12/070220 U.S. DEPARTMENT OF COMMERCE Form PTO-1595 (Rev. 07/05) 02/15/2008 OMB No. 0651-0027 (exp. 6/30/2008) United States Patent and Trademark Office 02-25-2008 ET documents or the new address(es) below. To the Director of the U.S. Patent and 103484364 1. Name of conveying party(ies) Jong-Heun Lim Suk-Hun Choi Name: Samsung Electronics Co., Ltd. Chang-Ki Hong Sang-Yeob Han Internal Address: Bo-Un Yoon Seong-Kyu Yun 3. Nature of conveyance/Execution Date(s): Street Address: 416, Maetan-dong, Execution Date(s) February 12, 2008 Yeongtong-gu ✓ Assignment Merger City: Suwon-si, Gyeonggi-do Security Agreement Change of Name Joint Research Agreement State: Government Interest Assignment Country: Republic of Korea Zip: Executive Order 9424, Confirmatory License Additional name(s) & address(es) attached? ☐ Yes ✓ No 4. Application or patent number(s): This document is being filed together with a new application. A. Patent Application No.(s) B. Patent No.(s) 6. Total number of applications and patents 5. Name and address to whom correspondence concerning document should be mailed: involved: 1 Name: Steven M. Mills 7. Total fee (37 CFR 1.21(h) & 3.41) \$_40.00_ Authorized to be charged by credit card Internal Address:_____ Authorized to be charged to deposit account **Enclosed** Street Address: Mills & Onello LLP None required (government interest not affecting title) Eleven Beacon Street, Suite 605 8. Payment Information City: Boston a. Credit Card Last 4 Numbers 1008 Zip: 02108 Expiration Date 06/11 State: Massachusetts 02/20/2008 HMARZI1 00000042 12070220 b. Deposit Account Number _____ Phone Number: (617) 994-4900 Fax Number: (617) 742-7774 Authorized User Name Email Address: mail@millsonello.com 9. Signature: Signature Total number of pages including cover Steven M. Mills, Registration No. 36,610 sheet, attachments, and documents: Name of Person Signing

U.S. PTO

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Reference No.: SAM-1235

ASSIGNMENT

We, Jong-Heun Lim, of #2508, Hyundal, 1338-20, Seocho 2-dong, Seocho-gu, Seoul, Republic of Korea; Chang-Ki Hong, of 1007-302, Mujigae-Macul Samsung Apt., Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea; Bo-Un Yoon, of 23-105, Sinbanpo Hansin Apt., Banpo 2-dong, Seocho-gu, Seoul, Republic of Korea; Seong-Kyu Yun, of 104-1203, Yeoksam Lucky Apt., Dogok 1-dong, Gangnam-gu, Seoul, Republic of Korea; Suk-Hun Choi, of 946-1402, Byeokjeok-gol Lotte Apt., Yeongtong-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea and Sang-Yeob Han, of 602-601, Ggummaeul Hyundai Apt., Pyeongchon-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Republic of Korea; having invented improvements in METHODS OF FORMING SEMICONDUCTOR DEVICES described in an application for Letters Patent of the United States, executed by us on even date herewith, for good and valuable consideration, receipt of which is hereby acknowledged from Samsung Electronics Co., Ltd., a Korean corporation having a place of business at 416, Maetan-dong. Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea (and hereinafter called the Assignee, which term shall include its successors and assigns), do hereby sell, assign and transfer unto the Assignee our entire right, title, and interest in and throughout the United States of America (including its territories and dependencies) and all countries foreign thereto, in and to and under said application (which term shall include hereinafter where the context so admits all divisional, continuing, reissue and other patent applications based thereon) and the inventions (which term shall include each and every such invention. or part thereof) therein described, and any and all patents and like rights of exclusion (including extensions thereof) of any country which may be granted on or for said inventions or on said application;

And for the same consideration We do also hereby sell, assign, and transfer unto the Assignee, all our rights under the International Convention for the Protection of Industrial Property, the Patent Cooperation Treaty, and all other treaties of like purpose in respect of said inventions and said application, and We do hereby authorize the Assignee to apply in our name or its own name or its designee for patents and like rights of exclusion on or for said inventions in all countries, claiming (if the Assignee so desires) the priority of the filing date of said application under the provisions of said Convention, Treaty or any such other Convention or Treaty;

And for the same consideration, We do hereby agree for ourselves and for our heirs, executors, and administrators, promptly upon request of the Assignee to execute and deliver without further compensation any power of attorney, assignment, original, divisional, continuing, reissue or other application or applications for patent or patents or like rights of exclusion of any country, or other lawful documents and any further assurances that may be deemed necessary or desirable by the Assignee, fully to secure to it said right, title, and interest as aforesaid in and to said inventions, applications, and said several patents and like rights of exclusion (including extensions thereof) or any of them, all, however, at the expense of the Assignee, its successors, or assigns;

And We do hereby authorize and request the Commissioner of Patents and Trademarks of the United States of America and the corresponding Official of each country foreign thereto to issue to the Assignee, any and all patents and like rights of exclusion which may be granted in any country upon said United States application on or for said inventions;

And We do hereby covenant for ourselves and our legal representatives and agree with the Assignee, that We have granted no right or license to make, use, or sell said inventions to anyone except the Assignee, that prior to the execution of this deed our right, title, and interest in and to said inventions has not been otherwise encumbered by us, and that We have not executed and will not execute any instruments in conflict herewith.

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First or Sole Inventor:

Signature:

Second Joint Inventor:

Signature:

Ski Hors Date: 2/12/2008

Third Joint Inventor:

Bo. Un Your Date: 2/12/20.8

Fourth Joint Inventor:

Signature:

Scong-Kyu Yun

Date: 2/12 / 2008

Fifth Joint Inventor:

Signature:

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Sixth Joint Inventor:

Signature:

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Sang-Yeob Han

Date: 2/12/ 2008

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