

AI Revolutionizing Semiconductor Testing

Panchami Phadke
TechInsights



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AI Revolutionizing Semiconductor Testing

2023

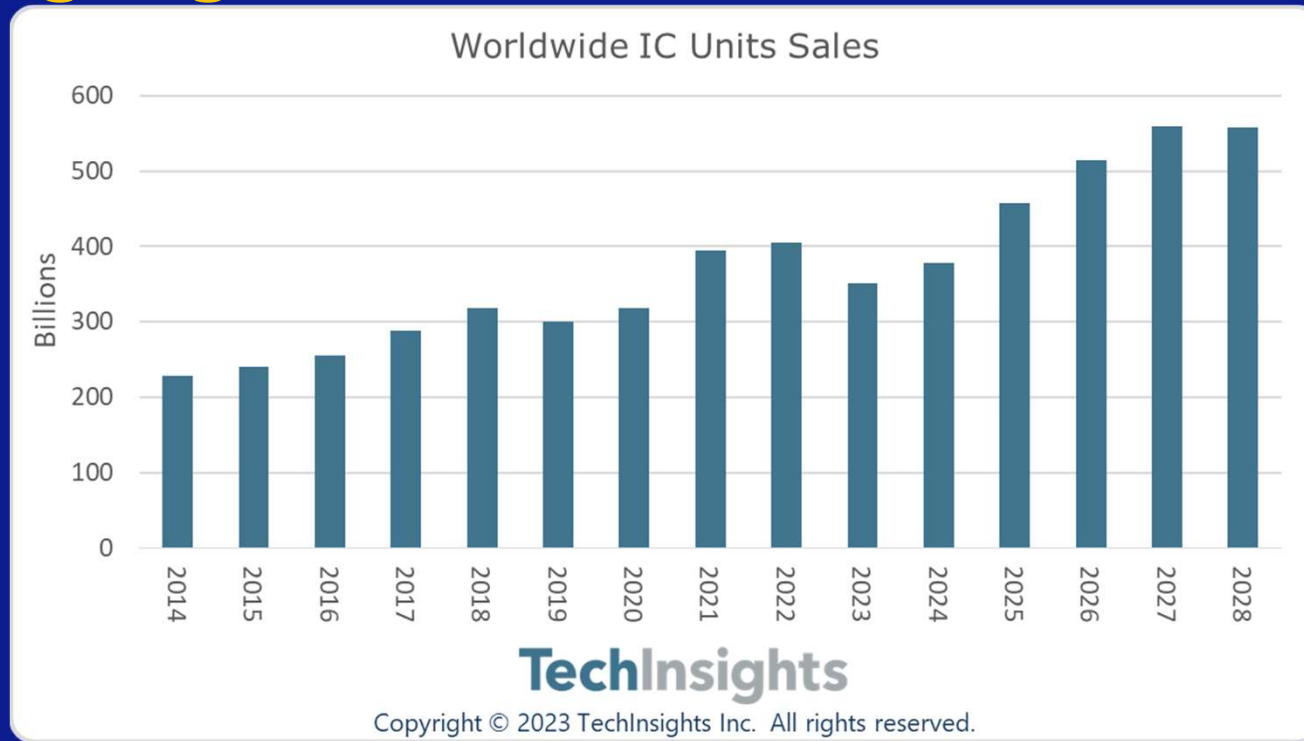
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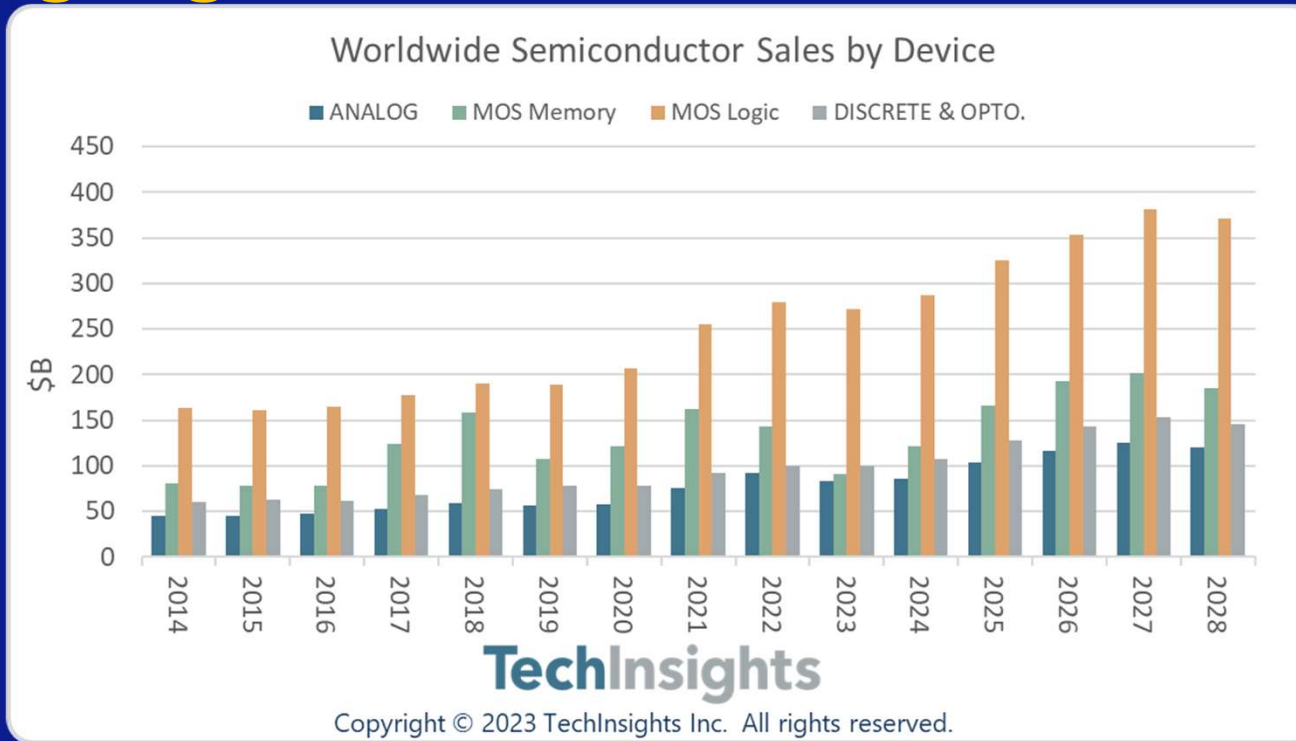
Highlights of Semiconductor Market

