

Seale & Associates

SEMICONDUCTOR INDUSTRY
Q3 2023
VALUATION UPDATE

Introduction

We are pleased to share our Semiconductor Industry Multiples Valuation Update for Q3 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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Semiconductor Industry Growth Opportunities in Mexico

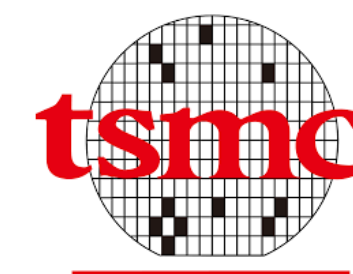
The **global semiconductor industry** is experiencing **strong growth, driven by the increasing demand for semiconductors** in various **applications** such as **automotive, healthcare, consumer electronics, and telecommunications**.

Top players in the **global semiconductor industry** include companies such as **Intel, Samsung Electronics, TSMC, NXP and Broadcom**, among others. These companies have a significant market share and are **continually expanding** their **manufacturing capabilities** to meet the increasing demand for semiconductors.

Mexico's domestic semiconductor industry has been **experiencing growth** as well, and **nearshoring** has **played a significant role** in this **development**. Nearshoring, the practice of moving operations closer to the primary market, has become increasingly attractive to U.S. companies seeking to reduce supply chain risk and costs. With the **ongoing U.S.-China trade war**, many **U.S. companies** are **looking** for **alternative** sourcing and manufacturing **options**, and **Mexico** is emerging as a **favorable destination** for nearshoring.

Nearshoring is a key factor **driving growth** in Mexico's semiconductor industry. With its **strategic location**, lower labor costs, and **favorable regulatory environment**, Mexico has become a preferred destination for U.S. companies seeking to reduce supply chain risk and costs. Top players such as NXP Semiconductors, Intel, and Samsung Electronics have set up manufacturing facilities across the country. **Regions** such as Guadalajara, San Luis Potosi, Cd. Juarez, Monterrey, Queretaro, and Tijuana have been **better-suited regions** for the semiconductor industry **with easy access to highways, airports, and seaports**.

Key Industry Players



Semiconductor Industry Growth Opportunities in Mexico

Mexico's **regulatory environment** has also played a **significant role** in driving **growth** in the semiconductor industry. The **government** has **implemented policies and programs** aimed at **attracting foreign investment** in the semiconductor industry, **including tax incentives** and **simplified registration** procedures. Furthermore, **Mexico's free trade agreement** with over 40 countries, including the United States and Canada, has **created a favorable business environment** for the semiconductor industry, **reducing trade barriers** and increasing market access for Mexican companies.

The enactment of the **CHIPS for America Act** will further **strengthen** the **semiconductor** industry in **Mexico**, providing new opportunities for growth and investment. **The act provides funding to increase domestic semiconductor production and strengthen the supply chain** in the United States. This has **encouraged U.S. semiconductor companies** to **invest in expanding** their **manufacturing capabilities** in Mexico, as they seek to comply with the new regulations and **reduce** their **dependence** on **Chinese** suppliers.

Advanced packaging manufacturing has **emerged** as a new **opportunity** for growth in Mexico's semiconductor industry. **Mexico's well-developed education system** produces a **steady stream** of **highly skilled** workers in **STEM** fields, who are well suited for advanced packaging operations.

The wider packaging ecosystem of components and materials also offers huge opportunities for growth as **western countries seek to build reliable and resilient nearshore supply chains**, especially in IC substrates which are produced almost exclusively in Asia today.

In conclusion, the semiconductor industry in **Mexico offers significant opportunities** for **growth** and **investment**, with regions such as Guadalajara, San Luis Potosi, Cd. Juarez, Monterrey, Queretaro, and Tijuana being better-suited regions for the industry. **Nearshoring, regulatory benefits**, and the **enactment** of the **CHIPS for America Act** have **strengthened the industry's growth trajectory**, with top players setting up manufacturing facilities across the country. While challenges such as the limitation of IC substrate capabilities in the United States exist, **Mexico's skilled workforce** and **favorable regulatory environment** make it an **attractive destination** for the semiconductor industry, which is poised for further growth and development in the coming years.

