



Part 24

TEST REPORT

Product Name	HSPA+ Module
Model Name	DTL718-W
FCC ID	RHZWDTL718-W
Client	AnyDATA Shanghai Co., Ltd
Manufacturer	AnyDATA Shanghai Co., Ltd
Date of issue	August 15, 2013

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GENERAL SUMMARY

Reference Standard(s)	FCC CFR47 Part 2 (2012) Frequency Allocations And Radio Treaty Matters; General Rules And Regulations FCC CFR47 Part 24E (2012) Personal Communications Services ANSI/TIA-603-C(2004) Land mobile FM or PM Communications Equipment Measurements and Performance Standards. KDB 971168 D01 Power Meas License Digital Systems v02r01 Measurement Guidance for Certification of Licensed Digital Transmitters
Conclusion	This mobile 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 杨伟中
Director

Revised by 唐凯
RF Manager

Performed by 王峰
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. This report only refers to the item that has undergone the test.

This report standalone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

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

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1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
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Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: yangweizhong@ta-shanghai.com

1.3. Applicant Information

Company: AnyDATA Shanghai Co., Ltd
Address: 489 SongTao Road, Sector B, 1st FL. Pudong ZhangJiang Hi-Tech Park, Shanghai
City: Shanghai
Postal Code: 201203
Country: China

1.4. Manufacturer Information

Company: AnyDATA Shanghai Co., Ltd
Address: 489 SongTao Road, Sector B, 1st FL. Pudong ZhangJiang Hi-Tech Park, Shanghai
City: Shanghai
Postal Code: 201203
Country: China

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1.5. Information of EUT

General information

Name of EUT:	HSPA+ Module		
IMEI:	358163050030166		
Hardware Version:	DTL718-W_V3.2		
Software Version:	DTL718_MD6200A_1251_10_R07G_CN		
Antenna Type:	External Antenna		
Device Operating Configurations:			
Operating Mode(s):	GSM1900/GPRS/EGPRS; WCDMA Band II/HSDPA/HSUPA/HSPA+;		
Release Version:	Release7		
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.I.R.P.	GSM 1900: 28.66 dBm WCDMA Band II: 22.17 dBm		
Power Supply:	Battery or Charger		
Rated Power Supply Voltage:	3.8V		
Extreme Voltage:	Minimum: 3.5V Maximum: 4.2V		
Extreme Temperature:	Lowest: -20°C Highest: +60°C		
Test Channel: (Low - Middle - High)	512 - 661 - 810 (GSM 1900) (tested) 9262 – 9400 – 9538 (WCDMA Band II) (tested)		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8
	WCDMA Band II	1852.4 ~ 1907.6	1932.4 ~ 1987.6

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Equipment Under Test (EUT) is HSPA+ Module with external antenna. The EUT is tested GSM1900 and WCDMA Band II in this report.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Information of Auxiliary Equipments:

No.	Name	Type	Manufacturer	Gain
01	Acetabulum Antenna	HYT - GSM/WCDMA - X2 - 02	Hua Yuan	2dBi
02	Control Board	DTPX18_V1.0	AnyDATA	/

1.7. Test Date

The test is performed from July 26, 2013 to July 27, 2013.

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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 Isotropic Radiated power	24.232	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	24.238	PASS
5	Frequency Stability	2.1055 / 24.235	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 24.238	PASS
7	Radiates Spurious Emission	2.1053 / 24.238	PASS

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2.2. RF Power Output

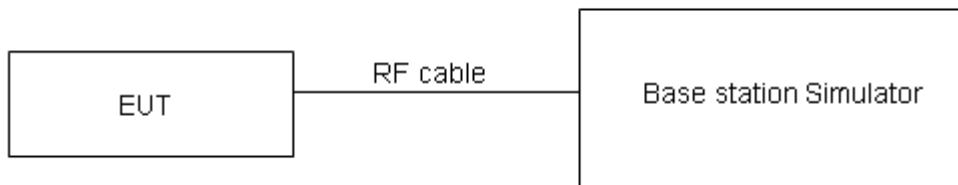
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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.

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Test Results

GSM 1900		Conducted Power(dBm)		
		Channel 512	Channel 661	Channel 810
		1850.2(MHz)	1880(MHz)	1909.8(MHz)
GPRS (GMSK)	1TXslot	30.03	30.12	29.56
	2TXslots	29.21	29.40	28.73
	3TXslots	28.00	27.53	27.25
	4TXslots	25.60	25.32	24.95
EGPRS (8PSK)	1TXslot	24.86	24.98	24.58
	2TXslots	24.84	24.86	24.53
	3TXslots	24.82	24.86	24.42
	4TXslots	24.79	24.89	24.32

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 II		Conducted Power(dBm)		
		Channel 9262	Channel 9400	Channel 9538
		1852.4(MHz)	1880(MHz)	1907.6(MHz)
RMC		22.62	22.59	22.70
HSDPA	Sub - Test 1	21.17	21.08	21.21
	Sub - Test 2	21.15	21.06	21.19
	Sub - Test 3	21.11	21.03	21.18
	Sub - Test 4	21.14	21.01	21.16
HSUPA	Sub - Test 1	21.12	20.79	21.11
	Sub - Test 2	20.14	20.12	20.23
	Sub - Test 3	20.05	20.21	20.34
	Sub - Test 4	21.06	20.46	21.12
	Sub - Test 5	21.15	21.06	21.19

2.3. Effective Isotropic Radiated Power

Ambient condition

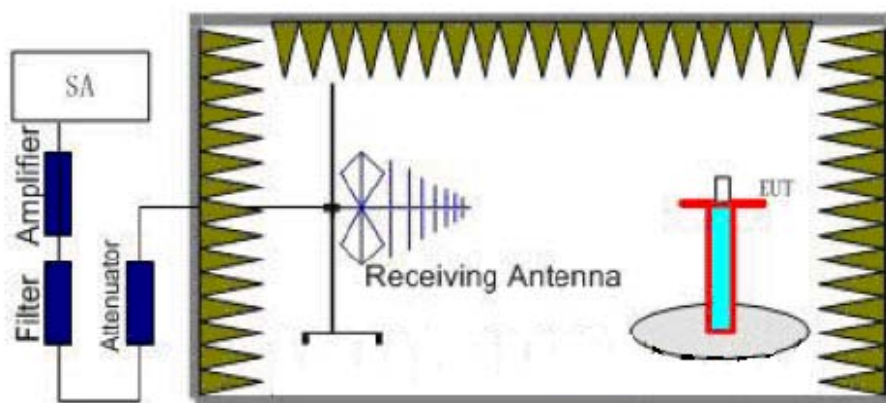
Temperature	Relative humidity
21°C ~25°C	40%~60%

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. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$
 P_s (dBm) : Input power to substitution antenna.
 G_s (dBi or dBd) : Substitution antenna Gain.
 $E_t = R_t + AF$
 $E_s = R_s + AF$
 AF (dB/m) : Receive antenna factor
 R_t : The highest received signal in spectrum analyzer for EUT.
 R_s : The highest received signal in spectrum analyzer for substitution antenna.

Test Setup



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Limits

Rule Part 24.232(b) specifies that "Mobile/portable stations are limited to 2 watts EIRP. Peak power" and Rule Part 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage".

Limit (EIRP)	$\leq 2 \text{ W}$ (33 dBm)
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Measurement Uncertainty

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

Test Results:Pass

Mode	Channel	Polarization	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	E.I.R.P. (dBm)
GSM 1900 GPRS(GMSK)	512	Horizontal	-26.47	-53.21	0	1.92	28.66
	661	Horizontal	-28.80	-53.42	0	1.94	26.56
	810	Horizontal	-29.14	-53.67	0	1.90	26.43
GSM 1900 EGPRS(8-PSK)	512	Horizontal	-30.83	-53.21	0	1.92	24.30
	661	Horizontal	-31.55	-53.42	0	1.94	23.81
	810	Horizontal	-31.44	-53.67	0	1.90	24.13
WCDMA Band II	512	Horizontal	-32.94	-53.19	0	1.92	22.17
	661	Horizontal	-34.08	-53.42	0	1.94	21.28
	810	Horizontal	-35.55	-53.66	0	1.92	20.03

Note: 1. EIRP= E.R.P+2.15

Mode	Channel	Polarization	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	E.I.R.P. (dBm)
GSM 1900 GPRS(GMSK)	512	Vertical	-29.07	-53.70	0	1.92	26.55
	661	Vertical	-31.94	-53.91	0	1.94	23.91
	810	Vertical	-33.59	-54.55	0	1.90	22.86
GSM 1900 EGPRS(8-PSK)	512	Vertical	-32.45	-53.70	0	1.92	23.17
	661	Vertical	-32.70	-53.91	0	1.94	23.15
	810	Vertical	-32.46	-54.55	0	1.90	23.99
WCDMA Band II	512	Vertical	-35.21	-53.69	0	1.92	20.40
	661	Vertical	-36.74	-53.91	0	1.94	19.11
	810	Vertical	-39.61	-54.54	0	1.92	16.85

Note: 1. EIRP= E.R.P+2.15

2.4. Occupied Bandwidth

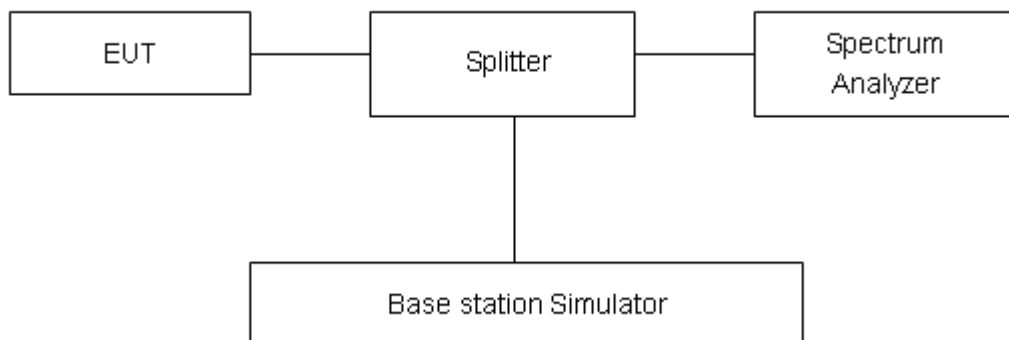
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 1900 and RBW is set to 51kHz, VBW is set to 100kHz for WCDMA Band II. 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 $k = 2$, $U = 624\text{Hz}$.

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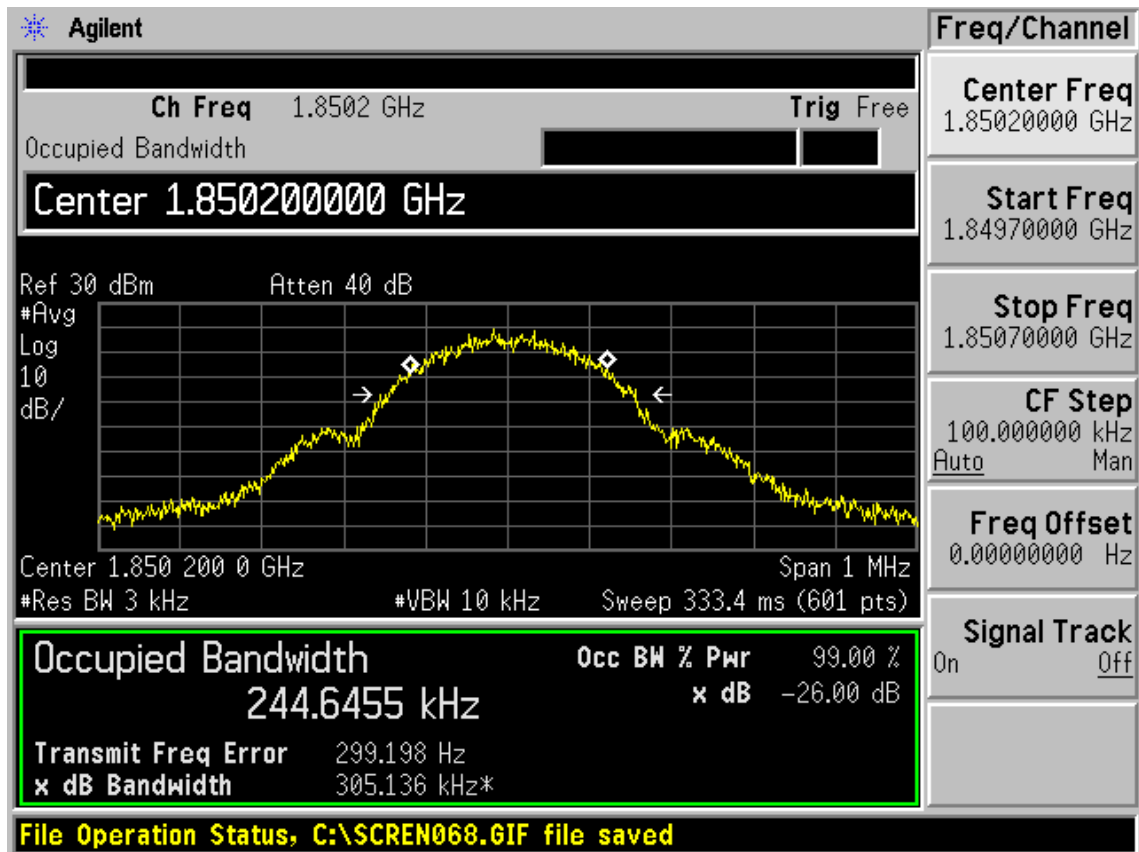
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Test Result

	Channel	Frequency (MHz)	99% Power Bandwidth (kHz)	-26dBc Bandwidth(kHz)
GSM 1900+GPRS	512	1850.2	244.6455	305.136
	661	1880.0	242.0789	308.872
	810	1909.8	241.0205	307.389
GSM 1900+EGPRS	512	1850.2	240.7559	299.209
	661	1880.0	240.7771	302.247
	810	1909.8	244.2232	308.566

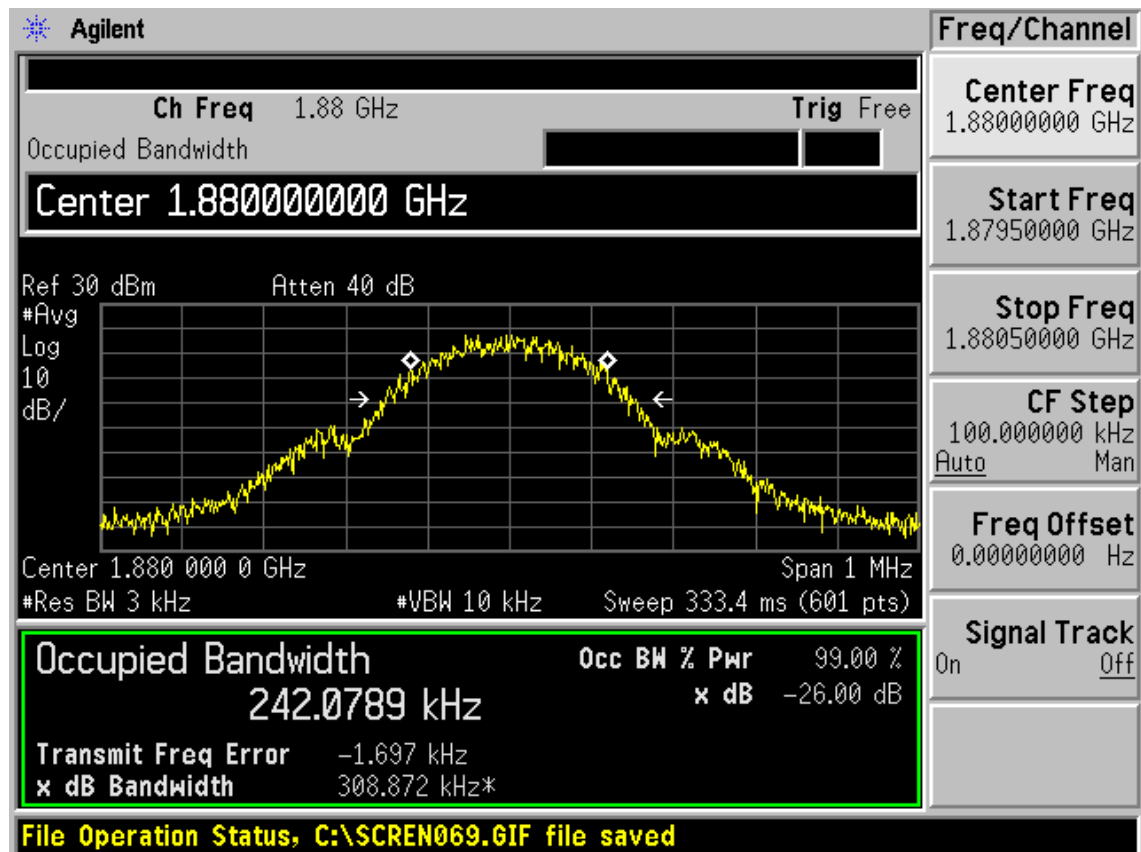


GSM1900+GPRS CH512 Occupied Bandwidth

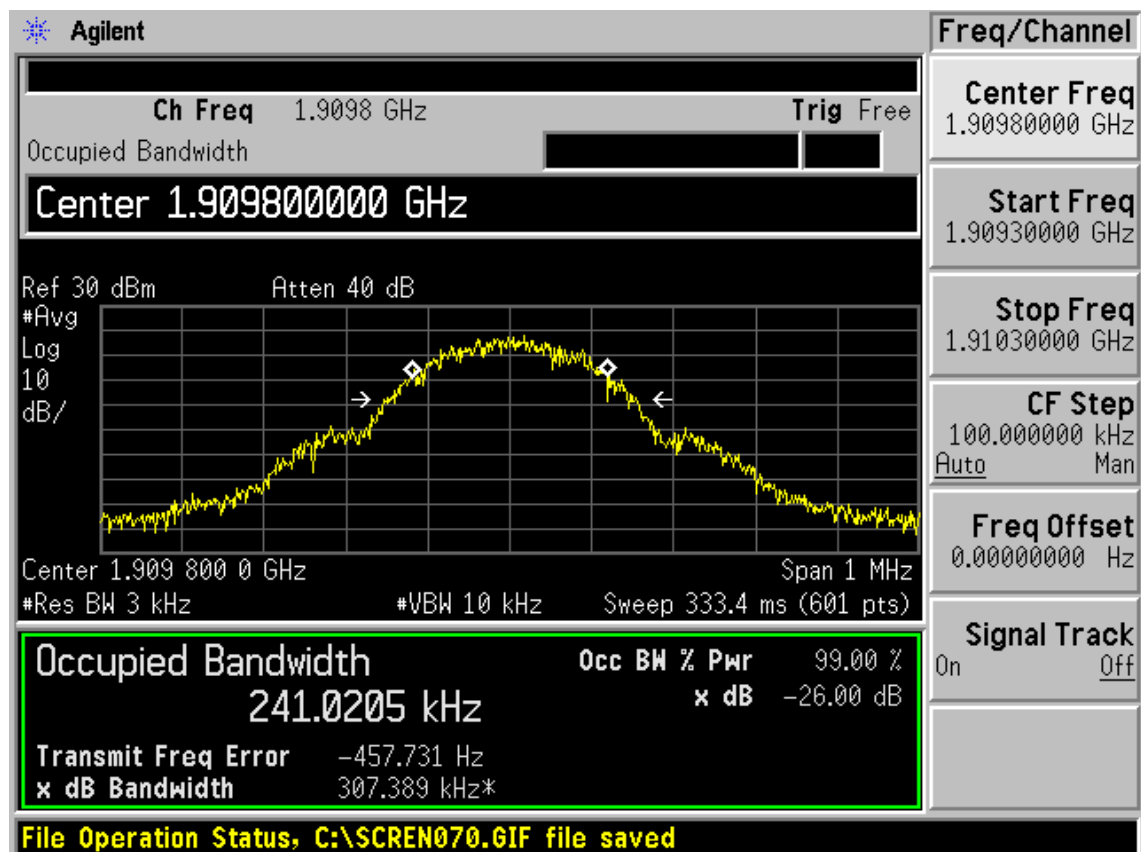
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GSM 1900+GPRS CH661 Occupied Bandwidth

