

Figure Channel 189 (836.40MHz)

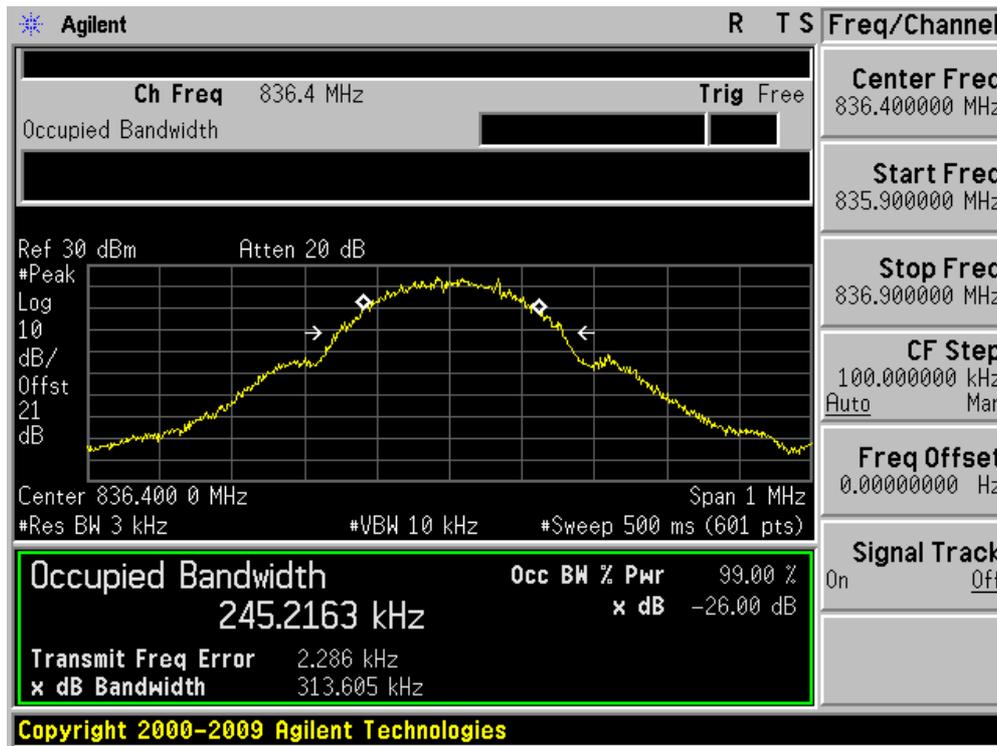


Figure Channel 251 (848.80MHz)



Product	GSM Mobile Phone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: PCS 1900 Link		
Date of Test	2013/03/01	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
512	1850.20	315.95	242.73
661	1880.00	312.11	247.54
810	1909.80	314.95	245.87

Figure Channel 512 (1850.20MHz)

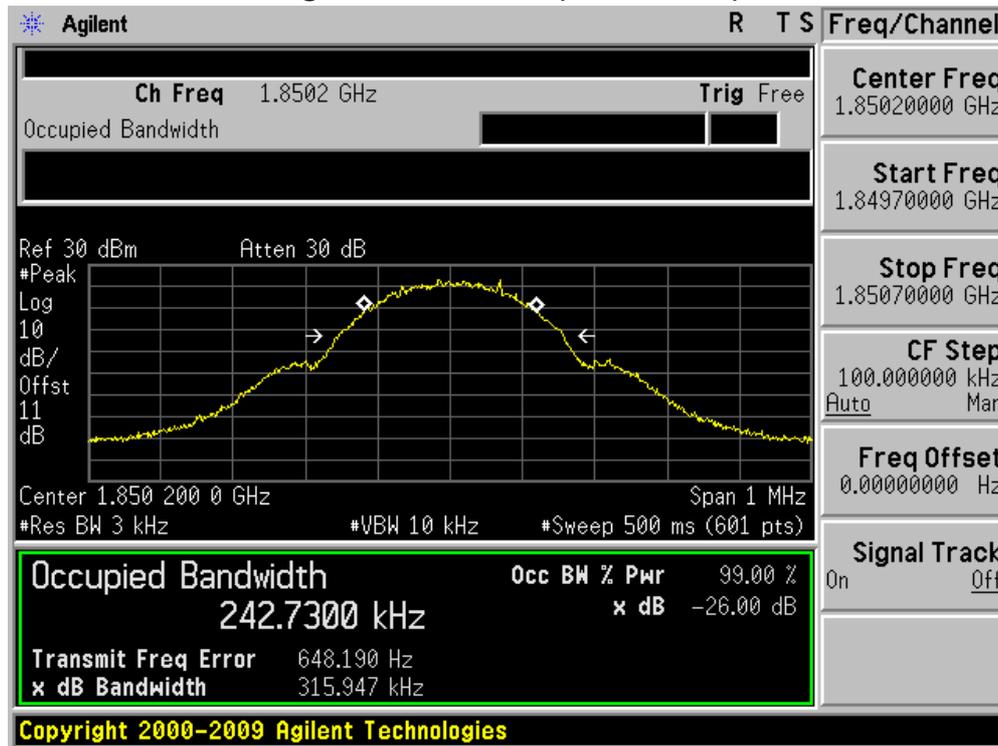


Figure Channel 661 (1880.00MHz)

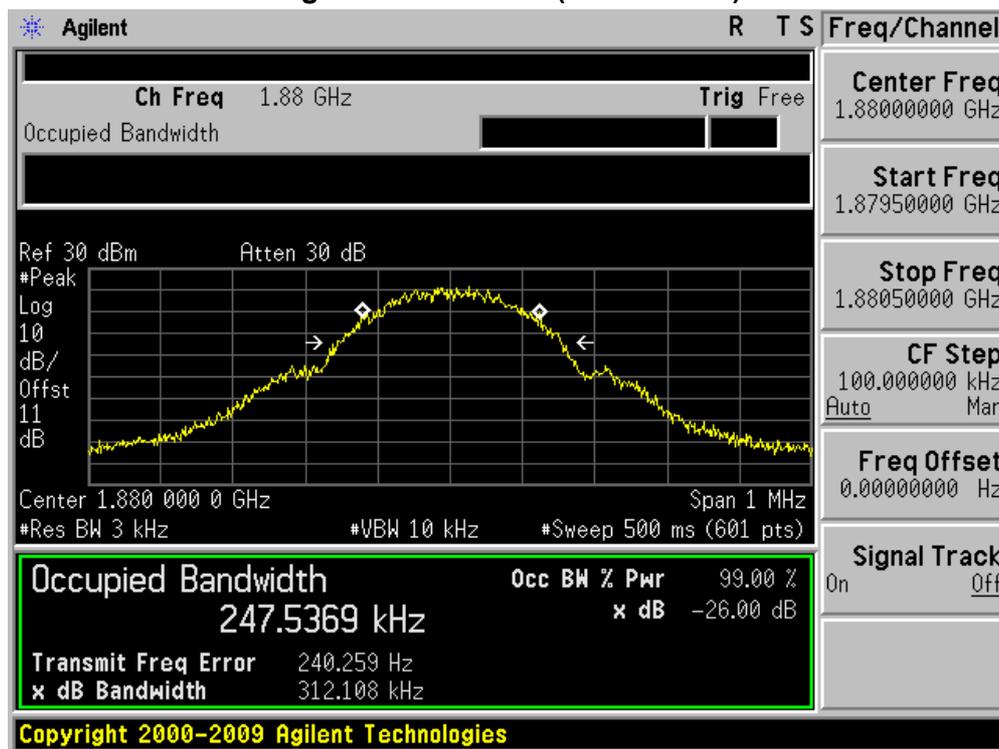


Figure Channel 810 (1909.80MHz)



