

<b>PATENT ASSIGNMENT COVER SHEET</b>
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EPAS ID: PAT3761477

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT

**CONVEYING PARTY DATA**

Name	Execution Date
GRANDIS, INC.	02/24/2016

**RECEIVING PARTY DATA**

<b>Name:</b>	SAMSUNG SEMICONDUCTOR INC.
<b>Street Address:</b>	3655 NORTH FIRST STREET
<b>City:</b>	SAN JOSE
<b>State/Country:</b>	CALIFORNIA
<b>Postal Code:</b>	95134

**PROPERTY NUMBERS Total: 84**

Property Type	Number
Patent Number:	8077508
Patent Number:	8077501
Patent Number:	9099181
Patent Number:	8315090
Patent Number:	8456926
Patent Number:	7576956
Patent Number:	7777261
Patent Number:	7224601
Patent Number:	7430135
Patent Number:	7851840
Patent Number:	7973349
Patent Number:	7957179
Patent Number:	8213221
Patent Number:	7894248
Patent Number:	7859034
Patent Number:	8072800
Patent Number:	8456898
Patent Number:	8825442
Patent Number:	8406045
Patent Number:	9141473

PATENT

Property Type	Number
Patent Number:	6888742
Patent Number:	6920063
Patent Number:	7106624
Patent Number:	6714444
Patent Number:	6838740
Patent Number:	6829161
Patent Number:	6933155
Patent Number:	6847547
Patent Number:	6985385
Patent Number:	7161829
Patent Number:	7245462
Patent Number:	7282755
Patent Number:	6967863
Patent Number:	7242048
Patent Number:	7227773
Patent Number:	6958927
Patent Number:	7190611
Patent Number:	7110287
Patent Number:	7821087
Patent Number:	7242045
Patent Number:	7531882
Patent Number:	7821088
Patent Number:	6992359
Patent Number:	7233039
Patent Number:	7009877
Patent Number:	7098494
Patent Number:	7088609
Patent Number:	7057921
Patent Number:	7495303
Patent Number:	7369427
Patent Number:	7126202
Patent Number:	7241631
Patent Number:	7190612
Patent Number:	7289356
Patent Number:	7518835
Patent Number:	7230845
Patent Number:	7489541
Patent Number:	7272034

Property Type	Number
Patent Number:	7272035
Patent Number:	7286395
Patent Number:	7187577
Patent Number:	7791931
Patent Number:	7515457
Patent Number:	7916433
Patent Number:	7760474
Patent Number:	7486551
Patent Number:	8625339
Patent Number:	8723557
Patent Number:	7742328
Patent Number:	7486552
Patent Number:	8378438
Application Number:	13035726
Patent Number:	8913350
Patent Number:	8385106
Patent Number:	8422285
Patent Number:	8159866
Patent Number:	8411497
Patent Number:	8546986
Patent Number:	8891290
Patent Number:	8248100
Patent Number:	8374048
Patent Number:	8399941
Patent Number:	8432009
Patent Number:	8446761

**CORRESPONDENCE DATA**

**Fax Number:** (626)577-8800

*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:** (626)795-9900

**Email:** pto@lrrc.com

**Correspondent Name:** LEWIS ROCA ROTHGERBER CHRISTIE LLP

**Address Line 1:** P.O. BOX 29001

**Address Line 4:** GLENDALE, CALIFORNIA 91209

**ATTORNEY DOCKET NUMBER:** 10/S1500/JEJ/DMW

**NAME OF SUBMITTER:** DEREK WIBBEN

**SIGNATURE:** /Derek Wibben/

<b>DATE SIGNED:</b>	02/29/2016
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**Total Attachments: 8**

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**ASSIGNMENT**

**WHEREAS, GRANDIS, INC.**, a Delaware corporation, having a business address of 1123 Cadillac Court, Milpitas, California, 95035 (hereafter, together with any successors, legal representatives or assigns thereof, called "ASSIGNOR") is the assignee of record of certain U.S. Patents listed on Appendix I, which is attached hereto (hereinafter referred to as "PATENTS").

**AND WHEREAS, SAMSUNG SEMICONDUCTOR INC.**, a California corporation, having a place of business at 3655 North First Street, San Jose, California, 95134 (hereafter, together with any successors, legal representatives or assigns thereof, called "ASSIGNEE") has acquired and wants to acquire the entire right, title and interest in and to said PATENTS and all inventions therein, and ASSIGNOR is willing to enter into such assignment.

