

## Thermal sector

### Strong earnings growth on liquid cooling transition for AI server

#### Key message

1. GB200 liquid cooling ramp up to fuel thermal plays' sales, gross margin and EPS expansion in 2025F.
2. Five drivers of thermal plays' earnings growth in 2025F: (1) stronger liquid cooling sales; (2) server sales weighting expansion; (3) commercial PC replacement demand, with rising VC shipments; (4) a new RTX-50 GPU with higher TDP benefits for increased VC adoption; and (5) iPhone 17 Pro thermal upgrade to VC.
3. We are positive on the thermal sector, with Outperform ratings on Asia Vital Components (3017 TT, NT\$626, OP), Auras Technology (3324 TT, NT\$652, OP), and Sunonwealth Electric Machine (2421 TT, NT\$98.9, OP) on strong sales and earnings growth in 2025F.

#### Event

We are positive on the thermal sector in 2025F in light of growing liquid cooling demand from GB200 ramp-ups, growing the total addressable market (TAM) value significantly. In addition, new RTX-50 series GPUs launched by Nvidia (US), and commercial PC replacement demand, will boost vapor chamber (VC) adoption, boosting ASP and gross margin.

#### Impact

Benefits from GB200 liquid cooling shipments ramp-up. We expect the liquid cooling sales of several Taiwan thermal plays will more than double next year, based on recent comments by Nvidia's CEO Jenson Huang regarding "insane" demand for AI servers with powerful GB200 NVL72 designs, coupled with Vertiv's (US) forecast of a liquid cooling sales CAGR of 35% in 2024-27F. Major beneficiaries include Asia Vital Components (AVC; 3017 TT, NT\$626, OP), which will handle most US CSP GB200 orders for shipments of cold plate modules, fan doors, chassis, and manifolds with quick disconnectors (QD), looking to ramp up after 2Q25F. Other beneficiaries are Auras Technology (3324 TT, NT\$652, OP), which will ship cold plate modules and manifolds to US CSPs and server brands after 2Q25F, and Delta Electronics (2308 TT, NT\$406, OP), which will ship cold plate modules, fans, sidecars and coolant distribution units (CDU) to US CSPs next year. According to our channel checks, 50-60k racks of GB200 NVL36/72 servers will be shipped in 2025F, and we estimate 72-126 units of cold plates will be required for each one (six units for a compute tray, two units for a switch tray), with ASP of US\$200-400 per unit. Rack manifolds will require 50-60k pairs (two units) each, with ASP of close to US\$8,000, plus 80-90 pairs of QD, with ASP of around US\$50/ pair. 50-60k NV36/72 racks will require 50-120k sidecars (liquid to air, L2A, 1 NVL36/72 rack for 1-2 sidecars), with ASP of US\$40-60k, including 16 units for each sidecar fan door, with ASP of US\$80, and 177-249 fan units for each NVL36/72 rack, with ASP of US\$6-16. The TAM for these liquid cooling components is estimated to be US\$4-13bn, or NT\$130-420bn, depending on different designs, which represents a huge business opportunity for the thermal industry. Despite strong competition in the liquid cooling component market, these firms have been awarded orders.

Margin expansion on better product mix in 2025F. We have identified five key drivers of thermal plays' sales and gross margin in 2025F. First, AI server demand growth, particularly for GB200 mass production, will fuel liquid cooling sales expansion. We estimate liquid cooling sales weightings to be at 20% for AVC in 2025F, 30-40% for Auras, and 5-10% for Delta. Secondly, the total server sales growth of these three firms will rebound to over 40% in 2025F on AI server sales, benefiting gross margins for the firms. Thirdly, commercial PC will see replacement demand, with VC adoption increasing. Fourthly, a new gaming GPU series (RTX-50) will be launched in 1Q25F, and VC adoption will grow on over 30% higher thermal design power (TDP) versus RTX-40 GPU, to 400-600 watts. Finally, we expect the iPhone 17 Pro series to have first-time slim VC adoption, upgrading from the graphite used for the last several generations. These business opportunities will drive up thermal product ASP and gross margins in 2025F. We expect the gross margins of AVC, Auras and Sunonwealth Electric Machine (2421 TT, NT\$98.9, OP) to rise to 25%, 29% and 29%, respectively, next year, boosting 2025F EPS to NT\$31.61 (up 48% YoY), NT\$38.3 (up 74% YoY), and NT\$7.23 (up 24% YoY).

#### Stocks for Action

We are positive on the Taiwan thermal sector, and forecast thermal companies' 2025-26F EPS to grow strongly. Near term, we estimate 4Q24F sales of AVC will grow 6% QoQ, while those of Auras and Sunonwealth will be more moderate at 2-3% QoQ, as CSPs' GB200 liquid cooling order wins by AVC and 3D VC for Hopper AI server orders will continue in 4Q24F. We expect these firms' sales and earnings to rally after 2Q25F on GB200 mass production, boosting liquid cooling sales and EPS. Our target price for AVC is NT\$885, for Auras NT\$990 and for Sunonwealth NT\$130. All are rated to Outperform.

