Faraday RISC-V Based ASIC Solution for Edge AI and IoT SoCs

Nov., 2019

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Synergy for Excellence

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Agenda

- Faraday Company Profile
- AIoT ASIC Achievements
- Comprehensive IP Solutions & Low Power Design
- Platform Based Service for AIoT ASIC

Faraday Company Profile

Faraday at A Glance

Established since Y1993
- Taiwan IPO since Y1999 (TWSE: 3035)
- Commitment in ASIC & IP business

Financial status
- Capital: US$80M
- Revenue: US$163M (Y2018)

Top management
- Chairman: Stan Hung
- President: Steve Wang
- COO: Flash Lin

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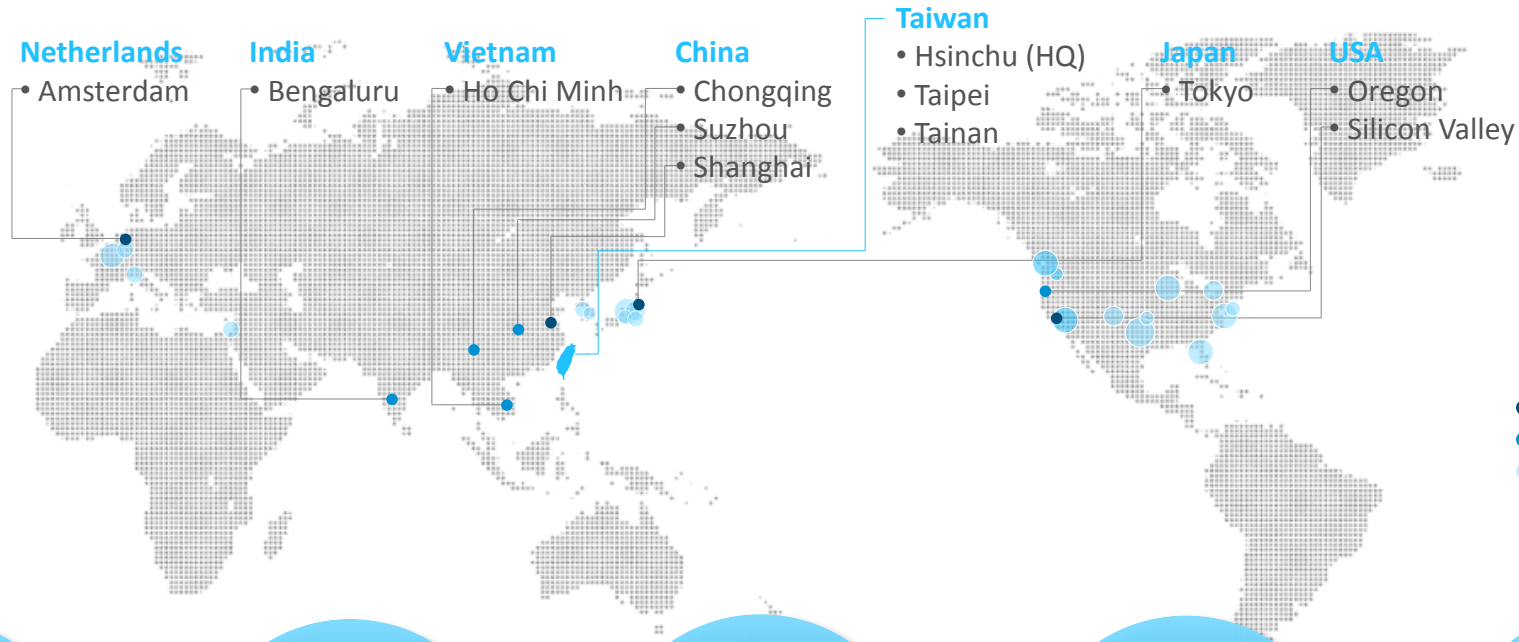
Global Deployment



