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China Technology Sector

Implications of SMIC/Hua Hong 2Q22 results and recent US semi restrictions

SMIC/Hua Hong Semi's mixed guidance suggested consumer tech weakness and inventory correction will continue to weigh on the sector into 2H22E. While Hua Hong Semi remains bullish on 2H22E outlook given high utilization and strong demand from specialty technology platforms, SMIC expected weaker utilization into 2H22E given macro uncertainties and ongoing inventory correction. Despite near-term demand weakness, we believe US Chips Act and US's recent export ban on advanced semi equipment/ EDA for GAA will accelerate localization of semi equipment/foundries in China given supply chain safety and geopolitical tensions. Overall, we believe macro weakness and inventory correction are major overhang for the supply chain, and China semi localization remains the structural growth driver in the long run.

- **SMIC/Hua Hong Semi 2Q22 results beat; inventory correction cycle to continue into 1H23E.** Key takeaways include: 1) SMIC/Hua Hong's 2Q22 GPM beat due to better ASP and less-than-expected impact from COVID-19 lockdown; 2) positive 3Q22 revenue/GPM guidance despite SMIC's conservative utilization outlook; 3) SMIC expected inventory correction cycle to continue into 1H23E and potential demand recovery after Feb 2023; 4) 2022 CAPEX guidance is maintained. Overall, we believe weakness in PC/smartphone and macro uncertainties will continue to impact industry demand, and TSMC/UMC's 2Q22 comments also suggested inventory correction will last for the next 2-3 quarters.

- **US Chips Act set to accelerate localization of foundries/equipment in China; Limited NT impact from Ga_2O_3/EDA restriction.** The US$280bn US Chips Act passed last week aims to boost US chip manufacturing capabilities, but also **prohibits recipients of funds from expanding advanced capacity below 28nm in China for ten years**. In addition, US BIS has recently tightened export restrictions on China on **advanced semi equipment for logic fabs (14nm and below)**, as well as **advanced EDA tools for GAA design rules (3nm and below)**. While we believe global equipment and US IDM/foundry will be direct beneficiaries from US Chips Act, there are mixed impacts for Asia foundries with footprints in both the US and China (e.g. Samsung/TSMC). For Chinese semi equipment/foundries, we believe US Chips Act and BIS's export controls on advanced equipment (14nm and below) will boost 1) localization of semi equipment in China and 2) demand for domestic foundries given foreign foundries' capex slowdown in China, while restriction on Ga_2O_3/EDA tools (GAA for 3nm and below) will have limited NT impact on Chinese foundries as domestic capacity currently focuses on 14nm or above.

- **Remain conservative on 2H22E outlook amid inventory correction and demand weakness.** We maintain our conservative view on overall supply chain given global macro uncertainties, consumer electronics weakness, and rising concerns on oversupply. For ongoing A/H-share earnings season, we remain cautious on earnings downside for names with high exposure to smartphone/PC, and positive on semi names riding on localization trends. Overall, we suggest to stay on the sidelines until higher visibility for demand recovery and new growth drivers from emerging technology such as AR/VR and major technology upgrade/breakthroughs.

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China Technology Sector

Alex Ng
(852) 3900 0881
alexng@cmbi.com.hk

Lily Yang, Ph.D
(852) 3916 3716
lilyyang@cmbi.com.hk

Hanqing Li
lihanqing@cmbi.com.hk

Figure 1: US CHIPS Act funding outlays during 2022-26, with US$25bn for capex grants and US$22bn for tax credits (as of 20 July 2022)

	By Fiscal Year, Millions of Dollars											
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2022-2026	2022-2031
	Increases in Budget Authority and Outlays											
Division A. CHIPS Act of 2022												
Budget Authority	24,150	8,875	6,825	6,650	7,150	550	0	0	0	0	53,650	54,200
Estimated Outlays	0	2,324	5,570	7,975	9,314	8,327	6,608	5,101	3,867	2,858	25,183	51,944
Division B. Research and Innovation[a]												
Estimated Budget Authority	0	5	170	490	830	853	873	903	923	943	1,495	5,990
Estimated Outlays	0	1	13	47	119	250	442	632	773	853	180	3,130
Division C. Supplemental Appropriations to Address Threats to the Supreme Court of the United States[b]												
Budget Authority	19	0	0	0	0	0	0	0	0	0	19	19
Estimated Outlays	0	17	2	0	0	0	0	0	0	0	19	19
Total												
Estimated Budget Authority	24,169	8,880	6,995	7,140	7,980	1,403	873	903	923	943	55,164	60,209
Estimated Outlays	0	2,342	5,585	8,022	9,433	8,577	7,050	5,733	4,640	3,711	25,382	55,093
Division A. CHIPS Act of 2022												
Section 107. Advanced Manufacturing Investment Credit	0	-2,993	-5,616	-6,606	-6,908	-2,337	118	65	19	7	-22,123	-24,251

Source: US Congressional Budget Office (cbo.gov)

Figure 2: US restrictions on recipients of incentive funds from expanding advanced capacity in specific countries

Sec. 103—Semiconductor incentives.

