

PATENT ASSIGNMENT COVER SHEET

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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
FREESCALE SEMICONDUCTOR, INC.	04/11/2011
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Property Type	Number
Application Number:	13526419
Application Number:	14147929
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DATE SIGNED:	10/22/2014
Total Attachments: 20	
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ASSIGNMENT OF PATENT RIGHTS

This Assignment of Patent Rights is entered into as of the below-date by and between Freescale Semiconductor, Inc., a company organized under the laws of Delaware with a principal place of business at 6501 William Cannon Drive West, Austin, TX 78735 ("Assignor"), and Apple Inc., a California corporation with principal place of business at 1 Infinite Loop, Cupertino, CA 95014 ("Assignee").

For good and valuable consideration, the receipt of which is hereby acknowledged, Assignor, does hereby irrevocably sell, assign, transfer, and convey unto Assignee, or its designees all right, title, and interest that exist today and may exist in the future in and to all of the following (collectively, the "Patent Rights"):

- (a) the patent applications and patents listed in Attached Appendix A (the "Assigned Patents");
- (b) the right to prosecute reissues, reexaminations, extensions, continuations, continuations in part, continuing prosecution applications, requests for continuing examinations, and divisions of any item in the foregoing category (a) and any rights arising there under;
- (c) items in the foregoing category (a), whether or not expressly listed as Assigned Patents below and whether or not claims in any of the foregoing have been rejected, withdrawn, cancelled, or the like;
- (d) rights to all inventions, invention disclosures, and discoveries described in any item in the foregoing categories (a) through (c) and all other rights arising out of such inventions, invention disclosures, and discoveries;
- (e) rights to apply in any or all countries of the world for patents, certificates of invention, utility models, industrial design protections, design patent protections, or other governmental grants or issuances of any type related to any item in the foregoing categories (a) through (d), including, without limitation, under the Paris Convention for the Protection of Industrial Property, the International Patent Cooperation Treaty, or any other convention, treaty, agreement, or understanding;
- (f) causes of action (whether currently pending, filed, or otherwise) and other enforcement rights under, or on account of, any of the Assigned Patents and/or any item in any of the foregoing categories (a) through (e), including, without limitation, all causes of action and other enforcement rights for (i) damages, (ii) injunctive relief, and (iii) other remedies of any kind for past, current, and future infringement; and
- (g) all rights to collect royalties and other payments under or on account of any of the Assigned Patents and/or any item in the foregoing categories (b) through (f).

Assignor hereby authorizes the respective patent office or governmental agency in

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each jurisdiction to issue any and all patents, certificates of invention, utility models or other governmental grants or issuances that may be granted upon any of the Patent Rights in the name of Assignee, as the assignee to the entire interest therein.

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

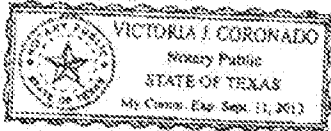
Austin, Texas on 4/11/2011

ASSIGNOR

By: Freescale Semiconductor, Inc.



Name: CHANGHAE PARK
Title: VP, IP Licensing



Victoria J. Coronado

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APPENDIX A - ASSIGNED PATENTS

L. LTE PATENTS

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	12/076697	US 2009-0201861 A1		11-Feb-08	Method for Efficient CQI Feedback	Filed
USA	12/052821	US 2009-0238121 A1		20-Mar-08	Techniques for Reducing Communication Errors in a Wireless Communication System	Filed
USA	12/053877		7821960	22-Mar-08	Channel rank updates in multiple input multiple output communication systems	Granted
USA	12/091160	US 2011-0009148 A1		22-Mar-08	Channel Rank Updates in Multiple-Input Multiple-Output Communication Systems	Filed
USA	12/056258	unpublished		26-Mar-08	User equipment buffer management in multiple-input multiple-output communication systems	Filed
USA	12/058345	US 2009-0245223 A1		28-Mar-08	Techniques for reducing buffer overflow in a communication system	Filed
USA	12/250613	US 2010-0091825 A1		14-Oct-08	Techniques for improving Channel Estimation and Tracking in a Wireless Communication System	Filed
USA	12/192884	US 2010-0042881 A1		15-Aug-08	Management of ARO Detection Threshold in Communication Networks	Filed
USA	12/262643	US 2010-0113105 A1		31-Oct-08	Transmit power measurement and control methods and apparatus	Filed
USA	12/263898	US 2010-0110901 A1		03-Nov-08	Techniques for radio link problem and recovery detection in a wireless communication system	Filed
PCT	PCT/US09/081445	WO2010/067503		03-Nov-08		Filed
Taiwan	098197261			03-Nov-08		Filed
USA	12/284173	US 2010-0116358 A1		03-Nov-08	Method for Efficient Control Signaling of Two Codeword to One Codeword Transmission	Filed
USA	11/002218		7093126	23-Feb-00	Managing packets for transmission in a communication system	Granted
USA	11/247481		7690184	11-Oct-05	Blind preamble detection for an orthogonal frequency division multiplexed sample stream	Granted

