



## Test Report

Product Name : MOBILE PHONE  
Model No : PG220  
FCC ID : VOMTS200

Applicant : CENTURY TELECOM CO., LTD  
Address : 9F.-8, NO.20, Lane 609, Sec. 5,  
Chongxin Rd., Sanchong City, Taipei  
Country 241, Taiwan (R.O.C.)

Date of Receipt : 2009/04/15  
Issued Date : 2009/05/19  
Report No. : 094287R-HPUSP07V01  
Report Version : 1.0

The test results relate only to the samples tested.  
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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

# Test Report Certification

Issued Date : 2009/05/19

Report No.: 094287R-HPUSP07V01



Accredited by NIST (NVLAP)  
NVLAP Lab Code: 200533-0

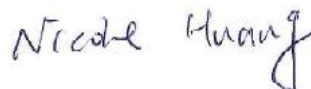
Product Name : MOBILE PHONE  
Applicant : CENTURY TELECOM CO., LTD  
Address : 9F.-8, NO.20, Lane 609, Sec. 5, Chongxin Rd., Sanchong City,  
Taipei Country 241, Taiwan (R.O.C.)  
Manufacturer : MOBILE 2000 CO., LTD.  
Trade Name : PHONEX  
Model No. : PG220  
Rated Voltage : AC 120V/60Hz  
EUT Voltage : DC3.7V  
Measurement Standard : FCC CFR Title 47 Part 2 22 24  
Measurement Reference : TIA/EIA 603-C  
Test Result : Complied

Test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of Quie Tek Corporation.

This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Documented By :



(Engineering Adm. Assistant /  
Nicole Huang)

Tested By :



(Engineer / Vorana Chen)

Approved By :



(Manager / Vincent Lin)

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	MOBILE PHONE
Model No.	PG220
Trade Name	PHONEX
IMEI No.	387540-01-986541-7
FCC ID.	VOMTS200
Antenna Type	Internal
TX Frequency	824MHz~849MHz(GSM 850) 1850MHz ~ 1910MHz(PCS 1900)
Rx Frequency	869MHz~894MHz(GSM 850) 1930MHz ~ 1990MHz(PCS 1900)
Hardware version	B100-150
Software version	B100-MB-V2.0

## 1.2. Operational Description

The information contained within this report is intended to show verification of compliance of the 850/1900MHz Notebook to the requirements of 47CFR2, 22 and 24.

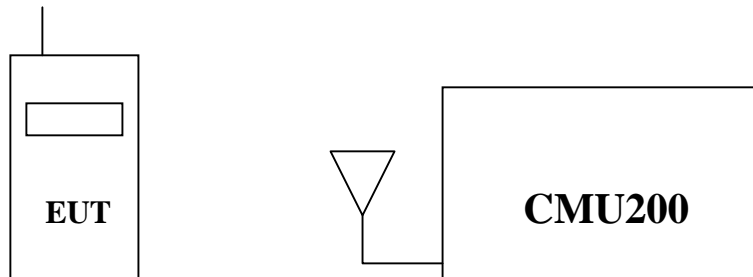
The EUT provide all functions described as above. The EUT is tested with maximum rated TX power via the Base Station simulator.

Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

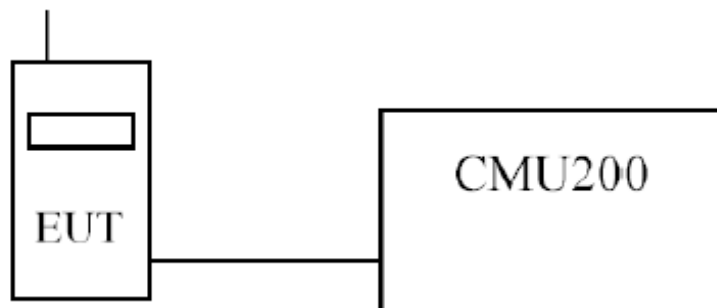
Test Mode:	GSM 850 Voice
	GSM 850 GPRS
	PCS 1900 Voice
	PCS 1900 GPRS

### 1.3. Configuration of tested System

(a) Configuration of Radiated measurement



(b) Configuration of Conducted measurement



### 1.4. EUT Setup Procedures

- (1) Setup the EUT and simulators as shown on 1.3
- (2) Turn on the power of all equipments.
- (3) The EUT was set to communicate with CMU200.
- (4) Repeat the above procedure (3).

## 1.5. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	23
Humidity (%RH)	25-75	52
Barometric pressure (mbar)	860-1060	982

Site Description: File on

Federal Communications Commission  
FCC Engineering Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046  
FCC Registration Number :92195



July 03, 2001 Accreditation on NVLAP  
NVLAP Lab Code: 200533-0



Site Name: Quie Tek Corporation

Linkou Testing Laboratory:

No. 5, Ruei-Shu Valley, Ruei-Ping Tsuen,  
Lin-Kou Shiang, Taipei,  
Taiwan, R.O.C.  
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789  
E-Mail : [service@quietek.com](mailto:service@quietek.com)

FCC Accreditation Number: TW1014



## 1.6. Type of Emission

GSM/GPRS: 300KG7W



## 2. Peak Power Output

### 2.1. Test Equipment

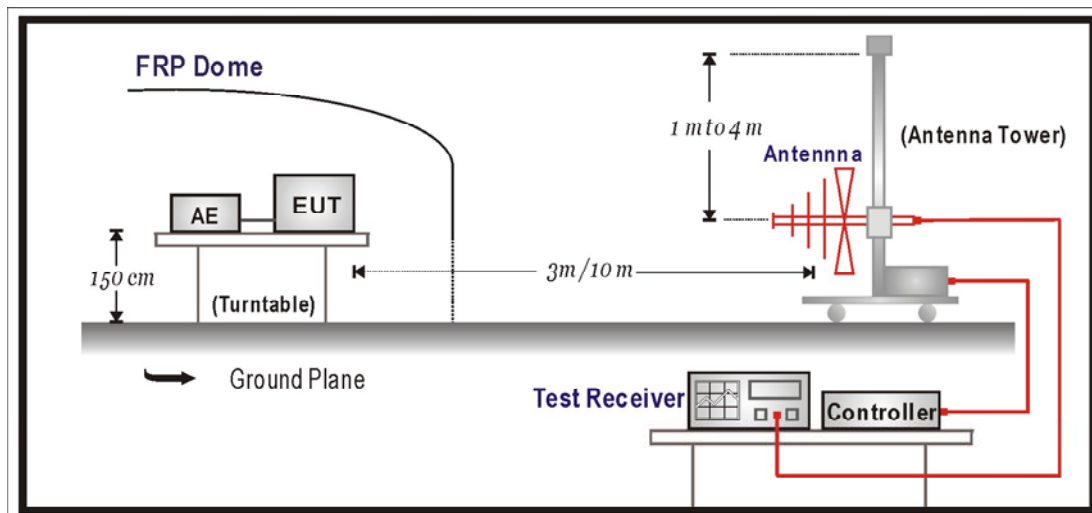
The following test equipments are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒OATS 2	Test Receiver	R & S	ESCS 30 / 100122	Feb., 2009
	Universal Radio Communication Tester	R & S	CMU200 / 104846	May., 2009
	Spectrum Analyzer	Agilent	E4408B/ MY45102743	Aug., 2009
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May., 2009
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May., 2009
	Horn Antenna	ETS	3115 / 0005-6160	Jul., 2008
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	Jul., 2008

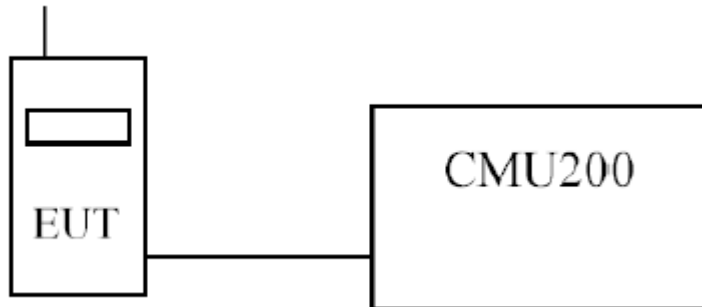
Note: 1. All equipments that need to be calibrated are with calibration period of 1 year.

### 2.2. Test Setup

#### Radiated Power Measurement



## Conducted Power Measurement



### 2.3. Limits

Cellular Band 850	<7W
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PCS Band 1900	<2W or +33dBm
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### 2.4. Test Procedure

#### ➤RF Out Power (Radiated)

The Spectrum Analyzer was tuned to the test frequency. The device was put into Transmit mode then rotated through 360 degrees until the highest power level was observed in both horizontal and vertical polarization. The device was then replaced with a substitution antenna, which input signal was adjusted until the received level matched that of the previously detected emission.

The EUT is tested with maximum rated TX power via the Base Station simulator.

#### ➤RF Out Power (Conducted)

The EUT is tested with maximum rated TX power via the Base Station simulator, and the output power was measured at the antenna terminals of the EUT.

### 2.5. Test Specification

According to Part 2.1046, 22.913,24.232.

## 2.6. Test Result of Peak Power Output

Product	MOBILE PHONE			
Test Mode	RF Output Power (Conducted)			
Date of Test	2009/04/22	Test Site	CTR	

GSM 850 Voice				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	31.88	0.4	32.28	1.69
836.4	32.52	0.4	32.92	1.96
848.8	32.49	0.4	32.89	1.95
GSM 850 GPRS				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	31.82	0.4	32.22	1.67
836.4	32.47	0.4	32.87	1.94
848.8	32.43	0.4	32.83	1.92
PCS 1900 Voice				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	29.51	0.6	30.11	1.03
1880	29.57	0.6	30.17	1.04
1909.8	29.44	0.6	30.04	1.01
PCS 1900 GPRS				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	29.44	0.6	30.04	1.01
1880	29.48	0.6	30.08	1.02
1909.8	29.38	0.6	29.98	1.00

Product	MOBILE PHONE		
Test Mode	RF Output Power (Radiated)		
Date of Test	2009/04/21	Test Site	OATS 2
Test Condition	GSM 850 Voice		

#### Maximum Power-GSM 850 Voice

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBd)	Cable Loss (dB)	Result ERP (dBm)	Result ERP (W)
824.2	18.34	21.21	4.45	0.51	25.15	0.33
836.4	19.37	22.27	4.45	0.51	26.21	0.42
848.8	18.69	21.57	4.45	0.51	25.51	0.36

#### Note:

1. The EUT meets the requirements of FCC CFR 47: Part 22, Section 22.913(a) for Effective Radiated Power.
2. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
3. Result ERP = Substitution Level + Substitution Antenna Gain - Cable Loss

Product	MOBILE PHONE		
Test Mode	RF Output Power (Radiated)		
Date of Test	2009/04/21	Test Site	OATS 2
Test Condition	GSM 850 GPRS		

#### Maximum Power-GSM 850 GPRS

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBd)	Cable Loss (dB)	Result ERP (dBm)	Result ERP (W)
824.2	18.31	21.18	4.45	0.51	25.12	0.33
836.4	19.24	22.14	4.45	0.51	26.08	0.41
848.8	18.67	21.55	4.45	0.51	25.49	0.35

#### Note:

1. The EUT meets the requirements of FCC CFR 47: Part 22, Section 22.913(a) for Effective Radiated Power.
2. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
3. Result ERP = Substitution Level + Substitution Antenna Gain - Cable Loss

Product	MOBILE PHONE		
Test Mode	RF Output Power (Radiated)		
Date of Test	2009/04/21	Test Site	OATS 2
Test Condition	PCS 1900 Voice		

#### Maximum Power-PCS 1900 Voice

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result EIRP (W)
1850.2	-15.880	14.370	10.4	1.02	23.750	0.24
1880.0	-14.010	15.868	10.4	1.02	25.248	0.33
1909.8	-16.340	14.152	10.4	1.02	23.532	0.23

#### Note:

1. The EUT meets the requirements of FCC CFR 47: Part 24, Section 24.232(b) for Effective Isotropically Radiated Power.
2. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

Product	MOBILE PHONE		
Test Mode	RF Output Power (Radiated)		
Date of Test	2009/04/21	Test Site	OATS 2
Test Condition	PCS 1900 GPRS		

#### Maximum Power-PCS 1900 GPRS

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result EIRP (W)
1850.2	-15.810	14.440	10.4	1.02	23.820	0.24
1880.0	-14.020	15.858	10.4	1.02	25.238	0.33
1909.8	-16.200	14.292	10.4	1.02	23.672	0.23

#### Note:

1. The EUT meets the requirements of FCC CFR 47: Part 24, Section 24.232(b) for Effective Isotropically Radiated Power.
2. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

### 3. Occupied Bandwidth

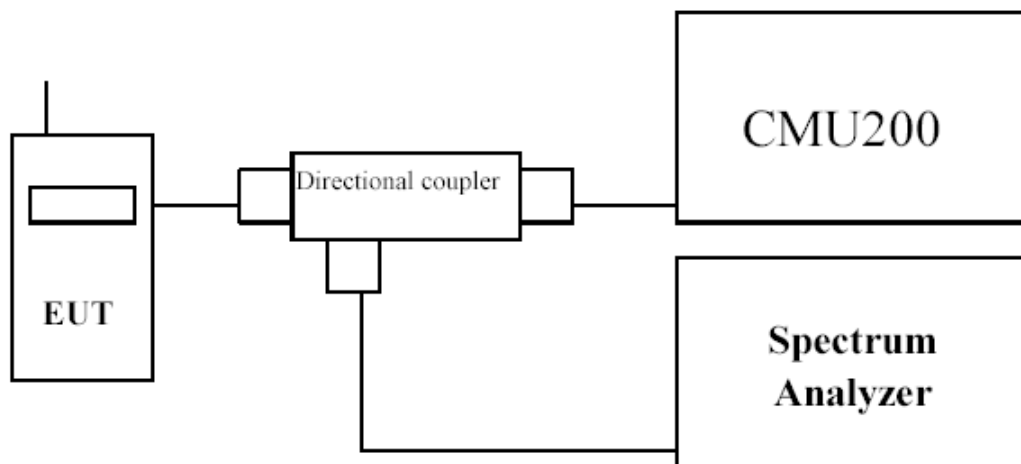
#### 3.1. Test Equipment

The following test equipments are used during the occupied bandwidth tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	Agilent	E4408B/ MY45102743	Aug., 2009
Universal Radio Communication Tester	R & S	CMU200 / 104846	May., 2009
Directional coupler	Agilent	87300C / MY44300353	Aug., 2008
Directional coupler	Agilent	778D-012/ 50550	Aug., 2008

Note: All equipments upon which need to be calibrated are with calibration period of 1 year.

