

...embedding excellence



## ARM+DSP - a winning combination on Qseven



# ARM on Qseven – your first in module technology

## Qseven

- Over 6 Billion ARM-based chips sold in 2010
  - 10% market share in mobile computers
  - 35% market share in set-top boxes
- IHS market research predicts 23% market share in PC's thru Microsoft's Windows 8 by 2015
- Qseven supports x86 and ARM on a module using the same carrier board
- New ARM technology is interchangeable and upgradable with Qseven modules
  - Secure investment and 2<sup>nd</sup> source supply
  - Upgrade / downgrade of system solutions using different CPU modules



# Target Applications

Qseven



- ✓ High-end Test and Measurement (Signal/Waveform Generation and Analyses)
- ✓ Machine/Industrial Vision (Automated Inspection, Identification)

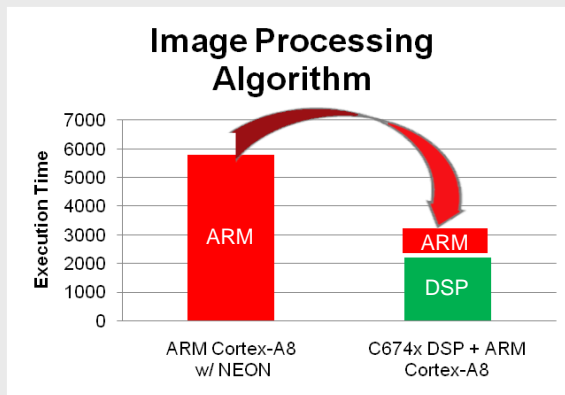


- ✓ Tracking and Control (Avionics/Guidance, Radar/Sonar, Solar Tracking)
- ✓ Biological Vision (e.g. Cell-sorting and Analysis)



- ✓ Multi-channel full HD Video Encode/Decode/Transcode/Transrate

### Why DSP+ARM?



- DSPs are up to 60% more efficient for signal processing tasks such as FFTs, digital filtering and image analysis
- Frees ARM CPU resources for applications processing
- Increases overall system performance

**DSP + ARM. Do more with less.**

### TI makes DSP programming easy for ARM developers:

- TI's C6EZRun for code porting – Enables developers to easily run ARM code on a DSP without learning DSP code
- TI's C6EZAccel library – Provides a library of more than 130 signal processing algorithms with ARM APIs to accelerate development time

# Q7-TI8168 - major features

## Qseven

- Based on TI816x Netra family of pin compatibles SOC's
  - ARM Cortex-A8 up to 1.2 GHz
  - C674x floating/fixed point DSP to 1.0 GHz (C8168 & DM8168)
  - Video acceleration – simultaneous Encode / Decode up to 3x 1080p videos in real time (DM8168 only)
- Display interfaces :
  - HDMI 1.3/DVI - 1920x1200 @60Hz
  - Single channel LVDS - 1440 x 900 @60Hz



