

Semiconductor WEEK:

June 24, 2022

An overview of results and conclusions from recent reports at TechInsights

Chip Market Research Services

It's cooling off but orders are still humming along

- Order activity for semiconductor equipment fell nearly three points in the third week of June, slipping below the 100-degree mark for the first time this year
- Capacity Utilization Rates

Semiconductor Analytics

Last Week in the Semiconductor Market:

Semiconductor sales growth slipped last week, down 4% W/W. The IC weather cooled 7°F. Zooming in on semiconductor growth this week, the 13-wk MA is slowing across all segments with the predicted cooling in chip demand from capacity expansion and macro issues. TechInsights' IC Supply/Demand indices loosened for the week to Balanced. Foundry went to Loose, More Moore to Saturated, while More than Moore and OSAT moved to Balanced. IDM and Analog & Power remained Balanced, NAND stayed Tight, and Auto ICs are still in Shortage. Chip demand – cooled by inflation and monetary tightening – and capacity expansion are working to ease the shortage. Electronics' Retail Prices are turning down.

Customer Satisfaction Survey

White Paper: Technoprobe 5th Year as #1 Probe Card Supplier

Chip History Center

ASML - PAS 2000 Wafer Stepper: Virtually everyone seemed to be entering the semiconductor capital equipment business in the early eighties.

The Chip Insider

Strategy and Tactics: Chiplets a new design methodology? Becoming Great: Tom Tsuneishi. Lowering blame game probability.

Semiconductor Manufacturing Markets: Foundry & IDM Capital Expenditures

Semiconductor Stocks

- *Three of TechInsights' Semiconductor Stock Indices increased this week along with the market. Electronic Materials Index hit a new yearly low.*
- *Semiconductor Stock Index eked out a gain.*
- *Semiconductor Equipment Stock Index was led up by FormFactor.*
- *EDA Stock Index was led up Ansys and Cadence.*
- *Electronics Materials Stock Index decreased.*
- *Hottest Stocks: FormFactor, Ansys, Cadence, Teradyne, ASML, and Onto Innovation.*

TechInsights



TECHNOPROBE

5th Year as #1 Probe Card Supplier


TechInsights Customer Satisfaction Survey 2022





Technoprobe awarded RANKED 1st Supplier in Test Subsystems

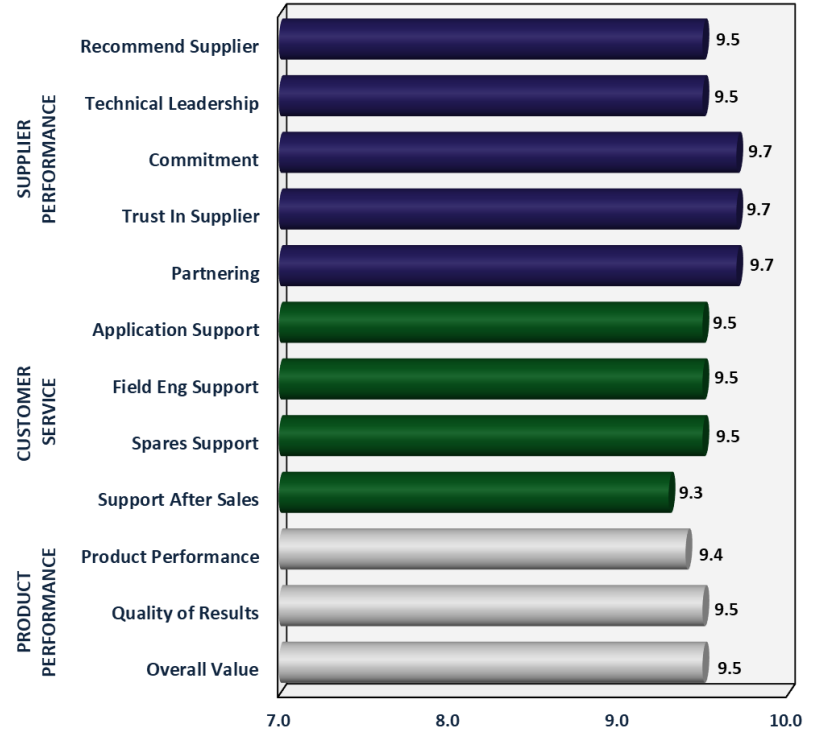
- Technoprobe, a world leader in advanced probing solutions, awarded RANKED 1st *Test Subsystems Suppliers* for a fifth year
- Customers award Technoprobe with 5 Stars
 - improves score to a 9.52
- Technoprobe is devoted to innovation and the constant growth of its technological expertise
 - with 2,300 employees worldwide and three research centers

