TESTING
No. L2264

Part 22

TEST REPORT

Product Name	Smartisan T1
Model Name	SM701
FCC ID	2AEUYSM701
Applicant	Smartisan Technology Co., Ltd
Manufacturer	Smartisan Technology Co., Ltd
Date of issue	July 22, 2015

TA Technology (Shanghai) Co., Ltd.

GENERAL SUMMARY

Reference Standard(s)	**FCC CFR47 Part 2 (2013)** Frequency Allocations And Radio Treaty Matters; General Rules And Regulations **FCC CFR 47 Part 22H (2013)** Public Mobile Services(850MHz) **ANSI/TIA-603-C(2004)** Land mobile FM or PM Communications Equipment Measurements and Performance Standards. **KDB 971168 D01 Power Meas License Digital Systems v02r02** Measurement Guidance for Certification of Licensed Digital Transmitters
Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 2 of this test report are below limits specified in the relevant standards. General Judgment: **Pass**
Comment	The test result only responds to the measured sample.

Approved by Kai Xu	**Revised by** Lingling Kang	**Performed by** Changxu Wan
Kai Xu	Lingling Kang	Changxu Wan
Director	RF Manager	RF Engineer

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1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 428261.

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 8510A.

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. The sample under test was selected by the Client. This report only refers to the item that has undergone the test.

The test results in this test report relate only to the devices specified in this report.This report shall not be reproduced except in full without the written approval of **TA Technology (Shanghai) Co., Ltd.**

If the electronic report is inconsistent with the printed one, it should be subject to the latter.

1.2. Testing laboratory

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City:	Shanghai
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1.3. Applicant Information

Company:	Smartisan Technology Co., Ltd
Address:	7th Floor, Motorola Building, 1 East Wangjing Road, Chaoyang District, Beijing, 100102, P.R. China

1.4. Manufacturer Information

Company:	Smartisan Technology Co., Ltd
Address:	7th Floor, Motorola Building, 1 East Wangjing Road, Chaoyang District, Beijing, 100102, P.R. China

1.5. Information of EUT

General information

Product IMEI:	864516020010443		
Hardware Version:	MMR500003C		
Software Version:	V1.5.0		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Test Mode(s):	GSM 850: WCDMA Band V;		
Test Modulation:	(GSM)GMSK,8PSK; (WCDMA)QPSK		
GPRS Multislot Class:	12		
EGPRS Multislot Class:	12		
HSDPA UE Category:	14		
HSUPA UE Category:	6		
Maximum E.R.P.	GSM 850: 24.35 dBm WCDMA Band V: 14.80 dBm		
Power Supply:	Battery or Charger (AC adaptor)		
Rated Power Supply Voltage:	3.8V		
Extreme Voltage:	Minimum: 3.4V Maximum: 4.35V		
Extreme Temperature:	Lowest: -10°C Highest: +55°C		
Test Channel: (Low - Middle - High)	128 - 190 - 251 (GSM 850) 4132 - 4183 - 4233 (WCDMA Band V)		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM850	824.2 ~ 848.8	869.2 ~ 893.8
	WCDMA Band V	826.4 ~ 846.6	871.4 ~ 891.6

Auxiliary Equipment Details

AE1: Battery	
Model:	DC701
Capacity:	2570mAh
Manufacture:	Desay Battery Co., Ltd.
AE2: Charger	
Name:	Adapter
Model:	CD701
Voltage:	100-240V~50/60 Hz 0.3 A
Manufacture:	Xiamen Salom Electronic Co., Ltd.

1.6. Test Date

The test is performed from June 20, 2015 to June 29, 2015.

2. Test Information

2.1. Summary of test results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Radiated Power	22.913(a)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	22.917	PASS
5	Frequency Stability	2.1055 / 22.355	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 22.917(a)	PASS
7	Radiates Spurious Emission	2.1053 / 22.917 (a)	PASS

PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

2.2. RF Power Output

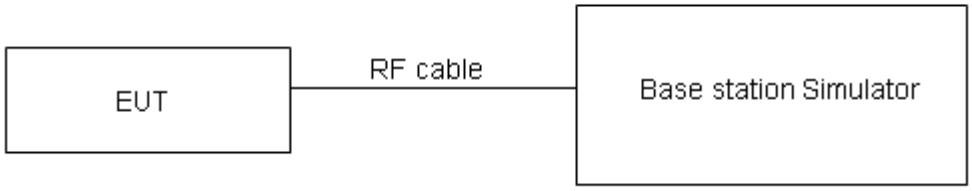
Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

Limits

No specific RF power output requirements in part 2.1046.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.4 dB.

Test Results

GSM 850		Conducted Power(dBm)		
		Channel 128	Channel 190	Channel 251
		824.2 (MHz)	836.6 (MHz)	848.8 (MHz)
GSM	Results	32.211	32.151	32.031
GPRS (GMSK)	1TXslot	**32.251**	**32.111**	**32.011**
	2TXslots	30.271	30.061	30.061
	3TXslots	29.241	29.071	29.041
	4TXslots	28.151	28.021	27.911
EGPRS (GMSK)	1TXslot	25.821	25.801	25.671
	2TXslots	25.271	25.261	25.091
	3TXslots	24.131	24.151	23.941
	4TXslots	23.041	23.071	22.901

Note:

1) The maximum RF Output Power numbers are marks in bold.

2)The following testing in GPRS/EGPRS is set to 1TXslot based on the maximum RF Output Power.

WCDMA Band V		Conducted Power(dBm)		
		Channel 4357	Channel 4408	Channel 4458
		826.4(MHz)	836.6(MHz)	846.6(MHz)
RMC		23.74	23.72	23.57
HSDPA	Sub - Test 1	20.72	20.75	20.85
	Sub - Test 2	**20.96**	**20.92**	**21.08**
	Sub - Test 3	20.05	20.39	20.45
	Sub - Test 4	20.04	20.38	20.43
HSUPA	Sub - Test 1	21.14	20.90	20.27
	Sub - Test 2	20.05	20.04	20.15
	Sub - Test 3	20.50	19.82	19.67
	Sub - Test 4	21.04	21.08	20.11
	Sub - Test 5	**21.25**	**21.09**	**21.16**

Note:

1) The maximum RF Output Power numbers are marks in bold.

2) The following testing in HSDPA/HSUPA is set to Sub - Test 2/ Sub - Test 5 based on the maximum RF Output Power.

2.3. Effective Radiated Power

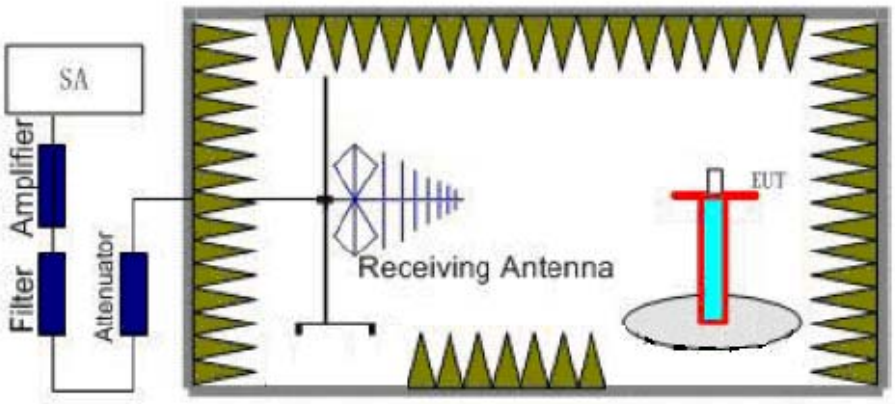
Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

Methods of Measurement

The measurement procedures in TIA- 603C are used.
1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;
UMTS operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
Ps (dBm)：Input power to substitution antenna.
Gs (dBi or dBd)：Substitution antenna Gain.
Et = Rt + AF
Es = Rs + AF
AF (dB/m)：Receive antenna factor
Rt：The highest received signal in spectrum analyzer for EUT.
Rs：The highest received signal in spectrum analyzer for substitution antenna.

Test Setup



Limits

Rule Part 22.913(a) specifies that "Mobile/portable stations are limited to 7 watts ERP”.

Limit	≤ 7 W (38.45 dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 1.19 dB

Test Results:Pass

GSM850					
Horizontal Polarization					
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBd)**	**ERP(dBm)**
824.2	-21.424	-45.53	0	-1.09	23.02
836.6	-21.051	-45.38	0	-0.91	23.42
848.8	-20.254	-45.37	0	-0.77	24.35
Vertical Polarization					
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBd)**	**ERP(dBm)**
824.2	-31.456	-45.65	0	-1.09	13.1
836.6	-30.959	-45.46	0	-0.91	13.59
848.8	-29.941	-45.49	0	-0.77	14.78
GPRS 850					
Horizontal Polarization					
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBd)**	**ERP(dBm)**
824.2	-23.794	-45.53	0	-1.09	20.65
836.6	-23.441	-45.38	0	-0.91	21.03
848.8	-22.894	-45.37	0	-0.77	21.71
Vertical Polarization					
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBd)**	**ERP(dBm)**
824.2	-28.806	-45.65	0	-1.09	15.75
836.6	-29.219	-45.46	0	-0.91	15.33
848.8	-27.581	-45.49	0	-0.77	17.14
EGPRS 850					
Horizontal Polarization					
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBd)**	**ERP(dBm)**
824.2	-24.964	-45.53	0	-1.09	19.48
836.6	-24.381	-45.38	0	-0.91	20.09
848.8	-24.064	-45.37	0	-0.77	20.54
Vertical Polarization					
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBd)**	**ERP(dBm)**
824.2	-31.076	-45.65	0	-1.09	13.48
836.6	-30.869	-45.46	0	-0.91	13.68
848.8	-29.491	-45.49	0	-0.77	15.23

WCDMA Band V					
Horizontal Polarization					
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBd)**	**ERP(dBm)**
826.4	-30.838	-45.44	0	-1.02	13.58
836.6	-30.241	-45.38	0	-0.91	14.23
846.6	-29.778	-45.38	0	-0.8	14.8
Vertical Polarization					
Frequency(MHz)	**Rt(dBm)**	**Rs(dBm)**	**Ps(dBm)**	**Gs(dBd)**	**ERP(dBm)**
826.4	-40.639	-45.54	0	-1.02	3.88
836.6	-39.929	-45.46	0	-0.91	4.62
846.6	-39.359	-45.49	0	-0.8	5.33

Note: ERP = EIRP - 2.15

2.4. Occupied Bandwidth

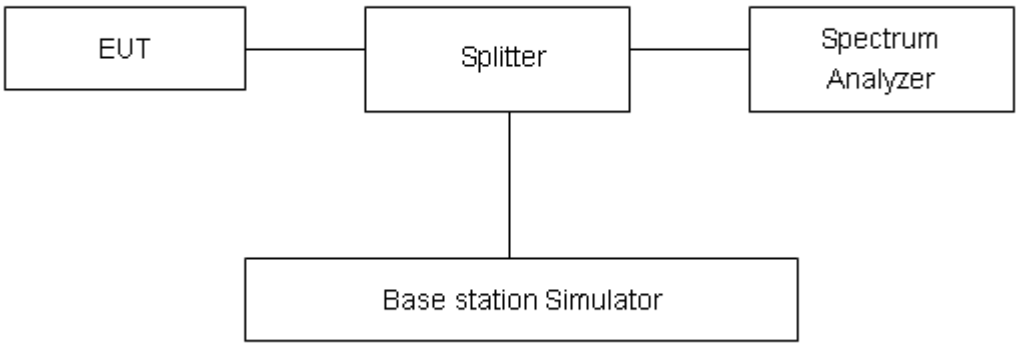
Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 3kHz,VBW is set to 10kHz for GSM 850 and RBW is set to 51kHz,VBW is set to 100kHz for WCDMA Band V. 99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

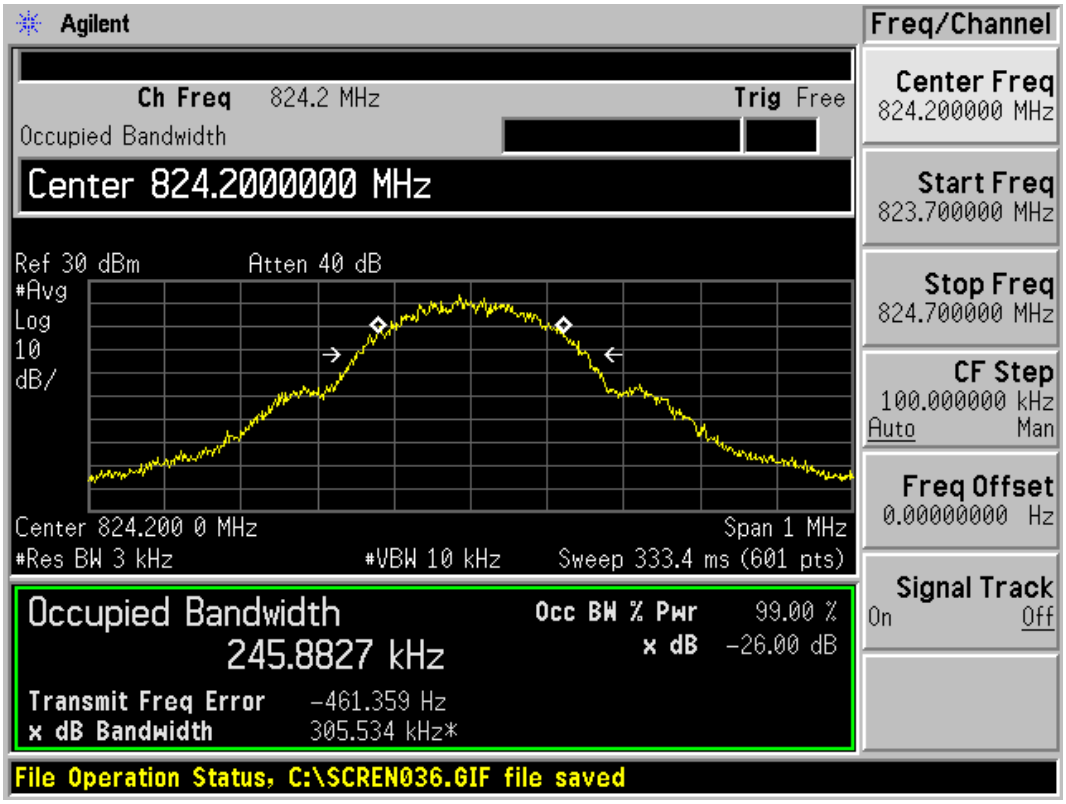
No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

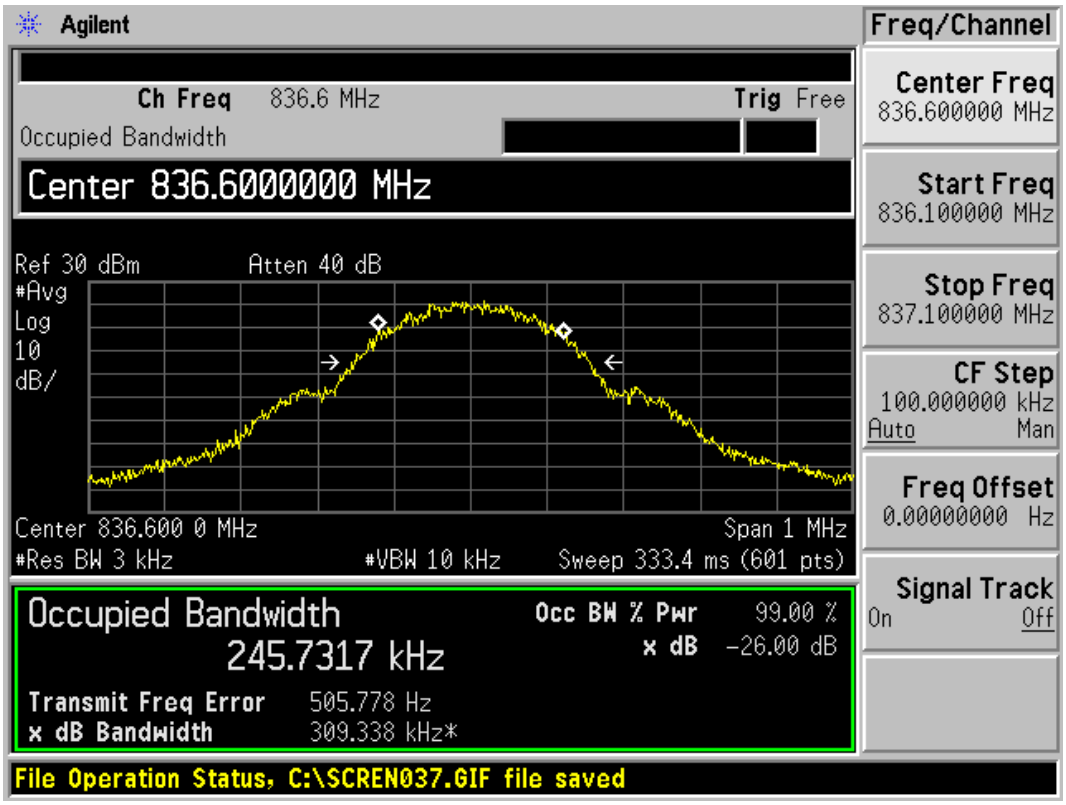
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 624Hz.

