

# Semiconductor WEEK:

November 11, 2022

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

## Chip Market Research Services

*The fog has rolled in..*

- Order activity for semiconductor equipment extended its decline, slipping to 63 degrees
- Worldwide Chip Making Equipment Markets

## Semiconductor Analytics

**Last Week in the Semiconductor Market:**

Semiconductor sales jumped 10% last week, in an EOY run. The IC weather warmed 1°F in Cool conditions, up 3°F since bottoming September 30. Zooming in on Analog & Power this week, 13-wk MA growth is refusing to normalize, since peaking at +86% the week of July 9, 2021. They were at +20% last week. TechInsights forecasts A&P sales will reach \$111B in 2023. TechInsights' IC Supply/Demand metrics continued to improve for the 6th week in a row. Foundry improved to Tight, as More Moore went to Balanced and More than Moore to Tight. OSAT improved to Balanced. But NAND slipped back down to Balanced. Auto ICs remained in Shortage, Analog and Power in Tight, and IDM in Balanced. Overall held in Tight. Electronics' Retail Prices have peaked before the holidays.

## Critical Subsystems

CSUBS Driving Forces Forecast Update

## Chip History Center

**How KLA-Tencor Meets Stringent Process Control**

**Requirements:** Ken Schroeder, then President & CEO of KLA-Tencor, discusses the history of process control and the role K-T played in improving wafer fab yields

**KLA 200 Series Reticle Inspection Systems:** KLA's technical success was founded on how it used software to identify defects in optical images.

## **Semiconductor Stocks**

- *TechInsights' Semiconductor Stock Indices and S7P 500 jumped this week.*
- *Semiconductor Stock Index was led up by SkyWater Technology*
  - *SkyWater Technology was this week's biggest winner*
- *Semiconductor Equipment Stock Index was led up by BESI*
- *EDA Stock Index soared*
- *Electronics Materials Stock Index was led up by Entegris*
- *Hottest Stocks: SkyWater Technology, BESI, ASML, Entegris, Applied Materials, and Synopsys*

**TechInsights**

## Manufacturing Analysis Conferences



Dan is Vice Chair of TechInsights Inc. He is a recognized authority on the semiconductor industry, winning SEMI's Sales and Marketing Excellence Award<sup>1</sup> in 2012 for "empowering executives with tremendous strategic and tactical marketing value" through his e-letter, *The Chip Insider*<sup>®</sup>; his book *Maxims of Hi-Tech*, and his many interviews of executives.

As some industry leaders have said, "He is the marketing voice and expert for the industry." "Dan has methodically captured the essence of the industry and produced it in such a way for all to benefit ... He has been such an integral part of the industry for so long, it is difficult to imagine the industry without his contributions."

Dan's public work on the industry has often focused on challenging predictions of the demise of Moore's Law that date back decades by demonstrating how doomsayers have been outpaced by emergent behavior through the innate ability of technologists to innovate. This has included invited articles for *Scientific American*, the *SIA*, and the Plenary at the *SPIE Advanced Lithography Conference*.

<sup>1</sup> Formerly SEMI's Bob Graham Award

### Dan Hutcheson

#### Keynote

Wednesday, November 16<sup>th</sup>

9:05 am

**Frontier of Challenge and  
Opportunity: Semiconductors  
Shortages, Geopolitics & Outlooks  
Room 14a**

#### Moderator

Wednesday, November 16<sup>th</sup>

11:35 am

**Navigating Through Global  
Developments Affecting the Supply  
Chain Management  
Room 14a**

**SEMICON<sup>®</sup> EUROPA**

November 15-18<sup>th</sup>, 2022

Messe München  
Munich, Germany

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



**October 2022**

*The fog has rolled in..*

- Order activity for semiconductor equipment extended its decline, slipping to 63 degrees
- All segments trended lower with Memory getting hit the hardest, falling to a new low for the year
- Memory fundamentals continue to deteriorate
- TechInsights' Chip Price Performance Index continued to trend lower

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%

[Contact us to access more details](#)

