

## Industry Flash

11 February 2009 | 11 pages

# Taiwan Semiconductor Supply Chain

## Jan 09: A Bad Start Might Be A Trough Start

- **What's New** — Taiwan Semiconductor and TFT-LCD Supply Chain reports Jan sales of NT\$129bn, -9% mom and -55% yoy. Jan mom decline was worse than the 3-year average of -2% mom due to the reduced number of working days. Jan yoy decline was worse than Dec 08's -50% yoy, suggesting yoy decline will deteriorate, despite our expectations this will reverse starting Feb or Mar 09.
- **Winners and Losers** — Among sub-sectors, memory ICs (+1% mom), fabless (+4% mom), large panel makers (-5% mom), and Nand controllers (+2% mom) outperformed foundry (-14% mom), OSAT (-21% mom), substrate (-40% mom), and consumer ICs (-19% mom).
- **What does OEM/EMS tell us?** — Due to the Chinese Holiday effect, Taiwan OEM/EMS supply chain reported Jan sales of NT\$335.7bn, -23% mom and -28% yoy. Similar to the semi space, Jan mom decline was worse than the 3-year average of -9% mom. Among these, we saw a larger fall on notebooks (-28% mom), wireless LANs (-26% mom), casings (-28% mom), and DSCs (-24% mom).
- **View on Feb/March** — Due to increased working days and selective rush orders, we should see the Taiwan semi, TFT-LCD and OEM/EMS supply chain's mom sales growth and yoy decline decelerate. Inventory adjustment across the supply chain should continue during 1Q09E.

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**Figure 1. Weightings within Pan Asia Semiconductor/TFT Sector and Stock Recommendations**

Subsectors	Weights	TOP Buys	BUYs	HOLDs	SELLs	TOP Sells
Pan Asia Semi						
OSAT	Overweight	SPIL	Powertech	Amkor	ASE	Ardentec
TFT LCD	Neutral		LG Display, AUO		CMO, Sharp	
Fabless	Overweight	MediaTek	Realtek, Novatek		GUC, Ralink, Richtek	
Memory	Neutral	Samsung	Hynix	Elpida, Toshiba	PowerC, Inotera	Nanya Tech
IC substrate	Neutral		Kinsus, Nanya	Shinko, Ibiden	Semco	
Foundries	Neutral	TSMC	Vanguard			UMC, Chartered

Source: Company Reports and CIR Estimates

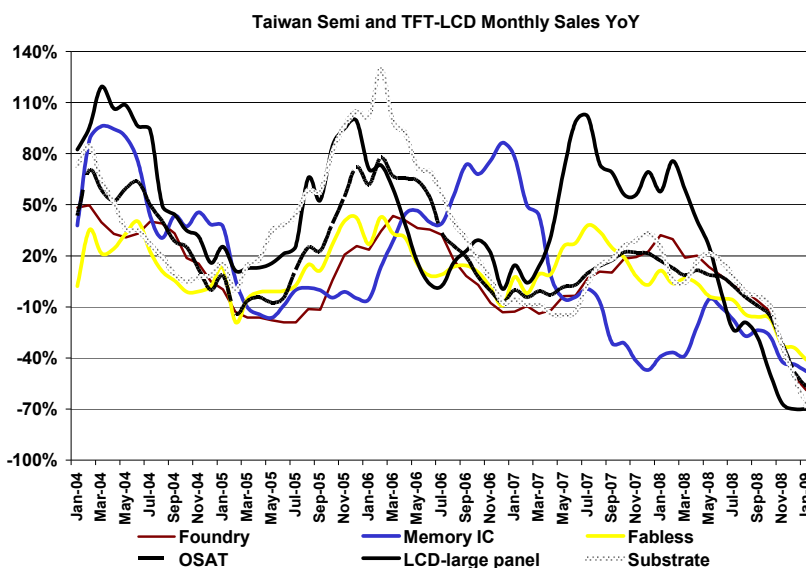
**See Appendix A-1 for Analyst Certification and important disclosures.**

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<sup>1</sup>Citigroup Global Markets Taiwan Securities Co. Limited

