



- (51) **International Patent Classification:**  
C23C 28/00 (2006.01) C23C 16/455 (2006.01)
- (21) **International Application Number:**  
PCT/US2014/022175
- (22) **International Filing Date:**  
8 March 2014 (08.03.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
61/787,141 15 March 2013 (15.03.2013) US
- (71) **Applicant:** ROBERT BOSCH GMBH [DE/DE]; Postfach 30 02 20, D-70442 Stuttgart (DE).
- (72) **Inventors; and**
- (71) **Applicants :** FEYH, Ando [DE/US]; 742 Encina Grande Drive, Palo Alto, CA 94306 (US). PURKL, Fabian [DE/US]; 724 Arstradero Road, #313, Palo Alto, CA 94306 (US). SAMARAO, Ashwin [IN/US]; 877 Heatherstone Way, #708, Mountain View, CA 94040 (US). YAMA, Gary [US/US]; 1520 Gretel Lane, Mountain View, CA 94040 (US). O'BRIEN, Gary [US/US]; 4009 Miranda Avenue, Palo Alto, CA 94304 (US).
- (74) **Agent:** MAGINOT, Paul, J.; Maginot, Moore & Beck LLP, One Indiana Square, Suite 2200, Indianapolis, IN 46204 (US).
- (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, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, 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, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, 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, 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).

**Published:**

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

- (88) **Date of publication of the international search report:**  
29 January 2015

(54) **Title:** ANISOTROPIC CONDUCTOR AND METHOD OF FABRICATION THEREOF

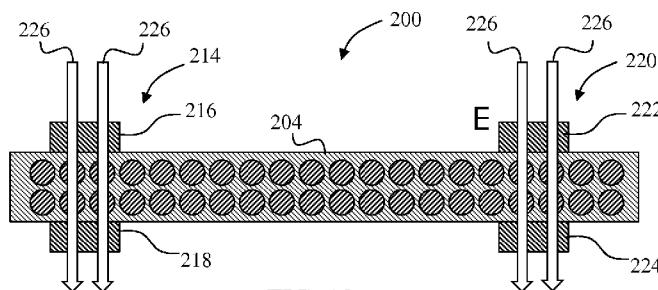


FIG. 10

(57) **Abstract:** An anisotropic conductor and a method of fabrication thereof. The anisotropic conductor includes an insulating matrix and a plurality of nanoparticles disposed therein. A first portion of the plurality of nanoparticles provides a conductor when subjected to a voltage and/or current pulse. A second portion of the plurality of the nanoparticles does not form a conductor when the voltage and or current pulse is applied to the first portion. The anisotropic conductor forms a conductive path between conductors of electronic devices, components, and systems, including microelectromechanical systems (MEMS) devices, components, and systems.



**A. CLASSIFICATION OF SUBJECT MATTER****C23C 28/00(2006.01)i, C23C 16/455(2006.01)j**

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)

C23C 28/00; H01L 21/8246; H01L 21/336; H01L 29/94; H01L 29/792; H01L 21/314; H01L 21/8238; C23C 16/455

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) &amp; Keywords: insulator, dielectric, nanoparticle, noble, platinum and atomic layer deposition(ALD)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008-0296650 A1 (AHN, K. Y. et al.) 04 December 2008 See abstract, Figures 3-4, [0048]-[0049], [0054]-[0055], [0060], [0083]-[0087] and claims 1-45.	1-4, 9, 11, 13-14, 18-19
A		5-8, 10, 12, 15-17, 20
A	US 2009-0302371 A1 (KRAUS, B. D. et al.) 10 December 2009 See abstract, [0030]-[0032], Fig. 4A and claims 1-25.	1-20
A	US 2011-0227142 A1 (RAMASWAMY, D. V. N. et al.) 22 September 2011 See abstract and claims 1-49.	1-20
A	US 6946336 B2 (PANG, H. F. et al.) 20 September 2005 See abstract and claims 1-22.	1-20

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

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

15 December 2014 (15.12.2014)

Date of mailing of the international search report

**15 December 2014 (15.12.2014)**

Name and mailing address of the ISA/KR

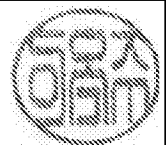
International Application Division  
Korean Intellectual Property Office  
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan City, 302-701,  
Republic of Korea

Facsimile No. +82-42-472-7140

Authorized officer

LEE, Ok Joo

Telephone No. +82-42-481-8717



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2014/022175**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008-0296650 A1	04/12/2008	US 2013-153986 A1 US 8367506 B2	20/06/2013 05/02/2013
US 2009-0302371 A1	10/12/2009	US 2007-0092989 A1 US 2009-0173991 A1 US 7575978 B2 US 7989290 B2	26/04/2007 09/07/2009 18/08/2009 02/08/2011
US 2011-0227142 A1	22/09/2011	TW 201145389 A US 2013-001673 A1 US 8288811 B2 WO 2011-119424 A2 WO 2011-119424 A3	16/12/2011 03/01/2013 16/10/2012 29/09/2011 05/01/2012
US 6946336 B2	20/09/2005	AU 2003-299494 A1 AU 2003-299494 A8 US 2004-110350 A1 WO 2004-041712 A2 WO 2004-041712 A3	07/06/2004 07/06/2004 10/06/2004 21/05/2004 09/12/2004