Registration Num:428261

Report No.: RZA2010-0701_22

TESTING
No. L2264

Part 22

TEST REPORT

Product Name	GSM/GPRS Dual Band Mobile Phone
FCC ID	YCNA330
Model	Lenovo A330
Applicant	Lenovo Mobile Communication Technology Ltd.

TA Technology (Shanghai) Co., Ltd.

GENERAL SUMMARY

Product Name	GSM/GPRS Dual Band Mobile Phone	**Model**	Lenovo A330
FCC ID	YCNA330	**Report No.**	RZA2010-0701_22
Client	Lenovo Mobile Communication Technology Ltd.		
Manufacturer	Lenovo Mobile Communication Technology Ltd.		
Reference Standard(s)	**FCC Part 2** Frequency allocations and radio treaty matters; general rules and regulation. (December 17, 2009) **FCC Part 22** Public Mobile Services. (December 17, 2009) **ANSI/TIA-603-C** Land mobile FM or PM Communications Equipment Measurements and Performance Standards.(2004)		
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** (Stamp) **Date of issue: May 12th, 2010**		
Comment	The test result only responds to the measured sample.		

Approved by Yang Weizhong **Revised by** Xu kai **Performed by** Du Ruwei

TABLE OF CONTENT

1. General Information

1.1. Notes of the test report

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 dose 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.

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
Contact: Yang Weizhong
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Website: http://www.ta-shanghai.com
E-mail: yangweizhong@ta-shanghai.com

1.3. Applicant Information

Company:	Lenovo Mobile Communication Technology Ltd.
Address:	No.999,Qishan North 2nd Road,Information&Optoelectronics Park,Torch Hi-tech Indu
City:	Xiamen
Postal Code:	/
Country:	P.R. China
Contact:	Qiu shouyu
Telephone:	86-0592-2166651
Fax:	86-0592-2169999-6651

1.4. Manufacturer Information

Company:	Lenovo Mobile Communication Technology Ltd.
Address:	No.999,Qishan North 2nd Road,Information&Optoelectronics Park,Torch Hi-tech Indu
City:	Xiamen
Postal Code:	/
Country:	P.R. China
Telephone:	86-0592-2166651
Fax:	86-0592-2169999-6651

1.5. Information of EUT

General information

Device type:	Portable device		
Name of EUT:	GSM/GPRS Dual Band Mobile Phone		
Device operating configurations:			
IMEI or SN:	910040160000597/910040160000946		
Operating mode(s):	GSM 850:（tested）		
Test modulation:	GMSK		
GPRS multislot class :	10		
Antenna type:	internal antenna		
Rated Power Supply Voltage:	3.8V		
Extreme Voltage:	Minimum: 3.4V Maximum: 4.2V		
Extreme Temperature:	Lowest: -15°C Highest: +55°C		
Operating frequency range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM850	824.2 ~ 848.8	869.2 ~ 893.8
Hardware version:	V1.0		
Software version:	A330_VE_S001_100424		

Auxiliary equipment details

AE1: Battery

Model:	HBL801
Manufacture:	ZHUHAISUNDA TECHNOLOGY CO.,LTD
IMEI or SN:	/

AE2: Travel Adaptor

Model:	ZT-668-01B2K
Manufacture:	SHENZHEN ZHONGTIAN ELECTRONIC CO.,LTD
IMEI or SN:	/

Equipment Under Test (EUT) is GSM/GPRS Dual Band Mobile Phone with internal antenna. The EUT supports GSM 850 in this report.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Test Date

The test date is from May 5, 2010 to May 12, 2010.

2. Test Information

2.1. Summary of test results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046(a)	PASS
2	Effective Radiated power	22.913(a)(2)	PASS
3	Occupied Bandwidth	2.1049(h)	PASS
4	Band Edge Compliance	22.917	PASS
5	Frequency Stability	2.1055(a)(1) / 2.1055(d)(2)/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

2.2. RF Power Output

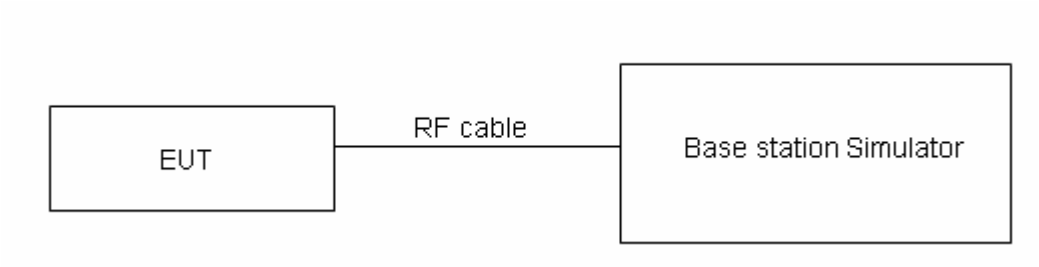
Ambient condition

Temperature	Relative humidity	Pressure
24°C	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. These measurements have been tested at following channels: 128, 190, and 251 for GSM 850.

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

Channel	Frequency(MHz)	RF Output Power (dBm)
128	824.2	31.68
190	836.6	31.56
251	848.8	31.50

GSM 850 GPRS

Channel	Frequency(MHz)	RF Output Power (dBm)	
		1down 1up	1down 2up
128	824.2	31.69	29.78
190	836.6	31.56	29.65
251	848.8	31.51	29.59

2.3. Effective Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
24°C	50%	101.5kPa

Methods of Measurement

The measurement procedures in TIA- 603C are used.

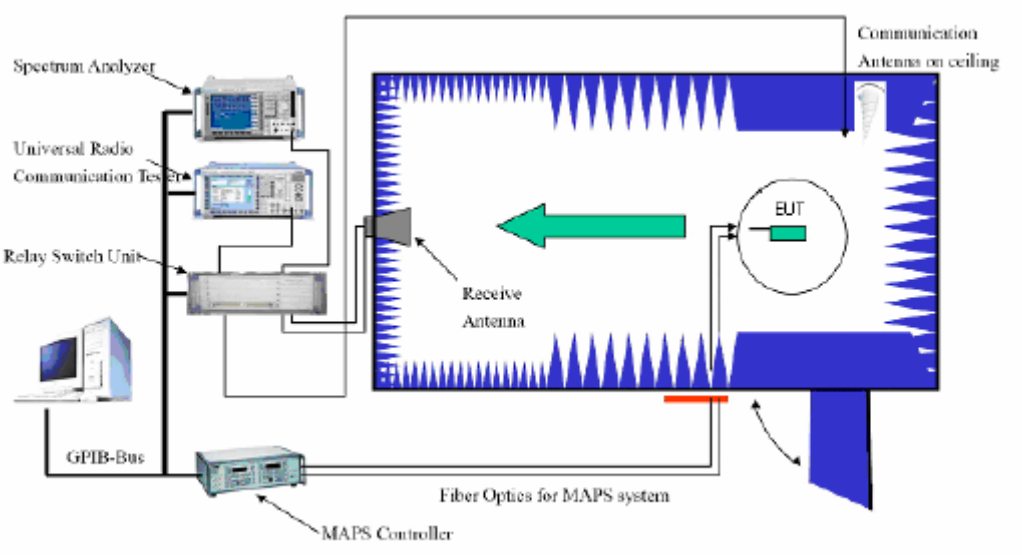
The radiated power was measured using ETS-LINDGREN OTA Chamber in “Peak” mode.

1. In an fully anechoic chamber, a sleeve dipole antenna for the frequency band of interest is placed on the reference centre of the turntable at a 5 meters test distance from the test receive antenna. An RF signal source is connected to the dipole with a Tx cable that has been constructed to not interfere with radiation pattern of the antenna. A known (measured) power (Pin) is applied to input of dipole, and the power received (P_r) is recorded from the spectrum analyzer.
2. The EUT substituted for the dipole at the reference centre of the chamber. A radio link shall be established between EUT and the Base Station Simulator. The EUT is controlled to ensure at its maximum power level and proper modulation.
3. A scan is performed to obtain the radiation pattern. A peak detector is used while RBW and VBW are both set to 3MHz. From these measurements, the maximum radiated power (P_{er}) was recorded from the spectrum analyzer from the 360 degrees rotation of the turntable and in both horizontally and vertically polarized orientations of the test antenna.

   The Reference Path loss = Pin –Pr-Tx cable loss+ Substitution antenna gain

   EIRP= P_{er} + Path loss
4. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP =EIRP - 2.15 dBi.
5. The measurement will be conducted at three channels No.128, No.190 and No.251 (Bottom, middle and top channels of GSM 850).

Test Setup



Limits

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

Limit (ERP)	≤ 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

GSM 850

Channel	Frequency (MHz)	LVL （EUT）	S.G	Gain (dBi)	Cable Loss	Pr (dBm)	Correction Factor (dBm)	ERP (dBm)
128	824.2	-16.1	0	1.06	14.7	60.58	46.94	28.69
190	836.6	-14.78	0	1.20	14.72	60.49	46.97	30.06
251	848.8	-12.85	0	1.38	14.77	60.54	47.15	32.15

GSM 850 GPRS (1down 1up)

Channel	Frequency (MHz)	LVL （EUT）	S.G	Gain (dBi)	Cable Loss	Pr (dBm)	Correction Factor(dBm)	ERP (dBm)
128	824.2	-18.67	0	1.06	14.7	60.58	46.94	28.12
190	836.6	-14.88	0	1.20	14.72	60.49	46.97	29.96
251	848.8	-13.23	0	1.38	14.77	60.54	47.15	31.77

2.4. Occupied Bandwidth

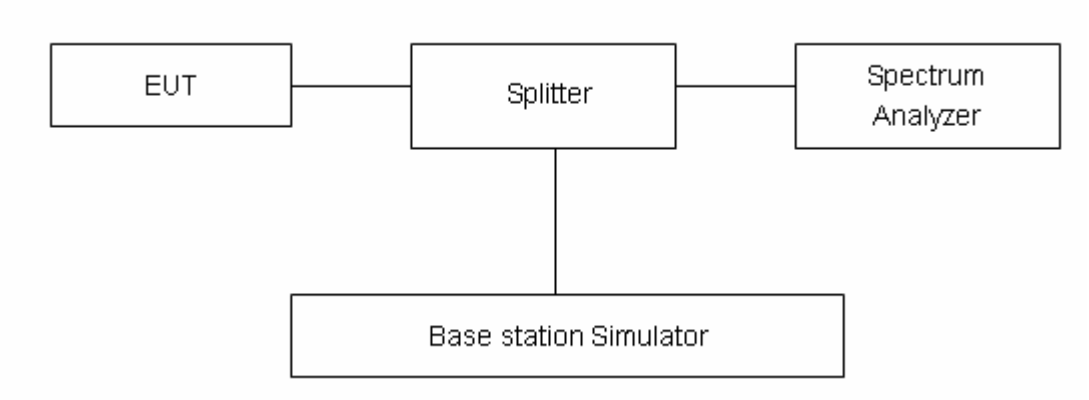
Ambient condition

Temperature	Relative humidity	Pressure
24°C	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 3 kHz on spectrum analyzer. 99% power and -26dBC occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages. The measurement will be conducted at three channels No. 128, 190, 251 for GSM 850.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