#### 3.2. Test Setup



#### 3.3. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the occupied bandwidth was measured at the antenna terminals of the EUT.

The Resolution BW of the analyzer is set to 1 % of the emission bandwidth. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The plots below show the resultant display from the Spectrum Analyzer.



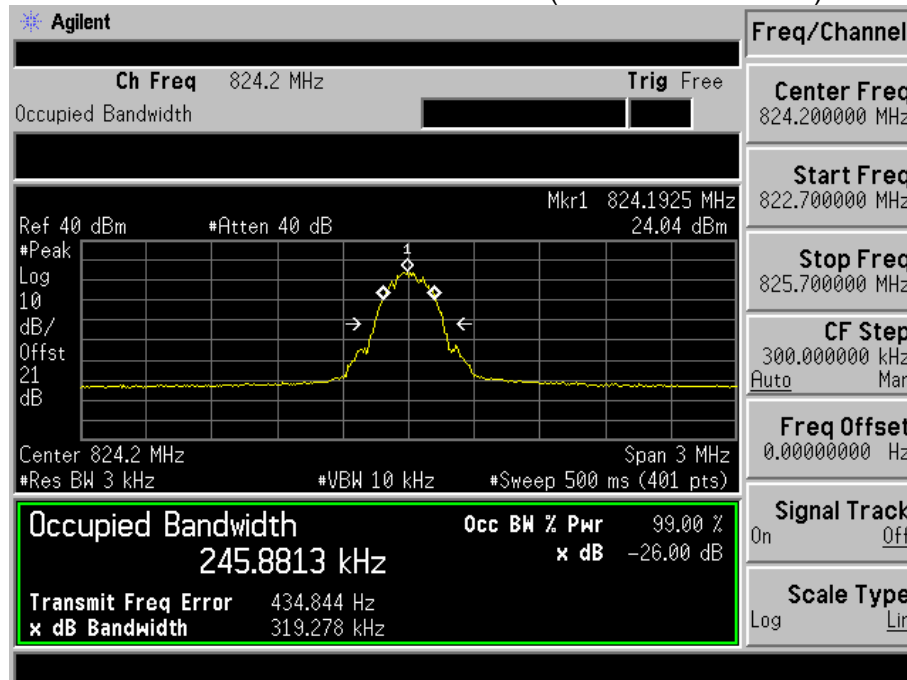
### **3.4. Test Specification**

According to Part 2.1049, 22.917(b), 24.238(b).

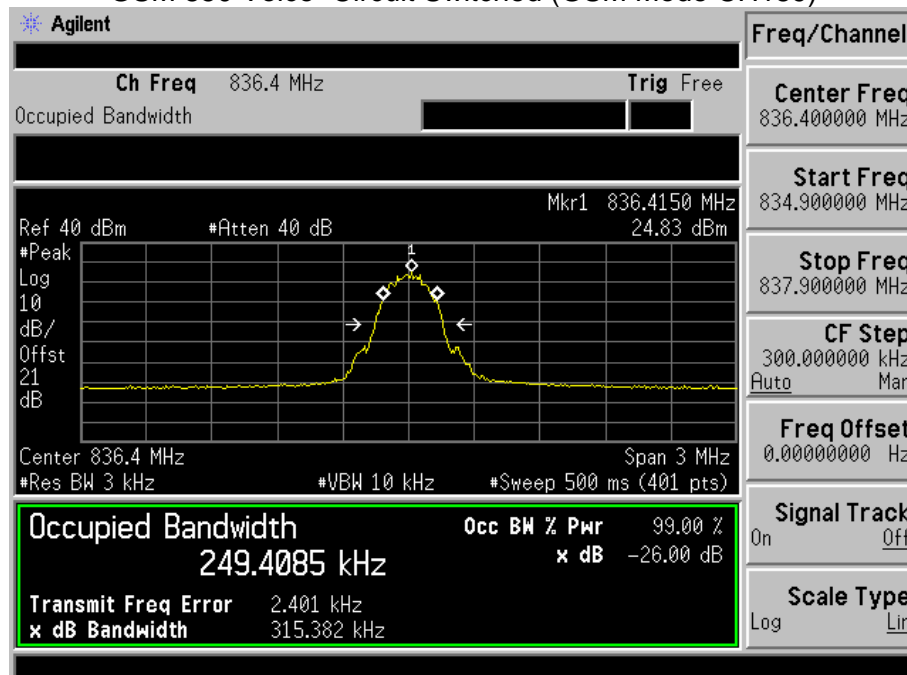
### 3.5. Test Result of Occupied Bandwidth

Product	MOBILE PHONE		
Test Mode	Occupied Bandwidth		
Date of Test	2009/04/22	Test Site	CTR

GSM 850 Voice- Circuit Switched (GSM Mode CH 128)

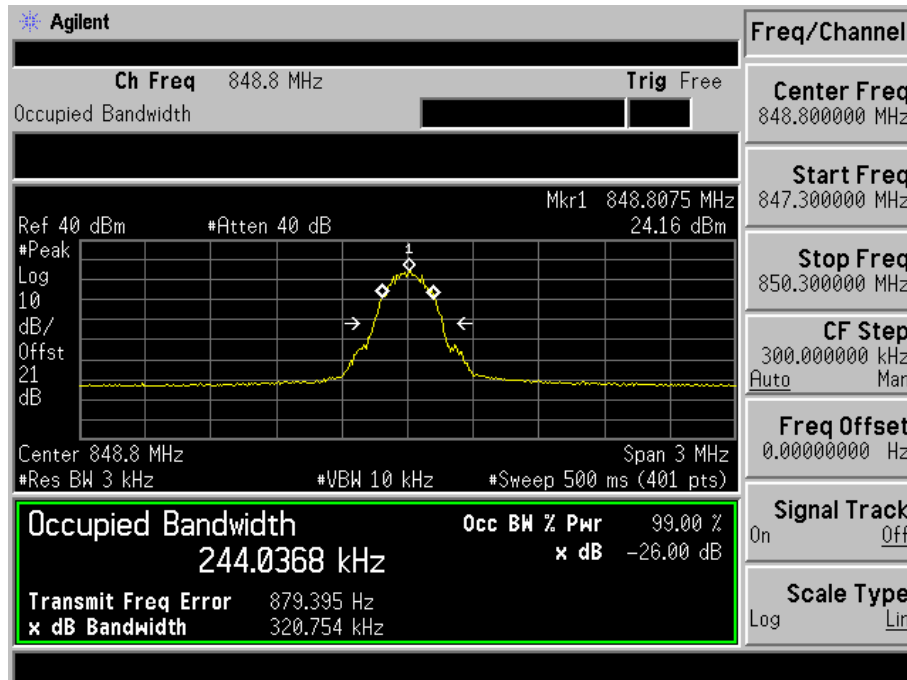


GSM 850 Voice- Circuit Switched (GSM Mode CH189)



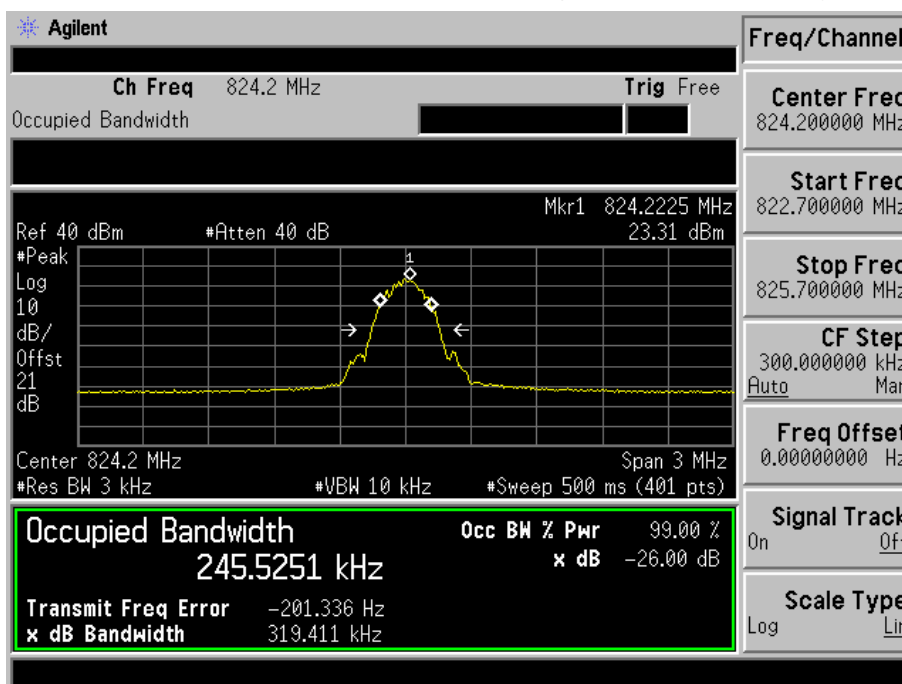
Product	MOBILE PHONE		
Test Mode	Occupied Bandwidth		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	GSM 850 Voice		

GSM 850 Voice- Circuit Switched (GSM Mode CH 251)

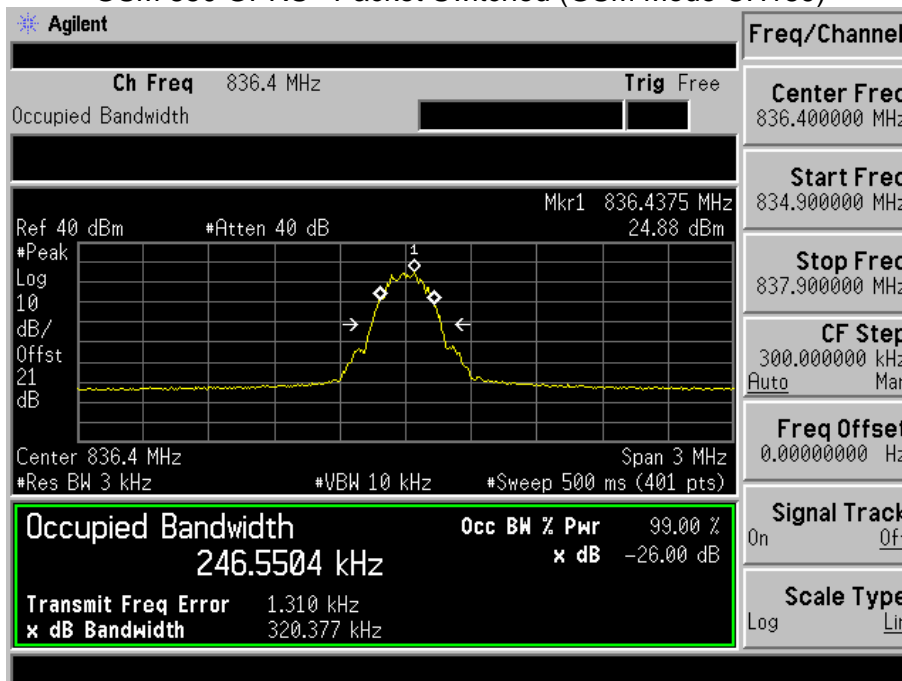


Product	MOBILE PHONE		
Test Mode	Occupied Bandwidth		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	GSM 850 GPRS		

GSM 850 GPRS - Packet Switched (GSM Mode CH 128)

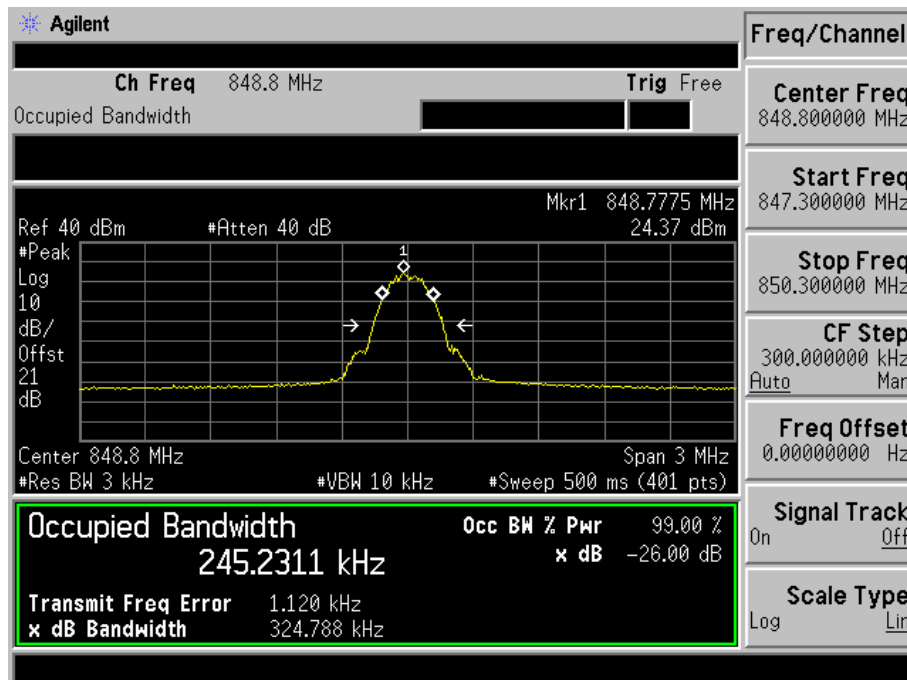


GSM 850 GPRS - Packet Switched (GSM Mode CH189)



