



Embedded Module Market

Make vs Buy



Presenter:

Wolfgang Heinz-Fischer (HeiFi)

Head of Marketing & PR / TQ-Group





- The market demand and situation
- Make vs Buy
- The market players
- How to select the right supplier

Embedded Module Market

Design Concerns / Design Goal



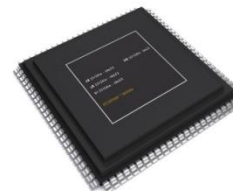
Time



Cost



Technology



Risk





Technology
is getting
more complex



Longer
development
time



Higher
design
risk



Shorter
Time-to-
Market



Less
HW Design
resources



Shorter
product
lifecycle

How you solve this contradiction?

Modular Design!

Embedded Module Market

Modular Design (SOM/COM) Principle

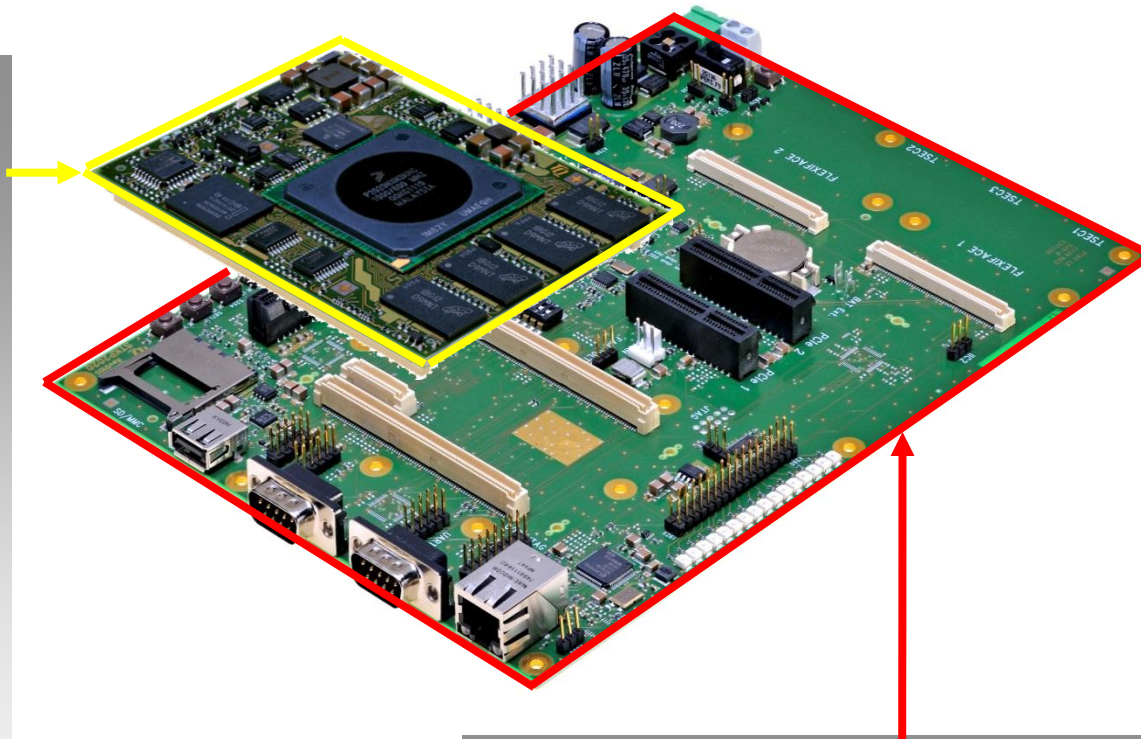
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event
2014**



SOM/COM Module

60% to 80%
done in COM
Module

Processor,
Memory and
general
Interface
Technology
delivered by
COTS



Customer Applicationboard

20% to 40% flexible Design for perfect fit.
Resources and design focus on Application Know
How and Core Competence.



Faster Development Time

- Processor core board (COTS) already ready and tested
- Majority of the hardware design is available prior to the project start
- Carrier / application board more simple and can be developed faster
- Reference designs available and tested on development board / starterkit
- Software development can start from beginning on target platform
- Performance test can be done before final prototype is ready

Customer Benefit = Time-to-Market



Cost Saving

- Development cost only for carrier / application board
- Carrier / application board less layer (COTS = 10 to 12, Carrier = 6 to 10)
- Using additional feature elements that have already been tested
- Lower risk for respin need, product ready after first shot
- Lower risk for redesign during life cycle
- Lower investment for development means lower interest cost
- Reuse same COTS and design knowlege in other products (higher qty.)

Customer Benefit = lower Product Cost



Reduce Complexity

- Be able to design and manage the technology
- Be able to manufacture the product
- Design more simple carrier / application board
- Benefit from design knowledge of COM vendor
- COM vendor has the expertise to deal with high speed design and multiprocessor

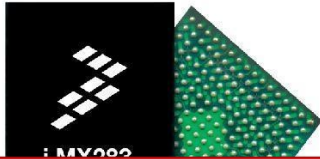
Customer Benefit = Confidence / lower Cost



Minimize Risk

- Lower design risk by more simple carrier / application board design
- By using tried and tested elements, get the design right first time
- Lower risk for redesign during life cycle, due to more simple carrier board design (redesign risk mainly on COM board)
- Better chance to meet the planned market entry date
- Lower investment risk by lower investment cost

Customer Benefit = Confidence



In most cases the processor is not
the core competency of the customer

Modular Design enables you
to put the focus on your own core competency:

The Application!!!

