

**Analog Semiconductor Leaders Forum**

**i-Sedex**

**2009-10-16**

# **Status and Strategy of Korea System Semiconductor Industry**

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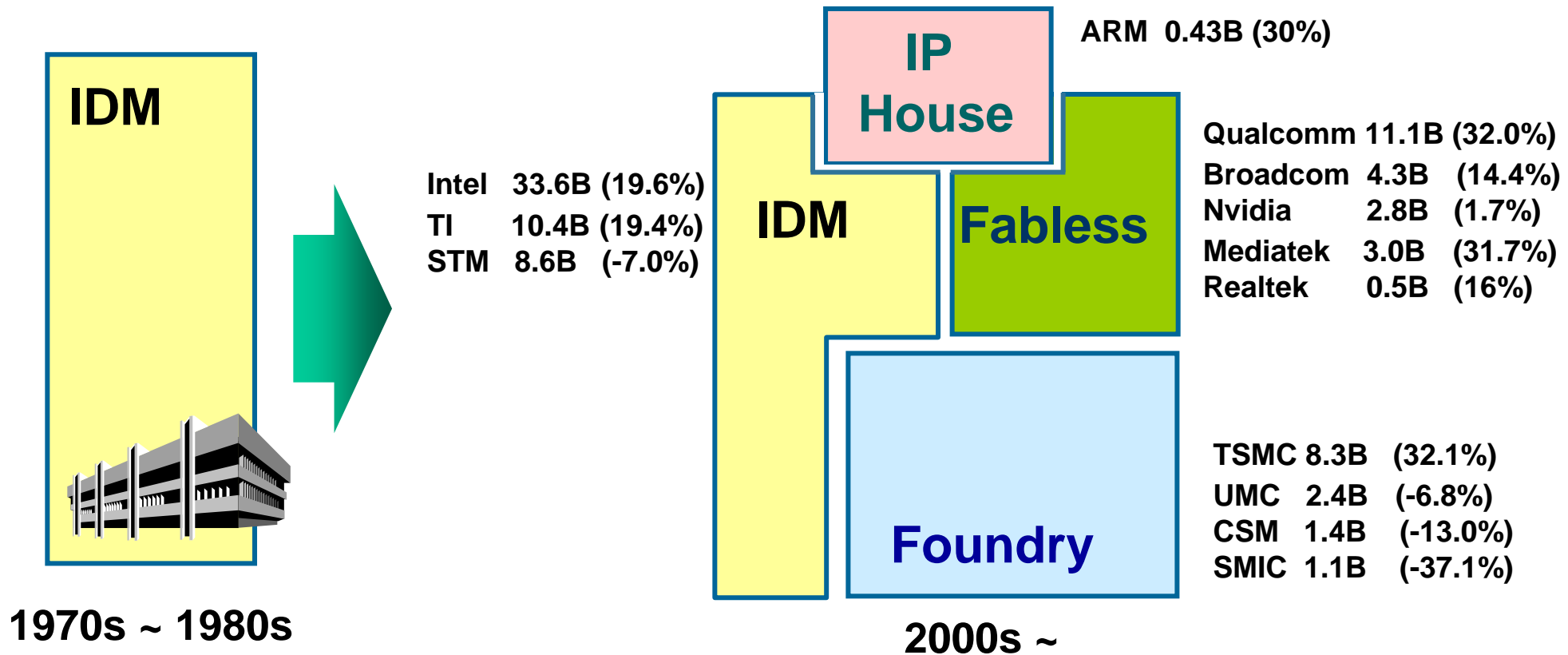
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**Silicon Mitus**

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# Paradigm Shift of Semiconductor Industry

- Vertical to Horizontal structure
- Synergy between pure play foundry and fabless industry
- Investment focus and efficiency => increased industry valuation



Note: The \$ amount is LTM revenue and (%) is LTM EBIT.