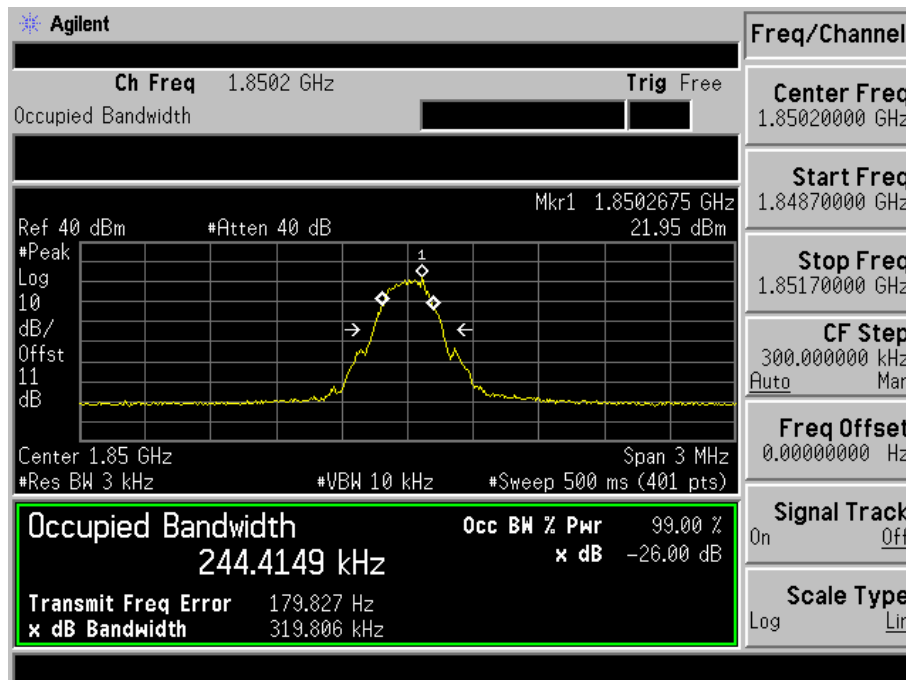
Product	MOBILE PHONE		
Test Mode	Occupied Bandwidth		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	GSM 850 GPRS		

GSM 850 GPRS - Packet Switched (GSM Mode CH 251)

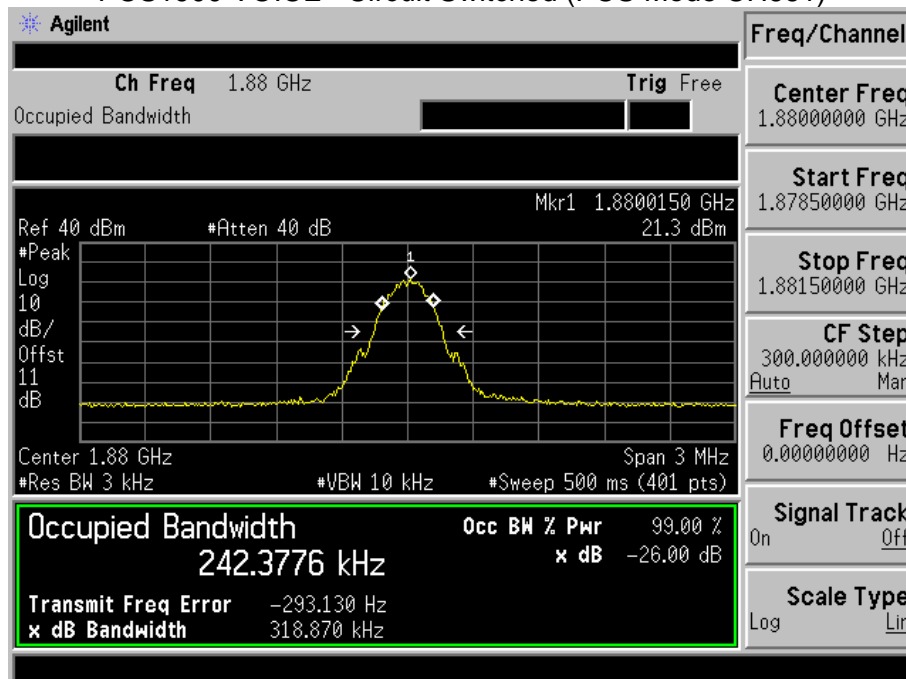


Product	MOBILE PHONE		
Test Mode	Occupied Bandwidth		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	PCS1900		

PCS1900 VOICE - Circuit Switched (PCS Mode CH 512)

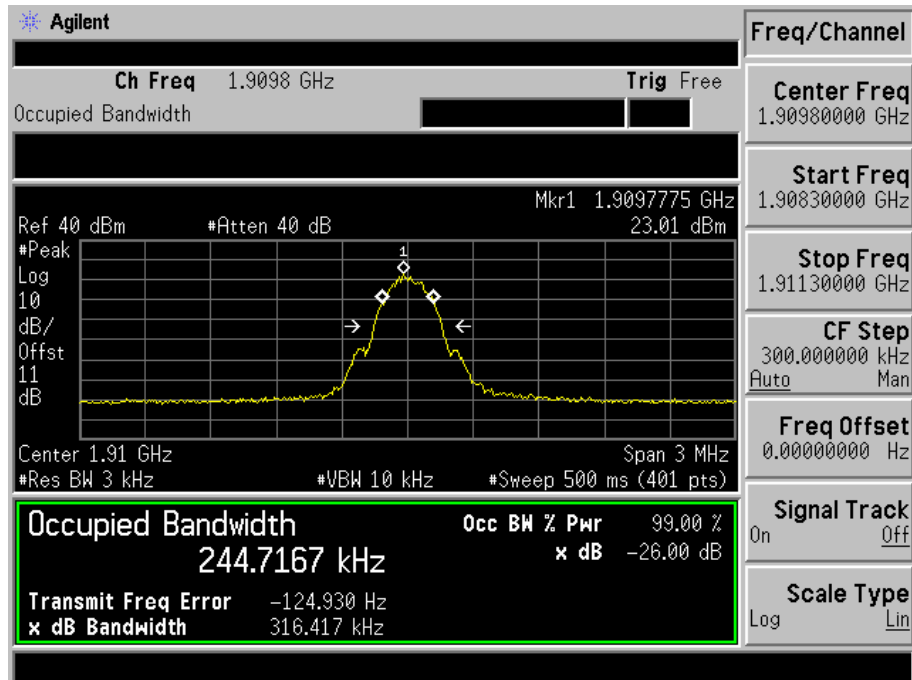


PCS1900 VOICE - Circuit Switched (PCS Mode CH661)



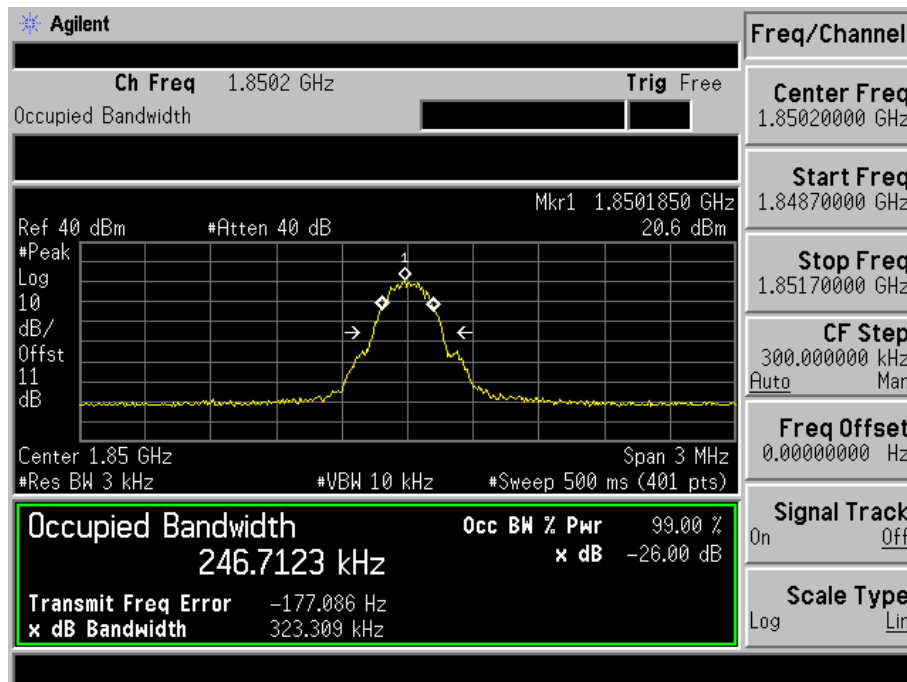
Product	MOBILE PHONE		
Test Mode	Occupied Bandwidth		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	PCS1900		

PCS1900 VOICE - Circuit Switched (PCS Mode CH 810)

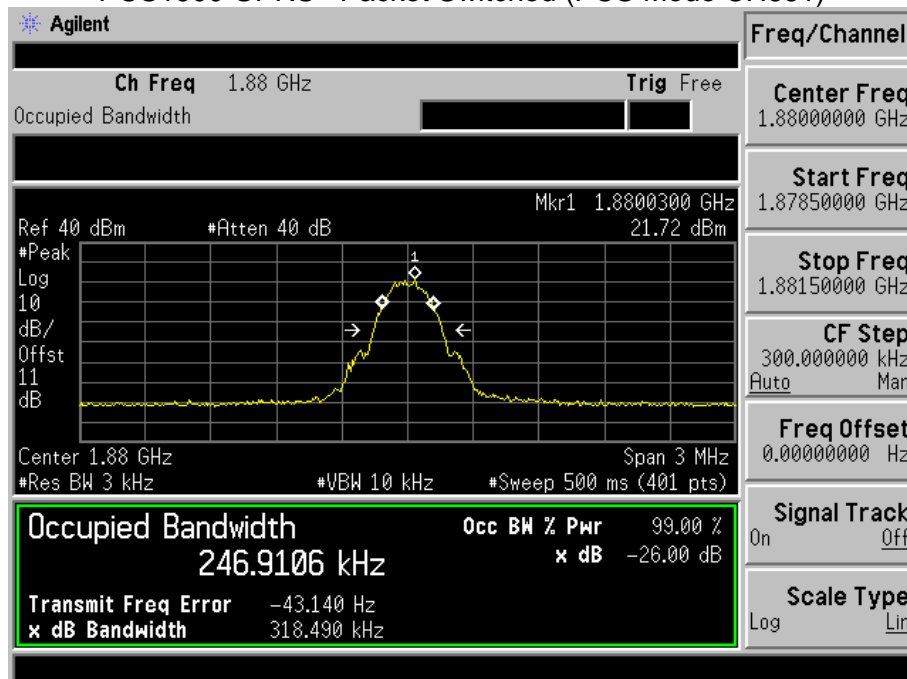


Product	MOBILE PHONE		
Test Mode	Occupied Bandwidth		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	PCS1900 GPRS		

PCS1900 GPRS - Packet Switched (PCS Mode CH 512)



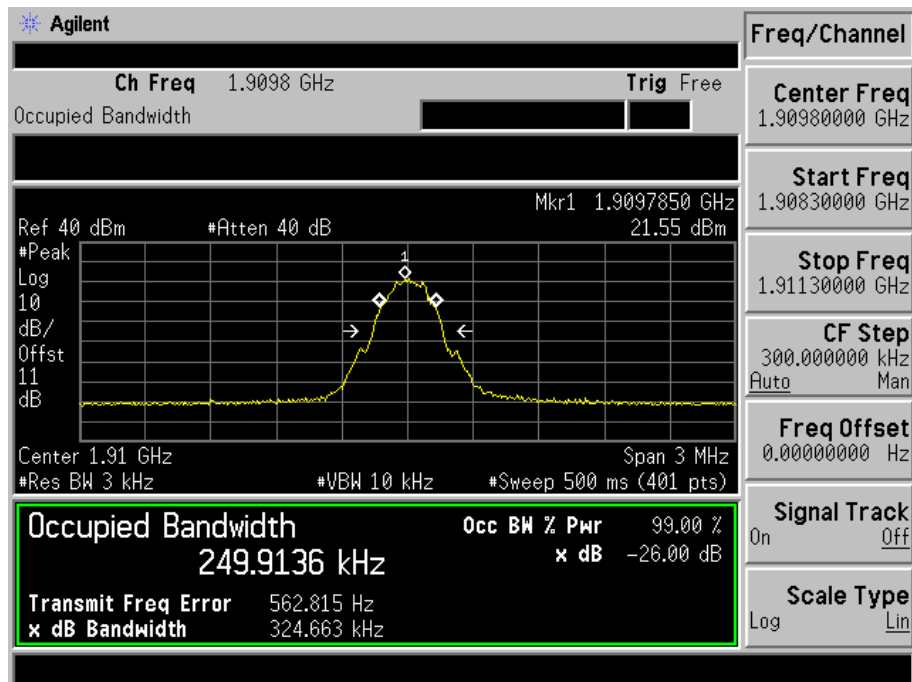
PCS1900 GPRS - Packet Switched (PCS Mode CH661)





Product	MOBILE PHONE		
Test Mode	Occupied Bandwidth		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	PCS1900 GPRS		

PCS1900 GPRS - Packet Switched (PCS Mode CH 810)



#### 4. Spurious Emission At Antenna Terminals (+/-1MHz)

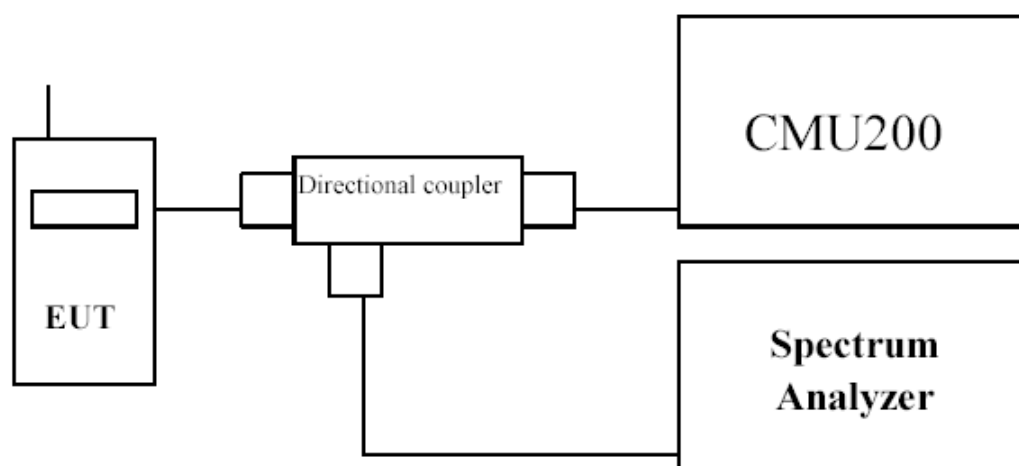
##### 4.1. Test Equipment

The following test equipments are used during the spurious emission test

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	Agilent	E4408B/ MY45102743	Aug., 2009
Universal Radio Communication Tester	R & S	CMU200 / 104846	May., 2009
Directional coupler	Agilent	87300C / MY44300353	Aug., 2008
Directional coupler	Agilent	778D-012/ 50550	Aug., 2008

Note: All equipments upon which need to be calibrated are with calibration period of 1 year.

