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12th Annual

Asia Pacific Semiconductor Roadshow

Consumer ASSP's MUST Innovate and Integrate!

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May 16, 2006, Taipei

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Semiconductors limit OEM and Consumer demands

- **Semiconductors are limiting future CE because:**
  - Consumers demand more Features & Performance, Lower Power, Lower Cost
  - There is not enough SW support
  - Chip Design methodologies must be re-thought

Key Issues:

- Why will the future consumer market be VERY DIFFERENT from the past?
- What ASSP strategies will WIN in consumer electronics?
- Which consumer electronics features are DRIVING semiconductor demand?

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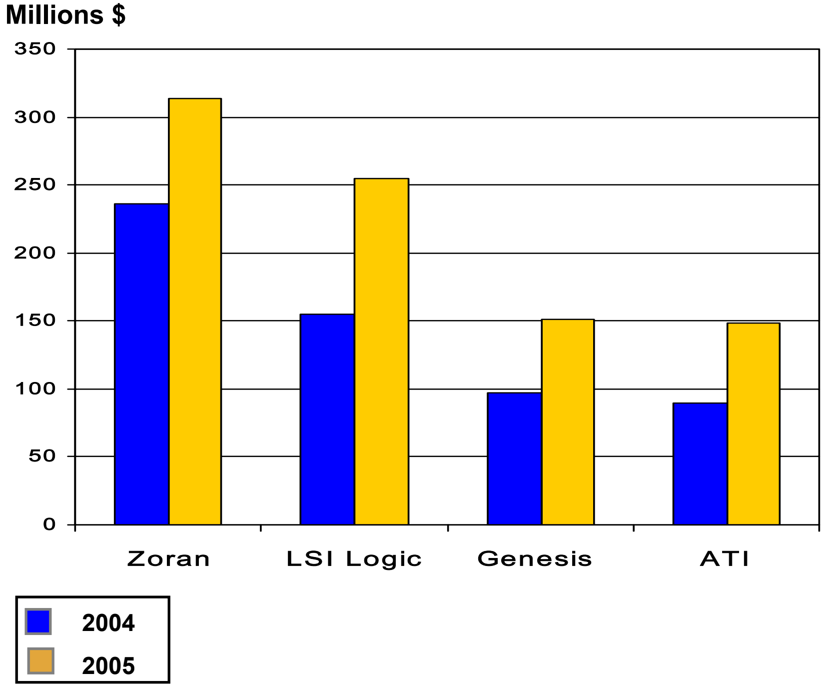
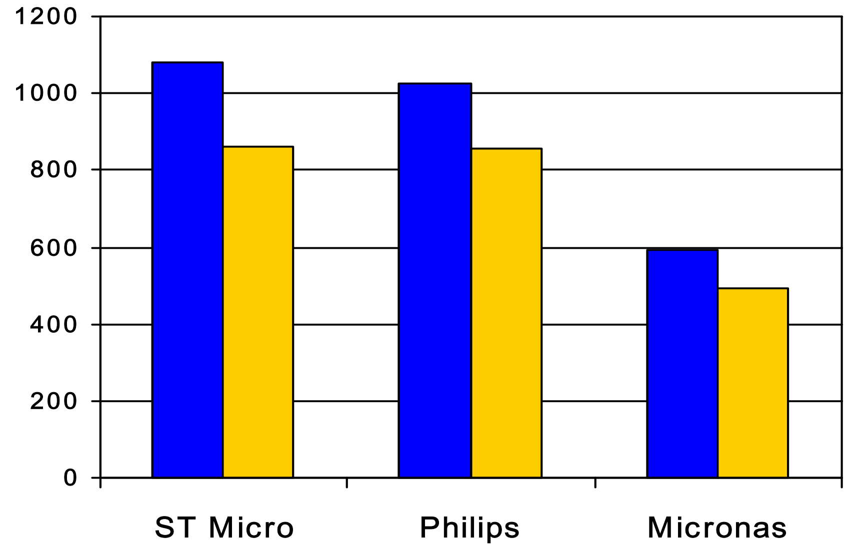
Why will the future consumer market be VERY DIFFERENT from the past?