Test Result

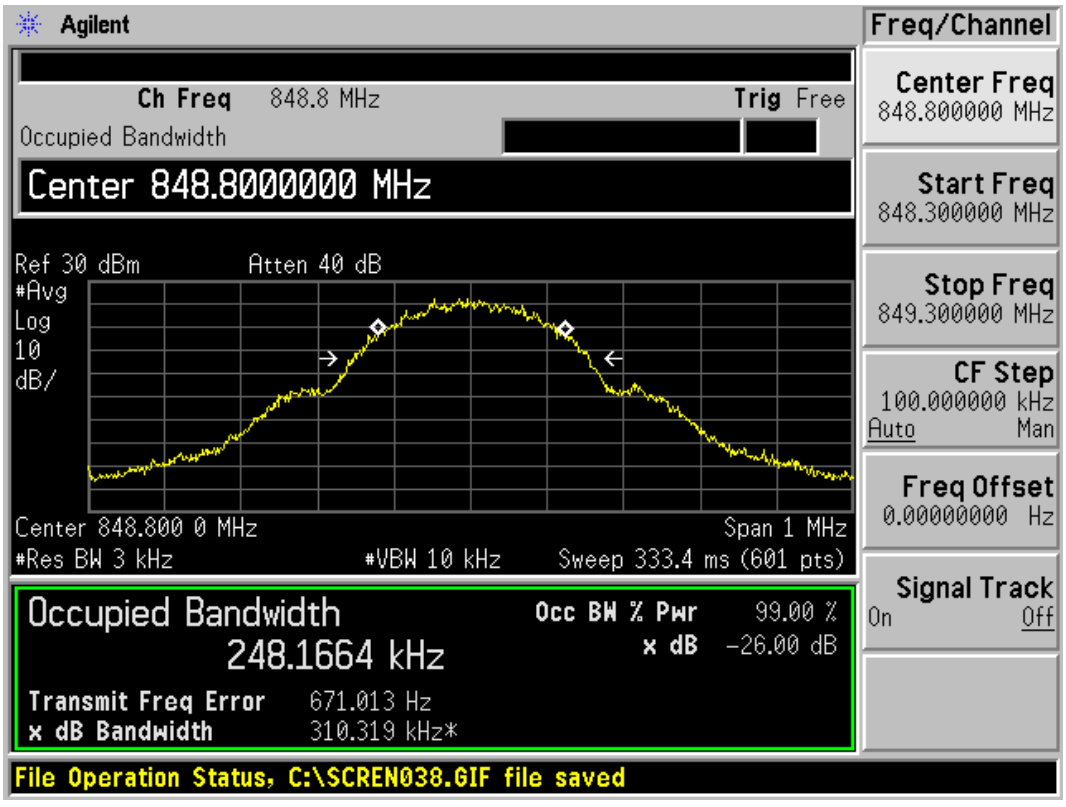
	Channel	Frequency (MHz)	99% Power Bandwidth (kHz)	-26dBc Bandwidth(kHz)
GSM 850	128	824.2	245.8827	305.534
	190	836.6	245.7317	309.338
	251	848.8	248.1664	310.319
GPRS (GMSK)	128	824.2	247.0704	311.442
	190	836.6	242.6906	309.922
	251	848.8	246.6451	313.073
EGPRS (8-PSK)	128	824.2	248.0326	312.761
	190	836.6	248.0103	310.256
	251	848.8	243.4677	305.081



