



Semiconductor Investing & Moore #15

TSMC Update / GlobalFoundries and GM Chips Deal / Memory Chip Demand/
Big Tech Battle / Kulicke & Soffa Earnings / Arista Networks Data Center
Engineering / AMD Market Share Gain



TSMC Updates



Interested to see Feb #s

TSMC January 2023 Revenue Report

HSINCHU, Taiwan, R.O.C. – Feb. 10, 2023 - TSMC (TWSE: 2330, NYSE: TSM) today announced its net revenue for January 2023: On a consolidated basis, revenue for January 2023 was approximately NT\$200.05 billion, an increase of 3.9 percent from December 2022 and an increase of 16.2 percent from January 2022.

TSMC January Revenue Report (Consolidated):

(Unit:NT\$ million)

Period	January 2023	December 2022	M-o-M Increase (Decrease) %	January 2022	Y-o-Y Increase (Decrease) %
Net Revenue	200,051	192,560	3.9	172,176	16.2



TSMC's 3nm process is expected to be fully loaded throughout the year

Business Times Su Jiawei 2023.02.11

NVIDIA GPU Demand To Exceed Supply As Green Team Bets On ChatGPT, Thousands of AI Chips Expected To be Incorporated By Tech Giants

Hassan Mujtaba · Feb 11, 2023 12:04 PM EST · Copy Shortlink

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5. Approved the capital injection of not more than US\$3.5 billion to TSMC Arizona, a wholly-owned subsidiary of TSMC.



Warren Buffett Dumps 86% of TSMC Shares

- It was just a few months ago in early Nov, where everyone was talking about Berkshire entering into the semi space.
- Why do you think there was a change and such a quick turn around?





GlobalFoundries and GM Strike Groundbreaking Supply Deal

- Industry has historically relied on complex supply chain, with base chips manufacturers (GF, in this case) at least one step removed (usually via an equipment manufacturer) from end manufacturer (GM).
- This supply chain contributed to the chip shortage, which in turn has created “bullwhip effect” in global economy.
- Landmark “direct supply” agreement could change things.





GlobalFoundries and GM

GlobalFoundries and GM Announce Long-Term Direct Supply Agreement for U.S. Production of Semiconductor Chips

February 09, 2023

 [PDF Version](#)

MALTA, N.Y. and DETROIT, Feb. 09, 2023 (GLOBE NEWSWIRE) -- General Motors Co. (NYSE: GM) and GlobalFoundries (NASDAQ: GFS) (GF) today announced a strategic, long-term agreement establishing a dedicated capacity corridor exclusively for GM's chip supply. Through this first-of-its-kind agreement, GF will manufacture for GM's key chip suppliers at GF's advanced semiconductor facility in upstate New York bringing a critical process to the U.S.

This agreement supports GM's strategy to reduce the number of unique chips needed to power increasingly complex and tech-laden vehicles. With this strategy, chips can be produced in higher volumes and are expected to offer better quality and predictability, maximizing high value content creation for the end customer.

Semiconductors are the foundation of the technologies that are powering the electrification, autonomous driving and connectivity of the auto industry, and they have been center stage in the global chip shortage that has impacted automakers the last couple of years.

"We see our semiconductor requirements more than doubling over the next several years as vehicles become technology platforms," said Doug Parks, GM executive vice president of Global Product Development, Purchasing and Supply Chain. "The supply agreement with GlobalFoundries will help establish a strong, resilient supply of critical technology in the U.S. that will help GM meet this demand, while delivering new technology and features to our customers."

"At GF we are committed to working with our customers in new and innovative ways to best address the challenges of today's global supply chains," said Dr. Thomas Caulfield, president and CEO of GF. "GF will expand its production capabilities exclusively for GM's supply chain, enabling us to strengthen our partnership with the automotive industry and New York State, while further accelerating automotive innovation with U.S.-based manufacturing for a more resilient supply chain."



Questions

How much do you think this “changes the narrative” surrounding legacy automakers like GM?