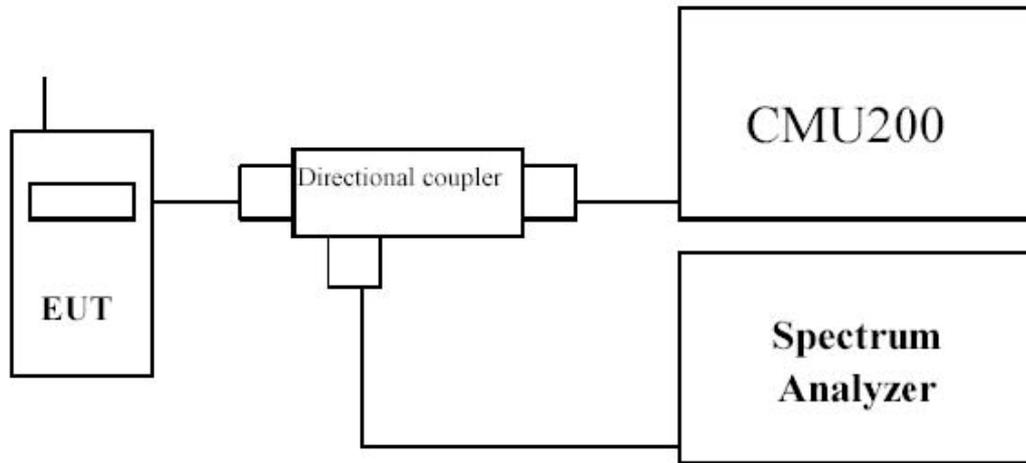
6. Spurious Emission At Antenna Terminals (+/- 1MHz)

6.1. Test Equipment

Spurious Emission At Antenna Terminals (+/- 1MHz) / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2013.04.10
Radio Communication Tester	R&S	CMU 200	117088	2013.04.18
Dual Directional Coupler	Agilent	778D	20160	2013.04.18
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2014.01.11

6.2. Test Setup



6.3. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

6.4. Test Procedure

In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

6.5. Uncertainty

The measurement uncertainty is defined as ± 1.2 dB.

6.6. Test Result

Product	GSM Mobile Phone		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 1: GSM 850 Link		
Date of Test	2013/03/01	Test Site	AC-6

Figure Channel 128 (824.20MHz)

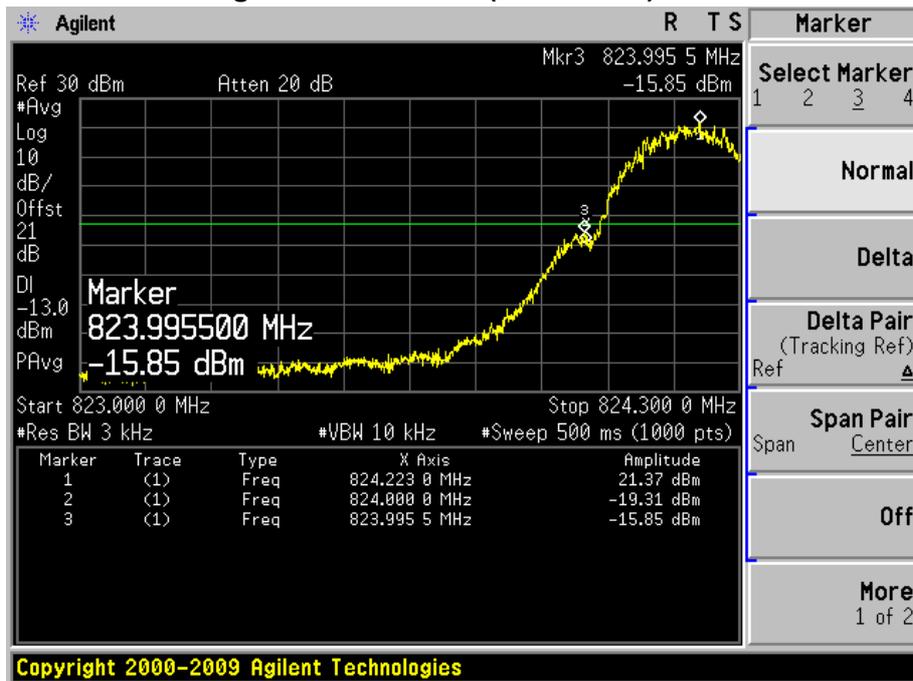
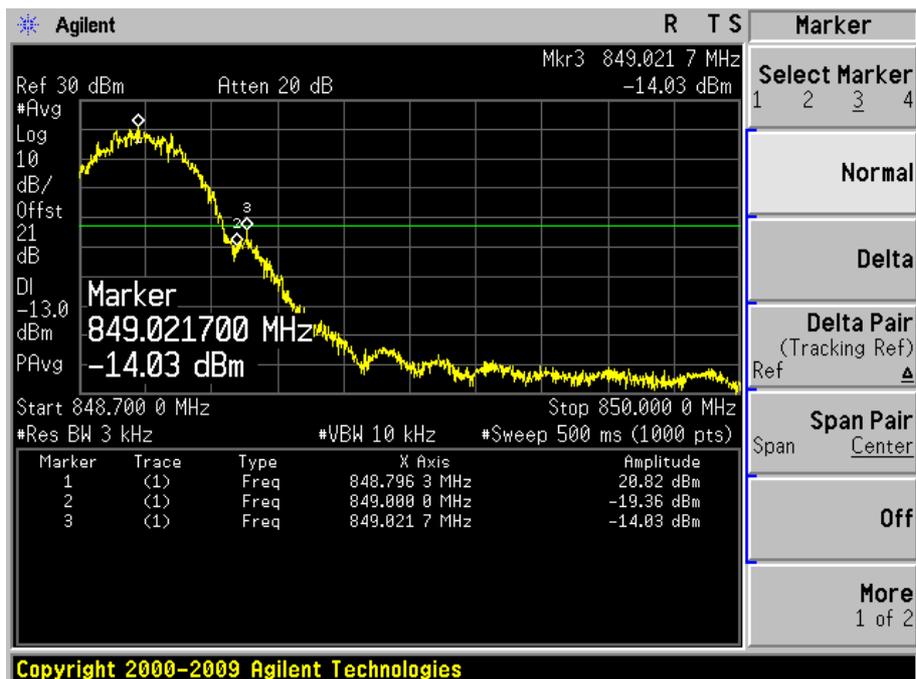


