Test Report

From

Kyocera Wireless Corp

Dual-Band Tri-mode AMPS/CDMA Cellular Phone

FCC Part 22 & 24 Certification IC RSS-129 & 133	
FCC ID:	**OVFKWC-KX160A**
Models:	**KX160A**

STATEMENT OF CERTIFICATION

The data, data evaluation and equipment configuration represented herein are a true and accurate representation of the measurements of the sample's radio frequency interference emissions characteristics as of the dates and at the times of the test under the conditions herein specified.

STATEMENT OF COMPLIANCE

This product has been shown to be capable of compliance with the applicable technical standards as indicted in the measurement report and was tested in accordance with the measurement procedures specified in §2.947.

Date of Test:	July 19, 2005 – July 22, 2005
Test performed by:	Kyocera Wireless Corp. 10300 Campus Point Drive San Diego, CA - 92121
Report Prepared by:	Jagadish Nadakuduti, Engineer
Report Reviewed by:	Lin Lu, Principal Engineer

Nemko USA, Inc. performed the tests that required an OATS site.

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1 General Information

Applicant:	Kyocera Wireless Corp 10300 Campus Point Drive San Diego CA 92121		
FCC ID:	OVFKWC-KX160A		
Product:	Dual-Band Tri-mode Cellular Phone		
Model Numbers:	KX160A		
EUT Serial Number:	A6DX----1C6RBG		
Type:	[ ] Prototype, [X] Pre-Production, [ ] Production		
Device Category:	Portable		
RF Exposure Environment:	General Population / Uncontrolled		
Antenna:	Fixed Stubby		
Detachable Antenna:	Yes		
External Input:	Audio/Digital Data		
Quantity:	Quantity production is planned		
FCC Rule Parts:	§22H	§22H	§24E
Modes:	800 AMPS	800 CDMA	1900 CDMA
Multiple Access Scheme:	FDMA	CDMA	CDMA
TX Frequency (MHz):	824 - 849	824 – 849	1850 - 1910
Emission Designators:	40K0F1D, 40K0F8W	1M25F9W	1M25F9W
Max. Output Power (W)	0.302 ERP	0.288 ERP	0.468 EIRP

2 Product Description

The OVFKWC-KX160A phones are Tri-mode Dual-Band 1XRTT products. The phones have assisted GPS software feature enabled to meet the emergency location requirements of the FCC's E911 Phase II mandate. The Tri-mode architecture is defined as 1900MHz (PCS CDMA), 800MHz (cellular CDMA and AMPS).

The phone is designed in compliance with the technical specifications for compatibility of mobile and base stations in the Cellular Radio telephone service contained in "Cellular System Mobile Station -Land Station Compatibility Specification" as specified in OET Bulletin 53 and TIA Standards

As described in Exhibit 1 (operation description). OVFKWC-KX160A can operate in the CDMA mode specified in IS-2000.2 standard, release 0. It can only invoke a Spreading Rate 1 (SR1) operational mode. SR1 is defined as a 1.2288 Mcps chip rate-based system using a direct-spread single carrier, which limits the bandwidth to the same 1.25MHz bandwidth occupied by the legacy IS-95/8-A/B system. Thus, for SR1 in IS-2000, the frequency response is identical to the legacy IS-95 B system standard.

For Part 22 and 24, all of CDMA measurements were conducted with KWC software. The software can set the phone in the test mode and make it to transmit an IS-95B based waveform. The CDMA signal was configured for all of measurements as follows:

Radio Configuration: RC1
Code domain channels: R-FCH + R-PICH
Mobile Power: Max
Data Rate: full rate

KX160A

3 Electronic Serial Numbers (ESN) Protection

The Tri-mode Phone, FCC ID: OVFKWC-KX160A uses ESN. The ESN is a unique identification number to each phone, which is contained in the Numeric Assignment Module and is automatically transmitted to the base station whenever a call is placed. The ESN is stored in an EPROM and is isolated from fraudulent contact and tampering. Any attempt to change the ESN will render the portable phone inoperative.

The phone complies with all requirements for ESN under Part 22.919.

4 FCC Compliance Emergency 911

FCC § 22.921
When an emergency 911 call is originated by the user, the mobile will attempt to acquire any available system and originate the emergency call on that system, disregarding restrictions set by the roaming list. The FCC NPRM WT99-13, CC94-102 automatic analog A/B roaming option has been implemented for 911 emergency calls. The phones have Global Positioning System (GPS) support.

5 TTY compliance

FCC § 255 of the Telecom Act
The OVFKWC-KX160A phone models have been designed for TTY Compliance with Cellular Compatibility Standard.

6 Transmitter RF Power Output

6.1 Conducted Power

FCC: § 2.1046	IC: RSS-129 §7.1, RSS-133 §6.2

Measurement Procedures:

The RF output power was measured using a Giga-tronics 8541C Universal Power Meter and HP 8594E Spectrum Analyzer that has the CDMA personality option. Terminated to a resistive coaxial load of 50 ohms.

Mode	Frequency (MHz)	Channel	Power (dBm)
AMPS	824.04	991	25.42
	836.49	383	25.40
	848.97	799	25.44
CDMA 800	824.70	1013	25.39
	836.49	383	25.43
	848.31	777	25.42
CDMA 1900	1851.25	25	23.46
	1880.00	600	23.42
	1908.75	1175	23.48

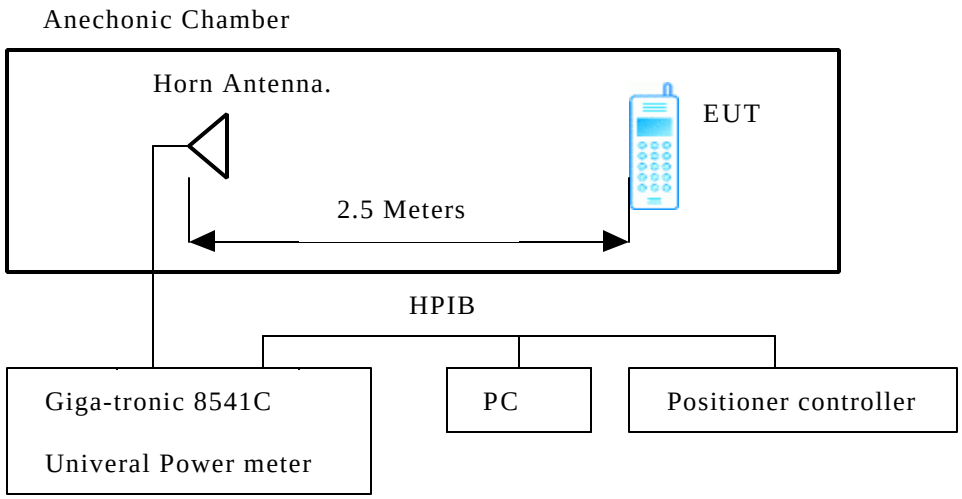
6.2 Radiated Power

FCC: § 22.913, § 24.232	IC: RSS-129 §7.1 and §9.1, RSS-133 §6.2

Measurement Procedures:

The EUT (SN: A6DX----TC6RGJ) was positioned on a 2-axis non-conductive positioner inside an anechoic chamber.

The EUT conducted power was set by the phone control software. During tests, the phone was rotated 360 degree in azimuth and elevation by an automated antenna measurement workstation. Maximum radiated power was recorded using a Giga-tronics 8541C Universal Power Meter. All measurement results are EIRP in dBm. For ERP, subtract 2.1 dB from the EIRP data.



Mode	Frequency (MHz)	Channel	Max. Power (dBm)	Ref.
AMPS	824.04	991	24.00	ERP
	836.49	383	24.40	
	848.97	799	24.80	
CDMA 800	824.70	1013	24.20	ERP
	836.49	383	24.60	
	848.31	777	24.60	
CDMA 1900	1851.25	25	26.00	EIRP
	1880.00	600	26.50	
	1908.75	1175	26.70	

7 Transmitter Modulation Requirement

7.1 Transmitter Audio Frequency Response

FCC: § 2.1047, § 22.915	IC: RSS-129 §6.2

Measurement Procedures:

Measured with HP8924 RF communication test set & HP 3588A spectrum analyzer.

- Operate the transmitter with the compressor disabled, and monitor the output with HP8924 test receiver without de-emphasis. Apply a sine wave audio input to the transmitter external audio input port, vary the modulating frequency from 100 to 3000 Hz, and observe the input levels necessary to maintain a constant ± 2.9 kHz system deviation.

- Adjust the audio input level to 20 dB greater than that required to produce ± 8 kHz deviation with 1 kHz tone. Vary the modulation frequency from 3 kHz to 30 kHz and observe the deviation while maintaining a constant audio input level. Use the audio spectrum analyzer to measure the output deviation at the same frequency as the input signal.

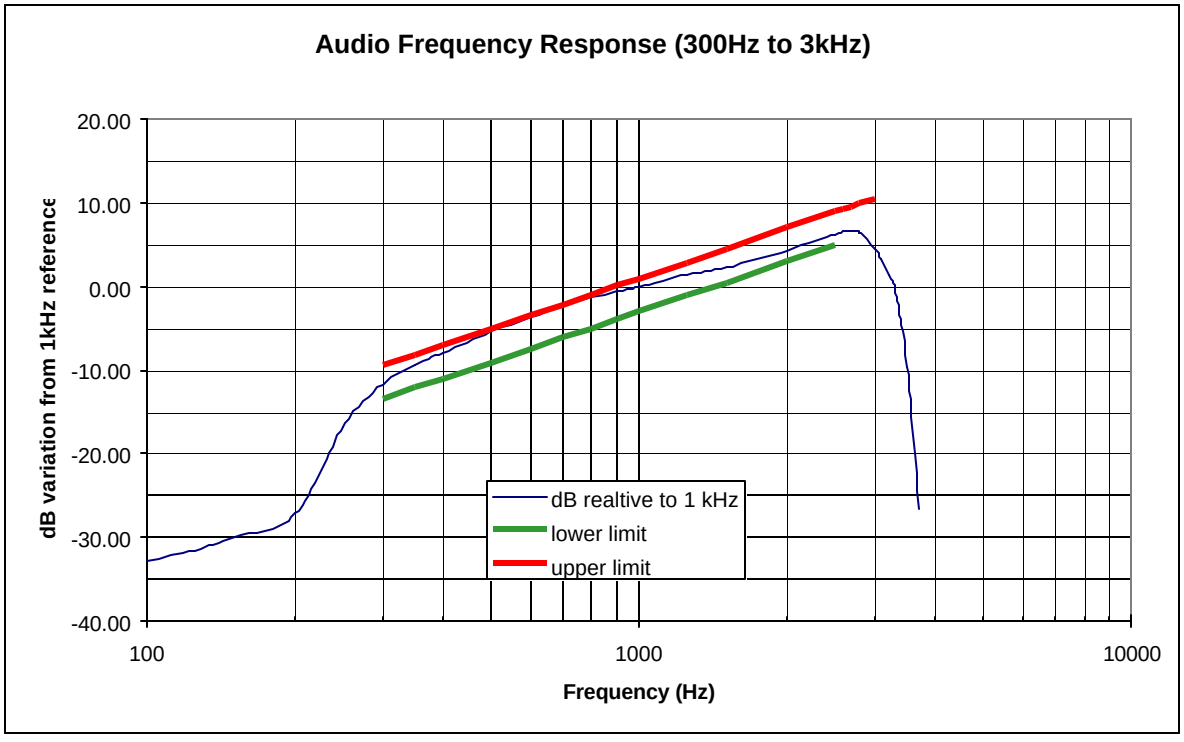


Figure 7.1 Audio Filter Characteristics (100-3000Hz)

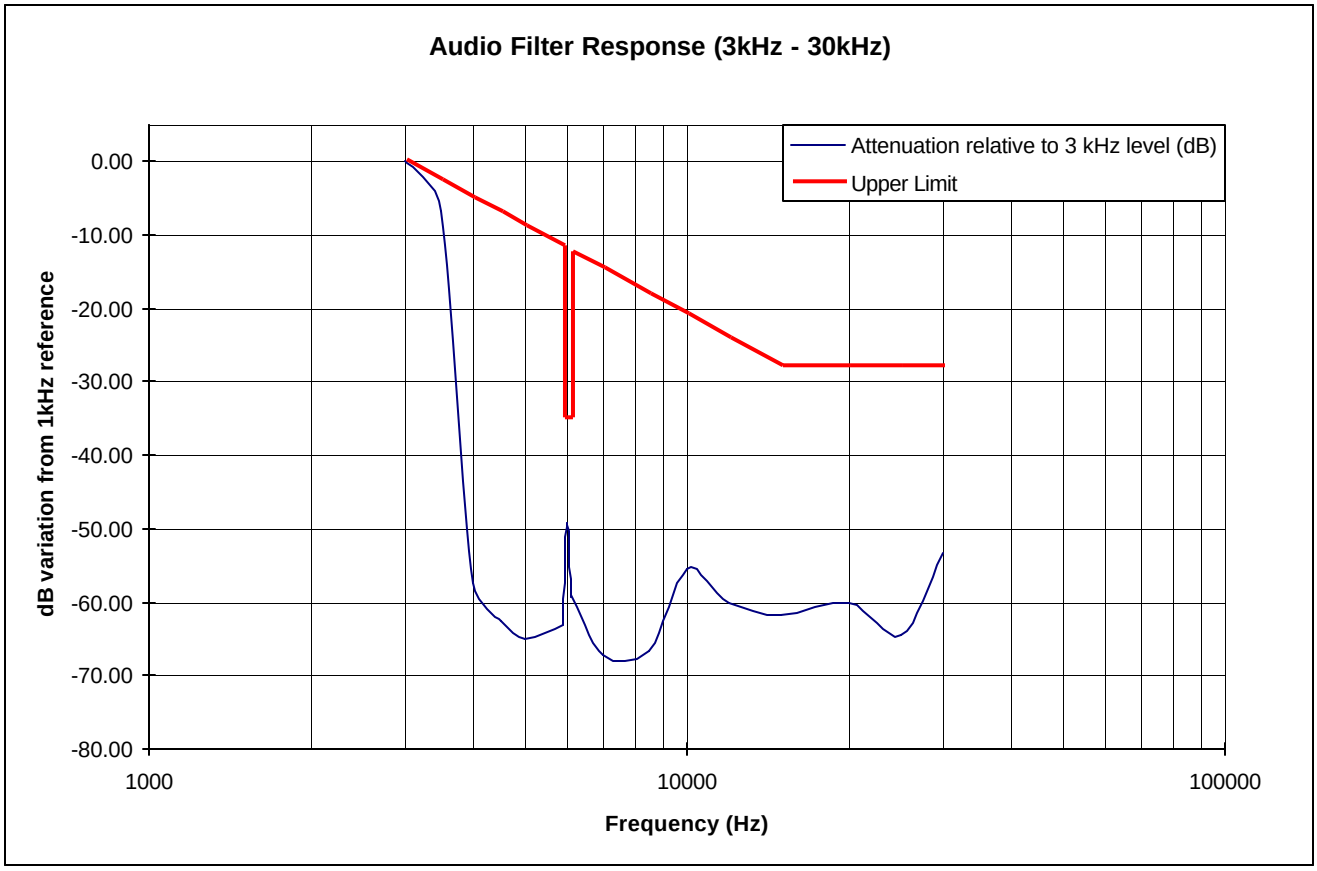


Figure 7.2 Post Limiter Filter Attenuation

7.2 Transmitter Modulation Deviation Limiting

FCC: § 2.1047(b), § 22.915(b)(c)	IC: RSS-129 §6.1

Measurement Procedures:

Measured with HP8924 RF communication test set as an audio signal generator.

