

# **Semiconductor Market Insights and Advanced Packaging Trends**

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**TechInsights**



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- Overview of Semiconductor Market
- Probe Card Market
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## Semiconductor Market Insights



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## TechInsights' Forecast Summary

TechInsights' Current Forecast											
Forecast as of January 2025:	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2024	Q1 2025	Q2 2025	Q3 2025	Q4 2025	2025	
Semi Equipment (\$B):	\$ 31.6	\$ 33.2	\$ 36.3	\$ 38.3	\$ 139.6	\$ 36.0	\$ 36.1	\$ 37.6	\$ 39.2	\$ 148.8	
Sequential Change	-6.0%	4.9%	9.5%	5.5%	4.8%	-6.2%	0.3%	4.2%	4.4%	6.6%	
Capacity Utilization:	71.2%	74.6%	77.1%	79.4%	75.7%	78.9%	80.8%	83.9%	88.1%	82.9%	
ICs (\$B):	\$ 129.7	\$ 139.4	\$ 153.6	\$ 167.5	\$ 590.3	\$ 159.9	\$ 162.8	\$ 181.1	\$ 197.5	\$ 701.4	
Sequential Change	0.0%	7.5%	10.2%	9.0%	28.5%	-4.5%	1.8%	11.3%	9.1%	18.8%	
IC Units (BU):	79.0	87.4	97.6	91.6	355.6	87.5	95.7	107.4	104.4	395.0	
Sequential Change	-4.5%	10.6%	11.6%	-6.1%	2.7%	-4.5%	9.4%	12.1%	-2.8%	11.1%	
Electronics (\$B) :	\$ 589.4	\$ 568.4	\$ 616.7	\$ 708.6	\$ 2,483	\$ 597.3	\$ 593.7	\$ 651.3	\$ 762.0	\$ 2,604	
Sequential Change	-13.8%	-3.6%	8.5%	14.9%	2.1%	-15.7%	-0.6%	9.7%	17.0%	4.9%	

	2024	Q4 2024	2025
Equipment	Unchanged	Unchanged	Unchanged
IC Sales	Unchanged	Unchanged	Unchanged
IC Units	Unchanged	Unchanged	Unchanged
Electronics	Downgraded: from 3% to 2%	Downgraded: from 17% to 15%	Downgraded: from 8% to 5%



## Semiconductor Sales and Shipments AI Logic and HBM Boosting Semis to New Highs

SEMICONDUCTOR SALES (worldwide sales, \$B, calendar year)						
	2024	2025	2026	2027	2028	2029
Analog	82	84	94	87	100	119
y-o-y growth	-2%	3%	12%	-7%	15%	19%
DRAM	98	139	170	150	156	206
y-o-y growth	87%	42%	22%	-12%	4%	32%
NAND	68	73	91	81	85	93
y-o-y growth	74%	8%	24%	-11%	5%	10%
MPU	64	69.2	69.7	62.4	68.5	74.2
y-o-y growth	19%	8%	1%	-10%	10%	8%
GPU	117	157	157	162	181	197
y-o-y growth	83%	34%	0%	3%	12%	9%
APU	37	40	43	39	42	46
y-o-y growth	7%	7%	8%	-11%	10%	8%
Other Logic	120	135	139	127	142	158
y-o-y growth	-6%	13%	3%	-9%	12%	11%
Discrete, Opto & Other	98	103	114	113	126	147
y-o-y growth	-6%	6%	10%	-1%	12%	17%
Total Semiconductor	683	801	878	821	901	1040
y-o-y growth	22%	17%	10%	-7%	10%	15%

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SEMICONDUCTOR SHIPMENTS (worldwide sales, B units, calendar year)						
	2024	2025	2026	2027	2028	2029
Analog	209	228	268	256	281	314
y-o-y growth	2%	9%	17%	-4%	10%	12%
DRAM	20	20	21	23	24	26
y-o-y growth	5%	2%	1%	10%	6%	9%
bit growth	20%	18%	16%	22%	17%	21%
NAND	14	14	14	14	14	15
y-o-y growth	2%	0%	-1%	-2%	2%	2%
bit growth	14%	15%	21%	25%	23%	24%
MPU	0.6	0.6	0.7	0.6	0.6	0.7
y-o-y growth	19%	10%	8%	-10%	5%	5%
GPU	0.1	0.1	0.2	0.2	0.2	0.2
y-o-y growth	10%	12%	17%	4%	13%	12%
APU	1.4	1.5	1.6	1.4	1.5	1.6
y-o-y growth	1%	5%	9%	-10%	5%	7%
Other Logic	98	116	136	129	133	141
y-o-y growth	4%	19%	17%	-6%	4%	6%
Discrete, Opto & Other	606	667	796	770	844	930
y-o-y growth	3%	10%	19%	-3%	10%	10%
Total Semiconductor	949	1048	1237	1193	1298	1428
y-o-y growth	3%	10%	18%	-4%	9%	10%

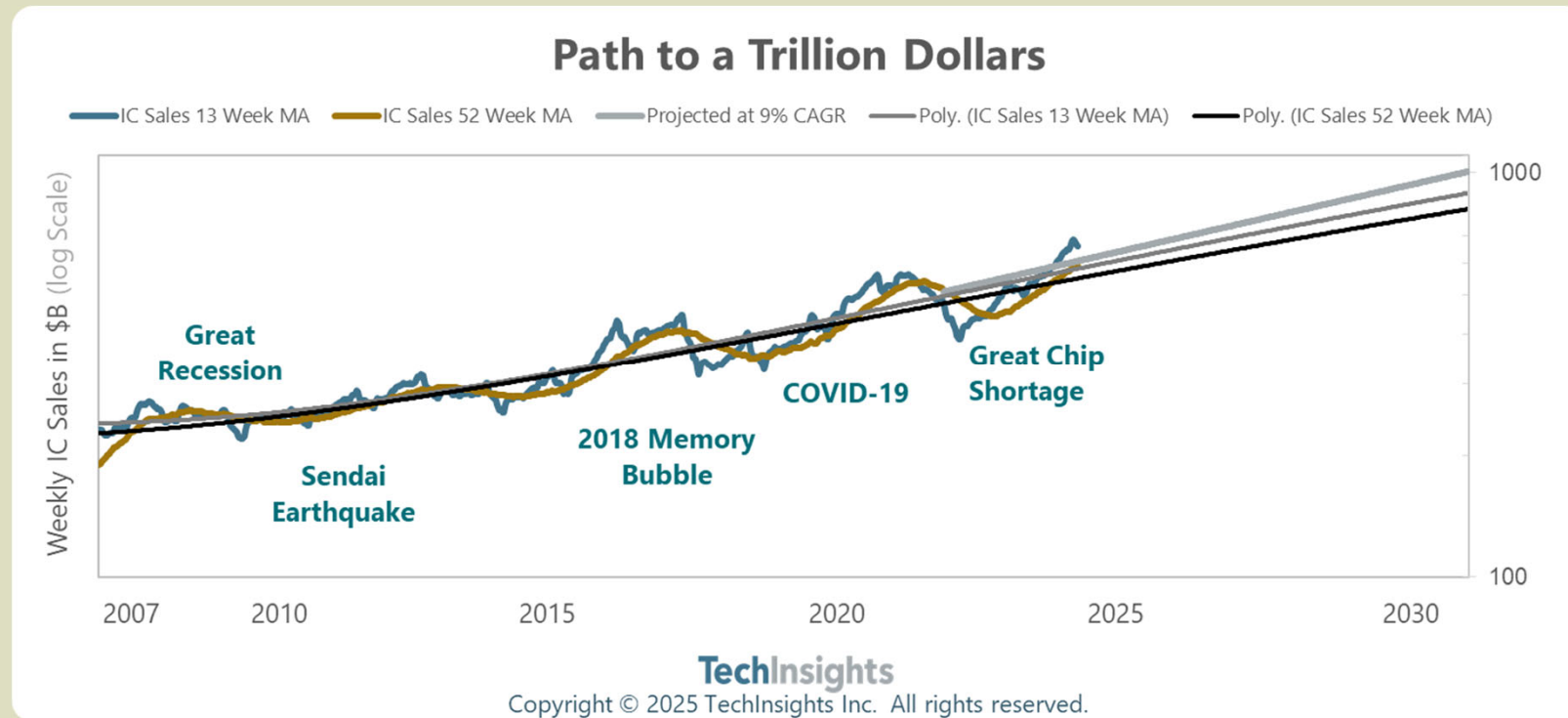
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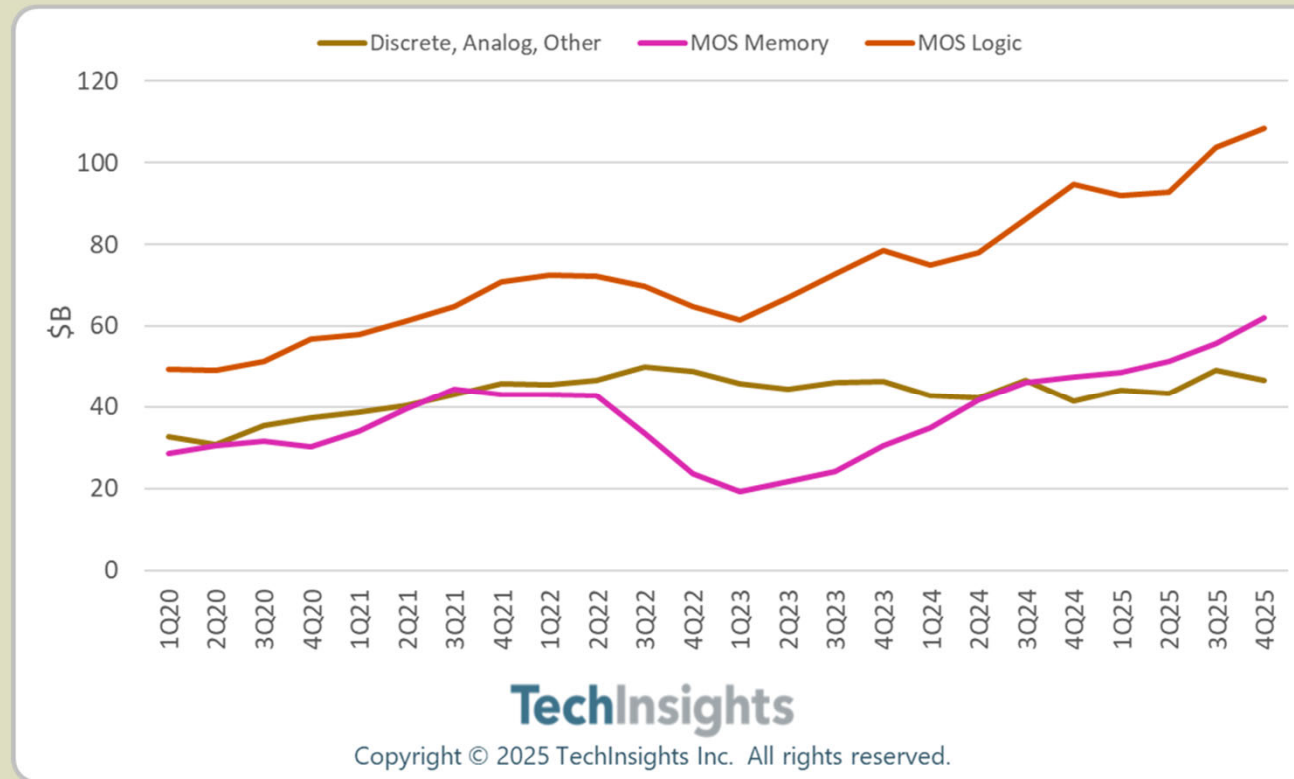
## Semiconductor Sales



