

恩智浦面部识别解决方案

吴建斌
高级市场经理
BL-EP
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SECURE CONNECTIONS
FOR A SMARTER WORLD

PUBLIC

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NXP 目标市场

AUTOMOTIVE



INDUSTRIAL & IOT



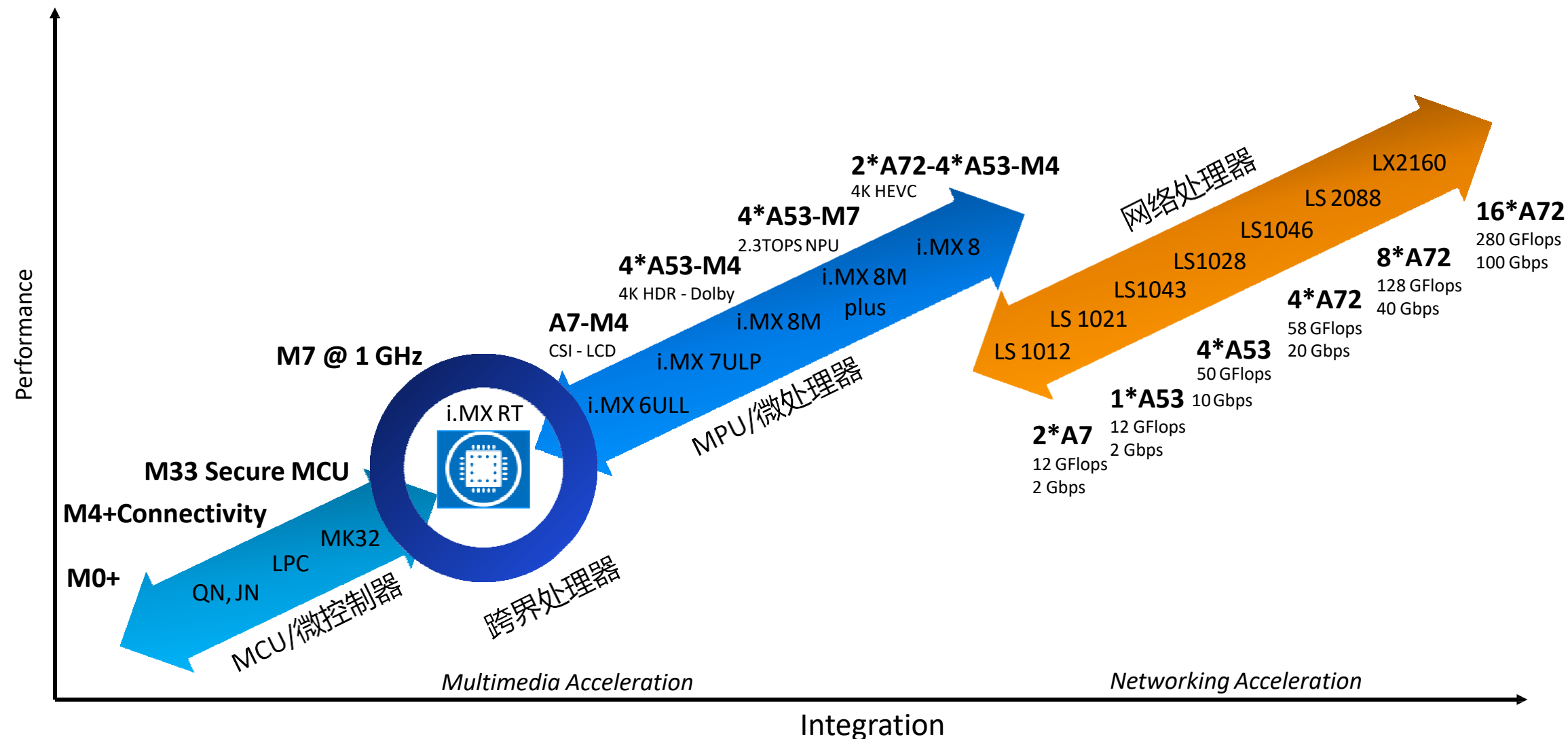
MOBILE



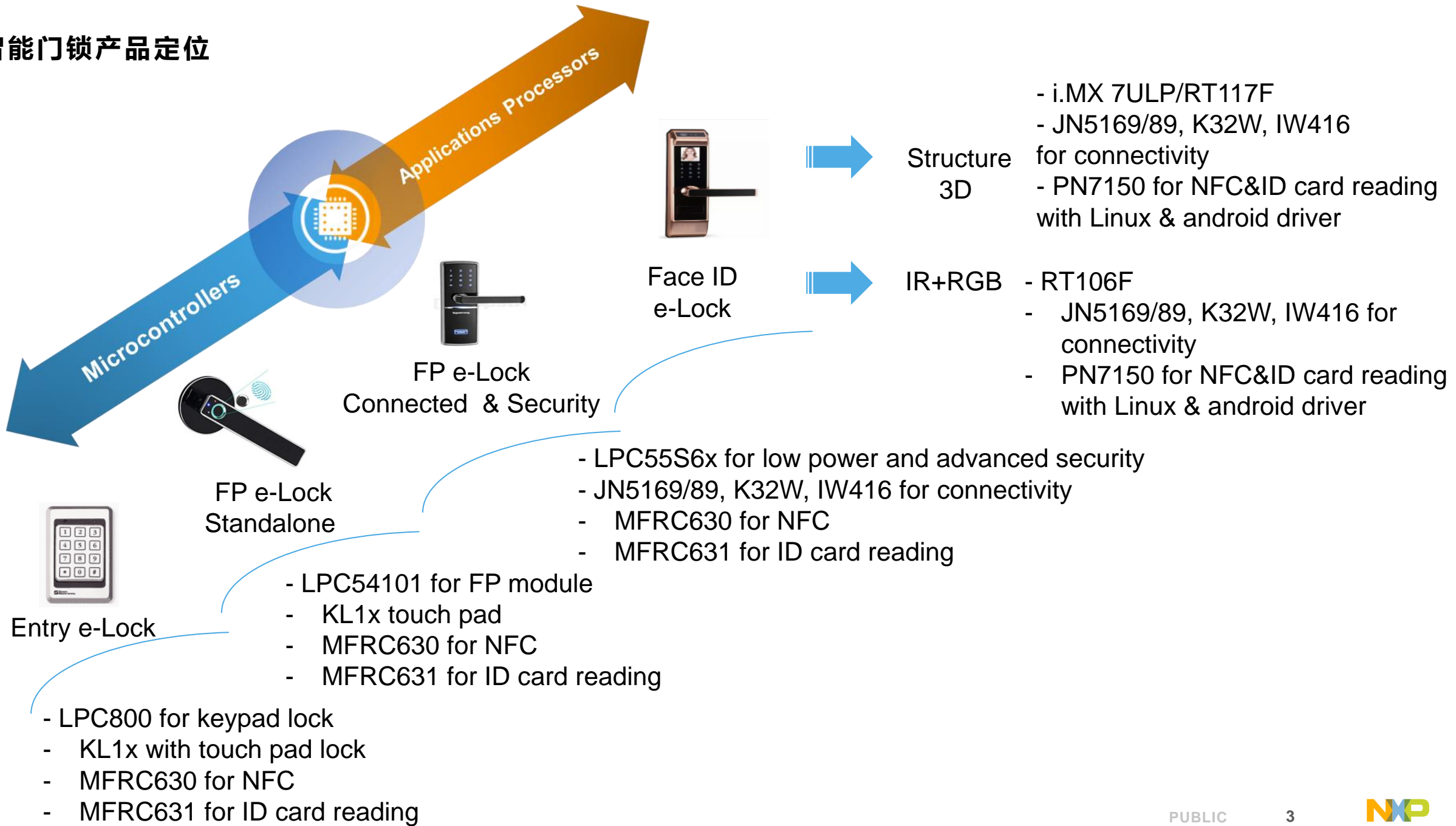
COMMUNICATION INFRASTRUCTURE



丰富的产品组合



智能门锁产品定位



MPU VS. NEW MCU



	MPU (Application Processor)	MCU (Embedded Processor)
Applications	Smart phones & tablets, Smart screens, Routers/gateways, Robo-cleaners, etc.	Switches, Appliances, Power tools, Toys, etc.
Graphics	Complex UI	None, or basic bit mapped
Operating System	Linux, Android, iOS, Windows, ...	FreeRTOS, MicroC/OS, Mbed OS, ...
Virtual Memory Support	Memory Management Unit	No
Storage	Giga Bytes (NAND Flash)	Mega Bytes (NOR Flash – often on chip)
Memory	Giga Bytes (SDRAM)	Mega Byte (SRAM – usually all on chip)
CPU	Arm Cortex-A Intel Core i7	Arm Cortex-M Intel 8051
Number of cores	1, 2, 4, 8, ...	1 (or 2)
NXP Example Family	i.MX 8M	i.MX RT1060