With the compressor enabled and the SAT disabled, and at three different modulating frequencies (300Hz, 1kHz and 3kHz), adjust the audio input level from -20 dB to +20 dB in reference to the level required to generate 8kHz deviation at 1KHz.

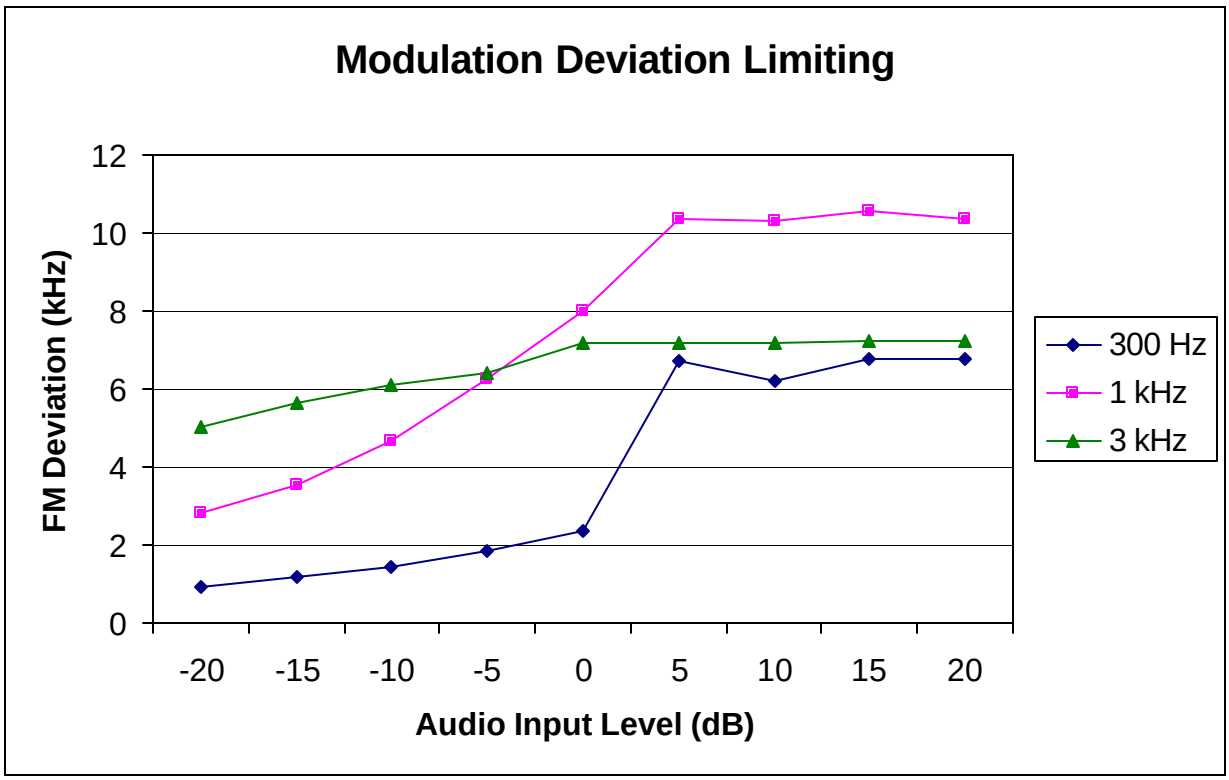


Figure 7.3 Modulation Deviation Limiting

8 Occupied Bandwidth

FCC: § 2.1049, § 22.917(b)(d), § 24.238	IC: RSS-129 §6.3, §8.1

Measurement Procedures:

The RF output of the EUT was connected to the input of the spectrum analyzer with sufficient attenuation. The spectrum with no modulation was recorded.

For Analog: The audio input signal was adjusted to as followings: (1) For combined voice and SAT, disable the compressor, modulate with a 2500 Hz sine wave 13.5 dB greater than that required to produce ± 8 kHz peak deviation at 1000 Hz and a 6000 Hz SAT with ± 2.0 kHz peak deviation. (2) For combined Signaling Tone and SAT, modulate with a 10 kHz ST with ± 8 kHz peak deviation and a 6000 Hz SAT with ± 2.0 kHz peak deviation. (3) For wideband data, modulate with a quasi-random 10 kbps data pattern with ± 8 kHz peak deviation. (4) For voice only, disable the compressor, modulate with a 2500 Hz sine wave 13.5 dB greater than that required to produce ± 8 kHz peak deviation at 1000 Hz. (5) For SAT only, modulate with a 6000 Hz SAT with ± 2.0 kHz peak deviation. (6) For ST only, modulate with a 10 kHz ST with ± 8 kHz peak deviation. (7) For combined SAT and DTMF, modulate with a 6000 Hz SAT with ± 2.0 kHz peak deviation and one of the DTMF tones. All measurements were performed on middle channel.

For Digital: Modulate with full rate.

List of Figures

Figure	Mode	Description
8-1	AMPS	Unmodulated Signal
8-2		SAT
8-3		Voice + SAT
8-4		ST
8-5		SAT+ST
8-6		SAT + DTMF_9
8-7		10kb Wideband Data
8-8	CDMA 800	CDMA @ CH 383
8-9	CDMA 1900	CDMA @ CH 600
8-10		Lower Band Edge @ CH 25
8-11		Upper Band Edge @ CH 1175

