

## Evolving Semiconductor Testing Trends

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**Tech**  
Insights

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## Introduction

### Positives

- Generative AI as lead driver
- Central Banks are holding rates steady
- Industries are shifting due to technology advancements
- Semiconductor sales clearly increasing

### Negatives

- Higher rates are dampening the demand
- China's Macro problems from COVID-19 policies
- War in Europe
- U.S Export Controls to China



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## TechInsights' Forecast Summary

TechInsights' Current Forecast											
Forecast as of November 2023:	Q1 2023	Q2 2023	Q3 2023	Q4 2023	2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2024	
Semi Equipment (\$B):	\$ 34.7	\$ 32.6	\$ 32.9	\$ 33.7	\$ 133.9	\$ 32.5	\$ 33.4	\$ 35.7	\$ 36.8	\$ 138.4	
Sequential Change	-1.4%	-6.2%	1.1%	2.3%	-2.4%	-3.3%	2.5%	7.1%	3.1%	3.4%	
Capacity Utilization:	76.6%	73.4%	72.8%	73.4%	74.0%	76.9%	82.0%	84.7%	84.8%	82.1%	
ICs (\$B):	\$ 102.8	\$ 109.2	\$ 119.3	\$ 129.7	\$ 461.0	\$ 122.5	\$ 128.2	\$ 137.0	\$ 142.5	\$ 530.2	
Sequential Change	-8.3%	6.3%	9.3%	8.7%	-10.4%	-5.6%	4.7%	6.8%	4.0%	15.0%	
IC Units (BU):	86.9	89.2	87.3	82.8	346.2	83.8	94.0	105.1	104.7	387.6	
Sequential Change	-9.7%	2.6%	-2.1%	-5.2%	-14.5%	1.2%	12.1%	11.8%	-0.4%	12.0%	
Electronics (\$B) :	\$ 600.5	\$ 557.9	\$ 589.2	\$ 735.8	\$ 2,483	\$ 634.7	\$ 593.0	\$ 641.5	\$ 798.1	\$ 2,667	
Sequential Change	-13.5%	-7.1%	5.6%	24.9%	-2.8%	-13.7%	-6.6%	8.2%	24.4%	7.4%	

	2023	2024
Equipment	Unchanged	Unchanged
IC Sales	Upgraded from -12% to -10%	Downgraded from 17% to 15%
IC Units	Downgraded from -14% to -15%	Upgraded from 11% to 12%
Electronics	Upgraded from -4% to -3%	Unchanged



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## Semiconductor Sales

SEMICONDUCTOR SALES						
(worldwide sales, \$B, calendar year)						
	2022	2023	2024	2025	2026	2027
Analog	91	82	85	102	114	110
y-o-y growth	21%	-10%	3%	20%	12%	-4%
DRAM	83	52	72	96	111	106
y-o-y growth	-13%	-38%	39%	34%	15%	-4%
NAND	55	39	52	72	82	74
y-o-y growth	-9%	-30%	35%	38%	15%	-10%
MPU	60.0	51.1	55.9	64.4	70.2	66.0
y-o-y growth	-12%	-15%	9%	15%	9%	-6%
Other Logic	219	224	256	282	308	297
y-o-y growth	17%	2%	15%	10%	9%	-4%
Discrete, Opto & Other	105	103	116	138	153	145
y-o-y growth	7%	-1%	13%	19%	11%	-5%
Total Semiconductor	614	550	637	754	838	797
y-o-y growth	5%	-10%	16%	18%	11%	-5%

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SEMICONDUCTOR SHIPMENTS						
(worldwide sales, B units, calendar year)						
	2022	2023	2024	2025	2026	2027
Analog	235	205	226	270	307	302
y-o-y growth	7%	-13%	10%	20%	14%	-1%
DRAM	20	18	21	24	27	26
y-o-y growth	-10%	-6%	13%	16%	9%	-3%
NAND	11	13	15	19	22	20
y-o-y growth	-17%	12%	21%	24%	15%	-7%
MPU	0.6	0.5	0.5	0.6	0.6	0.6
y-o-y growth	-13%	-17%	9%	16%	10%	-9%
Other Logic	122	98	110	120	128	120
y-o-y growth	2%	-19%	12%	9%	6%	-6%
Discrete, Opto & Other	707	594	679	813	876	844
y-o-y growth	-7%	-16%	14%	20%	8%	-4%
Total Semiconductor	1096	929	1051	1247	1360	1313
y-o-y growth	-4%	-15%	13%	19%	9%	-3%

