

PATENT ASSIGNMENT COVER SHEET

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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:	14500870	
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DATE SIGNED:	09/29/2014	
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or not expressly listed as Assigned Patents below and whether or not claims in any of the foregoing have been rejected, withdrawn, cancelled, or the like;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

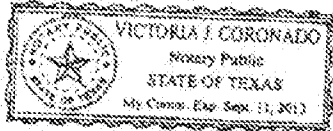
ASSIGNOR

By: Freescale Semiconductor, Inc.



Name: CHANGHAE PARK

Title: VP, IP Licensing



Victoria J. Coronado

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APPENDIX A - ASSIGNED PATENTS

I. LTE PATENTS

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	12/076897	US 2009-0201881 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	12/053577		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	WO2010/062503		03-Nov-08		Filed
Taiwan	098137261			03-Nov-08		Filed
USA	12/264173	US 2010-0116358 A1		03-Nov-08	Method for Efficient Control Signaling of Two Codeword to One Codeword Transmission	Filed
USA	11/302218		7053126	23-Feb-00	Managing packets for transmission in a communication system	Granted
USA	11/247481		7600184	11-Oct-05	Blind preamble detection for an orthogonal frequency division multiplexed sample stream	Granted

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
PCT	PCT/J500/38648	WO2007044770				Inactive
EPC	06816680.0	EP1636461		11-Oct-05		Filed
Japan	2006-535633	JP2006512346		11-Oct-05		Filed
Taiwan	095137386	200723793		11-Oct-05		Filed
USA	11/302214		7675644	24-Feb-03	Synchronization for OFDM signals	Granted
PCT	PCT/J507/62109	WO2007100962				Inactive
USA	11/284675		7623509	21-Nov-05	Blind bandwidth detection for a sample stream	Granted
PCT	PCT/J506/60250	WO2007126434				Inactive
EPC	06851171.8	EP1655466		21-Nov-05		Filed
Korea	10-2009-7011975	KR20090070826		21-Nov-05		Filed
Taiwan	095140121	200722154		21-Nov-05		Filed
USA	11/450847	US 2008-0025197 A1		28-Jul-06	Estimating Frequency Error of a Sample Stream	Filed
USA	11/562667		7613455	22-Nov-05	Decoding MIMO space time code symbol pairs	Granted
USA	11/254392		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	11/335679	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	11/589874	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	12/606544	US 2010-0322220 A1		18-Jan-08	Pilot signal in an FDMA communication system	Filed
USA	11/334006		7606898	18-Jan-06	Pilot signal in an FDMA communication system	Granted
PCT	PCT/J506/62380	WO2007117328				Inactive
EPC	06850932.5	EP1680035		18-Jan-06		Filed
Japan	2006-551277	JP200624348		18-Jan-06		Filed
Korea	10-2009-7011503	KR20090050502		18-Jan-06		Filed
USA	11/346649		7652811	03-Feb-03	Communication system with MIMO channel estimation using peak-limited pilot signals	Filed
USA	12/591171	US 2010-0061278 A1		26-Apr-03	System and method for controlling a wireless device	Filed
PCT	PCT/J507/63770	WO2007127552				Inactive

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	11/412865		7627325	28-Apr-06	System and method for controlling a wireless device	Granted
China	200780015468.7	CN101554035		28-Apr-06		Filed
EPC	07758332.8	EP2018748		28-Apr-06		Filed
India	8261/Del/11P/2008			28-Apr-06		Filed
Japan	2009-507864	JP2009035919		28-Apr-06		Filed
USA	11/830458	US 2009-0034480 A1		30-Jul-07	Adaptive Antenna System Signal Detection	Filed
USA	11/833689	US 2009-0034836 A1		03-Aug-07	Feedback scheduling to reduce feedback rates in MIMO systems	Filed
PCT	PCT/US08/0959	WO2009/020723				Inactive
China	200860191868.7	CN101755209		03-Aug-07		Filed
EPC	06781297.8	EP2176900		03-Aug-07		Filed
Japan	2010-520033	JP2010236245		03-Aug-07		Filed
Korea	10-2010-7004717	KR20100093596		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	12/702013	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	WO2008/042667				Inactive
EPC	07960118.7	EP2074719		29-Sep-06		Filed
USA	11/619833	US 2008-0165717 A1		04-Jan-07	Novel MIMO 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 Bounding Techniques for a Wireless Communication System	Filed
PCT	PCT/US08/55984	WO2008/115898				Inactive
USA	11/725423	US 2008-0233902 A1		19-Mar-07	Resource allocation in a communication system	Filed
PCT	PCT/US08/54823	WO2008/115660				Inactive
China	20086030085/7.8	CN101637556		19-Mar-07		Filed
EPC	08730294.2	EP2137104		19-Mar-07		Filed
Japan	2009-554619	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/US08/54352	WO2008/115649				Inactive
China	200860007575.8	CN101627656		19-Mar-07		Filed
EPC	08743498.1	EP2130354		19-Mar-07		Filed

