

Memory sector

Ignore market noise & focus on supply-demand fundamentals

Key message

1. Adoption of 8Hi in Rubin Ultra is driven by tight supply of HBM rather than cost cuts.
2. We have highlighted our base case scenario for HBM supply and key variables, and note that uncertainty remains in supply capacity allocation.
3. Capacity cannibalization by HBM to worsen, and there is no risk of DRAM and NAND oversupply in 2028F.

Event

We have analyzed recent market concerns about potential HBM spec downgrades.

Impact

Adoption of 8Hi in Rubin Ultra is driven by tight supply of HBM rather than cost cuts. According to our supply chain checks, the Rubin Ultra platform, which is expected to enter mass production in 2027, will initially adopt HBM4e/HBM4 8Hi configurations. Based on our semiconductor research team estimates for 2027-28 GPU and ASIC shipments, we predict respective HBM demand of approximately 196mn and 238mn units (Figure 2). On the supply side, assuming all HBM4e/HBM4 products adopt 12Hi configurations, we forecast total HBM output of only 152mn and 218mn units in 2027-28, respectively (Figure 3), which would be insufficient to support projected logic chip shipments. As a result, we believe the adoption of 8Hi configurations for certain products is reasonable in the face of HBM supply constraints. Conversely, if HBM supply tightness eases, products could gradually migrate from 8Hi to 12Hi configurations. We believe the 4Hi option is more likely a negotiating tool rather than an actual production specification. While adopting a 4Hi configuration in Rubin Ultra could improve HBM bandwidth, memory capacity would be substantially reduced compared to the standard Rubin platform, which in turn would diminish client incentives to upgrade from Rubin to Rubin Ultra. Therefore, such a configuration does not seem feasible from the perspective of product iteration.

Our base-case scenario & key variables for HBM supply; uncertainty remains in supply capacity allocation. Our base-case assumptions for 2026-28 HBM supply and pricing are as follows: (1) industry wafer starts of 414k, 579k, and 745kwpm; (2) bit shipments of 37.5bn, 52.5bn, and 86.0bn Gb; and (3) average pricing for HBM3e/HBM4 to rise significantly from US\$1.5 and US\$2.2 per Gb in 2026F to US\$3.00 and US\$4.16 per Gb in 2027F. In addition, HBM4e is expected to command a 20% premium over HBM4 (Figure 8), while HBM pricing for ASIC clients is expected to remain above that for Nvidia (US). Key variables that could lead us to revise these base-case assumptions include a substantial downward revision in GPU and ASIC shipment forecasts, stronger-than-expected growth in agentic AI demand, which could drive higher CPU demand and further exacerbate DDR5 shortages, prompting memory makers to allocate more capacity to DDR5 at the expense of HBM supply, and shortages of other critical components, such as substrates and CPUs, which could result in a component mismatch and constrain actual AI server shipments.

Capacity cannibalization by HBM to worsen; no risk of DRAM & NAND oversupply in 2028F. Based on the aforementioned assumptions, we estimate the weighting of HBM in total DRAM wafer starts will rise from 19% in 2026 to a respective 24% and 28% in 2027-28, implying continued cannibalization of conventional DRAM capacity by HBM moving forward. Although most greenfield capacity additions are expected to come on line in 2028, conventional DRAM wafer starts, excluding HBM, are only projected to grow by mid-single digits. Given limited supply expansion, we do not expect any risk of DRAM oversupply or price declines in 2028. For NAND flash, DRAM generates substantially higher value than NAND on a per-wafer basis. In addition, a portion of South Korean memory makers' capacity can be flexibly allocated between DRAM and NAND production. As a result, we believe NAND is also unlikely to suffer from oversupply in 2028.

Stocks for Action

Current HBM pricing negotiations are still underway, while Apple (US) is also in active discussions with memory makers regarding supply agreements and pricing. As a result, market noise is likely to increase in the near term. However, when viewed through the lens of supply-demand fundamentals, we do not see any signs of a reversal in industry trends and therefore remain positive about the sustainability of earnings growth for memory makers. Our top picks within the sector is Nanya Tech (2408 TT, NT\$517, OP), but we also like Winbond (2344 TT, NT\$180, OP) and Macronix (2337 TT, NT\$124.5, OP).

Risk

Slowdown in AI-related capex; mismatch of critical components like substrates and PCBs.