##### 4.2. Setup



### 4.3. Limits

Cellular Band Transmitter limits for narrowband spurious emission

Lower Block Edge Test Frequencies	Upper Block Edge Test Frequencies
Block A Channel : 128 Frequency : 824.2 MHz	Block B Channel : 251 Frequency : 848.8 MHz

PCS Band Transmitter limits for narrowband spurious emission

Lower Block Edge Test Channels/Frequencies	Upper Block Edge Test Channels/Frequencies
Block A Channel : 512 Frequency : 1850.2 MHz	Block C Channel : 810 Frequency : 1909.8 MHz

### 4.4. Test Procedure

In accordance with Part 22.917 and 24.238, at least 1% of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1MHz, the resolution and video bandwidth were increased to 1MHz.

The reference power and path losses of all channels used for testing in each frequency block were measured.

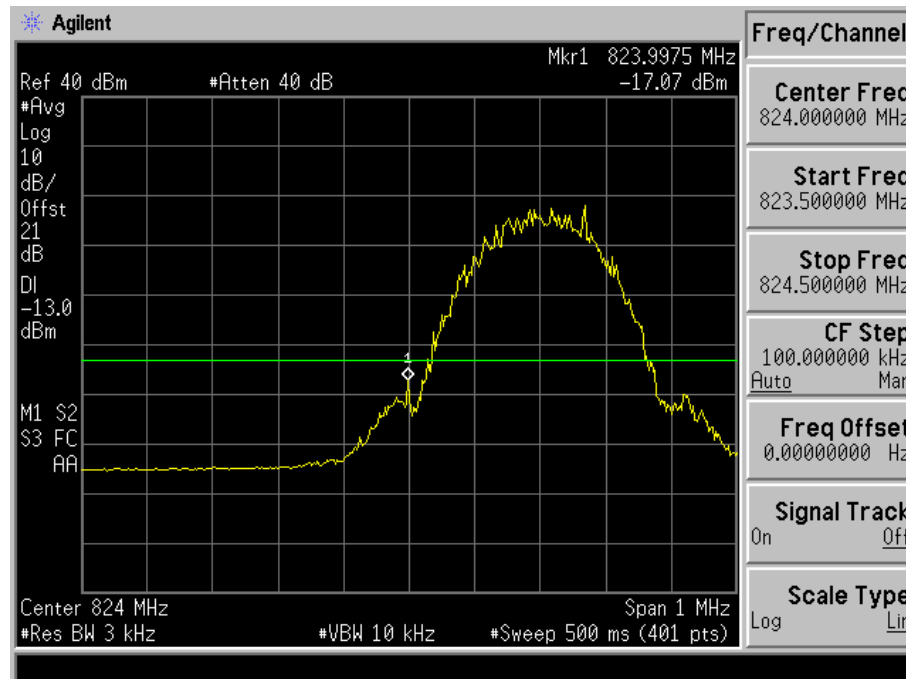
### 4.5. Test Specification

According to Part 2.1049, 22.917,24.238.

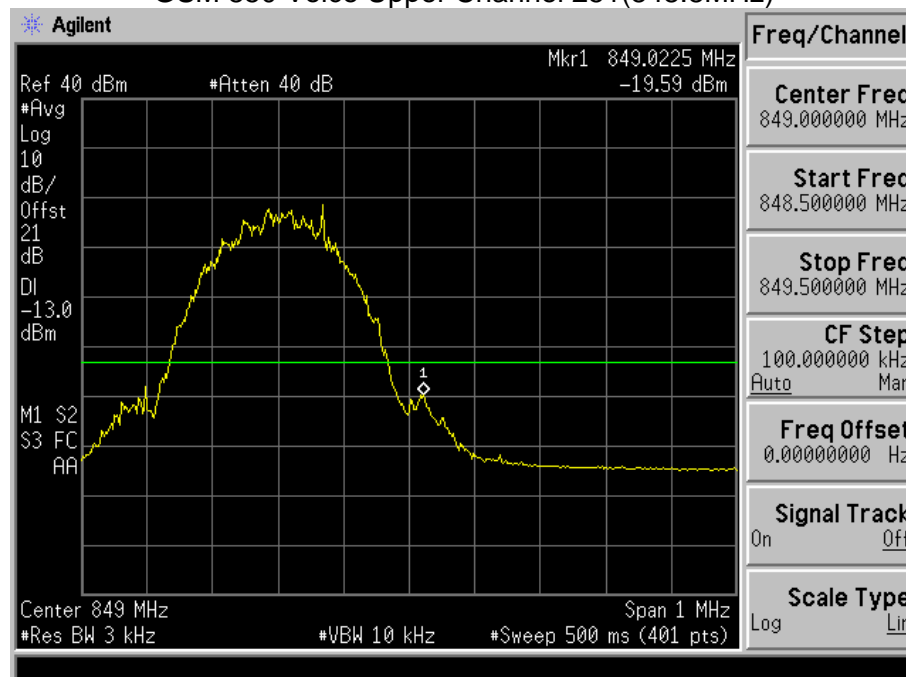
#### 4.6. Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

Product	MOBILE PHONE		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 Voice)		

GSM 850 Voice Lower Channel 128 (824.2MHz)

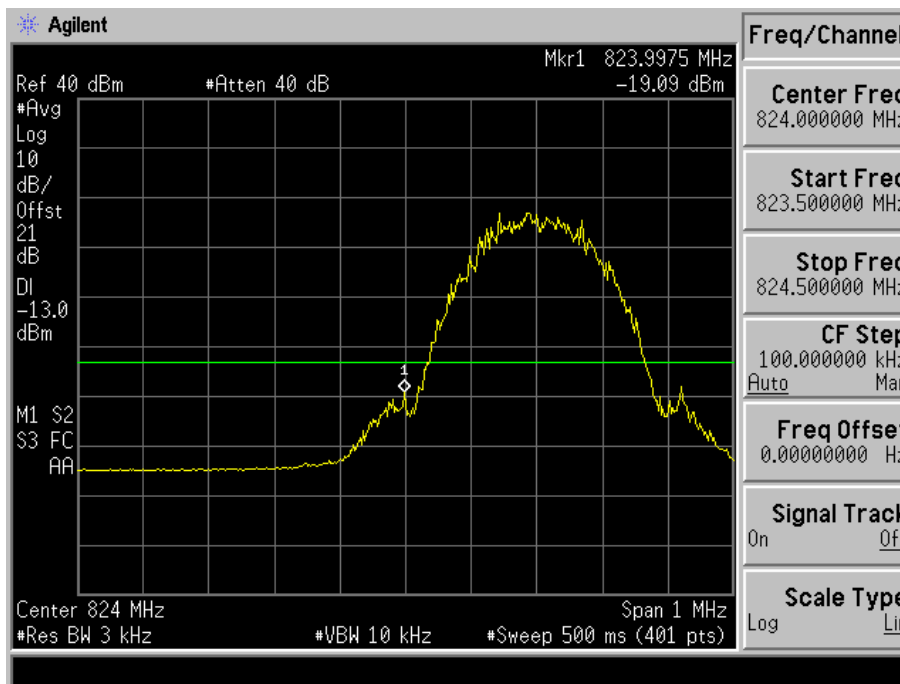


GSM 850 Voice Upper Channel 251(848.8MHz)

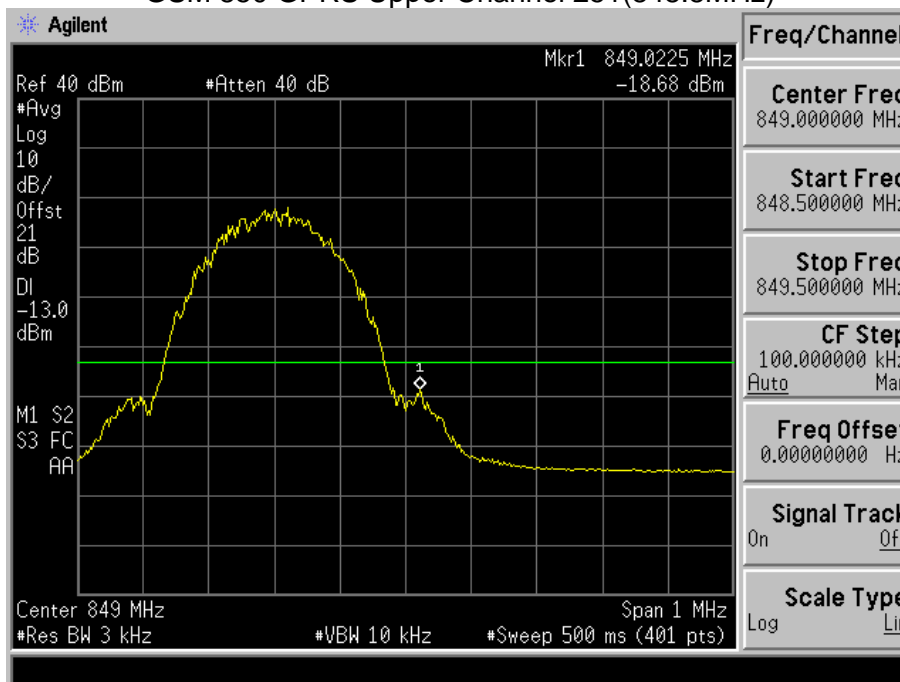


Product	MOBILE PHONE		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 GPRS)		

GSM 850 GPRS Lower Channel 128 (824.2MHz)

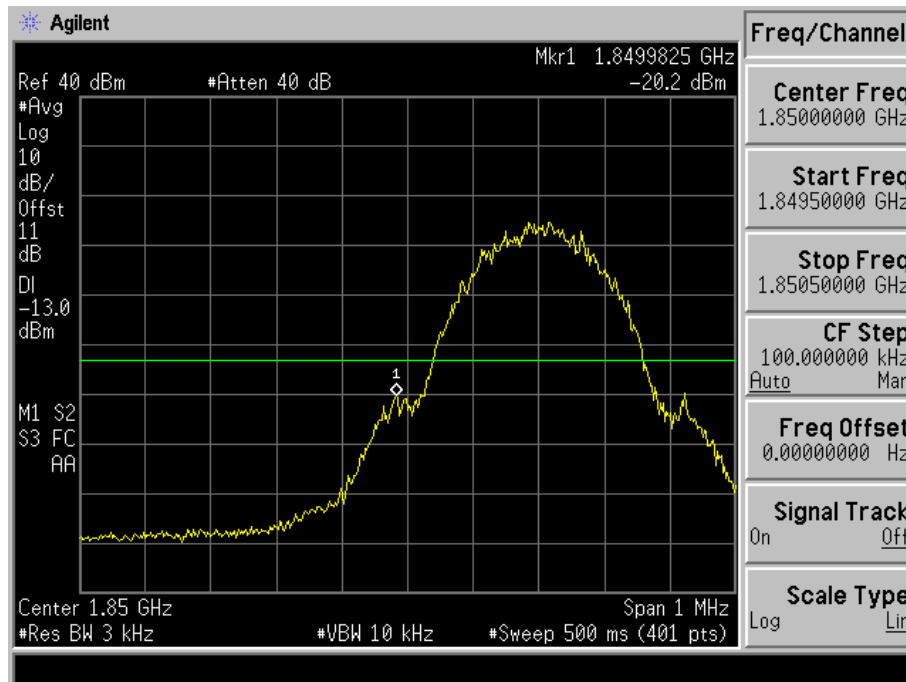


GSM 850 GPRS Upper Channel 251(848.8MHz)

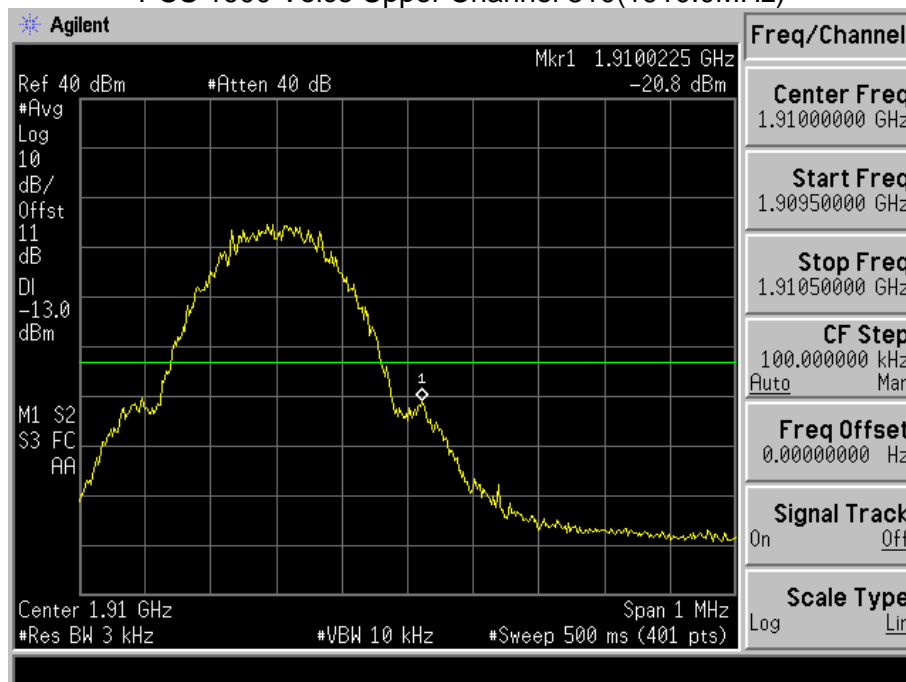


Product	MOBILE PHONE		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 Voice)		

PCS 1900 Voice Lower Channel 512 (1850.2MHz)

