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TEST REPORT For FCC

Test Report No. : 2008110038
Date of Issue : November 26, 2008
FCC ID : A3LSCS-26UC2
Model/Type No. : SCS-26UC2
Classification : PCS Licensed Transmitter(PCB)
Applicant : Samsung Electronics Co., Ltd.
Applicant Address : Maetan-3 dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742, Korea
Manufacturer : Samsung Electronics Co., Ltd.
Manufacturer Address : Maetan-3 dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742, Korea
Contact Person : Duk-Hun, Kim
Telephone : +82-31-279-3509
Received Date : November 10, 2008
Test period : Start : November 11, 2008 End : November 26, 2008
Test Results : ☒ In Compliance ☐ Not in Compliance

The test results presented in this report relate only to the object tested.

Tested by

Hyun-Chae, You
Test Engineer
Date: November 26, 2008

Reviewed by

Young-Joon, Park
Technical Manager
Date: November 26, 2008



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REPORT REVISION HISTORY

Date	Revision	Page No
November 26, 2008	Issued (2008110038)	All

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TEST REPORT

1. 1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

2.1 General Information

Classification	: PCS Licensed Transmitter(PCB)
EUT Type	: Indoor Base Station Transceiver System
FCC Rule Part(s)	: §2; §24(E)
Model name	: SCS-26UC2
Serial number	: Identical prototype
Emission Designators:	: PCS CDMA : 1M25F9W
Tx Freq. Range	: 1931.25 ~ 1988.75 MHz (PCS CDMA)
Rx Freq. Range	: 1851.25 ~ 1908.75 MHz (PCS CDMA)
Modulation(s):	: PCS CDMA
Frequency Tolerance:	: ± 0.00025 % (2.5ppm)
Maximum Output Power	: PCS CDMA : 17.47dBm for 1xRTT
Maximum ERP/EIRP	: PCS CDMA : 19.50dBm for 1xRTT
Power Source	: DC 12V, 1.5A from AC/DC adapter
Operator Selection of Frequency	: Software Controlled
Power Output Adjustment Capability:	: Software Controlled



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3.1 DESCRIPTION OF TESTS

3.1.1 Occupied Bandwidth Emission Limits

- (a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB.
- (b) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- (c) The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

3.1.2 Occupied Bandwidth

The 99% power bandwidth was measured with a calibrated spectrum analyzer.

3.1.3 Spurious and Harmonic Emissions at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to 10 GHz (PCS Mode: 20GHz).

3.1.4 Frequencies

At the input terminals of the spectrum analyzer, an isolator (RF pad) and a high-pass filter are connected between the test transceiver (for conducted tests) or the receive antenna (for radiated tests) and the analyzer. The high-pass filter is to limit the fundamental frequency from interfering with the measurement of low-level spurious and harmonic emissions and to ensure that the preamplifier is not saturated.

3.1.5 Radiation Spurious and Harmonic Emissions

Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna.

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

3.1.6 Frequency Stability / Temperature Variation.

The frequency stability of the transmitter is measured by:

- a) **Temperature** :The temperature is varied from -30°C to + 60°C using an environmental chamber.
- b) **Primary Supply Voltage** :The primary supply voltage is varied from 85% to 115% of the voltage Normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification –The minimum frequency stability shall be +/- 0.00025% at any time during normal operation.

Specification — The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025 (\pm 2.5 \text{ ppm})$ of the center frequency.



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Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27 °C to provide a reference)
2. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at -30°C(usually 14-16 hours),the equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency to the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements is made at 10°C interval up to room temperature. At least a period of one and one half hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency were made at 10 intervals starting at -30°C up to +60°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

3.1.7 Radiated Emission

Final test was performed according to ANSI C63.4-2003 at the open field test site. There are no deviations from the standard.

The EUT was placed in a 0.8m high table along with the peripherals. The turn table was separated from the antenna distance 3meters. Cables were placed in a position to produce maximum emissions as determined by experimentation, and operation mode was selected for maximum.

The frequencies and amplitudes of maximum emission were measured at varying azimuths, antenna heights and antenna polarities. Reported are maximized emission levels.

These tests were performed at 120kHz of 6dB bandwidth.

4.1 TEST DATA

4.1.1 Conducted Output Power

The output power was measured under all R.C.s and S.O.s which are listed below measurement data.

The worst case output power is reported with SO9 of RC3 for CDMA band.

The worst case output power is reported with SO9 of RC3 for PCS band.

1. 1X RRT

- Test Mode : SO2 of RC1, SO2 of RC2, SO9 of RC3 and SO9 of RC5
- other configurations supported by the DUT
- power control - Software Controlled

- Measurement data

Band	Channel	1xRTT			
		RC1	RC2	RC3	RC5
		SO2	SO2	SO9	SO9
PCS	25	17.31	17.34	17.47	17.41
	600	17.30	17.29	17.41	17.38
	1175	16.03	16.02	16.01	16.04

Beacon	25	16.08	16.08	16.11	16.11
	600	16.27	16.25	16.39	16.34
	1175	14.52	14.55	14.63	14.60

*Unit is dBm



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4.1.2 Equivalent Isotropic Radiated Power (E.I.R.P) PCS CDMA

- Modulation: PCS CDMA(1xRTT)

Freq. Tuned (MHz)	Measured Level (dBm)	REF. LEVEL (dBm)	Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	EIRP (W)	Supplied Power
1931.25	-21.38	11.50	8.0	V	19.50	0.089	AC 110V
1960.00	-21.41	11.47	8.0	V	19.47	0.089	AC 110V
1988.75	-22.86	10.13	8.0	V	18.13	0.065	AC 110V

- Modulation: Beacon Signal

Freq. Tuned (MHz)	Measured Level (dBm)	REF. LEVEL (dBm)	Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	EIRP (W)	Supplied Power
1931.25	-22.54	10.12	8.0	V	18.12	0.065	AC 110V
1960.00	-22.36	10.30	8.0	V	18.30	0.068	AC 110V
1988.75	-24.01	8.90	8.0	V	16.90	0.049	AC 110V

NOTES:

Equivalent Isotropic Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer.

A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The EIRP is recorded.

*This devices was tested all R.C.s and S.O.s and the worst case is Reported with RC3/SO9

4.1.3 PCS CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY : 1931.25 MHz
 CHANNEL : 25(Low)
 MEASURED OUTPUT POWER : 17.47 dBm = 0.056 W
 MODULATION SIGNAL : PCS CDMA (Internal)
 DISTANCE : 3 meters
 LIMIT : $43 + 10 \log_{10} (W) = \underline{\quad 30.48 \quad}$ dBc

Remarks

The worst mode (1xRTT(S09, RC3)) for final test.

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3782.70	-38.63	9.6	-29.03	V	-46.50
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

NOTES:

Radiated Spurious Emission Measurements by Substitution Method
 according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.



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4.1.3 PCS CDMA Radiated Measurements

(Continued...)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY : 1960.00 MHz
CHANNEL : 600(Mid)
MEASURED OUTPUT POWER : 17.41 dBm = 0.055 W
MODULATION SIGNAL : PCS CDMA (Internal)
DISTANCE : 3 meters
LIMIT : $43 + 10 \log_{10} (W) = 30.40$ dBc

Remarks

The worst mode (1xRTT(SO9, RC3)) for final test.

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3840.45	-41.71	9.6	-32.11	V	-49.52
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

NOTES:

Radiated Spurious Emission Measurements by Substitution Method
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.



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4.1.3 PCS CDMA Radiated Measurements (Continued...)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY : 1988.75 MHz
CHANNEL : 1175(High)
MEASURED OUTPUT POWER : 16.01 dBm = 0.040 W
MODULATION SIGNAL : PCS CDMA (Internal)
DISTANCE : 3 meters
LIMIT : $43 + 10 \log_{10} (W) = 29.02$ dBc

The worst mode (1xRTT(S09, RC3)) for final test.

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3897.85	-45.02	9.6	-35.42	V	-51.43
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.



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4.1.4 Beacon signal Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY : 1931.25 MHz
CHANNEL : 25(Low)
MEASURED OUTPUT POWER : 16.11 dBm = 0.041 W
MODULATION SIGNAL : PCS CDMA (Internal)
DISTANCE : 3 meters
LIMIT : $43 + 10 \log_{10} (W) = 29.13$ dBc

Remarks

The worst mode (1xRTT(SO9, RC3)) for final test.

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3782.70	-39.10	9.6	-29.50	V	-45.61
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

NOTES:

Radiated Spurious Emission Measurements by Substitution Method
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Beacon signal Radiated Measurements (Continued)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY : 1960.00 MHz
CHANNEL : 600(Mid)
MEASURED OUTPUT POWER : 16.39 dBm = 0.044 W
MODULATION SIGNAL : PCS CDMA (Internal)
DISTANCE : 3 meters
LIMIT : $43 + 10 \log_{10} (W) = 29.43$ dBc

Remarks

The worst mode (1xRTT(SO9, RC3)) for final test.