# Valuation: IDM vs. Fabless

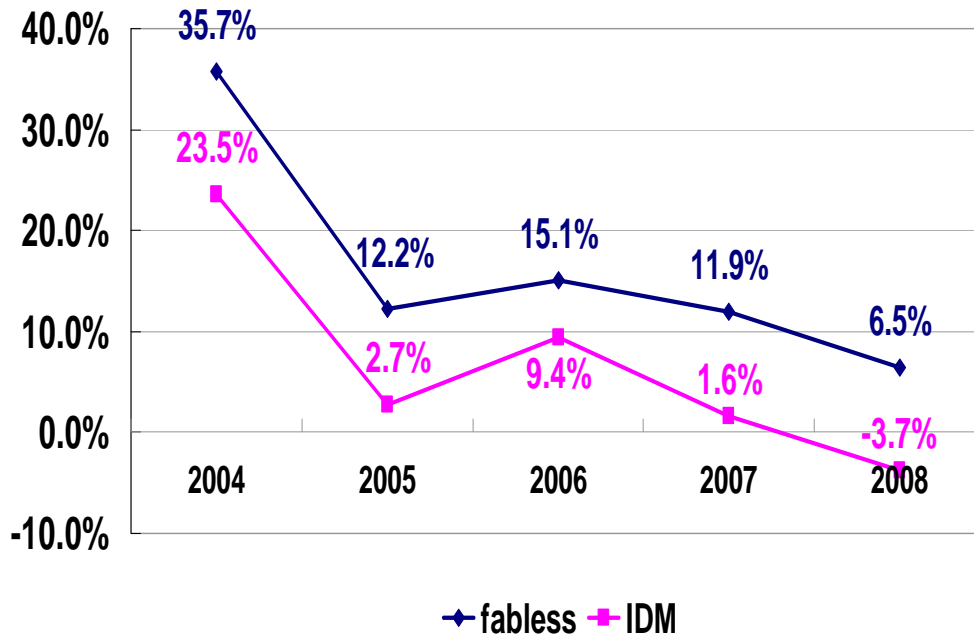
- 1.9x** Diversified: TI2.7, STM1.1, NEC0.3, Renesas, LSI Logic1.3, Infineon0.9  
MPU: Intel2.7, AMD1.5, MicroChip4.8
- 2.1x** PLD: Altera4.4, Xilinx2.9, Actel0.8
- 2.3x** Analog/Mixed Signal/Power  
- IDM: NS3.1, Maxim3.0, Linear6.9, ADI3.3, Intersil2.5, Fairchild1.1, On Semi2.2  
- Fabless: Cirrus1.6, Monolithic4.8, Voltera4.8, Silicon Lab4.7, AATI1.1, Wolfson2.9
- 2.6x** Communications  
- Wireline: Broadcom3.0, Marvell3.7, Conexant1.7  
- Wireless: Qualcomm5.7, Atheros3.2, RF Micro2.0, MediaTek4.5
- 1.4x** Multimedia: nVidia2.8, Omnivision1.0, Realtek1.7
- 4.3x** IP: ARM6.4, MoSys2.7, Rambus13.2
- 1.6x** Memory: Samsung0.8, Hynix2.8, Elpida2.2, Micron2.1, Powerchip2.9, Qimonda
- 3.6x** Foundry: TSMC5.7, UMC4.3, Chartered3.1, SMIC1.8

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Note: Numbers in the above indicates Firm value to LTM revenue ratio, where  $FV = EV + Debt - Cash$ .

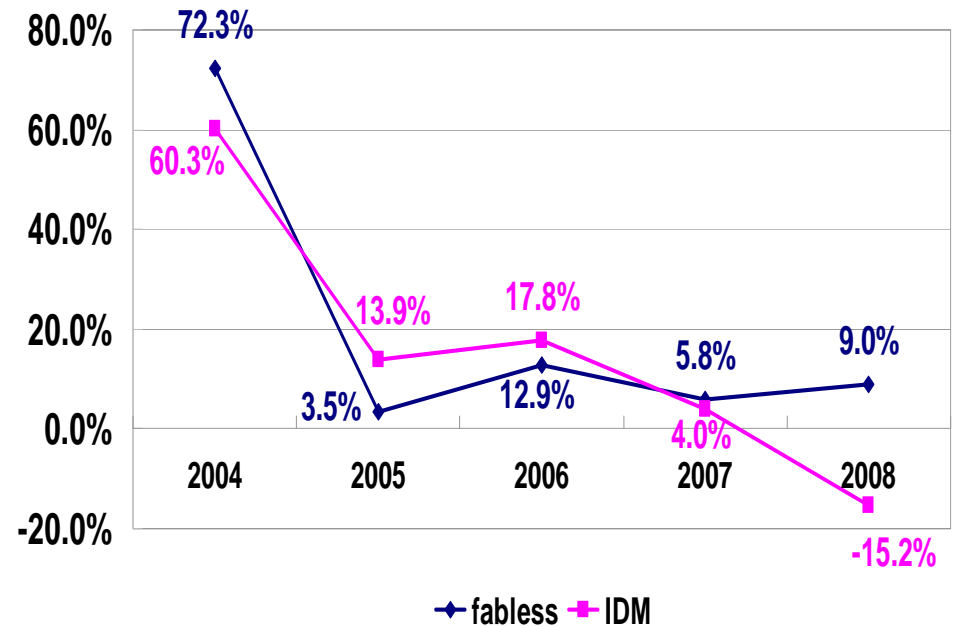
# Industry Growth Rate: IDM vs. Fabless

## Worldwide



Source: iSupply(2008.12)

