Shenzhen CCE Test Electronic Co., Ltd.

FCC PART 22 AND PART 24 TEST REPORT

FCC Part 22 / Part 24

Report Reference No.....:	**CT10122494-S-F**
Compiled by (position+printed name+signature)..:	File administrators Mike Chen
Name of the organization performing the tests (position+printed name+signature)..:	Test Engineer Kendy Wang
Approved by (position+printed name+signature)..:	Manager Tracy Qi
Date of issue.....:	December 15, 2010
Representative Laboratory Name .:	**Shenzhen CCE Test Electronic Co., Ltd.**
Address.....:	21F., COFCO Property Group Center, 3th Area of Baoan, Shenzhen, China
Test Firm.....:	**Bontek Compliance Testing Laboratory Ltd**
Address.....:	1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China
Applicant's name.....:	**LINNAEA TECHNOLOGY CO., LTD.**
Address.....:	Rm.1909-1910,Block West,ShengTang Building,TaiRan road9,Futian District,ShenZhen,GuangDong
Test specification:	
Standard .....:	**FCC CFR Title 47 Part 2, Part 22H and Part 24E** **EIA/TIA 603-C: 2004**
TRF Originator.....:	Shenzhen VITE Technology CO., Ltd
Master TRF.....:	Dated 2009-03

Test item description ..... :	vooma peel
Trade Mark .....:	/
Model/Type reference.....:	T166, T168
Difference description.....:	Only the model name is difference
Modulation .....:	GMSK
Multislot Class .....:	GPRS: 12
Tx Frequency Range……..:	GSM 850: 824MHz to 849MHz, PCS 1900: 1850MHz to 1910MHz
Rx Frequency Range……..:	GSM 850: 869MHz to 894MHz, PCS 1900: 1930MHz to 1990MHz
Antenna Type……:	Fixed
FCC ID……..:	Y3B-T166-T168
Result.....:	**Positive**

T E S T R E P O R T

Test Report No. :	CT10122494-S-F	December 15, 2010 Date of issue

Equipment under Test	:	vooma peel
Model /Type	:	T166
Listed Models	:	T168
Applicant	:	LINNAEA TECHNOLOGY CO., LTD.
Address	:	Rm.1909-1910,Block West,ShengTang Building,TaiRan road9,Futian District,ShenZhen,GuangDong
Manufacturer		LINNAEA TECHNOLOGY CO., LTD.
Address		Rm.1909-1910,Block West,ShengTang Building,TaiRan road9,Futian District,ShenZhen,GuangDong

Test Result according to the standards on page 4:	**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.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Part 22: Public Mobile Services

FCC Part 24: Personal Communications Services

EIA/TIA 603-C: 2004

2 . SUMMARY

2.1. General Remarks

Date of receipt of test sample : November 28, 2010

Testing commenced on : November 30, 2010

Testing concluded on : December 12, 2010

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : o 120V / 60 Hz o 115V / 60Hz
o 12 V DC o 24 V DC
● Other (specified in blank below)

DC 3.7V from Battery

2.3. Short description of the Equipment under Test (EUT)

A vooma peel for iTouch.

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.4. EUT operation mode

VITE 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
Mode 1: GSM 850
Mode 2: PCS 1900

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

o - supplied by the manufacturer

o - supplied by the lab

o Manufacturer :
Model No. :

o Manufacturer :
Model No. :

2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **Y3B-T166-T168** filing to comply with of the FCC Part 22 and Part 24 Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Bontek Compliance Testing Laboratory Ltd
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements
of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 7631A

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2008.

FCC-Registration No.: 338263

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

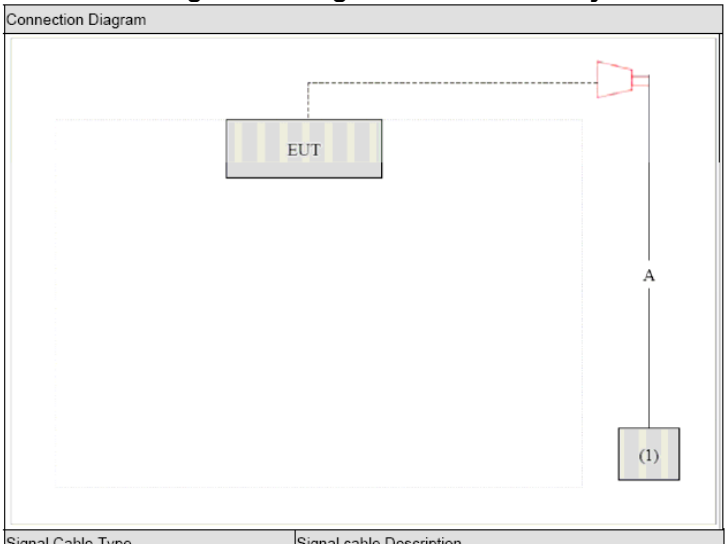
3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Signal Cable Type		Signal cable Description
A	Coaxial Cable	Shielded, >5m

3.5. 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 Bontek Compliance Testing Laboratory Ltd 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.

Hereafter the best measurement capability for Bontek laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

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

3.6. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Last Cal.	Due. Date
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	2010/04/15	2011/04/14
2	Radio Communication Tester	ROHDE & SCHWARZ	CMU200	2010/04/15	2011/04/14
3	Dual Directional Coupler	Agilent	778D	2010/04/15	2011/04/14
4	10dB attenuator	SCHWARZBECK	MTAIMP-136	2010/04/15	2011/04/14
5	Tunable Bandreject filter	K&L	3TNF-800	2010/04/15	2011/04/14
6	Tunable Bandreject filter	K&L	5TNF-1700	2010/04/15	2011/04/14
7	High-Pass Filter	K&L	9SH10-2700/X12750-O/O	2010/04/15	2011/04/14
8	High-Pass Filter	K&L	41H10-1375/U12750-O/O	2010/04/15	2011/04/14
9	Coaxial Cable	Huber+Suhner	AC4-RF-H	2010/04/15	2011/04/14
10	AC Power Supply	IDRC	CF-500TP	2010/04/15	2011/04/14
11	DC Power Supply	IDRC	CD-035-020PR	2010/04/15	2011/04/14
12	RF Current Probe	FCC	F-33-4	2010/04/15	2011/04/14
13	Temperature /Humidity Meter	zhicheng	ZC1-2	2010/04/15	2011/04/14
14	MICROWAVE AMPLIFIER	HP	8349B	2010/04/15	2011/04/14
15	Amplifier	HP	8447D	2010/04/15	2011/04/14
16	SIGNAL GENERATOR	HP	8647A	2010/04/15	2011/04/14
17	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	2010/04/15	2011/04/14
18	Horn Antenna	Schwarzbeck	BBHA9120A	2010/04/15	2011/04/14
19	EMI Test Receiver	R&S	ESPI	2010/04/15	2011/04/14

3.7. Summary of Test Result

No deviations from the test standards

Emission			
Performed Item	Normative References	Test Performed	Deviation
Peak Output Power	FCC Part 22.913(a)(2) and Part 2.1046 EIA/TIA 603-C	Yes	No
Modulation Characteristic	FCC Part 2.1047(d)	Yes	No
Occupied Bandwidth	FCC Part 2.1049	Yes	No
Spurious Emission At Antenna Terminals (+/- 1MHz)	FCC Part 22.917(a) and Part 2.1049	Yes	No
Spurious Emission	FCC Part 22.917(b) and Part 2.1051, 2.1053 EIA/TIA 603-C	Yes	No
Frequency Stability Under Temperature & Voltage Variations	FCC Part 22.355 and 2.1055 EIA/TIA 603-C	Yes	No

Deviations from the test standards as below description: For GSM 850 (FCC Part 22H & Part 2)

For PCS 1900 (FCC Part 24E & Part 2)

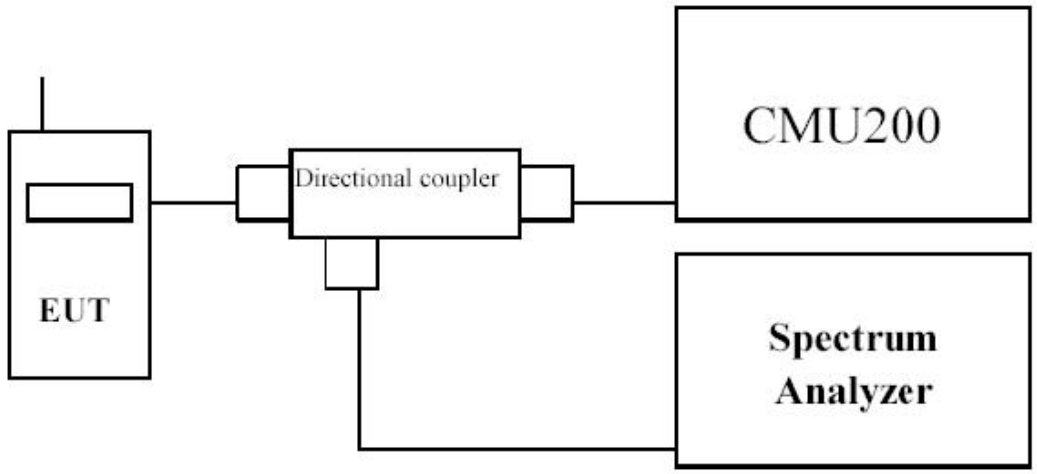
Emission			
Performed Item	Normative References	Test Performed	Deviation
Peak Output Power	FCC Part 24.232(b) and Part 2.1046 EIA/TIA 603-C	Yes	No
Modulation Characteristic	FCC Part 2.1047(d)	Yes	No
Occupied Bandwidth	FCC Part 24.238(b) and Part 2.1049	Yes	No
Spurious Emission At Antenna Terminals (+/- 1MHz)	FCC Part 24.238(a) and Part 2.1049	Yes	No
Spurious Emission	FCC Part 24.238(b) and Part 2.1051, 2.1053 EIA/TIA 603-C	Yes	No
Frequency Stability Under Temperature & Voltage	FCC Part 24.235 and 2.1055 EIA/TIA 603-C	Yes	No

4. TEST CONDITIONS AND RESULTS

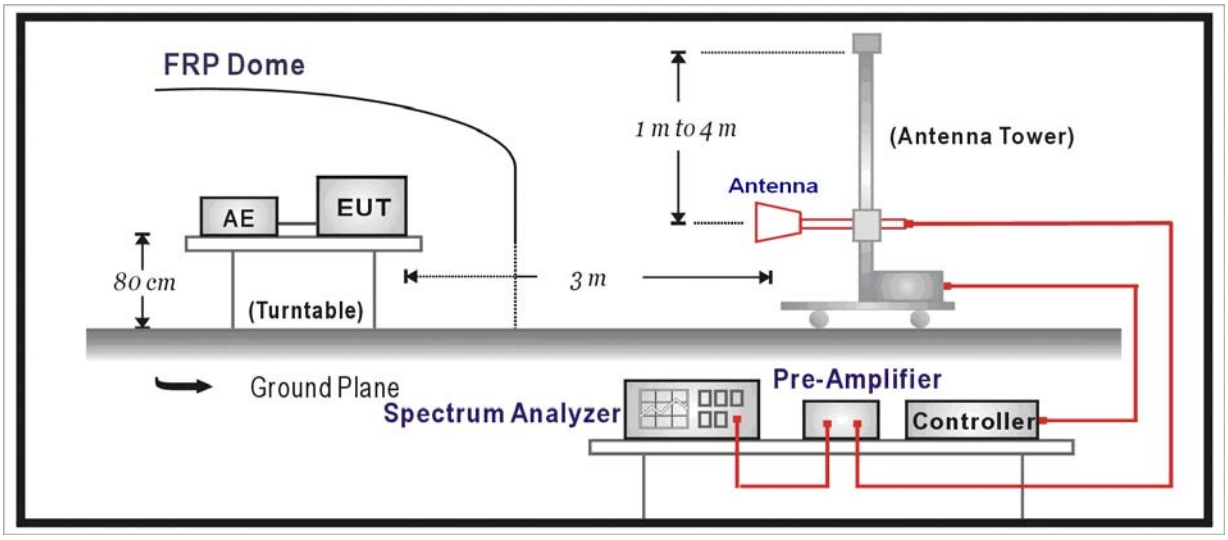
4.1. Peak Output Power

TEST CONFIGURATION

Conducted Power Measurement:



Radiated Power Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

Conducted Power 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.

Radiated Power 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.

h) The maximum signal level detected by the measuring receiver shall be noted.

i) The transmitter shall be replaced by a substitution antenna.

j) 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.

k) The substitution antenna shall be connected to a calibrated signal generator.

l) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

m) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.

n) 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.

o) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

p) 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.

LIMIT

For FCC Part 22.913(a)(2):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(b):

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

TEST RESULTS

Product	vooma peel		
Test Item	Peak Output Power		
Test Mode	Mode 1: GSM 850		
Date of Test	2010/12/02	Test Site	AC-2

Channel No.	Frequency (MHz)	Modulation	Conducted Peak Output Power Measurement	Radiated Peak Output Power Measurement (dBm)	Limit (dBm)	Result
128	824.2	GSM	32.30	30.01	38.50	Pass
189	836.4	GSM	32.42	30.05	38.50	Pass
251	848.8	GSM	32.48	30.10	38.50	Pass

Radiated Measurement

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
824.20	-13.50	H	19.64	2.56	-0.02	17.06	38.50	-21.47
824.20	-1.41	V	32.59	2.56	-0.02	30.01	38.50	-9.35
Middle Channel 380 (836.40MHz)								
836.40	-13.12	H	19.92	2.59	0.10	17.43	38.50	-21.07
836.40	-1.22	V	32.54	2.59	0.10	30.05	38.50	-10.28
High Channel 773 (848.80MHz)								
848.80	-13.04	H	20.43	2.54	0.13	18.02	38.50	-20.45
848.80	-1.13	V	32.51	2.54	0.13	30.10	38.50	-9.46

Product	vooma peel		
Test Item	Peak Output Power		
Test Mode	Mode 2: PCS 1900		
Date of Test	2010/12/02	Test Site	AC-2

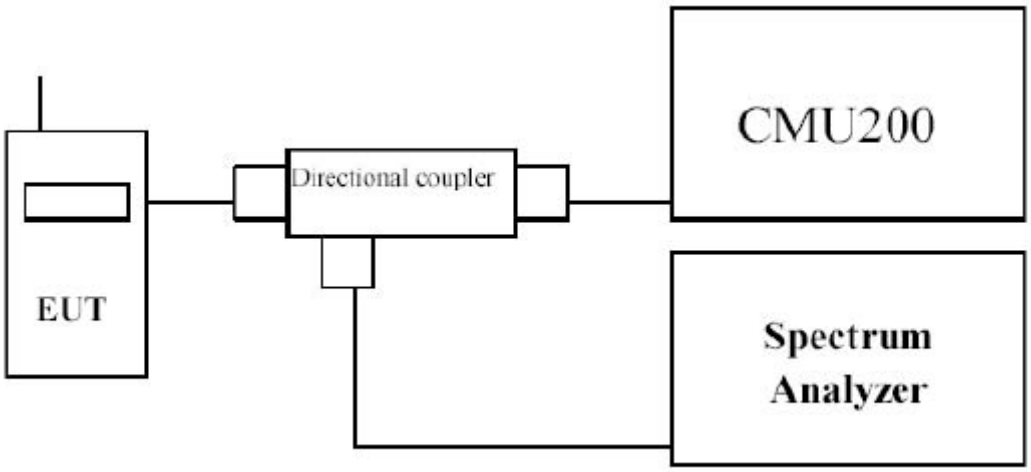
Channel No.	Frequency (MHz)	Modulation	Conducted Peak Output Power Measurement	Radiated Peak Output Power Measurement (dBm)	Limit (dBm)	Result
512	1850.2	GPRS	29.68	25.41	33.00	Pass
661	1880.0	GPRS	29.96	25.53	33.00	Pass
810	1909.8	GPRS	29.78	25.63	33.00	Pass

Radiated Measurement

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)								
1850.20	-16.11	H	9.63	3.55	10.40	16.48	33.00	-6.52
1850.20	-10.25	V	18.56	3.55	10.40	25.41	33.00	-5.69
Middle Channel 661 (1880.00MHz)								
1880.00	-15.93	H	10.42	3.53	10.43	17.32	33.00	-5.98
1880.00	-10.06	V	18.63	3.53	10.43	25.53	33.00	-5.55
High Channel 810 (1909.80MHz)								
1909.80	-15.06	H	9.79	3.56	10.44	16.67	33.00	-5.65
1909.80	-10.14	V	18.75	3.56	10.44	25.63	33.00	-4.82

4.2. Modulation Characteristic

TEST CONFIGURATION



LIMIT

N/A

TEST PROCEDURE

GMSK is a form of binary signaling schemes which represent digital states as a shift between discrete sinusoidal frequencies called Frequency Shift Keying (FSK). Minimum Shift Keying (MSK) is continuous phase FSK with the smallest possible modulation index h. Modulation index is defined as:
h = 2*F*Tb
where F = Peak frequency deviation in Hz and Tb = Bit period in seconds

Two discrete frequencies, representing two distinct digital states, with equal phases at switch time t = 0 requires a minimum value of h = 0.5. The Gaussian part of GMSK describes the fact that the digital pulses are filtered in the time domain. This results in bits which are sinusoidal rather than square. The effective spectrum is then compressed with the average carrier frequency in the center of the passband. This is a great advantage because of the significantly reduced bandwidth. GMSK is utilized because of these bandwidth conservation properties.

The bandwidth for GSM is a 60 MHz up-link at 1850-1910 MHz and down-link at 1930-1990 MHz. The 65 MHz is divided into 299 channels, each of which is 200 kHz wide. Slight spectral spillage is allowed into neighboring channels (which is minimized by GMSK). This separated transmit/receive frequencies scheme under GSM enables easier duplex filtering.

Within the bandwidth, individual channels are subdivided into multiframes (made of 26 frames), frames (made of 8 time slots), and time slots (made of 8 fields). The time slots are 0.57 ms long allowing 156.25 bits of information including overhead.