Read article ...

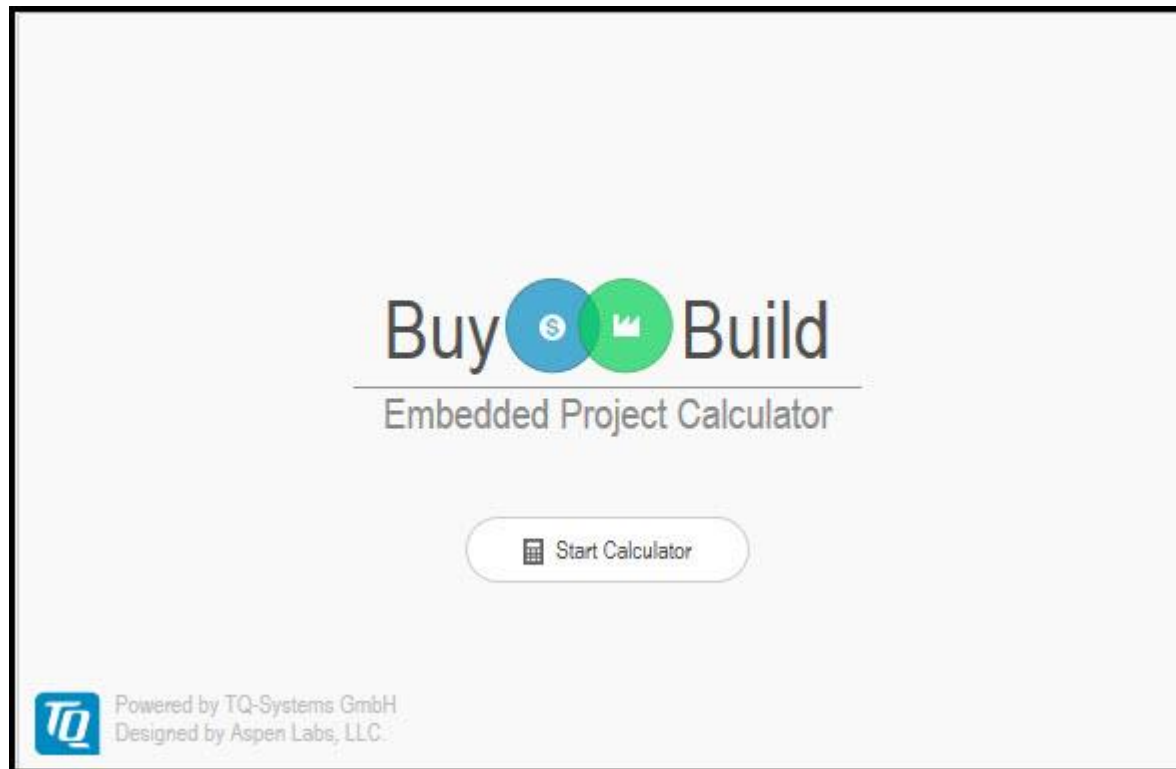
Embedded Modules

Buy Vs. Build

Part 1: Advantages of a Modular Design

By Wolfgang-Heinz Fischer, TQ Group

Modular Design Calculator

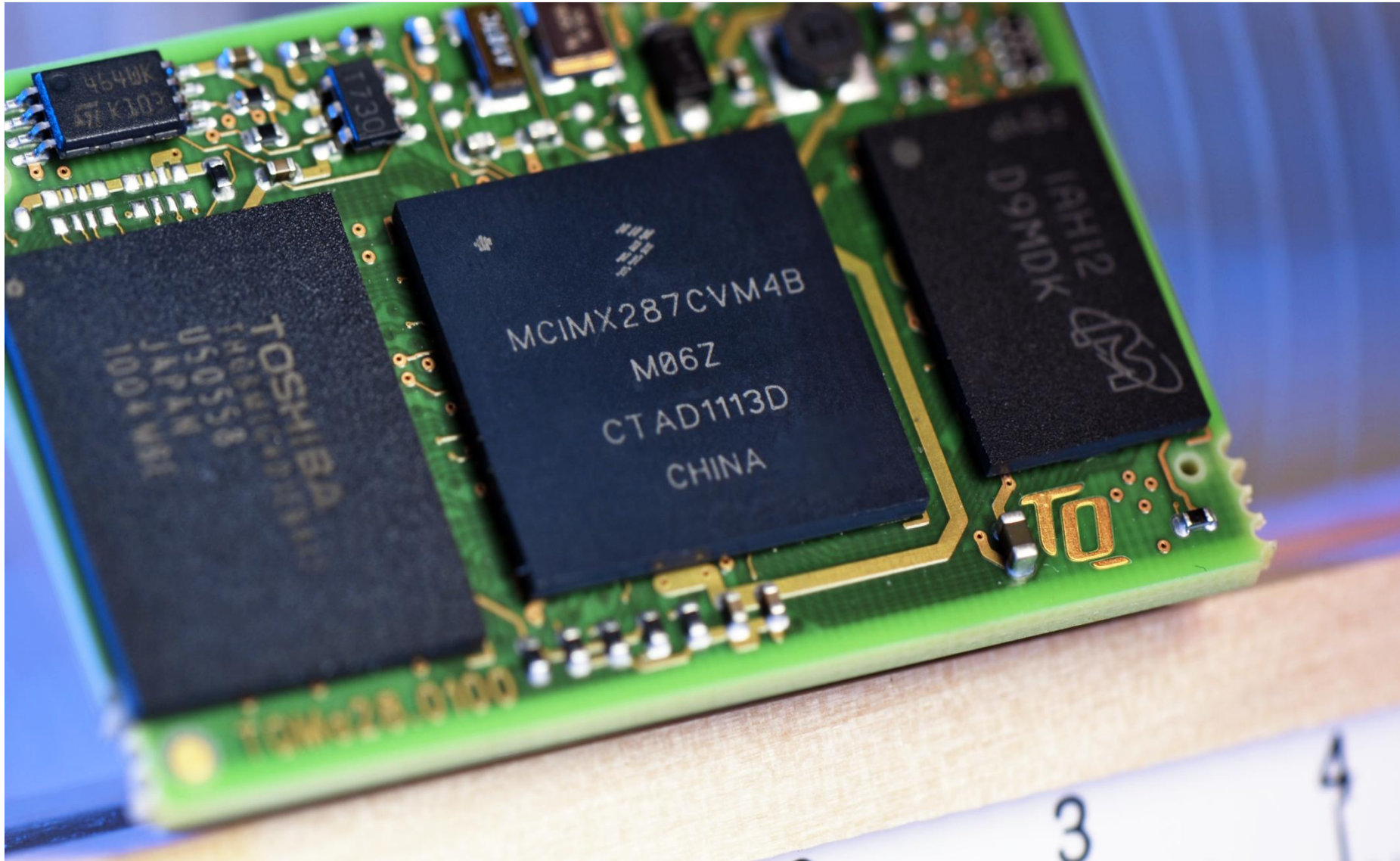


Webinar Thursday, Oct. 30, 17:00

Embedded Module Market

The Market Offers

