

Development of QNX BSP for LN2440SBC

PROJECT

The LN2440SBC is a single board computer based on Samsung's S3C2440A microprocessor, which uses the ARM920T as the processor core. The S3C2440A is a highly integrated SOC designed to provide hand-held devices with a low-power high-performance microcontroller solution in a small die size. Besides the ARM920T core, the SOC includes several system peripherals such as:

- SD memory card
- USB Host
- NAND Flash
- AC97 audio with microphone
- TFT LCD screen
- Ethernet
- UARTs

The LN2440SBC has 64MB SDRAM and 32MB NAND Flash, and comes with BSP for Windows CE 5.0 and Linux.



The customer is a leading navigation systems provider in South Korea. They develop and market car OEM navigation systems and portable navigation devices (PND) to Asian markets such as Korea, China, and Japan. This customer was developing their next-generation PND based on the S3C2440 processor, and wanted to use QNX as the operating system for this project.

The customer wanted Atrisys to develop the QNX BSP for this board to enable them to port their navigation and multimedia application software. Atrisys reviewed the application requirements to determine the scope of the effort and develop the implementation plan to deliver the BSP in the shortest time possible.

SOLUTION

Atrisys developed the following components to support this project's requirements:

- Startup code for QNX operating system. This startup code is responsible for setup of the hardware resources on the board as required by the QNX operating system.
- NAND ETFS file system driver providing transaction support for enhanced reliability. This file system provides greater reliability than FAT16/32 file system.
- Ethernet driver based on the CS8900A chip.
- DMA library that works with 4 channel DMA controller. This DMA library is used by other device drivers such as audio.
- UART serial driver
- SD memory card driver to support 2GB memory cards.
- AC97 audio driver that supported 2 channel stereo output and input.
- 2D graphics driver. This driver was written to work with QNX GF graphics subsystem.
- Ported QNX USB host stack to S3C2440 integrated host controller. Tested with mass storage class driver for support of USB memory sticks.

The Atrisys team developed test utilities where required, and reused existing utilities to test & validate the functionality & performance of these components. In addition, the BSP was packaged as per the packaging method used by other QNX developed BSPs, allowing for installation & building by customer's development team. An installation guide and release notes were also created to document the BSP.