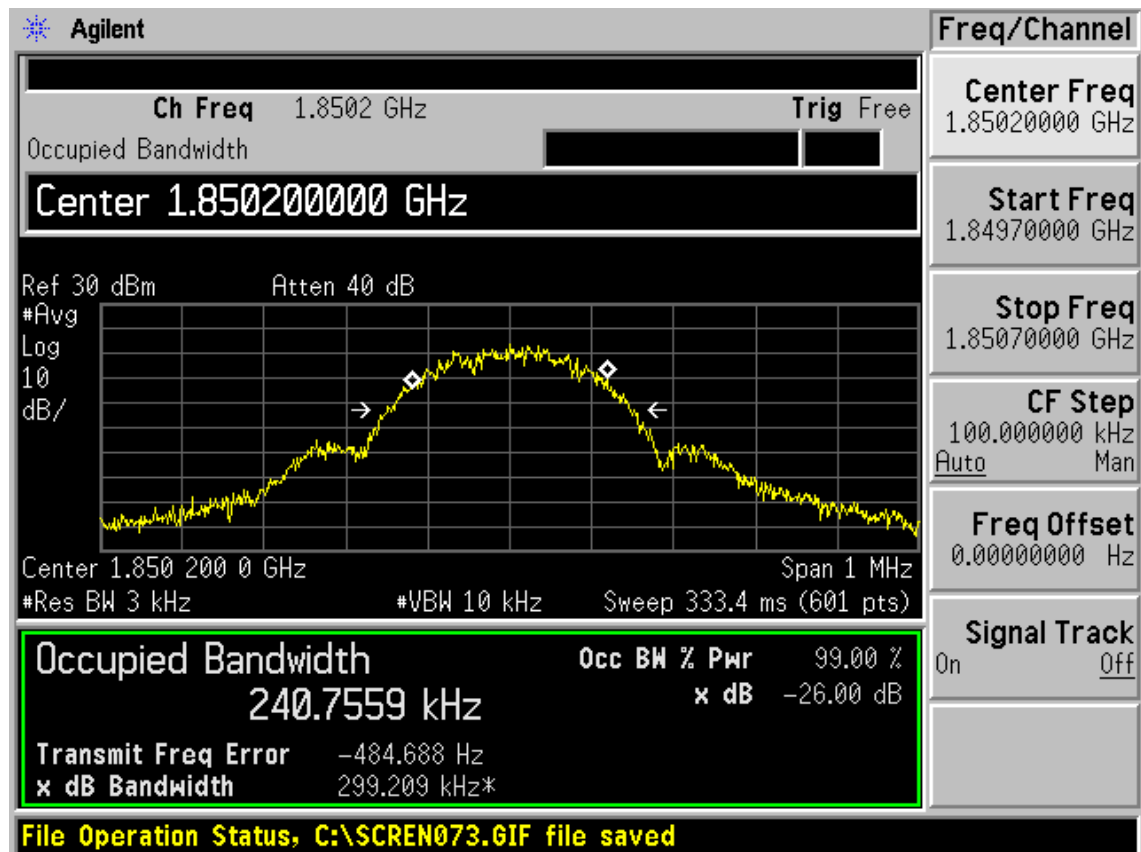


GSM 1900+GPRS CH810 Occupied Bandwidth

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GSM1900 EGPRS CH512 Occupied Bandwidth

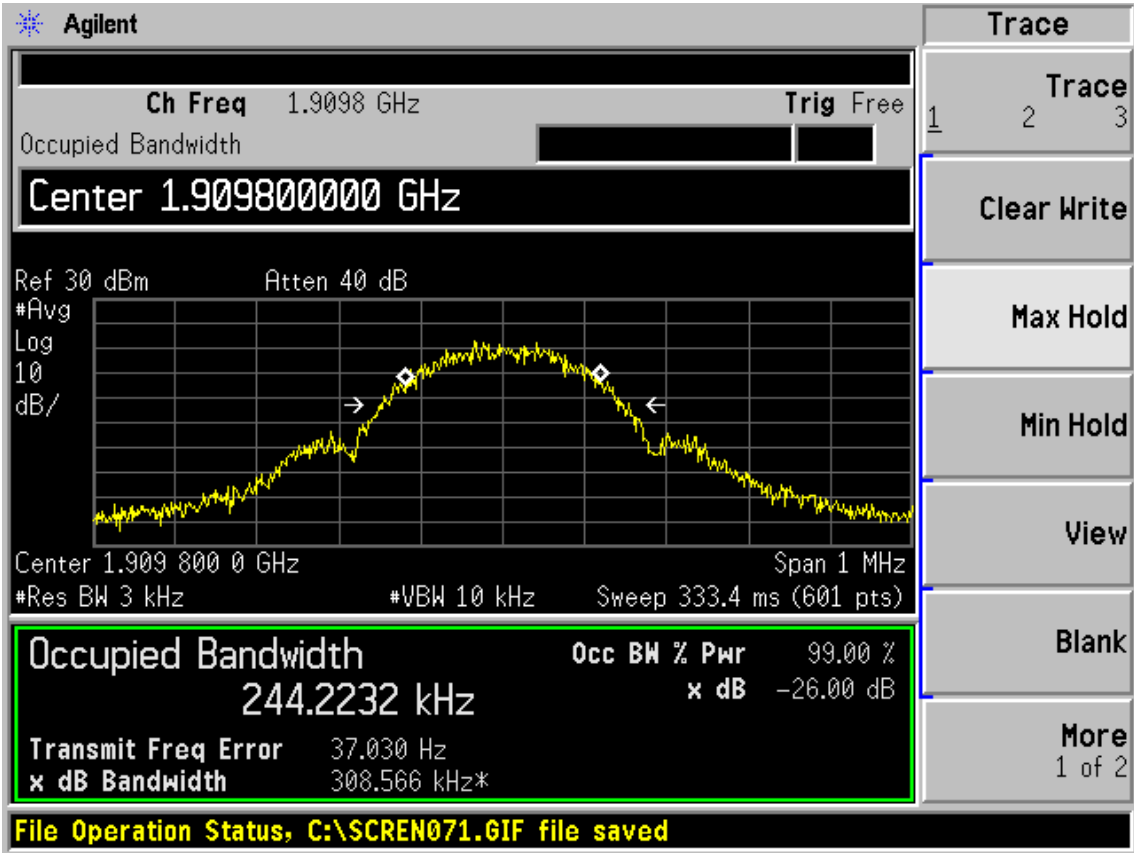


GSM 1900 EGPRS CH661 Occupied Bandwidth

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GSM 1900 EGPRS CH810 Occupied Bandwidth

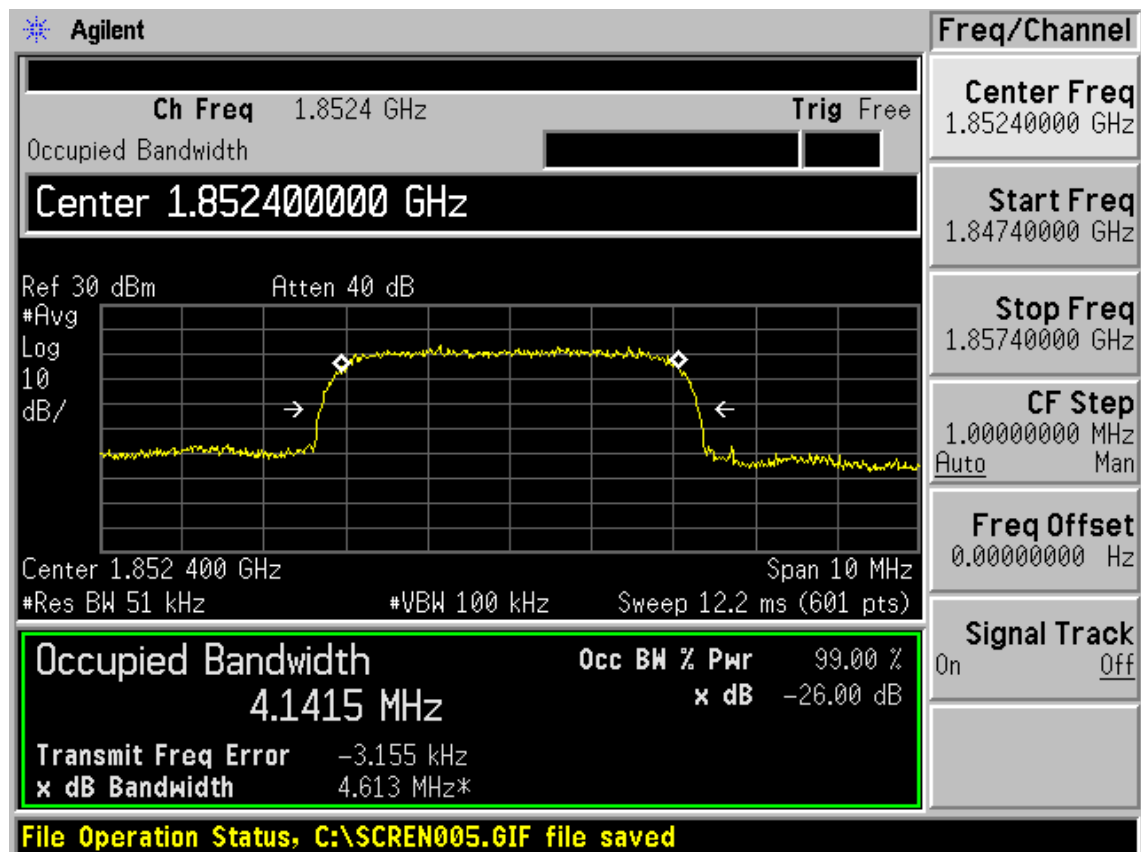
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	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
WCDMA Band II	9262	1852.4	4.1415	4.613
	9400	1880	4.1312	4.615
	9538	1907.6	4.1464	4.627
WCDMA Band II+HSDPA	9262	1852.4	4.1570	4.610
	9400	1880	4.1351	4.627
	9538	1907.6	4.1417	4.623
WCDMA Band II+HSUPA	9262	1852.4	4.1413	4.619
	9400	1880	4.1684	4.610
	9538	1907.6	4.1670	4.590

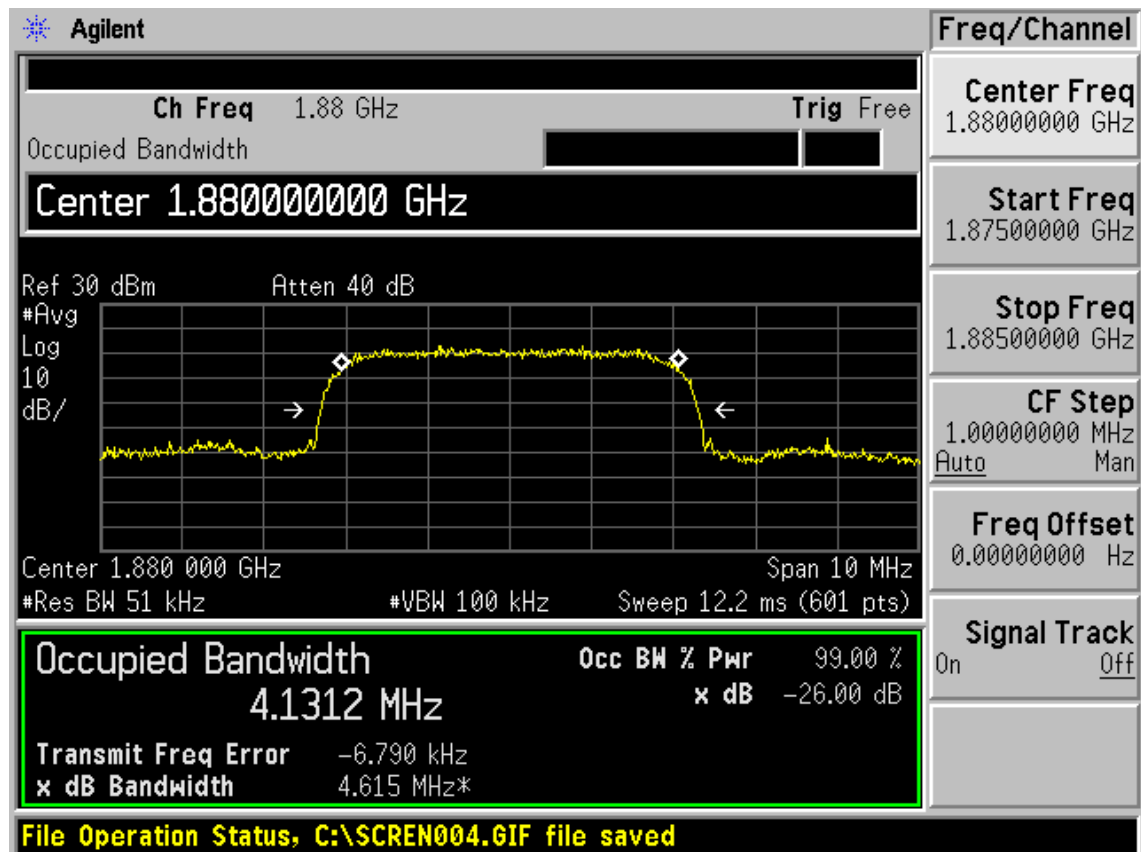


WCDMA Band II CH9262 Occupied Bandwidth

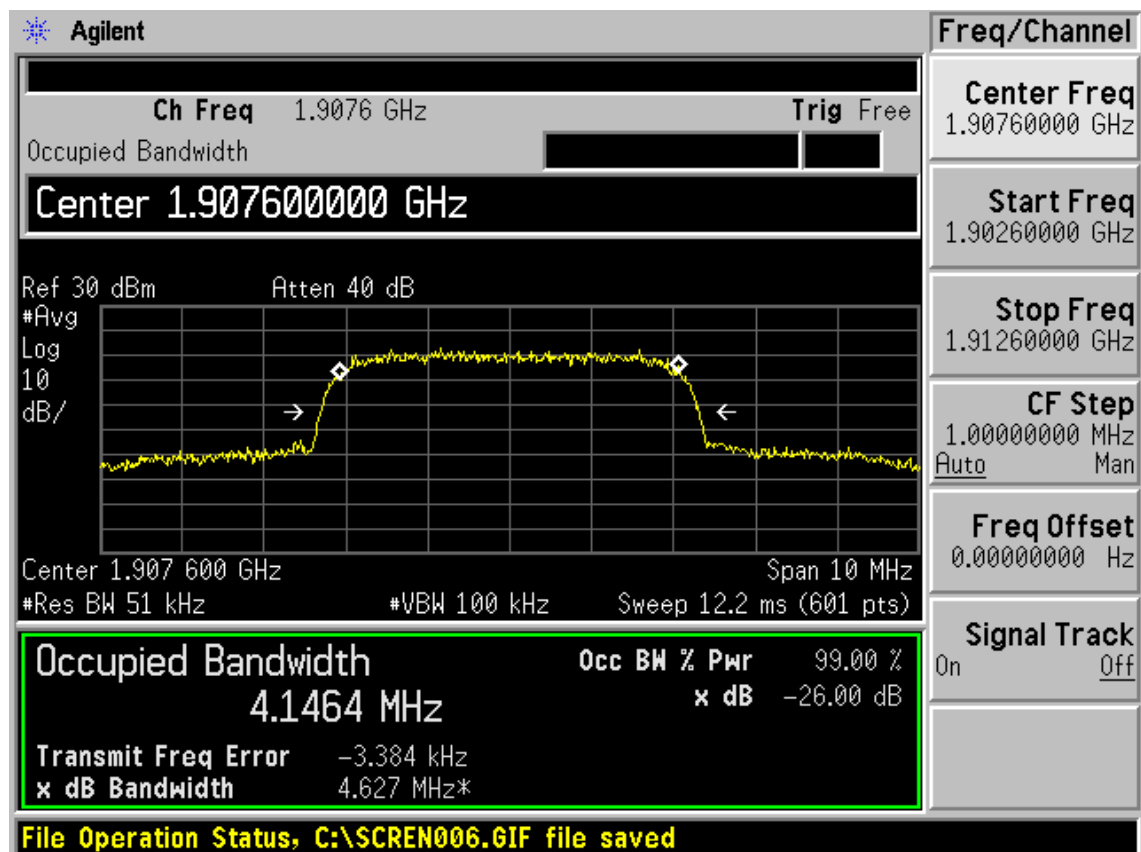
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WCDMA Band II CH9400 Occupied Bandwidth

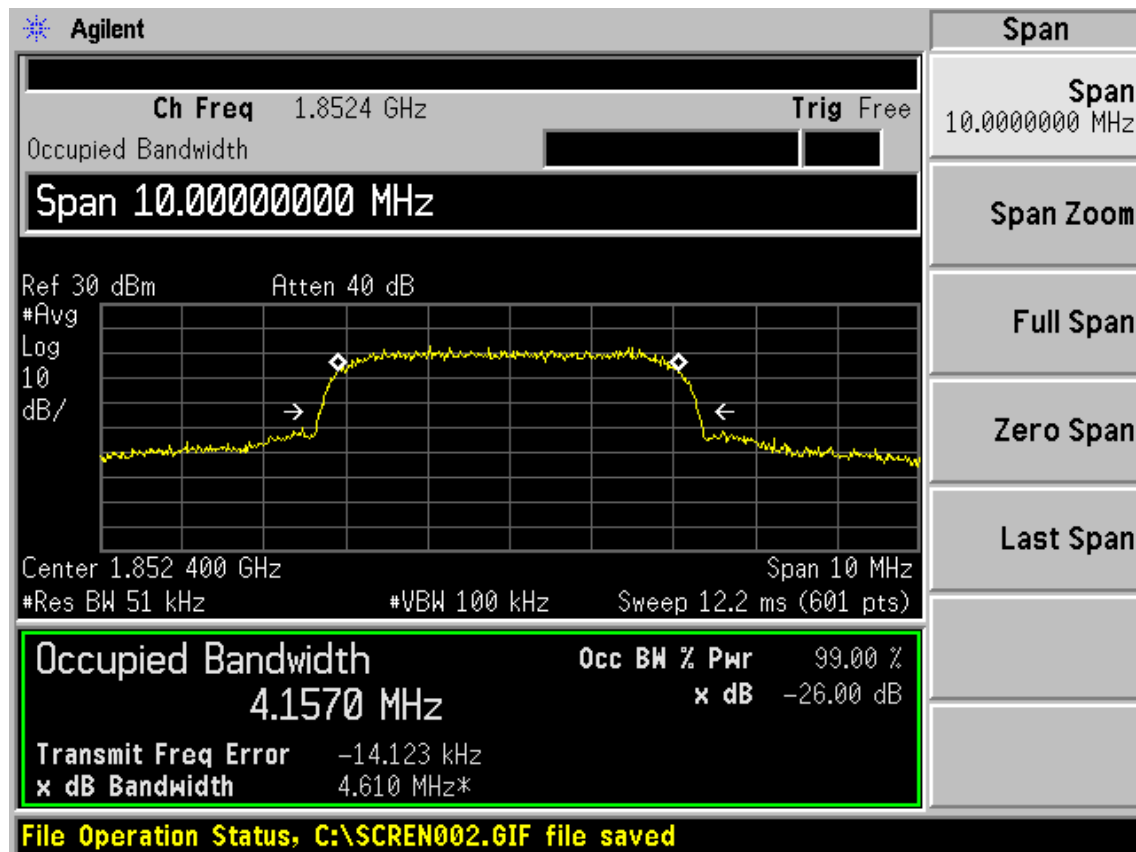


WCDMA Band II CH9538 Occupied Bandwidth

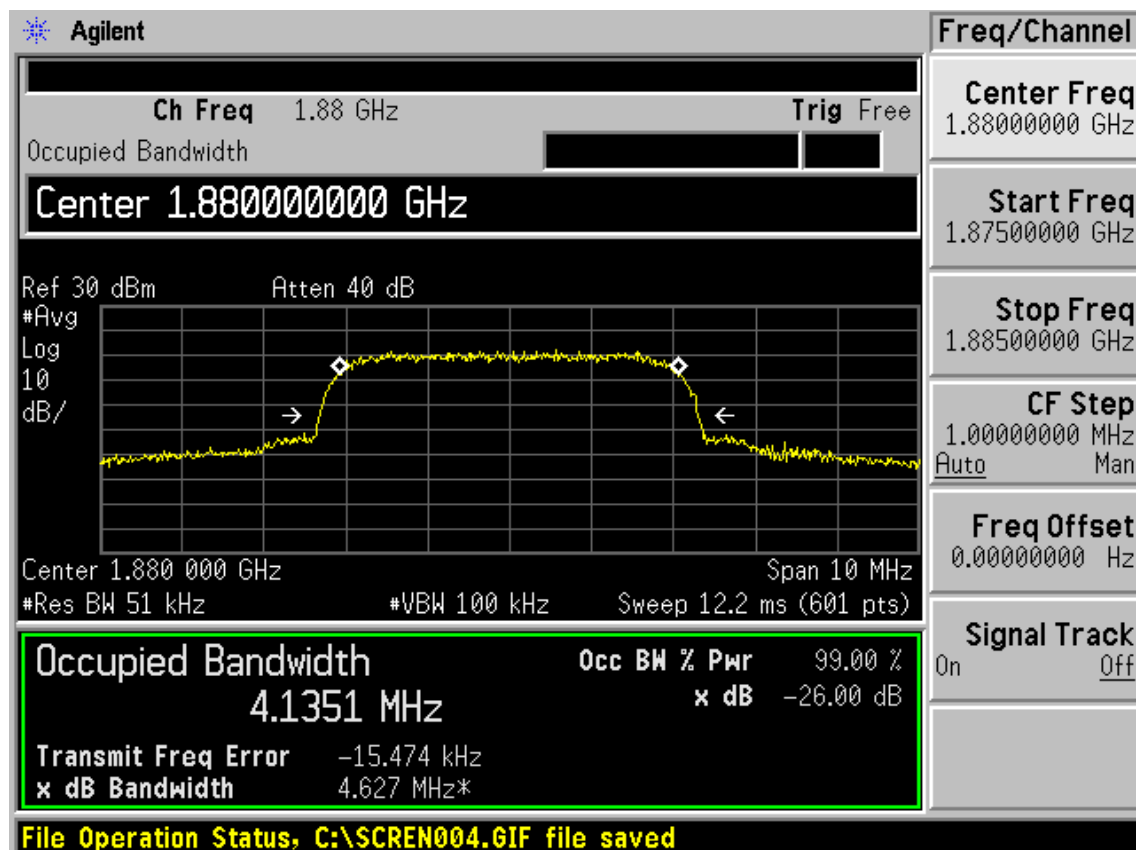
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WCDMA Band II HSDPA CH9262 Occupied Bandwidth