Figure Channel 251 (848.80MHz)



Product	GSM Mobile Phone		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 2: PCS1900 Link		
Date of Test	2013/03/01	Test Site	AC-6

Figure Channel 512 (1850.20MHz)

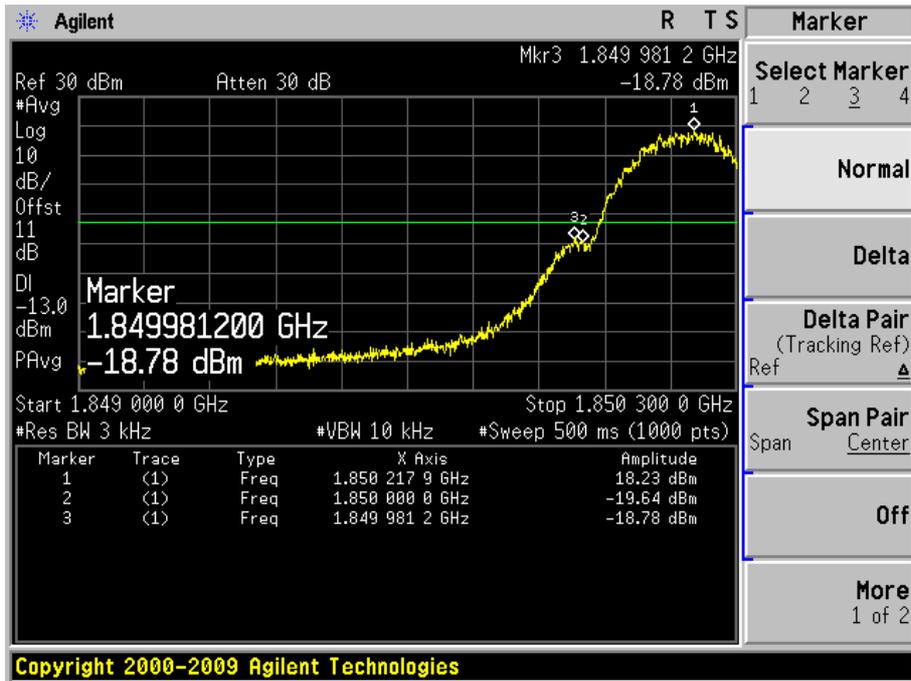
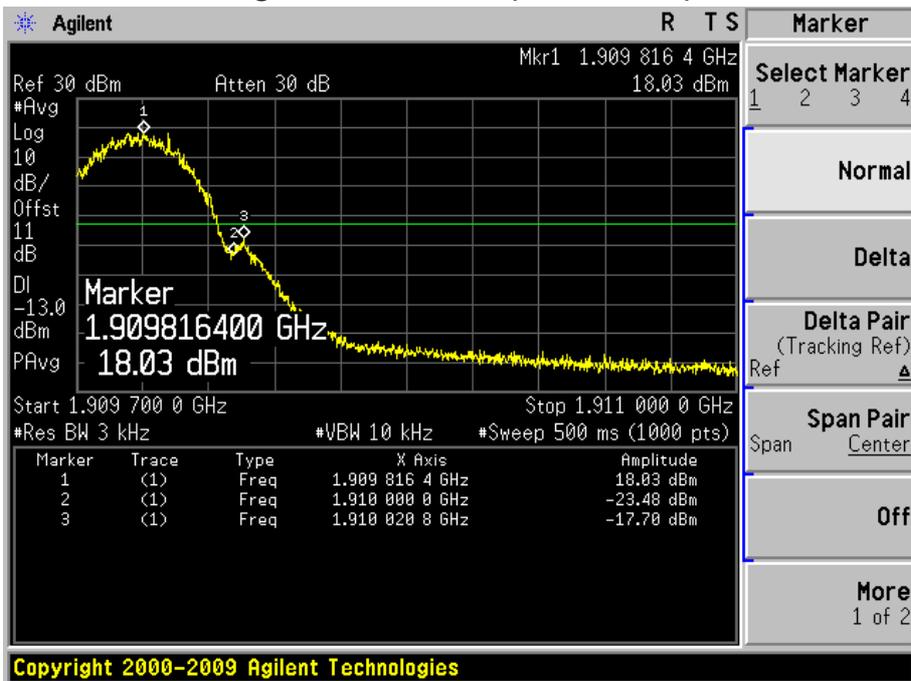


Figure Channel 810 (1909.80MHz)



