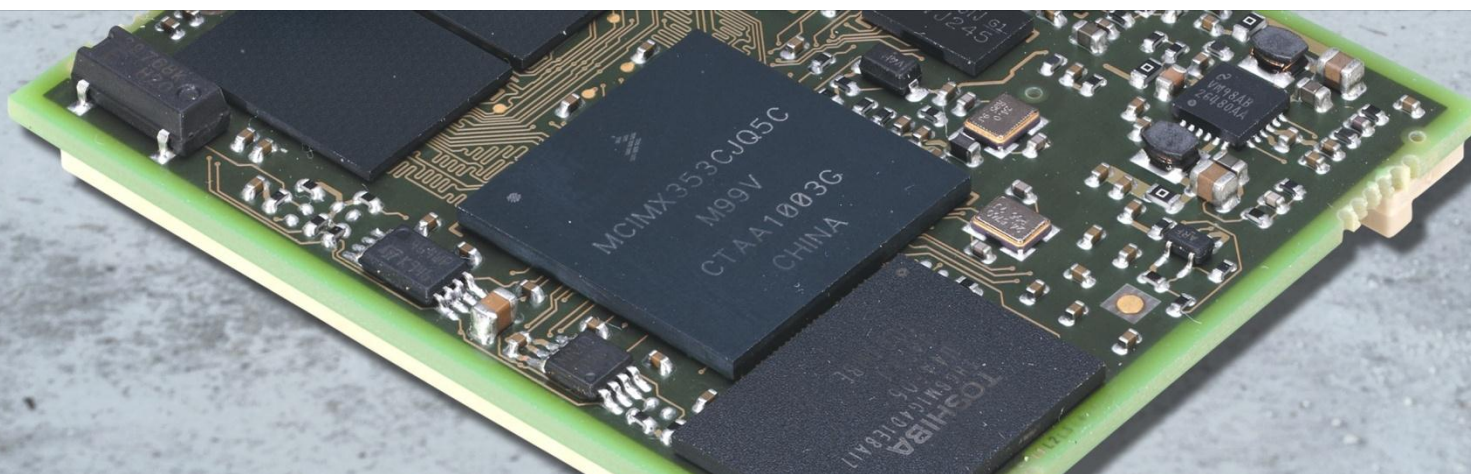




Standardization for ARM-based Modules

Standards and Players

Wolfgang Heinz-Fischer (HeiFi)
Head of Marketing



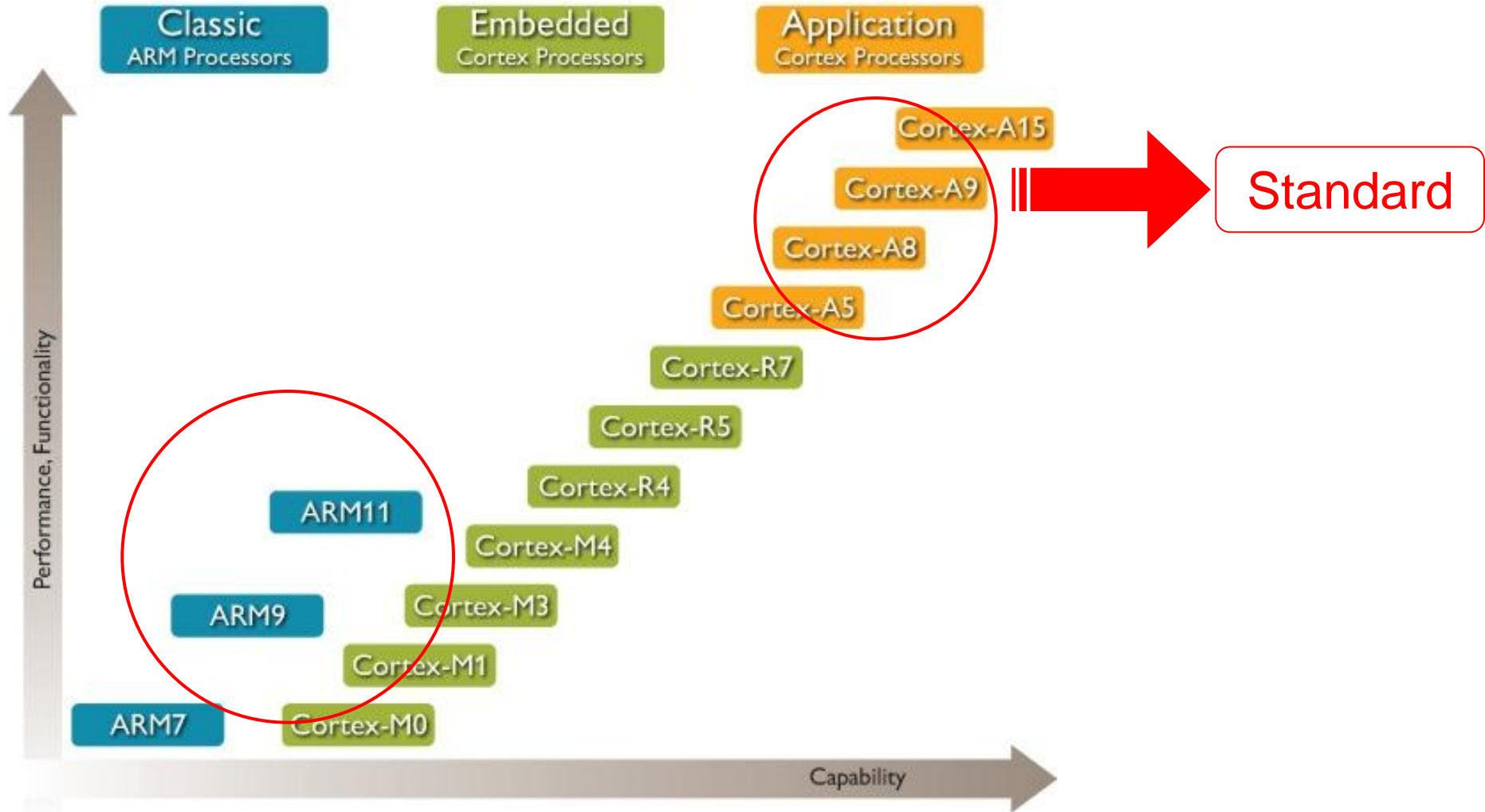
- What is a Standard
- What Standards are available in the ARM Module Market
- How to select the right board vendor