TechInsights' Current Forecast										
Forecast as of September 2023:	Q1 2023	Q2 2023	Q3 2023	Q4 2023	2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2024
Semi Equipment (\$B):	\$ 34.8	\$ 32.3	\$ 32.0	\$ 31.4	\$ 130.5	\$ 32.4	\$ 32.9	\$ 34.7	\$ 35.3	\$ 135.2
Sequential Change	-1.2%	-7.2%	-1.0%	-1.8%	-4.9%	3.0%	1.6%	5.5%	1.7%	3.7%
Capacity Utilization:	76.9%	73.7%	75.1%	74.3%	75.0%	78.3%	86.5%	90.1%	84.2%	85.0%
ICs (\$B):	\$ 102.4	\$ 107.9	\$ 115.3	\$ 120.1	\$ 445.7	\$ 117.3	\$ 120.0	\$ 126.1	\$ 130.8	\$ 494.1
Sequential Change	-8.7%	5.4%	6.9%	4.2%	-13.3%	-2.4%	2.3%	5.1%	3.8%	10.9%
IC Units (BU):	86.9	89.2	85.8	89.1	351.0	86.1	90.9	97.5	104.2	378.6
Sequential Change	-9.7%	2.6%	-3.8%	3.9%	-13.3%	-3.4%	5.5%	7.2%	6.9%	7.9%
Electronics (\$B) :	\$ 600.5	\$ 557.9	\$ 597.1	\$ 727.8	\$ 2,483	\$ 610.3	\$ 583.2	\$ 630.7	\$ 779.0	\$ 2,603
Sequential Change	-13.5%	-7.1%	7.0%	21.9%	-2.8%	-16.1%	-4.4%	8.1%	23.5%	4.8%