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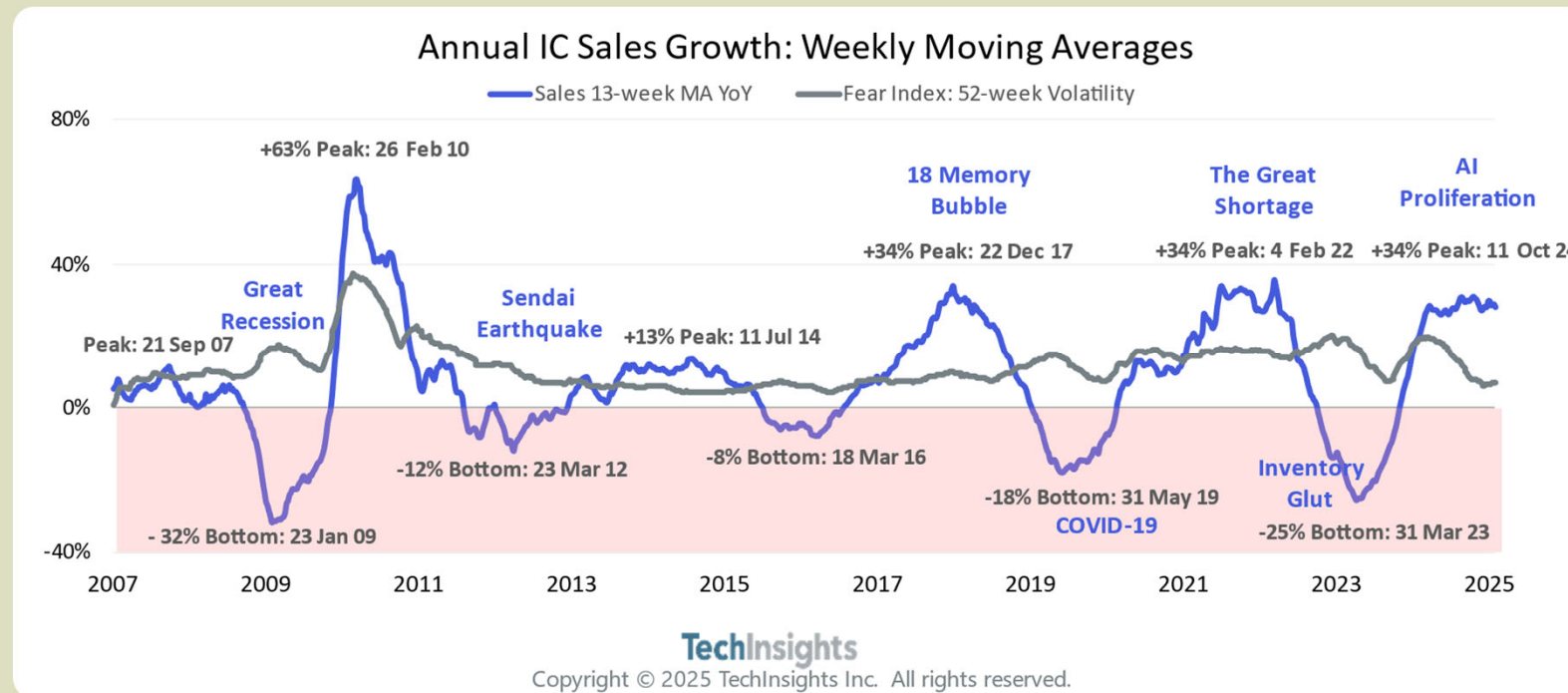
## Semiconductor Sales are Diverging



