Deutscher Akkreditierungs Rat

No. DAT-P-114/01-01

TEST REPORT

No. 2007TAR004

Test name	FCC Test
Product	GSM/WiFi Dual-Mode Phone
Model	hipi 2300
Client	Paragon Wireless Inc.

Telecommunication Metrology Center

of Ministry of Information Industry

Notice

1. The test report is invalid if not marked with “exclusive stamp for the test report” or the stamp of the test center.
2. Any copy of the test report is invalid if not re-marked with the “exclusive stamp for the test report” or the stamp of the test center.
3. The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
4. The test report is invalid if there is any evidence of erasure and/or falsification.
5. If there is any dissidence for the test report, please file objection to the test center within 15 days from the date of receiving the test report.
6. Normally, entrust test is only responsible for the samples that have undergone the test.
7. Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the test center.

Address: No. 52, Huayuanbei Road, Beijing, P. R. China
Post code: 100083 Cable: 04282
Telephone: +86 10 62302041 Fax: +86 10 62304793

Product	GSM/WiFi Dual-Mode Phone	**Model** / **Trade mark**	hipi 2300
Client	Paragon Wireless Inc.		
Manufacturer	Paragon Wireless Inc.	**Arrival Date of sample**	Jan 26, 2007
Place of sampling	/	**Carrier of the samples**	Wang Wuji
Quantity of the samples	2	**Date of product**	/
Base of the samples	(Blank)	**Items of test**	8
Series number	EUT1: 355470010010615 EUT2: 355470010010557		
Standard(s)	FCC Part 24(10-1-06 Edition) FCC Part 22(10-1-06 Edition)		
Conclusion	The testcases requested by the client in this test report have passed the test. (Stamp) **Date of issue:** Apr 11th, 2007		
Comment	The test result relates only to the tested samples.		

Approved by (Lu Bingsong) **Reviewed by** (Song Chongwen) **Performed by** (Zi Xiaogang)

(Lu Bingsong - **Deputy Director of the laboratory**)

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1. COMPETENCE AND WARRANTIES

Telecommunication Metrology Center of Ministry of Information Industry(hereinafter TMC) is a test laboratory accredited by DAR (DATech) – Deutschen Akkreditierungs Rat (Deutsche Akkreditierungsstelle Technik), for the tests indicated in the Certificate No. **DAT-P-114/01-01**.

TMC is a test laboratory accredited by CNAL – Accreditation Certificate of China National Accreditation Board for Laboratories, for the tests indicated in the Certificate No. **L0442**.

TMC is FCC listed lab. FCC listed number is **733176**.

The test site in **TMC** is registered in Industry Canada. The IC registration number is **6629.**

TMC is a testing laboratory competent to carry out the tests described in this report.

TMC guarantees the reliability of the data presented in this report, which is the result of measurements and tests performed to the item under test on the date and under the conditions stated on the report and is based on the knowledge and technical facilities available at TMC at the time of execution of the test.

TMC is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the item under test and the results of the test.

2. Testing Laboratory

2.1 Testing Location

Company Name:	Telecommunication Metrology Center of Ministry of Information Industry
Address:	No 52, Huayuan beilu, Haidian District, Beijing,P.R.China
Postal Code:	100083
Telephone:	00861062303288
Fax:	00861062304793

2.2 Testing Environment

Semi-anechoic chamber (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃**,** Max. = 30 ℃
Relative humidity	Min. = 30 %**,** Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.2 dB, 10 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 26 to 1000 MHz

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 26 to 1000 MHz

2.3 Testing Period

Testing Start Date:	Jan. 26, 2007
Testing End Date:	Mar. 26, 2007

3. Applicant Information

3.1 Client Information

Name or Company	Paragon Wireless Inc.
Address/Post	A-1801, E-wing Center, No.113 Zhichun Road, Haidian District, Beijing 100086, P.R.China
City	Beijing
Postal Code	100086
Country	P.R.China
Telephone	86-10-62616660-270
Fax	86-10-62616669

3.2 Manufacturer Information

Name or Company	Paragon Wireless Inc.
Address/Post	A-1801, E-wing Center, No.113 Zhichun Road, Haidian District, Beijing 100086, P.R.China
City	Beijing
Postal Code	100086
Country	P.R.China
Telephone	86-10-62616660-270
Fax	86-10-62616669

4. Equipment Under Test (EUT) and Ancillary Equipment (AE)

4.1 About EUT

Model	hipi 2300
FCC ID:	UANHIPI2300
Description	GSM/WiFi Dual-Mode Phone
Frequency	1850.2MHz – 1909.8MHz for PCS 1900; 824.2MHz – 848.8MHz for GSM 850
Type of modulation	GMSK
Number of channels	299 for PCS 1900;124 for GSM 850
Antenna	Internal
Power supply	Battery or Charger (AC Adaptor)
Output power	30.33dBm maximum EIRP measured for PCS 1900
Extreme vol. Limits	3.6VDC to 4.2VDC (nominal: 3.8 VDC)
Extreme temp. Tolerance	-30°C to +50°C

4.2 Internal Identification of EUT used during the test

EUT ID	SN or IMEI	HW Version	SW Version
EUT1	355470010010615	MB03318T000	P1_WINMOBILE_PARAGON_A_3_00_00_SHIP_Build_W
EUT2	355470010010557	MB03318T000	P1_WINMOBILE_PARAGON_A_3_00_00_SHIP_Build_W

*EUT code: is used to identify the test sample in the lab internally.

4.3 Photographs of EUT

Photographs of Telephone Set and Charger are respectively shown in ANNEX B of this test report.

5. SUMMARY OF TEST RESULTS

Items	List	Clause in FCC rules	Verdict
1	Output Power	22.913(a)/24.232(b)	P
2	Emission Limit	2.1051/22.917/24.238	P
3	Conducted Emission	15.107/207	P
4	Frequency Stability	2.1055/24.235	P
5	Occupied Bandwidth	2.1049(h)(i)	P
6	Emission Bandwidth	22.917(b)/24.238(b)	P
7	Band Edge Compliance	22.917(b)/24.238(b)	P
8	Conducted Spurious Emission	2.1057/22.917/24.238	P

6. MAIN TEST INSTRUMENTS

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL DUE DATE
1	Test Receiver	ESS	847151/015	R&S	2007-10-30
2	Test Receiver	ESI40	831564/002	R&S	2008-2-11
3	BiLog Antenna	3142B	9908-1403	EMCO	2008-1-16
4	BiLog Antenna	3142B	9908-1405	EMCO	2009-9-19
5	Signal Generator	SMT06	831285/005	R&S	2007-12-26
6	Signal Generator	SMP04	100070	R&S	2007-4-20
7	LISN	ESH2-Z5	829991/012	R&S	2007-8
8	Spectrum Analyzer	E4440A	MY41000262	Agilent	2007-4-18
9	Universal Radio Communication Tester	CMU200	100680	R&S	2007-8-23
10	Dual-Ridge Waveguide Horn Antenna	3115	9906-5827	EMCO	2008-3
11	Dual-Ridge Waveguide Horn Antenna	3116	2663	EMCO	2008-3
12	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2008-3
13	Climatic chamber	PL-2G	343074	ESPEC	2007-5-15

ANNEX A MEASUREMENT RESULTS

A.1 OUTPUT POWER (§22.913(a)/§24.232(b))

A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200) to ensure max power transmission and proper modulation.
This result contains peak output power and EIRP measurements for the EUT.
In all cases, output power is within the specified limits.

A.1.2 Conducted

A.1.2.1 Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.
The power was measured with Agilent Spectrum Analyzer E4440A (peak)
These measurements were done at 3 frequencies, 1850.2 MHz, 1880.0 MHz and 1909.8 MHz for PCS1900 band, 824.4MHz, 836.6MHz and 848.8MHz for GSM850 band (bottom, middle and top of operational frequency range).

GSM850

Limit

Power step	Nominal Peak output power (dBm)	Tolerance (dB)
5	33dBm(2W)*	± 2

*GSM Specification – ETSI EN 300 910 V8.5.1 (2000-11) Section 4.1

Measurement result

EUT1: 355470010010615;

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	5	32.92
836.6	5	32.95
848.8	5	32.86

PCS1900

Limit

Power step	Nominal Peak output power (dBm)	Tolerance (dB)
0	30dBm(1W)*	± 2

*GSM Specification – ETSI EN 300 910 V8.5.1 (2000-11) Section 4.1

Measurement result

EUT1: 355470010010615;

Frequency(MHz)	Power Step	Peak EIRP(dBm)
1850.2	0	29.26
1880.0	0	29.19
1909.8	0	28.21

A.1.3 Radiated

A.1.3.1 Description

This is the test for the maximum radiated power from the EUT.

Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 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."

Rule Part 22.913(a) specifies ”Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

A.1.3.2 Method of Measurement

1. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.
2. A "reference path loss" is established as Pin + 2.15 - Pr.
3. The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.
5. The EUT is then put into pulse mode at its maximum power level (Power Step 0 for PCS1900, 5 for GSM 850).
6. "Gated mode" power measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

GSM 850-ERP 22.913(a)

Limits

Power Step	Burst Peak ERP (dBm)
5	≤38.45dBm (7W)

Measurement result

Frequency(MHz)	Power Step	Peak ERP(dBm)
824.2	5	25.87
836.6	5	25.73
848.8	5	24.47

ANALYZER SETTINGS: RBW = VBW = 3MHz

PCS1900-EIRP 24.232(b)

Limits

Power Step	Burst Peak EIRP (dBm)
0	≤33dBm (2W)

Measurement result

Frequency(MHz)	Power Step	Peak EIRP(dBm)
1850.2	0	30.33
1880.0	0	29.69
1909.8	0	28.66

ANALYZER SETTINGS: RBW = VBW = 3MHz

A.2 EMISSION LIMIT (§2.1051/§24.238)

A.2.1 Measurement Method

The measurements procedures in TIA-603C-2004 are used.

The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the PCS1900 and GSM850 band.

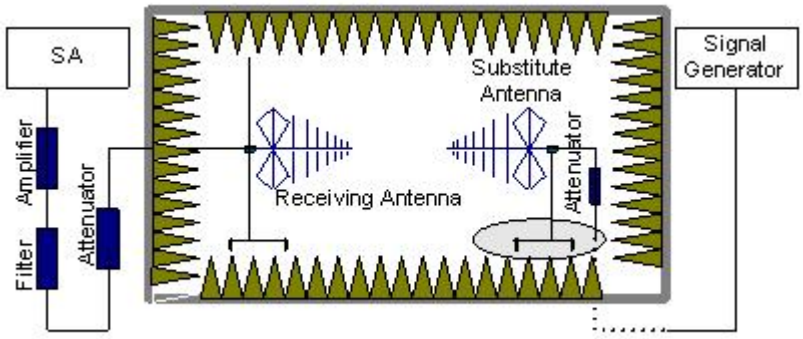
The procedure of radiated spurious emissions is as follows:

a) Pre-calibration

With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as,

RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）

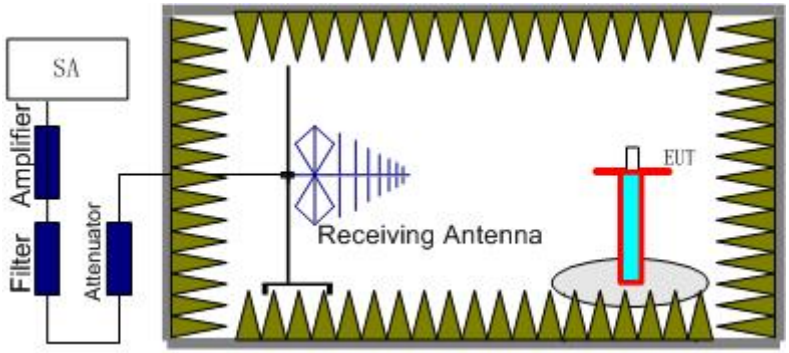
The SA is calibrated using following setup.



b) EUT test

EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector

and 1MHz bandwidth.



A.2.2 Measurement Limit

Sec. 24.238 Emission Limits.

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS band (1850.2 MHz, 1880 MHz and 1909.8 MHz) and GSM850 band (824.2MHz, 836.6MHz, 848.8MHz). It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the PCS1900 and GSM850 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

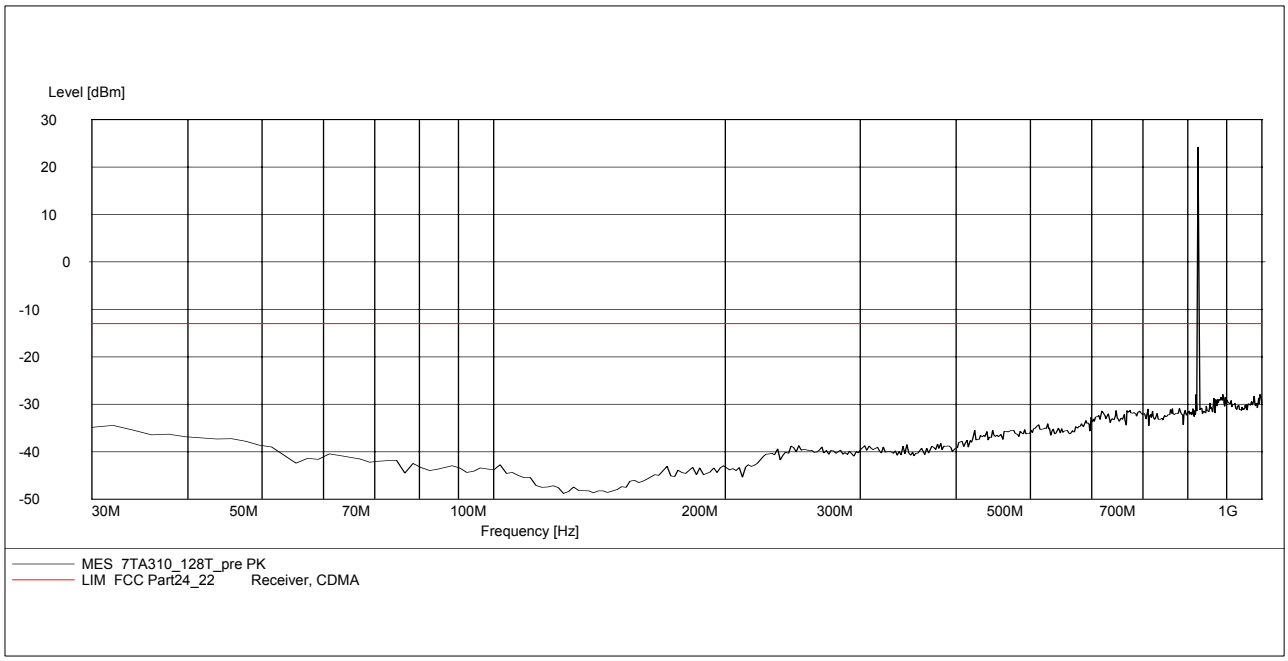
NOTE: The spurious emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels.

GSM 850

A.2.3.1 RADIATED SPURIOUS EMISSIONS-Channel 128: 30MHz –1GHz

Radiated spurious emission limit :-13dBm.

