



Seale & Associates

SEMICONDUCTOR INDUSTRY
Q4 2023
VALUATION UPDATE

Introduction

We are pleased to share our Semiconductor Industry Multiples Valuation Update for Q4 2023.

At Seale & Associates, we are committed to providing process-driven solutions designed to optimize value and achieve our client's strategic objectives in a range of transactions, including **Mergers, Acquisitions, Divestitures and Carve-Outs, Business Sales, Recapitalizations, and Joint Ventures**, among other corporate finance and strategy consulting services.

Over the course of 25+ years, we have successfully served clients all over the world, and we are delighted to continue providing investment banking advisory services to our Semiconductor Industry clients who are looking to grow through acquisitions or optimize their portfolios through strategic divestitures.

Seale has extensive experience advising leading multinational companies, private equity firms, and family-owned businesses across a wide range of industries.



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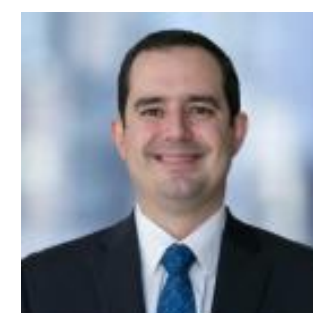
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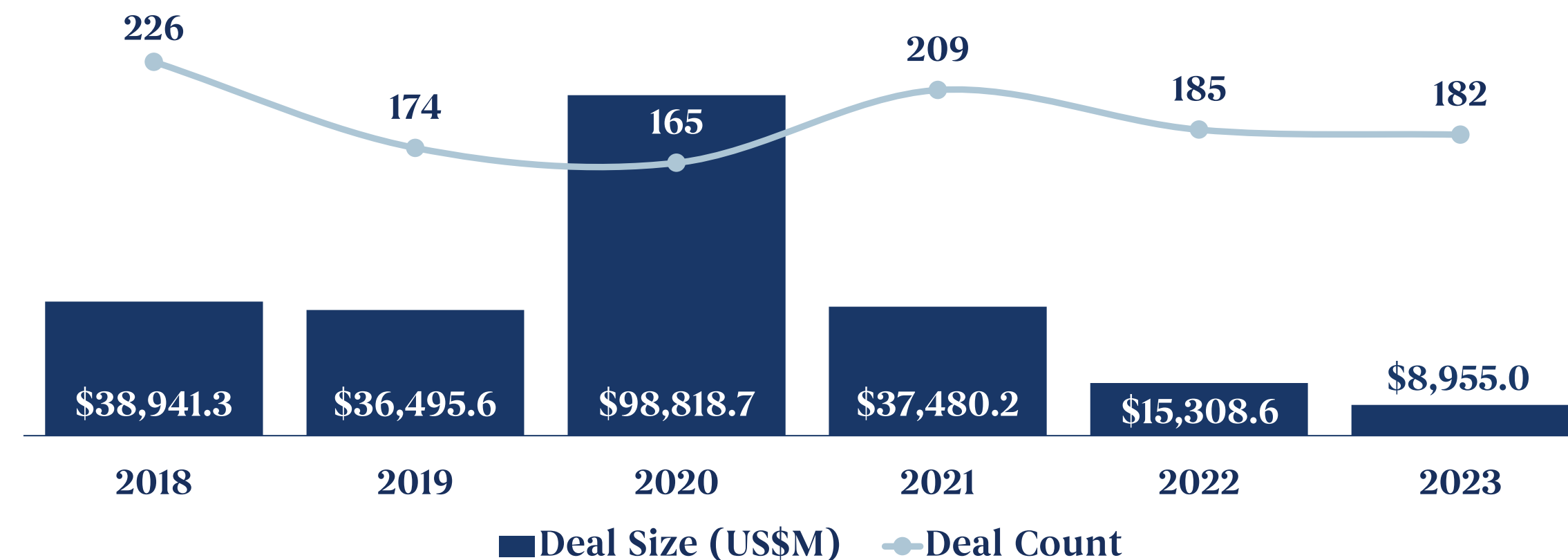
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Semiconductor Industry Overview, M&A Trends and Market Intelligence

