

Making Design and Procurement Surprisingly Simple With Our Recommended System on Module (SoM)

Arrow Electronics Japan K.K.
(Authorized Distributor of Variscite)

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Challenges in Developing Devices Using the Latest Processors

- **Increased Design Complexity**
In addition to offering numerous functions, the latest SoCs feature extremely high-speed interfaces, making design increasingly complex.
- **Thermal Measures and Power Management**
As operating frequencies increase, heat generation also rises, making heat generation measures and power management important matters
- **Securing Development Resources**
Designs using multifunctional SoCs require engineers with a broad range of specialized expertise
- **Supply Chain**
Even if the processor is available for long-term supply, peripheral components may reach EOL

In order to solve these challenges,

allow us to introduce you to System-on-Module (SoM) solutions



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Today's Agenda

- **About Variscite**
- Challenges and Solutions
- Comparison of Chip-Down Design and SoM
- Introduction to Variscite SoM Products
- Variscite Case Studies
- Demo

About Variscite

Variscite is a leading System-on-Modules designer and manufacturer

Key Figures:

Established:	2003
Target Markets:	Embedded products
Customer base:	Over 7000 customers worldwide
Production:	Internal production facilities with a total capacity of >3500Ku/year

- Local offices in Europe and North America
- ISO 9001:2015 and ISO13485:2016 certified

About Variscite

Variscite current positions

- A leader in the ARM-based SoM market, with extensive customer base and pipeline
- The most diversified ARM based product portfolio, with extensive longevity and compliance policies
- The first SoM vendor in NXP's Platinum membership and its partner on the entire i.MX8 and i.MX9 product lines
- Internal production lines for stable availability and solid lead times



The Challenge



Market says MORE

- **More bells and whistles**
Market is moving to “Smart devices”. Basic UI just doesn’t cut it
- **More connectivity**
IoT - Everything is now connected
- **More support**
Complexity of the processors and entire system design requires higher level of hardware and mainly software support
- **More features**
OEMs continuously introduce new generations and derivative with new features, more graphics and integrated intelligence

For example:

The Evolution of a coffee vending machine



- Basic Microprocessor
- Alpha numeric display
- No connectivity
- Mechanical coin-based payment