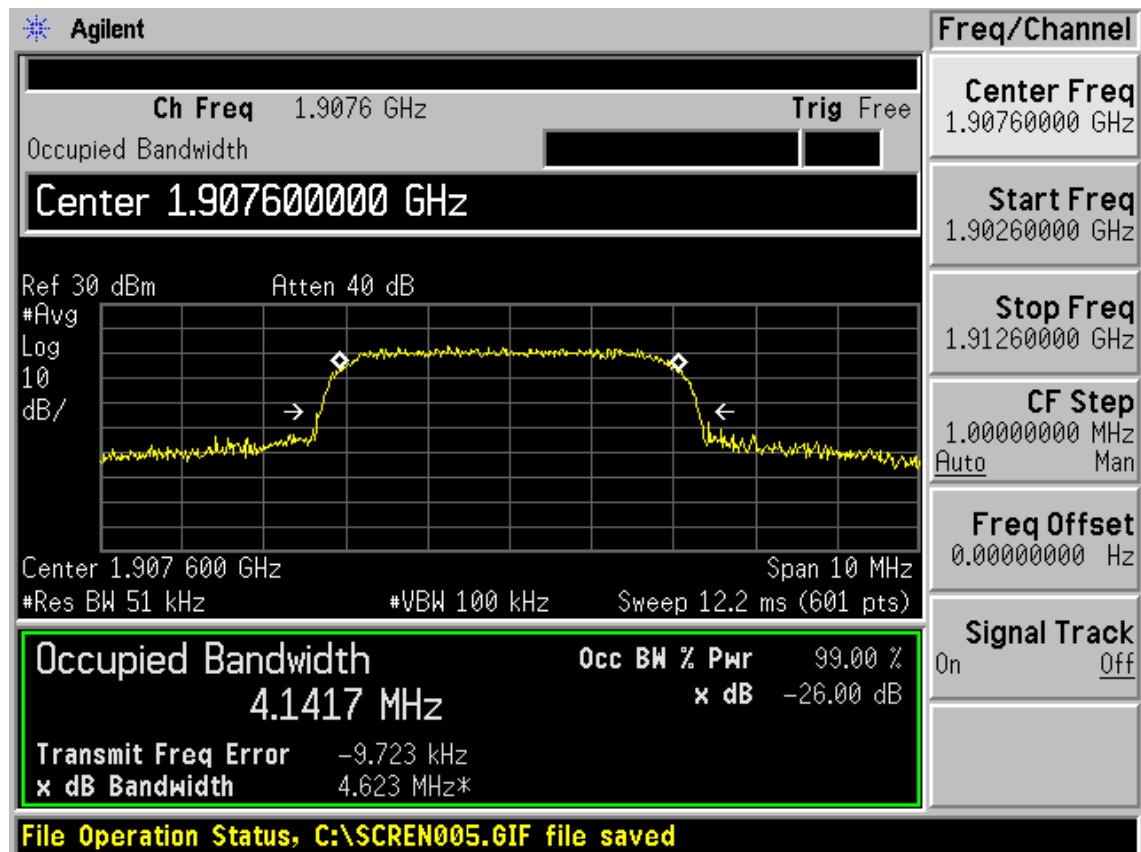


WCDMA Band II HSDPA CH9400 Occupied Bandwidth

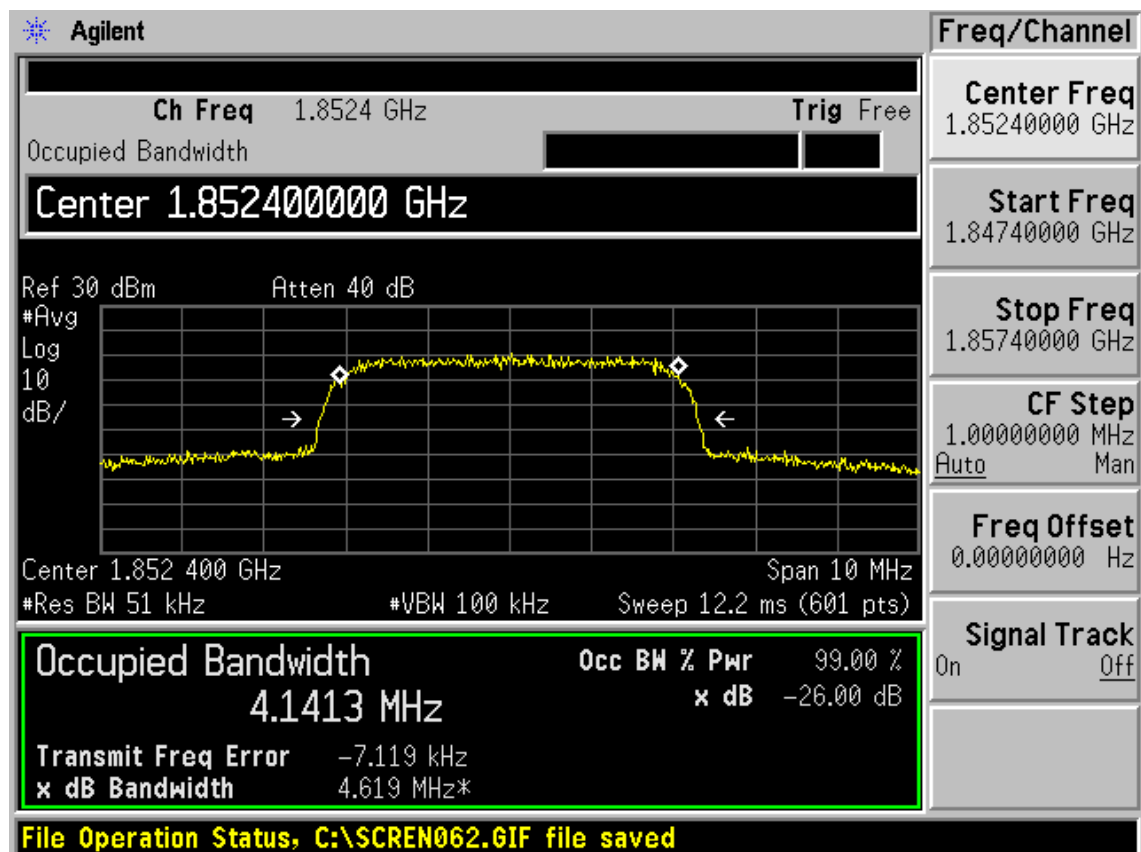
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WCDMA Band II HSDPA CH9538 Occupied Bandwidth

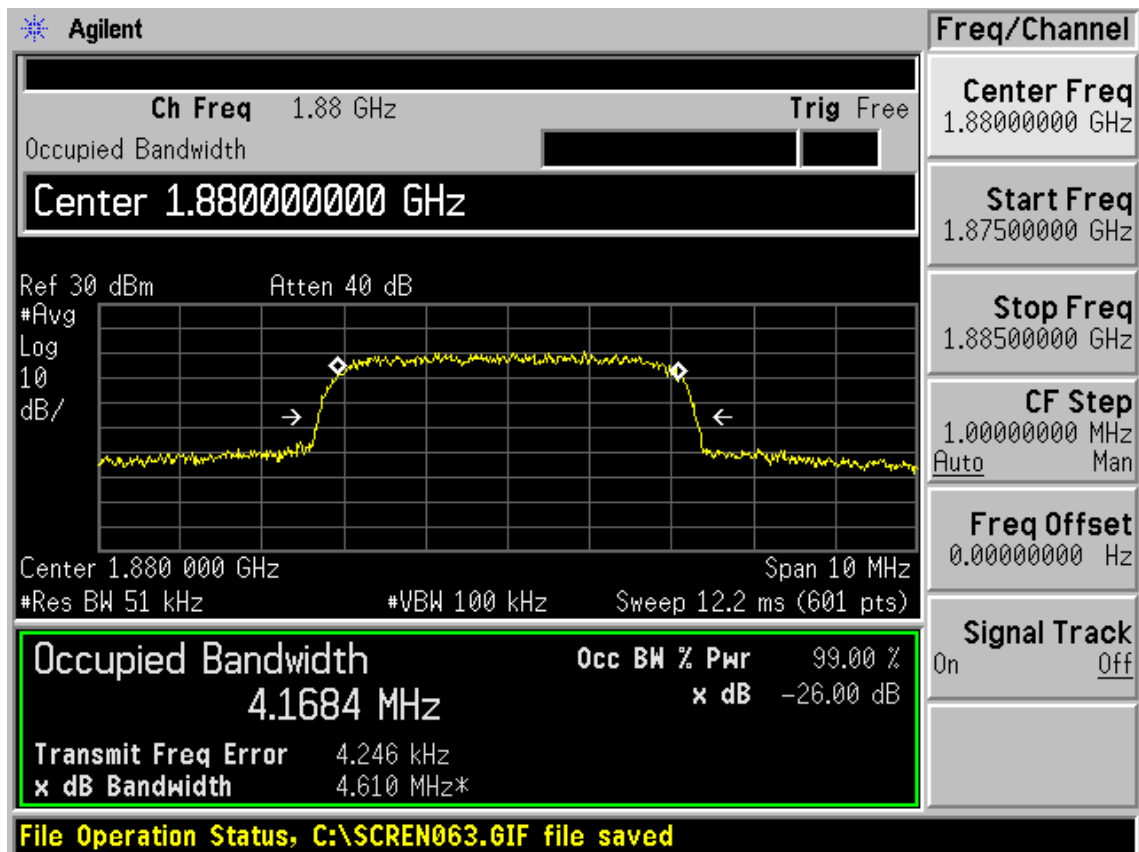


WCDMA Band II HSUPA CH9262 Occupied Bandwidth

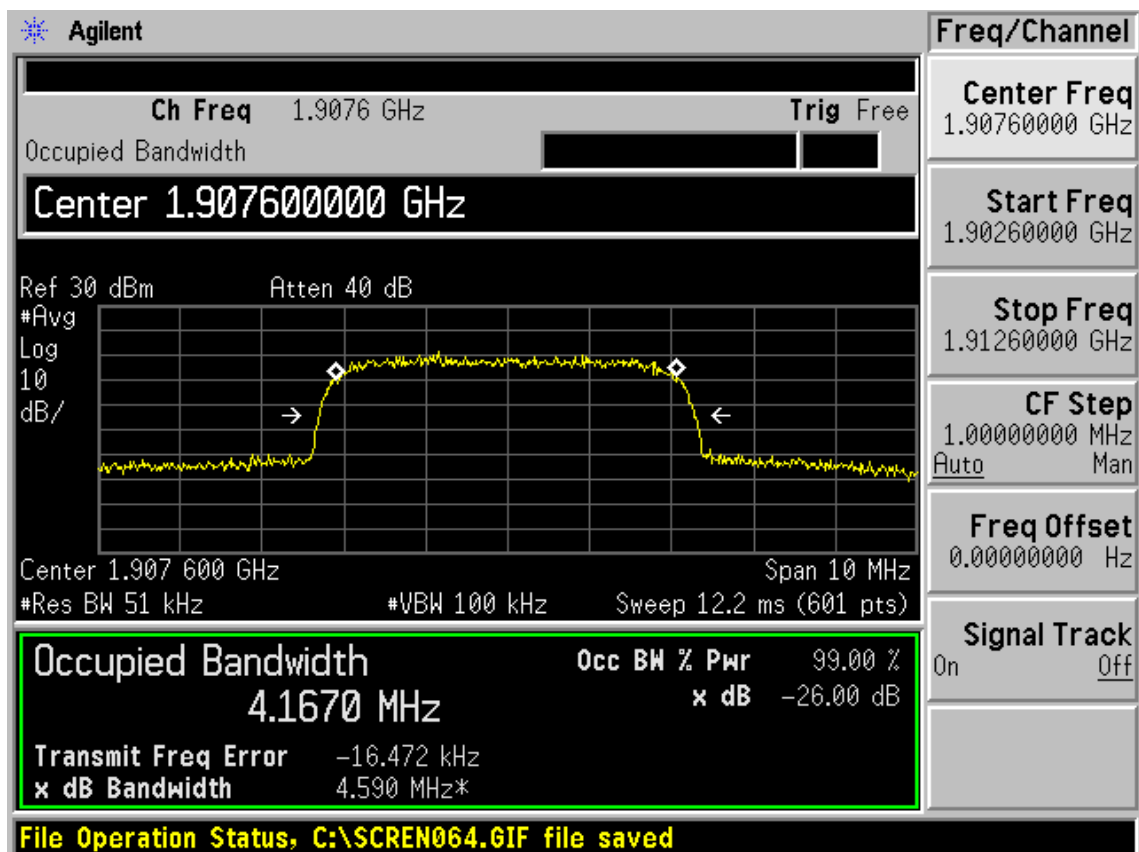
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WCDMA Band II HSUPA CH9400 Occupied Bandwidth



WCDMA Band II HSUPA CH9538 Occupied Bandwidth

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2.5. Band Edge Compliance

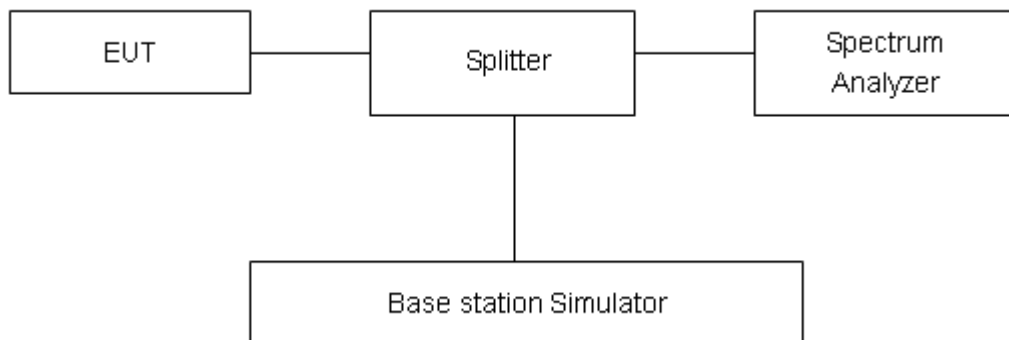
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 and RBW is set to 3kHz,VBW is set to 10kHz for GSM 1900 and RBW is set to 51kHz,VBW is set to 100kHz for WCDMA Band II. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB.”

Limit	-13 dBm
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Measurement Uncertainty

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

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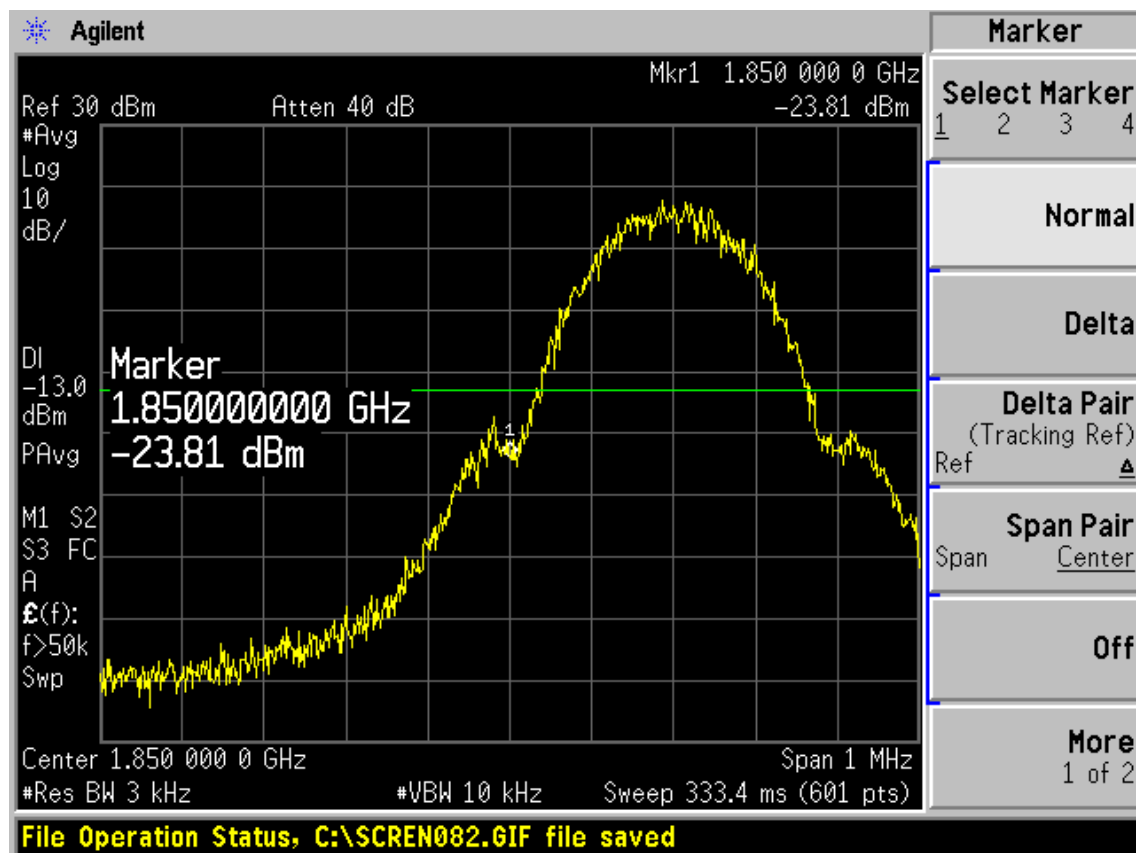
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Test Result:

	Carrier frequency (MHz)	Reference value (dBm)	Limit	Conclusion
GSM 1900+GPRS	1850.0	-23.81	-13	PASS
	1910.0	-24.21	-13	PASS
GSM 1900+EGPRS	1850.0	-24.85	-13	PASS
	1910.0	-26.91	-13	PASS

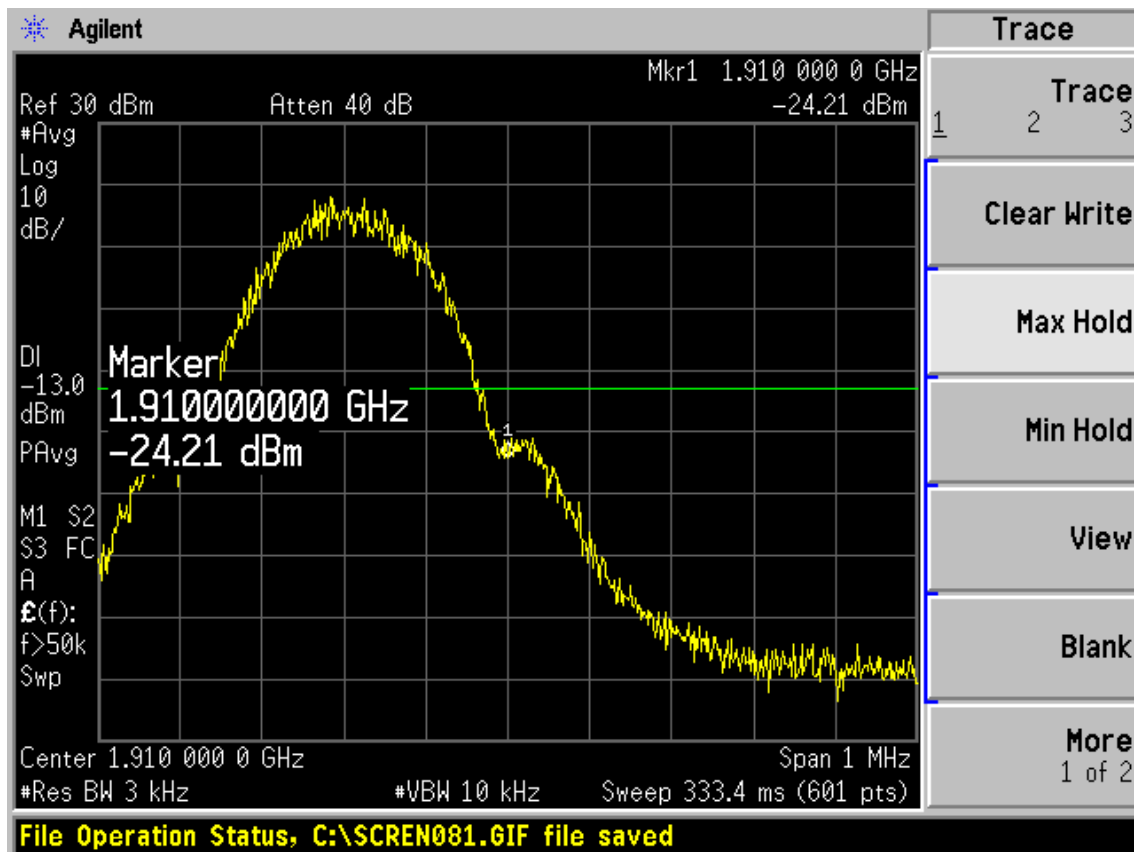


GSM 1900 GPRS 512 Channel

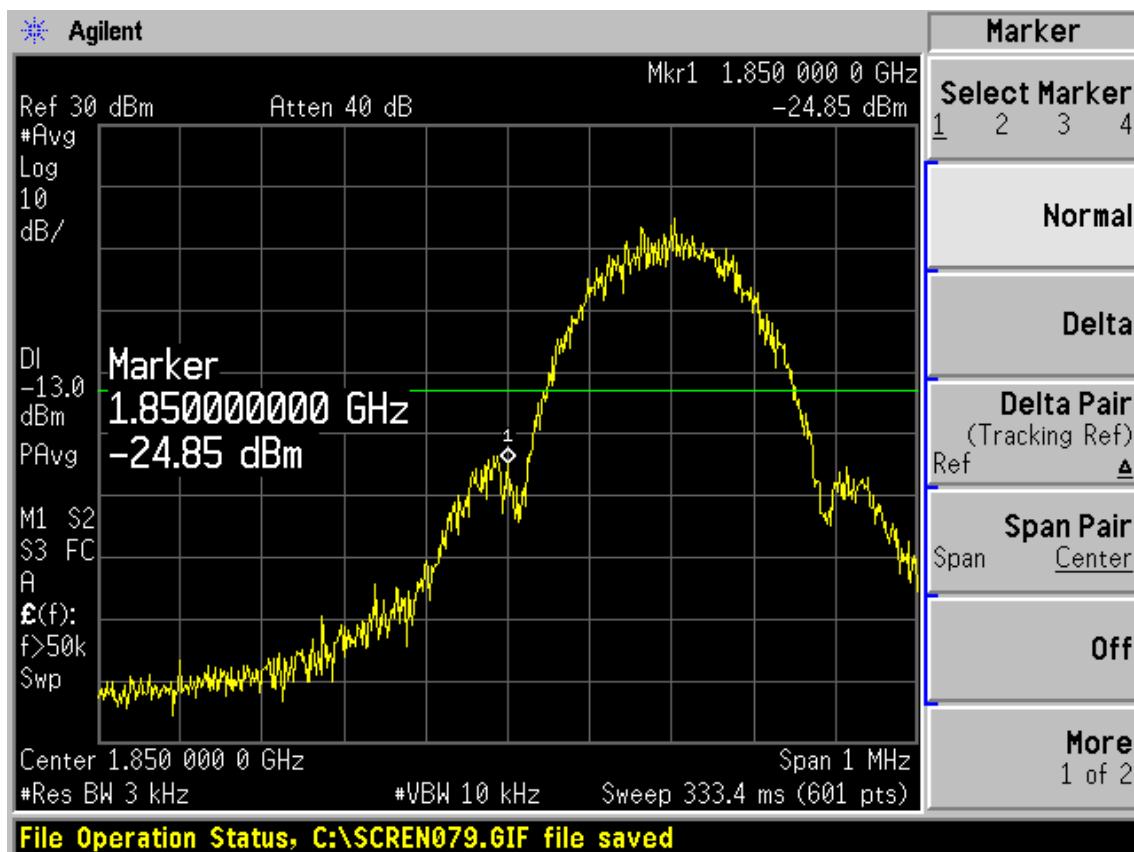
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GSM1900 GPRS 810 Channel

