

Semiconductor WEEK:

October 7, 2022

An overview of results and conclusions from recent reports at TechInsights

Chip Market Research Services

Caution rises as clouds darken the road

- Order activity for semiconductor equipment was flat last week with the overall temperature hovering at a warm 80 degrees
- Fab Capacity Utilization by Wafer Size

Semiconductor Analytics

Last Week in the Semiconductor Market:

Semiconductor sales pulled up 3% last week, narrowing the gap with 2021 levels to -18%. However, the IC weather moved in the opposite direction, cooling 3°F to Cold conditions. Zooming in on Analog & Power this week, 13-wk MAs growth has been steadily cooling, since peaking at 31% the week of March 4, to 15% last week. TechInsights forecasts Analog & Power sales will reach \$111B in 2022, with Y/Y growth of 17% which cools to 0% in 2023.

TechInsights' IC Supply/Demand metrics improved again last week, rising from Loose to Balanced conditions overall and for NAND as well. More than Moore Foundry and OSAT left Glut status, rising to Saturated.

Electronics' Retail Price Down Trend has bottomed.

Critical Subsystems

CSUBS Graphics uploaded to Platform: (Located in Driving Forces under Misc. Reports). 2022 will be a strong year for Critical Sub-systems with revenues increasing 15%.

Chip History Center

Ultratech's History in Semiconductor Manufacturing — Founded in 1979 as Ultratech Stepper, it was the oldest stepper company in the world until its sale to Veeco in 2017. Unique in its use of a 1X lens, it was less expensive to build than a reduction stepper, while giving it a very large field size.

The Chip Insider

Strategy and Tactics: Re-Globalizing the Semiconductor Industry. Maxims for a Downturn

Semiconductor Stocks

- Semiconductor Stock Index was led up by Western Digital
- Semiconductor Equipment Stock Index was led up by Advantest
- EDA Stock Index fell
- Electronics Materials Stock Index was led up by Shin-Etsu
- Hottest Stocks: Western Digital, SK hynix, Advantest, FormFactor, Tokyo Electron, and Infineon.

TechInsights

The Chip Insider[®]'s Graphics File

September 2022



Caution rises as clouds darken the road

- Order activity for semiconductor equipment was flat last week with the overall temperature hovering at a warm 80 degrees
- Activity remains bifurcated with Memory and SOC Consumer slipping into correction territory while SOC Mobile, SOC Compute, and DAO are still expanding, albeit at a slower rate
- TechInsights' Chip Price Performance Index continued to trend lower

Forecast as of September 2022:	2022	2023
Semi Equipment (\$B):	\$ 139.4	\$ 132.3
Sequential Change	9.9%	-5.1%
Capacity Utilization:	96.2%	90.9%
ICs (\$B):	\$ 529.1	\$ 507.7
Sequential Change	7.5%	-4.0%
IC Units (BU):	419.3	415.9
Sequential Change	6.4%	-0.8%
Electronics (\$B) :	\$ 2,534	\$ 2,430
Sequential Change	-1.6%	-4.1%

[Contact us to access more details](#)