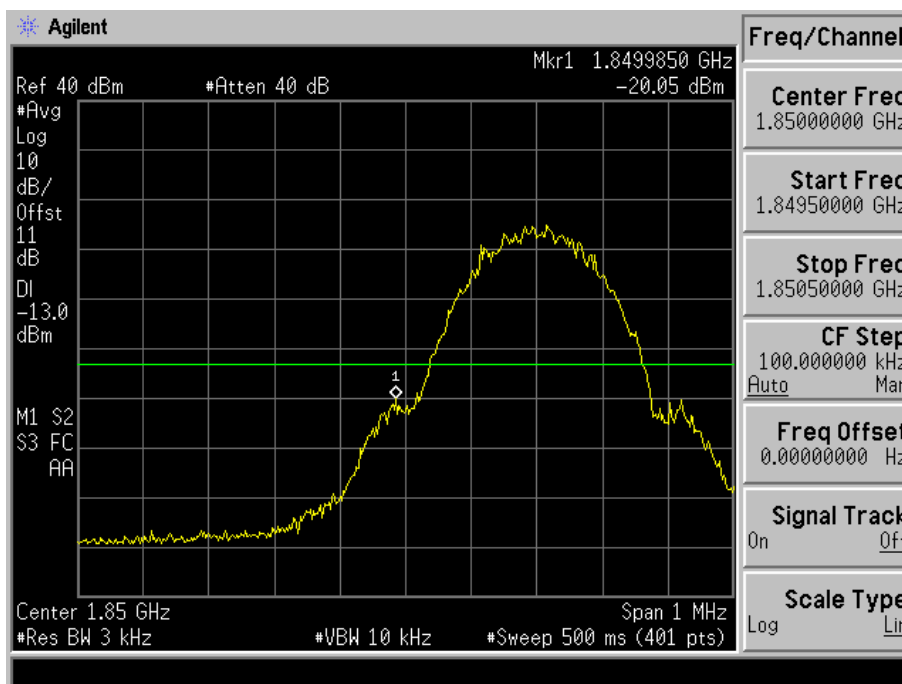


PCS 1900 Voice Upper Channel 810(1910.0MHz)

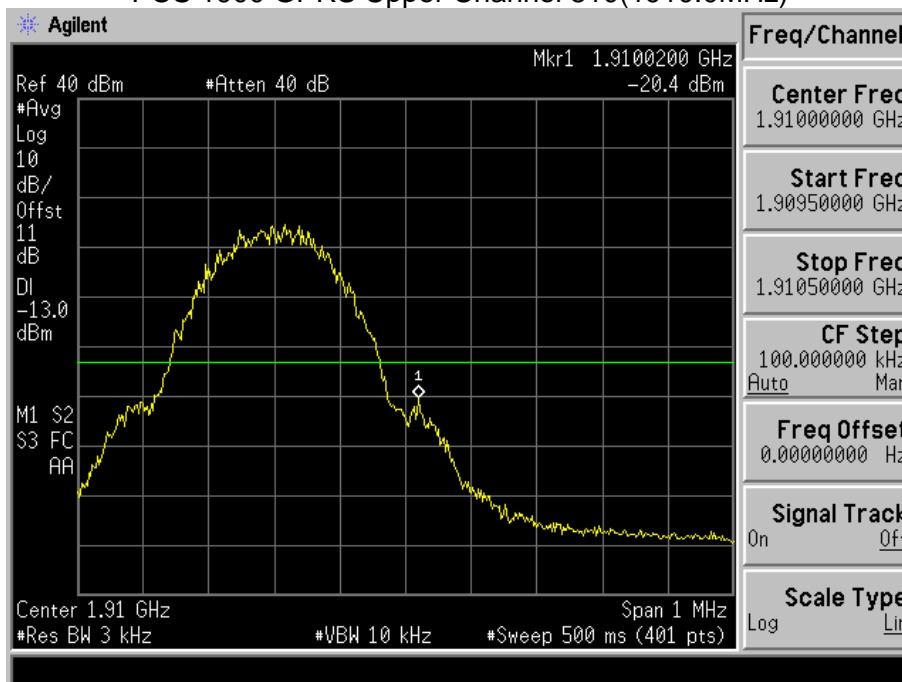


Product	MOBILE PHONE		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 GPRS)		

PCS 1900 GPRS Lower Channel 512 (1850.2MHz)



PCS 1900 GPRS Upper Channel 810(1910.0MHz)



## 5. Spurious Emission

### 5.1. Test Equipment

The following test equipments are used during the radiated emission test:

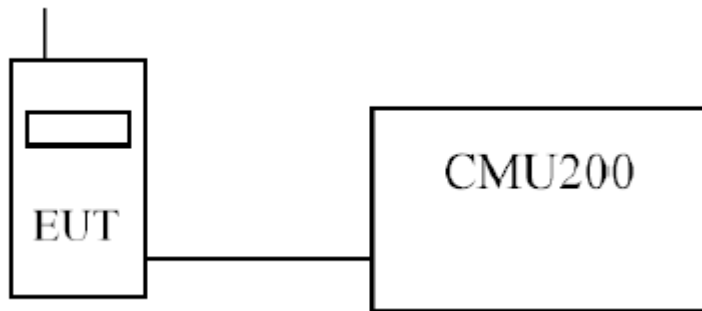
Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒CTR	Spectrum Analyzer	Agilent	E4408B/ MY45102743	Aug., 2009
	Dual Directional couple	Agilent	778D-012/50550	Aug , 2008
	Directional coupler	Agilent	87300C/ MY44300353	Aug ., 2008
☒SITE2	Universal Radio Communication Tester	R & S	CMU200 / 104846	Apr ., 2009
	Bilog Antenna	Schaffner Chase	CBL6112B/2921	Aug ., 2008
	Broadband Horn Antenna	Schwarzbeck	BBHA9170/497	Sep ., 2008
	Horn Antenna	Schwarzbeck	BBHA9120D/305	Sep ., 2008
	Pre-Amplifier	QTK	N/A	N/A
	Microwave Amplifier (0.5GHZ-26.5GHZ)	Agilent	83017A/ MY39500682	Aug ., 2008
	Test Receiver	R & S	ESCS 30 / 100122	Feb., 2009
	Universal Radio Communication Tester	R & S	CMU200 / 104846	May ., 2009

Note: 1. All equipments that need to be calibrated are with calibration period of 1 year.

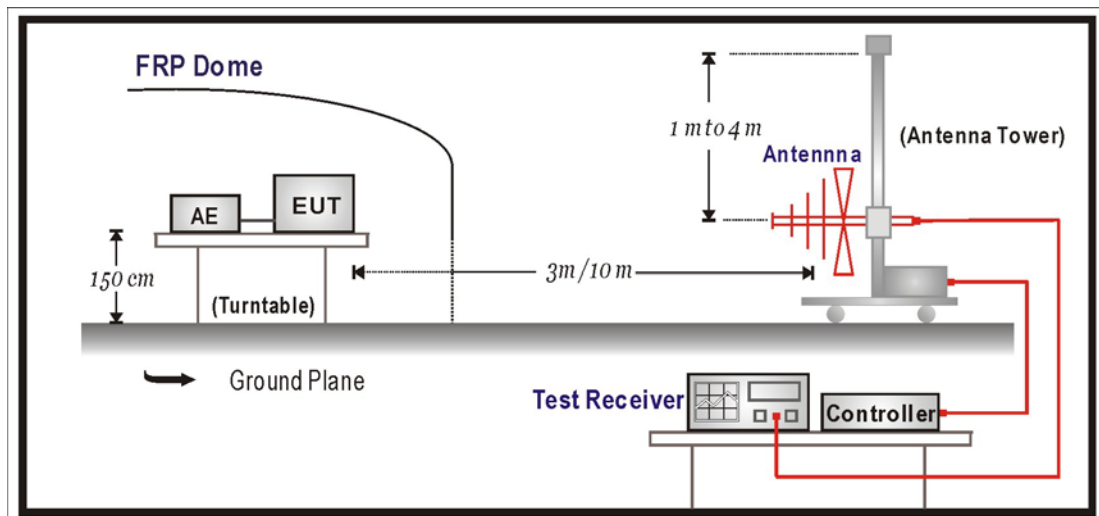


## 5.2. Test Setup

### 5.2.1.1 Spurious emissions at antenna terminals.



### 5.2.1.2 Field strength of spurious radiation.



## 5.3. Limits

Limit	$<-13\text{dBm}$
-------	------------------

$43 + 10\text{Log}(P)$  down on the carrier where  $P$  is the power in Watts.

#### **5.4. Test Procedure**

In accordance with Part 2.1051, the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 30MHz to 20GHz. The EUT was set to transmit on full power. The EUT was tested on Low, middle and High channels for both power levels. The resolution and video bandwidth was set to 3MHz in accordance with Part 22.917&24.238. The spectrum analyzer detector was set to Max Hold.

In addition, measurements were made up to the 10<sup>th</sup> harmonic of the fundamental.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to TIA/EIA 603-C on radiated measurement.

#### **5.5. Test Specification**

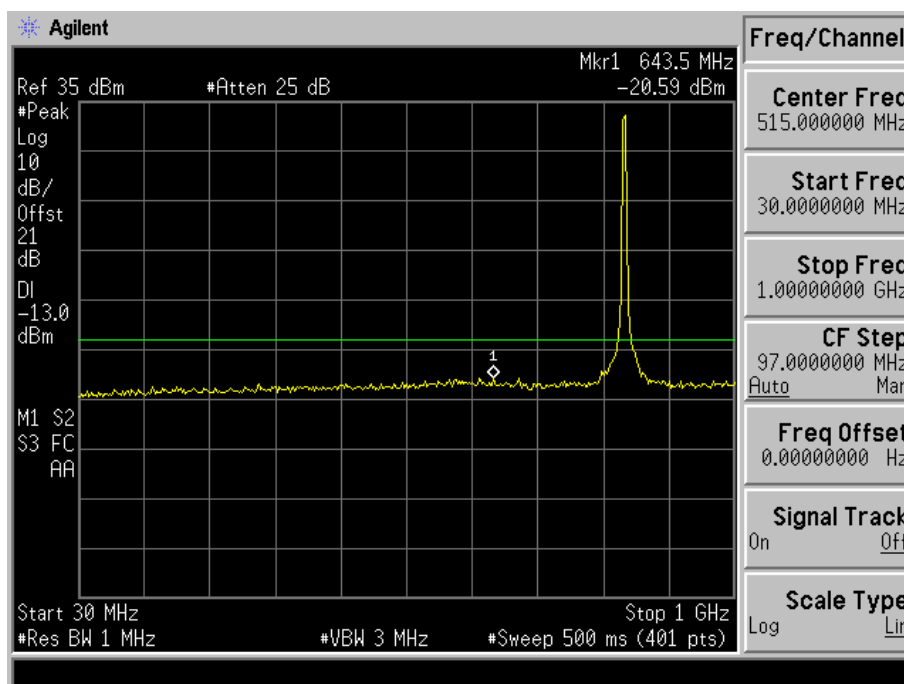
According to Part 2.1051, 2.1053, 22.917(a), 24.238(b).

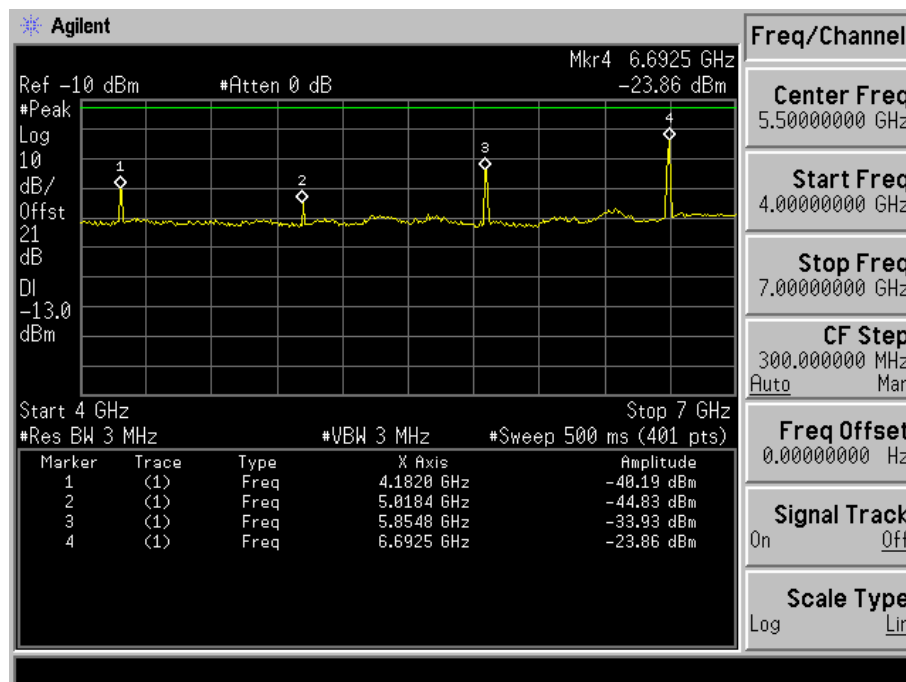
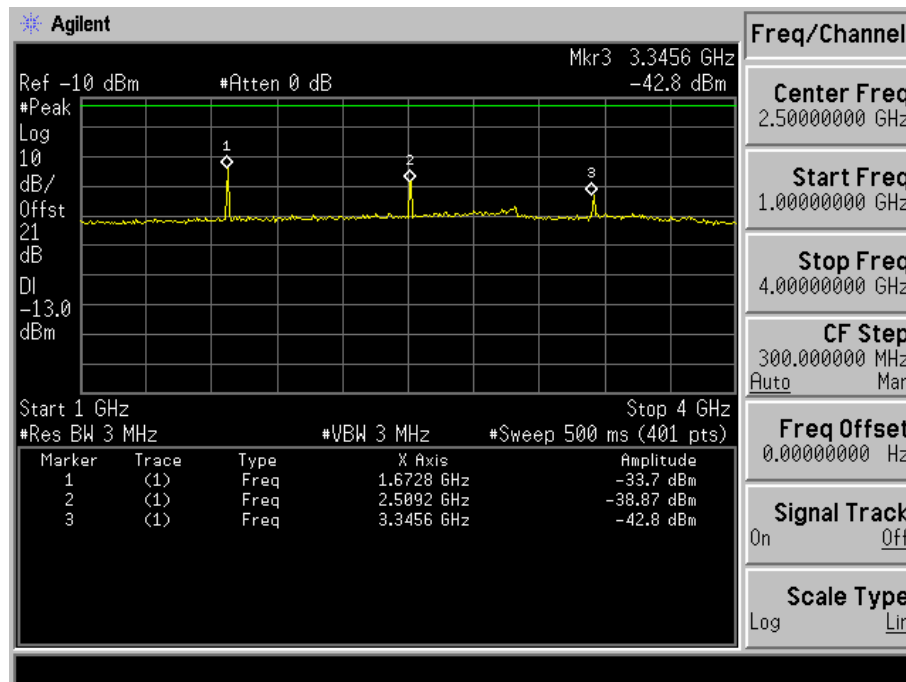
## 5.6. Test Result of Spurious Emission

