

Panel Discussion I

Embedded Core Design-In Services : Driving Global Embedded Business

Moderator: Steve Chang, Advantech AVP

Panelists: Aaron Su, Advantech AVP

Rex Lee, Advantech Product Director

Tony An, Advantech Sales Director



Embedded Core Design-in Services

Embedded Software Services



- Embedded BIOS
- Embedded OS
- SUSI Software API
- iManager : Intelligent Self-Management

Windows Embedded



Device Operation Management



- Remote Management
- Update Management
- Monitor & Control
- Alert & Action

WISE-PaaS/DeviceOn

Software & Cloud Integration



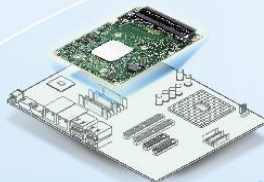
AIoT Solutions & Marketplace

- Multiple Cloud Support
- McAfee IoT Security Solution
- Acronis Backup and Recovery
- Marketplace Online Software Store

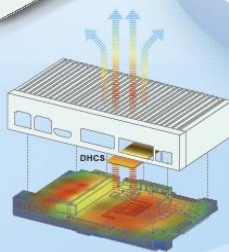
Microsoft Azure arm PELION

McAfee Acronis

Carrier Boards Design



Thermal Optimization



Multiple I/O Extension



AI Acceleration Modules



Industrial Display Systems



SSD, Memory, Wireless Modules



m2.com



Full Spectrum of Embedded Platforms

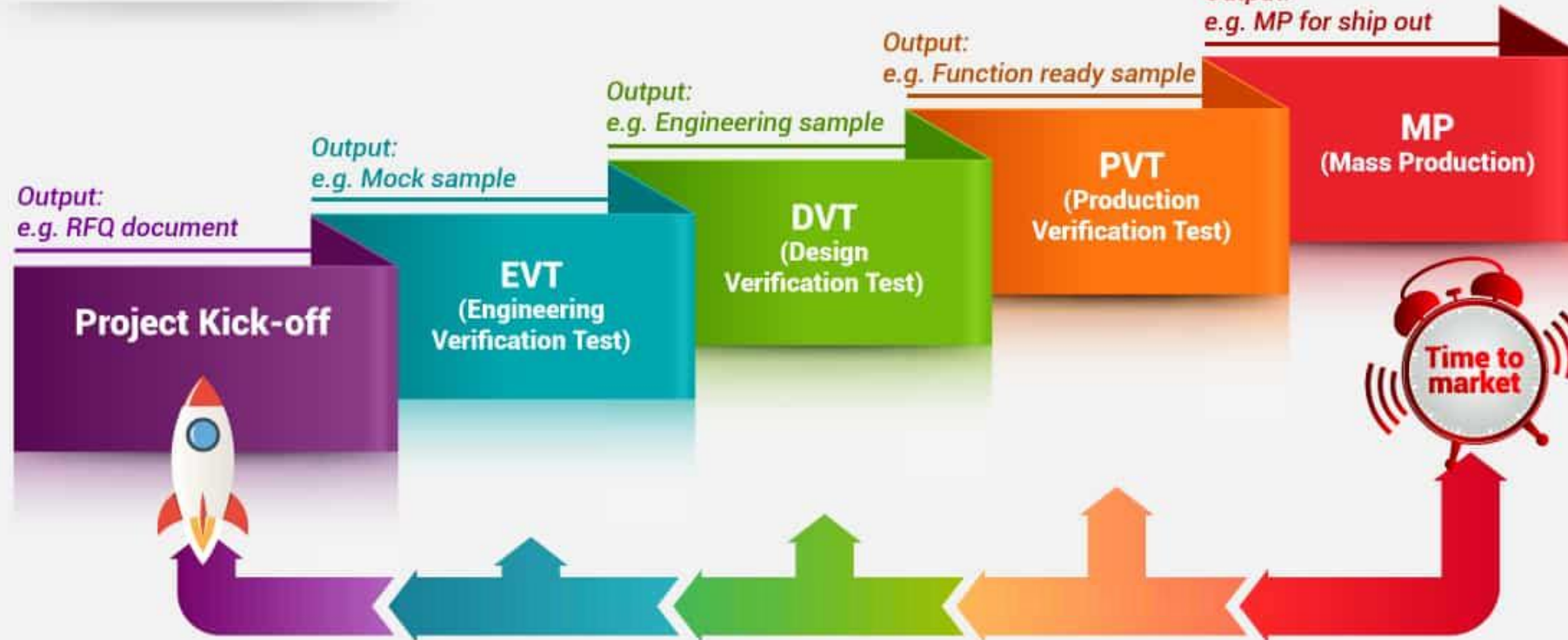


Embedded Core Design-In Services

Technology Innovation

Software Services

Integration Acceleration

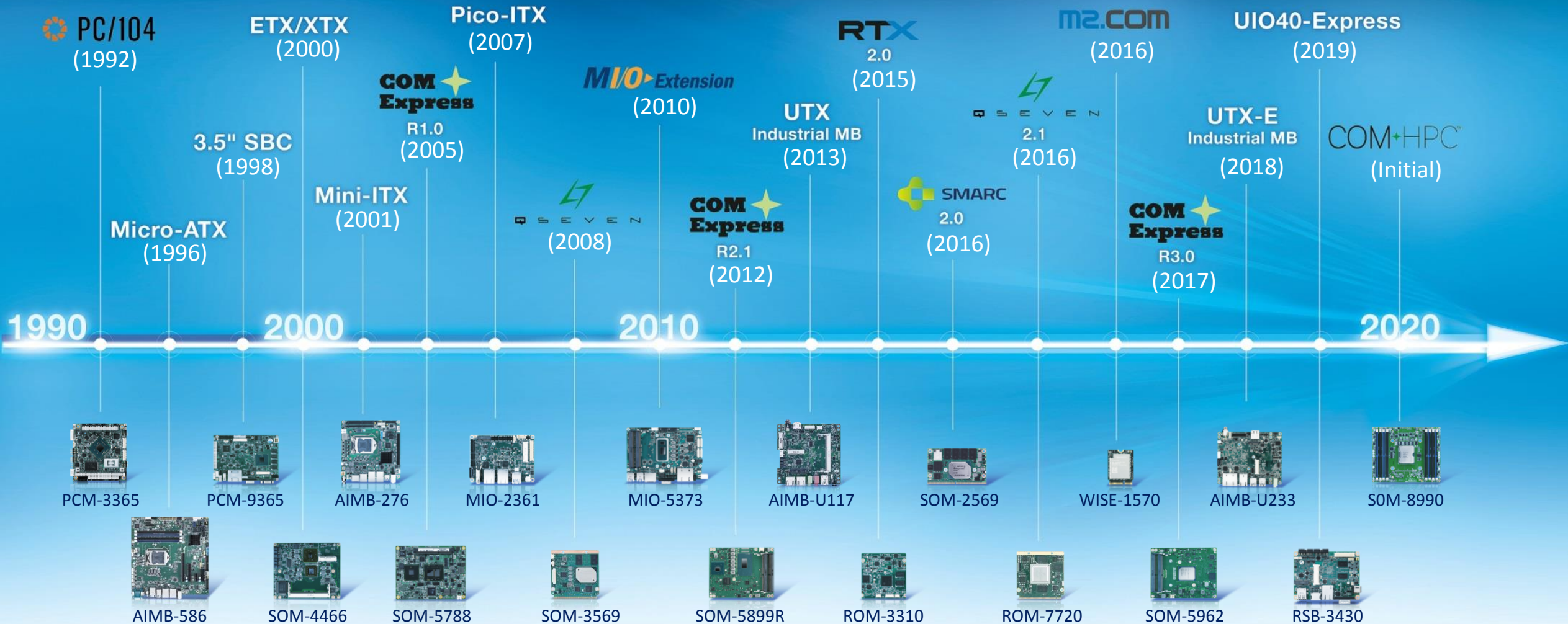