TEST RESULTS

Product	vooma peel		
Test Item	Modulation Characteristic		
Test Mode	Mode 1: GSM 850		
Date of Test	2010/12/02	Test Site	AC-4

Figure (GSM 850-Channel 128)

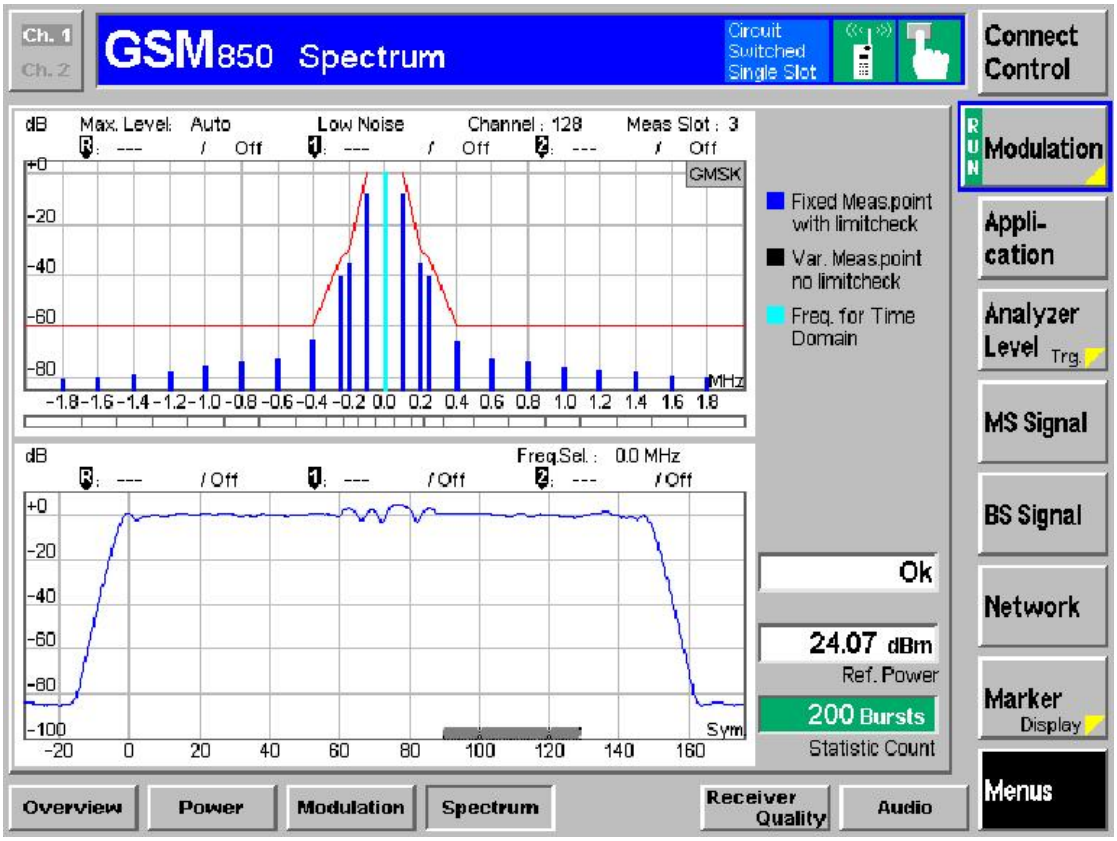


Figure (GSM 850-Channel 189)

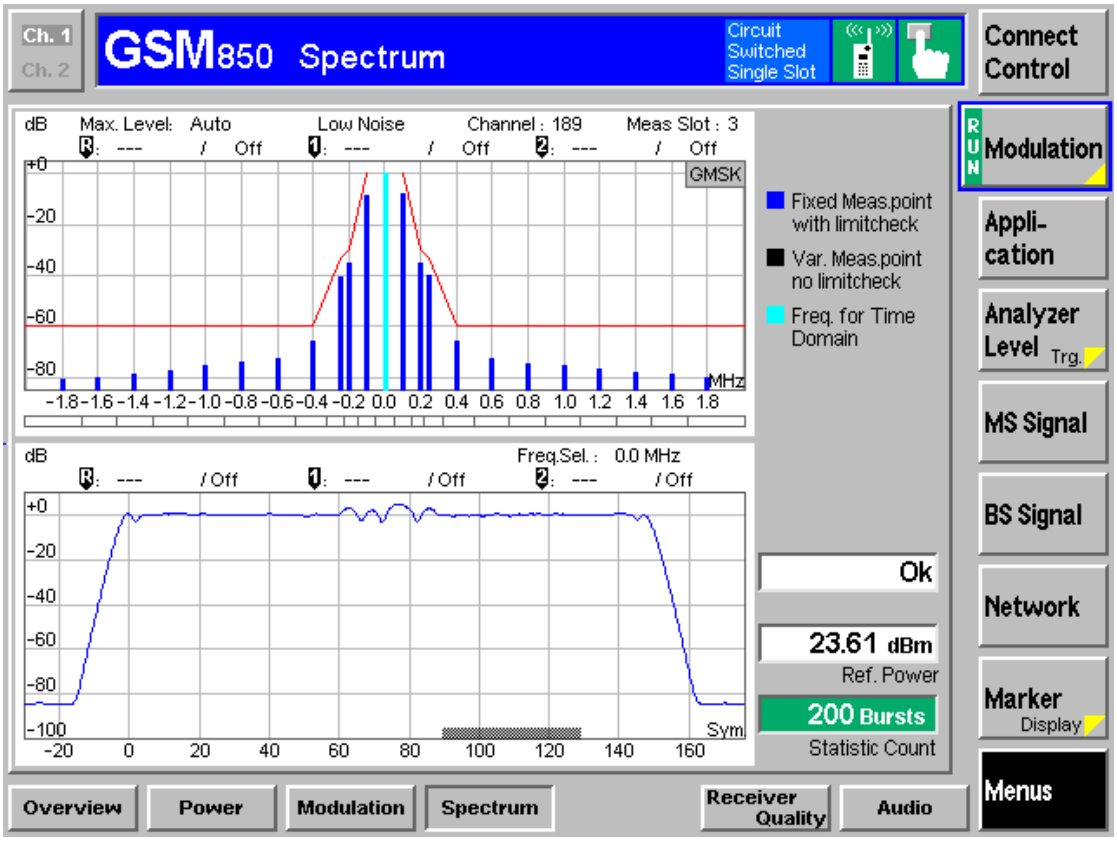
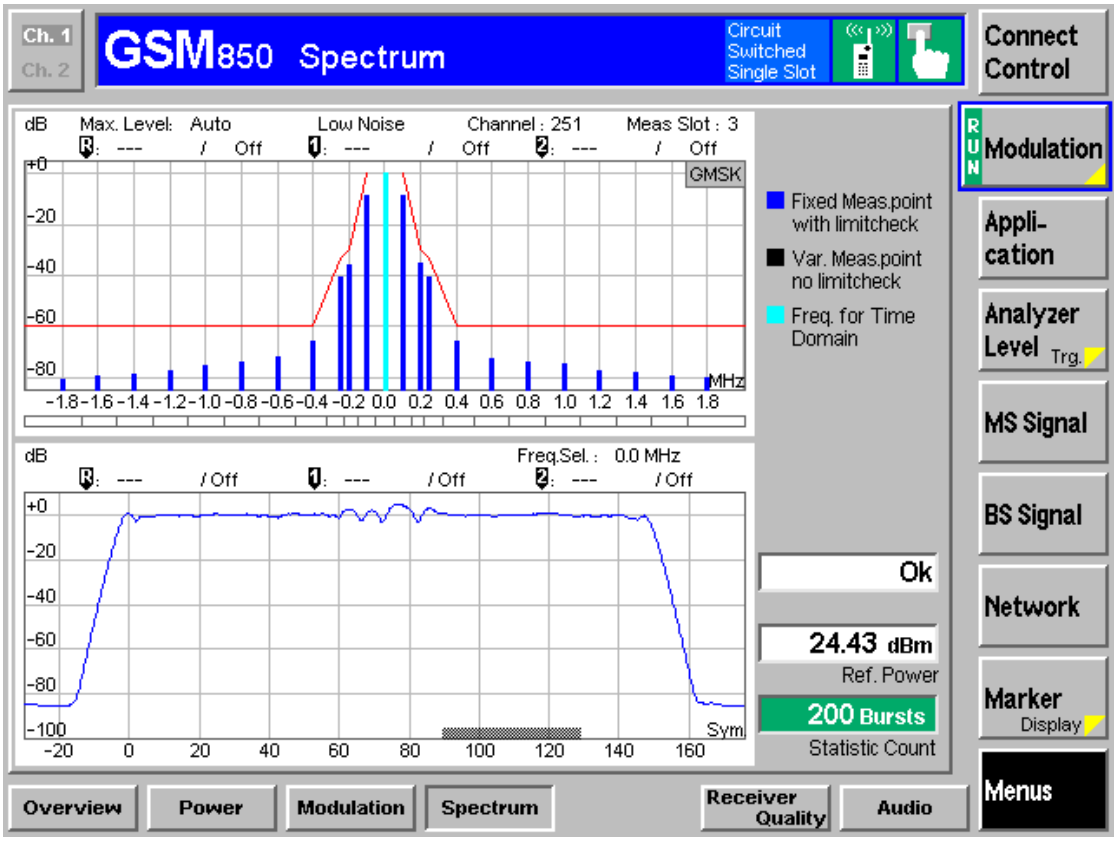


Figure (GSM 850-Channel 251)



Product	vooma peel		
Test Item	Modulation Characteristic		
Test Mode	Mode 2: PCS 1900		
Date of Test	2010/12/02	Test Site	AC-4

Figure (PCS 1900-Channel 512)

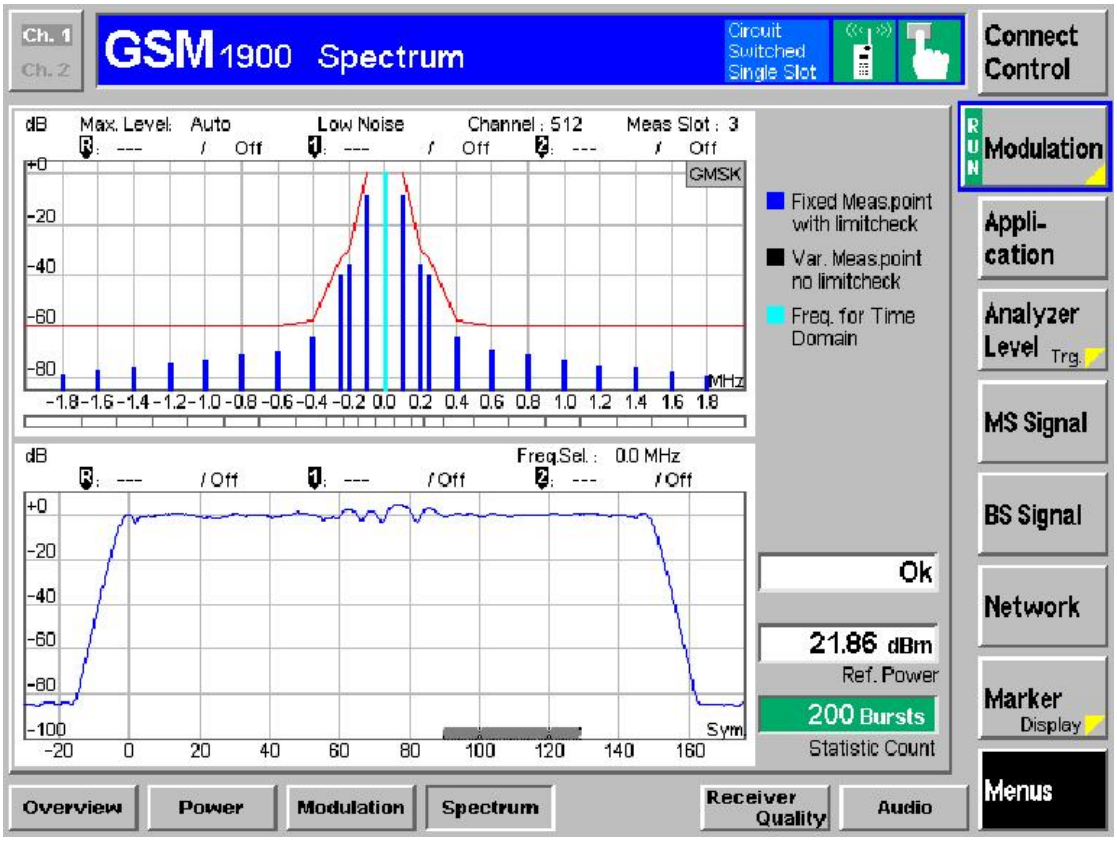


Figure (PCS 1900-Channel 661)

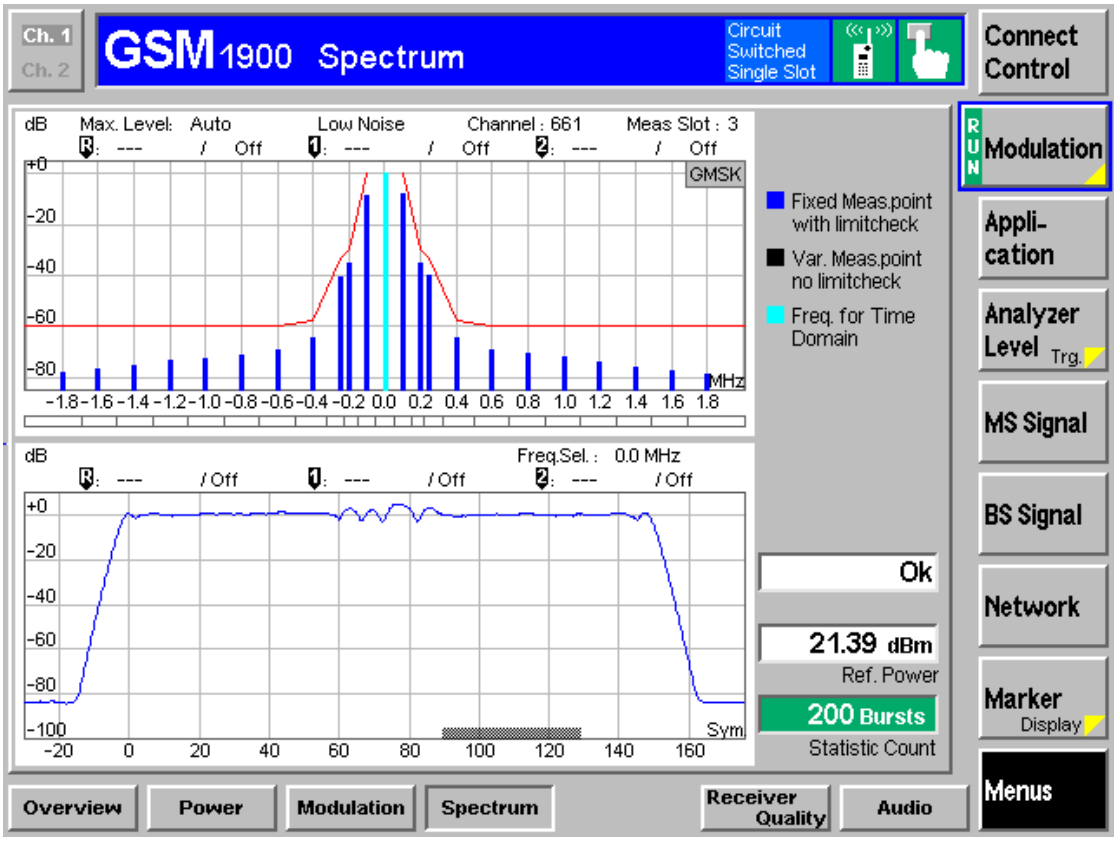
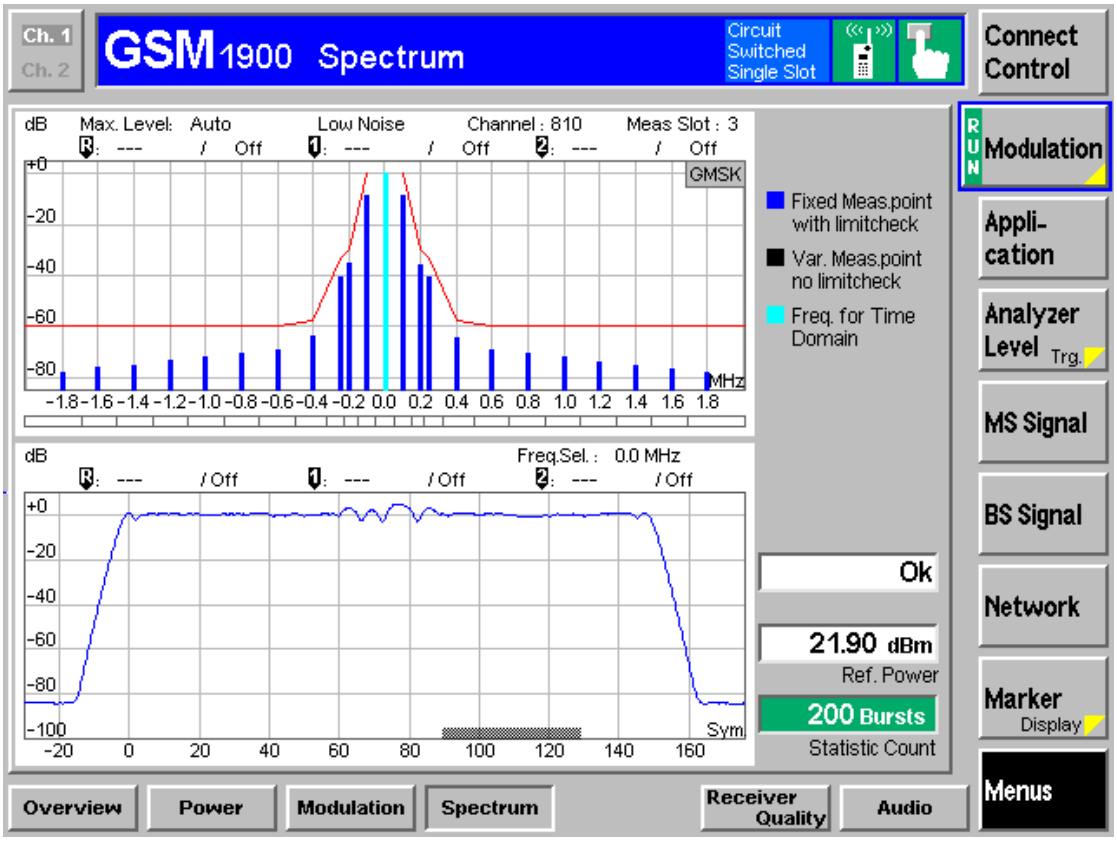
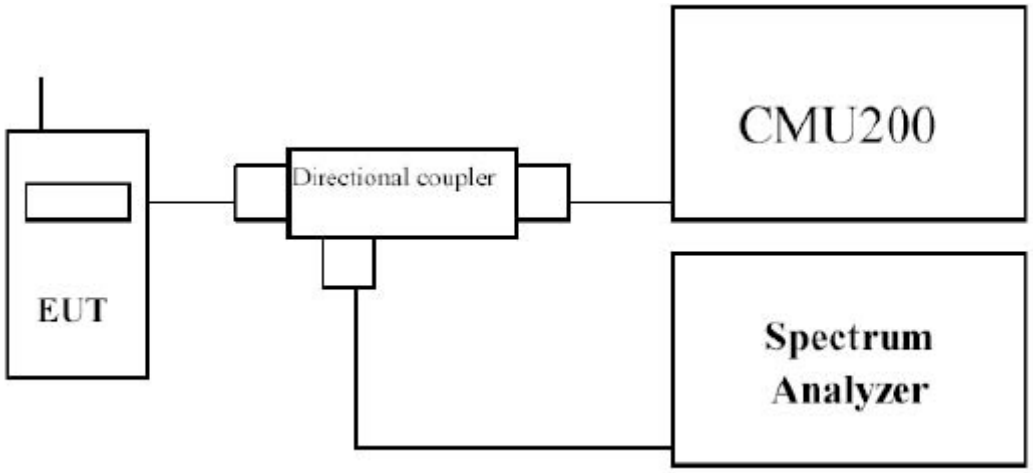


Figure (PCS 1900-Channel 810)



4.3. Occupied Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

Using a resolution bandwidth of 3kHz and a video bandwidth of 10kHz, the -26dBc points were established and the emission bandwidth determined. The plots below show the resultant display from the Spectrum Analyzer.

