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Test Report

From

Kyocera Wireless Corp

PCS CDMA Cellular Phone

FCC Part 24 Certification **IC RSS 133**
FCC ID: **OVFKWC-K493** Models: **K490 Family**

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.

Test performed by:	Patrick Bowen Staff Engineer	Date of Test:	6/2/2004 – 6/14/2004
Report Prepared by:	Patrick Bowen Staff Engineer	Date of Report:	6/14/2004
Report Reviewed by:	C. K. Li Engineer, Senior Staff/Manager	Date of Review:	7/1/2004
Tests that required an OATS site were performed by Nemko San Diego, California.			

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1 General Information

Applicant:	Kyocera Wireless Corp 10300 Campus Point Drive San Diego CA 92121
FCC ID:	OVFKWC-K493
Product:	PCS CDMA Cellular Phone
Model Numbers:	K493L, K493N, K493LC, K493XLC, K493NC, K493XNC, K493MC, K493XMC
EUT Serial Number:	7A-X----0WB78W (model K493LC)
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:	§24E
Modes:	1900 CDMA
Multiple Access Scheme:	CDMA
TX Frequency (MHz):	1850 - 1910
Emission Designators:	1M25F9W
Max. Output Power (W)	0.372 EIRP

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2   Product Description

The phones OVFKWC-K493 are PCS 1XRTT products. Models that contain the letter "L" have integrated Assisted GPS software feature enabled to meet the emergency location requirements of the FCC's E911 Phase II mandate. The PCS architecture is defined as 1900MHz (PCS CDMA).

All models included in the OVFKWC-K493 filing filing use the same antenna and have identical PCB layouts in regards to the RF Circuitry, Basic Frequency Determining and Stabilization Circuitry, Basic Modulator Circuit, Transmitter Active Devices, and Tuning Targets. The only differences between models are the choice of color or greyscale LCD, and the software applications supported (GPS, Brew, WAP, etc.). See product matrix in Figure 2.1 below.

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

The phone will support certain CDMA2000 radio-configurations (RC) as describes in Exhibit 1 (operation description).

	Energi
	K490
	Non-BREW / BREW
KWC PCS/GPS/Greyscale	K493L
KWC PCS/no GPS/Greyscale	K493N
KWC PCS/GPS/Color	K493LC / K493XLC
KWC PCS/no GPS/Color	K493NC / K493XNC
KWC PCS / GPS/WAP 2.0	K493MC / K493XMC

Figure 2.1 OVFKWC-K493 Product Matrix

3   Electronic Serial Numbers (ESN) Protection

The PCS Phone, FCC ID: OVFKWC-K493 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. Note that the models that contain the letter "L" have Global Positioning System (GPS) support.

5   TTY compliance

FCC § 255 of the Telecom Act
The OVFKWC-K493 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-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)
CDMA 1900	1851.25	25	23.10
	1880.00	600	23.10
	1908.75	1175	23.08

6.2 Radiated Power

FCC: § 24.232	IC: RSS-133 §6.2

Measurement Procedures:

The EUT (SN: 7A-X----0WB7FJ) 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.

Anechonic Chamber

Horn Antenna.

EUT

2.5 Meters

HPIB

Giga-tronic 8541C

Univeral Power meter

PC

Positioner controller

Mode	Frequency (MHz)	Channel	Max. Power (dBm)	Ref.
CDMA 1900	1851.25	25	25.71	EIRP
	1880.00	600	25.63	
	1908.75	1175	24.98	

7 Occupied Bandwidth

FCC: § 2.1049, § 24.238	IC: RSS-133 §6.3
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 Digital: Modulate with full rate.	

