

# Semiconductor WEEK:

November 18, 2022

*An overview of results and conclusions from recent reports at TechInsights*

## Chip Market Research Services

***It's cold and foggy...***

- Order activity for semiconductor equipment extended its decline, slipping one point to 62 degrees
- Capacity Utilization Rates

## Semiconductor Analytics

**Last Week in the Semiconductor Market:**

Semiconductor sales increased 1% last week. The IC weather warmed nearly 5°F in Cool conditions, up 8°F since bottoming September 30. Zooming in on Auto ICs this week, 13-wk MA growth is remaining elevated at 21%. TechInsights forecasts Auto IC sales will reach \$38B in 2023 with a Y/Y increase of 10%, coming off 23% growth in 2022.

TechInsights' IC Supply/Demand continued to improve for the 7th week. Overall conditions moved to Shortage from Tight. Foundry went from Tight to Shortage with More Moore Foundry going to Tight and More than Moore Foundry to Shortage conditions. OSAT and IDM improved to Tight conditions while DRAM, NAND, and Analog & Power remain unchanged. Electronics' Retail Prices have peaked before the holidays.

## Critical Subsystems

Silicon and Silicon Carbide Components  
Ceramic Electrostatic Chucks

## Chip History Center

**Time Line: Applied Materials - AME 8100 Batch Etcher:** The blockbuster that remapped the etch market ushering in the modern era of etching.

**Exhibits: Nikon - 25 Years of Innovation:** Traces the history of Nikon Steppers ending with early feasibility work on immersion.

## Semiconductor Stocks

- *Three of TechInsights' Semiconductor Stock Indices and S&P 500 slipped this week. Semiconductor Index eked out a gain.*
- *Semiconductor Stock Index was led up by Amkor*
  - *Amkor was this week's biggest winner*
- *Semiconductor Equipment Stock Index slipped*
- *EDA Stock Index fell*
- *Electronics Materials Stock Index slipped*
- *Hottest Stocks: Amkor, TSMC, ASM Pacific Technology, Infineon, JCET, and SOITEC*

**TechInsights**

# The Chip Insider<sup>®</sup>'s Graphics File



October 2022

*It's cold and foggy...*

- Order activity for semiconductor equipment extended its decline, slipping one point to 62 degrees
- All other segments declined with Memory getting hit the hardest, falling to 2019 levels
- The outlook for equipment suppliers remains uncertain due to the current macroenvironment and geopolitical tensions
- TechInsights' Chip Price Performance Index continued its downward trend



Forecast as of October 2022:	2022	2023
<b>Semi Equipment (\$B):</b>	<b>\$ 136.9</b>	<b>\$ 118.2</b>
Sequential Change	7.9%	-13.6%
<b>Capacity Utilization:</b>	95.4%	89.8%
<b>ICs (\$B):</b>	<b>\$ 516.2</b>	<b>\$ 486.3</b>
Sequential Change	4.9%	-5.8%
<b>IC Units (BU):</b>	412.9	405.9
Sequential Change	4.7%	-1.7%
<b>Electronics (\$B) :</b>	<b>\$ 2,534</b>	<b>\$ 2,430</b>
Sequential Change	-1.6%	-4.1%

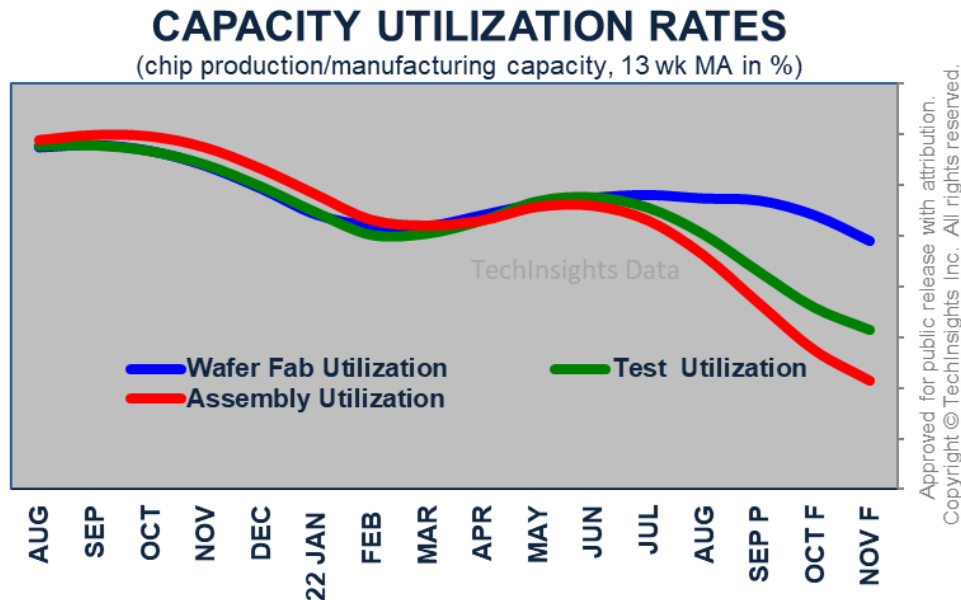
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# The Chip Insider<sup>®</sup> Graphics