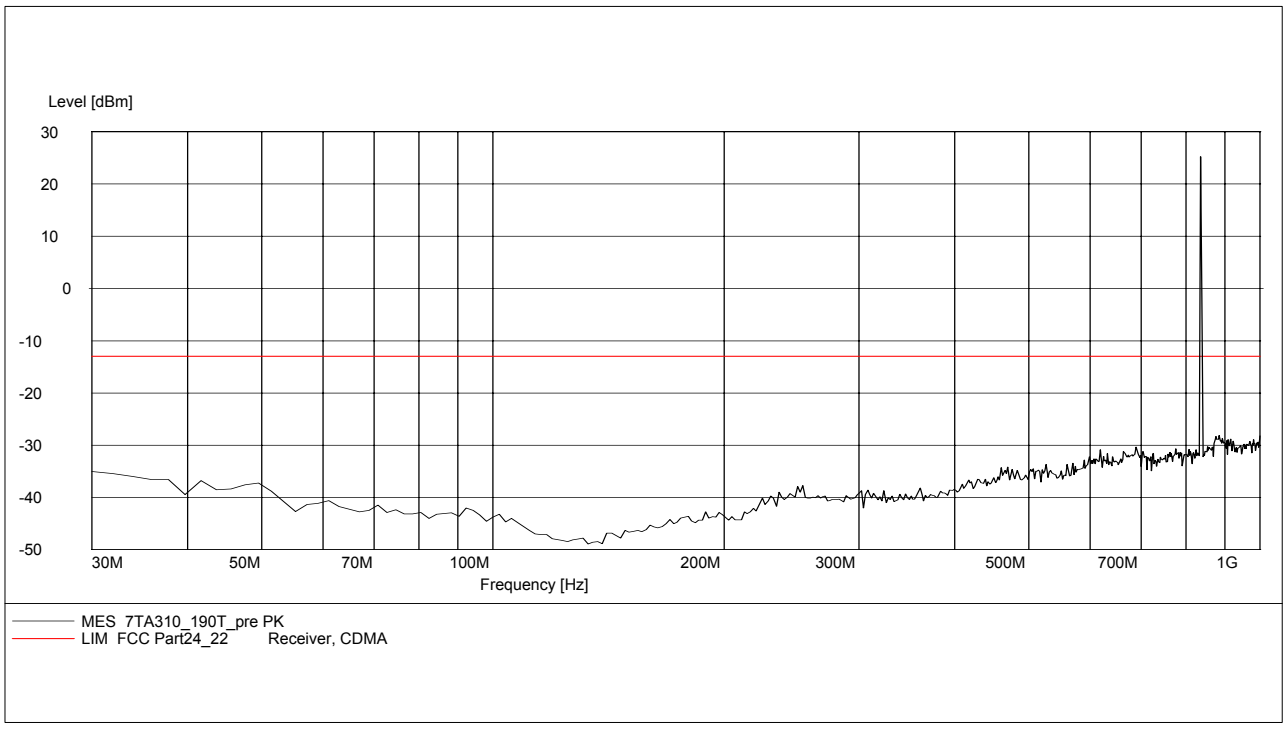
NOTE: peak above the limit line is the Carrier frequency @ ch-128



A.2.3.2 RADIATED SPURIOUS EMISSIONS-Channel 190: 30MHz – 1GHz

Radiated spurious emission limit :-13dBm.

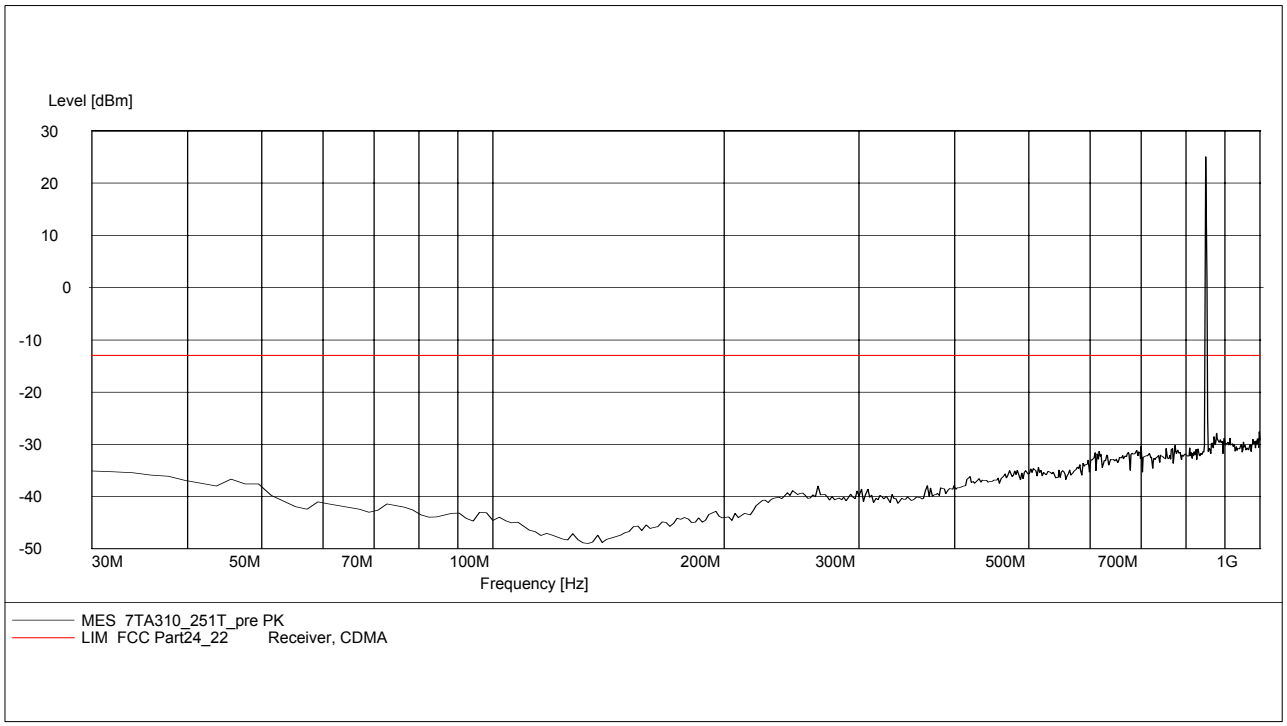
NOTE: peak above the limit line is the Carrier frequency @ ch-190



A.2.3.3 RADIATED SPURIOUS EMISSIONS-Channel 251: 30MHz – 1GHz

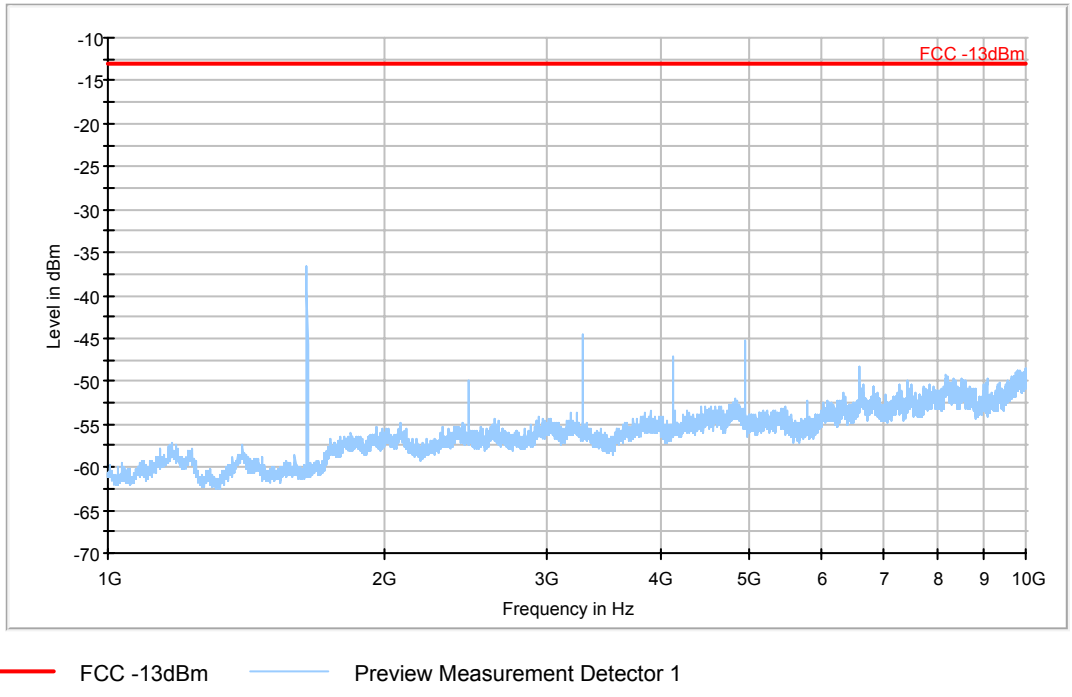
Radiated spurious emission limit :-13dBm.

NOTE: peak above the limit line is the Carrier frequency @ ch-251



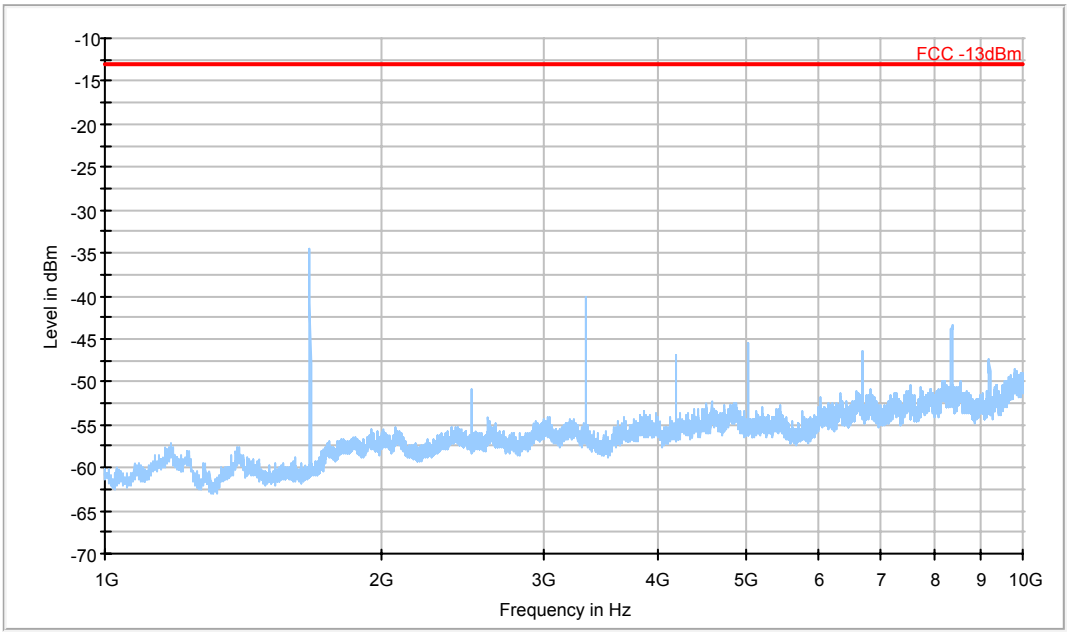
A.2.3.4 RADIATED SPURIOUS EMISSIONS-Channel 128: 1GHz – 10GHz

Radiated spurious emission limit :-13dBm.



A.2.3.5 RADIATED SPURIOUS EMISSIONS-Channel 190: 1GHz – 10GHz

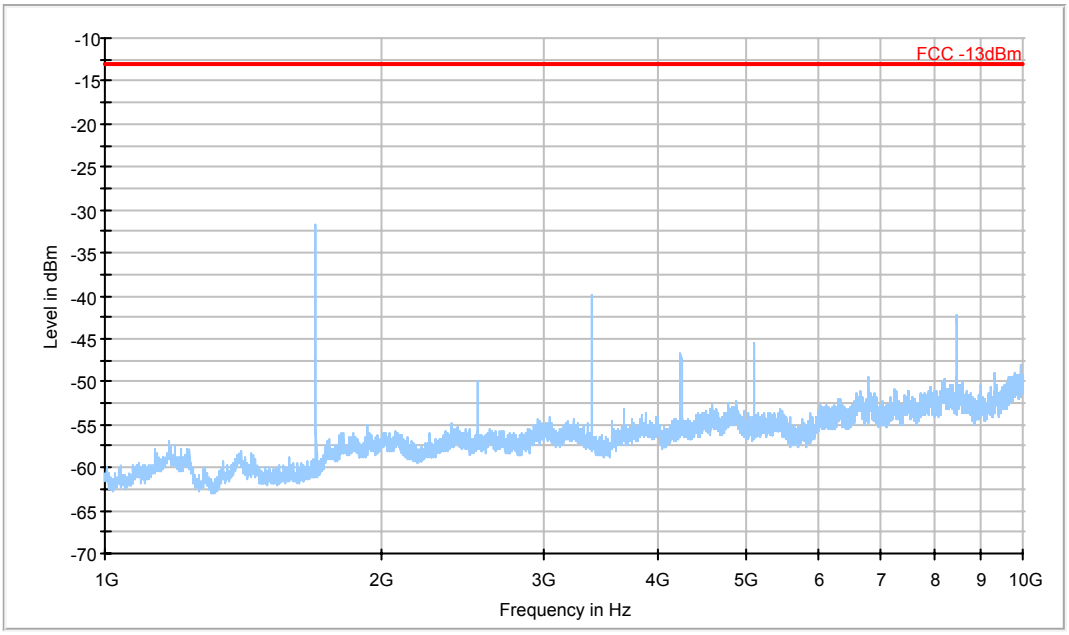
Radiated spurious emission limit :-13dBm.



FCC -13dBm Preview Measurement Detector 1

A.2.3.6 RADIATED SPURIOUS EMISSIONS-Channel 251: 1GHz – 10GHz

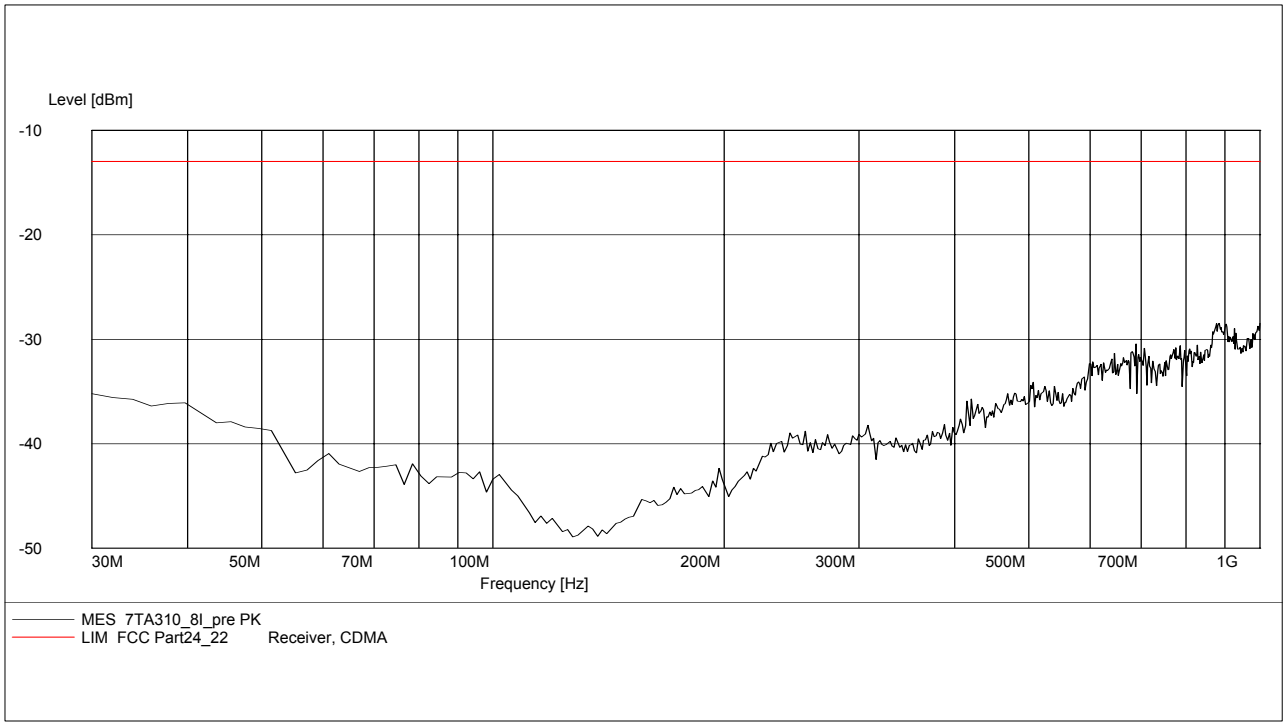
Radiated spurious emission limit :-13dBm.