2200+ ASIC projects taped-out

850+ Employees worldwide

5 Global sales offices with 20+ Sales Rep.

8 Design centers

3000+ IPs silicon-proven

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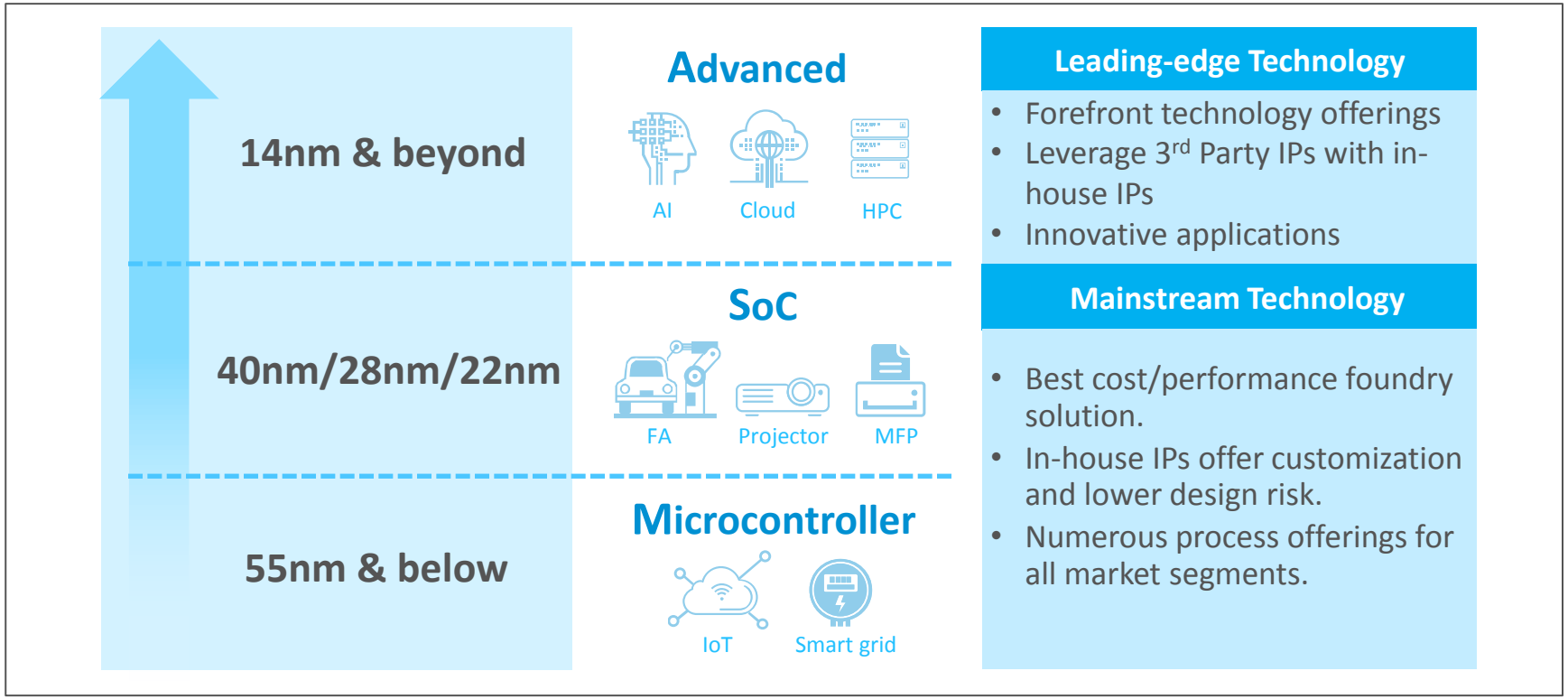
From Mainstream to Leading-edge Technology



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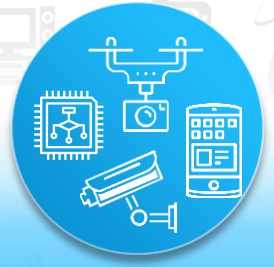
Diversified Application Coverage

Communication

- Femtocell
- Switch
- Networking security
- Pre5G/5G
- Home gateway



Consumer/ Multimedia/ PC peripheral

- DSC
- IP Cam
- Drone
- Consumer MCU
- Speech controller
- Calculator
- USB dongle/Hub
- eMMC/NAND flash/UFS

AIoT

- **AI**
- **Pico projector**
- **Enterprise SSD**
- **3D Sensing**
- **Security IC**
- **HPC**
- **Smart home**
- **SSD**
- **Wearable**
- **Ethernet MCU**
- **Pressure sensor**
- **Sweeping robot**

Industrial

- Agriculture
- Automotive
- Aviation
- Medical
- MFP
- Robot
- FPGA
- Factory automation
- Solar power

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AIoT ASIC Achievements

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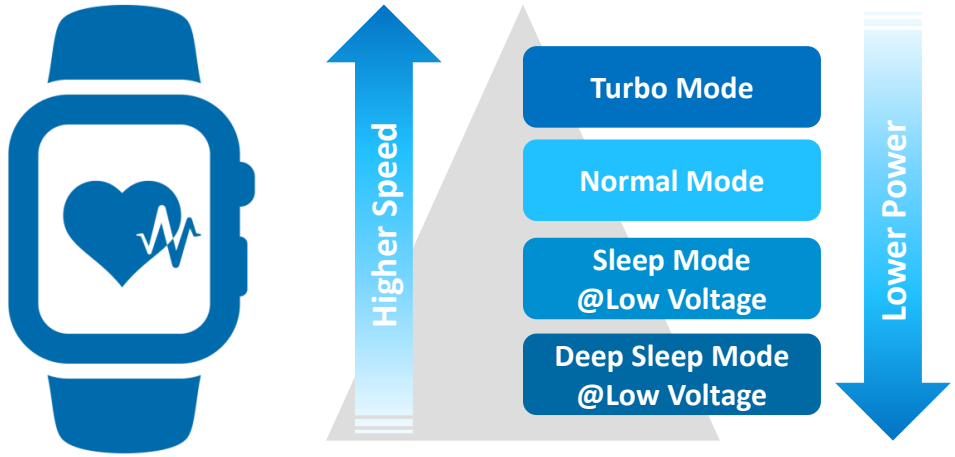
WW 1st RISC-V Based AI Wearable SoC