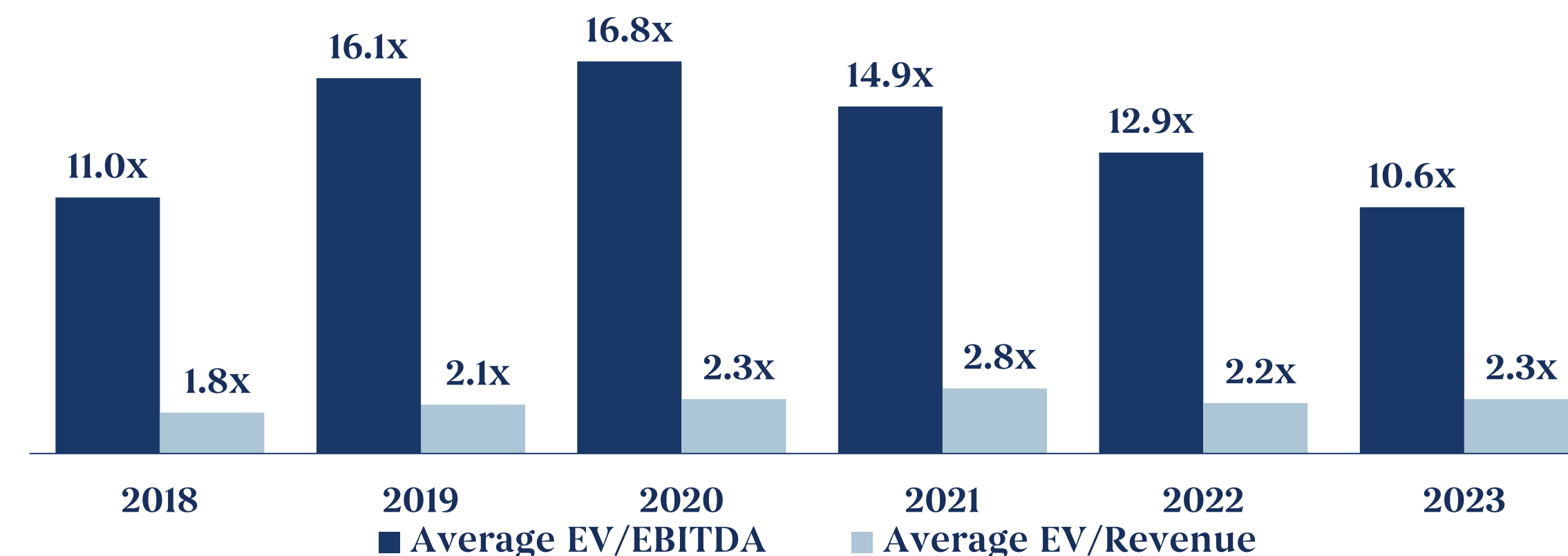
Industry Overview

- The **Semiconductor market** is expected to **grow to US\$1.21 trillion by 2029**, representing a **CAGR of 10.86%**
- The industry experiences growth as they are becoming the fundamental components of contemporary technology. **Significant expansion** is expected due to the demand for semiconductors in emerging technologies such as artificial intelligence (AI), autonomous driving, IoT, and 5G. The progress and breakthroughs in this industry are directly influencing all subsequent technologies
- There are **significant opportunities for strategic M&A**. Companies are focusing on acquiring niche players and startups in areas like **design, AI, advanced materials, and components**
- Challenges include the **restrictions** particularly tightened around advanced semiconductor manufacturing and AI-related chips in October 2023
- Amid **rising geopolitical tensions** with China, in 2024, semiconductor companies must actively seek alternative sourcing locations, regularly reassess global supplier and distributor contracts, and consider direct customer engagements to mitigate disruptions











