

## Test Report On

### Dual-Band CDMA 1xRTT/1xEVDO ExpressCard

#### FCC Part 22 & 24 Certification

FCC ID: **OVFKWC-KPC680**

Models: **KPC680**

Date: **January 31,2007**

#### 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:** January 29 - January 31,2007

**Test performed by:** Kyocera Wireless Corp.  
10300 Campus Point Drive  
San Diego, CA 92121

**Report Prepared by:** Thuy To, Regulatory Engineer

**Report Reviewed by:** C.K. Li, Engineer, Principle

Compliance Certification Services (CCS) performed the tests that required an OATS site.

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1 General Information

<b>Applicant:</b>	Kyocera Wireless Corp 10300 Campus Point Drive San Diego CA 92121	
<b>FCC ID:</b>	OVFKWC-KPC680	
<b>Product:</b>	KPC680 Dual-Band Dual mode Cellular Phone	
<b>Model Numbers:</b>	KPC680	
<b>EUT Serial Number:</b>	19010581245	
<b>Type:</b>	<input checked="" type="checkbox"/> Identical Prototype, <input type="checkbox"/> Pre-Production, <input type="checkbox"/> Production	
<b>Device Category:</b>	Portable	
<b>RF Exposure Environment:</b>	General Population / Uncontrolled	
<b>Antenna:</b>	Monopole, 0 to 90° flip-up, Unique connector	
<b>External Input:</b>	Digital Data	
<b>Quantity:</b>	Quantity production is planned	
<b>FCC Rule Parts:</b>	§22H	§24E
<b>Modes:</b>	1XRTT, EVDO (Rel 0, Rev A)	1XRTT, EVDO (Rel 0, Rev A)
<b>Multiple Access Scheme:</b>	CDMA	CDMA
<b>TX Frequency (MHz):</b>	824 – 849	1850 - 1910
<b>Emission Designators:</b>	1M25F9W	1M25F9W
<b>Rated Conducted Output Power (dBm):</b>	24	24

## 2 Product Description

The OVFKWC-KPC680 is a Dual-Band 1XRTT and EVDO modem in PC ExpressCard format. The devices have assisted GPS software feature enabled to meet the emergency location requirements of the FCC's E911 Phase II mandate. The dual-band architecture is defined as 1900MHz (PCS CDMA) and 800MHz (cellular CDMA).

The device 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.

Station -Land Station Compatibility Specification" as specified in OET Bulletin 53 and TIA Standards

## 3 Measurement Conditions for CDMA2000

The device supports CDMA2000 in 1X (Phase I, Protocol revision 6), 1xEVDO Rel 0 and 1xEVDO Rev A. CDMA2000 1X includes TIA/EIA-95B as a subset and was approved for publishing in July 1999. It provides voice and data capabilities within a standard 1.25 MHz CDMA channel. This RF bandwidth is identical to the legacy IS-95 B system standard.

For Part 22 and 24, all measurements were conducted with FTM or Agilent 8960 as a base station simulator. The base station simulator establishes a CDMA link with the test device:

<b>1xRTT</b>	Protocol Rev :	6
	Data rate :	Full
	TDSO F-SCH :	153.6 kpps
	TDSO R-SCH :	153.6 kbps
	Power Control :	All up bits

<b>1xEVDO</b>	Protocol Rev :	0
	FTAP :	307 kpps, 2 slots
	RTAP :	153.6 kbps
	Power Control :	All up bits

<b>1xEVDO</b>	Protocol Rev :	A
	FETAP :	307 kpps, 2 slots
	RETAP :	4096 bps, 16 slots
	Power Control :	All up bits

The device was pre-tested under all RC/SO configuration to determine the worst case scenario:

CDMA 800 CONFIGURATION (Full Rate)		CONDUCTED POWER (dBm)					
		Ch 1013		Ch 383		Ch 777	
		Ave	Peak	Ave	Peak	Ave	Peak
SO2	RC1	24.18	28.25	24.30	28.17	24.18	27.75
	RC3	24.21	27.99	24.29	27.93	24.22	27.66
SO55	RC1	24.07	28.25	24.19	28.03	24.05	27.63
	RC3	24.02	27.59	23.81	27.46	23.76	27.05
TDSO	RC3 (FCH)	23.73	27.64	23.98	27.55	23.75	27.12
SO32	RC3 (FCH+SCH)	23.94	27.65	23.85	27.52	23.95	27.15
1xEVDO	FTAP	24.12	28.61	24.12	28.36	24.13	27.90
Rel 0	RTAP (Subtype 0/1 PHY)	24.23	28.55	24.38	28.35	24.18	27.81
1xEVDO	FETAP	24.04	28.47	24	28.32	24.11	27.87
Rev A	RETAP (Subtype 2 PHY)	24.10	28.58	24.05	28.26	24.12	27.76

CDMA 1900 CONFIGURATION (Full Rate)		CONDUCTED POWER (dBm)					
		Ch 25		Ch 600		Ch 1175	
		Ave	Peak	Ave	Peak	Ave	Peak
SO2	RC1	23.14	26.81	23.43	27.28	23.65	26.61
	RC3	23.13	26.75	23.41	27.12	23.53	26.44
SO55	RC1	23.11	26.85	23.30	27.13	23.52	26.37
	RC3	23.17	26.67	23.29	27.13	23.52	26.37
TDSO	RC3 (FCH)	23.09	26.72	23.35	27.05	23.64	26.53
SO32	RC3 (FCH+SCH)	23.05	26.64	23.58	27.18	23.72	26.59
1xEVDO	FTAP	23.36	27.26	23.59	27.81	24.01	27.32
Rel 0	RTAP (Subtype 0/1 PHY)	23.41	26.87	23.42	27.63	23.64	23.64
1xEVDO	FETAP	23.32	27.21	23.45	27.71	23.97	27.15
Rev A	RETAP (Subtype 2 PHY)	23.36	27.18	23.28	27.51	23.62	27.00

The following configuration was determined and reported as worst case for all measurements:

- EVDO Rev 0, Protocol FTAP

Transmitter RF Power Output

**3.1 Conducted Power**

<b>FCC:</b> § 2.1046	<b>IC:</b> RSS-129 §7.1, RSS-133 §6.2
<p><b>Measurement Procedures:</b></p> <p>The Peak and Average RF output power was measured using a Giga-tronics 8541C Universal Power Meter. Terminated to a resistive coaxial load of 50 ohms.</p>	

Mode	Frequency (MHz)	Channel	Max. Power (dBm)	
			Peak	Average
CDMA 800	824.70	1013	28.61	24.23
	836.52	383	28.36	24.38
	848.31	777	27.90	24.22
CDMA 1900	1851.25	25	27.26	23.41
	1880.00	600	27.81	23.45
	1908.75	1175	27.32	23.97