FCC -13dBm Preview Measurement Detector 1

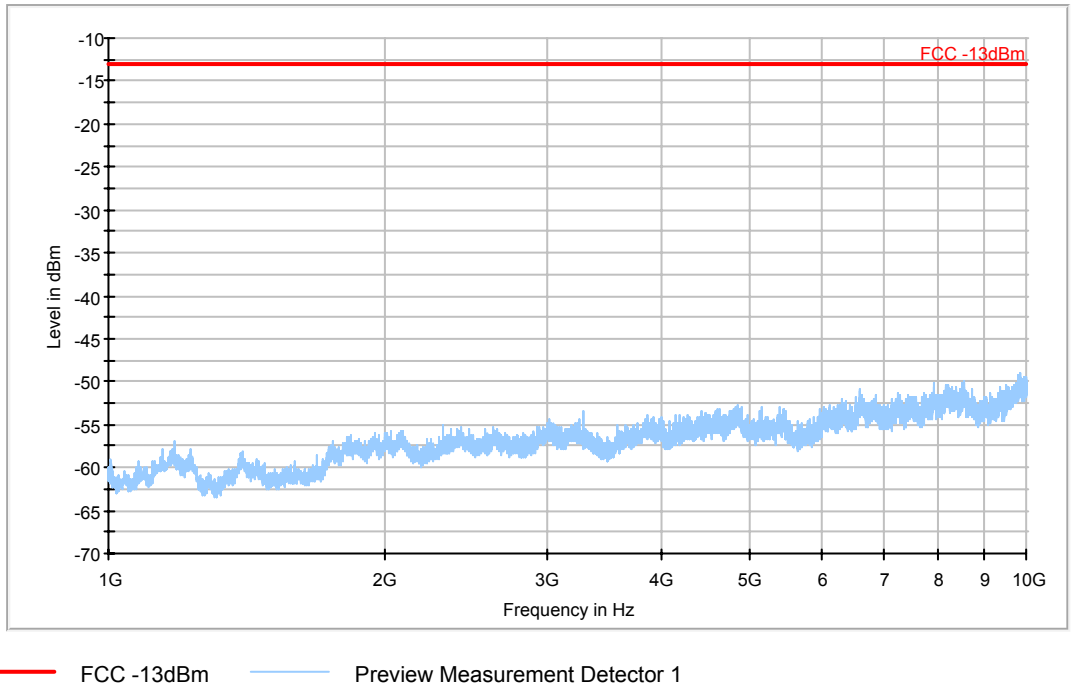
A.2.3.7 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 1GHz

Radiated spurious emission limit :-13dBm.



A.2.3.8 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 1GHz – 10GHz

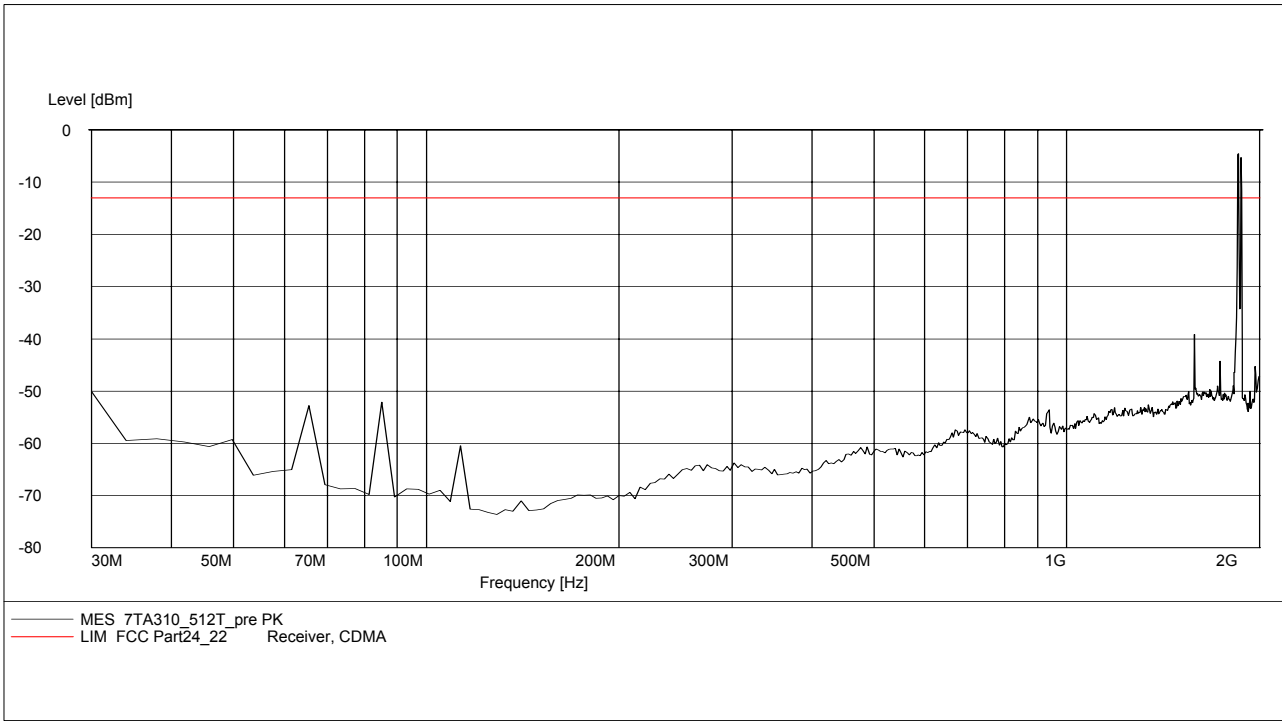
Radiated spurious emission limit :-13dBm.



PCS 1900

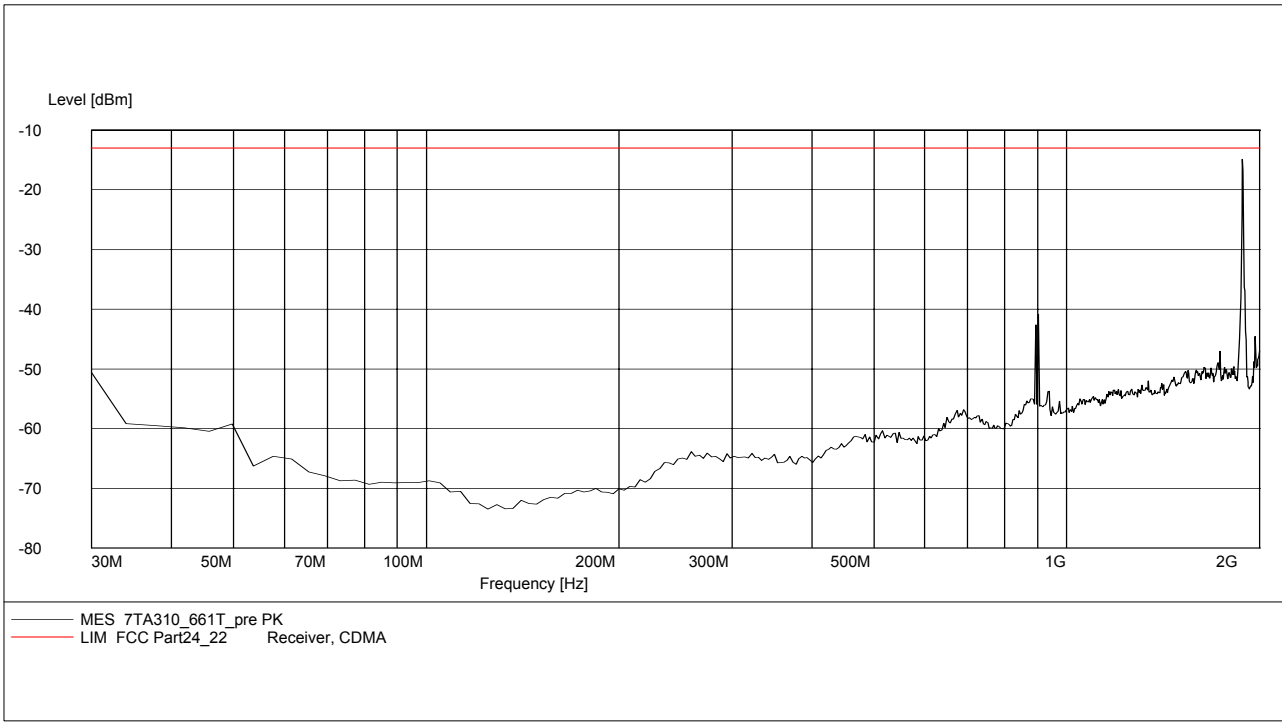
A.2.3.9 RADIATED SPURIOUS EMISSIONS-Channel 512: 30MHz – 2GHz

NOTE: peak above the limit line is the Carrier frequency @ ch-512



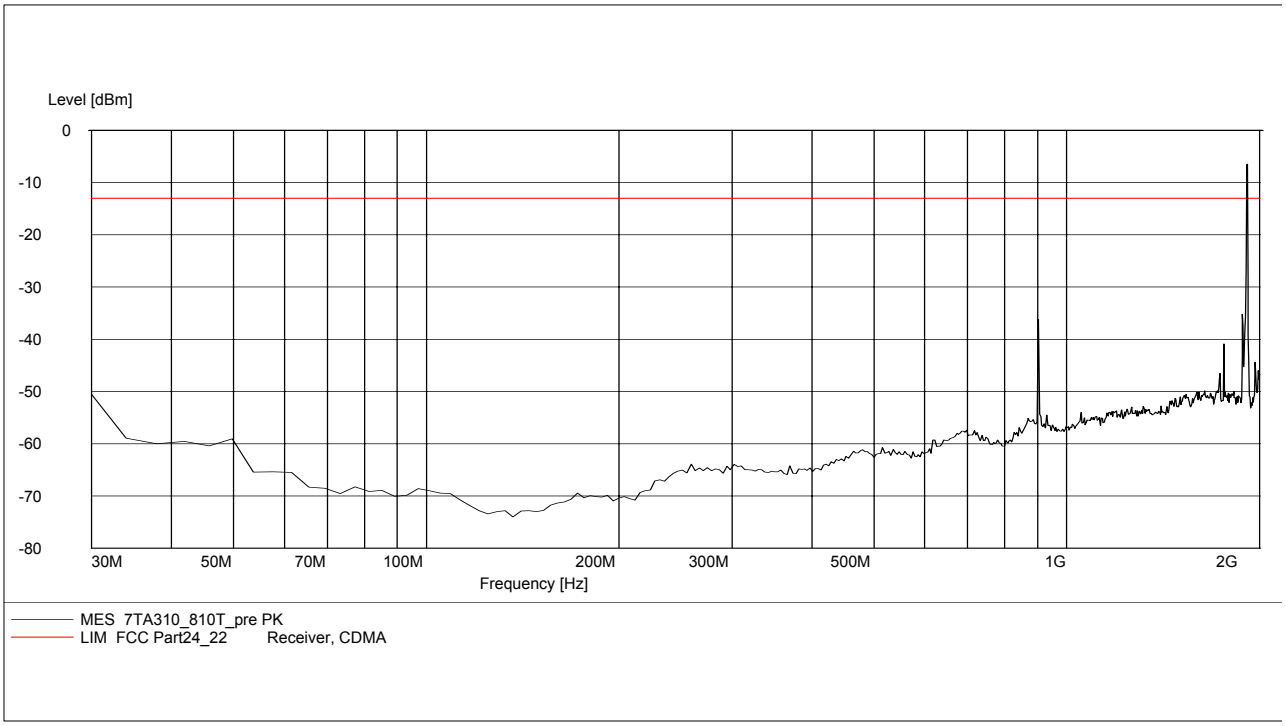
A.2.3.10 RADIATED SPURIOUS EMISSIONS-Channel 661: 30MHz – 2GHz

NOTE: peak above the limit line is the Carrier frequency @ ch-661

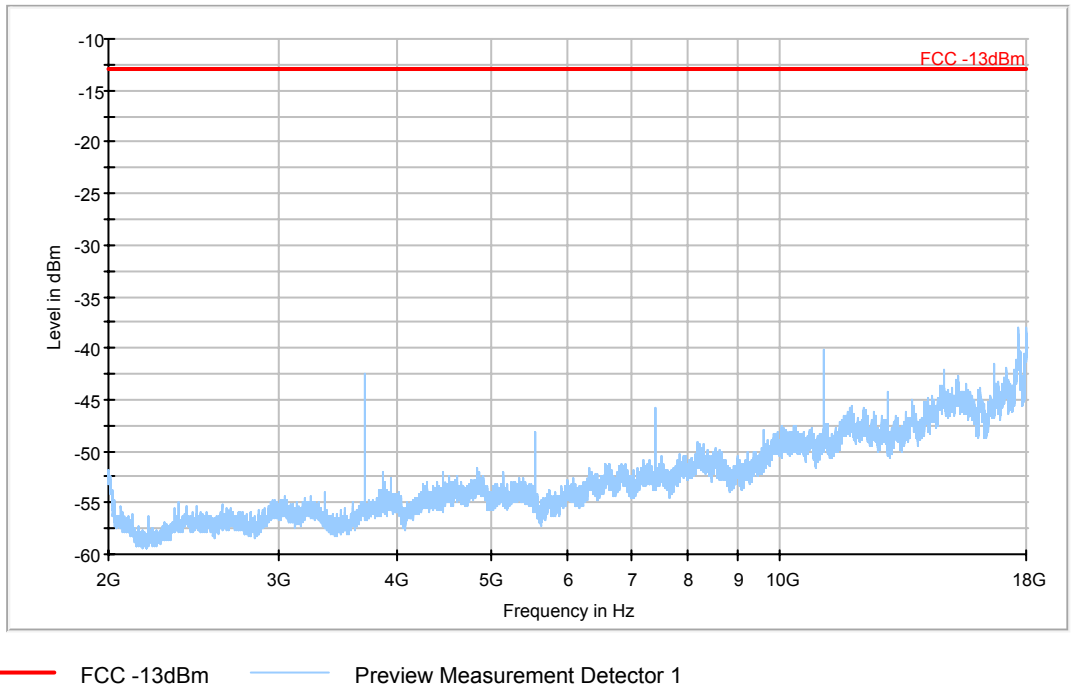


A.2.3.11 RADIATED SPURIOUS EMISSIONS-Channel 810: 30MHz – 2GHz

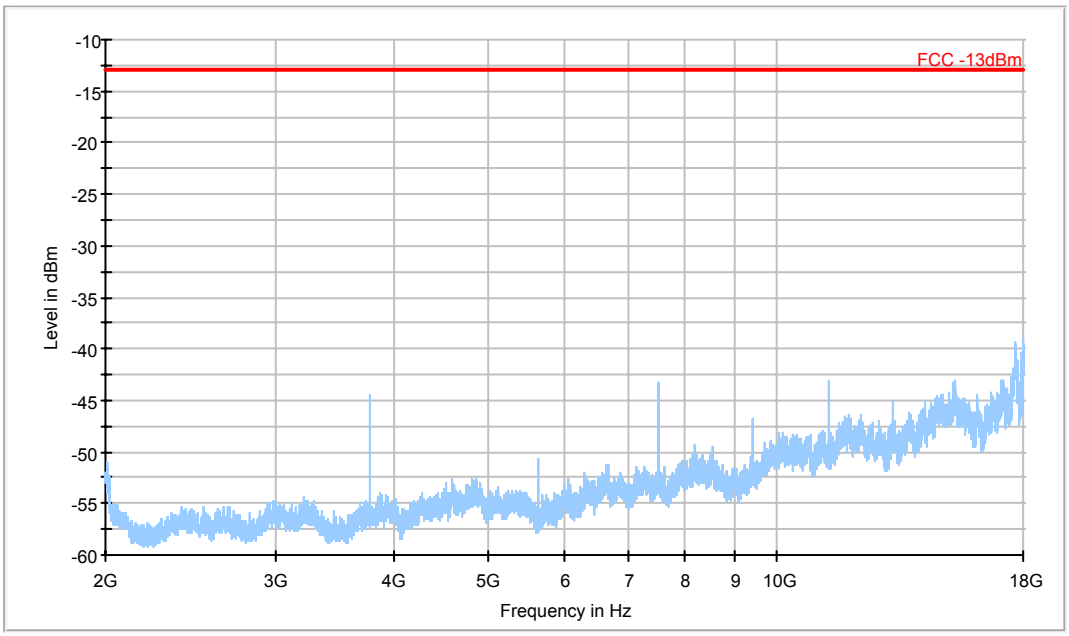
NOTE: peak above the limit line is the Carrier frequency @ ch-810