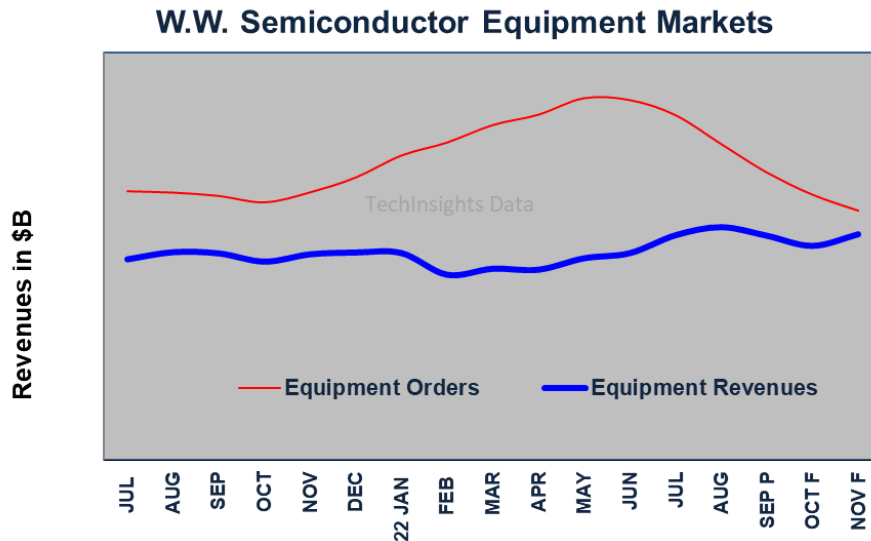
**TechInsights**

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

## Worldwide Chip Making Equipment Markets

- Equipment Orders have been decreasing

**Worldwide Chip Making Equipment Markets:** Chart shows rolling averages in \$B for semiconductor equipment orders and revenues, contrasted against a 36-month rolling average of revenues



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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



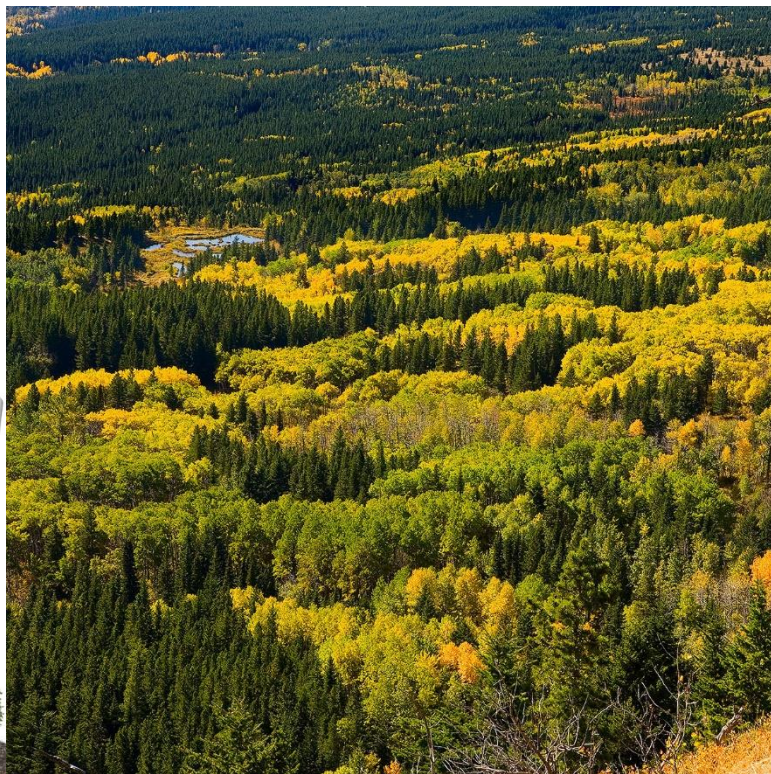
For more information about tickets and  
sponsorship opportunities please contact  
Sarah Ravi at [sravi@semiconductors.org](mailto:sravi@semiconductors.org)



# Semiconductor Analytics

## Last Week in the Semiconductor Market:

Semiconductor sales jumped 10% last week, in an EOY run. The IC weather warmed 1°F in Cool conditions, up 3°F since bottoming September 30. Zooming in on Analog & Power this week, 13-wk MA growth is refusing to normalize, since peaking at +86% the week of July 9, 2021. They were at +20% last week. TechInsights forecasts A&P sales will reach \$111B in 2023. TechInsights' IC Supply/Demand metrics continued to improve for the 6th week in a row. Foundry improved to Tight, as More Moore went to Balanced and More than Moore to Tight. OSAT improved to Balanced. But NAND slipped back down to Balanced. Auto ICs remained in Shortage, Analog and Power in Tight, and IDM in Balanced. Overall held in Tight. Electronics' Retail Prices have peaked before the holidays.