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3840.45	-44.61	9.6	-35.01	V	-51.40
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

NOTES:

Radiated Spurious Emission Measurements by Substitution Method
according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

4.1.3 Beacon signal Radiated Measurements (Continued)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY : 1988.75 MHz
 CHANNEL : 1175(High)
 MEASURED OUTPUT POWER : 14.63 dBm = 0.029 W
 MODULATION SIGNAL : PCS CDMA (Internal)
 DISTANCE : 3 meters
 LIMIT : $43 + 10 \log_{10} (W) = 27.62$ dBc

The worst mode (1xRTT(S09, RC3)) for final test.

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3897.85	-45.09	9.6	-35.49	V	-50.12
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.



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4.1.5 Frequency Stability PCS CDMA (1xRTT)

OPERATING FREQUENCY : 1,959,999,086 Hz
CHANNEL : 600(Mid)
Test Mode : 1xRTT
REFERENCE VOLTAGE : 110 VAC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ (Hz)	Deviation (%)
100%	110	+25(Ref)	1,959,999,086	0.000000
100%		-30	1,959,999,017	-0.000004
100%		-20	1,959,999,031	-0.000003
100%		-10	1,959,999,044	-0.000002
100%		0	1,959,999,066	-0.000001
100%		+10	1,959,999,080	0.000000
100%		+20	1,959,999,083	0.000000
100%		+25	1,959,999,086	0.000000
100%		+30	1,959,999,106	0.000001
100%		+40	1,959,999,111	0.000001
100%		+50	1,959,999,123	0.000002
100%		+60	1,959,999,141	0.000003
85%	93.5	+25	1,959,999,088	0.000000
115%	126.5	+25	1,959,999,084	0.000000
BATT.ENDPOINT	-	+25	-	-



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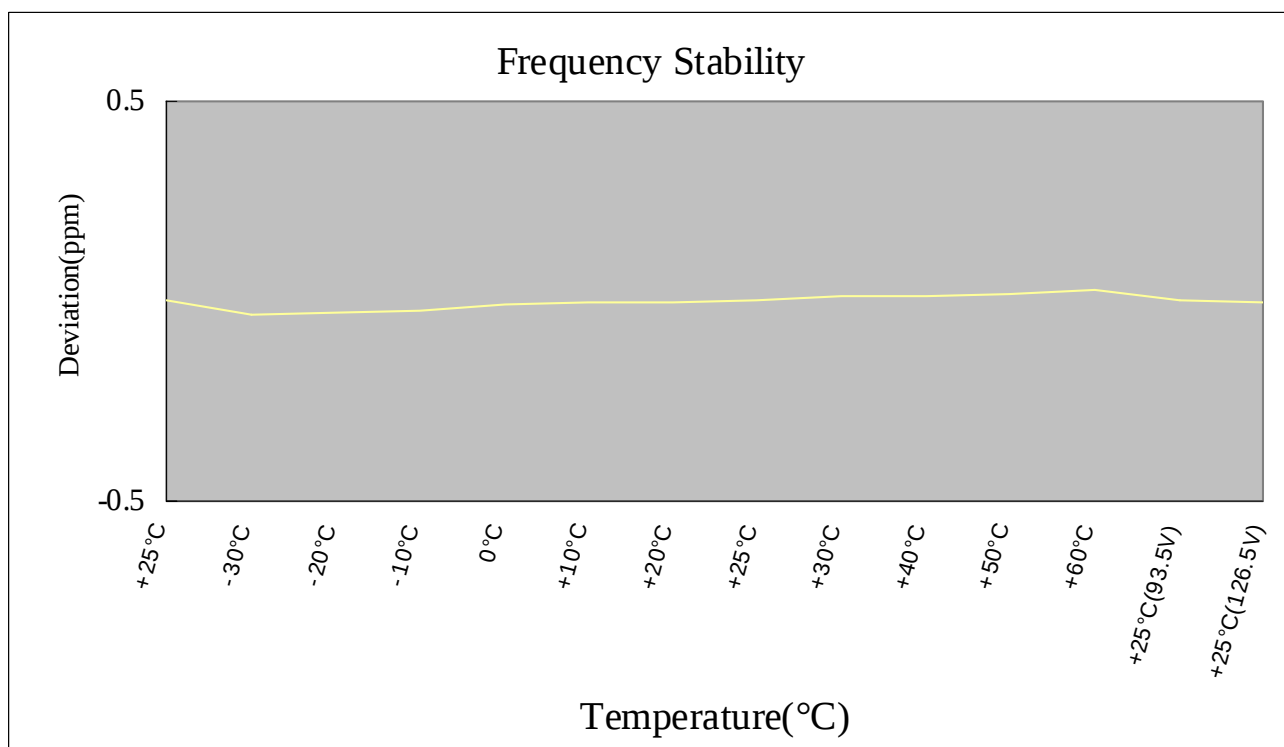
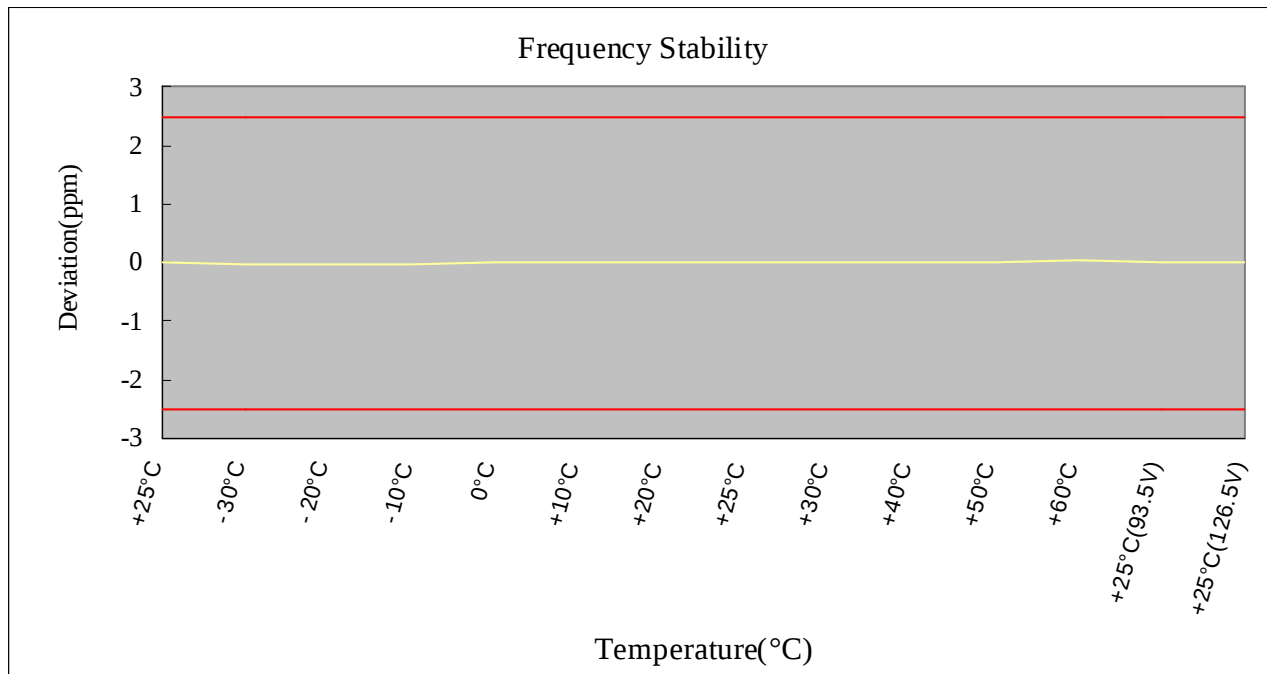
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4.1.5 Frequency Stability

(Continued...)





