







The Most Cost-effective Intelligent Multi-mic Voice Interaction Chip

Intelligent Voice Interaction Solution

Overview

With the computing power of the cost-effective dual-core Cortex™-A7 CPU, R328 provides the optimal general computing power at the extreme cost, and supports the mainstream voice pick-up and playback scheme without adding external DSP voice chip through high integrated CODEC circuit. Integrated 8 PDM channels, 16 I2S channels, 3 ADC channels and 1 differential DAC channel provide audio input/output interface and a rich and flexible microphone array; the embedded VAD low-power voice wake-up module realizes the ultra-low power consumption in the voice standby state. The excellent audio engine supports all mainstream high resolution audio formats, and works seamlessly with CPU, which can accelerate multimedia running algorithm and improve user experience. R328 is the ideal SoC for the intelligent speaker and intelligent home markets.

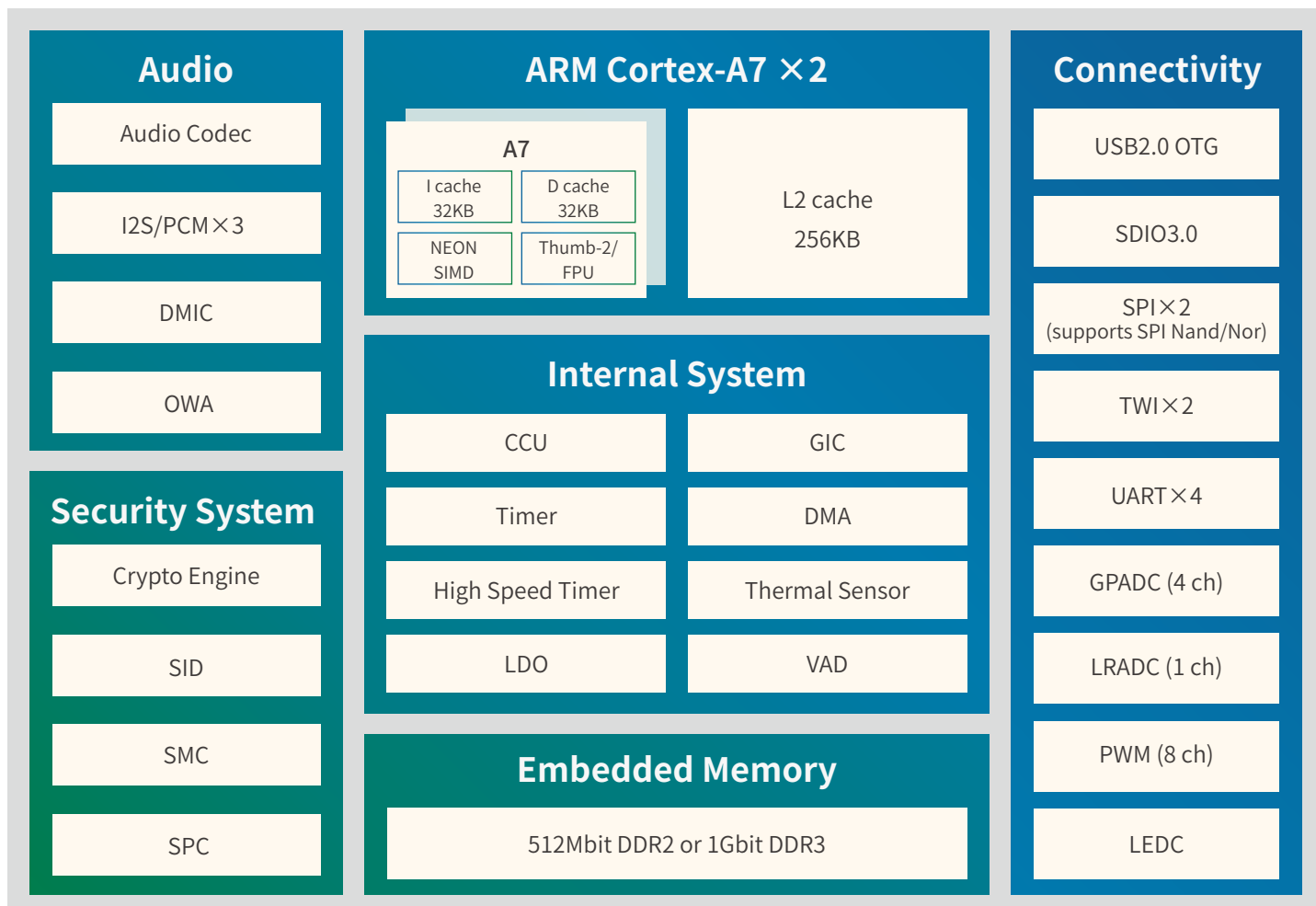
Highlights

-  **High Integration**
R328 integrates dual-core Cortex™-A7, 64MB DDR2 or 128MB DDR3, and high performance 3 ADC, 1 DAC, 3 I2S, 8 DMIC, which provides the perfect voice interaction solution.
-  **Low Cost Solution**
With small LFBGA package, integrated 2 LDOs and companion WIFI&BT chip, R328 can complete two-layer PCB board, and realize the extremely low cost solution.
-  **Low Power Architecture**
The advanced 28nm process enables R328 to realize high energy efficiency and low heat. The embedded VAD voice wake-up module realizes the ultra-low power consumption in the voice standby state.
-  **High Quality Assurance**
Industrial grade working temperature, 10-years chip life.