CONFIDENTIAL

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	WO2008115650				Inactive
USA	12/697417	US 2011-0019631 A1		16-Mar-07	Generalized Reference Signaling Scheme for Multi-User, Multiple Input, Multiple Output MU-MIMO Using Arbitrarily Precoded Reference Signals	Filed
China	200890508640.X	CN101838929		16-Mar-07		Filed
USA	11/687376	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/US08/61265	WO2008137323				Inactive
USA	12/981423	unpublished		30-Apr-07	Channel sounding techniques for a wireless communication system	Filed
China	200880016424.X	CN101682392		30-Apr-07		Filed
EPC	08746549.6	EP2145402		30-Apr-07		Filed
USA	11/742295	US 2008-0268888 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	633/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

CONFIDENTIAL

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 2008-0318578 A1		22-Jun-07	Techniques for Resource Block Mapping in a Wireless Communication System	Filed
PCT	PCT/US08/08606	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/US08/68030	WO2009023379				Inactive
Japan	2010-521061	JP2010537485				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	WO2009042260				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	T08917727		28-Sep-07		Filed
USA	11/855341		7912083	01-Oct-07	Techniques for Reducing a Cell Identification Falsing 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 Estimation Using Dynamic-Range-Limited Pilot Signals	Inactive

CONFIDENTIAL

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/US99/10208	WO9934333				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-93	Apparatus and method for varying the coupling of a radio frequency signal	Granted
PCT	PCT/US94/03713	WO9425997				Inactive
Brazil	BR19940005309		BR9400339			Inactive
Canada	CA19942138029		CA2138029			Inactive
China	CN19941080250		CN1109295			Inactive
UK	GB19940026477		GB2284103			Inactive
Japan	JP19940564274		JP7508872			Inactive
USA	08/042956		5448770	05-Apr-93	Temperature-coefficient controlled radio frequency signal detecting circuitry	Granted
Australia	AU19940059133		AU667261			Inactive
Australia	AU19940059133		AU5813394			Inactive
Brazil	BR19940001376		BR9401376			Inactive
Canada	CA19942120095		CA2120095			Inactive
Germany	DE19944411733		DE4411733			Inactive
France	FR19940003557		FR2703880			Inactive
UK	GB19940003554		GB2276992			Inactive
Japan	JP19940085262		JP7030460			Inactive
Sweden	SE19940001053		SE9401053			Inactive
Sweden	SE19940001053		SE9401053			Inactive
China	94103550.6		CN1104000	05-Apr-93		Granted
USA	08/144940		5493780	29-Oct-93	Automatic frequency control apparatus	Granted
PCT	PCT/US94/10324		WO9512233			Inactive
Brazil	BR19940005977		BR9403977			Inactive
Canada	CA19942150819		CA2150819			Inactive
China	CN19941099811		CN1115021	29-Oct-93		Granted
China	CN19941099811		CN1033651	29-Oct-93		Granted
Germany	DE199444082917		DE4408291			Inactive
France	FR19940012601		FR2711808			Inactive
UK	GB19940013085		GB2280383			Inactive
Japan	JP19940512610		JP6505308			Inactive
Korea	KR19940007074		KR9406656			Inactive
Sweden	SE19950002306		SE9502306			Inactive
Sweden	SE19950002306		SE9502306			Inactive
Singapore	SG10080020585		SG44455			Inactive
Japan	JP19940512610		JP3006073	29-Oct-93		Granted
USA	08/407787		5513382	31-Mar-93	Multi-ceramic layer switch circuit	Granted
USA	08/040780					Inactive
PCT	PCT/US94/02896		WO9422531			Inactive
Australia	AU19940006687		AU664672			Inactive
Australia	AU19940006598		AU6588794			Inactive