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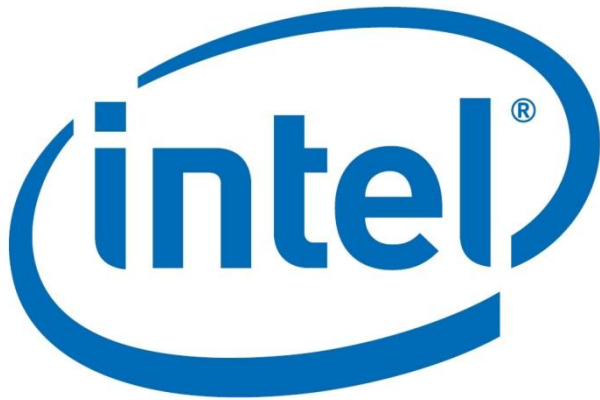
< 10.000 Arguments

< 1.000 Boards

< 100 Vendors

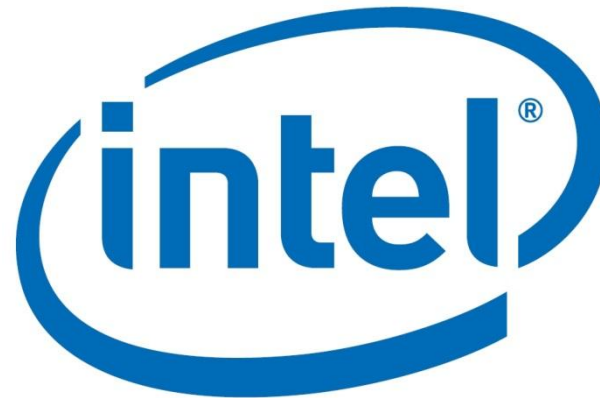
Embedded Module Market


The Module World



Embedded Module Market

The Intel Module World



 = Standard

■ PC/104

■ COMs

ETX

XTX

Qseven

COM Express

■ SBC

EBX

3.5"