**3.2 Radiated Power**

<b>FCC:</b> § 22.913, § 24.232	<b>IC:</b> RSS-129 §7.1 and §9.1, RSS-133 §6.2
<p><b>Measurement Procedures:</b></p> <p>Tests were performed in OATS using substitution method. See separated radiated emission report for details.</p>	

Mode	Frequency (MHz)	Channel	Max. Power (dBm)	Ref.
CDMA 800	824.70	1013	26.9	ERP
	836.52	383	27.9	
	848.31	777	28.1	
CDMA 1900	1851.25	25	29.6	EIRP
	1880.00	600	27.6	
	1908.75	1175	27.5	

#### 4 Occupied Bandwidth

<b>FCC:</b> § 2.1049, § 22.917(b)(d), § 24.238	<b>IC:</b> RSS-129 §6.3, §8.1
<b>Measurement Procedures:</b>  The RF output of the EUT was connected to the input of the spectrum analyzer (S.A.) with sufficient attenuation.  S.A. Setting: RBW=30kHz, VBW=100kHz	

**List of Figures**

Figure	Mode	Description
4-1	CDMA 800	CDMA @ Ch383
4-2	CDMA 1900	CDMA @ CH600

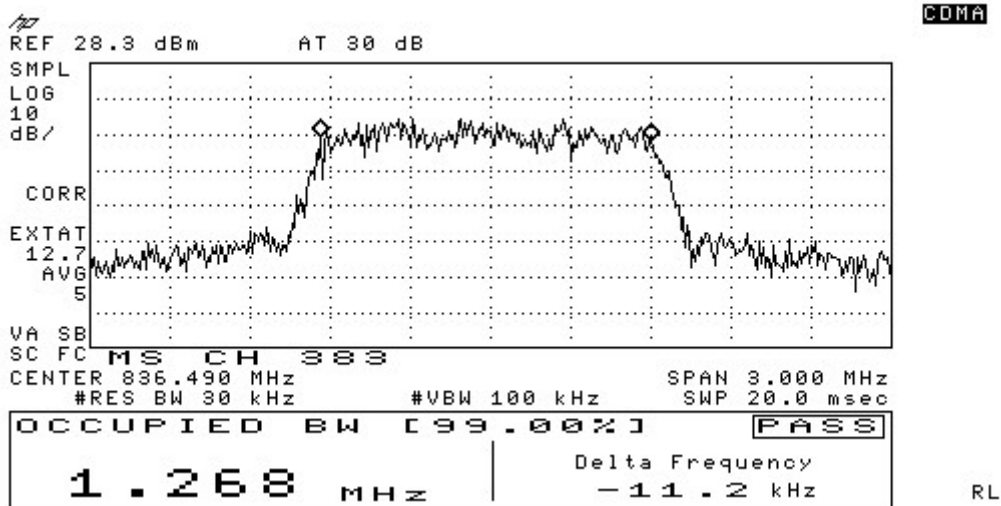


Figure 4-1 CDMA 800 @ CH 383

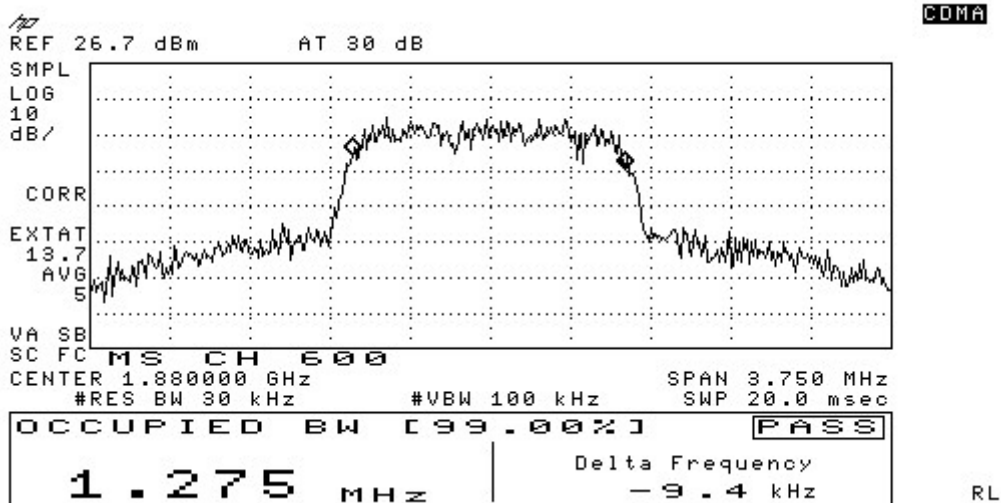


Figure 4-2 CDMA 1900 @ CH 600

5 Spurious Emissions At Antenna Terminals

<b>FCC:</b>	§ 2.1051, § 22.917(e)(f), § 24.238	<b>IC:</b>	RSS-129 §6.3, §8.1, RSS-133 §6.3
<b>Measurement Procedures:</b>			
<p><u>Out of Band:</u> 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.</p> <p>S.A. Setting: RBW=1MHz, VBW=1MHz</p> <p><u>Band-Edge:</u> @ ch 25 and 1175</p> <p>S.A. Setting: RBW=30kHz, VBW=30kHz</p> <p><u>Base Band:</u> Spectrum was investigated from 869-894 MHz for Cellular.</p> <p>S.A. Setting: RBW=10kHz, VBW=10kHz</p>			

**List of Figures:**

Figure	Mode	Channel	Plot Description
5-1	CDMA 800	1013	Emissions in base station frequency range, 869 - 894 MHz
5-2			Conducted spurious emissions, 9kHz to 10GHz
5-3		383	Emissions in base station frequency range, 869 - 894 MHz
5-4			Conducted spurious emissions, 9kHz to 10GHz
5-5		777	Emissions in base station frequency range, 869 - 894 MHz
5-6			Conducted spurious emissions, 9kHz to 10GHz
5-7	CDMA 1900	25	Conducted spurious emissions, 9kHz to 20GHz
5-8			Lower Band Edge @ CH 25
5-9		600	Conducted spurious emissions, 9kHz to 20GHz
5-10		1175	Conducted spurious emissions, 9kHz to 20GHz
5-11			Upper Band Edge @ CH 1175