List of Figures
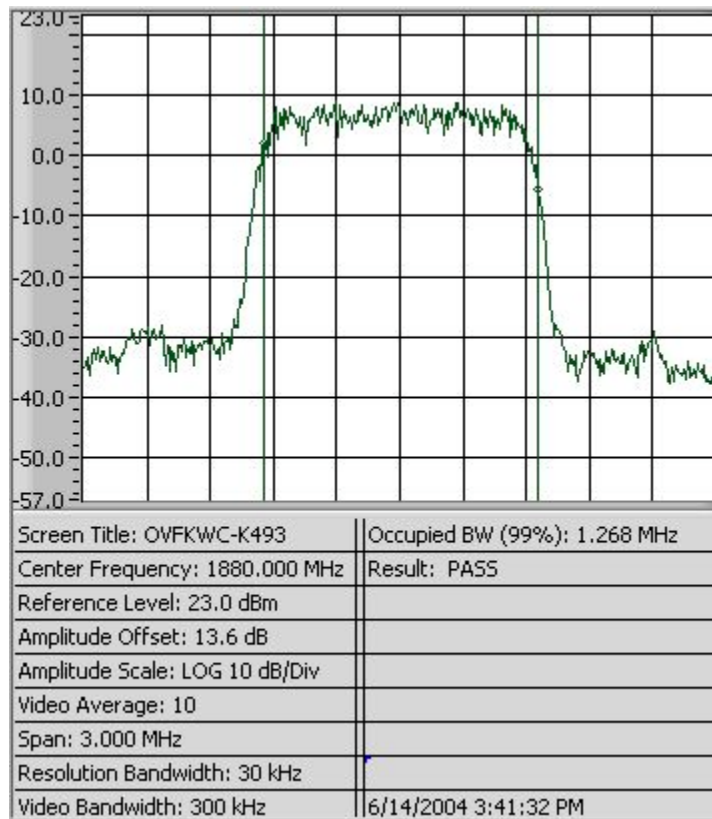
Figure 8-1 CDMA 1900 at RC1

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Screen Title: OVFKWC-K493	Occupied BW (99%): 1.268 MHz
Center Frequency: 1880.000 MHz	Result: PASS
Reference Level: 23.0 dBm	
Amplitude Offset: 13.6 dB	
Amplitude Scale: LOG 10 dB/Div	
Video Average: 10	
Span: 3.000 MHz	
Resolution Bandwidth: 30 kHz	
Video Bandwidth: 300 kHz	6/14/2004 3:45:58 PM
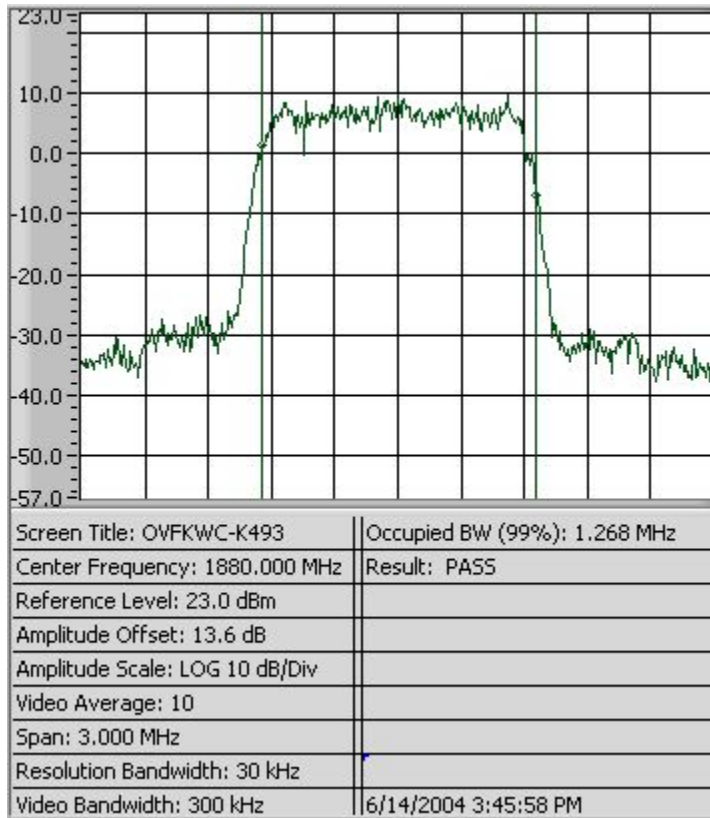
Figure 8-2 CDMA 1900 1X at RC3