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5.1 PLOTS OF EMISSIONS

(SEE ATTACHMENT "Test Plots")



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6.1 LIST OF TEST EQUIPMENT

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
1	Spectrum Analyzer	Agilent	N9020A	MY48011598	2009-10-29
2	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2009-10-31
4	EMI Test Receiver	Rohde & Schwarz	ESVS30	826638/008	2009-03-07
5	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2009-06-12
6	LOOP ANTENNA	EMCO	6502	9107-2652	2010-10-13
7	LOOP ANTENNA	EMCO	6502	9607-3020	2009-03-06
8	System Power Supply	HP	6032A	3440A-10521	2009-07-07
9	EPM Series Power Meter	HP	E4418A	GB38272734	2009-10-31
10	Power Sensor	HP	8481A	331BA92056	2009-11-10
11	Power Sensor	HP	8482B	331BA05406	2009-11-10
12	Audio Analyzer	HP	8903B	2747A03432	2009-11-03
13	ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2009-10-31
14	SYNTHESIZED SWEEPER	HP	8341B	2819A01563	2009-10-31
15	Modulation Analyzer	HP	8901B	3438A05228	2009-11-07
16	Attenuator	HP	8494A	3308A33351	2009-10-31
18	Temp&Humi Chamber	Kunpoong	KP-1000	2002KP050041	2009-01-21
19	Temp&Humi Chamber	Kunpoong	KP-RC2000	2002KP650042	2009-01-21
20	EMC Analyzer	Agilent	E7405A	MY45110859	2009-01-21
21	Horn Antenna	ETS-Lindgren	3115	00078894	2008-11-29
22	Horn Antenna	ETS-Lindgren	3115	00078895	2008-11-29
23	Horn Antenna	ETS-Lindgren	3116	00062504	2008-11-27
24	Horn Antenna	ETS-Lindgren	3116	00062916	2008-11-27
25	Dipole Antenna	SCHWARZBECK	VHA 9103	VHA91032557	2009-11-27
26	Dipole Antenna	SCHWARZBECK	UHA 9105	UHA91052417	2009-11-27
27	OPT H64 AMPLIFIER	HP	8447F	3113A06814	2009-03-13
28	PREAMPLIFIER	Agilent	8449B	3008A02307	2009-10-31
29	Radio Communication Tester	Rohde & Schwarz	CMU200	106765	2009-02-14
30	Band Reject Filter	Wainwright Instruments	WRCG824	-	2009-04-01
31	Band Reject Filter	Wainwright Instruments	WRCG1750	-	2009-04-01



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7.1 SAMPLE CALCULATIONS

A. Emission Designator

- PCS CDMA Band

Emission Designator = 1M25F9W

PCS CDMA 1xRTT BW = 1.250 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

(Measured at the 99% power bandwidth)



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8.1 CONCLUSION

The data collected shows that the PCS Indoor CDMA Base station Transceiver System (PCS CDMA) **FCC ID: A3LSCS-26UC2** complies with all the requirements of Parts 2 and 24 of the FCC rules.



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9.1 TEST PLOTS



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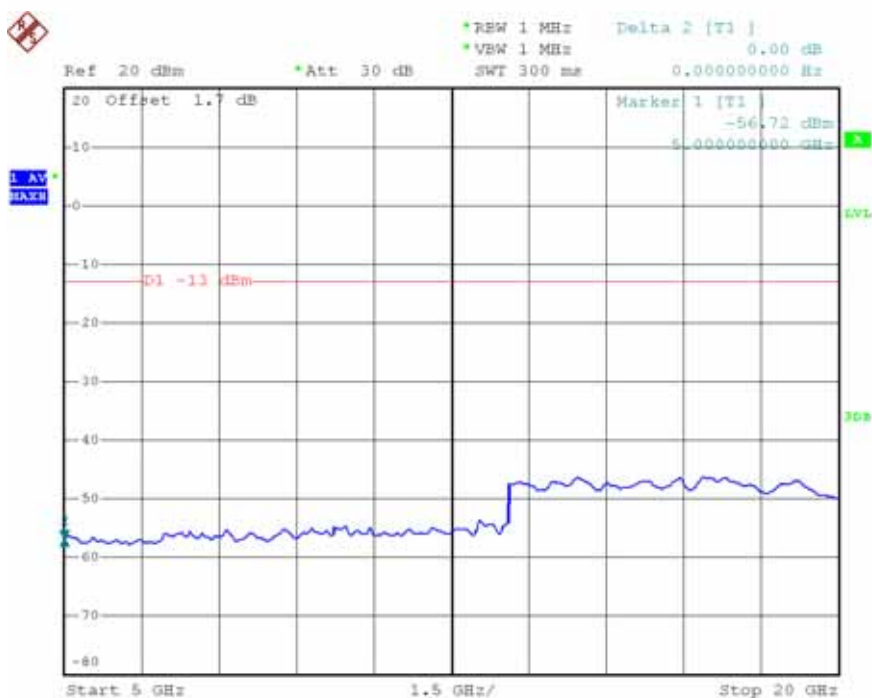
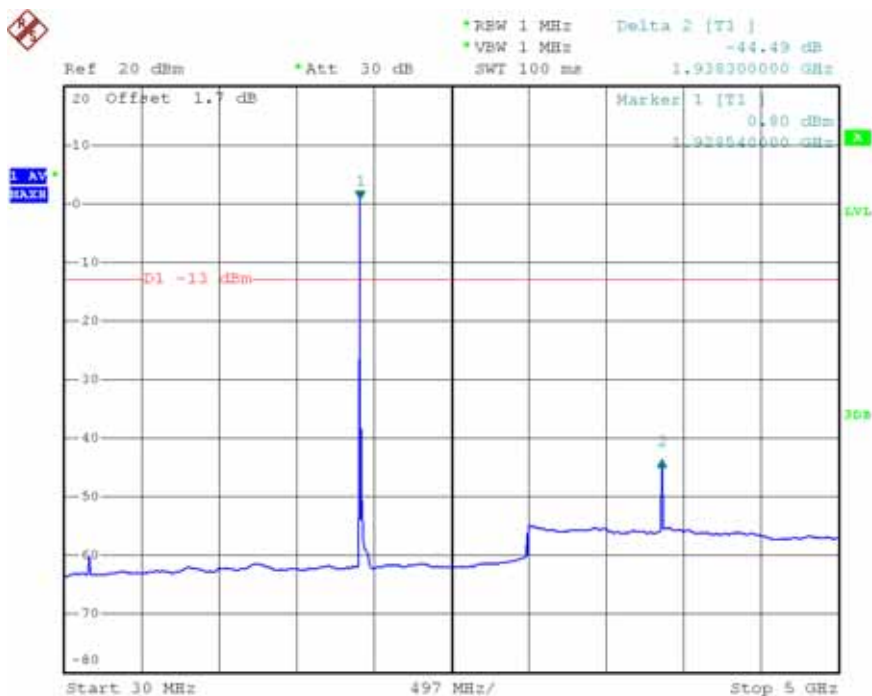
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- Conducted Spurious US PCS Mode ch.25 for 1xRTT

- Frequency Range : 30M-20G





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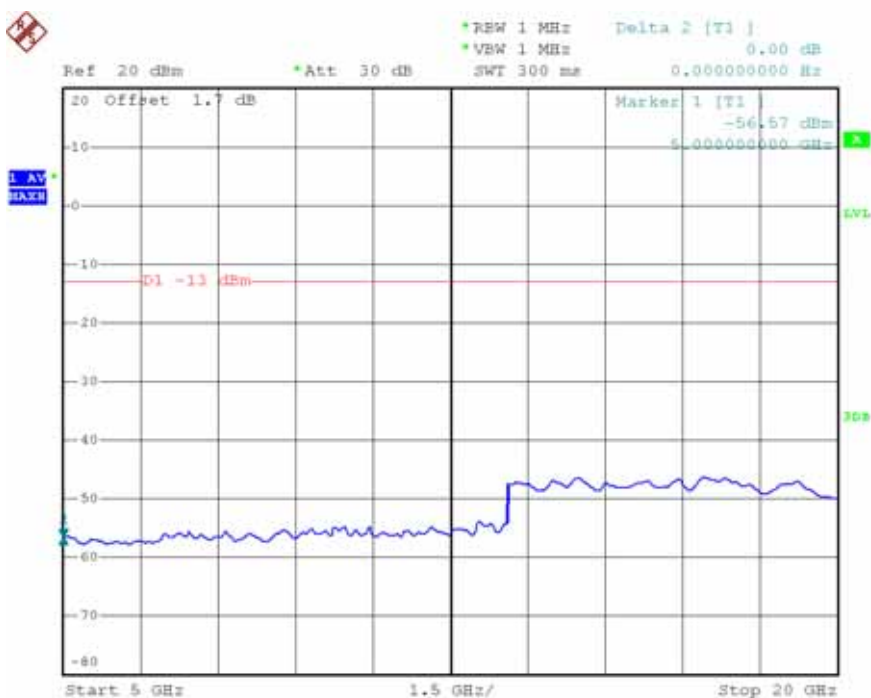
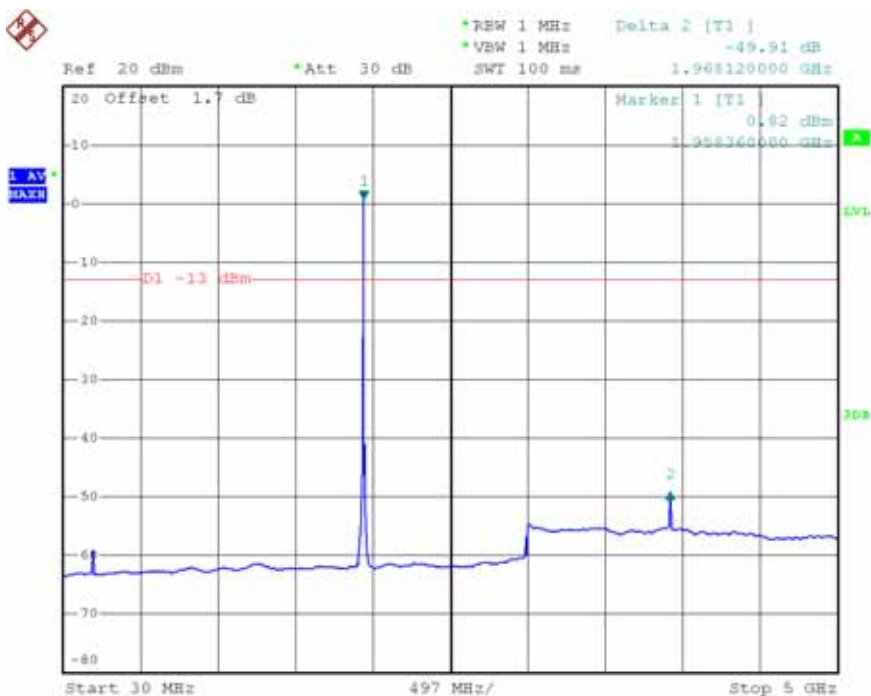
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- Conducted Spurious US PCS Mode ch.600 for 1xRTT - Frequency Range : 30M-20G