Figure 2. Taiwan semi and TFT-LCD supply chain sales YoY (updated to Jan 09)



Source: Company Reports and CIR Estimates

Figure 3. Taiwan Semi Sector Monthly Check (NT Dollars in Billions, Percent)

				MoM %		YoY %			09 Accu	09 YoY
	Nov 08	Dec 08	Jan 09	Nov 08	Dec 08	Nov 08	Dec 08	Jan 09		
Foundry	27.6	19.6	16.7	-29%	-29%	-14%	-34%	-51%	16.7	-59%
Memory IC	16.3	14.6	14.7	-31%	-11%	1%	-42%	-44%	14.7	-48%
Fabless	17.2	13.7	14.2	-29%	-21%	4%	-32%	-34%	14.2	-41%
OSAT	22.0	16.0	12.7	-23%	-27%	-21%	-32%	-48%	12.7	-57%
F.C./Substrate	4.3	3.1	1.8	-25%	-29%	-40%	-33%	-52%	1.8	-68%
LCD-large panel	38.2	30.6	29.1	-37%	-20%	-5%	-67%	-70%	29.1	-70%
LCD-small panel	3.7	3.1	2.6	-33%	-15%	-18%	-41%	-41%	2.6	-52%
LCD IC	2.3	1.5	1.4	-33%	-35%	-9%	-53%	-64%	1.4	-70%
PC chipset	0.6	0.6	0.5	-34%	-6%	-12%	-60%	-54%	0.5	-70%
Networking IC	1.1	0.9	1.1	-35%	-20%	23%	-35%	-27%	1.1	-45%
Consumer IC	2.1	1.5	1.2	-24%	-29%	-19%	-32%	-47%	1.2	-60%
Power mgmt IC	1.1	0.8	0.7	-29%	-31%	-8%	-23%	-40%	0.7	-52%
NAND flash	1.4	1.4	1.4	-18%	-4%	2%	-36%	-10%	1.4	-8%
IC Channel	39.3	41.6	36.7	-23%	6%	-12%	-31%	-21%	36.7	-37%
<b>Non-LCD semi</b>	<b>126</b>	<b>108</b>	<b>97</b>	<b>-26%</b>	<b>-14%</b>	<b>-10%</b>	<b>-34%</b>	<b>-38%</b>	<b>97</b>	<b>-48%</b>
<b>Total sum up</b>	<b>168</b>	<b>142</b>	<b>129</b>	<b>-29%</b>	<b>-16%</b>	<b>-9%</b>	<b>-46%</b>	<b>-50%</b>	<b>129</b>	<b>-55%</b>

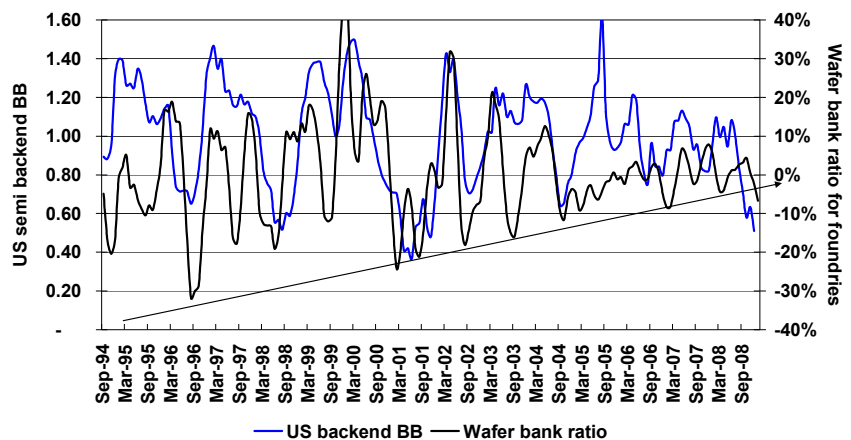
Source: Companies

Figure 4. Taiwan OEM/ODM/Components Check (NT Dollars in Billions, Percent)