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## IC Sales Growth

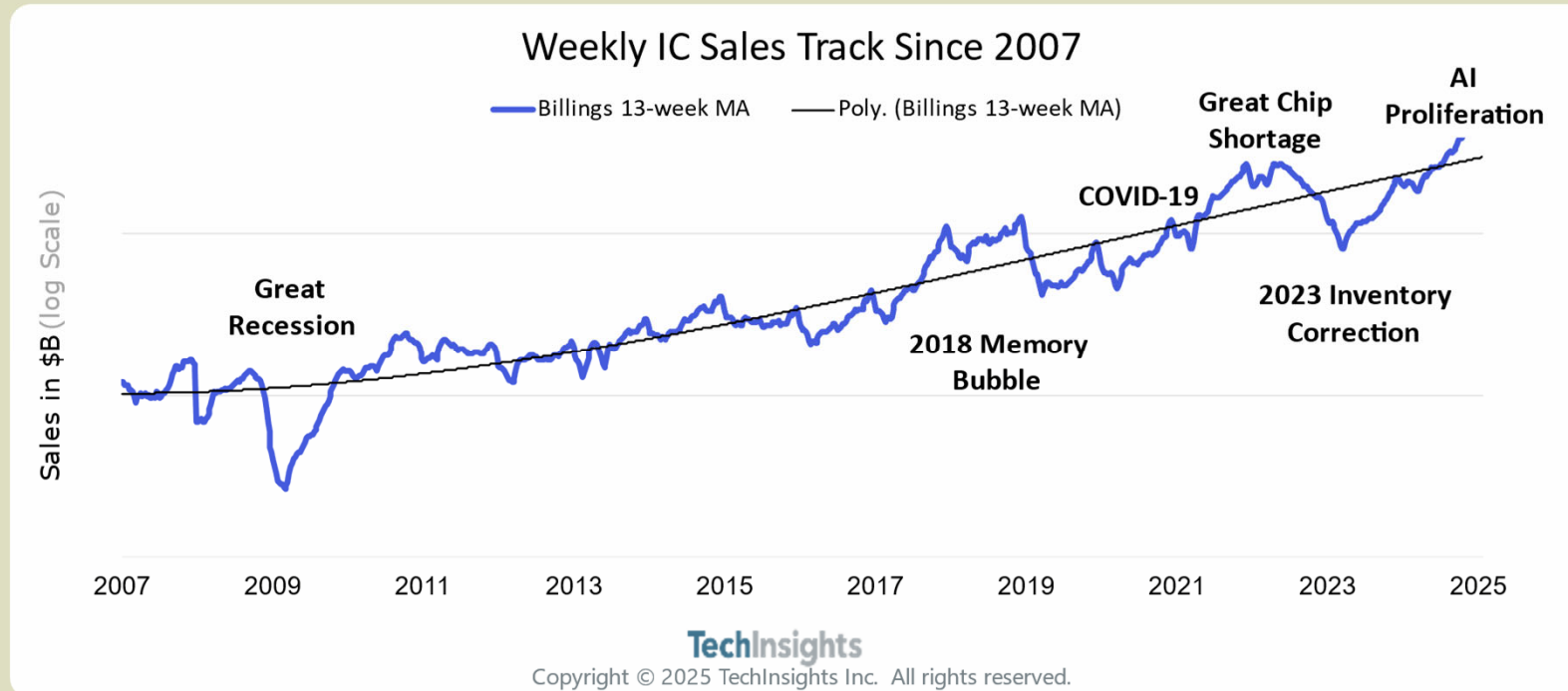


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## IC Sales Track

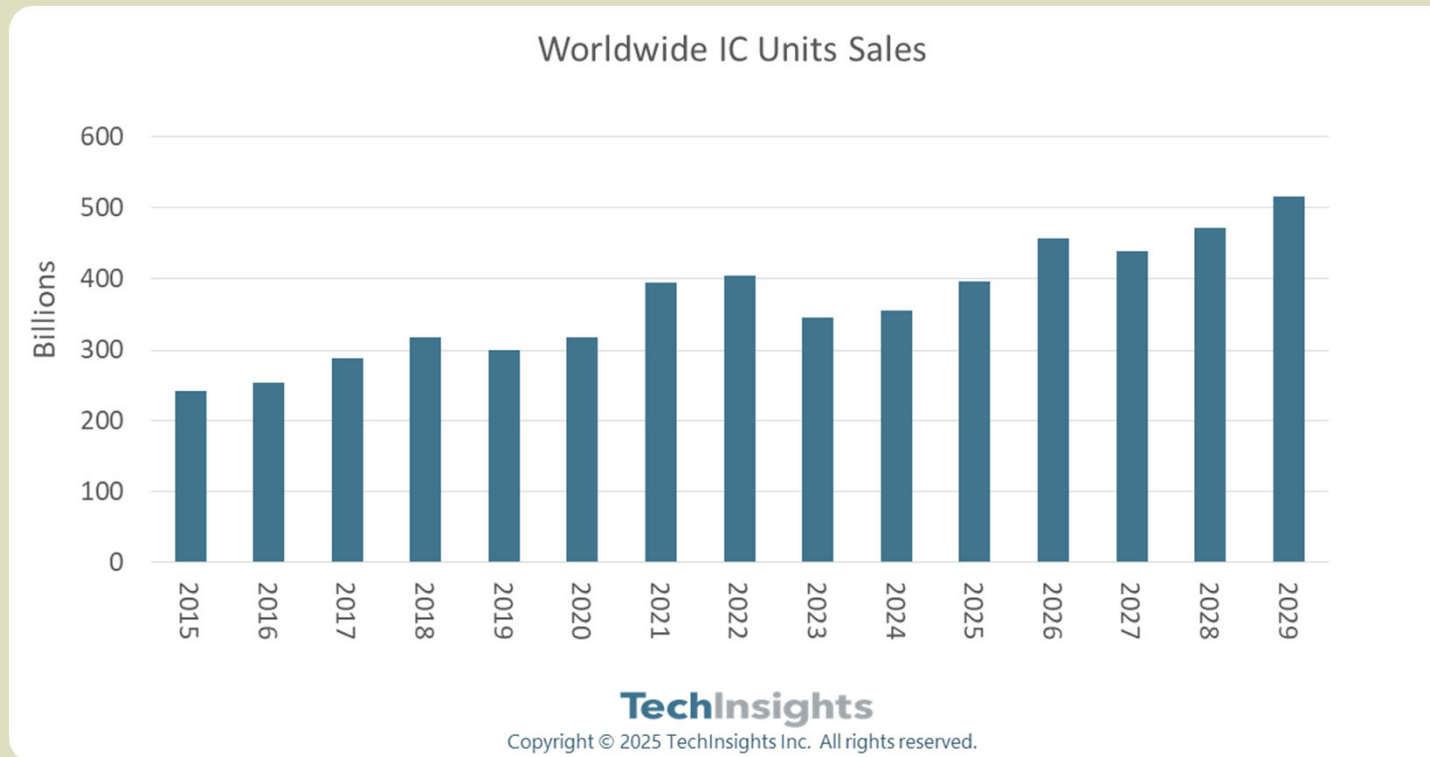


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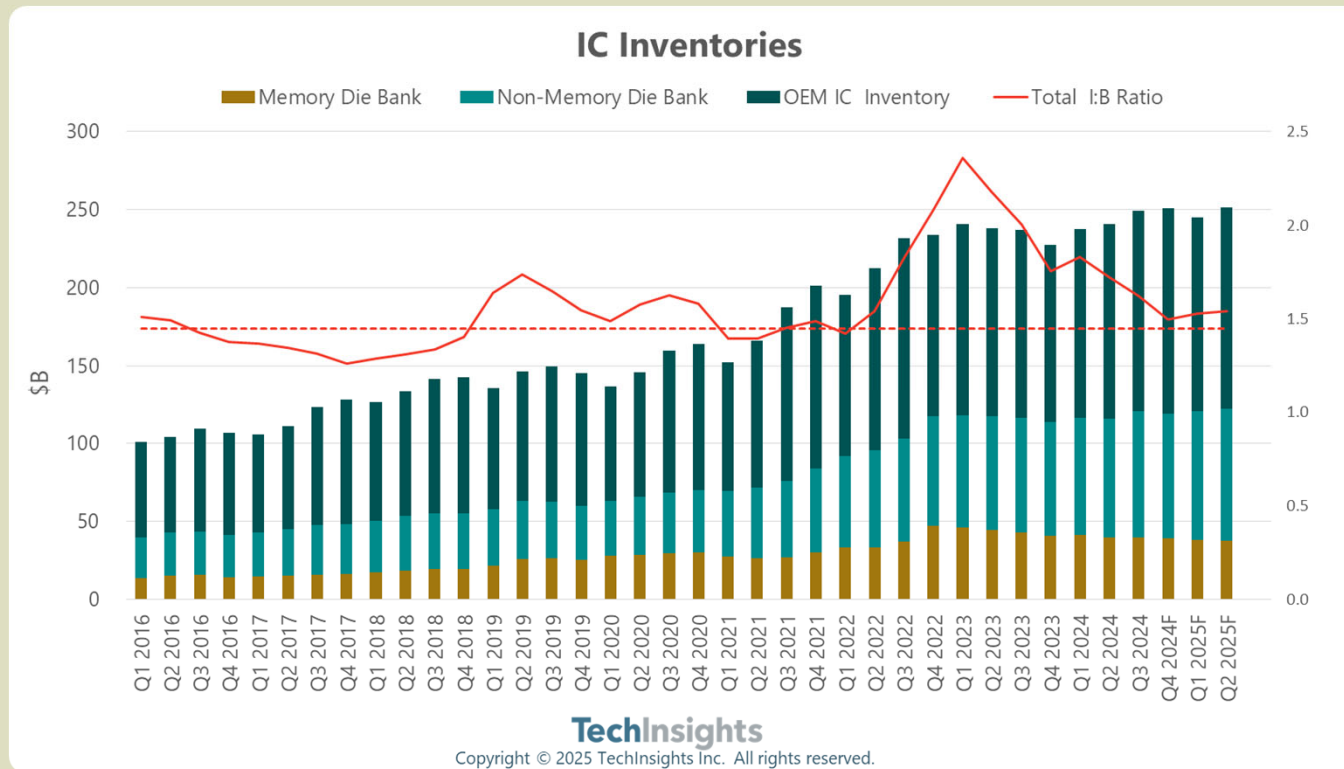
## Worldwide IC Units Sales



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## Inventories remain elevated



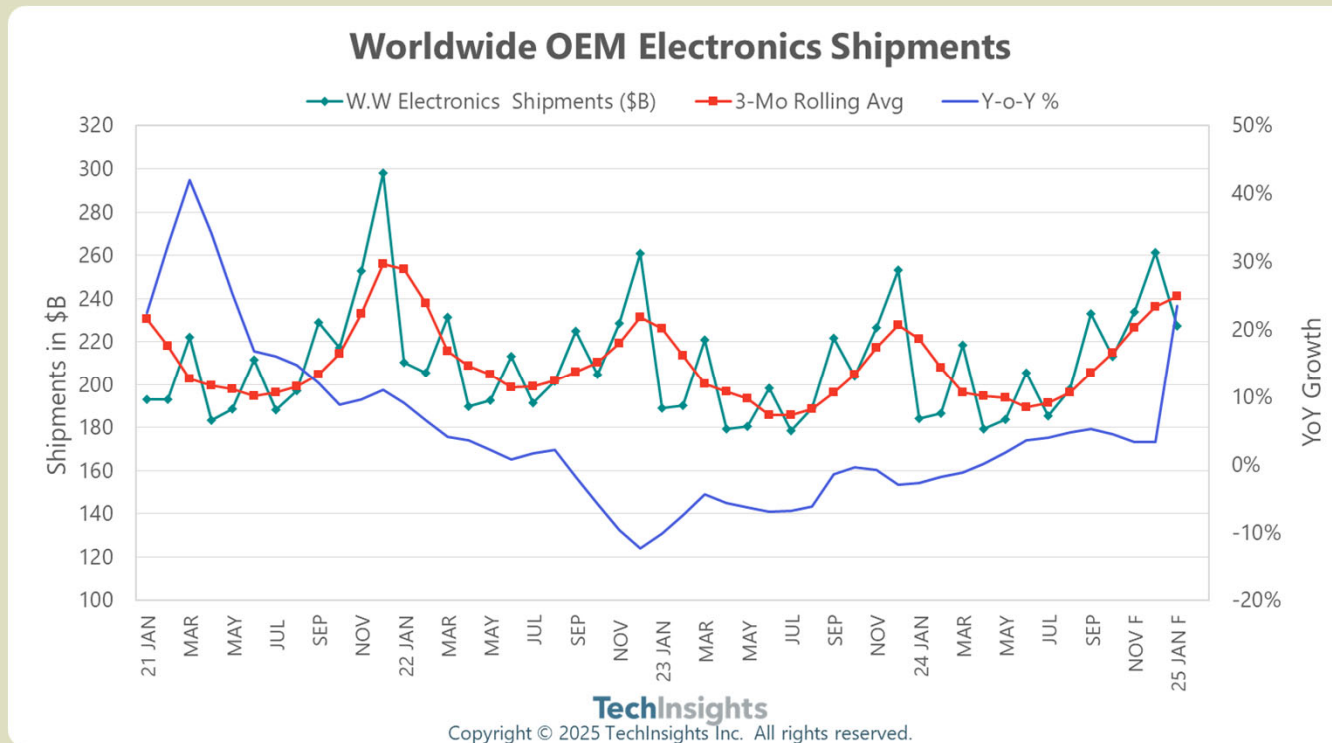
Inventory-to-billings has been slowly coming down but is still elevated



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## Electronics Demand is Improving



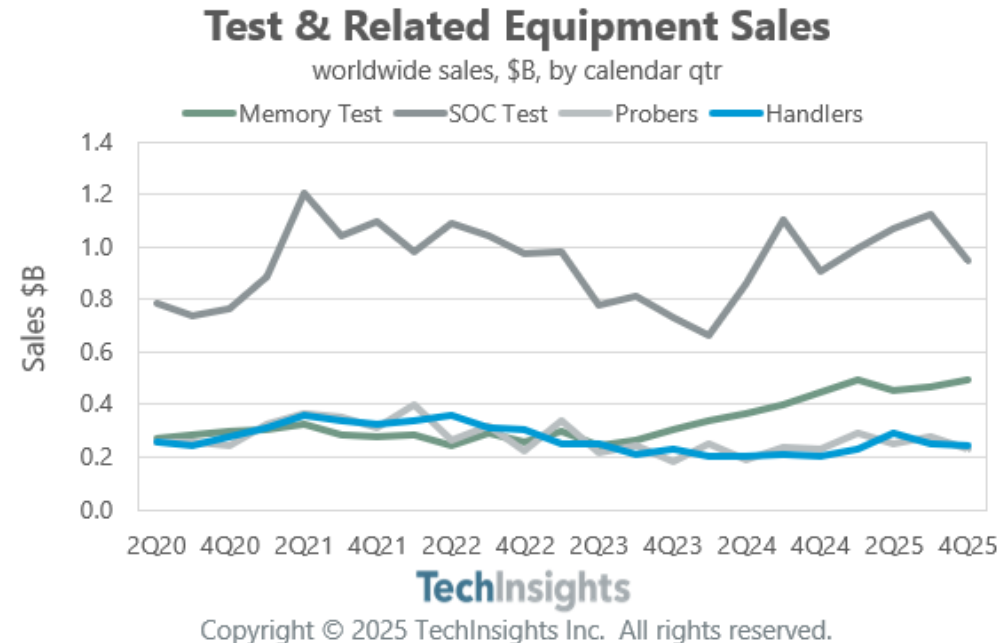
OEM Electronic Sales  
Expected to Increase  
5% In 2025

