

FCC TEST REPORT

For

M2micro (Changshu) Co., Ltd.

M2micro Center Control Unit

Model No.: MCC6000-CD01

Additional Model No : MCC6000-DD01

Prepared for
Address: M2micro (Changshu) Co., Ltd.
: No.1bldg, Science Technology Park, Sihai Road, Economic
Development Zone, Changshu, Jiangsu 215503, ChinaPrepared by
Address: Shenzhen LCS Compliance Testing Laboratory Ltd.
: 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an
District, Shenzhen, Guangdong, China

Date of receipt of test sample	:	January 11, 2013
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	November 11, 2012 – February 25, 2013
Date of Report	:	February 25, 2013

FCC TEST REPORT

FCC CFR 47 PART 22 SUBPART H AND PART 24 SUBPART E

Report Reference No. : **LCS121101006QF**

Date of Issue : February 25, 2013

Testing Laboratory Name : **Shenzhen LCS Compliance Testing Laboratory Ltd.**Address : 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd.,
Bao'an District, Shenzhen, Guangdong, China
Full application of Harmonised standards Testing Location/ Procedure : Partial application of Harmonised standards
Other standard testing method **Applicant's Name** : **M2micro (Changshu) Co., Ltd.**Address : No.1bldg, Science Technology Park, Sihai Road, Economic
Development Zone, Changshu, Jiangsu 215503, China**Test Specification**Standard : FCC CFR 47 PART 2, FCC CFR 47 PART 22 SUBPART H
AND PART 24 SUBPART E**Test Report Form No.** : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test Item Description : **M2micro Center Control Unit**

Trade Mark : M2Micro

Model/ Type reference : MCC6000-CD01

Ratings : Input: AC 110-240V, 50/60Hz
Output: DC 9V, 3AResult : **Positive****Compiled by:**

Ada Liang / File administrators

Supervised by:

Vito Cao/ Technique principal

Approved by:

Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS121101006QFFebruary 25, 2013

Date of issue

Type / Model..... : MCC6000-CD01

EUT..... : M2micro Center Control Unit

Applicant..... : M2micro (Changshu) Co., Ltd.

Address..... : No.1bldg, Science Technology Park, Sihai Road, Economic Development Zone, Changshu, Jiangsu 215503, China

Telephone..... : /

Fax..... : /

Manufacturer..... : M2micro (Changshu) Co., Ltd.

Address..... : No.1bldg, Science Technology Park, Sihai Road, Economic Development Zone, Changshu, Jiangsu 215503, China

Telephone..... : /

Fax..... : /

Factory..... : M2micro (Changshu) Co., Ltd.

Address..... : No.1bldg, Science Technology Park, Sihai Road, Economic Development Zone, Changshu, Jiangsu 215503, China

Telephone..... : /

Fax..... : /

Test Result:**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : M2micro Center Control Unit

Model Number : MCC6000-CD01

Power Supply : Input: AC 110-240V, 50/60Hz
Output: DC 9V, 3A

Frequency Range : 433.92MHz

Number of Channels : 1

Modulation Type : FSK

Antenna Type and Gain : External Antenna, 2dBi

Tx/Rx Frequency Range : GSM/GPRS 850: 824.2~848.8MHz/869.2~893.8MHz
PCS/GPRS 1900: 1850.2~1909.8MHz/1930.2~1989.8MHz

Number of Channels : GSM/GPRS 850: 128 / 190 / 251
PCS/GPRS 1900: 512 / 661 / 810

Modulation Type : GMSK

Antenna Type and Gain : GSM 850 Integral Antenna, 4.28dBi
PCS 1900 Integral Antenna, 3.0dBi

Test PCL/Class : GSM/GPRS 850: Level 5 / Class 4
PCS/GPRS 1900: Level 0 / Class 1

Maximum RF Output Power : 31.82dBm for GSM 850; 31.77dBm for GPRS 850
28.56dBm for PCS 1900; 28.49dBm for GPRS 1900

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
M2micro (Changshu) Co., Ltd.	Adapter	RHD-093000	01	Verification

1.3. External I/O Port

I/O Port	Description	Quantity	Cable
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1.4. Description of Test Facility

Site Description

EMC Lab. : Accredited by CNAS, June 04, 2010

The Certificate Registration Number. is L4595.

Accredited by FCC, July 14, 2011

The Certificate Registration Number. is 899208.

Accredited by Industry Canada, May. 02, 2011

The Certificate Registration Number. is 9642A-1

1.5. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation Uncertainty :	9KHz~30MHz	± 3.10dB	(1)
	30MHz~200MHz	± 2.96dB	(1)
	200MHz~1000MHz	± 3.10dB	(1)
	1GHz~26.5GHz	± 3.80dB	(1)
Conduction Uncertainty :	150kHz~30MHz	± 1.63dB	(1)
Power disturbance :	30MHz~300MHz	± 1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7. Test environment

All tests were performed under the following environmental conditions:

Condition	Minimum value	Maximum value
Barometric pressure	86kPa	106kPa
Temperature	15°C	30°C
Relative Humidity	20 %	75 %
Power supply range	±5% of rated voltages	

2. TEST METHODOLOGY

All tests and measurements indicated in this document were performed in accordance with FCC CFR 47 part 2, FCC CFR 47 part 22 subpart H and part 24 subpart E.

Applicable Standards: TIA/EIA603-C, ANSI C63.4-2003. The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. Objective

This type approval report is prepared on behalf of **M2micro (Changshu) Co., Ltd.** in accordance with FCC CFR 47 part 2, FCC CFR 47 part 22 subpart H and part 24 subpart E.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristics, occupied bandwidth, spurious emissions at antenna terminal, field strength of spurious radiation, frequency stability, band edge, and conducted and radiated margin.

2.3. General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4

2.4. Test Mode

GSM / GPRS 850: Channel Low (CH128), Channel Mid (CH190) and Channel High (CH251) were chosen for full testing. The test PCL(Power Control Level)/Class is level 5/class 4.

PCS / GPRS 1900: Channel Low (CH512), Channel Mid (CH661) and Channel High (CH810) were chosen for full testing. The test PCL(Power Control Level)/Class is level 0/class 1.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

For the field strength of spurious emission, the worst emission was found in lie-down position (X axis) for GSM 850 / GPRS 850, stand-up position (X axis) for PCS 1900 / GPRS 1900, and the worst case was recorded.

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The EUT had been tested under operating condition. EUT staying in continuous transmitting mode.

3.2. EUT Exercise Software

N/A.

3.3. Special Accessories

N/A.

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: 47 CFR FCC Part 22 Subpart H, Part 24 Subpart E			
FCC Rules	Description of Test		Result
§2.1046, §22.913 / §24.232	RF Output Power	Conducted Output Power	Compliant
		Radiated Output Power	
§2.1049, §22.905 §2.917, §24.238	Occupied Bandwidth		Compliant
§2.1053 §2.917, §24.238	Spurious Radiated Emissions		Compliant
§2.1051 §2.917, §24.238	Spurious Emissions at Antenna Terminals		Compliant
§2.917, §24.238	Band Edge		Compliant
§2.1055 §22.355, §24.235	Frequency Stability		Compliant
§15.107 / §15.207	AC power line conducted emissions		Compliant
§1.1310, §2.1091	RF Exposure Information		Compliant

5. TEST RESULT

5.1. RF OUTPUT POWER

5.1.1. Standard Applicable

According to FCC §2.1046 and §22.913, the maximum effective radiated power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to FCC §2.1046 and §22.232, mobile and portable stations are limited to 2 Watts and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

Compliance with part 22.913, in no any case may the peak power of a mobile station transmitter exceed 7 W. The calculated longitude ERP by following formula:
 $ERP(dBm) = 10 * \log (ERP \text{ in watts})$.

And for conducted power, we can use Antenna Gain to calculate the limit. So the conducted power:

$P_{cod.}(dBm) = ERP(dBm) - Gain(dBd)$.

and $Gain(dBd) = Gain(dBi) - 2.15dB$

Maximum Output Power (Watts)	< 7 Watts(38.5dBm)
Antenna Gain(dBi):	4.28
Antenna Gain(dBd):	2.13
Maximum Conducted Output Power (dBm)	< 36.37

Compliance with part 24.232, in no any case may the peak power of a mobile station transmitter exceed 2 W. The calculated longitude EIRP by following formula:
 $EIRP(dBm) = 10 * \log (EIRP \text{ in mW})$.

And for conducted power, we can use Antenna Gain to calculate the limit. So the conducted power:

$P_{cod.}(dBm) = EIRP(dBm) - Gain(dBi)$.

and $Gain(dBi) = Gain(dBd) + 2.15dB$

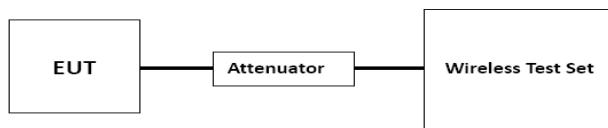
Maximum Output Power (Watts)	< 2 Watts (33 dBm)
Antenna Gain(dBi):	3
Maximum Conducted Output Power (dBm)	< 30

5.1.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.1.3. Test Procedures

Conducted method:



Radiated method:

TIA 603-D section 2.2.17

5.1.4. Test Results

Temperature	25°C	Humidity	60%
ATM Pressure:	101.4kPa	Test Engineer	Leo

Conducted Power:

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
GSM 850	128	824.2	31.70	36.37
	190	836.6	31.82	36.37
	251	848.8	31.73	36.37
GPRS 850 (Slot 1)	128	824.2	31.67	36.37
	190	836.6	31.77	36.37
	251	848.8	31.74	36.37
GPRS 850 (Slot 2)	128	824.2	30.97	36.37
	190	836.6	31.04	36.37
	251	848.8	31.01	36.37
GPRS 850 (Slot 3)	128	824.2	29.01	36.37
	190	836.6	29.06	36.37
	251	848.8	29.03	36.37
GPRS 850 (Slot 4)	128	824.2	27.87	36.37
	190	836.6	27.91	36.37
	251	848.8	27.89	36.37

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
PCS 1900	512	1850.2	28.46	30
	661	1880.0	28.56	30
	810	1909.8	28.37	30
GPRS 1900 (Slot 1)	512	1850.2	28.41	30
	661	1880.0	28.49	30
	810	1909.8	28.34	30
GPRS 1900 (Slot 2)	512	1850.2	27.47	30
	661	1880.0	27.51	30
	810	1909.8	27.45	30
GPRS 1900 (Slot 3)	512	1850.2	25.18	30
	661	1880.0	25.21	30
	810	1909.8	25.16	30
GPRS 1900 (Slot 4)	512	1850.2	24.39	30
	661	1880.0	24.43	30
	810	1909.8	24.37	30

Radiated Power:

The worst test data as follow:

Mode	Channel	Frequency (MHz)	Test Result		Limit (dBm)
			Max. Peak ERP (dBm)	Polarization	
GSM 850	128	824.2	30.30	H	38.5
	190	836.6	30.61	H	38.5
	251	848.8	30.24	H	38.5

Mode	Channel	Frequency (MHz)	Test Result		Limit (dBm)
			Max. Peak EIRP (dBm)	Polarization	
PCS 1900	512	1850.2	26.88	H	33
	661	1880.0	26.99	H	33
	810	1909.8	26.80	H	33

5.2. OCCUPIED BANDWIDTH

5.2.1. Standard Applicable

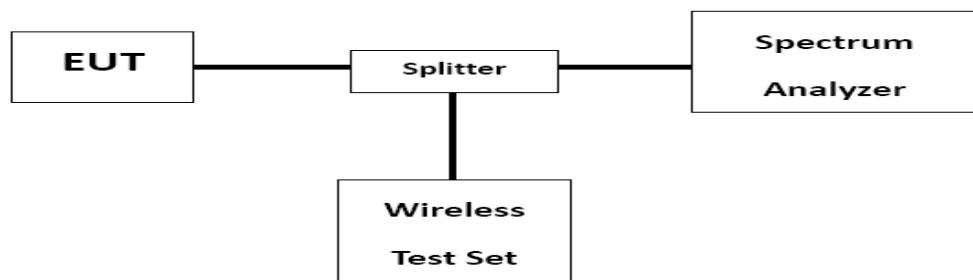
FCC §2.1049, §22.917, §22.905 and §24.238.