PicoITX

■ Mainboard

MiniITX

Embedded Module Market

The Power Architecture Module World



Embedded Module Market

The Power Architecture Module World



= Vendor specific

= few offers only

Embedded Module Market

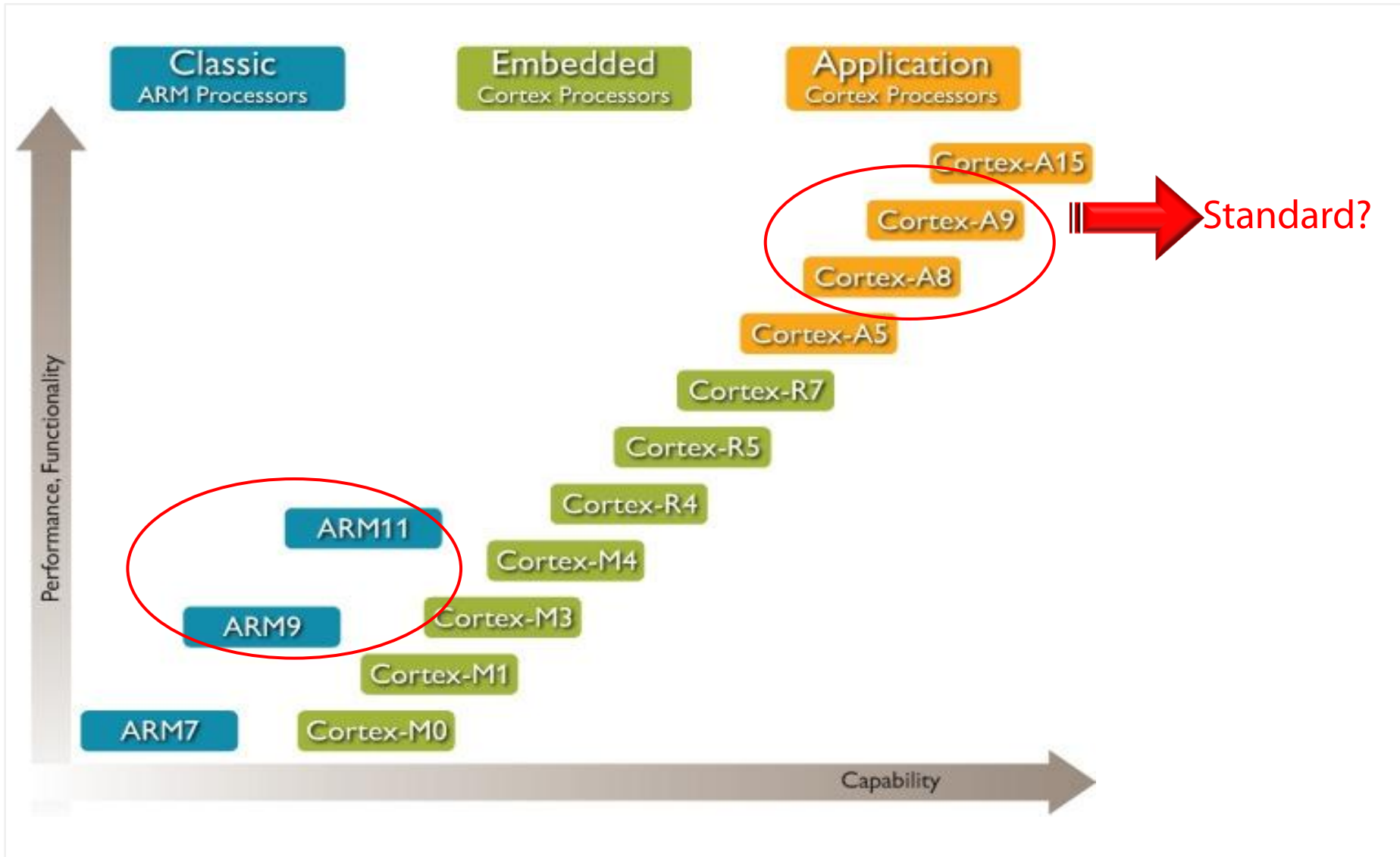
The ARM Module World



Embedded Module Market

ARM Processors

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Embedded Module Market

ARM Module Standards???