# TestConX 2025

## ATE: Recovery underway in 2024, followed by stronger growth in 2025

Test Equipment Sales (worldwide sales, \$B, CY 2023 - 2025)			
	2023	2024	2025
<b>Memory Test</b>	<b>1.1</b>	<b>1.5</b>	<b>1.9</b>
y-o-y growth	2%	40%	23%
<b>SOC Test</b>	<b>3.3</b>	<b>3.5</b>	<b>4.1</b>
y-o-y growth	-19%	7%	17%
<b>Other Test</b>	<b>0.4</b>	<b>0.4</b>	<b>0.5</b>
y-o-y growth	-26%	-7%	27%
<b>Handlers</b>	<b>0.9</b>	<b>0.8</b>	<b>1.0</b>
y-o-y growth	-29%	-13%	24%
<b>Probers</b>	<b>1.0</b>	<b>0.9</b>	<b>1.1</b>
y-o-y growth	-18%	-8%	16%
<b>Total Semiconductor</b>	<b>6.7</b>	<b>7.2</b>	<b>8.6</b>
y-o-y growth	-18.1%	6.7%	19.5%

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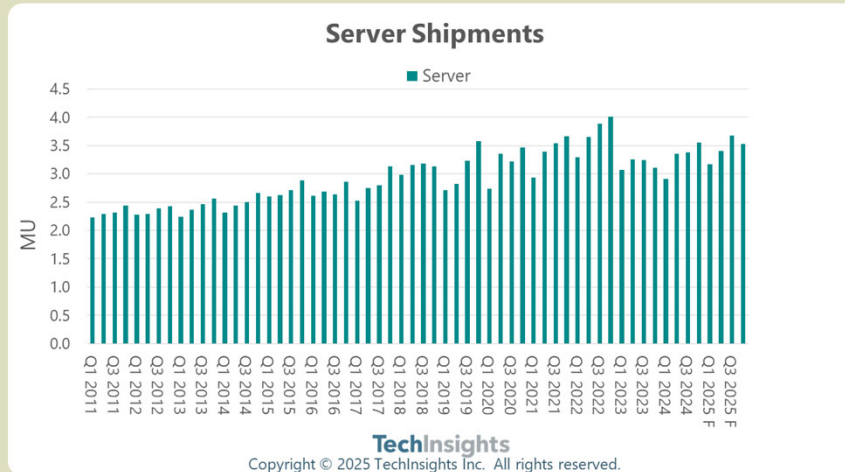


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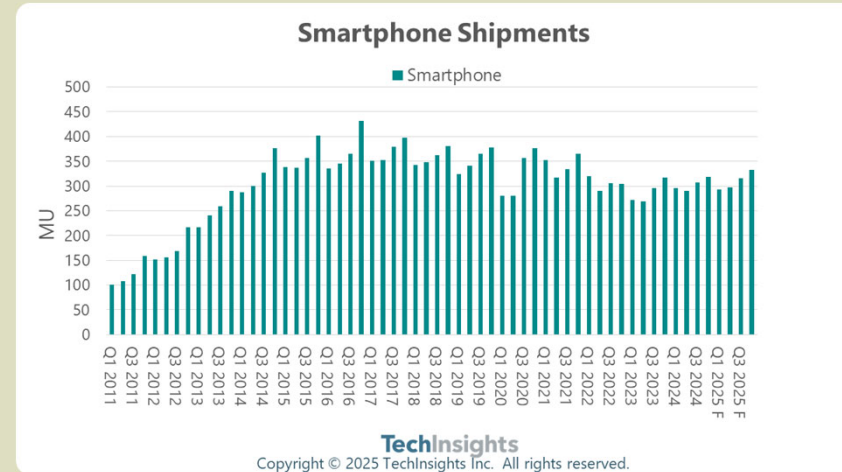
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# 2025

## Key Semiconductor Drivers are Improving

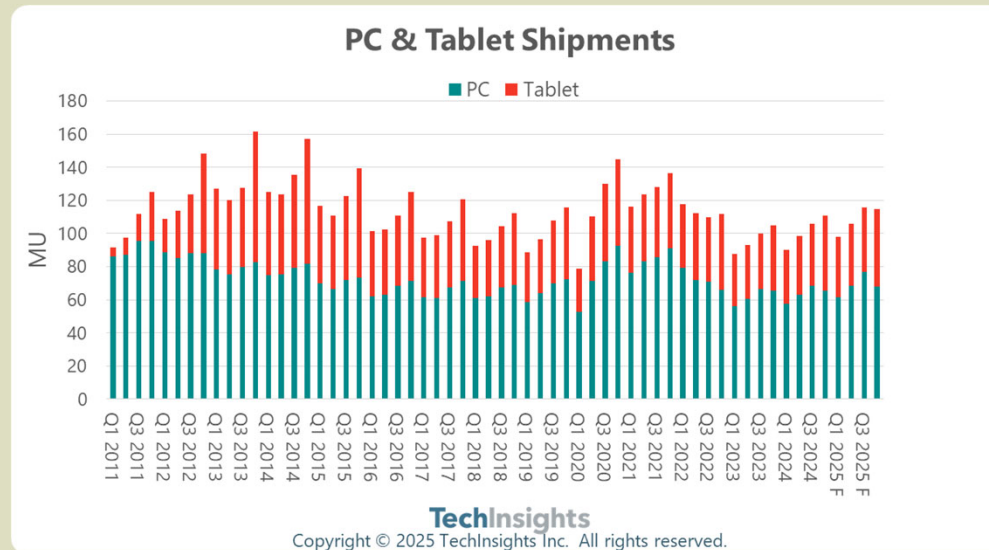


- Servers ▲4% in 2025
- Strong demand for AI servers



- SP Shipments ▲2% in 2025
- Headwinds from potential geopolitical tensions

## Key Semiconductor Drivers are Improving



- PCs ▲ 8% in 2025
  - Post COVID replacement cycle
  - EOL of Windows 10
    - Commercial PC refresh
- AI-enabled PC Adoption

## Test Connectivity Outlook

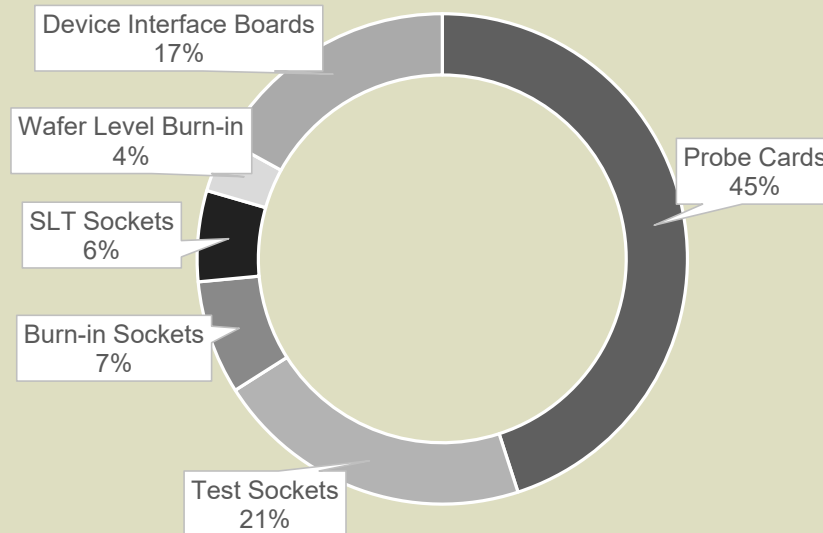


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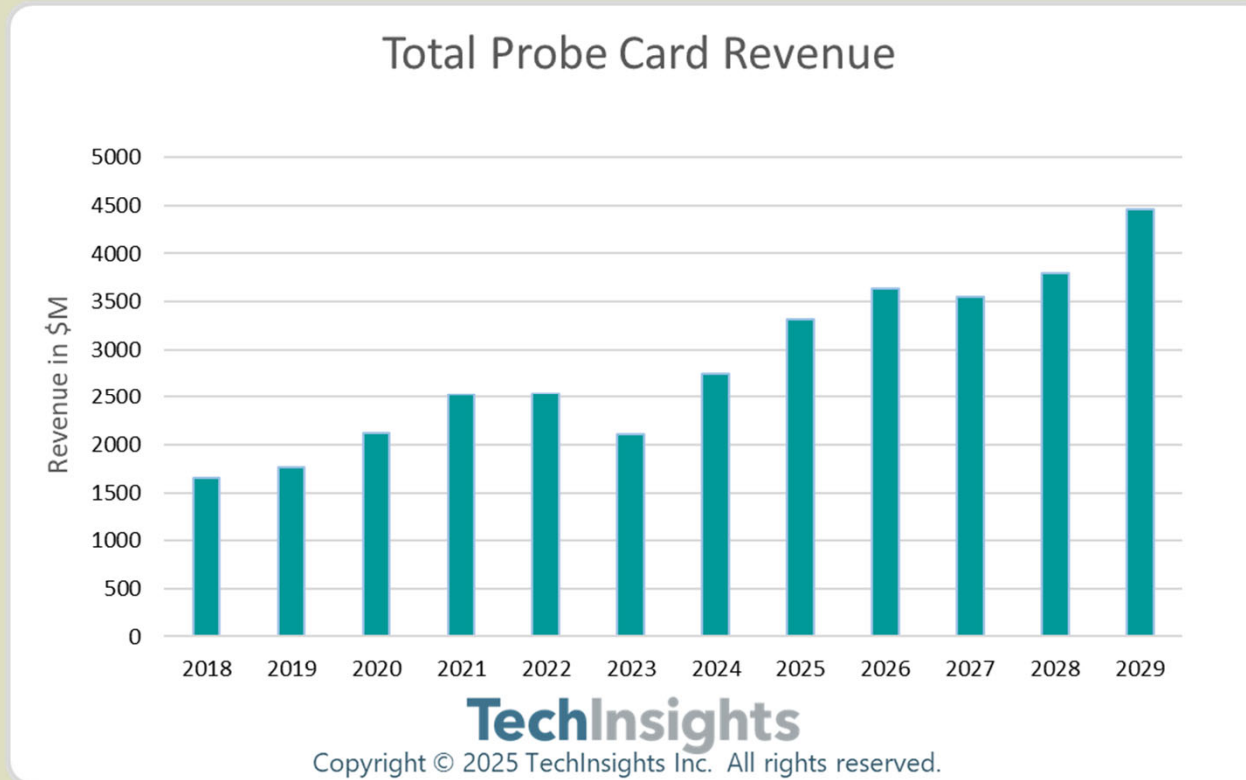


## Test Connectivity Market Share 2024



- Test Connectivity Market is forecasted to reach \$8B by 2028.
- Multiple drivers such as cost management, sustainability, and complexity of devices.
- Test Connectivity Market share expected to shift in 2025.