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
Canada	CA19942135799		CA2135799			Inactive
China	CN19941090155		CN11040923			Inactive
France	FR19940003656		FR2793939			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	CN19941091888		CN1121752			Inactive
Germany	DE19944480702		DE4480702			Inactive
France	FR19950000718		FR2718588			Inactive
UK	GB19950020613		GB2291754			Inactive
Japan	JP19970127230		JP8509889			Inactive
Russia	RU19950119833		RU2121755			Inactive
Sweden	SE19950003087		SE9503087			Inactive
Singapore	SG1996001060		SG469852			Inactive
South Africa	ZA1995000442		ZA950442			Inactive
Taiwan	82112284		80-075214	23-Feb-94		Granted
Thailand	025408			23-Feb-94		Inactive
USA	08/939157		6185411	09-Nov-93	Apparatus and method for ensuring elements of a phase locked loop	Granted
PCT	PCT/US94/11476		WO9512669			Inactive
Australia	AU199500103925		AU1538295			Inactive
Brazil	BR19940005782		BR9405782			Inactive
Canada	CA19942152181		CA2152181			Inactive
China	CN19941090894		CN1116474			Inactive
China	CN19941090894		CN1053072			Inactive
Germany	DE199444967461		DE4496746			Inactive
France	FR19940013274		FR2713415			Inactive
UK	GB19950013837		GB2289174			Inactive
Japan	JP188405138227		JP8505798			Inactive
Korea	KR19950073863		KR100188162			Inactive
Singapore	SG19960000580		SG81848			Inactive
USA	08/624329		5737327	29-Mar-92	Method and apparatus for demodulation and power control bit detection in a spread spectrum communication system	Granted
Argentina	PD70101233		AR00841781	29-Mar-96		Granted
Brazil	PR9704090-0		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	P19712836.3		DE19712836	29-Mar-96		Granted

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
Germany	19756850.8			29-Mar-95		Filed
India	738/TJE/1997		214741	29-Mar-95		Granted
Japan	JP19870090149		JP3091711	29-Mar-95		Granted
Japan	09-278105	JP10012560	3989650	29-Mar-95		Granted
Korea	10-1997-0011223	243720	KR100243720	29-Mar-95		Granted
Korea	10-1997-0042413	298571		29-Mar-95		Granted
Mexico	972271	204930	MX9702273	29-Mar-95		Granted
USA	08/806331	9799011	5799011	29-Mar-95	CDMA power control channel estimation using dynamic coefficient scaling	Granted
USA	09/089992	6243410	6243410	29-Mar-96	Demodulator having an infinite-duration impulse response filter with dynamic coefficient scaling	Granted
USA	08/025658		5673003	29-Mar-96	Amplifier circuit having a variable bandwidth	Granted
Japan	09-094577	JP10041781	JP4018222	29-Mar-96		Granted
USA	08/760787		5857083	05-Dec-96	Gain distribution circuit	Granted
USA	09/015824		6402218	29-Feb-00	Variable gain control circuit for a receiver and method therefor	Granted
USA	09/042753		6049233	17-Mar-98	Phase detection apparatus	Granted
Brask	9901014-3		BR9901014	17-Mar-98		Inactive
China	99104030.9	ZI.99104030.9	CN1258600	17-Mar-98		Granted
Japan	11-087580	JP11330658	JP4218383	17-Mar-98		Granted
UK	GB19960306736		GB2318597			Inactive
USA	08/725671		5905757	04-Oct-98	Filter co-processor	Granted
PCT	PCT/US97/11435		WO9815056			Inactive
Australia	AU19970035875		AU3587507			Inactive
Canada	CA19972238299		CA2238299			Inactive
China	97191376.5	ZI.97191376.5	CN1205133	04-Oct-96		Granted
Germany	DE19971081047		DE19781047			Inactive
Spain	ES19970002085		ES2147893			Inactive
Finland	FI19960001263		FI881263			Inactive
France	FR19970010122		FR2754388			Inactive
UK	GB19950011085		GB2322057			Inactive
Italy	IT1997RM00253		IT1295391			Inactive
Russia	RU19960112274		RU2178949			Inactive
Sweden	SE19960091956		SE9617510			Inactive
Sweden	SE19960001858		SE9801958			Inactive
India	2072/DRL/97		217376	04-Oct-96		Granted
Japan	10-516499		JP4494531	04-Oct-96		Granted
Korea	10-1996-0704193		KP306014	04-Oct-96		Granted
Taiwan	88111549		NI-096775	04-Oct-96		Granted
USA	08/011573		5584053	04-Aug-95	Commonly coupled high frequency transmitting/receiving switching module	Granted
PCT	PCT/US95/01140		WO9700000			Inactive