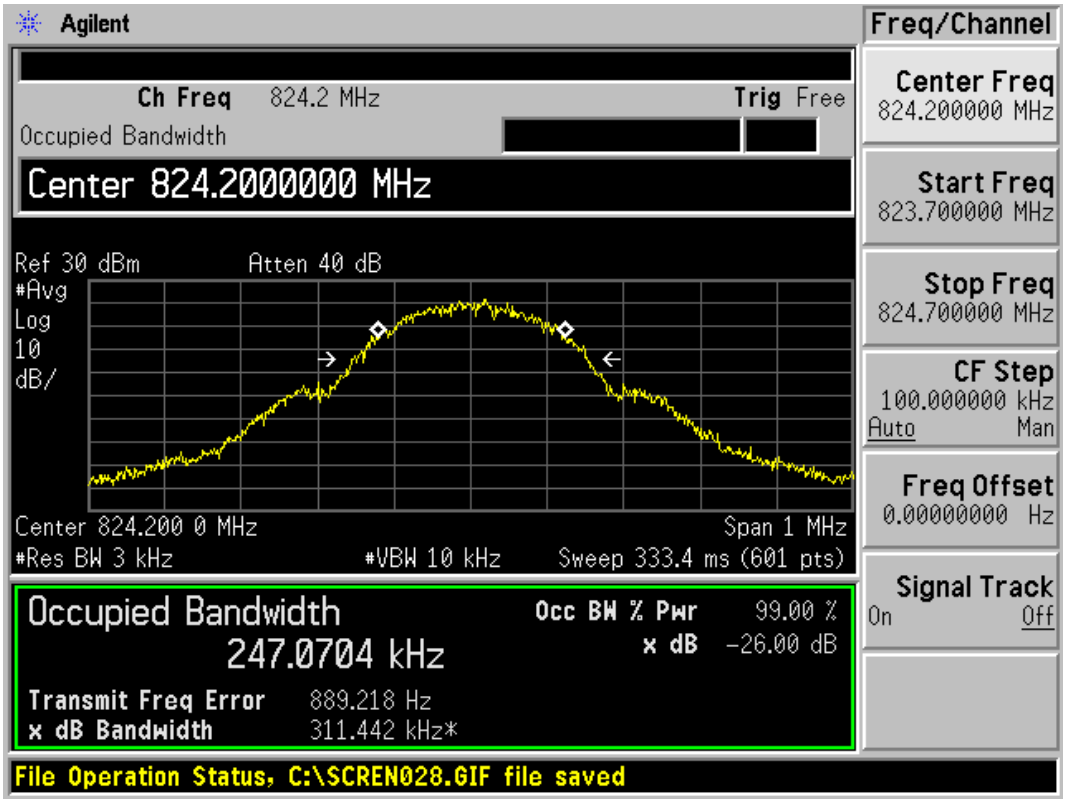
GSM 850 CH128 Occupied Bandwidth



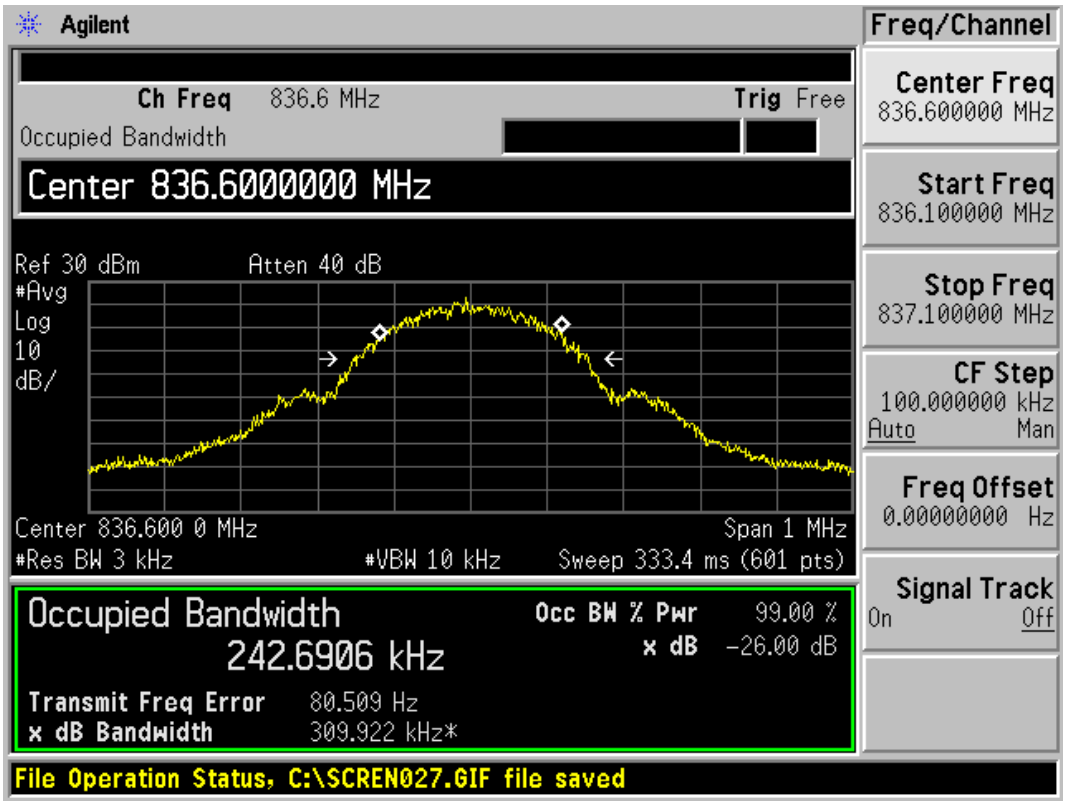
GSM 850 CH190 Occupied Bandwidth



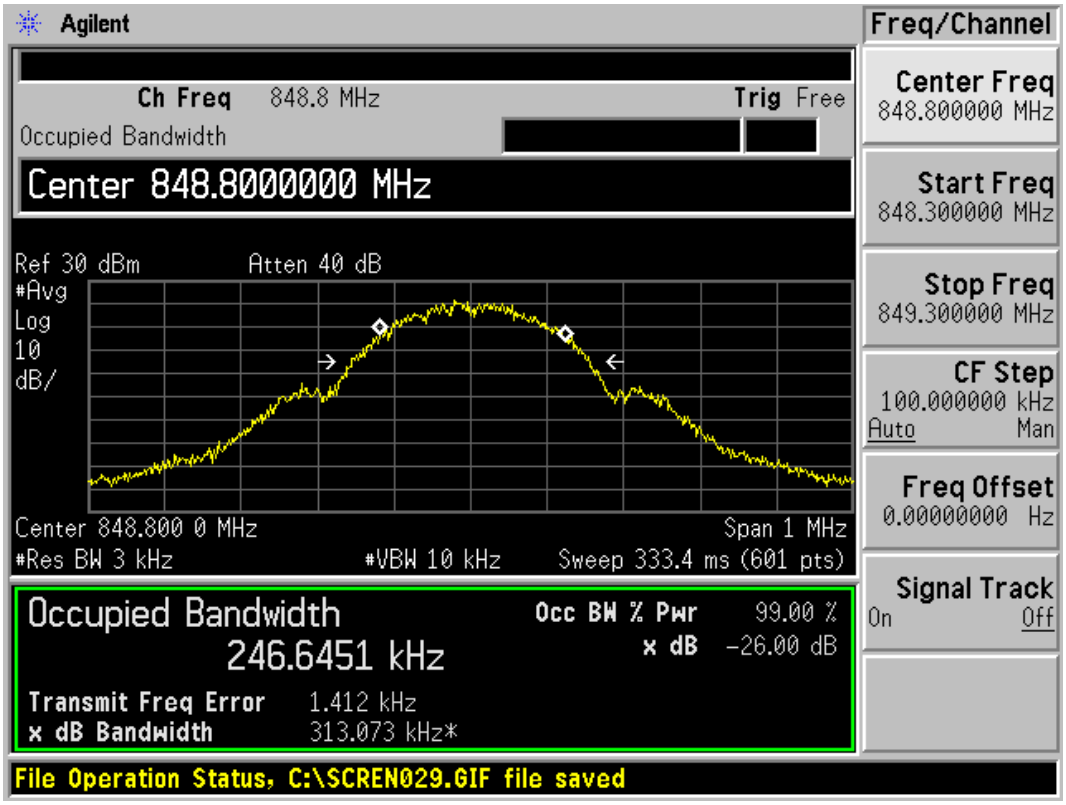
GSM 850 CH251 Occupied Bandwidth



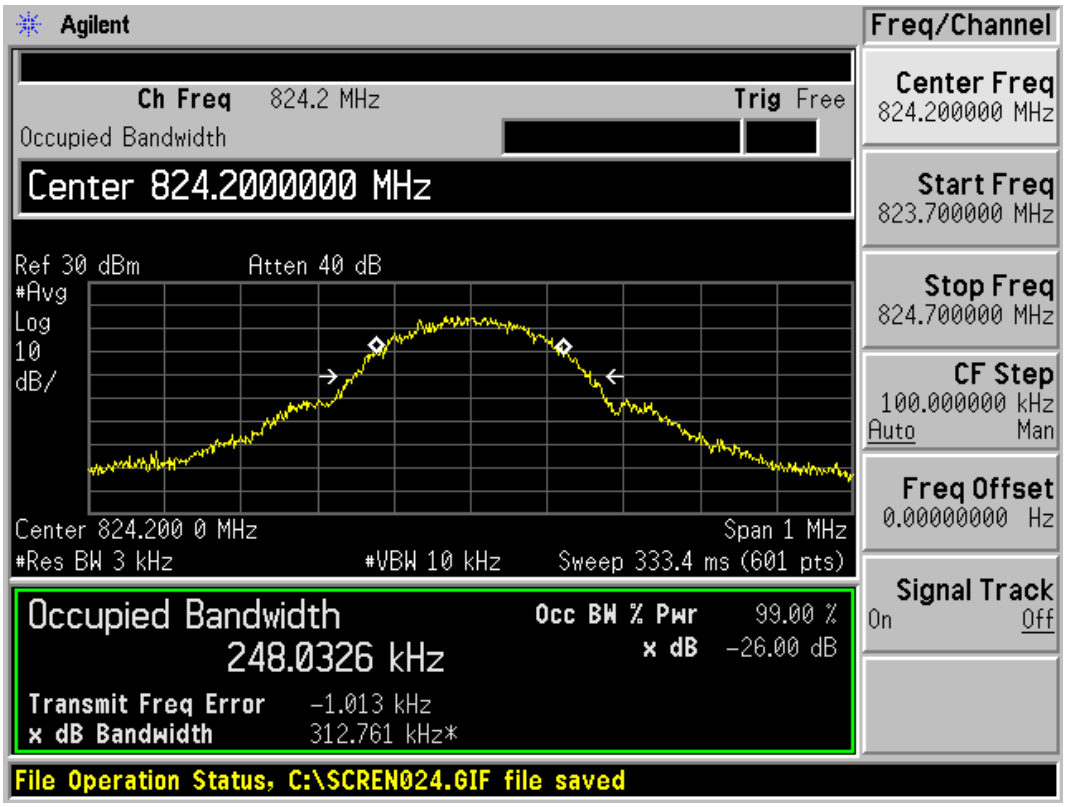
GSM 850 GPRS CH128 Occupied Bandwidth



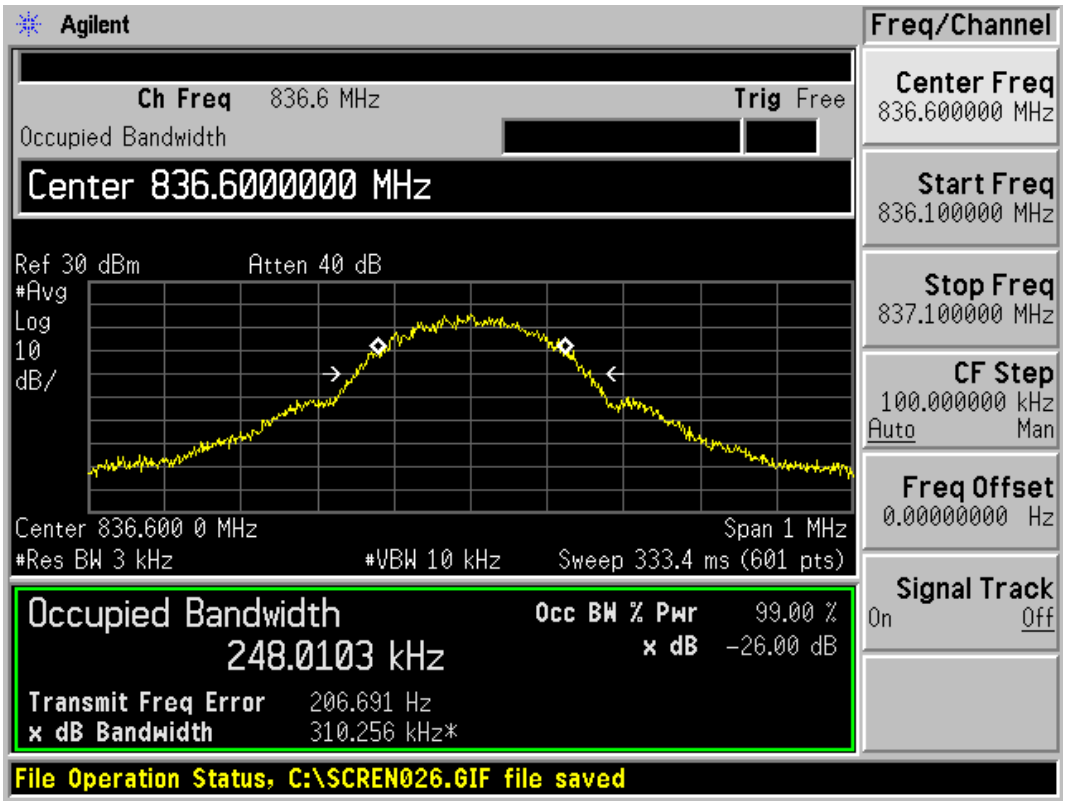
GSM 850 GPRS CH190 Occupied Bandwidth



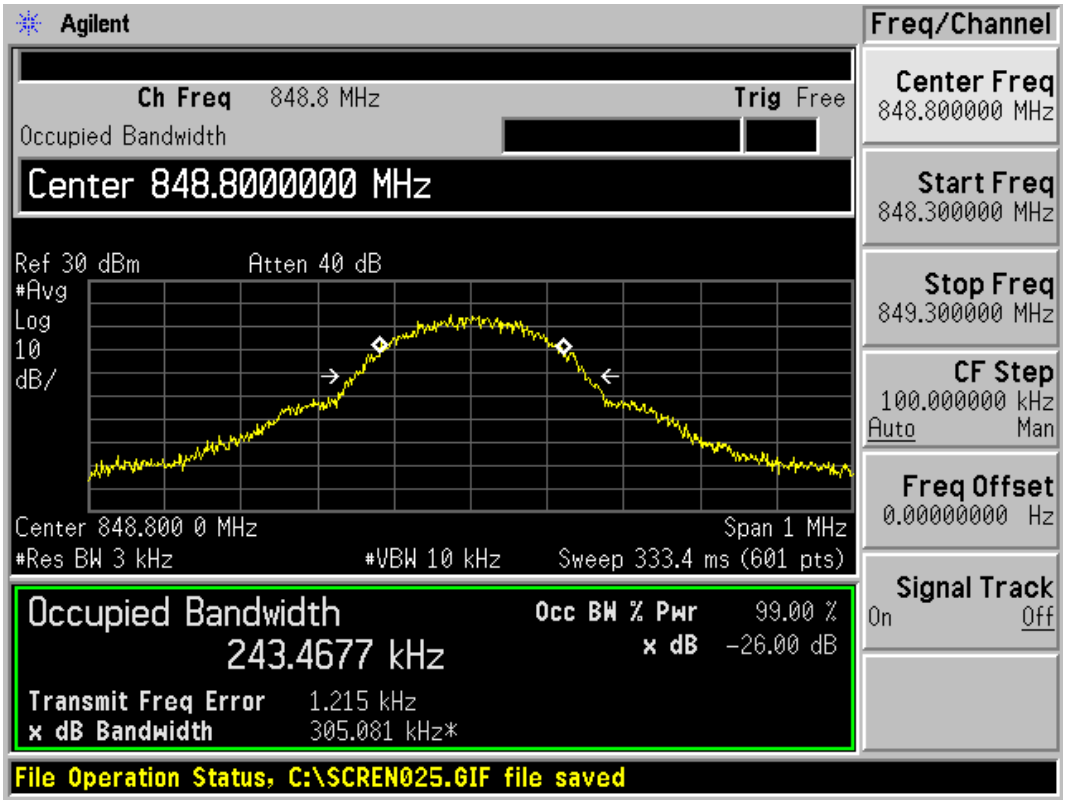
GSM 850 GPRS CH251 Occupied Bandwidth



GSM 850 EGPRS CH128 Occupied Bandwidth

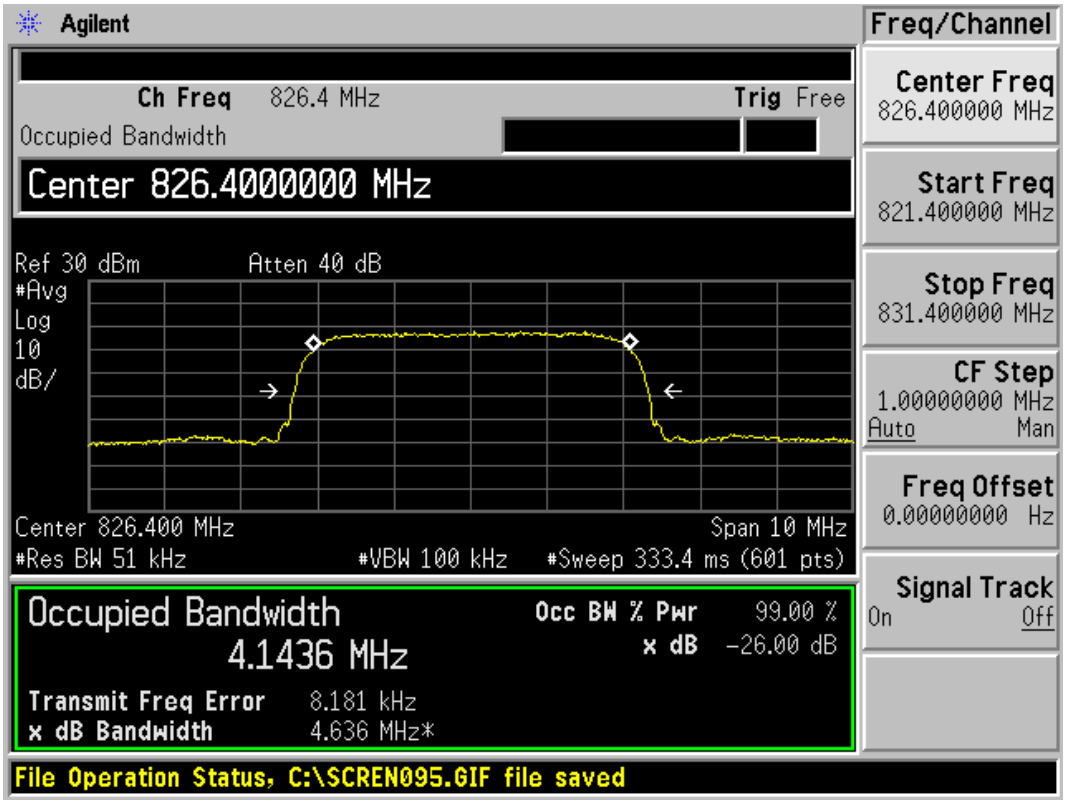


GSM 850 EGPRS CH190 Occupied Bandwidth

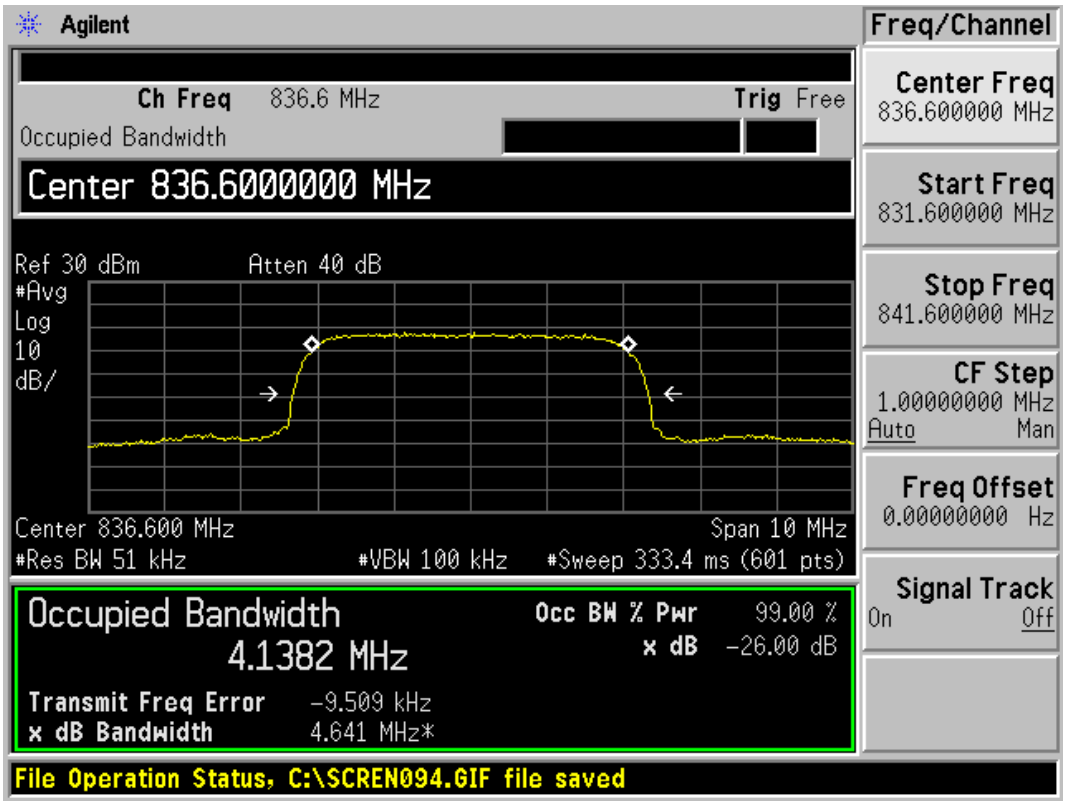


GSM 850 EGPRS CH251 Occupied Bandwidth

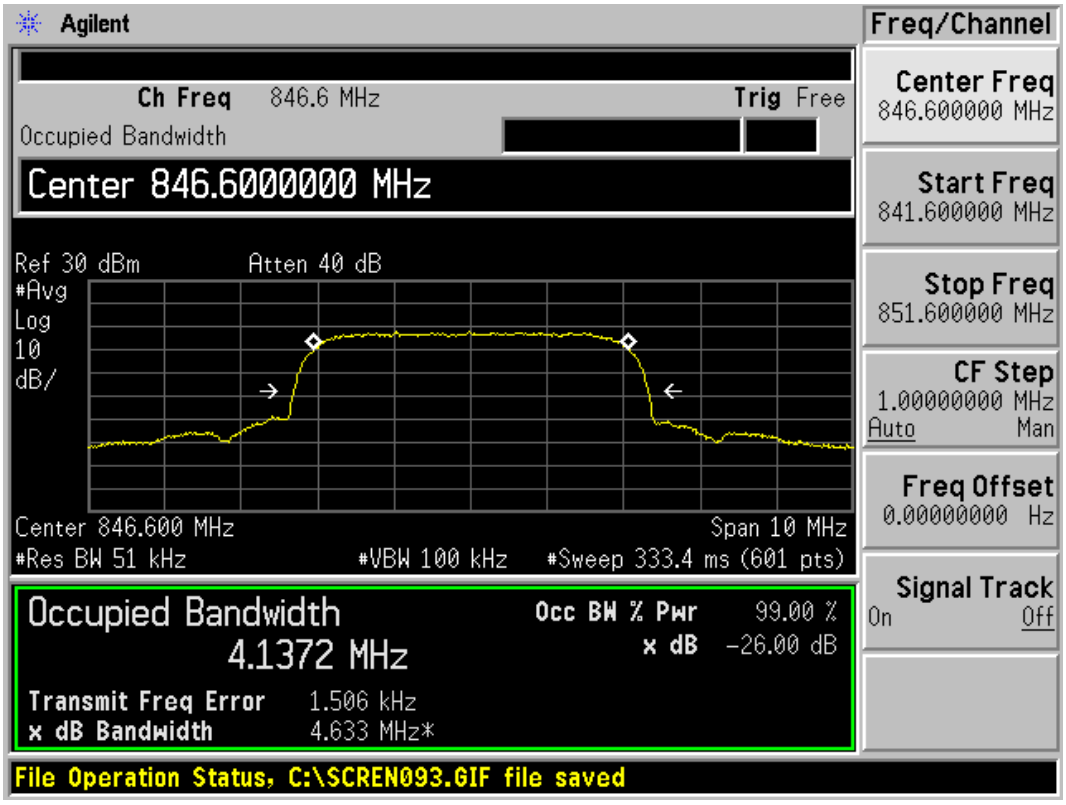
	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
WCDMA Band V	4132	826.4	4.1436	4.636
	4183	836.6	4.1382	4.641
	4233	846.6	4.1372	4.633
HSDPA	4132	826.4	4.1664	4.663
	4183	836.6	4.1533	4.653
	4233	846.6	4.1389	4.644
HSUPA	4132	826.4	4.1637	4.662
	4183	836.6	4.1543	4.650
	4233	846.6	4.1534	4.655