SUBSYSTEMS - TEST	Rating	TechnInsights Stars
 TECHNOPROBE	9.52	★★★★★
FormFactor	9.29	★★★★★
Nidec SV TCL	9.16	★★★★★
Japan Electronic Materials	7.72	★★★★
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How Customers Perceive Technoprobe

- Receives highest score of all THE BEST *Test Subsystem Suppliers* in all 12 categories
- Improves ratings in 5 categories
 - *commitment* and *trust in supplier* up 20 basis points
 - *recommend supplier*, *partnering*, and *overall value* up 10 basis points
- Highest scores*
 - *Commitment*
 - *Trust In Supplier*
 - *Partnering*
 - *Recommend Supplier*
 - *Technical Leadership*
 - *Application Support*
 - *Field Engineering Support*
 - *Spares Support*
 - *Quality of Results*
 - *Overall Value*

*Listed in order of score, highest to lowest



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[Click for White Paper](#)

**Tech
Insights**

The Chip Insider[®]'s Graphics File



June 2022

It's cooling off but orders are still humming along

- Order activity for semiconductor equipment fell nearly three points in the third week of June, slipping below the 100-degree mark for the first time this year
- The recent declines are bringing the order activity down to earth; however, at 99 degrees it's still hot and well above the growth-decline line
- TechInsights' Chip Price Performance Index continued to warn



This issue contains the latest forecast.

Forecast as of June 2022:	2021	2022
Semi Equipment (\$B):	\$ 126.6	\$ 149.8
Sequential Change	36.6%	18.3%
Capacity Utilization:	97.2%	96.9%
ICs (\$B):	\$ 492.3	\$ 570.0
Sequential Change	27.4%	15.8%
IC Units (BU):	394.2	434.3
Sequential Change	23.7%	10.2%
Electronics (\$B) :	\$ 2,574	\$ 2,758
Sequential Change	18.9%	7.1%

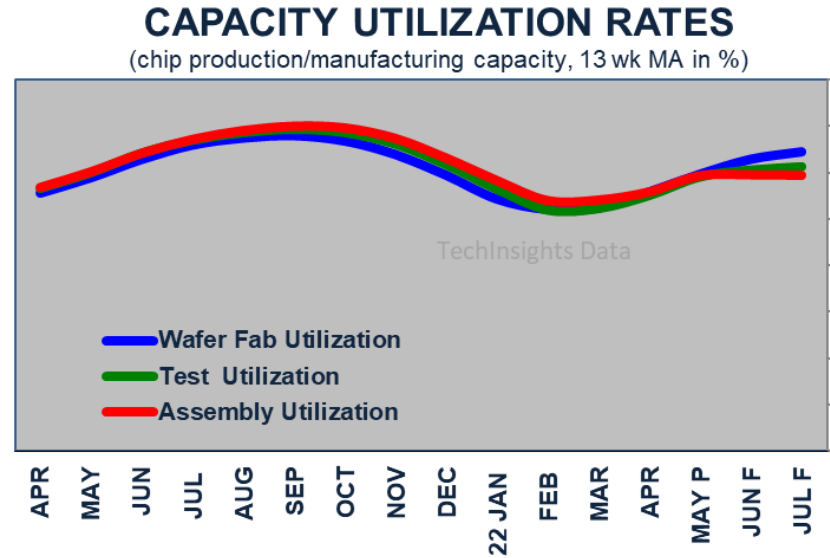
[Contact us to access more details](#)

The Chip Insider[®] Graphics

Capacity Utilization Rates:

- Utilization rates remain elevated

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



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Insights Interview:

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.

