FCC TEST REPORT

For

TOPTEN ELECTRONICS TECHNOLOGY LIMITED

GPS Vehicle Tracker

Model No.: GT08

Additional Model No.: GT08M, GT08S, MT08

Prepared for	:	TOPTEN ELECTRONICS TECHNOLOGY LIMITED
Address	:	3/F, Bldg.1, No.11, Tangdong Guangtang West Rd., Guangtang Industrial Zone, Tianhe District, Guangzhou, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Date of receipt of test sample	:	September 25, 2014
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	September 25, 2014 – October 15, 2014
Date of Report	:	October 15, 2014

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

Report Reference No.	**:**	**LCS1409251173E**
Date of Issue	:	October 15, 2014
Testing Laboratory Name.....	**:**	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure.....	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name.....	**:**	**TOPTEN ELECTRONICS TECHNOLOGY LIMITED**
Address	:	3/F, Bldg.1, No.11, Tangdong Guangtang West Rd., Guangtang Industrial Zone, Tianhe District, Guangzhou, China
Test Specification		
Standard	:	FCC CFR 47 PART 2, FCC CFR 47 PART 22 SUBPART H AND PART 24 SUBPART E
Test Report Form No.....	**:**	LCSEMC-1.0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

Test Item Description.	**:**	**GPS Vehicle Tracker**
Trade Mark	:	TOPTEN
Model/ Type reference.....	:	GT08
Ratings	:	DC 3.7V by build-in battery(500mAh) or DC 12V/DC 24V(any one) by car battery
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Leo Lee	Danny Huang	Gavin Liang
Leo Lee/ File administrators	Danny Huang/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS1409251173E	October 15, 2014 Date of issue

Type / Model.....	: GT08
EUT.....	: GPS Vehicle Tracker
Applicant.....	**: TOPTEN ELECTRONICS TECHNOLOGY LIMITED**
Address.....	: 3/F, Bldg.1, No.11, Tangdong Guangtang West Rd., Guangtang Industrial Zone, Tianhe District, Guangzhou, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: GUANGZHOU TOPTEN ELECTRONICS FACTORY**
Address.....	: 3/F, Bldg.1, No.11, Tangdong Guangtang West Rd., Guangtang Industrial Zone, Tianhe District, Guangzhou, China
Telephone.....	: /
Fax.....	: /
Factory.....	**: GUANGZHOU TOPTEN ELECTRONICS FACTORY**
Address.....	: 3/F, Bldg.1, No.11, Tangdong Guangtang West Rd., Guangtang Industrial Zone, Tianhe District, Guangzhou, China
Telephone.....	: /
Fax.....	: /

Test Result	Positive

The test report merely corresponds to the test sample.

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

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	GPS Vehicle Tracker
Test Model	:	GT08
Power Supply	:	DC 3.7V by build-in battery(500mAh) or DC 12V/DC 24V(any one) by car battery
2G	:	
Support Band	:	☒GSM 900 (EU-Band) ☒DCS 1800 (EU-Band) ☒GSM 850 (U.S.-Band) ☒PCS 1900 (U.S.-Band)
Release Ver.	:	R99
GPRS Class	:	Class 10
Uplink	:	GSM 850: 824.2MHz ~ 848.8MHz PCS 1900: 1850.2MHz ~ 1909.8MHz
Downlink	:	GSM 850: 869.2MHz ~ 893.8MHz PCS 1900: 1930.2MHz ~ 1989.8MHz
Number of Channels	:	GSM/GPRS 850: 128 / 190 / 251 PCS/GPRS 1900: 512 / 661 / 810
Type Of Modulation	:	GMSK for GSM/GPRS
Antenna Description	:	Integral Antenna, 3.0dBi
Test PCL/Class	:	GSM/GPRS 850: Level 5 / Class 4 PCS/GPRS 1900: Level 0 / Class 1
Maximum RF Output Power	:	30.42dBm for GSM 850 28.39dBm for PCS 1900
GPS Receiver	:	
Receive Frequency	:	1575.42MHz
Channel Number	:	1
Rx Antenna	:	Ceramic Antenna

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
renewable energy company	car battery	RM 12-18	N/A	VOC

1.3. External I/O

I/O Port Description	Quantity	Cable
N/A	N/A	N/A

1.4. Description of Test Facility

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

The Certificate Registration Number. is L4595.

Accredited by FCC, July 14, 2011

The Certificate Registration Number. is 899208.

Accredited by Industry Canada, May. 02, 2011

The Certificate Registration Number. is 9642A-1

1.5. Statement of The Measurement Uncertainty

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

1.6. Measurement Uncertainty

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

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

1.7. Test environment

All tests were performed under the following environmental conditions:

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

2. TEST METHODOLOGY

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

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

2.1. EUT Configuration

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

2.2. Objective

This type approval report is prepared on behalf of **TOPTEN ELECTRONICS TECHNOLOGY LIMITED** in accordance with FCC CFR 47 part 2, FCC CFR 47 part 22 subpart H and part 24 subpart E.

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

2.3. General Test Procedures

2.3.1 Conducted Emissions

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

2.3.2 Radiated Emissions

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

2.4. Test Mode

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

level 5/class 4.

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

level 0/class 1.

There is three test configurations for the pre-testing:

Configuration 1: Stand-alone(Power supplied by build-in battery DC 3.7V)

Configuration 2: Configured with car battery(DC 12V)

Configuration 3: Configured with car battery (DC 24V)

For pre-testing, we found the Configuration 2 was the worst case and used for the full test and recorded in this report.

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing. The worst condition was recorded in the test report if no other modes test data.

This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.

3. SYSTEM TEST CONFIGURATION

3.1. Justification

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

3.2. EUT Exercise Software

N/A.

3.3. Special Accessories

N/A.

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

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

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

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

5. TEST RESULT

5.1. RF OUTPUT POWER

5.1.1. Standard Applicable

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

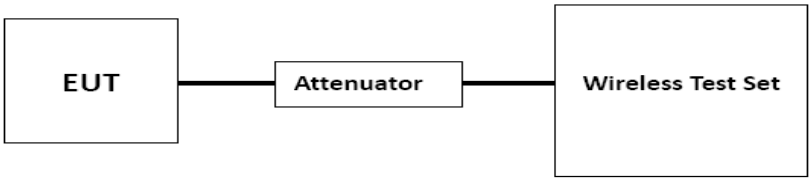
According to FCC §2.1046 and §24.232, mobile and portable stations are limited to 2 Watts and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

5.1.2. Measuring Instruments

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

5.1.3. Test Procedures

Conducted method:



Radiated method:

TIA 603-D section 2.2.17

5.1.4. Test Results

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

Conducted Power:

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
GSM 850	128	824.2	30.26	38.45
	190	836.6	**30.42**	38.45
	251	848.8	30.14	38.45
GPRS 850 (Slot 1)	128	824.2	30.13	38.45
	190	836.6	30.19	38.45
	251	848.8	30.01	38.45
GPRS 850 (Slot 2)	128	824.2	28.17	38.45
	190	836.6	28.20	38.45
	251	848.8	28.12	38.45

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
PCS 1900	512	1850.2	28.32	33
	661	1880.0	**28.39**	33
	810	1909.8	28.36	33
GPRS 1900 (Slot 1)	512	1850.2	28.25	33
	661	1880.0	28.36	33
	810	1909.8	28.31	33
GPRS 1900 (Slot 2)	512	1850.2	26.77	33
	661	1880.0	26.81	33
	810	1909.8	26.73	33

Radiated Power:

The worst test data as follow:

Mode	Channel	Frequency (MHz)	Test Result		Limit (dBm)
			Max. Peak ERP (dBm)	Polarization	
GSM 850	128	824.2	28.36	H	38.45
	190	836.6	28.47	H	38.45
	251	848.8	28.29	H	38.45
	128	824.2	26.45	V	38.45
	190	836.6	26.51	V	38.45
	251	848.8	26.38	V	38.45
GPRS 850	128	824.2	27.69	H	38.45
	190	836.6	27.58	H	38.45
	251	848.8	27.44	H	38.45
	128	824.2	25.31	V	38.45
	190	836.6	25.24	V	38.45
	251	848.8	25.19	V	38.45

Mode	Channel	Frequency (MHz)	Test Result		Limit (dBm)
			Max. Peak EIRP (dBm)	Polarization	
PCS 1900	512	1850.2	27.21	H	33
	661	1880.0	27.33	H	33
	810	1909.8	27.26	H	33
	512	1850.2	25.82	V	33
	661	1880.0	25.93	V	33
	810	1909.8	25.89	V	33
GPRS 1900	512	1850.2	26.78	H	33
	661	1880.0	26.74	H	33
	810	1909.8	26.68	H	33
	512	1850.2	24.83	V	33
	661	1880.0	24.77	V	33
	810	1909.8	24.74	V	33

5.2. PEAK-TO-AVERAGE RATIO

5.2.1. Standard Applicable

According to FCC §2.1046 and §24.232(d), the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

5.2.2. Measuring Instruments

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

5.2.3. Test Procedures

The following steps outline the procedure used to measure the Peak-to-Average Ratio from the EUT.

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.

2. For GSM/GPRS operating modes:

a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.

b. Set EUT in maximum power output, and triggered the burst signal.

c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.

3. For UMTS operating modes:

a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.

b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

5.2.4. Test Results

Modes	PCS 1900		
Channel	512	661	810
	Low	Mid	High
Frequency(MHz)	1850.2	1880	1909.8
Peak-To-Average Ratio (dB)	0.68	0.77	0.63

5.3. OCCUPIED BANDWIDTH

5.3.1. Standard Applicable

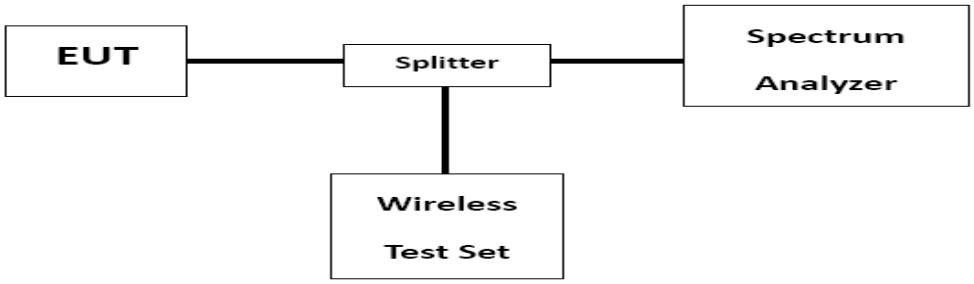
FCC §2.1049, §22.917, §22.905 and §24.238.

5.3.2. Measuring Instruments

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

5.3.3. Test Procedures

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



The -26dB & 99% bandwidth was recorded.

5.3.4. Test Results

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

Summary of The Worst Test Result:

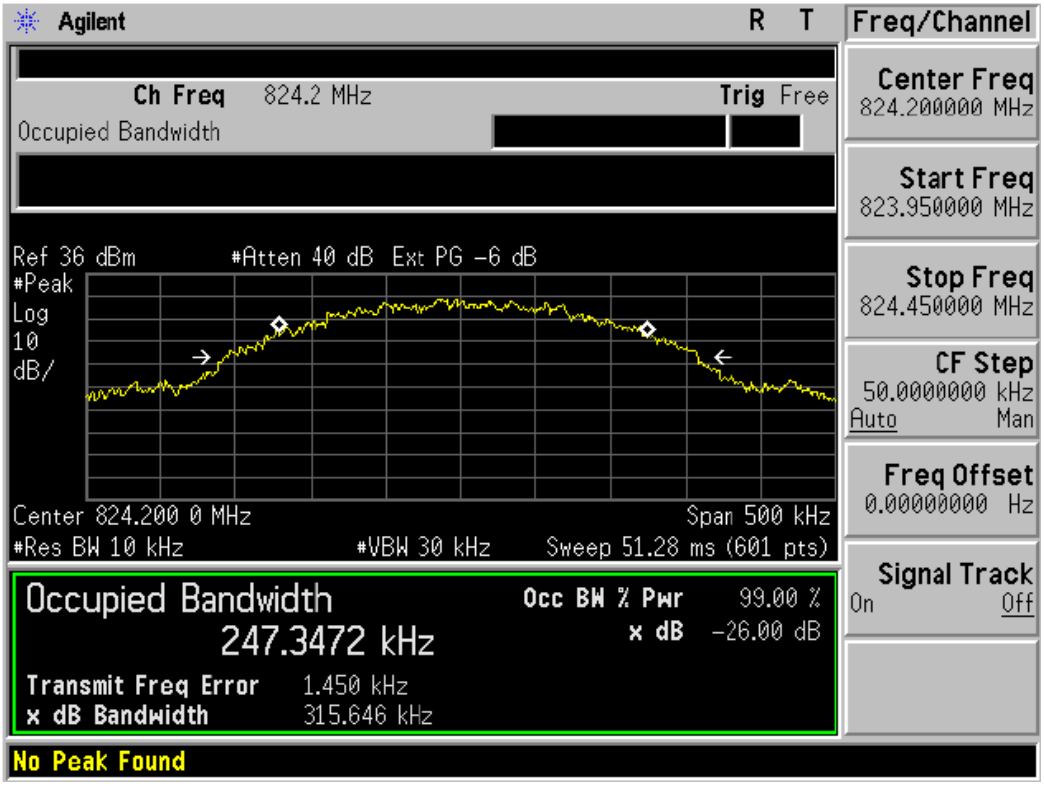
Band	Mode	Emission Bandwidth (-26dBc) (kHz)	Occupied Bandwidth (99%) (kHz)
GSM 850 Band	GSM	316.65	247.35
	GPRS	316.01	244.42
GSM 1900 Band	GSM	316.56	247.08
	GPRS	314.61	244.83

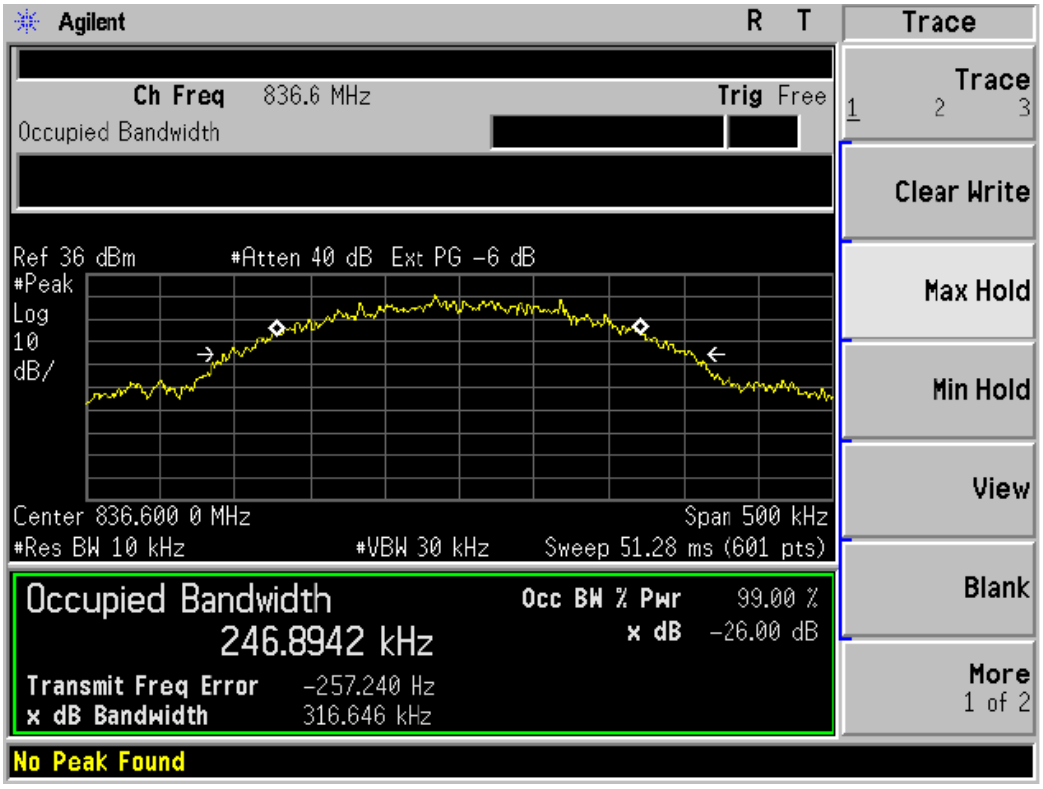
The worst test data as follow:

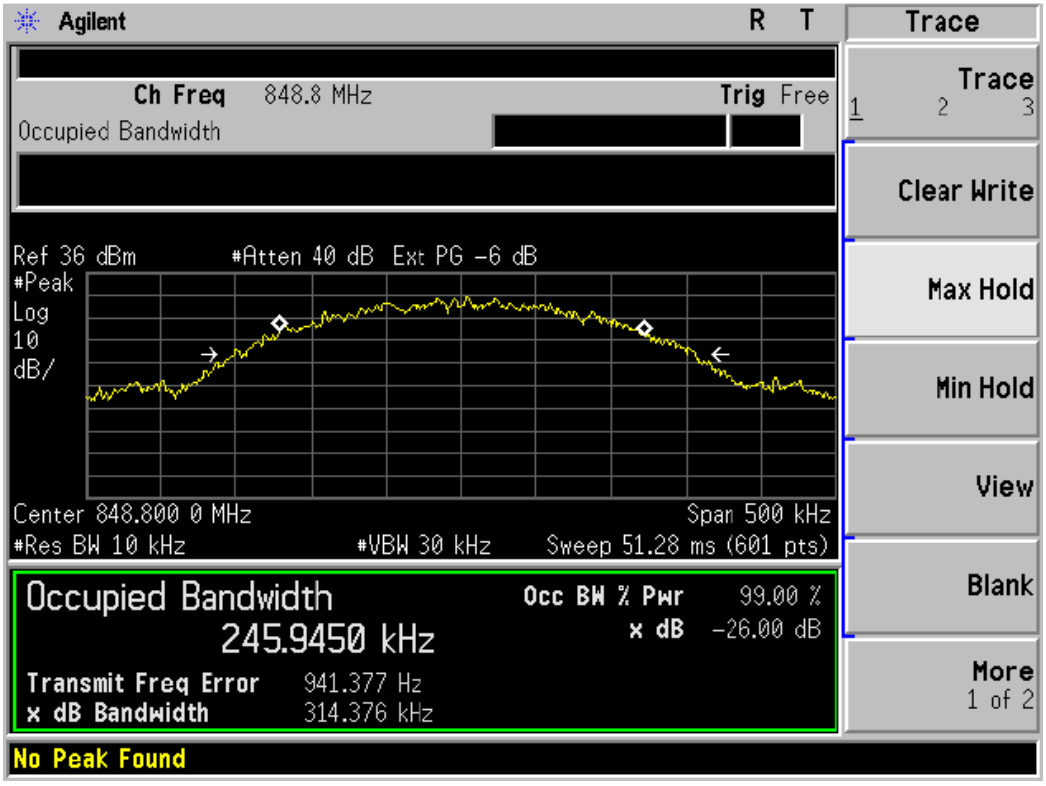
Mode	Channel	Frequency (MHz)	Emission Bandwidth (-26dBc) (kHz)	Occupied Bandwidth (99%) (kHz)
GSM 850	128	824.2	315.65	247.35
	190	836.6	316.65	246.89
	251	848.8	314.38	245.95
GPRS 850	128	824.2	315.95	244.30
	190	836.6	315.98	244.42
	251	848.8	316.01	244.33