7. Spurious Emission

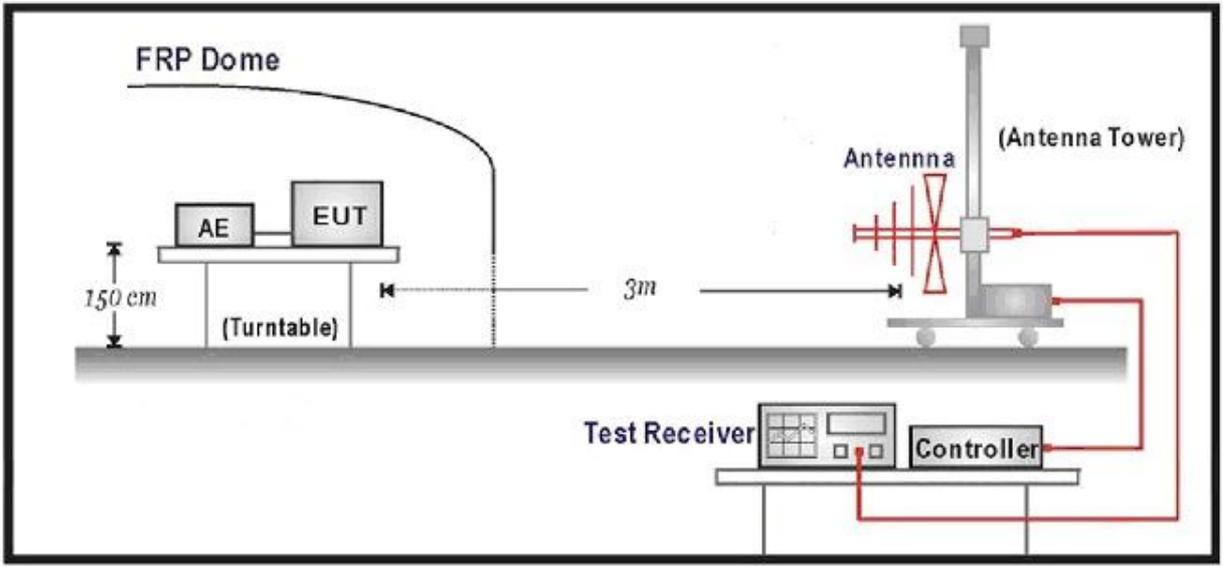
7.1. Test Equipment

Spurious Emission / AC-5

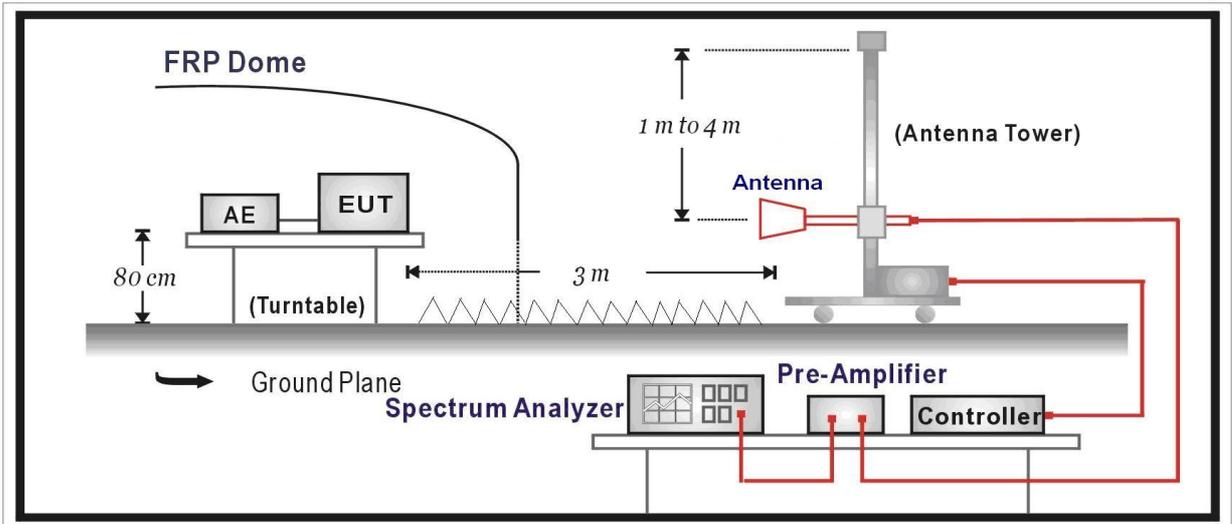
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2013.04.10
Radio Communication Tester	R&S	CMU 200	117088	2013.04.18
Dual Directional Coupler	Agilent	778D	20160	2013.04.18
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2013.04.18
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2013.04.18
Preamplifier	QuieTek	AP-025C	CHM-0503006	2013.05.04
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2013.10.15
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2014.06.08
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2014.01.11

7.2. Test Setup

Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



7.3. Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

7.4. Test Procedure

Conducted Spurious Measurement:

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
- c) EUT Communicate with CMU200, then select a channel for testing.
- d) Add a correction factor to the display of spectrum, and then test.
- e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

- a) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- c) The output of the test antenna shall be connected to the measuring receiver.
- d) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- v) The maximum signal level detected by the measuring receiver shall be noted.
- h) The transmitter shall be replaced by a substitution antenna.
- i) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- j) The substitution antenna shall be connected to a calibrated signal generator.
- k) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- l) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- m) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.

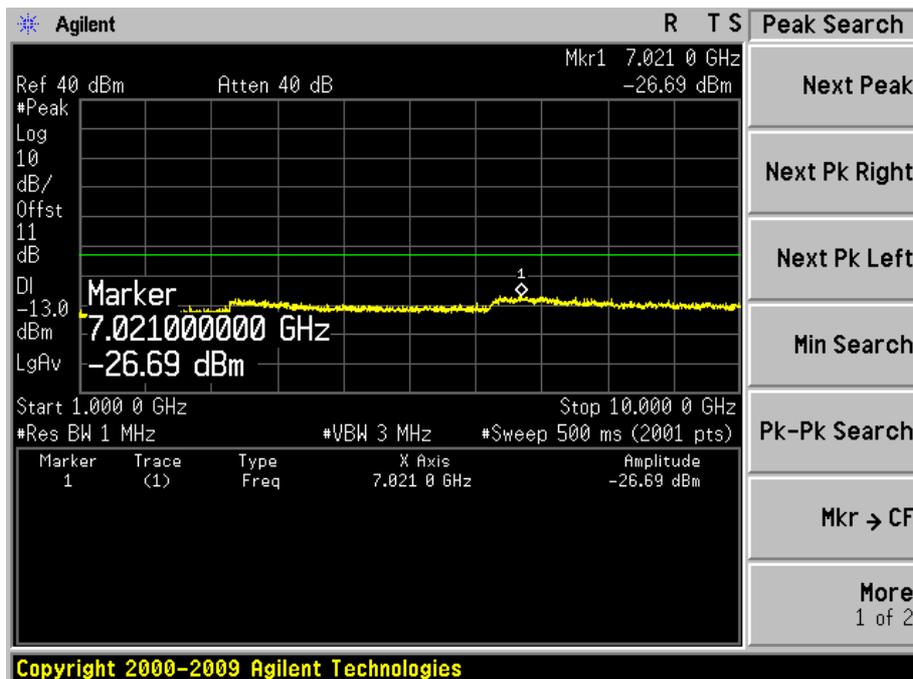
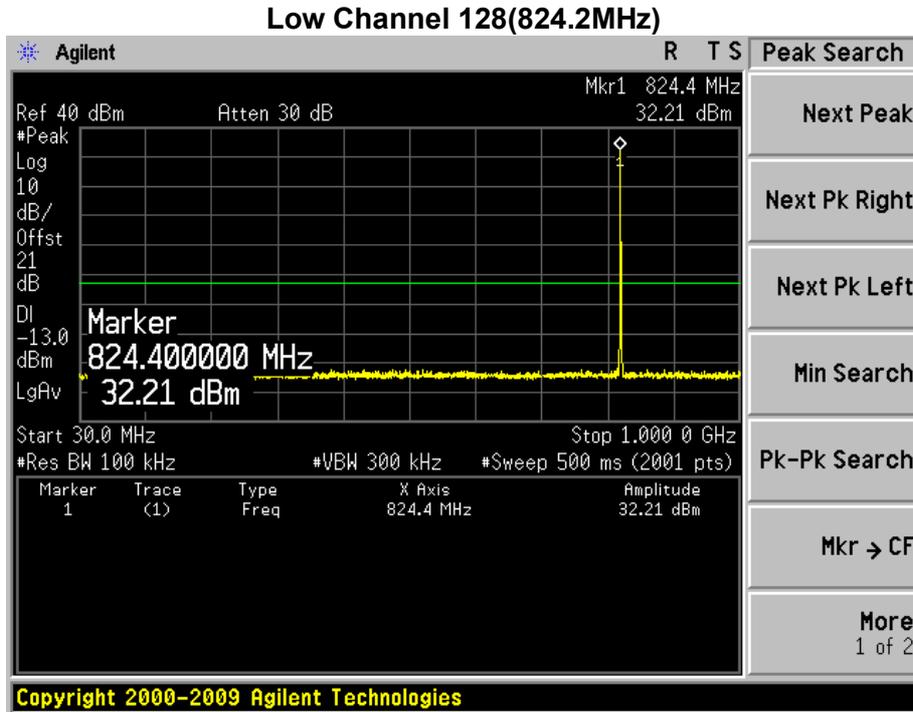
- n) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- o) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- p) The frequency range was checked up to 10th harmonic.
- q) Test site anechoic chamber refer to ANSI C63.4: 2009