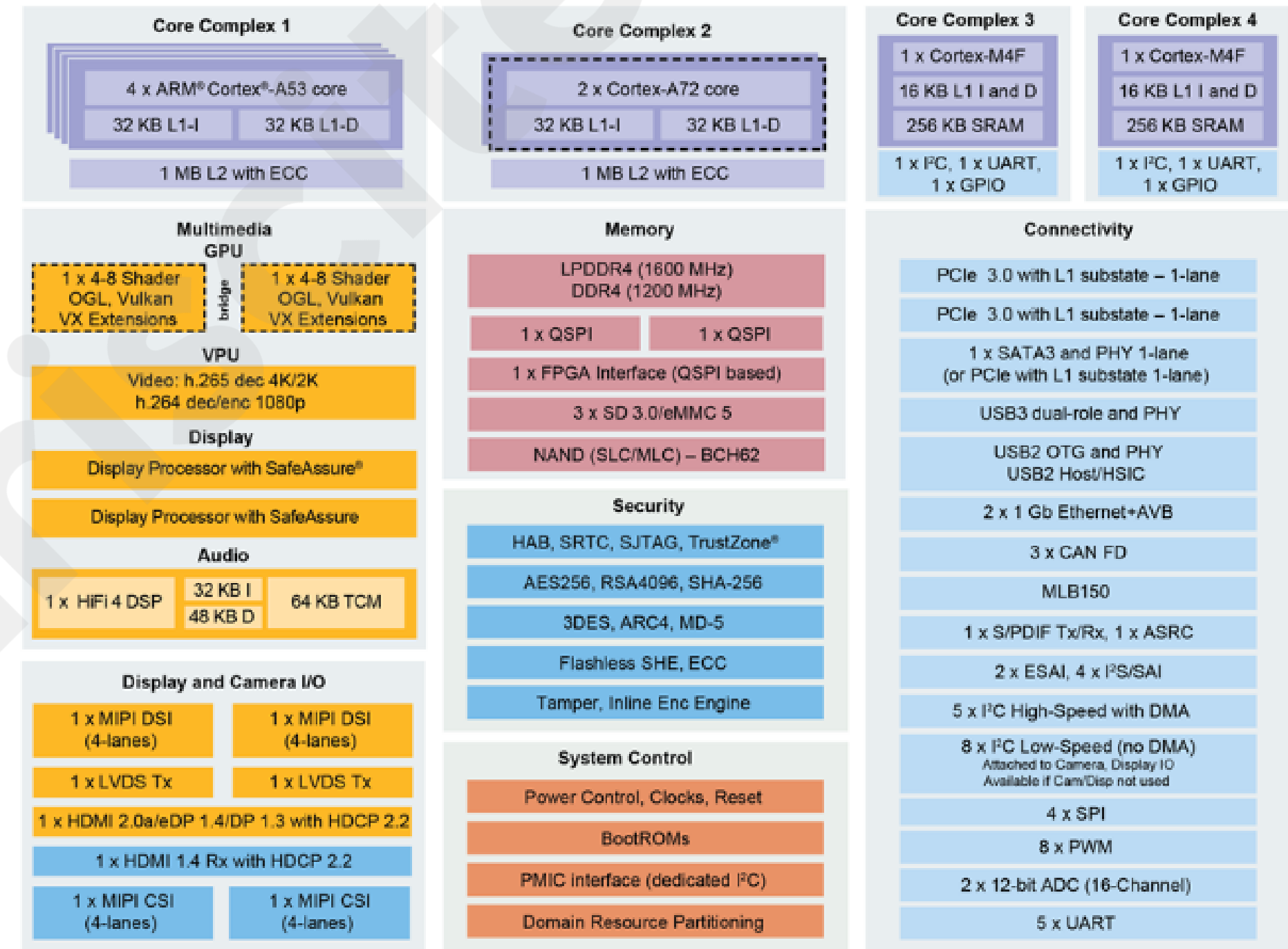


- High performance application processor
- 1080p graphics and video rendering
- Video stream via Wireless network
- NFC based wireless payment