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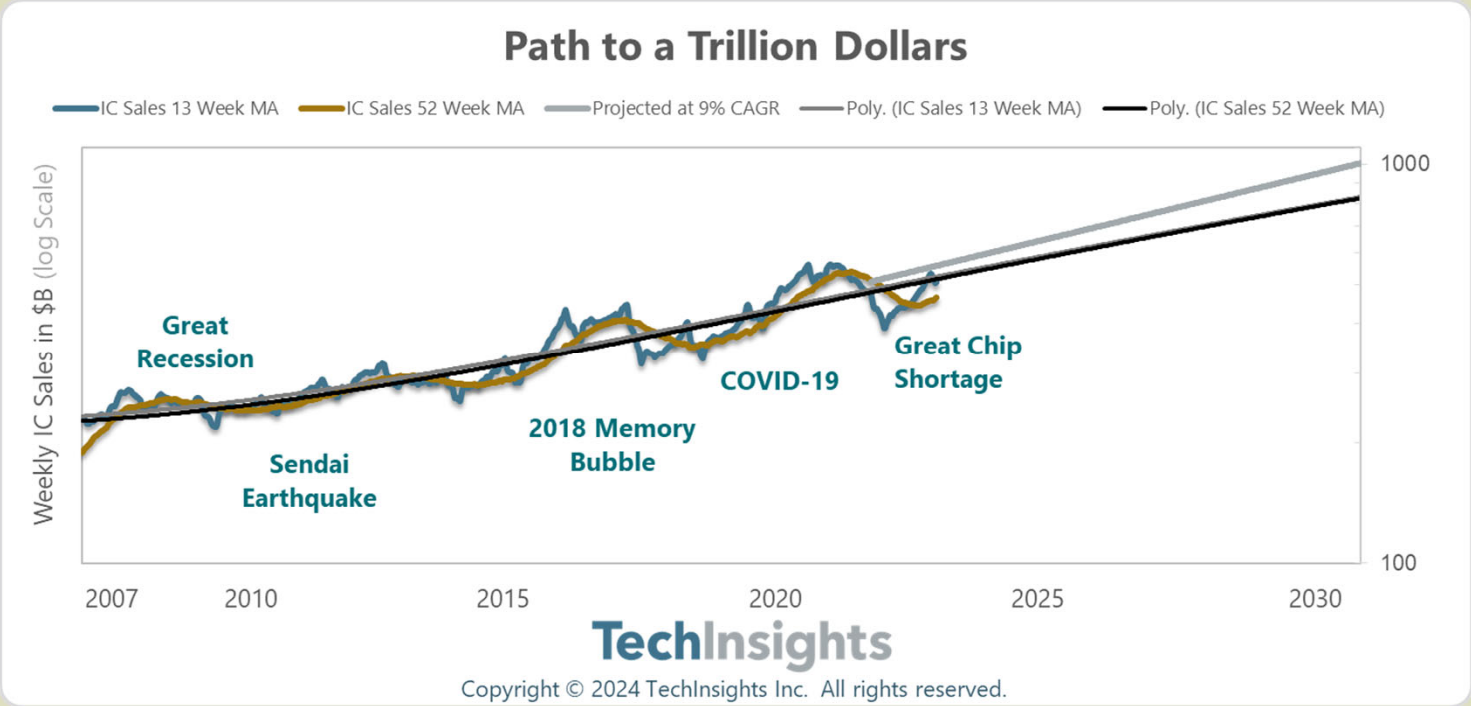
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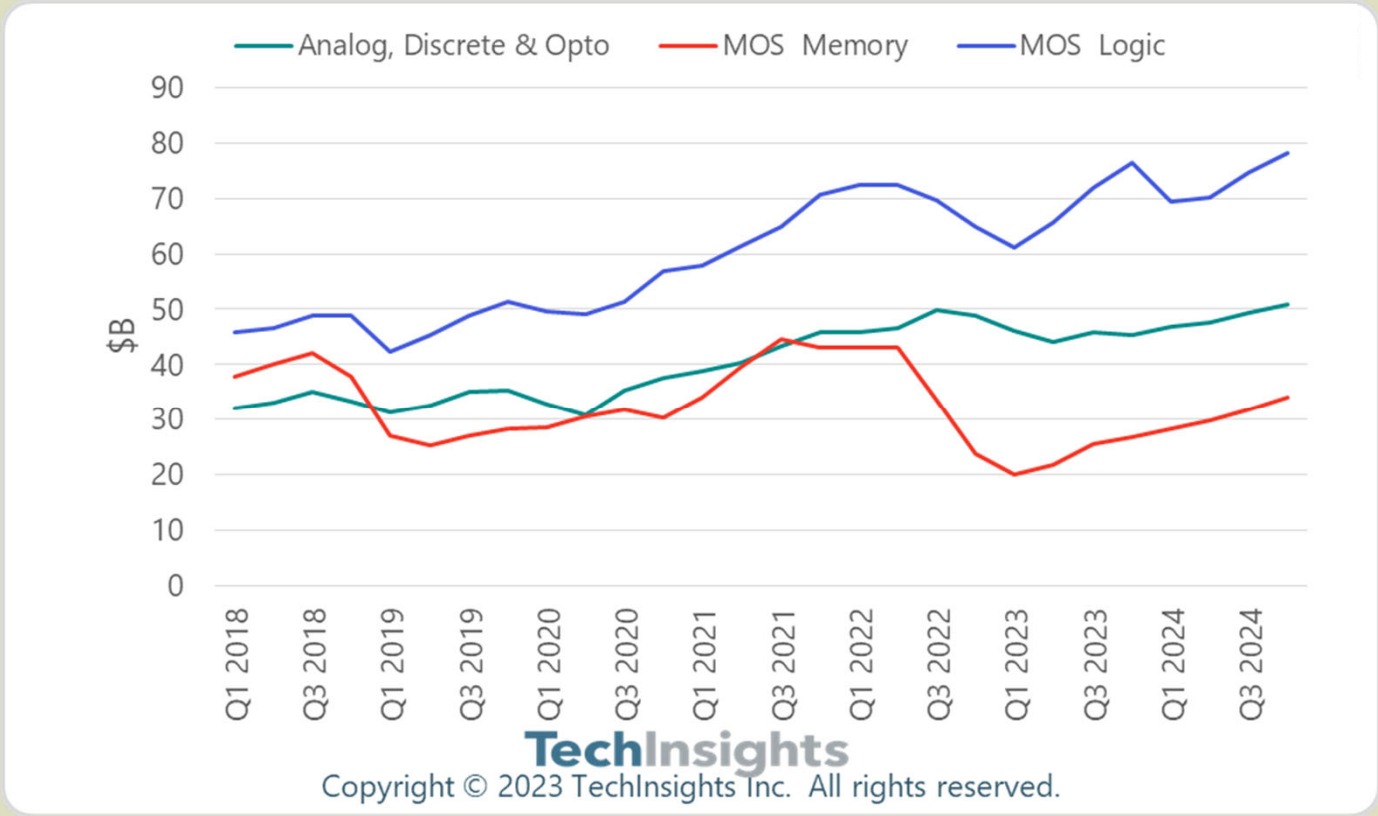
Semiconductor Sales