## Korea



Source: iSupply(2008.12), KSIA(2009.03)

# Korea Semiconductor Industry Position

## Yr 2008

#	Company name	Rev (U\$M)	MS	#	Company name	Rev (U\$M)	MS
1	Intel	34,140	12.8 %	11	AMD	5,910	2.2 %
2	Samsung	17,890	6.7 %	12	NEC	5,861	2.2 %
3	Texas Instruments	11,500	4.3 %	13	Freescale	5,276	2.0 %
4	Toshiba	11,463	4.3 %	14	Broadcom	3,746	1.8 %
5	STMicroelectronics	10,710	4.0 %	15	Panasonic	4,544	1.7 %
6	Renesas Technology	7,863	2.9 %	16	Micron	4,422	1.7 %
7	Sony	7,052	2.6 %	17	NXP	4,374	1.6 %
8	Qualcomm	6,718	2.5 %	18	Elpida	3,851	1.4 %
9	Hynix	6,416	2.4 %	19	Sharp	3,775	1.4 %
10	Infineon	6,313	2.4 %	20	nVidia	3,540	1.3 %

Cum MS of top 20: 62.4 %

Cum MS of top 30: 72.0 %

# Top 10 Fabless Industry Comparison (Yr 2008)

U.S.A.

Taiwan

Korea

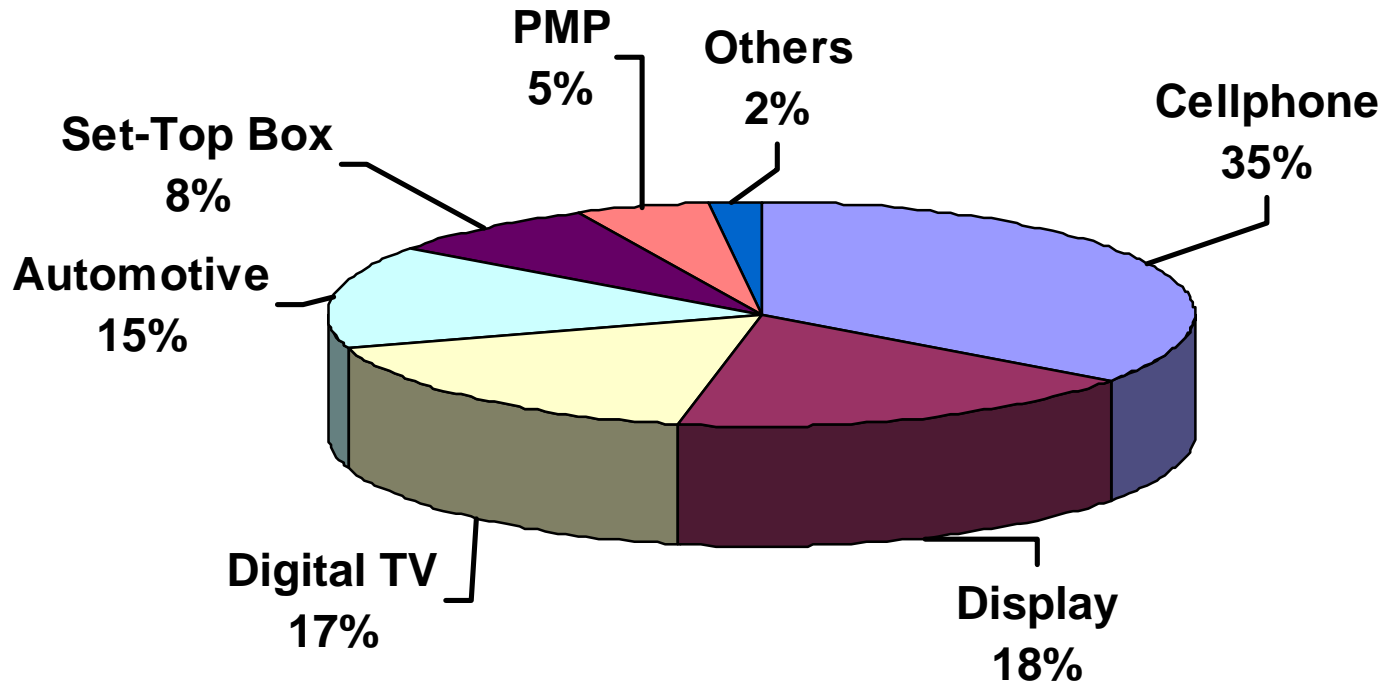
	Company name	Revenue (U\$ M)	Company name	Revenue (U\$ M)	Company name	Revenue (Krw B)
1	Qualcomm	6,718	MediaTek	3,020	MtekVision	164
2	Broadcom	4,736	Novatek	919	Silicon Works	125
3	nVidia	3,450	Himax	908	Core Logic	92
4	Marvell	3,238	Realtek	562	Telechips	89
5	Xilinx	1,927	Via Technology	266	TLI	86
6	LSI Logic	1,838	Etron Technology	259	Fidelix	72
7	Altera	1,402	-	-	Siliconfile	58
8	Omnivision	711	-	-	Dawin Tech	50
9	PMC Sierra	534	-	-	FCI	37
10	Atheros	508	-	-	NeoFidelity	36
	<b>Total</b>	<b>25,062</b>	<b>Total</b>	<b>~ 6,540</b>	<b>Total</b>	<b>809</b>

