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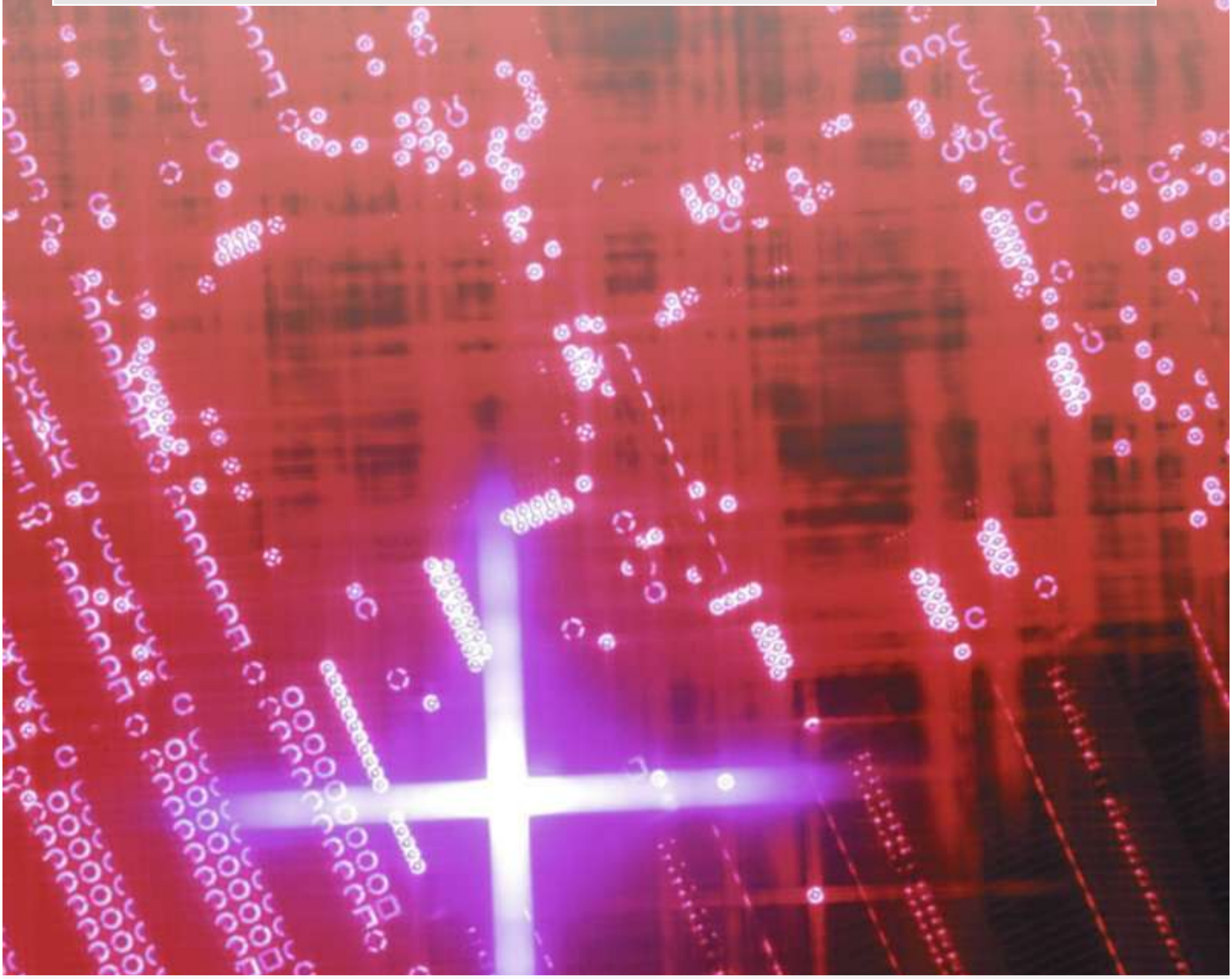
IC Advanced Packaging Industry Report, 2009