- **Enabling AI Technology in Wearable Devices**
  - Neural Network Hardware Accelerator
  - Support Heart ID, ECG, ECG Pro and Arrhythmia
- **IP customization service**
  - CPU hardness expertise
  - Analog IP customization
- **Ultra low-power SoC Design**
  - UMC 55ULP process
  - Support AON (Always ON)
  - Low operating voltage for long battery life
- **Proven software design kit based on FreeRTOS**



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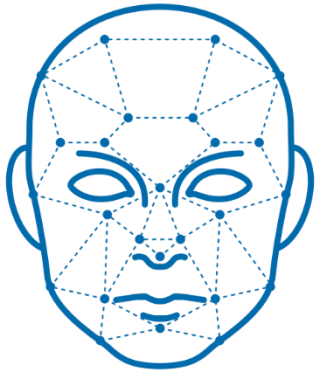
AIoT ASIC Success Stories

- AIoT SoC manufactured by 28nm, 40nm, and 55nm low power process
- PBS team helps the customer accelerate time-to-market
- Applications covering 3D face recognition, drone vision, voice recognition, and language translation, etc.



Comprehensive IP Solutions & Low Power Design

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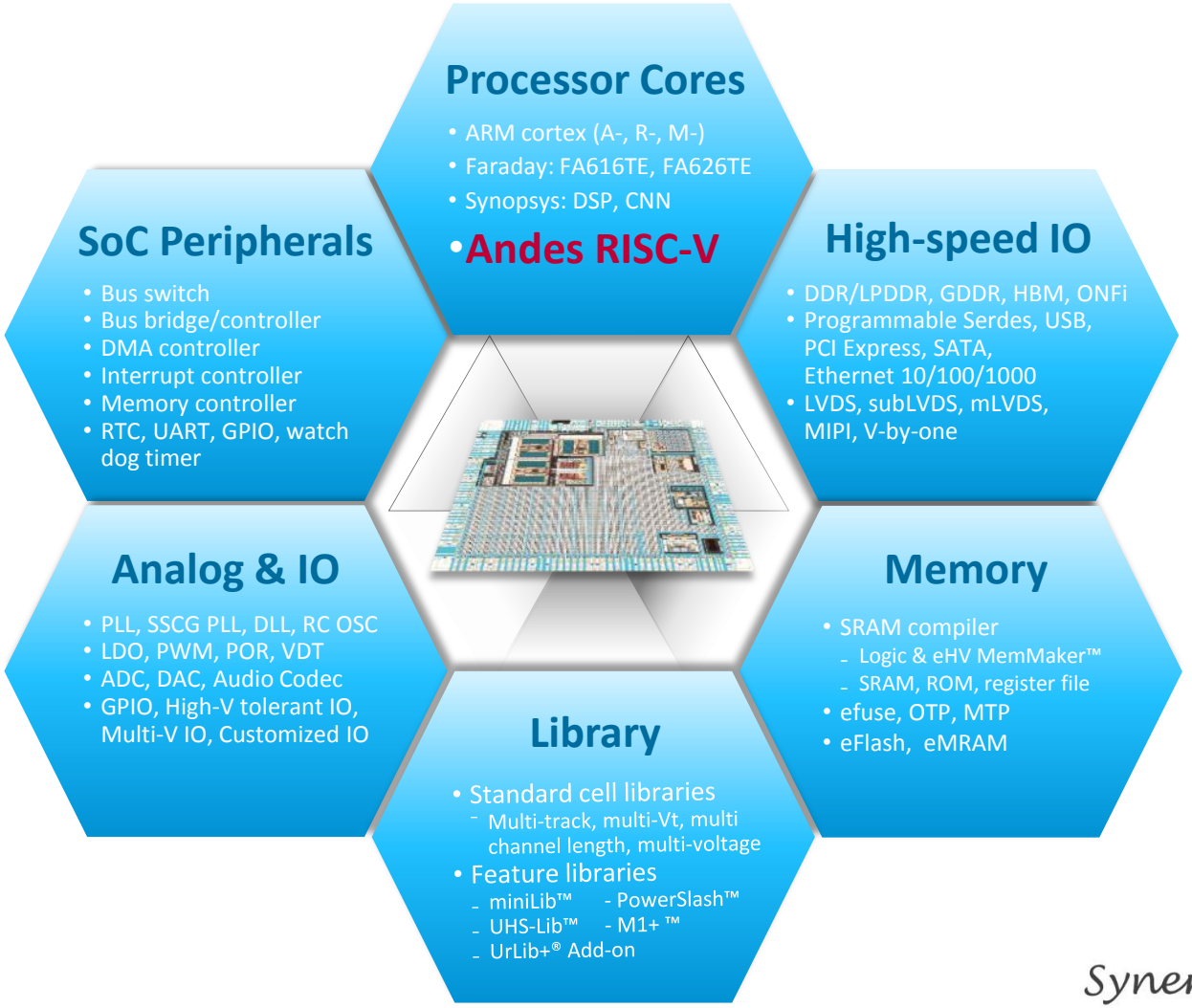
Comprehensive IP Portfolio



