

Nemko Korea CO., Ltd.

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FCC EVALUATION REPORT FOR CERTIFICATION

Applicant :

Telit Communications S.p.A.

Via Stazione di Prosecco, 5/B 34010 Sgonico

Trieste, Italy

Dates of Issue : May 6, 2008

Test Report No. : NK08R101

Test Site : Nemko Korea Co., Ltd.

FCC ID

RI7UC864G

Brand Name

Telit

Telit Communications S.p.A.

Via Stazione di Prosdcco, 5/B 34010 Sgonico

Trieste, Italy

CONTACT PERSON

Mr. Andrea Fragiacomò

Telephone No. : +39 040 4192111

Applied Standard: FCC 47 Part 2 & 22H & 24E

Classification: PCS Licensed Transmitter (PCB)

EUT Type: GSM850/1900(GPRS/EGPRS)/UMTS850/1900(HSDPA) Module

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003.

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



Tested By : Minchul Shin
Engineer



Reviewed By : H.H. Kim
Manager & Chief Engineer

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1. Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC Part 2 & Part 22 & 24.

Responsible Party :	Telit Communications S.p.A.
Contact Person :	Mr. Andrea Fragiacomò Tel No. : +39 040 4192111
Manufacturer :	Telit Communications S.p.A. Via Stazione di Prosdcco, 5/B 34010 Sgonico, Trieste, Italy

- FCC ID: RI7UC864G
- Model: UC864-G
- Brand Name: Telit
- EUT Type: GSM850/1900(GPRS/EGPRS)/UMTS850/1900(HSDPA)
Module
- Electric Rating: +3.8 Vdc
- Equipment Class: PCS Licensed Transmitter (PCB)
- Applied Standard: FCC 47 CFR 2
FCC 47 CFR Part 22H &24E
- Dates of Test: April 21, 2008 to April 30, 2008
- Place of Tests: Nemko Korea Co., Ltd.

2. Introduction (Site Description)

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions emanating from **Telit Communications S.p.A.**

FCC ID : **RI7UC864G**

These measurement tests were conducted at **Nemko Korea Co., Ltd.**

The site address is 300-2, Osan-Ri, Mohyeon-Myeon, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, KOREA

The area of Nemko Korea Corporation Ltd. Test site is located in a mountain area at 80 kilometers (48 miles) southeast and Incheon International Airport (Incheon Airport), 30 kilometers (18miles) south-southeast from central Seoul.

It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures.

The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.4 2003.



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Fig. 1. The map above shows the Seoul in Korea vicinity area.
The map also shows Nemko Korea Corporation Ltd. and Incheon Airport.

3. Test Conditions & EUT Information

Operating During Test

The EUT was tested at the lowest channel, middle channel and the highest channel under all configurations. Maximum RF power and the worst data were reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GPRS mode using 1 uplink and 1 downlink slot.

Environmental Conditions

Temperature	20 °C ~ 25 °C
Relative Humidity	30 % ~ 55 %

Description of EUT

Frequency Band	Tx	GSM850 : 824.2 ~ 848.8 MHz PCS1900 : 1850.2 ~ 1909.8 MHz WCDMA Band V : 826.4 ~ 846.6 MHz WCDMA Band II : 1852.4 ~ 1907.6 MHz
	Rx	GSM850 : 869.2 ~ 893.8 MHz PCS1900 : 1930.2 ~ 1989.8 MHz WCDMA Band V : 871.4 ~ 891.6 MHz WCDMA Band II : 1932.4 ~ 1987.6 MHz
Output Power	GSM850(GPRS) : 1.633 W(32.13 dBm) GSM850(EDGE) : 0.516 W(27.13 dBm) PCS1900(GPRS) : 0.817 W(29.12 dBm) PCS1900(EDGE) : 0.410 W(26.13 dBm) WCDMA Band V(HSDPA) : 0.211 W(23.25 dBm) WCDMA Band II(HSDPA) : 0.190 W(22.78 dBm)	
Modulation Method	GSM/GPRS: GMSK EDGE: 8PSK WCDMA/HSDPA: QPSK	
Emission Designator	GSM 850(GPRS): 253KGXW GSM 850(EDGE): 245KG7W PCS 1900(GPRS): 246KGXW PCS 1900(EDGE): 246KG7W WCDMA Band V(HSDPA): 4M18F9W WCDMA Band II(HSDPA): 4M19F9W	

Antenna Gain	GSM850,WCDMA Band V (-2.8 dBi) / PCS1900,WCDMA Band II (-1.6 dBi)
Dimensions	45 mm x 30mm x 4.8 mm
Weight	Approx. 13 g
Voltage	3.8 Vdc

Support Equipment

DUAL BAND GSM/UMTS module	Telit Communicaitons S.p.A. Model: UC864-G	S/N: N/A
Wireless Communications Test Set	Agilent Model : E5515C	S/N: GB44051011

4. Measuring Instrument Calibration

All measurements were made with instruments calibrated according to the recommendation by manufacturer. Measurement of radiated emissions and conducted emissions were made with instruments conforming to American National Standards Institute, ANSI C63.4-2003.

The calibration of measuring instrument, including any accessories that may affect test results, were performed according to the recommendation by manufacturer.

5. Summary of Test Results

The EUT has been tested according to the following specification:

Description of Test	FCC Rule	Result
Modulation Characteristics	§2.1047	Complies
ERP / EIRP Measurement	§22.913(a) §24.232(c)	Complies
Conducted Output Power	§2.1046(a)	Complies
Occupied Bandwidth / 26dB Emission Bandwidth	§2.1049	Complies
Spurious Emission at antenna Terminals	§2.1051 §22.917(a) §24.238(a)	Complies
Field Strength of spurious Radiations	§2.1053 §22.917(a) §24.238(a)	Complies
Frequency Stability / Temperature Variation	§2.1055 §22.355 §24.235	Complies
Band Edge	§22.917(a) §24.238(a)	Complies

6. Recommendation / Conclusion

The data collected shows that the **Telit Communications S.p.A.**

FCC ID : **RI7UC864G, GSM850/1900(GPRS/EGPRS)/UMTS850/1900(HSDPA)**

Module. The highest emission observed was at **1697.6 MHz** for radiated emissions with a margin of **17.93 dB.**

7. Test Equipment List

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	Test Receiver	R & S	ESCS 30	833364/020	Apr. 01 2008	1 year
2	*Test Receiver	R & S	ESCS 30	100302	Dec. 03 2007	1 year
3	Amplifier	HP	8447F	2805A03427	Aug. 07 2007	1 year
4	*Amplifier	HP	8447F	2805A03351	Oct. 23 2007	1 year
5	*Amplifier	HP	8449B	3008A00107	May. 12 2007	1 year
6	Spectrum Analyzer	HP	8566B	267A03469	Sep. 06 2007	1 year
7	*LISN	R & S	ESH3-Z5	833874/006	Oct. 23 2007	1 year
8	*Spectrum Analyzer	Agilent	E4440A	MY44303257	Sep. 12 2007	1 year
9	*Biconical Log-Perio. Antenna	ARA	LBP-2520/A	1209	Dec. 31 2007	1 year
10	*Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-474	Jul. 24 2007	1 year
11	*Biconical Log Antenna	ARA	LPB-2520/A	1180	Apr. 21 2008	1 year
12	Signal Generator	R & S	SMP02	833286/003	Aug. 07 2007	1 year
13	*LISN	R & S	ESH3-Z5	833874/006	Oct. 23 2007	1 year
14	*Position Controller	DAEIL EMC	N/A	N/A	N/A	N/A
15	*Turn Table	DAEIL EMC	N/A	N/A	N/A	N/A
16	*Antenna Mast	DAEIL EMC	N/A	N/A	N/A	N/A
17	*Anechoic Chamber	EM Eng.	N/A	N/A	N/A	N/A
18	*Shielded Room	EM Eng.	N/A	N/A	N/A	N/A
19	*Position Controller	Inn-co	CO2000	N/A	N/A	N/A
20	*Turn Table	Inn-co	DS1200S	N/A	N/A	N/A
21	*Antenna Mast	Inn-co	AS2000P	N/A	N/A	N/A
22	*Anechoic Chamber	Seo-Young EMC	N/A	N/A	N/A	N/A
23	*Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-508	Dec. 27 2007	1 year
24	*Communications Test Set	Agilent	E5515C	GB43193659	Jun. 18 2007	1 year
25	*Spectrum Analyzer	Agilent	E4440A	MY44022567	Dec.04 2007	1 year
26	*Signal Generator	Anritsu	68245B	983206	Dec. 05 2007	1 year
27	*Communications Test Set	Agilent	E5515C	GB44051011	Oct. 25 2007	1 year

*) Test equipment used during the test

8. Description of Tests

8.1 Conducted Emissions

The Line conducted emission test facility is located inside a 4 X 7 X 2.5 meter shielded enclosure.

It is manufactured by EM engineering. The shielding effectiveness of the shielded room is in accordance with MIL-STD-285 or NSA 65-6.

A 1m X 1.5m wooden table 0.8m height is placed 0.4m away from the vertical wall and 1.5m away from the side of wall of the shielded room

Rohde & Schwarz (ESH3-Z5) and Kyoritsu (KNW-407) of the 50ohm/50uH Line Impedance Stabilization Network(LISN) are bonded to the shielded room.

The EUT is powered from the Rohde & Schwarz LISN and the support equipment is powered from the Kyoritsu LISN. Power to the LISN s are filtered by high-current high insertion loss Power line filters. The purpose of filter is to attenuate ambient signal interference and this filter is also bonded to shielded enclosure. All electrical cables are shielded by tinned copper zipper tubing with inner diameter of 1/2".

If DC power device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the LISNs,

All interconnecting cables more than 1 meter were shortened by non inductive bundling (serpentine fashion) to a 1 meter length.

Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT. The spectrum was scanned from 150kHz to 30MHz with 20msec sweep time.

The frequency producing the maximum level was re-examined using the EMI test receiver. (Rohde & Schwarz ESCS30).

The detector function were set to CISPR quasi-peak mode & average mode.

The bandwidth of receiver was set to 9KHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.

Each emission was maximized by; switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; which ever determined the worst case emission.

Each EME reported was calibrated using the R&S signal generator.

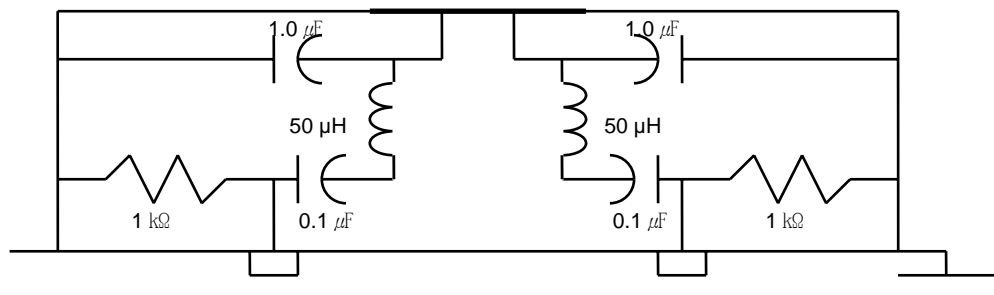


Fig. 2. LISN Schematic Diagram

8.2 Radiated Emissions

Preliminary measurement were made indoors at 3 meter using broad band antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The Technology configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna was note for each frequency found. The spectrum was scanned from 30 to 1000MHz using Biconical log Antenna (ARA, LPB-2520/A).

Final Measurements were made outdoors at 3 or 10m test range using Logbicon Super Antenna (Schwarzbeck, VULB 9166).

The test equipment was placed on a wooden table.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

Each frequency found during pre-scan measurements was reexamined and investigated using EMI test receiver.(ESCS30)

The detector function were set to CISPR quasi-peak and peak mode and the bandwidth of the receiver were set to 120KHz and 1MHz depending on the frequency or type of signal. The half wave dipole antenna was tuned to the frequency found during preliminary radiated measurements.

The EUT support equipment and interconnecting cables were re configured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8m high non- metallic 1.0X 1.5 meter table.

The EUT, support equipment and interconnecting cables were re-arranged and manipulated to maximize each EME emission.

The turn table containing the Technology was rotated; the antenna height was varied 1 to 4meter and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by : switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; which ever determined the worst case emission.

Each EME reported was calibrated using the R/S signal generator.

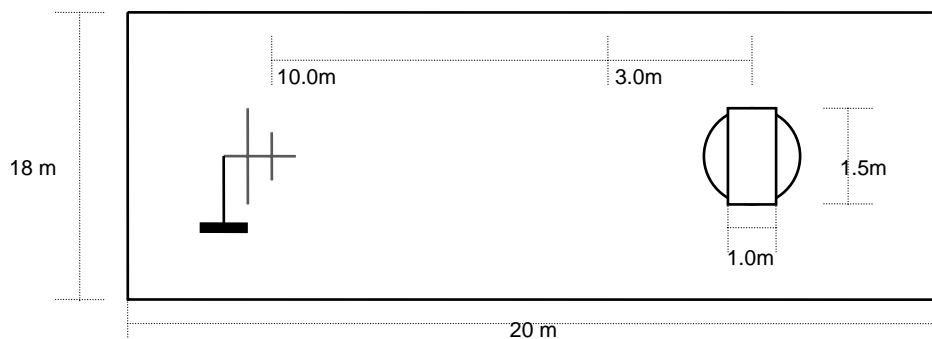


Fig. 3. Dimensions of Outdoor Test Site

8.3 Effective Radiated Power / Equivalent Isotropic Radiated Power

Test Set-up

Effective Radiated Power Output and Equivalent Isotropic Radiated Power output Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2003.

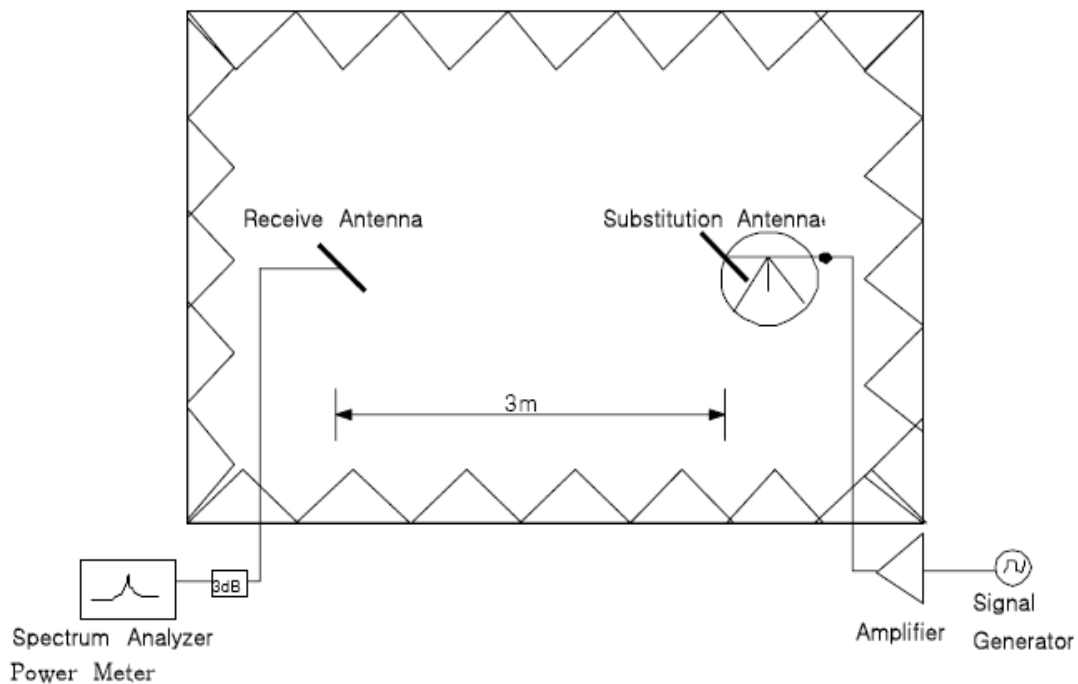


Figure 4. Diagram of ERP/EIRP test Set-up

The EUT was set on a non-conductive turntable in a semi anechoic chamber. In the corner of the chamber there was a communication antenna, which was connected to the BS simulator located outside the chamber. The radiated power from the EUT was measured with an antenna fixed to a antenna tower. The tower and turn table were remotely controlled to turn the EUT and change the antenna polarization. The measured signal was routed from the measuring antenna to the spectrum analyzer. The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

Test Method

- a) The maximum power level was searched by moving the turn table and measuring antenna and manipulating the EUT. This level (P_{EUT}) was recorded.
For CDMA signals, a peak detector is used, with $RBW = VBW = 3$ MHz.
For WCDMA signals, a peak detector is used, with $RBW = VBW = 5$ MHz.
For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with $RBW = VBW = 1$ MHz.
- b) The EUT was replaced with a substituting antenna.

- c) The substituting antenna was fed with the power ($P_{\text{Subst_TX}}$) giving a convenient reading on the spectrum analyzer. That reading ($P_{\text{Subst_RX}}$) on spectrum analyzer was recorded.

8.4 Radiated Spurious & Harmonic Emission

Test Set-up

Effective Radiated Power Output and Equivalent Isotropic Radiated Power output Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2003.

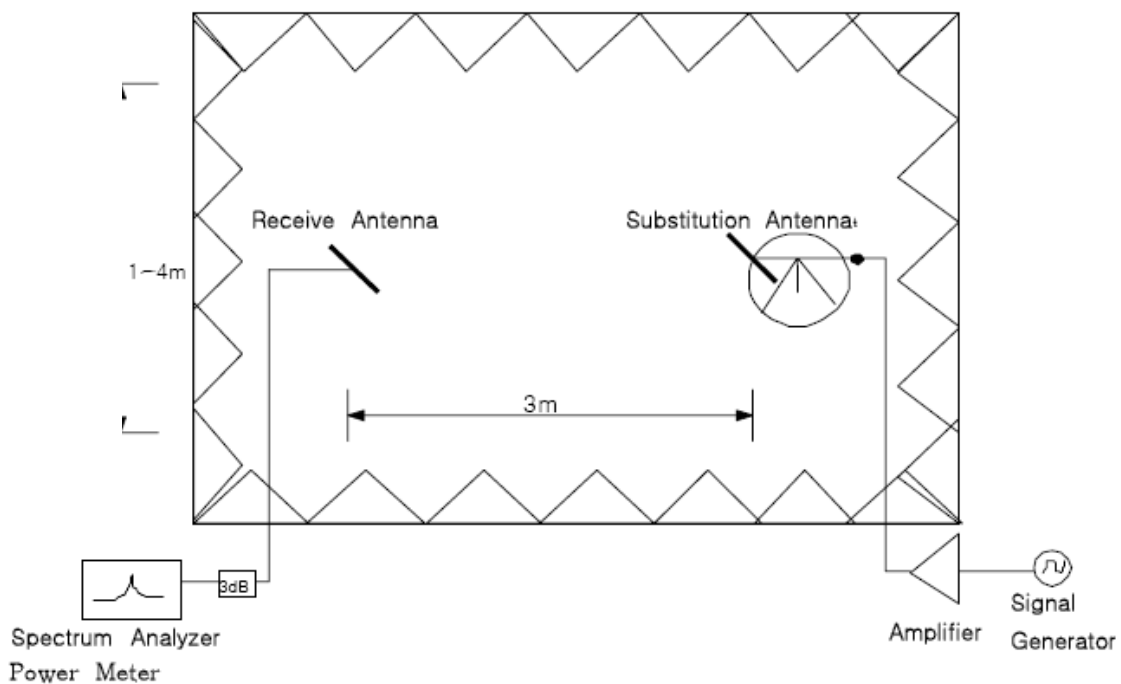


Figure 5. Diagram of Radiated Spurious & Harmonic test Set-up

The EUT was set on a non-conductive turntable in a semi anechoic chamber. In the corner of the chamber there was a communication antenna, which was connected to the BS simulator located outside the chamber. The radiated power from the EUT was measured with an antenna fixed to a antenna tower. The tower and turn table were remotely controlled to turn the EUT and change the antenna polarization. The measured signal was routed from the measuring antenna to the spectrum analyzer. The BS simulator was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

Test Method

- a) The maximum power level was searched by moving the turn table and measuring antenna and manipulating the EUT. This level (P_{EUT}) was recorded. For CDMA signals, a peak detector is used, with $\text{RBW} = \text{VBW} = 3 \text{ MHz}$.

For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz.
 For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz.

- b) The EUT was replaced with a substituting antenna.
- c) The substituting antenna was fed with the power (P_{Subst_TX}) giving a convenient reading on the spectrum analyzer. That reading (P_{Subst_RX}) on spectrum analyzer was recorded.

CALCULATION

The formula below was used to calculate the ERP/EIRP of the EUT.

$P_{subst_TX[dBm]}$, $P_{subst_RX[dBm]}$, $L_{Cable[dB]}$ and $G_{substitute_antenna[dBd]/[dBi]}$ factors are combined in one correction factor.

$$P_{ERP[W]} = \frac{10^{(P_{subst_TX[dBm]} + P_{EUT[dBm]} - P_{subst_RX[dBm]} + G_{subst_antenna[dBd]/[dBi]} - L_{cable[dB]})}}{1000}$$

where the variables are as follows:

$P_{EUT [dBm]}$	Measured power level from the EUT
$P_{Subst_TX [dBm]}$	Power fed to the substituting antenna
$P_{Subst_RX [dBm]}$	Power received with the spectrum analyzer
$G_{Substitute_antenna [dBd]/[dBi]}$	Gain of the substitutive antenna
$L_{Cable [dB]}$	Loss of the cable between signal generator and the substituting antenna

8.5 Occupied Bandwidth / 26dB Emission Bandwidth

Occupied Bandwidth

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown.

26dB Emission Bandwidth

The transmitter output is connected to the spectrum analyzer. The RBW of spectrum analyzer is set to approximately 1% of the emission bandwidth. And peak detection is used. The emission bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 26dB.

8.6 Spurious and Harmonic Emissions at Antenna Terminal

8.6.1 Occupied Bandwidth Emission Limits

- a) On any frequency outside a license's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB.
- b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater.
However, in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed.
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- d) The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

BLOCK	Frequency Range (MHz) Transmitter (Tx)	Frequency Range (MHz) Receiver (Rx)
A* Low +A	824 ~ 835	869 ~ 880
B	835 ~ 845	880 ~ 890
A* High	845 ~ 846.5	890 ~ 891.5
B*	846.5 ~ 849	891.5 ~ 894

Table 1. Cellular Service Frequency Blocks

BLOCK	Frequency Range (MHz) Transmitter (Tx)	Frequency Range (MHz) Receiver (Rx)
A	1850 ~ 1865	1930 ~ 1745
B	1870 ~ 1885	1950 ~ 1965
C	1895 ~ 1910	1975 ~ 1990
D	1865 ~ 1870	1945 ~ 1950
E	1885 ~ 1890	1965 ~ 1970
F	1890 ~ 1895	1970 ~ 1975

Table 2. Broadband PCS Service Frequency Blocks

8.6.2 Conducted Spurious Emission

Minimum standard:

On any frequency outside a license frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43+10\log(P)$ dB. Limit equivalent to -13 dBm, calculation shown below.

$$43 + 10\log(1.77 \text{ W}) = 45.48 \text{ dB}$$

$$32.48 \text{ dBm} - 45.48 \text{ dB} = -13 \text{ dBm}$$

Compliance with the out-of-band emissions requirement is based on test being performed with an analyzer resolution bandwidth of 1 MHz. However in the 1 MHz band immediately outside and adjacent to the frequency block a resolution bandwidth of at least 1 % of the fundamental emissions bandwidth may be employed.