Vendor
specific

EDM
Standard

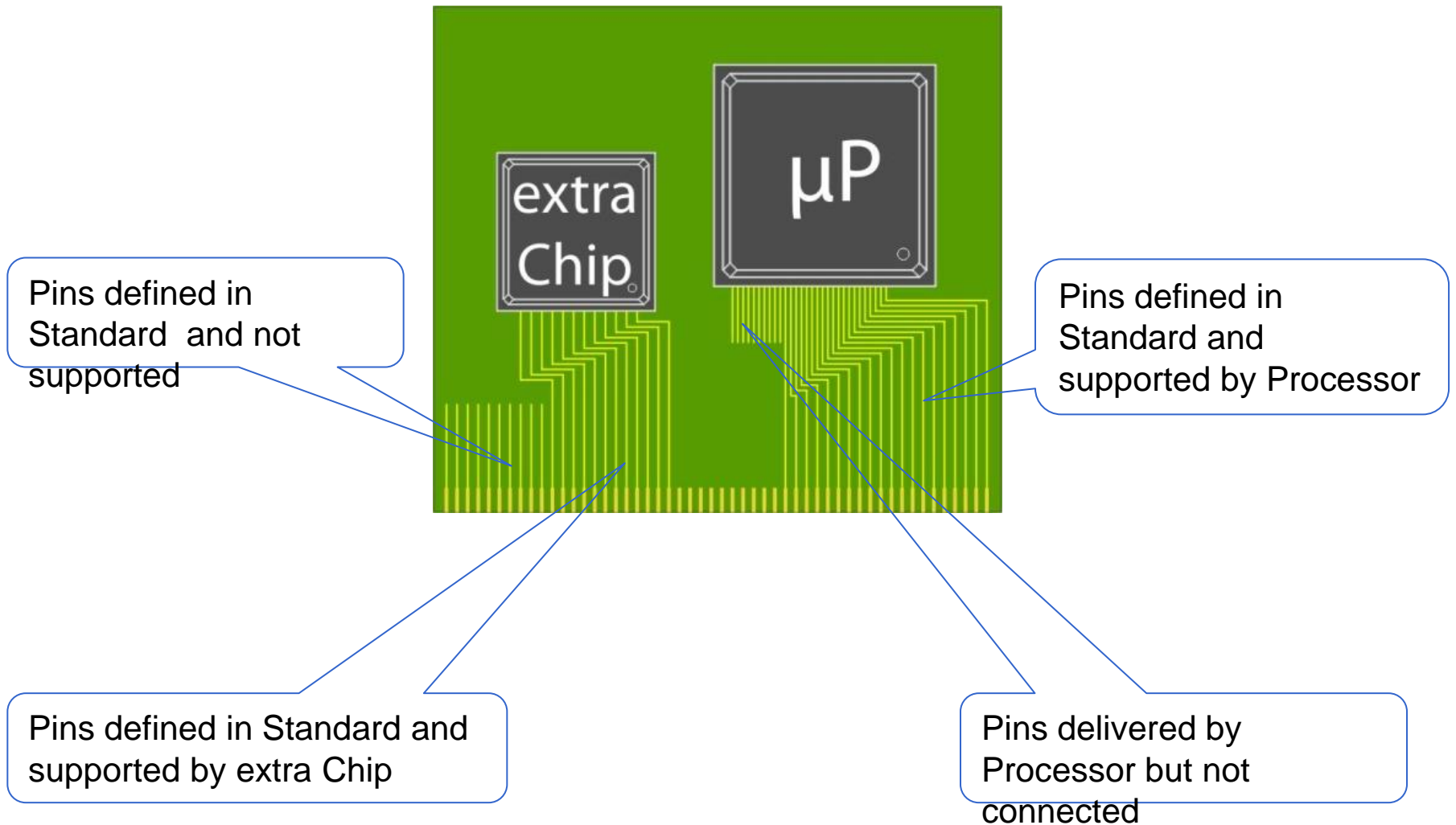
TX
Standard

SOM

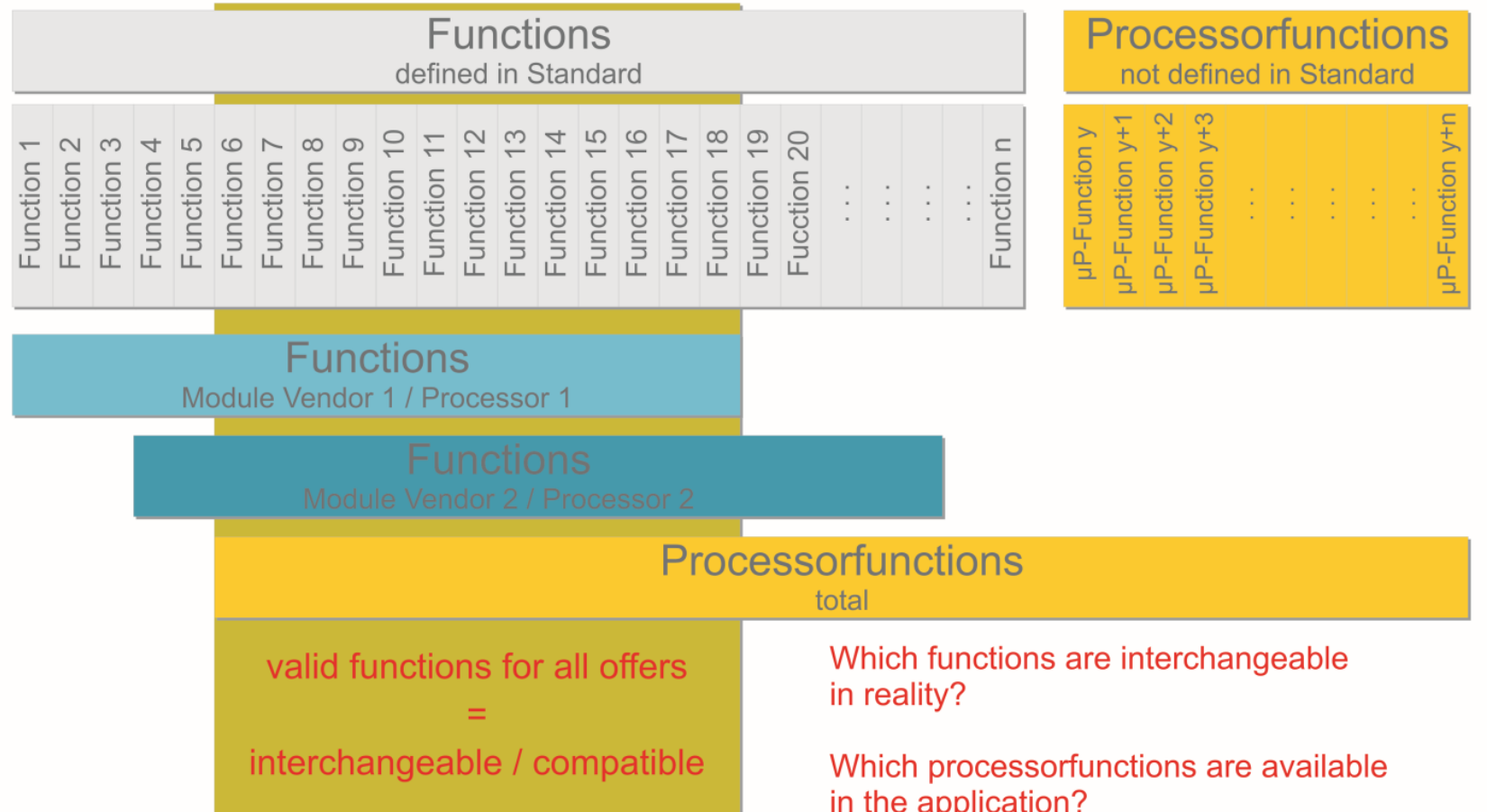