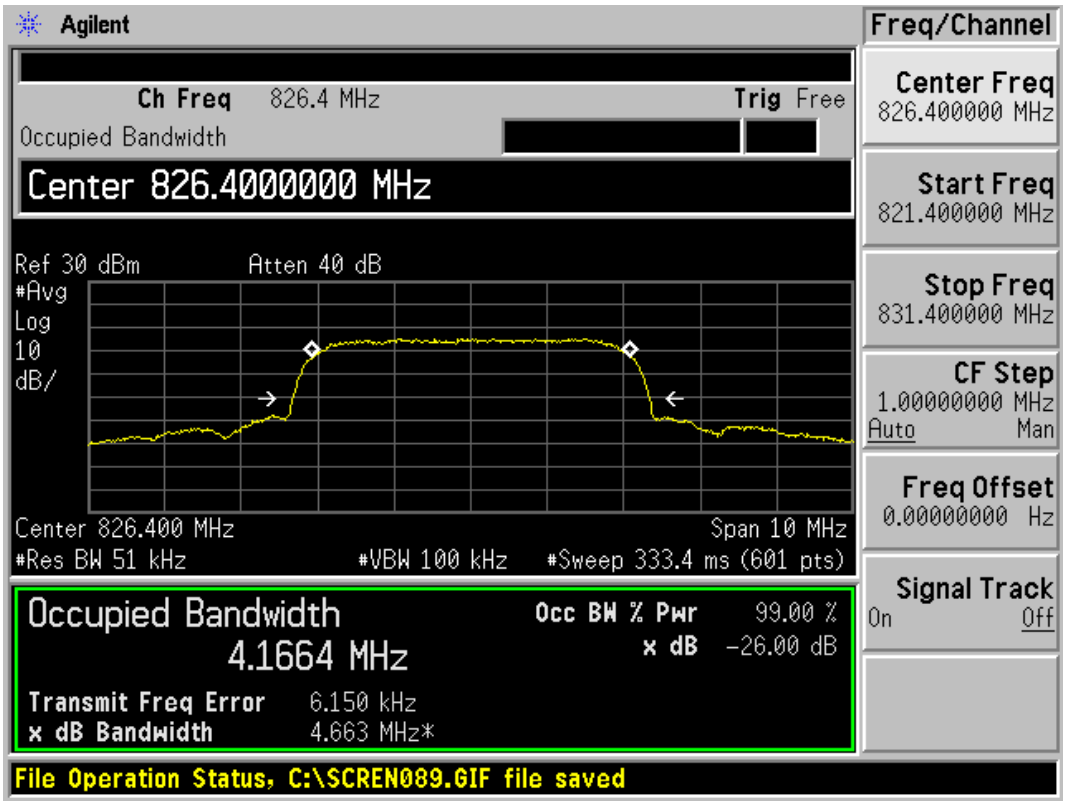
WCDMA Band V CH4132 Occupied Bandwidth



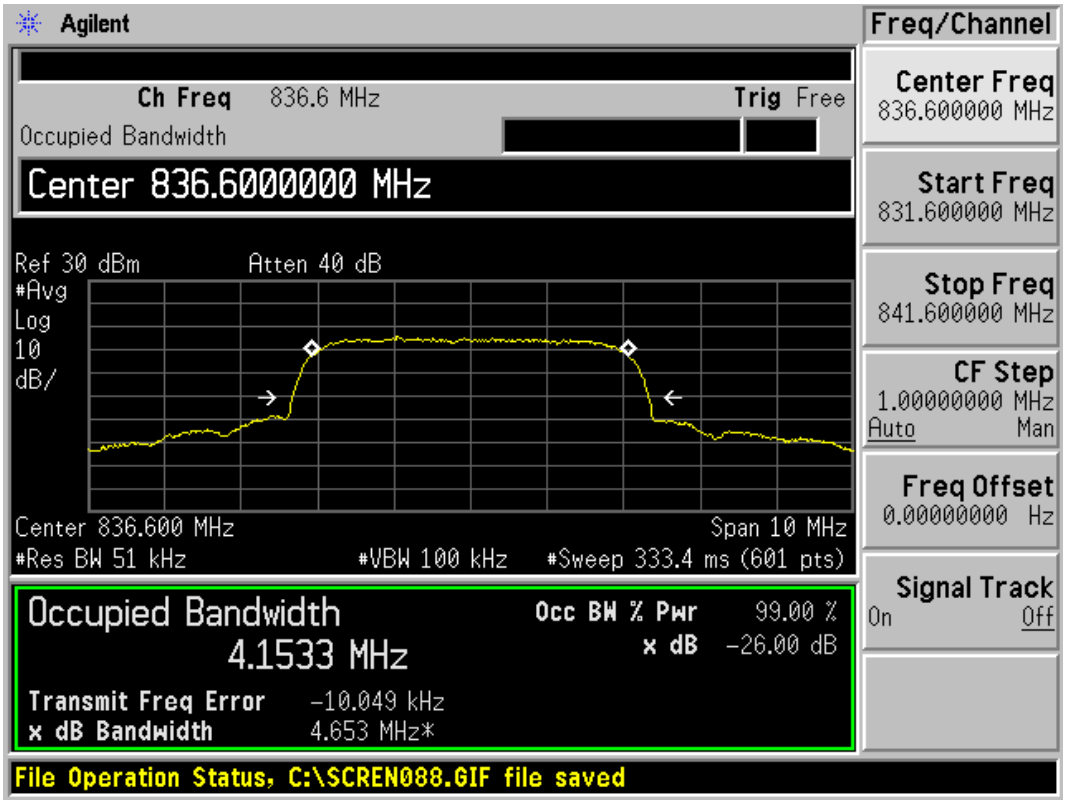
WCDMA Band V CH4183 Occupied Bandwidth



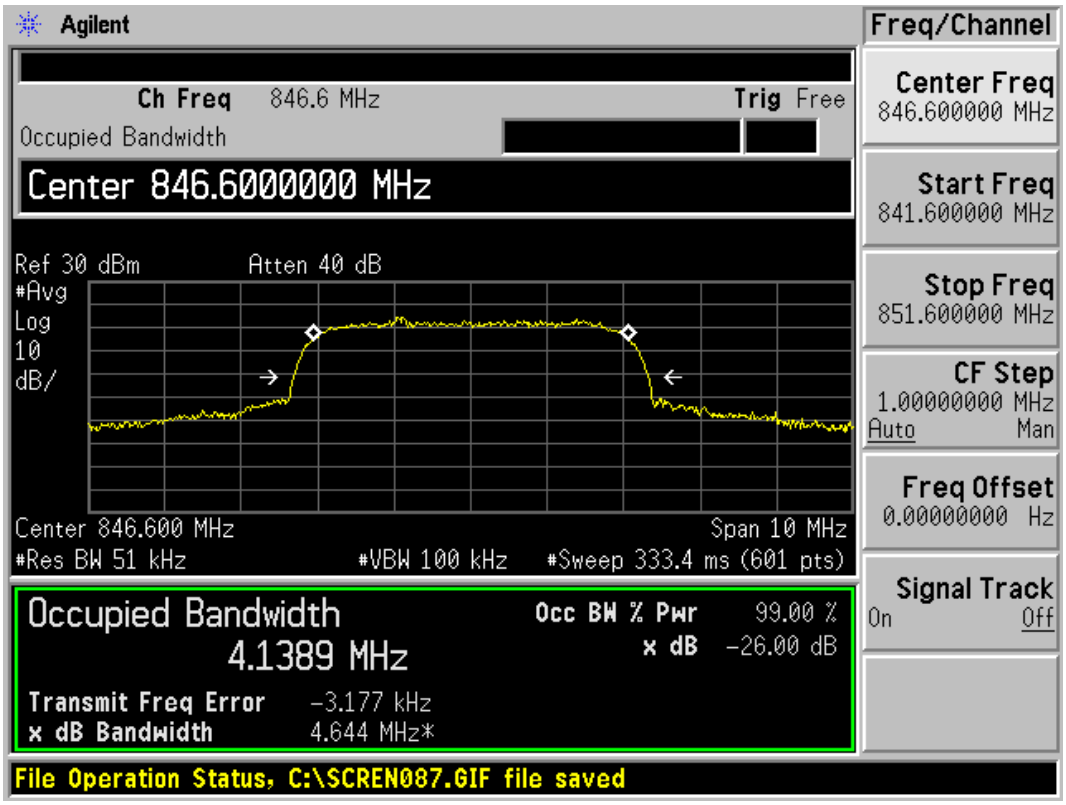
WCDMA Band V CH4233 Occupied Bandwidth



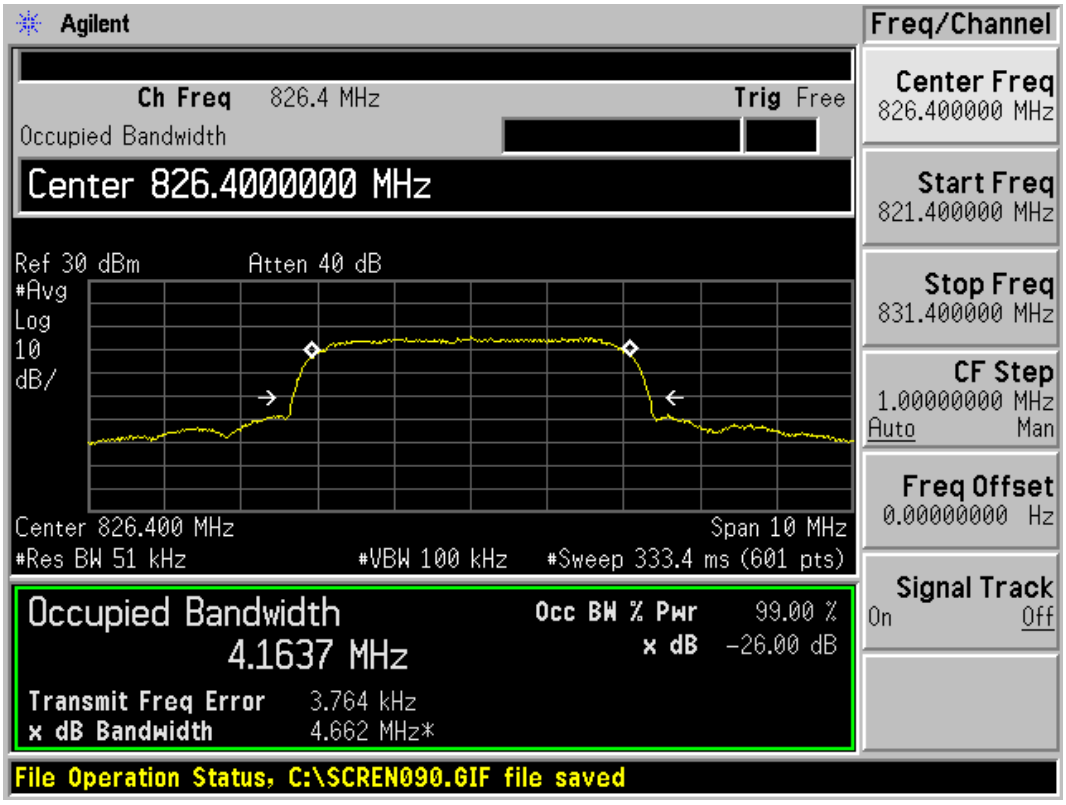
WCDMA Band V HSDPA CH4132 Occupied Bandwidth



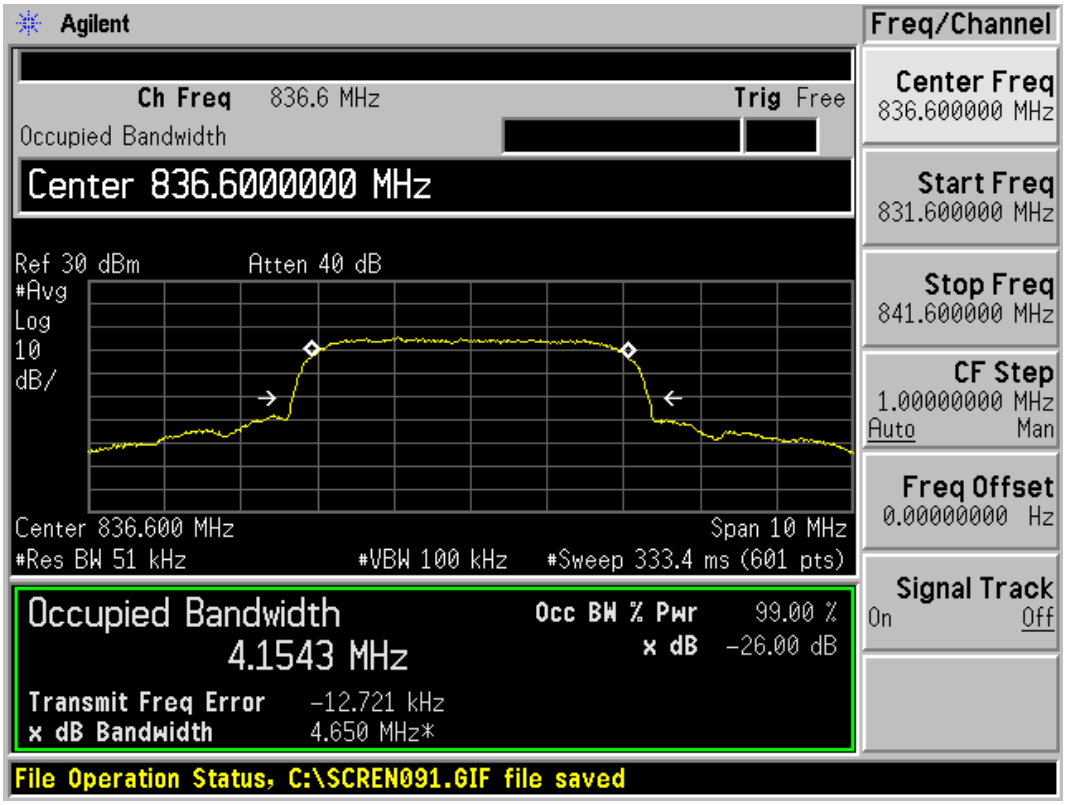
WCDMA Band V HSDPA CH4183 Occupied Bandwidth



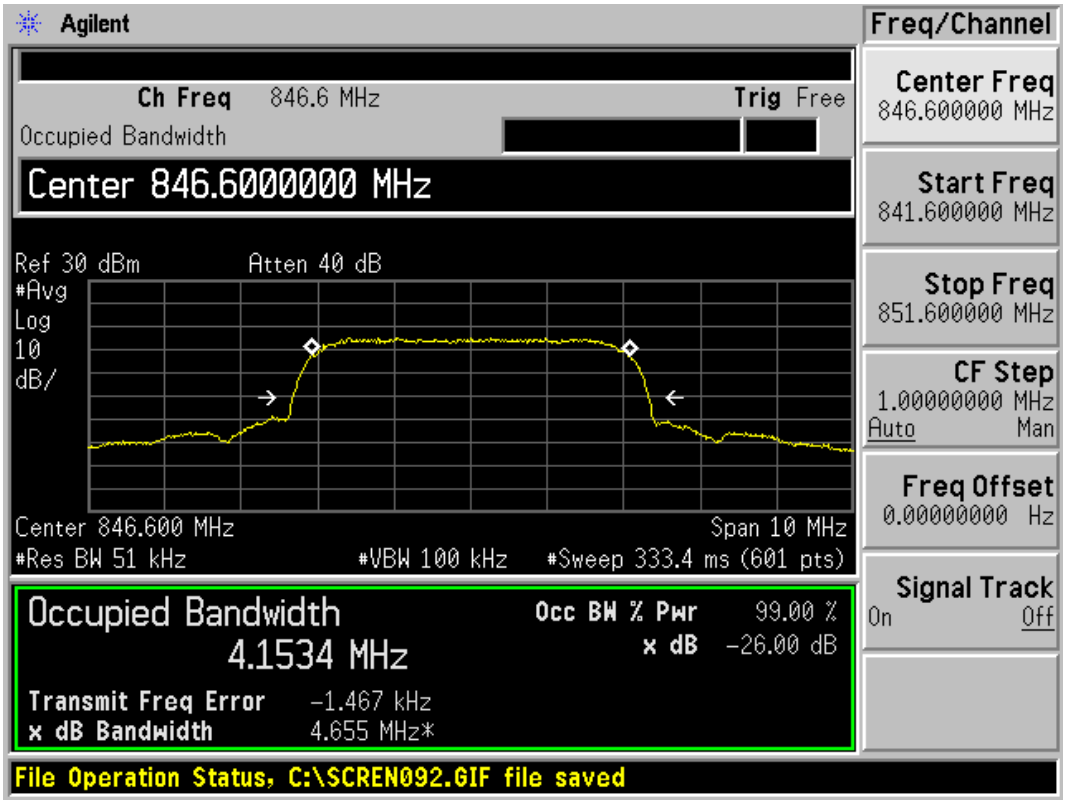
WCDMA Band V HSDPA CH4233 Occupied Bandwidth



WCDMA Band V HSUPA CH4132 Occupied Bandwidth



WCDMA Band V HSUPA CH4183 Occupied Bandwidth



WCDMA Band V HSUPA CH4233 Occupied Bandwidth

2.5. Band Edge Compliance

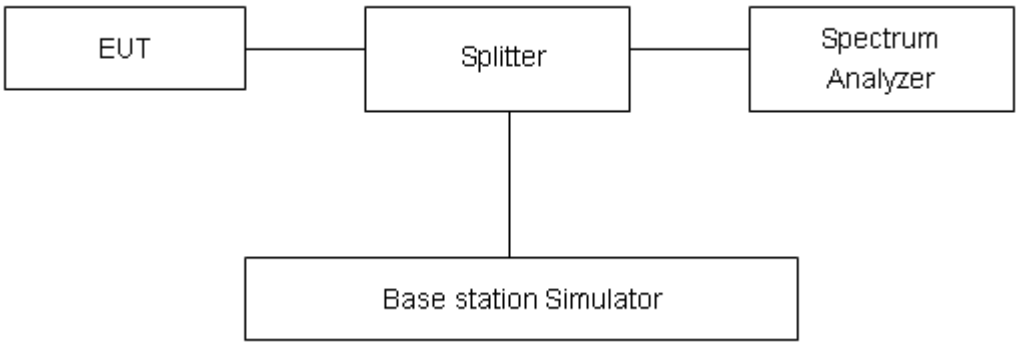
Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The average detector is used. RBW is set to 3kHz,VBW is set to 10kHz for GSM 850 and RBW is set to 51kHz,VBW is set to 100kHz for WCDMA Band V. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.”