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Country	App #	Publication #	Patent #	Priority Date	Title	Status
PCT	PCT/US00/38648	WO2007044770				Inactive
EPC	08810680.0	EP1638481		11-Oct-05		Filed
Japan	2006-535833	JP2006512348		11-Oct-05		Filed
Taiwan	095137386	200723793		11-Oct-05		Filed
USA	11/302214		7675844	24-Feb-03	Synchronization for OFDM signals	Granted
PCT	PCT/US07/62109	WO2007100982				Inactive
USA	11/284675		7623509	21-Nov-05	Blind bandwidth detection for a sample stream	Granted
PCT	PCT/US06/62250	WO2007126434				Inactive
EPC	06851171.8	EP1855468		21-Nov-05		Filed
Korea	10-2009-7011675	KR20090079829		21-Nov-05		Filed
Taiwan	095140121	200725154		21-Nov-05		Filed
USA	11/450847	US 2008-0925197 A1		28-Jul-06	Estimating Frequency Error of a Sample Stream	Filed
USA	11/562867		7813455	22-Nov-05	Decoding MIMO space time code symbol pairs	Granted
USA	11/284382		7602637	20-Oct-05	Beamforming for non-cooperative, space division multiple access systems	Granted
USA	12/418701	US 2009-0109638 A1		20-Oct-05	Beamforming for Non-Cooperative, Space Division Multiple Access Systems	Filed
USA	11/335879	US 2008-0075058 A1		27-Sep-06	Methods for opportunistic multi-user beamforming in collaborative MIMO-SDMA	Filed
USA	11/335702	US 2008-0076370 A1		27-Sep-06	Methods for optimal collaborative MIMO-SDMA	Filed
USA	11/389874	US 2008-0101494 A1		31-Oct-06	System and method for generating MIMO signals	Filed
USA	11/538280	US 2008-0090449 A1		26-Sep-06	Generalized Codebook Design Method for Limited Feedback Systems	Filed
USA	11/529311	US 2008-0080632 A1		29-Sep-06	Method and device for operating a precoded MIMO system	Filed
USA	12/600544	US 2010-0222220 A1		18-Jan-08	Pilot signal in an FDMA communication system	Filed
USA	11/334006		7808898	18-Jan-06	Pilot signal in an FDMA communication system	Granted
PCT	PCT/US06/62380	WO2007117328				Inactive
EPC	05650932.9	EP1680035		18-Jan-06		Filed
Japan	2006-551277	JP200624348		18-Jan-06		Filed
Korea	10-2008-7011500	KR20080050902		18-Jan-06		Filed
USA	11/346649		7852811	03-Feb-08	Communication system with MIMO channel estimation using peak-limited pilot signals	Filed
USA	12/591171	US 2010-0061278 A1		28-Apr-08	System and method for controlling a wireless device	Filed
PCT	PCT/US07/63770	WO2007127502				Inactive

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Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	11/412866		7627325	28-Apr-06	System and method for controlling a wireless device	Granted
China	200780015466.7	CN101554035		28-Apr-06		Filed
EPC	07758332.8	EP2018748		28-Apr-06		Filed
India	8261/Del/11/72008			28-Apr-06		Filed
Japan	2009-078864	JP2009035619		28-Apr-06		Filed
USA	11/830458	US 2008-0034480 A1		30-Jul-07	Adaptive Antenna System Signal Detection	Filed
USA	11/833689	US 2008-0034838 A1		03-Aug-07	Feedback scheduling to reduce feedback rates in MIMO systems	Filed
PCT	PCT/US08/0959	WO2009/020723				Inactive
China	200880191886.7	CN101755209		03-Aug-07		Filed
EPC	08781287.8	EP2176900		05-Aug-07		Filed
Japan	2010-020033	JP2010238245		03-Aug-07		Filed
Korea	10-2010-7004717	KR20100093586		03-Aug-07		Filed
USA	11/537902		7702020	02-Oct-06	MIMO precoding enabling spatial multiplexing, power allocation and adaptive modulation and coding	Granted
USA	12/762013	US 2010-0202553 A1		02-Oct-06	MIMO precoding enabling spatial multiplexing, power allocation and adaptive modulation and coding	Filed
USA	11/540784	US 2008-0080430 A1		29-Sep-06	Cell identifier encoding and decoding methods and apparatus	Filed
PCT	PCT/US07/77952	WO2008/042807				Inactive
EPC	07800118.7	EP2074719		29-Sep-06		Filed
USA	11/619833	US 2008-0165717 A1		04-Jan-07	Novel MBSG user detection scheme for 3GPP LTE	Filed
USA	11/620203	US 2008-0165875 A1		05-Jan-07	Multi-user MIMO-SDMA for finite rate feedback systems	Filed
USA	11/688093	US 2008-0232234 A1		19-Mar-07	Channel Bonding Techniques for a Wireless Communication System	Filed
PCT	PCT/US08/05984	WO2008/115898				Inactive
USA	11/725423	US 2008-0233902 A1		19-Mar-07	Resource allocation in a communication system	Filed
PCT	PCT/US08/04823	WO2008/115860				Inactive
China	200800000507.8	CN101637956		19-Mar-07		Filed
EPC	08730594.2	EP2137184		19-Mar-07		Filed
Japan	2009-054619	JP2010523021		19-Mar-07		Filed
Korea	10-2009-7020608	KR20100014715		19-Mar-07		Filed
USA	11/725422	US 2008-0233954 A1		19-Mar-07	Uplink control channel allocation in a communication system and communicating the allocation	Filed
PCT	PCT/US08/04352	WO2008/115949				Inactive
China	200800007575.8	CN101627050		19-Mar-07		Filed
EPC	08743498.1	EP2130384		19-Mar-07		Filed

