

Semiconductors

OCP Summit – Well Attended – MRVL, SMCI, and ARM are Key Players

Summary

We attended the Open Compute Project's Global Summit in San Jose last week, an event that showcases an open IT ecosystem of top tech players sharing innovative approaches to industry challenges.

The top two themes in our opinion revolved around the challenges in optical road maps (intra and inter DC), and data center liquid cooling as next generation AI compute stresses cloud connectivity and power. Both themes drew standing room only crowds to deep dives and panel sessions that included industry luminaries.

Marvell – Optical Play in 5nm/3nm

In optics, we were drawn by the strong presence of Marvell which had a multitude of new products launched or sampling now. Marvell's 5nm-based Orion 800 Gbps coherent DSP and COLORZ 800G ZR/ZR+, which ramp in volume in 2024, are key to support the DCI links as core switches/routers move from 12.9T to 51.2T speeds.

Inside the DC Marvell showed off the 1st 1.6T PAM4 optical modules at 5nm which support 200G wavelengths per lane.

Lastly and perhaps more importantly, Marvell showcased its 5nm/3nm custom ASIC capabilities which include 112G SerDes, PCIe Gen6, CXL 3.0, etc.

Supermicro – Best Positioned in New DC Design Focus of Liquid Cooling

Liquid cooling was a rather surprising topic of urgent interest as if now DC designers had avoided the topic as if it could be ignored. Not anymore, liquid cooling is the new design focus for DC's and there is confusion on how best to deploy at scale.

Our view is Supermicro's early focus on liquid cooling for over 6-years has proven over 40% OpEx reduction vs. air conditioning and 1-year average ROI payback. In our view, next gen CPUs/GPUs will not scale properly without liquid cooling.

ARM – DPU Push and Grace

ARM had a strong floor presence at the OCP Summit with the company making the case that DPU deployments are set to enable a TAM sized over \$4B in the coming years. ARM partners Marvell and Nvidia have already gone through ARM's certification program for DPUs (ensures compatibility), with Broadcom, AMD, and Intel soon to follow.

The ARM-based Grace CPU as part of the Grace-Hopper Nvidia super chip was shown at multiple board partner vendors on the floor.

AMD, Intel, and Nvidia – As Expected

New CPUs such as AMD's Genoa, Bergamo, and Siena; and Intel's Sapphire Rapids were visible at the conference as expected. Nvidia Hopper and Grace-Hopper systems have become mainstream in terms of support by ecosystem partners. We did not see AMD's MI300X as the part is in sampling mode however several players indicated the infrastructure (boards/platforms) has been set for a ramp in 2024.

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Related Companies:

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Share Price:

\$33.85

Semiconductor Industry Comp Sheet

Company Name	Ticker	Rating	10/22/2023 Price	Price Target	Upside/ Downside	Market Cap (\$M)	Enterprise Value (\$M)	Valuation											
								EV/Sales			P/E			EV/FCF			EV/EBITDA		
								CY22E	CY23E	CY24E	CY22E	CY23E	CY24E	CY22E	CY23E	CY24E	CY22E	CY23E	CY24E
Analog/MCUs																			
Microchip Technology Incorporated	MCHP-US	Buy	\$75.36	\$110.00	46%	41,021	47,345	5.5x	5.4x	5.2x	12.4x	12.3x	11.6x	14.0x	14.7x	13.9x	11.3x	11.3x	10.5x
Monolithic Power Systems, Inc.	MPWR-US	Buy	\$420.04	\$580.00	38%	20,069	19,546	10.7x	9.4x	8.0x	35.9x	32.0x	26.2x	38.3x	37.8x	25.5x	29.1x	25.0x	20.6x
ON Semiconductor Corporation	ON-US	Neutral	\$84.83	\$100.00	18%	36,607	39,195	4.7x	4.4x	4.0x	16.2x	15.0x	12.9x	45.1x	22.3x	17.7x	11.8x	10.9x	9.8x
Texas Instruments Incorporated	TXN-US	Buy	\$147.81	\$230.00	56%	134,207	137,061	7.6x	7.1x	6.5x	20.2x	19.4x	17.6x	59.2x	28.9x	24.0x	15.2x	13.8x	12.0x
SiTime Corporation	SITM-US	NR	\$107.21	NR	NR	2,381	1,801	12.3x	8.9x	7.2x	670.1x	85.1x	52.7x	NM	NM	NM	-127.3x	104.7x	41.8x
Infineon Technologies AG Sponsored ADR	IFNNY-US	NR	\$31.13	NR	NR	40,654	44,269	2.9x	2.5x	2.4x	14.0x	11.3x	11.1x	27.7x	31.9x	24.4x	8.3x	6.9x	6.6x
STMicroelectronics NV ADR RegS	STM-US	NR	\$39.77	NR	NR	36,387	36,110	2.1x	2.0x	1.9x	9.2x	9.2x	8.4x	29.3x	17.9x	14.2x	5.8x	5.7x	5.2x
Communications/DC																			
Broadcom Inc.	AVGO-US	Buy	\$853.63	\$1,000.00	17%	352,323	391,786	11.6x	10.8x	9.9x	22.2x	19.9x	18.1x	23.7x	21.7x	19.2x	18.4x	16.8x	15.5x
Lattice Semiconductor Corporation	LSCC-US	Buy	\$73.12	\$110.00	50%	10,079	10,177	13.4x	11.8x	14.1x	35.1x	29.8x	NM	37.9x	30.8x	39.0x	35.6x	27.5x	42.1x
Navitas Semiconductor Corporation	NVTS-US	Buy	\$5.59	\$12.00	115%	971	869	18.4x	7.0x	4.1x	NM	NM	46.0x	-16.2x	-19.2x	-25.1x	-22.6x	-48.8x	26.2x
Vicor Corporation	VICR-US	NR	\$51.78	NR	NR	1,684	2,130	5.1x	4.4x	3.6x	39.3x	29.0x	18.8x	35.8x	44.6x	25.5x	25.6x	18.6x	11.6x
QuickLogic Corporation	QUIK-US	NR	\$9.30	NR	NR	129	123	5.8x	4.3x	NM	116.3x	26.2x	NM	-26.8x	24.2x	NM	72.5x	22.4x	NM
Power Integrations, Inc.	POWI-US	NR	\$70.61	NR	NR	4,053	3,726	7.5x	6.2x	5.4x	43.1x	28.5x	24.3x	39.3x	24.3x	20.4x	32.5x	21.6x	20.9x
Wolfspeed Inc	WOLF-US	NR	\$31.88	NR	NR	3,993	5,320	5.7x	4.5x	3.1x	NM	NM	NM	-3.3x	-3.1x	-6.8x	-73.3x	683.3x	13.7x
Computing																			
Advanced Micro Devices, Inc.	AMD-US	Buy	\$101.81	\$200.00	96%	164,492	162,220	7.1x	5.9x	5.2x	37.0x	24.6x	19.4x	42.9x	31.0x	24.7x	24.7x	21.8x	17.0x
Ambarella, Inc.	AMBA-US	Buy	\$49.90	\$85.00	70%	1,990	1,773	7.6x	6.9x	5.1x	NM	NM	363.1x	861.9x	-63.4x	-7292.9x	-89.8x	-125.4x	44.2x
Intel Corporation	INTC-US	Sell	\$34.92	\$17.00	-51%	146,245	174,767	3.3x	3.0x	2.7x	54.9x	20.1x	14.0x	-12.7x	-67.6x	120.5x	15.9x	11.0x	8.6x
