

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT3886754

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
NIHAR JINDAL	08/13/2015
MURAT MESE	12/10/2015
AROGYASWAMI PAULRAJ	02/15/2015
LOUAY JALLOUL	02/20/2015
AMIN MOBASHER	05/18/2014
SAM ALEX	08/27/2015
RECEIVING PARTY DATA	
Name:	BROADCOM CORPORATION
Street Address:	5300 CALIFORNIA AVENUE
City:	IRVINE
State/Country:	CALIFORNIA
Postal Code:	92617
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	14142581
CORRESPONDENCE DATA	
Fax Number:	(202)371-2540
<i>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.</i>	
Email:	aedelin@skgf.com
Correspondent Name:	STERNE KESSLER GOLDSTEIN & FOX
Address Line 1:	1100 NEW YORK AVENUE, NW
Address Line 4:	WASHINGTON, D.C. 20005
ATTORNEY DOCKET NUMBER:	3875.8470001
NAME OF SUBMITTER:	KAVON NASABZADEH
SIGNATURE:	/Kavon Nasabzadeh, #62,721/
DATE SIGNED:	05/24/2016
Total Attachments: 12	
source=38758470001Asgn#page1.tif	

source=38758470001Asgn#page2.tif
source=38758470001Asgn#page3.tif
source=38758470001Asgn#page4.tif
source=38758470001Asgn#page5.tif
source=38758470001Asgn#page6.tif
source=38758470001Asgn#page7.tif
source=38758470001Asgn#page8.tif
source=38758470001Asgn#page9.tif
source=38758470001Asgn#page10.tif
source=38758470001Asgn#page11.tif
source=38758470001Asgn#page12.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: **Nihar JINDAL, Murat MESE, Arogyaswami PAULRAJ, Louay JALLOUL, Amin MOBASHER and Sam ALEX**, hereby sell and assign to **Broadcom Corporation**, a corporation formed under the laws of California, whose mailing address is 5300 California Avenue, Irvine, California 92617 (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 **Cross Cell Beam Persistence In A Massive Multiple-Input, Multiple Output (MIMO) Environment** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 27, 2013 (also known as United States Application No. 14/142,581), 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.

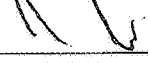
The undersigned inventors agree to execute all papers necessary in connection with any interference or patent enforcement action (judicial or otherwise) related to the application(s) or any non-provisional, continuing (continuation, divisional, or continuation-in-part), reissue or reexamination application(s) thereof and to cooperate with the Assignee in every way possible in obtaining evidence and going forward with such interference or patent enforcement action.

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 49579** 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 49579** 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: 8/13/15 Signature of Inventor: 
Nihar JINDAL

Date: _____ Signature of Inventor: _____
Murat MESE

Date: _____ Signature of Inventor: _____
Arogyaswami PAULRAJ

Date: _____ Signature of Inventor: _____
Louay JALLOUL

Date: _____ Signature of Inventor: _____
Amin MOBASHER

Date: _____ Signature of Inventor: _____
Sam ALEX

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: **Nihar JINDAL, Murat MESE, Arogyaswami PAULRAJ, Louay JALLOUL, Amin MOBASHER and Sam ALEX**, hereby sell and assign to **Broadcom Corporation**, a corporation formed under the laws of California, whose mailing address is 5300 California Avenue, Irvine, California 92617 (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 **Cross Cell Beam Persistence In A Massive Multiple-Input, Multiple Output (MIMO) Environment** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 27, 2013 (also known as United States Application No. 14/142,581), 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 interference 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 and to cooperate with the Assignee in every way possible in obtaining evidence and going forward with such interference or patent enforcement action.

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 49579** 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 49579** 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: _____ Signature of Inventor: _____
Nihar JINDAL

Date: 12/12/15 Signature of Inventor: _____
Murat MESE

Date: _____ Signature of Inventor: _____
Arogyaswami PAULRAJ

Date: _____ Signature of Inventor: _____
Louay JALLOUL

Date: _____ Signature of Inventor: _____
Amin MOBASHER

Date: _____ Signature of Inventor: _____
Sam ALEX

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: **Nihar JINDAL, Murat MESE, Arogyaswami PAULRAJ, Louay JALLOUL, Amin MOBASHER and Sam ALEX**, hereby sell and assign to **Broadcom Corporation**, a corporation formed under the laws of California, whose mailing address is 5300 California Avenue, Irvine, California 92617 (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 **Cross Cell Beam Persistence In A Massive Multiple-Input, Multiple Output (MIMO) Environment** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 27, 2013 (also known as United States Application No. 14/142,581), 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 interference 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 and to cooperate with the Assignee in every way possible in obtaining evidence and going forward with such interference or patent enforcement action.

