

FCC PART 24E
MEASUREMENT AND TEST REPORT

For

JDTECK INC

107 South Hoagland Blvd, Kissimmee FL, United States 34741

FCC ID: SQX-JD60-9-19-LC

Report Type: Original Report	Product Type: Wireless Cellular Repeater
Test Engineer: <u>Felix Li</u> <i>Felix Li</i>	
Report Number: <u>RSZ111102006-00</u>	
Report Date: <u>2011-12-15</u>	
Reviewed By: <u>EMC Engineer</u> <i>Merry Zhao</i>	
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	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.

* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	5
JUSTIFICATION	5
EQUIPMENT MODIFICATIONS	5
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL I/O CABLE.....	5
CONFIGURATION OF TEST SETUP	6
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
FCC §1.1307 (B) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	8
STANDARD APPLICABLE	8
FCC §2.1047 - MODULATION CHARACTERISTIC	9
FCC § 2.1046 & § 24.232 (A) - RF OUTPUT POWER	10
APPLICABLE STANDARD	10
TEST PROCEDURE	10
TEST EQUIPMENT LIST AND DETAILS.....	10
TEST DATA	10
FCC §2.1049 & §24.238 - OCCUPIED BANDWIDTH.....	24
APPLICABLE STANDARDS.....	24
TEST PROCEDURE	24
TEST EQUIPMENT LIST AND DETAILS.....	24
TEST DATA	24
FCC §2.1051 & §24.238(A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	37
APPLICABLE STANDARDS.....	37
TEST PROCEDURE	37
TEST EQUIPMENT LIST AND DETAILS.....	37
TEST DATA	37
FCC §2.1053 & §24.238 - SPURIOUS RADIATED EMISSIONS	68
APPLICABLE STANDARDS.....	68
TEST PROCEDURE	68
TEST EQUIPMENT LIST AND DETAILS.....	68
TEST DATA	69
FCC §24.238(A) - BAND EDGES	70
APPLICABLE STANDARDS.....	70
TEST PROCEDURE	70
TEST EQUIPMENT LIST AND DETAILS.....	70
TEST DATA	70

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *JDTECK INC*'s product, model number: *JD60-9-19-LC (FCC ID: SQX-JD60-9-19-LC)* or the "EUT" as referred to in this report is a *Wireless Cellular Repeater*, which measures approximately: 34.0 cm L x 25.5 cm W x 5.5 cm H, rated input voltage: DC 12 V adapter.

Adapter Information: AC/DC ADAPTER
MODEL: GM-120600
INPUT: AC 100-240V 50/60Hz
OUTPUT: DC 12V 6.0A

Frequency Range:

GSM/EDGE/CDMA/WCDMA PCS Band: 1850-1910 MHz (Uplink); 1930-1990 MHz (Downlink)

Transmitter Output Power:

GSM: 20 ± 1 dBm (Uplink); 30 ± 1 dBm (Downlink)
EDGE: 20 ± 1 dBm (Uplink); 30 ± 1 dBm (Downlink)
CDMA: 20 ± 1 dBm (Uplink); 30 ± 1 dBm (Downlink)
WCDMA: 20 ± 1 dBm (Uplink); 30 ± 1 dBm (Downlink)

** All measurement and test data in this report was gathered from production sample serial number: 1110120 (Assigned by BACL, Shenzhen). The EUT was received on 2011-11-02.*

Objective

This type approval report is prepared on behalf of *JDTECK INC* in accordance with Part 2, Subpart J, 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)

No related submittal(s).

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 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-C, 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 on 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-C.

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

Equipment Modifications

No modifications were made to the EUT.

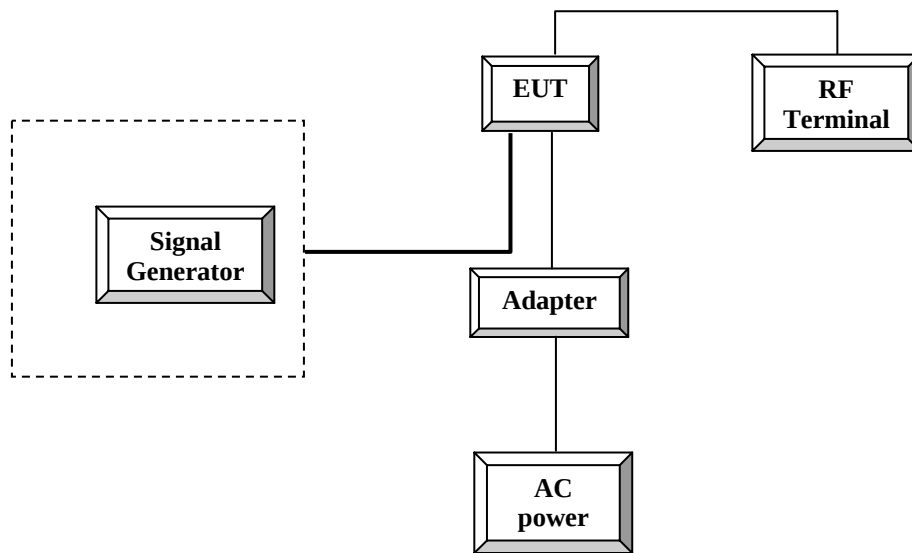
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universal Radio Communication Tester (Signal Generator)	CMU200	109038
Agilent	ESG-D Series Signal Generator	E4432B	GB40051703

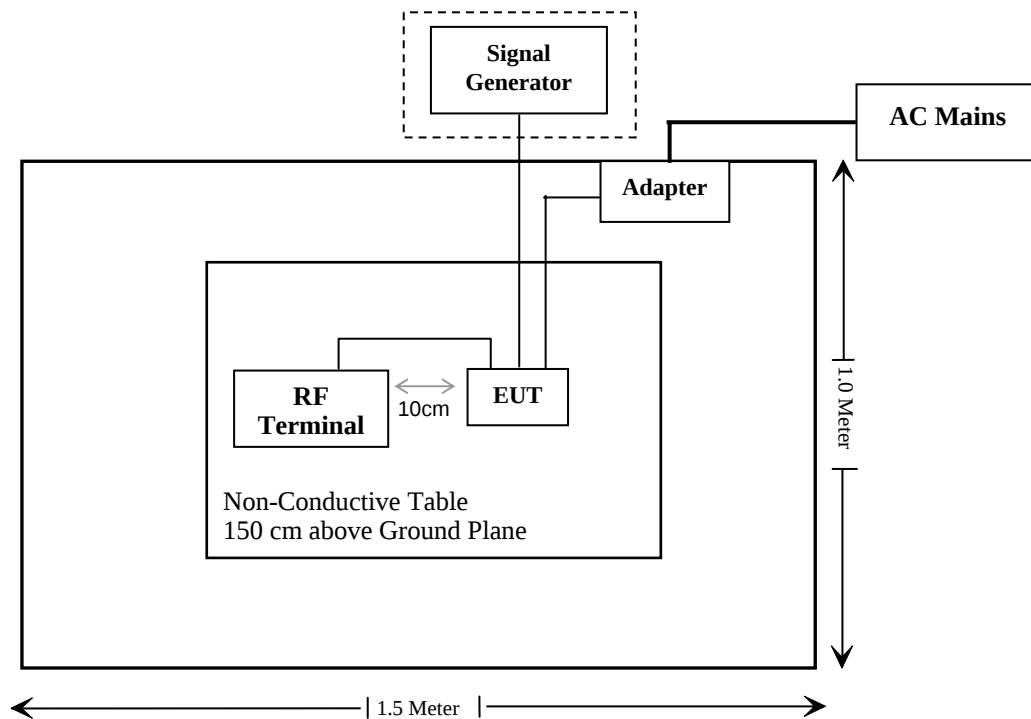
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable Power Cable	1.70	AC power	Adapter
Unshielded Detachable Power Cable	1.30	Adapter	EUT
Coaxial Cable	1.20	Signal Generator	EUT
Coaxial Cable	1.20	RF Terminal	EUT

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

N/A*: The device is an amplifier.

FCC §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Standard Applicable

According to subpart 1.1307 (b)(1), 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

MPE Calculation

Predication of MPE limit at a given distance

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

Where: S = power density (in appropriate units, e.g. mW/cm²);

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

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
GSM(Uplink)	1880.00	9.5	8.91	20.33	107.89	20	0.191	1
GSM(Downlink)	1960.00	3.0	2.00	29.74	941.89	20	0.375	1
EDGE(Uplink)	1880.00	9.5	8.91	20.39	109.40	20	0.194	1
EDGE(Downlink)	1960.00	3.0	2.00	30.13	1030.39	20	0.410	1
CDMA(Uplink)	1880.00	9.5	8.91	20.69	117.22	20	0.208	1
CDMA(Downlink)	1960.00	3.0	2.00	30.54	1132.40	20	0.451	1
WCDMA(Uplink)	1880.00	9.5	8.91	20.73	118.30	20	0.210	1
WCDMA(Downlink)	1960.00	3.0	2.00	30.56	1137.63	20	0.453	1

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

FCC §2.1047 - MODULATION CHARACTERISTIC

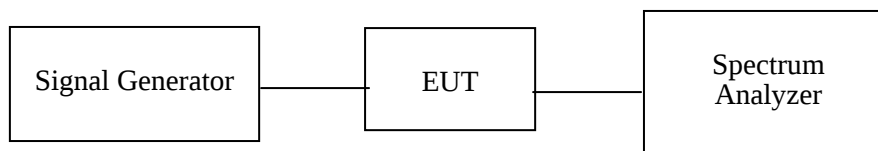
According to FCC § 2.1047(d), 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046 & § 24.232 (a) - RF OUTPUT POWER**Applicable Standard**

FCC §2.1046 and §24.232 (C)

Test Procedure*Conducted method:*

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

*Radiated method:*

TIA 603-C section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PSA Series Spectrum Analyzer	E4443A	MY45300749	2011-01-07	2012-01-07
Agilent	ESG-D Series Signal Generator	E4432B	GB40051703	2011-11-20	2012-11-20
Rohde & Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2011-11-11	2012-11-10

*** 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 Felix Li from 2012-02-15.

Conducted Power**PCS Band (Part 24E)****GSM mode:**

Mode	Channel	Frequency (MHz)	Output Power (dBm)
Uplink	Low Channel	1850.20	20.08
	Middle Channel	1880.00	20.33
	High Channel	1909.80	19.26
Downlink	Low Channel	1930.20	29.61
	Middle Channel	1960.00	29.74
	High Channel	1989.80	29.69

EDGE mode:

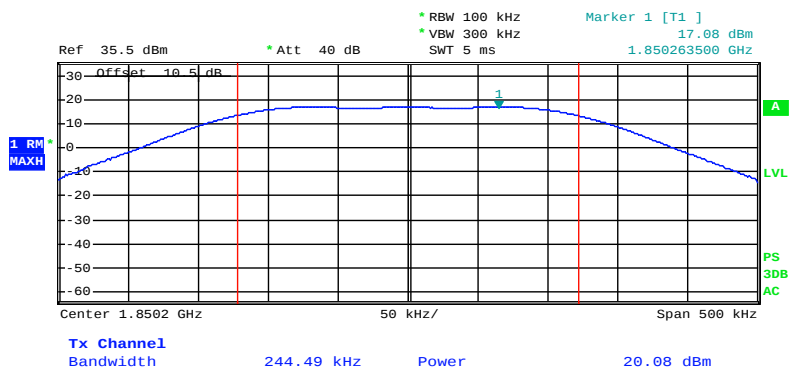
Mode	Channel	Frequency (MHz)	Output Power (dBm)
Uplink	Low Channel	1850.20	20.31
	Middle Channel	1880.00	20.39
	High Channel	1909.80	20.07
Downlink	Low Channel	1930.20	29.65
	Middle Channel	1960.00	30.13
	High Channel	1989.80	29.95

CDMA mode:

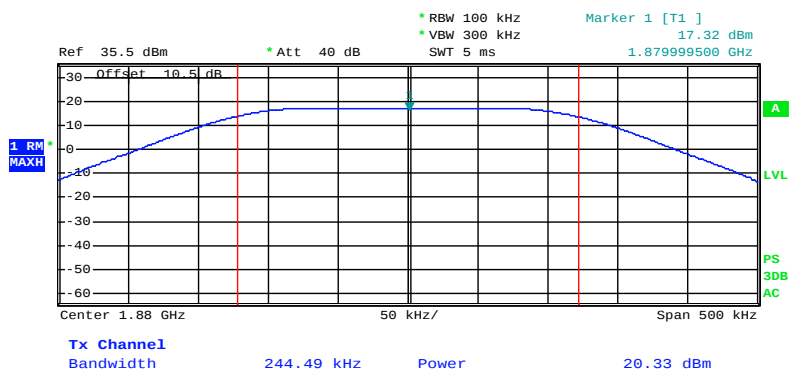
Mode	Channel	Frequency (MHz)	Output Power (dBm)
Uplink	Low Channel	1851.25	20.42
	Middle Channel	1880.00	20.69
	High Channel	1908.75	20.22
Downlink	Low Channel	1931.25	29.89
	Middle Channel	1960.00	30.54
	High Channel	1988.75	30.21

WCDMA mode:

Mode	Channel	Frequency (MHz)	Output Power (dBm)
Uplink	Low Channel	1852.40	20.51
	Middle Channel	1880.00	20.73
	High Channel	1907.60	20.33
Downlink	Low Channel	1932.40	30.35
	Middle Channel	1960.00	30.56
	High Channel	1987.60	30.53

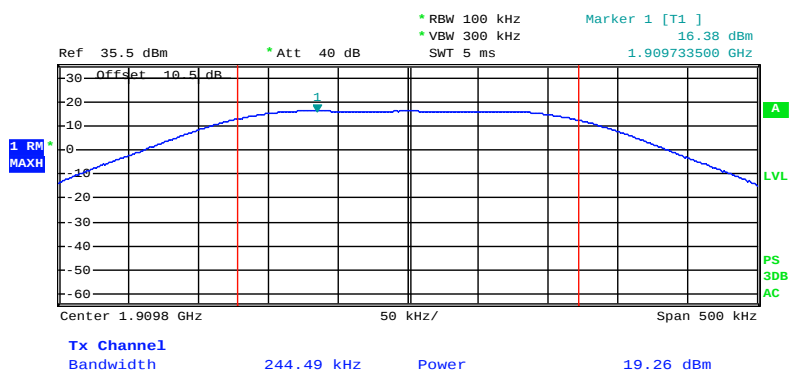
GSM mode:**Uplink: Low Channel**

Date: 15.FEB.2012 09:38:41

Uplink: Middle Channel

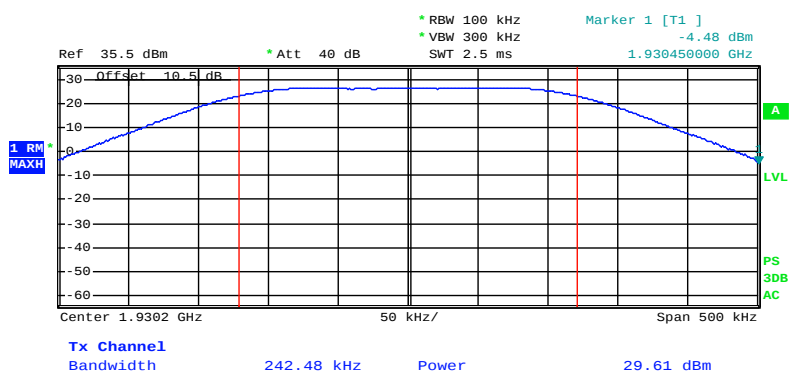
Date: 15.FEB.2012 09:38:05

Uplink: High Channel



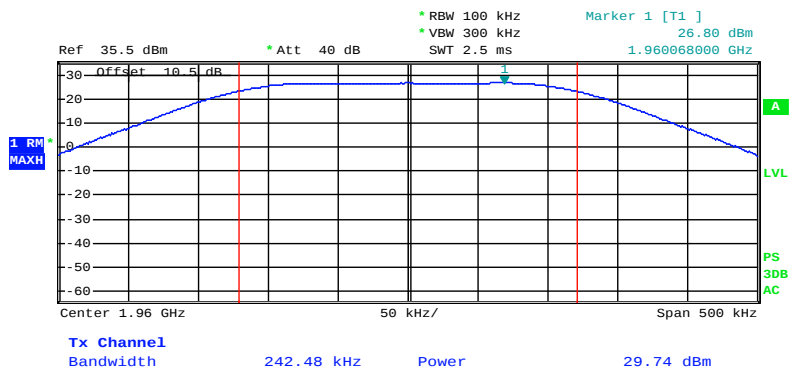
Date: 15.FEB.2012 09:37:06

Downlink: Low Channel



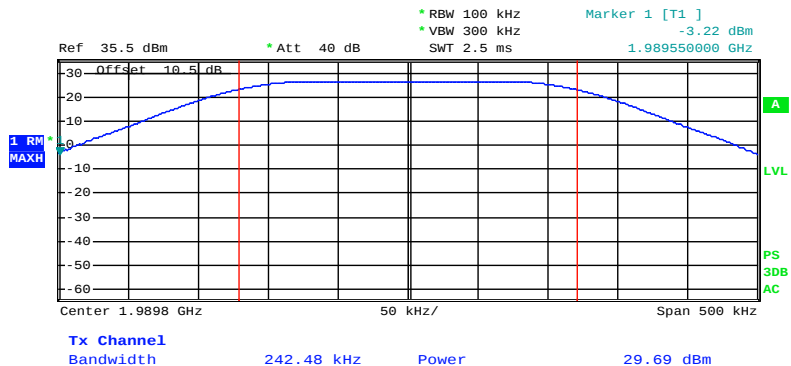
Date: 15.FEB.2012 08:53:32

Downlink: Middle Channel

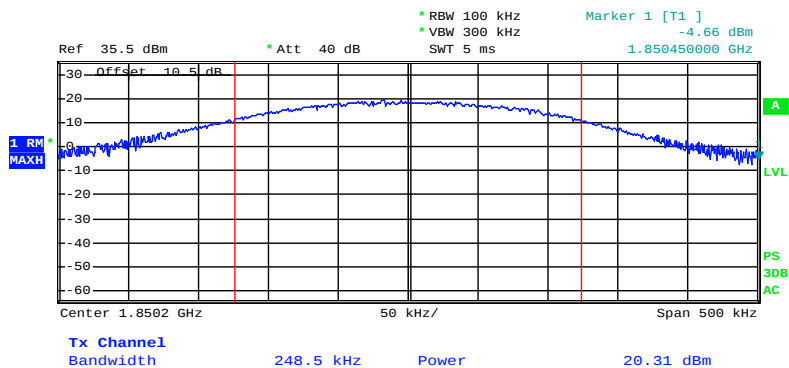


Date: 15.FEB.2012 08:52:33

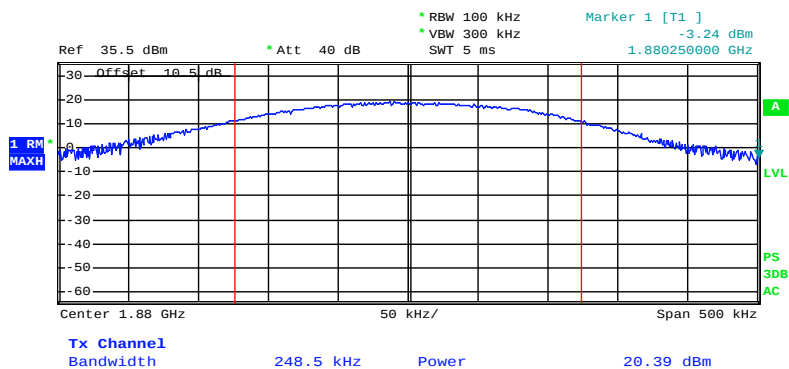
Downlink: High Channel



Date: 15.FEB.2012 08:54:13

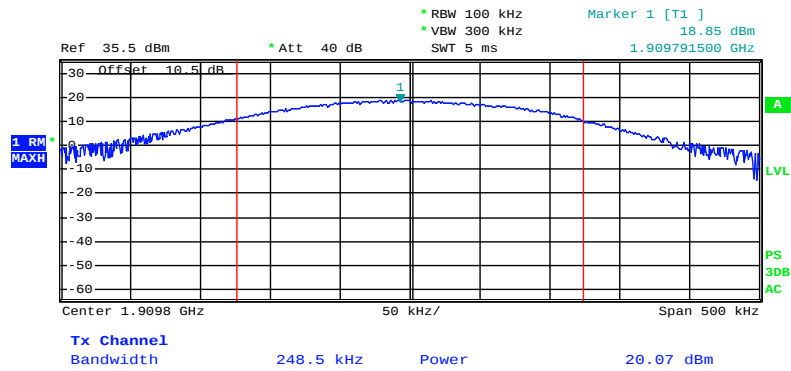
EDGE mode:**Uplink: Low Channel**

Date: 15.FEB.2012 09:34:00

Uplink: Middle Channel

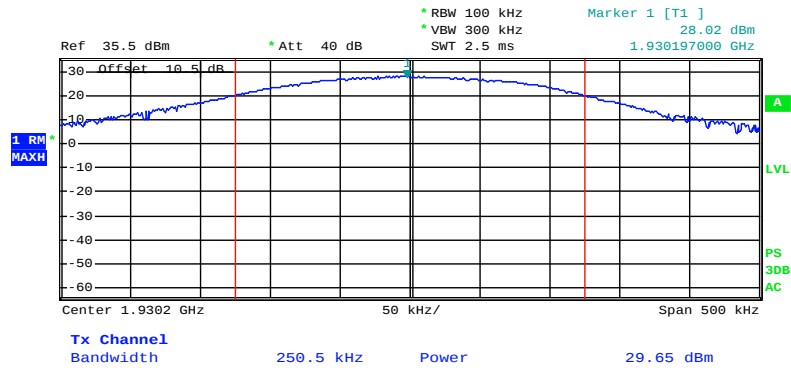
Date: 15.FEB.2012 09:32:56

Uplink: High Channel



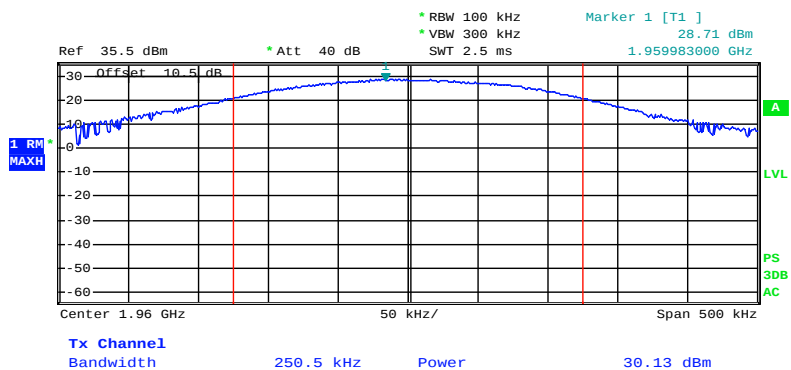
Date: 15.FEB.2012 09:35:39

Downlink: Low Channel



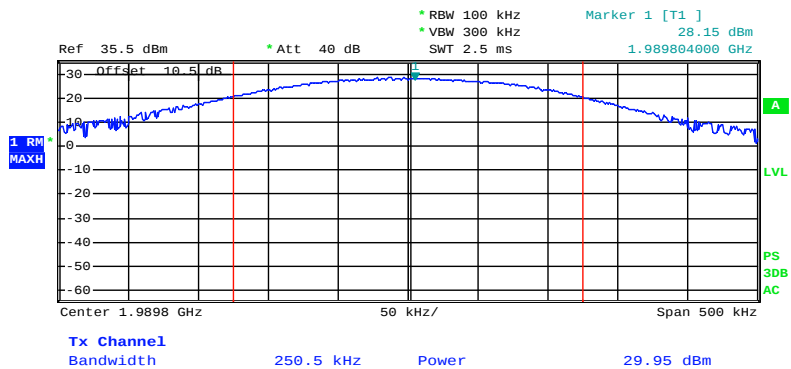
Date: 15.FEB.2012 09:00:41

Downlink: Middle Channel



Date: 15.FEB.2012 08:59:15

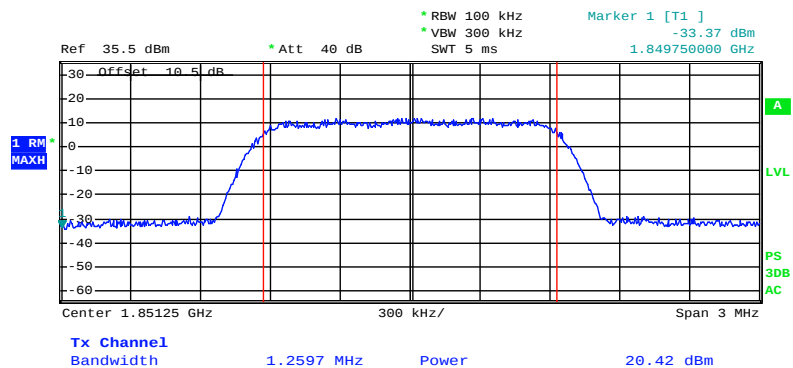
Downlink: High Channel



Date: 15.FEB.2012 09:01:50

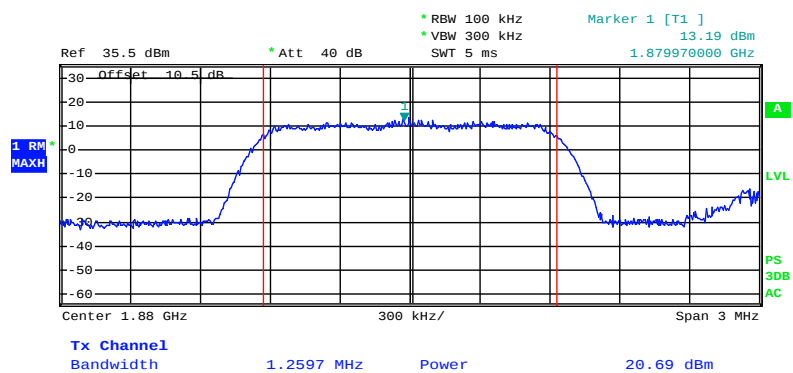
CDMA mode:

