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Iizumi et al.(10) **Pub. No.: US 2023/0230878 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **METHOD OF MANUFACTURING
BARRIER-METAL-FREE METAL
INTERCONNECT STRUCTURE, AND
BARRIER-METAL-FREE METAL
INTERCONNECT STRUCTURE****Publication Classification**(51) **Int. Cl.****H01L 21/768** (2006.01)**H01L 23/532** (2006.01)(52) **U.S. Cl.****CPC H01L 21/7684** (2013.01); **H01L 21/76877**(2013.01); **H01L 21/76873** (2013.01); **H01L****21/76816** (2013.01); **H01L 23/53238**

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(71) Applicant: **EBARA CORPORATION**, Tokyo (JP)(72) Inventors: **Takeshi Iizumi**, Tokyo (JP); **Ryota
Koshino**, Tokyo (JP); **Shinro Ota**,
Tokyo (JP)(73) Assignee: **EBARA CORPORATION**, Tokyo (JP)(21) Appl. No.: **17/998,191**(22) PCT Filed: **Apr. 26, 2021**(86) PCT No.: **PCT/JP2021/016602**

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ABSTRACT

The present invention relates to a metal interconnect structure containing no barrier metal and a method of manufacturing the metal interconnect structure. The method includes: filling at least a first interconnect trench with an intermetallic compound by depositing the intermetallic compound on an insulating layer having the first interconnect trench and a second interconnect trench formed in the insulating layer, the second interconnect trench being wider than the first interconnect trench; performing a planarization process of polishing the intermetallic compound until the insulating layer is exposed; and then performing a height adjustment process of polishing the intermetallic compound and the insulating layer until a height of the intermetallic compound in the first interconnect trench reaches a predetermined height.

