

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5741753

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
MARVELL WORLD TRADE LTD.	09/26/2019
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	MARVELL INTERNATIONAL LTD.
<b>Street Address:</b>	CANON'S COURT, 22 VICTORIA STREET
<b>City:</b>	HAMILTON
<b>State/Country:</b>	BERMUDA
<b>Postal Code:</b>	HM12
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15669884
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(408)222-2755
<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>	
<b>Phone:</b>	408-222-2500
<b>Email:</b>	kimberly@marvell.com
<b>Correspondent Name:</b>	KELVIN VIVIAN
<b>Address Line 1:</b>	5488 MARVELL LANE
<b>Address Line 4:</b>	SANTA CLARA, CALIFORNIA 95054
<b>ATTORNEY DOCKET NUMBER:</b>	MP653211
<b>NAME OF SUBMITTER:</b>	KELVIN VIVIAN
<b>SIGNATURE:</b>	/Kelvin Vivian/
<b>DATE SIGNED:</b>	09/27/2019
<b>Total Attachments: 88</b>	
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PATENT

ASSIGNMENT AND CANCELLATION OF EXCLUSIVE LICENSE  
MWTL to MIL

WHEREAS, Marvell World Trade Ltd., a corporation of Barbados, having a place of business at L'Horizon, Gunsite Road, Brittons Hill, St. Michael, Barbados BB14027 (hereafter the "ASSIGNOR"), is the owner by respective Assignment of patents and patent applications identified in Exhibit A (hereafter the "ASSIGNED PATENTS"), attached hereto and incorporated herein by reference, and has granted an exclusive license for some or all of the ASSIGNED PATENTS to Marvell International Ltd., a corporation of Bermuda, having a place of business at Canon's Court, 22 Victoria Street, Hamilton, HM12, Bermuda (hereafter the "ASSIGNEE"); and

WHEREAS, ASSIGNOR and ASSIGNEE desire to cancel the exclusive licenses to the ASSIGNED PATENTS (if applicable), and ASSIGNEE desires to acquire the entire right, title, and interest of ASSIGNOR in, to and under said ASSIGNED PATENTS and all inventions and improvements described and claimed therein or entitled to the benefit thereof.

THEREFORE, for good and valuable consideration paid by ASSIGNEE, the receipt of which is hereby acknowledged, ASSIGNOR and ASSIGNEE hereby cancel the exclusive licenses to the ASSIGNED PATENTS (if applicable), and the ASSIGNOR does hereby sell, assign and transfer to the ASSIGNEE, ASSIGNOR's entire right, title and interest in and to the ASSIGNED PATENTS including all inventions and improvements disclosed therein and the right to sue for past, present and future infringement thereof, in the U.S. and every foreign country, and all patent rights, including extensions or derivations thereof, both foreign and domestic, that exist and may issue on the ASSIGNED PATENTS, and in any continuation, continuation-in-part, divisional, re-examination, priority application, reissue or extension of the ASSIGNED PATENTS, and further assigns to the ASSIGNEE the priority right provided by the International Convention. This assignment includes assignment to ASSIGNEE of the right to make application in its own behalf for protection of the ASSIGNED PATENTS and any patents issued on the ASSIGNED PATENTS, in the U.S. and countries foreign to the U.S., and to claim under the Patent Cooperation Treaty, the International Convention and/or other international arrangement for any such application the date of any earlier U.S. application (or any other application on the invention) to gain priority with respect to other applications. The ASSIGNED PATENTS and all patents that issue on the ASSIGNED PATENTS shall be held and enjoyed by the ASSIGNEE, its successors and assigns as fully and entirely as the same would have been held and enjoyed by the ASSIGNOR had this assignment not been made, including all rights therein provided by international conventions and treaties, and the right to sue for past, present and future infringement thereof.

PATENT

By its undersigned representative, the ASSIGNOR agrees

a. to execute all papers necessary in connection with the ASSIGNED PATENTS and any continuing, divisional, reissue, reexamination or corresponding application thereof and also to execute separate Assignment in connection with such application as the ASSIGNEE may deem necessary or expedient;

b. to execute all papers necessary in connection with any interference which may be declared concerning the ASSIGNED PATENTS or any continuation, division, reissue or reexamination thereof and to cooperate with the ASSIGNEE in every way possible in obtaining evidence and going forward with such interference; and

c. to perform all affirmative acts which may be necessary to obtain a grant of a valid United States patent to the ASSIGNEE on any of the ASSIGNED PATENTS and on any continuation, division, reissue or reexamination of any of the ASSIGNED PATENTS.

IN WITNESS WHEREOF, executed by the ASSIGNOR's undersigned representative on the date following the undersigned's name.

MARVELL WORLD TRADE LTD.

By: 

Name: STEVEN PARKER

Title: DIRECTOR

Date: SEPTEMBER 26<sup>th</sup>, 2019

Accepted on behalf of:  
Marvell International Ltd.

By: 

Name: Sherman Taylor

Title: General Manager

Date: September 26, 2019

**PATENT**

**Exhibit A**

<i>Country</i>	<i>MP Number</i>	<i>Application Number</i>	<i>Filing Date</i>	<i>Patent Number</i>	<i>Issue Date</i>	<i>Status</i>	<i>Title</i>	<i>MP Family</i>
US	MP0708	11/429,633	5/5/2006	7,995,543	8/9/2011	Issued	Network Device For Implementing Multiple Access Points And Multiple Client Stations	MP0708
US	MP0708C1	13/205,774	8/9/2011	N/A	N/A	Abandoned	Network Device For Implementing Access Points And Multiple Client Stations	MP0708
JP	MP0708WJD1	2012-097600	4/23/2012	5440890	12/27/2013	Issued	Network Device For Implementing Multiple Access Points And Multiple Client Stations	MP0708
WO	MP0708WO	PCT/US2007/010418	4/30/2007	N/A	N/A	Expired	Network Device For Implementing Multiple Access Points And Multiple Client Stations	MP0708
CN	MP0708WOCN	200780025336	4/30/2007	ZL200780025336.1	5/18/2011	Issued	Network Device For Implementing Multiple Access Points And Multiple Client Stations	MP0708
EP	MP0708WOEP	EP07794419.7	4/30/2007	EP2016788	6/16/2010	Issued	Network Device for Implementing Multiple Access Points and Multiple Client Stations	MP0708
DE	MP0708WOEPDE	07794419.7	4/30/2007	6020070072077	6/16/2010	Issued	Network Device For Implementing Multiple Access Points And Multiple Client Stations	MP0708
FR	MP0708WOEPFR	7794419.7	4/30/2007	2016788	6/16/2010	Issued	Network Device For Implementing Multiple Access Points And Multiple Client Stations	MP0708
GB	MP0708WOEPGB	7794419.7	4/30/2007	2016788	6/16/2010	Issued	Network Device For Implementing Multiple Access Points And Multiple Client Stations	MP0708



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JP	MP0708WOJP	2009-509637	4/30/2007	4986304	5/11/2012	Issued	<i>Network Device For Implementing Multiple Access Points And Multiple Client Stations</i>	MP0708
US	MP0872PR	60/749,222	12/9/2005	N/A	N/A	Expired	<i>Method for Detection and Estimation of Frequency Variation</i>	MP0872
US	MP0872	11/493,473	7/26/2006	7,747,222	6/29/2010	Issued	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872
US	MP0872C1	12/825,775	6/29/2010	8,346,174	1/1/2013	Issued	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872
US	MP0872C1C1	13/730,420	12/28/2012	8,781,401	7/15/2014	Issued	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872
CN	MP0872CN	200610162087.8	12/8/2006	ZL200610162087.8	6/20/2012	Issued	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872
EP	MP0872EP	EP06024208.8	11/22/2006	1795908	7/3/2019	Issued	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872
DE	MP0872EPDE	EP06024208.8	11/22/2006	6.02006E+11	7/3/2019	Issued	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872
FR	MP0872EPFR	EP06024208.8	11/22/2006	1795908	7/3/2019	Issued	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872
GB	MP0872EPGB	EP06024208.8	11/22/2006	1795908	7/3/2019	Issued	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872
HK	MP0872HK	71132342	12/8/2006	N/A	N/A	Published	<i>Detection and Estimation of Radio Frequency Variations</i>	MP0872

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JP	MP0872JP	2006332097	12/8/2006	5052111	8/3/2012	Issued	Detection Estimation of Radio Frequency Variations	MP0872
SG	MP0872SG	2006079768	11/20/2006	N/A	N/A	Published	Detection Estimation of Radio Frequency Variations	MP0872
SG	MP0872SG01	2009038399	11/20/2006	153131	4/29/2011	Issued	Detection and Estimation of Radio Frequency Variations	MP0872
TW	MP0872TW	95146001	12/8/2006	1422196	1/1/2014	Issued	A System for Detection and Estimation of Radio Frequency Variations	MP0872
US	MP0896PR	60/757,605	1/10/2006	N/A	N/A	Expired	Sub-Carrier and Channel Matrix Element Ordering For Receiver Feedback	MP0896
US	MP0896	11/526,319	9/25/2006	8,155,597	4/10/2012	Issued	Transmission Scheduling For Receiver Feedback	MP0896
US	MP0896C1	13/442,301	4/9/2012	8,442,450	5/14/2013	Issued	Sub-Carrier and Channel Matrix Element Ordering For Receiver Feedback	MP0896
US	MP0896C2	13/892,811	5/13/2013	8,838,041	9/16/2014	Issued	Sub-Carrier and Channel Matrix Element Order For Receiver Feedback	MP0896
US	MP0926PR	60/387,234	1/10/2006	N/A	N/A	Expired	Multimode Modulator Employing A Phase Lock Loop For Wireless Communications	MP0926
US	MP0926	10/386,352	3/10/2003	6,924,711	8/2/2005	Issued	Multimode Modulator Employing A Phase Lock Loop For Wireless Communications	MP0926
TW	MP0926TW	92112467	5/7/2003	1327011	7/1/2010	Issued	Multimode Modulator Employing A Phase Lock Loop For Wireless Communications	MP0926

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WO	MP0926WO	PCT/US2003/017338	5/30/2003	N/A	N/A	Published	Multimode Modulator Employing A Phase Lock Loop For Wireless Communications	MP0926
US	MP0933PR	60/621,392	10/22/2004	N/A	N/A	Expired	Encoding and Error Correction System For Enhanced Performance	MP0933
US	MP0933	11/256,218	10/21/2005	7,712,005	5/4/2010	Expired	Encoding and Error Correction System For Enhanced Performance Of Legacy Communications Networks	MP0933
US	MP0933C1	12/772,588	5/3/2010	8,122,326	2/21/2012	Issued	Encoding and Error Correction System For Enhanced Performance Of Legacy Communications Networks	MP0933
WO	MP0933WO	PCT/US2005/038044	10/21/2005	N/A	N/A	Expired	Encoding and Error Correction System For Enhanced Performance Of Legacy Communications Networks	MP0933
CN	MP0933WOCN	200580044338	10/21/2005	ZL200580044338.6	5/12/2010	Issued	Encoding and Error Correction System For Enhanced Performance Of Legacy Communications Networks	MP0933
HK	MP0933WOHK	81068624	6/20/2008	N/A	N/A	Pending	Encoding and Error Correction System For Enhanced Performance Of Legacy Communications Networks	MP0933
US	MP10203	15/963,016	4/25/2018	N/A	N/A	Pending	Low Power Wakeup in a Wireless Network	MP10203
WO	MP10203WO	PCT/US2018/029375	4/25/2018	N/A	N/A	Published	Low Power Wakeup in a Wireless Network	MP10203
US	MP10224PR	62/469,345	3/9/2017	N/A	N/A	Expired	60GHz WLAN Segmentation and Reassembly	MP10224

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US	MP10224	15/916,940	3/9/2018	N/A	N/A	Pending	<i>Systems and Methods for Segmentation and Reassembly of Data Frames in 802.11 Wireless Local Area Networks</i>	MP10224
WO	MP10224WO	PCT/US2018/021824	3/9/2018	N/A	N/A	Published	<i>Systems and Methods for Segmentation and Reassembly of Data Frames in 802.11 Wireless Local Area Networks</i>	MP10224
US	MP10287PR	62/542,614	8/8/2017	N/A	N/A	Expired	<i>Ranging with Near Far STAs</i>	MP10287
US	MP10287	16/054,484	8/3/2018	N/A	N/A	Pending	<i>Multi-User Null Data Packet (NDP) Ranging</i>	MP10287
WO	MP10287WO	PCT/US2018/045182	8/3/2018	N/A	N/A	Published	<i>Multi-User Null Data Packet (NDP) Ranging</i>	MP10287
US	MP10316PR	16/132,154	9/14/2018	N/A	N/A	Expired	<i>Media Access Control for Duplex Transmissions in Wireless Local Area Networks</i>	MP10316/ MP10325
US	MP10316	16/132,154	9/14/2018	N/A	N/A	Pending	<i>Media Access Control for Duplex Transmissions in Wireless Local Area Networks</i>	MP10316/ MP10325
CN	MP10316CN	201811116552.3	9/25/2018	N/A	N/A	Pending	<i>Duplex Mac Consideration</i>	MP10316/ MP10325
US	MP10327PR	62/561,972	9/22/2017	N/A	N/A	Expired	<i>High Efficiency Physical Layer Protocol Data Unit with Midamble Transmission and Reception in 802.11ax</i>	MP10316/ MP10325
US	MP10327	16/135,852	9/19/2018	N/A	N/A	Pending	<i>Determining Number of Midambles in a Packet</i>	MP10327/ MP10372
WO	MP10327WO	PCT/US2018/51738	9/19/2018	N/A	N/A	Published	<i>Determining Number of Midambles in a Packet</i>	MP10316/ MP10325

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US	MP1033PR	60/783,300	3/17/2006	N/A	N/A	Expired	Preamble Sequence Detection For IEEE 802.16e	MP1033/ MP1060/ MP1143/ MP1331
US	MP1033	11/648,735	12/29/2006	8,031,784	10/4/2011	Issued	Preamble Detection With Unknown Channel	MP1033/ MP1060/ MP1143/ MP1331
US	MP1033C1	11/717,405	3/13/2007	8,175,197	5/8/2012	Issued	Preamble Detection With Unknown Channel	MP1033/ MP1060/ MP1143/ MP1331
US	MP1033C1C1	13/460,109	4/30/2012	8,442,166	5/14/2013	Issued	Preamble Detection With Unknown Channel	MP1033/ MP1060/ MP1143/ MP1331
WO	MP1033WO	PCT/US2007/006739	3/16/2007	N/A	N/A	Published	Preamble Detection With Unknown Channel	MP1033/ MP1060/ MP1143/ MP1331
US	MP10342	16/171,934	10/26/2018	N/A	N/A	Pending	Method and Apparatus for Concurrent Coexistence of a Plurality of Radio Access Technologies in Wireless Communication	MP10342
US	MP10346PR	62/574,631	10/19/2017	N/A	N/A	Expired	Wake-Up Radio Dual Frame Format Design	MP10346
US	MP10346	16/155,701	10/9/2018	N/A	N/A	Pending	Wakeup Radio (WUR) Packet Multi-Format Design	MP10346
WO	MP10346WO	PCT/US2018/055045	10/9/2018	N/A	N/A	Published	Wake-Up Radio Dual Frame Format Design	MP10346
US	MP10367PR	62/596,637	12/8/2017	N/A	N/A	Expired	MAC Support of WiFi Channel Aggregation	MP10367
US	MP10367	16/179,634	11/2/2018	N/A	N/A	Pending	WIFI Operation with Channel Aggregation	MP10367

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US	MP10367-2	16/179,647	11/2/2018	N/A	N/A	Pending	WiFi Operation with Channel Aggregation	MP10367
WO	MP10367WO	PCT/US2018/059022	11/2/2018	N/A	N/A	Published	WiFi Operation with Channel Aggregation	MP10367
WO	MP10367WO2	PCT/US2018/059027	11/2/2018	N/A	N/A	Published	MAC Support of WiFi Channel Aggregation	MP10367
US	MP10389PR	62/623,419	1/29/2018	N/A	N/A	Expired	Clear Channel Assessment (CCA) and Error Recovery of Null Data Packet (NDP) Ranging	MP10389
US	MP10389PR2	62/723,946	8/28/2018	N/A	N/A	Expired	Clear Channel Assessment (CCA) and Error Recovery of Null Data Packet (NDP) Ranging	MP10389
US	MP10389	16/179,477	11/2/2018	N/A	N/A	Pending	Error Recovery in Null Data packet (NDP) Ranging	MP10389
WO	MP10389WO	PCT/US2018/058931	11/2/2018	N/A	N/A	Published	Error Recovery in Null Data packet (NDP) Ranging	MP10389
US	MP10399PR	62/656,287	4/11/2018	N/A	N/A	Expired	Method for Zero Forcing based on Back-Substitution	MP10399
US	MP10399	16/381,713	4/11/2019	N/A	N/A	Pending	Receiver Having Equalization with Iterative Parallel Processing and Noise De-Whitening Mitigation	MP10399
WO	MP10399WO	PCT/US2019/027000	4/11/2019	N/A	N/A	Pending	Receiver Having Equalization with Iterative Parallel Processing and Noise De-Whitening Mitigation	MP10399
US	MP10445PR	62/630,120	2/13/2018	N/A	N/A	Expired	Multi-Antenna Receiver with Interference Cancellation	MP10445

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US	MP10445	16/163,167	10/17/2018	N/A	N/A	Pending	Apparatus and Methods for Interference Cancellation in Multi-Antenna Receivers	MP10445
DE	MP10445DE	102018220130.7	11/23/2018	N/A	N/A	Published	Multi-Antenna Receiver with Interference Cancellation	MP10445
US	MP10478PR	62/651,554	4/2/2018	N/A	N/A	Expired	Basic Service Set (BSS) Color in Null Data Packet (NDP) Ranging	MP10478
US	MP10478	16/051,186	7/31/2018	N/A	N/A	Pending	Basic Service Set (BSS) Color in Null Data Packet (NDP) Ranging	MP10478
WO	MP10478WO	PCT/US2018/044684	7/31/2018	N/A	N/A	Pending	Basic Service Set (BSS) Color in Null Data Packet (NDP) Ranging	MP10478
US	MP10480PR	62/650,179	3/29/2018	N/A	N/A	Expired	Rate Adaptation	MP10480
US	MP10480	16/049,739	7/30/2018	N/A	N/A	Pending	Rate Adaptation in Wireless Local Area Networks (WLANS)	MP10480
WO	MP10480WO	PCT/US2018/044403	7/30/2018	N/A	N/A	Pending	Rate Adaptation in Wireless Local Area Networks (WLANS)	MP10480
US	MP10489PR	62/677,949	5/30/2018	N/A	N/A	Expired	Smart Distributed Multiple Input Multiple Output (MIMO)	MP10489
US	MP10489PR2	62/694,800	7/6/2018	N/A	N/A	Expired	Smart Distributed Multiple Input Multiple Output (MIMO)	MP10489
US	MP10489PR3	62/730,407	9/12/2018	N/A	N/A	Expired	Smart Distributed Multiple Input Multiple Output (MIMO)	MP10489

