Lab Code: 200707-0

FCC PART 22H, PART 24E

MEASUREMENT AND TEST REPORT

For

Beijing Telestone Technology Co., Ltd.

6F, Saiou Scientific Building, No. 5 Haiying Road,

Fengtai Science Park, Beijing, China

FCC ID: U5TU-DAS-RAM2241

Report Type:	Product Type:
Original Report	Remote Unit for U-DAS

Test Engineer:	Jimmy Xiao
Report Number:	RSZ120425005-00A
Report Date:	2012-06-27
Reviewed By:	Sula Huang EMC Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Beijing Telestone Technology Co., Ltd.*'s product, model number: *RAM2241 (FCC ID:U5TU-DAS-RAM2241*) or the "EUT" as referred to in this report is a *Remote Unit for U-DAS*, which measures approximately: 41.5 cm (L) x 35.0 cm (W) x 16.2 cm (H), rated input voltage: DC 48V.

Frequency Range:

CDMA850 Cellular Band: 824-849 MHz (Uplink), 869-894 MHz (Downlink)
CDMA1900 PCS Band: 1850-1910 MHz (Uplink), 1930-1990 MHz (Downlink)
UMTS1900 PCS Band: 1850-1910 MHz (Uplink), 1930-1990 MHz (Downlink)

Modulation Type:

Cellular 850 MHz: CDMA
PCS1900 MHz: CDMA, WCDMA

** All measurement and test data in this report was gathered from production sample serial number: 12010040 (Assigned by applicant). The EUT was received on 2011-04-25.*

Objective

This type approval report is prepared on behalf of *Beijing Telestone Technology Co., Ltd.* in accordance with Part 2, Subpart J, Part 22 Subpart H, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

None

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-D, ANSI C63.4-2009.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-D.

The final qualification test was performed with the EUT operating at normal mode.

Equipment Modifications

No modifications were made to the EUT.

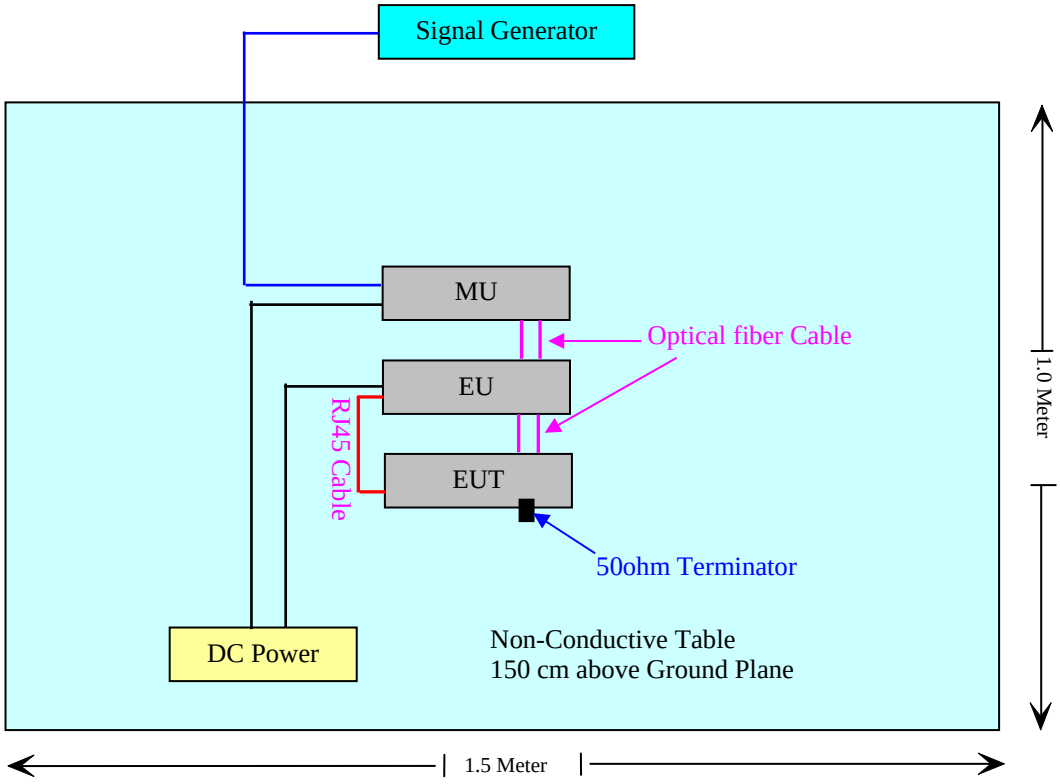
Local Support Equipment List and Details

Manufacturer	Device Name	Model	Serial Number
R&S	Vector Signal Generator	SMU200A	GB40051862
R&S	Universal Radio Communication Tester	CMU200	109038
LONGWEI	DC Power supply	TPR-64200	0398363
Beijing Telestone Technology Co., Ltd.	U-DAS2200 system (Expansion Unit)	RD2200	12010062
Beijing Telestone Technology Co., Ltd.	U-DAS2200 system (Main Unit)	RS2200	12010044

External I/O Cable

Cable Description	Length (m)	From/Port	To
Fiber cables	3.0	EU/MU	EUT (Remote Unit)
DC Power Cable	1.5	EU/MU	DC Power
AC Power Cable	2.0	EU/MU	AC Power
RJ45 Cable	3.0	EU	EUT (Remote Unit)

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)(1), §2.1091	RF Exposure	Compliance
§2.1046; § 22.913 (a); § 24.232 (c)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049; § 22.905 § 22.917; § 24.238	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051, § 22.917 (a); § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053 § 22.917 (a); § 24.238 (a)	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a)	Out of band emission, Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

FCC §1.1307 & §2.1091 - RF EXPOSURE

Applicable Standard

According to §1.1307 (b)(1) and §2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz;
* = Plane-wave equivalent power density;

Test Data

Predication of MPE limit at a given distance, Equation from OET 65, Edition97-01

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Cellular Band:

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
CDMA850 (Downlink)	869.70	5	3.16	21.82	152.05	20	0.0956	0.5798
CDMA1900 (Downlink)	1931.25	5	3.16	21.63	145.55	20	0.0915	1
UMTS1900 (Downlink)	1932.40	5	3.16	21.63	145.55	20	0.0915	1

Note: The Uplink is connected to BTS directly.

Result: The device meets FCC MPE limit at 20 cm distance.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC §2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC §2.1046, §22.913 (a) & §24.232 (c) - RF OUTPUT POWER

Applicable Standards

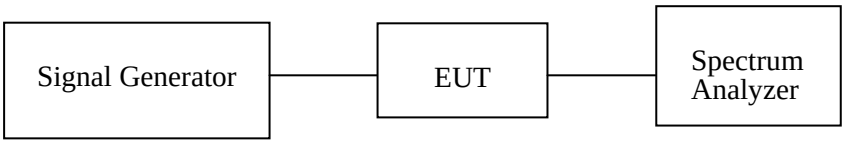
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (c), in no case may the peak output power of a base station transmitter exceed 2 watt EIRP.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the Signal Generator and the spectrum analyzer through sufficient attenuation.



Radiated method:

TIA 603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
R&S	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao from 2012-05-13 to 2012-05-14.

Conducted Power

Cellular Band (Part 22H)

CDMA850 Mode:

Mode	Channel	Frequency (MHz)	Output Power (dBm)
Downlink	Low	869.70	21.82
	Middle	881.52	21.18
	High	893.31	21.17

PCS Band (Part 24E)

CDMA1900 Mode:

Mode	Channel	Frequency (MHz)	Output Power (dBm)
Downlink	Low	1931.25	21.63
	Middle	1960.00	21.20
	High	1988.75	20.30

UMTS1900 Mode:

Mode	Channel	Frequency (MHz)	Output Power (dBm)
Downlink	Low	1932.40	21.63
	Middle	1960.00	21.22
	High	1987.60	21.08

FCC §2.1049, §22.917, §22.905 & §24.238 - OCCUPIED BANDWIDTH

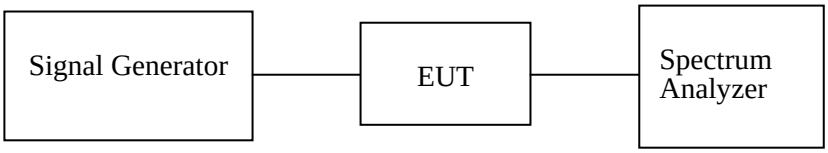
Applicable Standards

FCC §2.1049, §22.917, §22.905, and §24.238.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 100 kHz (Cellular /PCS) and the 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
R&S	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao on 2012-05-13 to 2012-06-05.

Cellular Band (Part 22H)

CDMA850 Mode:

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Input Signal				
Downlink	Middle	881.52	1.270	1.431
Output Signal				
Downlink	Middle	881.52	1.264	1.428

PCS Band (Part 24E)

CDMA1900 Mode:

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Input Signal				
Downlink	Middle	1960	1.270	1.435
Output Signal				
Downlink	Middle	1960	1.272	1.424

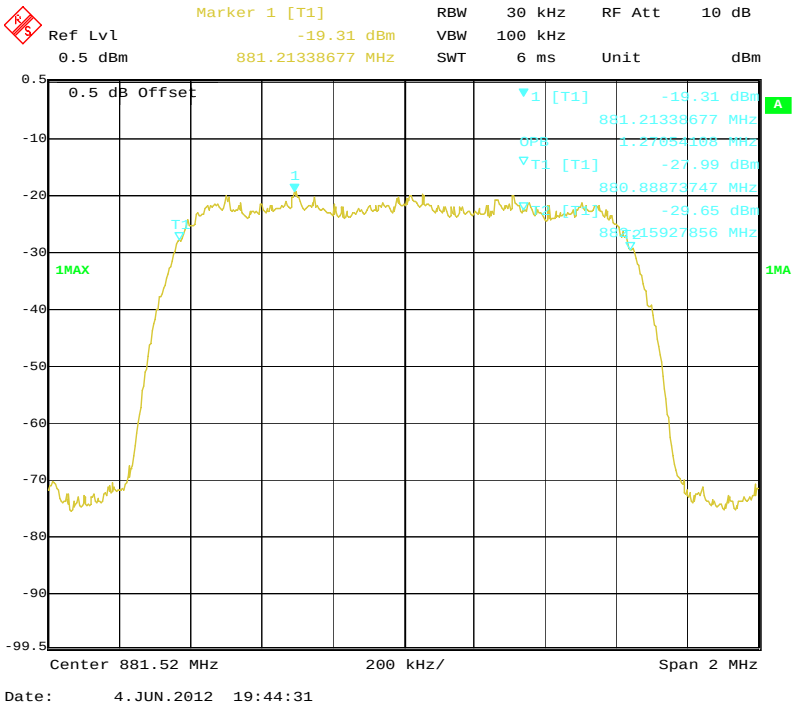
UMTS1900 Mode:

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
Input Signal				
Downlink	Middle	1960	4.196	4.725
Output Signal				
Downlink	Middle	1960	4.188	4.728

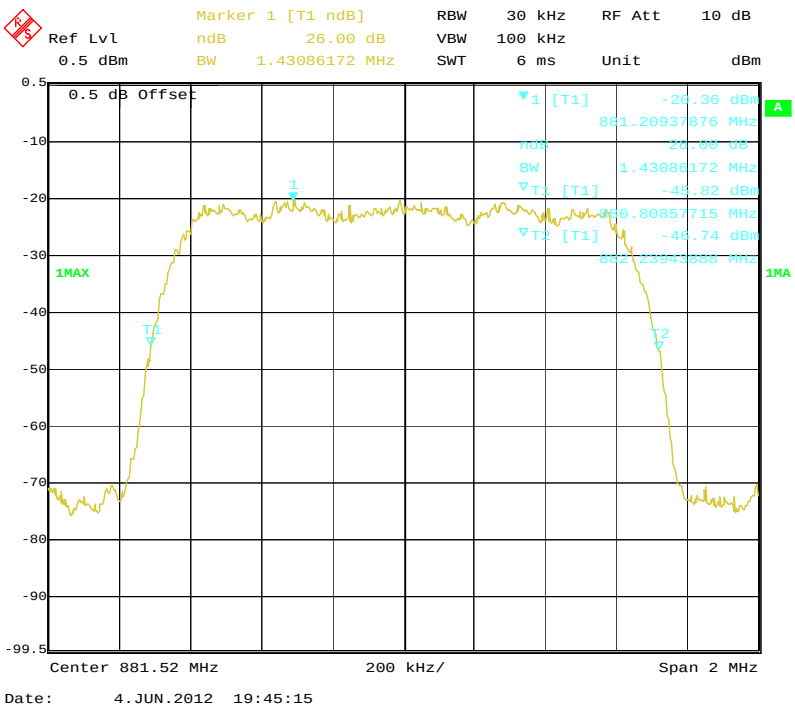
Cellular Band (Part 22H)