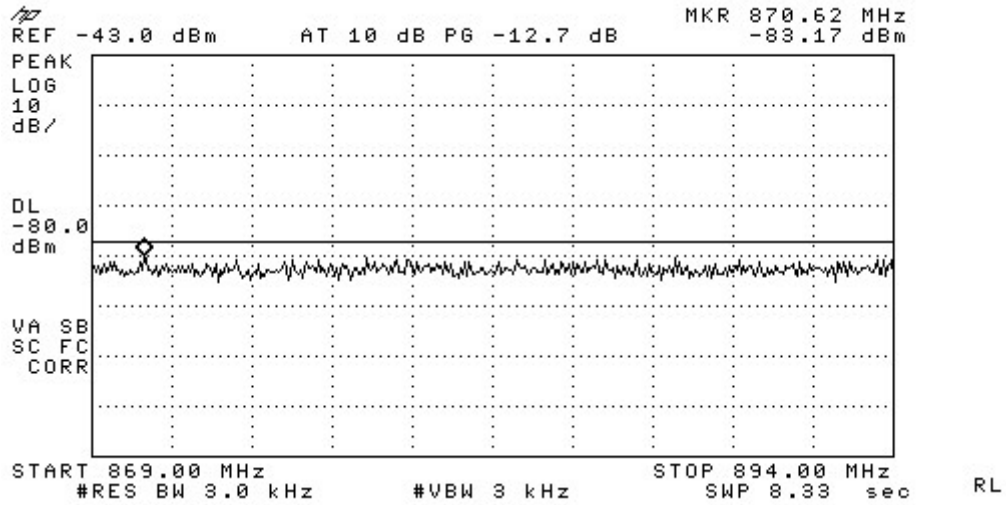


Figure 5-1 CDMA 800 - Emissions in base station frequency range (CH 1013)

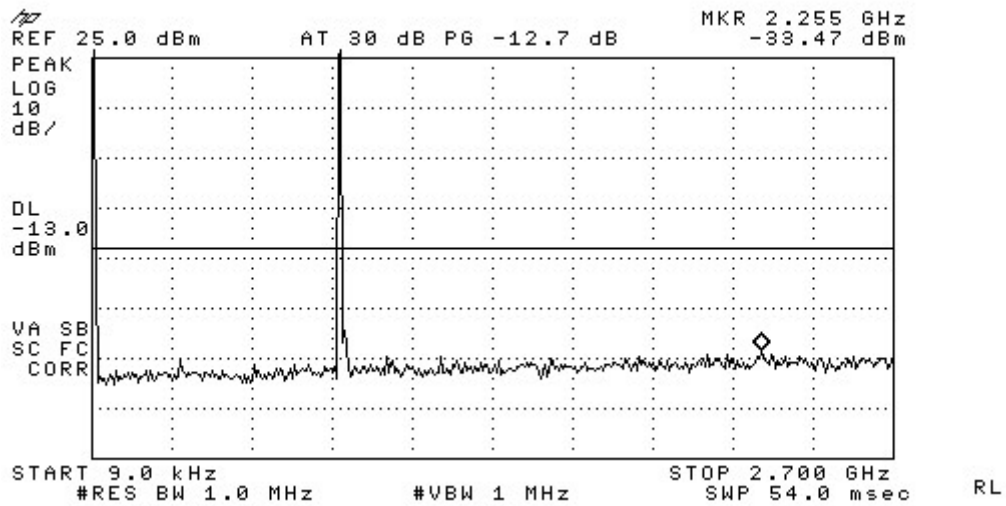


Figure 5-2a CDMA 800 – Conducted Spurious Emission (CH 1013)

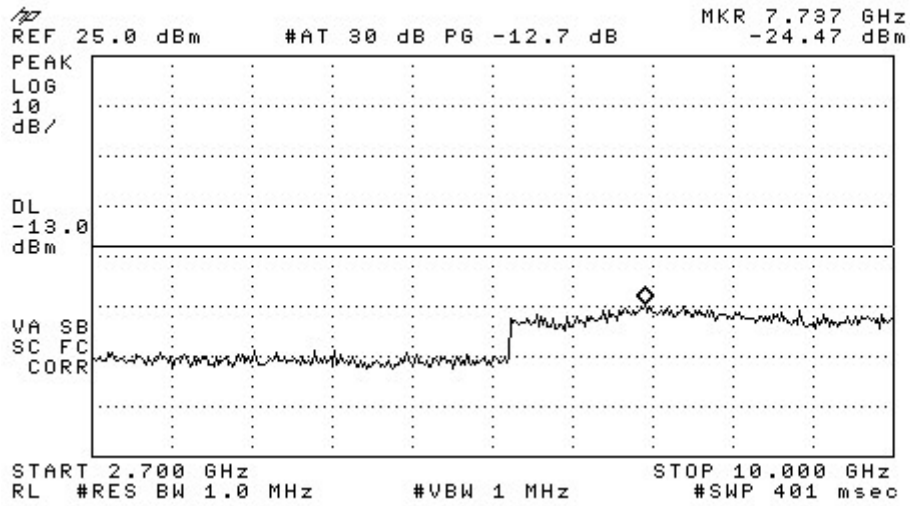


Figure 5-2b CDMA 800 – Conducted Spurious Emission (CH 1013)

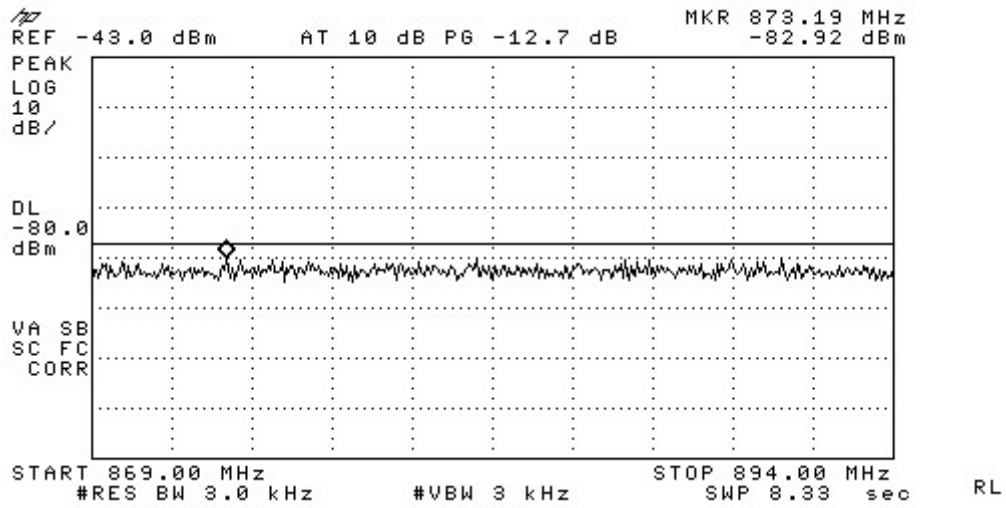


Figure 5-3 CDMA 800 - Emissions in base station frequency range (CH 383)