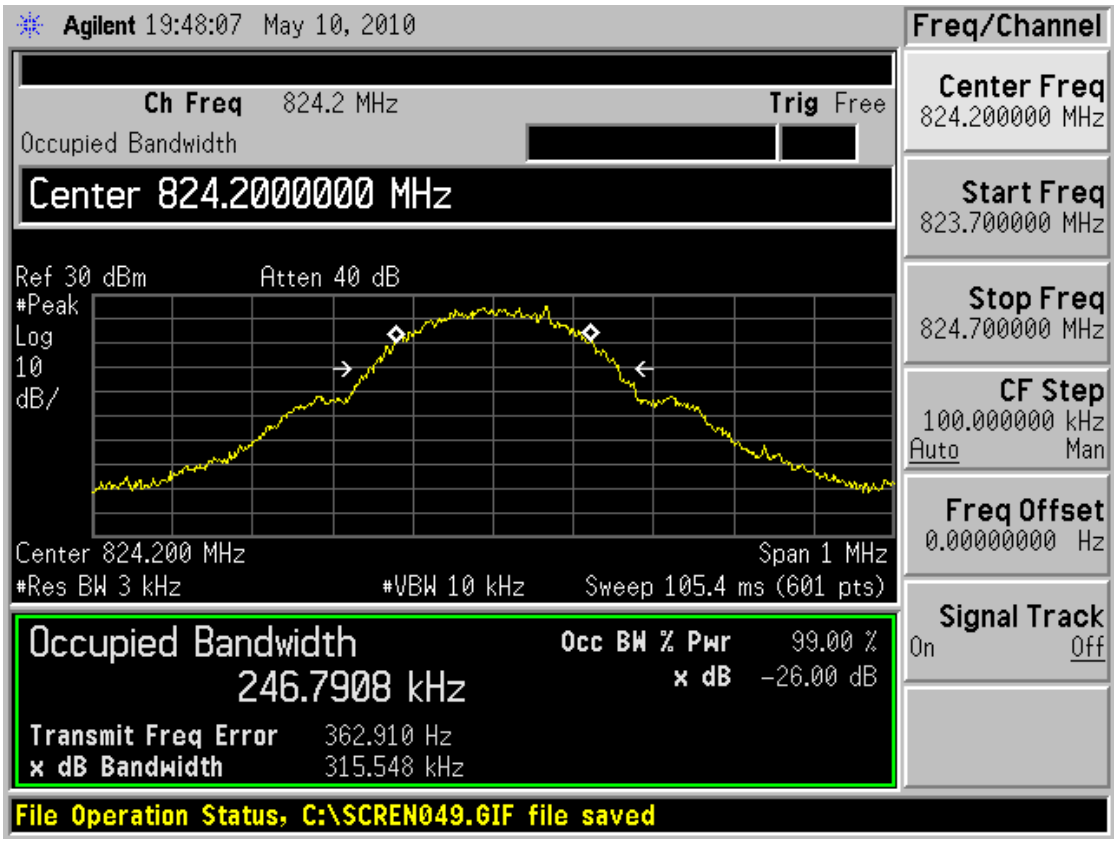
Measurement Uncertainty

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

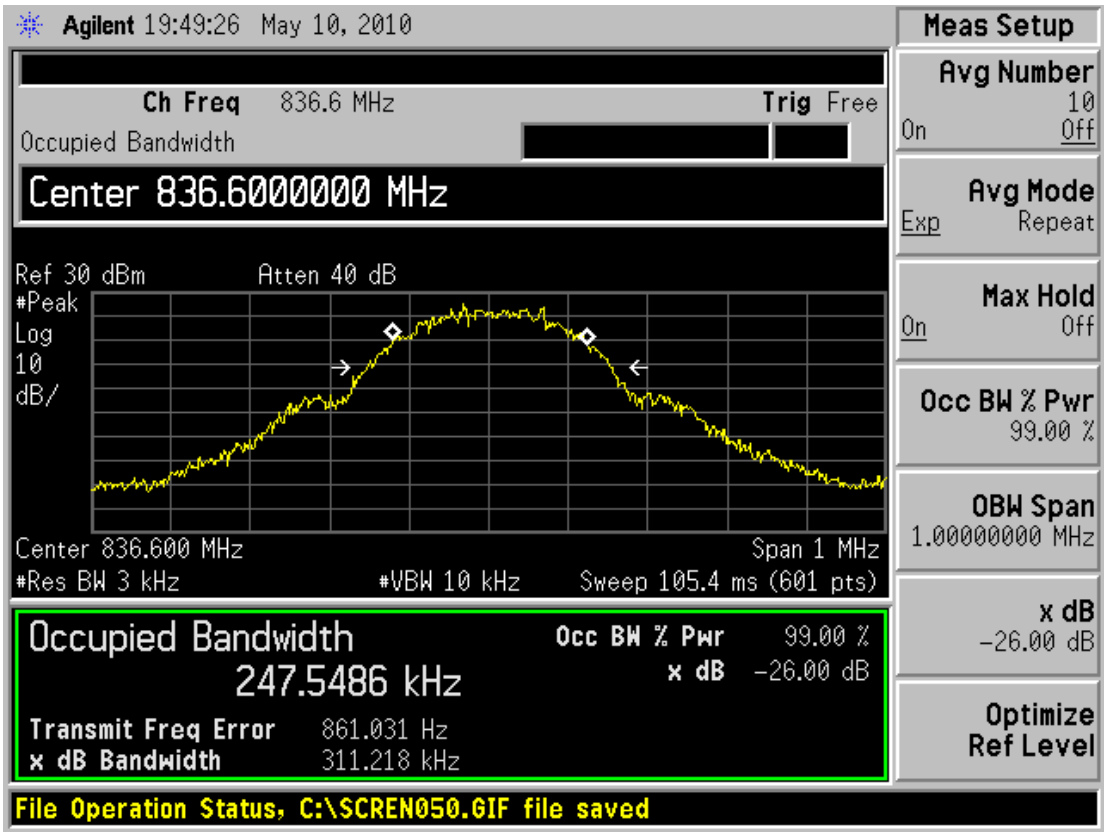
Test Result

GSM 850

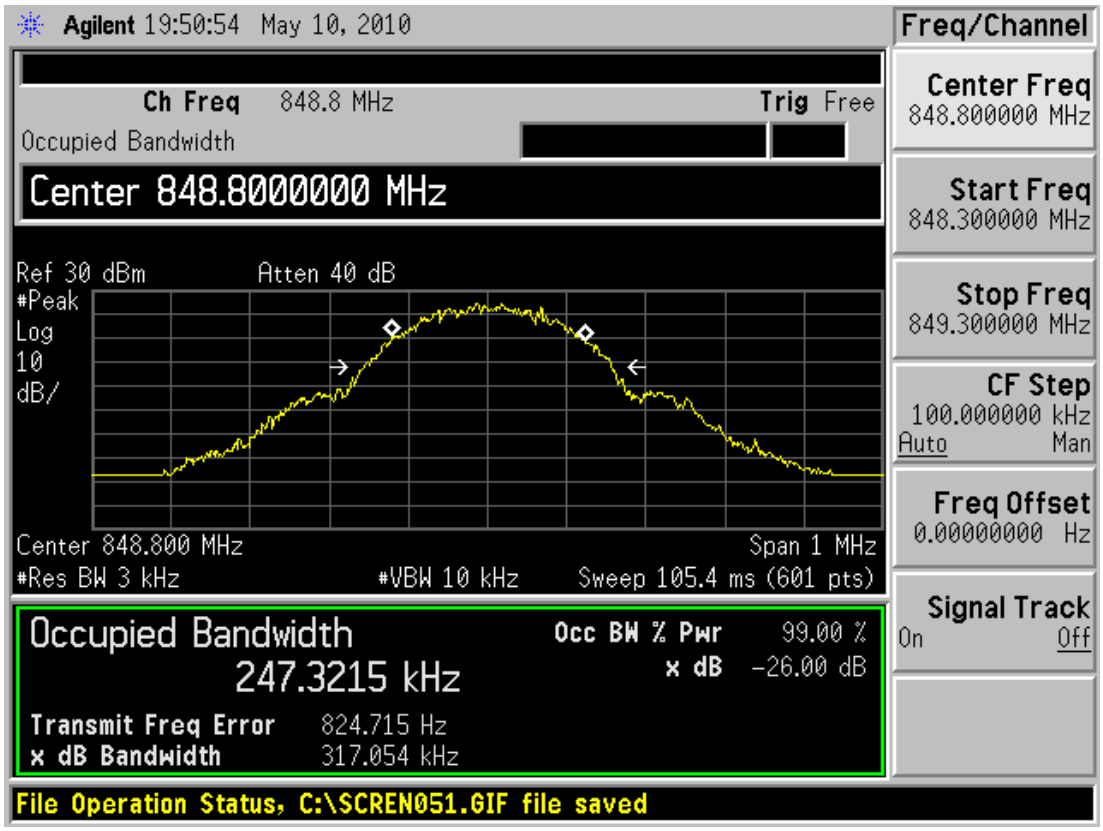
Channel	Frequency (MHz)	99% Power Bandwidth (kHz)	-26dBc Bandwidth(kHz)
128	824.2	246.79	315.55
190	836.6	247.55	311.22
251	848.8	247.32	317.05