## Capacity Utilization Rates:

- Utilization rates are falling across the board

**Capacity Utilization Rates:** chart gives rolling averages for semiconductor wafer fab, test, and assembly



## 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.

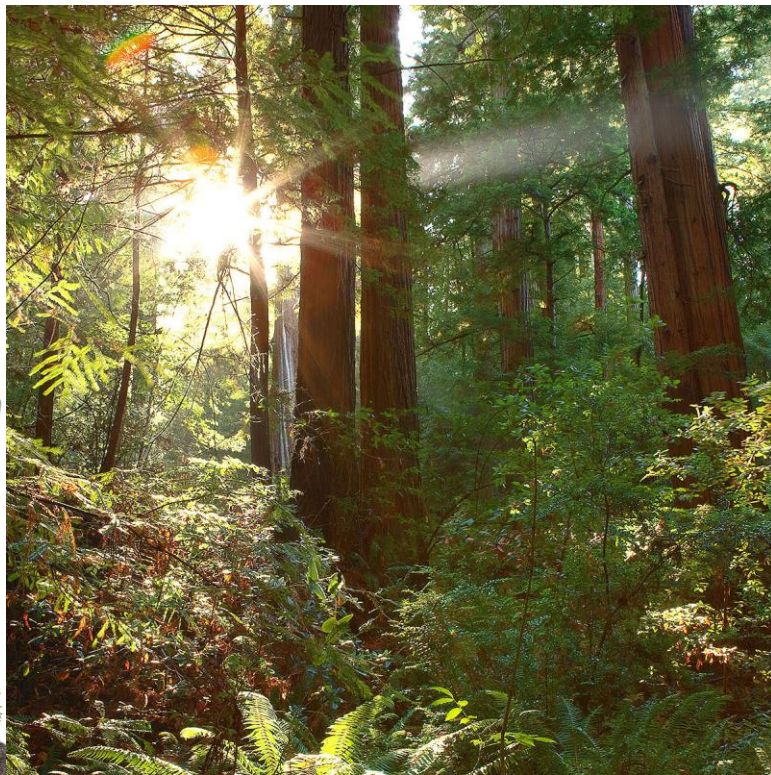
[Click here to watch online](#)