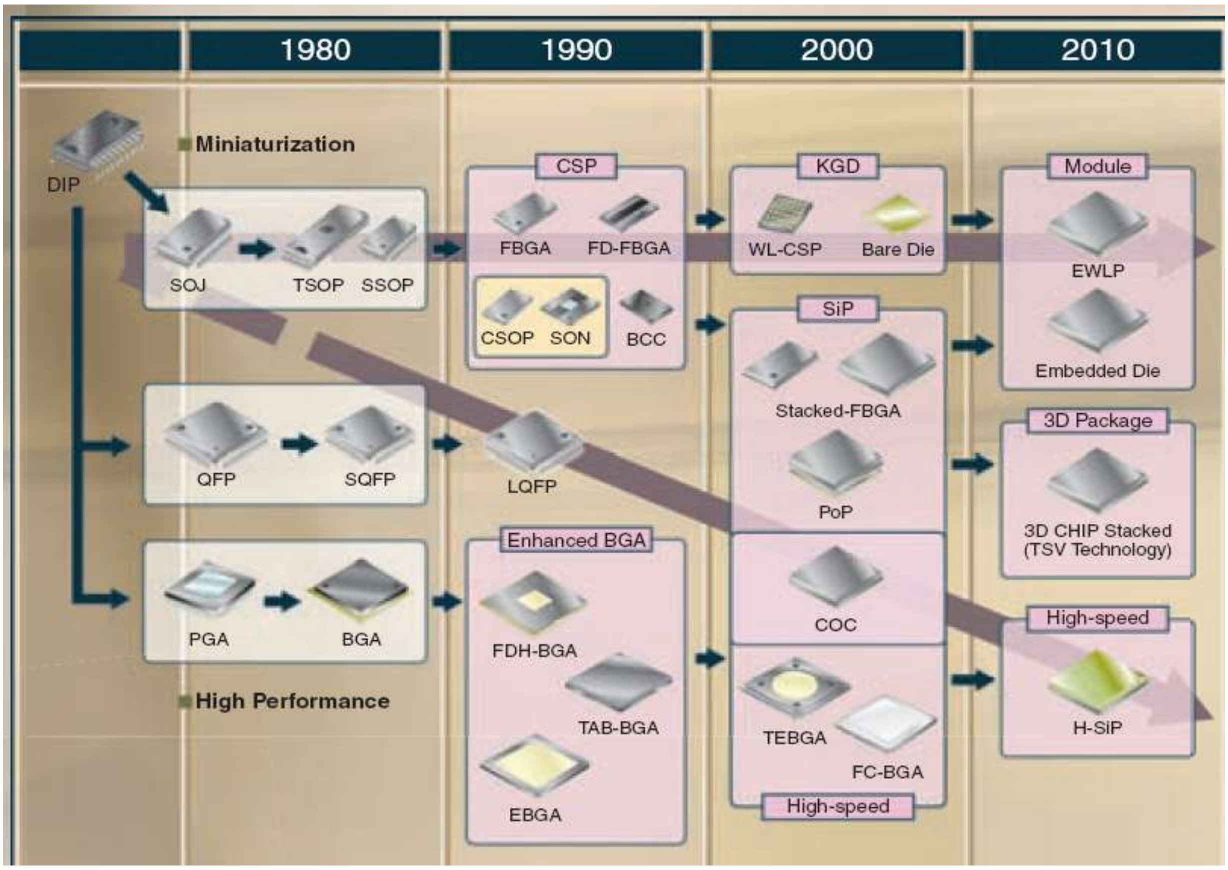
Oct 2009



1.2 IC Packaging Types

In this report, the lead-out wire IC packaging is called advanced packaging.