Test Procedure:

The EUT was setup to maximum output power at its lowest channel.

The Resolution BW of the analyzer is set to 1% of the emission bandwidth to show compliance with the -13 dBm limit, in the 1MHz bands immediately outside and adjacent to the edge of the frequency block.

The measurements are repeated for the EUT's highest channel. For the Out-of-Band measurements a 1MHz RBW was used to scan from 30 MHz to 20 GHz.

A display line was placed at -13dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

Plots are shown.

8.7 Frequency Stability / Temperature Variation

The frequency stability of the transmitter is measured by:

- a.) Temperature: The temperature is carried from -30°C to +50°C using an environmental chamber.
- b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (20°C to 25°C to provide a reference).
2. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at -30°C (Usually 14~16 hours), the equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three minute interval after applying to the transmitter.
4. Frequency measurements are made at 10°C interval up to room temperature. At least a period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency measurements are at 10 intervals starting at -30°C up to +50°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after re-applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

9. Test Data

9.1 Effective Radiated Power (ERP/EIRP)

EUT Mode : GSM 850 (GPRS)

Frequency (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBd)	L _{Cable} (dBm)	ERP (dBm)	ERP (Watts)
824.2	H	-6.73	0.00	-39.60	1.00	1.83	32.04	1.600
	V	-18.91	0.00	-39.28	1.00	1.83	19.54	0.090
836.6	H	-5.66	0.00	-37.62	1.30	1.72	31.54	1.426
	V	-17.81	0.00	-37.60	1.30	1.72	19.37	0.086
848.8	H	-5.48	0.00	-37.99	1.61	1.64	32.48	1.770
	V	-17.83	0.00	-37.91	1.61	1.64	20.05	0.101

EUT Mode : PCS 1900 (GPRS)

Frequency (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBi)	L _{Cable} (dBm)	EIRP (dBm)	EIRP (Watts)
1850.2	H	-11.05	0.00	-33.63	10.40	2.69	30.29	1.069
	V	-11.57	0.00	-33.42	10.40	2.69	29.56	0.904
1880.0	H	-11.72	0.00	-33.55	10.43	2.64	29.62	0.916
	V	-11.65	0.00	-33.55	10.43	2.64	29.69	0.931
1909.8	H	-11.82	0.00	-33.43	10.44	2.59	29.46	0.883
	V	-11.31	0.00	-33.52	10.44	2.59	30.06	1.014

Radiated Measurements at 3meters

EUT Mode : GSM 850 (EDGE)

Frequency (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBd)	L _{Cable} (dBm)	ERP (dBm)	ERP (Watts)
824.2	H	-11.39	0.00	-39.60	1.00	1.83	27.38	0.547
	V	-22.85	0.00	-39.28	1.00	1.83	15.60	0.036
836.6	H	-10.29	0.00	-37.62	1.30	1.72	26.91	0.491
	V	-21.23	0.00	-37.60	1.30	1.72	15.95	0.039
848.8	H	-10.27	0.00	-37.99	1.61	1.64	27.69	0.587
	V	-20.97	0.00	-37.91	1.61	1.64	16.91	0.049

EUT Mode : PCS 1900 (EDGE)

Frequency (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBi)	L _{Cable} (dBm)	EIRP (dBm)	ERP (Watts)
1850.2	H	-13.53	0.00	-33.63	10.40	2.69	27.81	0.604
	V	-14.22	0.00	-33.42	10.40	2.69	26.91	0.491
1880.0	H	-14.04	0.00	-33.55	10.43	2.64	27.30	0.537
	V	-14.18	0.00	-33.55	10.43	2.64	27.16	0.520
1909.8	H	-14.20	0.00	-33.43	10.44	2.59	27.08	0.511
	V	-14.27	0.00	-33.52	10.44	2.59	27.10	0.513

Radiated Measurements at 3meters

EUT Mode : WCDMA Band V (12.2 kbps)

Frequency (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBd)	L _{Cable} (dBm)	ERP (dBm)	ERP (Watts)
826.4	H	-14.23	0.00	-39.60	1.00	1.83	24.54	0.284
	V	-25.44	0.00	-39.28	1.00	1.83	13.01	0.020
836.6	H	-14.36	0.00	-37.62	1.30	1.72	22.84	0.192
	V	-25.14	0.00	-37.60	1.30	1.72	12.04	0.016
846.6	H	-14.86	0.00	-37.99	1.61	1.64	23.10	0.204
	V	-25.25	0.00	-37.91	1.61	1.64	12.63	0.018

EUT Mode : WCDMA II (12.2 kbps)

Frequency (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBi)	L _{Cable} (dBm)	EIRP (dBm)	EIRP (Watts)
1852.4	H	-14.84	0.00	-33.63	10.40	2.69	26.50	0.447
	V	-15.33	0.00	-33.42	10.40	2.69	25.80	0.380
1880.0	H	-15.30	0.00	-33.55	10.43	2.64	26.04	0.402
	V	-15.34	0.00	-33.55	10.43	2.64	26.00	0.398
1907.6	H	-15.10	0.00	-33.43	10.44	2.59	26.18	0.415
	V	-14.72	0.00	-33.52	10.44	2.59	26.65	0.462

Radiated Measurements at 3meters

EUT Mode : WCDMA Band V (HSDPA)

Frequency (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBd)	L _{Cable} (dBm)	ERP (dBm)	ERP (Watts)
826.4	H	-13.94	0.00	-39.60	1.00	1.83	24.83	0.304
	V	-25.04	0.00	-39.28	1.00	1.83	13.41	0.022
836.6	H	-13.77	0.00	-37.62	1.30	1.72	23.43	0.220
	V	-24.50	0.00	-37.60	1.30	1.72	12.68	0.019
846.6	H	-14.02	0.00	-37.99	1.61	1.64	23.94	0.248
	V	-24.80	0.00	-37.91	1.61	1.64	13.08	0.020

EUT Mode : WCDMA II (HSDPA)

Frequency (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBi)	L _{Cable} (dBm)	EIRP (dBm)	EIRP (Watts)
1852.4	H	-13.56	0.00	-33.63	10.40	2.69	27.78	0.600
	V	-14.11	0.00	-33.42	10.40	2.69	27.02	0.504
1880.0	H	-13.19	0.00	-33.55	10.43	2.64	28.15	0.653
	V	-14.13	0.00	-33.55	10.43	2.64	27.21	0.526
1907.6	H	-14.41	0.00	-33.43	10.44	2.59	26.87	0.486
	V	-14.53	0.00	-33.52	10.44	2.59	26.84	0.483

Radiated Measurements at 3meters

9.2 Conducted Output Power

Measurement Results:

EUT Mode	Channel	Frequency	Measurement Power	Measurement Power
		(MHz)	(dBm)	(Watts)
GSM850 (GPRS)	128	824.2	32.13	1.633
	190	836.6	32.11	1.626
	251	848.8	32.01	1.589
PCS1900 (GPRS)	512	1850.2	29.06	0.805
	661	1880.0	29.12	0.817
	810	1909.8	28.98	0.791
GSM850 (EDGE)	128	824.2	27.13	0.516
	190	836.6	27.11	0.514
	251	848.8	27.05	0.507
PCS1900 (EDGE)	512	1850.2	26.06	0.404
	661	1880.0	26.13	0.410
	810	1909.8	26.01	0.399
WCDMA Band V (12.2 kbps)	4132	826.4	23.22	0.210
	4182	836.4	22.98	0.199
	4233	846.6	23.18	0.208
WCDMA Band V (64 kbps)	4132	826.4	23.25	0.211
	4182	836.4	22.95	0.197
	4233	846.6	23.24	0.211
WCDMA Band V (144 kbps)	4132	826.4	23.23	0.210
	4182	836.4	22.97	0.198
	4233	846.6	23.23	0.210
WCDMA Band V (384 kbps)	4132	826.4	23.22	0.210
	4182	836.4	22.97	0.198
	4233	846.6	23.24	0.211
WCDMA Band V (AMR)	4132	826.4	23.18	0.208
	4182	836.4	22.97	0.198
	4233	846.6	23.21	0.209
WCDMA Band V (12.2 kbps+HSDPA)	4132	826.4	23.16	0.207
	4182	836.4	22.79	0.190
	4233	846.6	23.04	0.201

EUT Mode	Channel	Frequency	Measurement Power	Measurement Power
		(MHz)	(dBm)	(Watts)
WCDMA Band II (12.2 kbps)	9262	1852.4	22.77	0.189
	9400	1880.0	22.52	0.179
	9538	1907.6	22.56	0.180
WCDMA Band II (64 kbps)	9262	1852.4	22.72	0.187
	9400	1880.0	22.52	0.179
	9538	1907.6	22.55	0.180
WCDMA Band II (144 kbps)	9262	1852.4	22.78	0.190
	9400	1880.0	22.55	0.180
	9538	1907.6	22.56	0.180
WCDMA Band II (384 kbps)	9262	1852.4	22.76	0.189
	9400	1880.0	22.56	0.180
	9538	1907.6	22.56	0.180
WCDMA Band II (AMR)	9262	1852.4	22.75	0.188
	9400	1880.0	22.52	0.179
	9538	1907.6	22.54	0.179
WCDMA Band II (12.2 kbps+HSDPA)	9262	1852.4	22.56	0.180
	9400	1880.0	22.33	0.171
	9538	1907.6	22.28	0.169

9.3 Occupied Bandwidth / 26dB Emission Bandwidth

Measurement Result:

EUT Mode	Channel	Frequency (MHz)	Occupied Bandwidth (kHz)	26dB Emission Bandwidth (kHz)
GSM850 (GPRS)	128	824.2	245	313
	190	836.6	253	321
	251	848.8	248	318
PCS1900 (GPRS)	512	1850.2	246	311
	661	1880.0	245	309
	810	1909.8	246	314
GSM850 (EDGE)	128	824.2	243	311
	190	836.6	245	313
	251	848.8	242	313
PCS1900 (EDGE)	512	1850.2	246	316
	661	1880.0	242	308
	810	1909.8	240	309

EUT Mode	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26dB Emission Bandwidth (MHz)
WCDMA Band V (12.2 kbps)	4132	826.4	4.169	4.701
	4182	836.4	4.201	4.694
	4233	846.6	4.186	4.693
WCDMA Band V (12.2 kbps+HSDPA)	4132	826.4	4.156	4.653
	4182	836.4	4.174	4.685
	4233	846.6	4.179	4.706
WCDMA Band II (12.2 kbps)	9262	1852.4	4.169	4.694
	9400	1880.0	4.179	4.687
	9538	1907.6	4.191	4.658
WCDMA Band II (12.2 kbps+HSDPA)	9262	1852.4	4.182	4.698
	9400	1880.0	4.173	4.690
	9538	1907.6	4.194	4.676

9.4 Radiated Spurious & Harmonic Emission (GSM850_GPRS)

CH128 (824.2MHz)

Freq. (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBd)	L _{Cable} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1648.4	H	-44.96	0.00	-1.12	7.51	2.39	-38.72	-13	25.72
	V	-53.32	0.00	-0.83	7.51	2.39	-47.37	-13	34.37
2472.6	H	-51.77	0.00	-2.88	8.34	2.80	-43.35	-13	30.35
	V	-49.40	0.00	-2.66	8.34	2.80	-41.20	-13	28.20
3296.8	H	-66.20	0.00	-4.59	10.38	3.57	-54.80	-13	41.80
	V	-65.45	0.00	-4.15	10.38	3.57	-54.49	-13	41.49
4121.0	H	-66.47	0.00	-8.39	10.51	4.02	-51.59	-13	38.59
	V	-66.16	0.00	-8.36	10.51	4.02	-51.31	-13	38.31

CH190 (836.6MHz)

Freq. (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBd)	L _{Cable} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1673.2	H	-41.79	0.00	-1.08	7.62	2.41	-35.50	-13	22.50
	V	-42.70	0.00	-0.82	7.62	2.41	-36.67	-13	23.67
2509.8	H	-49.33	0.00	-3.12	8.42	2.81	-40.60	-13	27.60
	V	-47.25	0.00	-2.84	8.42	2.81	-38.80	-13	25.80
3346.4	H	-66.22	0.00	-4.41	10.58	3.56	-54.79	-13	41.79
	V	-66.08	0.00	-3.97	10.58	3.56	-55.09	-13	42.09
4183.0	H	-65.13	0.00	-8.39	10.54	4.12	-50.32	-13	37.32
	V	-65.96	0.00	-8.32	10.54	4.12	-51.22	-13	38.22

CH251 (848.8MHz)

Freq. (MHz)	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	G_{antenna} (dBd)	L_{Cable} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1697.6	H	-37.25	0.00	-1.03	7.73	2.44	-30.93	-13	17.93
	V	-37.97	0.00	-0.80	7.73	2.44	-31.88	-13	18.88
2546.4	H	-48.59	0.00	-3.36	8.50	2.83	-39.56	-13	26.56
	V	-45.42	0.00	-3.01	8.50	2.83	-36.74	-13	23.74
3395.2	H	-65.57	0.00	-4.24	10.79	3.55	-54.09	-13	41.09
	V	-65.34	0.00	-3.79	10.79	3.55	-54.31	-13	41.31
4244.0	H	-67.42	0.00	-8.43	10.55	4.15	-52.59	-13	39.59
	V	-66.58	0.00	-8.24	10.55	4.15	-51.94	-13	38.94

Note: 1. All modes of operation were investigated and the worst -case emission are reported.

9.5 Radiated Spurious & Harmonic Emission (PCS1900_GPRS)

CH512 (1850.2MHz)

Freq. (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBi)	L _{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3700.4	H	-66.25	0.00	-11.32	12.66	3.79	-46.06	-13	33.06
	V	-66.97	0.00	-11.38	12.66	3.79	-46.72	-13	33.72
5550.6	H	-66.78	0.00	-9.55	13.15	4.67	-48.75	-13	35.75
	V	-62.47	0.00	-9.14	13.15	4.67	-44.85	-13	31.85
7400.8	H	-66.49	0.00	-17.64	11.01	5.43	-43.27	-13	30.27
	V	-65.79	0.00	-17.32	11.01	5.43	-42.89	-13	29.89
9251.0	H	-66.99	0.00	-18.97	11.70	6.12	-42.44	-13	29.44
	V	-64.96	0.00	-19.21	11.70	6.12	-40.17	-13	27.17

CH661 (1880.0MHz)

Freq. (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBi)	L _{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3760.0	H	-66.16	0.00	-10.55	12.71	3.84	-46.74	-13	33.74
	V	-65.41	0.00	-10.63	12.71	3.84	-45.91	-13	32.91
5640.0	H	-66.93	0.00	-9.87	13.14	4.72	-48.64	-13	35.64
	V	-59.37	0.00	-9.49	13.14	4.72	-41.46	-13	28.46
7520.0	H	-65.93	0.00	-17.77	11.28	5.54	-42.42	-13	29.42
	V	-66.97	0.00	-17.45	11.28	5.54	-43.78	-13	30.78
9400.0	H	-67.11	0.00	-19.06	11.59	5.77	-42.23	-13	29.23
	V	-66.03	0.00	-19.32	11.59	5.77	-40.89	-13	27.89

CH810 (1909.8MHz)

Freq. (MHz)	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	G_{antenna} (dBi)	L_{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3819.6	H	-66.54	0.00	-9.87	12.74	3.87	-47.80	-13	34.80
	V	-65.85	0.00	-9.96	12.74	3.87	-47.02	-13	34.02
5729.4	H	-67.23	0.00	-10.62	13.11	4.91	-48.41	-13	35.41
	V	-59.94	0.00	-10.20	13.11	4.91	-41.54	-13	28.54
7639.2	H	-67.00	0.00	-17.85	11.46	5.61	-43.30	-13	30.30
	V	-67.36	0.00	-17.53	11.46	5.61	-43.98	-13	30.98
9549.0	H	-66.84	0.00	-19.26	11.85	5.84	-41.57	-13	28.57
	V	-66.54	0.00	-19.51	11.85	5.84	-41.02	-13	28.02

Note: 1. All modes of operation were investigated and the worst -case emission are reported.

9.6 Radiated Spurious & Harmonic Emission (WCDMA Band V_HSDPA)

CH4132 (826.4 MHz)

Freq. (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBd)	L _{Cable} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1652.8	H	-57.62	0.00	-1.11	7.53	2.40	-51.38	-13	38.38
	V	-60.50	0.00	-0.83	7.53	2.40	-54.54	-13	41.54
2479.2	H	-65.66	0.00	-2.93	8.36	2.80	-57.17	-13	44.17
	V	-65.66	0.00	-2.69	8.36	2.80	-57.41	-13	44.41
3305.6	H	-65.91	0.00	-4.56	10.41	3.56	-54.50	-13	41.50
	V	-66.42	0.00	-4.12	10.41	3.56	-55.45	-13	42.45
4132.0	H	-67.11	0.00	-8.39	10.52	4.04	-52.24	-13	39.24
	V	-66.87	0.00	-8.35	10.52	4.04	-52.04	-13	39.04

CH4182 (836.4 MHz)

Freq. (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBd)	L _{Cable} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1673.2	H	-49.45	0.00	-1.08	7.62	2.41	-43.16	-13	30.16
	V	-51.64	0.00	-0.82	7.62	2.41	-45.61	-13	32.61
2509.8	H	-65.03	0.00	-3.12	8.42	2.81	-56.30	-13	43.30
	V	-65.86	0.00	-2.84	8.42	2.81	-57.41	-13	44.41
3346.4	H	-65.81	0.00	-4.41	10.58	3.56	-54.38	-13	41.38
	V	-65.89	0.00	-3.97	10.58	3.56	-54.90	-13	41.90
4183.0	H	-66.82	0.00	-8.39	10.54	4.12	-52.01	-13	39.01
	V	-66.74	0.00	-8.32	10.54	4.12	-52.00	-13	39.00

CH4233 (846.6 MHz)

Freq. (MHz)	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	G_{antenna} (dBd)	L_{Cable} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1693.2	H	-50.16	0.00	-1.04	7.71	2.43	-43.84	-13	30.84
	V	-51.68	0.00	-0.80	7.71	2.43	-45.60	-13	32.60
2539.8	H	-65.67	0.00	-3.31	8.49	2.83	-56.70	-13	43.70
	V	-65.33	0.00	-2.98	8.49	2.83	-56.69	-13	43.69
3386.4	H	-66.28	0.00	-4.27	10.75	3.55	-54.81	-13	41.81
	V	-65.80	0.00	-3.82	10.75	3.55	-54.78	-13	41.78
4233.0	H	-66.02	0.00	-8.42	10.55	4.15	-51.20	-13	38.20
	V	-66.57	0.00	-8.25	10.55	4.15	-51.92	-13	38.92

Note: 1. All modes of operation were investigated and the worst -case emission are reported.

9.7 Radiated Spurious & Harmonic Emission (WCDMA Band II_HSDPA)

CH9262 (1852.4 MHz)

Freq. (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBi)	L _{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3700.4	H	-67.55	0.00	-11.27	12.66	3.79	-47.41	-13	34.41
	V	-67.29	0.00	-11.32	12.66	3.79	-47.10	-13	34.10
5550.6	H	-65.97	0.00	-9.54	13.15	4.67	-47.95	-13	34.95
	V	-67.63	0.00	-9.14	13.15	4.67	-50.01	-13	37.01
7400.8	H	-67.60	0.00	-17.65	11.03	5.44	-44.36	-13	31.36
	V	-67.28	0.00	-17.33	11.03	5.44	-44.36	-13	31.36
9251.0	H	-67.36	0.00	-18.98	11.69	6.09	-42.78	-13	29.78
	V	-66.71	0.00	-19.22	11.69	6.09	-41.89	-13	28.89

CH9400 (1880.0 MHz)

Freq. (MHz)	Ant. Pol.	P _{EUT} (dBm)	P _{TX} (dBm)	P _{RX} (dBm)	G _{antenna} (dBi)	L _{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3760.0	H	-67.72	0.00	-10.55	12.71	3.84	-48.30	-13	35.30
	V	-65.66	0.00	-10.63	12.71	3.84	-46.16	-13	33.16
5640.0	H	-66.94	0.00	-9.87	13.14	4.72	-48.65	-13	35.65
	V	-67.04	0.00	-9.49	13.14	4.72	-49.13	-13	36.13
7520.0	H	-66.34	0.00	-17.77	11.28	5.54	-42.83	-13	29.83
	V	-67.03	0.00	-17.45	11.28	5.54	-43.84	-13	30.84
9400.0	H	-66.77	0.00	-19.06	11.59	5.77	-41.89	-13	28.89
	V	-66.71	0.00	-19.32	11.59	5.77	-41.57	-13	28.57

CH9538 (1907.6 MHz)

Freq. (MHz)	Ant. Pol.	P_{EUT} (dBm)	P_{TX} (dBm)	P_{RX} (dBm)	G_{antenna} (dBi)	L_{Cable} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3815.20	H	-66.07	0.00	-9.91	12.74	3.88	-47.30	-13	34.30
	V	-62.65	0.00	-10.00	12.74	3.88	-43.79	-13	30.79
5722.80	H	-67.69	0.00	-10.56	13.11	4.90	-48.92	-13	35.92
	V	-67.49	0.00	-10.14	13.11	4.90	-49.14	-13	36.14
7630.40	H	-67.18	0.00	-17.85	11.46	5.61	-43.48	-13	30.48
	V	-67.20	0.00	-17.53	11.46	5.61	-43.82	-13	30.82
9538.00	H	-67.08	0.00	-19.26	11.83	5.84	-41.83	-13	28.83
	V	-66.71	0.00	-19.49	11.83	5.84	-41.23	-13	28.23

Note: 1. All modes of operation were investigated and the worst -case emission are reported.

9.8 Frequency Stability / Temperature Variation (GSM850_GPRS)

Test Mode : Set to Middle channel (836.6MHz)

Deviation Limit : $\pm 2.5\text{ppm}$

Measurement Result :

Voltage (%)	Power (Vdc)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	PPM
100%	3.8	+23(Ref.)	836599989	-11	-0.0131
100%		-30	836599985	-15	-0.0179
100%		-20	836600013	13	0.0155
100%		-10	836600018	18	0.0215
100%		0	836600010	10	0.0120
100%		10	836600023	23	0.0275
100%		20	836599991	-9	-0.0108
100%		30	836599988	-12	-0.0143
100%		40	836600011	11	0.0131
100%		50	836599985	-15	-0.0179
85%		3.23	23	836599977	-23
115%	4.37	23	836599986	-14	-0.0167

*The temperature is varied from -30°C to +50°C using an environmental chamber.

