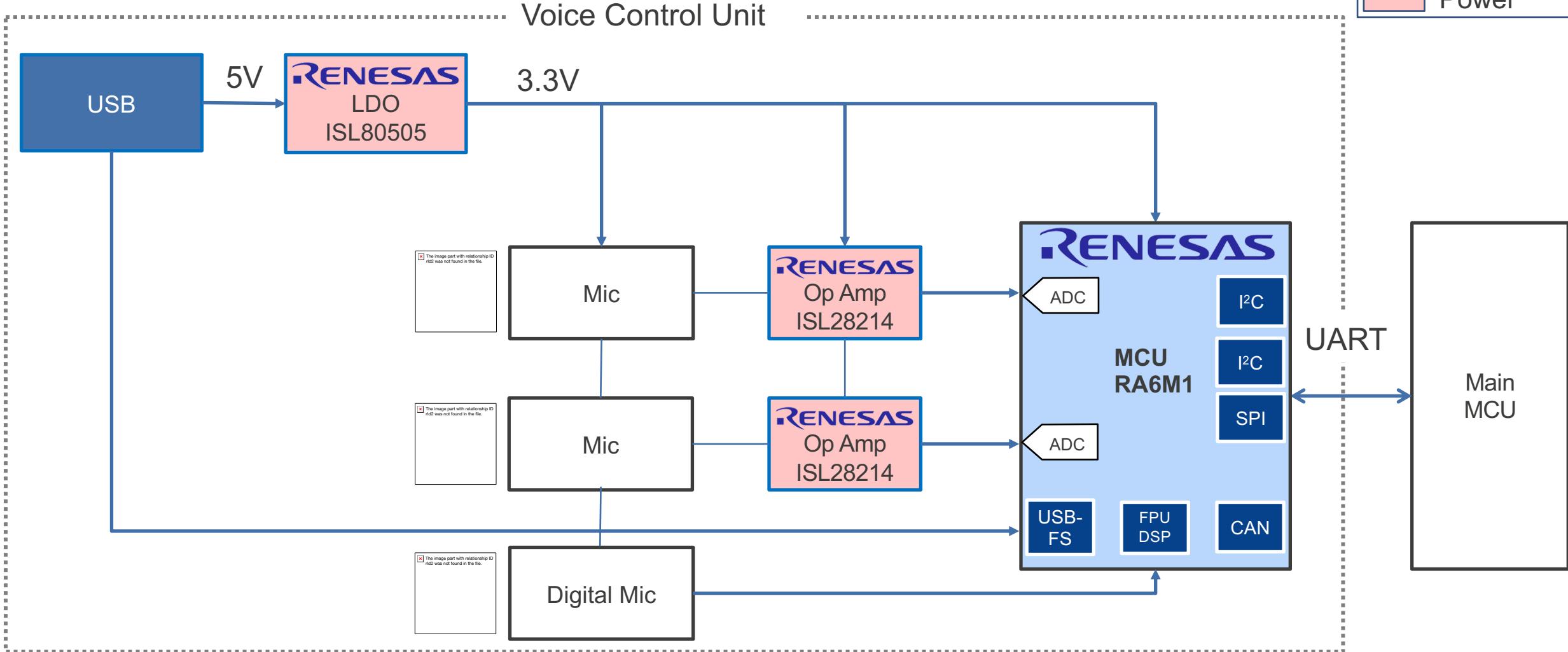
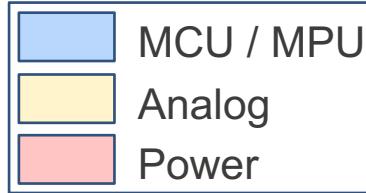
▪ Overview

This design provides a voice recognition solution with low power consumption. It improves recognition rates by implementing beam forming and noise suppressor functions, which tune according to the usage in the environment.

▪ System Benefits

- Achieves high performance voice recognition by using low power consumption technology and DSP from the RA6M1 MCU
- Quick evaluation and development of speech recognition functions

Edge Keyword Detection



Block Diagram #JP035
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Edge Keyword Detection

Device Category	P/N	Key Features
MCU	RA6M1	Arm® Cortex®-M4 512kB Flash with 256kB RAM. Advanced security, connectivity & flexible SW.
Power	ISL28214	Dual General Purpose Micropower, RRIO Operational Amplifiers
	ISL80505	High PSRR for Instrumentation, Industrial, and Medical Applications

RA6M1 – Ultra-Low Power 120-MHz Arm® Cortex®-M4 Core

For Control/ Security/Graphical and Capacitive Touch

High Performance

- 120MHz Arm® Cortex®-M4 CPU

Highly Integrated Capabilities

- Up to 512KB Flash Memory and 256KB SRAM
- 128-bit unique ID
- 12-Bit ADC x2
- 12-Bit DAC x2

Communication Interfaces

- USB 2.0 (Full Speed/ High Speed)
- Ethernet Controller with DMA
- SCI x7/SPIx2/IICx2