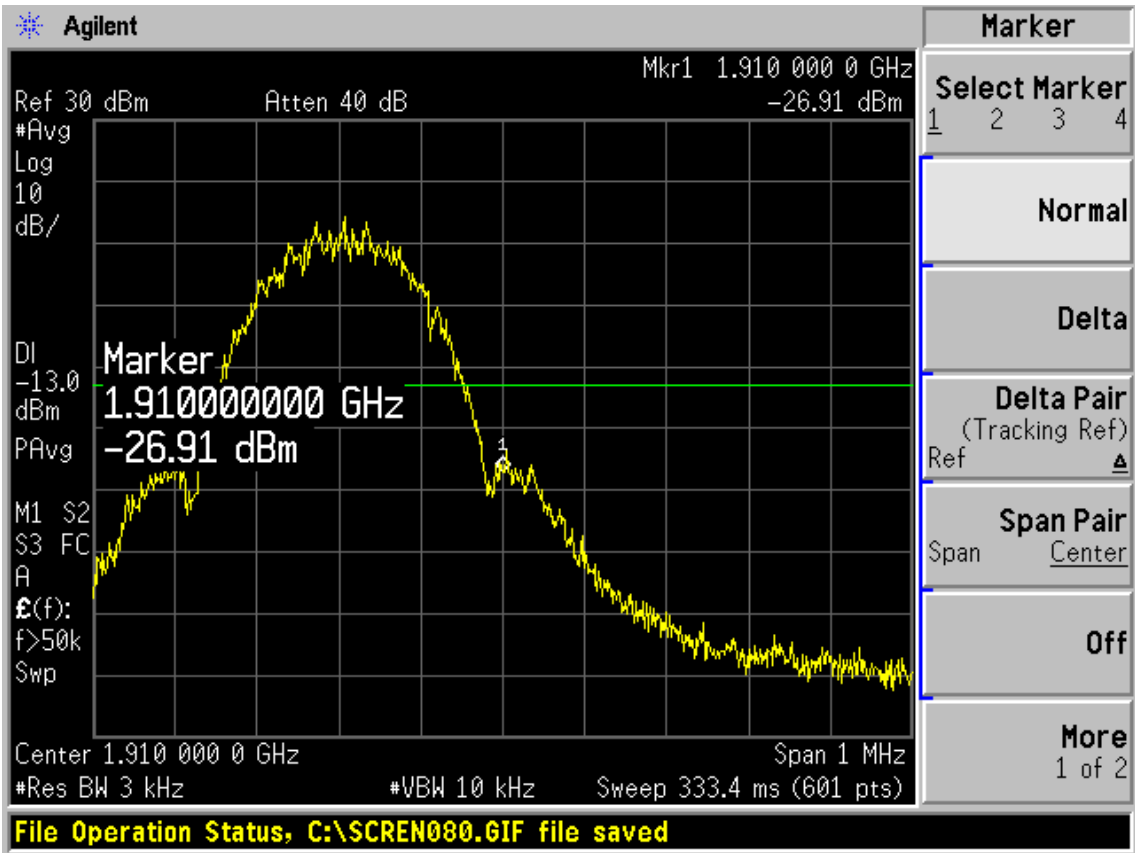


GSM 1900 EGPRS 512 Channel

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GSM1900 EGPRS 810 Channel

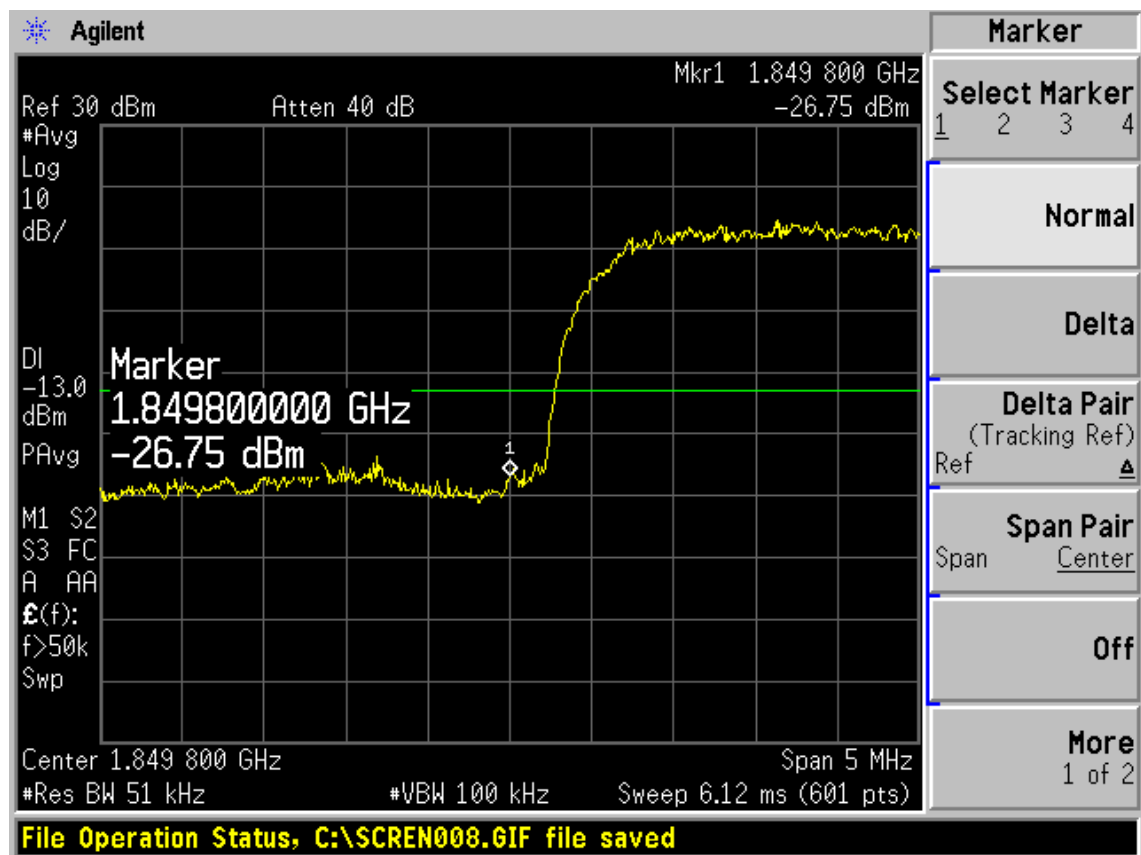
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	Carrier frequency (MHz)	Reference value (dBm)	Limit	Conclusion
WCDMA Band II	1849.8	-26.75	-13	PASS
	1910.2	-22.20	-13	PASS
WCDMA Band II+HSDPA	1849.8	-21.16	-13	PASS
	1910.2	-26.99	-13	PASS
WCDMA Band II+HSUPA	1849.8	-21.12	-13	PASS
	1910.2	-23.92	-13	PASS

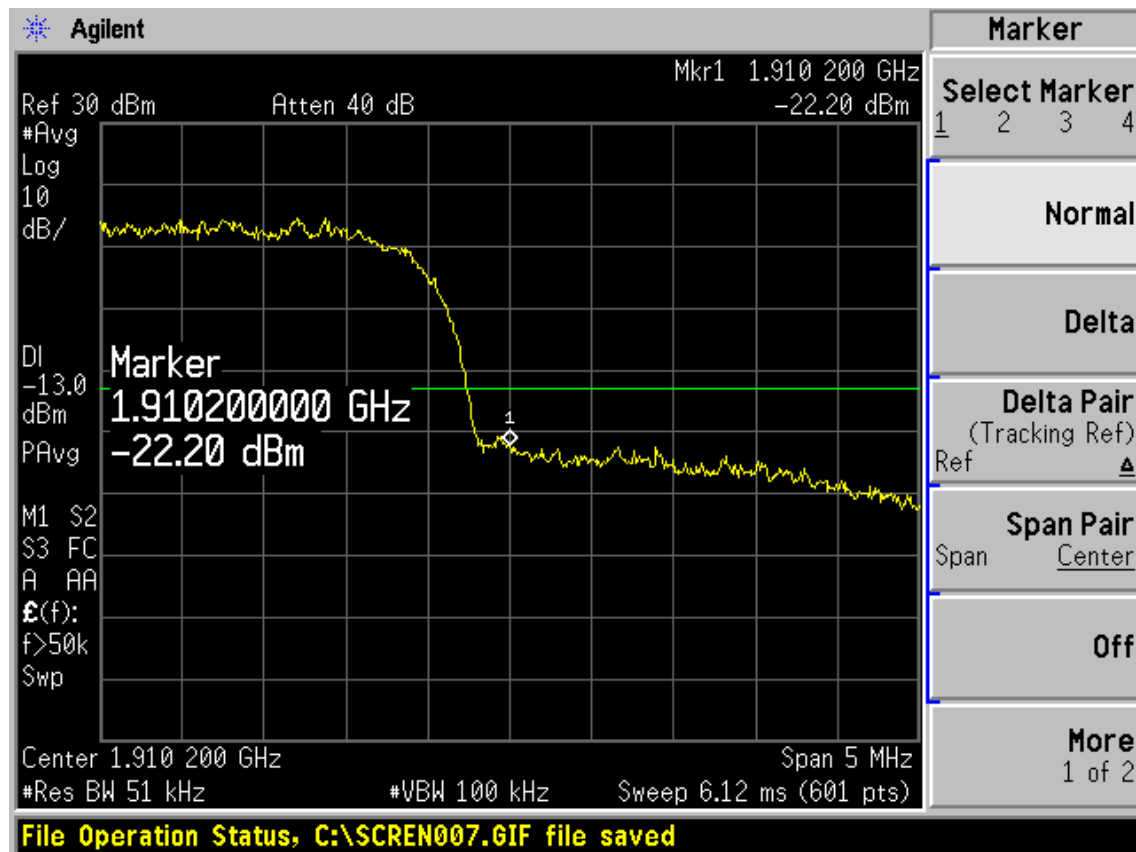


WCDMA Band II 9262 Channel

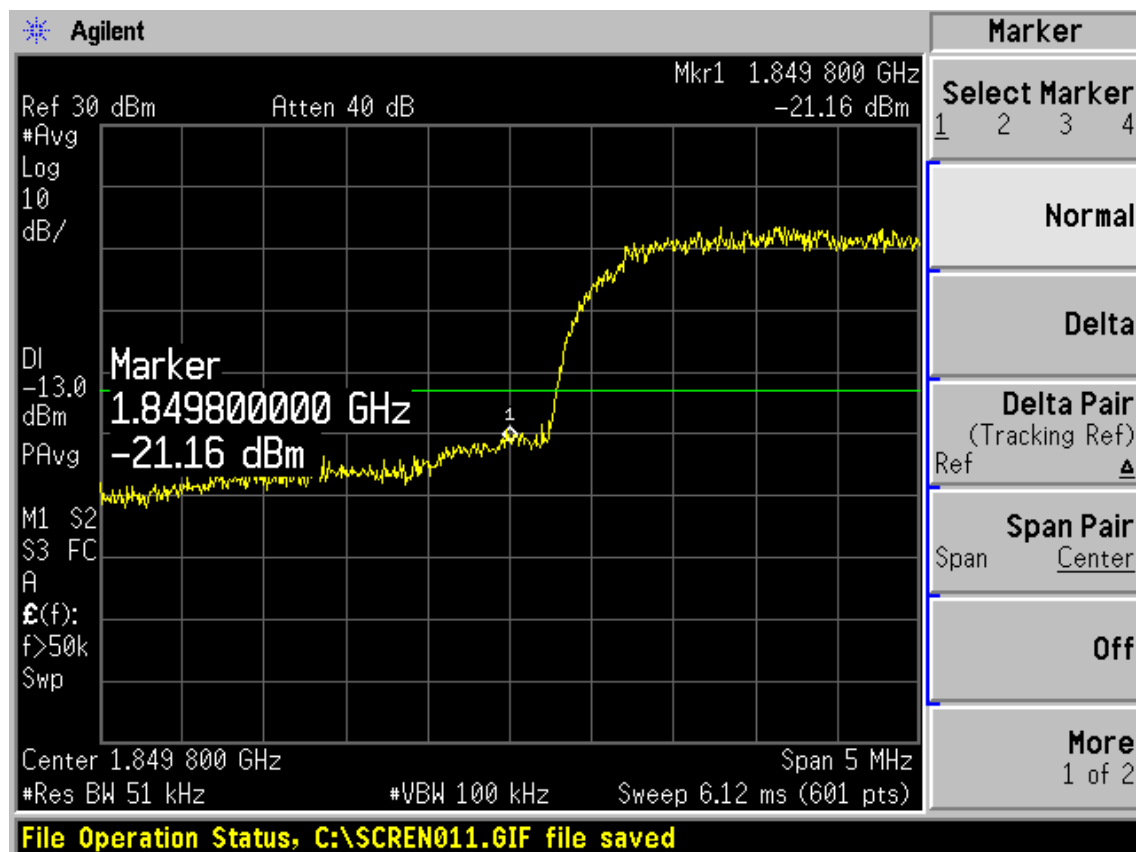
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WCDMA Band II 9538 Channel

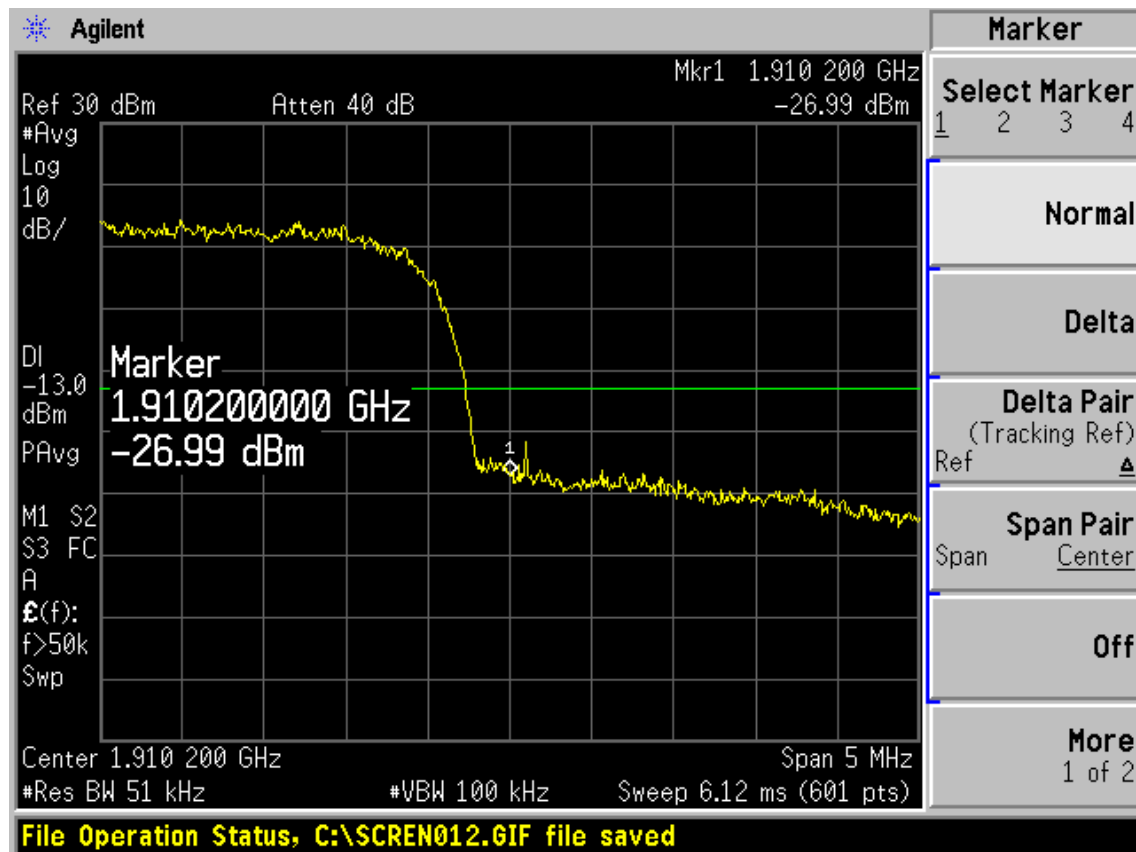


WCDMA Band II HSDPA 9262 Channel

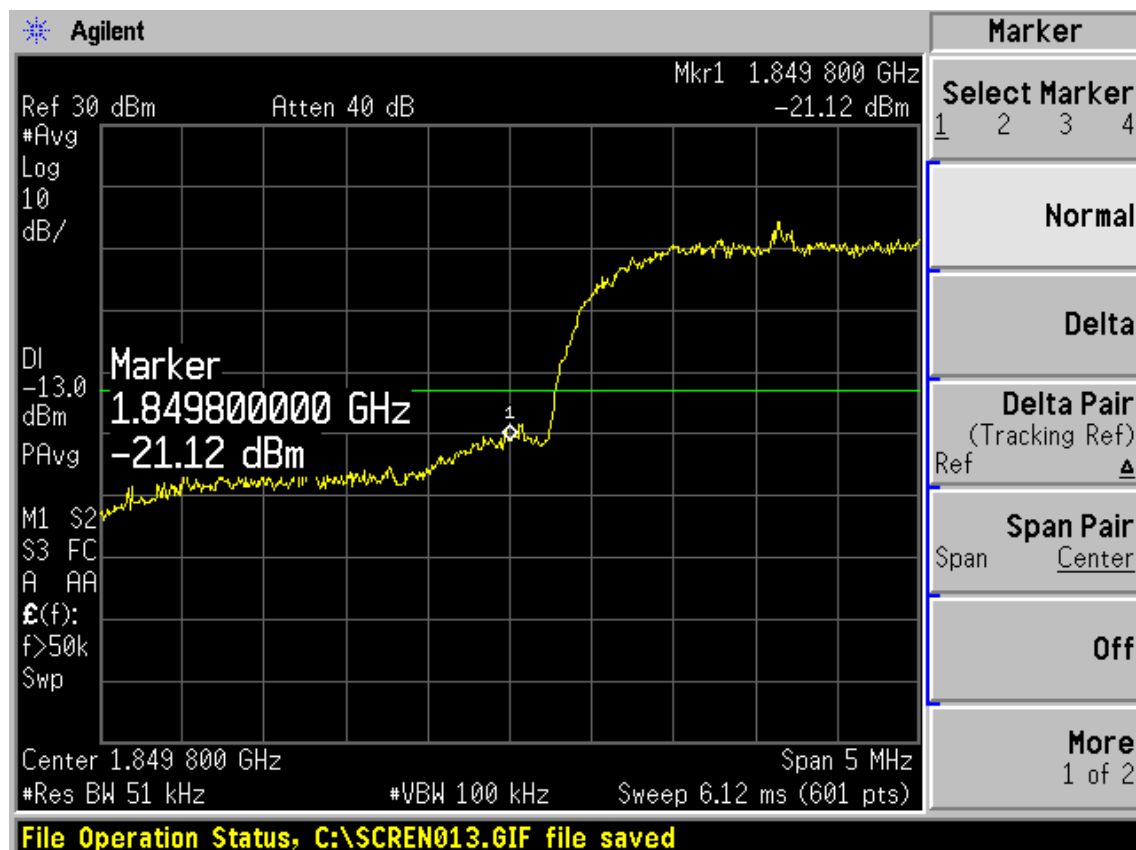
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WCDMA Band II HSDPA 9538 Channel