9.9 Frequency Stability / Temperature Variation (PCS1900_GPRS)

Test Mode : Set to Middle channel (1880.0MHz)

Deviation Limit : $\pm 2.5\text{ppm}$

Measurement Result :

Voltage (%)	Power (Vdc)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	PPM
100%	3.8	+23(Ref.)	1879999991	-9	-0.0048
100%		-30	1879999990	-10	-0.0053
100%		-20	1880000006	6	0.0032
100%		-10	1879999992	-8	-0.0043
100%		0	1880000016	16	0.0085
100%		10	1879999967	-33	-0.0176
100%		20	1880000011	11	0.0059
100%		30	1879999974	-26	-0.0138
100%		40	1879999959	-41	-0.0218
100%		50	1880000022	22	0.0117
85%		3.23	23	1879999968	-32
115%	4.37	23	1879999983	-17	-0.0090

*The temperature is varied from -30°C to +50°C using an environmental chamber.

9.10 Frequency Stability / Temperature Variation (GSM850_EDGE)

Test Mode : Set to Middle channel (836.6MHz)

Deviation Limit : $\pm 2.5\text{ppm}$

Measurement Result :

Voltage (%)	Power (Vdc)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	PPM
100%	3.8	+23(Ref.)	836599986	-14	-0.0167
100%		-30	836599981	-19	-0.0227
100%		-20	836600006	6	0.0072
100%		-10	836600009	9	0.0108
100%		0	836599958	-42	-0.0502
100%		10	836600005	5	0.0060
100%		20	836600012	12	0.0143
100%		30	836599979	-21	-0.0251
100%		40	836599980	-20	-0.0239
100%		50	836599963	-37	-0.0442
85%		3.23	23	836599982	-18
115%	4.37	23	836600011	11	0.0131

*The temperature is varied from -30°C to +50°C using an environmental chamber.

9.11 Frequency Stability / Temperature Variation (PCS1900_EDGE)

Test Mode : Set to Middle channel (1880.0MHz)

Deviation Limit : $\pm 2.5\text{ppm}$

Measurement Result :

Voltage (%)	Power (Vdc)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	PPM
100%	3.8	+23(Ref.)	1880000025	25	0.0133
100%		-30	1879999979	-21	-0.0112
100%		-20	1880000011	11	0.0059
100%		-10	1880000011	11	0.0059
100%		0	1879999898	-102	-0.0543
100%		10	1879999960	-40	-0.0213
100%		20	1880000022	22	0.0117
100%		30	1879999965	-35	-0.0186
100%		40	1879999961	-39	-0.0207
100%		50	1879999911	-89	-0.0473
85%		3.23	23	1879999985	-15
115%	4.37	23	1880000023	23	0.0122

*The temperature is varied from -30°C to +50°C using an environmental chamber.

9.12 Frequency Stability / Temperature Variation (WCDMA Band V_HSDPA)

Test Mode : Set to Middle channel (836.6MHz)

Deviation Limit : $\pm 2.5\text{ppm}$

Measurement Result :

Voltage (%)	Power (Vdc)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	PPM
100%	3.8	+23(Ref.)	836599921	-79	-0.0944
100%		-30	836599904	-96	-0.1148
100%		-20	836599922	-78	-0.0932
100%		-10	836600112	112	0.1339
100%		0	836599906	-94	-0.1124
100%		10	836599900	-100	-0.1195
100%		20	836599923	-77	-0.0920
100%		30	836599903	-97	-0.1159
100%		40	836599928	-72	-0.0861
100%		50	836600060	60	0.0717
85%		3.23	23	836599901	-99
115%	4.37	23	836599919	-81	-0.0968

*The temperature is varied from -30°C to +50°C using an environmental chamber.

9.13 Frequency Stability / Temperature Variation (WCDMA Band II_HSDPA)

Test Mode : Set to Middle channel (1880.0MHz)

Deviation Limit : $\pm 2.5\text{ppm}$

Measurement Result :

Voltage (%)	Power (Vdc)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	PPM
100%	3.8	+23(Ref.)	1879999917	-83	-0.0441
100%		-30	1879999909	-91	-0.0484
100%		-20	1879999883	-117	-0.0622
100%		-10	1880000097	97	0.0516
100%		0	1879999892	-108	-0.0574
100%		10	1879999898	-102	-0.0543
100%		20	1879999920	-80	-0.0426
100%		30	1879999907	-93	-0.0495
100%		40	1879999904	-96	-0.0511
100%		50	1880000068	68	0.0362
85%		3.23	23	1880000094	94
115%	4.37	23	1879999889	-111	-0.0590

*The temperature is varied from -30°C to +50°C using an environmental chamber.

10. Emission Designator

Emission Designator

Emission Designator = 250KGXW

GSM Bandwidth = 250KHz

G = Phase Modulation

X = Cases not otherwise covered

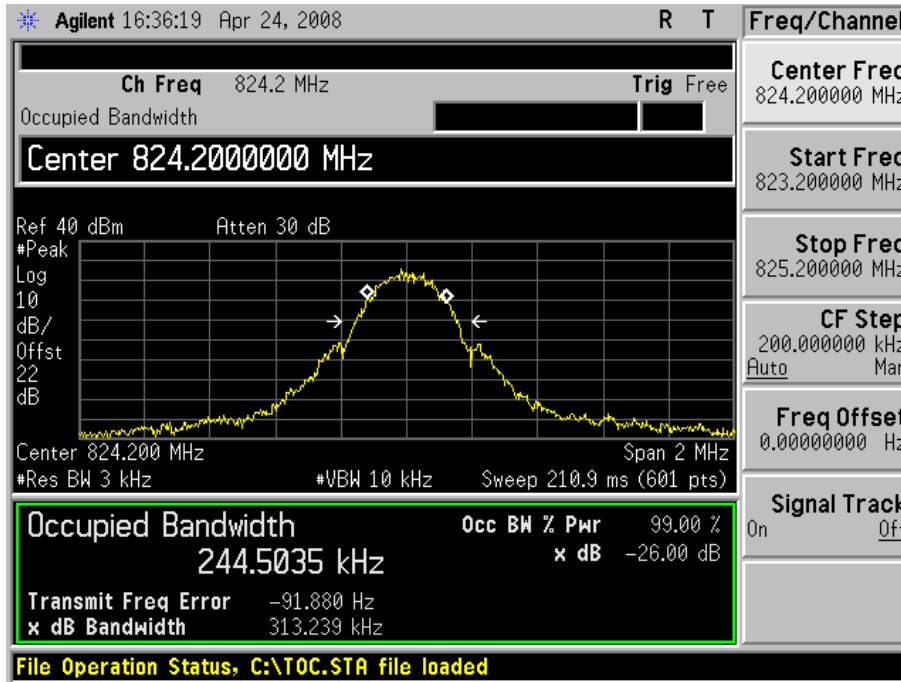
W = Combination (Audio/Data)

- End of page -

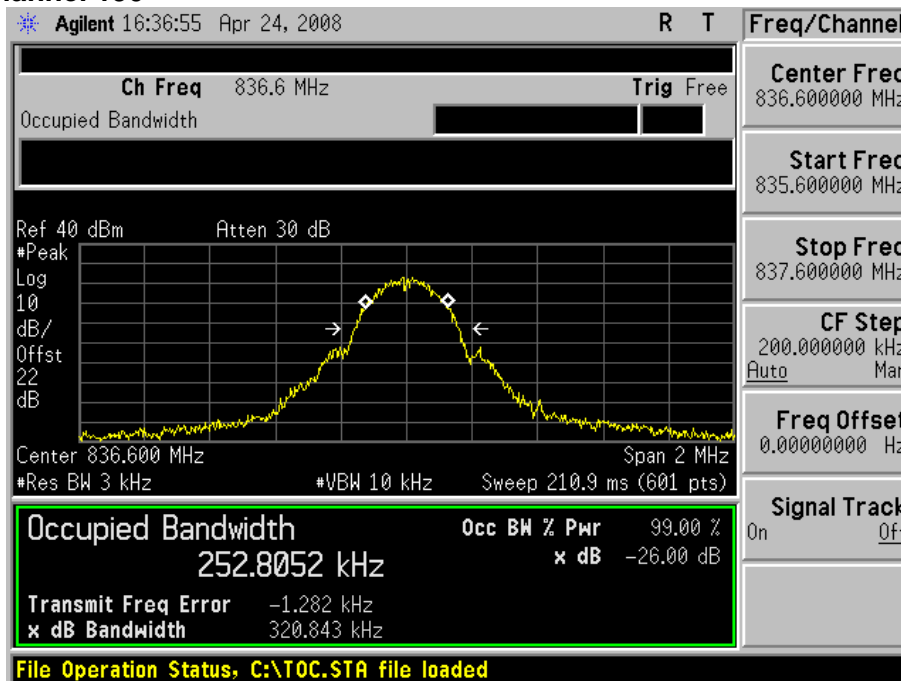
11. Test Plots (GSM850_GPRS)

● Occupied Bandwidth / 26dB Bandwidth

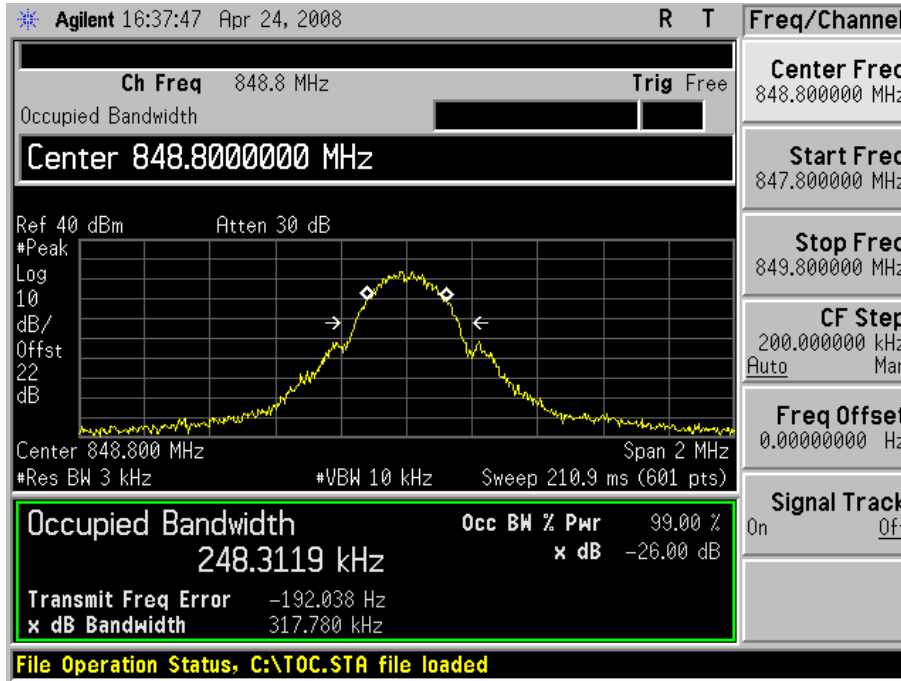
Channel 128



Channel 190

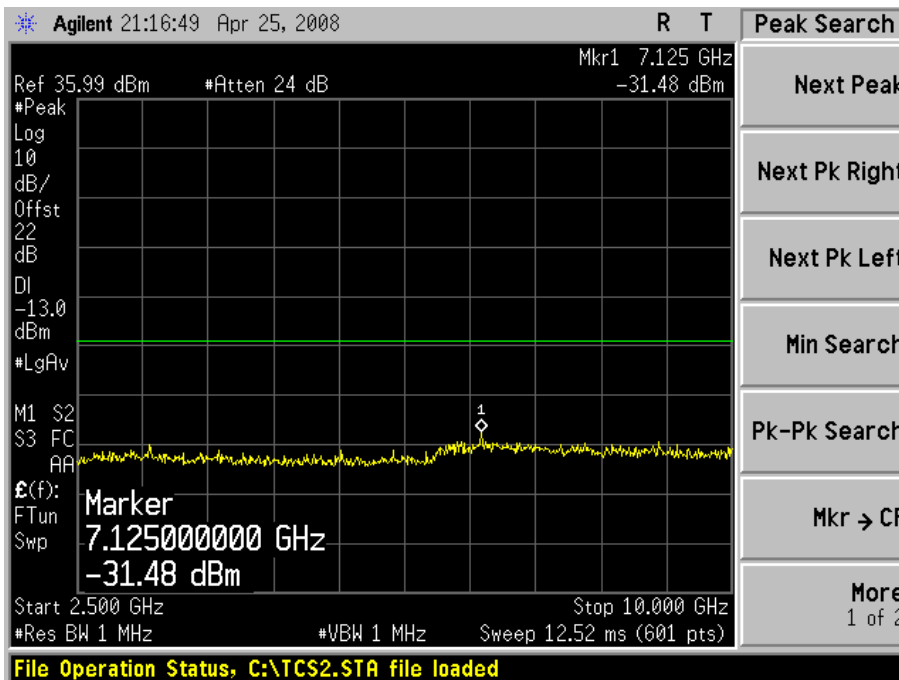
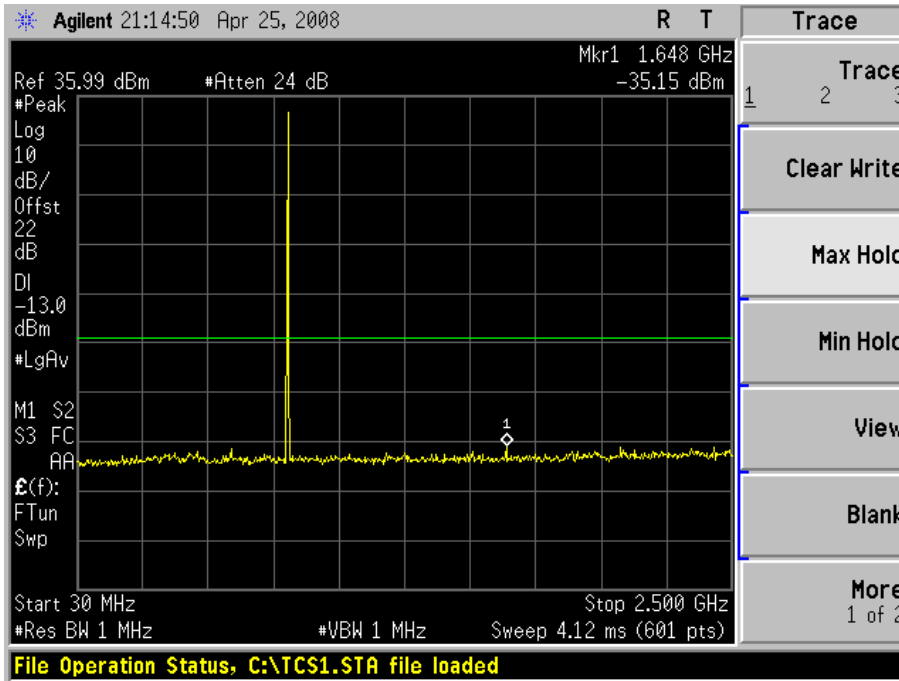


Channel 251

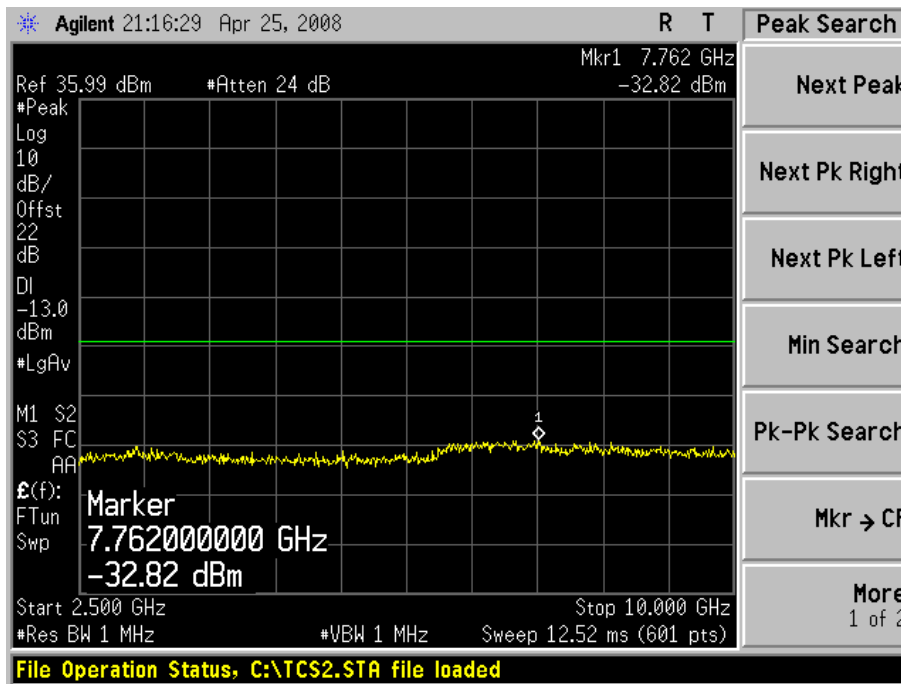
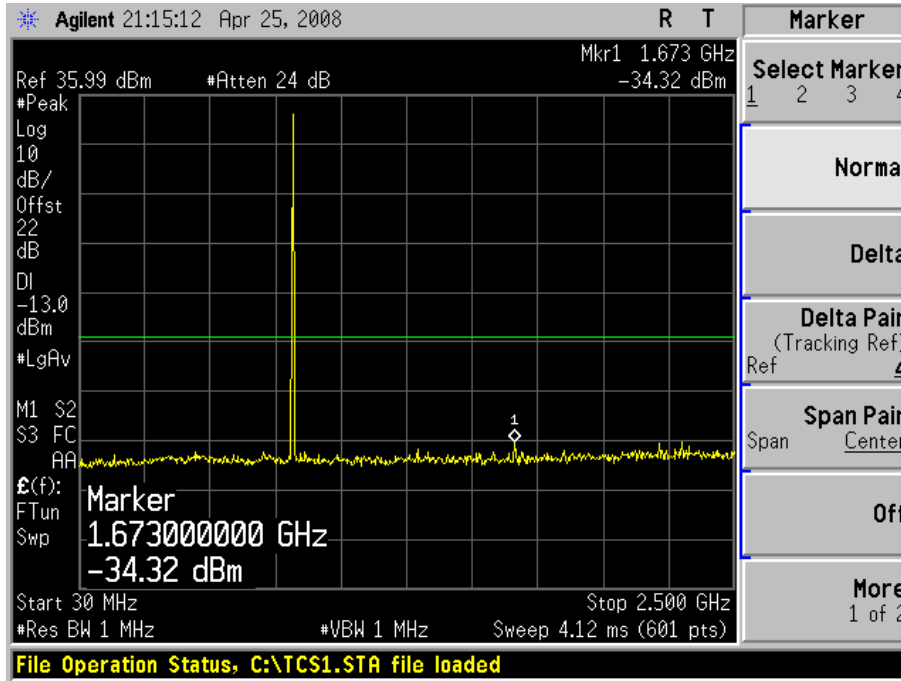


● Spurious Emission at antenna Terminals

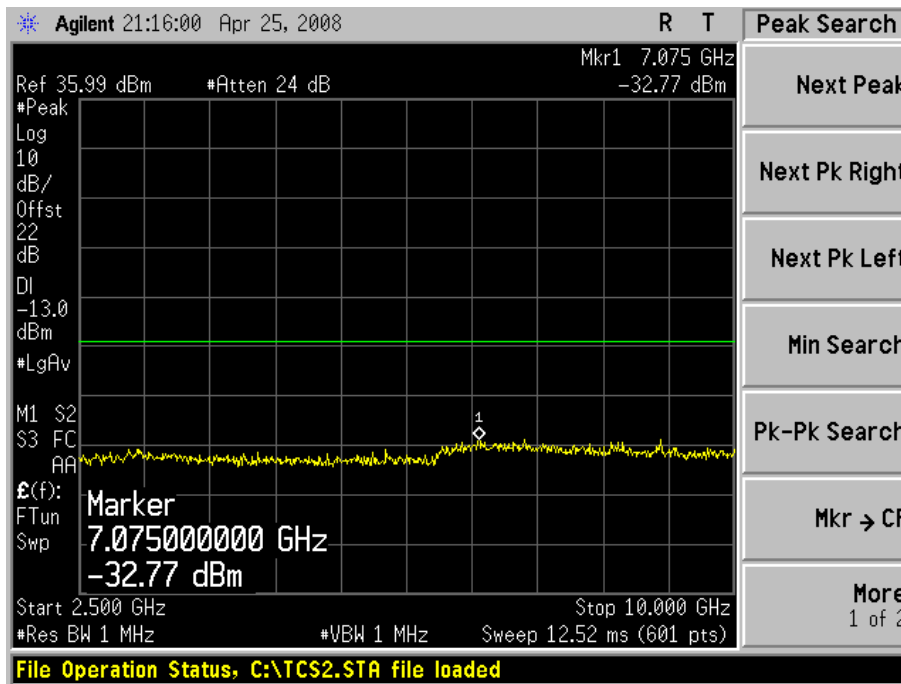
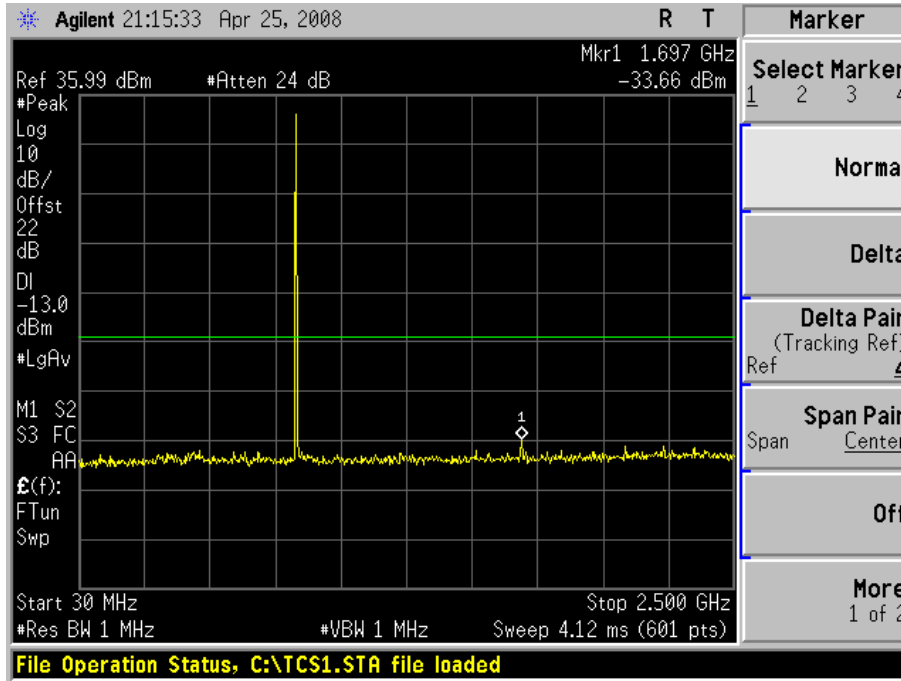
Channel 128



