



Taiwan + China Semiconductor Outlook

January 12, 2006

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Broadcom Corporation

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Agenda

- **Who is Broadcom?**
- **Taiwan + China**
 - Design and development
 - Manufacturing
 - End markets
- **Staying ahead: technology leadership**



Who is Broadcom?

About Broadcom

- **Founded in 1991**
- **Initial public offering on April 1998 (NASDAQ-BRCM)**
- **Leading company focused exclusively on semiconductors for broadband communications**
- **2004 revenue of \$2.4 billion up 49% year-over-year**
- **Q3 2005 revenue \$695 million**
 - **Record revenue and up nearly 15% sequentially**
- **Currently 4,002 employees worldwide – 2/3 of employees in Engineering**
 - **\$695,000 annualized revenue per employee**
- **Proven leadership expertise in mixed-signal and CMOS RF technologies, full-custom processor and DSP design and state-of-the-art system-on-a-chip (SoC) implementation**



Market Leadership Positions

Current Markets

802.11x/Wi-Fi®



Cable/Satellite STB
Cable Modems



Fast and Gigabit
Ethernet Switches



Gigabit Ethernet
Controllers



Emerging Markets

HDTV



Bluetooth®



XDSL



Mobile



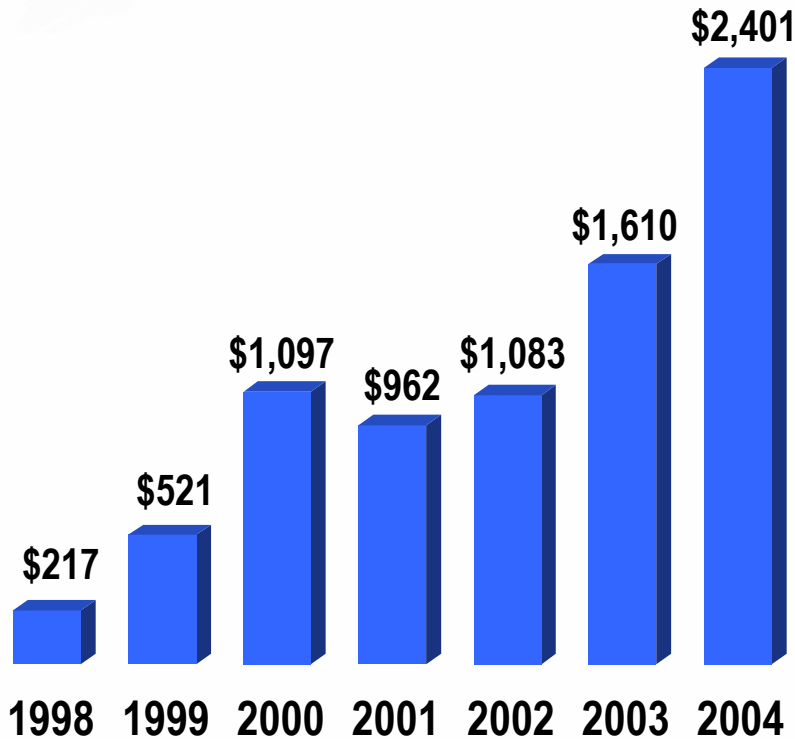
2nd Largest Fabless Semiconductor Company

1. Qualcomm	\$3,224
2. Broadcom Corporation	\$2,401
3. ATI	\$2,141
4. Nvidia	\$2,010
5. SanDisk	\$1,777
6. Xilinx	\$1,589
7. MediaTek	\$1,252
8. Marvell	\$1,224