Uplink: Low Channel



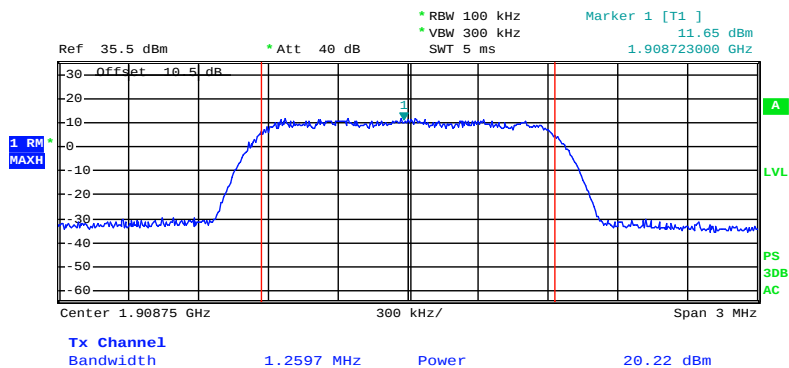
Date: 15.FEB.2012 09:30:02

Uplink: Middle Channel



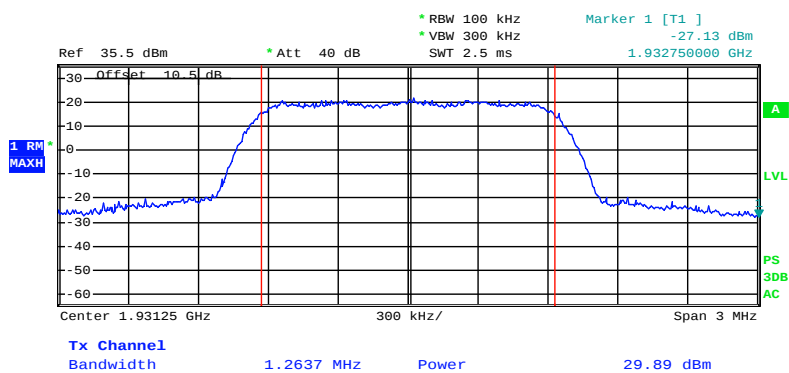
Date: 15.FEB.2012 09:28:33

Uplink: High Channel

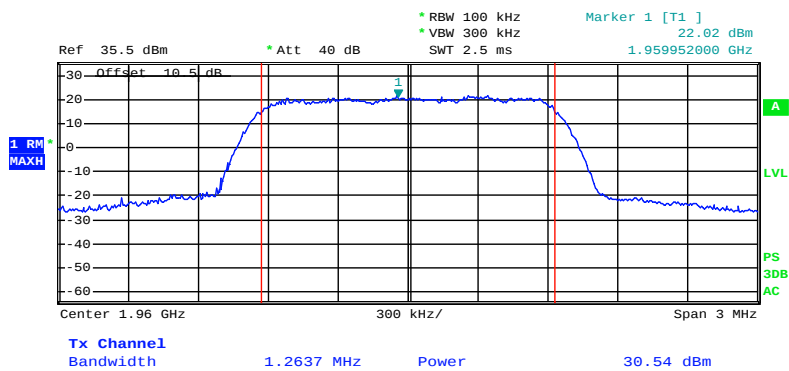


Date: 15.FEB.2012 09:31:00

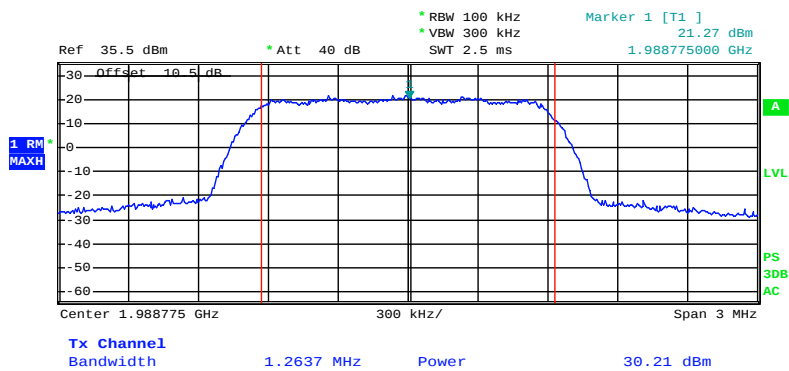
Downlink: Low Channel



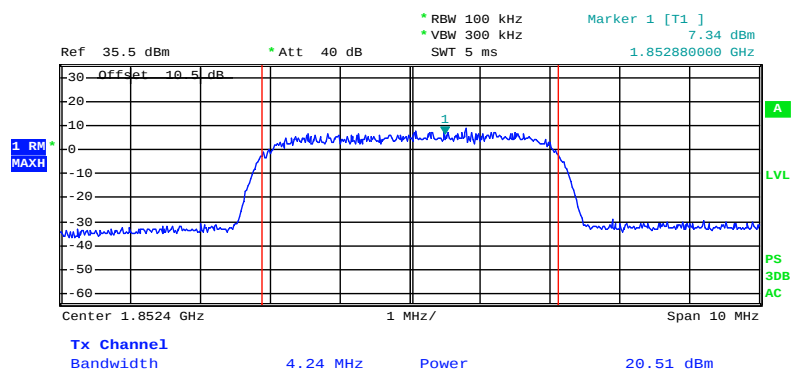
Date: 15.FEB.2012 09:09:07

Downlink: Middle Channel

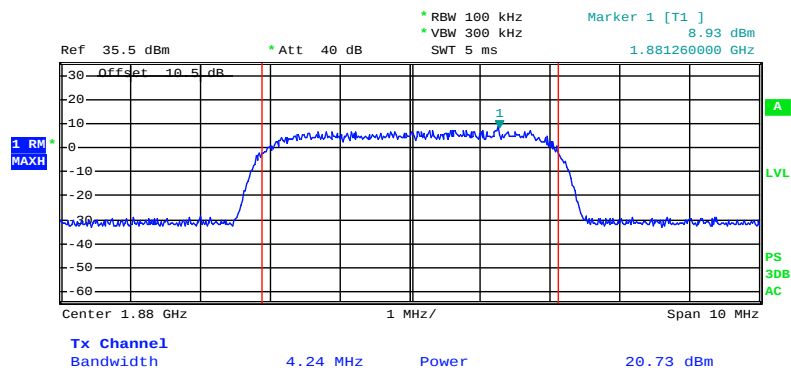
Date: 15.FEB.2012 09:07:50

Downlink: High Channel

Date: 15.FEB.2012 09:10:22

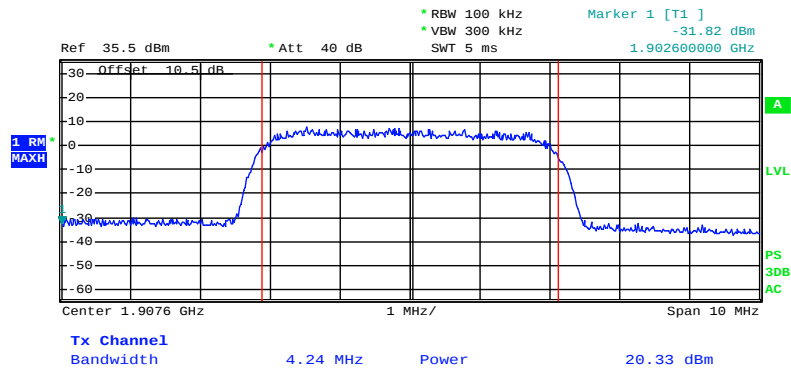
WCDMA mode:**Uplink: Low Channel**

Date: 15.FEB.2012 09:21:00

Uplink: Middle Channel

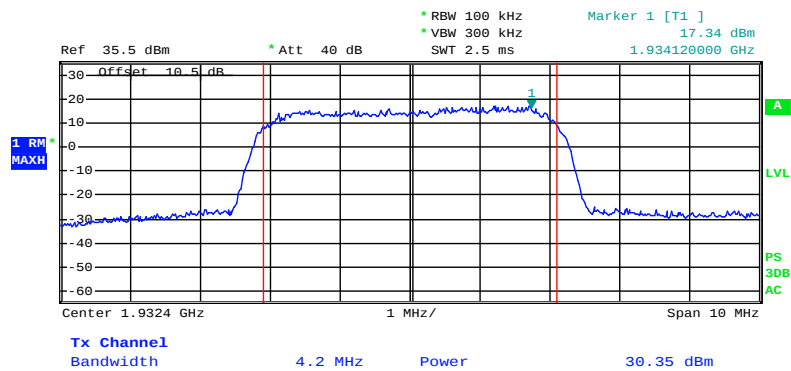
Date: 15.FEB.2012 09:23:02

Uplink: High Channel



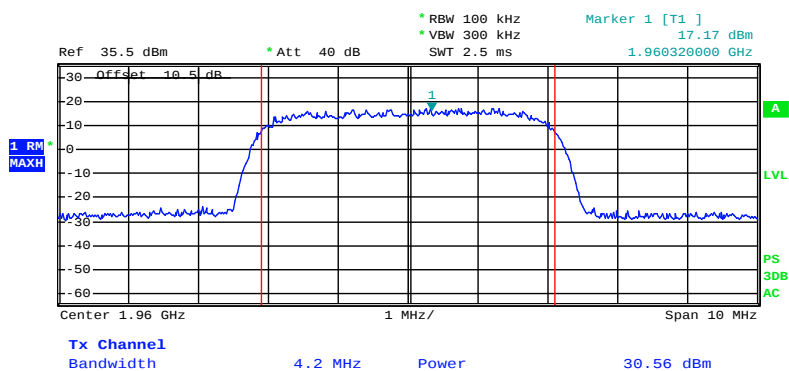
Date: 15.FEB.2012 09:24:00

Downlink: Low Channel



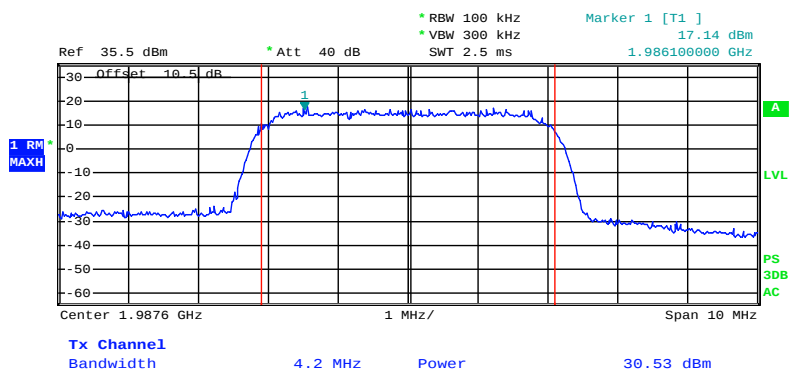
Date: 15.FEB.2012 09:15:29

Downlink: Middle Channel



Date: 15.FEB.2012 09:14:38

Downlink: High Channel



Date: 15.FEB.2012 09:16:17

FCC §2.1049 & §24.238 - OCCUPIED BANDWIDTH

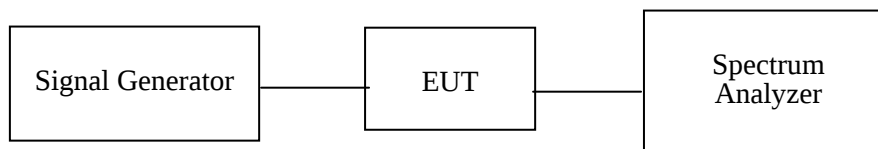
Applicable Standards

CFR 47 §2.1049 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 3 kHz (PCS) and the 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PSA Series Spectrum Analyzer	E4443A	MY45300749	2011-10-28	2012-10-27
Agilent	ESG-D Series Signal Generator	E4432B	GB40051703	2011-10-28	2012-10-27
Rohde & Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2011-11-11	2012-11-10

*** 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 Felix Li from 2011-11-30 to 2011-12-02.

PCS Band (Part 24E)**GSM mode:**

Input signal:

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Uplink (1850-1910MHz)			
Middle Channel	1880.00	244.49	314.63
Downlink (1930-1990MHz)			
Middle Channel	1960.00	238.00	300.00

Output signal:

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Uplink (1850-1910MHz)			
Middle Channel	1880.00	244.49	316.63
Downlink (1930-1990MHz)			
Middle Channel	1960.00	242.48	314.63

EDGE mode:

Input signal:

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Uplink (1850-1910MHz)			
Middle Channel	1880.00	248.49	320.64
Downlink (1930-1990MHz)			
Middle Channel	1960.00	250.50	314.63

Output signal:

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Uplink (1850-1910MHz)			
Middle Channel	1880.00	248.50	320.64
Downlink (1930-1990MHz)			
Middle Channel	1960.00	250.50	322.64

CDMA mode:

Input signal:

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Uplink (1850-1910MHz)			
Middle Channel	1880.00	1.2660	1.405
Downlink (1930-1990MHz)			
Middle Channel	1960.00	1.2642	1.401

Output signal

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Uplink (1850-1910MHz)			
Middle Channel	1880.00	1.2597	1.401
Downlink (1930-1990MHz)			
Middle Channel	1960.00	1.2637	1.394

WCDMA mode:

Input signal:

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Uplink (1850-1910MHz)			
Middle Channel	1880.00	4.20	4.76
Downlink (1930-1990MHz)			
Middle Channel	1960.00	4.22	4.72

Output signal

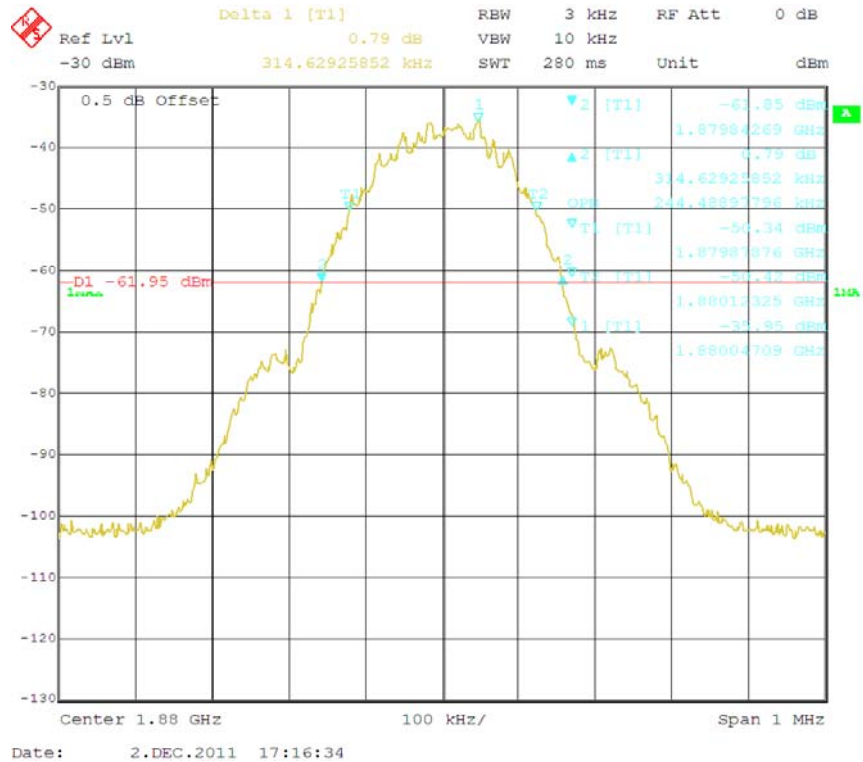
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Uplink (1850-1910MHz)			
Middle Channel	1880.00	4.24	4.72
Downlink (1930-1990MHz)			
Middle Channel	1960.00	4.20	4.72

Please refer to the following plots.

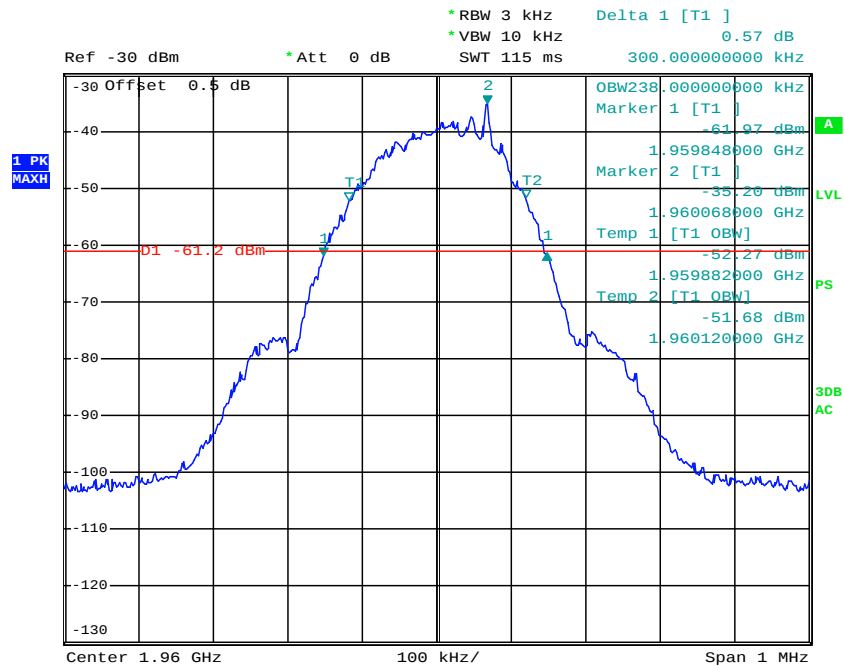
PCS Band (Part 24E)

GSM mode:

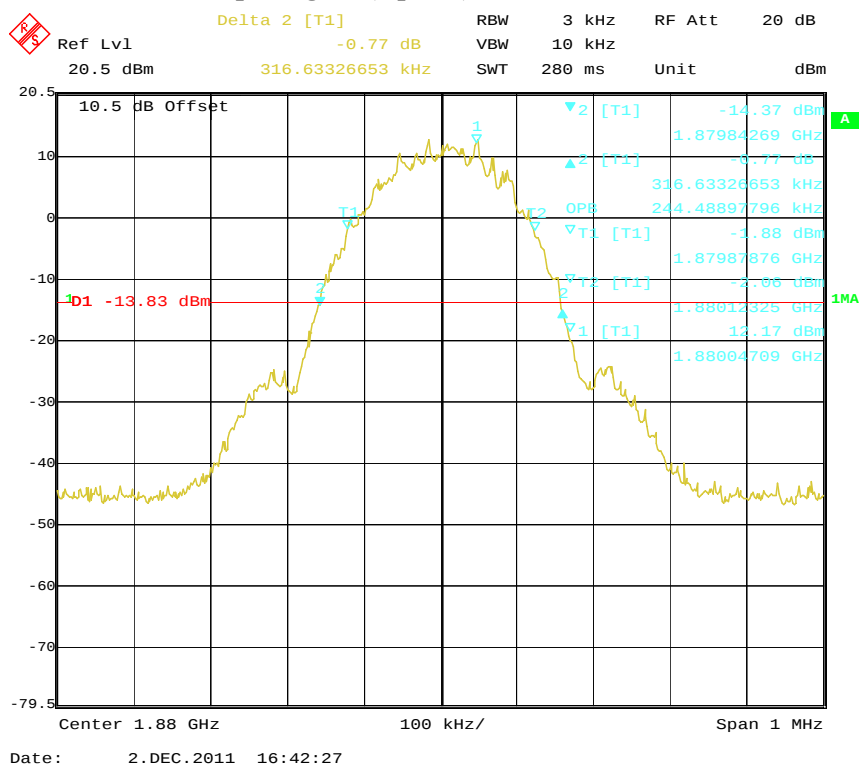
Input signal (Uplink): Middle Channel



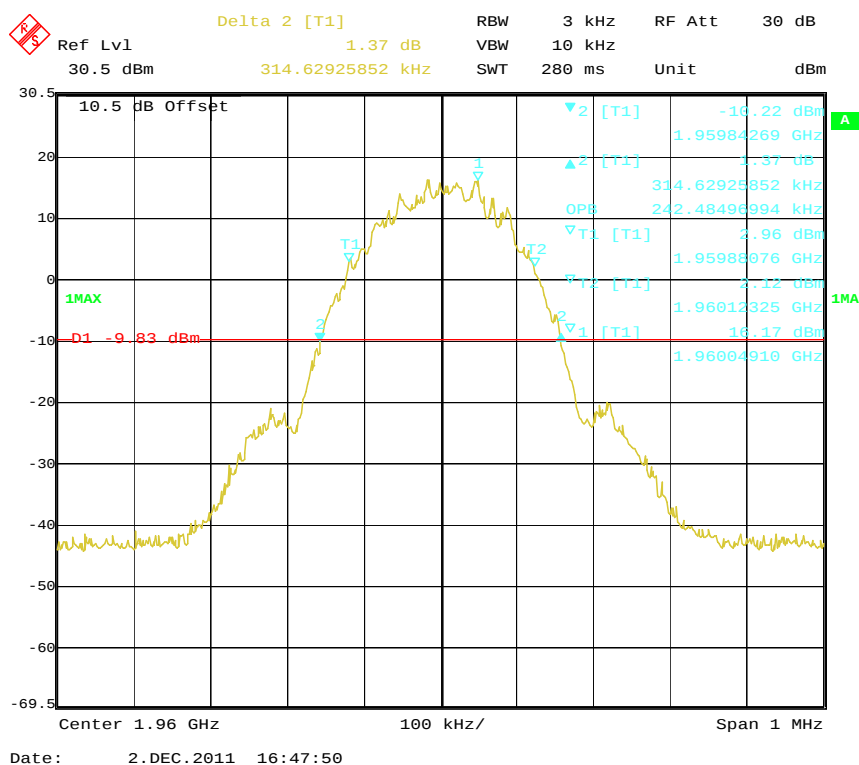
Input signal (Downlink): Middle Channel

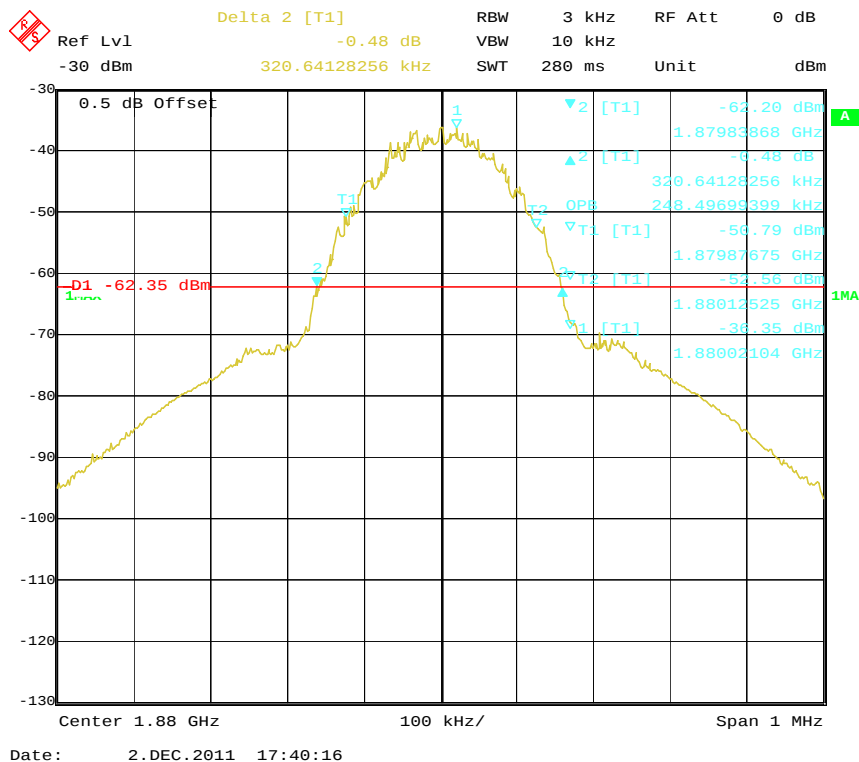
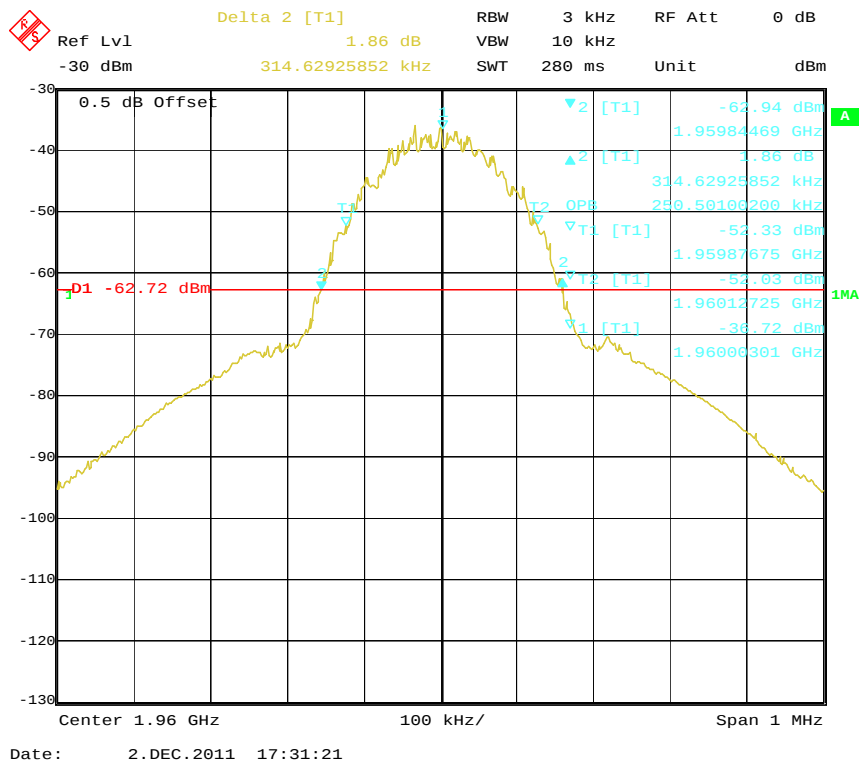


Output signal (Uplink): Middle Channel



Output signal (Downlink): Middle Channel



EDGE mode:**Input signal (Uplink): Middle Channel****Input signal (Downlink): Middle Channel**