# Semiconductor Analytics

## Last Week in the Semiconductor Market:

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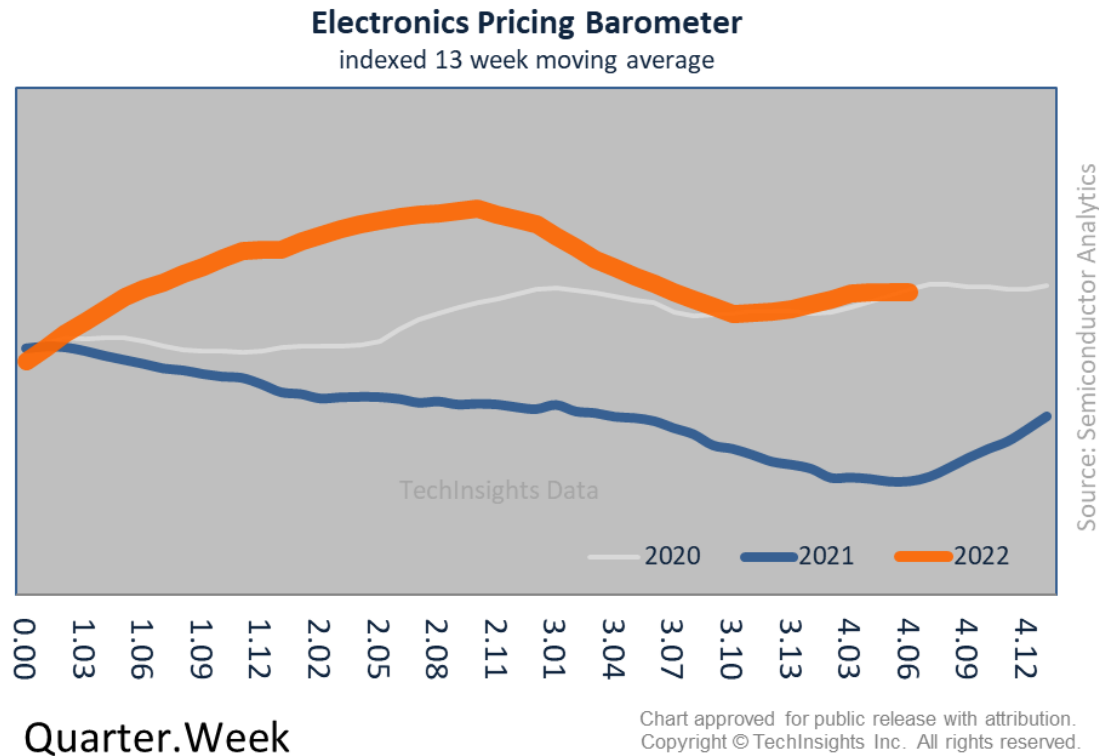


IC Weather Measures Order Activity S/D Measures Pricing Power

# Electronics Retail Pricing Trends:

for PC notebooks Tablets Smartphones Cell phones Digital Cameras Appliances TVs

Electronics' Retail  
Prices have peaked  
before the holidays.



# Critical Sub-systems

## Silicon and Silicon Carbide Components

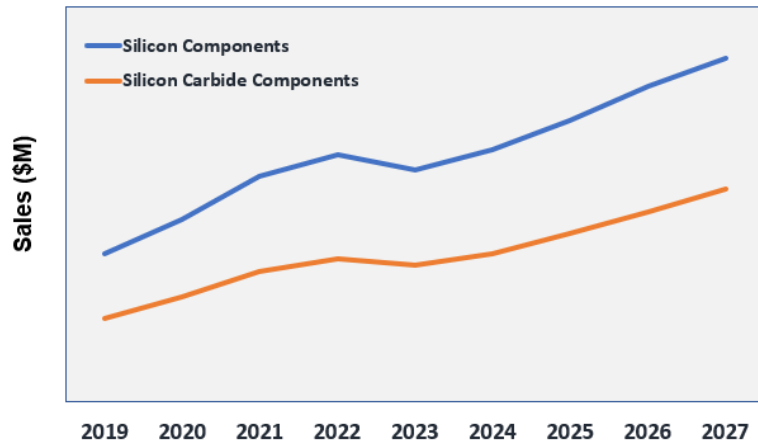


We recently completed a focused report on Silicon and Silicon Carbide Components for semiconductor equipment. Summary data has been added to the Platform.

Silicon Components revenues are on track to reach \$1B in 2022 and surpass \$1.3B in 2027. Largest suppliers include Silfex, HANA, Worldex, and SKC.

Silicon Carbide Components revenues are on track to reach \$580M in 2022 and surpass \$850M in 2027. Largest suppliers include Tokai Carbon Korea and Tokai Carbon Japan, Asahi Glass, and CoorsTek.

Silicon Components for Semi Eqpt



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# Critical Sub-systems

## Ceramic Electrostatic Chucks

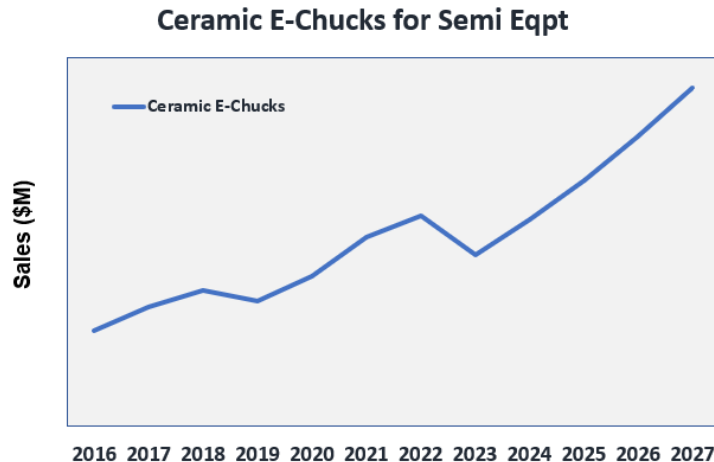


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Ceramic E-Chucks for Semiconductor Equipment to reach \$1.2B in 2022