IC Packaging Development History, 1980-2010



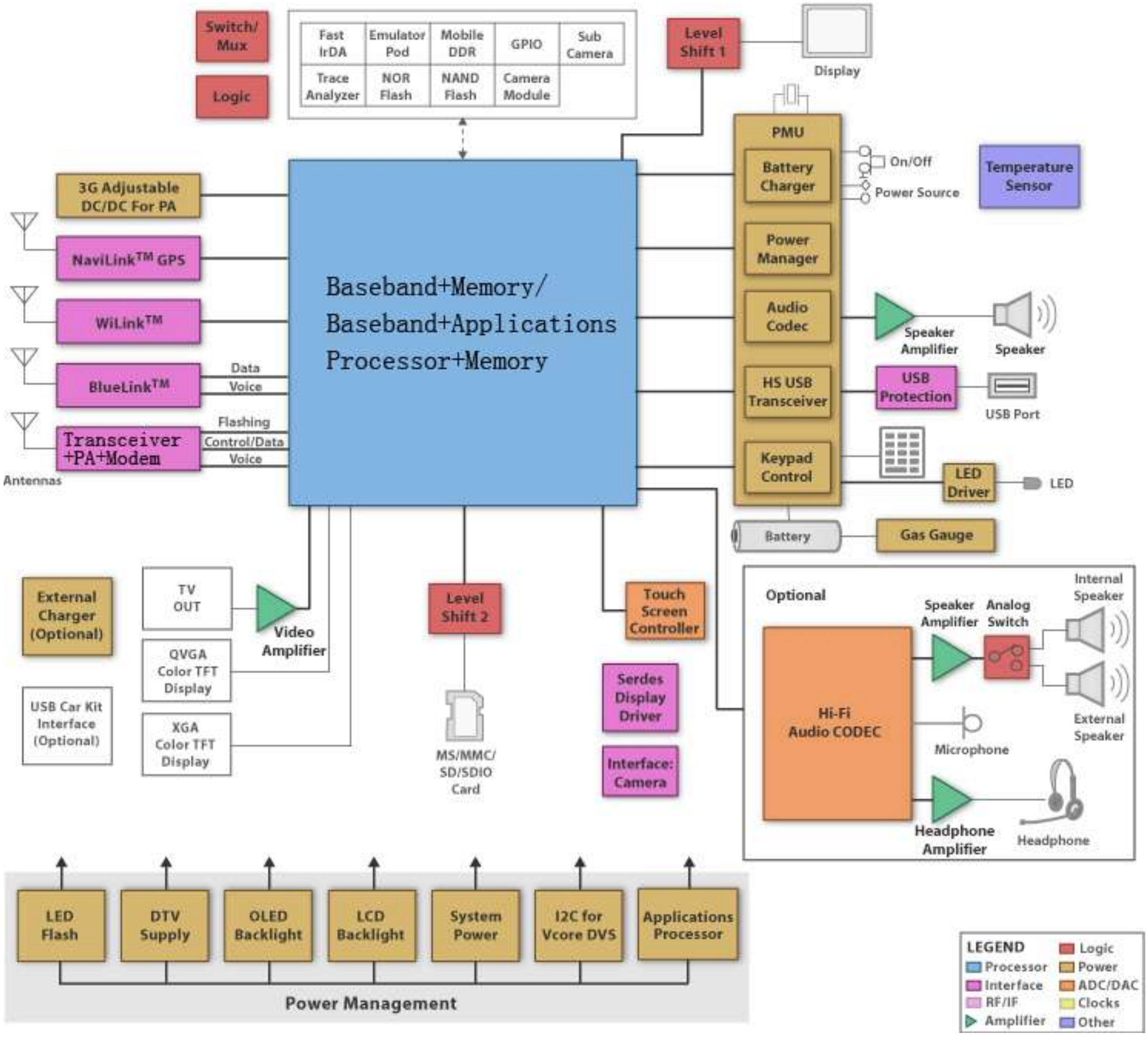
2. IC Advanced Packaging Market

IC advanced packaging market covers mobile phones, memory, PC (CPU, GPU and Chipest), network communication, and consumer electronics. Network communication includes high-speed switches, routers, base stations. Consumer electronics mainly refers to game machines, IPOD, ITOUCH, and high-end PMP.

2.1 Cell Phone IC Advanced Packaging Market

The application and development of mobile phones promote the development of advanced IC packaging. In accordance with performance and functionality of mobile phone IC, a variety of advanced packaging is adopted.

Typical Cell Phone Block Diagram



	2000-2008	2008-2010	2010 Later
Baseband	PBGA	FBGA/FC-CSP	TSV
Applications Processor	PBGA	FBGA	FC-CSP/TSV
Memory	PBGA	FBGA	FC-CSP/TSV
PMU	BGA	BGA	TFBGA
Transceiver	QFN/CSP	QFN/WLCSP	WLCSP
PA	QFN/LGA/COB/MCM	MCM/COB/IPD	COB/IPD
LDO	QFN	QFN	WLCSP
ESD/EMI	QFN	QFN	WLCSP
FM Radio	QFN	QFN	WLCSP
Bluetooth	CSP	WLCSP	WLCSP
WLAN	CSP	WLCSP	WLCSP
GPS	QFN/CSP	WLCSP	WLCSP
TV TUNER	COB/IPD	COB/IPD	COB/IPD
Audio Codec	QFN	QFN	WLCSP
Audio Amplifier	QFN	QFN	WLCSP
SENSOR	MEMS	MEMS	TSV+MEMS