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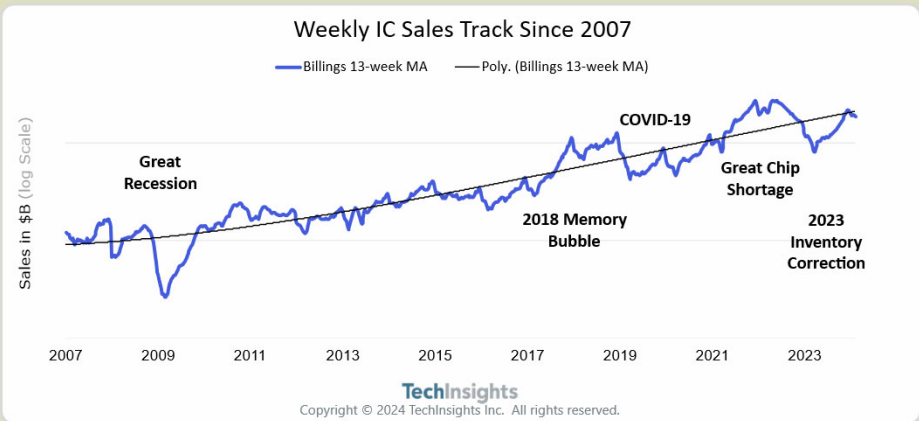
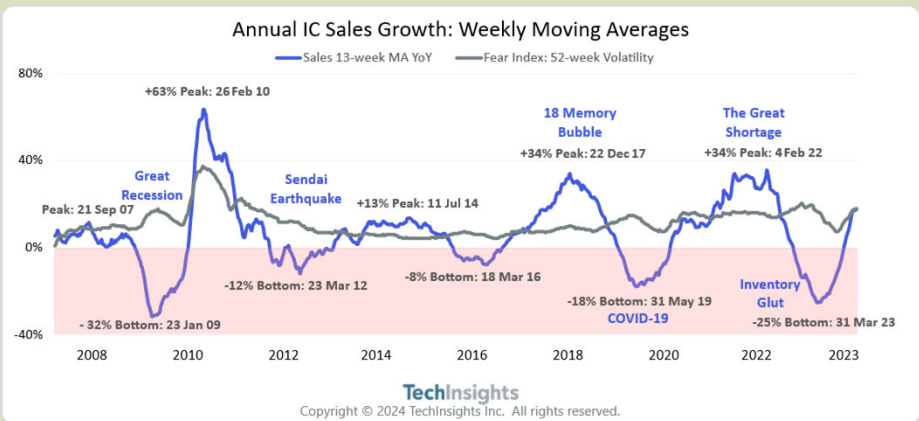
Semiconductor Sales are Diverging



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## IC Sales Growth/IC Sales Track



Overheated  
or  
Underheated



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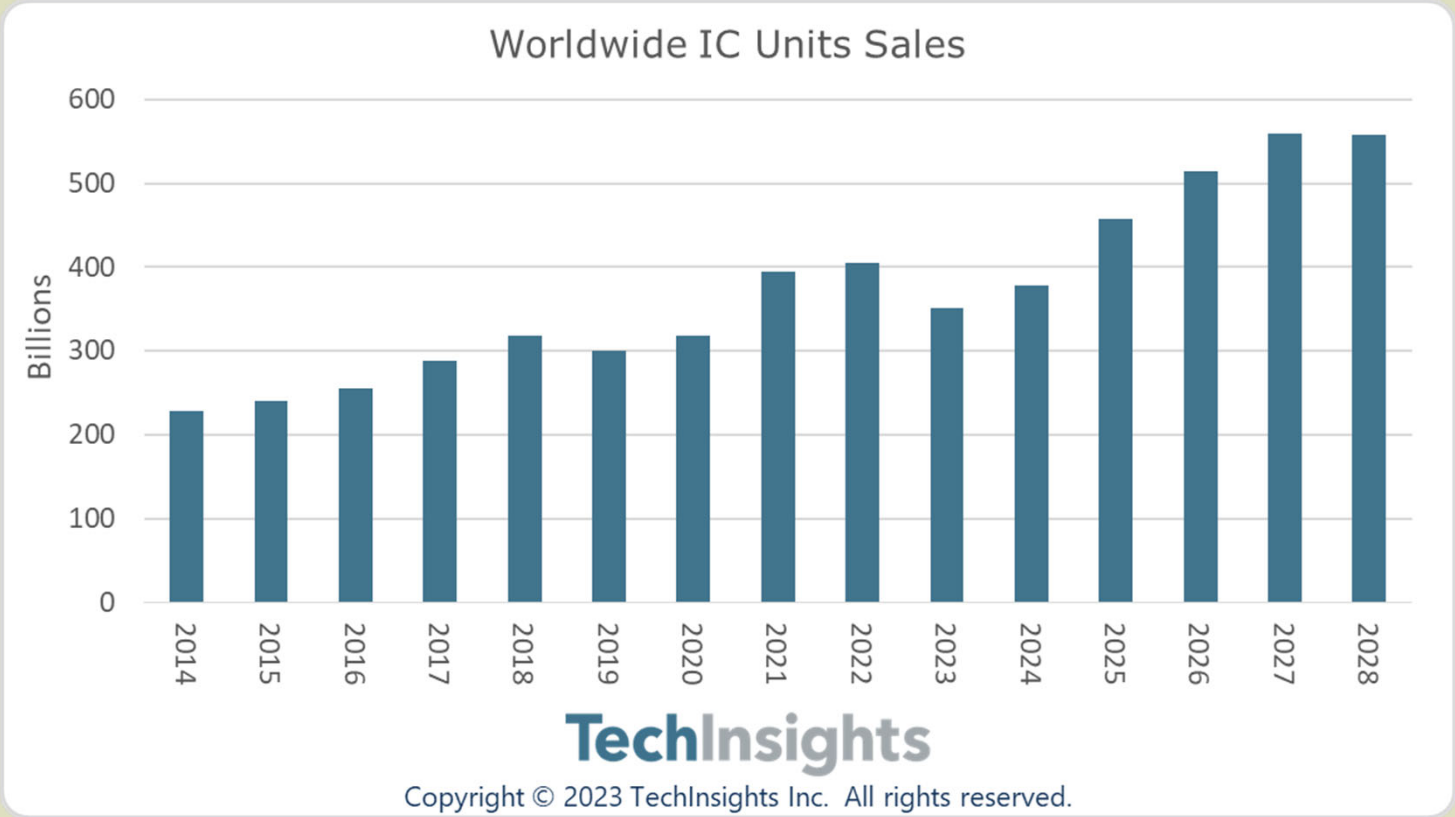
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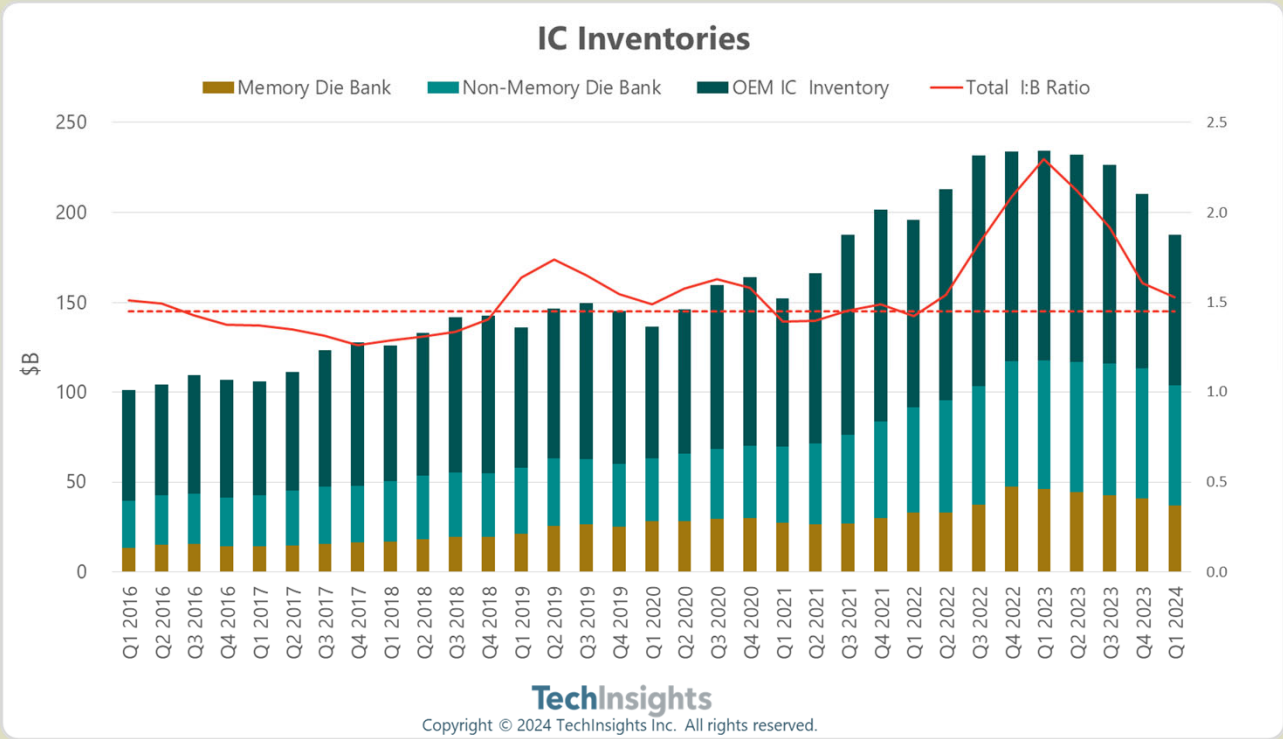
Worldwide IC Units Sales