CDMA850 Mode:

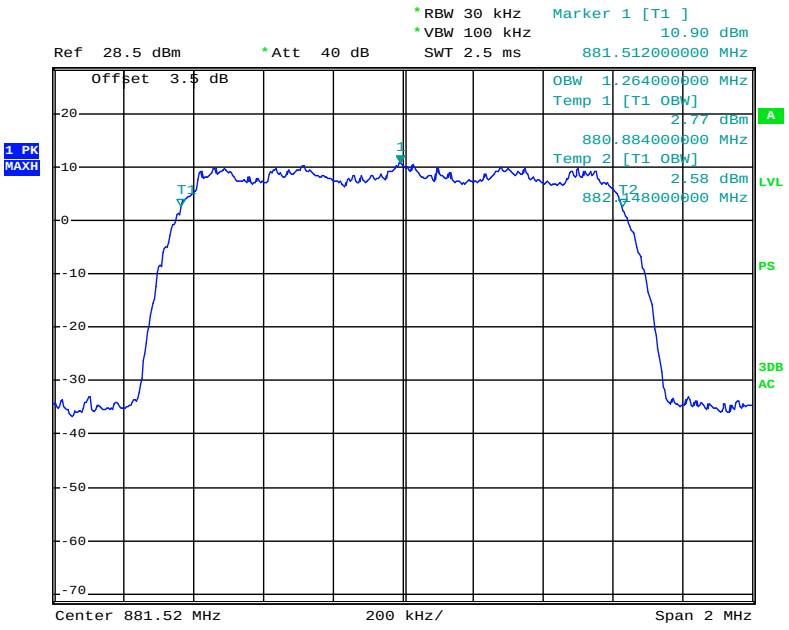
Input signal (Downlink): 99% Occupied Bandwidth, Middle Channel



Input signal (Downlink): 26 dB Bandwidth, Middle Channel



Output signal (Downlink): 99% Occupied Bandwidth, Middle Channel



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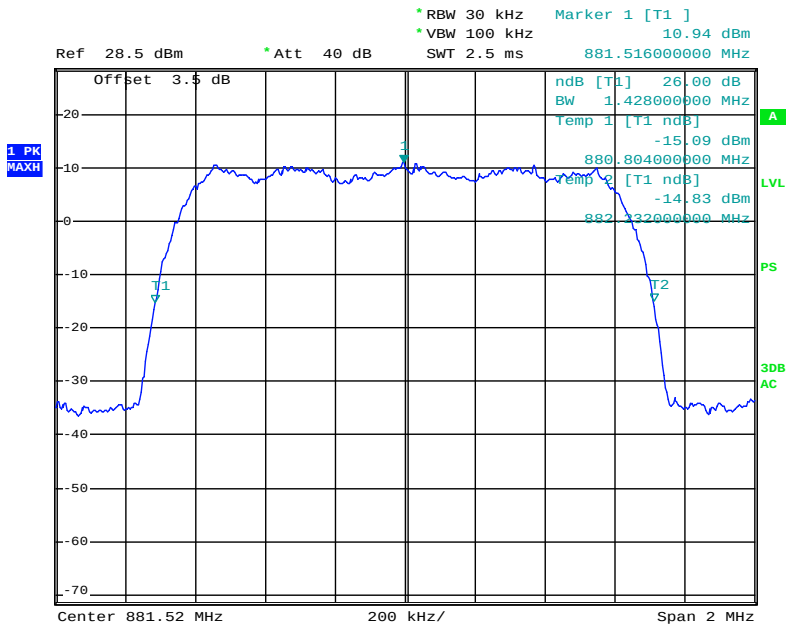
Output signal (Downlink): 26 dB Bandwidth, Middle Channel



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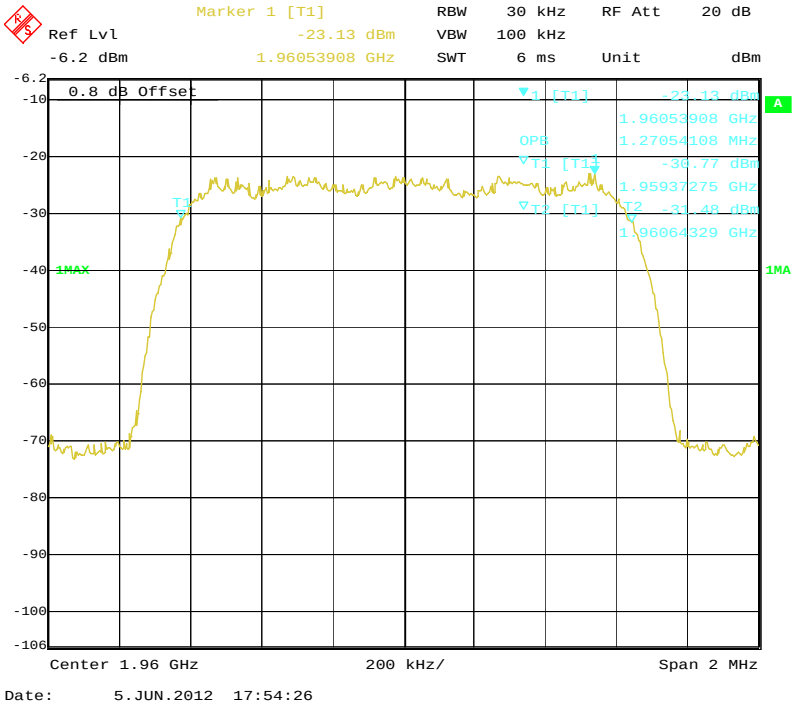
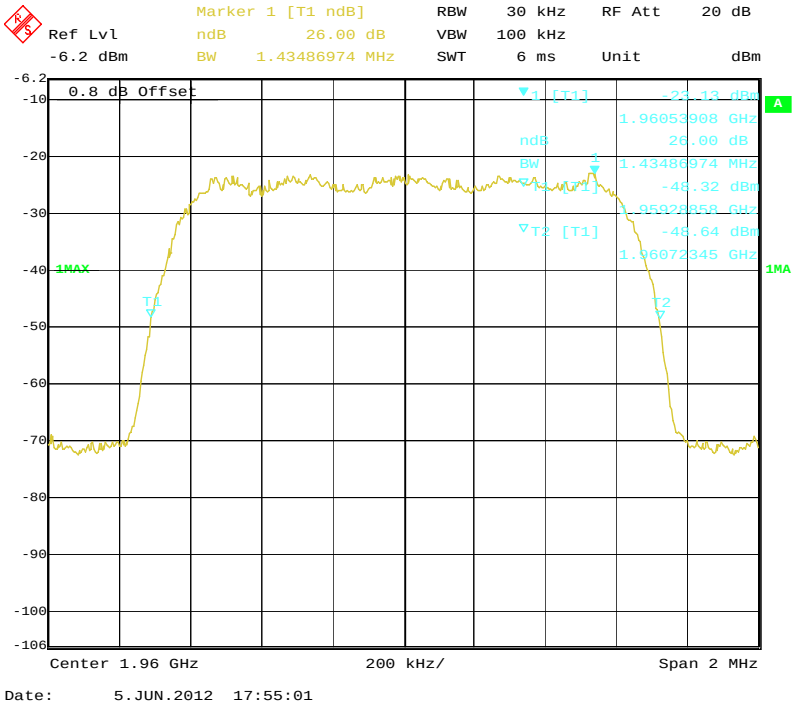
PCS Band (Part 24E)

CDMA1900 Mode:

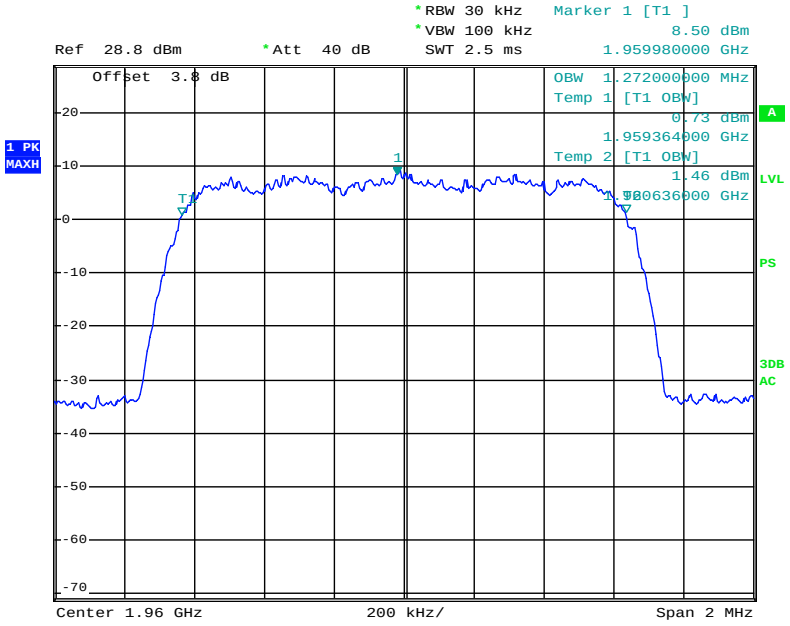
Input signal (Downlink): 99% Occupied Bandwidth, Middle Channel



Input signal (Downlink): 26 dB Bandwidth, Middle Channel



Output signal (Downlink): 99% Occupied Bandwidth, Middle Channel



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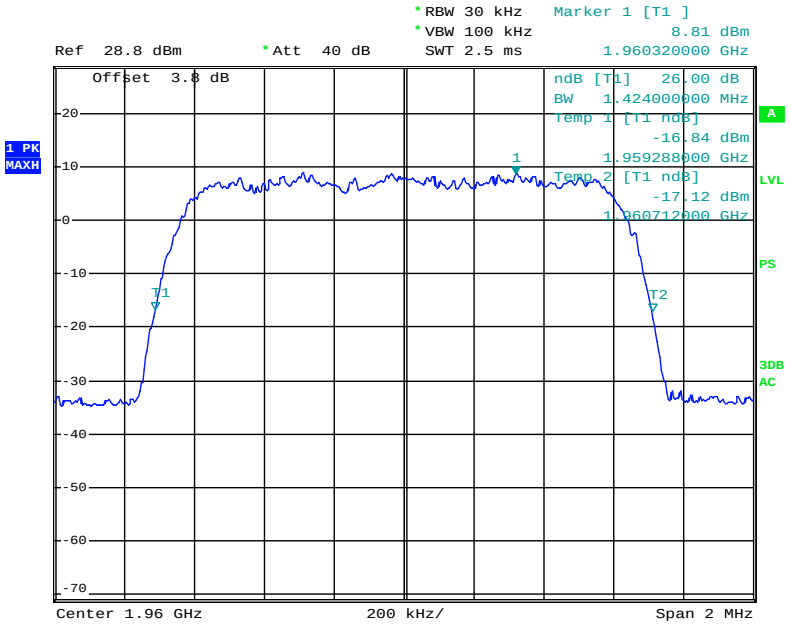
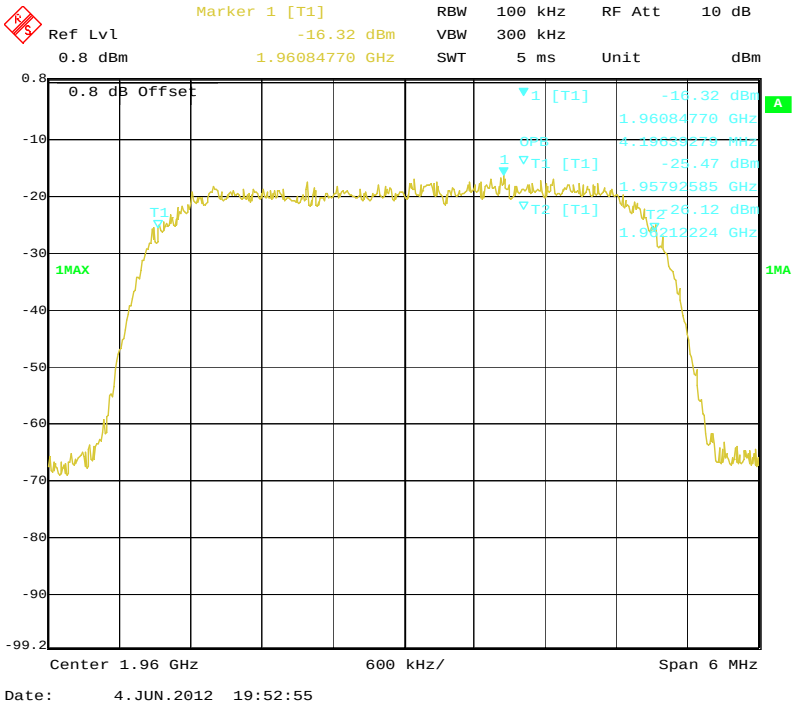
Output signal (Downlink): 26 dB Bandwidth, Middle Channel