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Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	12/014530	US 2009-0181080 A1		15-Jan-08	Dynamic Allocation of Communication Resources in a Wireless System	Filed
USA	11/687441	US 2008-0227495 A1		16-Mar-07	Reference Signaling Scheme Using Compressed Feedforward Codebooks for Multi-user, Multiple Input, Multiple Output (MU-MIMO) Systems	Filed
USA	11/687508		7809074	16-Mar-07	Generalized reference signaling scheme for multi-user, multiple input, multiple output (MU-MIMO) using arbitrarily precoded reference signals	Granted
PCT	PCT/US08/54355	WO2008115850				Inactive
USA	12/697417	US 2011-0019031 A1		16-Mar-07	Generalized Reference Signaling Scheme for Multi-User, Multiple Input, Multiple Output MU-MIMO Using Arbitrarily Precoded Reference Signals	Filed
China	200820008640.X	CN101838929		16-Mar-07		Filed
USA	11/687378	US 2008-0229177 A1		16-Mar-07	Channel Quality Index Feedback Reduction for Broadband Systems	Filed
PCT	PCT/US08/56475	WO2008118735				Inactive
USA	11/688125	US 2008-0232308 A1		19-Mar-07	Method and System for Wireless Communications Between Base and Mobile Stations	Filed
USA	11/742291		7881721	30-Apr-07	Channel sounding techniques for a wireless communication system	Granted
PCT	PCT/US08/61285	WO2008137323				Inactive
USA	12/981423	unpublished		30-Apr-07	Channel sounding techniques for a wireless communication system	Filed
China	200890016424.X	CN101682392		30-Apr-07		Filed
EPC	08746849.6	EP2145402		30-Apr-07		Filed
USA	11/742295	US 2008-0268808 A1		30-Apr-07	Techniques for Improving Control Channel Acquisition in a Wireless Communication System	Filed
USA	12/400834	US 2009-0232957 A1		10-Mar-08	Method and Apparatus for Performing Handover in a Wireless Communication System	Filed
India	533/DEL/2008			13-Mar-08		Filed
USA	11/742280	US 2008-0268785 A1		30-Apr-07	UE-autonomous CFI reporting	Filed
PCT	PCT/US08/61218	WO2008137320				Inactive

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Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	11/742204	US 2008-0287057 A1		30-Apr-07	System and method for resource block-specific control signaling	Filed
PCT	PCT/US08/81704	WO2008137370				Inactive
USA	11/766888	US 2008-0318878 A1		22-Jun-07	Techniques for Resource Block Mapping in a Wireless Communication System	Filed
PCT	PCT/US08/88608	WO2009002714				Inactive
USA	11/838029	US 2009-0046788 A1		13-Aug-07	Techniques for Reducing Precoding Overhead in a Multiple-Input Multiple-Output Wireless Communication System	Filed
PCT	PCT/US08/68830	WO2009023379				Inactive
Japan	2010-521091	JP2010537495				Inactive
EPC	08780958.8					Filed
USA	12/204975	US 2010-0081468 A1		05-Sep-08	Method for estimating channel statistics in an OFDM receiver	Filed
USA	11/864066	US 2009-0304169 A1		26-Sep-07	Retransmission method for HARQ in MIMO systems	Filed
PCT	PCT/US08/72131	WO2009042290				Inactive
China	200880108325.4	CN101809922		28-Sep-07		Filed
EPC	08797118.0	EP2209284		28-Sep-07		Filed
India	1400/DELNP/2010			28-Sep-07		Filed
Taiwan	957132413	T08817727		28-Sep-07		Filed
USA	11/855341		7912083	01-Oct-07	Techniques for Reducing a Cell Identification Failing Rate in a Wireless Communication System	Granted
PCT	PCT/US08/75574	WO2009045081				Filed
USA	12/057514	US 2009-0245148 A1		28-Mar-08	Techniques for Channel Sounding in a Wireless Communication System	Filed
USA	12/351273	US 2009-0181091 A1		11-Jan-08	Channel Rank Feedback in Multiple-Input Multiple-Output Communication Systems	Filed
USA	11/935242		7710835	05-Nov-07	Techniques for Signaling Reference Signal Parameters in a Wireless Communication System	Granted
USA	11/466007	US 2008-0043883			Channel Estimator Using Dynamic-Range-Limited Pilot Signals	Inactive

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APPENDIX A - ASSIGNED PATENTS

2. NON-LTE PATENTS

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	09/579834		6301306	26-May-00	Method and apparatus for generating a short-range wireless data communication link	Granted
PCT	PCT/US01/16208	WO0193433				Inactive
EPC	01922881.6	EP1297670		26-May-00		Filed
Japan	2002-509543	JP2004507129		26-May-00		Inactive
Korea	10-2002-7016934		715832	26-May-00		Granted
USA	08/055000		5363071	04-May-03	Apparatus and method for varying the coupling of a radio frequency signal	Granted
PCT	PCT/US04/03713	WO0425997				Inactive
Brazil	BR19940001309		BR0403339			Inactive
Canada	CA19942138029		CA2138029			Inactive
China	CN15941880250		CN1169295			Inactive
UK	GB18940026477		GB2264103			Inactive
Japan	JP1940564374		JP7508872			Inactive
USA	06/042856		5448770	05-Apr-03	Temperature-coefficient controlled radio frequency signal detecting circuitry	Granted
Australia	AU19940059133		AU667261			Inactive
Australia	AU19940059133		AU2813394			Inactive
Brazil	BR19940001376		BR9401376			Inactive
Canada	CA19942120085		CA2120085			Inactive
Germany	DE19944411733		DE4411733			Inactive
France	FR19940003557		FR2703880			Inactive
UK	GB19940003554		GB2276992			Inactive
Japan	JP19940085262		JP7630460			Inactive
Sweden	SE19940001053		SE9416787			Inactive
Sweden	SE19940001053		SE9401053			Inactive
China	94103550.6		CN1104000	05-Apr-93		Granted
USA	08/144840		5493780	29-Oct-03	Automatic frequency control apparatus	Granted
PCT	PCT/US04/10324		WO0512232			Inactive
Brazil	BR19940005977		BR9405977			Inactive
Canada	CA19942150819		CA2150819			Inactive
China	CN15941990611		CN11150221	29-Oct-03		Granted
China	CN15941990811		CN10336561	29-Oct-03		Granted
Germany	DE199144882911		DE1498281			Inactive
France	FR19940012601		FR2711808			Inactive
UK	GB19940013088		GB2289382			Inactive
Japan	JP199405126101		JP8505308			Inactive
Korea	RR19920027074		KR90166626			Inactive
Sweden	SE19950002306		SE9502306			Inactive
Sweden	SE19950002306		SE9502306			Inactive
Singapore	SG19980025185		SG244455			Inactive
Japan	JP19940512610		JP3006073	29-Oct-03		Granted
USA	08/407787		6813362	31-Mar-03	Multi-ceramic layer switch circuit	Granted
USA	08/040780					Inactive
PCT	PCT/US04/02896		WO0422531			Inactive
Australia	AU19940065687		AU664572			Inactive
Australia	AU19940065688		AU6588794			Inactive