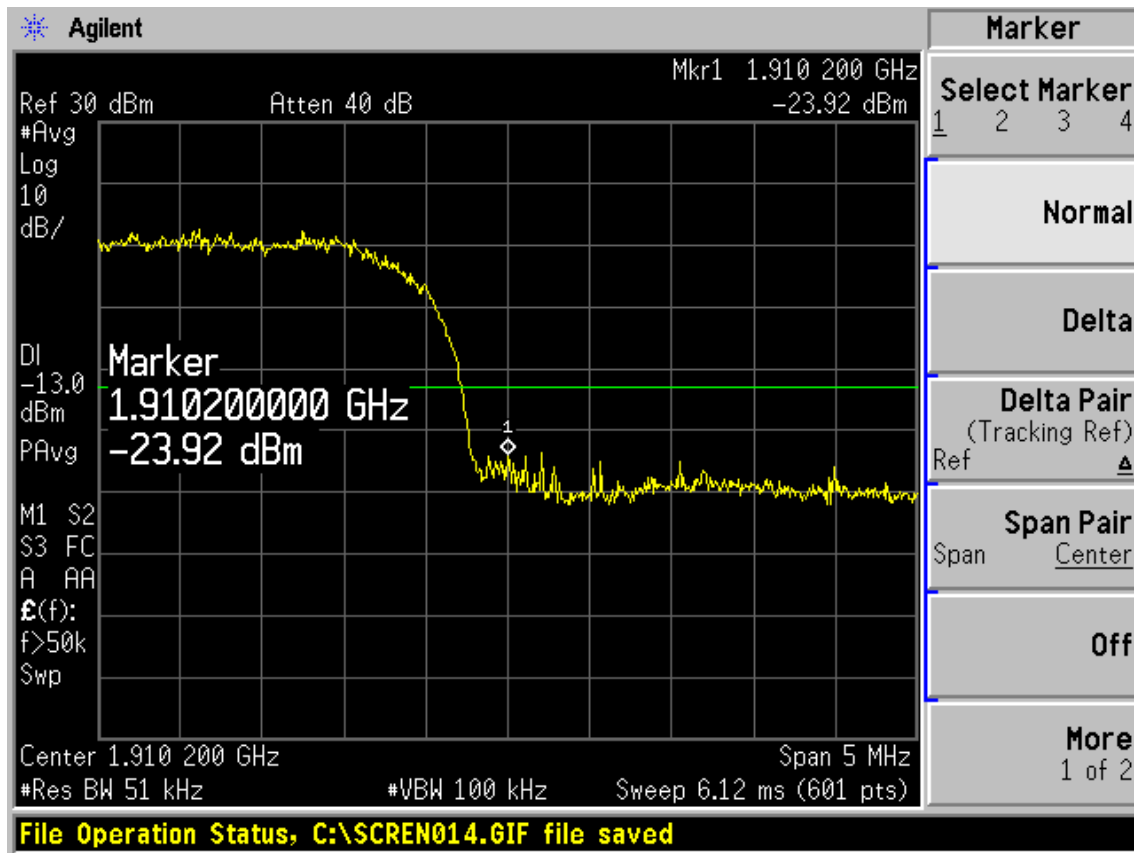


WCDMA Band II HSUPA 9262 Channel

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WCDMA Band II HSUPA 9538 Channel

2.6. Peak-to-Average Power Ratio (PAPR)

Ambient condition

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

Methods of Measurement

The measurement procedures in KDB971168 are used.

The inherent randomness of the power peaks in a noise-like signal makes it difficult to quantify the peak power using traditional measurement techniques for determining the peak power of an analog signal. The peak power of a digitally-modulated signal is predictable only on a statistical basis. Thus, for these types of signals, a statistical measurement of the peak power is necessary.

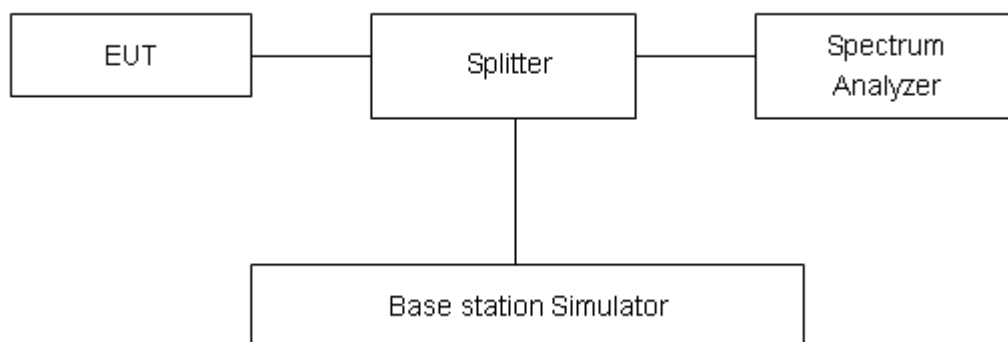
Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth.

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

Step 2. Set the CCDF option in Spectrum analyzer.

Step 3. Record the maximum PAPR level associated with a probability of 0.1%.

Test Setup



Limits

No specific Peak-to-Average Ratio requirements in KDB 971168.

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.

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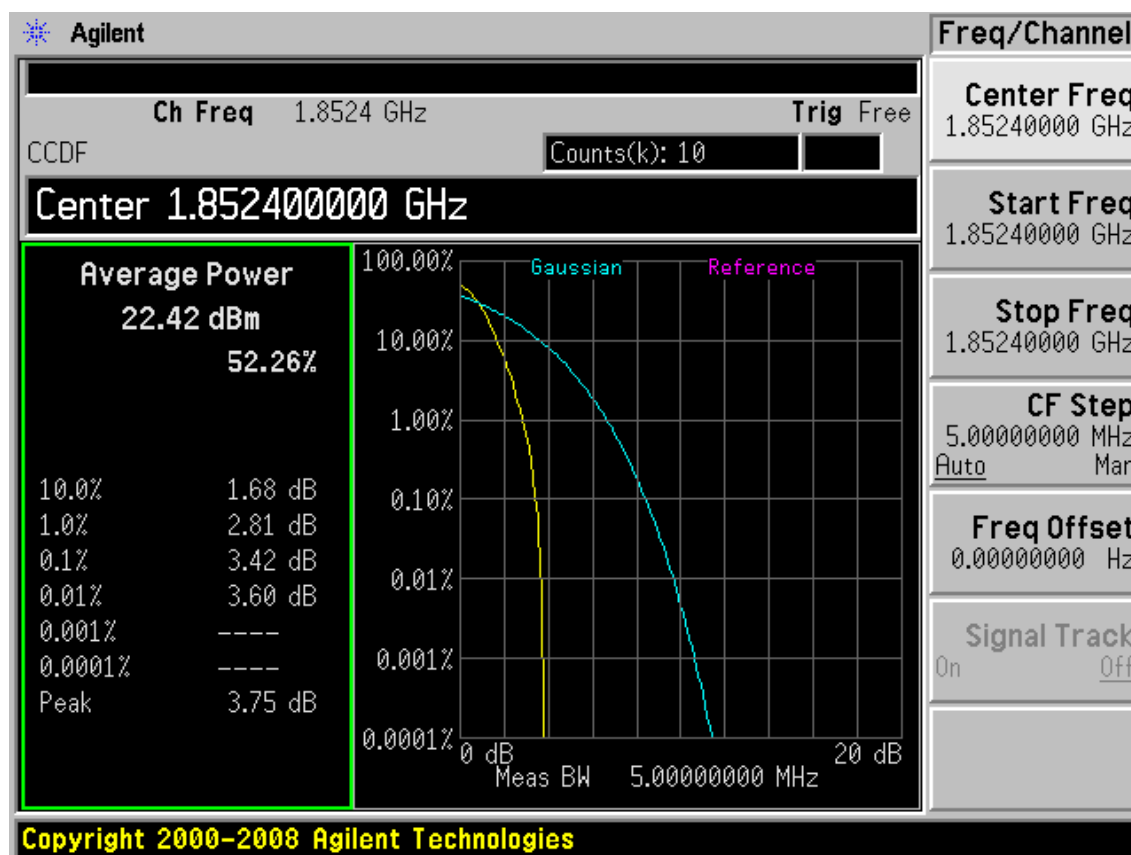
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Test Result:

Test Results

Mode	Channel	Frequency (MHz)	Test Result(dB)
WCDMA Band II	9262	1852.4	3.42
	9400	1880	3.45
	9538	1907.6	3.85
WCDMA Band II+HSDPA	9262	1852.4	5.07
	9400	1880	4.96
	9538	1907.6	4.39
WCDMA Band II+HSUPA	9262	1852.4	3.85
	9400	1880	3.84
	9538	1907.6	3.89

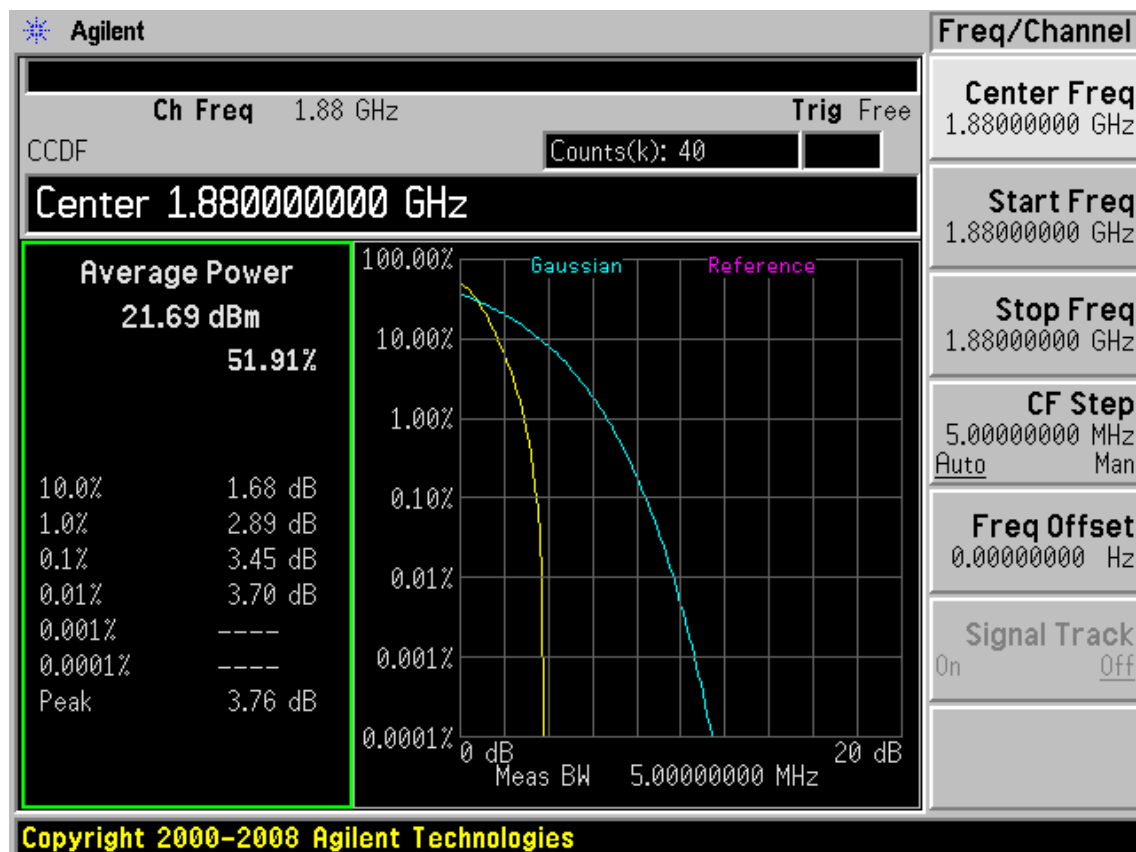


WCDMA Band II CH9262

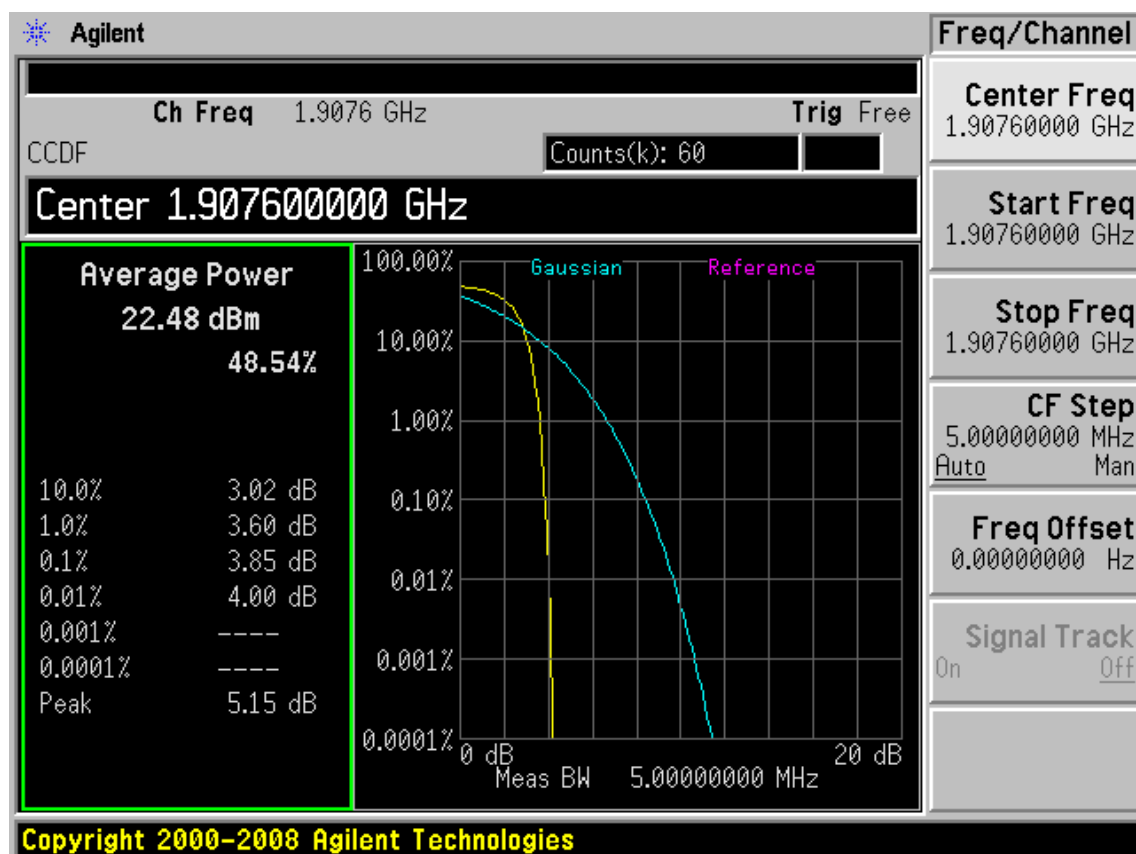
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WCDMA Band II CH9400

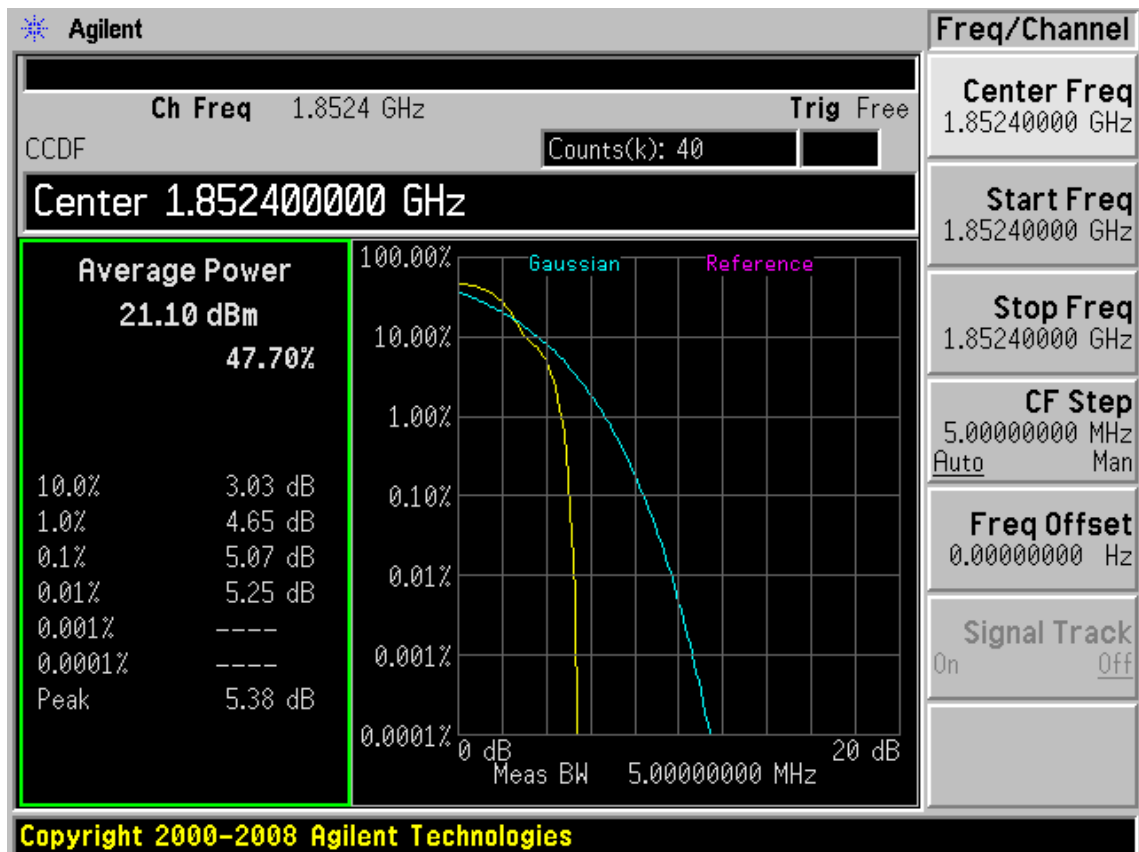


WCDMA Band II CH9538

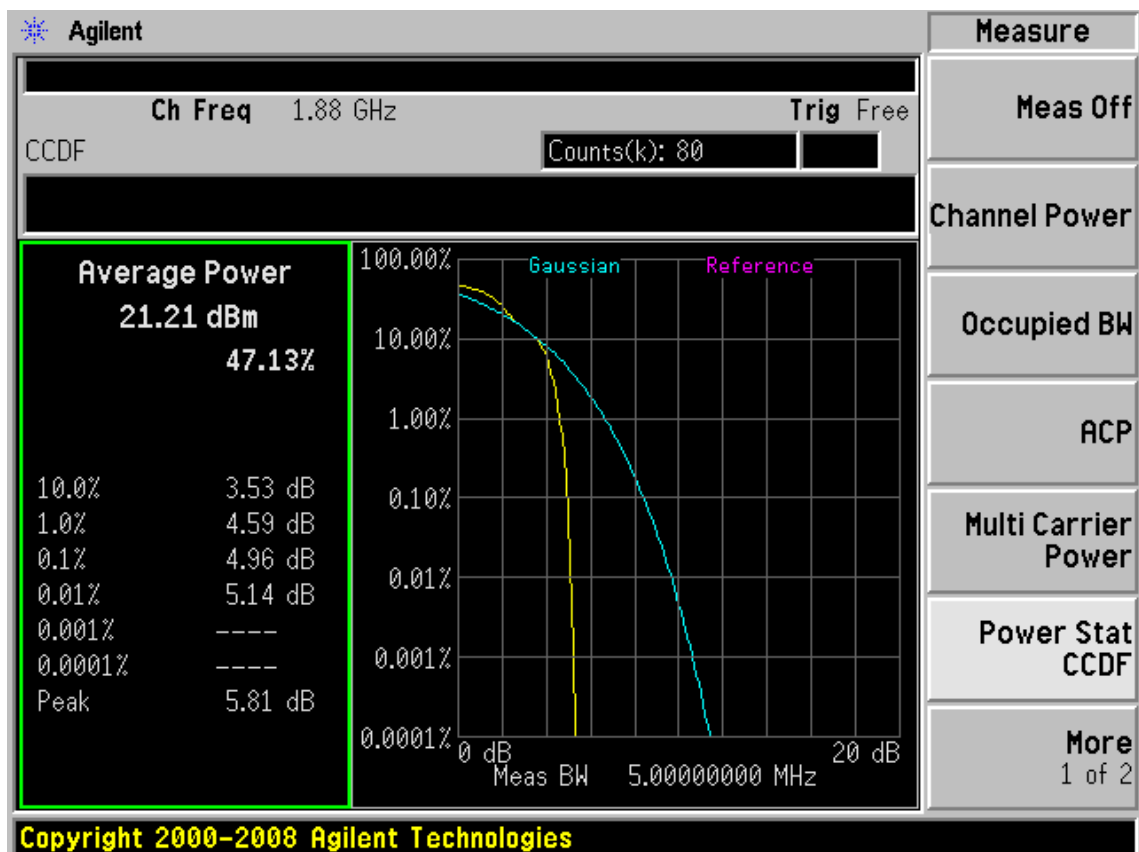
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WCDMA Band II+HSDPA CH9262

