



Internet of Everything Module (IEM) FCC Part 22 & 24 Conducted Test Report

80-H6937-1 Rev A

January 21, 2011

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January 18, 2011,

Internet of Everything Module (IEM) FCC Part 22 & 24 Conducted Test Report
80-H6937-1 Rev A

Internet of Everything Module (IEM) FCC Part 22 & 24 Conducted Test Report

FCC Part 22 & 24 Certification	
FCC ID:	J9CIEMEVDO
Model:	IEM6085

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>	
Test performed by:	QUALCOMM Incorporated 5775 Morehouse Drive San Diego, CA 92121-1714
Report Prepared by:	QUALCOMM Incorporated 5775 Morehouse Drive San Diego, CA 92121-1714
Tests that required an OATS site were performed by UL/CCS Compliance Certification Services.	



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1. Introduction and Purpose

This document provides FCC test data for Qualcomm's IEM 6085 1x/EVDO module. The test results included in this report are limited to conducted test results. Radiated testing was performed at UL/CCS Compliance Certification Services in Fremont, CA, and the test results are contained in the 10U13553-1 Test Report.

2. Description of Device Under Test

The Internet of Everything Module (IEM) 1x/EVDO is an ultra small, 21 x 22 x 4.4 mm WWAN module that can be integrated into a multitude of host devices. The IEM 1x/EVDO module operates on the 800/1900 MHz CDMA2000 1x/EVDO networks. The module uses Qualcomm's QSC 6085 chip set and has stand alone GPS, AGPS, gpsOneXTRA-tm and Bluetooth 2.0 technologies. Interfaces for the module include USB 2.0, Bluetooth 2.0, I2C, RUIM support, LCD, camera, keypad, 2 LED control lines, vibrator control, audio and primary RF coax. The IEM design is optimized for minimal cost, minimal size, maximum battery life and superb position location performance. The IEM 1x/EVDO device meets the following standards: IS-2000 for CDMA 1xRTT, IS-856 Release A for 1xEV-DO, 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.

The software loaded in the IEM 1x/EVDO module is Q6085BSNAYAZW53905.

3. Test Summary

FCC/IC Rule	Description of Test	Result	Page
§2.1046	RF Power Output	Complies	11
§2.1049	Occupied Bandwidth	Complies	13
§22.359, 24.238	Block Edge Requirement	Complies	21
§2.1051, 22.917, 24.238(a)	Out of Band Emission at Antenna Terminals	Complies	26
§2.1055, 22.355, 24.235	Frequency Stability vs. Temperature vs. Voltage	Complies	34
§1.1310, 2.1091	RF Exposure	Complies	See MPE Report
§2.1053, 22.917, 24.238(a)	Field Strength of Spurious Radiation	Complies	See Radiated Test Report

4. RF Power Output Verification

FCC:	§ 2.1046
Limit:	n/a
DUT SN	N10F9CGV1

1. Base Station Emulator Settings and Measurement Procedures

As shown in the figure below, connect the transmitter output of the IEM 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 8960 box to measure CDMA 1x/1xEVDO 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.



2. For CDMA2000 1xEV-DO

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, Reverse/Forward TCH RC2, and RC3 Reverse FCH and demodulation of RC 3, 4 and 5.
 - 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 IEM Module.
 - d. Measure the output power at IEM Module 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. RC1, SO55
 - ii. RC2, SO9
 - iii. RC2, SO55
 - iv. RC3, SO55
- 2) Test for RC 3 Reverse FCH, RC3 Reverse SCH0 and demodulation of RC 3, 4 and 5.
 - a. Set up a call using Supplemental Channel Test Mode 3 (RC 3, SO 32) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.
 - b. As per C.S0011 or TIA/EIA-98-F Table 4.4.5.2-2, set the test parameters as shown in Table 4-2.

- c. Send alternating '0' and '1' power control bit to the IEM Module
- d. Determine the active channel configuration. If the desired channel configuration is not the active channel configuration, increase $\hat{I}_{or}$ by 1 dB and repeat the verification. Repeat this step until the desired channel configuration becomes active.
- e. Measure the output power at the IEM Module antenna connector.
- f. Decrease $\hat{I}_{or}$ by 0.5 dB.
- g. Determine the active channel configuration. If the active channel configuration is the desired channel configuration, measure the output power at the IEM Module antenna connector.
- h. Repeat step f and g until the output power no longer increases or the desired channel configuration is no longer active. Record the highest output power achieved with the desired channel configuration active.
- i. Repeat step a through h ten times and average the result.

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

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

Table 4-2 Parameters for Max. Power with multiple traffic code channel, SR1

Parameter	Units	Value
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

1xEV-DO

1) Use 1xEV-DO Rel 0 protocol in the call box 8960.

a. FTAP

- Select Test Application Protocol to FTAP
- Set FTAP Rate to 307.2 kbps (2 Slot, QPSK)
- Generator Info -> Termination Parameters -> Max Forward Packet Duration -> 16 Slots
- Set $\hat{I}_{or}$ to -60 dBm/1.23 MHz
- Send continuously '0' power control bits
- Measure the power at IEM Module antenna connector

b. RTAP

- Select Test Application Protocol to RTAP
- Set RTAP Rate to 9.6 kbps
- Generator Info -> Termination Parameters -> Max Forward Packet Duration -> 16 Slots
- Set $\hat{f}$ for to -60 dBm/1.23 MHz
- Send continuously '0' power control bits
- Measure the power at IEM Module antenna connector
- Repeat above steps for RTAP Rate = 19.2 kbps, 38.4 kbps, 76.8 kbps and 153.6 kbps respectively

2) Use 1xEV-DO Rev A protocol in the call box 8960

a. FETAP

- Select Test Application Protocol to FETAP
- Set FETAP Rate to 307.2 kbps (2 Slot, QPSK)
- Generator Info -> Termination Parameters -> Max Forward Packet Duration -> 16 Slots
- Set $\hat{f}$ for to -60 dBm/1.23 MHz
- Send continuously '0' power control bits
- Measure the power at IEM Module antenna connector

b. RETAP

- Select Test Application Protocol to RETAP
- F-Traffic Format -> 4 (1024, 2, 128) Canonical (307.2k, QPSK)
- Set R-Data Pkt Size to 128
- Protocol Subtype Config -> Release A Physical Layer Subtype -> Subtype 2
->PL Subtype 2 Access Channel MAC Subtype -> Default (Subtype 0)
- Generator Info -> Termination Parameters -> Max Forward Packet Duration -> 16 Slots
->ACK R-Data After -> Subpacket 0 (All ACK)

- Set $\hat{I}$ or to -60 dBm/1.23 MHz
- Send continuously '0' power control bits
- Measure the power at IEM Module antenna connector
- Repeat above steps for R-Data Pkt Size = 256, 512, 768, 1024, 1536, 2048, 3072, 4096, 6144, 8192, 12288 respectively.

3. Test Results

CDMA2000 1xEV-DO

Mode	Test Case			BC0 (850MHz) Channel Power (dBm)			BC1 (1900MHz) Channel (dBm)		
				1013	384	777	25	600	1175
	#	FWD RC/TAP	REV RC/TAP						
1x	1	RC1	RC1 (SO2)	24.89	24.70	24.59	25.01	25.15	25.17
	2	RC1	RC1 (SO55)	24.92	24.81	24.58	24.92	25.07	25.22
	3	RC2	RC2 (SO9)	24.86	24.69	24.56	24.91	25.05	25.21
	4	RC2	RC2 (SO55)	24.88	24.71	24.55	24.93	25.06	25.23
	5	RC3	RC3 (SO55)	24.94	24.75	24.52	24.97	25.12	25.16
	6	RC3	RC3 (SO32)	24.92	24.80	24.51	24.98	25.13	25.22
1xEVDO Rel0	7a	FTAP Rate = 307kbps (2 slot, QPSK)	RTAP rate = 9.6kbps	24.98	24.80	24.75	25.11	25.09	25.21
	7b		RTAP rate = 19.2kbps	24.97	24.91	24.79	25.21	25.25	25.35
	7c		RTAP rate = 38.4kbps	24.96	24.78	24.80	25.25	25.15	25.30
	7d		RTAP rate = 76.8kbps	25.03	24.95	24.75	25.26	25.24	25.28
	7e		RTAP rate =153.6kbps	25.02	24.97	24.79	25.16	25.20	25.27
1xEVDO RevA	8a	FETAP rate = 307kbps (2 slot, ACK channel is transmitt ed at all the slots)	RETAP - payload size = 128	24.85	24.67	24.47	25.02	24.97	25.22
	8b		RETAP - payload size = 256	24.86	24.75	24.73	25.10	25.15	25.21
	8c		RETAP - payload size = 512	25.12	24.89	24.75	25.18	25.22	25.43
	8d		RETAP - payload size = 768	25.22	24.90	24.83	25.38	25.29	25.46
	8e		RETAP - payload size = 1024	24.87	24.77	24.72	25.17	24.98	25.26
	8f		RETAP - payload size = 1536	24.98	24.87	24.69	25.29	25.27	25.56
	8g		RETAP - payload size = 2048	25.05	24.90	24.69	25.28	25.18	25.37
	8h		RETAP - payload size = 3072	24.99	24.06	24.70	25.28	25.14	25.33
	8i		RETAP - payload size = 4096	25.10	24.97	24.82	25.18	25.27	25.48
	8j		RETAP - payload size = 6144	25.01	24.88	24.77	25.25	25.15	25.39
	8k		RETAP - payload size = 8192	25.11	24.89	24.80	25.34	25.23	25.40
	8l		RETAP - payload size = 12288	25.04	24.84	24.78	25.28	25.24	25.32

Note: All measurements are based on an average detector.

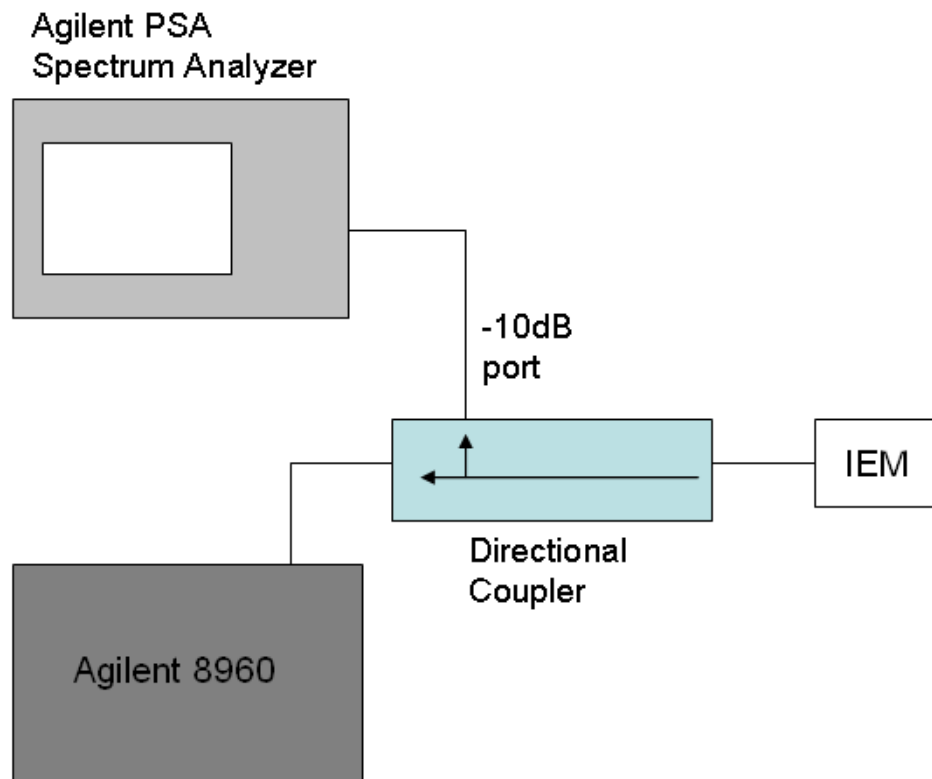
5. Occupied Bandwidth

FCC:	§2.1049
Limit:	n/a
DUT SN	N10F9CGV1
Modes Tested	CDMA 1x / 1x-EVDO
	▪ RC2 SO55
	▪ Rel 0, RTAP rate = 19.2kbps
	▪ Rev A, RETAP payload = 1536

4. Test Procedures

As Figure below indicates, connected the transmitter output to a calibrated coaxial cable and coupler. The other end of coupler was connected to the spectrum analyzer. Measured the occupied bandwidth (defined as the 99% power bandwidth) with the appropriate personality features integrated in the PSA.

Used 8960 call box for CDMA 1x/1x-EVDO measurement.



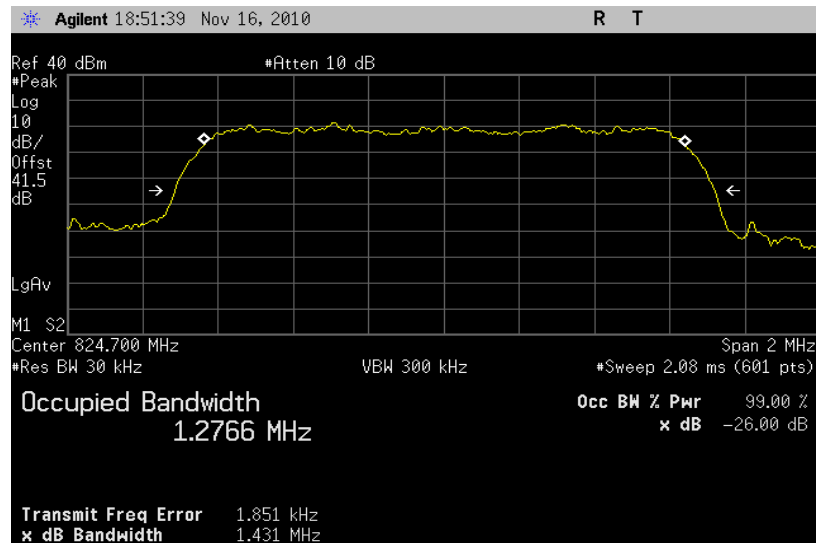
5. Test Results

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

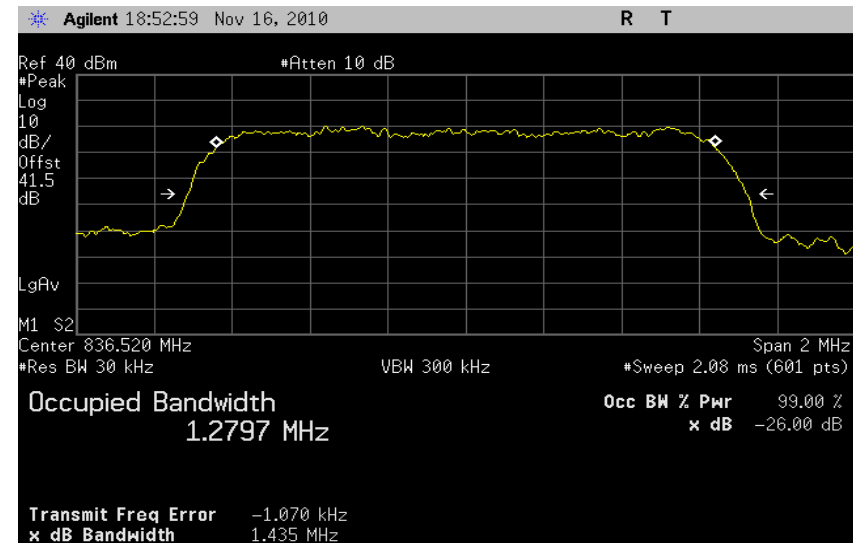
Mode		Frequency (MHz)	Channel	99% Occupied Bandwidth (MHz)	Plot number
CDMA1x/ 1x-EVDO	RC2 SO55	824.7	1013	1.2766	Plot 5.2 - 1
		836.52	384	1.2797	Plot 5.2 - 2
		848.31	777	1.2750	Plot 5.2 - 3
		1851.25	25	1.2747	Plot 5.2 - 4
		1880	600	1.2747	Plot 5.2 - 5
		1908.75	1175	1.2771	Plot 5.2 - 6
	Rel 0 RTAP rate = 19.2kbps	824.7	1013	1.2762	Plot 5.2 - 7
		836.52	384	1.2775	Plot 5.2 - 8
		848.31	777	1.2797	Plot 5.2 - 9
		1851.25	25	1.2778	Plot 5.2 - 10
		1880	600	1.2762	Plot 5.2 - 11
		1908.75	1175	1.2743	Plot 5.2 - 12
	Rev A RETAP Payload size = 1536kbps	824.7	1013	1.2760	Plot 5.2 - 13
		836.52	384	1.2759	Plot 5.2 - 14
		848.31	777	1.2802	Plot 5.2 - 15
		1851.25	25	1.2756	Plot 5.2 - 16
		1880	600	1.2794	Plot 5.2 - 17
		1908.75	1175	1.2802	Plot 5.2 - 18

6. Plots

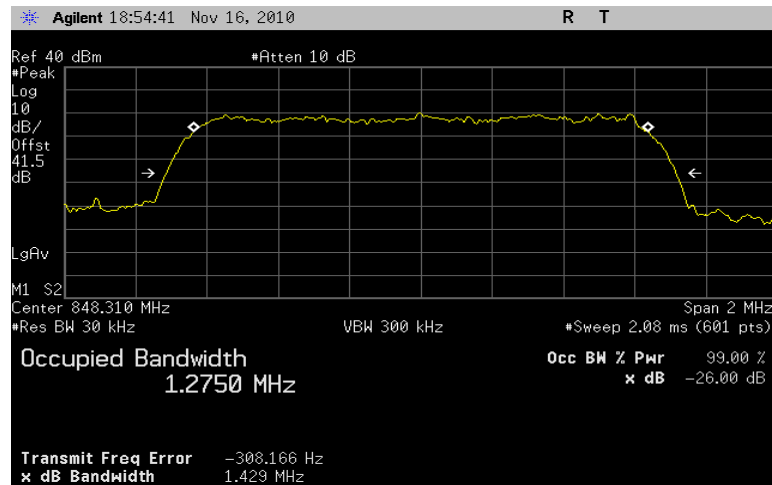
Plot 5.2 - 1 (Ch1013, RC2 SO55)



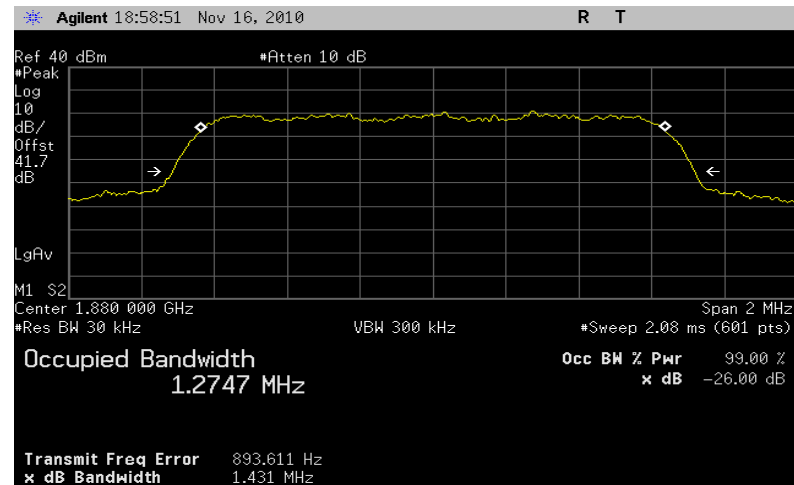
Plot 5.2 - 2 (Ch384, RC2 SO55)



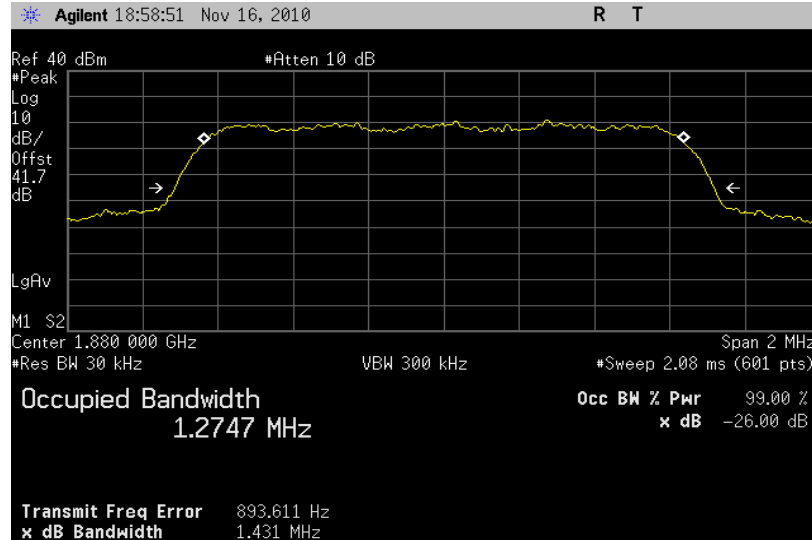
Plot 5.2 - 3 (Ch777, RC2 SO55)



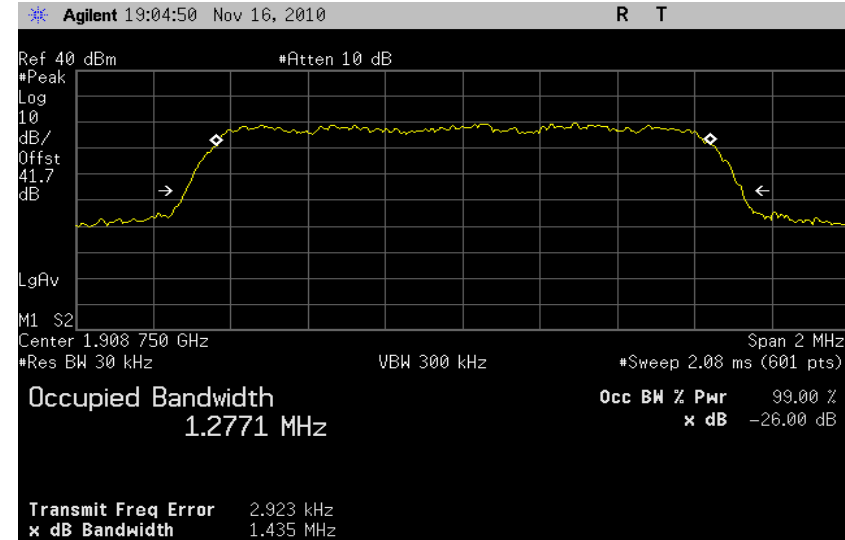
Plot 5.2 - 4 (Ch25,RC2 SO55)



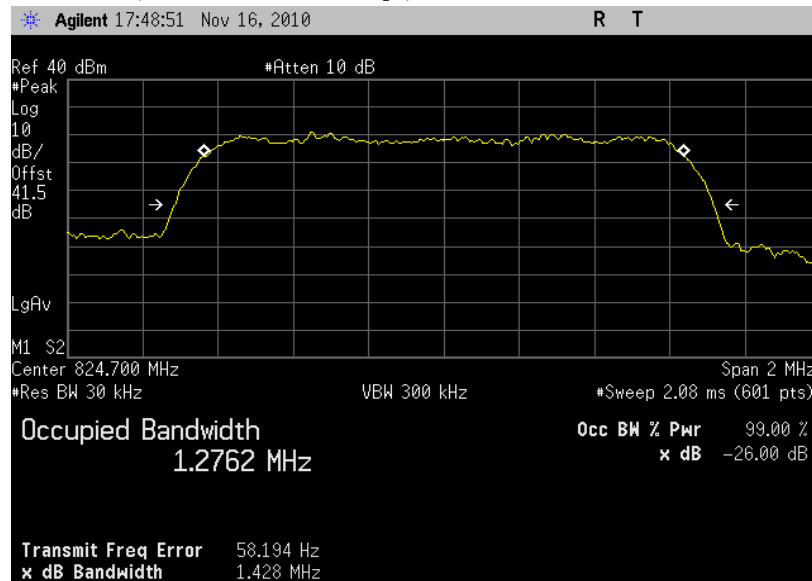
Plot 5.2 - 5 (Ch600, RC2 SO55)



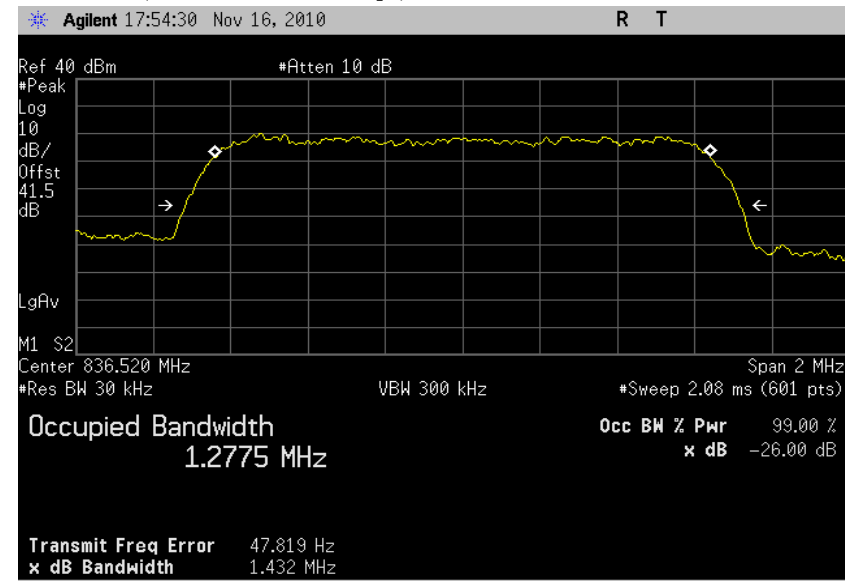
Plot 5.2 - 6 (Ch1175, RC2 SO55)



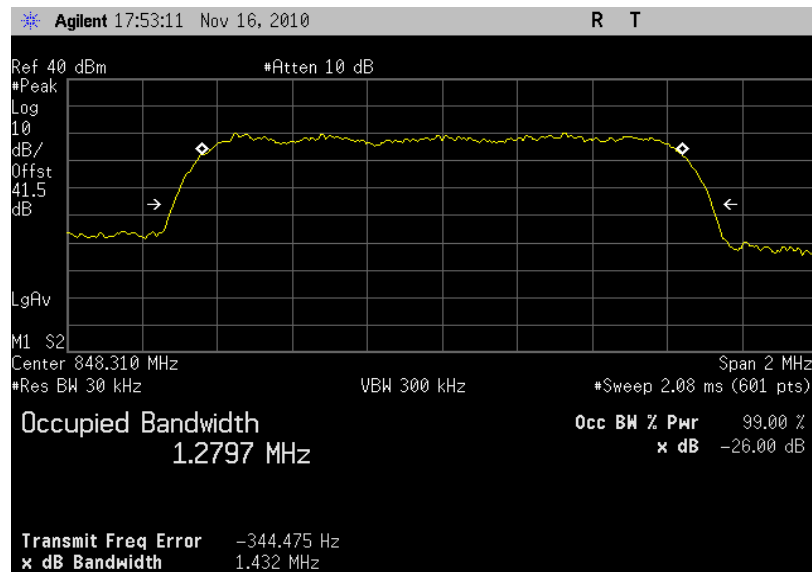
Plot 5.2 - 7 (Ch1013, Rel 0, 19.2kbps)



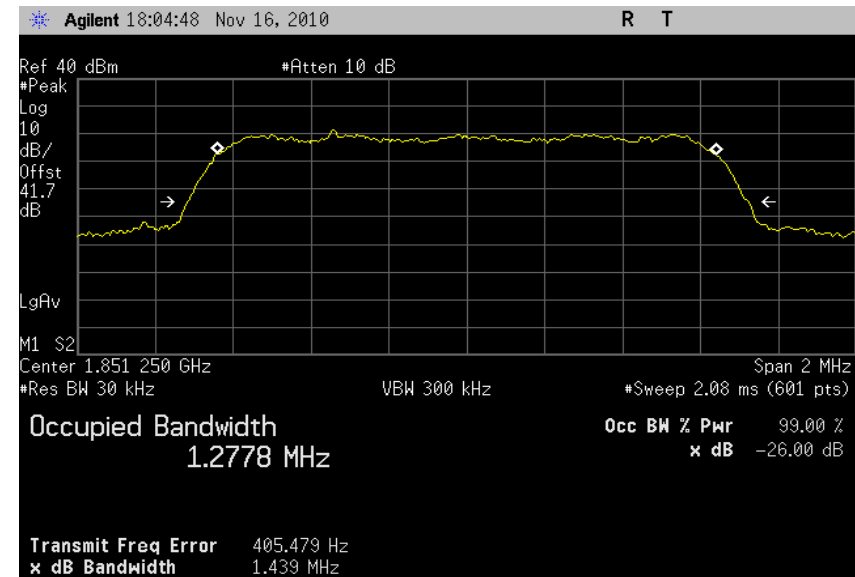
Plot 5.2 - 8 (Ch384, Rel 0, 19.2kbps)



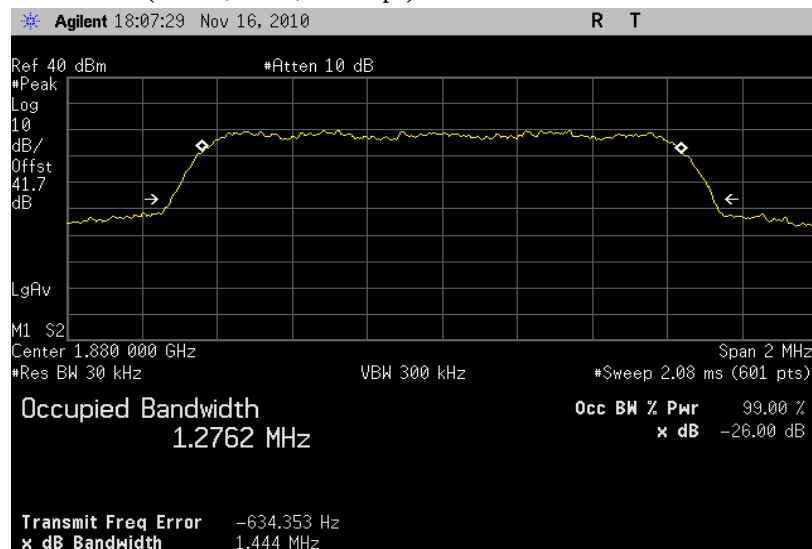
Plot 5.2 - 9 (Ch777, Rel 0, 19.2kbps)



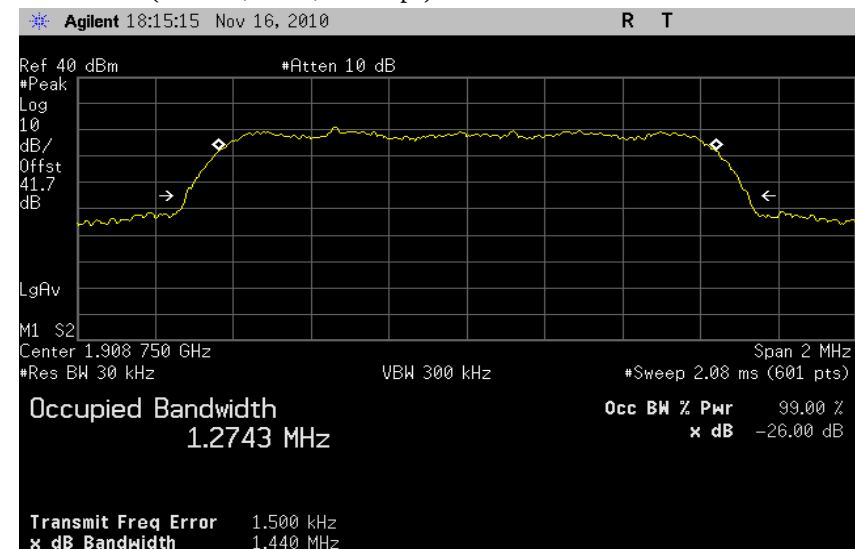
Plot 5.2 - 10 (Ch25, Rel 0, 19.2kbps)



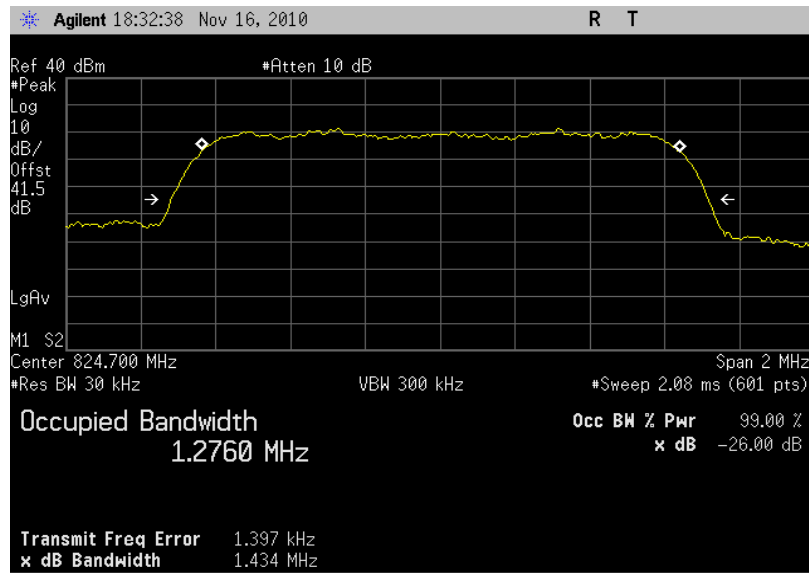
Plot 5.2 - 11 (Ch600, Rel 0, 19.2kbps)



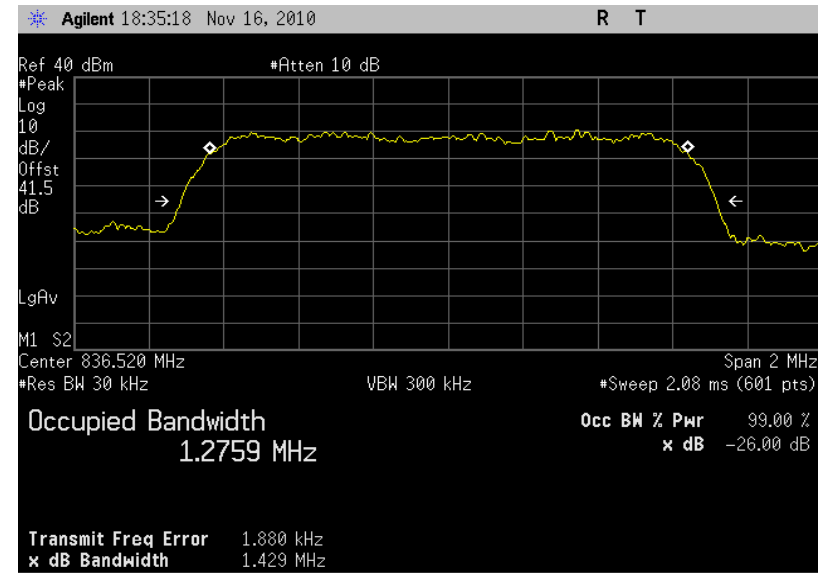
Plot 5.2 - 12 (Ch1175, Rel 0, 19.2kbps)



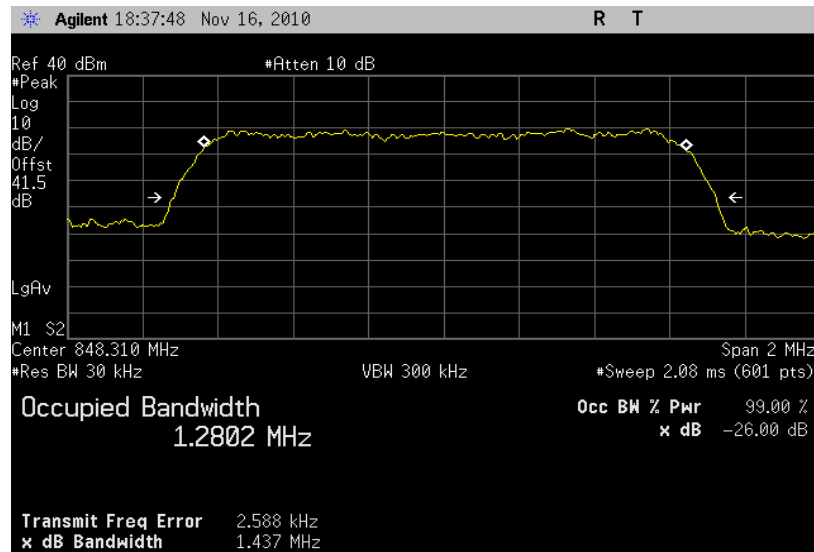
Plot 5.2 - 13 (Ch1013, Rel A, 1536 payload size)



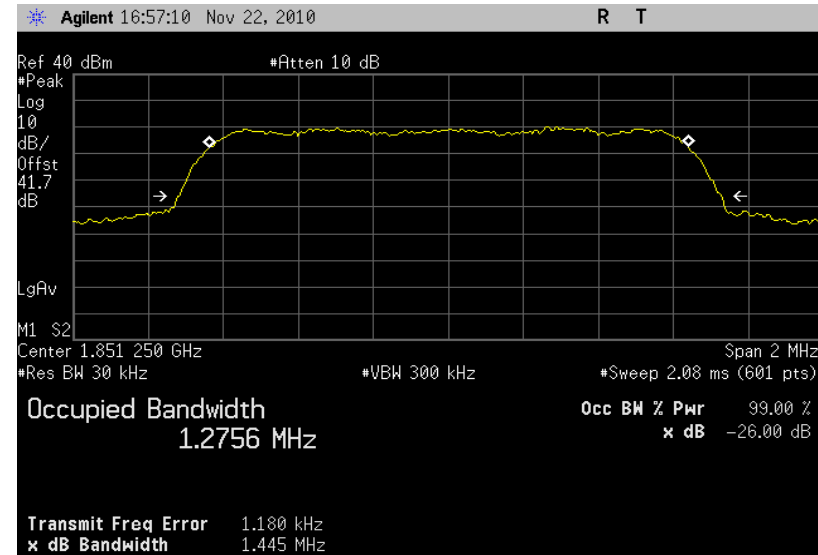
Plot 5.2 - 14 (Ch384, Rel A, 1536 payload size)



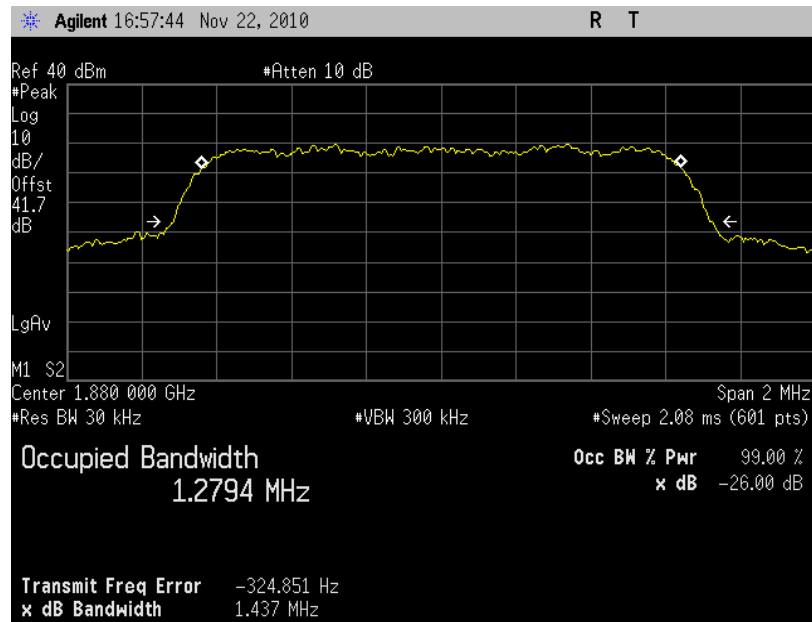
Plot 5.2 - 15 (Ch777, Rel A, 1536 payload size)



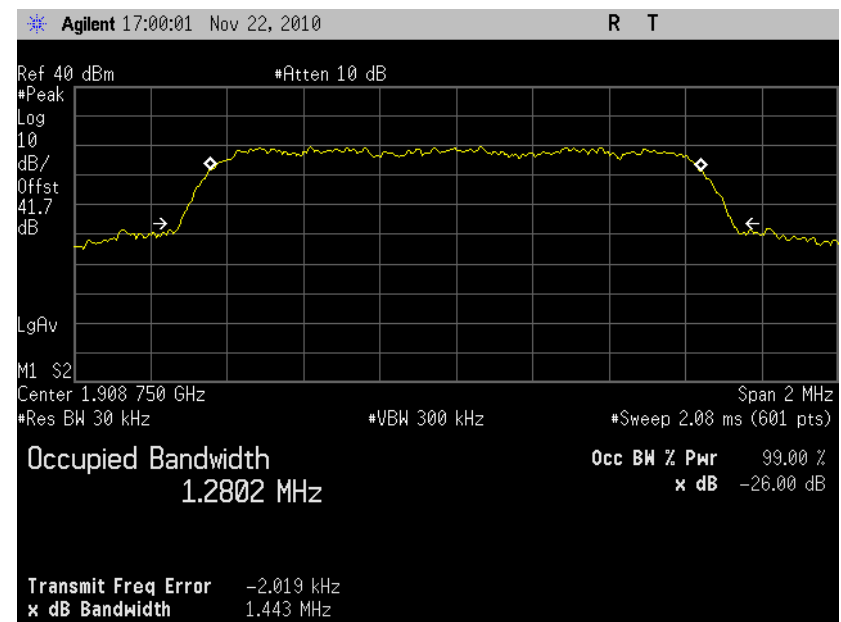
Plot 5.2 - 16 (Ch25, Rel A, 1536 payload size)



Plot 5.2 - 17 (Ch600, Rel A, 1536 payload size)



Plot 5.2 - 18 (Ch1175, Rel A, 1536 payload size)



6. Block Edge Compliance

FCC:	§22.359, 24.238
Limit:	-13dBm
DUT SN	N10F9CGV1
Modes Tested	CDMA 1x / 1x-EVDO
	▪ RC2 SO55
	▪ Rel 0, RTAP rate = 19.2kbps
	▪ Rev A, RETAP payload = 1536

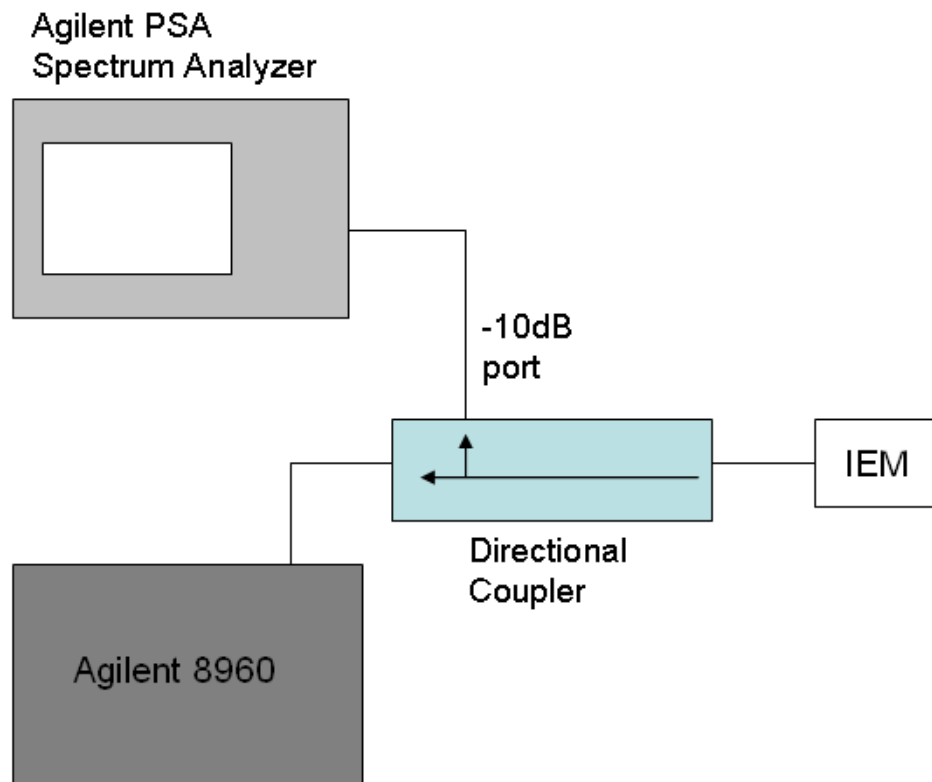
7. Test Procedures

As shown in Figure below, connected the RF output to 8960, configured the IEM 1x/EVDO module to operate at maximum power. Measured the block edge emissions 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
- For CDMA measurement, set video averaging to 10 samples

Used 8960 call box for CDMA 1x/1x-EVDO measurement.



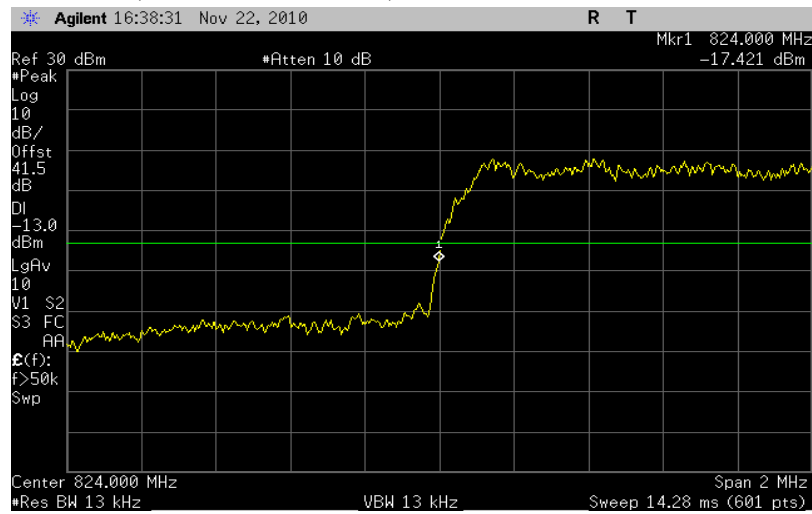
8. Test Results

The test was conducted at block edges in each band.

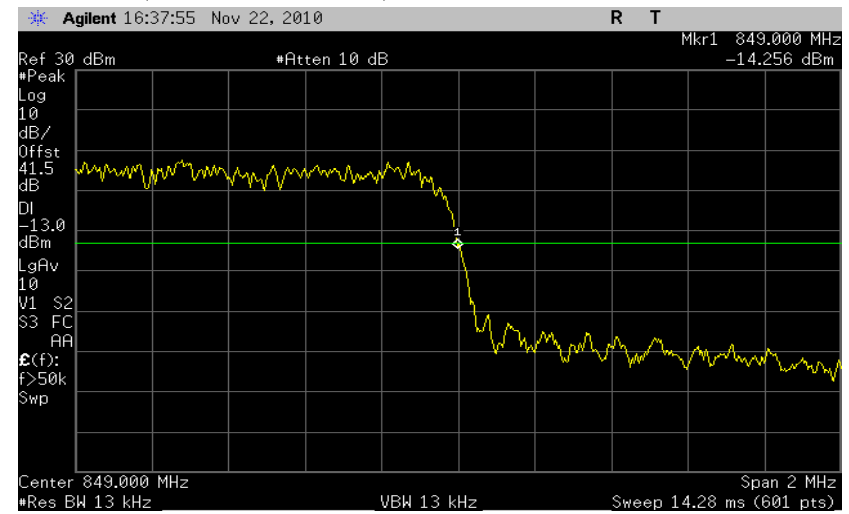
Mode		Frequency (MHz)	Channel Tested	Corresponding Plot number	Test Result
CDMA1x/ 1x-EVDO	RC2 SO55	824	1013	Plot 6.2 - 1	Complies
		849	777	Plot 6.2 - 2	Complies
		1850	25	Plot 6.2 - 3	Complies
		1910	1175	Plot 6.2 - 4	Complies
	Rel 0 RTAP rate = 19.2kbps	824	1013	Plot 6.2 - 5	Complies
		849	777	Plot 6.2 - 6	Complies
		1850	25	Plot 6.2 - 7	Complies
		1910	1175	Plot 6.2 - 8	Complies
	Rev A RETAP Payload Size = 1536kbps	824	1013	Plot 6.2 - 9	Complies
		849	777	Plot 6.2 - 10	Complies
		1850	25	Plot 6.2 - 11	Complies
		1910	1175	Plot 6.2 - 12	Complies

9. Plots

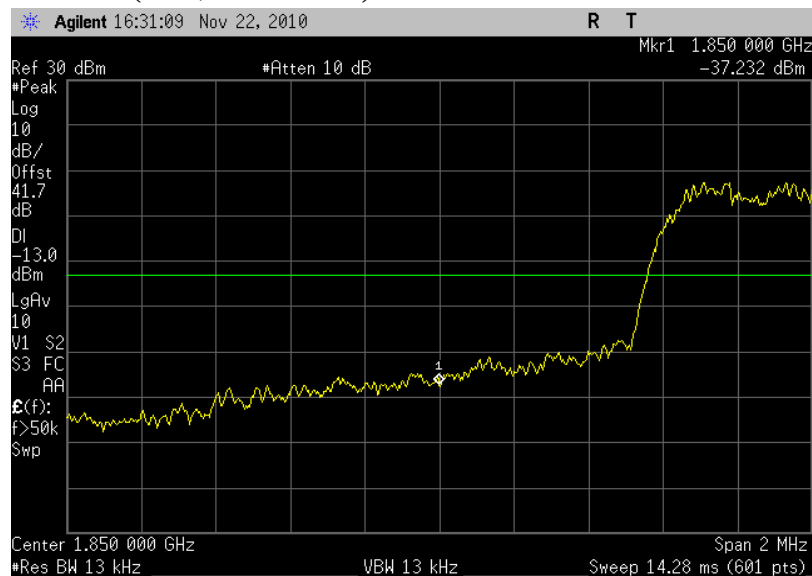
Plot 6.2 - 1 (Ch1013, 1x RC2 SO55)



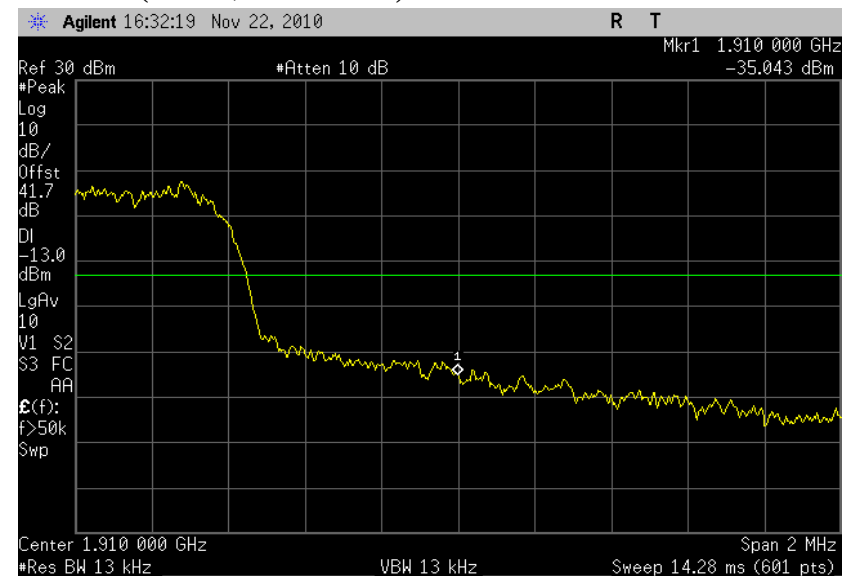
Plot 6.2 - 2 (Ch777, 1x RC2 SO55)



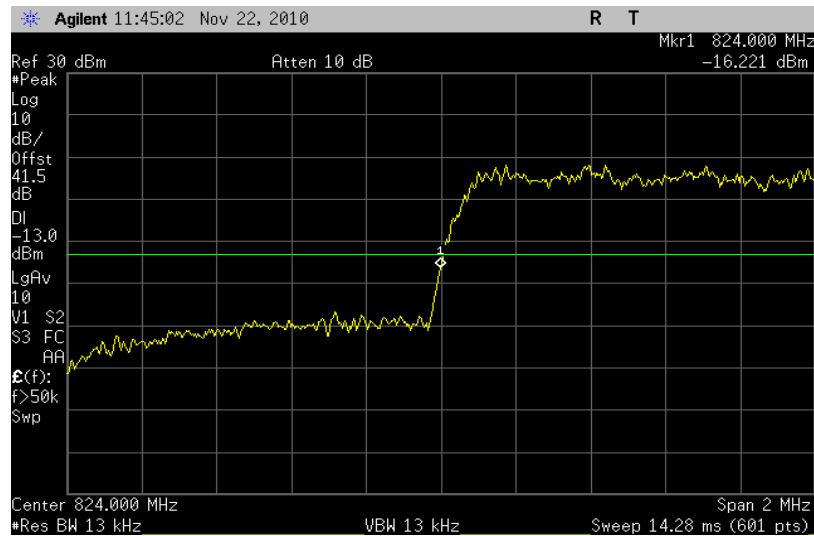
Plot 6.2 - 3 (Ch25, 1x RC2 SO55)



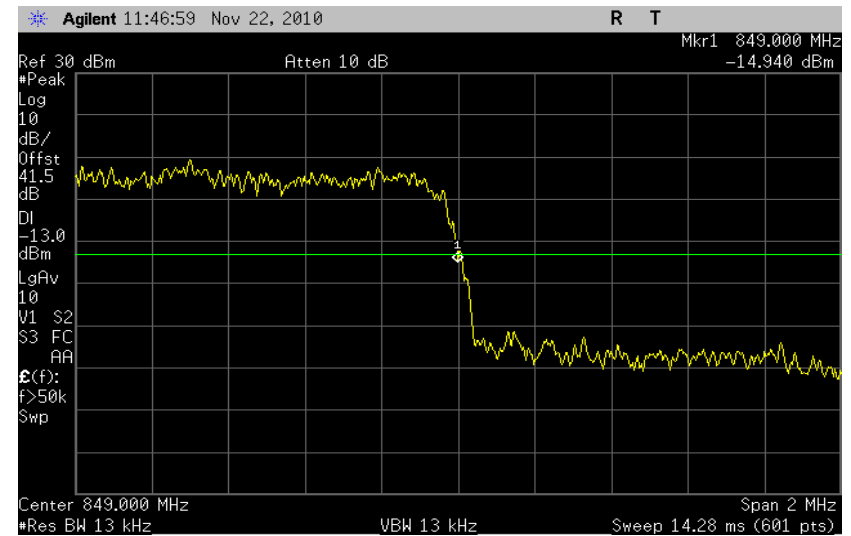
Plot 6.2 - 4 (Ch1175, 1x RC2 SO55)



Plot 6.2 - 5 (Ch1013, 1xEVDO Rel 0, 19.2kbps)



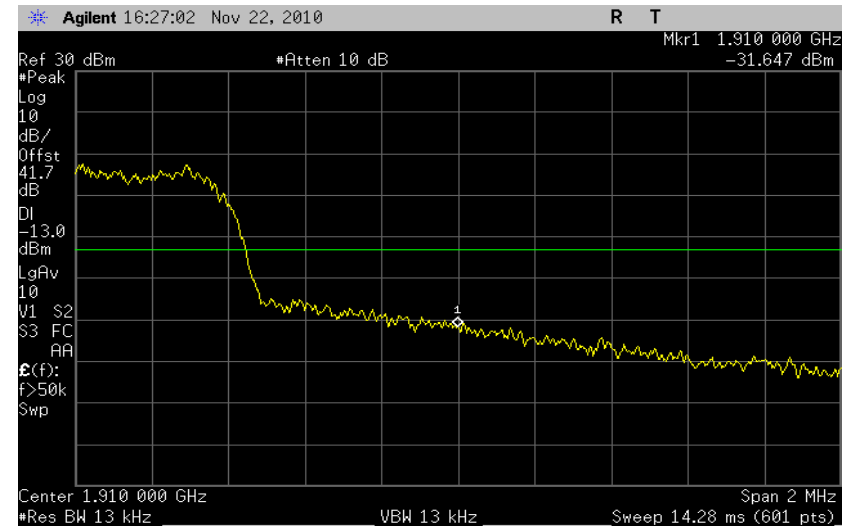
Plot 6.2 - 6 (Ch777, 1xEVDO Rel 0, 19.2kbps)



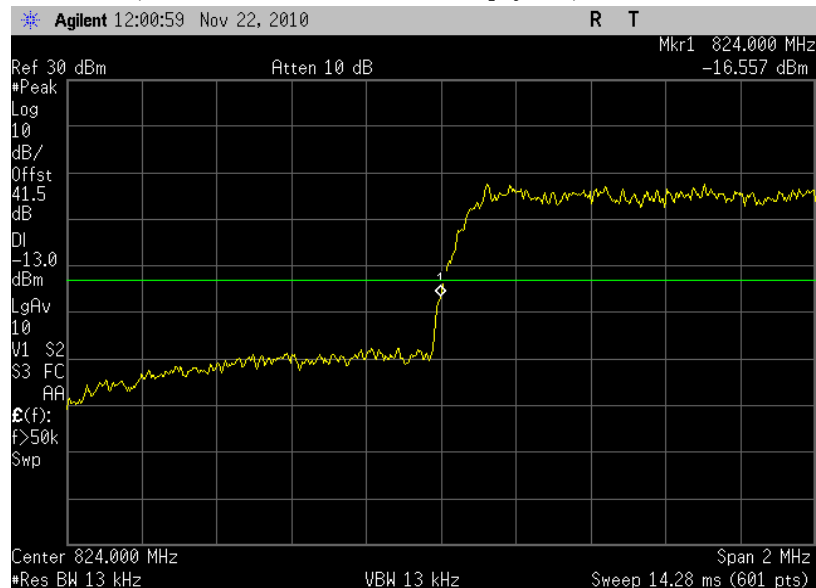
Plot 6.2 - 7 (Ch25, 1xEVDO Rel 0, 19.2kbps)



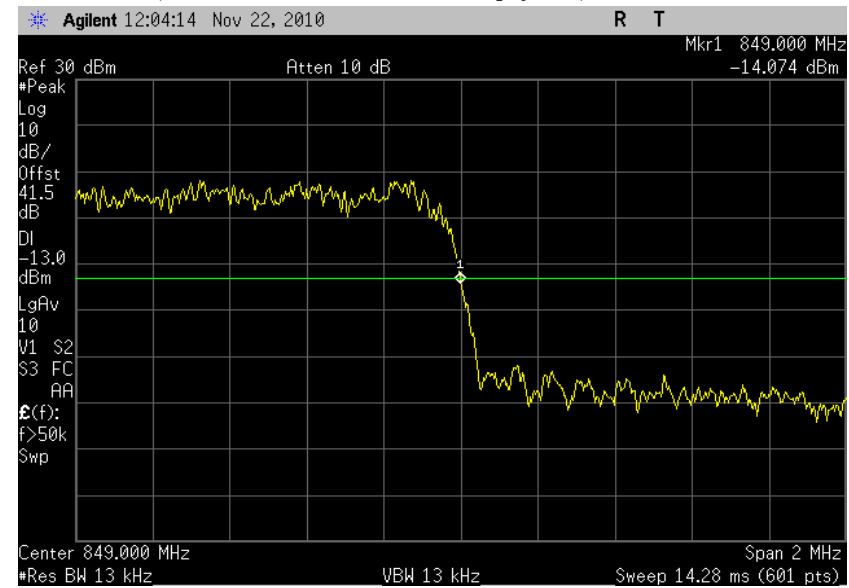
Plot 6.2 - 8 (Ch1175, 1xEVDO Rel 0, 19.2kbps)



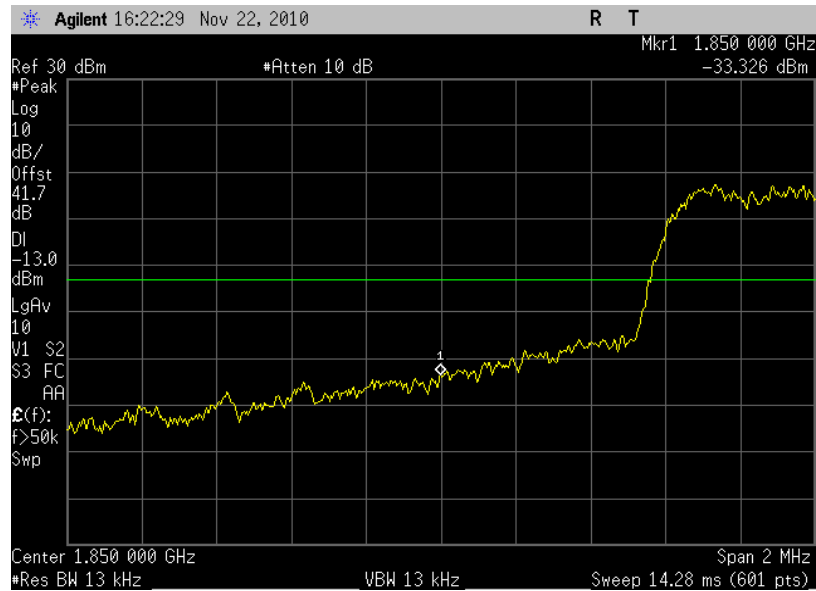
Plot 6.2 - 9 (Ch1013, 1xEVDO Rev A, 1536 payload)



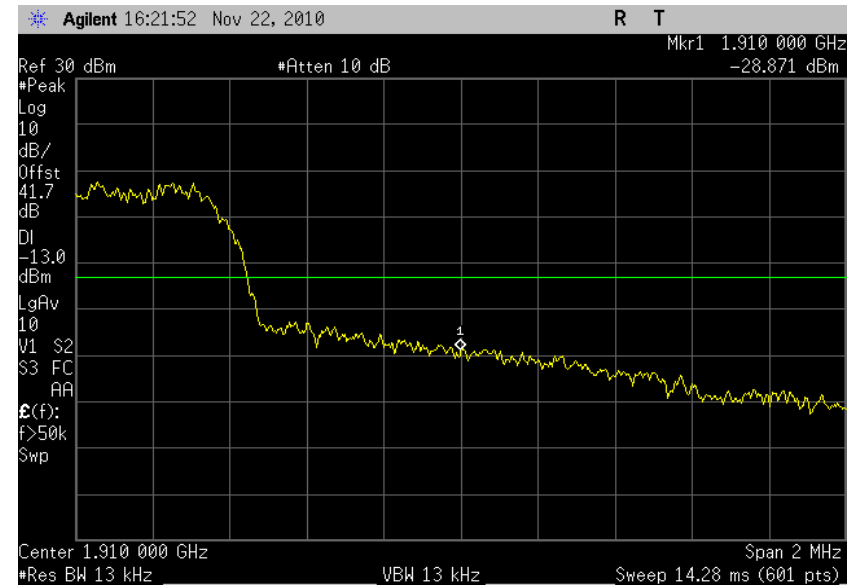
Plot 6.2 - 10 (Ch777, 1xEVDO Rev A, 1536 payload)



Plot 6.2 - 11 (Ch25, 1xEVDO Rev A, 1536 payload)



Plot 6.2 - 12 (Ch1175, 1xEVDO Rev A, 1536 payload)



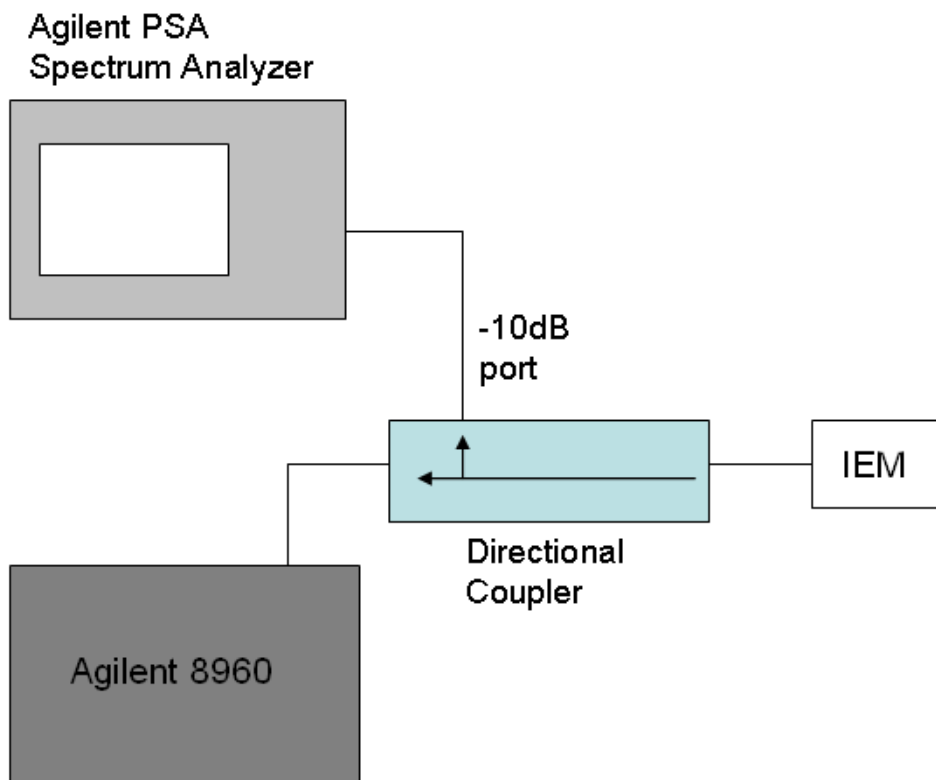
7. Out of Band Emission at Antenna Terminals

FCC:	§22.901(d), 22.917, 24.238 (a)
Limit:	-13dBm
DUT SN	N10F9CGV1
Modes Tested	CDMA 1x / 1x-EVDO
	▪ Rev A, RETAP Payload Size = 1536 kbps

10. Test Procedure

As Figure below indicates, connected the RF output to the spectrum analyzer through a calibrated coaxial cable. Scan the out-of-band emission up to 10th harmonics. Set RBW and VBW as 100kHz for the measurement 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 was caught.

Used 8960 call box for CDMA 1x/1x-EVDO measurement.



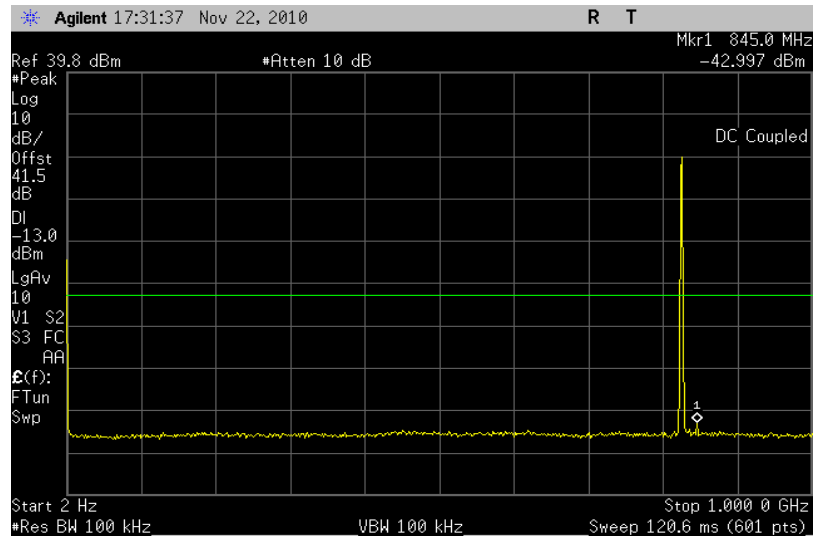
11. Test Results

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

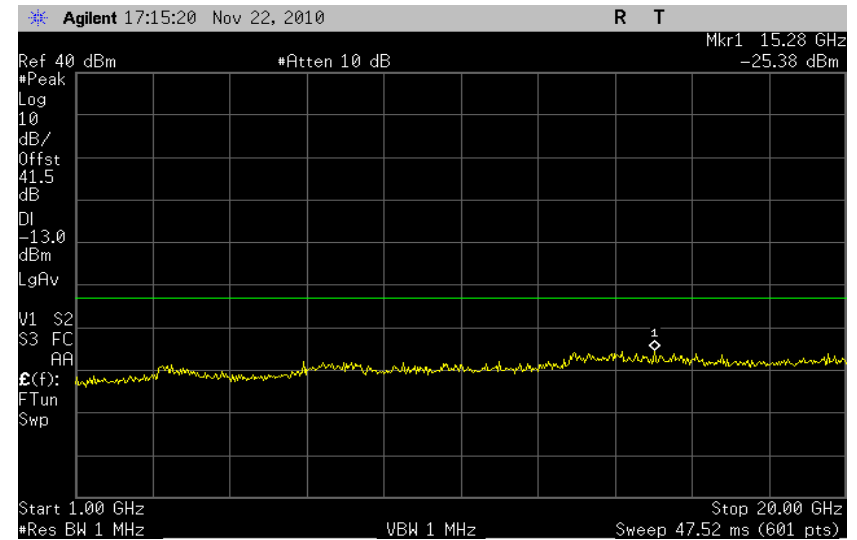
Mode		Frequency (MHz)	Channel Tested	Corresponding Plot number	Test Result
CDMA1x/ 1x-EVDO	Rev A RETAP Payload Size = 1536kbps	0 ~ 20 GHz	1013	Plot 7.2 – 1,2	Complies
		0 ~ 20 GHz	384	Plot 7.2 – 3,4	Complies
		0 ~ 20 GHz	777	Plot 7.2 – 5,6	Complies
		0 ~ 20 GHz	25	Plot 7.2 – 7,8	Complies
		0 ~ 20 GHz	600	Plot 7.2 – 9,10	Complies
		0 ~ 20 GHz	1175	Plot 7.2 – 11,12	Complies

12. Plots

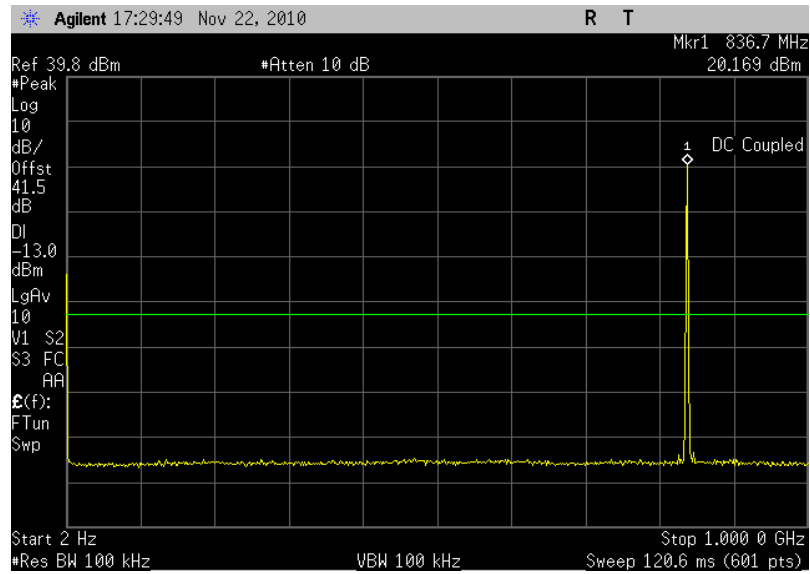
Plot 7.2 - 1 (EVDO, Rev A, 1536kbps, Ch1013)



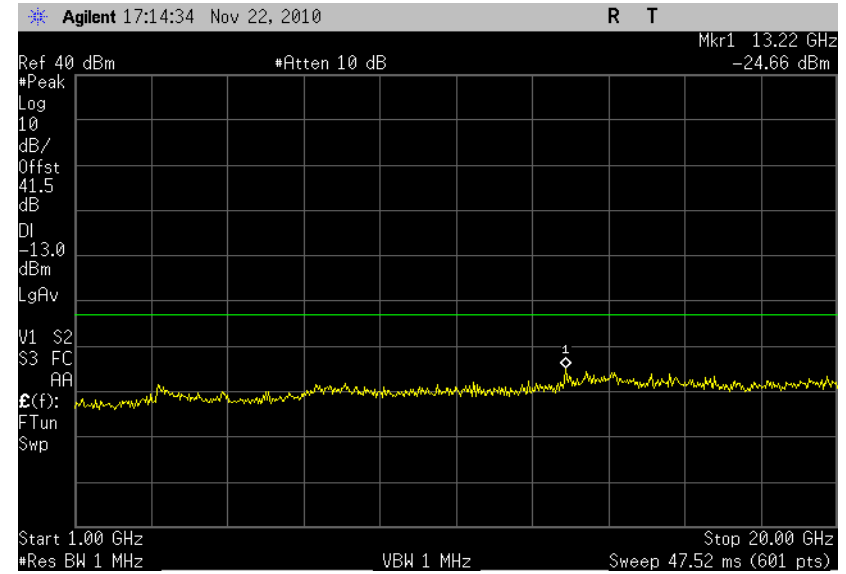
Plot 7.2 - 2 (EVDO, Rev A, 1536kbps, Ch1013)



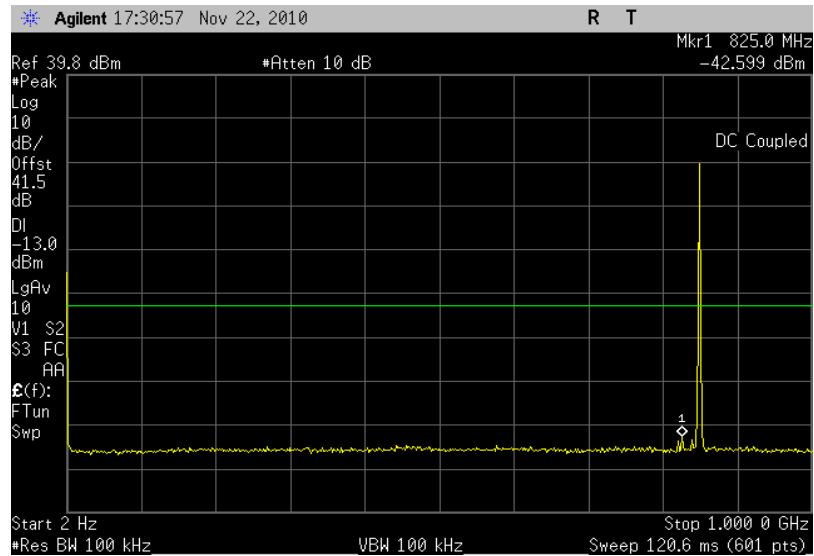
Plot 7.2 - 3 (EVDO, Rev A, 1536kbps, Ch384)



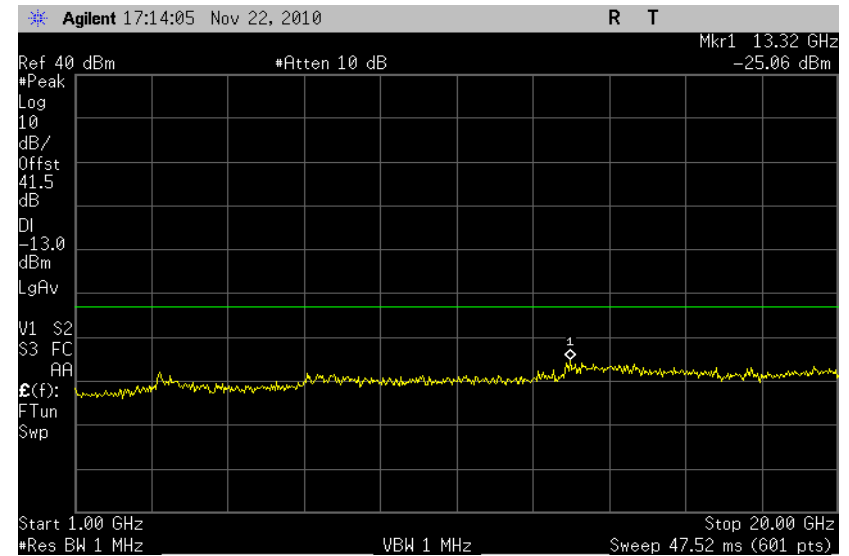
Plot 7.2 - 4 (EVDO, Rev A, 1536kbps, Ch384)



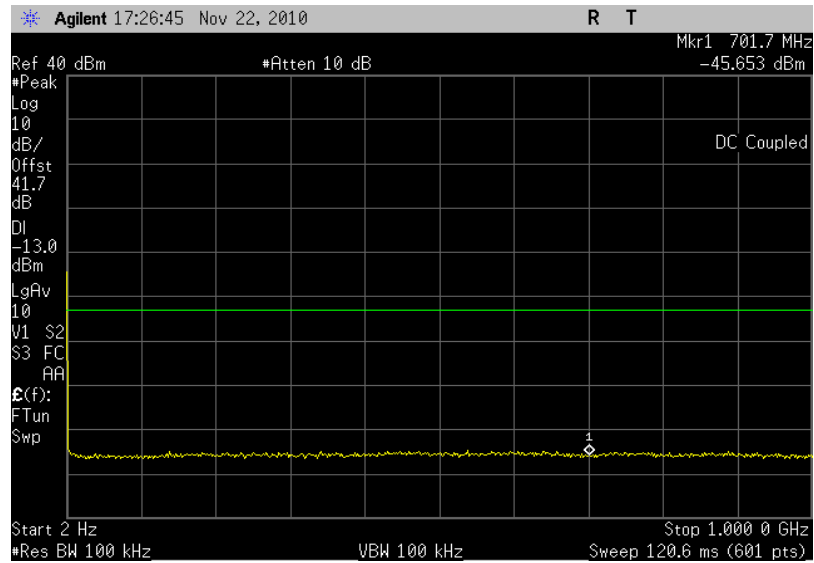
Plot 7.2 - 5 (EVDO, Rev A, 1536kbps, Ch777)



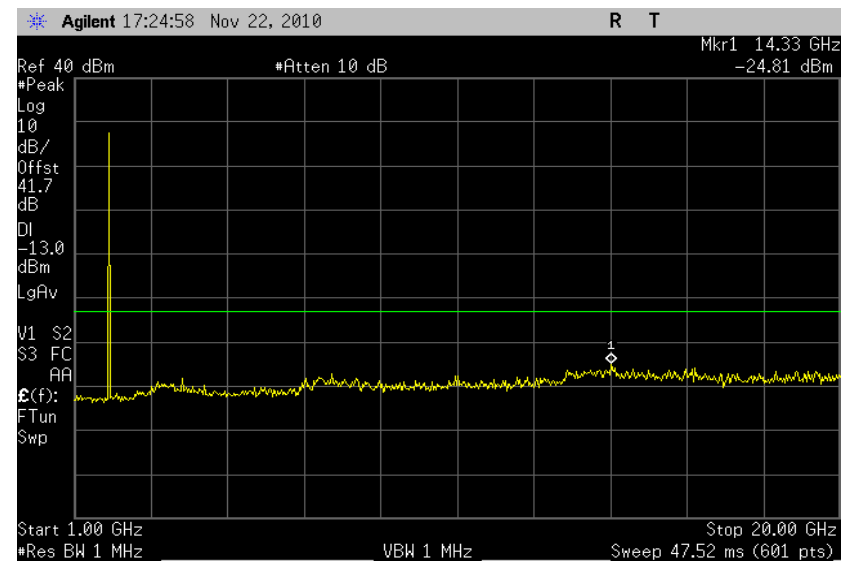
Plot 7.2 - 6 (EVDO, Rev A, 1536kbps, Ch777)



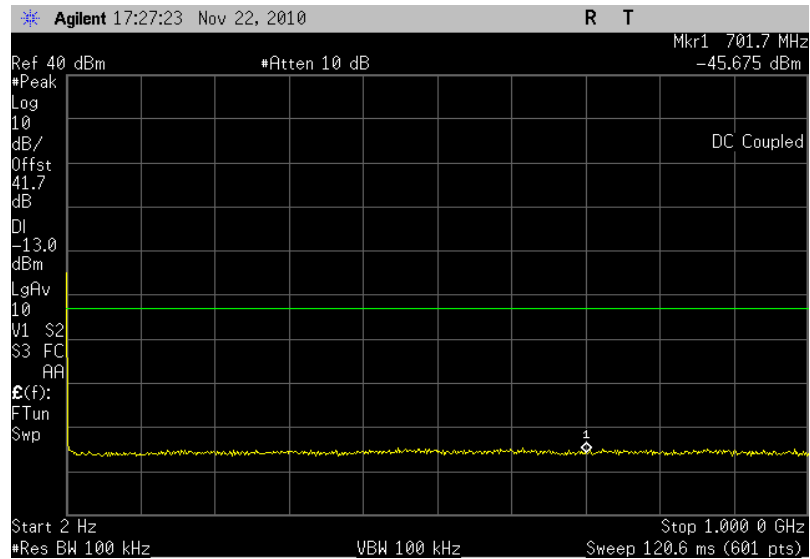
Plot 7.2 - 7 (EVDO, Rev A, 1536kbps, Ch25)



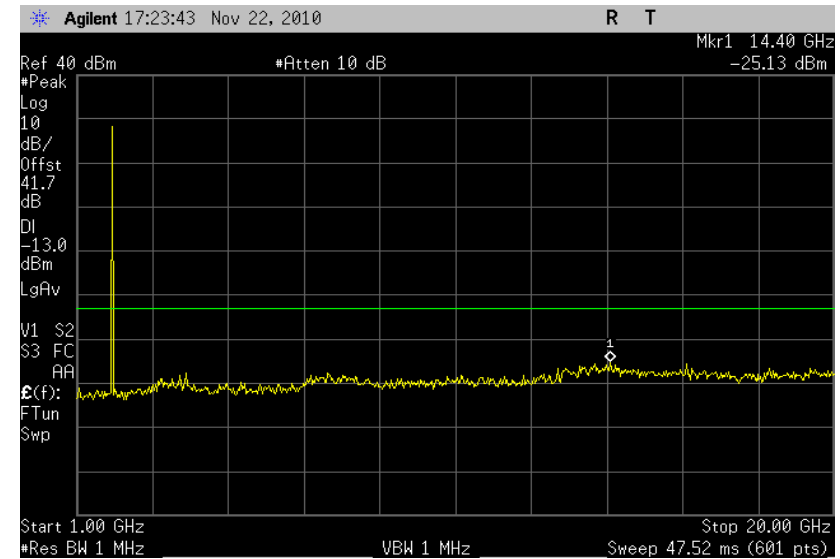
Plot 7.2 - 8 (EVDO, Rev A, 1536kbps, Ch25)



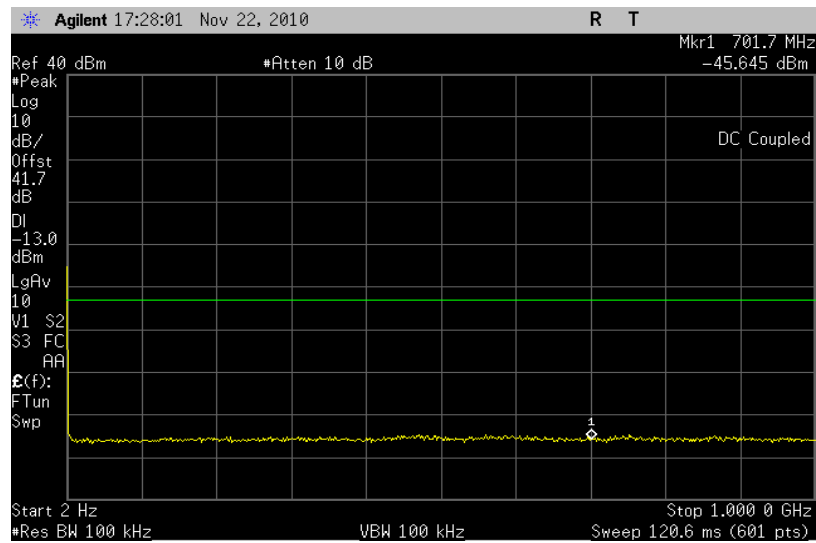
Plot 7.2 - 9 (EVDO, Rev A, 1536kbps, Ch600)



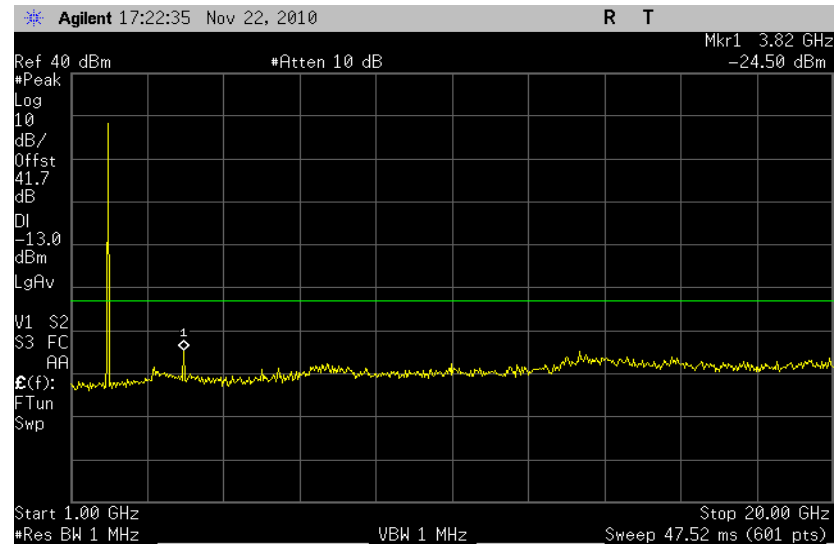
Plot 7.2 - 10 (EVDO, Rev A, 1536kbps, Ch600)



Plot 7.2 - 11 (EVDO, Rev A, 1536kbps, Ch1175)



Plot 7.2 - 12 (EVDO, Rev A, 1536kbps, Ch1175)



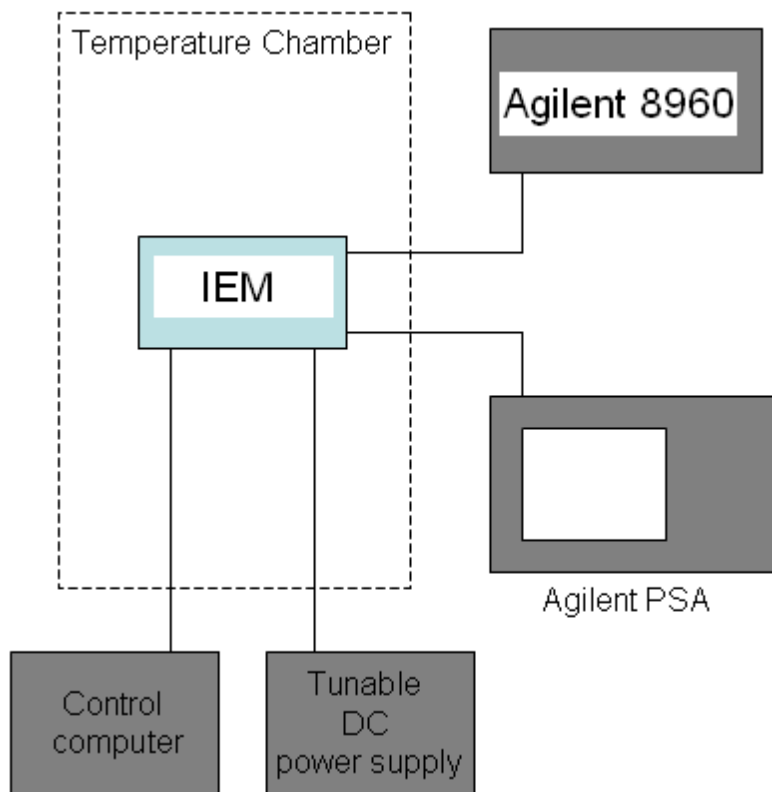
8. Frequency Stability

FCC:	§2.1055, 22.355, 24.235
Limit:	±2.5ppm
DUT SN	N10F9CGV1
Modes Tested	CDMA 1x / 1x-EVDO
	▪ Rev A, RETAP rate = 1536kbps

13. Test Procedure

As the test setup indicates, placed the IEM inside the temperature chamber. Measured the transmitting frequency error at 20 degrees C with DC voltage varying from 3.0 volts to 3.6 volts, and then set the temperature to -30 degrees C and allow it to stabilize. After 1 hour soak time, take the measurement on transmitting frequency error at -30 degrees in the same manner. As an incremental of 10 degrees C, repeat the same process until +60 degrees C is completed.

Used 8960 call box for CDMA 1x/1x-EVDO measurement.



14. Test Results

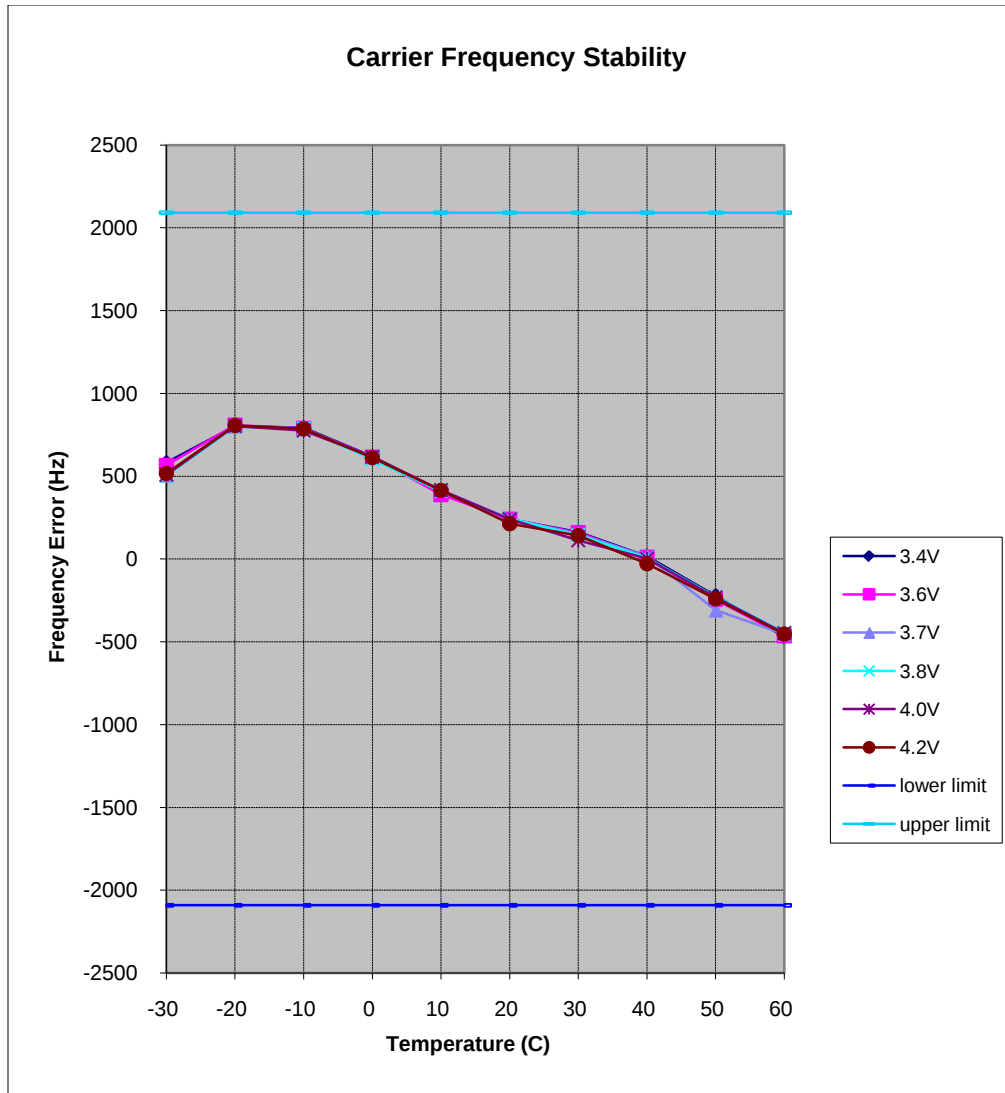
The test was conducted at mid channel in each band.

Operation Mode:	EVDO, Rev A, RETAP rate = 1536kbps	Channel:	383
Tx Frequency:	836.52MHz	Voltage:	3.8v (3.4v ~ 4.2v)
Limit:	±2.5ppm (±2091Hz)		

Measured with a Agilent Spectrum Analyzer

Carrier Frequency Reference at 25 Degrees C: 836501769 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	582	566	506	502	509	516	-2091	2091
-20	802	809	802	799	802	806	-2091	2091
-10	792	789	786	789	776	786	-2091	2091
0	618	616	612	602	616	612	-2091	2091
10	406	389	416	409	416	414	-2091	2091
20	240	241	242	244	241	213	-2091	2091
30	162	159	152	146	112	142	-2091	2091
40	16	10	16	6	2	-28	-2091	2091
50	-221	-244	-308	-228	-231	-241	-2091	2091
60	-471	-464	-454	-444	-448	-454	-2091	2091

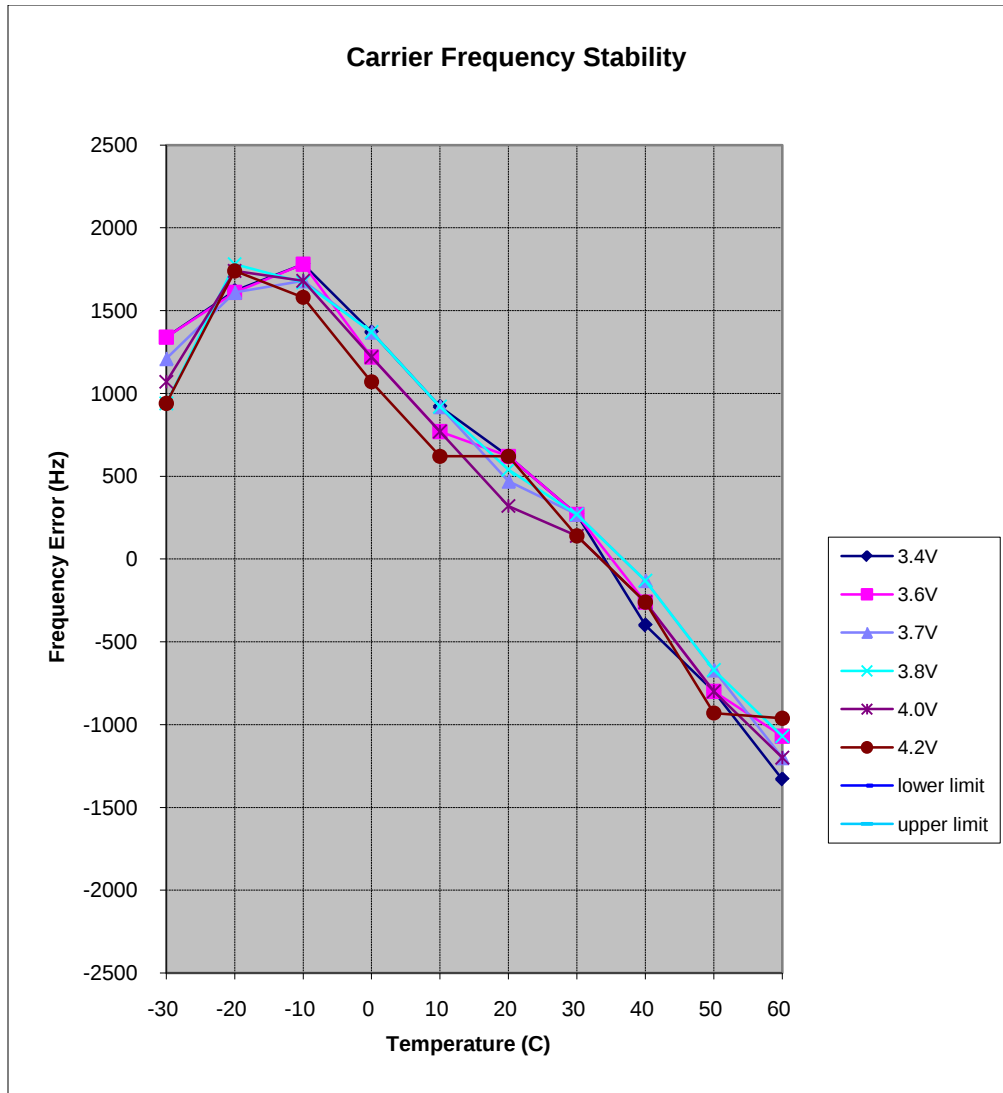


Operation Mode:	EVDO, Rev A, RETAP rate = 1536kbps	Channel:	600
Tx Frequency:	1880MHz	Voltage:	3.8v (3.4v ~ 4.2v)
Limit:	$\pm 2.5\text{ppm } (\pm 4700\text{Hz})$		

Measured with a Agilent Spectrum Analyzer

Carrier Frequency Reference at 25 Degrees C: 1,880,026310
Hz

	transmitter carrier frequency (MHz)						specification	
temp. (C)	3.4V	3.6V	3.7V	3.8V	4.0V	4.2V	lower limit	upper limit
-30	1340	1340	1210	940	1070	940	-4700	4700
-20	1620	1610	1610	1780	1740	1740	-4700	4700
-10	1780	1780	1680	1670	1680	1580	-4700	4700
0	1370	1220	1370	1370	1220	1070	-4700	4700
10	920	770	920	920	770	620	-4700	4700
20	620	620	470	540	320	620	-4700	4700
30	270	270	270	270	140	140	-4700	4700
40	-400	-260	-130	-130	-260	-260	-4700	4700
50	-800	-800	-670	-670	-800	-930	-4700	4700
60	-1330	-1070	-1200	-1070	-1200	-962	-4700	4700



9. Test Equipment and Firmware

The following test equipments were used.

Model	Manufacturer	Description	S/N	Cal Date	Cal Due Date
8960 Series 10 E5515C	Agilent	Wireless Communication Set	K113695	7/21/2010	7/21/2011
E4440A PSA Series	Agilent	Spectrum Analyzer	K130220	8/25/2010	8/25/2011
Compaq 6910p	Hewlett Packard	Notebook Computer	P132198	N/R	N/R
Model 105	TestEquity	Temperature Chamber	K162535	10/26/2010	10/26/2011
8542C	Gigatronics	Universal Power Meter	K44846	9/01/2011	9/01/2012
80601A	Gigatronics	Power Sensor	X18310	1/11/2010	1/11/2011

The firmwares built in the 8960 are as follows, and have been validated to support the testing for all technologies implemented in IEM.

Call Box	Technology	Firmware Rev
8960	EVDO	A.11.12
	1x	B.16.12