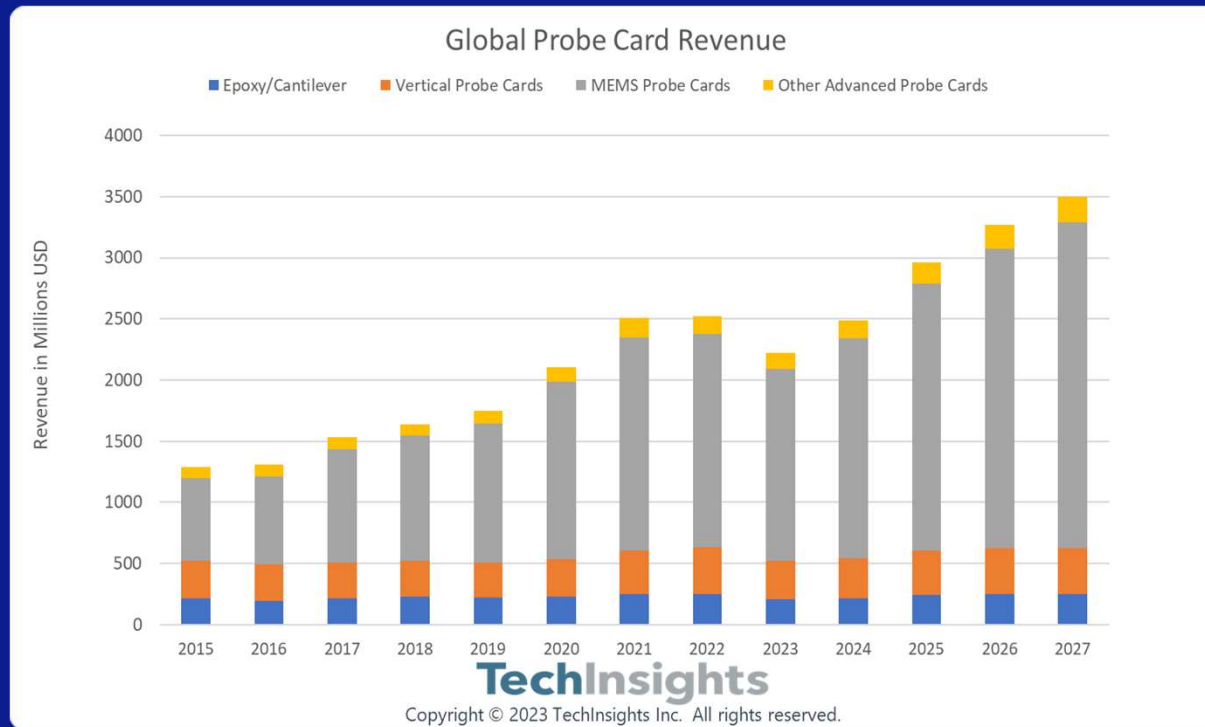
Highlights of Semiconductor Market

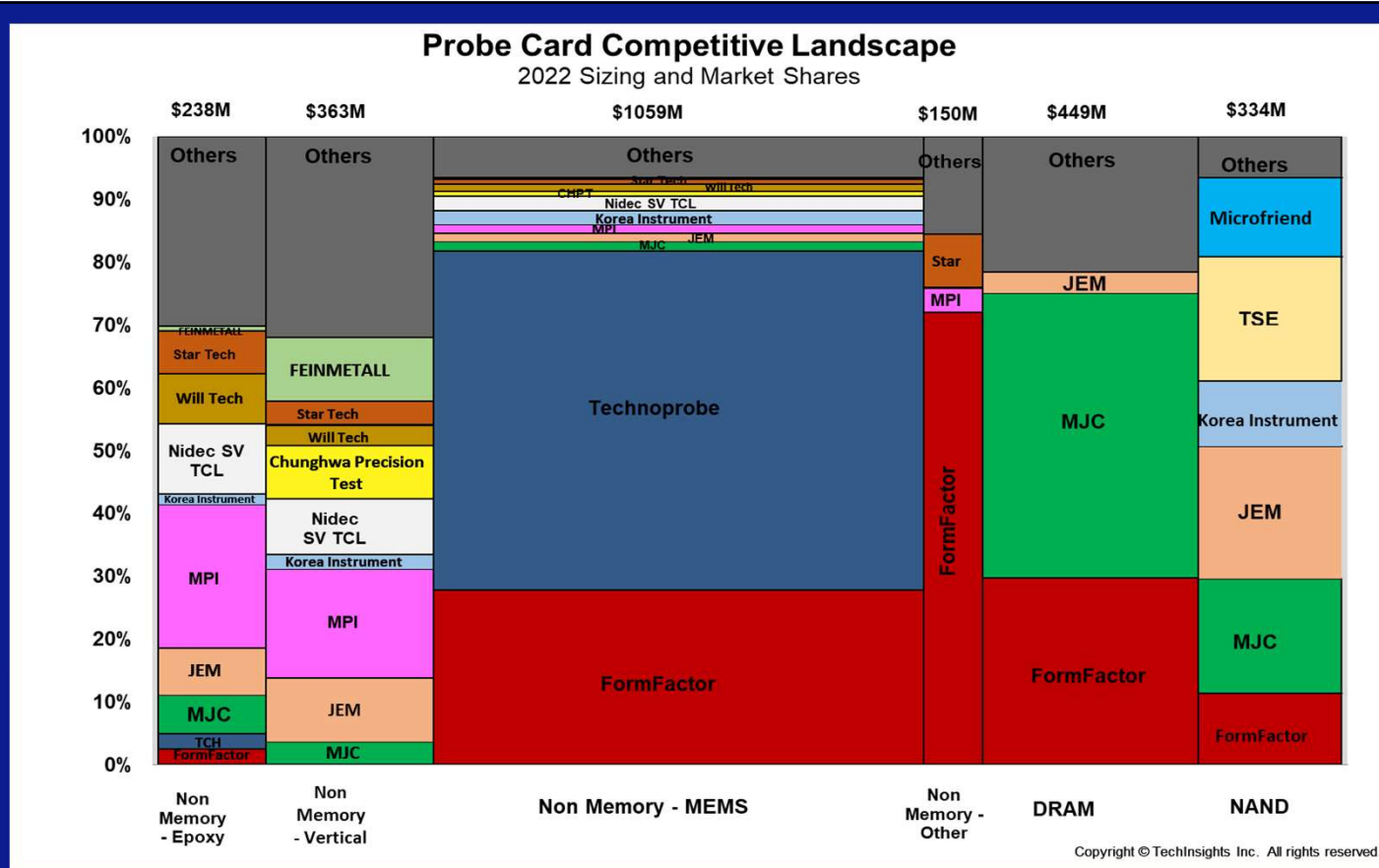


Highlights of Semiconductor Market

