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[Continued on next page]

(54) **Title:** METAL AND SILICON CONTAINING CAPPING LAYERS FOR INTERCONNECTS

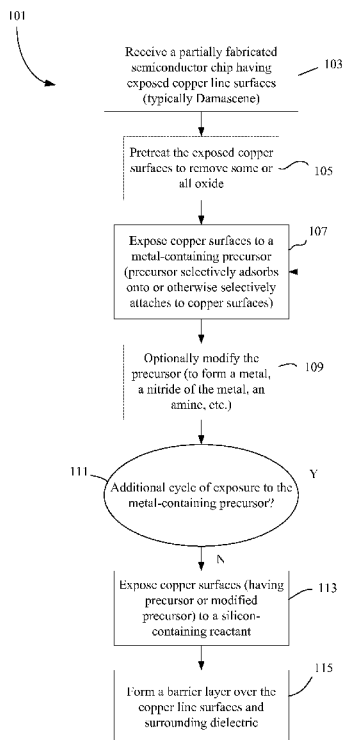


Figure 1

(57) **Abstract:** Disclosed methods cap exposed surfaces of copper lines with a layer of metal or metal-containing compound combined with silicon. In some cases, the metal or metal-containing compound forms an atomic layer. In certain embodiments, the methods involve exposing the copper surface first to a metal containing precursor to form an atomic layer of adsorbed precursor or metal atoms, which may optionally be converted to an oxide, nitride, carbide, or the like by, e.g., a pinning treatment. Subsequent exposure to a silicon-containing precursor may proceed with or without metallic atoms being converted.



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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: copper,cap,adhesion,metal,silicon,silane,precursor

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2010-0308463 A1 (YU JENGYI et al.) 09 December 2010 See abstract; figures 1A-7; paragraphs [0008]-[0154]	1-27
Y	US 2008-0233745 A1 (CHANG HUI-LIN et al.) 25 September 2008 See abstract; figures 1-5; paragraph [0035]	1-27
A	US 7576006 B1 (YU YONGSIK et al.) 18 August 2009 See abstract; figures 1A-7; column 1 line 66 - column 26 line 24	1-27
A	US 7396759 B1 (VAN SCHRAVENDIJK BART et al.) 08 July 2008 See abstract; figures 2A-8; column 5 line 45 - column 10 line 27	1-27

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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INTERNATIONAL SEARCH REPORT

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