i.MX8 Quad Max Processor Block Diagram

The problem

Product designs are getting more complex

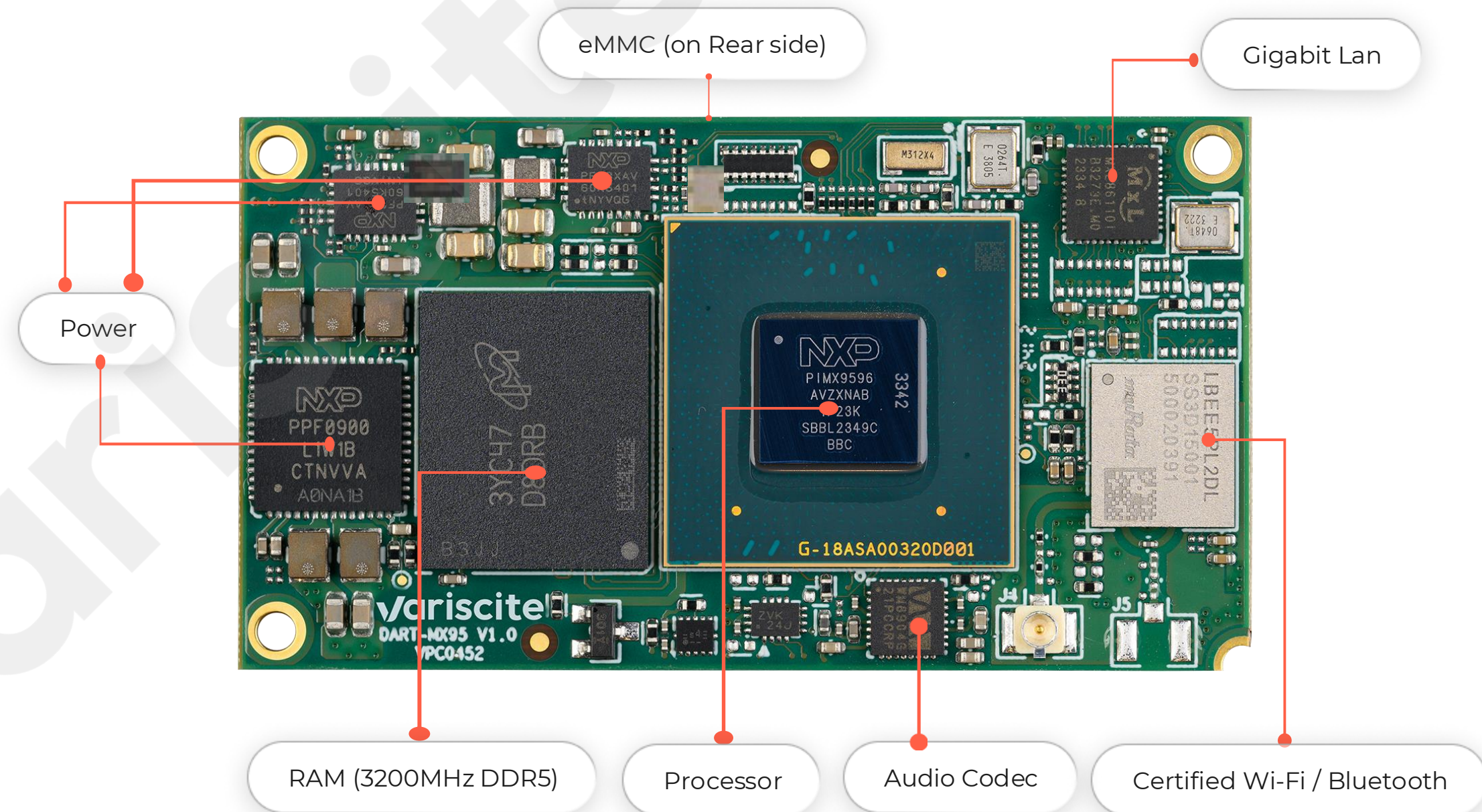


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The solution

SoM:
System on Module

Example shown:
DART-MX95



What is a System on Module:

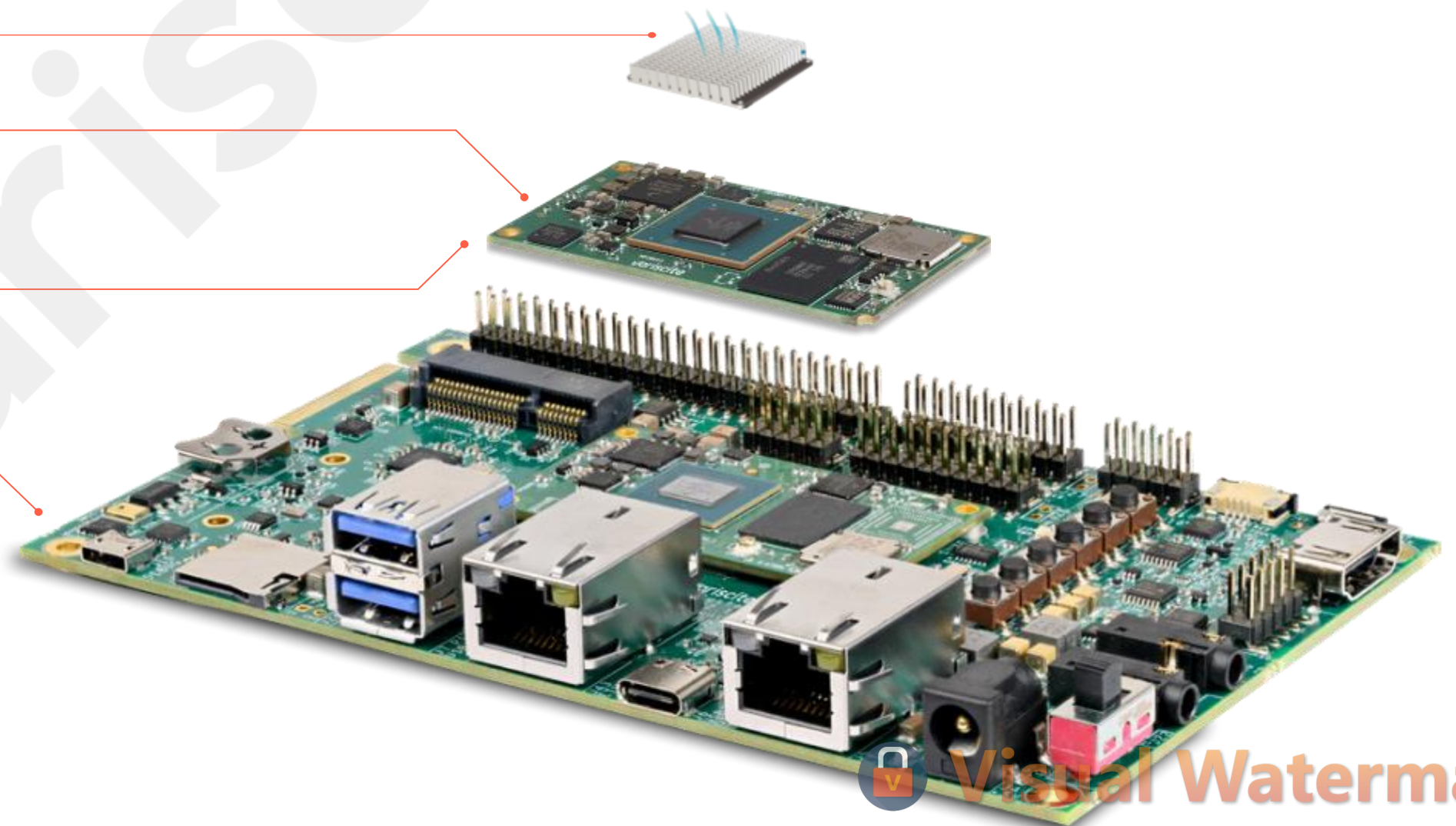
SOM and Carrier structure

Optional Thermal Solution

SOM Product

Embedded Software

Carrier Board



Chip-Down Design vs. Variscite System on Modules

Aspect	Chip-Down Design	System on Module
Time-to-Market	Long design cycles; requires full PCB design, integration, certifying and testing - often takes years	Off-the-shelf certified, validated modules cut development to even months; faster prototyping
Control & Customization	Full control over every component; design can be optimized for unique or niche applications	Extensive flexibility; customization available at low volumes of even 25 units
Risk & Reliability	First-time custom configurations prone to errors; greater chance of failures post-launch	Field-tested platforms; lower design risk; validated drivers and BSPs
Scalability	Each upgrade or change requires full redesign	Pin-to-pin compatible SoMs enable easy upgrades/downgrades without redesign

Chip-Down Design vs. Variscite System on Modules

Aspect	Chip-Down Design	System on Module
Longevity & Maintenance	Lifecycle management fully in-house; requires dedicated engineers; component EOL can force redesign	Vendor-guaranteed long-term availability (15 years); ongoing software support
Supply Chain	Multiple suppliers for each component; complex to manage	Simplified; doesn't requires stocking hardware
Cost	Economical only at very high volumes (>100k units annually)	Lower upfront investment; cost-effective for low to medium volumes; starting at \$24
Expertise Required	Large, experienced in-house hardware team needed	Hardware abstraction allows software- and product-focused teams to innovate without deep hardware design
Best Fit For	Ultra-high volume consumer products; highly specialized niche devices needing unique hardware	Versatile- industrial, medical, IoT, AI/ML edge devices; low to mid-volume production

Variscite Pin2Pin Families



VAR-SOM Pin2Pin product family

Highly scalable across multiple processors and
cost/performance options 200-pin SO-DIMM edge connector