A.2.3.12 RADIATED SPURIOUS EMISSIONS-Channel 512: 2GHz – 18GHz

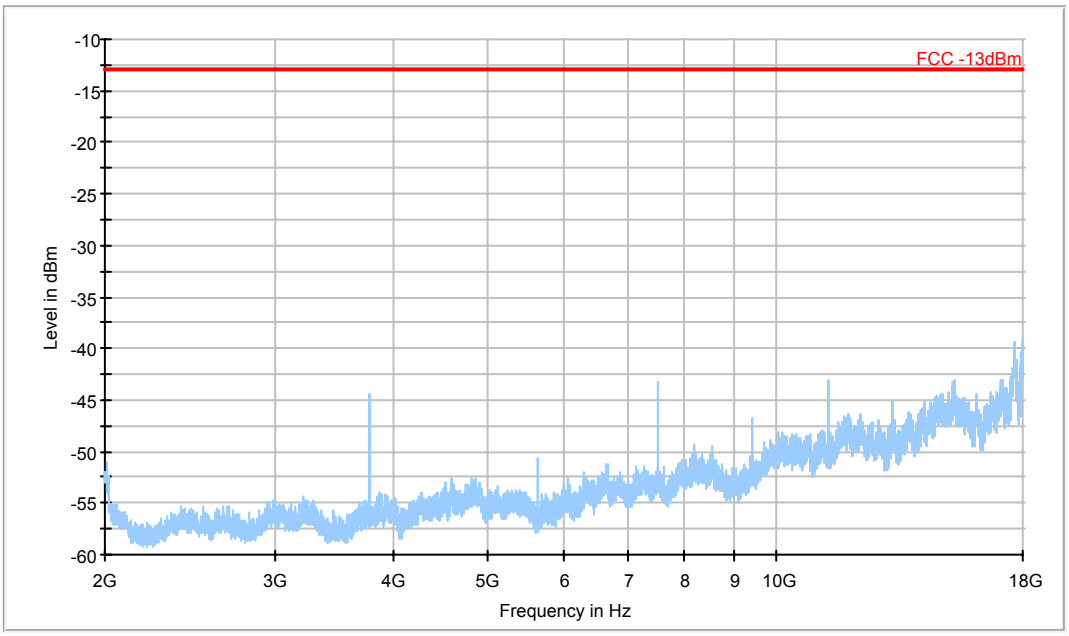


A2.3.13 RADIATED SPURIOUS EMISSIONS-Channel 661: 2GHz – 18GHz



FCC -13dBm Preview Measurement Detector 1

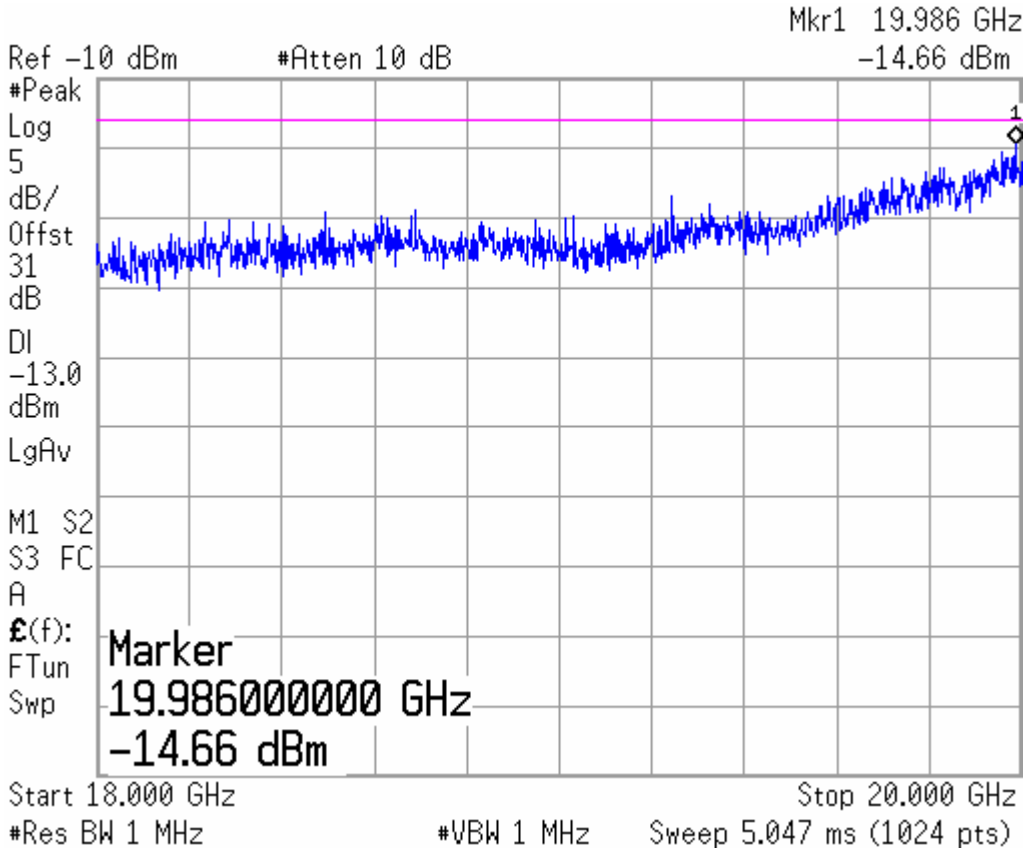
A.2.3.14 RADIATED SPURIOUS EMISSIONS-Channel 810: 2GHz – 18GHz



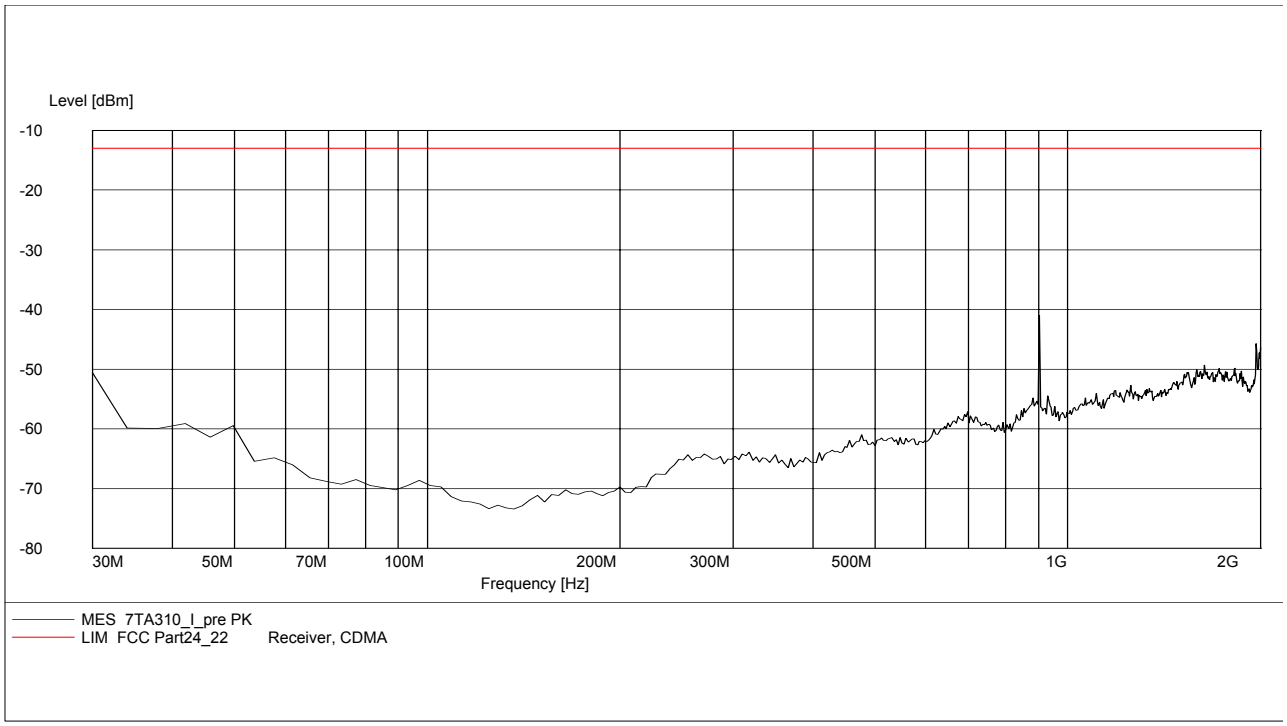
FCC -13dBm Preview Measurement Detector 1

A.2.3.15 Radiated spurious emission (18GHz-20GHz)

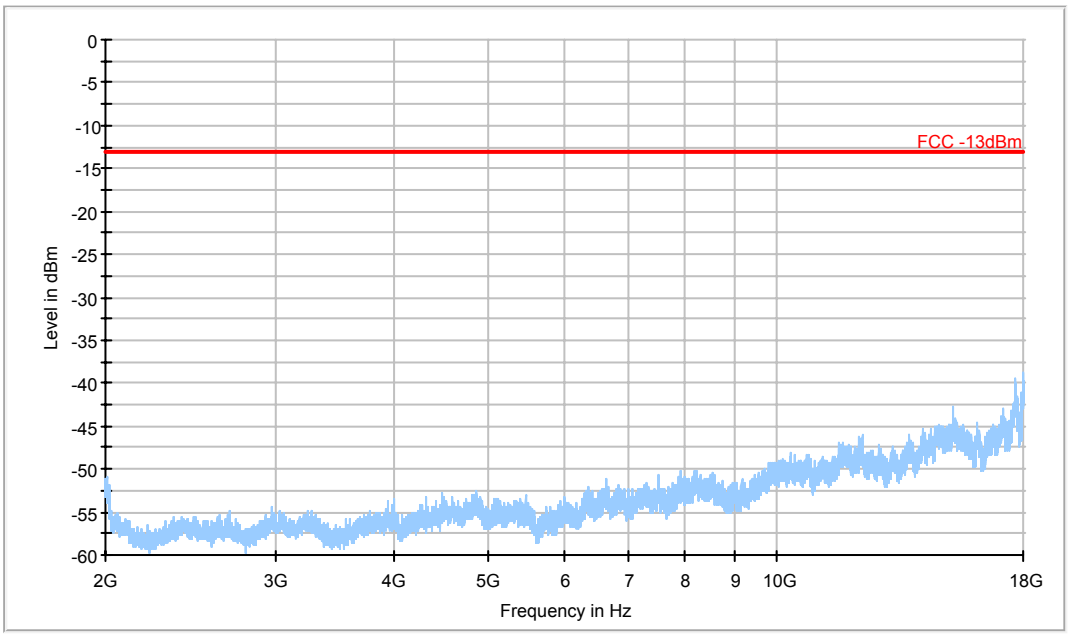
Note: This plot is valid for low, mid & high channels. It is same as the floor noise.



A.2.3.16 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 2GHz

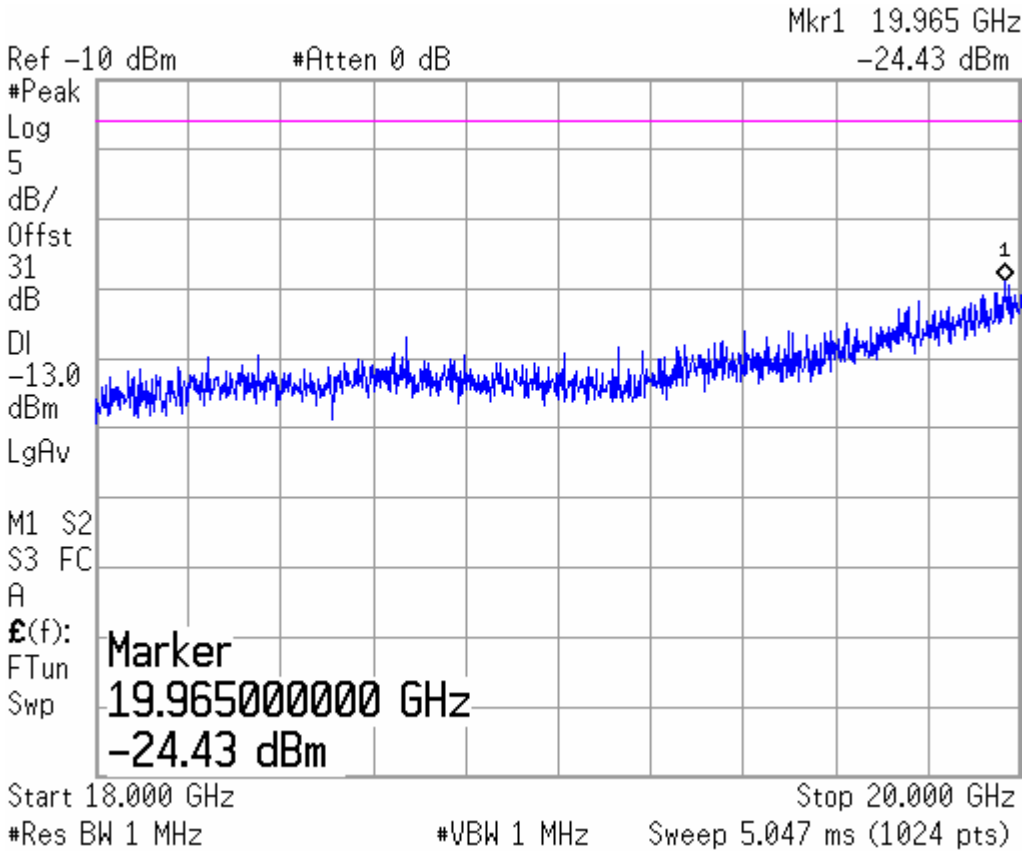


A.2.3.17 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 2GHz – 18GHz



A.2.3.18 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 18GHz – 20GHz

Note: It is same as the floor noise.



A.3 CONDUCTED EMISSION (§15.107§15.207)

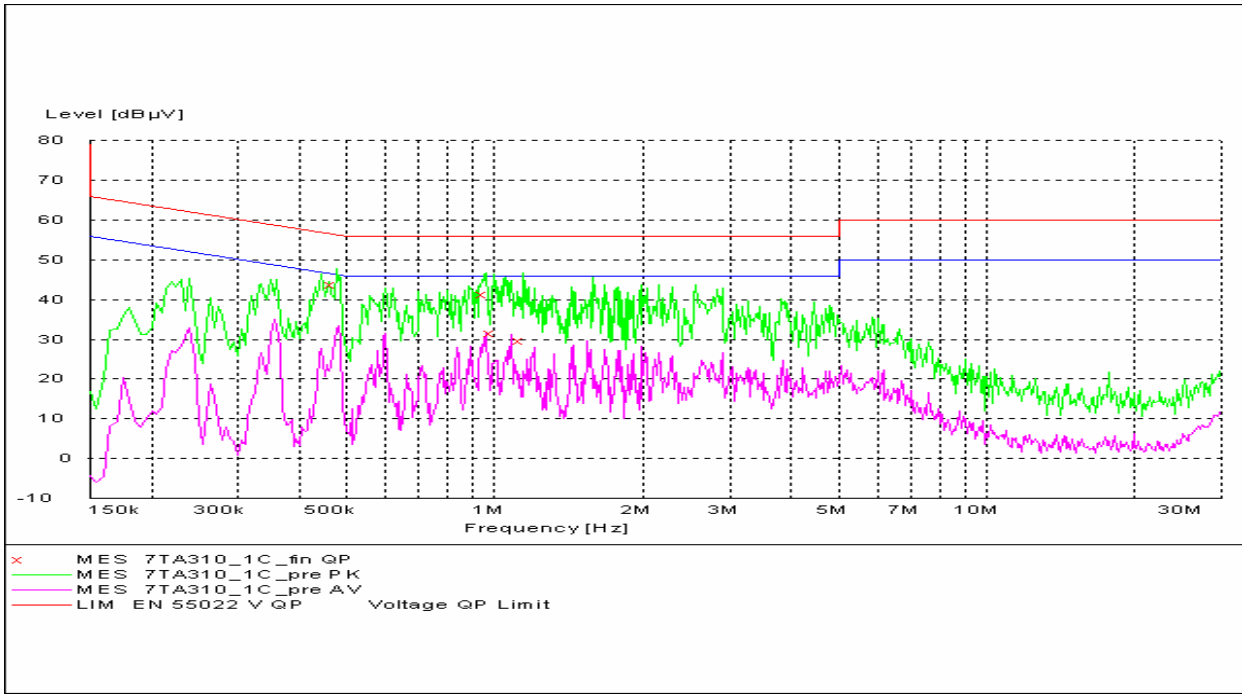
The measurement procedure in ANSI C63.4-1003 is used. Conducted Emission is measured with travel charger ETC-100.