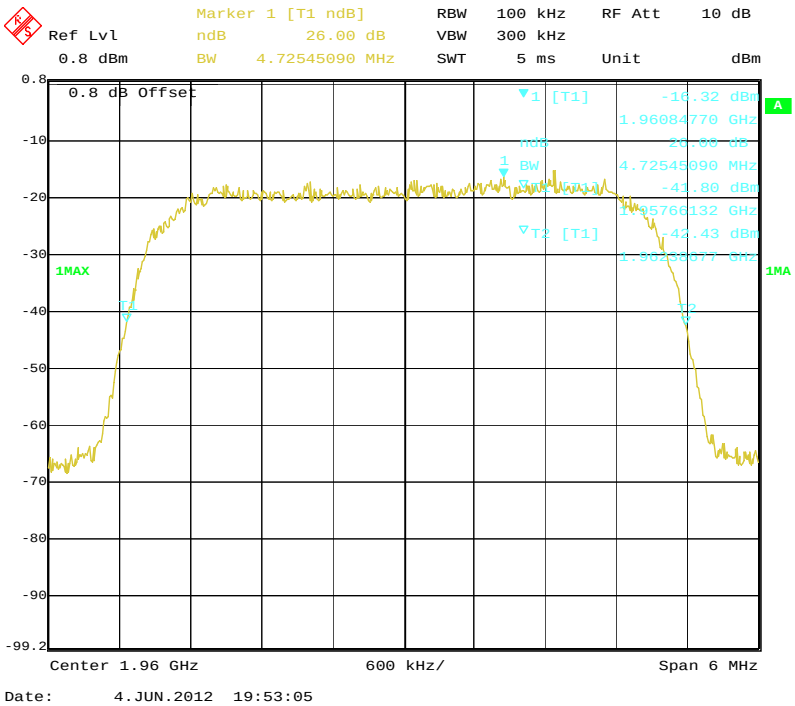
Date: 14.MAY.2012 23:11:53

UMTS1900 Mode:

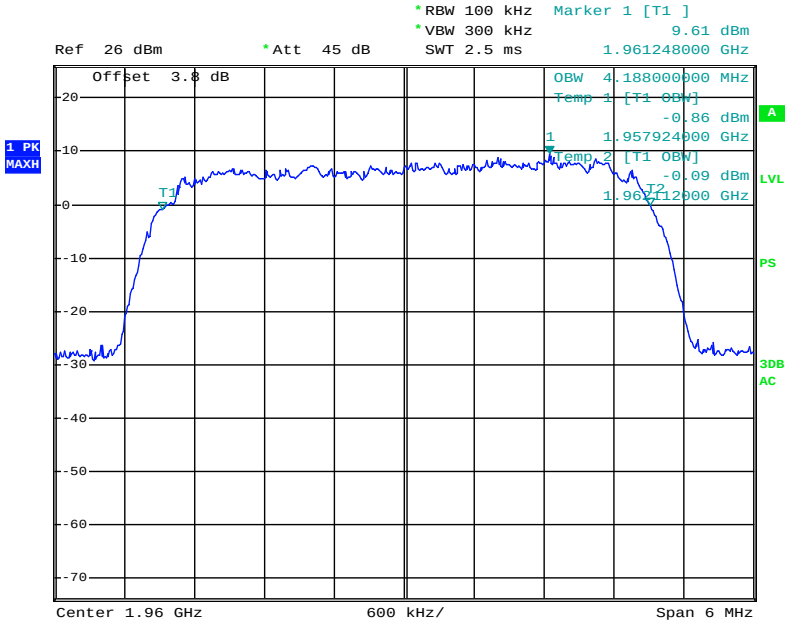
Input signal (Downlink): 99% Occupied Bandwidth, Middle Channel



Input signal (Downlink): 26 dB Bandwidth, Middle Channel

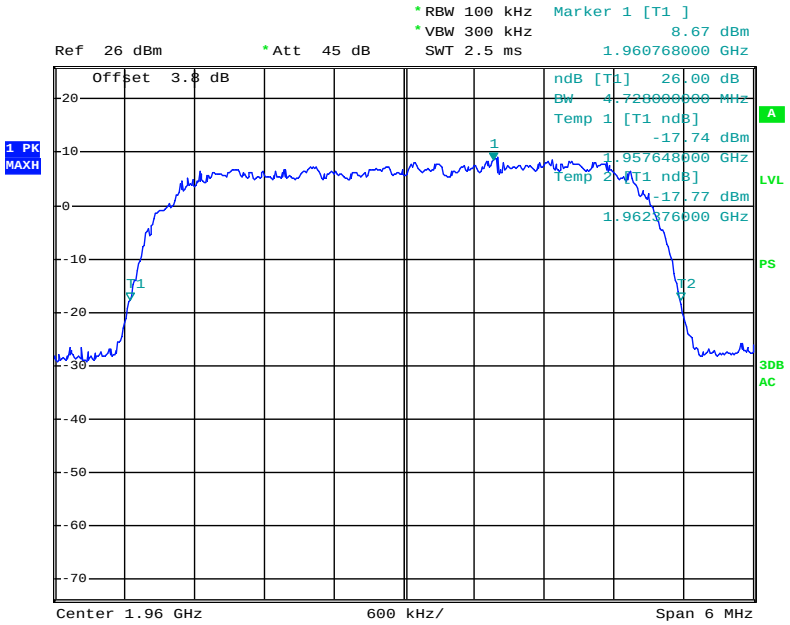


Output signal (Downlink): 99% Occupied Bandwidth, Middle Channel



Date: 13.MAY.2012 15:07:45

Output signal (Downlink): 26 dB Bandwidth, Middle Channel



Date: 13.MAY.2012 15:06:47

FCC §2.1051, §22.917(a) & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

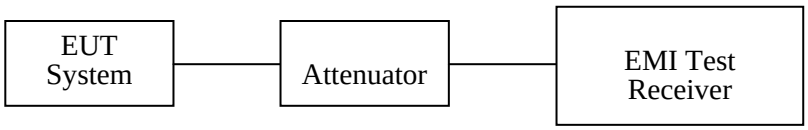
Applicable Standards

FCC §2.1051, §22.917(a) and §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
R&S	Vector Signal Generator	SMU200A	GB40051862	2011-08-06	2012-08-06
R&S	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

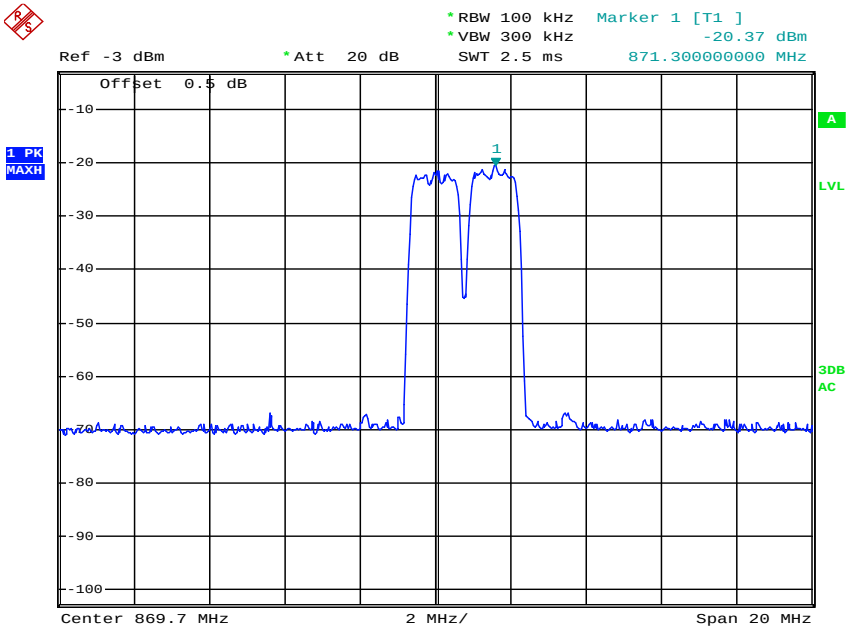
The testing was performed by Jimmy Xiao on 2012-05-13, 2012-05-14 and 2012-06-27.

Please refer to the following plots.

Cellular Band (Part 22H)

CDMA850 mode (Downlink)

Input Signal: Inter-modulation, Low Channel



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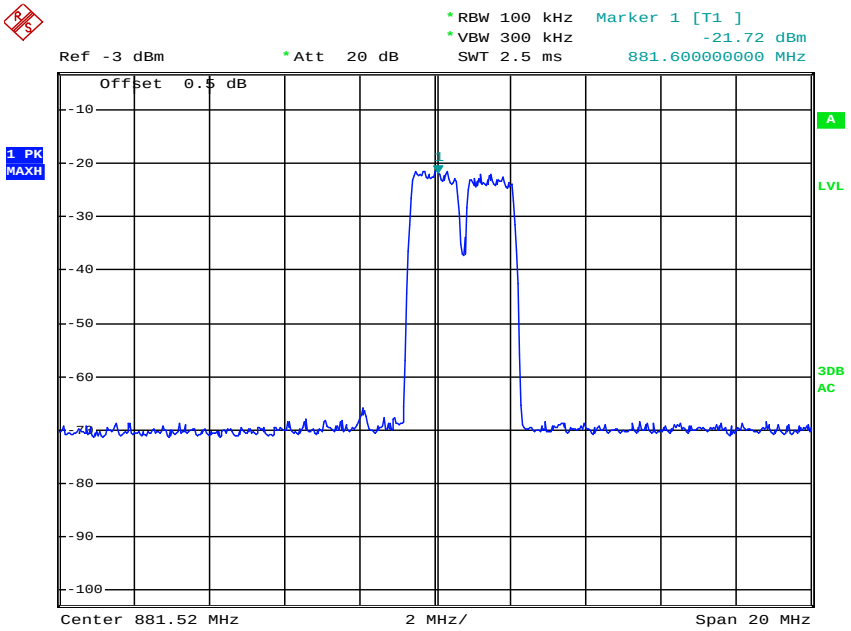
Input Signal: Inter-modulation, Middle Channel



