

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
06 July 2023 (06.07.2023)



(10) International Publication Number
WO 2023/124816 A1

(51) International Patent Classification:

H01L 25/065 (2023.01) H01L 21/56 (2006.01)
H01L 25/18 (2023.01) H01L 21/60 (2006.01)
H01L 23/485 (2006.01)

(21) International Application Number:

PCT/CN2022/136783

(22) International Filing Date:

06 December 2022 (06.12.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

202111630406.4 28 December 2021 (28.12.2021) CN

(71) Applicant: **YANGTZE MEMORY TECHNOLOGIES CO., LTD.**, [CN/CN]; No.88 Weilai 3rd Road, East Lake High-tech Development Zone, Wuhan, Hubei 430000 (CN).

(72) Inventors: **ZENG, Xinru**; No. 88 Weilai 3rd Road, East Lake High-tech Development Zone, Wuhan, Hubei 430000 (CN). **CHEN, Peng**; No. 88 Weilai 3rd Road, East Lake High-tech Development Zone, Wuhan, Hubei 430000 (CN). **ZHOU, HouDe**; No. 88 Weilai 3rd Road, East Lake High-tech Development Zone, Wuhan, Hubei 430000 (CN).

(74) Agent: **NTD UNIVATION INTELLECTUAL PROPERTY AGENCY LTD.**; 10th Floor, Tower C, Beijing Global Trade Center, 36 North Third Ring Road East, Dongcheng District, Beijing 100013 (CN).

(81) Designated States (unless otherwise indicated, for every kind of national protection available):

AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available):

ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

— with international search report (Art. 21(3))

(54) Title: MEMORY SYSTEM PACKAGING STRUCTURE, AND METHOD FOR FORMING THE SAME

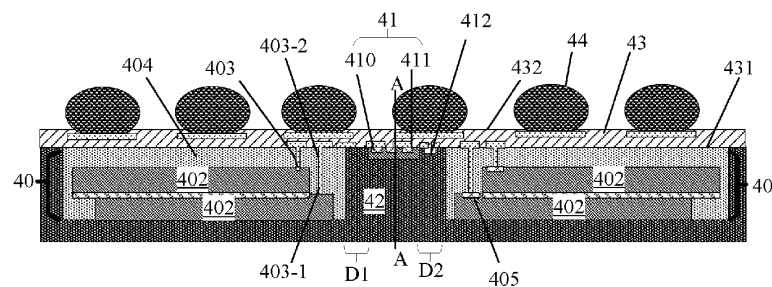


FIG. 4A

(57) Abstract: The present disclosure provides a memory system packaging structure and fabrication methods. The memory system packaging structure includes memory modules, a memory controller, a redistribution layer electrically connected to the memory controller, a plastic encapsulation layer encapsulating the memory modules and the memory controller, and one or more connecting pillars extending in the vertical direction and configured for providing electric power to the memory modules. Each memory module includes memory dies stacked in a vertical direction. Each connecting pillar includes a first portion being in physical contact with one of the memory dies and a second portion being in physical contact with the redistribution layer.



WO 2023/124816 A1