Consumer ASSP Revenue Growth is NOT Guaranteed

Semiconductor Vender Revenue from Consumer ASSP shipments

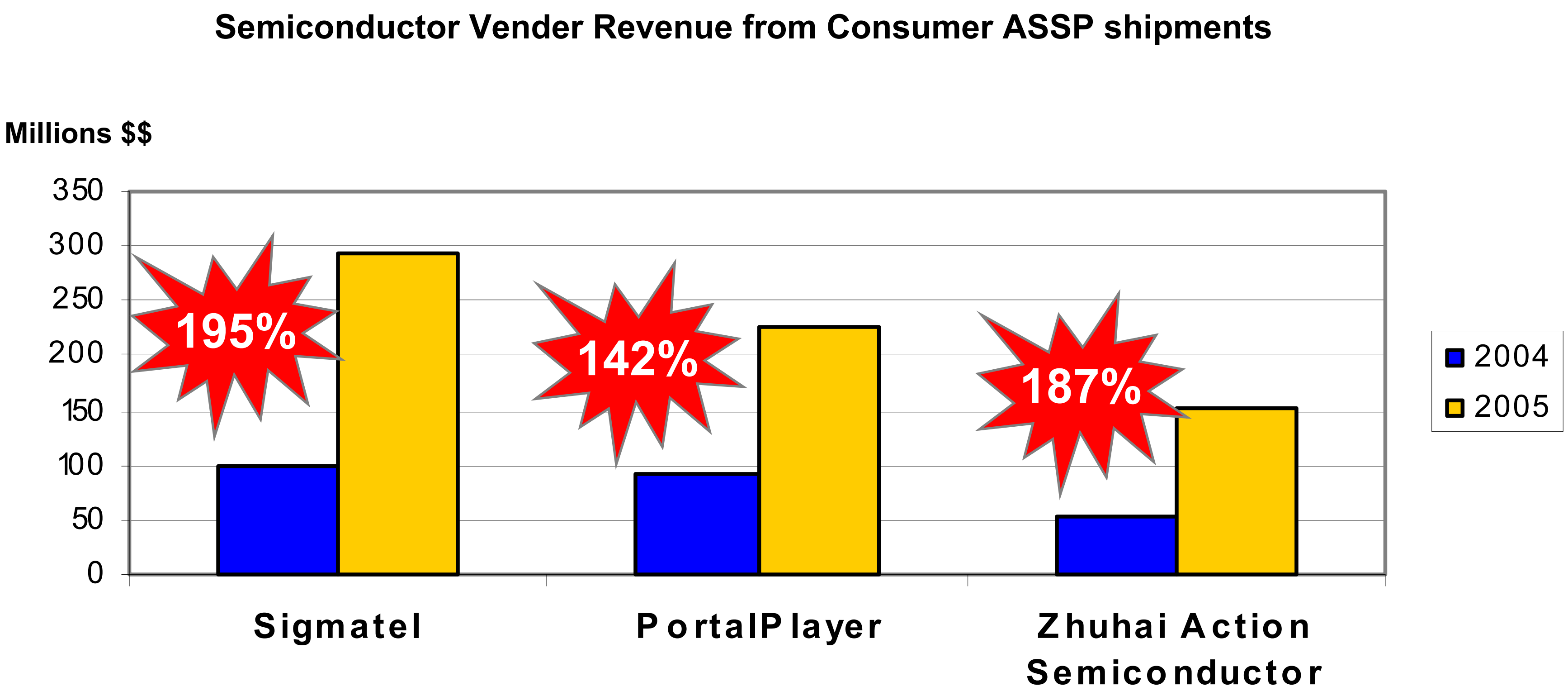




Growth & Healthy Profits from DTV CE production benefits selected vendors

STB production matures with weak profit margin and market share lost to smaller vendors!

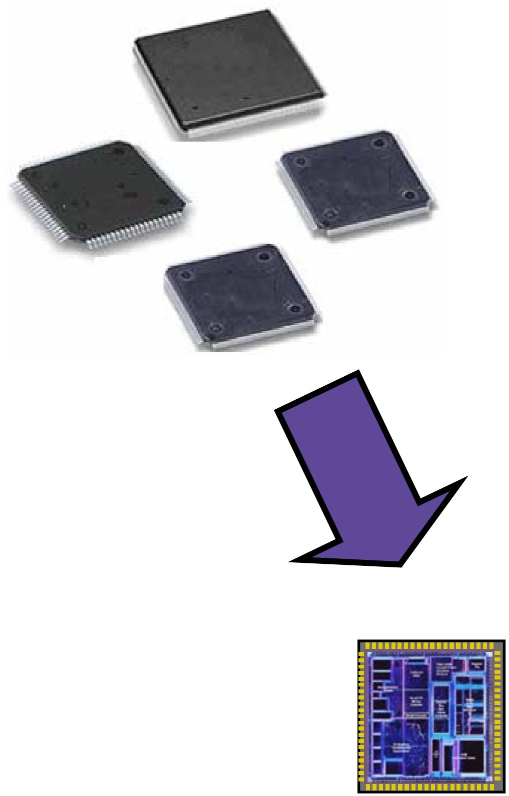
Smaller Players Rely on Timely Entry into HOT Markets… .