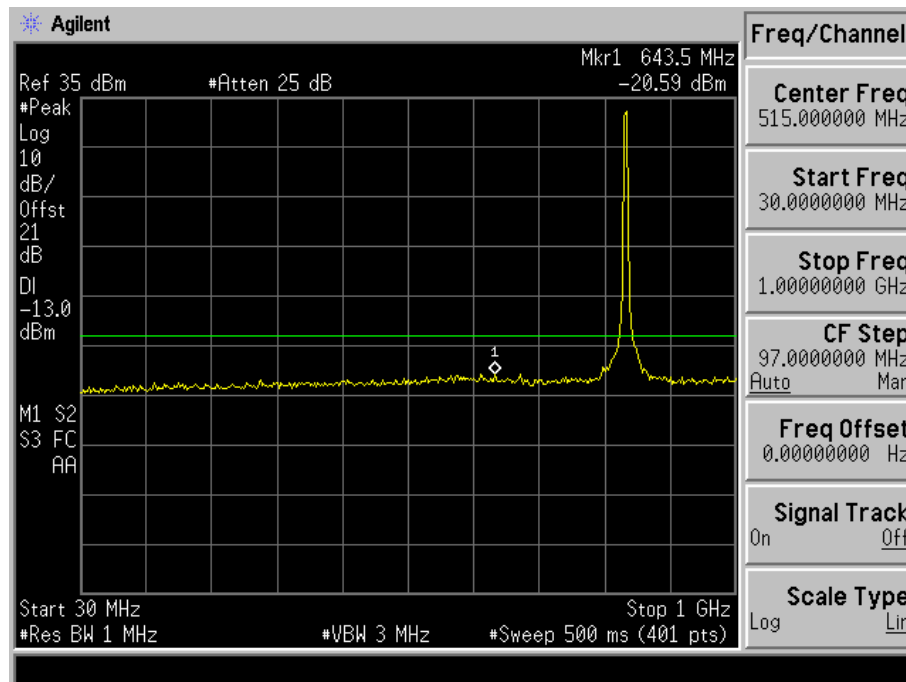
Product	MOBILE PHONE		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	GSM 850 Voice	Test Range	30MHz~10GHz

### GSM 850 Voice Middle-Channel 189

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1672.8	-33.700	0.58	-33.120	-13
2509.2	-38.870	0.7	-38.170	-13
3345.6	-42.800	1.01	-41.790	-13
4182	-40.190	1.18	-39.010	-13
5018.4	-44.830	1.23	-43.600	-13
5854.8	-33.930	1.45	-32.480	-13
6691.2	-23.860	1.56	-22.300	-13
7527.6	-46.860	1.59	-45.270	-13
8364	-48.300	1.82	-46.480	-13



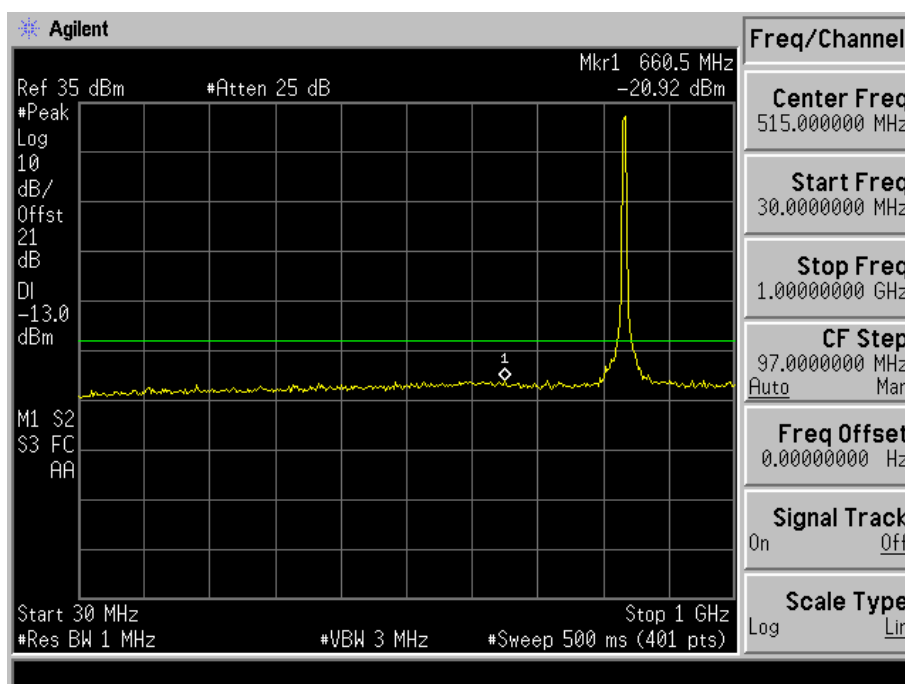


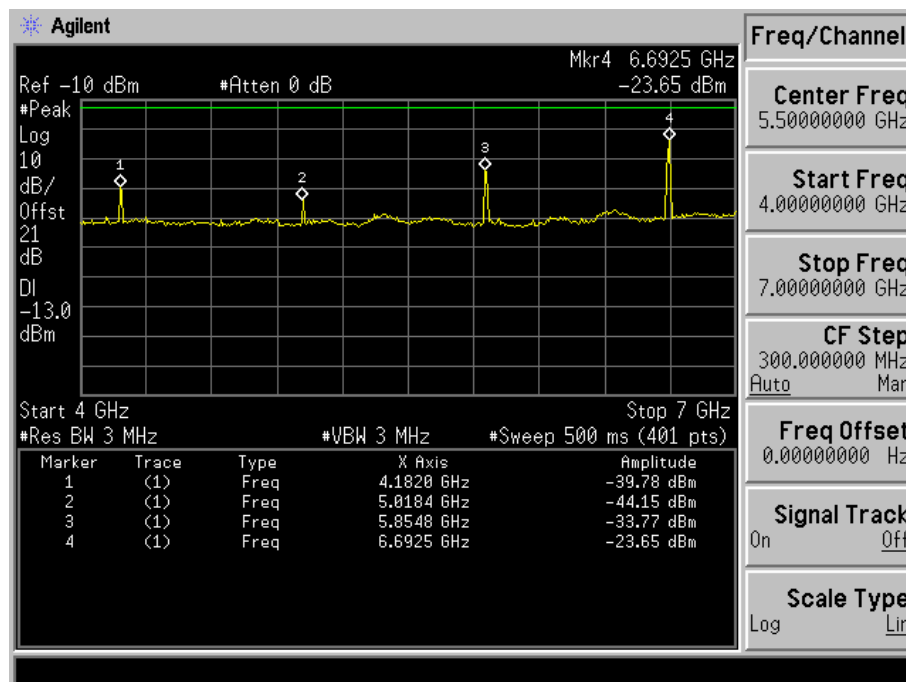
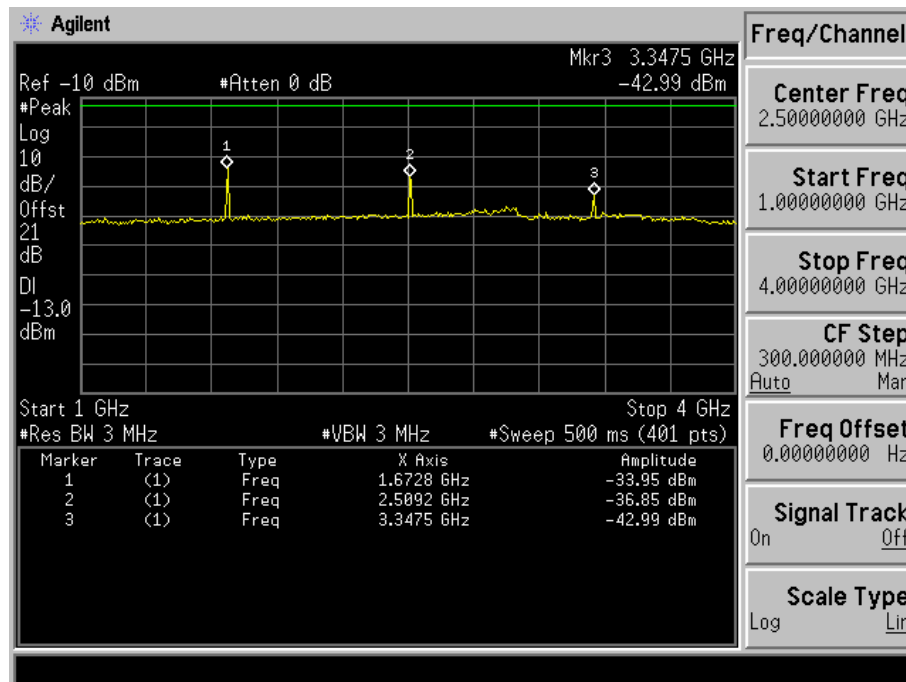


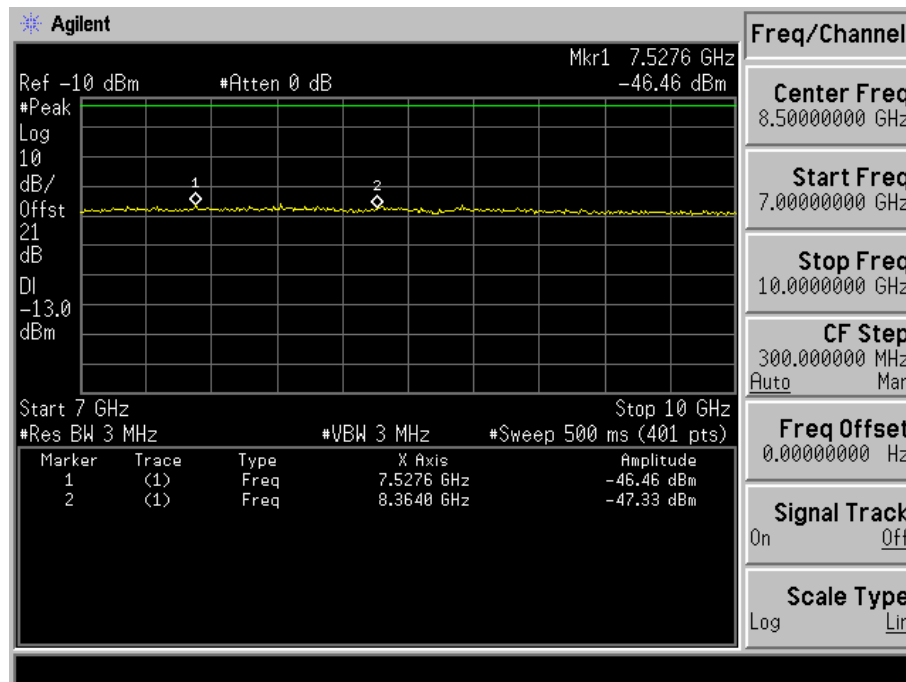
Product	MOBILE PHONE		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	GSM 850 GPRS	Test Range	30MHz~10GHz

#### GSM 850 GPRS Middle-Channel 189

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1672.8	-33.950	0.58	-33.370	-13
2509.2	-36.850	0.7	-36.150	-13
3345.6	-42.990	1.01	-41.980	-13
4182	-39.780	1.18	-38.600	-13
5018.4	-44.150	1.23	-42.920	-13
5854.8	-33.770	1.45	-32.320	-13
6691.2	-23.650	1.56	-22.090	-13
7527.6	-46.460	1.59	-44.870	-13
8364	-47.330	1.82	-45.510	-13