Sectors	Nov 08	Dec 08	Jan 09	MoM %			YoY %			09 Accu	09 YoY
				Nov 08	Dec 08	Jan 09	Nov 08	Dec 08	Jan 09		
Motherboard/ Game console	82.2	57.8	<b>49.3</b>	-18%	-30%	<b>-15%</b>	-15%	-28%	<b>-38%</b>	<b>49.3</b>	<b>-38%</b>
Notebook	208.4	180.0	<b>128.9</b>	-19%	-14%	<b>-28%</b>	-2%	-5%	<b>-28%</b>	<b>128.9</b>	<b>-28%</b>
LCD Monitor	6.1	5.6	<b>5.1</b>	14%	-8%	<b>-7%</b>	-28%	-35%	<b>-33%</b>	<b>5.1</b>	<b>-33%</b>
LCD components	1.4	1.2	<b>1.2</b>	-52%	-13%	<b>-2%</b>	-76%	-78%	<b>-79%</b>	<b>1.2</b>	<b>-79%</b>
CD-ROM/DVD	6.1	5.3	<b>4.4</b>	0%	-13%	<b>-16%</b>	-31%	-33%	<b>-45%</b>	<b>4.4</b>	<b>-45%</b>
Networking	4.7	4.4	<b>3.7</b>	-8%	-6%	<b>-18%</b>	-20%	-27%	<b>-30%</b>	<b>3.7</b>	<b>-30%</b>
Broadband	1.2	0.9	<b>0.8</b>	-2%	-24%	<b>-16%</b>	-15%	-29%	<b>-35%</b>	<b>0.8</b>	<b>-35%</b>
Wireless LAN	2.5	2.7	<b>2.0</b>	3%	8%	<b>-26%</b>	20%	24%	<b>-5%</b>	<b>2.0</b>	<b>-5%</b>
Handset Players	57.0	41.8	<b>35.6</b>	1%	-27%	<b>-15%</b>	5%	-10%	<b>-27%</b>	<b>35.6</b>	<b>-27%</b>
DSC players	5.9	3.8	<b>2.9</b>	-25%	-35%	<b>-24%</b>	-28%	-13%	<b>-32%</b>	<b>2.9</b>	<b>-32%</b>
PC Case	2.3	1.9	<b>1.4</b>	-14%	-17%	<b>-28%</b>	-31%	-19%	<b>-46%</b>	<b>1.4</b>	<b>-46%</b>
LED	2.3	1.8	<b>1.5</b>	-25%	-23%	<b>-14%</b>	-28%	-38%	<b>-50%</b>	<b>1.5</b>	<b>-50%</b>
Passive comp	2.9	2.3	<b>2.1</b>	-27%	-22%	<b>-8%</b>	-34%	-37%	<b>-54%</b>	<b>2.1</b>	<b>-54%</b>
PCB	6.5	5.1	<b>4.4</b>	-38%	-21%	<b>-14%</b>	-41%	-47%	<b>-53%</b>	<b>4.4</b>	<b>-53%</b>
<b>Total sum up</b>	<b>526.1</b>	<b>438.2</b>	<b>336.7</b>	<b>-17%</b>	<b>-17%</b>	<b>-23%</b>	<b>-6%</b>	<b>-16%</b>	<b>-28%</b>	<b>336.7</b>	<b>-28%</b>