Embedded Core Design-In Services : Innovative Technology

Rex Lee, Advantech Product Director



Advantech Embedded Platform Innovation



Next Gen. Server-Grade Platform with Super Speed IO



Scalability & Easy Deployment

Full Spectrum for Diverse Applications

Remote Management

Easy Accessibility & Operations



Data Processing Capability

Manage Mass Data at Edge

Low Latency

Time-Sensitive Communication



High Network Bandwidth

Reduce Data Transmission Time

Server-Grade Computing Power

- 20 core/110W processor
- Max. 1TB reliable ECC memory

More PCIe for Function Expansion

- Max. 65 Lanes PCIe

Super Speed IO Bandwidth

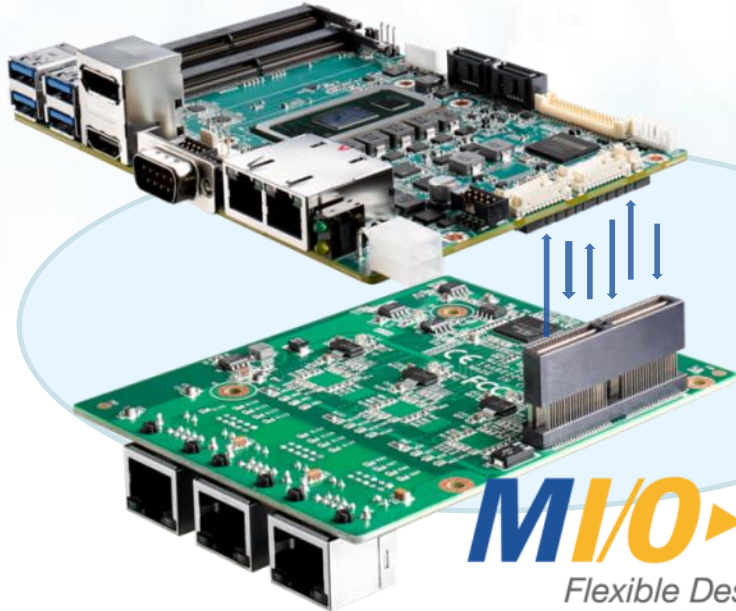
- Max. 100 Gb LAN
- PCI Express Gen5 (32GT/s)
- USB4.0, Thunderbolt (40Gbps)

Quick Buildup System with Flexible I/O Options



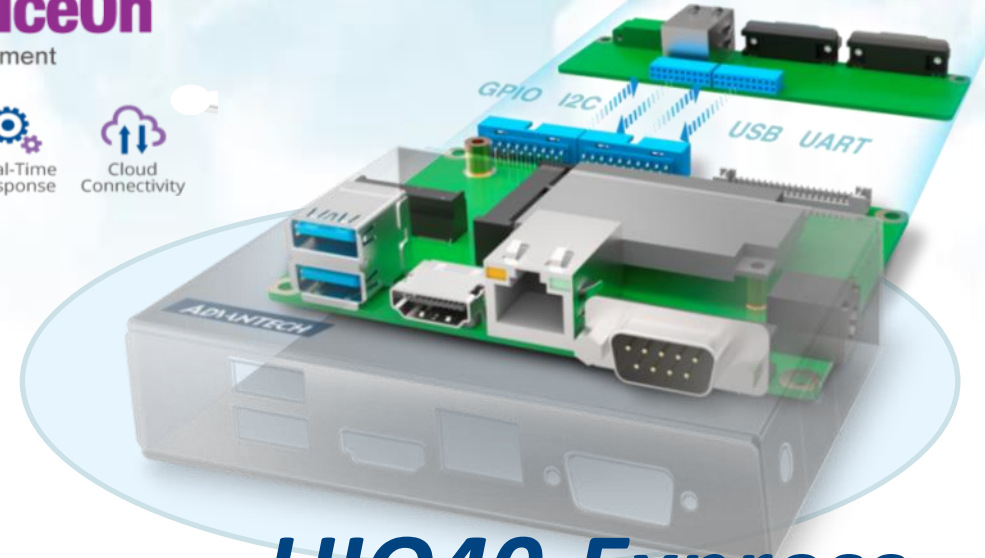
WISE-PaaS/ DeviceOn

IoT Device Operation Management



MIO Extension

Flexible Design Made Easy



UIO40-Express

Build IO for Your Vertical Applications Speedily

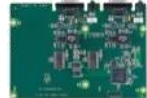
- 3.5" Compact Size
- Rugged B/B Connection
- High Bandwidth PCIe
- Off-the-Self MIOe Module
- Compact Structure
- Various I/O Options
- Off-the-Self UIO Module
- Unified Software Package