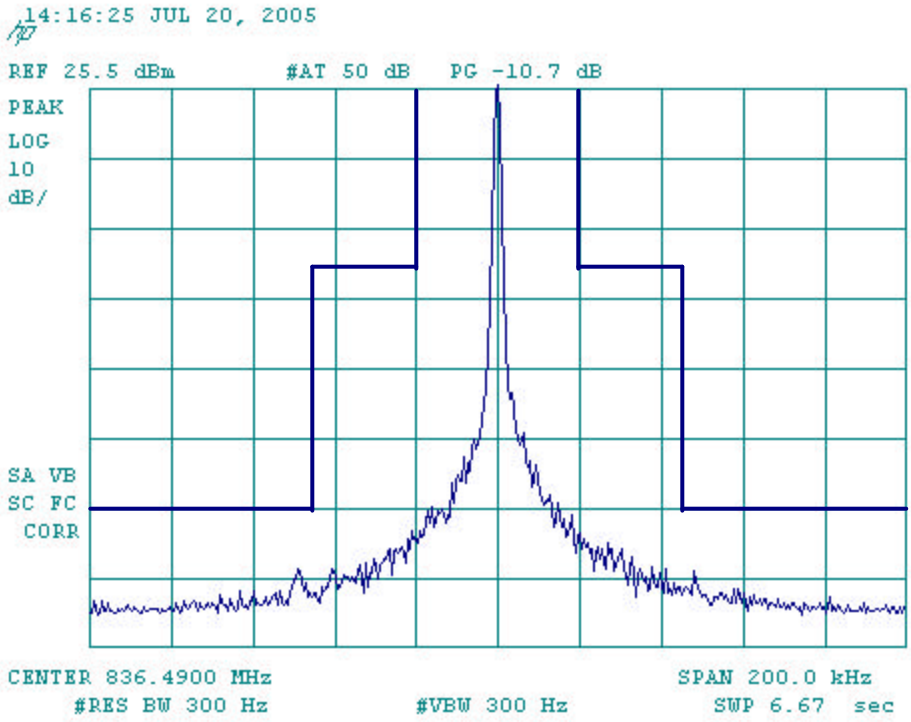


Figure 8-1 AMPS Unmodulated Signal

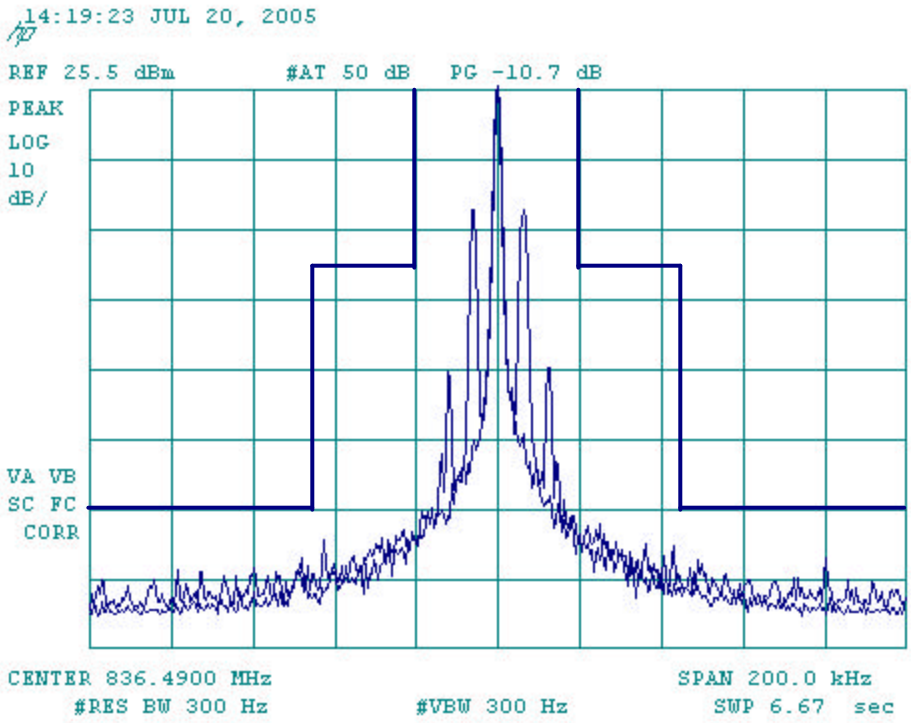


Figure 8-2 AMPS SAT

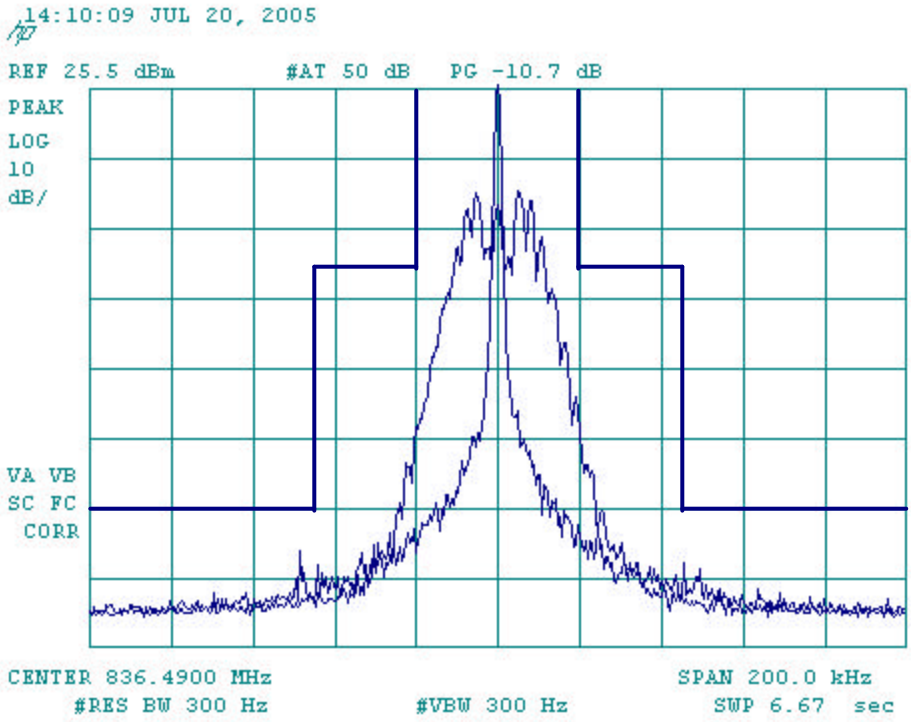


Figure 8-3 AMPS Voice + SAT

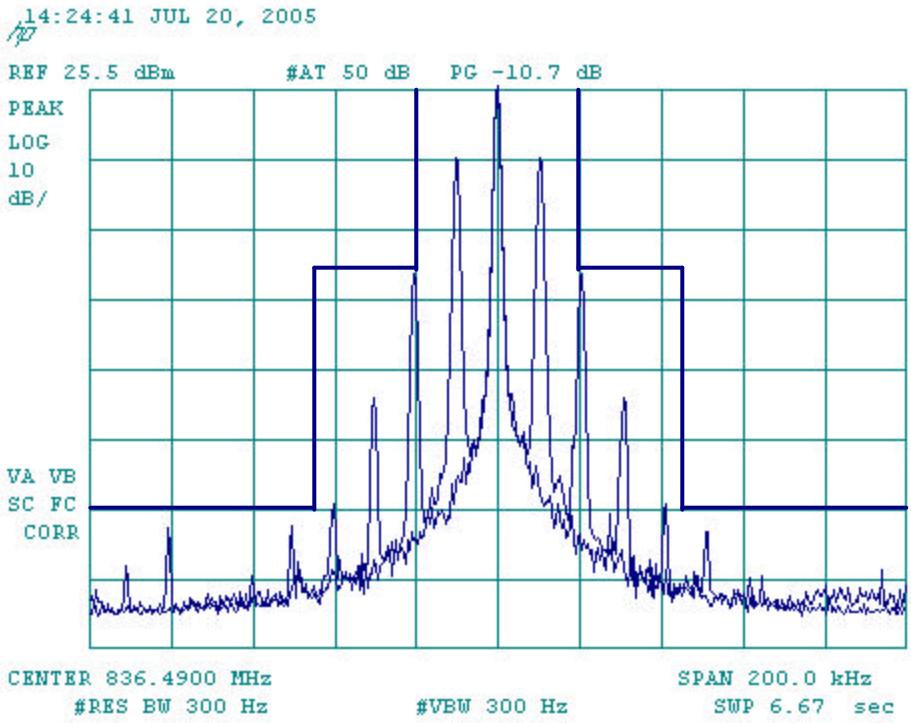


Figure 8-4 AMPS ST

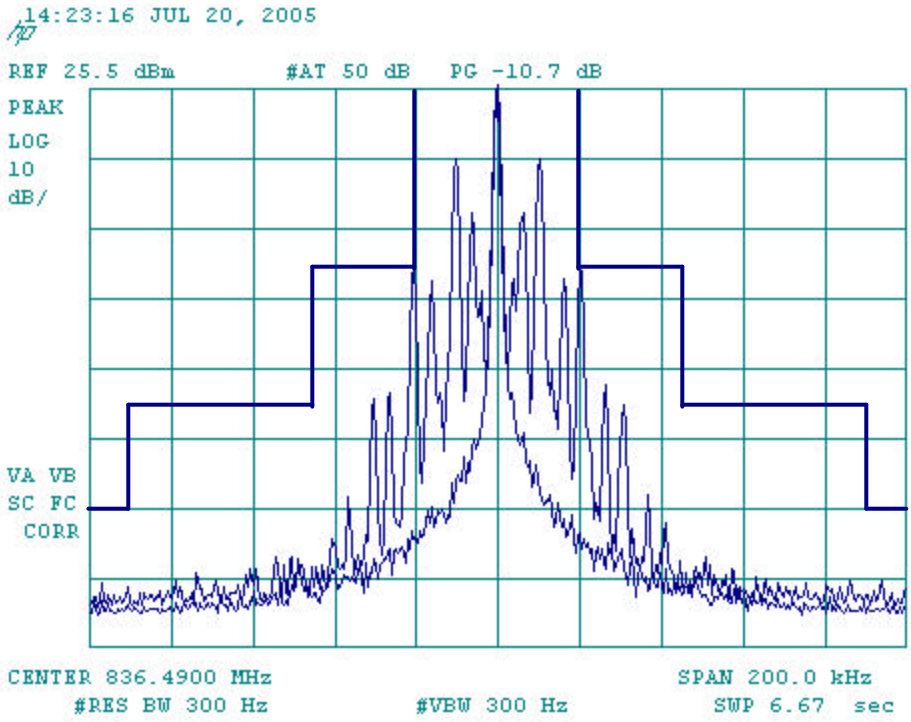


Figure 8-5 AMPS ST + SAT

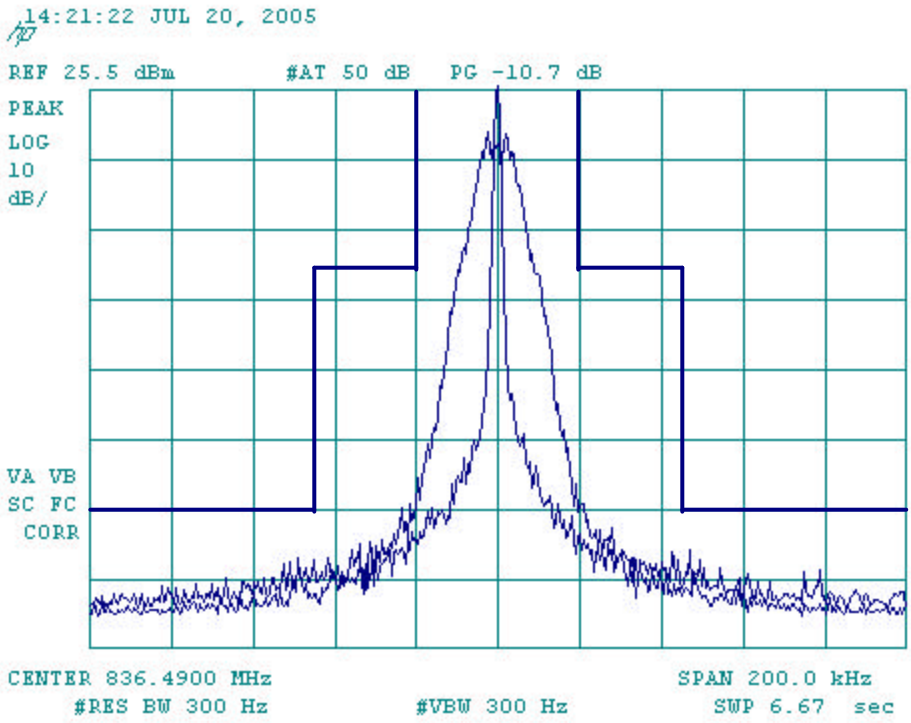


Figure 8-6 SAT + DTMF_9

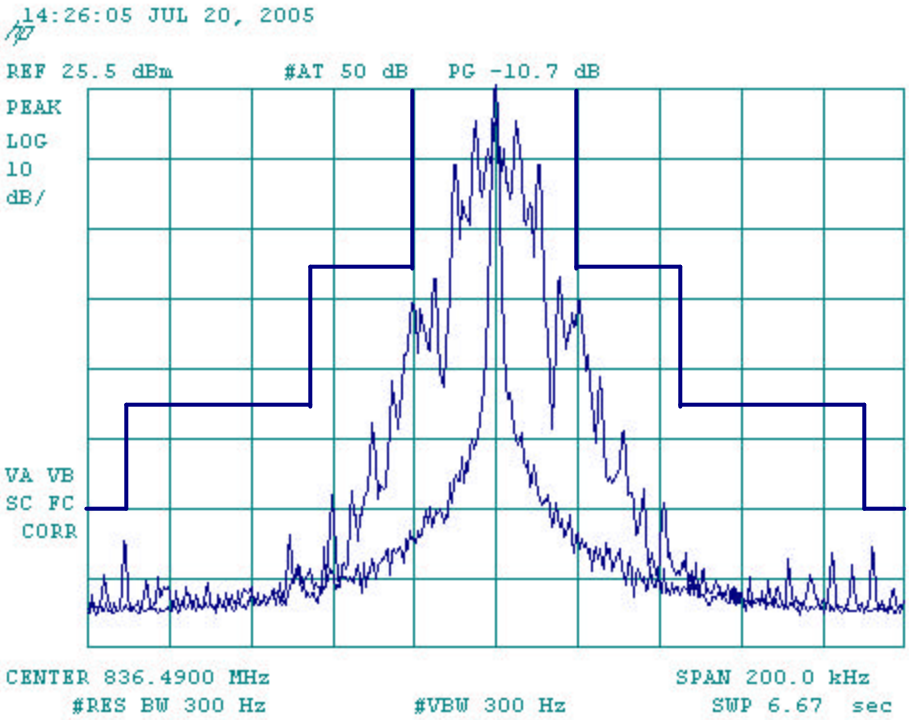


Figure 8-7 AMPS WIDEBAND

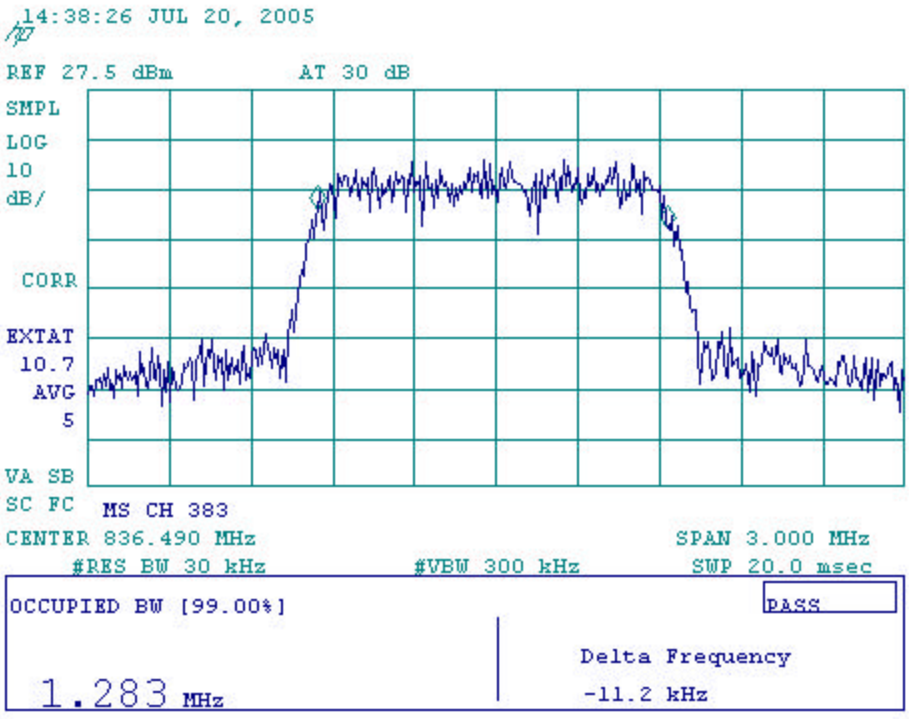


Figure 8-8 CDMA 800 @ CH 383

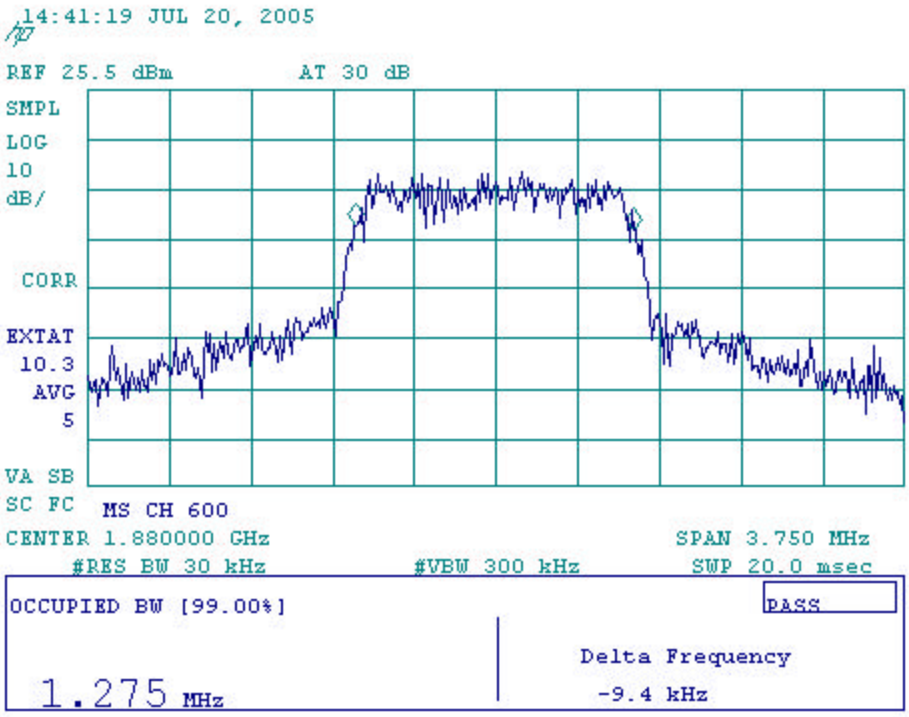


Figure 8-9 CDMA 1900 @ CH 600

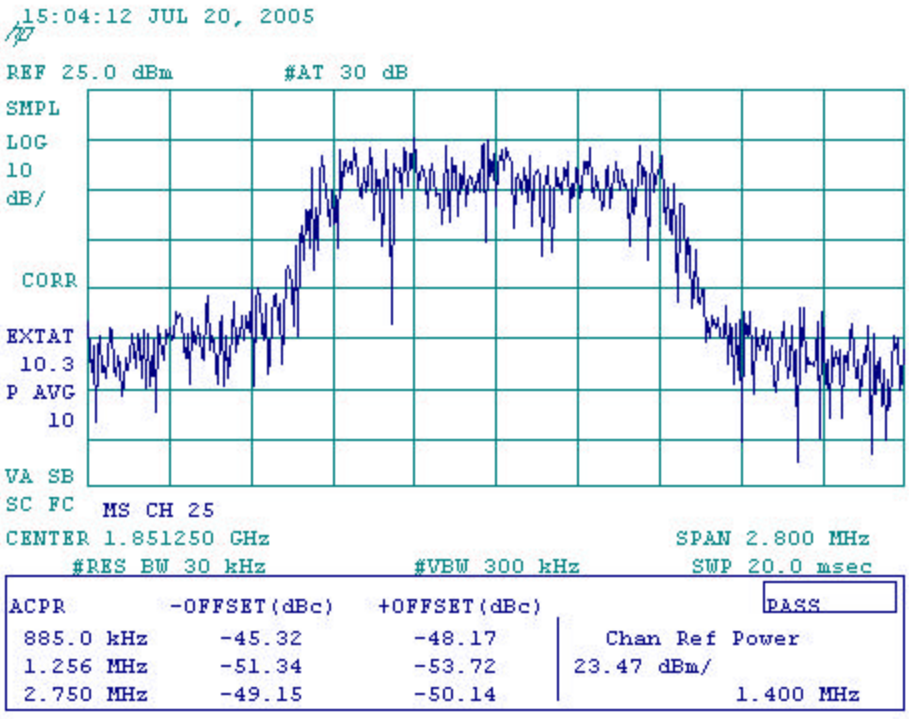


Figure 8-10 CDMA 1900 Lower Band Edge

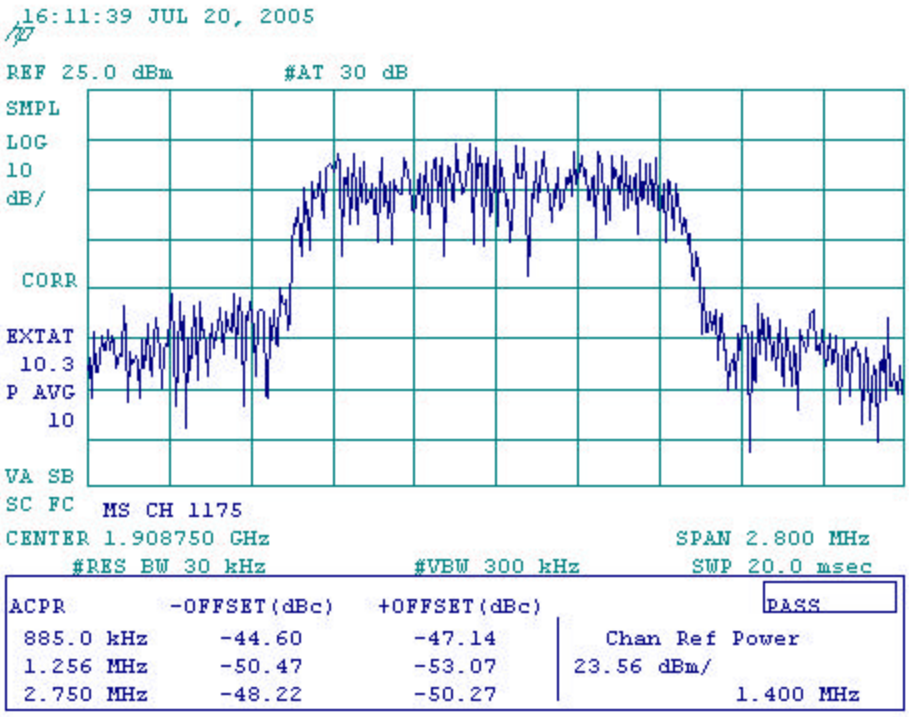


Figure 8-11 CDMA 1900 Upper Band Edge

9 Spurious Emissions At Antenna Terminals

FCC: § 2.1051, § 22.917(e)(f), § 24.238	IC: RSS-129 §6.3, §8.1, RSS-133 §6.3

Measurement Procedures:

Out of Band: The RF output of the EUT was connected to the input of the spectrum analyzer with sufficient attenuation. The modulating signal was applied accordingly. The frequency spectrum was investigated from the lowest frequency signal generated up to at least the tenth harmonic of the fundamental.

Base Band: Spectrum was investigated from 869-894 MHz for Cellular.

List of Figures:

Figure	Mode	Channel	Plot Description