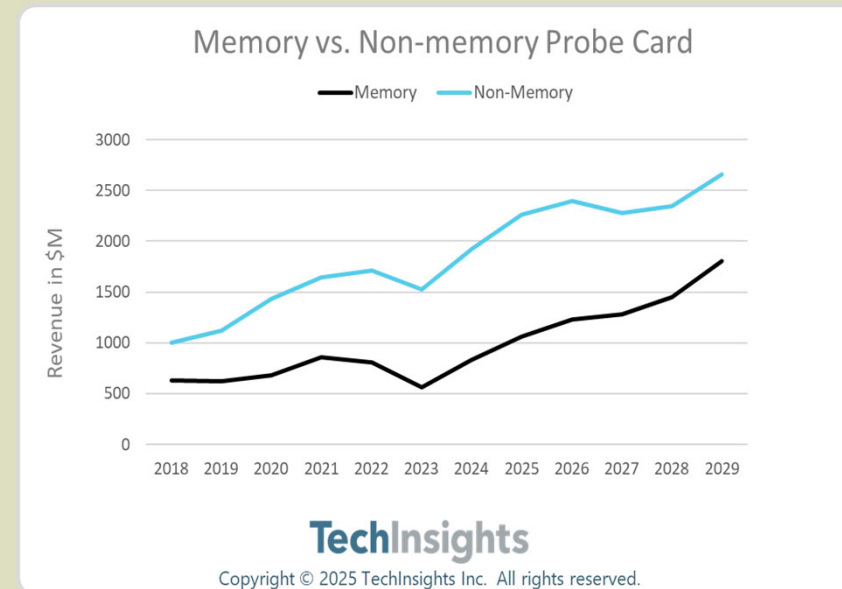
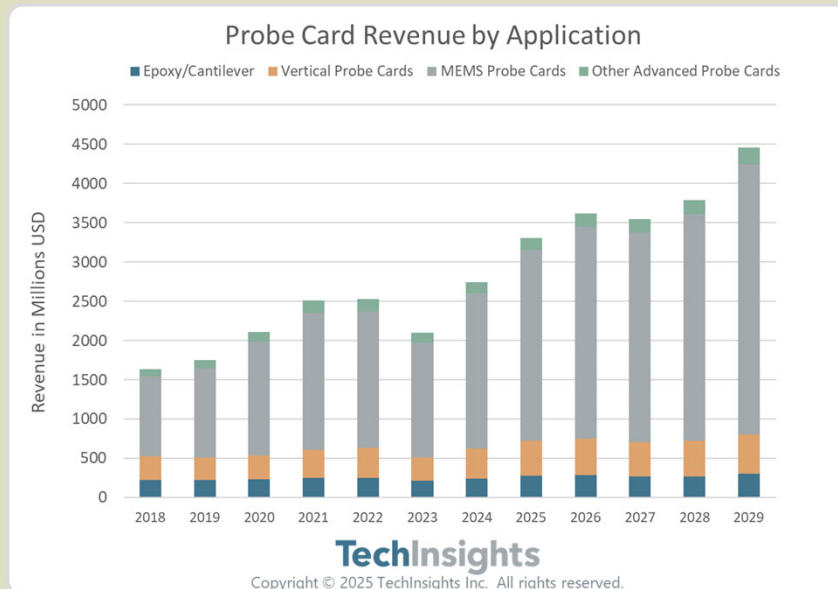
## Global Probe Cards Market



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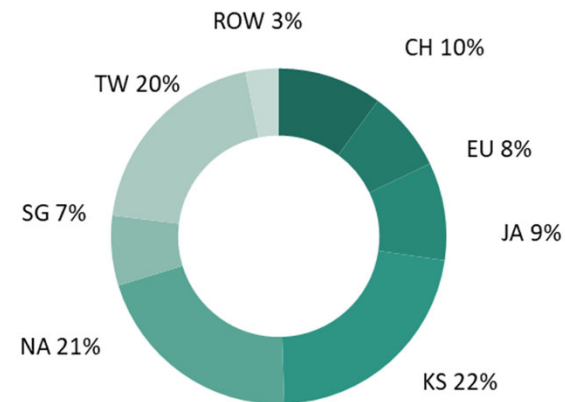
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## Probe Cards by Application & Device Type



## Probe Cards by Region

Probe Cards by Regional Consumption - 2024



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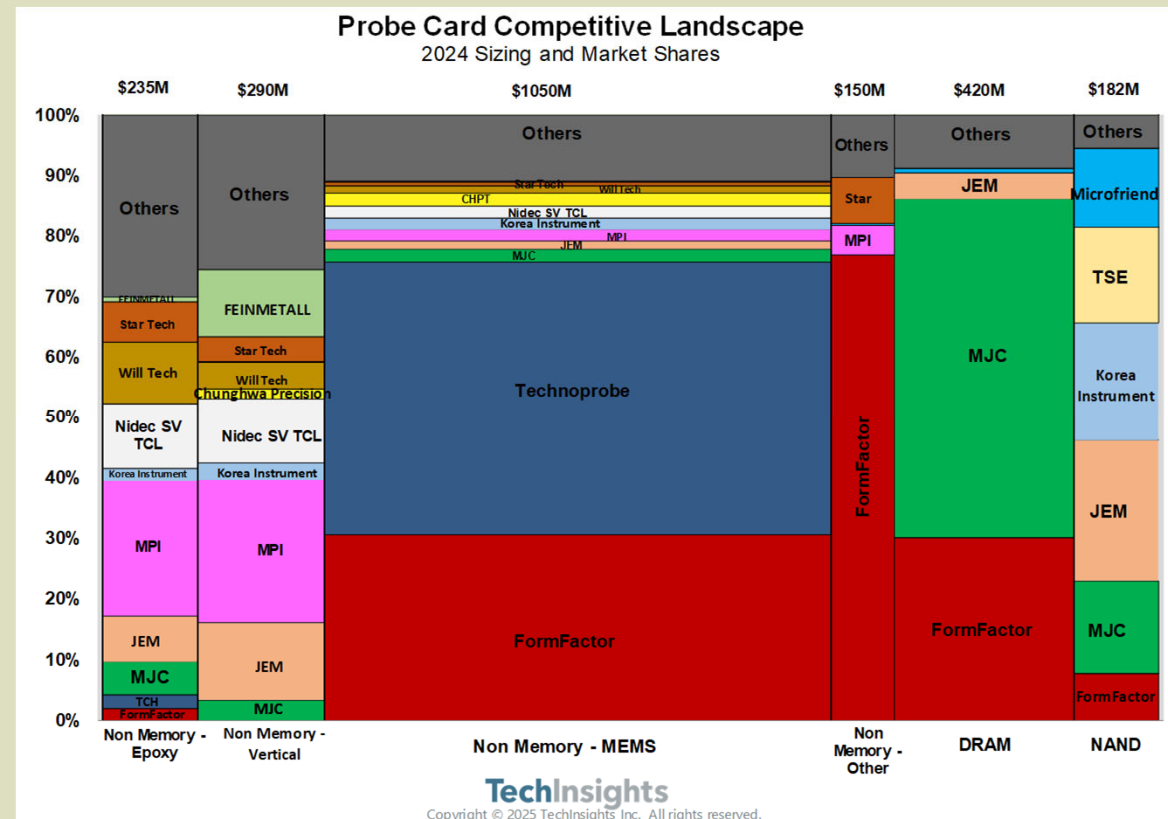
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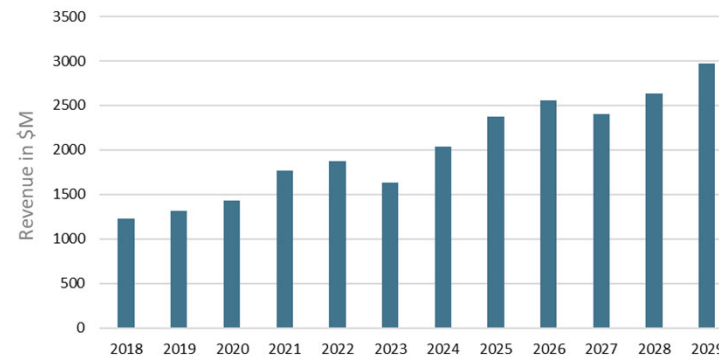
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## Competitive Landscape of Probe Card Market



## Test & Burn-in Socket Market Outlook

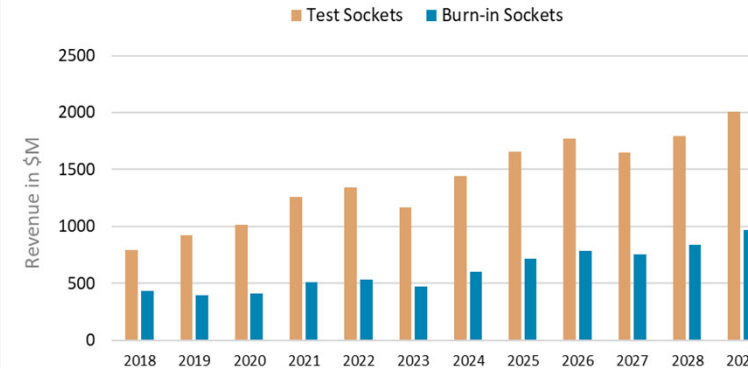
Total Socket Revenue & Forecast



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Test & Burn-in Sockets Revenue



