TSMC 2Q Exceeds on HPC Strength Despite Smartphone Weakness

TSM	5 est.	Taiwan Semi/TSMC		CY24rev:	23%
Qtr:	2Q	Grade:	B	Growth	(qtr-qtr)
Rev:	20,822	Rev:	+++	Rev:	10.3%
GM:	53.2%	EPS:	+++	Fcst:	+8+11%
EPS:	$1.48	Fcst:	++	Div:	$0.5627

Taiwan Semiconductor/TSMC *(TSM $165.77 -6.10 at close on 7/19/24)*
2Q Earnings: TSM announced 2Q results above expectations (very) early Thursday due to strength from leading 3/5nm technology to HPC applications partially offset by weak seasonality from smartphones. Guidance for 3Q reflects continued HPC strength as well as a seasonal smartphone recovery. Management raised expected revenue growth this year to slightly above mid-20% from the low- to mid-20% range due to HPC and smartphone strength.

2Q Results: 2Q revenue of $20.8B increased by +10% sequentially (in US$) on strength from leading 3/5nm technology in HPC (High Performance Computing/AI processors) that grew by +28% and accounted for 52% of sales, partially offset by seasonal weakness from smartphones that declined by -1% and accounted for 33% of sales. Internet of Things (IoT) grew by +6% for 6% of sales, Automotive was up +5% for 5%, digital consumer electronics (DCE) grew by +20% for 2%, and Others increased by +5% for 2%. Advanced technologies accounted for 67% of total wafer revenue up from 65% last quarter which included 3nm at 15% up from 9%, 5nm at 35% down from 37%, and 7nm at 17% down from 19%. North American customers accounted for 65% of revenue while China accounted for 16%, Asia Pacific 9%, Japan 6%, and EMEA (Europe, Middle East, and Africa) 4%.

Gross margin increased by 10bps sequentially to 53.2% due to cost reductions and a favorable foreign exchange rate partially offset by margin dilution from the 3nm ramp. Operating margin was 42.5%, net profit was 36.8%, and cap ex totaled $6.36B.

Technology: The 3nm technology family is ramping up quickly and will be a large and long-lasting node. Family members include N3E, N3P and N3X; it is taking a couple quarters longer than N5 and N7 to reach corporate margins amid increasing process complexity; and 5nm resources are being converted.

Next generation 2nm technology will adopt a nanosheet transistor structure and will offer improvements over N3E of 10-15% in speed or 25-30% in power at >15% in density with volume production in 2025, pulled in from 4Q25. Customer engagements are robust with tape-outs expected to exceed that of the prior two nodes during its first two years, and the margin profile is expected to be better than that of the 3nm node. Subsequent N2P will offer a 5% increase in speed or 5-10% in power for both HPC and smartphones with volume beginning 2H26.

A16 with a backside power rail called SPR (Super Power Rail) for HPC applications will offer improvements over N2P of 8-10% in speed or 15-20% in power and 7-10% in density with volume beginning 2H26.

Mature nodes account for <20% of revenue. 28nm (at 8% last quarter) is expected to support multiple specialty technologies for strategic customers with high yields at corporate average gross margins.

Overseas Fabs: No changes since last quarter. While the initial cost of overseas wafer fabs are higher than in Taiwan, management expects to minimize the cost premiums and deliver profitable growth to shareholders.

A Japan specialty technology fab in Kumamoto for 12/16nm and 22/28nm technologies opened in February with volume production expected 4Q24. A second specialty fab with partners for 40nm, 12/16nm and 6/7nm technologies to support a strategic customer's consumer, automotive, industrial and HPC applications has been announced with construction beginning 2H24 for production late-2027.

In the US, TSMC has plans for three major wafer fabs in Arizona and has secured $6.6B in government CHIPS grants. The first began engineering runs on 4nm in April with volume production expected 1H25. The second is nearing completed construction and will begin production in 2028 on 2/3nm specifically for AI applications. And the third is planned for production at the end of the decade on 2nm or better.

In Europe, a specialty technology fab in Dresden, Germany is planned for automotive and industrial applications with joint venture partners, with construction beginning 4Q24.

Previously the company reported Taiwan is expanding 3nm capacity in Tainan Science Park with N2 volume production in 2025, along with multiple fabs on 2nm planned in Hsinchu and Kaohsiung science parks and proposed for Taichung Science Park.

3Q Guidance: 3Q guidance calls for revenue up +8 to +11% to $22.4-23.2B on both HPC/AI and smartphone strength in leading technology; gross margin up 130bps to 53.5-55.5% due to increasing capacity utilization and cost reductions partially offset by continued dilution of the 3N ramp, the 5N to 3N conversion, and higher electricity costs in Taiwan; and operating margin of 42.5-44.5% assuming 32.5-NTD/USD.

2024 Outlook: For 2024 management continues to expect the overall semiconductor market excluding memory to increase by 10% while it raised guidance for company growth to slightly above the mid-20% range from the low to mid-20% in U.S. dollars due to incremental strength from AI-processors and smartphones. Management re-defined its foundry market sector to include industry back-end operations which more than doubles the TAM to $250B from $115B last year, pegs its share at 28%, and expects to gain share amid +10% growth this year. Cap ex was narrowed to $30-32B from $28-32B after last year's $30.45B with 70-80% allocated for advanced process technologies, 10-20% for specialty technologies and 10% for advanced packaging, testing and mask making.

Management noted longer-term strategic price increases to offset increasing costs from the growing complexity of leading technology including a richer mix of lower-margin 3nm revenue, increasing electricity costs in Taiwan, global expansion into higher-cost regions, and inflation. Nevertheless, the long-term gross margin target remains at 53%—or more if capacity utilization is high.

AI processor demand continues to grow and is constrained by back-end CoWoS capacity that is now more than doubling annually, and the company is engaging OSATs to assist. Management hopes that supply will catch up to demand in 2025—but it may not until 2026.

Fair Valuation: TSM is a wafer foundry juggernaut hoarding most of the sector's market share and even more of its profitability and is well positioned for continued dominance for the foreseeable future. Unfortunately, much of this is already priced into the shares at the current price level, in my opinion. The shares are trading at 7.4-times book value, 10.1-times 2024 expected sales (+23% growth) and 8.2-times 2025 sales (+23%), and 26-times expected 2024 EPS at $6.46 per share and 20.5-times 2025 EPS of $8.09. While there may be room for incremental upside due to persistent strength from AI-processors, the shares retreated by -11.5% last week.

LEGEND			
+++	exceeded the high-end of the range	***Grade***	
++	above consensus, within the high-end of the range	A	all +++
+	slightly above consensus	B	all +
o	met consensus	C	all o/+
-	slightly below consensus	D	mixed -/o/+
- -	missed consensus, within the low-end of the range	E	all o/-
- - -	missed the low-end of the range	F	all -

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