LIMIT

N/A

TEST RESULTS

Product	vooma peel		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: GSM 850		
Date of Test	2010/12/02	Test Site	AC-4

Channel No.	Frequency (MHz)	Measurement of -26dB Bandwidth (kHz)
128	824.20	312.87
189	836.40	314.69
251	848.80	310.19

Figure Channel 128 (824.20MHz)

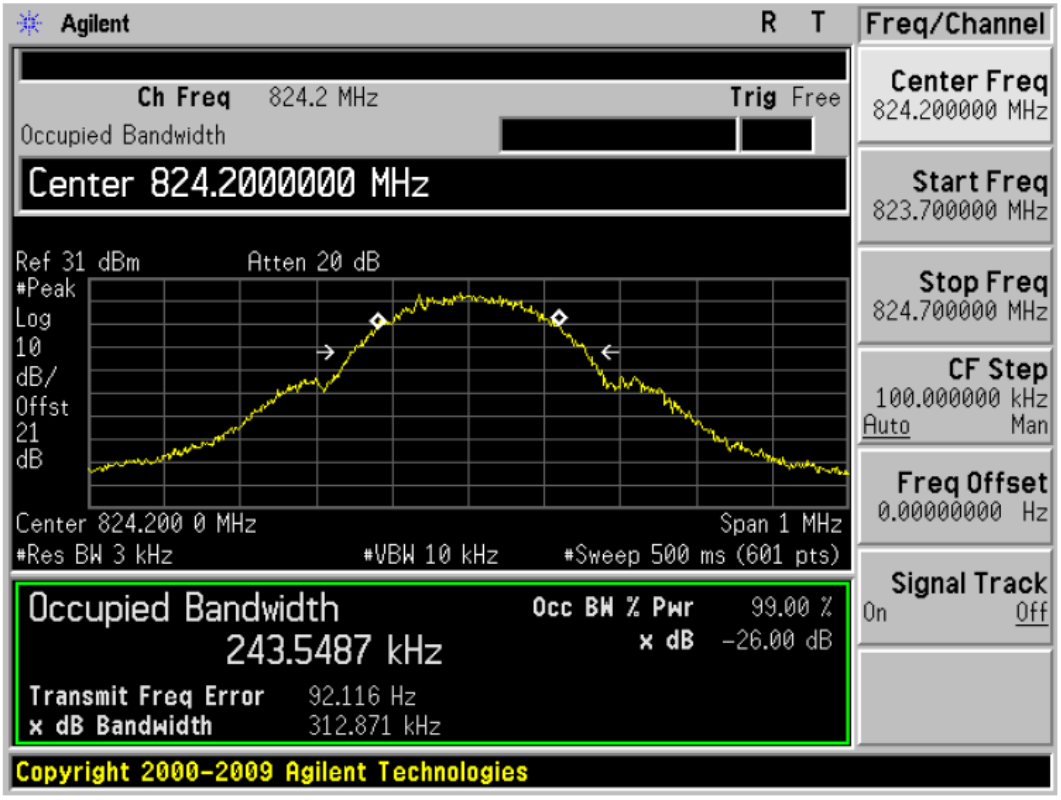


Figure Channel 189 (836.40MHz)

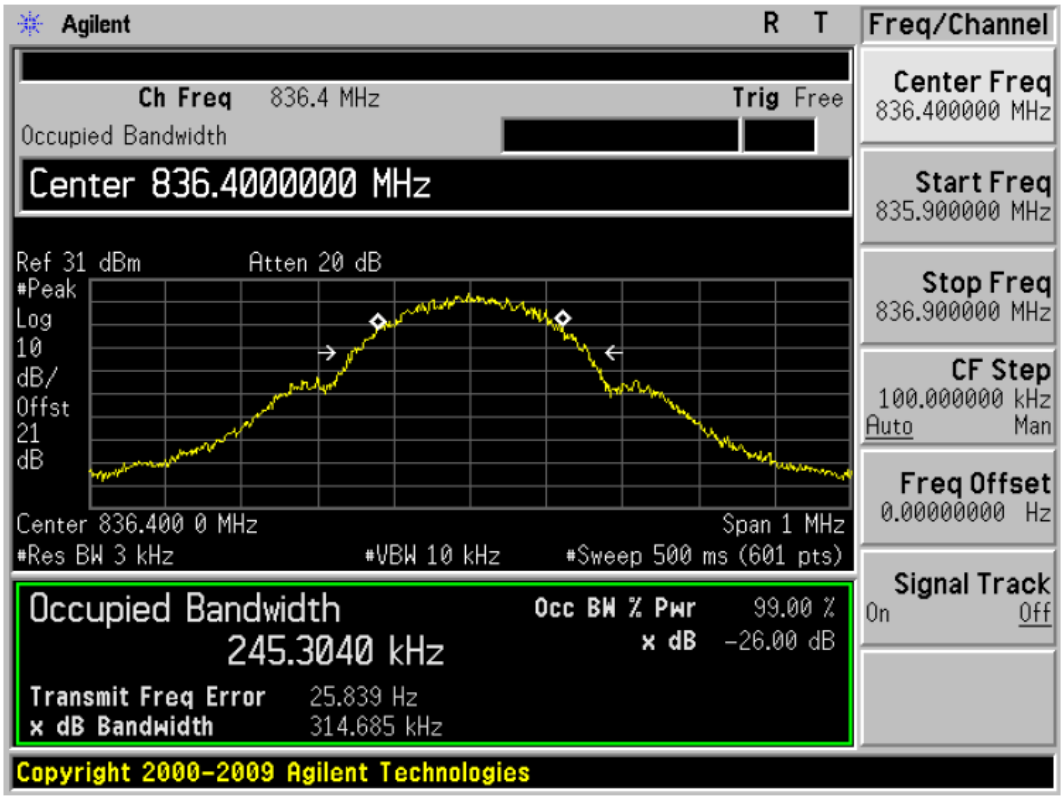
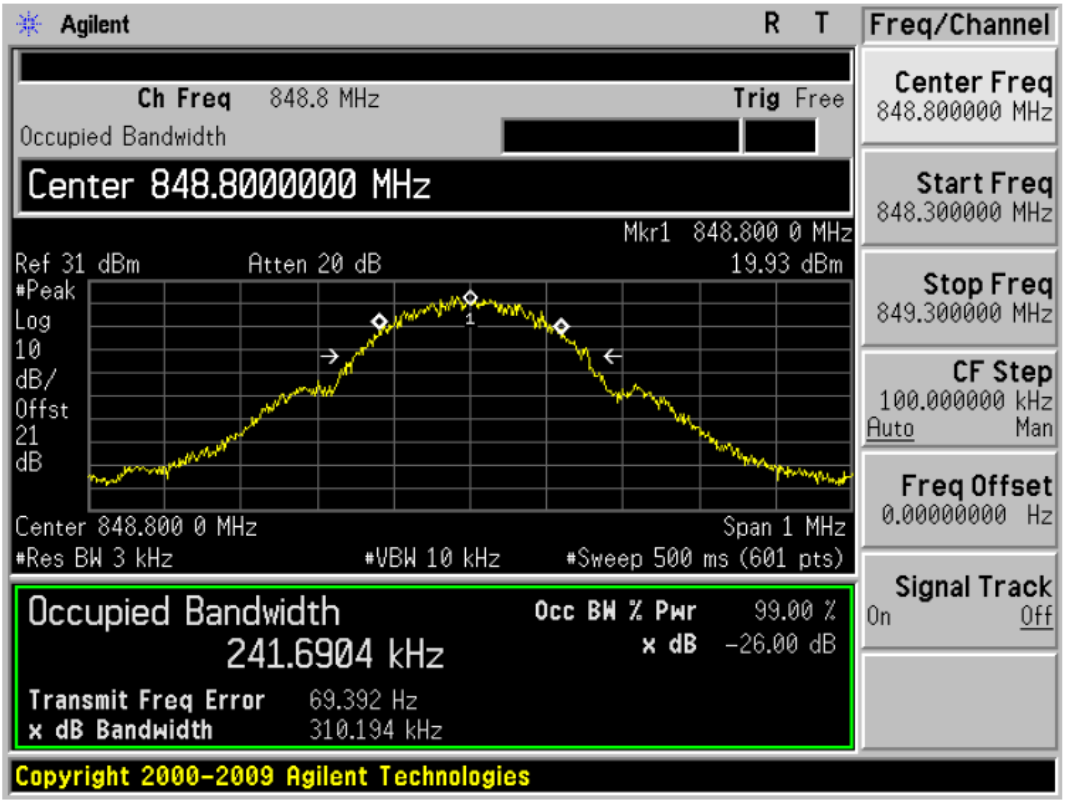


Figure Channel 251 (848.80MHz)



Product	vooma peel		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: PCS 1900		
Date of Test	2010/12/02	Test Site	AC-4

Channel No.	Frequency (MHz)	Measurement of -26dB Bandwidth (kHz)
512	1850.20	313.69
661	1880.00	313.38
810	1909.80	308.45

Figure Channel 512 (1850.20MHz)

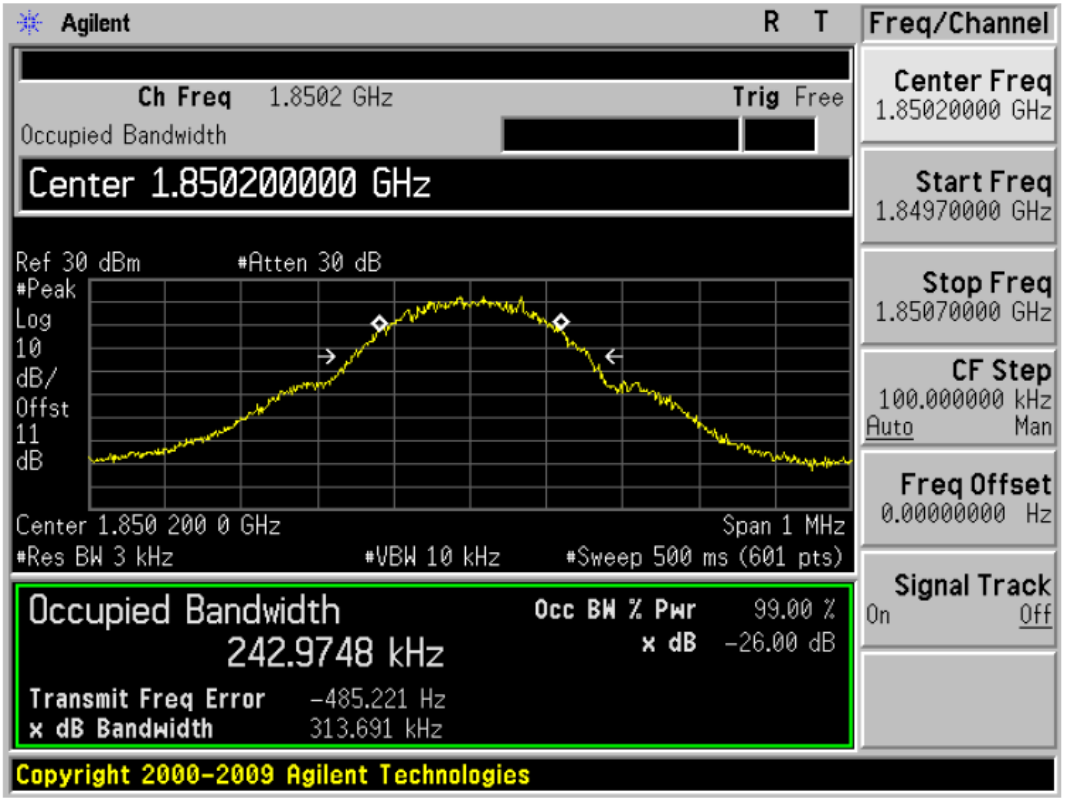


Figure Channel 661 (1880.00MHz)

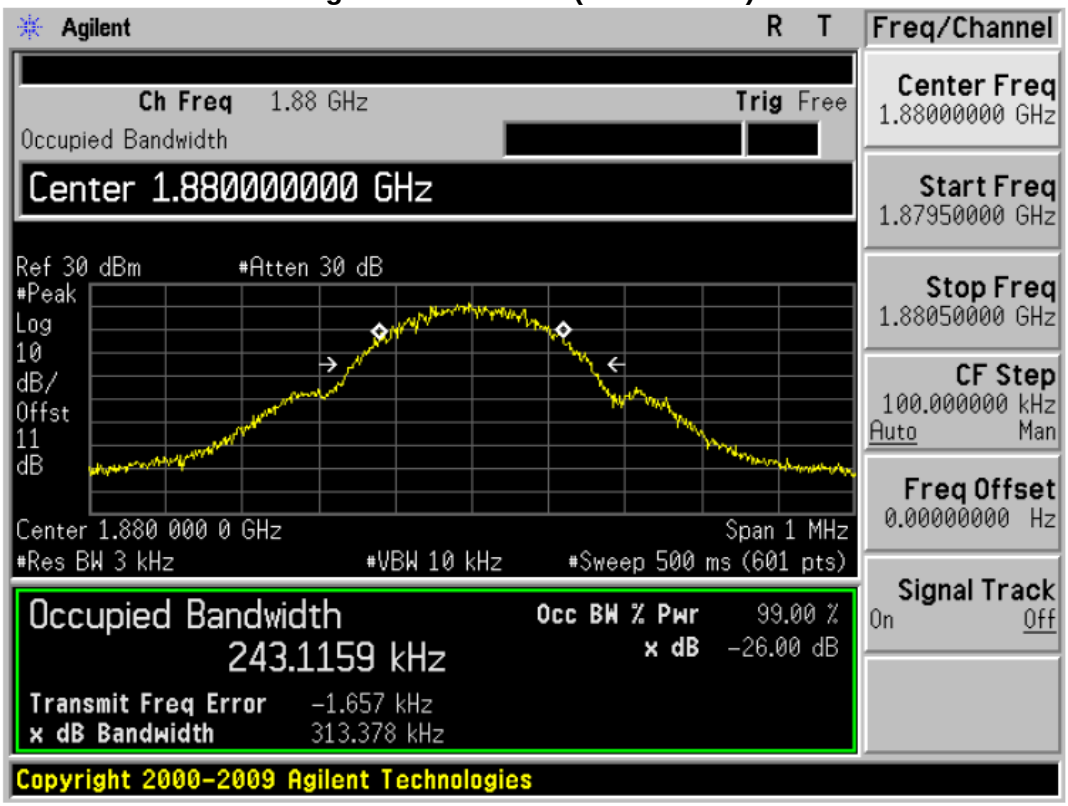
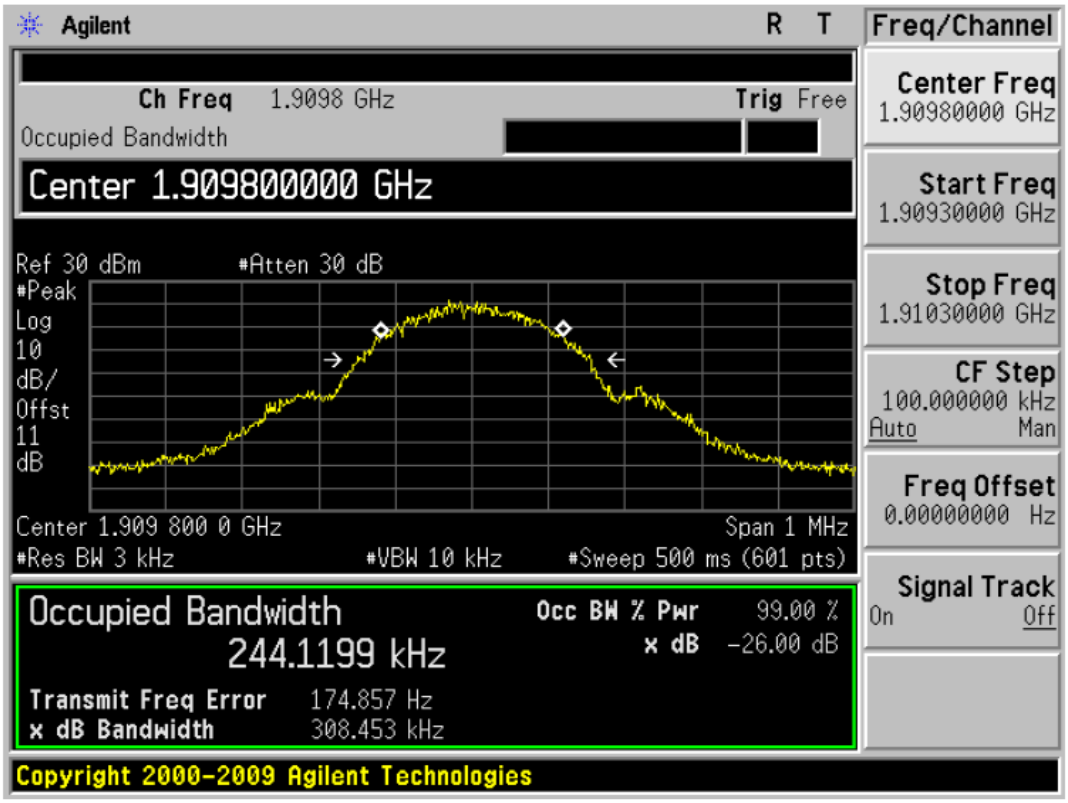
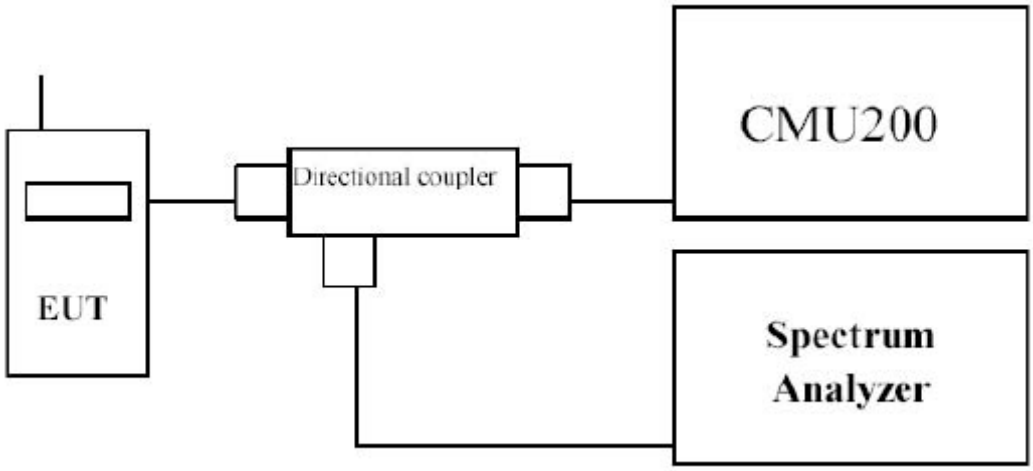


Figure Channel 810 (1909.80MHz)



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

TEST CONFIGURATION



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.

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 + 10log(P) dB.

TEST RESULTS

Figure Channel 128 (Mode 1: GSM850--824.20MHz)

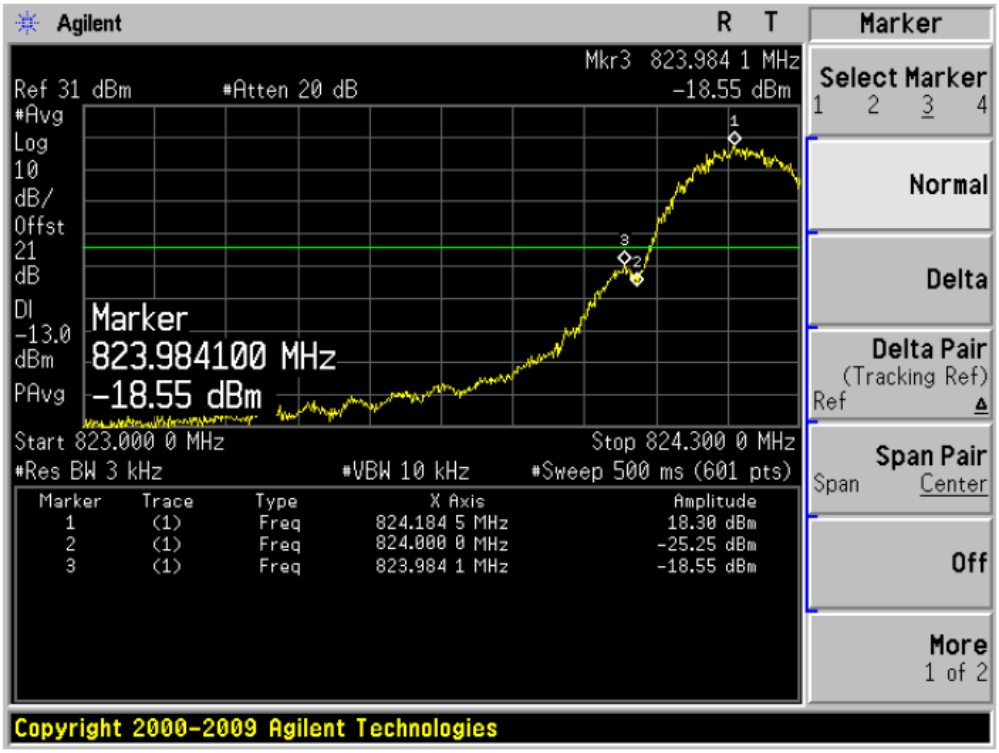


Figure Channel 251 (Mode 1: GSM850--848.80MHz)

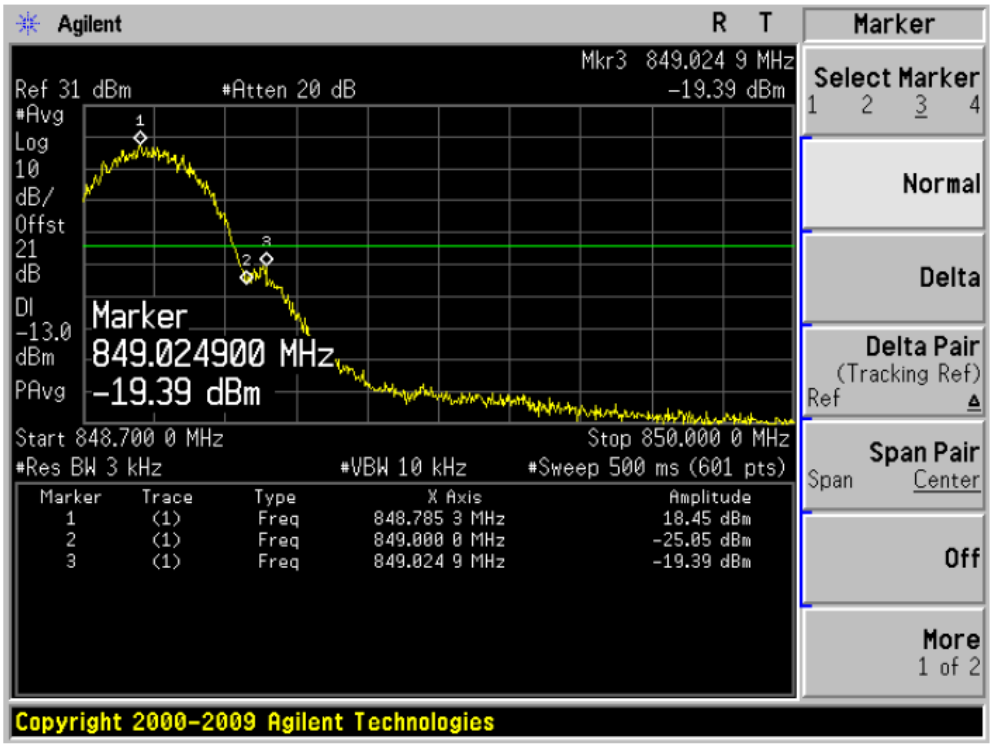


Figure Channel 512 (Mode 2: PCS1900--1850.20MHz)