GSM 850 CH128 Occupied Bandwidth



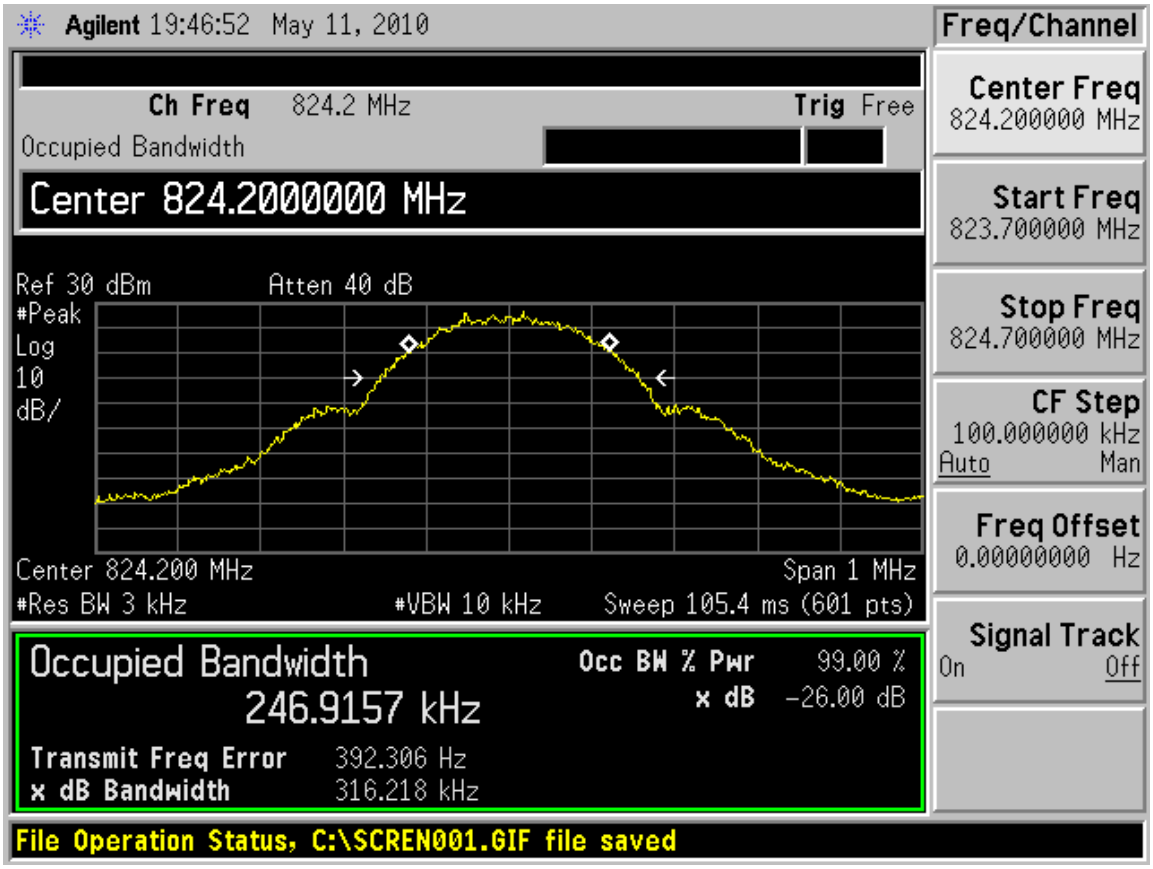
GSM 850 CH190 Occupied Bandwidth



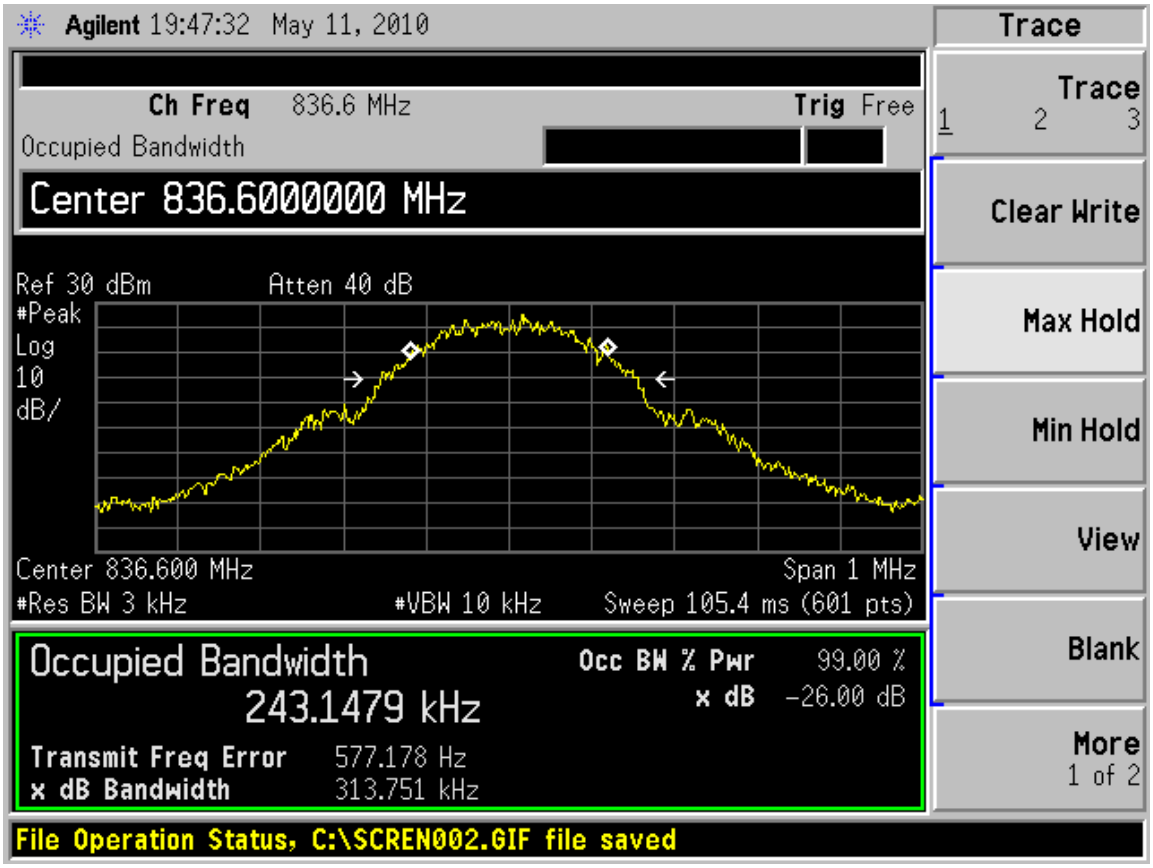
GSM 850 CH251 Occupied Bandwidth

GSM 850 GPRS

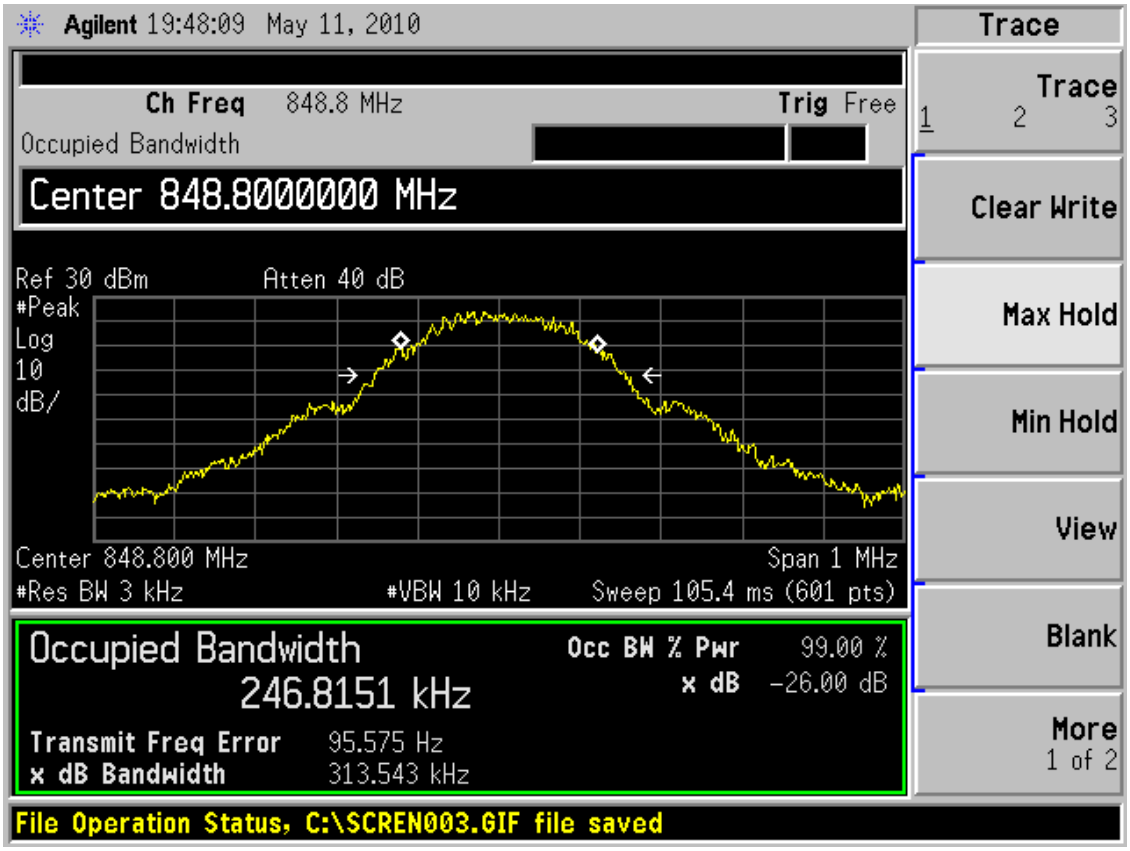
Channel	Frequency (MHz)	99% Power Bandwidth (kHz)	-26dBc Bandwidth(kHz)
128	824.2	246.92	316.22
190	836.6	243.15	313.75
251	848.8	246.82	313.54



GSM 850 CH128 GPRS Occupied Bandwidth



GSM 850 CH190 GPRS Occupied Bandwidth



GSM 850 CH251 GPRS Occupied Bandwidth

2.5. Band Edge Compliance

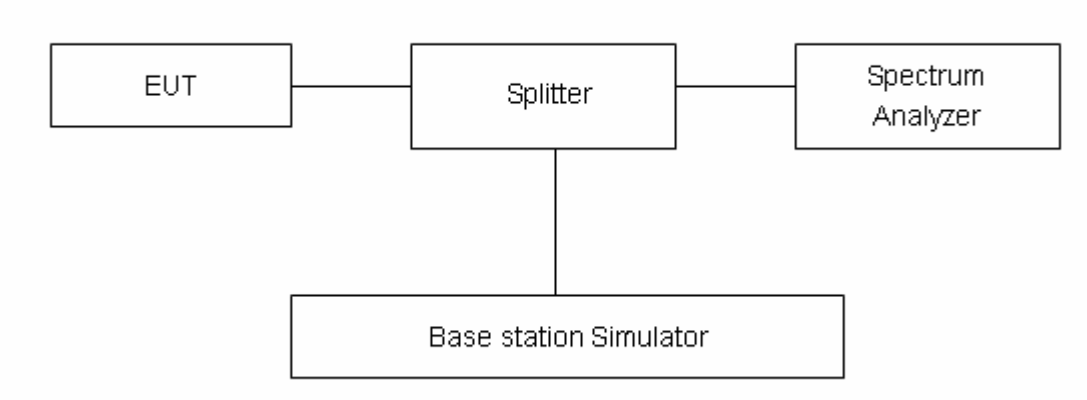
Ambient condition

Temperature	Relative humidity	Pressure
24°C	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 was measured. The Average detector is used and RBW is set to 3 kHz on spectrum analyzer. Spectrum analyzer plots are included on the following pages. The measurement will be conducted at channels No. 128 and 251 for GSM 850.

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.”

