

## PATENT ASSIGNMENT COVER SHEET

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<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
TSUNG-HSIEN TSAI	02/02/2017
RUEY-BIN SHEEN	02/02/2017
CHIH-HSIEN CHANG	02/02/2017
CHENG-HSIANG HSIEH	02/02/2017
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<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15428841
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<b>DATE SIGNED:</b>	02/10/2017
<b>Total Attachments: 3</b>	
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source=4630056assignment#page3.tif	

**ASSIGNMENT**

In consideration of the sum of One Dollar (\$1.00) or equivalent and other good and valuable consideration paid to each of the undersigned inventors: **Tsung-Hsien TSAI, Ruey-Bin SHEEN, Chih-Hsien CHANG and Cheng-Hsiang HSIEH**, hereby sell and assign to **Taiwan Semiconductor Manufacturing Co., Ltd.**, a corporation formed under the laws of Taiwan, Republic of China, whose mailing address is No. 8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu, Taiwan 300-77 (hereafter referred to as the Assignee), his/her entire right, title and interest, including the right to sue for past infringement and to collect for all past, present and future damages, for the United States of America (as defined in 35 U.S.C. § 100) and throughout the world,

(a) in the invention(s) known as **HYBRID PHASE LOCK LOOP** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of Herewith (also known as United States Application No. To Be Assigned), in any and all applications thereon, in any and all Letters Patent(s) therefor, and

(b) in any and all applications that claim the benefit of the patent application listed above in part (a), including non-provisional applications, continuing (continuation, divisional, or continuation-in-part) applications, reissues, extensions, renewals and reexaminations of the patent application or Letters Patent therefor listed above in part (a), to the full extent of the term or terms for which Letters Patents issue, and

(c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals and reexaminations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the Assignor had this assignment and sale not been made.

The undersigned inventors agree to execute all papers necessary in connection with the application(s) and any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue, reexamination or corresponding application(s) thereof and also to execute separate assignments in connection with such application(s) as the Assignee may deem necessary or expedient.

The undersigned inventors agree to execute all papers necessary in connection with any judicial or administrative proceeding, including but not limited to an interference, derivation, post-grant proceeding, or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof or Letters Patent(s) therefor and to cooperate with the Assignee in every way possible in obtaining evidence and assisting with such judicial or administrative proceeding.

The undersigned inventors hereby represent that he/she has full right to convey the entire interest herein assigned, and that he/she has not executed, and will not execute, any agreement in conflict therewith.

The undersigned inventors hereby grant the patent practitioners associated with **CUSTOMER NUMBER 134593** the power to insert in this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

The undersigned inventors hereby represent that he/she understands that the patent practitioners associated with **CUSTOMER NUMBER 134593** are the legal representatives of, and attorneys for, the assignee, and are NOT the legal representatives of, and attorneys for, the inventors.

IN WITNESS WHEREOF, executed by the undersigned inventors on the date opposite his/her name.

Date: 2017/2/2 Signature of Inventor: Tsung-Hsien Tsai  
 Tsung-Hsien TSAI

Date: 2017/2/2 Signature of Inventor: Ruey-Bin Sheen  
 Ruey-Bin SHEEN

Date: 2017/2/2 Signature of Inventor: Chih-Hsien Chang  
 Chih-Hsien CHANG

Date: 2017/Feb/2nd Signature of Inventor: Cheng-Hsiang Hsieh  
 Cheng-Hsiang HSIEH

SIGNED on behalf of the said ASSIGNEE,

TAIWAN SEMICONDUCTOR  
MANUFACTURING CO., LTD.

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

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