A.3.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi -Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50
* Decreases with logarithm of the frequency		

A.3.2 Measurement result

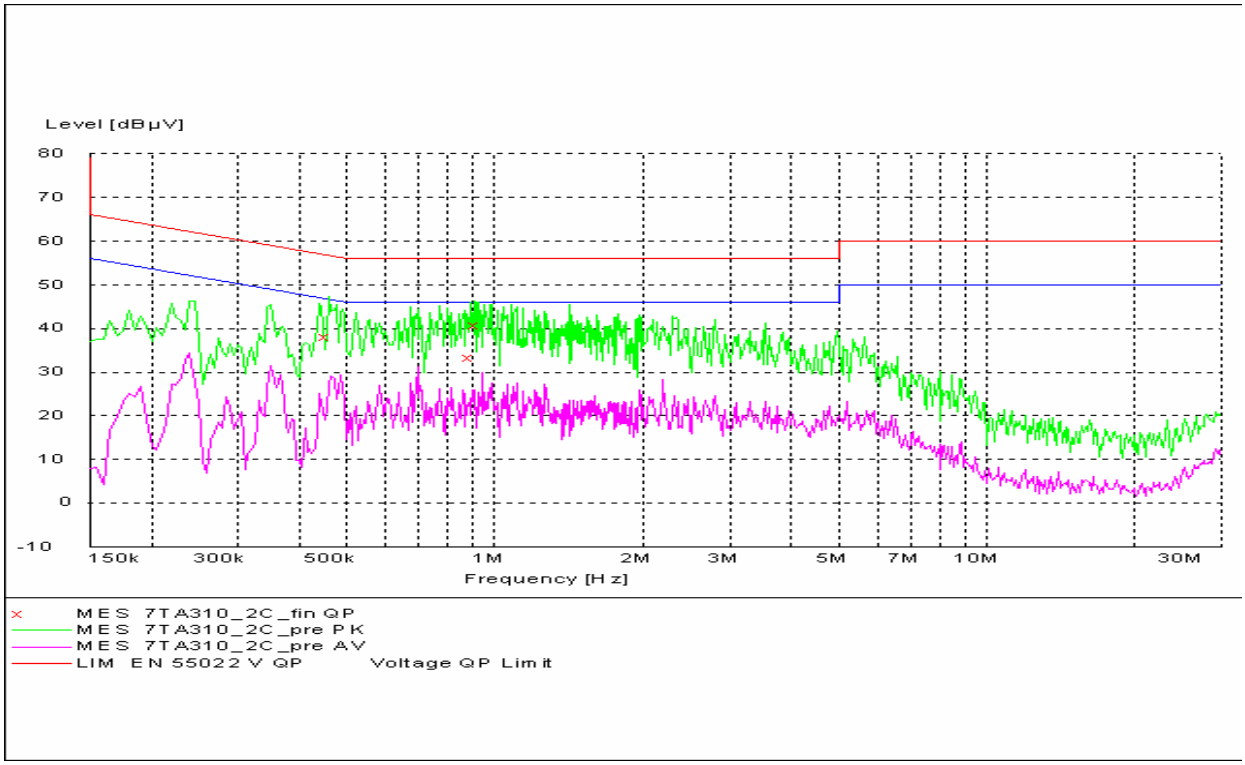
GSM850MHz



MEASUREMENT RESULT: "7TA310_1C_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.475000	43.80	10.1	56	12.7	L1	FLO
0.960000	41.40	10.1	56	14.6	L1	FLO
1.000000	31.60	10.1	56	24.4	N	FLO
1.145000	29.60	10.1	56	26.4	L1	GND

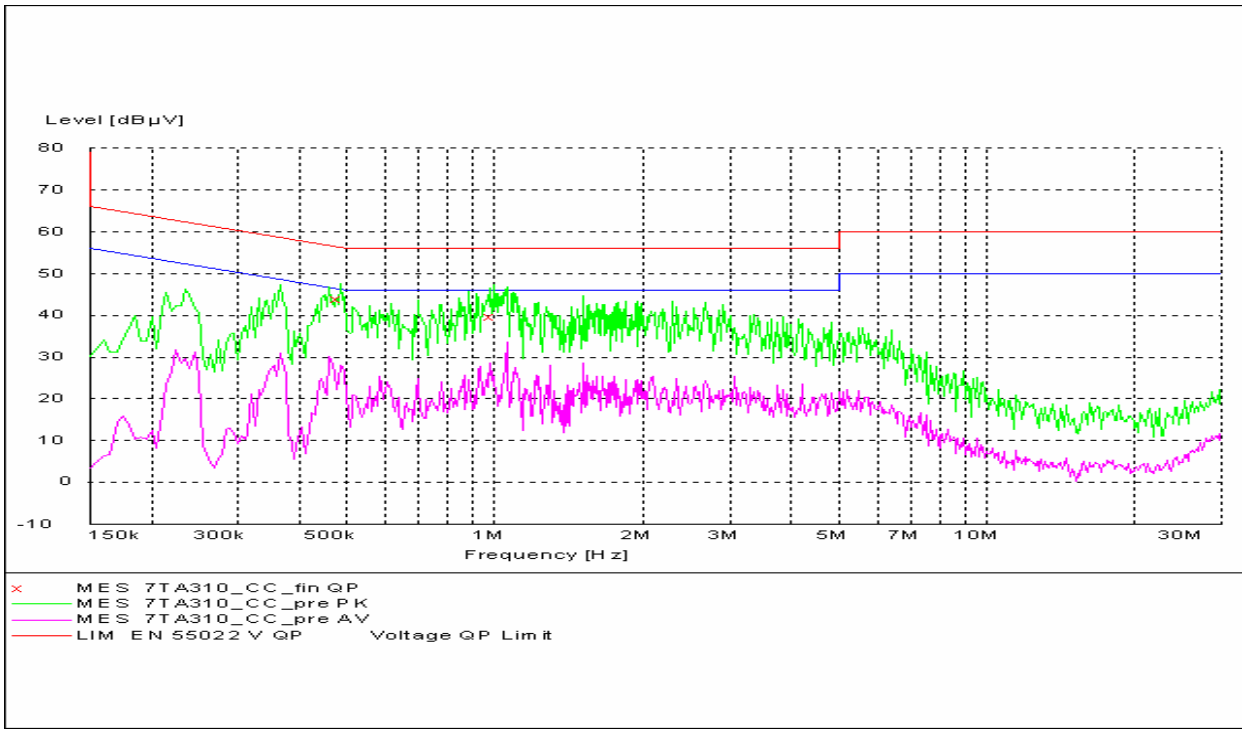
PCS 1900MHz



MEASUREMENT RESULT: "7TA310_2C_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.460000	37.90	10.1	57	18.8	N	GND
0.905000	33.20	10.1	56	22.8	N	FLO
0.930000	40.80	10.1	56	15.2	L1	GND

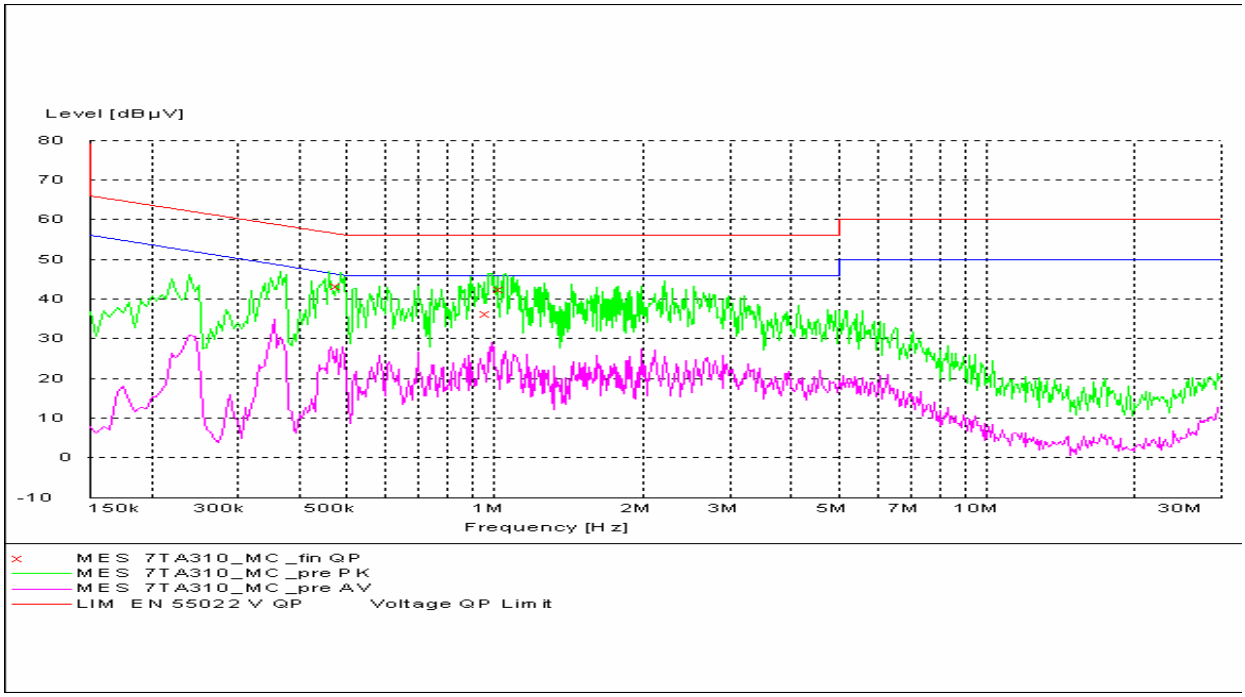
Camera



MEASUREMENT RESULT: "7TA310_CC_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.485000	43.80	10.1	56	12.4	L1	GND
1.000000	39.60	10.1	56	16.4	L1	FLO

MP3



MEASUREMENT RESULT: "7TA310_MC_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.485000	43.30	10.1	56	12.9	L1	GND
0.985000	36.40	10.1	56	19.6	N	FLO
1.050000	42.50	10.1	56	13.5	L1	GND

A.4 FREQUENCY STABILITY (§2.1055/§24.235)

A.4.1 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 and channel 190 for GSM850, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 (centre channel), measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C increments from +50℃ to -30℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

A.4.2 Measurement Limit

A.4.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.6VDC and 4.2VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

A.4.2.2 For equipment powered by primary supply voltage

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies.

This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

A.4.3 Measurement results

GSM 850

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	9	0.011
3.8	7	0.008
4.2	7	0.008

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	12	0.014
-20	10	0.012
-10	8	0.010
0	9	0.011
10	11	0.013
20	12	0.014
30	13	0.016
40	13	0.016
50	15	0.018

PCS 1900

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	18	0.010
3.8	16	0.009
4.2	19	0.010

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	23	0.012
-20	19	0.010
-10	18	0.010
0	17	0.009
10	19	0.010
20	19	0.010
30	21	0.011
40	19	0.010
50	22	0.012

A.5 OCCUPIED BANDWIDTH (§2.1049(h)(i))

A.5.1 Occupied Bandwidth Results

Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the USPCS frequency band. The table below lists the measured -20dBc BW (99%). Spectrum analyzer plots are included on the following pages.

GSM 850(-20dBc)

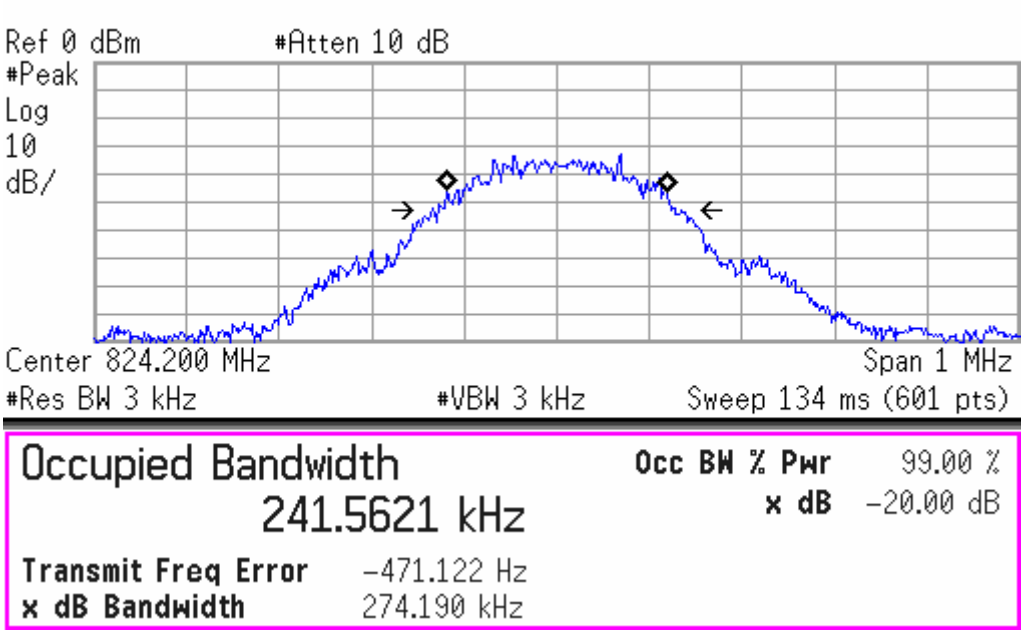
EUT1: 355470010010615

Frequency(MHz)	Occupied Bandwidth (–20dBc BW)(kHz)
824.2	274.190
836.6	269.909
848.8	272.300