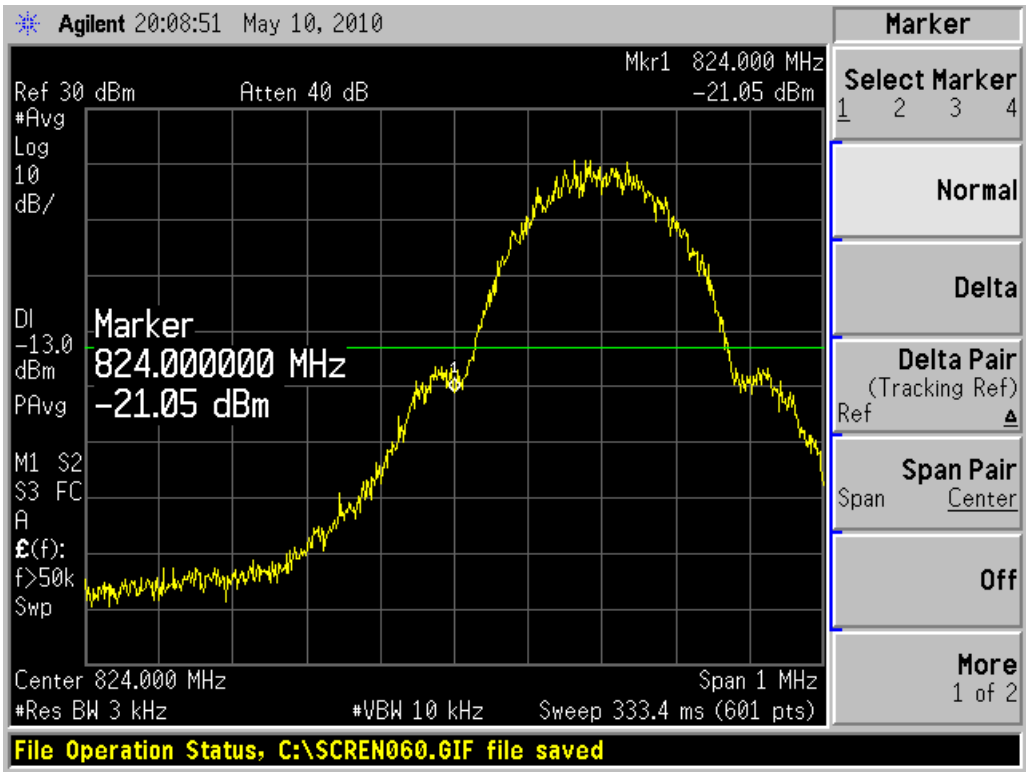
Limit	-13 dBm

Measurement Uncertainty

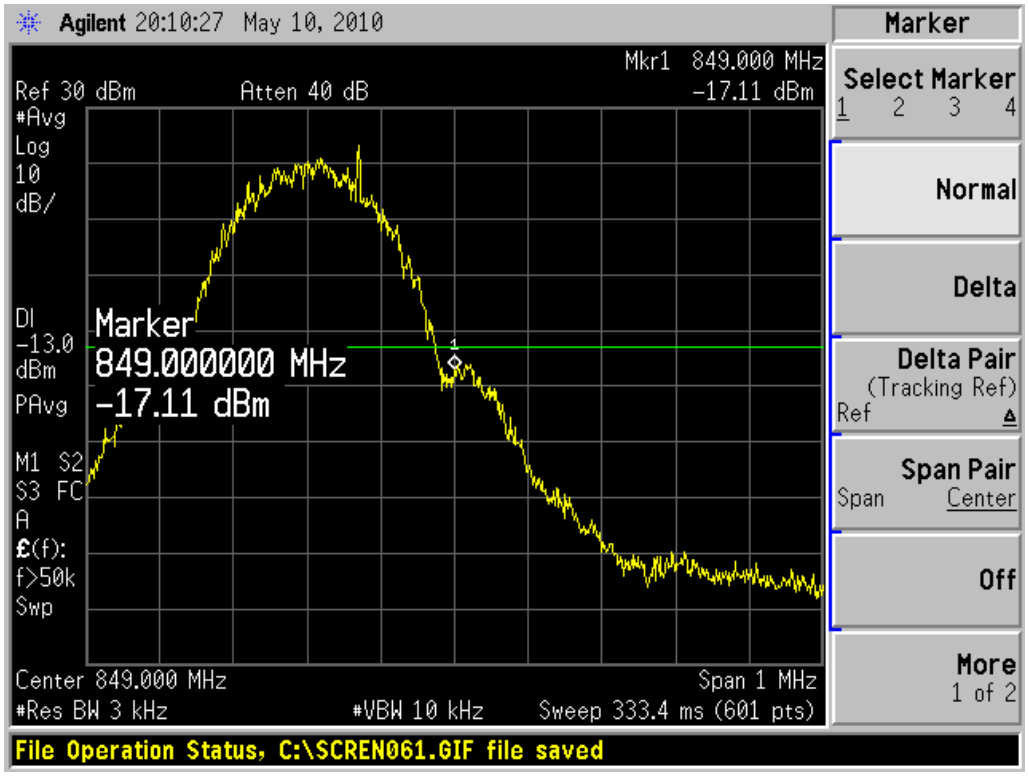
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U=0.684dB.

Test Result

GSM 850

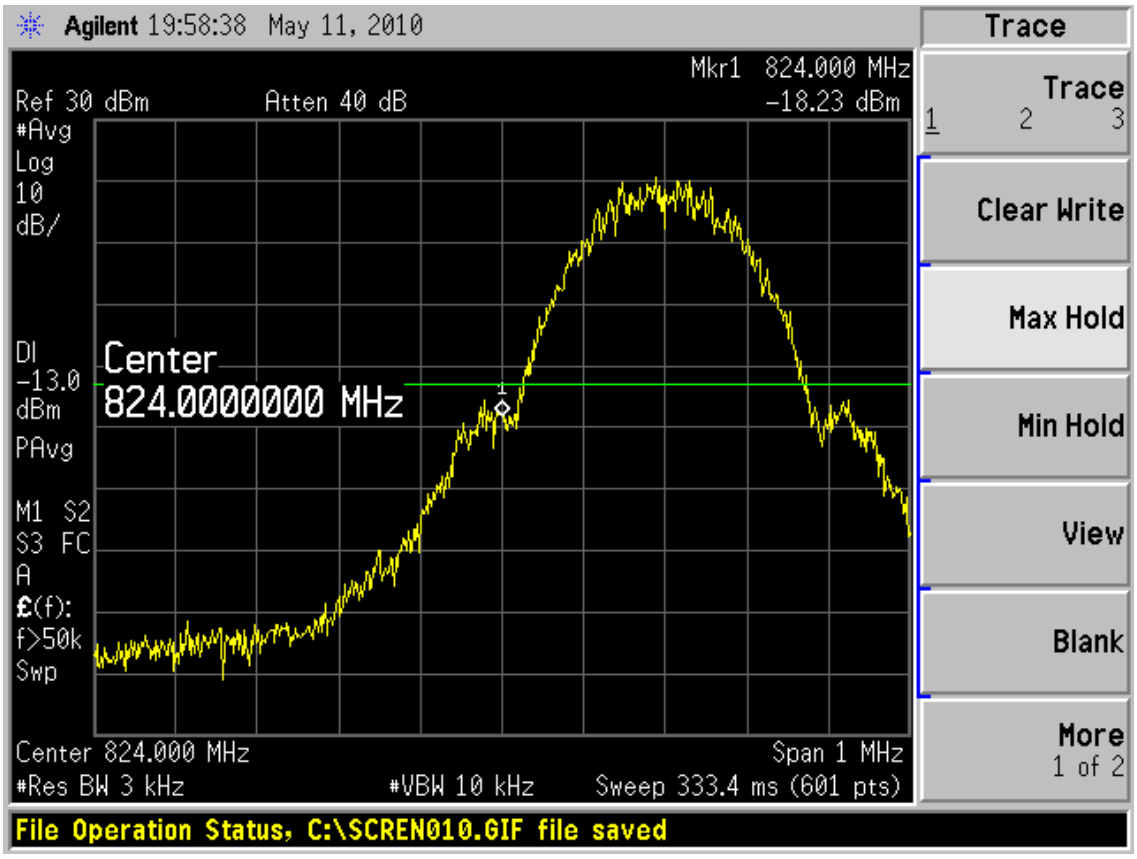


GSM 850 CH128 Channel

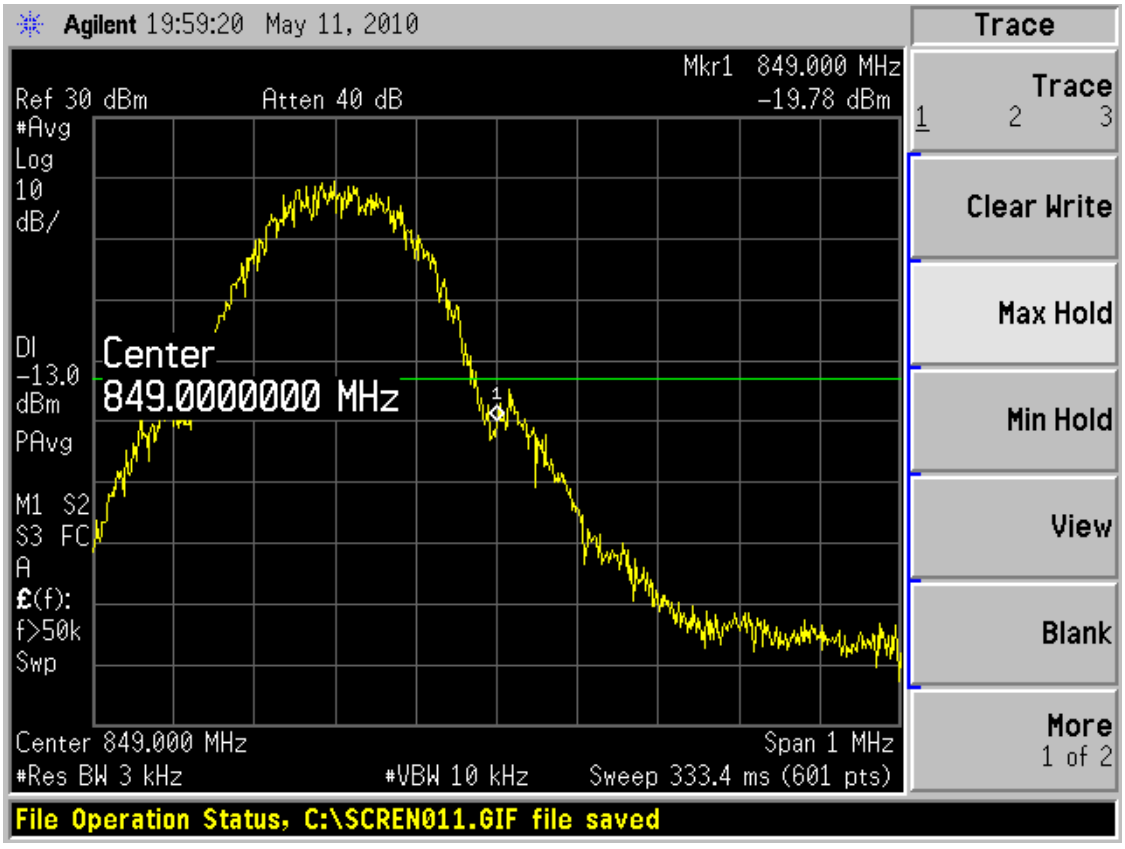


GSM 850 CH251 Channel

GSM 850 GPRS



GSM 850 GPRS CH128 Channel



GSM 850 GPRS CH251 Channel

2.6. Frequency Stability

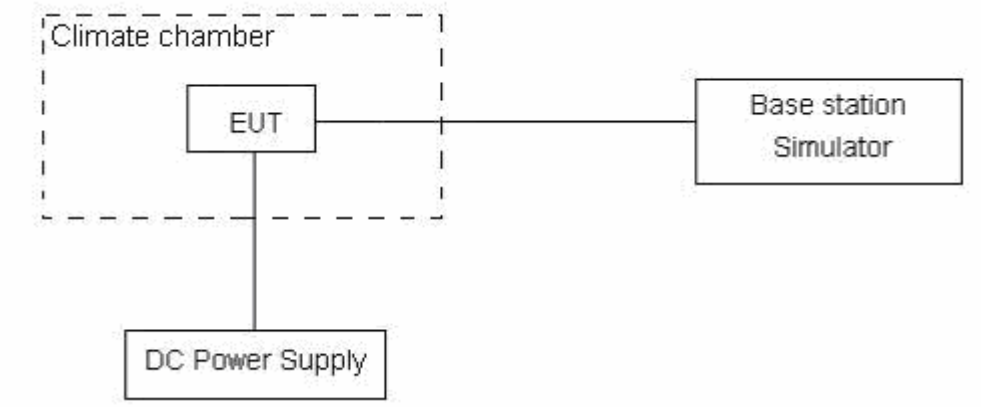
Ambient condition

Temperature	Relative humidity	Pressure
24°C	50%	101.5kPa

Method of Measurement

1. Frequency Stability (Temperature Variation)
   The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size,
   (1) With all power removed, the temperature was decreased to -30°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 -30°C to +50°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 4.2 V, with a nominal voltage of 3.8V.
   The measurement will be conducted at one channel No.190 for GSM 850.

