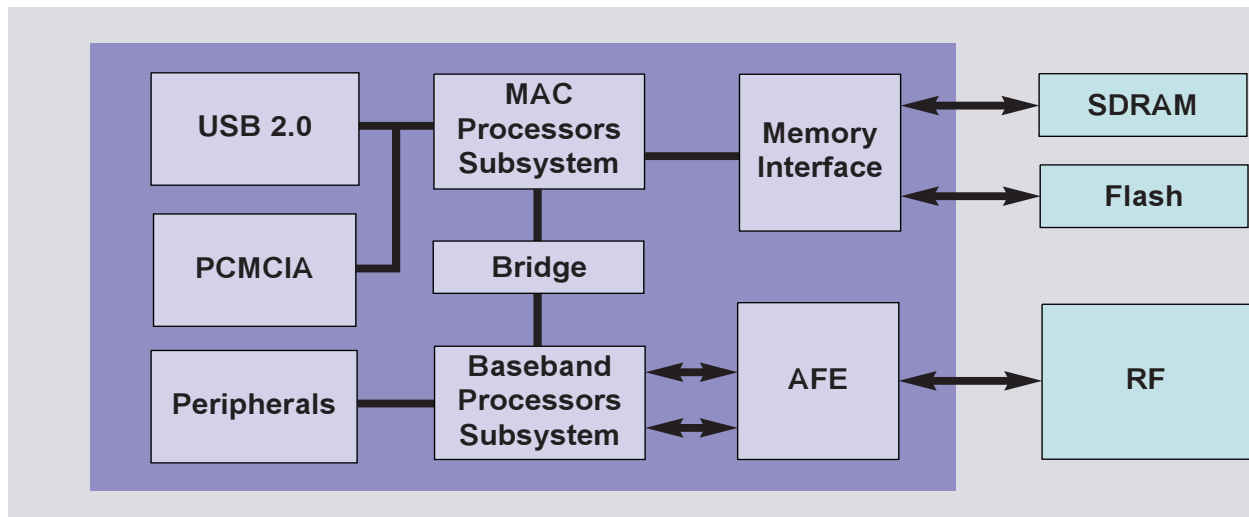FUJITSU

MB86K21
The Fujitsu 802.16e-2005 Mobile WiMAX SoC
Product Brief

Fujitsu MB86K21 Mobile WiMAX Block Diagram

► Features

- Implements all features required for Wave 2 Mobile WiMAX certification in an integrated SoC
- Support for mobile stations/terminals and PC Cards
- 512/1024 FFT OFDMA PHY with MAC processors
- Support for 5MHz and 10MHz channel bandwidth
- Adaptive modulation schemes including 64QAM, 16QAM and QPSK
- Programmable automatic gain control (AGC) supporting a broad range of RF attenuators
- Dual RISC processors for implementing upper and lower MAC layers

- Security implementation based on AES-CCM encryption/decryption
- Support for 2x2 STC/MIMO
- Support for antenna diversity
- USB 2.0 and CardBus/PCI host interface support
- 90nm with low-leakage process technology
- Small-footprint FBGA package
- Complete reference design with software and radio solution

► Applications

The Fujitsu Mobile WiMAX SoC suits several types of applications including:

- Mobile stations and terminals
- PC cards

The Fujitsu 802.16e-2005 Mobile WiMAX SoC

▶ Description

As the supplier of the first Fixed WiMAX System-on-Chip (SoC) based on the IEEE 802.16d-2004 standard, Fujitsu has been actively involved in WiMAX and IEEE 802.16 activities since 2003. Solutions based on the Fujitsu WiMAX SoC have been designed, developed and commercially deployed around the world.

To continue the progression of WiMAX from fixed to mobility, Fujitsu has developed a one-chip, integrated MAC and PHY, baseband processor for next-generation Mobile WiMAX applications based on the IEEE 802.16e-2005 standard. The mixed signal MB86K21 is designed to optimize power

consumption using the Fujitsu advanced 90nm, low-leakage process technology.

Performance enhancement can be realized with the on-chip MAC processors. The 512/1024 FFT OFDMA PHY is carefully designed and optimized to provide the high performance required for successful mobile applications.