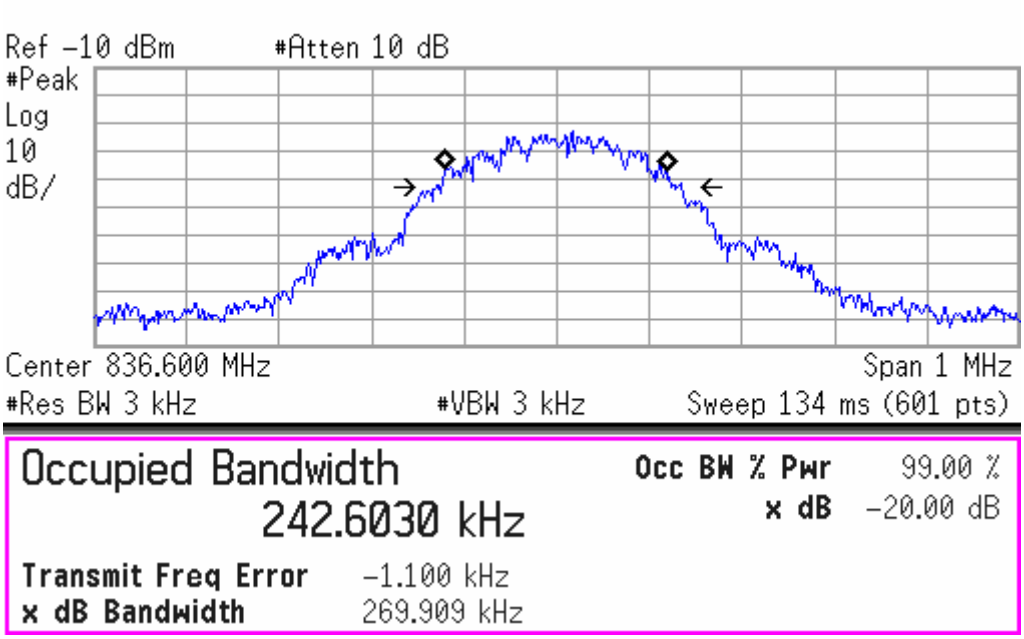
ANALYZER SETTINGS: RBW=VBW=3kHz

GSM 850

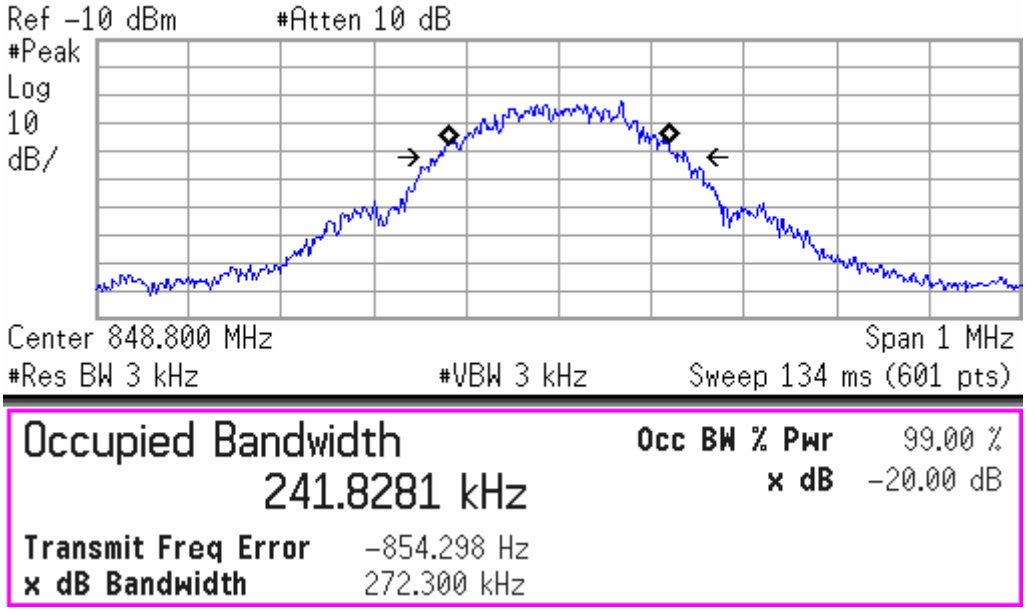
Channel 128-Occupied Bandwidth (-20dBc BW)



Channel 190-Occupied Bandwidth (-20dBc BW)



Channel 251-Occupied Bandwidth (-20dBc BW)



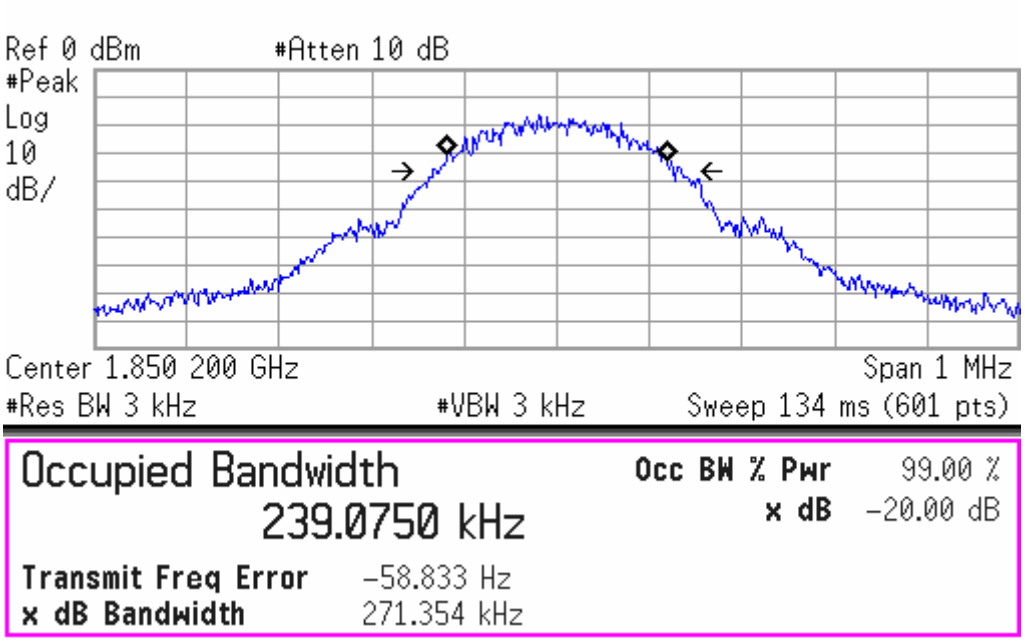
PCS 1900(-20dBc)

Frequency(MHz)	Occupied Bandwidth (–20dBc BW)(kHz)
1850.2	271.354
1880.0	254.703
1909.8	256.619

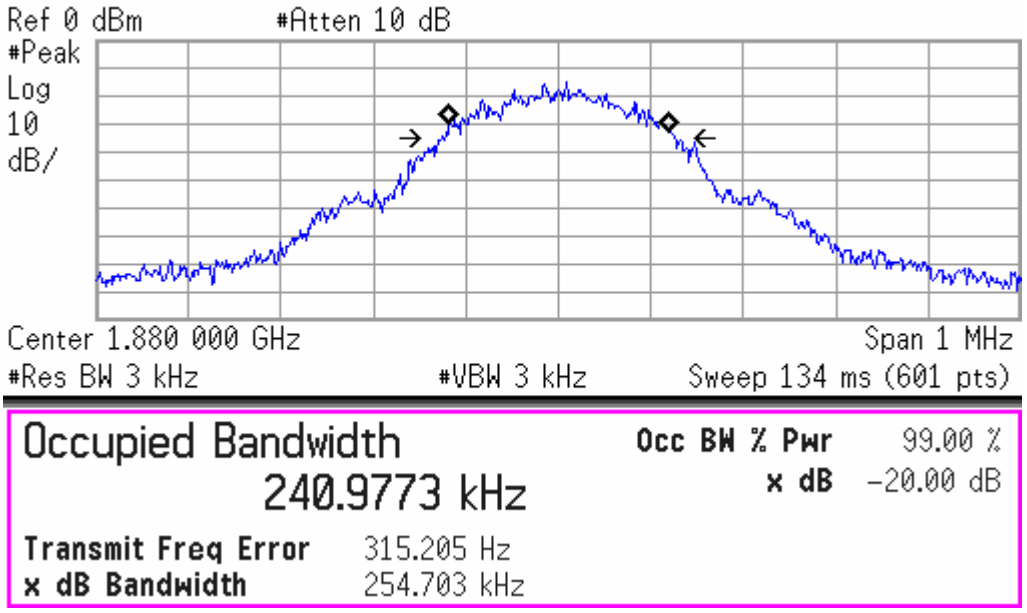
ANALYZER SETTINGS: RBW=VBW=3kHz

PCS 1900

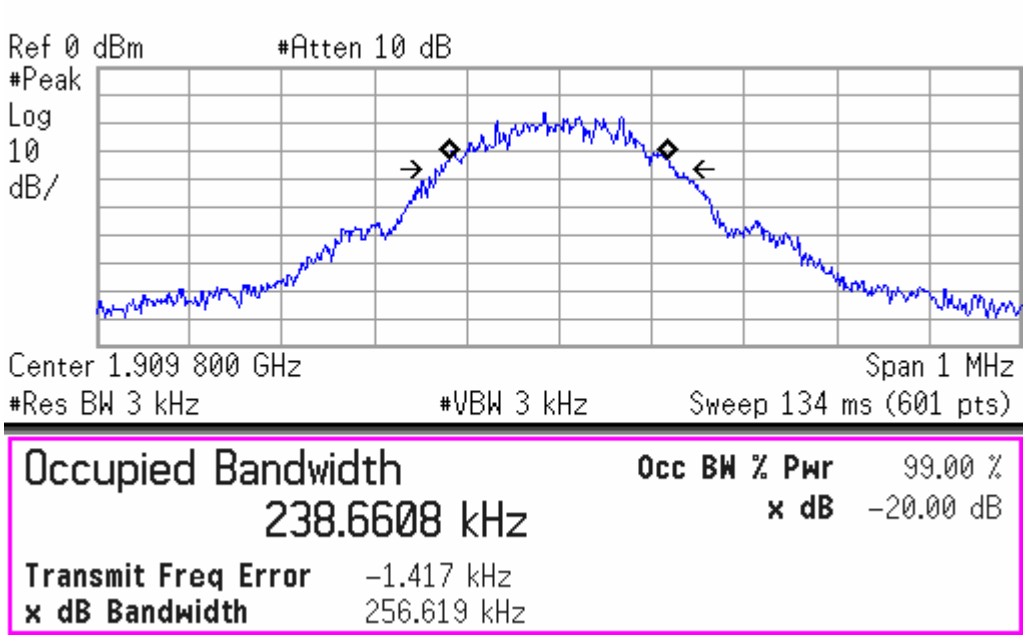
Channel 512-Occupied Bandwidth (-20dBc BW)



Channel 661-Occupied Bandwidth (-20dBc BW)



Channel 810-Occupied Bandwidth (-20dBc BW)



A.6 EMISSION BANDWIDTH (§22.917(b)/§24.238(b))

A.6.1Emission Bandwidth Results

Similar to conducted emissions; Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the PCS1900 band and GSM850 band. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

GSM 850(-26dBc)

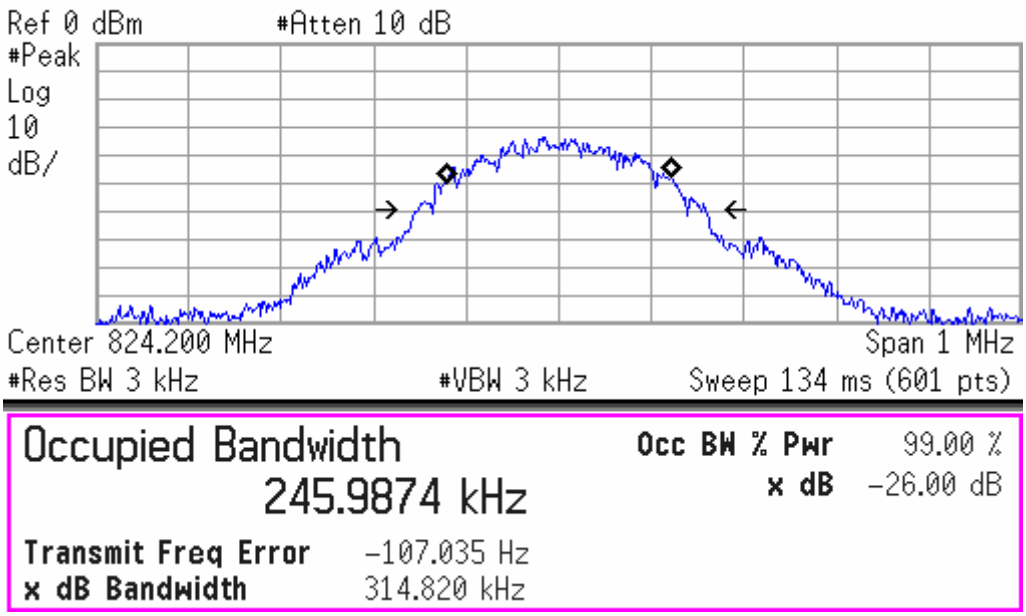
EUT1: 355470010010615

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	314.820
836.6	310.372
848.8	312.207

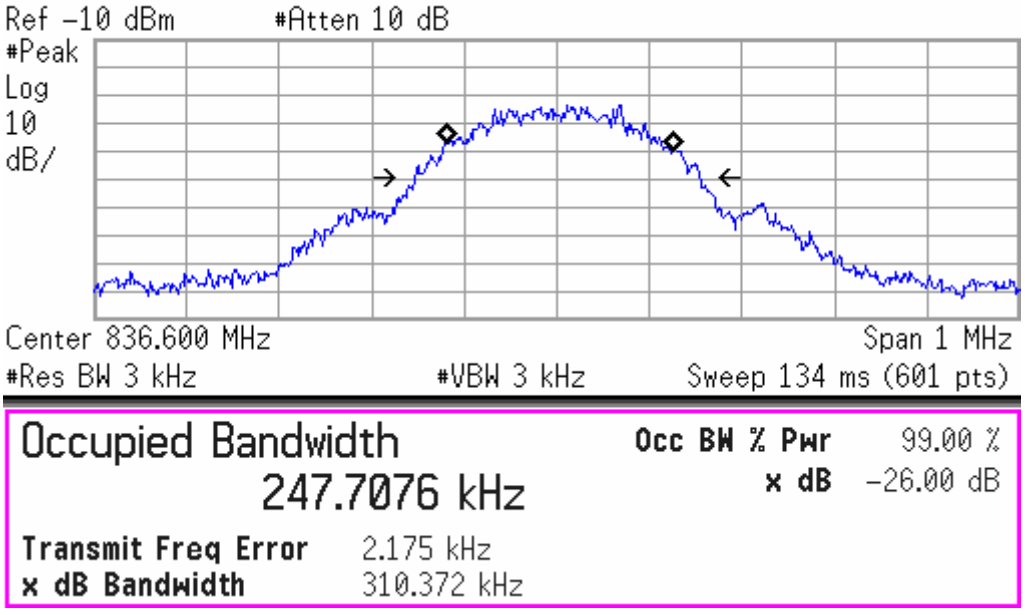
ANALYZER SETTINGS: RBW=VBW=3kHz

GSM 850

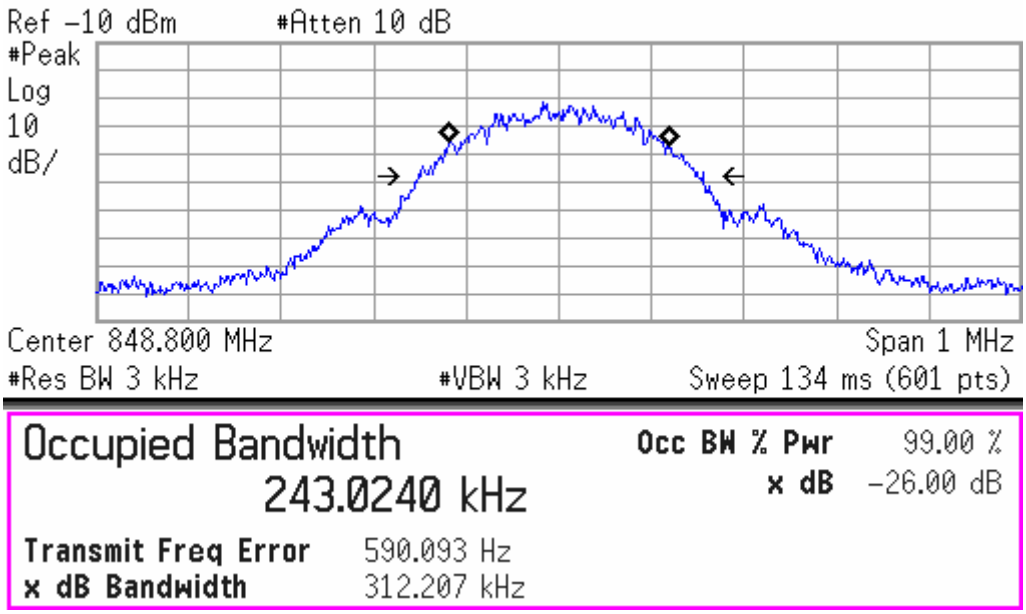
Channel 128-Occupied Bandwidth (-26dBc BW)