Semiconductor Industry M&A Deal Size and Volume



Semiconductor Industry M&A Average EV/EBITDA and EV/Revenue











Manufacturers Global Comparable Public Companies








Company	Country	Market Cap. US\$M	Enterprise Value US\$M	Revenue US\$M	EBITDA Margin	Annual Average EV/EBITDA		Fourth Quarter Dec. 31, 2023		
						2021	2022	EV/EBITDA	EV/Revenue	
Infineon Technologies AG		DEU	\$54,473	\$56,158	\$18,027	35.2%	19.6x	10.2x	8.9x	3.1x
Intel Corporation		USA	\$211,854	\$238,463	\$52,864	17.1%	6.6x	5.5x	26.4x	4.5x
Micron Technology, Inc.		USA	\$94,208	\$98,608	\$16,181	8.7%	8.2x	4.2x	69.7x	6.1x
NVIDIA Corporation		USA	\$1,223,193	\$1,215,939	\$44,870	49.9%	65.0x	41.8x	54.3x	27.1x
NXP Semiconductors N.V.		NLD	\$59,203	\$66,631	\$13,166	37.4%	21.6x	12.6x	13.5x	5.1x
QUALCOMM Incorporated		USA	\$160,973	\$165,716	\$35,820	29.8%	16.3x	11.2x	15.5x	4.6x
Samsung Electronics Co., Ltd.		KOR	\$400,918	\$344,747	\$201,749	17.7%	6.2x	3.7x	9.7x	1.7x
SK hynix Inc.		KOR	\$75,086	\$95,198	\$22,465	12.3%	6.1x	3.5x	34.3x	4.2x
Texas Instruments Incorporated		USA	\$154,812	\$157,086	\$17,519	51.2%	22.2x	14.5x	17.5x	9.0x
Taiwan Semiconductor Manufacturing Company Limited		TWN	\$501,917	\$484,855	\$70,557	68.3%	15.7x	10.8x	10.1x	6.9x
						Mean	11.3x	8.5x	12.5x	4.5x
						Median	16.0x	10.5x	16.5x	4.8x

■ Excluded from mean and median






Chip Designers Global Comparable Public Companies

Company	Country	Market Cap. US\$M	Enterprise Value US\$M	Revenue US\$M	EBITDA Margin	Annual Average EV/EBITDA		Fourth Quarter Dec. 31, 2023		
						2021	2022	EV/EBITDA	EV/Revenue	
Advanced Micro Devices, Inc.		USA	\$238,141	\$235,218	\$22,680	14.5%	48.9x	28.9x	71.4x	10.4x
Broadcom Inc.		USA	\$522,562	\$548,021	\$35,819	56.7%	18.2x	15.0x	27.0x	15.3x
Intel Corporation		USA	\$211,854	\$238,463	\$54,228	16.6%	6.6x	5.5x	26.4x	4.4x
Marvell Technology, Inc.		USA	\$52,138	\$55,835	\$5,500	18.9%	63.6x	37.1x	53.7x	10.2x
MediaTek Inc.		TWN	\$52,737	\$50,646	\$13,450	20.1%	19.0x	8.4x	18.7x	3.8x
NXP Semiconductors N.V.		NLD	\$59,203	\$66,631	\$13,166	37.4%	21.6x	12.6x	13.5x	5.1x
QUALCOMM Incorporated		USA	\$160,973	\$165,716	\$36,292	29.4%	16.3x	11.2x	15.5x	4.6x
Renesas Electronics Corporation		JPN	\$31,981	\$34,115	\$10,623	33.8%	15.3x	8.4x	9.5x	3.2x
■ Excluded from mean and median						Mean	16.2x	10.2x	18.5x	4.2x
						Median	18.6x	11.9x	22.6x	4.8x

