

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT3887090

<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	09/30/2015
CHIH-HSIEN CHANG	09/30/2015
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LTD.
<b>Street Address:</b>	NO.8, LI-HSIN RD. 6, HSINCHU SCIENCE PARK
<b>City:</b>	HSINCHU
<b>State/Country:</b>	TAIWAN
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
Application Number:	14871602
<b>CORRESPONDENCE DATA</b>	
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<b>DATE SIGNED:</b>	05/24/2016
<b>Total Attachments: 2</b>	
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source=US5479-Assignment#page2.tif	

**ASSIGNMENT**

WHEREAS, I(we), TSAI, TSUNG-HSIEN , CHANG, CHIH-HSIEN whose post office address(es) appear(s) below, hereinafter referred to as ASSIGNOR, have invented certain new and useful invention entitled **FREQUENCY SCALING METHOD, CIRCUIT AND ASSOCIATED ALL-DIGITAL PHASE-LOCKED LOOP**

(hereinafter referred to as the INVENTION) for which an application for United States Letters Patent /Utility Patent is executed on even date herewith unless at least one of the following is checked:

- United States Design Patent was
- executed on:
- filed on: 30 September 2015 Serial No.: 14/871,602
- established by PCT International Patent Application No.: \_\_\_\_\_ filed: \_\_\_\_\_ designating the
- United States of America
- issued on \_\_\_\_\_ as U.S. Patent No.: \_\_\_\_\_

WHEREAS, TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LTD. whose post office address is NO.8, LI-HSIN RD. 6, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN, R.O.C. hereinafter referred to as ASSIGNEE, is desirous of acquiring the entire right, title and interest in and to the same in the United States and its territorial possessions;

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, I (we), ASSIGNOR, by these presents do sell, assign and transfer unto said ASSIGNEE, the entire right, title, and interest in and to said INVENTION and application throughout the United States of America, including any and all Letters Patent granted on any division, continuation, continuation-in-part and reissue of said application for the full term or terms for which the same may be granted, including all priority rights under any International Convention.

ASSIGNOR further covenants that no assignments, sale, agreement or encumbrance has been or will be made or entered into which would conflict with this Assignment;

ALSO, ASSIGNOR hereby agrees to execute any documents that legally may be required in connection with the filing, prosecution and maintenance of said application or any other patent application(s) in the United States for said INVENTION, including additional documents that may be required to affirm the rights of ASSIGNEE in and to said INVENTION, all without further consideration. ASSIGNOR also agrees, without further consideration and at ASSIGNEE'S expense, to identify and communicate to ASSIGNEE at ASSIGNEE'S request documents and information concerning the INVENTION that are within ASSIGNOR'S possession or control, and to provide further assurances and testimony on behalf of ASSIGNEE that lawfully may be required of ASSIGNOR in respect of the prosecution, maintenance, litigation and defense of any patent application or patent encompassed within the terms of this instrument. ASSIGNOR'S obligations under this instrument shall extend to ASSIGNOR'S heirs, executors, administrators and other legal representatives.

ALSO, ASSIGNOR hereby authorizes and requests the Commissioner of Patents and Trademarks to issue any and all Letters Patent referred to above to ASSIGNEE, as the ASSIGNEE of the entire right, title and interest in and to the same, for ASSIGNEE'S sole use and behoof; and for the use and behoof of ASSIGNEE'S legal representatives and successors, to the full end of the term for which such Letters Patent may be granted, as fully and entirely as the same would have been held by ASSIGNOR had this assignment and sale not been made.

Assignor Name TSAI, TSUNG-HSIEN	Address 9F., NO.63, LN. 829, ZHUANGJING RD., ZHONGLI CITY, TAoyUAN COUNTY 320, TAIWAN (R.O.C.)
Signature of Assignor (X) <u>TSAI, Tsung-Hsien</u>	Date of Signature (X) <u>2015/9/30</u>
Name of Witness (optional)	Name of Witness (optional)
Signature of Witness (optional)	Signature of Witness (Optional)

Assignor Name CHANG, CHIH-HSIEN	Address 2F. NO. 235, YUNGJEN ROAD, CHUNGHO DIST. NEW TAIPEI CITY, TAIWAN (R.O.C.)
Signature of Assignor (X) <i>Chih-Hsien Chang</i>	Date of Signature (X) <i>2015/9/30</i>
Name of Witness (optional)	Name of Witness (optional)
Signature of Witness (optional)	Signature of Witness (Optional)