Feature List

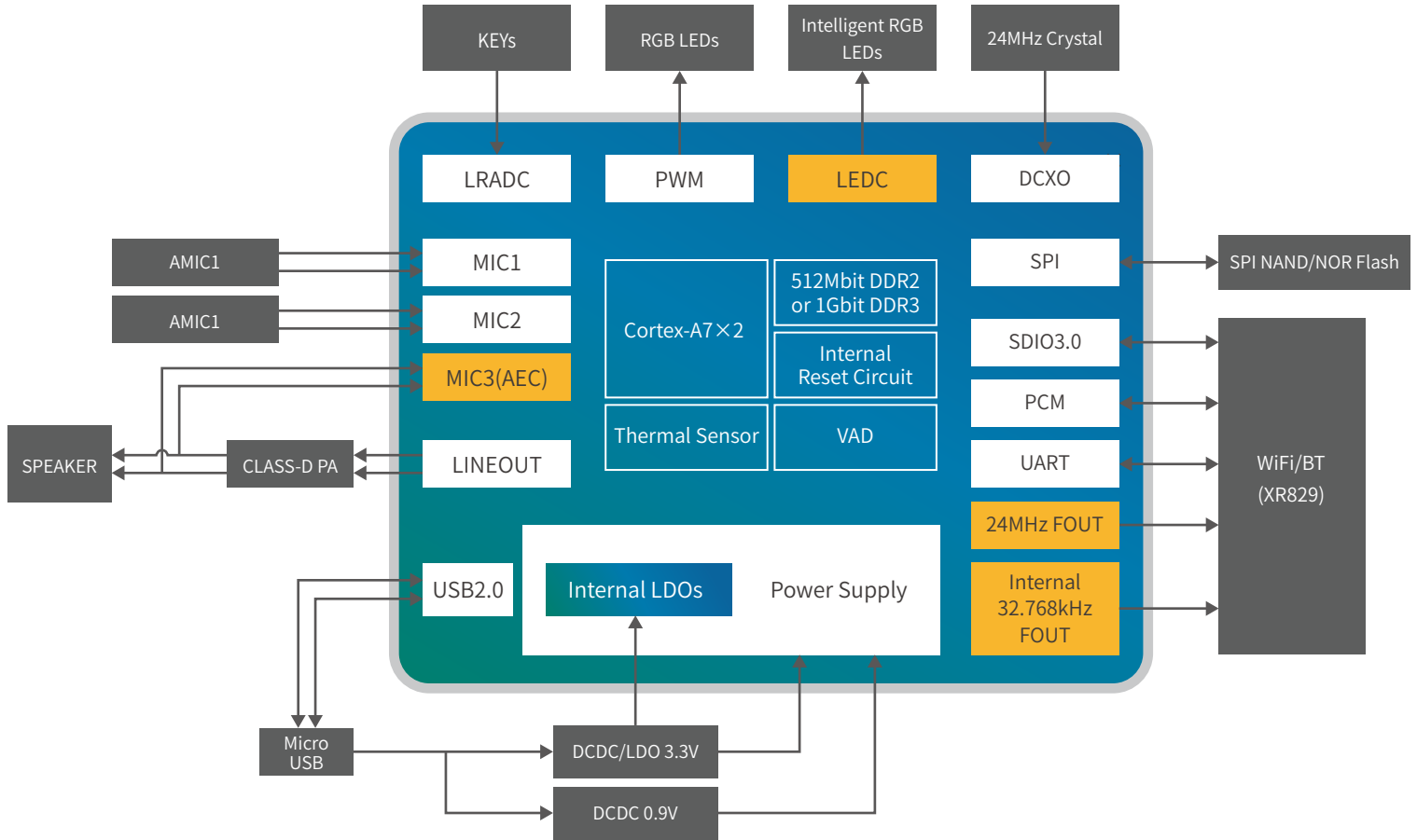
CPU	<ul style="list-style-type: none">• Dual-core ARM Cortex™-A7@1.2GHz• 32KB L1 I-cache + 32KB L1 D-cache per core• 256KB L2 cache
Memory	<ul style="list-style-type: none">• Embedded 64MB DDR2(R328-S2) or 128MB DDR3(R328-S3)• Supports SPI Nand/Nor Flash
Audio	<ul style="list-style-type: none">• Embedded with VAD voice wake-up module• Supports 1 audio DAC and 3 audio ADC• Supports 3 analog audio inputs and 1 analog audio output• Up to 3 I2S/PCM controllers for connecting Bluetooth and external audio codec, each I2S/PCM supports maximum 16 channels• Integrated digital microphone, supports maximum 8 digital microphones
Security Engine	<ul style="list-style-type: none">• Supports Symmetrical algorithm: AES, DES, 3DES• Supports Hash algorithm: MD5, SHA, HMAC• Supports Public Key algorithm: RSA• Supports 160-bit hardware PRNG with 175-bit seed• Supports 256-bit hardware TRNG• Supports 1K-bit EFUSE for chip ID and security application
Connectivity	<ul style="list-style-type: none">• USB 2.0 OTG• SDIO 3.0• LEDC• 2 x TWI, 2 x SPI, 4 x UART• 8-ch PWM, 4-ch GPADC, 1-ch LRADC
WiFi	XR829 or others
OS	Linux 4.9
Package	LFBGA 143balls(R328-S2), LFBGA 144balls(R328-S3) 9.25mm x 9.15mm body size,0.65mm ball pitch,0.35mm ball size(R328-S2) 9.15mm x 11.1mm body size,0.65mm ball pitch,0.35mm ball size(R328-S3)
Process	28nm HPC

Block Diagram



Application Diagram

- Intelligent speaker solution:



ABOUT ALLWINNER

Allwinner Technology is a leading fabless design company dedicated to smart application processor SoCs and smart analog ICs. Its product line includes multi-core application processors for smart devices and smart power management ICs used by brands worldwide.

With its focus on cutting edge UHD video processing, high performance multi-core CPU/GPU integration, and ultra-low power consumption, Allwinner Technology is a mainstream solution provider for the global tablet, internet TV, smart home device, automotive in-dash device, smart power management, and mobile connected device markets. Allwinner Technology is headquartered in Zhuhai, China.

CONTACT US

For more product info, please contact service@allwinnertech.com, or scan the QR code to follow us on Wechat.

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