Embedded Module Market

Standards

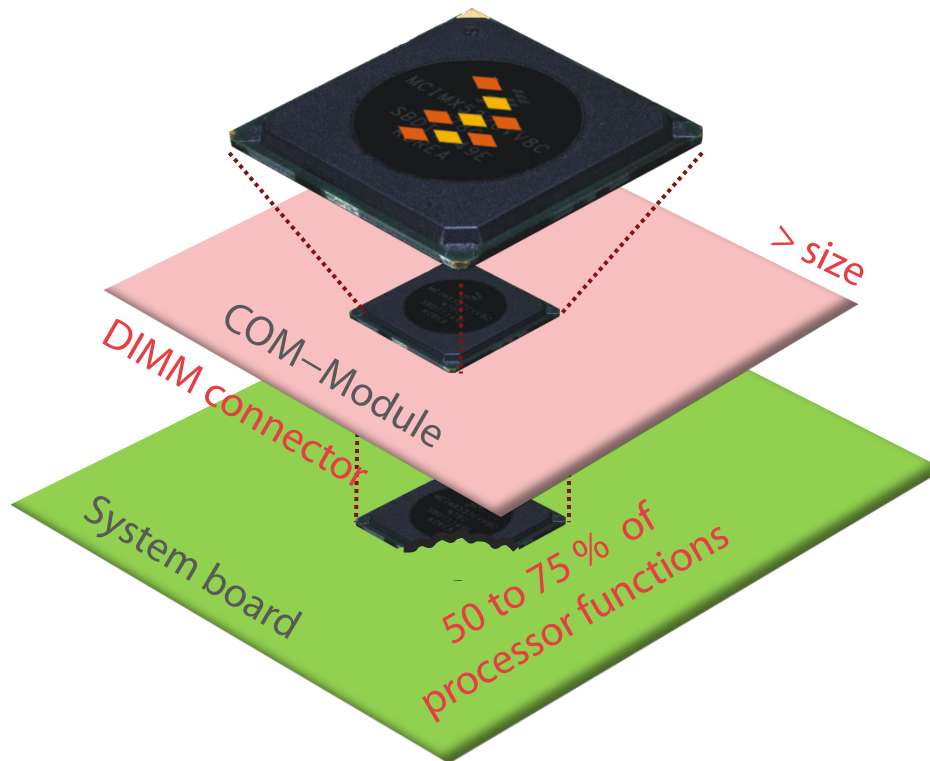


Standard = interchangeable, scaleable ???



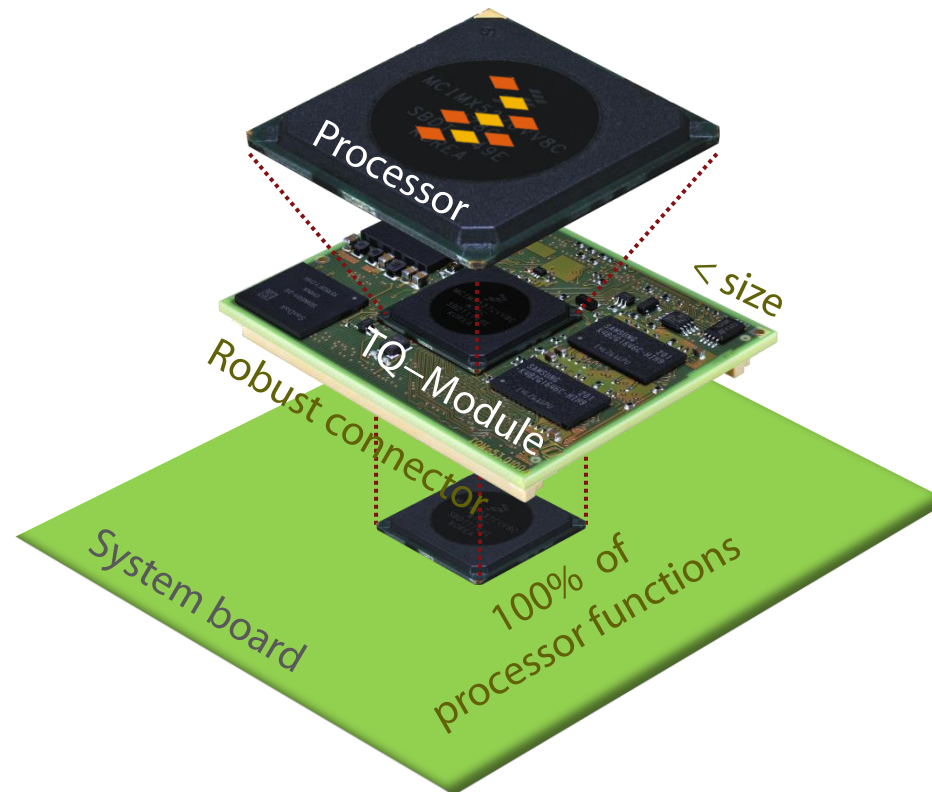
Embedded Module Market

Standard Offering



Embedded Module Market

TQ Offering



Maximum Design Freedom

How to select the right COM (Differentiation)

- Application
- Processor (Consumer / Industrial = Longevity)
- Dimension
- Memory System (Consumer / Industrial)
- Connector System
 - No. of Pins (all Signals available?)
 - Pitch
 - Robust System (Schock / Vibration)
 - Current / Transfer Speed
- other Specification
- Longevity
- Software Support
- Vendor behind

How to select the right COM vendor (Differentiation)

- How much experience has the vendor with the processor
- How many people involved
- Support
 - No. of support people
 - SW support (BSP, ???)
 - Design support
 - Application support
- Own production
- Test methods
- Obsolescence management
- Proven records

How to select the right embedded
module and the right module provider

By Wolfgang Heinz-Fischer, TQ Group

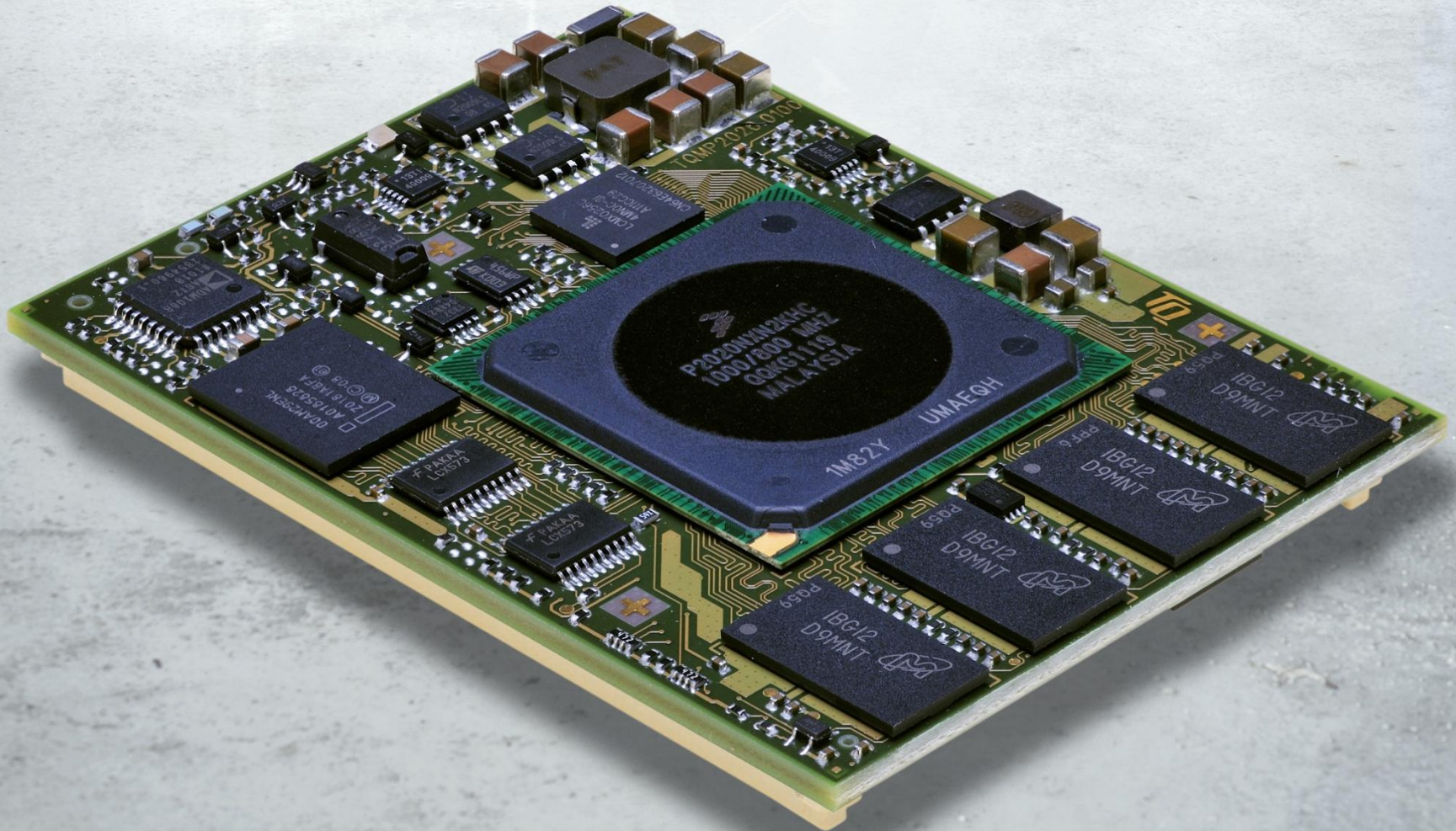
Read article ...



TQ-Modules offers ...

- ✓ Complete, independent system
- ✓ All necessary functions on board (DC/DC, sequencing, clocking)
- ✓ Maximum memory size
- ✓ Maximum safety (temperature & power control)
- ✓ Single DC supply
- ✓ **All processor functions available** on connector
- ✓ **Maximum robustness** (connector system, industrial design)
- ✓ **Minimum board size**
- ✓ Built-in boot mechanism
- ✓ **Long time availability** (> 10 years, life cycle management)
- ✓ Starterkit available
- ✓ BSPs available
- ✓ **SW & design support**
- ✓ Mainboard schematics review
- ✓ **Customized mainboard design** and **own production**
- ✓ „Made in Germany“

*xxx = TQ USPs





Most complete Freescale ARM Module Offering



ARM9 / i.MX28

TQMa28L

- 1.18 x 1.18 inch
(30 x 30 mm)
- 161 pin LGA



ARM9 / i.MX28

TQMa28

- 1.6 x 1 inch
(40 x 26 mm)
- 160 pin, 0.8 mm



ARM11 / i.MX35

TQMa35

- 2.1 x 1.7 inch
(54 x 44 mm)
- 320 pin, 0.8 mm



ARM Cortex-A8

TQMa53

- 2.2 x 1.7 inch
(55 x 44 mm)
- 240 pin, 0.8 mm



ARM Cortex-A9

TQMa6

- 2.8 x 1.8 inch
70 x 46 mm
- 360 pin, 0.8 mm

TQ-Group

Power Architecture Module Portfolio



Most complete
Power Architecture
Module Offering



PowerQUICC I / MPC8xx
TQM8xx

- 54 mm x 44 mm
- 280 Pin, 0.8 mm



PowerQUICC II Pro / MPC83xx
TQM8315M (MPC8315)

- 70 mm x 50 mm (MPC8315)
- 320 Pin, 0.8 mm (MPC8315)

TQM8360L (MPC8360)

- 77 mm x 75 mm (MPC8360)
- 500 Pin, 0.8 mm (MPC8360)



PowerQUICC III / MPC85xx
TQM8548

- 100 mm x 75 mm
- 600 Pin, 0.8 mm



QorIQ / P1 / P2
TQMP1xxx
TQMP2xxx

- 74 mm x 54 mm
- 360 Pin, 0.8 mm



MPC5200B
TQM5200 / TQM5200S

- 80 mm x 60 mm (TQM5200 with Graphic)
- 320 Pin, 0.8 mm
- 56 mm x 60 mm (TQM5200S no Graphic)
- 240 Pin, 0.8 mm



- TQ = Technology in Quality
- Founded 1994
- 1.275 Employees, 150 Design Engineers, >200 Mio € Revenue (As of May 2014)
- Leading European CEM / E²MS Provider
- OEM / ODM Provider (Embedded, Embedded Drives, Building Automation)
- 8 Manufacturing Locations, 5 Design Locations
- ISO 9001, ISO 14001, ISO 13485 (Medical), EN 9100 (Aviation), ISO 16949 (Automotive) certified
- Leading Freescale Partner since 1998



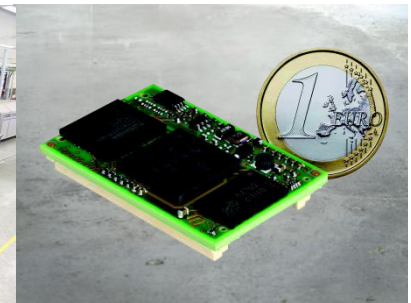
Managing Directors (Owner):
Detlef Schneider (left)
and Rüdiger Stahl



Head office:
Seefeld / Delling (West of Munich)
Germany



SMD Production Line:
Durach
Germany



Embedded Product:
i.MX28 / ARM9 Module
1.6 inch * 1 inch

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ARM9 / i.MX28 Module
40 mm x 26 mm

www.tq-group.com

P2020 Module
75 mm x 54 mm