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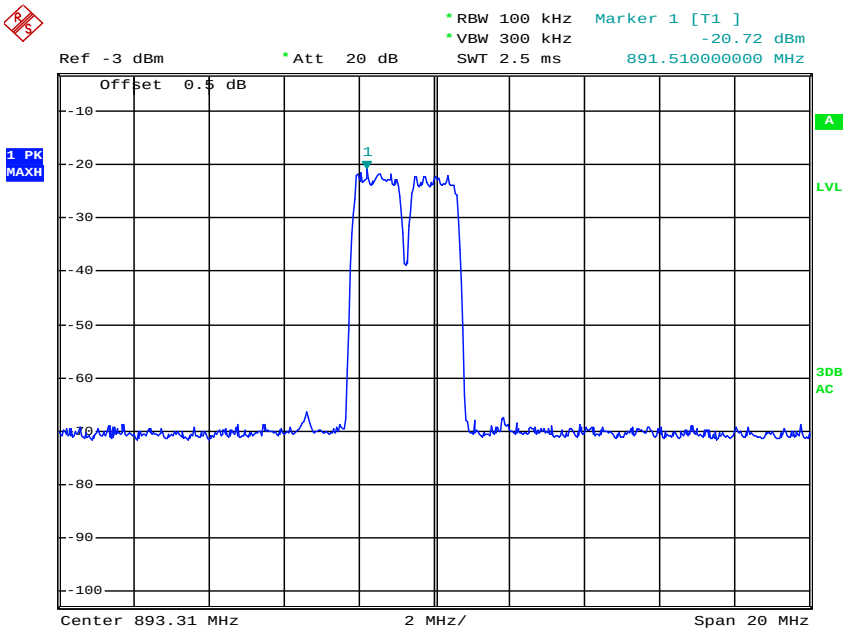
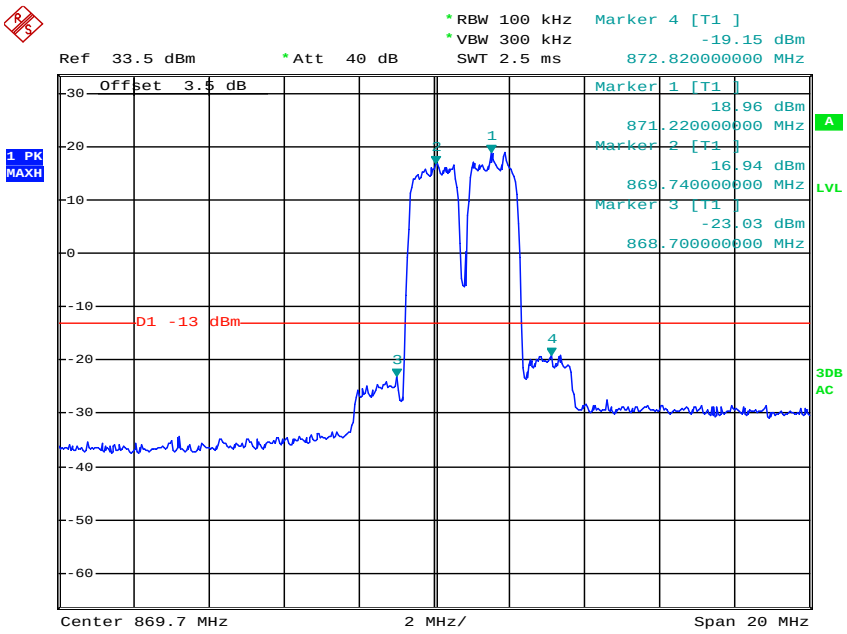
Input Signal: Inter-modulation, High Channel



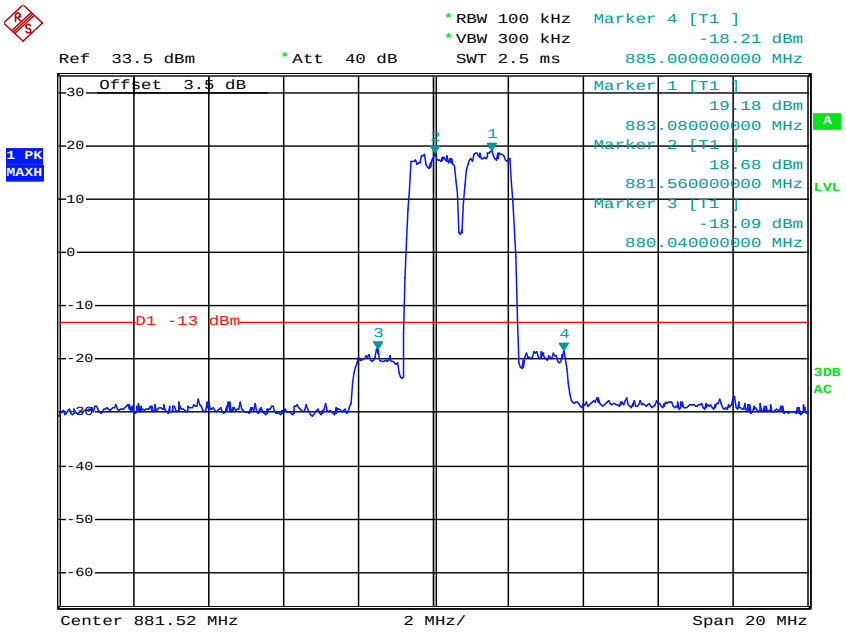
Date: 27.JUN.2012 08:29:39

Output Signal: Inter-modulation, Low Channel



Date: 27.JUN.2012 12:03:45

Output Signal: Inter-modulation, Middle Channel



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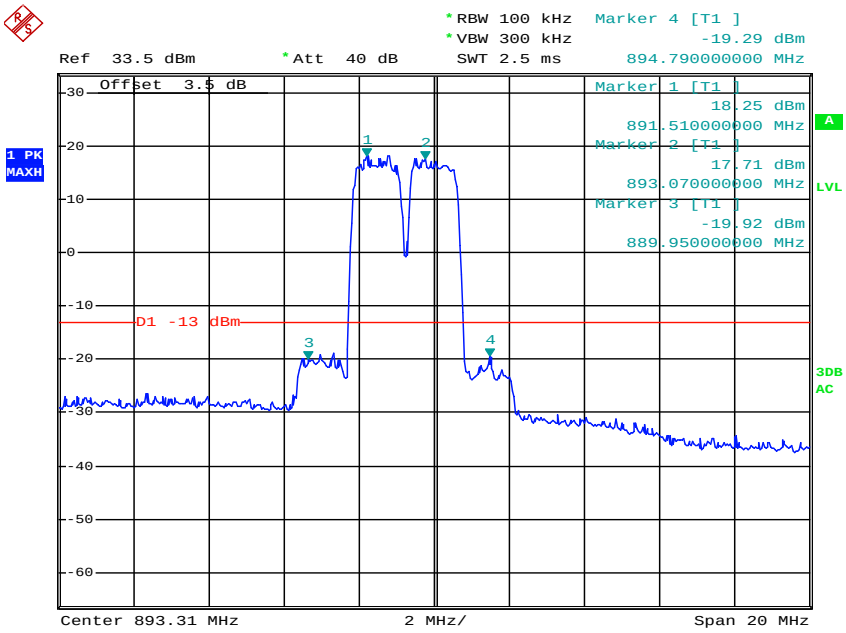
Output Signal: Inter-modulation, High Channel



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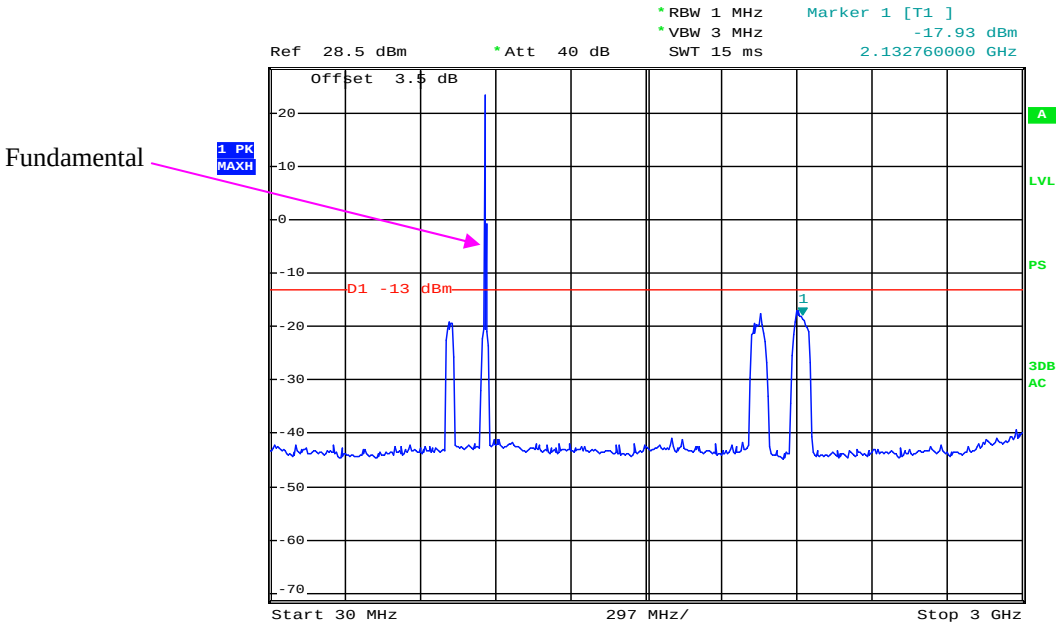
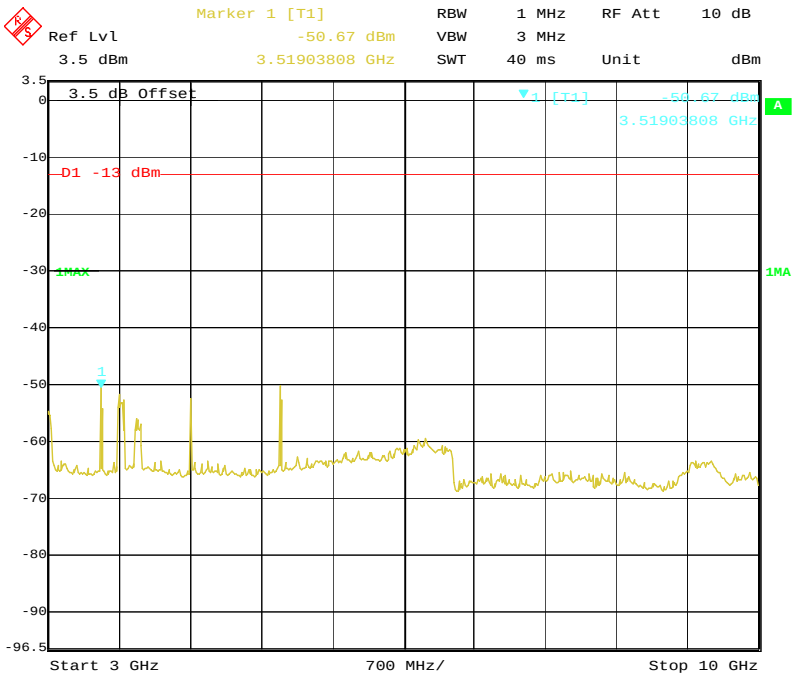
Spurious Emissions at Antenna Terminal, Middle Channel: 30 MHz-3 GHz