Channel 190-Occupied Bandwidth (-26dBc BW)



Channel 251-Occupied Bandwidth (-26dBc BW)



PCS 1900(-26dBc)

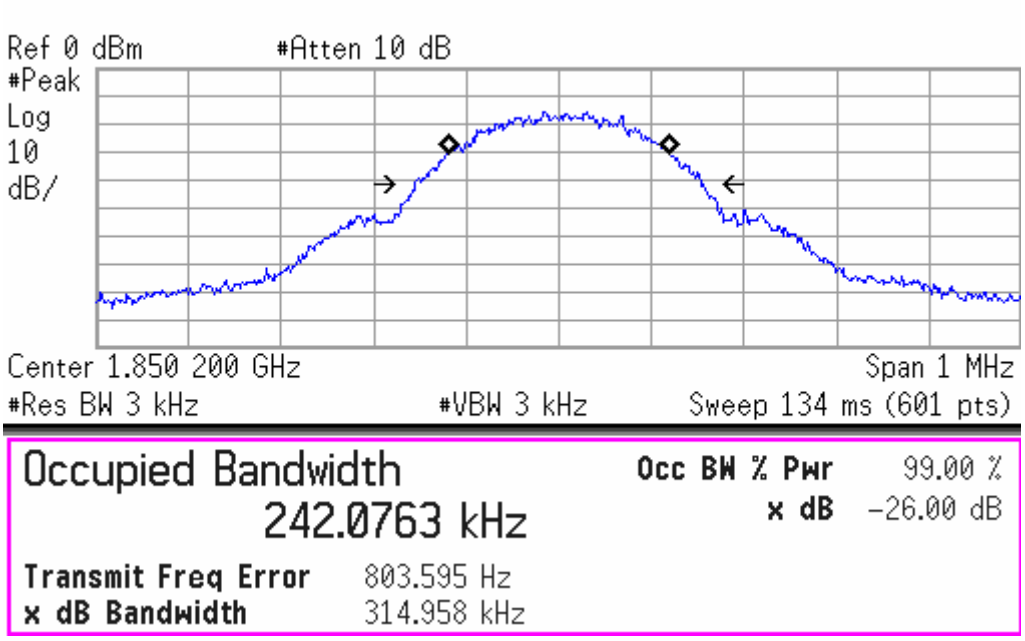
EUT1:

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
1850.2	314.958
1880.0	297.540
1909.8	302.653

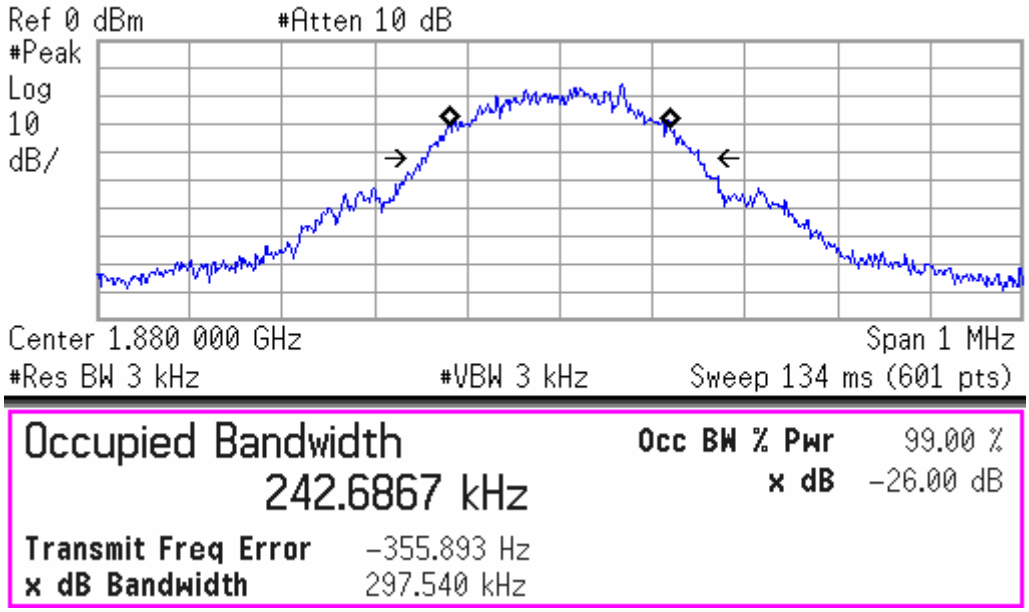
ANALYZER SETTINGS: RBW=VBW=3kHz;

PCS 1900

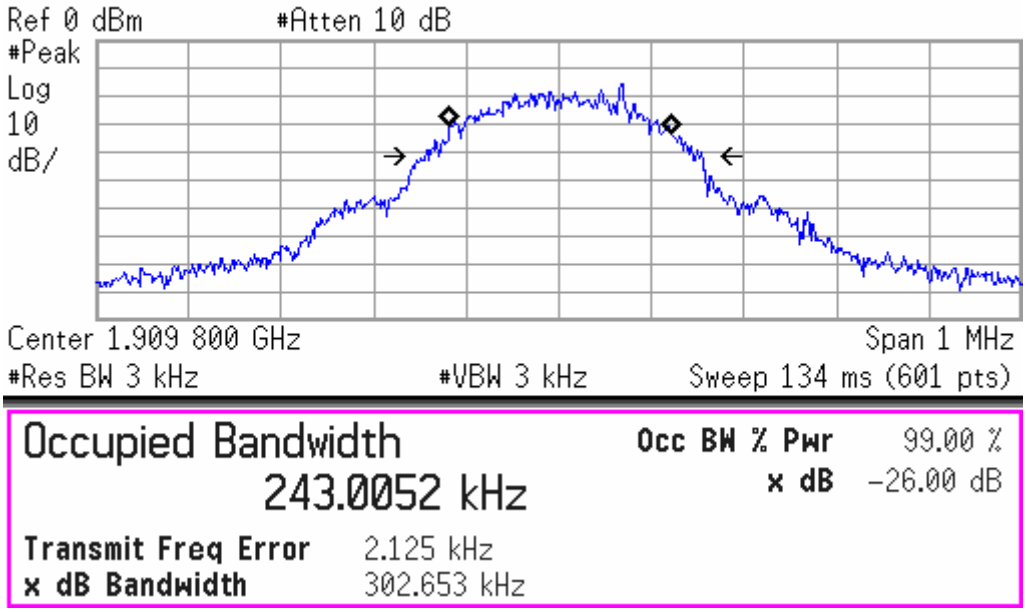
Channel 512-Occupied Bandwidth (-26dBc BW)



Channel 661-Occupied Bandwidth (-26dBc BW)



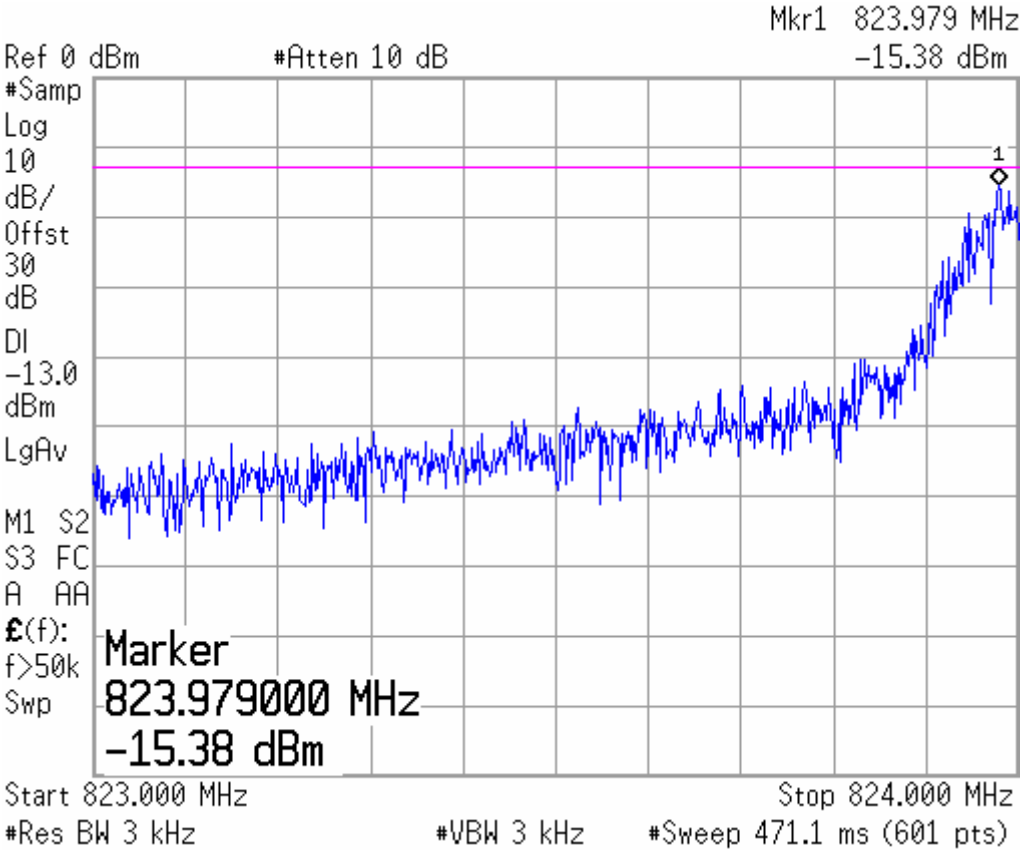
Channel 810-Occupied Bandwidth (-26dBc BW)



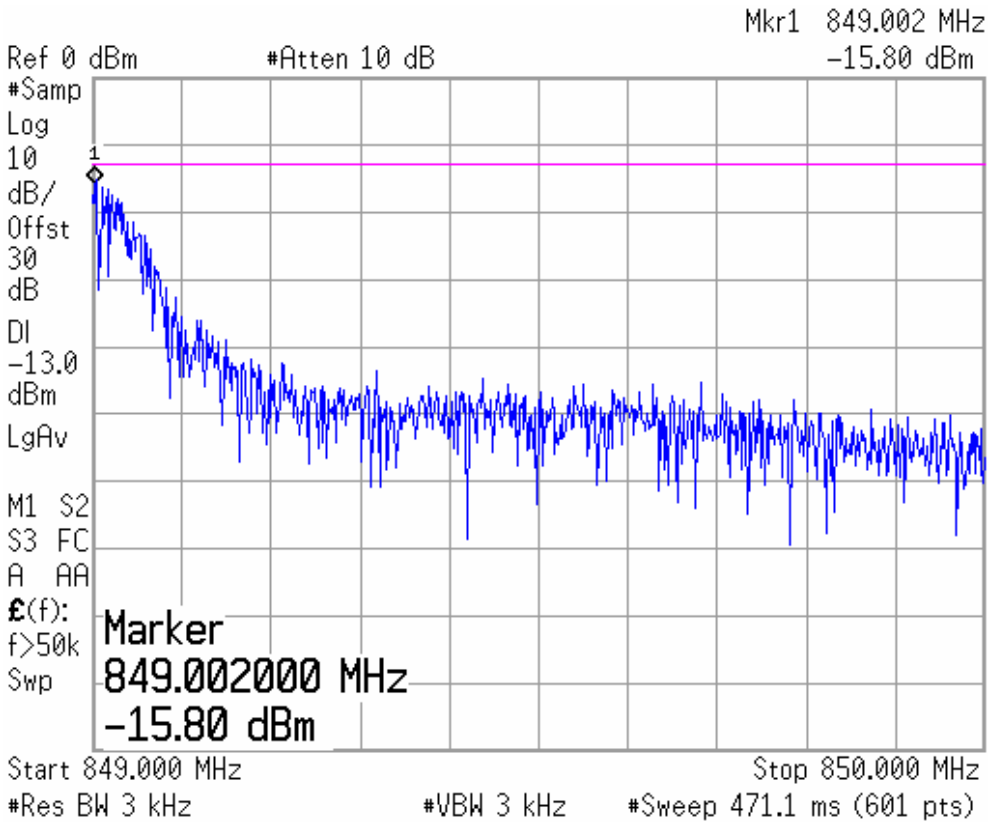
A.7 BAND EDGE COMPLIANCE (§22.917(b)/§24.238(b))

GSM850

LOW BAND EDGE BLOCK-A (GSM850)-Channel 128

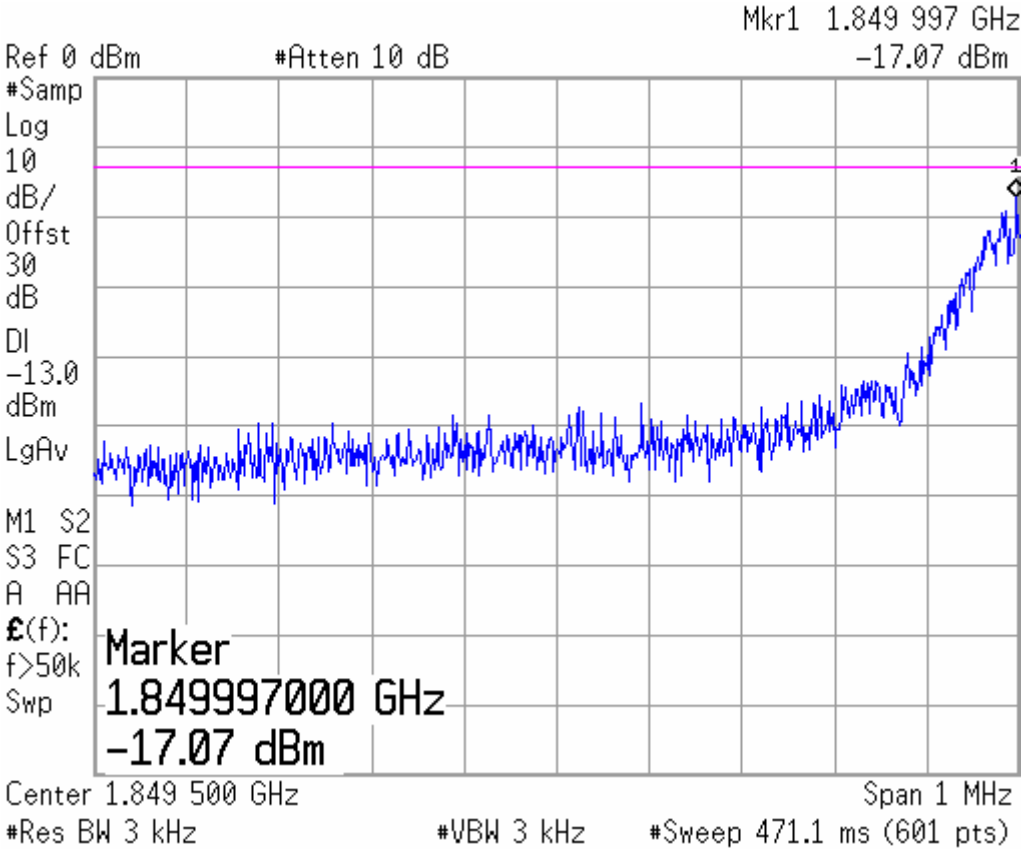


HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251

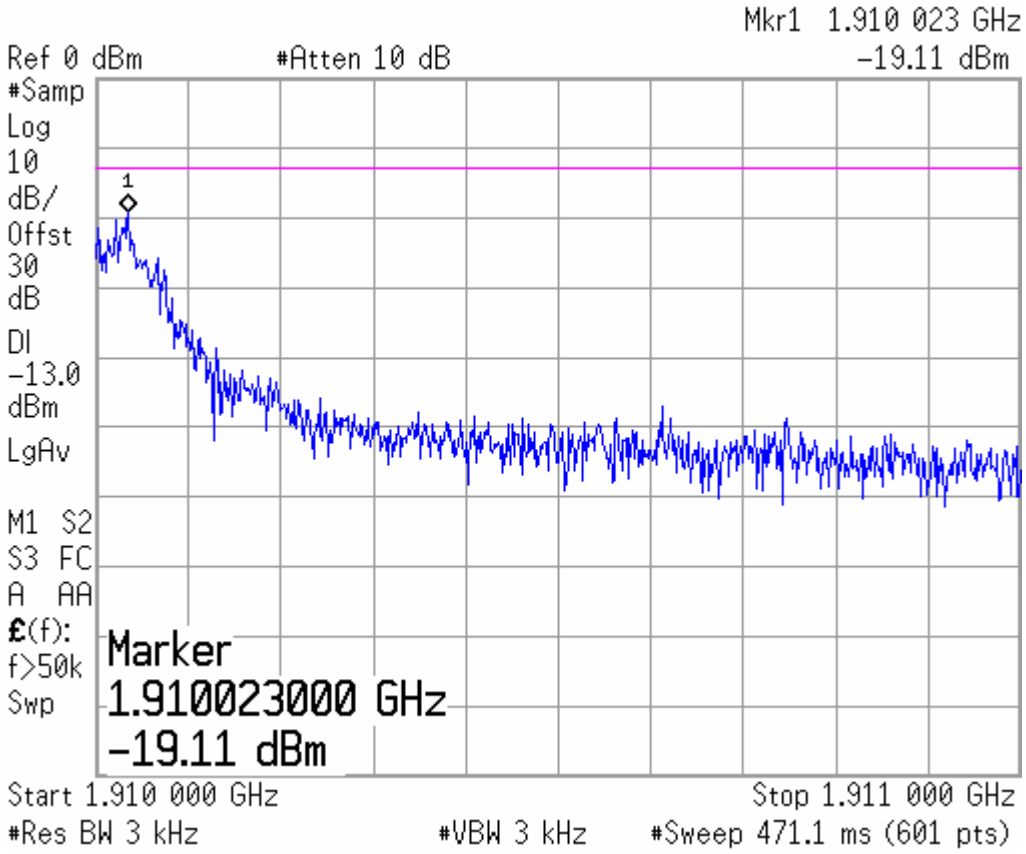


PCS 1900

LOW BAND EDGE BLOCK-A (PCS-1900)-Channel 512



HIGH BAND EDGE BLOCK-C (PCS-1900) –Channel 810



A.8 CONDUCTED SPURIOUS EMISSION (§2.1057/§22.917/§24.238)

