Product Brief

Intel® Quark SoC X1000

Product Overview

The Intel® Quark SoC X1000 is the first product in a new roadmap of innovative, small core products targeted at rapidly growing areas ranging from industrial IoT to wearables. It will bring low power and Intel compute capabilities for thermally constrained, fanless, and headless applications. With its security and manageability features, this SoC is ideally suited for the Internet of Things (IoT) and for the next wave of cost-effective intelligent connected devices.

Featuring secure boot, extended lifecycle support, extended temperature and ECC, this processor offers an excellent solution for embedded market segments such as transportation, energy, and commercial and industrial control. The processor remains software compatible with previous 32-bit Intel® architecture and complementary silicon.

This Pentium® ISA compatible, single-core, single-threaded SoC offers rich I/O capabilities and flexibility via high-bandwidth interfaces such as PCI Express® and USB 2.0 and offers the interfaces for a broad range of connectivity options such as two Ethernet* interfaces on chip and interfaces to connect Cellular, Bluetooth*, ZigBee*, and other connectivity options. Using SD/SDIO/eMMC card interfaces, SPI, UART, and GPIO ports, the SoC connects seamlessly to sensors and various memory options.

IoT Software Stack

The Intel® Quark SoC X1000 is provided with a software suite of interoperable security, manageability and connectivity features, allowing true scalability in performance and features. It is supported by the Wind River Intelligent Device Platform (IDP), which is the operating system and middleware software stack that binds together the connectivity, security, and management on a scalable Intel architecture processing solution. This software solution is specifically packaged and validated to support the ability for developers to move immediately to the creation of high value applications and services.

Software Stack Highlights

- Provides interoperable connectivity, security, and manageability features on a scalable Intel architecture processing solution.
- Packaged to enable rapid application and service development.
- Validated and tested to assure seamless interoperability.
- Compatible and interoperable with the IoT stacks on other Intel processors such as Intel® Atom™ processor and Intel® Core™ processor.
Intel® Quark SoC X1000

Product Highlights - Hardware

- Pentium® ISA compatible, single-core, single-threaded, 32-bit Intel® Quark processor based on Intel architecture running at 400 MHz.
- DDR3 800MTs memory interface with ECC.
- AMBA Bus fabric provides flexible silicon IP offering.
- High integration level of high and low speed I/O interfaces, clocks, and voltage regulator into a 15x15 mm package reduces the number of external components required on the platform.
- Large 0.593 ball pitch allows for low cost PCB designs to address cost sensitive applications.
- Embedded temperature range option of -40°C to +85°C meets requirements for industrial, medical, and military application designs with constrained thermal environments to extend the product reach into harsh environments.
- Embedded lifecycle support protects system investment by enabling extended product availability for embedded customers.
- Legacy Bridge interface to PC compatible features.
- Provided as an Integrated Software Stack including:
  - Hardware based root of trust for secure boot
  - UEFI EDK II Open Source firmware
  - GRUB open source bootloader
  - Wind River Linux with IDP 2.0
  - Wind River VxWorks
  - McAfee Embedded Control

Industry Standard Software Systems

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Contact</th>
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<tbody>
<tr>
<td>Linux® (Yocto)</td>
<td>Intel-provided drivers / build scripts</td>
</tr>
<tr>
<td>Wind River® Linux 5.0</td>
<td>Wind River Systems</td>
</tr>
<tr>
<td>VxWorks®</td>
<td>Wind River Systems</td>
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<tr>
<td>UEFI</td>
<td>Intel-provided drivers</td>
</tr>
<tr>
<td>Grub</td>
<td>Intel-provided drivers</td>
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Intel® Quark SoC for Embedded Computing and IoT

<table>
<thead>
<tr>
<th>Product Variant</th>
<th>Core Speed</th>
<th>Memory Speed</th>
<th>SRAM</th>
<th>Thermal Design Point</th>
<th>Temperature</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Quark SoC X1000</td>
<td>400 MHz</td>
<td>800 MTs</td>
<td>On-die 512 KB</td>
<td>TDP = 1.9W - 2.2W (depends on VR) Tj = 110°C</td>
<td>0 to 70°C (commercial) Extended temperature variants coming soon.</td>
<td>15 mm x 15 mm</td>
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