Date: 14.MAY.2012 23:00:18

Spurious Emissions at Antenna Terminal, Middle Channel: 3 GHz-10 GHz



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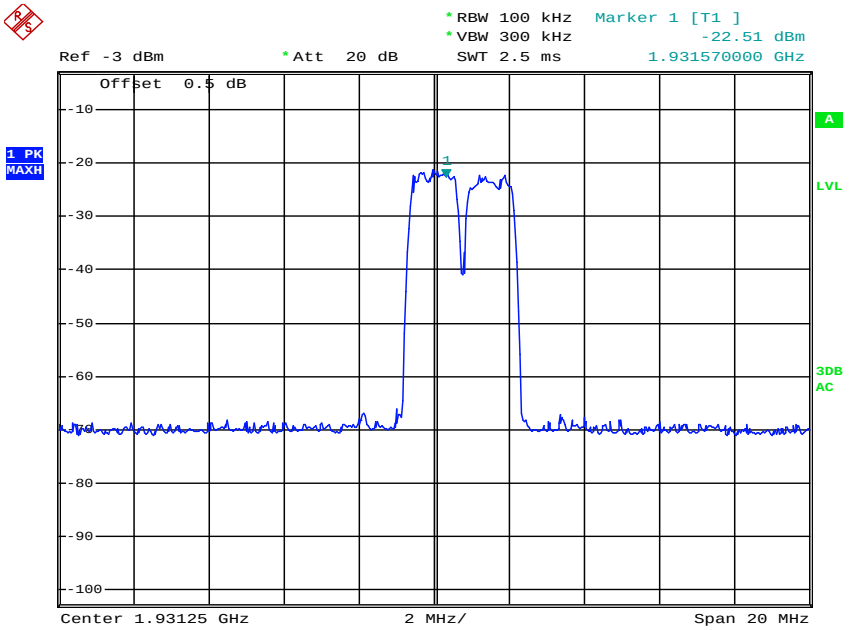
PCS Band (Part 24E)

CDMA1900 mode (Downlink)

Input Signal: Inter-modulation, Low Channel



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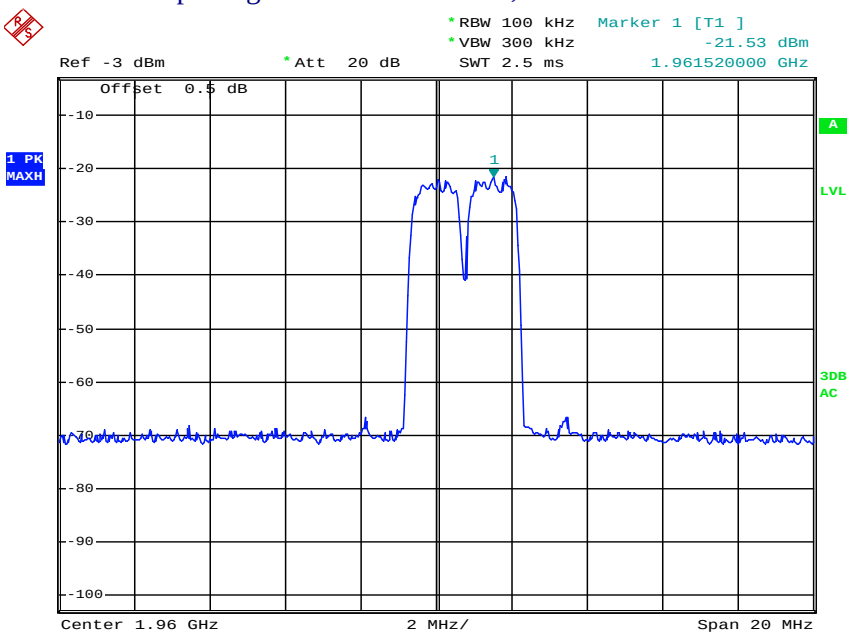
Input Signal: Inter-modulation, Middle Channel



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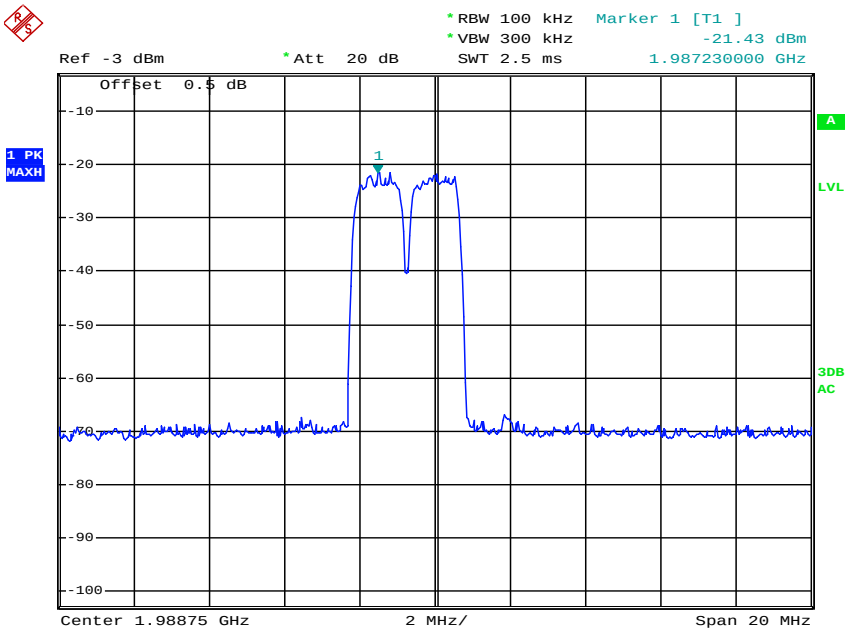
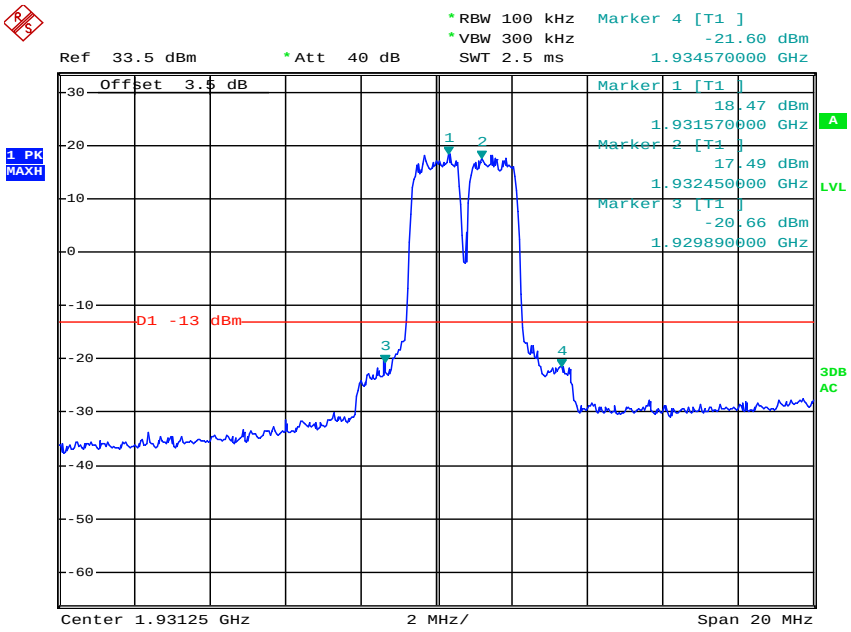
Input Signal: Inter-modulation, High Channel



