Advancing Innovation with Intel® Atom™ Processor for Embedded

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A new generation of digital devices is transforming the planet. Are you in? Join the embedded internet era at intel.com/embedded/15billion

* Gantz, John. The Embedded Internet: Methodology and Findings, IDC, January 2009. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and other countries. © 2009 Intel Corporation. All rights reserved.
What is the News?

• Intel Unveils Embedded Specific Intel® Atom™ Processors

• Intel Atom is enabling “The Embedded Internet” which will include 15 billion intelligent connected devices

• New embedded applications coming to market to change the way consumers live, work and play

• Announcing Reference Design for Media Phones
The Embedded Internet
BY 2015

Researchers

Mainframes

Servers, PC’s

Cell Phones MIDS

Embedded

Invisible

Ubiquitous

Many

15B Devices

Internet - 7x24, Every Modality of Life
Intel® Architecture for Embedded
Delivering Growth Beyond the PC & Server

>30 Segments - 3500 + Customers - >30 Years
Characteristics of the Connected Devices

Security-enabled

User Interface

Energy Efficient

Remote Management

Multi-OS Environment

Dedicated Function

Intelligent

IP-based

Connected
Intel Architecture Processors for Embedded

Traditional Intel Architecture for Embedded
- Core 2
- Centrino 2
- Xeon

Desktop Mobile Server

Low Power Intel Architecture Intel® Atom™ for Embedded
- 6 design options
- Built for embedded
- Choice in package size, performance, & temperature ranges
- Fan-less
- Ultra Low Power
- Small Footprint

Smart SoCs for Embedded
- Smaller Footprint with Lower Power*
- Full Feature SoC
- Integrated Accelerators support with Intel® QuickAssist Technology

*Assumptions: Compares Intel® Pentium® M processor platform with external PCI crypto accelerator to EP80579 256 byte packets with 2048 IPsec VPN tunnels
New Options for Intel® Atom™ Processor Product Line

Intel’s smallest processor for Embedded with new options
- Industrial or commercial temp
- 2 package sizes (13x14 mm; 22x22 mm)
- Sub 2.5 watt TDP
- 1.10 GHz, 1.33 GHz, 1.60 GHz

Advanced Technologies for Improved Power Efficiency
- 45nm High-K
- Hyper-Threaded
- Enhanced Intel SpeedStep®
- Deep Power Down

System Controller Options
- Industrial or commercial temp
- 2 package sizes (22x22 mm; 37.5x37.5 mm)
- Integrated 2D & 3D graphics, video acceleration, memory (MCH), & I/O
  - High Def Audio & SDIO

Embedded Requirements
- 7 year extended life cycle support
- IA software compatible
- Multiple operating system support
- Intel® Embedded Graphics Drivers

Adding 4 Processors and 2 System Controller Hub Options for Embedded Product Lineup
Announced Intel® Atom™ Products for Embedded

**Hardware**

- EuroTech Inc
- Portwell
- Interface
- Curtiss Wright Controls
- AAEON
- RadiSys
- DFI-ACP
- ADI
- NORCO
- Norsys
- Advantech
- congatec
- PHYTEC

**Software and Tools**

- Microsoft Auto
- tenAsys
- GNX
- COQOS
- virtual Logix
- LynuxWorks
- Phoenix Technologies
- American Megatrends
- Green Hills Software

**Integrated Product**

- Harman International
- Telemetria Inc.
- SBS
On the Ground or On the Go
Electrify with Intel Atom

**Energy**
Design opportunity for an extended temp solution for power grid monitoring & control.

Key requirements are extended temp, low power drain & I/O options.

The EuroTech product fits the requirements and will be an 800MHz x86 migration to Intel Atom.

Other uses for the EuroTech solution:
- Alternative Energy
- Electronic control systems
- Smart Grid technologies
- Wind Power

**Enabling the Military**
Targeted at the military, the Curtiss Wright Manpack product includes wearable electronics.

Offers soldiers situational awareness and actionable intelligence through networked sensors.