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Inventory Peak is Behind



Inventory-to-billing  
ratio coming back

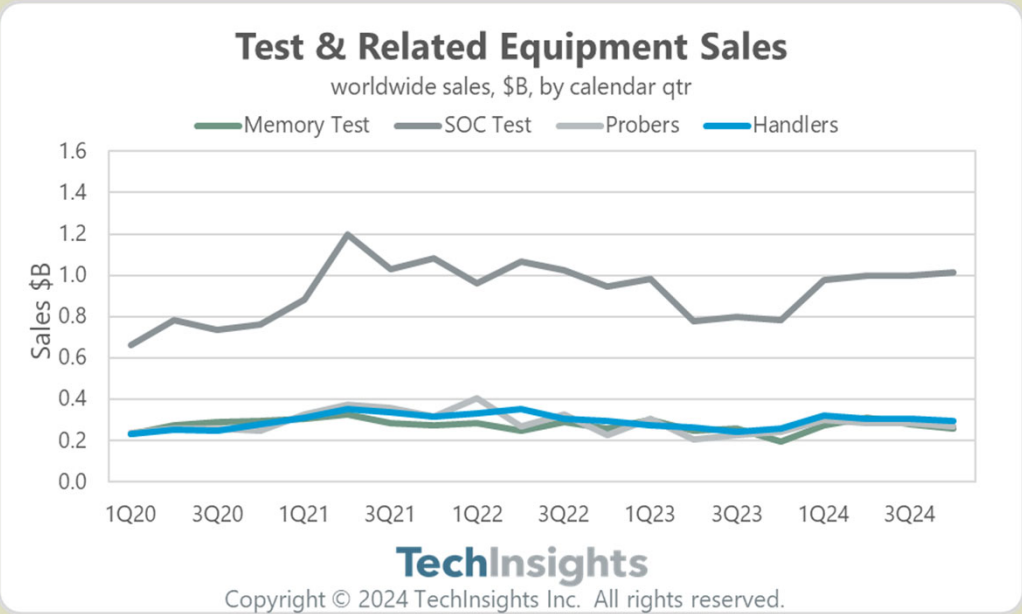


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Test & Related Rebounding in 2024