9-1	AMPS	991	Emissions in base station frequency range, 869 - 894 MHz
9-2			Conducted spurious emissions, 9kHz to 10GHz
9-3		383	Emissions in base station frequency range, 869 - 894 MHz
9-4			Conducted spurious emissions, 9kHz to 10GHz
9-5		799	Emissions in base station frequency range, 869 - 894 MHz
9-6			Conducted spurious emissions, 9kHz to 10GHz
9-7	CDMA 800	1013	Emissions in base station frequency range, 869 - 894 MHz
9-8			Conducted spurious emissions, 9kHz to 10GHz
9-9		383	Emissions in base station frequency range, 869 - 894 MHz
9-10			Conducted spurious emissions, 9kHz to 10GHz
9-11		777	Emissions in base station frequency range, 869 - 894 MHz
9-12			Conducted spurious emissions, 9kHz to 10GHz
9-13	CDMA 1900	25	Conducted spurious emissions, 9kHz to 20GHz
9-14		600	Conducted spurious emissions, 9kHz to 20GHz
9-15		1175	Conducted spurious emissions, 9kHz to 20GHz

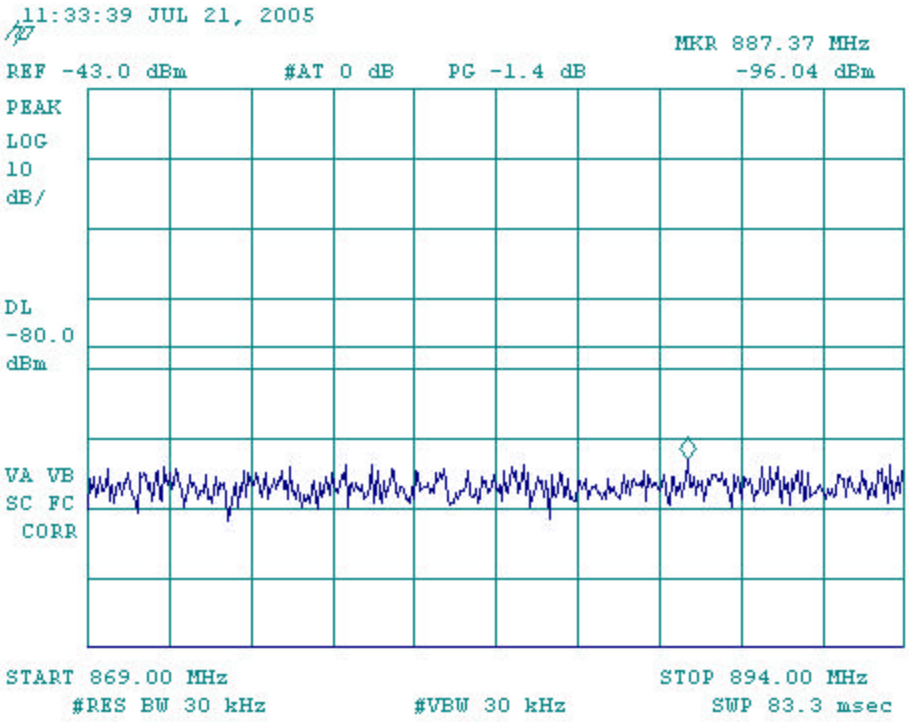


Figure 9-1 AMPS - Emissions in base station frequency range (CH 991)

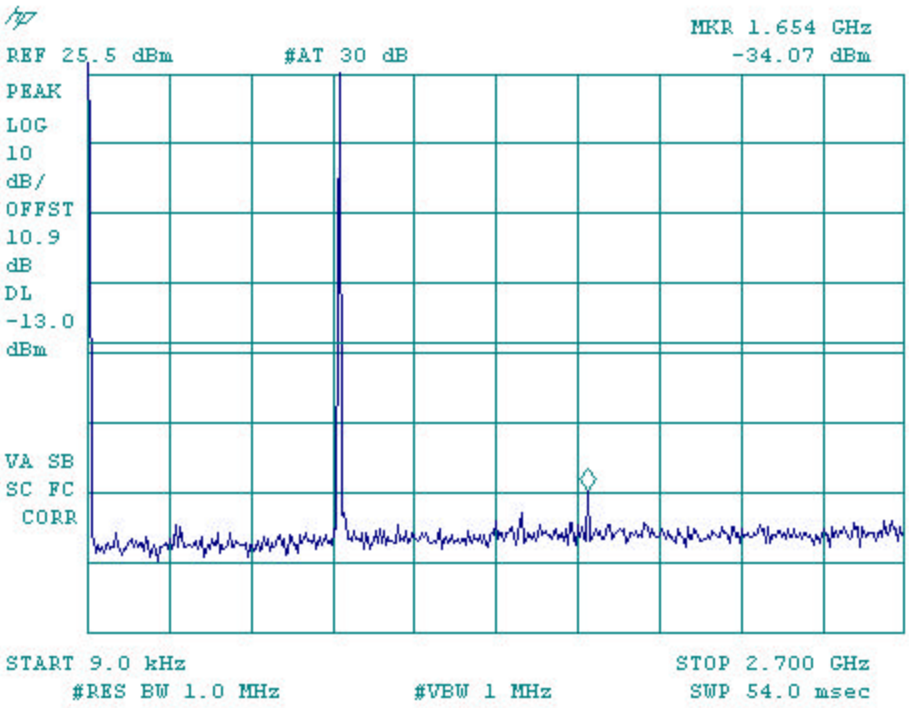


Figure 9-2a AMPS – Conducted Spurious Emission (CH 991)

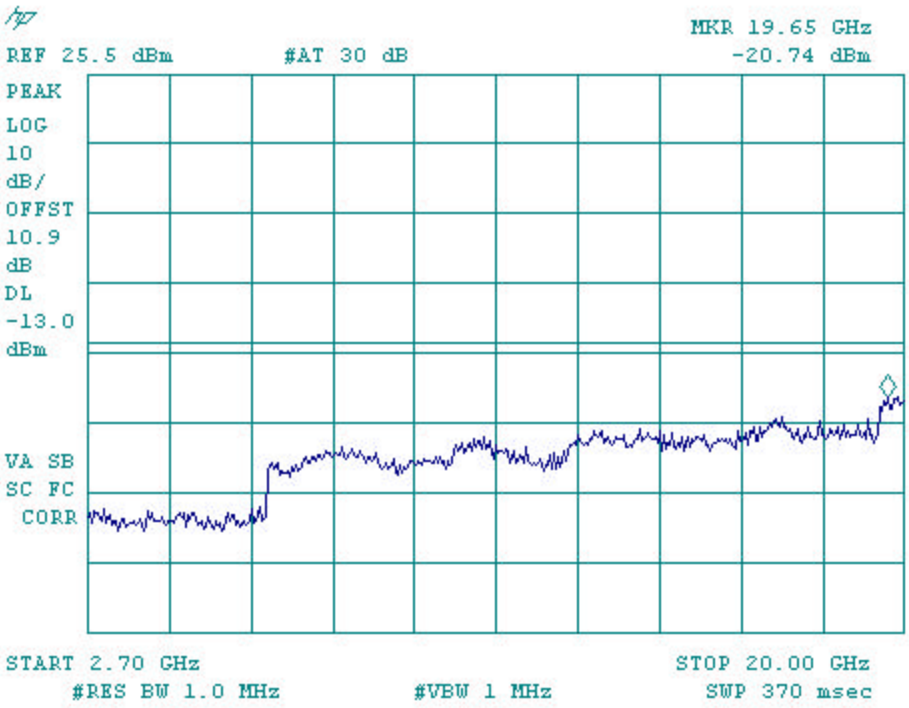


Figure 9-2b AMPS – Conducted Spurious Emission (CH 991)

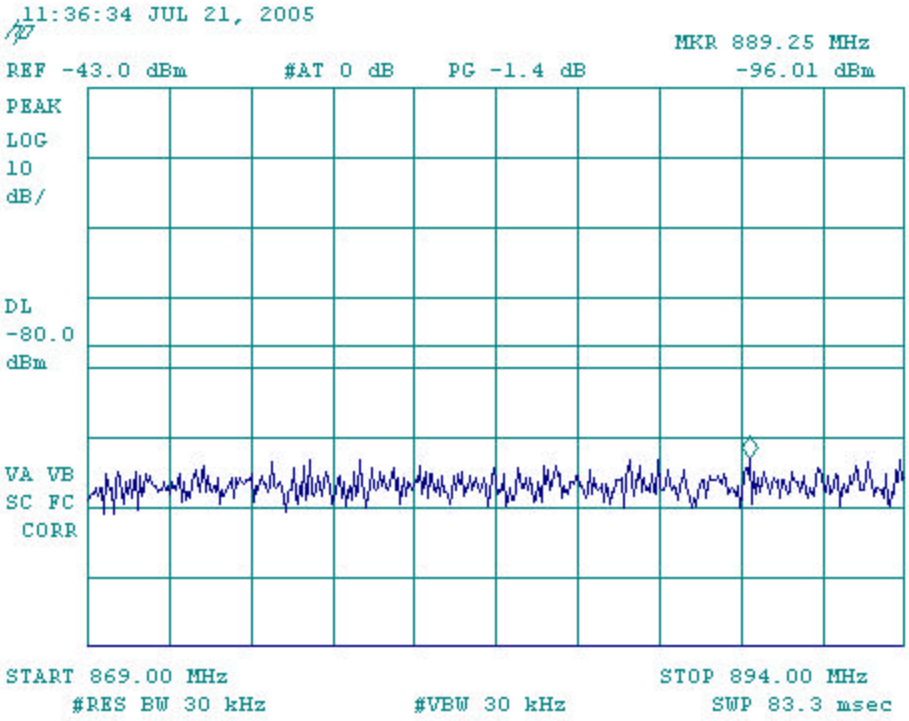


Figure 9-3 AMPS - Emissions in base station frequency range (CH 383)

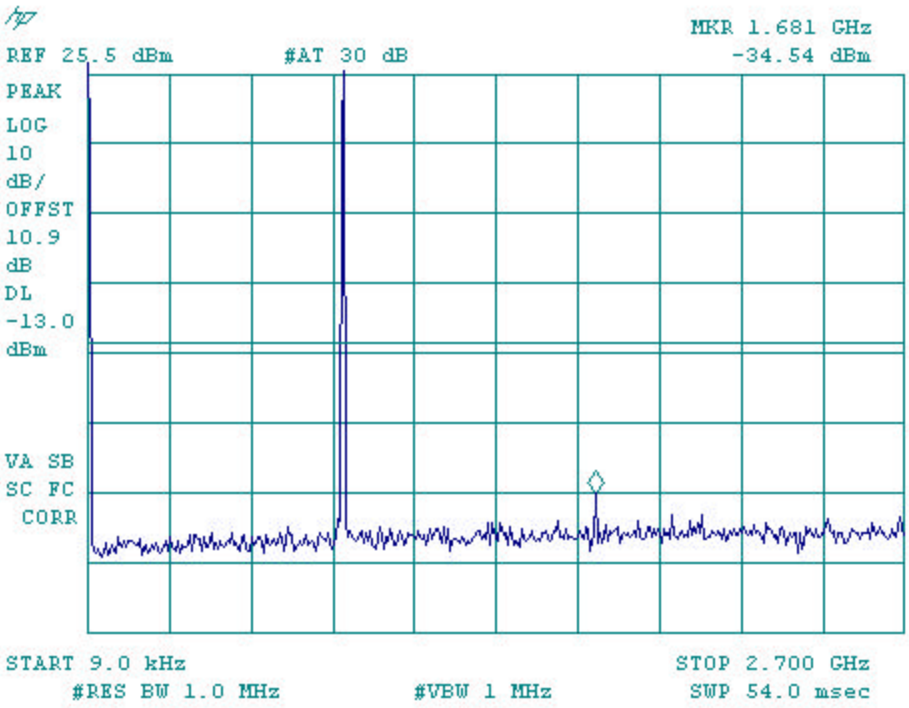


Figure 9-4a AMPS – Conducted Spurious Emission (CH 383)