Top Suppliers include NGK Insulators, Shinko, TOTO, and Kyocera

Ceramic E-Chucks forecast to surpass \$1.8B in 2027



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The Virtual Museum of Semiconductors

Section

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## Time Line: Applied Materials - AME 8100 Batch Etcher:

The blockbuster that remapped the etch market ushering in the modern era of etching. Applied celebrated its 50<sup>th</sup> anniversary in 2017.

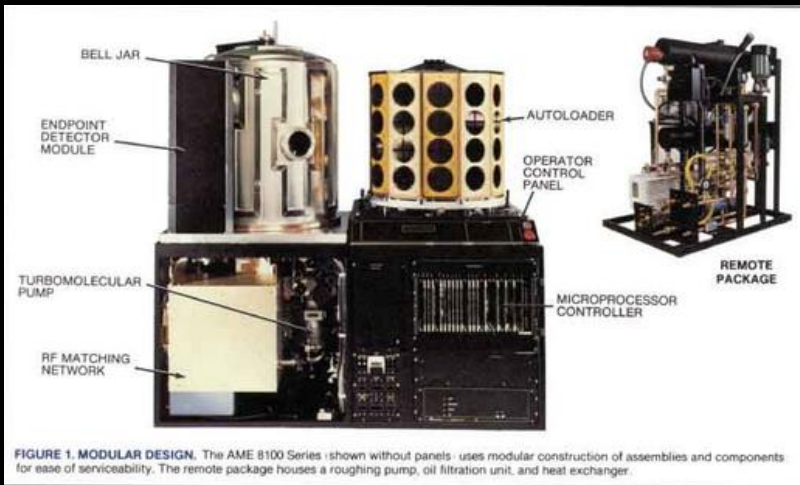


FIGURE 1. MODULAR DESIGN. The AME 8100 Series (shown without panels) uses modular construction of assemblies and components for ease of serviceability. The remote package houses a roughing pump, oil filtration unit, and heat exchanger.

Exhibits: Nikon - 25 Years of Innovation: Traces the history of Nikon Steppers ending with early feasibility work on immersion. Nikon celebrated its 100<sup>th</sup> anniversary in 2017.



Nikon's first stepper: NSR-1010G

Supporters:

ADVANTEST

APPLIED  
MATERIALS  
make possible

ASE Technology  
Holding Co., Ltd.

exyte

intel

KLA  
Keep Looking Ahead

semi

VLSIresearch  
Intelligence to make better decisions faster

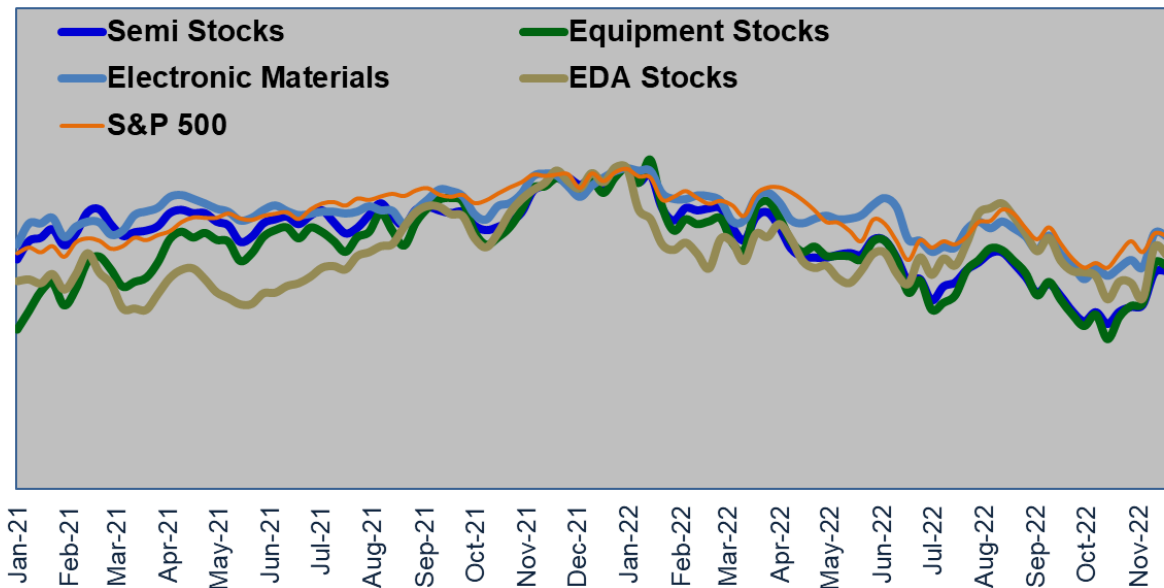
# semiStockWEEK:

Three of TechInsights' Semiconductor Stock Indices and the S&P 500 slipped this week while the Semiconductor Index eked out a gain.



## Semiconductor Industry Stock Performance Indices

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



### TechInsights' Stock Indices:

Semiconductors +0.5%  
Equipment -0.8%  
Electronic Materials -0.9%  
EDA -2.5%

# Semiconductor Stocks:

## Weekly Growth and Forward P/E Ratios by Company

Weekly Gains			11/18/2022		
Semiconductor Stocks	Price Change	Forward P/E	Semiconductor Stocks	Price Change	Forward P/E
<b>IDM</b>			<b>Fab-lite to Fabless</b>		
Intel	-1.8%	16	AMD	1.7%	20
Micron	-6.3%	16	Analog Devices	-1.3%	17
ON Semiconductor	-3.5%	16	Broadcom	-0.6%	13
Samsung Electronics	-1.7%	–	IBM	3.1%	15
SK hynix	-5.5%		Infineon	8.2%	16
STMicroelectronics	1.7%	10	MagnaChip Semiconductor	-2.2%	19
Western Digital	-7.3%	10	MaxLinear	-2.2%	9
<b>Foundry &amp; OSAT</b>			MediaTek	3.1%	–
Amkor	12.4%	9	NVIDIA	-5.6%	38
ASE	1.1%	7	Panasonic	2.5%	12
GLOBALFOUNDRIES	4.1%	28	Qualcomm	2.0%	10
JCET	7.3%	14	Silicon Laboratories	-0.4%	38
SkyWater Technology	-22.2%	–	Skyworks	-2.1%	9
SMIC	1.6%	11	Texas Instruments	-2.4%	22
TSMC	11.3%	12			
UMC	1.5%	9			

Above Avg

Top 4-6

Top 1-3

**TechInsights' Semiconductor Stock Index** was led up by Amkor who was this week's biggest winner followed by TSMC, Infineon, and JCET who were all top performers this week.

IDM -3.5%  
Foundry & OSAT +2.1%  
Fabless & Fablite +0.3%

AMD<sup>AMD</sup> Analog Devices<sup>ADI</sup> Amkor<sup>AMKR</sup> ASE<sup>ASE</sup>  
ASX<sup>ASX</sup> Broadcom<sup>AVGO</sup> GLOBALFOUNDRIES<sup>GFS</sup>  
IBM<sup>IBM</sup> Infineon<sup>IFNNY.PK</sup> Intel<sup>INTC</sup>  
JCET<sup>600584.SS</sup> Micron Technology<sup>MU</sup> On Semiconductor<sup>ON</sup> Panasonic<sup>PC</sup> MagnaChip Semiconductor<sup>MX</sup> MaxLinear<sup>MXL</sup>  
MediaTek<sup>2454.TW</sup> NVIDIA<sup>NVDA</sup> Qualcomm<sup>QCOM</sup>  
Samsung Electronics<sup>005930.KS</sup> Silicon Laboratories<sup>SLAB</sup> SkyWater Technology<sup>SKYT</sup>  
Skyworks<sup>SWKS</sup> SMIC<sup>SMI</sup> STMicroelectronics<sup>STM</sup>  
Texas Instruments<sup>TXN</sup> TSMC<sup>TSM</sup> UMC<sup>UMC</sup>  
Western Digital<sup>WDC</sup>