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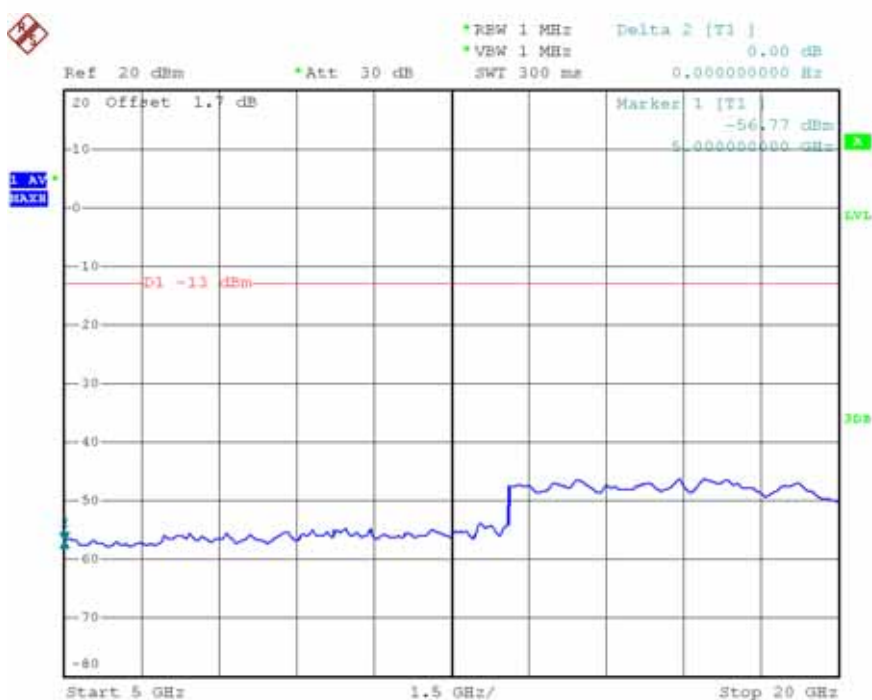
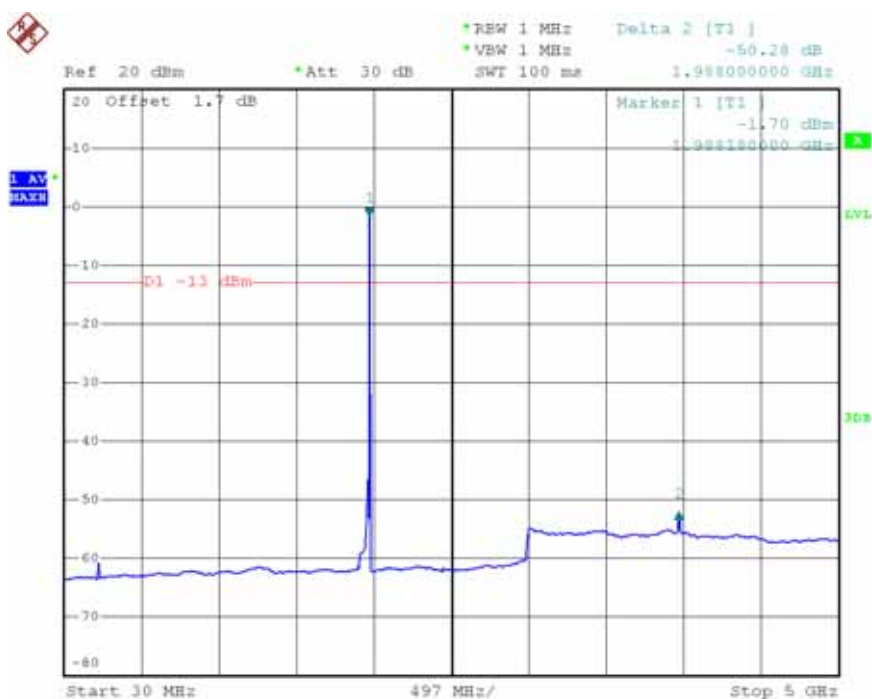
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- Conducted Spurious US PCS Mode ch.1175 for 1xRTT - Frequency Range : 30M-10G





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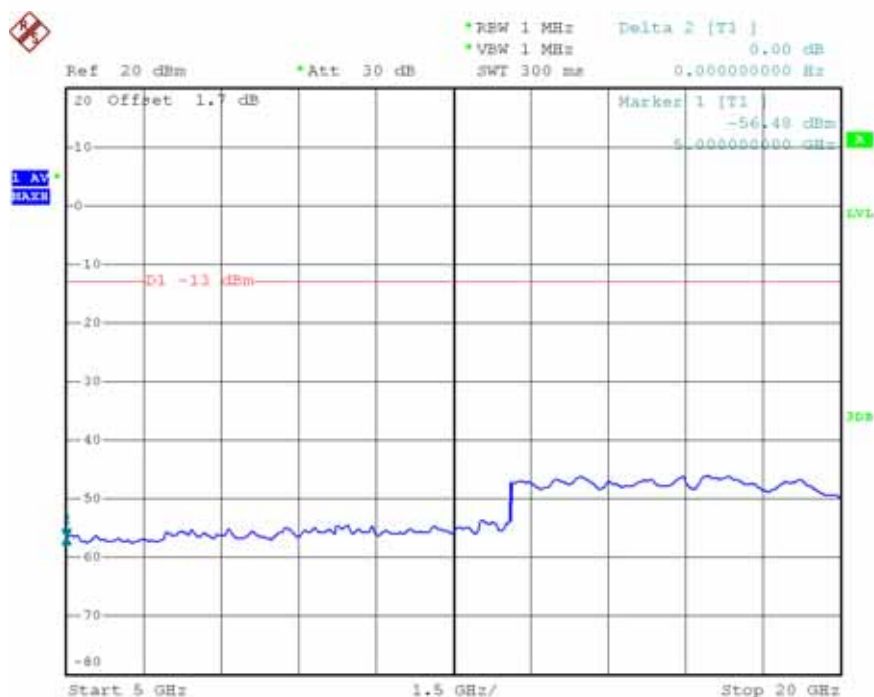
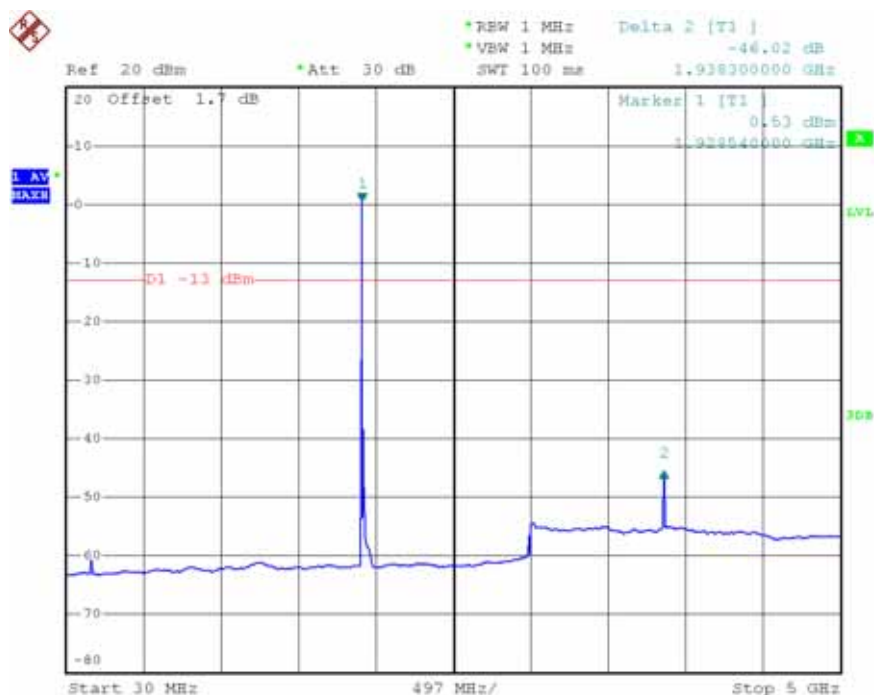
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- Conducted Spurious Beacon Mode ch.25 for 1xRTT