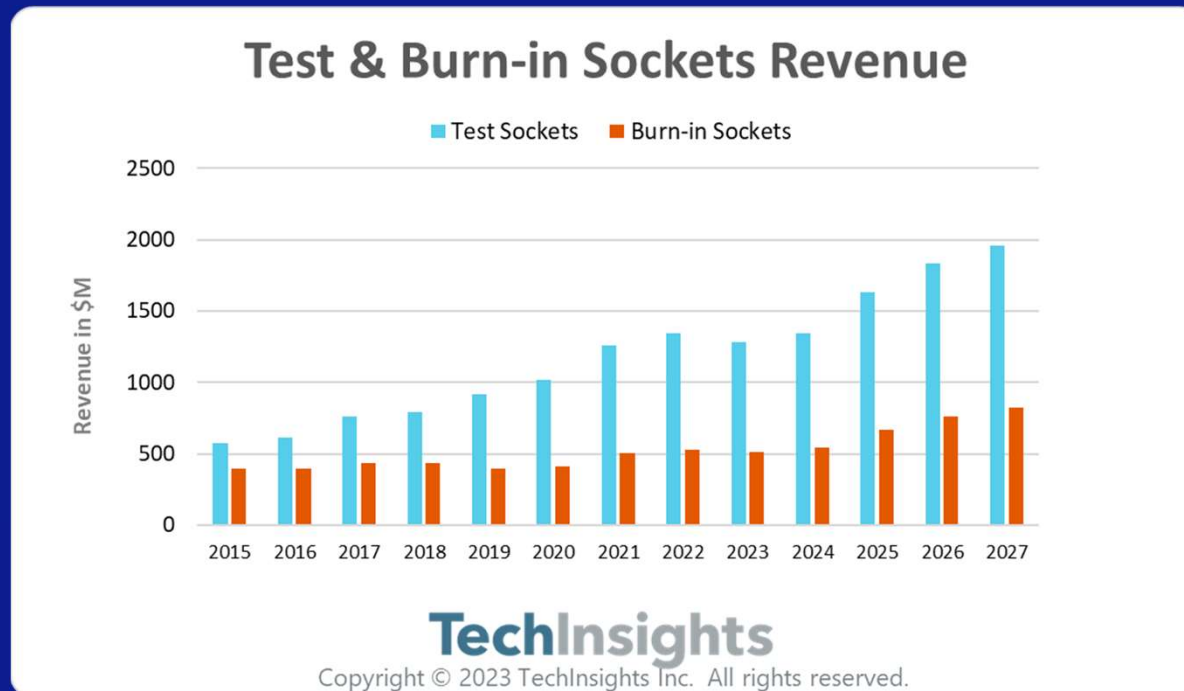


Global Probe Card Market

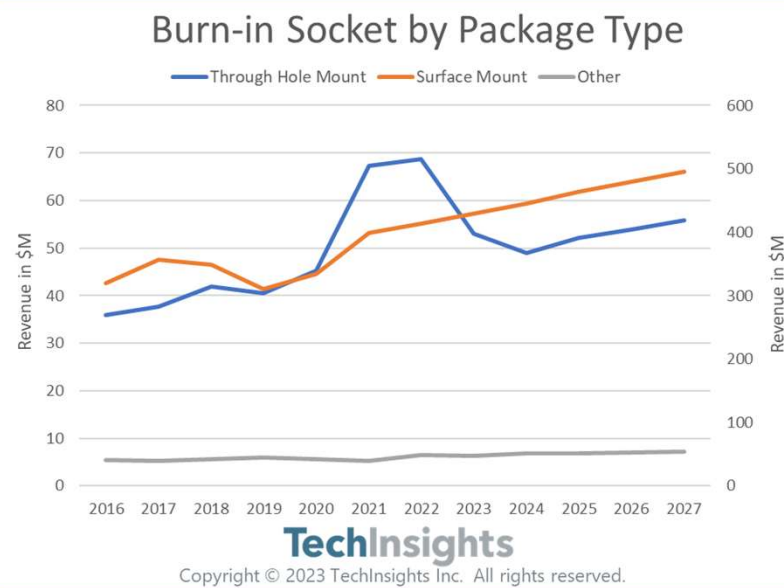
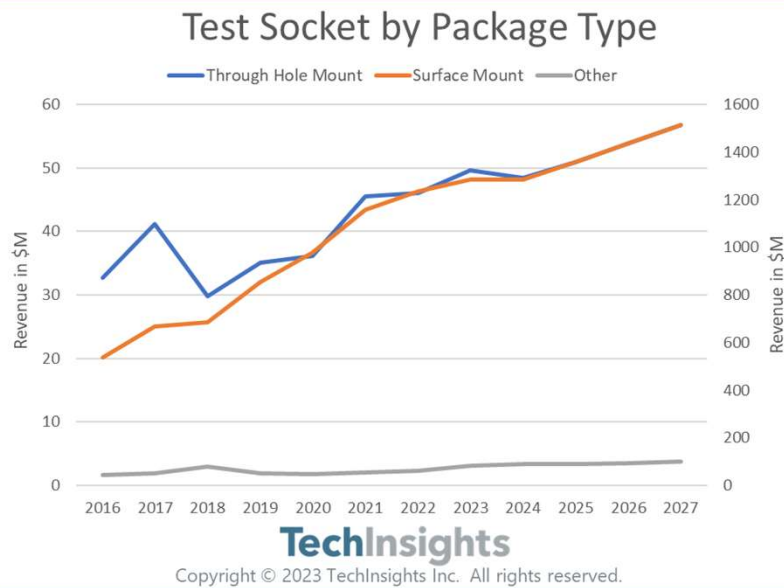