Continued Integration

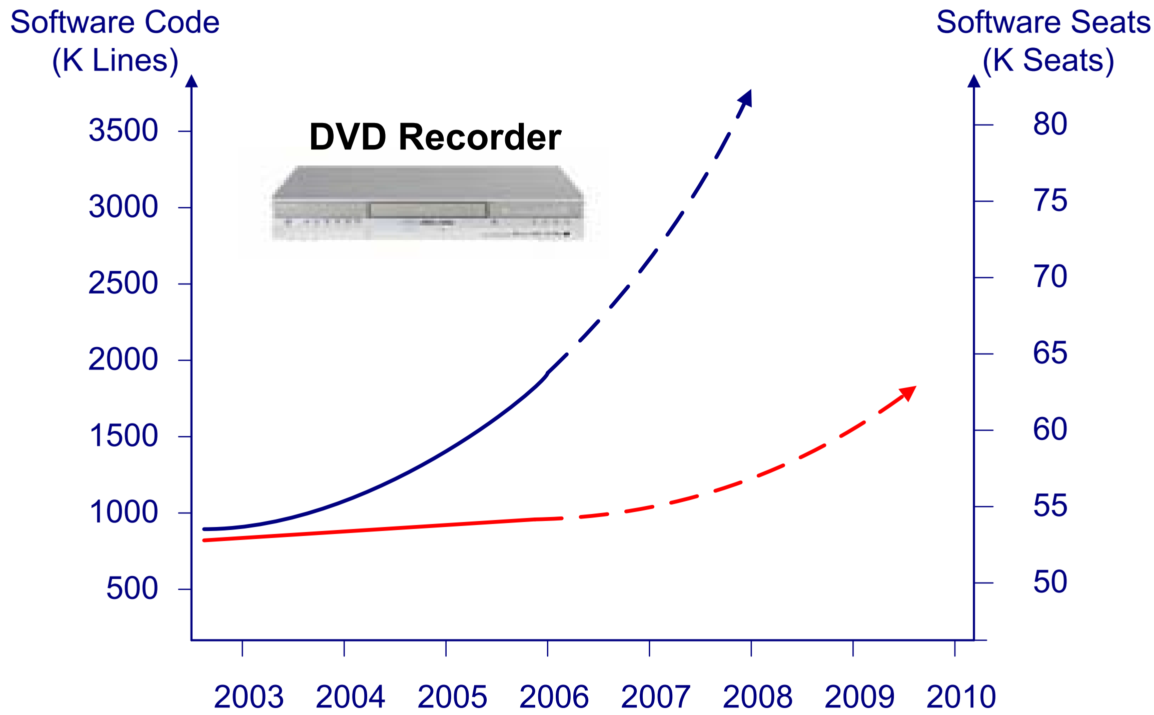
- Consumer semiconductor market growth is slowing
- BUT costs are not slowing
  - Hardware Design costs rising
  - Hardware/Software Support costs rising
- Today's Semiconductor Vendor is struggling to balance performance & cost

Multiple Devices



System on Chip

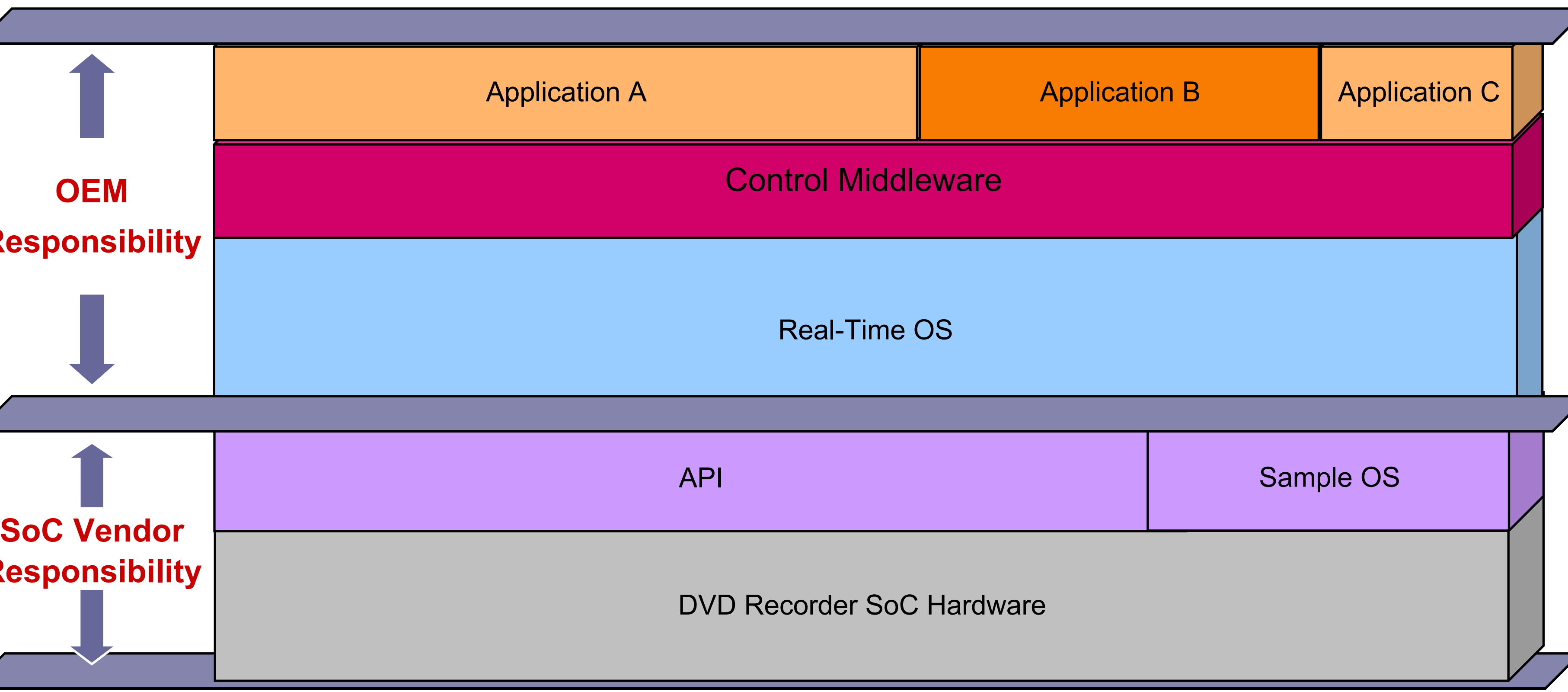
Exponential Growth in Embedded Software: The Dilemma