- Frequency Range : 30M-20G





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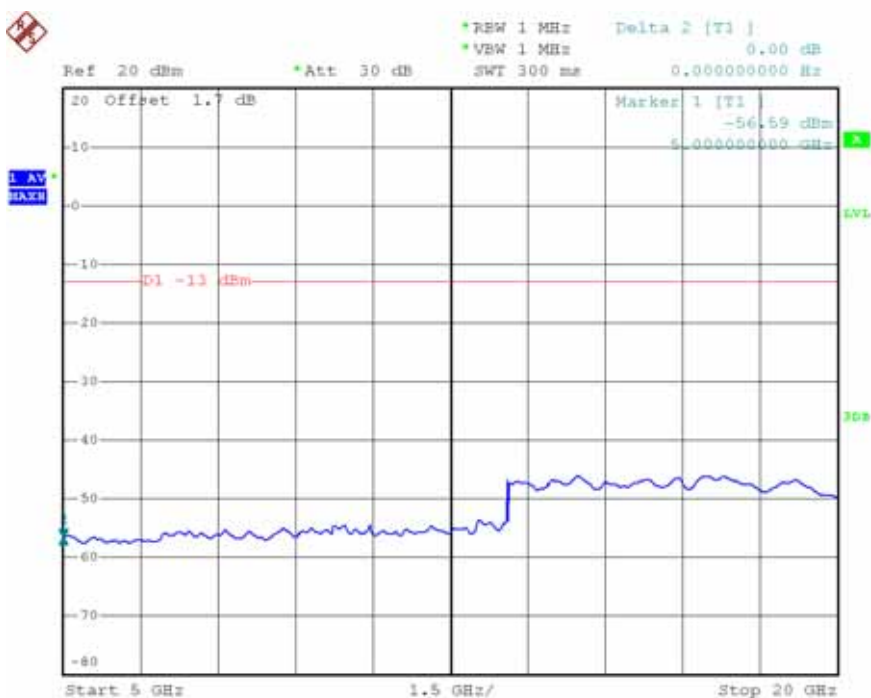
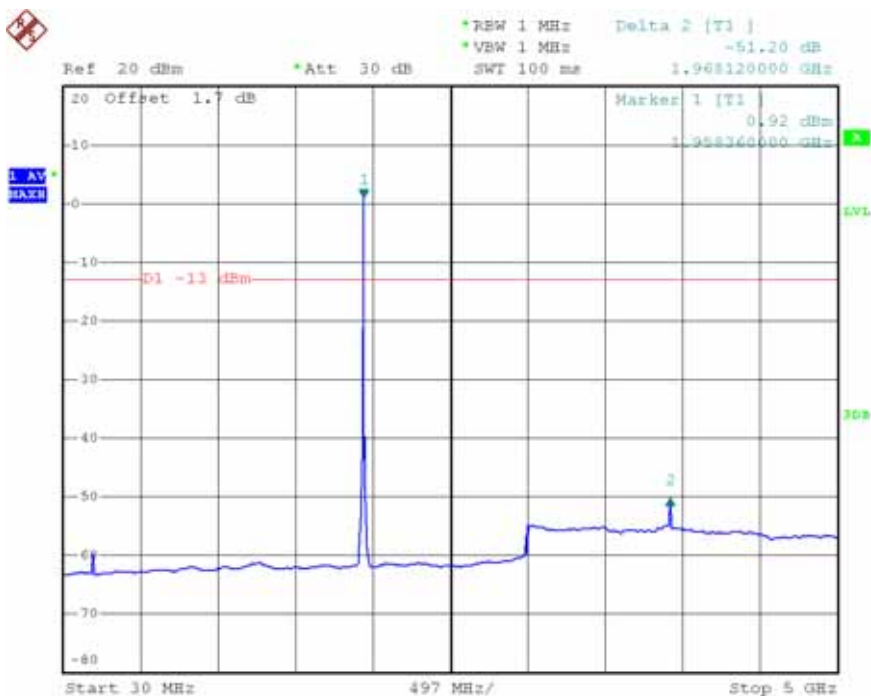
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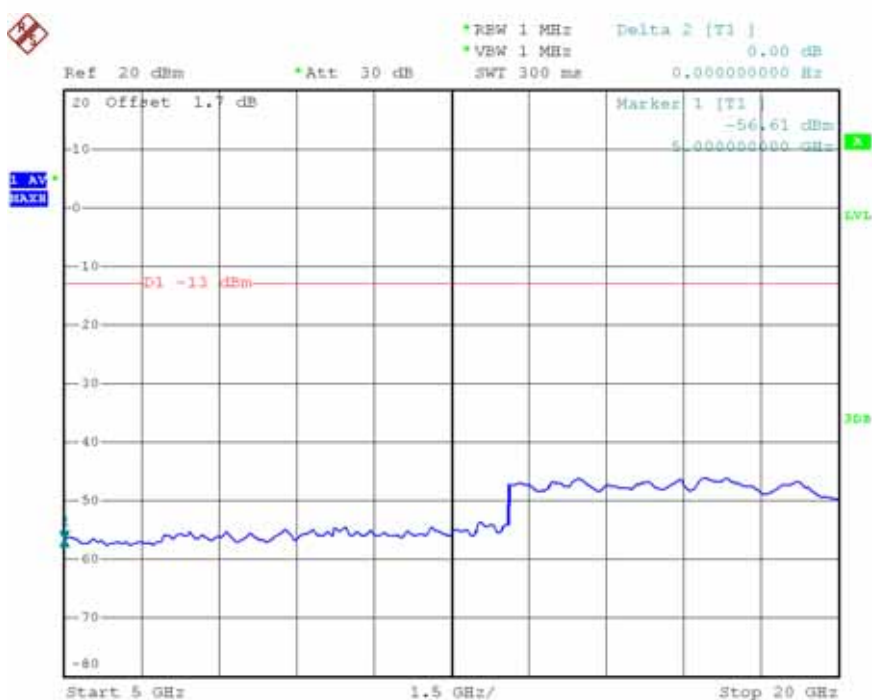
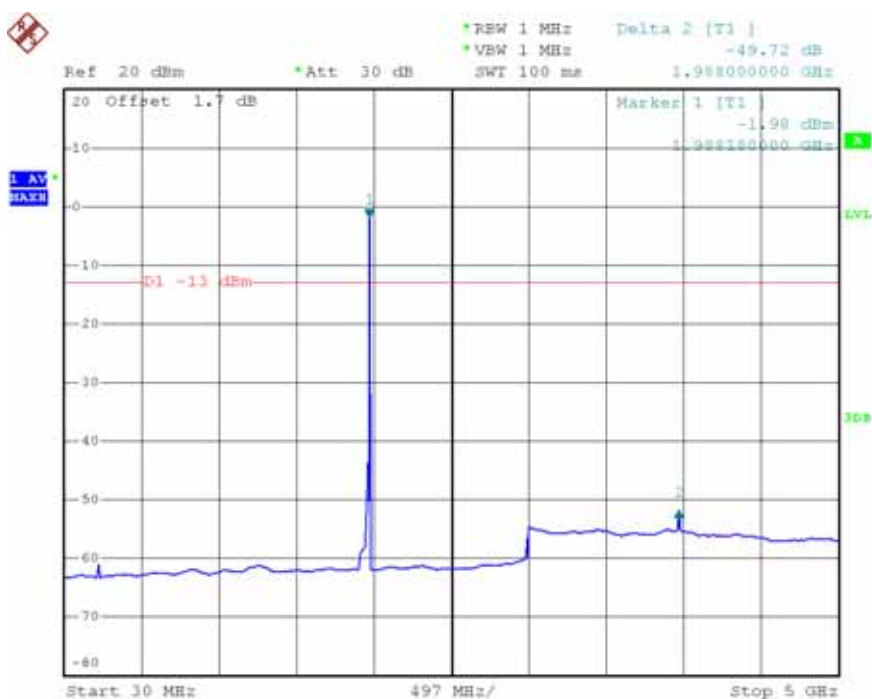
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- Power Out US PCS Mode ch.25 for 1xRTT