Better-suited regions

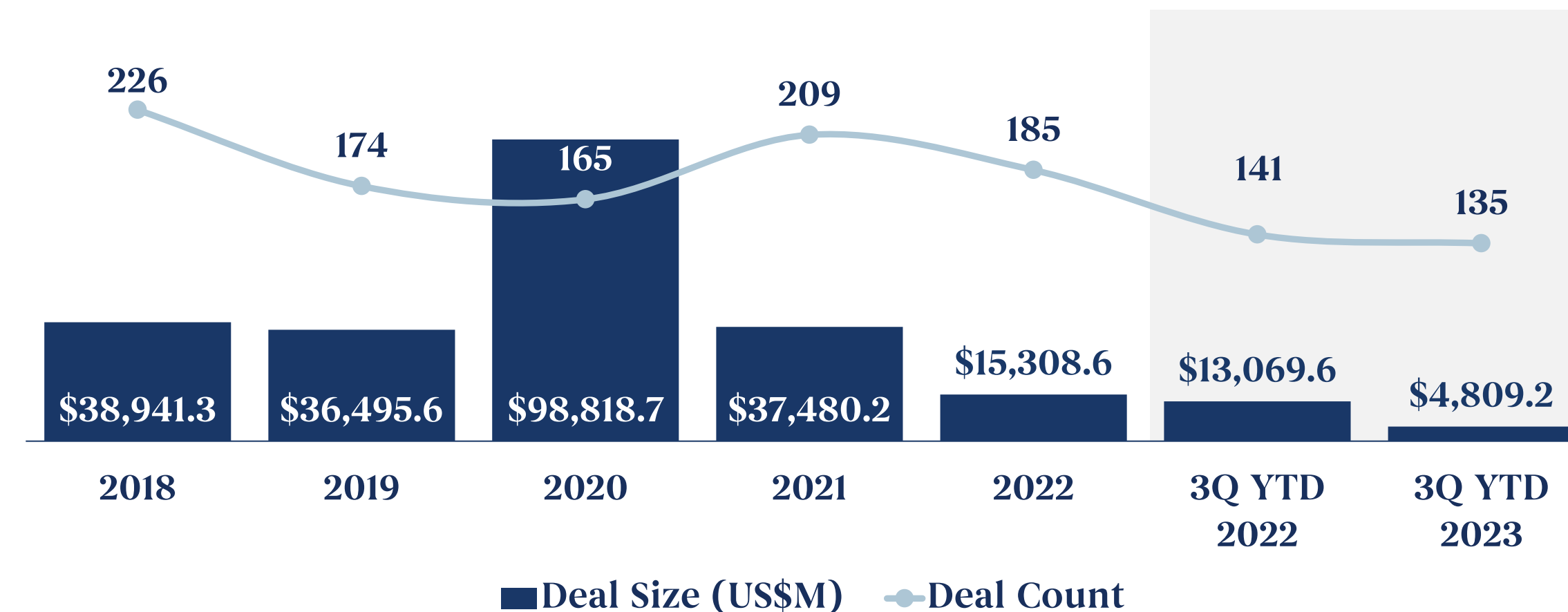


Semiconductor Industry Overview, M&A Trends and Market Intelligence

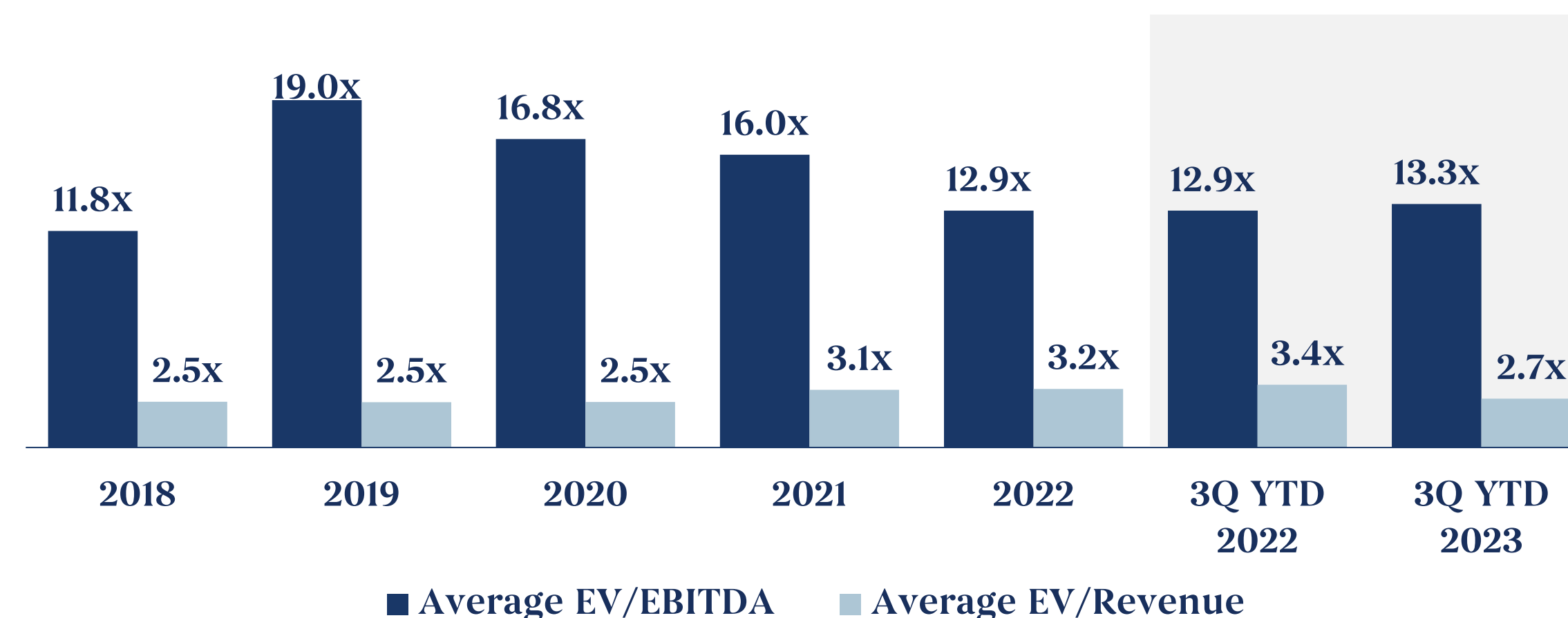
Industry Overview

- The **Semiconductor market** is expected to **grow to US\$1.09 trillion by 2028**, representing a **CAGR of 10.86%**
- The industry experiences growth driven by several factors: there is a **constant demand for consumer electronics** like smartphones and laptops. **Emerging technologies** such as AI, IoT, machine learning, and 5G create new opportunities for semiconductor applications, pushing technological boundaries. **Continuous innovation**, producing smaller, more efficient devices and denser, more powerful chips
- Current **M&A trends showcase strategic moves by major players**. Companies like Broadcom, Nvidia, and Qualcomm are opting for consolidation, acquiring smaller entities to bolster their technological offerings and market presence
- Concurrently, **a shift toward vertical integration is observed**, with companies aiming to secure critical components and reduce reliance on external suppliers
- Additionally, **cross-border M&A activities are on the rise**, reflecting the industry's globalization