7.5. Uncertainty

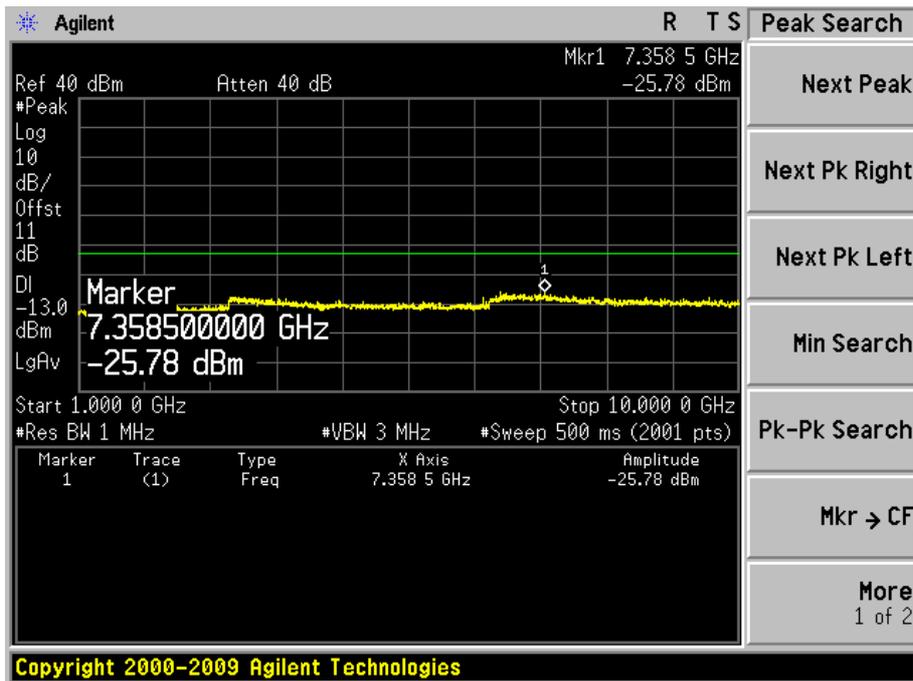
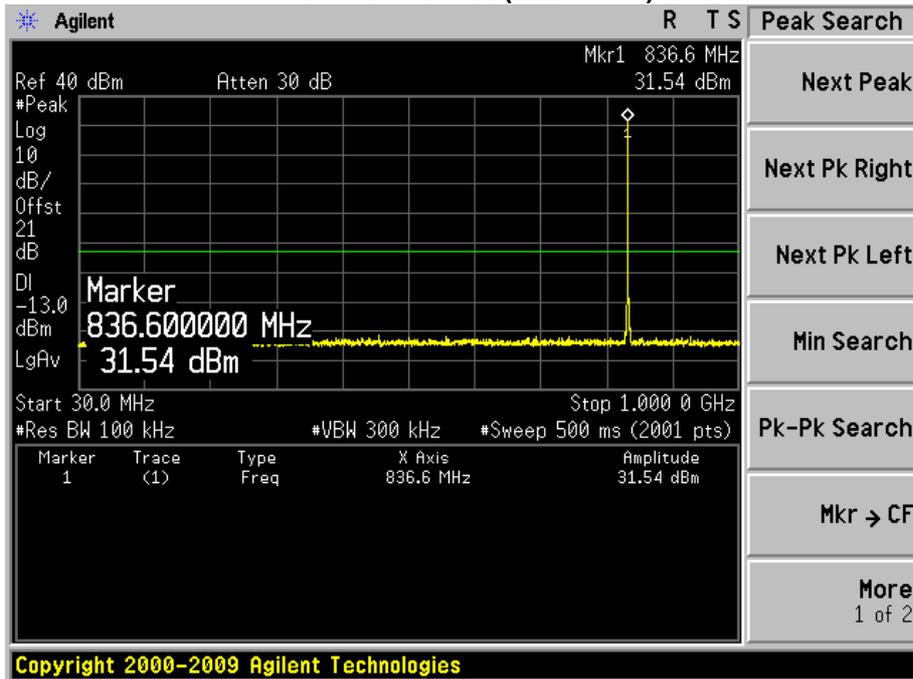
The measurement uncertainty is defined as 3.2 dB for Radiated Power Measurement.

7.6. Test Result

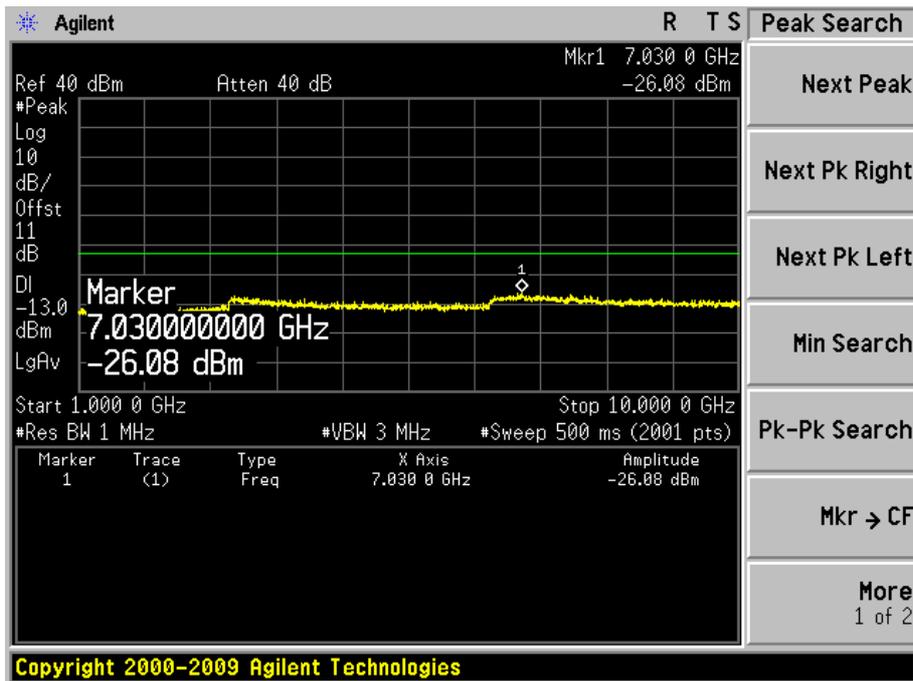
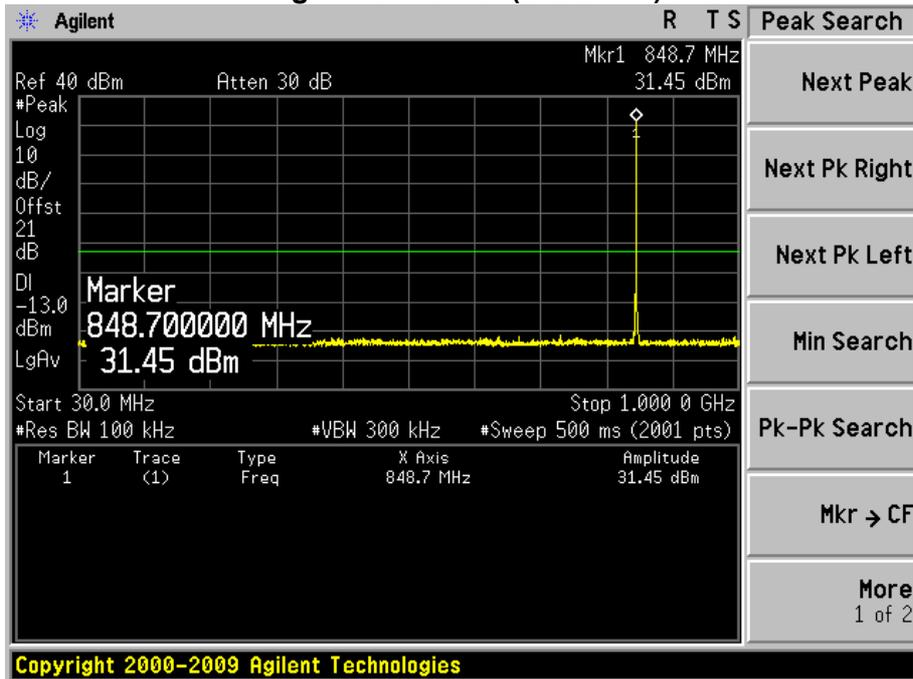
Product	GSM Mobile Phone		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: GSM 850 Link		
Date of Test	2013/03/01	Test Site	TR-8