# Status of Korea Fabless Industry

- About 200 fabless in Korea
- Survey from 45 fabless in 2008:
  - Avg revenue KrW11.7B (2003) => KrW27.4B (2008)
  - Top 10 fabless companies cover 70% of total revenue
  - Total wafer production: 263K (8”), 27K (12”), 4K (6”)
- Strong dependency on Korean local market
- Sustainable growth in question
- No global player yet
  
- Fabless to watch:
  - Silicon Mitus
  - Melfas
  - I&C Technology, Nextchip
  - XRONet
  - MCtech
  - LGE System IC Division
  - Others ...

# Korea Fabless Industry Survey

## Areas of applications with high success possibility?



\*Source: KSIA(2009.03)



# High Volume System Market in Korea

## - Opportunity for fabless and foundry

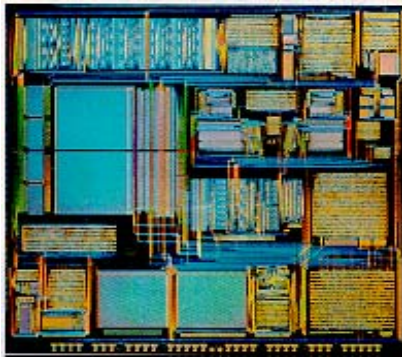
- **Cell phones**
  - Samsung(#2), LG (#3), Pantech
  - More than 300 million units
- **LCD display**
  - Samsung (#1), LG Display(#2)
  - More than 50% WW market share
  - Leading OLED technology
- **DTV**
  - Samsung(#1), LG (#2)
- **Home appliances**
  - LG(#1), Samsung
- **Automotive**
  - Hyundai Motor, 500M cars/year

Note: (#) indicates the worldwide market share ranking.

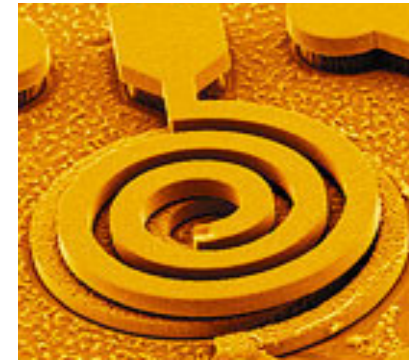
# Semiconductor: Enabler of Technology Convergence