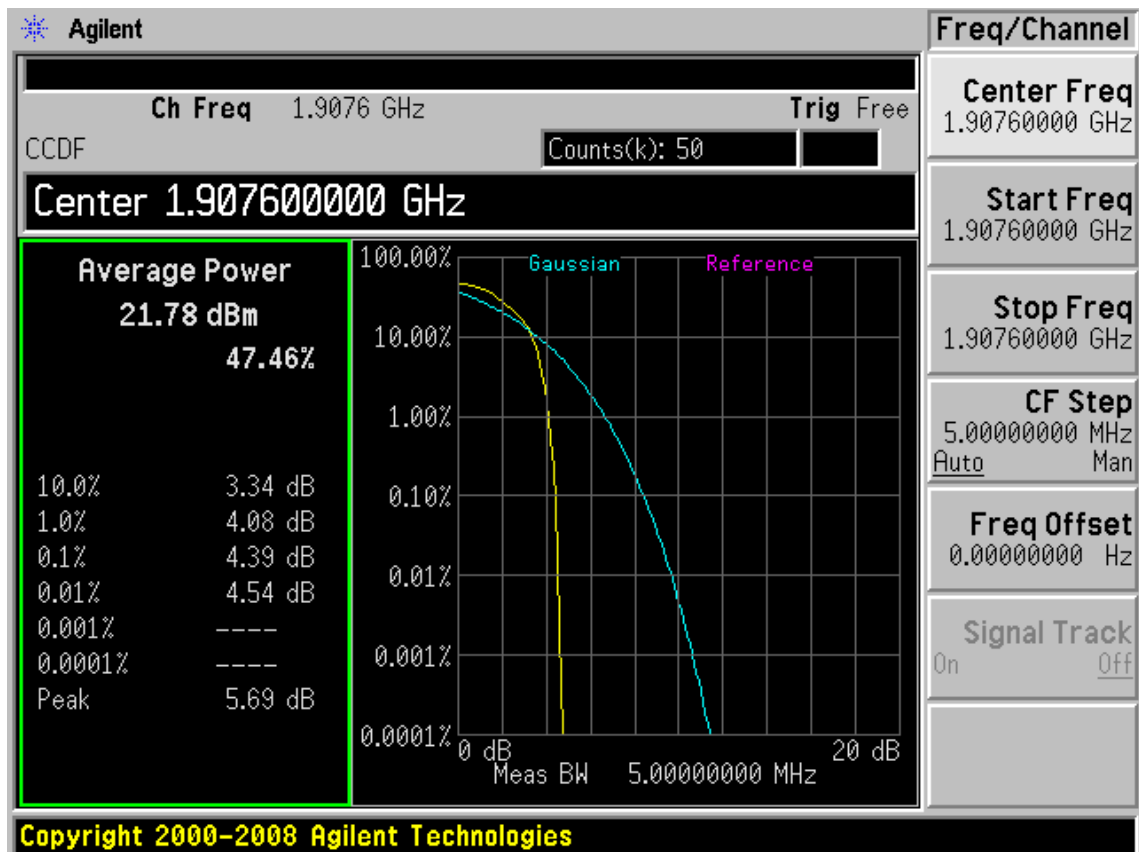


WCDMA Band II+HSDPA CH9400

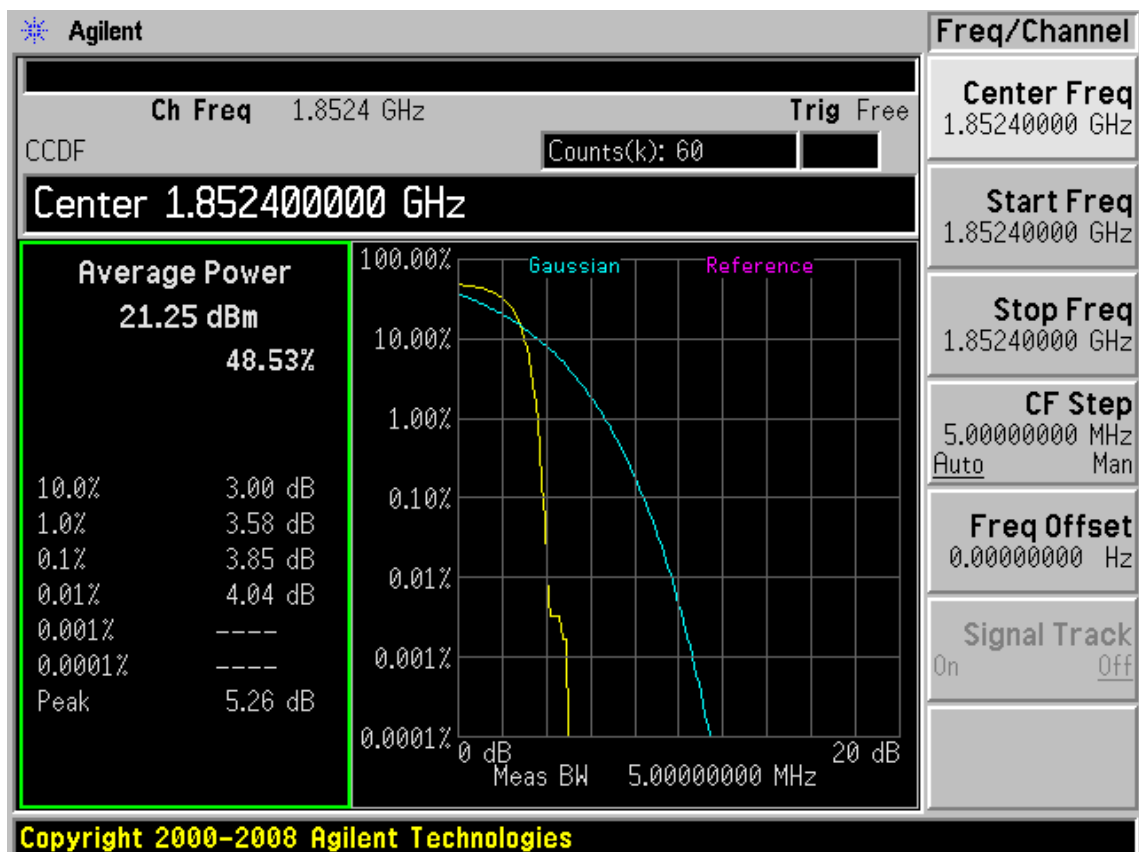
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WCDMA Band II+HSDPA CH9538

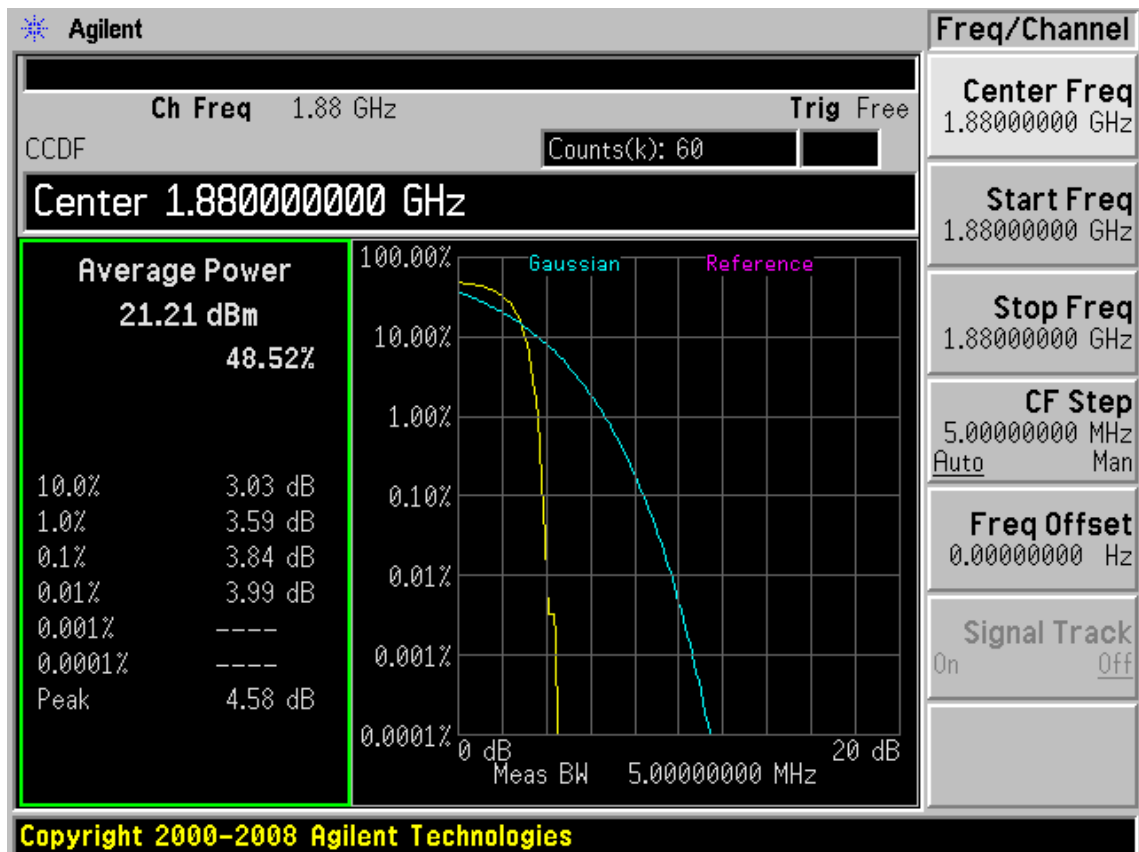


WCDMA Band II+HSUPA CH9262

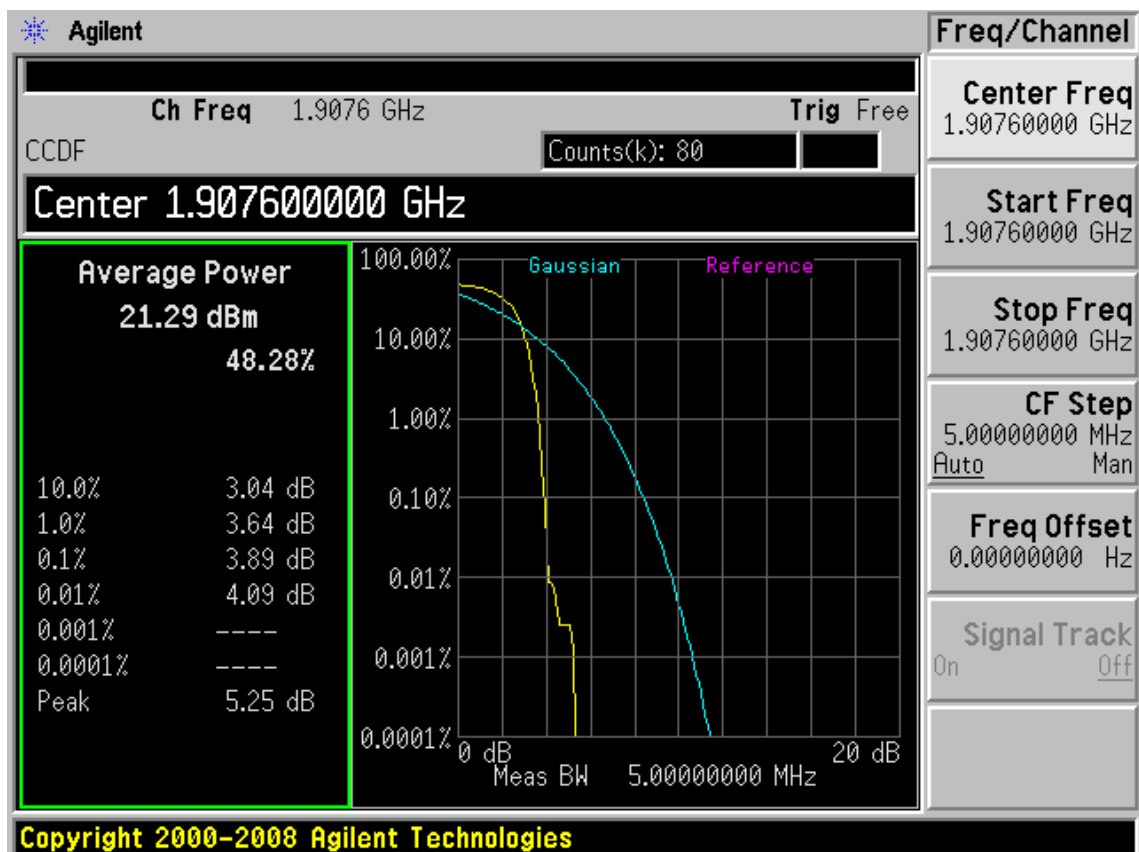
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WCDMA Band II+HSUPA CH9400



WCDMA Band II+HSUPA CH9538

2.7. Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -20°C to +60°C in 10°C step size,

(1) With all power removed, the temperature was decreased to -20°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 -20°C to +60°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

2. Frequency Stability (Voltage Variation)

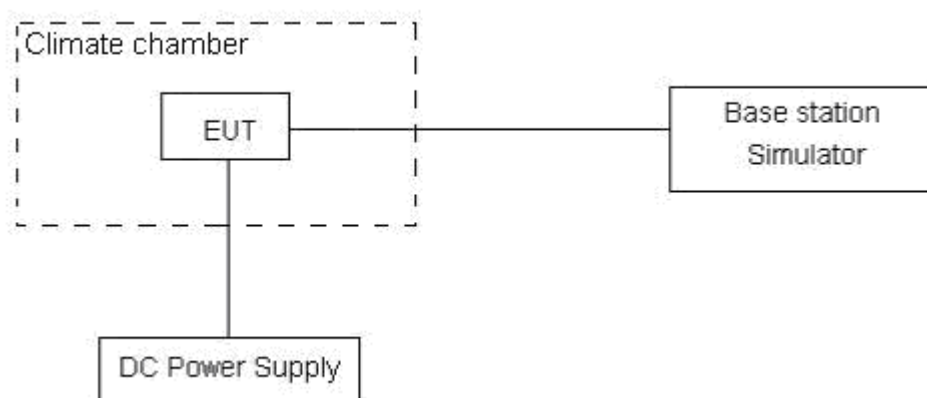
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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 3.5 V and 4.2 V, with a nominal voltage of 3.8V.

Test setup



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Limits

No specific frequency stability requirements in part 24.235

Measurement Uncertainty

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

Test Result

GSM 1900

GPRS

Temperature (°C)	Test Results (ppm) / 3.8 V Power supply
	Channel 661
-20	0.002505
-10	-0.01276
0	-0.02047
10	-0.01953
20	-0.02242
30	-0.02164
40	-0.02017
50	-0.02397
60	-0.02624

Voltage (V)	Test Results(ppm) / 20°C
	Channel 661
3.5	-0.02420
3.8	-0.02242
4.2	-0.02566

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EGPRS

Temperature (°C)	Test Results (ppm) / 3.8 V Power supply
	Channel 661
-20	0.000606
-10	-0.00741
0	-0.01736
10	-0.00197
20	-0.01207
30	0.001053
40	-0.00209
50	-0.00853
60	-0.00164

Voltage (V)	Test Results(ppm) / 20°C
	Channel 661
3.5	-0.01708
3.8	-0.01207
4.2	-0.01796

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WCDMA Band II

Temperature (°C)	Test Results (ppm) / 3.8 V Power supply
	Channel 9400
-20	0.001803
-10	0.003894
0	0.004521
10	0.001223
20	0.004207
30	0.001606
40	0.003766
50	-0.0006
60	0.003564

Voltage (V)	Test Results(ppm) / 20°C
	Channel 9400
3.5	0.001559
3.8	0.004207
4.2	0.002782

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2.8. Spurious Emissions at Antenna Terminals

Ambient condition

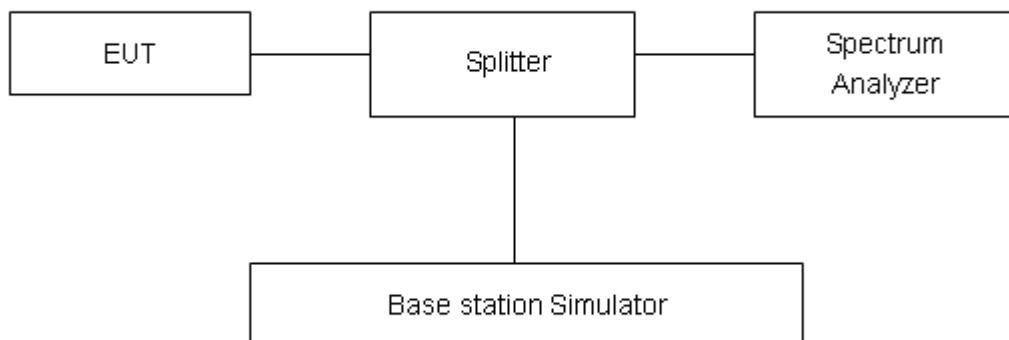
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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. For GSM 1900, RBW and VBW are set to 100 kHz, Sweep is set to ATUO. For WCDMA Band II, 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 24.238(a) specifies that “on any frequency outside a licensee’s frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ 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

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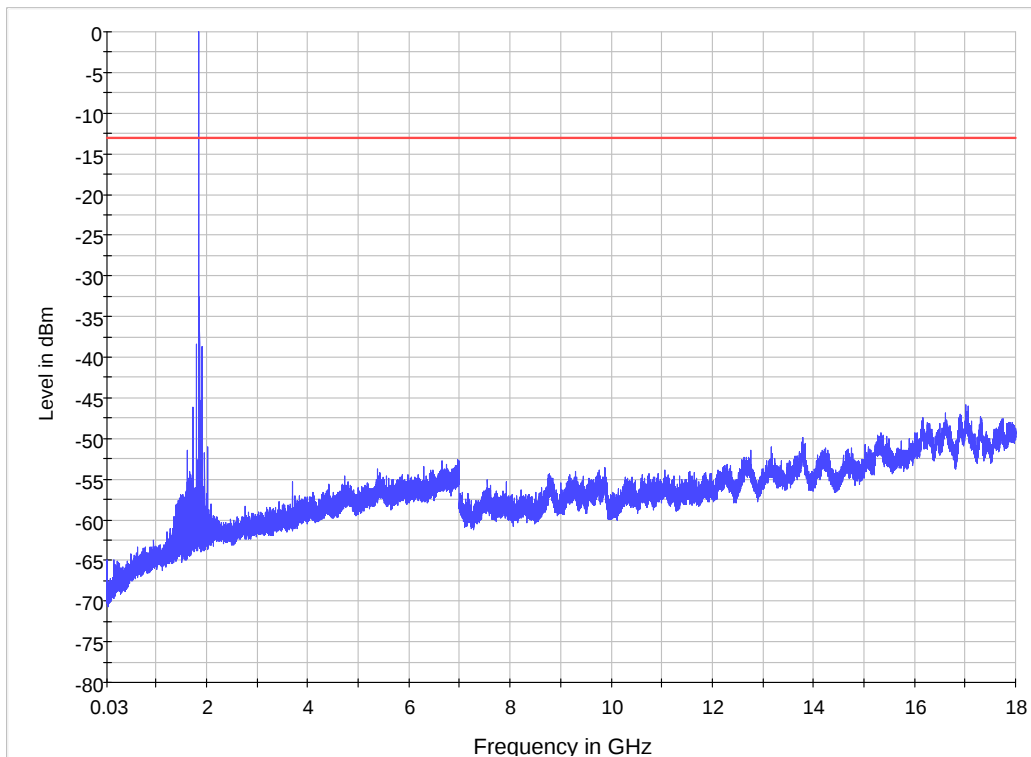
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Test Result