Screen Title: OVFKWC-K493	Result: PASS
Center Frequency: 1851.250 MHz	Chan Ref Power: 23.06 dBm/1.40 M
Reference Level: 23.0 dBm	-1.25625 MHz Offset: -61.20 dBc
Amplitude Offset: 13.6 dB	-2.75 MHz Offset: -54.75 dBc
Amplitude Scale: LOG 10 dB/Div	
Video Average: 10	
Span: 3.0 MHz	
Resolution Bandwidth: 30 kHz	
Video Bandwidth: 300 kHz	6/14/2004 3:43:43 PM
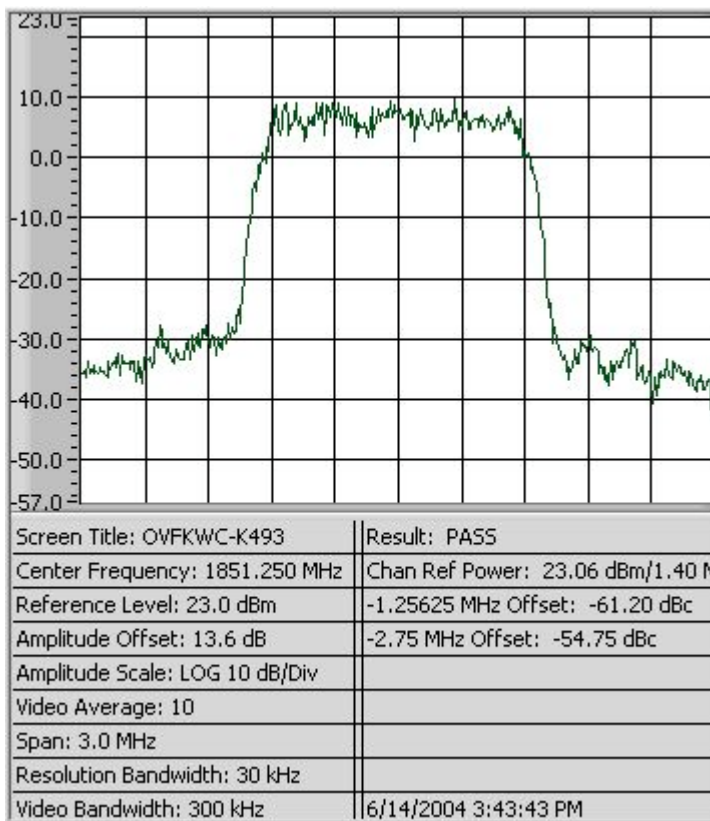
Figure 8-3 CDMA 1900 Lower Band Edge

Screen Title: OVFKWC-K493	Result: PASS
Center Frequency: 1908.750 MHz	Chan Ref Power: 22.87 dBm/1.40 M
Reference Level: 23.0 dBm	+1.25625 MHz Offset: -51.15 dBc
Amplitude Offset: 13.6 dB	+2.75 MHz Offset: -52.04 dBc
Amplitude Scale: LOG 10 dB/Div	
Video Average: 10	
Span: 3.0 MHz	
Resolution Bandwidth: 30 kHz	
Video Bandwidth: 300 kHz	6/14/2004 3:44:56 PM
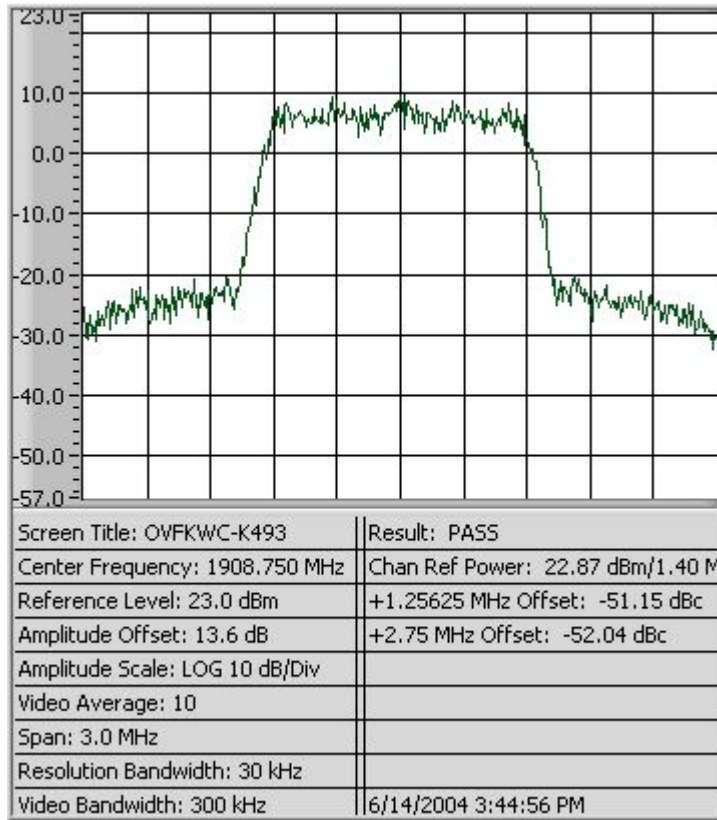
Figure 8-4 CDMA 1900 Upper Band Edge