Mode	Channel	Frequency (MHz)	Emission Bandwidth (-26dBc) (kHz)	Occupied Bandwidth (99%) (kHz)
PCS 1900	512	1850.2	315.47	247.08
	661	1880.0	315.56	245.49
	810	1909.8	315.94	245.35
GPRS 1900	512	1850.2	314.12	244.70
	661	1880.0	314.39	244.68
	810	1909.8	314.61	244.83

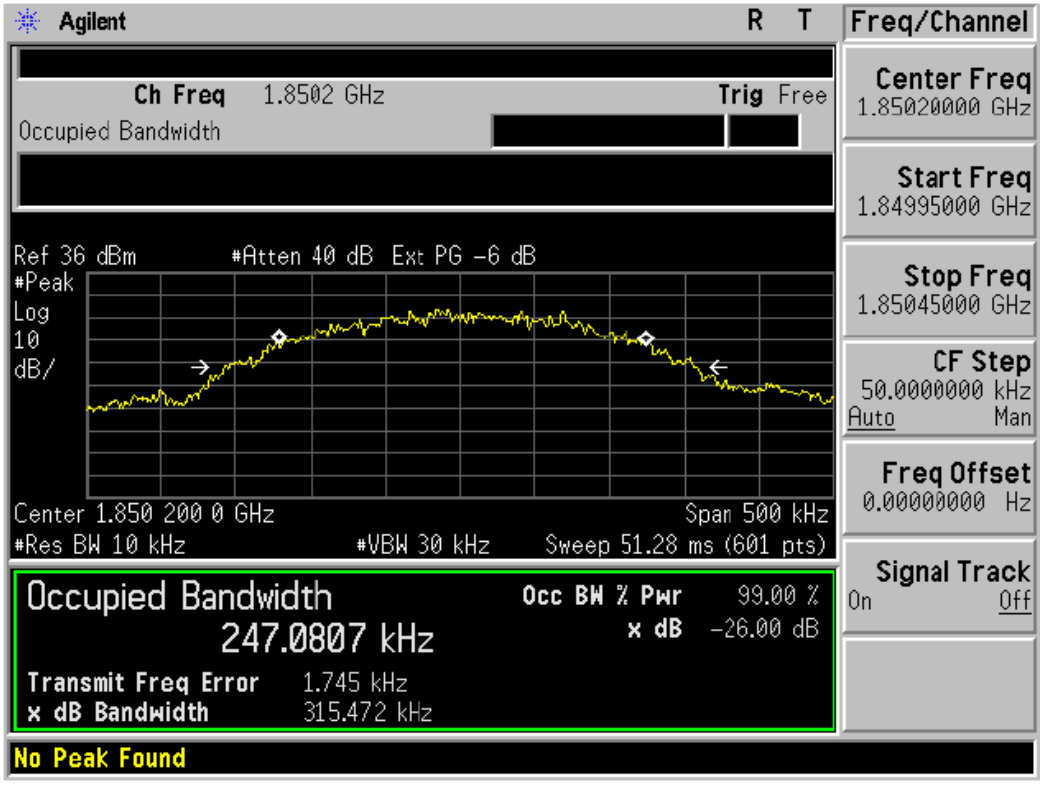
Test Plots For GSM 850

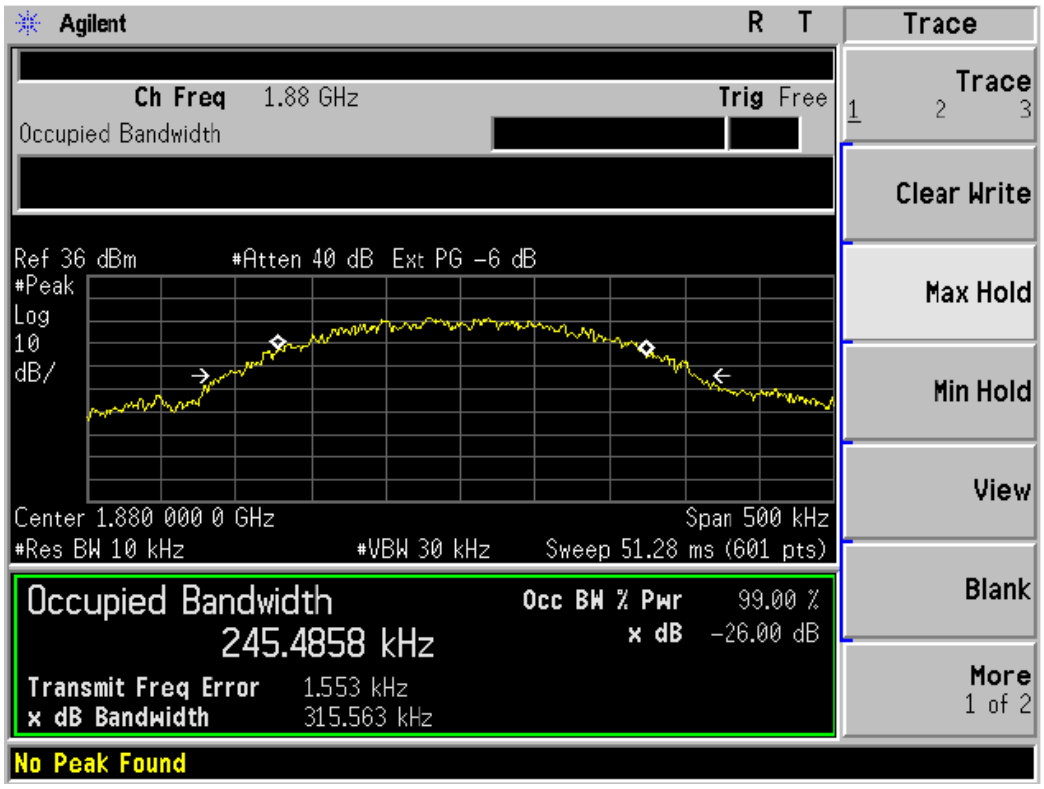


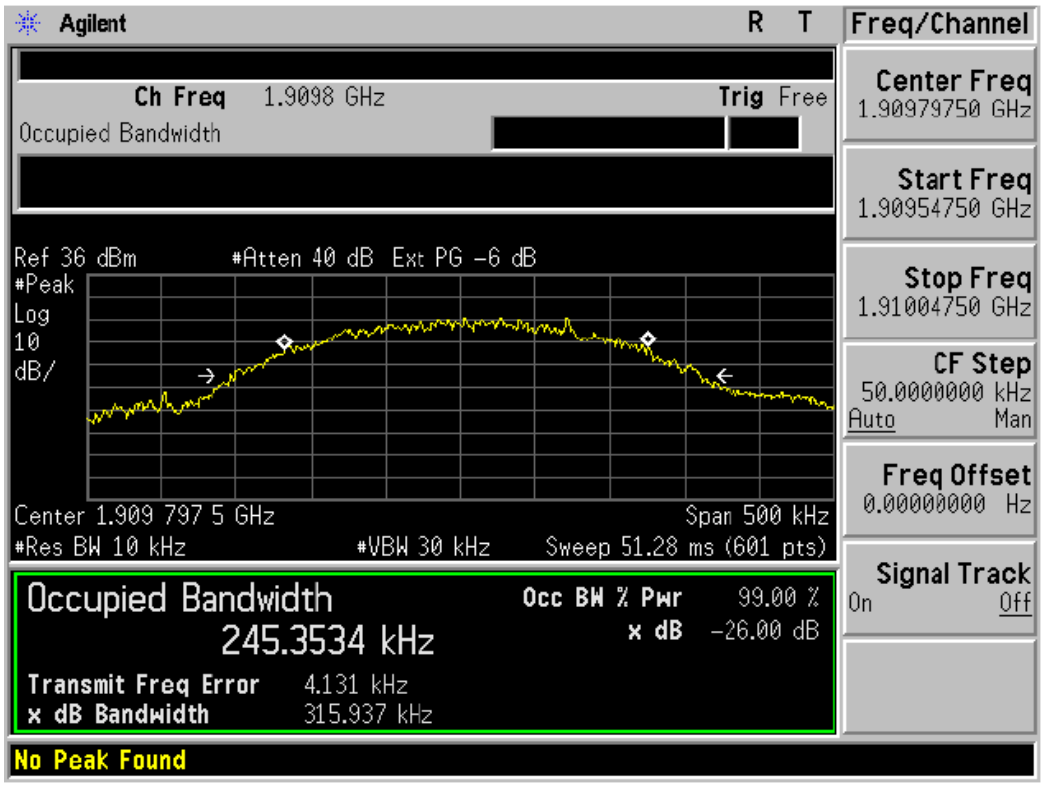




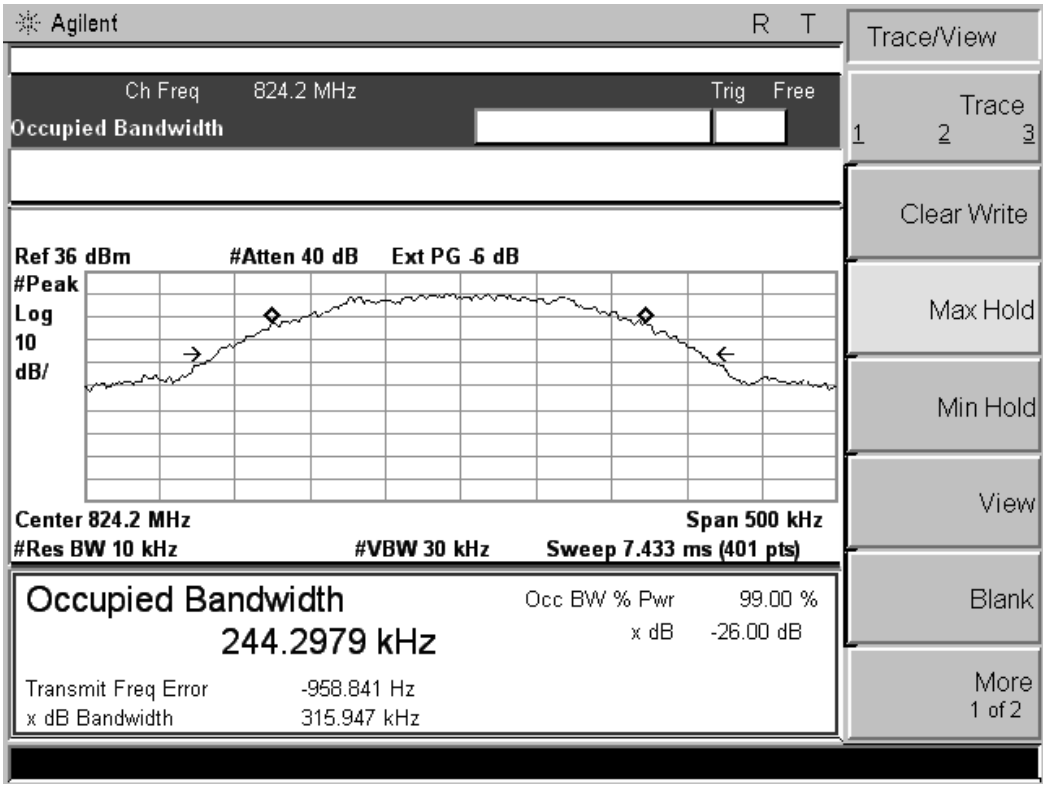
Test Plots For PCS 1900

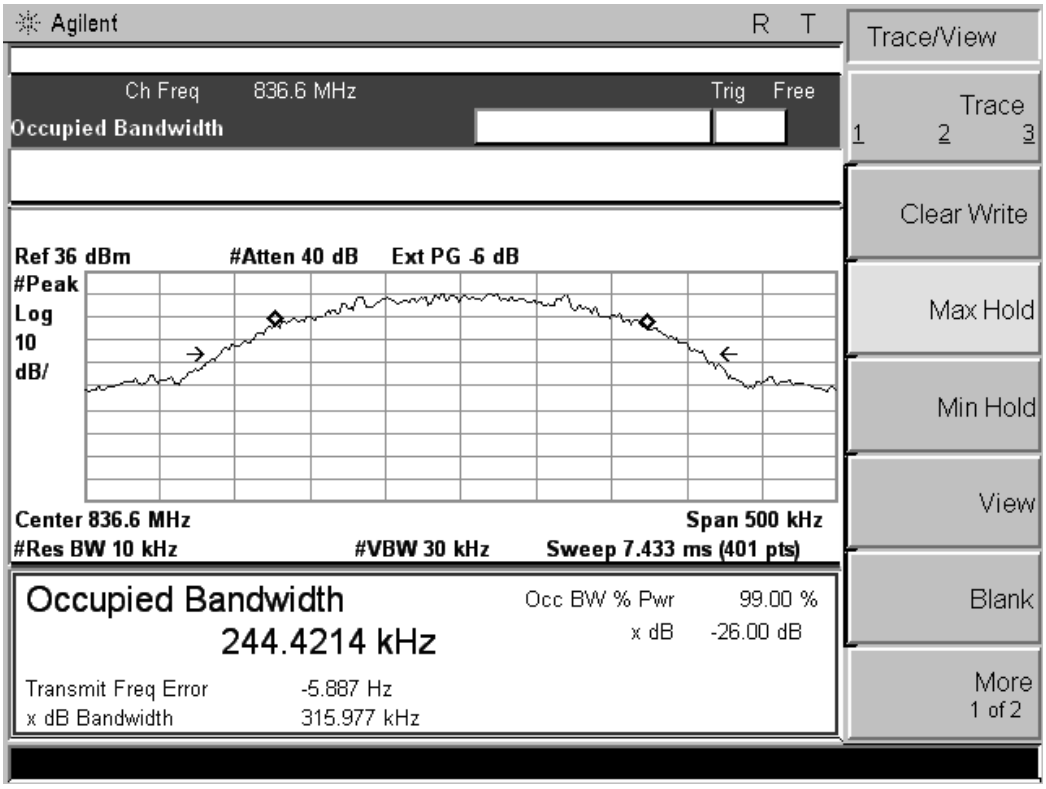


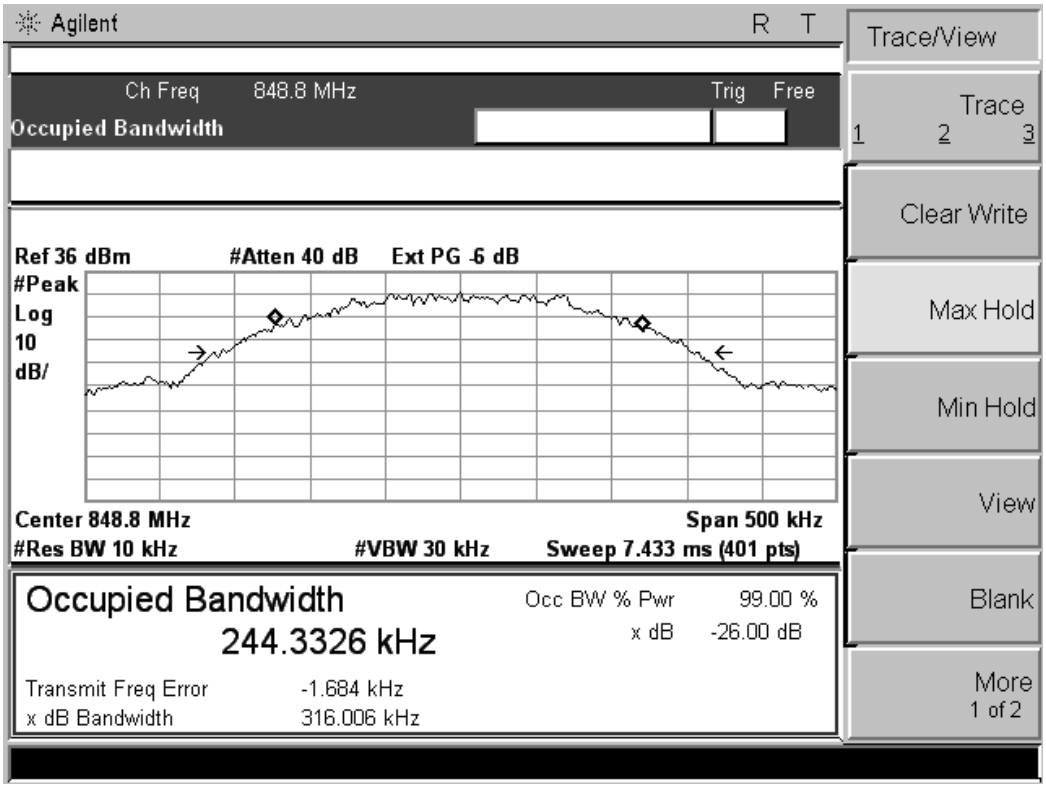




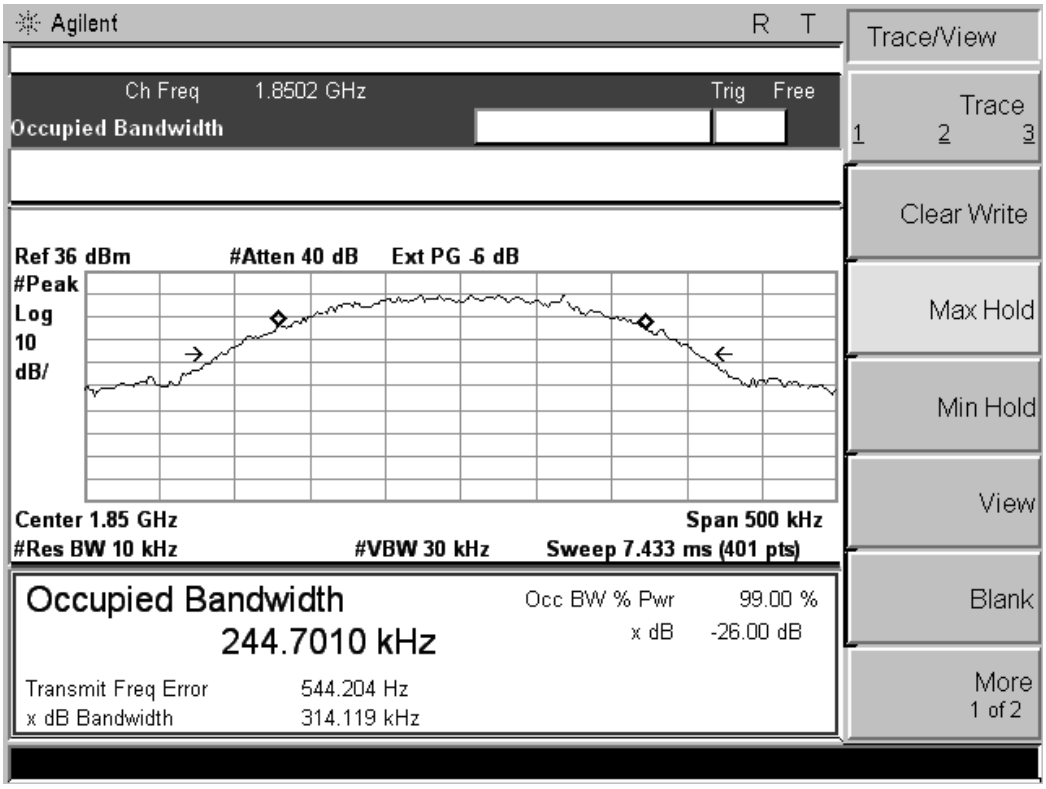
Test Plots For GPRS 850

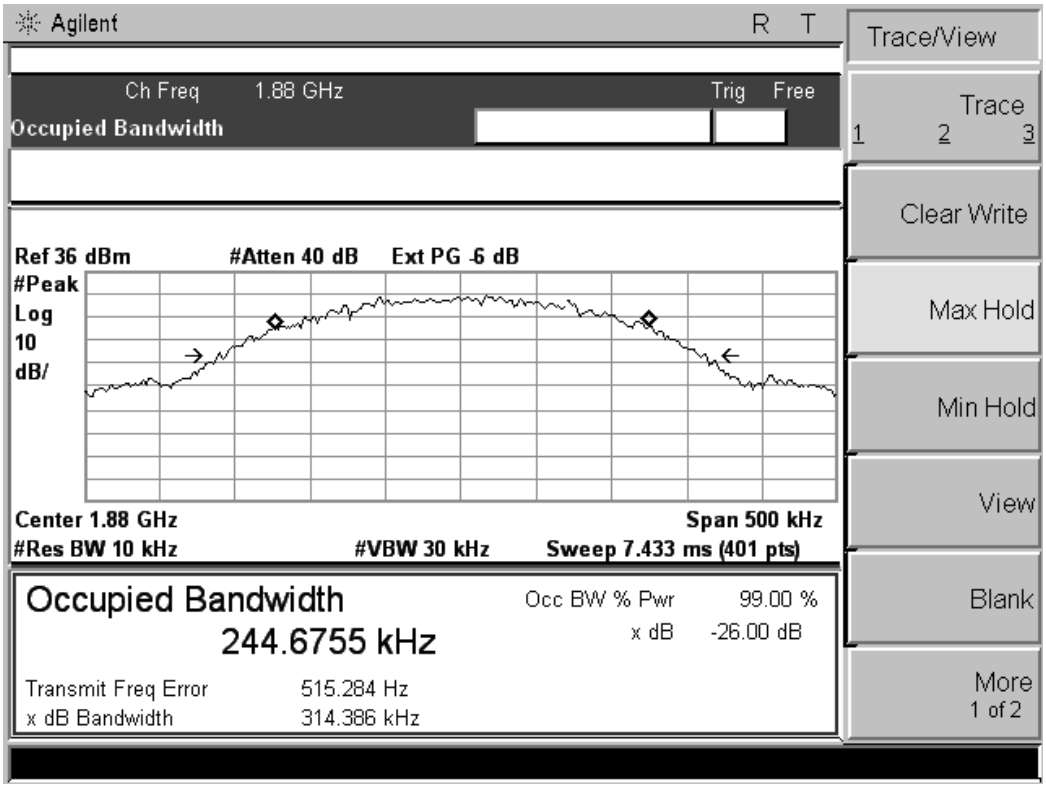