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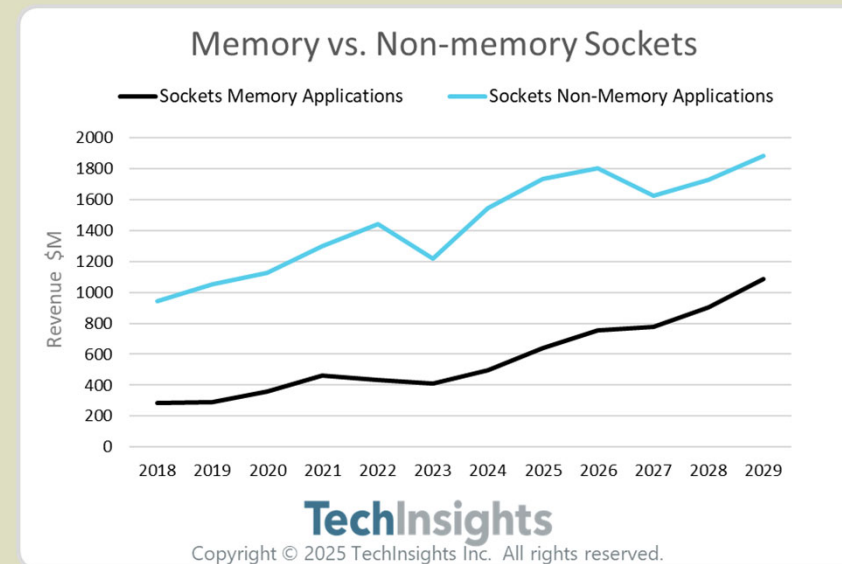
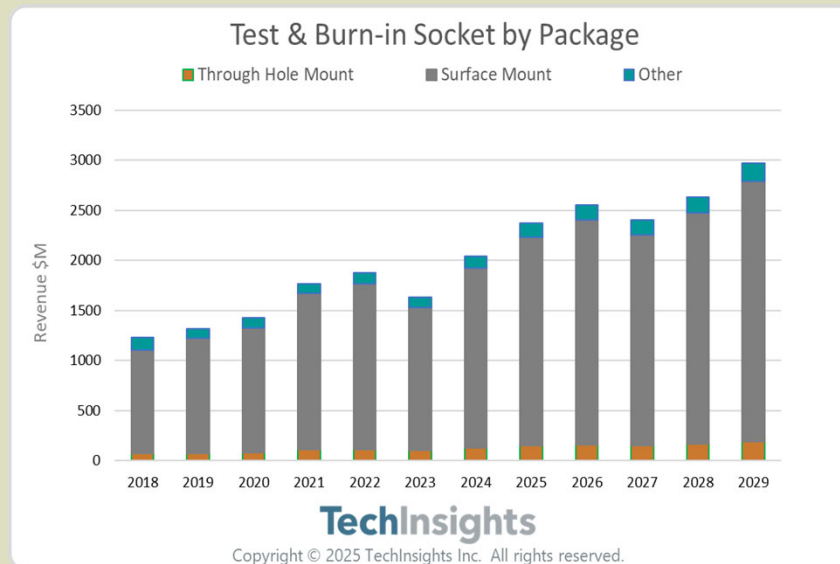


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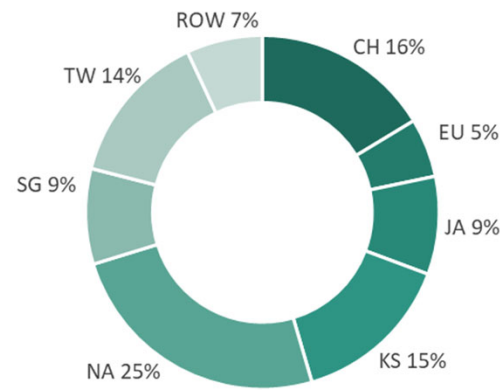
**2025**

## Sockets by Application & Device Type



## Test & Burn-in Sockets by Region

Sockets Regional Consumption - 2024



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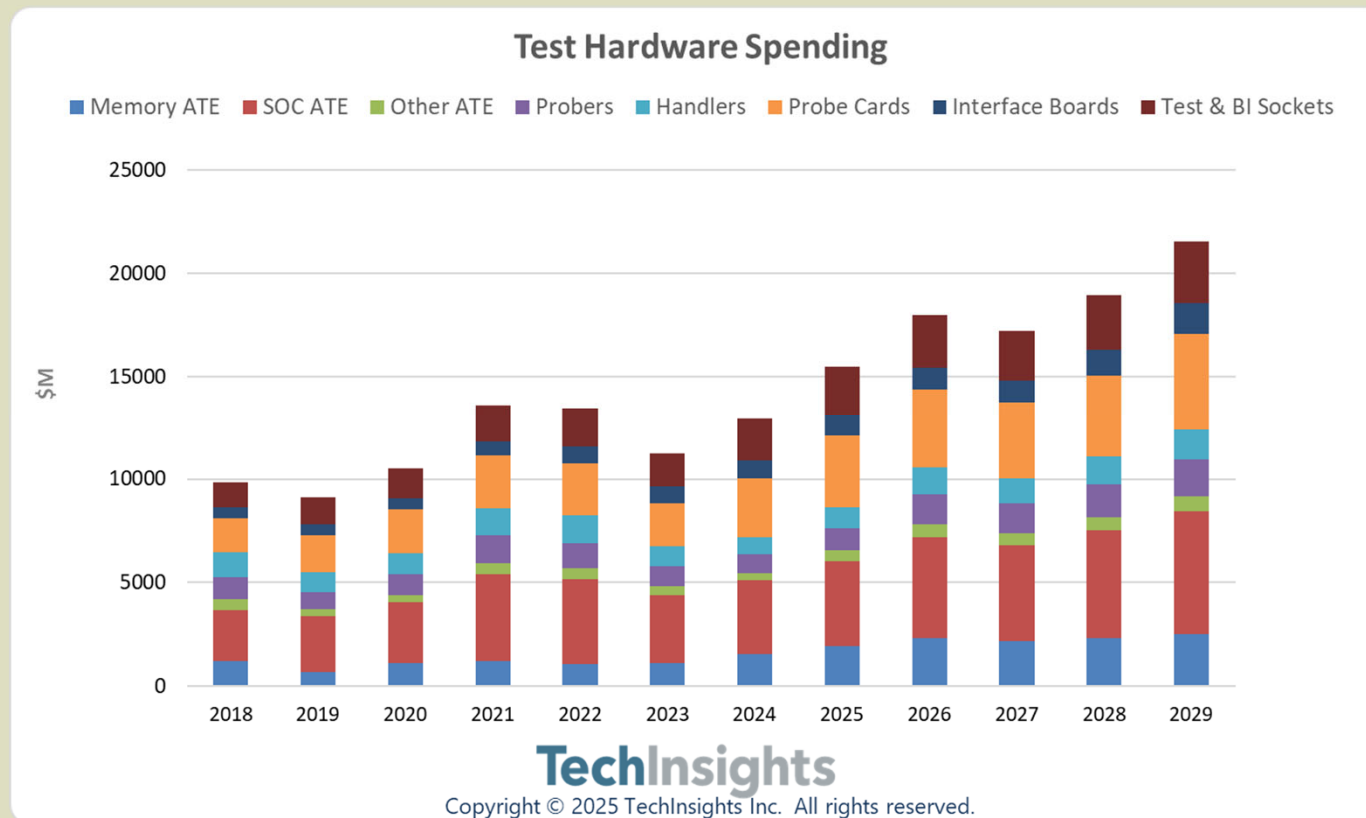


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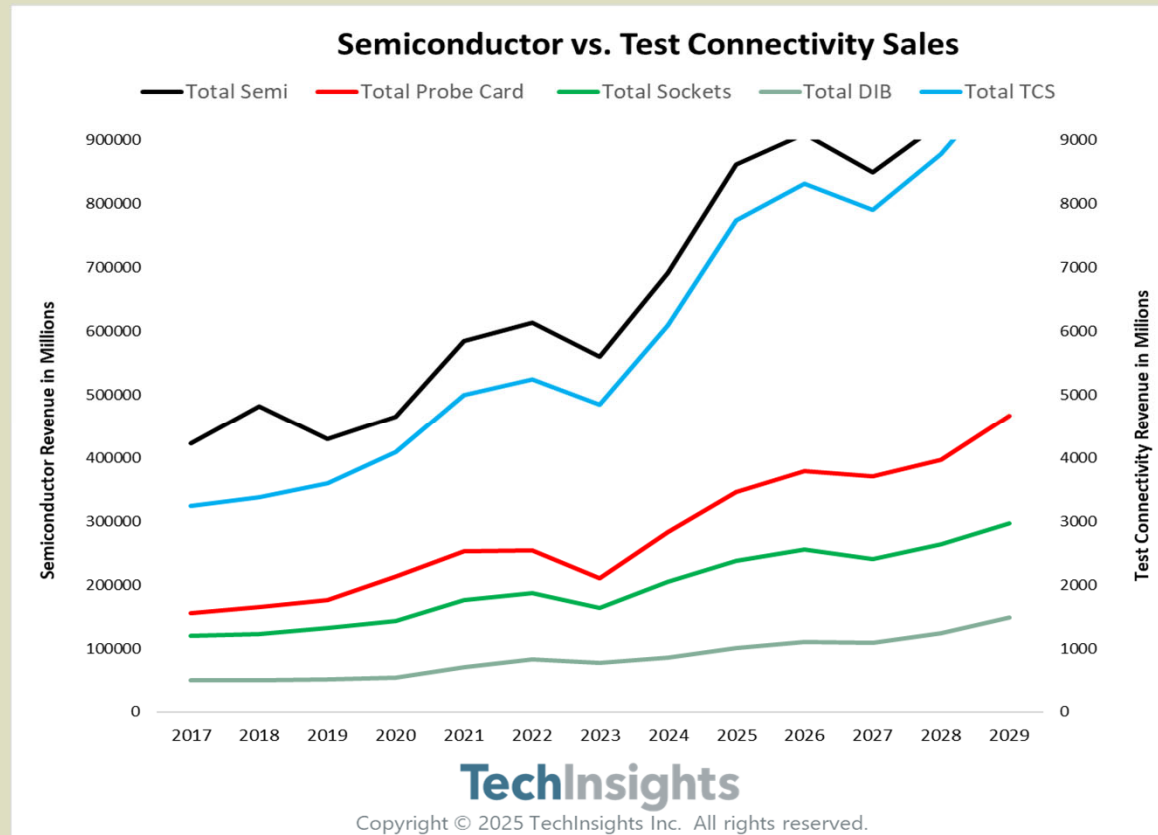
## Semiconductor Test Market