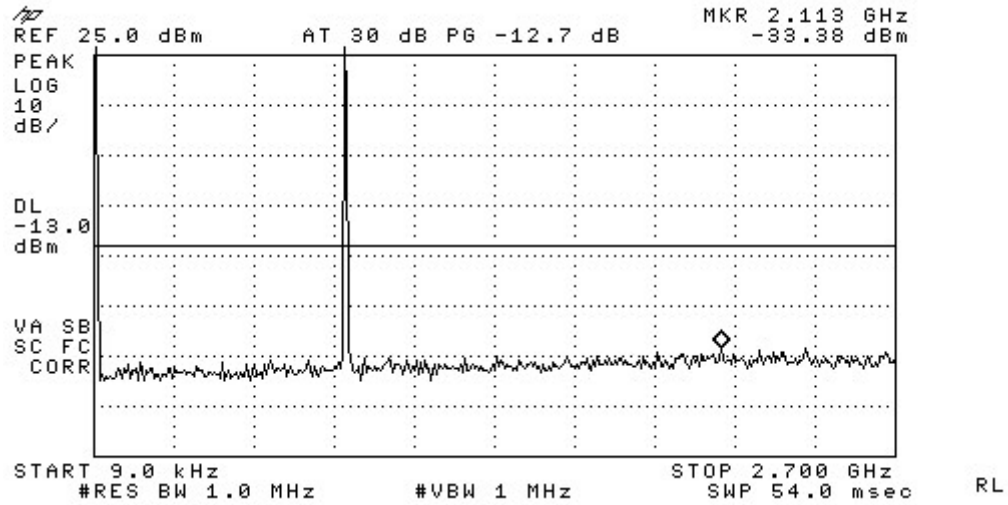


Figure 5-4a CDMA 800 – Conducted Spurious Emission (CH 383)

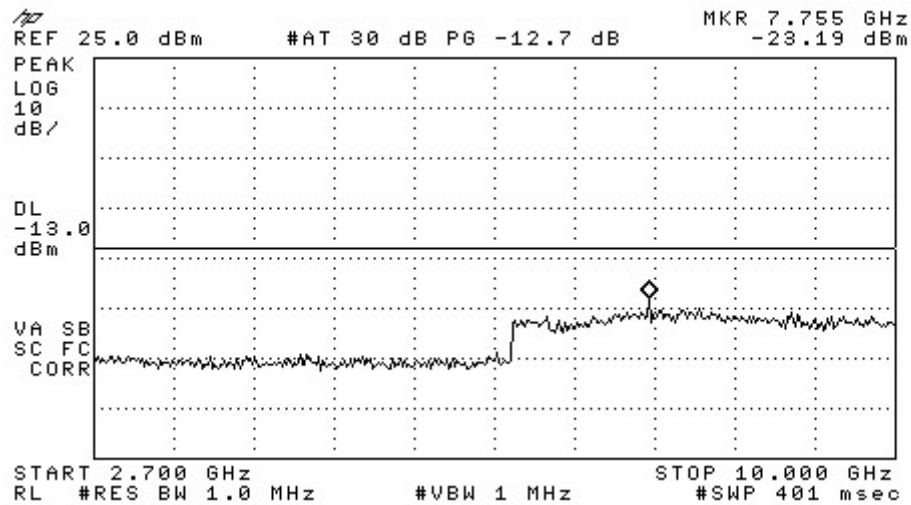


Figure 5-4b CDMA 800 – Conducted Spurious Emission (CH 383)

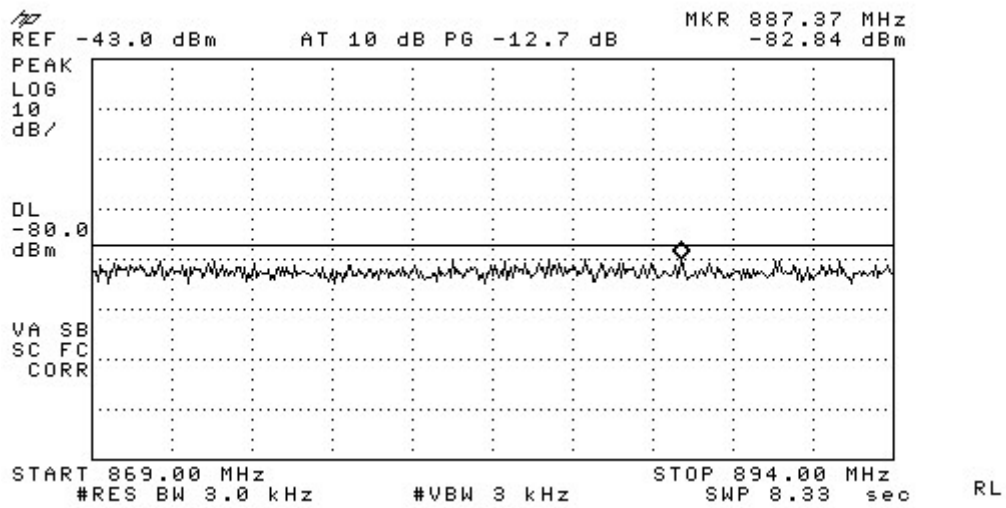
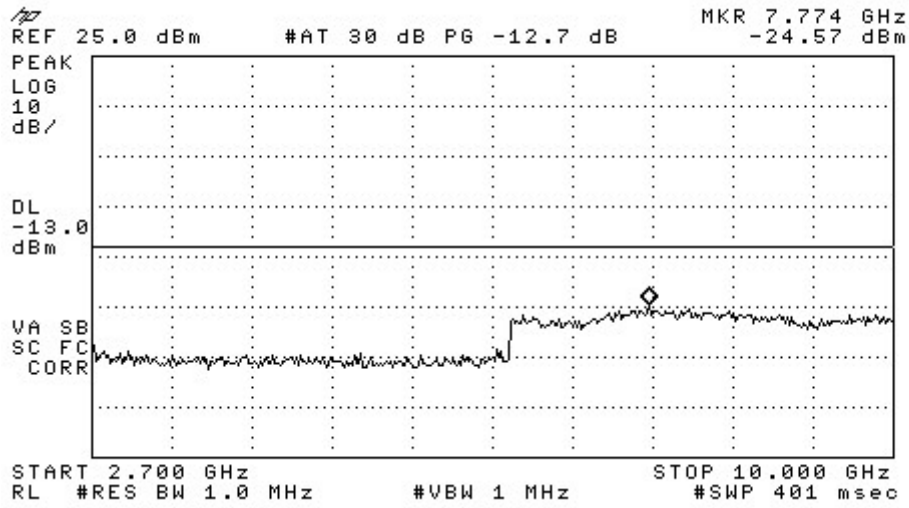
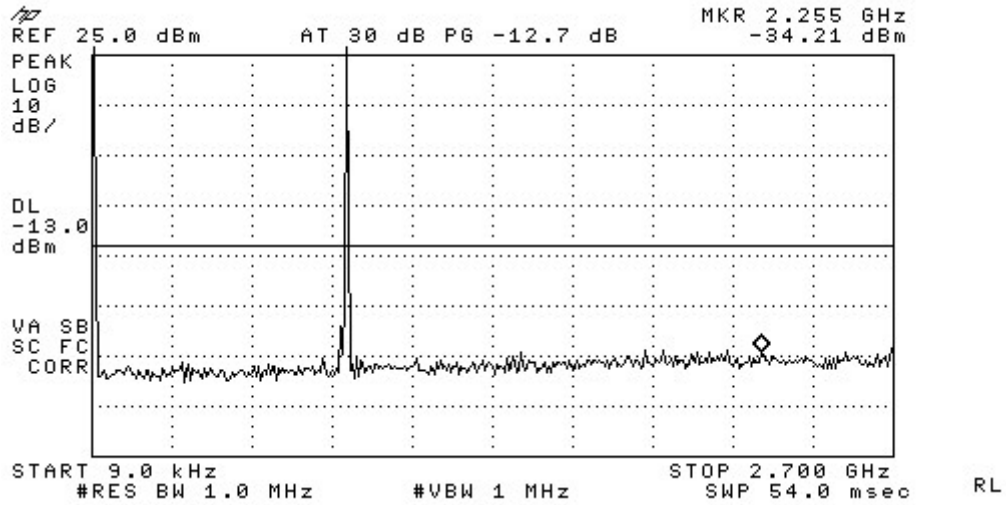
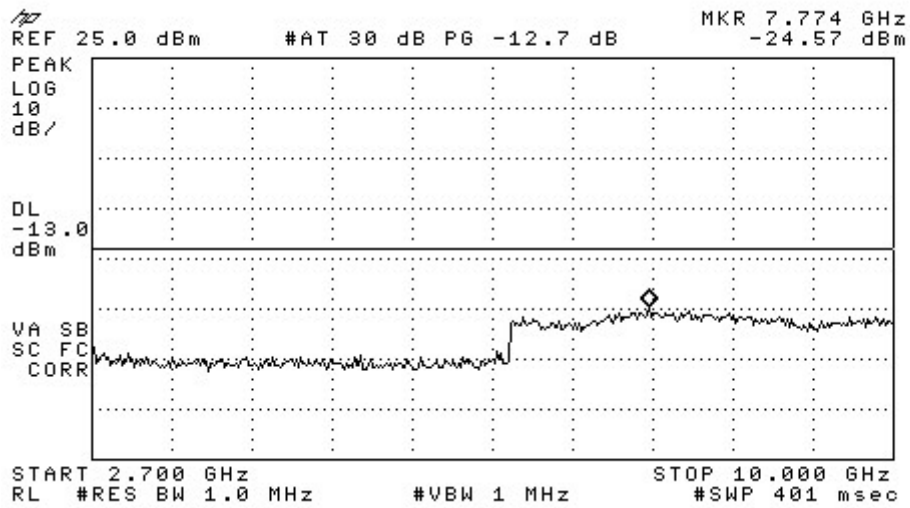