NXP 人脸识别可选平台

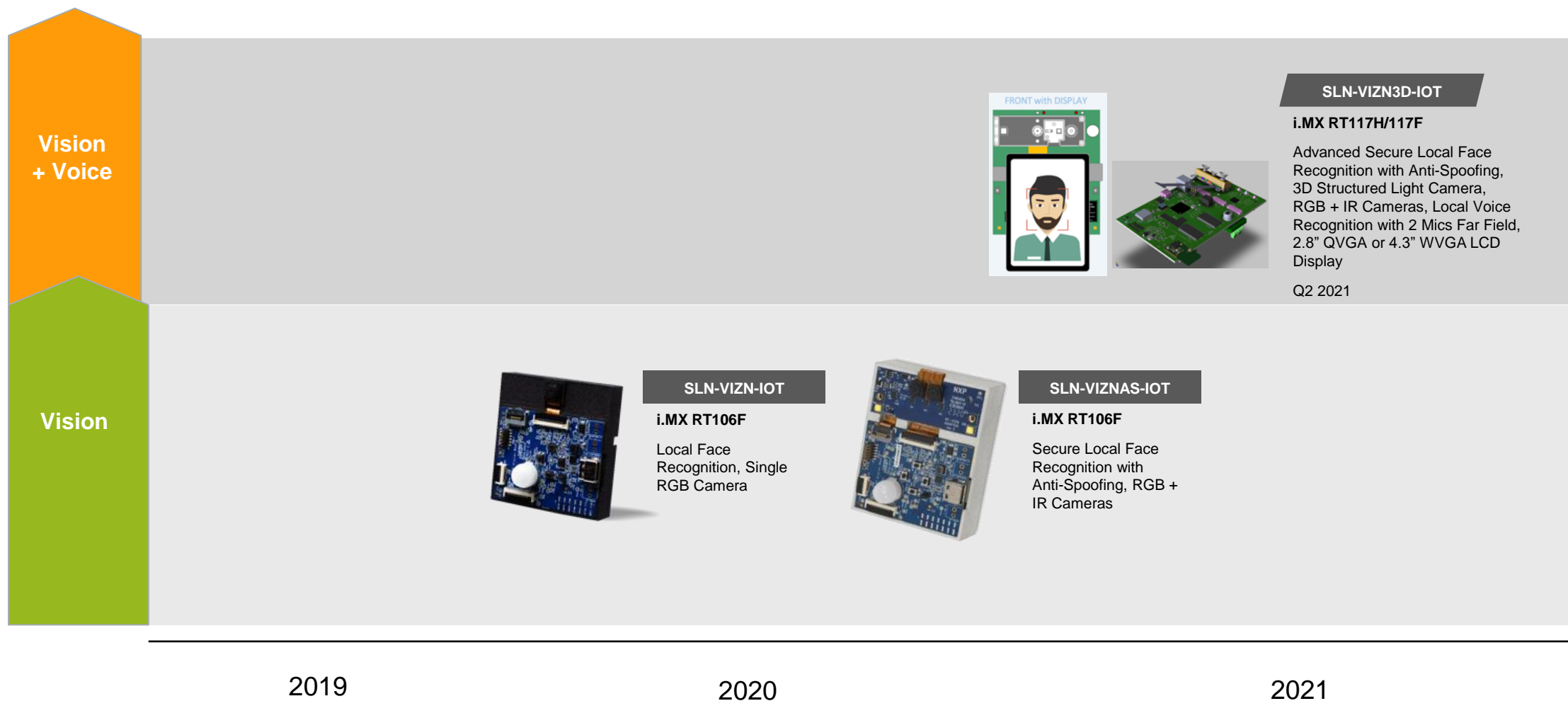
平台	i.MX RT106F	RT117F/I.MX7ULP	i.MX 8M mini
镜头	3D (IR+RGB)	3D (NIR + 结构光)/ToF	3D (NIR + 结构光)/ToF
算法	NXP	NXP/3 rd partner	Alibaba/Tencent
目标市场	门锁,门禁,考勤	门锁	人脸支付
推广方式	NXP Solution	NXP Solution/PCBA	Reference design
			