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US	MP10489PR4	62/774,782	12/3/2018	N/A	N/A	Pending	Smart Distributed Multiple Input Multiple Output (MIMO)	MP10489
US	MP10489PR5	62/783,144	12/20/2018	N/A	N/A	Pending	Smart Distributed Multiple Input Multiple Output (MIMO)	MP10489
US	MP10489	16/424,532	5/29/2019	N/A	N/A	Pending	Distributed MIMO Based on Access Point Collaboration	MP10489
US	MP10489D1	16/510,992	7/15/2019	N/A	N/A	Pending	Distributed MIMO Based on Access Point Collaboration	MP10489
WO	MP10489WO	PCT/IB2019/054429	5/29/2019	N/A	N/A	Pending	Distributed MIMO Based on Access Point Collaboration	MP10489
US	MP10490PR	62/662,072	4/24/2018	N/A	N/A	Expired	Fast Rate Adaptation Method for Wireless Local Area Network (WLAN) Communications	MP10490
US	MP10490	16/386,331	4/17/2019	N/A	N/A	Pending	Fast Rate Adaptation for WLAN Devices	MP10490
CN	MP10490CN	201910336060.3	4/24/2019	N/A	N/A	Pending	Fast Rate Adaptation for WLAN Devices	MP10490
DE	MP10490DE	102019205805.1	4/24/2019	N/A	N/A	Pending	Fast Rate Adaptation for WLAN Devices	MP10490
US	MP11026PR	62/712,079	7/30/2018	N/A	N/A	Expired	Frame Transmission in Punctured/Aggregated WiFi Channels	MP11026
US	MP11026	16/526,716	7/30/2019	N/A	N/A	Pending	Media Access Control for Punctured/Aggregated Communication Channels in WLAN	MP11026



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US	MP11026C1	16/526,937	7/30/2019	N/A	N/A	Pending	Media Access Control for Punctured/Aggregated Communication Channels in WLAN	MP11026
WO	MP11026WO	PCT/US2019/44229	7/30/2019	N/A	N/A	Pending	Media Access Control for Punctured/Aggregated Communication Channels in WLAN	MP11026
WO	MP11026WO2	PCT/US2019/44219	7/30/2019	N/A	N/A	Pending	Media Access Control for Punctured/Aggregated Communication Channels in WLAN	MP11026
US	MP11088PR	62/772,451	11/28/2018	N/A	N/A	Pending	MM-wave Plastic Waveguide Channel Dispersion and Multiple In-Line Connectors Channel Compensation Using OFDM Modulation	MP11088
US	MP11088	16/527,109	7/31/2019	N/A	N/A	Pending	Dispersion Compensation in MM-Wave Communication Over Plastic Waveguide Using OFDM	MP11088
US	MP1206PR	60/820,419	7/26/2006	N/A	N/A	Expired	Symbol-Level Combining For MIMO Systems With Harq And/Or Repetition Coding	MP1206/ MP2026
US	MP1206PR2	60/822,294	8/14/2006	N/A	N/A	Expired	Optimal ML Receiver For MIMO Systems With HARQ And/Or Repetition Coding	MP1206/ MP2026
US	MP1206PR3	60/822,821	8/18/2006	N/A	N/A	Expired	Low-Complexity Architecture For MIMO MRC Combining	MP1206/ MP2026

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US	MP1206	11/781,208	7/20/2007	8,027,402	9/27/2011	Issued	Symbol-Level Combining for Multiple Input Multiple Output (MIMO) Systems with Hybrid Automatic Repeat Request (HARQ) and/or Repetition Coding	MP1206/ MP2026
US	MP1206C1	13/236,410	9/19/2011	8,279,966	10/2/2012	Issued	Symbol-Level Combining for Multiple Input Multiple Output (MIMO) Systems with Hybrid Automatic Repeat Request (HARQ) and/or Repetition Coding	MP1206/ MP2026
CN	MP1206CN	200780035909.9	7/24/2007	ZL200780035909.9	8/14/2013	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
EP	MP1206EP	EP20070836245	7/24/2007	2050218	12/27/2017	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
EP	MP1206EPD1	12007307.7	7/24/2007	EP2560313	9/3/2014	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
DE	MP1206EPDE	EP20070836245	7/24/2007	2050218	12/27/2017	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
FR	MP1206EPFR	EP20070836245	7/24/2007	2050218	12/27/2017	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
GB	MP1206EPGB	EP20070836245	7/24/2007	2050218	12/27/2017	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
TW	MP1206TW	96127316	7/26/2007	I466505	12/21/2014	Expired	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
TW	MP1206TWD1	103134192	7/26/2007	I524704	3/1/2016	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026

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DE	MP1206UADE	12007307.7	7/24/2007	60 2007 038 472.9	9/3/2014	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
FR	MP1206UAFR	12007307.7	7/24/2007	2560313	9/3/2014	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
GB	MP1206UAGB	12007307.7	7/24/2007	2560313	9/3/2014	Issued	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
WO	MP1206WO	PCT/US2007/016728	7/24/2007	N/A	N/A	Expired	Symbol-Level Combining for MIMO Systems with HARQ and/or Repetition Coding	MP1206/ MP2026
US	MP1229PR	60/821,771	8/8/2006	N/A	N/A	Expired	WiFi Simple Config Design	MP1229/ MP1381/ MP1382
US	MP1229PR2	60/825,986	9/18/2006	N/A	N/A	Expired	Adhoc Simple Config	MP1229/ MP1381/ MP1382
US	MP1229	11/800,166	5/4/2007	8,619,623	12/31/2013	Issued	Ad-Hoc Simple Configuration	MP1229/ MP1381/ MP1382
US	MP1229C1	14/143,541	12/30/2013	9,019,866	4/28/2015	Issued	Ad-Hoc Simple Configuration	MP1229/ MP1381/ MP1382
CN	MP1229CN	200780037626.8	8/7/2007	ZL200780037626.8	12/3/2014	Issued	Ad-Hoc Simple Configuration	MP1229/ MP1381/ MP1382
EP	MP1229EP	EP07836581.4	8/7/2007	N/A	N/A	Allowed	Ad-Hoc Simple Configuration	MP1229/ MP1381/ MP1382
JP	MP1229JP	2009-523819	8/7/2007	JP4944958	3/9/2012	Issued	Ad-Hoc Simple Configuration	MP1229/ MP1381/ MP1382

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TW	MP1229TW	96129265	8/8/2007	I470972	1/21/2015	Issued	Ad-Hoc Simple Configuration	MP1229/ MP1381/ MP1382
WO	MP1229WO	PCT/US2007/017529	8/7/2007	N/A	N/A	Expired	Ad-Hoc Simple Configuration	MP1229/ MP1381/ MP1382
US	MP1230PR	60/821,772	8/8/2006	N/A	N/A	Expired	Optimal Linear Equalizer For MIMO Systems With HARQ And/Or Repetition Coding	MP1230
US	MP1230	11/834,466	8/6/2007	8,411,778	4/2/2013	Issued	Optimal Linear Equalizer for MIMO Systems with HARQ and/or Repetition Coding	MP1230
US	MP1230C1	13/776,117	2/25/2013	8,718,177	5/6/2014	Issued	Optimal Linear Equalizer for MIMO Systems with HARQ and/or Repetition Coding	MP1230
WO	MP1230WO	PCT/US2007/017861	8/8/2007	N/A	N/A	Expired	Optimal Linear Equalizer for MIMO Systems with HARQ and/or Repetition Coding	MP1230
US	MP1232PR	60/821,777	8/8/2006	N/A	N/A	Expired	Maximal Ratio Combining of Equalized Symbols for MIMO Systems with HARQ and/or Repetition Coding	MP1232
US	MP1232	11/834,599	8/6/2007	8,718,166	5/6/2014	Issued	Maximal Ratio Combining of Equalized Symbols for MIMO Systems with HARQ and/or Repetition Coding	MP1232
US	MP1232C1	14/261,204	4/24/2014	9,020,062	4/28/2015	Issued	Maximal Ratio Combining of Equalized Symbols for MIMO Systems with HARQ and/or Repetition Coding	MP1232
WO	MP1232WO	PCT/US2007/017862	8/8/2007	N/A	N/A	Expired	Maximal Ratio Combining of Equalized Symbols for MIMO Systems with HARQ and/or Repetition Coding	MP1232

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US	MP1264PR	60/822,827	8/18/2006	N/A	N/A	Expired	Low-Complexity Scalable Architecture For Concatenation-Assisted Symbol-Level Combining	MP1264
US	MP1264	11/839,004	8/15/2007	8,019,023	9/13/2011	Issued	Low-Complexity Scalable Architecture for Concatenation-Assisted Symbol-Level Combining	MP1264
TW	MP1264TW	96130640	8/17/2007	N/A	N/A	Published	Low-Complexity Scalable Architecture for Concatenation-Assisted Symbol-Level Combining	MP1264
WO	MP1264WO	PCT/US2007/018339	8/16/2007	N/A	N/A	Expired	Low-Complexity Scalable Architecture for Concatenation-Assisted Symbol-Level Combining	MP1264
US	MP1314PR	60/825,443	9/13/2006	N/A	N/A	Expired	Decoding Method For Alamouti Scheme With Hybrid ARQ And/Or Repetition Coding	MP1314/ MP1805
US	MP1314PR2	60/949,160	7/11/2007	N/A	N/A	Expired	Decoding Method For Alamouti Scheme With Hybrid ARQ And/Or Repetition Coding	MP1314/ MP1805
US	MP1314	11/854,219	9/12/2007	8,014,470	9/6/2011	Issued	Decoding Method for Alamouti Scheme with HARQ and/or Repetition Coding	MP1314/ MP1805
US	MP1381PR	60/829,614	10/16/2006	N/A	N/A	Expired	Automatic Ad-Hoc Network Creation And Coalescing Using WPS	MP1229/ MP1381/ MP1382
US	MP1381	11/867,661	10/4/2007	8,732,315	5/20/2014	Issued	Automatic Ad-Hoc Network Creation And Coalescing Using WiFi Protected Setup	MP1229/ MP1381/ MP1382
US	MP1381C1	14/281,317	5/19/2014	9,444,874	9/13/2016	Issued	Automatic Ad-Hoc Network Creation And Coalescing Using WPS	MP1229/ MP1381/ MP1382
TW	MP1381TW	96138538	10/15/2007	I439099	5/21/2014	Issued	Automatic Ad-Hoc Network Creation And Coalescing Using WPS	MP1229/ MP1381/ MP1382

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US	MP1927PR	60/917,433	5/11/2007	N/A	N/A	Expired	<i>BICM Decoding In The Presence Of Co-Channel Interference</i>	MP1927/ MP2039/ MP2137
US	MP1927	12/119,264	5/12/2008	8,135,098	3/13/2012	Issued	<i>BICM Decoding in the Presence of Co-Channel Interference BICM</i>	MP1927/ MP2039/ MP2137
US	MP1927C1	13/402,381	2/22/2012	8,654,902	2/18/2014	Issued	<i>BICM Decoding in the Presence of Co-Channel Interference BICM</i>	MP1927/ MP2039/ MP2137
US	MP1927C1C1	14/104,543	12/12/2013	8,873,684	10/28/2014	Issued	<i>BICM Decoding in the Presence of Co-Channel Interference BICM</i>	MP1927/ MP2039/ MP2137
WO	MP1927WO	PCT/US2008/006092	5/12/2008	N/A	N/A	Expired	<i>BICM Decoding in the Presence of Co-Channel Interference BICM</i>	MP1927/ MP2039/ MP2137
US	MP2026	11/781,200	7/20/2007	8,090,063	1/3/2012	Issued	<i>Symbol-Level Combining for Multiple Input Multiple Output (MIMO) Systems with Hybrid Automatic Repeat Request (HARQ) and/or Repetition Coding</i>	MP1206/ MP2026
US	MP2039PR	60/950,425	7/18/2007	N/A	N/A	Expired	<i>Co-Channel Interference Cancellation With Multiple Receive Antennas For BICM</i>	MP1927/ MP2039/ MP2137
US	MP2039	12/171,790	7/11/2008	8,243,860	8/14/2012	Issued	<i>Co-Channel Interference Cancellation with Multiple Receive Antennas for BICM</i>	MP1927/ MP2039/ MP2137
US	MP2039C1	13/570,750	8/9/2012	8,654,910	2/18/2014	Issued	<i>Co-Channel Interference Cancellation with Multiple Receive Antennas for BICM</i>	MP1927/ MP2039/ MP2137
US	MP2232PR	60/980,036	10/15/2007	N/A	N/A	Expired	<i>Reliability And Range Of Multiple-Antenna Wireless Communications System Through Opportunistic Beamforming</i>	MP2232
US	MP2232	12/251,834	10/15/2008	8,213,870	7/3/2012	Issued	<i>Beamforming Using Predefined Spatial Mapping Matrices</i>	MP2232

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US	MP2232C1	13/539,131	6/29/2012	8,644,765	2/4/2014	Issued	<i>Beamforming Using Predefined Spatial Mapping Matrices</i>	MP2232
US	MP2232C1aa	14/797,740	7/13/2015	9,621,240	4/11/2017	Issued	<i>Beamforming Using Predefined Spatial Mapping Matrices</i>	MP2232
US	MP2232C1C1	14/171,269	2/3/2014	9,083,401	7/14/2015	Issued	<i>Beamforming Using Predefined Spatial Mapping Matrices</i>	MP2232
US	MP2232C1Za	15/457,392	3/13/2017	10,200,096	2/5/2019	Issued	<i>Beamforming Using Predefined Spatial Mapping Matrices</i>	MP2232
WO	MP2232WO	PCT/US2008/011805	10/15/2008	N/A	N/A	Expired	<i>Beamforming Using Predefined Spatial Mapping Matrices</i>	MP2232
US	MP2284PR	61/051,725	5/9/2008	N/A	N/A	Expired	<i>Location Aware Hotspot Access</i>	MP2284
US	MP2284	12/437,312	5/7/2009	8,598,984	12/3/2013	Issued	<i>Systems and Methods for Providing Location-Aware Wi-Fi Access for a Portable Device</i>	MP2284
US	MP2284C1	14/094,698	12/2/2013	9,374,775	6/21/2016	Issued	<i>Systems and Methods for Providing Location-Aware Wi-Fi Access for a Portable Device</i>	MP2284
WO	MP2284WO	PCT/US2009/043204	5/7/2009	N/A	N/A	Expired	<i>Systems and Methods for Providing Location-Aware Wi-Fi Access for a Portable Device</i>	MP2284
CN	MP2284WOCN	200980115562.8	5/7/2009	ZL200980115562.8	6/17/2015	Issued	<i>Systems and Methods for Providing Location-Aware Wi-Fi Access for a Portable Device</i>	MP2284
EP	MP2284WOEP	09743704.0	5/7/2009	2283693	7/11/2018	Issued	<i>Systems and Methods for Providing Location-Aware WI-FI Access for a Portable Device</i>	MP2284

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DE	MP2284WOEPDE	09743704.0	5/7/2009	2283693	7/11/2018	Issued	Systems and Methods for Providing Location-Aware WI-FI Access for a Portable Device	MP2284
FR	MP2284WOEPFR	09743704.0	5/7/2009	2283693	7/11/2018	Issued	Systems and Methods for Providing Location-Aware WI-FI Access for a Portable Device	MP2284
GB	MP2284WOEPGB	09743704.0	5/7/2009	2283693	7/11/2018	Issued	Systems and Methods for Providing Location-Aware WI-FI Access for a Portable Device	MP2284
JP	MP2284WOJP	2011-508685	5/7/2009	5517079	4/11/2014	Issued	Systems and Methods for Providing Location-Aware WI-FI Access for a Portable Device	MP2284
US	MP2465PR	61/060,583	6/11/2008	N/A	N/A	Expired	Mixed Mode Security for Mesh Networks	MP2465
US	MP2465	12/482,817	6/11/2009	9,232,389	1/5/2016	Issued	Mixed Mode Security for Mesh Networks	MP2465
WO	MP2465WO	PCT/US2009/047077	6/11/2009	N/A	N/A	Expired	Mixed Mode Security for Mesh Networks	MP2465
US	MP2493PR	61/060,587	6/11/2008	N/A	N/A	Expired	Optimizations For Dense Mesh	MP2493
US	MP2493	12/477,751	6/3/2009	8,787,330	7/22/2014	Issued	Dense Mesh Network Communications	MP2493
WO	MP2493WO	PCT/IB2009/005851	6/3/2009	N/A	N/A	Expired	Dense Mesh Network Communications	MP2493
US	MP2558PR	61/046,934	4/22/2008	N/A	N/A	Expired	Data Symbol Mapping For MIMO HARQ	MP2558



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US	MP2558	12/410,044	3/24/2009	8,279,963	10/2/2012	Issued	Data Symbol Mapping For Multiple-Input Multiple-Output Hybrid Automatic Repeat Request	MP2558
WO	MP2558WO	PCT/US2009/041081	4/20/2009	N/A	N/A	Expired	Data Symbol Mapping For Multiple-Input Multiple-Output Hybrid Automatic Repeat Request	MP2558
US	MP2588PR	61/051,941	5/9/2008	N/A	N/A	Expired	Symbol-Level Combining Receiver For Incremental Redundancy HARQ With MIMO	MP2588
US	MP2588	12/463,017	5/8/2009	8,750,418	6/10/2014	Issued	Symbol Vector-Level Combining Transmitter for Incremental Redundancy HARQ with MIMO	MP2588
US	MP2588C1	14/283,802	5/21/2014	9,100,065	8/4/2015	Issued	Symbol Vector-Level Combining Transmitter for Incremental Redundancy HARQ with MIMO	MP2588
US	MP2588D1	12/463,025	5/8/2009	8,271,861	9/18/2012	Issued	Symbol Vector-Level Combining Transmitter for Incremental Redundancy HARQ with MIMO	MP2588
US	MP2588D1C1	13/605,099	9/6/2012	8,516,353	8/20/2013	Issued	Symbol Vector-Level Combining Transmitter for Incremental Redundancy HARQ with MIMO	MP2588
WO	MP2588WO	PCT/US2009/002881	5/8/2009	N/A	N/A	Expired	Symbol Vector-Level Combining Transmitter for Incremental Redundancy HARQ with MIMO	MP2588
US	MP2598PR	61/053,526	5/15/2008	N/A	N/A	Expired	Preamble Format To 60GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2598PR2	61/078,925	7/8/2008	N/A	N/A	Expired	PHY Preamble Format For 60GHz Wideband Wireless Communication Systems	MP2598/ MP2693

