

## PATENT ASSIGNMENT COVER SHEET

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

**CONVEYING PARTY DATA**

Name	Execution Date
PANNOVA SEMIC, LLC	07/17/2020

**RECEIVING PARTY DATA**

<b>Name:</b>	TAIWAN SEMICONDUCTOR MANUFACTURING CO., LTD.
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<b>City:</b>	HSINCHU
<b>State/Country:</b>	TAIWAN
<b>Postal Code:</b>	300

**PROPERTY NUMBERS Total: 51**

Property Type	Number
Patent Number:	7329322
Patent Number:	6956729
Patent Number:	7148151
Patent Number:	7402527
Patent Number:	6762129
Patent Number:	7341922
Patent Number:	6940152
Patent Number:	6730951
Patent Number:	7022466
Patent Number:	6764811
Patent Number:	6830869
Patent Number:	6721390
Patent Number:	7198888
Patent Number:	7413843
Patent Number:	7166418
Patent Number:	7221690
Patent Number:	6645807
Patent Number:	6689536
Patent Number:	6645694

PATENT

Property Type	Number
Patent Number:	6511786
Patent Number:	6784468
Patent Number:	7183595
Patent Number:	6965141
Patent Number:	7189612
Patent Number:	6958508
Patent Number:	6576398
Patent Number:	6716730
Patent Number:	6809359
Patent Number:	7354791
Patent Number:	7196346
Patent Number:	7169530
Patent Number:	6831018
Patent Number:	7103271
Patent Number:	7273820
Patent Number:	7184344
Patent Number:	6888759
Patent Number:	6963095
Patent Number:	6602721
Patent Number:	7217353
Patent Number:	6875623
Patent Number:	6667185
Patent Number:	6538937
Patent Number:	6703711
Patent Number:	6500769
Patent Number:	7432556
Patent Number:	6583453
Patent Number:	7288456
Patent Number:	7550344
Patent Number:	6943398
Patent Number:	7244982
Patent Number:	7091541

**CORRESPONDENCE DATA**

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**ATTORNEY DOCKET NUMBER:** 0941-4415PUS1

**NAME OF SUBMITTER:** LINDA RUFF

**SIGNATURE:** /Linda Ruff/

**DATE SIGNED:** 09/11/2020

**Total Attachments: 4**

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EXHIBIT B

Patent Assignment

This Patent Assignment ("Patent Assignment") is effective as of July 1, 2020, and is from Pannova Semic, LLC, a Delaware limited liability company, with a principal place of business at 3945 Freedom Circle, Suite 900, Santa Clara, CA 95054 ("Seller"), to Taiwan Semiconductor Manufacturing Company Limited, an entity organized under the laws of the Republic of China, with an address at No. 8 Li-Hsin Road 6, Hsinchu Science Park, Hsinchu, 300 Taiwan ("Buyer").

For good and valuable consideration, the receipt of which is hereby acknowledged, Seller hereby irrevocably assigns to Buyer Seller's entire right, title, and interest throughout the world in and to, (i) the patents and patent applications identified on Schedule 1 hereto, and any and all foreign counterparts of any of the foregoing; (ii) any and all patents that have issued or may issue from any of the patents or patent applications described in (i); (iii) any and all patents and patent applications that, in whole or in part, claim priority to (directly or indirectly), or the benefit of the filing date of, any of the patents or patent applications described in (i) or (ii), including any and all child, continuation, continuation-in-part, continuing prosecution, divisional, provisional, non-provisional, reissue, reexamination, substitution, extension and counterpart patents and patent applications of any of the patents or patents applications described in (i) or (ii); (iv) any and all extensions or renewals of any of the patents or patent applications described in this sentence (the "Assigned Patents"), and (b) all causes of action (whether known or unknown or whether currently pending, filed or otherwise) and other enforcement rights under or on account of, the Assigned Patents, including, without limitation, all causes of action and other enforcement rights for damages, injunctive relief, and any other remedies of any kind for past, current and future infringement.

The terms and conditions of this Patent Assignment will inure to the benefit of Buyer, its successors, assigns, and other legal representatives and will be binding upon Seller, its successors, assigns, and other legal representatives. In the event of any conflict between the terms of this Patent Assignment and that Patent Sale Agreement between the Seller and Buyer dated July 1, 2020, the Patent Sale Agreement will govern.