## Applications in IT+BT+NT => New Business Opportunities

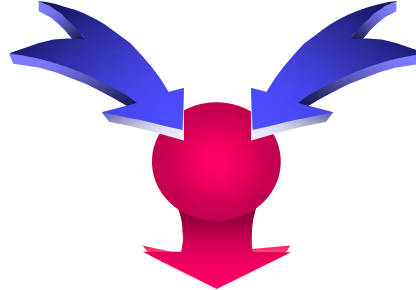
**SOC / NANO**



**MEMS / Sensor / Bio**



**Convergence**



**IT Centric**

**Next Generation Products**

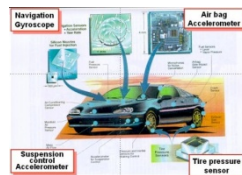
**NT and BT Centric**



**Mobile Handset**



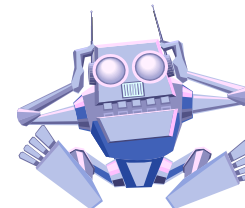
**Home Network**



**Telematics**



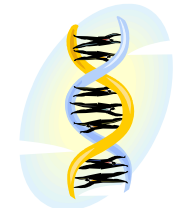
**E-Car**



**Robot**



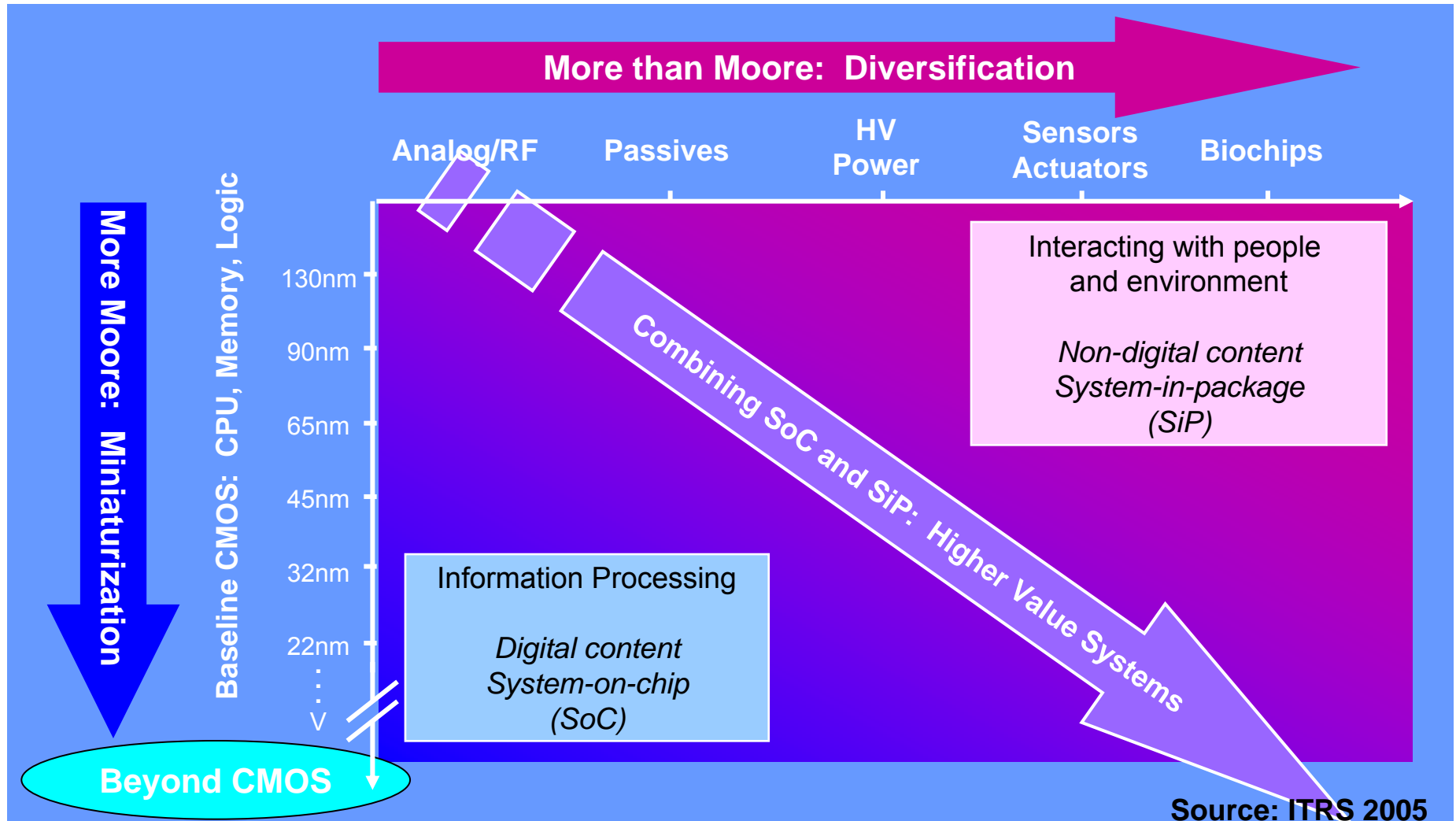
**Health**



**Bio**

# Direction of Semiconductor Development

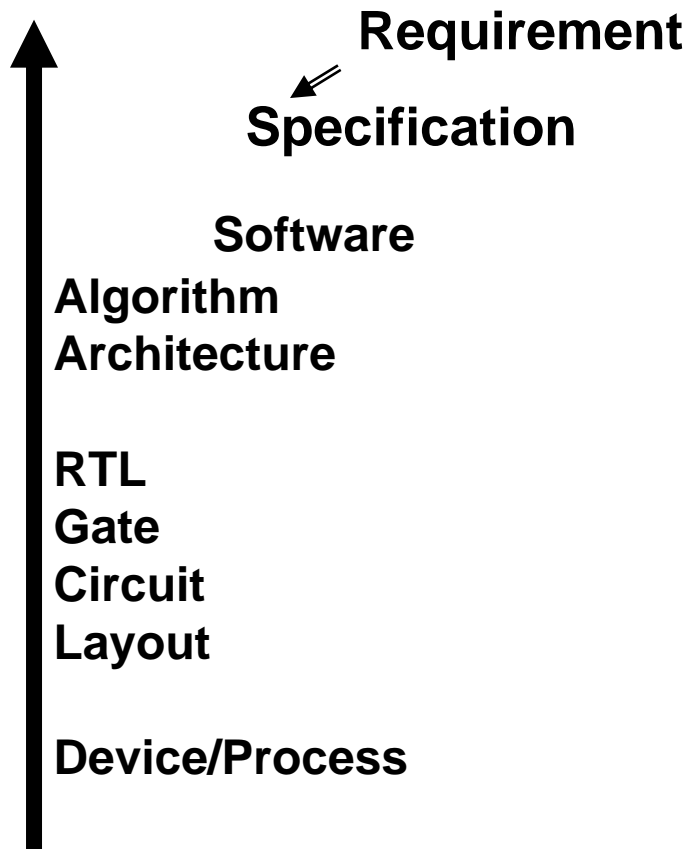
## More Moore vs. More than Moore



Source: ITRS 2005

