

Title (en)  
THREE-DIMENSIONAL MEMORY DEVICE CONTAINING BONDED CHIP ASSEMBLY WITH THROUGH-SUBSTRATE VIA STRUCTURES AND METHOD OF MAKING THE SAME

Title (de)  
DREIDIMENSIONALE SPEICHERVORRICHTUNG MIT GEBONDETER CHIP-ANORDNUNG MIT SUBSTRATDURCHGANGSSTRUKTUREN UND VERFAHREN ZUR HERSTELLUNG DAVON

Title (fr)  
DISPOSITIF DE MÉMOIRE TRIDIMENSIONNEL CONTENANT UN ENSEMBLE PUCE LIÉ AVEC DES STRUCTURES DE TROU D'INTERCONNEXION TRAVERSANT UN SUBSTRAT ET SON PROCÉDÉ DE FABRICATION

Publication  
**EP 3669398 A4 20210901 (EN)**

Application  
**EP 18910814 A 20181120**

Priority  
• US 201815928340 A 20180322  
• US 201815928407 A 20180322  
• US 2018062107 W 20181120

Abstract (en)  
[origin: WO2019182657A1] Multiple semiconductor chips can be bonded through copper-to-copper bonding. The multiple semiconductor chips include a logic chip and multiple memory chips. The logic chip includes a peripheral circuitry for operation of memory devices within the multiple memory chips. The memory chips can include front side bonding pad structures, backside bonding pad structures, and sets of metal interconnect structures providing electrically conductive paths between pairs of a first side bonding pad structure and a backside bonding pad structure. Thus, electrical control signal can vertically propagate between the logic chip and an overlying memory chip through at least one intermediate memory chip located between them. The backside bonding pad structures can be formed as portions of integrated through- substrate via and pad structures that extend through a respective semiconductor substrate.

IPC 8 full level  
**H10B 41/20** (2023.01); **H10B 43/40** (2023.01); **H01L 21/768** (2006.01); **H01L 21/98** (2006.01); **H01L 23/00** (2006.01); **H01L 25/18** (2006.01); **H10B 41/35** (2023.01); **H10B 43/20** (2023.01); **H10B 43/35** (2023.01); **H10B 43/27** (2023.01)

CPC (source: EP KR)  
**H01L 21/6835** (2013.01 - EP); **H01L 21/76898** (2013.01 - EP); **H01L 23/5226** (2013.01 - KR); **H01L 23/58** (2013.01 - EP); **H01L 24/06** (2013.01 - KR); **H01L 24/97** (2013.01 - KR); **H01L 25/0657** (2013.01 - EP); **H01L 25/18** (2013.01 - EP); **H01L 25/50** (2013.01 - EP); **H10B 41/20** (2023.02 - KR); **H10B 41/35** (2023.02 - KR); **H10B 43/20** (2023.02 - KR); **H10B 43/40** (2023.02 - EP); **H01L 24/05** (2013.01 - EP); **H01L 24/11** (2013.01 - EP); **H01L 24/13** (2013.01 - EP); **H01L 24/16** (2013.01 - EP); **H01L 24/81** (2013.01 - EP); **H01L 2221/68327** (2013.01 - EP); **H01L 2221/6834** (2013.01 - EP); **H01L 2224/03002** (2013.01 - EP); **H01L 2224/03462** (2013.01 - EP); **H01L 2224/03464** (2013.01 - EP); **H01L 2224/05567** (2013.01 - EP); **H01L 2224/05647** (2013.01 - EP); **H01L 2224/08146** (2013.01 - EP); **H01L 2224/11002** (2013.01 - EP); **H01L 2224/11462** (2013.01 - EP); **H01L 2224/11464** (2013.01 - EP); **H01L 2224/13009** (2013.01 - EP); **H01L 2224/13022** (2013.01 - EP); **H01L 2224/13147** (2013.01 - EP); **H01L 2224/16146** (2013.01 - EP); **H01L 2224/48227** (2013.01 - EP); **H01L 2224/81895** (2013.01 - EP); **H01L 2225/06541** (2013.01 - EP); **H01L 2225/06544** (2013.01 - EP); **H01L 2924/15311** (2013.01 - EP); **H10B 43/27** (2023.02 - EP)

C-Set (source: EP)  
1. **H01L 2224/11462 + H01L 2924/00014**  
2. **H01L 2224/11464 + H01L 2924/00014**  
3. **H01L 2224/13147 + H01L 2924/00014**  
4. **H01L 2224/81895 + H01L 2924/00014**  
5. **H01L 2224/05647 + H01L 2924/00014**  
6. **H01L 2224/03462 + H01L 2924/00014**  
7. **H01L 2224/03464 + H01L 2924/00014**

Citation (search report)  
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• [Y] US 2013252416 A1 20130926 - TAKEDA YASUHIRO [JP], et al  
• [Y] US 2016079164 A1 20160317 - FUKUZUMI YOSHIKI [JP], et al  
• [Y] US 8697495 B2 20140415 - CHEAH BOK ENG [MY], et al  
• See also references of WO 2019182657A1

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

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**US 2018062107 W 20181120**; CN 201880068190 A 20181120; EP 18910814 A 20181120; KR 20207009288 A 20181120