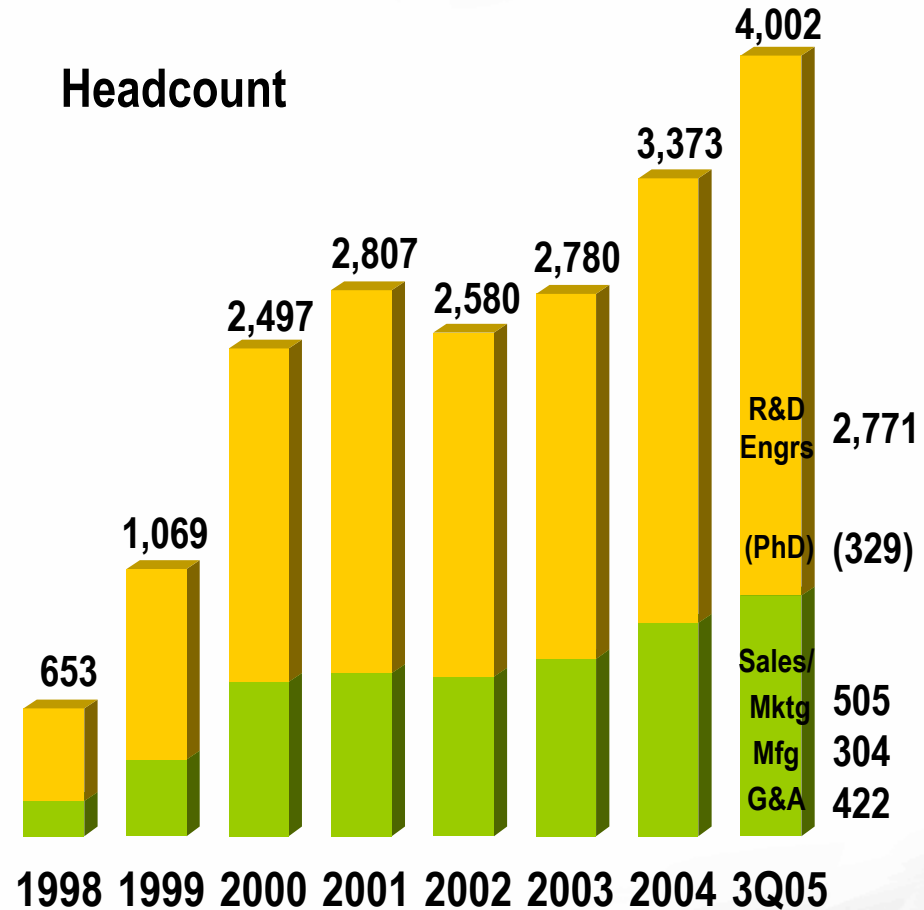
Source: FSA, August 2005

Annual Revenue and Headcount

Revenue (\$M)



Headcount



Record Year 49% Growth

2/3 of Employees are Engineering

Broadcom's Global Presence



- Sales / Marketing
- Design Centers
- Manufacturing
- Representative Offices

BROADCOM PROPRIETARY & CONFIDENTIAL



Taiwan and China

- Design and development
 - Manufacturing
 - End markets



Taiwan Design Center, Sponsored by MOEA (Ministry Of Economic Affairs)

Dr. Henry Samueli and Taiwan Government Vice President Ms. Lu Announcement of BRCM Taiwan Design Center

加強 SoC 研發 Broadcom 在台設立中心

【本報訊】Broadcom(博通公司)近日在台宣布成立「Broadcom 台灣 Network SoC 研發中心」，未來主要研發力向為 Gigabit Switch SoC、Broadband Router SoC、Multimedia Gateway SoC 等，促使台灣半導體產業逐漸轉型，並早日落實台灣成為亞洲區 SoC 研發重鎮之願景。

