Introducing the Fujitsu Mobile WiMAX System-on-Chip Solution

Fujitsu at a Glance

- Headquarters: Tokyo, Japan
- President: Hiroaki Kurokawa
- Established: June 1935
- Net Sales: 4,791.4 billion yen (US$40.6 billion)
- Net Income: 68.5 billion yen (US$581 million)
- R&D Expenditure: 241.5 billion yen (US$2.0 billion)
- Employees: 158,000 worldwide
- Principal Business Areas: Technology Solutions, Ubiquitous Product Solutions, Device Solutions


Program

- Introduction
- Q&A / Reception

Emi Igarashi
Keith Horn
George Wu

All

Principal Services & Products

- Technology Solutions
- System Solutions
- IT Infrastructure Management
- Network Services
- Software
- Retail and Financial Systems

- Ubiquitous Product Solutions
- Personal Computers
- Mobile Phones
- Hard Disk Drives and Other Storage Devices
- Document Imaging and Other Peripherals
- Optical Modules

- Device Solutions
- Semiconductors
- Media Devices
- Electronic Components
- Foundry Services

Note: Japan market only
Mobile WiMAX Application

First Generation Mobile WiMAX SoC Features

- Fully compliant with the IEEE 802.16e-2005 Mobile WiMAX standard
- Highly integrated, scalable, 1024 FFT OFDMA PHY and full MAC processors
- Adaptive modulation schemes including 64QAM, 16QAM, QPSK, and BPSK
- Interface for MIMO RF modules
- 90nm with low-leakage process technology
- Small-footprint FBGA package

First Generation Mobile WiMAX SoC Block Diagram

- Multiple processing engine design
- Power management system and multiple clock domains
- Optimized HW/SW partitioning
  - To ensure the lowest power dissipation and highest performance
- Applying Fujitsu's 90nm silicon technology
  - To deliver high packing density to achieve maximum performance and minimum power dissipation

First Generation Mobile WiMAX SoC Timeline

- Establishment of early engagement relationships
  - Target application
  - Feature definition
  - Architecture collaboration and finalization
- Test vehicles development and evaluation
  - 3Q CY2006
- Engineering samples
  - 1Q CY2007
- Reference Design Kit
  - 3Q CY2007
- Certification starts
  - 3Q CY2007
Mobile WiMAX SoC Roadmap

- **1st Gen BB SoC**
  - Mobile WiMAX Compliant
  - Extreme Low Power
- **MIMO RF Module**
- **2nd Gen BB SoC**
  - VoIP Features
  - Deep Sub-micron
- **3rd Gen BB SoC**
  - MIMO RF Module

- **Fujitsu’s Strength – Multimedia Expertise**
  - Expertise in multimedia cores
  - Ready to support media-rich applications provided through broadband mobile WiMAX

- **Fujitsu’s Strength – End-to-end Capability**
  - Integrated Services on High BW Dynamic Pipe
  - Metro Fiber
  - IP, ATM Core
  - Enterprise
  - ISP
  - PSTN
  - CS100A LL (90nm, low leak)
    - Logic: 3.1M gate
    - RAM/ROM: 6.3/1.2Mbit
    - CPU: ARM946
    - DSP: Hi-perion2
  - Mobile Phone
    - Power dissipation 50% lower than the previous generation

- **Fujitsu’s Strength – Low-Power Mobile Baseband SoC**
  - Mobile phone powered by the Fujitsu baseband SoC
    - CS100A LL (90nm, low leak)
    - Logic: 3.1M gate
    - RAM/ROM: 6.3/1.2Mbit
    - CPU: ARM946
    - DSP: Hi-perion2
    - Mobile Phone
      - Power dissipation 50% lower than the previous generation
Fujitsu’s Strength – Enabling WiMAX

Core Technology Integration

Building Blocks

- Process Design Manufacturing
- Design Libraries (Digital Mixed Signal CMOS RF)
- Foundation Technologies
  - Deep-submicron Process (90nm & below)
  - IP
  - Tried-&-proven Design Methodology
  - Robust Manufacturing Know-how

SoC

Fujitsu’s Strength – New IDM Model

- Time and performance-proven solutions
- Robust solutions through partnerships

Foundation Technologies

- Deep-submicron Process (90nm & below)
- IP
- Tried-&-proven Design Methodology
- Robust Manufacturing Know-how

Application-Specific SoCs & Modules

Other HW/ SW Partners

Cellular Mobile BTS

Summary

- Mobile WiMAX is the logical progression of Fujitsu’s experience in fixed WiMAX
- Mobile WiMAX opens up exciting new applications that, in turn, generate increased demand for connectivity
- Fujitsu’s first-generation mobile WiMAX SoC has the integrated features, and is fully compliant with the IEEE 802.16e-2005 Mobile WiMAX standard
- Fujitsu focuses its development on MIMO-based mobile WiMAX, targeting Wave 2 certification
- Fujitsu's accumulated knowledge and expertise about wireless network systems will be utilized in the mobile WiMAX SoC

THE POSSIBILITIES ARE INFINITE