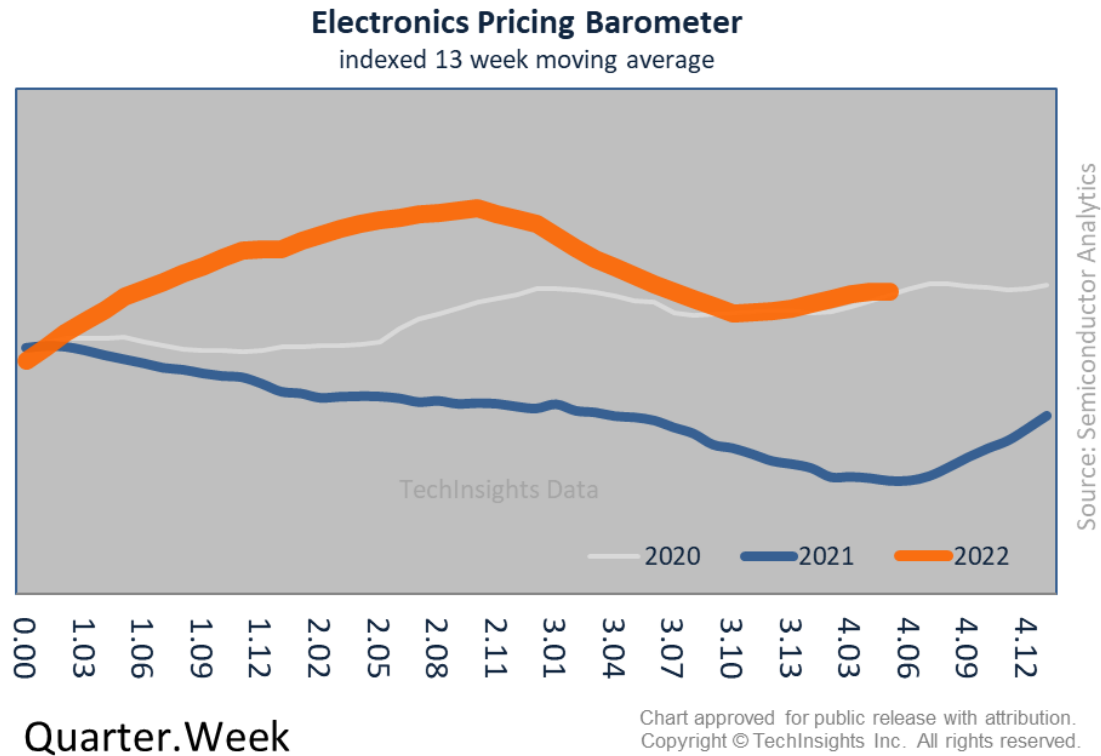


IC Weather Measures Order Activity S/D Measures Pricing Power

# Electronics Retail Pricing Trends:

for PC notebooks Tablets Smartphones Cell phones Digital Cameras Appliances TVs

Electronics' Retail  
Prices have peaked  
before the holidays.



## 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](#)



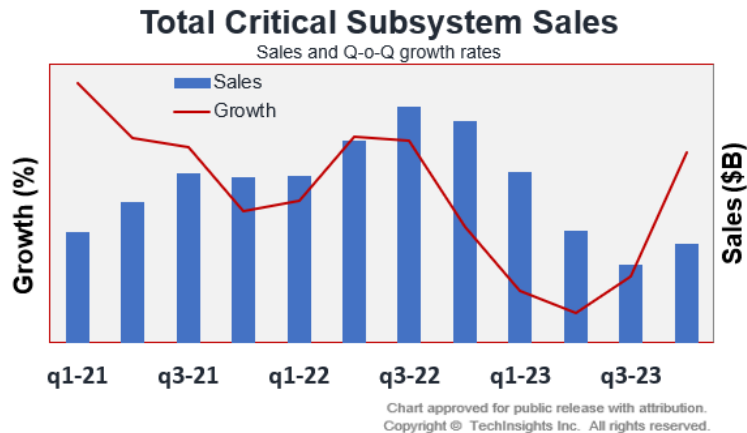
# Critical Sub-systems

## CSUBS Driving Forces Forecast Update



Combined Critical Subsystems are expected to grow 12% in 2022 (Y-o-Y), surpassing \$20B. Semiconductor critical subsystem revenue will surge 15% this year, propelled by a strong WFE market. Headwinds are in full force for the upcoming 2022 Q4 due to rising interest rates in the US, Chinese export controls and a dim macroeconomic outlook. As a result, the semiconductor market is slowing down significantly in 2023 and is expected to slip into the negative as early as Q4 2022. Therefore, we expect semiconductor critical subsystem sales to decline 19% in 2023 as chipmakers rein in spending to assess the slowing demand.

