

Test Report On
Tri-Band CDMA Cellular Phone with Bluetooth

Certification	
FCC Part 22, 24 & 27 RSS 132, 133, 139	
FCC ID:	OVF-K5402
IC #:	3572A-E3100
Models:	K54-02, E3100
Date:	June 14, 2010

STATEMENT OF CERTIFICATION	
<i>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.</i>	
STATEMENT OF COMPLIANCE	
<i>This product has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947.</i>	
Date of Test:	June 14-15, 2010
Test performed by:	Kyocera Communications, Inc. 10300 Campus Point Drive San Diego, CA 92121
Report Prepared by:	Thuy To, Senior Regulatory Engineer
Report Approved by:	C.K. Li, Director of Regulatory Engineering
Compliance Certification Services performed the tests that required an OATS site.	

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1 General Information

Applicant:	Kyocera Communications, Inc. 10300 Campus Point Drive San Diego CA 92121		
FCC ID:	OVF-K54302		
IC #:	3572A-E3100		
Product:	Tri-Band CDMA Cellular Phone with Bluetooth		
Model Numbers:	K54-02, E3100		
EUT Serial Number:	FFE31000002572		
Type:	<input type="checkbox"/> Identical Prototype, <input checked="" type="checkbox"/> Pre-Production, <input type="checkbox"/> Production		
Device Category:	Portable		
RF Exposure Environment:	General Population / Uncontrolled		
Antenna:	Internal Antenna		
Detachable Antenna:	No		
External Input:	Audio/Digital Data		
Quantity:	Quantity production is planned		
FCC Rule Parts:	§22H	§27L	§24E
IC Rule Parts :	RSS132	RSS139	RSS133
Modes:	800 CDMA	1700 CDMA	1900 CDMA
Multiple Access Scheme:	CDMA	CDMA	CDMA
TX Frequency (MHz):	824 – 849	1710 - 1755	1850 - 1910
Emission Designators:	1M25F9W	1M25F9W	1M25F9W
Max. Output Power (W):	0.46 ERP	0.37 EIRP	0.44 EIRP

2 Product Description

The EUT K54-02 is a Tri-Band 1XRTT CDMA Cellular phone with Bluetooth. The tri-band architecture is defined as 800MHz (Cellular CDMA), 1700MHz (AWS CDMA) and 1900MHz (PCS CDMA). K54-02 and E3100 are identical, different model numbers are for marketing reasons only.

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), The EUT 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 1.25 MHz 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.

3 Test Configuration

For Part 22, 24, and 27 all of CDMA measurements were conducted with Agilent 8960 as a base station simulator. The base station simulator establishes a CDMA link with the test device. To justify on the selection of applicable configurations, the EUT was pre-tested under all R.C. and S.O. operation modes to determine the worst-case scenario:

CONFIGURATION	CONDUCTED POWER (dBm)								
	CDMA 800			CDMA 1700			CDMA 1900		
	Ch 1013	Ch 383	Ch 777	Ch 25	Ch 450	Ch 875	Ch 25	Ch 600	Ch 1175
	Peak	Peak	Peak	Peak	Peak	Peak	Peak	Peak	Peak
SO2, RC1 Full Rate	29.24	27.94	27.86	26.37	26.77	26.12	25.98	27.56	27.09
SO2, RC3 Full Rate	28.71	27.37	27.51	25.53	26.52	25.57	25.64	26.76	26.85
SO55, RC1 Full Rate	29.36	28.02	27.96	26.45	27.06	26.25	26.05	27.41	27.49
SO55, RC3 Full Rate	28.84	27.44	27.31	25.71	26.61	25.48	25.49	27.05	26.40
TDSO SO32, RC3 (+F-SCH) Full Rate	28.94	27.54	27.32	25.81	26.50	25.46	25.32	27.29	26.43
TDSO SO32, RC3 (+SCH) Full Rate	28.68	27.47	27.27	25.47	26.36	25.54	25.42	26.97	26.58

CONFIGURATION	CONDUCTED POWER (dBm)								
	CDMA 800			CDMA 1700			CDMA 1900		
	Ch 1013	Ch 383	Ch 777	Ch 25	Ch 450	Ch 875	Ch 25	Ch 600	Ch 1175
	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg
SO2, RC1 Full Rate	24.24	22.60	22.95	20.78	21.63	20.77	20.66	22.20	21.89
SO2, RC3 Full Rate	24.23	22.49	22.93	20.72	21.70	20.60	20.80	22.14	21.91
SO55, RC1 Full Rate	24.18	22.61	22.91	20.72	21.69	20.85	20.75	22.07	21.92
SO55, RC3 Full Rate	24.26	22.52	22.89	20.66	21.65	20.65	20.49	22.17	21.81
TDSO SO32, RC3 (+F-SCH) Full Rate	24.29	22.58	22.96	20.75	21.63	20.78	20.43	22.22	21.84
TDSO SO32, RC3 (+SCH) Full Rate	24.16	22.63	22.68	20.68	21.73	20.67	20.61	22.14	21.79

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

Radio Configuration: RC1
Service Options: SO55
Data Rate: full rate

4 TTY compliance

FCC § 255 of the Telecom Act

The EUT has been designed for TTY Compliance with Cellular Compatibility Standard.

5 Transmitter RF Power Output

5.1 Conducted Power

FCC: § 2.1046

IC: RSS-GEN 4.9

Measurement Procedures:

The RF output power was measured using a Giga-tronics 8541C Universal Power Meter. Terminated to a resistive coaxial load of 50 ohms.

Mode	Frequency (MHz)	Channel	Power (dBm)
CDMA 800	824.70	1013	24.26
	836.52	383	22.52
	848.31	777	22.89
CDMA 1700	1711.25	25	20.66
	1732.5	450	21.65
	1753.75	875	20.65
CDMA 1900	1851.25	25	20.49
	1880	600	22.17
	1908.75	1175	21.81

5.2 Radiated Power

FCC: § 22.913, § 24.232	IC: RSS-132, RSS-133 (6.4), RSS-139 (6.4)
<p>Measurement Procedures:</p> <p>Tests were performed in Compliance Certification Service using substitution method. See separated radiated emission report for details.</p>	

Mode	Frequency (MHz)	Channel	Max. Power (dBm)	Ref.
CDMA 800	824.70	1013	25.1	ERP
	836.52	383	26.2	
	848.31	777	26.6	
CDMA 1700	1711.25	25	25.4	EIRP
	1732.5	450	25.6	
	1753.75	875	25.4	
CDMA 1900	1851.25	25	24.4	EIRP
	1880.00	600	26.4	
	1908.75	1175	25.4	