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Country	App #	Publication #	Patent #	Priority Date	Title	Status
Canada	CA19942135799		CA2135799			Inactive
China	CN19941030155		CN1104923			Inactive
France	FR1994003656		FR2793339			Inactive
UK	GB19940022582		GB2282270			Inactive
Russia	RU19940046113		RU2127946			Inactive
South Africa	ZA19940002266		ZA9402266			Inactive
USA	08/201284		5430416	23-Feb-94	Power amplifier having nested amplitude modulation controller and phase modulation controller	Granted
PCT	PCT/US94/03713		WO9523493			Inactive
Australia	AU19950016749		AU672549			Inactive
Australia	AU19950015745		AU1674995			Inactive
China	CN19941031868		CN1121752			Inactive
Germany	DE19944496702		DE4460702			Inactive
France	FR19950000718		FR2716588			Inactive
UK	GB19950020613		GB2291784			Inactive
Japan	JP19950227230		JP8509369			Inactive
Russia	RU19950119833		RU2121755			Inactive
Sweden	SE19950003087		SE9503087			Inactive
Singapore	SG1996001060		SG69852			Inactive
South Africa	ZA19950000442		ZA9500442			Inactive
Taiwan	TG112284		TG-075214	23-Feb-94		Granted
Thailand	025408			23-Feb-94		Inactive
USA	08/939157		6185411	09-Nov-93	Apparatus and method for sensing elements of a phase locked loop	Granted
PCT	PCT/US94/01476		WO9512669			Inactive
Australia	AU199500103825		AU1338295			Inactive
Brazil	BR19940205782		BR9405782			Inactive
Canada	CA19942162181		CA2152181			Inactive
China	CN19941036804		CN1116474			Inactive
China	CN19941090894		CN1053072			Inactive
Germany	DE199444967461		DE4458746			Inactive
France	FR19940013274		FR2713415			Inactive
UK	GB19950013637		GB2289174			Inactive
Japan	JP188405138227		JP8505798			Inactive
Korea	KR19950073863		KR100186162			Inactive
Singapore	SG19960000580		SG81848			Inactive
USA	08/624329		6737327	29-Mar-96	Method and apparatus for demodulation and power control bit detection in a spread spectrum communication system	Granted
Argentina	PD70101233		AR0064178	29-Mar-96		Granted
Brazil	PI9704090-0		BR9704090	29-Mar-96		Granted
China	97101733.7		CN1084592	29-Mar-96		Granted
China	97116939.1		CN1087895	29-Mar-96		Granted
France	9703405		FR2746800	29-Mar-96		Granted
UK	GB19970018113		GB2322773	29-Mar-96		Granted
Germany	P19712936.3		DE19712839	29-Mar-96		Granted

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Country	App #	Publication #	Patent #	Priority Date	Title	Status
Germany	19706830.8			29-Mar-99		Filed
India	738/DEL/1997		214741	29-Mar-99		Granted
Japan	JP199700092149		JP3091711	29-Mar-99		Granted
Japan	99-278105	JP10012560	3999656	29-Mar-99		Granted
Korea	10-1997-0011223	243720	KR100243720	29-Mar-99		Granted
Korea	10-1997-0003413	290571		29-Mar-99		Granted
Mexico	972271	204930	MX9702273	29-Mar-99		Granted
USA	08/808331	9799011	5799011	29-Mar-99	CDMA power control channel estimation using dynamic coefficient scaling	Granted
USA	09/099992	0243410	6243410	29-Mar-00	Demodulator having an infinite-duration impulse response filter with dynamic coefficient scaling	Granted
USA	06/025658		5673003	29-Mar-98	Amplifier circuit having a variable bandwidth	Granted
Japan	09-094577	JP10041781	JP4018222	29-Mar-98		Granted
USA	08/760767		5897083	05-Dec-98	Gain distribution circuit	Granted
USA	09/015824		6400218	29-Feb-00	Variable gain control circuit for a receiver and method therefor	Granted
USA	09/042758		6049233	17-Mar-99	Phase detection apparatus	Granted
Brazil	9901014-3		BR9901014	17-Mar-99		Inactive
China	99104030.9	ZI.99104030.9	CN1259600	17-Mar-99		Granted
Japan	11-007589	JP11030658	JP4218353	17-Mar-99		Granted
UK	GB19980306736		GB2336507			Inactive
USA	08/725671		5905757	04-Oct-98	Filter co-processor	Granted
PCT	PCT/AJ/S97/11435		WO9815056			Inactive
Australia	AU19970035875		AU3587597			Inactive
Canada	CA19972238299 19970758		CA2238299			Inactive
China	97191376.5	ZI.97191376.5	CN1205133	04-Oct-96		Granted
Germany	DE19971081047		DE19781047			Inactive
Spain	ES19970002085		ES2147893			Inactive
Finland	FI19980001263		FI881263			Inactive
France	FR19970010122		FR2754389			Inactive
UK	GB19980011085		GB2322957			Inactive
Italy	IT1997RM00253		IT126591			Inactive
Russia	RU19990112274		RU2178949			Inactive
Sweden	SE19980001956		SE9817510			Inactive
Sweden	SE19980001958		SE9801958			Inactive
India	2072/Del/97		217376	04-Oct-96		Granted
Japan	10-516499		JP4494531	04-Oct-96		Granted
Korea	10-1098-0704193		KP306014	04-Oct-96		Granted
Taiwan	88111549		NT-098775	04-Oct-96		Granted
USA	08/011573		5584053	04-Aug-95	Commonly coupled high frequency transmitting/receiving switching module	Granted
PCT	PCT/AJ/S99/10140		WO9906000			Inactive