5.2.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.2.3. Test Procedures

The RF output of the transmitter was connected to the wireless communication tester and spectrum analyzer through attenuation.



The -26dB & 99% bandwidth was recorded.

5.2.4. Test Results

Temperature	25°C	Humidity	60%
ATM Pressure:	101.4kPa	Test Engineer	Leo

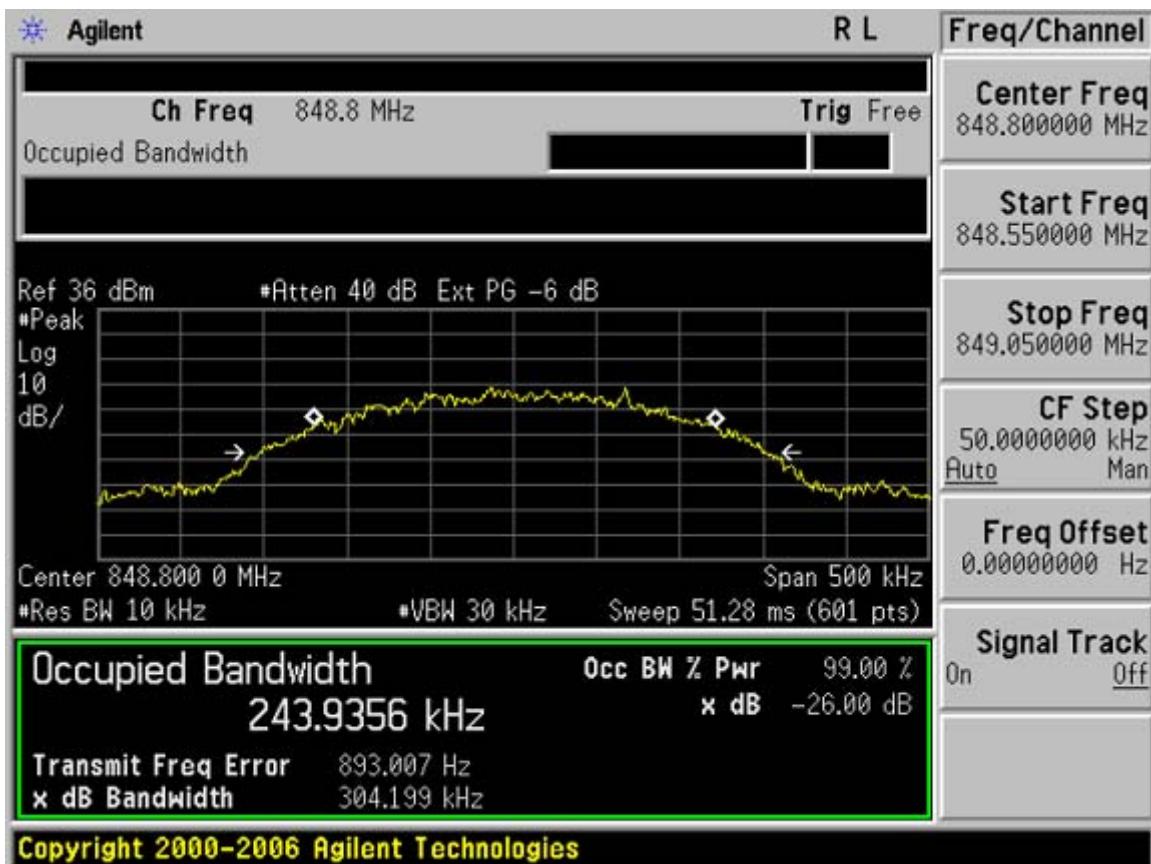
The worst test data as follow:

Mode	Channel	Frequency (MHz)	Emission Bandwidth (-26dBc) (kHz)	Occupied Bandwidth (99%) (kHz)
GSM 850	128	824.2	312.55	243.96
	190	836.6	310.08	244.53
	251	848.8	304.20	243.94

Mode	Channel	Frequency (MHz)	Emission Bandwidth (-26dBc) (kHz)	Occupied Bandwidth (99%) (kHz)
PCS 1900	512	1850.2	306.48	241.87
	661	1880.0	307.35	243.35
	810	1909.8	312.24	244.45

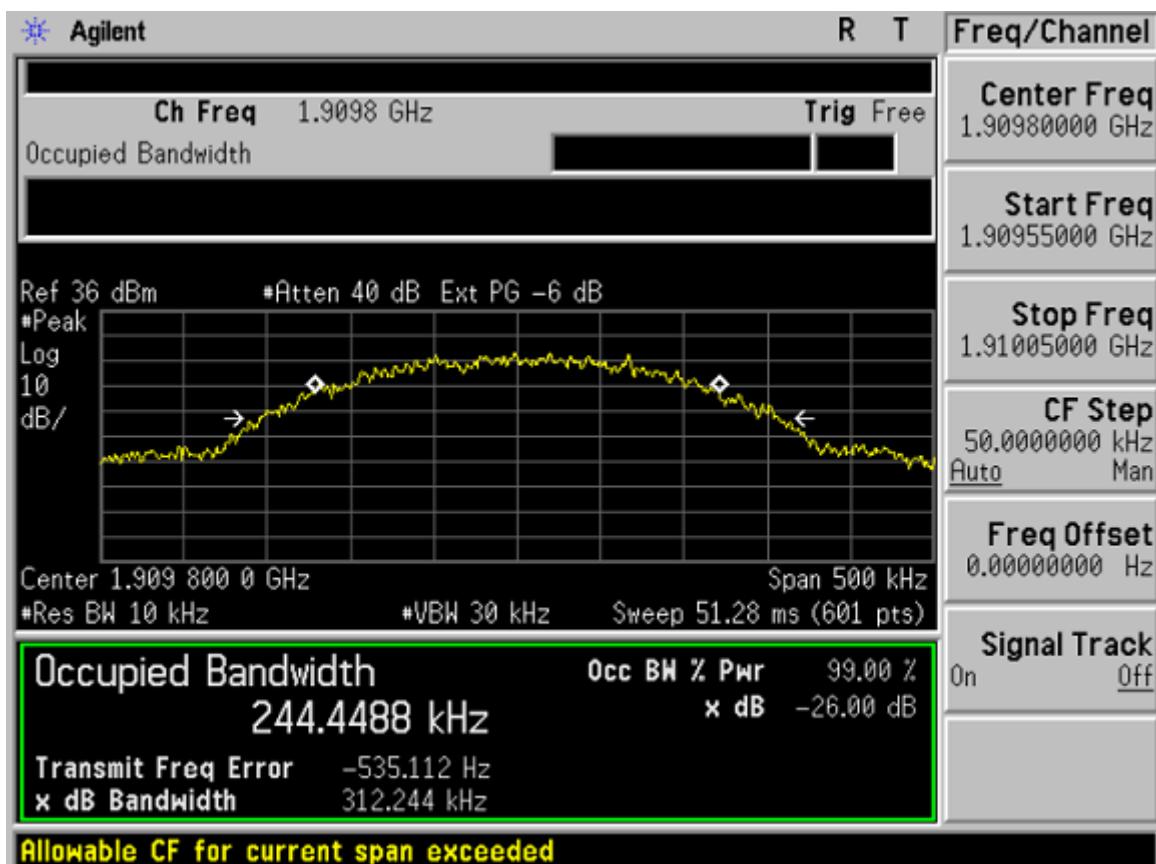
Test Plots For GSM 850





Test Plots For PCS 1900





5.3. SPURIOUS AND HARMONIC EMISSION AT ANTENNA TERMINAL

5.3.1. Standard Applicable

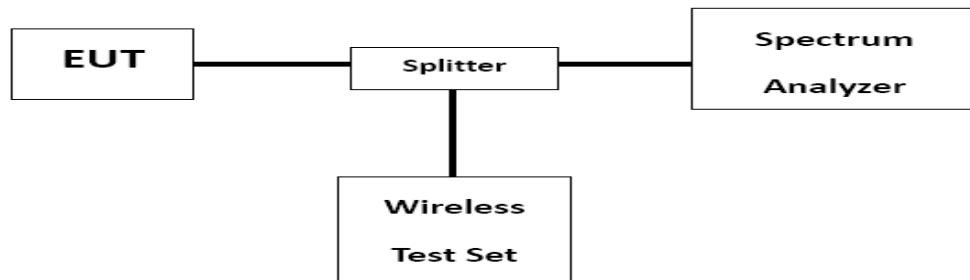
FCC §2.1051, §22.917 and §24.238.