6 Occupied Bandwidth

FCC:	§ 2.1049, § 22.917(b)(d), § 24.238, § 27.53(g)(1)	IC:	RSS-GEN 4.6
Measurement Procedures:			
The RF output of the EUT was connected to the input of the spectrum analyzer (S.A.) with sufficient attenuation. The spectrum with no modulation was recorded.			
For Digital: Modulate with full rate all up power control bit.			
S.A. Setting	RBW	VBW	
Bandwidth Measurement	30KHz	300kHz	
Band Edge Measurement	100KHz	100KHz	

List of Figures

Figure	Mode	Description
6-1	CDMA 800	CDMA @ Ch383
6-2		Lower Band Edge @ Ch 1013
6-3		Upper Band Edge @ Ch 777
6-4	CDMA 1700	AWS @ CH450
6-5		Lower Band Edge @ CH25
6-6		Upper Band Edge @ CH875
6-7	CDMA 1900	CDMA @ CH600
6-8		Lower Band Edge @ CH 25
6-9		Upper Band Edge @ CH 1175

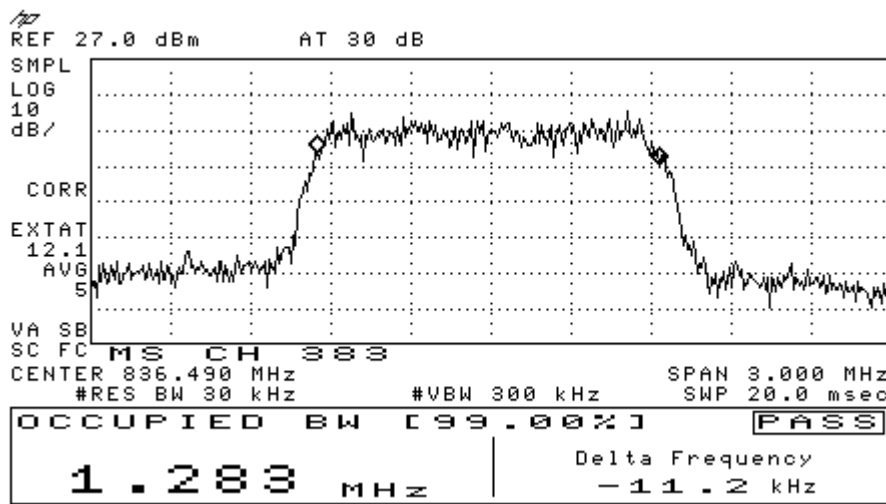


Figure 6-1 CDMA 800 @ CH 383

RL

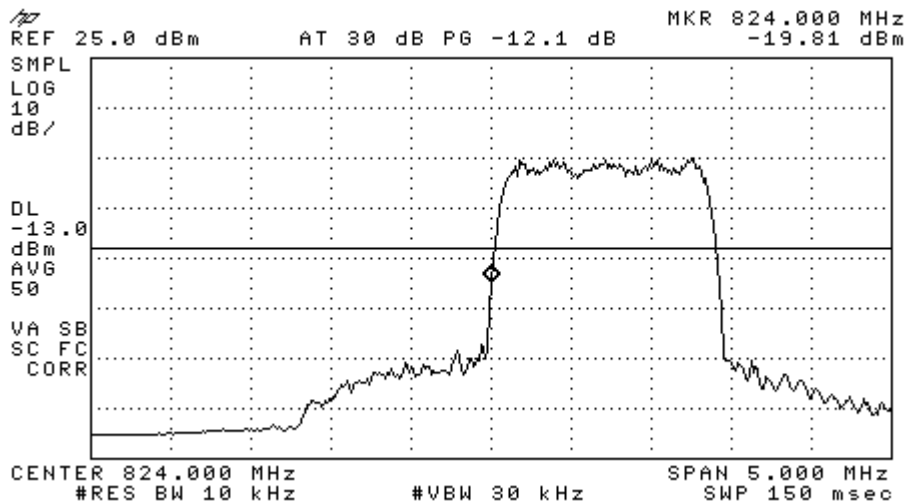


Figure 6-2 CDMA 800 Lower Band Edge @ CH 1013

RL

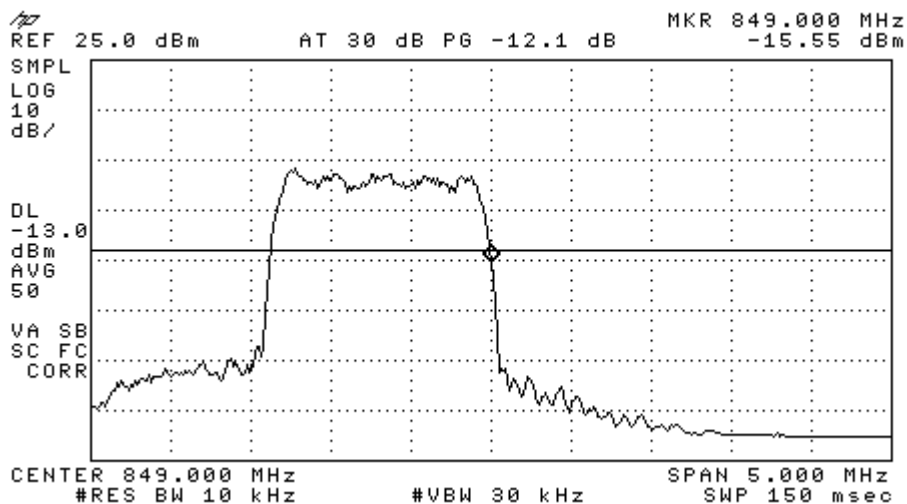
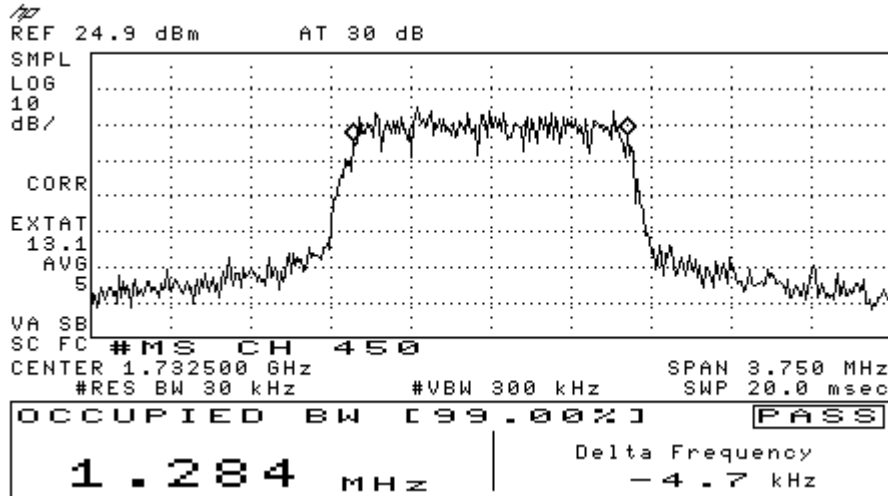