Smart Packing
MIOe-210
6 UARTs



Surveillance
MIOe-3674
4 PoE



Medical Equipment
MIOe-3680
4 CAN w/ 15KV



Automation
MIOe-220
3 GbE



AI
MIOe-260
GbE, M.2, mPCIe



UIO-4030
RS-485, RS-232, GPIO



UIO-4032
USB 2.0, RS-232, GbE



UIO-4034
CAN, RS-232

Palm-sized UTX MB Shrinks Down System Dimension



45% Dimension Shrank

Fast Time-to-Market

EPC-U
series



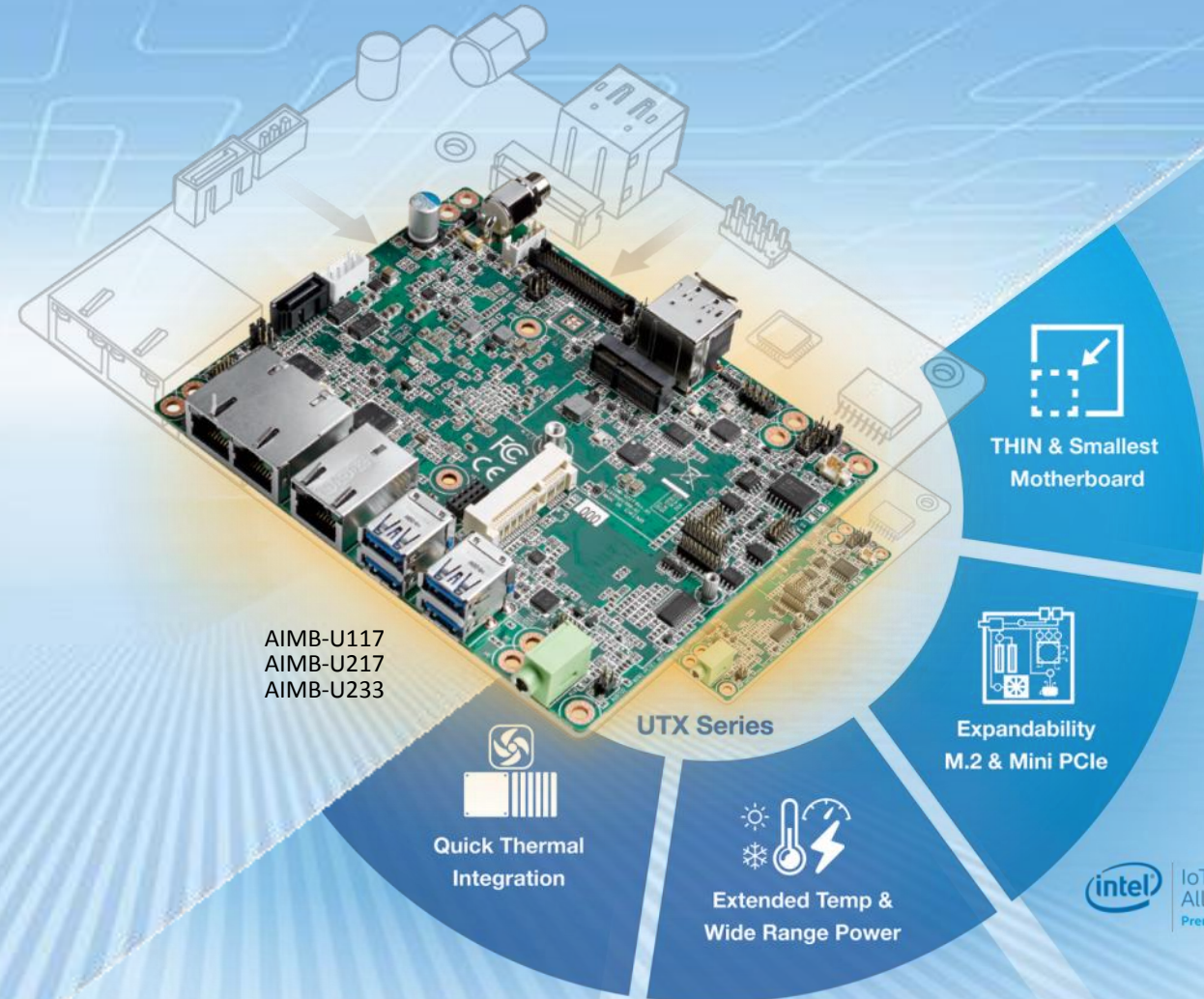
EPC-U2233
Performance



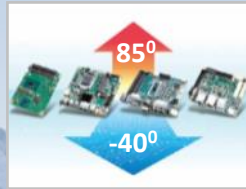
EPC-U2117
Wireless



EPC-U2217
AGV



Wide Temperature



100% Quality
Inspection

IEC60068-2

Anti-Vibration



From Standard to
Military-Grade

IEC60068-2-64/MIL-STD 810G

Conformal
Coating



Tailor-Made Service &
Automated Process

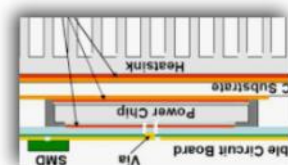
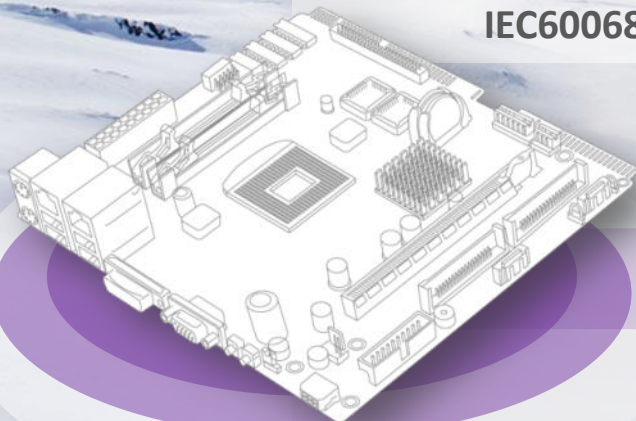
CONAP® CE-1171

Manufacture
Capability

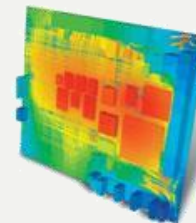


Capability to Meet Highest
Manufacture Process

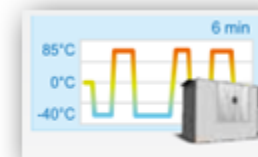
IPC-A-610G Class 3



Thermal Design



Thermal Simulation



Thermal Validation

Embedded Core Design-in Service for Rugged Applications

QFCS Releases 100% of Computing Power

Quadro Flow Cooling System

Quadro Heat Flows

- Heat pipe, Metal contact
- Mixed fins, Vented holes

100% CPU Power No Throttling

- 45W CPU @ 60C



Silent Operating

- Smart fan control
- 45 dB @ 4300 rpm (full run)