Production Equipment Manufacturers Global Comparable Public Companies

Company	Country	Market Cap. US\$M	Enterprise Value US\$M	Revenue US\$M	EBITDA Margin	Annual Average EV/EBITDA		Fourth Quarter Dec. 31, 2023 EV/		
						2021	2022	EBITDA	Revenue	
Advantest Corporation	 JPN	\$25,104	\$25,064	\$3,566	27.7%	21.8x	11.5x	25.4x	7.0x	
Applied Materials, Inc.	 USA	\$134,691	\$133,821	\$26,517	31.2%	19.4x	11.9x	16.2x	5.0x	
ASML Holding N.V.	 NLD	\$297,327	\$297,352	\$30,462	34.9%	43.1x	31.3x	28.0x	9.8x	
KLA Corporation	 USA	\$79,244	\$81,961	\$9,671	43.8%	19.7x	14.1x	19.3x	8.5x	
Lam Research Corporation	 USA	\$103,227	\$103,055	\$14,317	37.0%	19.5x	11.4x	19.5x	7.2x	
SCREEN Holdings Co., Ltd.	 JPN	\$8,023	\$6,726	\$3,302	18.5%	13.1x	5.6x	11.0x	2.0x	
Tokyo Electron Limited	 JPN	\$82,872	\$80,301	\$13,086	26.9%	19.5x	12.2x	22.8x	6.1x	
■ Excluded from mean and median						Mean	18.8x	11.1x	16.5x	5.5x
						Median	19.5x	11.9x	19.5x	7.0x










Material Providers Global Comparable Public Companies

Company	Country	Market Cap. US\$M	Enterprise Value US\$M	Revenue US\$M	EBITDA Margin	Annual Average EV/EBITDA		Fourth Quarter Dec. 31, 2023		
						2021	2022	EV/EBITDA	EV/Revenue	
BASF SE	 BASF	DEU	\$48,123	\$70,536	\$79,977	4.3%	14.4x	5.2x	20.6x	0.9x
DuPont de Nemours, Inc.		USA	\$33,083	\$40,998	\$12,274	25.3%	10.0x	9.8x	13.2x	3.3x
JSR Corporation	 JSR Corporation	JPN	\$5,917	\$6,871	\$2,782	10.6%	15.6x	12.3x	23.3x	2.5x
Shin-Etsu Chemical Co., Ltd.		JPN	\$83,657	\$72,710	\$17,505	43.8%	12.1x	6.7x	9.5x	4.2x
Sumitomo Chemical Company, Limited	 SUMITOMO CHEMICAL	JPN	\$3,990	\$15,661	\$18,105	NM	8.4x	6.4x	NM	0.9x
						Mean	10.2x	6.1x	11.4x	1.9x
						Median	12.1x	6.7x	16.9x	2.5x

■ Excluded from mean and median
















NM: Not Meaningful

Testing & Packaging Global Comparable Public Companies

Company	Country	Market Cap. US\$M	Enterprise Value US\$M	Revenue US\$M	EBITDA Margin	Annual Average EV/EBITDA		Fourth Quarter Dec. 31, 2023 EV/		
						2021	2022	EBITDA	Revenue	
Amkor Technology, Inc.		USA	\$8,177	\$8,336	\$6,657	19.1%	5.3x	3.7x	6.6x	1.3x
ASE Technology Holding Co., Ltd.		TWN	\$18,979	\$24,065	\$19,543	17.9%	6.8x	4.5x	6.9x	1.2x
BE Semiconductor Industries N.V.		NLD	\$11,636	\$11,553	\$616	37.2%	24.4x	13.2x	50.4x	18.8x
ChipMOS TECHNOLOGIES INC.		TWN	\$1,003	\$1,165	\$663	31.8%	4.6x	3.2x	5.5x	1.8x
Cohu, Inc.		USA	\$1,681	\$1,354	\$690	18.6%	16.6x	6.6x	10.6x	2.0x
Hangzhou Changchuan Technology Co.,Ltd		CHN	\$3,330	\$3,415	\$287	4.0%	191.6x	109.0x	300.3x	11.9x
Kulicke and Soffa Industries, Inc.		USA	\$3,104	\$2,393	\$742	13.5%	14.7x	4.0x	23.8x	3.2x
Powertech Technology Inc.		TWN	\$3,439	\$4,221	\$2,279	31.1%	4.1x	3.1x	5.9x	1.9x
Rorze Corporation		JPN	\$1,882	\$1,972	\$626	31.6%	14.7x	9.7x	10.0x	3.1x
						Mean	11.4x	6.0x	9.9x	2.1x
						Median	14.7x	4.5x	10.0x	2.0x