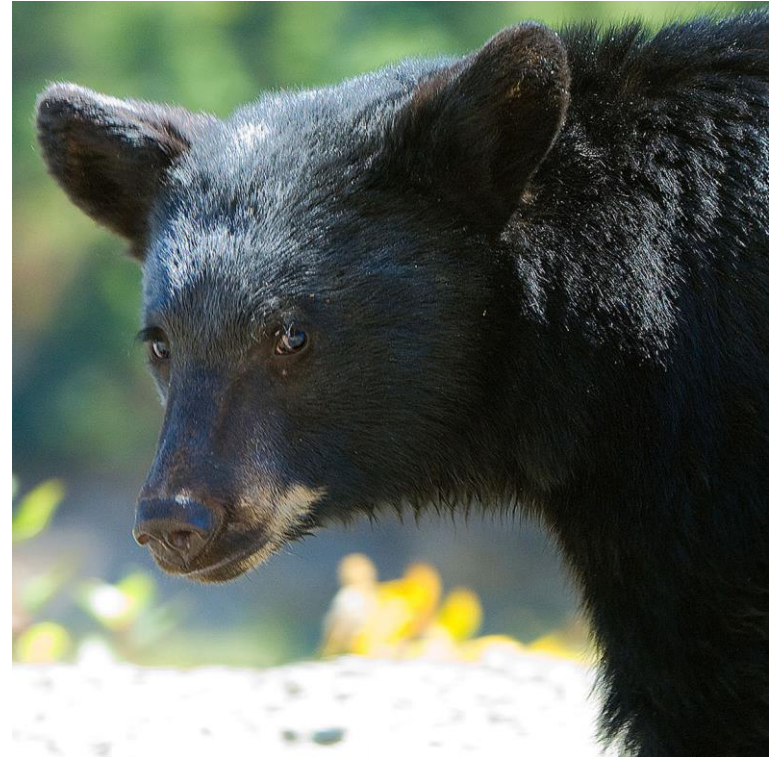
[Click here to watch online](#)

Semiconductor Analytics

Last Week in the Semiconductor Market:

Semiconductor sales growth slipped last week, down 4% W/W. The IC weather cooled 7°F. Zooming in on semiconductor growth this week, the 13-wk MA is slowing across all segments with the predicted cooling in chip demand from capacity expansion and macro issues. TechInsights' IC Supply/Demand indices loosened for the week to Balanced. Foundry went to Loose, More Moore to Saturated, while More than Moore and OSAT moved to Balanced. IDM and Analog & Power remained Balanced, NAND stayed Tight, and Auto ICs are still in Shortage.

Chip demand – cooled by inflation and monetary tightening – and capacity expansion are working to ease the shortage. Electronics' Retail Prices are turning down.



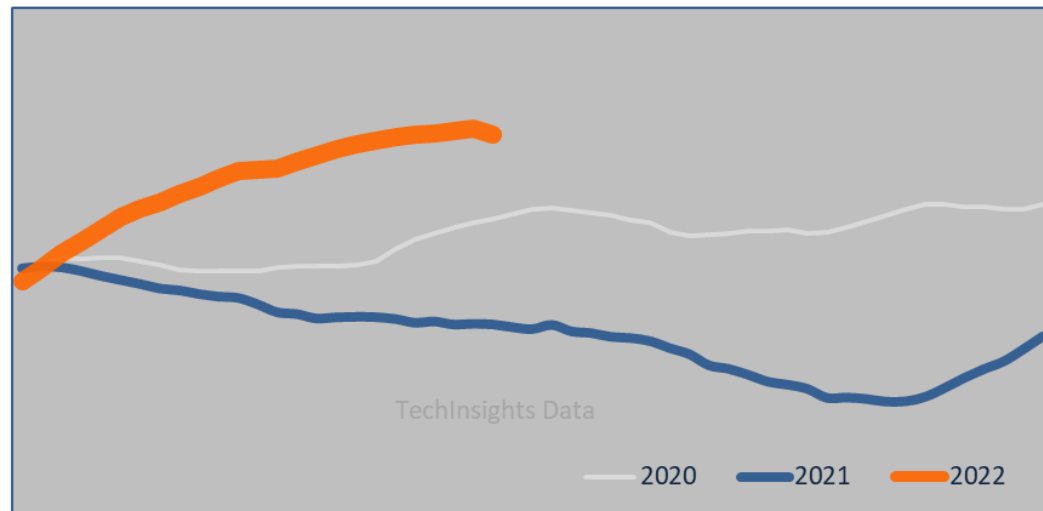
1: Measures Order Activity 2: Measures Pricing Power