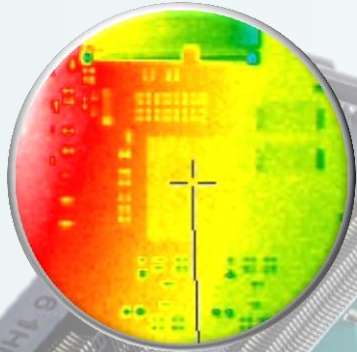
Thin & Light

- Height: 27 mm
- Weight: 250 g



Design for SOM-5899 & SOM-5897

-40~85°C Extended Operational Temp. Guarantee



-40~85 °C Operation



Component Selection



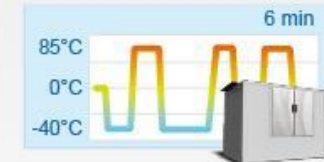
- Industrial grade power solution
- -40 ~ 85°C companion chip
- Centralized component management center (CMC)

Strict Thermal Design



- FloTHERM simulation tool finds hot spots
- Innovation thermal solution: DHCS, QFCS

Laboratory Validation



- Industrial standard -40 ~ 85°C validation: IEC60068-2-1, IEC60068-2-2, IEC60068-2-78, IEC60068-2-14

Mass Production



- Phoenix: 100% testing in chamber before shipping
- Phoebe: regular ongoing reliability tests (ORT)

Strict Design & Reliable Manufacture Process



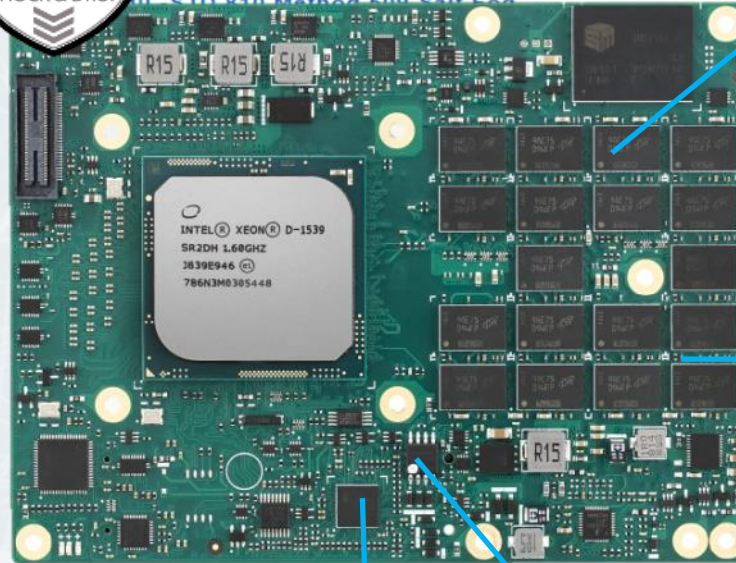
IPC-A-610G Class 3

810
SHOCK & D

MIL-STD-810G



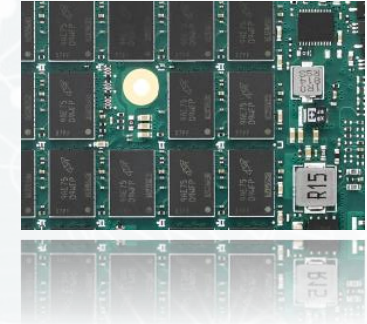
- MIL-STD 810 Method 500 Low Pressure (Altitude)
- MIL-STD 810 Method 501 High Temperature
- MIL-STD 810 Method 502 Low Temperature
- MIL-STD 810 Method 503 Temperature Shock
- MIL-STD 810 Method 504 Contamination by Fluids
- MIL-STD 810 Method 505 Solar Radiation (Sunshine)
- MIL-STD 810 Method 506 Rain (Wind/Blown Rain)
- MIL-STD 810 Method 508 Fungus
- MIL-STD 810 Method 509 Salt Fog



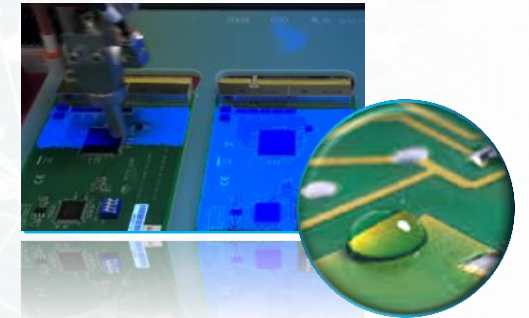
Corner Bonding



Onboard Design



Conformal Coating



IPC-A-610G



Embedded Core Design-In Services : Comprehensive Software

Aaron Su, Advantech AVP



Comprehensive Embedded Software Services

Public Cloud & Private Cloud

Azure Cloud Services

Azure Cloud Migration Suite

WISE-PaaS/DeviceOn

IoT Device Operation Management

AI Applications

Azure Machine Learning

Microsoft Azure / WISE-PaaS / Data Service Server



Edge Computer

Applications & APIs

Embedded Security Solution



- Configuration toolkit
- Whitelist protection
- Prevent Zero-Day Attacks

Backup & Recovery Solution



- Whole system backup
- Runtime incremental backup
- One key recovery

Windows 10 Lockdown Utility



- Unified Write Filter
- Keyboard & USB filter
- Block Windows update

HDD Predictive Maintenance Quality



- Storage health monitoring
- Support hard disk & SQFlash
- HDD lifetime prediction