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USA	07/700966		5128632	16-May-91	Adaptive lock time controller for a frequency synthesizer and method therefor	Granted
USA	08/517106		5758776	29-Sep-95	Method and apparatus for scheduling adaptation for a notch filter	Granted
USA	09/515843		6356217	29-Feb-00	Enhanced DC offset correction through bandwidth and clock speed selection	Granted
USA	09/515634		6317064	29-Feb-00	DC offset correction adaptable to multiple requirements	Granted
USA	09/473673		6327313	29-Dec-99	Method and apparatus for DC offset correction	Granted
PCT	PCT/US00/34343		WI/0148825			Inactive
Taiwan	89124413	TW830482	NI-178508	29-Dec-89		Granted
USA	08/745345		5778306	08-Nov-95	Low loss high frequency transmitting/rectifying switching module	Granted
USA	08/973596		6845233	09-Oct-01	RF receivers with reduced spurious responses for mobile stations and methods therefor	Granted
PCT	PCT/US02/31243		WO2003032811			Inactive
Australia	AU20020334762		AU2002334762			Inactive
China	02819472.1	ZL02819472.1	CN100435488	09-Oct-01		Granted
EP	EP20020800868		EP1436502			Inactive
Japan	2003-535443		JP4202419	09-Oct-01		Granted
Korea	10-2004-7094931	10-928850	KR20050033501	09-Oct-01		Granted
Taiwan	091123282	TYV583850	NI-199850	09-Oct-01		Granted
USA	09/929578		6487196	14-Aug-01	Low noise architecture for a direct conversion transmitter	Granted
PCT	PCT/US02/22756		WO03021718			Inactive
USA	10/008638		6850910	08-Nov-01	Mobile wireless communication device architectures and methods therefor	Granted
USA	11/220735		7127583	08-Nov-01	Enhanced memory architecture	Granted
USA	10/092966		6893490	07-Mar-02	Adjustable gain control system and method thereof	Granted
PCT	PCT/US03/06370		WO03077416			Inactive
AU	AU20030216484		AU2003216484			Inactive
EPC	EP20030744142		EP1490966			Inactive
Japan	2003-575507	JP2005-19559	JP4489436	07-Mar-02		Granted
Korea	10-2004-7014043	10-1006820		07-Mar-02		Granted
Taiwan	892104809		NI-297238	07-Mar-89		Granted

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USA	10/092932		6889036	07-Mar-02	Integrated frequency-selectable resonant coupling network and method thereof	Granted
PCT	PCT/US00/08021		WO20003077418			Inactive
AU	AU200030212448		AU20003212448			Inactive
USA	07/792568		5194933	15-Nov-01	Airbridge compensated microwave conductors	Granted
Japan	04-324707		JP3502400	15-Nov-01		Granted
USA	07/663319		5387047	15-Nov-01	Process for adjusting the impedance of a microwave conductor using an air bridge	Granted
USA	08/279379		5695787	22-Jul-04	Demodulator with baseband doppler shift compensation and method	Granted
USA	08/612967		7040009	27-Jun-01	Method and apparatus for controlling the timing of a communication device	Granted
USA	11/412761		7324558	27-Jun-01	Method and apparatus for controlling the timing of a communication device	Granted
USA	09/791950		6990158	22-Feb-01	Signal detection using a CDMA receiver	Granted
USA	10/004188	US 2005-0111528		22-Feb-01		Inactive
PCT	PCT/US05/08856		WO2006050055			Inactive
China	200580034880.4	200580034880.4	CN101040454	26-Oct-04		Granted
India	187603ELNP2007			26-Oct-04		Filed
Japan	2007-038143		JP2008519486	28-Oct-04		Filed
Korea	10-2007-7006613		KR20070072696	28-Oct-04		Inactive
PCT	PCT/US05/08856			28-Oct-04		Inactive
SING	200702192-0		130992	28-Oct-04		Granted
USA	09/941101		6861011	27-Aug-01	Data compression system	Granted
USA	09/882190		7010338	15-Jun-01	Multicode receiver	Granted
USA	11/336500		7313186	15-Jun-01	Multicode receiver	Granted
USA	09/666015		6804501	25-Sep-00	Receiver having gain control and narrowband interference detection	Granted
USA	09/245636		6170211	05-Feb-99	Method and apparatus for facilitating reception of a signal on one of a plurality of contiguous channels	Granted
USA	09/667267		6594328	20-Jul-99	Method and apparatus for facilitating an estimation of a carrier frequency error in a receiver of a wireless communication system	Granted