Ref Lvl 20.5 dBm Delta 2 [T1] 1.16 dB RBW 3 kHz RF Att 20 dB

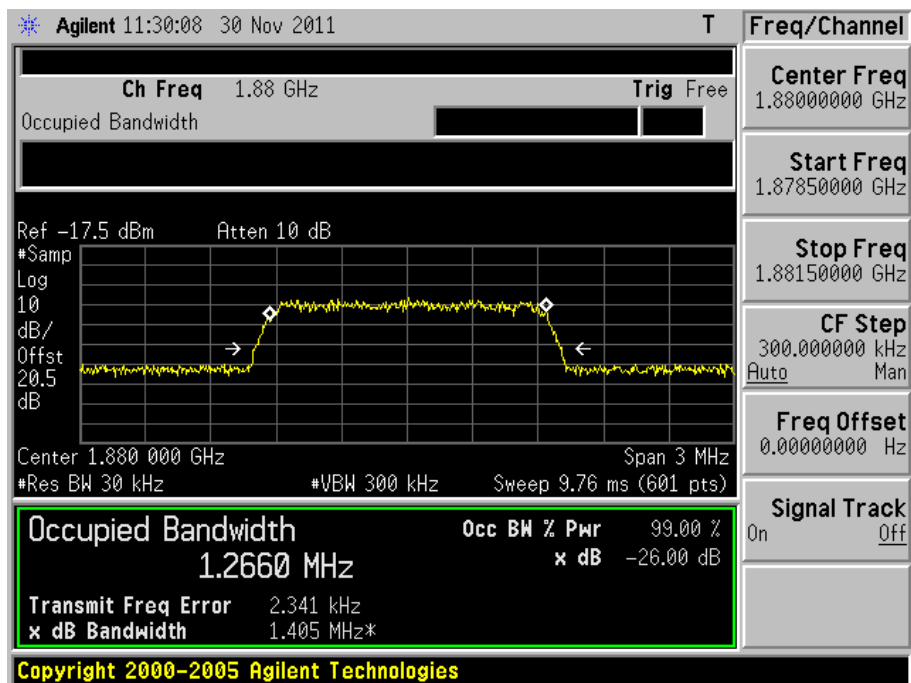
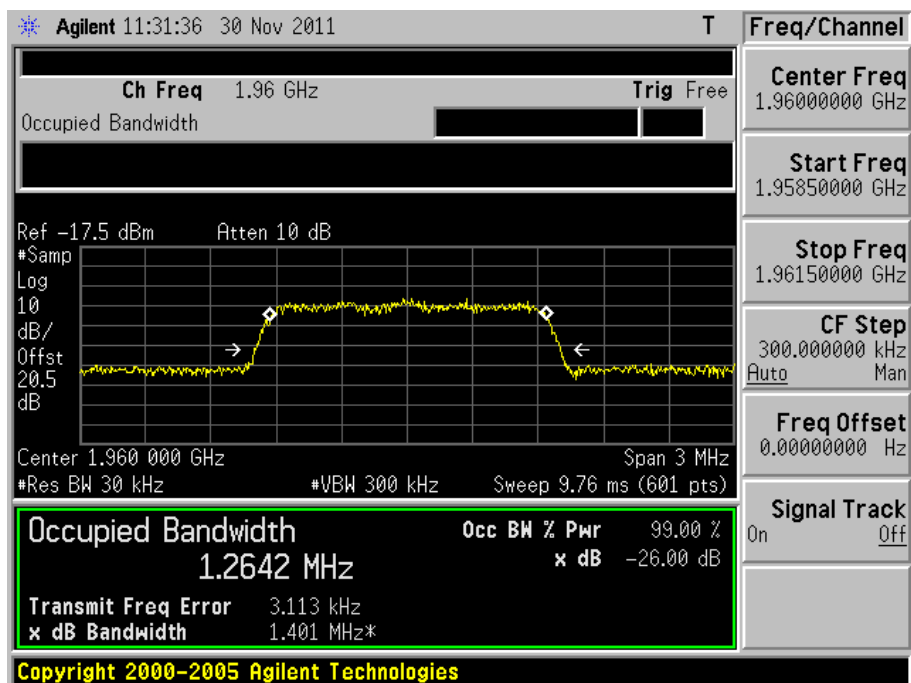
20.5 dBm 320.64128257 kHz SWT 280 ms Unit dBm

10.5 dB Offset

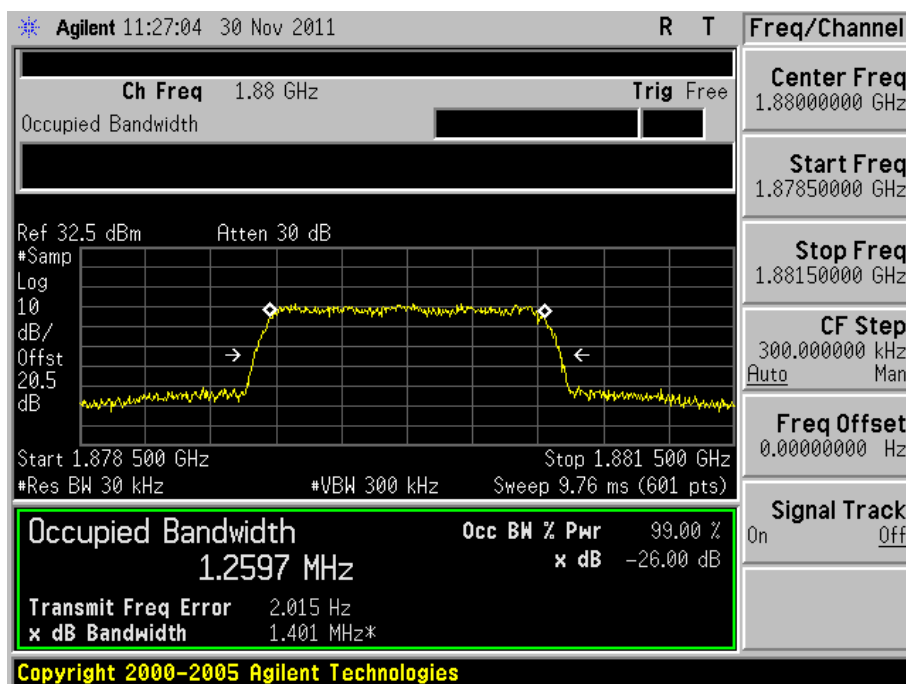
Center 1.88 GHz 100 kHz/ Span 1 MHz

Date: 2.DEC.2011 17:56:33

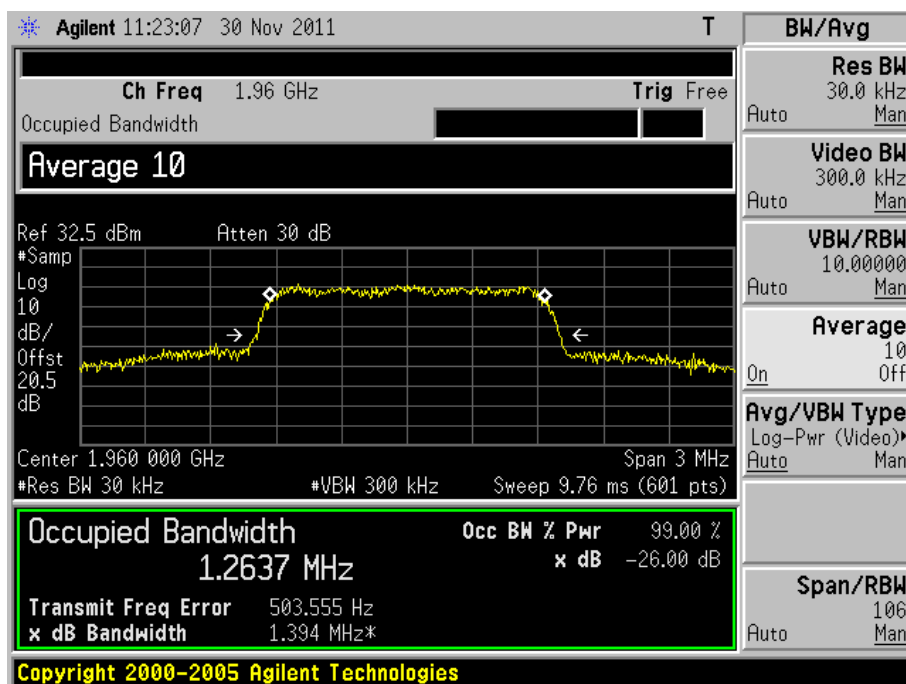
[illegible]

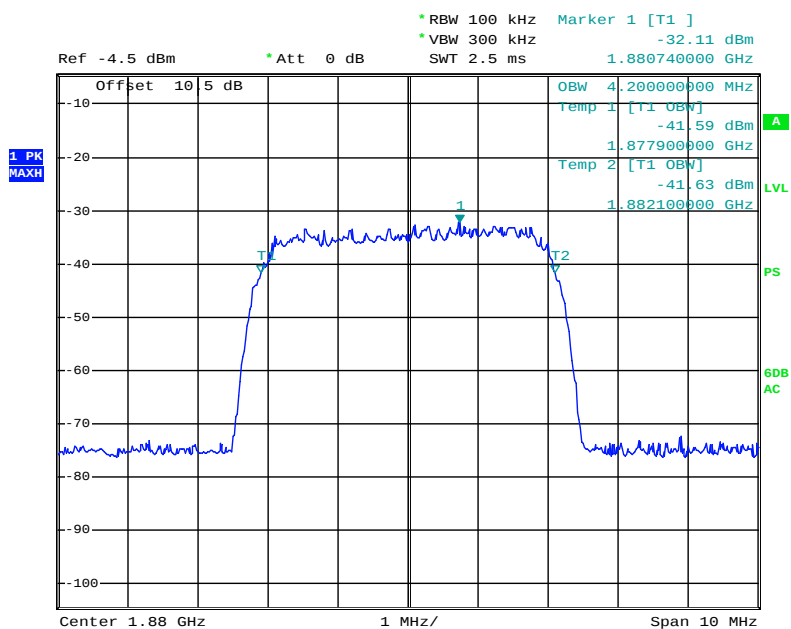
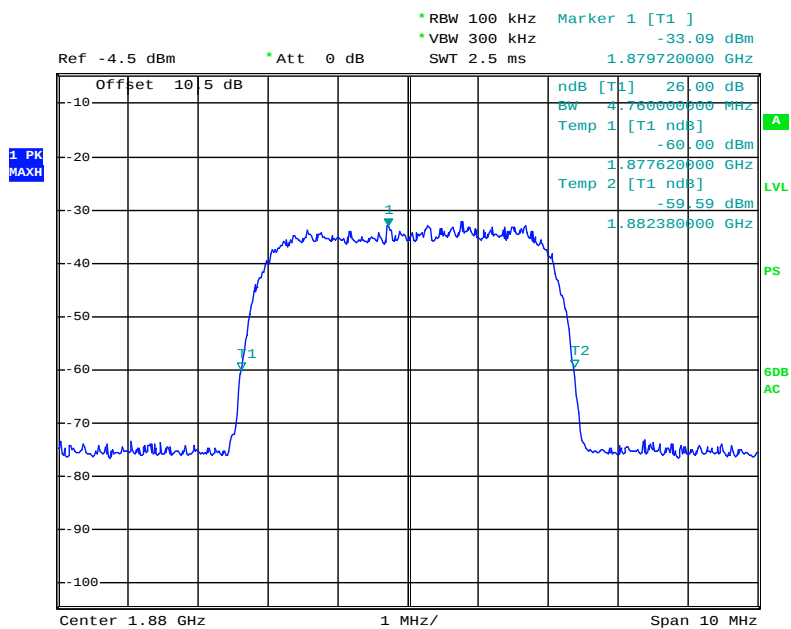
CDMA mode:**Input signal (Uplink): Middle Channel****Input signal (Downlink): Middle Channel**

Output signal (Uplink): Middle Channel

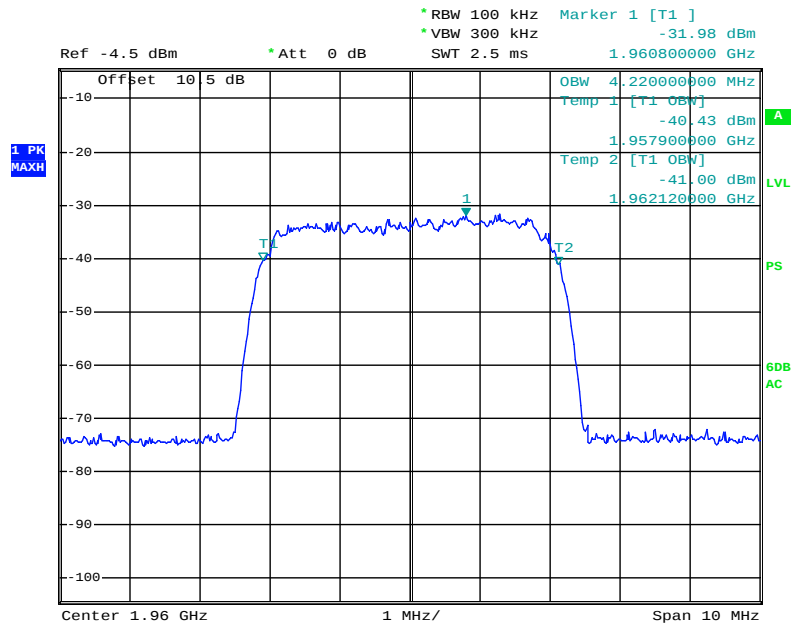


Output signal (Downlink): Middle Channel

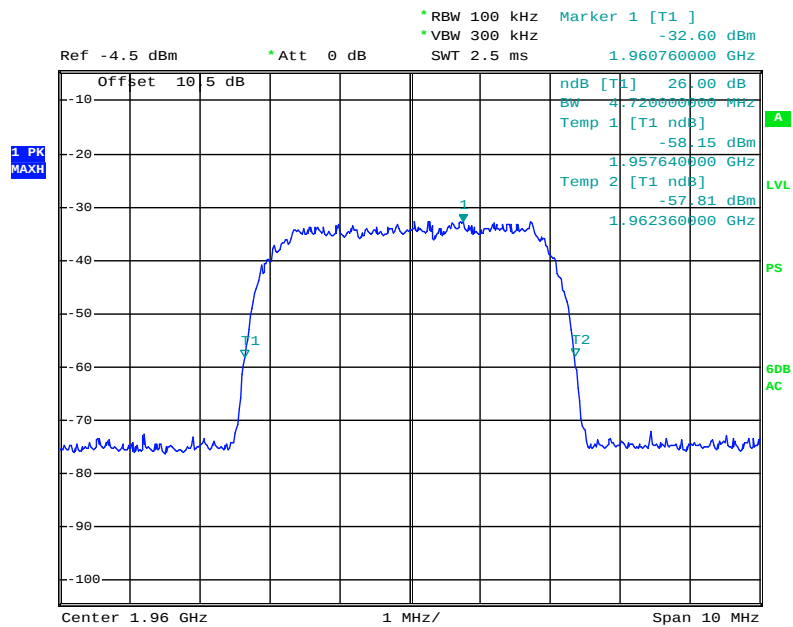


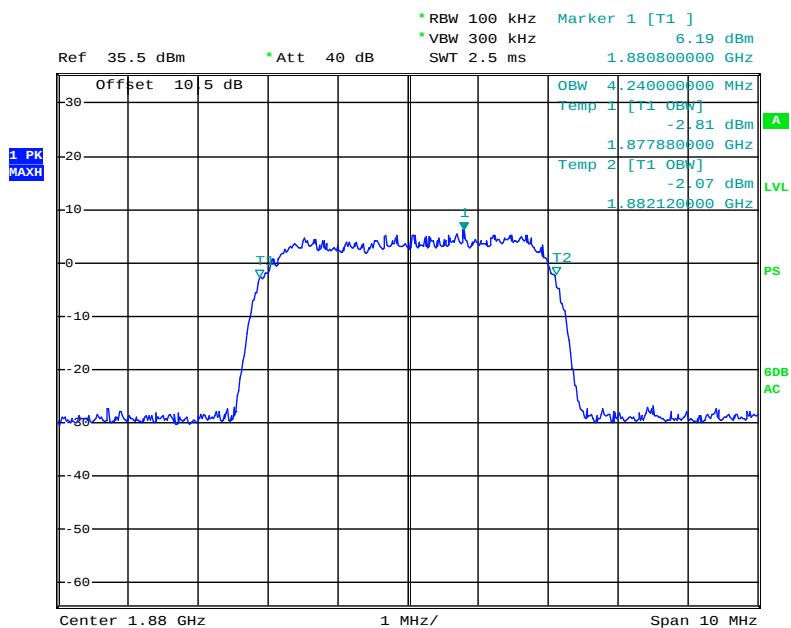
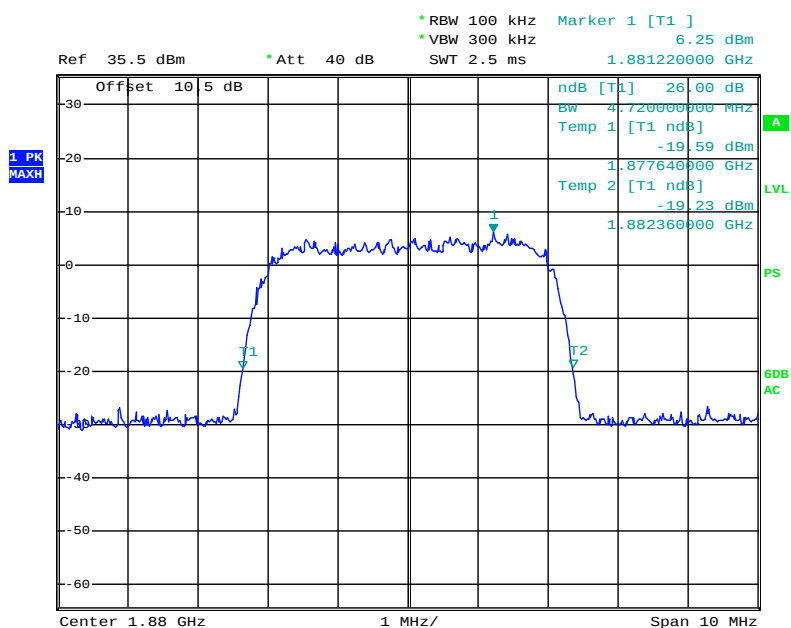
WCDMA mode:**Input signal (Uplink): 99% Occupied Bandwidth, Middle Channel****Input signal (Uplink): 26dB Occupied Bandwidth, Middle Channel**

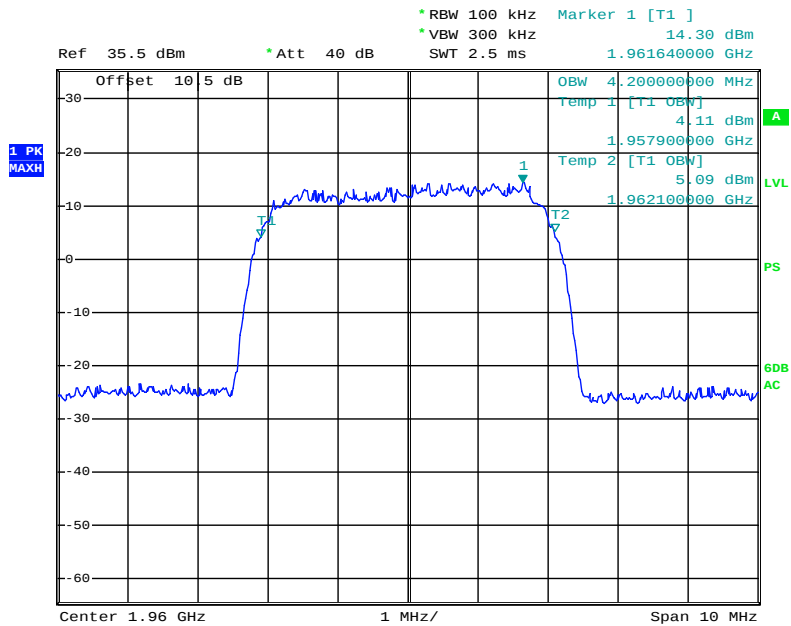
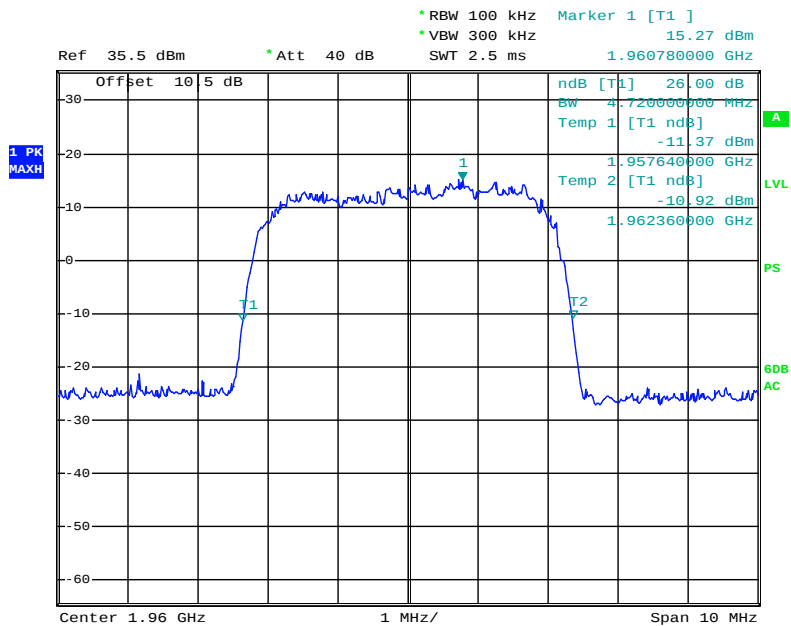
Input signal (Downlink): 99% Occupied Bandwidth, Middle Channel



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



Output signal (Uplink): 99% Occupied Bandwidth, Middle Channel**Output signal (Uplink): 26dB Occupied Bandwidth, Middle Channel**

Output signal (Downlink): 99% Occupied Bandwidth, Middle Channel**Output signal (Downlink): 26dB Occupied Bandwidth, Middle Channel**

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

Applicable Standards

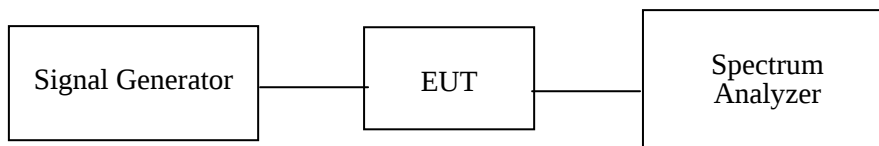
CFR 47 §2.1051 and §24.238(a).

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

The power of any emission 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 EUT system was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the EMI test receiver was set at as following table. 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	FSIQ 26	609358	2011-07-08	2012-07-07
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2011-10-28	2012-10-27
Agilent	ESG-D Series Signal Generator	E4432B	MY45300749	2011-11-20	2012-11-20
Agilent	PSA Series Spectrum Analyzer	E4443A	GB40051703	2011-01-07	2012-01-07

*** 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

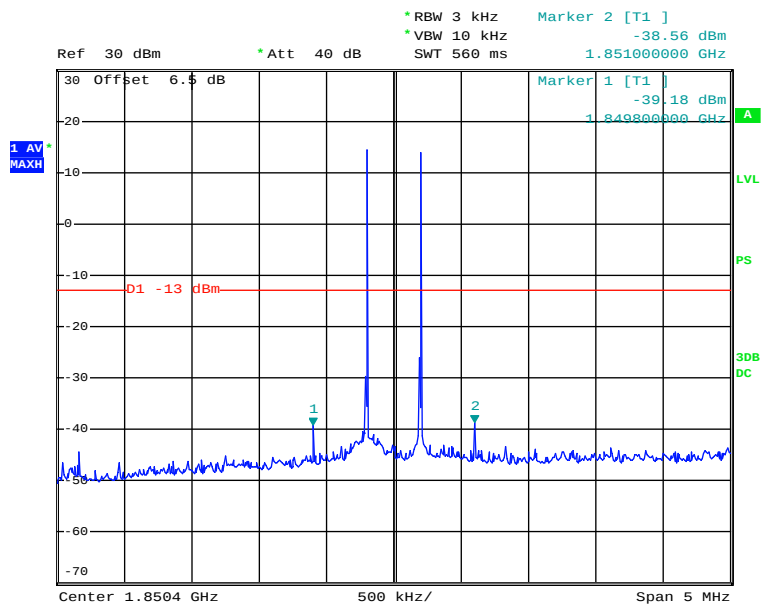
The testing was performed by Felix Li from 2011-12-02 to 2012-01-17.

Please refer to the following plots.