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## Semiconductor Sales vs Test Connectivity



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## Introduction to Advanced Packaging

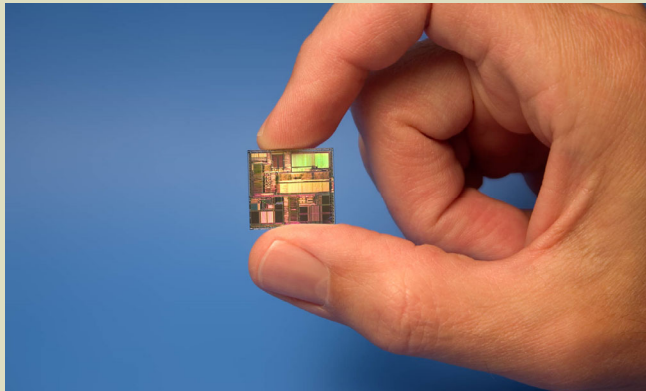


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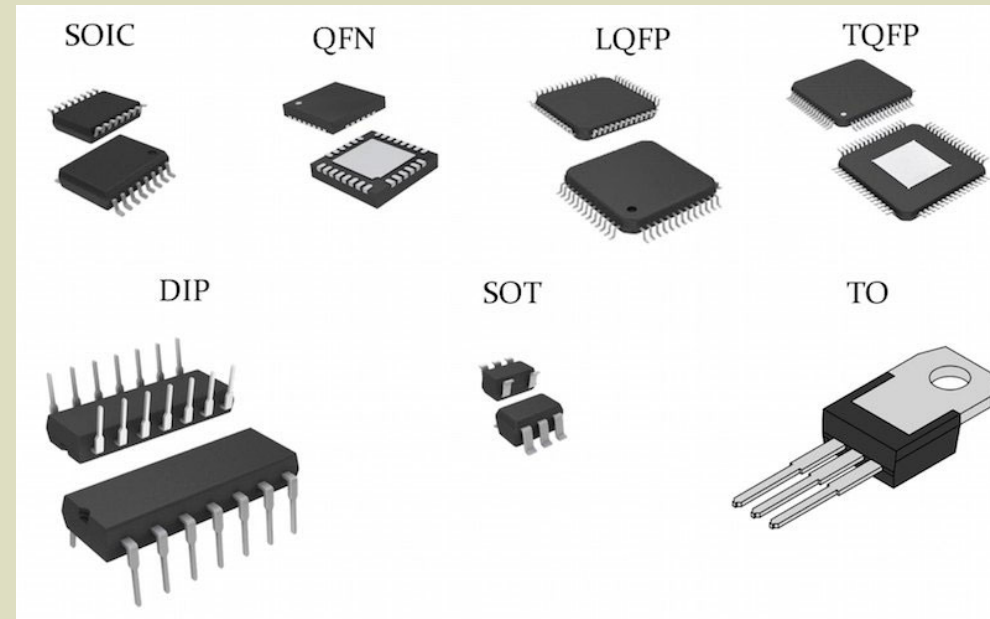
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## Advanced Packaging Market Overview

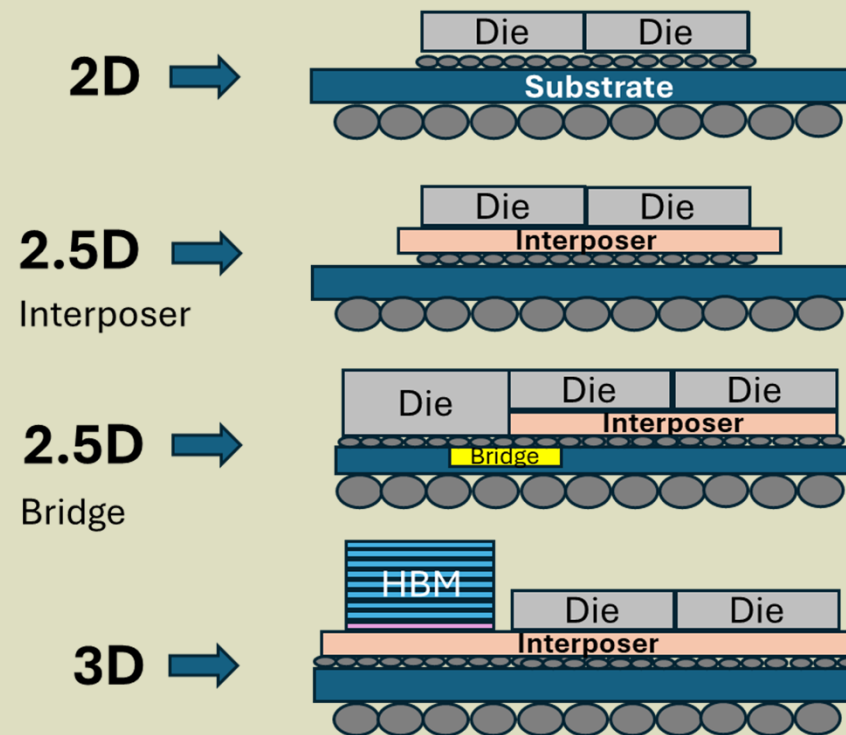
- What is Chip Packaging?
  1. Protect
  2. Connect



Source: Synopsys



## Advanced Packaging Market Overview



30-year-old Multi-Chip-Module



Source: Intel

### Interconnects:

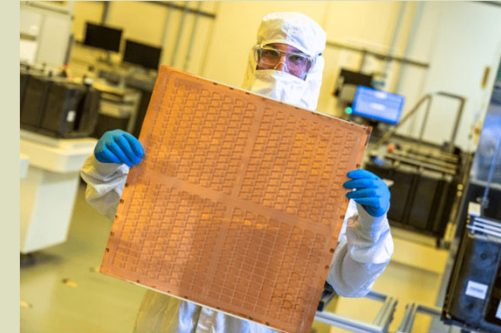
Wire bonding  
C4  
μ-bump  
TSV  
Hybrid bonding

### Who:

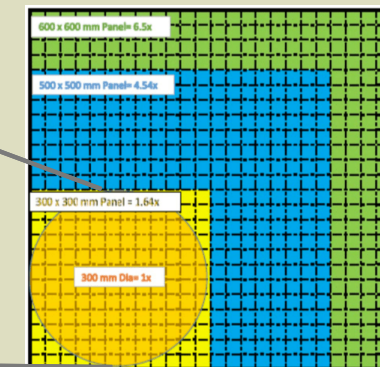
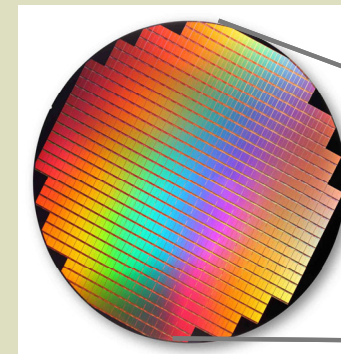
Foundries  
OSATs  
IDMs

## Panel-Level Packaging

- Panel-level packaging - Round wafers -> square panels
  - Better utilization rates
  - Larger possible components
  - Reduction in cost
  - Minimizes waste material
- Challenges -> new tools, stress/warpage, uniformity, no standard panel size



Source: Intel Corp.