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USA	09/406358		6625233	29-Sep-99	Method and apparatus in a wireless receiver for demodulating a continuous-phase frequency-shift-keyed signal	Granted
USA	00/571872		6289080	12-May-00	Method and apparatus for performing a generalized viterbi search to demodulate a sequence of symbols	Granted
PCT	PCT/AJ501/13146		WO0169060			Inactive
Australia	AU20010857184		AU5719401			Inactive
USA	06/565518		5630222	04-Dec-98	Method and apparatus for generating multiple signals at multiple frequencies	Granted
PCT	PCT/US98/17658		WO9721275			Inactive
USA	08/341813		6276540	01-Oct-97	Selective call receiver having an apparatus for modifying an analog signal to a digital signal and method therefor	Granted
USA	07/710637		5175729	05-Jun-91	Radio with fast lock phase-locked loop	Granted
PCT	PCT/JP92/04605		WO9222147			Inactive
Australia	AU19920021785		AU2650382			Inactive
Australia	AU16920921768D		AL2178532			Inactive
Brazil	BR19920009080		BR9208080			Inactive
Canada	CA10022197496		CA2102490			Inactive
EP	EP19920913445		EP0507765			Inactive
Finland	FI19930005416		FI935416			Inactive
Japan	JP199205096131		JP9510542			Inactive
Norway	NO19930004391		NO934391			Inactive
USA	08/329103		5481226	25-Oct-94	Low-voltage intermediate frequency amplifier providing automatic gain control of a source amplifier	Granted
USA	06/399785		5678223	07-Mar-95	Method and apparatus for an automatic frequency control receiver	Granted
USA	06/098805		5686731	07-Mar-95	Zero-IF receiver with tracking second local oscillator and demodulator phase locked loop oscillator	Granted
USA	06/399784		5604926	07-Mar-95	Phase locked loop circuit current mode feedback	Granted
USA	06/503386		5670861	17-Jul-95	Radio communication device and method for generating threshold levels in a radio communication device for receiving four-level signals	Granted
USA	08/324634		5471665	18-Oct-94	Differential DC offset compensation circuit	Granted

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USA	08/511061		5633895	08-Aug-95	Communication device with synchronized zero-crossing demodulator and method	Granted
USA	08/502997		5701600	17-Jul-95	Radio receiver and method of calibrating same	Granted
PCT	PCT/US99/07192		WO9704930			Inactive
EP	EP10960520269		EP0839410			Inactive
USA	08/020435		5734974	27-Mar-96	Selective call receivers with stepwise variable gain control	Granted
USA	08/025984		6233287	04-Apr-97	Method and apparatus for mixing signals	Granted
USA	08/501081		5943376	01-Aug-96	Digital signal clock recovery	Granted
USA	08/867498		5769043	02-Jun-97	Method and apparatus for decoding a two-level radio signal	Granted
USA	08/880355		5960042	01-Jul-97	Method in a selective call receiver for synchronizing to a multi-level radio signal	Granted
USA	09/085828		6400821	29-May-98	Digital tone generator	Granted
USA	PCT/US98/08004		WO9903733	29-May-98		Inactive
China	CN1998607908		CN1371586	29-May-98		Inactive
USA	09/050411		6445780	29-May-98	Digital tone generator	Granted
USA	08/986900		6130921	23-Dec-97	Frequency shift modulation automatic frequency correction circuit and method	Granted
USA	09/072055		6073002	04-May-98	Mixer circuit and communication device using the same	Granted
USA	09/010043		6055436	20-Jan-98	Method and apparatus for detecting simulcast channel conditions	Granted
USA	09/285077		6487250	06-Apr-99	Method and apparatus for efficient correlation detection	Granted
USA	09/798216		6560447	05-Mar-01	DC offset correction scheme for wireless receivers	Granted
PCT	PCT/US02/04627	WO02071636	WO02071636			Inactive
China	02600519.B	ZL 02800919.B	CN1215687	05-Mar-01		Granted
EPC	EP20020706333		EP1368901			Inactive
Japan	2002-570426		JP4072561	05-Mar-01		Granted
Korea	10-2002-7014779		KR682773	05-Mar-01		Granted
USA	09/885487		6952572	20-Jun-01	Image rejection mixer with switchable high or low side injection	Granted
USA	08/758832		5874850	06-Feb-96	High frequency amplifier and control	Granted
Germany	DE19976014881	DE60714881	DE69714881			Inactive
EP	EP10970101439	EP0789451	EP0789451			Inactive
France	FR10260061362	FR2744678	FR2744678			Inactive

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Japan	JP19970034099	JP4232875	JP3901780	06-Feb-96		Granted
USA	08/696060		5777516	13-Aug-96	High frequency amplifier in CMOS	Granted
USA	08/696076		5812027	13-Aug-96	Spike insensitive intermediate frequency amplifier	Granted
USA	09/232504		6393071	15-Jan-98	Circuit and method of identifying a burst frequency	Granted
France	08400054.6		EP0930745	15-Jan-98		Granted
UK	08400054.6		EP0930745	15-Jan-98		Granted
Germany	08400054.6	DE19980026454	DE6982945.8	15-Jan-98		Granted
USA	09/364289		6762038	30-Jul-98	Method and apparatus for radio communications	Granted
China	99111904.5	ZL99111904.5	CN1146386	30-Jul-98		Granted
Germany	DE19986031751T		DE6982175.1			Inactive
EP	EP10060401954		EP0977351			Inactive
Japan	JP19980214875	JP2000106533				Inactive
USA	10/302031		6932766	17-Aug-00	Apparatus and method for improved chopping mixer	Granted
PCT	PCT/EP01/06154		WO2002015285			Inactive
Australia	AU2001008965R0		AL8995801			Inactive
China	CN20010014137		CN1448006			Inactive
EP	EP20000402301		EP1184971			Inactive
Japan	JP20020203801	JP2004507139				Inactive
Korea	10-2003-7002618		KR200474	17-Aug-00		Granted
Taiwan	050127410	TW543788	NI-181817	17-Aug-00		Granted
USA	08/451866		5478773	28-Apr-94	Method of making an electronic device having an integrated inductor	Granted
USA	10/433780		7117234	07-Dec-00	Waveform generator for use in IQ modulation	Granted
PCT	PCT/EP01/12402		WO0247344			Inactive
Austria	AT20000403442		AT260521			Inactive
Australia	AU20020023850		AU2365002			Inactive
Germany	DE20000088501		DE6000885.1			Inactive
Germany	DE20000030307		DE6003033.7			Inactive
EP	EP20000004242		EP1213880			Inactive
EP	EP20030291889		EP1376968			Inactive
Japan	JP20020548543	JP2004515979				Inactive
USA	10/451094		7158578	20-Dec-00	Quadrature modulator with pulse-shaping	Granted
PCT	PCT/EP01/11520		WO0251093			Inactive
Austria	AT20000403609		AT266287			Inactive
Australia	AU20020018211		AU1821102			Inactive
China	01821117.8	ZL01821117.8	CN1266993	20-Dec-00		Granted
Germany	DE30006010512		DE6001051.2			Inactive
EP	EP20000403609		EP1238840			Inactive
Japan	2002-522259		JP3931140	20-Dec-00		Granted
Korea	10-2003-7008356		KR20035515	20-Dec-00		Granted
USA	10/154126		6906634	23-May-02	Transceiver circuit arrangement and method	Granted