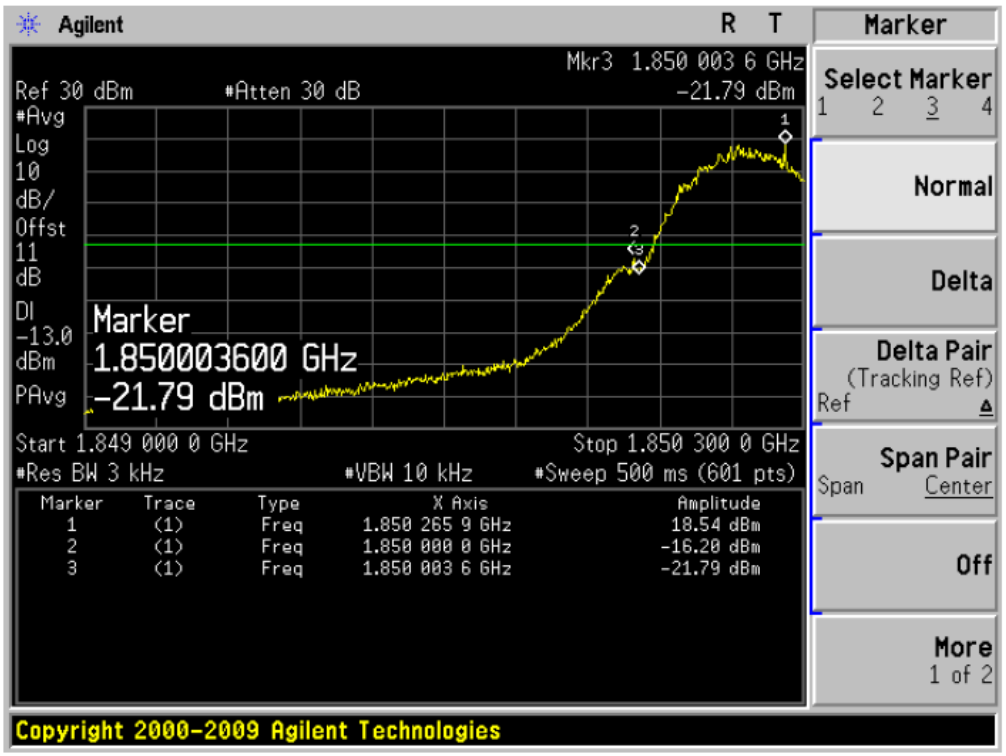
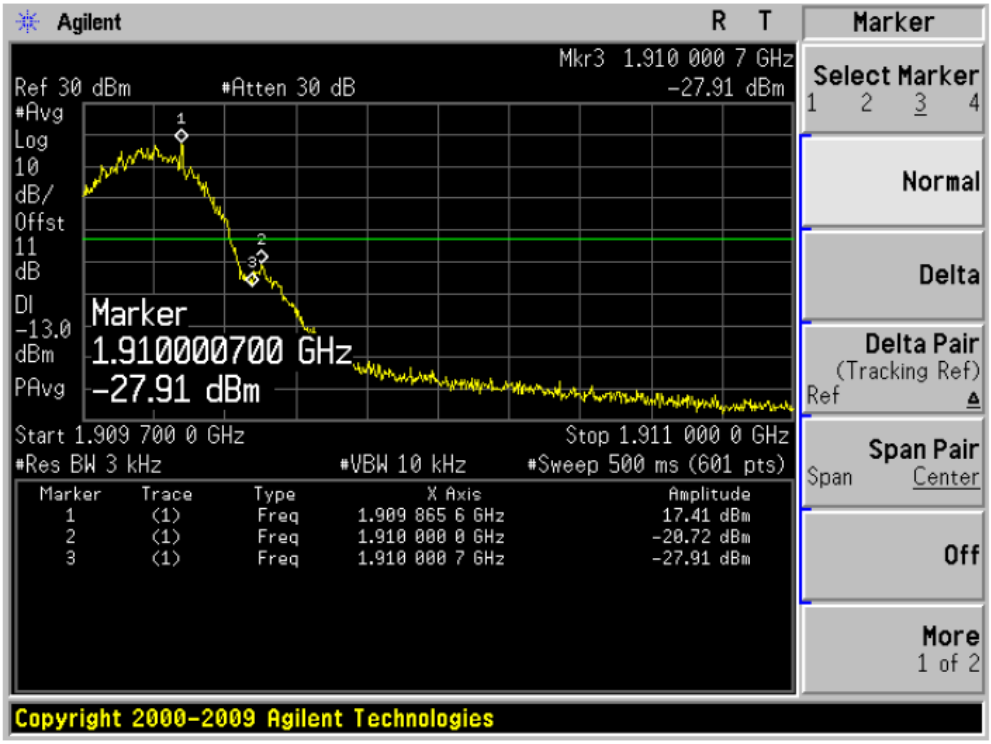


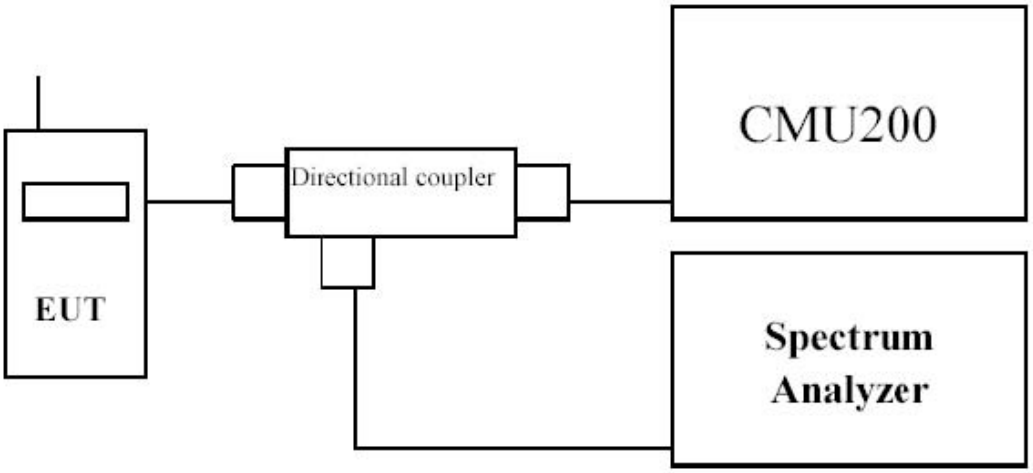
Figure Channel 810 (Mode 2: PCS1900--1909.80MHz)



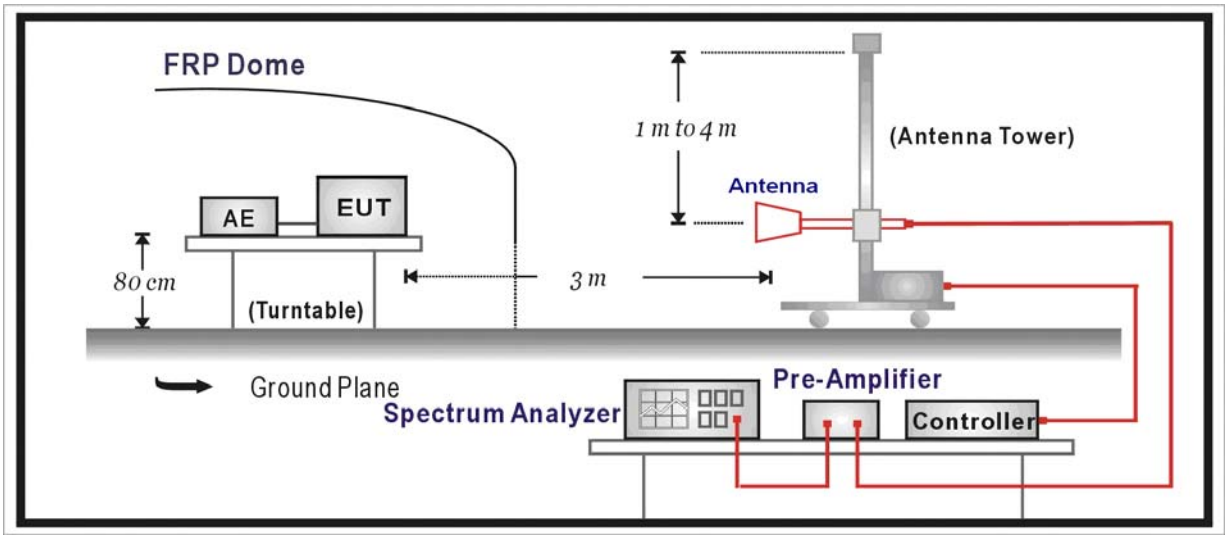
4.5. Spurious Emission

TEST CONFIGURATION

Conducted Spurious Measurement:



Radiated Spurious Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

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 100 kHz for Part 22 and 1MHz for Part 24, sufficient scans were taken to show the out of band Emission if any up to10th 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.

q) 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 resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1

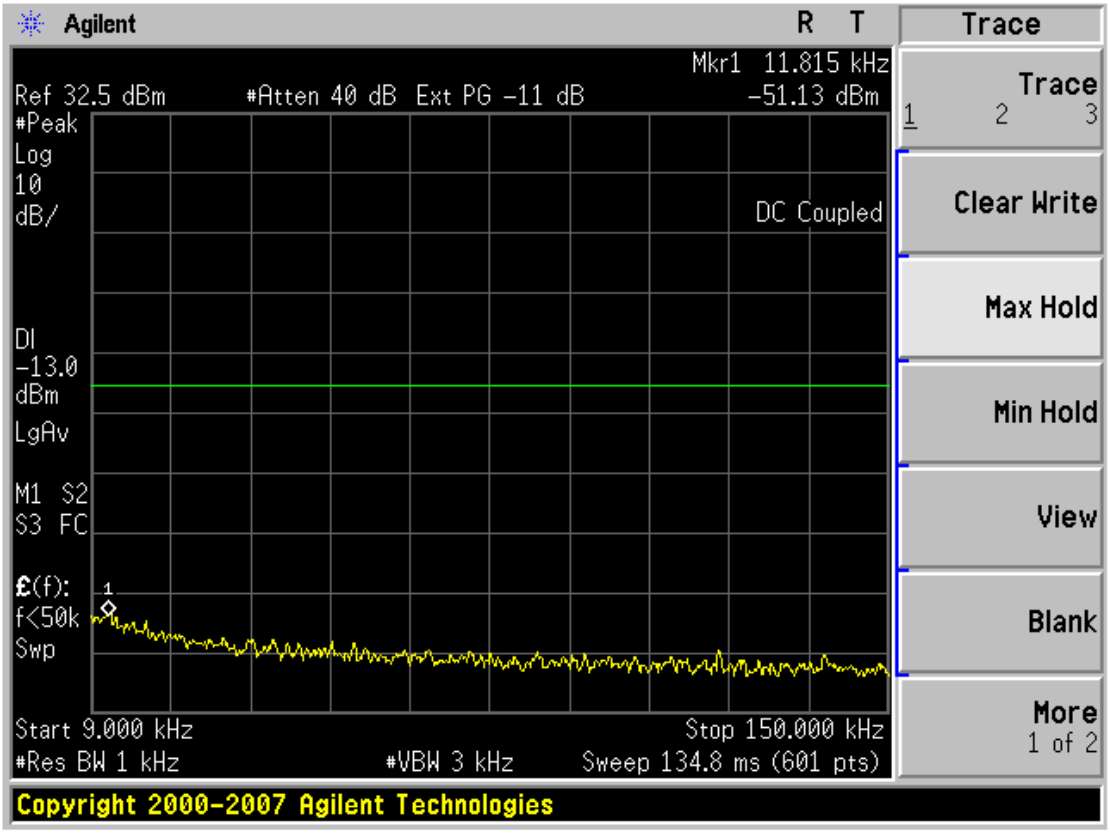
MHz for Part 24. The frequency range was checked up to 10th harmonic.

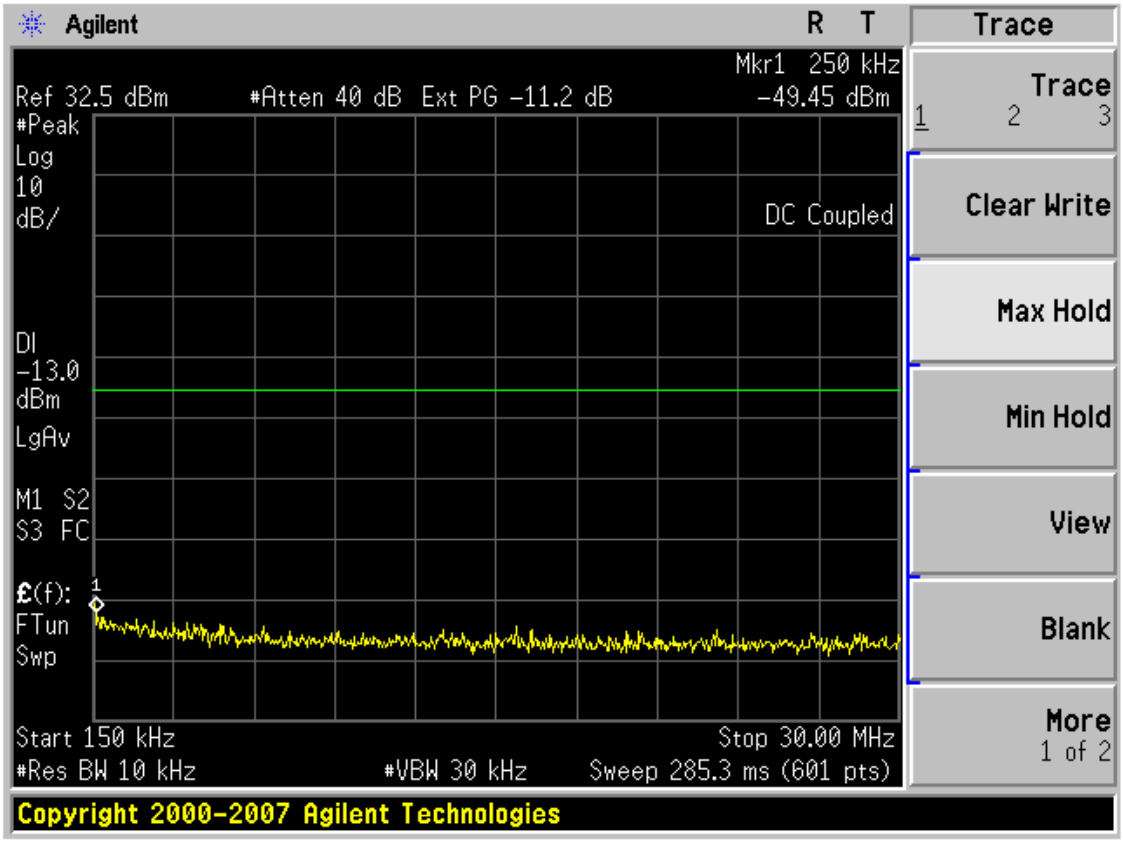
LIMIT

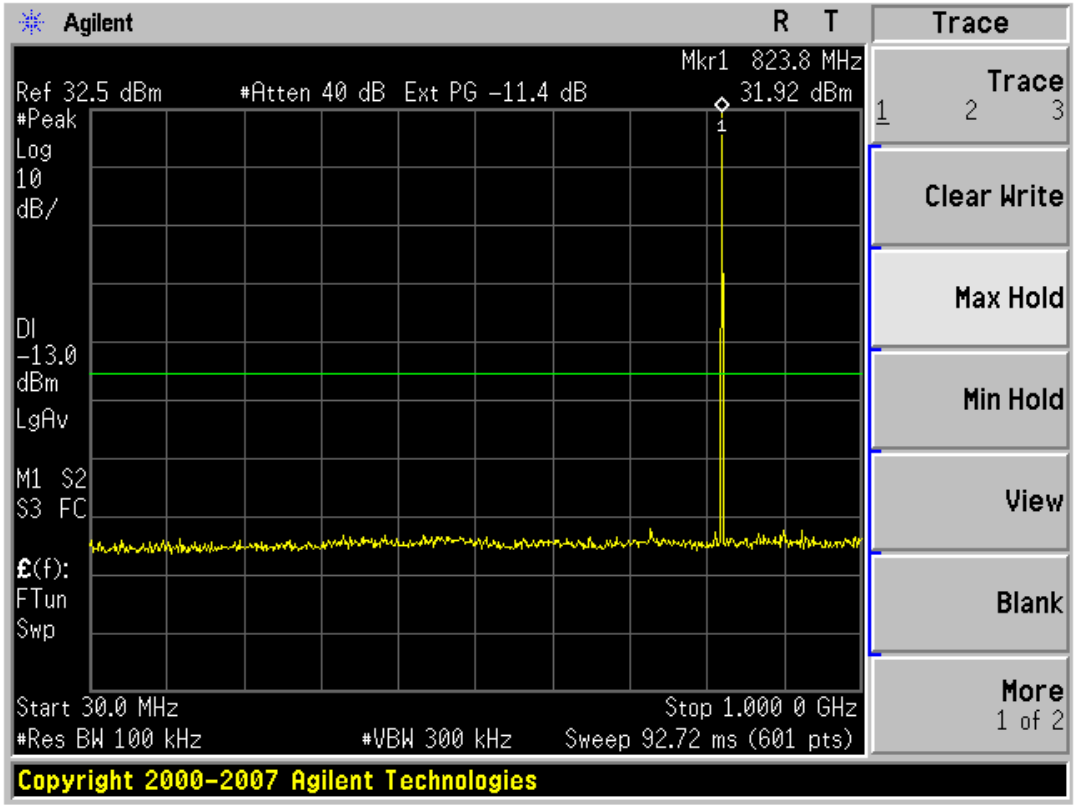
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

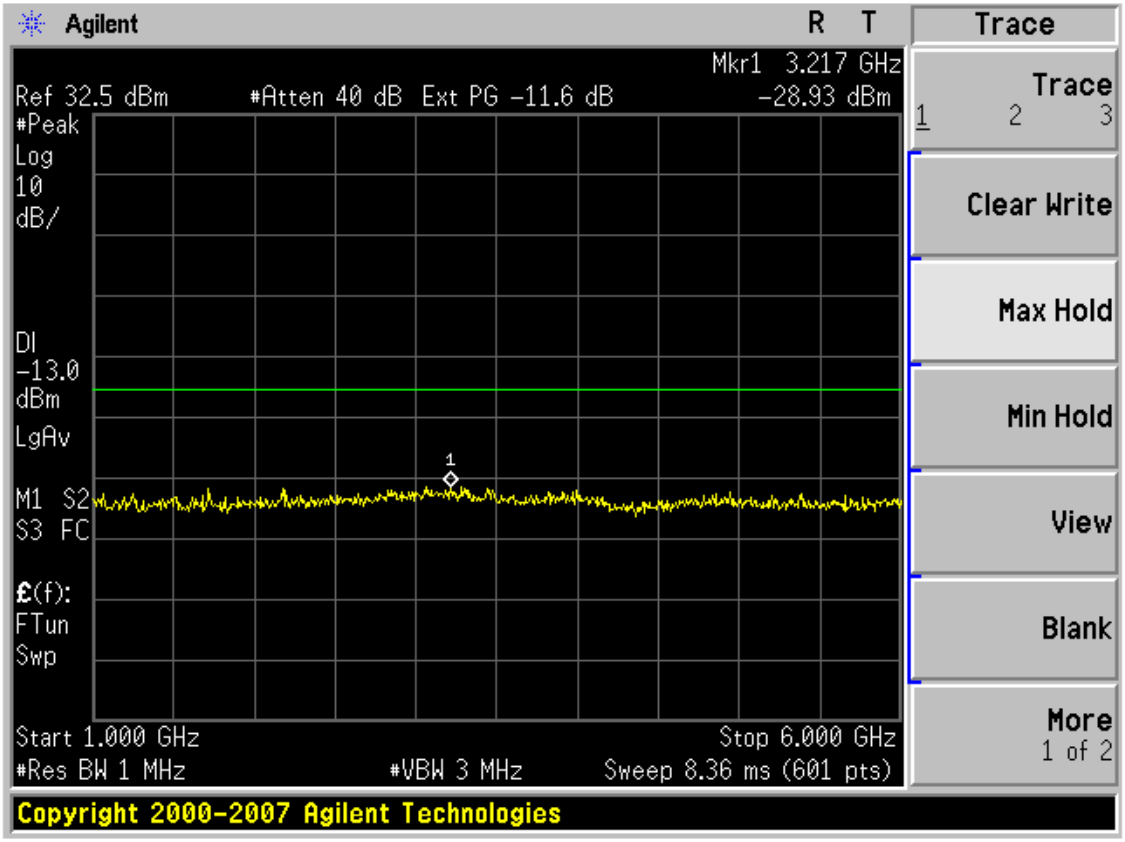
TEST RESULTS

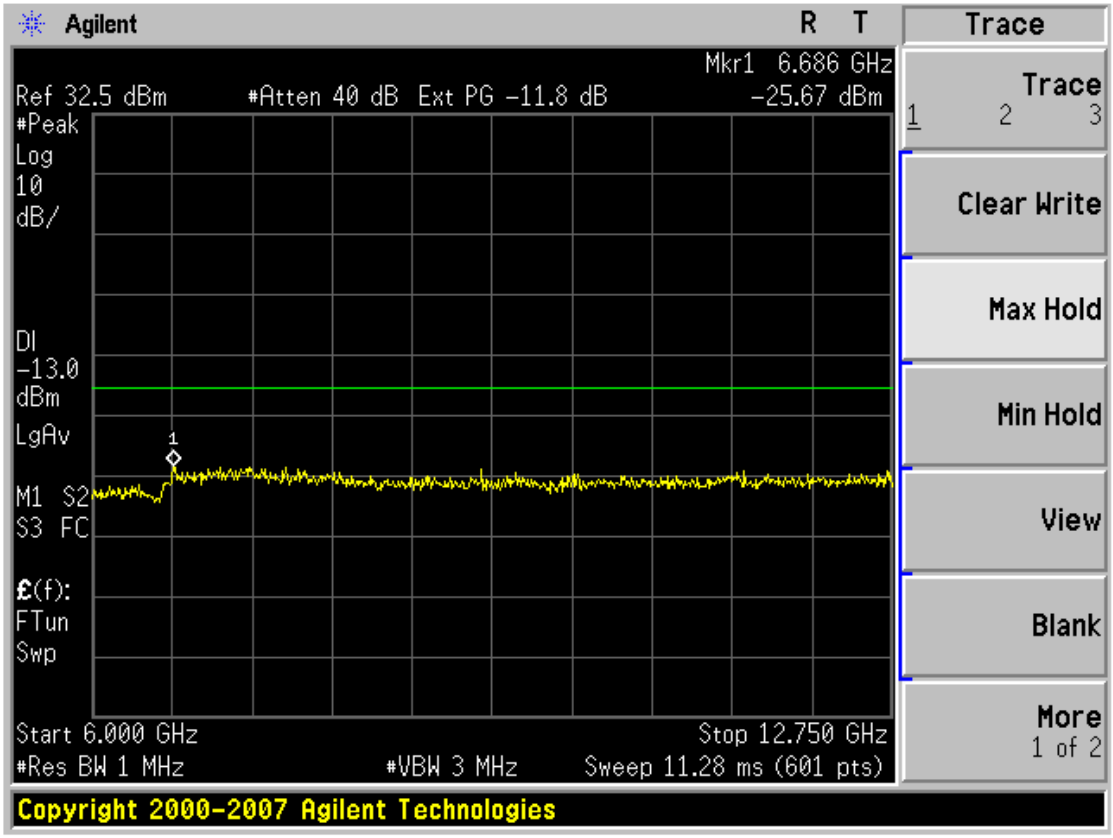
Engineer : John	
Site : Shielding Room	Time : 2010/12/02 - 10:02
Limit : FCC_22&24_Spurious_03M_PK	Margin : 0
EUT : T166	Probe : - Line1
Power : DC 3.7V	Note : GSM850 Channel 128



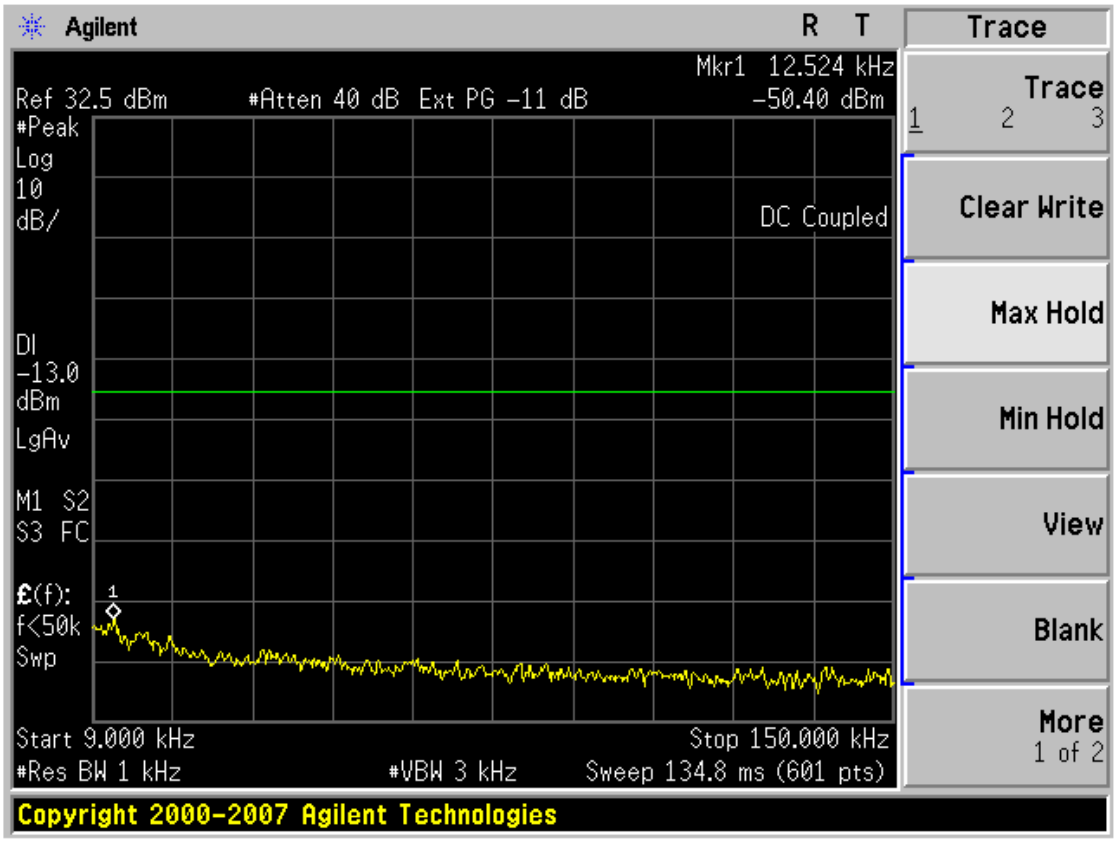


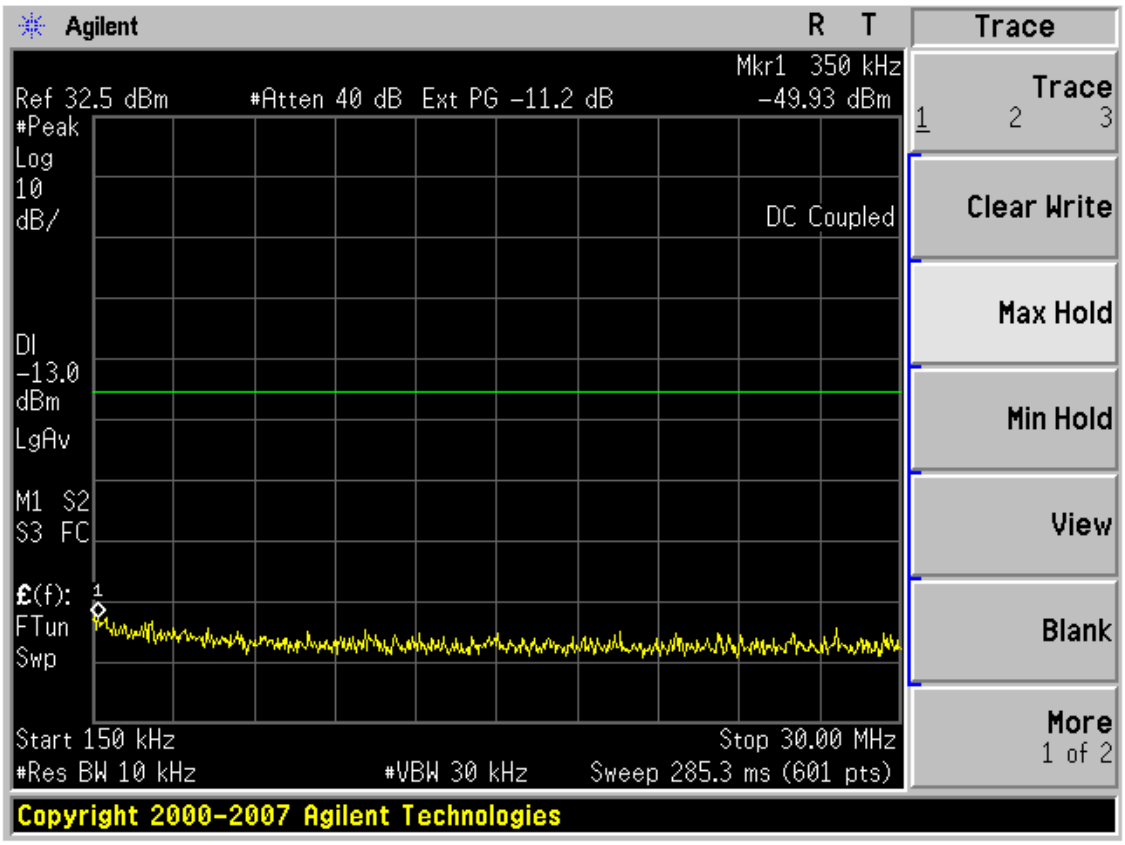

Agilent
R T
Trace
Mkr1 823.8 MHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -11.4 dB
31.92 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 92.72 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies

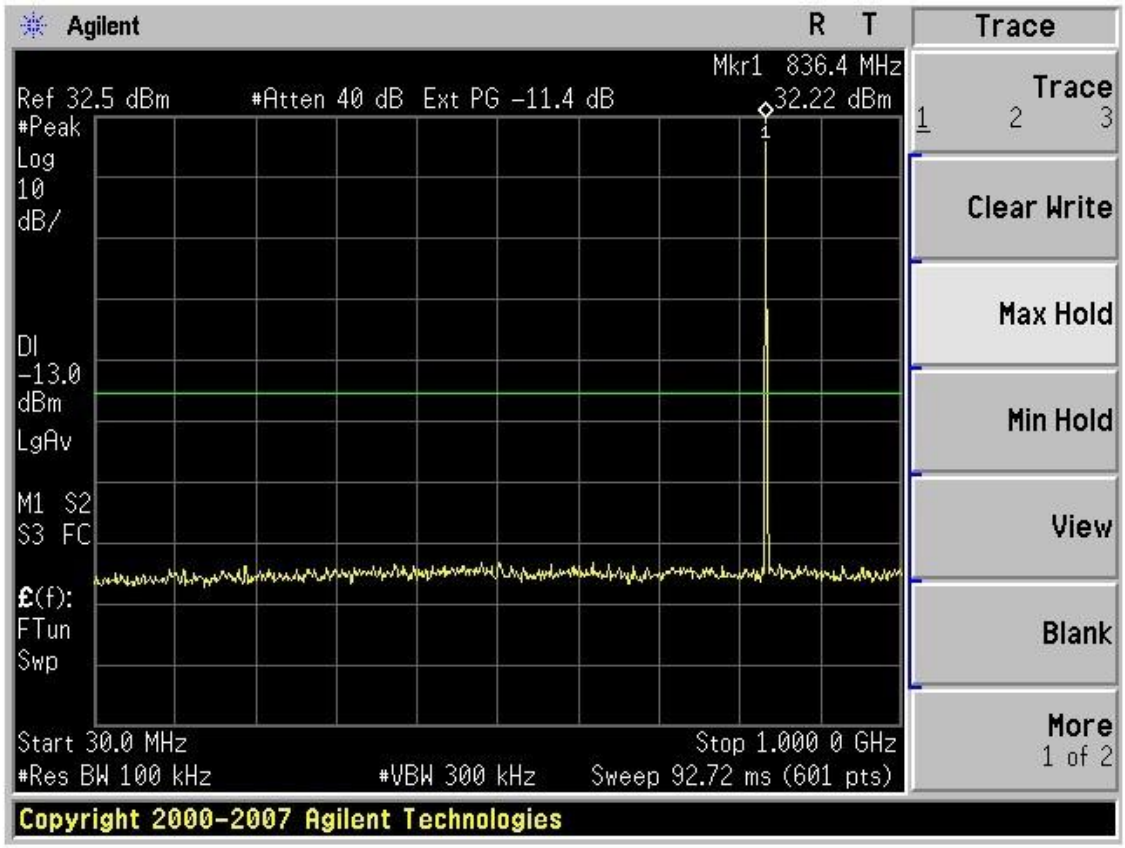

Agilent
R T
Trace
Mkr1 3.217 GHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -11.6 dB
-28.93 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 1.000 GHz
Stop 6.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 8.36 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies

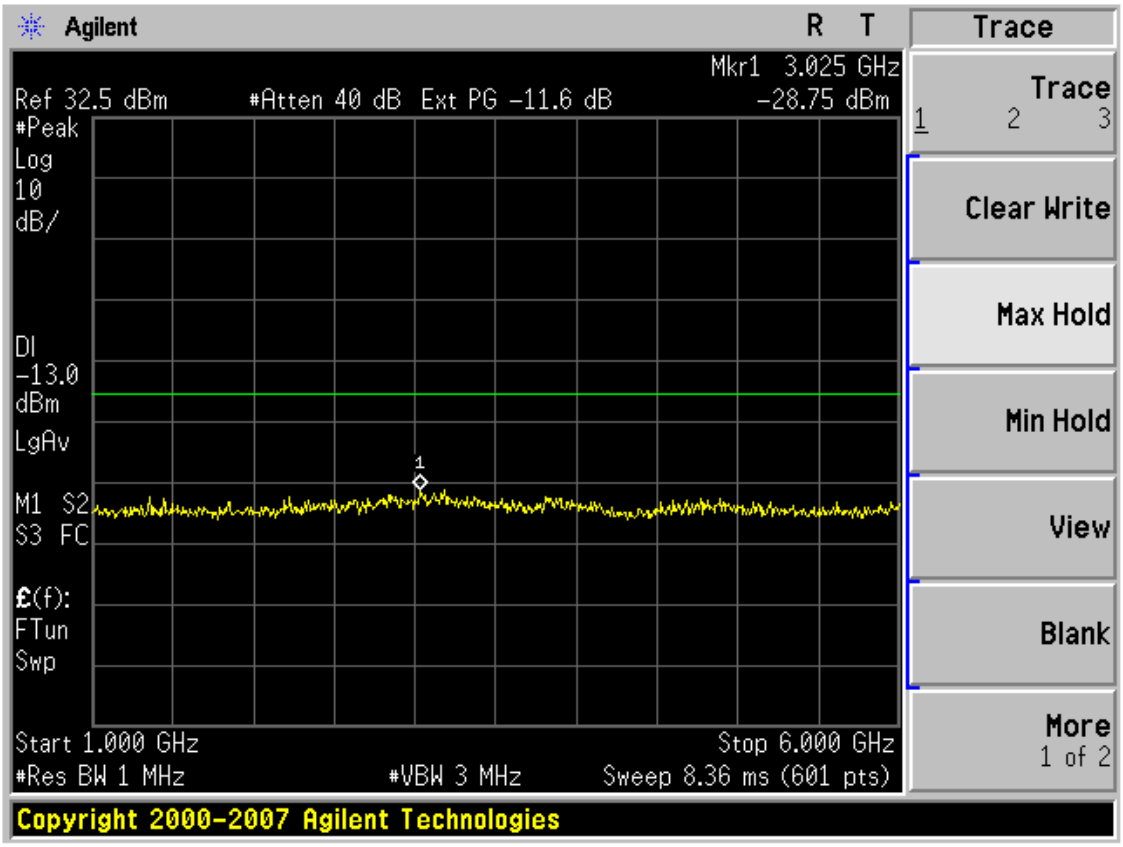


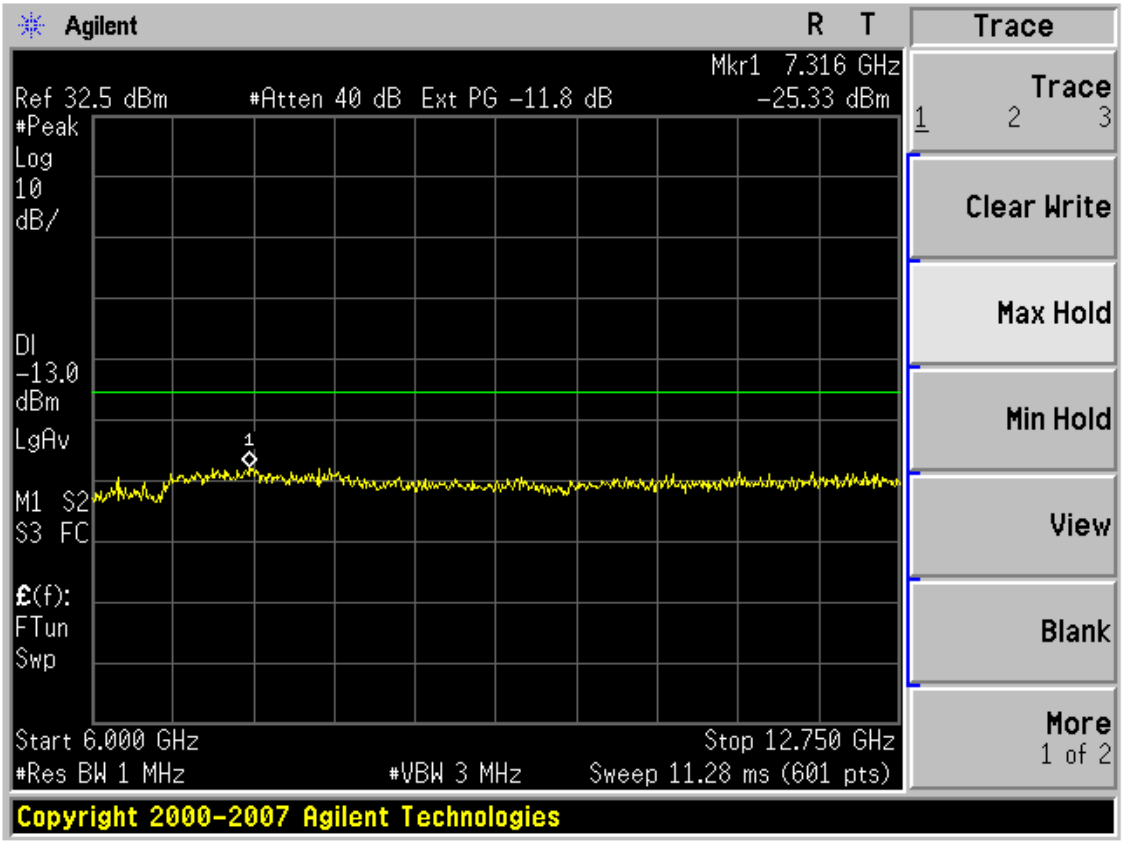
Engineer : John	
Site : Shielding Room	**Time : 2010/12/02 - 10:04**
Limit : FCC_22&24_Spurious_03M_PK	**Margin : 0**
EUT : T166	**Probe : - Line1**
Power : DC 3.7V	**Note : GSM850 Channel 189**




Agilent
R T
Mkr1 350 kHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -11.2 dB
-49.93 dBm
#Peak
Log
10
dB/
DC Coupled
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 150 kHz
Stop 30.00 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies


Agilent
R T
Mkr1 836.4 MHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -11.4 dB
32.22 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 92.72 ms (601 pts)
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies


Agilent
R T
Mkr1 3.025 GHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -11.6 dB
-28.75 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 1.000 GHz
Stop 6.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 8.36 ms (601 pts)
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies


Agilent
R T
Mkr1 7.316 GHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -11.8 dB
-25.33 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 6.000 GHz
Stop 12.750 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 11.28 ms (601 pts)
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
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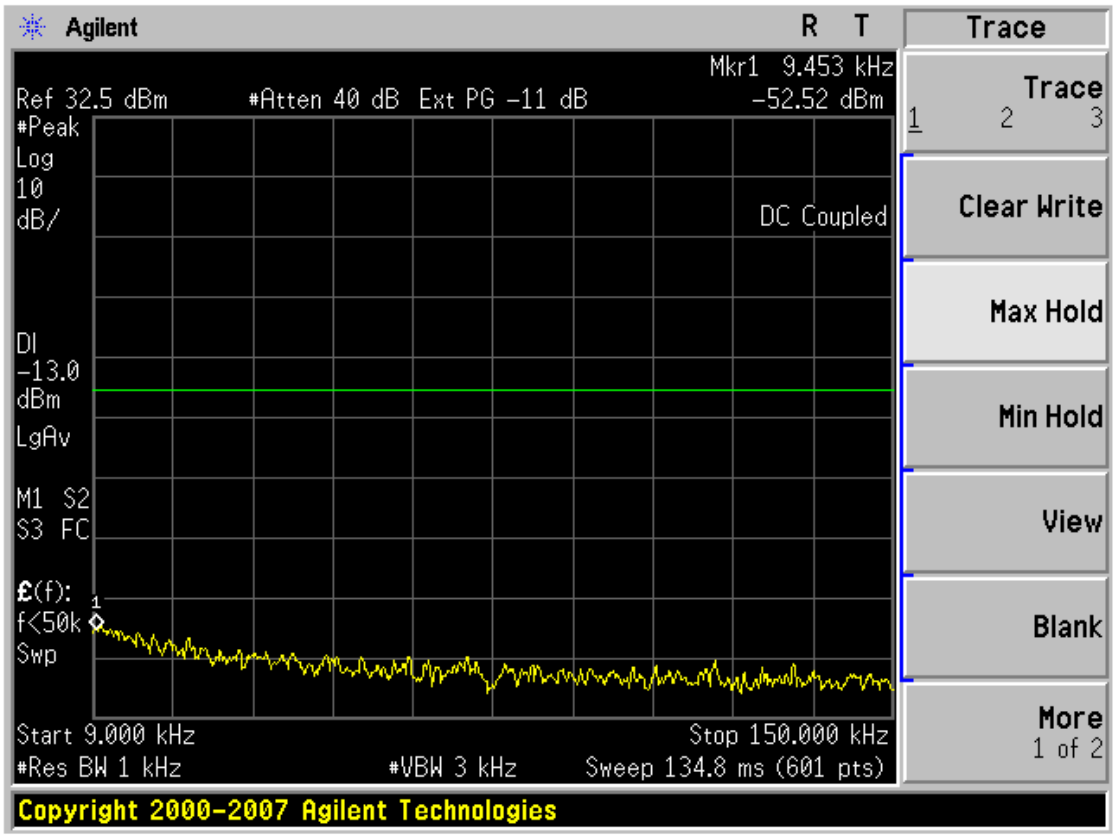
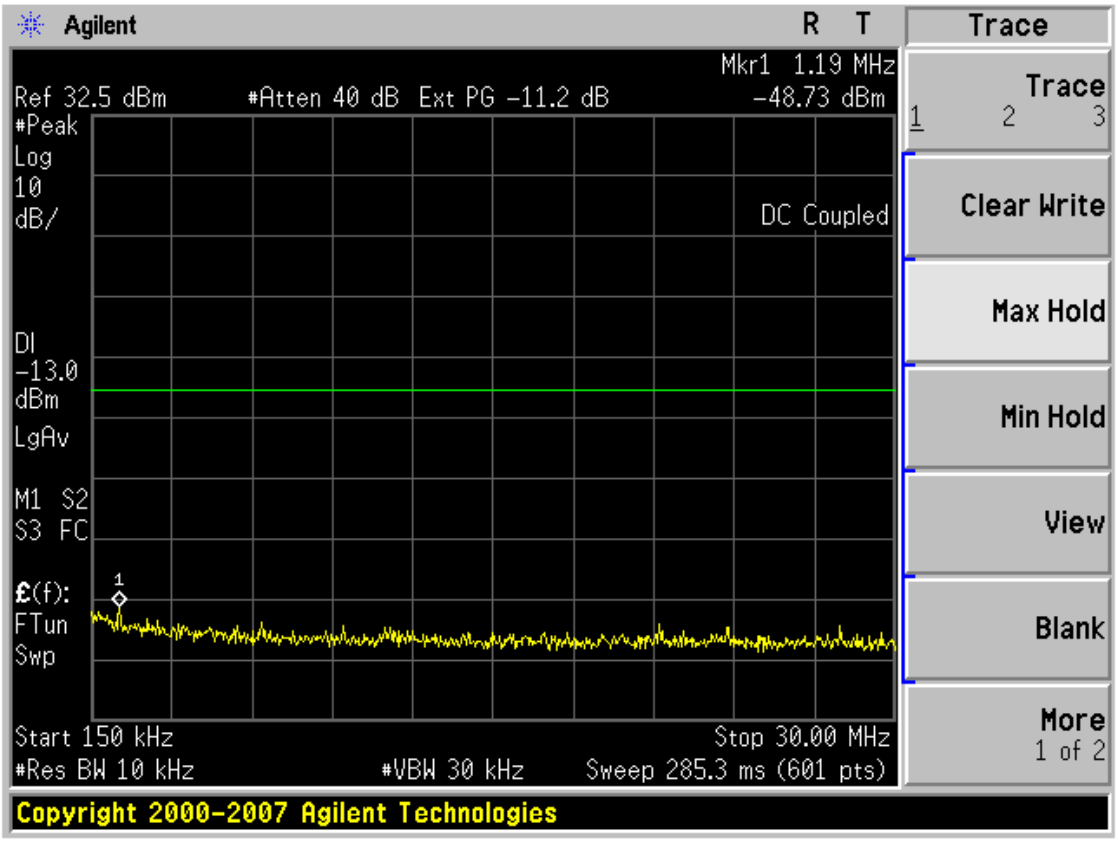
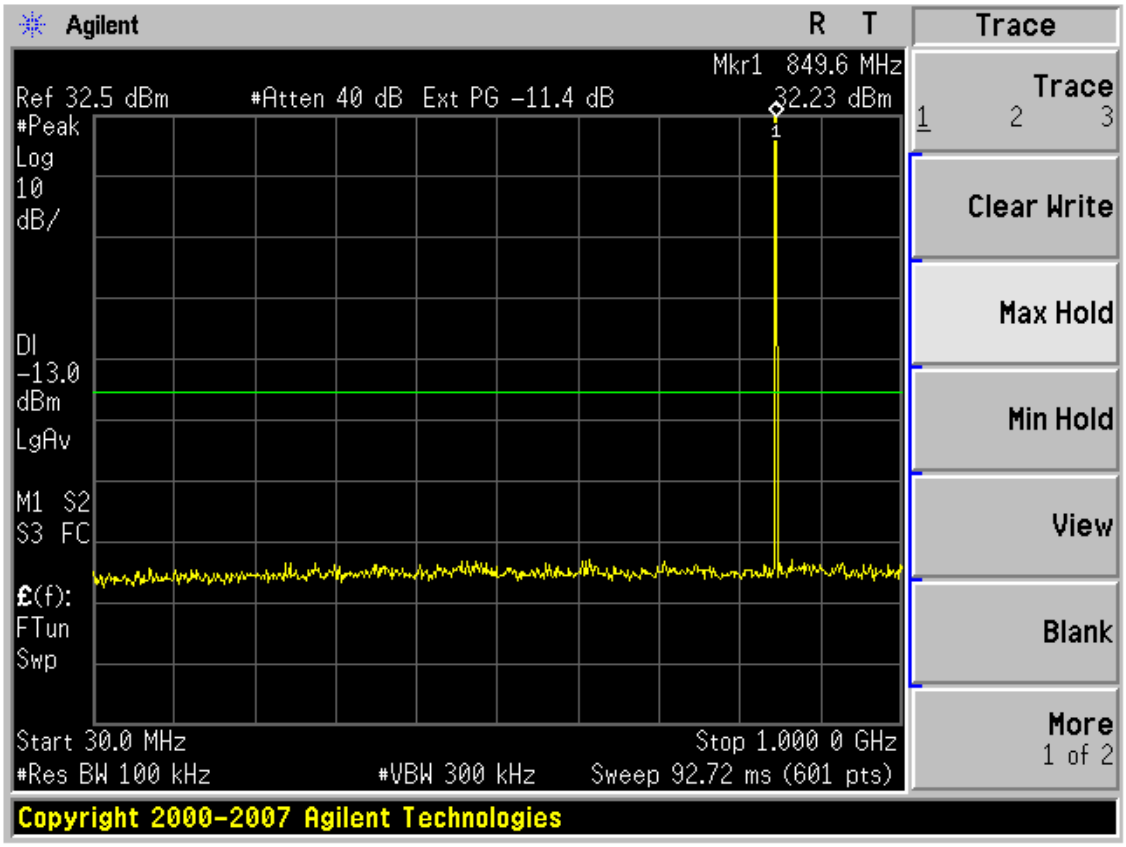
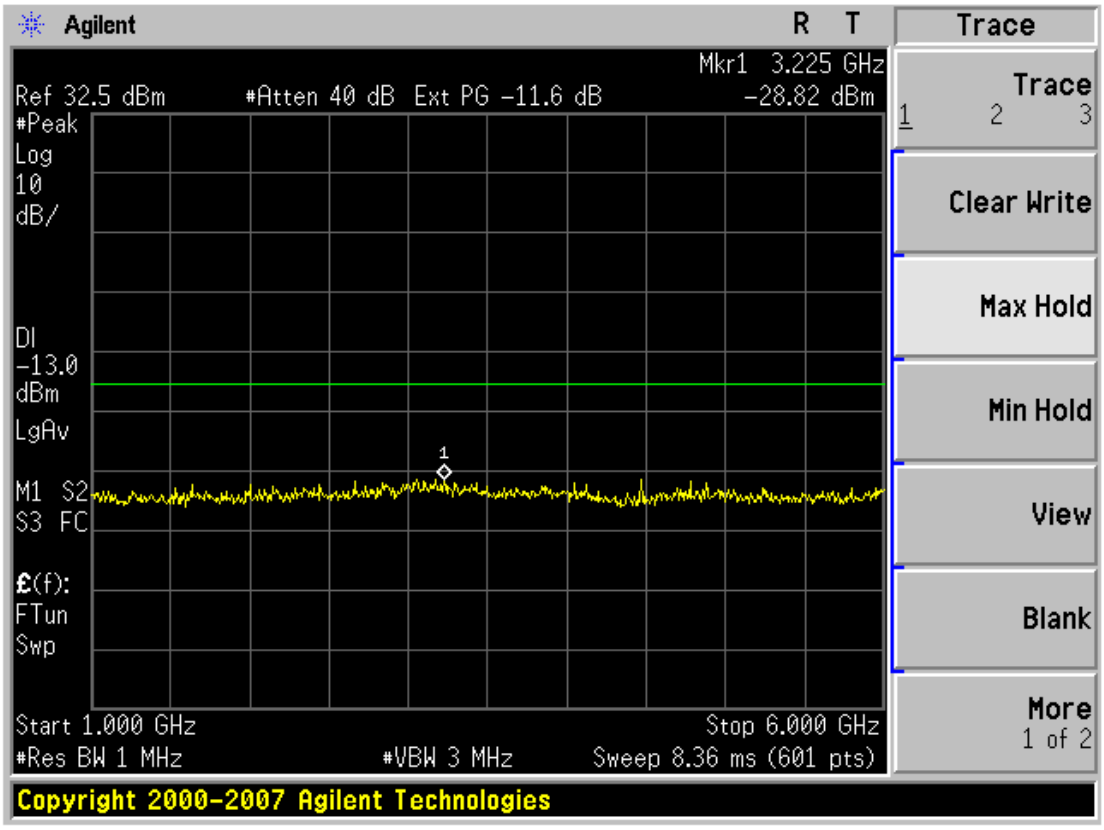
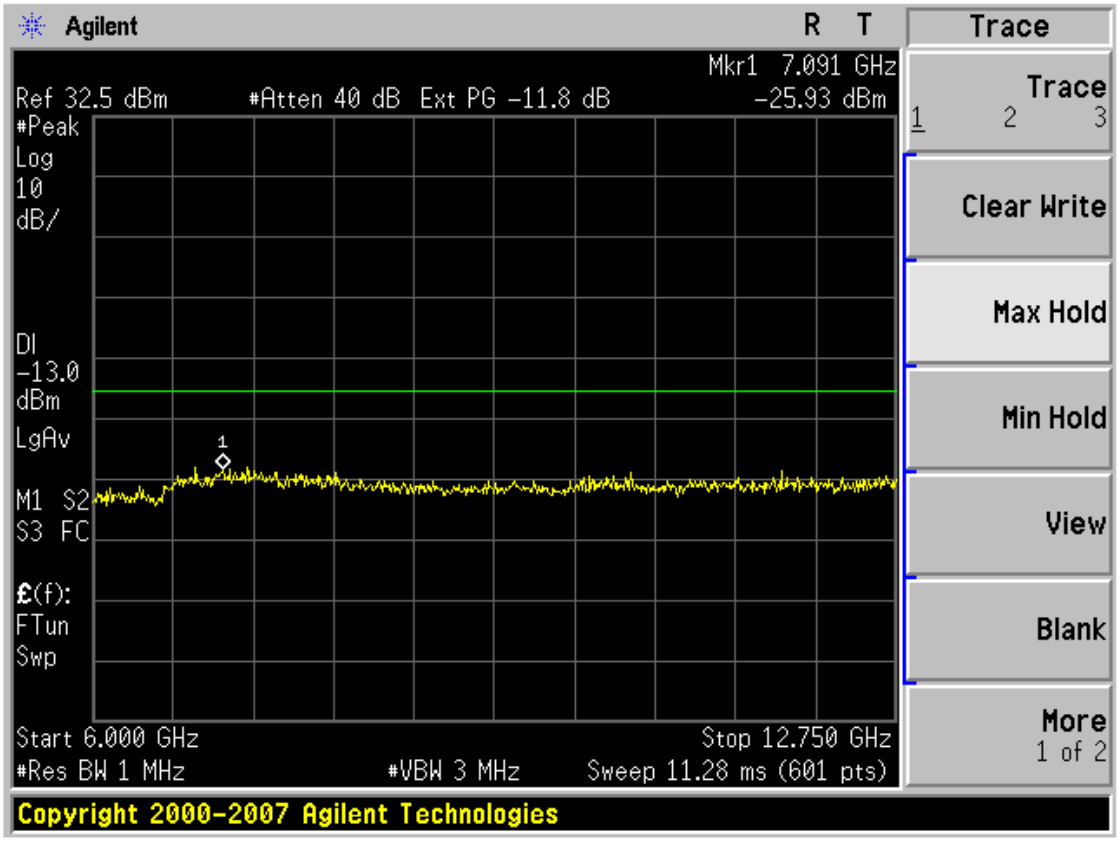
Engineer : John	
Site : Shielding Room	Time : 2010/12/02 - 10:04
Limit : FCC_22&24_Spurious_03M_PK	Margin : 0
EUT : T166	Probe : - Line1
Power : DC 3.7V	Note : GSM850 Channel 251



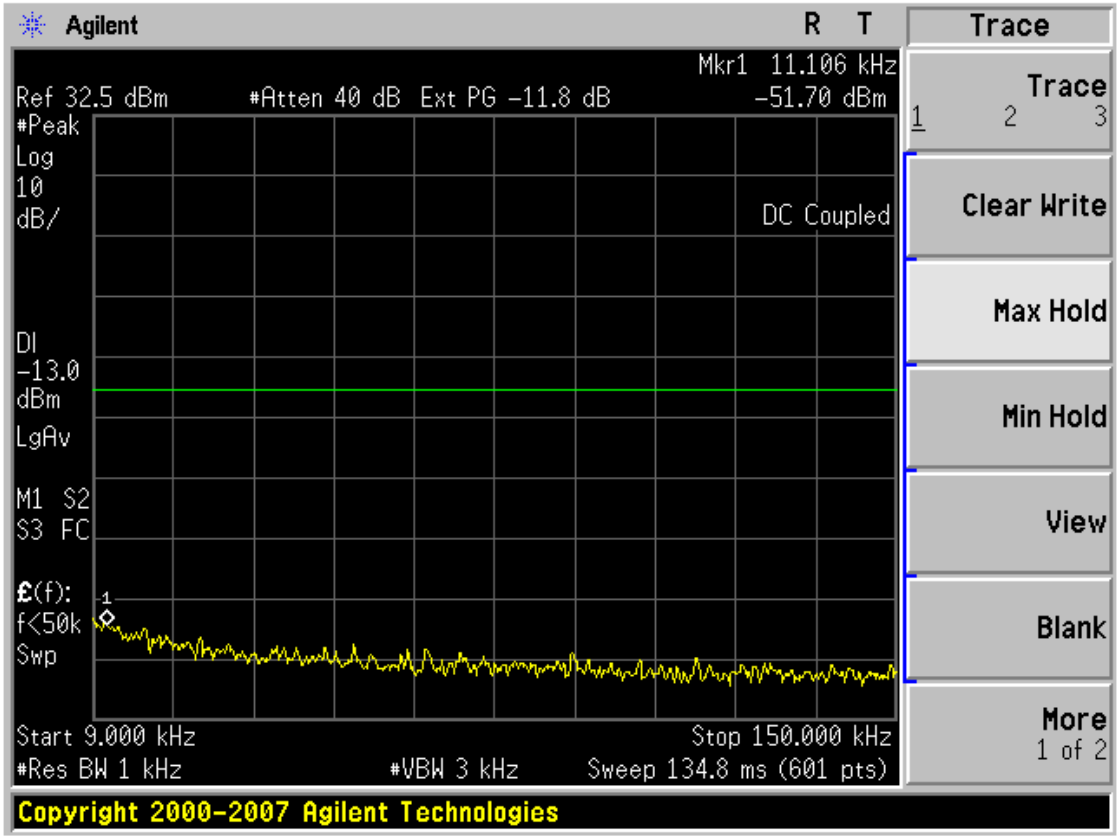


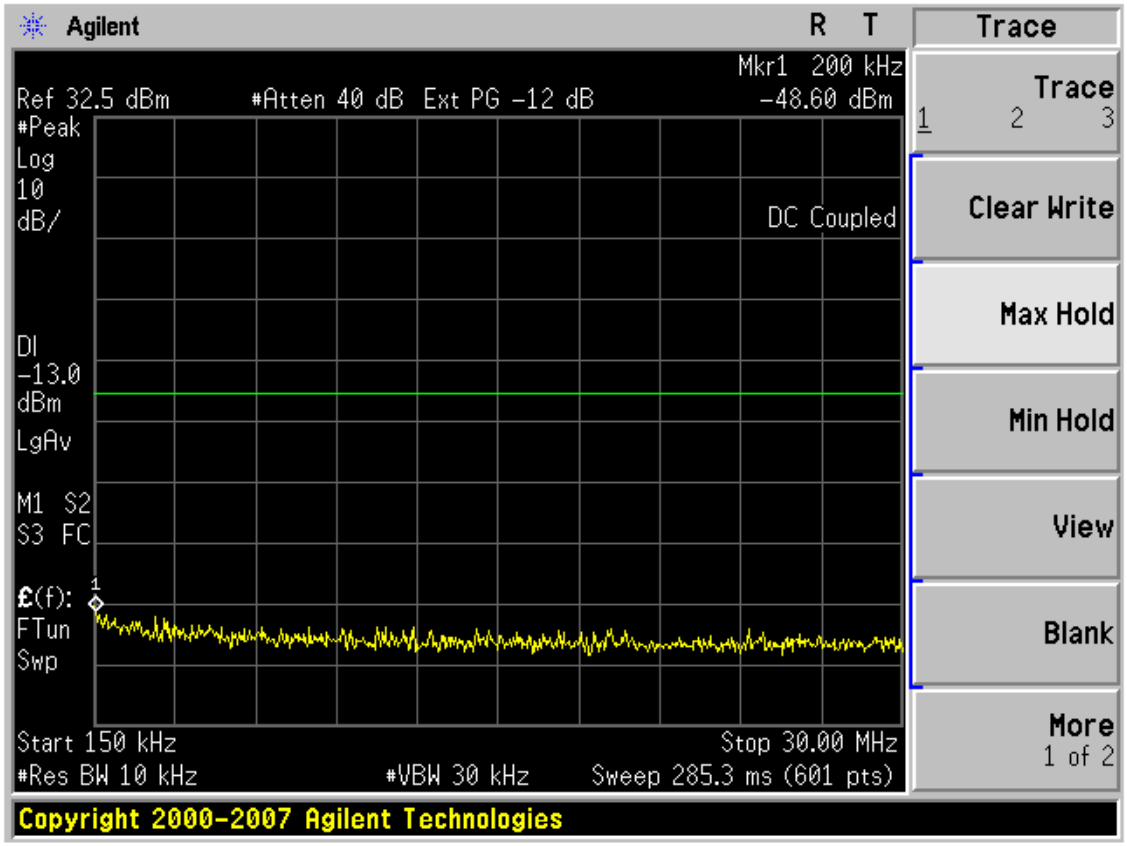

Agilent
R T
Trace
Mkr1 849.6 MHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -11.4 dB
32.23 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 92.72 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies

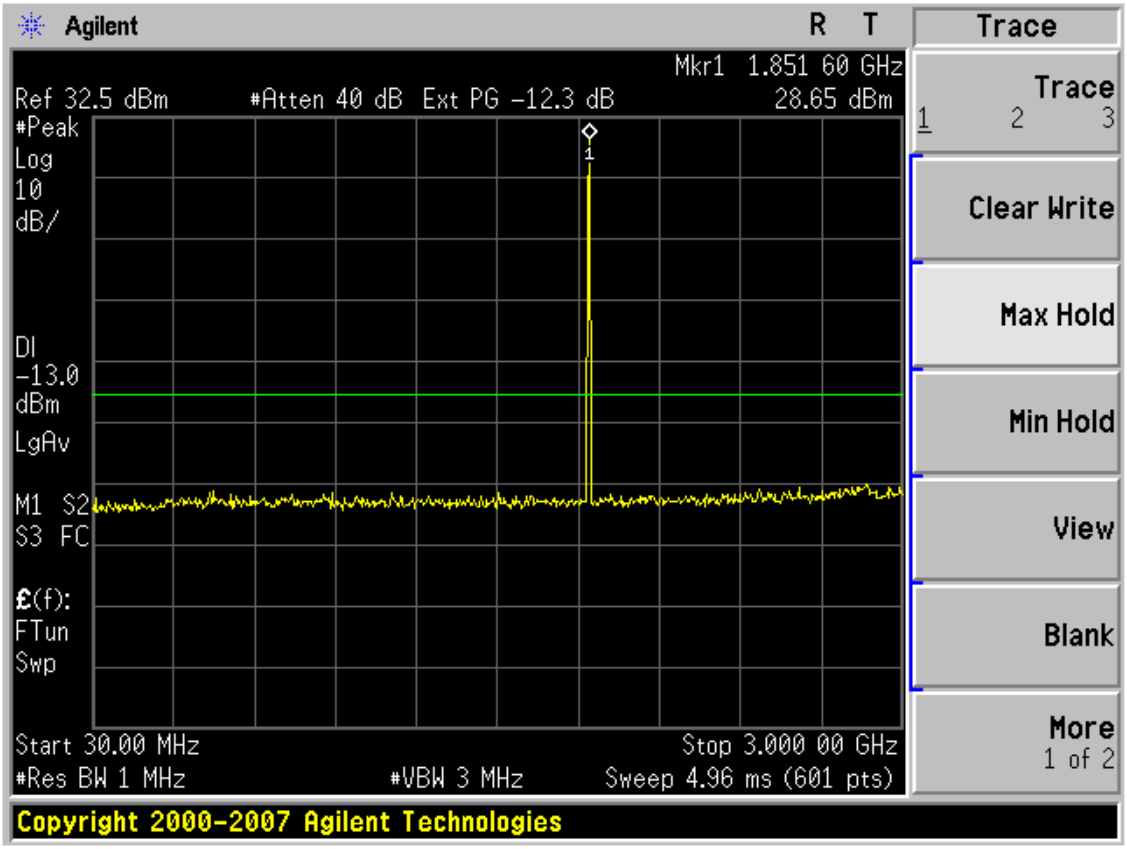

Agilent
R T
Trace
Mkr1 3.225 GHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -11.6 dB
-28.82 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 1.000 GHz
Stop 6.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 8.36 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies



Engineer : John	
Site : Shielding Room	**Time : 2010/12/02 - 10:07**
Limit : FCC_22&24_Spurious_03M_PK	**Margin : 0**
EUT : T166	**Probe : - Line1**
Power : DC 3.7V	**Note : PCS1900 Channel 512**




Agilent
R T
Trace
Mkr1 200 kHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -12 dB
-48.60 dBm
#Peak
Log
10
dB/
DC Coupled
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 150 kHz
Stop 30.00 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies


Agilent
R T
Trace
Mkr1 1.851 60 GHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -12.3 dB
28.65 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 30.00 MHz
Stop 3.000 00 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4.96 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
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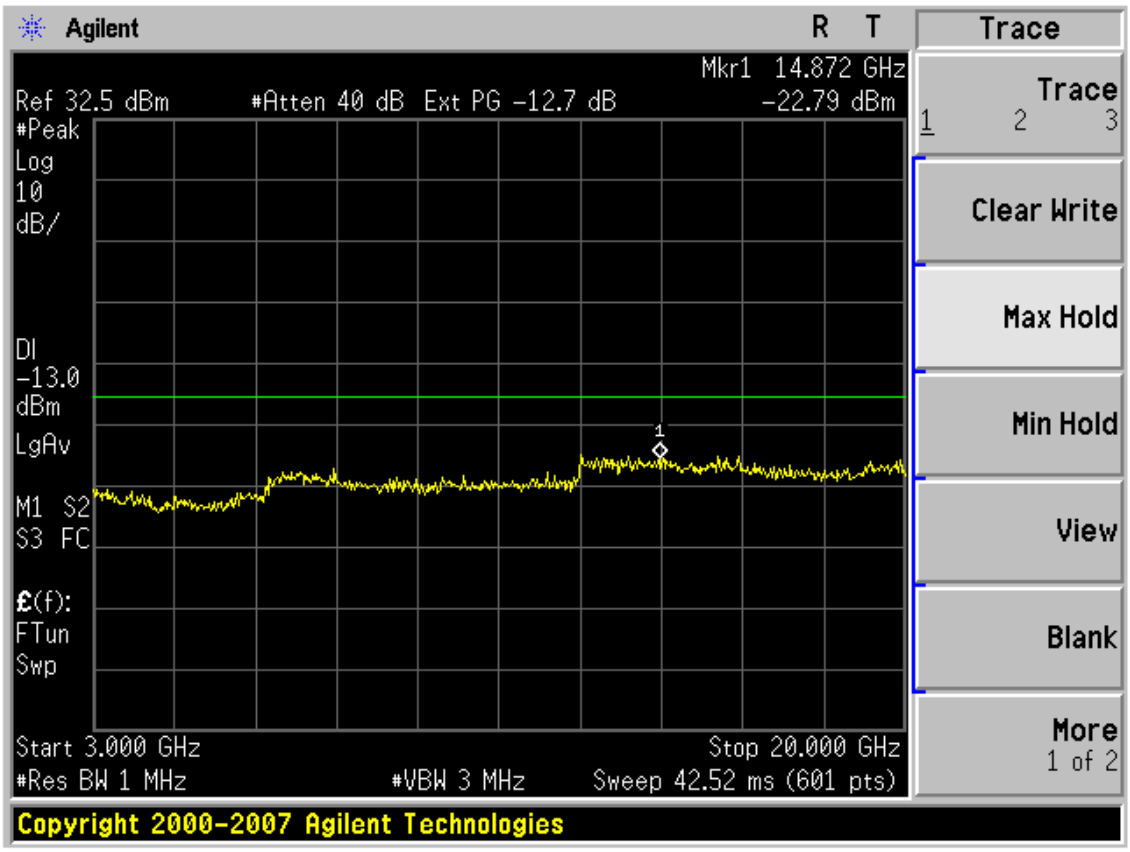
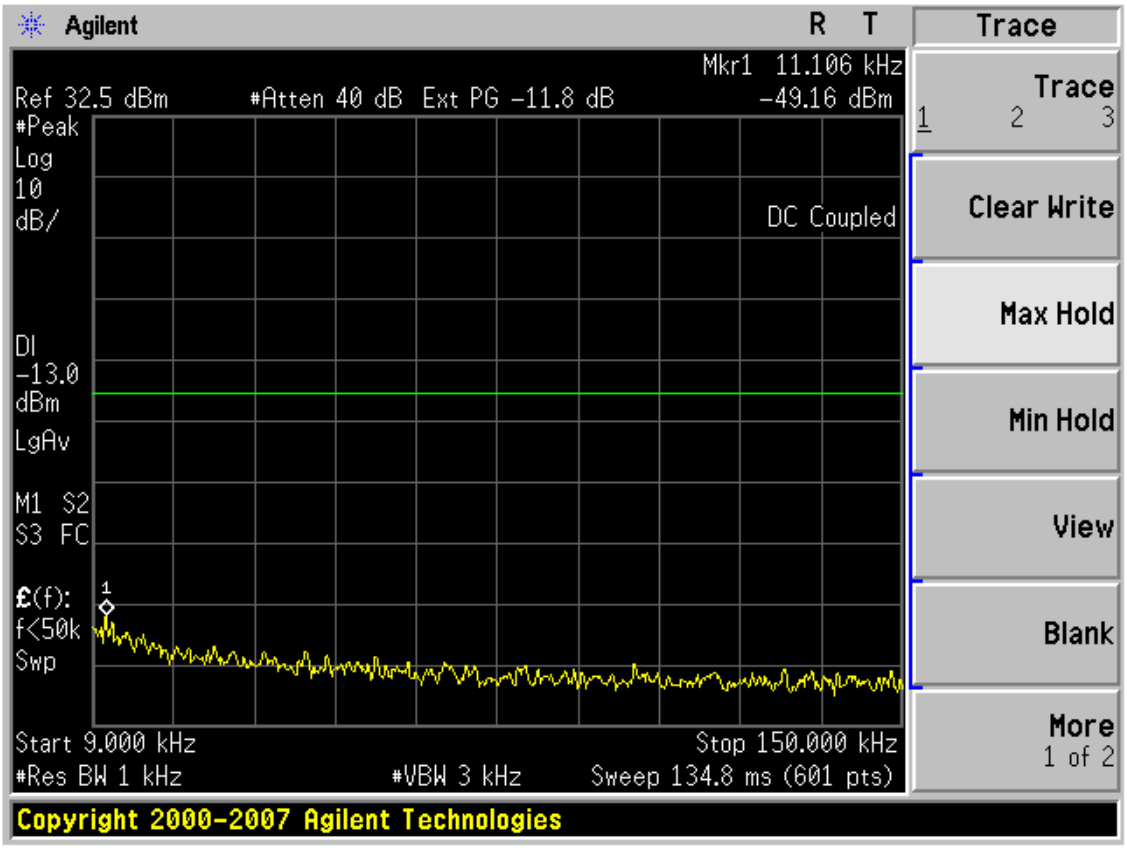
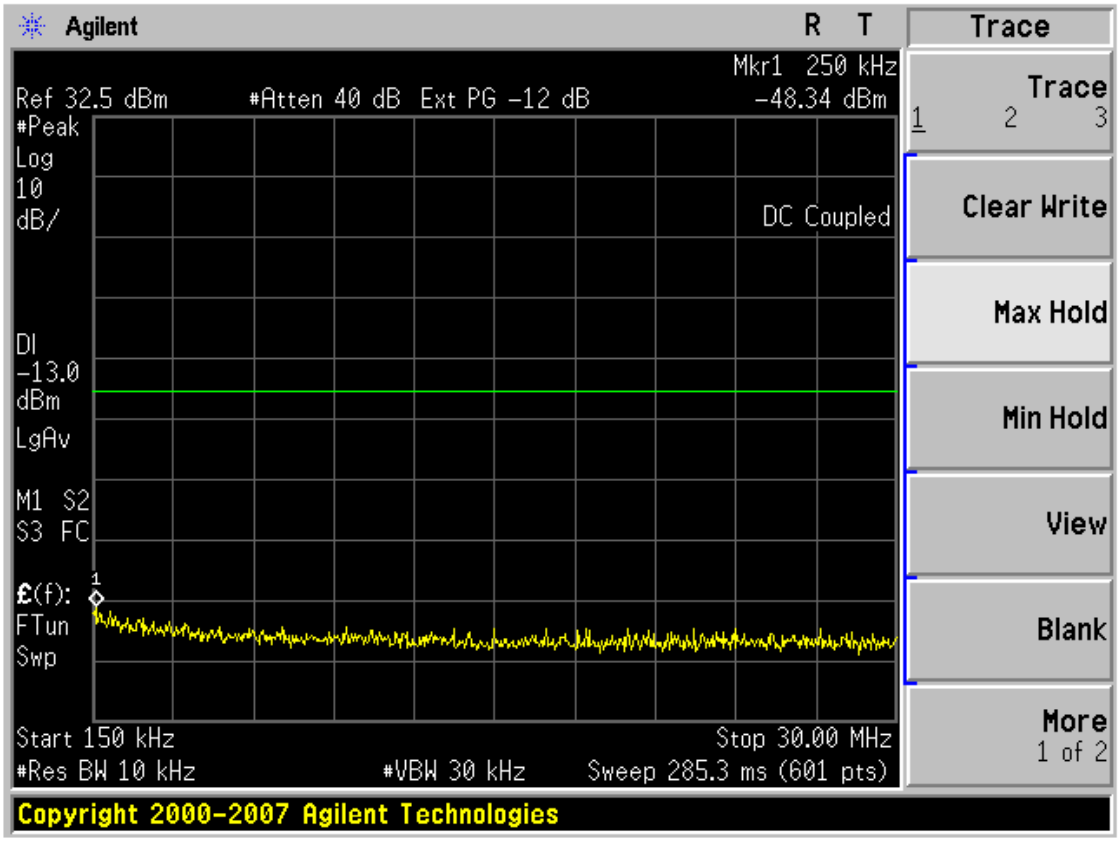
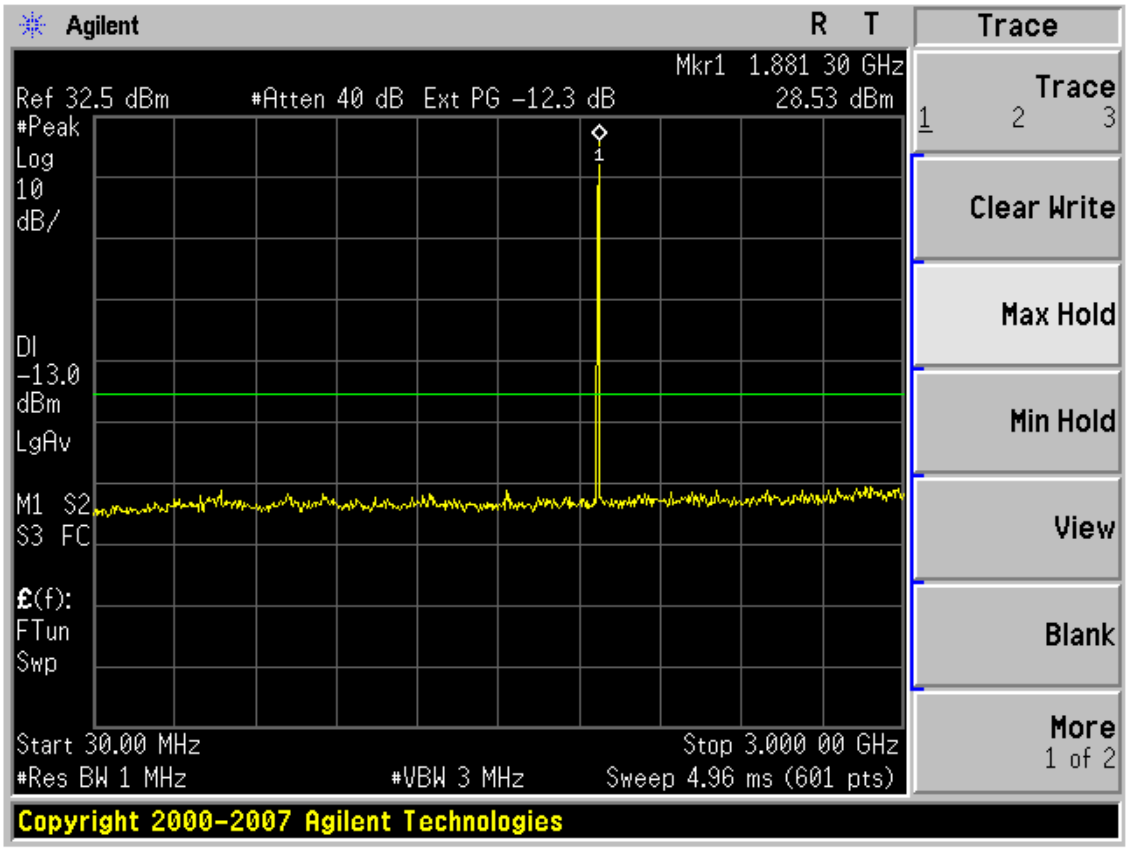
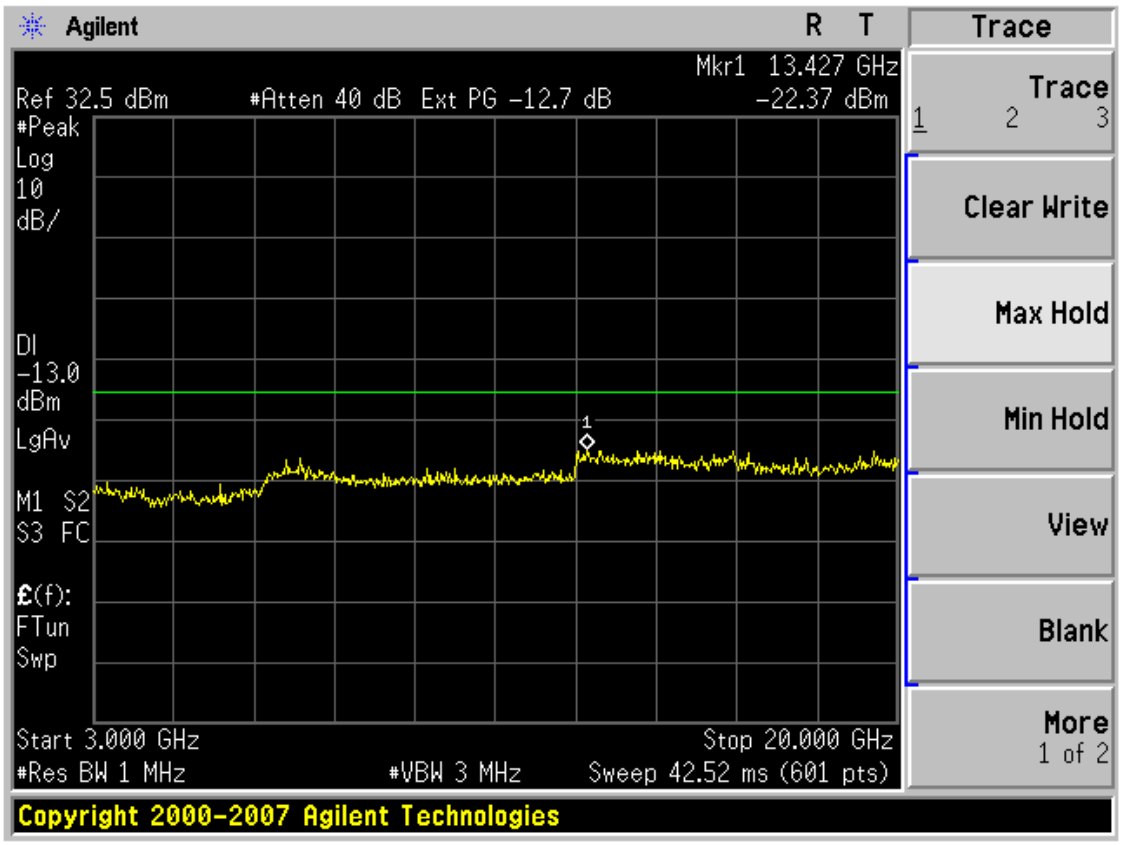


Engineer : John	
Site : Shielding Room	**Time : 2010/12/02 - 10:08**
Limit : FCC_22&24_Spurious_03M_PK	**Margin : 0**
EUT : T166	**Probe : - Line1**
Power : DC 3.7V	**Note : PCS1900 Channel 661**