Electronics Retail Pricing Trends:

for PC notebooks Tablets Smartphones Cell phones Digital Cameras Appliances TVs

Electronics' Retail Prices are turning down

Electronics Pricing Barometer
indexed 13 week moving average



Source: Semiconductor Analytics

Quarter.Week

0.00 1.03 1.06 1.09 1.12 2.02 2.05 2.08 2.11 3.01 3.04 3.07 3.10 3.13 4.03 4.06 4.09 4.12

2020 2021 2022

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Insights Interview:

Innovation in Memory ...

with Scott DeBoer of Micron
Technology



What the conversation is about:

- Scott DeBoer of Micron Technology has a conversation with Dan Hutcheson about what it takes to innovate in Memory today. Scott leads Micron's global technology development and engineering efforts – from silicon design to high-value system solutions.

[Click here to watch online](#)



Strategy and Tactics: *Chipelets a new design methodology?
Becoming Great: Tom Tsuneishi. Lowering blame game probability.*

Summaries:

Are Chipelets a new design methodology? *There's been a great marketing war over nomenclature ownership ever since the industry recognized the future after monolithic SoCs is polyolithic SiPs (i.e. single-die System-on-Chip versus multi-die System-in-Package). The technological approach is ancient. In the beginning, Jack Kilby's Integrated Circuit, circa 1958, was made up of multiple die wire-bonded together on a single substrate... I expect the new UCle initiative (Universal Chipelet Interconnect express) to lock in the use of chipelet... The other 'too many toos' problems are being resolved as well... Companies are figuring out how to test and deliver KGD which are ... Intel was the first to announce this ... The too difficult to design barrier is ... There are also new opportunities here for EDA suppliers to make a polyolithic design appear... There are new opportunities in areas such... The point is, it doesn't matter what you call it, the opportunity is there.*

Becoming Great: Tetsuo (Tom) Tsuneishi's path to greatness

Comments, Questions & Answers: *Regarding Memory Lithography and Product Strategy.*

Maxims Applied: *Sourcing others lowers blame game probability – Intel was slammed by ...*

“Strategy requires a sense of the whole that reveals the significance of respective parts.”

– John Lewis Gaddis

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

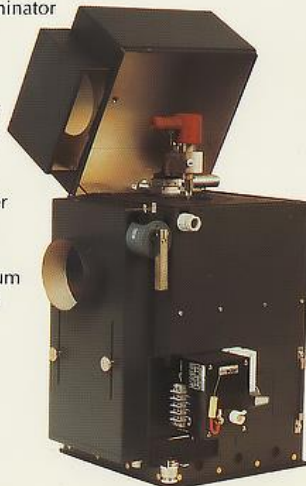


ASML - PAS 2000 Wafer Stepper: Virtually everyone seemed to be entering the semiconductor capital equipment business in the early eighties. Entourages were continuously scouting opportunities in Silicon Valley. Thus, it came as no great surprise when the Dutch Government teamed up with Phillips and ASM to enter the stepper market under the Philips name. Their first product soon followed—the Sire 3. But the triumvirate was not to last; Philips soon begged out and a fourth company was born: ASM Lithography or ASML as it was to become known. The outcome was introduction of the ASML PAS 2000 Wafer Stepper, which would launch the company onto a stellar path. But it was not easy, as you can find out here.

I was there – Richard George, Project Manager

The high-intensity illuminator allows rapid exposure speeds of 0.1 to 0.22 seconds—a necessary capability for fast throughput. The use of the PAS 2000 patented test marker alignment method assures rapid, yet precise layer-to-layer pattern overlays.