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US	MP2598	12/419,460	4/7/2009	8,385,390	2/26/2013	Issued	PHY Preamble Format For Wireless Communication System	MP2598/ MP2693
US	MP2598C1	13/751,388	1/28/2013	9,313,754	4/12/2016	Issued	PHY Preamble Format For Wireless Communication System	MP2598/ MP2693
US	MP2598-US-CON- CON	15/090,064	4/4/2016	N/A	N/A	Pending	PHY Preamble Format for Wireless Communication System	MP2598/ MP2693
WO	MP2598WO	PCT/US2009/039724	4/7/2009	N/A	N/A	Expired	PHY Preamble Format for Wireless Communication System	MP2598/ MP2693
CN	MP2598WOCN	200980123723.8	4/7/2009	ZL200980123723.8	4/16/2014	Issued	PHY Preamble Format for Wireless Communication System	MP2598/ MP2693
DE	MP2598WODE	09747075.1	4/7/2009	EP2277270	6/11/2014	Issued	PHY Preamble Format for Wireless Communication System	MP2598/ MP2693
EP	MP2598WOEP	EP09747075.1	4/7/2009	EP2277270	6/11/2014	Issued	PHY Preamble Format for Wireless Communication System	MP2598/ MP2693
FR	MP2598WOFR	09747075.1	4/7/2009	2277270	6/11/2014	Issued	PHY Preamble Format for Wireless Communication System	MP2598/ MP2693
GB	MP2598WOGB	09747075.1	4/7/2009	EP2277270	6/11/2014	Issued	PHY Preamble Format for Wireless Communication System	MP2598/ MP2693
JP	MP2598WOJP	2011-509515	4/7/2009	5453704	1/17/2014	Issued	PHY Preamble Format for Wireless Communication System	MP2598/ MP2693
US	MP2611PR	61/118,727	12/1/2008	N/A	N/A	Expired	Portable AP Enhancements	MP2611

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US	MP2611	12/435,871	5/5/2009	9,055,531	6/9/2015	Issued	Portable AP Enhancements	MP2611
WO	MP2611WO	PCT/US2009/042884	5/5/2009	N/A	N/A	Expired	Access Point Enhancements	MP2611
CN	MP2611WOCN	200980116723.5	5/5/2009	N/A	N/A	Abandoned	Access Point Enhancements	MP2611
EP	MP2611WOEP	09830754.9	5/5/2009	2277286	11/23/2016	Issued	Access Point Enhancements	MP2611
DE	MP2611WOEPDE	09830754.9	5/5/2009	2277286	11/23/2016	Issued	Access Point Enhancements	MP2611
FR	MP2611WOEPFR	09830754.9	5/5/2009	2277286	11/23/2016	Issued	Access Point Enhancements	MP2611
GB	MP2611WOEPGB	09830754.9	5/5/2009	2277286	11/23/2016	Issued	Access Point Enhancements	MP2611
US	MP2693PR	61/080,514	7/14/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2693PR2	61/084,133	7/28/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2693PR3	61/084,776	7/30/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2693PR4	61/085,763	8/1/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693

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US	MP2693PR5	61/090,058	8/19/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2693PR6	61/091,885	8/26/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2693PR7	61/098,128	9/18/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2693PR8	61/098,970	9/22/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2693PR9	61/100,112	9/25/2008	N/A	N/A	Expired	Shortened PHY Preamble Format For 60 GHz Wideband Wireless Communication Systems	MP2598/ MP2693
US	MP2693	12/466,984	5/15/2009	8,331,419	12/11/2012	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
US	MP2693D1	12/466,997	5/15/2009	8,175,118	5/8/2012	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
US	MP2693D1C1	13/465,743	5/7/2012	8,929,397	1/6/2015	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
US	MP2693D2	12/467,010	5/15/2009	8,175,119	5/8/2012	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
US	MP2693D2D1	13/456,941	4/26/2012	8,885,669	11/11/2014	Issued	Method and Apparatus for Processing a Preamble of a Packet	MP2598/ MP2693
US	MP2693D3	12/467,022	5/15/2009	8,385,440	2/26/2013	Issued	Apparatus for Generating Spreading Sequences and Determining Correlation	MP2598/ MP2693

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US	MP2693D3D1	13/771,596	2/20/2013	8,989,287	3/24/2015	Issued	Apparatus for Generating Spreading Sequences and Determining Correlation	MP2598/ MP2693
EP	MP2693EPD1	EP12008566.7	5/15/2009	EP2573992	4/16/2014	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
DE	MP2693EPD1DE	12008566.7	5/15/2009	2573992	4/16/2014	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
FR	MP2693EPD1FR	12008566.7	5/15/2009	2573992	4/16/2014	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
GB	MP2693EPD1GB	12008566.7	5/15/2009	2573992	4/16/2014	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
CN	MP2693WCD1	201410049626.1	5/15/2009	ZL201410049626.1	4/26/2017	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
JP	MP2693WJD1	2014-078383	4/7/2014	5813816	10/2/2015	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
WO	MP2693WO	PCT/US2009/044160	5/15/2009	N/A	N/A	Expired	Efficient Physical Layer Preamble Format	MP2598/ MP2693
CN	MP2693WOCN	200980116743.2	5/15/2009	ZL200980116743.2	3/12/2014	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
EP	MP2693WOEP	EP09747686.5	5/15/2009	EP2281357	12/26/2012	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
DE	MP2693WOEPDE	9747686.5	5/15/2009	6020090	12/26/2012	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693

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FR	MP2693WOEPFR	9747686.5	5/15/2009	2281357	12/26/2012	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
GB	MP2693WOEPGB	9747686.5	5/15/2009	2281357	12/26/2012	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
JP	MP2693WOJP	2011-509752	5/15/2009	5610233	9/12/2014	Issued	Efficient Physical Layer Preamble Format	MP2598/ MP2693
US	MP2926PR	61/100,948	9/29/2008	N/A	N/A	Expired	Control PHY Preamble Format For 60GHz Wideband Wireless Communication Systems	MP2926
US	MP2926PR2	61/101,833	10/1/2008	N/A	N/A	Expired	Control PHY Preamble Format For 60GHz Wideband Wireless Communication Systems	MP2926
US	MP2926PR3	61/108,079	10/24/2008	N/A	N/A	Expired	Control PHY Preamble Format For 60GHz Wideband Wireless Communication Systems	MP2926
US	MP2926PR4	61/110,357	10/31/2008	N/A	N/A	Expired	Control PHY For 60GHz Wideband Wireless Communication Systems	MP2926
US	MP2926PR5	61/120,973	12/9/2008	N/A	N/A	Expired	Control PHY Preamble Format For 60GHz Wideband Wireless Communication Systems	MP2926
US	MP2926PR6	61/121,392	12/10/2008	N/A	N/A	Expired	Control PHY For 60GHz Wideband Wireless Communication Systems	MP2926
US	MP2926PR7	61/153,102	2/17/2009	N/A	N/A	Expired	Control PHY For 60GHz Wideband Wireless Communication Systems	MP2926

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US	MP2926PR8	61/156,651	3/2/2009	N/A	N/A	Expired	Next Generation mmWave Specification	MP2926
US	MP2926PR9	61/171,343	4/21/2009	N/A	N/A	Expired	Control PHY For 60GHz Wideband Wireless Communication Systems	MP2926
US	MP2926PR10	61/174,382	4/30/2009	N/A	N/A	Expired	Control PHY For 60GHz Wideband Wireless Communication Systems	MP2926
US	MP2926	12/569,547	9/29/2009	8,165,185	4/24/2012	Issued	Physical Layer Data Unit Format	MP2926
US	MP2926C1	13/448,847	4/17/2012	8,599,900	12/3/2013	Issued	Physical Layer Data Unit Format	MP2926
US	MP2926C2	13/453,609	4/23/2012	8,774,251	7/8/2014	Issued	Physical Layer Data Unit Format	MP2926
US	MP2926C2C1	14/324,977	7/7/2014	9,525,759	12/20/2016	Issued	Physical Layer Data Unit Format	MP2926
CN	MP2926WCN1	2014103485305	9/29/2009	ZL2014103485305	9/22/2017	Issued	Physical Layer Data Unit Format	MP2926
JP	MP2926WJD1	2014-005784	1/16/2014	5669052	12/26/2014	Issued	Physical Layer Data Unit Format	MP2926
WO	MP2926WO	PCT/US2009/058795	9/29/2009	N/A	N/A	Expired	Physical Layer Data Unit Format	MP2926
CN	MP2926WOCN	200980138268.9	9/29/2009	ZL200980138268.9	8/20/2014	Issued	Physical Layer Data Unit Format	MP2926

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EP	MP2926WOEP	EP09793116.6	9/29/2009	2359511	8/15/2018	Issued	Physical Layer Data Unit Format	MP2926
JP	MP2926WOJP	2011-529353	9/29/2009	5462267	1/24/2014	Issued	Physical Layer Data Unit Format	MP2926
DE	MP2926WUDE	EP09793116.6	9/29/2009	602009053914.0	8/15/2018	Issued	Physical Layer Data Unit Format	MP2926
FR	MP2926WUFR	EP09793116.6	9/29/2009	2359511	8/15/2018	Issued	Physical Layer Data Unit Format	MP2926
GB	MP2926WUGB	EP09793116.6	9/29/2009	2359511	8/15/2018	Issued	Physical Layer Data Unit Format	MP2926
US	MP3287PR	61/219,924	6/24/2009	N/A	N/A	Expired	Wireless Multiband Security	MP3287/ MP3362
US	MP3287PR2	61/243,422	9/17/2009	N/A	N/A	Expired	Wireless Multiband Security	MP3287/ MP3362
US	MP3287PR3	61/255,035	10/26/2009	N/A	N/A	Expired	Wireless Multiband Security	MP3287/ MP3362
US	MP3287PR4	61/259,582	11/9/2009	N/A	N/A	Expired	Wireless Multiband Security	MP3287/ MP3362
US	MP3287PR5	61/264,200	11/24/2009	N/A	N/A	Expired	Wireless Multiband Security	MP3287/ MP3362
US	MP3287PR6	61/290,127	12/24/2009	N/A	N/A	Expired	Wireless Multiband Security	MP3287/ MP3362



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US	MP3287PR7	61/294,705	1/13/2010	N/A	N/A	Expired	Wireless Multiband Security	MP3287/ MP3362
US	MP3287	12/784,050	5/20/2010	8,812,833	8/19/2014	Issued	Wireless Multiband Security	MP3287/ MP3362
US	MP3287C1	14/459,827	8/14/2014	9,462,472	10/4/2016	Issued	System And Method For Establishing Security In Network Devices Capable Of Operating In Multiple Frequency Bands	MP3287/ MP3362
US	MP3287C1C1	15/277,557	9/27/2016	9,992,680	6/5/2018	Issued	System And Method For Establishing Security In Network Devices Capable of Operating In Multiple Frequency Bands	MP3287/ MP3362
WO	MP3287WO	PCT/US2010/039641	6/23/2010	N/A	N/A	Expired	Wireless Multiband Security	MP3287/ MP3362
CN	MP3287WOCN	201080028451.6	6/23/2010	ZL201080028451.6	8/12/2015	Issued	Wireless Multiband Security	MP3287/ MP3362
EP	MP3287WOEP	EP10729013.2	6/23/2010	EP2446698	11/30/2016	Issued	Wireless Multiband Security	MP3287/ MP3362
DE	MP3287WOEPDE	10729013.2	6/23/2010	6020100384330	11/30/2016	Issued	Wireless Multiband Security	MP3287/ MP3362
FR	MP3287WOEPFR	10729013.2	6/23/2010	2446698	11/30/2016	Issued	Wireless Multiband Security	MP3287/ MP3362
GB	MP3287WOEPGB	10729013.2	6/23/2010	2446698	11/30/2016	Issued	Wireless Multiband Security	MP3287/ MP3362
JP	MP3287WOJP	2012-517682	6/23/2010	5780558	7/24/2015	Issued	Wireless Multiband Security	MP3287/ MP3362

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KR	MP3287WOKR	1020127001843	6/23/2010	101659988	9/20/2016	Issued	Wireless Multiband Security	MP3287/ MP3362
US	MP3362PR	61/239,295	9/2/2009	N/A	N/A	Expired	AES-GCM Support In Next Generation WLAN System	MP3287/ MP3362
US	MP3362PR2	61/243,272	9/17/2009	N/A	N/A	Expired	AES-GCM Support In Next Generation WLAN System	MP3287/ MP3362
US	MP3362PR3	61/244,787	9/22/2009	N/A	N/A	Expired	AES-GCM Support In Next Generation WLAN System	MP3287/ MP3362
US	MP3362	12/858,950	8/18/2010	8,560,848	10/15/2013	Issued	Galois/Counter Mode Encryption In A Wireless Network	MP3287/ MP3362
US	MP3362C1	14/053,109	10/14/2013	9,071,416	6/30/2015	Issued	Galois/Counter Mode Encryption In A Wireless Network	MP3287/ MP3362
WO	MP3362WO	PCT/US2010/046595	8/25/2010	N/A	N/A	Expired	GALOIS/Counter Mode Encryption In A Wireless Network	MP3287/ MP3362
CN	MP3362WOCN	201080045802.4	8/25/2010	ZL201080045802.4	1/7/2015	Issued	GALOIS/Counter Mode Encryption In A Wireless Network	MP3287/ MP3362
EP	MP3362WOEP	EP10751744.3	8/25/2010	N/A	N/A	Expired	Galois/Counter Mode Encryption in a Wireless Network	MP3287/ MP3362
JP	MP3362WOJP	2012-527912	8/25/2010	5725306	4/10/2015	Issued	GALOIS/Counter Mode Encryption In A Wireless Network	MP3287/ MP3362
KR	MP3362WOKR	1020127007125	8/25/2010	101699915	1/19/2017	Issued	GALOIS/Counter Mode Encryption In A Wireless Network	MP3287/ MP3362

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US	MP3381PR	61/243,848	9/18/2009	N/A	N/A	Expired	Short Packet For Use in Beamforming	MP3381
US	MP3381	12/876,758	9/7/2010	9,219,576	12/22/2015	Issued	Short Packet For Use in Beamforming	MP3381
US	MP3381C1	14/977,027	12/21/2015	9,608,771	3/28/2017	Issued	Short Packet For Use in Beamforming	MP3381
WO	MP3381WO	PCT/US2010/047990	9/7/2010	N/A	N/A	Expired	Short Packet For Use in Beamforming	MP3381
US	MP3423PR	61/257,768	11/3/2009	N/A	N/A	Expired	Receiving Filtering by Using Preamble	MP3423
US	MP3423PR2	61/354,013	6/11/2010	N/A	N/A	Expired	VHT Power Saving Enhancements	MP3423
US	MP3423	12/938,260	11/2/2010	9,480,018	10/25/2016	Issued	PHY Data Unit Format for MIMO	MP3423
US	MP3423C1	15/332,662	10/24/2016	N/A	N/A	Pending	Power Saving in a Communication Device	MP3423
WO	MP3423WO	PCT/US2010/055118	11/2/2010	N/A	N/A	Expired	Power Saving in a Communication Device	MP3423
CN	MP3423WOCN	201080047912.4	11/2/2010	ZL201080047912.4	6/1/2016	Issued	Power Saving in a Communication Device	MP3423
EP	MP3423WOEP	EP10778776.4	11/2/2010	2497304	6/20/2018	Issued	Power Saving in a Communication Device	MP3423

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DE	MP3423WOEPDE	EP10778776.4	11/2/2010	2497304	6/20/2018	Issued	Power Saving in a Communication Device	MP3423
FR	MP3423WOEPFR	EP10778776.4	11/2/2010	2497304	6/20/2018	Issued	Power Saving in a Communication Device	MP3423
GB	MP3423WOEPGB	EP10778776.4	11/2/2010	2497304	6/20/2018	Issued	Power Saving in a Communication Device	MP3423
JP	MP3423WOJP	2012-537191	11/2/2010	5718350	3/27/2015	Issued	Power Saving in a Communication Device	MP3423
KR	MP3423WOKR	10-2012-7009312	11/2/2010	10-1679007	11/23/2016	Issued	Power Saving in a Communication Device	MP3423
US	MP3789PR	61/372,378	8/10/2010	N/A	N/A	Expired	Sub-Band V Feedback for 802.11ac Beamforming and Downlink-Multiuser MIMO	MP3789
US	MP3789	13/205,257	8/8/2011	9,252,991	2/2/2016	Issued	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789
US	MP3789C1	15/008,618	1/28/2016	9,806,784	10/31/2017	Issued	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789
US	MP3789C1C1	15/789,542	10/20/2017	10,389,425	8/20/2019	Issued	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789
US	MP3789C1C1C1	16/544,434	8/19/2019	N/A	N/A	Pending	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789
WO	MP3789WO	PCT/US2011/046934	8/8/2011	N/A	N/A	Expired	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789

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CN	MP3789WOCN	201180038983.2	8/8/2011	ZL201180038983.2	6/8/2016	Issued	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789
EP	MP3789WOEP	11752371.2	8/8/2011	N/A	N/A	Allowed	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789
JP	MP3789WOJP	2013-524148	8/8/2011	6002974	9/16/2016	Issued	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789
KR	MP3789WOKR	10-2013-7005438	8/8/2011	101829851	3/29/2018	Issued	Sub-Band Feedback for Beamforming on Downlink Multiple User MIMO Configurations	MP3789
US	MP3793PR	61/382,415	9/13/2010	N/A	N/A	Expired	Reduced Coverage Low Interference AP Profile	MP3793
US	MP3793	13/218,737	8/26/2011	8,811,206	8/19/2014	Issued	Access Point Controller for Adjusting a Wireless Access Point	MP3793
WO	MP3793WO	PCT/US2011/049307	8/26/2011	N/A	N/A	Expired	Access Point Controller for Adjusting a Wireless Access Point	MP3793
CN	MP3793WOCN	201180043963.4	8/26/2011	ZL201180043963.4	11/16/2016	Issued	Adjusting Transmission Rate and Range of a Wireless Access Point	MP3793
EP	MP3793WOEP	EP11802786.1	8/26/2011	EP2617253	11/22/2017	Issued	Adjusting Transmission Rate and Range of a Wireless Access Point	MP3793
JP	MP3793WOJP	2013-527697	8/26/2011	6023056	10/14/2016	Issued	Adjusting Transmission Rate and Range of a Wireless Access Point	MP3793
KR	MP3793WOKR	10-2013-7006364	8/26/2011	101942038	1/25/2019	Issued	Access Point Controller for Adjusting a Wireless Access Point	MP3793