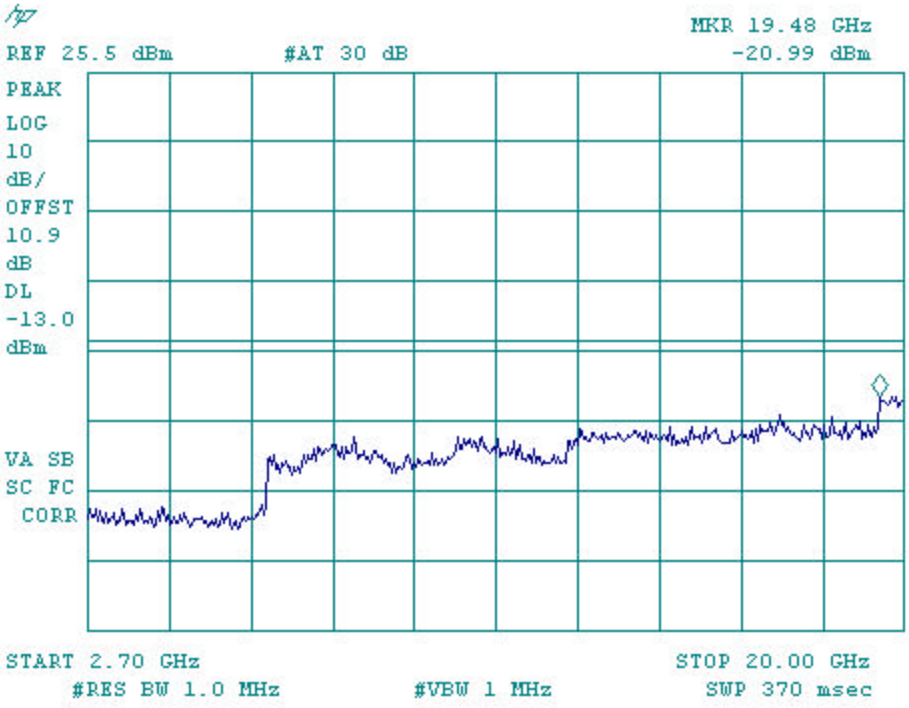


Figure 9-4b AMPS – Conducted Spurious Emission (CH 383)

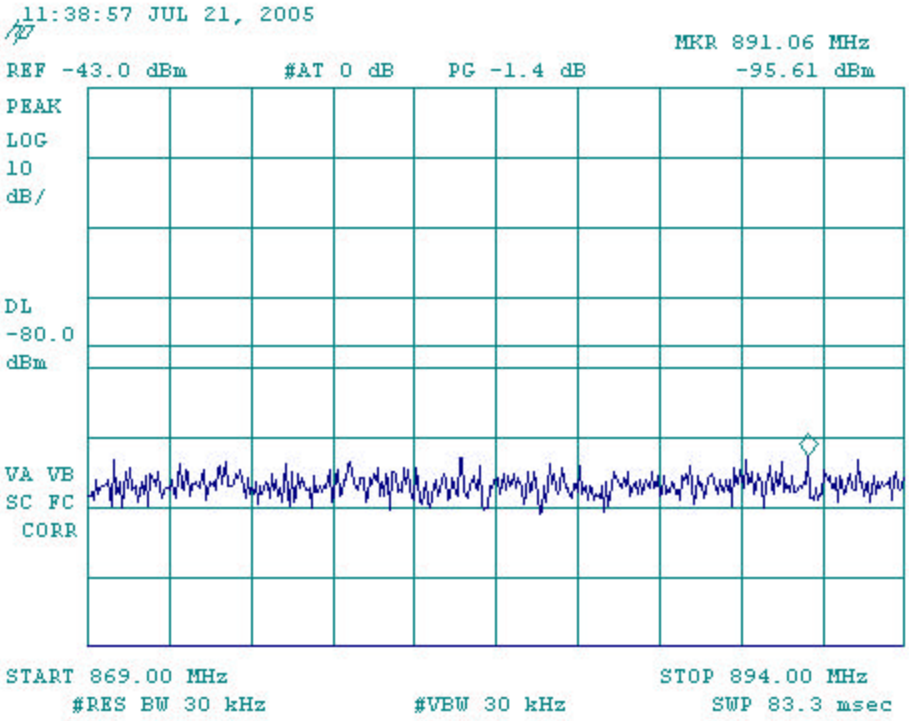


Figure 9-5 AMPS - Emissions in base station frequency range (CH 799)

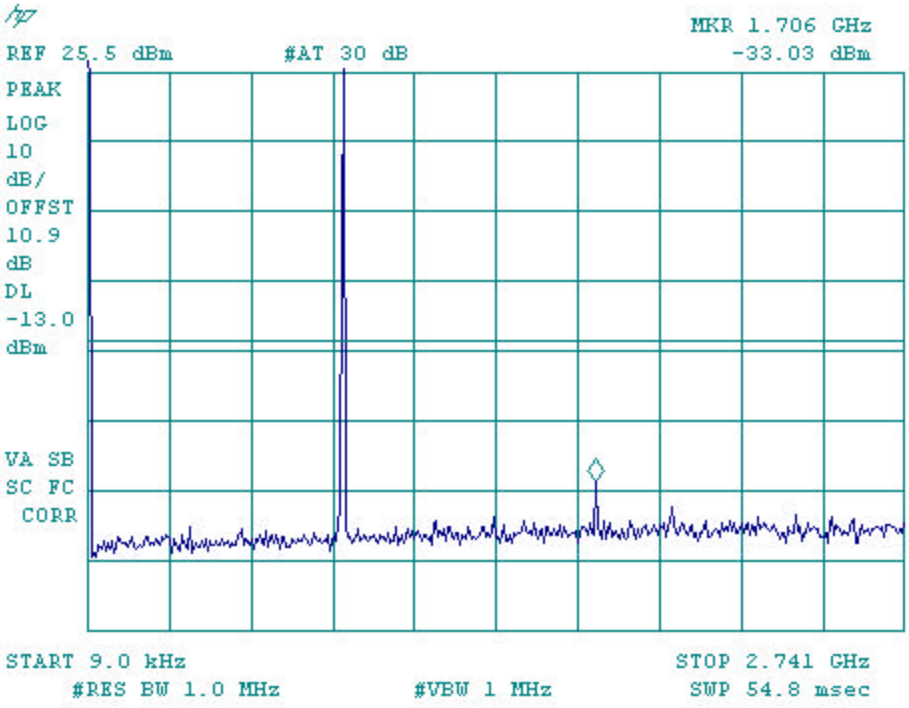


Figure 9-6a AMPS – Conducted Spurious Emission (CH 799)

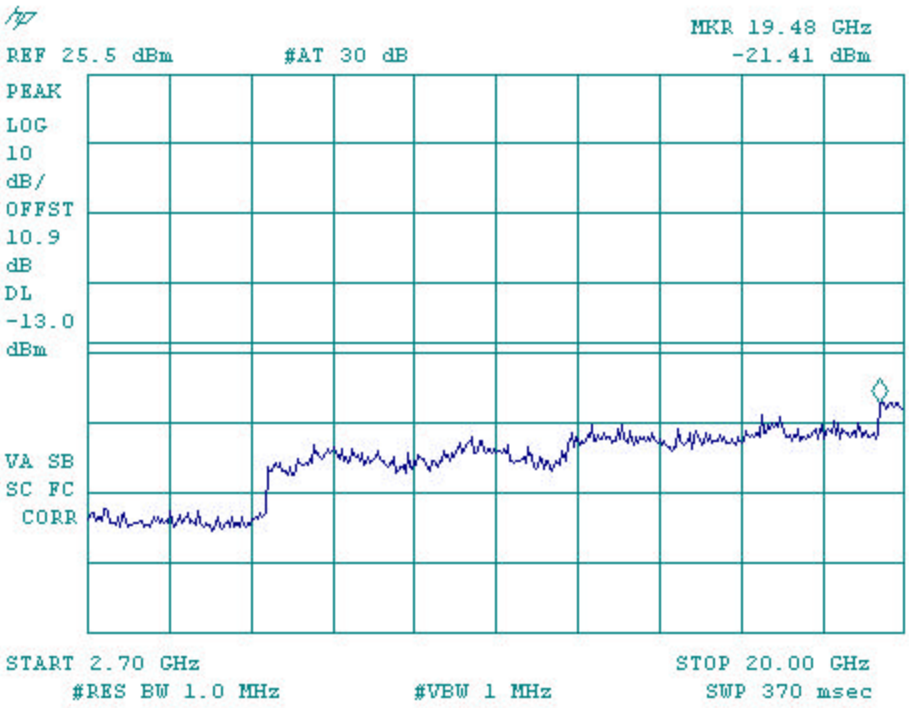


Figure 9-6b AMPS – Conducted Spurious Emission (CH 799)

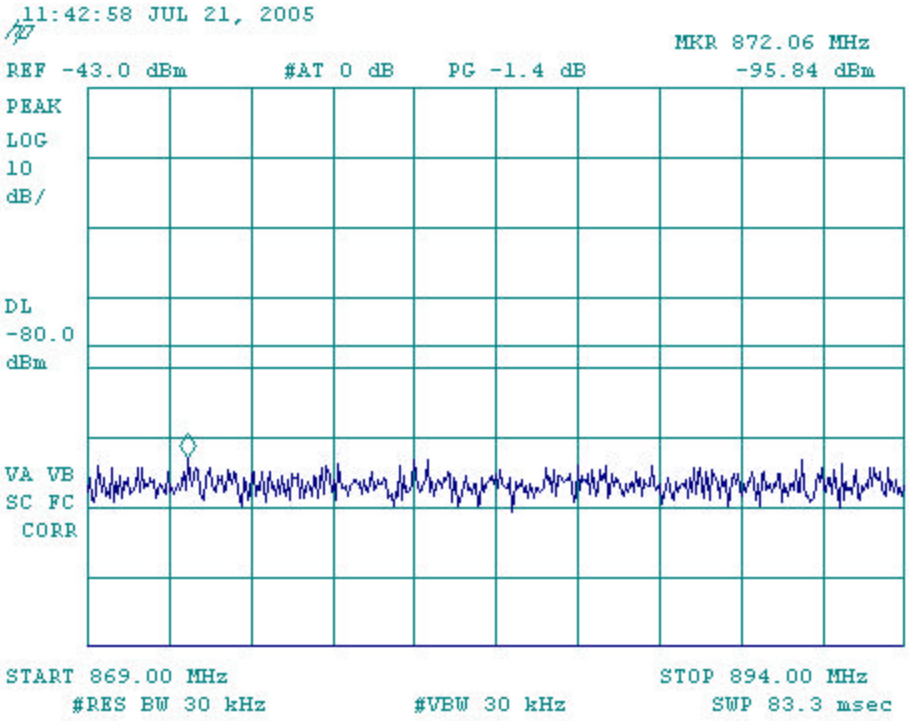


Figure 9-7 CDMA 800 - Emissions in base station frequency range (CH 1013)

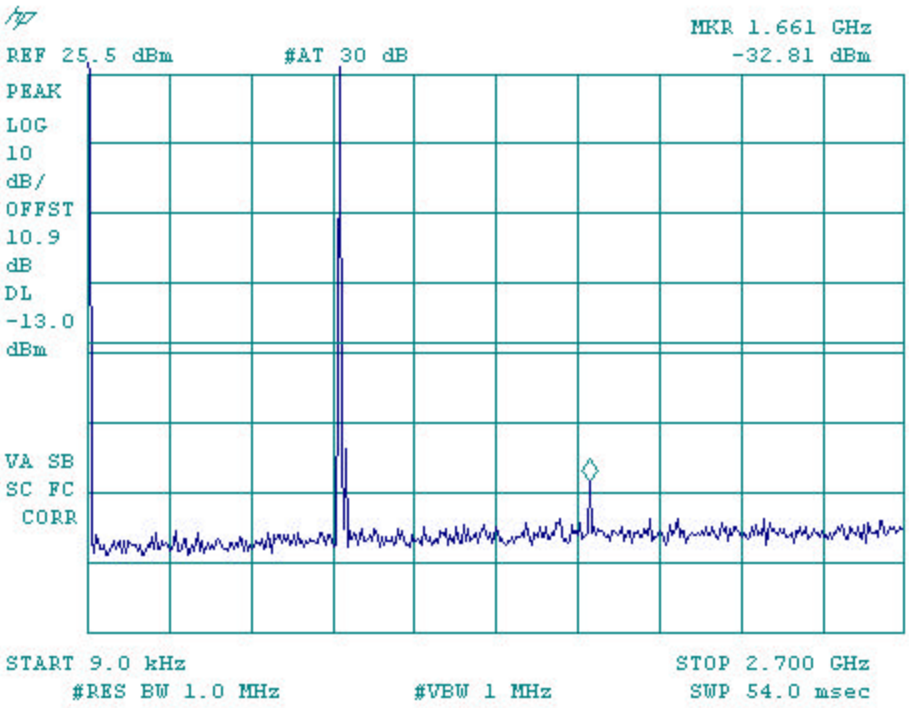


Figure 9-8a CDMA 800 – Conducted Spurious Emission (CH 1013)