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	07/700966		5128632	16-May-91	Adaptive lock time controller for a frequency synthesizer and method therefor	Granted
USA	08/517106		5758275	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	09/515834		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		WO0148823			Inactive
Taiwan	89124413	TW630482	NI-178508	29-Dec-88		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 response for mobile stations and methods therefor	Granted
PCT	PCT/US02/31243		WO0203032			Inactive
Australia	AU2002034762		AU2002034762			Inactive
China	02819472.1	ZL02819472.1	CN100435488	09-Oct-01		Granted
EP	EP20020900898		EP1436502			Inactive
Japan	2003-535443		JP4202419	09-Oct-01		Granted
Korea	10-2004-7004931	10-928850	KR20050032501	09-Oct-01		Granted
Taiwan	091123282	TV583850	NI-199550	09-Oct-01		Granted
USA	09/929578		6487196	14-Aug-01	Low noise architecture for a direct conversion transmitter	Granted
PCT	PCT/US02/22756		WO0302171			Inactive
USA	10/008538		6850910	08-Nov-01	Mobile wireless communication device architectures and methods therefor	Granted
USA	11/220735		7127583	08-Nov-01	Shared memory architecture	Granted
USA	10/092966		6893490	07-Mar-02	Adjustable gain control system and method thereof	Granted
PCT	PCT/US03/06370		WO0307741			Inactive
AU	AU20030216484		AU20030216484			Inactive
EP	EP20030744142		EP1490966			Inactive
Japan	2003-575507	JP2005519559	JP4489436	07-Mar-02		Granted
Korea	10-2004-7014043	10-1006829		07-Mar-02		Granted
Taiwan	892104809		NI-297239	07-Mar-89		Granted

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	10/092932		6889036	07-Mar-02	Integrated frequency-selectable resonant coupling network and method thereof	Granted
POI	PCT/US03/08021		WO2003077418			Inactive
AU	AU20030212448		AU2003212448			Inactive
USA	07/792568		5194533	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		5895787	22-Jul-04	Demodulator with baseband doppler shift compensation and method	Granted
USA	08/812787		7042009	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	10/004108	US 2005-0111528		22-Feb-01		Inactive
POI	PCT/US05/08856		WO2006050055			Inactive
China	200580034689.4	200580034389.4	CN101040454	26-Oct-04		Granted
India	157603ELNP/2007			26-Oct-04		Filed
Japan	2007-539140	JP2008519486		28-Oct-04		Filed
Korea	10-2007-7006613	KR20070072698		28-Oct-04		Inactive
POI	PCT/US05/08856			28-Oct-04		Inactive
Sing	200702192-0		130952	28-Oct-04		Granted
USA	09/941101		6861011	27-Aug-01	Data compression system	Granted
USA	09/882190		7610338	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		6179211	05-Feb-99	Method and apparatus for facilitating reception of a signal on one of a plurality of contiguous channels	Granted
USA	09/367267		6594328	28-Jul-99	Method and apparatus for facilitating an estimation of a carrier frequency error in a receiver of a wireless communication system	Granted