Broadcom 董事長 Henry Samueli

隨 Broadcom 全球布局策略，逐漸提升台灣成為全球網路 SoC 的設計重鎮。

經濟部技術處處長黃世傑表示，Broadcom 熟練通訊領域，此次設立研發中心將承接



副總統呂秀蓮、Broadcom 董事長 Henry Samueli、經濟部技術處處長黃世傑與工研院電通所所長林寶樹一同為 Broadcom 在台設研發中心祝賀。



IC 產業必將合併

IC 產業必將合併



Broadcom to expand SoC research; tripple engineers by 2006

Reuters

Ericsson, Broadcom to set up Taiwan R&D centres

Reuters

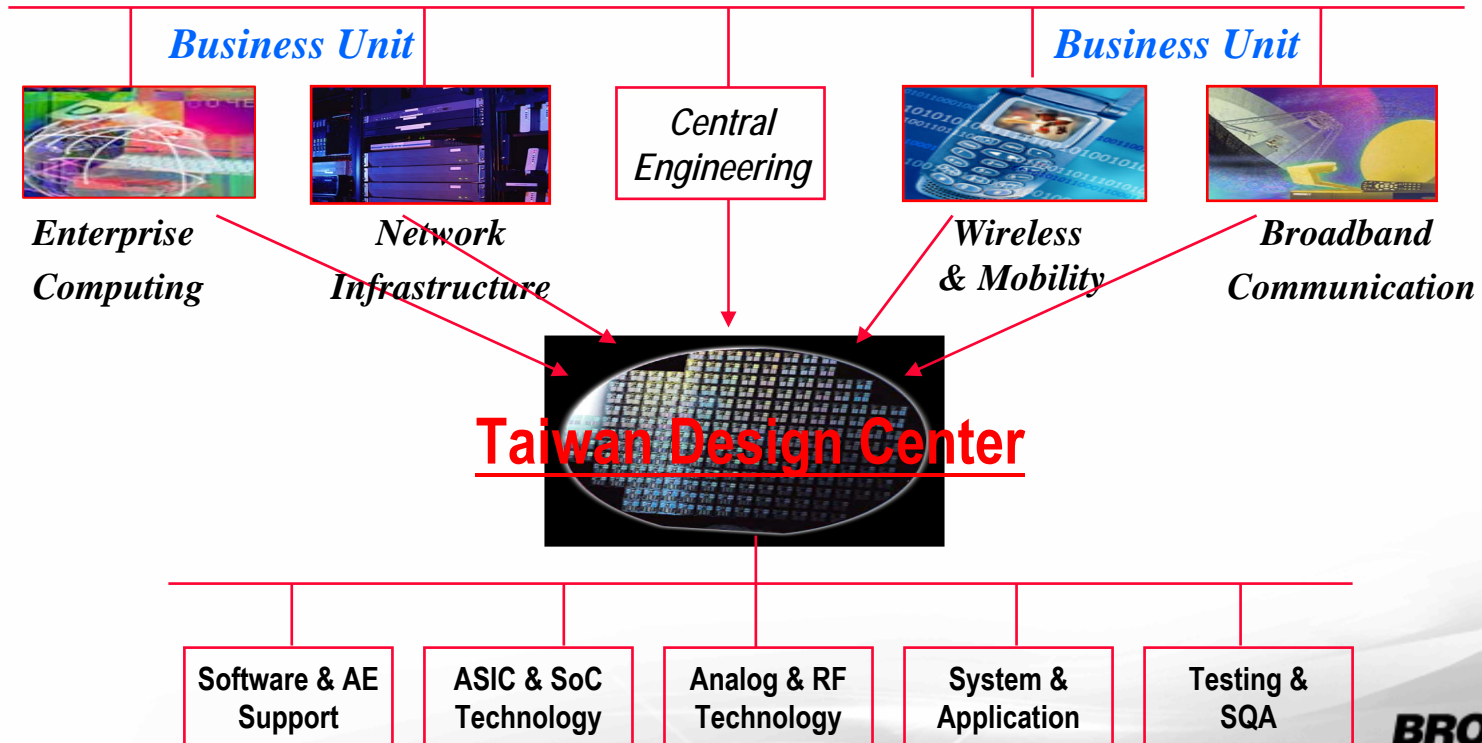
TUPE, Co. (Taipei) - Swedish telecoms equipment maker Ericsson (ERICSS) and U.S. semiconductor design Broadcom Corp. (Broadcom) - people's input deals with

Broadcom Taiwan Design Center

CEO



CTO



Taiwan Design Center



Broadcom Taiwan Design Center

- From 30 to 120 engineers in 3 years
- Cooperation with research and academic institutions: ITRI, National Chiao Tung University, National Taiwan University
- Support for Asia product requirements and customers



2008.1.1-18

本期刊目
封面故事
新聞專區
深度報導
生活觀察

訂閱電子報

訂閱 取消

原標題
數位時代雜誌
經理人周刊
最新出版
雜誌書

零離職，且超賺錢的Broadcom台灣研發中心

位於新竹的矽谷級研發中心，與中國設立研發中心，但全球第二大IC設計公司Broadcom是設在國外最大的晶片設計中心，而且還在一年內就交出兩個超額亮麗的成績單：無人才、無離職。