Amends the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Public Law 116-283) to—

1) Clarify the eligibility of upstream suppliers, essential to building strong domestic semiconductor manufacturing ecosystems, to receive CHIPS funding;
2) Ensure, in the provision of incentives for semiconductor manufacturing, consideration of a broad range of semiconductors and the relevance of the technology to supply chain vulnerabilities;
3) Authorize $2 billion in additional financial incentives for manufacturing of mature technology nodes, with priority for critical manufacturing industries, such as the automotive industry;
4) Provide the Department of Commerce with other transaction authority to enable efficient execution of CHIPS awards; and
5) Require that construction projects funded under the CHIPS Act are subject to Section 602 of the Public Works and Economic Development Act of 1965 (42 U.S.C. 3212).

Prohibit the recipients of Federal incentive funds from expanding or building new manufacturing capacity for certain advanced semiconductors in specific countries that present a national security threat to the United States. To ensure that these restrictions remain current with the status of semiconductor technology and with U.S. export control regulations, the Secretary of Commerce, in coordination with the Secretary of Defense and the Director of National Intelligence, would be required to regularly reconsider, with industry input, which technologies are subject to this prohibition.

Source: senate.gov

Figure 3: US BIS to tighten export control on advanced semi technologies

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BUREAU OF INDUSTRY AND SECURITY
Office of Congressional and Public Affairs
Media Contact: OCPA@bis.doc.gov

Commerce Implements New Multilateral Controls on Advanced Semiconductor and Gas Turbine Engine Technologies

WASHINGTON, D.C. – Today, the Commerce Department's Bureau of Industry and Security (BIS) issued an interim final rule that establishes new export controls on four technologies that meet the criteria for emerging and foundational technologies under Section 1758 of the Export Control Reform Act (ECRA) and are essential to the national security of the United States. These Section 1758 technologies support the production of advanced semiconductors and gas turbine engines. These four technologies are among the items that the 42 Participating States of the Wassenaar Arrangement reached consensus to control at the December 2021 Plenary. The United States additionally controls a wider range of technologies, including additional equipment, software, and technology used to produce semiconductors, beyond the items agreed upon in the Wassenaar Arrangement.

"Technological advancements that allow technologies like semiconductors and engines to operate faster, more efficiently, longer, and in more severe conditions can be game changers in both the commercial and military context," **said Under Secretary of Commerce for Industry and Security Alan Estevez.** "When we recognize the risks as well as the benefits, and act in concert with our international partners, we can ensure that our shared security objectives are met, innovation is supported, and companies across the globe operate on a level playing field."

"Global commerce is driven by innovation—new ideas, and novel ways to apply old ones. BIS is vigilant in assessing the development of new technology and whether it may be used for civil and military purposes," **said Assistant Secretary of Commerce for Export Administration Thea D. Rozman Kendler.** "We are protecting the four technologies identified in today's rule from nefarious end use by applying controls through a multilateral regime. This rule demonstrates our continued commitment to imposing export controls together with our international partners. Export controls are most effective when multilaterally imposed."

The four technologies covered by today's rule include two substrates of ultra-wide bandgap semiconductors: Gallium Oxide (Ga_2O_3), and diamond; Electronic Computer-Aided Design (ECAD) software specially designed for the development of integrated circuits with Gate-All-Around Field-Effect Transistor (GAAFET) structure; and Pressure Gain Combustion (PGC) technology. Additional information about these technologies is provided below:

- Gallium Oxide and diamond are materials that allow semiconductors that use them to work under more severe conditions, such as at higher voltages or higher temperatures. Devices that utilize these materials have significantly increased military potential.

- ECAD is a category of software tools used for designing, analyzing, optimizing, and validating the performance of integrated circuits or printed circuit boards. ECAD software is used in a variety of applications by the military and aerospace defense industries for designing complex integrated circuits. GAAFET technology approaches are key to scaling to 3 nanometer and below technology nodes. GAAFET technologies enable faster, energy efficient, and more radiation-tolerant integrated circuits that can advance many commercial as well as military applications including defense and communications satellites.