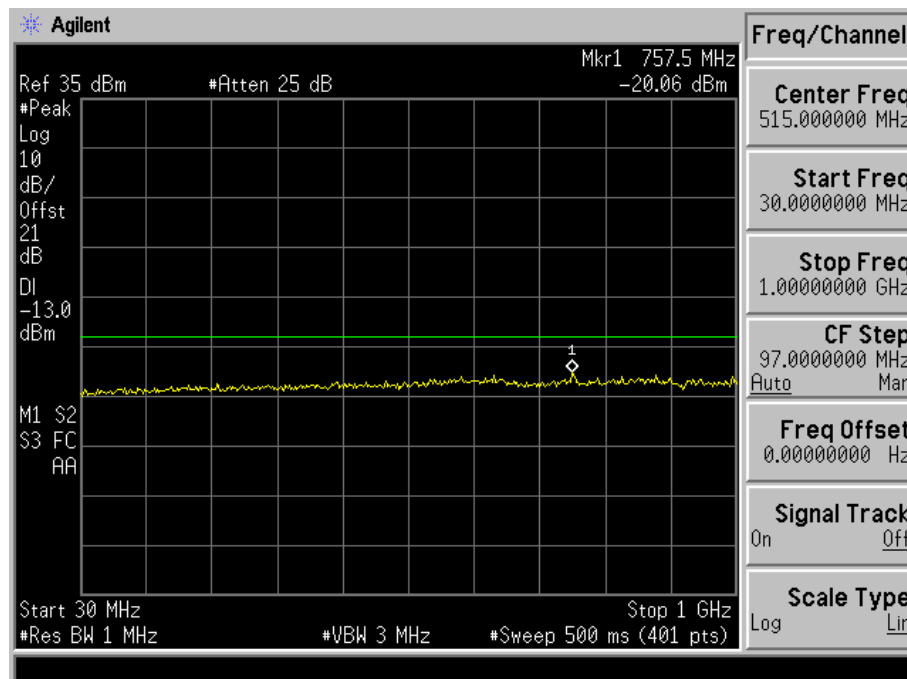


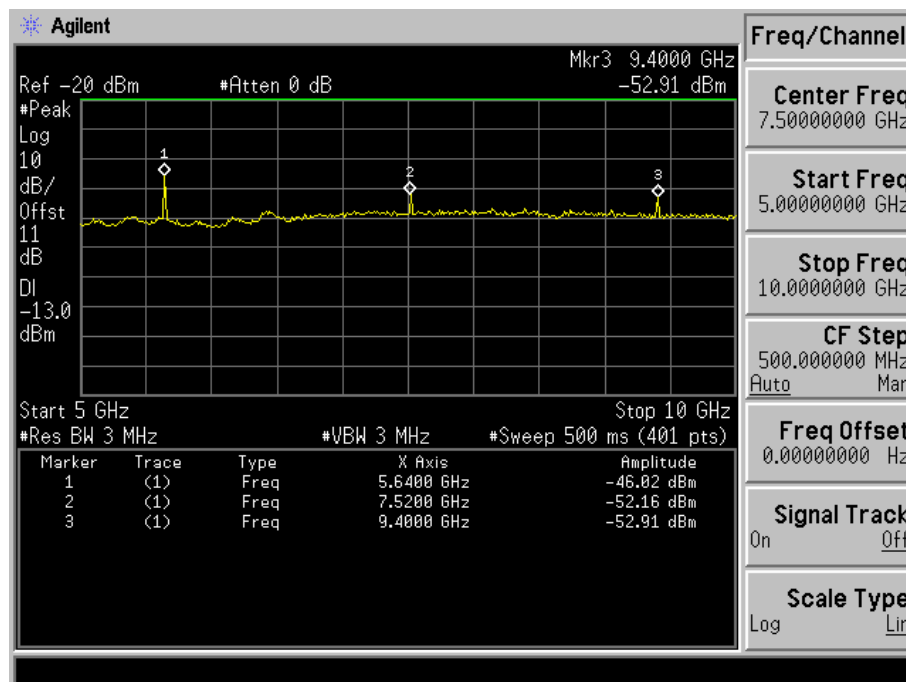
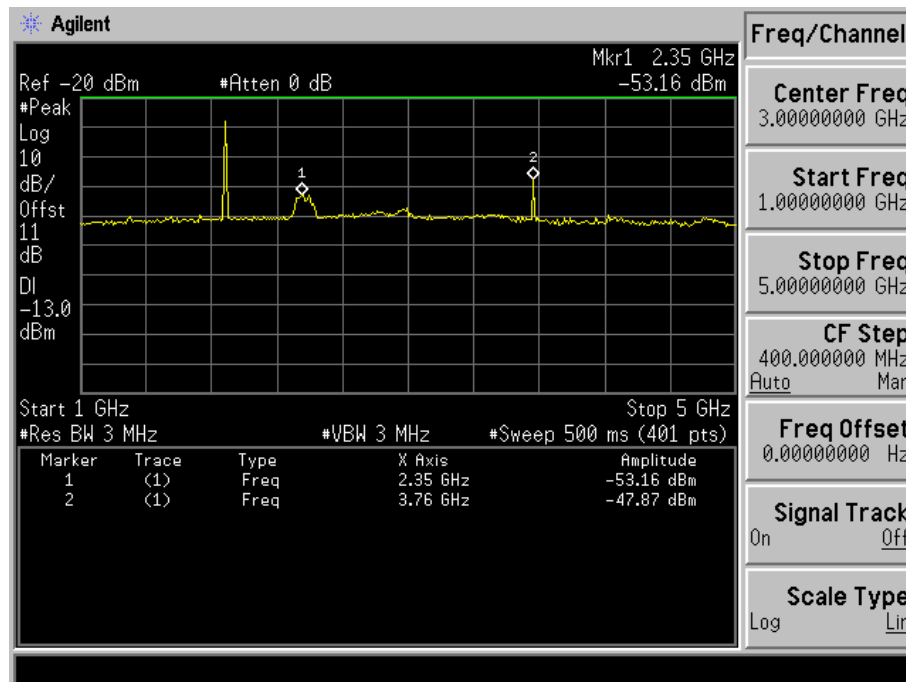


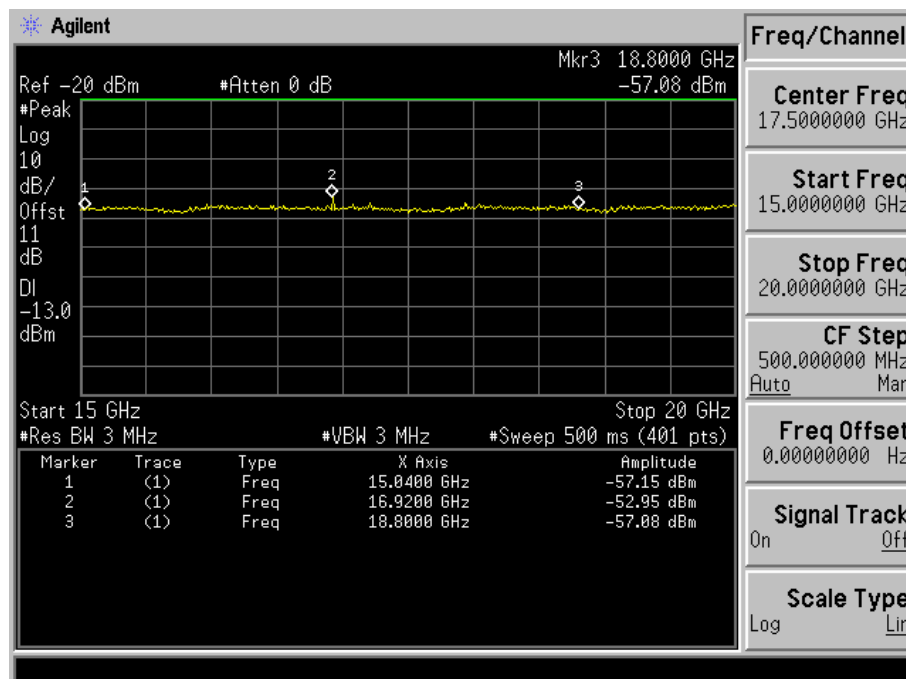
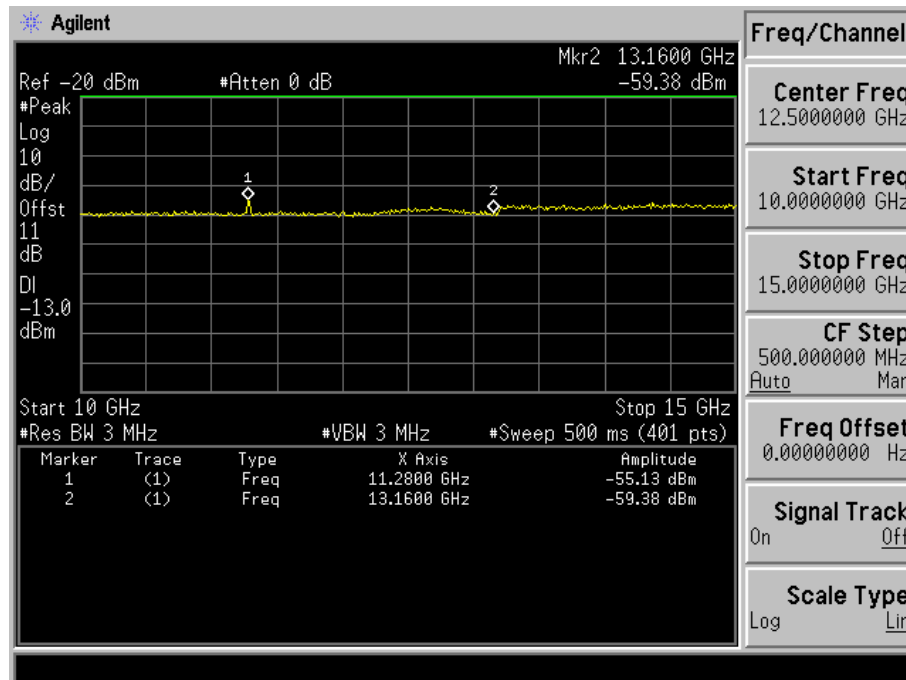
Product	MOBILE PHONE		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	PCS 1900 Voice	Test Range	30MHz~20GHz

#### PCS 1900 Voice Mid-Channel 661

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
2350	-53.160	0.67	-52.490	-13
3760	-47.870	1.1	-46.770	-13
5640	-46.020	1.23	-44.790	-13
7520	-52.160	1.59	-50.570	-13
9400	-52.910	1.89	-51.020	-13
11280	-55.130	2.07	-53.060	-13
13160	-59.380	2.26	-57.120	-13
15040	-57.150	2.64	-54.510	-13
16920	-52.950	3.5	-49.450	-13
18800	-57.080	3.7	-53.380	-13



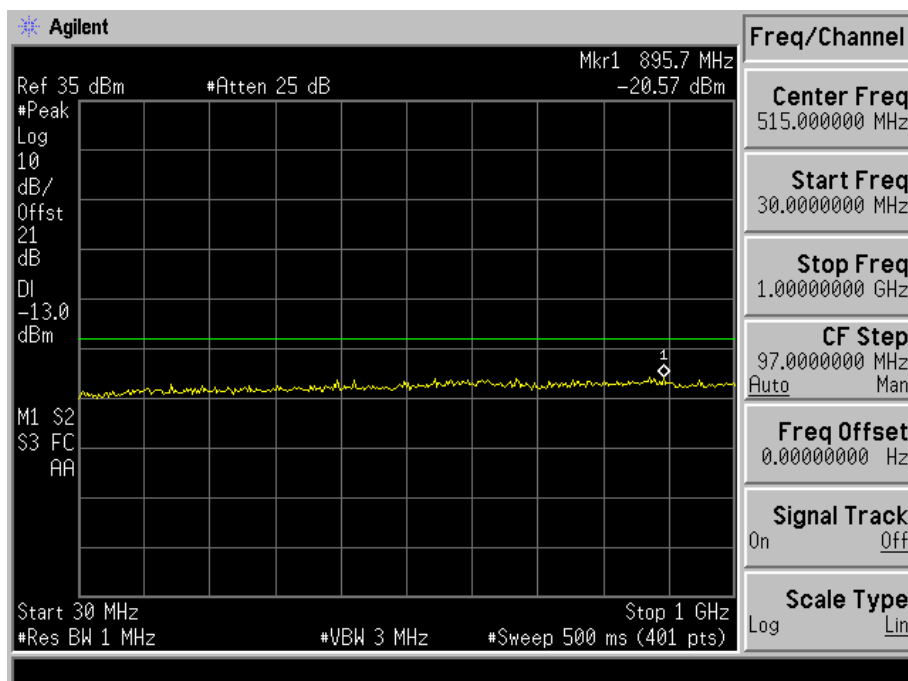


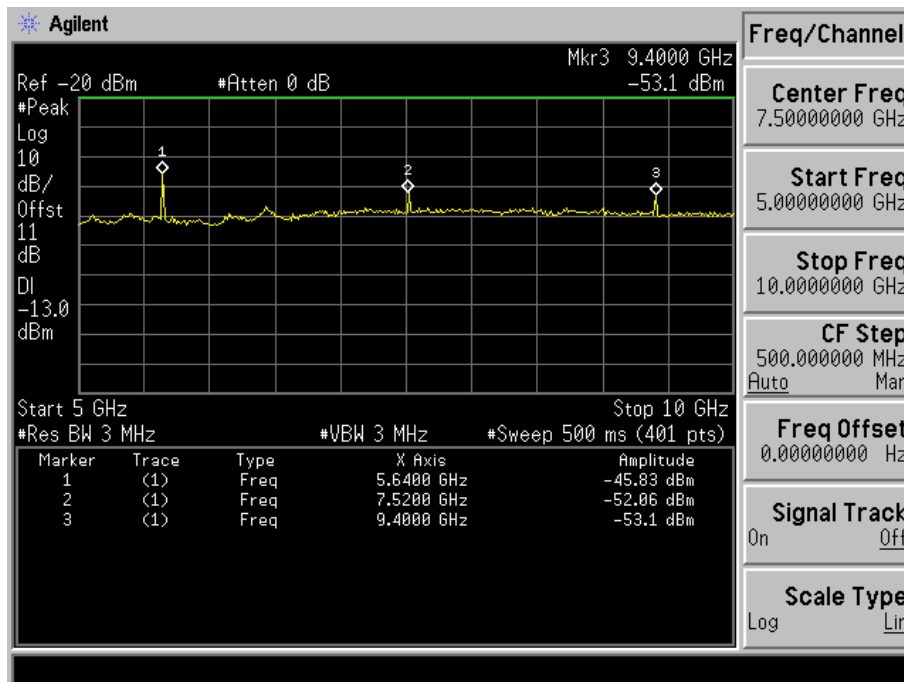
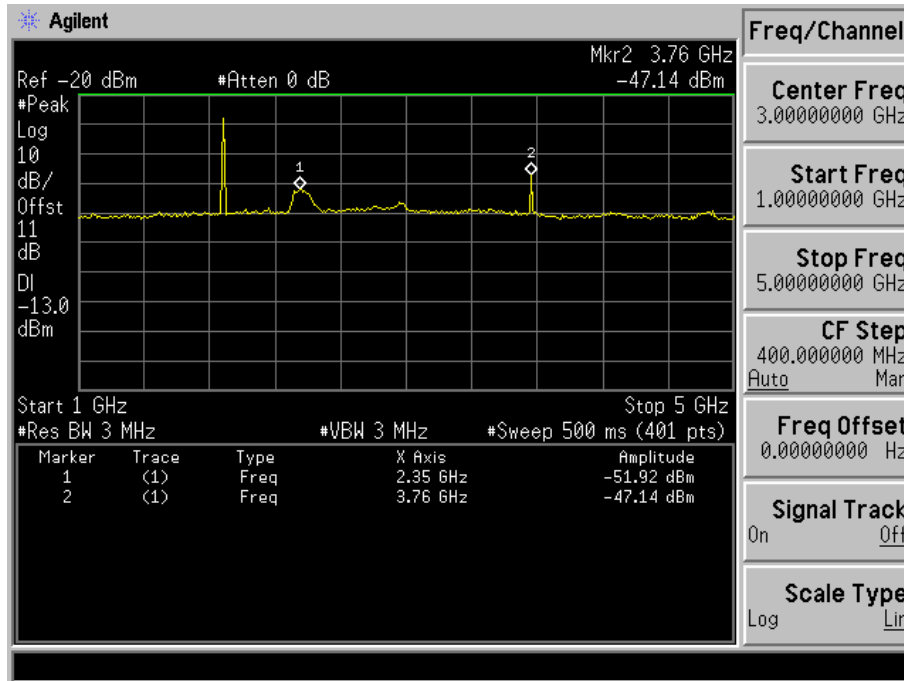