- **Challenges** include the **complex transition to smart factories**, **geopolitical tensions** affecting supply chains, and a notable wave of M&A as companies aim to enhance portfolios, access new technologies, and secure market share











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		Third Quarter Sep. 30, 2023		
						2021	2022	EV/EBITDA	EV/Revenue	
Infineon Technologies AG		DEU	\$43,233	\$45,416	\$17,262	36.0%	19.6x	10.2x	7.3x	2.6x
Intel Corporation		USA	\$148,883	\$175,831	\$52,864	18.0%	6.6x	5.5x	18.5x	3.3x
Micron Technology, Inc.		USA	\$74,513	\$78,008	\$15,540	14.9%	8.2x	4.2x	33.6x	5.0x
NVIDIA Corporation		USA	\$1,074,425	\$1,069,356	\$32,681	38.6%	65.0x	41.8x	84.8x	32.7x
NXP Semiconductors N.V.		NLD	\$51,540	\$59,136	\$13,177	37.8%	21.6x	12.6x	11.9x	4.5x
QUALCOMM Incorporated		USA	\$123,943	\$130,756	\$35,820	34.5%	16.3x	11.2x	10.6x	3.7x
Samsung Electronics Co., Ltd.		KOR	\$336,644	\$278,663	\$194,344	21.0%	6.2x	3.7x	6.8x	1.4x
SK hynix Inc.		KOR	\$58,629	\$77,438	\$21,641	25.0%	6.1x	3.5x	14.3x	3.6x
Texas Instruments Incorporated		USA	\$144,376	\$146,043	\$18,112	53.9%	22.2x	14.5x	15.0x	8.1x
Taiwan Semiconductor Manufacturing Company Limited		TWN	\$421,457	\$405,380	\$67,176	70.2%	15.7x	10.8x	8.6x	6.0x
						Mean	13.6x	8.5x	11.6x	4.2x
						Median	16.0x	10.5x	13.1x	4.1x