Channel 190

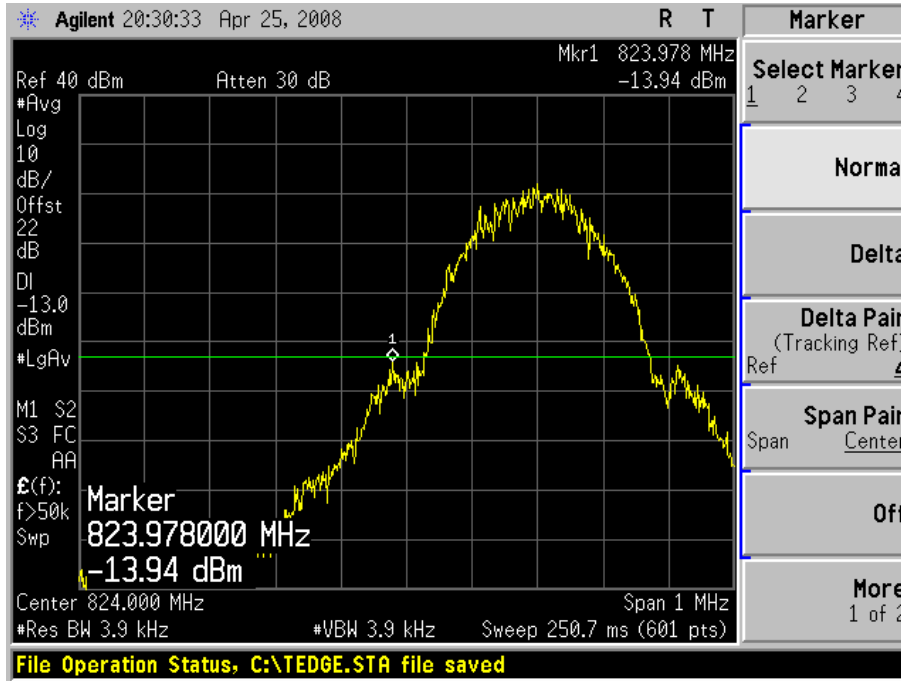


Channel 251

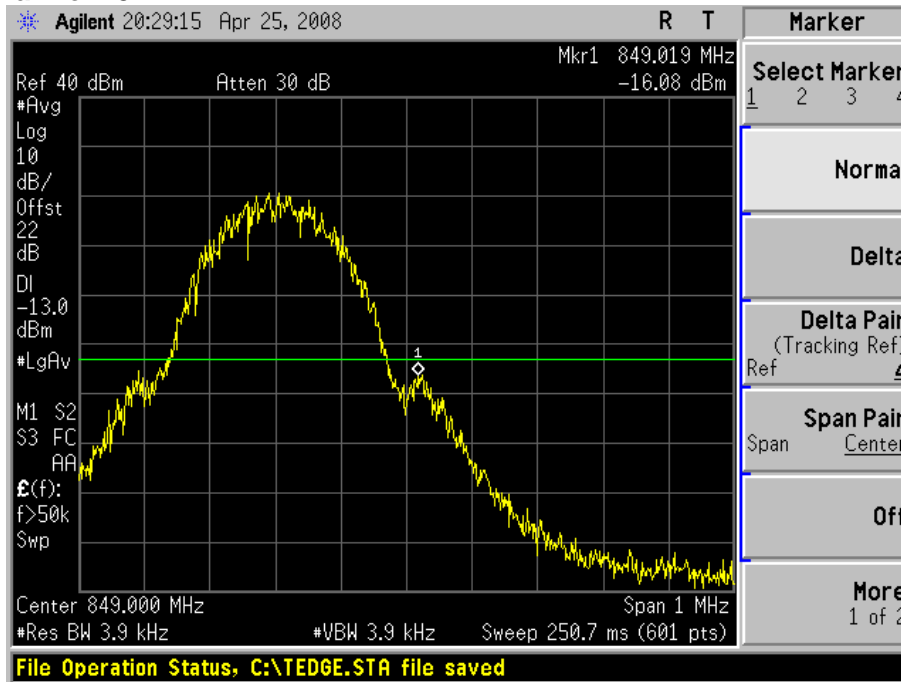


● Band Edge

Channel 128



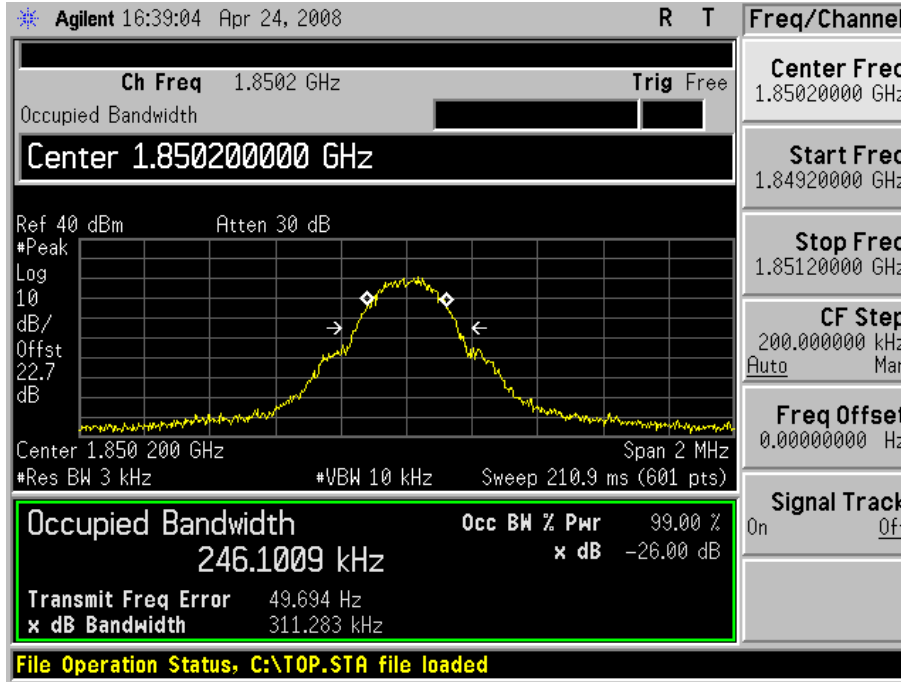
Channel 251



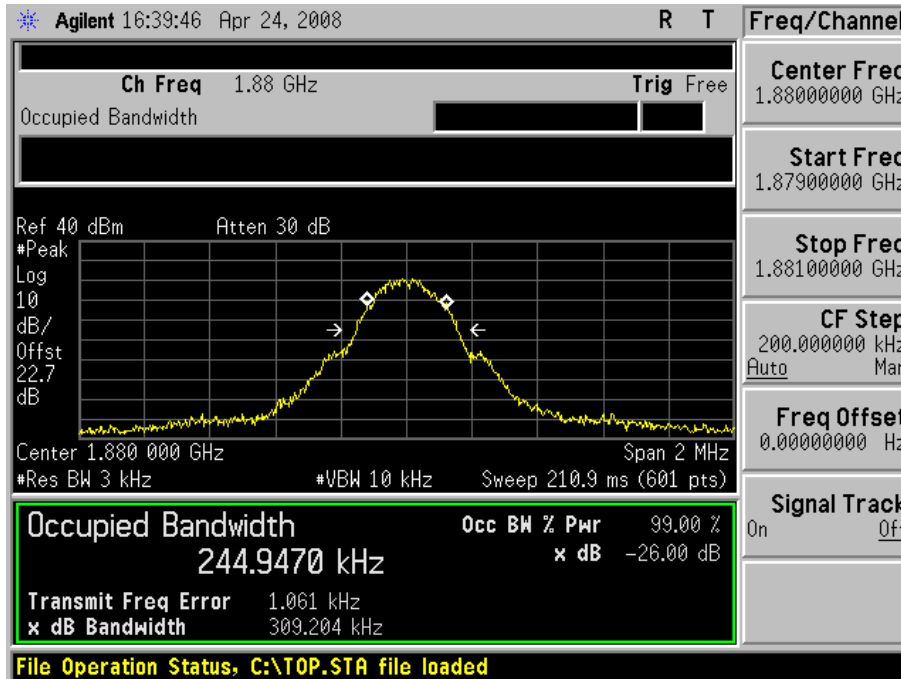
12. Test Plots (PCS1900_GPRS)

- Occupied Bandwidth / 26dB Bandwidth

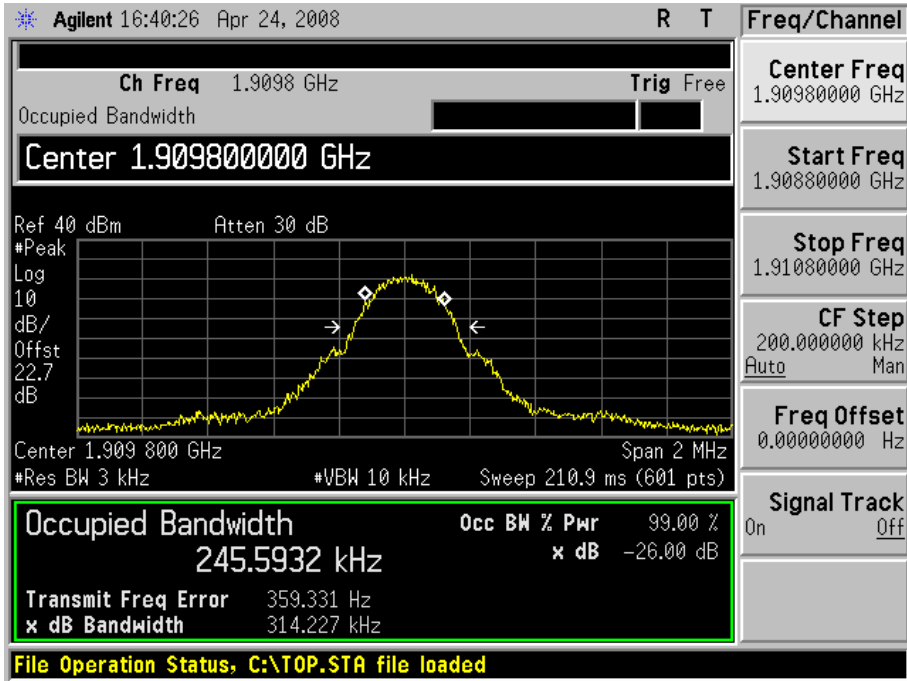
Channel 512



Channel 661

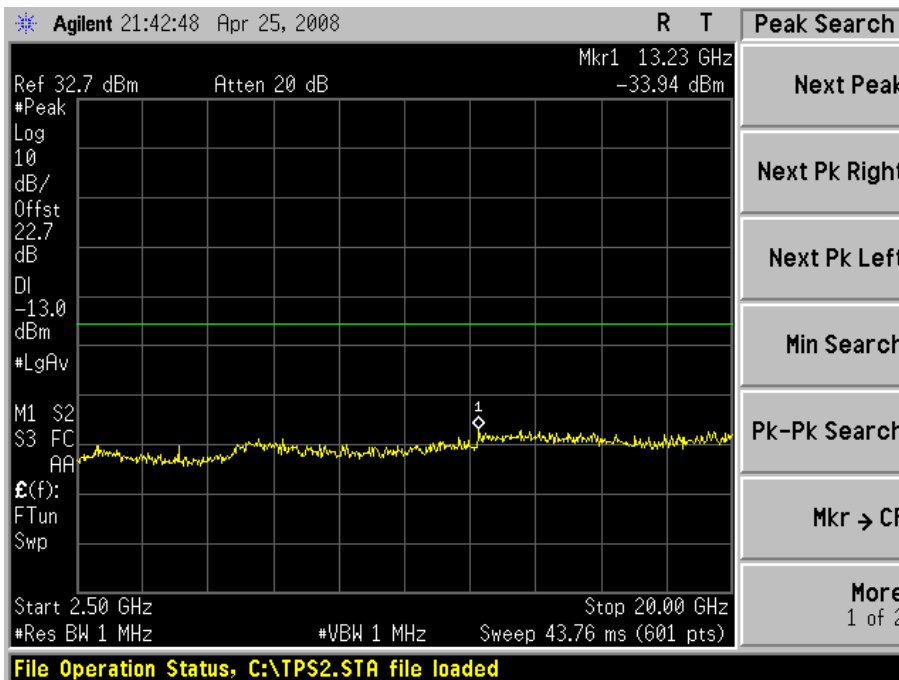
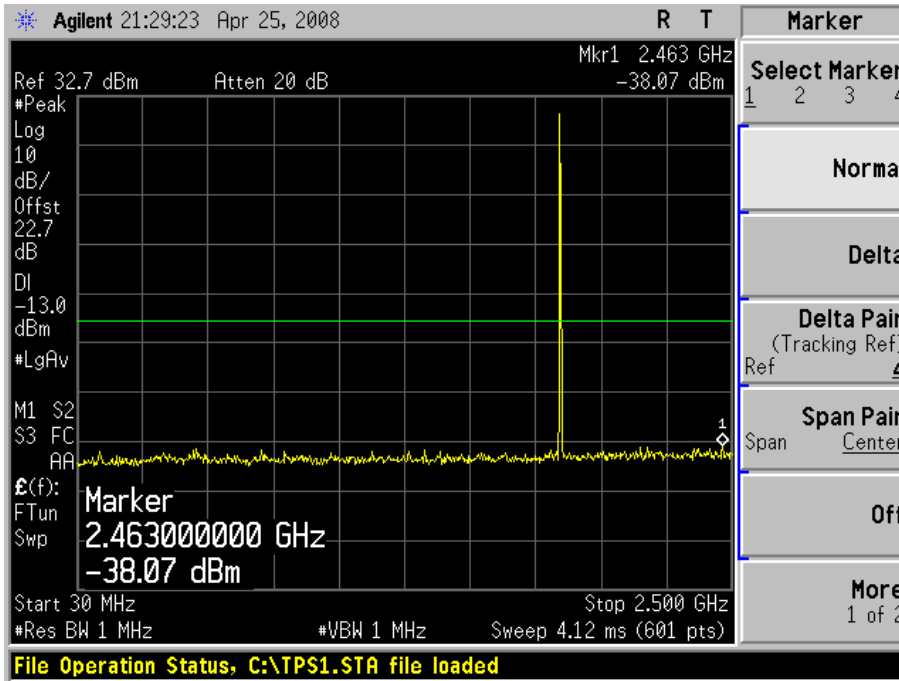


Channel 810

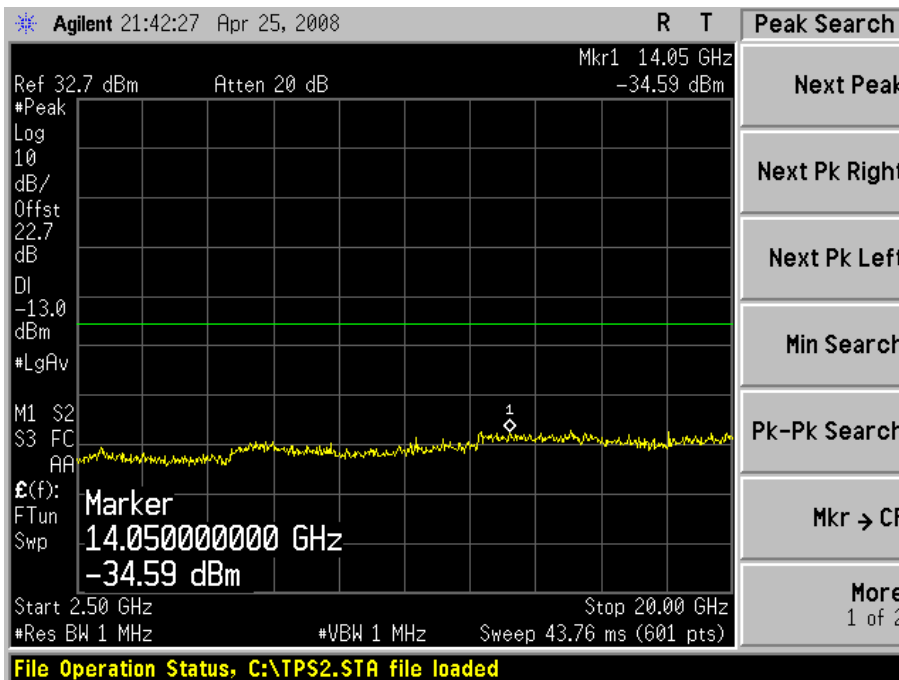
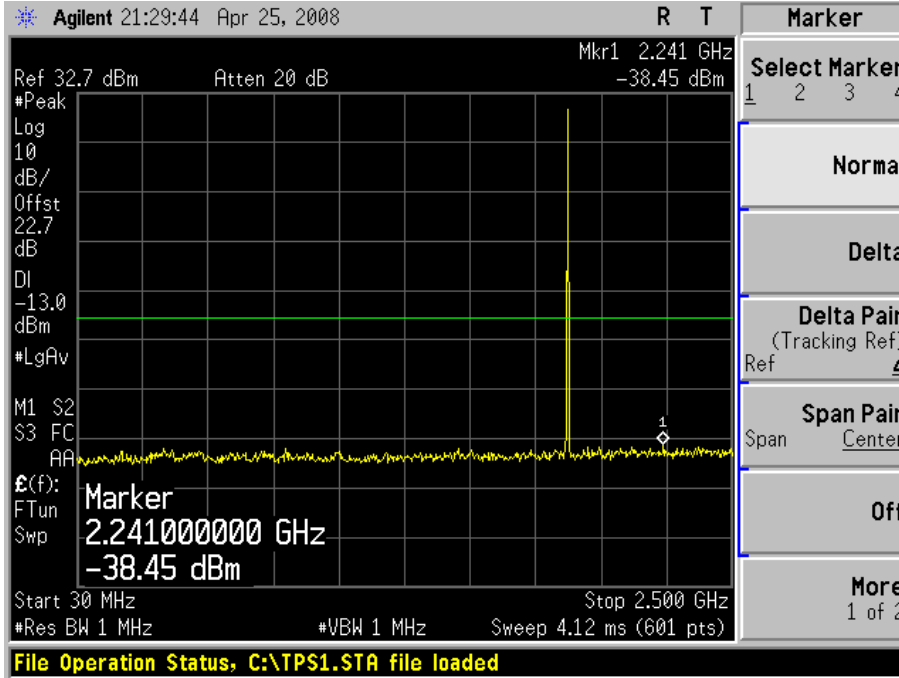


● Spurious Emission at antenna Terminals

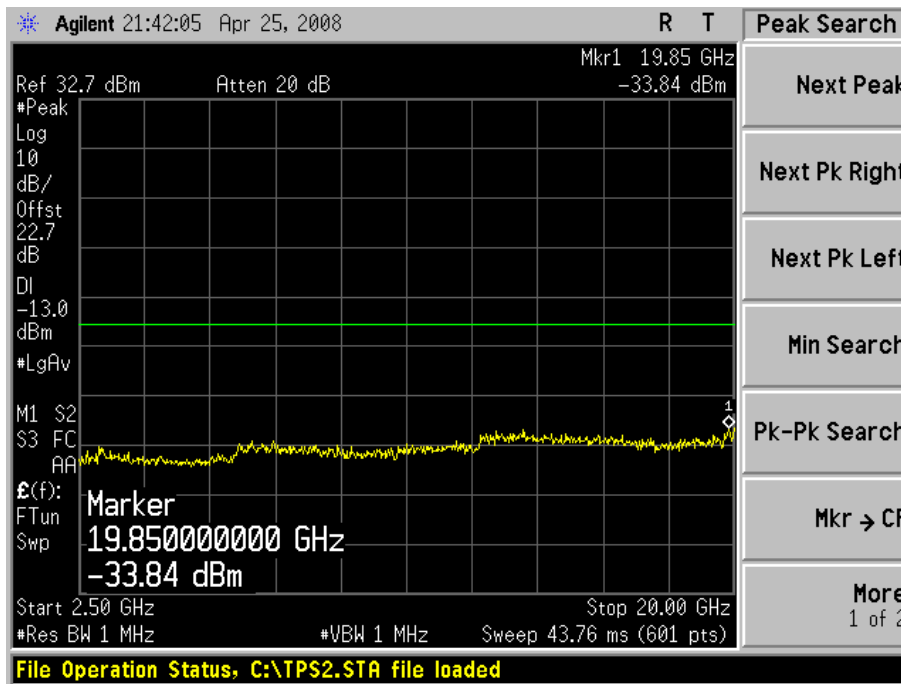
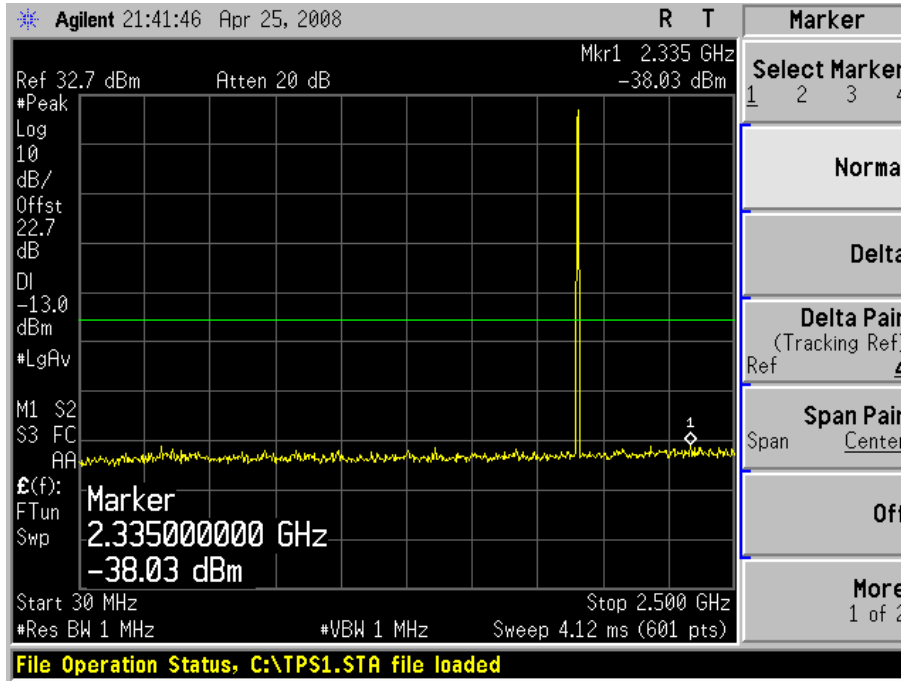
Channel 512