## Qseven

### First Qseven module – based on TI ARM SoC

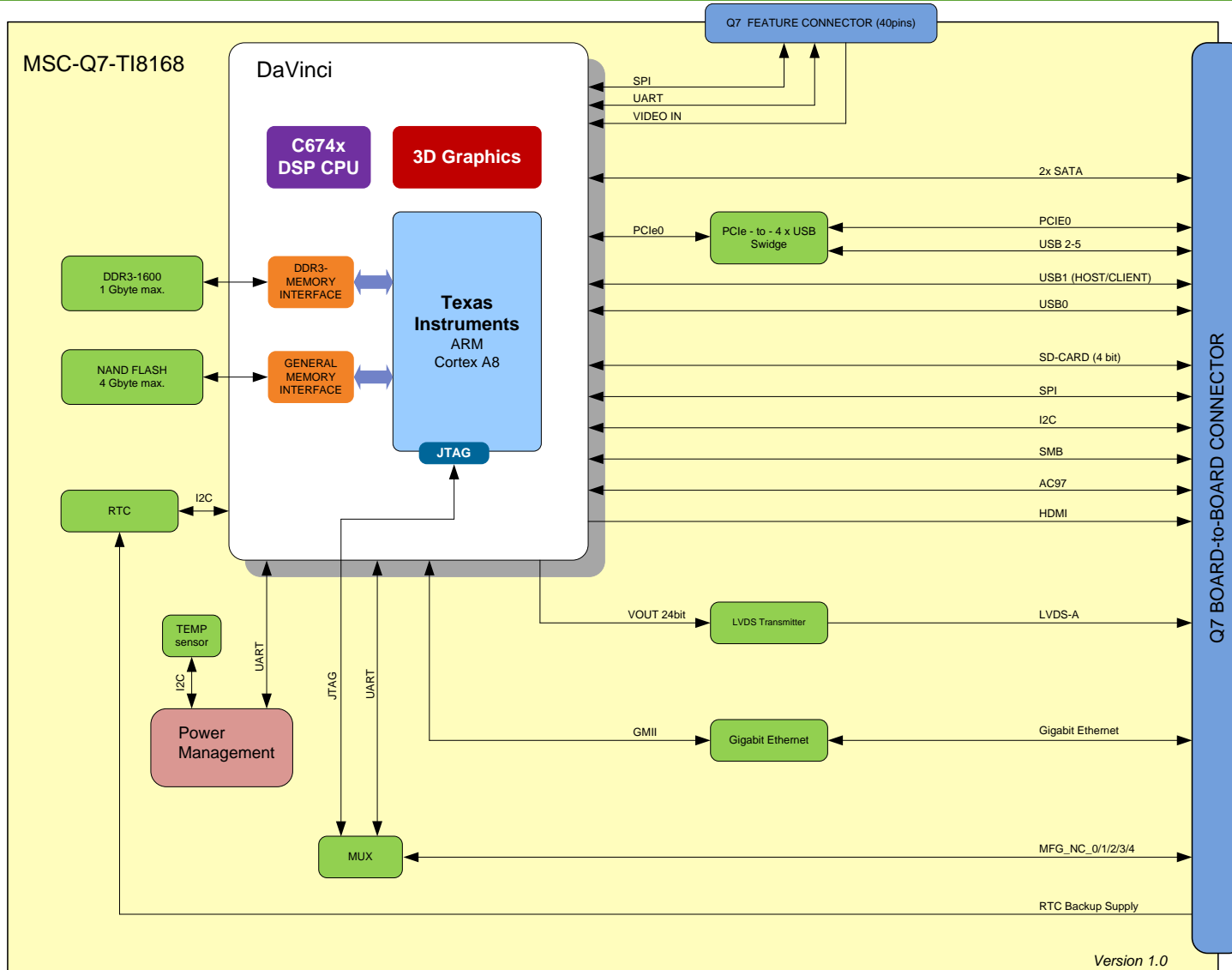
- ✓ ARM Cortex-A8 core (up to 1.2 GHz)
- ✓ C674x DSP (fixed/floating point @ 1.0 GHz)
- ✓ 3D graphics engine (SGX530, 27 Mpoly/sec)
- ✓ Rich set of peripherals
- ✓ 1 GB dual-port DDR3 SDRAM memory
- ✓ Up to 8 GB NAND Flash
- ✓ 9 W maximum power consumption on board

### Interfaces available on Qseven module:

- ✓ 5 x USB 2.0 host ports
- ✓ 1 x USB 2.0 client port
- ✓ 1 x PCIe 1.1
- ✓ 1 x Gbit Ethernet port
- ✓ HDMI video output
- ✓ LVDS display connection
- ✓ Camera/video in port (feature connector)
- ✓ AC97 audio
- ✓ Dual SATA 2.0 interface
- ✓ SD/MMC card interface
- ✓ SPI interface
- ✓ ACPI power management signals