This could help smooth out volatility in orders for foundries like GF. Are these stocks a buy?



Memory demand coming back?

Samsung and SK Hynix Enjoy a Rush of Orders for New Memories – 2/13/23

“Since the beginning of this year, Samsung Electronics and SK Hynix have been receiving a surge in orders for high bandwidth memories (HBMs). HBMs significantly increase data processing speeds compared to other DRAMs by vertically connecting several DRAMs. They work together with central processing units (CPUs) and graphics processing units (GPUs) and can greatly improve the learning and calculation performances of servers.

Until now, despite its excellent performances, HBMs have had fewer applications than general DRAMs. This is because HBMs’ average selling price (ASP) is at least three times that of DRAM. HBMs require a complex production process and highly advanced technology. The expansion of AI services has turned the tide.”

<http://www.businesskorea.co.kr/news/articleView.html?idxno=109380>



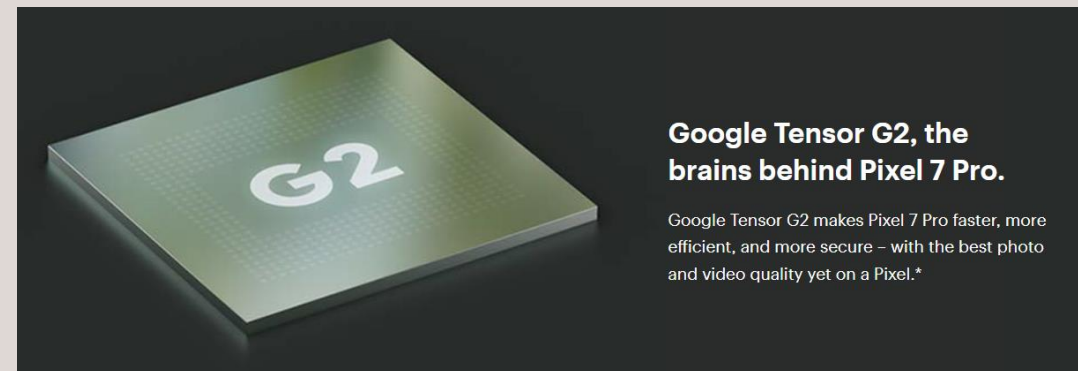
Big Tech Battle

Good or Bad for Chip Stocks?



Google New CPU Chips – Made By TSMC

- Reports that Google is ready to start testing its CPU processors for its clouding solutions.
 - Codenamed Maple and Cypress
 - Arm-based 5nm.
- Not the first chip design by Google, they also have TPUs used to accelerate certain workloads in Google Cloud, also used in their hardware.
- Should semiconductor companies worry about this growth in-house chip production?



Google Tensor G2, the brains behind Pixel 7 Pro.

Google Tensor G2 makes Pixel 7 Pro faster, more efficient, and more secure – with the best photo and video quality yet on a Pixel.*



Google

Introducing Bard


Introducing the new Bing

Ask real questions. Get complete answers. Chat and create.



NVIDIA GPU Demand To Exceed Supply As Green Team Bets On ChatGPT, Thousands of AI Chips Expected To be Incorporated By Tech Giants

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- This worries me, we are still in a huge consumer market over inventory correction – can this lead to the same for the data center market?
- We saw NVDA had to pay money to TSMC do to not keeping up with original demand they “purchased”
- But if NVDA does not build up inventory, can this open up and opportunity for AMD to grab market share?



KLIC FY Q1 Earnings

Concerns:

1. Revenue: \$176.2 billion (-61.8%) **MISS** Non-GAAP EPS \$0.37 **BEAT** (-68.7%)
1. General semi (-61% qoq) Memory (-80%) Auto (+41% qoq)
2. Slightly lowered FY outlook based on China Covid issues. (~\$840 million, down from ~\$890 million)
3. Gross margin could fall from ~50% to ~47% as new manufacturing ramps up.