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DE	MP3793WUDE	EP11802786.1	8/26/2011	602011043627.9	11/22/2017	Issued	Adjusting Transmission Rate and Range of a Wireless Access Point	MP3793
FR	MP3793WUFR	EP11802786.1	8/26/2011	2617253	11/22/2017	Issued	Adjusting Transmission Rate and Range of a Wireless Access Point	MP3793
GB	MP3793WUGB	EP11802786.1	8/26/2011	2617253	11/22/2017	Issued	Adjusting Transmission Rate and Range of a Wireless Access Point	MP3793
US	MP3837PR	61/389,664	10/4/2010	N/A	N/A	Expired	Chinese 125MHz Band Support	MP3837
US	MP3837PR2	61/392,614	10/13/2010	N/A	N/A	Expired	Chinese 125MHz Band Support	MP3837
US	MP3837	13/246,351	9/27/2011	8,787,338	7/22/2014	Issued	Determining a Communication Channel from a Plurality of Possible Channel Bandwidths	MP3837
US	MP3837C1	13/246,469	9/27/2011	8,670,399	3/11/2014	Issued	Determining a Communication Channel from a Plurality of Possible Channel Bandwidths	MP3837
WO	MP3837WO	PCT/US2011/053437	9/27/2011	N/A	N/A	Expired	Determining a Communication Channel from a Plurality of Possible Channel Bandwidths	MP3837
US	MP3845PR	61/390,971	10/7/2010	N/A	N/A	Expired	Avoiding MCS Exclusions in 11ac	MP3845
US	MP3845	13/246,577	9/27/2011	8,873,652	10/28/2014	Issued	Parsing and Encoding Methods in a Communication System	MP3845
US	MP3845I1PR	61/678,531	8/1/2012	N/A	N/A	Expired	Avoiding MCS Exclusions in 11ac	MP3845

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US	MP3845I1	13/957,309	8/1/2013	9,264,287	2/16/2016	Issued	Encoding Parameters for a Wireless Communication System	MP3845
US	MP3845I1C1	15/043,237	2/12/2016	9,936,053	4/3/2018	Issued	Encoding Parameters for a Wireless Communication System	MP3845
US	MP3845I1C1C1	15/943,170	4/2/2018	N/A	N/A	Pending	Encoding Parameters for a Wireless Communication System	MP3845
WO	MP3845WO	PCT/US2013/053277	8/1/2013	N/A	N/A	Published	Encoding Parameters for a Wireless Communication System	MP3845
CN	MP3845FWCN	201380049474.9	8/1/2013	ZL201380049474.9	1/18/2019	Issued	Encoding Parameters for a Wireless Communication System	MP3845
EP	MP3845FWEP	13750214.2	8/1/2013	N/A	N/A	Published	Encoding Parameters for a Wireless Communication System	MP3845
JP	MP3845FWJP	2015-525603	1/30/2015	6340650	5/25/2018	Issued	Encoding Parameters for a Wireless Communication System	MP3845
KR	MP3845FWKR	10-2015-7004999	8/1/2013	N/A	N/A	Published	Encoding Parameters for a Wireless Communication System	MP3845
US	MP3849PR	61/392,610	10/13/2010	N/A	N/A	Expired	120 Mhz Operation	MP3849
US	MP3849PR2	61/430,391	1/6/2011	N/A	N/A	Expired	120 Mhz Operation	MP3849
US	MP3849PR3	61/431,763	1/11/2011	N/A	N/A	Expired	120 Mhz Operation	MP3849

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WO	MP3849WO	PCT/US2011/055988	10/12/2011	N/A	N/A	Expired	Method and Apparatus for Generating an OFDM Symbol	MP3849
CN	MP3849WOCN	201180056537.4	10/12/2011	ZL201180056537.4	4/26/2017	Issued	Method and Apparatus for Generating an OFDM Symbol	MP3849
EP	MP3849WOEP	11773955.7	10/12/2011	2628285	3/7/2018	Issued	Method and Apparatus for Generating an OFDM Symbol	MP3849
JP	MP3849WOJP	2013-533978	10/12/2011	5822215	10/16/2015	Issued	Method and Apparatus for Generating an OFDM Symbol	MP3849
KR	MP3849WOKR	10-2013-7012	10/12/2011	N/A	N/A	Abandoned	Method and Apparatus for Generating an OFDM Symbol	MP3849
DE	MP3849WUDE	11773955.7	10/12/2011	602011046314.4	3/7/2018	Issued	Method and Apparatus for Generating an OFDM Symbol	MP3849
FR	MP3849WUFR	11773955.7	10/12/2011	2628285	3/7/2018	Issued	Method and Apparatus for Generating an OFDM Symbol	MP3849
GB	MP3849WUGB	11773955.7	10/12/2011	2628285	3/7/2018	Issued	Method and Apparatus for Generating an OFDM Symbol	MP3849
US	MP3987PR	61/430,428	1/6/2011	N/A	N/A	Expired	160 MHz CSD in 802.11ac	MP3987
US	MP3987	13/335,789	12/22/2011	8,625,561	1/7/2014	Issued	Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices	MP3987
US	MP3987C1	14/147,363	1/3/2014	9,397,802	7/19/2016	Issued	Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices	MP3987



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WO	MP3987WO	PCT/US2011/066964	12/22/2011	N/A	N/A	Published	<i>Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices</i>	MP3987
CN	MP3987WOCN	201180064422.X	12/22/2011	ZL201180064422.X	6/22/2016	Issued	<i>Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices</i>	MP3987
EP	MP3987WOEP	11811616.9	12/22/2011	2661850	10/3/2018	Issued	<i>Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices</i>	MP3987
DE	MP3987WOEPDE	11811616.9	12/22/2011	2661850	10/3/2018	Issued	<i>Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices</i>	MP3987
FR	MP3987WOEPFR	11811616.9	12/22/2011	2661850	10/3/2018	Issued	<i>Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices</i>	MP3987
GB	MP3987WOEPGB	11811616.9	12/22/2011	2661850	10/3/2018	Issued	<i>Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices</i>	MP3987
JP	MP3987WOJP	2013-548430	12/22/2011	5901077	3/18/2016	Issued	<i>Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices</i>	MP3987
KR	MP3987WOKR	10-2013-7020145	12/22/2011	N/A	N/A	Pending	<i>Cyclic Shift Delay Techniques for WLAN Multi-Radio Devices</i>	MP3987
US	MP4038PR	61/440,814	2/8/2011	N/A	N/A	Expired	<i>IEEE 802.11af</i>	MP4038/ MP4075
US	MP4038	13/369,102	2/8/2012	8,867,481	10/21/2014	Issued	<i>WLAN Channel Allocation</i>	MP4038/ MP4075
US	MP4038PR	61/440,814	2/8/2011	N/A	N/A	Expired	<i>IEEE 802.11af</i>	MP4038/ MP4075

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US	MP4038PR2	61/443,185	2/15/2011	N/A	N/A	Expired	IEEE 802.11af	MP4038/ MP4075
US	MP4038C1	13/402,869	2/22/2012	9,025,540	5/5/2015	Issued	WLAN Channel Allocation	MP4038/ MP4075
WO	MP4038WO	PCT/US2012/024351	2/8/2012	N/A	N/A	Expired	WLAN Channel Allocation	MP4038/ MP4075
CN	MP4038WOCN	201280015283.6	2/8/2012	ZL201280015283.6	7/14/2017	Issued	WLAN Channel Allocation In Unused TV Frequency	MP4038/ MP4075
EP	MP4038WOEP	12704359.4	2/8/2012	2674002	6/6/2018	Issued	WLAN Channel Allocation	MP4038/ MP4075
JP	MP4038WOJP	2013-552740	2/8/2012	6029113	10/28/2016	Issued	WLAN Channel Allocation	MP4038/ MP4075
KR	MP4038WOKR	10-2013-7023739	2/8/2012	10-1967413	4/3/2019	Issued	WLAN Channel Allocation In Unused TV Frequency	MP4038/ MP4075
DE	MP4038WUDE	12704359.4	2/8/2012	2674002	6/6/2018	Issued	WLAN Channel Allocation	MP4038/ MP4075
FR	MP4038WUFR	12704359.4	2/8/2012	2674002	6/6/2018	Issued	WLAN Channel Allocation	MP4038/ MP4075
GB	MP4038WUGB	12704359.4	2/8/2012	2674002	6/6/2018	Issued	WLAN Channel Allocation	MP4038/ MP4075
US	MP4075PR	61/452,475	3/14/2011	N/A	N/A	Expired	Wireless Location Assignment	MP4038/ MP4075

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US	MP4075	13/418,934	3/13/2012	8,971,942	3/3/2015	Issued	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
WO	MP4075WO	PCT/US2012/028918	3/13/2012	N/A	N/A	Expired	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
CN	MP4075WOCN	201280013366.1	3/13/2012	ZL201280013366.1	5/10/2017	Issued	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
EP	MP4075WOEP	12710429.7	3/13/2012	EP2687058	3/4/2015	Issued	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
JP	MP4075WOJP	2013-558113	3/13/2012	6278306	2/14/2018	Issued	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
KR	MP4075WOKR	1020137026897	3/13/2012	101509629	4/1/2015	Issued	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
DE	MP4075WUDE	12710429.7	3/13/2012	2687058	3/4/2015	Issued	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
FR	MP4075WUFR	12710429.7	3/13/2012	2687058	3/4/2015	Issued	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
GB	MP4075WUGB	12710429.7	3/13/2012	2687058	3/4/2015	Issued	Assisted Location-Based Wireless Spectrum Allocation	MP4038/ MP4075
US	MP4076PR	61/486,705	5/16/2011	N/A	N/A	Expired	Methods To Reuse The WCDMA Band1 TX For TDSCDMA Band1/2	MP4076
US	MP4076	13/446,485	4/13/2012	8,625,472	1/7/2014	Issued	Systems and Methods for Processing Time- Division Signals and Frequency- Division Signals	MP4076

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US	MP4076C1	14/100,864	12/9/2013	9,184,903	11/10/2015	Issued	Systems and Methods for Processing Time-Division Signals and Frequency-Division Signals	MP4076
WO	MP4076WO	PCT/US2012/033532	4/13/2012	N/A	N/A	Expired	Systems and Methods for Processing Time-Division Signals and Frequency-Division Signals	MP4076
CN	MP4076WOCN	201280023862.5	4/13/2012	ZL201280023862.5	3/15/2017	Issued	Systems and Methods for Processing Time-Division Signals and Frequency-Division Signals	MP4076
EP	MP4076WOEP	12721600	4/13/2012	N/A	N/A	Published	Systems and Methods for Processing Time-Division Signals and Frequency-Division Signals	MP4076
KR	MP4076WOKR	10-2013-7033239	4/13/2012	10-1769568	8/11/2017	Issued	Systems and Methods for Processing Time-Division Signals and Frequency-Division Signals	MP4076
US	MP4114PR	61/481,079	4/29/2011	N/A	N/A	Expired	WLAN/BT Coexistence Schemes for IBSS	MP4114/ MP4548
US	MP4114	13/458,227	4/27/2012	9,026,162	5/5/2015	Issued	Multi-Technology Coexistence For IBSS Networks	MP4114/ MP4548
US	MP4114C1	14/702,000	5/1/2015	9,485,767	11/1/2016	Issued	Method And Apparatus For Facilitating The Coexistence Of Wireless Communications Of Different Wireless Communication Technologies	MP4114/ MP4548
WO	MP4114WO	PCT/US2012/035597	4/27/2012	N/A	N/A	Expired	Multi-Technology Coexistence For IBSS Networks	MP4114/ MP4548
CN	MP4114WOCN	201280020850.7	4/27/2012	ZL201280020850.7	5/10/2017	Issued	Multi-Technology Coexistence For IBSS Networks	MP4114/ MP4548
EP	MP4114WOEP	12719234.2	4/27/2012	N/A	N/A	Allowed	Multi-Technology Coexistence For IBSS Networks	MP4114/ MP4548

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JP	MP4114WOJP	2014-508139	4/27/2012	5943068	6/3/2016	Issued	Multi-Technology Coexistence For IBSS Networks	MP4114/MP4548
KR	MP4114WOKR	1020137030268	4/27/2012	N/A	N/A	Allowed	Multi-Technology Coexistence For IBSS Networks	MP4114/MP4548
US	MP4170PR	61/494,362	6/7/2011	N/A	N/A	Expired	Remove Service Field in 11ah and 11af	MP4170
US	MP4170	13/491,527	6/7/2012	8,989,392	3/24/2015	Issued	Physical Layer Frame Format for Long Range WLAN	MP4170
US	MP4170PR	61/494,362	6/7/2011	N/A	N/A	Expired	Physical Layer Frame Format for Long Range WLAN	MP4170
US	MP4170C1	14/665,898	3/23/2015	9,736,724	8/15/2017	Issued	Physical Layer Frame Format for Long Range WLAN	MP4170
WO	MP4170WO	PCT/US2012/041422	6/7/2012	N/A	N/A	Expired	Physical Layer Frame Format for Long Range WLAN	MP4170
CN	MP4170WOCN	201280036053.8	6/7/2012	ZL201280036053.8	1/16/2018	Issued	Physical Layer Frame Format for Long Range WLAN	MP4170
EP	MP4170WOEP	12730296.6	6/7/2012	2719220	4/27/2016	Issued	Physical Layer Frame Format for Long Range WLAN	MP4170
DE	MP4170WOEPDE	12730296.6	6/7/2012	2719220	4/27/2016	Issued	Physical Layer Frame Format for Long Range WLAN	MP4170
FR	MP4170WOEPFR	12730296.6	6/7/2012	2719220	4/27/2016	Issued	Physical Layer Frame Format for Long Range WLAN	MP4170

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GB	MP4170WOEPGB	12730296.6	6/7/2012	2719220	4/27/2016	Issued	Physical Layer Frame Format for Long Range WLAN	MP4170
JP	MP4170WOJP	2014-514853	6/7/2012	5967632	7/15/2016	Issued	Physical Layer Frame Format for Long Range WLAN	MP4170
US	MP4182PR	61/497,274	6/15/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR2	61/513,452	7/29/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR3	61/514,164	8/2/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR4	61/523,014	8/12/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR5	61/523,799	8/15/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR6	61/524,231	8/16/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR7	61/531,548	9/6/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR8	61/534,641	9/14/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR9	61/537,169	9/21/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182

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US	MP4182PR10	61/550,321	10/21/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182PR11	61/552,631	10/28/2011	N/A	N/A	Expired	11ah OFDM Low Bandwidth PHY	MP4182
US	MP4182	13/494,505	6/12/2012	8,826,106	9/2/2014	Issued	Low Bandwidth PHY for WLAN	MP4182
US	MP4182C1	13/494,515	6/12/2012	8,891,435	11/18/2014	Issued	Low Bandwidth PHY for WLAN	MP4182
US	MP4182C2	13/494,527	6/12/2012	8,902,869	12/2/2014	Issued	Low Bandwidth PHY for WLAN	MP4182
WO	MP4182WO	PCT/US2012/042027	6/12/2012	N/A	N/A	Expired	Low Bandwidth PHY for WLAN	MP4182
CN	MP4182WOCN	201280037310.X	6/12/2012	ZL201280037310X	6/5/2018	Issued	Methods and Apparatuses for Wireless Local Area Networks	MP4182
EP	MP4182WOEP	12733258.3	6/12/2012	N/A	N/A	Published	Low Bandwidth PHY for WLAN	MP4182
EP	MP4182WED1	Not Yet Assigned	6/12/2012	N/A	N/A	Pending	Low Bandwidth PHY for WLAN	MP4182
JP	MP4182WOJP	2014-515913	6/12/2012	6143016	5/19/2017	Issued	Low Bandwidth PHY for WLAN	MP4182
KR	MP4182WOKR	2014-7001043	6/12/2012	101927495	12/11/2018	Issued	Low Bandwidth PHY for WLAN	MP4182

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US	MP4251PR	61/524,996	8/18/2011	N/A	N/A	Expired	Reduce SIG Field	MP4251
US	MP4251	13/587,667	8/16/2012	9,031,049	5/12/2015	Issued	Signal Field Design for WLAN	MP4251
US	MP4251D1	13/587,681	8/16/2012	9,078,169	7/7/2015	Issued	Signal Field Design for WLAN	MP4251
WO	MP4251WO	PCT/US2012/051184	8/16/2012	N/A	N/A	Expired	Signal Field Design for WLAN	MP4251
CN	MP4251WOCN	201280051253.0	8/16/2012	ZL201280051253.0	4/24/2018	Issued	Signal Field Design for WLAN	MP4251
EP	MP4251WOEP	12753308.1	8/16/2012	2745554	10/10/2018	Issued	Signal Field Design for WLAN	MP4251
DE	MP4251WOEPDE	12753308.1	8/16/2012	602012052043.4	10/10/2018	Issued	Signal Field Design for WLAN	MP4251
FR	MP4251WOEPFR	12753308.1	8/16/2012	2745554	10/10/2018	Issued	Signal Field Design for WLAN	MP4251
GB	MP4251WOEPGB	12753308.1	8/16/2012	2745554	10/10/2018	Issued	Signal Field Design for WLAN	MP4251
JP	MP4251WOJP	2014-526218	8/16/2012	5984160	8/12/2016	Issued	Signal Field Design for WLAN	MP4251
KR	MP4251WOKR	10-2014-7007084	8/16/2012	N/A	N/A	Allowed	Signal Field Design for WLAN	MP4251