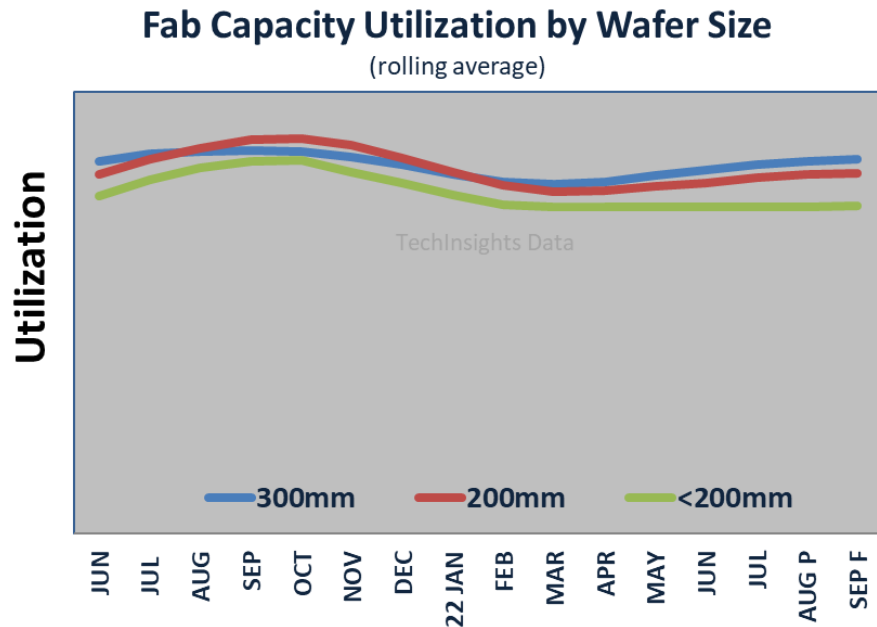
TechInsights

The Chip Insider[®] Graphics

Capacity Utilization by Wafer Size:

- Utilization rates remain high across the board

Fab Capacity Utilization by Wafer Size: Chart gives rolling averages for 300mm, 200mm, and smaller silicon wafers



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2022 SIA AWARDS DINNER THURSDAY, NOVEMBER 17, 2022

SAN JOSE MARRIOTT
301 S MARKET ST, SAN JOSE, CA 95113
SIA Reception: 5-6:30 p.m.
Dinner, Awards, Keynote: 6:30-8:30 p.m.
After-Dinner Reception: 8:30-10 p.m.

NOYCE AWARD RECIPIENT

LIP-BU TAN

Executive Chairman and Former CEO
Cadence Design Systems,
Inc. Founder and Chairman
Walden International
Founding Managing Partner
Walden Catalyst Ventures



KEYNOTE SPEAKER

JIM FARLEY

President and CEO
of Ford Motor
Company



For more information about tickets and
sponsorship opportunities please contact
Sarah Ravi at sravi@semiconductors.org

Semiconductor Analytics

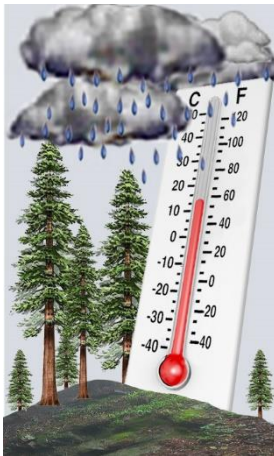
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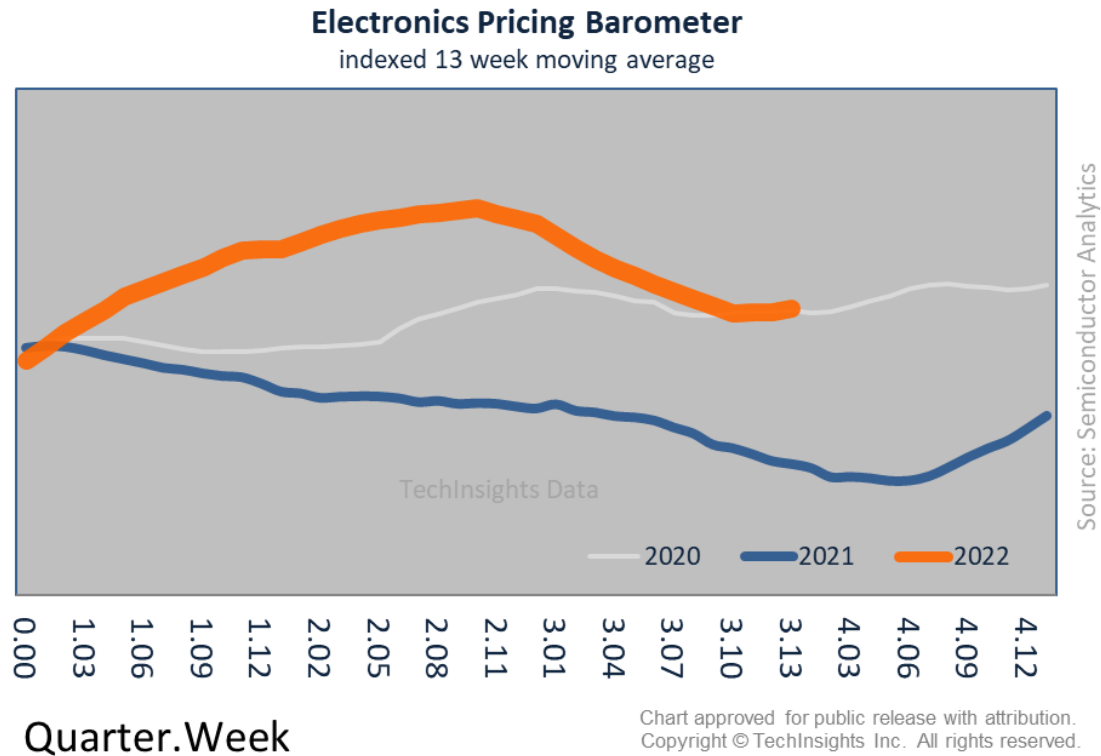