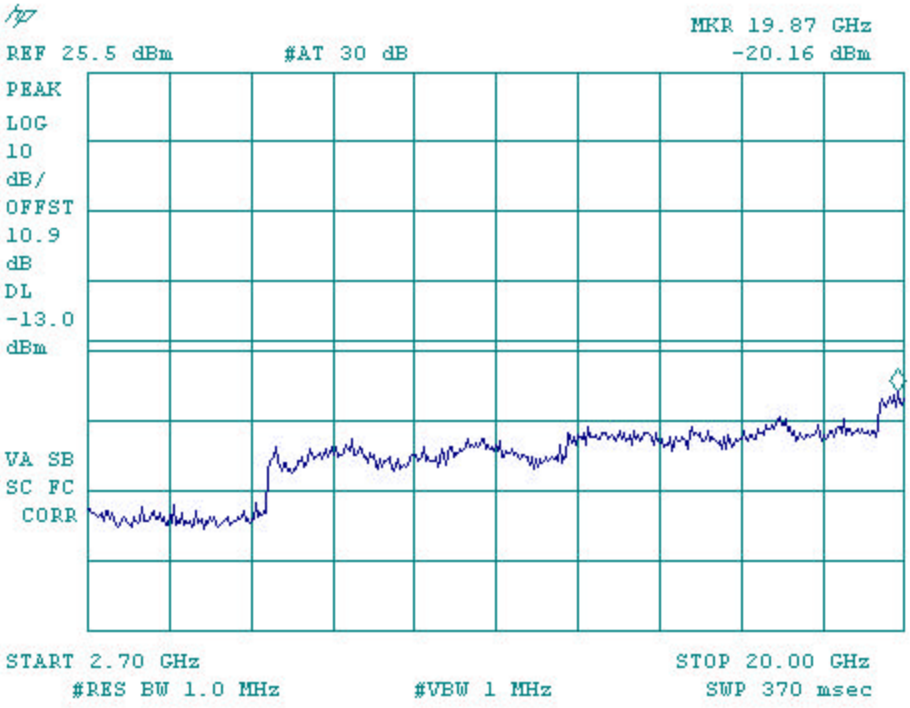


Figure 9-8b CDMA 800 – Conducted Spurious Emission (CH 1013)

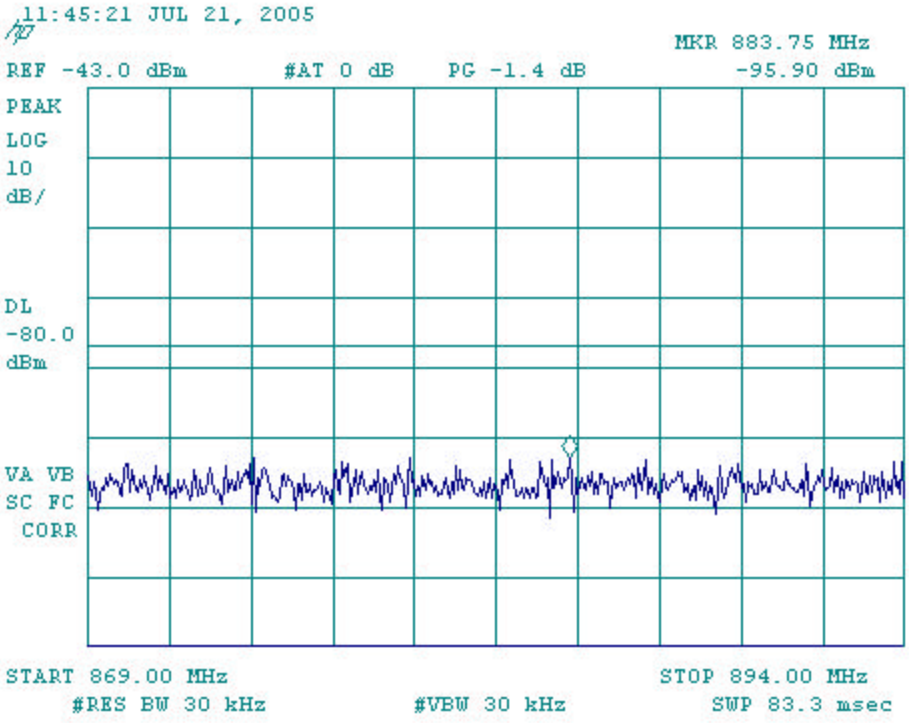


Figure 9-9 CDMA 800 - Emissions in base station frequency range (CH 383)

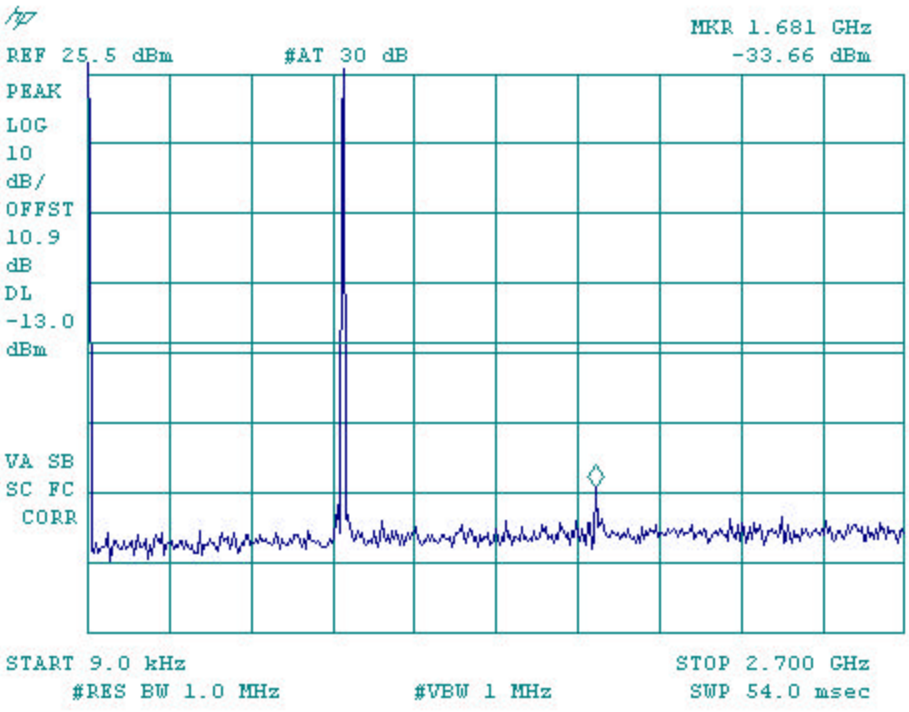


Figure 9-10a CDMA 800 – Conducted Spurious Emission (CH 383)

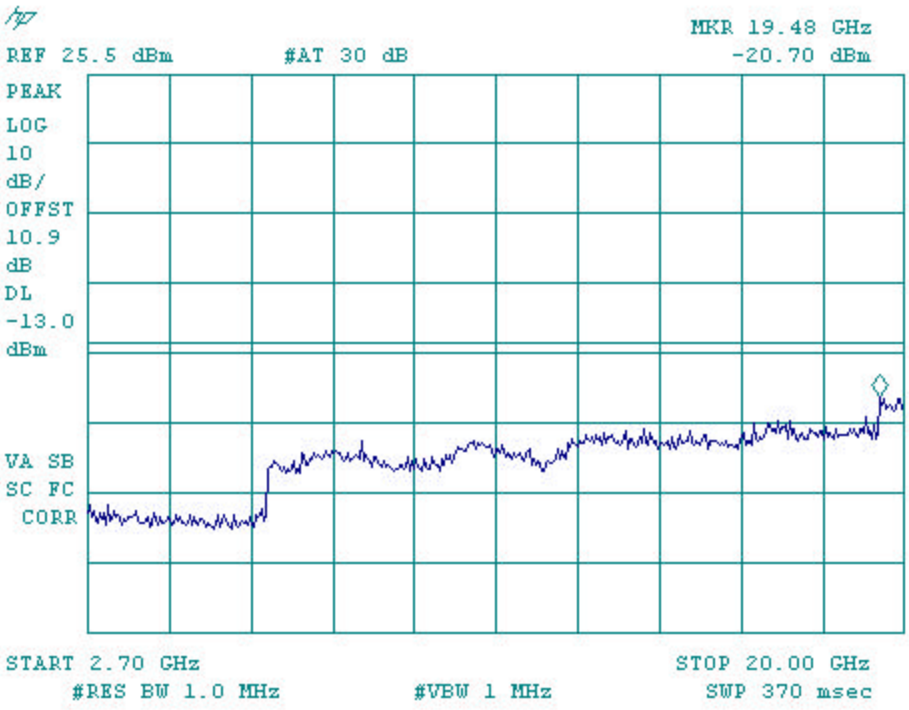


Figure 9-10b CDMA 800 – Conducted Spurious Emission (CH 383)

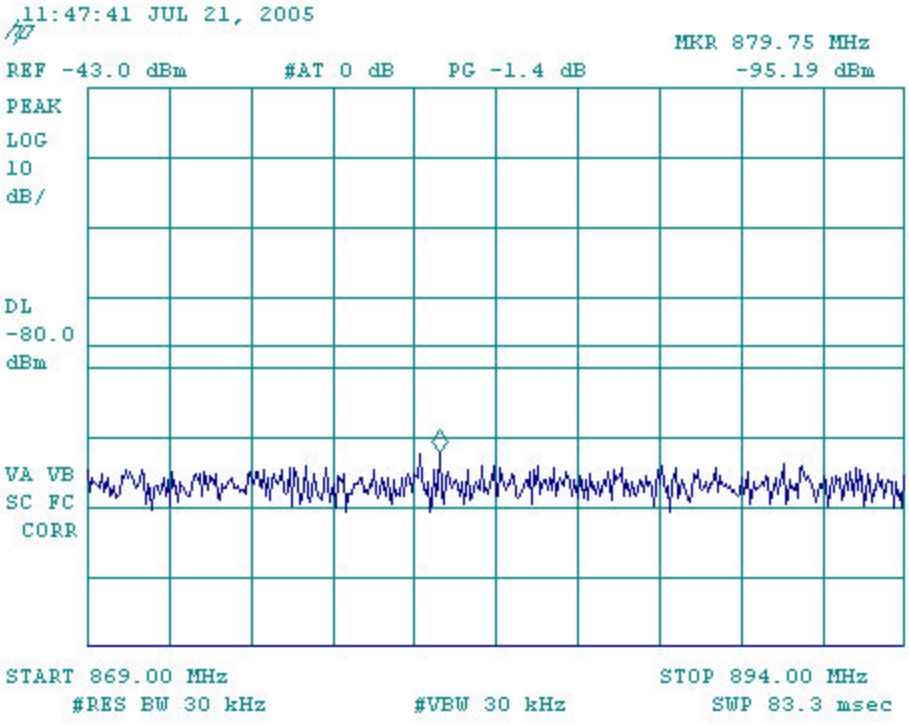


Figure 9-11 CDMA 800 - Emissions in base station frequency range (CH 777)

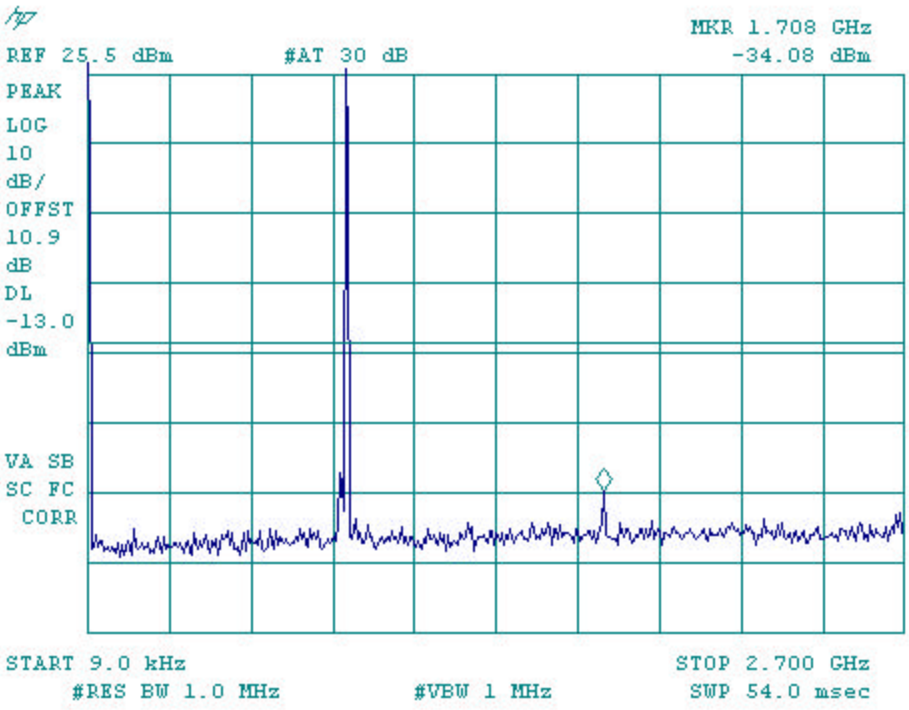


Figure 9-12a CDMA 800 – Conducted Spurious Emission (CH 777)

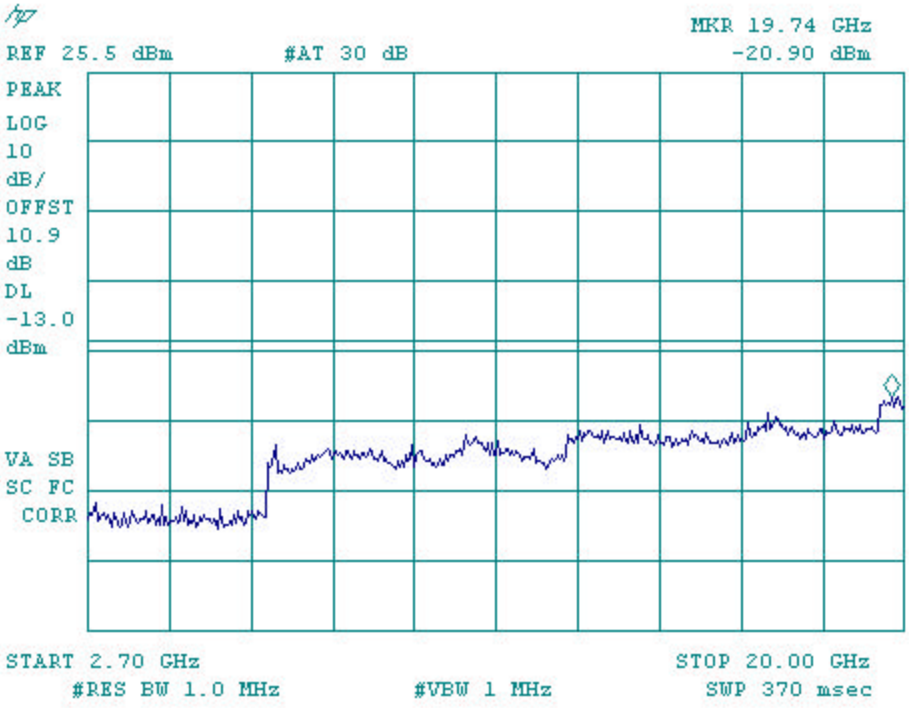


Figure 9-12b CDMA 800 – Conducted Spurious Emission (CH 777)