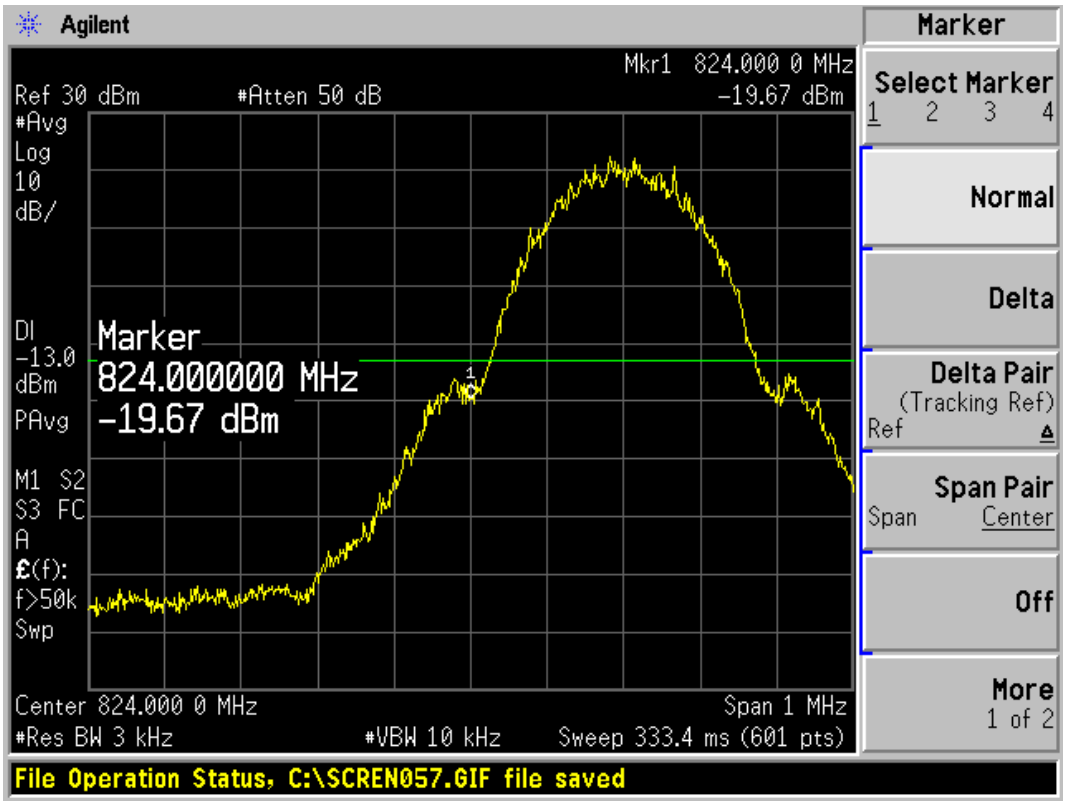
Limit	-13 dBm

Measurement Uncertainty

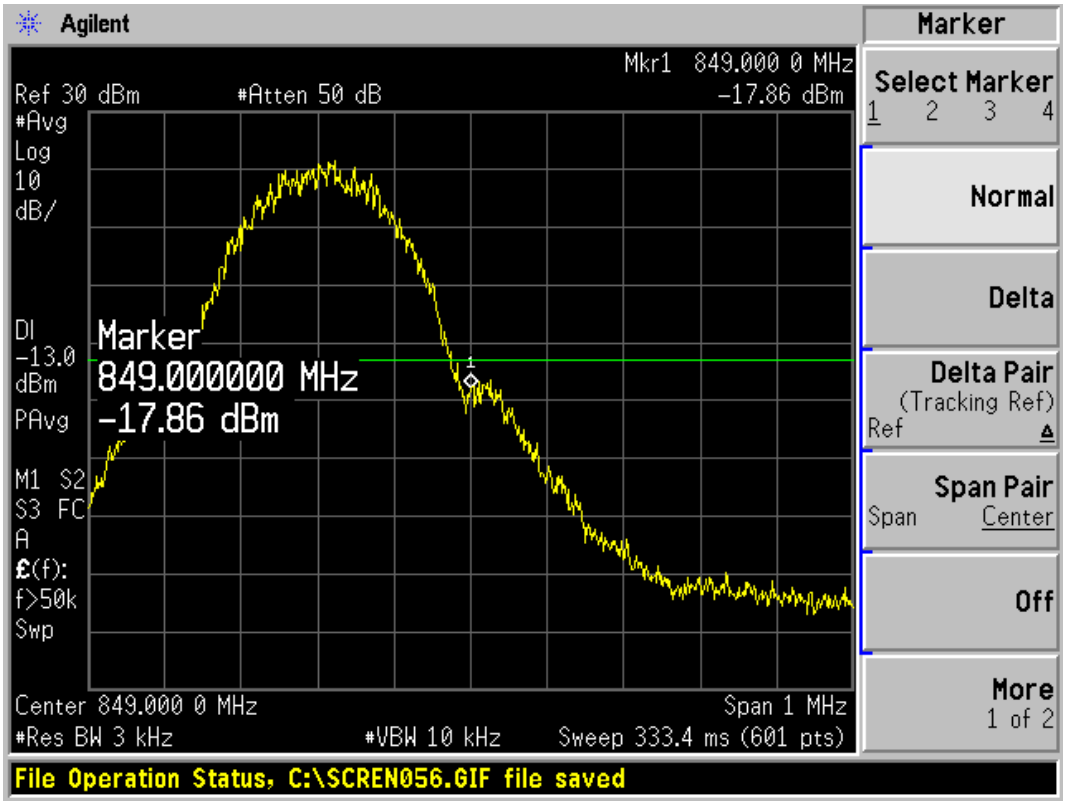
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U=0.684dB.

Test Result:

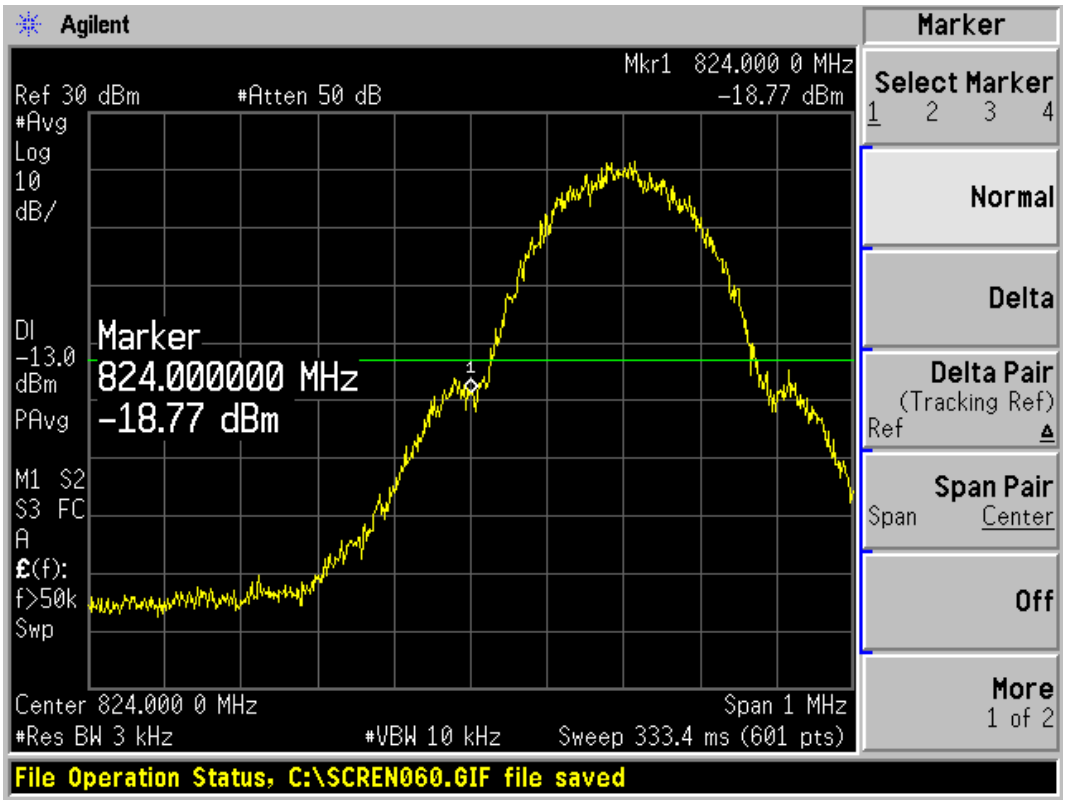
GSM 850	Carrier frequency (MHz)	Reference value (dBm)	Limit	Conclusion
GSM	824.0	-19.67	-13	PASS
	849.0	-17.86	-13	PASS
GPRS (GMSK)	824.0	-18.77	-13	PASS
	849.0	-17.80	-13	PASS
EGPRS (8-PSK)	824.0	-26.73	-13	PASS
	849.0	-27.23	-13	PASS