8 Spurious Emissions At Antenna Terminals

FCC:	§ 2.1051, § 24.238	IC:	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.

List of Figures:

Start Frequency: 9.000 kHz	Stop Frequency: 2.700 GHz
Screen Title: OVFKWC-K493	Marker Frequency: 1863.003 MHz
Reference Level: 25.0 dBm	Marker Amplitude: 21.78 dBm
Amplitude Offset: 4.1 dB	Display Line: -13.0 dBm
Amplitude Scale: LOG 10 dB/Div	Result: PASS
Video Average: OFF	
Resolution Bandwidth: 1 MHz	
Video Bandwidth: 1 MHz	6/14/2004 3:56:03 PM
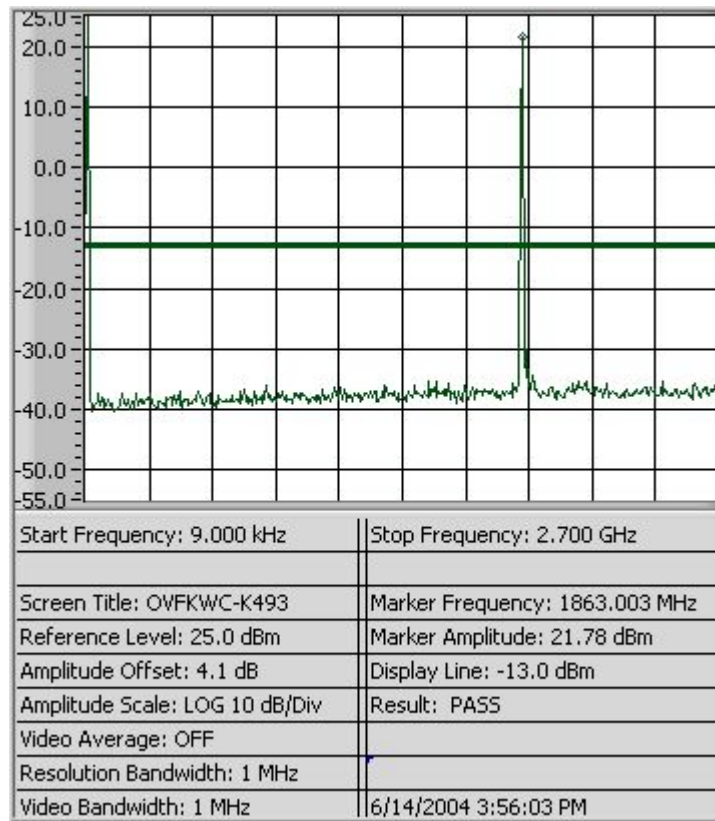
Figure 9-1a CDMA 1900 - Conducted Spurious Emission (CH 25)