Figure 5-5 CDMA 800 - Emissions in base station frequency range (CH 777)



**Figure 5-6a CDMA 800 – Conducted Spurious Emission (CH 777)**



**Figure 5-6b CDMA 800 – Conducted Spurious Emission (CH 777)**

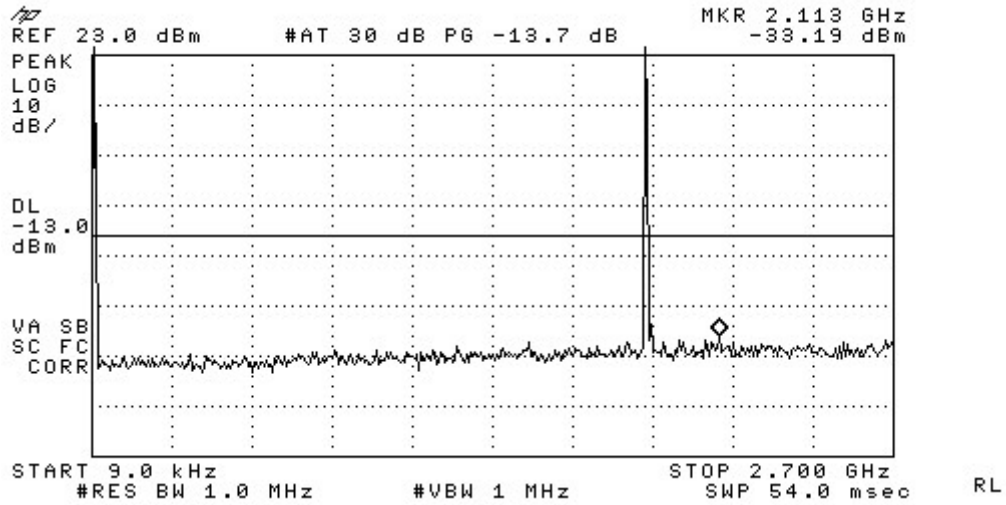


Figure 5-7a CDMA 1900 - Conducted Spurious Emission (CH 25)