**NOW, THEREFORE**, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, ASSIGNOR has sold, assigned, transferred, and set over, and does hereby sell, assign, transfer and set over to ASSIGNEE the entire right, title and interest in and to said PATENTS and all continuations, divisions, reexaminations, reissues and substitutes thereof, and said inventions therein, including the right to sue or otherwise bring action and to collect and receive damages therefrom, for past infringement thereof, and all priority rights under all available International Agreements, Treaties and Conventions for the protection of intellectual property in its various forms in every participating country, and all applications for patents (including related rights such as utility-model registrations, inventor's certificates, and the like) heretofore or hereafter filed for said inventions in any foreign countries, and all patents (including all continuations, divisions, extensions, renewals, substitutes, and reissues thereof) granted for said inventions in any foreign countries; and we hereby authorize and request the United States Commissioner of Patents and Trademarks, and any officials of foreign countries whose duty it is to issue patents on applications as aforesaid, to issue all patents for said inventions to ASSIGNEE in accordance with the terms of this Assignment;

**ASSIGNOR** hereby covenants that it has full right to convey the entire interest herein assigned, and that it has not executed, and will not execute, any agreement in conflict herewith;

~~ASSIGNOR~~ hereby further covenants and agrees that it will communicate to ASSIGNEE any and all facts known to it respecting said PATENTS, and testify in any legal proceeding, sign all lawful papers, execute all divisional, continuation, reexamination, reissue and substitute applications, and make all rightful oaths and generally do everything possible to aid ASSIGNEE to obtain and enforce proper patent protection for said invention in all countries.

**IN TESTIMONY WHEREOF**, I hereunto set my hand this 24 day of February, 2016.

GRANDIS, INC.

By M. P. Krounbi  
Mohamad Krounbi  
Senior Vice President, GRANDIS, INC.

JEJ/rav

**ASSIGNMENT  
Docket No. 10/S1500**

**APPENDIX I**

Application #	Patent # or Pub #	Title	Docket #
12544189	8,077,508	Dynamic multistate memory write driver	028073-000100US 1535-009
12558451	8,077,501	Differential Read and Write Architecture	028073-000200US 92506-773164 1535-010
13011726	9,099,181	Non-volatile static ram cell circuit and timing method	028073-000410US
12903152	8,315,090	Pseudo Page Mode Memory Architecture and Method	028073-000500US
13013616	8,456,926	Memory write error correction circuit	028073-000610US
11190255	7,576,956	Magnetic Tunnel Junction Having Diffusion Stop Layer	19340-0002001
11232356	7,777,261	Magnetic Device Having Stabilized Free Ferromagnetic Layer	19340-0003001
11271208	7,224,601	Oscillating-Field Assisted Spin Torque Switching of a Magnetic Tunnel Junction Memory Element	19340-0004001
11318337	7,430,135	Current-Switched Spin-Transfer Magnetic Devices with Reduced Spin-Transfer Switching Current Density	19340-0005001
11520868	7,851,840	Devices and Circuits Based on Magnetic Tunnel Junctions Utilizing a Multilayer Barrier	19340-0008001
11498294	7,973,349	Magnetic Device Having Multilayered Free Ferromagnetic Layer	19340-0009001
11769645	7,957,179	Magnetic shielding in magnetic multilayer structures	19340-0011001
13105797	8,213,221	Magnetic shielding in magnetic multilayer structures	19340-0011003
12210126	7,894,248	Programmable and redundant circuitry based on MTJ	19340-0020001
12425370	7,859,034	Magnetic devices having oxide antiferromagnetic layer next to free ferromagnetic layer	19340-0022001 related to 0003001, 0009001.
12560362	8,072,800	Magnetic element having perpendicular anisotropy with enhanced efficiency	19340-0027001