PCS Band (Part24E)

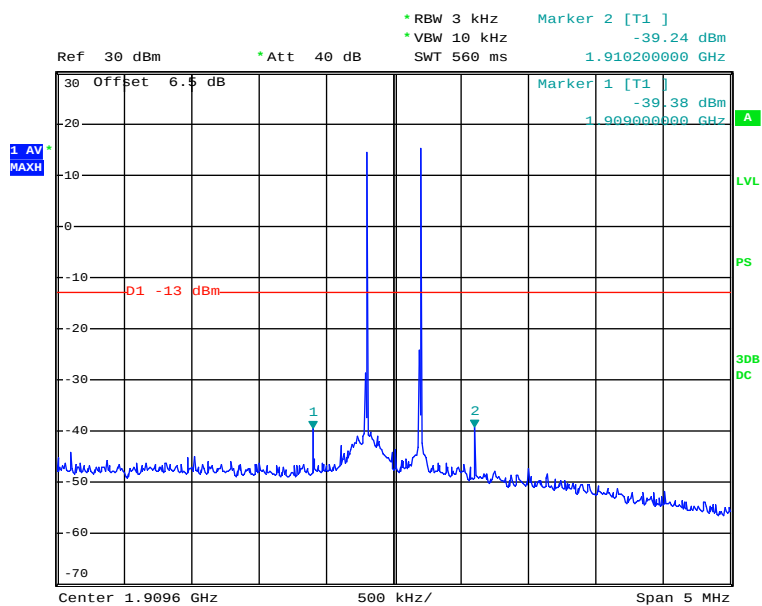
GSM mode (Uplink)

Inter-modulation, Low-band edge



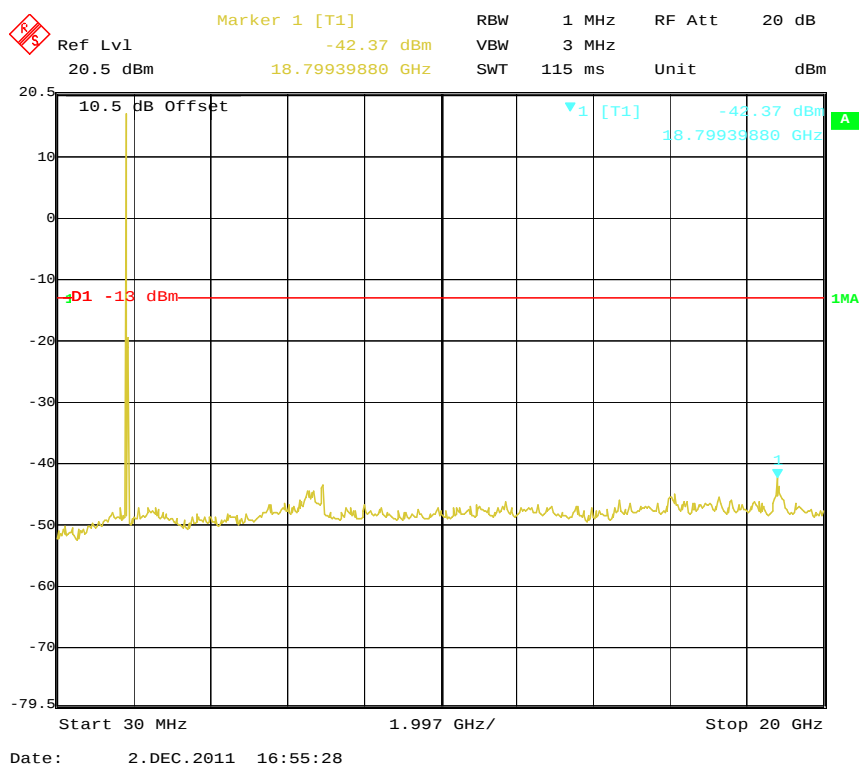
Date: 17.JAN.2012 18:07:36

Inter-modulation, High-band edge

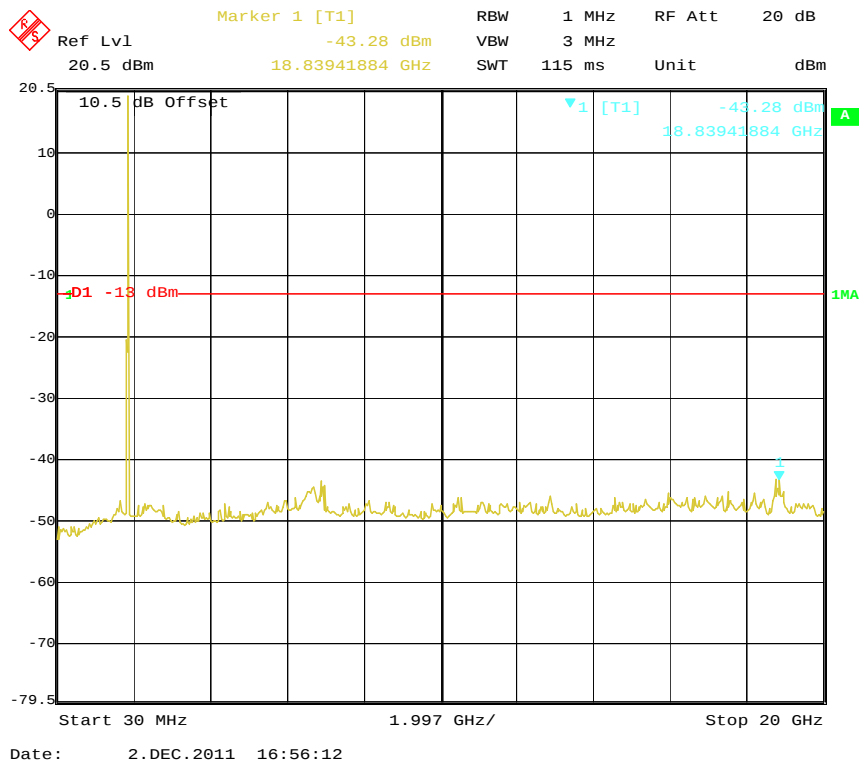


Date: 17.JAN.2012 18:10:40

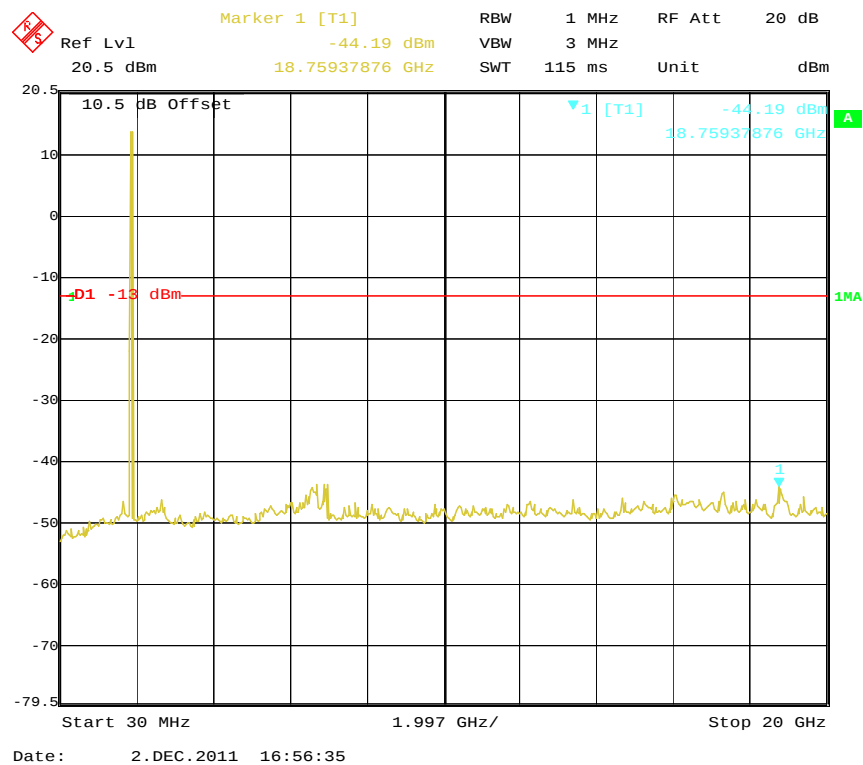
Spurious Emissions at Antenna Terminal, Low Channel

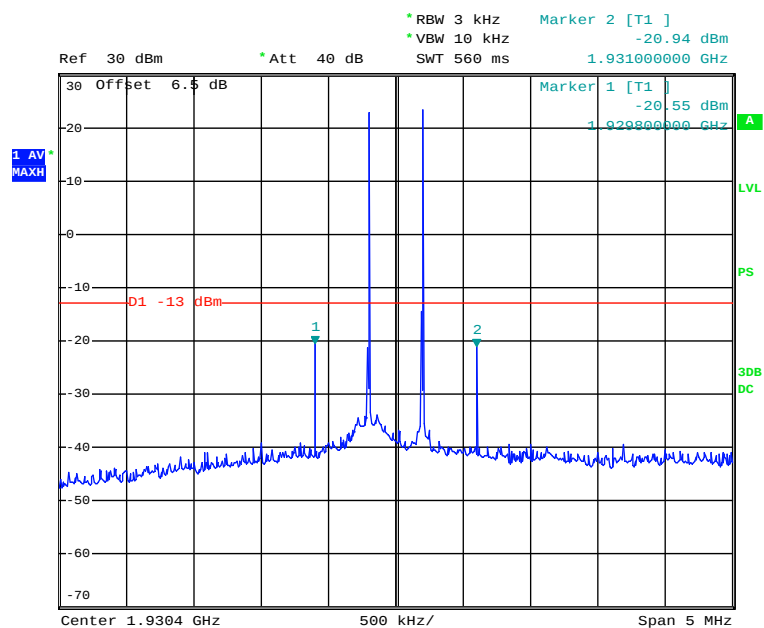


Spurious Emissions at Antenna Terminal, Middle Channel

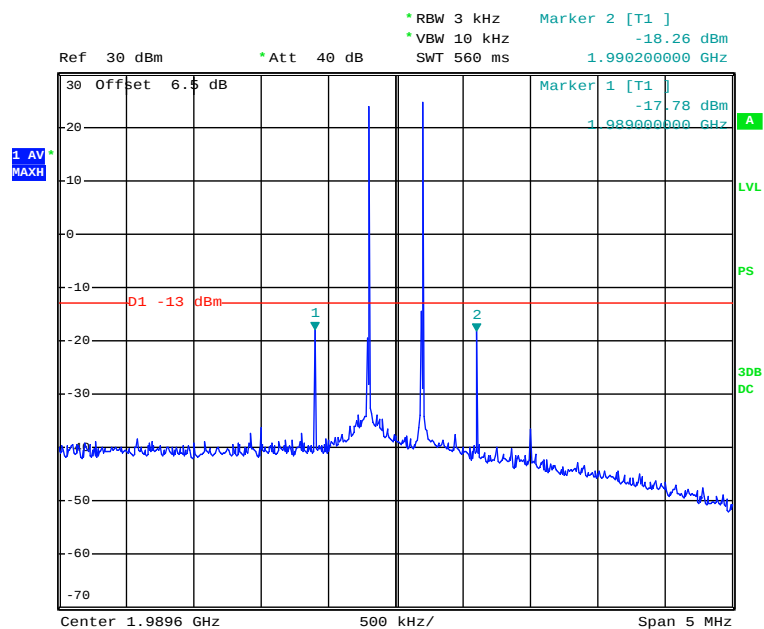


Spurious Emissions at Antenna Terminal, High Channel



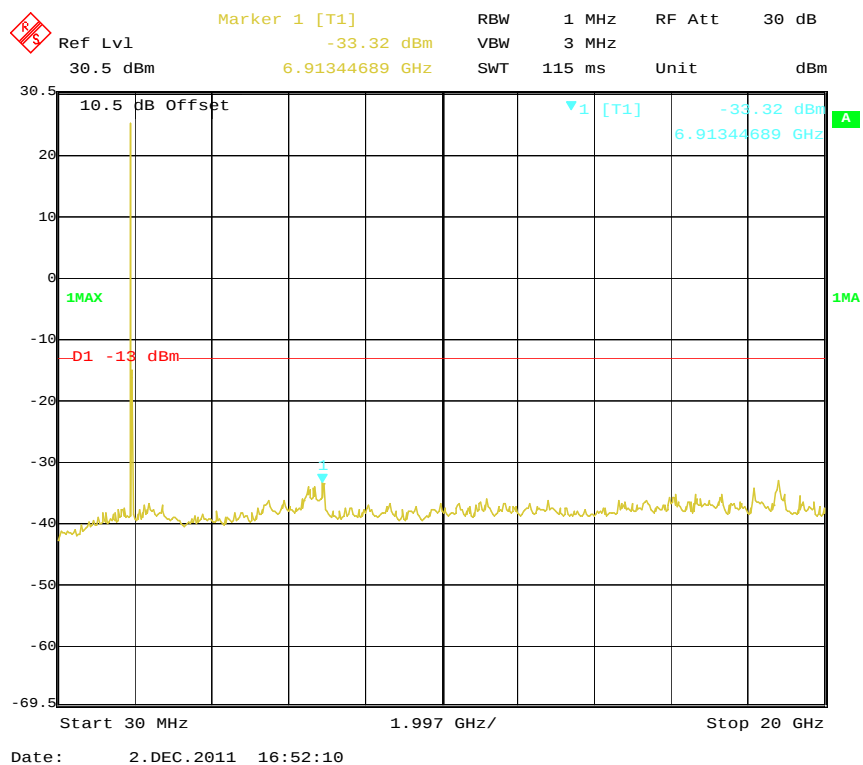
GSM mode (Downlink)**Inter-modulation, Low-band edge**

Date: 17.JAN.2012 18:20:27

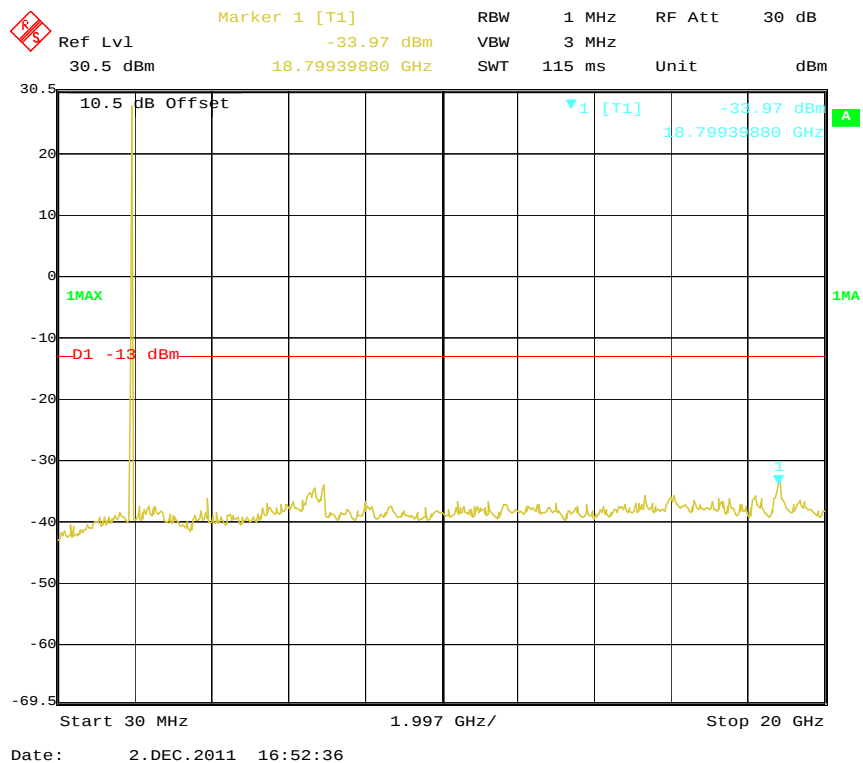
Inter-modulation, High-band edge

Date: 17.JAN.2012 18:14:17

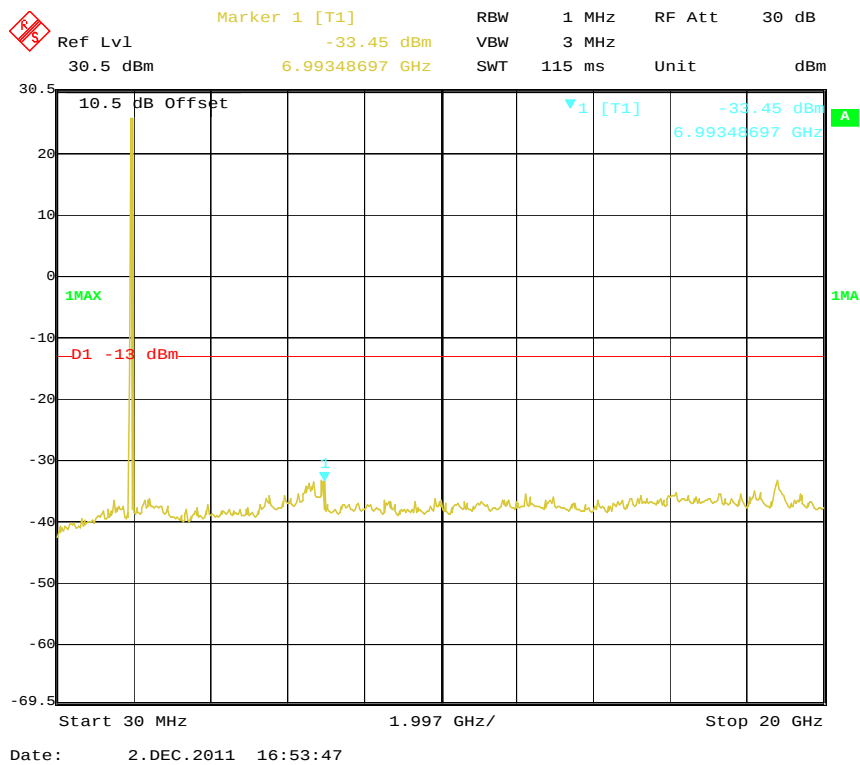
Spurious Emissions at Antenna Terminal, Low Channel

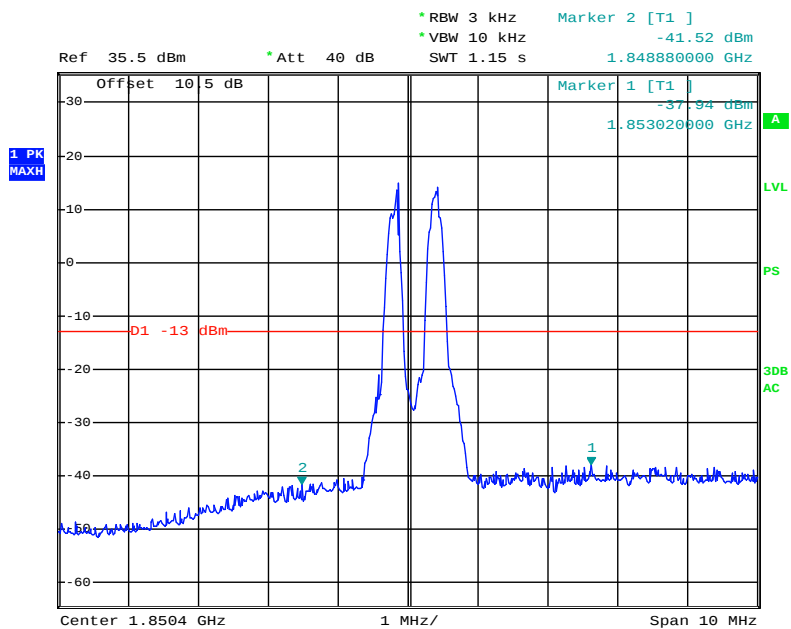
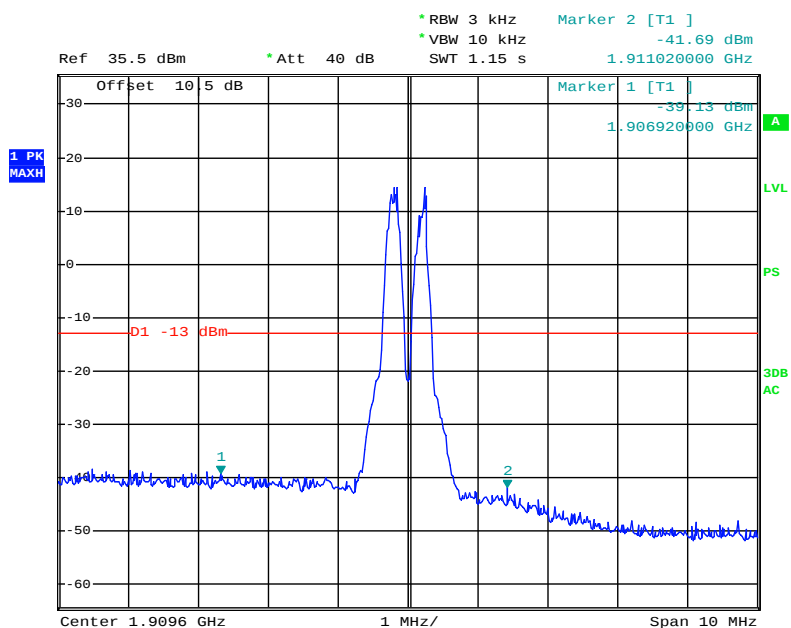


Spurious Emissions at Antenna Terminal, Middle Channel

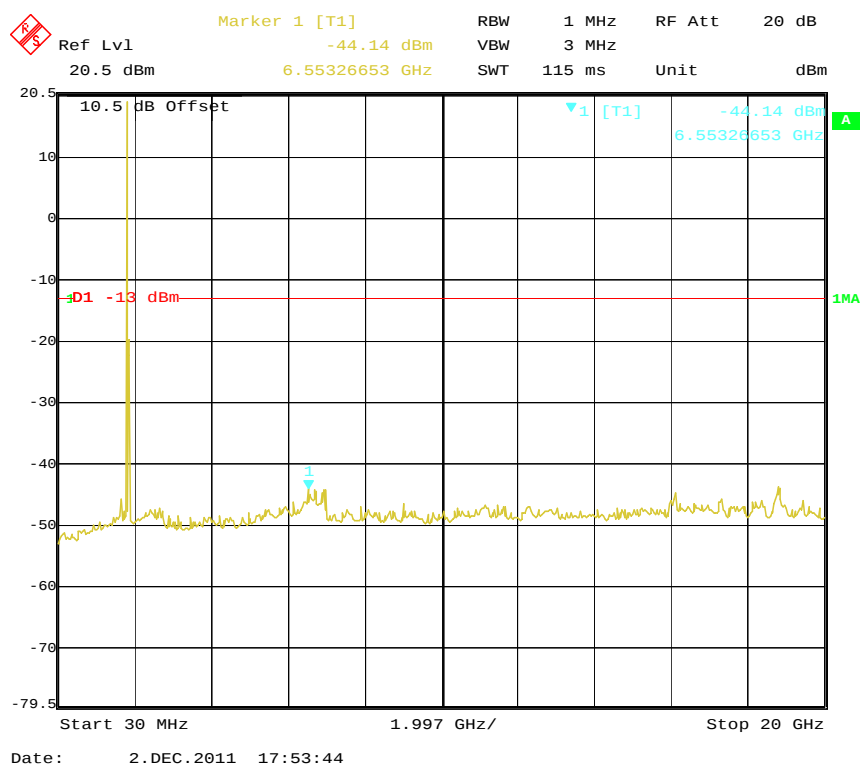


Spurious Emissions at Antenna Terminal, High Channel

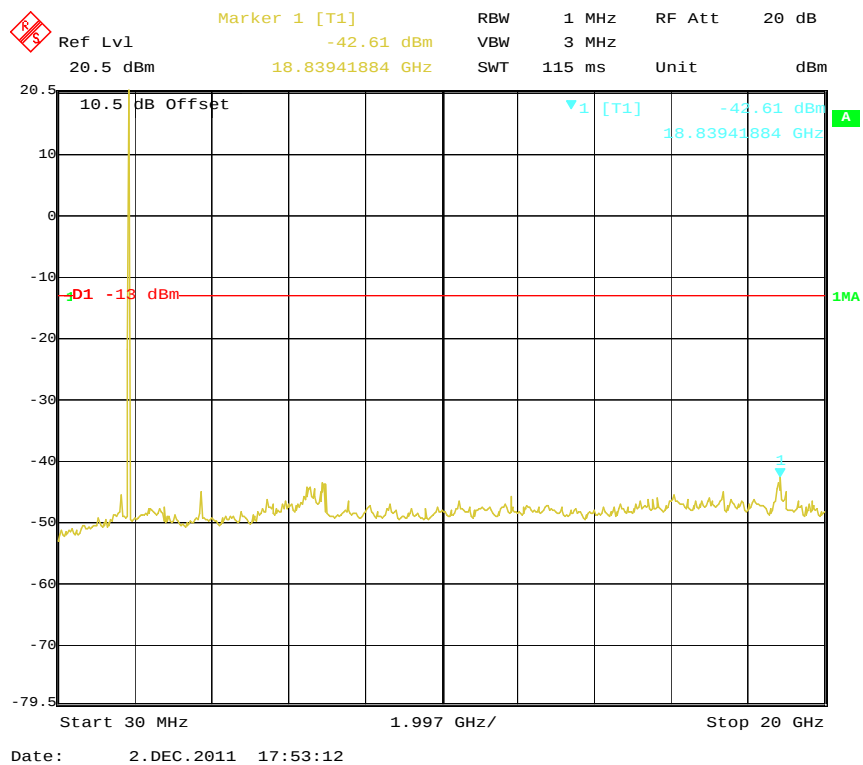


EDGE mode (Uplink)**Inter-modulation, Low-band edge****Inter-modulation, High-band-edge**

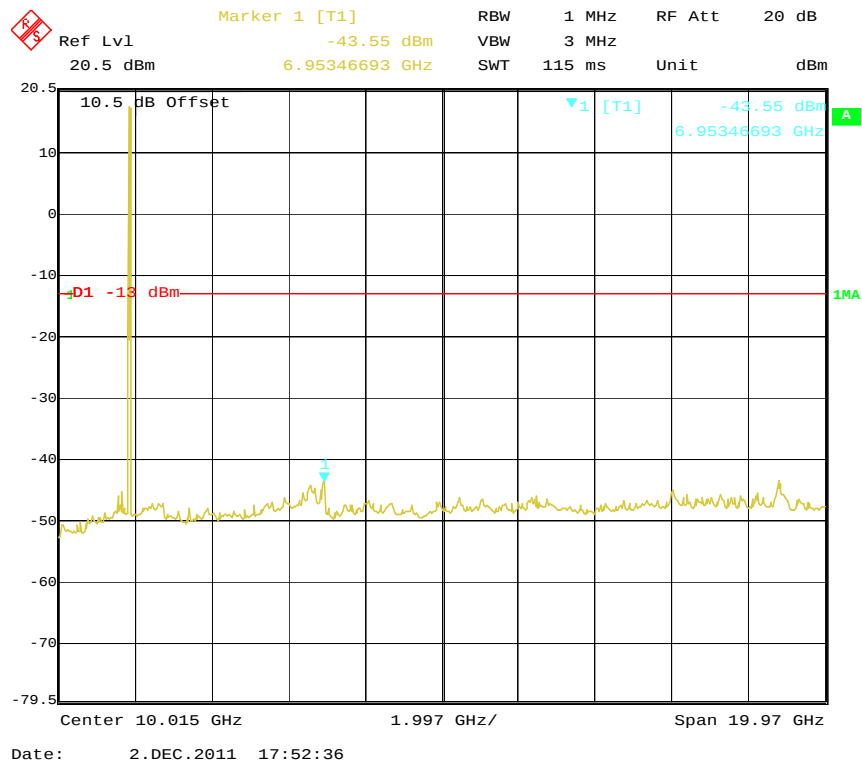
Spurious Emissions at Antenna Terminal, Low Channel

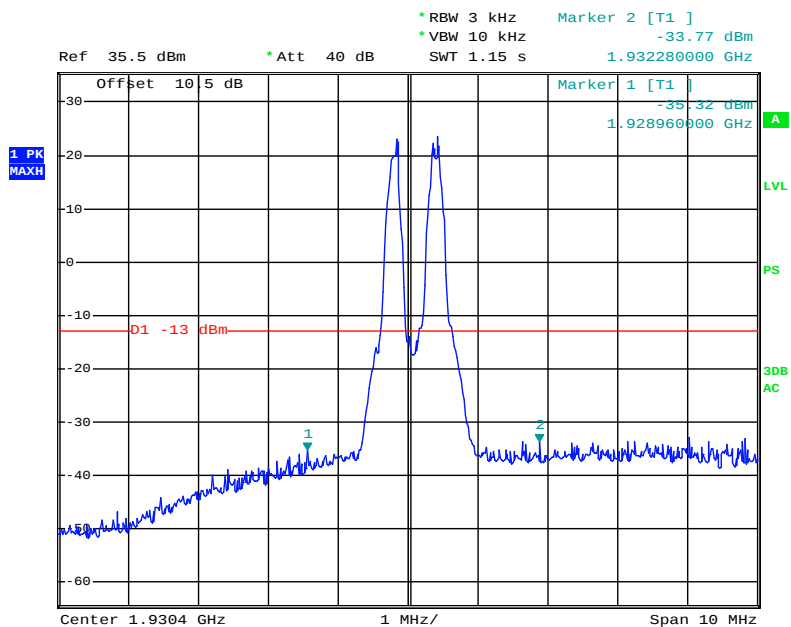
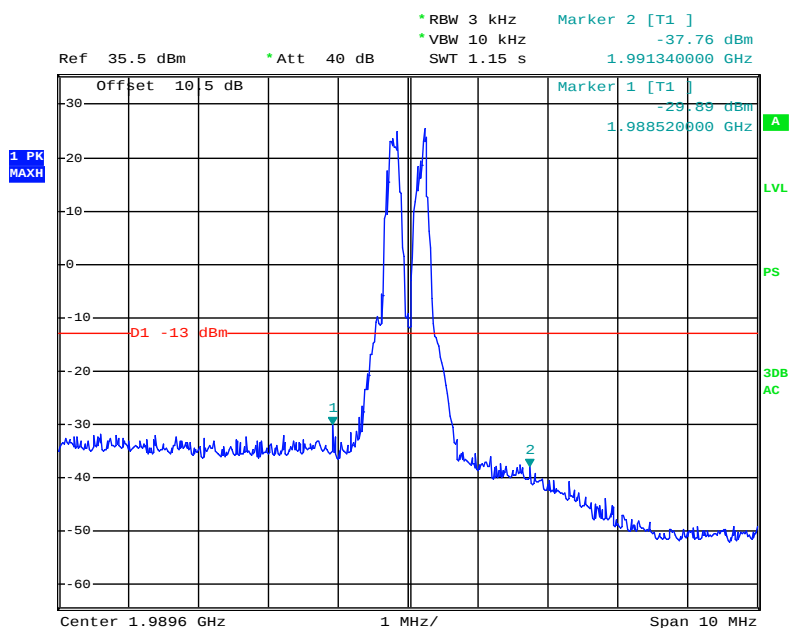