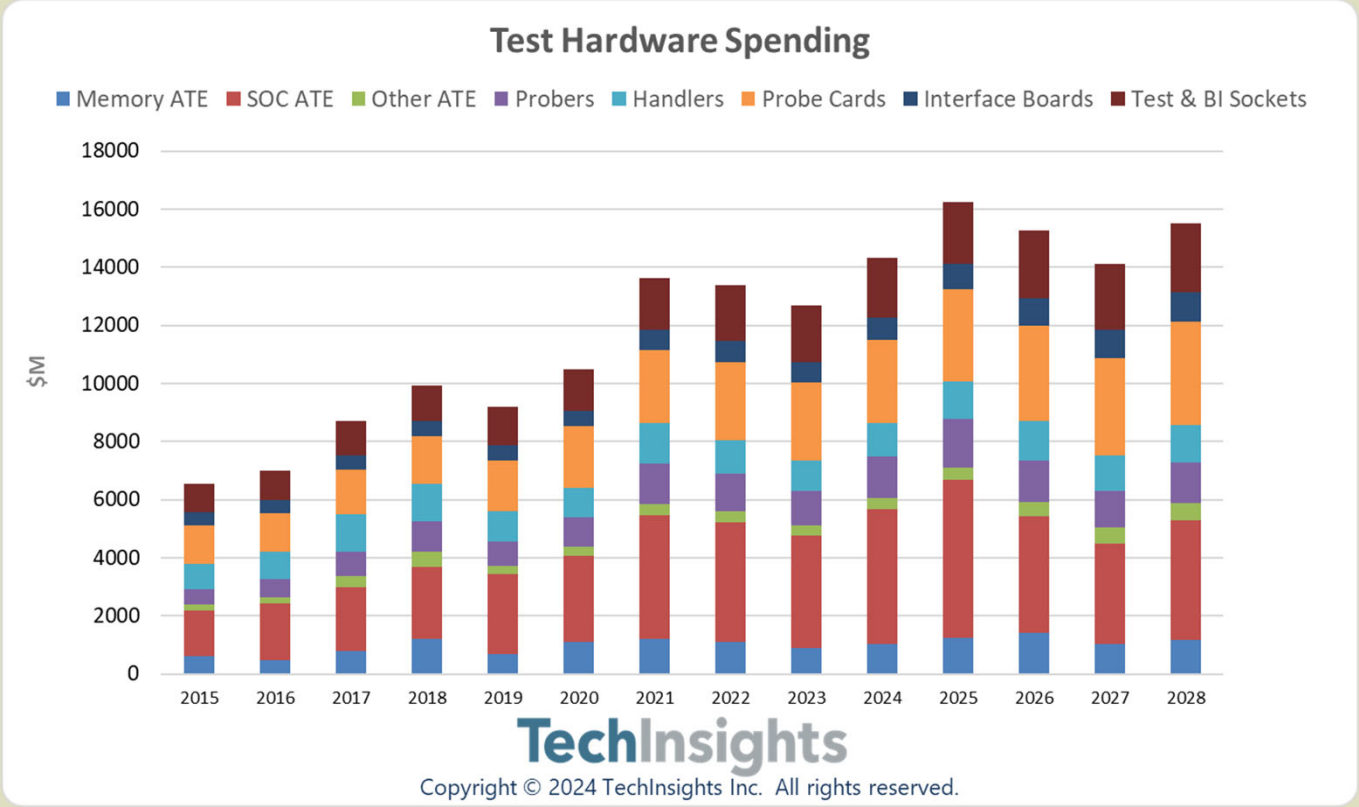
Test Equipment Sales			
(worldwide sales, \$B, CY 2022 - 2024)			
	2022	2023	2024
Memory Test	1.1	1.0	1.1
y-o-y growth	-9%	-8%	12%
SOC Test	4.0	3.3	4.0
y-o-y growth	-5%	-16%	19%
Other Test	0.6	0.6	0.6
y-o-y growth	18%	-10%	10%
Handlers	1.3	1.0	1.2
y-o-y growth	-2%	-19%	18%
Probers	1.2	1.0	1.1
y-o-y growth	-10%	-20%	16%
Total Semiconductor	8.2	6.9	8.1
y-o-y growth	-4.4%	-15.8%	16.8%



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## Semiconductor Test Market



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## Semiconductor Testing

- Crucial step in Semiconductor manufacturing process
- Various types at different stages of manufacturing
- Key types are -
  - Wafer Testing (Wafer Probing)
  - Final Test (Final Package Testing)
  - Parametric Testing
  - Functional Testing
  - Burn-in Testing
  - Automated Test Equipment (ATE)

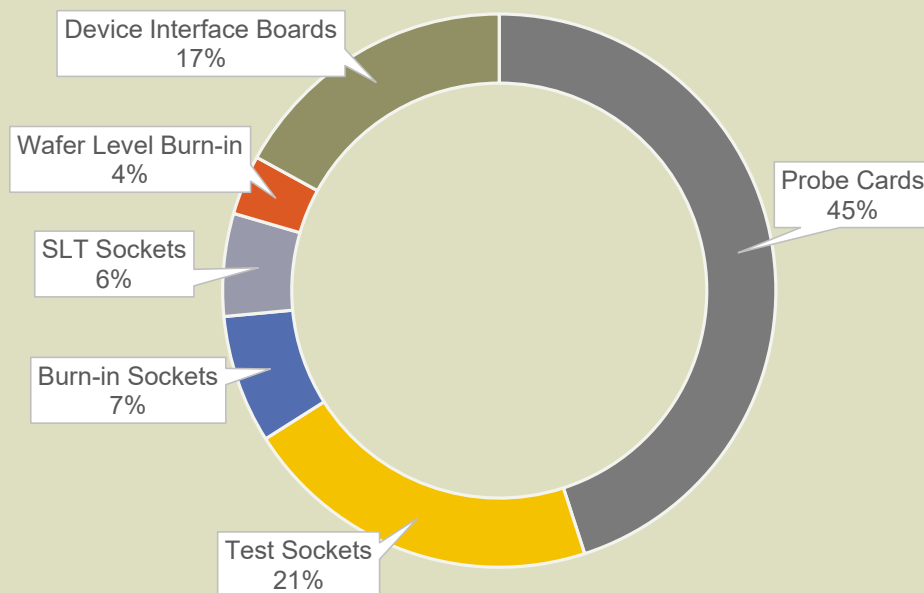


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## Test Connectivity Market Share 2024



- 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 2024.