■ 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		Third Quarter Sep. 30, 2023		
						2021	2022	EV/EBITDA	EV/Revenue	
Advanced Micro Devices, Inc.		USA	\$166,123	\$162,698	\$22,111	15.0%	48.9x	28.9x	48.9x	7.4x
Broadcom Inc.		USA	\$342,810	\$370,096	\$35,454	57.6%	18.2x	15.0x	18.1x	10.4x
Intel Corporation		USA	\$148,883	\$175,831	\$52,864	18.0%	6.6x	5.5x	18.5x	3.3x
Marvell Technology, Inc.		USA	\$46,703	\$50,668	\$5,618	23.5%	63.6x	37.1x	38.4x	9.0x
MediaTek Inc.		TWN	\$36,355	\$30,903	\$12,805	23.6%	19.0x	8.4x	10.2x	2.4x
NXP Semiconductors N.V.		NLD	\$51,540	\$59,136	\$13,177	37.8%	21.6x	12.6x	11.9x	4.5x
QUALCOMM Incorporated		USA	\$123,943	\$130,756	\$35,820	34.5%	16.3x	11.2x	10.6x	3.7x
Renesas Electronics Corporation		JPN	\$27,011	\$28,727	\$10,031	35.2%	15.3x	8.4x	8.1x	2.9x
■ Excluded from mean and median						Mean	16.2x	10.2x	12.9x	4.0x
						Median	18.6x	11.9x	15.0x	4.1x

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		Third Quarter Sep. 30, 2023		
						2021	2022	EV/EBITDA	EV/Revenue	
Advantest Corporation		JPN	\$20,659	\$20,611	\$3,367	31.9%	21.8x	11.5x	19.2x	6.1x
Applied Materials, Inc.		USA	\$115,818	\$115,382	\$26,543	31.4%	19.4x	11.9x	13.9x	4.3x
ASML Holding N.V.		NLD	\$233,504	\$232,700	\$27,368	35.1%	43.1x	31.3x	24.2x	8.5x
KLA Corporation		USA	\$62,526	\$65,346	\$10,169	43.7%	19.7x	14.1x	14.7x	6.4x
Lam Research Corporation		USA	\$82,873	\$82,747	\$15,836	37.5%	19.5x	11.4x	13.9x	5.2x
Nikon Corporation		JPN	\$3,656	\$3,187	\$4,493	11.8%	24.9x	3.9x	6.0x	0.7x
SCREEN Holdings Co., Ltd.		JPN	\$4,623	\$3,582	\$3,118	17.4%	13.1x	5.6x	6.6x	1.1x
Tokyo Electron Limited		JPN	\$63,364	\$60,679	\$12,357	34.2%	19.5x	12.2x	14.4x	4.9x
■ Excluded from mean and median						Mean	19.7x	10.1x	12.7x	4.1x
						Median	19.6x	11.7x	14.2x	5.1x