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Start Frequency: 2.700 GHz	Stop Frequency: 20.000 GHz
Screen Title: OVFKWC-K493	Marker Frequency: 19524.250 MHz
Reference Level: 25.0 dBm	Marker Amplitude: -17.09 dBm
Amplitude Offset: 4.1 dB	Display Line: -13.0 dBm
Amplitude Scale: LOG 10 dB/Div	Result: PASS
Video Average: OFF	
Resolution Bandwidth: 1 MHz	
Video Bandwidth: 1 MHz	6/14/2004 3:56:11 PM
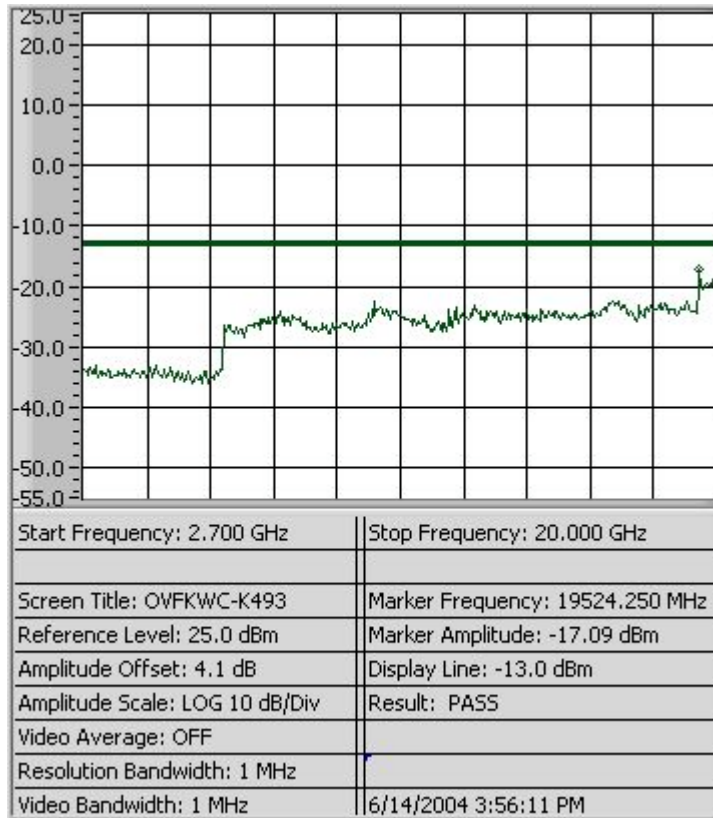
Figure 9-1b CDMA 1900 - Conducted Spurious Emission (CH 25)

Start Frequency: 9.000 kHz	Stop Frequency: 2.700 GHz
Screen Title: OVFKWC-K493	Marker Frequency: 1890.003 MHz
Reference Level: 25.0 dBm	Marker Amplitude: 22.25 dBm
Amplitude Offset: 4.1 dB	Display Line: -13.0 dBm
Amplitude Scale: LOG 10 dB/Div	Result: PASS
Video Average: OFF	
Resolution Bandwidth: 1 MHz	
Video Bandwidth: 1 MHz	6/14/2004 3:56:39 PM
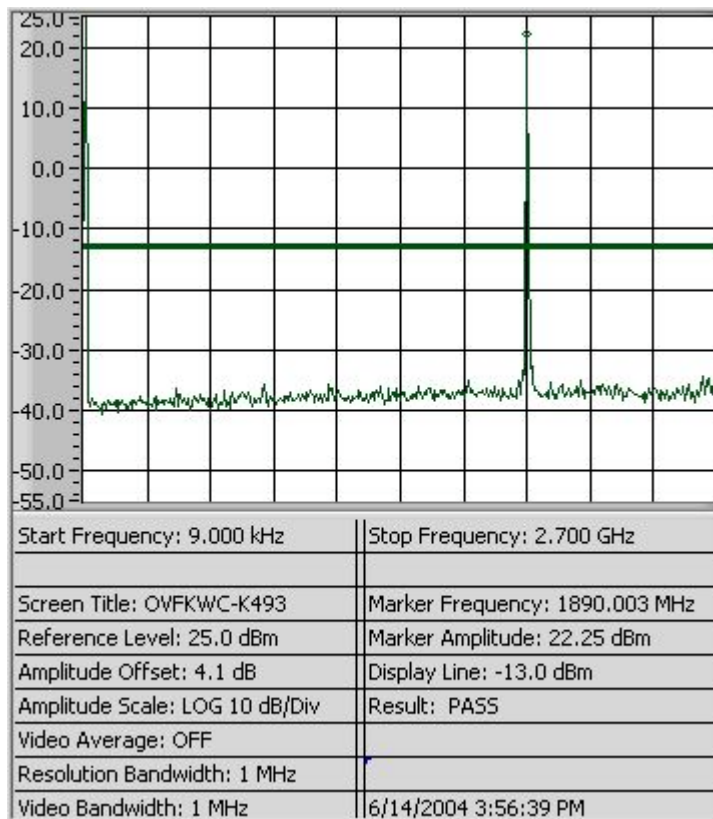
Figure 9-2a CDMA 1900 - Conducted Spurious Emission (CH 600)