# Chip Equipment & Related Stocks:

## Weekly Growth and Forward P/E Ratios by Company

Weekly Gains			11/18/2022		
Equipment Stocks	Price Change	Forward P/E	Equipment Stocks	Price Change	Forward P/E
<b>Wafer Fab:</b>			<b>Test:</b>		
Applied Materials	-5.3%	16	Advantest	0.9%	–
ASM International	-1.4%	24	Teradyne	-3.5%	25
ASML	2.9%	30	FormFactor	2.2%	27
KLA	-1.0%	20			
Lam Research	-8.8%	18	<b>Assembly:</b>		
Onto Innovation	-5.9%	–	BESI	0.1%	–
Nikon	-3.3%	–	Kulicke & Soffa	3.1%	12
TEL	0.5%	–	ASM Pacific Technology	10.4%	
Veeco Instruments	-0.5%	15			

Above Avg

Top 4-6

Top 1-3

**TechInsights' Semiconductor Equipment Stock Index** slipped this week despite strong gains from ASM Pacific Technology who came out on top. Kulicke & Soffa, ASML, FormFactor, Advantest, and TEL all finished above the weekly average.

WFE -2.5%

Test -0.1%

Assembly +4.5%

Applied Materials <sup>AMAT</sup> Advantest <sup>ATEYY</sup>

ASM International <sup>ASMIY</sup>

ASM Lithography <sup>ASML</sup> ASM Pacific <sup>0522.HK</sup>

BE Semiconductor <sup>BESII.PK</sup>

FormFactor <sup>FORM</sup> KLA <sup>KLAC</sup>

Kulicke & Soffa <sup>KLIC</sup> Lam Research <sup>LRCX</sup>

Onto Innovation <sup>ONTO</sup> Nikon <sup>7731</sup> Teradyne

TER Tokyo Electron Limited <sup>8035</sup> Veeco  
VECO

# Electronic Materials Stocks:

## Weekly Growth and Forward P/E Ratios by Company

Weekly Gains			11/18/2022		
EDA & Electronic Materials Stocks	Price Change	Forward P/E	EDA & Electronic Materials Stocks	Price Change	Forward P/E
<b>EDA</b>			DNP	-4.4%	–
Cadence	-1.1%	36	DuPont de Nemours	-2.0%	5
Synopsys	-1.7%	33	JSR	-2.0%	–
Ansys	-4.7%	31	Shin-Etsu	0.9%	–
<b>Electronic Materials</b>			SOITEC	4.6%	–
BASF	-2.7%	2	Tokyo Ohka	2.9%	–
Entegris	-4.2%	22			
			Above Avg	Top 4-6	Top 1-3

TechInsights' EDA Stock Index fell.

TechInsights' Electronic Materials Stock Index slipped this week. SOITEC claimed one of the top stock spots this week.

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

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							
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%
14-Oct-22	61.4	57.6	73.3	67.4	-4.6%	-9.5%	-2.6%	-7.9%	8	5.8%	-47	-16.1%	21.9%	75.2	-1.6%
21-Oct-22	64.4	63.1	75.3	71.8	4.9%	9.6%	2.8%	6.5%	45	21.9%	-10	-5.2%	27.1%	78.7	4.7%
28-Oct-22	65.6	65.8	77.2	71.4	1.8%	4.3%	2.5%	-0.5%	42	11.5%	-13	-24.7%	36.2%	81.8	4.0%
04-Nov-22	66.1	66.5	75.4	67.7	0.9%	1.0%	-2.4%	-5.3%	32	20.3%	-23	-21.5%	41.8%	79.1	-3.3%
11-Nov-22	74.1	76.5	83.9	80.5	12.1%	15.0%	11.3%	18.9%	53	37.4%	-2	-8.0%	45.4%	83.8	5.9%
18-Nov-22	74.5	75.8	83.2	78.5	0.5%	-0.8%	-0.9%	-2.5%	24	12.4%	-31	-22.2%	34.6%	83.2	-0.7%

# Links to Conference Call Transcripts

**November 17<sup>th</sup>**

[Applied Materials, Inc. \(AMAT\) Q4 2022 Earnings Call Transcript](#)