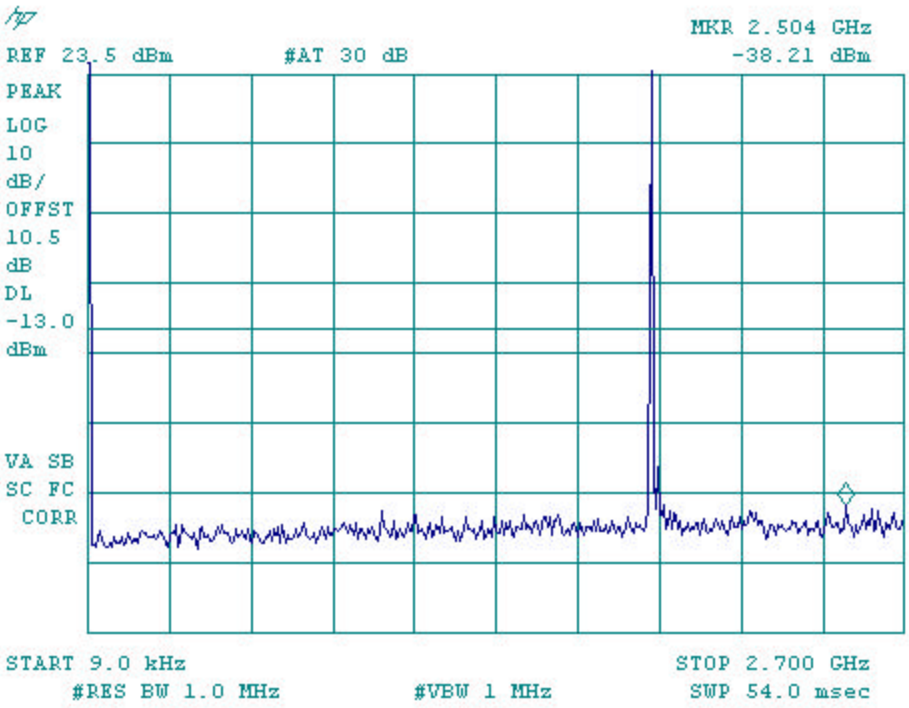


Figure 9-13a CDMA 1900 - Conducted Spurious Emission (CH 25)

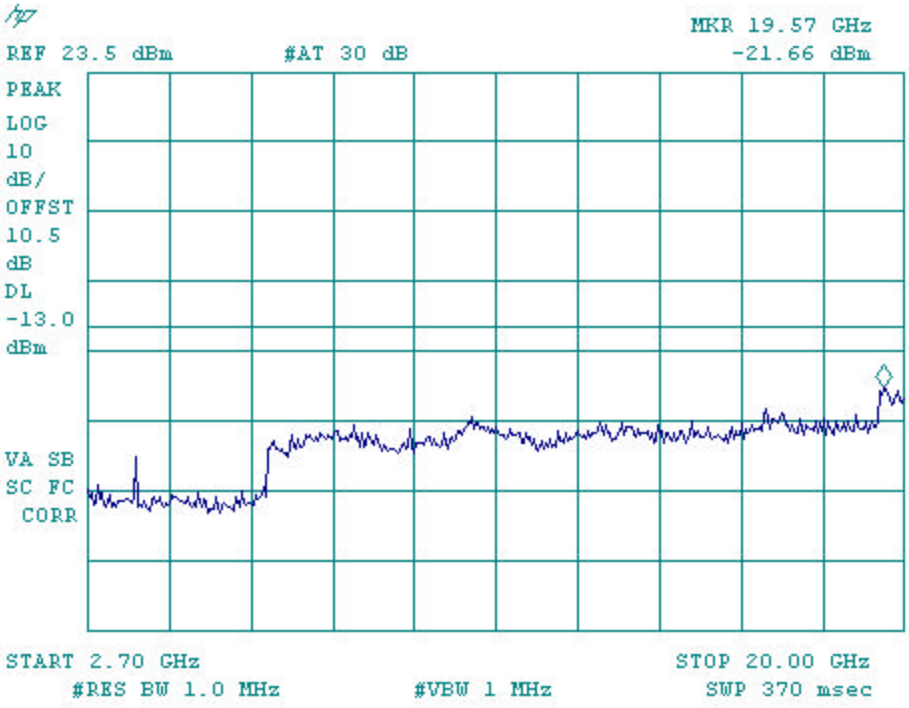


Figure 9-13b CDMA 1900 - Conducted Spurious Emission (CH 25)

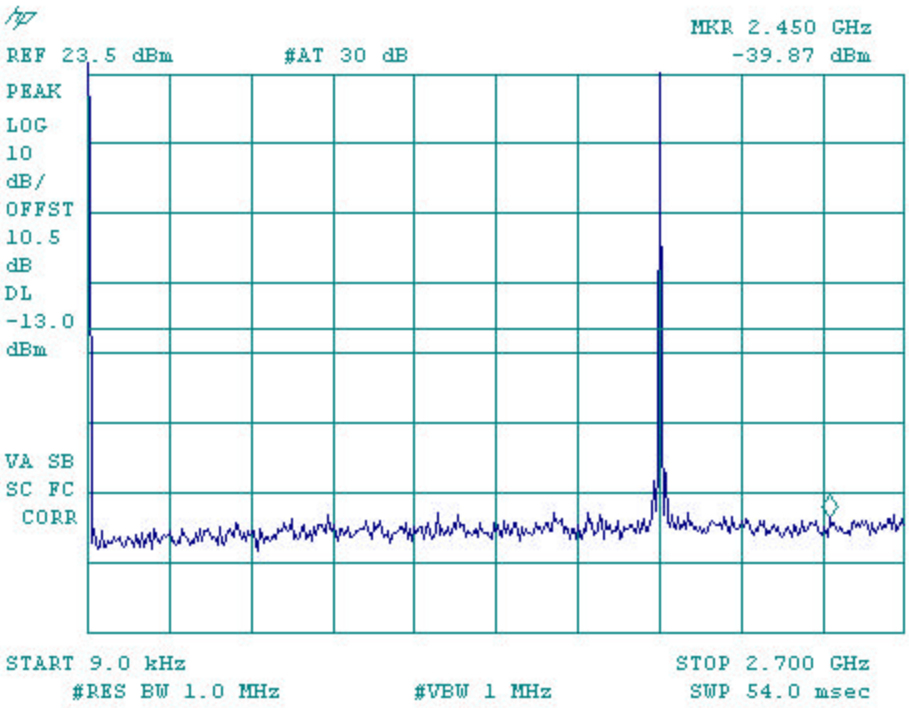


Figure 9-14a CDMA 1900 - Conducted Spurious Emission (CH 600)

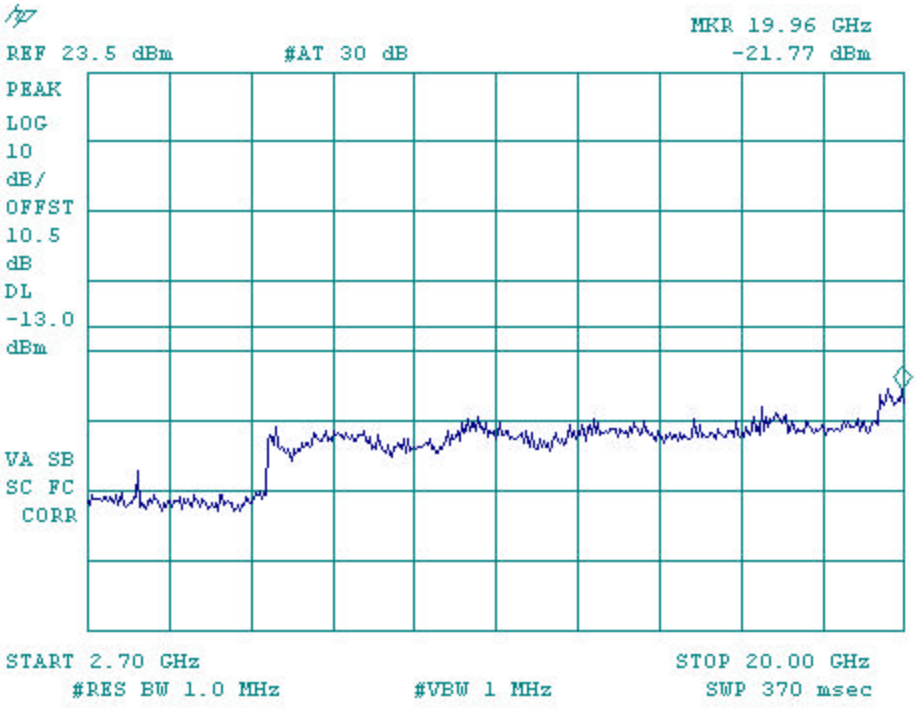


Figure 9-14b CDMA 1900 - Conducted Spurious Emission (CH 600)

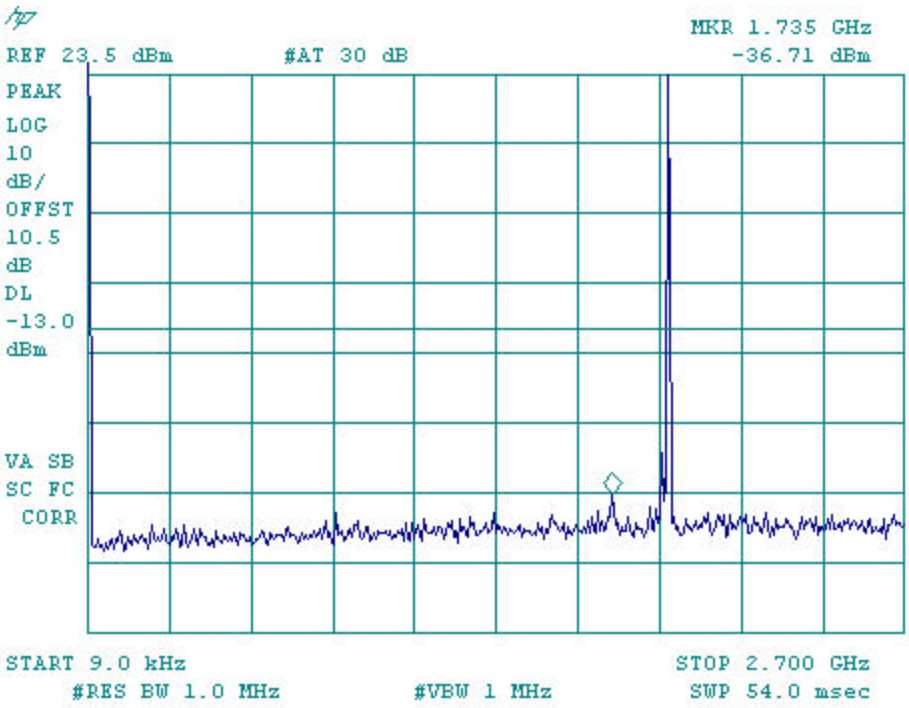


Figure 9-15a CDMA 1900 - Conducted Spurious Emission (CH 1175)

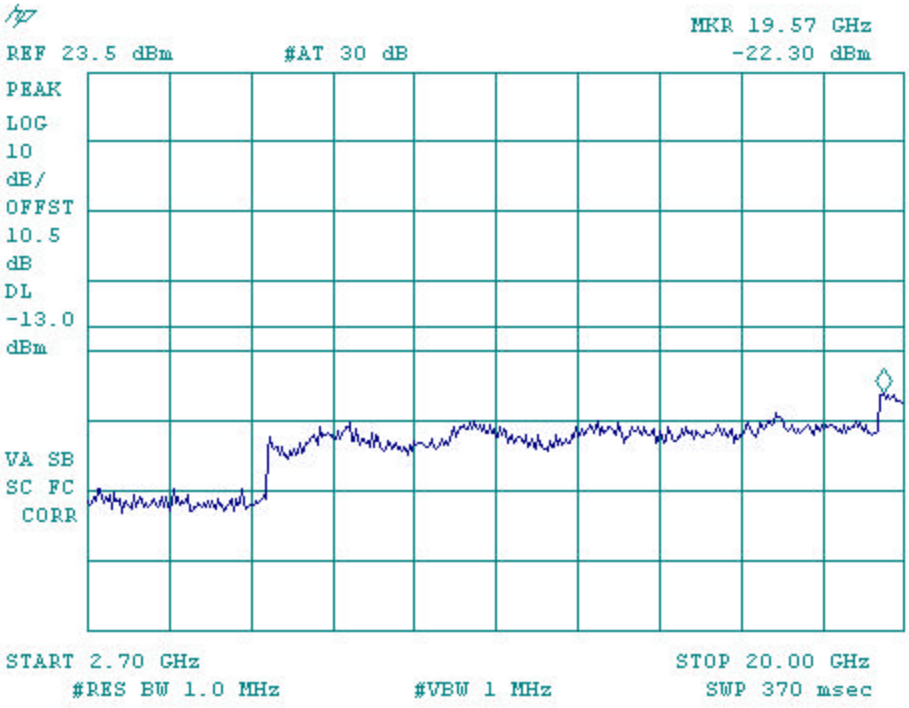


Figure 9-15b CDMA 1900 - Conducted Spurious Emission (CH 1175)

10 Transmitter Radiated Spurious Emissions Measured Data

FCC: § 2.1053, § 22.91, § 24.238	IC: RSS-129 §8.1, RSS-133 §6.3
Measurement Procedures: The radiated spurious emission test was performed at Nemko in San Diego, California. The test report is attached in a separate attachment.	

11 Receiver Spurious Emissions

FCC: § 15.109	IC: RSS-129 §10, RSS-133 §9
Measurement Procedures: The receiver radiated spurious emission test was performed at Nemko in San Diego, California. The test report is attached in a separate attachment.	