Spurious Emissions at Antenna Terminal, Middle Channel

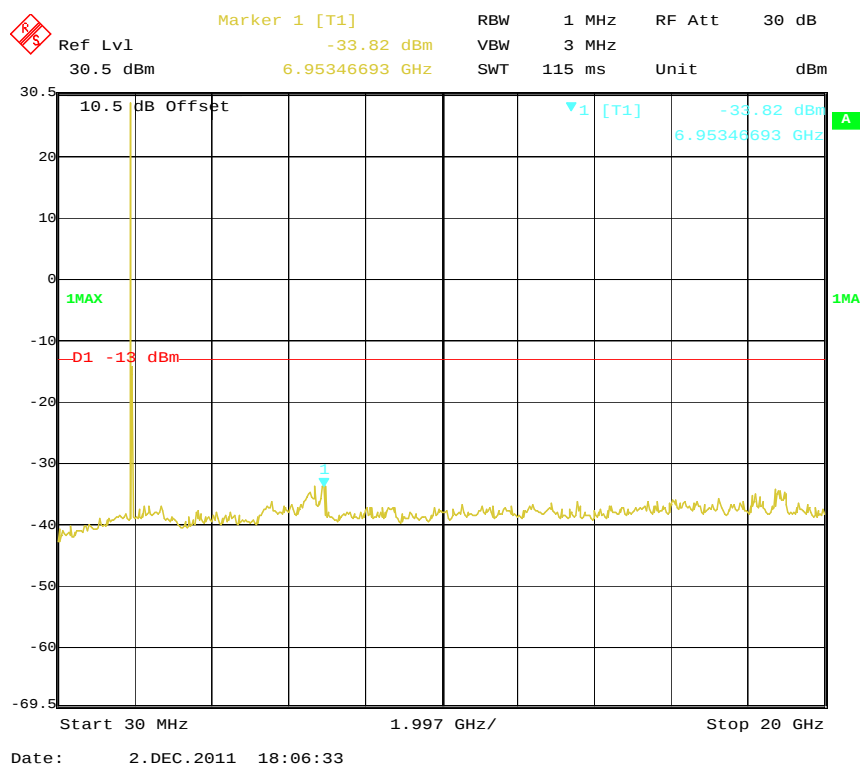


Spurious Emissions at Antenna Terminal, High Channel

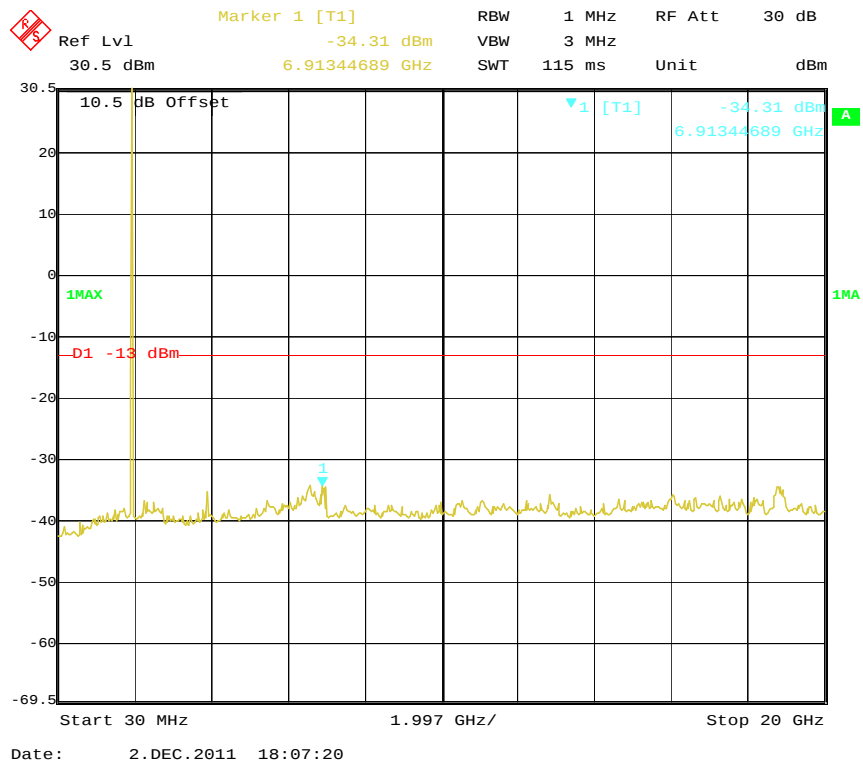


EDGE mode (Downlink)**Inter-modulation, Low-band edge****Inter-modulation, High-band-edge**

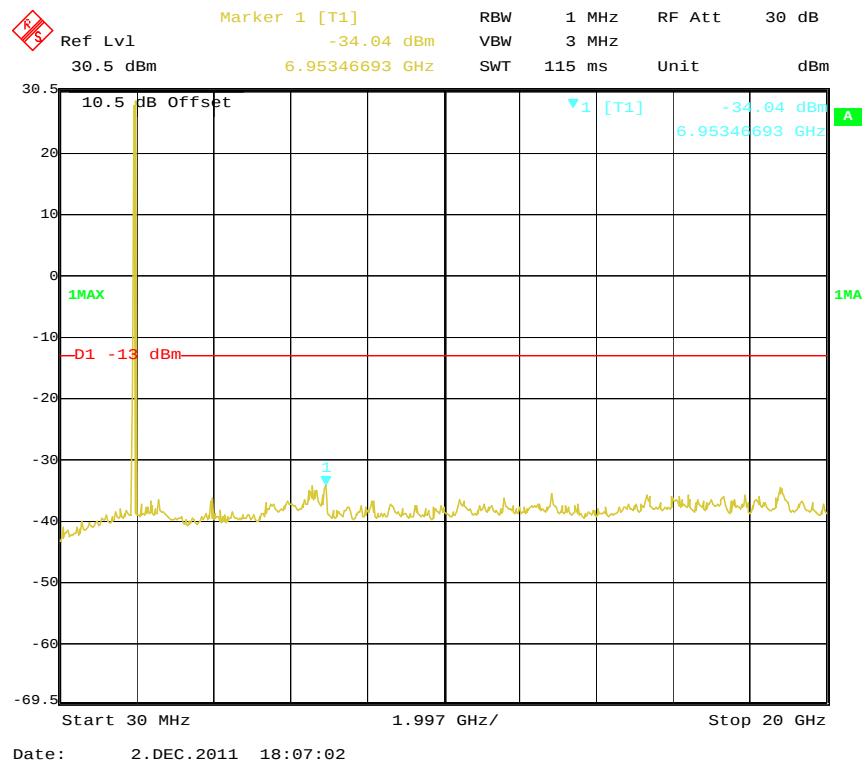
Spurious Emissions at Antenna Terminal, Low Channel



Spurious Emissions at Antenna Terminal, Middle Channel

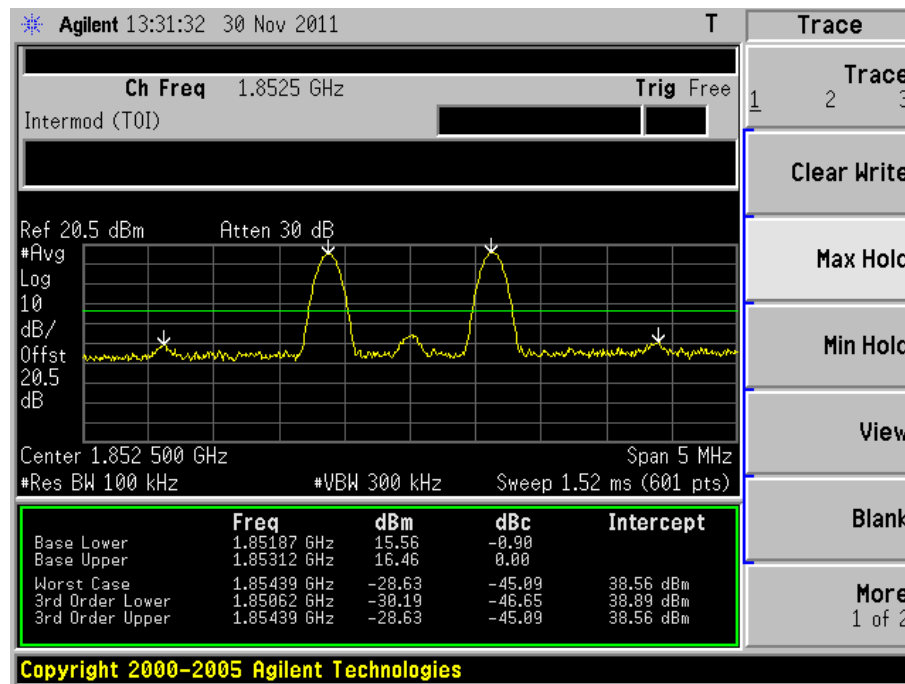


Spurious Emissions at Antenna Terminal, High Channel

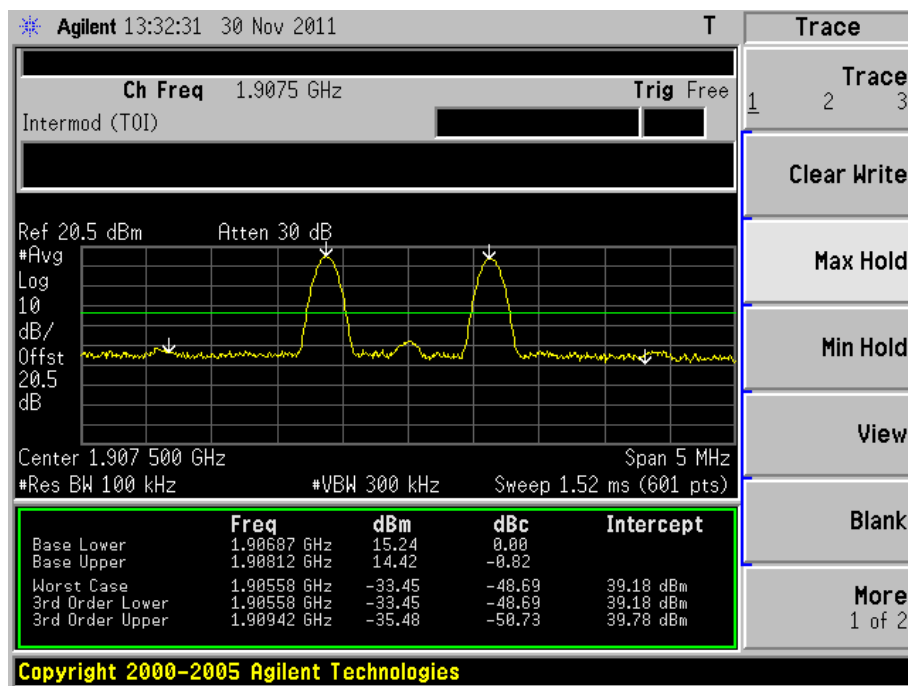


CDMA mode (Uplink)

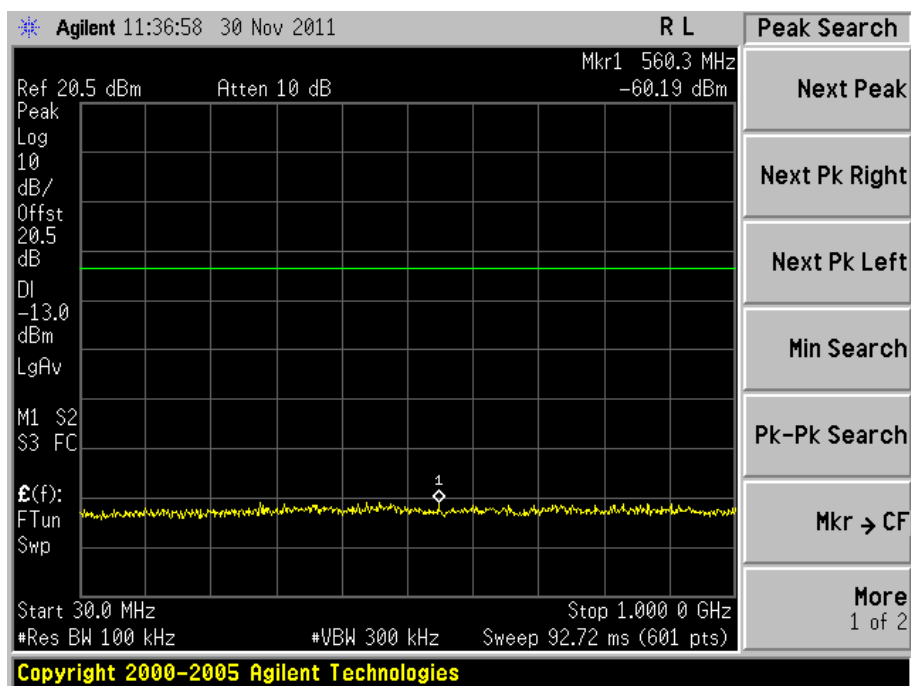
Inter-modulation, Low-band edge



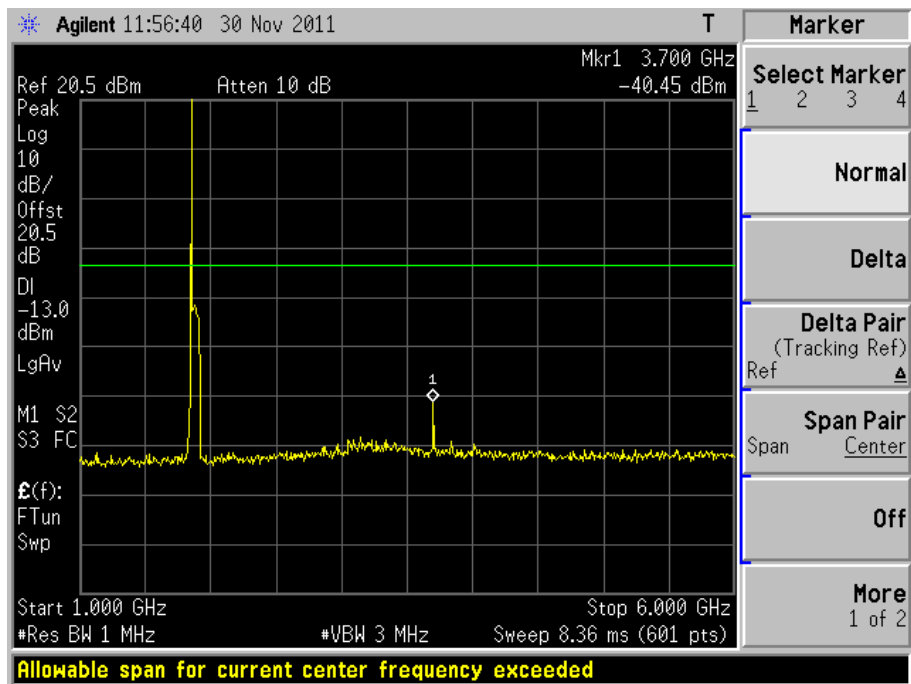
Inter-modulation, High-band edge



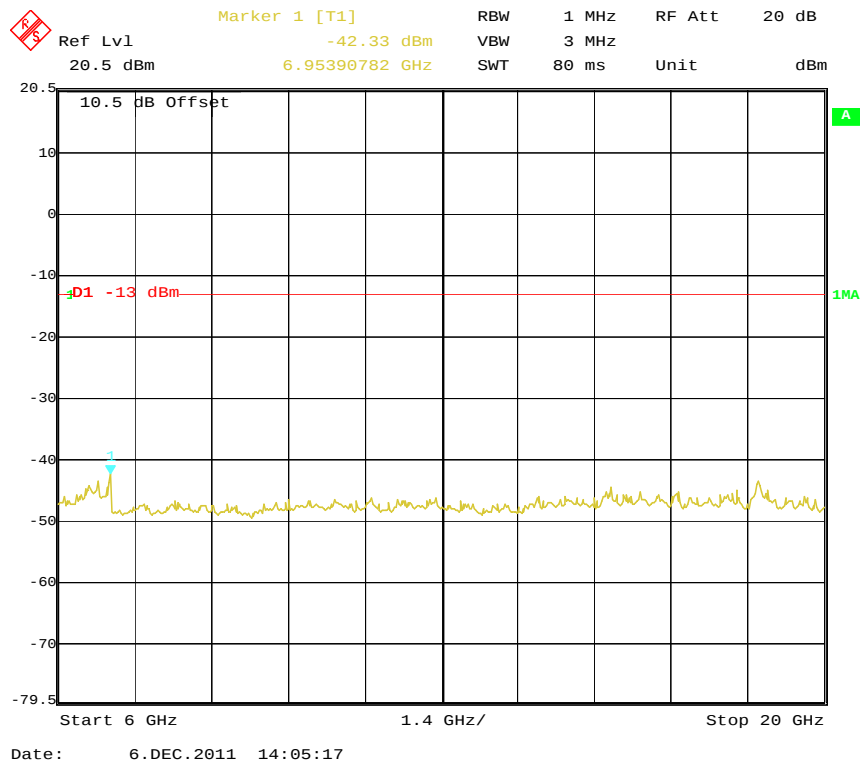
Spurious Emissions at Antenna Terminal, 30 MHz-1 GHz Low Channel



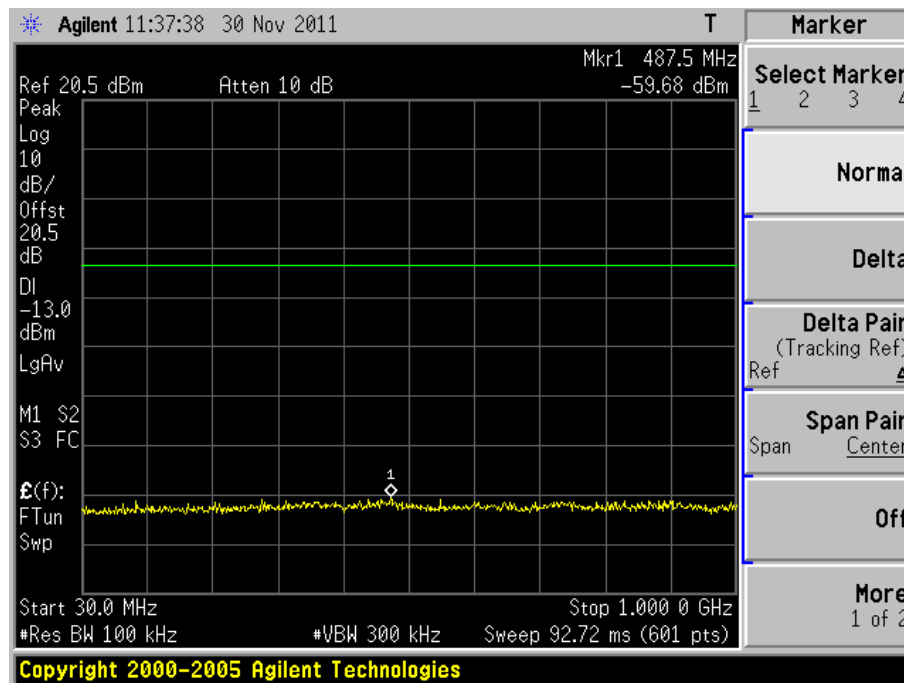
Spurious Emissions at Antenna Terminal, 1 GHz-6 GHz Low Channel



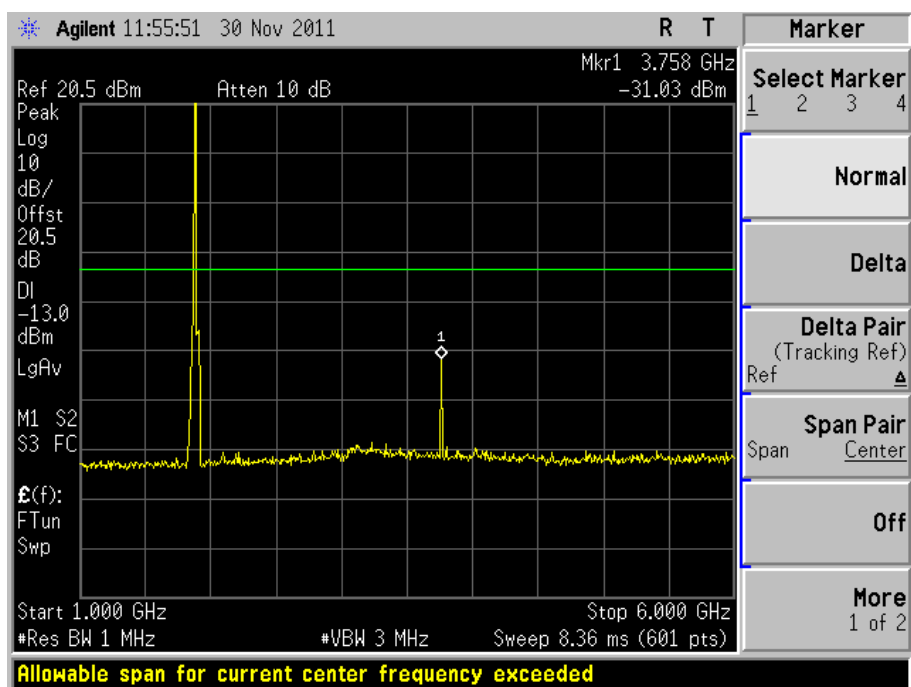
Spurious Emissions at Antenna Terminal, 6 GHz-20 GHz Low Channel



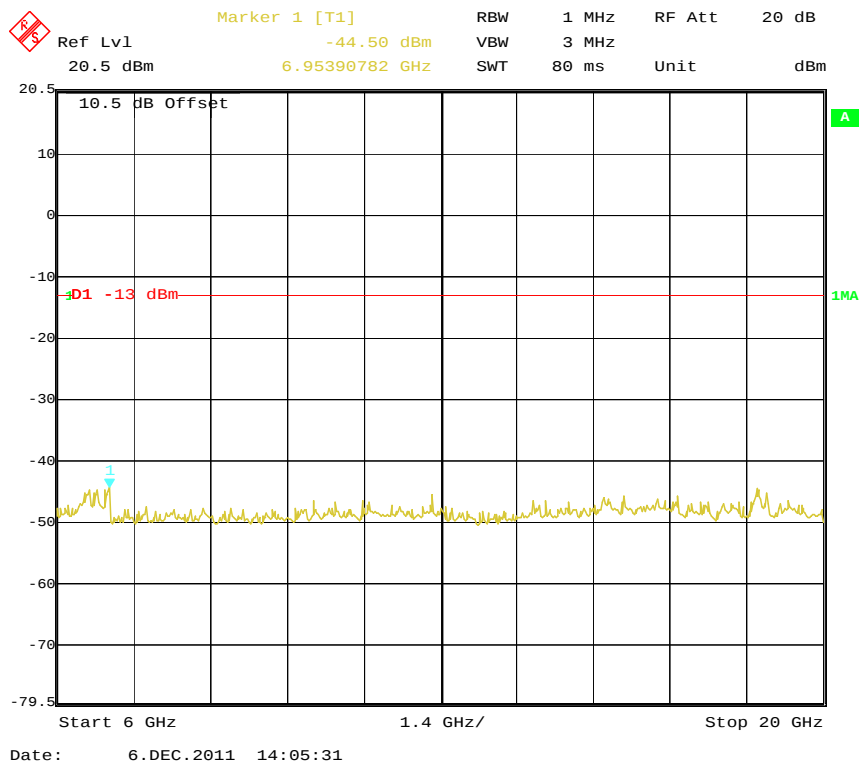
Spurious Emissions at Antenna Terminal, 30 MHz-1 GHz Middle Channel



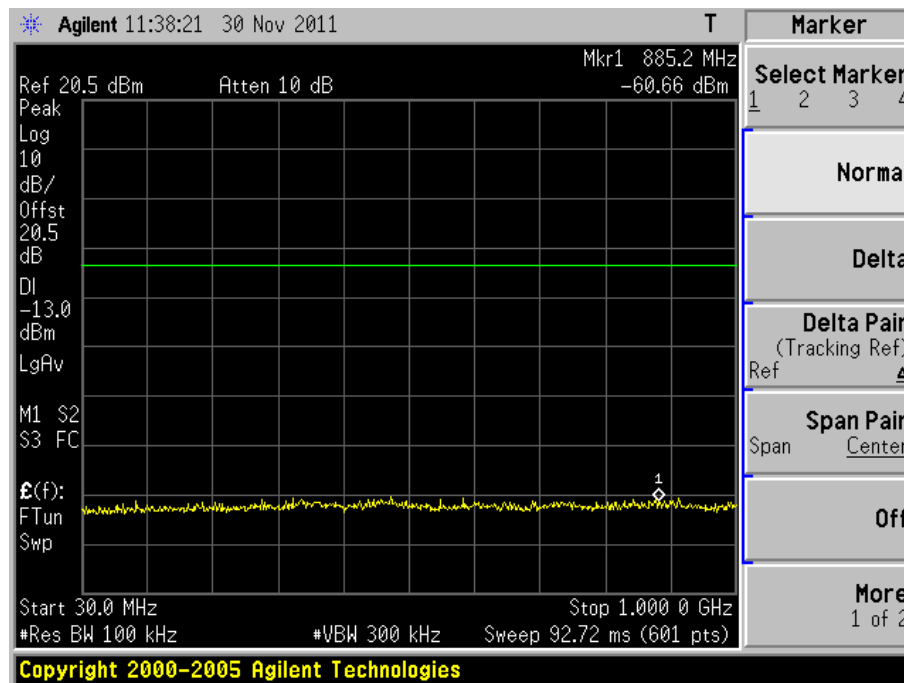
Spurious Emissions at Antenna Terminal, 1 GHz-6 GHz Middle Channel