Channel 661

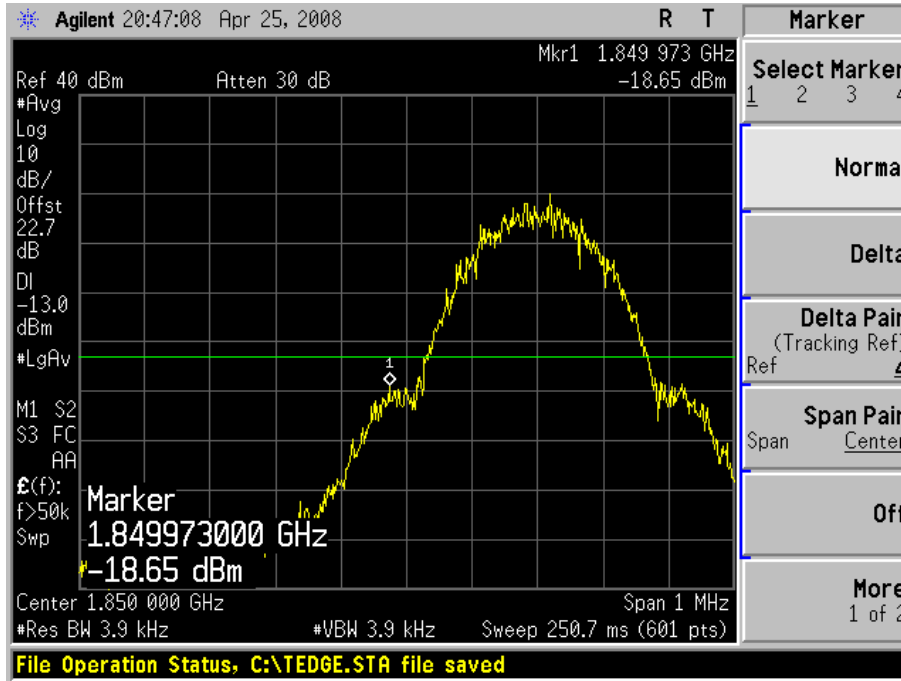


Channel 810

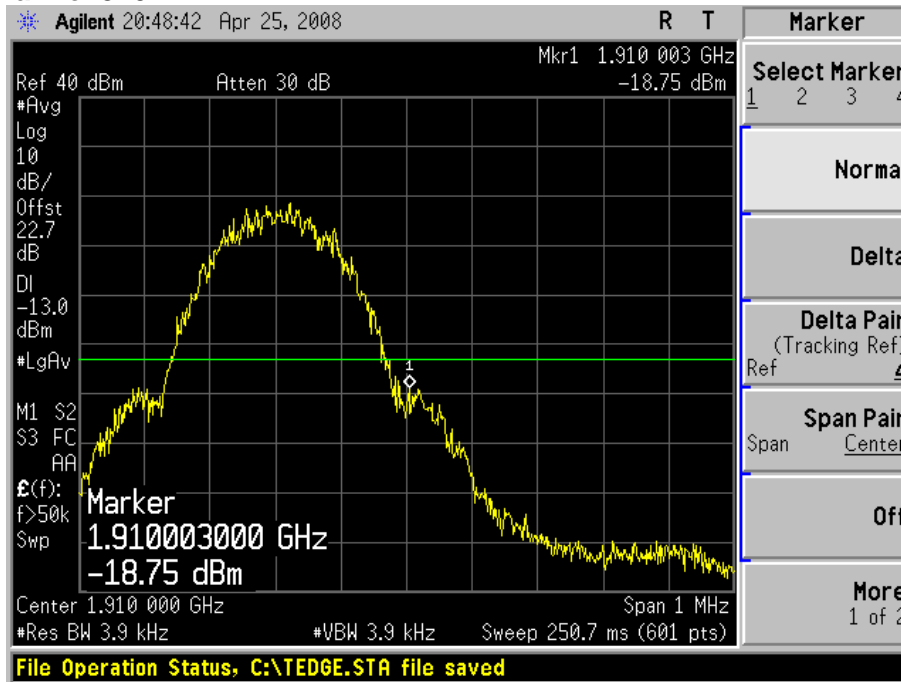


● Band Edge

Channel 512



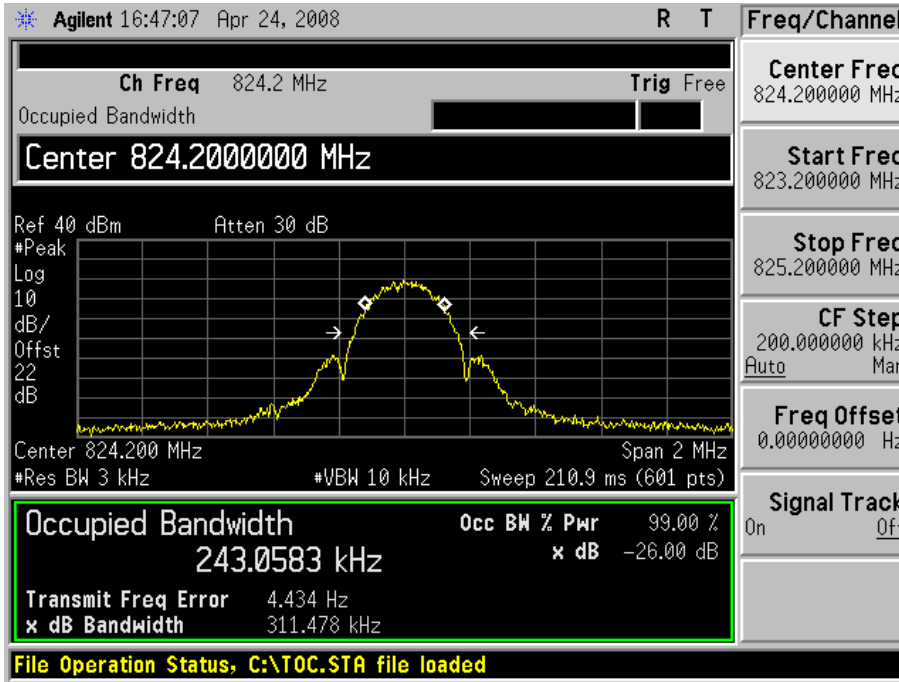
Channel 810



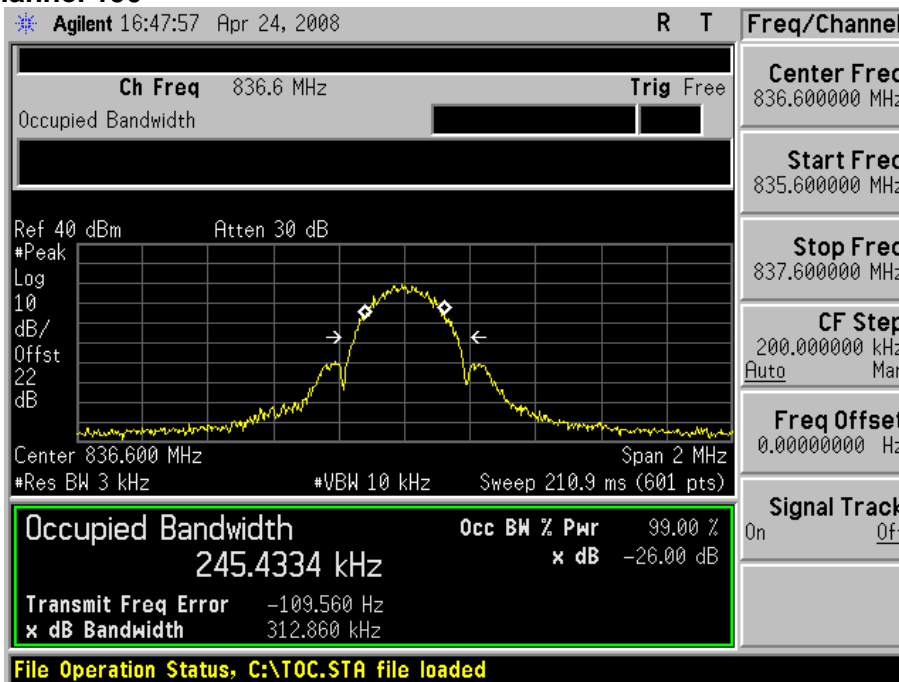
13. Test Plots (GSM850_EDGE)

● Occupied Bandwidth / 26dB Bandwidth

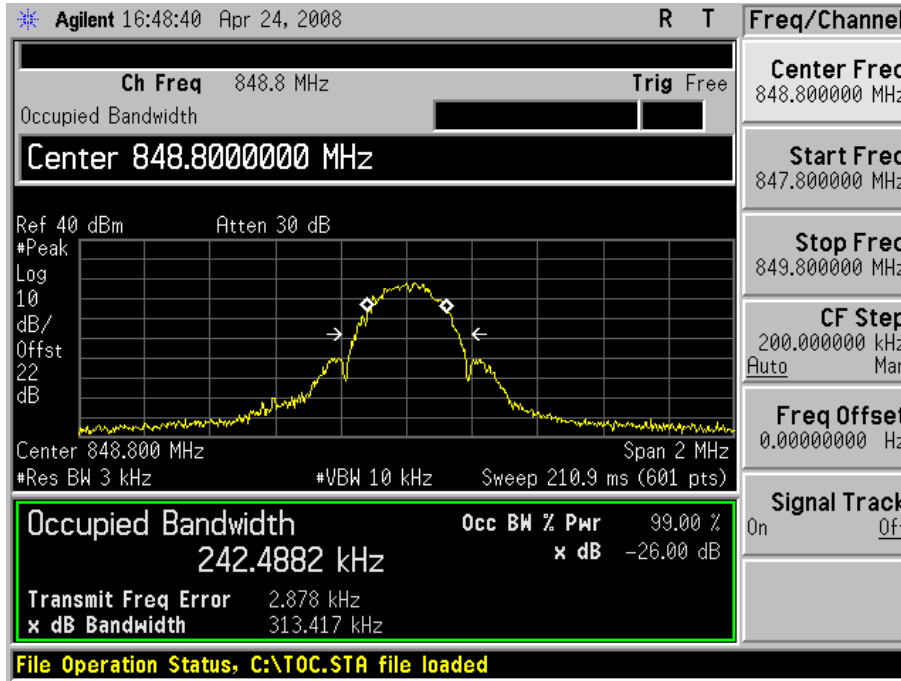
Channel 128



Channel 190

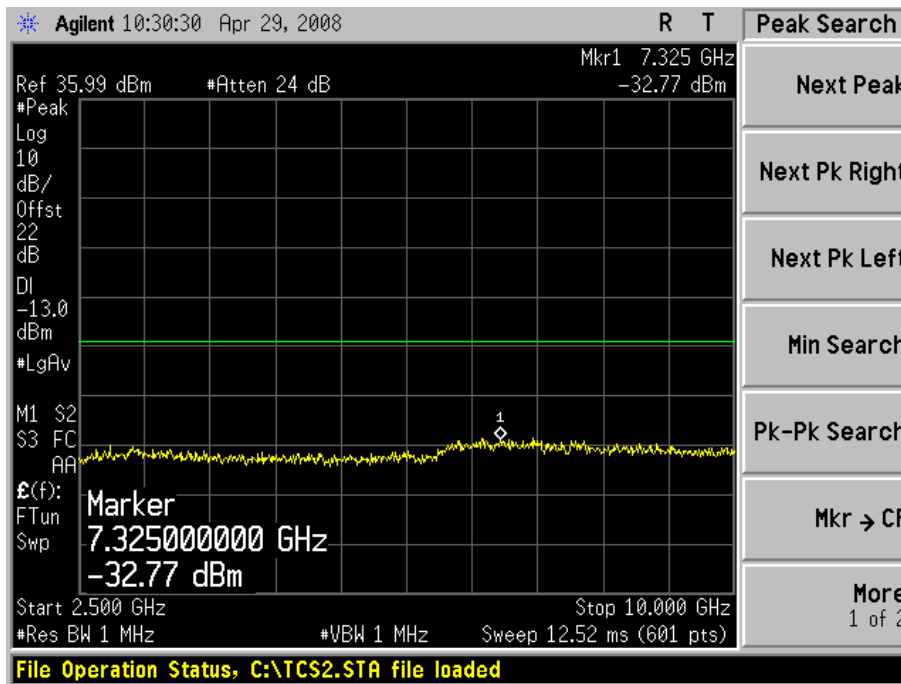
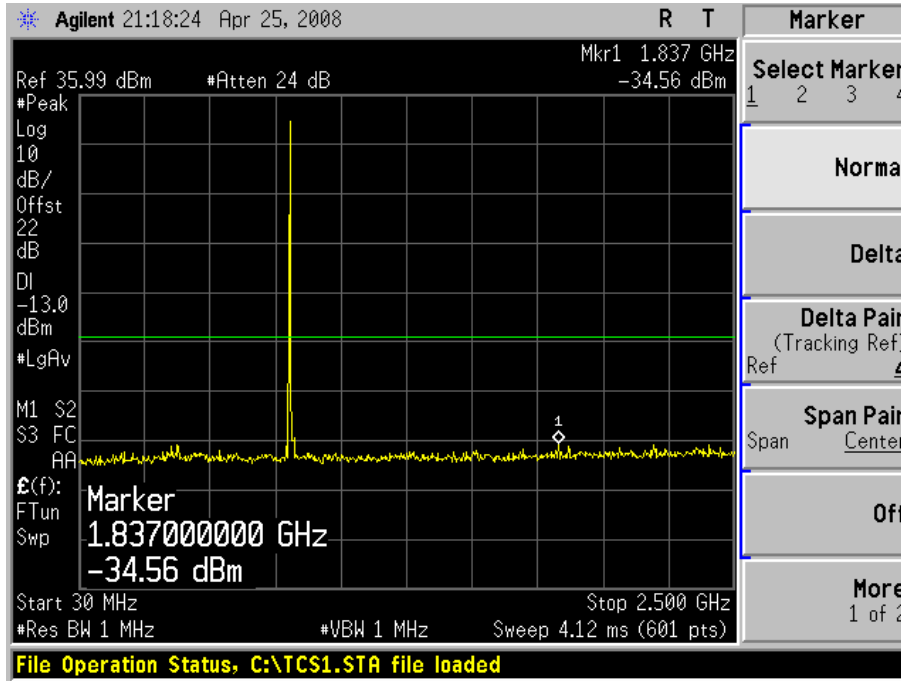


Channel 251

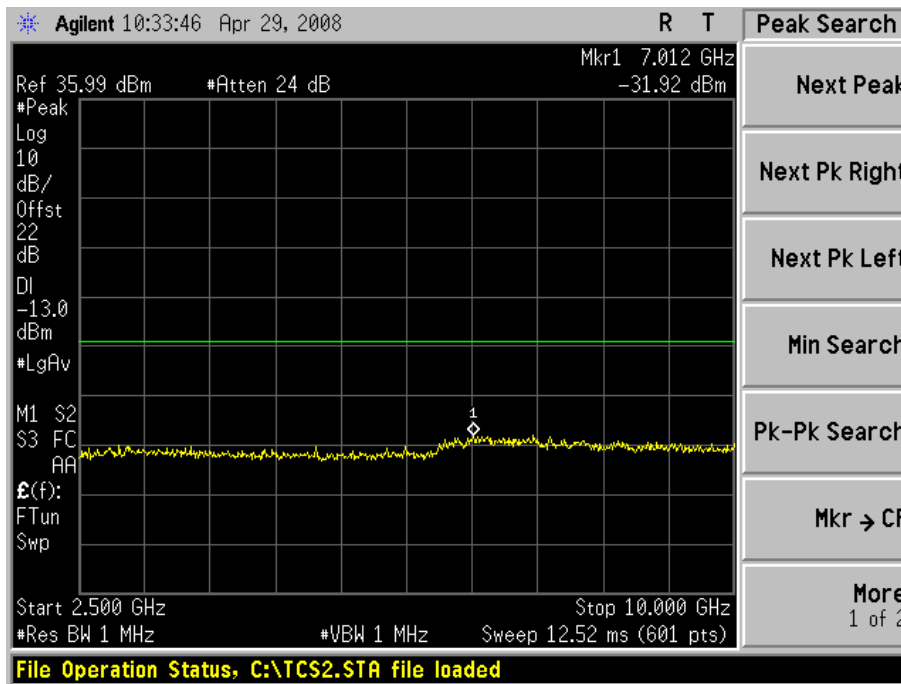
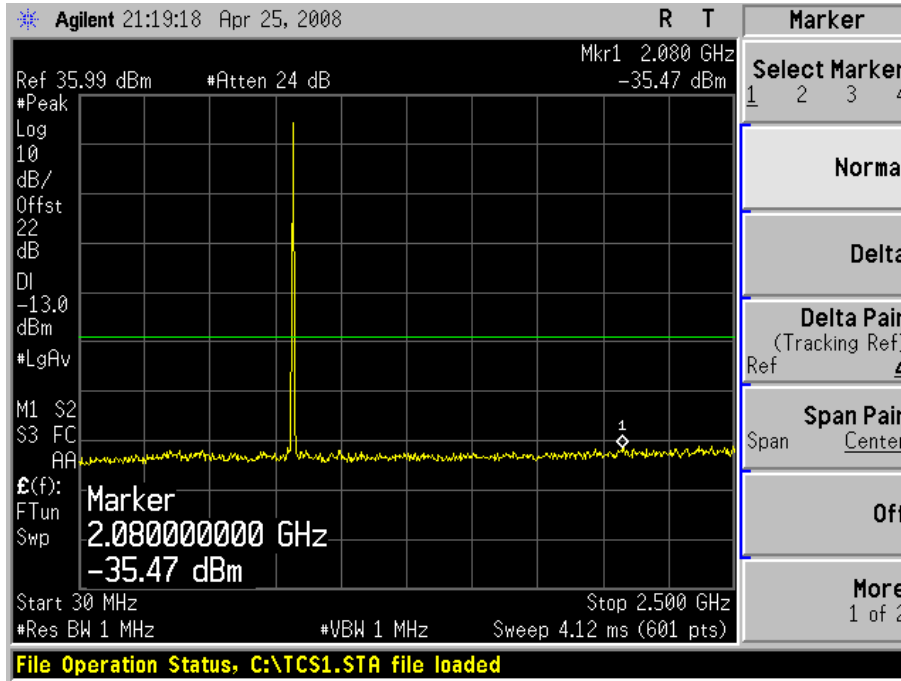


● Spurious Emission at antenna Terminals

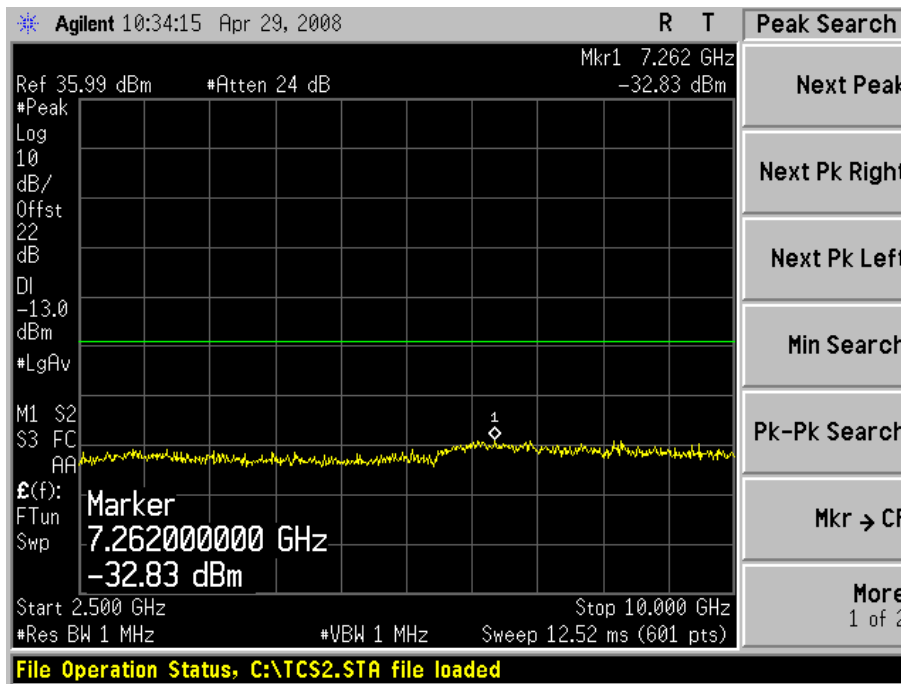
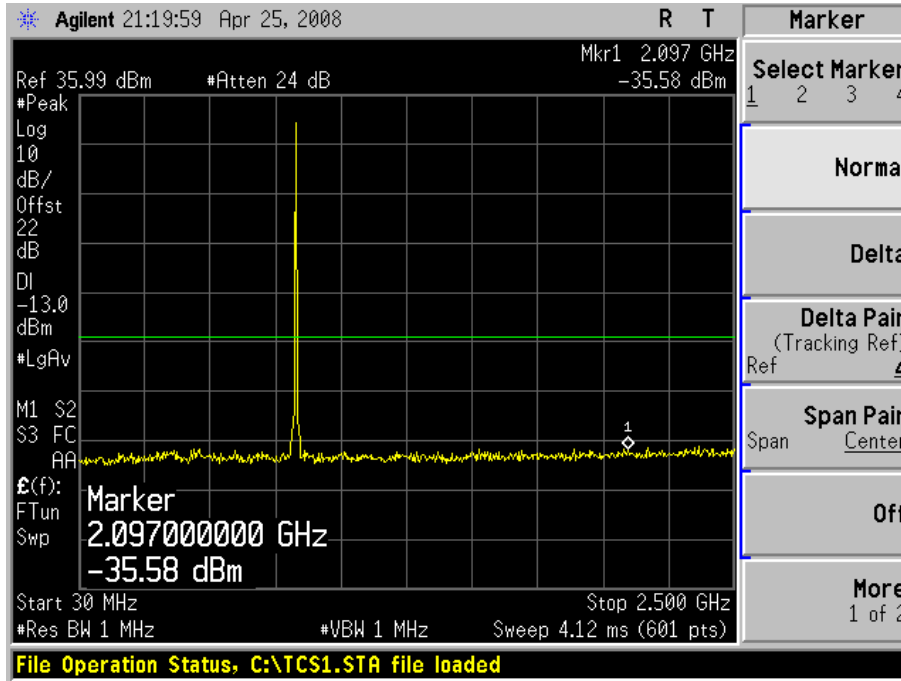
Channel 128



Channel 190

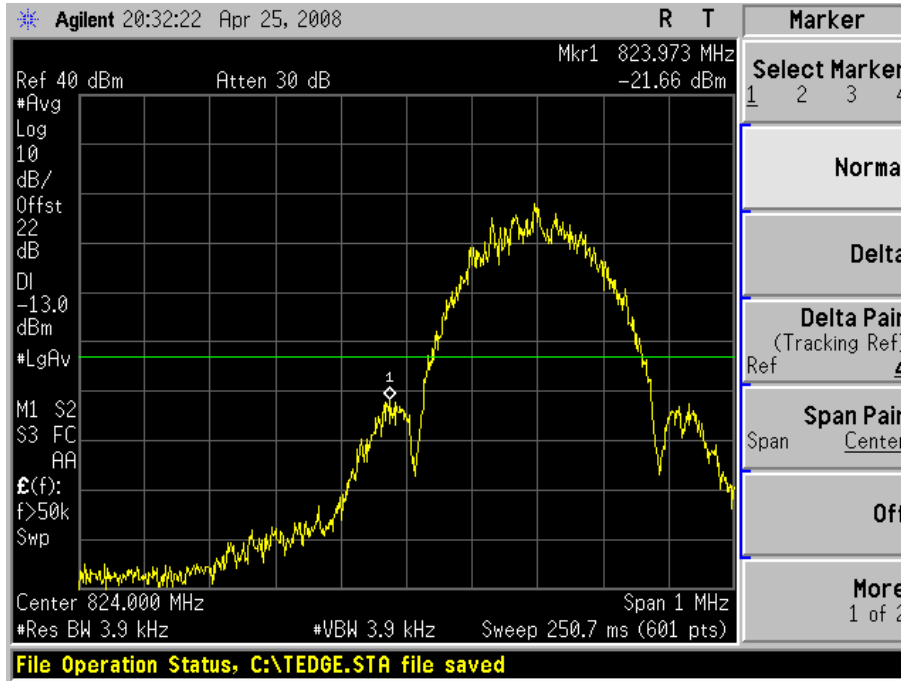


Channel 251

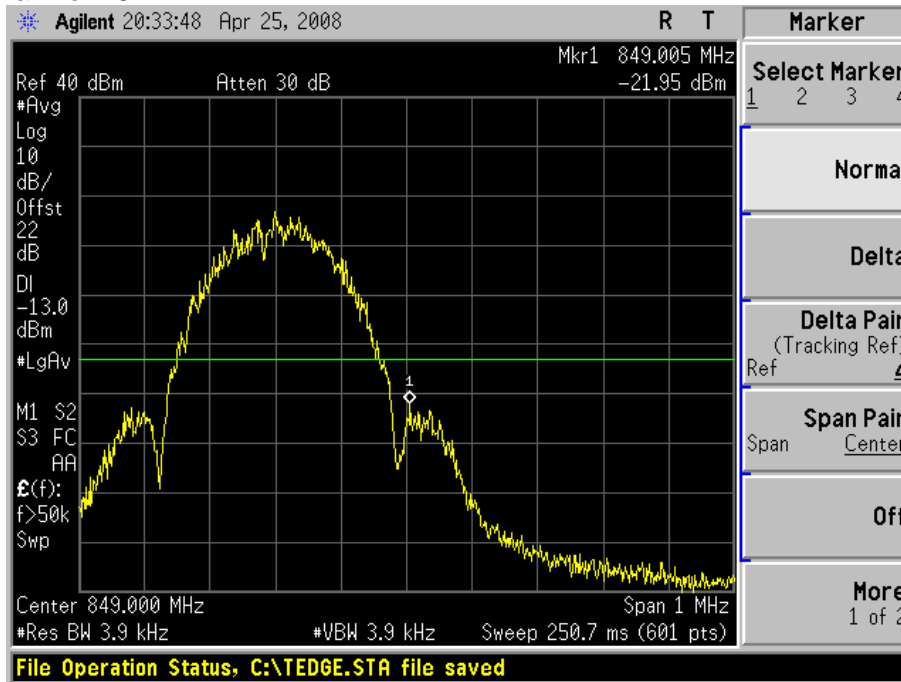


● Band Edge

Channel 128



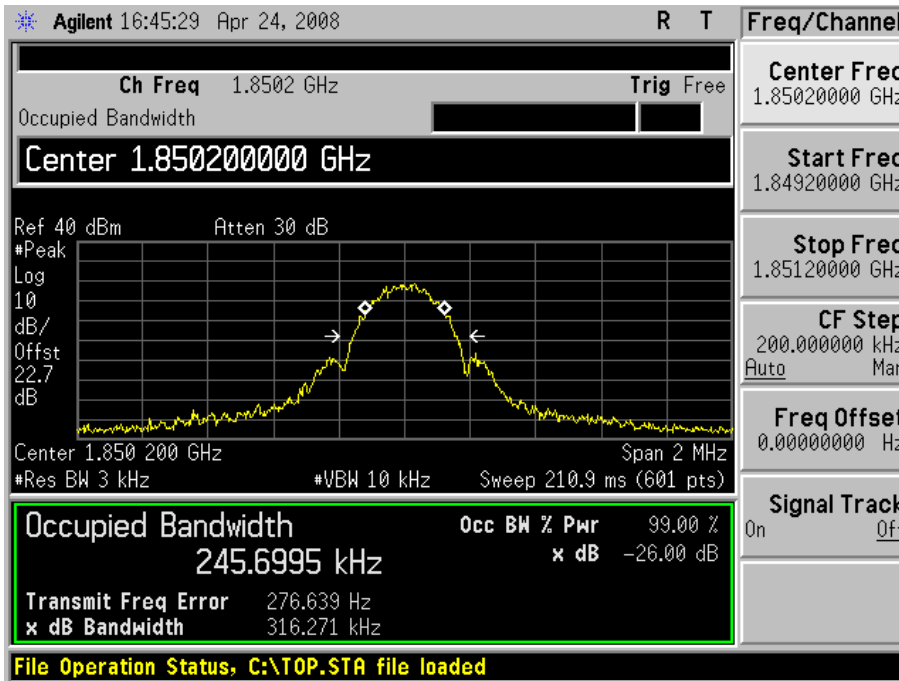
Channel 251



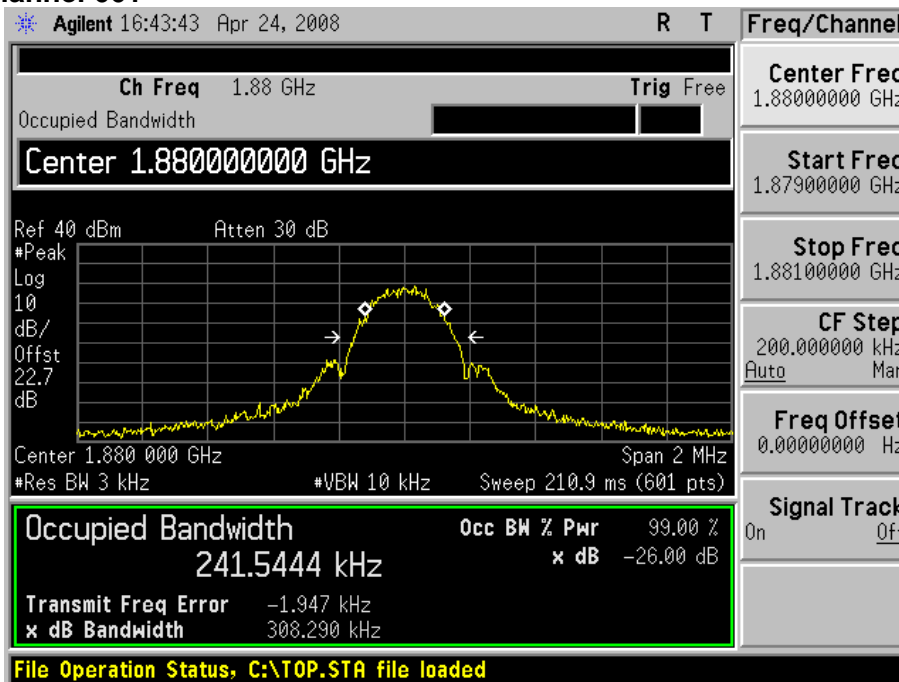
14. Test Plots (PCS1900_EDGE)

● Occupied Bandwidth / 26dB Bandwidth

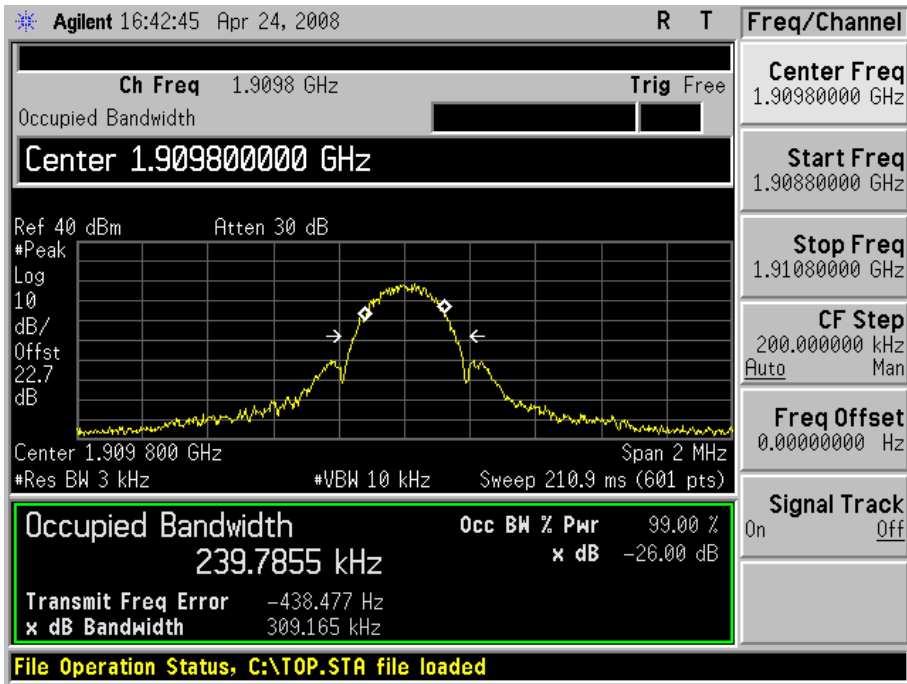
Channel 512



Channel 661

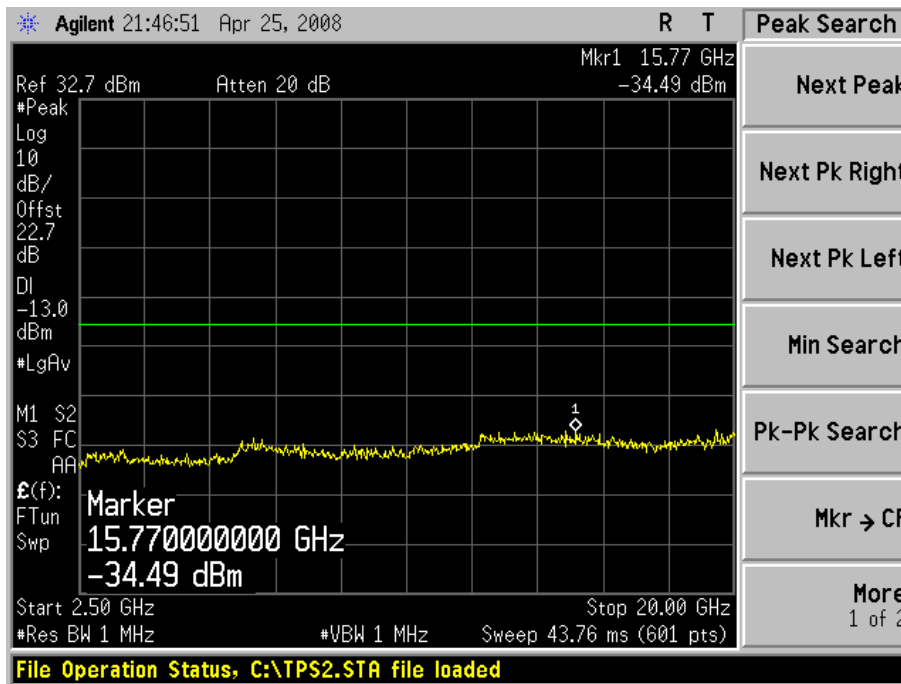
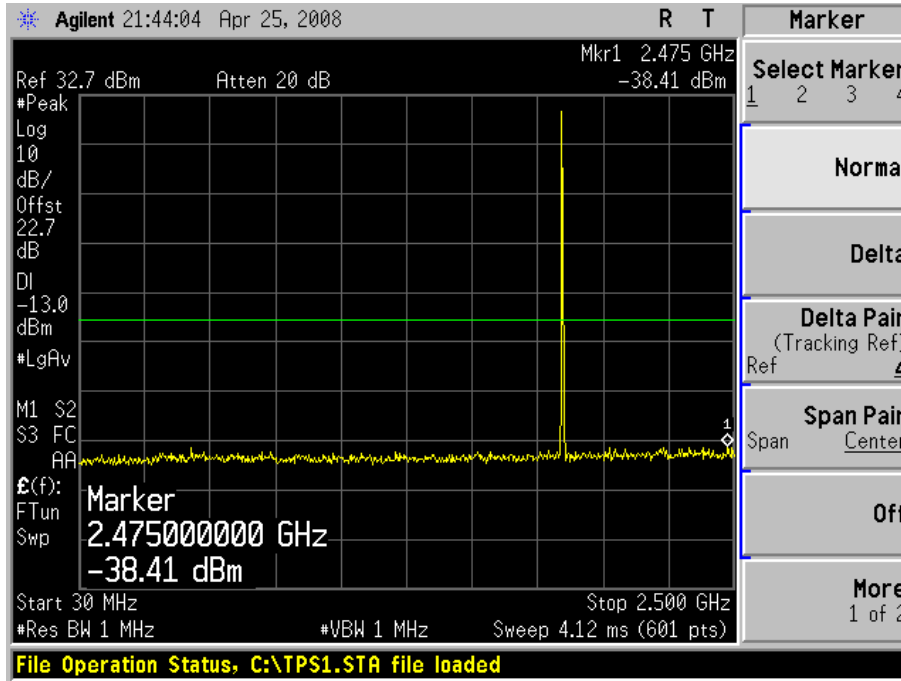


Channel 810

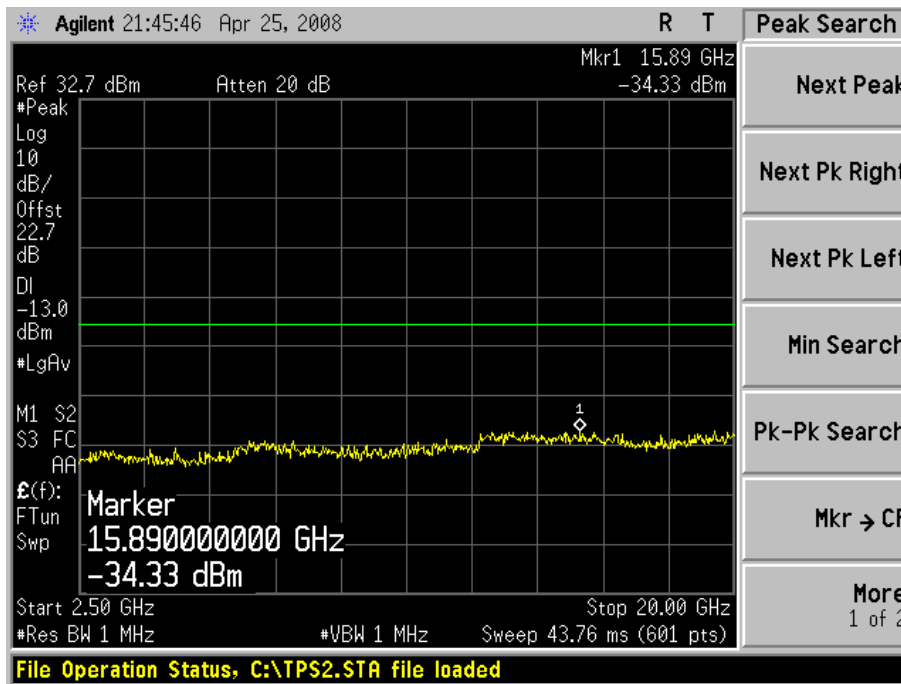
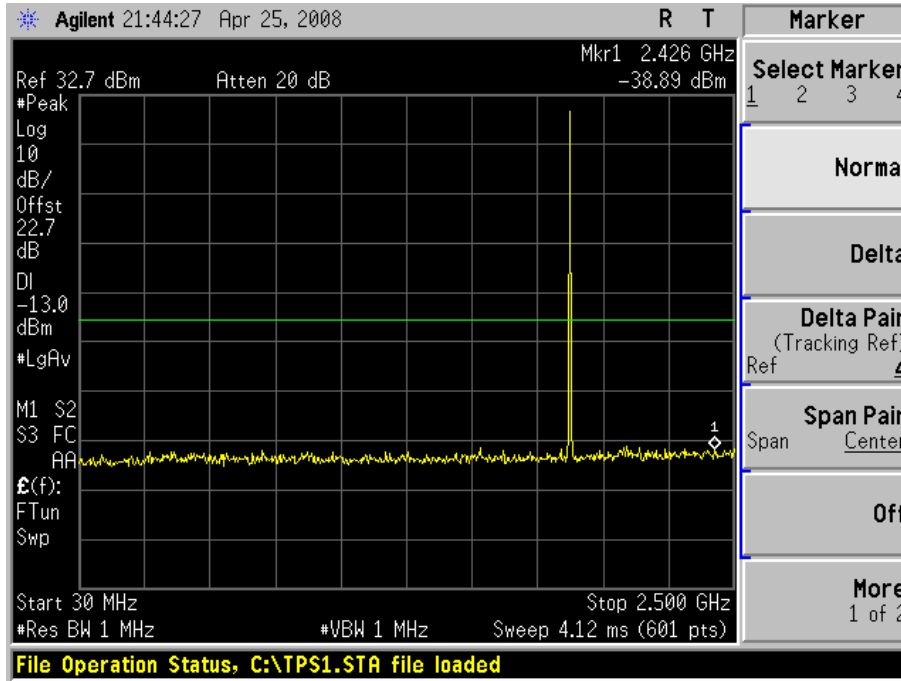


● Spurious Emission at antenna Terminals

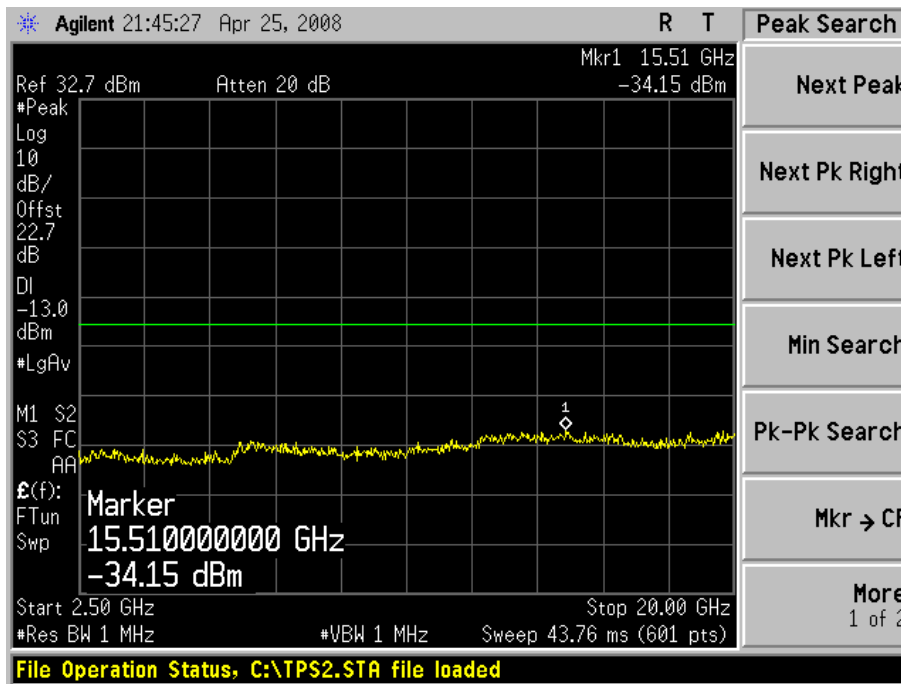
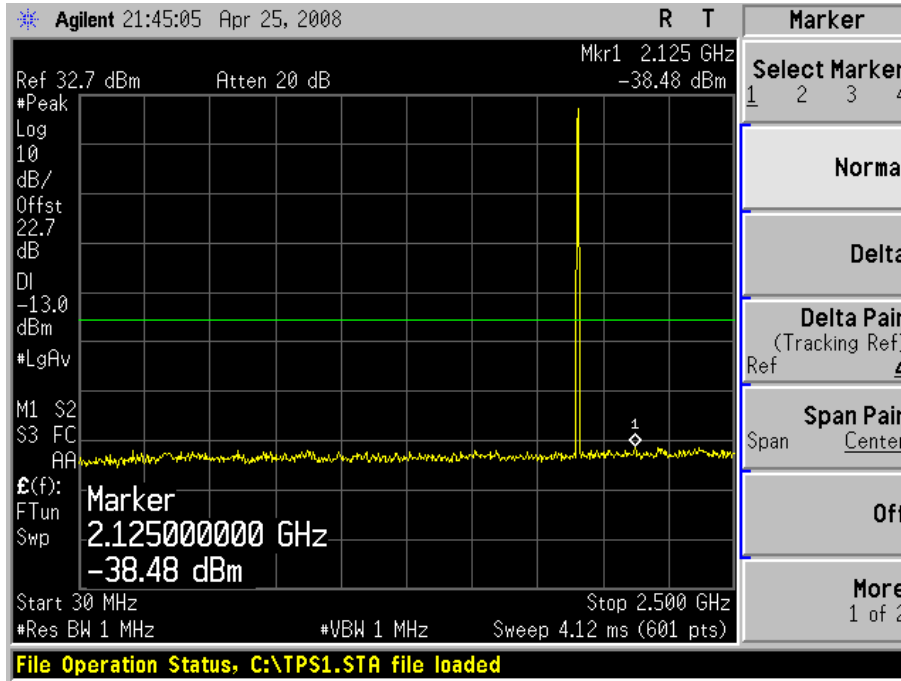
Channel 512