Embedded Software APIs



- IoT Standard compliant
- Multiple I/O control
- Cross operation systems



X86 Computing

Operation System

AIM-Linux | AIM-Android

yocto
PROJECT

ubuntu
Delivered by Canonical

Windows 10

BIOS & Embedded Controller

Multi-Layer Security



- Storage security
- Booting management
- Boot guard, BIOS guard

BIOS Customization Tools



- Change logo
- DMI edit
- Configuration tool



Arm Based Computing

Trust Embedded BIOS Service

Diverse BIOS Functions

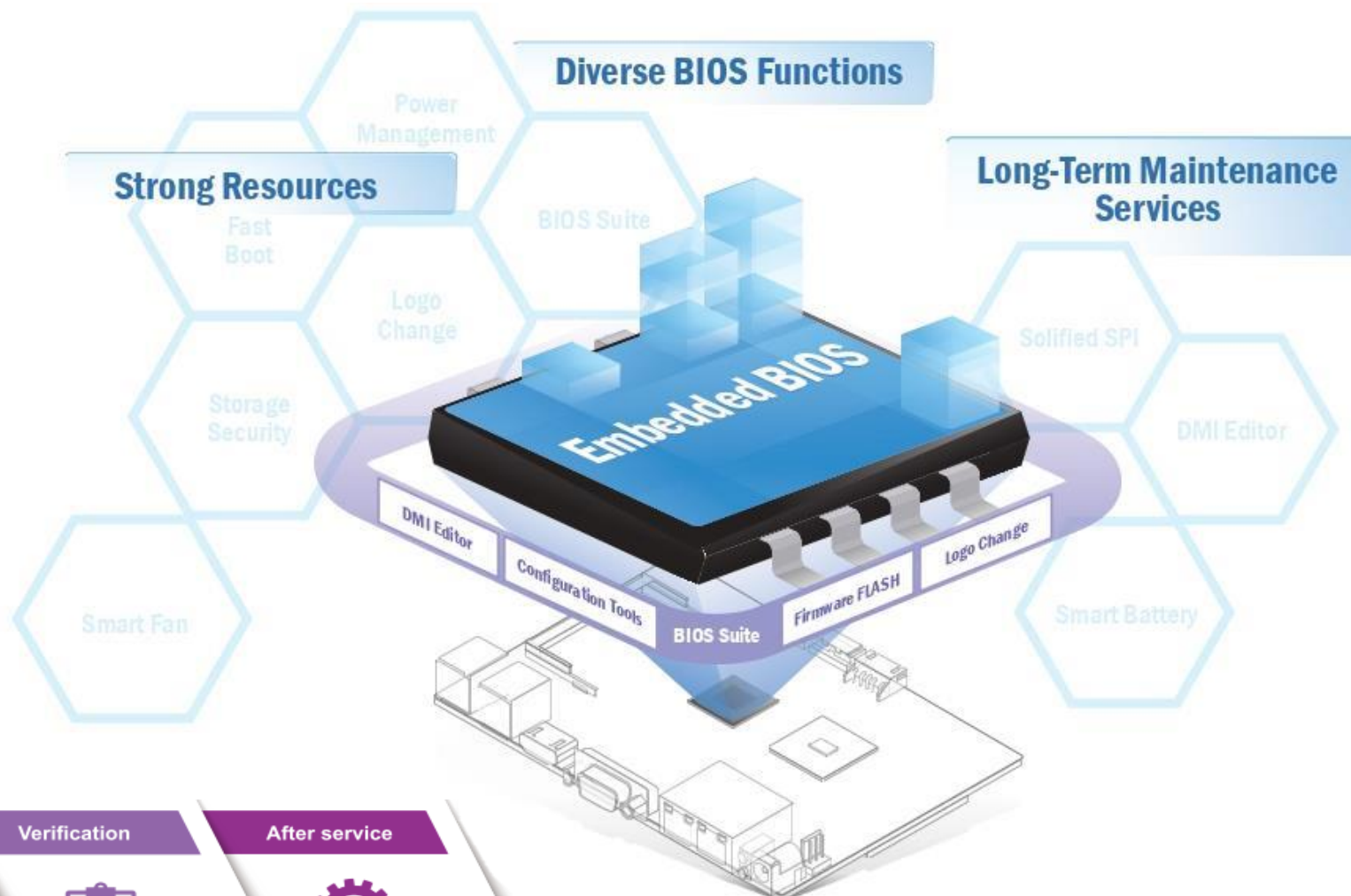
- Multi-layer Security
- 3" sec Fast Boot
- Power Management
- BIOS Suite Utility

Sufficient Sources

- Strong partnership with BIOS vendors
- Profound Industry BIOS experience
- 50+ Engineers with profound industrial BIOS experience

Long-Term Maintenance Services

- Platform Longevity Support
- 10 years BIOS version control
- BIOS Remote Backup



Request Evaluation



RD Design



Verification



After service



Allied Industrial Modular - Linux & Android Services

AIM-Linux & AIM-Android					
App Add-Ons & SDKs	Launcher <ul style="list-style-type: none"> • Quick Boot • Boot Logo • Status Bar • Navigation Bar 	Protocol <ul style="list-style-type: none"> • CANopen • J1708 • J1939 • MODBUS • 1-Wire 	Diagnostic <ul style="list-style-type: none"> • RF Diagnostic • Connection Diagnostic • System Diagnostic 	Management <ul style="list-style-type: none"> • SNMP • Multi-Screen Control • Resource Mgmt • Applications Mgmt 	Security <ul style="list-style-type: none"> • Secure Boot • License Management • Lock Device • Secure On-device Data
	Distribution <ul style="list-style-type: none"> • Yocto • Realtime • Debian • Ubuntu 	DevelopSDK <ul style="list-style-type: none"> • Qt • Python • Java • HTML5 	Maintenance <ul style="list-style-type: none"> • OTA • Remote Desktop • App Management 	Control <ul style="list-style-type: none"> • Device Control • System Control • Extension Port Access • Extension Modules Access 	Edge AI <ul style="list-style-type: none"> • HD PMQ • Pre-trained Models • Edge AI APP
Unified Embedded Platforms	Unified Core	Industrial I/O Drivers	Performance Optimization	Peripheral Integration	



Modularized Framework

- Efficient Resource Allocation
- Unified Core Structure
- Easy Migration



Value-Added Industrial App & SDK

- Accelerated Development
- High Efficient Library
- Comprehensive Documentation



Longevity BSP Maintenance

- Reliable Foundation
- LTS Kernel Selected
- Planned Roadmap and Validation



Development Documentation

<http://ess-wiki.advantech.com.tw/view/RISC>



TEXAS INSTRUMENTS

ADVANTECH

AIM-Linux Roadmap

V1.0

2018/12E

App Add-Ons

- Yocto 2.1
- Ubuntu 14.04
- Debian 8
- Security Boot
- Modbus
- CANopen

Kernel V4.1

V2.0

2019/8E

App Add-Ons

- Yocto 2.4/2.5
- Ubuntu 16.04
- Debian 9
- EdgeX
- Multi-Screen Control
- License Management

Kernel V4.14 LTS

V3.0

2020/6E

App Add-Ons

- Yocto 2.x
- Ubuntu 18.04
- Debian 10
- SNMP Manger
- Data Services with EdgeX
- Cipher SDK

Kernel V5.X

System Integration

- New peripheral module list
- New Display & Touch list

- NXP i.MX6
- TI AM335x
- TI AM57xx

+Plus

- NXP i.MX8
- Rockchip RK3288

+Plus

- Rockchip RK3399



TEXAS INSTRUMENTS



ADVANTECH

Next Generation of Arm Platform – i.MX8



Comprehensive Software Services

- Multi OS support
- Longevity BSP
- AIM-Linux & AIM-Android

Reliable H/W Design-in Service

- Various core module offerings
- Carrier board reference and consult
- Lifetime support

Trusty Peripherals Integration

- Industrial touch panel
- Wi-Fi , BT and cellular module
- Storage module



QSEVEN

ROM-7720 Qseven 2.1 (i.MX8QM)
Highest Performance for AI & Machine Vision Applications