2.2 Cell Phone Baseband Packaging

2.2.1 Cell Phone Baseband Industry

Market Shares of Global Cell Phone Baseband Manufacturers' Shipment, 2007-2009

	TI	Qualcomm	MediaTek	Freescale	Infineon	NXP	STMicroelectronics	Others
2007	39.3%	23.9%	9.3%	8.2%	6.5%	5.5%	1.2%	3.0%
2008	32%	26.4%	11.4%	8.1%	7.2%	4.6%	4.7%	4.0%
2009	24%	28.5%	14.2%	9.1%	9.8%	3.6%	5.0%	5.8%

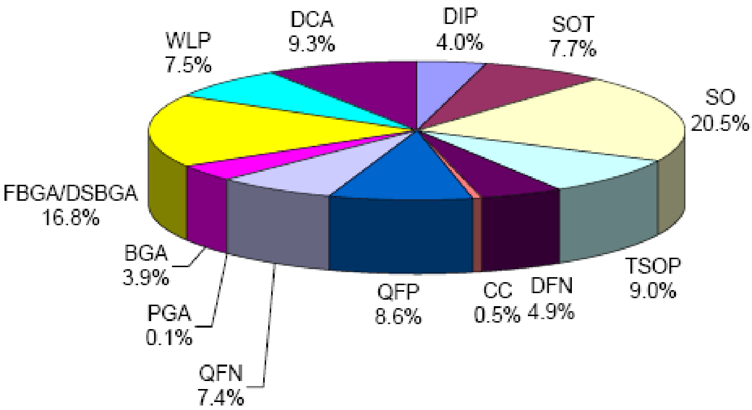
3 Advanced Packaging Industry

3.1 Industry Scale

	2008	2009	2010	2011	2012	2013
Output Value(US$: 100 million)	236	201	223	252	288	316
Proportion of Professional Packaging Manufacturers	32%	38%	39%	42%	45%	50%

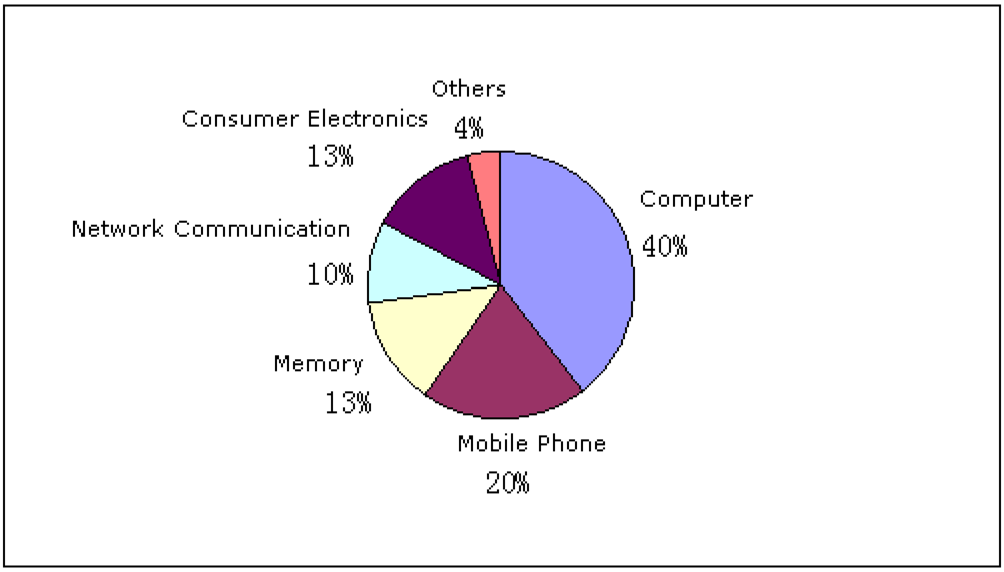
	2008	2009	2010	2011	2012	2013
Output Value(US$: 100 million)	236	211	223	252	268	296
Carrier	81	83	86	95	110	138
SiP+PoP	29	30	35	39	40	41
CSP	30	32	42	48	52	54
Others	96	66	70	70	66	62

Global IC Packaging Shipment by Type, 2012



3.2 Industry Patterns

Downstream Distribution of Global Advanced Packaging Industry, 2009



Market Shares of Main Global Advanced Packaging Manufacturers in Cell Phone Field, 2009