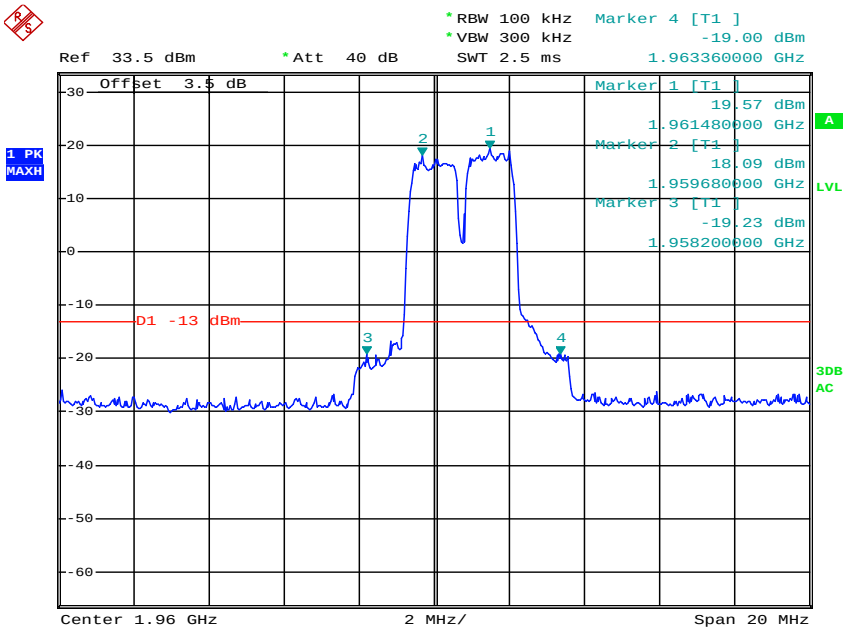
Date: 27.JUN.2012 08:34:58

Output Signal: Inter-modulation, Low Channel



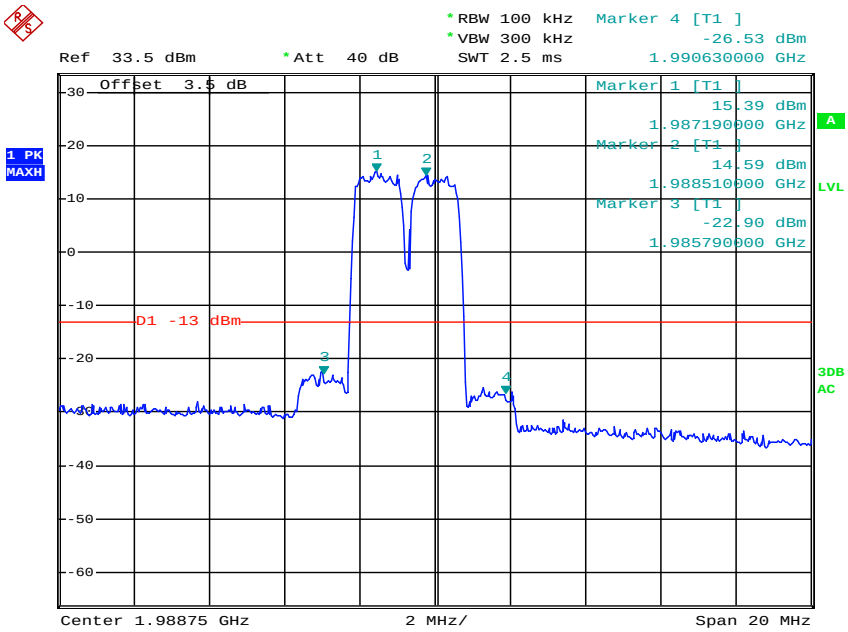
Date: 27.JUN.2012 12:12:20

Output Signal: Inter-modulation, Middle Channel



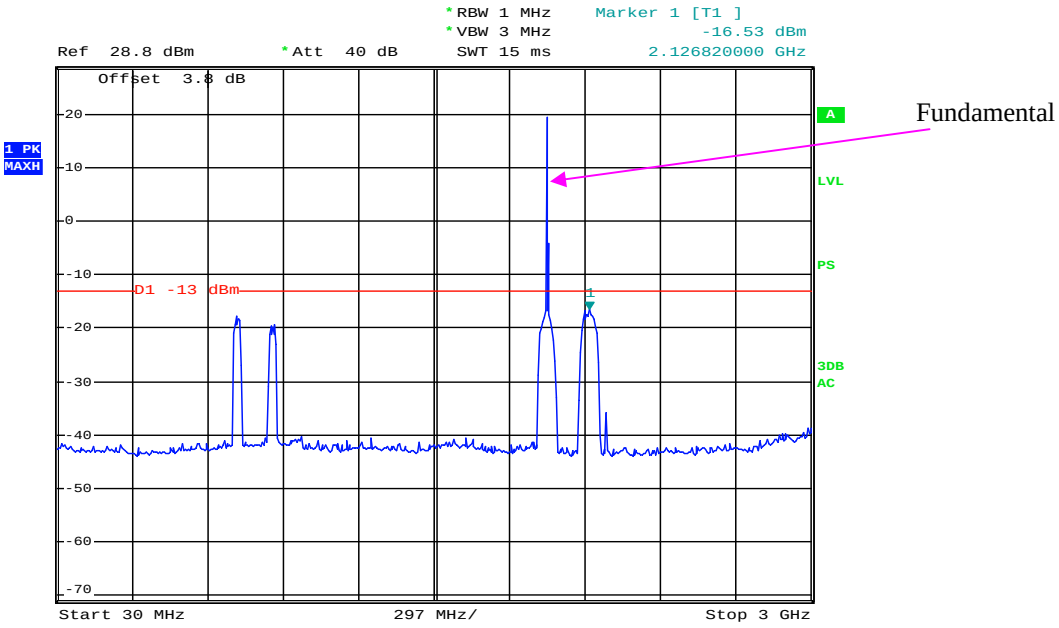
Date: 27.JUN.2012 12:15:01

Output Signal: Inter-modulation, High Channel



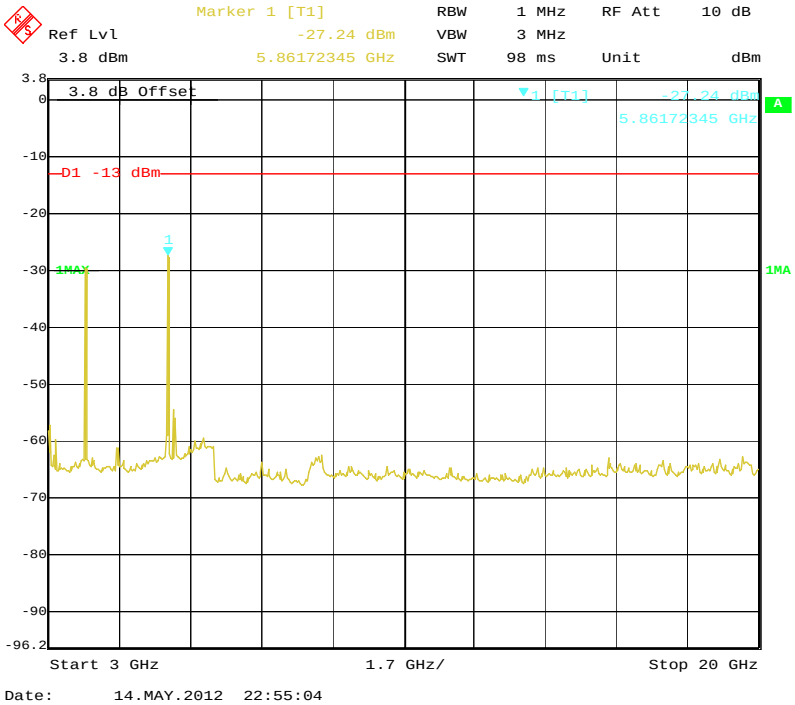
Date: 27.JUN.2012 12:16:42

Spurious Emissions at Antenna Terminal, Middle Channel: 30 MHz-3 GHz



Date: 14.MAY.2012 23:19:54

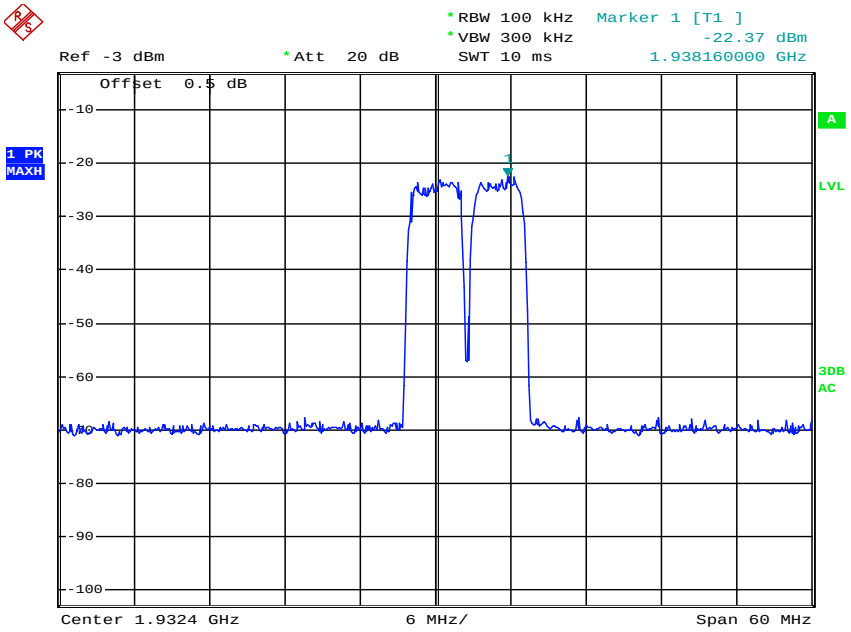
Spurious Emissions at Antenna Terminal, Middle Channel: 3 GHz-20 GHz



Date: 14.MAY.2012 22:55:04

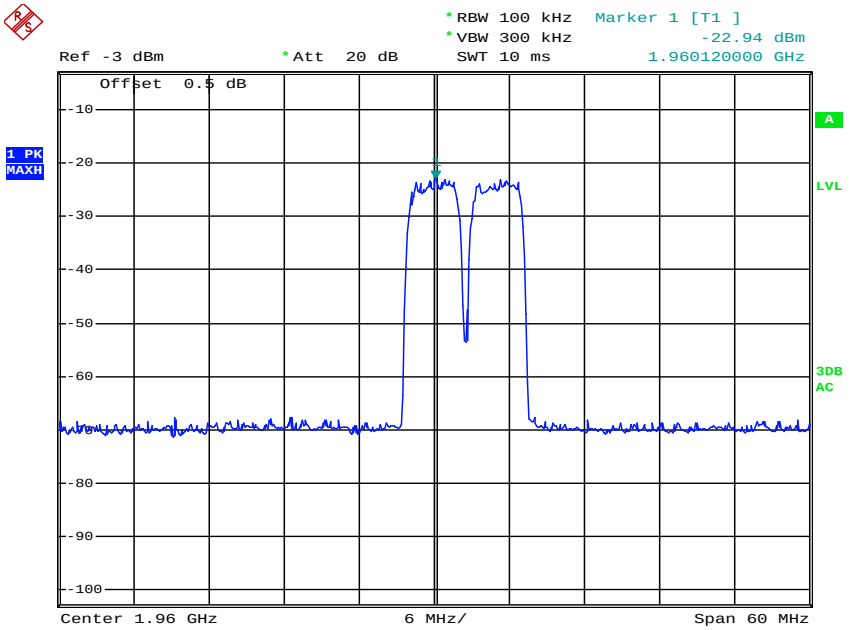
UMTS1900 mode (Downlink)