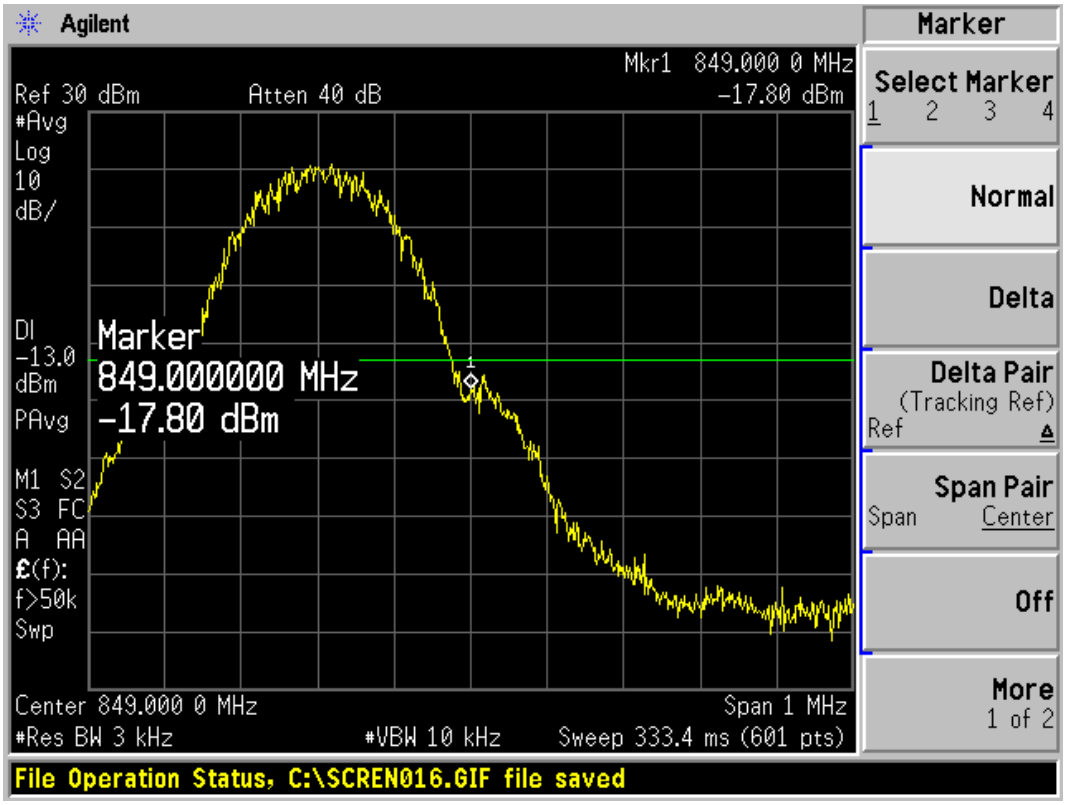
GSM 850 128 Channel



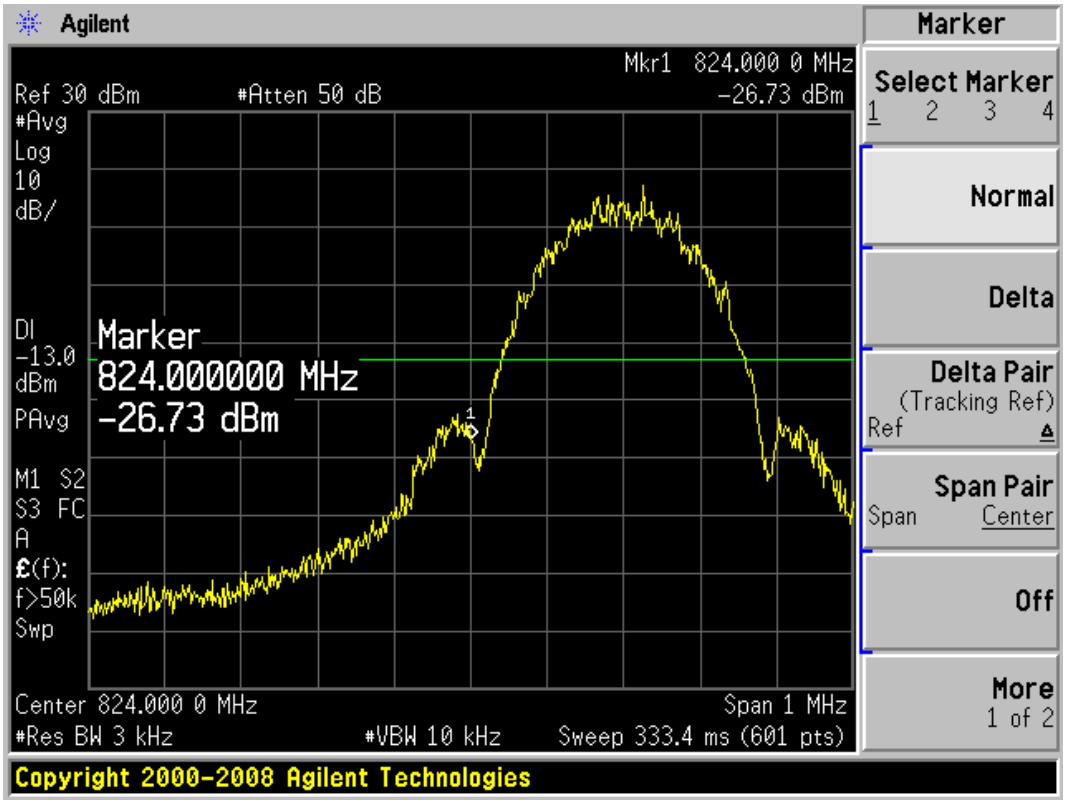
GSM 850 251 Channel



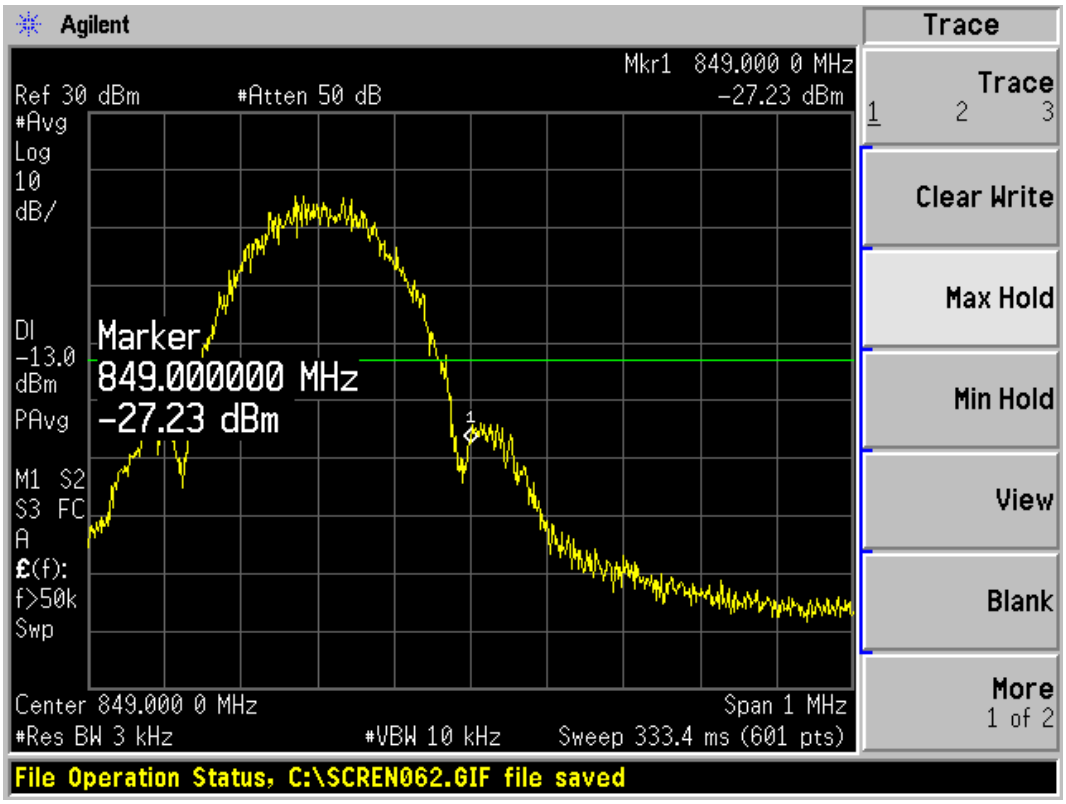
GSM 850 GPRS 128 Channel



GSM 850 GPRS 251 Channel

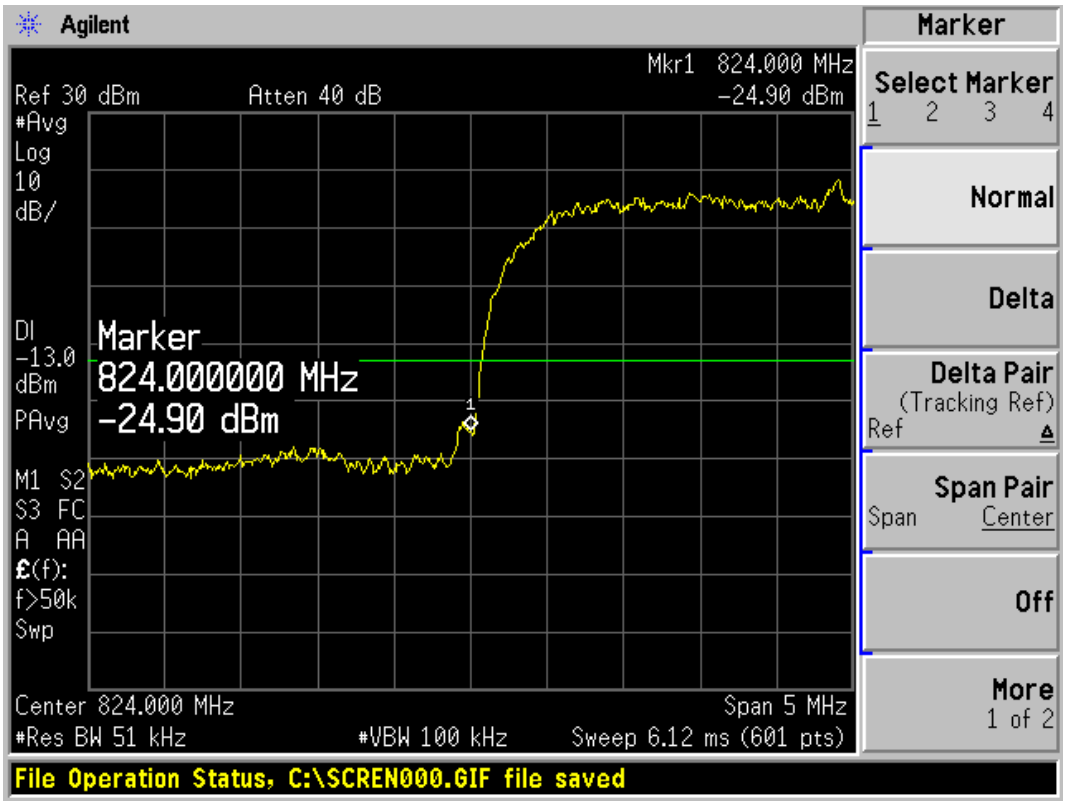


GSM 850 EGPRS 128 Channel

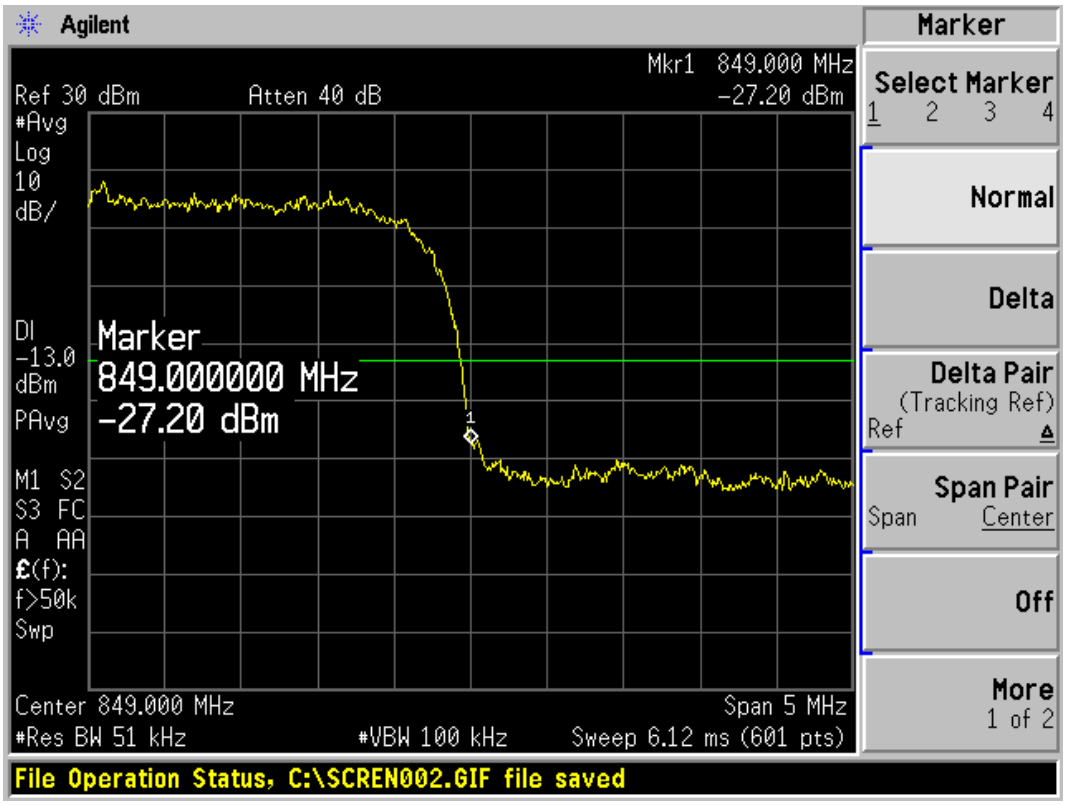


GSM 850 EGPRS 251 Channel

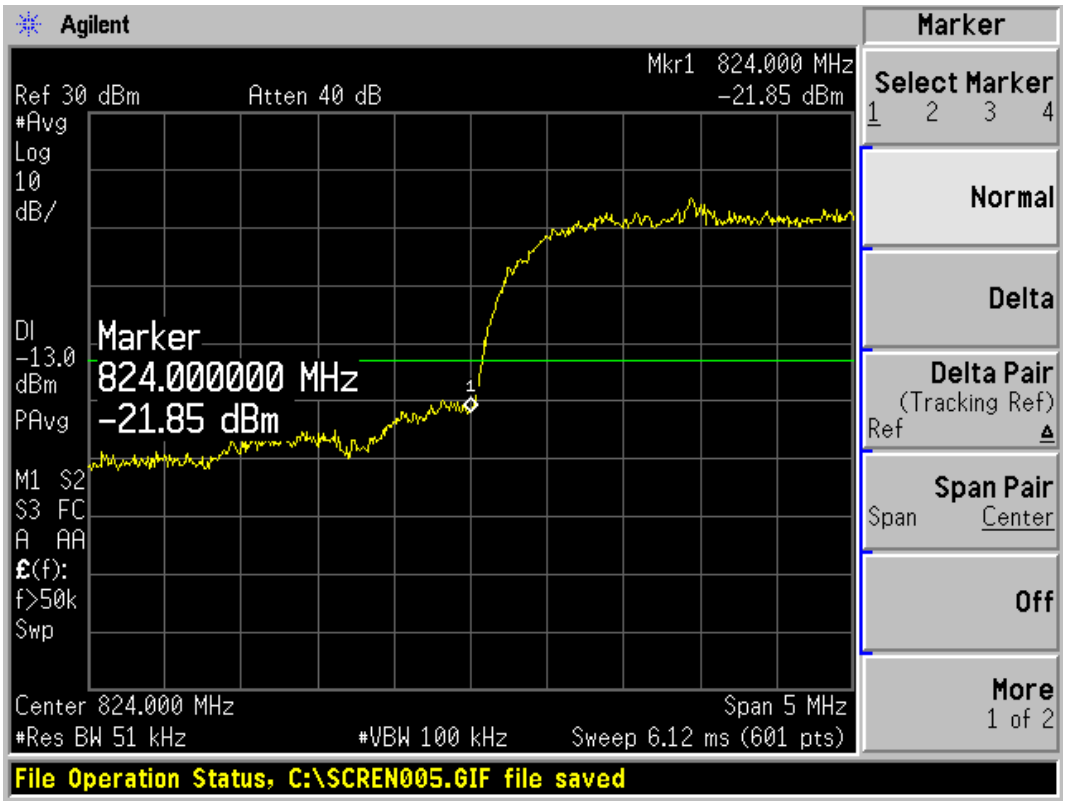
WCDMA Band V	Carrier frequency (MHz)	Reference value (dBm)	Limit	Conclusion
RMC	824	-24.90	-13	PASS
	849	-27.20	-13	PASS
HSDPA	824	-21.85	-13	PASS
	849	-19.77	-13	PASS
HSUPA	824	-21.93	-13	PASS
	849	-24.01	-13	PASS



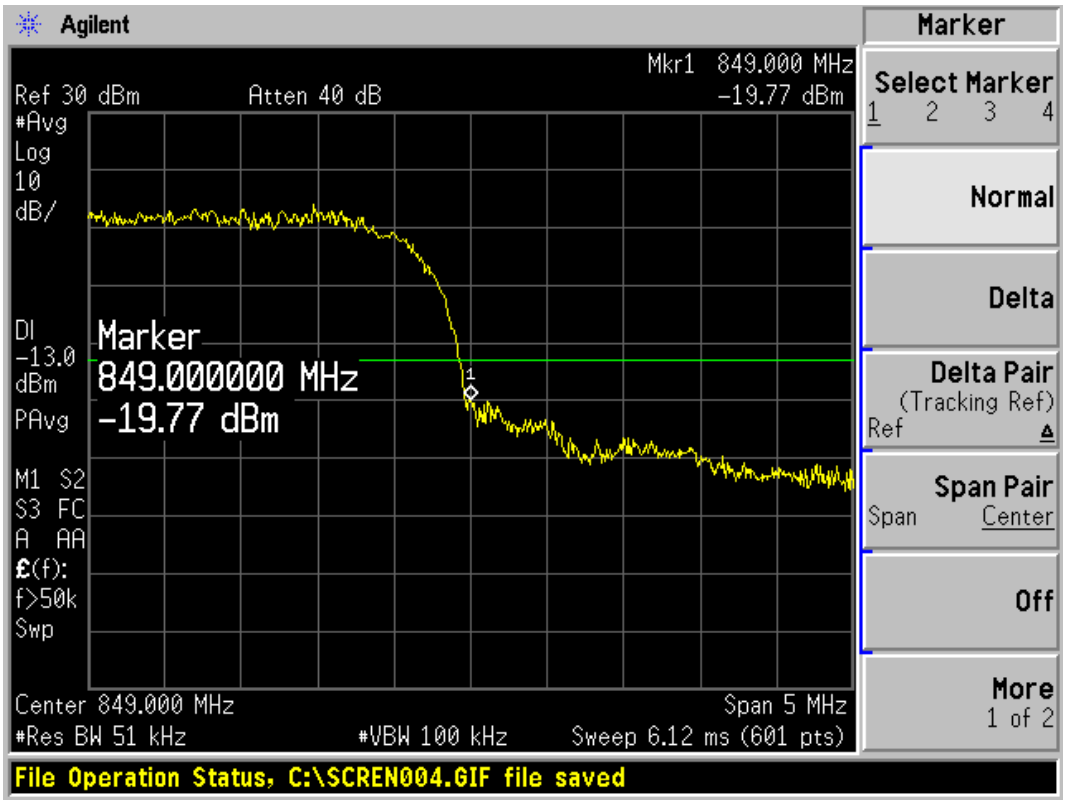
WCDMA Band V 4132 Channel



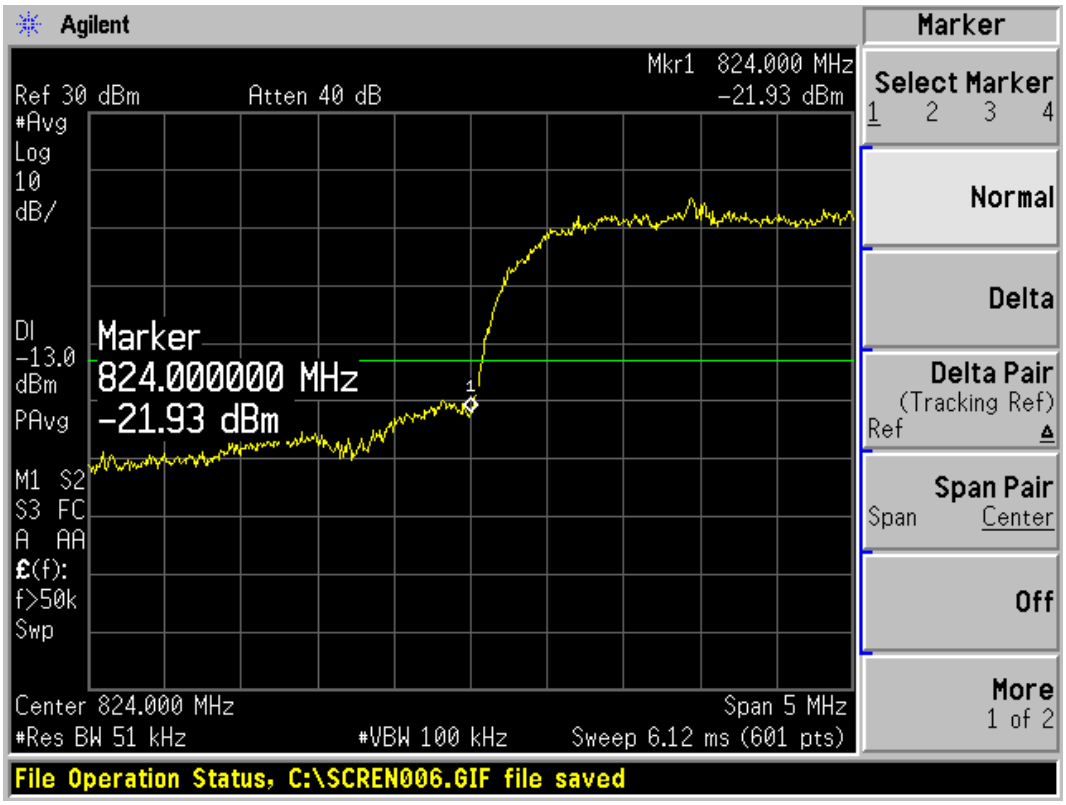
WCDMA Band V 4233 Channel



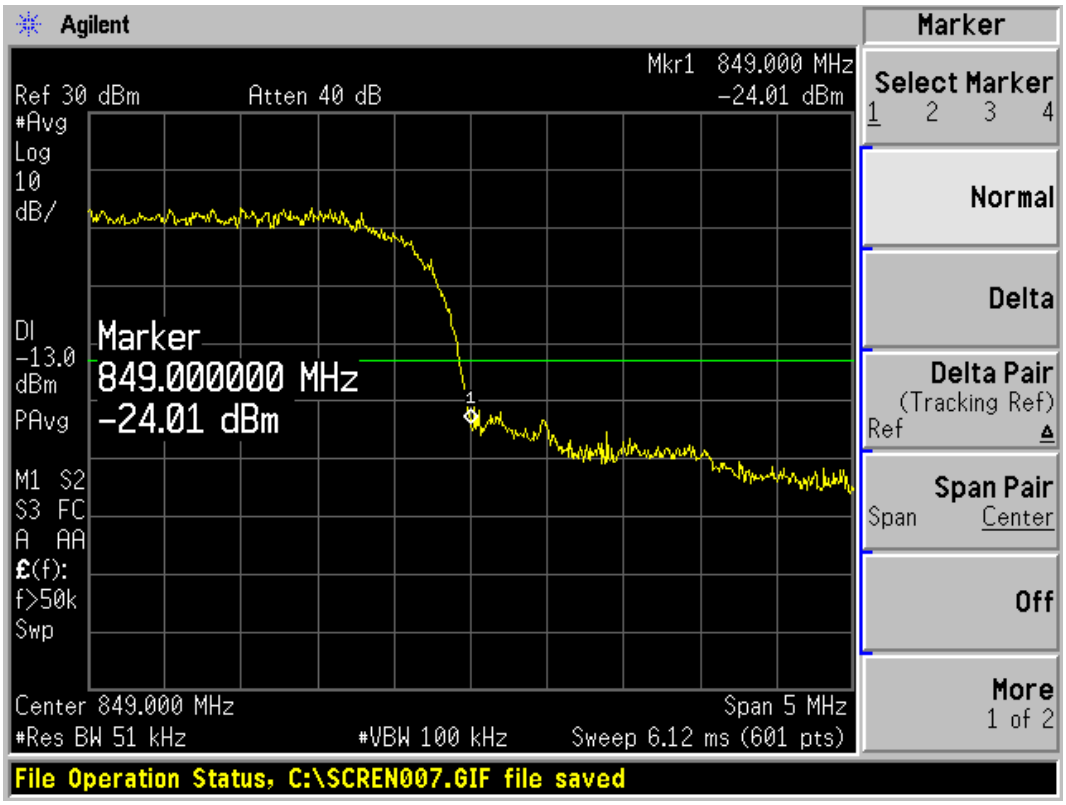
WCDMA Band V HSDPA 4132 Channel



WCDMA Band V HSDPA 4233 Channel



WCDMA Band V HSUPA 4132Channel



WCDMA Band V HSUPA 4233 Channel

2.6. Frequency Stability

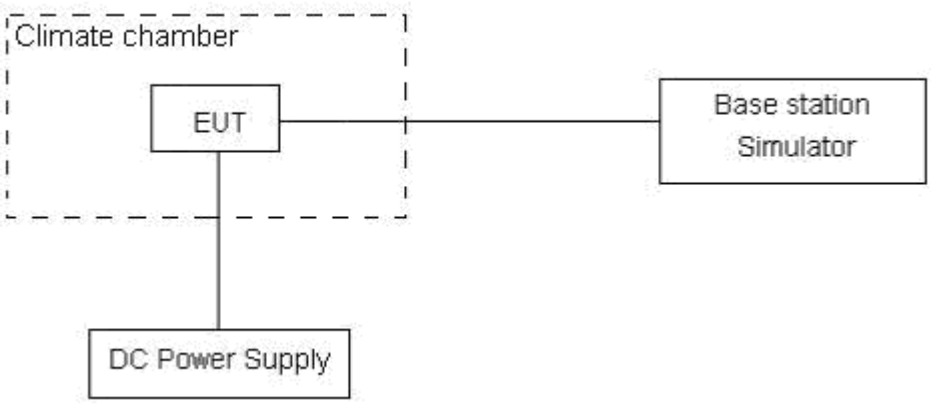
Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

Method of Measurement

1. Frequency Stability (Temperature Variation)
   The temperature inside the climate chamber is varied from -10°C to +60°C in 10°C step size,
   (1) With all power removed, the temperature was decreased to -10°C and permitted to stabilize for three hours.
   (2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.
   (3) Repeat the above measurements at 10°C increments from -10°C to +60°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.
2. Frequency Stability (Voltage Variation)
   The frequency stability shall be measured with variation of primary supply voltage as follows:
   (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
   (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.
   This transceiver is specified to operate with an input voltage of between 3.4 V and 4.35 V, with a nominal voltage of 3.8V.