# Digital vs. Analog

- Digital SoC: ECAD development => High level design => Architect
- Analog design: More experience based, “Art” rather than science



- **Digital SoC**

- => More integration
- => More software
- => Higher NRE due to nano scale
- => Bigger economies of scale

- **Analog IC products**

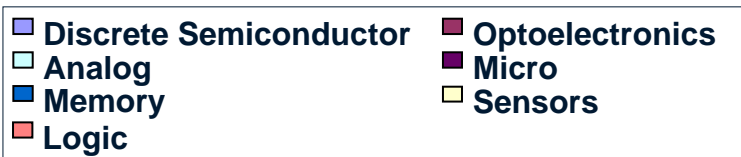
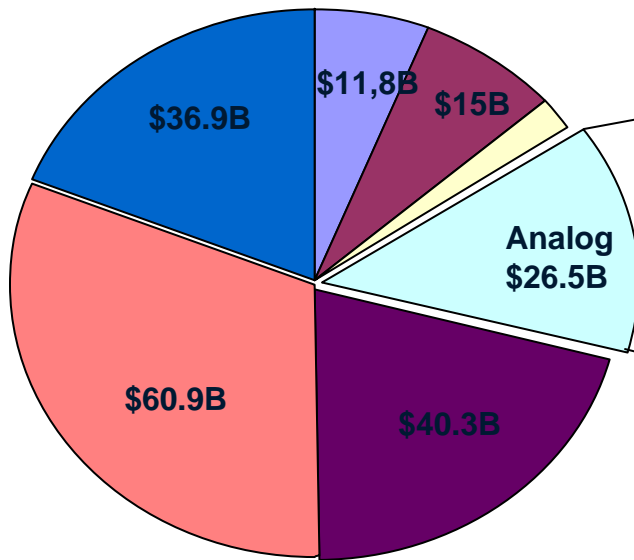
- => Broader applications
- => Toward solution/customization

- ⇒ **Opportunity in Analog**

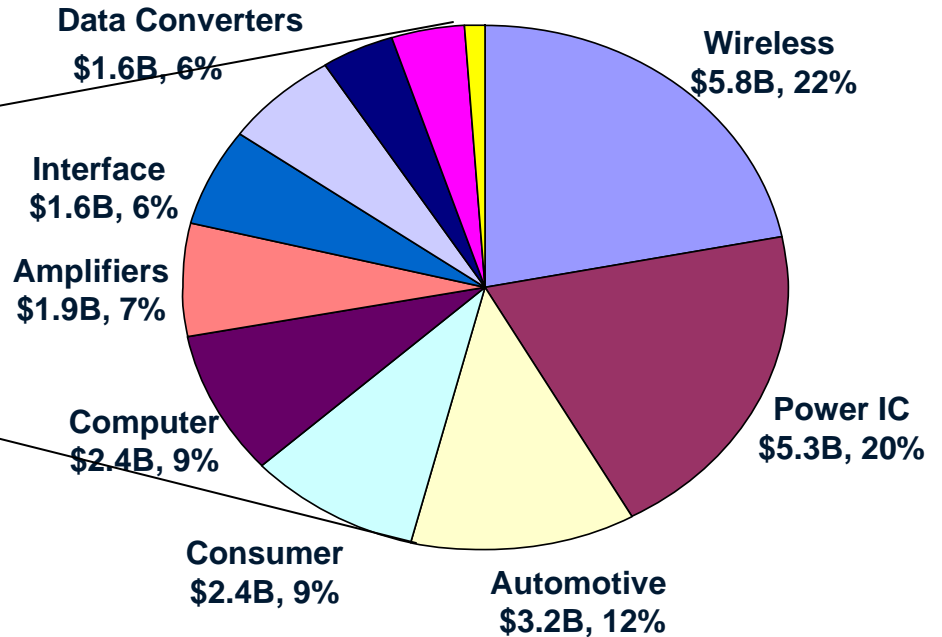
- ⇒ Proximity/engagement with local customers
- ⇒ Responsiveness to customers