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USA	08/688876		5748042	26-Jul-96	Method for sitaring a difference frequency signal and amplifier circuit thereof	Granted
USA	08/673588					Inactive
USA	08/908827		5926052	01-Jun-96	Variable phase shifter and method	Granted
USA	08/793243		5757237	28-Aug-96	Method for dynamically biasing an amplifier and circuit therefor	Granted
USA	08/673485		5757236	01-Jul-96	Amplifier bias circuit and method	Granted
USA	10/496524		7046077	19-Nov-01	Apparatus for generating multiple clock signals of different frequency characteristics	Granted
PCT	PCT/EP02/12270		WO0304495 2			Inactive
China	02626750.8	ZL02626750.8	CN1613182	18-Nov-01		Granted
Australia	AU20020365882		AU2002365 982			Inactive
EP	EP03610402965		EP1313220			Inactive
Japan	JP200305464797	JP200305464797				Inactive
Taiwan	981133383		Twi262372	19-Nov-01		Granted
USA	08/989220		6049703	28-Nov-97	Amplifier circuit and method for increasing linearity of the amplifier circuit	Granted
USA	09/039502		6487395	18-Mar-98	Radio frequency electronic switch	Granted
USA	09/211168		6263199	14-Dec-96	Circuit and method of signal frequency conversion	Granted
USA	09/122730		6132793	27-Jul-98	Circuit and method of amplifying a signal for a receiver	Granted
USA	08/128428		6137997	04-Aug-98	Circuit for receiving and transmitting signals and method	Granted
USA	09/323236		6490440	01-Jun-99	Digital transmitter circuit and method of operation	Granted
USA	08/241689		6100721	01-Feb-99	Circuit and method of extending the linear range of a phase frequency detector	Granted
USA	09/322045		6259318	29-May-99	Method for extending the linear range of an amplifier	Granted
USA	09/605084		6600344	26-Jun-00	Pre-distortion circuit for RF detector	Granted
USA	09/441022		6424825	16-Nov-99	Feedforward and feedback control in a radio	Granted
Germany	DE2006001900	DE60001900				Inactive
EPC	00124894.7		EP1102410	16-Nov-98		Granted
Japan	2000-347431	JP2001180932		16-Nov-98		Filed
USA	09/730445		6914935	21-Feb-01	Fractional N synthesizer with reduced fractionalization spurs	Granted

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USA	09/516915		6760386	27-Jul-01	Receiver and method therefor	Granted
China	350810210281.B	CN101340229		27-Jul-01		Filed
China	02816359.1	ZL02816359.1	CN1546772	27-Jul-01		Granted
EPC	EP20020744721		EP1418414			Inactive
Japan	2003-535363		JP4275539	27-Jul-01		Granted
Japan	2008-133143	JP2008263827		27-Jul-01		Filed
Taiwan	991115049	TW582141	NI-198811	27-Jul-01		Granted
USA	99/916,684		5751254			Granted
USA	99/916,685	US20030038488				Inactive
USA	10/033013		6959035	20-Dec-01	Post-correlation interpolation for duty cycled loops	Granted
USA	10/208959		6798353	31-Jul-02	Precoarse method and apparatus	Granted
USA	10/330852		7158003	26-Dec-02	Method and apparatus for compensating deviation variances in a 2-layer FCS FM transmitter	Granted
PCT	PCT/US02/30587		WO2004002085			Inactive
EP	EP20030770537		EP1579506			Inactive
AU	AU20030279029		AU20030279029			Inactive
China	03822721.1	CN1717881		20-Dec-02		Filed
Taiwan	99/128554			20-Dec-02		Inactive
USA	10/427581		6982609	01-May-03	Transformer coupled oscillator and method	Granted
USA	10/290031		7010278	25-Oct-02	Sideband suppression method and apparatus for quadrature modulator using magnitude measurements	Granted
USA	10/391979		6973142	19-Mar-03	Timing synchronization for M-DPSK channels	Granted
PCT	PCT/US04/03095		WO2004095720			Inactive
EP	EP20040703129		EP1695874			Inactive
Japan	2006-508656		JP4383445	19-Mar-03		Granted
Korea	10-2005-7017480	KP20050119289		19-Mar-03		Filed
Taiwan	99/152641		NI-335165	19-Mar-03		Granted
USA	10/420684		6912802	22-Apr-03	Method and apparatus for controlling a voltage controlled oscillator	Granted
USA	10/649427		7227916	26-Aug-03	Receiver with automatic gain control that operates with multiple protocols and method thereof	Granted
USA	10/649468		7209720	26-Aug-03	Multiband and multimode transmitter and method	Granted
USA	10/623047		6930554	18-Jul-03	Variable gain low noise amplifier and method	Granted
USA	10/721955		7340598	25-Nov-03	Communication receiver	Granted
USA	10/626957		7412006	24-Jul-03	Method and apparatus for RF carrier feedthrough suppression	Granted
USA	10/898268		7231585	21-Jul-04	Multi-rate video transmitter	Granted
USA	11/743167	US20073201686				Inactive