■ Excluded from mean and median

Semiconductors – Global Transactions

Date	Target	Country	Description	Buyer	Seller	% Acquired	Size US\$M	EV/ EBITDA	EV/ Revenue	
Dec-23	 ALLIED COMPONENTS INTERNATIONAL	USA	Designs and manufactures industry standard and modules magnetic components	 Avnan Capital	-	100.0%	-	-	-	
Dec-23	 blaize	USA	Develops and manufactures artificial intelligence (AI)-based processors	 FRANKLIN TEMPLETON	 FRANKLIN TEMPLETON	100.0%	\$894.0	-	-	
Dec-23	 宏茂微 UNIMOS	CHN	Provides semiconductor assembly and test services	 元禾控股 ORIZA HOLDINGS	 ChipMOS	45.0%	\$137.1	-	-	
Dec-23	 SHINKO	JPN	Developes and manufactures semiconductores packages	 DNP	 FUJITSU	50.0%	\$2,163.2	7.3x	2.1x	
Nov-23	 MOTION SOLUTIONS Confidence. Engineered.	USA	Designs and manufactures mechatronic solutions for semiconductors	 Novanta	 Frontenac	100.0%	\$189.0	-	-	
Nov-23	 xfab	BEL	Provides manufacturing and design support services	-	Xtrion N.V.	48.4%	\$615.7	4.4x	1.3x	
Nov-23	Neptune 6 Limited	GBR	Manufactures internal integrated circuits	 VISHAY	 nexperia	100.0%	\$177.0	-	-	
Nov-23	Device Interface Solutions Business of Teradyne, Inc.	USA	Provides device interface solutions	 TECHNOPROBE	 TERADYNE	100.0%	\$85.0	-	-	
Oct-23	Silicon Photonics business of Intel Co.	USA	Manufactures silicon photonics-based products	 JABIL	 intel	100.0%	-	-	-	
Oct-23	 HIS INNOVATIONS GROUP	USA	Designs and manufactures pre-fabricated systems	 UCT	-	100.0%	\$50.0	-	-	
Oct-23	 3dB	CHE	Develops, manufactures and sells semiconductor products	 infineon	-	100.0%	-	-	-	
								Mean	5.8x	1.7x
								Median	5.8x	1.7x

Selected Transactions Commentary



"The expertise of 3db in Ultra-Wideband technology accelerates Infineon's IoT roadmap for leveraging the market opportunities of secured, connected devices. Our combined strengths enable the UWB roll-out to address additional automotive, industrial and consumer IoT applications as the next logical step."

Thomas Rosteck, President of Infineon's Connected Secure Systems division



"This acquisition aligns with UCT's long-term strategy to pursue sustained and profitable growth by offering a more diversified portfolio of high-quality, high-value solutions to our customers."

Jim Scholhamer, CEO of Ultra Clean Holdings



"This deal better positions Jabil to cater to the needs of our valued customers in the data center industry, including hyperscale, next-wave clouds, and AI cloud data centers."



Matt Crowley, Senior Vice President of Cloud and Enterprise Infrastructure at Jabil



"The acquisition of Device Interface Solutions will allow us to enlarge our technology's competences in the Device Interface Board market."

Stefano Felici, CEO of Technoprobe S.p.A.

Private Equity Transactions

INDUSTRY CLASIFICATION	PERIOD	AVERAGE ENTERPRISE VALUE (IN USD)	REVENUE (IN USD)	TTM REVENUE GROWTH	ENTERPRISE VALUE / REVENUE	EBITDA MARGIN	ENTERPRISE VALUE /EBITDA	NUMBER OF TRANSACTIONS
 Semiconductor and Other Electric Component Manufacturing <small>NAICS 33441 – Semiconductor and Other Electric Component Manufacturing</small>	2018-2023	\$25.0M	\$33.7M	14.7%	0.9x	16.7%	5.4x	16
 Semiconductor and Related Device Manufacturing <small>NAICS 334413 – Semiconductor and Related Device Manufacturing</small>	2018-2023	\$44.6M	\$50.9M	18.7%	0.8x	17.5%	4.7x	3

Notes:

- Data obtained via GF Data, a subscription-based information platform, offering detailed information and metrics about the transactions of Private Equity funds in the U.S.
- The data is provided under a blind confidential format. Users of the data are unable to identify the exact company and transaction corresponding to the transaction details. Given this blind approach, the data submitted is less likely to be biased or manipulated.