Positives:

1. China may accelerate post-Covid. GMs rise as manufacturing footprint filled with revenue; new ball bonder systems coming out late '23
2. Mgmt bullish thermocompression bonding for chiplets (advanced nodes) – thinks it can achieve pitches below 10 microns – could greatly expand the market.
3. “By the end of fiscal 2023, we also expect to receive acceptance on the next phase of the customer-specific advanced display solution, which we will refer to as PROJECT W going forward. Demand for this system is expected to accelerate into fiscal 2024.”
4. APPLE ? - plans microLED for Watch soon, iPad and Pro in 2024, iPhone over long-term:
<https://www.bloomberg.com/news/articles/2023-01-11/apple-to-begin-making-in-house-screens-in-2024-in-shift-away-from-samsung>





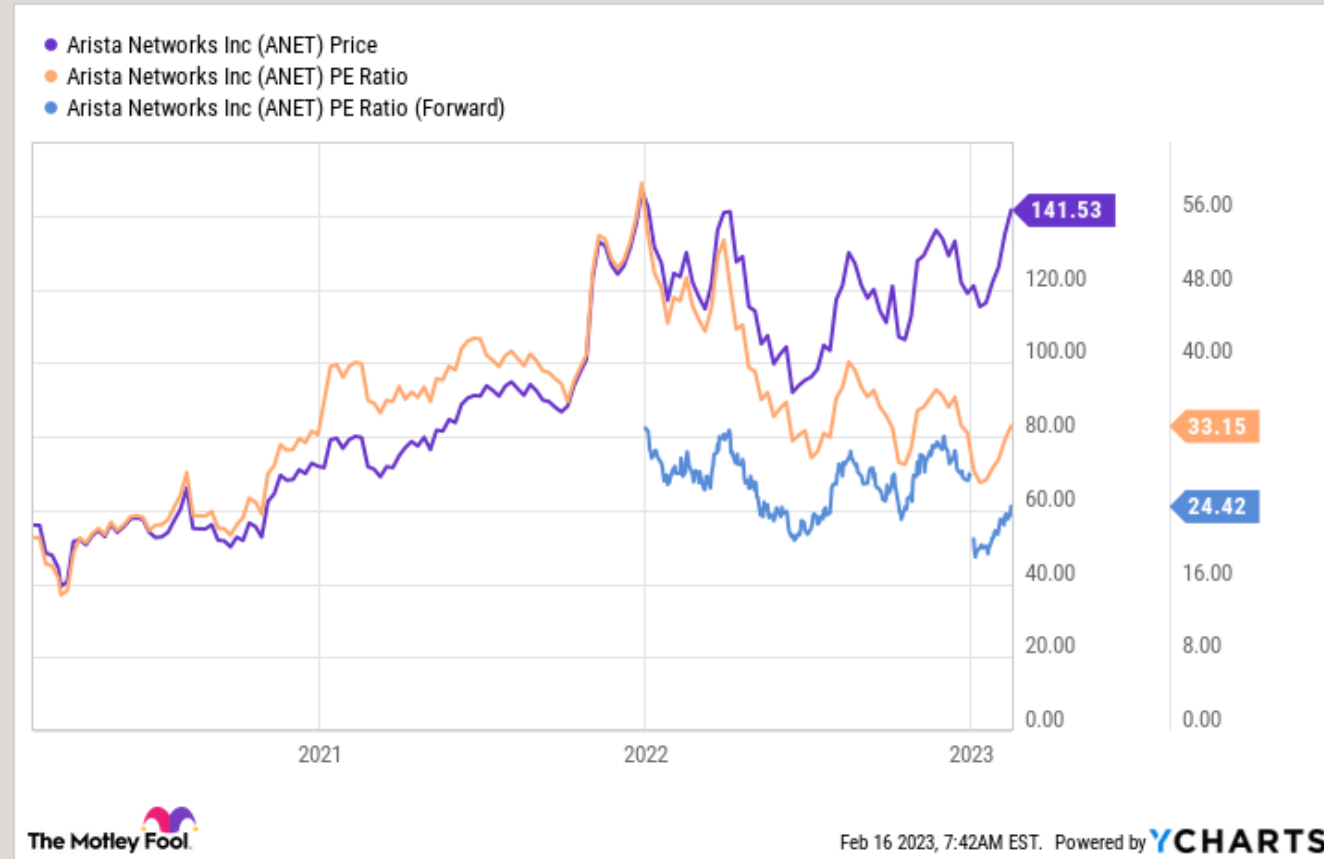
ANET Q4 '22 Earnings

1. Revenue: \$1.28 billion (+55%) Non-GAAP EPS \$1.41 (+72%)

1. Expected 2023 growth of ~25%, gross margin expansion, further upside in coming years from new data center designs around AI

Concerns

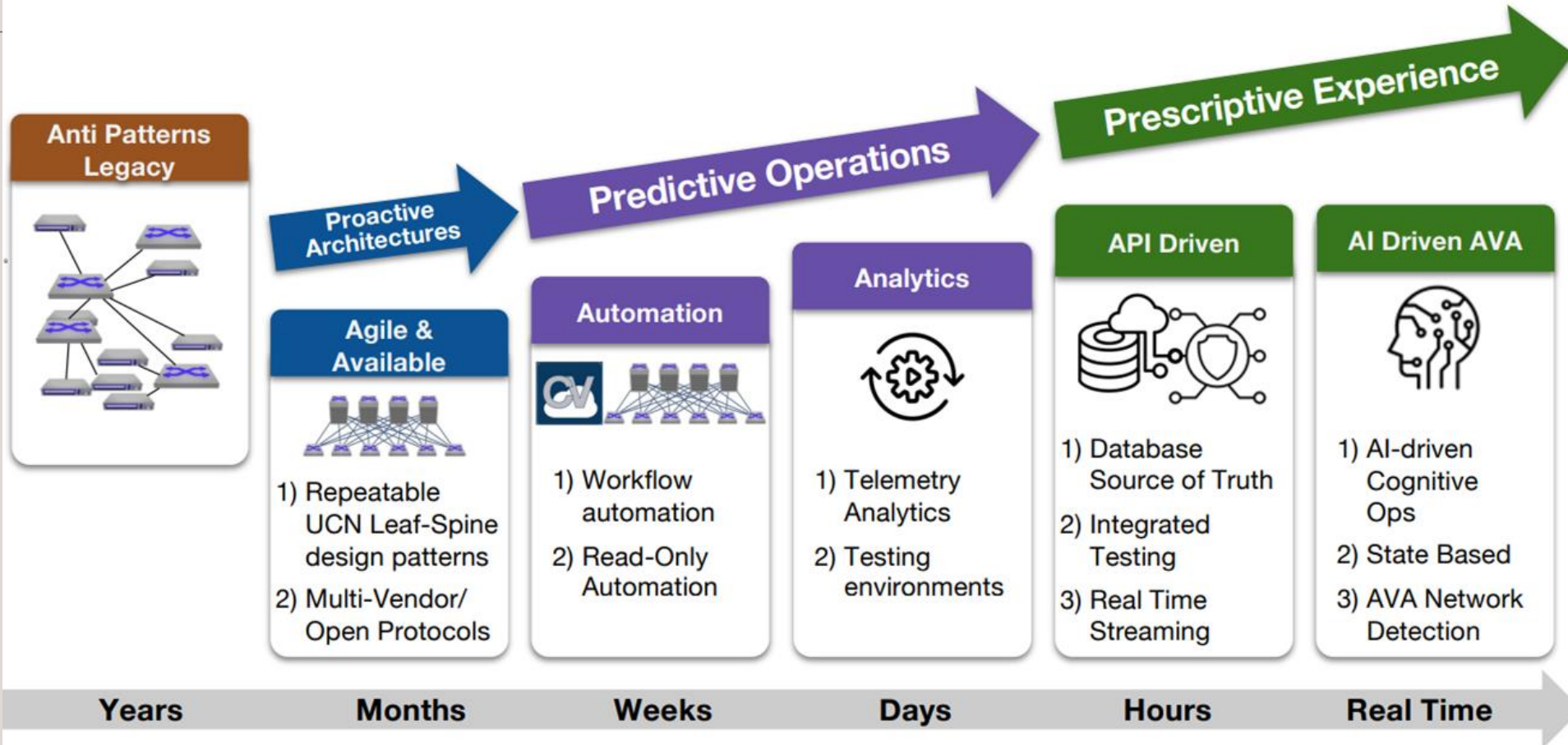
1. Not sure how long cloud data center boom will last
2. Valuation has come down significantly, but perhaps still a bit high