Kinsus	ASE	AMKOR	SPIL	PPt	StatsChipPAC	SEMCO	Others
25%	16%	14%	9%	7%	13%	10%	6%

4.10 Kinsus

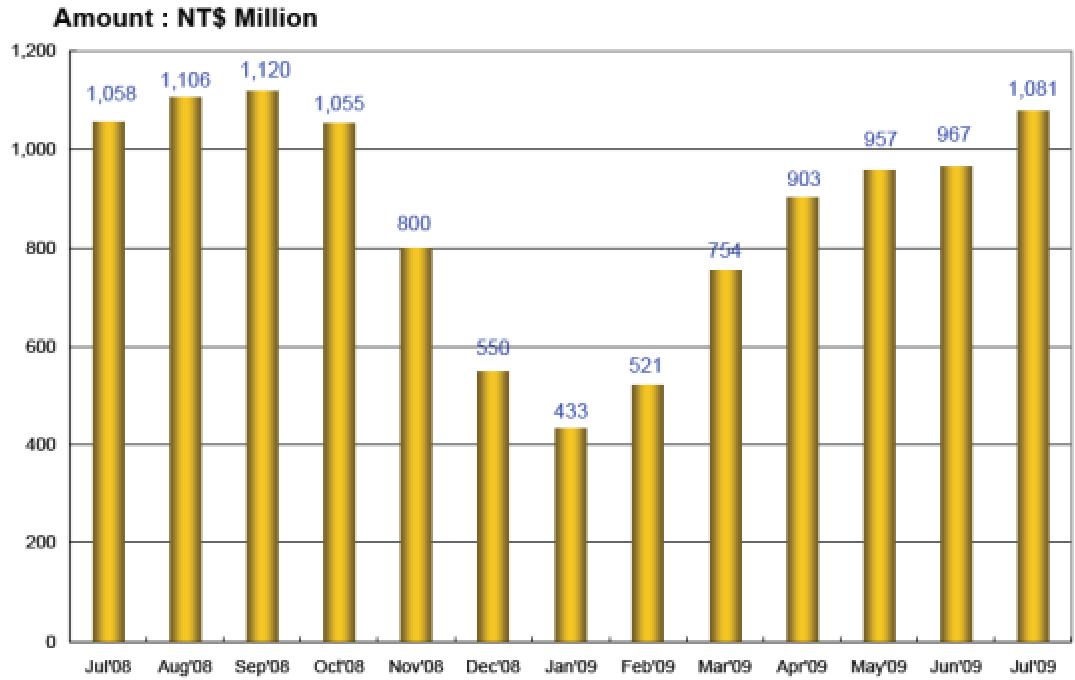
Kinsus was established in Sep 2000 and located at Shinwu Township, Tao yuan County. Its current paid-in capital has reached NTD2.898 billion. And its major shareholders are Asustek Computer, Quanta Computer, Nien Hsing Textile, etc.

Kinsus Revenue and Gross Profit Margin, 2001-2010E

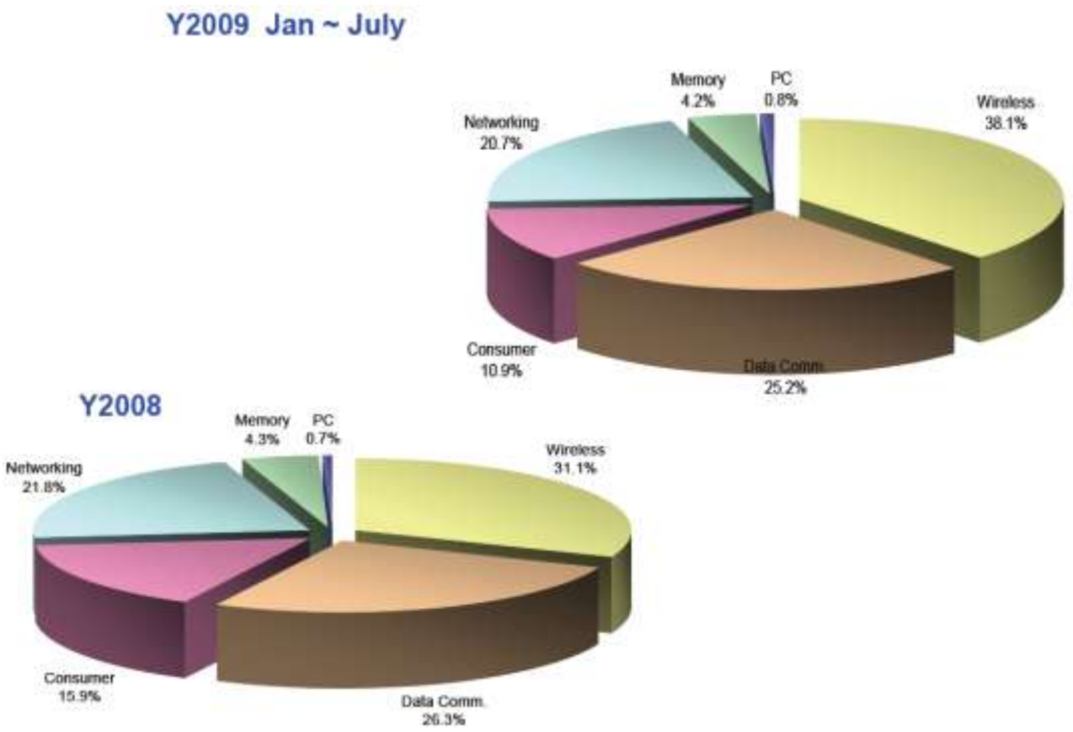
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Revenue （100 mln NTD）	1.16	9.75	21.55	46.34	66.36	119.14	129.89	122.15	109.51	131.33
Gross Profit Margin	15.95%	29.63%	38.7%	38.39%	35.01%	40.9%	37.1%	28. 5%	26.1%	27.7%