#### Risks

Material price increases; NT-dollar appreciation; weak demand for servers and gaming NB.

**Figure 1: Liquid cooling TAM for GB200 design assumptions**

	GB200 NVL36	GB200 NVL72	Note
<b>Rack TDP</b>	<b>60-70KW</b>	<b>120-130KW</b>	
<b>Shipments (units)</b>	<b>Scenario 1</b>	<b>Scenario 2</b>	
Cold plate per rack	72	126	6 for compute tray; 2 for switch tray
Racks	50,000	60,000	GB200 racks between 50-60k in 2025F
Sidecar	50,000	120,000	1-2 sidecar to support 1 rack
Fan on compute/switch/power tray	177	249	8 units for a compute tray; 7 units for switch tray; 42 units for power busbar
Fan on sidecar	800,000	1,800,000	16 units for NVL36 fan door on a sidecar; 30-32 units for NVL72
<b>Market TAM (US\$m) - 50-60k racks</b>	<b>GB200 NVL36</b>	<b>GB200 NVL72</b>	
Cold plate	1,080	2,268	Based on ASP of US\$300 for each cold plate
Sidecar (L2A)	2,000	9,600	
CDM	600	900	
Racks	250	300	
Fan on compute/switch/power tray	121	145	9 compute trays and 9 switch trays for NVL36; 18 compute trays and 9 switch trays for NVL72
Fan door on sidecar	64	144	
<b>Sales TAM (US\$m) - sidecar design</b>	<b>4,051</b>	<b>13,213</b>	Cold plate+sidecar+CDM+racks+fan on compute/switch/power trays
<b>Sales TAM (NT\$bn) - sidecar design</b>	<b>130</b>	<b>423</b>	USD/NTD exchange rate of 1:32
<b>ASP assumptions (US\$)</b>	<b>GB200 NVL36</b>	<b>GB200 NVL72</b>	
Cold plate	200-400	200-400	Cold plate ASP of GPU and switch to be higher than that of CPU
Sidecar (L2A)	40,000	80,000	Price includes fan door, pump
CDM (with QD)	12,000	15,000	CDM cost US\$8,000/pair + QD cost US\$50/pair with 40/42/48 pairs needed for a rack
Racks	5,000	5,000	
Fan on compute/switch tray	16	16	
Fan on power tray	6	6	
Fan door on sidecar	80	80	

Source: Company's data; KGI Research estimates

**Figure 2: Capacity plans by vendor – CDU**

DLC key components Capacity (k units/month)	Cold plate module		CDU		CDM	
	Current	2025F	Current	2025F	Current	2025F
AVC	115	365	1	2	2.5 / 15 (incl. inner)	2.5 / 15 (incl. inner)
Auras	30	330	1-2	2-3		2-3
Nidec			0.2	2		
Kaori				0.15-0.2	2	4
Kenmec			0.4			
Vertiv			0.045	2.025		

Source: Company data; KGI Research

Figure 3: Thermal solution transition to liquid cooling to create much higher content value for thermal plays

Parts of liquid cooling solution	Overseas Major suppliers	Domestic suppliers	Cost (US\$)
Cold plate module	CoolIT Systems Motivair	Cooler Master Taisol AVC Auras FCN Delta	1,500-2,500 (per server)
CDU/sidecar	CoolIT Systems Vertiv nVent Motivair	AVC Auras Delta Kaori Hon Hai Lite-On MGCooling Cooler Master KENMEC FCN	40,000-60,000 (per rack; in-rack)
Manifold & quick connector	CoolIT Systems Colder Product Co. (CPC) CEJN Parker Staubli Motivair	AVC Kaori Lotes Delta FCN	10,000-15,000 (quick connector 4,000-6,000)
RDHx & fan door	nVent CoolIT Systems Motivair	KENMEC Delta MGCooling	2,000-4,000
Rack			5,000
<b>Total</b>			<b>70,000-90,000</b>

US\$200-400/set  
US\$40,000-60,000  
US\$10,000-15,000

Source: Auras; KGI Research

Figure 4: Growing sales attributable to server sales growth

Company	Ticker	Thermal (NT\$bn)			YoY (%)			Total sales weighting by application in 2025F (%)							
		2023	2024F	2025F	2023	2024F	2025F	PC	Gaming/ VGA	Smartphone	Server	Networking	Auto	Others	Total
AVC	3017 TT	31.9	39.7	57.7	(43.1)	24.7	45.3	13		13	47	11	<1	16	100
Auras	3324 TT	12.7	16.0	23.5	(8.3)	25.8	46.6	28	15	2	53		1	1	100
Sunonwealth	2421 TT	12.9	14.9	17.3	(8.2)	15.2	16.1	16			46	9	12	17	100