Test setup



Limits

According to the Sec. 22.355, the frequency stability of the carrier shall be accurate to within 2.5 ppm of the received frequency for mobile stations.

Limits	≤ 2.5 ppm

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75％ confidence level for the normal distribution is with the coverage factor *k* = 3,*U*= 0.01ppm.

Test Result

GSM850

Temperature (°C)	Test Results (ppm) / 3.8 V Power supply		
	Channel 190		
	GSM(GMSK)	GPRS(GMSK)	EGPRS(8PSK)
-10	0.006228	0.018444	0.037545
0	0.004566	0.018778	0.036529
10	0.007399	0.018527	0.038943
20	0.003203	0.018061	0.037198
30	0.008355	0.01585	0.036959
40	0.005869	0.017452	0.039923
50	0.005582	0.018193	0.039457
60	0.007435	0.018492	0.038477

Voltage (V)	Test Results(ppm) / 20°C		
	Channel 190		
	GSM(GMSK)	GPRS(GMSK)	EGPRS(8PSK)
3.4	0.00563	0.016089	0.03672
3.8	0.003203	0.018061	0.037198
4.35	0.003968	0.017942	0.037437

WCDMA Band V

Temperature (°C)	Test Results (ppm) / 3.8 V Power supply		
	Channel 4183		
	WCDMA	HSDPA	HSUPA
-10	-0.00025	0.001769	0.006574
0	-0.00022	0.001052	0.003431
10	0.000502	0.001853	0.004267
20	0.000406	0.00141	0.0052
30	0.000239	0.00159	0.006622
40	-0.00013	0.00147	0.006108
50	0.0000956	-0.000036	0.005032
60	-0.00057	0.001984	0.001243

Voltage (V)	Test Results(ppm) / 20°C		
	Channel 4183		
	WCDMA	HSDPA	HSUPA
3.4	0.005295	-0.00188	0.001171
3.8	0.000406	0.00141	0.0052
4.35	0.002821	0.001781	0.003562

2.7. Spurious Emissions at Antenna Terminals

Ambient condition

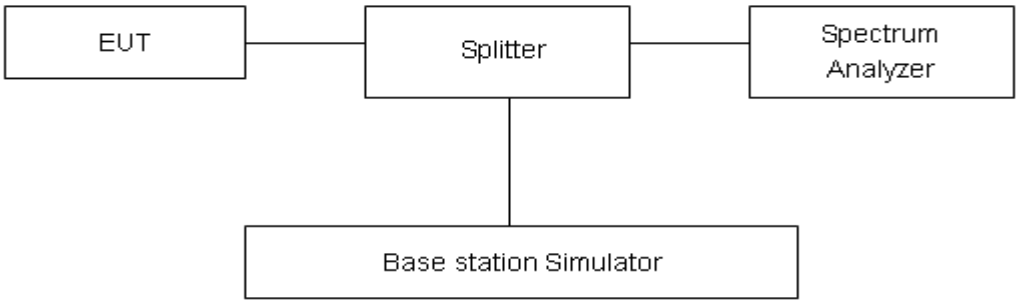
Temperature	Relative humidity
21°C ~25°C	40%~60%

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. For GSM 850,RBW and VBW are set to 100 kHz, Sweep is set to ATUO. For WCDMA Band V, RBW and VBW are set to 100 kHz for the carrier frequency, or RBW and VBW are set to 1MHz(other frequency), Sweep is set to ATUO.

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT

Test setup



Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.”

Limit	-13 dBm

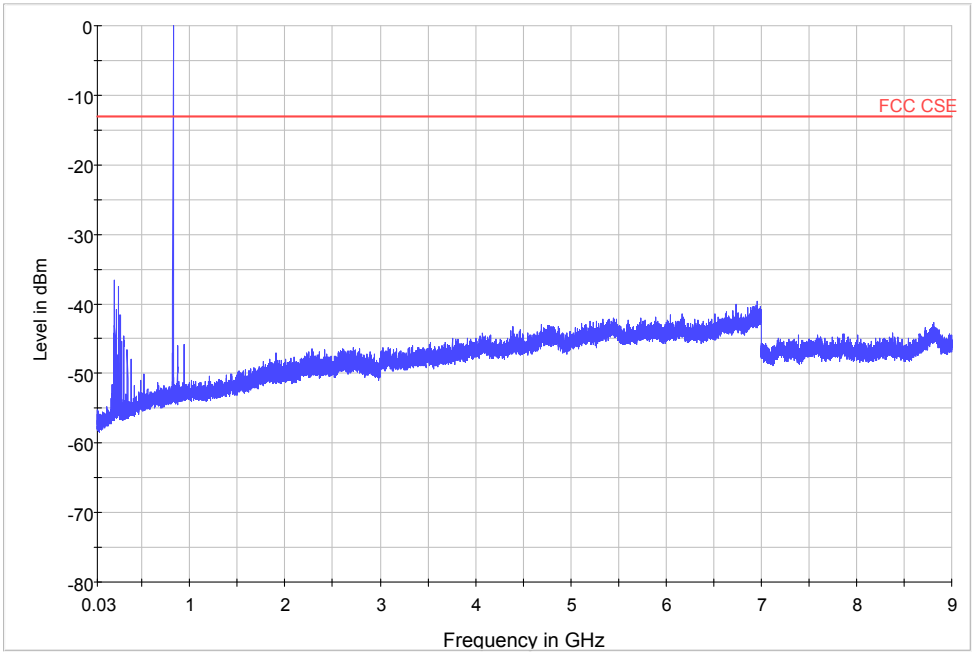
Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor *k* = 1.96.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-12.75GHz	1.407 dB

Test Result

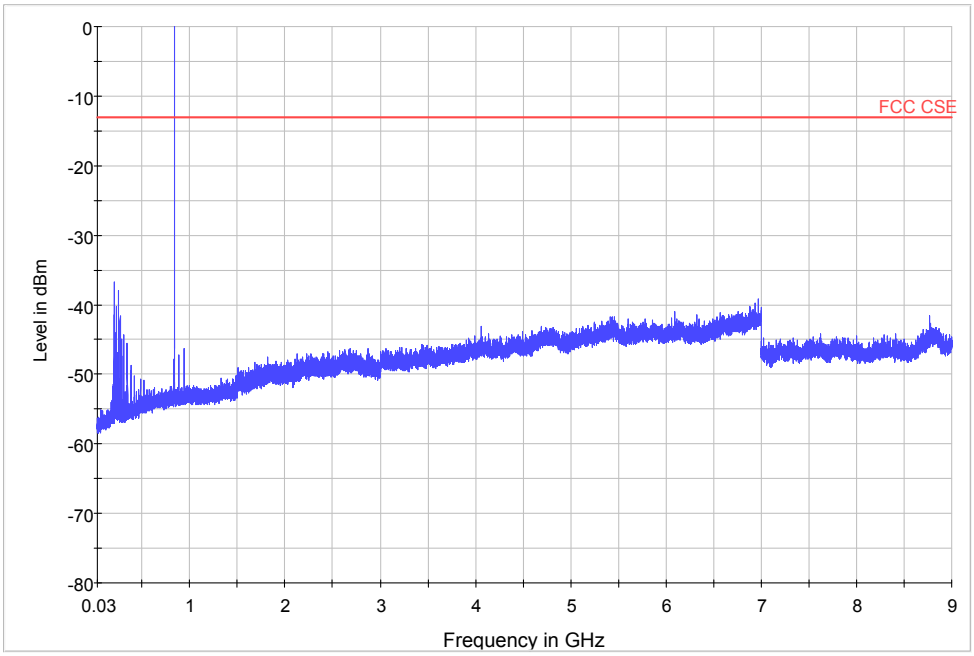
GSM 850 CH128



Note: The signal beyond the limit is carrier

GSM 850 128 Channel 30MHz~9GHz

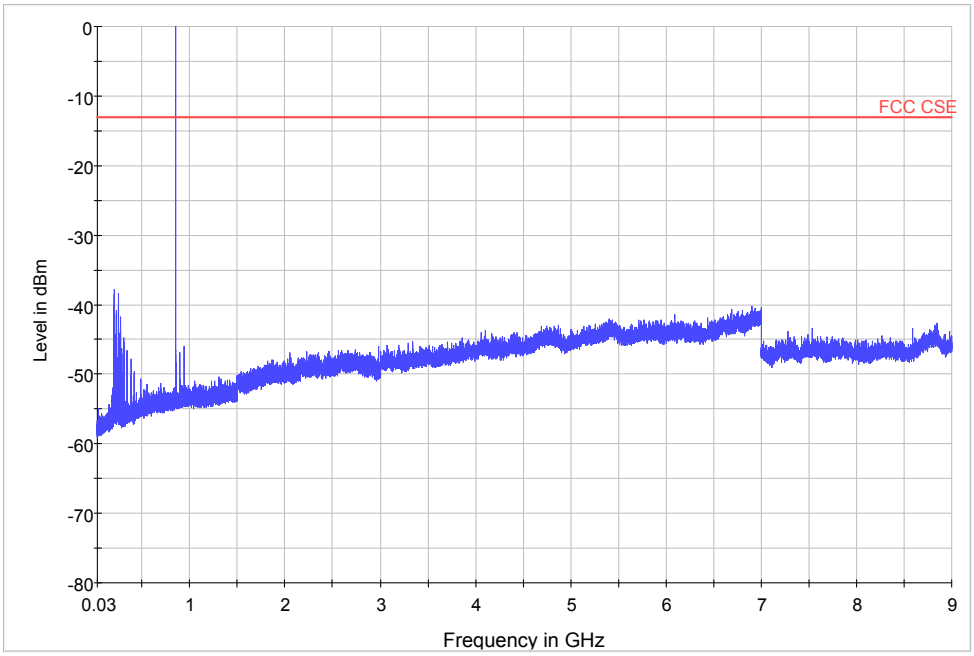
GSM 850 CH190



Note: The signal beyond the limit is carrier

GSM 850 190 Channel 30MHz~9GHz

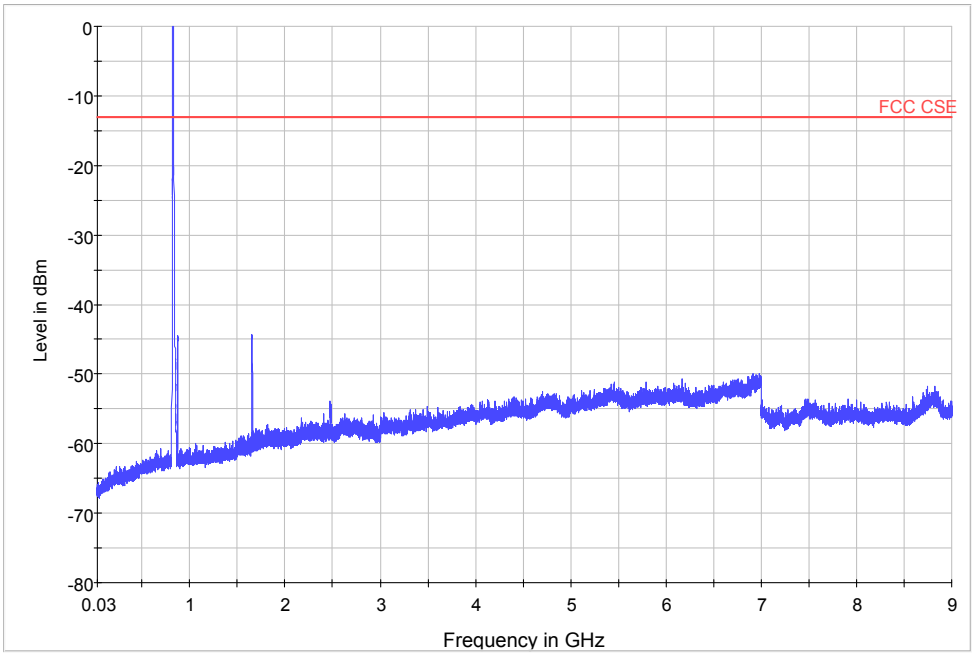
GSM 850 CH251



Note: The signal beyond the limit is carrier

GSM 850 251 Channel 30MHz~9GHz

WCDMA Band V CH4132

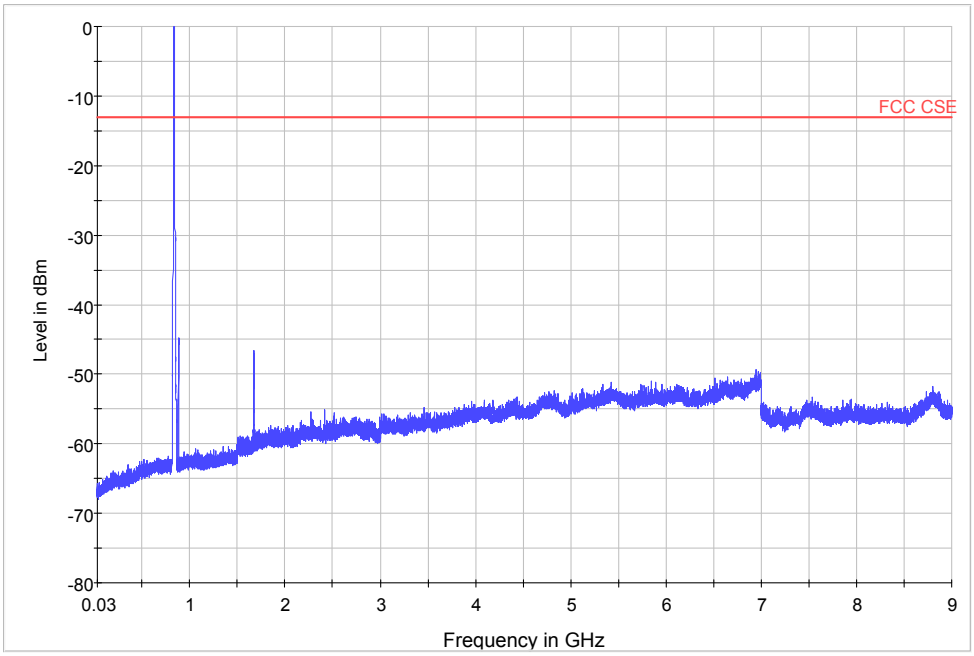


Note: The signal beyond the limit is carrier

WCDMA Band V 4132 Channel 30MHz~9GHz

Harmonic	Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	1654.31	-44.26	-13	31.26