IC Weather Measures Order Activity S/D Measures Pricing Power

Electronics Retail Pricing Trends:

for PC notebooks Tablets Smartphones Cell phones Digital Cameras Appliances TVs

Electronics' Retail Price
Down Trend has
bottomed.



Workforce Development Solutions...

with Ajit Manocha of SEMI



What the conversation is about:

- Labor shortages have become the echo pandemic from the ravages COVID has had on the economy.
- This is no truer than in the semiconductor industry, where Workforce Development has long been on the To-Do lists of many.
- Most industry efforts appear to be more about lobbying others to do something about workforce development.
- It's really hard to do something substantive about it but SEMI is.

[Click here to watch online](#)

Strategy & Tactics



Strategy and Tactics: Re-Globalizing the Semiconductor Industry. Maxims for a Downturn

Summaries:

Re-Globalizing the Semiconductor Industry: Governments are not pursuing DE-Globalization. They are trying to RE-Globalize the semiconductor industry. The term is something I conjured up but bear with me. The Chips acts of both the EU and US face a common criticism from pundits: The semiconductor industry is inherently global. Efforts to de-globalize it is a folly. Japan tried to do it in the 70s and 80s and failed. So did South Korea when they tried in the 90s. China's experiment to centralize chip manufacturing there since 2015 is far below the trajectory needed to reach their 2025 goals. But when people talk about DE-Globalization, they typically visualize the global trade routes between producing areas. The focus is on transactions, not the many layers of production in the supply chain. What was truly deglobalized over the span of 5 decades was leading-edge wafer fab production. This occurred for a variety of reasons, but no one can challenge that by the 2010s the bulk of such manufacturing had gone to Taiwan and South Korea. This was especially true after 2015...

Maxims for a Downturn: Companies throughout the semiconductor world have started to question if their long-term strategic plans are compatible with the dark clouds they see on the horizon. All they've had to do is watch TechInsights Manufacturing Analysis' weather get worse by the week. Semiconductors are the extreme sport of business. They are to business,

what F1 is to racing. As with F1, nothing matches its high g-force cornering, accelerating, and braking. It's very easy to lock up your brakes going into a downturn. You're lucky if you're not stuck in the kitty-litter, waiting to be acquired or out of business completely. If not, then you've flat-spotted your tires and must waste time in the pits as everyone passes by. Accelerate too hard in the upturn and you carry too much speed into the corner and you're also off in the kitty-litter. The long tail of semiconductor companies ranked by revenue or out of the business is littered with former great leaders. The lesson here... decisions today in the face of a dark 2023 may well be regretted in 24/25 when the next upturn comes. With that in mind, here are three Maxims ...

- You'll never save your way out of a downturn
- It is always more profitable to have excess capacity than to be short of capacity
- Cost management in a downturn determines who wins and who loses in the upturn

"If you don't like what's being said, change the conversation"

— Don Draper, Mad Men

[Contact us to get the full report and more](#)

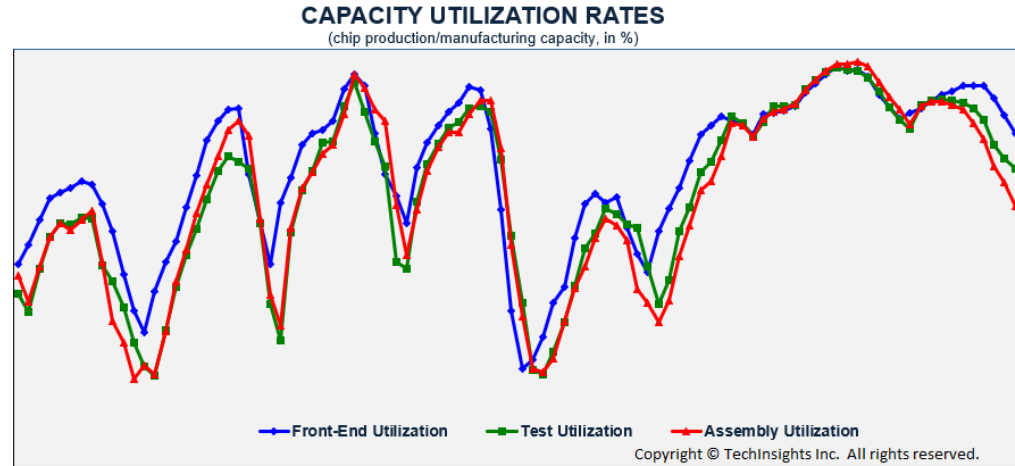
TechInsights

Critical Sub-systems



CSUBS Graphics uploaded to Platform last week (Located in Driving Forces under Misc. Reports)

2022 will be a strong year for Critical Sub-systems with revenues increasing 15%. However, the backdrop for 2023 is becoming more challenging due to growing pressures at the macro level stemming from high inflation, rising interest rates, and mounting geopolitical tensions. These factors, couple with excess levels of inventories, are taking a toll on semiconductor demand. As a result, equipment and subsystem sales will decline in 2023.



[Contact us to get the full report and more](#)



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[Ultratech's History in Semiconductor Manufacturing](#) — Founded in 1979 as Ultratech Stepper, it was the oldest stepper company in the world until its sale to Veeco in 2017. Unique in its use of a 1X lens, it was less expensive to build than a reduction stepper, while giving it a very large field size. Mispositioned in during the 80s as a competitor to reduction wafer exposure tools, Ultratech got left behind. This changed in 1990, when Art Zafiropoulo led a management buyout and repositioned the tool as complementary to reduction steppers, reducing fab cost. He was inducted into the [Semiconductor Hall of Fame](#) in 1994 for his ability to convince a reluctant industry of the value of mix-and-match. He was recognized by SEMI in 2000, naming him the first recipient of its [Bob Graham Award](#) for [sales and marketing excellence](#).

[Art Zafiropoulo 2000 BGA award interview](#)



www.chiphistory.org

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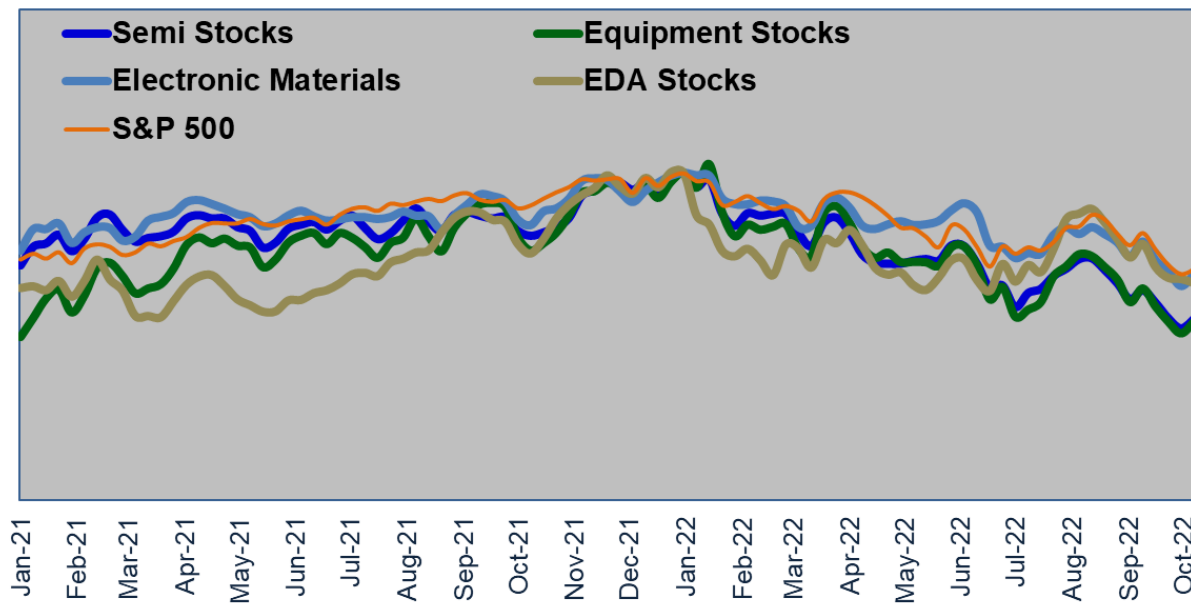
semiStockWEEK:

Three of TechInsights' Semiconductor Stock Indices increased this week along with S&P 500. EDA Stock Index fell.



Semiconductor Industry Stock Performance Indices

(Stock Prices Indexed to 100 in last week of 2021)



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TechInsights' Stock Indices:

Semiconductors +3.7%
Equipment +4.6%
Electronic Materials +3.9%
EDA -1.3%

Semiconductor Stocks:

Weekly Growth and Forward P/E Ratios by Company

Weekly Gains			10/7/2022		
Semiconductor Stocks	Price Change	Forward P/E	Semiconductor Stocks	Price Change	Forward P/E
IDM			Fab-lite to Fabless		
Intel	-0.2%	10	AMD	-7.8%	13
Micron	5.6%	8	Analog Devices	4.0%	15
ON Semiconductor	4.0%	13	Broadcom	3.7%	11
Samsung Electronics	5.8%	–	IBM	0.0%	12
SK hynix	9.7%		Infineon	8.6%	11
STMicroelectronics	5.8%	8	MagnaChip Semiconductor	4.8%	13
Western Digital	9.8%	6	MaxLinear	4.9%	8
Foundry & OSAT			MediaTek	2.7%	–
Amkor	5.1%	5	NVIDIA	-0.5%	27
ASE	4.2%	6	Panasonic	1.6%	10
GLOBALFOUNDRIES	4.9%	20	Qualcomm	7.0%	9
JCET	0.0%	12	Silicon Laboratories	2.0%	26
SkyWater Technology	-3.3%	–	Skyworks	2.3%	7
SMIC	7.5%	10	Texas Instruments	2.9%	17
TSMC	1.7%	11			
UMC	3.9%	6			

Above Avg

Top 4-6

Top 1-3

TechInsights' Semiconductor Stock Index was led up by Western Digital who was this week's biggest winner, followed by SK hynix, and Infineon.

IDM +5.8%
Foundry & OSAT +3.0%
Fabless & Fablite +2.6%

AMD^{AMD} Analog Devices^{ADI} Amkor^{AMKR} ASE^{ASX} Broadcom^{AVGO} GLOBALFOUNDRIES^{GFS} IBM^{IBM} Infineon^{IFNNY.PK} Intel^{INTC} JCET^{T600584.SS} Micron Technology^{MU} On Semiconductor^{ON} Panasonic^{PC} MagnaChip Semiconductor^{MX} MaxLinear^{MXL} MediaTek^{2454.TW} NVIDIA^{NVDA} Qualcomm^{QCOM} Samsung Electronics^{005930.KS} Silicon Laboratories^{SLAB} SkyWater Technology^{SKYT} Skyworks^{SWKS} SMIC^{SMI} STMicroelectronics^{STM} Texas Instruments^{TXN} TSMC^{TSM} UMC^{UMC} Western Digital^{WDC}

Chip Equipment & Related Stocks:

Weekly Growth and Forward P/E Ratios by Company

TechInsights' Semiconductor Equipment Stock Index was led up by Advantest, FormFactor, and Tokyo Electron. BESI, Onto Innovation, Kulicke & Soffa, ASM International, ASML, and KLA also performing over the weekly average.

WFE +4.1%

Test +7.1%

Assembly +5.1%

Applied Materials ^{AMAT} Advantest ^{ATEYY}
 ASM International ^{ASMIY}
 ASM Lithography ^{ASML} ASM Pacific ^{0522.HK}
 BE Semiconductor ^{BESII.PK}
 FormFactor ^{FORM} KLA ^{KLAC}
 Kulicke & Soffa ^{KLIC} Lam Research ^{LRCX}
 Onto Innovation ^{ONTO} Nikon ⁷⁷³¹ Teradyne
 TER Tokyo Electron Limited ⁸⁰³⁵ Veeco
 VECO

Weekly Gains			10/7/2022		
Equipment Stocks	Price Change	Forward P/E	Equipment Stocks	Price Change	Forward P/E
Wafer Fab:			Test:		
Applied Materials	0.8%	10	Advantest	9.6%	–
ASM International	5.0%	17	Teradyne	2.9%	15
ASML	4.6%	20	FormFactor	8.8%	14
KLA	3.8%	13			
Lam Research	2.4%	10	Assembly:		
Onto Innovation	6.7%	–	BESI	8.2%	–
Nikon	2.7%	–	Kulicke & Soffa	5.7%	10
TEL	8.8%	–	ASM Pacific Technology	1.3%	
Veeco Instruments	2.0%	11			

Above Avg

Top 4-6

Top 1-3

Electronic Materials Stocks:

Weekly Growth and Forward P/E Ratios by Company

Weekly Gains			10/7/2022		
EDA & Electronic Materials Stocks	Price Change	Forward P/E	EDA & Electronic Materials Stocks	Price Change	Forward P/E
EDA			DNP	2.1%	–
Cadence	-2.8%	36	DuPont de Nemours	3.9%	5
Synopsys	0.5%	30	JSR	5.9%	–
Ansys	-1.5%	26	Shin-Etsu	7.9%	–
Electronic Materials			SOITEC	3.5%	–
BASF	2.9%	2	Tokyo Ohka	5.8%	–
Entegris	-1.1%	18			
			Above Avg	Top 4-6	Top 1-3

TechInsights' EDA Stock Index fell.

TechInsights' Electronic Materials Stock Index was led up by Shin-Etsu, JSR, Tokyo Ohka, and DuPont de Nemours.

Ansys, Inc. ^{ANSS} BASF ^{BASFY}
 Entegris ^{ENTG} Cadence ^{CDNS} DNP ⁷⁹¹²
 DuPont ^{DD} JSR ⁴¹⁸⁵ Shin-Etsu ⁴⁰⁶³
 SOITEC ^{SOI.PA} Synopsys ^{SNPS} Tokyo
 Ohka ⁴¹⁸⁶

The Prior Week's Close	TechInsights' Indices of Chip Industry Stocks				Weekly Growth				Companies Up	Max Growth	Companies Down	Min Growth	Range of Growth	S&P 500	S&P 500 Growth
	Semi Stocks	Equipment Stocks	Materials Stocks	EDA Stocks	Semi Stocks	Equipment Stocks	Materials Stocks	EDA Stocks							
04-Mar-22	85.3	81.4	86.8	81.5	-5.3%	-6.9%	-5.5%	-1.2%	7	6.4%	-48	-18.6%	25.0%	90.8	-1.3%
11-Mar-22	82.1	79.7	87.1	76.9	-3.7%	-2.2%	0.3%	-5.7%	9	9.7%	-45	-11.1%	20.8%	88.2	-2.9%
18-Mar-22	87.9	90.3	92.7	83.7	7.1%	13.3%	6.5%	8.8%	53	31.3%	-2	-5.9%	37.2%	93.6	6.2%
25-Mar-22	89.1	91.8	94.0	82.9	1.3%	1.7%	1.3%	-0.9%	36	9.2%	-16	-5.5%	14.7%	95.3	1.8%
01-Apr-22	85.4	87.8	91.5	86.1	-4.2%	-4.3%	-2.6%	3.9%	5	5.0%	-50	-23.1%	28.1%	95.4	0.1%
08-Apr-22	80.1	81.9	87.1	82.3	-6.2%	-6.8%	-4.8%	-4.4%	2	5.5%	-53	-17.6%	23.1%	94.2	-1.3%
15-Apr-22	78.1	79.2	86.4	76.9	-2.5%	-3.3%	-0.9%	-6.6%	6	4.2%	-49	-10.9%	15.1%	92.2	-2.1%
22-Apr-22	77.8	80.5	87.4	75.2	-0.3%	1.6%	1.3%	-2.2%	30	9.3%	-25	-18.8%	28.1%	89.6	-2.8%
29-Apr-22	77.8	78.2	88.2	75.7	0.0%	-2.9%	0.9%	0.7%	22	21.1%	-32	-14.9%	36.0%	86.7	-3.3%
06-May-22	78.6	78.3	87.3	72.6	0.9%	0.1%	-1.0%	-4.1%	30	12.0%	-25	-11.7%	23.7%	86.5	-0.2%
13-May-22	79.0	78.1	87.5	71.4	0.5%	-0.1%	0.2%	-1.6%	28	8.2%	-25	-10.0%	18.2%	84.4	-2.4%
20-May-22	78.6	77.3	88.3	74.5	-0.5%	-1.1%	1.0%	4.3%	22	17.9%	-30	-7.7%	25.6%	81.9	-3.0%
27-May-22	82.3	81.9	90.9	78.7	4.8%	6.0%	2.9%	5.6%	48	30.3%	-7	-7.8%	38.1%	87.2	6.6%
03-Jun-22	82.1	82.0	92.6	78.9	-0.3%	0.1%	1.9%	0.3%	29	7.7%	-26	-4.6%	12.3%	86.2	-1.2%
10-Jun-22	77.8	77.3	90.3	73.8	-5.2%	-5.7%	-2.5%	-6.5%	6	9.7%	-49	-11.9%	21.6%	81.8	-5.1%
17-Jun-22	72.0	69.1	82.3	71.2	-7.5%	-10.6%	-8.9%	-3.6%	2	4.0%	-53	-17.3%	21.3%	77.1	-5.8%
24-Jun-22	72.5	72.1	82.0	77.8	0.8%	4.3%	-0.3%	9.3%	41	12.8%	-14	-19.4%	32.2%	82.1	6.4%
01-Jul-22	67.2	64.9	79.3	73.5	-7.3%	-10.1%	-3.3%	-5.6%	3	6.1%	-52	-20.1%	26.2%	80.3	-2.2%
08-Jul-22	70.7	66.6	80.5	77.5	5.2%	2.7%	1.5%	5.5%	47	20.5%	-7	-4.8%	25.3%	81.8	1.9%
15-Jul-22	71.7	68.5	80.3	75.8	1.4%	2.8%	-0.2%	-2.2%	32	10.1%	-21	-9.1%	19.2%	81.1	-0.9%
22-Jul-22	74.9	74.7	84.9	81.5	4.4%	9.1%	5.7%	7.5%	52	66.7%	-3	-8.3%	75.0%	83.1	2.5%
29-Jul-22	76.6	77.2	86.7	88.8	2.4%	3.3%	2.2%	9.0%	39	12.4%	-16	-9.9%	22.3%	86.7	4.3%
05-Aug-22	79.0	80.1	85.1	90.1	3.1%	3.8%	-1.9%	1.5%	47	33.8%	-8	-17.1%	50.9%	87.0	0.4%
12-Aug-22	79.2	79.6	86.8	91.2	0.3%	-0.6%	1.9%	1.3%	33	22.3%	-22	-17.4%	39.7%	89.8	3.3%
19-Aug-22	76.4	77.0	85.1	88.0	-3.6%	-3.3%	-1.9%	-3.6%	9	17.4%	-46	-8.1%	25.5%	88.7	-1.2%
26-Aug-22	73.1	74.0	83.1	83.9	-4.3%	-3.9%	-2.3%	-4.7%	2	1.1%	-53	-17.8%	18.9%	85.1	-4.0%
02-Sep-22	69.2	68.4	79.6	79.4	-5.4%	-7.5%	-4.1%	-5.4%	1	2.1%	-54	-16.1%	18.2%	82.3	-3.3%
09-Sep-22	71.4	71.8	83.3	82.7	3.2%	4.9%	4.6%	4.2%	50	13.1%	-5	-9.5%	22.6%	85.3	3.6%
16-Sep-22	68.3	67.3	78.8	77.0	-4.3%	-6.2%	-5.4%	-6.9%	4	2.3%	-50	-24.2%	26.5%	81.3	-4.8%
23-Sep-22	64.5	63.7	76.0	74.4	-5.5%	-5.5%	-3.5%	-3.4%	3	1.6%	-52	-15.8%	17.4%	77.5	-4.6%
30-Sep-22	62.0	60.8	72.5	74.1	-3.9%	-4.4%	-4.7%	-0.4%	5	4.7%	-49	-11.7%	16.4%	75.2	-2.9%
07-Oct-22	64.3	63.6	75.3	73.2	3.7%	4.6%	3.9%	-1.3%	46	9.8%	-7	-7.8%	17.6%	76.4	1.5%