Input Signal: Inter-modulation, Low Channel



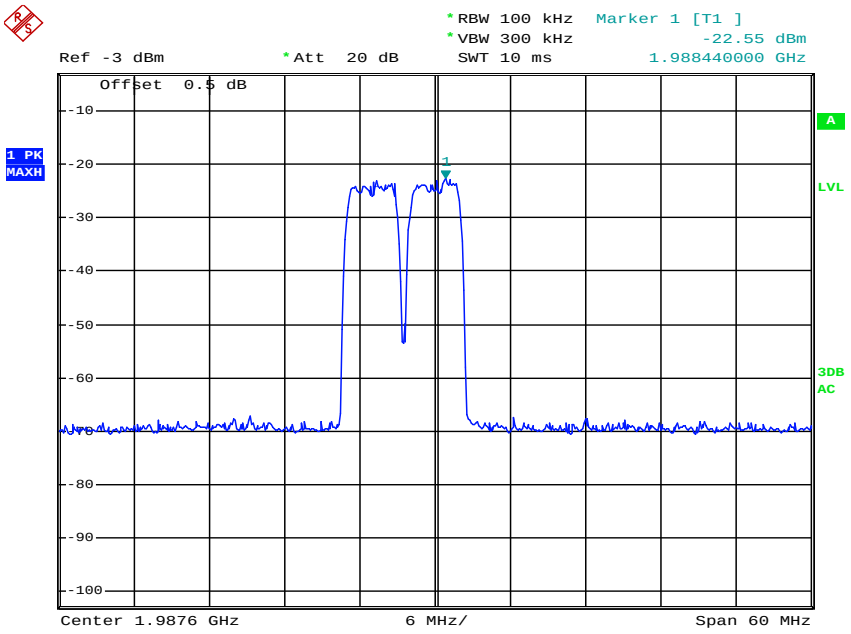
Date: 27.JUN.2012 08:39:22

Input Signal: Inter-modulation, Middle Channel



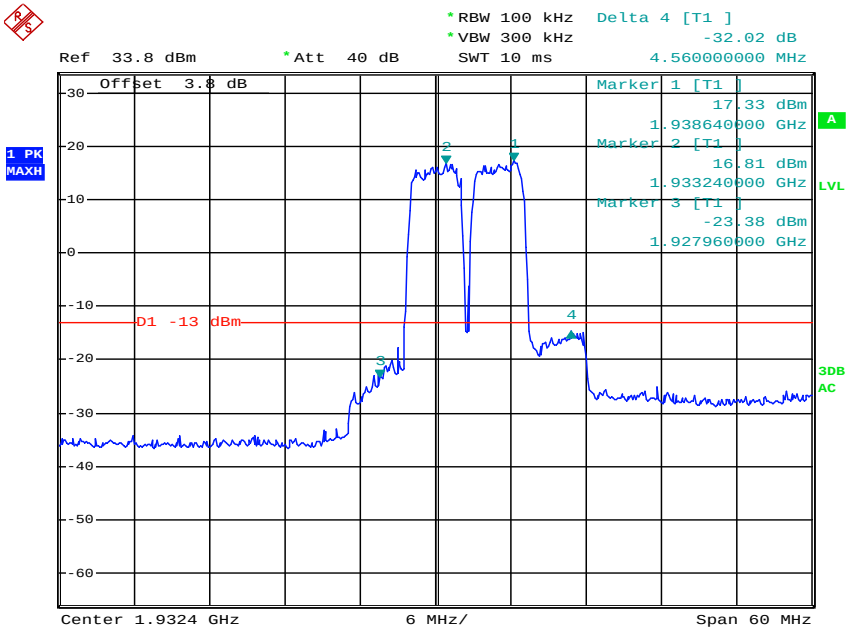
Date: 27.JUN.2012 08:40:42

Input Signal: Inter-modulation, High Channel



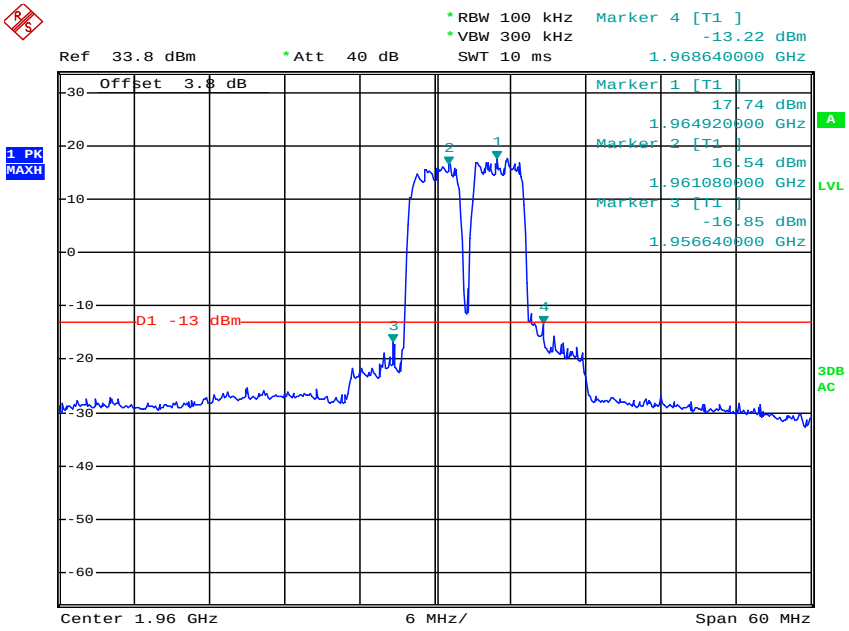
Date: 27.JUN.2012 08:42:14

Output Signal: Inter-modulation, Low Channel



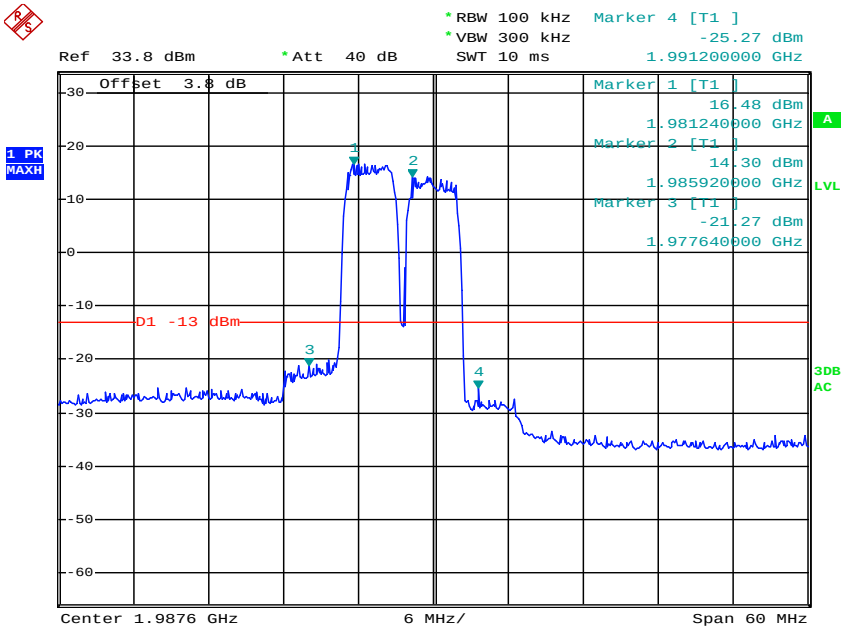
Date: 27.JUN.2012 11:43:45

Output Signal: Inter-modulation, Middle Channel



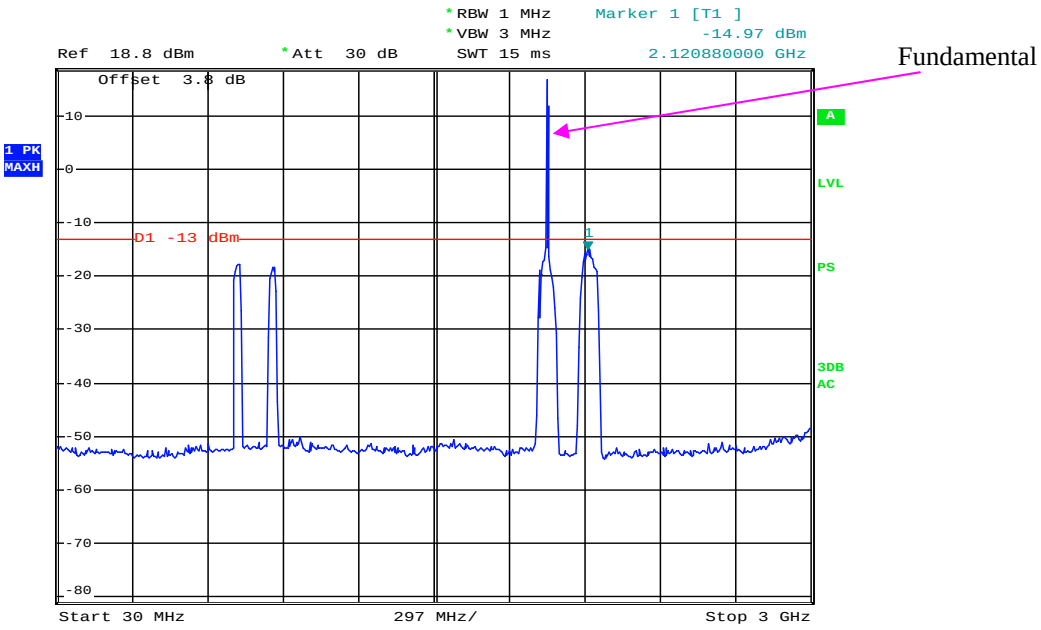
Date: 27.JUN.2012 11:47:51

Output Signal: Inter-modulation, High Channel



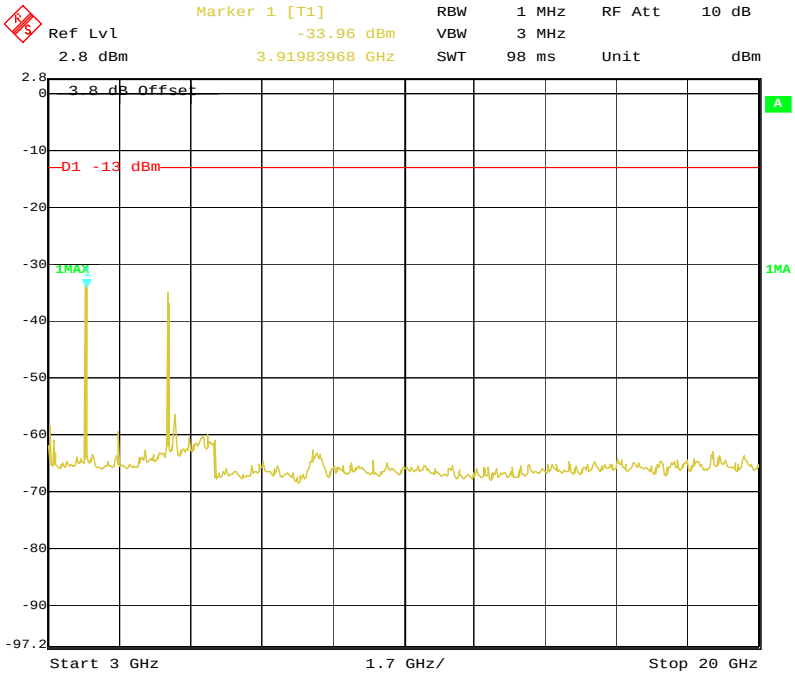
Date: 27.JUN.2012 11:54:53

Spurious Emissions at Antenna Terminal, Middle Channel: 30 MHz-3 GHz



Date: 13.MAY.2012 15:26:29

Spurious Emissions at Antenna Terminal, Middle Channel: 3 GHz-20 GHz



Date: 13.MAY.2012 14:59:46

FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053, §22.917 and § 24.238.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TX pwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2012-03-17	2013-03-16
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2012-03-08	2013-03-07
HP	Signal Generator	8657A	3217A04699	2011-12-19	2012-12-18
HP	Amplifier	HP8447D	2944A09795	2011-11-24	2012-11-23
HP	Synthesized Sweeper	8341B	2624A00116	2012-04-11	2013-04-10
COM POWER	Dipole Antenna	AD-100	041000	2012-04-25	2013-04-24
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2013-02-10
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao on 2012-06-04.

Test mode: Transmitting

Cellular Band (Part 22H)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBµV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dB)	Cable Loss (dB)			
CDMA850 mode											
739.8	45.32	130	1.4	V	739.8	-25.7	0	0.79	-26.49	-13	13.49
739.8	44.74	250	1.8	H	739.8	-26.3	0	0.79	-27.09	-13	14.09
2141.8	50.81	190	1.6	V	2141.8	-47.1	9.90	1.10	-38.30	-13	25.30
2141.8	49.65	140	1.9	H	2141.8	-52.7	9.90	1.10	-43.90	-13	30.90
1763.04	40.94	50	1.4	V	1763.04	-59.5	9.00	0.97	-51.47	-13	38.47
1763.04	39.65	330	2.3	H	1763.04	-63.4	9.00	0.97	-55.37	-13	42.37

PCS Band (Part 24E)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBµV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dB)	Cable Loss (dB)			
CDMA1900 mode											
738.2	45.19	180	1.9	V	738.2	-25.8	0	0.79	-26.59	-13	13.59
738.2	44.96	150	1.7	H	738.2	-26.0	0	0.79	-26.79	-13	13.79
5880	47.39	210	1.9	H	5880	-45.0	12.40	3.19	-35.79	-13	22.79
5880	44.60	140	1.3	V	5880	-46.9	12.40	3.19	-37.69	-13	24.69
2127.3	48.76	220	2.3	V	2127.3	-49.1	9.90	1.10	-40.30	-13	27.30
2127.3	51.33	170	1.4	H	2127.3	-51.0	9.90	1.10	-42.20	-13	29.20
UMTS1900 mode											
736.9	45.72	54	1.5	V	736.9	-25.3	0	0.79	-26.09	-13	13.09
736.9	46.33	132	1.9	H	736.9	-24.7	0	0.79	-25.49	-13	12.49
2126.4	49.83	254	1.6	V	2126.4	-48.1	9.90	1.10	-39.30	-13	26.30
2126.4	52.47	13	1.8	H	2126.4	-49.9	9.90	1.10	-41.10	-13	28.10
3920	36.13	334	1.5	V	3920	-59.2	12.00	3.20	-50.40	-13	37.40
3920	35.54	254	1.6	H	3920	-60.5	12.00	3.20	-51.70	-13	38.70

Note: The spectrum was detected from 30 MHz to 10th harmonic.
For radiated spurious emission measurement, the EUT antenna connector was terminated by a 50 ohm shielded dummy load.

FCC §22.917(a) & §24.238(a) - BAND EDGES

Applicable Standards

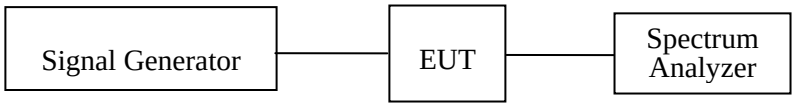
According to FCC § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to FCC §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao from 2012-05-13 to 2012-06-04.

Please refer to the following tables and plots.

Cellular Band (Part 22H)

CDMA850 mode:

Frequency (MHz)	Emission (dBm)	Limit (dBm)
868.996	-20.15	-13
894.004	-19.86	-13

PCS Band (Part 24E)

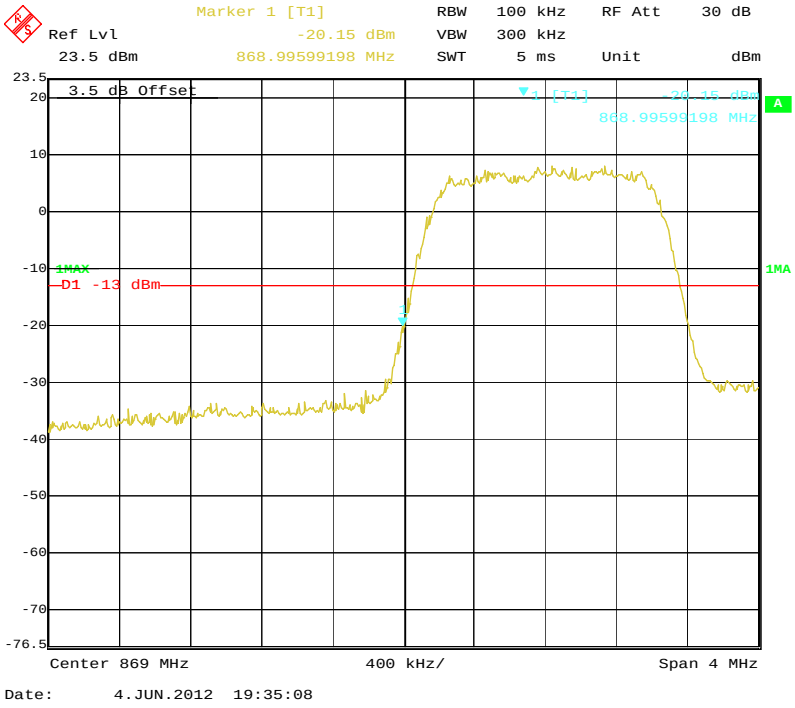
CDMA1900 mode:

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1929.956	-29.98	-13
1990.124	-33.21	-13

