TSMC 1Q Exceeds on HPC Strength Amid Smartphone Weakness

TSM	5 est.	Taiwan Semi/TSMC		CY24rev:	22%
Qtr:	1Q	Grade:	B	Growth	(qtr-qtr)
Rev:	18,873	Rev:	+++	Rev:	-3.8%
GM:	53.1%	EPS:	+++	Fcst:	+4+8%
EPS:	$1.38	Fcst:	++	Div:	$0.5627

Taiwan Semiconductor/TSMC *(TSM $127.70 -4.57 at close on 4/19/24)*
1Q Earnings: TSM announced 1Q results above expectations (very) early Thursday as unfavorable smartphone seasonality was partially offset by strong high-performance computing (HPC) demand. Guidance for 2Q reflects strength from leading 3/5nm technology partially offset by continued weak seasonality from smartphones. Management expects slightly lower industry growth this year while maintaining its outlook for over +20% growth.

4Q Results: 4Q revenue of $18.9B decreased by -4% sequentially (in US$) on weakness from smartphones that declined by -16% and accounted for 38% of sales, partially offset by HPC that grew by +3% and accounted for 46% of sales. Automotive was flat at 6% of sales, Internet of Things (IoT) grew by +5% for 6%, digital consumer electronics (DCE) grew by +33% for 2%, and others declined by -8% for 2%. Advanced technologies accounted for 65% of total wafer revenue down from 67% last quarter which included 3nm at 9% down from 15%, 5nm at 37% up from 35%, and 7nm at 19% up from 17%. Most AI accelerator chips are in 4/5nm. North American customers accounted for 69% of revenue while China accounted for 9%, Asia Pacific 12%, Japan 6%, and EMEA (Europe, Middle East, and Africa) 4%.

Gross margin increased by 10bps sequentially to 53.1% due to a favorably leaner mix of smartphones partially offset by an unfavorable foreign exchange rate. Operating margin was 42.0%, net profit was 38.0%, and cap ex totaled $5.77B.

Technology: Next-gen N3E entered volume production 4Q23 for both smartphone and HPC applications, and 3nm revenue is expected to more than triple and account for a mid-teens percentage of total wafer revenue this year. Further enhancements include N3P and the N3X, and the 3nm family will be a large and long-lasting node. N3 is expected to dilute gross margin by 3-4 percentage points for 2024 and is taking a couple quarters longer than N5 and N7 to reach corporate margins due to increasing process complexity, corporate margins, and inflation that has impacted original cost assumptions from several years ago.

2nm will adopt a nanosheet transistor structure and be the most advanced semiconductor technology in the industry in both density and energy efficiency when introduced to volume production in 4Q25 with meaningful revenue beginning 2Q26. N2 with backside power rail for HPC applications will follow shortly thereafter. Customer engagements are robust and 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.

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

Overseas Fabs: 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 maximize shareholder value.

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 now 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 this month 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.

Last quarter 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.

2Q Guidance: 2Q guidance calls for revenue up 6% to $19.6-20.4B on 3/5nm (HPC) strength, gross margin down 110bps to 51-53% including -50bps due to minor earthquake wafer-scrap losses and minus -70-80bps from higher electricity costs in Taiwan, and operating margin of 40-42% assuming 32.3-NTD/USD. Taxes will spike to 19% before falling back to 13-15% 2H24 for a full-year rate of 15-16%.

2024 Outlook: For 2024 management expects the overall semiconductor market excluding memory to increase by 10% (down from over 10%) with the foundry industry up in the mid- to high-teens (down from +20%), but TSMC to continue to grow in the low to mid-20% in U.S. dollars. The lower expectations are coming off a higher base last year and automotive is now expected to decline rather than grow. Smartphones are recovering gradually, the PC recovery is slower, servers are lukewarm, IoT and consumer remain sluggish, but AI servers are *VERY* strong.

TSMC's expected growth at over +20% is due to leading technology and a broader customer base with quarterly growth throughout the year as AI processors more than double into the low-teens percent of revenue. While the long-term gross margin target remains at 53%, it faces a number of headwinds this year somewhat offset by cost reductions and possible price increases: higher electricity costs trimming 60-70bps 2H; greater 3nm revenue costing 2-3% 1H and 3-4% 2H; and the conversion of 5nm tools to 3nm costing 1-2% 2H. Cap ex remains at $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.

Longer-term AI processors are expected to grow at a 50% CAGR to >20% of revenue by 2028 and the company plans to continue to pay 70% of annual free cash flow as dividends—although this will migrate to 'steadily increasing' from 'sustainable' in the past few years.

Incremental Upside: 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 5.8-times book value, 7.9-times 2024 expected sales (+22% growth), and over 20-times expected 2024 earnings that consensus estimates have exceeding $6 per share. However, there may be room for incremental upside based on 2025 estimates at 6.5-times sales (+20%) and 14-times EPS of $9.10 (+45%).

LEGEND

+++	exceeded the high-end of the range
++	above consensus, within the high-end of the range
+	slightly above consensus
o	met consensus
-	slightly below consensus
- -	missed consensus, within the low-end of the range
- - -	missed the low-end of the range

Grade	
A	all +++
B	all +
C	all o/+
D	mixed -/o/+
E	all o/-
F	all -

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