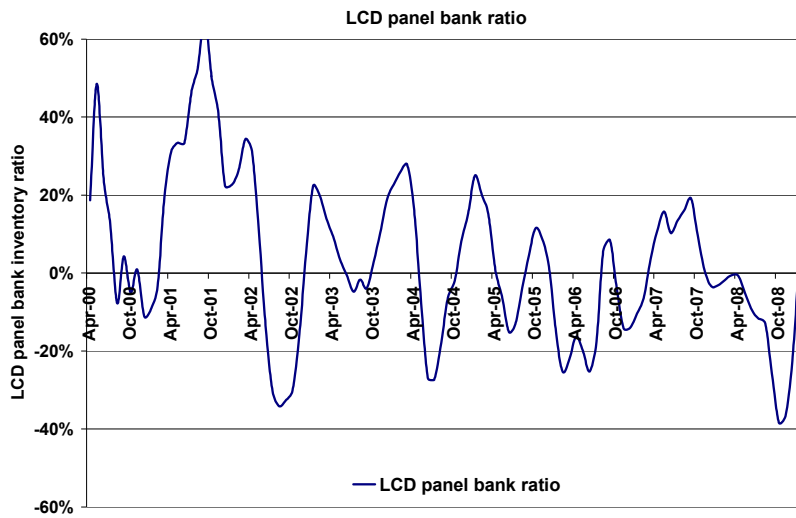
Source: Companies

Figure 5. Foundry wafer bank and US backend semi equipment BB comparison



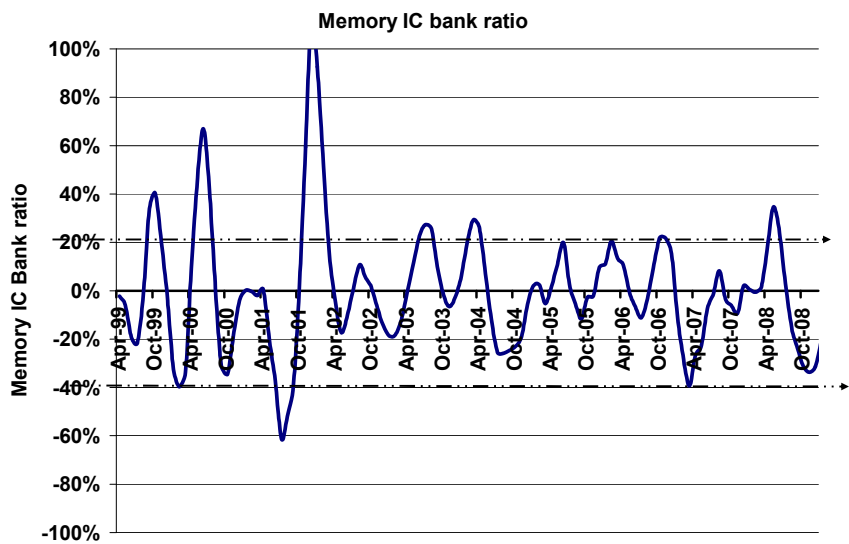
Source: Company Reports and CIR Estimates

Figure 6. TFT-LCD panel bank ratio



Source: Company Reports and CIR Estimates

Figure 7. Memory IC bank ratio



Source: Company Reports and CIR Estimates

Figure 8. Substrate Bank Ratio



Source: Company Reports and CIR Estimates

Figure 9. Top Taiwan semi and TFT-LCD CAGR comparison in past 3 years and next 5 years

Co. & Sector	Next 5 yr CAGR	Past 1 Year YoY	Past 2 yr CAGR	Past 3 yr CAGR
TSMC	7-8%	-5%	1%	5%
UMC	2-3%	-18%	-8%	-2%
Vanguard	10-12%	-7%	6%	9%
<b>Foundry</b>	<b>4-5%</b>	<b>-8%</b>	<b>-1%</b>	<b>4%</b>
SPIL	10-12%	-11%	1%	9%
ASE	6%	-13%	-5%	1%
Powertech	20-25%	23%	32%	39%
<b>OSAT</b>	<b>10-13%</b>	<b>-8%</b>	<b>1%</b>	<b>8%</b>
Nanya PCB	13-14%	-12%	-3%	11%
Kinsus	16-18%	-14%	-2%	18%
PPT	13-15%	-4%	0%	2%
<b>Substrate</b>	<b>14-15%</b>	<b>-9%</b>	<b>-1%</b>	<b>9%</b>
KYEC	8-10%	-11%	-3%	5%
Ardentec	15-16%	-2%	5%	14%
<b>Probing/test</b>	<b>11-13%</b>	<b>-9%</b>	<b>-2%</b>	<b>7%</b>
MediaTek	16-20%	10%	29%	24%
Realtek	14-15%	-1%	13%	14%
Richtek	20-24%	6%	22%	32%
GUC	25-30%	27%	58%	77%
Novatek	5-7%	-33%	-12%	-3%
<b>Fabless</b>	<b>14-16%</b>	<b>-1%</b>	<b>17%</b>	<b>18%</b>
AUO	15-20%	-22%	14%	20%
CMO	10-15%	-5%	26%	21%
Innolux	16-18%	-5%	18%	38%
<b>TFT LCD</b>	<b>15-17%</b>	<b>-17%</b>	<b>16%</b>	<b>17%</b>
<b>DRAM</b>	<b>6-8%</b>	<b>-28%</b>	<b>-27%</b>	<b>-1%</b>