人脸识别目标应用

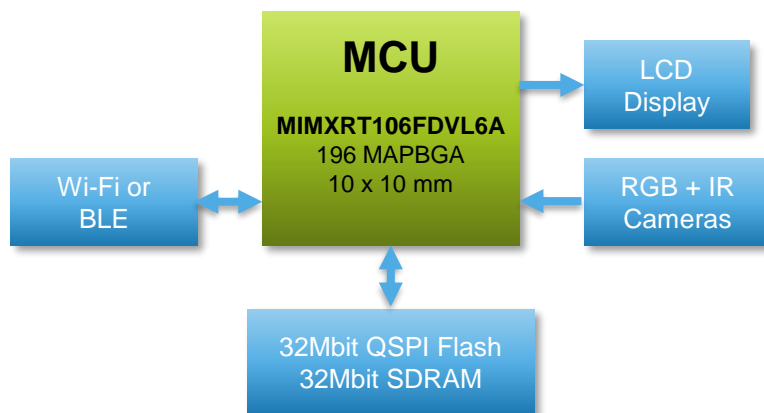
- **Smart eLock**
 - Power consumption is critical as battery based.
 - Liveness feature is critical.
 - User number <50.
- **Work Attendance Machine/Smart Door Access**
 - Less care of power consumption.
 - Liveness feature is needed.
 - User number ranges from tens to thousands.
- **Smart Door Bell**
 - Power consumption is critical.
 - FOV $\geq 160^\circ$ is a critical feature NXP solution supported.
 - No liveness feature needed. Use Single camera for day & night mode switch.