- **Real Standards**
 - Registered by an non profit organization (PICMG, PC104)
 - Fully compatible (interface, mechanics)
 - COM Express, MicroTCA, AMC, PC/104

- **Industrial Standards**
 - Organized by an interest group
 - „Compatible“
 - ETX, Qseven

- **Vendor Standards**
 - Defined by a single vendor
 - Lots of vendor standards (= no standard)

ARM Module Market



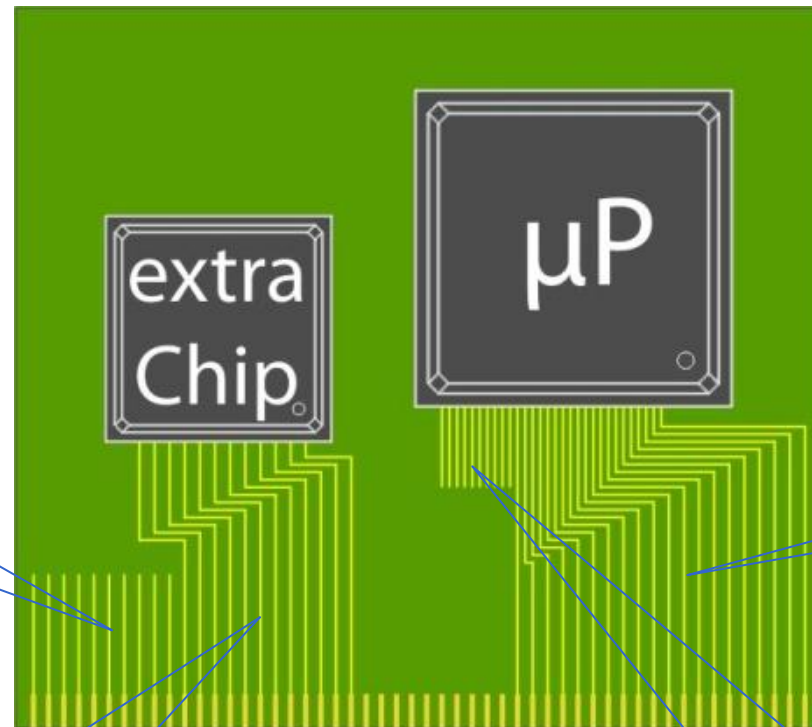
Standardization in the Embedded Board Market