WCDMA Band V CH4183

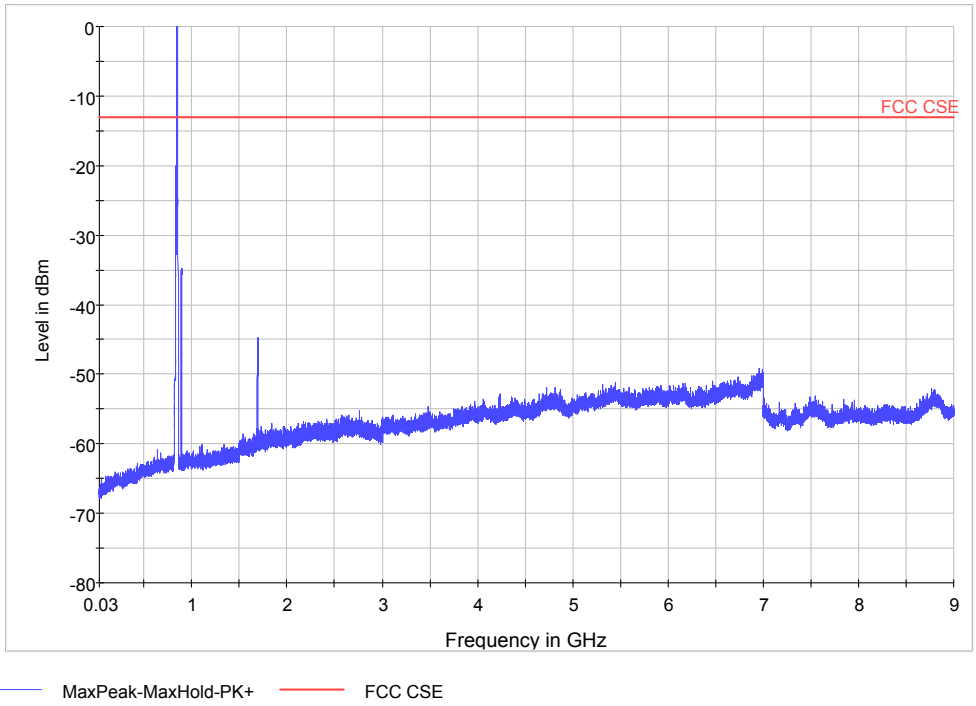


Note: The signal beyond the limit is carrier

WCDMA Band V 4183 Channel 30MHz~9GHz

Harmonic	TX ch.4183 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	1675.50	-46.65	-13	33.65

WCDMA Band V CH4233



Note: The signal beyond the limit is carrier
WCDMA Band V 4233 Channel 30MHz~9GHz

Harmonic	TX ch.4233 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	1694.63	-44.80	-13	31.80

2.8. Radiates Spurious Emission

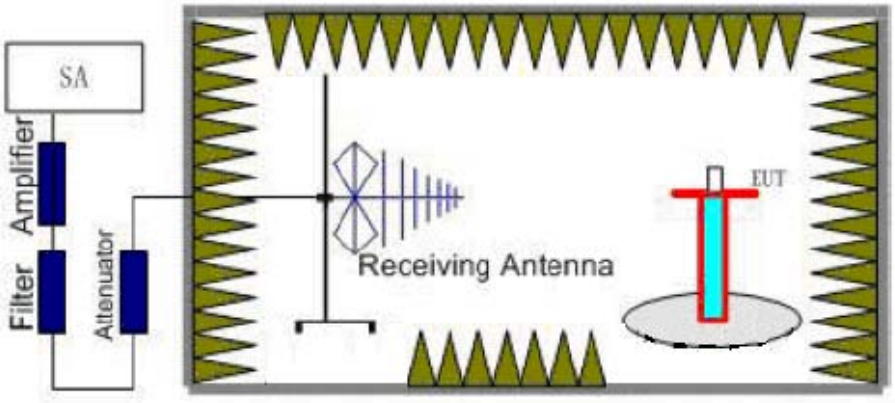
Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

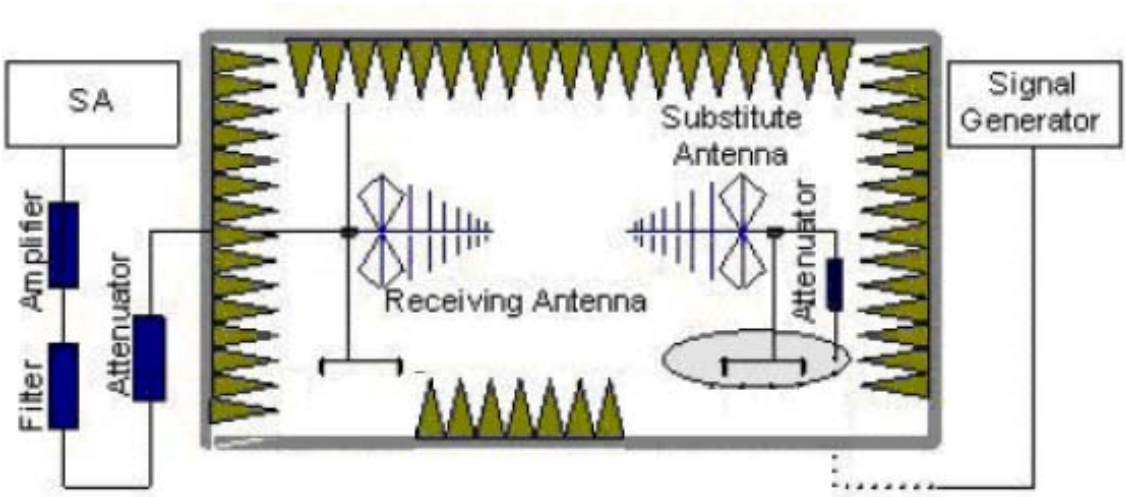
Method of Measurement

The measurements procedures in TIA -603C are used.
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment.
The emissions less than 20 dB below the permissible value are reported.

The procedure of Radiates Spurious Emission is as follows:
Step 1:
The measurement is carried out in the semi-anechoic chamber. EUT was placed on a 1.5 meters high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used while RBW and VBW are both set to 3MHz. During the measurement, the highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna moved up and down over a range from 1 to 4 meters in both horizontally and vertically polarized orientations. The test setup refers to figure below.



Step 2:
A dipole antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator with a adjustable S.G. applied through a Tx cable. Adjust the level of the signal generator output until the value of the receiver reach the previously recorded analyzer power level (LVL).Then The E.R.P. /E.I.R.P. of the EUT can be calculated through the level of the signal generator, Tx cable loss and the gain of the substitution antenna. The test setup refers to figure below.



E.R.P（peak power）=S.G. - Tx Cable loss + Substitution antenna gain – 2.15.
EIRP= E.R.P+2.15

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization(horizontal and vertical), The worst emission was found in position (Z axis, vertical polarization) and the worst case was recorded.

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT

Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.”

Limit	-13 dBm

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95％ confidence level for the normal distribution is with the coverage factor *k* = 1.96, *U*= 3.55 dB.

Test Result

GSM 850 CH128

Harmonic	TX ch.128 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1648.4	-69.24	2	10.15	Vertical	-63.24	-13	50.24	180
3	2472.6	-66.74	2.51	11.35	Vertical	-60.05	-13	47.05	0
4	3296.8	-64.45	4.2	10.85	Vertical	-59.95	-13	46.95	180
5	4121	-62.89	5.2	11.35	Vertical	-58.89	-13	45.89	90
6	4945.2	-63.43	5.5	11.95	Vertical	-59.13	-13	46.13	0
7	5769.4	-61.76	5.7	13.55	Vertical	-56.06	-13	43.06	270
8	6593.6	-61.10	6.3	13.75	Vertical	-55.80	-13	42.80	180
9	7417.8	-61.08	6.8	13.85	Vertical	-56.18	-13	43.18	0
10	8242	-59.52	6.9	14.25	Vertical	-54.32	-13	41.32	180

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2.The worst emission was found in the antenna is vertical position.

GSM 850 CH190

Harmonic	TX ch.190 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.2	-66.58	2	10.75	Vertical	-59.98	-13	46.98	0
3	2509.8	-62.78	2.51	11.05	Vertical	-56.39	-13	43.39	0
4	3346.4	-64.61	4.2	11.15	Vertical	-59.81	-13	46.81	180
5	4183	-62.67	5.2	11.15	Vertical	-58.87	-13	45.87	90
6	5019.6	-61.23	5.5	11.95	Vertical	-56.93	-13	43.93	0
7	5856.2	-62.70	5.7	13.55	Vertical	-57.00	-13	44.00	270
8	6692.8	-61.77	6.3	13.75	Vertical	-56.47	-13	43.47	180
9	7529.4	-60.26	6.8	13.85	Vertical	-55.36	-13	42.36	0
10	8366	-61.88	6.9	14.25	Vertical	-56.68	-13	43.68	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2.The worst emission was found in the antenna is vertical position.

GSM 850 CH251

Harmonic	TX ch.251 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1697.6	-60.63	2	10.15	Vertical	-54.63	-13	41.63	0
3	2546.4	-56.6	2.51	11.05	Vertical	-50.21	-13	37.21	0
4	3395.2	-64.16	4.2	11.15	Vertical	-59.36	-13	46.36	0
5	4244	-61.50	5.2	11.15	Vertical	-57.70	-13	44.70	180
6	5092.8	-62.89	5.5	11.95	Vertical	-58.59	-13	45.59	90
7	5941.6	-63.04	5.7	13.55	Vertical	-57.34	-13	44.34	0
8	6790.4	-60.84	6.3	13.75	Vertical	-55.54	-13	42.54	270
9	7639.2	-60.52	6.8	13.85	Vertical	-55.62	-13	42.62	180
10	8488	-62.22	6.9	14.25	Vertical	-57.02	-13	44.02	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2.The worst emission was found in the antenna is vertical position.

WCDMA Band V CH4132

Harmonic	TX ch.4132 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1652.8	-69.24	2	10.15	Vertical	-63.24	-13	50.24	180
3	2479.2	-66.74	2.51	11.35	Vertical	-60.05	-13	47.05	135
4	3305.6	-64.45	4.2	10.85	Vertical	-59.95	-13	46.95	90
5	4132	-62.89	5.2	11.35	Vertical	-58.89	-13	45.89	180
6	4958.4	-63.43	5.5	11.95	Vertical	-59.13	-13	46.13	270
7	5784.8	-61.76	5.7	13.55	Vertical	-56.06	-13	43.06	0
8	6611.2	-61.10	6.3	13.75	Vertical	-55.80	-13	42.80	180
9	7437.6	-61.08	6.8	13.85	Vertical	-56.18	-13	43.18	90
10	8264	-61.86	6.9	14.25	Vertical	-56.66	-13	43.66	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2.The worst emission was found in the antenna is vertical position.

WCDMA Band V CH4183

Harmonic	TX ch.4183 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.2	-66.58	2	10.75	Vertical	-59.98	-13	46.98	0
3	2509.8	-62.78	2.51	11.05	Vertical	-56.39	-13	43.39	90
4	3346.4	-64.61	4.2	11.15	Vertical	-59.81	-13	46.81	180
5	4183	-62.67	5.2	11.15	Vertical	-58.87	-13	45.87	270
6	5019.6	-61.23	5.5	11.95	Vertical	-56.93	-13	43.93	0
7	5856.2	-62.70	5.7	13.55	Vertical	-57.00	-13	44.00	180
8	6692.8	-61.77	6.3	13.75	Vertical	-56.47	-13	43.47	90
9	7529.4	-60.26	6.8	13.85	Vertical	-55.36	-13	42.36	0
10	8366	-61.88	6.9	14.25	Vertical	-56.68	-13	43.68	270

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2.The worst emission was found in the antenna is vertical position.

WCDMA Band V CH4233

Harmonic	TX ch.4233 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1693.2	-60.63	2	10.15	Vertical	-54.63	-13	41.63	180
3	2539.8	-56.6	2.51	11.05	Vertical	-50.21	-13	37.21	270
4	3386.4	-64.16	4.2	11.15	Vertical	-59.36	-13	46.36	0
5	4233	-61.50	5.2	11.15	Vertical	-57.70	-13	44.70	180
6	5079.6	-62.89	5.5	11.95	Vertical	-58.59	-13	45.59	90
7	5926.2	-63.04	5.7	13.55	Vertical	-57.34	-13	44.34	0
8	6772.8	-60.84	6.3	13.75	Vertical	-55.54	-13	42.54	90
9	7619.4	-60.52	6.8	13.85	Vertical	-55.62	-13	42.62	0
10	8466	-62.22	6.9	14.25	Vertical	-57.02	-13	44.02	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2.The worst emission was found in the antenna is vertical position.

3. Main Test Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Expiration Time	Valid Period
01	Base Station Simulator	CMU200	R&S	118133	2015-03-26	2016-03-25	1 year
02	Power Splitter	SHX-GF2 -2-13	Hua Xiang	10120101	NA	NA	NA
03	Spectrum Analyzer	E4445A	Agilent	MY46181146	2015-03-26	2016-03-25	1 year
04	Universal Radio Communication Tester	E5515C	Agilent	MY48367192	2015-03-26	2016-03-25	1 year
05	Signal Analyzer	FSV30	R&S	100815	2015-03-26	2016-03-25	1 year
06	Signal generator	SMB 100A	R&S	102594	2015-03-26	2016-03-25	1 year
07	EMI Test Receiver	ESCI	R&S	100948	2015-03-26	2016-03-25	1 year
08	Trilog Antenna	VUBL 9163	SCHWARZBECK	9163-201	2015-05-19	2018-05-18	3 years
09	Trilog Antenna	VUBL 9163	SCHWARZBECK	9163-391	2015-05-19	2018-05-18	3 years
10	Horn Antenna	HF907	R&S	100126	2015-03-01	2018-02-30	3 years
11	Horn Antenna	HF907	R&S	100125	2015-03-01	2018-02-30	3 years
12	Climatic Chamber	PT-30B	Re Ce	20101891	2014-09-01	2017-08-31	3 years
13	RF Cable	SMA 15cm	Agilent	0001	2015-06-07	2015-08-06	2 months

*******END OF REPORT *******

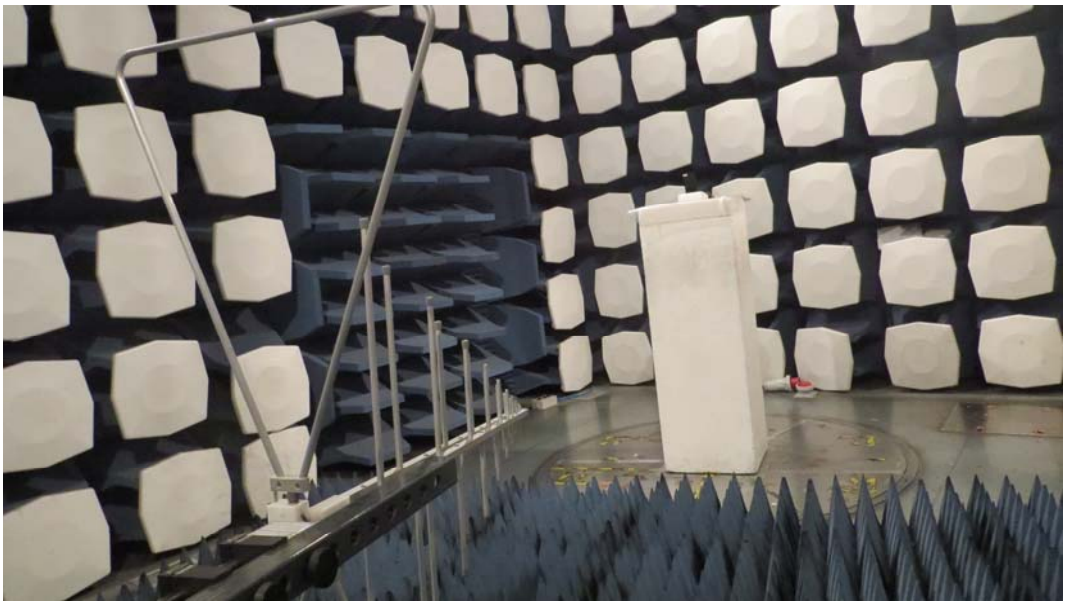
ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance

EUT

Picture 1 EUT

A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup