

# Tagg FTD Conducted Test Report

FCC Part 22 & 24 Certification	
FCC ID:	<b>J9CFTD1</b>
Model:	<b>Tagg FTD</b>

7403EBDA

## 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.*

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Tests that required an OATS site were performed UL/CCS.	



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## 1. Introduction and Purpose

This document provides the FCC test data for the Qualcomm Tagg FTD animal tracking device. The tests included in this report are limited to all conducted tests required. The radiated tests were performed at UL/CCS in Fremont, CA, and are reported in a separate document.

## 2. Description of Device Under Test

Tagg FTD – The Pet Tracker uses advanced GPS and cellular supported tracking technology, allowing people to see where their dog is. Or more importantly, where their dog isn’t. While the technology behind Tagg is complex, the idea is quite simple. If a dog isn’t where it’s suppose to be, the owner gets notified, quickly via an email or text message. So now you’ll always have the peace of mind of knowing where you dog is whenever, wherever.

You can check on your pet in three convenient ways:

- Using the Web app at your computer, you can see all of the information about your pet, including the Tagg Map, and all your account information.
- Using text messages on your phone, you can check on your pet’s location and, if he’s loose, get location updates while you’re looking for him.
- Using the smart phone mobile web app, similar to using the Web app, you can get updates on your pet and view the Tagg Map.

The Tagg FTD tracking device operates on the 800/1900 MHz CDMA2000 1x networks. The device uses Qualcomm’s QSC 6055 chip set and has stand alone GPS, AGPS and gpsOneXTRA-tm technologies. of clothing. The Tagg FTD tracking device meets the following standards: IS-2000 for CDMA 1xRTT, IS-707-A Data, IS-637-B SMS, IS-683-A Service provisioning, gpsOne and IS-98 CDMA Minimum Performance.

Only 850 MHz (Cellular) and 1900 MHz (PCS) bands are used for operation. The DUT is a pre-production sample.

## 3. Test Summary

FCC/IC Rule	Description of Test	Result	Page
§2.1046	RF Power Output	Complies	3
§2.1049	Occupied Bandwidth	Complies	6
§22.359, 24.238	Block Edge Requirement	Complies	11
§2.1051, 22.917, 24.238(a)	Out of Band Emission at Antenna Terminals	Complies	14
§2.1055, 22.355, 24.235	Frequency Stability vs. Temperature vs. Voltage	Complies	19
§1.1310, 2.1091	RF Exposure		See Exhibit 4
§2.1053, 22.917. 24.238(a)	Field Strength of Spurious Radiation	Complies	See Exhibit 3

## 4. RF Power Output Verification

<b>FCC:</b>	§ 2.1046 , 24.232(d)
<b>Limit:</b>	n/a
<b>DUT SN</b>	N10FDX8NY

#### 4.1 Base Station Emulator Settings and Measurement Procedures

As shown in the figure below, connect the transmitter output of the WMD 1x module to the communication test set 8960 and configure it to operate at maximum power in a call. Measure the power at three equally spaced operating frequencies for each band.

Use the build-in power measurement capability in the Agilent 8960 box to measure CDMA 1x conducted power outputs. The relevant cable loss is measured for the specific frequencies under test and added as a correction factor for all the tests.



##### 4.1.1 For CDMA2000 1x

Measure the power at Ch1013, 384 and 777 for US cell; Ch25, 600 and 1175 for US PCS band.

##### 1xRTT

Use CDMA2000 Rev 6 protocol in the call box 8960.

- 1) Test for Reverse/Forward TCH RC1 and RC3 Reverse FCH and demodulation of RC 3.
  - a. Set up a call using Fundamental Channel Test Mode 1 (RC1, SO 2) with 9600 bps data rate only.
  - b. As per C.S0011 or TIA/EIA-98-F Table 4.4.5.2-1, set the test parameters as shown in Table 4-1.
  - c. Send continuously '0' power control bits to the Tagg FTD.
  - d. Measure the output power at inGeo1AW antenna connector as recorded on the power meter with values corrected for cables losses.
  - e. Repeat step b through d for Fundamental Channel Test Mode:
    - i. RC3, SO55

**Table 4-1 Parameters for Max. Power with a single traffic code channel, SR1**

Parameter	Units	Value
$I_{or}$	dBm/1.23 MHz	-104
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

**4.2 Test Results**

CDMA2000 1x

Mode Conducted Power	Test Case			Cell Channel			PCS Channel		
	#	FWD RC/TAP	REV RC/TAP	1013	384	777	25	600	1175
	1	RC3	RC3 (SO55)	24.23	24.28	23.62	24.55	24.20	23.70

Mode Conducted Power PAR	Test Case			Cell Channel			PCS Channel		
	#	FWD RC/TAP	REV RC/TAP	1013	384	777	25	600	1175
	1	RC3	RC3 (SO55)	N/A	N/A	N/A	3.65	3.80	3.72

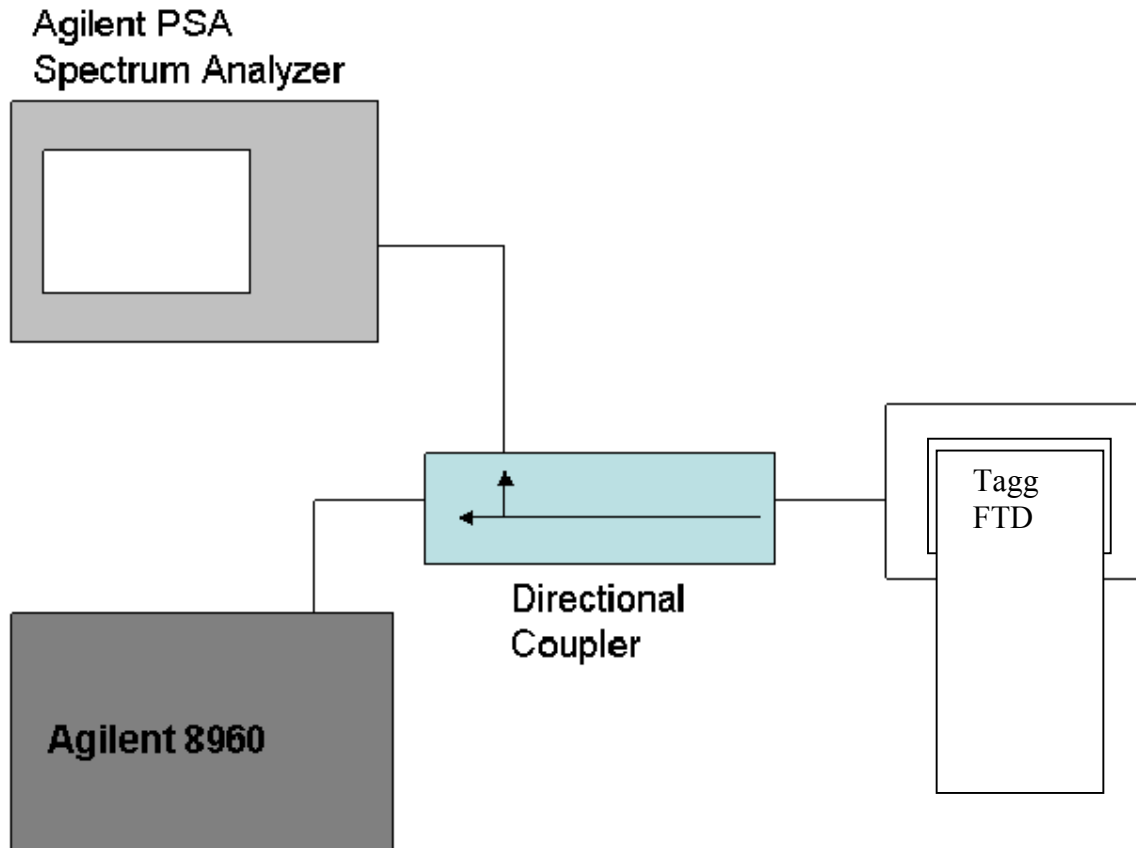
### 5. Occupied Bandwidth

<b>FCC:</b>	\$2.1049
<b>Limit:</b>	n/a
<b>DUT SN</b>	N10FDX8NY
<b>Modes Tested</b>	CDMA 1x
	RC3 SO55

#### 5.1 Test Procedures

As Figure below indicates, the Tagg FTD was connected to the call simulator test box through a calibrated coaxial cable and directional coupler. The coupled port of the coupler was connected to the spectrum analyzer. Occupied bandwidth (defined as the 99% power bandwidth) was measured using the PSA internal measurement personality feature.

Testing was completed using the Agilent 8960 for the CDMA 1x measurement.



### 5.2 Test Results

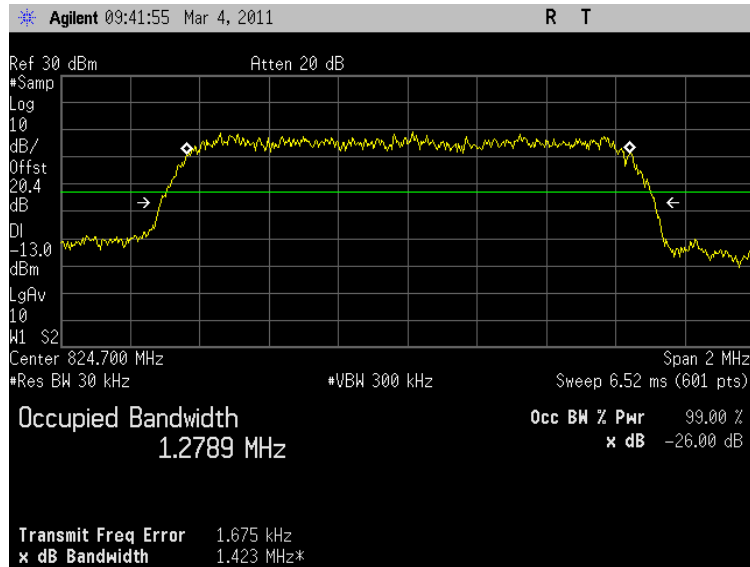
The occupied bandwidth was measured at low, mid and high channel in each band.

Mode		Frequency (MHz)	Channel	99% Occupied Bandwidth (MHz)	Plot number
CDMA1x/	RC3 SO55	824.7	1013	1.2789	Plot 5.2 – 1
		836.52	384	1.2878	Plot 5.2 – 2
		848.31	777	1.2767	Plot 5.2 – 3
		1851.25	25	1.2804	Plot 5.2 – 4
		1880	600	1.2754	Plot 5.2 – 5
		1908.75	1175	1.2806	Plot 5.2 – 6

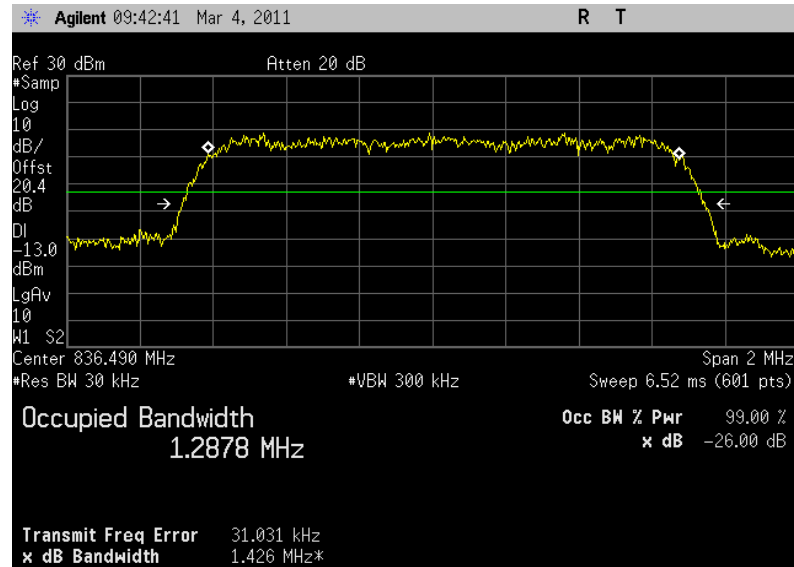


## **5.3 Plots**

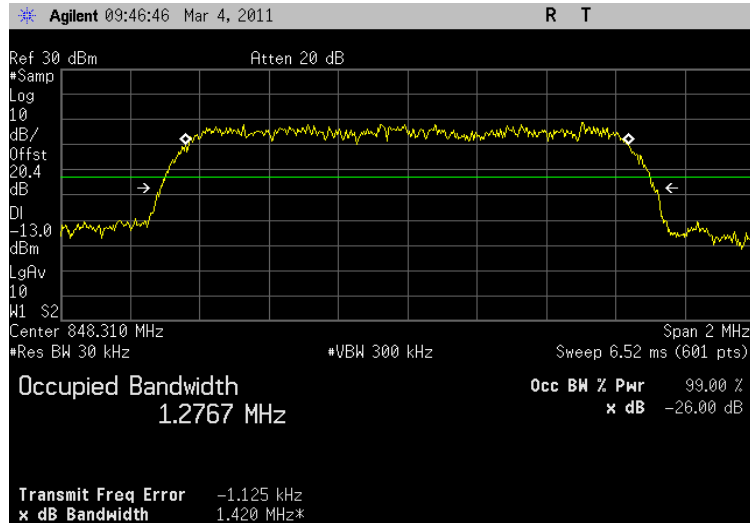
Plot 5.2 - 1 (Ch1013, RC3 SO55)



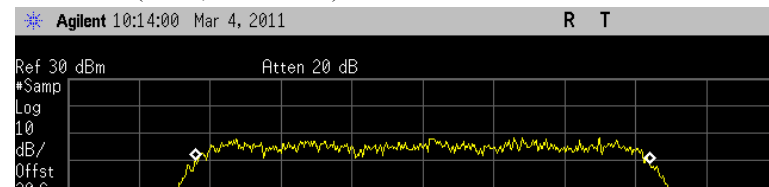
Plot 5.2 - 2 (Ch384, RC3 SO55)



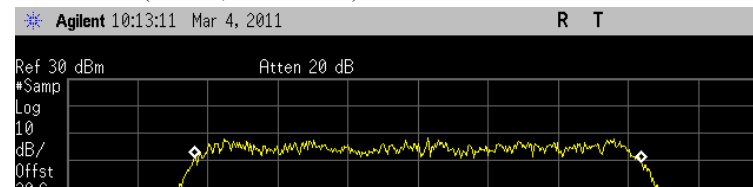
Plot 5.2 - 3 (Ch777, RC3 SO55)



Plot 5.2 - 4 (Ch25, RC3 SO55)



Plot 5.2 - 5 (Ch600, RC3 SO55)



## 6. Block Edge Compliance

<b>FCC:</b>	§22.359, 24.238
<b>Limit:</b>	-13dBm
<b>DUT SN</b>	N10FDX8NY
<b>Modes Tested</b>	CDMA 1x
	RC3 SO55

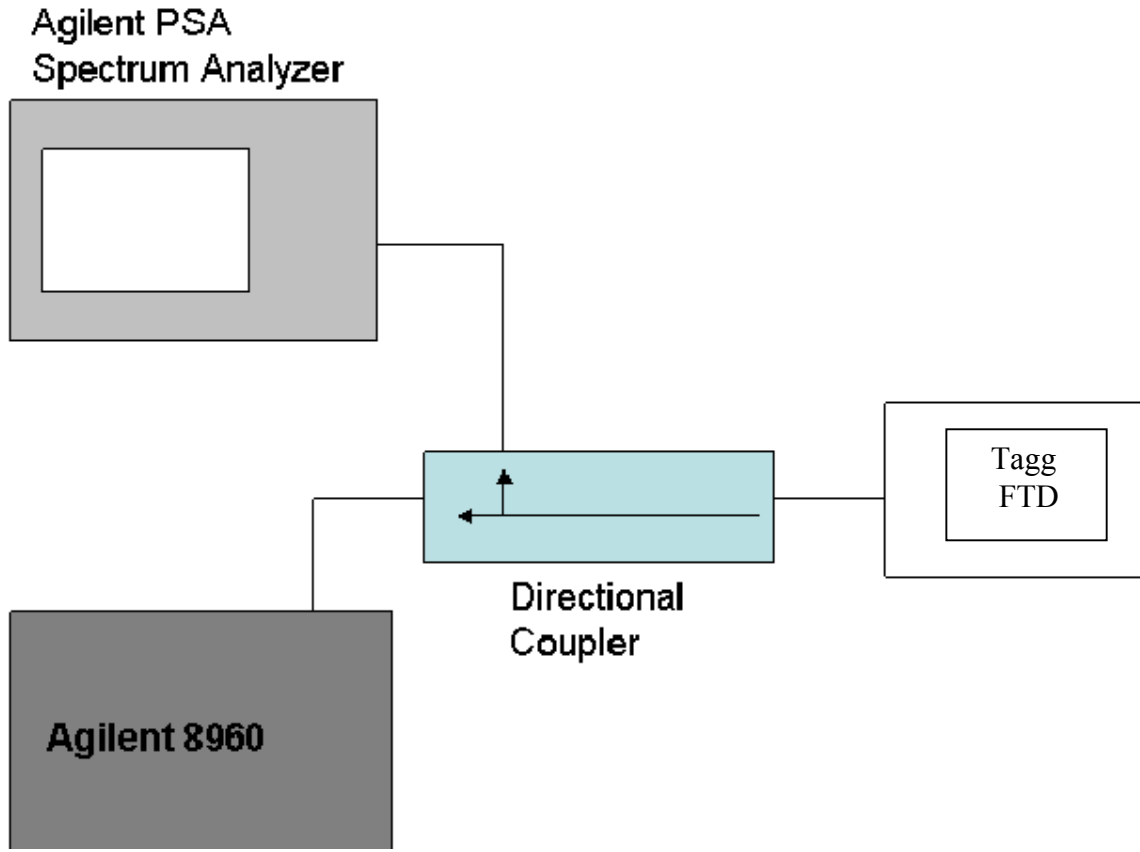
### 6.1 Test Procedures

As Figure below indicates, the Tagg FTD was connected to the call simulator test box through a calibrated coaxial cable and directional coupler. The coupled port of the coupler was connected to the spectrum analyzer. Block edge emissions were measured at the required operating frequencies in each band on the spectrum analyzer.

For Each block edge measurement:

- Set the spectrum analyzer span to include the block edge frequency (824, 848, 1850, 1910MHz)
- Set a marker to point the corresponding block edge frequency in each test case
- Set display line at -13dBm
- Set resolution bandwidth to at least 1% of emission BW
- Set video averaging to 10 samples

Testing was completed using the Agilent 8960 for CDMA 1x.



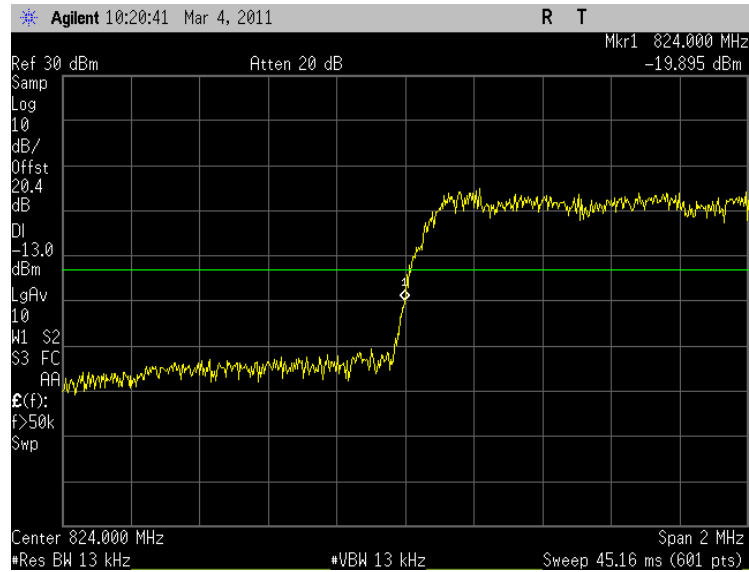
## 6.2 Test Results

The test was conducted at block edges in each band

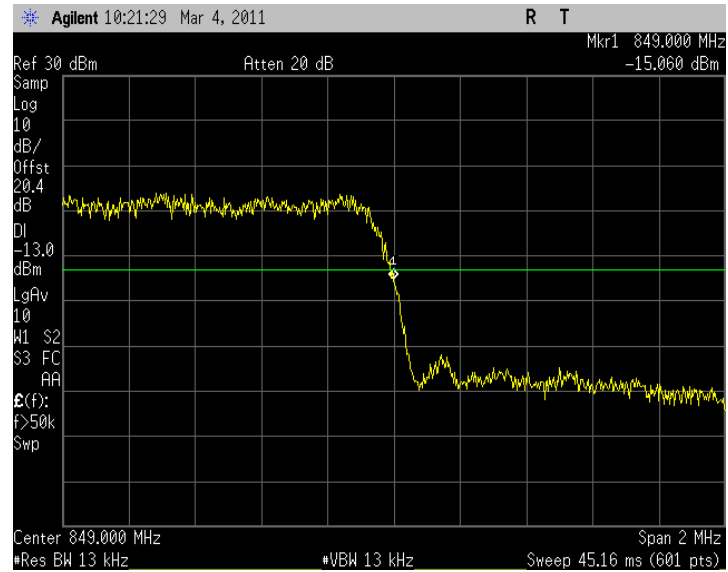
Mode	Frequency (MHz)	Channel Tested	Corresponding Plot number	Test Result
CDMA 1x	824	1013	Plot 6.2 - 1	Complies
	849	777	Plot 6.2 - 2	Complies
	1850	25	Plot 6.2 - 3	Complies
	1910	1175	Plot 6.2 - 4	Complies

### 6.3 Plots

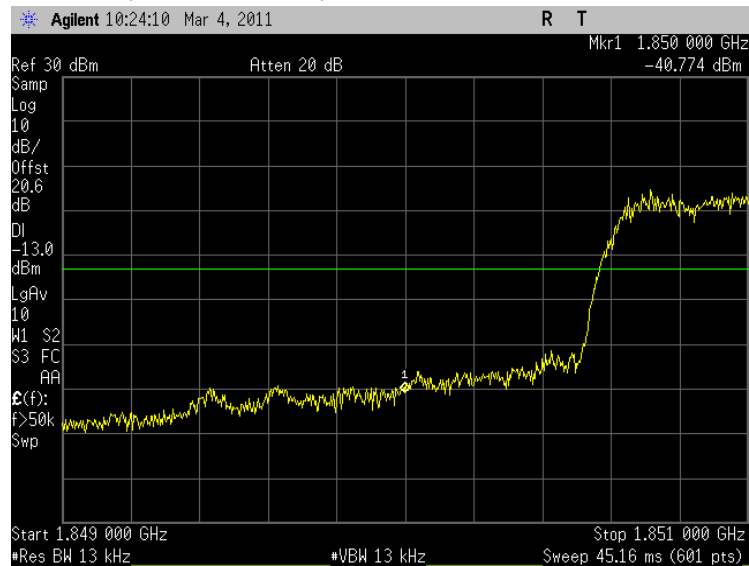
Plot 6.3 -1 (Ch1013, RC3 SO55)



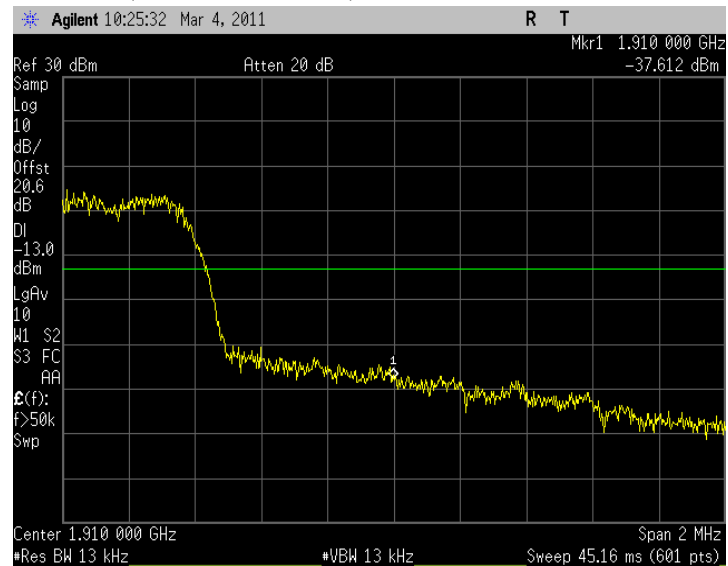
Plot 6.3-2 (Ch777, RC3 SO55)



Plot 6.3-3 (Ch25, RC3 SO55)



Plot 6.3-4 (Ch1175, RC3 SO55)



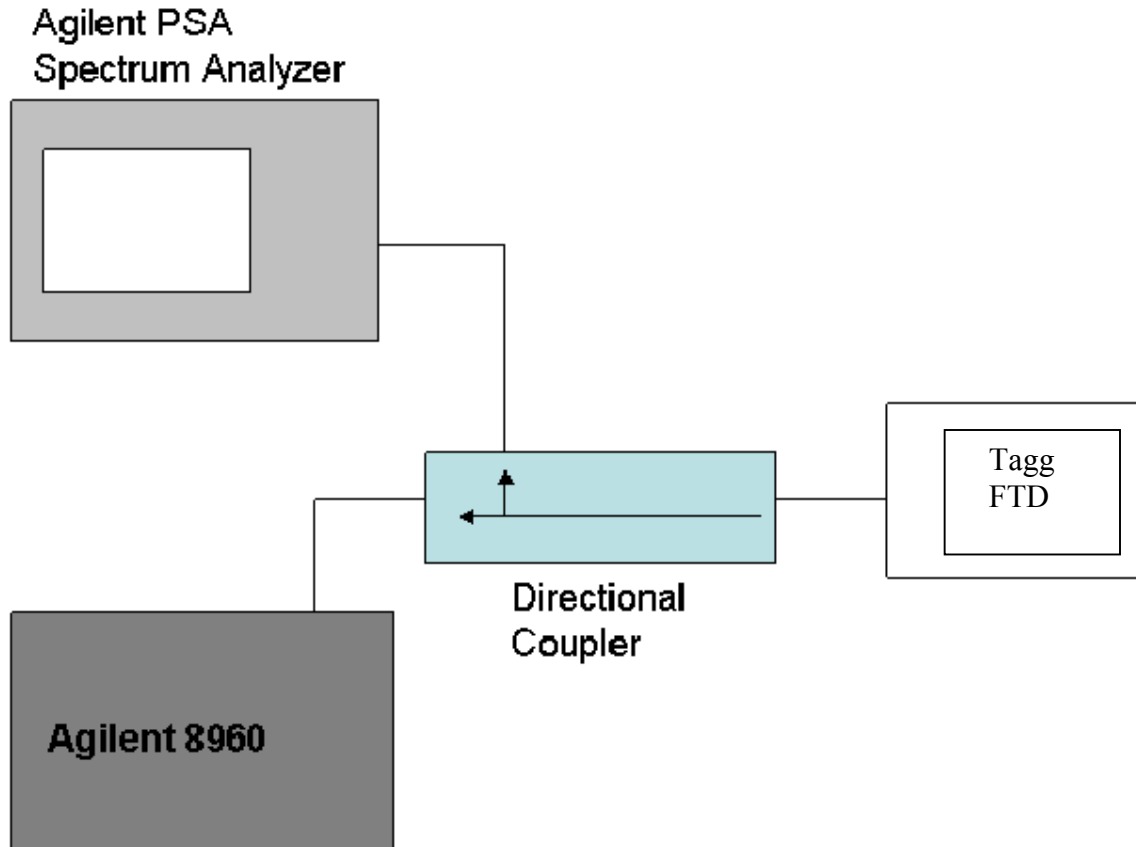
### 7. Out of Band Emission at Antenna Terminals

<b>FCC:</b>	§22.901(d), 22.917, 24.238 (a)
<b>Limit:</b>	-13dBm
<b>DUT SN</b>	N10FDX8NY
<b>Modes Tested</b>	CDMA 1x
	RC3 SO55

#### 7.1 Test Procedure

As Figure below indicates, the Tagg FTD was connected to the call simulator test box through a calibrated coaxial cable and directional coupler. The coupled port of the coupler was connected to the spectrum analyzer. The PSA was used to scan the out-of-band emission up to 10<sup>th</sup> harmonics. RBW and VBW were set to 100kHz for measurements below 1GHz and 1MHz for testing above 1GHz. Recorded multiple sweeps in maximum hold mode using a peak detector to ensure that the worst case emission were caught.

Testing was completed using the Agilent 8960 for CDMA 1x measurement testing.



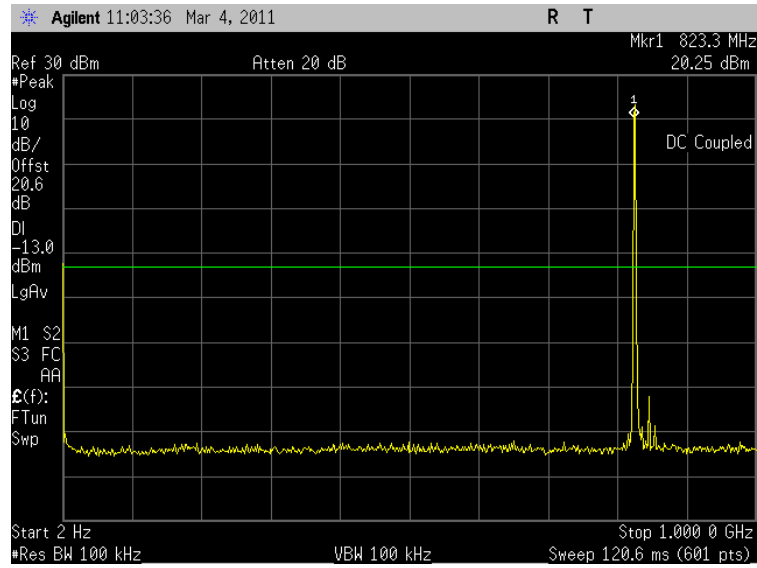
### 7.2 Test Result

The test was conducted at low, mid and high channel in each band.

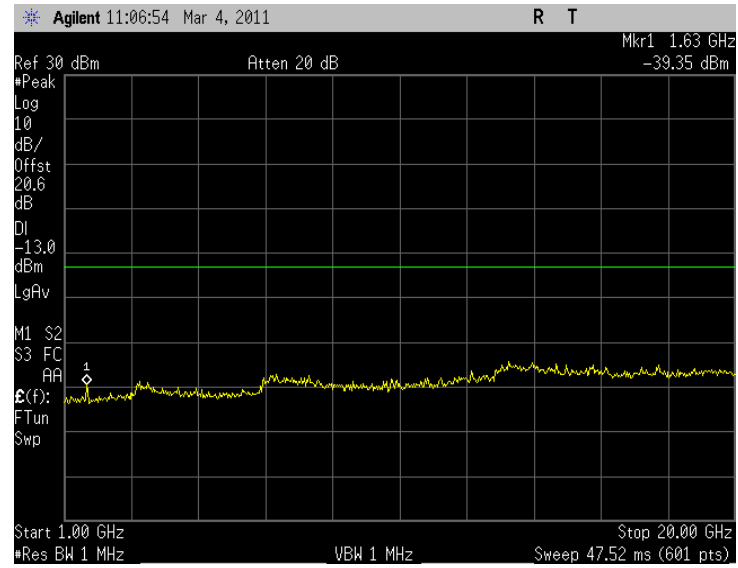
Mode		Frequency (MHz)	Channel Tested	Corresponding Plot number	Test Result
CDMA1x	RC3 SO55	0 ~ 20 GHz	1013	Plot 7.3 – 1,2	Complies
		0 ~ 20 GHz	384	Plot 7.3 – 3,4	Complies
		0 ~ 20 GHz	777	Plot 7.3 – 5,6	Complies
		0 ~ 20 GHz	25	Plot 7.3 – 7,8	Complies
		0 ~ 20 GHz	600	Plot 7.3 – 9,10	Complies
		0 ~ 20 GHz	1175	Plot 7.3 – 11,12	Complies

### 7.3 Plots

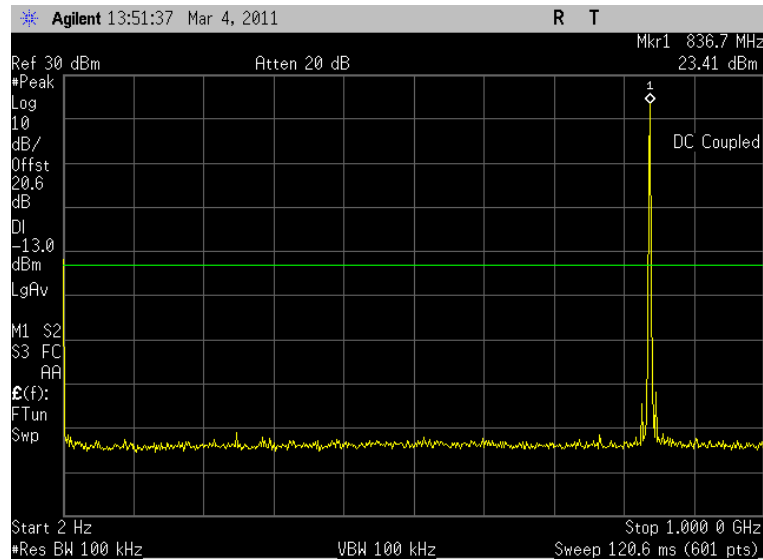
Plot 7.3 -1 (Ch1013, RC3 SO55)



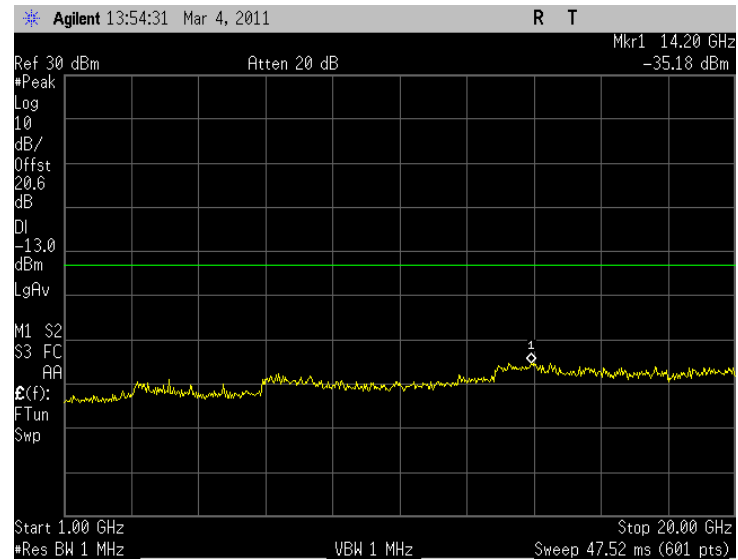
Plot 7.3-2 (Ch1013, RC3 SO55)



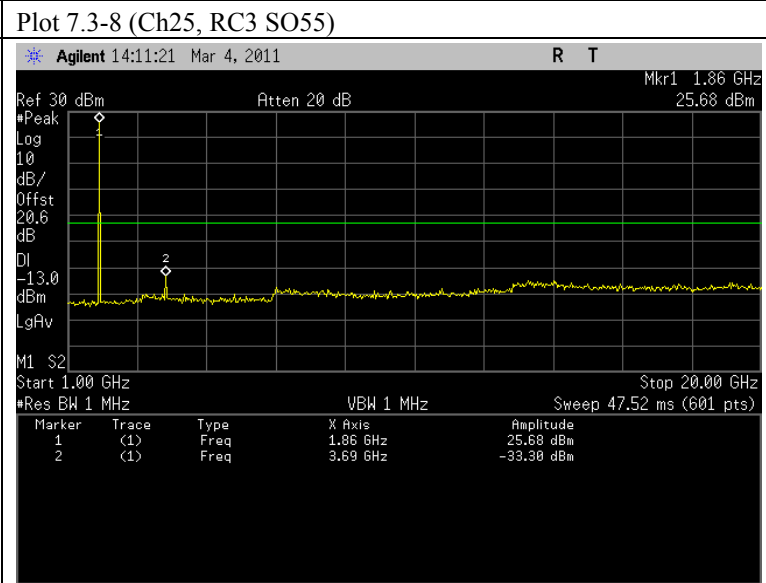
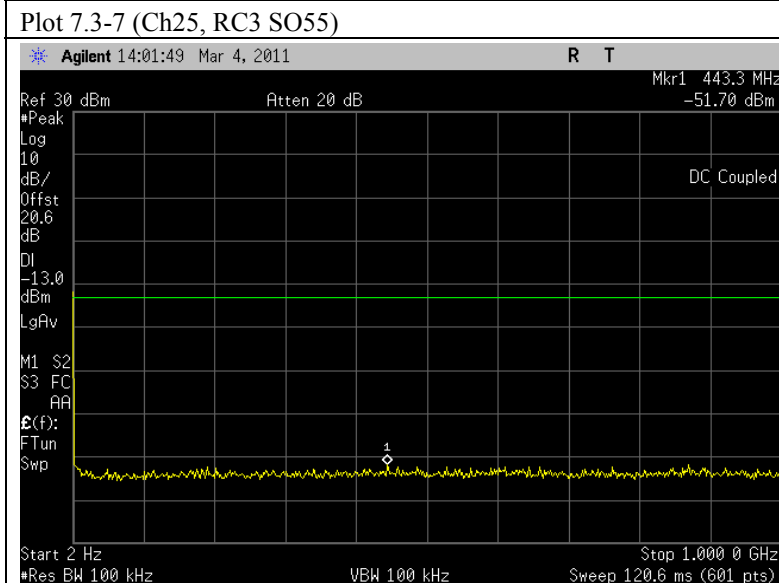
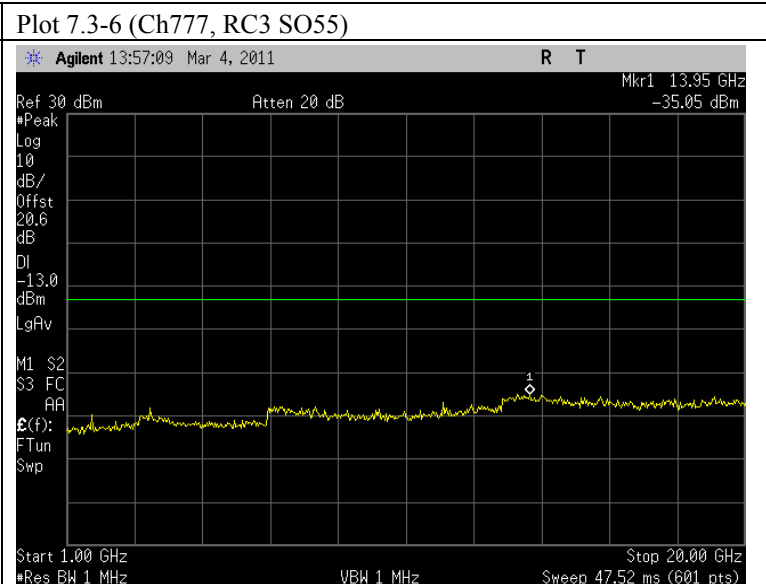
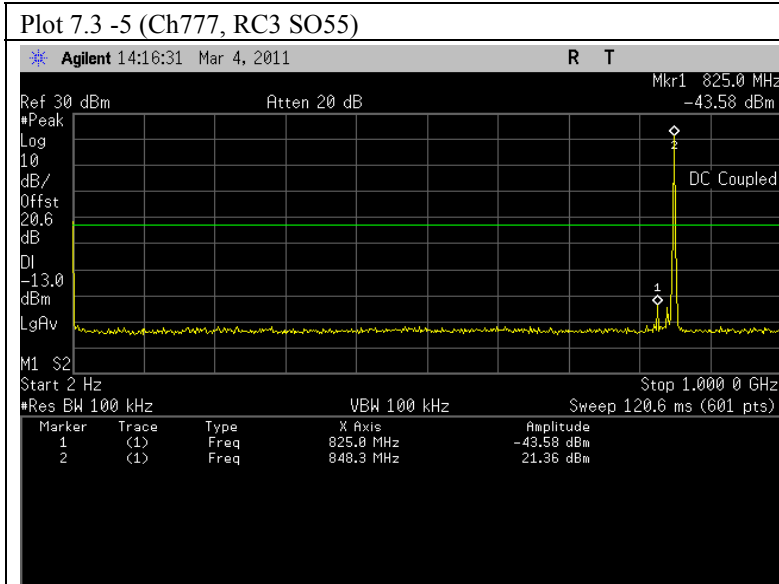
Plot 7.3-3 (Ch384, RC3 SO55)

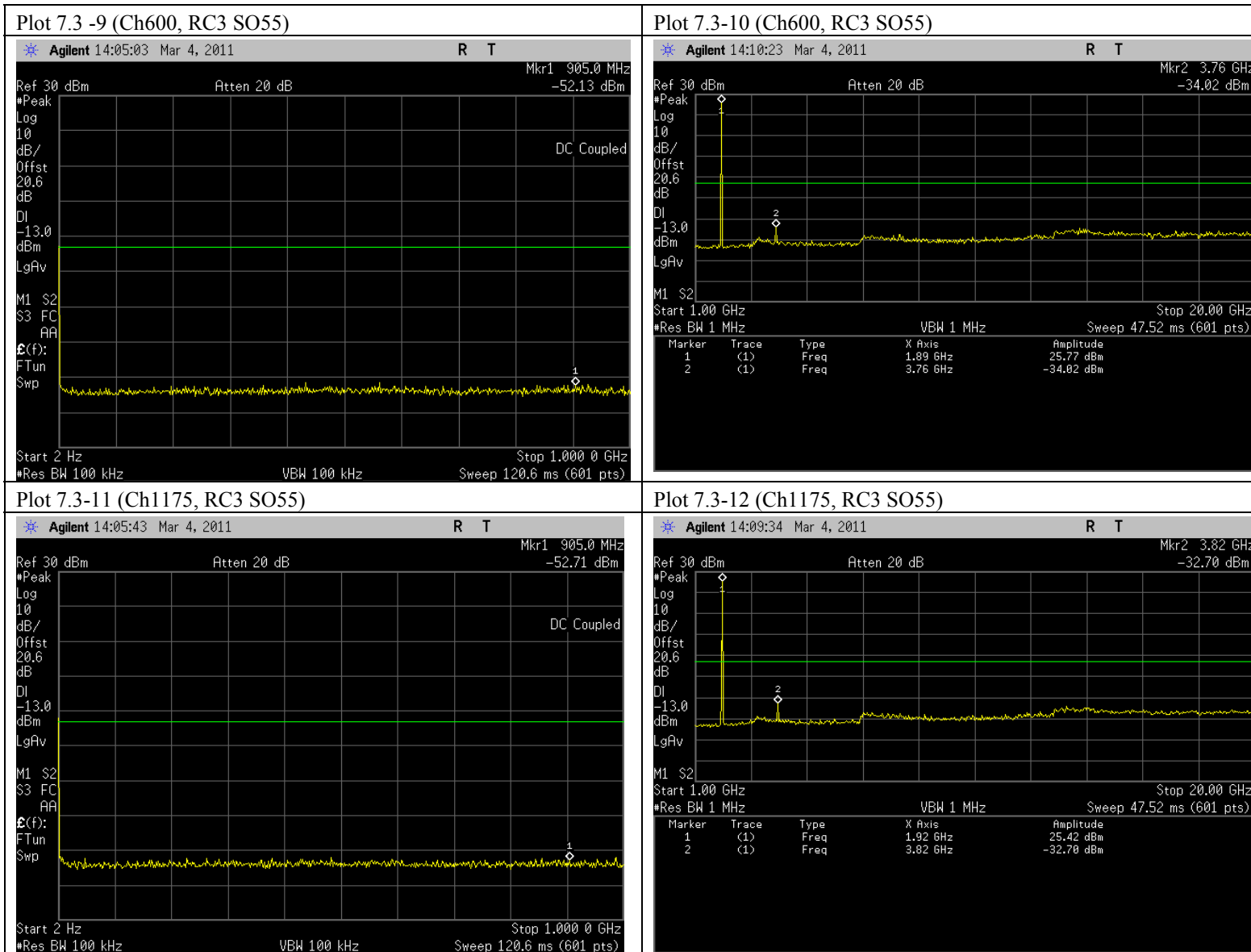


Plot 7.3-4 (Ch384, RC3 SO55)











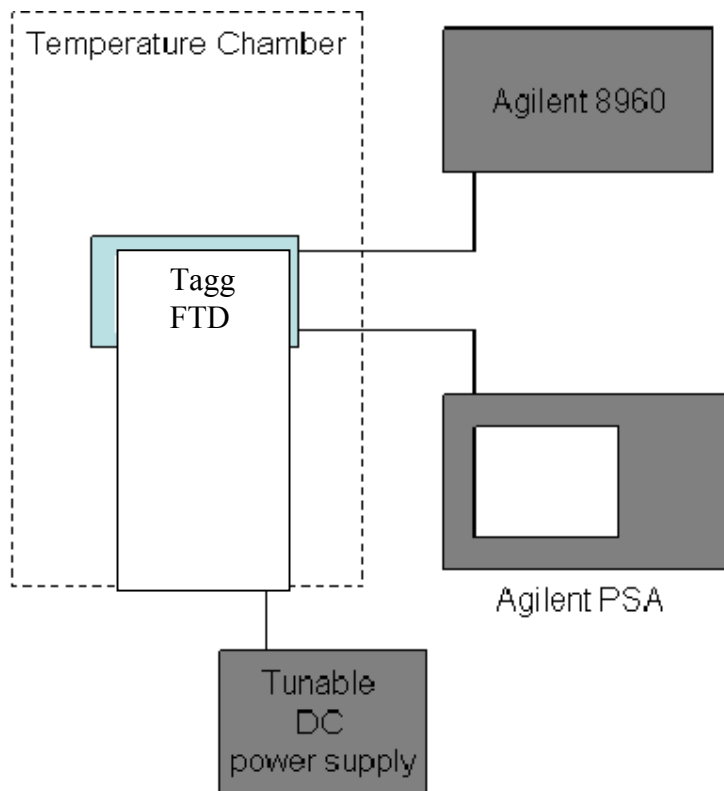
### 8. Frequency Stability

<b>FCC:</b>	§2.1055, 22.355, 24.235
<b>Limit:</b>	±2.5ppm
<b>DUT SN</b>	N10FDX8NY
<b>Modes Tested</b>	CDMA 1x
	RC3 SO55

#### 8.1 Test Procedure

As the test setup indicates, Tagg FTD was placed inside the temperature chamber. Transmitting frequency error was measured at 20 degrees C with DC voltage varying from 3.4 volts to 4.2 volts, and then set the temperature to -30 degrees C and allow it to stabilize. After 1 hour soak time, the transmitting frequency error measurement was recorded at -30 degrees. The process was repeated at an incremental of 10 degrees C until +60 degrees C is completed.

Testing was completed using the Agilent 8960 for CDMA 1x.



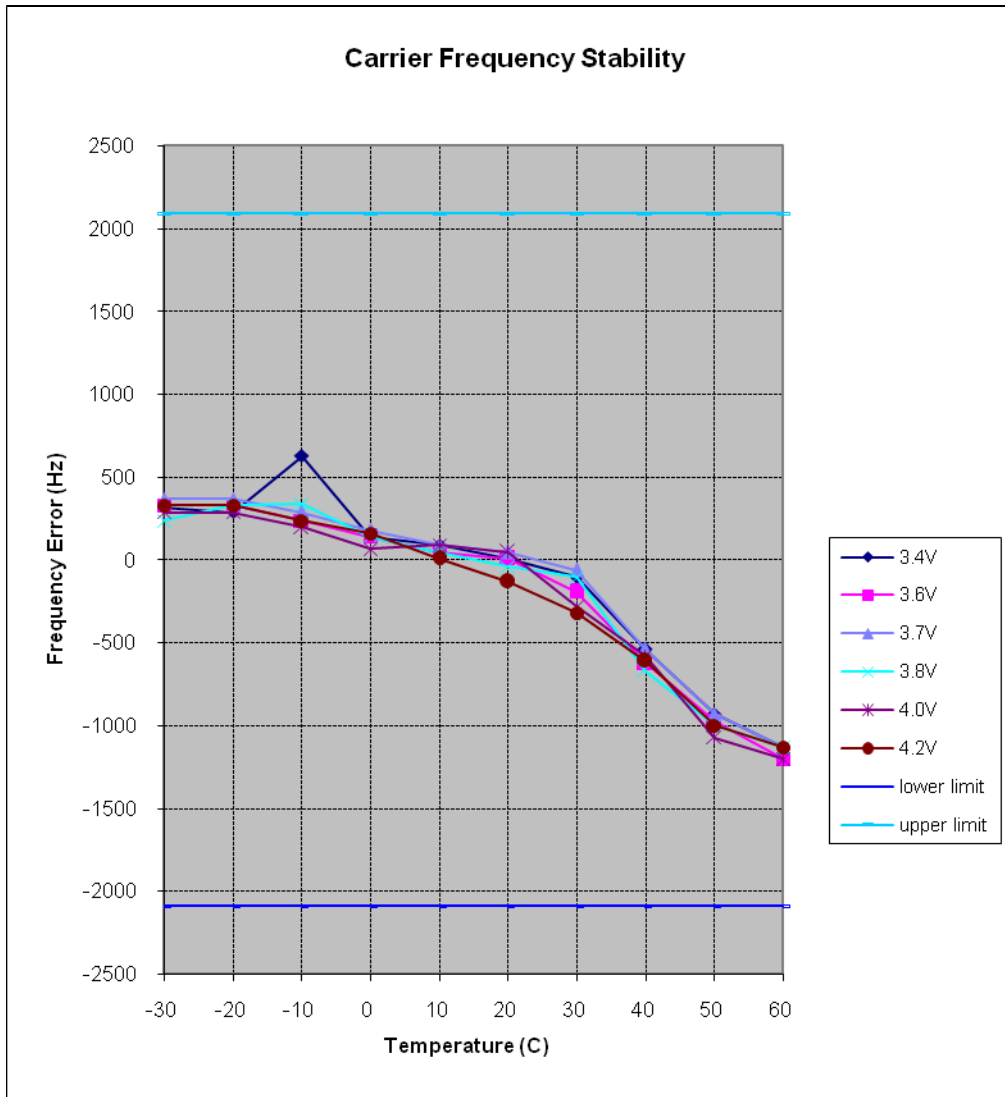
### 8.2 Test Results

The test was conducted at mid channel in each band.

<b>Operation Mode:</b>	CDMA 1x	<b>Channel:</b>	383
<b>Tx Frequency:</b>	836.49MHz	<b>Voltage:</b>	3.7v (3.4v ~ 4.2v)
<b>Limit:</b>	±2.5ppm (±2091Hz)		

Carrier Frequency Reference at 25 Degrees C: 836501928 Hz

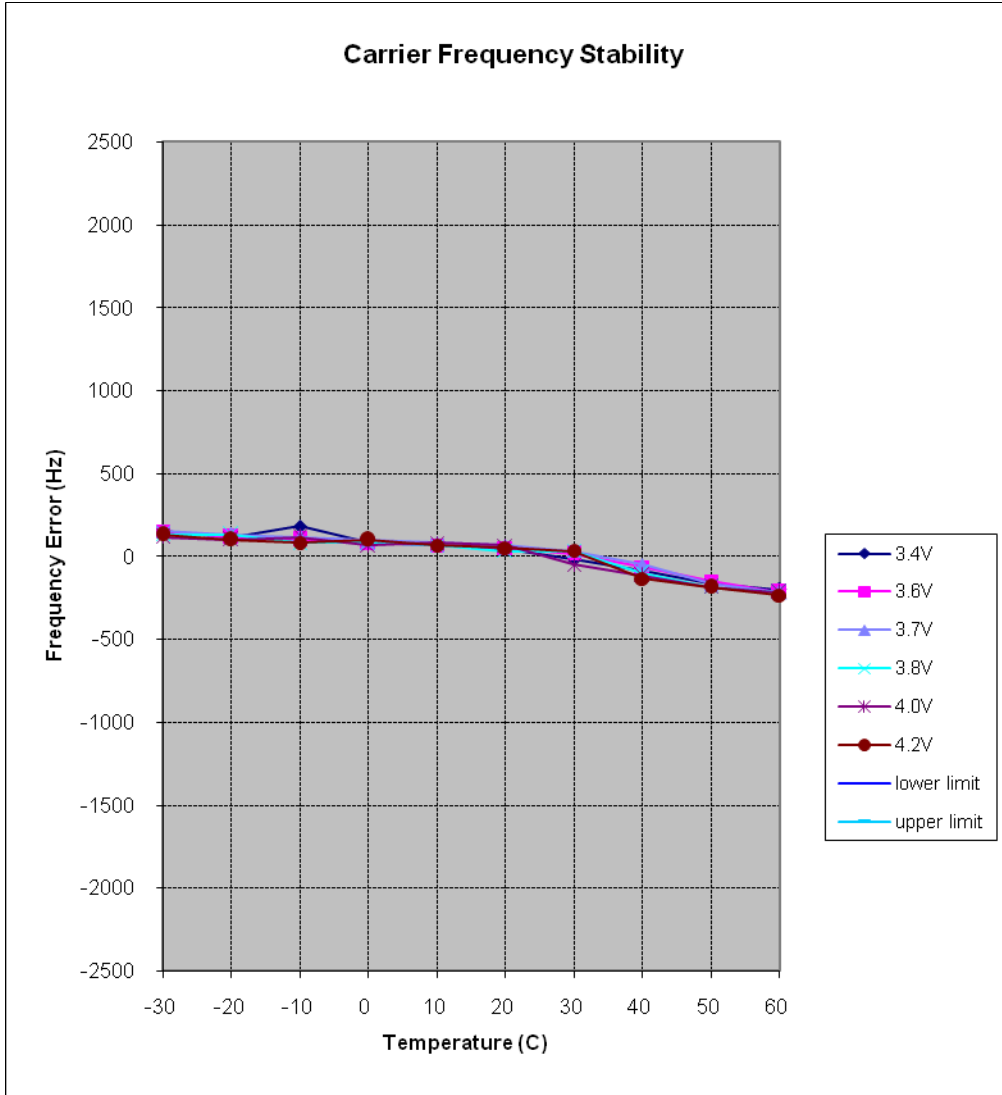
temp (C)	variation from carrier frequency reference (Hz)						specification	
	3.4V	3.6V	3.7V	3.8V	4.0V	4.2V	lower limit	upper limit
-30	318	328	368	238	288	328	-2091	2091
-20	288	328	368	328	288	328	-2091	2091
-10	628	238	288	338	198	238	-2091	2091
0	138	138	178	138	68	158	-2091	2091
10	88	48	88	48	88	8	-2091	2091
20	8	8	48	-42	48	-132	-2091	2091
30	-102	-192	-62	-102	-282	-322	-2091	2091
40	-542	-622	-542	-672	-582	-612	-2091	2091
50	-932	-972	-932	-1002	-1072	-1002	-2091	2091
60	-1132	-1202	-1132	-1132	-1202	-1132	-2091	2091



<b>Operation Mode:</b>	CDMA 1x PCS	<b>Channel:</b>	600
<b>Tx Frequency:</b>	1880MHz	<b>Voltage:</b>	3.7v (3.4v ~ 4.2v)
<b>Limit:</b>	±2.5ppm (±4700Hz)		

Carrier Frequency Reference at 25 Degrees C: 1,880,027,330 Hz

temp. (C)	transmitter carrier frequency (MHz)						specification	
	3.4V	3.6V	3.7V	3.8V	4.0V	4.2V	lower limit	upper limit
-30	150	150	150	133	116	133	-4700	4700
-20	116	116	133	133	100	100	-4700	4700
-10	183	100	116	83	116	83	-4700	4700
0	83	83	100	83	66	100	-4700	4700
10	66	66	83	66	83	66	-4700	4700
20	45	50	66	33	66	50	-4700	4700
30	-17	16	33	33	-50	33	-4700	4700
40	-84	-67	-50	-100	-117	-134	-4700	4700
50	-167	-150	-167	-184	-184	-184	-4700	4700
60	-200	-217	-217	-217	-217	-234	-4700	4700





## 9. Test Equipment and Firmware

The following test equipments were used.

Model	Manufacturer	Description	S/N	Cal Data	Cal Due Date
8960 Series 10 E5515C	Agilent	Wireless Communication Set	K113695	07/21/2010	07/21/2011
E4440A PSA Series	Agilent	Spectrum Analyzer	K159342	09/19/2010	09/19/2011
Model 105	TestEquity	Temperature Chamber	K141144	10/26/2010	10/26/2011

The firmware built in the 8960 was used to test the WMD 1x module.

Call Box	Technology	Firmware Rev
8960	1x	B.16.12