VAR-SOM-MX91
NXP I.MX 91
1X 1.4GHZ CORTEX-A55



VAR-SOM-AM62P
TI AM62P5X
4X 1.4GHZ CORTEX-A53



VAR-SOM-AM62
TI AM625X
4X 1.4GHZ CORTEX-A53



VAR-SOM-MX93
NXP I.MX 93
2X 1.7GHZ CORTEX-A55



VAR-SOM-MX8M-PLUS
NXP I.MX8M PLUS
4X 1.8GHZ CORTEX-A53



VAR-SOM-MX8M-MINI
NXP I.MX8M MINI
4X 1.8GHZ CORTEX-A53



VAR-SOM-MX8M-NANO
NXP I.MX8M NANO
4X 1.5GHZ CORTEX-A53



VAR-SOM-MX8
NXP I.MX8 2X 1.8GHZ
CORTEX-A72 + 4X 1.2GHZ
CORTEX-A53



VAR-SOM-MX8X
NXP I.MX8X
4X 1.2GHZ CORTEX-A35



VAR-SOM-MX6
NXP I.MX6
4X 1.2GHZ CORTEX-A9



VAR-SOM-SOLO/DUAL
NXP I.MX6
2X 1GHZ CORTEX-A9



VAR-SOM-6UL
NXP I.MX6 UL/ULL/ULZ
900MHZ CORTEX-A7

Note:
pin2pin compatibility depends on pinmux

DART Pin2Pin product family

Optimized size and extended pinout options

Three 90pin board2board connectors



DART-MX95

NXP I.MX95
6X 2.0GHZ CORTEX-A55



DART-MX93

NXP I.MX93
2X 1.7GHZ CORTEX-A55



DART-MX91

NXP I.MX91
1X 1.4GHZ CORTEX-A55



DART-MX8M-PLUS

NXP I.MX8M PLUS
4X 1.8GHZ CORTEX-A53



DART-MX8M

NXP I.MX8M
4X 1.5GHZ CORTEX-A53



DART-MX8M-MINI

NXP I.MX8M MINI
4X 1.8GHZ CORTEX-A53

Note:
pin2pin compatibility depends on pinmux

SMARC Pin2Pin product family

Highly scalable across multiple processors and
cost/performance options 314-pin SO-DIMM edge connector



VAR-SMARC-MX8M-PLUS

NXP I.MX8M PLUS
4X 1.8GHZ CORTEX-A53



VAR-SMARC-MX95

NXP I.MX95
6X 2.0GHZ CORTEX-A55

Note:
pin2pin compatibility depends on pinmux

Software Support



Software for Variscite SoMs:

OS Supported by Variscite SoMs:

- Linux (mainly Yocto and Debian)
- Android

The following OSs are also supported by some SoMs, including DART-MX95:

- FreeRTOS
- Zephyr
- QNX

Software Support Channels:

- Monthly software releases
- GitHub page
- Developer Center (Variscite support hub)
- Support Portal (engineer-to-engineer support)



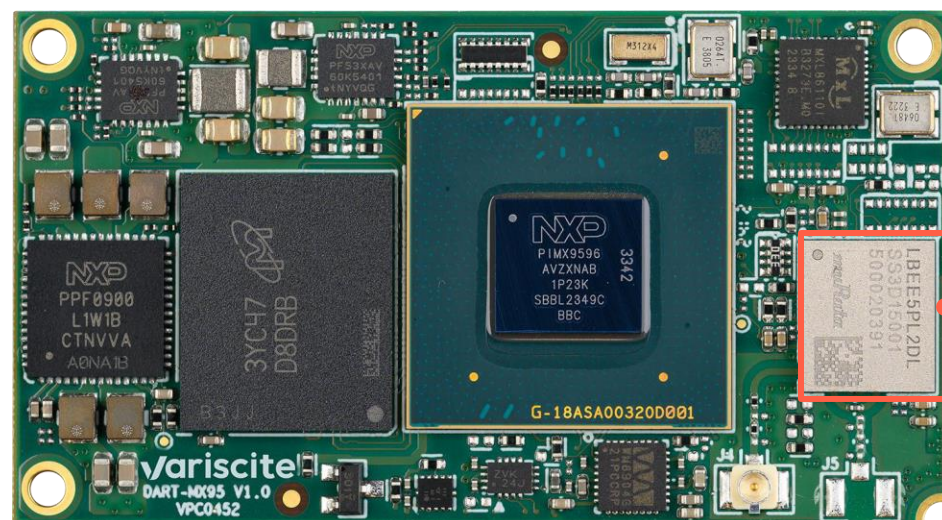
Variscite i.MX SoMs and Murata Wi-Fi® 6

Murata Wi-Fi/BT modules supported by Variscite SoMs:

- Murata Type 2EL(with NXP IW612)
- Murata Type 2DL (with NXP IW611)
- Murata Type 2LL (NXP with IW610G)
- MurataType 2KL (NXPwith IW610F)

Benefits for Variscite Users:

- The use of certified modules eliminates the need to obtain separate certification
- Secure and broad connectivity options
- Supports applications ranging from low cost solutions to high speed video streams
- Plug and play



Wi-Fi Module

- Multiple Wi-Fi modules are available for selection
- Unpopulated options are also available



Variscite Case Studies



Case Study

DMG MORI Digital Co., Ltd.