ROM-5720 SMARC 2.0 (i.MX8M)
4K Industrial Graphic Performance for Multimedia Applications



ROM-5721 SMARC 2.0 (i.MX8M Mini)
Power Efficiency for Entry HMI & Industrial Applications

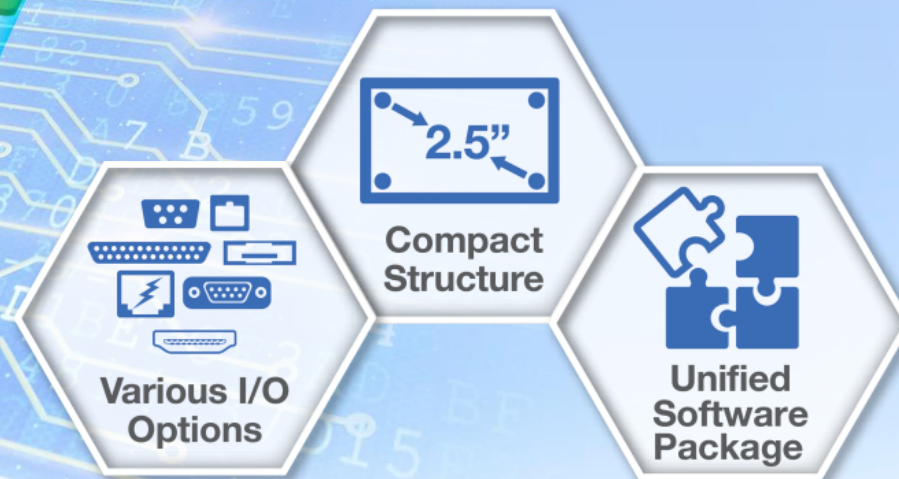
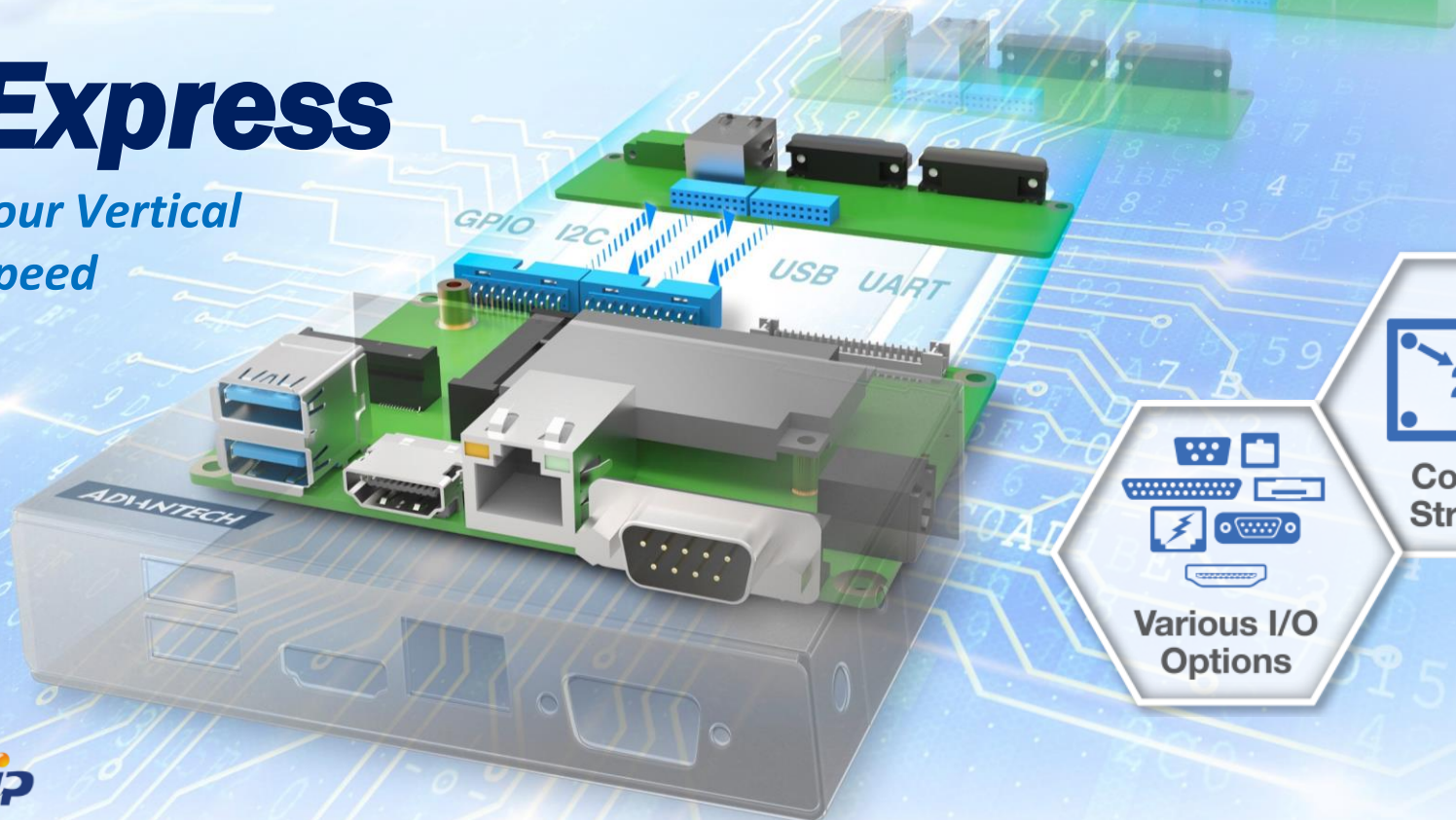


ROM-5620 SMARC 2.0 (i.MX8X)
Safety Certified for Automation & Embedded Applications

ADVANTECH

UIO40-Express

Build Systems for Your Vertical Applications with Speed



Step 1

2.5" Core Boards



RSB-3430
NXP i.MX6 Cortex-A9 Dual Lite Cores



RSB-3710
Rockchip RK3399 Cortex-A72/53 Dual/Quad Cores

Step 2

Vertical I/O Boards



UIO-4030
RS-485 x 1, RS-232 x 1, GPI x 4, GPO x 4



UIO-4032
USB 2.0 x 2, RS-232 x 2, GbE x 1



UIO-4034
CAN x 1, RS-232 x 2

Step 3

Vertical Application Systems



EPC-R3430 with RSB-3430 2.5" SBC
EPC-R3710 with RSB-3710 2.5" SBC

Step 4

AIM-Linux & AIM-Android



Modularized Framework



Value-added Industrial App & SDK



Longevity BSP Maintenance

Step 5

WISE-PaaS/ DeviceOn



IoT Devices Operation Management

Get Your AIM-Linux & AIM-Android Support!