# Q7-TI8168 Block Diagram

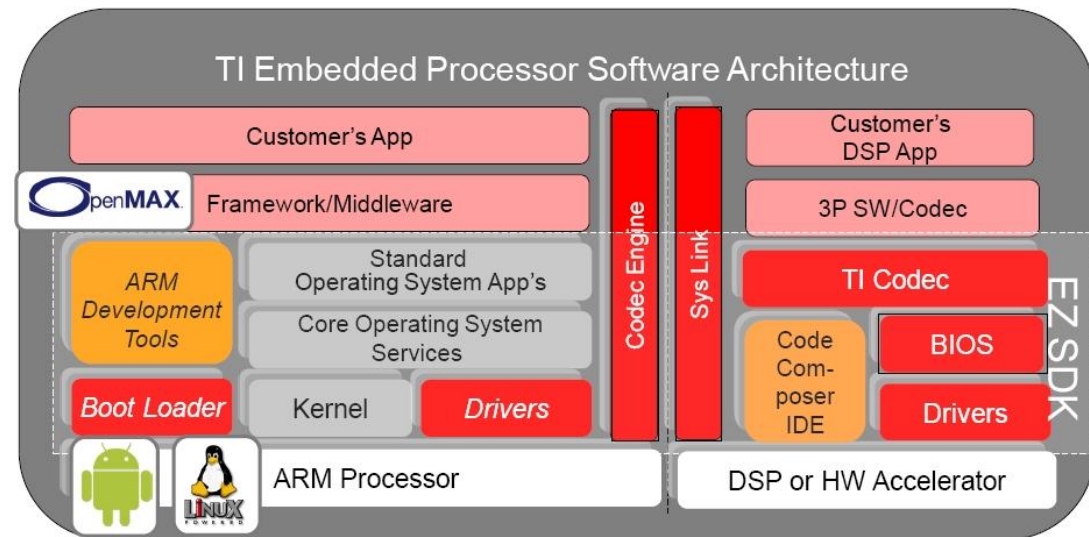
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# Linux Software Development Kit

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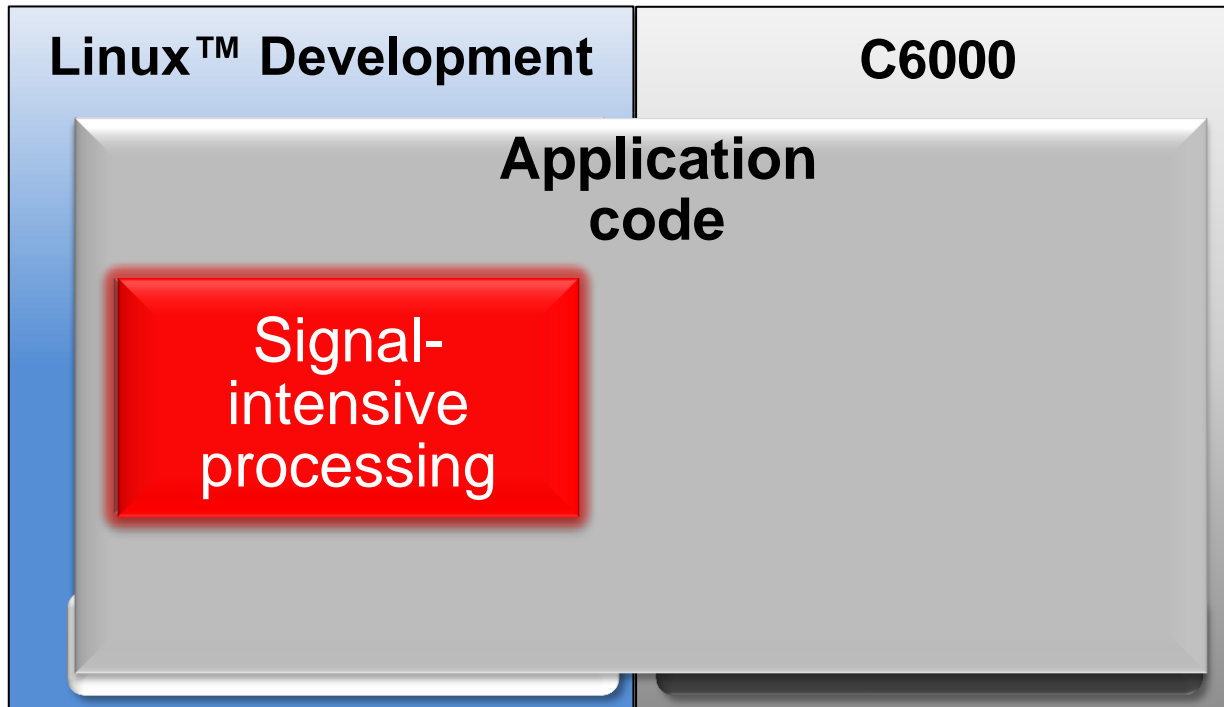
- Linux Software Development Kit (EZ SDK)
- GUI-based Application Launcher
- Includes Codecs
- Includes DSP tools
  - C6EZRun
  - C6EZAccel
- No licence fees



