PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT2963527

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
YOO HYUN NOH	07/24/2014
JONG MOO CHOI	07/25/2014
YOUNG SOO AHN	07/24/2014

RECEIVING PARTY DATA

Name:	SK HYNIX INC.
Street Address:	2091, GYEONGCHUNG-DAERO, BUBAL-EUB, ICHEON-SI
City:	GYEONGGI-DO
State/Country:	KOREA, REPUBLIC OF

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	14448791

CORRESPONDENCE DATA

Fax Number: (571)327-5452

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent

using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 571-327-5450

Email: ipntlaw@ipntlaw.com Correspondent Name: IP & T GROUP LLP Address Line 1: 8230 LEESBURG PIKE

Address Line 2: SUITE 650

Address Line 4: VIENNA, VIRGINIA 22182

ATTORNEY DOCKET NUMBER:	PO120159HD-D1
NAME OF SUBMITTER:	MYUNG SOO KIM
SIGNATURE:	/Myung Soo KIM/
DATE SIGNED:	07/31/2014
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 4

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PATENT

REEL: 033438 FRAME: 0929 502916928

ASSIGNMENT OF AND DECLARATION FOR APPLICATION FOR UNITED STATES LETTERS PATENT

WHEREAS, You Hyun NOH, Jong Moo CHOI and Young Soo AHN

hereinafter referred to collectively as the assignor and inventor, has invented a certain improvement relating to

THREE-DIMENSIONAL NON-VOLATILE MEMORY DEVICE, MEMORY SYSTEM AND METHOD OF MANUFACTURING THE SAME.

[O] said application being attached hereto; [] said application having been filed in the United States Patent	and Trademark Office on
, as Application Serial No.	, and was amended
on (if applicable) the specification of which was filed under the Patent Coopera	e);
[] the specification of which was filed under the Patent Coopera Serial No	ing designated.
AND WHEREAS, SK hynix Inc. of 2091, Gyeongchung-Korea, hereinafter referred to as the assignee or applicant, is dessaid application, including any and all divisions and continuation patents which may be granted therefor, including any and all rem	irous of acquiring the entire right, title and interest in and to is thereof, and in and to said invention and any and all
NOW THIS WITNESSETH, that for and in consider consideration paid by said assignee to said assignor, the recei assigns, sells and transfers to said assignee, and said assignee's interest in and to said application, including any and all division any and all patents which may be granted therefor, including ar assignee, and said assignee's successors and assigns, to have, hol all divisions and continuations thereof, and the said invention including any and all renewals, relissues and prolongations there anywise arising from or appertaining thereto, for and during thincluding any and all renewals, reissues and prolongations if assignee's successors and assigns, in as ample and beneficial a enjoyed the same, if this assignment had not been made.	successors and assigns, the full and exclusive right, title and a and continuations thereof, and in and to said invention and my and all renewals, reissues and prolongations thereof; said ic, exercise and enjoy the said application, including any and and any and all patents which may be granted therefor, for, with all the rights, powers, privileges and advantages in term or terms of any and all such patents when granted, acreof, for the use and benefit of said assignee, and said
AND said assignor hereby agrees to perform, upon the assigns, any and all acts relating to the obtaining or to the asser and prolongations thereof.	re request of said assignee, or said assignee's successors or ting of said patents, including any and all renewals, reissues
AND said assignor authorizes and requests the Commissaid application, and on any and all divisions and continuations assigns, in accordance herewith.	ssioner of Patents and Trademarks to issue Letters Patent on thereof, to said assignee, and said assignee's successors and
As an above-named inventor, I hereby declare that the made by me, and that I am the original inventor or an original joint.	above-identified application was made or authorized to be int inventor of a claimed invention in the application.
I hereby acknowledge that any willful false statement of by fine or imprisonment of not more than five (5) years, or both.	nade in this declaration is punishable under 18 U.S.C. 1001
ASSIGNOR (INVENTOR):	
Signature:	Date: 2014 7 24
Printed or Typed Name: Yoo Hyun NOH	

Page 1 of 2

ASSIGNMENT OF AND DECLARATION FOR APPLICATION FOR UNITED STATES LETTERS PATENT

ASSIGNOR (INVENTOR):	
Signature:	Date:
Printed or Typed Name: Jong Moo CHOI	
ASSIGNOR (INVENTOR):	
Signature:	Date: 30(4.7.24.

Printed or Typed Name: Young Soo AHN

Attorney Docket No.:	
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ASSIGNMENT OF AND DECLARATION FOR APPLICATION FOR UNITED STATES LETTERS PATENT

WHEREAS, Yoo Hyun NOH, Jong Moo CHOI and Young Soo AHN

hereinafter referred to collectively as the assignor and inventor, has invented a certain improvement relating to

THREE-DIMENSIONAL NON-VOLATILE MEMORY DEVICE, MEMORY SYSTEM AND METHOD OF MANUFACTURING THE SAME,

[] said application having been filed in the United States Patent and Trademark Office on	[O] said application being	attached hereto;						
If applicable); [] the specification of which was filed under the Patent Cooperation Treaty on Serial No, the United States of America being designated. AND WHEREAS, SK hynix Inc. of 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-do, Republic of Korea, hereinafter referred to as the assignee or applicant, is desirous of acquiring the entire right, title and interest in and said application, including any and all divisions and continuations thereof, and in and to said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof; NOW THIS WITNESSETH, that for and in consideration of One Dollar (\$1.00), and other good and value consideration paid by said assignee to said assignee, and said assignee's successors and assigns, the full and exclusive right, title interest in and to said application, including any and all divisions and continuations thereof, and in and to said invention any and all patents which may be granted therefor, including any and all prenewals, reissues and prolongations thereof, and assigns, to have, hold, exercise and enjoy the said application, including any all divisions and continuations thereof, and the said invention and any and all patents which may be granted there including any and all renewals, reissues and prolongations thereof, with all the rights, powers, privileges and advantage anywise arising from or appertaining thereot, for and during the term or terms of any and all supportaining therefor, for and during the term or terms of any and all supportaining therefor, for and during the term or terms of any and all any patents when gran including any and all renewals, reissues and prolongations thereof, for the use and benefit of said assignee, and sasignee's successors assignes, any and all acts relating to the obtaining or to the asserting of said patents, including any and all renewals, reissue and prolongations thereof. AND said assignor authorizes and requests the Commissioner of Paten	[] said application having	been filed in the United	States Patent an	d Trademark Office on				
[] the specification of which was filed under the Patent Cooperation Treaty on Serial No		, as Application	Serial No		,	and	was	amended
Serial No	on		(if applicable);					
AND WHEREAS, SK hynix Inc. of 2091, Gyeongchung-daero, Bubal-eub, Icheon-si, Gyeonggi-do, Republic of Korea, hereinafter referred to as the assignee or applicant, is desirous of acquiring the entire right, title and interest in and said application, including any and all divisions and continuations thereof, and in and to said invention and any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof; assigns, sells and transfers to said assignee, and said assignee's successors and assigns, the full and exclusive right, title interest in and to said application, including any and all divisions and continuations thereof, and in and to said invention any and all patents which may be granted therefor, including any and all renewals, reissues and prolongations thereof; assignce, and said assignee's successors and assigns, to have, hold, exercise and enjoy the said application, including any and all renewals, reissues and prolongations thereof, and the said invention and any and all patents which may be granted there including any and all renewals, reissues and prolongations thereof, with all the rights, powers, privileges and advantage anywise arising from or appertaining thereto, for and during the term or terms of any and all such patents when grant including any and all renewals, reissues and prolongations thereof, for the use and benefit of said assignee, and assignee's successors and assigns, in as ample and beneficial a manner as the said assigner might or could have held enjoyed the same, if this assignment had not been made. AND said assignor hereby agrees to perform, upon the request of said assignee, or said assignee's successors assigns, any and all renewals, reissues and prolongations thereof, to the use and benefic of said assignee's successors assigns, any and all renewals, reissues and prolongations thereof. AND said assignor hereby agrees to perform, upon the request of said assignee, or said assignee's successors assigns, any and all renewal	[] the specification of which	ch was filed under the Par	tent Cooperation	Treaty on		,		
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assigns, any and all acts relating to the obtaining or to the asserting of said patents, including any and all renewals, reiss and prolongations thereof. AND said assignor authorizes and requests the Commissioner of Patents and Trademarks to issue Letters Patent said application, and on any and all divisions and continuations thereof, to said assignee, and said assignee's successors assigns, in accordance herewith. As an above-named inventor, I hereby declare that the above-identified application was made or authorized to made by me, and that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 10 by fine or imprisonment of not more than five (5) years, or both. ASSIGNOR (INVENTOR): Signature: Date: Date:	consideration paid by said assigns, sells and transfers to interest in and to said applicant and all patents which in assignee, and said assignee's all divisions and continuat including any and all renew anywise arising from or application including any and all renew assignee's successors and a	assignee to said assigned to said assignee, and said cation, including any and may be granted therefor, is successors and assigns, ions thereof, and the said assigns, reissues and prolong pertaining thereto, for an awals, reissues and prolossigns, in as ample and	or, the receipt of d assignee's succeif all divisions an including any a to have, hold, e aid invention ar gations thereof, and during the to congations there beneficial a ma	of which is hereby ack essors and assigns, the d continuations thereon and all renewals, reissur- exercise and enjoy the s d any and all patents with all the rights, poverm or terms of any and of, for the use and b	cnowledge e full and of f, and in a es and pro- aid applic which m wers, privind all sucle enefit of	d, said exclusind to solongat ation, in ay be leges an pater said as	l assign we righ aid invo ions the includir granted and adv ats whe ssignee,	nor hereby t, title and ention and ereof; said ng any and d therefor, rantages in n granted, , and said
said application, and on any and all divisions and continuations thereof, to said assignee, and said assignee's successors assigns, in accordance herewith. As an above-named inventor, I hereby declare that the above-identified application was made or authorized to made by me, and that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 16 by fine or imprisonment of not more than five (5) years, or both. ASSIGNOR (INVENTOR): Date:	assigns, any and all acts rela							
made by me, and that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 10 by fine or imprisonment of not more than five (5) years, or both. ASSIGNOR (INVENTOR): Signature: Date:	said application, and on any	and all divisions and co						
by fine or imprisonment of not more than five (5) years, or both. ASSIGNOR (INVENTOR): Signature: Date:	As an above-name made by me, and that I am the	d inventor, I hereby dec he original inventor or an	lare that the abo	ove-identified applicati	on was m vention in	ade or the ap	authori plicatio	ized to be
Signature: Date:				in this declaration is	punishabk	e under	r 1 8 U .	S.C. 1001
	ASSIGNOR (INVENTOR):	;						
Printed or Typed Name: Yoo Hyun NOH	Signature:		Da	e:				
	Printed or Typed Name: Yo	o Hyun NOH						

Page 1 of 1

ASSIGNMENT OF AND DECLARATION FOR APPLICATION FOR UNITED STATES LETTERS PATENT

ASSIGNOR (INVENTOR):		
Signature: MCM91	Date: <u>1/21/2</u>	0/4
Printed or Typed Name: Jong Moo CHOI	•	
ASSIGNOR (INVENTOR):		
Signature:	Date:	<u> </u>

Page 2 of 2

PATENT REEL: 033438 FRAME: 0933

RECORDED: 07/31/2014

Printed or Typed Name: Young Soo AHN