Mid Channel 189(836.4MHz)

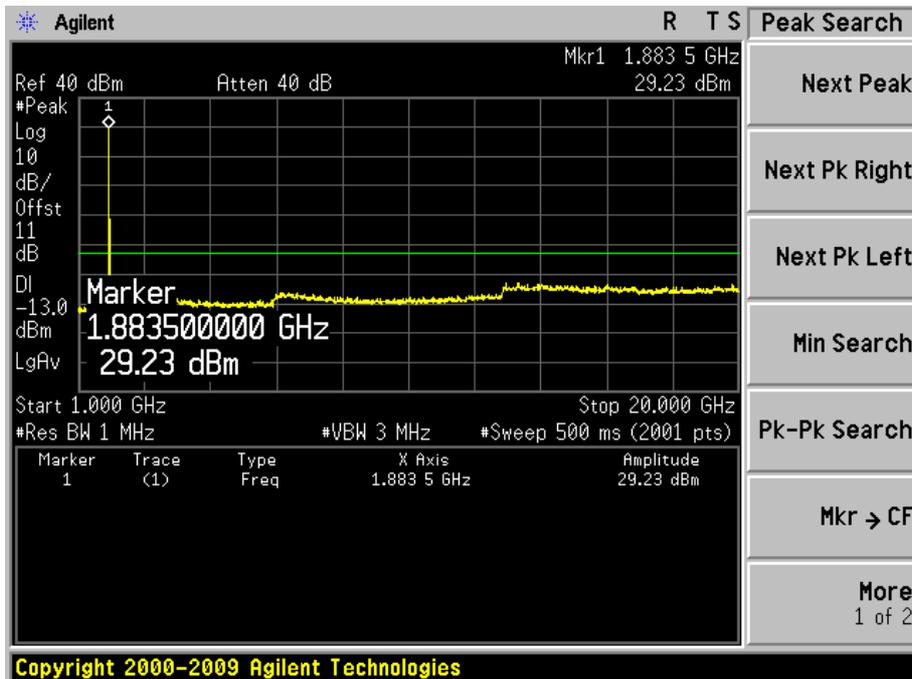
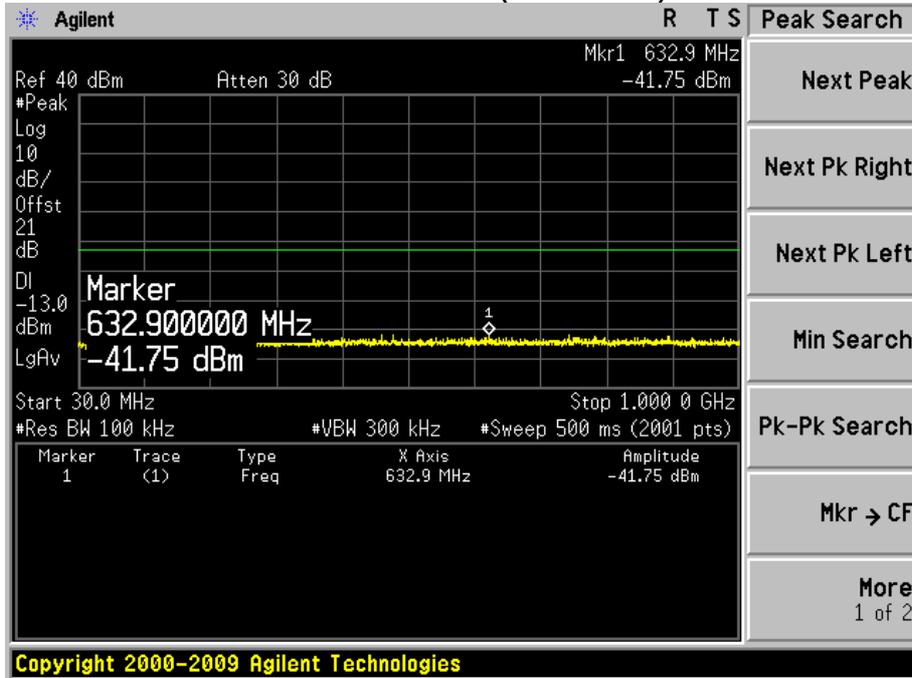


High Channel 251(848.8MHz)