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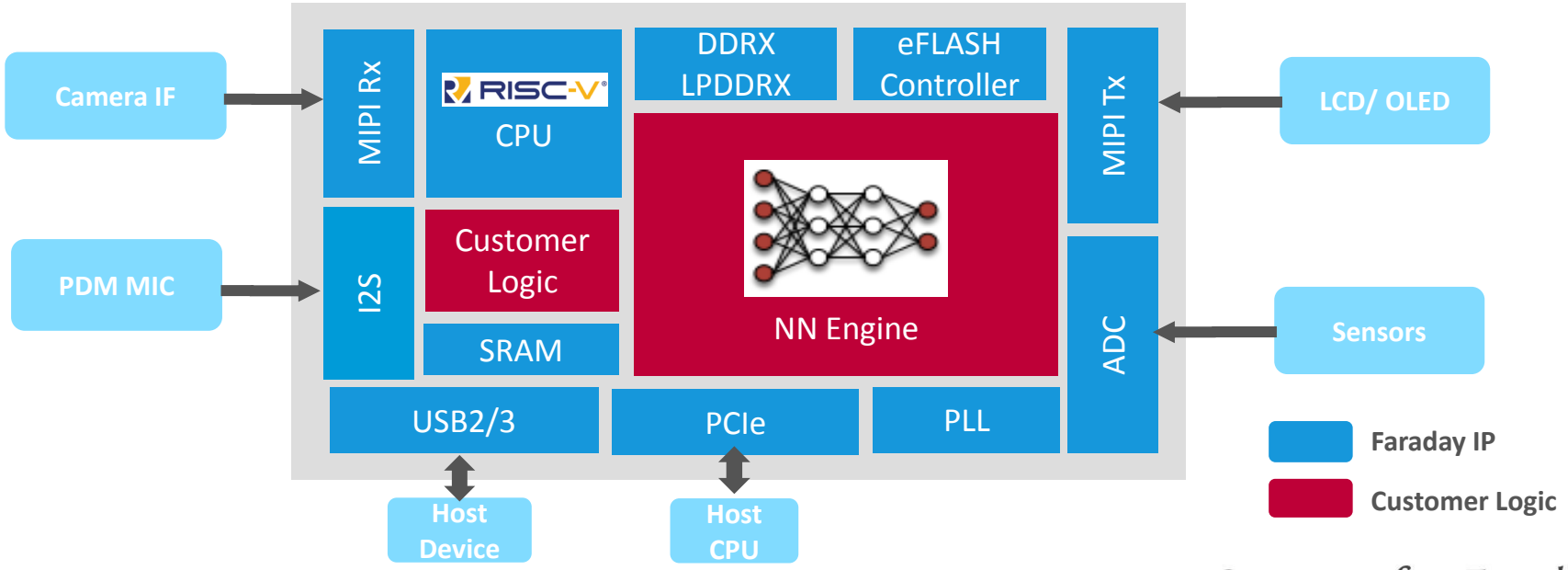
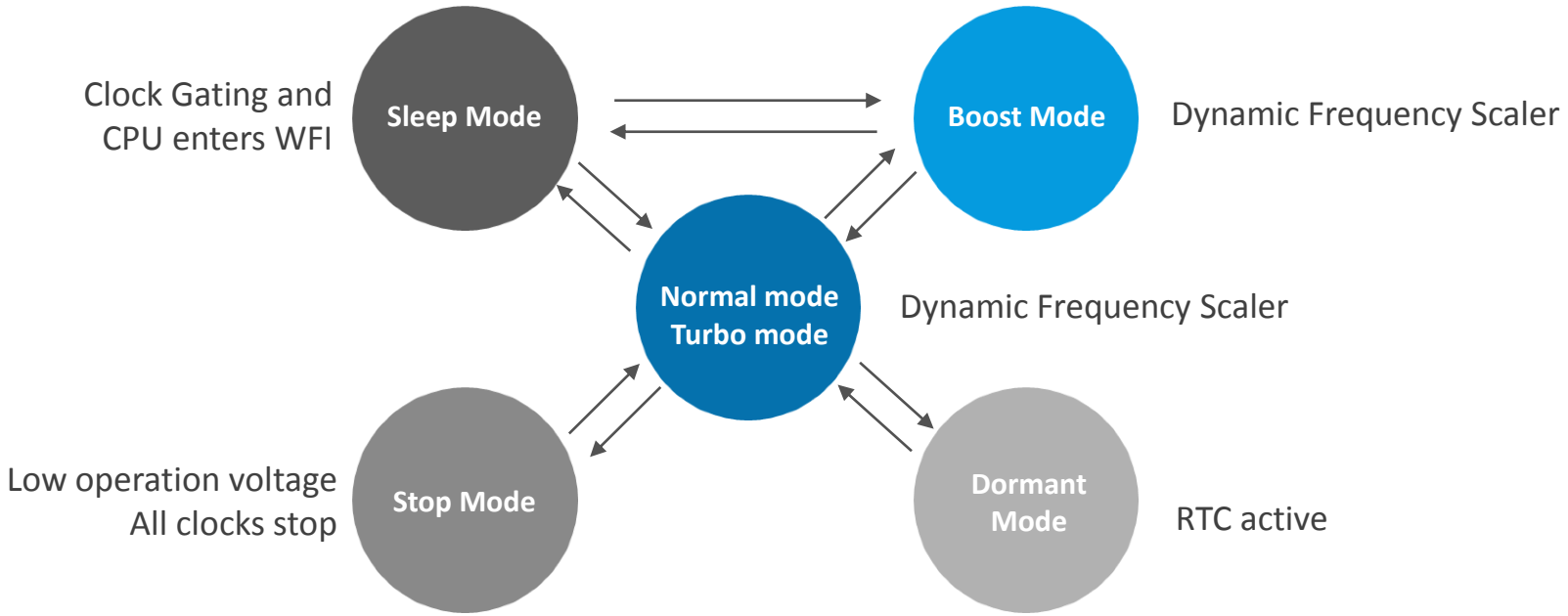
Total Solution Block Diagram of AI Edge Computing

- **Broad Applications :**Surveillance, Smart wristband, Smart speaker, etc.
- **CPU Harden for performance optimization**
- **In-house IP Customization :** SRAM**,** eFlash, DDR/LPDDR, MIPI, USB, PCIe, PLL, ADC, etc.
- **Wide Process Adoption:** 55nm/40nm/28nm/22nm



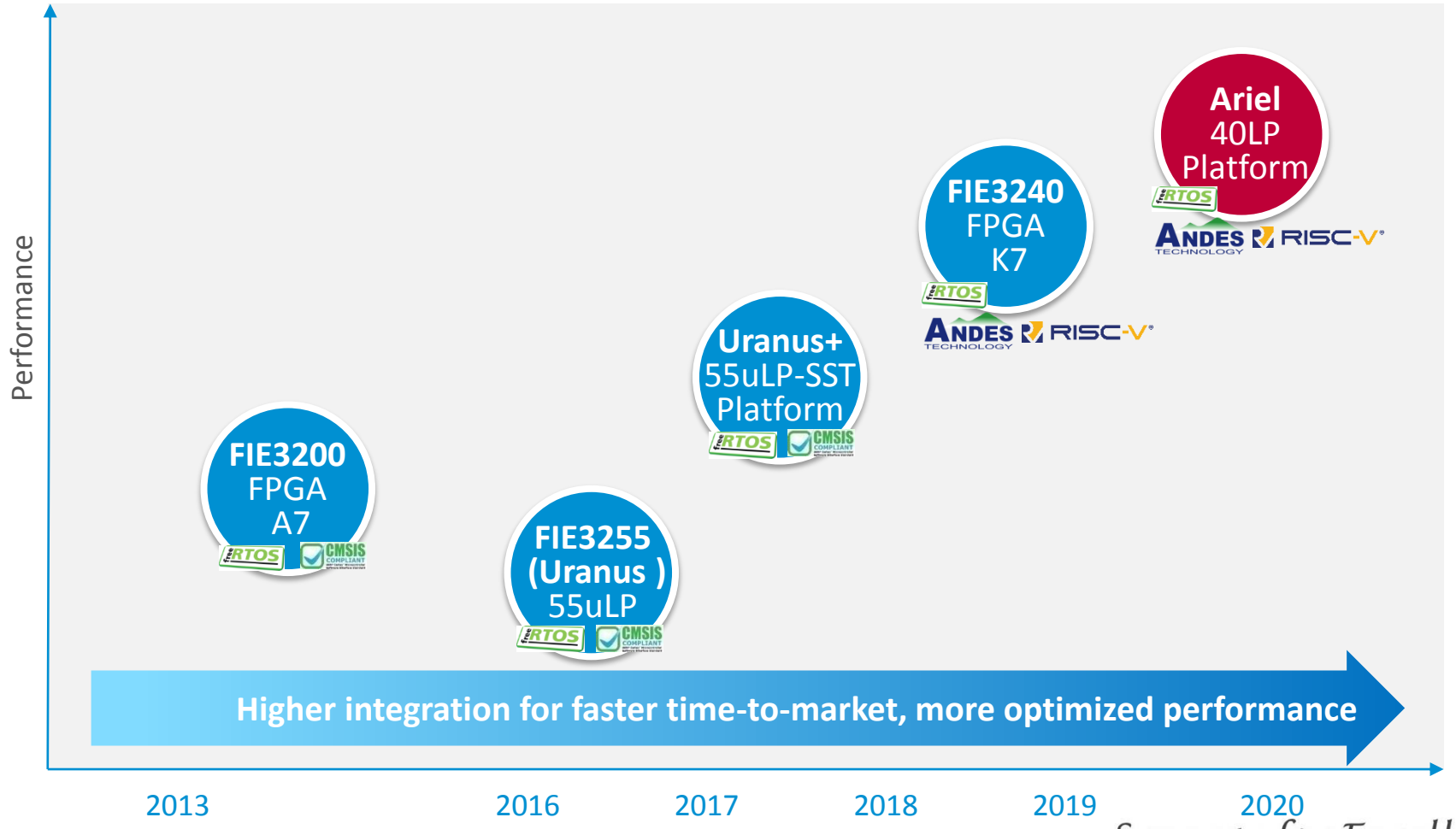
Low Power SoC Design and DVFS

- Power Domain Partition
- DVFS (dynamic voltage and frequency scaling)
- Micro program sequence engine for power saving



Platform Based Service for AIoT ASIC

SoCreative!™ IoT SoC Platform Development Roadmap



SoCreative!™ IoT SoC Platforms

SoCreative!™ – IoT

FIE3200

- FPGA
- A7-200T
- RISC-V Support
- SDK (CMSIS)

FIE3240

NEW

- FPGA
- K7-325T/K7-410T
- **RISC-V Demo**
- SDK (CMSIS)