The company's revenue increased over 100 times within five years. Moreover, its gross profit margin also rose with the increase of revenue, showing the company's strong profitability. The merger between Kinsus and FLEXIUM Interconnect, Inc in Mar 2005 was one of the causes of the company's large growth of revenue.

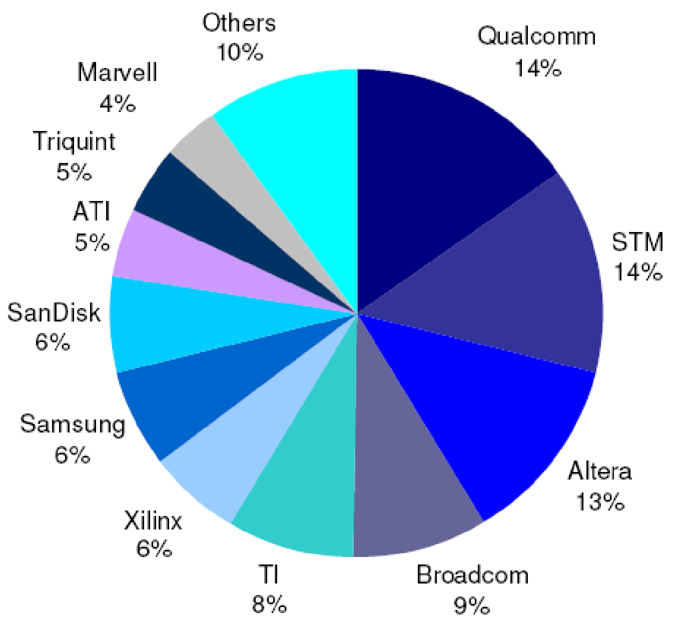
Kinsus Revenue, Jul, 2008-Jul, 2009



Downstream Application Ratio of Kinsus Products, Jan-Jul, 2009



Ratios of Main Clients to Kinsus Revenue, 2007H1



Kinsus Products by Technology, 2007-2009E

	2007	2008	2009
FC-CSP	10	14	25
WB-CSP	37	32	28
SiP/MCM	20	15	11
Bulid-upBGA	1	3	1
Standrad PBGA	10	7	9
HDI PBGA	7	6	8
EBGA	3	3	2
FC(BT)	6	7	7
FC (ABF)	4	6	7
COF	2	1	2
Others	4	7	3

PBGA-STD and PBGA-HDI of Kinsus are mainly applied in mobile phone, wireless network, digital photographing, and LAPTOP PC, the major application fields of other products are as follows: Cavitdown (NB, PDA, communication, wireless network, DSP, etc), SIP (MEMORY, CPU, communication), CSP (Mobile phone, NB, PC, PDA) and BT FC (3D graphics chip, PLD/FPGA).

Flip-Chip of Kinsus takes BT as its material, which is harder than ABF. Generally, the service life of ABF FC is 3 years, while that of BT FC is 5 years more. Currently, BT FC of the company is mainly applied in PLD/FPGA and FPGA.