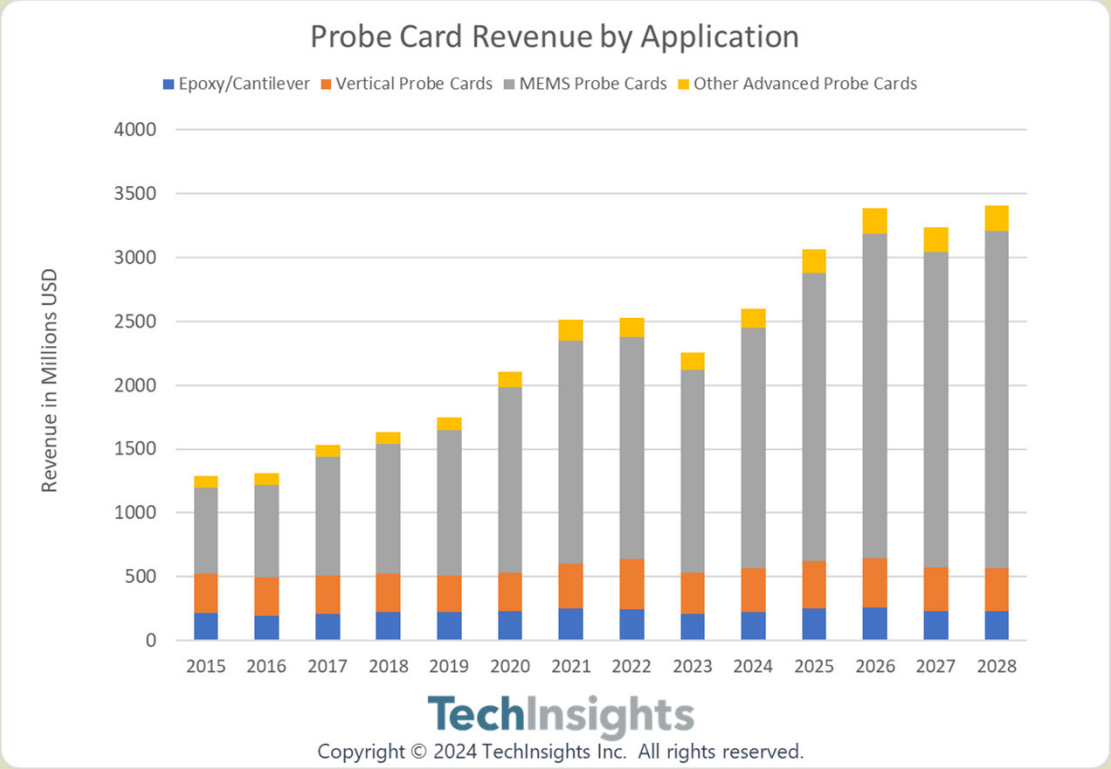


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## Global Probe Card Market

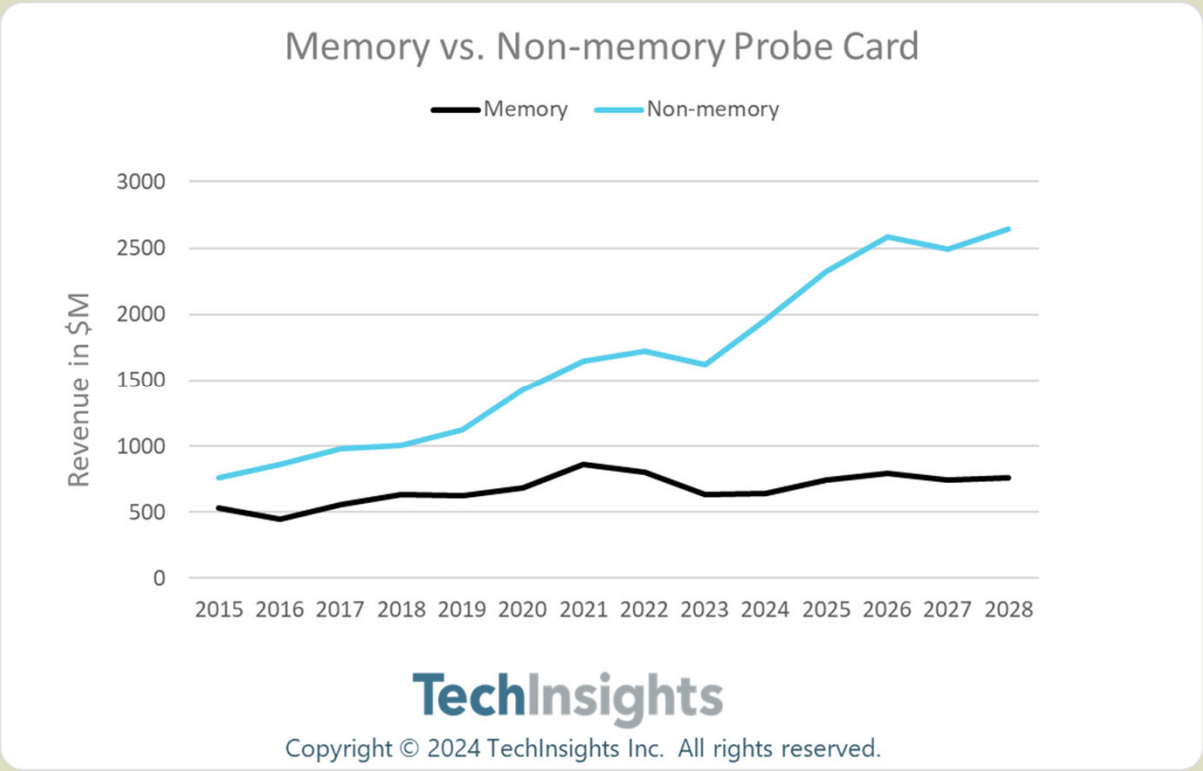


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## Memory vs Non-Memory Probe Cards