- Features
  - Linux support based on 2.6.37+ kernel
  - Android Gingerbread support
  - Audio/video codecs
  - Application examples: preconfigured projects for networked audio/video
  - Matrix application launcher and unified installer for applications
  - Quick start development
  - Qt graphics SDK plug-in
  - OpenMax libraries and ToolBox demos



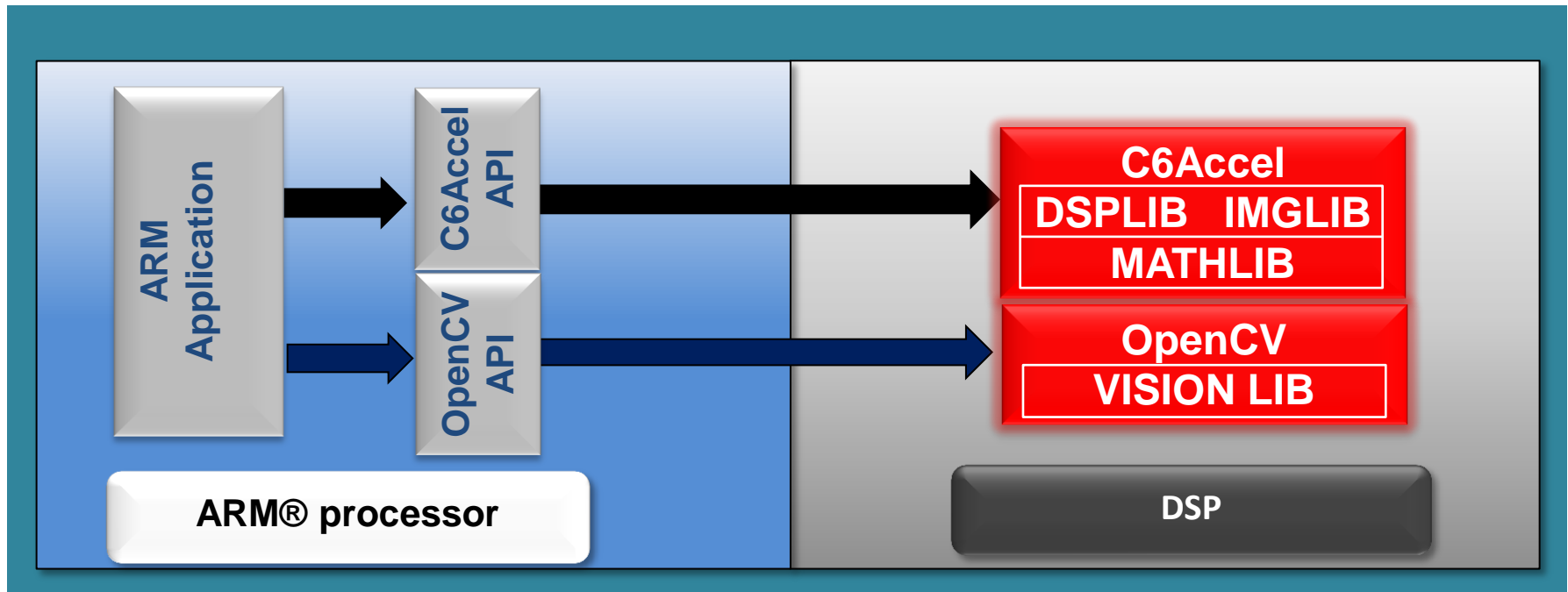
C6EZRun - Run ARM applications on the DSP, without re-writing a line of ARM code. Re-targeting done at the compiler level