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Start Frequency: 2.700 GHz	Stop Frequency: 20.000 GHz
Screen Title: OVFKWC-K493	Marker Frequency: 19654.000 MHz
Reference Level: 25.0 dBm	Marker Amplitude: -19.15 dBm
Amplitude Offset: 4.1 dB	Display Line: -13.0 dBm
Amplitude Scale: LOG 10 dB/Div	Result: PASS
Video Average: OFF	
Resolution Bandwidth: 1 MHz	
Video Bandwidth: 1 MHz	6/14/2004 3:56:47 PM
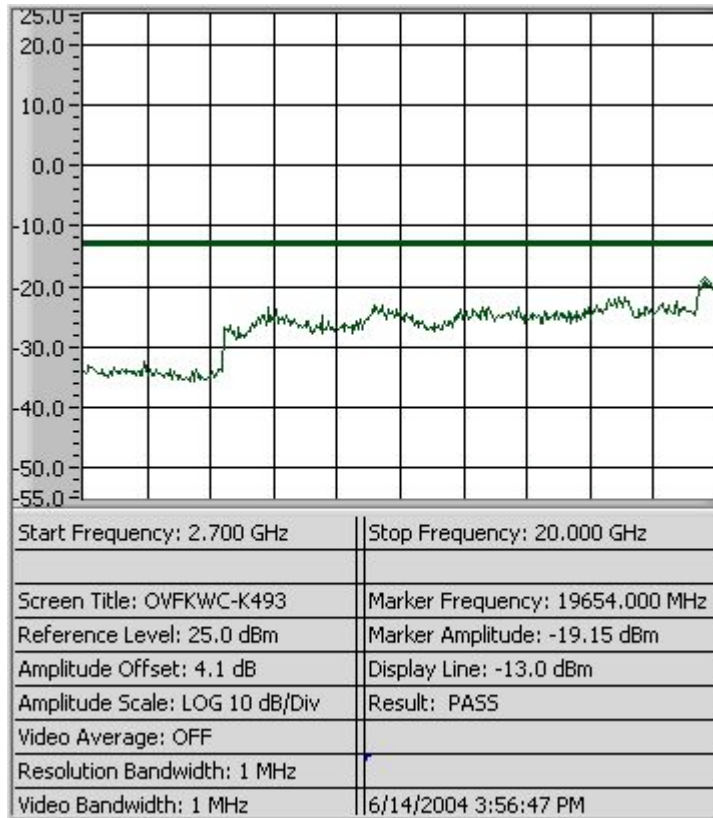
Figure 9-2b CDMA 1900 - Conducted Spurious Emission (CH 600)