Qualcomm is the biggest client of Kinsus. And Qualcomm has a dominant position in the 3G field. With the rapid development of 3G, the chip shipment of Qualcomm will rapidly grow, which will boost the revenue rise of Kinsus. Kinsus is adept at FC-CSP, which will be the packaging form of BB used by new-typed smart phones and ultra-thin mobile phones and 4-5 times more expensive than WB CSP in terms of price, and whose gross profit margin is about 50%. Only Kinsus and IBIDEN are capable of providing FC-CSP. In 2008, FC-CSP contributed 20-30% to the revenue of Kinsus, helping the company’s gross profit margin rise.

Kinsus is the world's 2nd largest Flip Chip Substrate supplier. Due to the appreciation of yen, uncompetitive quoted price of Japanese companies and yield problem faced by the production lines of Korean companies, the orders have obviously shifted to Kinsus. Besides, three telecom companies in Mainland China have started to construct 3G base stations. The gross profit margin of BT substrate is 50%. In the coming three years, BT subtrate will be the steady profit source of Kinsus. The operating revenue of Kinsus in Q2 was NTD2.83 billion, up 66% quarter-on-quarter.

Currently, Kinsus' monthly output of FC substrate is approximately 20 million, taking 25~30% of the company revenue. The company maintained steady shipment to the 3G bases stations in Mainland China, contributing monthly revenue of NTD100-150 million, 10% of the company's total revenue. As its gross profit margin is as high as 50%, it will contribute a lot to the company's profits. Samsung gradually increased Nand Flash output at the end of Q2, so the orders of SiP are expected to grow synchronically. In order to decrease mobile phone chip size and improve the processing speed of chips, the USA mobile phone chip manufacturers continuously changed WB packaging to FC packaging. The world's top three FC substrate suppliers' market shares are as follows: Ibiden 35%, Kinsus 30%, SEMCO 20%. The market concentration is high. Due to the appreciation of yen, uncompetitive quoted price of Japanese companies and yield problem faced by the production lines of Korean companies, the orders have obviously shifted to Kinsus. Besides, three telecom companies in Mainland China have started to construct 3G base stations, whose construction period is 2009-2011. Kinsus is their major supplier of BT substrate, with gross profit margin up to 50%. In the coming three years, BT subtrate will be the steady profit and revenue source of Kinsus.

Mobile phone manufacturers launched many high-end mobile phone models at the end of Q2, whose effects occurred in Q3. It is forecast that the quarterly sales of high-end mobile phone board will grow 20%. Besides, chip manufacturers are enhancing the ratio of FC substrate packaging, the current monthly output of FC substrate of Kinsus has approached 20 million, taking 25~30% of the company revenue. The gross profit margin of FC substrate is better than the company's average level, and its order visibility can extend to Sep. The orders of medium-end mobile phones and medium-high mobile phones in July were equal; the figure in Aug will be larger, rising 10%. The company maintained steady shipment to the 3G bases stations in Mainland China, contributing monthly revenue of NTD100-150 million, 10% of the company's total revenue. As its gross profit margin is as high as 50%, it will contribute a lot to the company's profits. Samsung, a memory manufacturer, gradually increased the capacity utilization ratio of Nand Flash production lines in Q2; its Nand Flash output in Q2 grew 20%. SiP, mainly applied in Nand Flash memory packaging, takes 15% of Kinsus' total revenue. The orders of SiP are expected to grow synchronically. In addition, the capacity utilization ratio of panel manufacturers in Q3 will surpass 80%, and the demand for driver IC packaging substrate will maintain a high level.

In 2008, Qualcomm, a large mobile phone chip manufacturer, adopted FC packaging for its 5% chips, and WB packaging for 95% chips. In order to decrease mobile phone chip size and improve the processing speed of chips, Qualcomm adopted FC packaging for its 20-25% chips, and WB packaging for 75-80% chips. According to Qualcomm's follow-up chip design plans, the ratio of FC packaging will continue rising. In H1 2009, STM, TI, Broadcom still focuses on WB packaging, but they will improve the ratio of FC packaging in H2 2009 as well. As the world's 2nd largest Flip Chip Substrate supplier, Kinsus' clients include Qualcomm, Broadcom, STM and TI thanks to its high product yield and competitive price. According to investment consulting institutions, Kinsus will benefit most under the current trend of the mobile phone substrate industry developing towards FC packaging.

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