Source: Company data; KGI Research

Figure 5: Higher margins to boost EPS growth in 2025F

Company	Ticker	GM (%)			OPM (%)			EPS (NT\$)			EPS YoY(%)			2024-26F CAGR
		2024F	2025F	2026F	2024F	2025F	2026F	2024F	2025F	2026F	2024F	2025F	2026F	
AVC	3017 TT	23.4	25.4	26.0	15.3	18.6	20.0	21.40	31.61	49.90	81.7	47.7	57.9	52.7
Auras	3324 TT	26.8	28.4	28.5	14.0	17.5	18.8	22.02	38.30	57.99	50.0	73.9	51.4	62.3
Sunonwealth	2421 TT	28.3	29.1	30.0	12.1	14.1	15.5	5.83	7.23	8.98	34.3	24.1	24.2	24.1

Source: Company data; KGI Research

Figure 6: Peer comparison – Valuations

Sector	Company	Ticker	Market cap. (US\$mn)	Share price (LCY)	Rating	Target Price (LCY)	EPS (LCY)			EPS YoY (%)			PE (x)			PB (x)			ROE (%)			Cash yield (%)	
							2023	2024F	2025F	2023	2024F	2025F	2023	2024F	2025F	2023	2024F	2025F	2023	2024F	2025F	2023	2024F
Cooling fan	Sunonwealth	2421 TT	843	98.9	Outperform	130.0	5.16	5.83	7.23	18.9	13.0	24.0	19.2	17.0	13.7	3.7	3.5	3.3	21.5	21.4	24.8	3.5	4.2
	Nidec Corp*	6594 JP	24,824	3,184.0	Not rated	N.A.	32.13	125.07	165.43	(72.3)	289.3	32.3	99.1	25.5	19.2	2.7	2.4	2.1	2.8	10.1	11.2	1.1	1.2
	Sun Max Tech*	6591 TT	60	51.0	Not rated	N.A.	3.40	N.M.	N.M.	(50.7)	N.A.	N.A.	15.0	N.A.	N.A.	1.0	N.A.	N.A.	6.8	N.M.	N.M.	5.4	N.A.
	Minebea Mitsumi*	6479 JP	7,628	2,732.0	Not rated	N.A.	178.23	123.27	188.41	4.8	(30.8)	52.8	15.3	22.2	14.5	1.8	1.7	1.4	12.5	7.7	10.4	1.5	1.5
Thermal module /cooling fan	AVC	3017 TT	7,476	626.0	Outperform	885.0	14.11	21.40	31.61	19.7	51.7	47.7	44.4	29.2	19.8	10.9	9.2	7.5	28.3	24.1	41.6	1.1	1.7
	Delta Elec	2308 TT	32,859	406.0	Outperform	528.0	12.86	15.27	19.54	2.2	18.8	28.0	31.6	26.6	20.8	5.3	4.6	4.0	17.3	18.5	20.6	1.6	1.9
	Vertiv	VRT US	42,642	113.6	Not rated	N.A.	1.21	2.64	3.37	505.0	118.0	27.7	93.9	43.1	33.7	21.5	21.1	18.9	26.6	43.4	53.5	0.0	0.1
	Dover Corporation	DOV US	26,404	192.5	Not rated	N.A.	7.56	8.17	9.43	1.2	8.1	15.4	25.5	23.6	20.4	5.3	4.6	4.3	22.5	23.5	19.9	1.1	1.1
Thermal module	Nidec CCI*	6230 TT	562	209.0	Not rated	N.A.	7.02	N.M.	N.M.	(1.1)	N.A.	N.A.	29.8	N.A.	N.A.	3.1	N.A.	N.A.	10.9	N.M.	N.M.	0.5	N.A.
	Auras	3324 TT	1,847	652.0	Outperform	990.0	14.28	22.02	38.30	(2.7)	54.2	73.9	45.7	29.6	17.0	12.2	7.5	6.1	20.2	26.9	38.9	1.0	1.5
	Foxconn Tech*	2354 TT	3,230	73.3	Not rated	N.A.	3.01	2.98	2.96	(0.3)	(1.0)	(0.7)	24.4	24.6	24.8	1.0	0.7	0.7	4.1	4.0	3.9	2.0	2.0
	Fujikura Ltd*	5803 JP	10,211	5,279.0	Not rated	N.A.	148.27	164.86	257.41	4.5	11.2	56.1	35.6	32.0	20.5	5.4	4.6	3.7	16.7	15.8	19.2	0.6	0.9
	Furukawa Elect*	5801 JP	1,718	3,718.0	Not rated	N.A.	225.80	32.64	214.14	57.5	(85.5)	556.1	16.5	113.9	17.4	0.9	0.9	0.8	5.5	0.6	4.6	2.2	1.6

\*Bloomberg consensus

Source: Bloomberg; KGI Research estimates

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