Figure 6-3 CDMA 800 Lower Band Edge @ CH 777

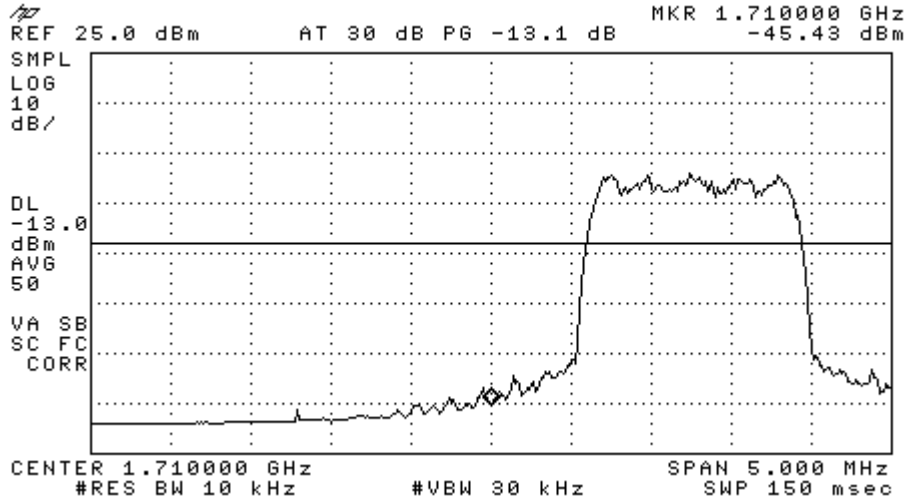
RL

CDMA



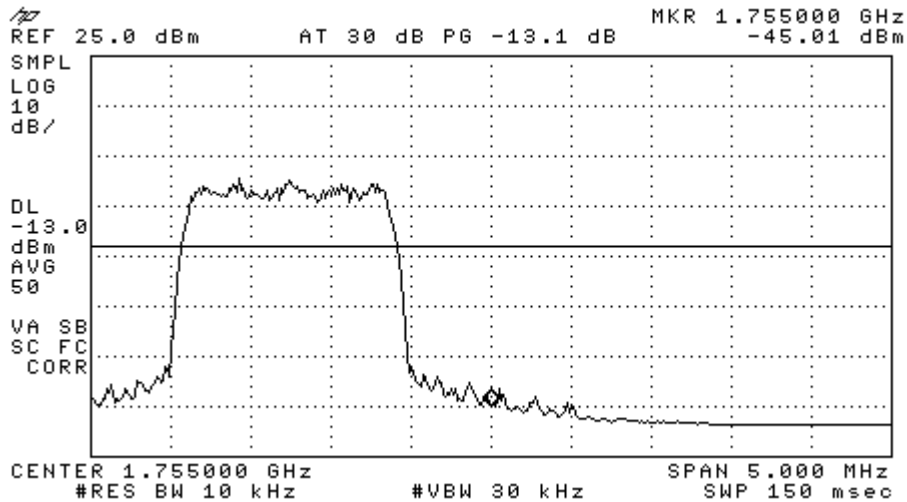
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Figure 6-4 AWS 1700 @ CH 450



RL

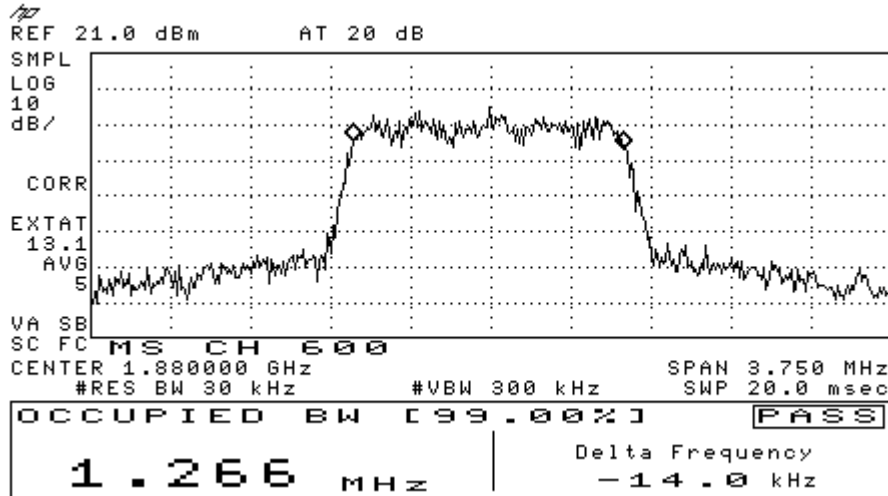
Figure 6-5 AWS 1700 Lower Band Edge @ CH 25



RL

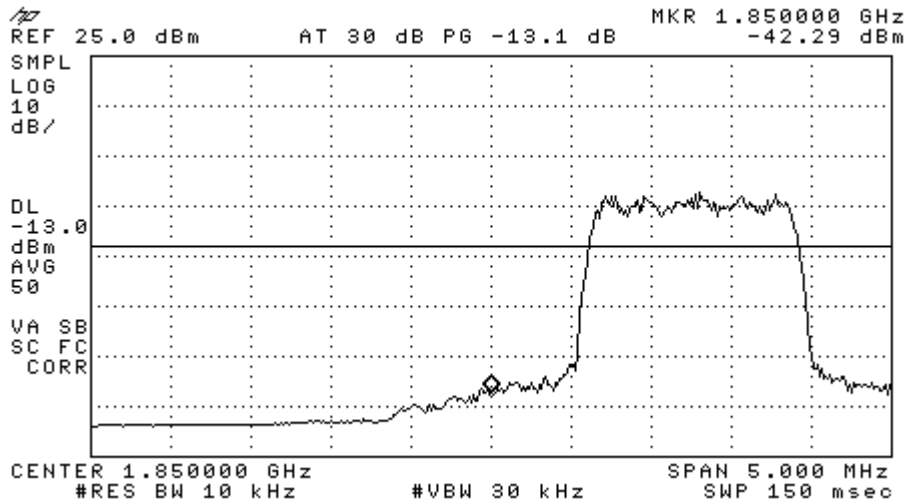
Figure 6-6 AWS 1700 Upper Band Edge @ CH 875