**ASSIGNMENT**  
**Docket No. 10/S1500**

13311308	8,456,898	Magnetic element having perpendicular anisotropy with enhanced efficiency	19340-0027002
12888257	8,825,442	Probabilistic Switching Voltage Determination	19340-0030001
13009818	8,406,045	Three Terminal Magnetic Element	19340-0031001
13427465	9,141,473	Parallel memory error detection and correction	19340-0032001 (1535-028)
10231430	6,888,742	Off-Axis Pinned Layer Magnetic Element Utilizing Spin Transfer and an MRAM Device using the Magnetic Element	2546P
10741188	6,920,063	Magnetic Element Utilizing Spin Transfer and an MRAM Device Using the Magnetic Element	2550C
11114946	7,106,624	Magnetic Element Utilizing Spin Transfer and an MRAM Device Using the Magnetic Element	2550C-2
10213537	6,714,444	Magnetic Element Utilizing Spin Transfer and an MRAM Device Using the Magnetic Element	2550P
10259129	6,838,740	Thermally Stable Magnetic Elements Utilizing Spin Transfer and an MRAM Device Using the Magnetic Element	2621P
10339962	6,829,161	Magnetostatically Coupled Magnetic Elements Utilizing Spin-Transfer and an MRAM Device Using the Magnetic Element	2679P
10443936	6,933,155	Method and System for Providing a Sub .25 Micron Magnetic Memory Structure	2711P
10377689	6,847,547	Magnetostatically Coupled Magnetic Elements Utilizing Spin Transfer and an MRAM Device Using the Magnetic Element	2755P
10649119	6,985,385	Magnetic Memory Element Utilizing Spin Transfer Switching and Storing Multiple Bits	2808P
10665945	7,161,829	Current Confined Pass Layer for Magnetic Elements Utilizing Spin-Transfer and an MRAM Device Using such Magnetic Elements	2892P
10839064	7,245,462	Magnetoresistive Element Having Reduced Spin Transfer Induced Noise	2929P
10714357	7,282,755	Stress Assisted Current Driven Switching for Magnetic Memory Applications	2959P
10787701	6,967,863	Perpendicular Magnetization Magnetic Element Utilizing Spin Transfer	2973P

**ASSIGNMENT  
Docket No. 10/S1500**

11413744	7,242,048	Magnetic Elements with Ballistic Magnetoresistance Utilizing Spin-Transfer and an MRAM Device Using Such Magnetic Elements	2990D
11256387	7,227,773	Magnetic Element Utilizing Spin-Transfer and Half-Metals and an MRAM Device Using the Magnetic Element	3008C
10269011	6,958,927	Magnetic Element Utilizing Spin-Transfer and Half-Metals and an MRAM Device Using the Magnetic Element	3008P
10338148	7,190,611	Spin Transfer Multilayer Stack Containing Magnetic Layers with Resettable Magnetization	3009P
10778735	7,110,287	Method and System for Providing Heat Assisted Switching of a Magnetic Element Utilizing Spin Transfer	3036P
11685723	7,821,087	Spin Transfer Magnetic Element Having Low Saturation Magnetization Free Layers	3037D
10783416	7,242,045	Spin Transfer Magnetic Element Having Low Saturation Magnetization Free Layers	3037P
11239969	7,531,882	Spin transfer magnetic element with free layers having high perpendicular anisotropy and in-plane equilibrium magnetization	3066C
12133671	7,821,088	Spin transfer magnetic element with free layers having high perpendicular anisotropy and in-plane equilibrium magnetization	3066C2
10789334	6,992,359	Spin Transfer Magnetic Element with Free Layers Having High Perpendicular Anisotropy and In-Plane Equilibrium Magnetization	3066P
10829313	7,233,039	Spin Transfer Magnetic Elements with Spin Depolarization Layers	3095P
10714073	7,009,877	Three-Terminal Magnetostatically Coupled Spin Transfer-Based MRAM Cell	3104P
10869734	7,098,494	Re-Configurable Logic Elements Using Heat Assisted Magnetic Tunneling Elements	3154P
10843157	7,088,609	Spin Barrier Enhanced Magnetoresistance Effect Element and Magnetic Memory Using the Same	3163P



**ASSIGNMENT  
Docket No. 10/S1500**

10842973	7,057,921	Spin Barrier Enhanced Dual Magnetoresistance Effect Element and Magnetic Memory Using the Same	3165P
11699160	7,495,303	Magnetic Elements with Spin Engineered Insertion Layers and MRAM Devices Using the Magnetic Elements	3230C
10938219	7,369,427	Magnetic Elements with Spin Engineered Insertion Layers and MRAM Devices Using the Magnetic Elements	3230P
10990561	7,126,202	Method and System for Providing Enhanced Spin Transfer and Heat Assisted Switching of a Magnetic Element	3233P
11027397	7,241,631	MTJ Elements with High Spin Polarization Layers Configured for Spin-Transfer Switching and Spintronics Devices Using the Magnetic Elements	3399P
11096626	7,190,612	Circuitry for Use in Current Switching A Magnetic Cell	3525P
11147944	7,289,356	Fast Magnetic Memory Devices Utilizing Spin Transfer and Magnetic Elements Used Therein	3557P
11173087	7,518,835	Magnetic Elements Having A Bias Field and Magnetic Memory Devices Using the Magnetic Elements	3615P
11192811	7,230,845	Magnetic Devices Having A Hard Bias Field and Magnetic Memory Devices Using the Magnetic Devices	3648P
11210452	7,489,541	Spin-Transfer Switching Magnetic Elements Using Ferrimagnets and Magnetic Memories Using the Magnetic Elements	3667P
11217258	7,272,034	Current Driven Switching of Magnetic Storage Cells Utilizing Spin Transfer and Magnetic Memories Using Such Cells	3671P
11217524	7,272,035	Current Driven Switching of Magnetic Storage Cells Utilizing Spin Transfer and Magnetic Memories Using Such Cells	3691P

**ASSIGNMENT  
Docket No. 10/S1500**

11260778	7,286,395	Current Driven Switched Magnetic Storage Cells Having Improved Read and Write Margins and Magnetic Memories Using Such Cells	3725P
11286083	7,187,577	Method and System for Providing Current Balanced Writing for Memory Cells and Magnetic Devices	3735P
12413535	7,791,931	Current driven memory cells having enhanced current and enhanced current symmetry	3753C
11361267	7,515,457	Current Driven Memory Cells Having Enhanced Current and Enhanced Current Symmetry	3753P
12816108	7,916,433	Magnetic Element Utilizing Free Layer Engineering	3887DIV
11487552	7,760,474	Magnetic Element Utilizing Free Layer Engineering	3887P
11695614	7,486,551	Magnetic Element Using Domain-Wall Assisted Switching of Magnetization and MRAM Devices Using the Magnetic Element	4090P
13083854	8,625,339	Multi-cell per memory-bit circuit and method	92506-798158 (000700US)
13153031	8,723,557	MULTI-SUPPLY SYMMETRIC DRIVER CIRCUIT AND TIMING METHOD	92506-806670 (000310US); 1535-012
11764057	7,742,328	Method and System for Providing Spin Transfer Tunneling Magnetic Memories Utilizing Non-Planar Transistors	GR001
11763800	7,486,552	Method and System for Providing a Spin Transfer Device with Improved Switching Characteristics	GR002

**ASSIGNMENT  
Docket No. 10/S1500**

12328255	8,378,438	Method and system for providing magnetic elements having enhanced magnetic anisotropy and memories using such magnetic elements	GR006
13035726	2012/0155156	Method and system for providing magnetic tunneling junction elements having improved performance through capping layer induced perpendicular anisotropy and memories using such magnetic elements	GRAN007CIP2
12538489	8,913,350	Method and system for providing MTJ elements having improved performance through capping layer induced perpendicular anisotropy and memories using such magnetic elements	GRAN007US
12565273	8,385,106	Method and system providing a hierarchical data path for STTRAM	GRAN010US
13033021	8,422,285	Method and system for providing dual magnetic tunneling junctions usable in spin transfer torque magnetic memories	GRAN011CIP
12609764	8,159,866	Method and system for providing dual magnetic tunneling junctions usable in spin transfer torque magnetic memories	GRAN011US
12774703	8,411,497	Method and system for providing a magnetic field aligned spin transfer torque random access memory	GRAN014
12941031	8,546,986	Method and System for providing magnetic tunneling junction elements having laminated free layers and memories using such magnetic elements	GRAN015US
13045528	8,891,290	Method and system for providing inverted dual magnetic tunneling junction elements	GRAN016US
13089605	8,248,100	Method and system for providing spin transfer based logic elements	GRAN017US
12854628	8,374,048	Method and system for providing magnetic tunneling junction elements having a biaxial anisotropy	GRAN018

**ASSIGNMENT**  
**Docket No. 10/S1500**

12940926	8,399,941	Method and system for providing hybrid magnetic tunneling junction elements with improved switching	GRAN019
13011849	8,432,009	Method and System for Providing Magnetic Layers Having Insertion Layers for Use in Spin Transfer Torque Memories	GRAN020
13031001	8,446,761	Method and System for Providing Multiple Logic Cells in a Single Stack	GRAN021US

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