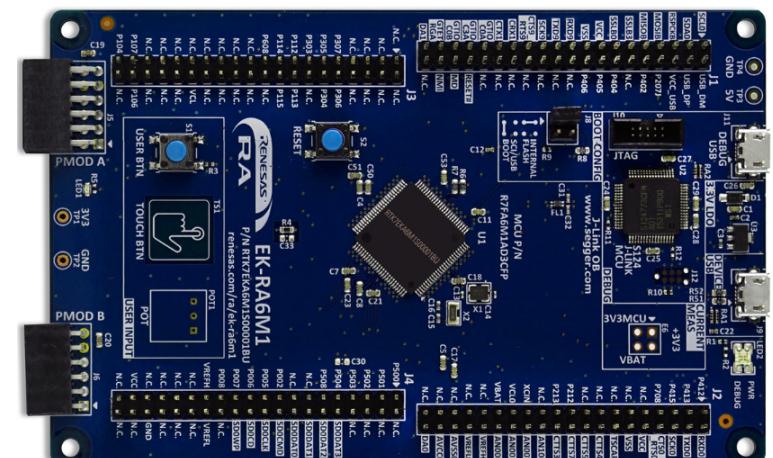
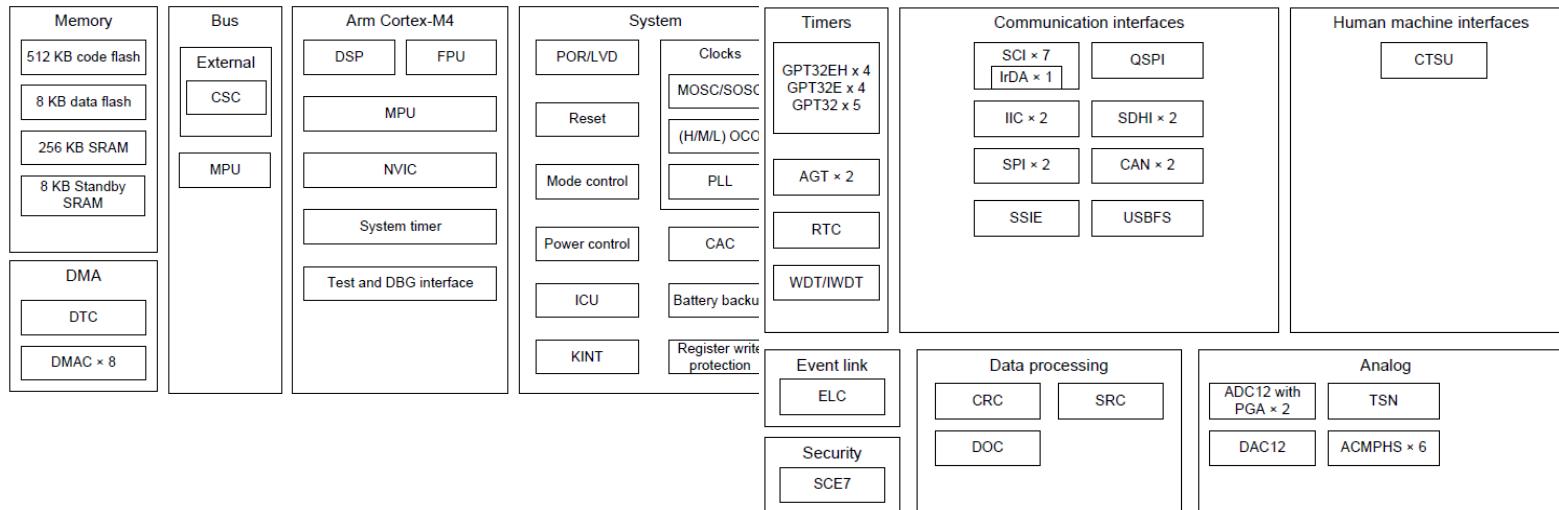
HMI Interface

- Capacitive Touch Sensing Unit (12ch.)
- Graphics LCD Controller

Security and Encryption

- AES128/192/256, 3DES/ARC4, SHA1/SHA224/SHA256/MD5, GHASH, RSA/DSA/ECC
- True Random Number Generator (TRNG)

Part #	Flash Memory	RAM	Temp	Package
R7FA6M1AD3CFP	512KB	256KB	40~105°C	100 LQFP
R7FA6M1AD3CFM	512KB	256KB	40~105°C	64 LQFP