- SoC Vendors simply underestimated this growth
- Fundamental change in software support Infrastructure is required
- Organizational changes required
  - Traditional ASIC design teams > Embedded software support team

SoC Embedded Software — 2005

SoC Vendor With a Greater Role



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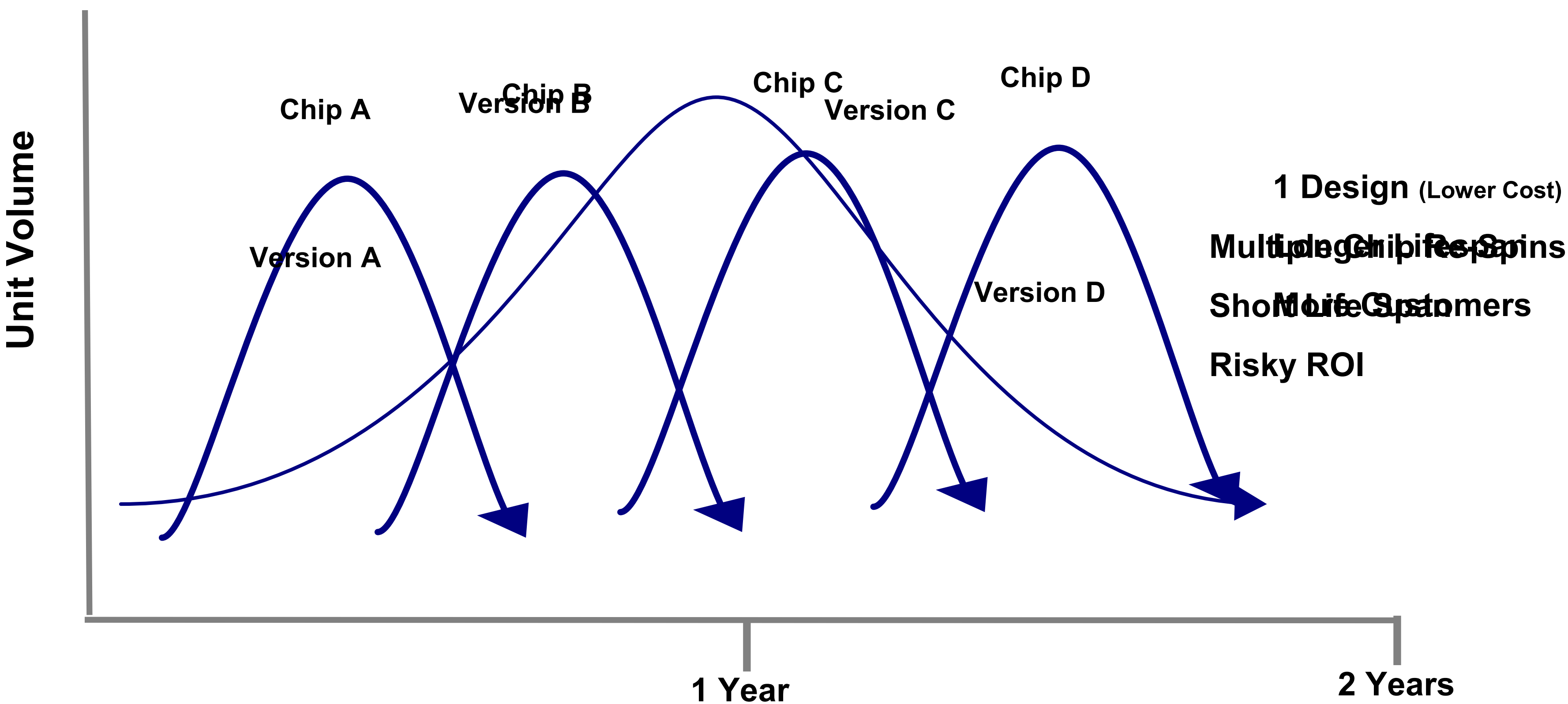
The Painful Evolution of the Consumer Market