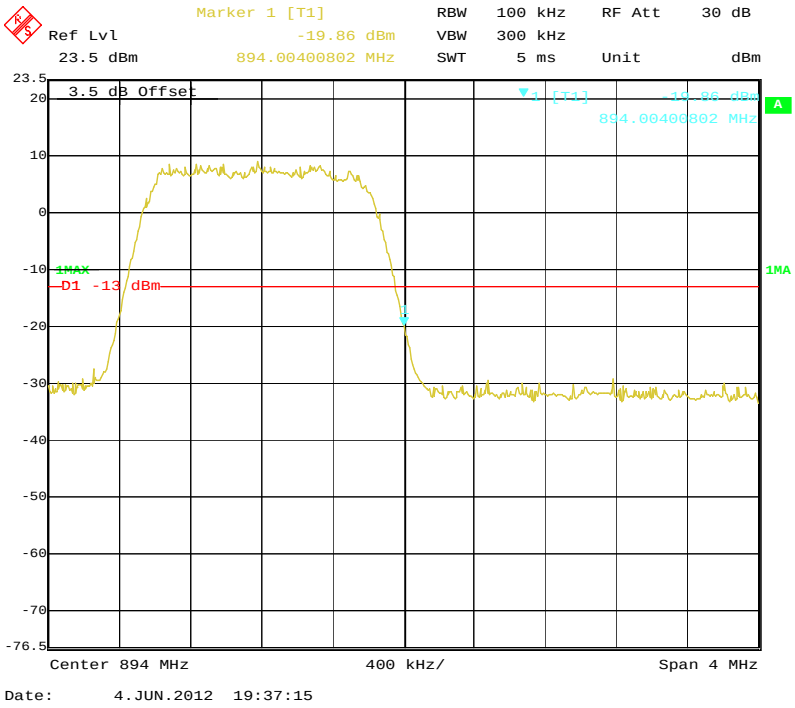
UMTS1900 mode:

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1929.980	-28.59	-13
1990.020	-25.49	-13

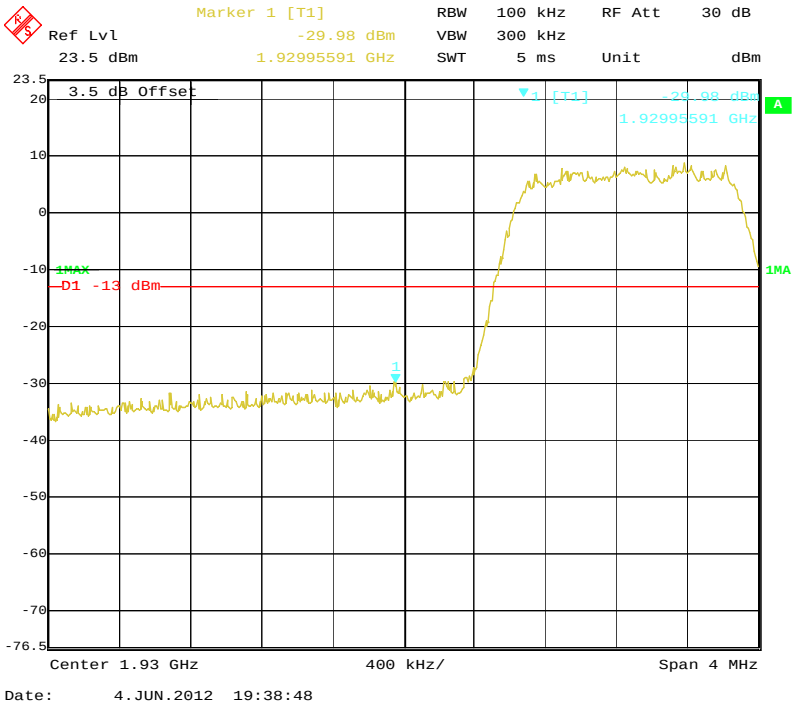
CDMA850 mode: Cellular Band, Lowest Channel



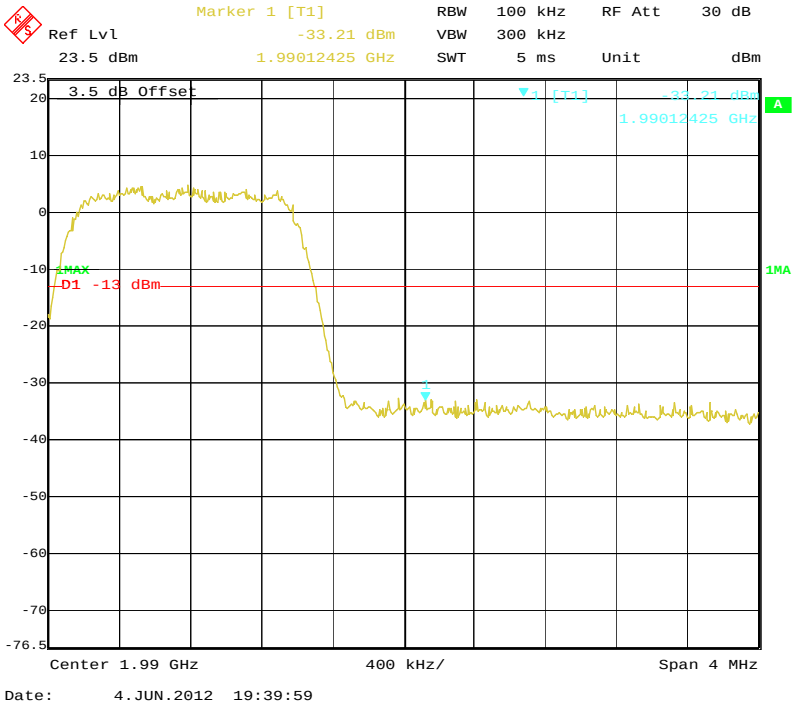
CDMA850 mode: Cellular Band, Highest Channel



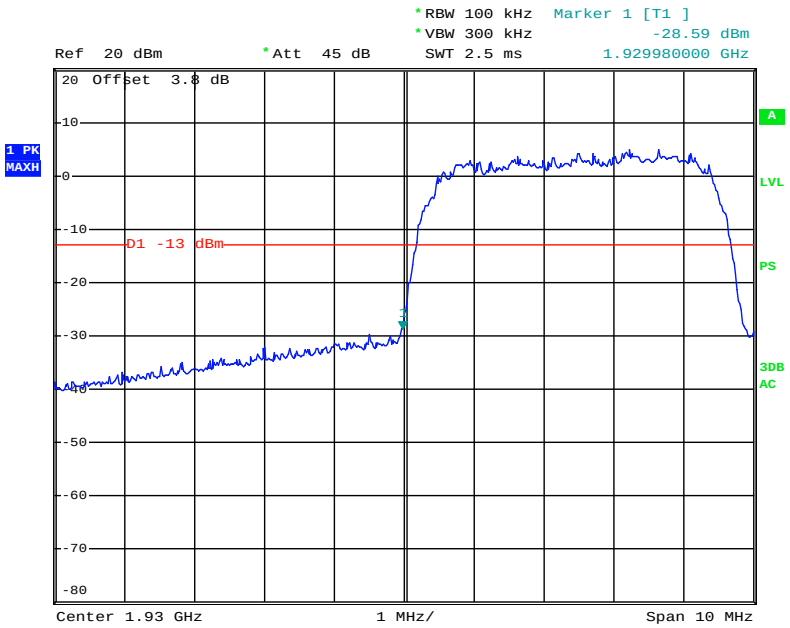
CDMA1900 mode: PCS Band, Lowest Channel



CDMA1900 mode: PCS Band, Highest Channel

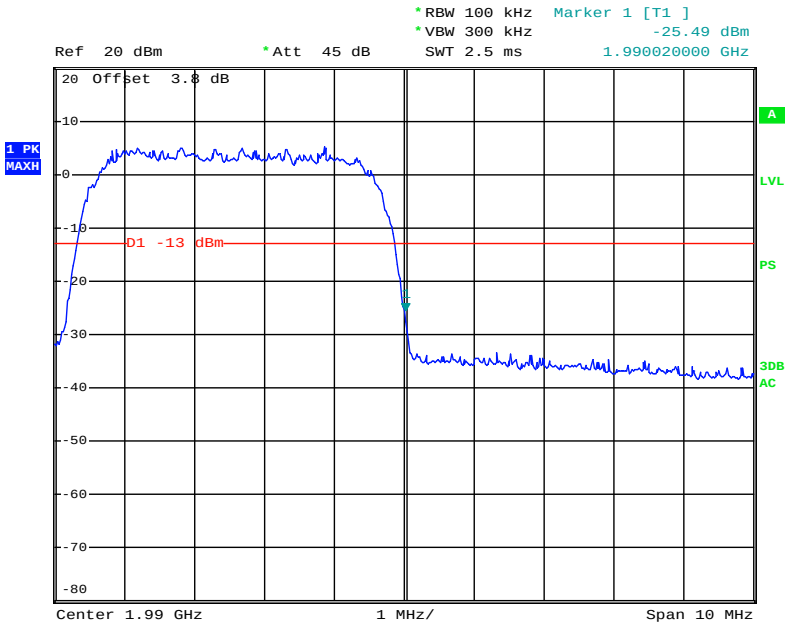


UMTS1900 mode: PCS Band, Lowest Channel



Date: 13.MAY.2012 15:10:27

UMTS1900 mode: PCS Band, Highest Channel



Date: 13.MAY.2012 15:12:07

FCC §2.1055, §22.355, §24.235 - FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

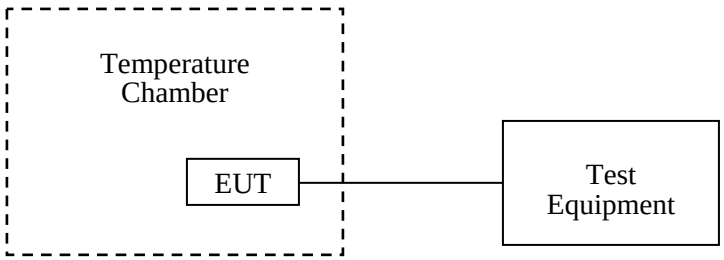
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2011-11-24	2012-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2011-11-17	2012-11-16
R&S	Universal Radio Communication Tester	CMU200	109038	2011-12-16	2012-12-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Jimmy Xiao on 2012-06-04.

Cellular Band (Part 22H)

The EUT was tested at 881.52 MHz.

Frequency Drift with supply voltage variation		
Voltage (V_{DC})	**Frequency Error (Hz)**	**Frequency Error (ppm)**
40.8	121.9	0.138284
55.2	136.3	0.154619

Frequency Drift with Supply Temperature Variation		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
50	108.5	0.123083
40	110.2	0.125011
30	132.1	0.149855
20	141.2	0.160178
10	138.1	0.156661
0	119.5	0.135561
-10	98.7	0.111966
-20	106.9	0.121268
-30	105.4	0.119566

PCS Band (Part 24E)

CDMA1900 Mode:

The EUT was tested at 1960 MHz.

Frequency Drift with supply voltage variation		
Voltage (V_{DC})	**Frequency Error (Hz)**	**Frequency Error (ppm)**
40.8	350.2	0.178673
55.2	335.4	0.171122

Frequency Drift with Supply Temperature Variation		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
50	361.5	0.184439
40	372.4	0.190000
30	326.9	0.166786
20	314.7	0.160561
10	296.8	0.151429
0	336.4	0.171633
-10	375.4	0.191531
-20	326.4	0.166531
-30	364.5	0.185969

UMTS1900 Mode:

The EUT was tested at 1960 MHz.

Frequency Drift with supply voltage variation		
Voltage (V_{DC})	**Frequency Error (Hz)**	**Frequency Error (ppm)**
40.8	281.5	0.143622
55.2	295.7	0.150867

Frequency Drift with Supply Temperature Variation		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
50	276.4	0.141020
40	265.9	0.135663
30	321.4	0.163980
20	300.6	0.153367
10	289.7	0.147806
0	274.8	0.140204
-10	305.9	0.156071
-20	312.5	0.159439
-30	274.1	0.139847

******* END OF REPORT *******