The PAS 2000—accomplishing maximum throughput capabilities without sacrificing pattern definition.



High-Intensity Illuminator



The Chip Insider[®]

Semiconductor Manufacturing Markets

Foundry & IDM Capital Expenditures

- Changes Since Last Forecast
- Company Focus
- Advanced Logic & Foundry
- DRAM & NAND
- Semiconductor Manufacturing CapEx
- TechInsights' View



WildPhotons: A person can only grow...

Company Focus

Spending is expected to decline in 2023 as supply constraints diminish

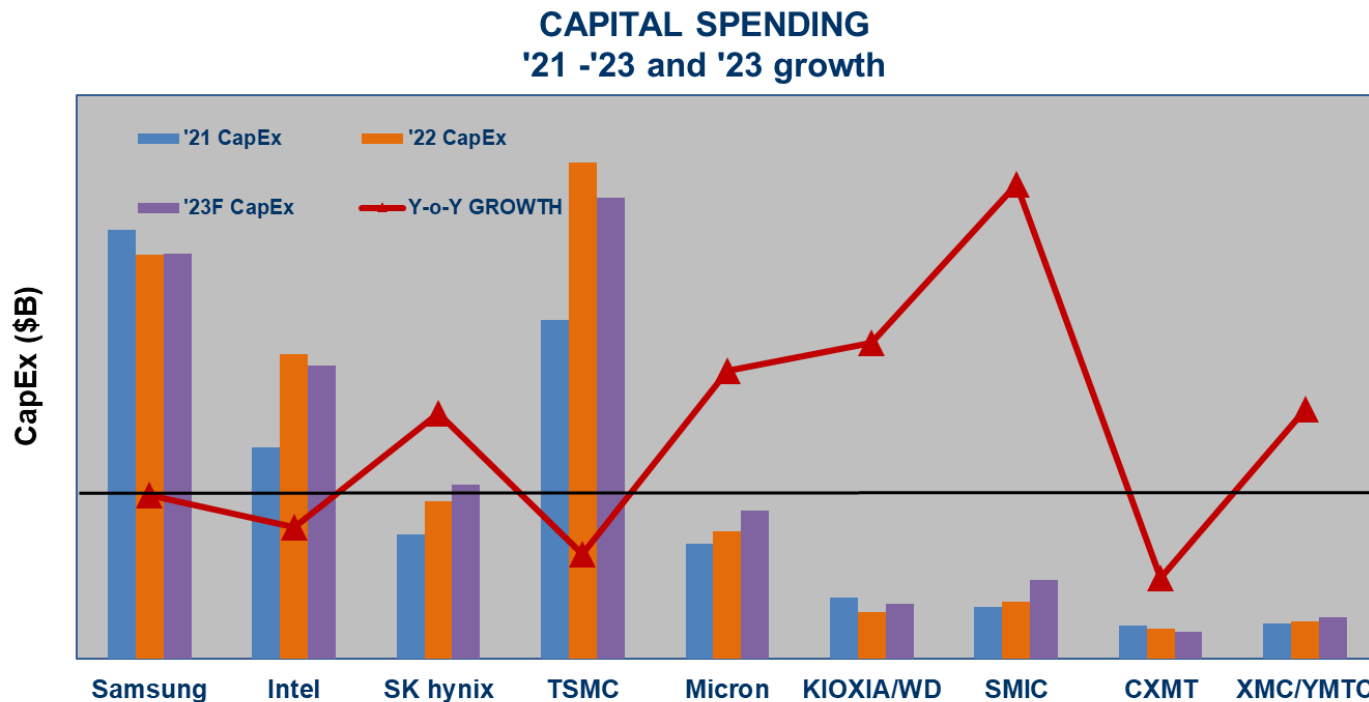


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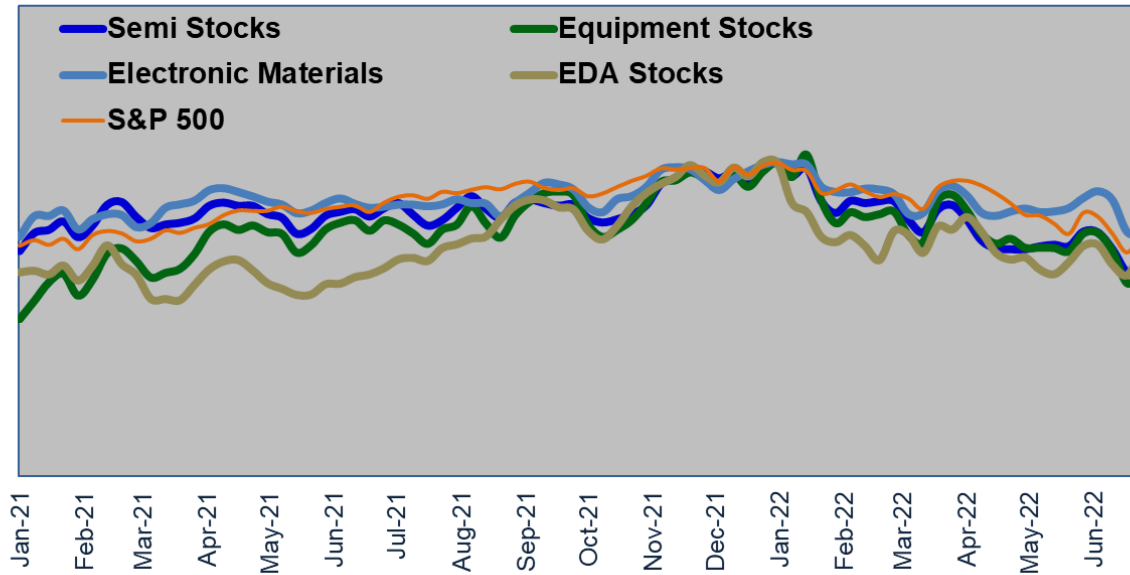
semiStockWEEK:

Three of TechInsights' Semiconductor Stock Indices increased this week along with the market. Electronic Materials Index hit a new yearly low.



Semiconductor Industry Stock Performance Indices

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



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TechInsights' Stock Indices:

Semiconductors +0.8%
Equipment +4.3%
Electronic Materials -0.3%
EDA +9.3%

Semiconductor Stocks:

Weekly Growth and Forward P/E Ratios by Company

Weekly Gains			6/24/2022		