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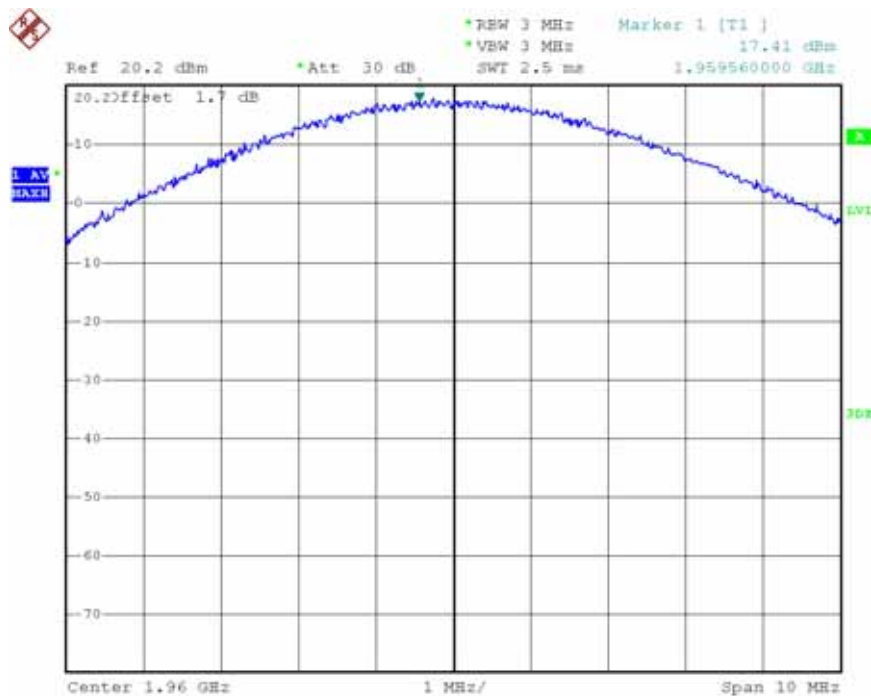
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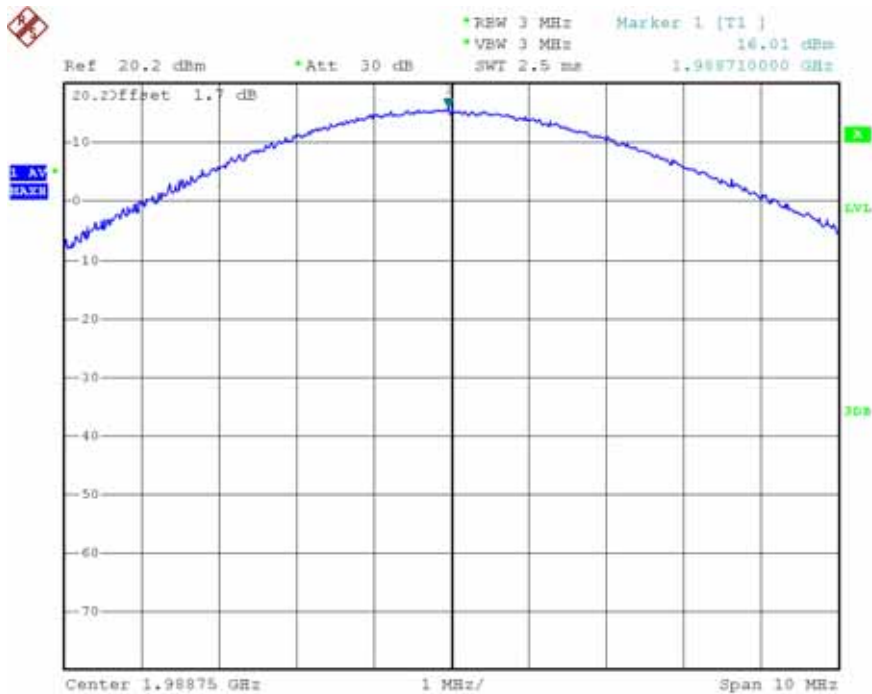
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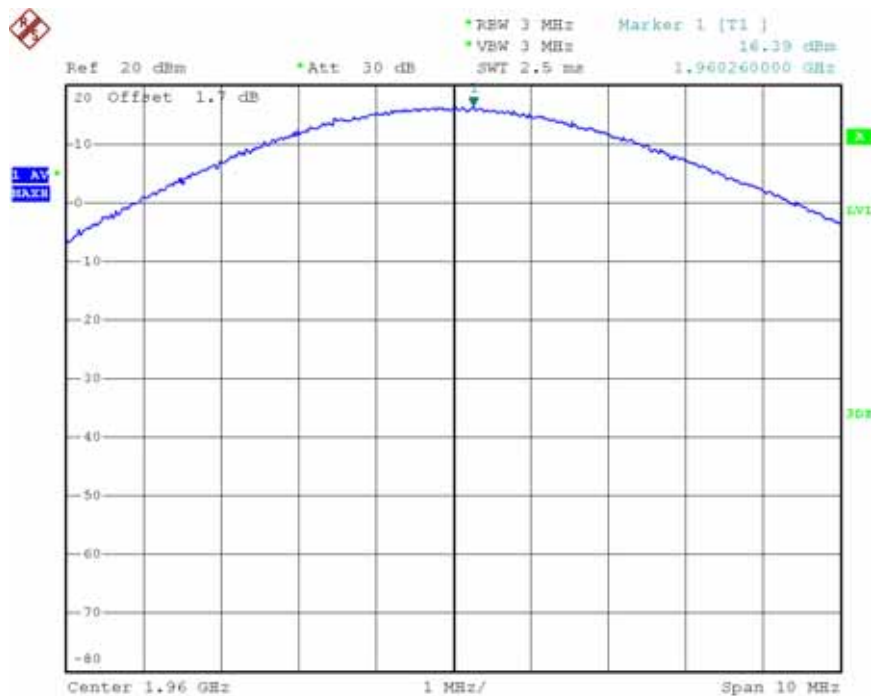
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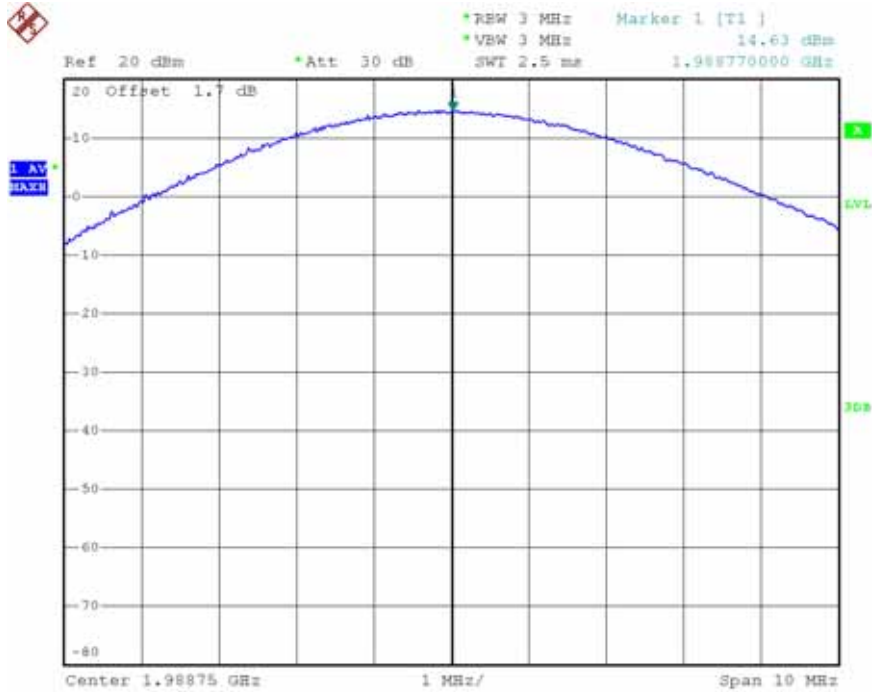
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- Power Out US Beacon Mode ch.1175 for 1xRTT





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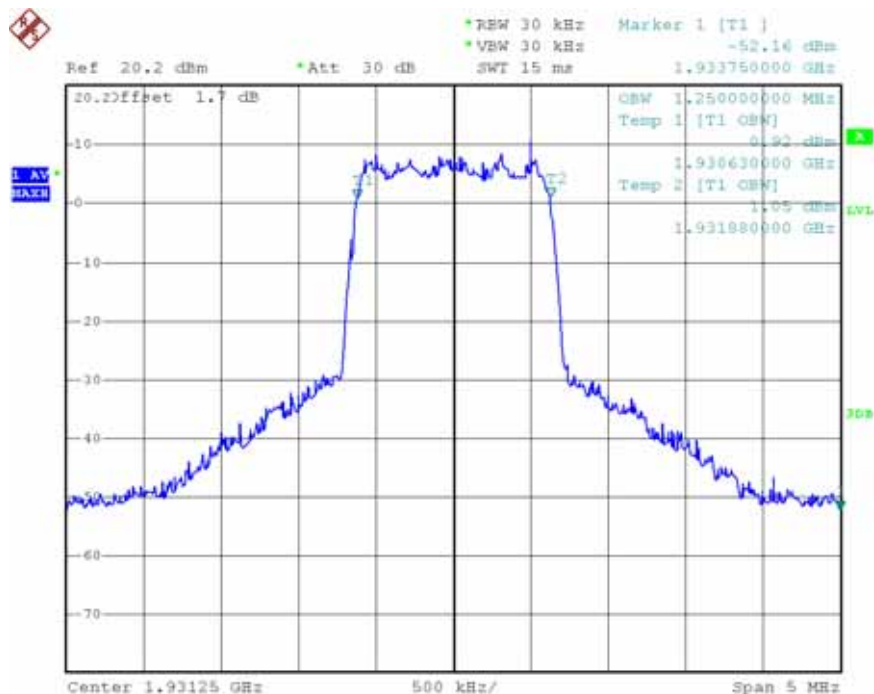
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- Occupied Bandwidth US PCS Mode ch.25 for 1xRTT