Uranus+™

- 55uLP SoC
- CM4
- Up to 100MHz
- 1MB eFlash

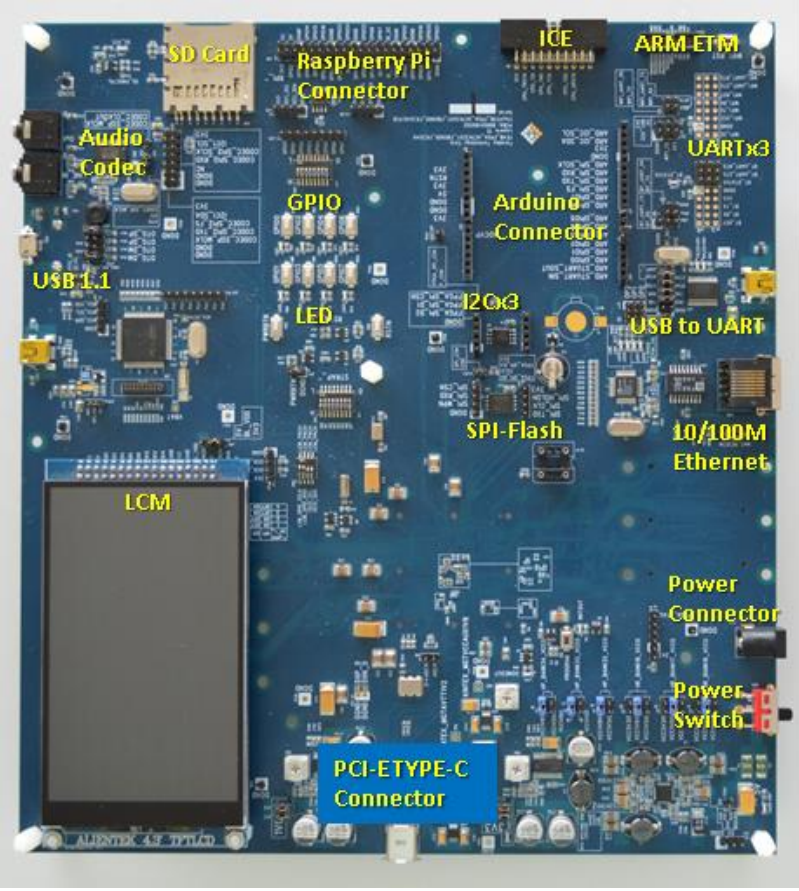
Ariel™

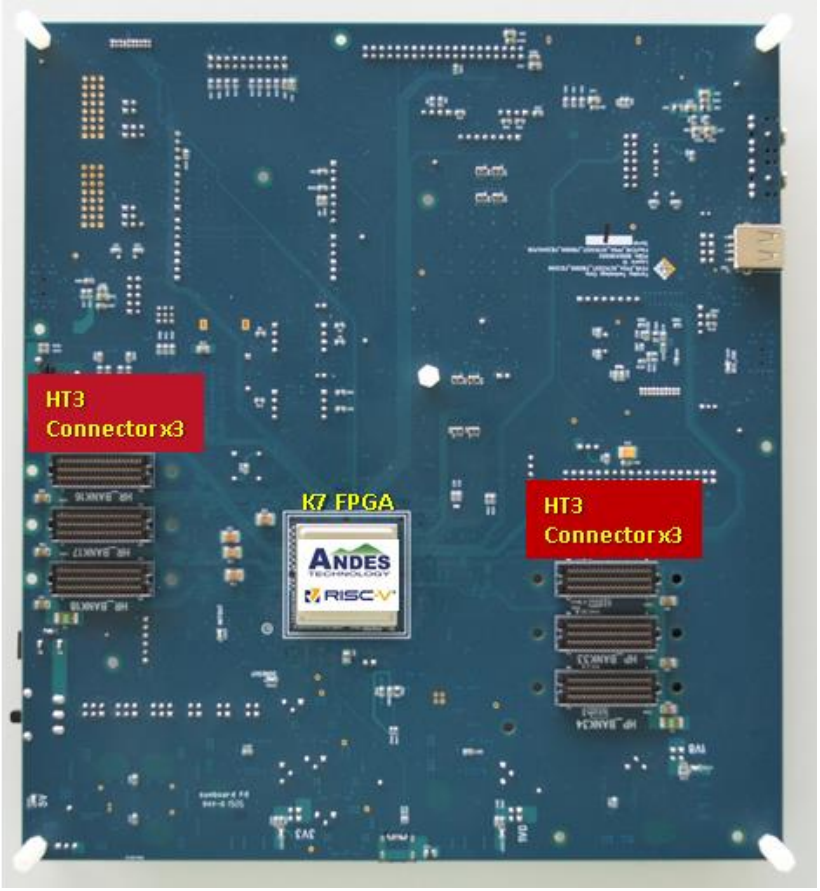
NEW

Coming Soon

- 40LP- SoC
- **Andes N25F**
- Up to 200MHz
- 1MB eFlash

FIE3240 Demo





- **Features:**
  - Xlilinx K7 FPGA
  - Supports PCIe-to-PCIe interconnect
    - High speed type-C connector
    - FPGA2FPGA, FPGA2ASIC communication
  - HT3 daughter boards
    - Enable USB3, MIPI, GPHY, DDR functions
  - Multiple Voltage IO
    - 1.8V/2.5V/3.3V