NVIDIA Corporation	NVDA-US	Buy	\$413.87	\$1,100.00	166%	1,022,259	1,029,192	19.6x	13.0x	10.7x	41.1x	25.2x	20.6x	47.4x	27.2x	21.6x	36.3x	22.7x	18.7x
Super Micro Computer, Inc.	SMCI-US	Buy	\$248.58	\$375.00	51%	13,151	13,763	1.6x	1.2x	1.2x	17.3x	13.3x	14.1x	38.5x	35.8x	16.0x	13.8x	11.6x	12.4x
IoT																			
Synaptics Incorporated	SYNA-US	Buy	\$90.43	\$100.00	11%	3,530	3,730	3.1x	3.1x	NM	16.2x	17.5x	NM	17.6x	24.7x	NM	13.4x	14.3x	NM
IP																			
Arteris, Inc.	AIP-US	Buy	\$5.88	\$21.00	257%	212	157	2.8x	2.3x	1.7x	NM	NM	26.7x	-17.5x	-104.7x	NM	-5.2x	-6.2x	NM
ARM Holdings PLC ADR	ARM-US	Buy	\$47.87	\$85.00	78%	49,078	47,291	16.4x	13.5x	11.3x	NM	38.0x	30.5x	79.7x	46.5x	29.9x	NM	30.8x	25.0x
CEVA, Inc.	CEVA-US	Buy	\$18.18	\$35.00	93%	430	300	2.6x	2.3x	1.9x	158.6x	35.8x	21.6x	28.9x	81.2x	19.2x	NM	NM	NM
Rambus Inc.	RMBS-US	Buy	\$54.77	\$73.00	33%	5,977	5,811	10.4x	8.8x	7.3x	31.6x	25.4x	20.2x	29.1x	29.4x	25.4x	20.2x	16.2x	12.8x
Adeia Inc.	ADEA-US	NR	\$8.43	NR	NR	900	1,500	3.8x	3.6x	NM	6.5x	5.9x	NM	NM	NM	NM	5.9x	5.6x	NM
Movella Holdings Inc.	MVLA-US	NR	\$0.49	NR	NR	25	29	0.8x	0.6x	NM	NM	NM	NM	NM	NM	NM	-1.8x	-161.8x	NM
Memory/Storage																			
Marvell Technology, Inc.	MRVL-US	Buy	\$49.47	\$100.00	102%	42,683	46,853	8.4x	7.3x	6.3x	31.2x	21.9x	17.2x	47.9x	29.3x	21.6x	27.7x	20.3x	16.1x
Micron Technology, Inc.	MU-US	Buy	\$67.22	\$100.00	49%	73,810	77,876	4.5x	3.3x	2.5x	NM	105.7x	10.7x	-18.9x	119.1x	20.8x	20.1x	8.8x	5.2x
Seagate Technology Holdings PLC	STX-US	Buy	\$66.69	\$68.00	2%	13,861	18,852	2.7x	2.5x	2.2x	163.9x	26.7x	13.5x	35.2x	27.8x	18.5x	21.3x	14.2x	10.5x
SMART Global Holdings, Inc.	SGH-US	Buy	\$13.49	\$35.00	159%	675	1,141	0.8x	0.9x	NM	6.8x	9.8x	NM	NM	NM	NM	6.0x	6.9x	NM
Western Digital Corporation	WDC-US	Neutral	\$42.86	\$38.00	-11%	13,893	19,836	1.6x	1.4x	1.1x	NM	NM	8.8x	-21.1x	201.8x	16.0x	-72.3x	13.8x	6.0x
Mobile																			
Qorvo, Inc.	QRVO-US	Neutral	\$90.00	\$95.00	6%	8,812	10,170	2.8x	2.6x	2.3x	17.0x	13.0x	9.7x	17.1x	12.7x	10.1x	12.2x	10.5x	8.6x
QUALCOMM Incorporated	QCOM-US	Buy	\$108.63	\$145.00	33%	121,231	128,913	3.1x	3.6x	3.4x	9.5x	12.8x	11.5x	16.6x	14.3x	12.1x	7.3x	9.8x	9.6x
Skyworks Solutions, Inc.	SWKS-US	Buy	\$92.19	\$150.00	63%	14,694	15,726	3.0x	3.3x	3.1x	8.8x	10.7x	9.9x	11.8x	8.6x	8.7x	6.4x	7.6x	7.5x
LIDAR																			
Luminar Technologies, Inc. Class A	LAZR-US	Neutral	\$3.68	\$6.00	63%	1,079	1,676	19.9x	6.9x	2.9x	NM	NM	NM	-7.0x	-12.3x	-66.9x	-6.4x	-9.9x	-30.9x
Ouster, Inc.	OUST-US	Buy	\$4.16	\$17.50	321%	164	5	0.1x	0.0x	0.0x	NM	NM	NM	NM	NM	NM	0.0x	-0.1x	-0.1x
Innoviz Technologies Ltd.	INVZ-US	Neutral	\$1.40	\$5.00	257%	228	104	6.2x	1.3x	0.3x	NM	NM	NM	-1.1x	-1.2x	-2.3x	-0.9x	-0.9x	-2.4x

Sources: Rosenblatt Estimates, FactSet

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