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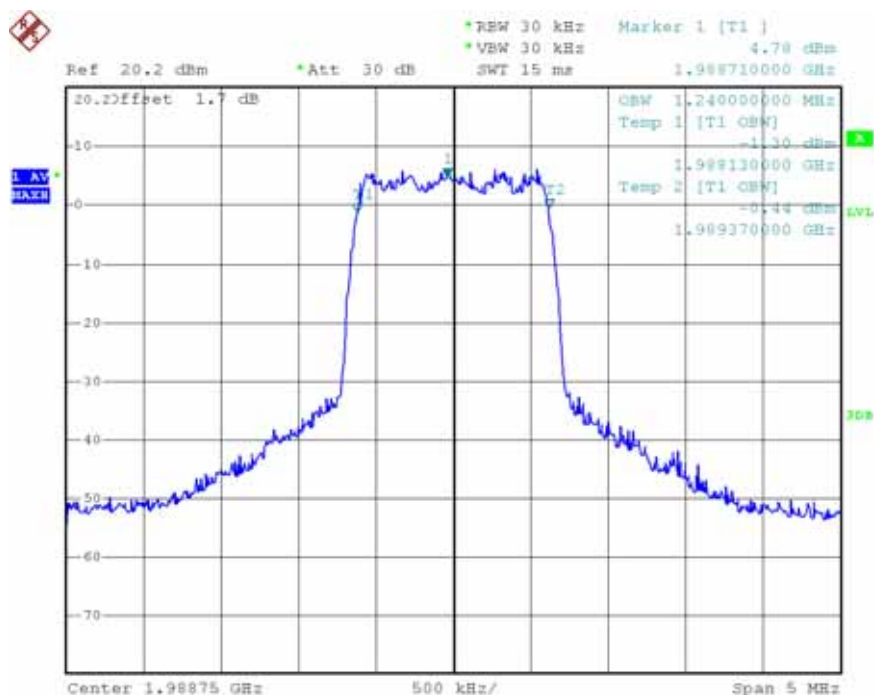
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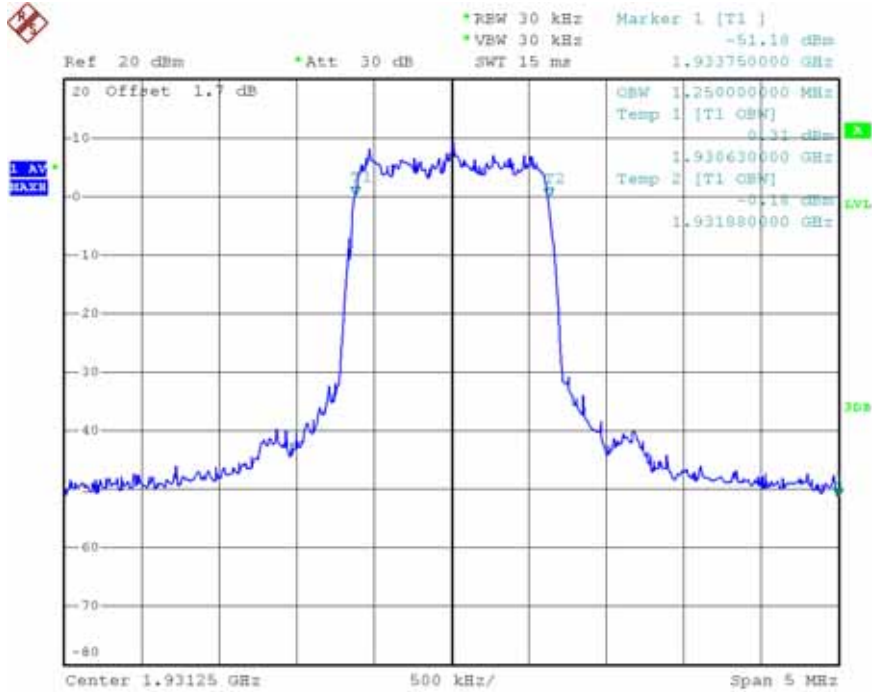


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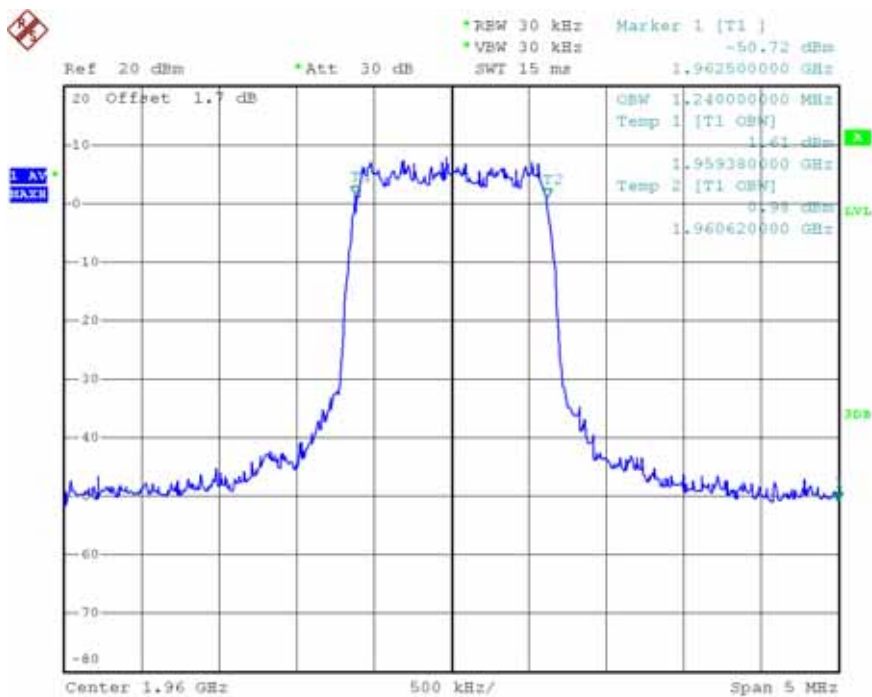
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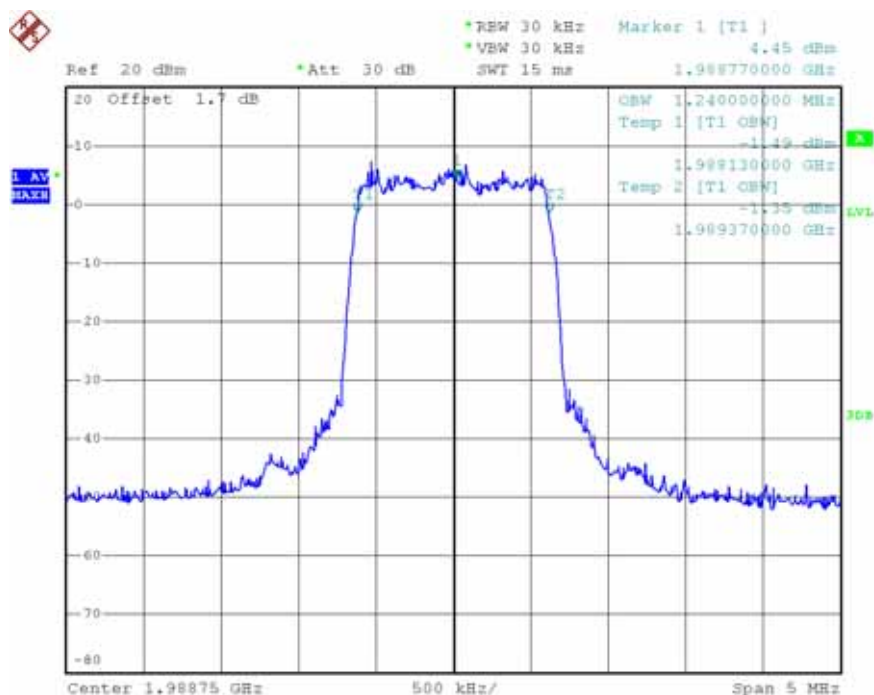
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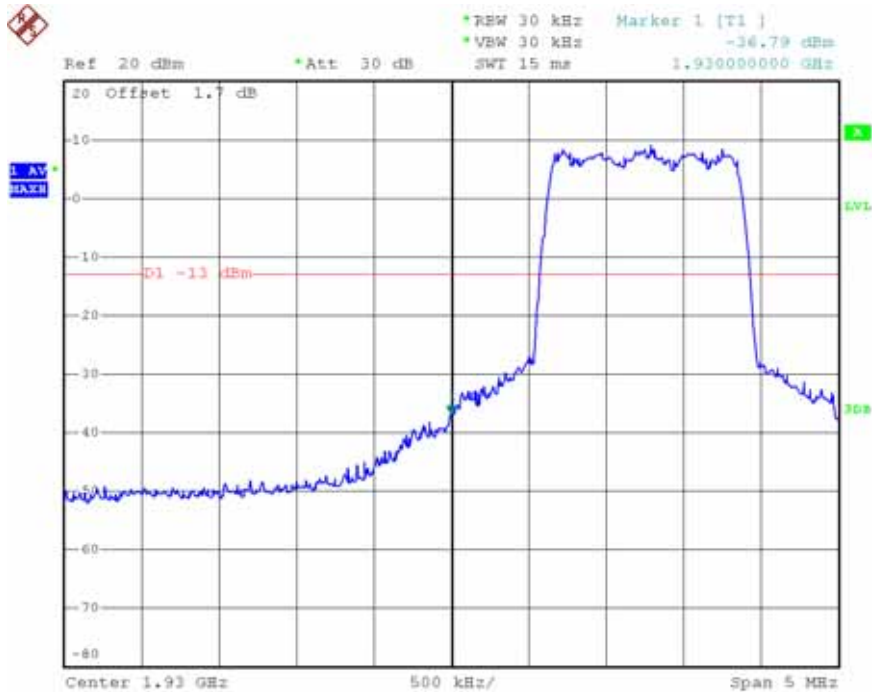