Test setup



Limits

The frequency stability of the carrier shall be accurate to within 2.5 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 22.355 Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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

Temperature (° C)	Test Results (ppm) / 3.8 V Power supply
	GSM 850 Channel 190
-30	0.027
-20	0.046
-10	0.063
0	0.049
10	0.066
20	0.063
30	0.058
40	0.062
50	0.052

Voltage (V)	Test Results(ppm) / 20° C
	GSM 850 Channel 190
3.4	0.081
3.8	0.063
4.2	0.077

2.7. Spurious Emissions at Antenna Terminals

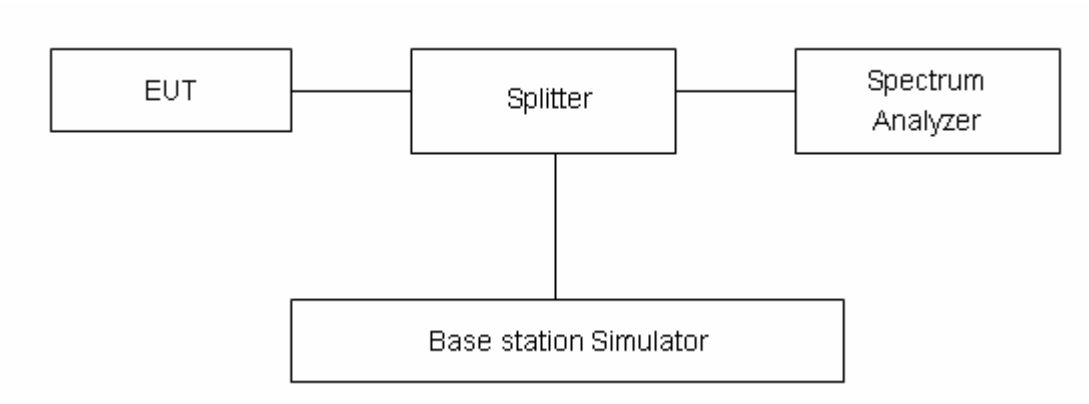
Ambient condition

Temperature	Relative humidity	Pressure
24°C	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. The peak detector is used and RBW is set to 1MHz on spectrum analyzer. The measurement will be conducted at three channels No.128, No.190 and No.251 (Bottom, middle and top channels of GSM 850 band).

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.”

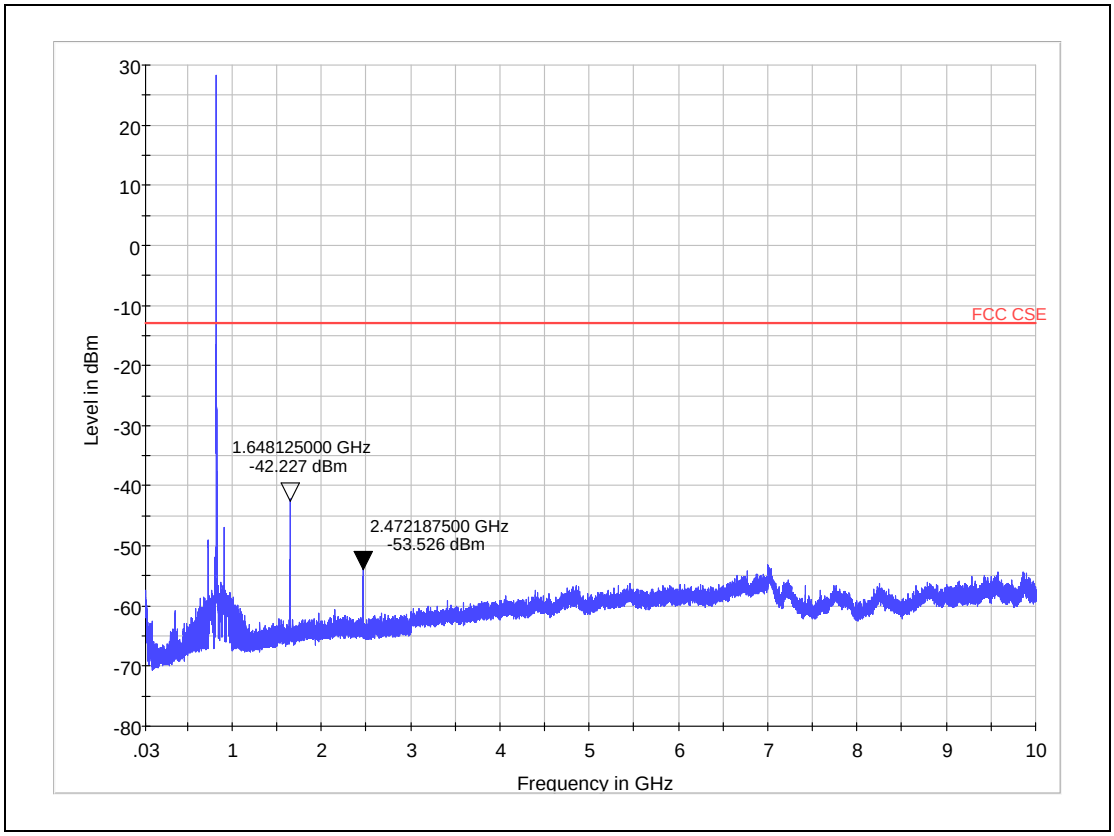
Limit	-13 dBm

Measurement Uncertainty

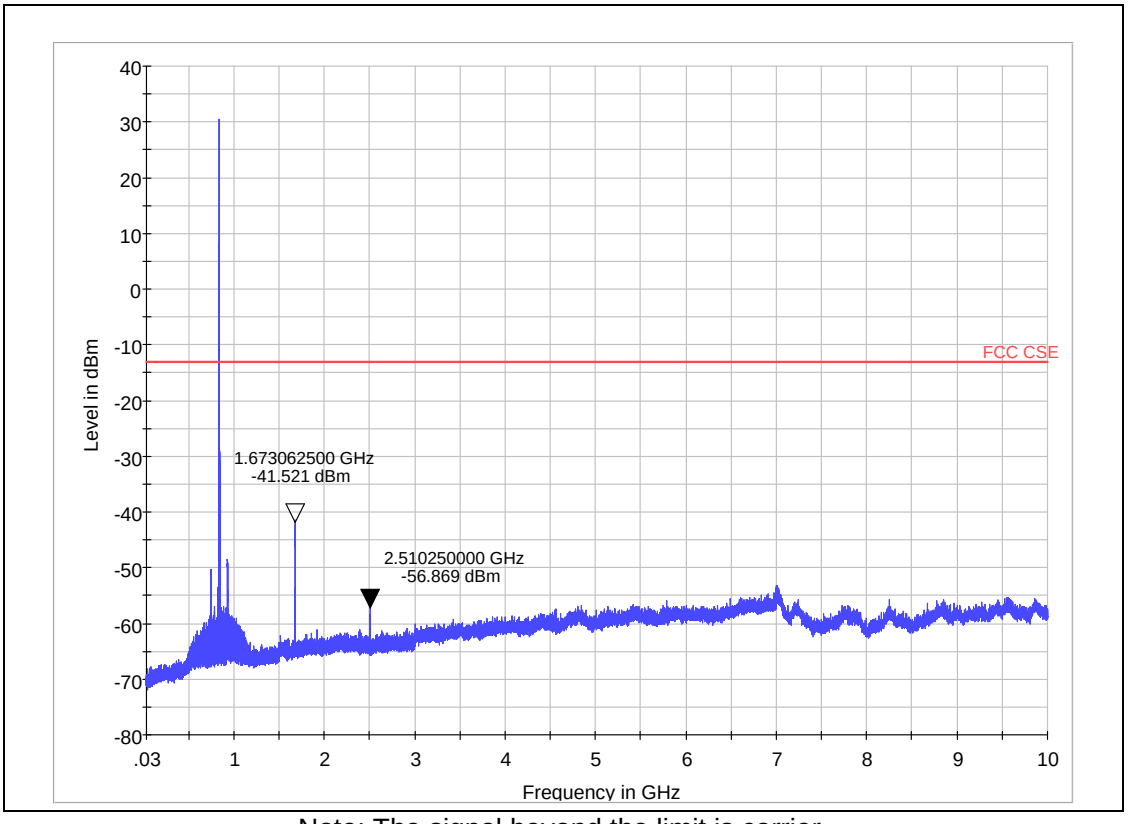
The assessed measurement uncertainty to ensure 99.75％ confidence level for the normal distribution is with the coverage factor *k* = 1.96.

