

## PATENT ASSIGNMENT COVER SHEET

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 Stylesheet Version v1.2

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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>
PANTECH INC.		03/27/2018
<b>RECEIVING PARTY DATA</b>		
<b>Name:</b>	APPLE INC.	
<b>Street Address:</b>	ONE APPLE PARK WAY	
<b>City:</b>	CUPERTINO	
<b>State/Country:</b>	CALIFORNIA	
<b>Postal Code:</b>	95014	
<b>PROPERTY NUMBERS Total: 27</b>		
<b>Property Type</b>	<b>Number</b>	
Application Number:	14360565	
Application Number:	13806488	
Application Number:	15240623	
Application Number:	13670915	
Application Number:	15236835	
Application Number:	14351819	
Application Number:	13883750	
Application Number:	14008590	
Application Number:	15390140	
Application Number:	14114080	
Application Number:	13963532	
Application Number:	15209409	
Application Number:	13805267	
Application Number:	13639051	
Application Number:	13978690	
Application Number:	13696237	
Application Number:	13505194	
Application Number:	13805318	
Application Number:	13640011	
Application Number:	14128449	

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Property Type	Number
Application Number:	13980483
Application Number:	12947679
Application Number:	12608561
Application Number:	14910490
Application Number:	14910798
Application Number:	13521432
Application Number:	14227466

#### CORRESPONDENCE DATA

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**ATTORNEY DOCKET NUMBER:** PANTECH 7888-2\*\*\*\*

**NAME OF SUBMITTER:** JEFFREY C. HOOD

**SIGNATURE:** / Jeffrey C. Hood /

**DATE SIGNED:** 04/13/2018

#### Total Attachments: 5

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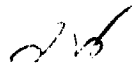
## ASSIGNMENT

This Assignment is made by **[Pantech Inc.]**, a company duly organized under the laws of the Republic of Korea and having an address at 4th Floor Cheongha Bldg. 503, Gangnam-Daero, Seocho-Gu, Seoul, Republic of Korea 06536 (hereinafter the "Assignor"):

WHEREAS, Assignor is the owner of all of the worldwide rights, title and interest in and to the patents and patent applications set forth on Schedule A hereto (hereinafter the "Listed Patents and Applications");

WHEREAS, **Apple Inc.**, a corporation duly organized under and pursuant to the laws of the State of California, and having a principal place of business at One Apple Park Way, Cupertino, California 95014 (hereinafter the "Assignee"), is desirous of acquiring the entire worldwide right, title and interest in and to said Listed Patents and Applications and the Assigned Patents and Applications (as defined below);

NOW, THEREFORE, for good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, said Assignor has sold, assigned, transferred and convey, and by this Assignment does hereby sell, assign, transfer and convey, unto said Assignee, its successors, legal representatives and assigns, Assignor's entire worldwide right, title and interest in and to the above-mentioned Listed Patents and Applications, and in and to any and all (a) applications (including, but not limited to, provisional applications) and patents from or to which any Listed Patents and Applications claim priority (in whole or in part) or that share common priority (in whole or in part) with any Listed Patents and Applications, (b) divisionals, continuations, continuations-in-part and foreign counterparts of any of the foregoing, (c) patents granted for, on, or extending any of any of the foregoing, (d) other types of patents, including, but not limited to, design patents, utility models, or other types of patents that derive from, extend, or claim priority based on any of any of the foregoing, (e) reissues, reexaminations and extensions of any of the foregoing, and (f) inventions described in any of the foregoing (collectively, the "Assigned Patents and Applications"), together with all rights under international treaties relating to intellectual property, including, but not limited to, the Paris Convention for the Protection of Industrial Property and the Patent Cooperation Treaty, and to claim all rights of priority resulting from the filing of any of the foregoing, all of the foregoing to be held and enjoyed by said Assignee, for its own use and behalf and the use and behalf of its successors, legal representatives and assigns, to the full end of the term or terms of any and all Assigned Patents and Applications for which patents may be granted, as fully and entirely as the same would have been held and enjoyed by the Assignor, had this sale and assignment not been made. Assignor does hereby sell, assign, transfer, and convey to Assignee, its successors, legal representatives, and assigns all claims for damages and all remedies arising out of any violation of the Assigned Patents and Applications that may have accrued prior to the date of assignment to Assignee, or may accrue hereafter including, but not limited to, the right to sue for, collect, and retain damages for past, present and future infringement of any of the said Assigned Patents and Applications before or after issuance. To the extent that Schedule A hereto contains any typographical or administrative error but it is clear which patent or patent application was intended to be included in the sale, assignment, transfer and conveyance under this Assignment, Assignor and Assignee each acknowledge and agree that the intended patent or patent application is hereby sold, assigned, transferred and conveyed, along with all other rights, privileges and claims enumerated above with respect to such intended patent or patent application.