《數位時代雜誌》第87期



二〇〇八年十一月，許多矽谷級研發中心大舉進駐（Broadcom）與華爾街山姆特（Henry Samueli）親自合夥，竹南廣設全球最大以外廠的SoC「SoC」研發中心，並計畫在未來四年內擴充，擴增二倍的人手。

一年過去，這個規模最大、與加州這座系統晶片研發重鎮的台灣研發中心交貨，交出一個亮眼的成績單。自離職一宗外，更順利開發出三款成為Broadcom帶來顯而易見獲利，3位元（Cigabit）交換器晶片就是其此的標本。究竟博通台灣研發中心何以能全球第二大的IC設計廠，帶來如此豐厚的收益？



美商博通留心 員工零離職

華人學心

整合全球資源 打響
在地需求



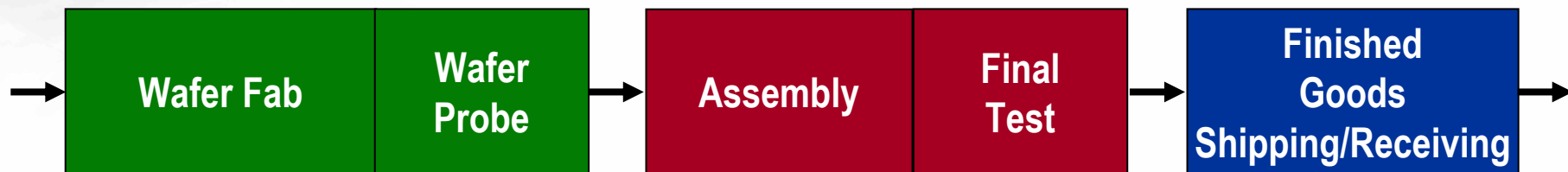
全球SoC的夢工廠
Broadcom台灣研發中心成果斐然



Everything™



Diversified Manufacturing Flow



World Class Manufacturing Partners

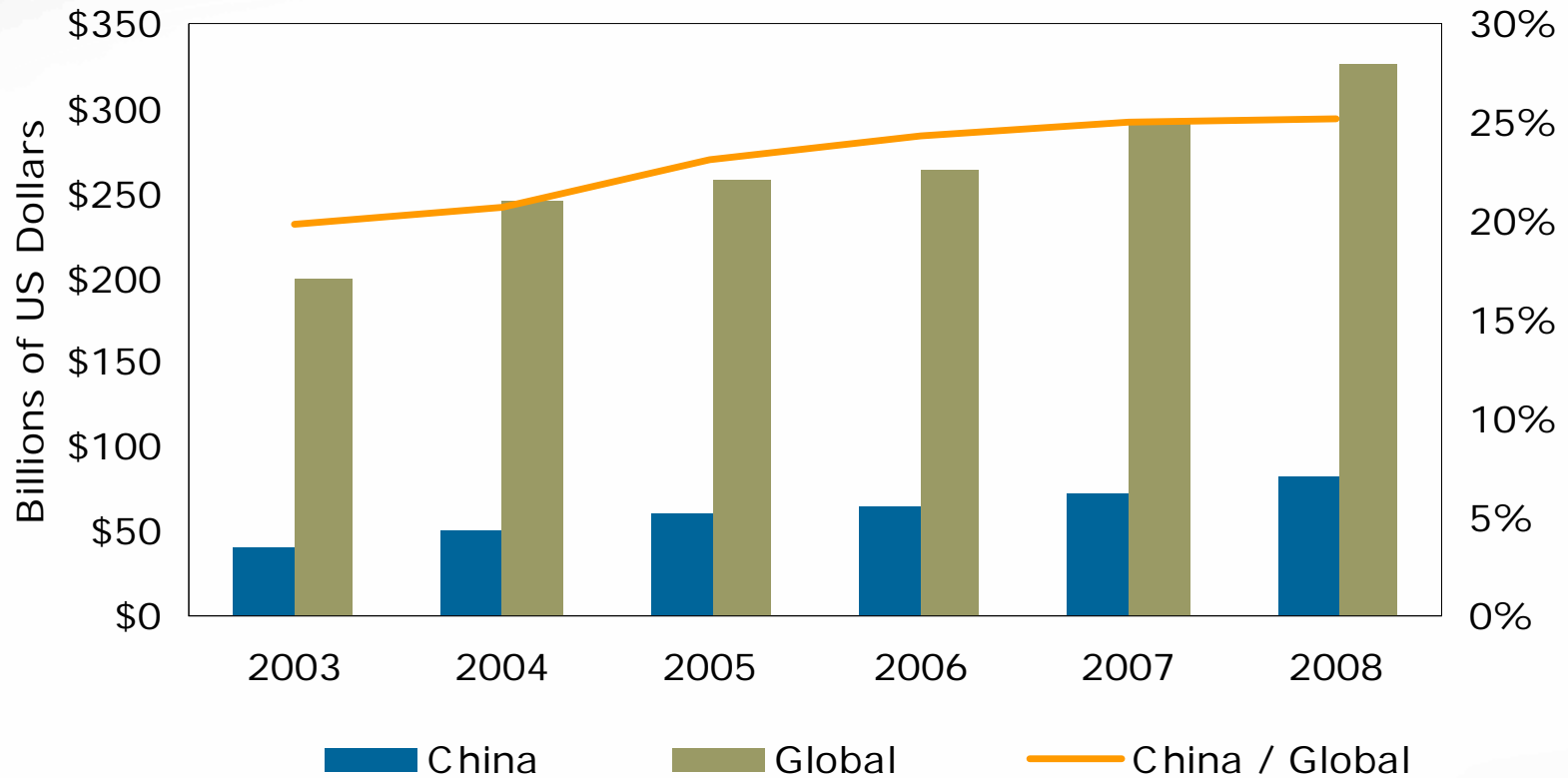
- **Foundry**

- **TSMC** - Taiwan, Singapore (SSMC)
- **Chartered** - Singapore
- **UMC** - Taiwan, Singapore
- **Silterra** - Malaysia
- **SMIC** - China

- **Assembly & Final Test**

- **STATSChipPAC** - Singapore, China, Korea & Malaysia
- **ASAT** - Hong Kong, China
- **AMKOR** - Korea, Philippines & China
- **Signetics** - Korea
- **SPIL** - Taiwan & China
- **UTAC** - Singapore & China

China Semiconductor Consumption



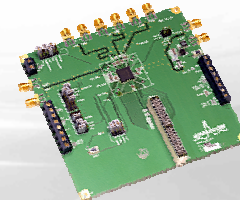
Source – iSuppli Research, February 2005



World Class ODMs and OEMs in Taiwan and China

- Arima
- Bird
- Dasan
- D-Link
- Huawei
- Huawei-3COM
- Konka
- Starnet
- Toplly
- UT Starcom
- Yuhua
- ZTE

- Accton
- Alpha
- Ambit