Semiconductor Stocks	Price Change	Forward P/E	Semiconductor Stocks	Price Change	Forward P/E
IDM			Fab-lite to Fabless		
Intel	4.4%	10	AMD	6.8%	16
Micron	4.8%	5	Analog Devices	3.5%	14
ON Semiconductor	1.0%	11	Broadcom	2.1%	2
Samsung Electronics	-2.3%	-	IBM	5.3%	13
SK hynix	-5.0%		Infineon	2.1%	12
STMicroelectronics	1.9%	9	MagnaChip Semiconductor	-10.4%	0
Western Digital	1.6%	5	MaxLinear	0.9%	8
Foundry & OSAT			MediaTek	-19.4%	-
Amkor	3.8%	6	NVIDIA	7.8%	25
ASE	-3.8%	7	Panasonic	0.2%	9
GLOBALFOUNDRIES	2.3%	18	Qualcomm	3.4%	9
JCET	-0.2%	14	Silicon Laboratories	6.9%	31
SkyWater Technology	4.8%	-	Skyworks	8.7%	7
SMIC	-0.8%	12	Texas Instruments	3.8%	17
TSMC	1.1%	13			
UMC	-7.9%	8			

Above Avg

Top 4-6

Top 1-3

TechInsights' Semiconductor Stock Index eked out a +0.8% gain with top performances by Skyworks, NVIDIA, Silicon Laboratories, and AMD.

IDM +0.9%
 Foundry & OSAT -0.1%
 Fabless & Fablite +1.6%

AMD^{AMD} Analog Devices^{ADI} Amkor^{AMKR} ASE^{ASX} Broadcom^{AVGO} GLOBALFOUNDRIES^{GFS} IBM^{IBM} Infineon^{IFNNY.PK} Intel^{INTC} JCET^{600584.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 FormFactor who was this week's biggest winner. Teradyne, ASML, and Onto Innovation also claimed three of the top six stock spots this week.