**3D** Imaging

## Qseven

C6EZAcel - Accelerate signal processing tasks by using DSP-optimized libraries, called from ARM APIs.



Over 130 DSP-optimized algorithms provided standard with all Netra family SDKs (free of charge). Includes algorithms for math, digital filtering (FFTs), image processing and vision processing.



- Off the Shelf module
- BSP's and Starter kits
- Value proposition
  - Combination of ARM core and DSP core
  - Common software interface with extensive library support
  - Extensive OS support
- Targeted for the Industry
  - Medical/Biological Imaging
  - Medical/Industrial Vision Systems
  - Test & Measurement

## Thank You

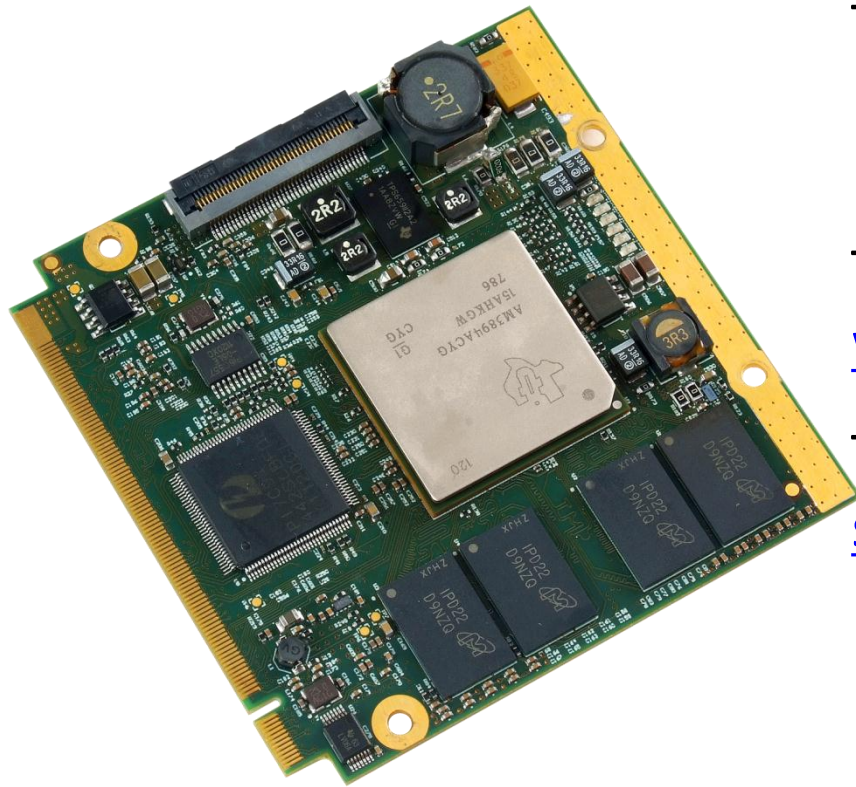
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