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	09/406398		6625233	29-Sep-99	Method and apparatus in a wireless receiver for demodulating a continuous-phase frequency-shift-keyed signal	Granted
USA	00/571872		6289060	12-May-00	Method and apparatus for performing a generalized viterbi search to demodulate a sequence of symbols	Granted
PCT	PCT/US01/13146		WO0169060			Inactive
Australia	AU20010057194		AU5719401			Inactive
USA	08/565518		5630222	04-Dec-95	Method and apparatus for generating multiple signals at multiple frequencies	Granted
PCT	PCT/US98/17668		WO9721275			Inactive
USA	08/541913		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/IL99/204604		WO0222147			Inactive
Australia	AU19920021785		AU650382			Inactive
Australia	AU16920021785D		AL2178532			Inactive
Brazil	BR19920005080		BR9208080			Inactive
Canada	CA10022192496		CA2102490			Inactive
EP	EP19920913445		EP0507765			Inactive
Finland	FI19930005416		FI935416			Inactive
Japan	JP199255056151		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	08/399785		5678223	07-Mar-95	Method and apparatus for an automatic frequency control receiver	Granted
USA	08/398805		5606731	07-Mar-95	Zero-IF receiver with tracking second local oscillator and demodulator phase locked loop oscillator	Granted
USA	08/399784		5604926	07-Mar-95	Phase locked loop circuit current mode feedback	Granted
USA	08/503396		5670951	17-Jul-95	Radio communication device and method for generating threshold levels in a radio communication device for receiving four-level signals	Granted
USA	09/324634		5471665	18-Oct-94	Differential DC offset compensation circuit	Granted

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	08/511061		5633895	01-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/US95/07192		WO97/04530			Inactive
EP	EP18960520269		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	08/880356		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		WO99/3733	29-May-98		Inactive
China	CN1998007908		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	09/205077		6487260	05-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	WO02/071636	WO02/071636			Inactive
China	02600519.8	ZL 02600519.8	CN1215687	05-Mar-01		Granted
EPC	EP20020706333		EP1368901			Inactive
Japan	2002-570426		JP4077061	05-Mar-01		Granted
Korea	10-2602-7014779		KR682773	05-Mar-01		Granted
USA	09/885187		6952572	20-Jun-01	Image rejection mixer with switchable high or low side injection	Granted
USA	08/750832		5874860	06-Feb-96	High frequency amplifier and control	Granted
Germany	DE19976014881	DE60714881	DE69714881			Inactive
EP	EP19970101439	EP0789451	EP0789451			Inactive
France	FR19960001392	FR2744578	FR2744578			Inactive

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
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	98400054.6		EP0930745	15-Jan-98		Granted
UK	98400054.6		EP0930745	15-Jan-98		Granted
Germany	98400054.6	DE19880028450	DE6982945	15-Jan-98		Granted
USA	09/364289		6782038	30-Jul-98	Method and apparatus for radio communications	Granted
China	99111904.5	ZL99111904.5	CN1145386	30-Jul-98		Granted
Germany	DE19986021751T		DE6982175			Inactive
EPC	EP10089491954		EP0977351			Inactive
Japan	JP19990214875	JP2000106533				Inactive
USA	10/302031		6933766	17-Aug-00	Apparatus and method for improved chopping mixer	Granted
PCT	PCT/EP01/06154		WO2002015285			Inactive
Australia	AU2001008965R0		AL8995801			Inactive
China	CN200110014137		CN1448006			Inactive
EPC	EP20000402501		EP1184971			Inactive
Japan	JP200201203801	JP2004507139				Inactive
Korea	10-2003-7002618		KR200471	17-Aug-00		Granted
Taiwan	090127410	TW549266	NL181817	17-Aug-00		Granted
USA	08/451866		5478773	28-Apr-94	Method of making an electronic device having an integrated inductor	Granted
USA	10/433760		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	DE20000008501		DE60000005			Inactive
Germany	DE20000003037		DE60030337			Inactive
EP	EP20000004242		EP1213880			Inactive
EP	EP2000000291689		EP1370968			Inactive
Japan	JP200200546943	JP2004515679				Inactive
USA	10/451094		7158578	20-Dec-00	Quadrature modulator with pulse-shaping	Granted
PCT	PCT/EP01/11523		WO0251093			Inactive
Austria	AT20000403609		AT266287			Inactive
Australia	AU20020018211		AU1821102			Inactive
China	01821117.8	ZL01821117.8	CN1266993	20-Dec-00		Granted
Germany	DE20000010512		DE60010512			Inactive
EP	EP20000403609		EP1238840			Inactive
Japan	2002-522259		JP3931140	20-Dec-00		Granted
Korea	10-2003-7008358		KR20035515	20-Dec-00		Granted
USA	10/154126		6906834	23-May-02	Transceiver circuit arrangement and method	Granted

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	08/688876		5748042	26-Jul-96	Method for altering a difference frequency signal and amplifier circuit thereof	Granted
USA	08/673566					Inactive
USA	08/908827		5926052	01-Jul-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	08/673465		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	02626750.9	ZL02626750.9	CN1613182	19-Nov-01		Granted
Australia	AU20020365982		AU2002365 982			Inactive
EP	EP23610402965		EP1313230			Inactive
Japan	JP200305464797	JP200305464797				Inactive
Taiwan	991133383		TW262372	19-Nov-01		Granted
USA	08/080220		6049703	28-Nov-97	Amplifier circuit and method for increasing linearity of the amplifier circuit	Granted
USA	09/039502		6487395	16-Mar-98	Radio frequency electronic switch	Granted
USA	09/211168		6263199	14-Dec-98	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	09/128428		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	23-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	DE2006001909	DE60001909				Inactive
EPC	00126894.7		EP1102410	16-Nov-98		Granted
Japan	2000-347431	JP2001186932		16-Nov-98		Filed
USA	09/790445		6914935	21-Feb-01	Fractional N synthesizer with reduced fractionalization spurs	Granted

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	09/516915		6760386	27-Jul-01	Receiver and method therefor	Granted
China	330810210281.B	CN101340229		27-Jul-01		Filed
China	02816359.1	ZL02816359.1	CN1545772	27-Jul-01		Granted
EPC	EP20020744721		EP1415414			Inactive
Japan	2003-535363		JP4275530	27-Jul-01		Granted
Japan	2008-133143	JP2008263827		27-Jul-01		Filed
Taiwan	991115249	TW582141	NI-198811	27-Jul-01		Granted
USA	99/916,884		6751254			Granted
USA	99/916,885	US20030038498				Inactive
USA	10/033013		6959035	26-Dec-01	Post-correlation interpolation for duty locked loops	Granted
USA	10/208059		6798353	31-Jul-02	Prescaler method and apparatus	Granted
USA	10/308552		7158003	26-Dec-02	Method and apparatus for compensating deviation variances in a 2-layer FSK FM transmitter	Granted
PCT	PCT/US02/30587		WO2004002085			Inactive
EP	EP20030770537		EP1579566			Inactive
AU	AU20030279025		AU20030279025			Inactive
China	03829721.1	CN1717881		26-Dec-02		Filed
Taiwan	99/128554			26-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	10/391978		6973142	19-Mar-03	Timing synchronization for M-DPSK channels	Granted
PCT	PCT/US04/03095		WO2004095720			Inactive
EP	EP20040703129		EP1685874			Inactive
Japan	2006-508656		JP4383445	19-Mar-03		Granted
Korea	10-2005-7017480	KR20050118285		19-Mar-03		Filed
Taiwan	99/152641		NI-335165	19-Mar-03		Granted
USA	10/420604		6812802	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	10/721958		7340598	25-Nov-03	Communication receiver	Granted
USA	10/625957		7412006	24-Jul-03	Method and apparatus for RF carrier feedthrough suppression	Granted
USA	10/898268		7231585	21-Jul-04	Multi-rate video decoder	Granted
USA	11/743187	US20070201886				Inactive

