Product Brief

Intel® System Controller Hub US15W
Embedded Computing

Intel® System Controller Hub US15W for Embedded Computing

Product Overview
The Intel® System Controller Hub (SCH) US15W, available in two package sizes as well as both commercial and industrial temperature options, is a low-power, highly integrated chipset that addresses key requirements of thermally constrained and fanless embedded applications. It combines the Intel® Graphics Media Accelerator 500 (Intel® GMA 500), memory controller, and I/O controller in a single-chip solution while featuring advanced 3D graphics and extensive I/O capabilities such as USB 2.0, SDIO and PCI Express.* It supports Intel® High Definition Audio1 and hardware video decode acceleration, a 400/533 MHz CMOS front-side bus (FSB), dual independent display, and 2 GB max memory in a single channel with one or two ranks.

The Intel SCH US15W has a thermal design power2 (TDP) of 2.3 watts and is validated with the Intel® Atom™ processor Z5xx series. This platform has a combined TDP under 5 watts and features embedded lifecycle support, making it ideal for many embedded market segments such as in-vehicle infotainment, industrial control and automation, gaming, medical, media phones, and retail and transaction solutions (i.e., kiosks, point-of-service terminals). The platform is also supported by the Intel® Embedded Graphics Drivers and video BIOS, developed specifically for embedded products and applications (developer.intel.com/design/intarch/SWsup/graphics_drivers.htm).

Graphics and Display
Intel GMA 500 is a flexible, programmable architecture that supports shader-based technology, 2D, 3D and advanced 3D graphics, high-definition video decode, and image processing. Features include screen tiling, internal true color processing, zero overhead anti-aliasing, programmable shader 3D accelerator, and 32-bit floating-point operations.

Dual display pipes with rotation support, along with low-voltage differential signaling (LVDS) and serial DVO (SDVO) display ports, permit simultaneous independent operation of one display or two. SDVO adapters provide interfaces to a variety of external display technologies while the LVDS interface allows the Intel GMA 500 to communicate directly to a flat-panel display. The LVDS interface supports 18-bit or 24-bit color and EDID and EDID-less displays with a maximum pixel clock of 112 MHz. SDVO may be used for any external display device such as HDMI/DVI, analog TV, VGA/CRT and LVDS, and includes EDID and EDID-less support with a 160 MHz pixel clock.

Video
Hardware video decode acceleration relieves the decode burden from the processor and reduces power consumption of the system. Full hardware acceleration of H.264, MPEG2, MPEG4, VC1, and WMV9 is supported, eliminating the need for software decode and off-loading the processor.

Audio
Intel High Definition Audio supports up to four audio streams (up to 16 channels each), 32-bit sample depth, and sample rates to 192 KHz.

Interfaces
The Intel SCH US15W supports eight USB 2.0 ports, and three Secure Digital I/O 1.1 and Multimedia Card Controller 4.0 ports. The SMBus Host Controller is compatible with most I²C devices, while the LPC 1.1 bus enables firmware hub, embedded controller and other legacy devices. A single-channel PATA interface supports two devices (master/slave), and two x1 ports support PCI Express Base Specification Revision 1.0a.
Advanced Configuration and Power Interface (ACPI) management exposes platform power management features and details to the operating system, allowing application control of system sleep states, device power states, CPU power states, CPU performance states, and CPU throttling states.

**Packaging and Operating Temperature**

For design flexibility, the Intel SCH US15W is offered in two package sizes. A small footprint version in a 0.6mm ball pitch is suitable for handheld and small form-factor designs. A larger version, in 1.0mm ball pitch, is available for designs without small space restrictions. The larger version also has an industrial temperature SKU option.

**Intel® System Controller Hub US15W for Embedded Computing**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Product Code</th>
<th>Thermal Design Power</th>
<th>Temperature Range</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® System Controller Hub US15W</td>
<td>AF82US15W</td>
<td>2.3 watts</td>
<td>Commercial: 0° to +70°C</td>
<td>1249-ball FCBGA lead free, 22x22 mm</td>
</tr>
<tr>
<td>Intel® System Controller Hub US15WP</td>
<td>LE82US15EC</td>
<td>2.3 watts</td>
<td>Commercial: 0° to +70°C</td>
<td>1295-ball FCBGA lead free, 375x375 mm</td>
</tr>
<tr>
<td>Intel® System Controller Hub US15wPT</td>
<td>LE82US15EE</td>
<td>2.3 watts</td>
<td>Industrial: -40° to +85°C</td>
<td>1295-ball FCBGA lead free, 375x375 mm</td>
</tr>
</tbody>
</table>

**Ecosystem Support**

Along with a strong ecosystem of hardware and software vendors, including members of the Intel® Embedded and Communications Alliance, Intel helps cost-effectively meet development challenges and speed time-to-market (intel.com/go/eca).

**Embedded Lifecycle**

Protects system investment by enabling extended product availability for embedded customers.

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1. Intel® High Definition Audio requires a system with an appropriate Intel chipset and a motherboard with an appropriate codec and the necessary drivers installed. System sound quality will vary depending on actual implementation, controller, codec, drivers and speakers. For more information about Intel® HD audio, refer to www.intel.com.
2. TDP specification should be used to design chipset thermal solution. It is not the maximum theoretical power the chipset can generate.

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