NXP Semiconductors

Data Sheet Supplement

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i.MX RT106x Crossover Processors for EdgeReady™ Off-The-Shelf ML/AI IoT Edge Compute Solutions

1. Document Overview

This document provides information supplemental to the IMXRT1060CEC data sheet, for the i.MX RT1060 Crossover Processors for Consumer Products.

The purpose of the supplement is to outline the differences between the various i.MX RT106x crossover processors for EdgeReady™ off-the-shelf ML/AI IoT edge compute solutions (MIMXRT106xDVL6A, where “x” can be a letter from “A” to “Z”) and the standard i.MX RT1060 parts, e.g. (MIMXRT1062DVL6A).

The i.MX RT106x devices use the same reference manual as the other i.MX RT1060 family members: IMXRT1060RM, i.MX RT1060 Processor Reference Manual.

The i.MX RT106x crossover processors are covered by the same specifications as the other i.MX RT1060 crossover processors described in the IMXRT1060CEC.

Contents

1. Document Overview 1
2. i.MX RT106A Introduction 2
3. i. MX RT106F Introduction 3
4. i. MX RT106L Introduction 4
5. Ordering Information 5
6. Revision History 6

2. i.MX RT106A Introduction

The i.MX RT106A audio crossover processor is an EdgeReady™ solution specific variant of the i.MX RT1060 family of crossover processors, targeting cloud based embedded voice 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 best real-time response. i.MX RT106A based solutions enable system designers to easily and inexpensively add cloud-based voice control capabilities to a wide variety of smart appliances, smart home, smart retail, and smart industry devices. The i.MX RT106A is licensed to run NXP's turnkey cloud-based voice assistant software solutions, which may include:

- Analog front end softDSP
    - Far field processing
    - Acoustic echo cancellation (barge-in)
    - Ambient noise reduction
    - Beam forming
    - Direction of arrival
    - Playback processing
    - Codecs
- Wake-word inference engine
- Media player/streamer
- Cloud SDK
- RTOS OTA Client
    - OTA Signing Scripts
    - CA Based Image Authentication
    - OTA Rollback
    - Image Redundancy
- Encrypted XIP Support
    - Encrypted XIP Read while write
    - Encrypted XIP Rollback
- USB MSD Update
- Auto Cert Generation
- High Assurance Boot
- Bootloader and Application Validation
- Encrypted Filesystem
- Factory Automation Scripts
- MQTT, LWIP, TLS
- Discovery and onboarding
- All drivers, including 802.11 Wi-Fi®, Ethernet and Bluetooth™
- Supported by MCUXpresso SDK, IDE and Config Tools

For more information, please refer to the documentation for the specific solution product development kit (e.g. SLN-ALEXA-IOT), including the User's Guide, API Guide, and Developers Guide.

3. i. MX RT106F Introduction

The i.MX RT106F face recognition crossover processor is an EdgeReady™ solution specific variant of the i.MX RT1060 family of crossover processors, targeting face recognition 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 best real-time response. i.MX RT106L based solutions enable system designers to easily and inexpensively add face recognition capabilities to a wide variety of smart appliances, smart home, smart retail, and smart industry devices. The i.MX RT106F is licensed to run NXP's turnkey solution for face recognition which may include:

- Camera drivers
- Image capture
- Image pre-processing
- Face detection
- Anti-spoofing
- Face tracking
- Face alignment
- Face recognition
- Confidence measure
- Face recognition quantified result
- RTOS OTW Client
    - OTW Signing Scripts
    - OTW Rollback
    - Image Redundancy
- USB MSD Update
- Bootloader and Application Validation
- Factory Automation Scripts
- Supported by MCUXpresso SDK, IDE and Config Tools

For more information, please refer to the documentation for the specific solution product development kit, including the User's Guide, API Guide, and Developers Guide.