基于I.MX RT106F人脸识别的路线图

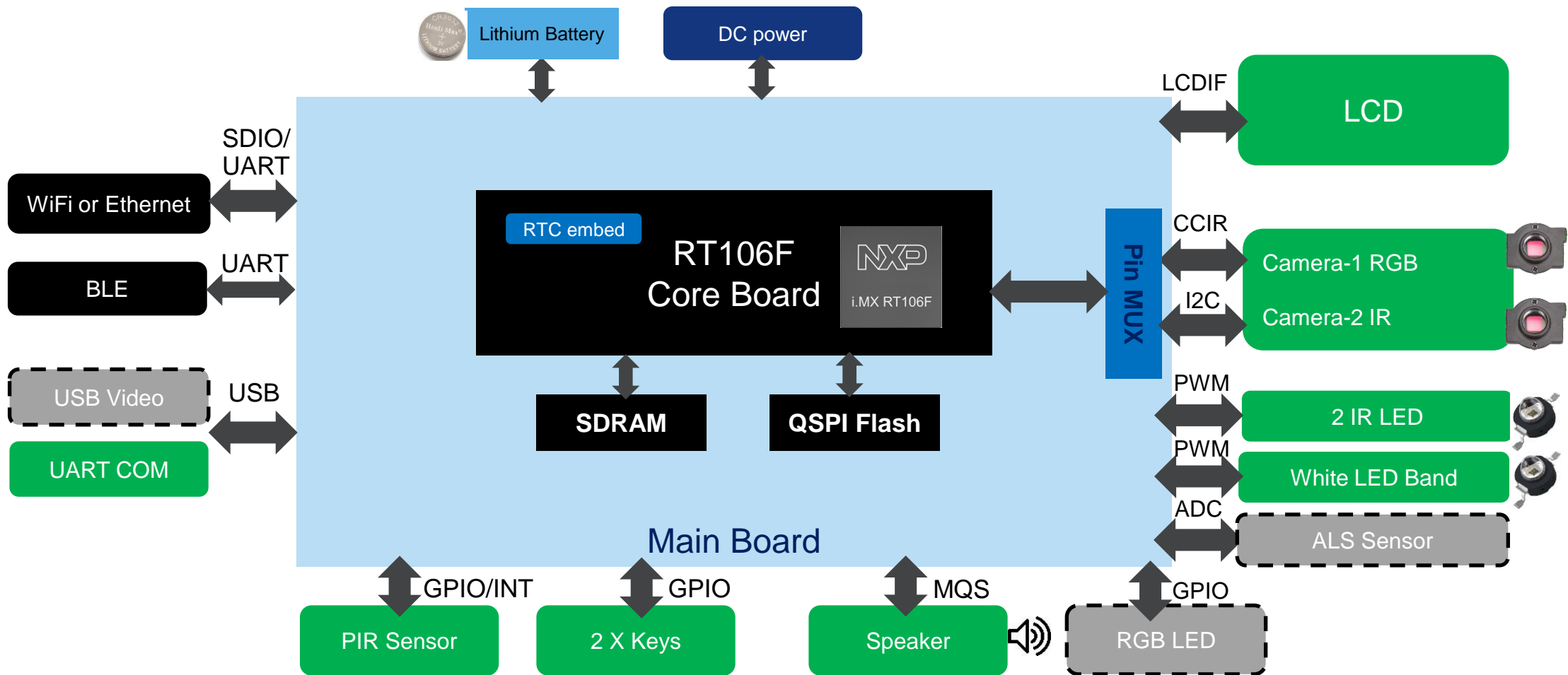


I.MX RT106F-BASED 人脸识别方案特点

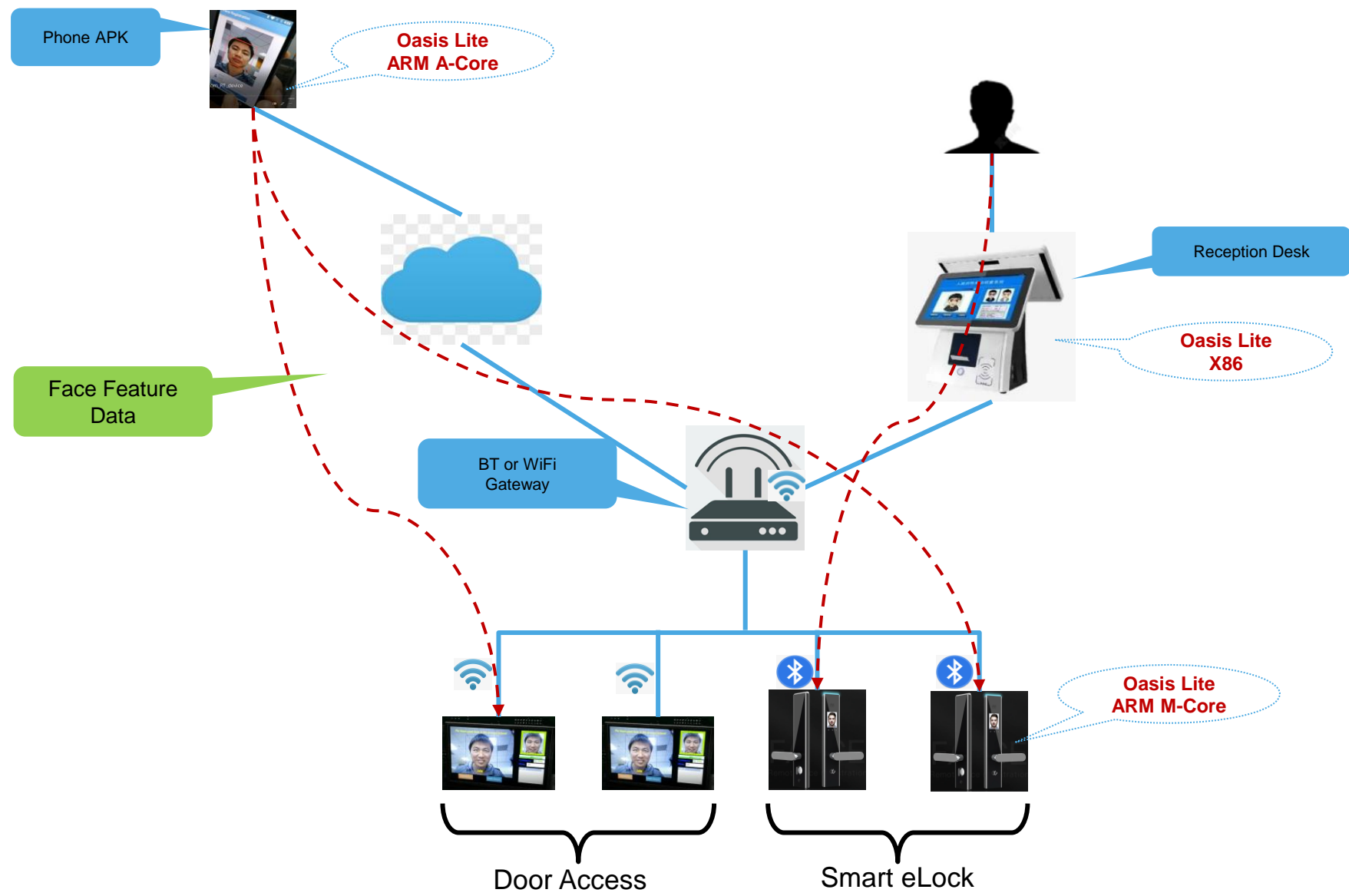


- Cost effective and energy efficient off-line liveness face recognition solution
- ML based NXP Nano.AI inference engine for MCU
 - True Accept Rate 99.7%, Fales Accept Rate 0.000001
 - Anti-spoofing Accuracy 96.5%
 - Detection / recognition distance 0.2 ~ 1m
 - Light model: max 50 faces for eLock and max 1000 faces for door access, <500ms total latency
 - Heavy model: max 200 faces for eLock and max 5000 faces for door access/control, <1s total latency
- Remote registration through phone and desktop – NXP Oasis lite AI/ML engine
- Ultra-low power SoC – 214mW peak active, 0.05mW sleep
- Customer DWIN system power – 1.4W peak include SoC + dual camera + LCD + 2 IR / 4 White LED
- MCU based solution with fast boot and low BOM cost – PCBA down to \$12
- Rich extra on-chip resource and system expansion
- Full system solution – complete design files, all certifications, NXP support
