

## PATENT ASSIGNMENT COVER SHEET

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LAPIS SEMICONDUCTOR CO., LTD	03/02/2012
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<b>DATE SIGNED:</b>	11/23/2016
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## ASSIGNMENT OF PATENT RIGHTS

For good and valuable consideration, the receipt of which is hereby acknowledged, Lapis Semiconductor Co., Ltd, a company formed under the laws of Japan with an office at 550-1 Higashiasakawa-cho, Hachioji-shi, Tokyo 193-8550, Japan ("*Assignor*"), does hereby sell, assign, transfer, and convey unto Intellectual Ventures Fund 77 LLC, a Delaware limited liability company, having an address at 7251 W Lake Mead Blvd, Ste 300, Las Vegas, NV 89128 ("*Assignee*"), or its designees, all right, title, and interest that exist today and may exist in the future in and to any and all of the following (collectively, the "*Patent Rights*");

(a) the provisional patent applications, patent applications and patents listed in the table below (the "*Patents*");

<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
6146964	US	06/10/1998	Method of manufacturing a semiconductor device having a fin type capacitor electrode  Hakamada, Shinichi
JP3373134	JP	06/13/1997	Manufacture of semiconductor device  Hakamada, Shinichi
KR10-0403886	KR	06/10/1998	Method of manufacturing a semiconductor device  Hakamada, Shinichi
6222426	US	05/05/1999	Branching filter with a composite circuit of an LC circuit and a serial arm SAW resonator  Komazaki, Tomokazu
6870440	US	02/20/2001	SAW branching filter with a branching filter circuit formed on the package  Komazaki, Tomokazu
6937113	US	04/03/2002	Branching filter package  Ohashi, Wataru
7479845	US	01/11/2005	Branching filter package  Ohashi, Wataru
7602263	US	10/30/2007	Branching filter package  Ohashi, Wataru

<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
7859362	US	10/30/2007	Branching filter package Ohashi, Wataru
7679472	US	10/30/2007	Branching filter package Ohashi, Wataru
7893794	US	10/30/2007	Branching filter package Ohashi, Wataru
KR10-0746065	KR	03/08/2000	Branching filter package Ohashi, Wataru
KR10-0759737	KR	03/27/2007	Branching filter package Ohashi, Wataru
5323127	US	01/11/1993	Branching filter having specific impedance and admittance characteristics Komazaki, Tomokazu
6489860	US	09/22/2000	Surface acoustic wave duplexer with first and second package ground patterns Ohashi, Wataru
JP3363870	JP	05/29/2000	Surface acoustic wave branching filter Ohashi, Wataru
6552631	US	03/22/2001	Resonator-type SAW filter with independent ground patterns for interdigital transducers and reflectors Huor, Ou Hok
6486752	US	03/31/2000	Surface acoustic wave filter pattern with grounding via connection lines to dicing lines Noguchi, Kazushige
JP3398631	JP	11/04/1999	Pattern of surface acoustic wave filter and method for the manufacturing the surface acoustic wave filter

<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
5963113	US	02/25/1998	Noguchi, Kazushige SAW ladder filter with inter-stage matching SAW resonator
CNZL98107320.4	CN	04/22/1998	Ou, Hok Huor SAW filter with inter-stage matching SAW resonator
DE69838694.9	DE	02/19/1998	Ou, Hok Huor SAW filter with inter-stage matching SAW resonator
GB0874457	GB	02/19/1998	Ou, Hok Huor SAW filter with inter-stage matching SAW resonator
JP3576350	JP	04/23/1997	Ou, Hok Huor Surface acoustic wave filter
KR10-0323270	KR	03/03/1998	Ou, Hok Huor SAW ladder filter with inter-stage matching SAW resonator
TWI121054	TW	02/24/1998	Ou, Hok Huor Surface-acoustic-wave filter
6031435	US	01/29/1999	Inose, Naoto Multiple-stage ladder type SAW filter having series resonators with decreasing electrode pitches
JP3576367	JP	01/30/1998	Inose, Naoto Surface acoustic wave filter
6737936	US	03/26/2002	Noguchi, Kazushige Surface-acoustic-wave duplexer with improved isolation
JP3648462	JP	04/27/2001	Noguchi, Kazushige Surface acoustic wave branching filter