Source: Company Reports and CIR Estimates

Figure 10. Pan Asia Semiconductor/ TFT Sector Ratings

Name	Code	Rating	Price	TP
Amkor Technology Inc	AMKR.O	2S	2.65	1.8
Ardentec	3264.TWO	3L	11.05	9.0
ASE	2311.TW	3L	11.60	8.0
AU Optronics	2409.TW	1L	26.85	29.0
Chartered Semiconductor	CSMF.SI	3M	0.29	0.2
Chi Mei Opto	3009.TW	3L	12.10	7.5
Elpida Memory	6665.T	2H	710.00	800.0
Global Unichip	3443.TW	3H	133.00	87.0
Hynix	000660.KS	1M	9,320.00	24,000.0
Ibiden	4062.T	2H	1,947.00	2,100.0
Inotera Memories	3474.TW	3H	14.65	7.5
Kinsus Interconnect Technology	3189.TW	1M	35.90	45.0
LG Display	034220.KS	1M	27,100.00	30,000.0
MediaTek	2454.TW	1L	270.50	305.0
Nan Ya PCB	8046.TW	1M	62.90	80.0
Nanya Tech	2408.TW	3H	7.22	3.3
Novatek	3034.TW	1M	39.70	42.0
Powerchip	5346.TWO	3H	3.87	2.0
Powertech Technology	6239.TW	1M	50.10	65.0
Ralink Technology	3534.TW	3H	74.60	57.0
Realtek	2379.TW	1M	35.65	40.0
Richtek Technology	6286.TW	3M	139.50	118.0
Samsung Electro-Mechanics	009150.KS	3M	38,750.00	27,000.0
Samsung Electronics	005930.KS	1L	511,000.00	664,000.0
Sharp	6753.T	3H	758.00	570.0
Shinko Electric Industries	6967.T	2H	797.00	900.0
SPIL	2325.TW	1L	28.65	30.0
Toshiba	6502.T	2H	256.00	400.0
TSMC	2330.TW	1L	44.40	55.0
UMC	2303.TW	3L	7.81	7.0
Vanguard	5347.TWO	1M	6.89	8.0

Priced as of 11 Feb 09

Source: Citi Investment Research estimates

# Appendix A-1

## Analyst Certification

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## IMPORTANT DISCLOSURES

### Hynix (000660.KS) Ratings and Target Price History Fundamental Research

Analyst: Henry H Kim, CFA  
Covered since August 11 2008

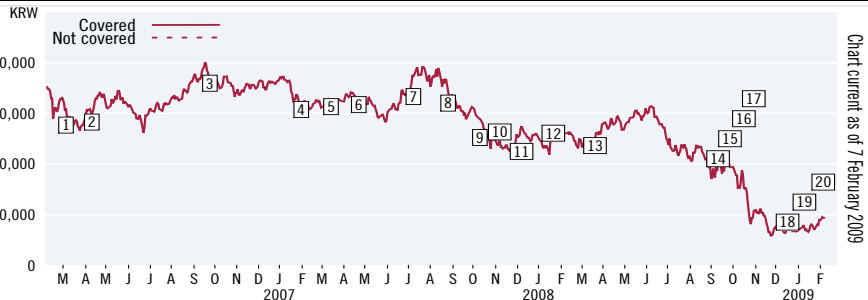


Chart current as of 7 February 2009

	Date	Rating	Target Price	Closing Price
1	5-Mar-06	1M	*50,000.00	30,500.00
2	11-Apr-06	1M	*47,000.00	29,700.00
3	24-Sep-06	*2M	*41,000.00	36,750.00
4	31-Jan-07	2M	*37,000.00	31,250.00
5	14-Mar-07	*1M	*41,000.00	31,900.00
6	23-Apr-07	1M	*39,000.00	32,350.00
7	9-Jul-07	1M	*45,800.00	37,400.00