Looking at quarterly growth rates, subsystems continued to grow in the third quarter of 2022 reaching a record high of \$6B. However, negative growth is forecast for the fourth quarter of 2022 and the first three quarters of 2023 followed by a recovery in the fourth quarter of 2023 and into 2024.



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



**How KLA-Tencor Meets Stringent Process Control Requirements:** Ken Schroeder, then President & CEO of KLA-Tencor, discusses the history of process control and the role K-T played in improving wafer fab yields for semiconductor companies in this 2005 video. K-T's Puma tool dark-field wafer inspection was introduced for the first time in this video. The Puma would go on to be one of the most popular wafer fab tools ever introduced. The 2800 broadband bright-field system was also introduced.



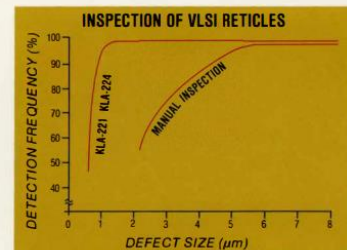
**KLA 200 Series Reticle Inspection Systems:** KLA's technical success was founded on how it used software to identify defects in optical images. KLA's business success was founded on its ability to shrink-wrap its software with a full system solution. There were plenty of others trying to do the same thing at the same time. The difference between KLA's success and the failure of other's was KLA's ability to tie its systems capabilities to key customer needs. You can see how they did it in this 1984 brochure.

## KLARIS: Automatic inspection of reticles against a database . . . and

### The Problem: How to Detect and Eliminate Killer Defects Before They're Repeated

VLSI circuits require more exacting and precise inspection of reticles and photomasks than ever before. The inability to compare a reticle or photomask die pattern to its database can lead to a fatal defect being repeated in hundreds of thousands of chips. However, installing a method of proper database comparison ensures that the geometry is correct, and that defects due to processing anomalies, contamination and handling will be located in time to prevent staggering losses . . . in both dollars and inventory.

Unfortunately, manual inspection simply doesn't work.



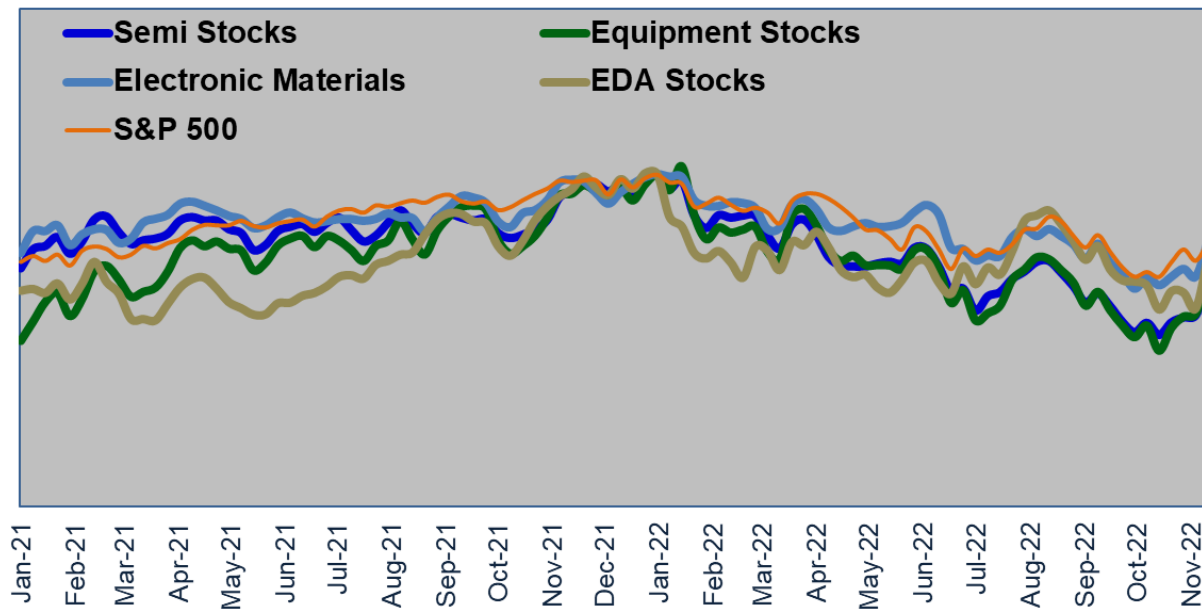
# semiStockWEEK:

TechInsights' Semiconductor Stock Indices and the S&P 500 jumped this week as investors hope cooler U.S. inflation will lead to less aggressive interest rate hikes by the Federal Reserve.