Materials Providers Global Comparable Public Companies

Company	Country	Market Cap. US\$M	Enterprise Value US\$M	Revenue US\$M	EBITDA Margin	Annual Average EV/EBITDA		Third Quarter Sep. 30, 2023		
						2021	2022	EV/EBITDA	EV/Revenue	
BASF SE	 BASF	DEU	\$40,573	\$63,419	\$76,582	6.5%	14.4x	5.2x	12.7x	0.8x
DuPont de Nemours, Inc.		USA	\$34,241	\$38,386	\$12,274	26.3%	10.0x	9.8x	11.9x	3.1x
JSR Corporation	 JSR Corporation	JPN	\$5,583	\$6,461	\$2,627	12.8%	15.6x	12.4x	19.3x	2.5x
Shin-Etsu Chemical Co., Ltd.		JPN	\$58,379	\$49,233	\$17,377	45.0%	12.1x	6.7x	6.3x	2.8x
Sumitomo Chemical Company, Limited		JPN	\$4,458	\$15,178	\$17,097	NM	8.4x	6.4x	NM	0.9x
						Mean	11.2x	7.0x	10.3x	1.8x
						Median	12.1x	6.7x	12.3x	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		Third Quarter Sep. 30, 2023		
						2021	2022	EV/EBITDA	EV/Revenue	
Amkor Technology, Inc.		USA	\$5,554	\$5,696	\$6,657	21.3%	5.3x	3.7x	4.0x	0.9x
ASE Technology Holding Co., Ltd.		TWN	\$14,643	\$18,596	\$18,606	19.8%	6.8x	4.5x	5.0x	1.0x
BE Semiconductor Industries N.V.		NLD	\$7,952	\$7,894	\$589	42.6%	24.4x	13.2x	31.5x	13.4x
ChipMOS TECHNOLOGIES INC.		TWN	\$845	\$952	\$631	31.6%	4.6x	3.2x	4.8x	1.5x
Cohu, Inc.		USA	\$1,639	\$1,331	\$690	22.3%	16.6x	6.6x	8.6x	1.9x
Hangzhou Changchuan Technology Co.,Ltd		CHN	\$2,825	\$2,918	\$278	10.0%	191.6x	109.0x	104.3x	10.5x
Kulicke and Soffa Industries, Inc.		USA	\$2,746	\$2,082	\$742	19.5%	14.7x	4.0x	14.4x	2.8x
Powertech Technology Inc.		TWN	\$2,357	\$3,052	\$2,169	32.8%	4.1x	3.1x	4.3x	1.4x
Rorze Corporation		JPN	\$1,219	\$1,314	\$601	31.4%	14.7x	9.7x	7.0x	2.2x
■ Excluded from mean and median						Mean	11.4x	6.0x	6.9x	1.7x
						Median	14.7x	4.5x	7.0x	1.9x

Semiconductor – Global Transactions

Date	Target	Country	Description	Buyer	Seller	% Acquired	Size US\$M	EV/ EBITDA	EV/ Revenue
Sep-23	 ILI Technology Leaders & Innovators	KOR	Designs and manufactures semiconductor products	 WONIK	-	35.5%	\$26.1	-	3.7x
Sep-23	 INTRINSIX	USA	Designs semiconductor products	 cadence®	 CEVA®	100.0%	\$35.0	-	-
Sep-23	 IMS Nanofabrication	AUT	Develops and manufactures electron beam devices for the semiconductor industry	 tsmc	 intel.	10.0%	\$430.0	-	-
Aug-23	The radio frequency business	USA	Provides allium nitride (GaN) and silicon carbide products used in semiconductor applications	 MACOM®	 Wolfspeed.	100.0%	\$125.0	-	0.8x
Aug-23	 CROCUS TECHNOLOGY Intelligence in Sensing™	USA	Provides advanced TMR sensor technology solutions to designers and manufacturers of industrial, automotive and consumer electronics	 ALLEGRO microsystems	-	100.0%	\$420.0	-	-
Aug-23	 SEQUANS	FRA	Designs and develops cellular semiconductor solutions for massive and broadband IoT markets	 RENESAS	-	ND	\$249.0	-	-
Jul-23	 MITSUBISHI ELECTRIC	JPN	Develops, manufactures, and supplies gallium oxide homo-epitaxial wafers	 MITSUBISHI ELECTRIC	-	ND	-	-	-
Jul-23	SerDes and memory interface PHY IP business	USA	Manufactures DDR memory interface chips	 cadence®	 Rambus	100.0%	\$110.0	-	-
Jul-23	 SOLARIUS™	USA	Provides high-tech manufacturing solutions for the consumer electronics and semiconductor industry	 MARPOSS	-	100.0%	-	-	-
Jul-23	Fine ceramics business	KOR	Provides semiconductor parts, components, and equipment	 Hahn & Company	 SK enpulse	100.0%	\$276.2	-	1.8x
Jul-23	 ISC	KOR	Develops, manufactures, and sells semiconductor test sockets	 SKC	 HELIOS Investment Partners	35.8%	\$402.5	18.9x	5.5x

ND: Not Disclosed

Mean 3.0x
Median 2.7x

Selected Transactions Commentary



"Cadence and Intrinsic are well-aligned in their missions to enable customers to achieve design excellence... Through the acquisition of Intrinsic, we will scale our system and IC design services team to support customers in key high-growth verticals like the aerospace and defense industry who are faced with meeting tight time-to-market deadlines and ever-increasing chip and system-level complexity."