- Fast time-to-market – from concept to product launch in 4 months

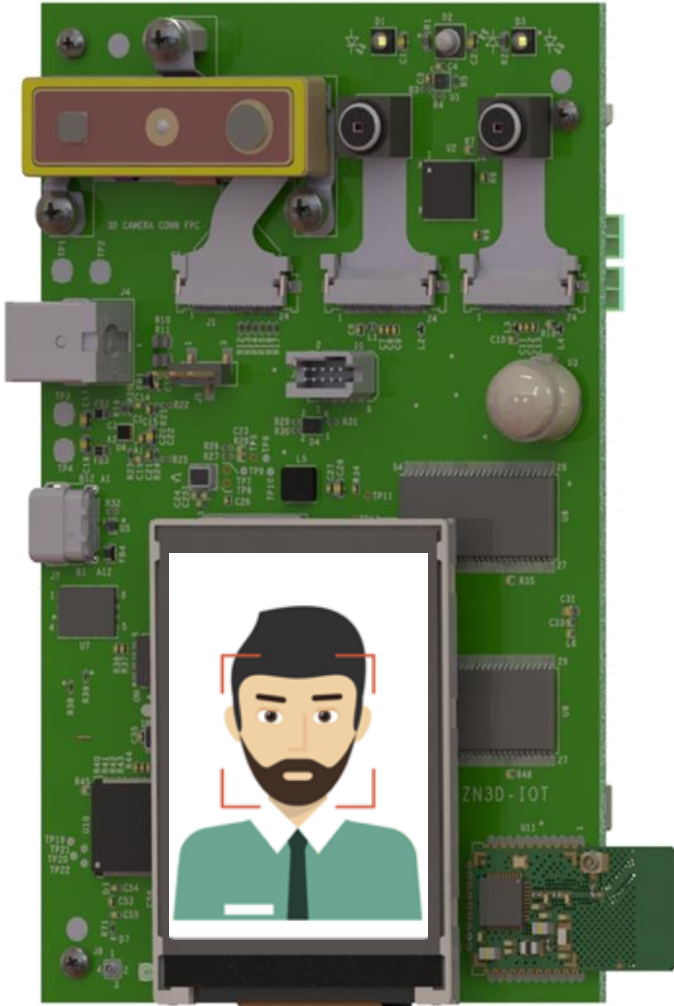
I.MX RT106F人脸方案硬件平台



远程人脸注册功能



I.MX RT117H/F-BASED 视觉+语音平台- SLN-VIZN3D-IOT



- MCU-based (1 GHz Cortex-M7) AI/ML Vision & Voice Solution
- Vision Input
 - 3D Structured Light camera module (10 fps & IR image up to 1080x1280)
 - RGB + IR dual camera module (30 fps image up to 1296x976)
 - Options to expand with 3D ToF or other camera types
- Voice Input
 - 2 PDM microphones for 180° far field – expansion options for up to 8 mics
- Display Output
 - 2.4" 240x320 LCD panel (optional 4.3" 480x272 LCD panel available)
- Wireless Connectivity Options
 - Dual band Wi-Fi 4 plus BLE 5 with NXP IW416 based module
 - BLE 5 support with QN9090 based module
- Turnkey solutions:
 - Smart lock & access control
 - Robust & highly secure anti-spoofing 3D face recognition in any lighting conditions
 - Smart touchless HMI with face recognition & offline voice control