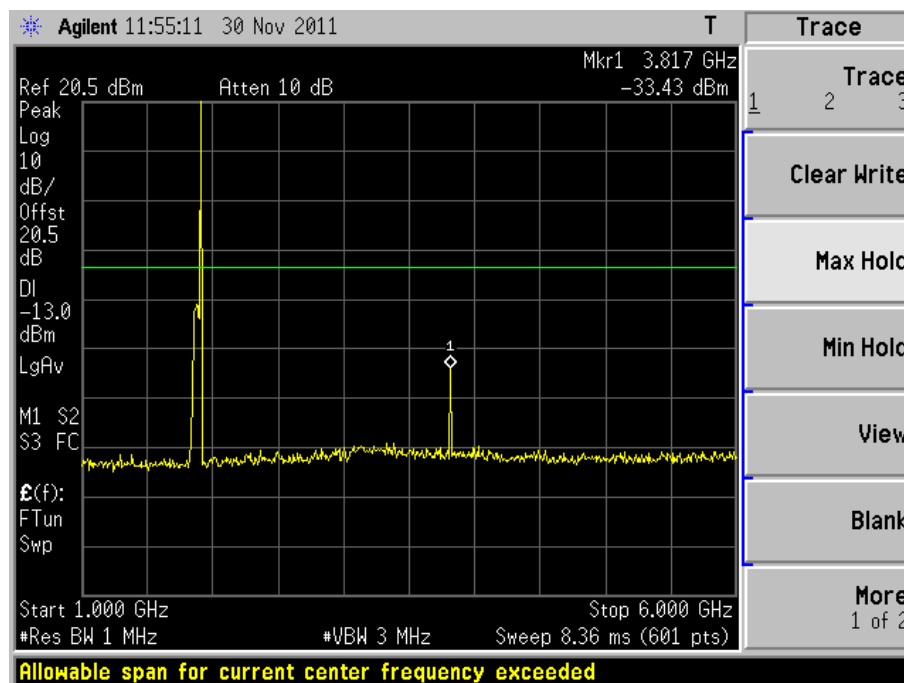
Spurious Emissions at Antenna Terminal, 6 GHz-20 GHz Middle Channel



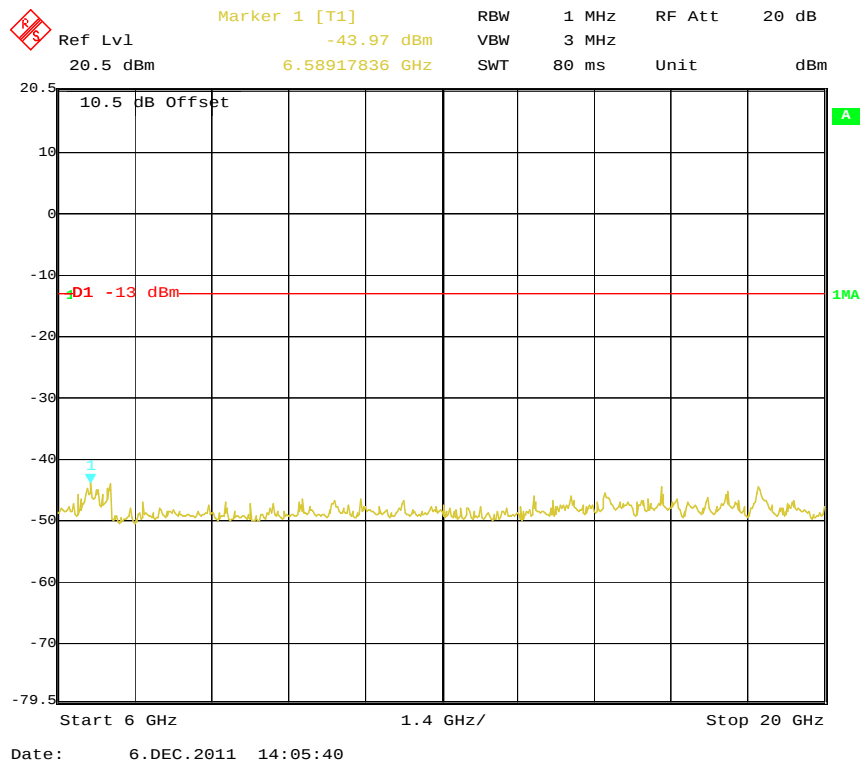
Spurious Emissions at Antenna Terminal, 30 MHz-1 GHz High Channel

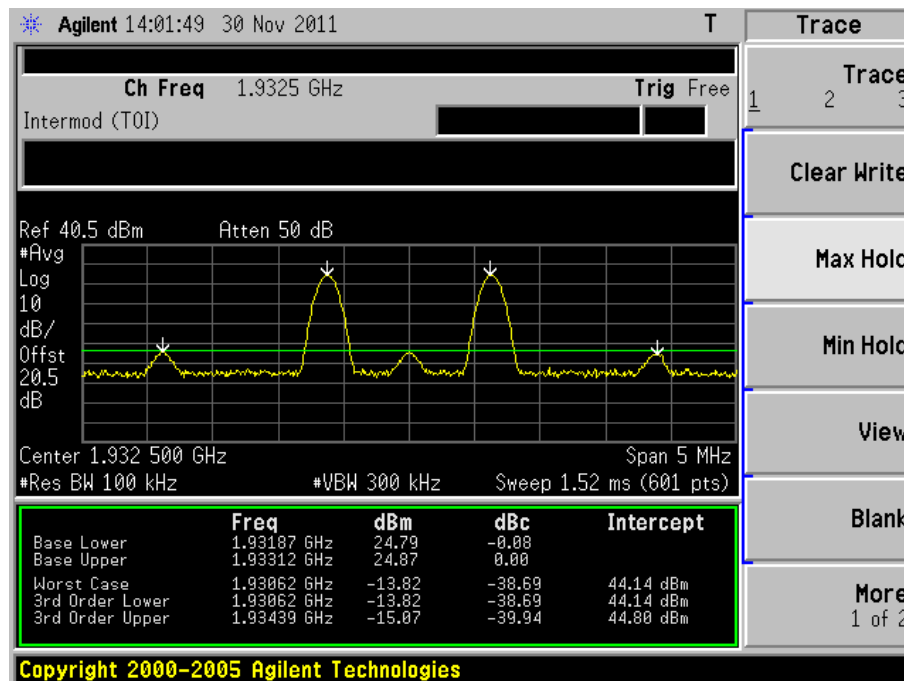
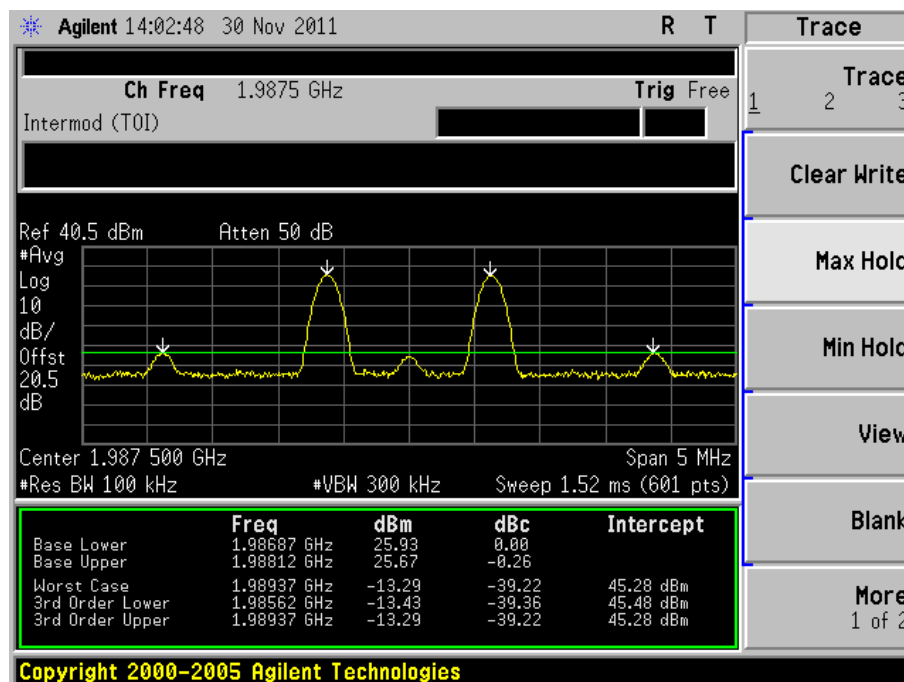


Spurious Emissions at Antenna Terminal, 1 GHz-6 GHz High Channel

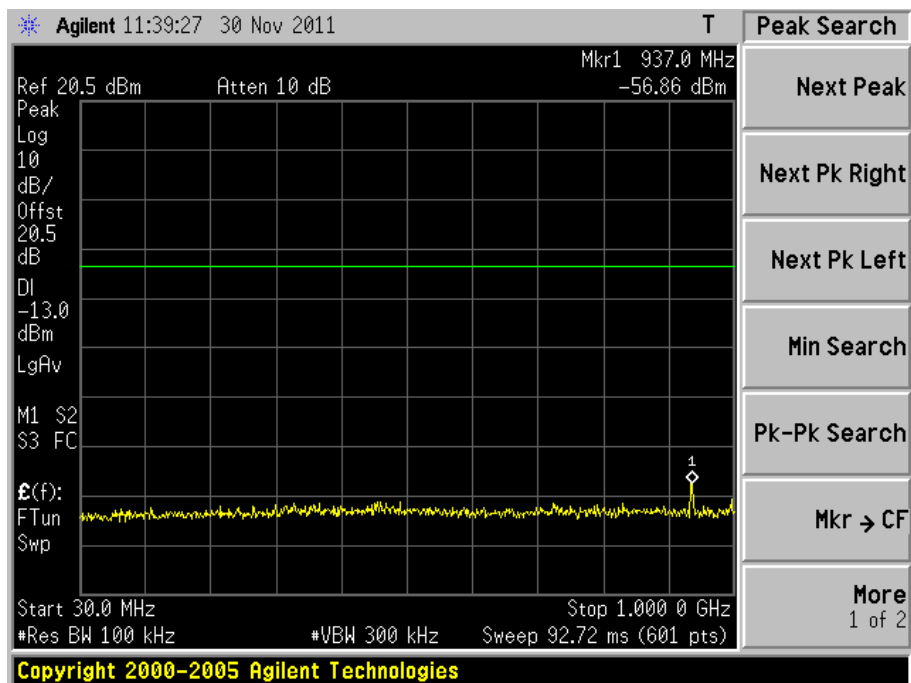


Spurious Emissions at Antenna Terminal, 6 GHz-20 GHz High Channel

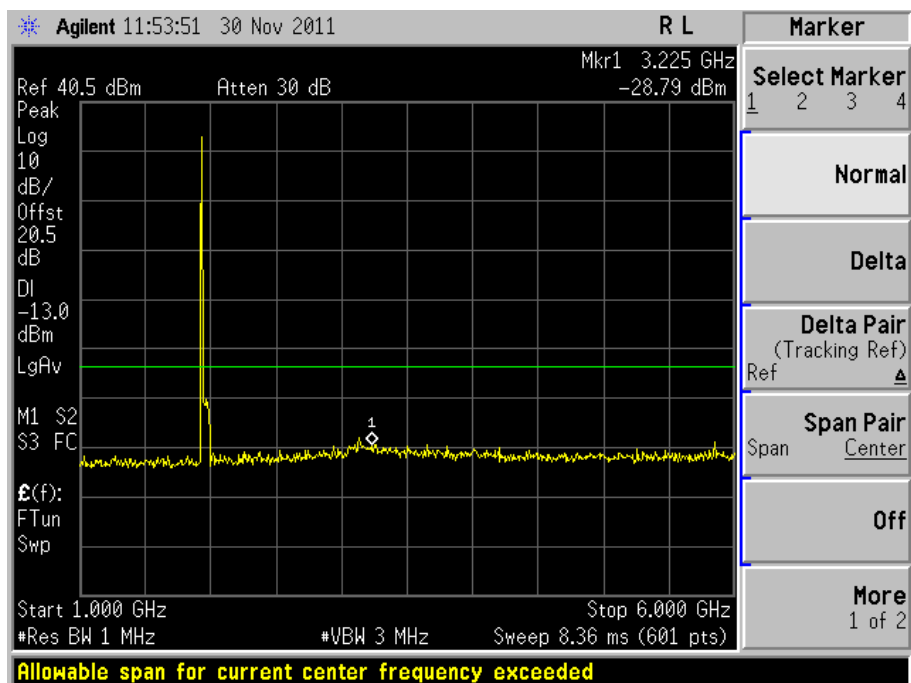


CDMA mode (Downlink)**Inter-modulation, Low-band edge****Inter-modulation, High-band edge**

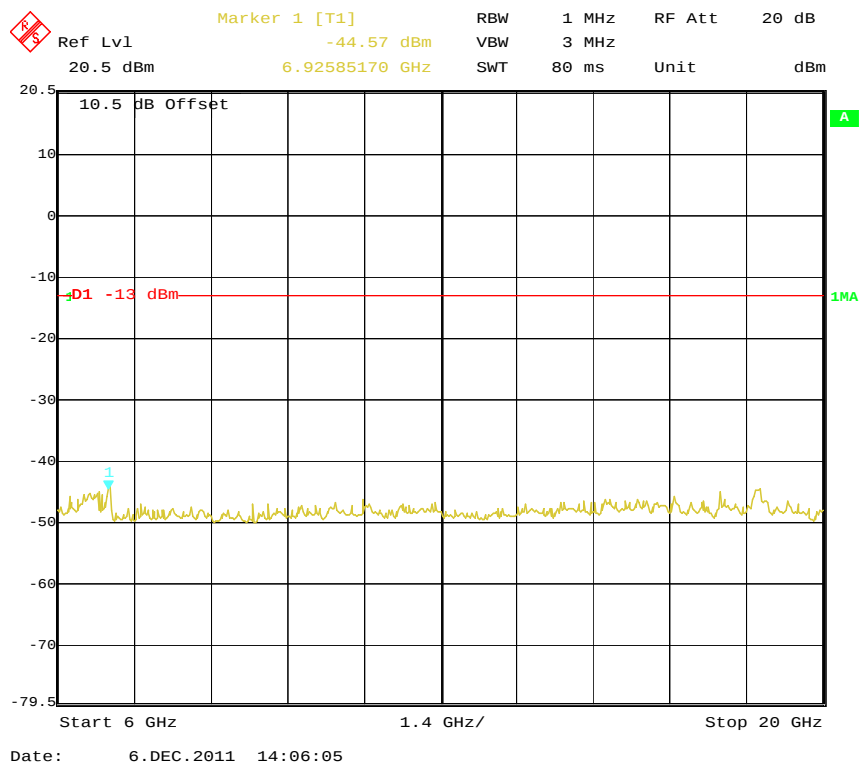
Spurious Emissions at Antenna Terminal, 30 MHz-1 GHz Low Channel



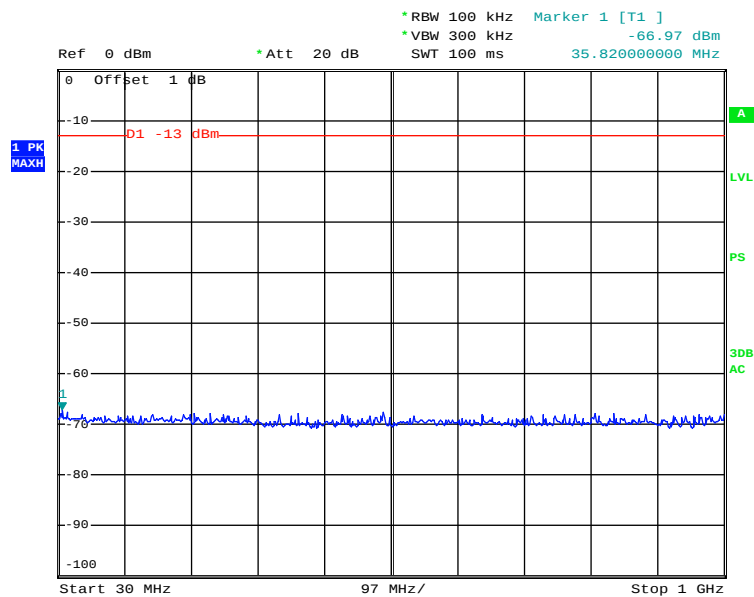
Spurious Emissions at Antenna Terminal, 1 GHz-6 GHz Low Channel



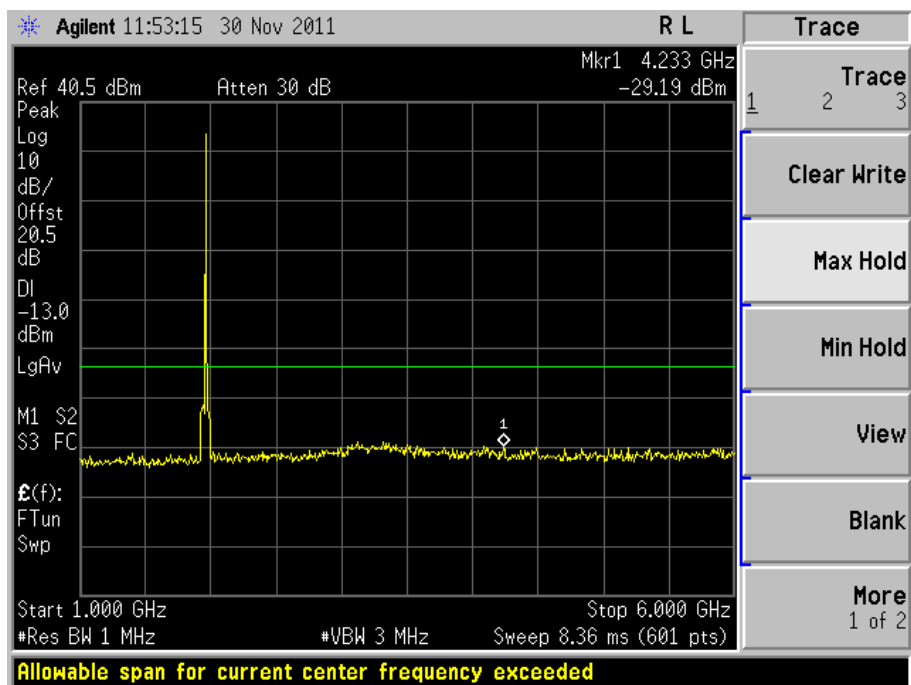
Spurious Emissions at Antenna Terminal, 6 GHz-20 GHz Low Channel



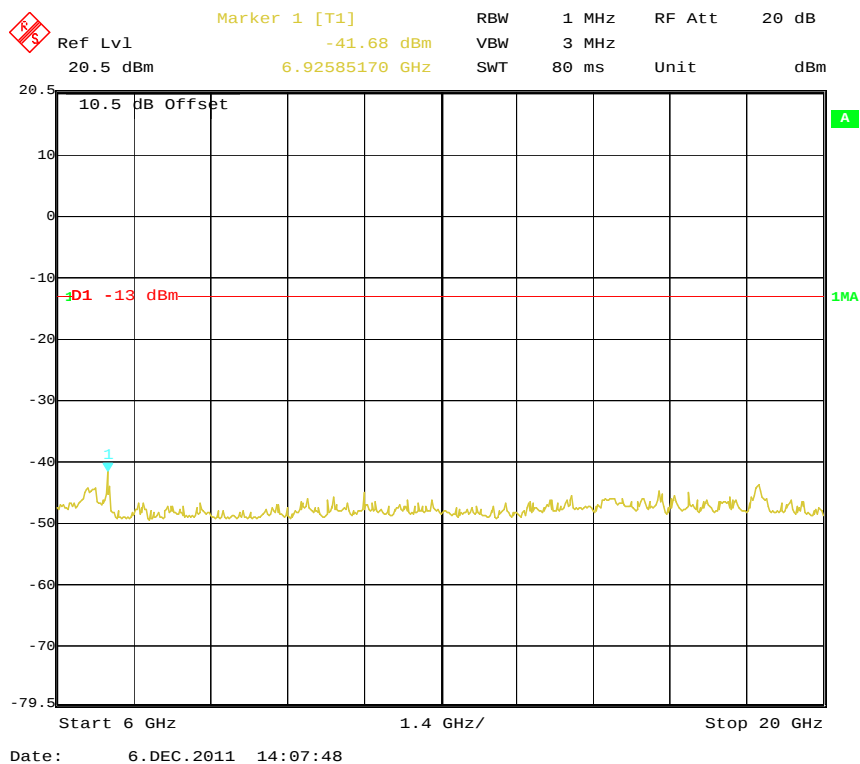
Spurious Emissions at Antenna Terminal, 30 MHz-1 GHz Middle Channel



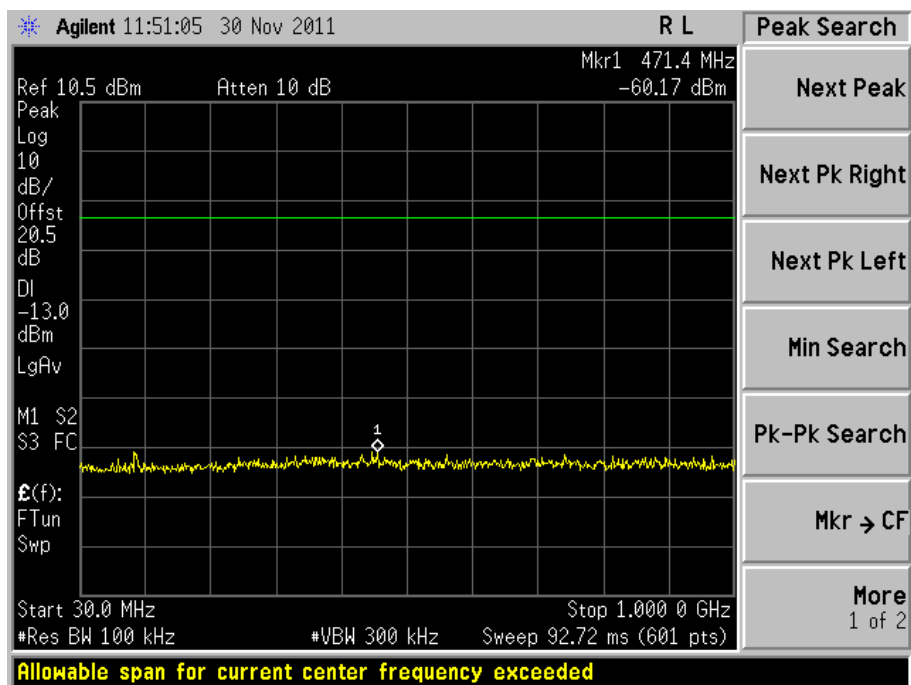
Spurious Emissions at Antenna Terminal, 1 GHz-6 GHz Middle Channel



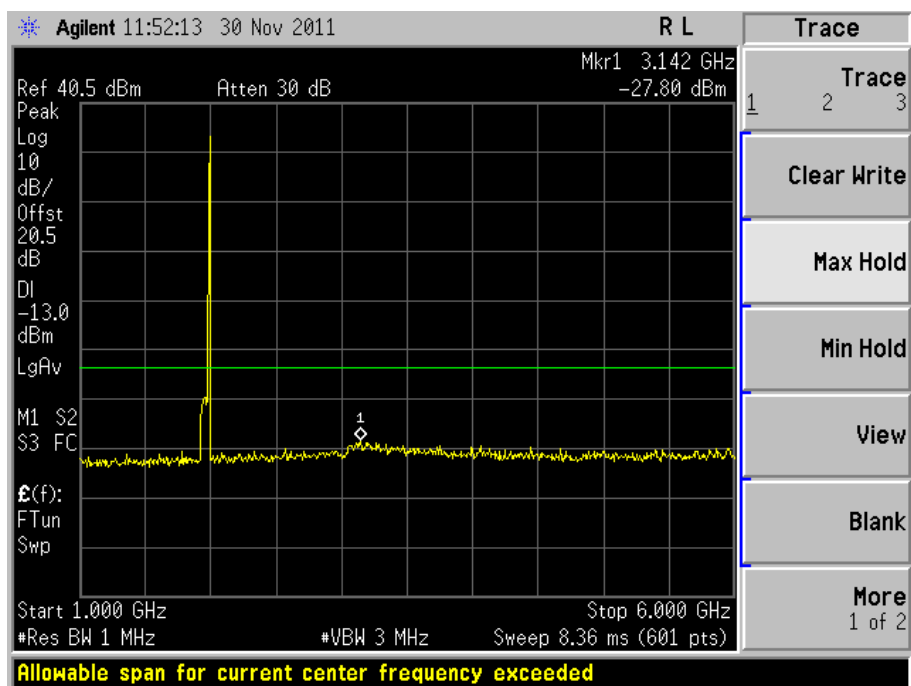
Spurious Emissions at Antenna Terminal, 6 GHz-20 GHz Middle Channel



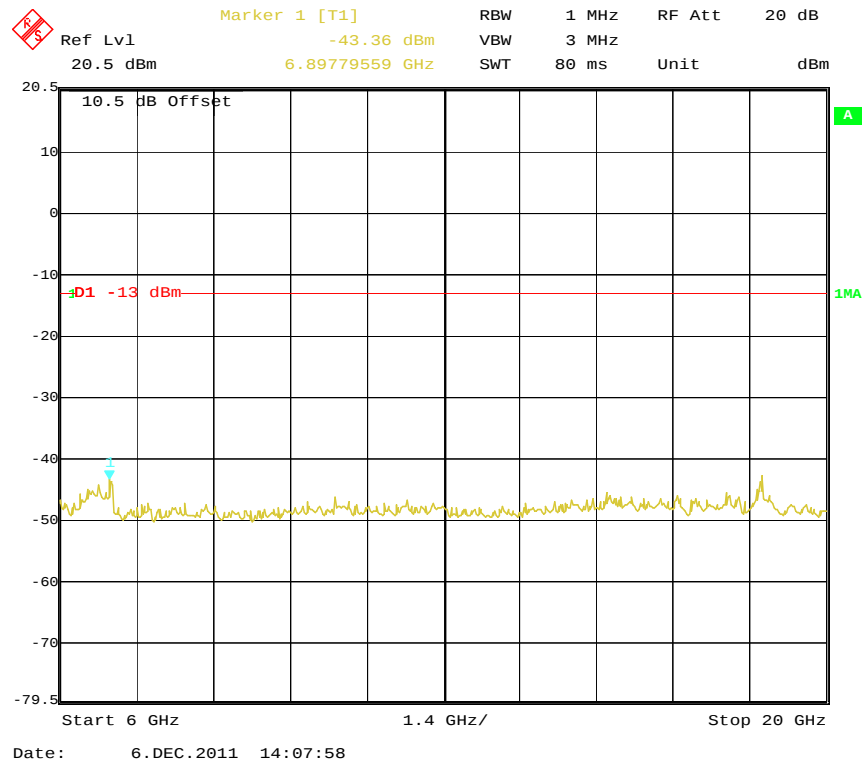
Spurious Emissions at Antenna Terminal, 30 MHz-1 GHz High Channel



