

Applicant:	Kyocera
FCC ID:	V65S2150
Report #:	CT-S2150-24-0812-R0

## RF Emissions Test Report

FCC Part 22, 24, 27

For

Kyocera Corporation  
c/o Kyocera Communication Inc.

Product:	CDMA Phone
Model:	S2150

Applicant:	Kyocera
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## ATTESTATION

The tested device complies with the requirements in respect of all parameters subject to the test.

The test results and statements relate only to the items tested.

The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.

The test methods were consistent with the methods described in the relevant standards.

<b>Product:</b>	CDMA Cellular Phone with Bluetooth
<b>Model #:</b>	S2150
<b>FCC ID:</b>	V65S2150
<b>Tested in accordance with:</b>	FCC Part 22, 24, 27
<b>Test performed by:</b>	CompTest Services LLC
<b>Test Requested by:</b>	Kyocera Corporation c/o Kyocera Communication Inc 8611 Balboa Avenue San Diego, CA 92121 United States
<b>Date of Test:</b>	August 31 – September 5, 2012

**Responsible Engineer**

***Benjamin Nguyen***

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Benjamin Nguyen  
Test Engineer

**Reviewed and approved by:**

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Tammy To  
Quality Manager



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## 1 SUMMARY OF TESTING

Section #	Rule Part	Test Description	Verdict
6	FCC § 2.1046	Conducted Power	Pass
7	FCC § 22.913, 24.232, 27.50	Radiated Power	Pass
8	FCC § 24.232(d)	Peak-to-Average Ratio	Pass
9	FCC § 2.1049, 22.917 (b)(d), 24.238, 27.53 (g)(1)	Occupied Bandwidth	Pass
10	FCC § 2.1051, 22.917(e)(f), 24.238, 27.53	Spurious Emissions at Antenna Terminals	Pass
11	FCC § 2.1053, 22.91, 24.238, 27.53(g)	Transmitter Radiated Spurious Emissions	Pass
12	FCC § 15.109	Receiver Spurious Emissions	Pass
13	FCC § 2.1055, 22.355, 24.235, 27.54	Transmitter RF Carrier Frequency Stability	Pass
14	FCC § 2.1093	Exposure of Humans to RF Fields	Pass

## 2 EQUIPMENT UNDER TEST INFORMATION

<b>EUT Serial Number:</b>	268435457816727685		
<b>Type:</b>	<input type="checkbox"/> Prototype, <input checked="" type="checkbox"/> Pre-Production, <input type="checkbox"/> Production		
<b>Equipment Category:</b>	Portable		
<b>RF Exposure Environment:</b>	General Population / Uncontrolled		
<b>Antenna:</b>	Internal Antenna		
<b>Detachable Antenna:</b>	No		
<b>External Input:</b>	Audio/Digital Data		
<b>Quantity:</b>	Quantity production is planned		
<b>Multiple Access Scheme:</b>	CDMA		
<b>Emission Designators:</b>	1M25F9W		
<b>FCC Rule Parts:</b>	§22H	§27L	§24E
<b>Modes:</b>	800 CDMA	1700 CDMA	1900 CDMA
<b>Band:</b>	BC-0	BC-15	BC-1
<b>TX Frequency (MHz):</b>	824-849	1710-1755	1850 - 1910

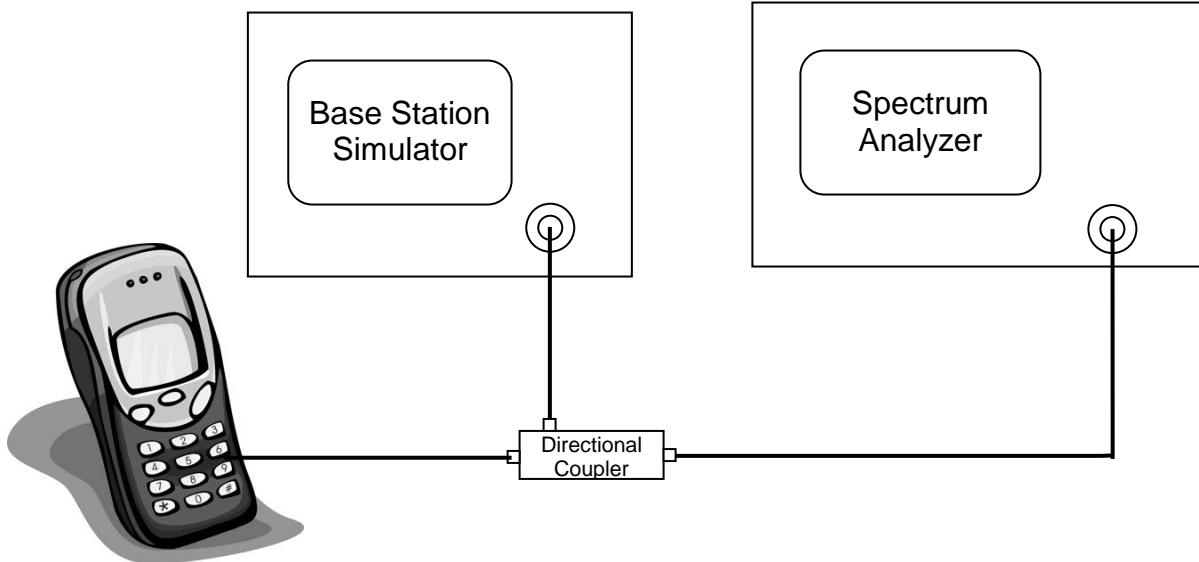


### 3 TEST FACILITIES

The test sites and measurement facilities used to collect data are located at 8611 Balboa Avenue, San Diego, CA 92123, USA

### 4 TEST SETUP

All CDMA measurements were conducted with a base station simulator to establish a CDMA link with the equipment under test (EUT). To investigate the response of the EUT the main antenna RF output port of the EUT was connected to the input of the spectrum analyzer with a RF cable. The amplitude of the spectrum analyzer is corrected for the cable insertion loss and any other applicable losses. A fully charged battery was used as a power supply voltage, except for the Transmitter RF Carrier Frequency Stability test a dummy battery connected to a power supply was used.



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## 4.1 Test Configuration

To justify on the selection of applicable configurations, the EUT was pre-tested under all Radio Configuration and Service Option operation modes to determine the worst-case scenario.

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

Radio Configuration:	<b>RC1</b>
Service Options:	<b>SO55</b>
Data Rate:	<b>Full Rate</b>

CONFIGURATION Peak Power	CONDUCTED POWER (dBm)								
	CDMA 800			CDMA 1700			CDMA 1900		
	Ch 1013	Ch 384	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	29.69	29.97	29.60	29.59	29.37	29.32	28.11	28.90	28.81
SO2, RC3 Full Rate	29.42	29.54	29.32	28.96	28.92	28.69	27.75	28.27	28.30
SO55, RC1 Full Rate	<b>29.04</b>	<b>29.50</b>	<b>29.05</b>	<b>29.56</b>	<b>29.36</b>	<b>29.28</b>	<b>28.24</b>	<b>28.69</b>	<b>28.60</b>
SO55, RC3 Full Rate	28.83	29.05	29.23	28.82	28.86	28.71	28.11	28.36	28.40
TDSO SO32, RC3 (+SCH) Full Rate	29.04	29.42	29.16	28.65	28.39	28.36	27.73	27.97	27.87
TDSO SO32, RC3 (+F-SCH) Full Rate	29.32	29.46	29.09	28.61	28.46	28.55	27.86	28.07	28.00

CONFIGURATION Average Power	CONDUCTED POWER (dBm)								
	CDMA 800			CDMA 1700			CDMA 1900		
	Ch 1013	Ch 384	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	24.65	24.72	24.62	24.65	24.35	24.50	23.68	23.85	24.26
SO2, RC3 Full Rate	24.63	24.72	24.55	24.56	24.50	24.47	23.84	23.80	24.20
SO55, RC1 Full Rate	24.50	24.57	24.53	24.55	24.52	24.53	23.88	23.64	23.88
SO55, RC3 Full Rate	<b>24.51</b>	<b>24.62</b>	<b>24.60</b>	<b>24.56</b>	<b>24.57</b>	<b>24.56</b>	<b>23.87</b>	<b>23.82</b>	<b>24.23</b>
TDSO SO32, RC3 (+SCH) Full Rate	24.53	24.60	24.40	24.20	24.12	24.24	23.85	23.50	23.83
TDSO SO32, RC3 (+F-SCH) Full Rate	24.54	24.62	24.35	24.23	24.19	24.23	23.84	23.54	23.86

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## 5 TTY COMPLIANCE

**FCC: § 255 of the Telecom Act**

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

## 6 CONDUCTED RF OUTPUT POWER

### 6.1 Test Configuration

**FCC: § 2.1046**

**IC: RSS132 §4.4; RSS133 §6.4**

The EUT was connected to a Universal Power Meter through a RF cable. The cable loss was taken into account for accurate power measurement. The EUT was set at low, mid, high channels and each frequency band to investigate the conducted power.

### 6.2 Test Results

Mode	Frequency (MHz)	Channel	Conducted Power (dBm)
CDMA 800	824.70	1013	24.51
	836.52	384	24.62
	848.31	777	24.60
CDMA 1700	1711.25	25	24.56
	1732.5	450	24.57
	1753.75	875	24.56
CDMA 1900	1851.25	25	23.87
	1880	600	23.82
	1908.75	1175	24.23

## 7 RADIATED RF OUTPUT POWER

### 7.1 Test Configuration

**FCC: § 22.913, § 24.232, §27.50**

**IC: RSS132 §4.4; RSS133 §6.4**

The test was performed in Compliance Certification Service using substitution method. See separated radiated emission report for details.

## 8 PEAK-AVERAGE RATIO

### 8.1 Test Configuration

FCC: § 24.232(d)

IC: RSS133 (6.4)

The RF output of the EUT was connected to the input of the spectrum analyzer (S.A.) with sufficient attenuation. The spectrum analyzer Complementary Cumulative Distribution Function (CCDF) function is utilized to determine the largest deviation between average and peak power of the EUT.

For Digital: Modulate with full rate and all up power control bit.

S.A. Setting	RBW	VBW
Power Stat CCDF	5MHz	auto

Limits: <13 dB

### 8.2 Test Result

Figure	Description	Mode	Result
8-1	CCDF @ Ch450	<b>CDMA 1700</b>	Pass
8-2	CCDF @ Ch600	<b>CDMA 1900</b>	Pass



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Figure 8-1 CCDF @ CH 450



Figure 8-2 CCDF @ CH 600



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## 9 OCCUPIED BANDWIDTH

### 9.1 Test Configuration

**FCC: § 2.1049, § 22.917(b)(d), § 24.238, § 27.53(g)(1)**

**IC: RSS132 §4.5; RSS133 §6.5**

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	30KHz	100KHz

**Limits:** Bandwidth: N/A

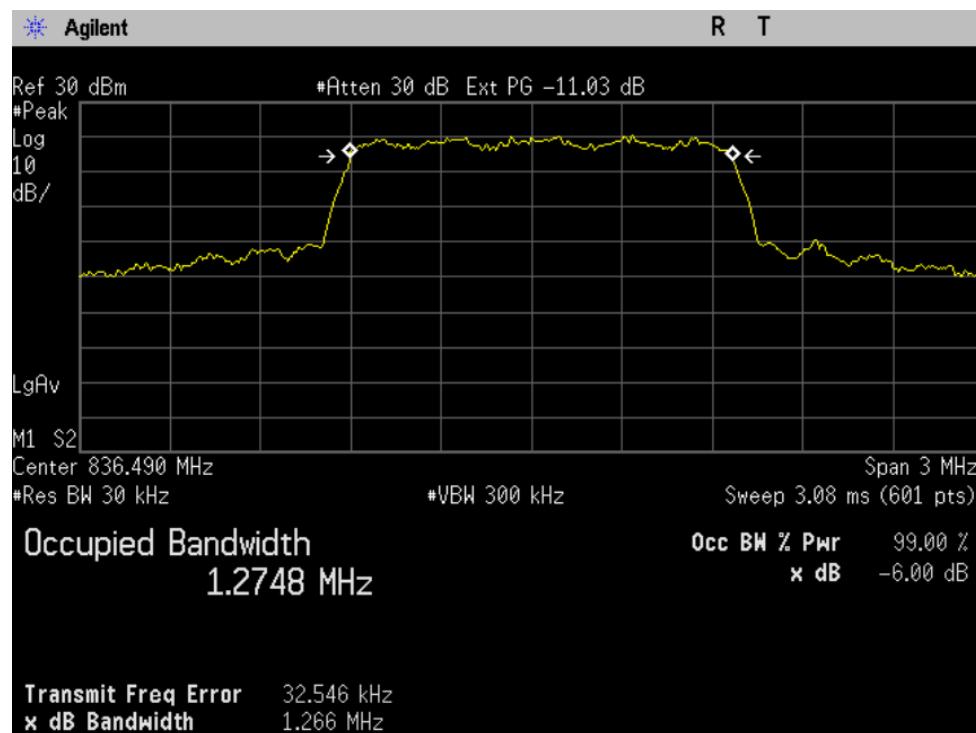
Bandedge: -13dBm

### 9.2 Test Result

Figure	Description	Mode	Result
9-1	CDMA @ CH384	CDMA 800	Pass
9-2	Lower Band Edge @ CH 1013		Pass
9-3	Upper Band Edge @ CH 777		Pass
9-4	AWS @ CH450	CDMA 1700	Pass
9-5	Lower Band Edge @ CH 25		Pass
9-6	Upper Band Edge @ CH 875		Pass
9-7	CDMA @ CH600	CDMA 1900	Pass
9-8	Lower Band Edge @ CH 25		Pass
9-9	Upper Band Edge @ CH 1175		Pass



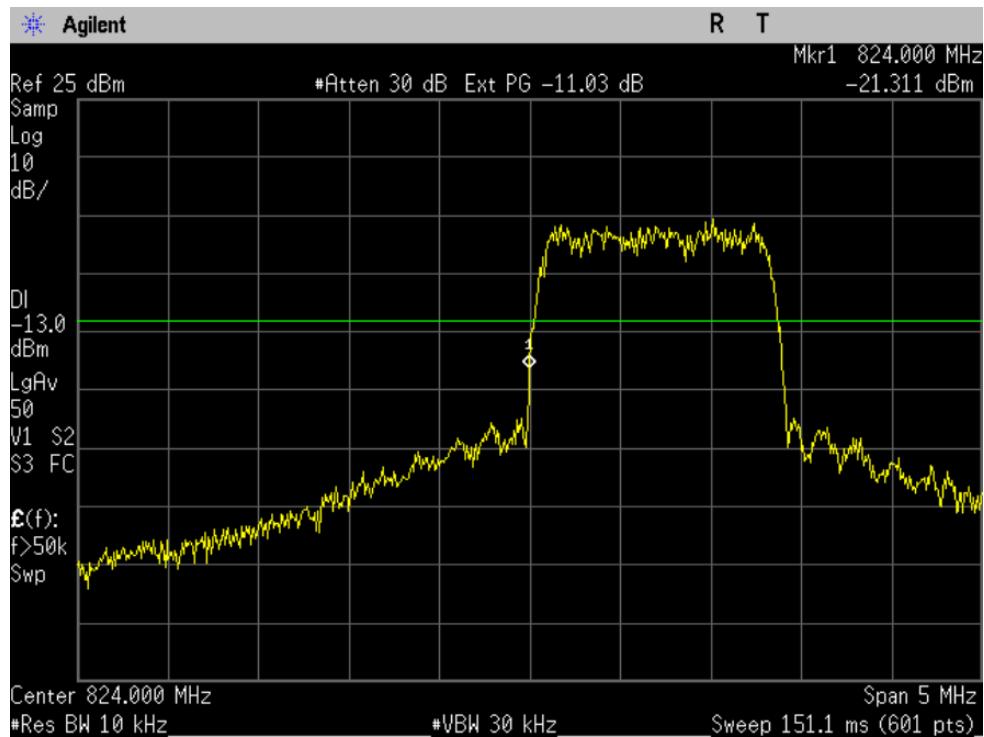
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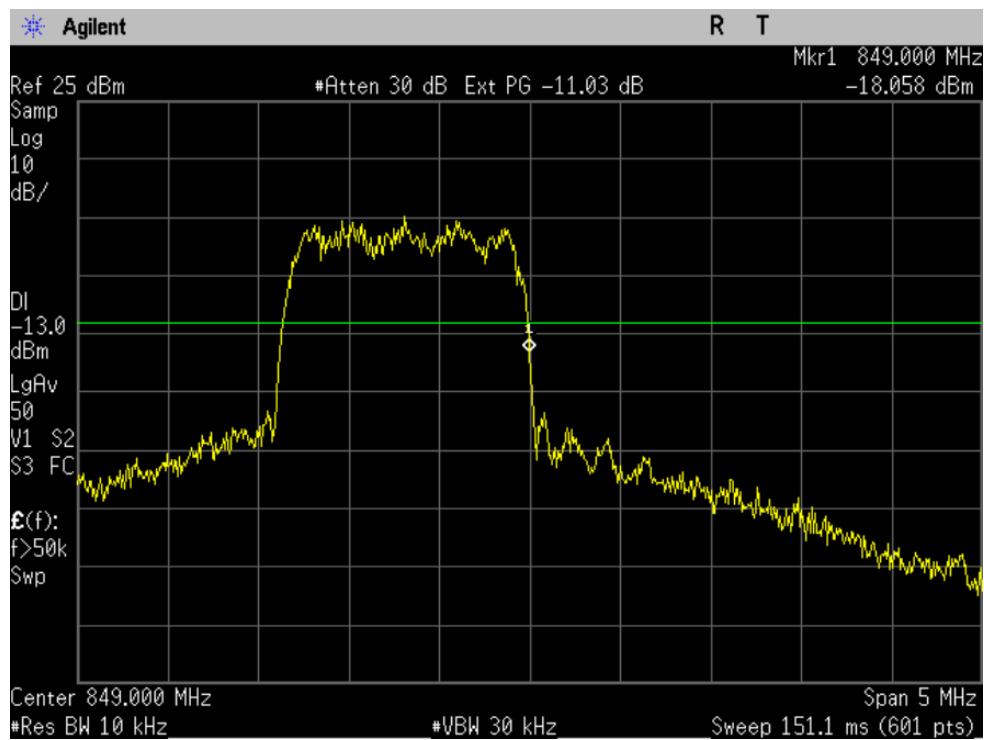
**Figure 9-1 CDMA 800 @ CH 384**



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**Figure 9-2 CDMA 800 Lower Band Edge @ CH 1013**



**Figure 9-3 CDMA 800 Lower Band Edge @ CH 777**



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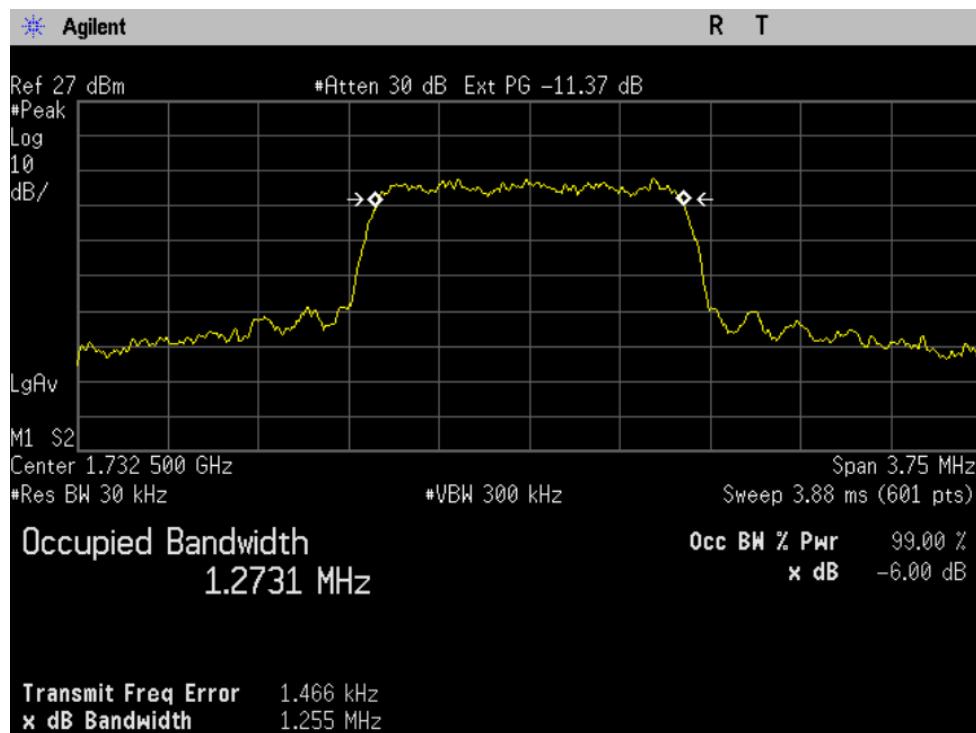
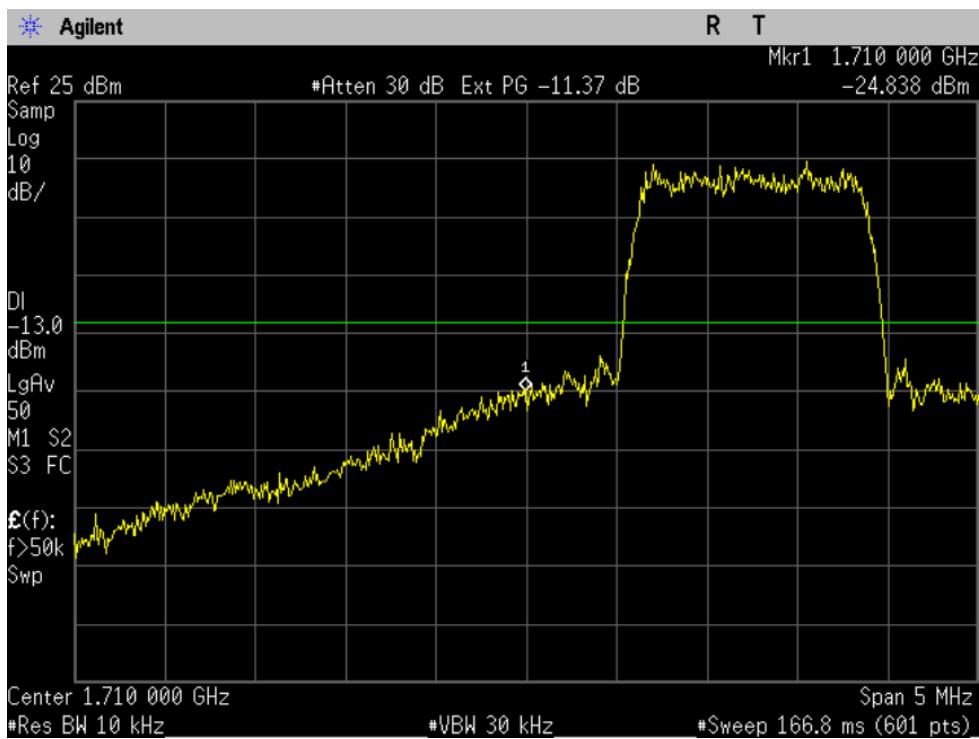


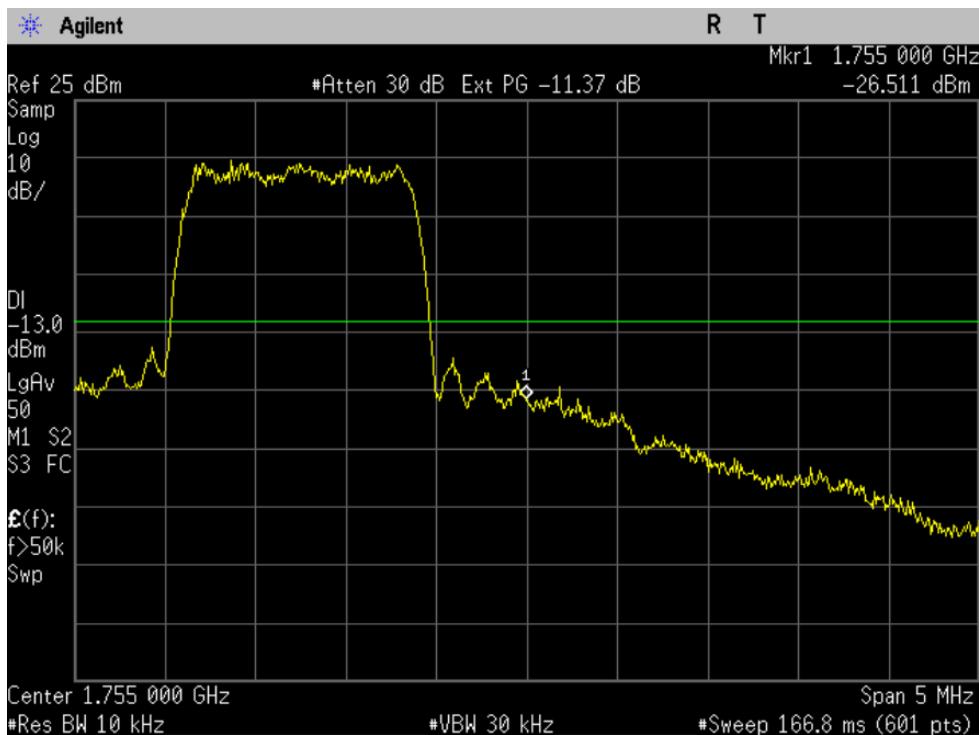
Figure 9-4 AWS 1700 @ CH 450



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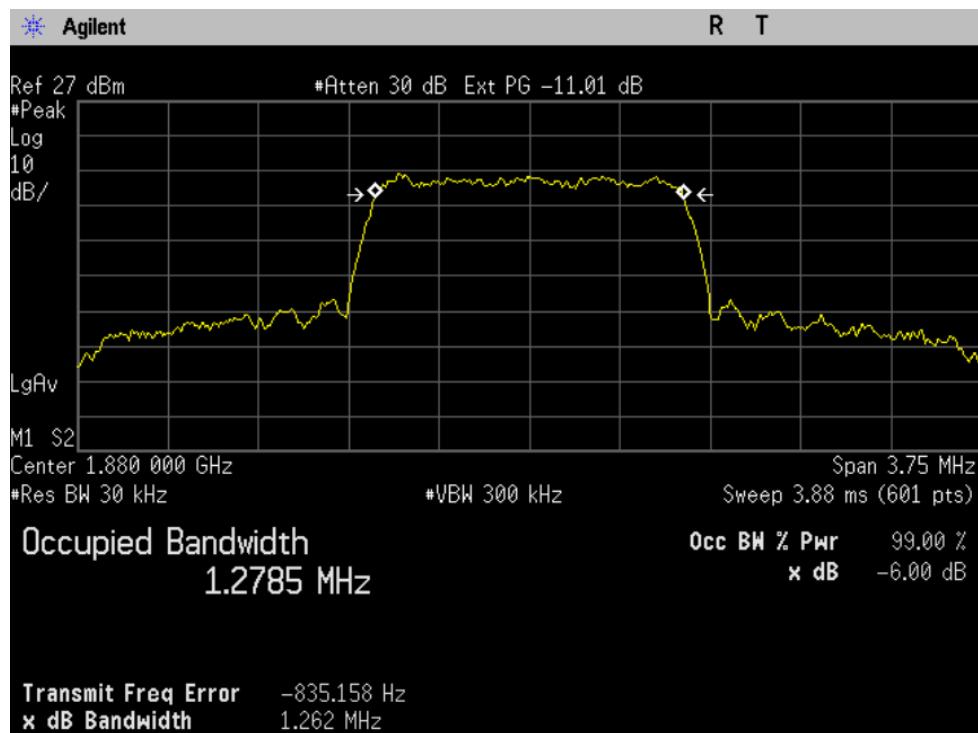
**Figure 9-5 AWS 1700 Lower Band Edge @ CH 25**



**Figure 9-6 AWS 1700 Upper Band Edge @ CH 875**



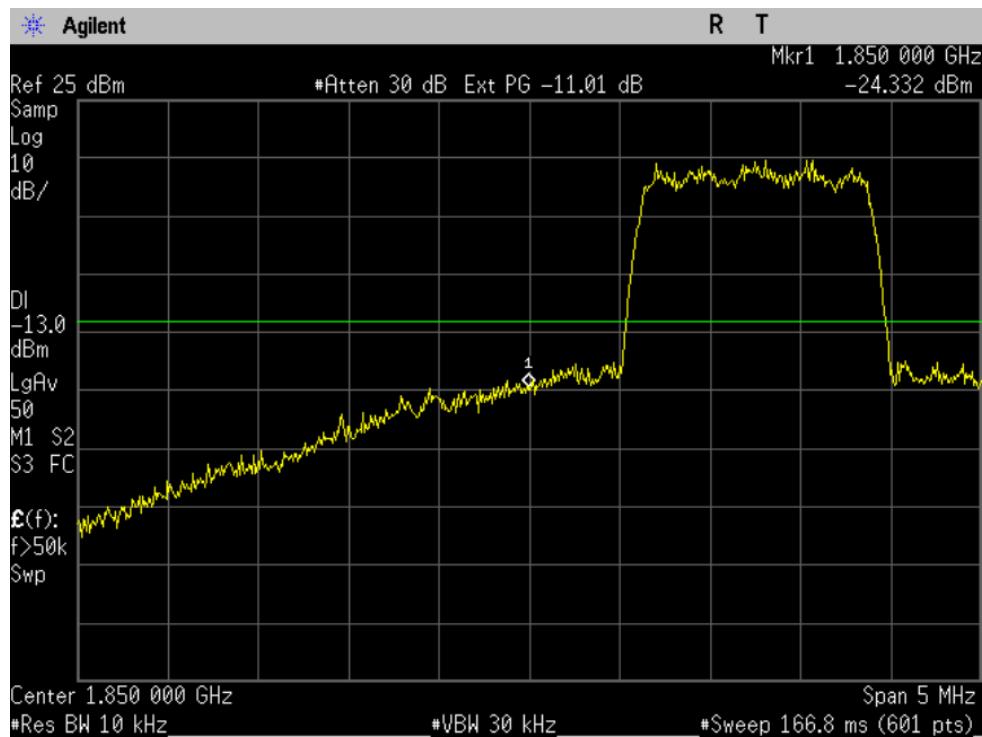
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**Figure 9-7 CDMA 1900 @ CH 600**



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-Figure 9-8 CDMA 1900 Lower Band Edge @ CH 25

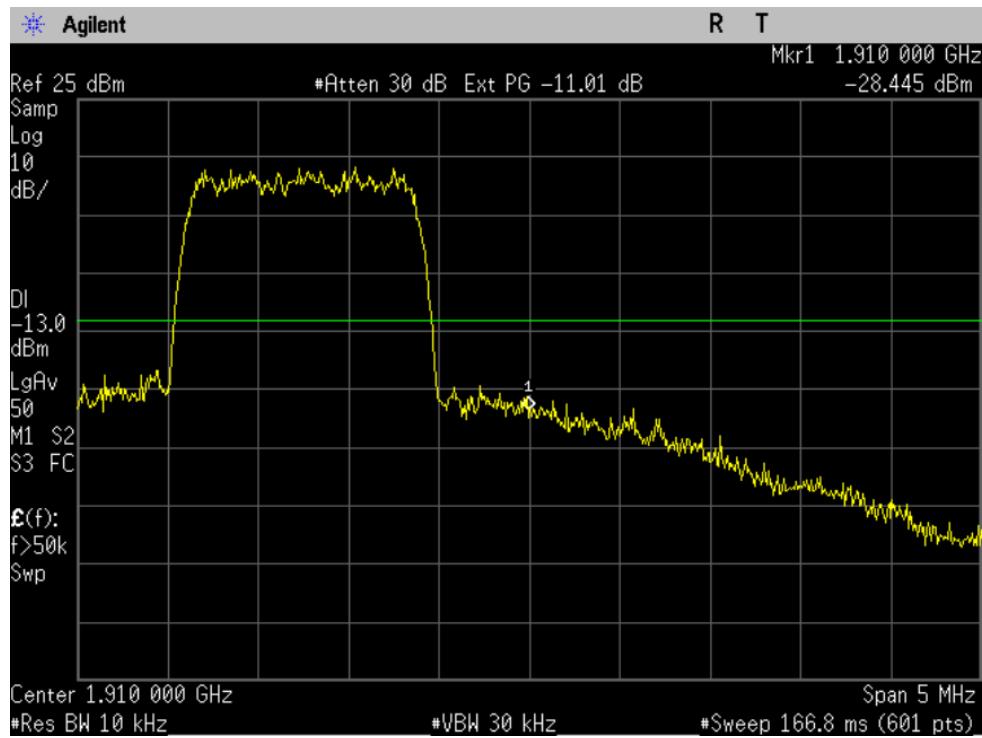


Figure 9-9 CDMA 1900 Upper Band Edge @ CH 1175



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## 10 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### 10.1 Test Configuration

**FCC: § 2.1051, § 22.917(e)(f), § 24.238, § 27.53**

**IC: RSS132 §4.5; RSS133 §6.5**

#### 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.

S.A. Setting	RBW	VBW
Spurious Emissions Measurement	1MHz	1MHz

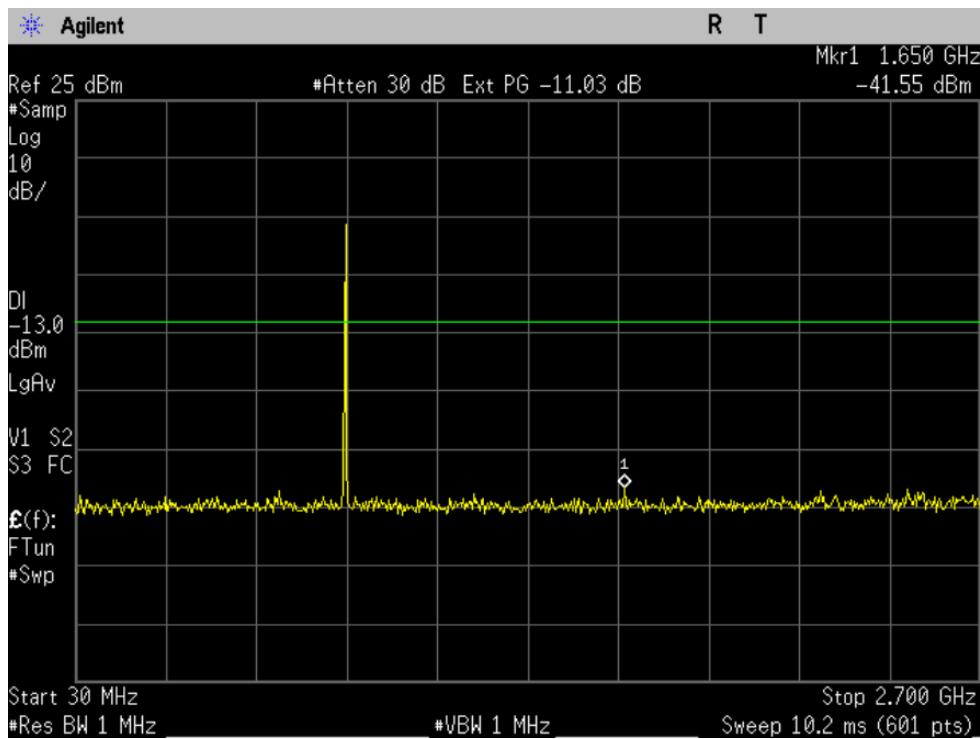
**Limits:** -13dBm

### 10.2 Test Result

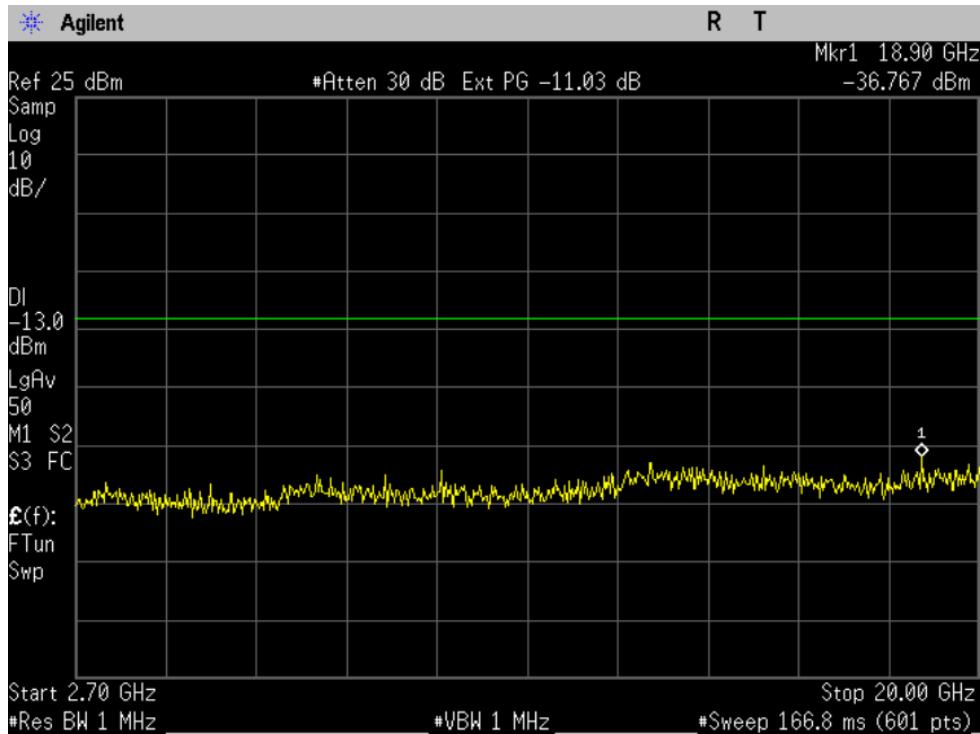
Figure	Channel	Plot Description	Result
10-1	1013	CDMA 800 Conducted spurious emissions 30MHz to 20GHz	Pass
10-2	384		Pass
10-3	777		Pass
10-4	25	CDMA 1700 Conducted spurious emissions 30MHz to 20GHz	Pass
10-5	450		Pass
10-6	875		Pass
10-7	25	CDMA 1900 Conducted spurious emissions 30MHz to 20GHz	Pass
10-8	600		Pass
10-9	1175		Pass



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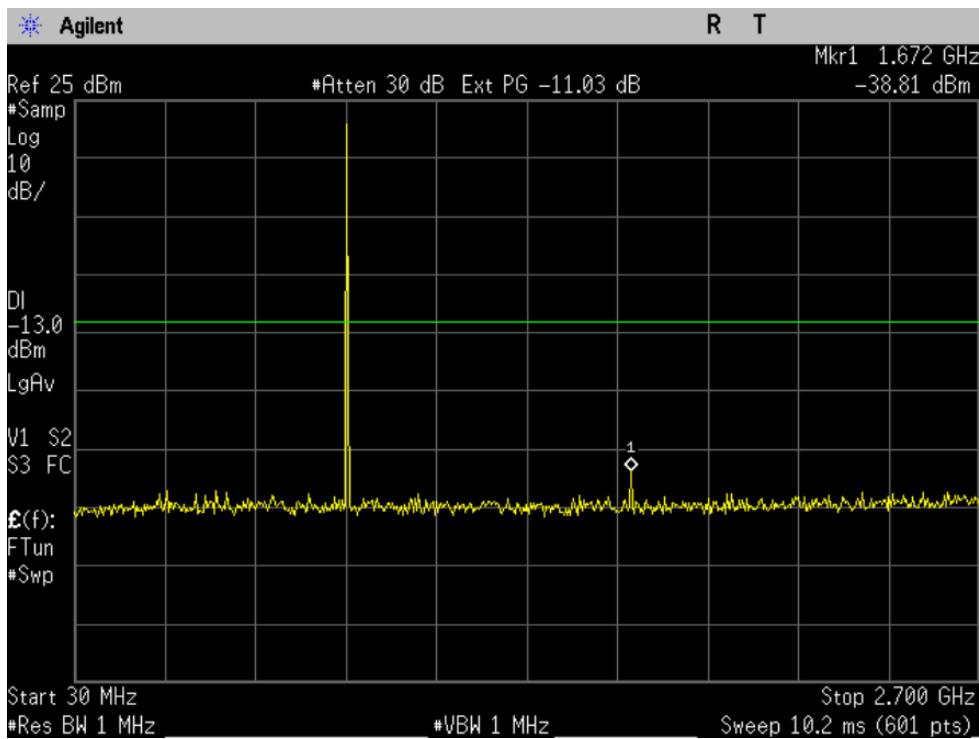
**Figure 10-1a CDMA 800 – Conducted Spurious Emission (CH 1013)**



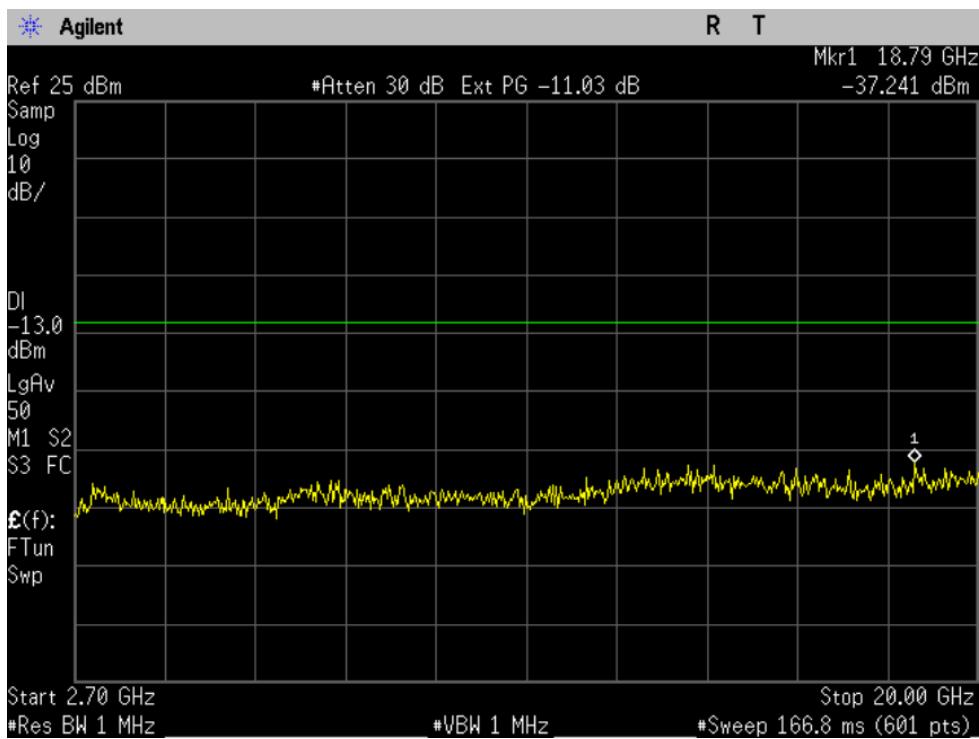
**Figure 10-1b CDMA 800 – Conducted Spurious Emission (CH 1013)**



Applicant:	Kyocera
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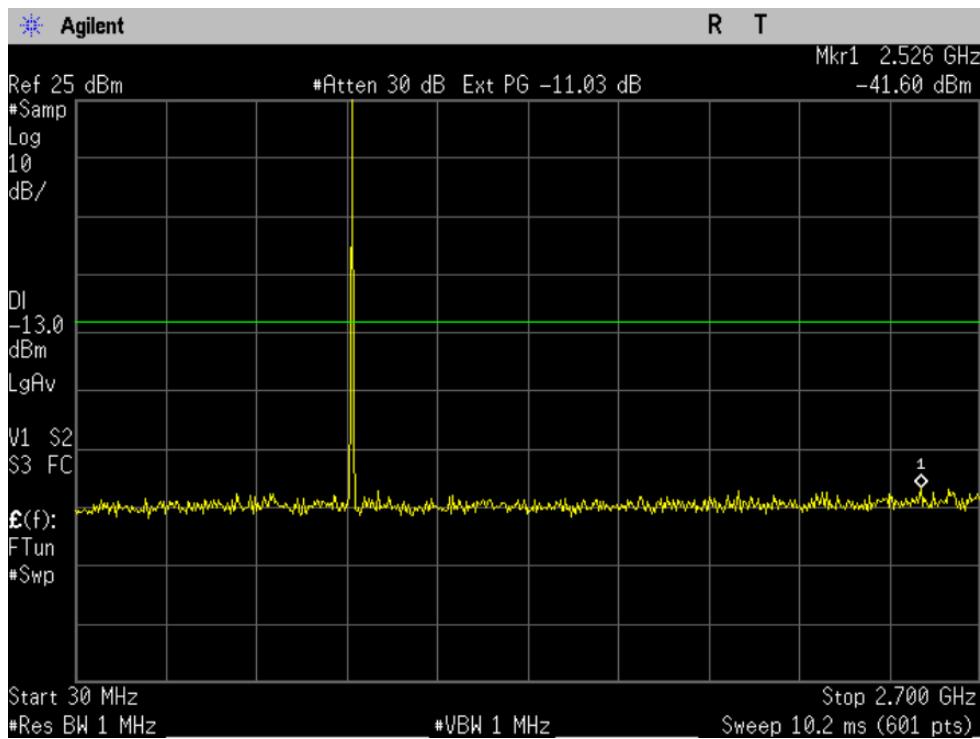
**Figure 10-2a CDMA 800 – Conducted Spurious Emission (CH 384)**



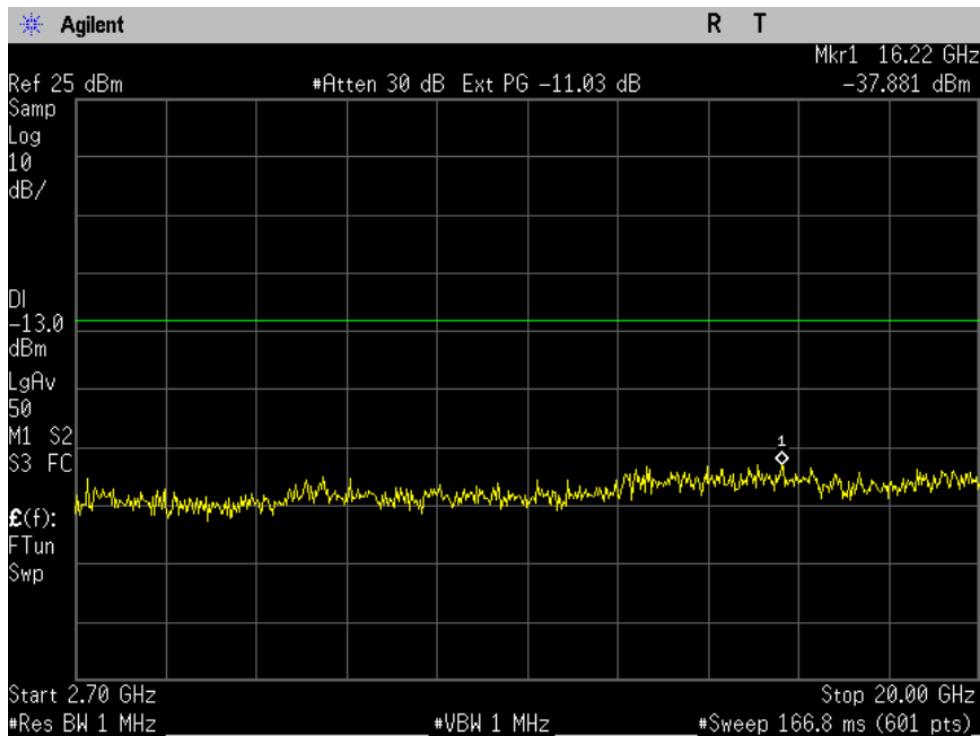
**Figure 10-2b CDMA 800 – Conducted Spurious Emission (CH 384)**



Applicant:	Kyocera
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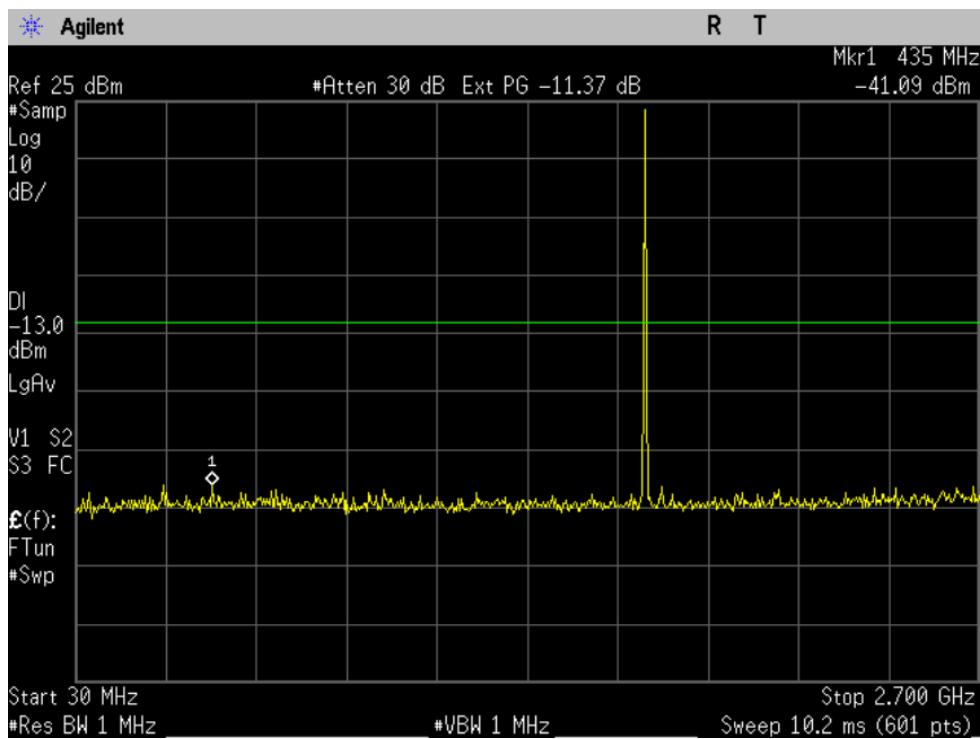
**Figure 10-3a CDMA 800 – Conducted Spurious Emission (CH 777)**



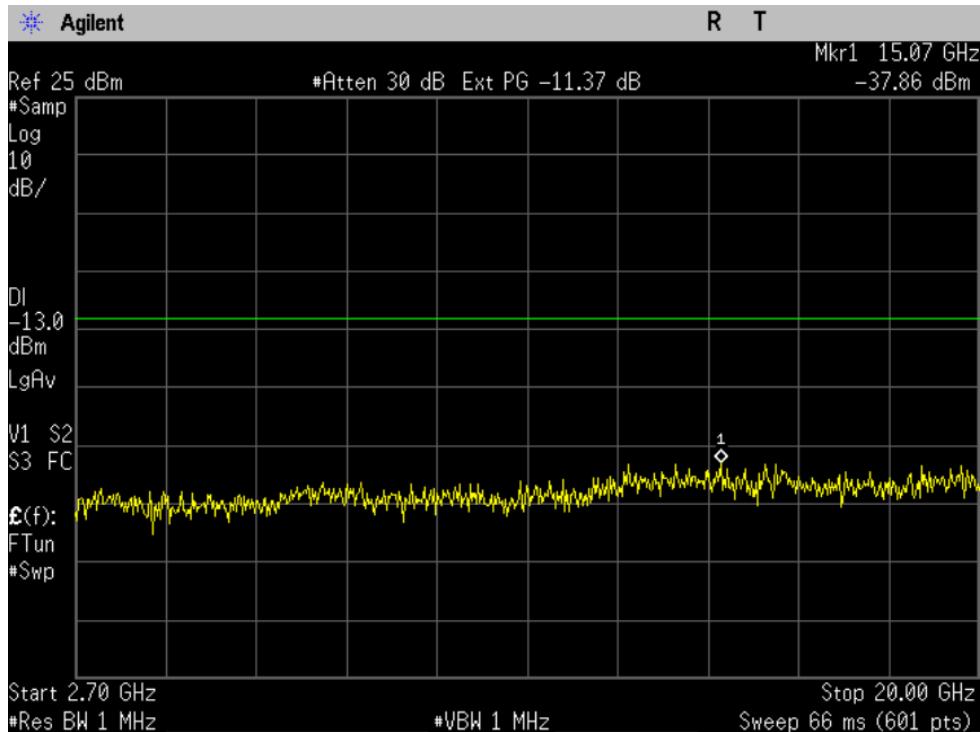
**Figure 10-3b CDMA 800 – Conducted Spurious Emission (CH 777)**



Applicant:	Kyocera
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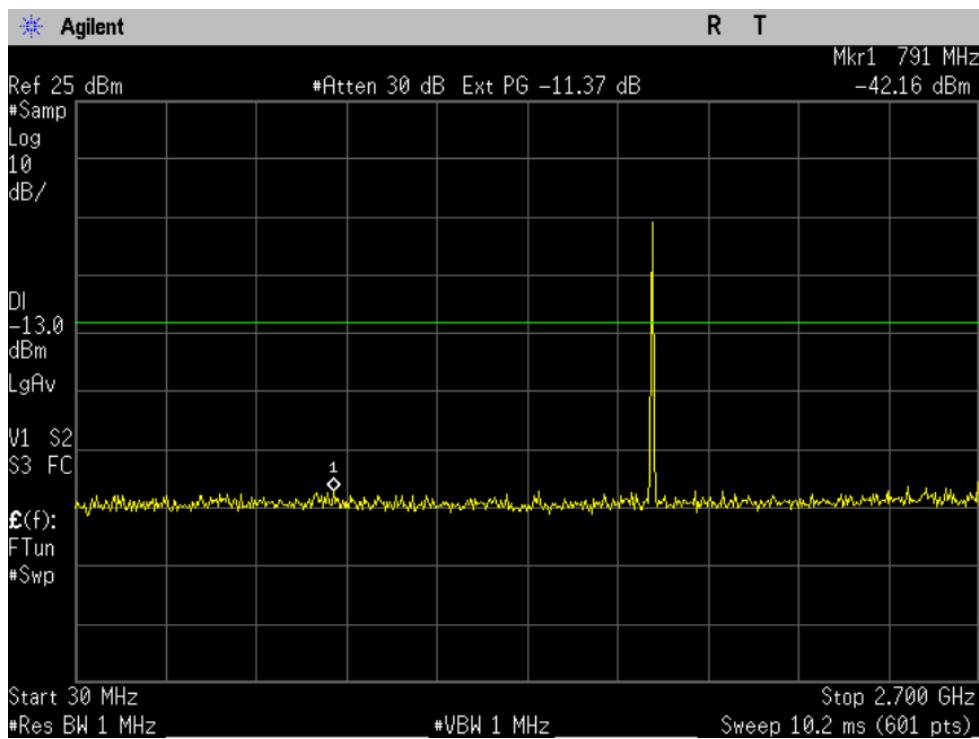
**Figure 10-4a AWS 1700 - Conducted Spurious Emission (CH 25)**



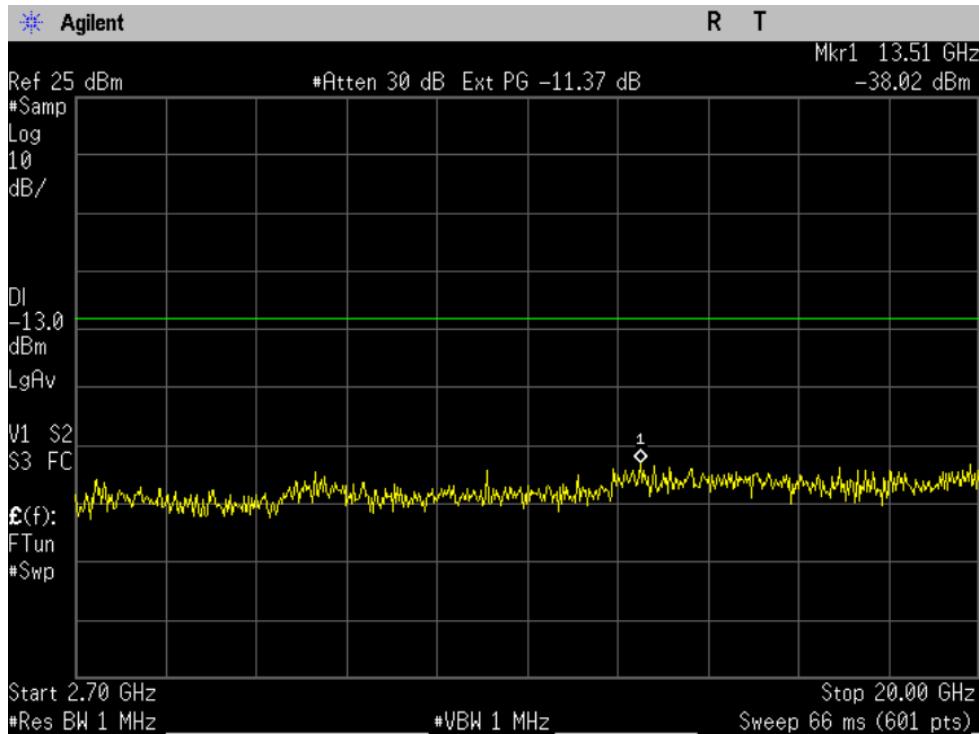
**Figure 10-4b AWS 1700 - Conducted Spurious Emission (CH 25)**



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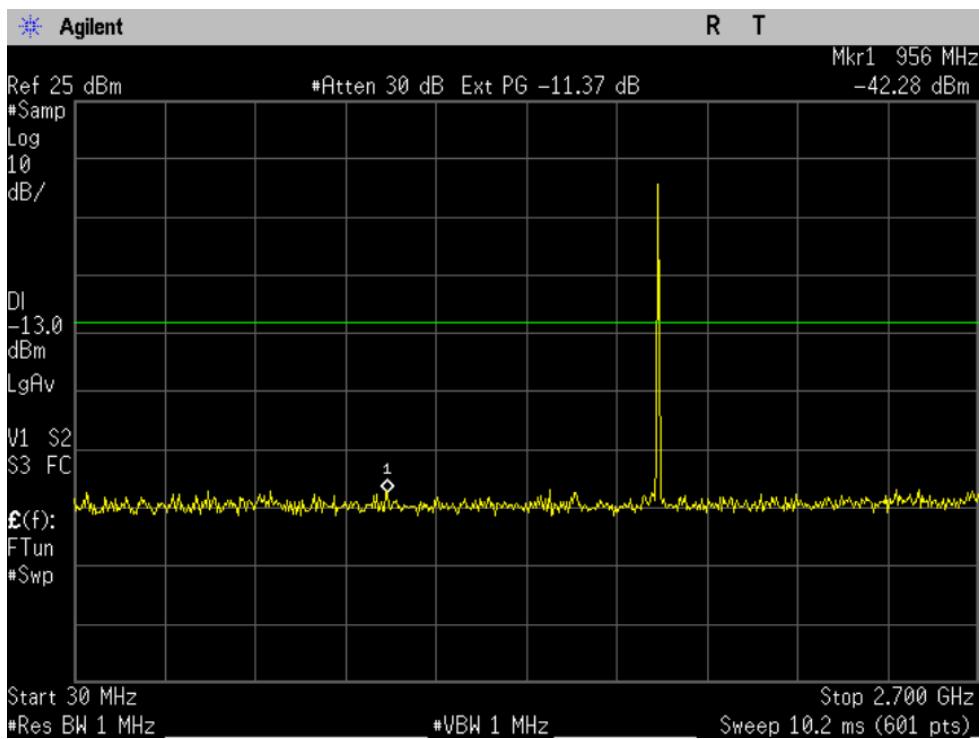
**Figure 10-5a AWS 1700 - Conducted Spurious Emission (CH 450)**



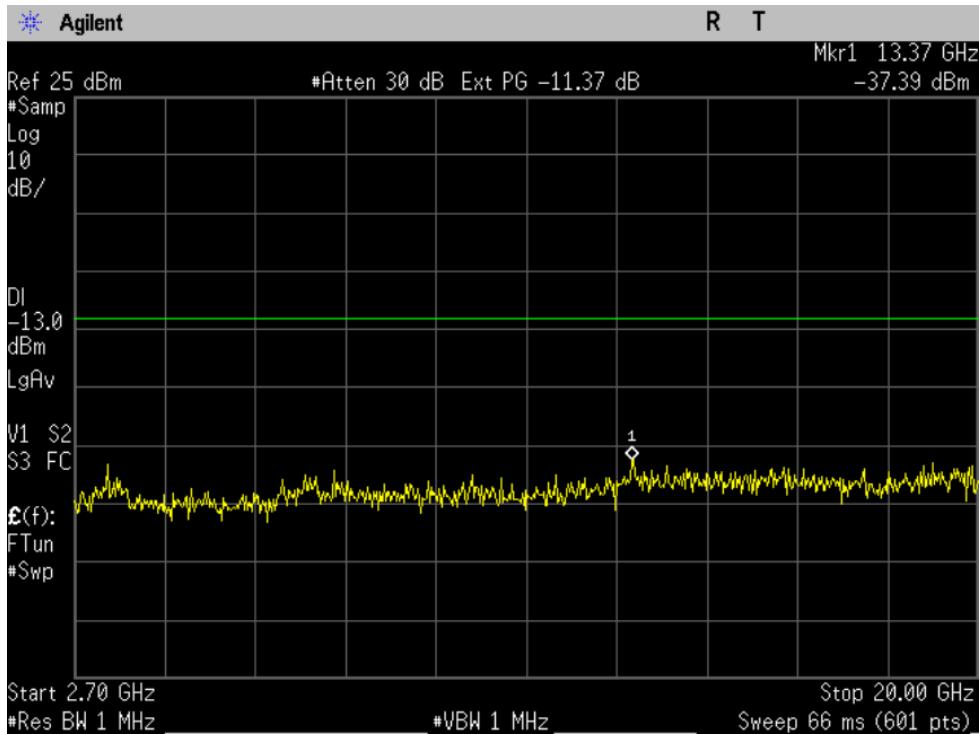
**Figure 10-5b AWS 1700 - Conducted Spurious Emission (CH 450)**



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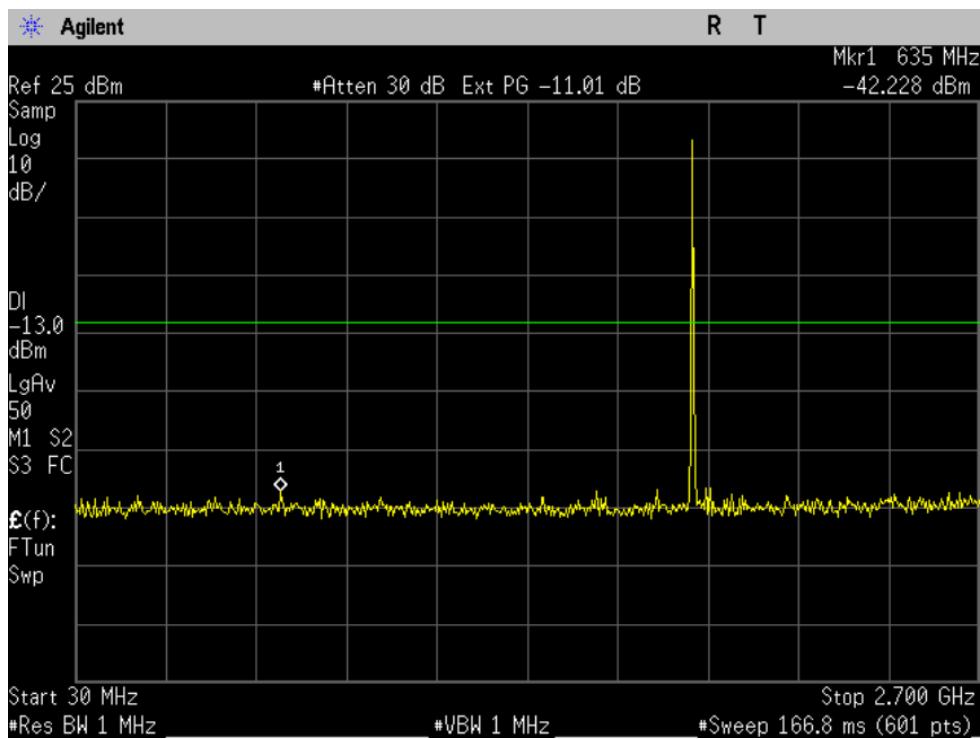
**Figure 10-6a AWS 1700 - Conducted Spurious Emission (CH 875)**



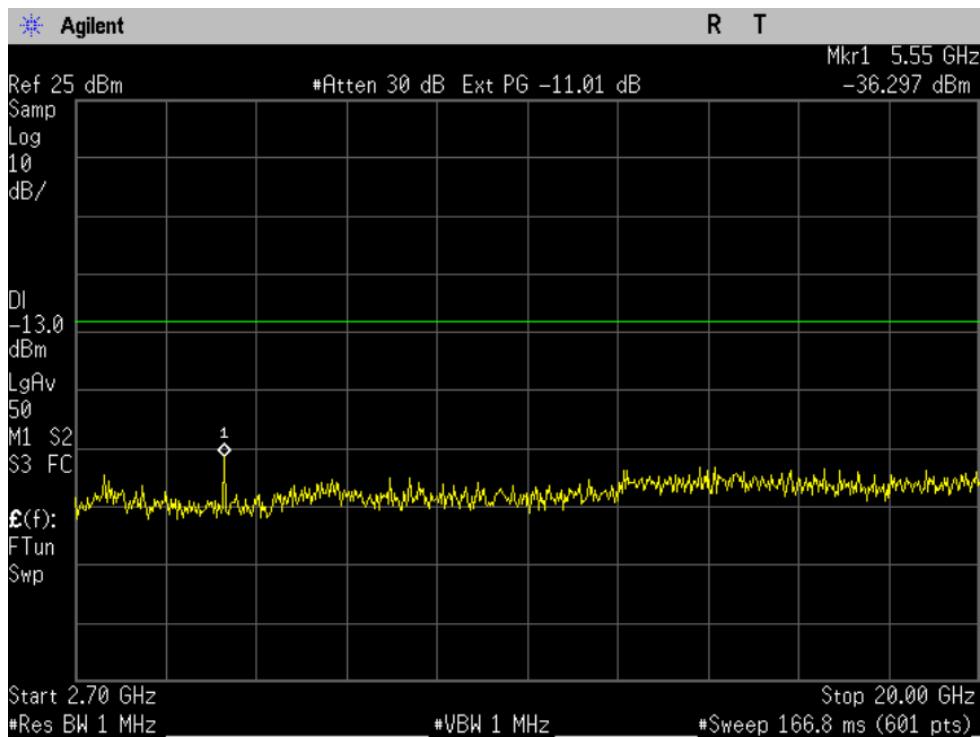
**Figure 10-6b AWS 1700 - Conducted Spurious Emission (CH 875)**



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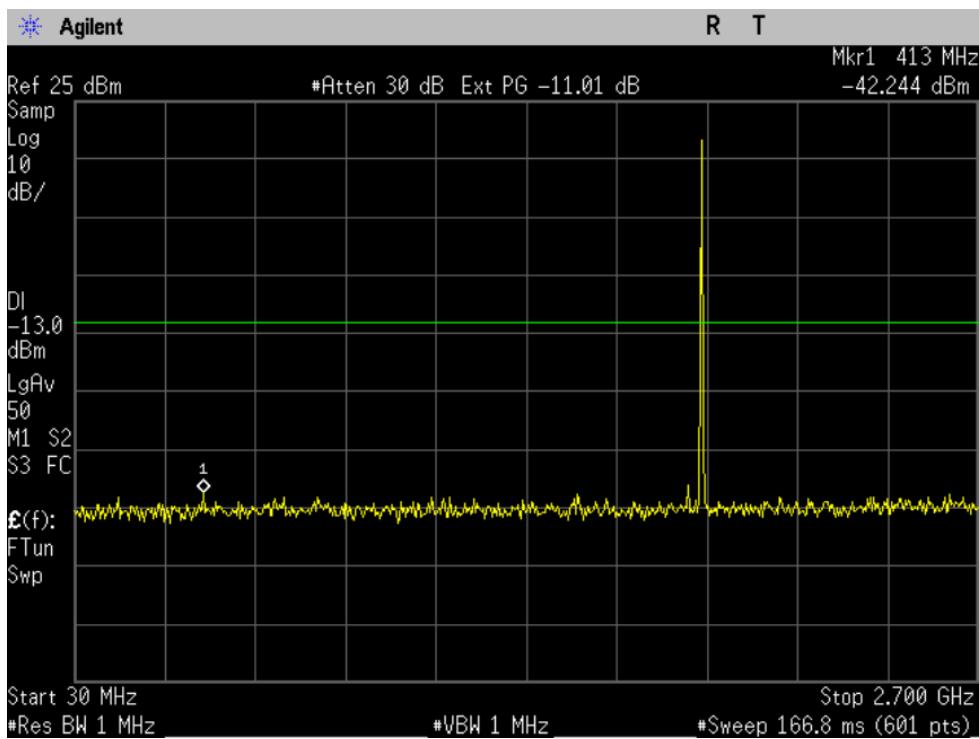
**Figure 10-7a CDMA 1900 - Conducted Spurious Emission (CH 25)**



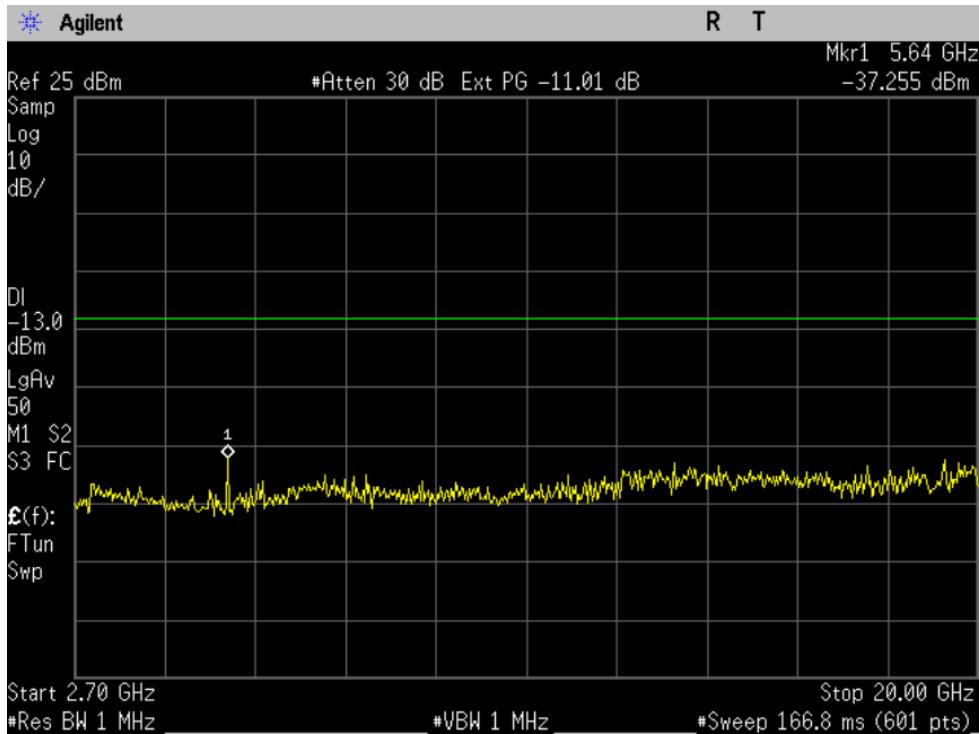
**Figure 10-7b CDMA 1900 - Conducted Spurious Emission (CH 25)**



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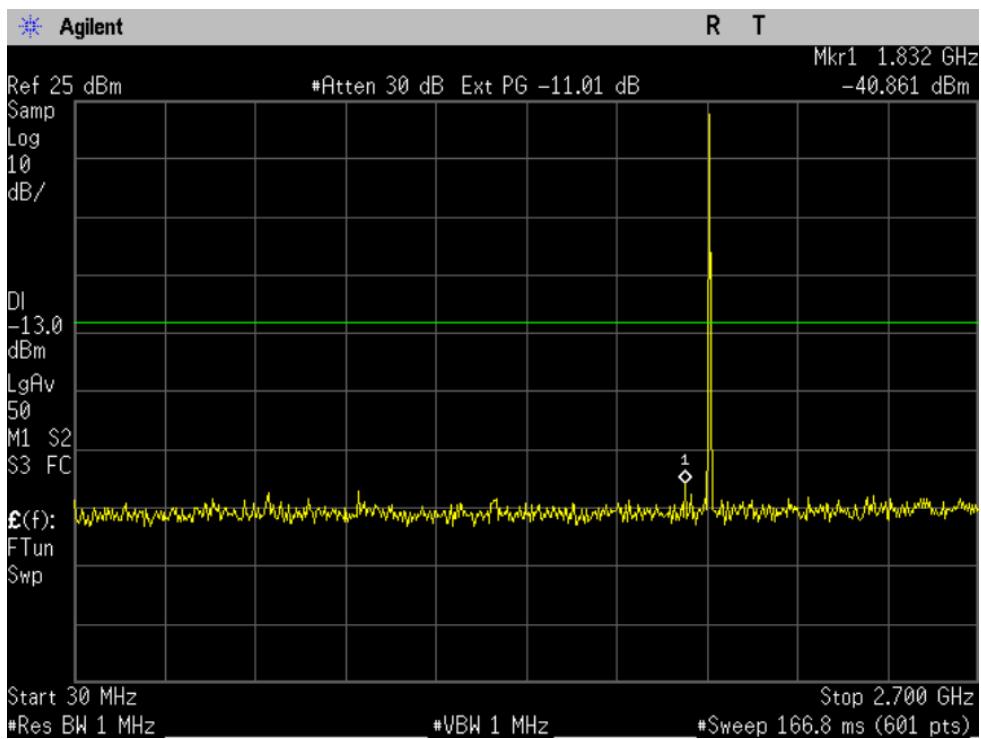
**Figure 10-8a CDMA 1900 - Conducted Spurious Emission (CH 600)**



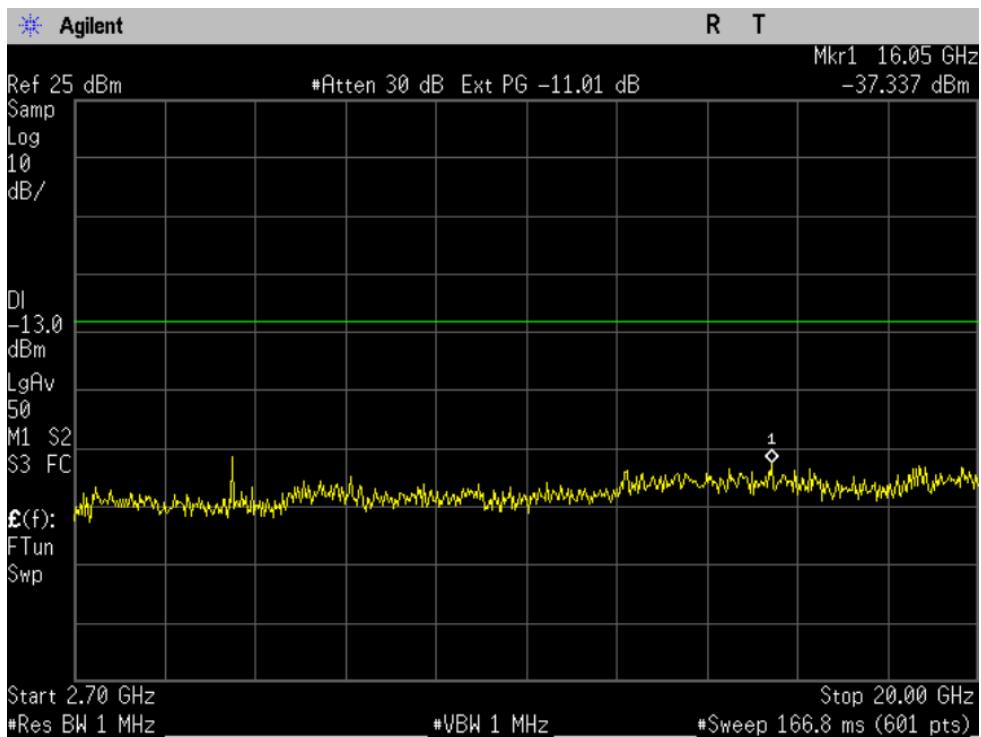
**Figure 10-8b CDMA 1900 - Conducted Spurious Emission (CH 600)**



Applicant:	Kyocera
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**Figure 10-9a CDMA 1900 - Conducted Spurious Emission (CH 1175)**



**Figure 10-9b CDMA 1900 - Conducted Spurious Emission (CH 1175)**

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## 11 TRANSMITTER RADIATED SPURIOUS EMISSIONS

**FCC: § 2.1053, § 22.91, § 24.238, §27.53(g)**

**IC: RSS132 §4.5; RSS133 §6.5**

The radiated spurious emission test was performed at Compliance Certification Service. The test report is attached in a separate attachment.

## 12 RECEIVER SPURIOUS EMISSIONS

### 12.1 Receiver Spurious Emissions

**FCC: § 15.109**

**IC: RSS-GEN**

The receiver radiated spurious emission test was performed at Compliance Certification Service. The test report is attached in a separate attachment.

## 13 TRANSMITTER RF CARRIER FREQUENCY STABILITY

### 13.1 Test Configuration

**FCC: § 2.1055, § 22.355, § 24.235, § 27.54**

**IC: RSS132 §4.3; RSS133 §6.3**

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. Only the mid channel of each frequency band was investigated.

#### Limits:

<b>Tx Frequency</b>	<b>Channel</b>	<b>Limit</b>
836.49 MHz	384	+/- 2.5 ppm (+/-2091 Hz)
1732.5 MHz	450	+/- 2.5 ppm (+/-4331 Hz)
1880 MHz	600	+/- 2.5 ppm (+/-4700 Hz)

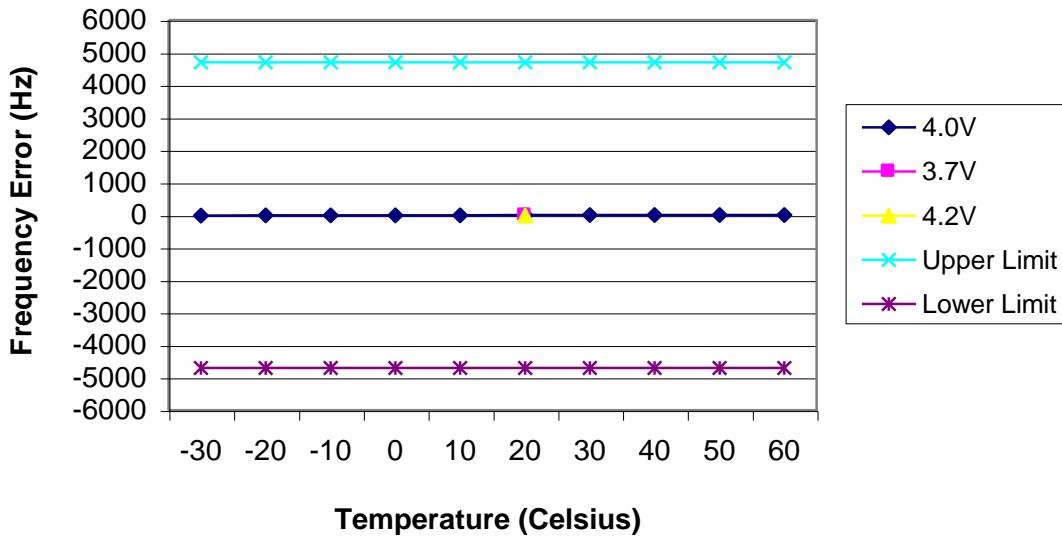


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Report #:	CT-S2150-24-0812-R0

## 13.2 Test Result

Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.3V (Battery endpoint)	3.7V	4.2V (115%)	Lower limit	Upper limit
-30	-12.02 -9.68 -9.71 -7.17 -6.85 -5.29 7.26 7.43 8.36 9.15	-12.02	-5.4	-4700	4700
-20		-9.68		-4700	4700
-10		-9.71		-4700	4700
0		-7.17		-4700	4700
10		-6.85		-4700	4700
20		-5.29		-4700	4700
30		7.26		-4700	4700
40		7.43		-4700	4700
50		8.36		-4700	4700
60		9.15		-4700	4700

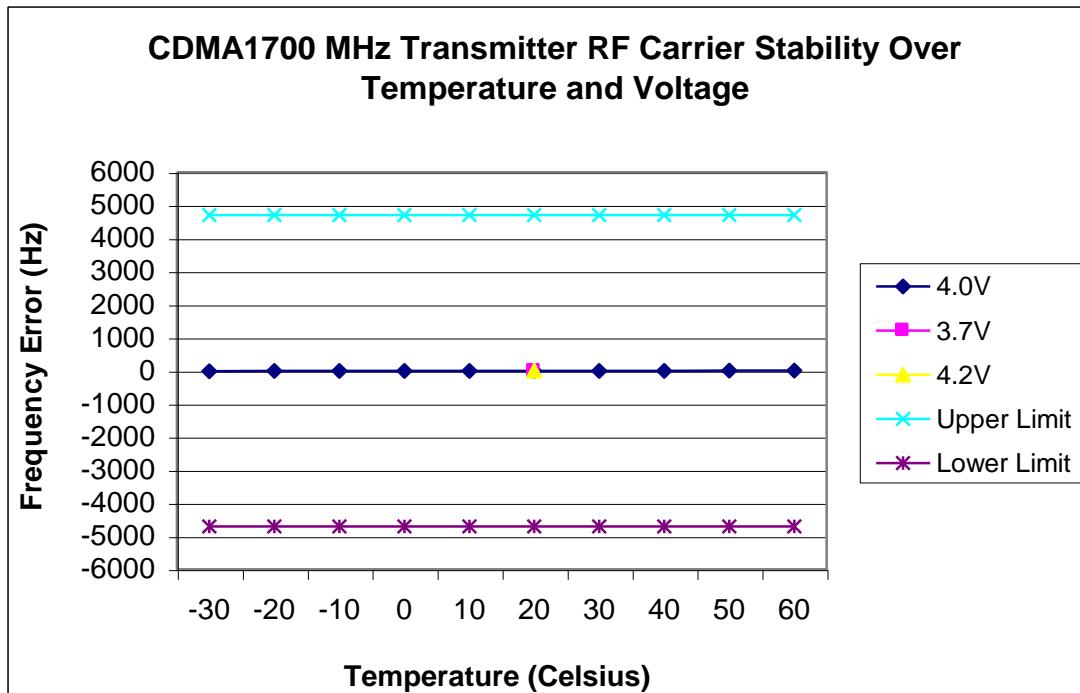
**CDMA 800 MHz Transmitter RF Carrier Stability Over  
Temperature and Voltage**





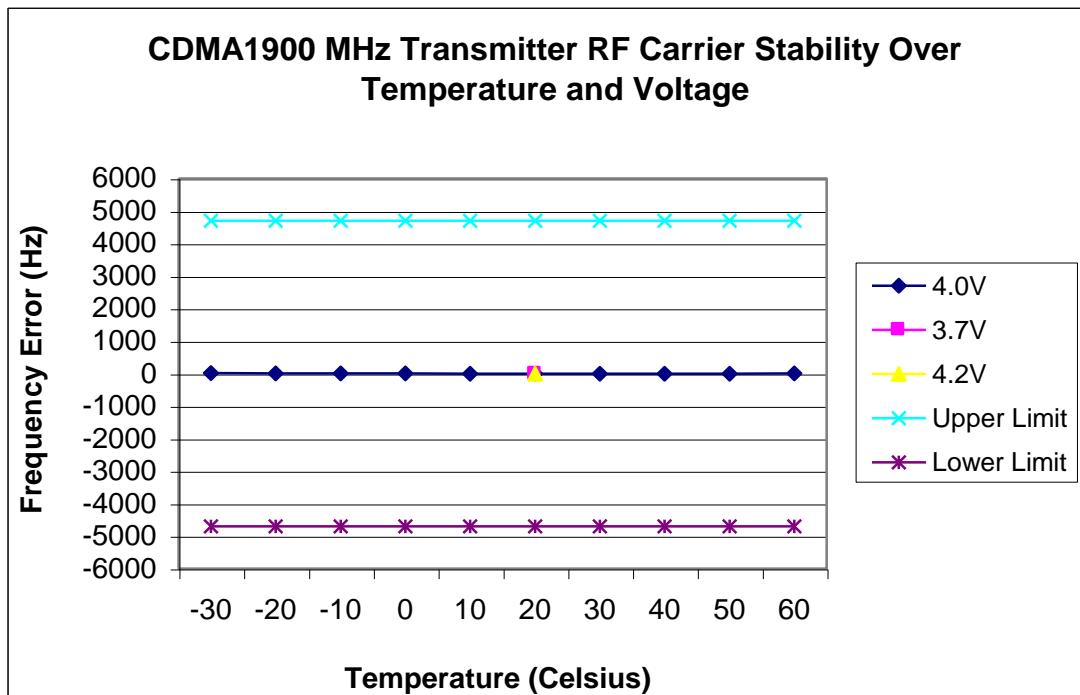
Applicant:	Kyocera
FCC ID:	V65S2150
Report #:	CT-S2150-24-0812-R0

Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.3V (Battery endpoint)	3.7V	4.2V (115%)	Lower limit	Upper limit
-30		-12.57		-4700	4700
-20		-8.09		-4700	4700
-10		-7.68		-4700	4700
0		-7.13		-4700	4700
10		-5.7		-4700	4700
20	-7.04	-6.7	5.2	-4700	4700
30		-5.82		-4700	4700
40		-6.37		-4700	4700
50		7.25		-4700	4700
60		6.96		-4700	4700





Temperature (°C)	Deviation of Carrier (Hz)			Specification (Hz)	
	3.3V (Battery endpoint)	3.7V	4.2V (115%)	Lower limit	Upper limit
-30		10.67		-4700	4700
-20		8.94		-4700	4700
-10		6.69		-4700	4700
0		6.99		-4700	4700
10		-6.39		-4700	4700
20	-5.63	-6.7	-5.8	-4700	4700
30		-7.12		-4700	4700
40		-7.42		-4700	4700
50		-8.78		-4700	4700
60		8.32		-4700	4700



Applicant:	Kyocera
FCC ID:	V65S2150
Report #:	CT-S2150-24-0812-R0

## 14 EXPOSURE OF HUMANS TO RF FIELDS (SAR)

### 14.1 Test Configuration and Result

**FCC: § 2.1093**

**IC: RSS102**

The SAR test report is attached in a separate attachment.

## 15 TEST EQUIPMENT

The test equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

Description	Manufacturer	Model No.	Serial No.	Cal Due Date
Power Meter	Giga-tronics	8541C	1831306	09/08/12
Spectrum Analyzer	Agilent	E4440A	MY44303130	12/14/12
Wireless Communications Test Set	Agilent	8960	GB44052789	12/02/13
Temperature Chamber	Test Equity	ZH2-033-033-H/AC	ZZ9622421	07/24/13