- Semiconductor Vendors are playing a 21st century game with 20th century tools.
- Larger players are struggling to find balance between cost and performance
- Smaller Players can win IF they hit time to market

What ASSP strategies will WIN in consumer electronics?

Consumer Driving Emergence of 2nd Generation SoC



The Emergence of the 2nd Generation SoC

Single-chip multifunctional device built with multiple processor cores, each driving a subsystem that has its own operating system firmware and API software

Spreading the Expertise (AND COST!!!) Across multiple Platforms

- Nexperia Home
- Nexperia Mobile

DAVINCI™

- TI OMAP
- TI DaVinci

Panasonic

- Matsushita “UniPhier”

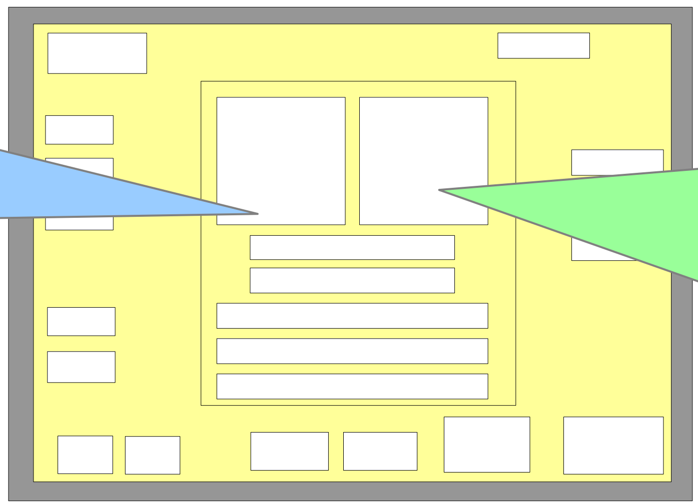
(Universal Platform for High-quality Image-Enhancing Revolution)

Recommendation: Collaborate With Partner Developers to Create Value

OMAP™
TEXAS INSTRUMENTS TECHNOLOGY
Developer Network

OS Support

- Linux
- Palm
- Windows Mobile
- SavaJe
- Symbian
- & More…



Applications Suppor

- Pace
- Sasken
- Philips
- PacketVideo
- Real Networks
- eMuzed
- ArcSoft
- SRS
- InnoPath
- & More…

The SoC Vendor Must Evolve

- Understand your value to the OEM & the their customer
  - What to Do: PortalPlayer & the iPod
  - What **NOT** to Do: Sony Network Walkman & Sony Connect
- If you don't have technology, buy it or partner with a company that has it.
  - Develop hard barriers to entry for your competition

Which consumer electronics features are DRIVING semiconductor demand?

Consumer ASIC + ASSP TAM: Top Applications by 2010 Revenue

	2005 $M	2005 Share	2010 $M	2010 Share	CAGR '05 -'10
TV	3886	21%	7067	28%	13%
Digital STB	3854	21%	4995	20%	5%
Video Game Consoles	2469	13%	2245	9%	-2%
Digital Audio Players	1289	7%	1866	7%	8%
DVD Recorders	650	4%	1632	6%	20%
Digital Still Camera	1314	7%	1475	6%	2%
Digital Camcorder	1076	6%	1392	6%	5%
Video Game Handhelds	1060	6%	1174	5%	2%
DVD Players	1080	6%	639	3%	-10%
Consumer ASIC+ASSP Total	18355	100%	25179	100%	7%
Mobile Phone ASIC+ASSP Total	19182	105%	35238	140%	13%

Source: Gartner Dataquest, November 2005
Semiconductor Forecast Worldwide--Forecast Database [SEQS-WW-DB-DATA]

