OVERVIEW

NXP’s MCU-based face recognition solution provides OEMs with a fully integrated, self-contained, software and hardware platform. The solution is based on the i.MX RT106F, an EdgeReady member of the i.MX RT crossover MCU family. It includes the NXP face and emotion recognition run-time library, a set of pre-integrated machine learning algorithms, as well as required drivers for peripherals such as camera, memories and optional connectivity features.

From an optimized, small form factor reference hardware to fully tested, documented and supported software, the solution is designed to accelerate time to market and reduce complexity for OEMs and ODMs.

TARGET APPLICATIONS

The i.MX RT106F MCU-based solution for Face Recognition enables designers to integrate facial recognition into a wide variety of smart home, appliance, security and industrial products.

- Smart appliances:
  - Washing machines, dryers, ovens, refrigerators, stoves, and dishwashers
- Home comfort devices:
  - Thermostats, HVAC and lighting control
- Counter top appliances:
  - Microwaves, coffee machines, and rice cookers
- Safety/Security/Alarm devices:
  - Alarm panels and automated access
- Toys:
  - Educational, Games & puzzles, Plush, App-enabled, Interactive playmates/robotics
- Smart industrial devices:
  - Power tools, ergonomic stations, industrial workstations
**FACE RECOGNITION HARDWARE**

**PART NUMBERS**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>FEATURES</th>
<th>DIMENSIONS</th>
</tr>
</thead>
</table>
| SLN-VIZN-IOT  | MCU-based Friction Free Interface solution evaluation and development kit | Out-of-box evaluation and prototyping for face recognition solutions including:  
• i.MX RT106F crossover processor  
• 802.11 b/g/n Wi-Fi  
• Bluetooth/Bluetooth LE 4.2  
• Digital MEMS microphones (x2)  
• Audio amplifier (Optional)  
• MC3461 Battery Charger  
• PCAL6524EV I/O Expander  
• FXOS8700CQ Motion Sensor (Optional)  
• PIR Sensor | 50 x 40 mm                   |
| MIMXRT106FDVL6A | i.MX RT106F Vision crossover processor | • 600 MHz Arm® Cortex®-M7 MCU with complete voice solution software  
• 1 MB On-chip RAM | 10 x 10 mm  
0.65 mm pitch  
196-pin MAPBGA |
| PCAL6524EV (Optional) | Ultra-low-voltage I/O expander | • PC-bus to parallel port expander  
• 1 MHz Fast-mode Plus I2C-bus  
• Operating power supply voltage range of 0.8 V to 3.6 V on the I2C-bus side  
• Allows bidirectional voltage-level translation and GPIO expansion between 0.8 V to 3.6 V  
5 GC/SDA and 1.8 V to 2.5 V, 3.3 V to 5.5 V I/O Port P  
• Low standby current consumption: 20 µA typical at 3.3 V VDD(P) | 5 x 5 x 0.56 mm |
| FXOS8700CQ (Optional) | Digital Motion Sensor Accelerometer | • Wide dynamic range ±1200 µT  
• Embedded vector magnitude detection  
• Embedded autonomous hard iron calibration  
• Low-power consumption  
• Embedded autonomous hard iron calibration | 3 x 3 mm |

**FACE RECOGNITION SOFTWARE BLOCK DIAGRAM**

**i.MX RT106F VISION CROSSOVER PROCESSOR OVERVIEW**

The i.MX RT106F is an EdgeReady member of the i.MX RT1060 family of crossover MCUs, targeting low cost embedded 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 real-time response. In addition to the face recognition capability, the i.MX RT106F has plenty of horsepower and peripherals, making it suitable to be the main processor in many applications. The i.MX RT106F processor is licensed to run NXP’s OASIS run-time library for face recognition which includes:

- Camera drivers
- Image capture
- Image pre-processing
- Face detection
- Face tracking
- Face alignment
- Face recognition
- Face provisioning
- Confidence measuring
- Face recognition quantified results
- Built-in security
- Connectivity