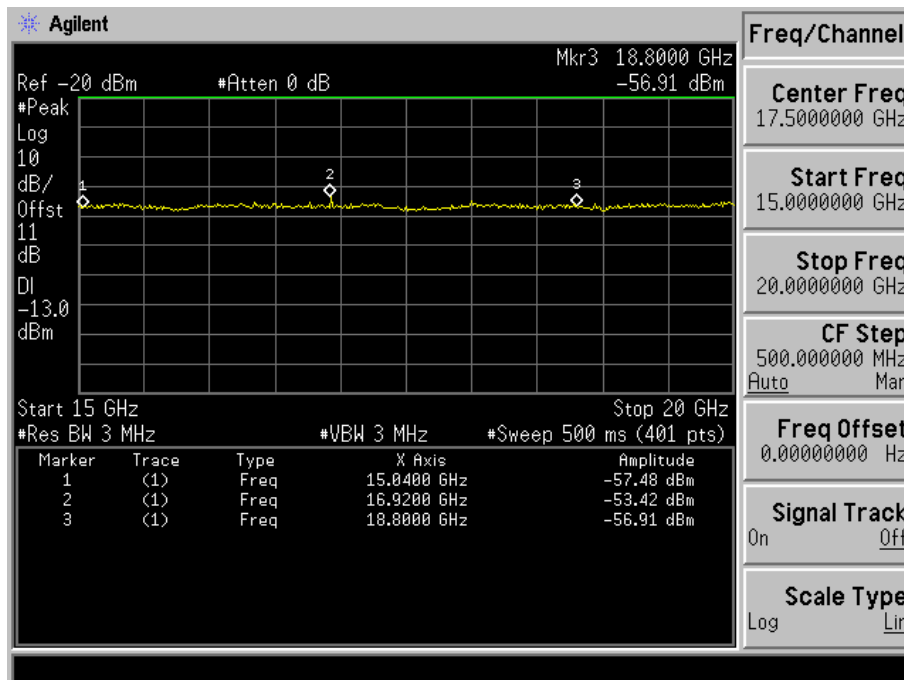
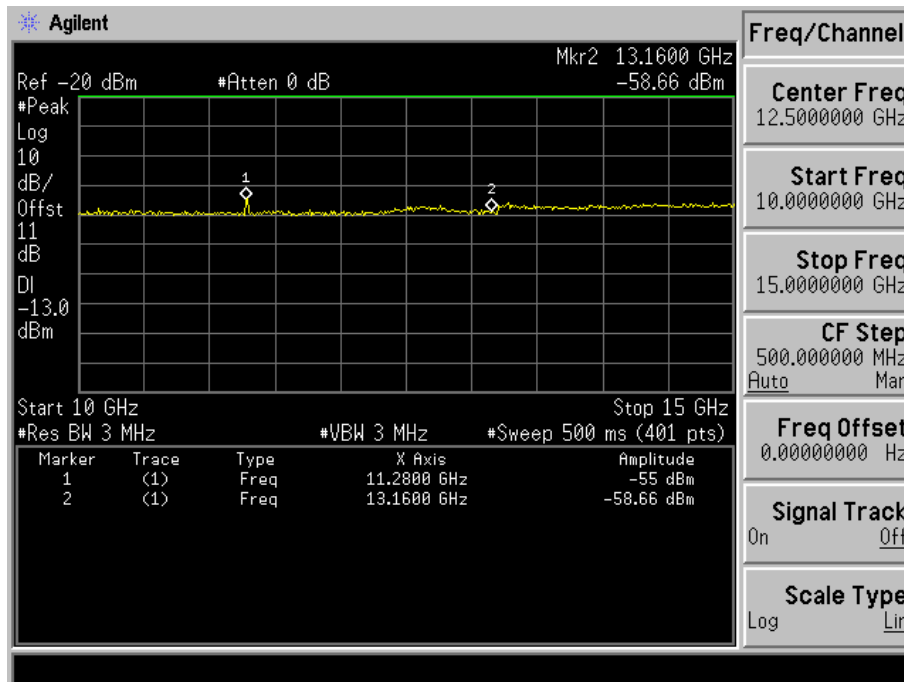
Product	MOBILE PHONE		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	PCS 1900 GPRS	Test Range	30MHz~20GHz

#### PCS 1900 GPRS Mid-Channel 661

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
2350	-51.920	0.67	-51.250	-13
3760	-47.140	1.1	-46.040	-13
5640	-45.830	1.23	-44.600	-13
7520	-52.060	1.59	-50.470	-13
9400	-53.100	1.89	-51.210	-13
11280	-55.000	2.07	-52.930	-13
13160	-58.660	2.26	-56.400	-13
15040	-57.480	2.64	-54.840	-13
16920	-53.420	3.5	-49.920	-13
18800	-56.910	3.7	-53.210	-13







Product	MOBILE PHONE		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2009/04/21	Test Site	OATS 2
Test Condition	Channel 189 (GSM 850 Voice)	Test Range	30MHz~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

#### Horizontal Emissions

1672.8	-34.330	-39.020	1.630	9.800	-30.850	-13
2509.2	-47.740	-47.907	2.100	10.600	-39.407	-13
3345.6	-55.820	-57.246	2.350	12.300	-47.296	-13
4182	-58.310	-57.831	2.700	12.600	-47.931	-13
5018.4	-56.590	-52.795	2.830	12.700	-42.925	-13
5854.8	-56.360	-50.936	3.200	13.000	-41.136	-13

#### Vertical Emissions

1672.8	-35.210	-39.527	1.630	9.800	-31.357	-13
2509.2	-49.230	-49.927	2.100	10.600	-41.427	-13
3345.6	-55.550	-57.484	2.350	12.300	-47.534	-13
4182	-57.430	-56.676	2.700	12.600	-46.776	-13
5018.4	-54.710	-51.508	2.830	12.700	-41.638	-13
5854.8	-53.710	-48.765	3.200	13.000	-38.965	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	MOBILE PHONE		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2009/04/21	Test Site	OATS 2
Test Condition	Channel 189 (GSM 850 GPRS)	Test Range	30MHz~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

#### Horizontal Emissions

1672.8	-33.480	-38.170	1.630	9.800	-30.000	-13
2509.2	-47.350	-47.517	2.100	10.600	-39.017	-13
3345.6	-55.660	-57.086	2.350	12.300	-47.136	-13
4182	-57.460	-56.981	2.700	12.600	-47.081	-13
5018.4	-57.820	-54.025	2.830	12.700	-44.155	-13
5854.8	-57.570	-52.146	3.200	13.000	-42.346	-13

#### Vertical Emissions

1672.8	-35.380	-39.697	1.630	9.800	-31.527	-13
2509.2	-49.740	-50.437	2.100	10.600	-41.937	-13
3345.6	-57.640	-59.574	2.350	12.300	-49.624	-13
4182	-57.890	-56.920	2.700	12.600	-47.020	-13
5018.4	-56.460	-53.258	2.830	12.700	-43.388	-13
5854.8	-55.450	-50.505	3.200	13.000	-40.705	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.



Product	MOBILE PHONE		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2009/04/21	Test Site	OATS 2
Test Condition	Channel 661 (PCS1900 Voice)	Test Range	30MHz~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

#### Horizontal Emissions

3760	-52.730	-53.260	2.530	12.600	-43.190	-13
5640	-54.570	-50.074	3.050	13.100	-40.024	-13
7520	-56.820	-45.820	3.650	11.500	-37.970	-13
9400	-62.100	-46.412	3.850	12.000	-38.262	-13
11280	-59.670	-44.532	4.580	12.000	-37.112	-13

#### Vertical Emissions

3760	-55.140	-55.952	2.530	12.600	-45.882	-13
5640	-57.290	-53.220	3.050	13.100	-43.170	-13
7520	-61.030	-50.334	3.650	11.500	-42.484	-13
9400	-62.750	-46.708	3.850	12.000	-38.558	-13
11280	-63.010	-48.397	4.580	12.000	-40.977	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	MOBILE PHONE		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2009/04/21	Test Site	OATS 2
Test Condition	Channel 661 (PCS1900 GPRS)	Test Range	30MHz~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

#### Horizontal Emissions

3760	-52.920	-53.450	2.530	12.600	-43.380	-13
5640	-55.520	-51.024	3.050	13.100	-40.974	-13
7520	-58.420	-47.420	3.650	11.500	-39.570	-13
9400	-62.690	-46.663	3.850	12.000	-38.513	-13
11280	-61.830	-46.657	4.580	12.000	-39.237	-13

#### Vertical Emissions

3760	-55.150	-55.962	2.530	12.600	-45.892	-13
5640	-55.060	-50.990	3.050	13.100	-40.940	-13
7520	-60.930	-50.234	3.650	11.500	-42.384	-13
9400	-63.670	-47.668	3.850	12.000	-39.518	-13
11280	-63.000	-48.271	4.580	12.000	-40.851	-13

#### Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

## 6. Frequency Stability Under Temperature & Voltage Variations

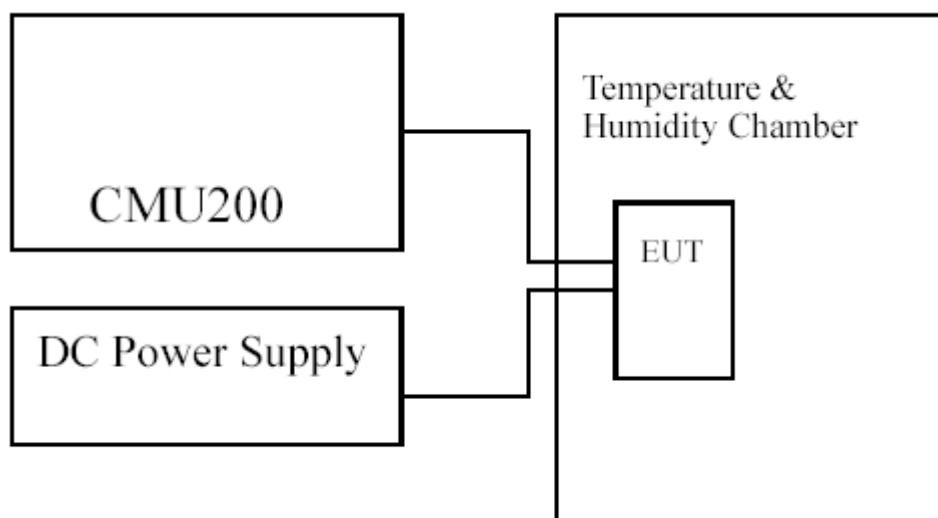
### 6.1. Test Equipment

The following test equipments are used during the frequency stability test:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Universal Radio Communication Tester	R & S	CMU200 / 104846	May., 2009
Standard Temperature & Humidity Chamber	WIT	TH-1S-B / 108210	Aug., 2008
DC Power Supply	Agilent	87421A / MY44350304	Apr., 2009

Note: All equipments upon which need to be calibrated are with calibration period of 1 year

### 6.2. Test Setup



### 6.3. Limits

Limit	<±2.5ppm
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#### **6.4. Test Procedure**

The frequency stability of transmitter is measured by:

- (a) Temperature: The temperature is varied from  $-30^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  in  $10^{\circ}\text{C}$  increment using a standard temperature & Humidity chamber.
- (b) Primary Supply Voltage: The primary supply voltage is varied 85% to 115% of the nominal value for non hand-carried equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating endpoint which shall be specified by the manufacturer.

The EUT was connected via the base station simulator. Universal Radio Communication Tester, (CMU200), was used to measure The Frequency Error. The maximum result of measurements was recorded.

#### **6.5. Test Specification**

According to Part 2.1055,22.355,24.235

## 6.6. Test Result of Frequency Stability Under Temperature Variations

Product	MOBILE PHONE		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	GSM 850 Voice/ Channel 189	Test Range	-30°C ~+50°C

### Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	0.836	52	±2.09
-20	0.836	-36	±2.09
-10	0.836	39	±2.09
0	0.836	35	±2.09
10	0.836	-26	±2.09
20	0.836	-23	±2.09
30	0.836	-29	±2.09
40	0.836	-37	±2.09
50	0.836	41	±2.09

### Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	0.836	27	±2.09
3.7	0.836	-23	±2.09
3.2	0.836	-19	±2.09

Product	MOBILE PHONE		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	GSM 850 GPRS / Channel 189	Test Range	-30°C ~+50°C

#### Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	0.836	-44	±2.09
-20	0.836	-50	±2.09
-10	0.836	-46	±2.09
0	0.836	-23	±2.09
10	0.836	-29	±2.09
20	0.836	-28	±2.09
30	0.836	-31	±2.09
40	0.836	-36	±2.09
50	0.836	-26	±2.09

#### Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	0.836	32	±2.09
3.7	0.836	-28	±2.09
3.2	0.836	36	±2.09

Product	MOBILE PHONE		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	PCS 1900 Voice/ Channel 661	Test Range	-30°C ~+50°C

### Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	1.88	-78	±4.7
-20	1.88	-49	±4.7
-10	1.88	61	±4.7
0	1.88	52	±4.7
10	1.88	51	±4.7
20	1.88	36	±4.7
30	1.88	-39	±4.7
40	1.88	46	±4.7
50	1.88	58	±4.7

### Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	1.88	-35	±4.7
3.7	1.88	-36	±4.7
3.2	1.88	-40	±4.7

Product	MOBILE PHONE		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2009/04/22	Test Site	CTR
Test Condition	PCS 1900 GPRS / Channel 661	Test Range	-30°C ~+50°C

#### Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	1.88	-116	±4.7
-20	1.88	-39	±4.7
-10	1.88	-43	±4.7
0	1.88	-71	±4.7
10	1.88	-73	±4.7
20	1.88	-63	±4.7
30	1.88	-39	±4.7
40	1.88	-34	±4.7
50	1.88	-46	±4.7

#### Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	1.88	-71	±4.7
3.7	1.88	-63	±4.7
3.2	1.88	60	±4.7



## **7. EMI Reduction Method During Compliance Testing**

No modification was made during testing.