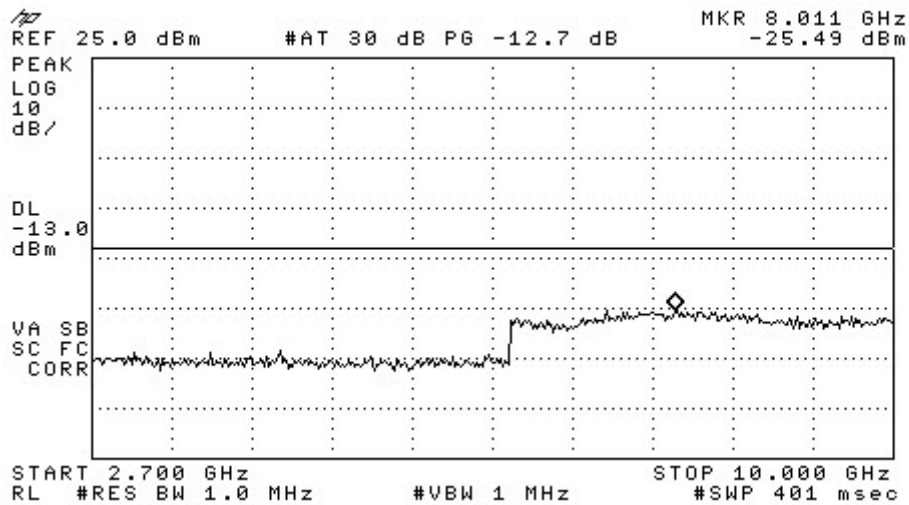
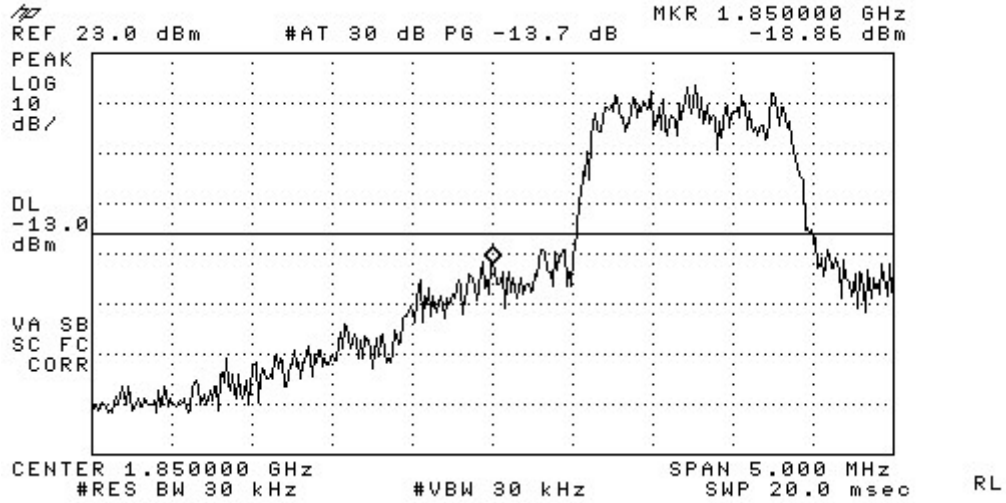
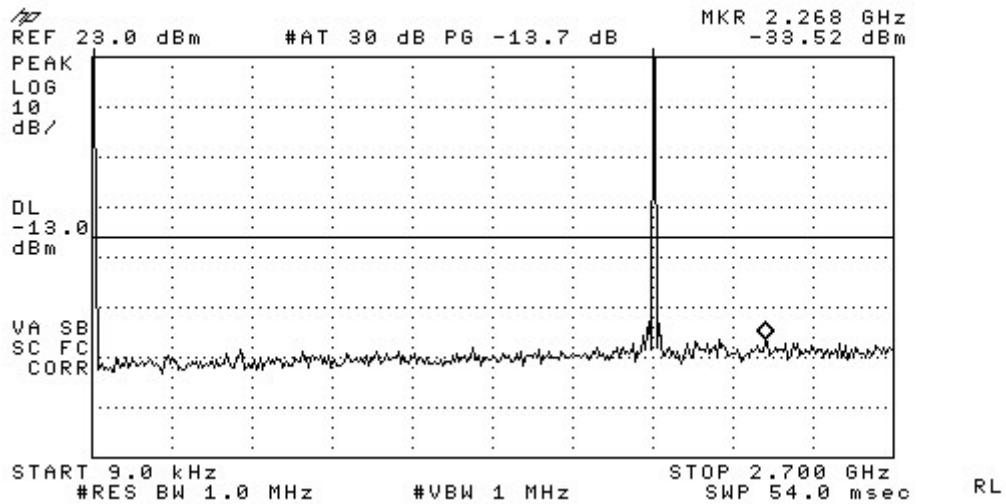


Figure 5-7b CDMA 1900 - Conducted Spurious Emission (CH 25)



**Figure 5-8 CDMA 1900 Lower Band Edge @ (CH 25)**



**Figure 5-9a CDMA 1900 - Conducted Spurious Emission (CH 600)**

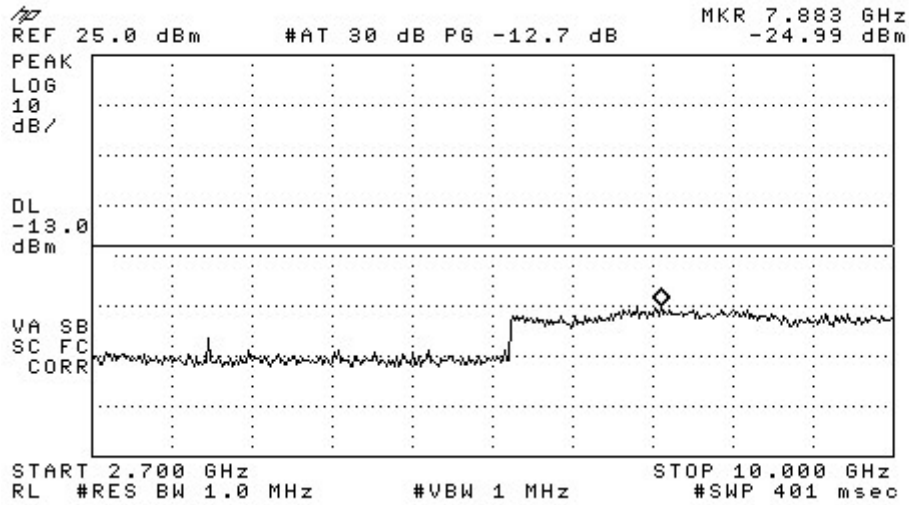


Figure 5-9b CDMA 1900 - Conducted Spurious Emission (CH 600)