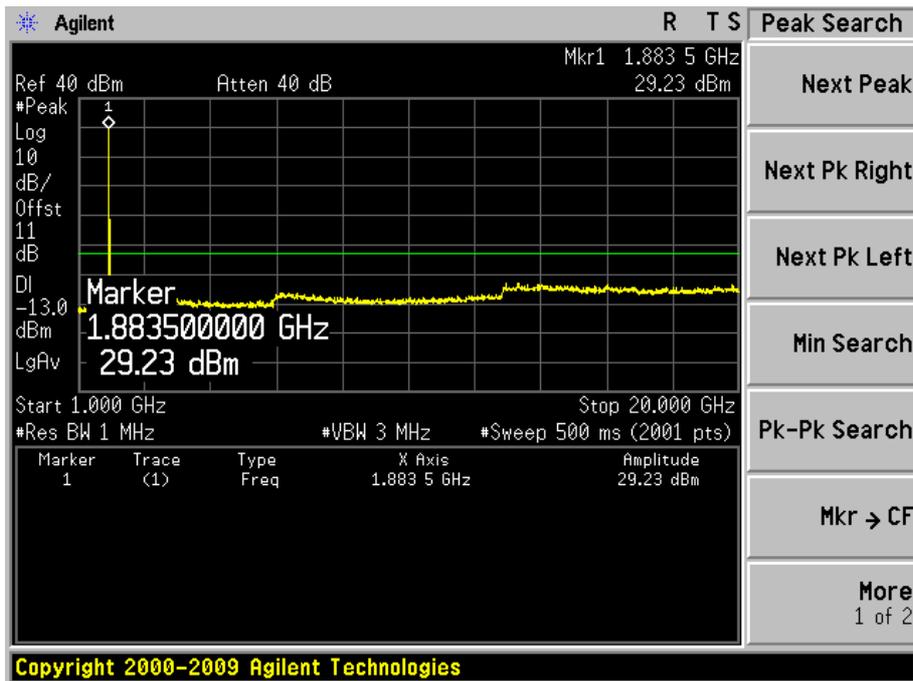
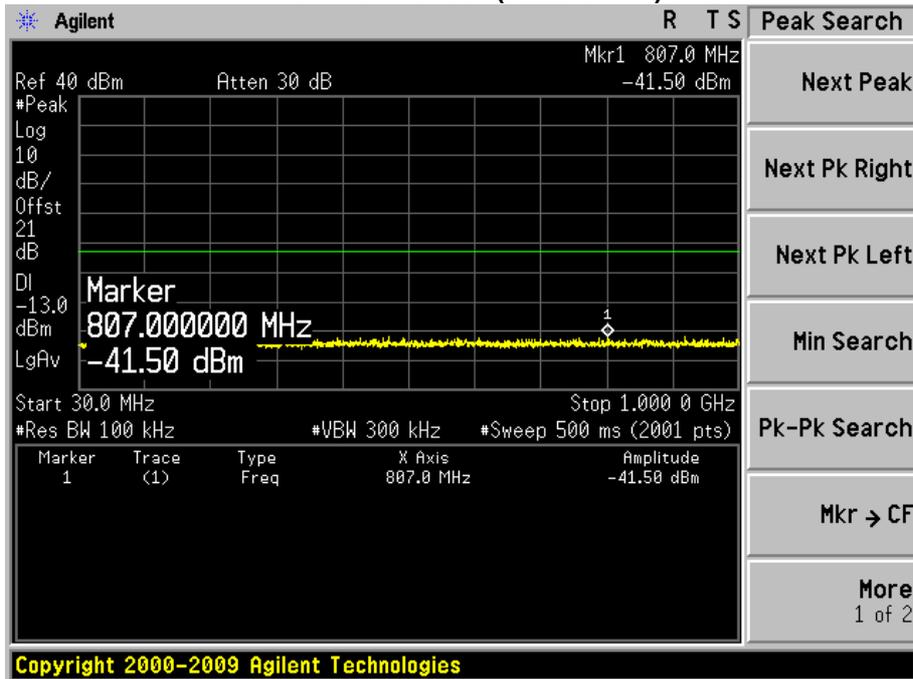


Product	GSM Mobile Phone		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 2: PCS1900 Link		
Date of Test	2013/03/01	Test Site	TR-8

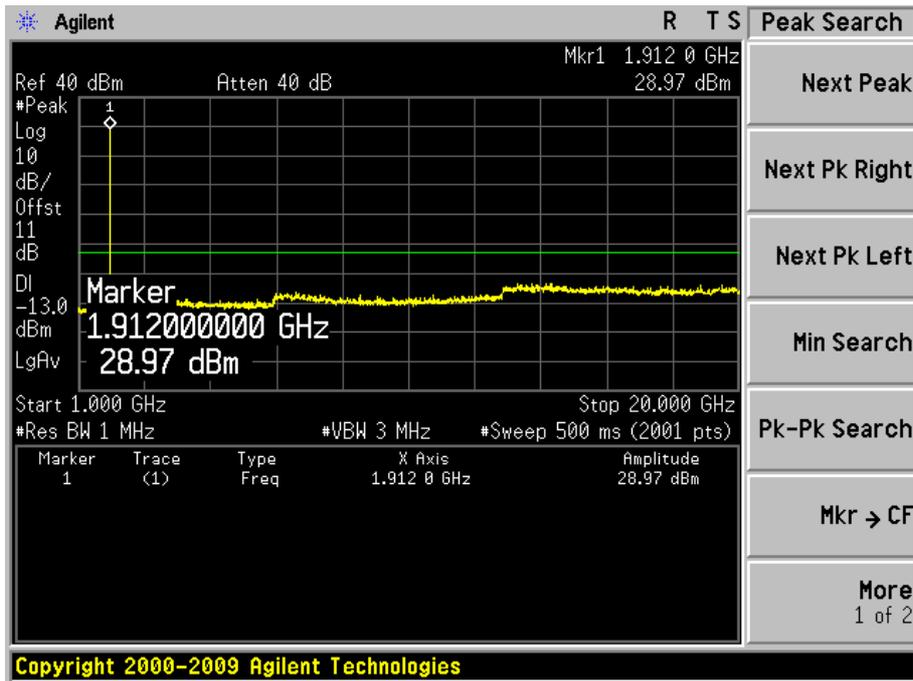
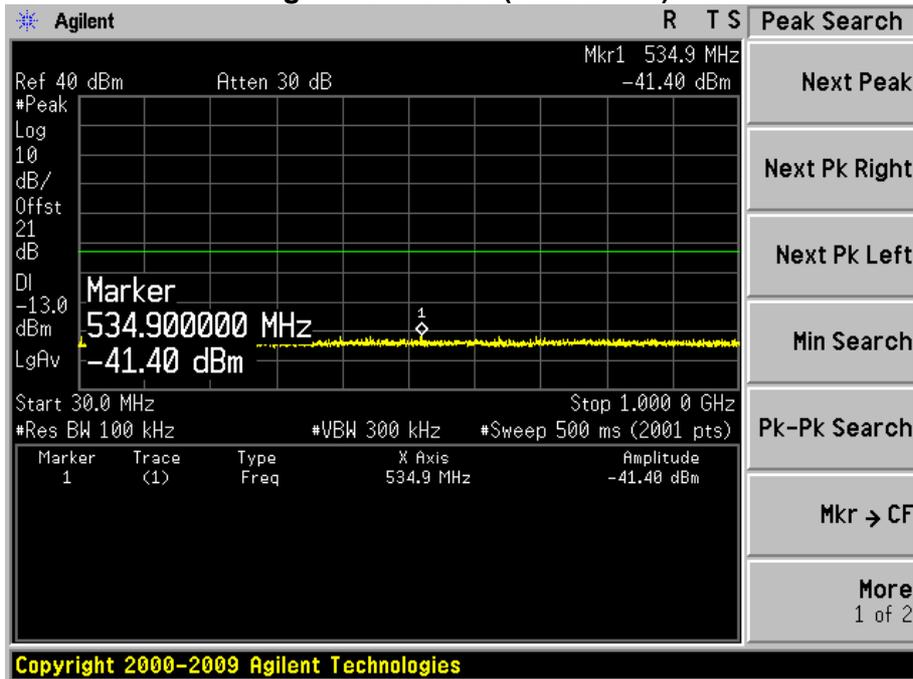
Low Channel 512(1850.2MHz)