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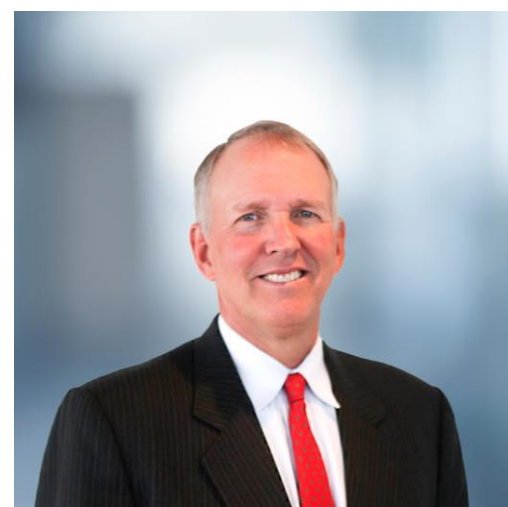
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Global M&A Representative Engagements

<p>BEIJER REF</p> <p>has been acquired by</p>  <p>HERITAGE DISTRIBUTION HOLDINGS</p>	<p>avangardinnovative MOVING THE CIRCULAR ECONOMY FORWARD</p> <p>has sold a controlling interest to</p>  <p>WASTE MANAGEMENT</p>	<p>ZN ZINC NACIONAL</p> <p>has sold</p> <p>GSDKO</p> <p>Zinc Oxide Corporation a subsidiary of</p>  <p>Korea Zinc</p>	<p>Electrolux PROFESSIONAL</p> <p>has acquired</p> <p>unified brands a DOVER company</p> <p>from</p>  <p>DOVER</p>	<p>Port Contractors STEVEDORES - TERMINAL OPERATORS</p> <p>has been acquired by</p>  <p>ENSTRUCTURE</p>	<p>Oxbow</p> <p>Oxbow's Senior Subordinated debt issued by</p>  <p>H.J. BAKER ESTABLISHED 1880</p> <p>was refinanced by</p>  <p>BMO</p>	<p>Hertz</p> <p>has acquired</p>  <p>DONLEN</p>
<p>Standex</p> <p>has sold</p> <p>Enginetics</p> <p>to</p>  <p>Enjet AERO</p>	<p>ITT</p> <p>has sold</p> <p>BURNY KALIBURN PLASMA CUTTING INNOVATION</p> <p>and</p> <p>CNC Cleveland Motion Controls</p> <p>to</p>  <p>LINCOLN ELECTRIC</p>	<p>Honeywell</p> <p>has sold</p> <p>TENSOR</p> <p>to</p>  <p>GE Power Systems</p>	<p>TRIUMPH™</p> <p>has sold</p> <p>Triumph Processing - Embee Division</p> <p>to</p>  <p>AMP ALL METALS PROCESSING</p>	<p>TRIUMPH™</p> <p>has sold</p> <p>Triumph Air Repair, the APU Overhaul Operations of Triumph Aviation Services - Asia, and Triumph Engines businesses</p> <p>to</p>  <p>TGG THE GORES GROUP</p>	<p>Rheem</p> <p>has acquired</p>  <p>HTPG</p>	<p>GRACE</p> <p>has sold its GRACE Membranes business</p> <p>Uop a subsidiary of</p> <p>Honeywell</p>
<p>convatec - forever caring -</p> <p>has sold</p> <p>SENSI CARE</p> <p>and</p> <p>ALOE VESTA™</p> <p>to</p>  <p>MEDLINE</p>	<p>United Technologies</p> <p>has sold</p> <p>MobileView</p> <p>to</p> <p>SAFE FLEET Driving Safety Forward™</p>	<p>United Technologies</p> <p>has sold</p> <p>HTPG A division of Carrier Commercial Refrigeration, Inc.</p> <p>to</p> <p>MONOMOY CAPITAL PARTNERS and Starboard Capital Partners</p>	<p>LOCKHEED MARTIN</p> <p>has sold</p> <p>Commercial Flight Training Business</p> <p>to</p> <p>ALTEON A BOEING COMPANY</p>	<p>FLOWSERVE</p> <p>has sold</p> <p>D&B</p> <p>to</p> <p>DB DaviesBaird</p>	<p>KBR</p> <p>has acquired</p> <p>Wabi Wabi Development Corporation</p>	<p>HARRISON GYPSUM, LLC</p> <p>has been recapitalized by</p> <p>H. I. G. PRIVATE EQUITY</p>