	Date	Rating	Target Price	Closing Price
8	27-Aug-07	*3M	*32,500.00	34,350.00
9	10-Oct-07	3M	*29,000.00	28,950.00
10	7-Nov-07	3M	*23,500.00	24,650.00
11	7-Dec-07	*2M	*31,300.00	27,500.00
12	22-Jan-08	2M	*30,000.00	25,000.00
13	20-Mar-08	2M	*29,000.00	24,750.00
14	10-Sep-08	2M	*24,000.00	20,100.00

	Date	Rating	Target Price	Closing Price
15	26-Sep-08	*1M	*30,000.00	19,400.00
16	16-Oct-08	1M	*28,000.00	15,350.00
17	30-Oct-08	1M	*25,500.00	10,750.00
18	17-Dec-08	1M	*22,500.00	7,230.00
19	9-Jan-09	1M	*21,400.00	7,340.00
20	5-Feb-09	1M	*24,000.00	9,350.00

\* Indicates change

Rating/target price changes above reflect Eastern Standard Time

### Samsung Electronics (005930.KS) Ratings and Target Price History Fundamental Research

Analyst: Henry H Kim, CFA  
Covered since August 11 2008

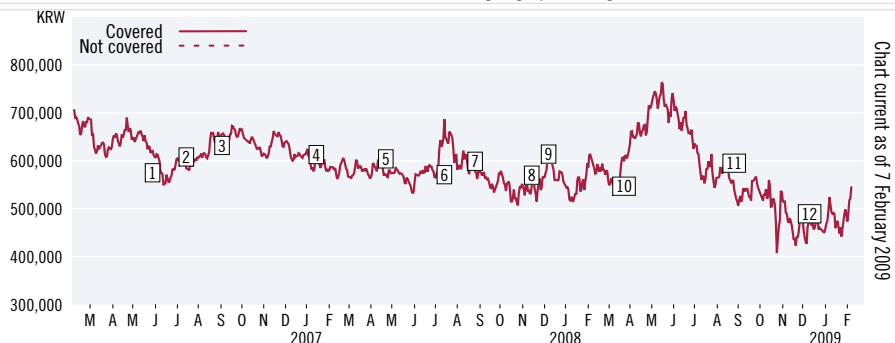


Chart current as of 7 February 2009

	Date	Rating	Target Price	Closing Price
1	29-May-06	1L	*800,000.00	622,000.00
2	14-Jul-06	1L	*770,000.00	584,000.00
3	3-Sep-06	*2L	*695,000.00	653,000.00
4	15-Jan-07	*1L	*750,000.00	612,000.00

	Date	Rating	Target Price	Closing Price
5	23-Apr-07	1L	*700,000.00	570,000.00
6	13-Jul-07	1L	*750,000.00	687,000.00
7	27-Aug-07	*2L	*620,000.00	577,000.00
8	14-Nov-07	2L	*584,000.00	547,000.00

	Date	Rating	Target Price	Closing Price
9	7-Dec-07	*1L	*790,000.00	608,000.00
10	24-Mar-08	1L	*820,000.00	599,000.00
11	26-Aug-08	1L	*700,000.00	540,000.00
12	10-Dec-08	1L	*664,000.00	481,000.00

\* Indicates change

Rating/target price changes above reflect Eastern Standard Time

**Samsung Electro-Mechanics  
(009150.KS)**

**Ratings and Target Price History  
Fundamental Research**

Analyst: Jonathan Rhee  
Covered since October 17 2007



Chart current as of 7 February 2009

	Date	Rating	Target Price	Closing Price
1	5-Apr-06	*1M	*46,000.00	38,500.00
2	17-Nov-06	1M	*51,000.00	42,450.00
3	12-Mar-07	1M	*50,000.00	33,600.00
4	23-Jul-07	*2M	*58,000.00	51,700.00