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

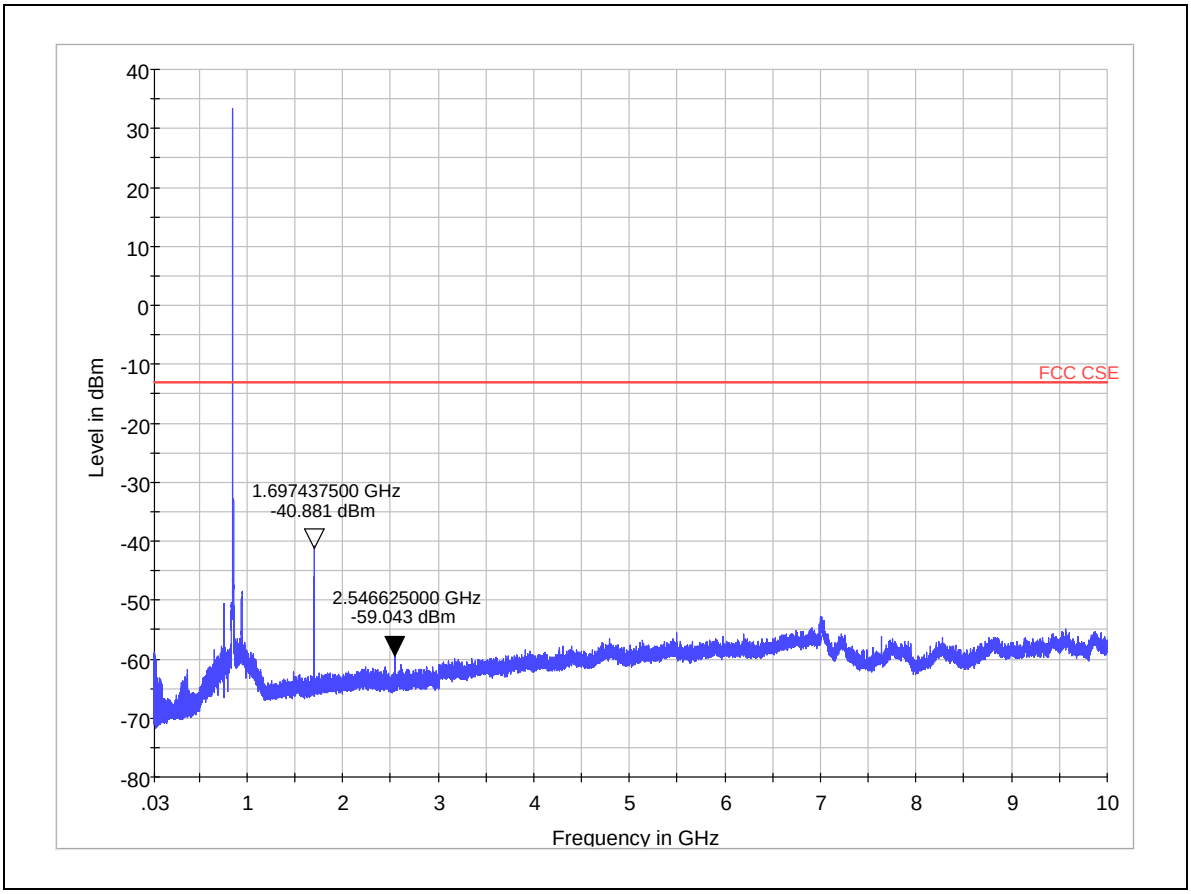
Test Result



Note: The signal beyond the limit is carrier.
Channel 128 30MHz ~10GHz



Note: The signal beyond the limit is carrier.
Channel 190 30MHz ~10GHz



Note: The signal beyond the limit is carrier.
Channel 251 30MHz ~10GHz

Harmonic	TX ch. 128 Frequency (MHz)	Level (dBm)	TX ch.190 Frequency (MHz)	Level (dBm)	TX ch.251 Frequency (MHz)	Level (dBm)
2	1648.125	-42.227	1673.0625	-41.521	1697.4375	-40.881
3	2472.1875	-53.526	2510.25	-56.869	2546.625	-59.043
4	3296.8	Nf	3346.4	Nf	3395.2	Nf
5	4121	Nf	4183	Nf	4244	Nf
6	4945.2	Nf	5019.6	Nf	5092.8	Nf
7	5769.4	Nf	5856.2	Nf	5941.6	Nf
8	6593.6	Nf	6692.8	Nf	6790.4	Nf
9	7417.8	Nf	7529.4	Nf	7639.2	Nf
10	8242	Nf	8366	Nf	8488	Nf
Nf: noise floor						

2.8. Radiates Spurious Emission

Ambient condition

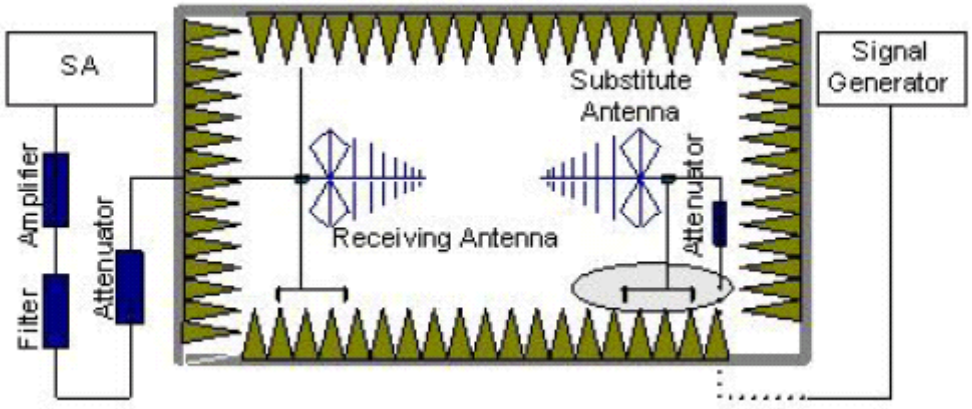
Temperature	Relative humidity	Pressure
24°C	50%	101.5kPa

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 measurement will be conducted at channels No.128, No.190 and No.251 (Bottom, middle and top channels of GSM 850 band).

The data of cable loss and antenna Gain has been calibrated in full testing frequency range before the testing.
The procedure of Radiates Spurious Emission is as follows:

1. Pre-calibration
   In an fully anechoic chamber, A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted at a 3 meter test distance from the receive antenna. An RF signal source is connected to the dipole with a Tx cable that has been constructed to not interfere with radiation pattern of the antenna. A known (measured) power (Pin) is applied to input of dipole, and the power received (Pr) is recorded from the spectrum analyzer.
   “Reference Path loss” is established as Pin –Pr-Tx cable loss+ Substitution antenna gain.



2. EUT Test
   EUT was placed on a 1.5 meter high non – conductive table at a 3 meter test distance from the receive antenna. The height of receiving antenna is 1.5 m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the table and adjusting the receiving antenna polarization. The measurement is carried out using a spectrum analyzer .The radiated emission measurements of all non-harmonic and harmonic of the transmit frequency from 30MHz to the 10th harmonic were measured with peak detector and 1MHz bandwidth. A notch filter is

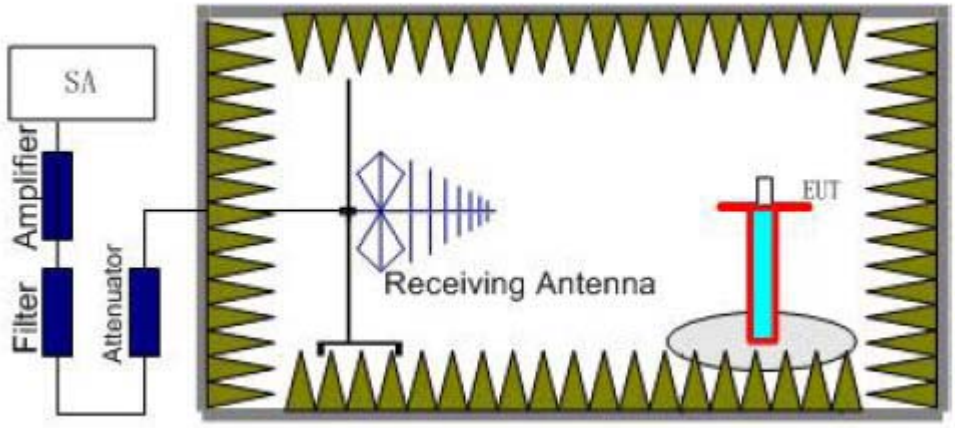
necessary in the band near to the carrier frequency. A high pass filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency. If the harmonic could not be detected above the noise floor, the ambient level was recorded.

The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

Calculation procedure:

RSE = Rx (dBm) + Reference Path loss

Rx: reading of the receiver



Limits

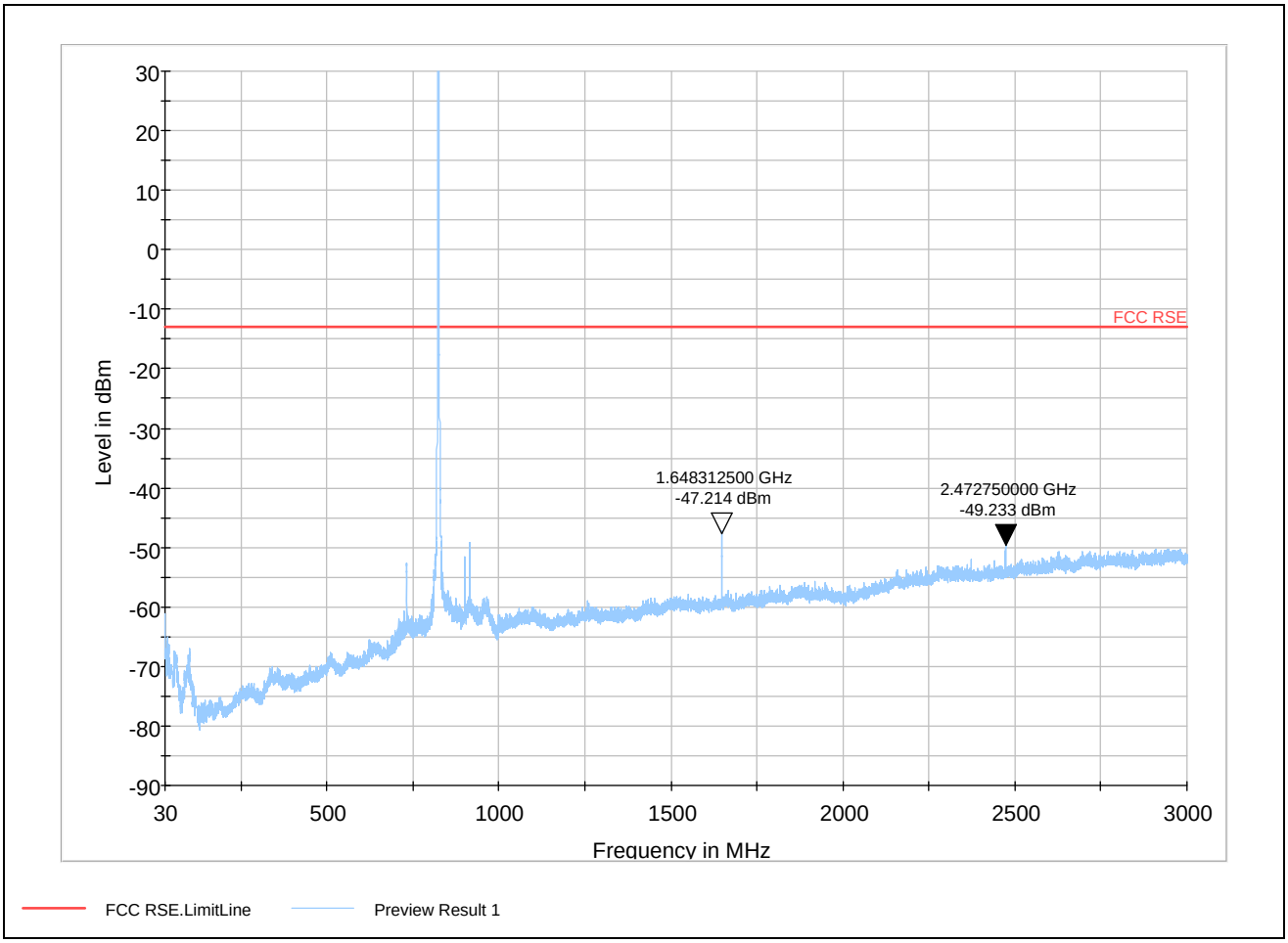
Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.”