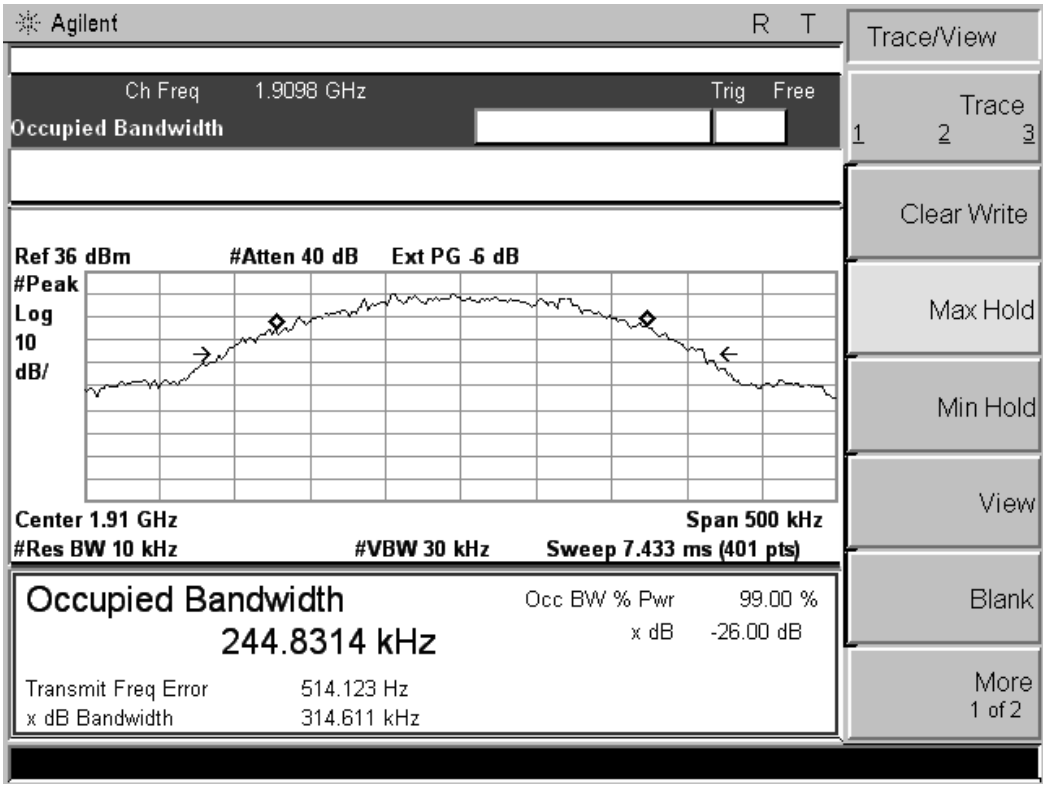




Test Plots For GPRS 1900







5.4. SPURIOUS AND HARMONIC EMISSION AT ANTENNA TERMINAL

5.4.1. Standard Applicable

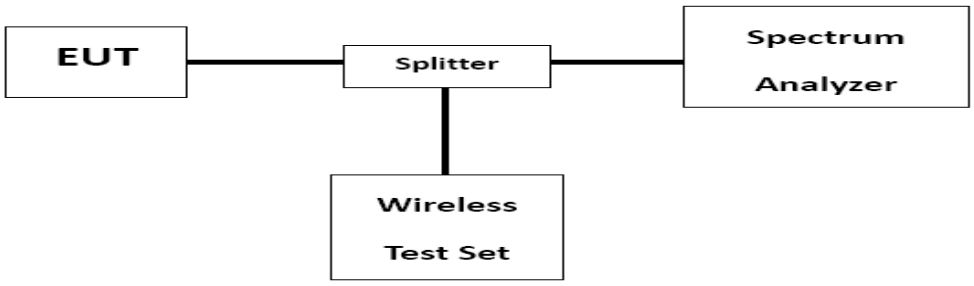
FCC §2.1051, §22.917 and §24.238. The limit for spurious emission is -13dBm.

5.4.2. Measuring Instruments

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

5.4.3. Test Procedures

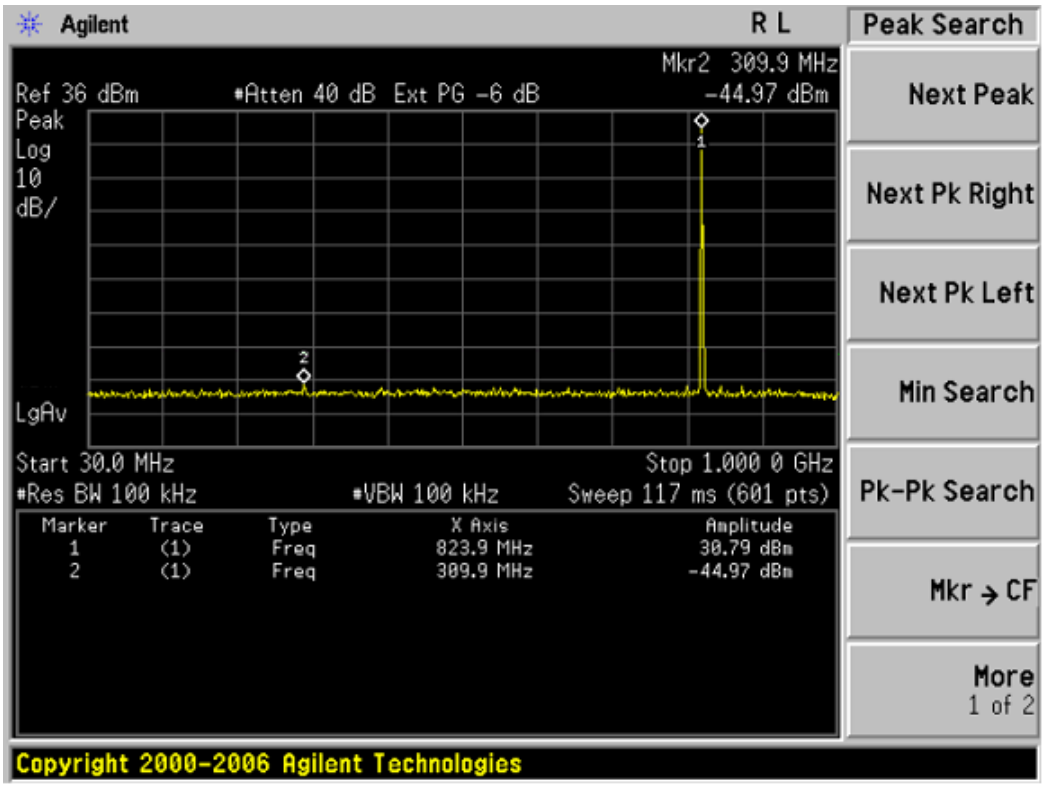
The RF output of the transmitter was connected to the wireless communication tester and spectrum analyzer through attenuation.

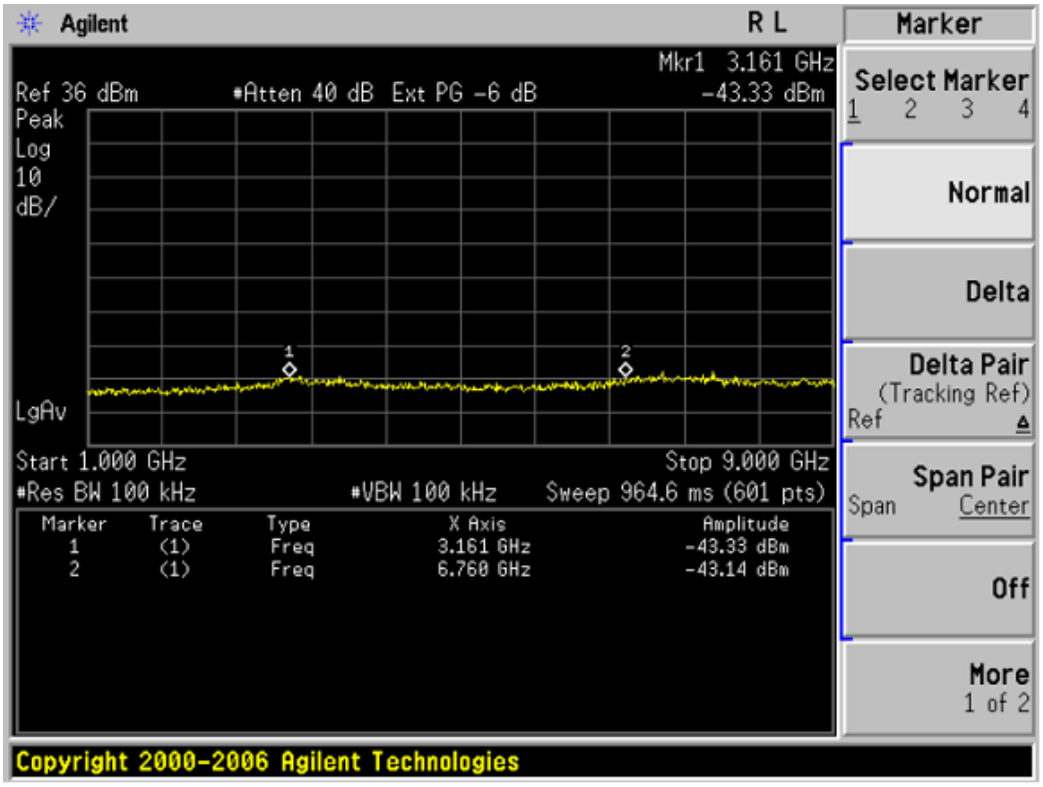


5.4.4. Test Results

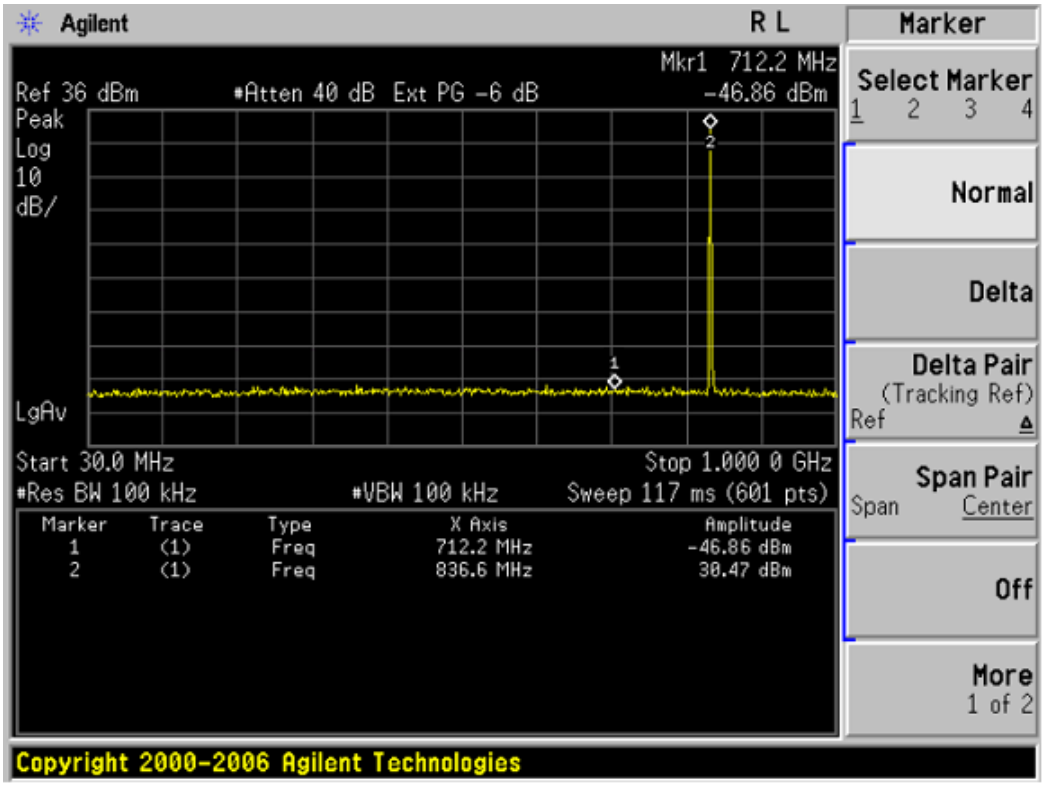
Please refer to the following plots.