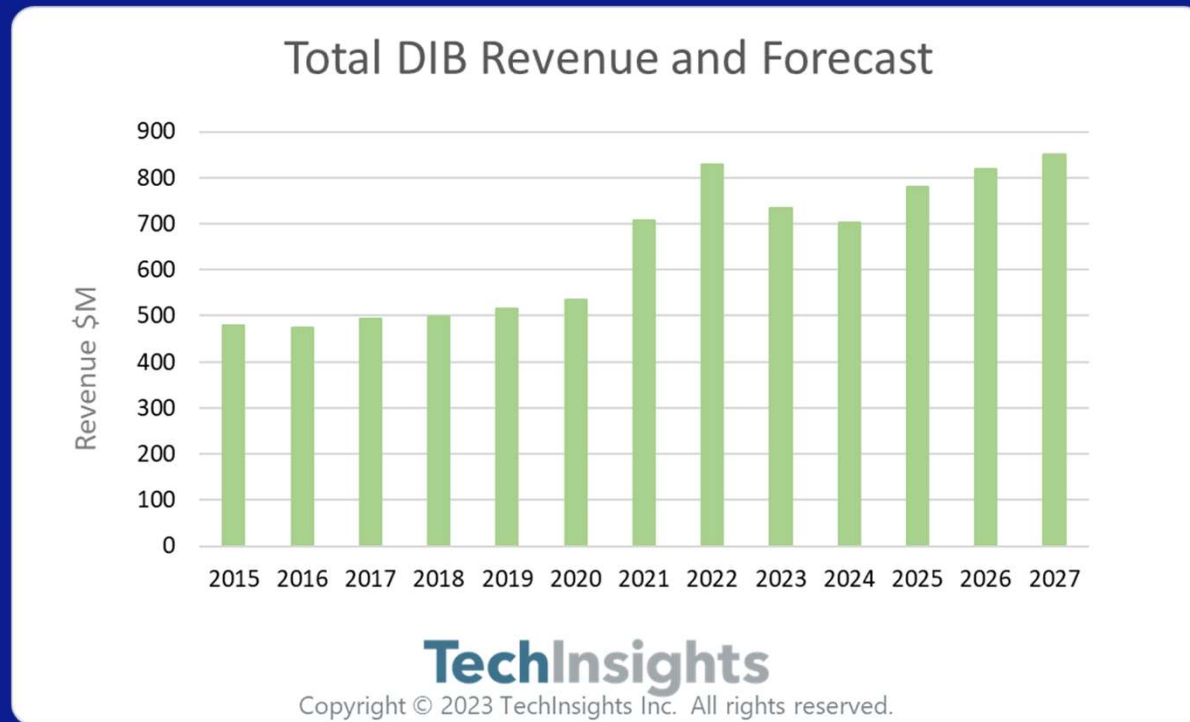
Test & Burn-in Socket Market



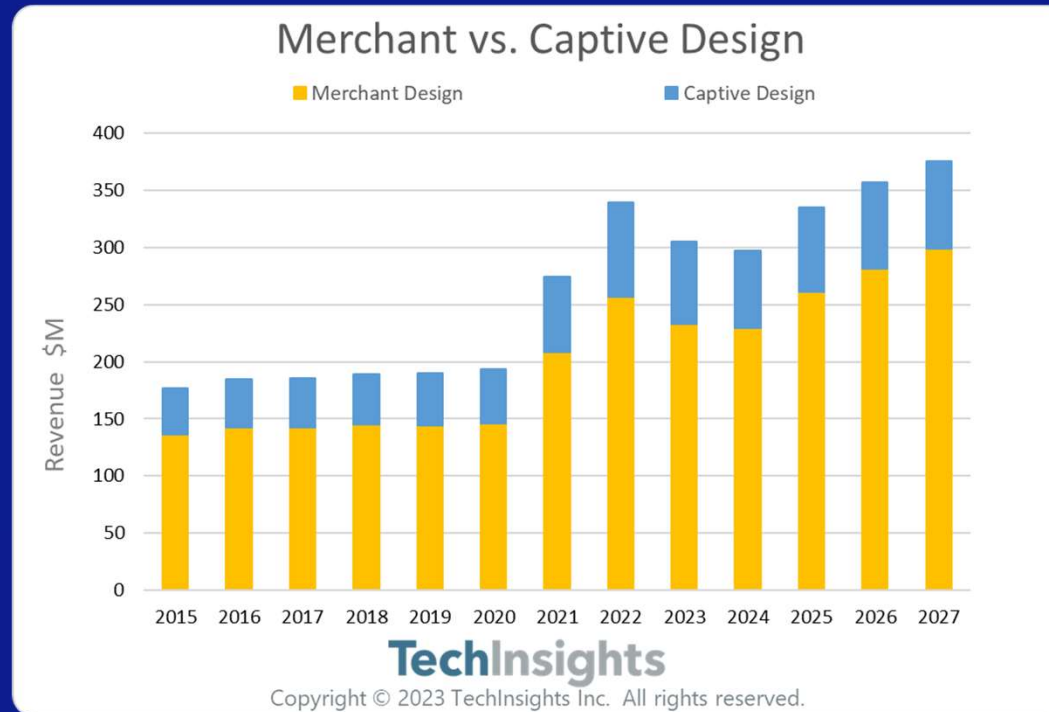
Test & Burn-in Socket by Package Type



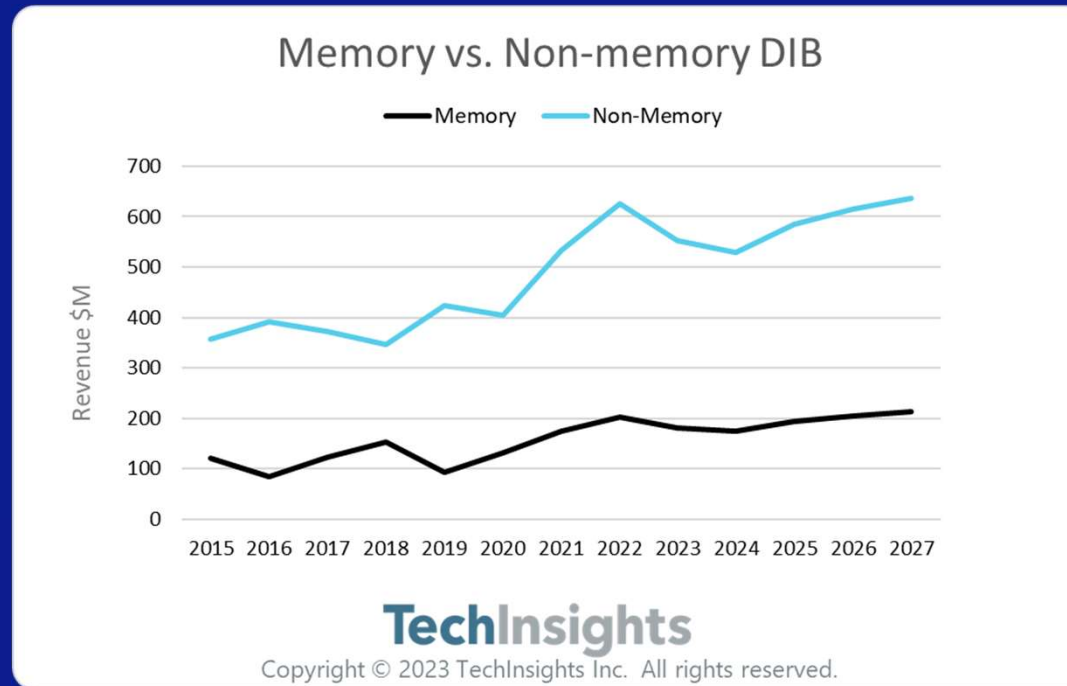
Device Interface Board Market



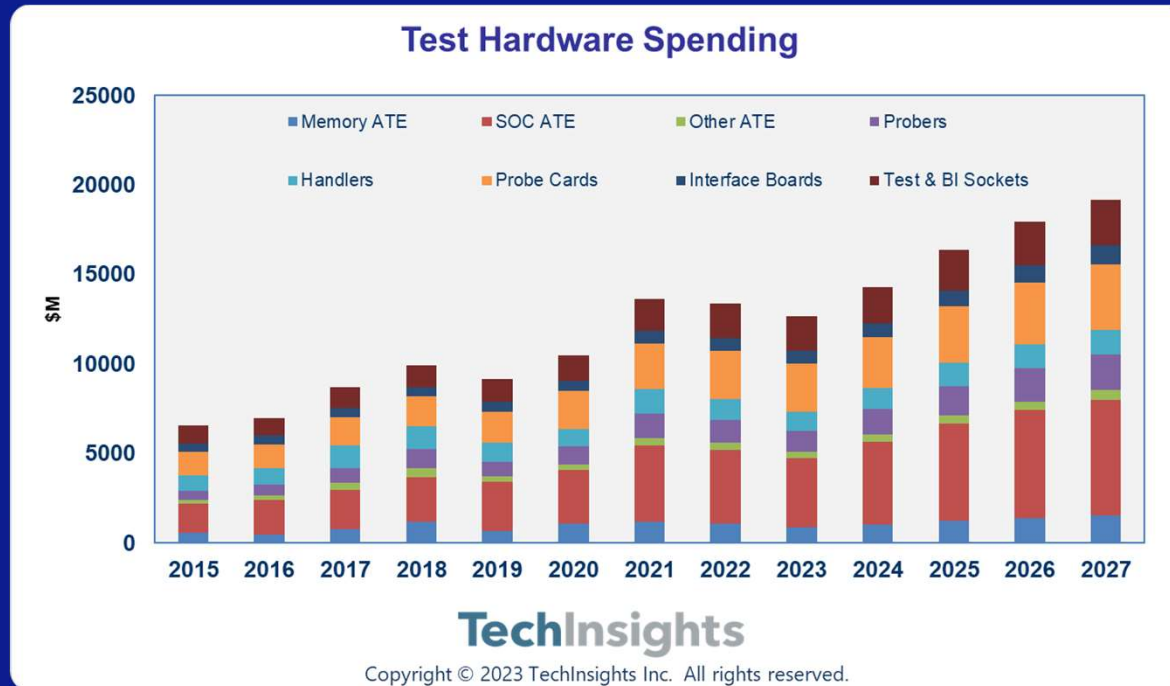