IN TESTIMONY WHEREOF,

Pantech Inc

By: 

Name: Byeong Jin Kim

Title: CEO

Date: 2018.02.20

Apple Inc

By: 

Name: BJ Watrous

Title: Assistant Secretary

Date: Mar. 27 2018

**SCHEDULE "A" to Assignment**

Country	Type of Patent	Application No.	Filing Date	Grant Number	Grant Date	Title
U.S.A	Utility Patent	14/360565	23-May-14	9596677	23-May-14	METHOD AND DEVICE FOR TRANSMITTING/RECEIVING TRANSMISSION MODE INFORMATION ON USER TERMINAL IN INTER-BAND TDD TRANSMISSION SCHEME
U.S.A	Utility Patent	13/806488	21-Dec-12	9451596	21-Sep-16	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING UPLINK CONTROL INFORMATION IN CARRIER AGGREGATION ENVIRONMENT
U.S.A	Utility Patent	15/240623	18-Aug-16			METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING UPLINK CONTROL INFORMATION IN CARRIER AGGREGATION ENVIRONMENT
U.S.A	Utility Patent	13/670915	7-Nov-12	9419822	16-Aug-16	APPARATUS AND METHOD FOR ESTIMATING CHANNEL
U.S.A	Utility Patent	15/236835	15-Aug-16			APPARATUS AND METHOD FOR ESTIMATING CHANNEL
U.S.A	Utility Patent	14/351819	14-Apr-14			METHOD AND APPARATUS FOR TRANSMITTING A REFERENCE SIGNAL IN WIRELESS COMMUNICATION SYSTEM
U.S.A	Utility Patent	13/883750	6-May-13	9603169	21-Mar-17	METHOD AND DEVICE FOR TRANSMITTING AND RECEIVING APERIODIC REFERENCE SIGNAL
U.S.A	Utility Patent	14/008590	30-Sep-13	9532287	27-Dec-16	HANDOVER APPARATUS AND METHOD FOR AVOIDING IN-DEVICE COEXISTENCE INTERFERENCE
U.S.A	Utility Patent	15/390140	23-Dec-16			HANDOVER APPARATUS AND METHOD FOR AVOIDING IN-DEVICE COEXISTENCE INTERFERENCE
U.S.A	Utility Patent	14/114080	6-Nov-13	9590784	7-Mar-17	METHOD AND DEVICE FOR CONTROLLING THE TRANSCPTION OF MULTIPLE PIECES OF CONTROL INFORMATION IN A WIRELESS COMMUNICATION SYSTEM
U.S.A	Utility Patent	13/963532	9-Aug-13	9408197	2-Aug-16	APPARATUS AND METHOD FOR TRANSMITTING CONTROL INFORMATION IN WIRELESS COMMUNICATION SYSTEM
U.S.A	Utility Patent	15/209409	13-Jul-16	9756642	5-Sep-17	APPARATUS AND METHOD FOR TRANSMITTING CONTROL INFORMATION IN WIRELESS COMMUNICATION SYSTEM
U.S.A	Utility Patent	13/805267	18-Dec-12	8873497	28-Oct-14	APPARATUS AND METHOD FOR TRANSMITTING INFORMATION ON POWER HEADROOM IN MULTIPLE COMPONENT CARRIER SYSTEM

U.S.A	Utility Patent	13/639051	5-Nov-12	9055491	9-Jun-15	HANDOVER DEVICE OF WIRELESS COMMUNICATION SYSTEM USING MULTI-COMPONENT CARRIER AND METHOD THEREOF
U.S.A	Utility Patent	13/978690	8-Jul-13	9179452	3-Nov-15	METHOD FOR CONFIGURING AND TRANSMITTING AN HARQ ACK/NACK SIGNAL, AND DEVICE USING SAME
U.S.A	Utility Patent	13/696237	5-Nov-12	8965434	24-Feb-15	METHOD AND APPARATUS FOR APERIODICALLY TRANSMITTING AND RECEIVING A SOUNDING REFERENCE SIGNAL
U.S.A	Utility Patent	13/505194	30-Apr-12	9042316	26-Feb-15	APPARATUS AND METHOD FOR GENERATING AND TRANSCIEIVING REFERENCE SIGNAL IN WIRELESS COMMUNICATION SYSTEM USING PLURAL COMPONENT CARRIERS
U.S.A	Utility Patent	13/805318	18-Dec-12	9113381	18-Aug-15	APPARATUS AND METHOD FOR PERFORMING HANDOVER IN MULTIPLE COMPONENT CARRIER SYSTEM
U.S.A	Utility Patent	13/640011	8-Oct-12	9036574	19-May-15	METHOD FOR EXPANSIVELY TRANSMITTING CHANNEL ESTIMATION REFERENCE SIGNAL AND METHOD AND DEVICE FOR TRANSMITTING AND RECEIVING CHANNEL ESTIMATION REFERENCE SIGNAL USING SAME
U.S.A	Utility Patent	14/128449	20-Dec-13	9236986	12-Jan-16	METHOD AND APPARATUS FOR CONTROLLING DATA TRAFFIC IN A TDD SYSTEM THAT USES MULTI-COMPONENT CARRIERS
U.S.A	Utility Patent	13/980483	18-Jul-13	9179458	3-Nov-15	METHOD FOR ALLOCATING RESOURCES FOR HARQ ACK/NACK SIGNAL TRANSMISSION, AND METHOD AND APPARATUS FOR HARQ ACK/NACK SIGNAL TRANSMISSION USING SAME
U.S.A	Utility Patent	12/947,679	16-Nov-10	8489087	16-Jul-13	APPARATUS AND METHOD FOR CONTROLLING SMALL BASE STATION
U.S.A	Utility Patent	12/608561	29-Oct-19	8284726	9-Oct-12	APPARATUS AND METHOD FOR ALLOCATING RESOURCE IN A WIRELESS COMMUNICATION SYSTEM USING OFDMA
U.S.A	Utility Patent	13/034455	24-Feb-11	8402050	19-Mar-13	APPARATUS AND METHOD FOR RECOGNIZING OBJECTS USING FILTER INFORMATION
U.S.A	Utility Patent	13/771747	20-Feb-13	9405986	2-Aug-16	Apparatus and Method for Recognizing Object using filter information
U.S.A	Utility Patent	15/225,434	1-Aug-16			APPARATUS AND METHOD FOR RECOGNIZING OBJECTS USING FILTER INFORMATION

U.S.A	Utility Patent	13/196753	2-Aug-11	8654151	18-Feb-14	APPARATUS AND METHOD FOR PROVIDING AUGMENTED REALITY BASED ON X-RAY VIEW
U.S.A	Utility Patent	12/987917	10-Jan-11	8576892	6-Nov-17	COMMUNICATION APPARATUS AND METHOD
U.S.A	Utility Patent	14/055322	16-Oct-13	8897336	25-Nov-14	COMMUNICATION APPARATUS AND METHOD
U.S.A	Utility Patent	14/910490	5-Feb-16			METHOD AND APPARATUS FOR CONTROLLING ADAPTIVE REPORTING IN TDD ENVIRONMENT
U.S.A	Utility Patent	14/910798	30-Mar-16			METHOD AND APPARATUS FOR CONTROLLING DOWNLINK HARQ TIMING IN TDD ENVIRONMENT
U.S.A	Utility Patent	13/521432	10-Jul-12	8711797	29-Apr-14	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING EXTENSION INFORMATION OF COMPONENT CARRIER IN WIRELESS COMMUNICATION SYSTEM
U.S.A	Utility Patent	14/227466	3/27/14	9161340	13-Oct-15	METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING EXTENSION INFORMATION OF COMPONENT CARRIER IN WIRELESS COMMUNICATION SYSTEM
E.P.O	Utility Patent	12763503.5	30-Sep-13			HANDOVER APPARATUS AND METHOD FOR AVOIDING IN-DEVICE COEXISTENCE INTERFERENCE
E.P.O	Utility Patent	12851569.9	23-May-14			METHOD AND DEVICE FOR TRANSMITTING/RECEIVING TRANSMISSION MODE INFORMATION ON USER TERMINAL IN INTER-BAND TDD TRANSMISSION SCHEME
E.P.O	Utility Patent	12847566.2	15-Jan-16			APPARATUS AND METHOD FOR ESTIMATING CHANNEL
CHINA	Utility Patent	201280065066.8	27-Jun-14	ZL201280065066.8	7-Nov-17	APPARATUS AND METHOD FOR ESTIMATING CHANNEL
CHINA	Utility Patent	201280025808.4	27-Nov-13			HANDOVER APPARATUS AND METHOD FOR AVOIDING IN-DEVICE COEXISTENCE INTERFERENCE
CHINA	Utility Patent	201280068010.8	24-Jul-14	ZL201280068010.8	5-Apr-17	METHOD AND DEVICE FOR TRANSMITTING/RECEIVING TRANSMISSION MODE INFORMATION ON USER TERMINAL IN INTER-BAND TDD TRANSMISSION SCHEME

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