- Asustek
- Cameo
- Compal
- Delta
- Foxcom
- LiteOn
- Runtop
- Zyxel



Staying Ahead: Technology Leadership

Staying Ahead: Technology Leadership

- **Education and talent pool**
- **Infrastructure**
- **Engineering focus**
- **Innovation**
- **Tackling complexity**
- **Intellectual Property**



World's Broadest Portfolio of Communication IC Intellectual Property

WAN Access	LAN Access	System Interfaces	Chipset Interfaces	Processor Options	Video Functions
GPRS/EDGE/ WCDMA/HSDPA Cellular	10/100/1000 Ethernet PHY	PCI/CB Host/Dev	DDR I/II 200/400 MHz	MIPS 32™ 300 MHz	MPEG-2 Encode/Decode
DOCSIS Cable Modem	10/100/1000/10G Ethernet Switching	USB 1.1, 2.0 Host/Dev	PCI-X 2.0 PCI Express	MIPS 64™ 1 GHz	MPEG-4 AVC Encode/Decode
ADSL VDSL	1/3/6 Gbps SERDES	P-ATA 100 S-ATA I/II	1.6 Gbps Hyper- Transport	ARM 7/9/11 100-300 MHz	HDTV Video Processing
QPSK/8PSK Satellite	802.11a/b/g Radio/BB/MAC	400/800 MHz P1394	12.5 Gbps XAUI	ZSP DSP 150 MHz	2D/3D Graphics
OC-48/192 SONET	802.11n MIMO	GPIO/Flash PCMCIA	10 Gbps SPI-4	TeakLite DSP 150MHz	NTSC Encode/Decode
Terrestrial HDTV/DVB-H	Bluetooth Radio/BB/MAC	1.6 Gbps DVI	Fiber Channel PHY	FirePath™ DSP 400 MHz	Conditional Access/DRM/ Encryption

