

EDGEREADY MCU-BASED SOLUTION FOR LOCAL VOICE CONTROL

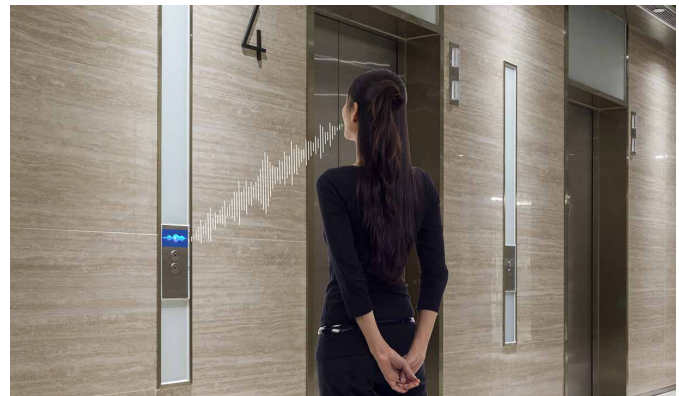
NXP's EdgeReady MCU-based solution for offline local voice control leverages the i.MX RT crossover MCU, enabling developers to quickly and easily add voice assistant capabilities to their products. This i.MX RT106S based turnkey solution includes a development kit (SLN-LOCAL2-IOT) with fully integrated software, for quick out-of-the-box evaluation and proof of concept development. This second-generation local voice solution includes a PC-based tool to create speech models for more than one hundred custom commands and multiple wake words from text input, with support for over forty different languages and dialects.

OVERVIEW

NXP's i.MX RT106L based local commands solution provides OEMs with a fully integrated software solution and hardware reference design. It comes with a phoneme-based automatic speech recognition engine for offline, local recognition of commands and wake words, plus a machine learning far field audio front end for noise suppression, beamforming and echo cancellation. The BOM cost-optimized reference design and production-ready SDK minimizes time to market, risk and development effort, enabling OEMs to easily add low latency hands-free voice control capabilities to their smart home, smart appliance, smart building and smart industrial products, without the need for Wi-Fi® or cloud connectivity, addressing the privacy concerns many consumers associate with cloud-based voice assistants.

TARGET APPLICATIONS

The i.MX RT106S MCU-based solution for local voice control enables device makers to integrate an offline voice assistant into a wide variety of smart home, smart appliance, smart building and smart industrial products.



- Light switches and dimmers
- Shade and fan controls
- Smart plugs and outlets
- Thermostats
- Alarm panels
- Smoke and CO detectors
- Set-top boxes, TVs and AVRs
- Home gateways and mesh Wi-Fi systems
- Garage door openers
- Room air conditioners
- Humidifiers and dehumidifiers
- Major appliances
 - E.g. fridge, cooking, laundry, dishwasher
- Small appliances
 - E.g. microwave oven, coffee maker, food processor
- Elevator control systems
- Vending machines
- Building intercom systems
- Industrial automation
- Hands-free process control

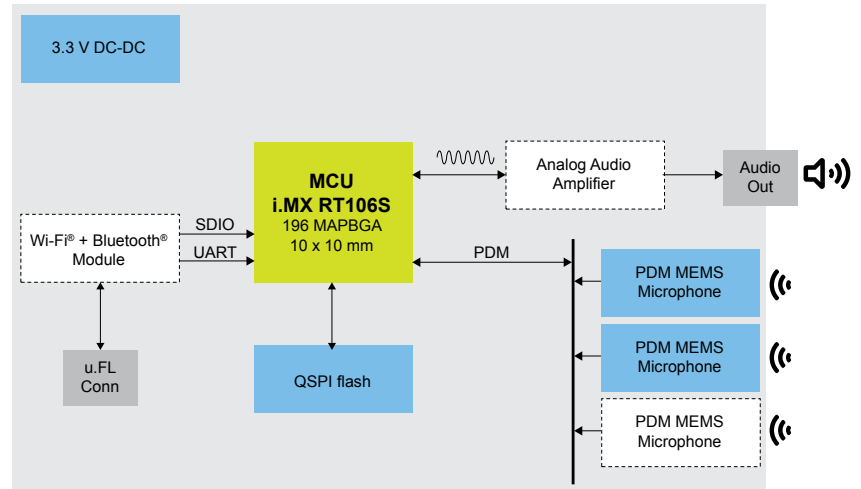
i.MX RT106S SPEECH RECOGNITION CROSSOVER PROCESSOR OVERVIEW