ULP-COM

Vendor
specific

Module Market - Standards

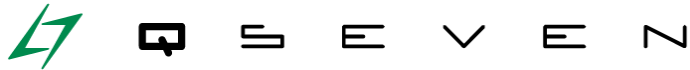


Pins defined in Standard and not supported

Pins defined in Standard and supported by Processor

Pins delivered by Processor but not connected

Pins defined in Standard and supported by extra Chip



- Q7 Spec Rev 1.0 focussed on Intel Atom
- Q7 Spec Rev 1.2 add ARM functionality
- ARM & x86 Markets Are Converging
- Motivation for Q7 members to use ARM is to keep their Intel market
- Dimension 70 mm x 70 mm
- 230 Pin, MXM, 0.5 mm pitch
- Only around 60% - 65% of i.MX6 pins used
- Members who announced i.MX6 Q7 board:
Congatec, iWave, Seco

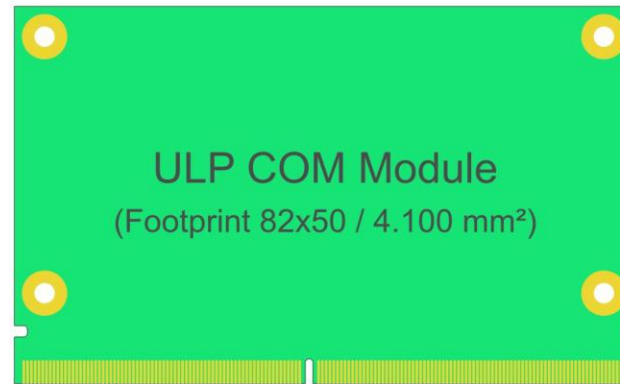
ULP-COM

- Two worlds: x86 <-> ARM
- If you need many USB, lots of PCIe, PCI Express graphics, LPC go with COM Express / x86
- If you need parallel TFT, camera interface, multiple SPI, multiple SDIO, serial ports go with ULP-COM
- Dimension 82 mm x 50 mm and 82 mm x 80 mm
- 314 Pin, MXM3.0, 0.5 mm pitch
- Only around 75% - 80% of i.MX6 pins used
- Members who announced i.MX6 ULP-COM board:
Kontron, Adlink, GreenBase

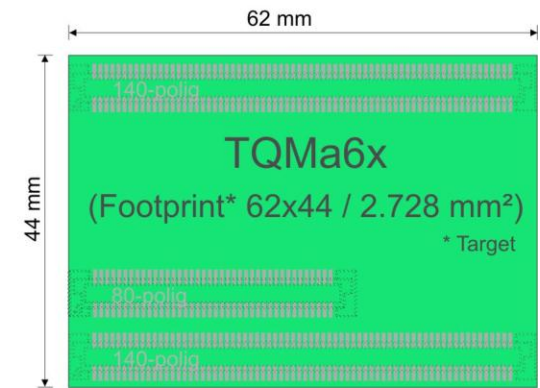
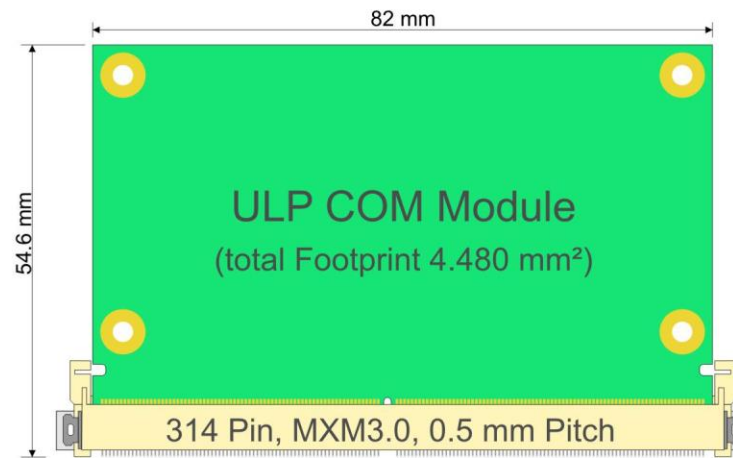
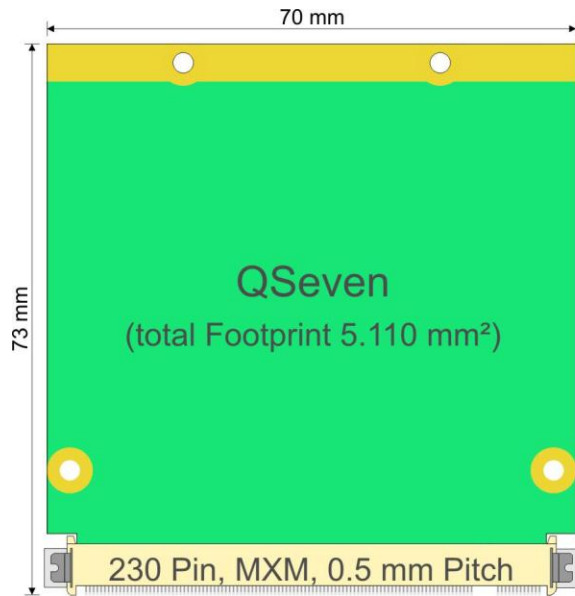
Vendor specific