Start Frequency: 9.000 kHz	Stop Frequency: 2.700 GHz
Screen Title: OVFKWC-K493	Marker Frequency: 1917.003 MHz
Reference Level: 25.0 dBm	Marker Amplitude: 21.44 dBm
Amplitude Offset: 4.1 dB	Display Line: -13.0 dBm
Amplitude Scale: LOG 10 dB/Div	Result: PASS
Video Average: OFF	
Resolution Bandwidth: 1 MHz	
Video Bandwidth: 1 MHz	6/14/2004 3:58:15 PM
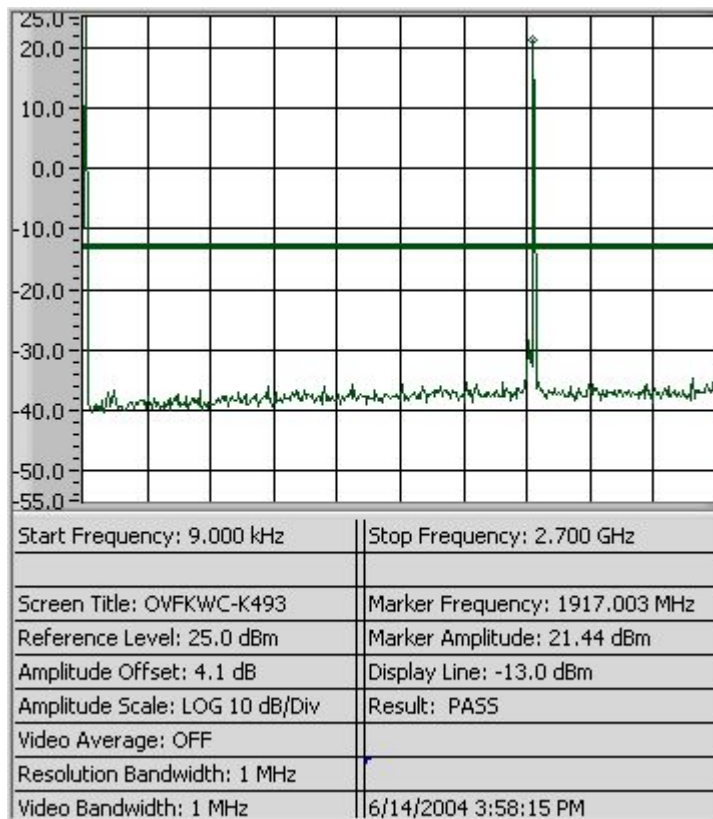
Figure 9-3a CDMA 1900 - Conducted Spurious Emission (CH 1175)
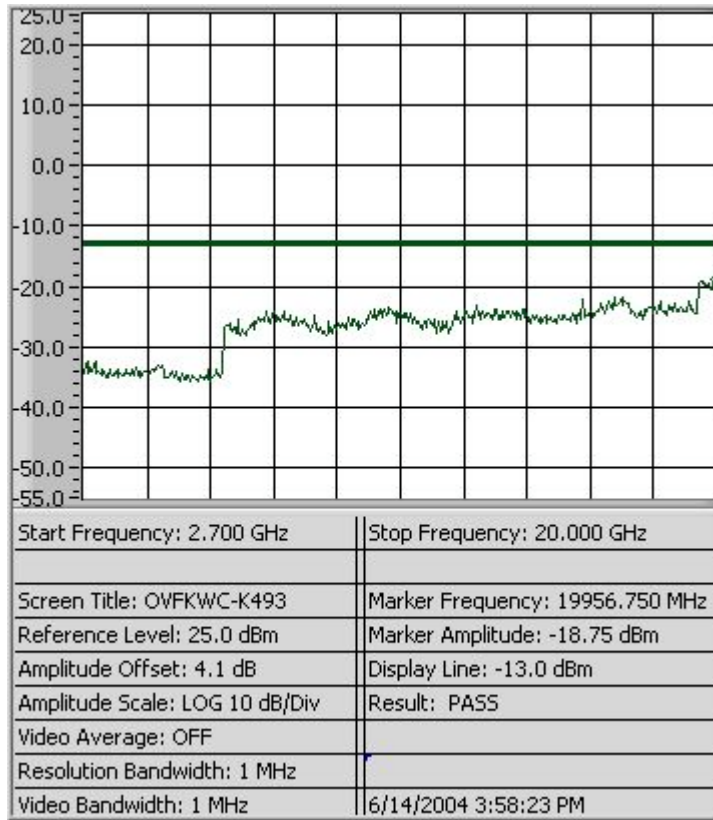
Kyocera Wireless Corp.

Figure 9-3b CDMA 1900 - Conducted Spurious Emission (CH 1175)

9 Transmitter Radiated Spurious Emissions Measured Data

FCC: § 2.1053, § 24.238	IC: 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.	