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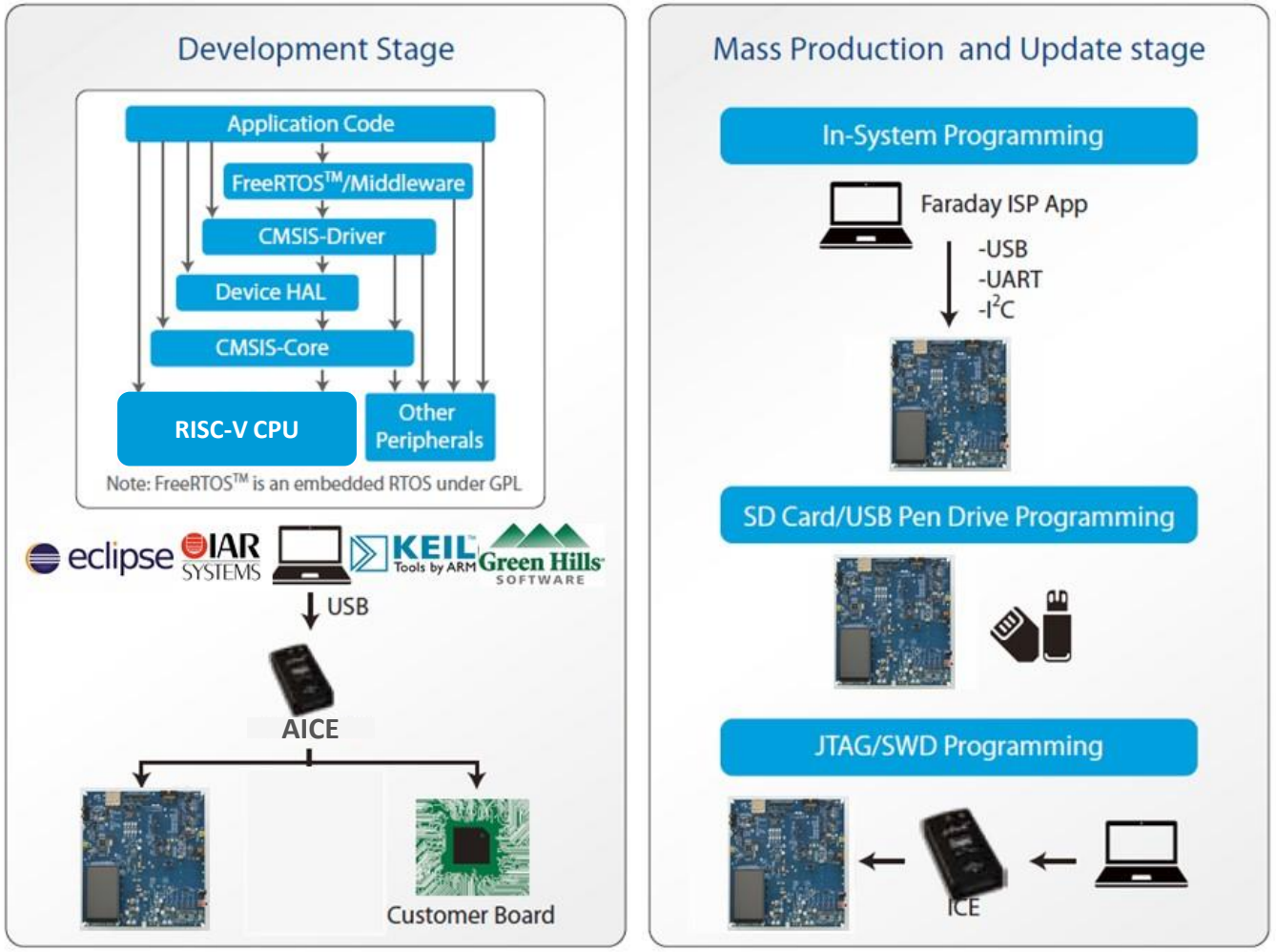
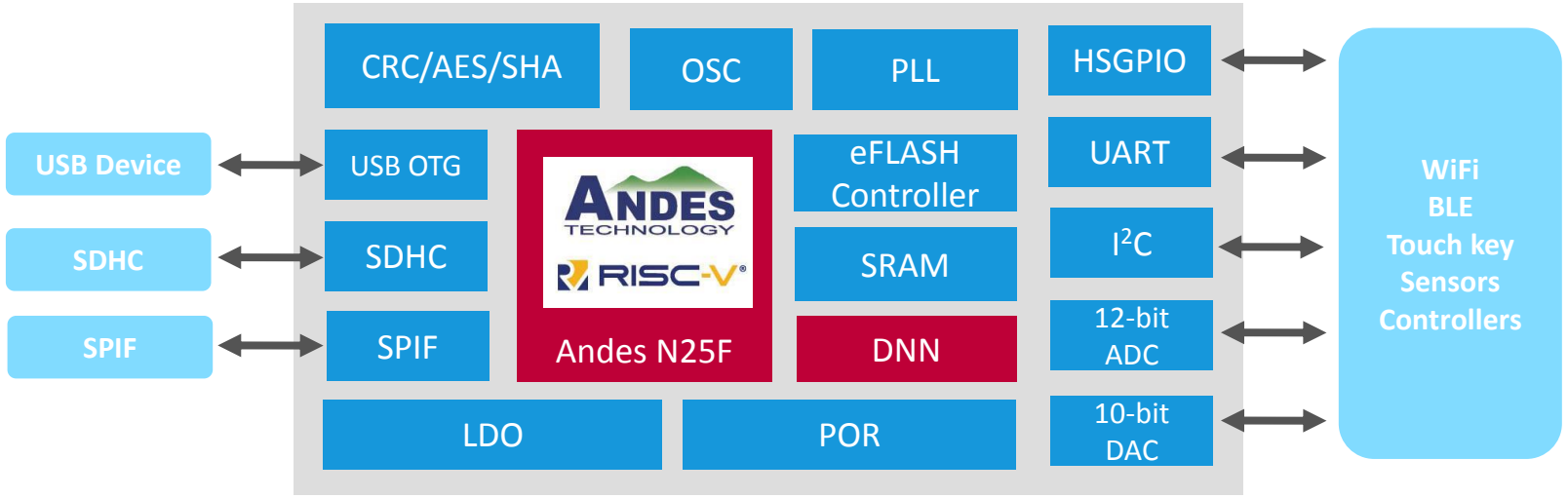
FIE3240 Development Environment



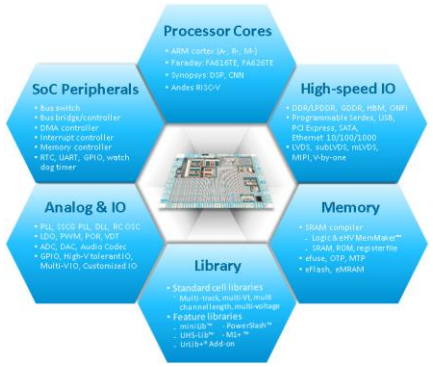
Ariel™ Platform

- UMC 40nm process with 1Mbits eFlash SoC
- Andes N25F RISC-V CPU
- Ultra low-power design with power partitions and DVFS
- IoT gateway and node demonstrations



Summary: Why Faraday?

Comprehensive IP Portfolio



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SoCreative!™ IoT SoC Platform

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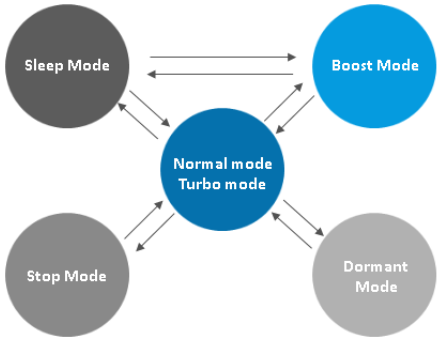
Low Power Design Methodology



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Your Idea

= **Success AIoT ASIC!**

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