Arm-Based Computing Platforms

- Why Advantech
- Products by Platform
- Product by Form Factor
- AIM-Linux Embedded Software Services
- What AIM-Linux Offers
 - Unified Embedded Platforms
 - App Add-Ons & SDKs
- Design-to-Order Services
- Download Center
- Media Center

What AIM-Linux Offers

AIM (Allied, Industrial and Modular) forms the core of Advantech's Embedded Operation System Services for Linux and Android. AIM-Linux and AIM-Android were created to help our customers accelerate their software development on Arm-based platforms by providing a flexible and modular framework, targeting the foundations of industrial markets, and focusing on long-term BSP maintenance and longevity support. With AIM, Advantech provides you with a verified solid foundation (Unified Embedded Platforms) and industrial-focused value-added supports (App Add-Ons and SDKs) embedded Linux and Android that allow you to simply focus on your own vertical application development.

Features and Benefits


**Modularized Framework**
Efficient Resource Allocation

**Value-Added Industrial App & SDK**
Accelerated Development

**Longevity BSP Maintenance**
Reliable Foundation

AIM-Linux Services Landscape

PaaS & Cloud Platform

**WISE-PaaS/ DeviceOn**

App Add-Ons

AIM-Linux/Security

- Secure Boot
- License Management
- Cipher SDK

AIM-Linux/Launcher

- Quick Boot
- Multi Boot
- Boot Logo


AIM-Linux/Management


- Auto Run
- Splash Screen
- SNMP
- Multi-Screen Control
- Audio Path Control


AIM-Linux/Distribution


- Yocto
- Debian
- Ubuntu
- Realtime

Unified Embedded Platforms

**Unified Core**

**Industrial I/O Drivers**

**Performance Optimization**

**Peripheral Integration**

Arm-Based Computing Platforms

- Why Advantech
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- Design-to-Order Services
- Download Center
- Documentation
- Software & Tools
- Media Center

Software & Tools

Select your product configuration from the menu below:

Platforms

NXP i.MX 6

Form Factor

Qseven

Model Name

ROM-7421

Search

ROM-7421

NXP i.MX6 Dual/Quad Plus 1GHz Qseven 2.0
Computer-on-Module

Product Page

App Add-On

Launcher	Management	DevelopmentSDK	Diagnostic	Protocol
Security	Edge AI			

Yocto

Sumo (Kernel 4.14.98)

[Developers Guide](#) [Release Notes](#) [Recovery SD](#) [Add-on Data](#)

Krogoth (Kernel 4.1.15)

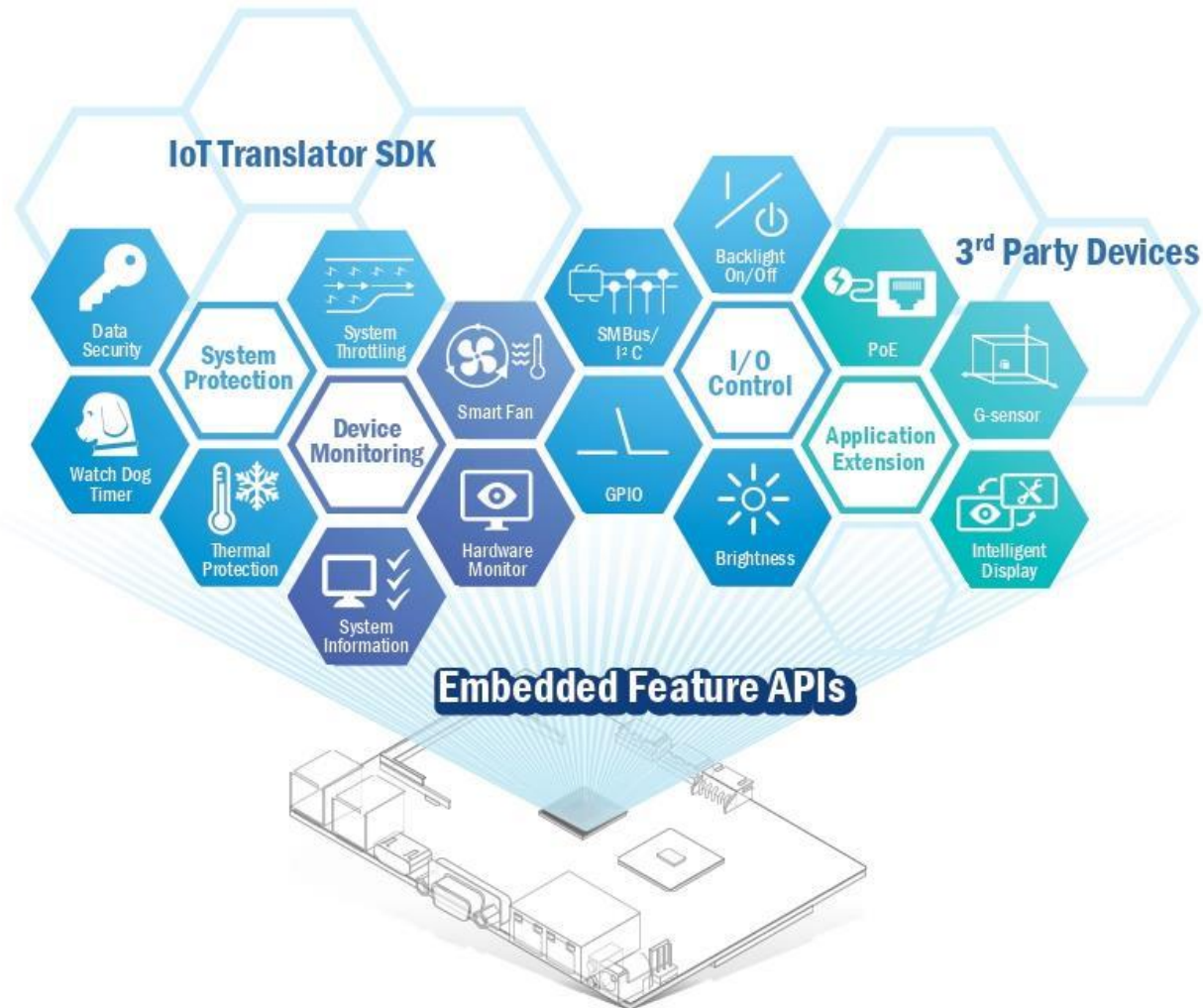
[Release Notes](#) [Recovery SD](#)