Channel 661

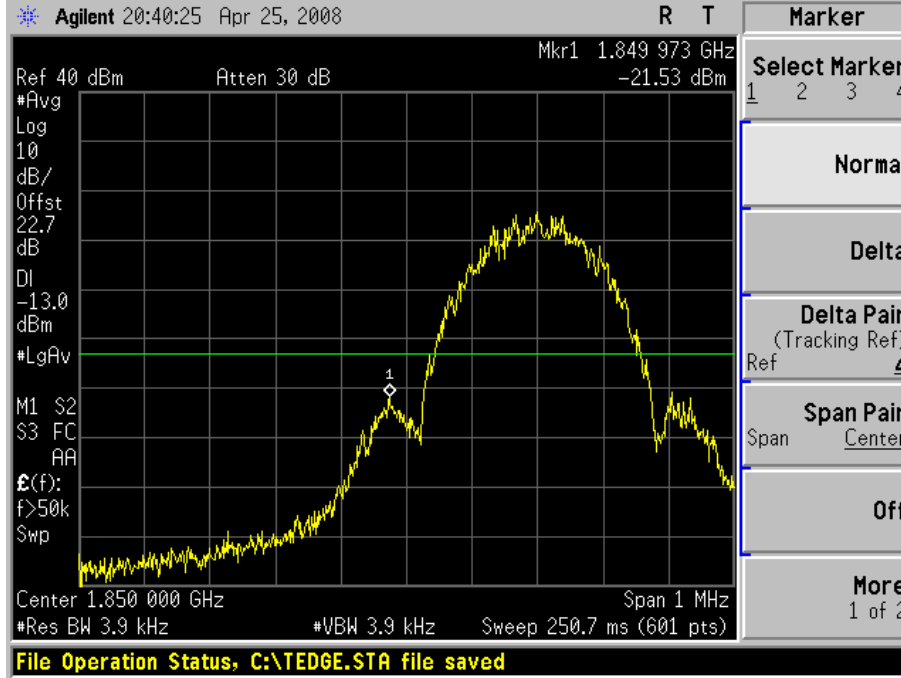


Channel 810

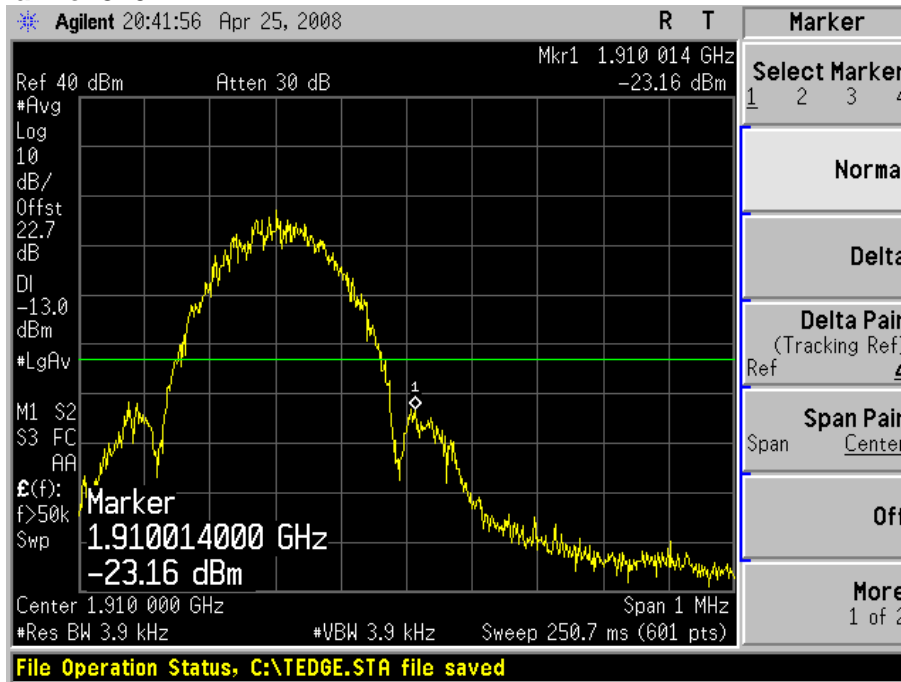


● Band Edge

Channel 512



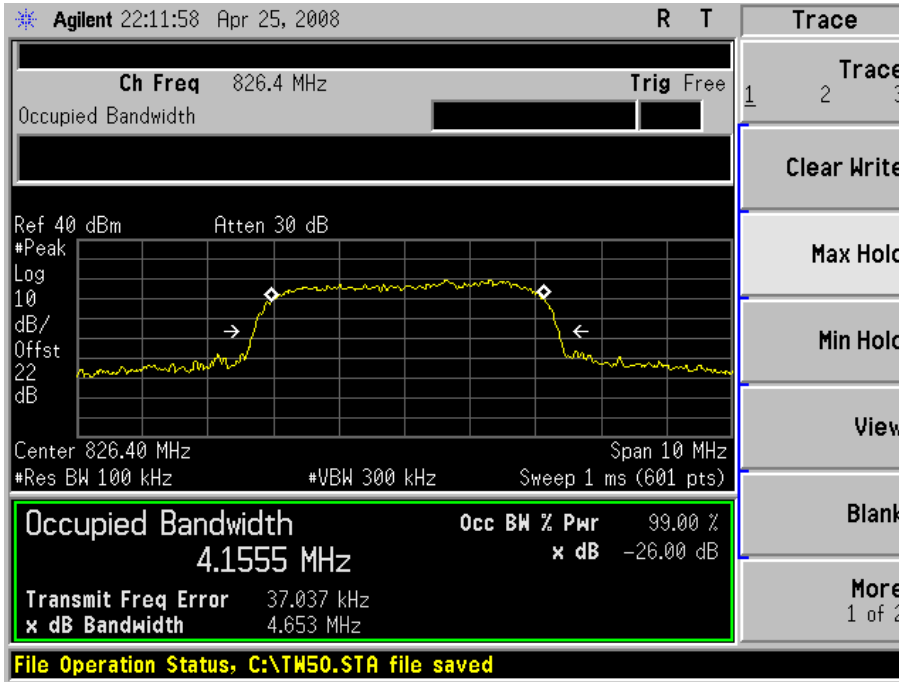
Channel 810



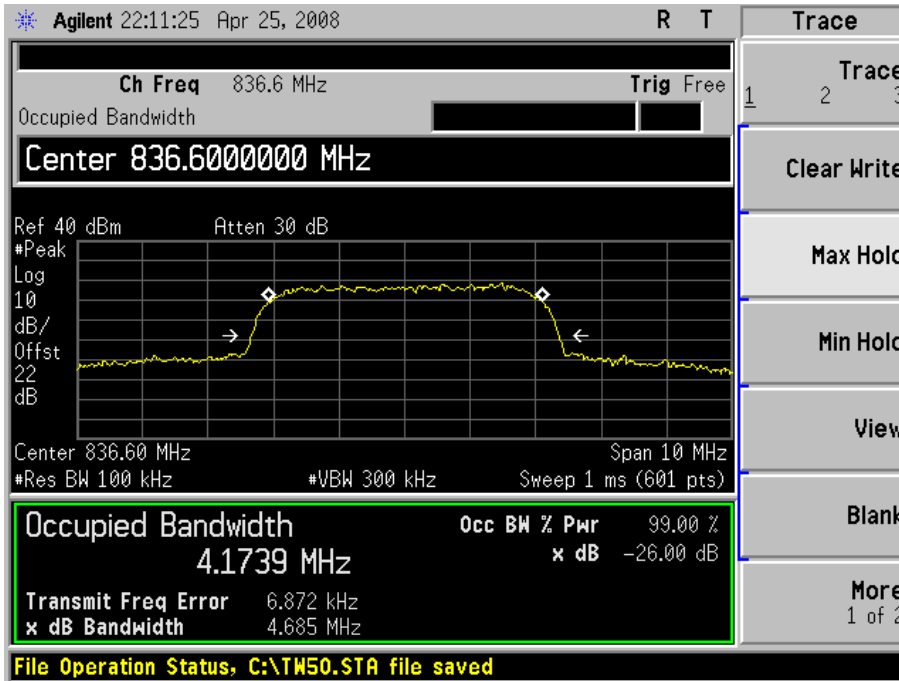
15. Test Plots (WCDMA Band V_HSDPA)

- Occupied Bandwidth / 26dB Bandwidth

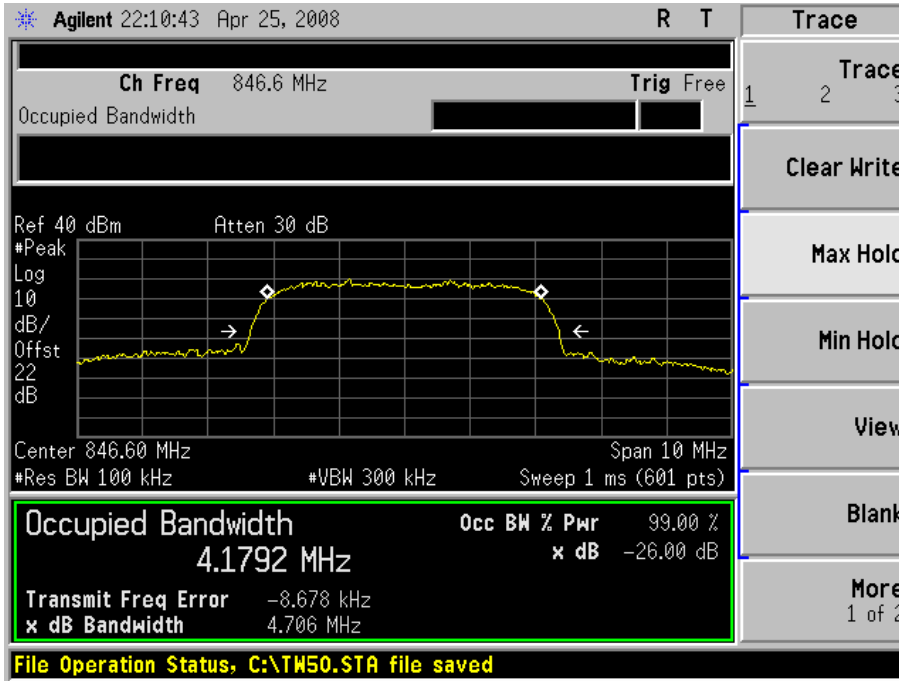
Channel 4132



Channel 4183

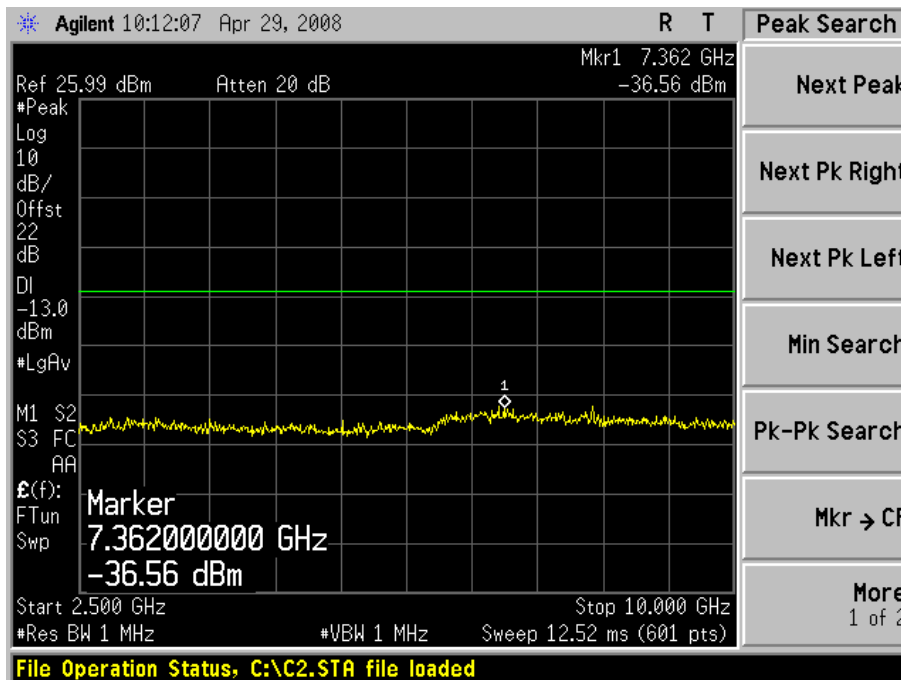
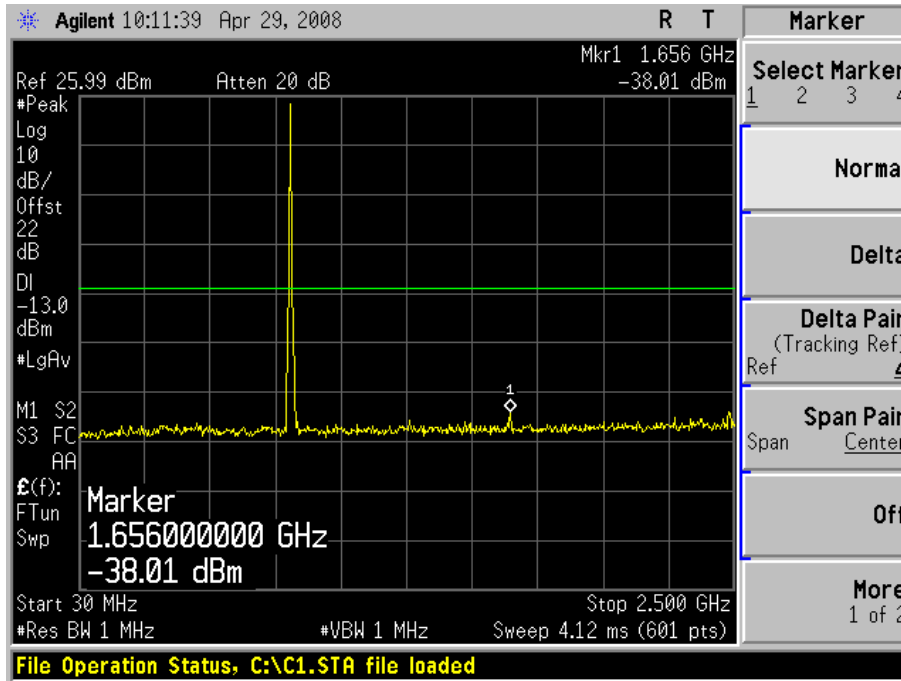


Channel 4233

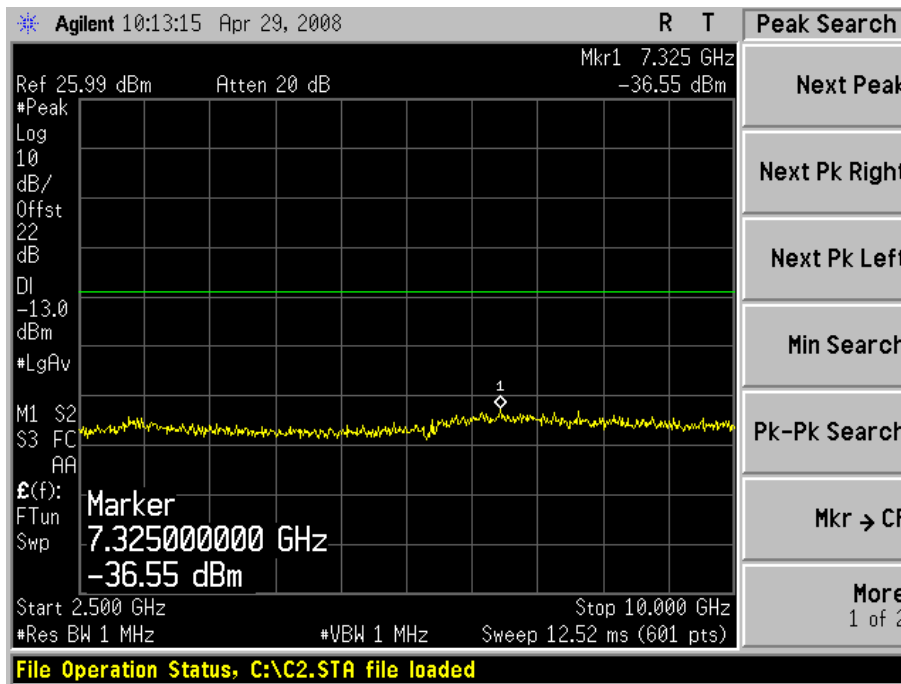
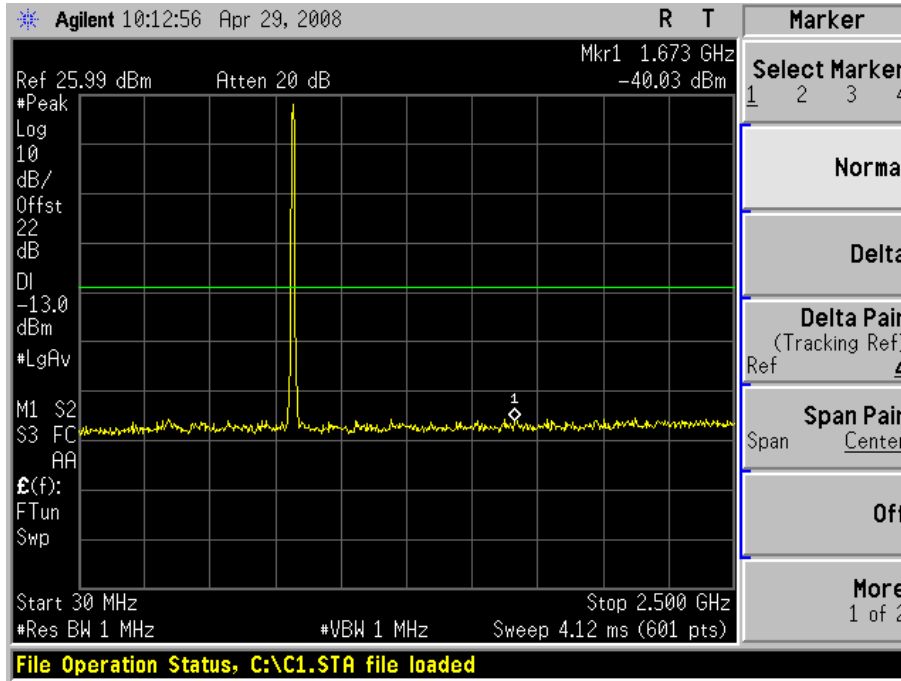


● Spurious Emission at antenna Terminals

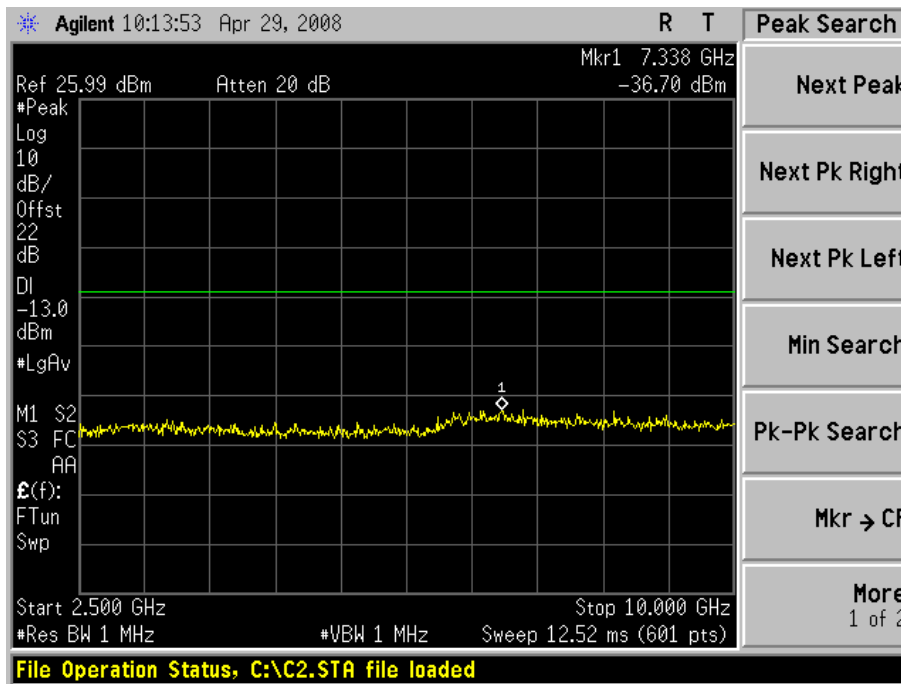
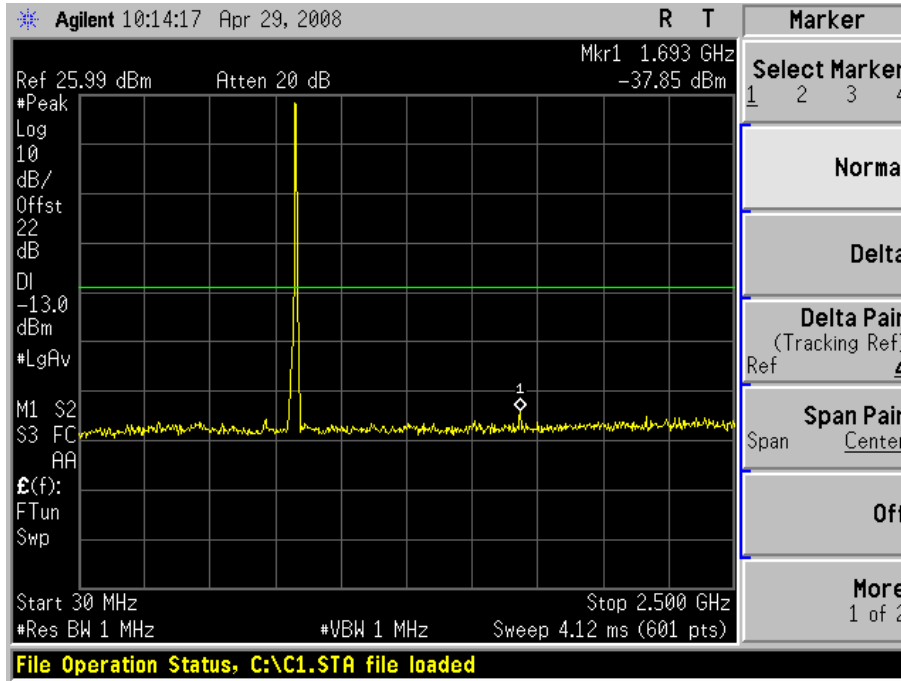
Channel 4132