GSM 1900 CH 512

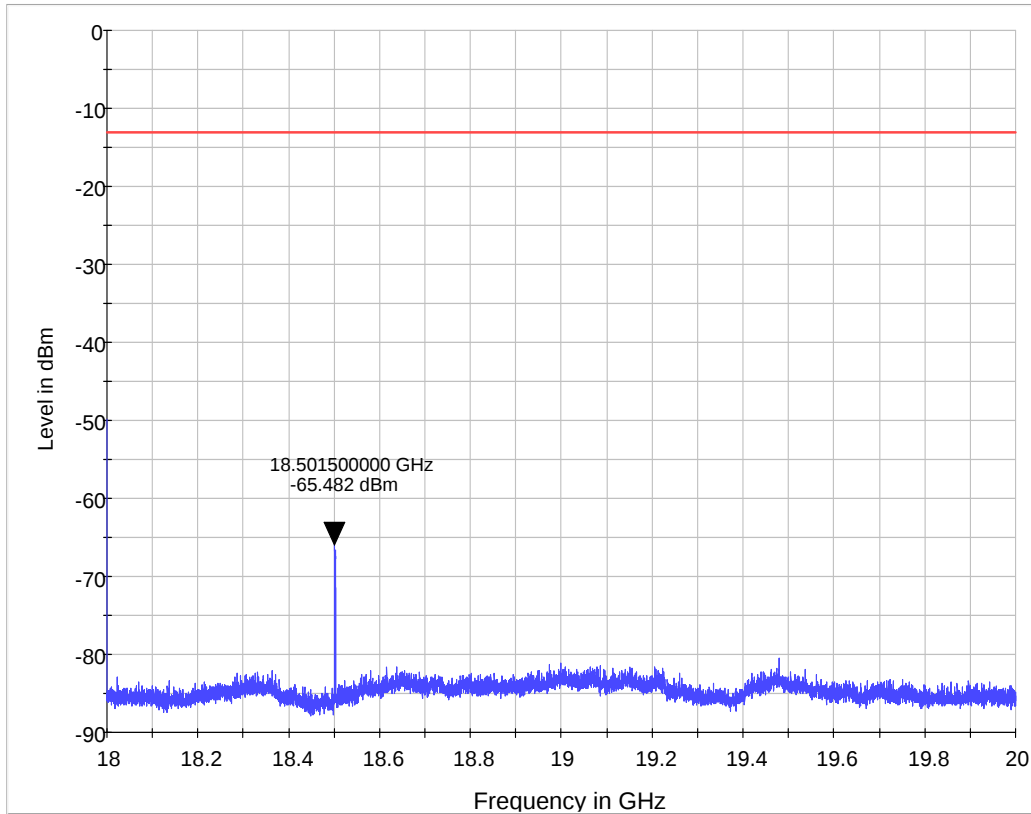


Note: The signal beyond the limit is carrier.
GSM 1900 512 Channel 30MHz~18GHz

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Note: The signal beyond the limit is carrier.
GSM 1900 512 Channel 18GHz ~20GHz

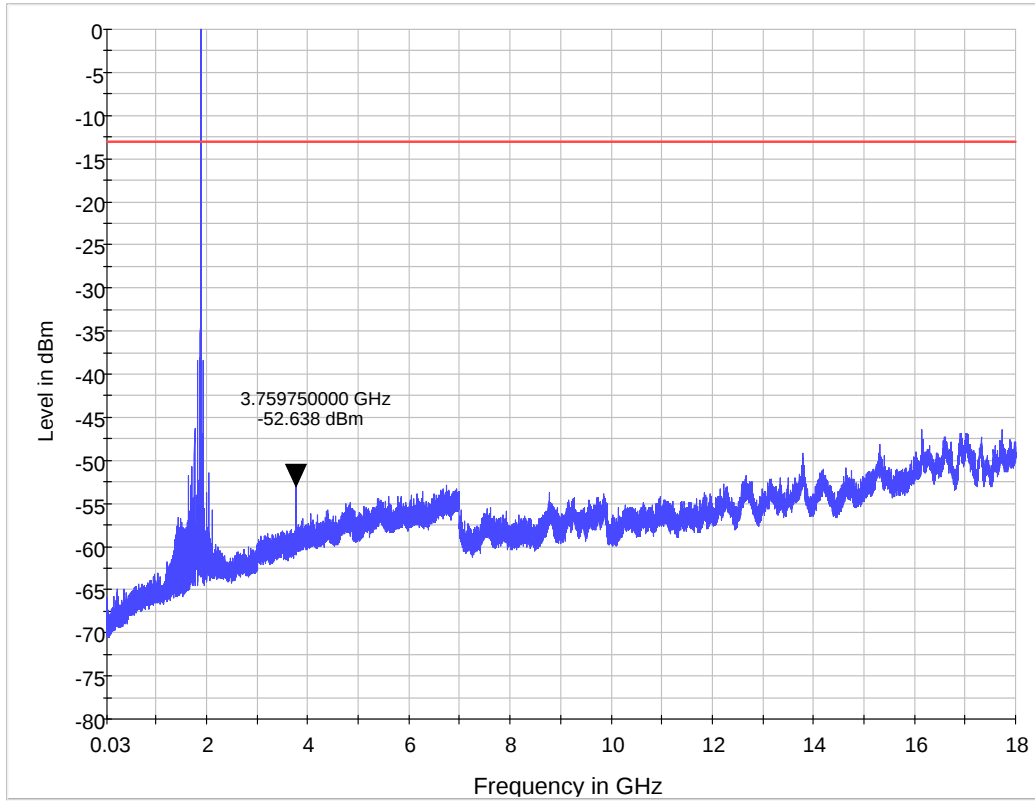
Harmonic	TX ch.512 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
10	18501.5	-65.48	-13	52.48

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GSM 1900 CH 661



Note: The signal beyond the limit is carrier.
GSM 1900 661 Channel 30MHz~18GHz

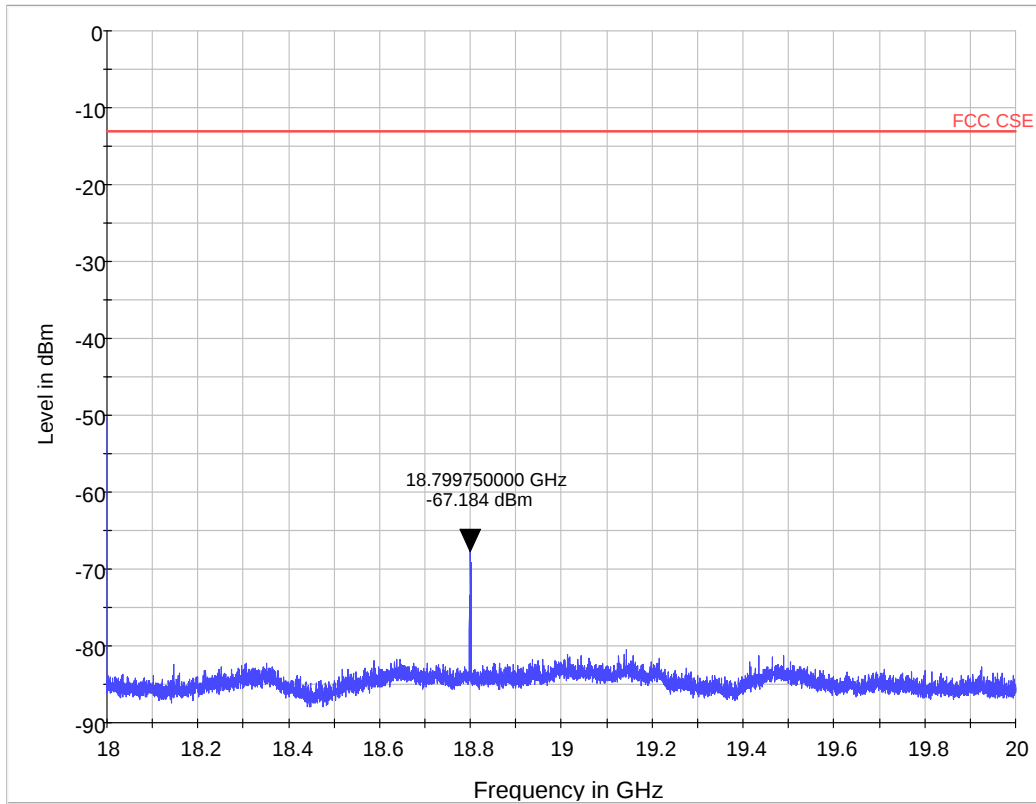
Harmonic	TX ch.661 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3759.8	-52.64	-13	39.64

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Note: The signal beyond the limit is carrier.
GSM 1900 661 Channel 18GHz ~20GHz

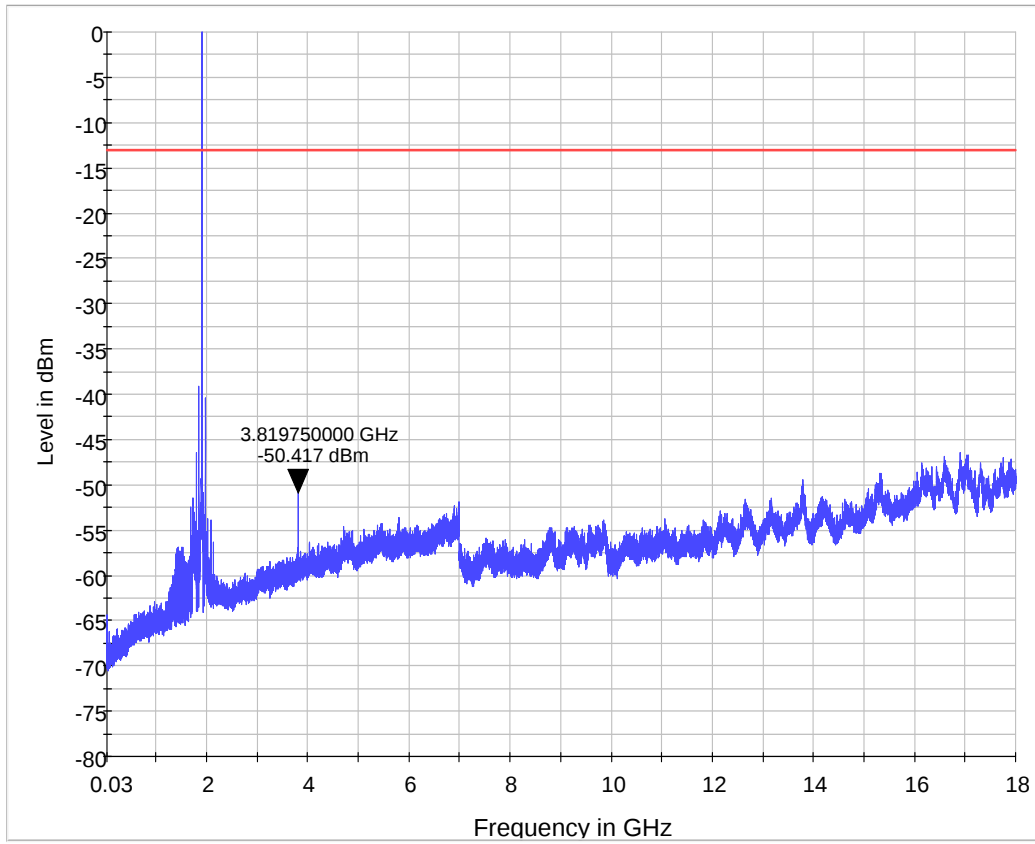
Harmonic	TX ch.661 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
10	18799.8	-67.18	-13	54.18

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GSM 1900 CH 810



Note: The signal beyond the limit is carrier.

GSM 1900 810 Channel 30MHz~18GHz

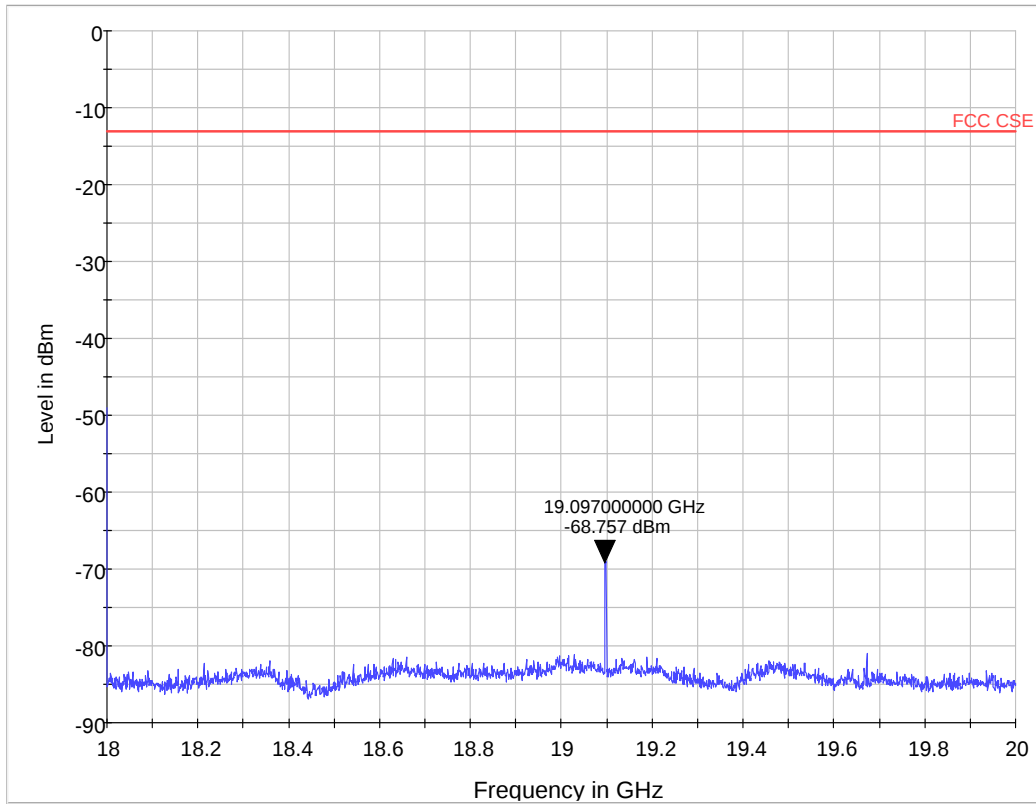
Harmonic	TX ch.661 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3819.8	-50.42	-13	37.42

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Note: The signal beyond the limit is carrier.
GSM 1900 810 Channel 18GHz ~20GHz

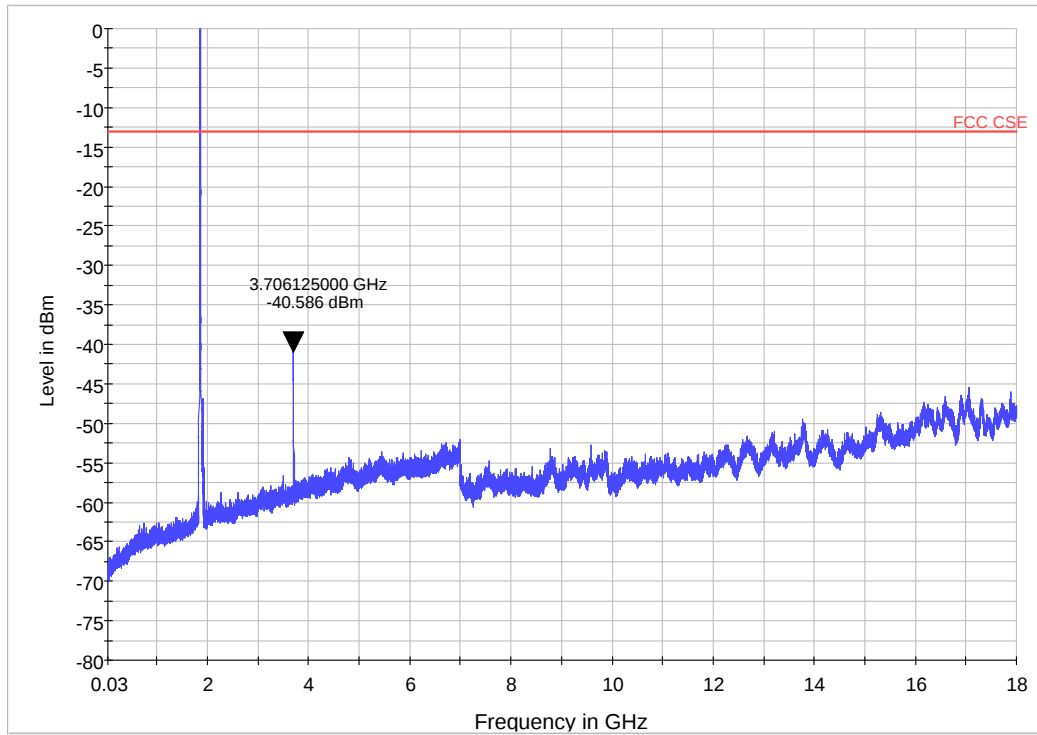
Harmonic	TX ch.810 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
10	19097.0	-68.76	-13	55.76

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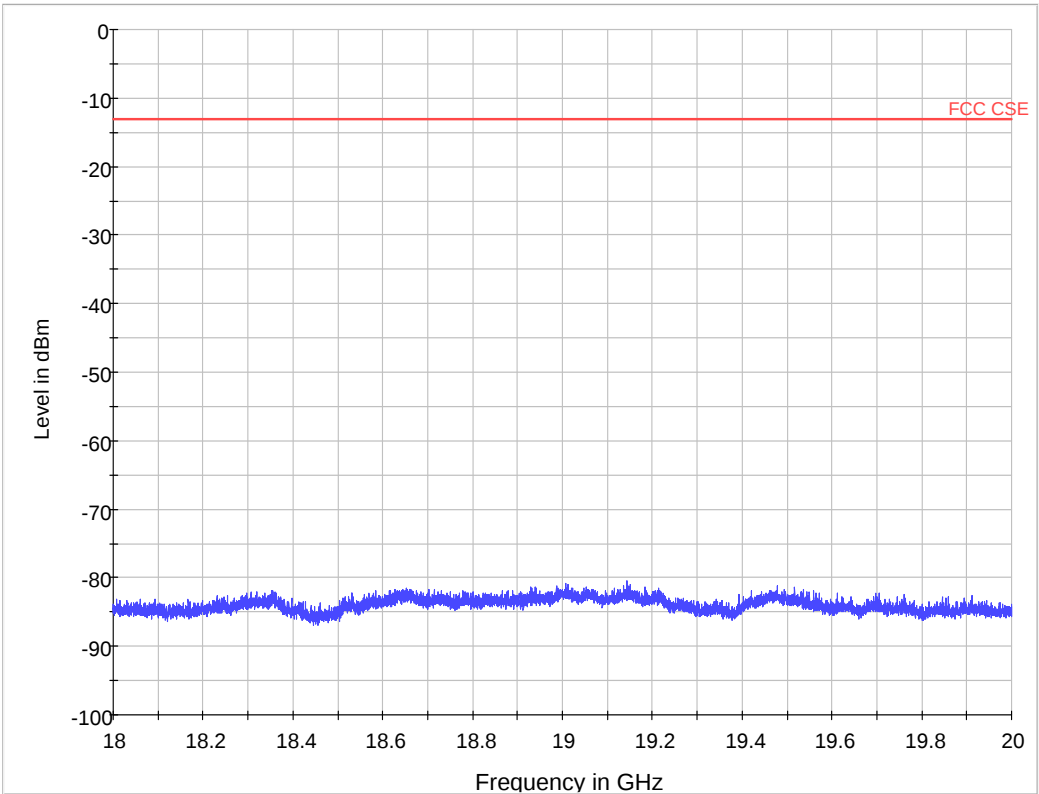
WCDMA Band II CH9262



Note: The signal beyond the limit is carrier.
WCDMA Band II 9262 Channel 30MHz~18GHz

Harmonic	TX ch.9262 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3706.1	-40.59	-13	27.59

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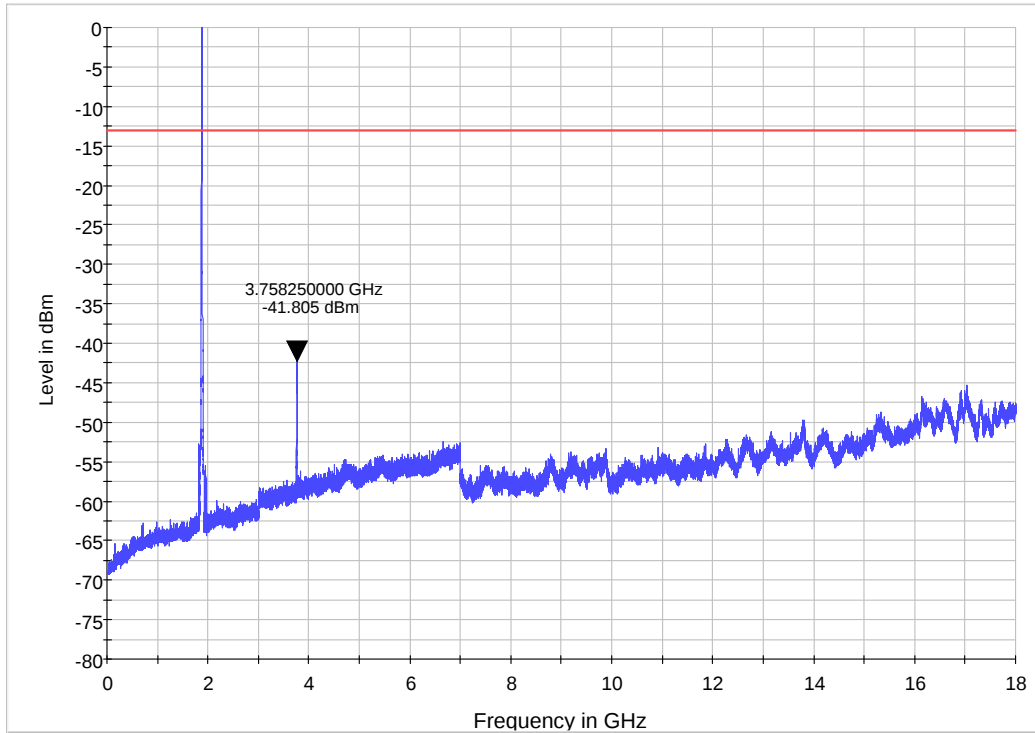
Note: The signal beyond the limit is carrier.
WCDMA Band II 9262 Channel 18GHz ~20GHz