The i.MX RT106S is an EdgeReady member of the i.MX RT1060 family of crossover MCUs, targeting offline embedded local voice assistant applications. It features NXP's advanced implementation of the Arm® Cortex®-M7 core, which operates at speeds up to 600 MHz to provide high CPU performance and real-time response. The i.MX RT106S processor is licensed to run NXP's turnkey voice assistant software solutions, which includes:

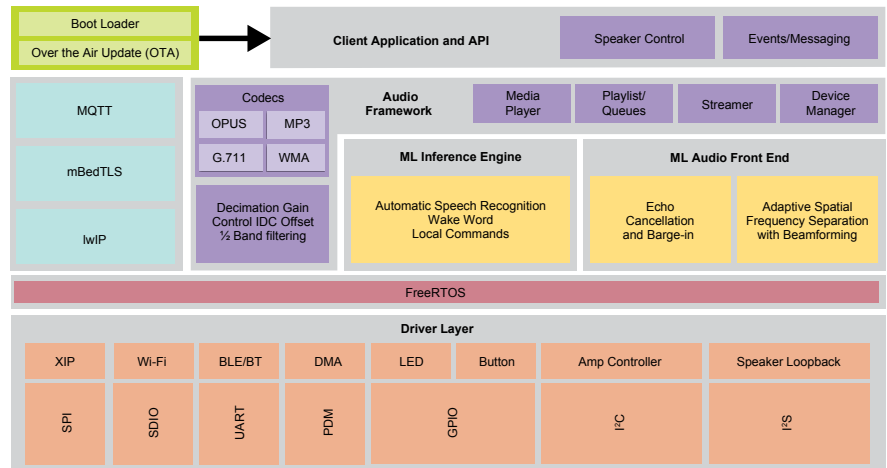
- Phoneme-based speech recognition engine with PC-based modelling tool
- Machine learning audio front end for far field voice
 - Deep learning based filtering and beamforming
 - Acoustic echo cancellation (barge-in)
- Playback processing
- Codecs, media player/streamer
- MQTT, lwIP, TLS (optional)
- Built on FreeRTOS and AWS IoT Core
- All hardware drivers, including Wi-Fi (optional) and Bluetooth® (optional)
- Supported by MCUXpresso SDK, IDE and configuration tools



HARDWARE REFERENCE DESIGN BLOCK DIAGRAM



SOFTWARE BLOCK DIAGRAM



PART NUMBER	DESCRIPTION	FEATURES	DIMENSIONS
SLN-LOCAL2-IOT	MCU-based secure far field local command solution evaluation and development kit	<ul style="list-style-type: none"> • EdgeReady, turnkey software solution for offline local voice assistants, with phoneme based speech recognition engine • i.MX RT106S speech crossover processor • Audio amplifier and speaker • 32 MB flash • 802.11 b/g/n Wi-Fi • Bluetooth/Bluetooth LE 4.2 • Digital MEMS microphones (x3) 	70 x 37 x 20 mm (including speaker)
MIMXRT106SDVL6B	i.MX RT106S speech recognition crossover MCU	<ul style="list-style-type: none"> • 600 MHz Arm Cortex-M7 MCU with run-time license to use local voice control solution software • 1 MB on-chip RAM 	10 mm x 10 mm 0.65 mm pitch 196-pin MAPBGA

www.nxp.com/mcu-local2

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