3G Handsets – New Design Challenges on the Way to Rich Content

Christian Dupont
Director of TI European Wireless Terminals Business Unit
3G Adoption Accelerates

Global Handset Unit Shipment Forecast (By Standard)

3G Market Drivers:

- Multimedia Applications to increase ARPU
- Low cost voice segment increasing network efficiency

Source: IDC Forecast, Dec 04
What’s Required for 3G?

- Total systems expertise: silicon to software
- Easy migration path: GSM/GPRS/EDGE to UMTS
- Consumer electronics expertise to integrate entertainment
- Differentiated services and variety of innovative handsets
- Real-time security for mobile applications and services
- Open solutions for maximum innovation and differentiation
Low-Cost Handsets Enable Growth in Emerging Markets

Emerging Markets Growth

VS. Industry Growth of 23%

- Eastern Europe: 66%
- China: 26%
- India: 98%
- Undeveloped Asia/ME: 36%
- South America: 59%

Handset Shipments

Source: Forward Concepts, Global Cellular Handset & Chip Markets, April 2005

TI Single-chip Cell Phone Solution for Low-Cost Handsets

- GSM Association (GSMA): handset cost biggest barrier to affordability in emerging markets
  - GSMA targets $40 handset, going to $30
  - Initial shipments estimated at 6M handsets, potential of over 100M subscribers per year
- DRP™ technology integrates major cell phone functions into single-chip
- Selected by Nokia for cost-effective, advanced handsets
- Roadmap to EDGE and UMTS

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Mobile Entertainment Taking Off

On 3G Handsets Today...

- Video Conferencing
  - Sony Ericsson Z1010
- 3D Gaming
  - Sharp 902 from Vodafone
- Multi Mega-pixel Camera
  - Samsung SPH-V4900
- Live TV
  - LG Cyon June SV9140
- Digital Music Player for MP3
  - Nokia 7600

Worldwide Mobile Entertainment Users

- Music
- Games
- Images
- Video

Source: ARC Group, 2004
TI OMAP-Vox™ Solutions: Enabling 3G for the Masses

- Easy migration from GSM/GPRS/EDGE to UMTS and HSDPA, across multiple market segments
- Extensive software re-use saves years of design effort and R&D cost
- Merges modem and application processing onto existing OMAP™ architecture
- Leverage 90/65nm processes and DRP™ technology for cost-optimized, high-volume 3G market segments
Digital TV Goes Mobile

Mobile Digital TV Gaining Momentum

- 40-60% of handset users interested in mobile DTV services; expect $10-15 monthly service fee per user (Source: IPDC Forum/HPI Research, DigiTAG)
- U.S. users expected to spend $30B annually on mobile TV services (Source: DigiTAG)
- DVB-H prototype handsets available from Samsung, Nokia, Siemens
- DVB-H trials underway in U.S., Europe, Australia; ISDB-T trials this year in Japan

Open Solutions for Live Digital TV on a Handset

- "Hollywood" Digital TV Chip
  - 3 chips become 1 using DRP™ technology
  - Receives & processes TV signals
  - Outputs video to OMAP™ processor
- OMAP Processor
  - High-quality image processing
  - Outputs image to the screen
- TI supports open standards for maximum flexibility
  - DVB-H for U.S. and Europe
  - ISDB-T for Japan

Technology for Innovators™
Complexity Increases as Technologies Converge

TI Has the Right Pieces Today

**Demanding Applications**
- OMAP™ Processors power innovative, high-performance entertainment applications

**Increasing Modem Complexity**
- TI’s robust, tested modem technology for high-bandwidth wireless services

**More Connectivity**
- Addressing co-existence challenges created with multiple connectivity technologies

**Space, Battery & Cost Constraints**
- Designing optimized, integrated systems with TI technology and system know-how

**Increasing Need for Mobile Security**
- TI’s system-level security enables a secure mobile environment, protecting valuable wireless content without affecting performance
Summary

- Flexibility to integrate for optimal chip costs and form factors
- Scalable, future-proof software solutions
- Open environment fueling differentiated and innovative services
- Architecture supporting mobile entertainment on the handset
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