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WCDMA Band II CH9400



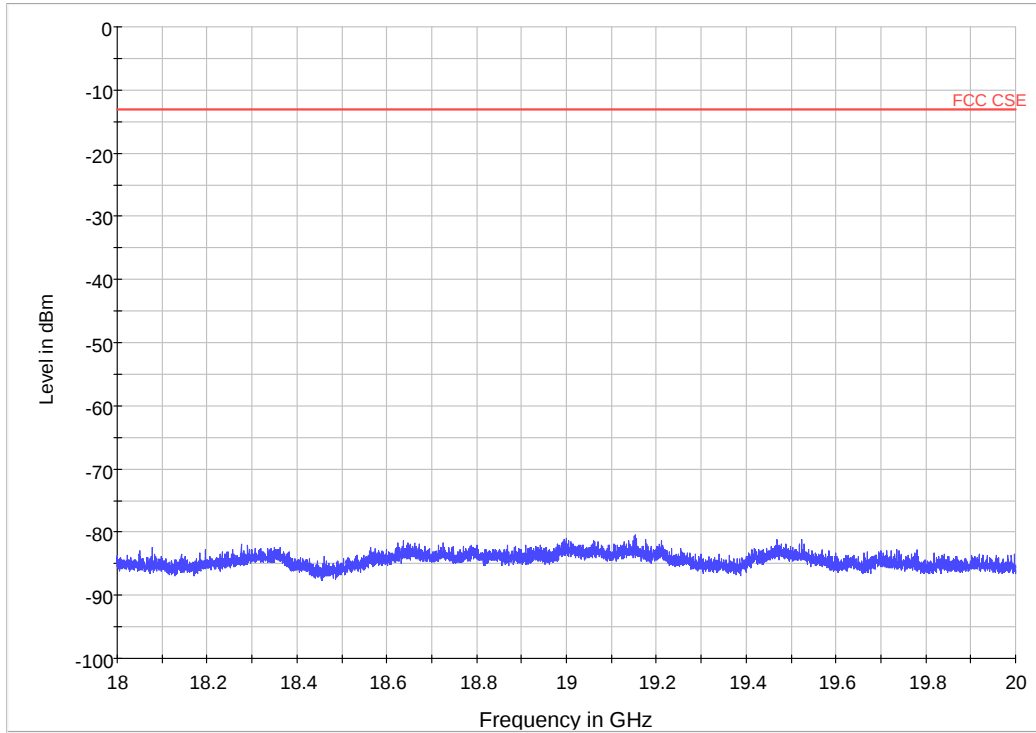
Note: The signal beyond the limit is carrier.
WCDMA Band II 9400 Channel 30MHz~18GHz

Harmonic	TX ch.9400 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3758.3	-41.81	-13	28.81

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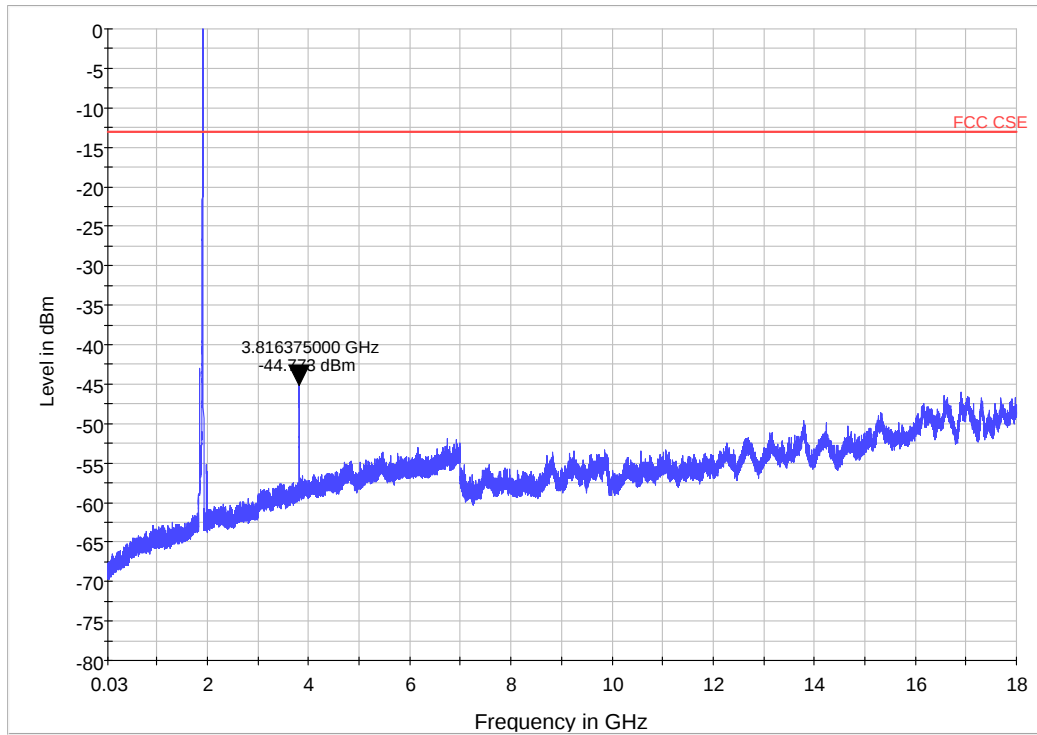
Note: The signal beyond the limit is carrier.
WCDMA Band II 9400 Channel 18GHz ~20GHz

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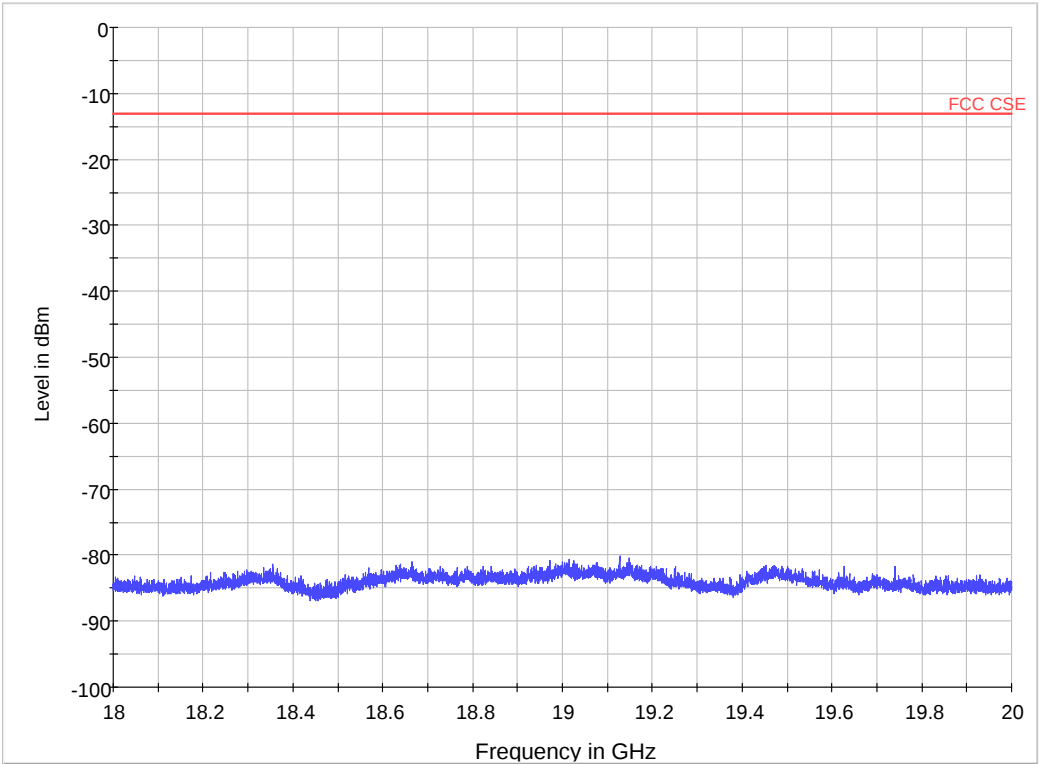
WCDMA Band II CH9538



Note: The signal beyond the limit is carrier.
WCDMA Band II 9538 Channel 30MHz~18GHz

Harmonic	TX ch.9538 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3816.4	-44.77	-13	31.77

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Note: The signal beyond the limit is carrier.
WCDMA Band II 9538 Channel 18GHz ~20GHz

2.8 Radiates Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

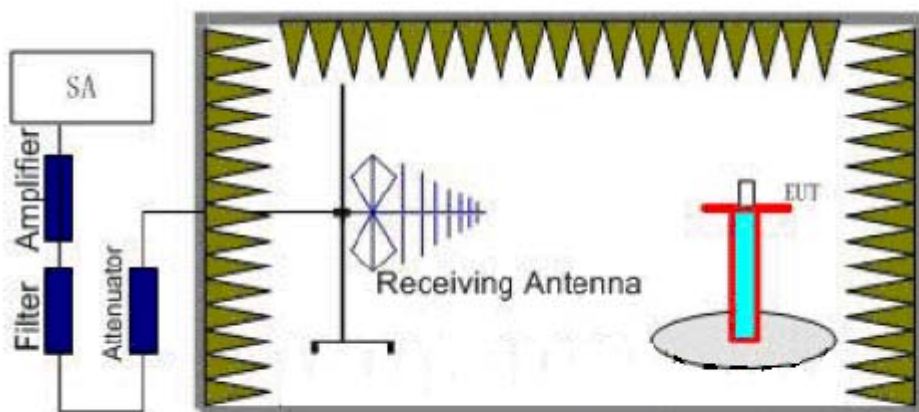
The measurements procedures in TIA -603C are used.

The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment.

. The 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.



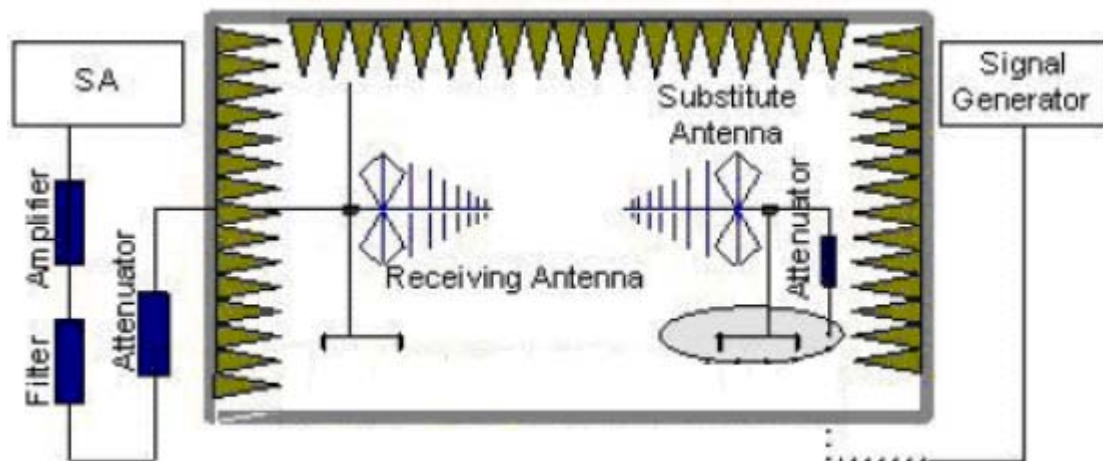
Step 2:

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.

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$E.R.P \text{ (peak power)} = S.G. - \text{Tx Cable loss} + \text{Substitution antenna gain} - 2.15.$
 $EIRP = E.R.P + 2.15$

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

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

Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB.”

Limit	-13 dBm
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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.

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Test Result

GSM 1900 CH 512

Harmonic	TX ch.512 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3700.1	-54.33	2	10.15	horizontal	-34.90	-13	21.90	315
3	5550.8	-53.01	2.51	11.35	vertical	-45.49	-13	32.49	315
4	7400.6	-60.30	4.2	10.85	vertical	-48.38	-13	35.38	270
5	9251	-58.25	5.2	11.35	horizontal	-54.25	-13	41.25	180
6	11101.5	-58.00	5.5	11.95	horizontal	-39.65	-13	26.65	45
7	12951.4	-60.50	5.7	13.55	vertical	-54.80	-13	41.80	0
8	14801.6	-54.79	6.3	13.75	vertical	-49.49	-13	36.49	180
9	16651.8	-45.72	6.8	13.85	horizontal	-40.82	-13	27.82	90
10	18502	-43.34	6.9	14.25	horizontal	-38.14	-13	25.14	0

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GSM 1900 CH 661

Harmonic	TX ch.661 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3759.8	-56.46	2	10.75	vertical	-31.40	-13	18.40	315
3	5640.0	-52.19	2.51	11.05	vertical	-49.25	-13	36.25	135
4	7519.9	-58.56	4.2	11.15	horizontal	-46.01	-13	33.01	45
5	9400	-60.62	5.2	11.15	vertical	-56.82	-13	43.82	270
6	11280.4	-58.89	5.5	11.95	vertical	-40.14	-13	27.14	45
7	13160	-56.89	5.7	13.55	horizontal	-51.19	-13	38.19	180
8	15040	-53.24	6.3	13.75	vertical	-47.94	-13	34.94	90
9	16920	-44.48	6.8	13.85	vertical	-39.58	-13	26.58	0
10	18800	-42.30	6.9	14.25	horizontal	-37.10	-13	24.10	270

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GSM 1900 CH 810

Harmonic	TX ch.810 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3819.8	-56.43	2	10.15	vertical	-31.64	-13	18.64	315
3	5729.6	-55.95	2.51	11.05	vertical	-46.35	-13	33.35	90
4	7639.1	-60.22	4.2	11.15	horizontal	-47.41	-13	34.41	45
5	9549	-60.60	5.2	11.15	vertical	-56.80	-13	43.80	180
6	11458.5	-59.97	5.5	11.95	vertical	-42.42	-13	29.42	45
7	13368.6	-58.37	5.7	13.55	horizontal	-52.67	-13	39.67	0
8	15278.4	-52.24	6.3	13.75	vertical	-46.94	-13	33.94	90
9	17188.2	-47.90	6.8	13.85	vertical	-43.00	-13	30.00	0
10	19098	-43.22	6.9	14.25	horizontal	-38.02	-13	25.02	0

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WCDMA Band II CH9262

Harmonic	TX ch.9262 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3706.5	-54.33	2	10.15	horizontal	-38.84	-13	25.84	270
3	5561.3	-53.01	2.51	11.35	horizontal	-46.32	-13	33.32	135
4	7409.6	-60.30	4.2	10.85	vertical	-55.80	-13	42.80	90
5	9262	-58.25	5.2	11.35	vertical	-54.25	-13	41.25	180
6	11114.4	-58.00	5.5	11.95	horizontal	-53.70	-13	40.70	270
7	12966.8	-60.50	5.7	13.55	vertical	-54.80	-13	41.80	0
8	14819.2	-54.79	6.3	13.75	vertical	-49.49	-13	36.49	180
9	16671.6	-45.72	6.8	13.85	vertical	-40.82	-13	27.82	90
10	18524	-43.34	6.9	14.25	vertical	-38.14	-13	25.14	0

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WCDMA Band II CH9400

Harmonic	TX ch.9400 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3758.3	-56.46	2	10.75	horizontal	-49.86	-13	36.86	0
3	5640	-52.19	2.51	11.05	horizontal	-45.80	-13	32.80	90
4	7520	-58.56	4.2	11.15	vertical	-53.76	-13	40.76	180
5	9396	-60.62	5.2	11.15	vertical	-56.82	-13	43.82	270
6	11272.5	-58.89	5.5	11.95	horizontal	-54.59	-13	41.59	0
7	13150.6	-56.89	5.7	13.55	horizontal	-51.19	-13	38.19	180
8	15040	-53.24	6.3	13.75	vertical	-47.94	-13	34.94	90
9	16920	-44.48	6.8	13.85	vertical	-39.58	-13	26.58	0
10	18800	-42.30	6.9	14.25	vertical	-37.10	-13	24.10	270

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WCDMA Band II CH9538

Harmonic	TX ch.9538 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3817.5	-56.43	2	10.15	horizontal	-39.54	-13	26.54	270
3	5726.3	-55.95	2.51	11.05	horizontal	-49.56	-13	36.56	270
4	7624.9	-60.22	4.2	11.15	vertical	-55.42	-13	42.42	0
5	9538	-60.60	5.2	11.15	vertical	-56.80	-13	43.80	180
6	11438	-59.97	5.5	11.95	horizontal	-55.67	-13	42.67	90
7	13353.2	-58.37	5.7	13.55	horizontal	-52.67	-13	39.67	0
8	15260.8	-52.24	6.3	13.75	vertical	-46.94	-13	33.94	90
9	17168.4	-47.90	6.8	13.85	vertical	-43.00	-13	30.00	0
10	19076	-43.22	6.9	14.25	horizontal	-38.02	-13	25.02	0

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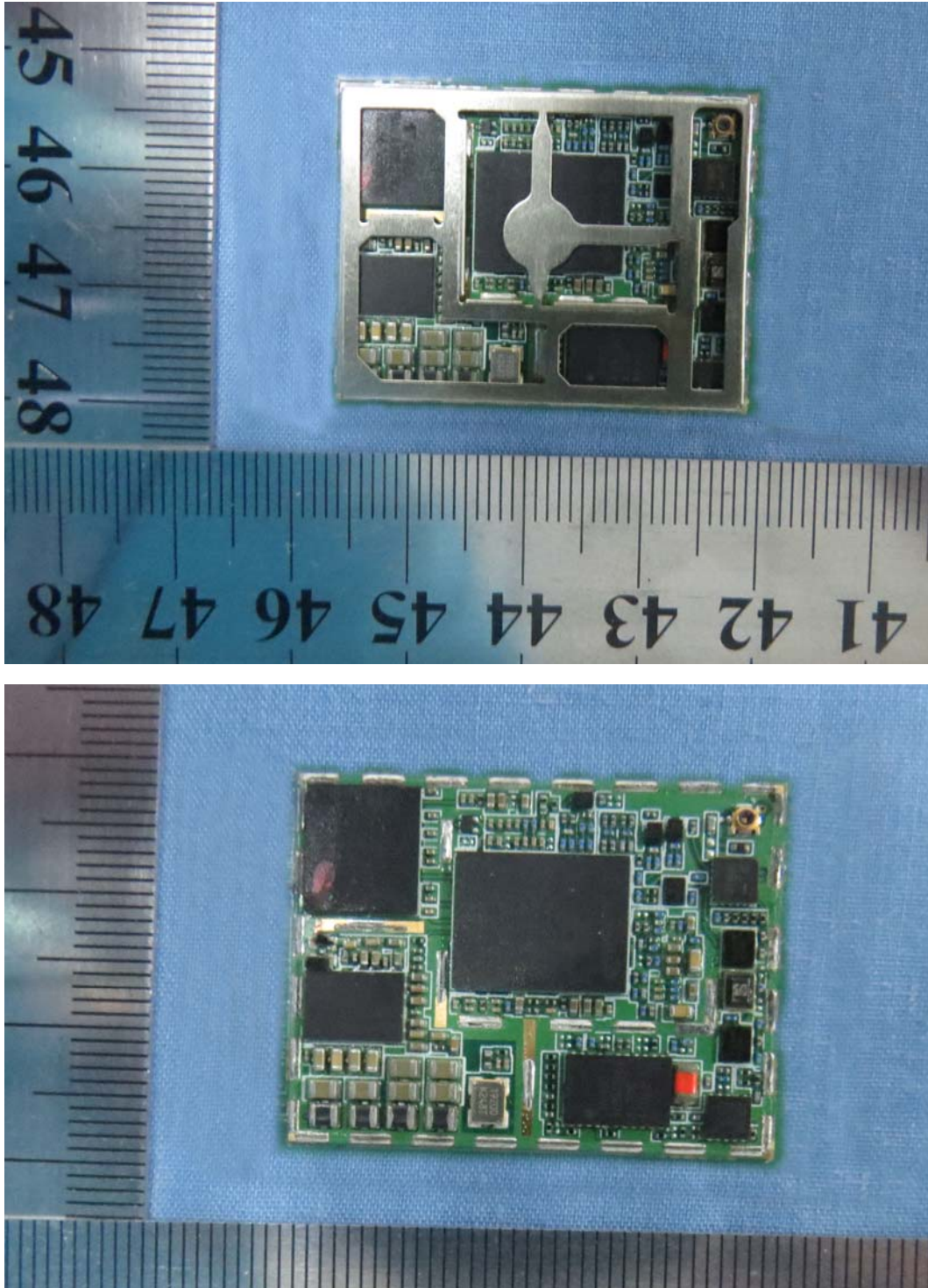
3. Main Test Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
01	Base Station Simulator	CMU200	R&S	118133	2013-06-29	One year
02	Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	NA	NA
03	Spectrum Analyzer	E4445A	Agilent	MY46181146	2013-06-29	One year
04	Universal Radio Communication Tester	E5515C	Agilent	MY48367192	2013-06-29	One year
05	Signal Analyzer	FSV30	R&S	100815	2013-06-29	One year
06	Signal generator	SMB 100A	R&S	102594	2013-06-29	One year
07	EMI Test Receiver	ESCI	R&S	100948	2013-06-29	One year
08	Trilog Antenna	VUBL 9163	SCHWARZB ECK	9163-201	2011-06-19	Three years
09	Horn Antenna	HF907	R&S	100126	2012-07-01	Three years
10	Climatic Chamber	PT-30B	Re Ce	20101891	2010-09-10	Three years
11	Standard Gain Horn	3160-09	ETS-Lindgren	00102644	2012-05-20	Three years

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

ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance



Picture 1 EUT

A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup