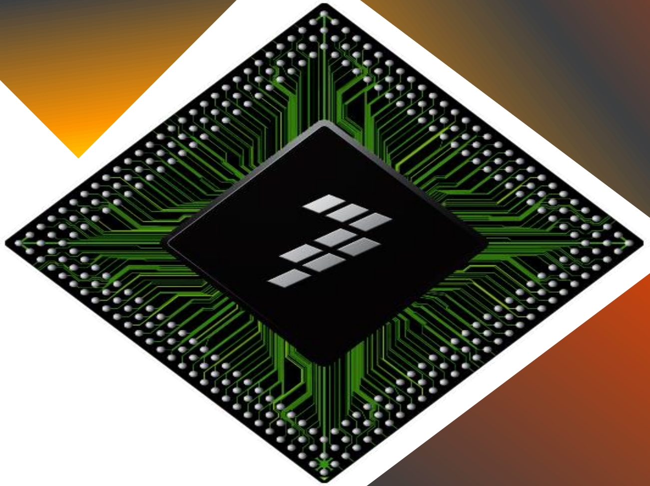
FTF 10th ANNIVERSARY

FREESCALE TECHNOLOGY FORUM 2015

Secure, Embedded Processing Solutions
for the Internet of Tomorrow



FTF Americas	FTF Brazil
June 22-25, 2015	September 15, 2015
JW Marriott Austin	Grand Hyatt São Paulo Hotel

freescale.com/FTF

congatec

Company Presentation - 2015

Tiago Rubortone Velasque
Field Applications Engineer

congatec

What is embedded computing?

Embedded Computers allow devices, machines and systems to be `intelligent and communicative`

At the supermarket, in an elevator, at the parking place or at the cash-point – you're in touch with `Embedded Computer Technology every day`

Thanks to embedded computers your life is made a little `easier each day`

Who is congatec?

The driver for innovation and technology leadership

Focused on COMs

- Computer-On-Modules

Leading in technology

- Freescale partners

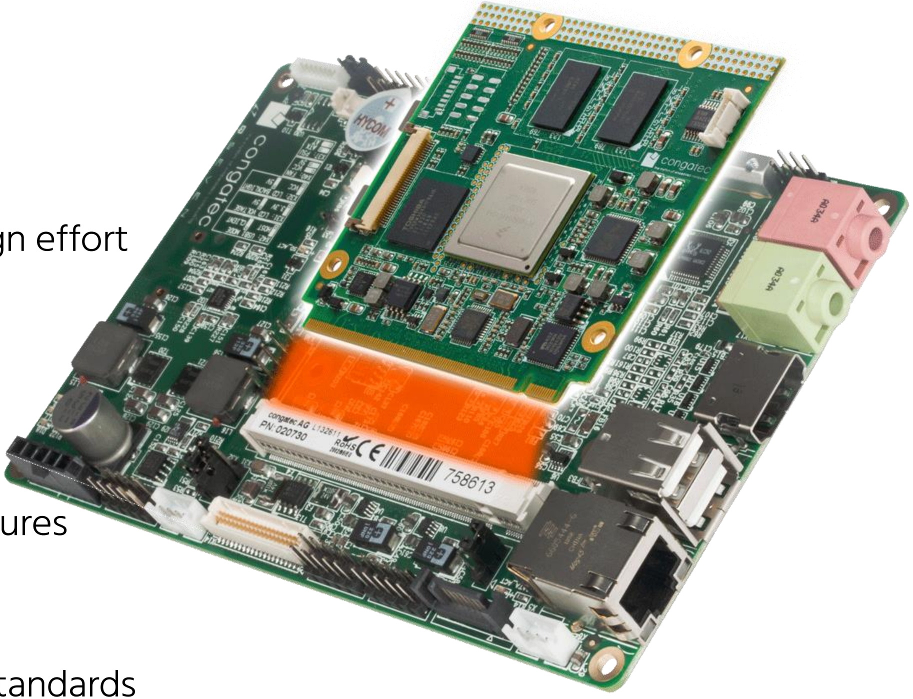
Accelerating time-to-market

- for x86 and ARM-based embedded computer design

The Module Concept

Concept

- CPU board with standard PC core functions
- Baseboard with customer specific functions and size
- The logical alternative to a chip-down design effort



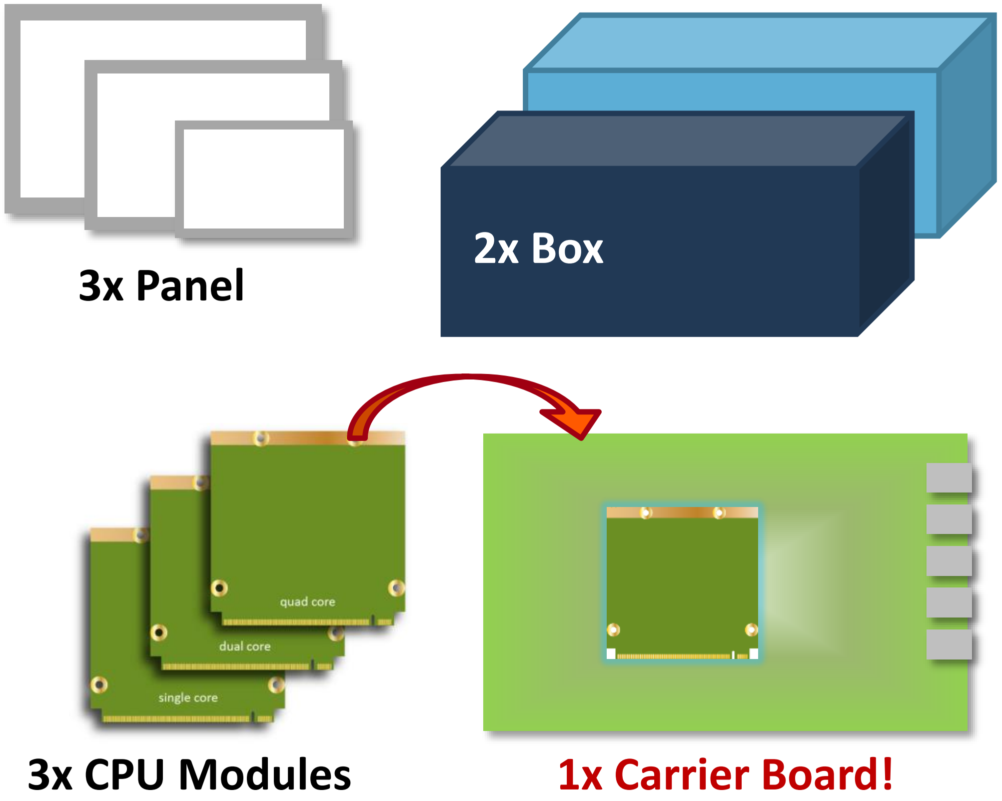
Benefits

- Faster time to market
- Reduced development costs
- Engineering resources focus on system features
- Scalable product range
- Faster reaction to market trends
- Second source philosophy – true industry standards

Module Advantages

Create your own product family

- Example
    - 3 Panel versions
    - 2 housing variants
    - 3 COMs
    - 1 Carrier board
- 18 catalog variants



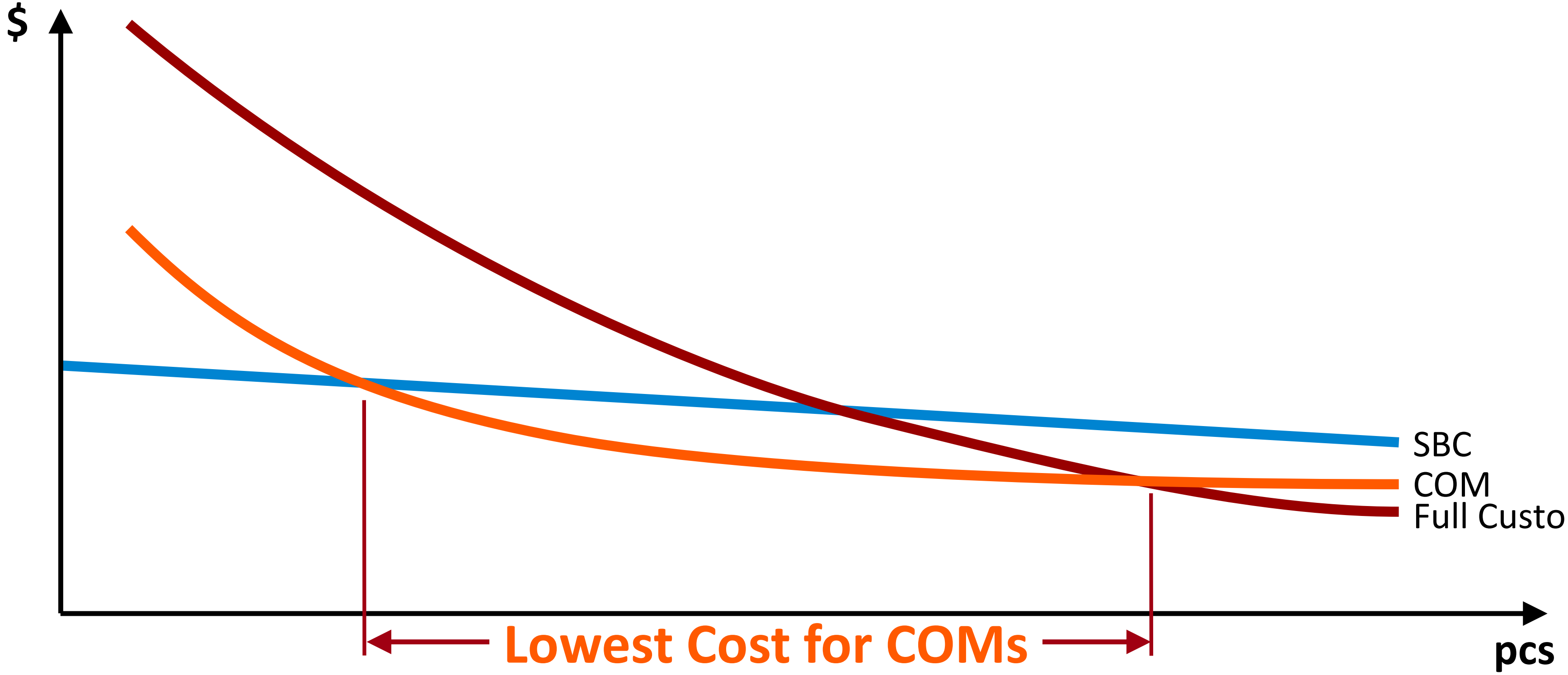
3x Panel

2x Box

3x CPU Modules

1x Carrier Board!

Project Size for Customized Solutions



Make versus Buy

Challenges	Full Custom	Module Based
Time to market	Longest design cycle	Flexible for upgrades by changing modules
Lowering design cost	Keeping up with full & complex processor technology evolution driving higher cost of resources	Outsourcing of the complex processor part Less design and investment risk
IP ownership	Most of the IP is not necessarily valued by customers	Limit the customer investment to better concentrate on their own IP (software and system)
Long life cycles	Customer responsibility for the complete design	Customer can rely on module vendor Quick module upgrade to extend life cycles
Unit Cost	Lowest for project size >100k units	Low cost due to multiple customers per module

conga-QMX6

Qseven standard

congatec

conga-QMX6

Freescale i.MX6 up to Quad Core 1.0 GHz
Commercial and Industrial Versions
Up to 2 GByte DDR3 RAM on Module
Up to 16 GByte eMMC Flash on Module

Interfaces…

- 1x PCI Express Gen. 2
- 1x SATA Gen. 2
- Gbit Ethernet
- MicroSD card connector on Module
- CAN Bus

freescale Connect
Proven Partner

Qseven Evolution

Qseven consortium founded in Feb. 2008

- First specification released in July 2008
- Fastest market introduction
- 60 member companies in 2012

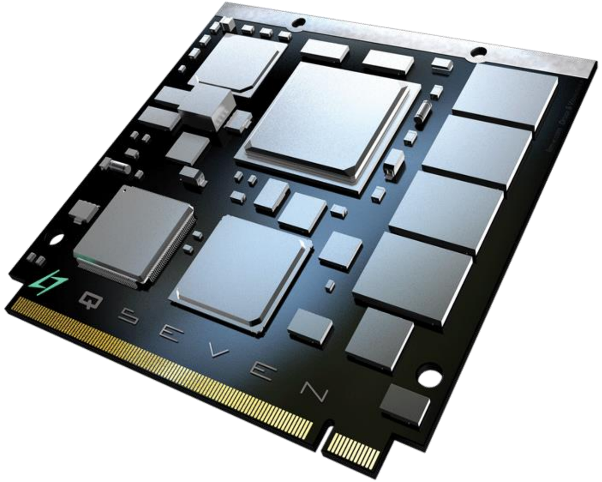
Open Standard

- Qseven Specification 2.0
- Qseven supports x86 & ARM

Moved to SGeT in 2012

- Standardization Group for Embedded Technology
- congatec is Founding Member and the
  editor of the Qseven Specification and Design Guide

www.sget.org



STANDARDIZATION
GROUP FOR
EMBEDDED
TECHNOLOGIES

Qseven Key Points

Optimized Connector

- MXM edge connector (230-pin)
- Low cost and high speed

Latest Technology

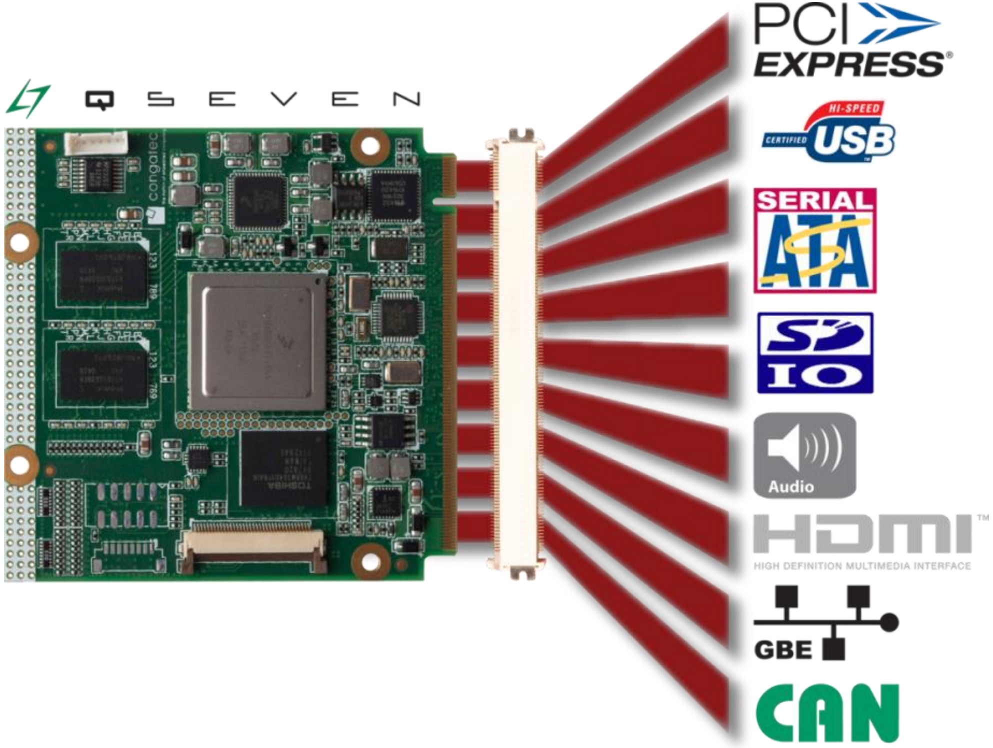
- Low power processors
- x86 and ARM

Modern Set of Interfaces

- PCI Express, SATA, USB 3.0,
  GB Ethernet, SDIO, LVDS, HDMI/DisplayPort

Further Benefits

- Onboard RAM and Flash for rugged applications
- 5V Power for easy battery operation
- Small Size: 70x70 mm or 70x40 mm
- Thermal cooling interface
- Full market acceptance



conga-QMX6 Variants

Commercial Module

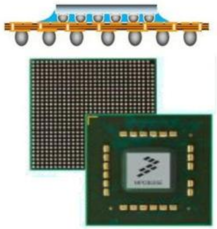
- 0 to +60°C ambient operating
- 5 year operation @ 50% duty cycle
- Longevity 5 years

CPUs

- Extended Commercial Versions (-20..105°C ambient operating)
  - i.MX6 Solo 1.0 GHz
  - i.MX6 Dual Lite 1.0 GHz
  - i.MX6 Dual 1.0 GHz
  - i.MX6 Quad 1.0 GHz
- Standard packaging

Memory

- 4 GByte eMMC/MLC
- 1 or 2 GByte DDR3L RAM



Industrial Module

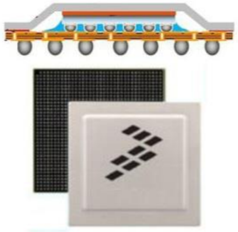
- -40 to 85°C ambient operating
- 10 year operation @ 100% duty cycle
- Longevity 10 years

CPUs

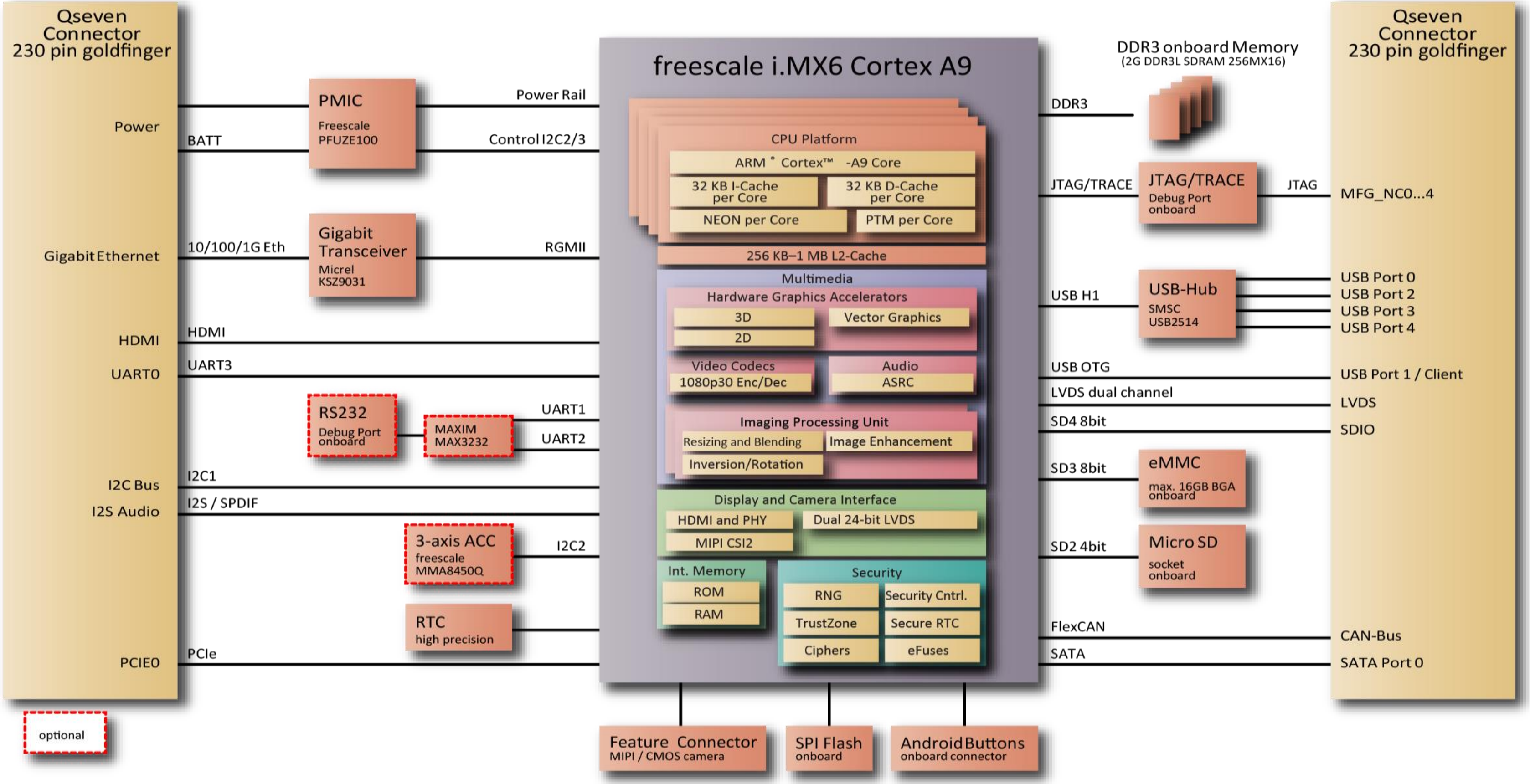
- Industrial Grade Versions (-40..105°C ambient operating)
  - i.MX6 Solo 800 MHz
  - i.MX6 Dual Lite 800 MHz
  - i.MX6 Dual 800 MHz
  - i.MX6 Quad 800 MHz
- Lidded packaging

Memory

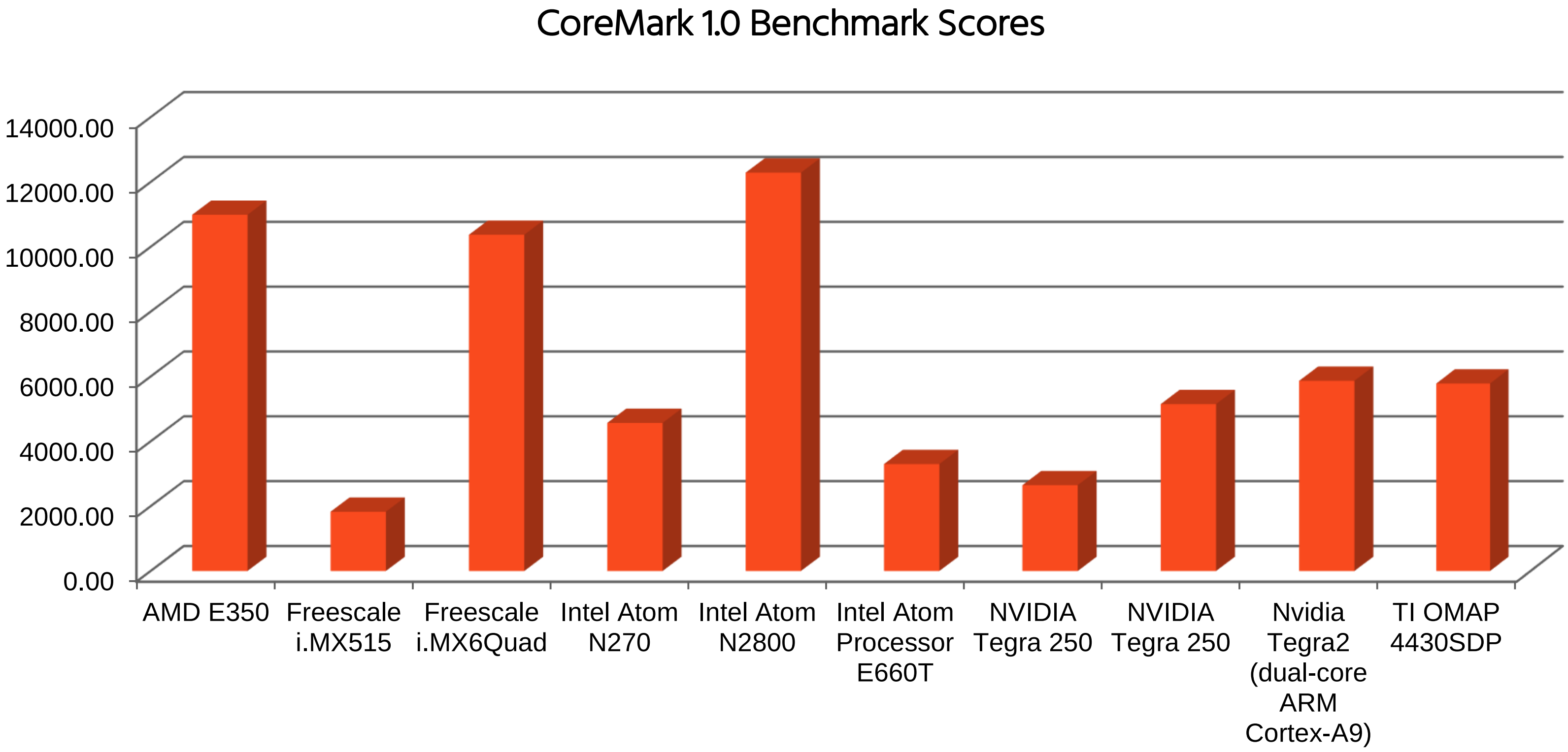
- 4GByte eMMC/iMLC
- 1 GByte DDR3L RAM



Block Diagram conga-QMX6



Performance Benchmark



Designing with Qseven ARM Modules

Designing with Qseven ARM Modules

Engineering Tools

Quick start with conga-QKIT/ARM

- For evaluation and rapid prototyping
- Content
  - conga-QMX6 quad core Qseven module
  - conga-QEVAL
  - I2S sound card
  - HDMI video converter
  - Power supply
  - Cable kit
  - Ready to go Ubuntu Linux image including BSP

Designing with Qseven ARM Modules

Qseven Deliverables

congatec website has everything you need to get started with your design.

- Qseven Specification
- Qseven Carrier Board Design Guide
- Qseven Carrier Board Reference Schematics
- Application Notes
- Tech Videos
- Dedicated Design-In Support

Qseven Reference Mini Carrier Board

Overview

To achieve a quick start with Qseven congatec offers an evaluation carrier board, which routes all the Qseven signals to standard interface connectors.

conga-MCB/Qseven: Evaluation Carrier Board for Qseven modules.

Specifications

- 1x miniPCI Express Socket
- 1x RJ45 connector with integrated Gigabit Ethernet Transformer
- 1x CFAST Socket
- 1x SATA
- 1x 8 bit SD Card Socket
- 2x USB at the front panel, 4x USB on pin header (one USB can be configured as a Client)
- 1x Display Port or 1x HDMI
- Dual LVDS 18/24 bits

Please select products

info(at)congatec.com
Tel: +49 (991) 2700-0

Subscribe for the congatec embedded newsletter

www.congatec.com/en/products/technologies/qseven.html

Designing with Qseven ARM Modules

Software Support

Software Support

- Standard BSPs are supported by congatec
- Customized BSP implementations are done by our partner Adeneo, embedded source code provided
  - Windows Embedded Compact 7.0
  - Linux (Ubuntu)
  - Android

Designing with Qseven ARM Modules

Partnerships

High Level Partnerships

- Hard- and Software Technology
- Worldwide

congatec

O.S. SYSTEMS

freescale Connect
Proven Partner

Adeneo Embedded

Designing with Qseven ARM Modules

BSP Overview

uBoot

- uBoot2009 : available via congatec Git server
- uBoot2013 : available via congatec Git server

Linux Kernel

- 3.0.35/4.1.0 : available via congatec Git server
- 3.10.17 : available via congatec Git server

Yocto

- dora 1.5.1; kernel 3.0.35/4.1.0 BSP : available via congatec Git server
- daisy 1.6; kernel 3.10.17 BSP : available via congatec Git server
- Android
- BSP IceCreamSandwich 4.0.4; kernel 3.0.35/1.1.0(A) : available via congatec Git server
- BSP JellyBean 4.2.2; kernel 3.0.35/4.0.0(A) : available via congatec Git server
- BSP JellyBean 4.3.0; kernel 3.0.35/1.0.0(A) : available via congatec Git server
- BSP KitKat 4.4.x; kernel 3.10.x : in progress

Windows

- WEC7 source and binary BSPs version 1.1.2 : available via Adeneo homepage
- WEC2013 source and binary BSP version 1.0.1 : available via Adeneo homepage

Applications

congatec target segments

Applications

Transportation

Automation

Applications

Gaming

Others

Summary

congatec

- it the specialist of Computer-On-Modules
- is leading supplier for COMs, worldwide No. 2
- provides strong integration support
- enables the most competitive system designs
- supports sustainable growth for customers

NXP

congatec