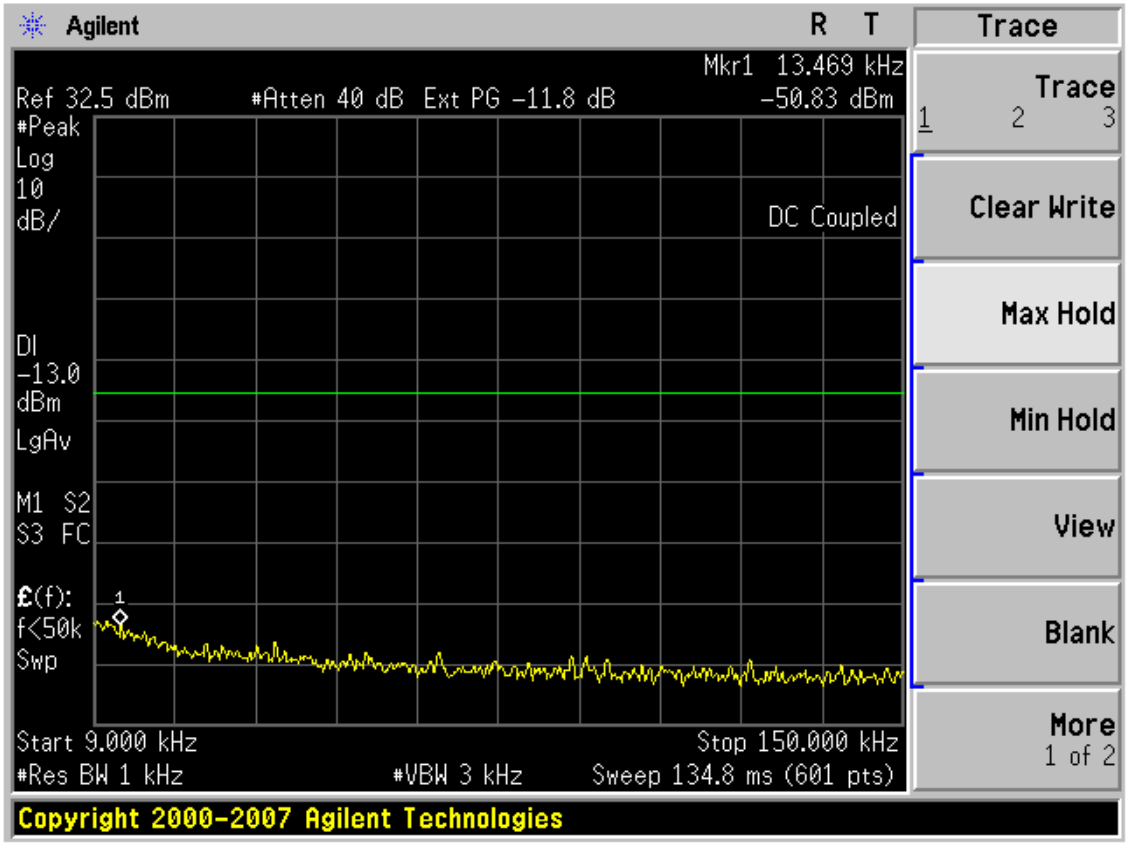


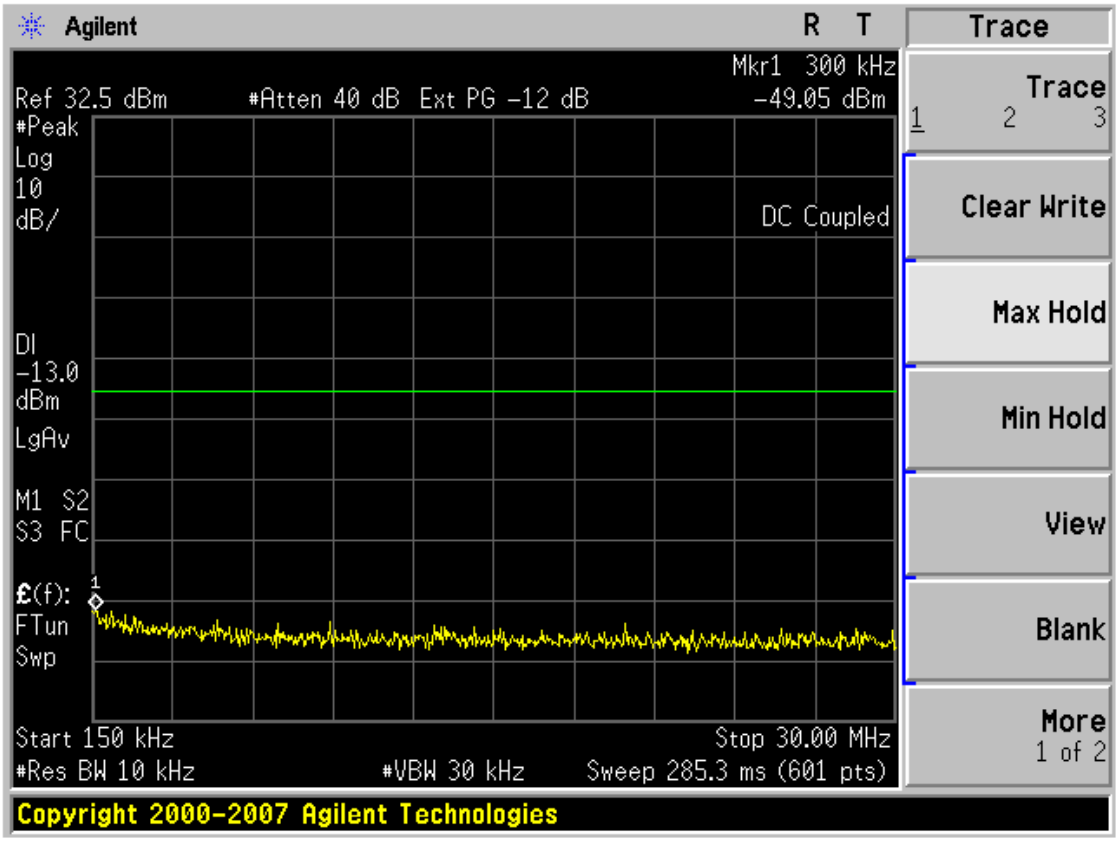

Agilent
R T
Trace
Mkr1 250 kHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -12 dB
-48.34 dBm
#Peak
Log
10
dB/
DC Coupled
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 150 kHz
Stop 30.00 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies

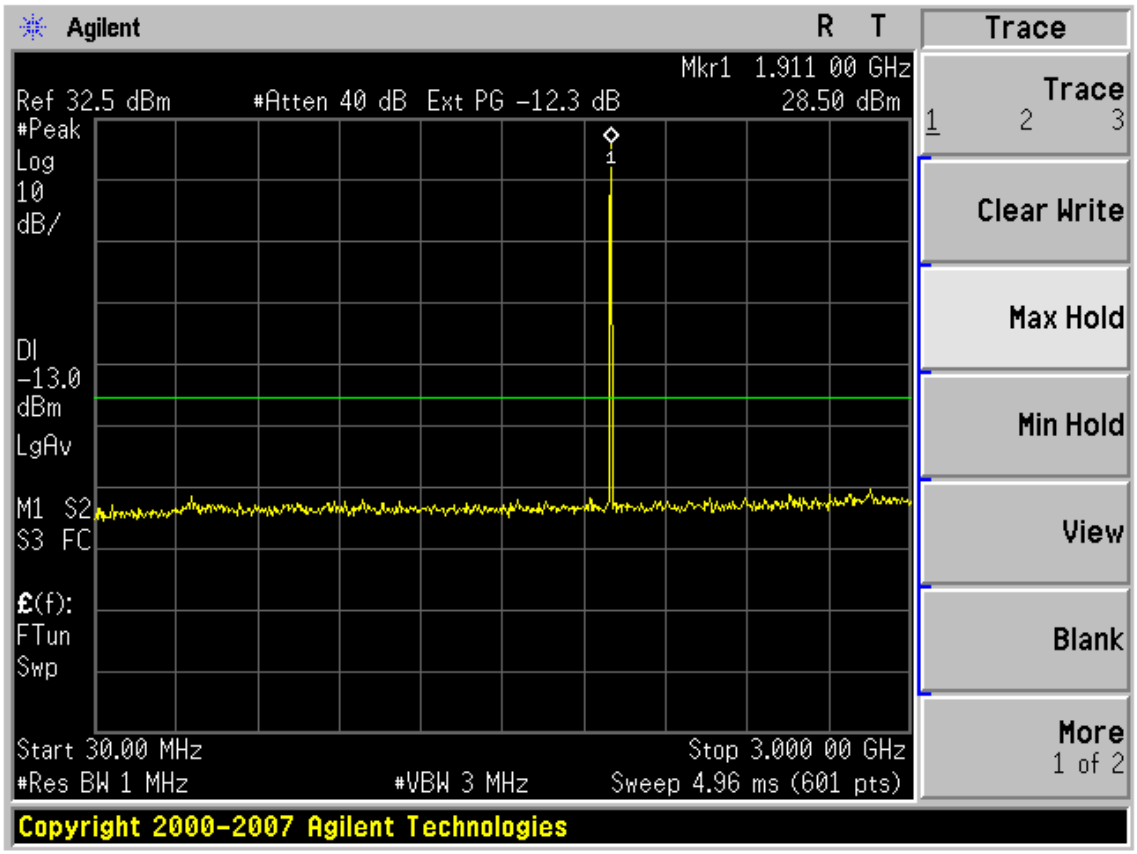

Agilent
R T
Trace
Mkr1 1.881 30 GHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -12.3 dB
28.53 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 30.00 MHz
Stop 3.000 00 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4.96 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2007 Agilent Technologies



Engineer : John	
Site : Shielding Room	**Time : 2010/12/02 - 10:08**
Limit : FCC_22&24_Spurious_03M_PK	**Margin : 0**
EUT : T166	**Probe : - Line1**
Power : DC 3.7V	**Note : PCS1900 Channel 810**




Agilent
R T
Trace
Mkr1 300 kHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -12 dB
-49.05 dBm
#Peak
Log
10
dB/
DC Coupled
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 150 kHz
Stop 30.00 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 285.3 ms (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
R T
Trace
Mkr1 1.911 00 GHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -12.3 dB
28.50 dBm
#Peak
Log
10
dB/
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 30.00 MHz
Stop 3.000 00 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4.96 ms (601 pts)
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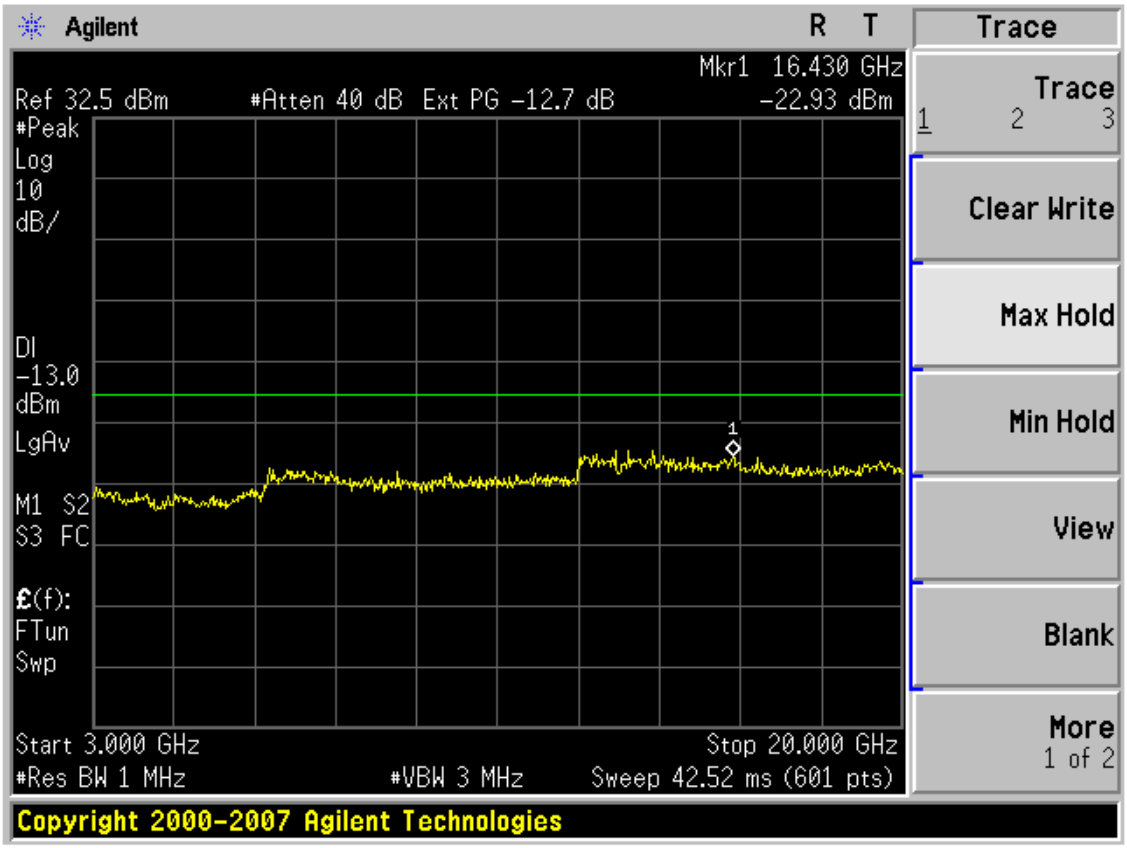
Agilent
R T
Trace
Mkr1 16.430 GHz
Ref 32.5 dBm
#Atten 40 dB Ext PG -12.7 dB
-22.93 dBm
#Peak
Log
10
dB/
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 3.000 GHz
Stop 20.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 42.52 ms (601 pts)
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
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Product	vooma peel		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: GSM 850		
Date of Test	2010/12/02	Test Site	AC-2

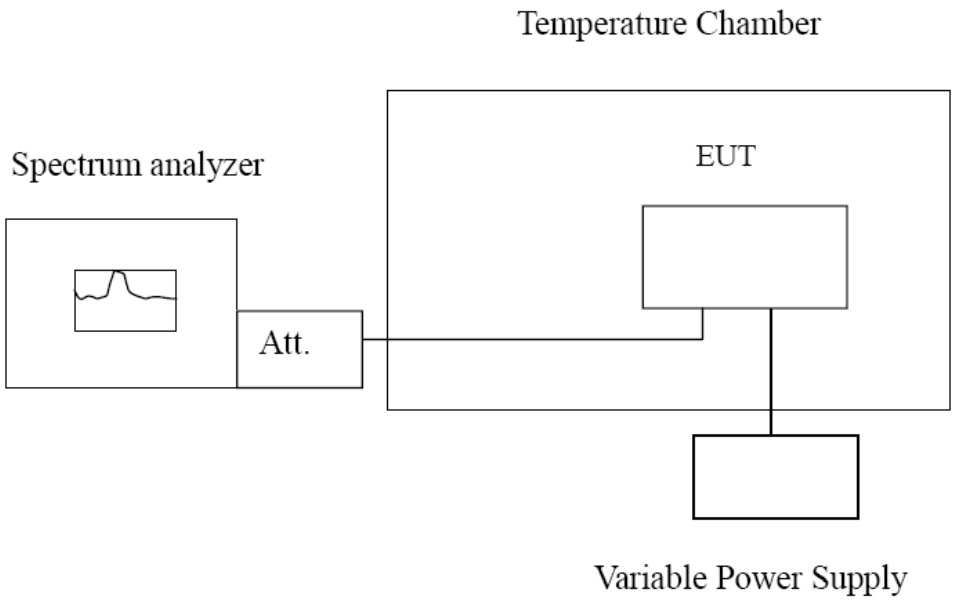
Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 128 (824.20MHz)								
1646.0	-31.32	V	-49.95	2.45	9.50	-42.90	-13.00	-29.90
2470.5	-30.91	V	-45.88	3.18	10.58	-38.48	-13.00	-25.48
1646.0	-33.02	H	-51.68	2.45	9.50	-44.63	-13.00	-31.63
2470.5	-30.80	H	-45.79	3.18	10.58	-38.39	-13.00	-25.39
Middle Channel 189 (836.40MHz)								
1671.5	-40.60	V	-59.35	2.50	9.90	-51.95	-13.00	-38.95
2462.0	-43.48	V	-58.46	3.18	10.62	-51.02	-13.00	-38.02
1646.0	-31.82	H	-50.82	2.50	9.90	-43.42	-13.00	-30.42
2470.5	-33.07	H	-48.10	3.18	10.62	-40.66	-13.00	-27.66
High Channel 251 (848.80MHz)								
1697.0	-40.22	V	-58.89	2.54	10.10	-51.33	-13.00	-38.33
2547.0	-28.24	V	-43.47	3.14	10.68	-35.93	-13.00	-22.93
1697.0	-38.78	H	-57.35	2.54	10.10	-49.79	-13.00	-36.79
2547.0	-28.43	H	-43.50	3.14	10.68	-35.96	-13.00	-22.96

Product	vooma peel		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 2: PCS 1900		
Date of Test	2010/12/02	Test Site	AC-2

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)								
3703.0	-29.72	V	-41.05	3.84	12.69	-32.20	-13.00	-19.20
5547.5	-34.92	V	-41.68	4.82	13.15	-33.35	-13.00	-20.35
3703.0	-28.83	H	-40.58	3.84	12.69	-31.73	-13.00	-18.73
5547.5	-30.78	H	-37.48	4.82	13.15	-29.15	-13.00	-16.15
Middle Channel 661 (1880.00MHz)								
3762.5	-31.66	V	-42.72	3.75	12.73	-33.74	-13.00	-20.74
5641.0	-28.16	V	-34.37	5.00	13.00	-26.37	-13.00	-13.37
3762.5	-37.38	H	-48.50	3.75	12.73	-39.52	-13.00	-26.52
5641.0	-34.30	H	-40.65	5.00	13.00	-32.65	-13.00	-19.65
High Channel 810 (1909.80MHz)								
3822.0	-35.19	V	-45.52	4.02	12.73	-36.81	-13.00	-23.81
5726.0	-26.11	V	-32.73	4.82	13.10	-24.45	-13.00	-11.45
3822.0	-36.40	H	-47.10	4.02	12.73	-38.39	-13.00	-25.39
5726.0	-22.76	H	-29.37	4.82	13.10	-21.09	-13.00	-8.09

4.6. Frequency Stability under Temperature & Voltage Variations

TEST CONFIGURATION



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

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

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20℃. 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 (±15%) and endpoint, record the maximum frequency change.

LIMIT

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

Limit < ± 2.5 ppm

TEST RESULTS

Product	vooma peel		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: GSM 850		
Date of Test	2010/12/01	Test Site	Shielding Room

Frequency Stability Under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.40	34	± 2091
-20	836.40	15	± 2091
-10	836.40	44	± 2091
0	836.40	54	± 2091
10	836.40	32	± 2091
20	836.40	46	± 2091
30	836.40	16	± 2091
40	836.40	34	± 2091
50	836.40	24	± 2091

Frequency Stability Under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (KHz)
3.40	836.40	64	± 2091
3.70	836.40	36	± 2091
4.25	836.40	54	± 2091

Product	vooma peel		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 2: PCS 1900		
Date of Test	2010/12/01	Test Site	Shielding Room

Frequency Stability Under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	1880.0	43	± 4700
-20	1880.0	54	± 4700
-10	1880.0	63	± 4700
0	1880.0	17	± 4700
10	1880.0	24	± 4700
20	1880.0	28	± 4700
30	1880.0	31	± 4700
40	1880.0	40	± 4700
50	1880.0	22	± 4700

Frequency Stability Under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
3.40	1880.0	29	± 4700
3.70	1880.0	51	± 4700
4.25	1880.0	61	± 4700

Note:

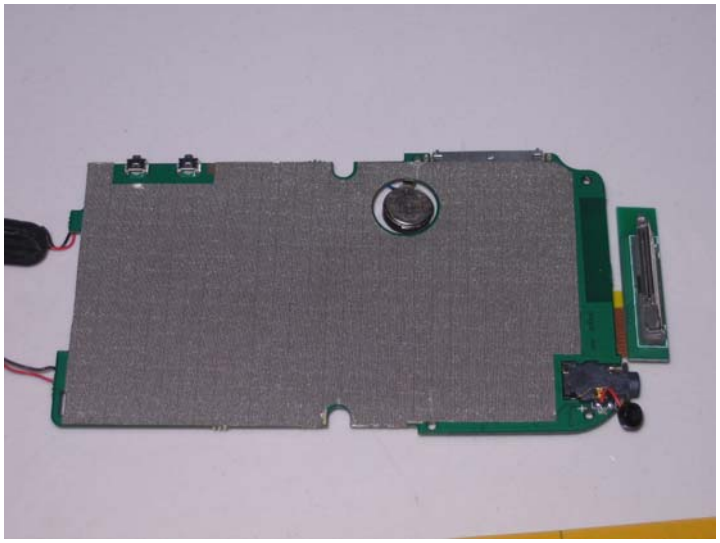
1. Normal Voltage: 3.7V
2. Battery End Point(BEP) = 3.5V

5. Test Setup Photos of the EUT

6. External and Internal Photos of the EUT

External Photos

Internal Photos



.....End of Report.....