Links to Conference Call Transcripts

October 7th

None this week

September 30th and before

[Micron Technology, Inc. \(MU\) Q4 2022 Earnings Call Transcript](#)

[Analog Devices Inc. \(ADI\) 13th Annual U.S. All Stars Conference \(Transcript\)](#)

[Advanced Micro Devices, Inc. \(AMD\) Goldman Sachs Communacopia + Technology Conference \(Transcript\)](#)

[QUALCOMM Incorporated \(QCOM\) Goldman Sachs 2022 Communacopia + Technology Conference \(Transcript\)](#)

[NVIDIA Corporation \(NVDA\) Presents at Goldman Sachs 2022 Communacopia + Technology Conference \(Transcript\)](#)

[NXP Semiconductors N.V. \(NXPI\) Goldman Sachs 2022 Communacopia + Technology Conference \(Transcript\)](#)

[Western Digital Corporation \(WDC\) Goldman Sachs Communacopia + Technology Conference Transcript](#)

[Applied Materials, Inc. \(AMAT\) Presents at Goldman Sachs Communacopia + Technology Conference \(Transcript\)](#)

[Western Digital Corporation \(WDC\) Presents at Evercore ISI 2nd Annual TMT Conference \(Transcript\)](#)

[ON Semiconductor Corporation \(ON\) Presents at Citi 2022 Global Technology Conference \(Transcript\)](#)

[ASML Holding NV \(ASML\) Citi 2022 Global Technology Conference \(Transcript\)](#)

[International Business Machines Corporation \(IBM\) Evercore ISI 2nd Annual Technology, Media & Telcom Conference 2022 Call Transcript](#)

[Analog Devices Inc. \(ADI\) 2022 Evercore ISI 2nd Annual Technology, Media & Telcom Conference \(Transcript\)](#)

[Applied Materials, Inc. \(AMAT\) Presents at Citi 2022 Global Technology Conference \(Transcript\)](#)

Links to Conference Call Transcripts

[Western Digital Corporation \(WDC\) Citi 2022 Global Technology Conference](#)

[NXP Semiconductors N.V. \(NXPI\) Presents at 2022 Citi's 2022 Global Technology Conference \(Transcript\)](#)

[Lam Research Corporation \(LRCX\) Management Presents at Evercore ISI 2nd Annual Technology, Media & Telecom Conference 2022 \(Transcript\)](#)

[Texas Instruments \(TXN\) Presents at Citigroup 2022 Global Technology Conference - Conference Call Transcript](#)

[Broadcom Inc. \(AVGO\) Q3 2022 Earnings Call Transcript](#)

[Micron Technology, Inc. \(MU\) Presents at Deutsche Bank 2022 Technology Conference \(Transcript\)](#)

[ON Semiconductor Corporation \(ON\) Deutsche Bank 2022 Technology Conference \(Transcript\)](#)

[Intel Corp \(INTC\) Deutsche Bank Technology Conference Transcript](#)

[Western Digital Corporation \(WDC\) Deutsche Bank 2022 Technology Conference \(Transcript\)](#)

[NVIDIA Corporation \(NVDA\) CEO Jensen Huang on Q2 2023 Results - Earnings Call Transcript](#)

[Applied Materials, Inc.'s \(AMAT\) CEO Gary Dickerson on Q3 2022 Results - Earnings Call Transcript](#)

[Synopsys, Inc. \(SNPS\) CEO Aart de Geus on Q3 2022 Results - Earnings Call Transcript](#)

[Analog Devices Inc. \(ADI\) CEO Vincent Roche on Q3 2022 Results - Earnings Call Transcript](#)

[Agilent Technologies, Inc. \(A\) CEO Mike McMullen on Q3 2022 Results - Earnings Call Transcript](#)

[SkyWater Technology, Inc. \(SKYT\) CEO Thomas Sonderman on Q2 2022 Results - Earnings Call Transcript](#)

[Magnachip Semiconductor Corporation \(MX\) CEO YJ Kim on Q2 2022 Results - Earnings Call Transcript](#)

Links to Conference Call Transcripts

[ACM Research, Inc. \(ACMR\) CEO David Wang on Q2 2022 Results - Earnings Call Transcript](#)

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