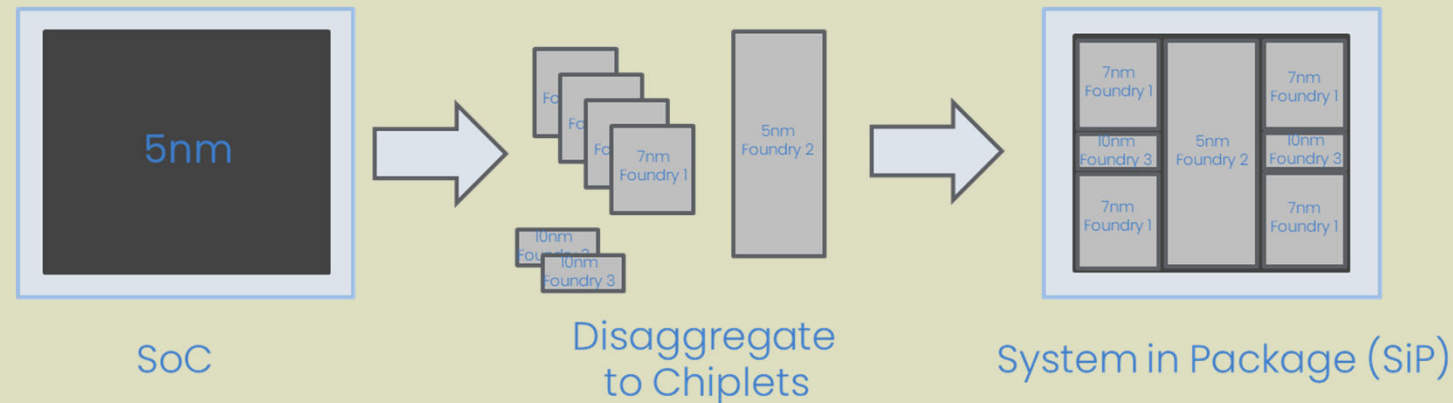


Source: JCET

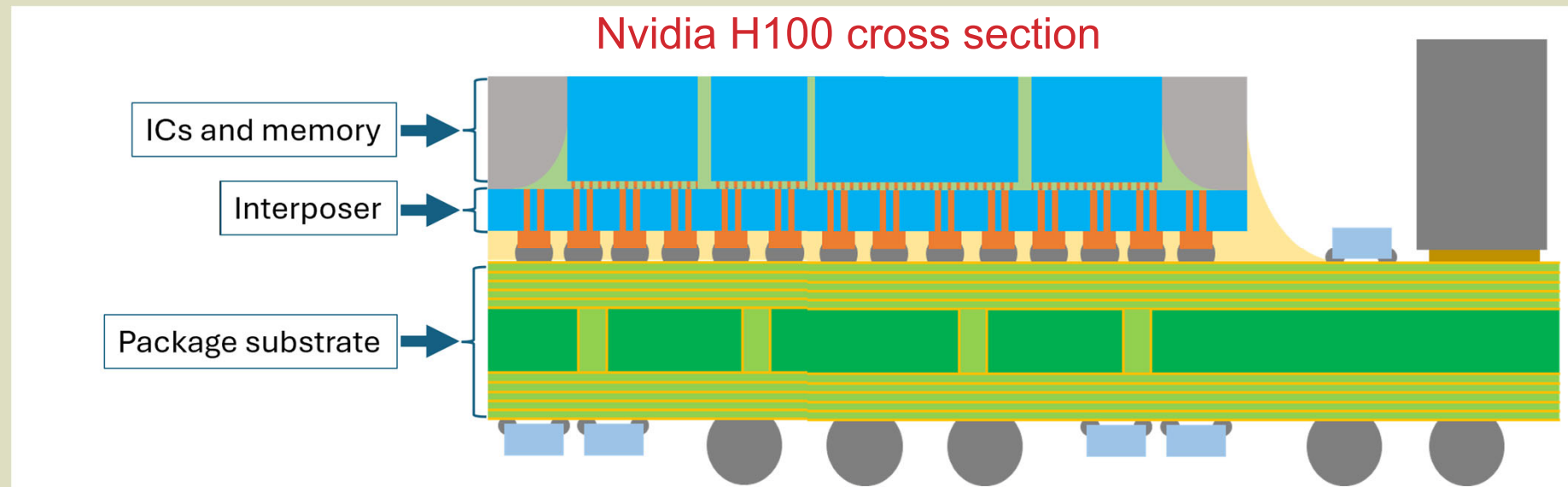
# TestConX 2025

## Chipelets ≠ Advanced Packaging

- **Chipelets** – a design strategy to **disaggregate an SoC** into functional blocks to be manufactured separately and then packaged together in one solution.
- **Advanced packaging** – a family of technologies that help enable **high-performance interconnects** between chipelets, dies, and packages in wide range of products.

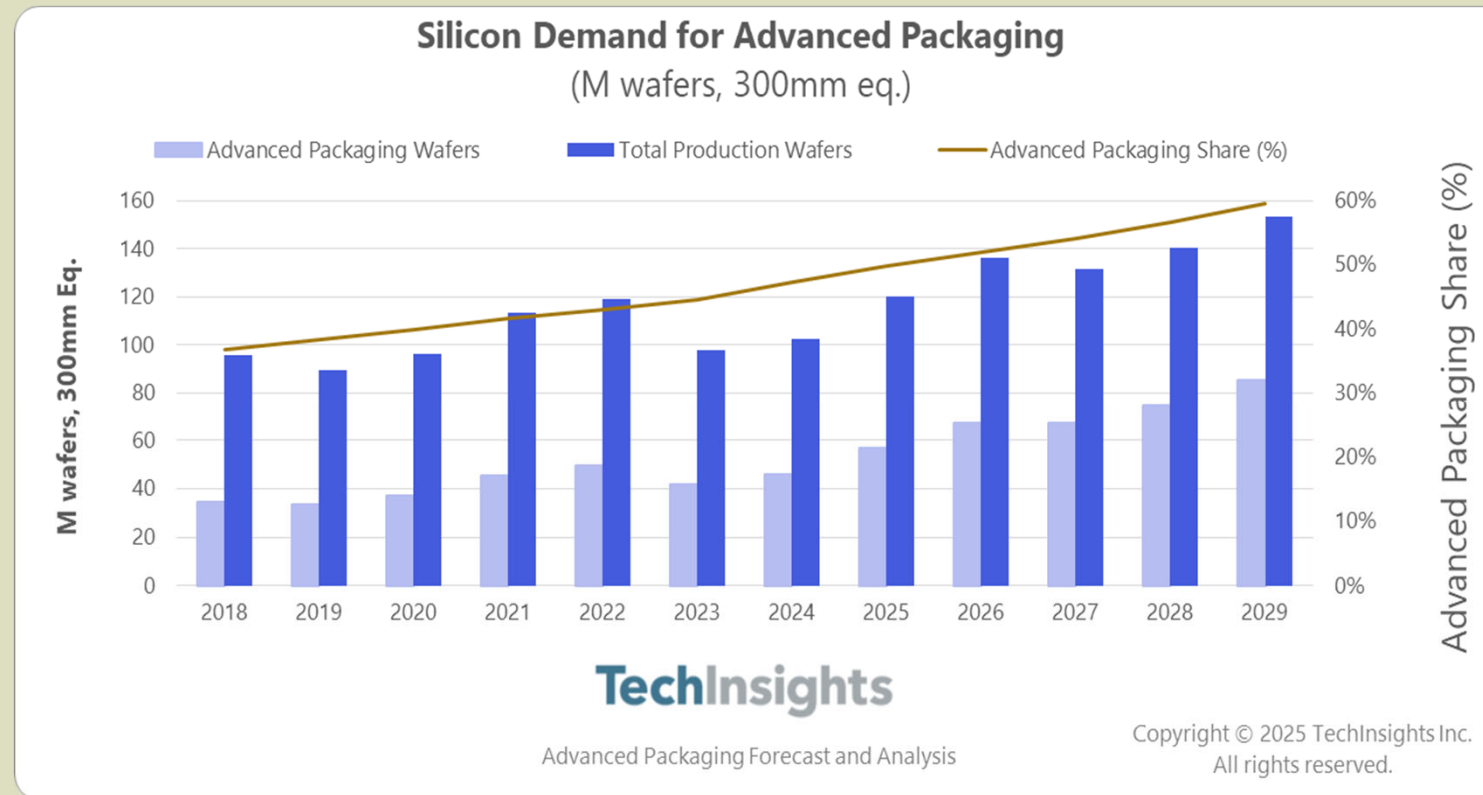


## What is an Interposer?





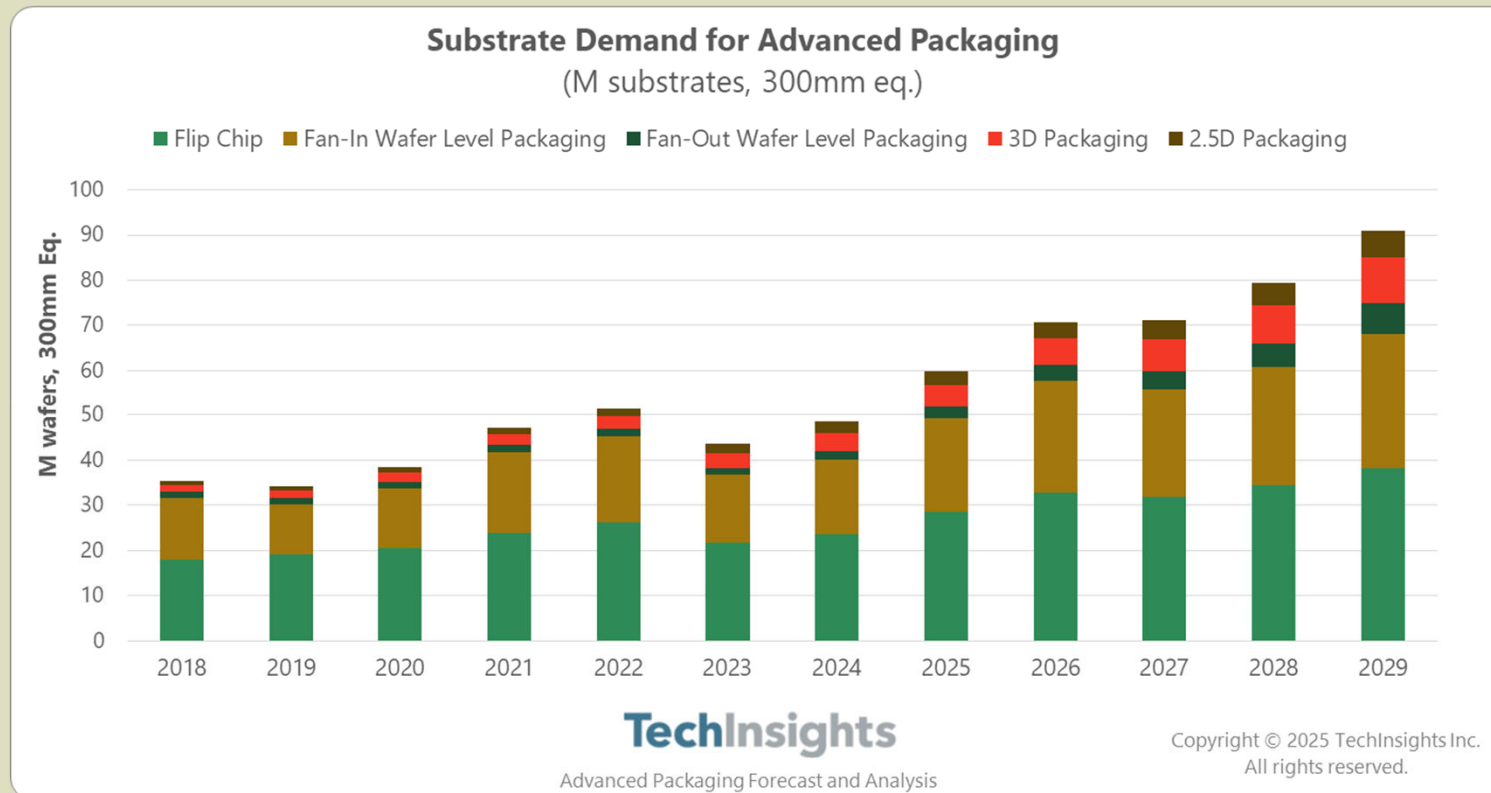
## Advanced Packaging Share of Total Silicon



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## Silicon and Substrate Demand for Advanced Packaging



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# 2025

# TestConX 2025

## Conclusion

- **Strong Semiconductor Market Outlook** – The semiconductor industry is poised for growth in 2025, with key drivers such as AI servers, commercial PC refresh cycles, and electronic sales improvements.
- **Test & Connectivity Market Expansion** – The test connectivity market is forecasted to reach \$8B by 2028, driven by cost management, sustainability, and increasing device complexity.
- **Advanced Packaging Trends** – Technologies like panel-level packaging and Chiplet integration are reshaping semiconductor design, improving efficiency and reducing costs.
- **Market Dynamics & Competitive Landscape** – The probe card and test & burn-in socket markets continue to evolve, with shifting market shares and new opportunities emerging.
- **Future Innovations & Challenges** – While growth is strong, challenges such as inventory management, geopolitical risks, and technological transitions will shape the industry's trajectory.



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