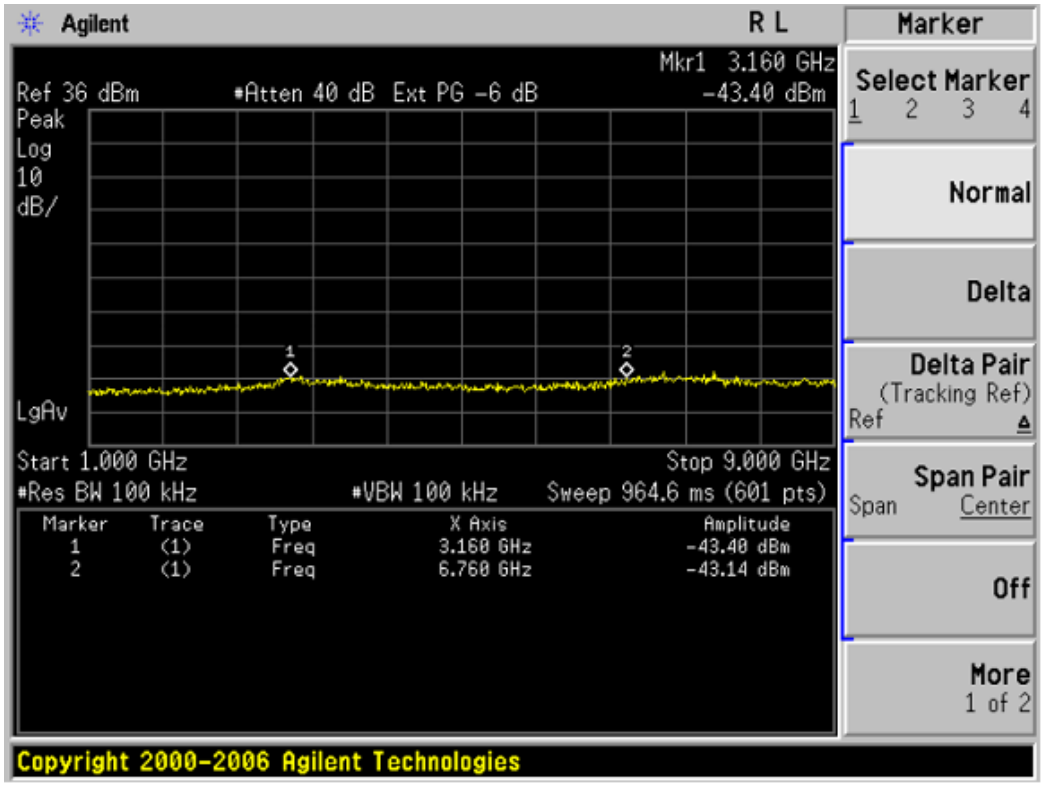
Transmitting Mode, CH 128, GSM 850



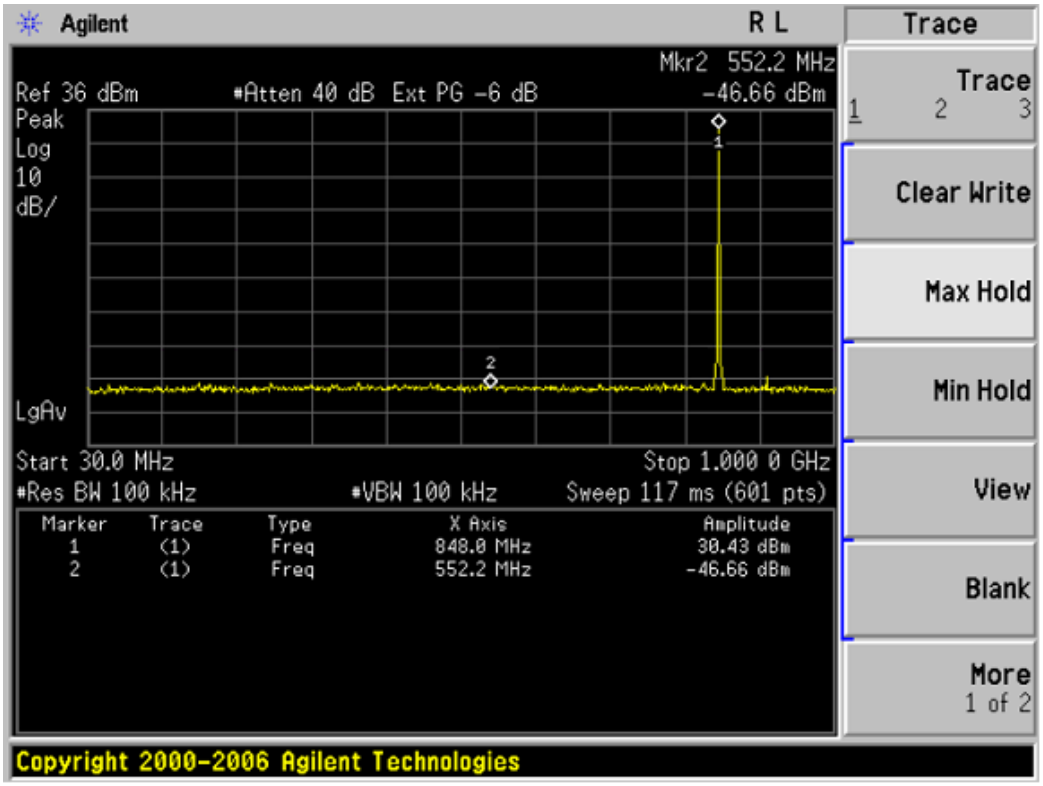


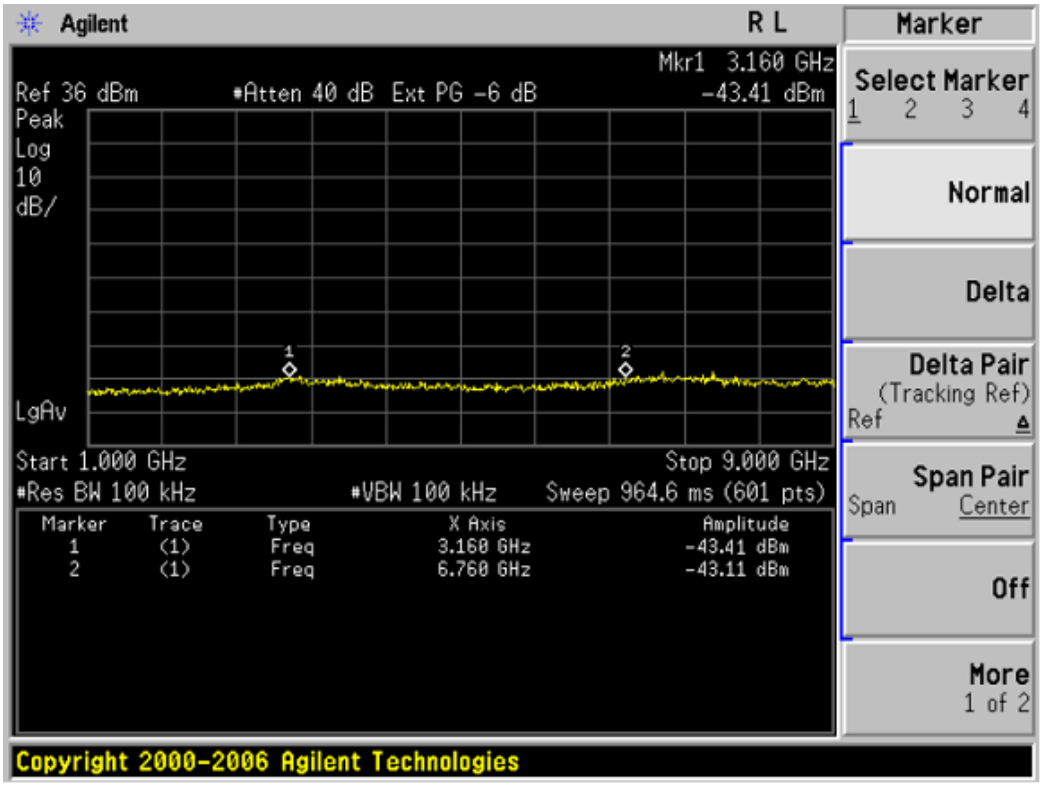
Transmitting Mode, CH 190, GSM 850



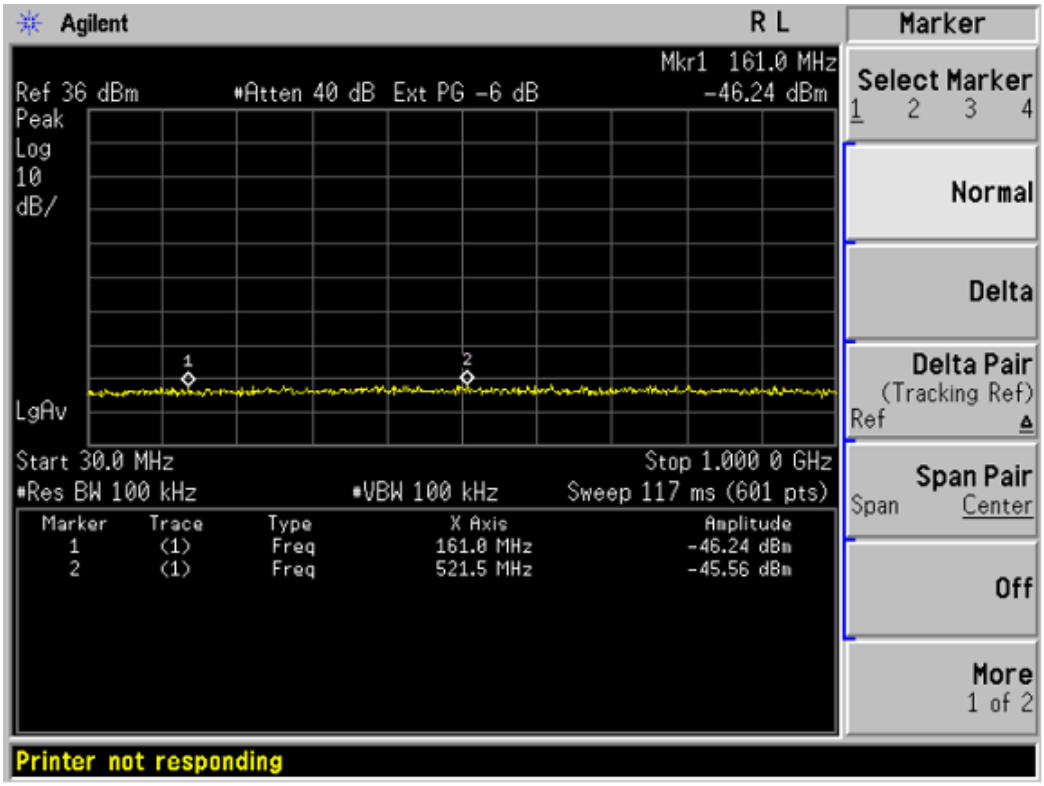


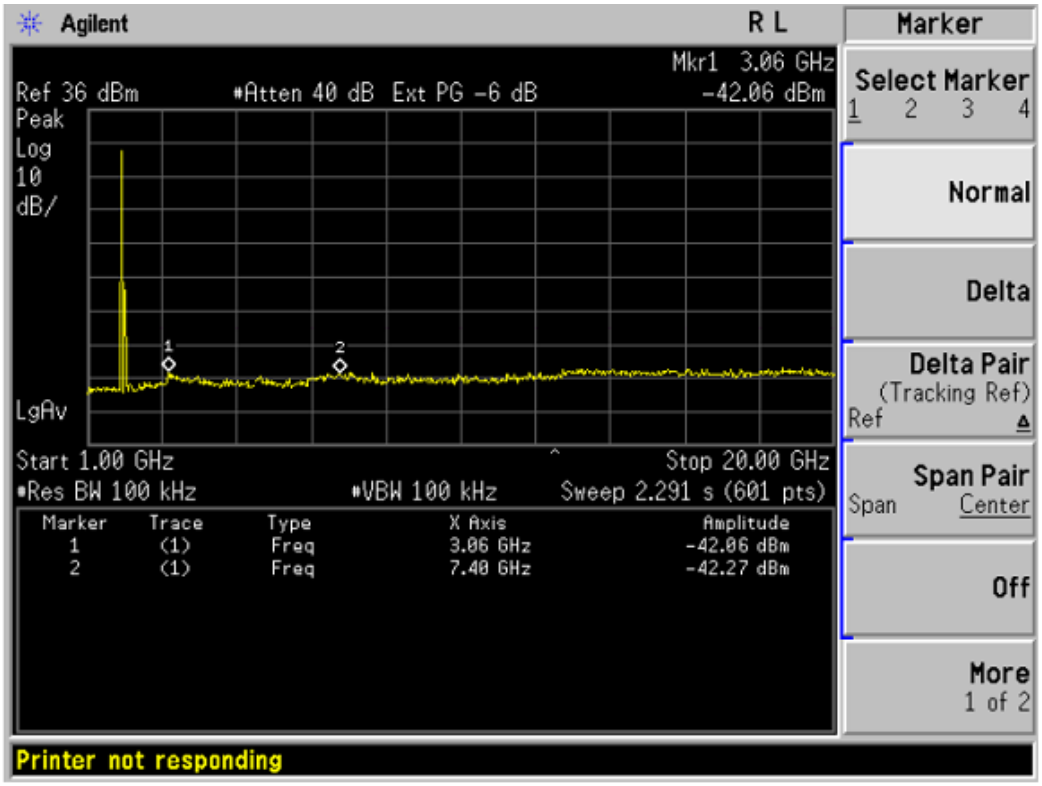
Transmitting Mode, CH 251, GSM 850



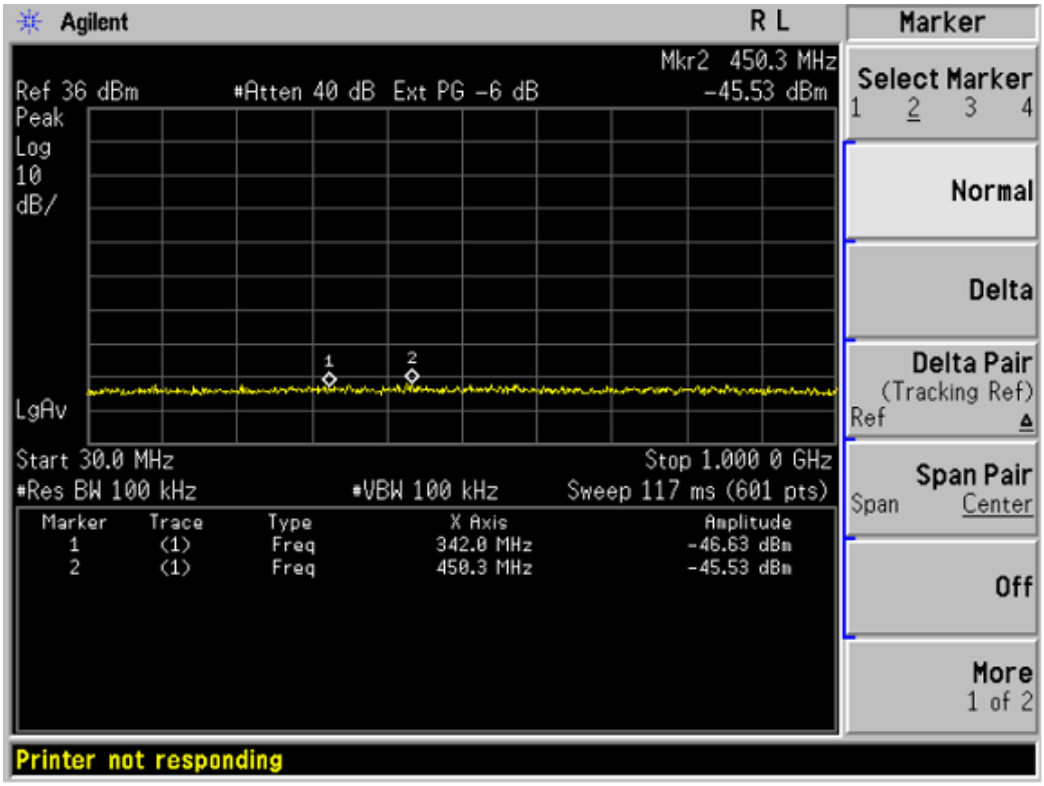


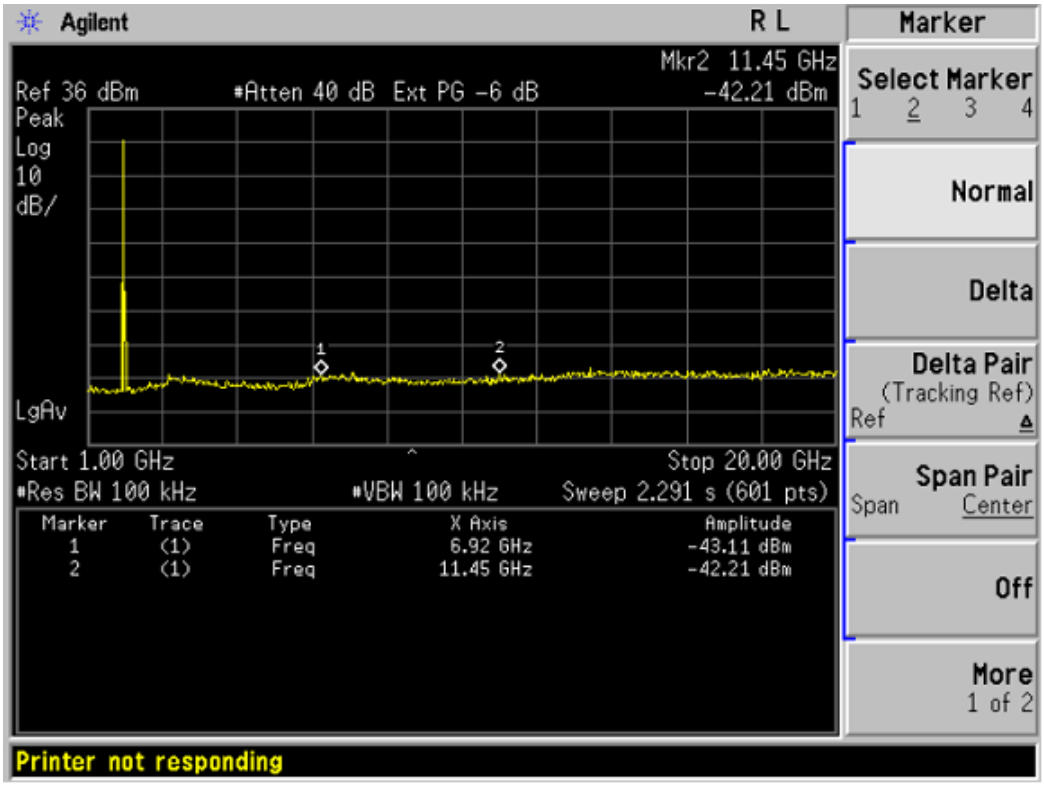
Transmitting Mode, CH 512, PCS 1900



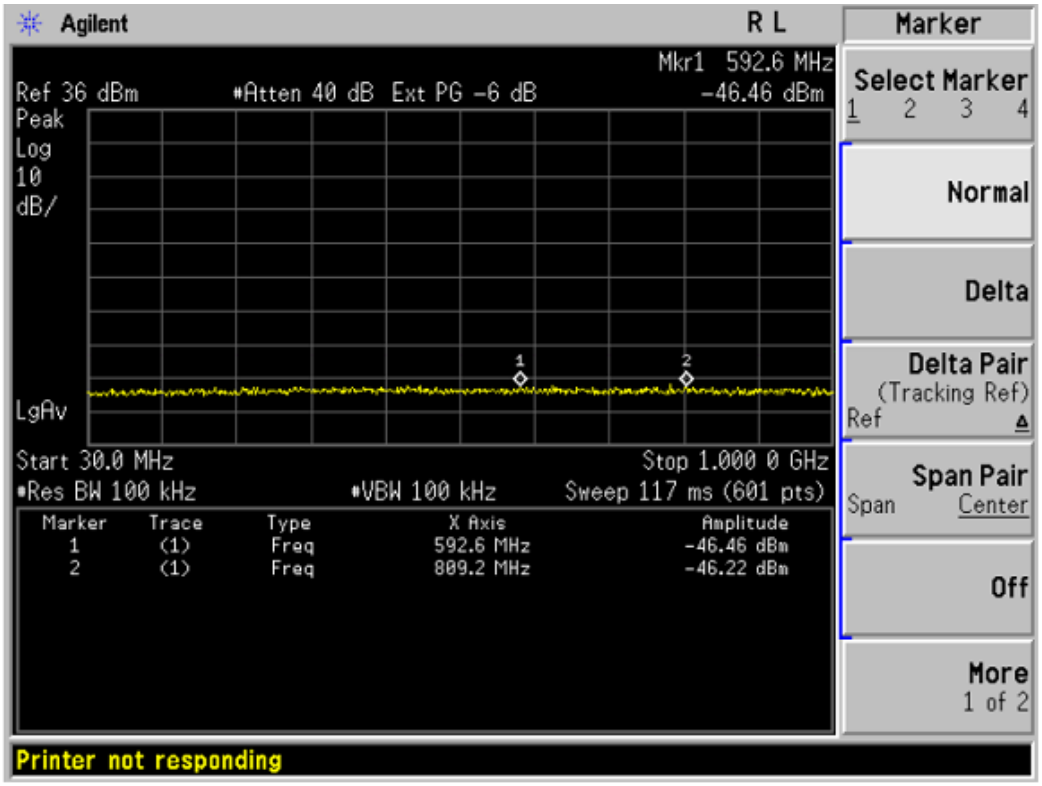