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- Band Edge. US PCS Mode ch.25 for 1xRTT





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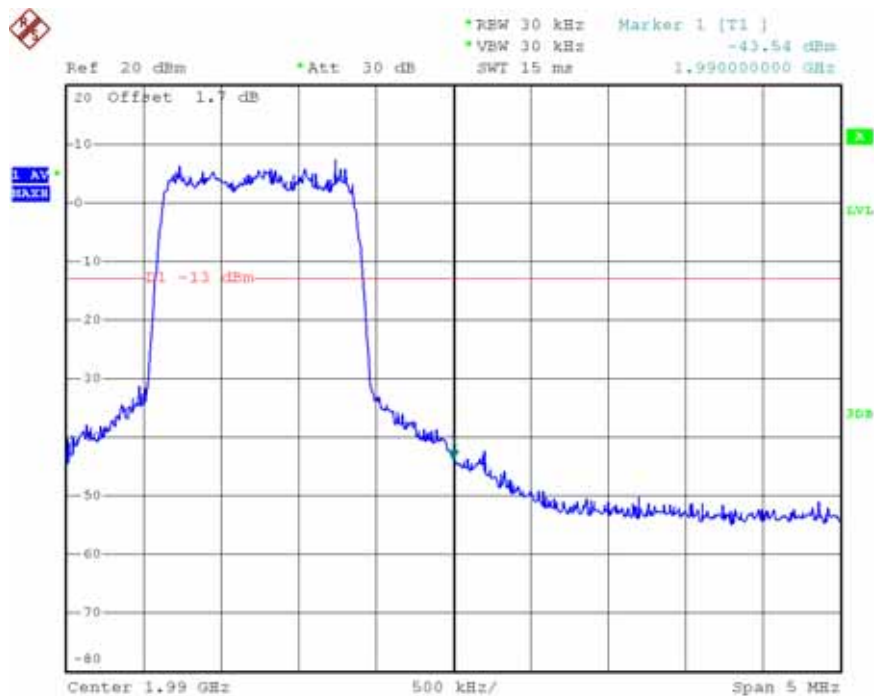
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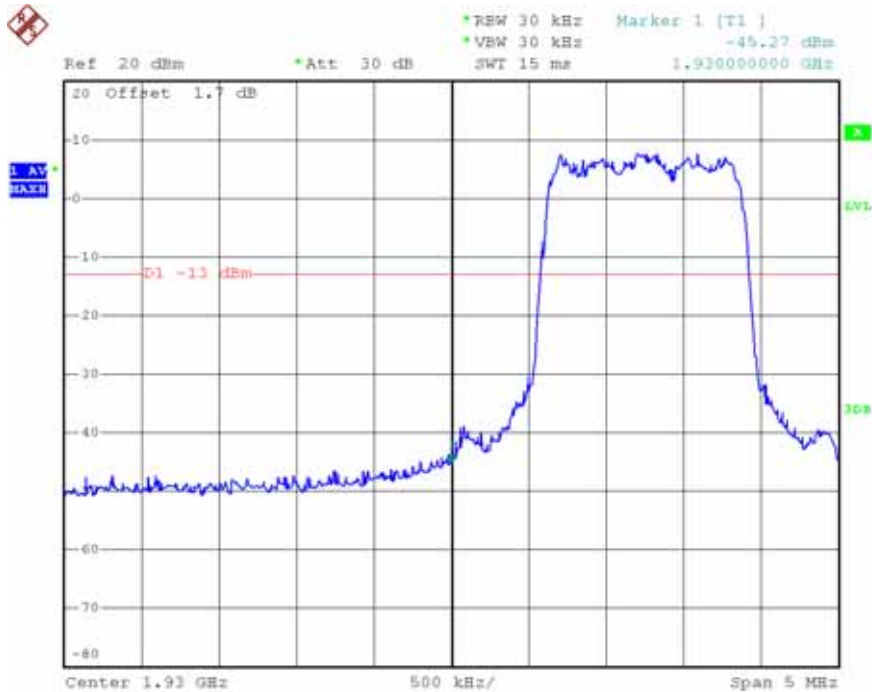


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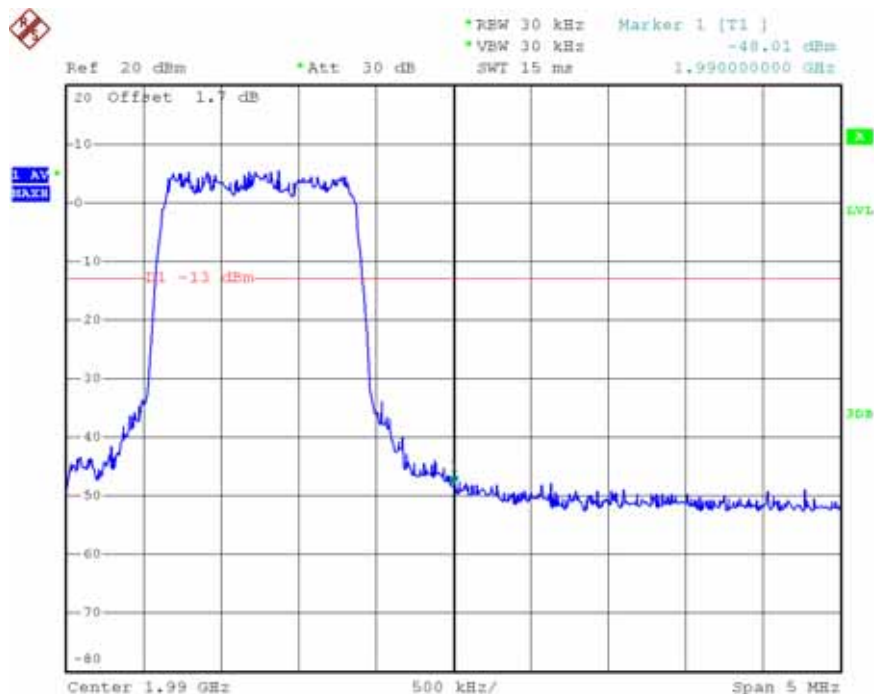
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APPENDIX B – MPE CALCULATION

* * PCS CDMA MPE Calculations * *

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

$EIRP = P + G$ $EIRP = 20.14 \text{ dBm}$	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)
--	--

The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$$G = \text{Log}^{-1} (\text{dB antenna gain} / 10)$$

$$G = \text{Log}^{-1} (2.674 / 10)$$

$$G = 1.85$$

Power density at the specific separation:

$S = PG / (4R^2 \pi)$ $S = (55.85 * 1.85) / (4 * 20^2 * \pi)$ $S = 0.0206 \text{ mW/cm}^2$	Where, S = Maximum power density (mW/cm^2) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)
--	--

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm^2 .

The power density at 20cm does not exceed the 1 mW/cm^2 limit.

Estimated safe separation:

$R = \sqrt{PG / 4\pi}$ $R = \sqrt{(55.85 * 1.85 / 4\pi)}$ $R = 2.87 \text{ cm}$	Where, P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)
---	--