Figure 1: Valuation overview

Company	Ticker	Revenue contribution of related products (%)	Market cap (NT\$bn)	Price (NT\$)	Rating	Target price (NT\$)	EPS (NT\$)				
							2023	2024	2025F	2026F	2027F
Nanya Technology	2408 TT	DRAM(100)	1,784	517.0	OP	720	(2.40)	(1.64)	2.13	75.16	130.67
Winbond	2344 TT	DRAM(53), Flash(33), Logic IC(13)	810	180.0	OP	200	(0.29)	0.14	0.87	29.03	69.97
Macronix	2337 TT	eMMC(25), NOR Flash(48), SLC NAND(18), ROM(6)	247	124.5	OP	218	(0.92)	(1.73)	(1.77)	21.84	67.00
Phison	8299 TT	Embedded ODM(32), Controller(6), Consumer(6), Industrial(16), Enterprise(39), Gaming(1)	463	2,095.0	OP	2,750	18.48	38.95	41.98	388.99	298.61

Source: TEJ; KGI Research

Figure 2: Shipments of logic IC carrying HBM in 2027-28F

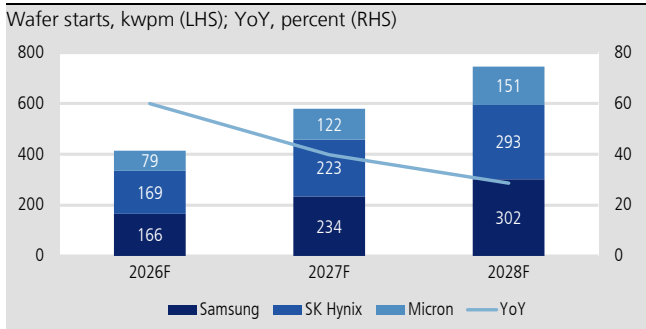
k units	Shipments		Number of carried HBM	
	2027F	2028F	2027F	2028F
NVIDIA GPU	8,626	9,500	69,008	76,000
Google TPU	9,154	11,000	65,832	84,000
AMD GPU	1,680	1,900	13,440	15,200
AWS Trainium	3,460	3,500	20,760	30,000
MSFT MAIA	480	900	3,840	7,200
META MTIA	936	550	7,488	4,400
Others	2,000	2,750	16,000	22,000
Total	26,336	30,100	196,368	238,800

Source: KGI estimates

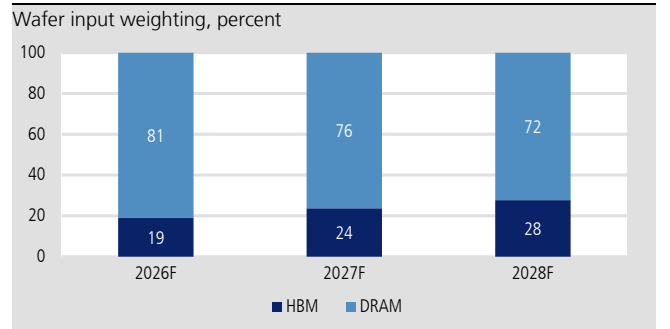
Figure 3: HBM output of individual producers in 2027-28F

k units	HBM total output (all 12Hi)		HBM total output (our estimate)	
	2027F	2028F	2027F	2028F
Samsung	64,410	87,455	68,807	102,529
SK Hynix	56,337	73,422	62,887	92,269
Micron	31,583	57,945	34,377	73,887
Total	152,329	218,821	166,072	268,686