Arista's Cognitive Cloud Principles: The Five "A"s

Evolving at The Speed of Cloud

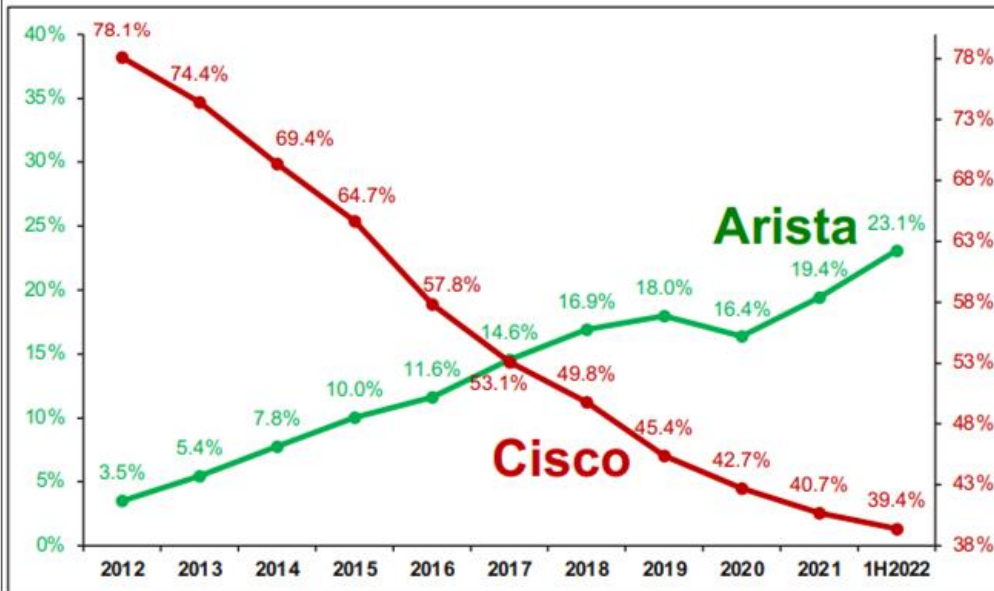




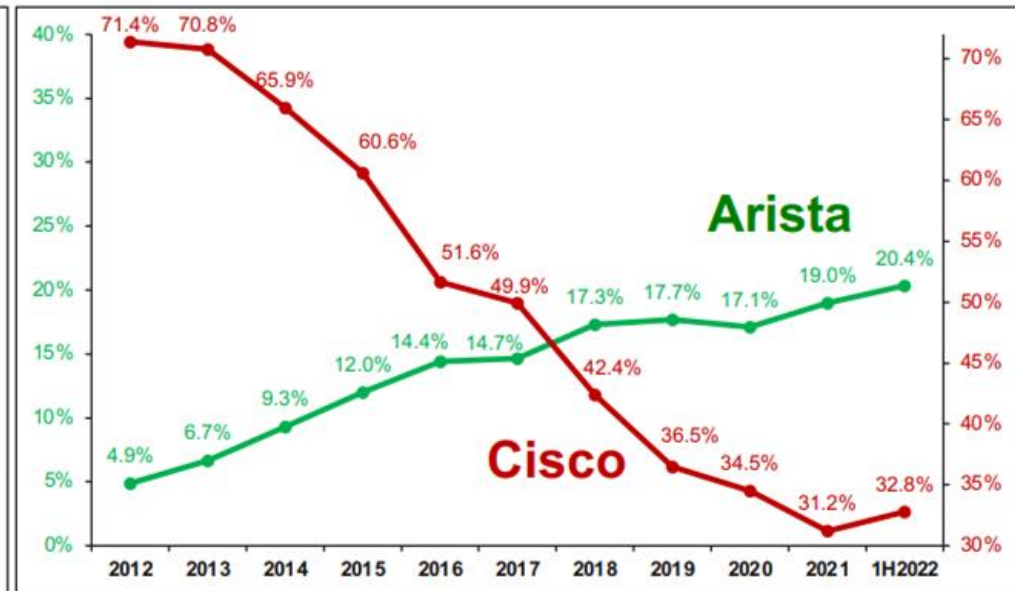
Delivering Consistent Market Share Gains vs Cisco

High Speed Data Center Switching Market

Share in Dollars



Share in Ports



Source: Crehan Research Datacenter Switch Market Share Report Q2'22

Note: 10GbE and Higher - Excludes blade switches



Questions

How long do you think the next-gen cloud data center boom can last?

At what point would you buy ANET stock? What valuation? Or not at all?



AMD Market Share



MERCURY RESEARCH

MERCURY RESEARCH	Q4 2022	Q3 2022	Q2 2022	Q1 2022	Q4 2021	Q3 2021	Q2 2021	Q1 2021	Q4 2020	Q3 2020	Q2 2020	Q1 2020
AMD Desktop CPU Market Share	18.60%	13.90%	20.60%	18.30%	16.20%	17.00%	17.10%	19.30%	19.30%	20.10%	19.20%	18.60%
AMD Mobility CPU Market Share	16.40%	15.70%	24.80%	22.50%	21.60%	22.00%	20.00%	18.00%	19.00%	20.20%	19.90%	17.10%
AMD Server CPU Market Share	17.60%	17.50%	13.90%	11.60%	10.70%	10.20%	9.50%	8.90%	7.10%	6.60%	5.80%	5.10%
AMD Overall x86 CPU Market Share	31.30%	28.50%	29.20%	27.70%	25.60%	24.60%	22.50%	20.70%	21.70%	22.40%	18.30%	14.80%

Slowdown in Server CPU Market?



Why Slow Down In Server Acceleration?

Lisa SU – Q4 Earnings

Lisa Su -- *President and Chief Executive Officer*

Yes. I would say, Joe, the total cost of ownership benefit of Genoa, particularly in some of the larger cloud workloads, is very, very significant. So I wouldn't say that that's necessarily slowing the pace of adoption. It is a new platform though.

So if you think about when we went from Rome to Milan, it was basically similar platforms. So I would say that that ramp was a bit faster. But as it relates to Genoa, we had always expected that Milan and Genoa would coexist through 2023. And that we would have -- we still have Milan instances that are just ramping now, and we expect that will continue through 2023.

And so, I really view this as the natural thing when we introduce Genoa at sort of the higher core count, that both will coexist. And as some of the platform costs come down, you'll see the Genoa cutover, and that's what I mentioned toward the fourth quarter of 2023.



Final AI Thoughts

Lisa SU – Q4 Earnings

Over the next several years, one of our largest growth opportunities is in AI, which is in the early stages of transforming virtually every industry service and product. We expect AI adoption will accelerate significantly over the coming years and are incredibly excited about leveraging our broad portfolio of CPUs, GPUs and adaptive accelerators in combination with our software expertise to deliver differentiated solutions that can address the full spectrum of AI needs in training and inference across cloud, edge and client. Now, I'd like to turn the call over to Jean to provide some additional color on our fourth quarter and full year financial results. Jean?