Neil Zaman, Senior Vice President and CRO of Cadence



"We are excited to welcome the RF Business team to MACOM... Going forward, we are committed to supporting all product and foundry customers and building upon the RF Business' established technology to strengthen our leadership position."

Stephen G. Daly, President, CEO and Chair of MACOM



"This highly strategic acquisition demonstrates Allegro's commitment to its leadership position in magnetic sensing. Further, we expect this combination to solidify Allegro as a leading TMR semiconductor company by leveraging a unique opportunity to drive broader adoption of TMR technology across high-growth strategic focus areas, including e-Mobility, Clean Energy and Automation."










Vineet Nargolwala, President and CEO of Allegro



"SKC's fine ceramics business is a market leader with attractive expansion opportunities in the global semiconductor industry. This acquisition reaffirms Hahn & Co.'s continued conviction in Korea."

Hahn Sang-won, CEO of Hahn & Co.

Private Equity Transactions

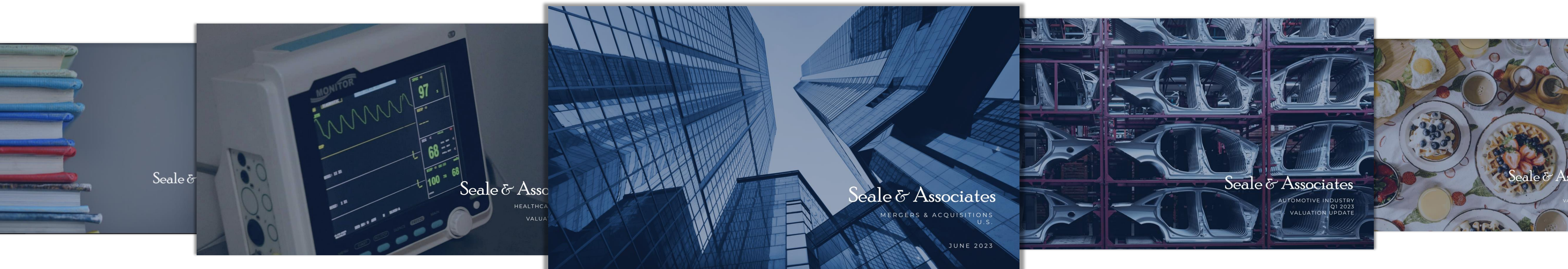
INDUSTRY CLASIFICATION	PERIOD	AVERAGE ENTERPRISE VALUE (IN USD)	REVENUE (IN USD)	TTM REVENUE GROWTH	ENTERPRISE VALUE / REVENUE	EBITDA MARGIN	ENTERPRISE VALUE /EBITDA	NUMBER OF TRANSACTIONS
 Semiconductor and Other Electric Component Manufacturing <small>NAICS 33441- Semiconductor and Other Electric Component 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>	2018-2019	\$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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 <p>INMAGUSA Grupo Galaz, S.A de C.V.</p> <p>has been acquired by</p> 	 <p>has sold</p>  <p>to</p> 	 <p>has sold its</p> <p>Sanitaryware business units</p> <p>ST. THOMAS CREATIONS <small>SAFARIWAYS THAT WORK BEAUTIFULLY</small></p> <p>and</p>  <p>to</p> 	 <p>has sold</p>  <p>to</p> 	 <p>has sold</p>  <p>to</p> 	 <p>has been acquired by</p> 	  <p>acquired</p> <p>The Zinc Recycling Business</p> <p>of</p> 
 <p>acquired</p>  <p>Automotive dealerships from</p> 	 <p>has sold</p>  <p>to</p> 	 <p>has sold</p> <p>Kidde de Mexico, S.A. de C.V.</p> <p>Fire Safety Solutions Business</p> <p>to an affiliate of</p> 	 <p>has sold its concrete pumping business</p> <p>to</p> 	<p>CORPORACION</p>  <p>has sold</p>  <p>to</p> 	 <p>has been acquired by</p> 	 <p>has been acquired by</p> 
 <p>has been acquired by</p> 	<p>intelectiva®</p> <p>has acquired</p>  <p>KFC Costa Rica from</p> 	 <p>Multiple acquisitions</p> 	 <p>has partnered with</p>  <p>a subsidiary of</p> 	 <p>has been acquired by</p> 	 <p>has merged its Beverage Division with</p> 	 <p>has merged its Beverage Division with</p> 

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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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25

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