The Fujitsu Mobile WiMAX SoC leverages Fujitsu capability to integrate complex electronic devices, its extensive experience in mobile phone design and development, and its system knowledge and expertise for end-to-end WiMAX solutions.

▶ System Design Kit

The Fujitsu Mobile WiMAX System Design Kit (SDK) is designed with many debug ports, auxiliary interfaces and controls. This SDK is best suited for hardware and software engineers who develop application specific products with the Fujitsu Mobile WiMAX SoC. This SDK will be shipped with an on-board 2.5GHz RF module.

Along with the SDK hardware, Fujitsu will provide a detailed design package to help customers develop their products. The hardware-and-software package will include comprehensive

design guidelines, CardBus and USB 2.0 drivers based on the Windows operating system, and an Application Programming Interface (API) software layer for customers to develop custom application and graphic user interfaces.

The SDK software also includes maintenance software running on Windows, which utilizes the APIs to control and operate the MB86K21 for many useful maintenance functions, such as network configuration, data management and manufacturing process automation.

▶ Reference Design Software Platform

Fujitsu will provide the MAC software in binary code based on the mobile WiMAX standard. Fujitsu will also provide drivers,

APIs and maintenance application software to help customers use the MB86K21 Mobile WiMAX SoC.

▶ Reference Design Hardware Platform

Fujitsu is committed to delivering a complete Certified Mobile WiMAX solution and system-level reference design of Type II PC-Card, which is expected to be one of the most popular form factors for the initial mobile WiMAX service.

With the Fujitsu Mobile WiMAX PC-Card reference design kit (RDK), customers can easily meet the time-to-market demands of Wave 2 MIMO Mobile WiMAX-based terminals, which operate in the 2.49~2.69GHz spectrum.

This PC Card reference design kit with the CardBus interface is designed for OEMs, ODMs, and system manufacturers who will

provide Mobile WiMAX terminals, taking advantage of the technology's high throughput, low-power low cost and security.