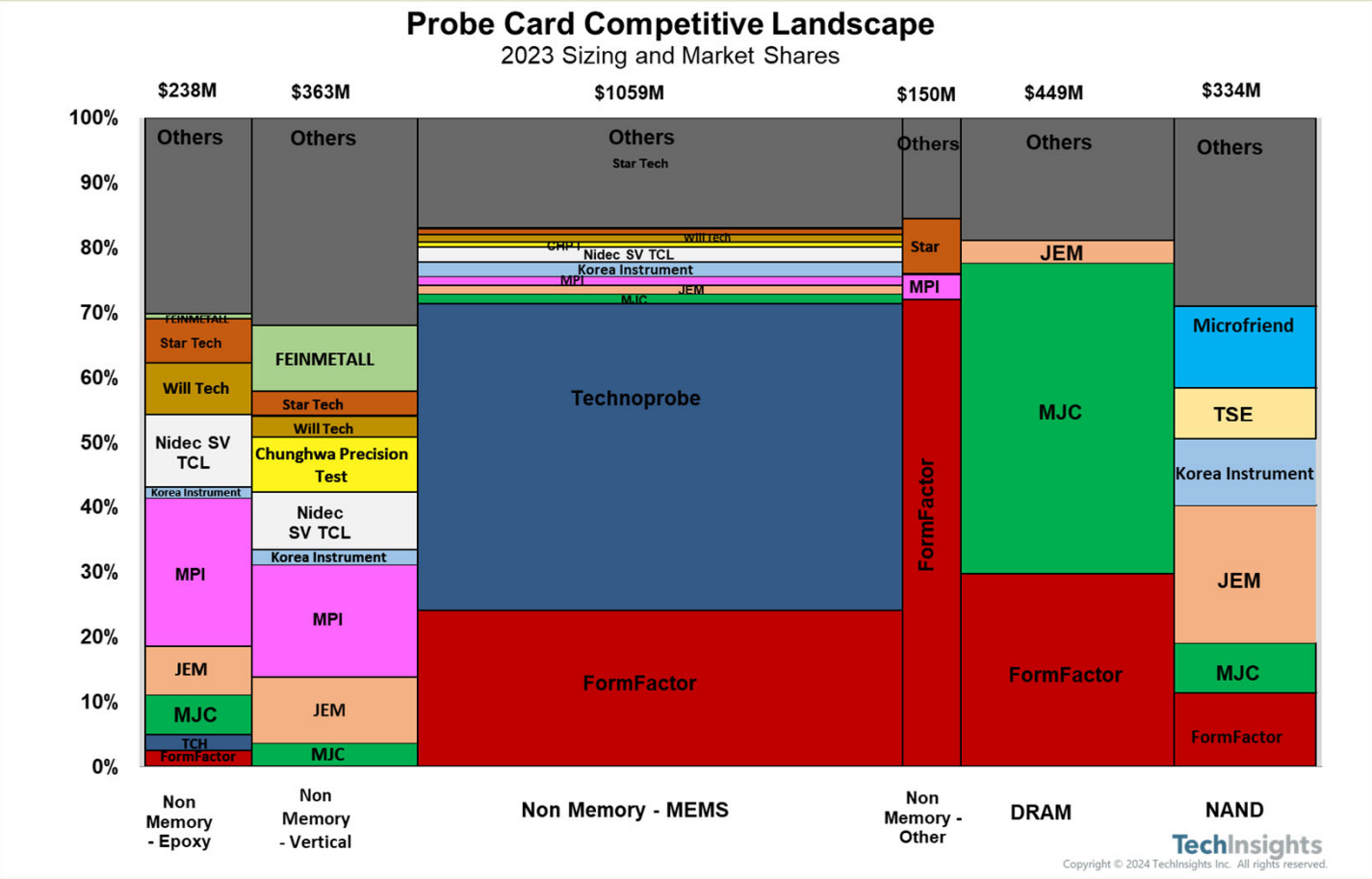
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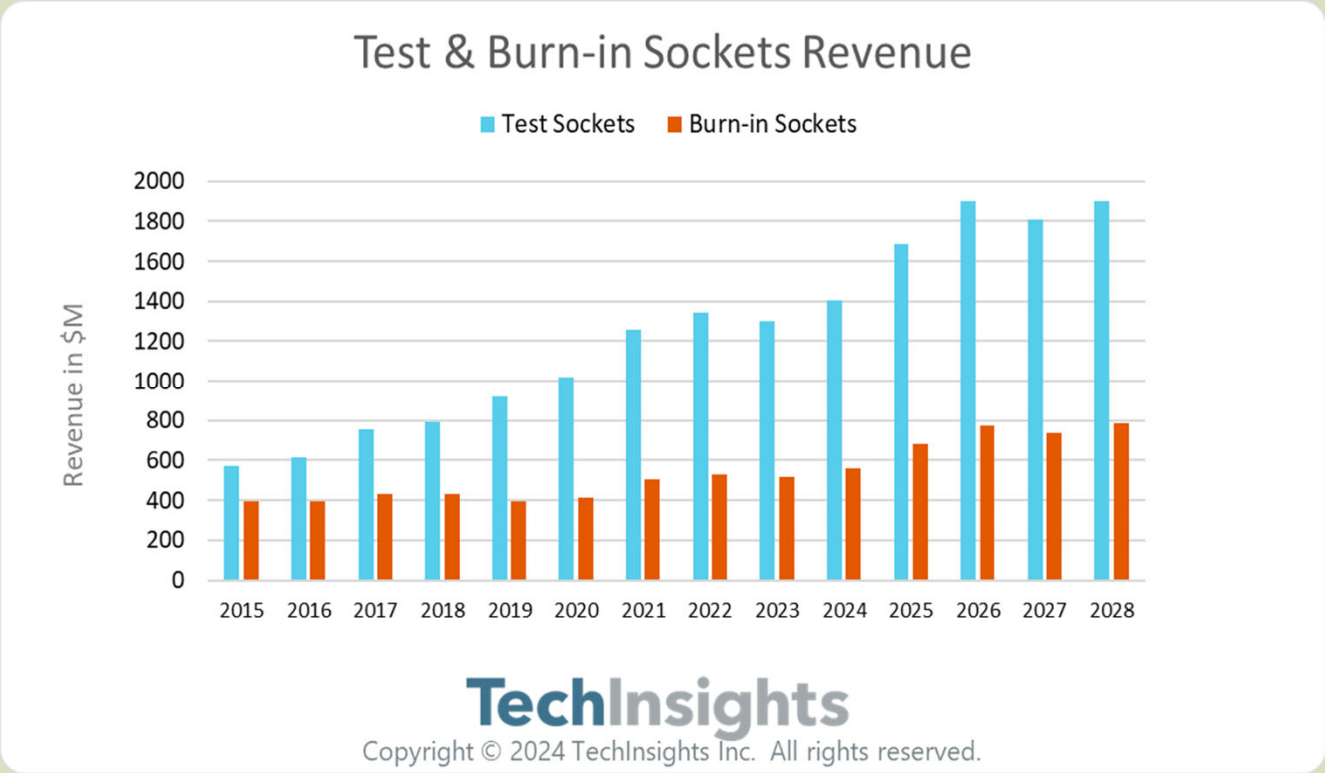
# TestConX 2024