Android

Ubuntu

ADVANTECH

Embedded Feature APIs



Unified APIs

- Standard API for H/W platform
- Cross-Platform Programming
- Easy upgrade and maintenance
- Ready to Use IoT Translator SDK

Self Management

- I/O Control
- System Protection
- Device Monitoring
- Application Extension

Cross-Platform

Easy Upgrade

Fast Development

**Connecting Your Application with
Advantech Hardware Feature**

ADVANTECH

WISE-PaaS/ DeviceOn

Empowers Edge Intelligence



Device Management

- Device Monitoring and Diagnostics
- Device Control & Updating



Data Management

- Data Acquisition and Storage
- Secure Data Access



Connectivity Service

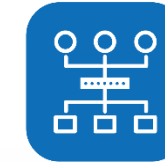
- Device Connectivity
- Plug-n-Play Peripherals

DeviceOn.Dev



OTA

- Software & Firmware Updates
- Advantech BIOS Updates



Rule Engine

- Distributed Rule Monitoring
- Flexible Trigger and Action



Data Security

- McAfee Threat Protection
- Acronis Backup Recovery

DeviceOn.App

DeviceOn OTA

OTA

- Software, firmware & configuration updates
- Advantech BIOS updates

DeviceOn FaceView

FaceView

- Facial recognition
- People counting
- Behavior detection

DeviceOn E2I

E2I

- Protocol conversion
- Edge intelligence
- Real-time visualization

DeviceOn ePaper

ePaper Manager

- EPD device auto-discover
- Fast transmission
- Device association

Standard Product Services

Smart Parking



Offering Std Product



AIMB/ESBC



Local Chassis



Storage



OS

Value Add Service

1. 8 Serial + 2 Giga Ethernet
2. Compact size design chassis
3. Long term MP schedule
4. Cloud service consulting
5. Recovery App provide
6. Embedded CPU providing

Self Gas



Offering Std Product



ESBC



Monitor



Storage



Ethernet

Value Add Service

1. Wide TEMP operating
2. 2 EA extra RS-232 module
3. Anti-electricity (high reliability)
4. IDK + local monitor chassis
5. Preload customer App
6. Solution provider (Switch etc)

EV Charger



Offering Std Product



ESBC



Monitor



Storage



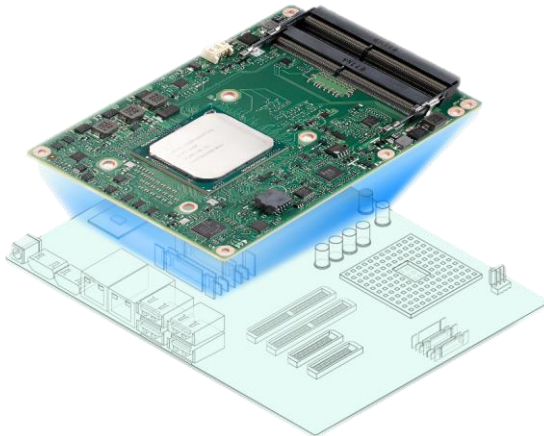
OS

Value Add Service

1. Customizing BIOS (LCD Resolution, quick boot)
2. Global technical support
3. Providing CERT. docs
4. Long term EOL plan (8 years)
5. Easy migrating for the next

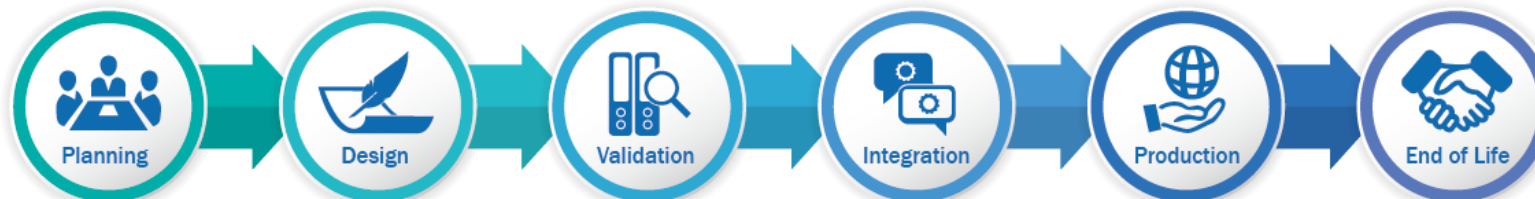
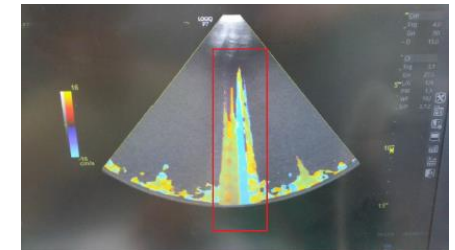
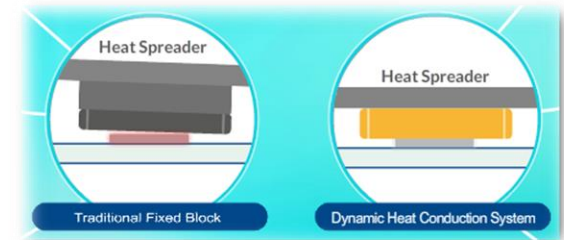
Semi-Customized Services

Medical



SOM

1. Support customizing thermal design
2. Provide customizing service
(Wide temp, BIOS/EC, SUSI, even H/W parts etc)
3. Understand Ultrasound feature
(Image noise, Strain, Device size etc)
4. Strong local technical ability for long term Biz



Embedded Core Design-In Services

Innovative Technology

Server Grade (COM-HPC)

MI/O Extension (2.5"/3.5")

UIO40-Express (2.5")

Quadro Flow Cooling System
(QFCS)

Software Services

WISE-PaaS/DeviceOn

Embedded Feature API

AIM-Linux / AIM-Android

Embedded BIOS

Integration Acceleration

EPC CTOS

(IMB, Chassis, Peripherals, OS)

Rugged Design Services

(Coating, Wide Temp., Anti-Vibration)

DTOS Services

(Custom Board, I/O, 610G Class 3)

Peripheral Integration

(Wireless, Storage, Display)



COM



SBC



MI/O



UTX



Mini-ITX



Arm-Based Module



Arm-Based SBC



UIO

Your Success

Our Mission

Faster Time-to-Market

Leading Innovation

Integration Acceleration



Industrial Motherboards

Computer On Module

Embedded Single Board Computers

Arm-Based Computing Platforms

Industrial Flash & Memory

Embedded PCs

Embedded Software

Embedded Wireless Module

Co-Creating the Future of the IoT World