4. i. MX RT106L Introduction

The i.MX RT106L automatic speech recognition crossover processor is an EdgeReady™ solution specific variant of the i.MX RT1060 family of crossover processors, targeting edge based local commands voice 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 best real-time response. i.MX RT106L based solutions enable system designers to easily and inexpensively add far-field local commands based voice control capabilities to a wide variety of smart appliances, smart home, smart retail, and smart industry devices. The i.MX RT106L is licensed to run NXP's turnkey solution for local commands automatic speech recognition, which may include:

- Analog front end softDSP
    - Far field processing
    - Acoustic echo cancellation (barge-in)
    - Ambient noise reduction
    - Direction of arrival
    - Playback processing
    - Codecs
- Automatic speech recognition engine for wake-word and local commands
- Media player/streamer
- RTOS OTA Client
    - OTA Signing Scripts
    - CA Based Image Authentication
    - OTA Rollback
    - Image Redundancy
- Encrypted XIP Support
    - Encrypted XIP Read while write
    - Encrypted XIP Rollback
- USB MSD Update
- Auto Cert Generation
- High Assurance Boot
- Bootloader and Application Validation
- Factory Automation Scripts
- MQTT, LWIP, TLS
- All drivers, including 802.11 Wi-Fi®, Ethernet and Bluetooth™
- Supported by MCUXpresso SDK, IDE and Config Tools

For more information, please refer to the documentation for the specific solution product development kit, including the User's Guide, API Guide, and Developers Guide.

5. Ordering Information

Part Number	Features		Package	Junction Temperature T_J (°C)
MIMXRT106ADVL6A	• 600 MHz, commercial grade for voice applications, with complete voice solution software • eDMA • Boot ROM (128 KB) • On-chip RAM (1 MB) • SEMC • GPT x2 • 4-channel PIT • Qtimer x4 • PWM x4 • ENC x4 • WDOG x4 • LCD/CSI/PXP • SPDIF x1 • SAI x3 • MQS x1 • USB OTG x2 • eMMC 4.5/SD 3.0 x2	• Ethernet x2 • UART x8 • I2C x4 • FlexSPI x2 • FlexCAN (with Flexible Data-Rate supported) • FlexIO x3 • 127 GPIOs (124 tightly coupled) • HAB/DCP/BEE • TRNG • SNVS • SJC • ADC x2 • ACMP x4 • TSC • DCDC • Temperature sensor • GPC hardware power management controller	10 x 10 mm, 0.65 mm pitch, 196-pin MAPBGA	0 to +95
MIMXRT106FADVL6A	• 600 MHz, commercial grade for voice applications, with complete voice solution software • eDMA • Boot ROM (128 KB) • On-chip RAM (1 MB) • SEMC • GPT x2 • 4-channel PIT • Qtimer x4 • PWM x4 • ENC x4 • WDOG x4 • LCD/CSI/PXP • SPDIF x1 • SAI x3 • MQS x1 • USB OTG x2 • eMMC 4.5/SD 3.0 x2	• Ethernet x2 • UART x8 • I2C x4 • FlexSPI x2 • FlexCAN (with Flexible Data-Rate supported) • FlexIO x3 • 127 GPIOs (124 tightly coupled) • HAB/DCP/BEE • TRNG • SNVS • SJC • ADC x2 • ACMP x4 • TSC • DCDC • Temperature sensor • GPC hardware power management controller	10 x 10 mm, 0.65 mm pitch, 196-pin MAPBGA	0 to +95

MIMXRT106LADVL6A	• 600 MHz, commercial grade for voice applications, with complete voice solution software • eDMA • Boot ROM (128 KB) • On-chip RAM (1 MB) • SEMC • GPT x2 • 4-channel PIT • Qtimer x4 • PWM x4 • ENC x4 • WDOG x4 • LCD/CSI/PXP • SPDIF x1 • SAI x3 • MQS x1 • USB OTG x2 • eMMC 4.5/SD 3.0 x2	• Ethernet x2 • UART x8 • I2C x4 • FlexSPI x2 • FlexCAN (with Flexible Data-Rate supported) • FlexIO x3 • 127 GPIOs (124 tightly coupled) • HAB/DCP/BEE • TRNG • SNVS • SJC • ADC x2 • ACMP x4 • TSC • DCDC • Temperature sensor • GPC hardware power management controller	10 x 10 mm, 0.65 mm pitch, 196-pin MAPBGA	0 to +95

6. Revision History

Revision	Date	Substantive changes
1	12/2018	Initial release
1.1	08/2019	Title changed, New part numbers added, Added **Section 4** and **Section 5**.

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