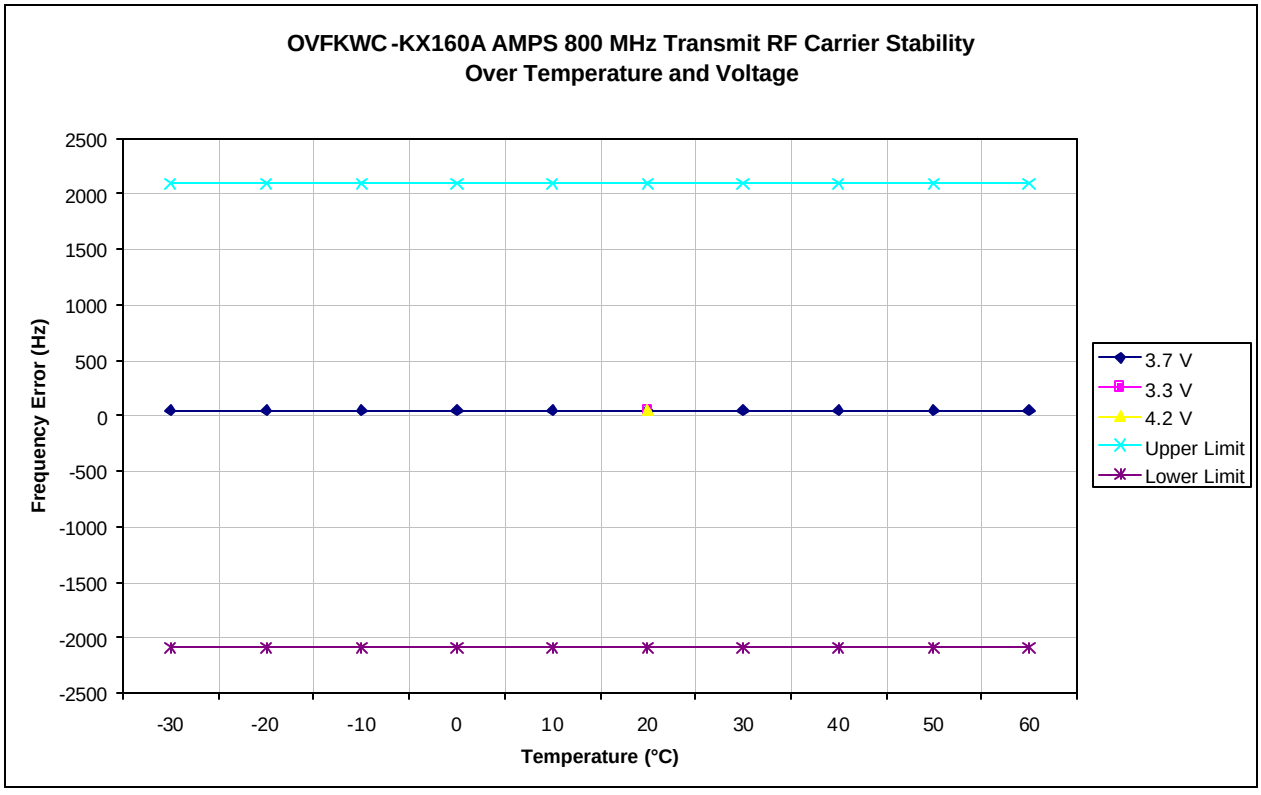
12 Transmitter RF Carrier Frequency Stability

FCC: § 2.1055, § 22.355, § 24.235	IC: RSS-129 §7.2 and §9.2, RSS-133 §7
Measurement Procedures: The EUT was placed in an environmental chamber. The RF output of the EUT was connected to Agilent 8960 Series 10 E5515C. A power supplier was connected as primary voltage supply.	

12.1 AMPS Mode

Tx Frequency:	836.49 MHz	**Voltage :**	3.7V
Tolerance:	+/- 2.5 Ppm (+/- 2091 Hz)	**Ch:**	383

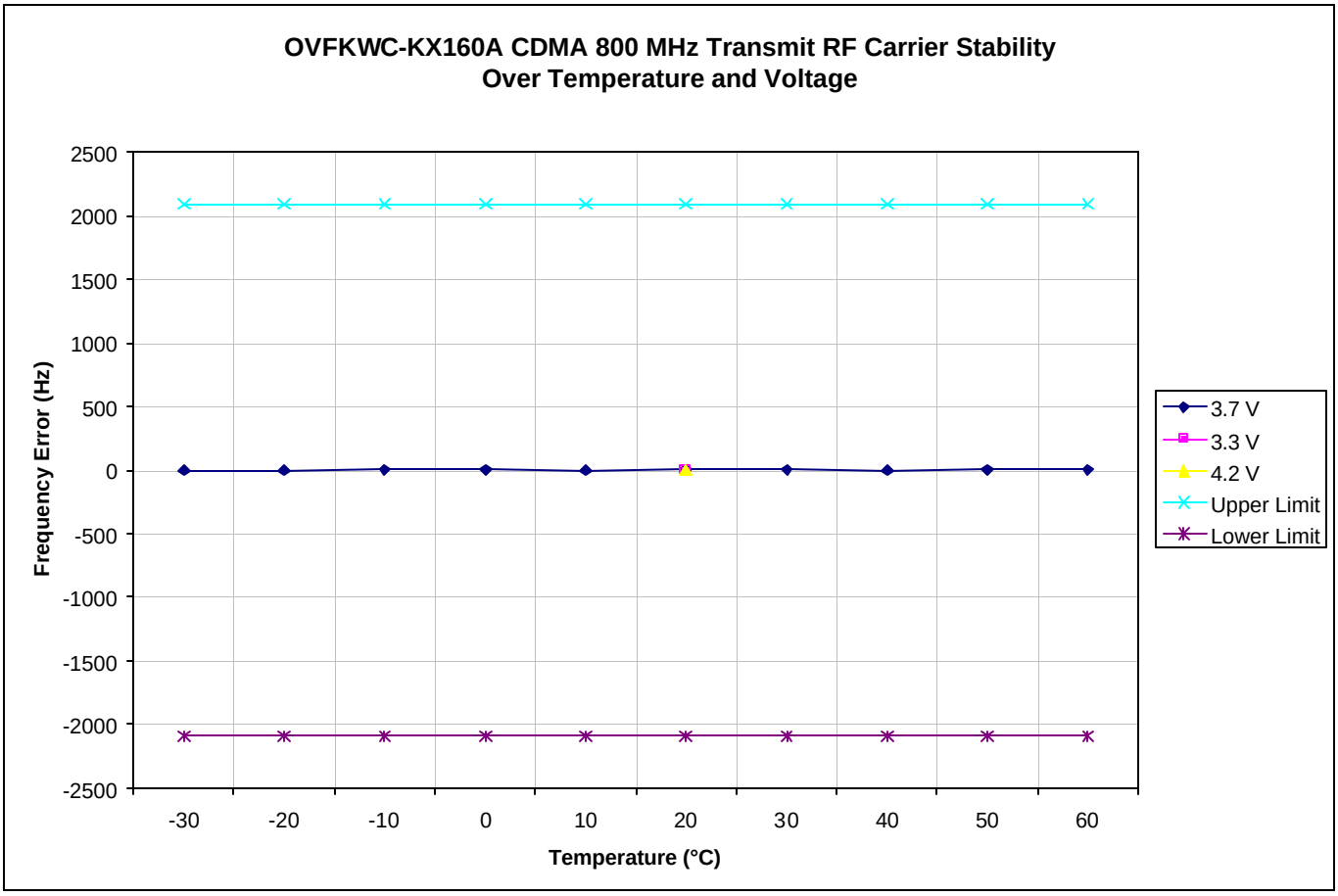
Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.2V (Battery endpoint)	3.7V	4.26V (115%)	Lower limit	Upper limit
-30		50.00		-2091	2091
-20		50.00		-2091	2091
-10		51.00		-2091	2091
0		51.00		-2091	2091
10		50.00		-2091	2091
20	**50**	**50.00**	**50.00**	-2091	2091
30		49.00		-2091	2091
40		50.00		-2091	2091
50		50.00		-2091	2091
60		50.00		-2091	2091



12.2 CDMA 800 Mode

Tx Frequency:	836.49 MHz	**Voltage :**	3.7V
Tolerance:	+/- 2.5 Ppm (+/- 2091 Hz)	**Ch:**	383

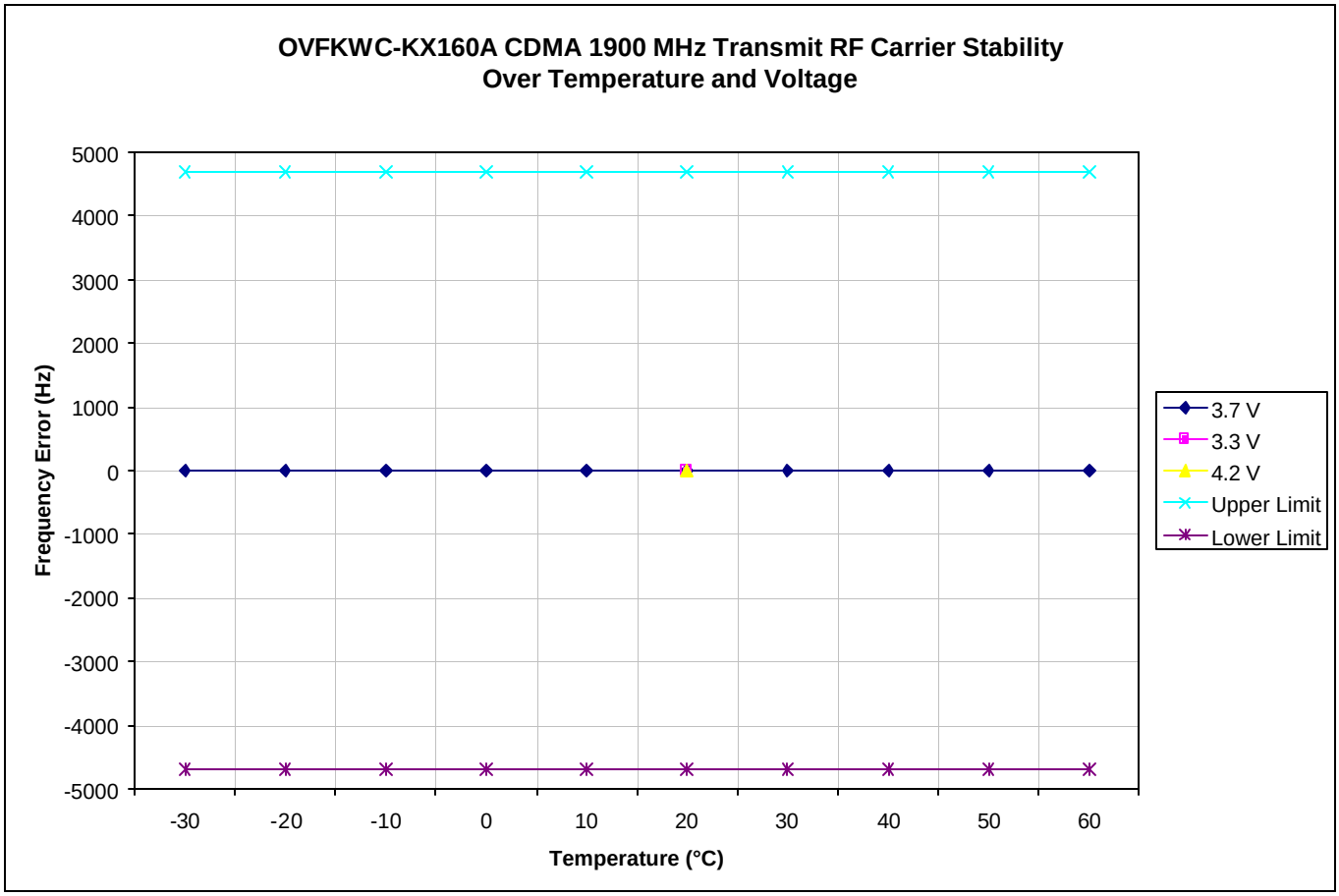
Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.2V (Battery endpoint)	3.7V	4.26V (115%)	Lower limit	Upper limit
-30		1.26		-2091	2091
-20		1.04		-2091	2091
-10		1.20		-2091	2091
0		1.48		-2091	2091
10		1.14		-2091	2091
20	**1.71**	**0.34**	**-0.37**	-2091	2091
30		1.60		-2091	2091
40		1.12		-2091	2091
50		1.71		-2091	2091
60		1.25		-2091	2091



12.3 CDMA 1900 Mode

Tx Frequency:	1880.00 MHz	**Voltage :**	3.7V
Tolerance:	+/- 2.5 Ppm (+/-4700 Hz)	**Ch:**	600

Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.2V (Battery endpoint)	3.7V	4.26V (115%)	Lower limit	Upper limit
-30		2.04		-4700	4700
-20		1.71		-4700	4700
-10		1.88		-4700	4700
0		1.39		-4700	4700
10		2.53		-4700	4700
20	**1.07**	**1.17**	**2.35**	-4700	4700
30		1.46		-4700	4700
40		1.34		-4700	4700
50		1.35		-4700	4700
60		0.36		-4700	4700



13 Exposure of Humans to RF Fields (SAR)

The SAR Test Report is showed in a separate attachment as Exhibit 9.

14 Test Equipment

Description	Manufacturer	Model Number	Serial Number	Cal Due Date
Power Meter	Giga-tronics	8541C	1835203	12/20/2005
Power Meter Sensor	Giga-tronics	80601A	1830321	06/16/2006
Spectrum Analyzer	Hewlett Packard	8593EM	3710A00203	03/14/2006
Spectrum Analyzer	Hewlett Packard	8594E	3810A04238	04/16/2006
Spectrum Analyzer	Rohde & Schwarz	FSEA	001854	03/04/2006
Wireless Communications Test Set	Agilent	8960	US41140252	07/16/2006
CDMA Mobile Station Test Set	Hewlett Packard	8924C	US37482647	09/16/2007
Temperature Chamber	CSZ	Z2033	Z9343034	03/11/2006