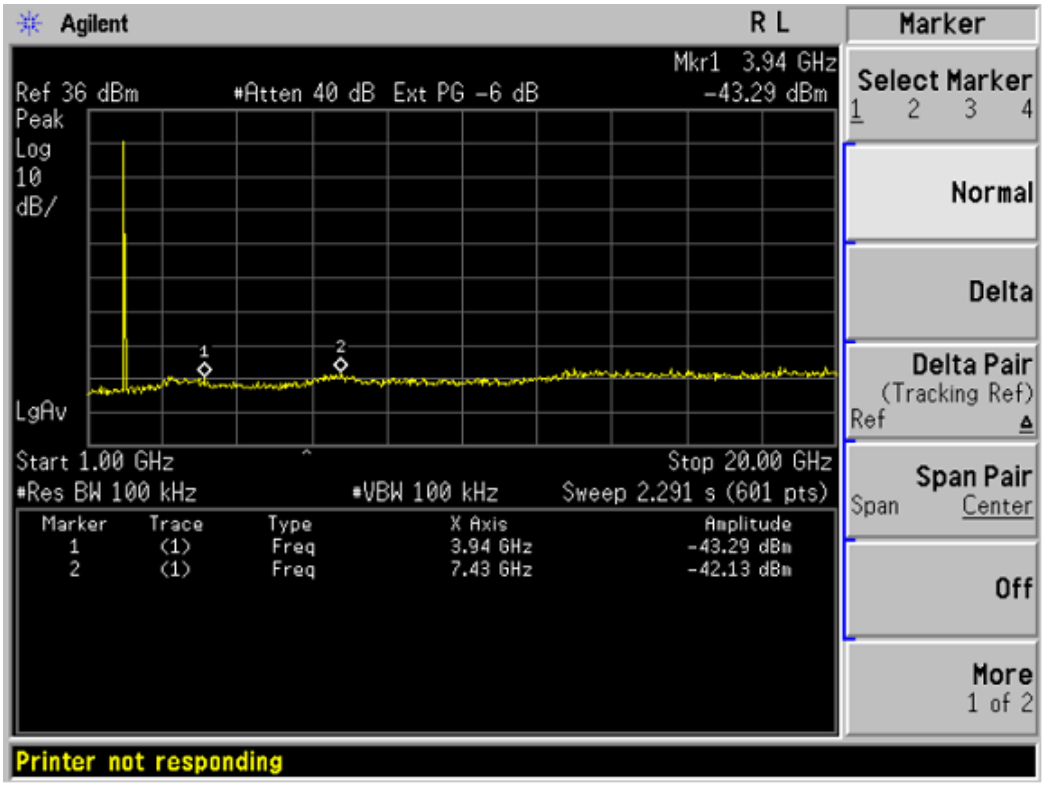
Transmitting Mode, CH 661, PCS 1900



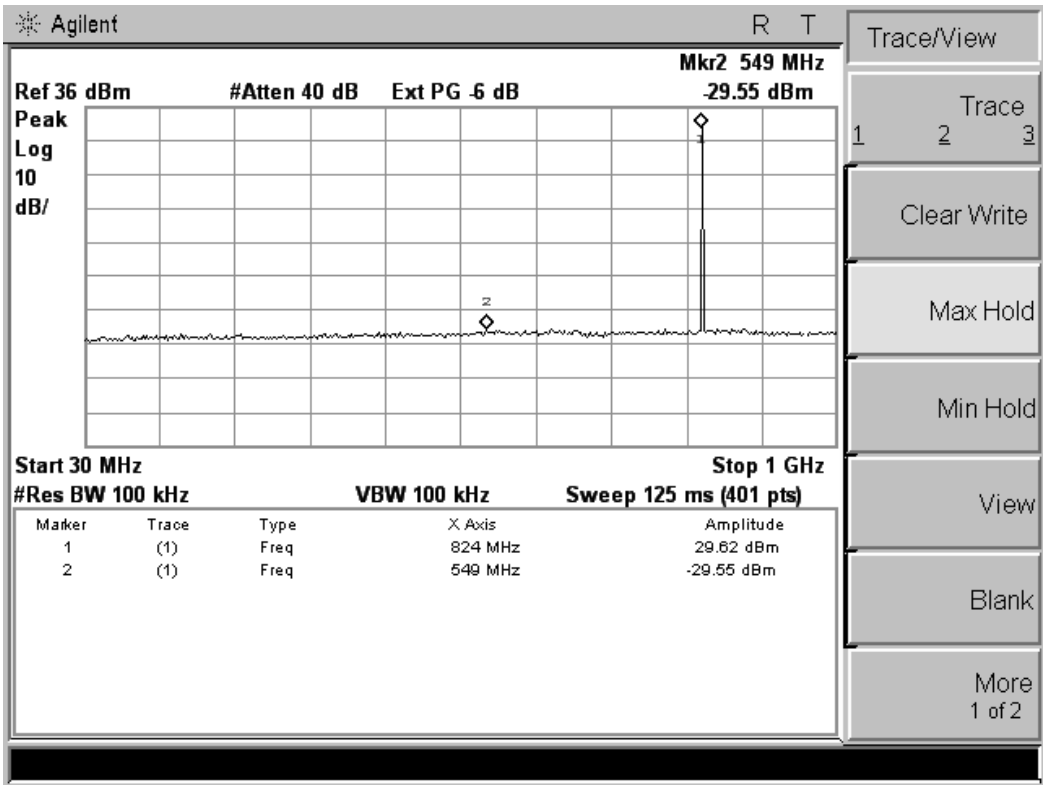


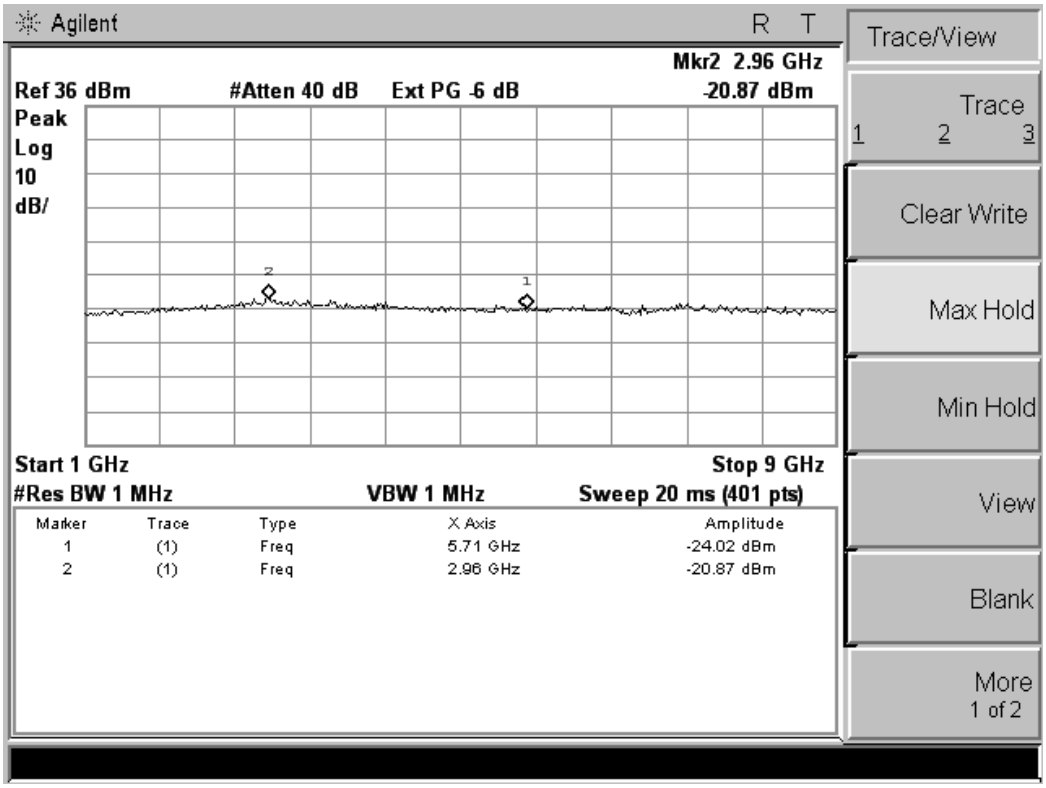
Transmitting Mode, CH 810, PCS 1900



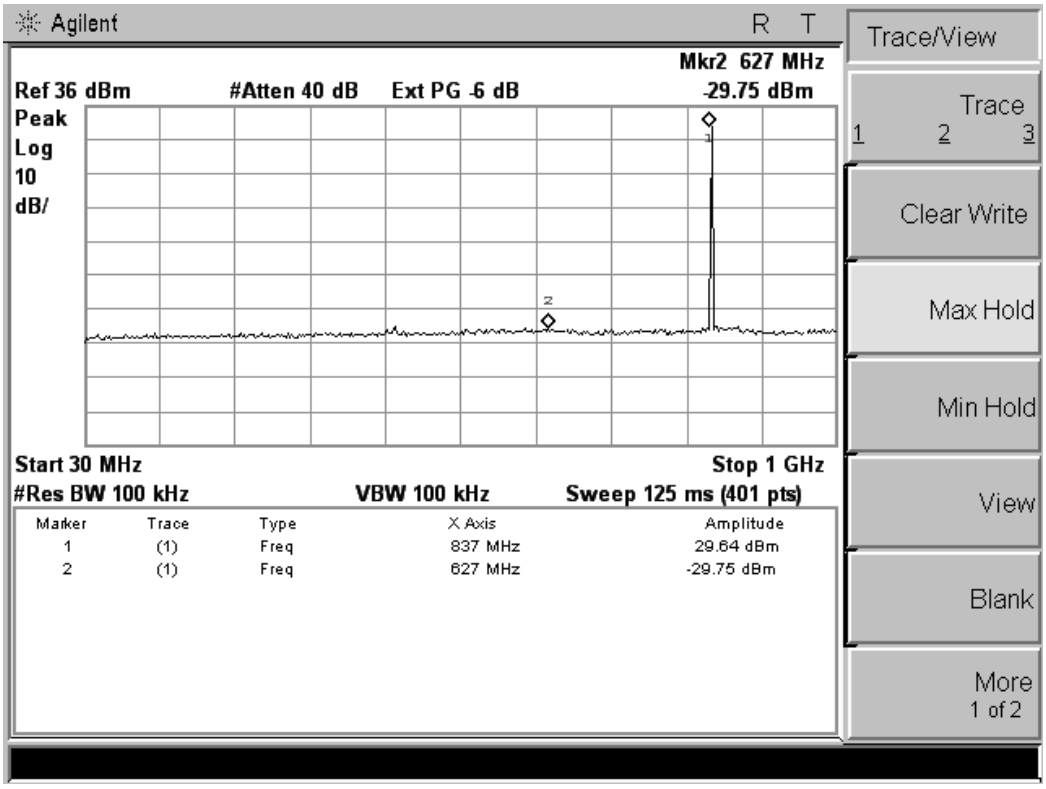


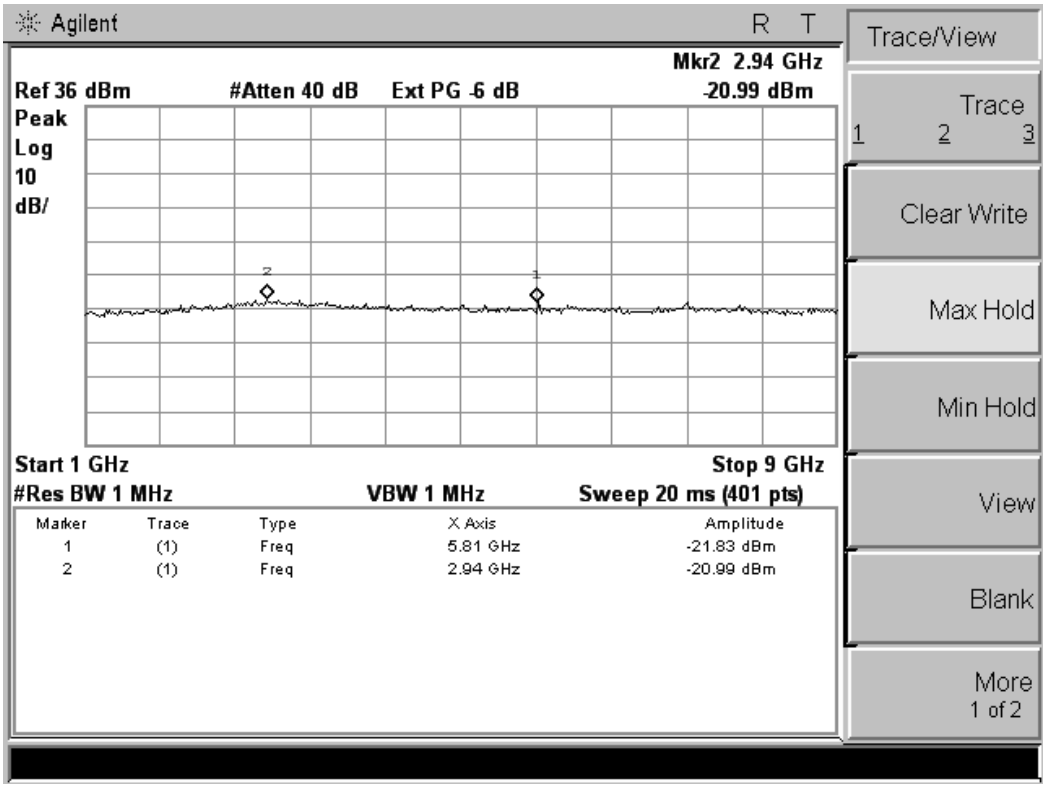
Transmitting Mode, CH 128, GPRS 850



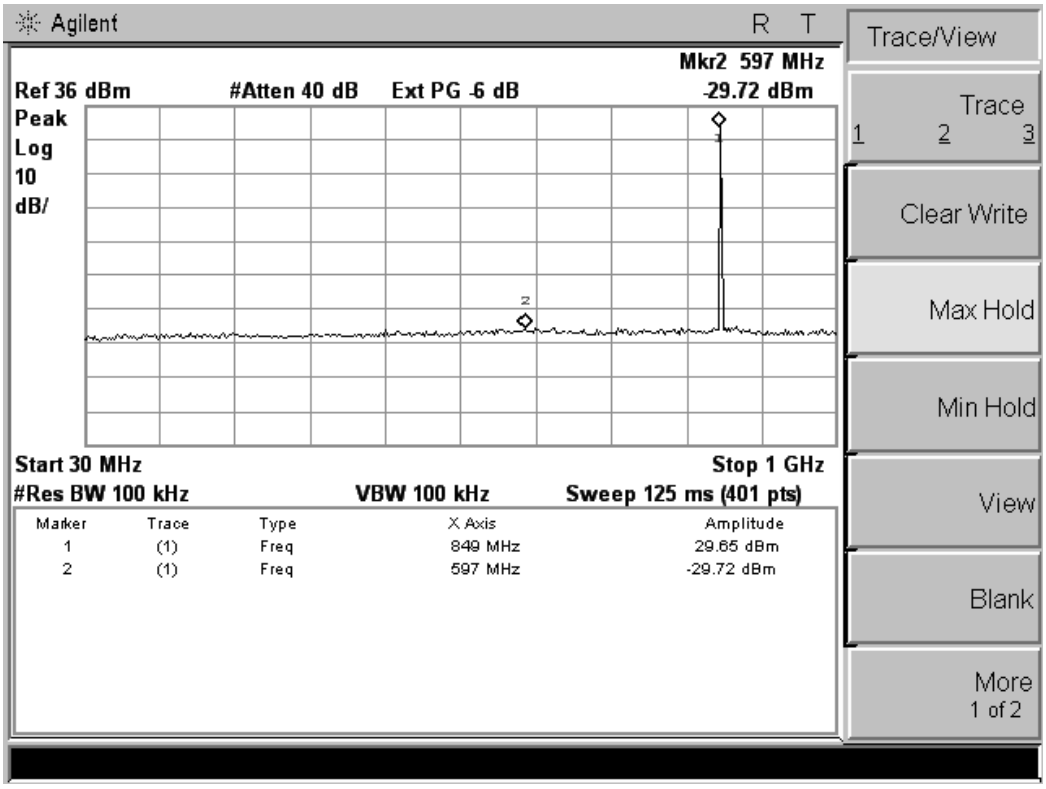


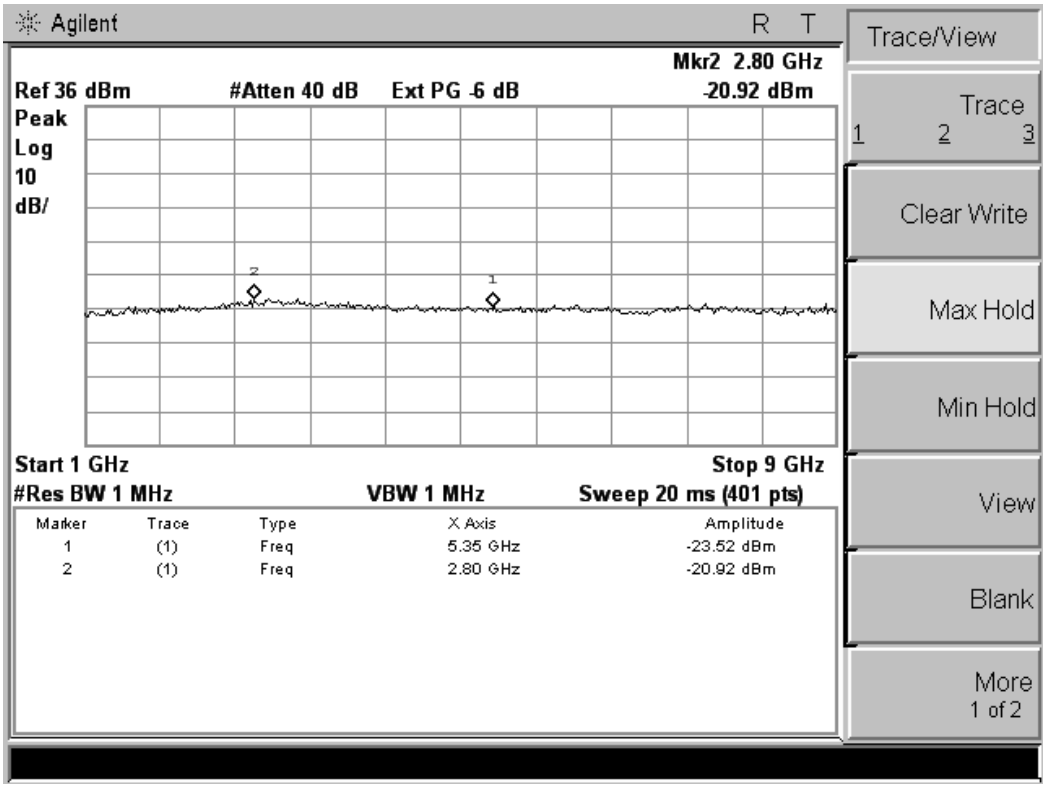
Transmitting Mode, CH 190, GPRS 850



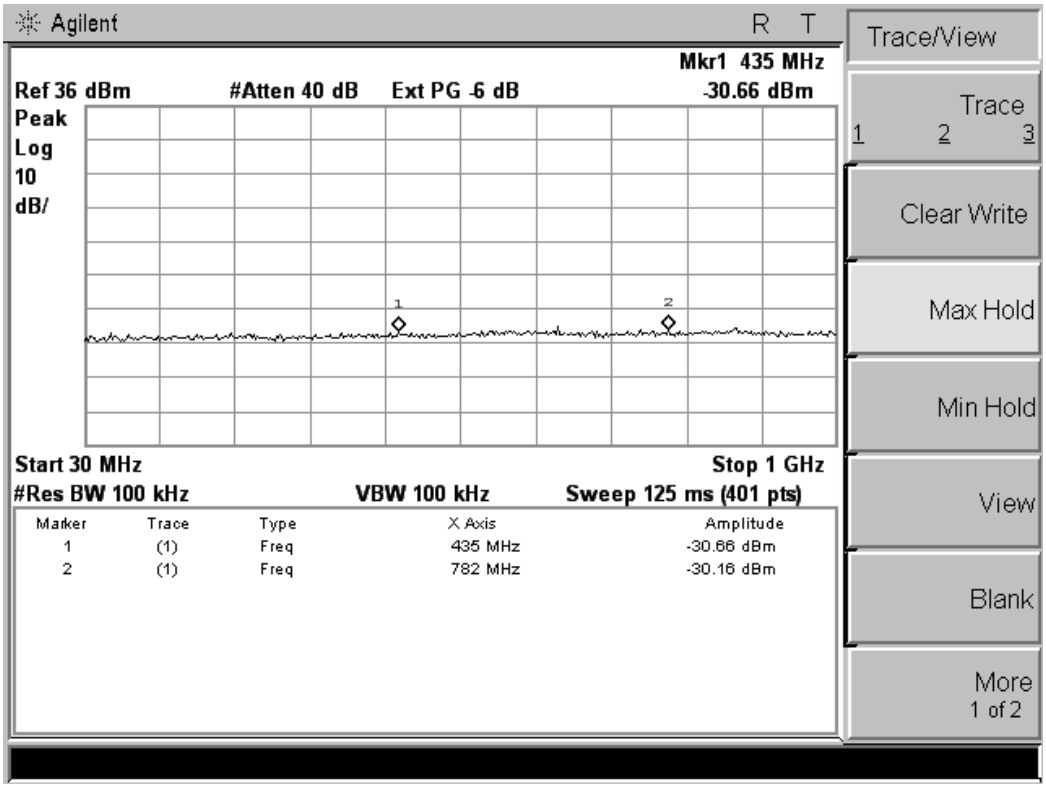


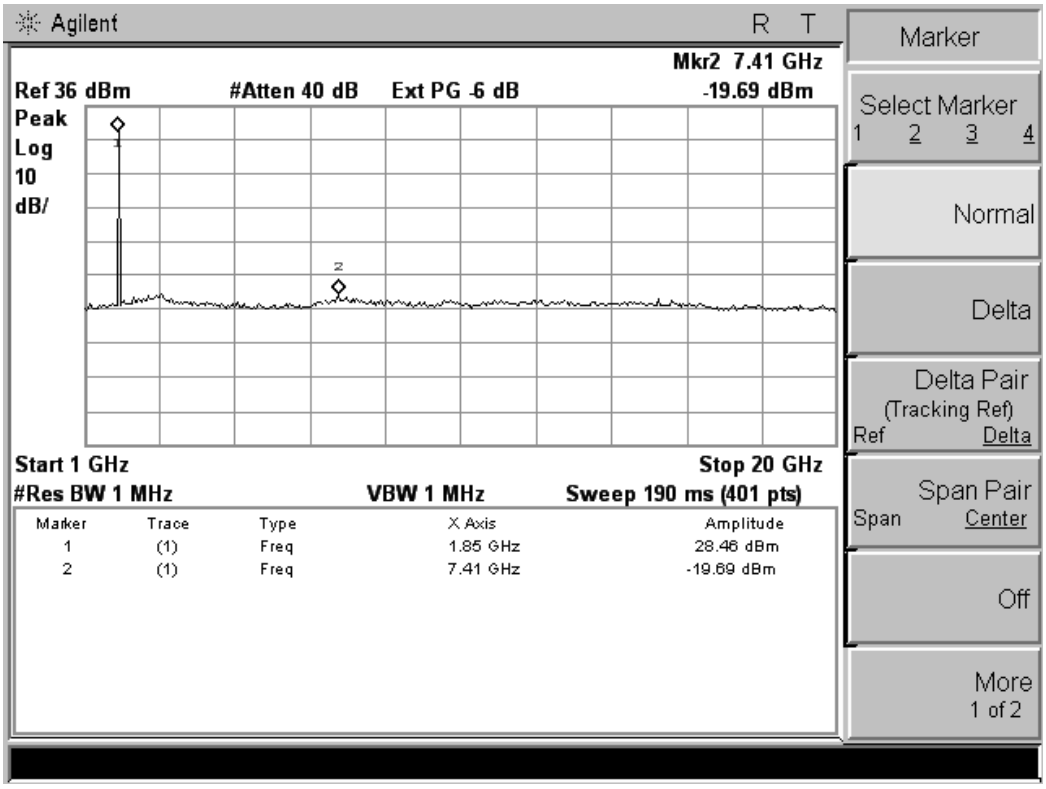
Transmitting Mode, CH 251, GPRS 850



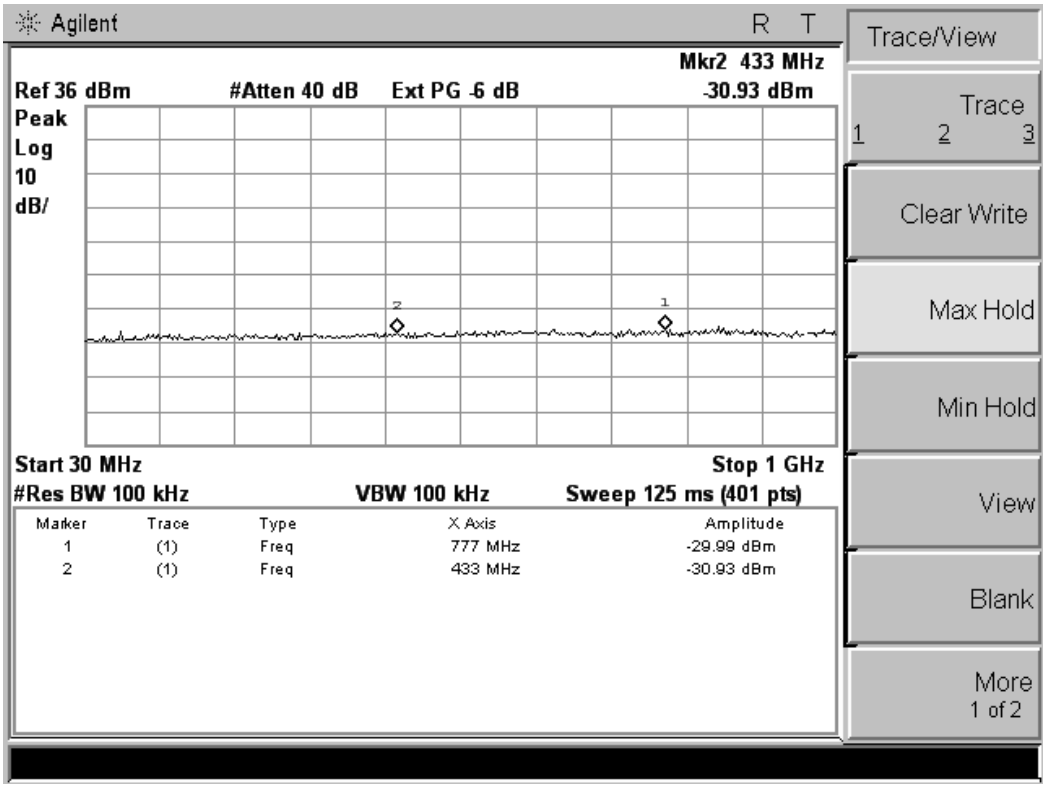


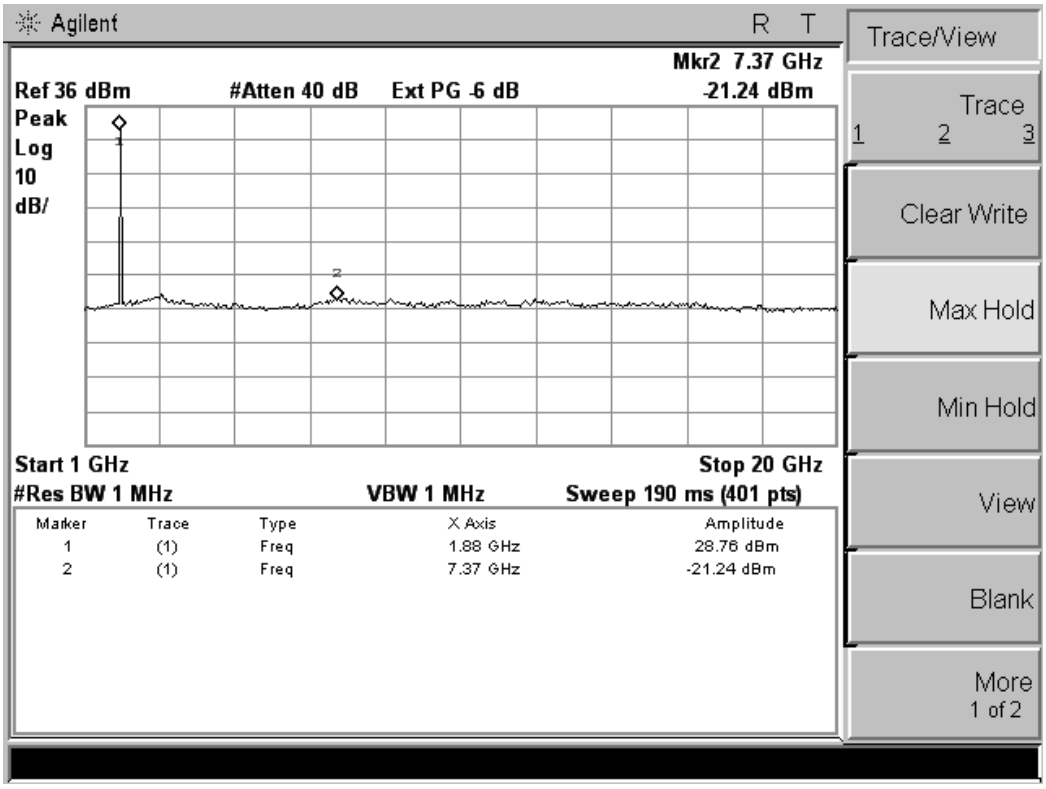
Transmitting Mode, CH 512, GPRS 1900



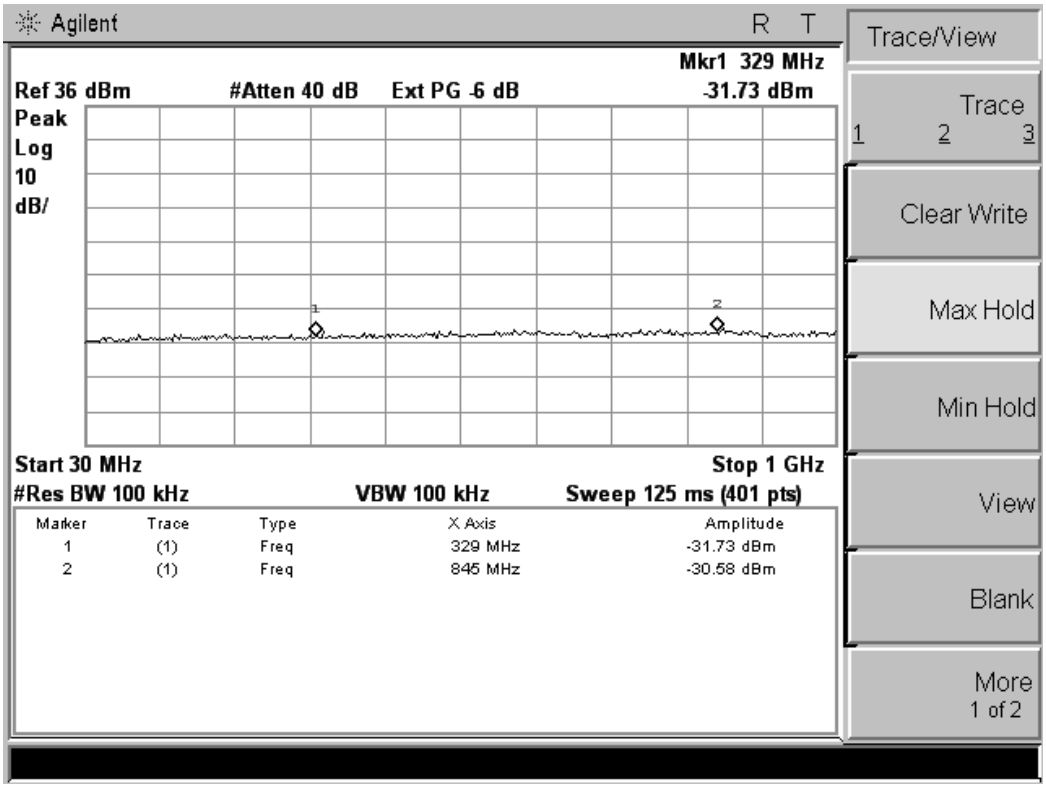


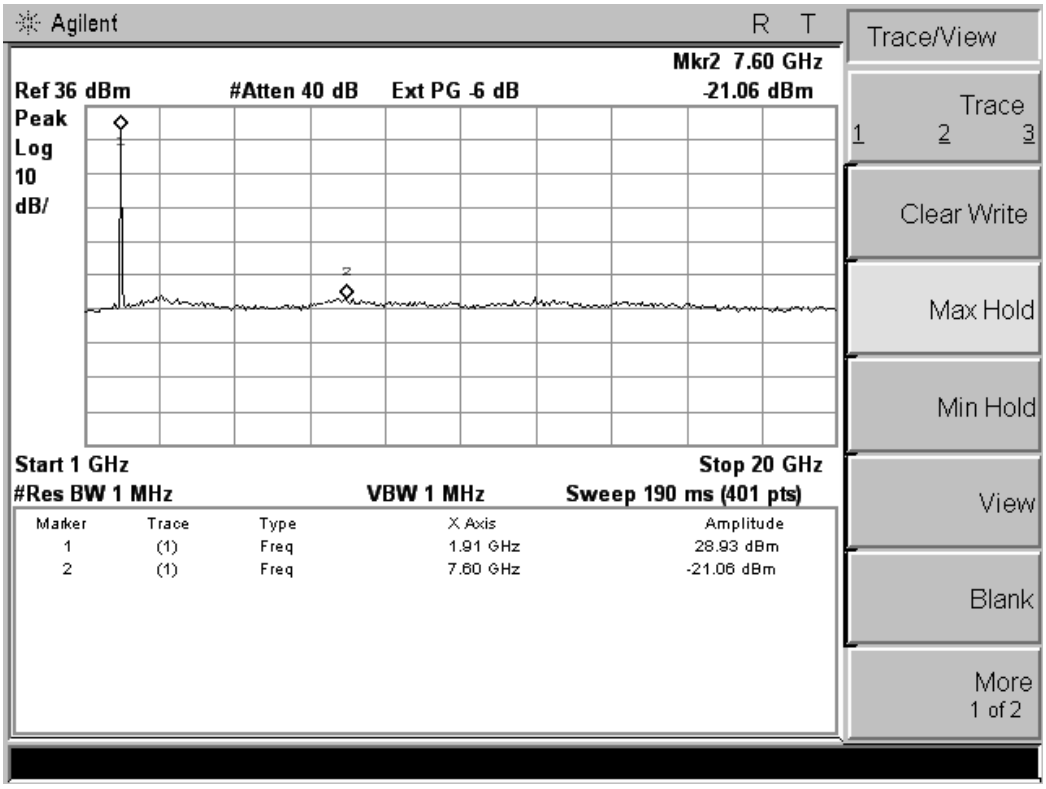
Transmitting Mode, CH 661, GPRS 1900



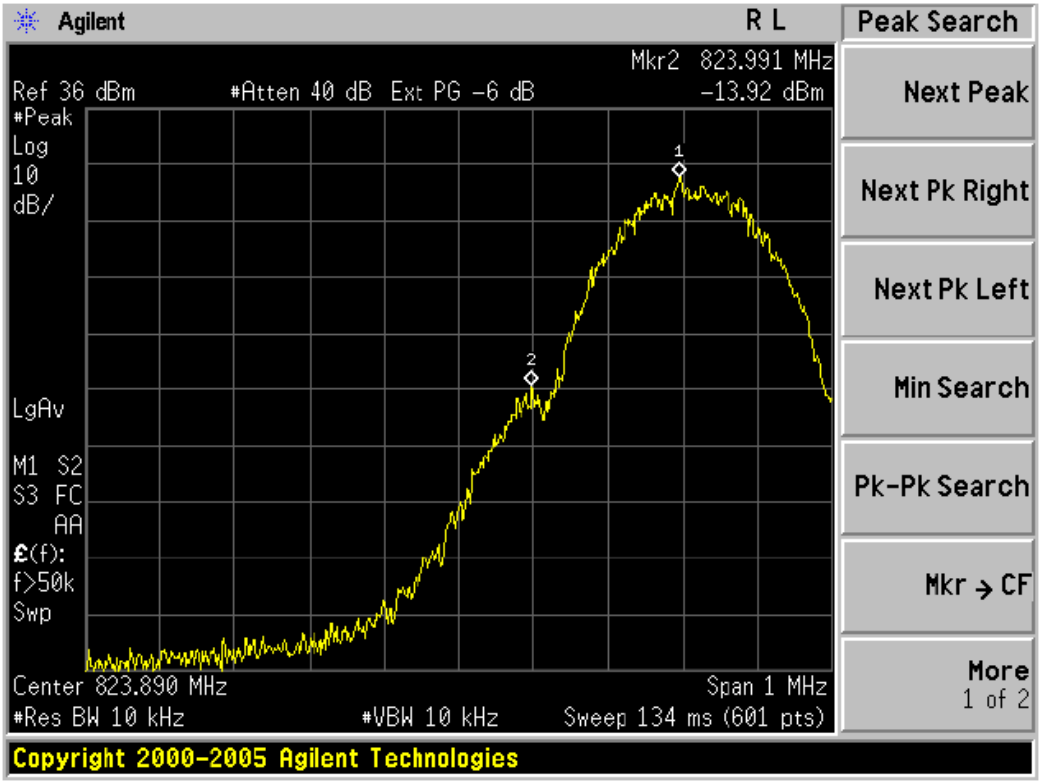


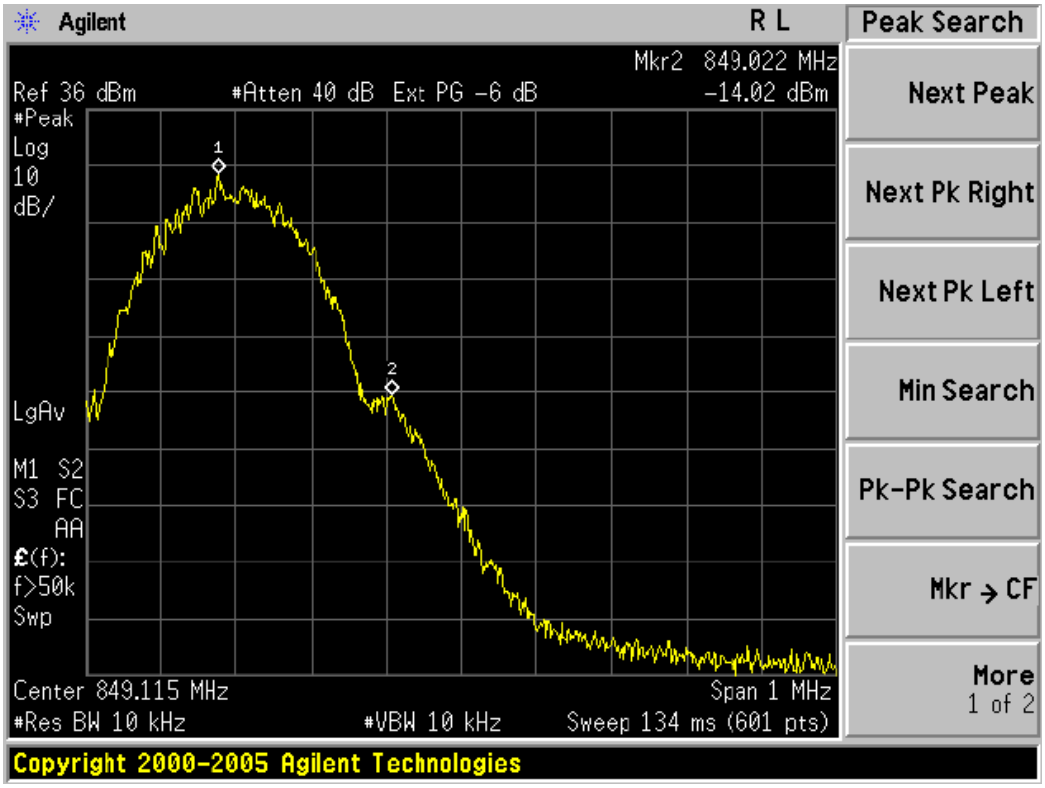
Transmitting Mode, CH 810, GPRS 1900



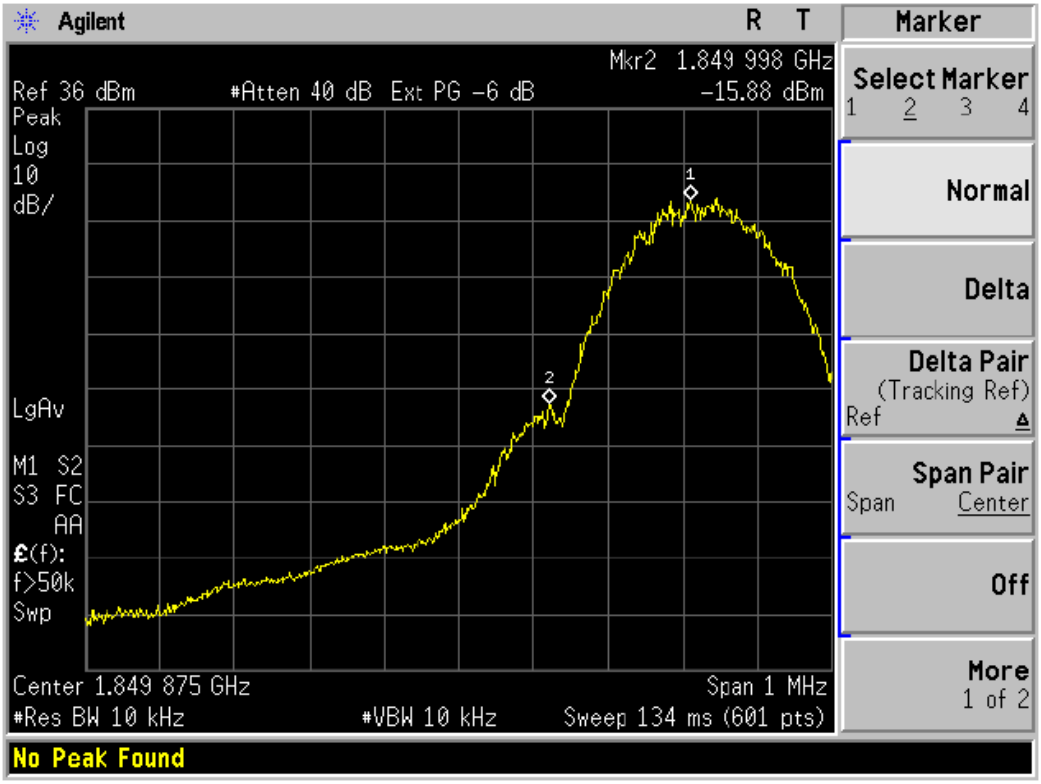