## Semiconductor Industry Stock Performance Indices

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



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### TechInsights' Stock Indices:

Semiconductors +12.1%  
Equipment +15.1%  
Electronic Materials +11.3%  
EDA +18.9%

# Semiconductor Stocks:

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

Weekly Gains			11/11/2022		
Semiconductor Stocks	Price Change	Forward P/E	Semiconductor Stocks	Price Change	Forward P/E
<b>IDM</b>			<b>Fab-lite to Fabless</b>		
Intel	8.1%	15	AMD	16.4%	17
Micron	11.6%	15	Analog Devices	13.7%	15
ON Semiconductor	19.2%	14	Broadcom	11.3%	11
Samsung Electronics	5.9%	–	IBM	4.7%	14
SK hynix	10.7%		Infineon	19.3%	13
STMicroelectronics	18.1%	9	MagnaChip Semiconductor	3.7%	13
Western Digital	12.4%	9	MaxLinear	13.4%	8
<b>Foundry &amp; OSAT</b>			MediaTek	17.3%	–
Amkor	19.8%	7	NVIDIA	15.5%	32
ASE	15.9%	6	Panasonic	0.9%	12
GLOBALFOUNDRIES	19.5%	23	Qualcomm	14.1%	9
JCET	-1.8%	14	Silicon Laboratories	17.6%	33
SkyWater Technology	37.4%	–	Skyworks	9.9%	7
SMIC	1.3%	11	Texas Instruments	10.6%	20
TSMC	18.4%	10			
UMC	17.7%	7			

Above Avg

Top 4-6

Top 1-3

### TechInsights' Semiconductor Stock Index

was led up by SkyWater Technology who announced better than expected third quarter earnings made them this week's biggest winner.

IDM +12.3%

Foundry & OSAT +16.0%

Fabless & Fablite +12.0%

AMD<sup>AMD</sup> Analog Devices<sup>ADI</sup> Amkor<sup>AMKR</sup> ASE<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

**TechInsights' Semiconductor Equipment Stock Index** was led up by strong gains from **BESI**, **ASML**, and **Applied Materials**. Who all claimed three of the top stock spots this week. All Test Equipment Suppliers also performing above the weekly average.

WFE +14.9%  
Test +15.6%  
Assembly +15.1%

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

Weekly Gains			11/11/2022		
Equipment Stocks	Price Change	Forward P/E	Equipment Stocks	Price Change	Forward P/E
<b>Wafer Fab:</b>			<b>Test:</b>		
Applied Materials	20.5%	14	Advantest	17.5%	–
ASM International	18.3%	20	Teradyne	13.9%	22
ASML	23.0%	24	FormFactor	15.5%	19
KLA	16.2%	17			
Lam Research	19.5%	15	<b>Assembly:</b>		
Onto Innovation	17.7%	–	BESI	23.6%	–
Nikon	-8.0%	–	Kulicke & Soffa	10.6%	11
TEL	16.9%	–	ASM Pacific Technology	11.0%	
Veeco Instruments	9.6%	11			

Above Avg

Top 4-6

Top 1-3



# Electronic Materials Stocks:

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

Weekly Gains			11/11/2022		
EDA & Electronic Materials Stocks	Price Change	Forward P/E	EDA & Electronic Materials Stocks	Price Change	Forward P/E
<b>EDA</b>			DNP	1.6%	–
Cadence	17.3%	31	DuPont de Nemours	15.0%	5
Synopsys	20.0%	27	JSR	5.8%	–
Ansys	19.5%	25	Shin-Etsu	10.3%	–
<b>Electronic Materials</b>			SOITEC	19.5%	–
BASF	12.8%	2	Tokyo Ohka	4.5%	–
Entegris	20.6%	16			
			Above Avg	Top 4-6	Top 1-3

TechInsights' EDA Stock Index soared.

TechInsights' Electronic Materials Stock Index was led up by Entegris.

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							
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%
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%

# Links to Conference Call Transcripts

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

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

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

**November 4<sup>th</sup> and before**

[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](#)

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

[Advanced Micro Devices, Inc. \(AMD\) Q3 2022 Earnings Call Transcript](#)

[Cirrus Logic, Inc. \(CRUS\) Q2 2023 Earnings Call Transcript](#)

[Sony Group Corporation \(SONY\) Q2 2022 Earnings Call Transcript](#)

# Links to Conference Call Transcripts

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

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

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

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