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US	MP4347PR	61/554,872	11/2/2011	N/A	N/A	Expired	11Ah 1Mhz/2Mhz Auto-Detection Using LTF1 Sequence	MP4347
US	MP4347	13/661,423	10/26/2012	9,350,583	5/24/2016	Issued	Method and Apparatus for Automatically Detecting a Physical Layer (PHY) Mode of a Data Unit in a Wireless Local Area Network (WLAN)	MP4347
WO	MP4347WO	PCT/US2012/062039	10/26/2012	N/A	N/A	Expired	Method and Apparatus for Automatically Detecting a Physical Layer (PHY) Mode of a Data Unit in a Wireless Local Area Network (WLAN)	MP4347
CN	MP4347WOCN	201280053208.9	10/26/2012	ZL201280053208.9	2/23/2018	Issued	Method and Apparatus for Automatically Detecting a Physical Layer (PHY) Mode of a Data Unit in a Wireless Local Area Network (WLAN)	MP4347
EP	MP4347WOEP	EP12791602.1	10/26/2012	N/A	N/A	Published	Method and Apparatus for Automatically Detecting a Physical Layer (PHY) Mode of a Data Unit in a Wireless Local Area Network (WLAN)	MP4347
JP	MP4347WOJP	2014-539999	10/26/2012	6124362	4/14/2017	Issued	Method and Apparatus for Automatically Detecting a Physical Layer (PHY) Mode of a Data Unit in a Wireless Local Area Network (WLAN)	MP4347
KR	MP4347WOKR	2014-7012034	5/2/2014	10-1945974	1/30/2019	Issued	Method and Apparatus for Automatically Detecting a Physical Layer (PHY) Mode of a Data Unit in a Wireless Local Area Network (WLAN)	MP4347
US	MP4402PR	61/560,733	11/16/2011	N/A	N/A	Expired	Frequency Domain 32FFT Duplication	MP4402

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US	MP4402	13/679,221	11/16/2012	8,953,579	2/10/2015	Issued	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
WO	MP4402WO	PCT/US2012/065507	11/16/2012	N/A	N/A	Expired	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
CN	MP4402WOCN	201280056359.X	11/16/2012	ZL201280056359.X	10/24/2017	Issued	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
EP	MP4402WOEP	EP12799388.9	11/16/2012	2781038	4/25/2018	Issued	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
JP	MP4402WOJP	2014-542491	11/16/2012	6083683	2/3/2017	Issued	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
KR	MP4402WOKR	2014-7012037	11/16/2012	N/A	N/A	Published	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
DE	MP4402WUDE	EP12799388.9	11/16/2012	2781038	4/25/2018	Issued	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
FR	MP4402WUFR	EP12799388.9	11/16/2012	2781038	4/25/2018	Issued	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
GB	MP4402WUGB	EP12799388.9	11/16/2012	2781038	4/25/2018	Issued	Frequency Duplication Mode for Use in Wireless Local Area Networks (WLANs)	MP4402
US	MP4509PR	61/585,550	1/11/2012	N/A	N/A	Expired	Padding/Tail Bits Flow For 11Ah	MP4509
US	MP4509PR2	61/592,519	1/30/2012	N/A	N/A	Expired	Padding/Tail Bits Flow For 11Ah	MP4509

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US	MP4509PR3	61/625,490	4/17/2012	N/A	N/A	Expired	Padding/Tail Bits Flow For 11Ah	MP4509
US	MP4509	13/739,657	1/11/2013	8,988,979	3/24/2015	Issued	Information BIT Padding Schemes for WLAN	MP4509
WO	MP4509WO	PCT/US2013/021213	1/11/2013	N/A	N/A	Expired	Information BIT Padding Schemes for WLAN	MP4509
CN	MP4509WOCN	201380009957.6	1/11/2013	ZL201380009957.6	5/24/2017	Issued	Information BIT Padding Schemes for WLAN	MP4509
EP	MP4509WOEP	EP13720531.6	1/11/2013	EP2803160	1/6/2016	Issued	Information BIT Padding Schemes for WLAN	MP4509
DE	MP4509WOEPDE	13720531.6	1/11/2013	2803160	1/6/2016	Issued	Information BIT Padding Schemes for WLAN	MP4509
FR	MP4509WOEPFR	13720531.6	1/11/2013	2803160	1/6/2016	Issued	Information BIT Padding Schemes for WLAN	MP4509
GB	MP4509WOEPGB	13720531.6	1/11/2013	2803160	1/6/2016	Issued	Information BIT Padding Schemes for WLAN	MP4509
JP	MP4509WOJP	2014-551691	1/11/2013	6025076	10/21/2016	Issued	Information BIT Padding Schemes for WLAN	MP4509
KR	MP4509WOKR	10-2014-7021837	1/11/2013	N/A	N/A	Allowed	Information BIT Padding Schemes for WLAN	MP4509
US	MP4515PR	61/586,565	1/13/2012	N/A	N/A	Expired	Single User Beamforming Format in 11ah	MP4515

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US	MP4515PR2	61/587,386	1/17/2012	N/A	N/A	Expired	Single User Beamforming Format in 11ah	MP4515
US	MP4515PR3	61/591,718	1/27/2012	N/A	N/A	Expired	Single User Beamforming Format in 11ah	MP4515
US	MP4515PR4	61/610,725	3/14/2012	N/A	N/A	Expired	Transmit Beamforming with MU-MIMO	MP4515
US	MP4515PR5	61/674,724	7/23/2012	N/A	N/A	Expired	Single User Beamforming Format in 11ah	MP4515
US	MP4515	13/741,094	1/14/2013	9,246,738	1/26/2016	Issued	Single User and Multi-User Data Unit Formats in Long-Range Wireless Local Area Networks (WLANS)	MP4515
US	MP4515D1	13/741,077	1/14/2013	9,203,683	12/1/2015	Issued	Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)	MP4515
US	MP4515D1C1	14/954,373	11/30/2015	9,667,462	5/30/2017	Issued	Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)	MP4515
WO	MP4515WO	PCT/US2013/021454	1/14/2013	N/A	N/A	Expired	Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)	MP4515
CN	MP4515WOCN	201380010106.3	1/14/2013	ZL201380010106.3	12/29/2017	Issued	Method and Apparatus for Generating Data Units for Transmission Via a Communication Channel Below 1 GHz	MP4515
EP	MP4515WOEP	EP13722047.1	1/14/2013	2803175	6/5/2019	Issued	Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)	MP4515

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EP	MP4515WEPD1	19169589.9	1/14/2013	N/A	N/A	<i>Pending</i>	<i>Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)</i>	MP4515
DE	MP4515WOEPDE	EP13722047.1	1/14/2013	602013056186.9	6/5/2019	<i>Issued</i>	<i>Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)</i>	MP4515
FR	MP4515WOEPFR	EP13722047.1	1/14/2013	2803175	6/5/2019	<i>Issued</i>	<i>Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)</i>	MP4515
GB	MP4515WOEPGB	EP13722047.1	1/14/2013	2803175	6/5/2019	<i>Issued</i>	<i>Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)</i>	MP4515
JP	MP4515WOJP	2014-551693	1/14/2013	6189330	8/10/2017	<i>Issued</i>	<i>Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)</i>	MP4515
KR	MP4515WOKR	10-2014-7021838	1/14/2013	N/A	N/A	<i>Published</i>	<i>Data Unit Format for Single User Beamforming in Long-Range Wireless Local Area Networks (WLANS)</i>	MP4515
US	MP4530PR	61/592,121	1/30/2012	N/A	N/A	<i>Expired</i>	<i>Efficient Wireless Discovery</i>	MP4530
US	MP4530	13/752,902	1/29/2013	9,161,201	10/13/2015	<i>Issued</i>	<i>Method and Apparatus for Discovering a Wireless Device in a Wireless Network</i>	MP4530
US	MP4530C1	14/682,808	4/9/2015	9,232,385	1/5/2016	<i>Issued</i>	<i>Method and Apparatus for Discovering a Wireless Device in a Wireless Network</i>	MP4530
WO	MP4530WO	PCT/US2013/023620	1/29/2013	N/A	N/A	<i>Expired</i>	<i>Method and Apparatus for Discovering a Wireless Device in a Wireless Network</i>	MP4530

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CN	MP4530WOCN	201380006449.2	1/29/2013	ZL201380006449.2	4/13/2018	Issued	Method and Apparatus for Discovering a Wireless Device in a Wireless Network	MP4530
EP	MP4530WOEP	EP13703284.3	1/29/2013	2810491	7/18/2018	Issued	Method and Apparatus for Discovering a Wireless Device in a Wireless Network	MP4530
DE	MP4530WOEPDE	EP13703284.3	1/29/2013	2810491	7/18/2018	Issued	Method and Apparatus for Discovering a Wireless Device in a Wireless Network	MP4530
FR	MP4530WOEPFR	EP13703284.3	1/29/2013	2810491	7/18/2018	Issued	Method and Apparatus for Discovering a Wireless Device in a Wireless Network	MP4530
GB	MP4530WOEPGB	EP13703284.3	1/29/2013	2810491	7/18/2018	Issued	Method and Apparatus for Discovering a Wireless Device in a Wireless Network	MP4530
JP	MP4530WOJP	2014-554940	1/29/2013	6443745	12/26/2018	Issued	Method and Apparatus for Discovering a Wireless Device in a Wireless Network	MP4530
KR	MP4530WOKR	10-2014-7021629	1/29/2013	10-2001645	7/12/2019	Issued	Method and Apparatus for Discovering a Wireless Device in a Wireless Network	MP4530
US	MP4548PR	61/596,126	2/7/2012	N/A	N/A	Expired	Simultaneous BSS Network Radio Function	MP4114/ MP4548
US	MP4548	13/761,949	2/7/2013	9,215,708	12/15/2015	Issued	Method and Apparatus for Multi-Network Communication	MP4114/ MP4548
WO	MP4548WO	PCT/US2013/025144	2/7/2013	N/A	N/A	Expired	Method and Apparatus for Multi-Network Communication	MP4114/ MP4548
US	MP4556PR	61/599,166	2/15/2012	N/A	N/A	Expired	1Mhz Transmission In Wider BW	MP4556

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US	MP4556	13/768,876	2/15/2013	8,942,311	1/27/2015	Issued	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
US	MP4556C1	14/605,858	1/26/2015	9,591,490	3/7/2017	Issued	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
WO	MP4556WO	PCT/US2013/026438	2/15/2013	N/A	N/A	Expired	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
CN	MP4556WOCN	201380009956.1	2/15/2013	ZL201380009956.1	12/29/2017	Issued	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
EP	MP4556WOEP	EP13708286.3	2/15/2013	2815531	4/18/2018	Issued	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
JP	MP4556WOJP	2014-557829	2/15/2013	6083684	2/3/2017	Issued	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
KR	MP4556WOKR	10-2014-7023769	2/15/2013	N/A	N/A	Published	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
DE	MP4556WUDE	EP13708286.3	2/15/2013	2815531	4/18/2018	Issued	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
FR	MP4556WUFR	EP13708286.3	2/15/2013	2815531	4/18/2018	Issued	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
GB	MP4556WUGB	EP13708286.3	2/15/2013	2815531	4/18/2018	Issued	Low Bandwidth PHY Transmission in a Wider Bandwidth	MP4556
US	MP4751PR	61/639,245	4/27/2012	N/A	N/A	Expired	Multi-Channel Scanning	MP4751

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US	MP4751PR2	61/792,405	3/15/2013	N/A	N/A	Expired	Multi-Channel Scanning	MP4751
US	MP4751	13/858,662	4/8/2013	9,198,120	11/24/2015	Issued	Method And Apparatus For Scanning Multiple Channels In A Wireless Network	MP4751
WO	MP4751WO	PCT/US2013/036315	4/12/2013	N/A	N/A	Expired	Method And Apparatus For Scanning Multiple Channels In A Wireless Network	MP4751
CN	MP4751WOCN	201380022076.8	4/12/2013	ZL201380022076.8	7/31/2018	Issued	Method And Apparatus For Scanning Multiple Channels In A Wireless Network	MP4751
US	MP4774PR	61/647,114	5/15/2012	N/A	N/A	Expired	Simple Compressed Beamforming Feedback Single Stream	MP4774
US	MP4774PR2	61/678,523	8/1/2012	N/A	N/A	Expired	Simple Compressed Beamforming Feedback Single Stream	MP4774
US	MP4774	13/890,852	5/9/2013	8,982,980	3/17/2015	Issued	Full and Partial Compressed Feedback Formats for WLAN	MP4774
WO	MP4774WO	PCT/US2013/040365	5/9/2013	N/A	N/A	Expired	Full and Partial Compressed Feedback Formats for WLAN	MP4774
CN	MP4774WOCN	201380025579.0	5/9/2013	ZL201380025579.0	2/23/2018	Issued	Full and Partial Compressed Feedback Formats for WLAN	MP4774
US	MP4845PR	61/666,156	6/29/2012	N/A	N/A	Expired	802.11Ah Full Beacon Design	MP4845
US	MP4845PR2	61/680,628	8/7/2012	N/A	N/A	Expired	802.11Ah Full Beacon Design	MP4845



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US	MP4845PR3	61/700,148	9/12/2012	N/A	N/A	Expired	802.11ah Full Beacon Design	MP4845
US	MP4845	13/931,280	6/28/2013	9,596,648	3/14/2017	Issued	Unified Beacon Format	MP4845
US	MP4845D1	13/931,380	6/28/2013	9,226,227	12/29/2015	Issued	Group-Based Beacons	MP4845
US	MP4845D2	13/931,399	6/28/2013	9,386,516	7/5/2016	Issued	Using Duration Field in Beacon to Reserve Channel Time Subsequent to Beacon	MP4845
WO	MP4845WO	PCT/US2013/048638	6/28/2013	N/A	N/A	Expired	Unified Beacon Format	MP4845
US	MP4878PR	61/679,353	8/3/2012	N/A	N/A	Expired	11ah Sig Field Overloading Bits	MP4878
US	MP4878	13/957,236	8/1/2013	9,246,729	1/26/2016	Issued	Multi-Mode Indication in Subfield in a Signal Field of a Wireless Local Area Network Data Unit	MP4878
US	MP4878C1	15/005,314	1/25/2016	N/A	N/A	Abandoned	Multi-Mode Indication in Subfield in a Signal Field of a Wireless Local Area Network Data Unit	MP4878
WO	MP4878WO	PCT/US2013/053275	8/1/2013	N/A	N/A	Expired	Multi-Mode Indication in Subfield in a Signal Field of a Wireless Local Area Network Data Unit	MP4878
US	MP5106PR	61/807,149	4/1/2013	N/A	N/A	Expired	Puncture Of Interfering UL Subframes To Facilitate IDC	MP5106
US	MP5106	14/242,674	4/1/2014	9,590,792	3/7/2017	Issued	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106

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US	MP5106C1	15/448,528	3/2/2017	10,212,721	2/19/2019	Issued	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106
WO	MP5106WO	PCT/IB2014/000471	4/1/2014	N/A	N/A	Expired	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106
CN	MP5106WOCN	201480019749.9	4/1/2014	N/A	N/A	Allowed	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106
EP	MP5106WOEP	EP14724501.3	4/1/2014	2982204	6/5/2019	Issued	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106
DE	MP5106WOEPDE	EP14724501.3	4/1/2014	602014047832.8	6/5/2019	Issued	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106
FR	MP5106WOEPFR	EP14724501.3	4/1/2014	2982204	6/5/2019	Issued	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106
GB	MP5106WOEPGB	EP14724501.3	4/1/2014	2982204	6/5/2019	Issued	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106
JP	MP5106WOJP	2016-504770	4/1/2014	6395006	9/26/2018	Issued	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106
KR	MP5106WOKR	10-2015-7030536	4/1/2014	N/A	N/A	Published	Termination of Wireless Communication Uplink Periods to Facilitate Reception of Other Wireless Communications	MP5106

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US	MP5122PR	61/810,602	4/10/2013	N/A	N/A	Expired	<i>Interference Mitigation By Txbf</i>	MP5122
US	MP5122	14/249,760	4/10/2014	9,325,540	4/26/2016	Issued	<i>Method and Apparatus for Mitigating Interference in a Wireless Network Through use of Transmit Beamforming</i>	MP5122
US	MP5122II	14/338,914	7/23/2014	10,320,459	6/11/2019	Issued	<i>Method and Apparatus for Mitigating Interference in a Wireless Network Through use of Transmit Beamforming</i>	MP5122
WO	MP5122WO	PCT/US2014/047809	7/23/2014	N/A	N/A	Expired	<i>Method and Apparatus for Mitigating Interference in a Wireless Network Through use of Transmit Beamforming</i>	MP5122
WO	MP5122II WO						<i>Method and Apparatus for Mitigating Interference in a Wireless Network Through use of Transmit Beamforming</i>	MP5122
US	MP5122II	14/338,914	7/23/2014	10,320,459	6/11/2019	Issued	<i>Method and Apparatus for Mitigating Interference in a Wireless Network Through use of Transmit Beamforming</i>	MP5122
US	MP5274PR	61/819,292	5/3/2013	N/A	N/A	Expired	<i>Beam Change And Smoothing In Mixed Mode WLAN Systems</i>	MP5274
US	MP5274	14/269,277	5/5/2014	9,313,691	4/12/2016	Issued	<i>Beam Change And Smoothing In Mixed Mode WLAN Systems</i>	MP5274
US	MP5274C1	15/077,109	3/22/2016	9,930,571	3/27/2018	Issued	<i>Systems And Methods For Providing WLAN Data Packet Having Dual Configurations</i>	MP5274

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WO	MP5274WO	PCT/US2014/036766	5/5/2014	N/A	N/A	Expired	<i>Beam Change And Smoothing In Mixed Mode WLAN Systems</i>	MP5274
CN	MP5274WOCN	201480024862.6	5/5/2014	ZL201480024862.6	2/15/2019	Issued	<i>Device, System and Method for Beam Changing and Smoothing in Mixed Mode WLAN Systems</i>	MP5274
EP	MP5274WOEP	14730297.0	5/5/2014	N/A	N/A	Published	<i>Beam Change And Smoothing Recommendation In Mixed Mode WLAN Systems</i>	MP5274
JP	MP5274WOJP	2016-512104	5/5/2014	6332771	5/30/2018	Issued	<i>Beam Change And Smoothing Recommendation In Mixed Mode WLAN Systems</i>	MP5274
KR	MP5274WOKR	1020157033247	5/5/2014	N/A	N/A	Published	<i>Beam Change And Smoothing Recommendation In Mixed Mode WLAN Systems</i>	MP5274
US	MP5361PR	61/837,997	6/21/2013	N/A	N/A	Expired	<i>Methods For Determining Indicators Used In CSI Feedback In Wireless Systems</i>	MP5361
US	MP5361	14/310,281	6/20/2014	9,130,630	9/8/2015	Issued	<i>Methods and Systems for Determining Indicators Used in Channel State Information (CSI) Feedback in Wireless Systems</i>	MP5361
WO	MP5361WO	PCT/US2014/043459	6/20/2014	N/A	N/A	Expired	<i>Methods and Systems for Determining Indicators Used in Channel State Information (CSI) Feedback in Wireless Systems</i>	MP5361
US	MP5524PR	61/902,413	11/11/2013	N/A	N/A	Expired	<i>OFDMA MAC Consideration</i>	MP5524
US	MP5524PR2	61/947,922	3/4/2014	N/A	N/A	Expired	<i>OFDMA MAC Consideration</i>	MP5524

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US	MP5524	14/538,573	11/11/2014	10,257,806	4/9/2019	Issued	Medium Access Control for Multi-Channel OFDM in a Wireless Local Area Network	MP5524
US	MP5524C1	16/370,610	3/29/2019	N/A	N/A	Pending	Medium Access Control for Multi-Channel OFDM in a Wireless Local Area Network	MP5524
WO	MP5524WO	PCT/US2014/065049	11/11/2014	N/A	N/A	Expired	Medium Access Control for Multi-Channel OFDM in a Wireless Local Area Network	MP5524
US	MP5543PR	61/909,598	11/27/2013	N/A	N/A	Expired	UL MU MIMO Beamforming	MP5543
US	MP5543	14/554,497	11/26/2014	9,166,660	10/20/2015	Issued	Uplink Multi-User Multiple Input Multiple Output Beamforming	MP5543
US	MP5543D1	14/755,722	6/30/2015	9,407,347	8/2/2016	Issued	Uplink Multi-User Multiple Input Multiple Output Beamforming	MP5543
US	MP5543D1C1	15/225,225	8/1/2016	9,699,748	7/4/2017	Issued	Uplink Multi-User Multiple Input Multiple Output Beamforming	MP5543
WO	MP5543WO	PCT/US2014/067596	11/26/2014	N/A	N/A	Expired	Uplink Multi-User Multiple Input Multiple Output Beamforming	MP5543
US	MP5544PR	61/909,700	11/27/2013	N/A	N/A	Expired	OFDMA For WLAN: Sounding And Tone-Block Allocation	MP5544
US	MP5544PR2	61/938,441	2/11/2014	N/A	N/A	Expired	OFDMA For WLAN: Sounding And Tone-Block Allocation	MP5544
US	MP5544	14/555,183	11/26/2014	9,473,341	10/18/2016	Issued	Sounding and Tone Block Allocation for Orthogonal Frequency Multiple Access (OFDMA) in Wireless Local Area Networks	MP5544

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US	MP5544C1	15/295,685	10/17/2016	10,075,318	9/11/2018	Issued	Sounding and Tone Block Allocation for Orthogonal Frequency Multiple Access (OFDMA) in Wireless Local Area Networks	MP5544
US	MP5544C1C1	16/126,678	9/10/2018	N/A	N/A	Allowed	Sounding and Tone Block Allocation for Orthogonal Frequency Multiple Access (OFDMA) in Wireless Local Area Networks	MP5544
US	MP5544D1	15/137,901	4/25/2016	10,103,923	10/16/2018	Issued	Sounding and Tone Block Allocation for Orthogonal Frequency Multiple Access (OFDMA) in Wireless Local Area Networks	MP5544
WO	MP5544WO	PCT/US2014/67728	11/26/2014	N/A	N/A	Expired	Sounding and Tone Block Allocation for Orthogonal Frequency Multiple Access (OFDMA) in Wireless Local Area Networks	MP5544
US	MP5827PR	61/980,417	4/16/2014	N/A	N/A	Expired	L-SIG Length Field Design For HEW	MP5827
US	MP5827PR2	62/012,930	6/16/2014	N/A	N/A	Expired	L-SIG Length Field Design For HEW	MP5827
US	MP5827PR3	62/114,232	2/10/2015	N/A	N/A	Expired	L-SIG Length Field Design For HEW	MP5827
US	MP5827PR4	62/138,148	3/25/2015	N/A	N/A	Expired	L-SIG Length Field Design For HEW	MP5827
US	MP5827	14/688,884	4/16/2015	10,044,476	8/7/2018	Issued	Signal Field Length Indication in a High Efficiency Wireless Local Area Network (WLAN)	MP5827
US	MP5827C1	16/055,743	8/6/2018	N/A	N/A	Pending	Signal Field Length Indication in a High Efficiency Wireless Local Area Network (WLAN)	MP5827

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US	MP5827D1	14/688,859	4/16/2015	10,142,067	11/27/2018	Issued	Determining a Number of Orthogonal Frequency Division Multiplexing (OFDM) Symbols in a Packet	MP5827
WO	MP5827WO	PCT/US2015/026160	4/16/2015	N/A	N/A	Expired	Signal Field Length Indication in a High Efficiency Wireless Local Area Network (WLAN)	MP5827
CN	MP5827WOCN	201580029948.2	4/16/2015	ZL 201580029948.2	8/13/2019	Issued	Signal Field Length Indication in a High Efficiency Wireless Local Area Network (WLAN)	MP5827
EP	MP5827WOEP	15720160.9	4/16/2015	N/A	N/A	Published	Signal Field Length Indication in a High Efficiency Wireless Local Area Network (WLAN)	MP5827
US	MP5842PR	61/986,650	4/30/2014	N/A	N/A	Expired	HEW NDP Frame Design	MP5842
US	MP5842PR2	62/141,173	3/31/2015	N/A	N/A	Expired	HEW NDP Frame Design	MP5842
US	MP5842	14/697,128	4/27/2015	9,749,975	8/29/2017	Issued	Systems And Methods For Implementing Protected Access Based On A Null Data Packet In A Wireless Network	MP5842
WO	MP5842WO	PCT/US2015/028013	4/28/2015	N/A	N/A	Published	Systems And Methods For Implementing Protected Access Based On A Null Data Packet In A Wireless Network	MP5842
US	MP5853PR	61/987,751	5/2/2014	N/A	N/A	Expired	Sync Of OFDMA, UL MU MIMO	MP5853
US	MP5853	14/702,480	5/1/2015	9,629,127	4/18/2017	Issued	Multiple User Allocation Signaling in a Wireless Communication Network	MP5853
WO	MP5853WO	PCT/US2015/028920	5/1/2015	N/A	N/A	Expired	Multiple User Allocation Signaling in a Wireless Communication Network	MP5853

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CN	MP5853WOCN	201580033447.1	5/1/2015	N/A	N/A	Published	Multiple User Allocation Signaling in a Wireless Communication Network	MP5853
EP	MP5853WOEP	15725444.2	5/1/2015	N/A	N/A	Published	Multiple User Allocation Signaling in a Wireless Communication Network	MP5853
JP	MP5853WOJP	2016-565142	5/1/2015	6430535	11/9/2018	Issued	Multiple User Allocation Signaling in a Wireless Communication Network	MP5853
KR	MP5853WOKR	10-2016-7033664	5/1/2015	N/A	N/A	Pending	Multiple User Allocation Signaling in a Wireless Communication Network	MP5853
US	MP5859IIPR	62/171,534	6/5/2015	N/A	N/A	Expired	OFDMA Contiguous Resource Allocation Signaling for WiFi	MP5859
US	MP5859IPR2	62/183,849	6/24/2015	N/A	N/A	Expired	OFDMA Contiguous Resource Allocation Signaling for WiFi	MP5859
US	MP5859IPR3	62/246,311	10/26/2015	N/A	N/A	Expired	OFDMA Contiguous Resource Allocation Signaling for WiFi	MP5859
US	MP5859I1	15/173,152	6/3/2016	10,164,695	12/25/2018	Issued	Tone Block and Spatial Stream Allocation	MP5859
WO	MP5859I1WO	PCT/US2016/35827	6/3/2016	N/A	N/A	Published	Tone Block and Spatial Stream Allocation	MP5859
CN	MP5859IWCN	201680043816.X	6/3/2016	N/A	N/A	Pending	Tone Block and Spatial Stream Allocation	MP5859
EP	MP5859I1WOEP	16730952.5	6/3/2016	N/A	N/A	Pending	Tone Block and Spatial Stream Allocation	MP5859



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US	MP5877PR	62/006,522	6/2/2014	N/A	N/A	Expired	High Efficiency OFDM PHY For WLAN 802.11Ax	MP5877
US	MP5877PR2	62/027,425	7/22/2014	N/A	N/A	Expired	High Efficiency OFDM PHY For WLAN 802.11Ax	MP5877
US	MP5877	14/728,802	6/2/2015	9,832,059	11/28/2017	Issued	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
US	MP5877C1	15/793,664	10/25/2017	10,257,006	4/9/2019	Issued	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
US	MP5877C1C1	16/370,588	3/29/2019	10,411,937	9/10/2019	Issued	Generating Packets Having Orthogonal Frequency Division Multiplexing (OFDM) Symbols	MP5877
US	MP5877C1C1C1	16/564,927	9/9/2019	N/A	N/A	Pending	Generating Packets Having Orthogonal Frequency Division Multiplexing (OFDM) Symbols	MP5877
WO	MP5877WO	PCT/US2015/033818	6/2/2015	N/A	N/A	Expired	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
CN	MP5877WOCN	201580041076.1	6/2/2015	N/A	N/A	Published	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
EP	MP5877WOEP	15748332.2	6/2/2015	3149879	5/23/2018	Issued	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877

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JP	MP5877WOJP	2016-570884	6/2/2015	6457557	12/28/2018	Issued	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
JP	MP5877WJD1	2018-238533	12/1/2016	N/A	N/A	Pending	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
KR	MP5877WOKR	10-2016-7035527	6/2/2015	N/A	N/A	Pending	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
DE	MP5877WUDE	15748332.2	6/2/2015	602015011469.8	5/23/2018	Issued	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
FR	MP5877WUFR	15748332.2	6/2/2015	3149879	5/23/2018	Issued	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
GB	MP5877WUGB	15748332.2	6/2/2015	3149879	5/23/2018	Issued	High Efficiency Orthogonal Frequency Division Multiplexing (OFDM) Physical Layer (PHY)	MP5877
US	MP5899PR	62/011,332	6/12/2014	N/A	N/A	Expired	Bandwidth/AC Selection and Acknowledge Indication OFDMA, UL MU, MIMO	MP5899
US	MP5899PR2	62/044,838	9/2/2014	N/A	N/A	Expired	Bandwidth/AC Selection and Acknowledge Indication OFDMA, UL MU, MIMO	MP5899
US	MP5899PR3	62/112,959	2/6/2015	N/A	N/A	Expired	Bandwidth/AC Selection and Acknowledge Indication OFDMA, UL MU, MIMO	MP5899
US	MP5899	14/738,521	6/12/2015	9,912,388	3/6/2018	Issued	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899

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US	MP5899C1	15/337,579	10/28/2016	N/A	N/A	Pending	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
US	MP5899C2	15/911,584	3/5/2018	N/A	N/A	Pending	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
WO	MP5899WO	PCT/US2015/035649	6/12/2015	N/A	N/A	Expired	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
CN	MP5899WOCN	201580043492.5	6/12/2015	N/A	N/A	Published	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
EP	MP5899WOEP	15731795.9	6/12/2015	3155751	3/20/2019	Issued	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
DE	MP5899WOEPDE	15731795.9	6/12/2015	602015026748.6	3/20/2019	Issued	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
FR	MP5899WOEPFR	15731795.9	6/12/2015	3155751	3/20/2019	Issued	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
GB	MP5899WOEPGB	15731795.9	6/12/2015	3155751	3/20/2019	Issued	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
JP	MP5899WOJP	2016-572661	6/12/2015	N/A	N/A	Published	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
KR	MP5899WOKR	10-2017-7000617	6/12/2015	N/A	N/A	Pending	Sub-Channel Allocation in Orthogonal Frequency Division Multiplex WLAN	MP5899
US	MP5900PR	62/010,787	6/11/2014	N/A	N/A	Expired	Compressed OFDM Symbol For Padding	MP5900/ MP6379

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US	MP5900PR2	62/027,525	7/22/2014	N/A	N/A	Expired	<i>Compressed OFDM Symbol For Padding and Preamble</i>	MP5900/ MP6379
US	MP5900PR3	62/034,502	8/7/2014	N/A	N/A	Expired	<i>Compressed OFDM Symbol For Padding and Preamble</i>	MP5900/ MP6379
US	MP5900PR4	62/041,858	8/26/2014	N/A	N/A	Expired	<i>Compressed OFDM Symbol For Padding and Preamble</i>	MP5900/ MP6379
US	MP5900PR5	62/051,089	9/16/2014	N/A	N/A	Expired	<i>Compressed OFDM Symbol For Padding and Preamble</i>	MP5900/ MP6379
US	MP5900PR6	62/087,083	12/3/2014	N/A	N/A	Expired	<i>Compressed OFDM Symbol For Padding and Preamble</i>	MP5900/ MP6379
US	MP5900PR7	62/094,825	12/19/2014	N/A	N/A	Expired	<i>Compressed OFDM Symbol For Padding and Preamble</i>	MP5900/ MP6379
US	MP5900PR8	62/148,456	4/16/2015	N/A	N/A	Expired	<i>Compressed OFDM Symbols For Padding And Preamble- V6</i>	MP5900/ MP6379
US	MP5900PR9	62/168,652	5/29/2015	N/A	N/A	Expired	<i>Compressed OFDM Symbol For Padding and Preamble</i>	MP5900/ MP6379
US	MP5900	14/737,316	6/11/2015	9,397,873	7/19/2016	Issued	<i>Compressed Orthogonal Frequency Division Multiplexing (OFDM) Symbols in a Wireless Communication System</i>	MP5900/ MP6379

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US	MP5900C1	15/212,927	7/18/2016	9,768,996	9/19/2017	Issued	<i>Compressed Orthogonal Frequency Division Multiplexing (OFDM) Symbols in a Wireless Communication System</i>	MP5900/ MP6379
US	MP5900C1C1	15/706,971	9/18/2017	10,116,477	10/30/2018	Issued	<i>Padding for Orthogonal Frequency Division Multiplexing (OFDM) Symbols in a Wireless Communication System</i>	MP5900/ MP6379
US	MP5900C1C1C1	16/170,919	10/25/2018	N/A	N/A	Pending	<i>Padding for Orthogonal Frequency Division Multiplexing (OFDM) Symbols in a Wireless Communication System</i>	MP5900/ MP6379
PCT	MP5900WO	PCT/US2015/035401	6/11/2015	N/A	N/A	Expired	<i>Compressed Orthogonal Frequency Division Multiplexing (OFDM) Symbols in a Wireless Communication System</i>	MP5900/ MP6379
CN	MP5900WOCN	201580042728.3	6/11/2015	N/A	N/A	Pending	<i>Compressed OFDM Symbols in a Wireless Communication System</i>	MP5900/ MP6379
EP	MP5900WOEP	15731211.7	6/11/2015	3155778	2/20/2019	Issued	<i>Compressed OFDM Symbols in a Wireless Communication System</i>	MP5900/ MP6379
DE	MP5900WOEPDE	15731211.7	6/11/2015	602015024871.6	2/20/2019	Issued	<i>Compressed OFDM Symbols in a Wireless Communication System</i>	MP5900/ MP6379
FR	MP5900WOEPFR	15731211.7	6/11/2015	3155778	2/20/2019	Issued	<i>Compressed OFDM Symbols in a Wireless Communication System</i>	MP5900/ MP6379

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GB	MP5900WOEPGB	15731211.7	6/11/2015	3155778	2/20/2019	Issued	<i>Compressed OFDM Symbols in a Wireless Communication System</i>	MP5900/ MP6379
JP	MP5900WOJP	2016-571725	6/11/2015	N/A	N/A	Pending	<i>Compressed OFDM Symbols in a Wireless Communication System</i>	MP5900/ MP6379
KR	MP5900WOKR	10-2017-7000223	6/11/2015	N/A	N/A	Pending	<i>Compressed Orthogonal Frequency Division Multiplexing (OFDM) Symbols in a Wireless Communication System</i>	MP5900/ MP6379
US	MP5900C1	15/212,927	7/18/2016	9,768,996	9/19/2017	Issued	<i>Compressed Orthogonal Frequency Division Multiplexing (OFDM) Symbols in a Wireless Communication System</i>	MP5900/ MP6379
US	MP5909PR	62/024,822	7/15/2014	N/A	N/A	Expired	<i>Channel Frame Structures For High Efficiency Wireless LAN (HEW)</i>	MP5909
US	MP5909	14/795,233	7/9/2015	10,009,922	6/26/2018	Issued	<i>Channel Frame Structures For High Efficiency Wireless LAN (HEW)</i>	MP5909
WO	MP5909WO	PCT/US2015/040110	7/13/2015	N/A	N/A	Expired	<i>Group Acknowledgement for Multiple user Communication in a Wireless Local Area Network</i>	MP5909
US	MP5945PR	62/028,559	7/24/2014	N/A	N/A	Expired	<i>Group Acknowledge Design for UL MU MIMO/OFDMA</i>	MP5945
US	MP5945PR2	62/115,371	2/12/2015	N/A	N/A	Expired	<i>Group Acknowledge Design for UL MU MIMO/OFDMA</i>	MP5945

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US	MP5945PR3	62/165,789	5/22/2015	N/A	N/A	Expired	Group Acknowledge Design for UL MU MIMO/OFDMA	MP5945
US	MP5945	14/808,932	7/24/2015	9,729,214	8/8/2017	Issued	Group Acknowledgement for Multiple User Communication in a Wireless Local Area Network	MP5945
US	MP5945C1	15/670,536	8/7/2017	N/A	N/A	Pending	Group Acknowledgement for Multiple User Communication in a Wireless Local Area Network	MP5945
US	MP5992PR	62/078,169	11/11/2014	N/A	N/A	Expired	MU Acknowledge	MP5992
US	MP5992PR2	62/148,659	4/16/2015	N/A	N/A	Expired	Acknowledge For DL MU MIMO/OFDMA	MP5992
US	MP5992PR3	62/156,047	5/1/2015	N/A	N/A	Expired	Acknowledge For DL MU MIMO/OFDMA	MP5992
US	MP5992PR4	62/204,169	8/12/2015	N/A	N/A	Expired	Acknowledge For DL MU MIMO/OFDMA	MP5992
US	MP5992	14/938,680	11/11/2015	9,992,774	6/5/2018	Issued	Acknowledgement for Multiple user Communication in a WLAN	MP5992
US	MP5992C1	15/337,668	10/28/2016	10,098,119	10/9/2018	Issued	Acknowledgement for Multiple user Communication in a WLAN	MP5992
US	MP5992C2	15/997,033	6/4/2018	N/A	N/A	Pending	Acknowledgement for Multiple user Communication in a WLAN	MP5992
US	MP5992C1C1C1	16/154,582	10/8/2018	N/A	N/A	Pending	Acknowledgement for Multiple user Communication in a WLAN	MP5992

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WO	MP5992WO	PCT/US2015/060211	11/11/2015	N/A	N/A	Expired	Acknowledgement for Multiple user Communication in a WLAN	MP5992
EP	MP5992WOEP	15798632.4	11/11/2015	N/A	N/A	Pending	Acknowledgment for Multiple User Communication in a WLAN	MP5992
US	MP5996PR	62/101,100	1/8/2015	N/A	N/A	Expired	Downlink Signaling for High Efficiency WiFi	MP5996
US	MP5996PR2	62/148,666	4/16/2015	N/A	N/A	Expired	Downlink Signaling for High Efficiency WiFi	MP5996
US	MP5996PR3	62/184,420	6/25/2015	N/A	N/A	Expired	Downlink Signaling for High Efficiency WiFi	MP5996
US	MP5996PR4	62/191,663	7/13/2015	N/A	N/A	Expired	Downlink Signaling for High Efficiency WiFi	MP5996
US	MP5996PR5	62/199,060	7/30/2015	N/A	N/A	Expired	Downlink Signaling for High Efficiency WiFi	MP5996
US	MP5996PR6	62/222,509	9/23/2015	N/A	N/A	Expired	Downlink Signaling for High Efficiency WiFi	MP5996
US	MP5996	14/991,564	1/8/2016	9,768,921	9/19/2017	Issued	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996
US	MP5996C1	15/702,812	9/13/2017	10,014,992	7/3/2018	Issued	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996
US	MP5996C1C1	16/025,229	7/2/2018	10,263,738	4/16/2019	Issued	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996



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US	MP5996C1C1C1	16/384,418	4/15/2019	N/A	N/A	Pending	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996
WO	MP5996WO	PCT/US2016/012704	1/8/2016	N/A	N/A	Expired	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996
CN	MP5996WOCN	201680014474.9	1/8/2016	N/A	N/A	Pending	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996
EP	MP5996WOEP	16713133.3	1/8/2016	N/A	N/A	Pending	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996
JP	MP5996WOJP	2017-535994	1/8/2016	6459015	1/11/2019	Issued	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996
KR	MP5996WOKR	10-2017-7021697	1/8/2016	N/A	N/A	Pending	Downlink Signaling in a High Efficiency Wireless Local Area Network (WLAN)	MP5996
US	MP6017PR	62/054,098	9/23/2014	N/A	N/A	Expired	Short Training Field for High Efficiency WiFi	MP6017
US	MP6017PR2	62/115,787	2/13/2015	N/A	N/A	Expired	Short Training Field for High Efficiency WiFi	MP6017
US	MP6017PR3	62/141,180	3/31/2015	N/A	N/A	Expired	Short Training Field for High Efficiency WiFi	MP6017
US	MP6017PR4	62/218,322	9/14/2015	N/A	N/A	Expired	Short Training Field for High Efficiency WiFi	MP6017
US	MP6017	14/863,208	9/23/2015	9,794,044	10/17/2017	Issued	Short Training Field for WiFi	MP6017

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US	MP6017C1	15/335,149	10/26/2016	10,038,540	7/31/2018	Issued	Short Training Field for WiFi	MP6017
US	MP6017C1C1	15/883,806	1/30/2018	10419187	9/17/2019	Issued	Short Training Field for WiFi	MP6017
US	MP6017C3	16/048,445	7/30/2018	N/A	N/A	Pending	Short Training Field for WiFi	MP6017
PCT	MP6017WO	PCT/US2015/051765	9/23/2015	N/A	N/A	Expired	Short Training Field for WiFi	MP6017
EP	MP6017WOEP	15775353.4	9/23/2015	N/A	N/A	Pending	Short Training Field for WiFi	MP6017
US	MP6023PR	62/058,887	10/2/2014	N/A	N/A	Expired	On the Tone Plan of OFDM/OFDMA Based Systems	MP6023
US	MP6023	14/823,257	8/11/2015	10,164,729	12/25/2018	Issued	System And Method Of Tone Mapping During Single User And Multiple User Operating Modes Including Transmissions Respectively of OFDM Symbols And OFDMA Symbols In A WLAN	MP6023
WO	MP6023WO	PCT/US2015/048117	9/2/2015	N/A	N/A	Expired	System And Method Of Tone Mapping During Single User And Multiple User Operating Modes Including Transmissions Respectively of OFDM Symbols And OFDMA Symbols In A WLAN	MP6023
CN	MP6023WOCN	201580053848.3	9/2/2015	N/A	N/A	Pending	System and Method of Tone Mapping in Single User and Multiple User Operating Modes	MP6023

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EP	MP6023WOEP	15763749.7	9/2/2015	3202074	12/12/2018	Issued	System and Method of Tone Mapping in Single User and Multiple User Operating Modes	MP6023
DE	MP6023WOEPDE	15763749.7	9/2/2015	602015021418.8	12/12/2018	Issued	System and Method of Tone Mapping in Single User and Multiple User Operating Modes	MP6023
FR	MP6023WOEPFR	15763749.7	9/2/2015	3202074	12/12/2018	Issued	System and Method of Tone Mapping in Single User and Multiple User Operating Modes	MP6023
GB	MP6023WOEPGB	15763749.7	9/2/2015	3202074	12/12/2018	Issued	System and Method of Tone Mapping in Single User and Multiple User Operating Modes	MP6023
JP	MP6023WOJP	2017-516734	9/2/2015	N.A	N/A	Pending	System And Method Of Tone Mapping During Single User And Multiple User Operating Modes Including Transmissions Respectively Of OFDM Symbols And OFDMA Symbols In A WLAN	MP6023
US	MP6071PR	62/115,051	2/11/2015	N/A	N/A	Expired	Interference Measurement Tones for OFDMA-WiFi	MP6071
US	MP6071	15/004,840	1/22/2016	9,992,001	6/5/2018	Issued	Interference Measurement Pilot Tones	MP6071
WO	MP6071WO	PCT/IB2016/050345	1/22/2016	N/A	N/A	Expired	Interference Measurement Pilot Tones	MP6071
US	MP6127PR	62/086,584	12/2/2014	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127

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US	MP6127PR2	62/092,053	12/15/2014	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127
US	MP6127PR3	62/102,554	1/12/2015	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127
US	MP6127PR4	62/105,459	1/20/2015	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127
US	MP6127PR5	62/112,524	2/5/2015	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127
US	MP6127PR6	62/112,976	2/6/2015	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127
US	MP6127PR7	62/156,059	5/1/2015	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127
US	MP6127PR8	62/191,658	7/13/2015	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127
US	MP6127PR9	62/222,566	9/23/2015	N/A	N/A	Expired	Signal Field Structure for High Efficiency WiFi	MP6127
US	MP6127	14/956,947	12/2/2015	10,027,449	7/17/2018	Issued	Signal Fields in a High Efficiency Wireless Local Area Network (WLAN)	MP6127
US	MP6127C1	16/036,666	7/16/2018	N/A	N/A	Pending	Signal Fields in a High Efficiency Wireless Local Area Network (WLAN) Data Unit	MP6127
US	MP6128PR	62/088,257	12/5/2014	N/A	N/A	Expired	Sync Design	MP6128/ MP6144/ MP6352/ MP6555/ MP6558

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US	MP6128PR2	62/112,528	2/5/2015	N/A	N/A	Expired	Sync Design	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6128PR3	62/112,894	2/6/2015	N/A	N/A	Expired	Sync Design	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6128PR4	62/204,164	8/12/2015	N/A	N/A	Expired	Sync (Trigger Frame) Design	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6128PR5	62/244,283	10/21/2015	N/A	N/A	Expired	OFDMA Beamforming Feedback	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6128PR6	62/255,822	11/16/2015	N/A	N/A	Expired	DL OFDMA With Broadcast RU	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6128	14/961,380	12/7/2015	10,334,571	6/25/2019	Allowed	Trigger Frame Format for Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6128C1	16/449,029	6/21/2019	N/A	N/A	Pending	Trigger Frame Format for Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
WO	MP6128WO	PCT/US2015/064307	12/7/2015	N/A	N/A	Expired	Trigger Frame Format for Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
CN	MP6128WOCN	201580075093.7	12/7/2015	N/A	N/A	Pending	Trigger Frame Format for Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
EP	MP6128WOEP	15816629.8	12/7/2015	N/A	N/A	Pending	Trigger Frame Format for Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558

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US	MP6128I1	15/144,543	5/2/2016	10,390,328	8/20/2019	Issued	Beamforming Training in Orthogonal Frequency Division Multiple Access (OFDMA) Communication Systems	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6128I1C1	16/544,312	8/19/2019	N/A	N/A	Pending	Beamforming Training in Orthogonal Frequency Division Multiple Access (OFDMA) Communication Systems	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
CN	MP6128IWCN	201680035079.9	5/2/2016	N/A	N/A	Pending	Beamforming Training in Orthogonal Frequency Division Multiple Access (OFDMA) Communication Systems	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
EP	MP6128IWEP	16730540.8	5/2/2016	N/A	N/A	Pending	Beamforming Training in Orthogonal Frequency Division Multiple Access (OFDMA) Communication Systems	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6144PR	62/145,407	4/9/2015	N/A	N/A	Expired	Random Access Signals For Wifi	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6144	15/096,098	4/11/2016	10,201,017	2/5/2019	Issued	Contention-Based Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6144C1	15/337,749	10/28/2016	N/A	N/A	Pending	Contention-Based Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
WO	MP6144WO	PCT/US2016/026962	4/11/2016	N/A	N/A	Expired	Contention-Based Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
CN	MP6144WOCN	201680033858.5	4/11/2016	N/A	N/A	Pending	Contention-Based Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558

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EP	MP6144WOEP	16718129.6	4/11/2016	N/A	N/A	Pending	Contention-Based Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6356PR	62/156,097	5/1/2015	N/A	N/A	Expired	TXOP Sharing And Extension	MP6356
US	MP6356PR2	62/323,261	4/15/2016	N/A	N/A	Expired	TXOP Sharing And Extension	MP6356
US	MP6356	15/144,577	5/2/2016	10,383,091	8/13/2019	Issued	Transmission Opportunity Ownership Transfer and Extension in a Wireless Local Area Network (WLAN)	MP6356
WO	MP6356WO	PCT/US2016/030440	5/2/2016	N/A	N/A	Expired	Transmission Opportunity Ownership Transfer and Extension in a Wireless Local Area Network (WLAN)	MP6356
CN	MP6356WOCN	201680036633.5	5/2/2016	N/A	N/A	Pending	Transmission Opportunity Ownership Transfer and Extension in a Wireless Local Area Network (WLAN)	MP6356
EP	MP6356WOEP	16730541.6	5/2/2016	N/A	N/A	Pending	Transmission Opportunity Ownership Transfer and Extension in a Wireless Local Area Network (WLAN)	MP6356
US	MP6357PR	62/166,856	5/27/2015	N/A	N/A	Expired	Individual OFDMA Resource Allocation Signaling For Wifi	MP6357
US	MP6357	15/167,643	5/27/2016	10,079,628	9/18/2018	Issued	Signaling Resource Allocations in Multi-User Data Units	MP6357
PCT	MP6357WO	PCT/US2016/034827	5/27/2016	N/A	N/A	Expired	Signaling Resource Allocations in Multi-User Data Units	MP6357

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CN	MP6357WOCN	20166839566	5/27/2016	N/A	N/A	Pending	Signaling Resource Allocations in Multi-User Data Units	MP6357
EP	MP6357WOEP	16730937.6	5/27/2016	N/A	N/A	Pending	Signaling Resource Allocations in Multi-User Data Units	MP6357
US	MP6379	14/737,273	6/11/2015	9,954,703	4/24/2018	Issued	Compressed Preamble for a Wireless Communication System	MP5900/ MP6379
US	MP6379C1	15/960,128	4/23/2018	N/A	N/A	Pending	Compressed Preamble for a Wireless Communication System	MP5900/ MP6379
WO	MP6379WO	PCT/US2015/035403	6/11/2015	N/A	N/A	Expired	Compressed Preamble for a Wireless Communication System	MP5900/ MP6379
CN	MP6379WOCN	201580042730.0	6/11/2015	N/A	N/A	Pending	Compressed Preamble for a Wireless Communication System	MP5900/ MP6379
EP	MP6379WOEP	15731212.5	6/11/2015	N/A	N/A	Pending	Compressed Preamble for a Wireless Communication System	MP5900/ MP6379
JP	MP6379WOJP	2016-572629	6/11/2015	N/A	N/A	Pending	Compressed Preamble for a Wireless Communication System	MP5900/ MP6379
KR	MP6379WOKR	10-2017-7000616	6/11/2015	N/A	N/A	Pending	Compressed Preamble for a Wireless Communication System	MP5900/ MP6379
US	MP6383PR	62/173,230	6/9/2015	N/A	N/A	Expired	Uplink Multi-User (UL-MU) Channel Access	MP6383
US	MP6383PR2	62/305,608	3/9/2016	N/A	N/A	Expired	Uplink Multi-User (UL-MU) Channel Access	MP6383



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US	MP6383	15/178,307	6/9/2016	10,285,202	5/7/2019	Issued	Channel Access for Simultaneous Uplink Transmissions by Multiple Communication Devices	MP6383
US	MP6383C1	16/404,119	5/6/2019	N/A	N/A	Pending	Channel Access for Simultaneous Uplink Transmissions by Multiple Communication Devices	MP6383
PCT	MP6383WO	PCT/US2016/036746	6/9/2016	N/A	N/A	Expired	Channel Access for Simultaneous Uplink Transmissions by Multiple Communication Devices	MP6383
CN	MP6383WOCN	2016800472230	6/9/2016	N/A	N/A	Pending	Channel Access for Simultaneous Uplink Transmissions by Multiple Communication Devices	MP6383
EP	MP6383WOEP	16732114.0	6/9/2016	N/A	N/A	Pending	Channel Access for Simultaneous Uplink Transmissions by Multiple Communication Devices	MP6383
US	MP6395PR	62/174,158	6/11/2015	N/A	N/A	Expired	Padding with Signal Extensions	MP6395
US	MP6395	15/179,150	6/10/2016	10,230,490	3/12/2019	Issued	Systems, Apparatuses and Methods for a Signal Extension Padding Scheme	MP6395
US	MP6395C1	16/295,499	3/7/2019	N/A	N/A	Pending	Systems, Apparatuses and Methods for a Signal Extension Padding Scheme	MP6395
WO	MP6395WO	PCT/US2016/036955	6/10/2016	N/A	N/A	Expired	Systems, Apparatuses and Methods for a Signal Extension Padding Scheme	MP6395
CN	MP6395WOCN	201680033714.X	6/10/2016	N/A	N/A	Pending	Systems, Apparatuses and Methods for a Signal Extension Padding Scheme	MP6395
EP	MP6395WOEP	16732835.0	6/10/2016	N/A	N/A	Pending	Systems, Apparatuses and Methods for a Signal Extension Padding Scheme	MP6395

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KR	MP6395WOKR	10-2017-7036402	6/10/2016	N/A	N/A	Pending	Systems, Apparatuses and Methods for a Signal Extension Padding Scheme	MP6395
US	MP6399PR	62/183,838	6/24/2015	N/A	N/A	Expired	OFDMA TWT	MP6399
US	MP6399PR2	62/259,212	11/24/2015	N/A	N/A	Expired	OFDMA TWT	MP6399
US	MP6399	15/191,441	6/23/2016	10,187,905	1/22/2019	Issued	Target Wake Time (TWT) Scheduling for Orthogonal Frequency-Division Multiple Access (OFDMA) Channelization	MP6399
WO	MP6399WO	PCT/IB2016/053760	6/24/2016	N/A	N/A	Pending	Target Wake Time (TWT) Scheduling for Orthogonal Frequency-Division Multiple Access (OFDMA) Channelization	MP6399
CN	MP6399WOCN	201680030233.3	6/24/2016	N/A	N/A	Pending	Target Wake Time (TWT) Scheduling for Orthogonal Frequency-Division Multiple Access (OFDMA) Channelization	MP6399
EP	MP6399WOEP	16741992.8	6/24/2016	N/A	N/A	Pending	Target Wake Time (TWT) Scheduling for Orthogonal Frequency-Division Multiple Access (OFDMA) Channelization	MP6399
US	MP6421PR	62/184,362	6/25/2015	N/A	N/A	Expired	OFDMA LTF Design for WLAN	MP6421
US	MP6421	15/174,263	6/6/2016	10,230,556	3/12/2019	Issued	Systems and Methods for Implementing an OFDMA LTF Design for Wireless Network Communication	MP6421
US	MP6421C1	16/291,649	3/4/2019	N/A	N/A	Pending	Systems and Methods for Implementing an OFDMA LTF Design for Wireless Network Communication	MP6421

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PCT	MP6421WO	PCT/US2016/036382	6/8/2016	N/A	N/A	Expired	Systems and Methods for Implementing an OFDMA LTF Design for Wireless Network Communication	MP6421
CN	MP6421WOCN	201680033219.9	6/8/2016	N/A	N/A	Pending	Systems and Methods for Implementing an OFDMA LTF Design for Wireless Network Communication	MP6421
EP	MP6421WOEP	16730972.3	6/8/2016	N/A	N/A	Pending	Systems and Methods for Implementing an OFDMA LTF Design for Wireless Network Communication	MP6421
KR	MP6421WOKR	10-2017-7035810	6/8/2016	N/A	N/A	Pending	Systems and Methods for Implementing an OFDMA LTF Design for Wireless Network Communication	MP6421
US	MP6452PR	62/205,132	8/14/2015	N/A	N/A	Expired	11Ay PHY Frame Format	MP6452
US	MP6452	15/236,242	8/12/2016	10,079,709	9/18/2018	Issued	Physical Layer Data Unit Format for a Wireless Communication Network	MP6452
PCT	MP6452WO	PCT/US2016/046893	8/12/2016	N/A	N/A	Expired	Physical Layer Data Unit Format for a Wireless Communication Network	MP6452
US	MP6476PR	62/216,550	9/10/2015	N/A	N/A	Expired	11Ax IX Preamble	MP6476
US	MP6476PR2	62/246,316	10/26/2015	N/A	N/A	Expired	11Ax IX Preamble	MP6476
US	MP6476	15/262,485	9/12/2016	10,075,874	9/11/2018	Issued	Systems and Methods for Transmitting a Preamble within a Wireless Local Area Network (WLAN)	MP6476
US	MP6476C1	16/126,344	9/10/2018	N/A	N/A	Pending	Systems and Methods for Transmitting a Preamble within a Wireless Local Area Network (WLAN)	MP6476

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WO	MP6476WO	PCT/US2016/051280	9/12/2016	N/A	N/A	Expired	Systems and Methods for Transmitting a Preamble within a Wireless Local Area Network (WLAN)	MP6476
CN	MP6476WOCN	CN2016851734	9/12/2016	N/A	N/A	Pending	Systems and Methods for Transmitting a Preamble within a Wireless Local Area Network (WLAN)	MP6476
EP	MP6476WOEP	16771042.5	9/12/2016	N/A	N/A	Pending	Systems and Methods for Transmitting a Preamble within a Wireless Local Area Network (WLAN)	MP6476
US	MP6485PR	62/243,769	10/20/2015	N/A	N/A	Expired	Acknowledgement of OFDMA A-MPDU With Multiple TCs	MP6485/ MP6590/ MP10301/ MP10303
US	MP6485PR3	62/297,236	2/19/2016	N/A	N/A	Expired	Acknowledgement of OFDMA A-MPDU With Multiple TCs	MP6485/ MP6590/ MP10301/ MP10303
US	MP6485PR4	62/304,570	3/7/2016	N/A	N/A	Expired	Acknowledgement of OFDMA A-MPDU With Multiple TCs	MP6485/ MP6590/ MP10301/ MP10303
US	MP6485	15/299,325	10/20/2016	10,278,224	4/30/2019	Issued	Acknowledgement Data Unit for Multiple Uplink Data Units	MP6485/ MP6590/ MP10301/ MP10303
US	MP6485C1	16/397,647	4/29/2019	N/A	N/A	Pending	Acknowledgement Data Unit for Multiple Uplink Data Units	MP6485/ MP6590/ MP10301/ MP10303
WO	MP6485WO	PCT/US2016/057978	10/20/2016	N/A	N/A	Expired	Acknowledgement Data Unit for Multiple Uplink Data Units	MP6485/ MP6590/ MP10301/ MP10303
US	MP6485I1	16/044,234	7/24/2018	N/A	N/A	Pending	Single Acknowledgement Policy for Aggregate MPDU	MP6485/ MP6590/ MP10301/ MP10303
US	MP6503PR	62/245,495	10/23/2015	N/A	N/A	Expired	Low-Power-Low-Rate Frame Structure	MP6503

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US	MP6503PR2	62/369,580	8/1/2016	N/A	N/A	Expired	Low-Power-Low-Rate Frame Structure	MP6503
US	MP6503	15/332,531	10/24/2016	10,165,094	12/25/2018	Issued	Structure for Low-Power-Low-Rate Data Transmission	MP6503
US	MP6503C1	16/226,174	12/19/2018	N/A	N/A	Pending	Structure for Low-Power-Low-Rate Data Transmission	MP6503
WO	MP6503WO	PCT/US2016/058466	10/24/2016	N/A	N/A	Expired	Structure for Low-Power-Low-Rate Data Transmission	MP6503
US	MP6521PR	62/246,445	10/26/2015	N/A	N/A	Expired	Dynamic CCA and Per TXOP Spatial Medium Sharing	MP6521
US	MP6521	15/335,160	10/26/2016	10,111,185	10/23/2018	Issued	Backoff Operation in Connection with Spatial Reuse	MP6521
WO	MP6521WO	PCT/US2016/058883	10/26/2016	N/A	N/A	Expired	Backoff Operation in Connection with Spatial Reuse	MP6521
US	MP6532PR	62/259,220	11/24/2015	N/A	N/A	Expired	A-MPDU With Fragment In MU PPDU	MP6532
US	MP6532	15/360,538	11/23/2016	N/A	N/A	Pending	Acknowledgement Data Unit for Data Unit Fragment	MP6532
WO	MP6532WO	PCT/US2016/063599	11/23/2016	N/A	N/A	Expired	Acknowledgement Data Unit for Data Unit Fragment	MP6532
CN	MP6532WOCN	MP6532WOCN	11/23/2016	N/A	N/A	Pending	Acknowledgement Data Unit for Data Unit Fragment	MP6532

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EP	MP6532WOEP	16816050.5	11/23/2016	N/A	N/A	Pending	Acknowledgement Data Unit for Data Unit Fragment	MP6532
US	MP6532I1	15/669,884	8/4/2017	N/A	N/A	Pending	Transmitter Defragmentation for Data Unit Fragments	MP6532
US	MP6536PR	62/263,979	12/7/2015	N/A	N/A	Expired	Trigger-Based Single User UL Transmission in 802.11Ax	MP6536
US	MP6536	15/372,146	12/7/2016	10,021,224	7/10/2018	Issued	Trigger-Based Single User Uplink Transmission	MP6536
US	MP6536C1	16/030,436	7/9/2018	10362152	9/3/2019	Issued	Trigger-Based Single User Uplink Transmission	MP6536
WO	MP6536WO	PCT/US2016/065406	12/7/2016	N/A	N/A	Expired	Trigger-Based Single User Uplink Transmission	MP6536
CN	MP6536WOCN	201680071893.6	12/7/2016	N/A	N/A	Pending	Trigger-Based Single User Uplink Transmission	MP6536
EP	MP6536WOEP	16820413.9	12/7/2016	N/A	N/A	Pending	Trigger-Based Single User Uplink Transmission	MP6536
US	MP6548PR	62/266,224	12/11/2015	N/A	N/A	Expired	Puncturing for HESIGB in 11Ax	MP6548
US	MP6548	15/375,450	12/12/2016	10,404,839	9/3/2019	Issued	Signal Field Encoding in a High Efficiency Wireless Local Area Network (WLAN)	MP6548
US	MP6548C1	16/558,270	9/2/2019	N/A	N/A	Pending	Signal Field Encoding in a High Efficiency Wireless Local Area Network (WLAN) Data Unit	MP6548

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PCT	MP6548WO	PCT/US2016/066096	12/12/2016	N/A	N/A	Expired	Signal Field Encoding in a High Efficiency Wireless Local Area Network (WLAN) Data Unit	MP6548
CN	MP6548WOCN	201680071894.0	12/12/2016	N/A	N/A	Pending	Signal Field Encoding in a High Efficiency Wireless Local Area Network (WLAN) Data Unit	MP6548
EP	MP6548WOEP	16822319.6	12/12/2016	N/A	N/A	Pending	Signal Field Encoding in a High Efficiency Wireless Local Area Network (WLAN) Data Unit	MP6548
US	MP6550PR	62/267,513	12/15/2015	N/A	N/A	Expired	PHY Indication of MAC Trigger	MP6550
US	MP6550PR2	62/358,236	7/5/2016	N/A	N/A	Expired	11ax Trigger Frame MAC Padding Extension	MP6550
US	MP6550	15/380,795	12/15/2016	10,014,917	7/3/2018	Issued	Triggered Uplink Transmissions in Wireless Local Area Networks	MP6550
US	MP6550C1	16/025,273	7/2/2018	N/A	N/A	Pending	Triggered Uplink Transmissions in Wireless Local Area Networks	MP6550
WO	MP6550WO	PCT/US2016/066956	12/15/2016	N/A	N/A	Expired	Triggered Uplink Transmissions in Wireless Local Area Networks	MP6550
CN	MP6550WOCN	201680074311.X	12/15/2016	N/A	N/A	Pending	Triggered Uplink Transmissions in Wireless Local Area Networks	MP6550
EP	MP6550WOEP	16823418.5	12/15/2016	N/A	N/A	Allowed	Triggered Uplink Transmissions in Wireless Local Area Networks	MP6550
US	MP6558	14/961,635	12/7/2015	10,375,679	8/6/2019	Issued	Trigger Frame Format for Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558

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US	MP6558C1	16/532,051	8/5/2019	N/A	N/A	Pending	Trigger Frame Format for Orthogonal Frequency Division Multiple Access (OFDMA) Communication	MP6128/ MP6144/ MP6352/ MP6555/ MP6558
US	MP6590PR	62/298,057	2/22/2016	N/A	N/A	Expired	Super BA Design	MP6485/ MP6590/ MP10301/ MP10303
US	MP6590PR2	62/323,400	4/15/2016	N/A	N/A	Expired	Super BA Design	MP6485/ MP6590/ MP10301/ MP10303
US	MP6590	15/438,578	2/21/2017	10,277,376	4/30/2019	Issued	Acknowledgement of Transmissions in a Wireless Local Area Network	MP6485/ MP6590/ MP10301/ MP10303
US	MP6590C1	16/397,722	4/29/2019	N/A	N/A	Pending	Acknowledgement of Transmissions in a Wireless Local Area Network	MP6485/ MP6590/ MP10301/ MP10303
WO	MP6590WO	PCT/US2017/18761	2/21/2017	N/A	N/A	Published	Acknowledgement of Transmissions in a Wireless Local Area Network	MP6485/ MP6590/ MP10301/ MP10303
CN	MP6590WOCN	201780023577.6	2/21/2017	N/A	N/A	Pending	Acknowledgement of Transmissions in a Wireless Local Area Network	MP6485/ MP6590/ MP10301/ MP10303
EP	MP6590WOEP	17709249.1	2/21/2017	N/A	N/A	Pending	Acknowledgement of Transmissions in a Wireless Local Area Network	MP6485/ MP6590/ MP10301/ MP10303
US	MP6590I1	16/039,248	7/18/2018	10,313,923	6/4/2019	Issued	Acknowledgement of Transmissions in a Wireless Local Area Network	MP6485/ MP6590/ MP10301/ MP10303
US	MP6590I1C1	16/430,034	6/3/2019	N/A	N/A	Pending	Acknowledgement of Transmissions in a Wireless Local Area Network	MP6485/ MP6590/ MP10301/ MP10303
WO	MP6590I1WO	PCT/US2018/42768	7/18/2018	N/A	N/A	Published	Acknowledgement of Transmissions in a Wireless Local Area Network	MP6485/ MP6590/ MP10301/ MP10303



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US	MP6594PR	62/290,184	2/2/2016	N/A	N/A	Expired	Adaptive EDCA Rules for Channel Access in IIax	MP6594
US	MP6594	15/423,371	2/2/2017	N/A	N/A	Pending	Methods and Apparatus for Adaptive Channel Access	MP6594
WO	MP6594WO	PCT/US2017/016252	2/2/2017	N/A	N/A	Expired	Methods and Apparatus for Adaptive Channel Access	MP6594
CN	MP6594WOCN	201780017232.X	2/2/2017	N/A	N/A	Pending	Methods and Apparatus for Adaptive Channel Access	MP6594
EP	MP6594WOEP	17705743.7	2/2/2017	N/A	N/A	Pending	Methods and Apparatus for Adaptive Channel Access	MP6594
US	MP6597I1PR	62/617,013	1/12/2018	N/A	N/A	Expired	Multiple BSSID Support	MP6597
US	MP6597I1	16/247,451	1/14/2019	N/A	N/A	Pending	Multiple Basic Service Set Support	MP6597
WO	MP6597I1WO	PCT/US2019/013551	1/14/2019	N/A	N/A	Pending	Multiple Basic Service Set Support	MP6597
US	MP6611PR	62/302,529	3/2/2016	N/A	N/A	Expired	Enabling Multi-TID Aggregation for 60GHz WLAN	MP6611
US	MP6611PR2	62/324,232	4/18/2016	N/A	N/A	Expired	Enabling Multi-TID Aggregation for 60GHz WLAN	MP6611
US	MP6611	15/448,303	3/2/2017	N/A	N/A	Pending	Multiple Traffic Class Data Aggregation in a Wireless Local Area Network	MP6611

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WO	MP6611WO	PCT/US2017/020463	3/2/2017	N/A	N/A	Expired	Multiple Traffic Class Data Aggregation in a Wireless Local Area Network	MP6611
US	MP6612PR	62/305,030	3/8/2016	N/A	N/A	Expired	Device Provisioning Protocol	MP6612
US	MP6612	16/079,984	2/22/2017	N/A	N/A	Pending	Methods and Apparatus for Secure Device Authentication	MP6612
WO	MP6612WO	PCT/IB2017/000230	2/22/2017	N/A	N/A	Expired	Methods and Apparatus for Secure Device Authentication	MP6612
CN	MP6612WOCN	201780028372.7	2/22/2017	N/A	N/A	Pending	Methods and Apparatus for Secure Device Authentication	MP6612
EP	MP6612WOEP	177128203.4	2/22/2017	N/A	N/A	Pending	Methods and Apparatus for Secure Device Authentication	MP6612
US	MP6613PR	62/321,703	4/12/2016	N/A	N/A	Expired	HE Control Field Content	MP6613
US	MP6613PR2	62/332,972	5/6/2016	N/A	N/A	Expired	HE Control Field Content-Scheduling Information for UL MU Response	MP6613
US	MP6613	15/486,186	4/12/2017	10,305,659	5/28/2019	Issued	Uplink Multi-User Transmission	MP6613
US	MP6613C1	16/422,459	5/24/2019	N/A	N/A	Pending	Communicating Subchannel Availability Information in a Wireless Local Area Network	MP6613
WO	MP6613WO	PCT/US2017/027214	4/12/2017	N/A	N/A	Expired	Uplink Multi-User Transmission	MP6613

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CN	MP6613WOCN	201780036273.3	4/12/2017	N/A	N/A	Pending	Uplink Multi-User Transmission	MP6613
EP	MP6613WOEP	17733567.6	4/12/2017	N/A	N/A	Pending	Uplink Multi-User Transmission	MP6613
US	MP6638PR	62/321,715	4/12/2016	N/A	N/A	Expired	BPSK Mapping for DCM Transmission	MP6638
US	MP6638	15/486,196	4/12/2017	N/A	N/A	Pending	Dual Carrier Modulation That Mitigates PAPR	MP6638
PCT	MP6638WO	PCT/US2017/027225	4/12/2017	N/A	N/A	Expires	Dual Carrier Modulation That Mitigates PAPR	MP6638
CN	MP6638WOCN	201780029378.6	4/12/2017	N/A	N/A	Pending	Dual Carrier Modulation That Mitigates PAPR	MP6638
EP	MP6638WOEP	17719134.3	4/12/2017	N/A	N/A	Pending	Dual Carrier Modulation That Mitigates PAPR	MP6638
US	MP6640PR	62/322,653	4/14/2016	N/A	N/A	Expired	MU Minimum MPDU Start Spacing and Maximum A-MPDU Length MU	MP6640
US	MP6640	15/487,717	4/14/2017	10,231,148	3/12/2019	Issued	Signaling Data Unit Format Parameters for Multi-user Transmissions	MP6640
WO	MP6640WO	PCT/US2017/027598	4/14/2017	N/A	N/A	Expired	Signaling Data Unit Format Parameters for Multi-user Transmissions	MP6640
CN	MP6640WOCN	201780029037.9	4/14/2017	N/A	N/A	Pending	Signaling Data Unit Format Parameters for Multi-user Transmissions	MP6640

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EP	MP6640WOEP	17733572.6	4/14/2017	N/A	N/A	Pending	Signaling Data Unit Format Parameters for Multi-user Transmissions	MP6640
US	MP6641PR	62/322,702	4/14/2016	N/A	N/A	Expired	Available Channel Polling for OFDMA Operation	MP6641
US	MP6641	15/487,766	4/14/2017	N/A	N/A	Allowed	Determining Channel Availability for Orthogonal Frequency Division Multiple Access Operation	MP6641
WO	MP6641WO	PCT/US2017/027608	4/14/2017	N/A	N/A	Expired	Determining Channel Availability for Orthogonal Frequency Division Multiple Access Operation	MP6641
CN	MP6641WOCN	201780029951.3	4/14/2017	N/A	N/A	Pending	Determining Channel Availability for Orthogonal Frequency Division Multiple Access Operation	MP6641
EP	MP6641WOEP	17722910.1	4/14/2017	N/A	N/A	Pending	Determining Channel Availability for Orthogonal Frequency Division Multiple Access Operation	MP6641
US	MP6682	15/629,435	6/21/2017	10,367,614	7/30/2019	Issued	Method and Apparatus for MU Resource Request	MP6682/ MP10051
US	MP6682C1	16/524,649	7/29/2019	N/A	N/A	Pending	Method and Apparatus for MU Resource Request	MP6682/ MP10051
WO	MP6682WO	PCT/US2017/038589	6/21/2017	N/A	N/A	Expired	Method and Apparatus for MU Resource Request	MP6682/ MP10051
CN	MP6682WOCN	201780038529.4	6/21/2017	N/A	N/A	Pending	Method and Apparatus for MU Resource Request	MP6682/ MP10051
DE	MP6682WODE	201780038529.4	6/21/2017	N/A	N/A	Pending	Method and Apparatus for MU Resource Request	MP6682/ MP10051

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JP	MP6682WOJP	2018-565731	6/21/2017	N/A	N/A	Pending	Method and Apparatus for MU Resource Request	MP6682/ MP10051
KR	MP6682WOKR	10-2019-7001542	6/21/2017	N/A	N/A	Pending	Method and Apparatus for MU Resource Request	MP6682/ MP10051
US	MP6683	15/628,535	6/20/2017	10,320,551	6/11/2019	Issued	Channel Bonding Design and Signaling in Wireless Communications	MP6683/ MP10084
US	MP6683C1	16/435,899	6/10/2019	N/A	N/A	Pending	Channel Bonding Mode Signaling for Punctured Channels	MP6683/ MP10084
PCT	MP6683WO	PCT/IB2017/053720	6/21/2017	N/A	N/A	Expired	Channel Bonding Design and Signaling in Wireless Communications	MP6683/ MP10084
CN	MP6683WOCN	201780051140.3	6/21/2017	N/A	N/A	Pending	Channel Bonding Design and Signaling in Wireless Communications	MP6683/ MP10084
DE	MP6683WODE	112007003070.6	6/21/2017	N/A	N/A	Pending	Channel Bonding Design and Signaling in Wireless Communications	MP6683/ MP10084
JP	MP6683WOJP	2018-566353	6/21/2017	N/A	N/A	Pending	Channel Bonding Design and Signaling in Wireless Communications	MP6683/ MP10084
KR	MP6683WOKR	10-2019-7001543	6/21/2017	N/A	N/A	Pending	Channel Bonding Design and Signaling in Wireless Communications	MP6683/ MP10084