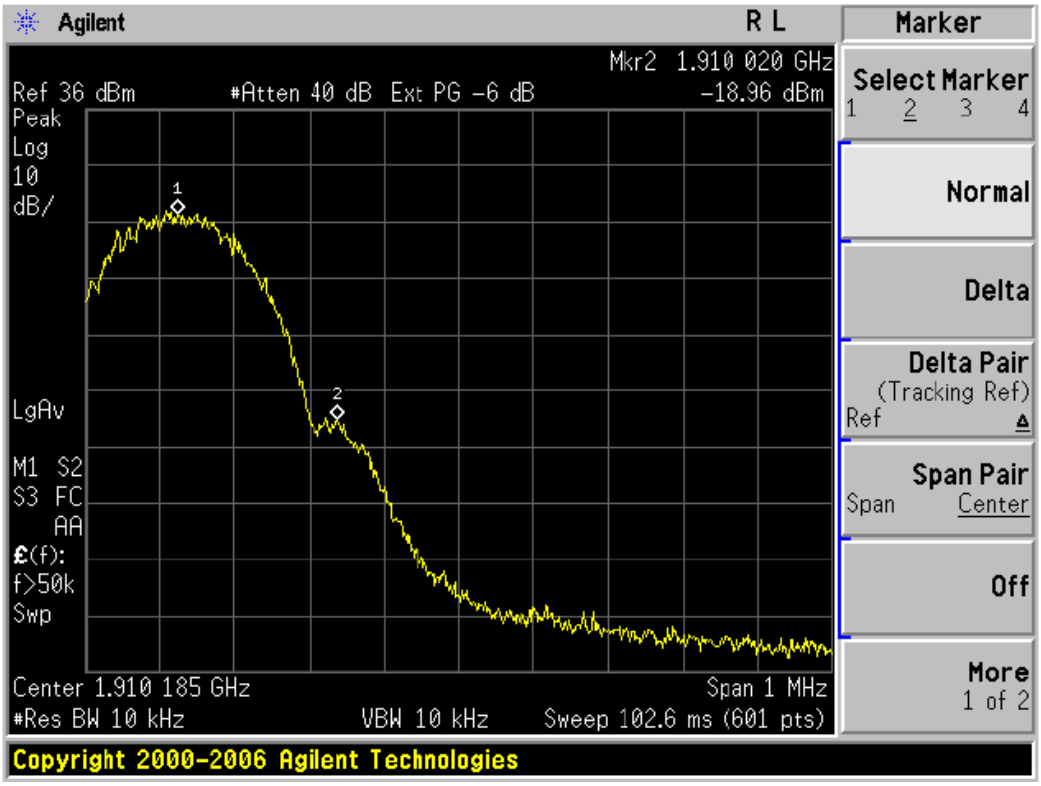
Test Result of Band Edge Emissions, GSM 850



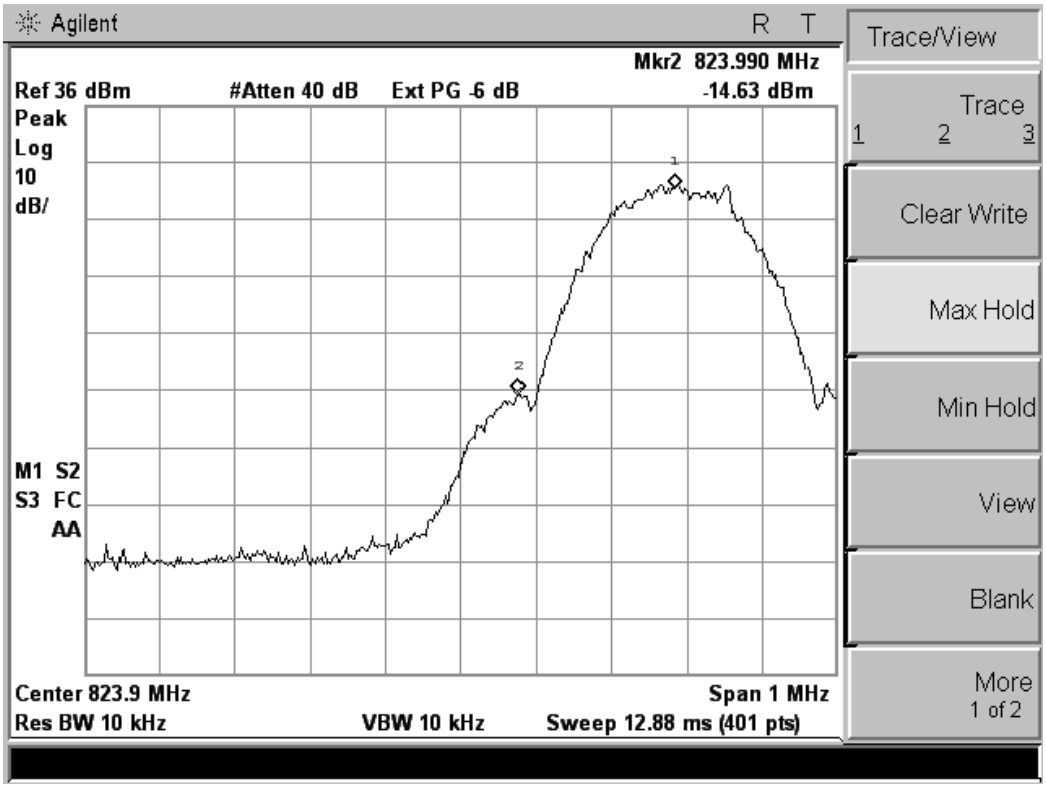


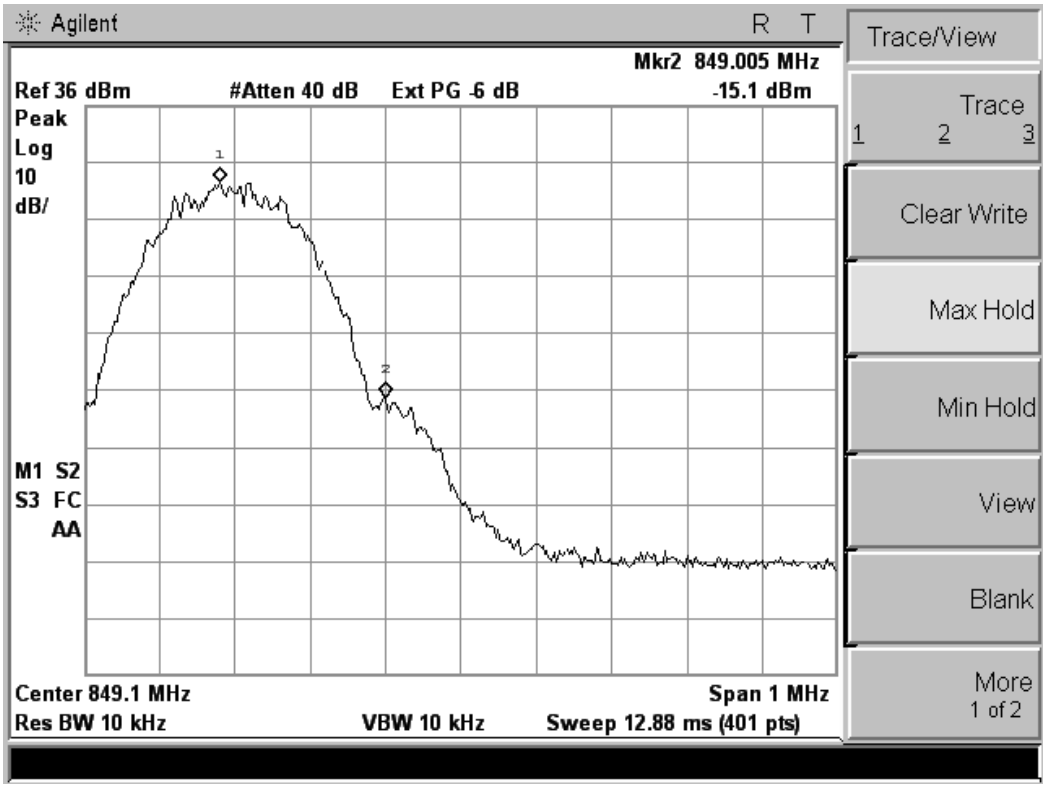
Test Result of Band Edge Emissions, PCS 1900



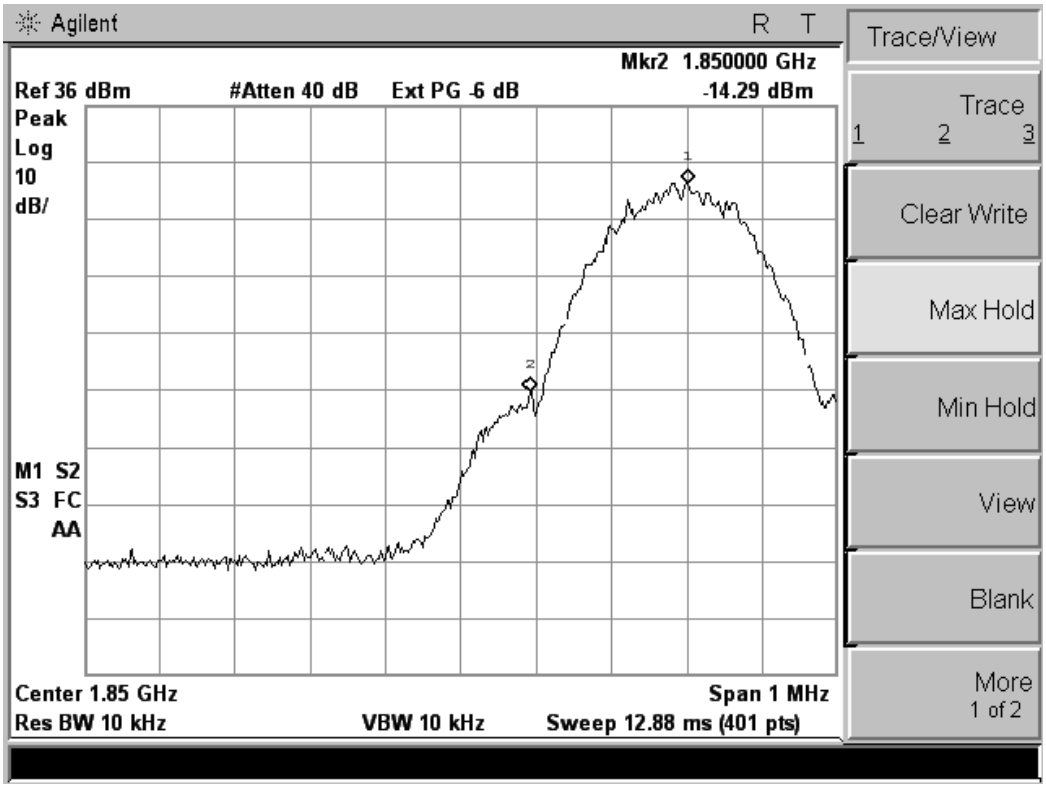


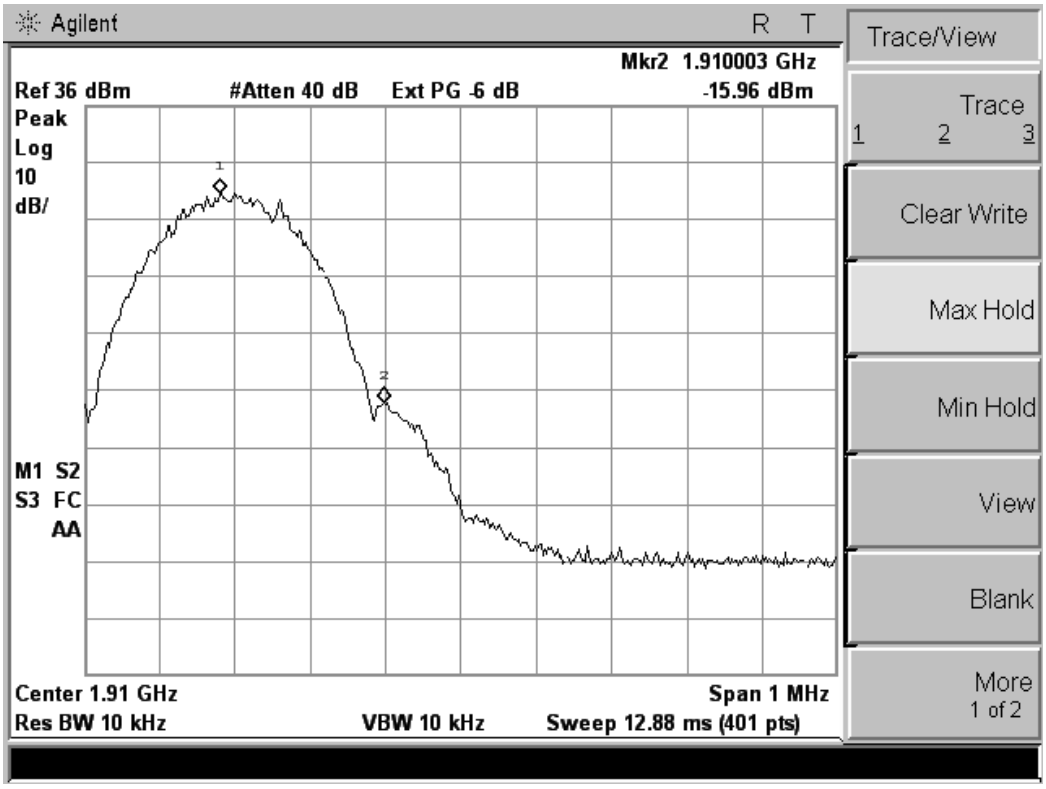
Test Result of Band Edge Emissions, GPRS 850





Test Result of Band Edge Emissions, GPRS 1900





5.5. RADIATED SPURIOUS EMISSIONS MEASUREMENT

5.5.1. Standard Applicable

FCC §2.1053, §22.917 and §24.238.

5.5.2. Measuring Instruments

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

5.5.3. Test Procedures

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

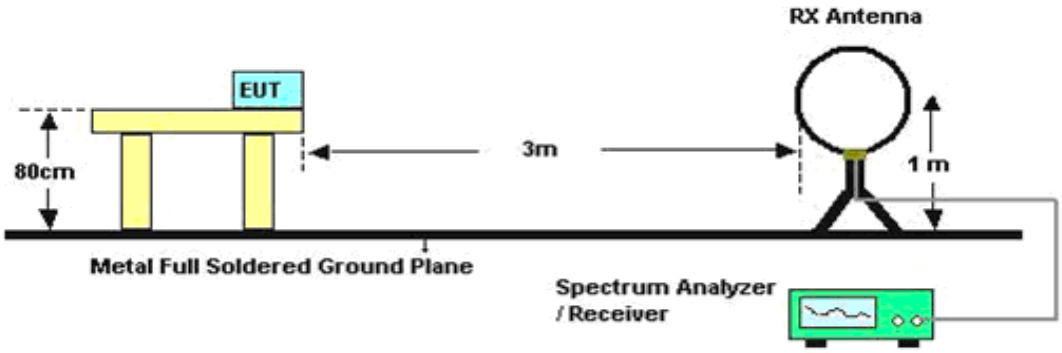
The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

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

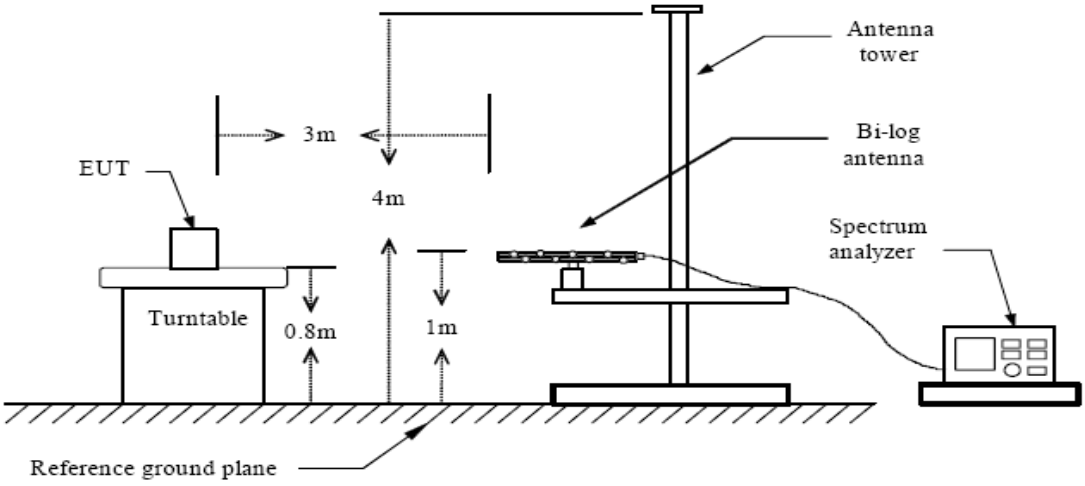
ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable (dB)

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

For radiated spurious emissions below 1GHz

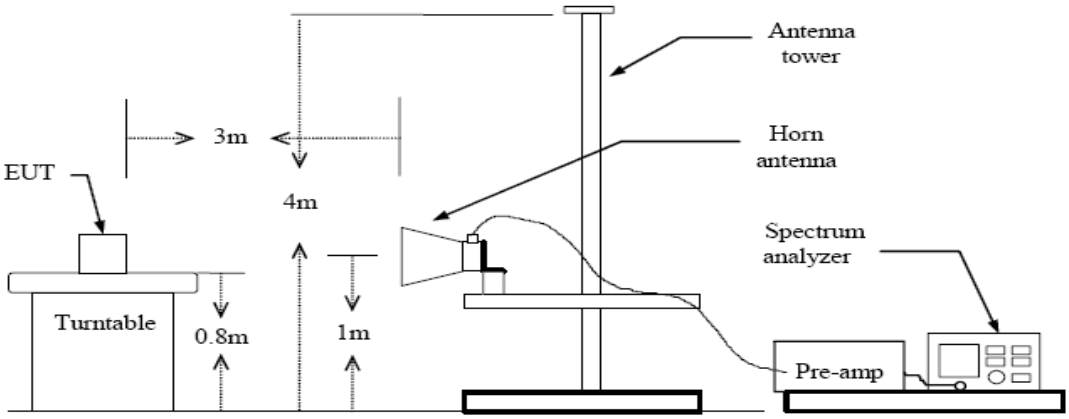


Below 30MHz

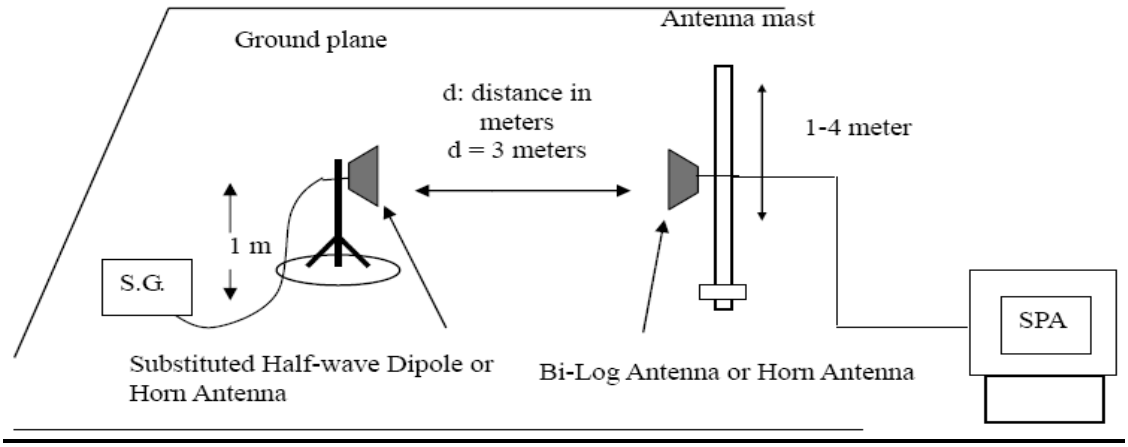


30MHz~1GHz

For radiated spurious emissions above 1GHz



Substituted Method



5.5.4. Test Results

1) Radiated Emissions (9kHz~30MHz)

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

2) Radiated Emissions (Above 30MHz)
The worst test data as follow:
30MHz~10GHz

The Worst Test Result For GSM 850, CH 128				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
67.76	-64.81	-13	-51.81	H
184.33	-74.47	-13	-61.47	H
689.11	-78.79	-13	-65.79	H
1781.90	-23.04	-13	-10.04	H
2496.74	-27.29	-13	-14.29	H
87.40	-64.67	-13	-51.67	V
182.12	-64.55	-13	-51.55	V
715.08	-73.42	-13	-60.42	V
1647.64	-22.11	-13	-9.11	V
2473.50	-41.80	-13	-28.80	V

The Worst Test Result For GSM 850, CH 190				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
76.85	-66.16	-13	-53.16	H
182.17	-75.53	-13	-62.53	H
665.90	-79.21	-13	-66.21	H
1666.35	-20.61	-13	-7.61	H
2511.10	-27.33	-13	-14.33	H
83.22	-59.02	-13	-46.02	V
180.67	-66.00	-13	-53.00	V
462.75	-71.49	-13	-58.49	V
1667.69	-21.99	-13	-8.99	V
2510.21	-34.20	-13	-21.20	V

The Worst Test Result For GSM 850, CH 251				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
78.14	-68.83	-13	-55.83	H
181.88	-75.40	-13	-62.40	H
672.49	-79.03	-13	-66.03	H
1667.10	-19.54	-13	-6.54	H
2507.78	-26.51	-13	-13.51	H
90.69	-60.59	-13	-47.59	V
187.87	-66.30	-13	-53.30	V
462.11	-71.86	-13	-58.86	V
1665.41	-26.42	-13	-13.42	V
2511.84	-33.79	-13	-20.79	V

30MHz~20GHz

The Worst Test Result For PCS 1900, CH 512				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
94.39	-65.16	-13	-52.16	H
183.79	-66.18	-13	-53.18	H
716.74	-73.01	-13	-60.01	H
1602.81	-24.00	-13	-11.00	H
2559.91	-29.84	-13	-16.84	H
95.73	-67.05	-13	-54.05	V
190.89	-63.94	-13	-50.94	V
709.58	-78.95	-13	-65.95	V
1694.09	-26.75	-13	-13.75	V
2511.99	-34.10	-13	-21.10	V

The Worst Test Result For PCS 1900, CH 661				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
72.42	-66.64	-13	-53.64	H
170.93	-75.08	-13	-62.08	H
692.02	-70.63	-13	-57.63	H
3643.74	-24.48	-13	-11.48	H
5438.86	-31.34	-13	-18.34	H
73.71	-69.93	-13	-56.93	V
160.40	-65.36	-13	-52.36	V
648.46	-78.82	-13	-65.82	V
3612.57	-27.68	-13	-14.68	V
5744.55	-33.01	-13	-20.01	V

The Worst Test Result For PCS 1900, CH 810				
Frequency (MHz)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity
89.93	-64.61	-13	-51.61	H
187.40	-72.89	-13	-59.89	H
637.50	-78.15	-13	-65.15	H
3830.74	-21.01	-13	-8.01	H
5731.19	-34.48	-13	-21.48	H
83.19	-67.91	-13	-54.91	V
198.71	-65.76	-13	-52.76	V
457.21	-70.50	-13	-57.50	V
3806.07	-26.16	-13	-13.16	V
5714.20	-32.15	-13	-19.15	V

Note: Only recorded the worst test data.

5.6. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

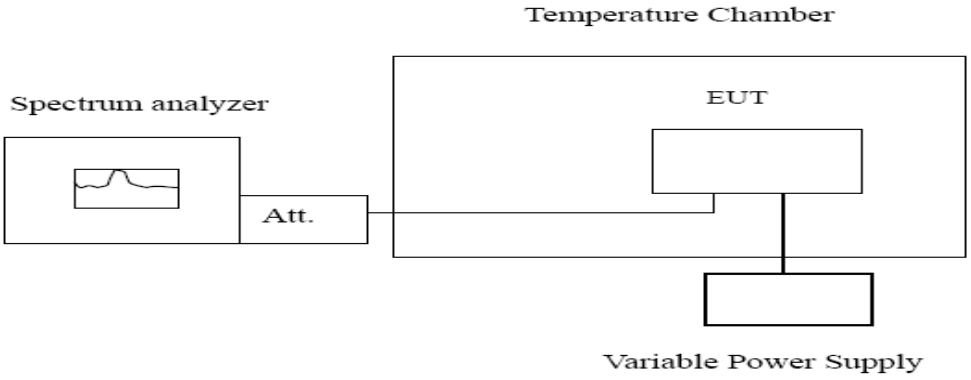
5.6.1. Standard Applicable

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

5.6.2. Test Procedures

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



5.6.3. Test Results

Pass

Summary Of The Worst Test Result(Power Rating: DC 3.7V)				
Band & Channel	**Mode**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
GSM 850 Band CH 190	GSM	21	0.02510	±2.5
	GPRS(Slot 1)	18	0.02152	±2.5
GSM 1900 Band CH 661	GSM	16	0.00851	±2.5
	GPRS(Slot 1)	13	0.00691	±2.5

Summary Of The Worst Test Result(Power Rating: DC 12V)				
Band & Channel	**Mode**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
GSM 850 Band CH 190	GSM	23	0.02749	±2.5
	GPRS(Slot 1)	20	0.02391	±2.5
GSM 1900 Band CH 661	GSM	18	0.00957	±2.5
	GPRS(Slot 1)	17	0.00904	±2.5

Summary Of The Worst Test Result(Power Rating: DC 24V)				
Band & Channel	**Mode**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
GSM 850 Band CH 190	GSM	20	0.02391	±2.5
	GPRS(Slot 1)	17	0.02032	±2.5
GSM 1900 Band CH 661	GSM	16	0.00851	±2.5
	GPRS(Slot 1)	16	0.00851	±2.5

The worst test data as follow:

The Worst Test Result For GSM 850, CH 190, f_O = 836.6MHz				
Temperature (℃)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	21	0.02510	±2.5
-20		17	0.02032	±2.5
-10		15	0.01793	±2.5
0		12	0.01434	±2.5
10		8	0.00956	±2.5
20		8	0.00956	±2.5
30		7	0.00837	±2.5
40		14	0.01673	±2.5
50		14	0.01673	±2.5
25	4.07	10	0.01195	±2.5
25	3.33	18	0.02152	±2.5

The Worst Test Result For PCS 1900, CH 661, f_O = 1880.0MHz				
Temperature (℃)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	11	0.00585	±2.5
-20		15	0.00798	±2.5
-10		13	0.00691	±2.5
0		6	0.00319	±2.5
10		9	0.00479	±2.5
20		11	0.00585	±2.5
30		14	0.00745	±2.5
40		9	0.00479	±2.5
50		13	0.00691	±2.5
25	4.07	11	0.00585	±2.5
25	3.33	16	0.00851	±2.5

The Worst Test Result For GSM 850, CH 190, f_O = 836.6MHz				
Temperature (℃)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	12	23	0.02749	±2.5
-20		19	0.02271	±2.5
-10		18	0.02152	±2.5
0		15	0.01793	±2.5
10		11	0.01315	±2.5
20		11	0.01315	±2.5
30		9	0.01076	±2.5
40		15	0.01793	±2.5
50		17	0.02032	±2.5
25	13.2	13	0.01554	±2.5
25	10.8	19	0.02271	±2.5

The Worst Test Result For PCS 1900, CH 661, f_O = 1880.0MHz				
Temperature (℃)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	12	17	0.00904	±2.5
-20		14	0.00745	±2.5
-10		12	0.00638	±2.5
0		7	0.00372	±2.5
10		9	0.00479	±2.5
20		12	0.00638	±2.5
30		18	0.00957	±2.5
40		14	0.00745	±2.5
50		14	0.00745	±2.5
25	13.2	15	0.00798	±2.5
25	10.8	15	0.00798	±2.5

The Worst Test Result For GSM 850, CH 190, f_O = 836.6MHz				
Temperature (℃)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	24	20	0.02391	±2.5
-20		16	0.01913	±2.5
-10		16	0.01913	±2.5
0		14	0.01673	±2.5
10		10	0.01195	±2.5
20		10	0.01195	±2.5
30		8	0.00956	±2.5
40		12	0.01434	±2.5
50		14	0.01673	±2.5
25	26.4	12	0.01434	±2.5
25	21.6	16	0.01913	±2.5

The Worst Test Result For PCS 1900, CH 661, f_O = 1880.0MHz				
Temperature (℃)	Power Supplied (Vdc)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	24	15	0.00798	±2.5
-20		15	0.00798	±2.5
-10		12	0.00638	±2.5
0		7	0.00372	±2.5
10		10	0.00532	±2.5
20		12	0.00638	±2.5
30		14	0.00745	±2.5
40		10	0.00532	±2.5
50		12	0.00638	±2.5
25	26.4	10	0.00532	±2.5
25	21.6	16	0.00851	±2.5

6. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18,2014	June 17,2015
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16,2014	July 15,2015
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18,2014	June 17,2015
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18,2014	June 17,2015
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18,2014	June 17,2015
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18,2014	June 17,2015
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18,2014	June 17,2015
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHzz	June 18,2014	June 17,2015
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16,2014	July 15,2015
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16,2014	July 15,2015
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	July 16,2014	July 15,2015
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18,2014	June 17,2015
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10,2014	June 09,2015
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10,2014	June 09,2015
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10,2014	June 09,2015
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18,2014	June 17,2015
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18,2014	June 17,2015
Spectrum Meter	R&S	FSP 30	100023	9kHz-30GHz	July 16,2014	July 15,2015
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18,2014	June 17,2015
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18,2014	June 17,2015
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18,2014	June 17,2015
AC Power Source	HPC	HPA-500E	HPA-9100024	AC 0~300V	June 18,2014	June 17,2015
DC power Soure	GW	GPC-6030D	C671845	DC 1V-60V	June 18,2014	June 17,2015
Temp. and Humidigy	Giant Force	GTH-225-20-S	MAB0103-00	N/A	June 18,2014	June 17,2015
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18,2014	June 17,2015
RF CABLE-2m	JYE Bao	RG142	CB)35-2m	20MHz-1GHz	June 18,2014	June 17,2015
Vector signal Generator	R&S	SMU200A	102098	100kHz~6GHz	June 18,2014	June 17,2015
Signal Generator	R&S	SMR40	10016	10MHz~40GHz	July 16,2014	July 15,2015
Universal Radio Communication	R&S	CMU200	112012	N/A	July 18,2014	July 17,2015

Note: All equipment through GRGT EST calibration

7. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

GT08M	GT08S	MT08	--

Belong to the tested device:

Product description : GPS Vehicle Tracker

Model name : GT08

Remark: PCB board, structure and internal of these model(s) are the same,

So no additional models were tested.

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