Channel 4183

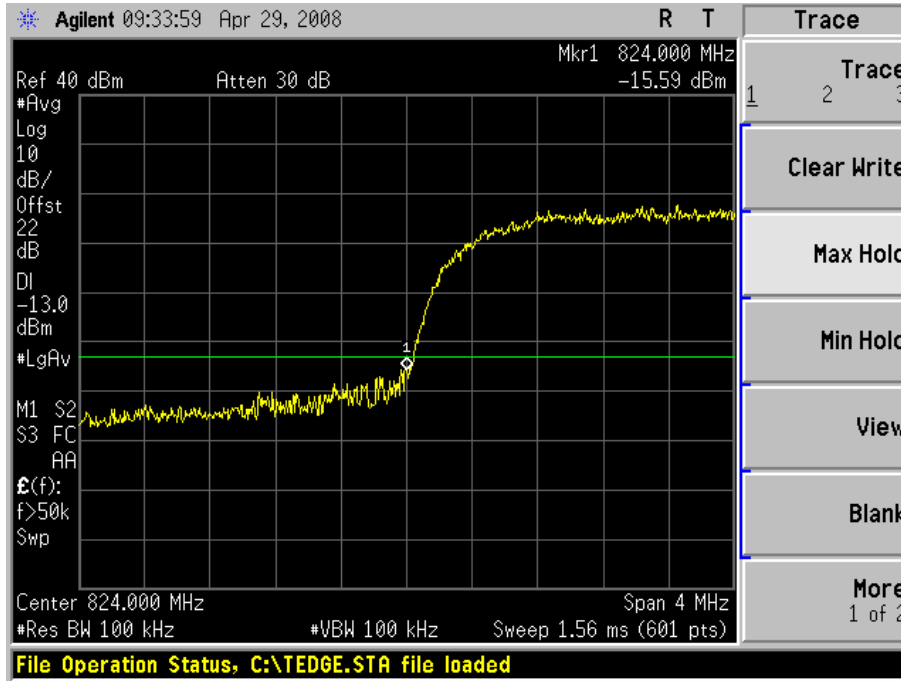


Channel 4233

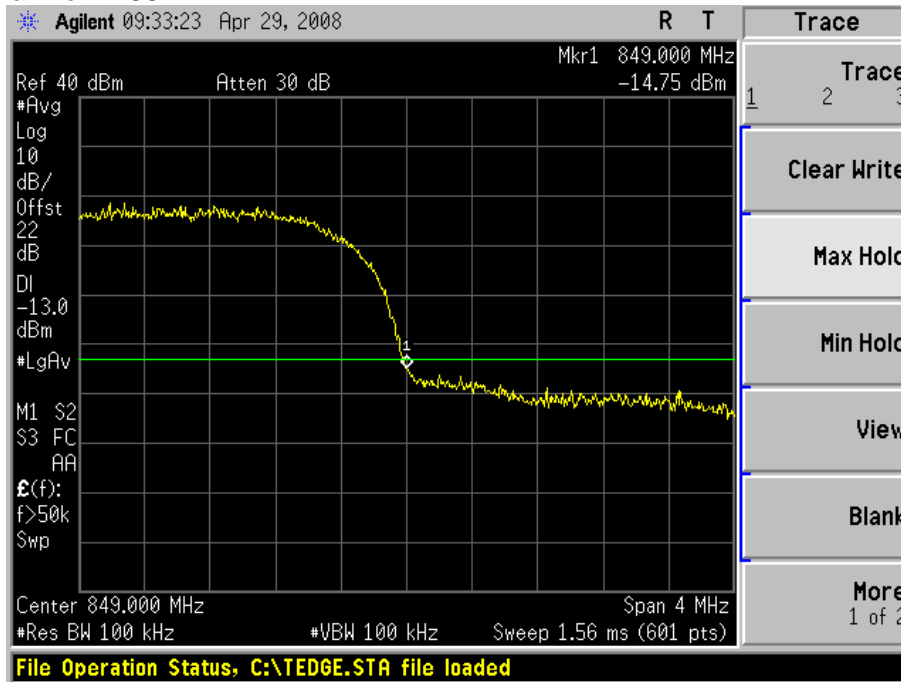


● Band Edge

Channel 4132



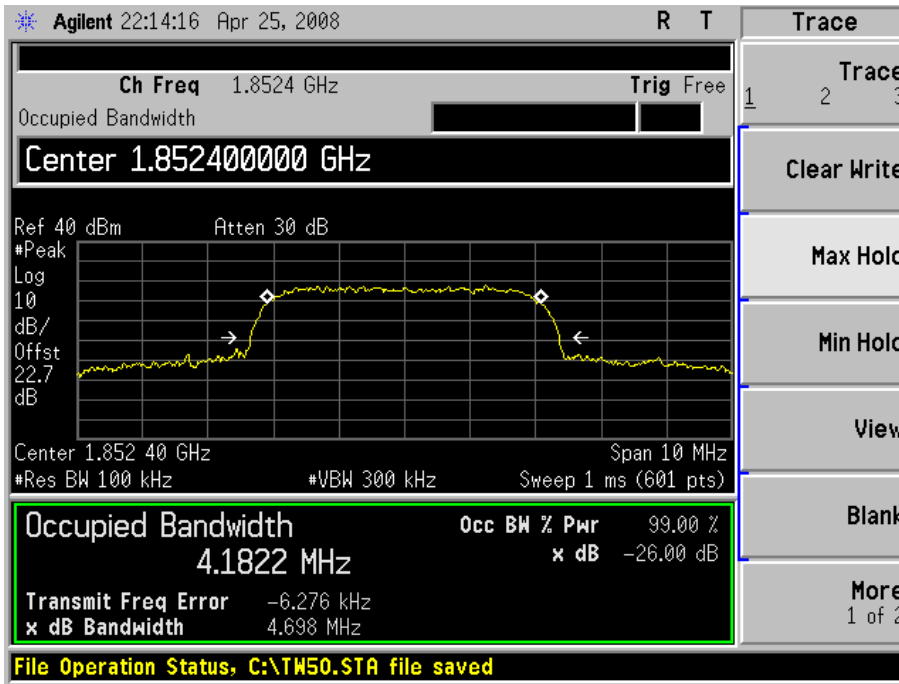
Channel 4233



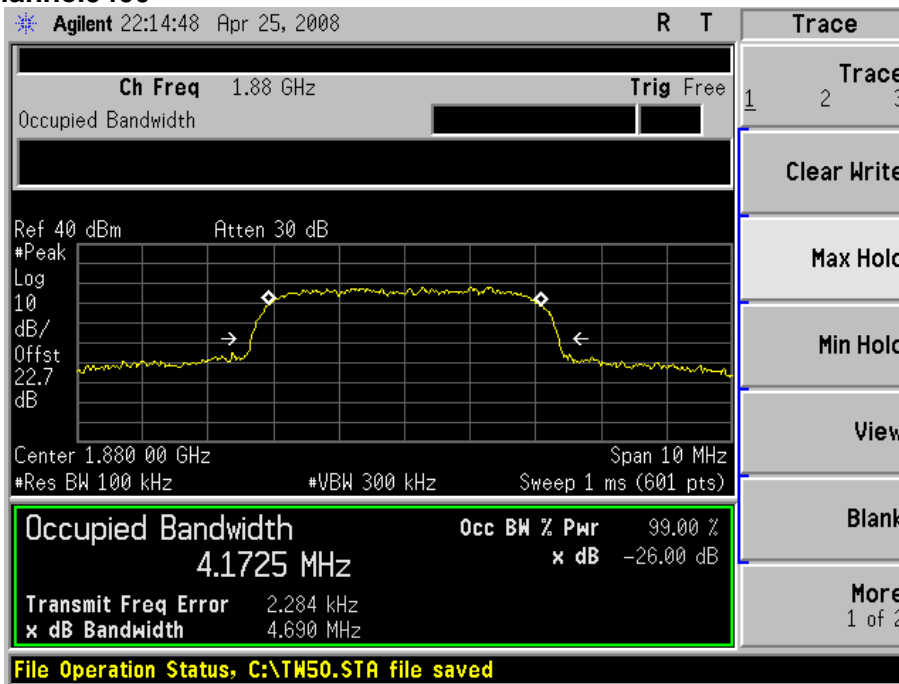
16. Test Plots (WCDMA Band II_HSDPA)

- Occupied Bandwidth / 26dB Bandwidth

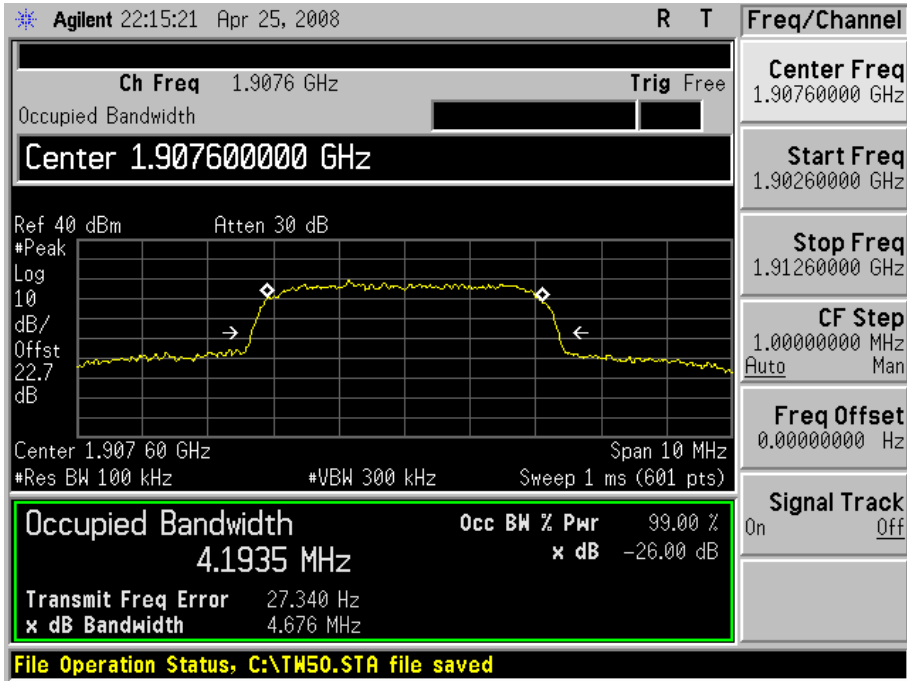
Channel 9262



Channel 9400

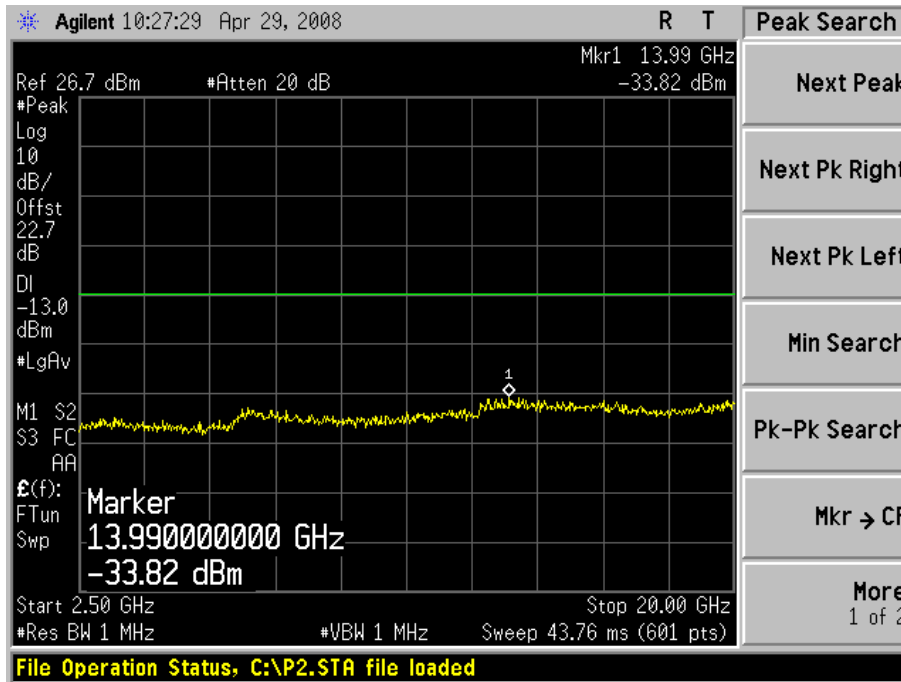
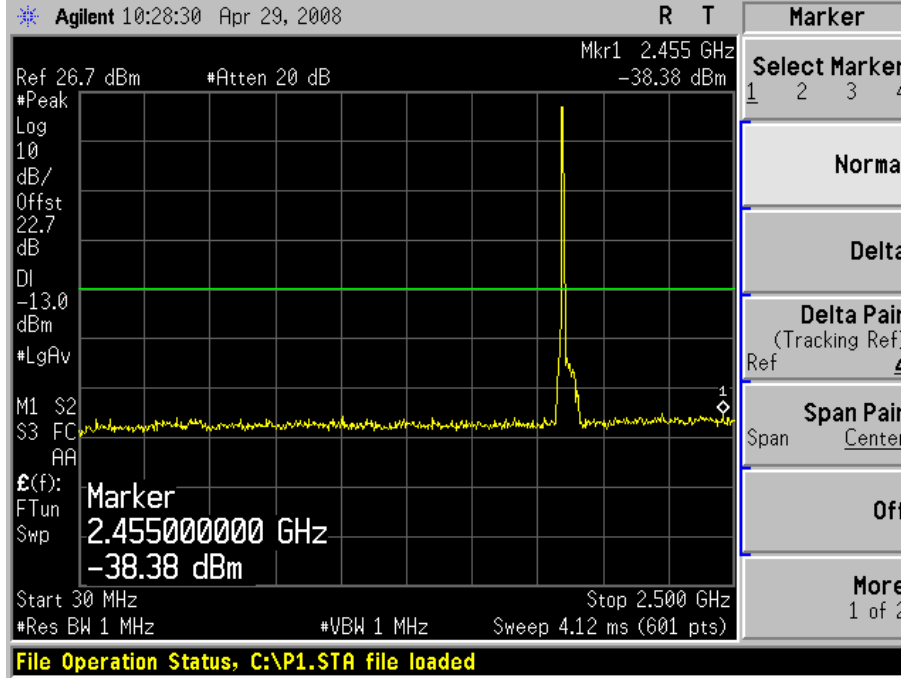


Channel 9538

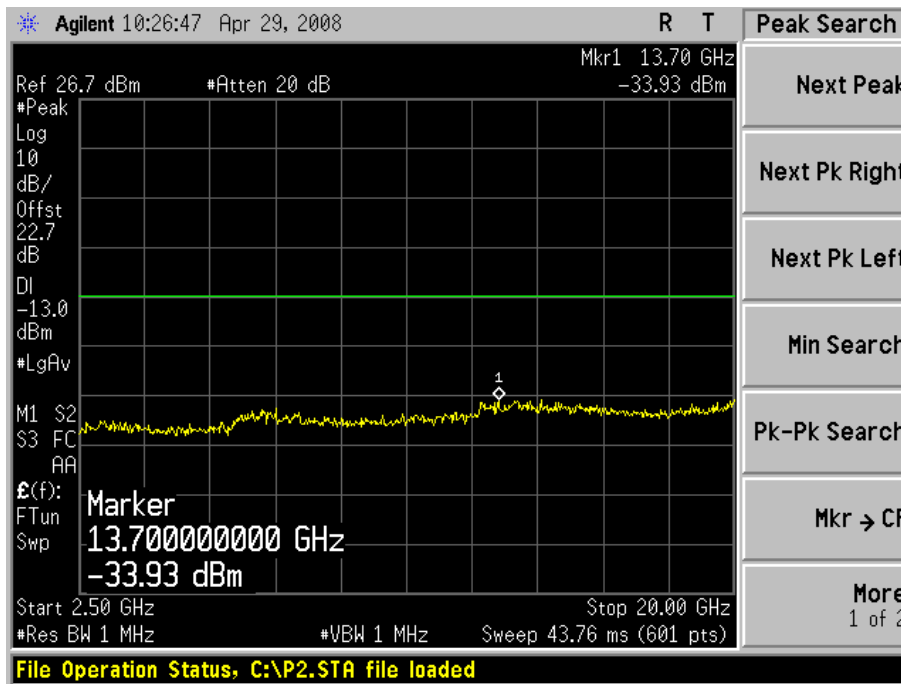
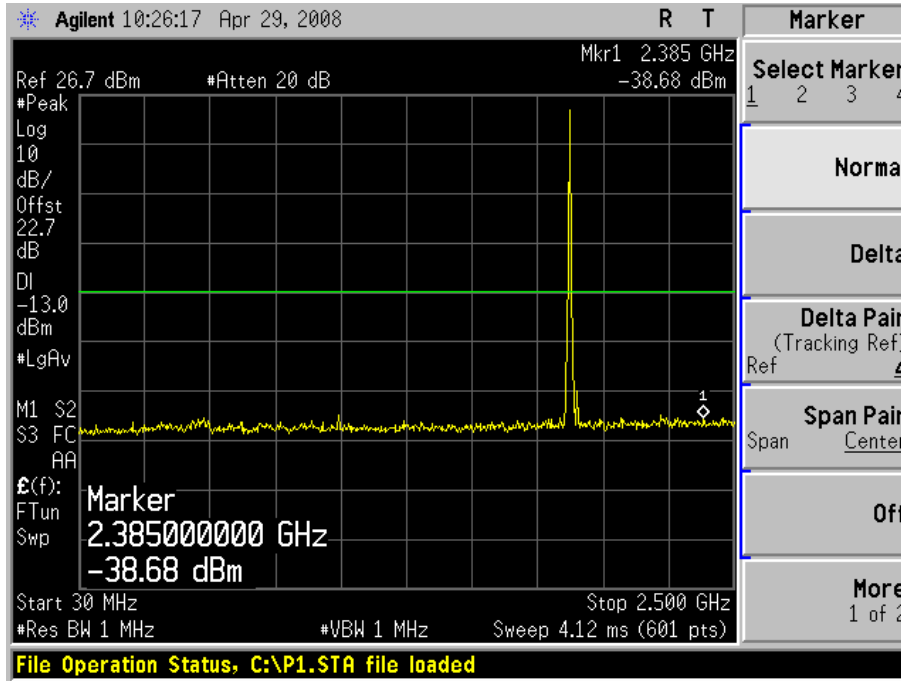


● Spurious Emission at antenna Terminals

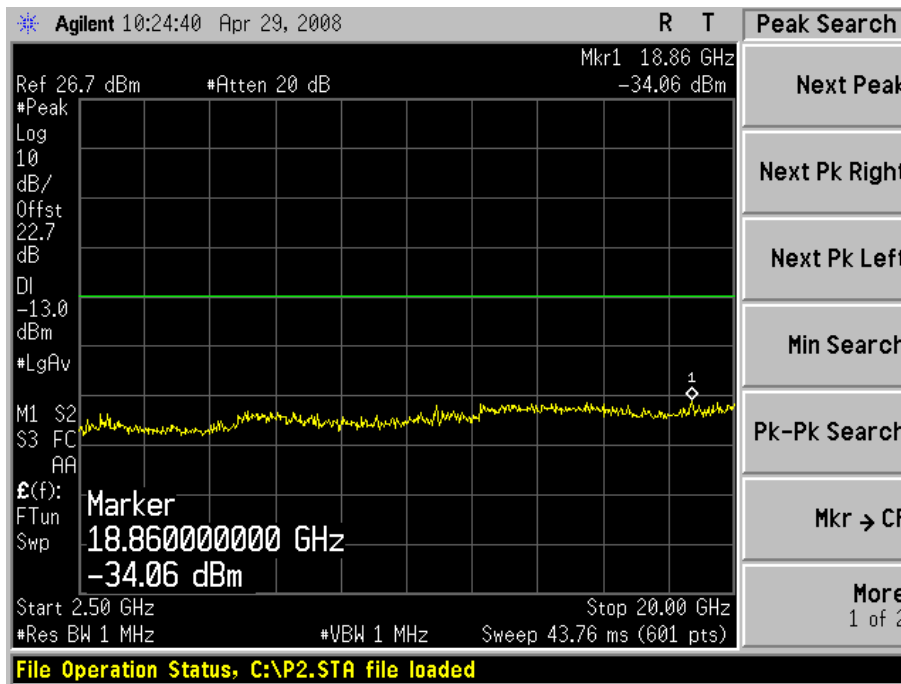
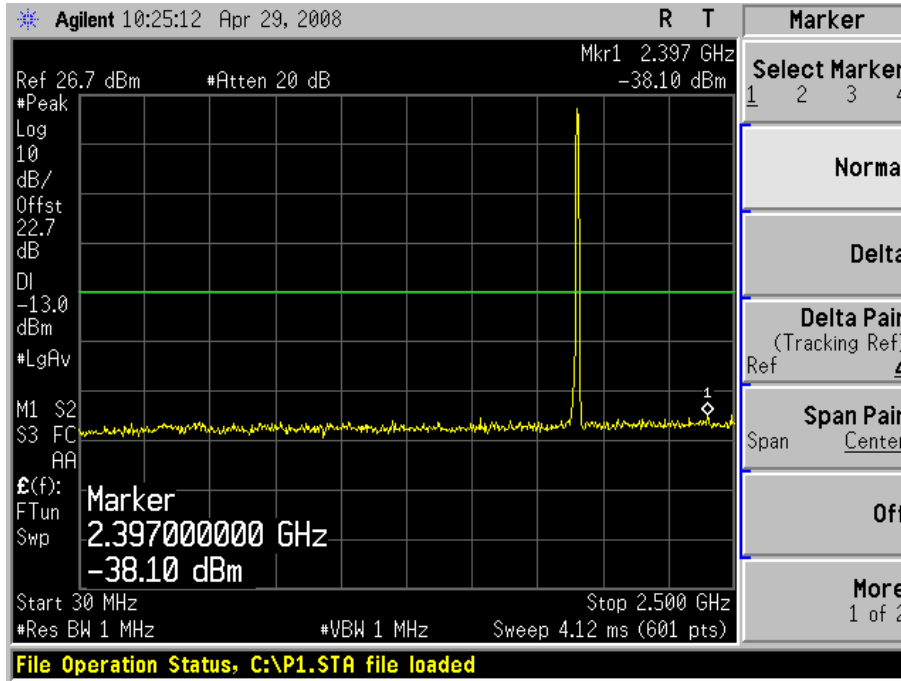
Channel 9262



Channel 9400

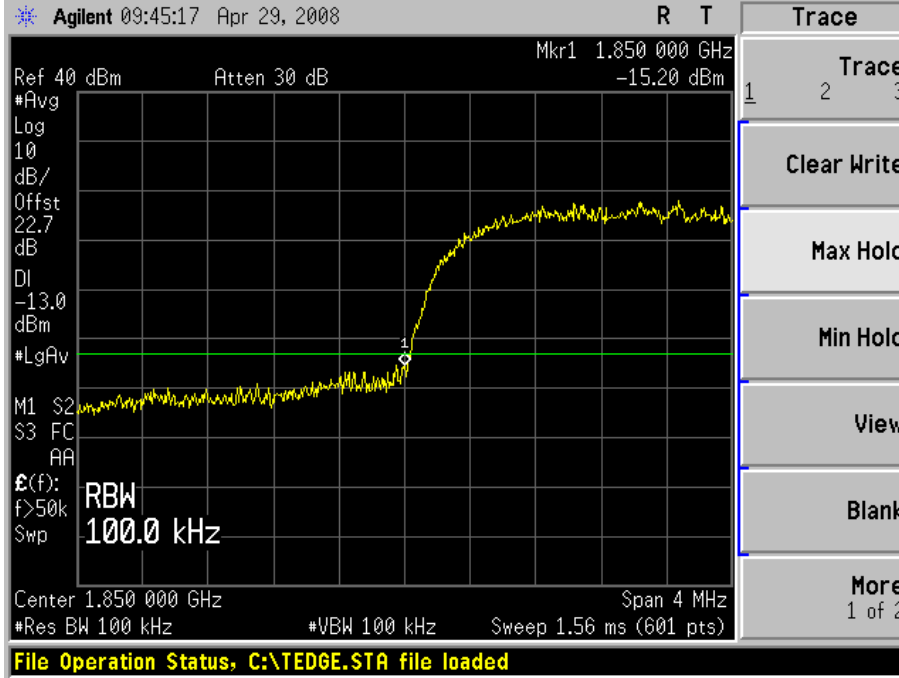


Channel 9538



● Band Edge

Channel 9262



Channel 9538