- Lots of vendors with own Formfactor
- Be compatible within Vendor „Standard“
- Optimize to processor

Board Dimension



Requested Board Space

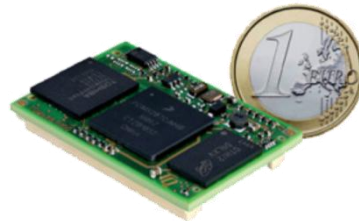




The winner is?

There is space for more ideas

How to select the right module vendor



How to select the right module vendor (Differentiation)

- by Application
- by Processor (Consumer / Industrial = Longevity)
- by Dimension
- by Memory System (Consumer / Industrial)
- by Connector System
 - No. of Pins (all Signals available?)
 - Pitch
 - Robust System (Schock / Vibration)
 - Current / Transfer Speed
- by other Specification
- by Software Support, ECO System and Design Support
- by Vendor behind (healthy, stable in the market, confident)

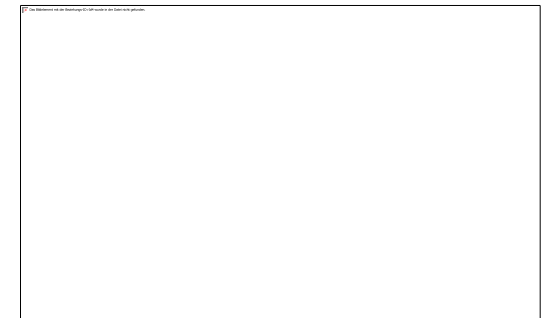
The ideal Module

- ✓ Complete, independent system
- ✓ All necessary functions on board (DC supply, Sequencing, others)
- ✓ Maximum integration (Memory Size)
- ✓ Maximum Safety (Temperature & Power Control)
- ✓ Single DC supply
- ✓ All processor functions available on connector
- ✓ Maximum robustness (Robust Connector System, Industrial Design)
- ✓ Minimum board size
- ✓ Build in Boot Mechanism
- ✓ Long time availability (> 10 Years, Lifecycle-Management)
- ✓ Starterkit available
- ✓ SW & Design support & schematic review

The ideal TQ Module – TQMa28



- ✓ With i.MX287 and i.MX283 processor
- ✓ Up to 256 MB DDR2-SDRAM
- ✓ Up to 32 GB eMMC-Flash
- ✓ 5 VDC single supply
- ✓ All processor signals available on connector
- ✓ 160 Pin, 0.8 mm pitch
- ✓ Only 40 mm x 26 mm
- ✓ Available in extended temperature range
- ✓ Long term available (> 10 years)
- ✓ Starterkit available



- TQ = Technology in Quality
- Founded 1994 (by Detlef Schneider and Rüdiger Stahl)
- 900 Employees (Febr. 2012)
- Revenue 135 Mio € (Year 2011/2012)
- 8 Locations (Seefeld, Murnau, Peißenberg, Peiting, Wetter, Chemnitz, Fontaines, Shanghai)
- ISO 9001, ISO 14001, EN 9100, ISO 13485 and ISO 16949 certified
- Leading Electronic Engineering und Manufacturing Services (E²MS, CEM)
- Designing, Layout, Manufacturing, Assembling, Testing all in House
- Standard Embedded Products (Freescale Alliance Member)
- Focused Markets: Automation, Aviation, Green Energy, Industry, Logistic & Transportation, Maritime Traffic, Medical, Railroad, Telecom



www.tq-group.com



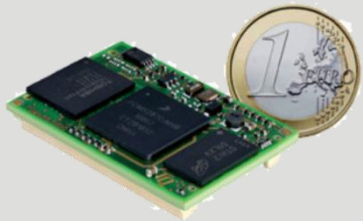
- Alliance Member since 1998
- Leading European Alliance Member
- Complete Power Architecture history from PowerQUICC to QorIQ
- More than 400.000 Power Architecture modules shipped
- Complete i.MX product offer from i.MX2x, i.MX3x to i.MX5x (i.MX6x will follow soon)



Wolfgang Heinz-Fischer
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Thank You



ARM9 / i.MX28 Module
TQMa28 - 40 mm x 26 mm



Cortex-A8 / i.MX53 Module
TQMa53 - 56 mm x 44 mm