Limit	-13 dBm

Measurement Uncertainty

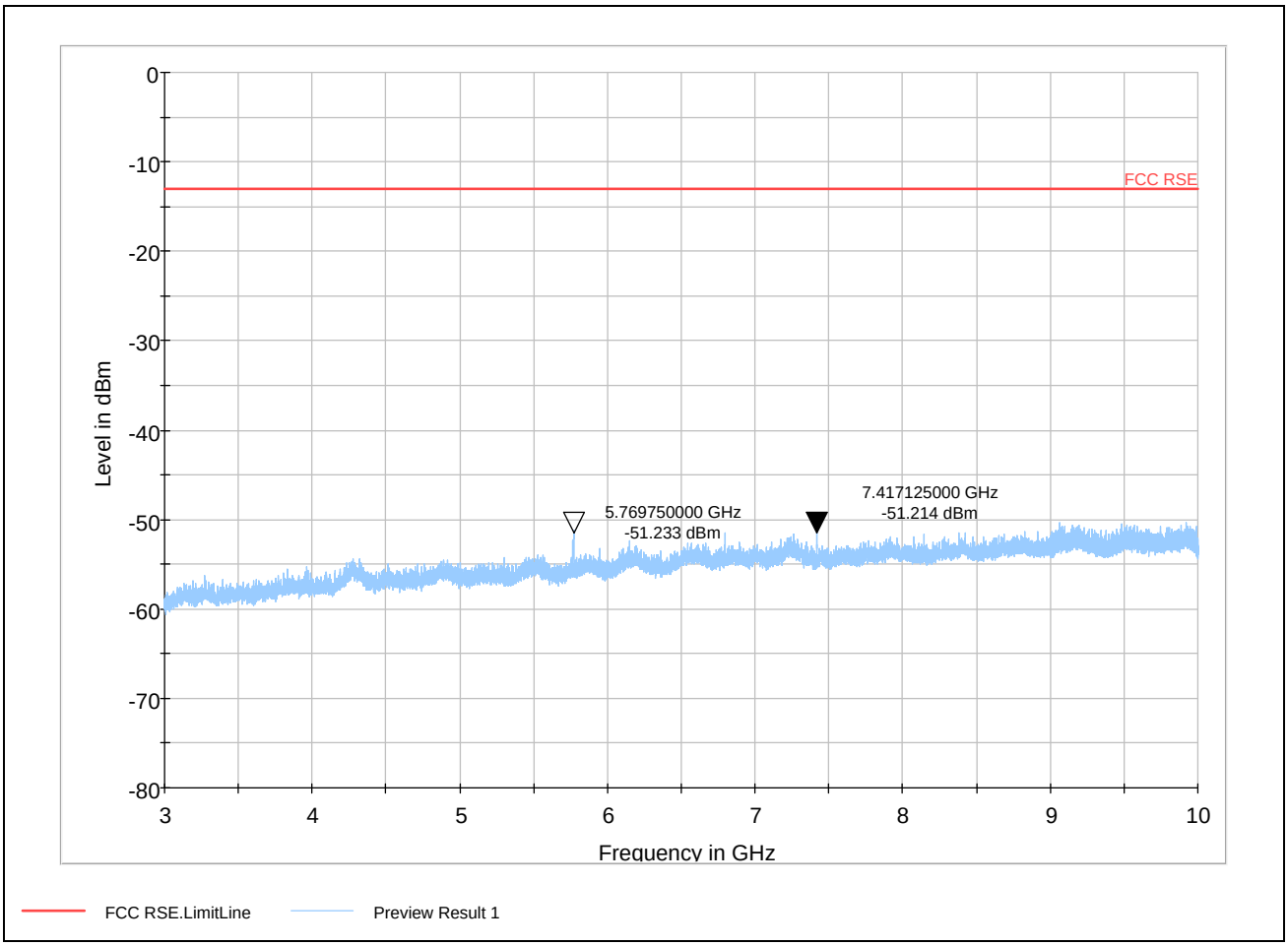
The assessed measurement uncertainty to ensure 95％ confidence level for the normal distribution is with the coverage factor *k* = 1.96. U=3.16 dB.

Test Result



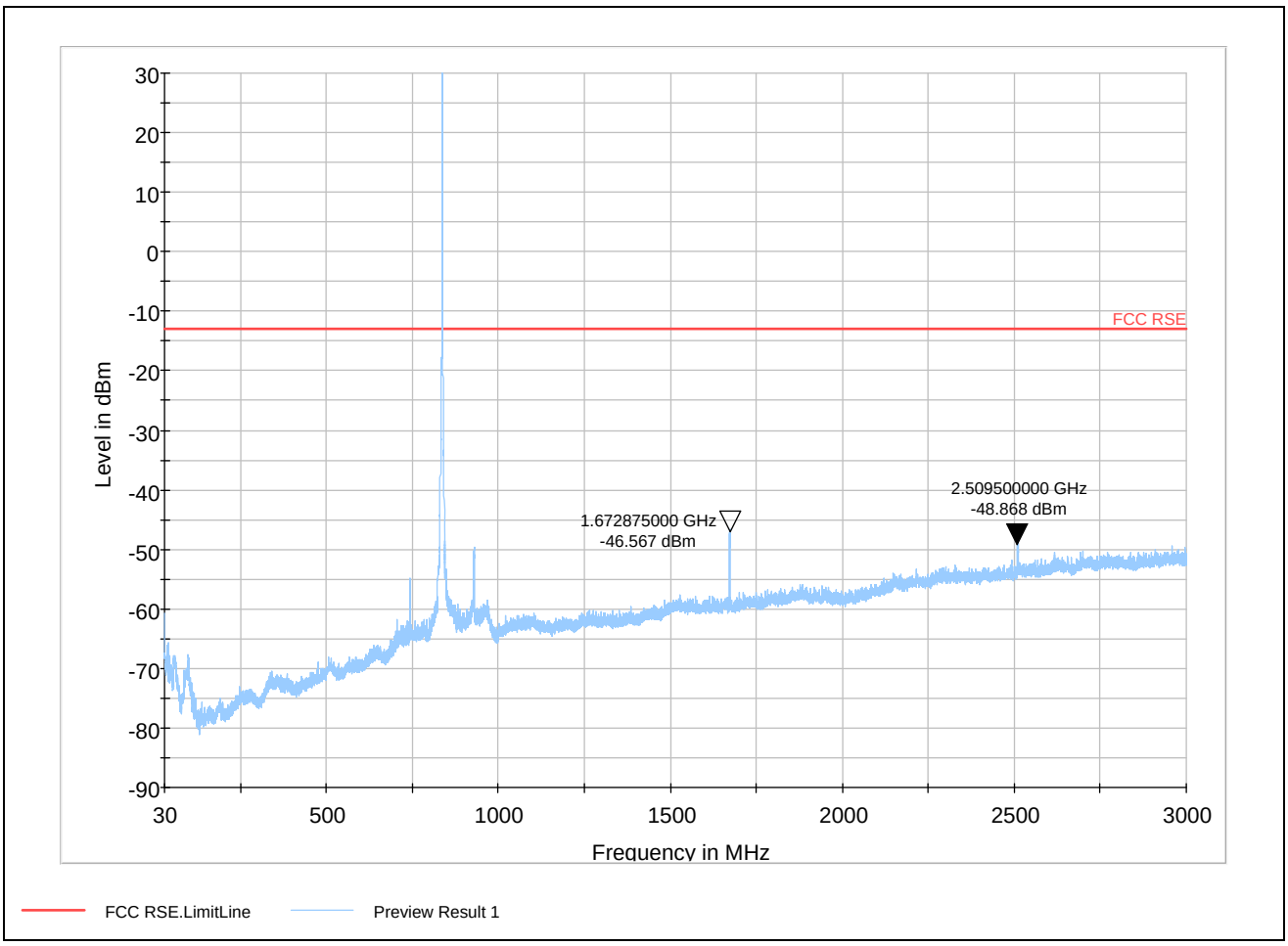
Note: The signal beyond the limit is carrier.

Channel 128 30MHz~3GHz



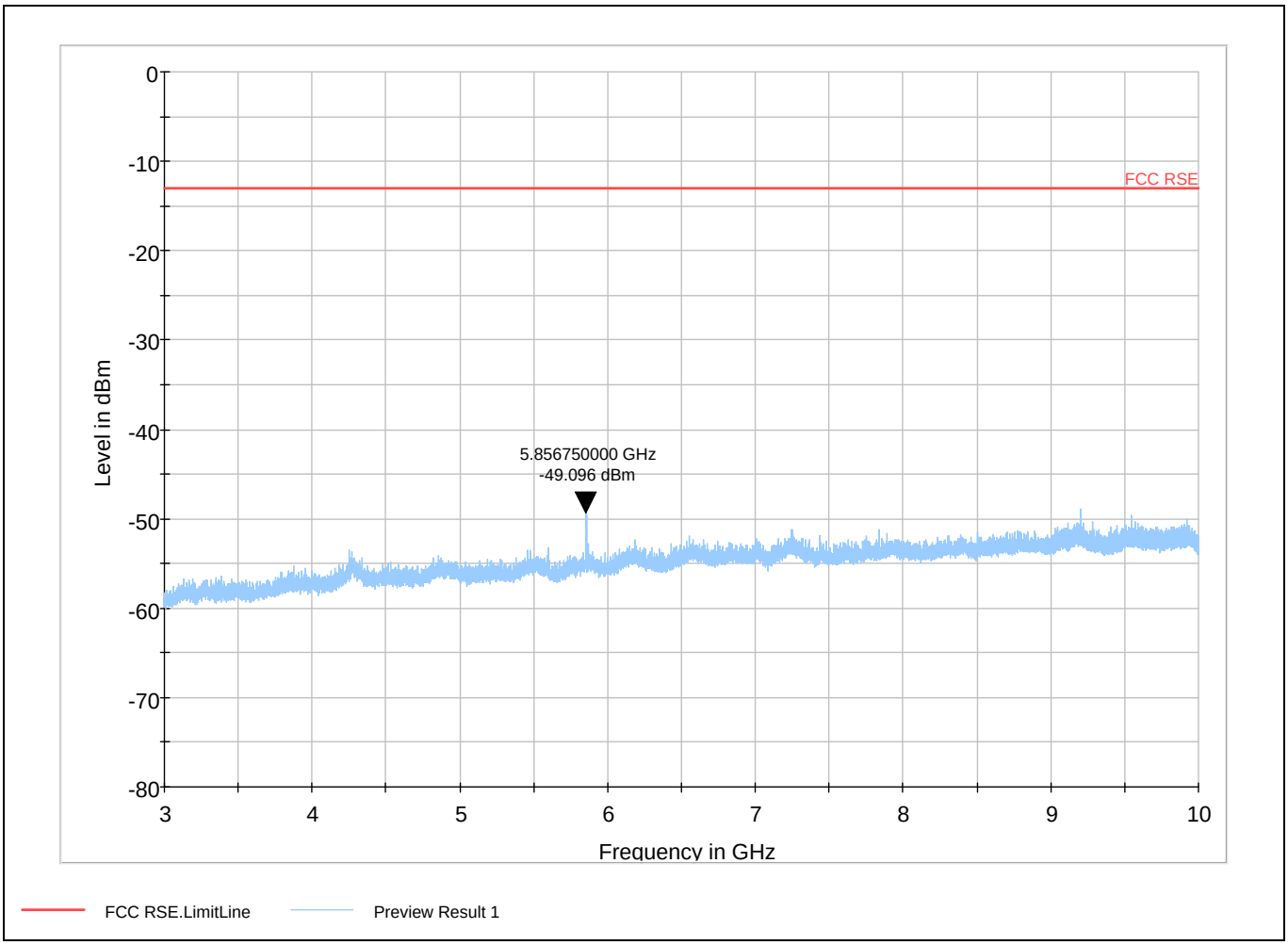
Channel 128 3GHz ~10GHz

Harmonic	TX ch.128 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	1648.3125	-47.214	-13
3	2472.75	-49.233	-13
4	3296.8	Nf	-13
5	4121	Nf	-13
6	4945.9	Nf	-13
7	5769.75	-51.233	-13
8	6593.6	Nf	-13
9	7417.125	-51.214	-13
10	8242	Nf	-13
Nf: noise floor			