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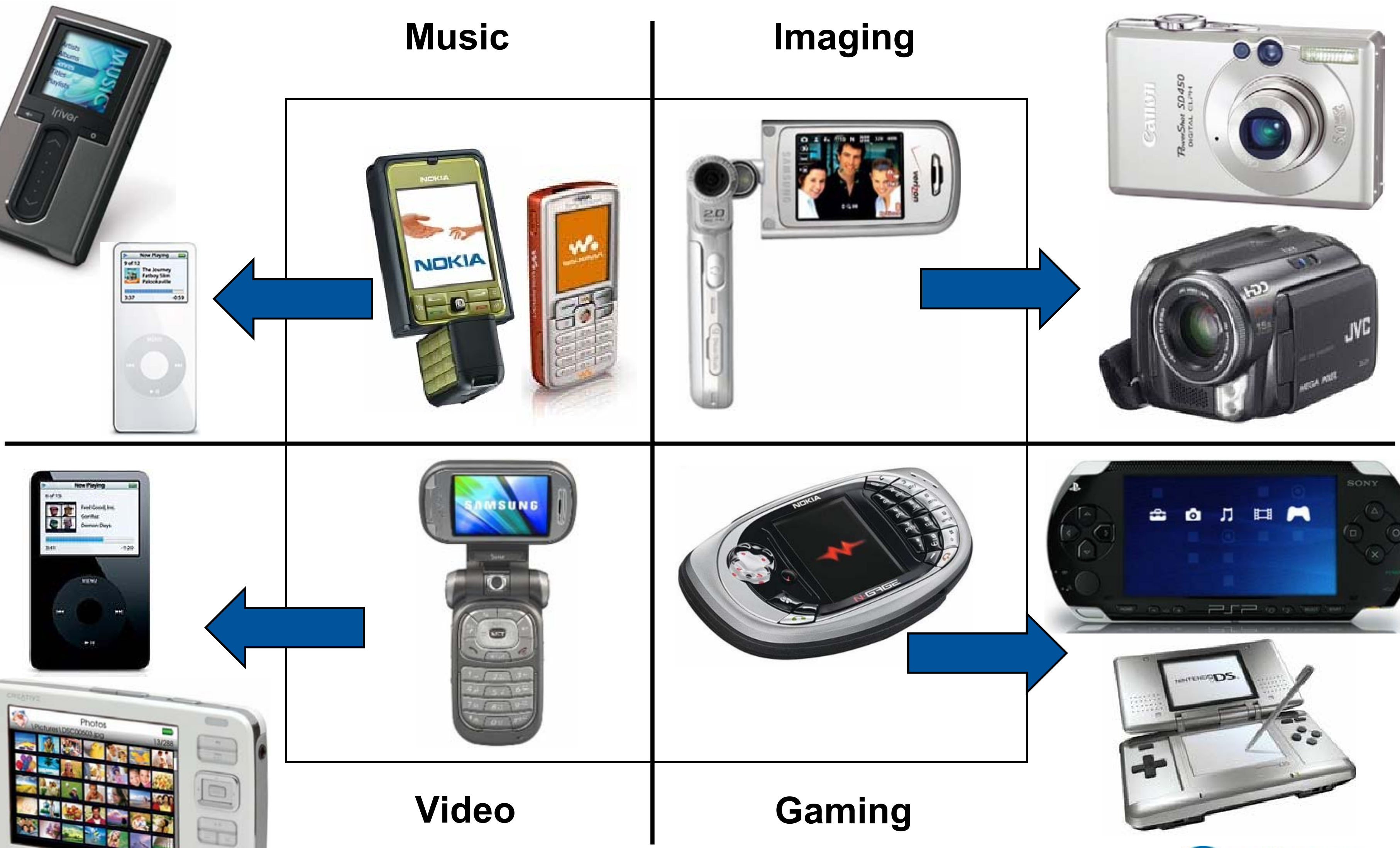
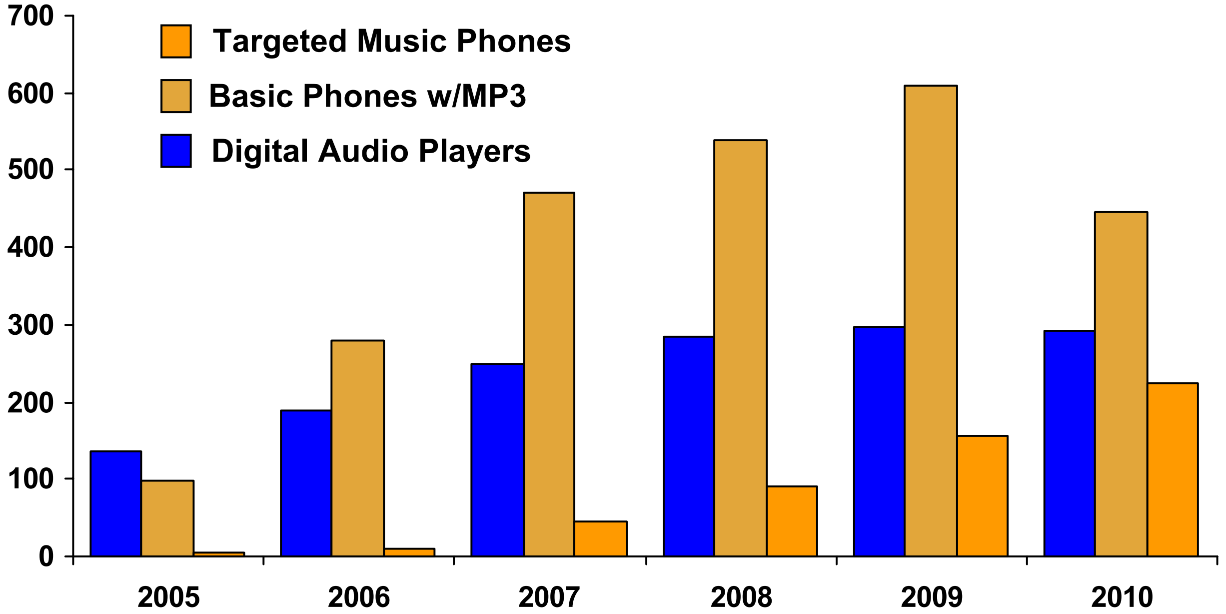
Imaging, Audio, Video, and Gaming Mobile Phones Compete In New Markets