CDMA



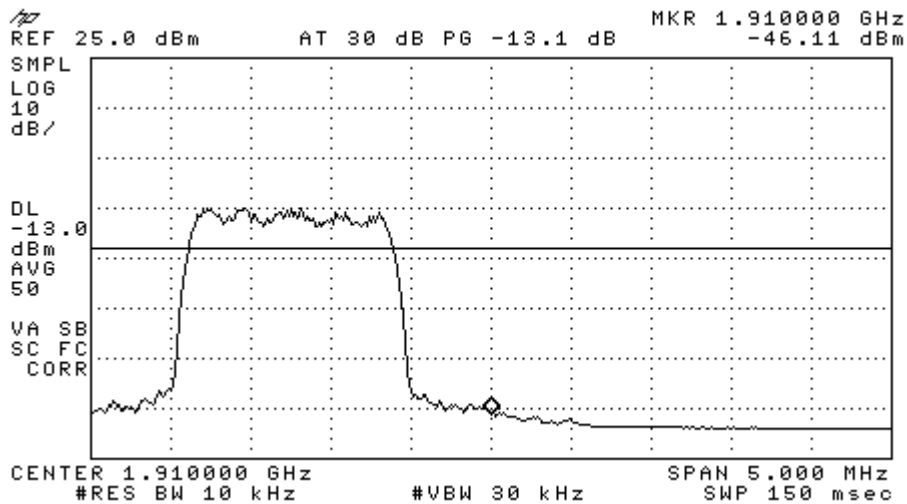
RL

Figure 6-7 CDMA 1900 @ CH 600



RL

-Figure 6-8 CDMA 1900 Lower Band Edge @ CH 25



RL

Figure 6-9 CDMA 1900 Upper Band Edge @ CH 1175

7 Spurious Emissions At Antenna Terminals

FCC:	§ 2.1051, § 22.917(e)(f), § 24.238	IC:	RSS-132 (4.5), RSS-133 (6.5), RSS-139 (6.5),
Measurement Procedures:			
<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>			
S.A. Setting		RBW	VBW
Spurious Emissions Measurement		1MHz	1MHz

List of Figures:

Figure	Mode	Channel	Plot Description
7-1	CDMA 800	1013	Conducted spurious emissions, 9kHz to 10GHz
7-2		383	Conducted spurious emissions, 9kHz to 10GHz
7-3		777	Conducted spurious emissions, 9kHz to 10GHz
7-4	CDMA 1700	25	Conducted spurious emissions, 9kHz to 20GHz
7-5		450	Conducted spurious emissions, 9kHz to 20GHz
7-6		875	Conducted spurious emissions, 9kHz to 20GHz
7-7	CDMA 1900	25	Conducted spurious emissions, 9kHz to 20GHz
7-8		600	Conducted spurious emissions, 9kHz to 20GHz
7-9		1175	Conducted spurious emissions, 9kHz to 20GHz

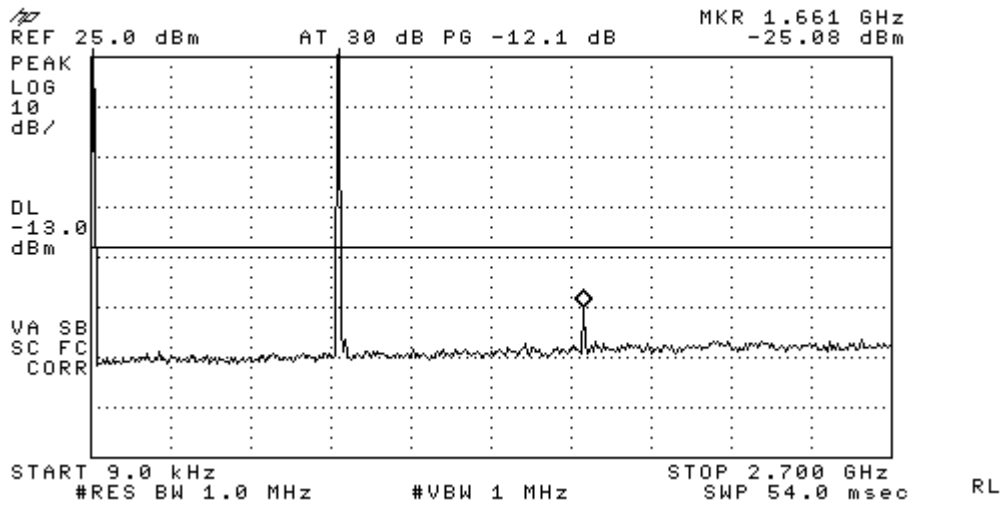


Figure 7-1a CDMA 800 – Conducted Spurious Emission (CH 1013)

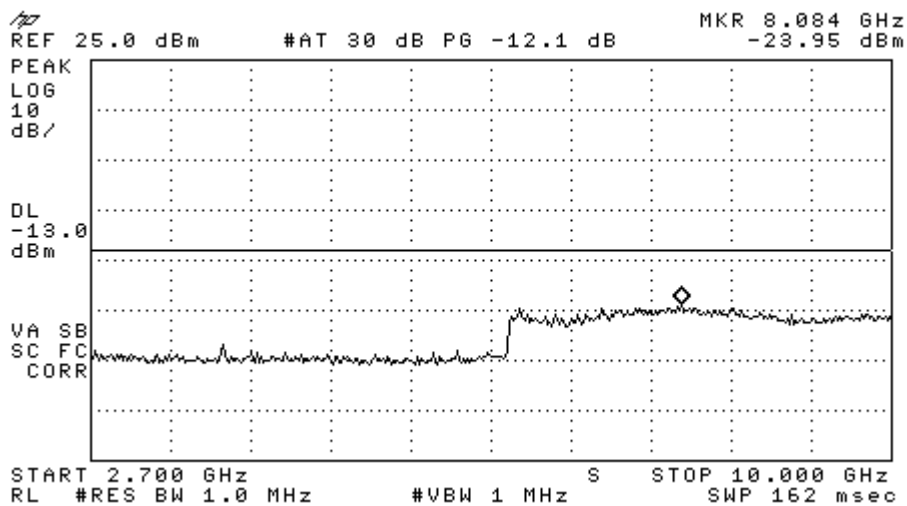


Figure 7-1b CDMA 800 – Conducted Spurious Emission (CH 1013)

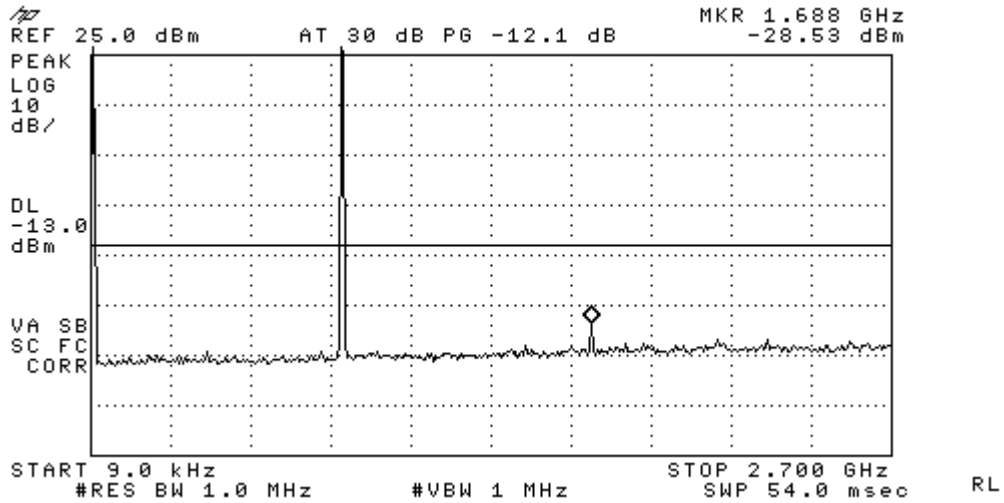


Figure 7-2a CDMA 800 – Conducted Spurious Emission (CH 383)

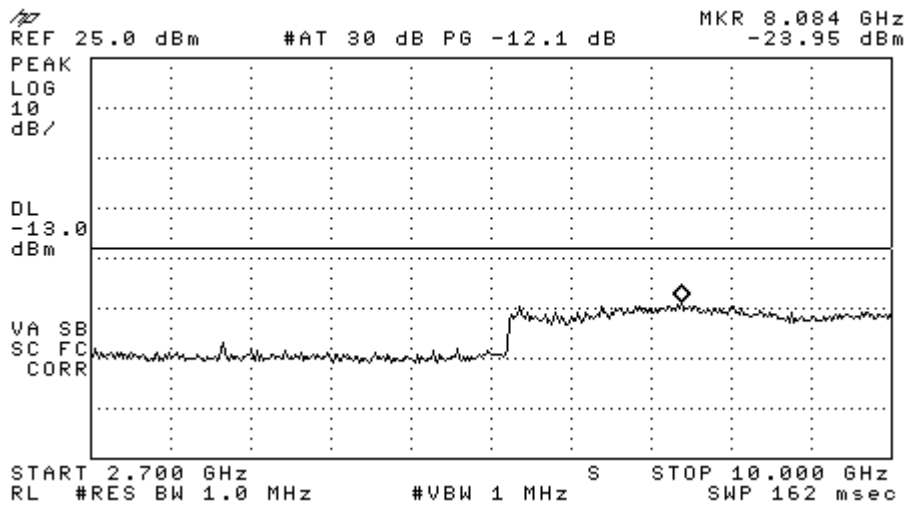


Figure 7-2b CDMA 800 – Conducted Spurious Emission (CH 383)

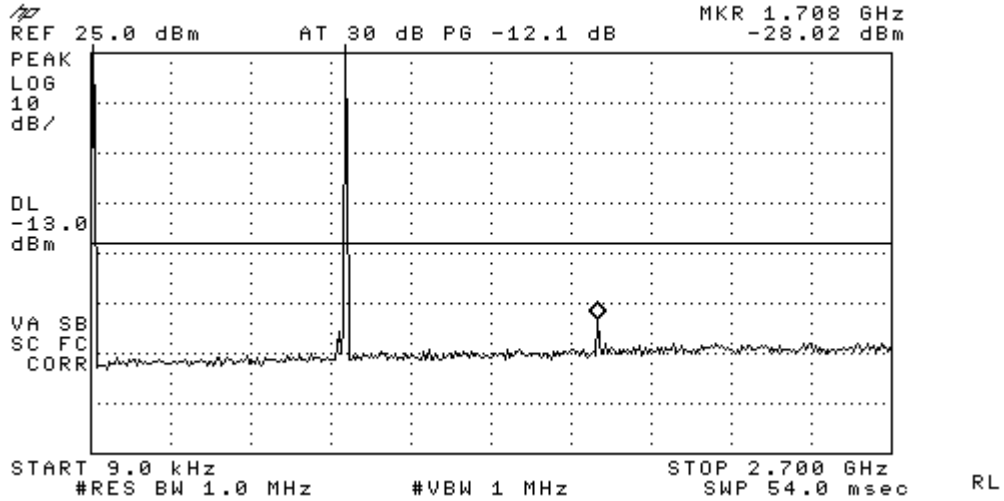


Figure 7-3a CDMA 800 – Conducted Spurious Emission (CH 777)

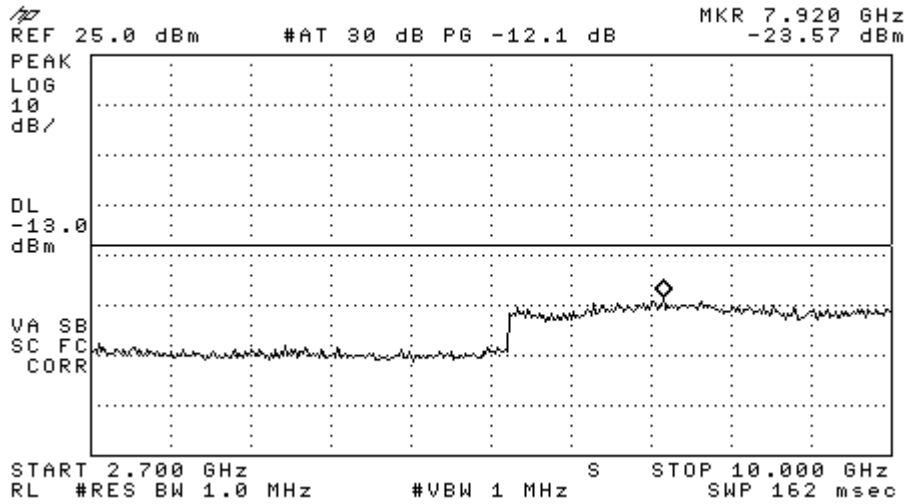


Figure 7-3b CDMA 800 – Conducted Spurious Emission (CH 777)

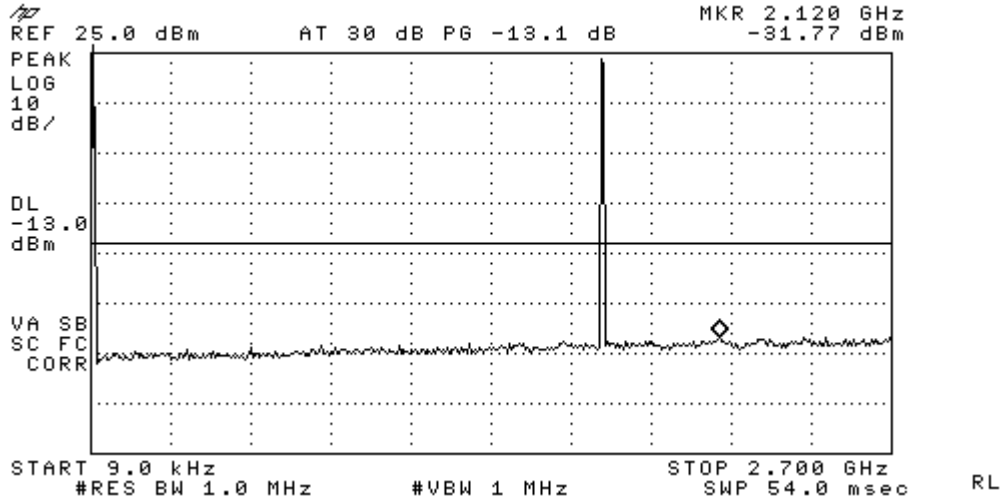


Figure 7-4a AWS 1700 - Conducted Spurious Emission (CH 25)

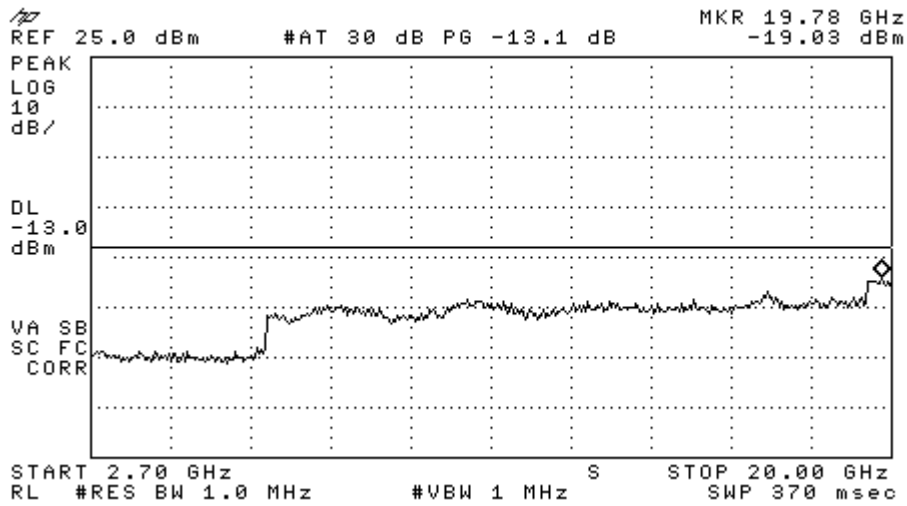


Figure 7-4b AWS 1700 - Conducted Spurious Emission (CH 25)

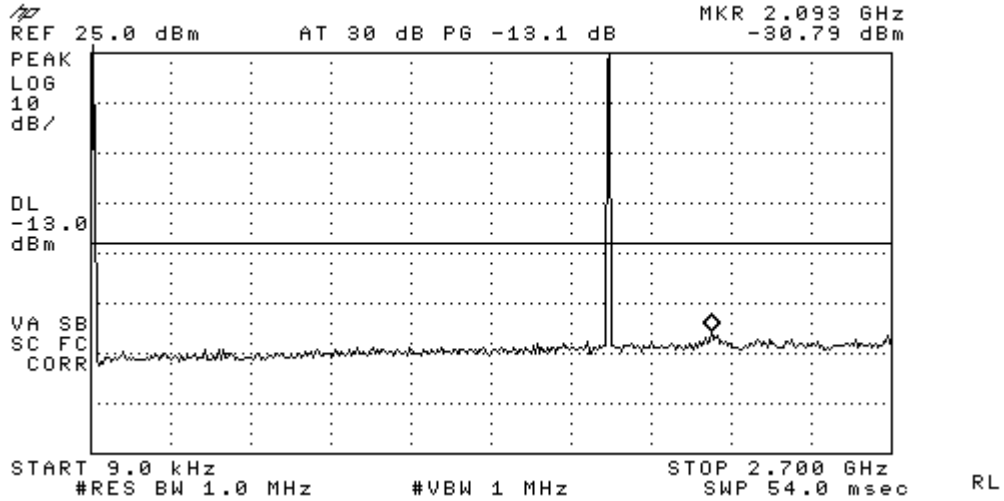


Figure 7-5a AWS 1700 - Conducted Spurious Emission (CH 450)

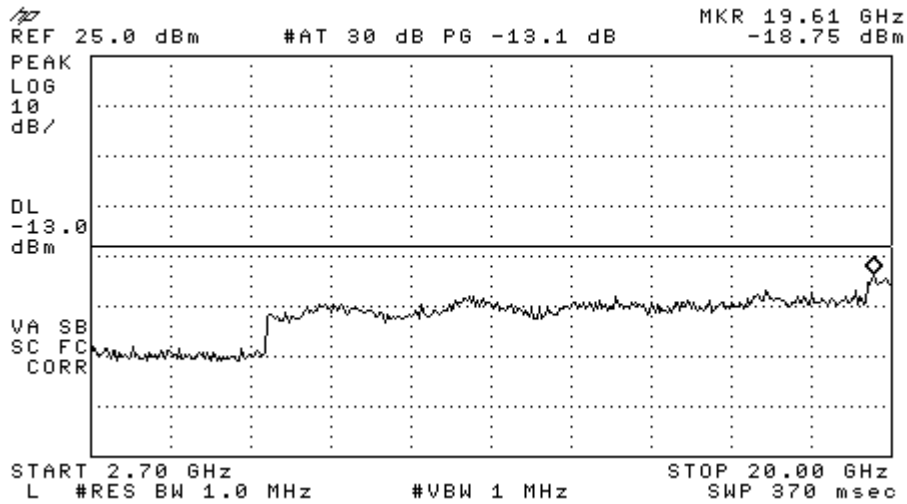


Figure 7-5b AWS 1700 - Conducted Spurious Emission (CH 450)