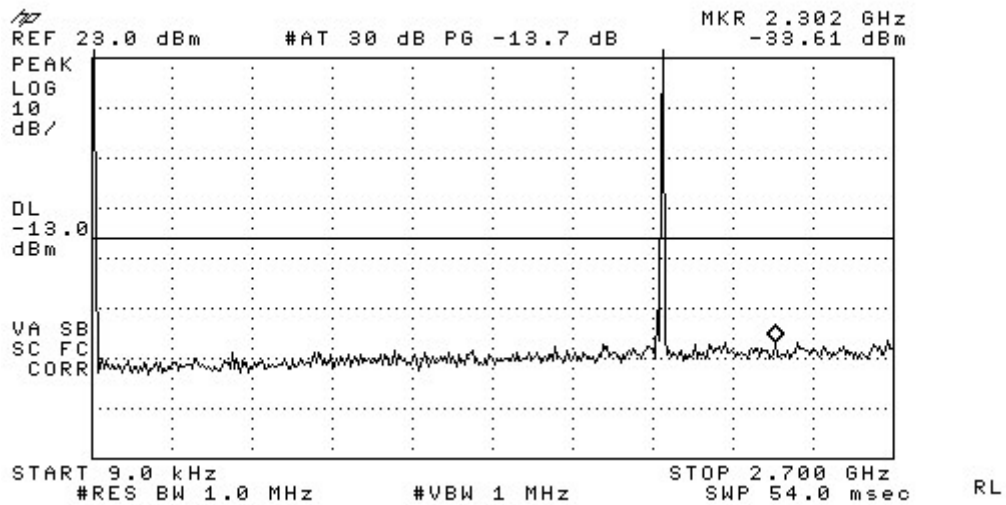
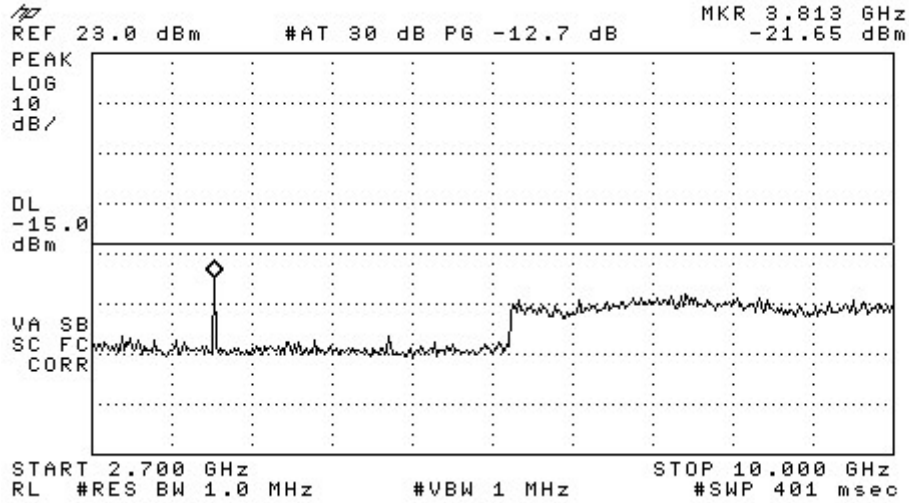
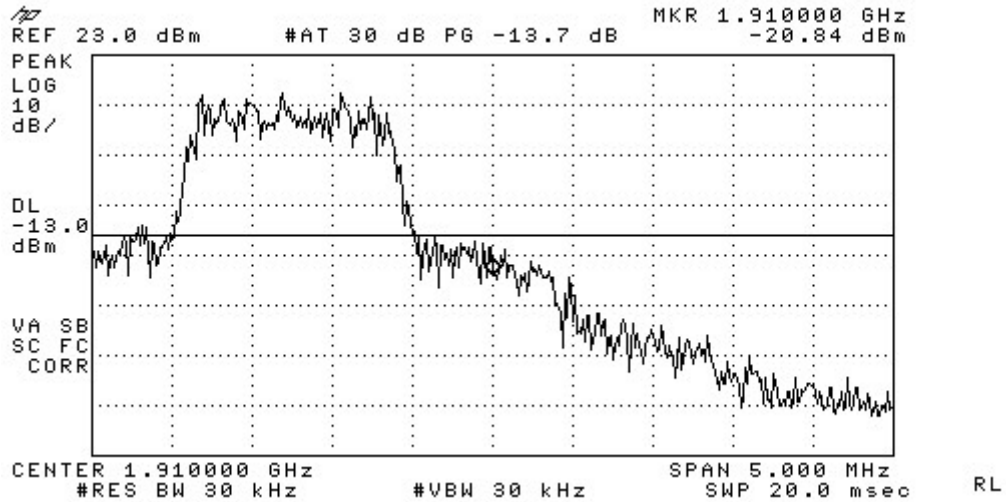


Figure 5-10a CDMA 1900 - Conducted Spurious Emission (CH 1175)





**Figure 5-10b CDMA 1900 - Conducted Spurious Emission (CH 1175)**



**Figure 5-11 CDMA 1900 Upper Band Edge @ (CH1175)**

**6 Transmitter Radiated Spurious Emissions Measured Data**

<b>FCC:</b> § 2.1053, § 22.91, § 24.238	<b>IC:</b> RSS-129 §8.1, RSS-133 §6.3
<p><b>Measurement Procedures:</b></p> <p>To determine the applicable configurations on CDMA system, the EUT were put in varies R.C./S.O. and EVDO operation modes. Worst case configurations for Radiated Emissions were determined by peak conducted power as in section 3.</p> <p>The worst case configurations found were fully tested on a 3 meter site at CCS, California. The test report is attached in a separate attachment.</p>	

**7 Receiver Spurious Emissions**

<b>FCC:</b> § 15.109	<b>IC:</b> RSS-129 §10, RSS-133 §9
<p><b>Measurement Procedures:</b></p> <p>The receiver radiated spurious emission test was performed at CCS, California. The test report is attached in a separate attachment.</p>	

**8 Transmitter RF Carrier Frequency Stability**

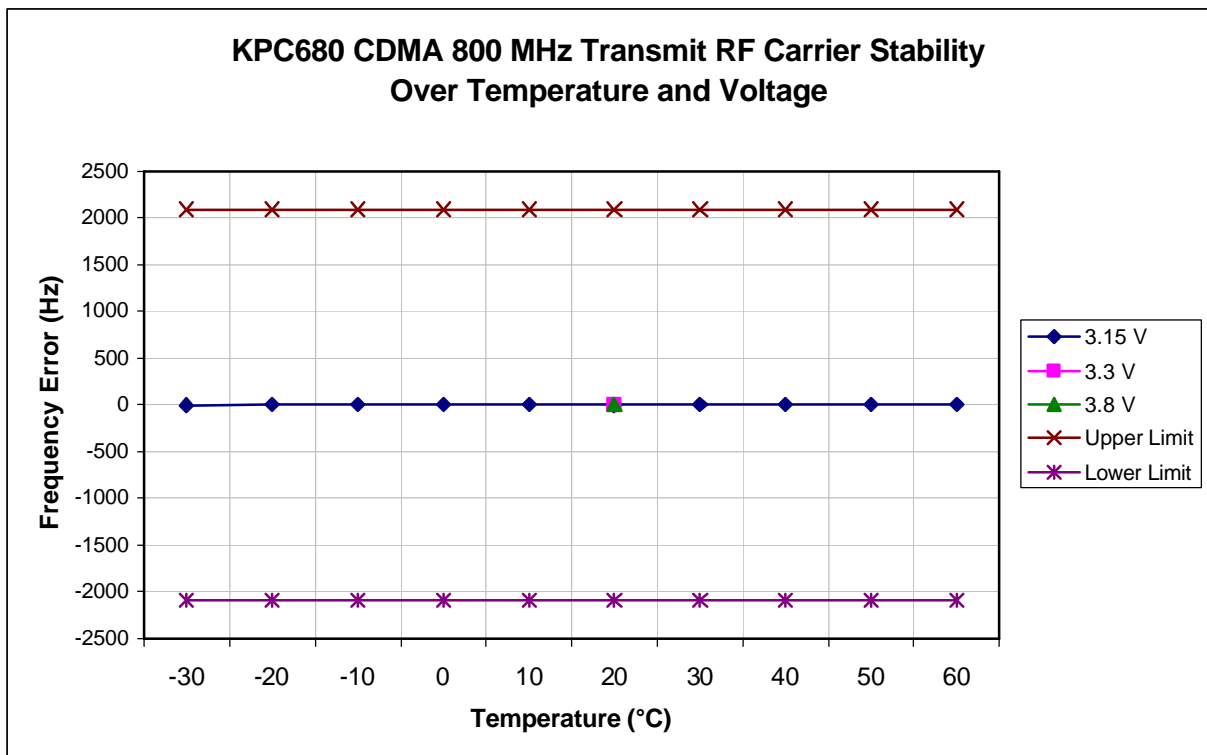
<b>FCC:</b> § 2.1055, § 22.355, § 24.235	<b>IC:</b> RSS-129 §7.2 and §9.2, RSS-133 §7
<p><b>Measurement Procedures:</b></p> <p>The EUT was placed in an environmental chamber. The RF output of the EUT was connected to Agilent 8960 Series 10 E5515C. A power supplier was connected as primary voltage supply.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

