



FCC TEST REPORT

Product Name	Telematics Terminal
Model Name	Gen7.05L, Gen7.1L
Applicant	LG Electronics Inc.
FCC ID	BEJLTGEN71L

ESTECH CO., LTD

Rm. 1015 World Venture Center, 426-5 Gasan-dong, Geumcheon-gu,
Seoul, 153-803, Korea. Tel:82-2-867-3201, Fax:82-2-867-3204



FCC Test Report

Report Number	ESTR0704-003			
Applicant	Company Name	LG Electronics Inc.		
	Address	16 Woomyeon-dong, Seocho-gu, Seoul 137-724, Korea		
Product	Product Name	Telematics Terminal		
	Model No.	Gen7.05L, Gen7.1L	Manufacturer	LG Electronics Inc.
	Serial No.	NONE	Country of origin	KOREA
Other	Issued Date	2007-04-03	Tested Date	2007-03-15 ~ 2007-04-03
	Test Result			
Pass				
Standard	FCC PART 24 Subpart E & PART 22 Subpart H			
Tested by	S.R. Kim/ Engineer (Signature)			
Approved by	Jay Kim/ Engineering Manager (Signature)			
ESTECH CO., LTD Rm. 1015 World Venture Center, 426-5 Gasan-dong, Geumcheon-gu, Seoul, 153-803, Korea. Tel:82-2-867-3201, Fax:82-2-867-3204				
o This is certified that the above mentioned products have been tested for the sample provided by client. o No part of this document may not be duplicated or reproduced by any means without the express written permission of Estech Co., Ltd.				



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1. General Information

1.1 EUT Description

FCC ID	BEJLTGEN71L
Product Name	Telematics Terminal
Model Name	Gen7.05L, Gen7.1L
Frequency	Tx :1851.25 ~ 1908.75MHz(PCS), 824.70 ~ 848.31MHz(Cellular), 824.04 ~ 848.97MHz(AMPS)
	Rx :1931.25 ~ 1988.75MHz(PCS), 869.70 ~ 893.31MHz(Cellular), 869.04 ~ 893.97MHz(AMPS)
Channel	PCS(25/600/1175), Cellular(1013/363/777), AMPS(991/384/799)
Modulation Type	CDMA, FM
Power Rating	12VDC(9 ~ 16VDC)



2. Laboratory Information

2.1 Laboratory Name Estech Co., Ltd.

2.2 Location

Head Office Rm. 1015, World Venture Center II, 426-5 Gasan-dong
Geumcheon-gu, Seoul, 153-803. Korea.

EMC Lab(Ichon) 58-1, Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea

EMC Lab(Yanggi) 97-1, Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

2.3 Quality System Accredited by KOLAS(ISO/IEC 17025)

2.4 Major Accredited Mark



3. Summary of Test Results

Test Item	Standard	Result
RF Output Power	Part 22 & 24	PASS
Occupied Bandwidth		PASS
Spurious and Harmonic Emission at Antenna Terminal		PASS
Field Strength of Spurious Radiation		PASS
Frequency stability		PASS

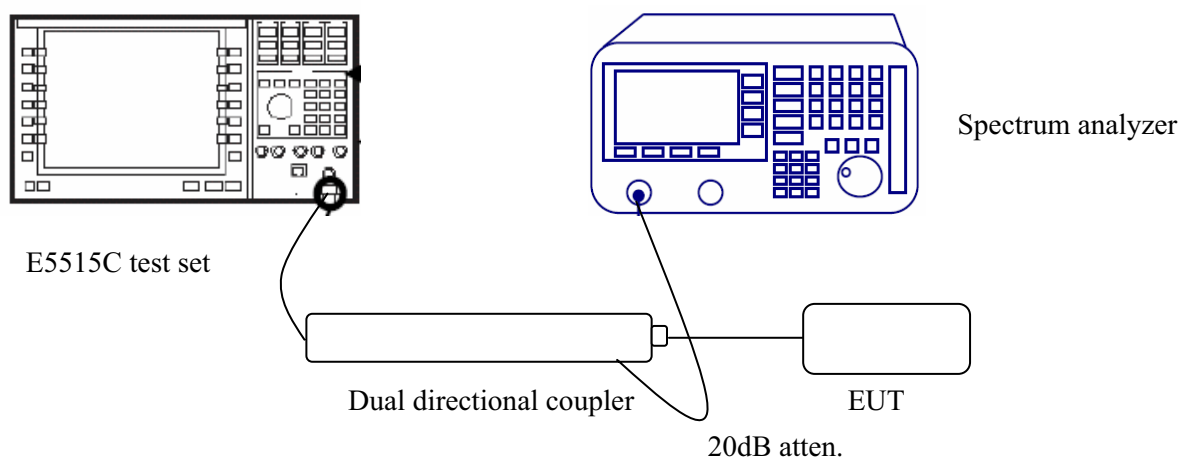
4. RF Output Power

4.1 Test Equipments& configuration

The following test equipments are used during tests

Equipment	Manufacturer	Model	Cal. Due Date
Dual Directional Coupler	HP	778D	2008-03-02
Wireless Communications Test Set	Agilent	E5515C	2008-02-07
Spectrum Analyzer	Agilent	E4407B	2008-03-02
DC Power Supply	INTERACT	AK-3010	2008-03-02

<Fig. 1>



4.2.1 Test Results (PCS)

Ch No.	Freq (MHz)	Conducted Output Power(dBm)
25	1851.25	23.50
600	1880.00	24.03
1175	1908.75	23.96



4.2.2 Test Results (Cellular)

Ch No.	Freq (MHz)	Conducted Output Power(dBm)
1013	824.70	23.80
363	835.89	23.65
777	848.31	24.01

4.2.3 Test Results (AMPS)

Ch No.	Freq (MHz)	Conducted Output Power(dBm)
991	824.04	28.97
384	836.52	28.99
799	848.97	28.96



5. Occupied Bandwidth

5.1 Test Procedure

- The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% of the Emission bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.
- The audio signal generator is adjusted to 1kHz. The output level is set to ± 6 kHz deviation. With the level constant, the frequency is set to 2500Hz. Then the audio signal level is increased by 16dB. The occupied bandwidth data is obtained for the SAT(Supervisory Audio Tone), ST(Signaling Tone), WBD(Wideband data). The results are shown on the attached graphs.

5.2 Test Equipments

The following test equipments are used during tests

Equipment	Manufacturer	Model	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	2008-03-02
Dual Directional Coupler	HP	778D	2008-03-02
Wireless Communications Test Set	Agilent	E5515C	2008-02-07
DC Power Supply	INTERACT	AK-3010	2008-03-02

5.3 Test Results

(PCS)

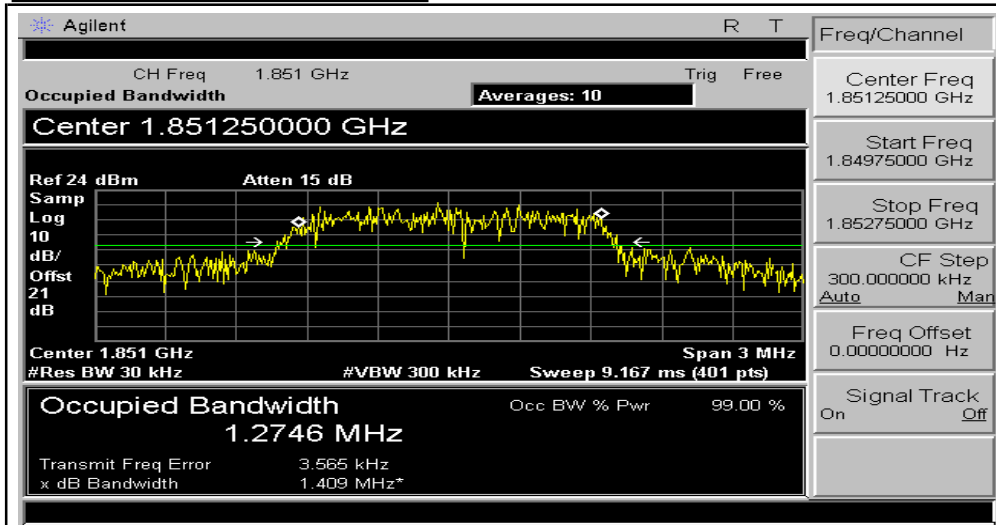
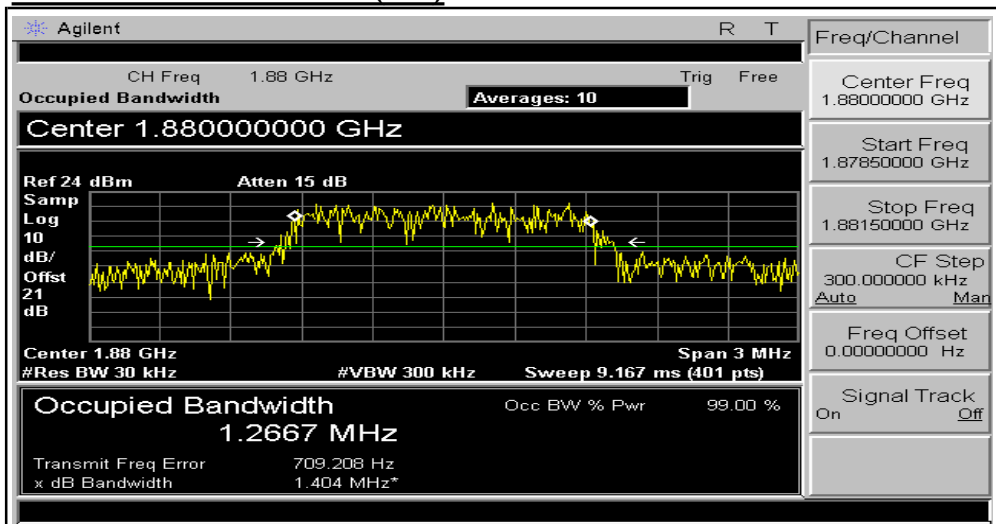
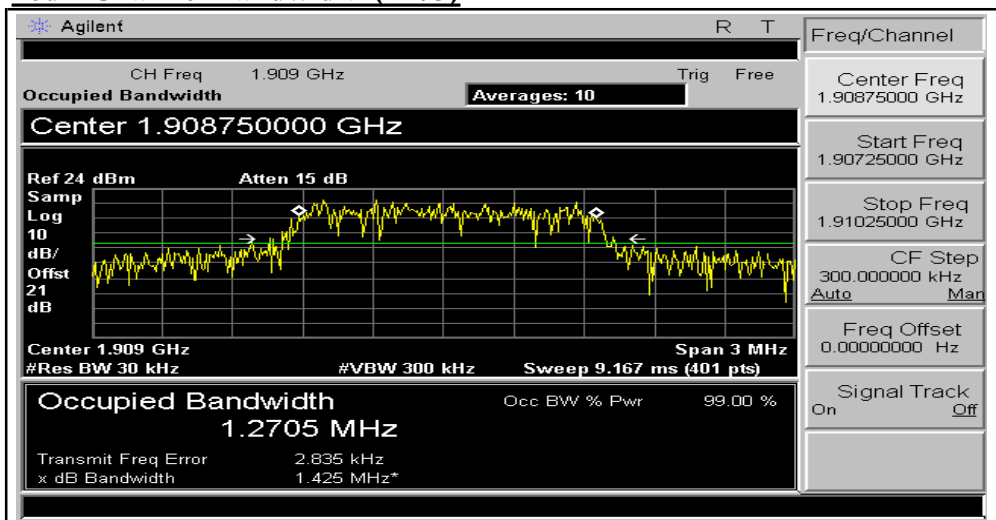
Channel	Frequency(MHz)	26dB Bandwidth(kHz)
25	1851.25	1.41
600	1880.00	1.40
1175	1908.75	1.43

(Cellular)

Channel	Frequency(MHz)	26dB Bandwidth(kHz)
1013	824.70	1.39
363	835.89	1.40
777	848.31	1.41

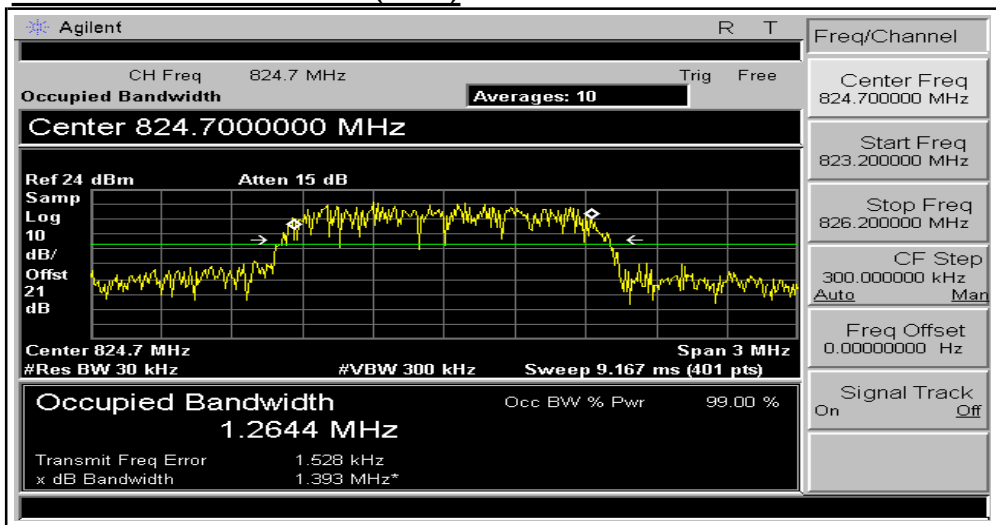
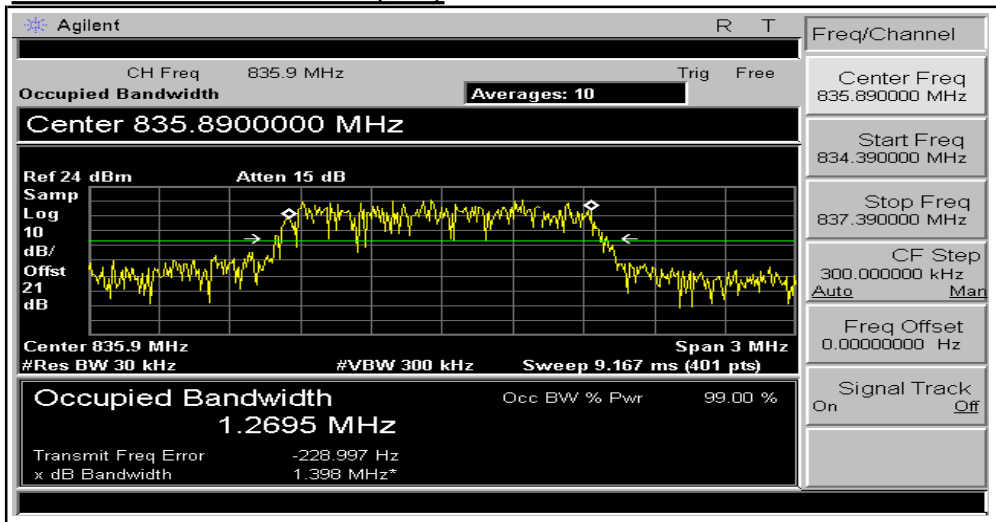
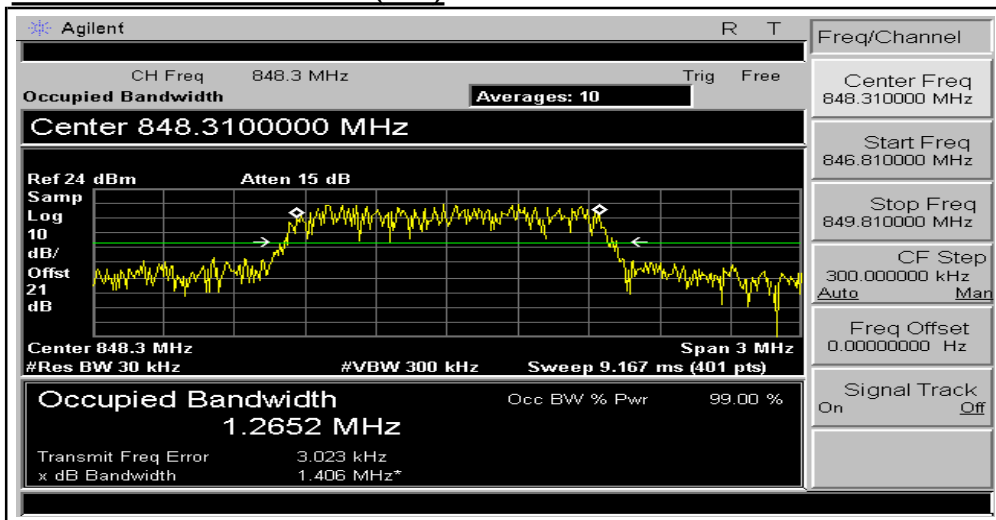


5.4 Test Plot

PCS26dB Channel Bandwidth(25)26dB Channel Bandwidth(600)26dB Channel Bandwidth(1175)



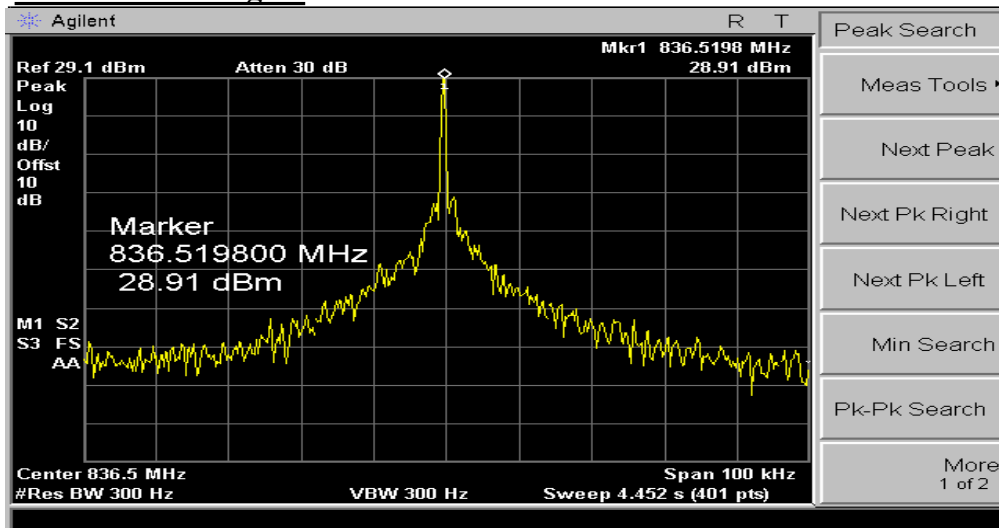
Cellular

26dB Channel Bandwidth(1013)**26dB Channel Bandwidth(363)****26dB Channel Bandwidth(777)**

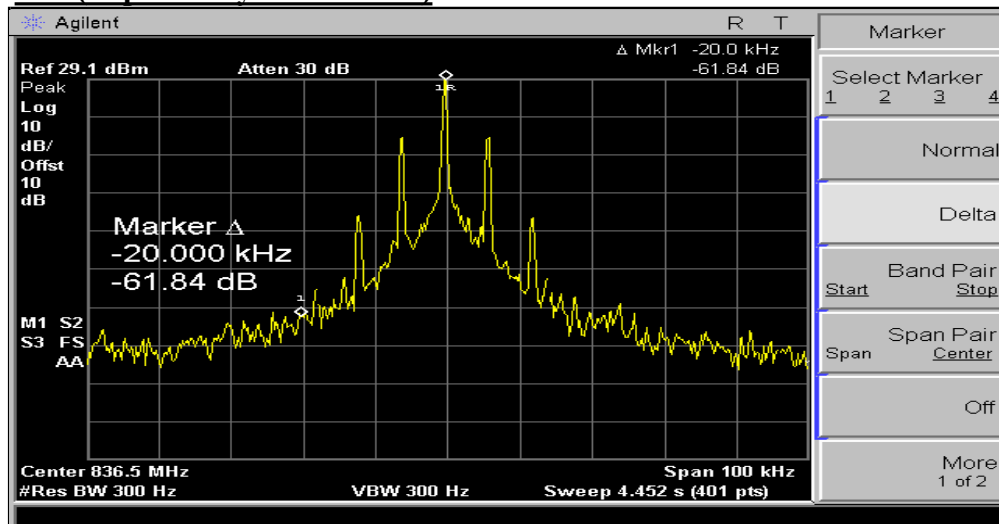


AMPS

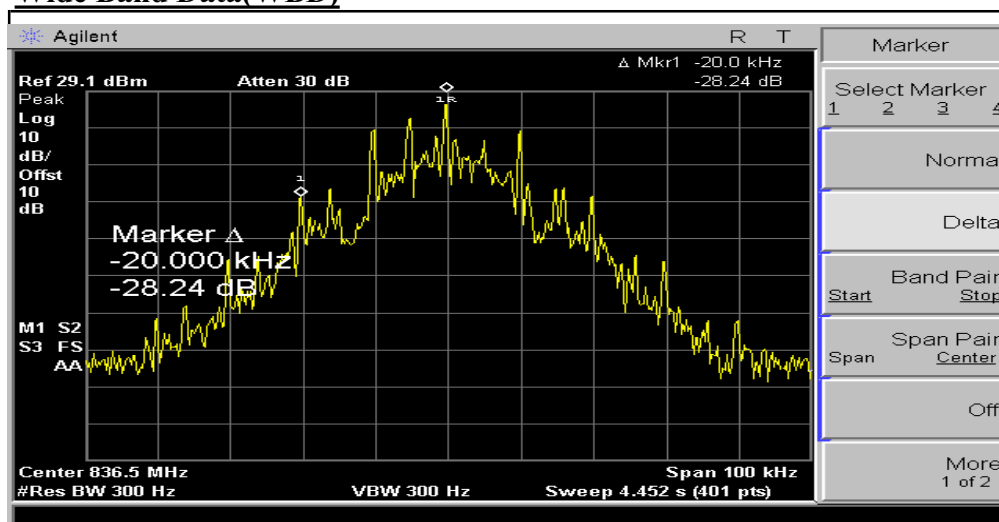
Un-modulated Signal



SAT(Supervisory Audio Tone)

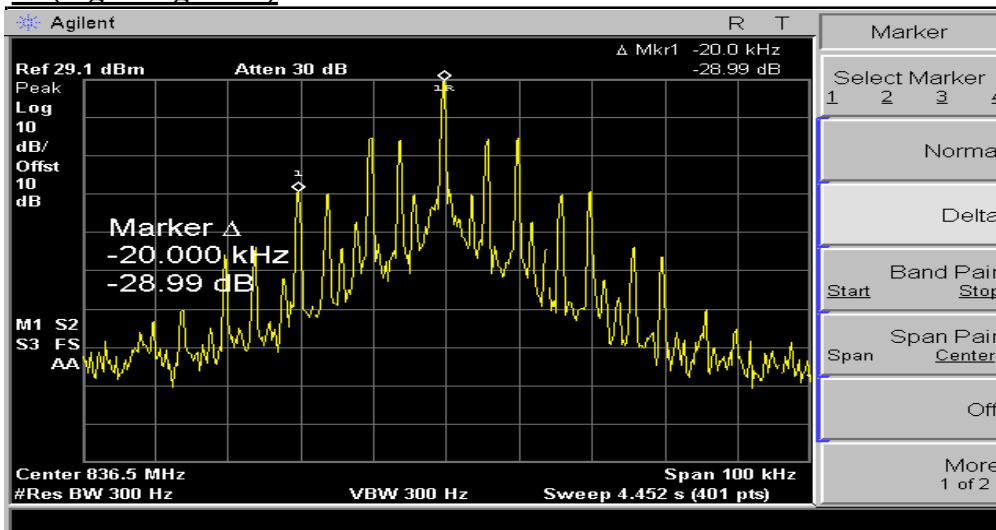


Wide Band Data(WBD)

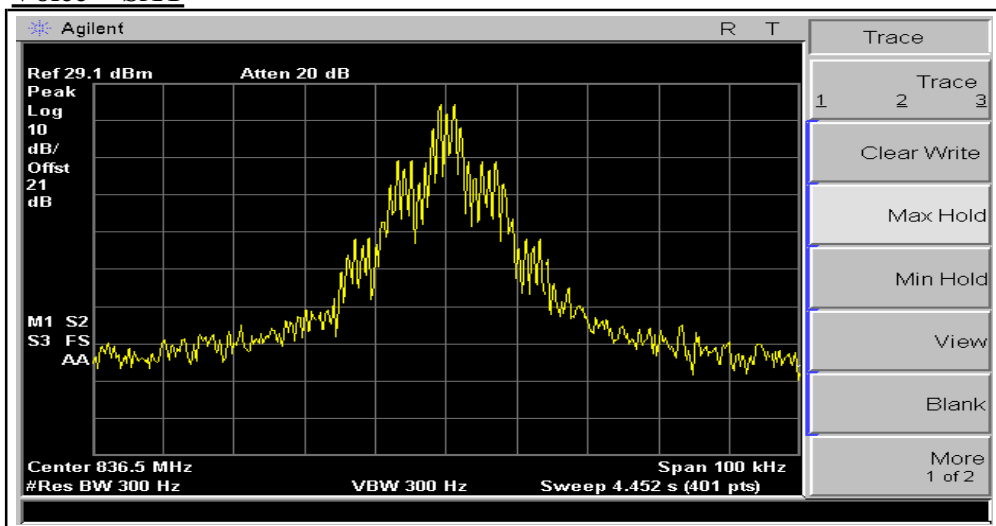




ST(Signaling Tone)



Voice + SAT





6. Spurious and Harmonic Emission at Antenna Terminal

6.1 Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to 10GHz. Set the RES BW to 1% of the emission bandwidth to show compliance with the -13dBm, limit, in the 1MHz bands immediately outside and adjacent to the top and bottom edges of the frequency block.

For the Out-of-Band measurements a 1MHz RBW was used to scan from 10MHz to 10xfo of the fundamental carrier for all frequency block. A display line was placed at -13dBm to show compliance for spurious, and harmonics.

22.917(f): Mobile emission in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitter operated must be attenuated to a level not to exceed -80dBm at the transmit antenna connector.

6.2 Test Equipments

The following test equipments are used during tests

Equipment	Manufacturer	Model	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	2008-03-02
Dual Directional Coupler	HP	778D	2008-03-02
Wireless Communications Test Set	Agilent	E5515C	2008-02-07
DC Power Supply	INTERACT	AK-3010	2008-03-02

6.3.1 Test Results (PCS)

CDMA(Spurious Emission: Band Edge)

Channel	Frequency	Result	Limit	Margin
25	1851.25	-19.12	-13.00	6.12
1175	1908.75	-17.14	-13.00	4.14

CDMA (Spurious Emission: Out of Band)

Channel	Frequency	Result	Limit	Margin
25	1851.25	-31.62	-13.00	18.62
600	1880.00	-31.85	-13.00	18.85
1175	1908.75	-31.95	-13.00	18.95



6.3.2 Test Results (Cellular)

CDMA(Spurious Emission: Band Edge)

Channel	Frequency	Result	Limit	Margin
1013	824.70	-15.89	-13.00	2.89
777	848.31	-14.25	-13.00	1.25

CDMA (Spurious Emission: Out of Band)

Channel	Frequency	Result	Limit	Margin
1013	824.70	-32.32	-13.00	19.32
363	835.89	-32.30	-13.00	19.30
777	848.31	-30.99	-13.00	17.99

6.3.3 Test Results (AMPS)

FM (Spurious Emission: Out of Band)

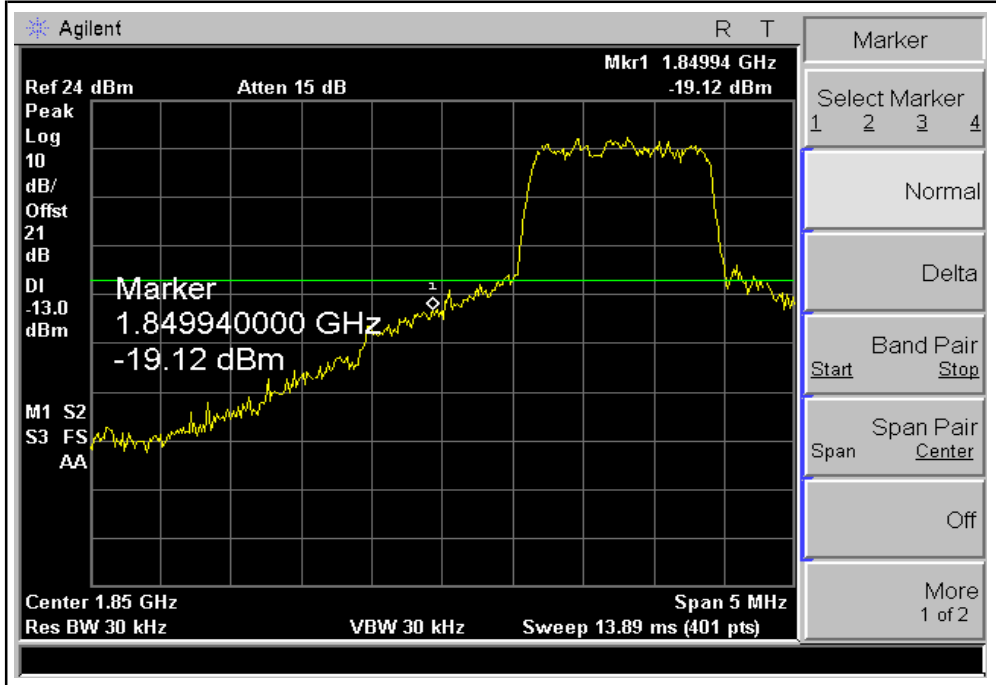
Channel	Frequency	Result	Limit	Margin
991	824.04	-25.85	-13.00	12.85
384	836.52	-26.96	-13.00	13.96
799	848.97	-26.78	-13.00	13.78



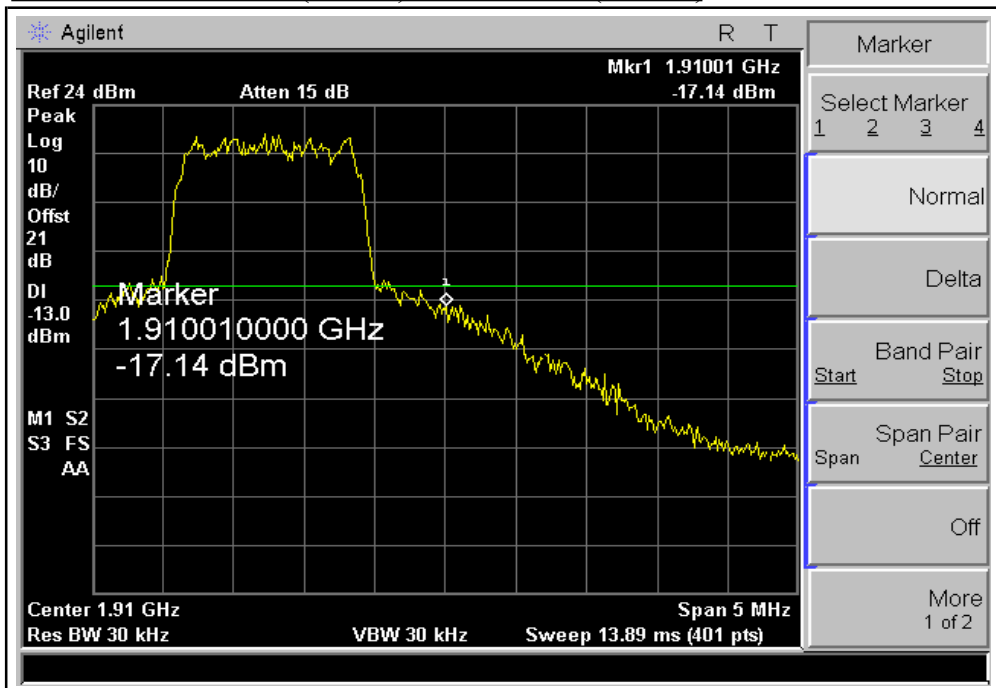
6.5 Test Plot

PCS

PLOTS OF EMISSION (CDMA): BAND EDGE(Ch25)



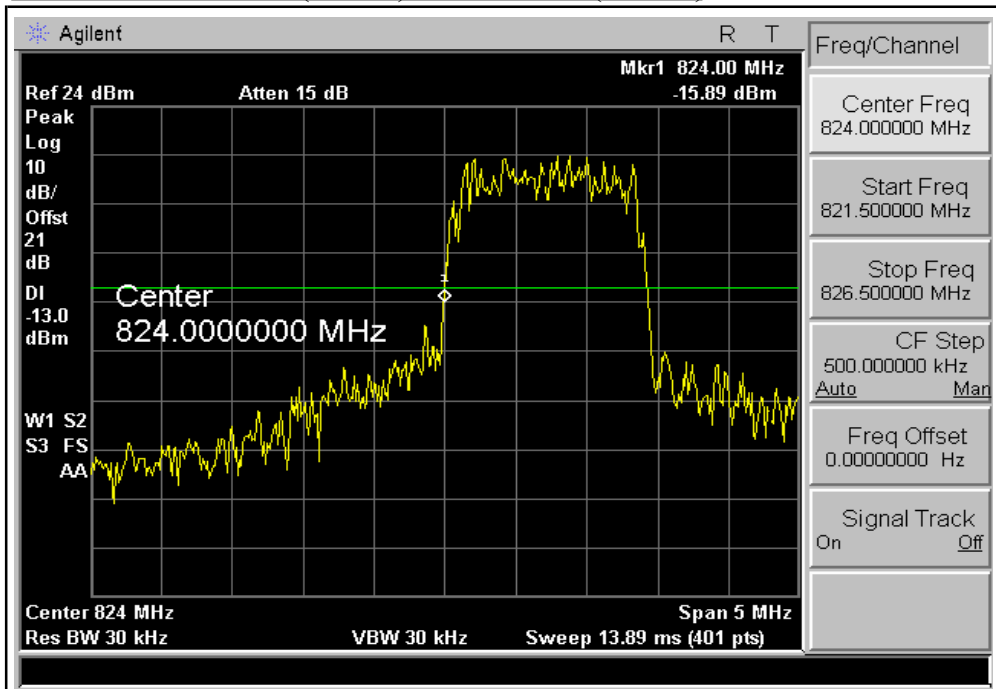
PLOTS OF EMISSION (CDMA): BAND EDGE(Ch1175)



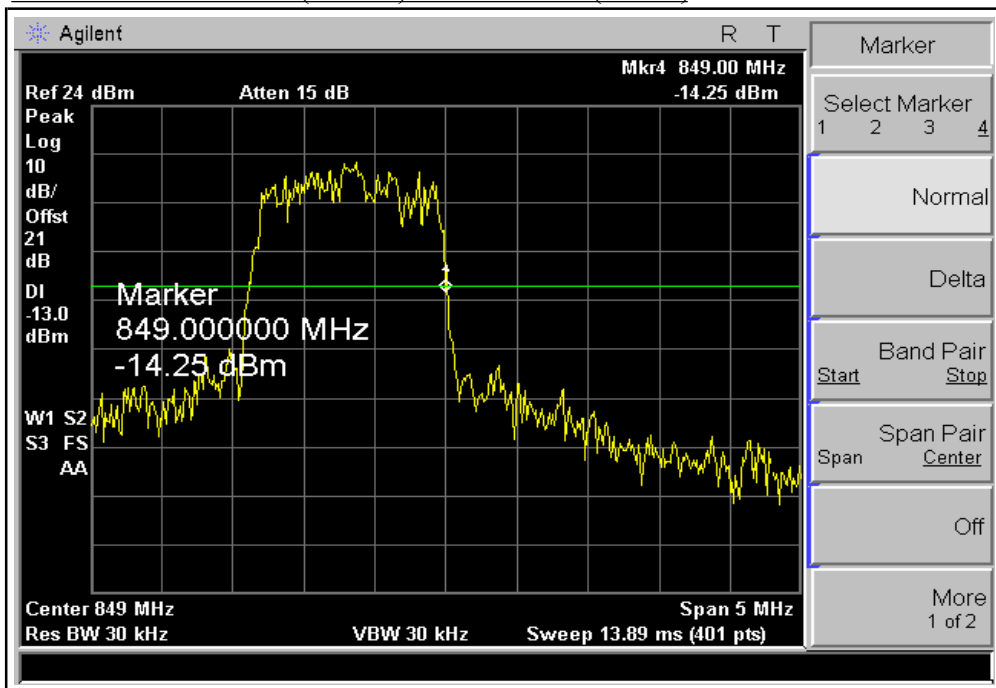


Cellular

PLOTS OF EMISSION (CDMA): BAND EDGE(Ch1013)



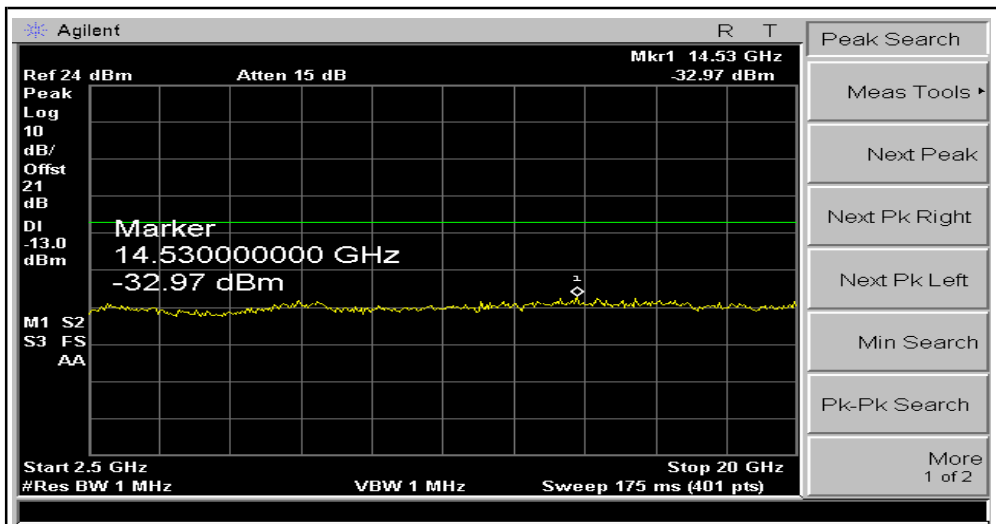
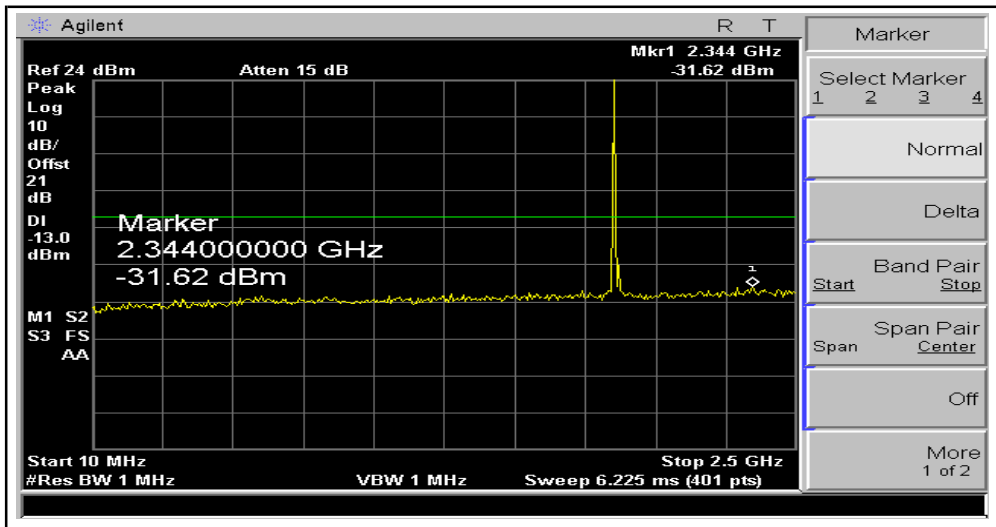
PLOTS OF EMISSION (CDMA): BAND EDGE(Ch777)



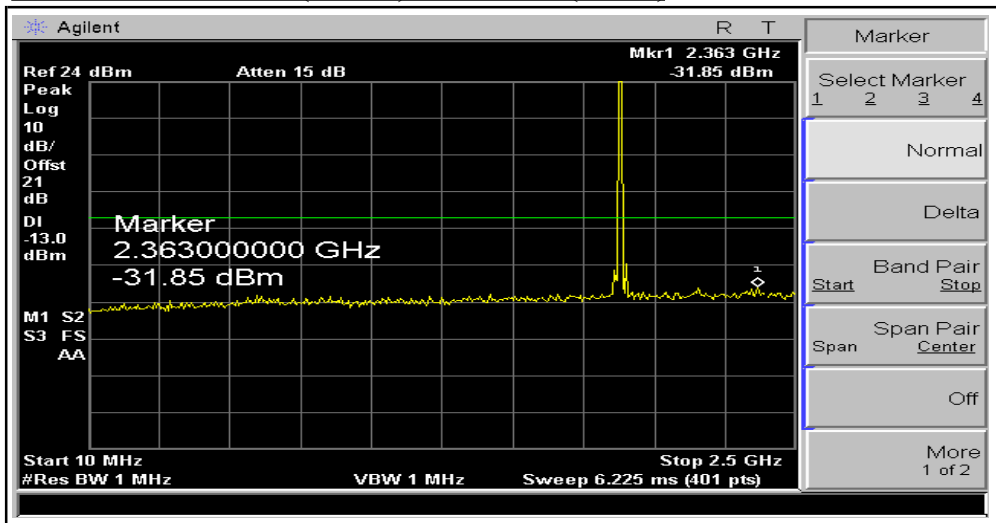


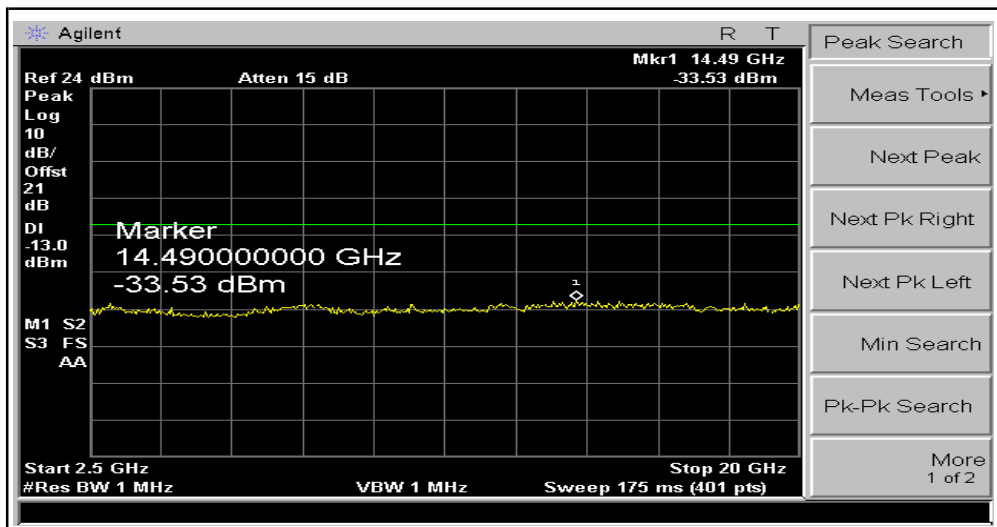
PCS

PLOTS OF EMISSION (CDMA): Out of Band(Ch25)

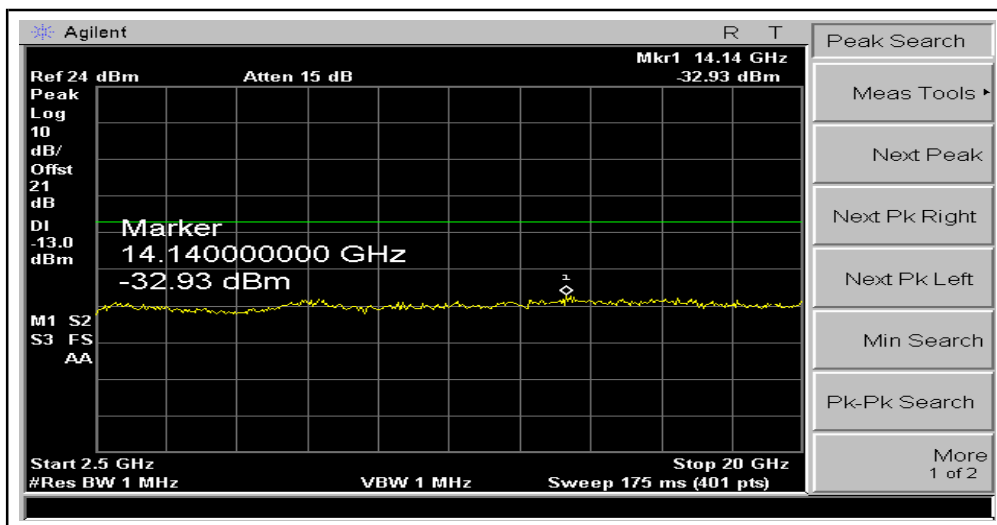
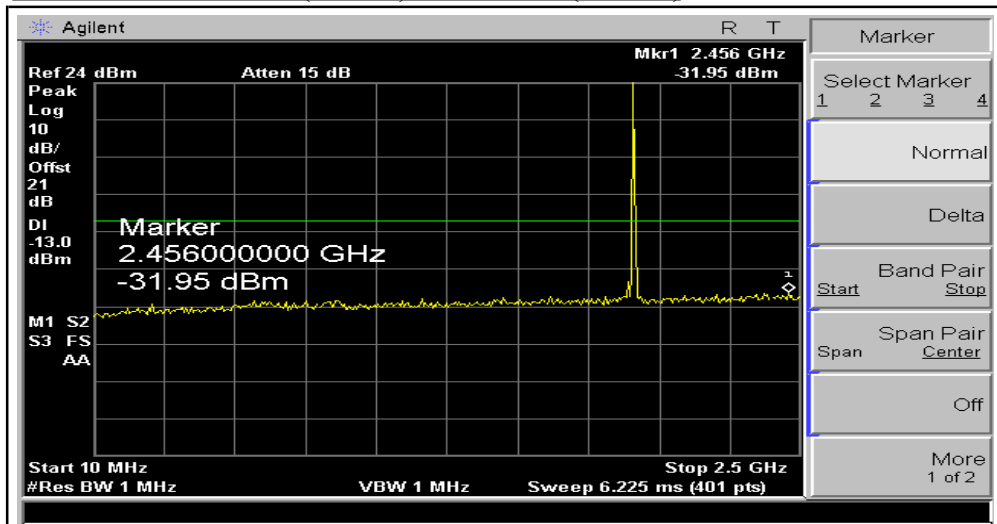


PLOTS OF EMISSION (CDMA): Out of Band(Ch600)





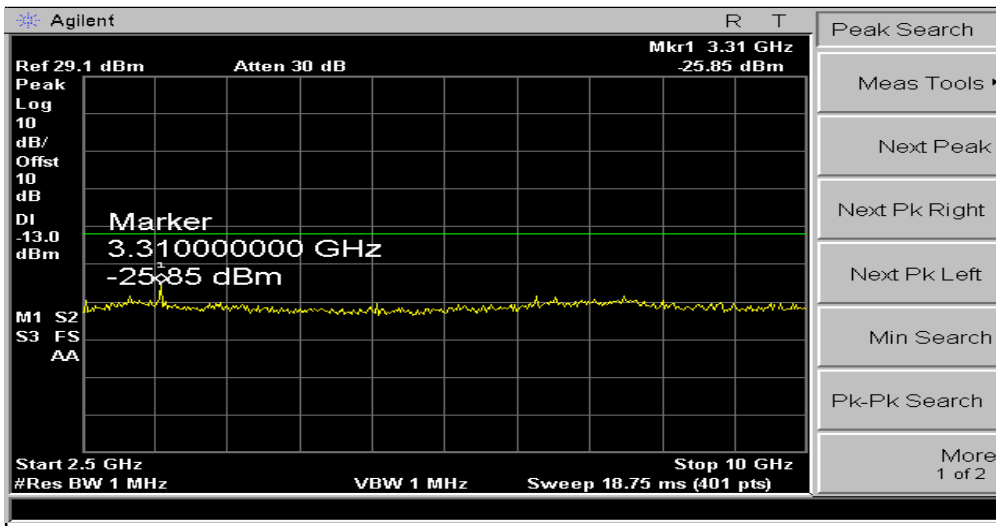
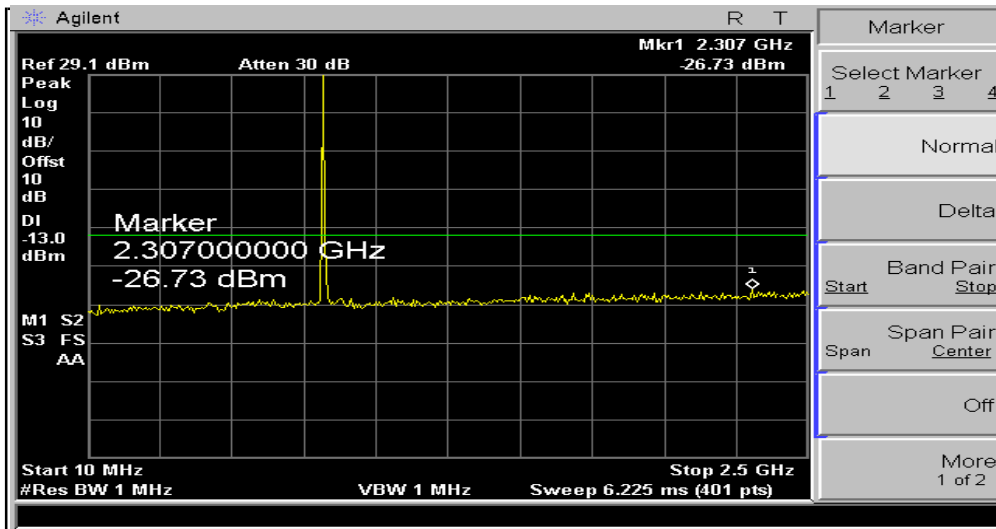
PLOTS OF EMISSION (CDMA): Out of Band(Ch1175)



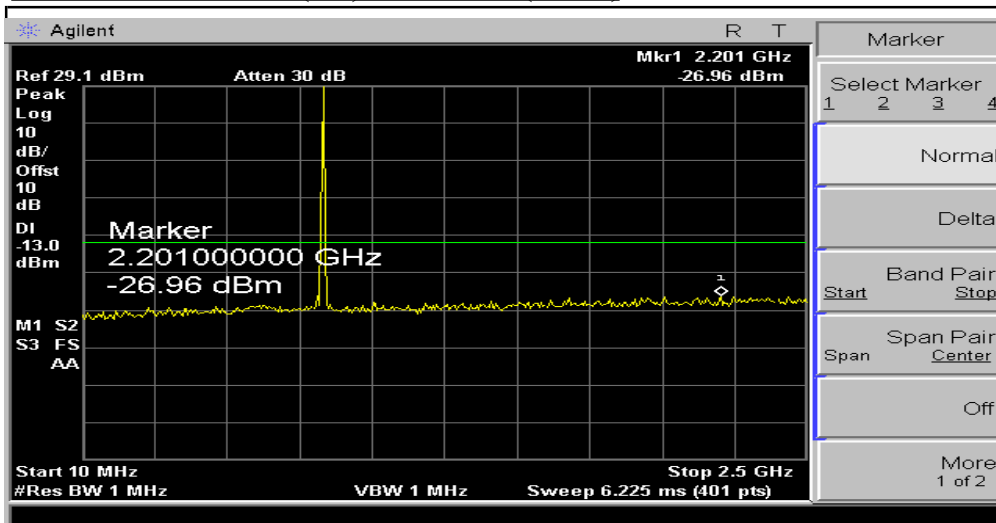


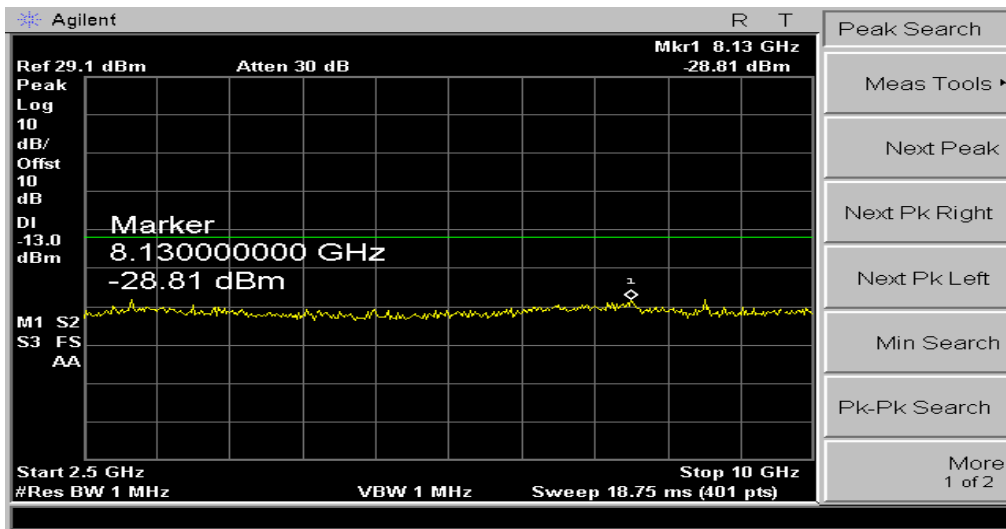
AMPS

PLOTS OF EMISSION (FM): Out of Band(Ch991)

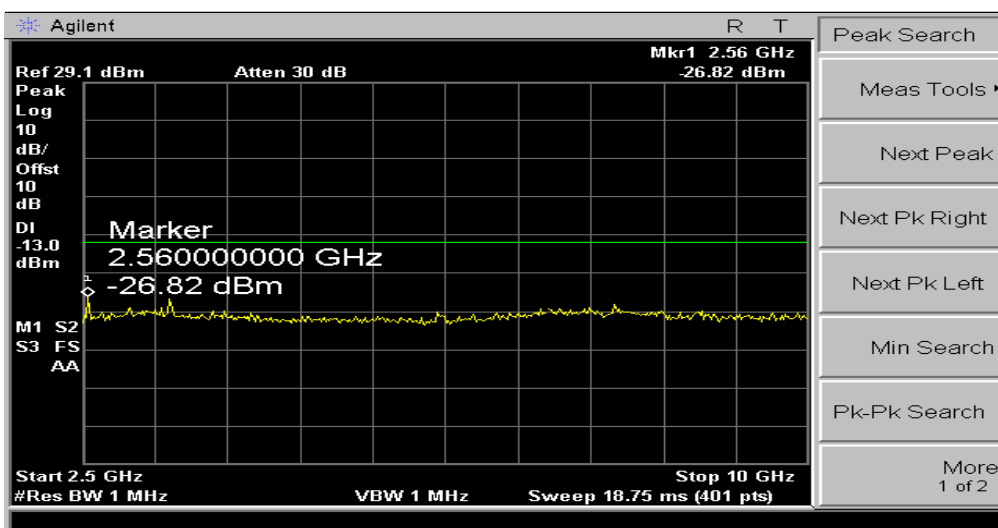
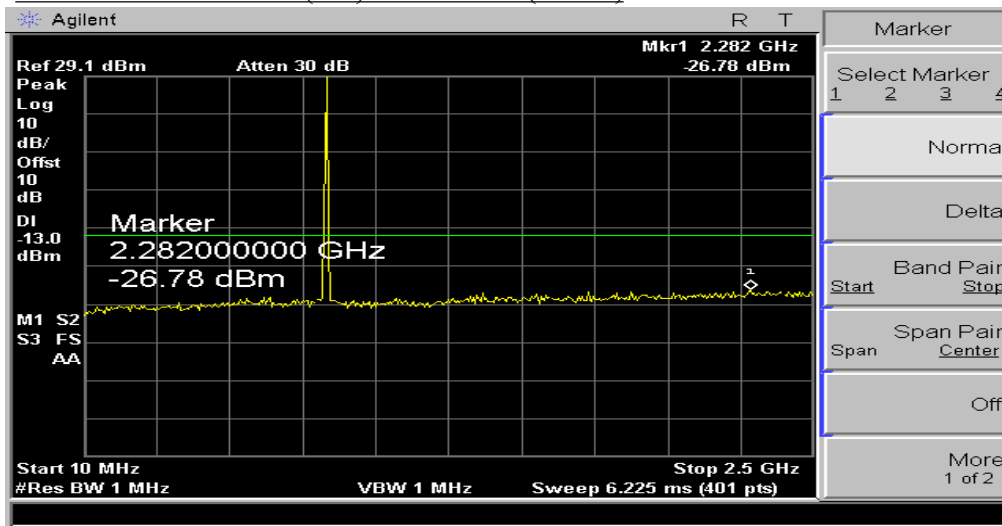


PLOTS OF EMISSION (FM): Out of Band(Ch384)





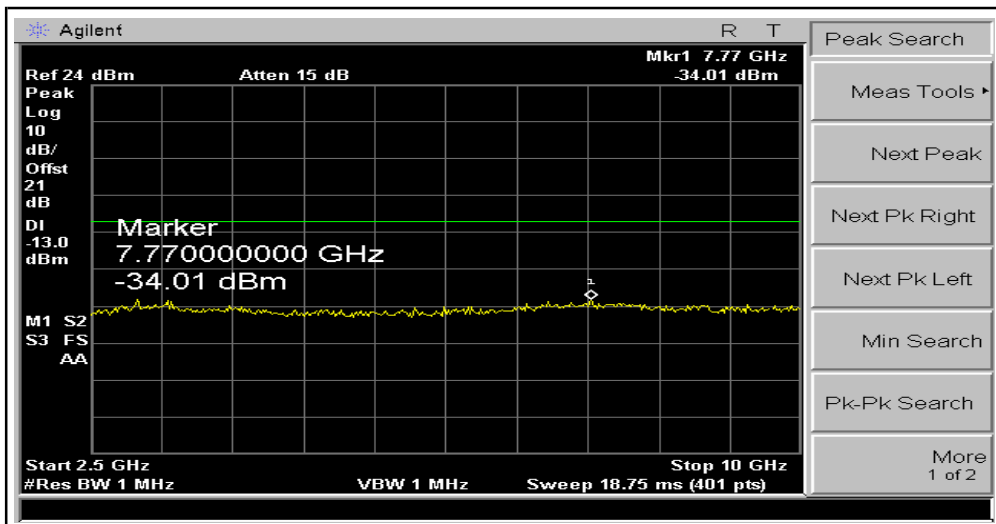
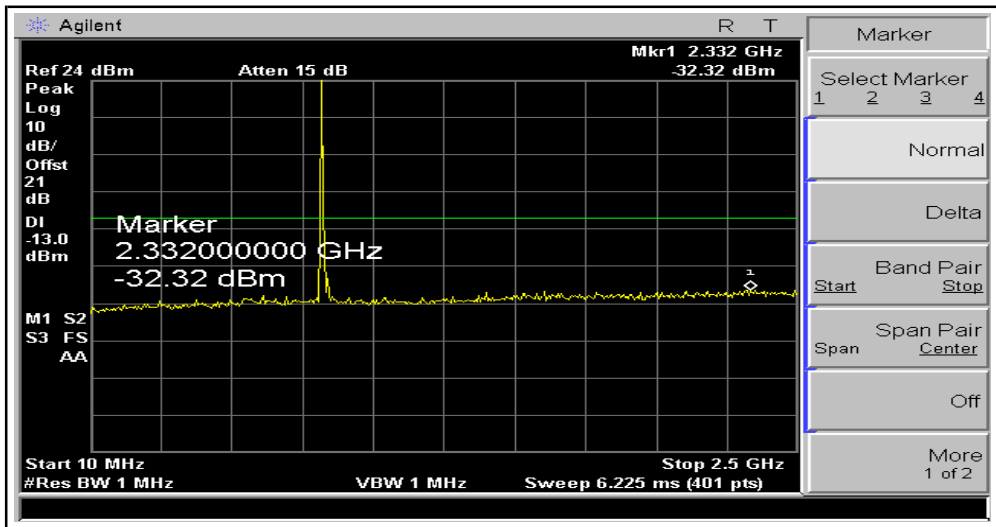
PLOTS OF EMISSION (FM): Out of Band(Ch799)



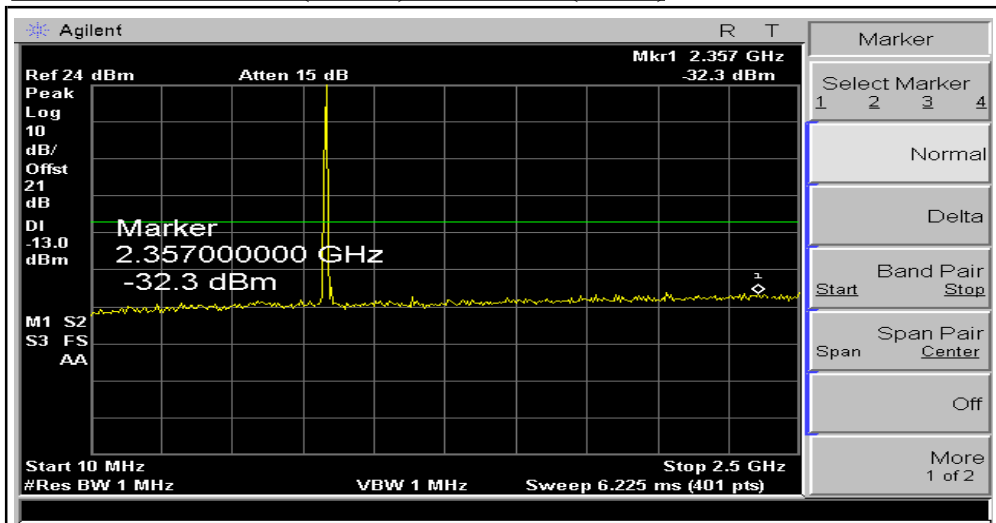


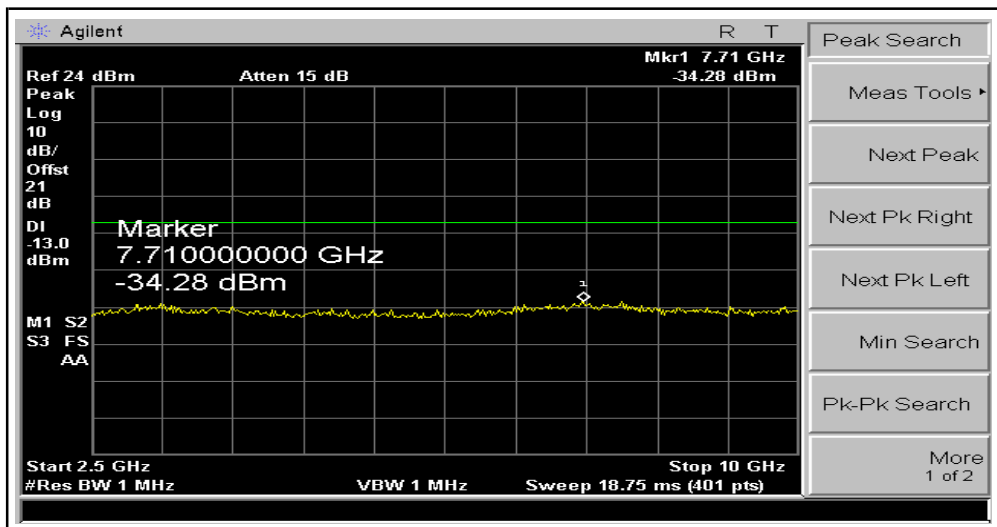
Cellular

PLOTS OF EMISSION (CDMA): Out of Band(Ch1013)

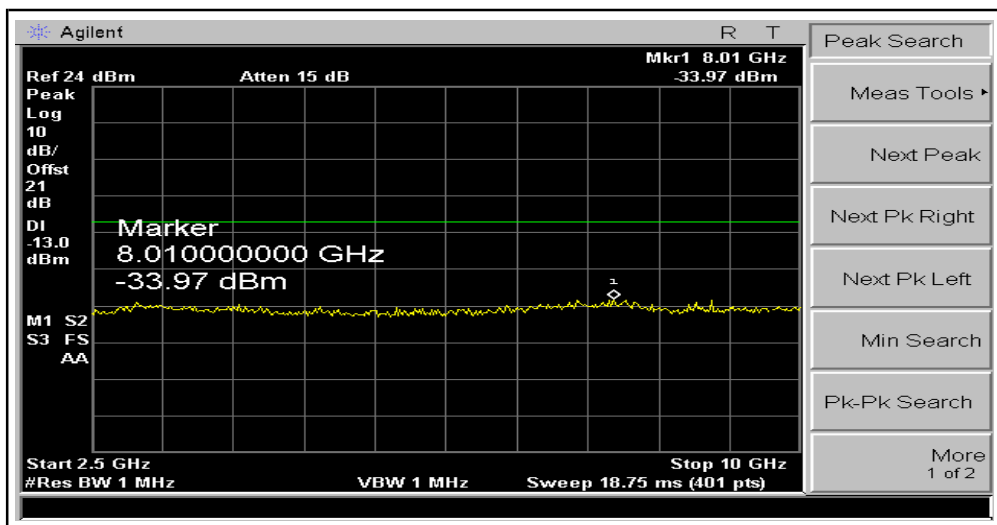
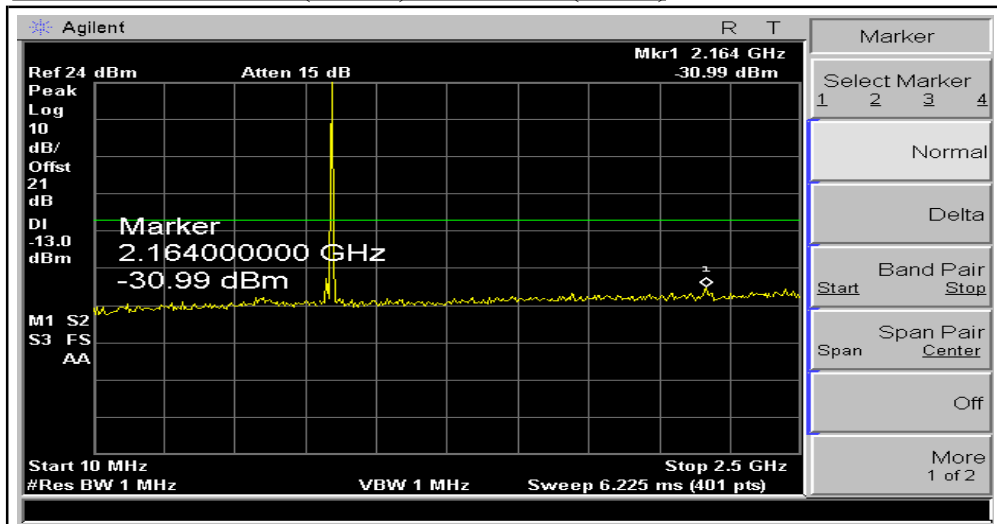


PLOTS OF EMISSION (CDMA): Out of Band(Ch363)



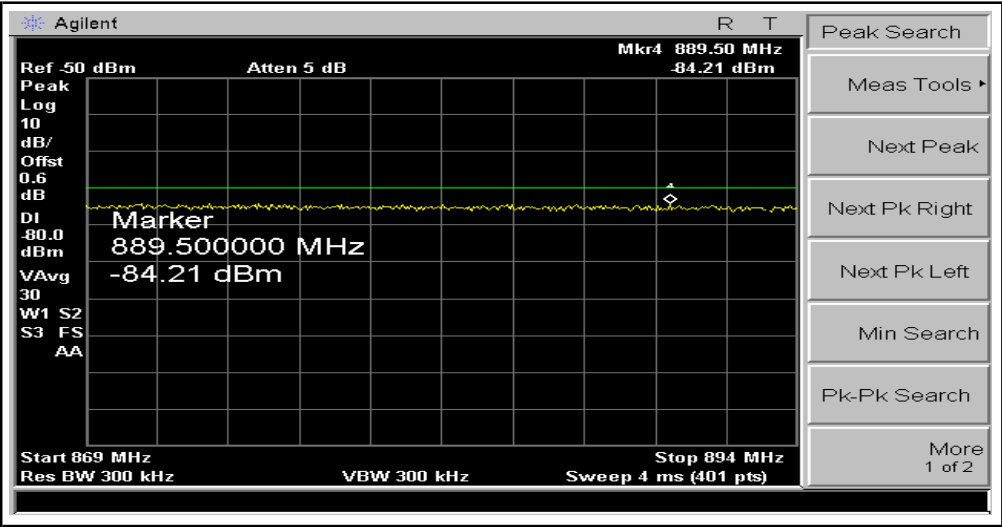


PLOTS OF EMISSION (CDMA): Out of Band(Ch777)





MOBILE EMISSION IN BASE FREQUENCY RANGE (RX BAND)





7. Field Strength of Spurious Radiation

7.1 Test Procedure

Radiation and harmonic emission are measured outdoors at our 3 meters test range. The equipment under test is placed on a wooden turntable 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer (or receiver). A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7.2 Test Equipments

The following test equipments are used during tests

Equipment	Manufacturer	Model	Cal. Due Date
Receiver	Rohde & Schwarz	ESPI7	2007-08-24
Signal Generator	HP	83620B	2007-09-07
Pre Amplifier	SONOMA INSTRUMENT	310N	2007-09-26
Wireless Communications Test Set	Agilent	E5515C	2008-02-07
Horn Antenna	SCHWARZBECK	BBHA 9120 D	2007-05-01
DC Power Supply	INTERACT	AK-3010	2008-03-02

* The spurious emission wasn't detected from 3rd harmonics.



7.3 Test Results

PCS

CDMA(Ch 25)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		EIRP(dBm)		Limit(dBm)	Polarity
		AG(dBi)	CL(dB)	SG Reading	Result		
3702.50	46.83	12.69	4.84	-58.13	-50.28	-13.00	V
5553.75	49.17	13.15	6.00	-49.23	-42.08	-13.00	V

CDMA(Ch 600)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		EIRP(dBm)		Limit(dBm)	Polarity
		AG(dBi)	CL(dB)	SG Reading	Result		
3760.00	49.67	12.73	4.84	-56.09	-48.20	-13.00	V
5640.00	49.17	13.14	6.00	-49.43	-42.29	-13.00	V

CDMA(Ch 1175)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		EIRP(dBm)		Limit(dBm)	Polarity
		AG(dBi)	CL(dB)	SG Reading	Result		
3817.50	48.00	12.73	4.84	-55.89	-48.00	-13.00	V
5726.25	49.67	13.11	6.17	-49.26	-42.32	-13.00	V



Cellular

CDMA(Ch 1013)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		ERP(dBm)		Limit(dBm)	Polarity
		AG(dBd)	CL(dB)	SG Reading	Result		
1649.40	55.50	9.78	3.05	-56.72	-49.99	-13.00	V
2474.10	50.83	10.50	4.36	-56.08	-49.94	-13.00	V

CDMA(Ch 363)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		ERP(dBm)		Limit(dBm)	Polarity
		AG(dBd)	CL(dB)	SG Reading	Result		
1671.78	51.83	9.94	3.05	-60.52	-53.63	-13.00	V
2507.67	51.00	10.61	4.36	-56.21	-49.96	-13.00	V

CDMA(Ch 777)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		ERP(dBm)		Limit(dBm)	Polarity
		AG(dBd)	CL(dB)	SG Reading	Result		
1696.62	55.00	10.11	3.05	-56.72	-49.66	-13.00	V
2544.93	54.00	10.68	4.36	-53.01	-46.69	-13.00	V



AMPS

FM(Ch 991)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		ERP(dBm)		Limit(dBm)	Polarity
		AG(dBd)	CL(dB)	SG Reading	Result		
1648.08	59.17	9.77	3.05	-53.02	-46.30	-13.00	V
2472.12	57.83	10.49	4.36	-49.21	-43.08	-13.00	V

FM(Ch 384)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		ERP(dBm)		Limit(dBm)	Polarity
		AG(dBd)	CL(dB)	SG Reading	Result		
1673.04	55.00	9.94	3.05	-57.32	-50.43	-13.00	V
2509.56	52.83	10.62	4.36	-54.21	-47.95	-13.00	V

FM(Ch 799)

Frequency (MHz)	Receiver Reading(dBuV)	Correction Factor(dB)		ERP(dBm)		Limit(dBm)	Polarity
		AG(dBd)	CL(dB)	SG Reading	Result		
1697.94	55.17	10.11	3.05	-56.02	-48.96	-13.00	V
2546.91	68.00	10.68	4.36	-48.61	-42.29	-13.00	V



8. Receiver Spurious Emissions

8.1 Test Procedure

The receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate.

In either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (local oscillator frequency, intermediate frequency or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable and local oscillator frequencies.

8.2 Test Equipments

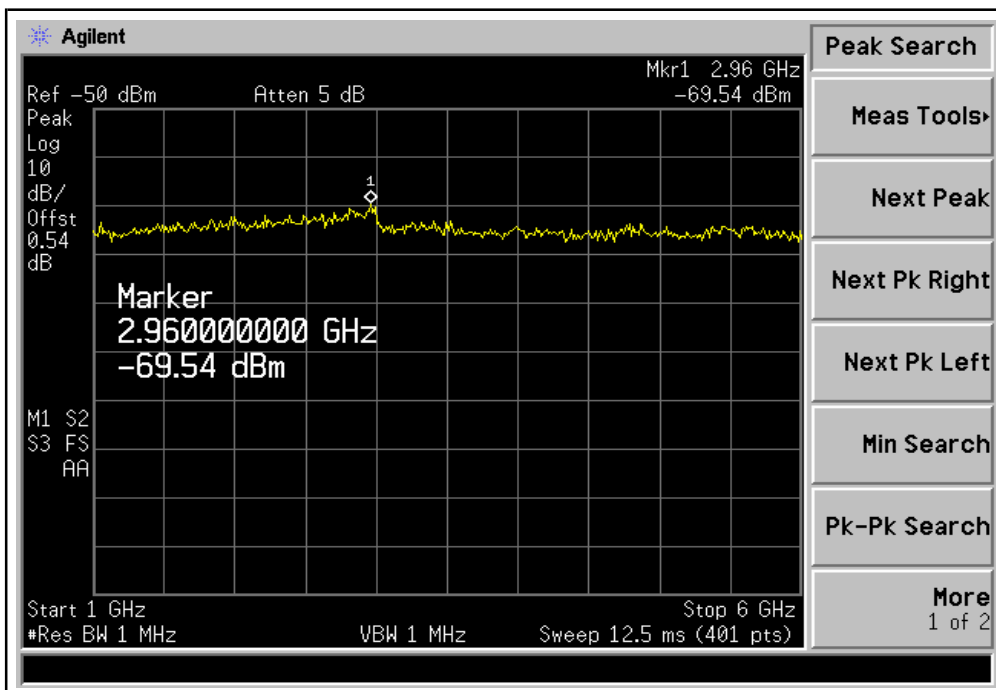
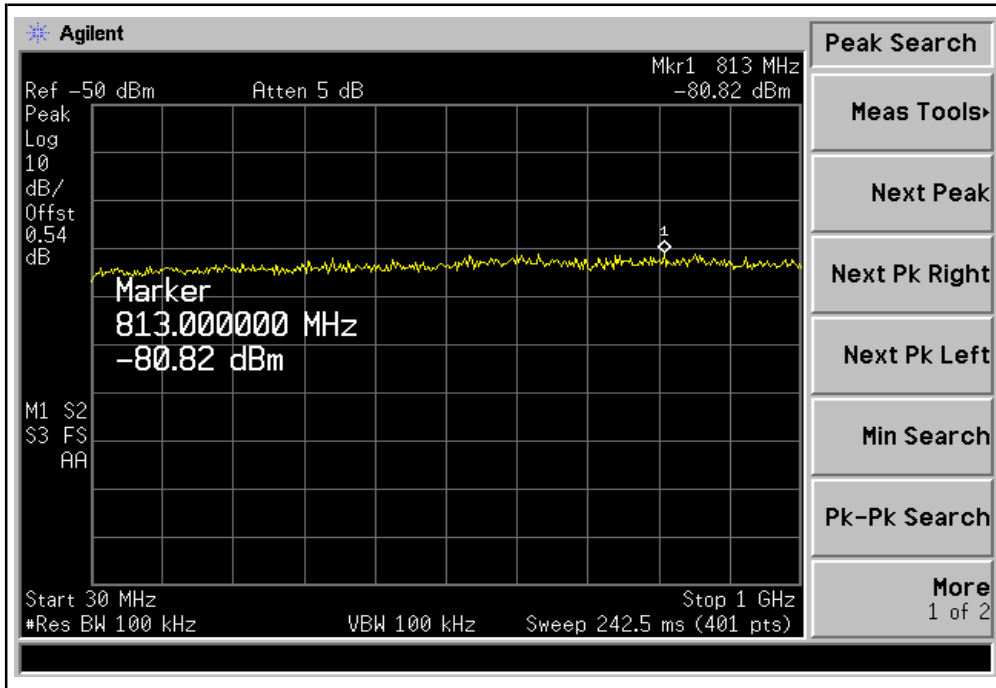
The following test equipments are used during tests

Equipment	Manufacturer	Model	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	2008-03-02
DC Power Supply	INTERACT	AK-3010	2008-03-02
Wireless Communications Test Set	Agilent	E5515C	2008-02-07



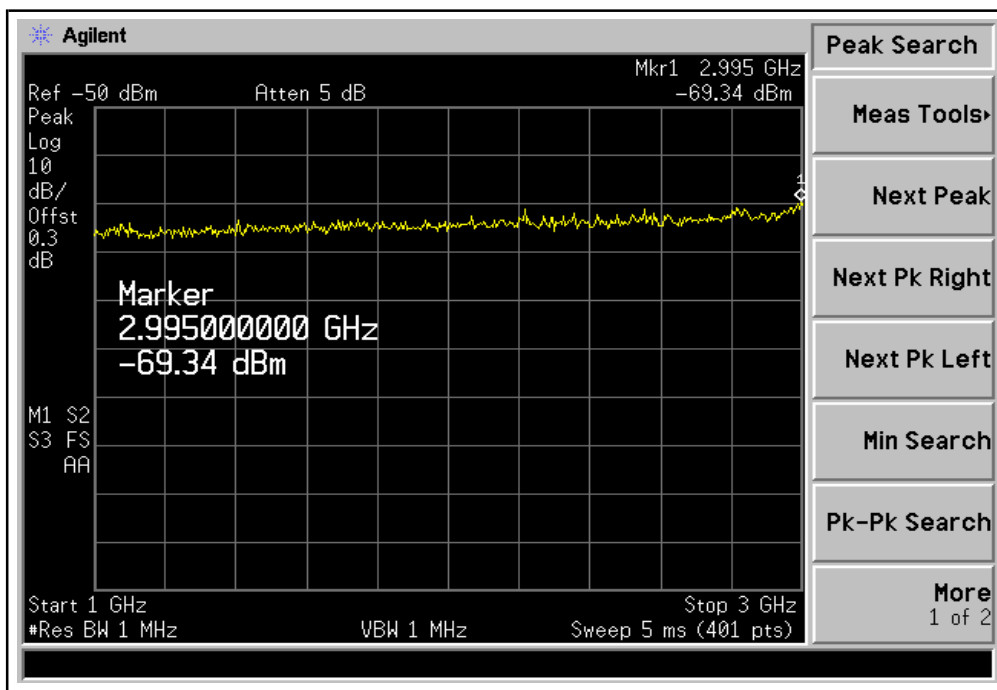
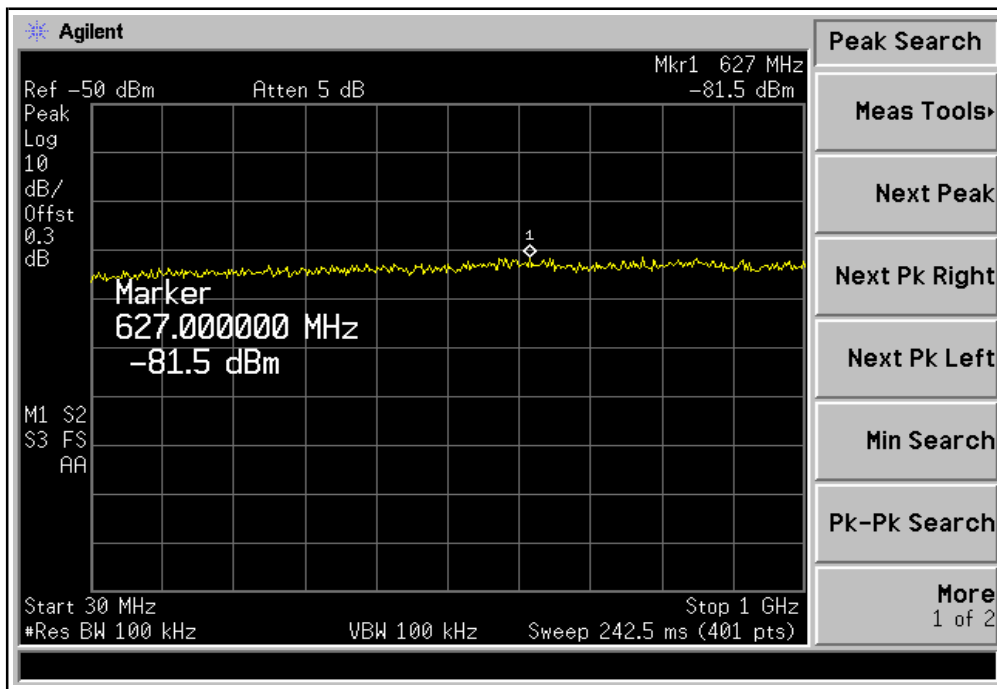
8.3 Test Plot

PCS





Cellular





9. Frequency stability

9.1 Test Procedure

The frequency stability of the transmitter is measured by:

a) Temperature: The temperature is varied from -30 °C to +60 °C using an environmental chamber.

b) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

※ The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ± 2.5 ppm of the center frequency.

9.2 Test Equipments

The following test equipments are used during tests

Equipment	Manufacturer	Model	Cal. Due Date
Wireless Communications Test Set	Agilent	E5515C	2008-02-07
DC Power Supply	INTERACT	AK-3010	2008-03-02
Tem/Hum Chamber	Myung Technology	SM-150-2	2008-03-02



9.3 Test Results

PCS

Operating Frequency :	1,880,000,000
Channel :	600
Reference Voltage :	12.00
Deviation Limit :	0.00025

Voltage (%)	Power (VDC)	Temperature (°C)	Frequency (Hz)	Deviation
100	12.00	+20 °C (Ref)	1,880,000,004	0.000000
100		-30	1,880,000,038	-0.000001
100		-20	1,879,999,970	0.000002
100		-10	1,879,999,964	0.000002
100		0	1,879,999,960	0.000002
100		10	1,879,999,972	0.000002
100		20	1,880,000,004	0.000000
100		25	1,879,999,978	0.000001
100		30	1,879,999,966	0.000002
100		40	1,879,999,970	0.000002
100		50	1,879,999,972	0.000002
100		60	1,879,999,976	0.000001
85	10.2	20	1,879,999,962	0.000002
115	13.8	20	1,879,999,968	0.000002
DC Power Endpoint	9.00	20	1,879,999,960	0.000002



Cellular

Operating Frequency :	835,890,000
Channel :	363
Reference Voltage :	12.00
Deviation Limit :	0.00025

Voltage (%)	Power (VDC)	Temperature (°C)	Frequency (Hz)	Deviation
100	12.00	+20 °C (Ref)	835,890,003	0.000000
100		-30	835,889,970	0.000004
100		-20	835,889,974	0.000003
100		-10	835,889,982	0.000003
100		0	835,889,976	0.000003
100		10	835,889,972	0.000004
100		20	835,890,003	0.000000
100		25	835,889,970	0.000004
100		30	835,889,968	0.000004
100		40	835,889,974	0.000003
100		50	835,889,977	0.000003
100		60	835,889,980	0.000003
85	10.2	20	835,889,972	0.000004
115	13.8	20	835,889,974	0.000003
DC Power Endpoint	9.00	20	835,889,970	0.000004



AMPS

Operating Frequency :	835,890,000
Channel :	363
Reference Voltage :	12.00
Deviation Limit :	0.00025

Voltage (%)	Power (VDC)	Temperature (°C)	Frequency (Hz)	Deviation
100	12.00	+20 °C (Ref)	835,890,003	0.000000
100		-30	835,889,968	0.000004
100		-20	835,889,972	0.000004
100		-10	835,889,980	0.000003
100		0	835,889,974	0.000003
100		10	835,889,970	0.000004
100		20	835,890,003	0.000000
100		25	835,889,978	0.000003
100		30	835,889,975	0.000003
100		40	835,889,972	0.000004
100		50	835,889,974	0.000003
100		60	835,889,970	0.000004
85	10.2	20	835,889,972	0.000004
115	13.8	20	835,889,976	0.000003
DC Power Endpoint	9.00	20	835,889,972	0.000004



10. MODULATION CHARACTERISTICS

10.1 Test Procedure

*Modulation Limiting

The audio signal generator is connected to the audio input circuit/microphone of the EUT. The modulation response is measured for each of the three modulating frequencies (300Hz, 1000Hz, and 3000Hz), and the input voltage is varied from 30% modulation(± 3.6 kHz deviation) to at least 20dB higher than the saturation point. Measurements of modulation and the plots are attached herein. Measurements were performed for ST, SAT, and wide-band data modulations. The corresponding results are shown herein.

10.2 Test Equipments

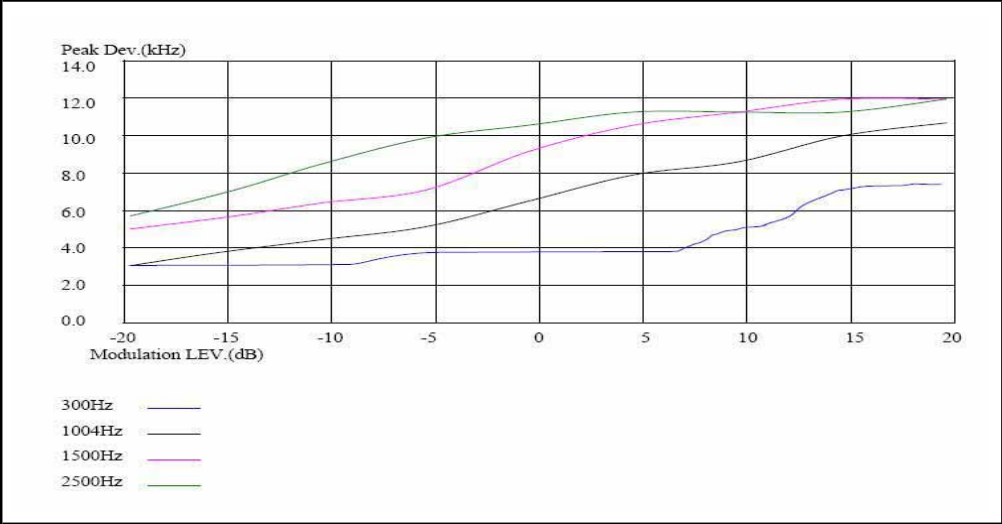
The following test equipments are used during tests

Equipment	Manufacturer	Model	Cal. Due Date
Audio Signal Generator	HP	8903B	2008-03-02
Modulation Analyzer	HP	8901B	2008-03-02
Wireless Communications Test Set	Agilent	E5515C	2008-03-02
DC Power Supply	INTERACT	AK-3010	2008-03-02



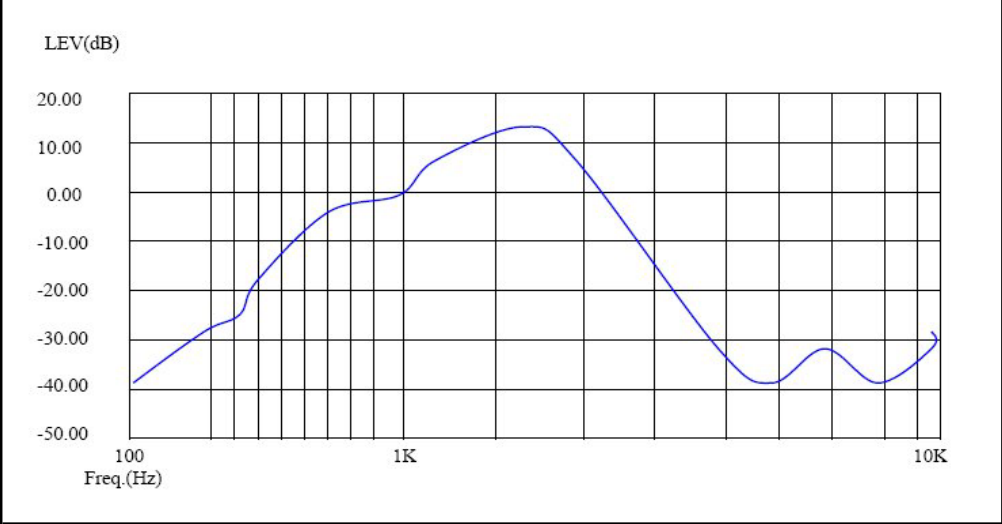
MODULATION LIMITINIG

REFERENCE: 1kHz = 0dB



Audio Response

REFERENCE: 1kHz = 0dB





Audio Low Pass Filter Response

REFERENCE: 1kHz = 0dB