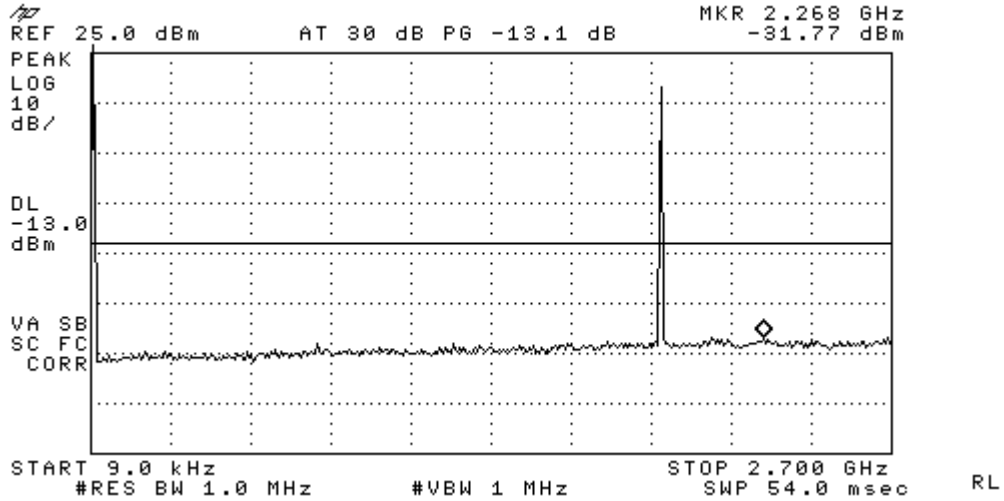


Figure 7-9a CDMA 1900 - Conducted Spurious Emission (CH 1175)

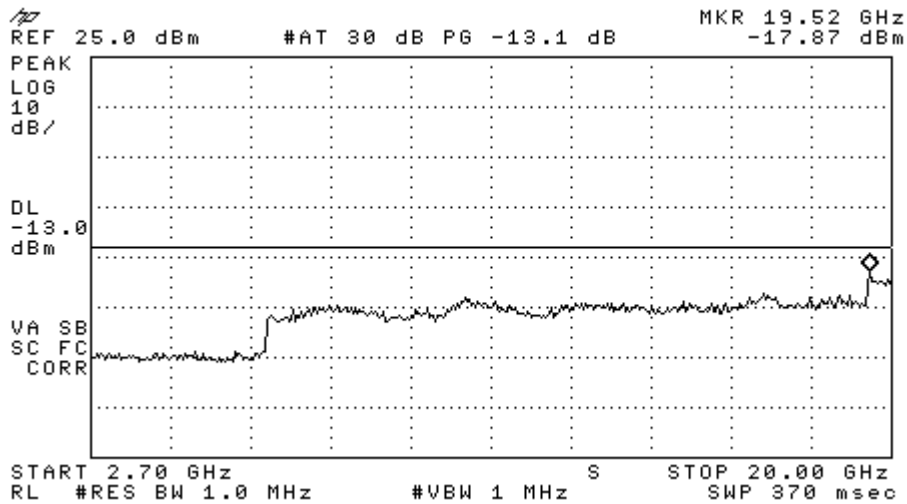


Figure 7-9b CDMA 1900 - Conducted Spurious Emission (CH 1175)

Figure	Mode	Channel	Plot Description
7-10	CDMA 800	1013	Emissions in base station frequency range, 869 - 894 MHz
7-11		383	Emissions in base station frequency range, 869 - 894 MHz
7-12		777	Emissions in base station frequency range, 869 - 894 MHz

8 Transmitter Radiated Spurious Emissions Measured Data

FCC:	§ 2.1053, § 22.91, § 24.238, §27.53(g)	IC:	RSS-132, RSS-133 (6.3), RSS-139 (6.3)
<p>Measurement Procedures:</p> <p>The radiated spurious emission test was performed at Compliance Certification Service. The test report is attached in a separate attachment.</p>			

9 Receiver Spurious Emissions

FCC:	§ 15.109	IC:	RSS-132 (4.6), RSS-133 (6.6), RSS-139 (6.6), RSS-GEN
<p>Measurement Procedures:</p> <p>The receiver radiated spurious emission test was performed at Compliance Certification Service. The test report is attached in a separate attachment.</p>			

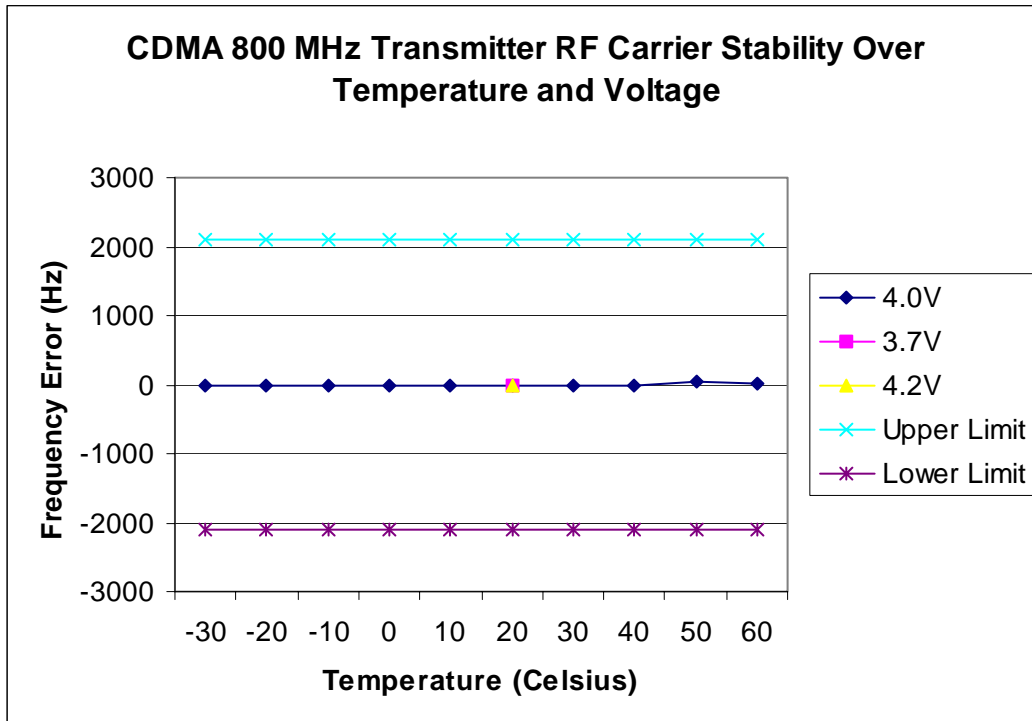
10 Transmitter RF Carrier Frequency Stability

FCC:	§ 2.1055, § 22.355, § 24.235, § 27.54	IC:	RSS-132 (4.3), RSS-133 (6.3), RSS-139 (6.3)
<p>Measurement Procedures:</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>			

10.1 CDMA 800 Mode

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

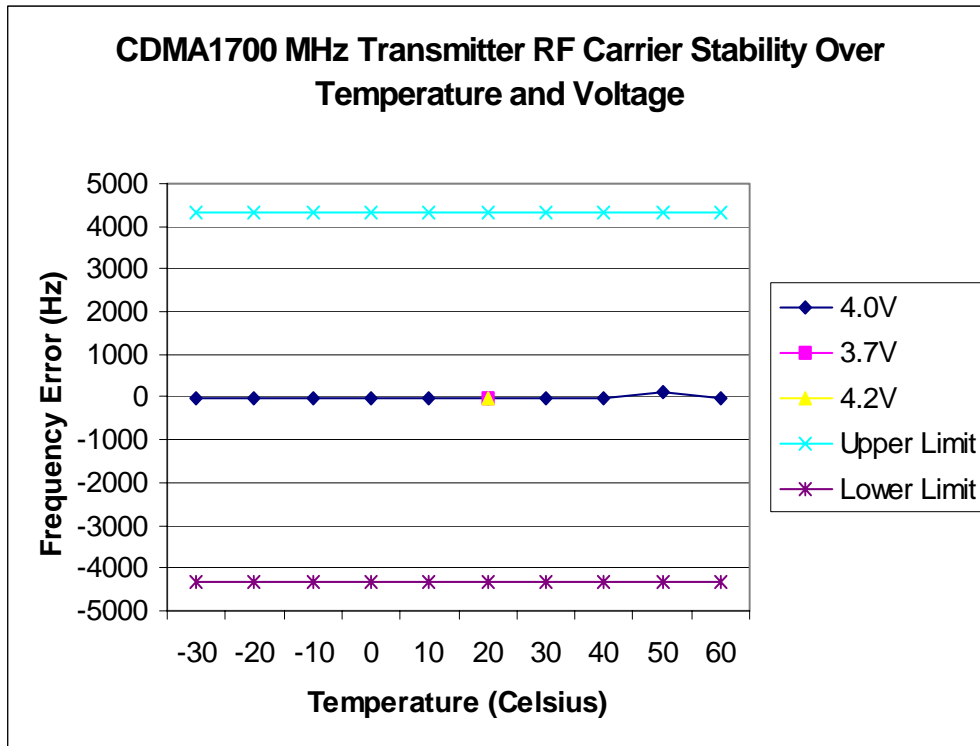
Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.7V (Battery endpoint)	4.0	4.26V (115%)	Lower limit	Upper limit
-30		-4.97		-2091	2091
-20		-6.63		-2091	2091
-10		-5.33		-2091	2091
0		-4.65		-2091	2091
10		-6.39		-2091	2091
20	-5.57	-3.59	-7.06	-2091	2091
30		-4.22		-2091	2091
40		-3.58		-2091	2091
50		40.26		-2091	2091
60		12.99		-2091	2091



10.2 CDMA 1700 Mode

Tx Frequency : 1732.50 MHz	Voltage : 3.7V
Tolerance : +/- 2.5 ppm (+/-4331 Hz)	Ch : 450

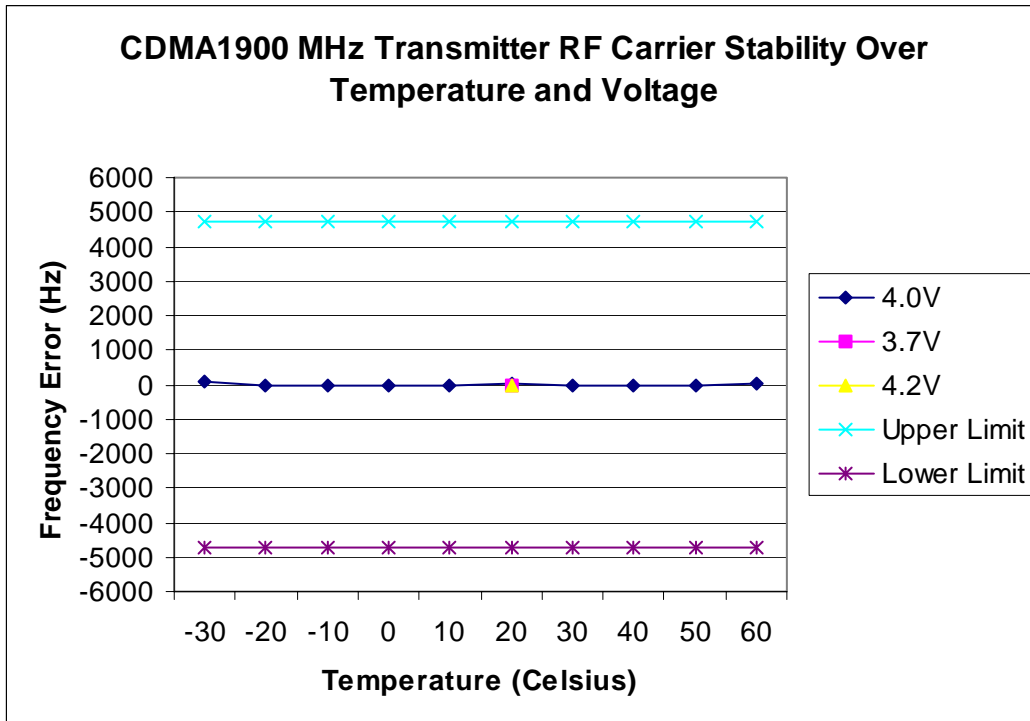
Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.7V (Battery endpoint)	4.0V	4.26V (115%)	Lower limit	Upper limit
-30		-11.43		-4331	4331
-20		-6.59		-4331	4331
-10		-6.18		-4331	4331
0		-5.29		-4331	4331
10		-7.63		-4331	4331
20	-3.79	-3.71	-4.75	-4331	4331
30		-6.4		-4331	4331
40		-6.7		-4331	4331
50		116.17		-4331	4331
60		-6.43		-4331	4331



10.3 CDMA 1900 Mode

Tx Frequency : 1880 MHz	Voltage : 3.7V
Tolerance : +/- 2.5 ppm (+/-4700 Hz)	Ch : 600

Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.7V (Battery endpoint)	4.0V	4.26V (115%)	Lower limit	Upper limit
-30		70.16		-4700	4700
-20		-6.82		-4700	4700
-10		-6.6		-4700	4700
0		-8.23		-4700	4700
10		-31.49		-4700	4700
20	-6.41	6.0	-7.0	-4700	4700
30		-5.67		-4700	4700
40		-6.93		-4700	4700
50		-26.72		-4700	4700
60		8.59		-4700	4700



11 Exposure of Humans to RF Fields (SAR)

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

12 Test Equipment

Description	Manufacturer	Model Number	Serial Number	Cal Due Date
Power Meter	Giga-tronics	8541C	1832048	03/09/10
Spectrum Analyzer	Hewlett Packard	8593EM	3710A00203	03/04/10
Spectrum Analyzer	Hewlett Packard	8595E	3911A03899	07/20/11
Spectrum Analyzer	Hewlett Packard	8594E	3543A02438	04/03/10
Wireless Communications Test Set	Agilent	8960	GB44052789	05/19/10
Temperature Chamber	Test Equity	ZH2-033-033-H/AC	ZZ9622421	04/13/10