Digital E3 Core Series "Edge AI Board"

(Uses DART-MX8M-PLUS)

- Compact, low-power embedded CPU board capable of camera imaging and AI processing
- High reliability, enabling operation even under severe environmental conditions involving vibration, heat, and electromagnetic noise
- Fanless and compact for easy installation, while enabling lower installation costs compared to industrial PCs

<Example Use>

AI analyzes the accumulation of chips generated during machine tool processing; the chips are automatically and efficiently removed, resulting in a reduction of machine stoppages and machining defects

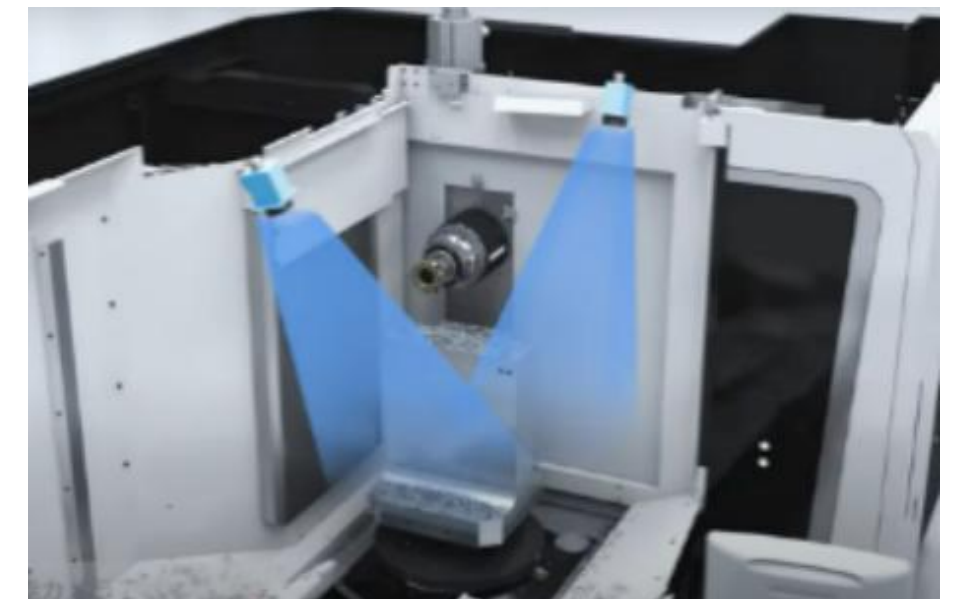
By replacing processing previously performed through the use of industrial PCs and dedicated boards, the need for large, separate equipment boxes is eliminated, achieving reduced power consumption and space savings

<Customer Feedback>

Use of an SoM enables the development period to be shortened and reduces design risks and component procurement risks associated with SoC peripheral circuits

DMG MORI

DIGITAL



[AI Chip Removal Introduction Video \(YouTube\)](#)



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Demo



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Support ▾

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Variscite Website

Blog

Contact Sales

Variscite Developer Center

Variscite's software knowledge base provides various technical information:

- Software releases – release notes and source code repositories
- Developer's guides for software and hardware setup, customization of the OS and debugging
- SD card images with pre-built software



NXP i.MX 9 Applications Processors



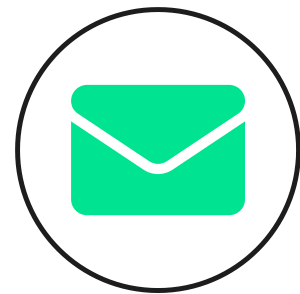
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Useful links



Website

www.variscite.com



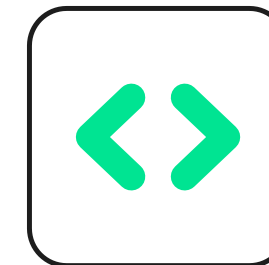
Email

sales@variscite.com



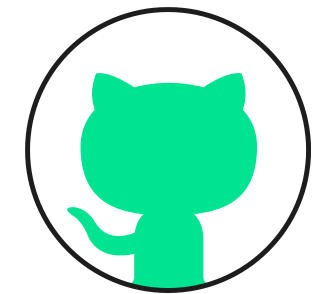
Contact Support

variscite.com/support



Developer Center

dev.variscite.com



Github

github.com/varigit



Thank You