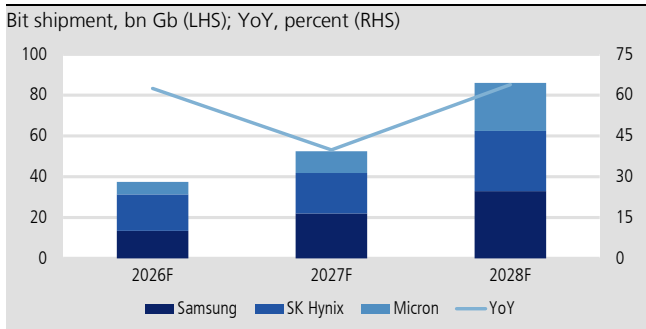
Source: KGI estimates

Figure 4: Wafer input for HBM in 2026-28F


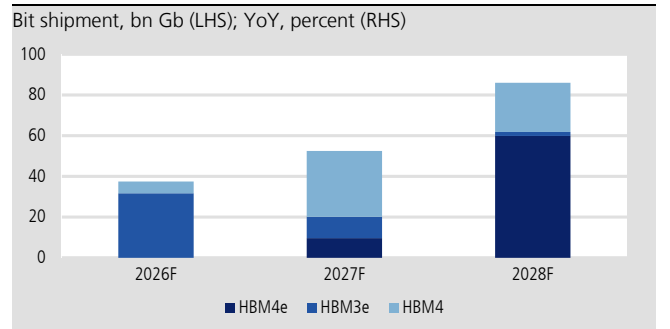
Source: KGI estimates

Figure 5: Capacity cannibalization by HBM to deteriorate


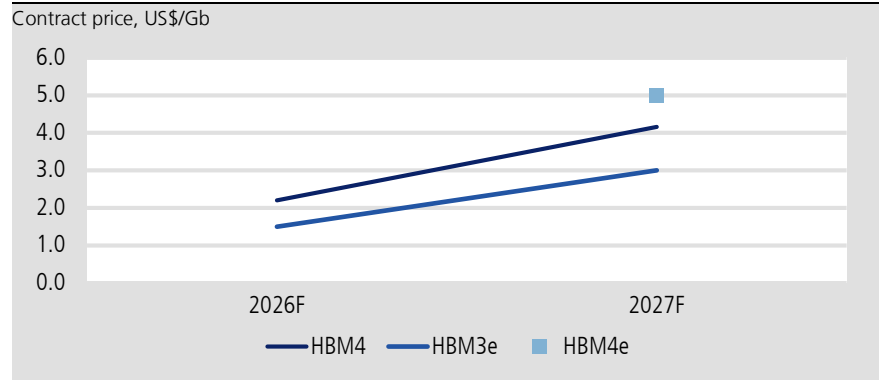
Source: KGI estimates

Figure 6: HBM bit shipments by producer in 2026-28F


Source: KGI estimates

Figure 7: HBM bit shipments by product type in 2026-28F


Source: KGI estimates

Figure 8: 2026-27F HBM contract price


KGI Locations

China Shanghai	Room 1507, Park Place, 1601 Nanjing West Road, Jingan District, Shanghai, PRC 200040
Taiwan Taipei	700 Mingshui Road, Taipei, Taiwan Telephone 886.2.2181.8888 • Facsimile 886.2.8501.1691
Hong Kong	41/F Central Plaza, 18 Harbour Road, Wanchai, Hong Kong Telephone 852.2878.6888 Facsimile 852.2878.6800
Thailand Bangkok	8th - 11th floors, Asia Centre Building 173 South Sathorn Road, Bangkok 10120, Thailand Telephone 66.2658.8888 Facsimile 66.2658.8014
Singapore	4 Shenton Way #13-01 SGX Centre 2 Singapore 068807 Telephone 65.6202.1188 Facsimile 65.6534.4826
Indonesia	Sona Topas Tower Fl.11 Jl. Jend. Sudirman kav.26 Jakarta Selatan 12920 Indonesia Telephone 62 21 250 6337

KGI's Ratings

Rating	Definition
Outperform (OP)	We take a positive view on the stock. The stock is expected to outperform the expected total return* of the KGI coverage universe in the related market over a 12-month investment horizon.
Neutral (N)	We take a neutral view on the stock. The stock is expected to perform in line with the expected total return* of the KGI coverage universe in the related market over a 12-month investment horizon.
Under perform (U)	We take a negative view on the stock. The stock is expected to underperform the expected total return* of the KGI coverage universe in the related market over a 12-month investment horizon.
Not Rated (NR)	The stock is not rated by KGI.
Restricted (R)	KGI policy and/or applicable law regulations preclude certain types of communications, including an investment recommendation, during the course of KGI's engagement in an investment banking transaction and in certain other circumstances.
<i>Total return = (12M target price - current price) / current price</i>	

Disclaimer

All the above named KGI analyst(s) is SFC licensed person accredited to KGI Asia Ltd to carry on the relevant regulated activities. Each of them and/or his/her associate(s) does not have any financial interest in the respectively covered stock, issuer and/or new listing applicant.

All the information contained in this report is not intended for use by persons or entities located in or residing in jurisdictions which restrict the distribution of this information by KGI Asia Limited ("KGI") or an affiliate of KGI. Such information shall not constitute investment advice, or an offer to sell, or an invitation, solicitation or recommendation to subscribe for or invest in any securities or investment products or services nor a distribution of information for any such purpose in any jurisdiction. In particular, the information herein is not for distribution and does not constitute an offer to sell or the solicitation of any offer to buy any securities in the United States of America, or to or for the benefit of United States persons (being residents of the United States of America or partnerships or corporations organised under the laws of the United States of America or any state, territory or possession thereof). All the information contained in this report is for general information and reference purpose only without taking into account of any particular investor's objectives, financial situation or needs. Such information is not intended to provide professional advice and should not be relied upon in that regard.

Some of KGI equity research and earnings estimates are available electronically on www.kgi.com.hk. Please contact your KGI representative for information. The information and opinions in this report are those of KGI internal research activity. KGI does not make any representation or warranty, express or implied, as to the fairness, accuracy, completeness or correctness of the information and opinions contained in this report. The information and opinions contained in this report are subject to change without any notice. No person accepts any liability whatsoever for any loss however arising from any use of this report or its contents. This report is not to be construed as an invitation or offer to buy or sell securities and/or to participate in any investment activity. This report is being supplied solely for informational purposes and may not be redistributed, reproduced or published (in whole or in part) by any means for any purpose without the prior written consent of KGI. Members of the KGI group and their affiliates may provide services to any companies and affiliates of such companies mentioned herein. Members of the KGI group, their affiliates and their directors, officers and employees may from time to time have a position in any securities mentioned herein.