Mid Channel 661(1880.0MHz)



High Channel 810(1909.8MHz)



Product	GSM Mobile Phone		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: GSM850 Link		
Date of Test	2013/03/01	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
1646.00	-34.51	V	-37.08	2.50	9.75	-29.83	-13.00	-16.83
2470.50	-58.10	V	-57.13	3.12	10.48	-49.77	-13.00	-36.77
1646.00	-36.79	H	-39.45	2.50	9.75	-32.20	-13.00	-19.20
2470.50	-57.81	H	-56.70	3.12	10.48	-49.34	-13.00	-36.34
Middle Channel 189 (836.40MHz)								
1671.50	-35.28	V	-37.95	2.52	9.95	-30.52	-13.00	-17.52
2513.00	-57.29	V	-56.61	3.18	10.62	-49.17	-13.00	-36.17
1671.50	-38.15	H	-40.57	2.52	9.95	-33.14	-13.00	-20.14
2513.00	-56.96	H	-55.89	3.18	10.62	-48.45	-13.00	-35.45
High Channel 251 (848.80MHz)								
1697.00	-34.93	V	-37.66	2.54	10.06	-30.14	-13.00	-17.14
2547.00	-57.16	V	-55.60	3.14	10.68	-48.06	-13.00	-35.06
1697.00	-37.36	H	-39.36	2.54	10.06	-31.84	-13.00	-18.84
2547.00	-57.16	H	-55.34	3.14	10.68	-47.80	-13.00	-34.80

Product	GSM Mobile Phone		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 2: PCS1900 Link		
Date of Test	2013/03/01	Test Site	AC-5

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 512 (1850.20MHz)								
3703.00	-50.36	V	-46.98	3.84	12.69	-38.13	-13.00	-25.13
5547.50	-62.43	V	-54.54	4.82	13.15	-46.21	-13.00	-33.21
3703.00	-55.16	H	-51.79	3.84	12.69	-42.94	-13.00	-29.94
5547.50	-62.99	H	-55.10	4.82	13.15	-46.77	-13.00	-33.77
Middle Channel 661 (1880.00MHz)								
3762.50	-49.57	V	-46.35	3.73	12.72	-37.36	-13.00	-24.36
5641.00	-64.80	V	-56.86	4.93	13.14	-48.65	-13.00	-35.65
3762.50	-56.83	H	-53.53	3.73	12.72	-44.54	-13.00	-31.54
5641.00	-64.74	H	-56.22	4.93	13.14	-48.01	-13.00	-35.01
High Channel 810 (1909.80MHz)								
3822.00	-49.46	V	-45.75	4.02	12.73	-37.04	-13.00	-24.04
5726.00	-65.18	V	-56.52	4.87	13.11	-48.28	-13.00	-35.28
3822.00	-53.11	H	-49.24	4.02	12.73	-40.53	-13.00	-27.53
5726.00	-61.96	H	-53.72	4.87	13.11	-45.48	-13.00	-32.48

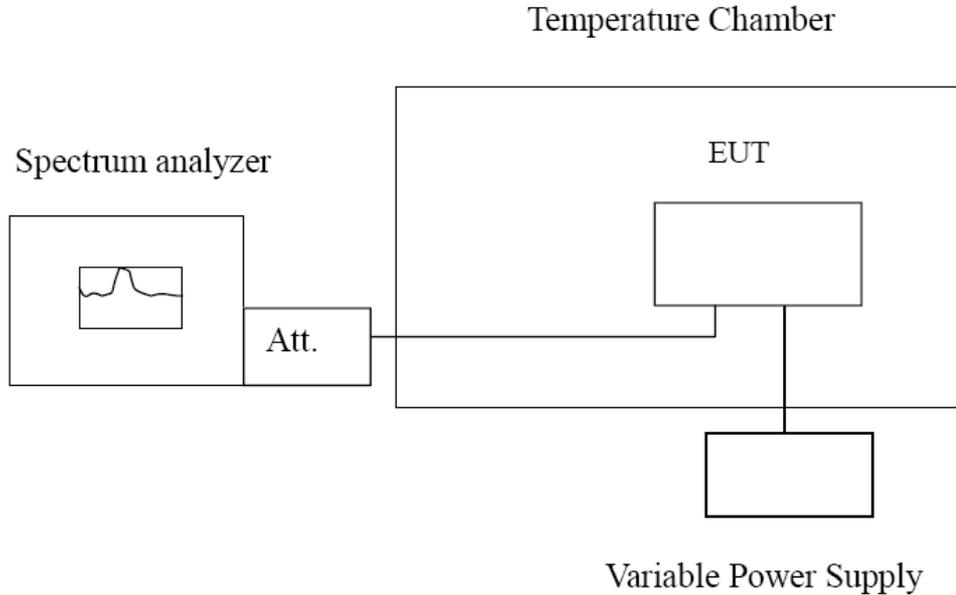
8. Frequency Stability Under Temperature & Voltage Variations

8.1. Test Equipment

Frequency Stability Under Temperature & Voltage Variations / TR-7

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2013.04.10
Radio Communication Tester	R&S	CMU 200	117088	2013.04.18
Dual Directional Coupler	Agilent	778D	20160	2013.04.18
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2013.04.18
DC Power Supply	IDRC	CD-035-020PR	977272	2013.09.17
Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2014.01.10
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR7-TH	2013.05.07

8.2. Test Setup



8.3. Limit

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Limit	$< \pm 2.5 \text{ ppm}$
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8.4. Test Procedure

Frequency Stability Under Temperature Variations:

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.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

8.5. Uncertainty

The measurement uncertainty is defined as $\pm 10 \text{ Hz}$.

8.6. Test Result

Product	GSM Mobile Phone		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: GSM 850 Link		
Date of Test	2013/03/01	Test Site	TR7

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.40	47	± 2091
-20	836.40	33	± 2091
-10	836.40	-21	± 2091
0	836.40	44	± 2091
10	836.40	39	± 2091
20	836.40	-51	± 2091
30	836.40	-28	± 2091
40	836.40	19	± 2091
50	836.40	-36	± 2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.40	23	± 2091
3.700	836.40	25	± 2091
3.400	836.40	-10	± 2091

Product	GSM Mobile Phone		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 2: PCS 1900 Link		
Date of Test	2013/03/01	Test Site	TR7

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	1880.00	55	± 4700
-20	1880.00	-36	± 4700
-10	1880.00	41	± 4700
0	1880.00	-26	± 4700
10	1880.00	-37	± 4700
20	1880.00	-46	± 4700
30	1880.00	44	± 4700
40	1880.00	43	± 4700
50	1880.00	28	± 4700

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	1880.00	21	± 4700
3.700	1880.00	-31	± 4700
3.400	1880.00	33	± 4700