Device Interface Board Market



Device Interface Boards by Application



Introduction to Semiconductor Testing



Introduction to 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)

AI and Semiconductor Testing

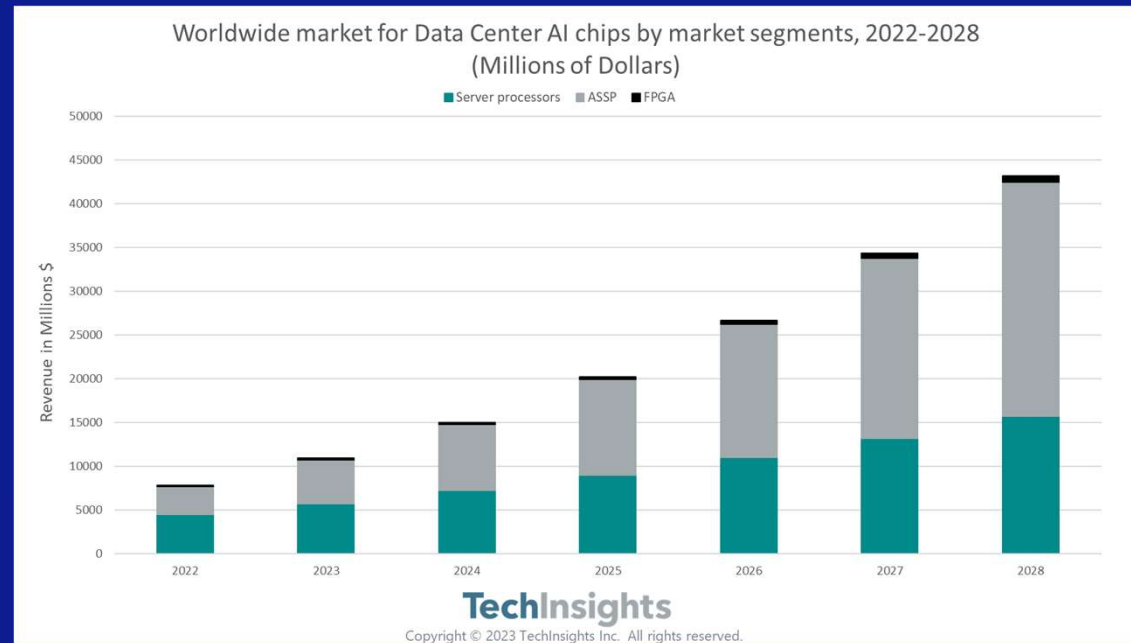
- Forecasted to reach \$3B by 2027, growing at CAGR 20%
- Increase Semiconductor revenue by 12% by 2025
- Cut production costs by 11% by 2025
- Boost productivity by 30% by 2027
- Reduce worldwide energy consumption by 10% by 2030



Artificial Intelligence Segments

Data Center AI Chips

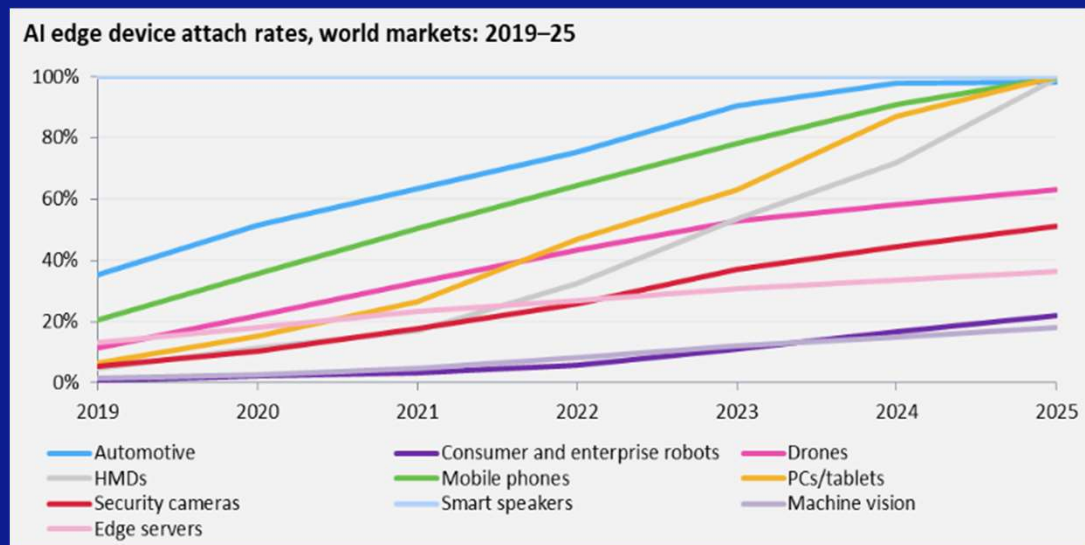
- Server Processors
- ASSP
- FPGA



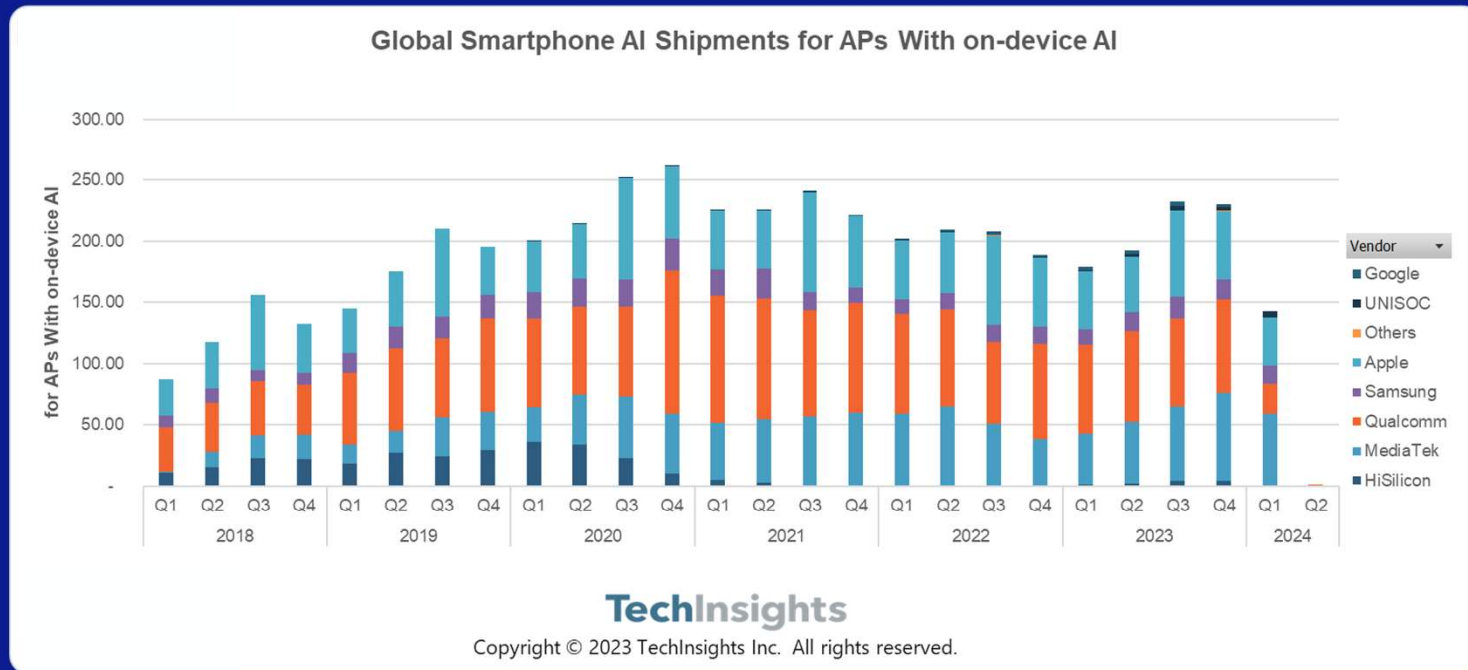
Artificial Intelligence Segments

Edge based AI Chips

- Automotive
- Security Cameras
- Cell phones, PC, Tablet
- Smart speaker
- Drones, Robots
- HMDs, Edge servers



AI Chip Market Share Tracker



Role of AI in Semiconductor Testing

- Test Pattern Generation
- Yield Enhancement
- Test Time Reduction
- Data Analysis
- Fault Classification
- Defect Detection
- Predictive Maintenance
- Adaptive Testing
- Quality Control
- Adaptive Testing for Emerging Technologies

AI Powered Innovations in Probe Cards

- Reduced Test time
- Predictive Maintenance
- ML for Alignment and Automatic Calibration
- Pattern Recognition
- Real-time Monitoring and control
- AI assisted Data analysis
- Remote Troubleshooting



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2023

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Conclusion

- Probe Card CAGR is 9.2% from 2022 to 2027
- Sockets CAGR is 8% from 2022 to 2027
- DIB CAGR is 7.9% from 2022 to 2027
- Semiconductor testing is the critical part of Semi manufacturing process
- AI leads to paradigm shift in Chip design, manufacture, testing and power management

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