Other portable and in-vehicle apps:
- Rugged-Mobile Internet Devices
- Secure Radios
- Wireless access point
- Embedded telematics displays

**Rail Tracking & Safety**
Market Opp: ~2 million US-based railcars and ~20,000 locomotives.
Identification & accurate location systems are aging & need to be replaced.

- Continuous monitoring enables safe increase in average train speed
- Preventative maintenance w/ wheel bearing monitoring
- Powered by vibration
Media Phone = Internet Enabled Phone

Media Phone is a platform that can take a different personality based on software & packaging Use Cases:

- Kitchen Internet Device (Consumer Version)
- Unified Communications Device (Enterprise Version)
- Bedside Internet Device (Hospitality, Telecare)

Source: IDC
Intel Reference Platform for Media Phone
Jump Start Customers for $11 Billion Market Opportunity

- **App Services**: Reference Platform Application Software
- **Middleware**:
  - Media Framework, App Framework
  - DSP SW, SIP/RTP/RTCP Stack
- **Device Drivers**: Graphics, HW-specific Drivers (e.g., touchscreen, LCD, DECT etc)
- **OS**: Moblin Linux
- **BIOS/Firmware**: BIOS
- ** Hardware**: Intel® Atom™ Processor

- Development Platform for software development
- Hardware reference design, schematics, & gerbers
- Validated software stack
- Established relationship with third parties to reduce go-to-market effort

1 Source: Nissen, Keith. *In-Depth Analysis: The Media Phone Has Arrived*, In-Stat, February 2009.
Harman International* sets the standard for energy-efficient infotainment solutions without compromise in performance & enjoyment. The first to fully-integrate the powerful Intel® Atom™ processor Z520PT into the complex automotive environment.

Telemetria Brings Broadband Mobile Connectivity and Infotainment to the Car with DashTop*

congatec Introduces First Full Industrial Grade Module

OpenSynergy integrates the Intel® Atom™ processor into in-car infotainment platforms First time in an AUTOSAR Environment

SBS Unveils New In-Vehicle Infotainment System

**Hot-but-not?**

*Your Car with Intel® Atom™ Can Handle the Heat*
Microsoft and Intel Collaborate in Automotive

New Microsoft Auto platform will support Intel® architecture
Intel joins Microsoft’s new automotive partner program

Collaboration enables automakers and suppliers to:
- Improve scalability of their designs across product generations
- More quickly meet demands for connected, multi-media rich applications
March 3, 2009 - Global technology leaders launch GENIVI Alliance to develop an in-vehicle infotainment platform derived through open source.

- Reduces cost of development & ownership
- Quickens Development
- Spurs Innovation

Coming in Summer 2009…
First technical deliverable - a prototype running on the Intel® Atom™ processor and Moblin-based Wind River Linux - will be available as open source code.
Intel Atom is

- Enabling new devices like media phones
- Enhancing existing segments like IVI
- Powering new embedded segments like energy
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<table>
<thead>
<tr>
<th>Product Name</th>
<th>Core Speed</th>
<th>Front-Side Bus</th>
<th>Thermal Design Power</th>
<th>Support for HT</th>
<th>Temperature Range</th>
<th>Package</th>
<th>Chipset Pairing</th>
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<tbody>
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<td>Intel® Atom™ processor Z530Δ</td>
<td>1.60 GHz</td>
<td>CMOS, 533 MHz, 32-bit address</td>
<td>2.2 watts</td>
<td>Yes</td>
<td>Commercial 0 to +70°C</td>
<td>441-ball lead-free FCBGA8 13x14 mm</td>
<td>Intel® SCH US15W</td>
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<td>2.0 watts</td>
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<td>Intel® SCH US15W</td>
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<td><strong>New Offerings:</strong></td>
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Δ Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.

1 The TDP specification should be used to design the processor thermal solution. TDP is not the maximum theoretical power the processor can generate.
Block Diagram for Intel® Atom™ Processor-based Platform