[Camtek LTD. \(CAMT\) Q3 2022 Earnings Call Transcript](#)

[Kulicke and Soffa Industries, Inc. \(KLIC\) Q4 2022 Earnings Call Transcript](#)

[NVIDIA Corporation \(NVDA\) Q3 2023 Earnings Call Transcript](#)

[Infineon Technologies AG \(IFNNY\) Q4 2022 Earnings Call Transcript](#)

**November 11<sup>th</sup> and before**

[GLOBALFOUNDRIES Inc. \(GFS\) Q3 2022 Earnings Call Transcript](#)

[Veeco Instruments, Inc. \(VECO\) Q3 2022 Earnings Call Transcript](#)

[Microchip Technology Inc. \(MCHP\) Q2 2023 Earnings Call Transcript](#)

[Skyworks Solutions, Inc. \(SWKS\) Q4 2022 Earnings Call Transcript](#)

[Axcelis Technologies, Inc. \(ACLS\) Q3 2022 Earnings Call Transcript](#)

[MKS Instruments, Inc. \(MKS\) Q3 2022 Earnings Call Transcript](#)

[Qualcomm Inc. \(QCOM\) Q4 2022 Earnings Call Transcript](#)

[Qorvo, Inc. \(QRVO\) Q2 2023 Earnings Call Transcript](#)

[Magnachip Semiconductor Corporation \(MX\) Q3 2022 Earnings Call Transcript](#)

[Vishay Intertechnology, Inc. \(VSH\) Q3 2022 Earnings Call Transcript](#)

[Entegris, Inc. \(ENTG\) Q3 2022 Earnings Call Transcript](#)

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[Advanced Energy Industries, Inc. \(AEIS\) Q3 2022 Earnings Call Transcript](#)

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[NXP Semiconductors N.V. \(NXPI\) Q3 2022 Earnings Call Transcript](#)

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[Amkor Technology, Inc. \(AMKR\) Q3 2022 Earnings Call Transcript](#)

[Panasonic Holdings Corporation \(PCRFY\) Q2 2023 Earnings Call Transcript](#)

[ON Semiconductor Corporation \(ON\) Q3 2022 Earnings Call Transcript](#)

[SK hynix \(HXSCF\) Q3 2022 Earnings Call Transcript](#)

[AIXTRON SE \(AIXXF\) Q3 2022 Earnings Call Transcript](#)

[MediaTek Inc. \(MDTKF\) CEO Rick Tsai on Q3 2022 Results - Earnings Call Transcript](#)

[STMicroelectronics N.V. \(STM\) Q3 2022 Earnings Call Transcript](#)

[Advantest Corporation \(ATEYY\) Q2 2022 Earnings Call Transcript](#)

[Onto Innovation Inc. \(ONTO\) Q3 2022 Earnings Call Transcript](#)

[Cohu, Inc. \(COHU\) Q3 2022 Earnings Call Transcript](#)

[Intel Corporation \(INTC\) Q3 2022 Earnings Call Transcript](#)

[ASE Technology Holding Co., Ltd. \(ASX\) Q3 2022 Earnings Call Transcript](#)

[Western Digital Corporation \(WDC\) Q1 2023 Earnings Call Transcript](#)

# Links to Conference Call Transcripts

[Samsung Electronics Co., Ltd. \(SSNLF\) Q3 2022 Results - Earnings Call Transcript](#)

[FormFactor, Inc. \(FORM\) Q3 2022 Earnings Call Transcript](#)

[KLA Corporation \(KLAC\) Q1 2023 Earnings Call Transcript](#)

[Teradyne, Inc. \(TER\) Q3 2022 Earnings Call Transcript](#)

[MaxLinear, Inc. \(MXL\) Q3 2022 Earnings Call Transcript](#)

[Texas Instruments Incorporated \(TXN\) Q3 2022 Earnings Call Transcript](#)

[BE Semiconductor Industries N.V. \(BESY\) Q3 2022 Earnings Call Transcript](#)

[Lam Research Corporation \(LRCX\) Q1 2023 Earnings Call Transcript](#)

[Taiwan Semiconductor Manufacturing Company Limited \(TSM\) Q3 2022 Earnings Call Transcript](#)

[Aehr Test Systems \(AEHR\) Q1 2023 Earnings Call Transcript](#)

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

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