Along with the reference design hardware, Fujitsu will provide detailed design document to help customers develop products. Fujitsu will provide documents such as schematics, layout, gerber files, as well as comprehensive design guidelines. The Fujitsu RDK software package includes CardBus drivers based on Windows operating system. On top of the hardware interface driver, Fujitsu will provide an API software layer for customers to develop custom application and graphic user interfaces.
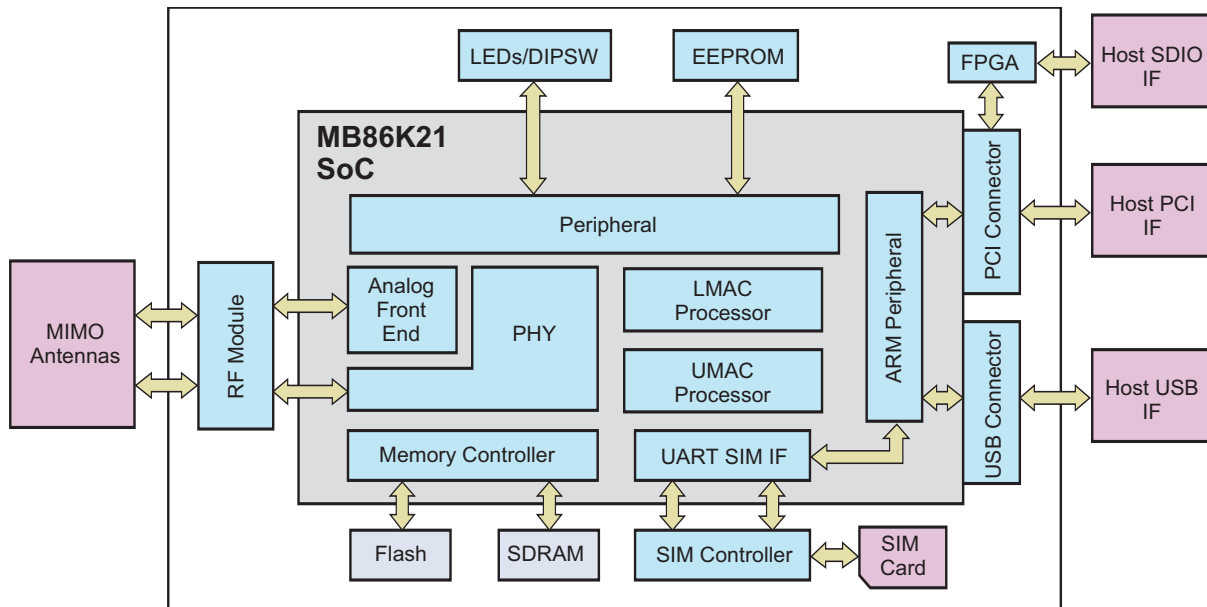
System Design Kit Block Diagram
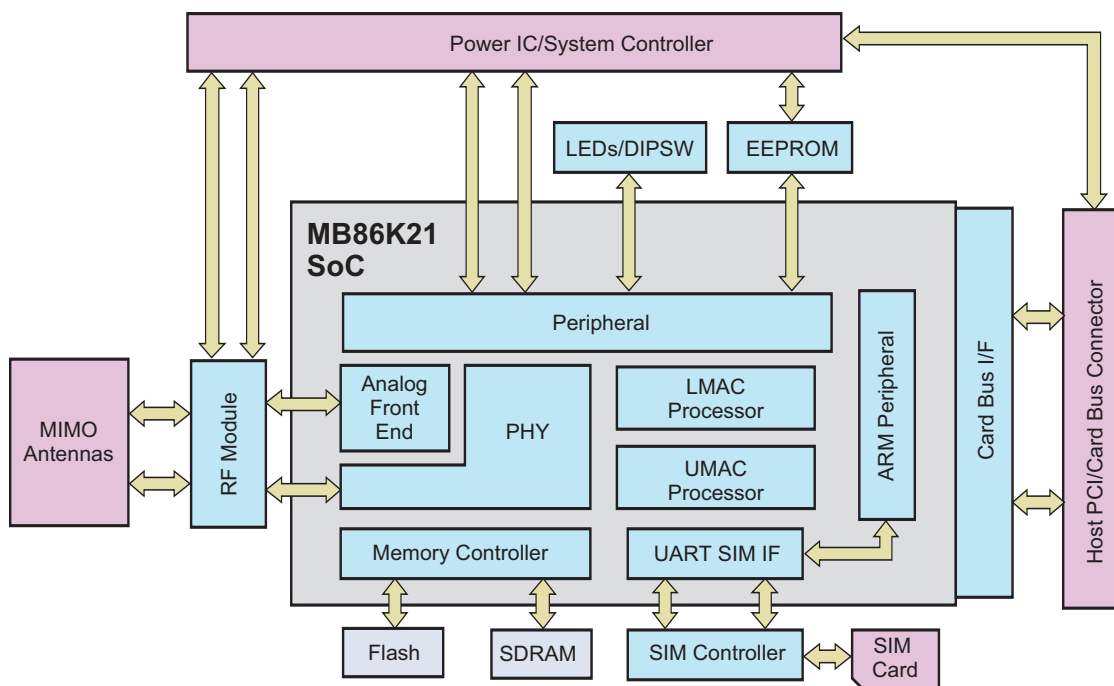
PC Card Reference Design Kit Block Diagram

The Fujitsu 802.16e-2005 Mobile WiMAX SoC

The reference design software includes maintenance software running on Windows operating system, which utilizes the APIs to control and operate the MB86K21 for many useful maintenance functions such as measuring air-traffic performance, noise level, error rates, transmitting and receiving powers, MAC management messages, connection IDs, as well as provides settings/readings for many useful parameters. The maintenance software can also be used and modified into an mass product automatic testing software as well.

▶ Certification and Compliance

Fujitsu has designed the MB86K21 WiMAX SoC to comply with the IEEE 802.16e-2005 standard.

More information on the IEEE 802.16 standard for broadband wireless access and the WiMAX Forum is available at www.wimaxforum.org and www.ieee802.org/16.

For more information on the Fujitsu WiMAX SoC family, please e-mail to inquiry.bwa@fma.fujitsu.com.

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