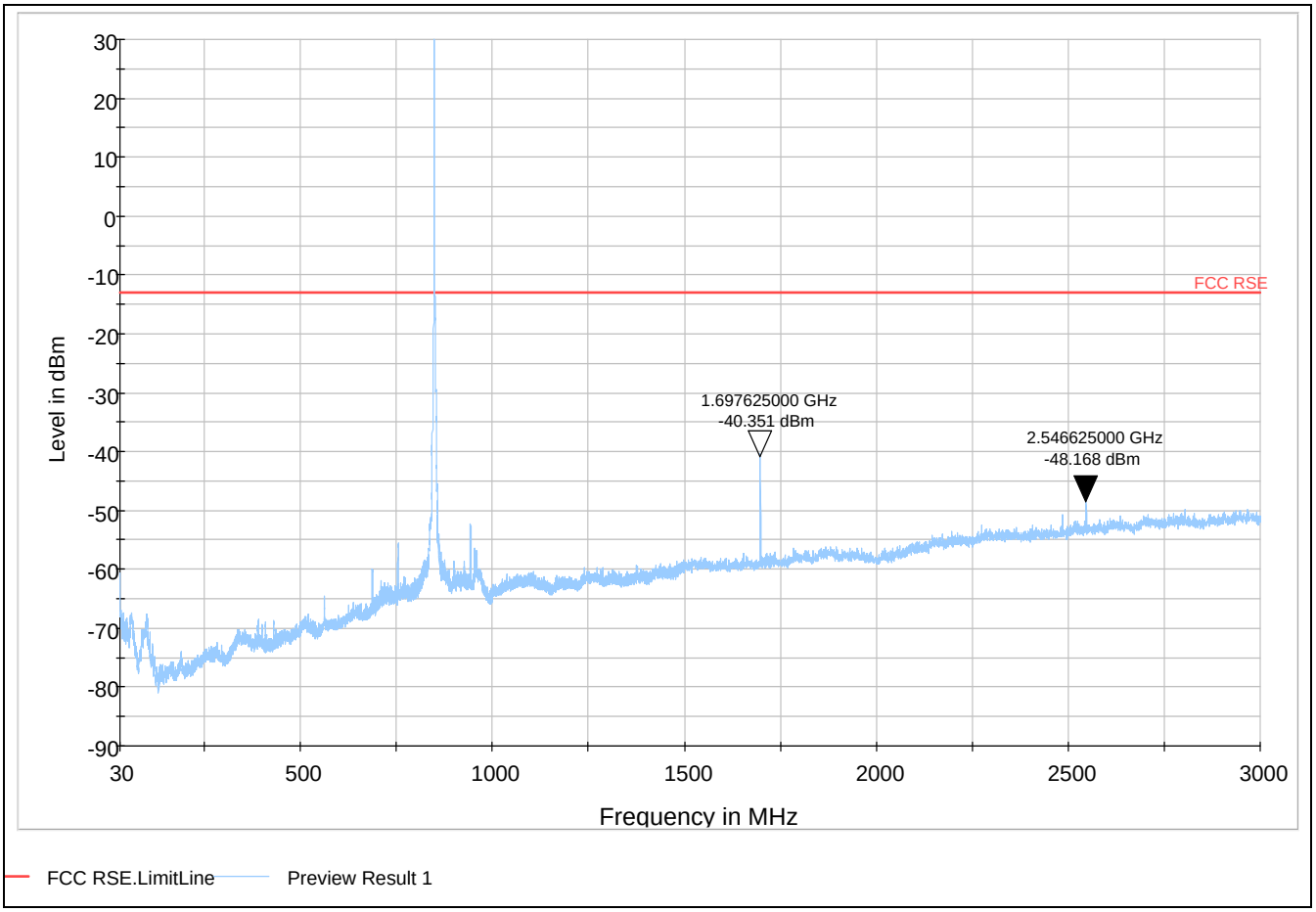
Note: The signal beyond the limit is carrier.

Channel 190 30MHz~3GHz



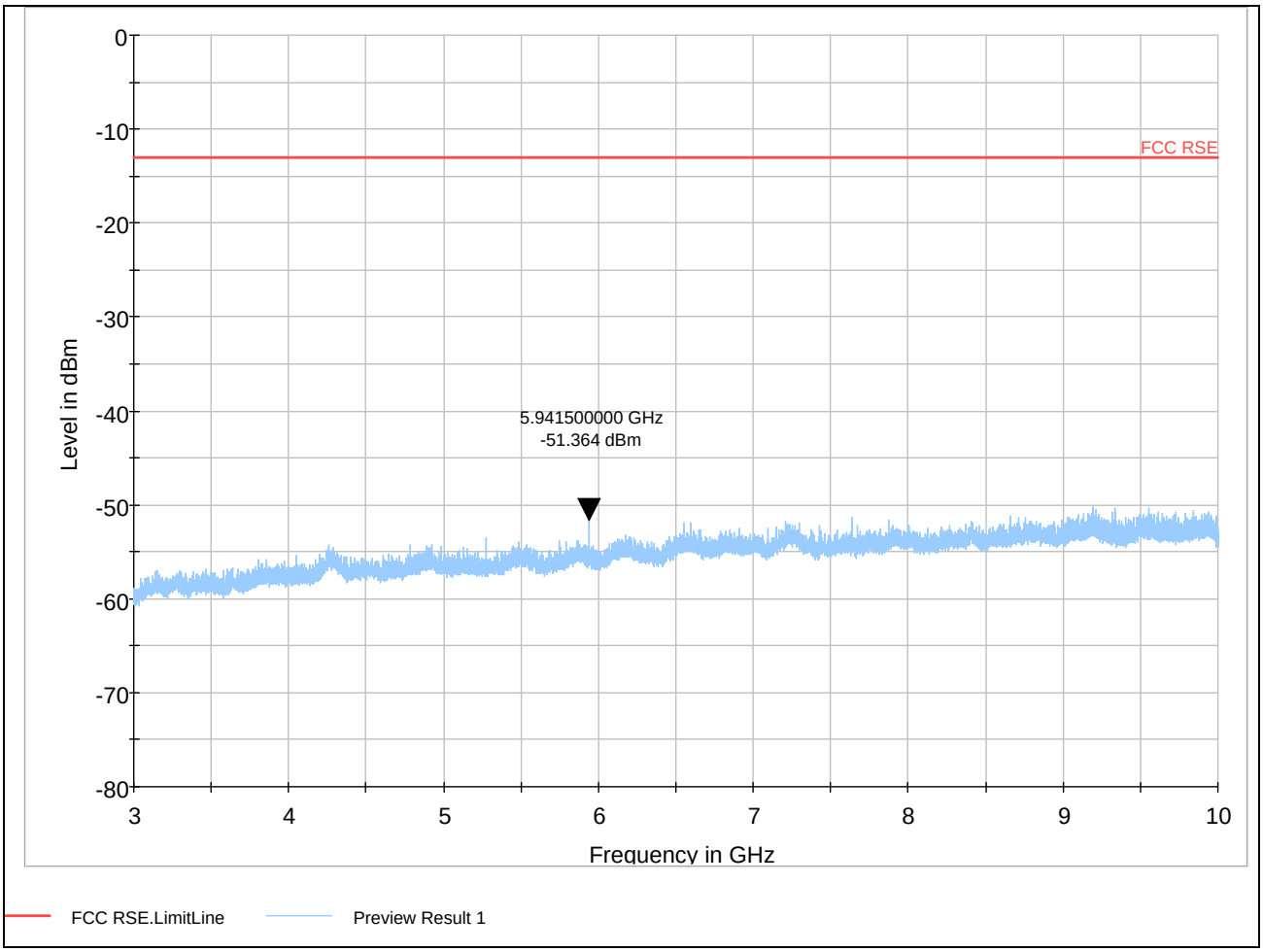
Channel 190 3GHz ~10GHz

Harmonic	TX ch.190 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	1672.875	-46.567	-13
3	2509.5	-48.868	-13
4	3346.4	Nf	-13
5	4183	Nf	-13
6	5019.6	Nf	-13
7	5856.75	-49.096	-13
8	6692.8	Nf	-13
9	7529.4	Nf	-13
10	8366	Nf	-13
Nf: noise floor			



Note: The signal beyond the limit is carrier.

Channel 251 30MHz~3GHz



Channel 251 3GHz ~10GHz

Harmonic	TX ch.251 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	1697.625	-40.351	-13
3	2546.625	-48.168	-13
4	3395.2	Nf	-13
5	4244	Nf	-13
6	5092.8	Nf	-13
7	5941.5	-51.364	-13
8	6790.4	Nf	-13
9	7639.2	Nf	-13
10	8488	Nf	-13
Nf: noise floor			

3. Main Test Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
01	Base Station Simulator	CMU200	R&S	118133	2009-06-02	One year
02	Base Station Simulator	E5515C	Agilent	MY48360957	2009-12-04	One year
03	Signal Analyzer	FSV	R&S	100815	2009-06-29	One year
04	Signal generator	SMR27	R&S	100365	2009-07-02	One year
05	Spectrum Analyzer	E4445A	Agilent	MY46181166	2009-06-08	One year
06	EMI Test Receiver	ESCI	R&S	100948	2009-07-02	One year
07	Trilog Antenna	VULB 9163	SCHWARZBECK	9163-391	2009-05-14	Two years
08	Horn Antenna	HF907	R&S	100126	2009-07-02	Two years
09	Biconical Antenna	VUBA 9117	SCHWARZBECK	9117-225	2009-05-14	One year
10	Quad-Ridge Horn Antenna	3164-03	ETS-Lindgren	1064	2009-05-20	One year
11	Power Splitter	11667A	Agilent	52960	NA	NA
12	DC Power Supply	GPS-3030D	GM	E877677	NA	NA
13	Semi-Anechoic Chamber	9.6*6.7*6.6m	ETS-Lindgren	NA	NA	NA
14	OTA Fully-Anechoic Chamber	7.4*3.6*3.6m	ETS-Lindgren	3658	NA	NA
15	EMI test software	ES-K1	R&S	NA	NA	NA
16	OTA test software	EMQuest	ETS-Lindgren	NA	NA	NA

*******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