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	10/731009		7215972	09-Dec-03	Adaptive transmit power control system	Granted
PCY	PCT/US04/37061		WO2005006451			Inactive
China	200430033064.0		CN1847438	09-Dec-03		Granted
EPC	04810476.0	EP1917714		09-Dec-03		Filed
India	1999/DELNP/2006		235688	09-Dec-03		Granted
Japan	2005-543620	JP2007514370		09-Dec-03		Filed
USA	11/046075		7100816	30-Jan-04	Dual port modulator comprising a frequency synthesizer	Granted
Austria	AT20040280252T		AT385307			Inactive
EP	EP20040290262		EP1580336			Inactive
France	04297262.7		EP1580336	30-Jan-04		Granted
UK	04297262.7		EP1580336	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		7177016	13-Aug-04	High linearity and low noise CMOS mixer and signal mixing method	Granted
USA	10/963387		7266359	12-Oct-04	DC interference removal in wireless communications	Granted
USA	11/069176		7346317	04-Apr-05	Dynamic gain and phase compensation for power amplifier load switching	Granted
PCT	PCT/US05/12238		WO20060107841			Inactive
EPC	05749361.8	EP1869778		04-Apr-05		Filed
Japan	2005-505413	JP2006536909		04-Apr-05		Filed
USA	11/046910		7148749	31-Jan-05	Closed loop power control with high dynamic range	Granted
PCT	PCT/US05/45206		WO20060583403			Inactive
China	200580044361.5	CN101118242		31-Jan-05		Filed
EPC	05854006.5	EP1861651		31-Jan-05		Filed
India	3391/DELNP/2007			31-Jan-05		Filed
Japan	2007-553099	JP2008520408		31-Jan-05		Filed
Korea	10-2007-7017801	KR20070119250		31-Jan-05		Filed
Taiwan	994146732			31-Jan-05		Filed
USA	11/282734		7391402	17-Nov-05	Soft saturation detection for power amplifiers	Granted
USA	11/114395		7489020	26-Apr-05	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

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
PCT	PCT/US05/11569		WO2006107550			Inactive
China	200510010175.4	CN101212749		04-Apr-05		Filed
Japan	2005-504332	JP2006535396		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	2006-504166	JP2006535388		01-Apr-05		Filed
USA	11/199737		7539462	08-Aug-05	Configurable multi-mode modulation system and transmitter	Granted
USA	11/243633		7493758	04-Oct-05	Linearized and balanced mixer apparatus and signal mixing method	Granted
Japan	2006-090220			04-Apr-06		Filed
USA	11/058456		7392026	04-Apr-05	Multi-band mixer and quadrature signal generator for a multi-mode radio receiver	Granted
USA	11/365774		7509321	26-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	Carrier frequency control of an integrated phase rotator band-pass filter using VCO coarse trim bits	Granted
PCT	PCT/US06/26255		WO2007018849			Inactive
Japan	2006-224975	JP2006304065		07-Aug-05		Filed
Korea	10-2006-7002833	KR20060034142		02-Aug-05		Filed
USA	11/363463	7609779	7609779	27-Feb-06	RF transmitter with interleaved IQ modulation	Granted
PCT	PCT/US07/061915		WO2007117791			Inactive
EPC	07758921.0	EP1992136		27-Feb-06		Filed
Korea	10-2006-7023528	KR20060098545		27-Feb-06		Filed
USA	11/280367		7539273	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		7593485	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

CONFIDENTIAL

Country	App #	Publication #	Patent #	Priority Date	Title	Status
USA	11/452457		7603094	14-Jun-06	DC offset correction for direct conversion receivers	Granted
USA	03/024482		5945878	17-Feb-98	Single-ended to differential converter	Granted
USA	09/131215		6310858	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		7495202	20-Aug-07	RF amplifier with stacked transistors, transceiving device, and method therefor	Granted
USA	11/895427		7495515	24-Aug-07	Low-noise amplifier	Granted
USA	08/771348		5885547	10-Dec-98	Circuit and method of controlling mixer linearity	Granted
USA	07/803,597		5661911	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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