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USA	10/731609		7215972	09-Dec-03	Adaptive transmit power control system	Granted
PCT	PCT/US04/37061		WO2005060451			Inactive
China	200580033064.0		CN1847438	09-Dec-03		Granted
EPC	04810476.0	EP1917714		09-Dec-03		Filed
India	1999/DCLNP/2006		235688	09-Dec-03		Granted
Japan	2005-543820	JP2007514370		09-Dec-03		Filed
USA	11/046076		7120816	30-Jan-04	Dual port modulator comprising a frequency synthesizer	Granted
Austria	AT20040280262T		AT365307			Inactive
EP	EP20040290262		EP1580336			Inactive
France	04297262.7		EP1569336	30-Jan-04		Granted
UK	04296262.7		EP1569336	30-Jan-04		Granted
Germany	DE200400007095		602004007095 50	30-Jan-04		Granted
USA	10/790916		7120402	01-Mar-04	Method and apparatus for a high performance and high dynamic range baseband power control system	Granted
USA	10/917891		7117016	13-Aug-04	High linearity and low noise CMOS mixer and signal mixing method	Granted
USA	10/863387		7266359	12-Oct-04	DC interference removal in wireless communications	Granted
USA	11/069176		7046317	04-Apr-05	Dynamic gain and phase compensation for power amplifier load switching	Granted
PCT	PCT/US05/12238		WO2006107841			Inactive
EPC	05749361.8	EP1809778		04-Apr-05		Filed
Japan	2005-505413	JP2005538909		04-Apr-05		Filed
USA	11/046910		7148749	31-Jan-05	Closed loop power control with high dynamic range	Granted
PCT	PCT/US05/45206		WO2006083463			Inactive
China	200580044361.5	CN101118042		31-Jan-05		Filed
EPC	05854066.5	EP1861651		31-Jan-05		Filed
India	3391/DCLNP/2007			31-Jan-05		Filed
Japan	2007-653699	JP2008520408		31-Jan-05		Filed
Korea	10-2007-7017801	KR20070119280		31-Jan-05		Filed
Taiwan	994146732			31-Jan-05		Filed
USA	11/282734		7301462	17-Nov-05	Soft saturation detection for power amplifiers	Granted
USA	11/114395		7489020	26-Apr-06	Systems, methods, and apparatus for reducing dynamic range requirements of a power amplifier in a wireless device	Granted
USA	11/098278		7486941	04-Apr-05	Method and apparatus for dynamic gain and phase compensations	Granted

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PCT	PCT/US05/11569		WO2006107550			Inactive
China	2005101175.4	CN101218749		04-Apr-05		Filed
Japan	2005-304332	JP2005336396		04-Apr-05		Filed
Taiwan	095112033			04-Apr-05		Filed
USA	11/098520		7369820	01-Apr-05	System and method for DC offset correction in transmit baseband	Granted
PCT	PCT/US06/010739		WO2006107514			Inactive
EPC	06739491.5	EP1869765		01-Apr-05		Filed
Japan	2005-304168	JP2005336388		01-Apr-05		Filed
USA	11/189737		7539462	08-Aug-05	Configurable multi-mode modulation system and transmitter	Granted
USA	11/243833		7493758	04-Oct-05	Linearized and balanced mixer apparatus and signal mixing method	Granted
Japan	2005-090326			04-Apr-02		Filed
USA	11/058456		7392026	04-Apr-05	Multi-band mixer and quadrature signal generator for a multi-mode radio receiver	Granted
USA	11/385774		7509321	25-Feb-06	Prioritization of connection identifiers for an uplink scheduler in a broadband wireless access communication system	Granted
USA	11/166476		7421252	02-Aug-05	Center frequency control of an integrated phase rotator band-pass filter using VCO coarse trim bits	Granted
PCT	PCT/US06/20255		WO2007018849			Inactive
Japan	2005-324975	JP2005304065		07-Aug-05		Filed
Korea	10-2005-702933	KR20050034142		02-Aug-05		Filed
USA	11/383463	7609779	7609779	27-Feb-06	RF transmitter with interleaved IQ modulation	Granted
PCT	PCT/US07/051915		WO2007117791			Inactive
EPC	07750921.0	EP1992136		27-Feb-06		Filed
Korea	10-2006-7923528	KR20060098549		27-Feb-06		Filed
USA	11/280367		7538273	30-Nov-05	Frequency error estimation and correction in a SAIC linear equalizer	Granted
USA	11/433590		7590419	12-May-06	Frequency correction channel burst detector in a GSMEDGE communication system	Granted
USA	11/423199		7592485	30-May-06	Wireless receiver for removing direct current offset component	Granted
USA	11/495500		7602861	30-May-06	Wireless receiver for removing direct current offset component	Granted

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USA	11/452457		7003054	14-Jun-06	DC offset correction for direct conversion receivers	Granted
USA	03/024482		5645878	17-Feb-98	Single-ended to differential converter	Granted
USA	09/131219		6310850	07-Aug-98	CDMA communications system having a searcher receiver and method therefor	Granted
USA	09/481858		6639381	12-Jan-00	Method and apparatus for coherent detection in a telecommunications system	Granted
USA	11/841457		7490202	20-Aug-07	RF amplifier with stacked transistors, transmitting device, and method therefor	Granted
USA	11/895427		7495515	24-Aug-07	Low-noise amplifier	Granted
USA	08/771348		5886547	10-Dec-06	Circuit and method of controlling mixer linearity	Granted
USA	07/803,597		5051911	03-Apr-90	SINGLE FAULT-TOLERANT MMIC SWITCHES	Expired
USA	07/591,183		5072193	01-Oct-90	WIRE SHIELDING FOR RF CIRCUIT BOARDS AND AMPLIFIERS	Expired

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