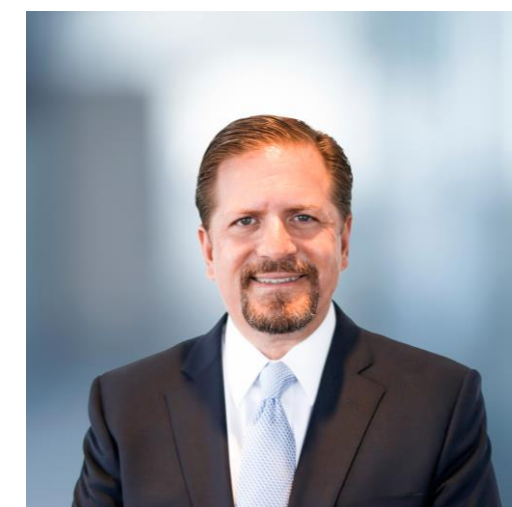


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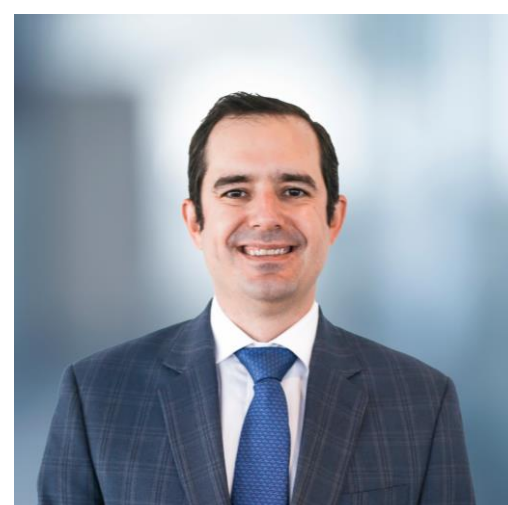


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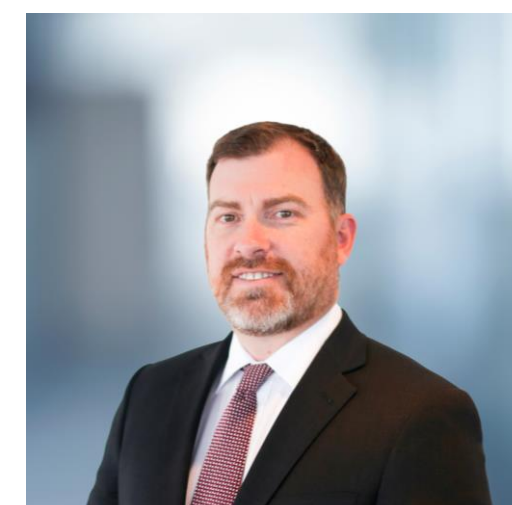


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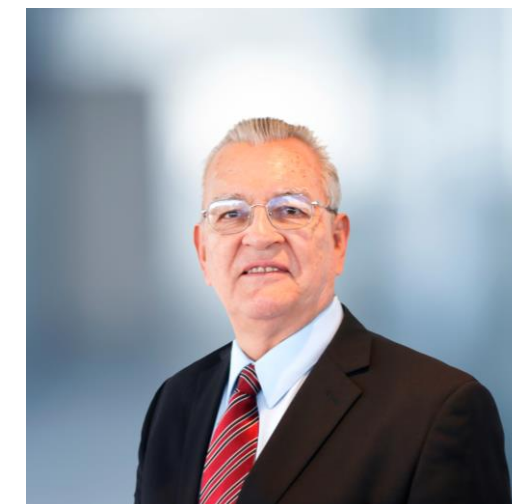


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Please contact us if you would like further information about M&A trends and/or specific transaction multiples for your industry.

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