<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
JP4400788	JP	12/20/2004	Noguchi, Kazushige Surface acoustic wave branching filter
6025763	US	01/28/1997	Noguchi, Kazushige Resonator-type surface-acoustic-wave ladder filter with improved upper stopband attenuation and reduced insertion loss
DE69715705.9	DE	03/10/1997	Morimoto, Shigeyuki Acoustic resonator surface acoustic wave filters with improved upper stopband attenuation in the stop band and low insertion loss
GB0795958	GB	03/10/1997	Morimoto, Shigeyuki Resonator-type surface-acoustic-wave filter with improved upper stopband attenuation and reduced insertion loss
JP3614234	JP	03/14/1996	Morimoto, Shigeyuki Resonator type surface acoustic wave filter
SE0795958	SE	03/10/1997	Morimoto, Shigeyuki Surface-acoustic-wave resonator filter of the type of improvement over the barrier band attenuation and reduced
6861786	US	06/19/2002	Morimoto, S. SAW device
7034435	US	01/25/2005	Hakamada, Shinichi SAW device
JP3926633	JP	01/21/2002	Hakamada, Shinichi SAW device and its manufacturing method
			Hakamada, Shinichi

<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
6774542	US	09/26/2002	SAW device  Anasako, Kenichi
JP4060090	JP	02/15/2002	Surface acoustic wave element  Anasako, Kenichi
6908562	US	01/27/2003	Method of forming electrode for SAW device  Hakamada, Shinichi
JP4053320	JP	03/18/2002	Electrode forming method for surface acoustic wave device  Hakamada, Shinichi
6329739	US	04/30/1999	Surface-acoustic-wave device package and method for fabricating the same  Sawano, Masayuki
6351194	US	06/29/1998	Electronic component utilizing face-down mounting  Takahashi
JP2007-151264	JP	06/07/2007	Surface acoustic wave filter package  Takahashi, Yoshiro
6480077	US	03/15/2001	Surface acoustic wave filter device having a signal line connected by a wire to a floating electrode  Ohashi, Wataru
JP3362727	JP	03/17/2000	Surface acoustic wave filter device  Ohashi, Wataru
6416934	US	06/28/2000	Manufacturing method of a surface acoustic wave device  Yamagishi, Masao
JP3432472	JP	12/09/1999	Manufacture of surface acoustic wave device  Yamagishi, Masao

<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
6424239	US	05/26/2000	Differential surface acoustic wave filter  Ehara, Hisanori
JP3607833	JP	05/28/1999	Differential surface acoustic wave filter  Ebara, Naganori
6911878	US	10/21/2002	Acoustic wave branching filter having transmitting filter with optimal power handling  Anasako, Kenichi
7420440	US	11/09/2004	Transmitting filter including SAW resonators  Anasako, Kenichi
JP3980323	JP	10/26/2001	Surface acoustic wave branching filter  Anasako, Kenichi
6844795	US	02/21/2003	SAW filter with an improved attenuation characteristic at a frequency any multiple of an attenuation pole frequency at one or both sides of a pass band  Inose, Naoto
JP4056798	JP	06/06/2002	Elastic surface-wave filter  Inose, Naoto
7242271	US	02/28/2005	SAW filter circuit  Komazaki, Tomokazu
JP4103855	JP	06/21/2004	SAW filter circuit  Komazaki, Tomokazu
5949305	US	02/10/1997	SAW filter encapsulated in a ceramic package with capacitance incorporated therein  Shimamura, Hajime
DE69738146.3	DE	02/07/1997	In ceramic package



<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
			encapsulated surface acoustic wave filter with integral capacity  Shimamura, Hajime
GB1653613	GB	02/07/1997	SAW filter encapsulated in a ceramic package with capacitance incorporated therein  Shimamura, Hajime
KR10-0326904	KR	02/12/1997	SAW filters inside the sealed ceramic package  Shimamura, Hajime
6208223	US	12/15/1998	Receiving filter of a SAW separator with greater electrode interdigitated width in first stage parallel resonator  Shimamura, Hajime
6380827	US	06/08/2000	Surface acoustic wave filter and branching filter utilizing it.  Noguchi, Kazushige
6373350	US	12/01/1999	Branching filter with SAW-resonator transmitting and receiving filters in separate packages and receiving-branch lines in both packages  Fujita, Yoshiaki
JP4253741	JP	12/01/1998	Branching filter  Fujita, Yoshiaki
6377140	US	03/15/2000	SAW resonator filter with bridged-T configuration  Ehara, Hisanori
DE60044597.6	DE	03/03/2000	SAW resonator filters with bridged T-network  Ehara, Hisanori
FR1067686	FR	03/03/2000	SAW resonator filter with bridged-T configuration

<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
			Ehara, Hisanori
GB1067686	GB	03/03/2000	SAW resonator filter with bridged-T configuration
			Ehara, Hisanori
KR10-0804460	KR	03/08/2000	The elastic surface wave resonator filters with bridged-T configuration
			Ehara, Hisanori
6861925	US	10/21/2002	Surface acoustic wave filter
			Ohashi, Wataru
10/822731	US	04/13/2004	Surface acoustic wave device and method of adjusting LC component of surface acoustic wave device
			Anasako, Kenichi
JP4381714	JP	04/16/2003	Surface acoustic wave device, method of adjusting LC element of surface acoustic wave device
			Anasako, Kenichi
7034392	US	07/08/2004	Duplexer
			Hirakawa, Akio
JP4344190	JP	07/23/2003	Branching filter
			Hirakawa, Akio
RE37639	US	01/18/2000	Surface-acoustic-wave filters with poles of attenuation created by impedance circuits
			Ehara, Hisanori
DE69722168.7	DE	11/28/1997	Surface-acoustic-wave filter with attenuation poles generated by impedance circuits
			Ehara, Hisanori