# WW Semi Market Status (Yr 2009 Estimated)

**WW Semi Market**  
U\$194B

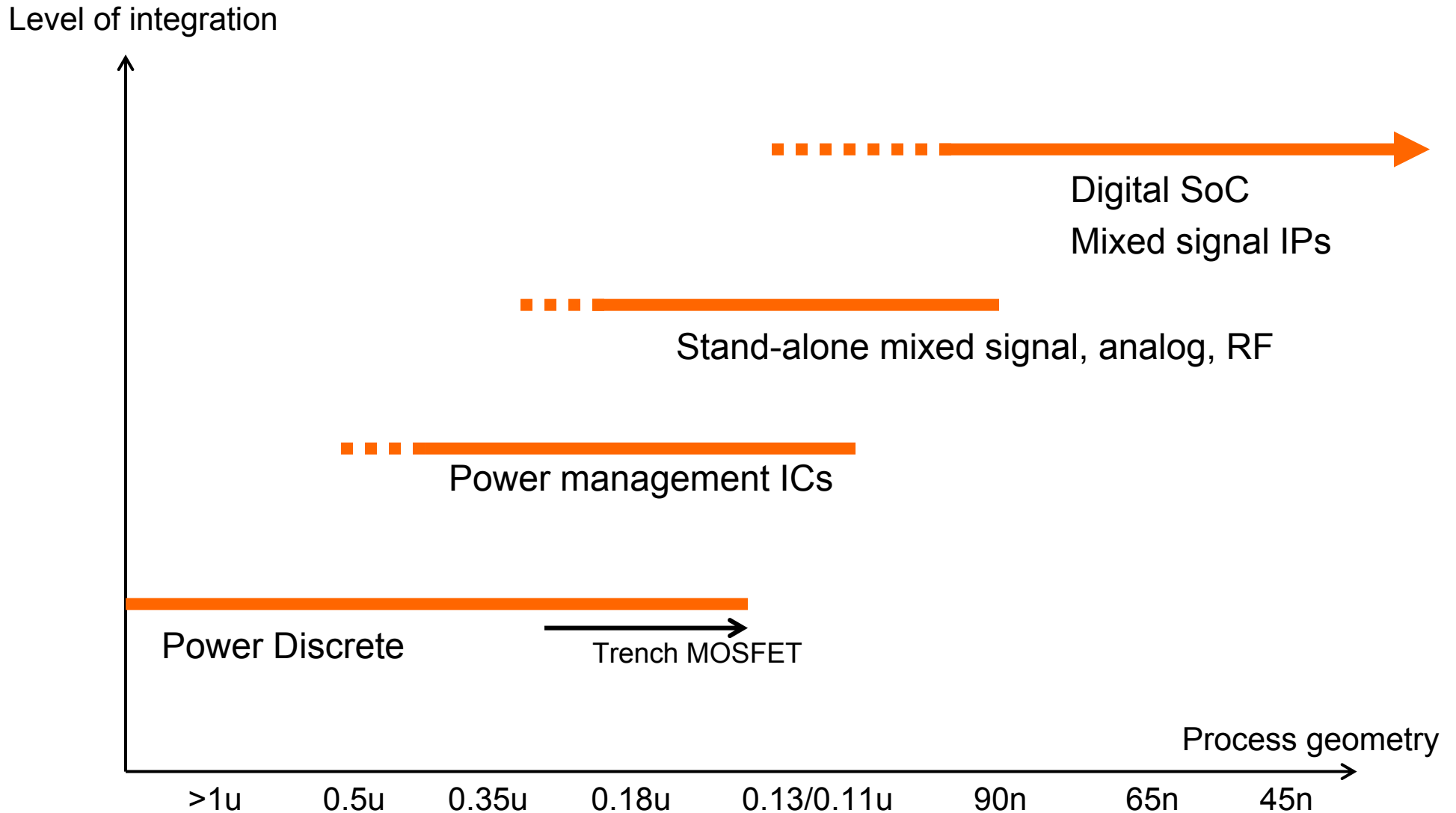


**WW Analog Market**  
U\$26.5B



Source: iSupply, Databeans

# Analog Products and Process Relationship

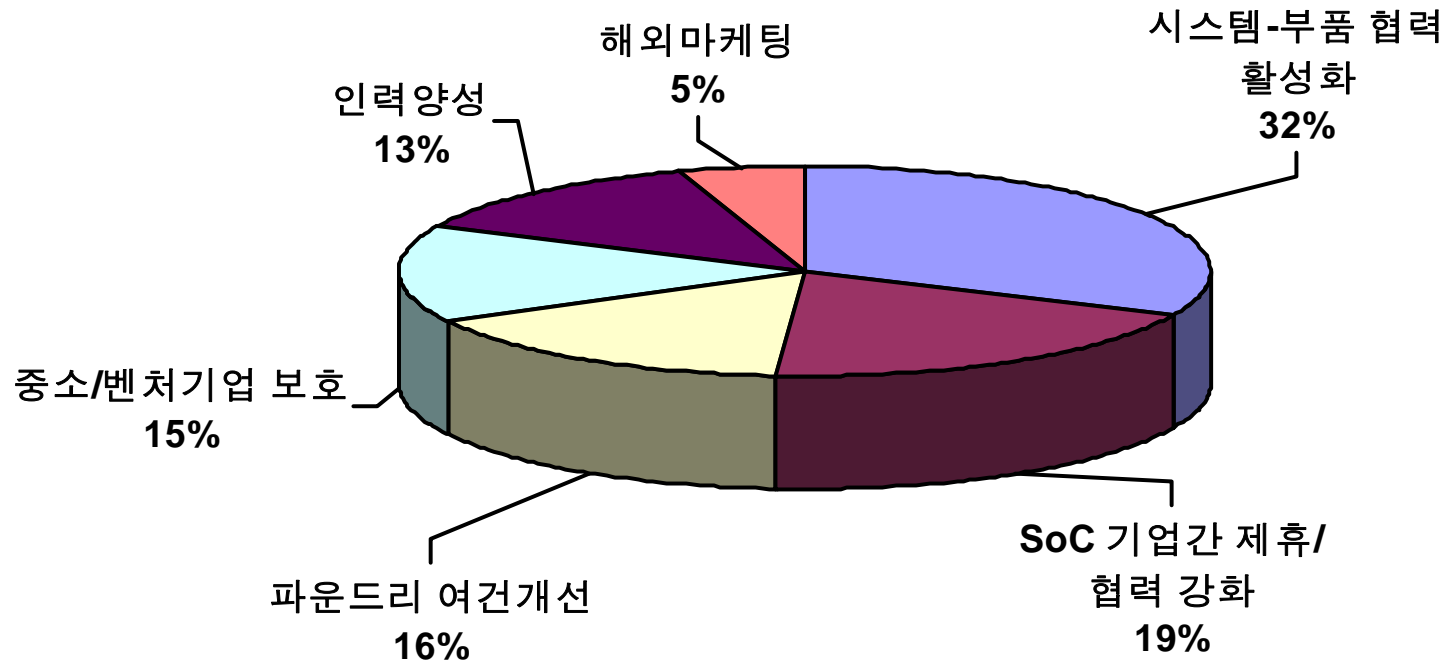


# Rise of Korean Fabless Industry

- **Past 10 year efforts**
  - **Priority on memory**
  - **National Project “System IC 2010” to build the base**
  - **Outcome: current top 10 fabless companies**
- **Shifting the gear for the next 10 years:**
  - **Fabless as a new growth engine after consolidation of memory industry**
  - **National Project “System Semiconductor 2015”**
  - **Synergy between system and semiconductor industry**
- **System - Fabless - Foundry model**
- **Focus-and-focus: Pursue of depth rather than breadth for BoB**
- **Build the echo system for fabless industry**

# Korea Fabless Industry Survey

## What do you need to vitalize the fabless business?



\*Source: KSIA(2009.03)



# Foundry

- **Analog/Power requires:**
  - **Process tuning/optimization/customization and derivative process technologies**
  - **PDK**
  - **IP portfolio**
- **TAT of hot run**
- **Foundry-oriented fab operation**
- **Strategic partnership**
  - **Going thru cycles together**
  - **Commitment to the capacity**

**Thanks**  
**감사합니다**