Analog and RF IP Library

Over 600 Unique Cores Available

Cable Set-Top Box	Cable Modem	Networking	WLAN
IB-AFE for NTSC/QAM IB-AFE for NTSC IF Demodulator AFE Video DAC US DAC + Power Amplifier 3/4RF Modulator Audio CODEC BTSC ADC HiFi Audio DAC OTP Out Of Band Receiver DiSEcQ DS-AFE for Satellite VCXO USB2.0 DVI HDMI Tx & Rx PLL 3rd Overtone Oscillator UHF Remote CMTS Up converter	IB-AFE for QAM Video DAC US DAC + Power Amplifier PLL E-PHY ADC for HeadEnd CMTS Up converter	E-PHY G-PHY FireWire IEEE-1984B USB2.0 SerDes/SGMII S-ATA S-ATA II SATA XAUI/XAUI+/CX-4 PCI-Express SPI-4 HyperTransport Regulator PLL / DLL 64-Channel Charge Sensor LC-based Clock Multiplier	802.11-a AFE 802.11-b AFE 802.11-a/b/g AFE 802.11-n AFE Headset Audio Rx
	Optical		Cellular
	Optical Equalization AFE XAUI OC-48 TXVR OC-192 TXVR XFI TXVR SFI-5 (2.7 Gb/s * 16) SFI-4 (667 Mb/s * 16) 10-G Cu Equalizer SMF-EDC 10-Gb/s MMF-EDC 10-Gb/s	Server/Storage	CODEC for Cellular Baseband for Cellular Power Amplifier Control Power Management Unit GSM Radio Tx Ana GSM Radio Rx Ana uPower DC-DC 32-kHz oscillator Class-D Audio Driver
		1.25 Gb/s SerDes SATA SATA2/SAS1 IMB3 5Gb/s Fiber-Channel PHY HT-2	xDSL
			ADSL-CPE AFE ADSL-CPE LD xDSL AFE VDSL AFE

World Class Software Expertise

Standards, Compliance & Certification:

IEEE, IETF, ITU, ANSI, WECA, CableLabs, KeyLabs, WHQL, UPnP, WME, MPEG, ...

Networking/Security:

LAN, WAN, WLAN, BT
IPv4/IPv6, TCP, ToE,
RDMA, iSCSI, SNMP, UPnP,
Broadsafe, WPA, AES,
Conditional Access, ...

Middleware:

Liberate, OpenTV
NDS, PowerTV,
MSTV, ...

Applications:

Communication Manager,
Diagnostics, Applets
Networking Wizards,
Web Configuration,
XML, Tools

Operating Systems Expertise/Ports:

Microsoft Windows, Windows CE, Linux, VxWorks, eCos, Nucleus, pSOS
PowerTV, uCos, VRTX, Proprietary RTEs, ...

Microprocessors/Compilers:

MIPS, ARM, FirePath, ZSP, X86, ...
Uni and Multiprocessors to 1GHz
Best in breed compiler technology

Drivers/Algorithms:

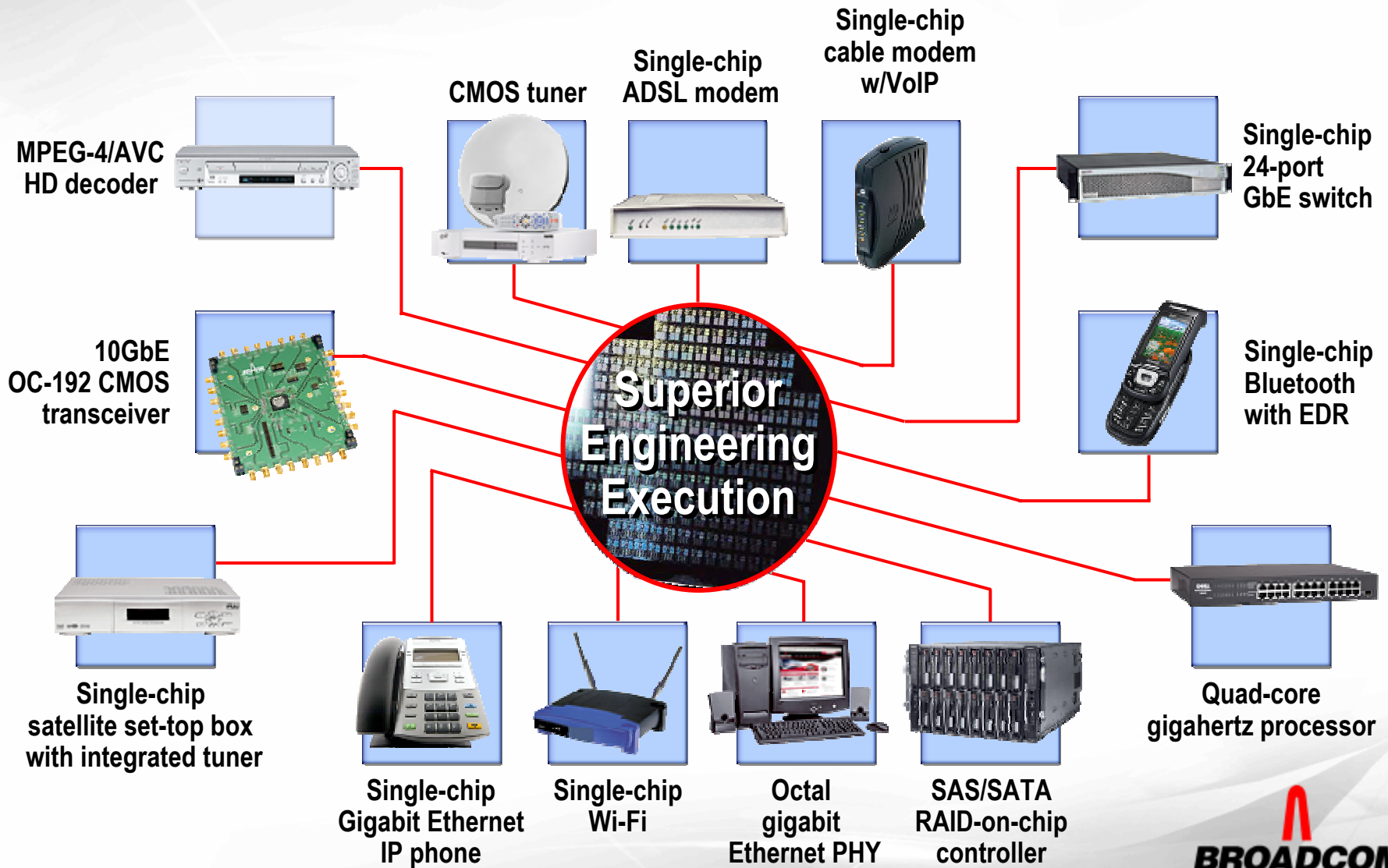
Cable, DSL, Satellite
10/100/1000 Ethernet, 802.11a/b/g,
Bluetooth, GPRS/EDGE, MPEG2/4,
MP3, WMV/WMA, VoIP, 1394, USB, ...

Complexity Is Our Friend

- **Moore's Law still applies**
 - 1 billion transistor SoC's are on the horizon
 - SoC's incorporate high-performance embedded processors, sophisticated DSP engines, millions of gates of random logic, high-density memories, high-precision analog interface circuits and multi-GHz RF transceivers
 - These SoC's require extensive firmware, software and reference design platforms to enable complete systems solutions
- **Need breadth and depth of skills and tools to design systems of such complexity**
 - Digital, mixed signals, analog, RF, software, systems, standards
 - Design methodology, EDA tools, cell and I/O libraries, memory technology, hardware emulation, design verification, software QA



Technology Firsts



Conclusion

- **Taiwan + China will be key to the semiconductor industry in 2006 and beyond**
 - **Design and development resources**
 - **Foundry, assembly and test partners**
 - **Tremendous end market opportunities**

- **Technology leadership requires staying ahead by attracting and retaining the best talent, innovation, intellectual property development, and tackling complexity**



Thank You