8.1 CDMA 800 Mode

<b>Tx Frequency:</b>	836.49 MHz	<b>Voltage :</b>	3.3V
<b>Tolerance:</b>	+/- 2.5 Ppm (+/- 2091 Hz)	<b>Ch:</b>	383

Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.15V	3.3V	3.8V (115%)	Lower limit	Upper limit
-30		-2.65		-2091	2091
-20		3.26		-2091	2091
-10		5.38		-2091	2091
0		2.95		-2091	2091
10		3.24		-2091	2091
20	<b>1.16</b>	<b>1.14</b>	<b>1.73</b>	-2091	2091
30		3.34		-2091	2091
40		2.25		-2091	2091
50		3.46		-2091	2091
60		3.23		-2091	2091

Note: \* Lowest Operating Voltage

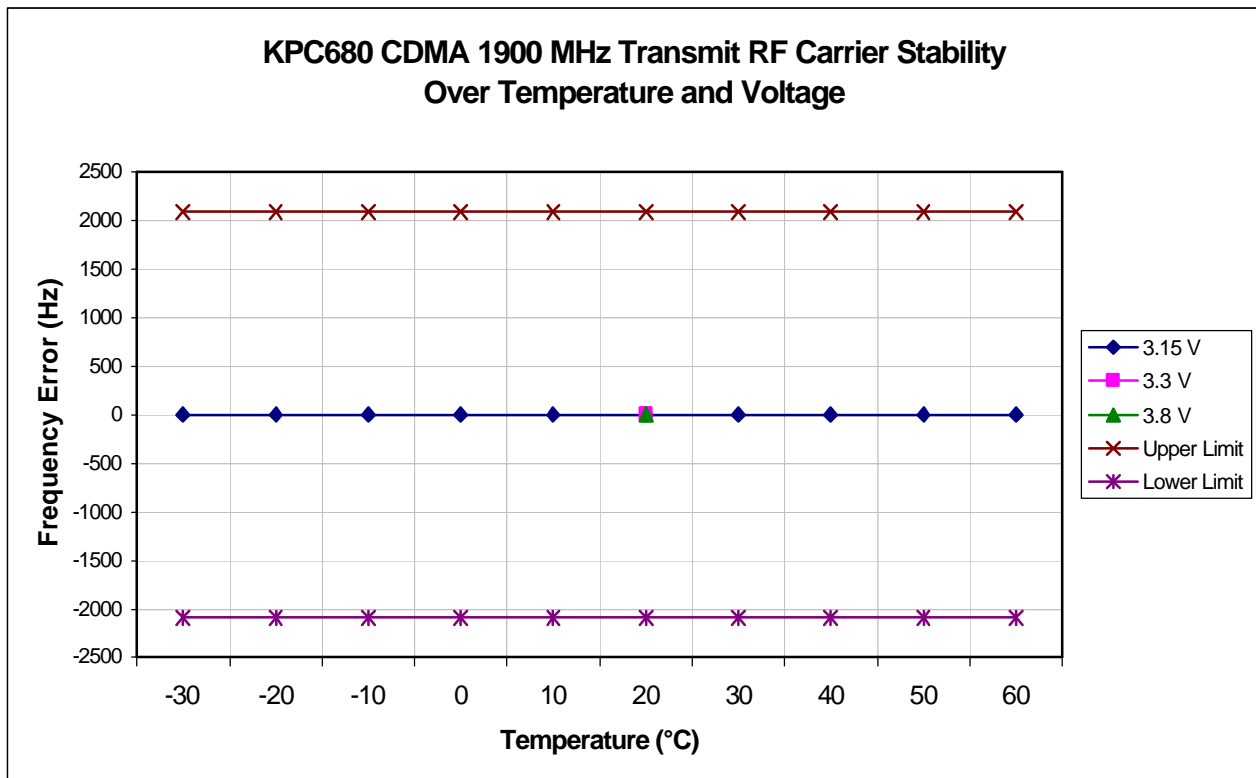


8.2 CDMA 1900 Mode

<b>Tx Frequency:</b> 1880.00 MHz	<b>Voltage :</b> 3.3V
<b>Tolerance:</b> +/- 2.5 Ppm (+/-4700 Hz)	<b>Ch:</b> 600

Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.15V*	3.3V	3.8V (115%)	Lower limit	Upper limit
-30		18.59		-4700	4700
-20		14.02		-4700	4700
-10		15.25		-4700	4700
0		12.53		-4700	4700
10		14.82		-4700	4700
20	<b>-11</b>	<b>13.99</b>	<b>14.2</b>	-4700	4700
30		12.77		-4700	4700
40		11.28		-4700	4700
50		14.82		-4700	4700
60		21.45		-4700	4700

Note: \* Lowest Operating Voltage



**9 Exposure of Humans to RF Fields (SAR)**

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

**10 Maximum Permissible Exposure (MPE)**

The MPE evaluation report is showed in a separated attachment.

**11 Test Equipment**

Description	Manufacturer	Model Number	Serial Number	Cal Due Date
Power Meter	Giga-tronics	8541C	1832552	03-16-07
Spectrum Analyzer	Hewlett Packard	8593EM	3710A0023	03-23-07
Spectrum Analyzer	Hewlett Packard	8595E	39.11A03899	07-11-07
Wireless Communications Test Set	Agilent	8960	US41070147	06-02-07
Temperature Chamber	Test Equity	ZH2-033-033-H/AC	ZZ9622421	08-20-07