	Date	Rating	Target Price	Closing Price
5	16-Oct-07	*3M	*60,000.00	64,000.00
6	20-Jan-08	3M	*38,000.00	44,600.00
7	11-Mar-08	*1M	*61,000.00	49,400.00
8	27-Jul-08	1M	*52,000.00	36,750.00

	Date	Rating	Target Price	Closing Price
9	5-Sep-08	1M	*45,000.00	31,100.00
10	26-Nov-08	1M	*42,000.00	33,000.00
11	23-Jan-09	*3M	*27,000.00	33,200.00

\* Indicates change

Rating/target price changes above reflect Eastern Standard Time

**LG Display (034220.KS)**

**Ratings and Target Price History  
Fundamental Research**

Analyst: Jonathan Rhee  
Covered since October 4 2007



Chart current as of 7 February 2009

	Date	Rating	Target Price	Closing Price
1	21-Jun-06	1H	*44,000.00	28,500.00
2	11-Jul-06	1H	*42,000.00	31,800.00
3	13-Sep-06	*1M	42,000.00	35,100.00
4	25-Sep-06	*3M	*25,000.00	32,000.00
5	16-Jan-07	3M	*23,000.00	29,200.00
6	12-Apr-07	3M	*31,000.00	35,650.00

	Date	Rating	Target Price	Closing Price
7	8-May-07	*2M	*44,000.00	41,000.00
8	15-Jun-07	*1M	*54,000.00	44,000.00
9	3-Oct-07	1M	*59,000.00	45,150.00
10	7-Nov-07	1M	*68,000.00	55,100.00
11	22-Jan-08	1M	*59,000.00	40,000.00
12	13-Mar-08	1M	*62,000.00	42,400.00

	Date	Rating	Target Price	Closing Price
13	3-Jul-08	1M	*54,000.00	37,600.00
14	1-Sep-08	1M	*37,000.00	25,250.00
15	24-Nov-08	1M	*35,000.00	17,800.00
16	15-Dec-08	1M	*30,000.00	24,900.00

\* Indicates change

Rating/target price changes above reflect Eastern Standard Time

Citigroup Global Markets Korea Securities Limited (CGMK) performs the role of liquidity provider on the warrants of which the underlying asset is Hynix Semiconductor. As at 10 Feb 09, CGMK holds 2,998,990 Citi ELW 8278, 2,993,670 Citi ELW 9014, 3,000,000 Citi ELW 9027 Call warrants & 4,194 shares of Hynix Semiconductor.

Citigroup Global Markets Korea Securities Limited (CGMK) performs the role of liquidity provider on the warrants of which the underlying asset is Samsung Elec. As at 10 Feb 09, CGMK holds 2,997,650 Citi ELW 8158, 2,979,540 Citi ELW 8204, 3,000,000 Citi ELW 8266, 2,999,910 Citi ELW 8222, 3,000,000 Citi ELW 8280, 2,995,780 Citi ELW 9013, 3,000,000 Citi ELW 9040 Call warrants, 2,999,890 Citi ELW 8141 Put warrants & 4,692 shares of Samsung Elec.

Citigroup Global Markets Korea Securities Limited (CGMK) performs the role of liquidity provider on the warrants of which the underlying asset is LG Display. As at 10 Feb 09, CGMK holds 312,620 Citi ELW 8137, 2,746,790 Citi ELW 8169, 3,000,000 Citi ELW 8188, 2,996,810 Citi ELW 8267, 2,967,030 Citi ELW 8277, 3,000,000 Citi ELW 9044 Call warrants & 5 shares of LG Display.

Citigroup Global Markets Inc is acting as financial advisor to Qimonda AG in the sale of its stake in Inotera Memories Inc to Micron Technology Inc

Hwee pyng Tee, administrative assistant, holds a long position in the shares of Chartered Semiconductor

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## Taiwan Semiconductor Supply Chain

11 February 2009

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