MP3 Phones Provide Competition for Digital Audio Players

Mobile Phone and Digital Audio Player Unit Production (Millions of Units)



Basic Phones w/MP3

2005: 97 million
2010: 445 million
CAGR: 36%

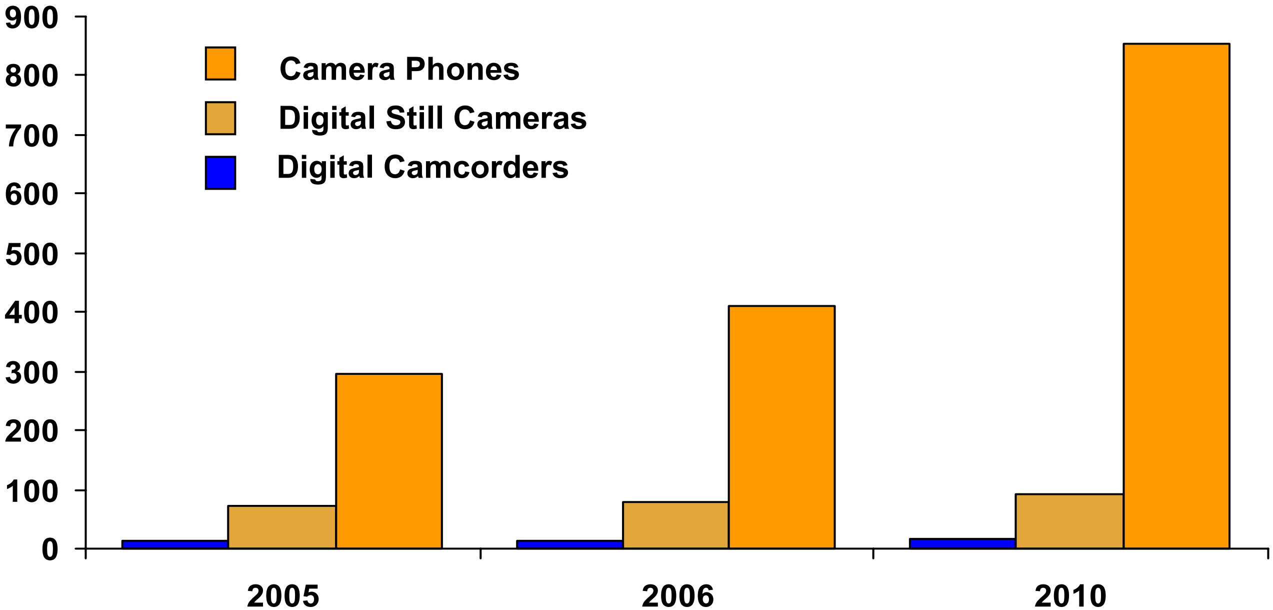
DAP Unit Production

2005: 135 Million
2010: 292 Million
CAGR: 17%

- Digital audio playback included in all but low end by 2008
- Targeted music phones will have the largest impact on the DAP market
- WAN/3G capabilities open up additional features — download to phone

Camera Phones Require Compromises

Camera Phone and Digital Camera and Camcorder Unit Production (Millions of Units)



Camera Phones

2005: 295 Million
2010: 854 Million
CAGR: 24%

Digital Still Cameras

2005: 72 million
2010: 94 million
CAGR: 5%

Digital Camcorders

2005: 13 Million
2010: 17 Million
CAGR: 6%

- Camera phones used for unexpected photo opportunities
- DSC and DVC used for birthday parties, weddings, graduations, etc.
- Low-end and single-use DSC and DVC products will be most affected

Home Entertainment Hardware: Four Models Evolving

Games Console

Sony
Microsoft
Nintendo

DVD Recorder + HDD

Panasonic, Toshiba, Hitachi, JVC, Philips, Sony

Media PC

Gateway, HP, Dell, Toshiba, Sony, Microsoft, Apple (?)