Spurious Emissions at Antenna Terminal, 1 GHz-6 GHz High Channel

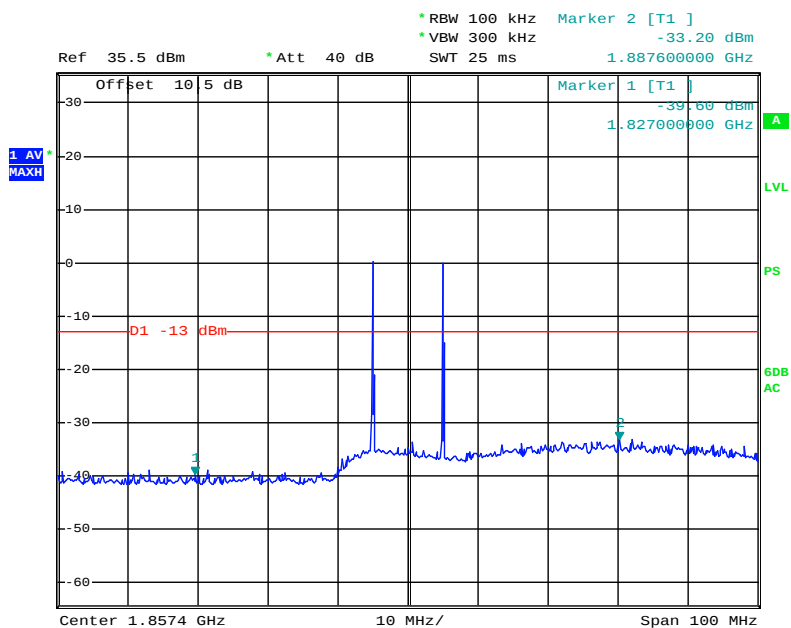


Spurious Emissions at Antenna Terminal, 6 GHz-20 GHz High Channel

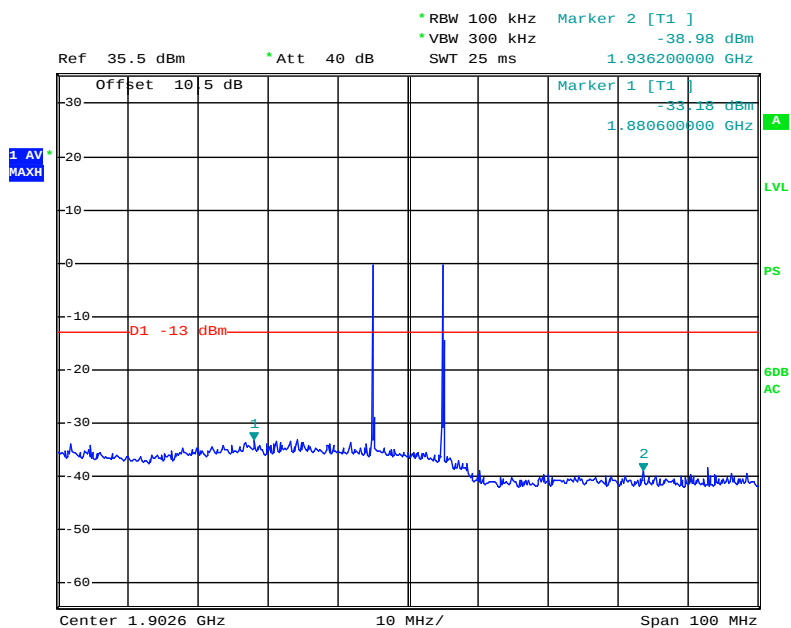


WCDMA mode (Uplink)

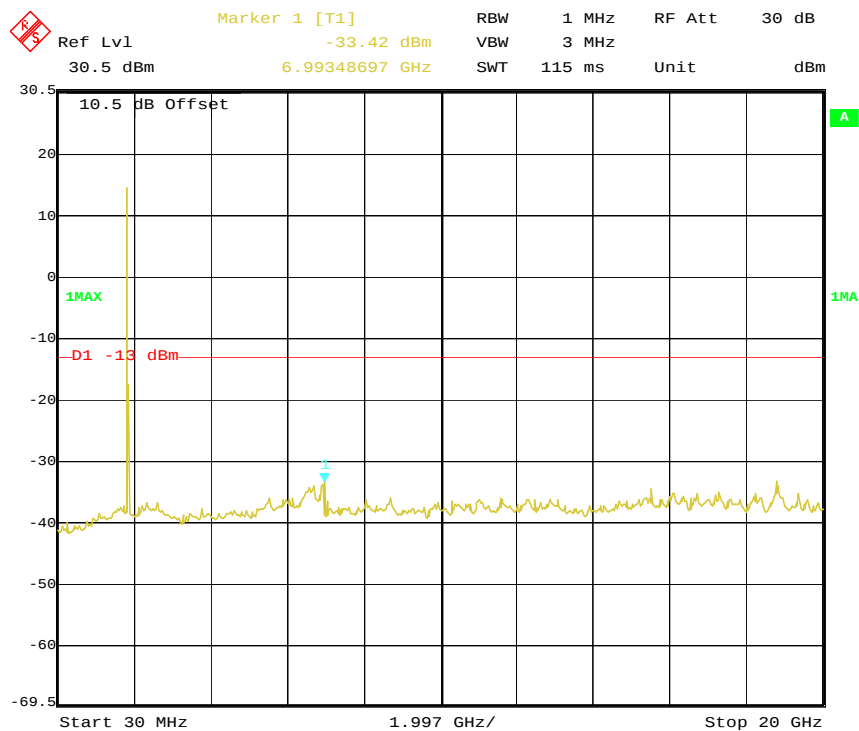
Inter-modulation, Low-band edge



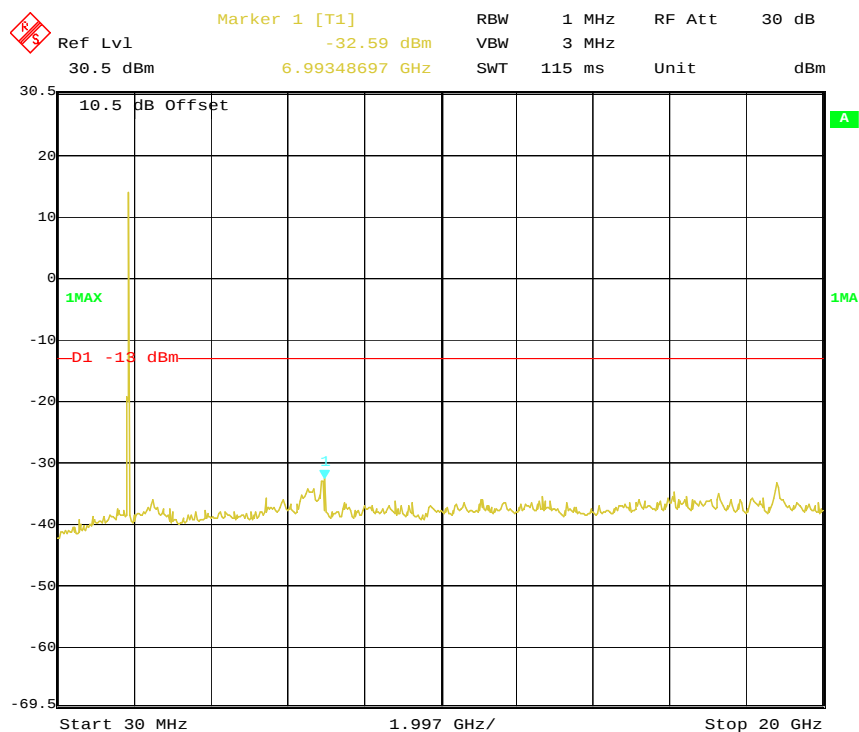
Inter-modulation, High-band edge



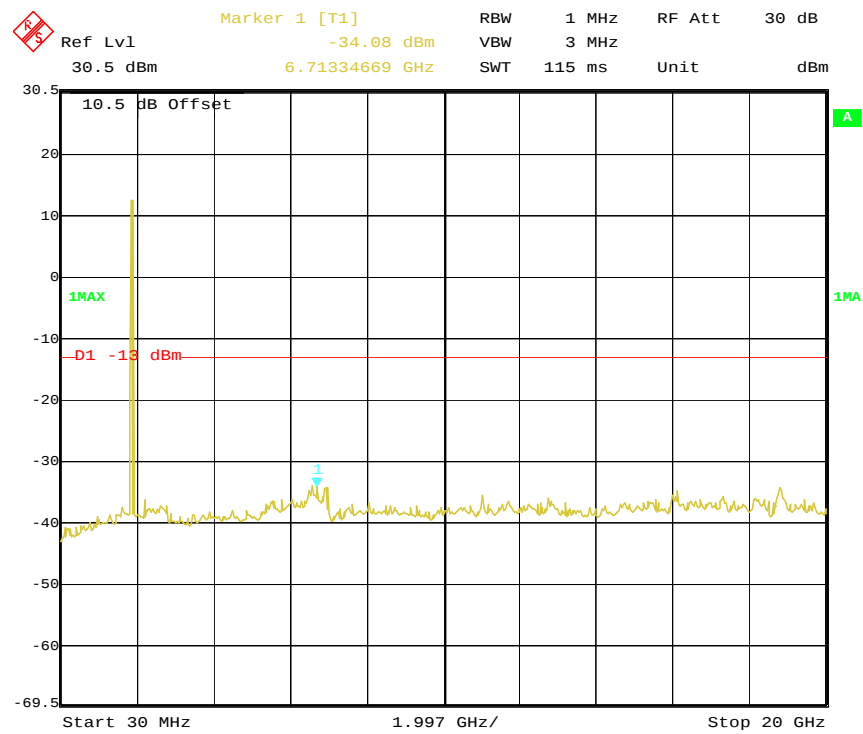
Spurious Emissions at Antenna Terminal, Low Channel



Spurious Emissions at Antenna Terminal, Middle Channel



Spurious Emissions at Antenna Terminal, High Channel

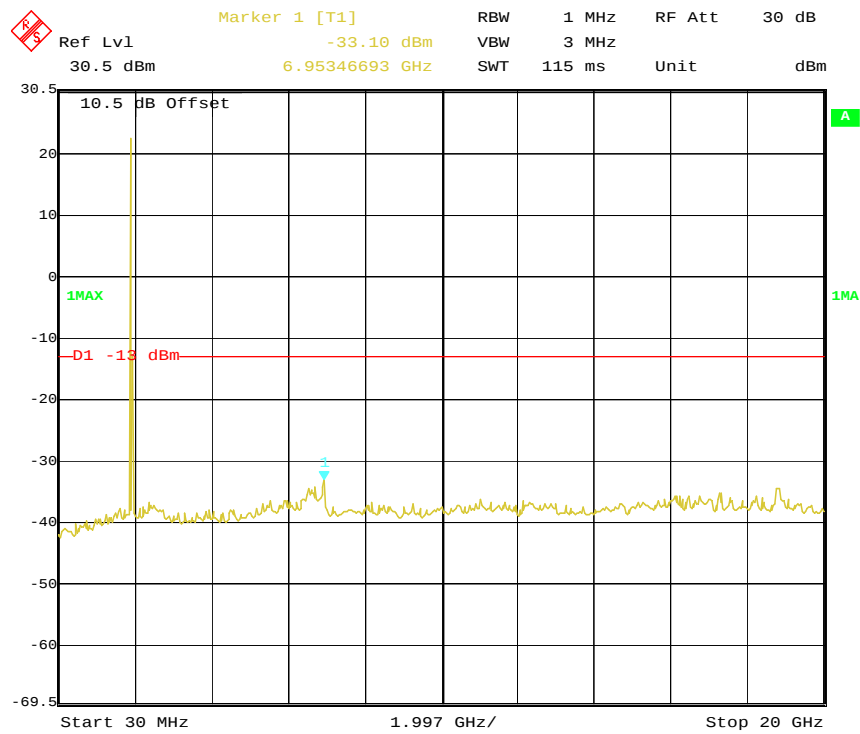


Inter-modulation, Low-band edge

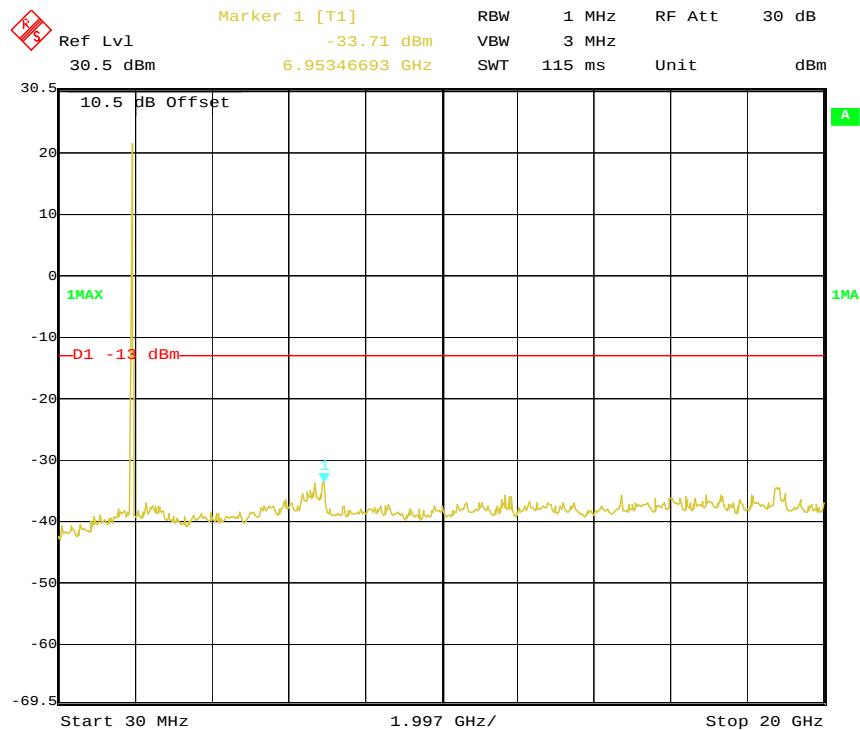


100 100 100 100 100 100 100 100 100

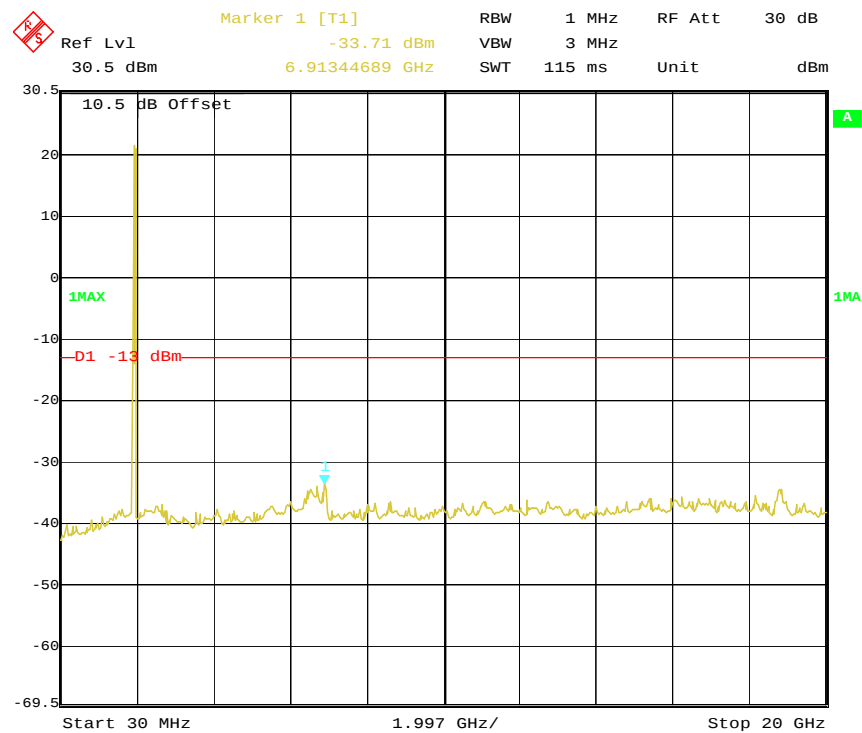
Spurious Emissions at Antenna Terminal, Low Channel



Spurious Emissions at Antenna Terminal, Middle Channel



Spurious Emissions at Antenna Terminal, High Channel



FCC §2.1053 & §24.238 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

CFR 47 § 2.1053 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 = $10 \lg(\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{ Log}_{10}(\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2011-05-05	2012-05-04
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2011-07-05	2012-07-04
Rohde & Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2011-03-08	2012-03-07
HP	Signal Generator	HP8657A	2849U00982	2011-10-28	2012-10-27
HP	Amplifier	HP8447D	2944A09795	2011-08-02	2012-08-02
HP	Synthesized Sweeper	8341B	2624A00116	2011-11-07	2012-11-06
COM POWER	Dipole Antenna	AD-100	041000	2011-09-25	2012-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2011-05-17	2012-05-17
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2011-05-05	2012-05-04

*** 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 Felix Li on 2011-11-26.

Test mode: Transmitting (Worst case mode: CDMA)

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)			
Uplink mode											
5424.84	50.11	51	1.0	H	5424.84	-43.0	8.2	1.74	-36.54	-13	23.54
5424.84	48.27	43	1.0	V	5424.84	-43.3	8.2	1.74	-36.84	-13	23.84
78.65	46.32	262	1.5	V	78.65	-48.9	0	0.10	-49.00	-13	36.00
103.11	45.31	12	1.4	V	103.11	-49.9	0	0.10	-50.00	-13	37.00
78.65	44.02	25	1.5	H	78.65	-51.2	0	0.10	-51.30	-13	38.30
103.11	43.51	12	1.5	H	103.11	-51.7	0	0.10	-51.80	-13	38.80
3464.8	34.87	205	1.7	H	3464.8	-59.4	6.7	1.39	-54.09	-13	41.09
3464.8	32.34	241	1.5	V	3464.8	-60.7	6.7	1.39	-55.39	-13	42.39
Downlink mode											
5832.46	50.02	80	1.0	H	5832.46	-44.1	8.4	1.78	-37.48	-13	24.48
5832.46	47.43	70	1.4	V	5832.46	-45.1	8.4	1.78	-38.48	-13	25.48
78.65	44.32	235	1.6	V	78.65	-50.9	0	0.10	-51.00	-13	38.00
78.65	43.63	15	1.5	H	78.65	-51.6	0	0.10	-51.70	-13	38.70
103.11	43.57	325	1.8	V	103.11	-51.6	0	0.10	-51.70	-13	38.70
103.11	42.41	45	1.5	H	103.11	-52.8	0	0.10	-52.90	-13	39.90
4264.8	31.81	105	1.5	V	4264.8	-63.1	7.6	1.57	-57.07	-13	44.07
4264.8	32.56	262	1.7	H	4264.8	-64.3	7.6	1.57	-58.27	-13	45.27

FCC §24.238(a) - BAND EDGES

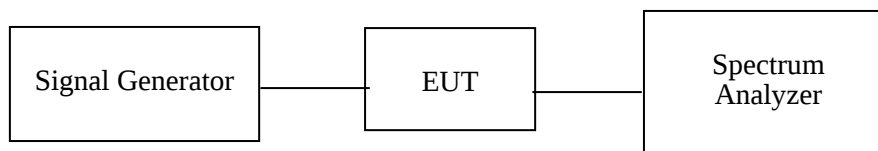
Applicable Standards

According to §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 3 kHz.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2011-11-11	2012-11-10
Rohde & Schwarz	Signal Analyzer	FSIQ 26	609358	2011-07-08	2012-07-07
Agilent	PSA Series Spectrum Analyzer	E4443A	MY45300749	2011-10-28	2012-10-27
Agilent	ESG-D Series Signal Generator	E4432B	GB40051703	2011-10-28	2012-10-27
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2011-11-11	2012-11-10

*** 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 Felix Li on 2011-12-02.

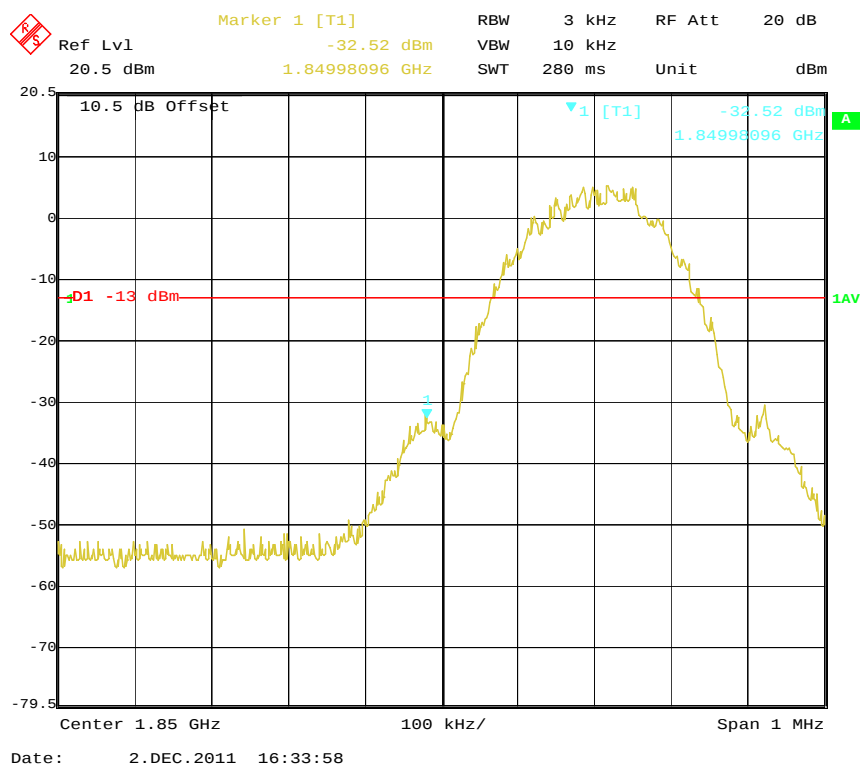
Please refer to the following tables and plots.

GSM mode:

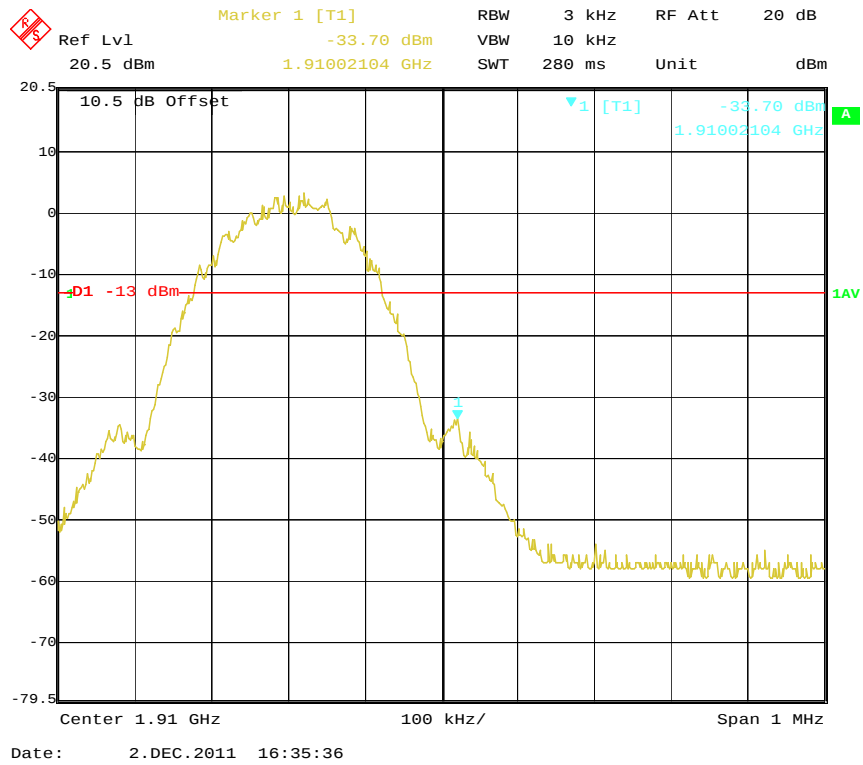
PCS Band (Part 24E)

Mode	Frequency (MHz)	Emissions (dBm)	Limit (dBm)
Uplink	1849.980	-32.52	-13
	1910.021	-33.70	-13
Downlink	1929.981	-24.18	-13
	1990.017	-20.26	-13