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 49579** 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 49579** 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: _____ Signature of Inventor: _____
Nihar JINDAL

Date: _____ Signature of Inventor: _____
Murat MESE

Date: 2/15/15 Signature of Inventor: 
Acogyaswami PAULRAJ

Date: _____ Signature of Inventor: _____
Louay JALLOUL

Date: _____ Signature of Inventor: _____
Amin MOBASHER

Date: _____ Signature of Inventor: _____
Sam ALEX

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: **Nihar JINDAL, Murat MESE, Arogyaswami PAULRAJ, Louay JALLOUL, Amin MOBASHER and Sam ALEX**, hereby sell and assign to **Broadcom Corporation**, a corporation formed under the laws of California, whose mailing address is 5300 California Avenue, Irvine, California 92617 (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 **Cross Cell Beam Persistence In A Massive Multiple-Input, Multiple Output (MIMO) Environment** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 27, 2013 (also known as United States Application No. 14/142,581), 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 interference 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 and to cooperate with the Assignee in every way possible in obtaining evidence and going forward with such interference or patent enforcement action.

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 49579** 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 49579** 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: _____ Signature of Inventor: _____
Nihar JINDAL

Date: _____ Signature of Inventor: _____
Murat MESE

Date: _____ Signature of Inventor: _____
Arogyaswami PAULRAJ

Date: 2/20/2015 Signature of Inventor: 
Louay JAKLOUL

Date: _____ Signature of Inventor: _____
Amin MOBASHER

Date: _____ Signature of Inventor: _____
Sam ALEX

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: **Nihar JINDAL, Murat MESE, Arogyaswami PAULRAJ, Louay JALLOUL, Amin MOBASHER and Sam ALEX**, hereby sell and assign to **Broadcom Corporation**, a corporation formed under the laws of California, whose mailing address is 5300 California Avenue, Irvine, California 92617 (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 **Cross Cell Beam Persistence in a Massive Multiple-Input, Multiple Output (MIMO) Environment** for which a provisional application for patent in the United States of America was filed on December 11, 2013 (also known as United States Application No. 61/914,893), in any and all non-provisional applications therefrom, in any and all Letters Patent(s) granted from such non-provisional applications, 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 interference 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 and to cooperate with the Assignee in every way possible in obtaining evidence and going forward with such interference or patent enforcement action.

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 49579** 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 49579** 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: _____ Signature of Inventor: _____
Nihar JINDAL

Date: _____ Signature of Inventor: _____
Murat MESE

Date: _____ Signature of Inventor: _____
Arogyaswami PAULRAJ

Date: _____ Signature of Inventor: _____
Louay JALLOUL

Date: May 18, 2014 Signature of Inventor: Amin Mobasher
Amin MOBASHER

Date: _____ Signature of Inventor: _____
Sam ALEX

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: **Nihar JINDAL, Murat MESE, Arogyaswami PAULRAJ, Louay JALLOUL, Amin MOBASHER and Sam ALEX**, hereby sell and assign to **Broadcom Corporation**, a corporation formed under the laws of California, whose mailing address is 5300 California Avenue, Irvine, California 92617 (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 **Cross Cell Beam Persistence In A Massive Multiple-Input, Multiple Output (MIMO) Environment** for which application(s) for patent in the United States of America has a filing date or a 371(c) date of December 27, 2013 (also known as United States Application No. 14/142,581), 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 interference 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 and to cooperate with the Assignee in every way possible in obtaining evidence and going forward with such interference or patent enforcement action.

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 49579** 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 49579** 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.

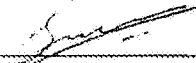
Date: _____ Signature of Inventor: _____
Nihar JINDAL

Date: _____ Signature of Inventor: _____
Murat MESE

Date: _____ Signature of Inventor: _____
Arogyaswami PAULRAJ

Date: _____ Signature of Inventor: _____
Louay JALLOUL

Date: _____ Signature of Inventor: _____
Amin MOBASHER

Date: 8/27/2015 Signature of Inventor: 
Sam ALEX

#1967663_1docx