Digital STB

Motorola, Scientific Atlanta (Cisco), Philips, TiVo, LG, Thomson, Sony

Home Entertainment Hardware: Four Models Evolving

Games Console

Most Niche
Gaming first but multimedia functions and broadband access will play a key role in next generation consoles.

DVD Recorder + HDD

Most Traditional Consumer Electronics Equipment **example of the four – wide consumer appeal, cost competitive. Cost, brand, features & ease of use define value.**

Media PC

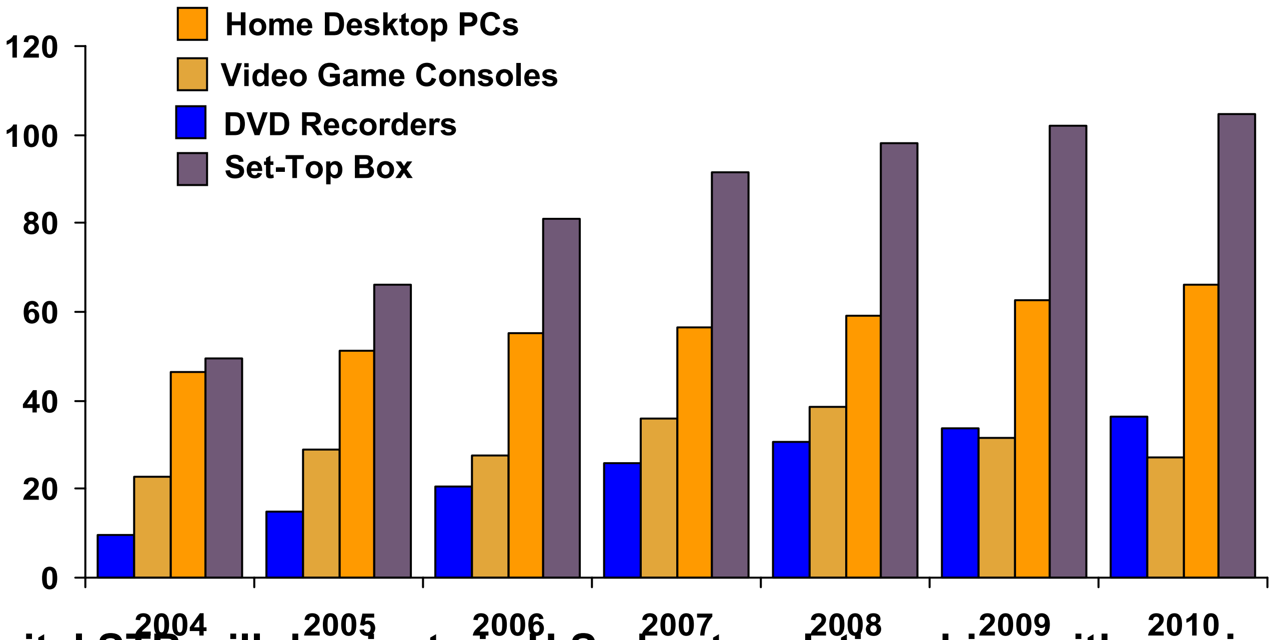
Most Flexible, and Expensive
Highly integrated and compact but reliability and maintenance issues need to be addressed.

Digital STB

Most Budget-Conscious
Pay TV subscription funds hardware. Service provider cannibalisation concerns limit future functionality.

Home Entertainment Hardware: Unit Production Forecast

Home Entertainment Hardware Unit Production (Millions of Units)



Set Top Boxes
2005: 65.9 million
2010: 104.7 million

Video Game Consoles
2005: 29.0 million
2010: 27.4 million

DVD Recorders
2005: 15.0 Million
2010: 36.5 Million

- Digital STB will dominate in U.S. due to relationships with service providers
- DVD Recorder with HDD will dominate in Europe and Japan
- Game Consoles will have limited success as media hubs and market will continue to b
cyclical based on new console introductions.
- Media PCs will evolve into media repositories for personal content

Conclusions

- Consumer System on Chip solutions must focus on configurable core designs and modular software to compete.
- The emergence of the consumer platform will benefi[t] large scale chip manufacturers.
- Mobile devices will have limited impact on stand-alone consumer electronics equipment.
- DVD Recorders +HDD and digital STBs will dominate in the living room.

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