<u>Patent or Application No.</u>	<u>Country</u>	<u>Filing Date</u>	<u>Title of Patent and First Named Inventor</u>
DE69738934.0	DE	11/28/1997	Surface-acoustic-wave filter with attenuation poles generated by impedance circuits  Ehara, Hisanori
FR0862266	FR	11/28/1997	Surface-acoustic-wave filters with poles of attenuation created by impedance circuits  Ehara, Hisanori
GB1326333	GB	11/28/1997	Surface-acoustic-wave filters with poles of attenuation created by impedance circuits  Ehara, Hisanori
GB0862266	GB	11/28/1997	Surface-acoustic-wave filters with poles of attenuation created by impedance circuits  Ehara, Hisanori
KR10-0325796	KR	12/30/1997	Impedance in the circuit with a surface acoustic wave generated by the attenuation-pole filter  Ehara, Hisanori
6677835	US	11/16/2001	SAW filter with an attenuation pole including a band-pass ladder type of saw filter having a saw resonator  Noguchi, Kazushige
11/328497	US	01/10/2006	Surface acoustic wave filter and SAW filter package  Noguchi, Kazushige
JP3614369	JP	01/11/2001	Polarized SAW filter  Noguchi, Kazushige
JP3907673	JP	01/11/2001	SAW filter package  Terada, Satoshi
JP3868472	JP	01/11/2001	Filter package  Terada, Satoshi

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JP3868473	JP	01/11/2001	SAW filter and SAW filter package Terada, Satoshi
JP3980046	JP	01/11/2001	SAW filter package Terada, Satoshi
6765456	US	12/17/2001	Surface acoustic wave duplexer and portable communication device using the same Ehara, Hisanori
JP3380417	JP	02/12/1997	Polarized SAW filter Ebara, Naganori

(b) all patents and patent applications (i) to which any of the Patents directly or indirectly claims priority, (ii) for which any of the Patents directly or indirectly forms a basis for priority, and/or (iii) that were co-owned applications that incorporate by reference, or are incorporated by reference into, the Patents;

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(h) all causes of action (whether known or unknown or whether currently pending, filed, or otherwise) and other enforcement rights under, or on account of, any of the Patents and/or any item in any of the foregoing categories (b) through (g), including, without limitation, all causes of action and other enforcement rights for

- (1) damages,
- (2) injunctive relief, and
- (3) any other remedies of any kind

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Assignor will, at the reasonable request of Assignee and without demanding any further consideration therefore, do all things necessary, proper, or advisable, including without limitation, the execution, acknowledgment, and recordation of specific assignments, oaths, declarations, and other documents on a country-by-country basis, to assist Assignee in obtaining, perfecting, sustaining, and/or enforcing the Patent Rights.

The terms and conditions of this Assignment of Patent Rights will inure to the benefit of Assignee, its successors, assigns, and other legal representatives and will be binding upon Assignor, its successors, assigns, and other legal representatives.

IN WITNESS WHEREOF this Assignment of Patent Rights is executed at Tokyo  
Japan on March 2<sup>nd</sup>, 2012.

**ASSIGNOR:**

**Lapis Semiconductor Co., Ltd**

By: [Signature]  
Name: Kotaro Yoshihara  
Title: Director, Administrative Headquarters  
(Signature MUST be attested)

**ATTESTATION OF SIGNATURE PURSUANT TO 28 U.S.C. § 1746**

The undersigned witnessed the signature of Kotaro Yoshihara to the above Assignment of Patent Rights on behalf of Lapis Semiconductor Co., Ltd and makes the following statements:

1. I am over the age of 18 and competent to testify as to the facts in this Attestation block if called upon to do so.
2. Kotaro Yoshihara is personally known to me (or proved to me on the basis of satisfactory evidence) and appeared before me on March 2, 2012 to execute the above Assignment of Patent Rights on behalf of Lapis Semiconductor Co., Ltd.
3. Kotaro Yoshihara subscribed to the above Assignment of Patent Rights on behalf of Lapis Semiconductor Co., Ltd.

I declare under penalty of perjury under the laws of the United States of America that the statements made in the three (3) numbered paragraphs immediately above are true and correct.

EXECUTED on March 2, 2012 (date)

[Signature]  
Print Name: MAKOTO TAKASHIMA