10 Receiver Spurious Emissions

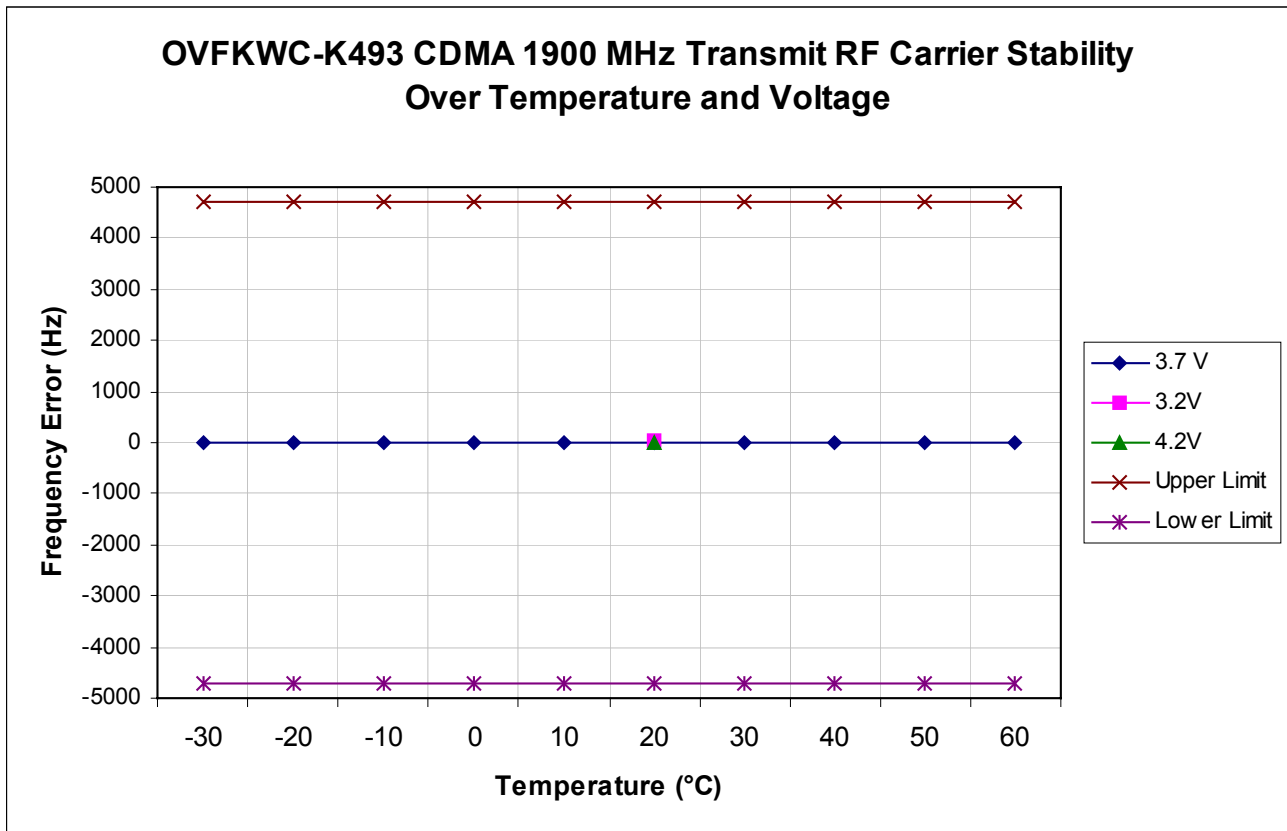| FCC: § 15.109	IC: RSS-133 §9
Measurement Procedures:	
The receiver radiated spurious emission test was performed at Nemko in San Diego, California. The test report is attached in a separate attachment.	

11 Transmitter RF Carrier Frequency Stability

FCC: § 2.1055, § 24.235	IC: 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.	

11.1   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		0.11		-4700	4700
-20		0.31		-4700	4700
-10		0.68		-4700	4700
0		0.39		-4700	4700
10		0.78		-4700	4700
20	**28.96**	**0.13**	**0.43**	-4700	4700
30		0.36		-4700	4700
40		0.74		-4700	4700
50		0.96		-4700	4700
60		1.14		-4700	4700

OVFKWC-K493 CDMA 1900 MHz Transmit RF Carrier Stability Over Temperature and Voltage

12 Exposure of Humans to RF Fields (SAR)

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

13 Test Equipment

Description	Manufacturer	Model Number	Serial Number	Cal Due Date
Power Meter	Giga-tronics	8541C	1835203	11/09/04
Power Meter Sensor	Giga-tronics	80601A	1830321	06/21/04
Spectrum Analyzer	Hewlett Packard	8593EM	3710A00203	04/30/05
Wireless Communications Test Set	Agilent	8960	US41140252	05/17/06
CDMA Mobile Station Test Set	Hewlett Packard	8924C	US37482647	04/22/06
PCS Interface	Hewlett Packard	83236B	3711303798	06/28/04
Temperature Chamber	CSZ	Z2033	Z9343034	04/02/05