RTK7EKA6M1S00001BU

ISL28214 – Dual General Purpose Micropower, RRIO Op Amp

Ideal for Power Supply Control/Regulation and Signal Gain/Buffers

Low Offset

- Low offset voltage: 0.5mV, Typ.
- Offset drift: 5 μ V/ $^{\circ}$ C Typ/

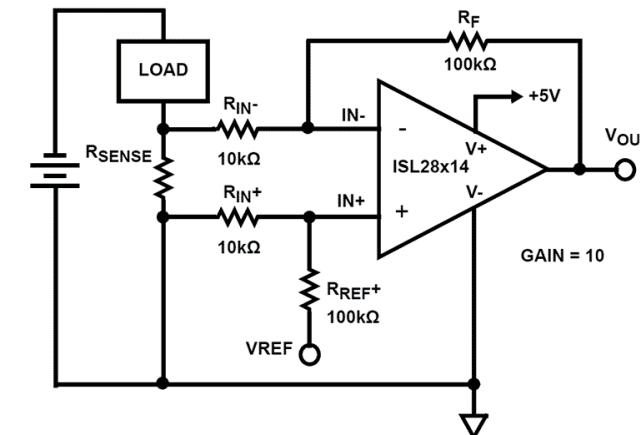
Good Dynamic Performance

- Wide Operating temperature: -40C to +125C.
- Rail-to-rail input and output: CMRR at $V_{CM} = -0.1V$ to 5.1V: 72dB, Typ
- Input bias current: 20pA Max
- Wide bandwidth: 5MHz

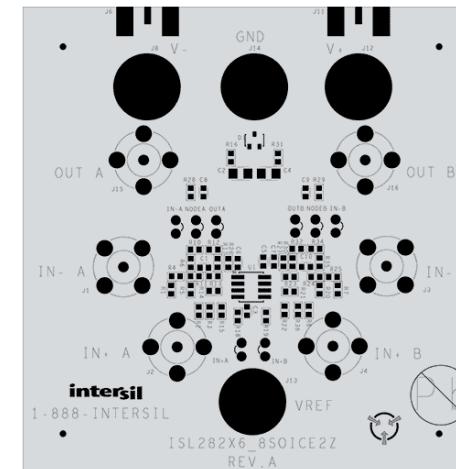
Low Power Design

- Low I_{CC} : 390 μ A, Typ
- Wide supply range: +1.8V to +5.5V

Part #	Temp.	Package
ISL28214FUZ	-40 - 125 $^{\circ}$ C	8 Ld 3x3mm MSOP
ISL28214FBZ	-40 - 125 $^{\circ}$ C	8 Ld 5x4mm SOICN



Typical Operating Circuit



ISL28214SOICEVAL2Z

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 $4.7\mu F$ output ceramic capacitor

High Efficiency

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

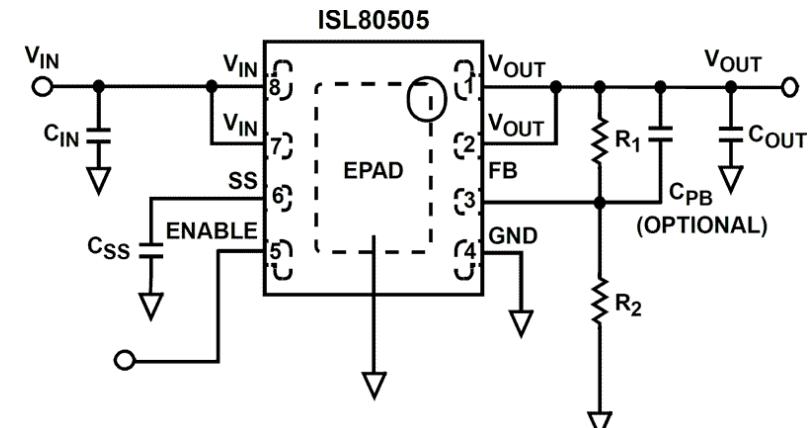
High Performance

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

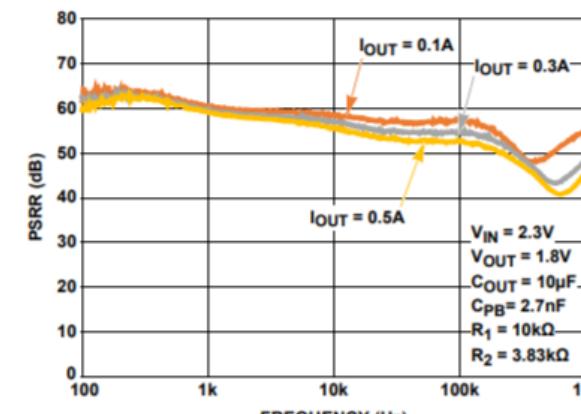
Excellent Safety

- Current limit protection
- Thermal shutdown function

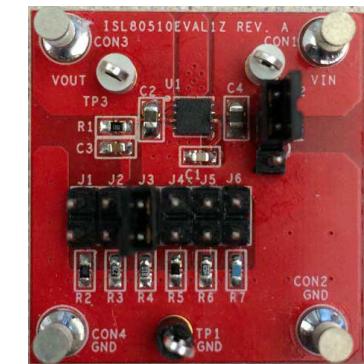
Part #	Vin (V)	Iout (A)	Package
ISL80505IRAJZ	1.8V to 6V	0.5	3x3 DFN
ISL80510IRAJZ	2.2V to 6V	1	3x3 DFN



Typical Application Circuit



PSRR (power supply rejection ratio)



ISL80510EVAL1Z 1A LDO Evaluation Board

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