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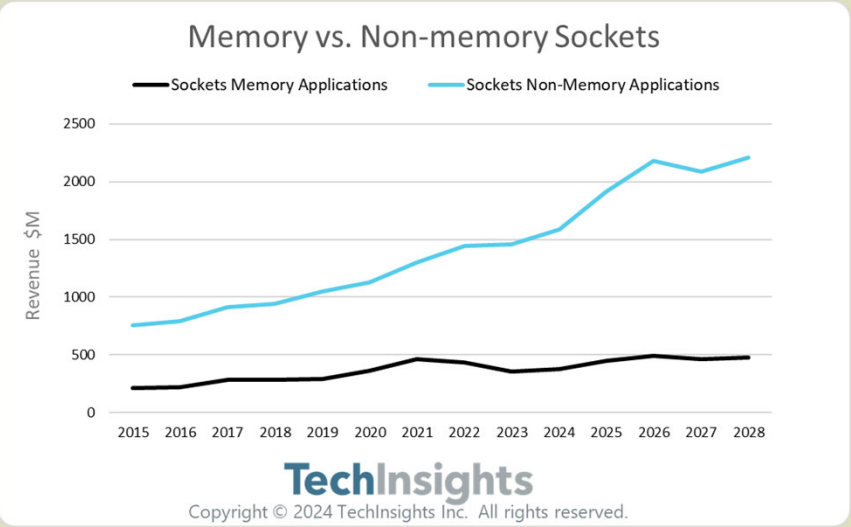
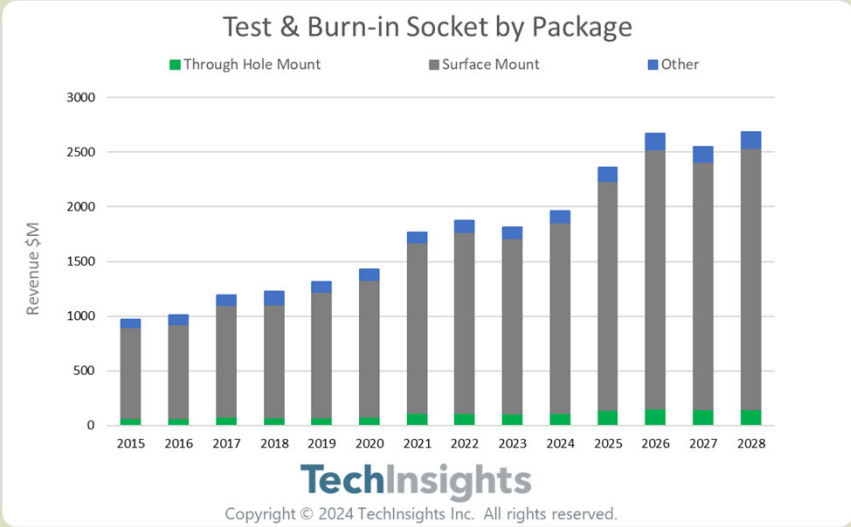
# Test & Burn-in Sockets Market



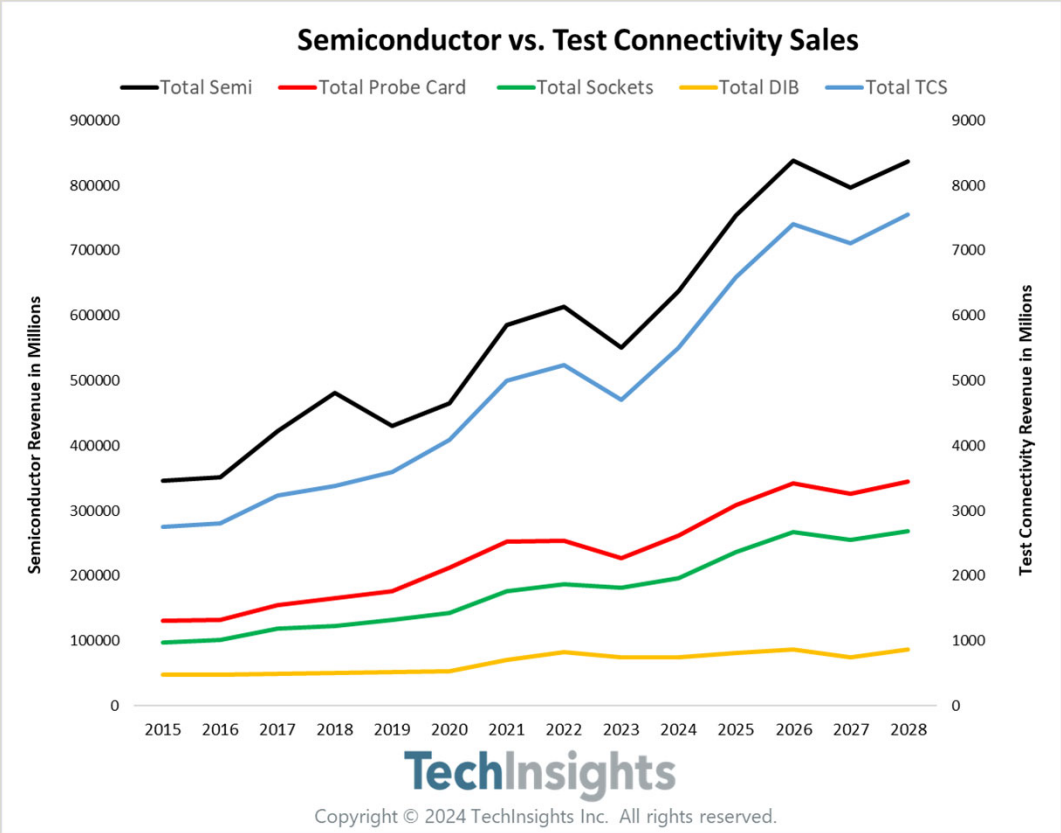
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## Sockets Market by Application & Type



Semi Growth vs Test Market



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## Conclusion

- Semiconductor demand has recovered from a cyclical downturn
- Demand for semiconductors returns with key secular drivers
- Key long-term drivers and trends continue to be important factors for Testing demand
- Memory market is forecasted to be up by 70% in 2024
- DRAM is estimated to increase by 75% in 2024
- Probe Card CAGR is 18% from 2023 to 2028
- Sockets CAGR is 13% from 2023 to 2028



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