Source: US BIS (bis.doc.gov)

Takeaways of SMIC (981 HK, NR) 2Q22 results:

2Q22 results beat
- Revenue: US$1.90bn, +41.6% YoY/+3.3% QoQ, in line with previous guidance (US$1.90bn), above consensus (US$1.89bn) by 0.3%
- GPM: 39.4%, +9.3ppts YoY/-1.3ppts QoQ, above high-end of previous guidance (39%) by 0.4ppts, above consensus (38.2%) by 1.2ppts
- Both revenue &GPM slightly exceed guidance, due to lower-than-expected impact on output from the lockdown (did not conduct annual maintenance of some fabs)
- Net profit: US$629.1mn, -11.2% YoY/+10.5% QoQ, exceeds consensus(US$469.5mn) by 34%

2Q22 Revenue breakdown
- By size
    - 12-inch: 68.3% of total sales, +4ppts YoY/+1.8ppts QoQ
    - 8-inch: 31.7% of total sales, -4ppts YoY/-1.8ppts QoQ
- By Application
    - Smart Phone: 25.4% of total sales, -6.2ppts YoY/-3.3ppts QoQ
    - Consumer Electronics: 23.8% of total sales, -1.3ppts YoY/+0.7ppts QoQ
    - Smart Home:16.2% of total sales, +3.8ppts YoY/+2.4ppts QoQ
- By Geography
    - Mainland China& HK: 69.4% of total sales, +6.5ppts YoY/+1.0ppts QoQ
    - North America: 18.9% of total sales, -4.4ppts YoY/-0.1ppts QoQ
    - Europe& Asia: 11.7% of total sales, -2.1ppts YoY/-0.9ppts QoQ

3Q22 guidance: revenue below but GPM above consensus
- Revenue: flat to up 2% QoQ, US$1.90-1.938bn, below consensus (US$1.955bn)
- GPM: 38%-40%, mid-point above consensus (36.3%) by 2.7ppts

Maintain FY22E guidance
- Sales growth higher than industry average
- GPM higher than 2021 level
- FY22 Capex US$5.0bn, for existing fab expansion and rolling out of three new projects

Other highlights from the call:
- 3Q utilization will be the same as 2Q (97%, vs 100% in 1Q)
- Pricing stays firm except smartphone and LCD drivers for panel
- Structural shortage persists in 2H22; the company will allocate more capacity in platforms in short supply
- Inventory cycle adjustment will continue into 1H23
- Mgmt. remain confident in medium- to long-term growth

Takeaways of Hua Hong Semi (1347 HK, NR) 2Q22 results:

2Q22 GPM beat on better ASP; net profit below due to FX losses

- Revenue: US$620.8mn, +79.4% YoY/+4.4% QoQ, in-line with guidance and 2% above consensus
- GPM: 33.6%, +8.8ppts YoY/+6.7ppts QoQ, well above guidance (28-29%) and consensus (28.6%), due to improved ASP
- Net profit: US$53.2mn, +43.2% YoY/ -47.8% QoQ, 39% below consensus due to US$57mn FX losses. Excluding one-off, NP of US$110mn is 26% above consensus.

2Q22 Revenue breakdown

- By technology platform: Envm/standalone NVM/discrete/logic&RF/analog&RF/analogy&PM
    - Revenue: +69.2%/+279.8%/+57.8%/+35.1%/133.0% YoY
    - Account for 28.2%/11.2%/30.5%/12.4%/17.6% of total sales

- **By technology node**
  55&65nm/90&95nm/0.11&0.13μm/0.15&0.18μm/0.25μm/above 0.25μm
    - Revenue: +274.0%/+132.9%/+47.5%/+28.2%/-48.2%/+56%
    - Account for 18.4%/18.5%/16.8%/7.6%/0.6%/38.1% of total sales

- **By End market**
  Consumer electronics/ Industrial & Auto/ Communications/ Computing
    - Revenue: +83.5%/+90.2%/+46.6%/+74.3% YoY
    - Account for 65.2%/20.3%/11.3%/3.2% of total sales

3Q22 guidance: revenue in-line; GPM beat

- Revenue: US$625mn (+38% YoY), in line with consensus
- GPM: 33-34%, mid-point above consensus (28.1%) by 5.4ppts

Other highlights from the call:

- Strong demand continues and orders are fully booked for the rest of the year
- Tight capacity across diverse platforms; mgmt. is confident about specialty technology platforms' outlook
- 12-inch fab new capacity ramp up quickly thanks to tool arrival
- UTR maintains 100%+
- 6% QoQ growth in pricing will result in significant overall ASP growth for the year
- A-share listing on track; the plan is running smoothly and successfully

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CMB International Global Markets Limited

Address: 45/F, Champion Tower, 3 Garden Road, Hong Kong, Tel: (852) 3900 0888 Fax: (852) 3900 0800

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