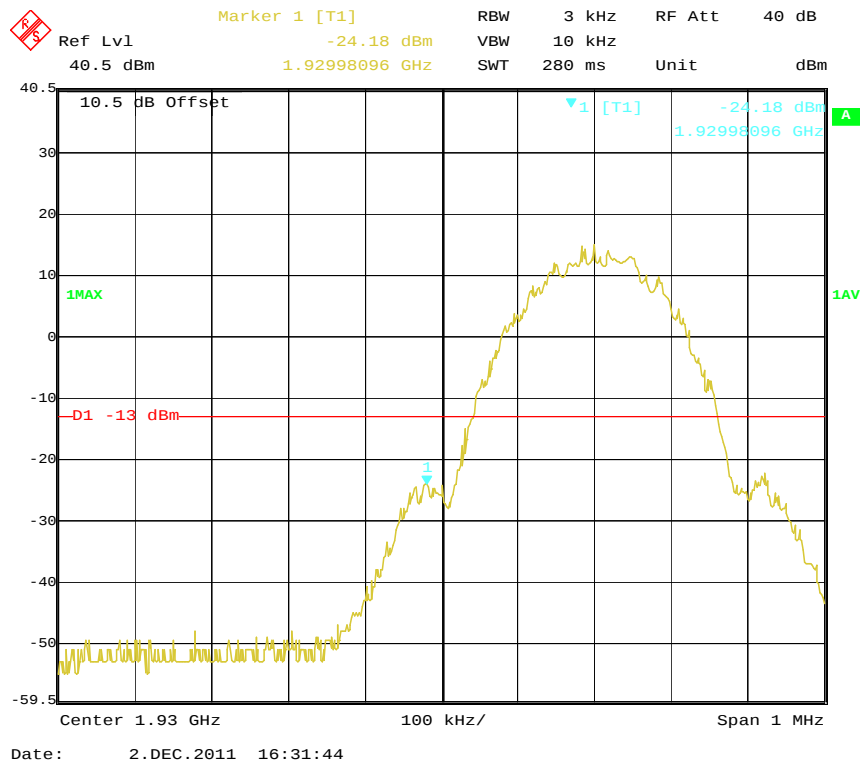
PCS Band, Lowest Channel, uplink mode

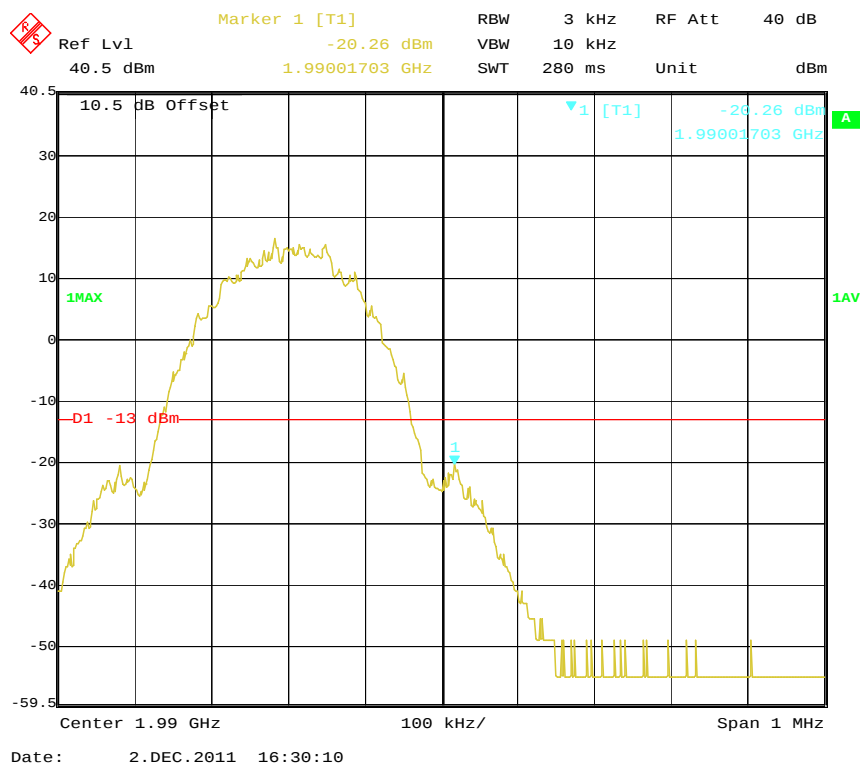


PCS Band, Highest Channel, uplink mode



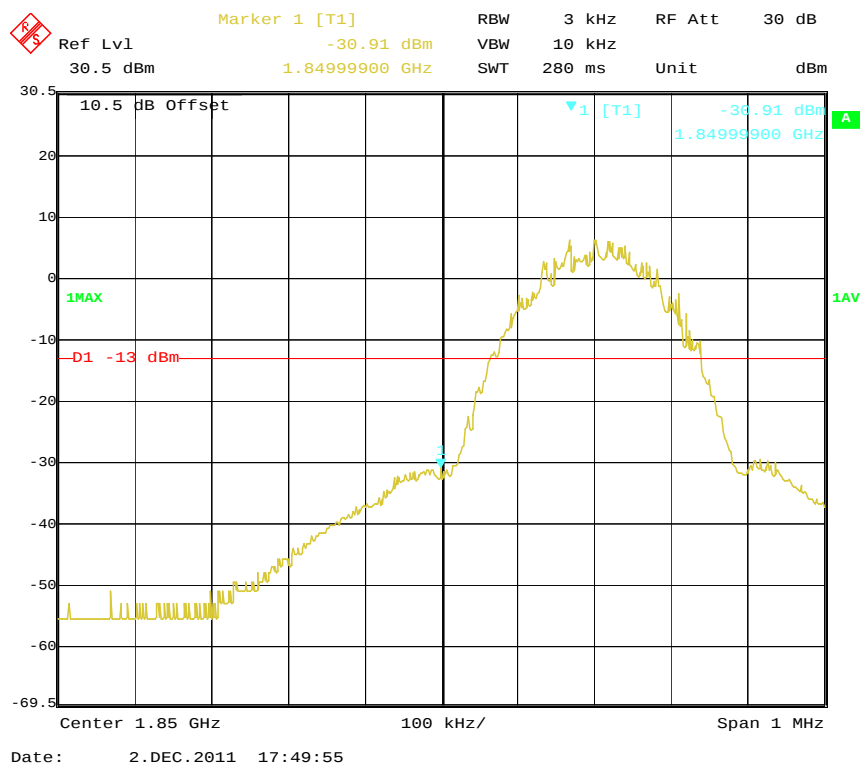
PCS Band, Lowest Channel, downlink mode



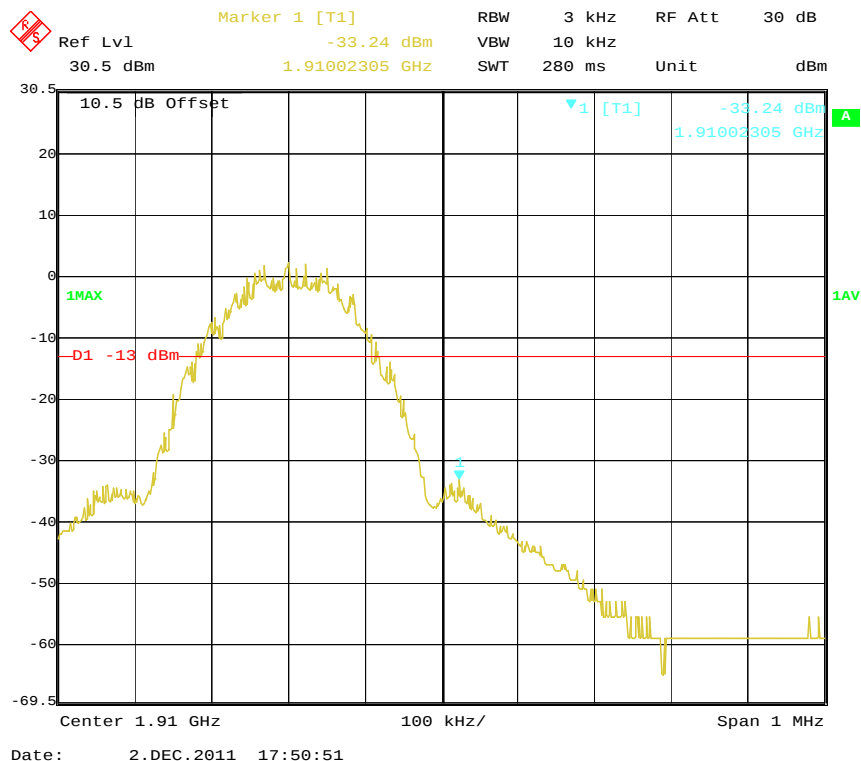
PCS Band, Highest Channel, downlink mode**EDGE mode:****PCS Band (Part 24E)**

Mode	Frequency (MHz)	Emissions (dBm)	Limit (dBm)
Uplink	1849.999	-30.91	-13
	1910.023	-33.24	-13
Downlink	1929.994	-23.93	-13
	1990.035	-22.39	-13

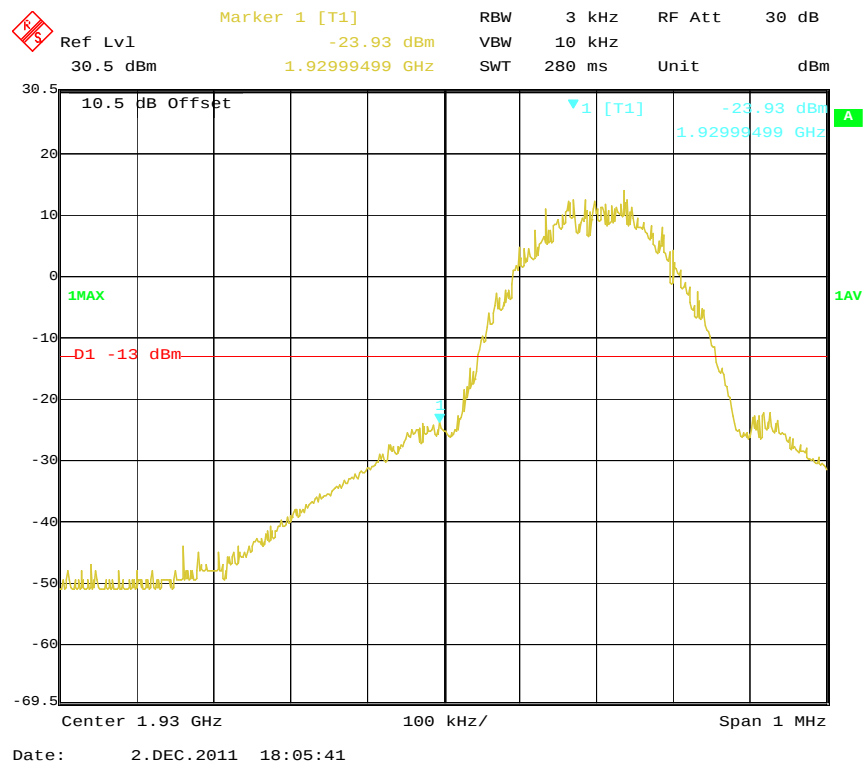
PCS Band, Lowest Channel, uplink mode



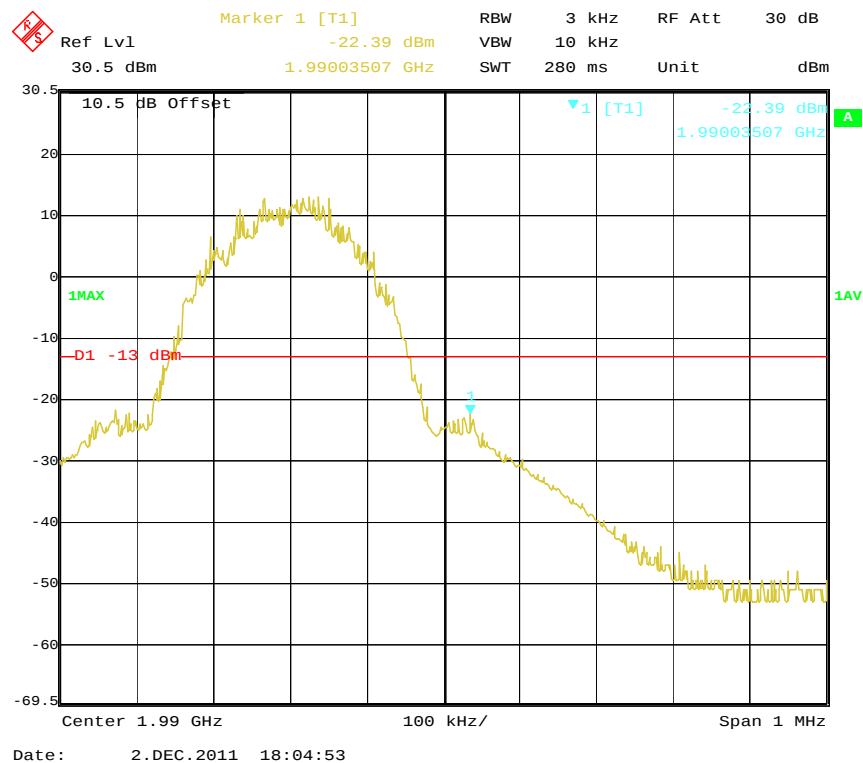
PCS Band, Highest Channel, uplink mode



PCS Band, Lowest Channel, downlink mode

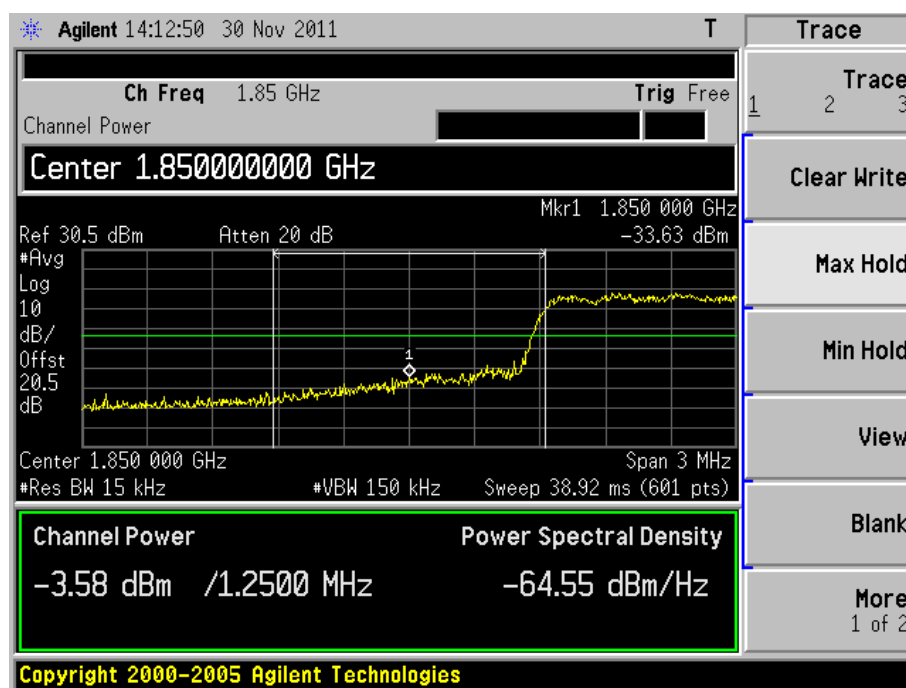


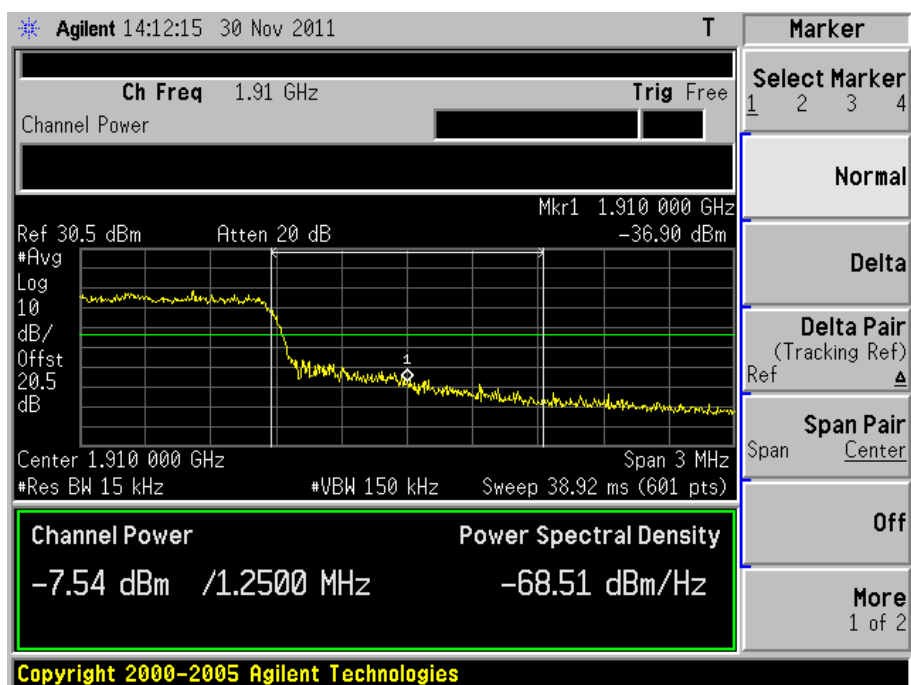
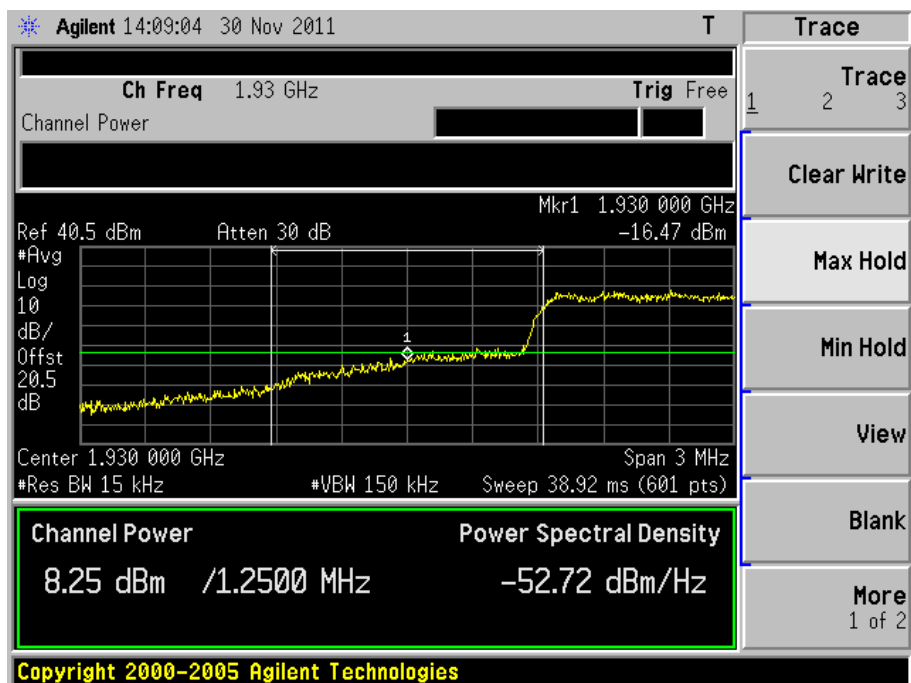
PCS Band, Highest Channel, downlink mode

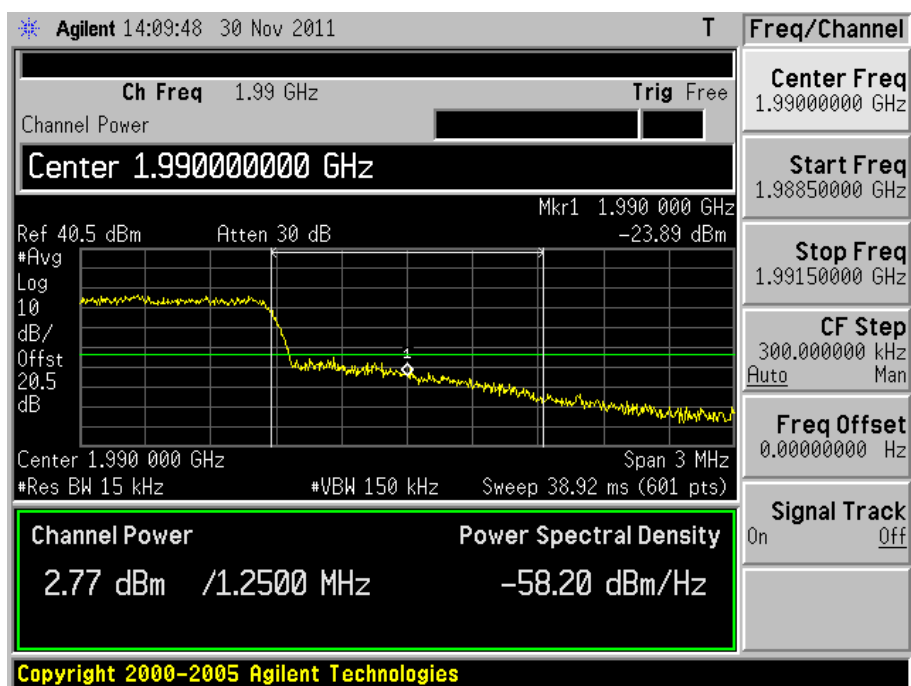


CDMA mode:**PCS Band (Part 24E)**

Mode	Frequency (MHz)	Emissions (dBm)	Limit (dBm)
Uplink	1850.000	-33.63	-13
	1910.000	-36.90	-13
Downlink	1930.000	-16.47	-13
	1990.000	-23.89	-13

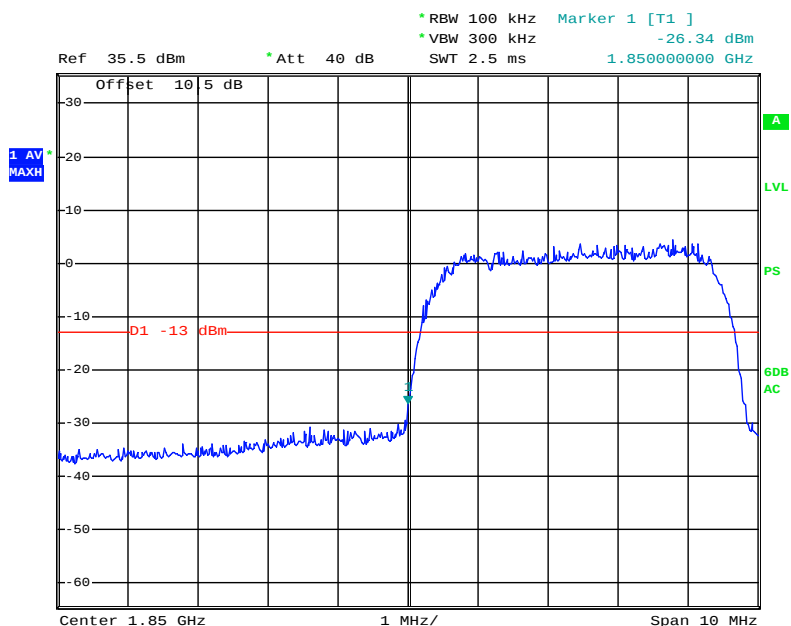
PCS Band, Lowest Channel, uplink mode

PCS Band, Highest Channel, uplink mode**PCS Band, Lowest Channel, downlink mode**

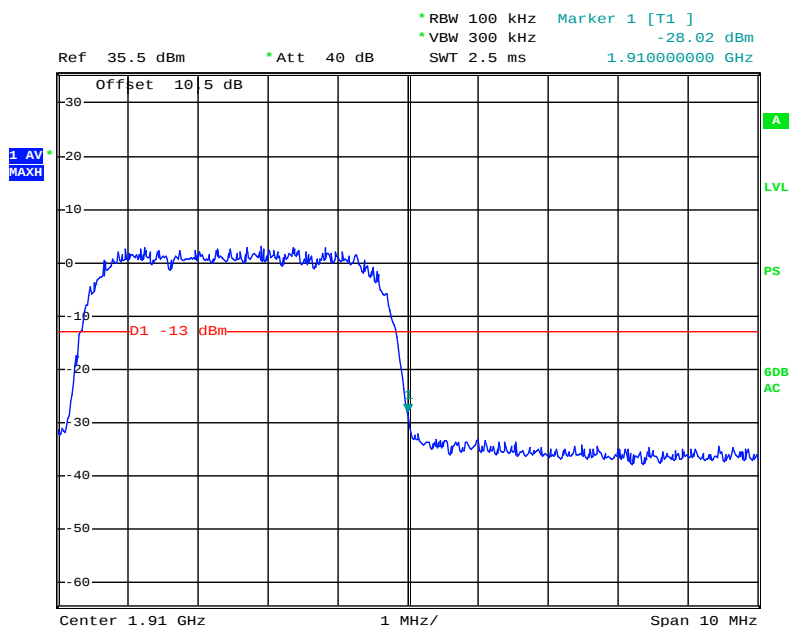
PCS Band, Highest Channel, downlink mode**WCDMA mode:****PCS Band (Part 24E)**

Mode	Frequency (MHz)	Emissions (dBm)	Limit (dBm)
Uplink	1850.000	-26.34	-13
	1910.000	-28.02	-13
Downlink	1930.000	-16.76	-13
	1990.000	-20.21	-13

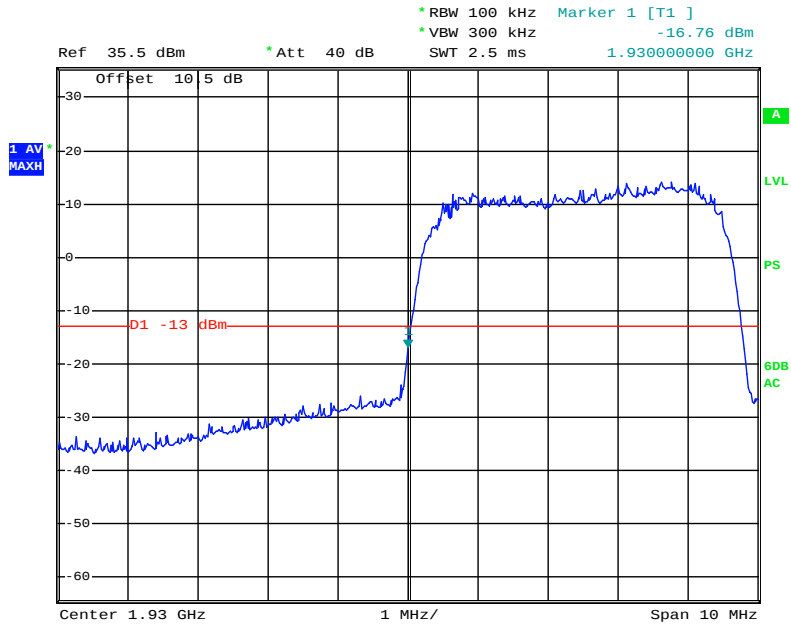
PCS Band, Lowest Channel, uplink mode



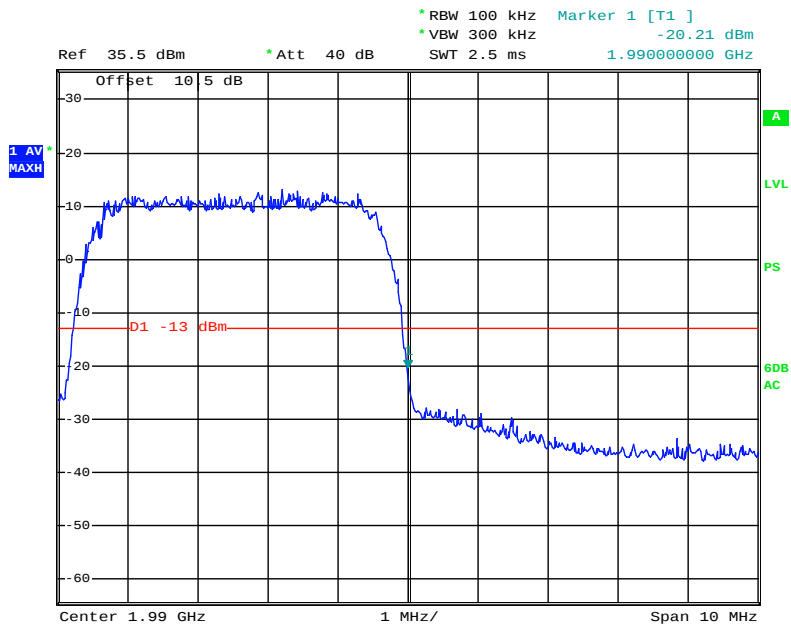
PCS Band, Highest Channel, uplink mode



PCS Band, Lowest Channel, downlink mode



PCS Band, Highest Channel, downlink mode



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