**SELLER:**

Pannova Semic, LLC

By: 

Name: Matthew K. Waskiewicz

Title: General Manager

**BUYER:**

Taiwan Semiconductor Manufacturing Company Limited

By: 

Name: Billie Chen

Title: Associate General Counsel and Chief IP Counsel

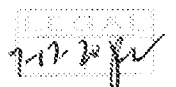
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SCHEDULE 1

PATENTS AND PATENT APPLICATIONS

As set forth in Exhibit A

A handwritten signature in black ink, appearing to be "M. J. F.", is located in the bottom right corner of the page.

**Schedule 1  
US PATENTS AND PATENT APPLICATIONS**

Patent No.	App. No.	Country	Description	Pub. Date	Exp. Date
US7329322		US11/101462	US	Exhaust apparatus, semiconductor device manufacturing system and method for manufacturing semiconductor device	2005/4/8 2008/2/12
US6907892		US10/011725	US	Exhaust apparatus, semiconductor device manufacturing system and method for manufacturing semiconductor device	2001/12/11 2005/6/21
US6956729		US10/636794	US	Capacitor element and production thereof	2003/8/7 2005/10/18
US7148151		US10/759180	US	Dry etching method, fabrication method for semiconductor device, and dry etching apparatus	2004/1/20 2006/12/12
US7402527		US11/545528	US	Dry etching method, fabrication method for semiconductor device, and dry etching apparatus	2006/10/11 2008/7/22
US6762129		US09/826098	US	Dry etching method, fabrication method for semiconductor device, and dry etching apparatus	2001/4/5 2004/7/13
US7341922		US11/487968	US	Dry etching method, fabrication method for semiconductor device, and dry etching apparatus	2006/7/18 2008/3/11
US6940152		US10/473573	US	Semiconductor storage device and its manufacturing method	2003/10/1 2005/9/6
US6730951		US10/175804	US	Capacitor, semiconductor memory device, and method for manufacturing the same	2002/6/21 2004/5/4
US7022466		US10/351308	US	Pattern formation method	2003/1/27 2006/4/4
US6764811		US10/032542	US	Pattern formation method	2002/1/2 2004/7/20
US6830869		US10/415434	US	Pattern forming material and method of pattern formation	2003/4/29 2004/12/14
US6721390		US10/164615	US	Soft x-ray reduction projection exposure system, soft x-ray reduction projection exposure method and pattern formation method	2002/6/10 2004/4/13
US7198888		US11/013333	US	Water-soluble material, chemically amplified resist and pattern formation method using the same	2004/12/17 2007/4/3
	US20070082292	US11/602377	US	Water-soluble material, chemically amplified resist and pattern formation method using the same	2006/11/21
US7413843		US11/641654	US	Sulfonamide compound, polymer compound, resist material and pattern formation method	2006/12/20 2008/8/19
US7166418		US10/932316	US	Sulfonamide compound, polymer compound, resist material and pattern formation method	2004/9/2 2007/1/23
US7221690		US10/643944	US	Semiconductor laser and process for manufacturing the same	2003/8/20 2007/5/22
	US20070195846	US11/790333	US	Semiconductor laser and process for manufacturing the same	2007/4/25
US6645807		US10/234119	US	Method for manufacturing semiconductor device	2002/9/5 2003/11/11
US6689536		US10/033899	US	Pattern formation material and pattern formation method	2002/1/3 2004/2/10
US6645694		US09/922638	US	Pattern formation material and pattern formation method	2001/8/7 2003/11/11
US6511786		US09/924093	US	Pattern formation material and pattern formation method	2001/8/8 2003/1/28
US6784468		US09/988817	US	Ferroelectric memory	2001/11/20 2004/8/31
US7183595		US10/919403	US	Ferroelectric memory	2004/8/17 2007/2/27
US6965141		US10/957618	US	Ferroelectric memory and method for manufacturing the same	2004/10/5 2005/11/15
	US20050242383	US11/175451	US	Ferroelectric memory and method for manufacturing the same	2005/7/7
US7189612		US11/029355	US	Ferroelectric memory and method for manufacturing the same	2005/1/6 2007/3/13
US6958508		US09/968948	US	Ferroelectric memory having ferroelectric capacitor insulative film	2001/10/3 2005/10/25
US6576398		US09/799068	US	Pattern formation material and method	2001/3/6 2003/6/10
US6716730		US10/339602	US	Pattern formation method	2003/1/10 2004/4/6
US6809359		US10/147343	US	Solid-state imaging device, method for manufacturing the same, and method for driving the same	2002/5/16 2004/10/26
US7354791		US10/940051	US	Solid-state imaging device, method for manufacturing the same, and method for driving the same	2004/9/13 2008/4/8
US7196346		US10/863330	US	Semiconductor memory device and method for fabricating the same	2004/6/9 2007/3/27
	US20070158635	US11/724209	US	Semiconductor memory device and method for fabricating the same	2007/3/15

**Schedule 1  
US PATENTS AND PATENT APPLICATIONS**

US7169530		US10/954374	US	Polymer compound, resist material and pattern formation method	2004/10/1	2007/1/30
US6831018		US10/128314	US	Method for fabricating semiconductor device	2002/4/24	2004/12/14
US7103271		US11/000223	US	Light irradiation heat treatment method and light irradiation heat treatment apparatus	2004/12/1	2006/9/5
US7273820		US10/399755	US	Method for fabricating semiconductor device	2003/4/22	2007/9/25
	US20070202666	US11/783131	US	Method for fabricating semiconductor device	2007/4/6	
US7184344		US11/062826	US	Semiconductor device comprising a differential sense amplifier, a write column selection switch and a read column selection switch	2005/2/23	2007/2/27
US6888759		US10/644744	US	Semiconductor device comprising a differential sense amplifier, a write column selection switch and a read column selection switch	2003/8/21	2005/5/3
US7106631		US11/247167	US	Semiconductor device	2005/10/12	2006/9/12
US6963095		US10/632931	US	Ferroelectric memory device and method for fabricating the same	2003/8/4	2005/11/8
US6602721		US09/987002	US	Method for fabricating ferroelectric memory device and method for fabricating the same	2001/11/13	2003/8/5
US7217353		US10/624564	US	Method and apparatus for plating substrate	2003/7/23	2007/5/15
US6875623		US10/602918	US	Method for fabricating semiconductor device	2003/6/25	2005/4/5
US6667185		US10/355069	US	Method of fabricating nitride semiconductor device	2003/1/31	2003/12/23
US6867112		US09/692211	US	Method of fabricating nitride semiconductor device	2000/10/20	2005/3/15
US6538937		US09/930968	US	Nonvolatile semiconductor memory test circuit and method, nonvolatile semiconductor memory and method for fabricating nonvolatile semiconductor memory	2001/8/17	2003/3/25
US6683381		US09/884135	US	Semiconductor device having a copper interconnect layer	2001/6/20	2004/1/27
US6906420		US10/737911	US	Semiconductor device	2003/12/18	2005/6/14
US6475912		US09/321713	US	Semiconductor device and method and apparatus for fabricating the same while minimizing operating failures and optimizing yield	1999/5/28	2002/11/5
US6703711		US10/330152	US	Semiconductor device and method for fabricating the same	2002/12/30	2004/3/9
US6500769		US09/708084	US	Semiconductor device and method for fabricating the same	2000/11/8	2002/12/31
US7432556		US11/620976	US	Semiconductor device with dummy conductors	2007/1/8	2008/10/7
	US20090001473	US12/201991	US	Semiconductor device and method for manufacturing the same	2008/8/29	
	US20050006707	US10/859921	US	Semiconductor device and method for manufacturing the same	2004/6/2	
US6583453		US10/012219	US	Semiconductor device having a voltage-regulator device	2001/11/6	2003/6/24
US7288456		US11/169040	US	Semiconductor device and method for fabricating the same	2005/6/29	2007/10/30
US7550344		US11/889231	US	Semiconductor device and method for fabricating the same	2007/8/10	2009/6/23
US6943398		US10/705984	US	Semiconductor device and method for fabricating the same	2003/11/13	2005/9/13
US7244982		US11/487969	US	Semiconductor device using a conductive film and method of manufacturing the same	2006/7/18	2007/7/17
US7091541		US10/885707	US	Semiconductor device using a conductive film and method of manufacturing the same	2004/7/8	2006/8/15