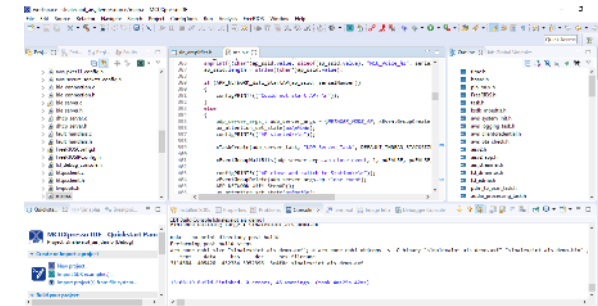
PRODUCTION GRADE, CERTIFIED AND QUALIFIED TURNKEY SOLUTIONS

- Production ready hardware design
 - Cost and form factor optimized
- Pre-integrated production ready software
 - Fully tested & FCC/CE certified
 - Source code provided for everything
 - Except ML/AI intellectual property
 - E.g. Audio front end, speech & face recognition
- NXP one-stop-shop for support & licensing
- Plug & play out-of-box-experience

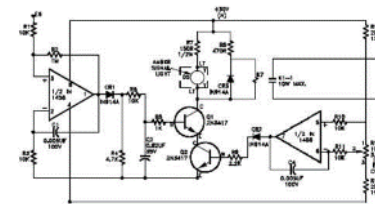
OOB HW/SW



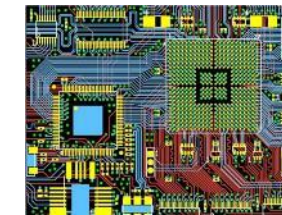
SOFTWARE SOURCE



SCHEMATICS



LAYOUTS



CERTIFICATIONS



BOMS

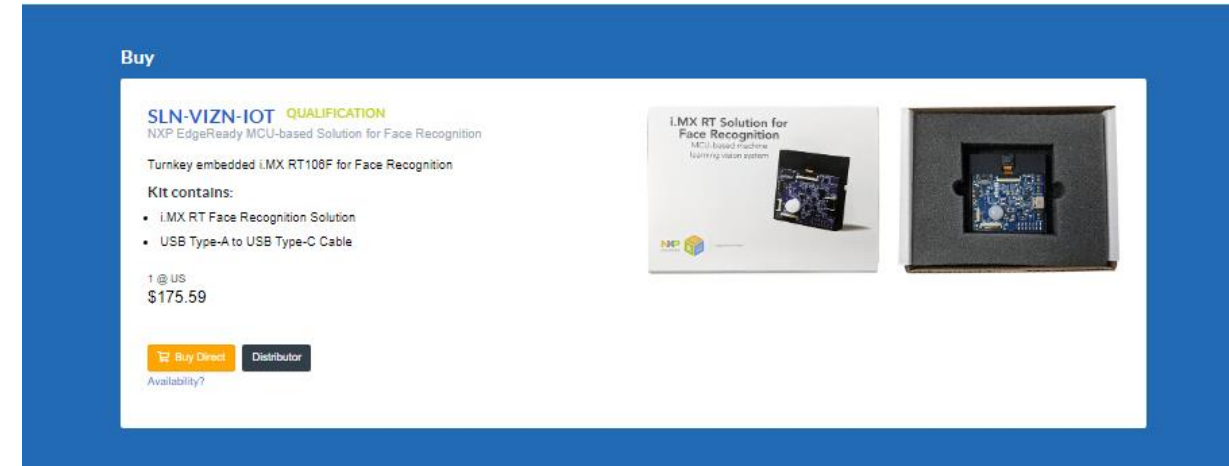
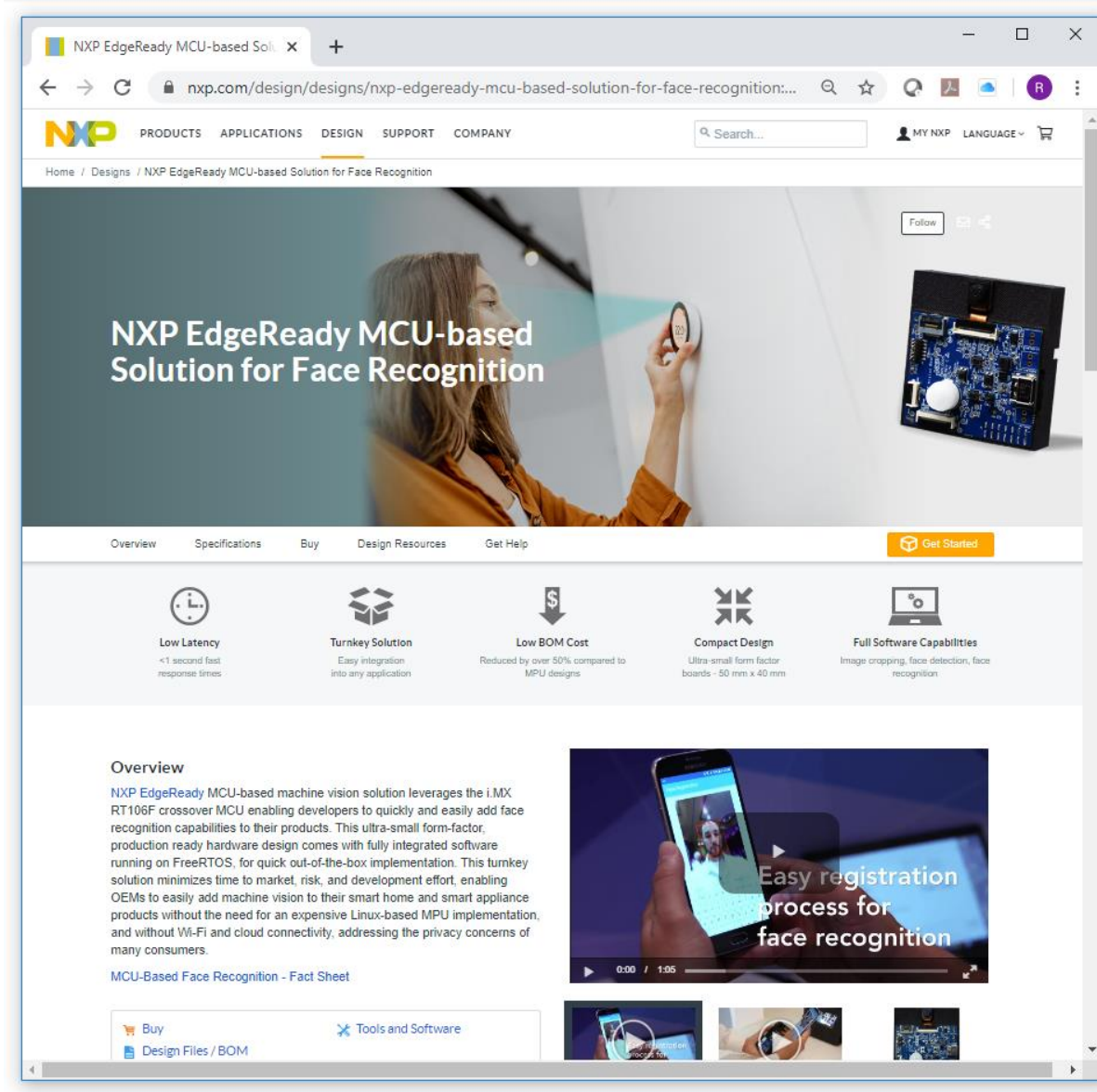
U1	MIMXRT1052DVL6B	i.MXRT1050 Cross Processor
U3	W9812G6JB-6I	128Mbit SDRAM 3V 166MHz
U4	IS26KL256S-DABUQ	256Mb Hyperflash 3V 100MHz Fla
U5	A7101CHTK2	Secure IoT/Authentication Conn
U6	LBEE5KL1DX-883	IC WIFI BT/BLE B/G/N 3-4.8V LGA
U7	MKW21Z512VHT4	KINETIS L 32-BIT MCU CORTX-M
U8,U9	NX3L2267GM,115	IC ANALOG SWITCH SPDT 10XQF
U10	XCL214B333DR	DC/DC CONVERTER 3.3V 5W

DOCUMENTATION



FOR MORE INFORMATION...

www.nxp.com/mcu-vision



- **Download** schematics, BOM, layout
 - Kit comes with software download codes
 - Source, binaries, documentation
 - MCUXpresso SDK
- **Buy** SLN-VIZN-IOT kits (\$199)
- **View** getting started pages and videos
- **Available** www.nxp.com/mcu-vision2
 - SLN-VIZNAS-IOT kit



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