WFE +5.0%
 Test +7.9%
 Assembly +1.7%

Applied Materials ^{AMAT} Advantest ^{ATEYY}
 ASM International ^{ASMIY}
 ASM Lithography ^{ASML} ASM Pacific ^{0522.HK}
 BE Semiconductor ^{BESY.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			6/24/2022		
Equipment Stocks	Price Change	Forward P/E	Equipment Stocks	Price Change	Forward P/E
Wafer Fab:			Test:		
Applied Materials	8.4%	1	Advantest	1.7%	-
ASM International	5.4%	18	Teradyne	9.1%	13
ASML	8.9%	22	FormFactor	12.8%	17
KLA	8.8%	13			
Lam Research	7.4%	11	Assembly:		
Onto Innovation	8.9%	-	BESI	-1.2%	-
Nikon	-5.8%	-	Kulicke & Soffa	4.5%	7
TEL	-2.7%	-	ASM Pacific Technology	1.9%	
Veeco Instruments	5.5%	10			

Above Avg

Top 4-6

Top 1-3

Electronic Materials Stocks:

Weekly Growth and Forward P/E Ratios by Company

Weekly Gains			6/24/2022		
EDA & Electronic Materials Stocks	Price Change	Forward P/E	EDA & Electronic Materials Stocks	Price Change	Forward P/E
EDA			DNP	-1.8%	–
Cadence	10.2%	32	DuPont de Nemours	3.9%	5
Synopsys	7.2%	30	JSR	2.3%	–
Ansys	10.5%	27	Shin-Etsu	-7.9%	–
Electronic Materials			SOITEC	1.8%	–
BASF	-5.9%	2	Tokyo Ohka	0.8%	–
CMC Materials	4.1%	22			

Above Avg
Top 4-6
Top 1-3

TechInsights' EDA Stock Index was led up by Ansys and Cadence.

TechInsights' Electronic Materials Stock Index decreased this week.

Ansys, Inc. ^{ANSS} BASF ^{BASFY}
 CMC Materials ^{CCMP} 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							
19-Nov-21	98.3	97.5	98.2	99.4	2.6%	2.1%	-0.4%	3.2%	39	12.2%	-16	-16.8%	29.0%	98.6	0.3%
26-Nov-21	97.7	96.0	95.5	96.8	-0.6%	-1.6%	-2.8%	-2.7%	16	11.8%	-39	-9.6%	21.4%	98.6	0.1%
03-Dec-21	95.9	94.5	92.9	95.0	-1.9%	-1.6%	-2.7%	-1.9%	12	6.0%	-44	-11.1%	17.1%	95.2	-3.5%
10-Dec-21	97.5	96.9	95.7	98.8	1.6%	2.6%	3.0%	4.0%	40	13.2%	-15	-7.5%	20.7%	98.9	3.8%
17-Dec-21	94.7	93.8	97.7	96.5	-2.9%	-3.2%	2.1%	-2.3%	12	25.6%	-43	-15.6%	41.2%	96.9	-1.9%
24-Dec-21	98.6	97.7	99.3	100.2	4.1%	4.2%	1.7%	3.8%	50	13.8%	-6	-2.8%	16.6%	99.2	2.3%
31-Dec-21	100.0	100.0	100.0	100.0	1.5%	2.3%	0.7%	-0.2%	44	8.1%	-11	-2.7%	10.8%	100.0	0.9%
07-Jan-22	96.6	96.3	99.4	89.7	-3.4%	-3.7%	-0.6%	-10.3%	10	7.4%	-45	-17.5%	24.9%	98.1	-1.9%
14-Jan-22	98.5	102.0	99.3	87.4	2.0%	5.9%	-0.1%	-2.5%	36	23.7%	-20	-4.9%	28.6%	97.8	-0.3%
21-Jan-22	90.1	90.4	93.8	81.0	-8.5%	-11.4%	-5.6%	-7.3%	3	5.1%	-53	-20.3%	25.4%	92.3	-5.7%
28-Jan-22	87.1	84.5	92.4	79.7	-3.4%	-6.6%	-1.5%	-1.7%	11	5.0%	-45	-21.8%	26.8%	93.0	0.8%
04-Feb-22	90.2	87.3	92.3	81.5	3.5%	3.3%	-0.1%	2.3%	41	17.5%	-13	-4.3%	21.8%	94.4	1.6%
11-Feb-22	89.6	86.1	93.2	78.7	-0.7%	-1.4%	1.0%	-3.4%	20	10.6%	-33	-8.9%	19.5%	92.7	-1.8%
18-Feb-22	90.1	86.8	93.0	75.0	0.6%	0.8%	-0.2%	-4.7%	28	12.2%	-26	-7.0%	19.2%	91.2	-1.6%
25-Feb-22	90.1	87.5	91.9	82.5	0.0%	0.8%	-1.3%	9.9%	30	14.7%	-25	-9.5%	24.2%	92.0	0.8%
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%