5.3.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.3.3. Test Procedures

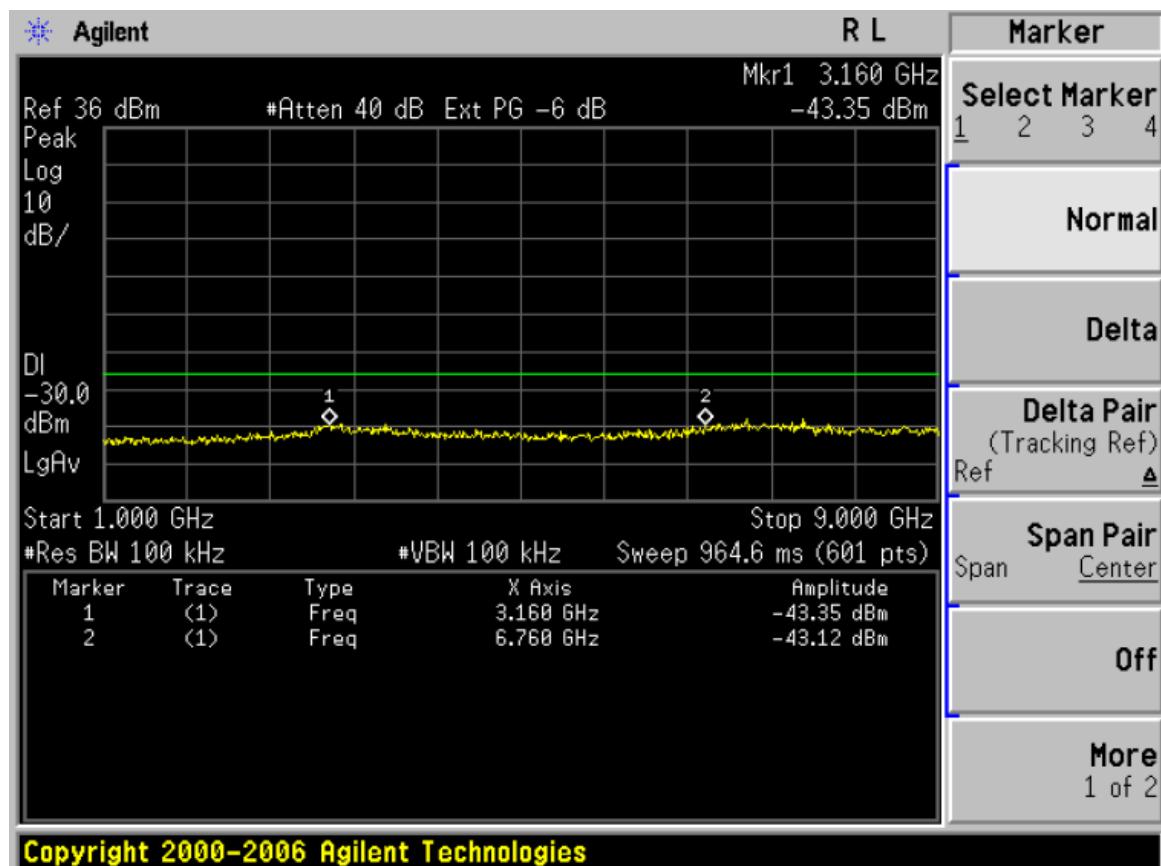
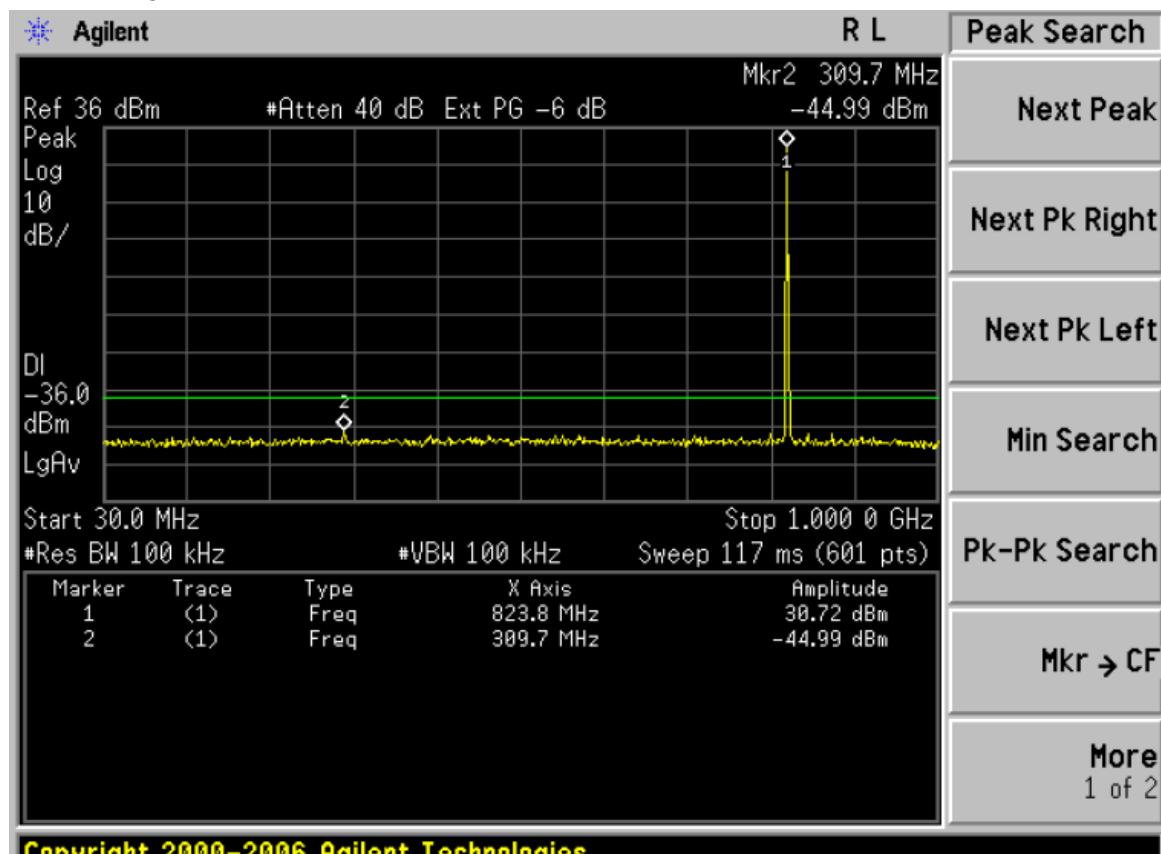
The RF output of the transmitter was connected to the wireless communication tester and spectrum analyzer through attenuation.



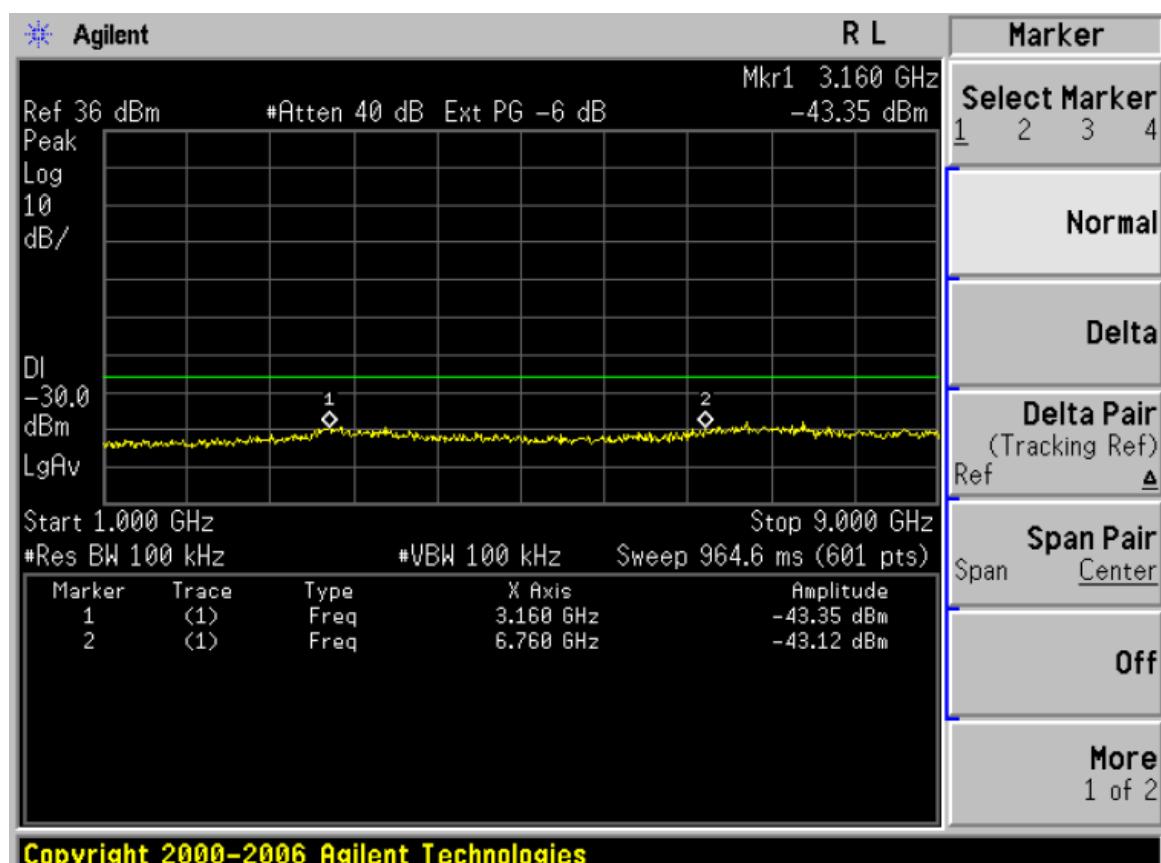
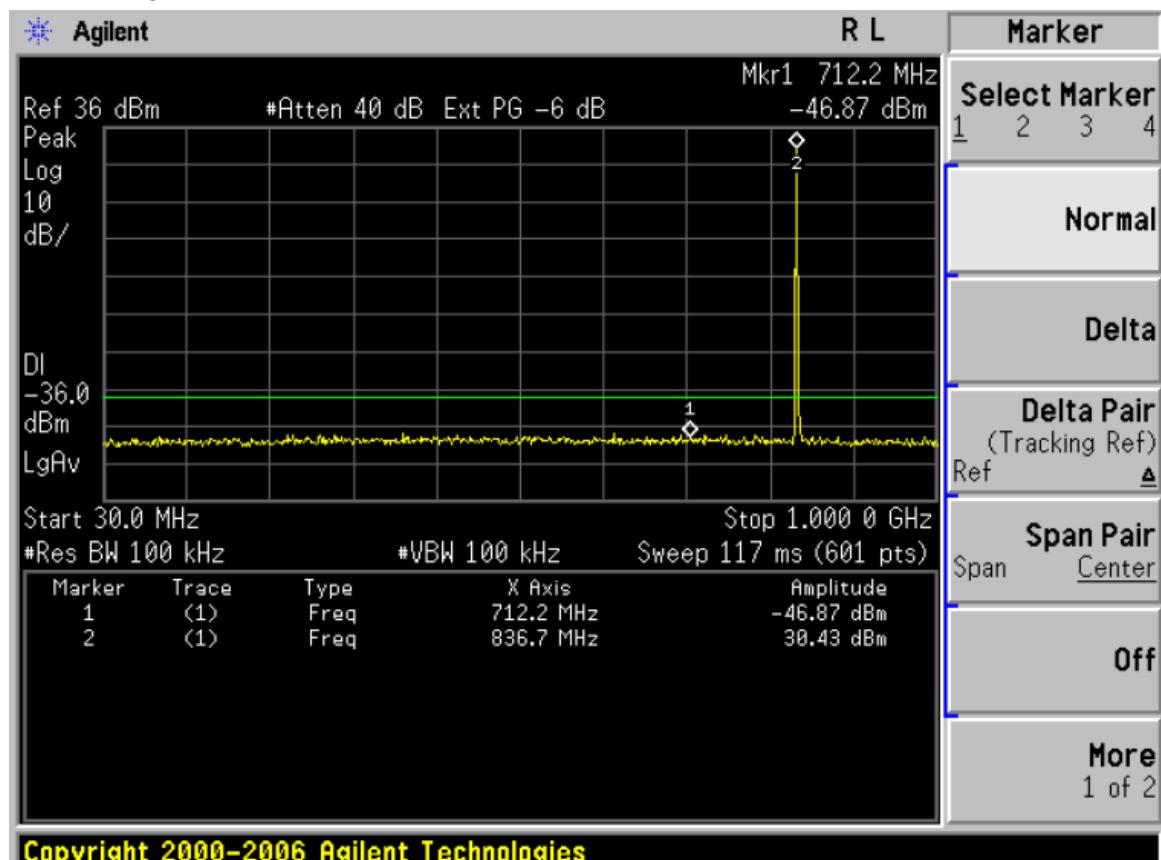
5.3.4. Test Results

Please refer to the following plots.

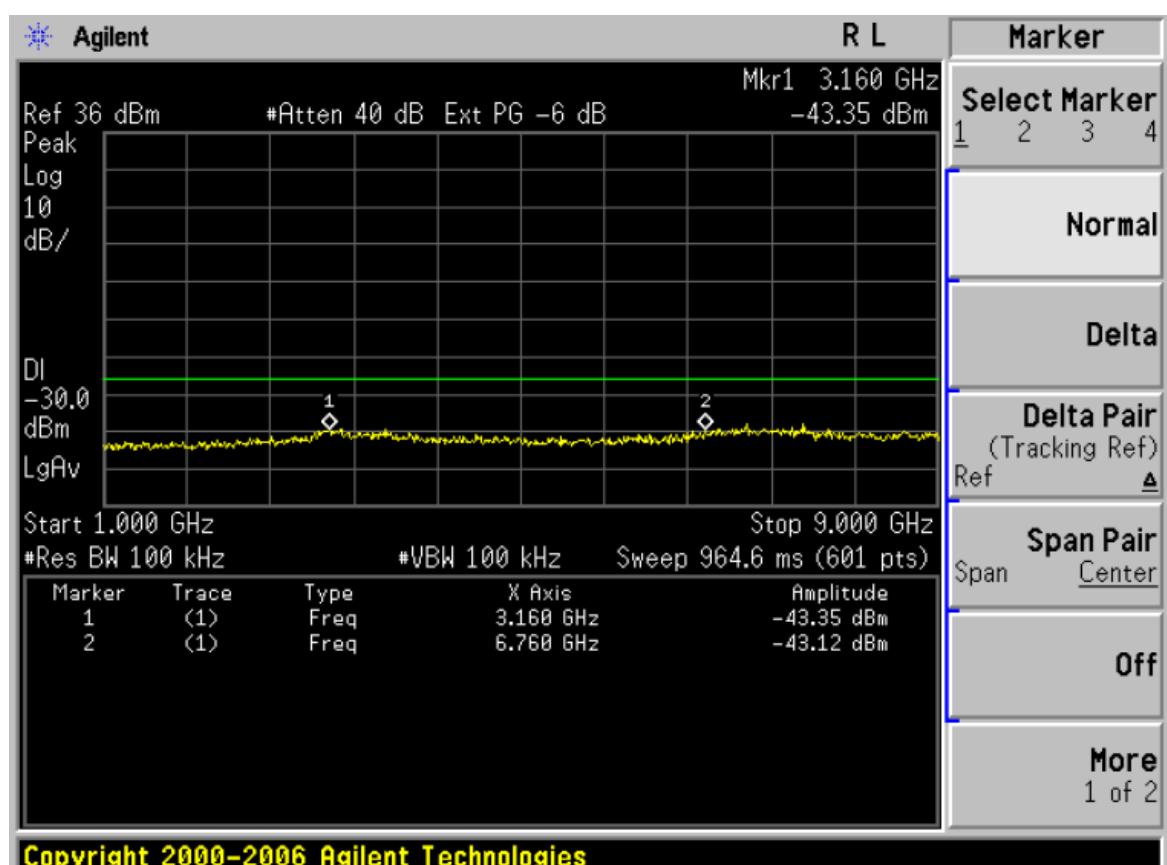
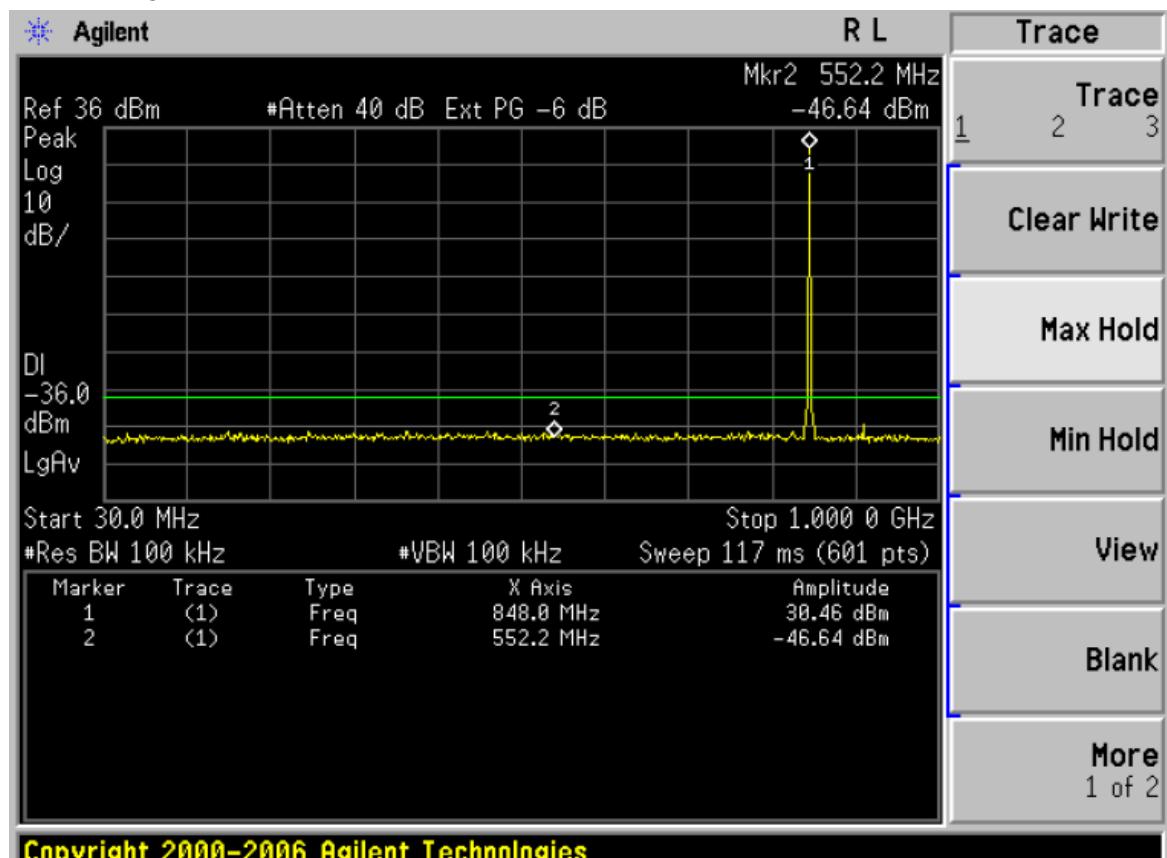
Transmitting Mode, CH 128, GSM 850



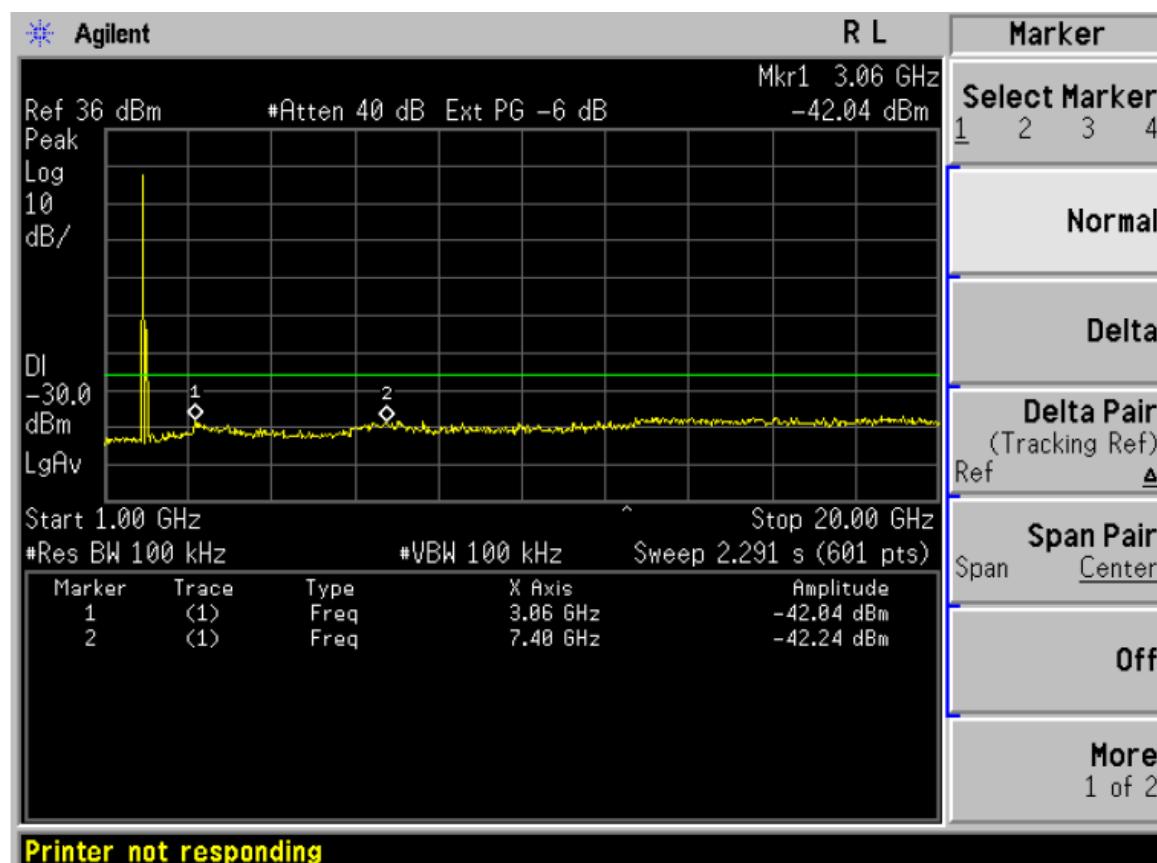
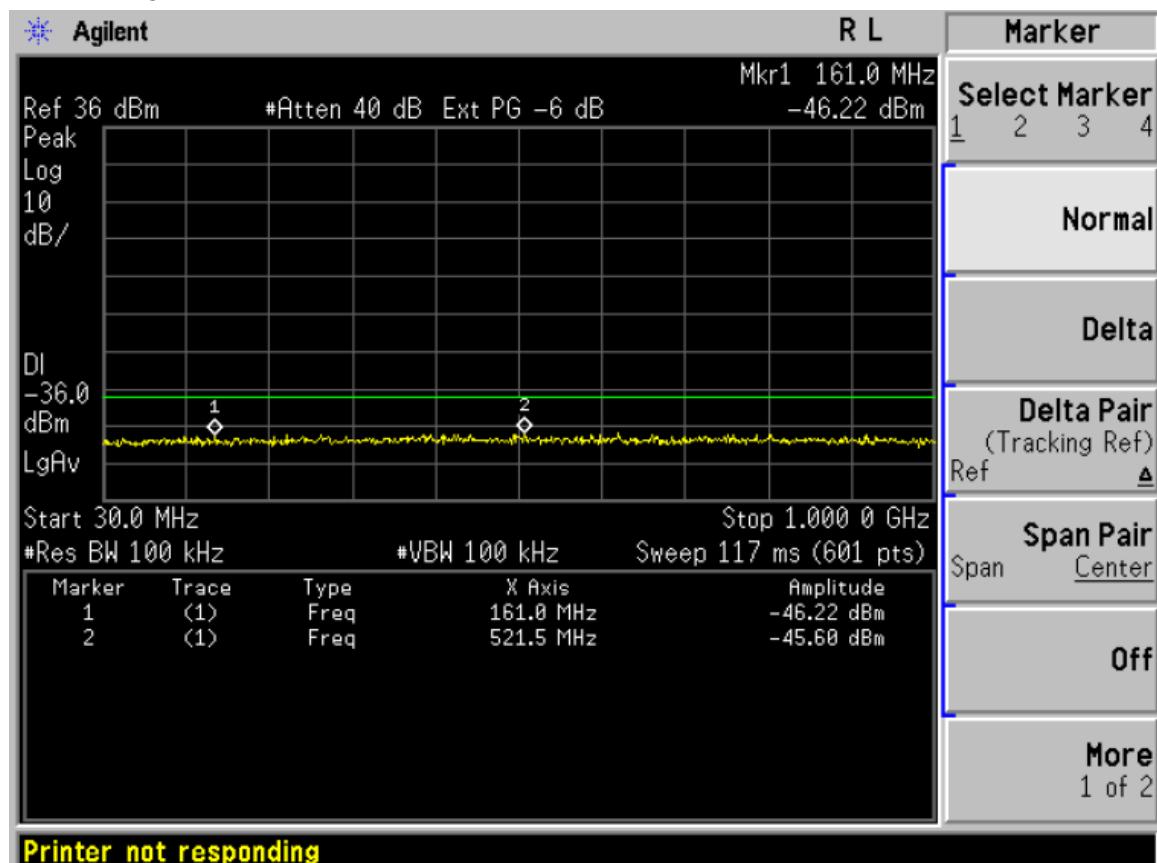
Transmitting Mode, CH 190, GSM 850



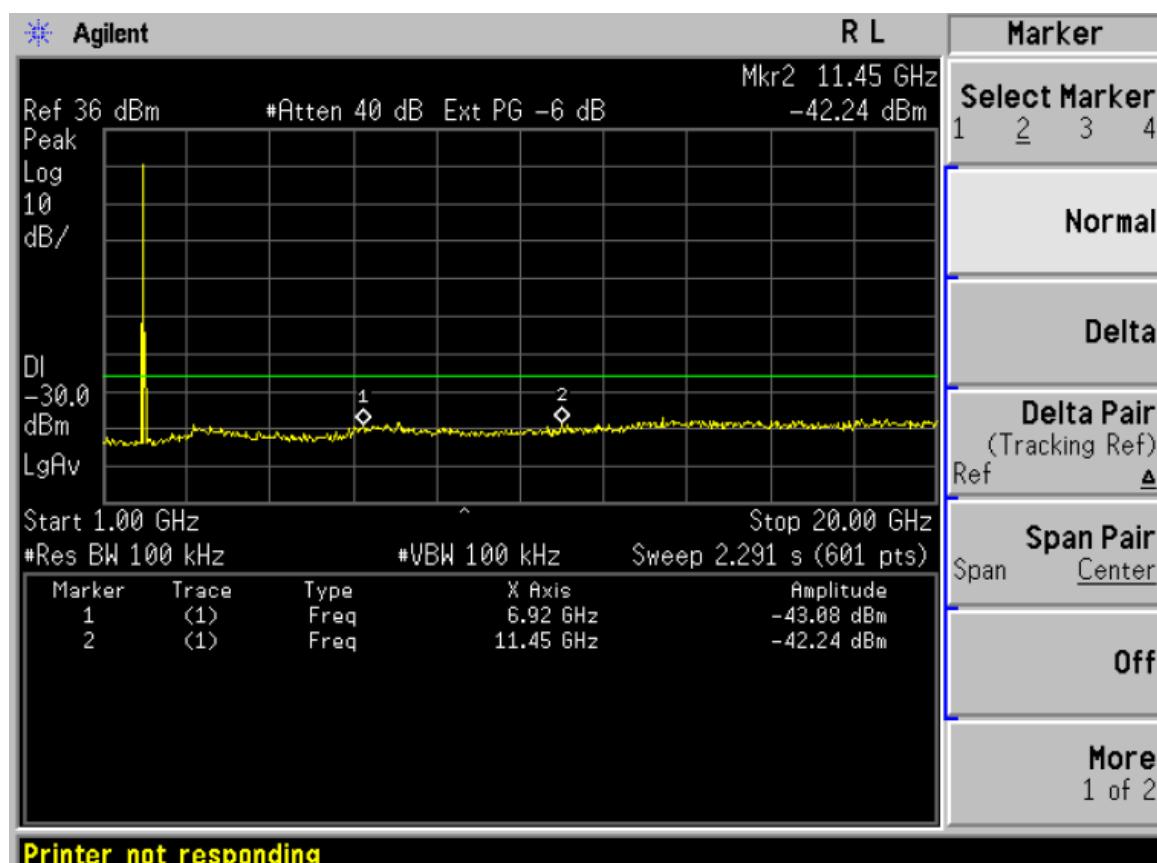
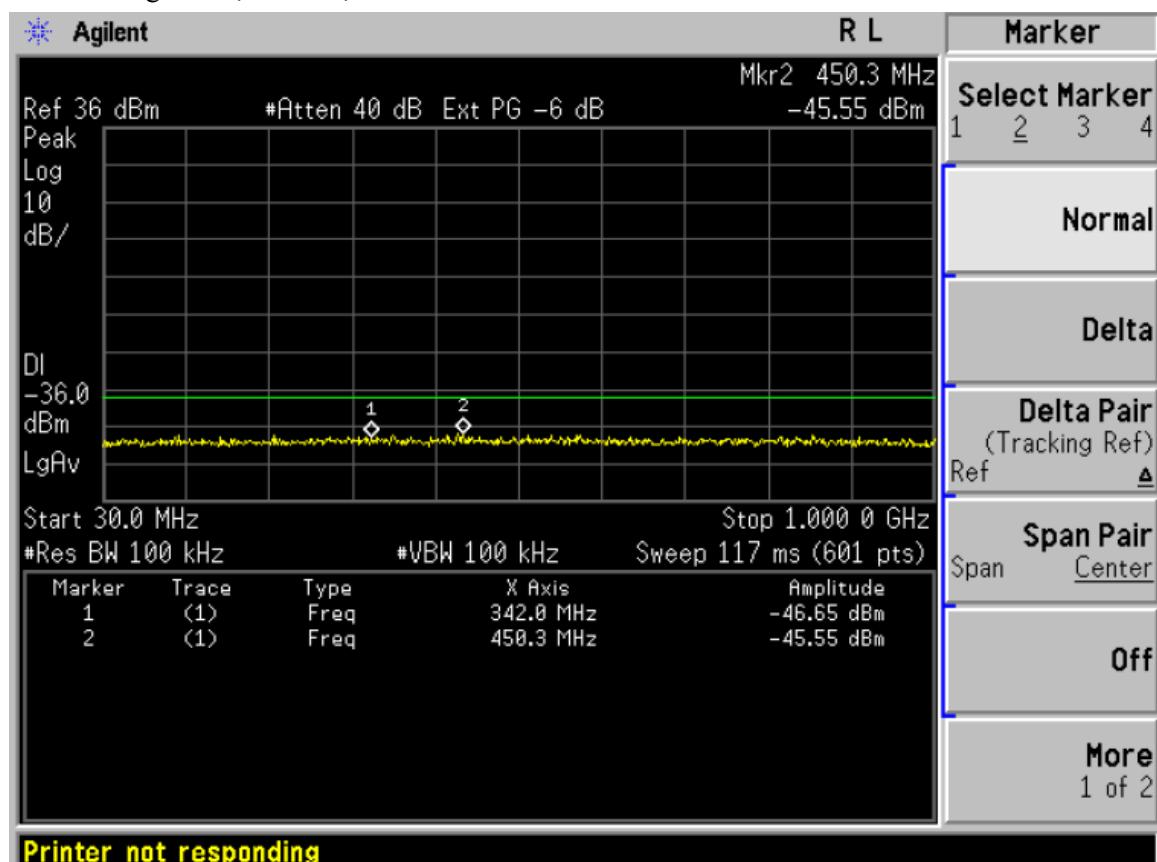
Transmitting Mode, CH 251, GSM 850



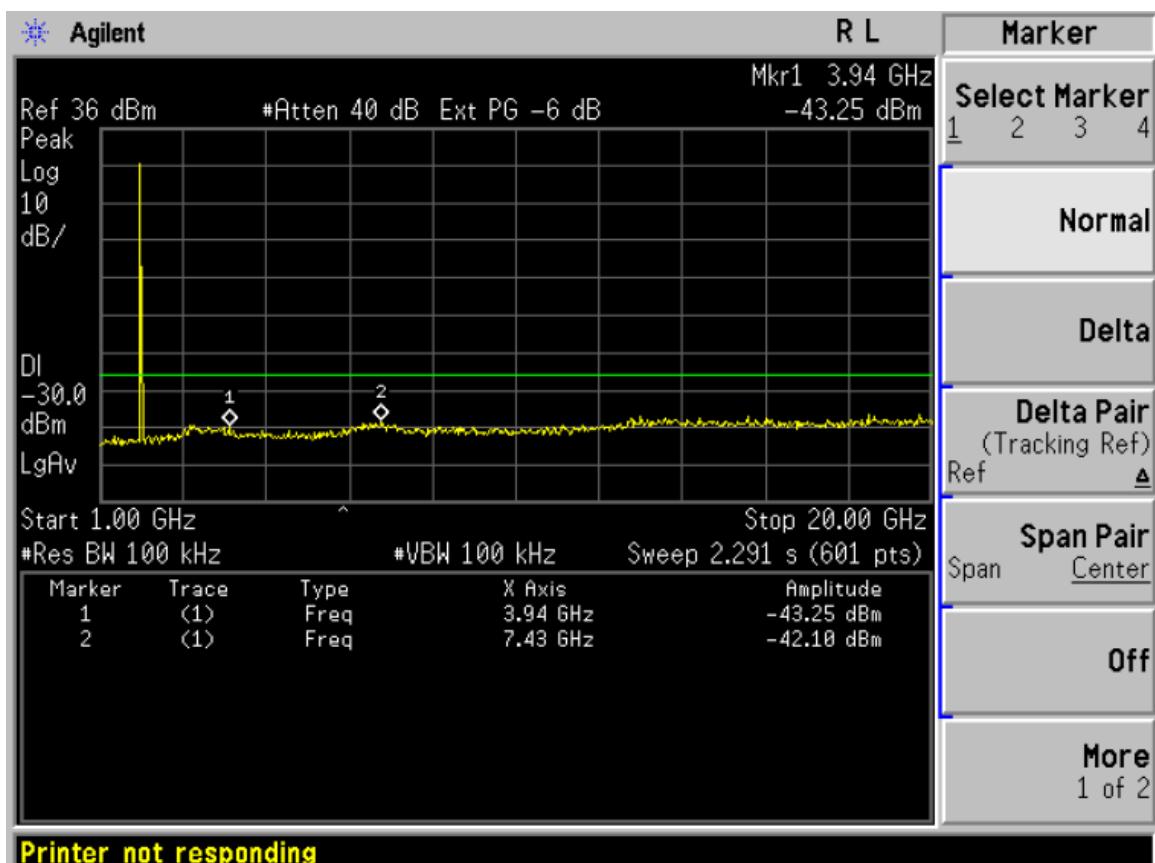
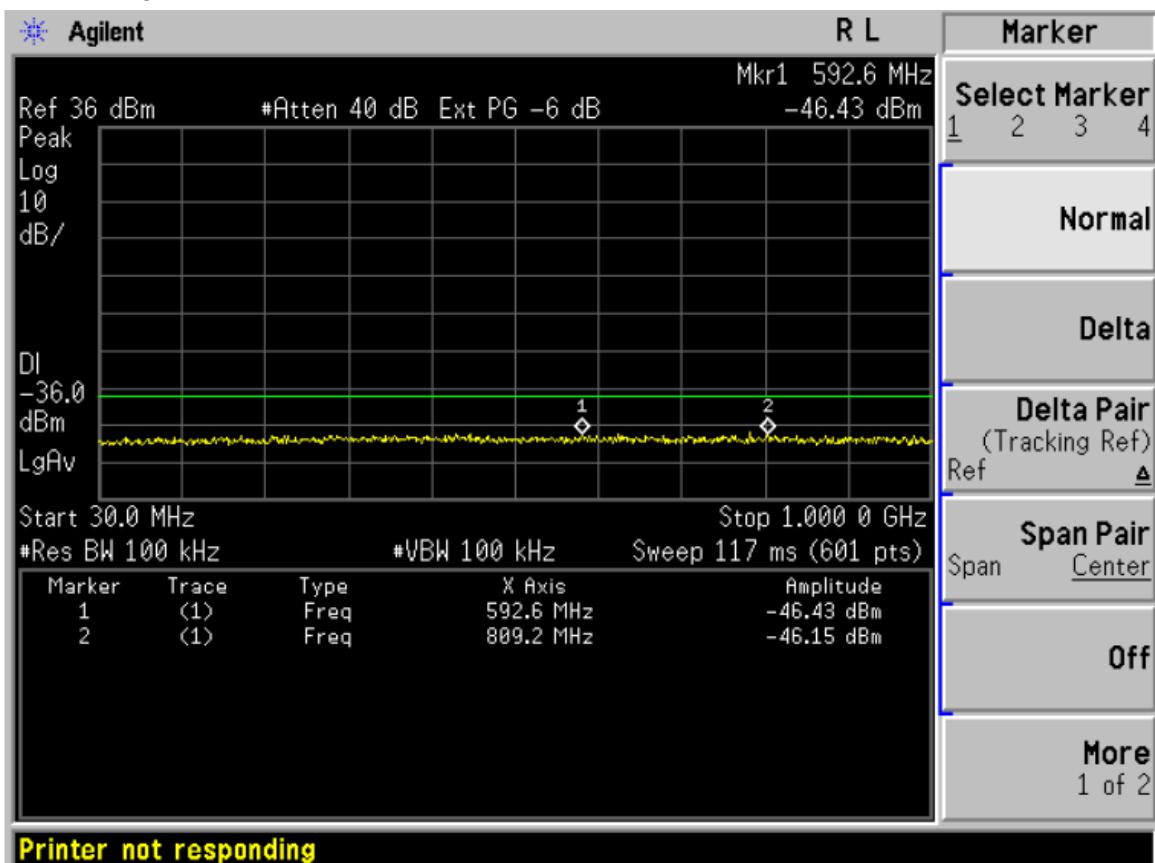
Transmitting Mode, CH 512, PCS 1900



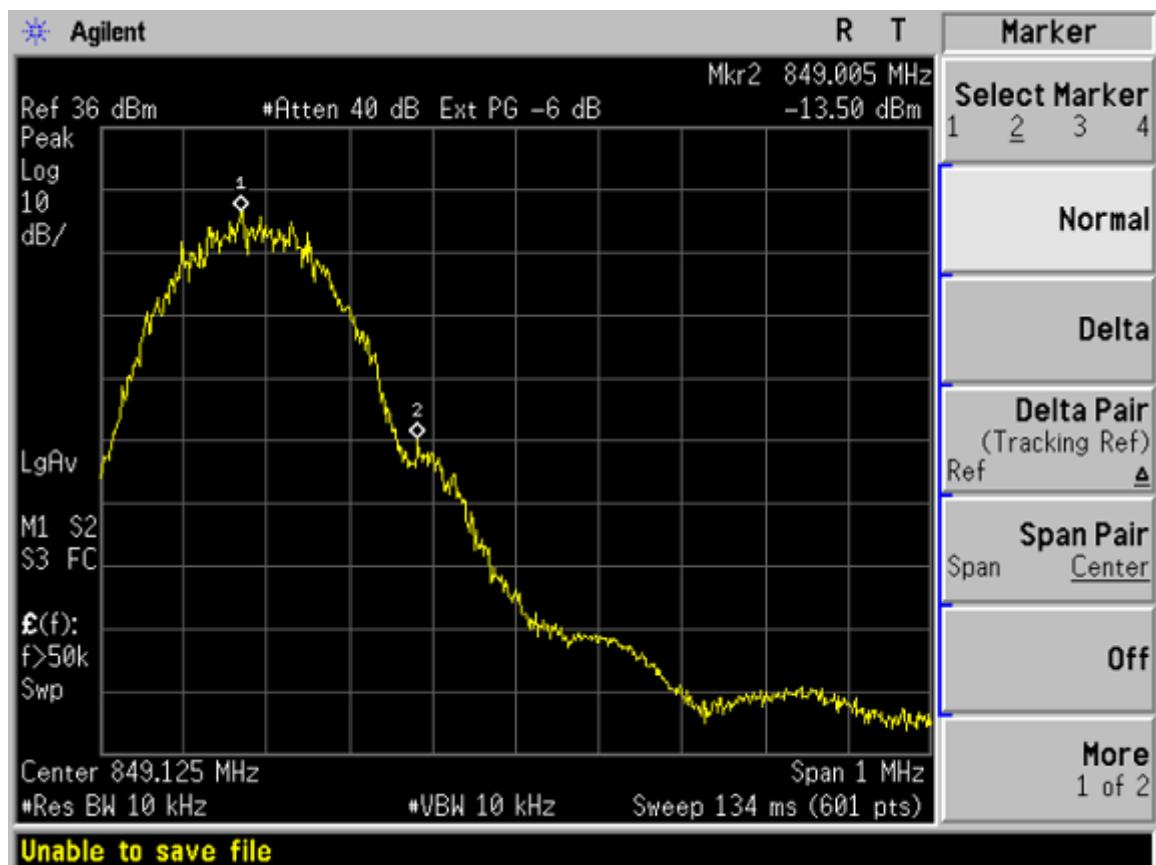
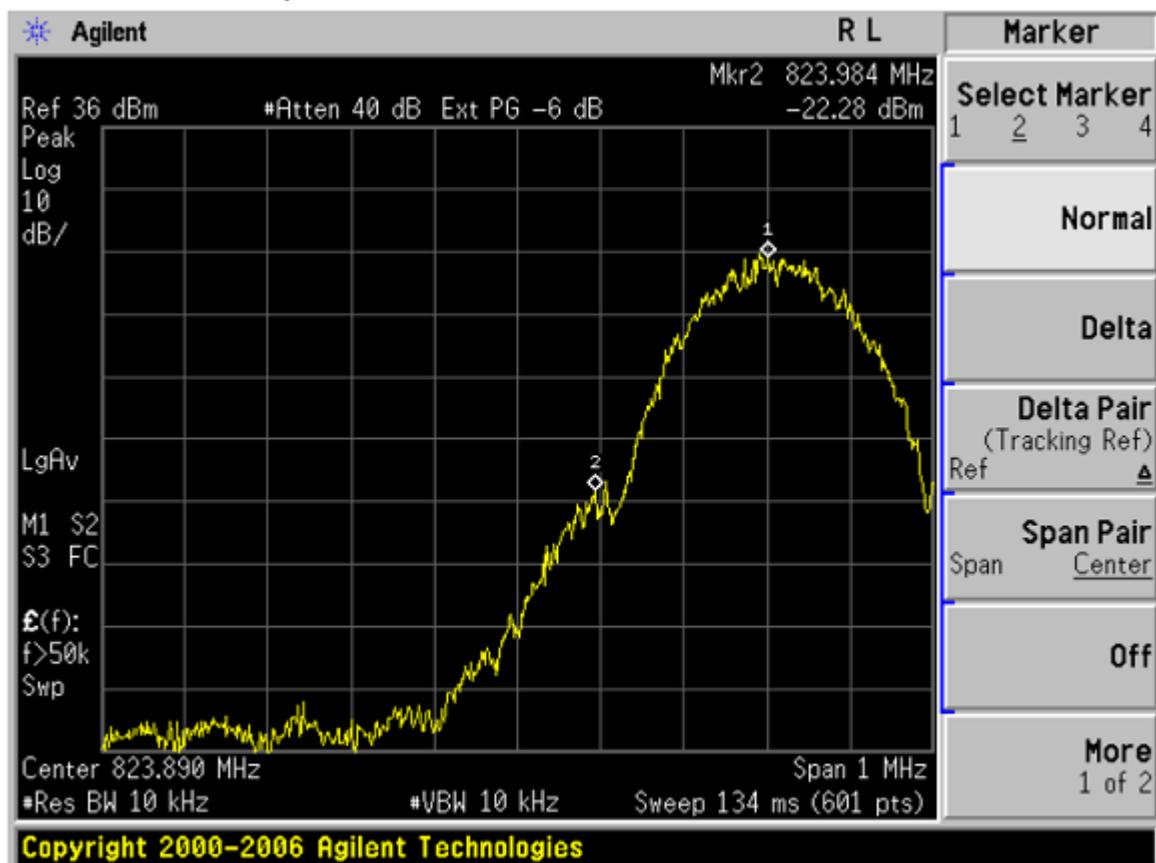
Transmitting Mode, CH 661, PCS 1900



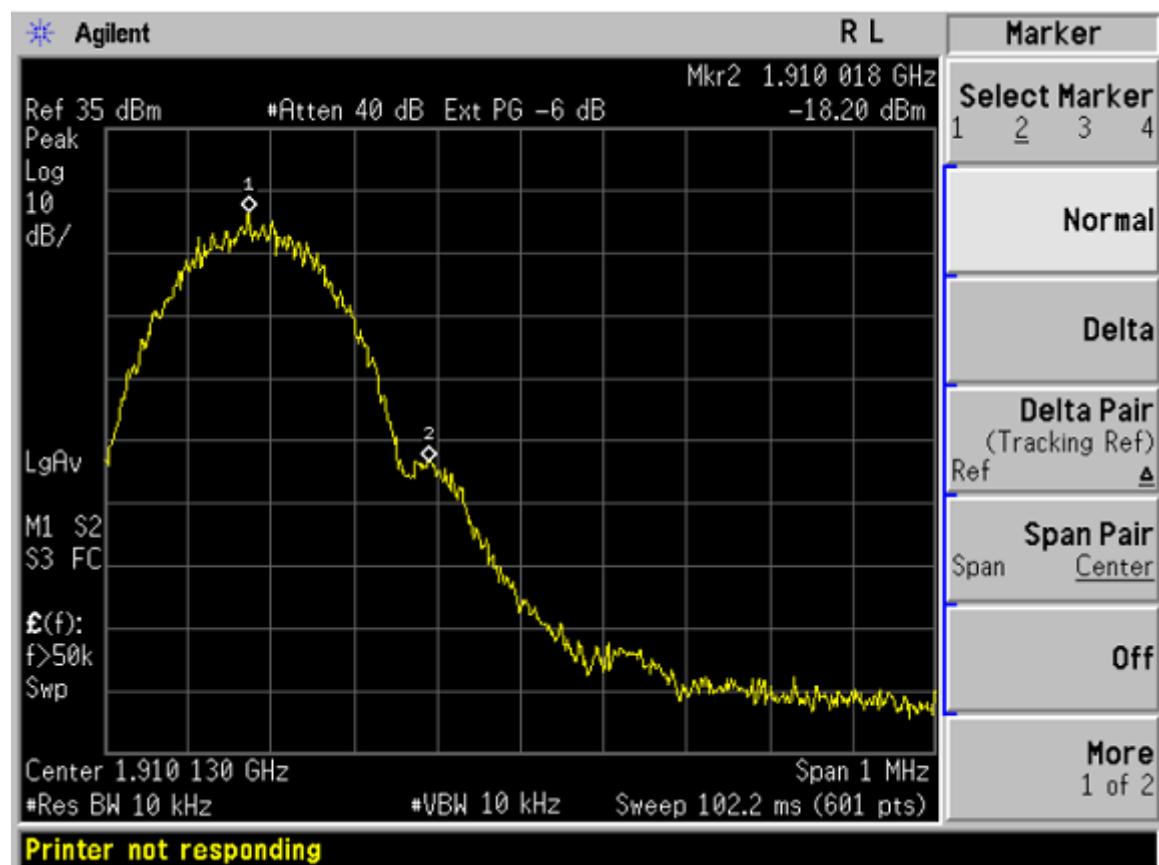
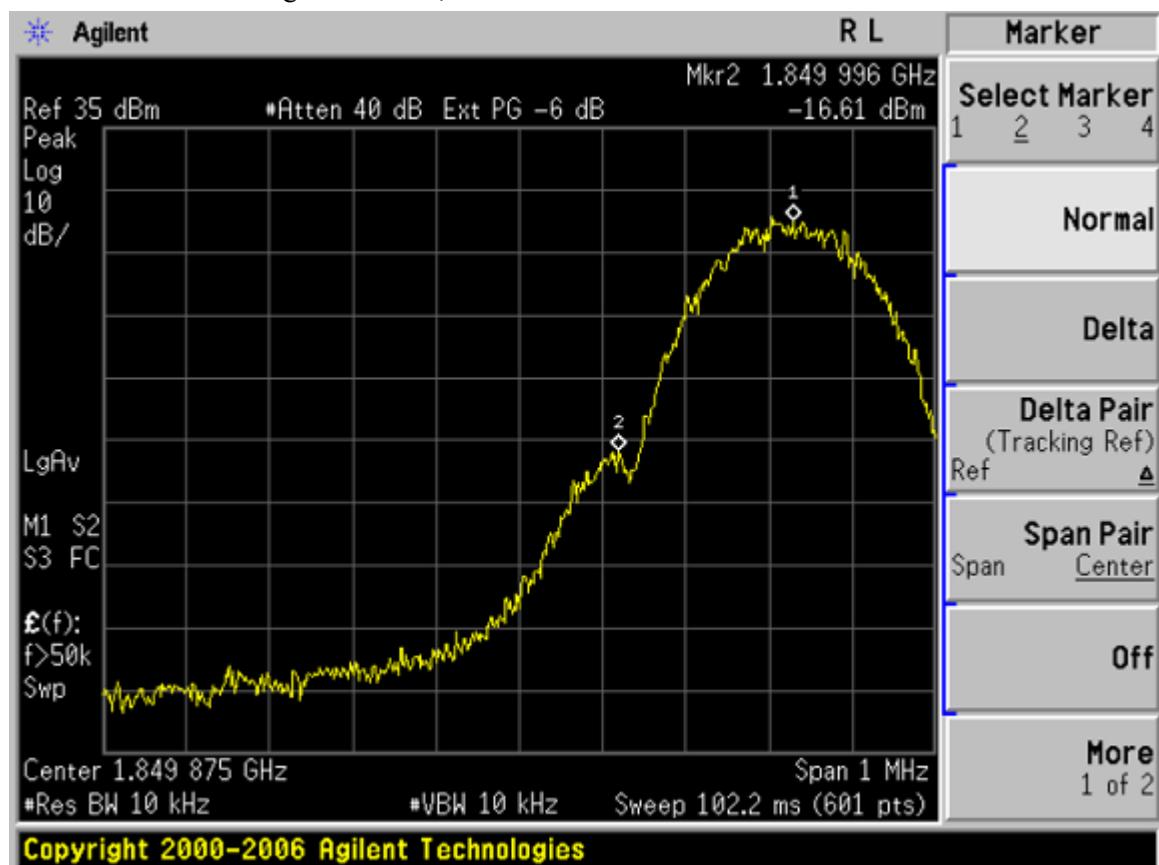
Transmitting Mode, CH 810, PCS 1900



Test Result of Band Edge Emissions, GSM 850



Test Result of Band Edge Emissions, PCS 1900



5.4. RADIATED SPURIOUS EMISSIONS MEASUREMENT

5.4.1. Standard Applicable

FCC §2.1053, §22.917 and §24.238.

5.4.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.4.3. Test Procedures

The EUT was placed on a non-conductive, the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

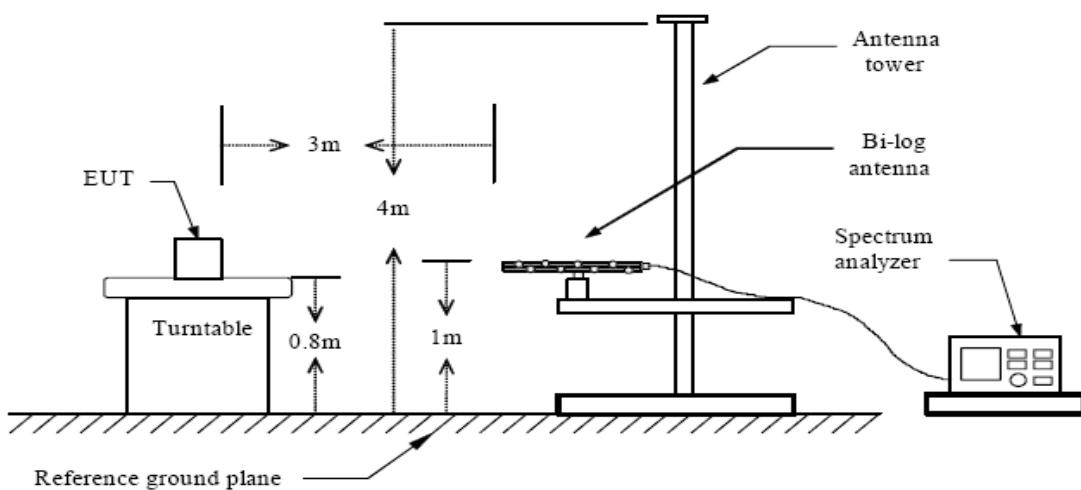
The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

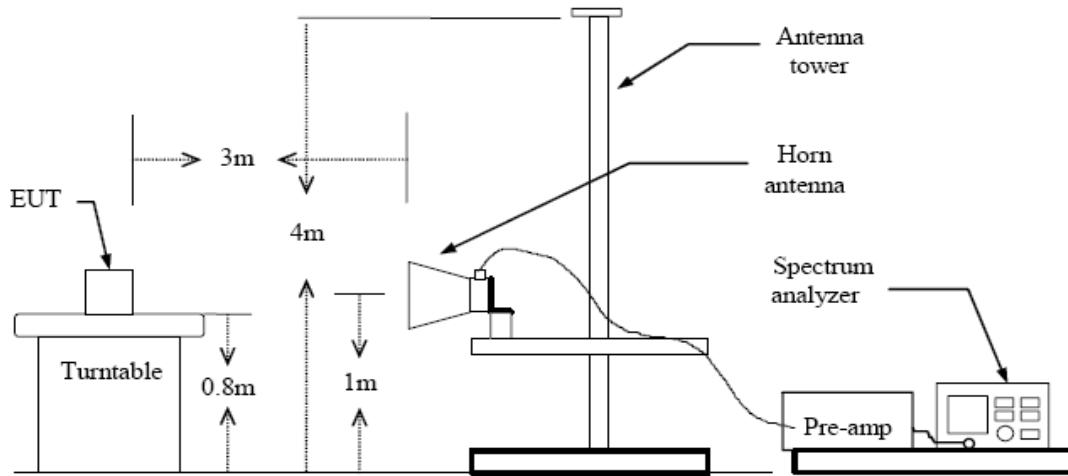
$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

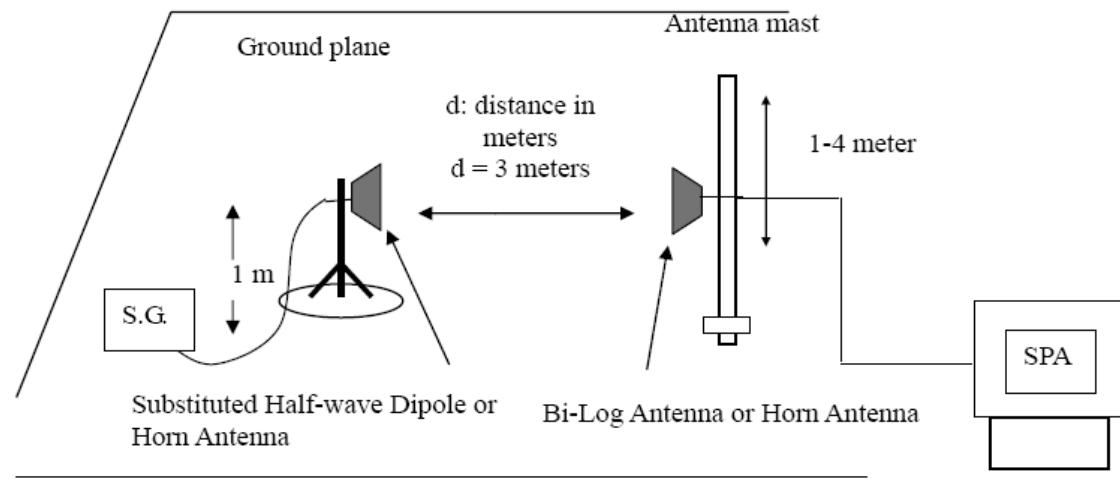
For radiated spurious emissions below 1GHz



For radiated spurious emissions above 1GHz



Substituted Method



5.4.4. Test Results

The worst test data as follow:

30MHz~10GHz

The Worst Test Result For GSM 850, CH 128				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
80.1700	-66.59	-13	-53.59	H
185.9650	-75.71	-13	-62.71	H
710.3600	-80.43	-13	-67.43	H
1648.5100	-22.48	-13	-9.48	H
2473.1000	-31.97	-13	-18.97	H
80.1700	-66.11	-13	-53.11	V
185.9650	-67.67	-13	-54.67	V
710.3600	-75.71	-13	-62.71	V
1648.5100	-25.31	-13	-12.31	V
2473.1000	-40.51	-13	-27.51	V

The Worst Test Result For GSM 850, CH 190				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
83.3500	-65.67	-13	-52.67	H
182.7750	-74.56	-13	-61.56	H
670.2000	-80.08	-13	-67.08	H
1673.2000	-21.97	-13	-8.97	H
2509.8000	-31.76	-13	-18.76	H
83.3500	-65.50	-13	-52.5	V
194.9050	-66.92	-13	-53.92	V
468.9250	-75.12	-13	-62.12	V
1673.2000	-24.26	-13	-11.26	V
2509.8000	-39.48	-13	-26.48	V

The Worst Test Result For GSM 850, CH 251				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
89.7300	-67.34	-13	-54.34	H
196.5610	-75.11	-13	-62.11	H
710.2100	-79.62	-13	-66.62	H
1697.0100	-23.01	-13	-10.01	H
2546.4560	-32.73	-13	-19.73	H
89.7300	-66.57	-13	-53.57	V
196.5610	-67.43	-13	-54.43	V
710.2100	-76.33	-13	-63.33	V
1697.0100	-25.69	-13	-12.69	V
2546.4560	-39.47	-13	-26.47	V

30MHz~20GHz

The Worst Test Result For PCS 1900, CH 512				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
69.8150	-65.27	-13	-52.27	H
174.4150	-74.59	-13	-61.59	H
650.5500	-78.51	-13	-65.51	H
3700.6350	-26.07	-13	-13.07	H
5551.3100	-33.26	-13	-20.26	H
69.8150	-67.89	-13	-54.89	V
174.4150	-67.44	-13	-54.44	V
650.5500	-78.31	-13	-65.31	V
3700.6350	-27.56	-13	-14.56	V
5551.3100	-34.39	-13	-21.39	V

The Worst Test Result For PCS 1900, CH 661				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
89.9250	-65.94	-13	-52.94	H
185.2150	-75.44	-13	-62.44	H
641.5000	-79.52	-13	-66.52	H
3819.6100	-25.86	-13	-12.86	H
5729.4100	-32.99	-13	-19.99	H
83.3500	-67.77	-13	-54.77	V
194.9000	-68.50	-13	-55.5	V
454.3850	-77.72	-13	-64.72	V
3819.6000	-28.16	-13	-15.16	V
5729.4150	-34.41	-13	-21.41	V

The Worst Test Result For PCS 1900, CH 810				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
110.1250	-60.57	-13	-47.57	H
196.4100	-74.57	-13	-61.57	H
667.8000	-78.49	-13	-65.49	H
3820.0700	-25.86	-13	-12.86	H
5730.1100	-32.99	-13	-19.99	H
110.1250	-61.35	-13	-48.35	V
196.4100	-69.43	-13	-56.43	V
667.8000	-76.89	-13	-63.89	V
3820.0700	-27.33	-13	-14.33	V
5730.1100	-33.67	-13	-20.67	V

Note: Only recorded the worst test data.

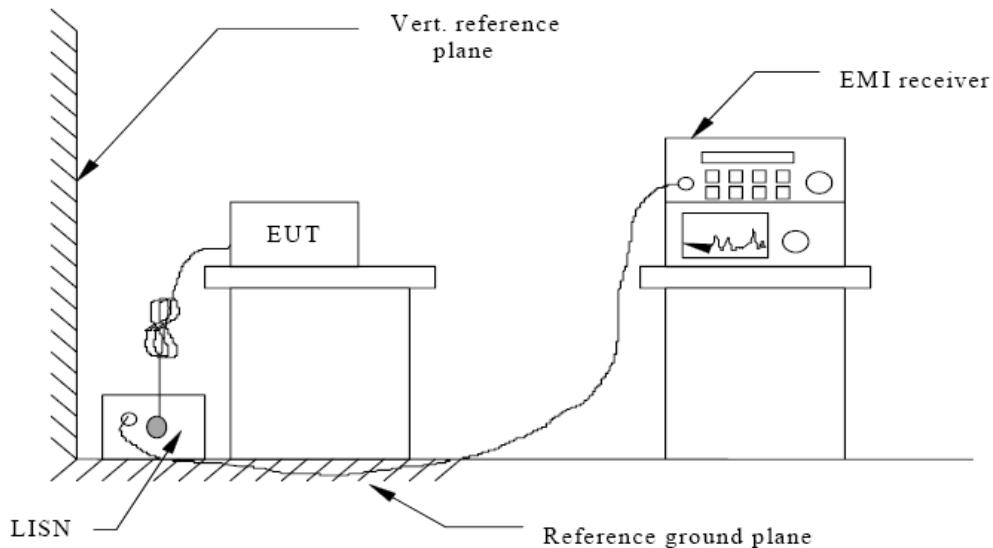
5.5. POWER LINE CONDUCTED EMISSIONS

5.5.1 Standard Applicable

According to §15.107 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

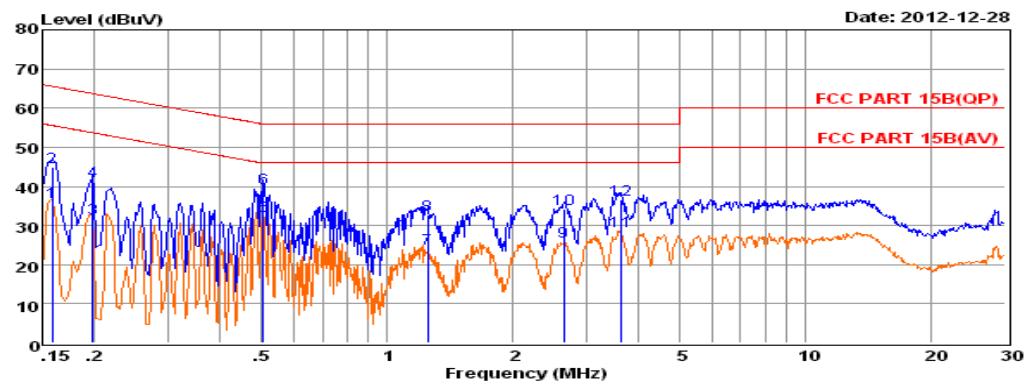
5.5.2 Block Diagram of Test Setup



5.5.3 Test Results

PASS.

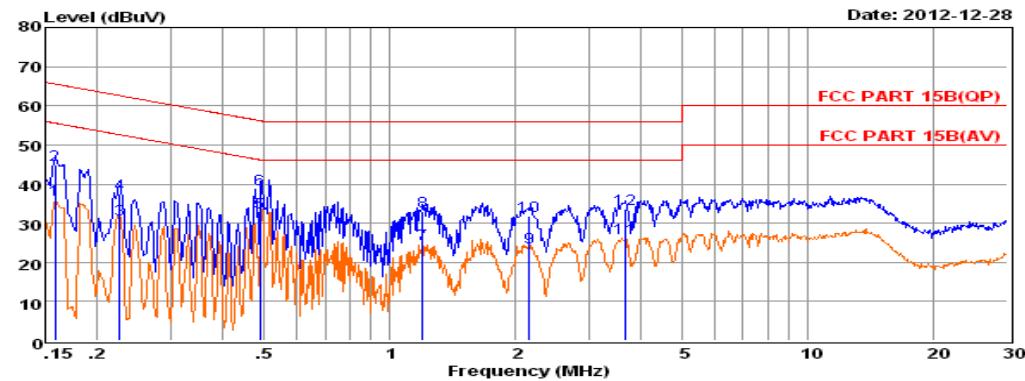
The test data please refer to following page.



Env. Ins: 24*/56%
 EUT: M2micro Center Control Unit
 M/N: MCC6000-CD01
 Power Rating: AC 120V/60Hz
 Test Mode: On
 Operator: Andy
 Memo:
 Pol: LINE

Freq	Reading	LisnFac	CabLos	Measured		Over	Remark	
				MHz	dBuV	dB	dBuV	dBuV
1	0.16	26.52	9.58	0.02	36.12	55.56	-19.44	Average
2	0.16	35.17	9.58	0.02	44.77	65.56	-20.79	QP
3	0.20	22.30	9.63	0.02	31.95	53.71	-21.76	Average
4	0.20	31.59	9.63	0.02	41.24	63.71	-22.47	QP
5	0.50	22.72	9.62	0.04	32.38	46.00	-13.62	Average
6	0.50	29.88	9.62	0.04	39.54	56.00	-16.46	QP
7	1.25	14.33	9.63	0.05	24.01	46.00	-21.99	Average
8	1.25	23.16	9.63	0.05	32.84	56.00	-23.16	QP
9	2.65	16.14	9.64	0.05	25.83	46.00	-20.17	Average
10	2.65	24.42	9.64	0.05	34.11	56.00	-21.89	QP
11	3.62	18.71	9.65	0.06	28.42	46.00	-17.58	Average
12	3.62	26.78	9.65	0.06	36.49	56.00	-19.51	QP

Remarks: 1. Measured = Reading + Lism Factor +Cable Loss.
 2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24*/56%
 EUT: M2micro Center Control Unit
 M/N: MCC6000-CD01
 Power Rating: AC 120V/60Hz
 Test Mode: On
 Operator: Andy
 Memo:
 Pol: NEUTRAL

Freq	Reading	LisnFac	CabLos	Measured		Over	Remark	
				MHz	dBuV	dB	dBuV	dBuV
1	0.16	26.36	9.68	0.02	36.06	55.56	-19.50	Average
2	0.16	35.25	9.68	0.02	44.95	65.56	-20.61	QP
3	0.23	21.32	9.59	0.03	30.94	52.61	-21.67	Average
4	0.23	27.87	9.59	0.03	37.49	62.61	-25.12	QP
5	0.49	23.07	9.62	0.04	32.73	46.19	-13.46	Average
6	0.49	29.12	9.62	0.04	38.78	56.19	-17.41	QP
7	1.20	14.96	9.63	0.05	24.64	46.00	-21.36	Average
8	1.20	23.19	9.63	0.05	32.87	56.00	-23.13	QP
9	2.16	14.05	9.63	0.05	23.73	46.00	-22.27	Average
10	2.16	22.17	9.63	0.05	31.85	56.00	-24.15	QP
11	3.66	16.49	9.65	0.06	26.20	46.00	-19.80	Average
12	3.66	23.92	9.65	0.06	33.63	56.00	-22.37	QP

Remarks: 1. Measured = Reading + Lism Factor +Cable Loss.
 2. The emission levels that are 20dB below the official limit are not reported.

Note: Pre-scan all mode and recorded the worst case results in this report (GSM 850, Normal Link)

5.6. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

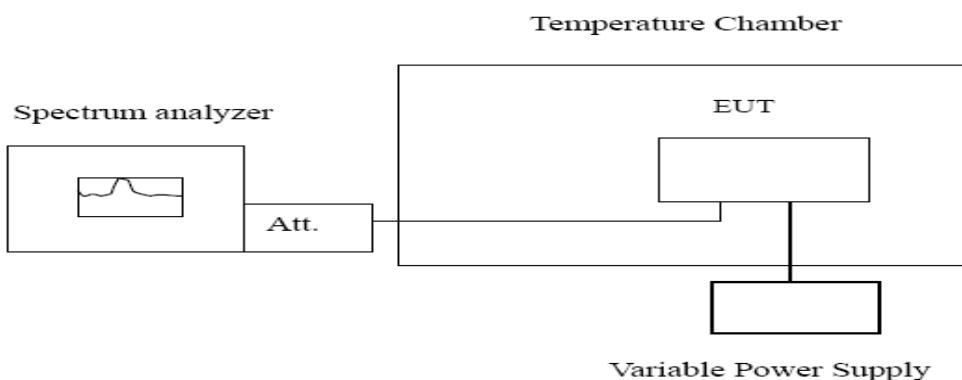
5.6.1. Standard Applicable

FCC §2.1055, §22.355 and §24.235, Frequency Tolerance: 2.5 ppm

5.6.2. Test Procedures

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency.

Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.



5.6.3. Test Results

Pass

The worst test data as follow:

The Worst Test Result For GSM 850, CH 190, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	7.4	-11	-0.01315	2.5
-20		-13	-0.01554	2.5
-10		-6	-0.00717	2.5
0		-10	-0.01195	2.5
10		-11	-0.01315	2.5
20		-8	-0.00956	2.5
30		-6	-0.00717	2.5
40		-13	-0.01554	2.5
50		-14	-0.01673	2.5
25	8.2	-9	-0.01076	2.5
25	6.7	-11	-0.01315	2.5

The Worst Test Result For PCS 1900, CH 661, $f_0 = 1880.0\text{MHz}$				
Temperature (°C)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Conclusion
-30	7.4	6	0.00319	Pass
-20		8	0.00426	Pass
-10		11	0.00585	Pass
0		8	0.00426	Pass
10		7	0.00372	Pass
20		9	0.00479	Pass
30		12	0.00638	Pass
40		7	0.00372	Pass
50		8	0.00426	Pass
25	8.2	9	0.00479	Pass
25	6.7	7	0.00372	Pass

6. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
Signal Generator	Agilent	E4438C	MY42082646	June 18,2012	June 17,2013
Power Meter	Agilent	E4416A	GB41291412	June 18,2012	June 17,2013
Attenuator	WEINSCHEL	67-30-33	BR0530	June 18,2012	June 17,2013
Temperature and Humidity Chamber	Korea Eng	KR-1005L	KRAC05063-3CH	June 29,2012	June 28,2013
Signal Analyzer	Agilent	N9020A	US46220219	June 18,2012	June 17,2013
EMI Test Receiver	R&S	ESI26	10887490.26	June 18,2012	June 17,2013
BI-LOG Antenna	Schwarzbeck	VULB 9168	9168-200	June 18,2012	June 17,2013
Antenna Position Tower	HD	MA240	556	N/A	N/A
Turn Table	EMCO	1050	114	N/A	N/A
Controller	HD GmbH	HD 100	13	N/A	N/A
SlideBar	HD GmbH	KMS 560	12	N/A	N/A
Horn Antenna	MITEQ	AFS44-00102650-42-10P44-PS	1532439	June 18,2012	June 17,2013
Horn Antenna	Schwarzbeck	BBHA 9120D	147	July 07,2012	July 06,2013
Loop Antenna	Schwarzbeck	BBHA 9120D	296	July 07,2012	July 06,2013
Signal Generator	EMCO	6502	9009-2536	July 07,2012	July 06,2013
Wireless Communications Test Set	Agilent	8960 E5515C	GB47050534	June 18,2012	June 17,2013
Universal Radio Communication Tester	R&S	CMU200	112012	June 18,2012	June 17,2013
Spectrum	Agilent	E4407B	MY41440754	June 18,2012	June 17,2013

7. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

MCC6000-DD01	--	--	--
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Belong to the tested device:

Product description : M2micro Center Control Unit

Model name : MCC6000-CD01

*Remark: PCB board, structure and internal of these model(s) are the same,
So no additional models were tested.*

-----THE END OF REPORT-----