Links to Conference Call Transcripts

June 24th

None this week.

June 17th and before

[Honeywell International Inc.'s \(HON\) Management Presents at Leadership Webcast Series - Innovations in Sustainable Buildings \(Transcript\)](#)

[ASML Holding N.V. \(ASML\) Management presents at Goldman Sachs Global Semiconductor Virtual Conference \(Transcript\)](#)

[Cisco Systems, Inc.'s \(CSCO\) Management Presents at Nasdaq Investor Conference \(Transcript\)](#)

[NXP Semiconductors N.V. \(NXPI\) CEO Kurt Sievers Presents at Jefferies and Nasdaq Conference Presentation \(Transcript\)](#)

[ON Semiconductor Corporation's \(ON\) Management Presents at BofA Securities 2022 Global Technology Conference \(Transcript\)](#)

[Qualcomm, Inc. \(QCOM\) Presents at Bank of America 2022 Global Technology Conference](#)

[Western Digital Corp. \(WDC\) Presents at BofA Securities 2022 Global Technology Conference \(Transcript\)](#)

[DuPont de Nemours, Inc. \(DD\) CEO Ed Breen Presents at Deutsche Bank's 13th Annual Global Materials Conference \(Transcript\)](#)

[Intel Corporation's \(INTC\) Management Presents at Bank of America Securities Global Technology Brokers Conference \(Transcript\)](#)

[HP Inc's \(HPQ\) CEO Enrique Lores on Cowen 50th Annual Technology, Media & Telecom Conference \(Transcript\)](#)

[International Business Machines Corporation's \(IBM\) CEO Arvind Krishna Presents at Bernstein 38th Annual Strategic Decisions Conference \(Transcript\)](#)

[American Superconductor Corporation \(AMSC\) CEO Daniel McGahn on Q4 2021 Results - Earnings Call Transcript](#)

[Texas Instruments Incorporated's \(TXN\) CEO Rich Templeton Presents at Bernstein 38th Annual Strategic Decisions Conference \(Transcript\)](#)

[HP Inc.'s \(HPQ\) CEO Enrique Lores at Bernstein's 38th Annual Strategic Decisions Conference \(Transcript\)](#)

Links to Conference Call Transcripts

[QUALCOMM Incorporated's \(QCOM\) CEO Cristiano Amon Presents at Bernstein 38th Annual Strategic Decisions Brokers Conference \(Transcript\)](#)

[Lam Research Corporation \(LRCX\) CEO Tim Archer Presents at Bernstein 38th Annual Strategic Decisions Conference \(Transcript\)](#)

[Broadcom Inc. \(AVGO\) CEO Hock Tan on Q2 2022 Results and VMware Acquisition \(Transcript\)](#)

[HP Inc. \(HPQ\) CEO Enrique Lores on Q2 2022 Results - Earnings Call Transcript](#)

[NVIDIA Corporation \(NVDA\) CEO Jensen Huang On Q1 2023 Results - Earnings Call Transcript](#)

[Applied Materials, Inc. \(AMAT\) CEO Gary Dickerson on Q2 2022 Results - Earnings Call Transcript](#)

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