A.8.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

GSM850 Transmitter

Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

PCS1900 Transmitter

Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

A. 8.2 Measurement Limit

Sec. 24.238 Emission Limits.

(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

A. 8.3 Measurement result

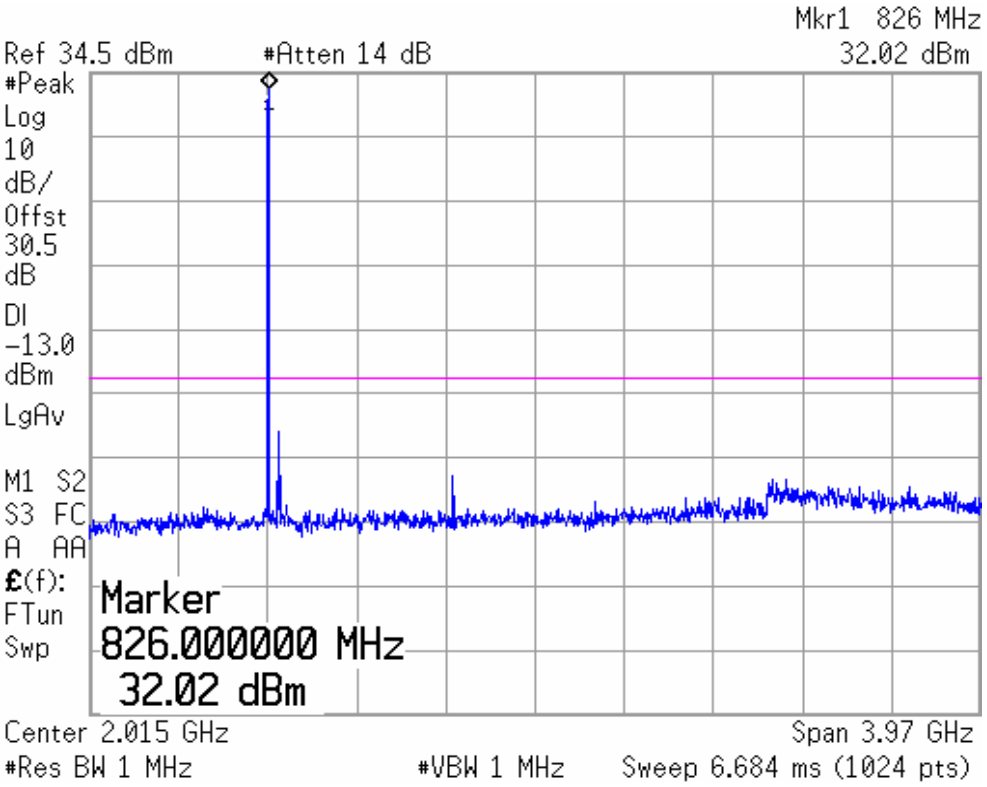
GSM850

Harmonic	Tx ch. 128 Freq. (MHz)	Level (dBm)	Tx ch. 190 Freq. (MHz)	Level (dBm)	Tx ch. Freq. (MHz) 251	Level (dBm)
2	1648.4	nf	1673.2	nf	1697.6	nf
3	2472.6	nf	2509.8	nf	2546.4	nf
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						

A.8.3.1 Channel 128: 30MHz – 4GHz

Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.



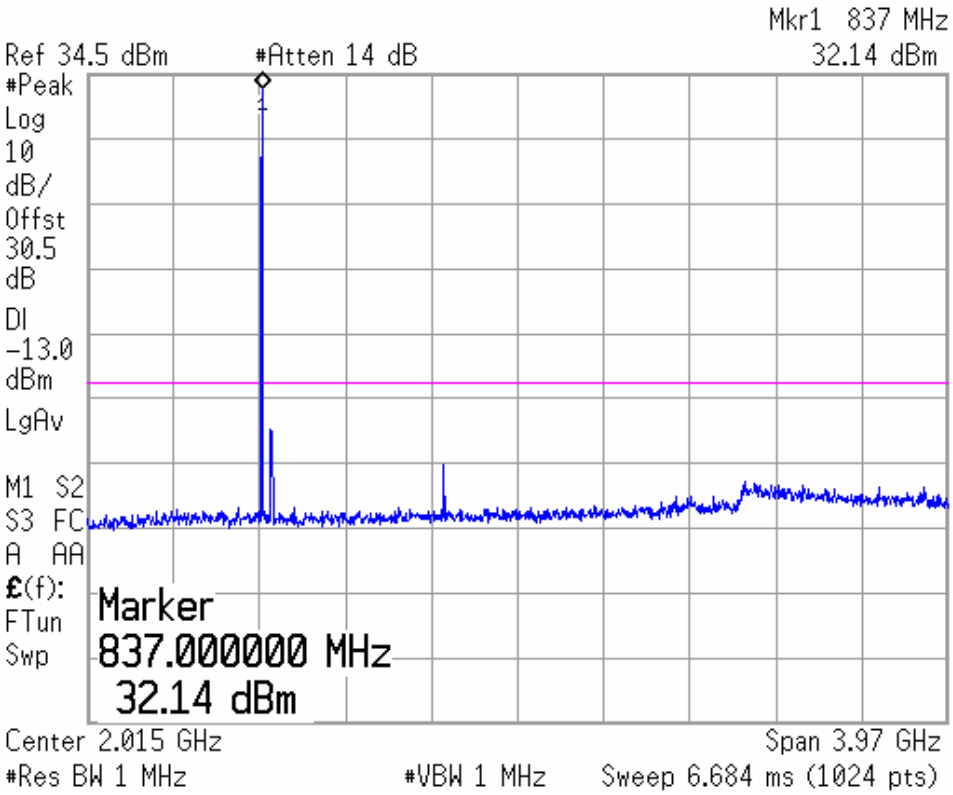
A.8.3.2 Channel 128: 4GHz – 20GHz

Spurious emission limit –13dBm.

A.8.3.3 Channel 190: 30MHz – 4GHz

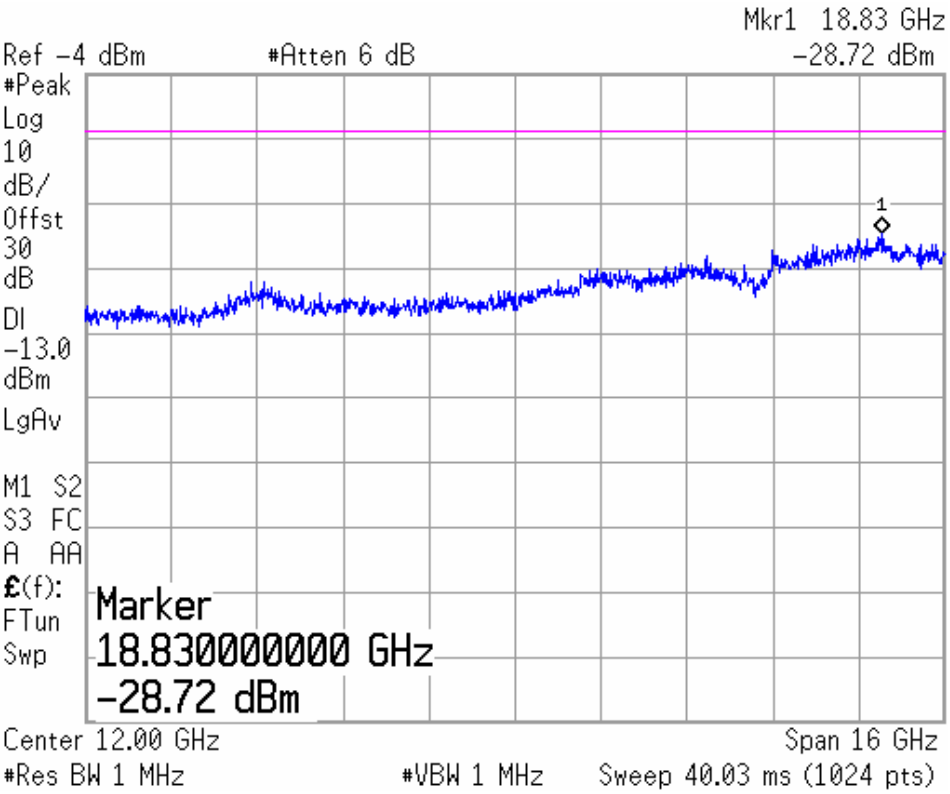
Spurious emission limit –13dBm

NOTE: peak above the limit line is the carrier frequency.



A.8.3.4 Channel 190: 4GHz –20GHz

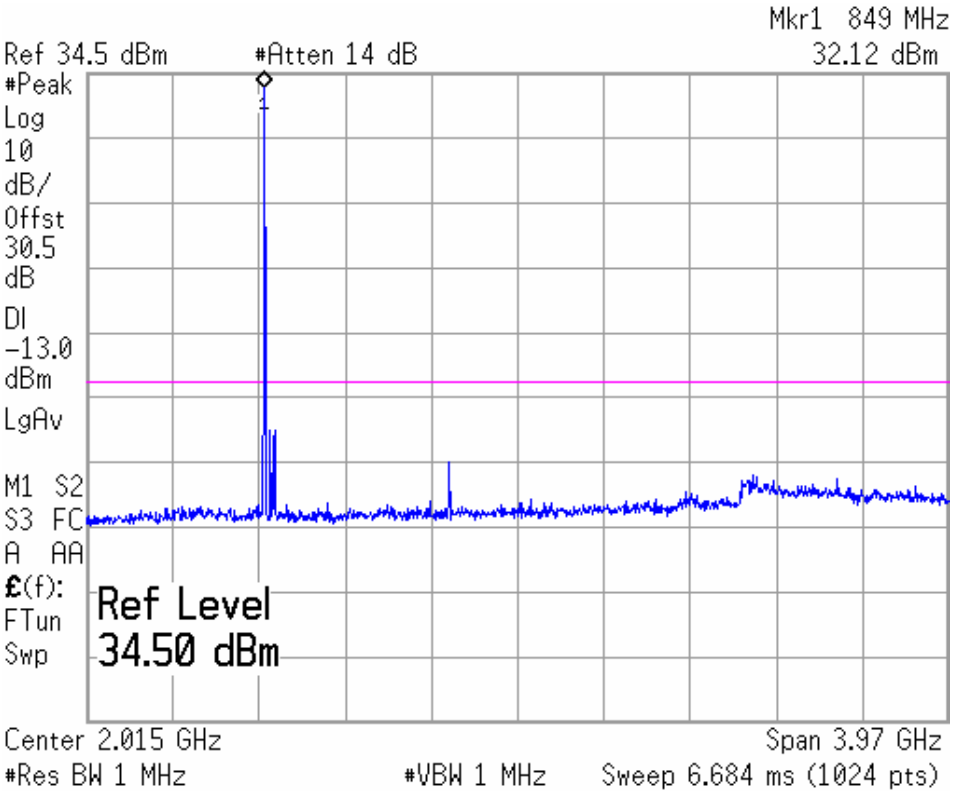
Spurious emission limit –13dBm



A.8.3.5 Channel 251: 30MHz – 4GHz

Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.



A.8.3.6 Channel 251: 4GHz – 20GHz

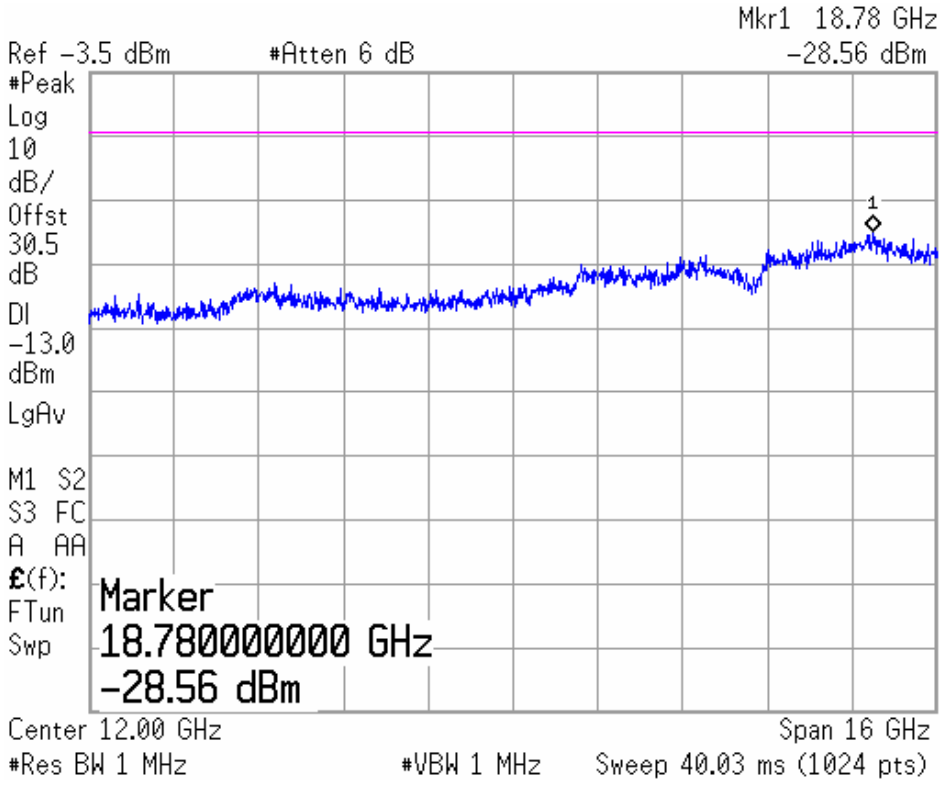
Spurious emission limit –13dBm.

A.8.3.7 Idle mode: 30MHz – 4GHz

Spurious emission limit –13dBm.

A.8.3.8 Idle mode: 4GHz – 20GHz

Spurious emission limit –13dBm.



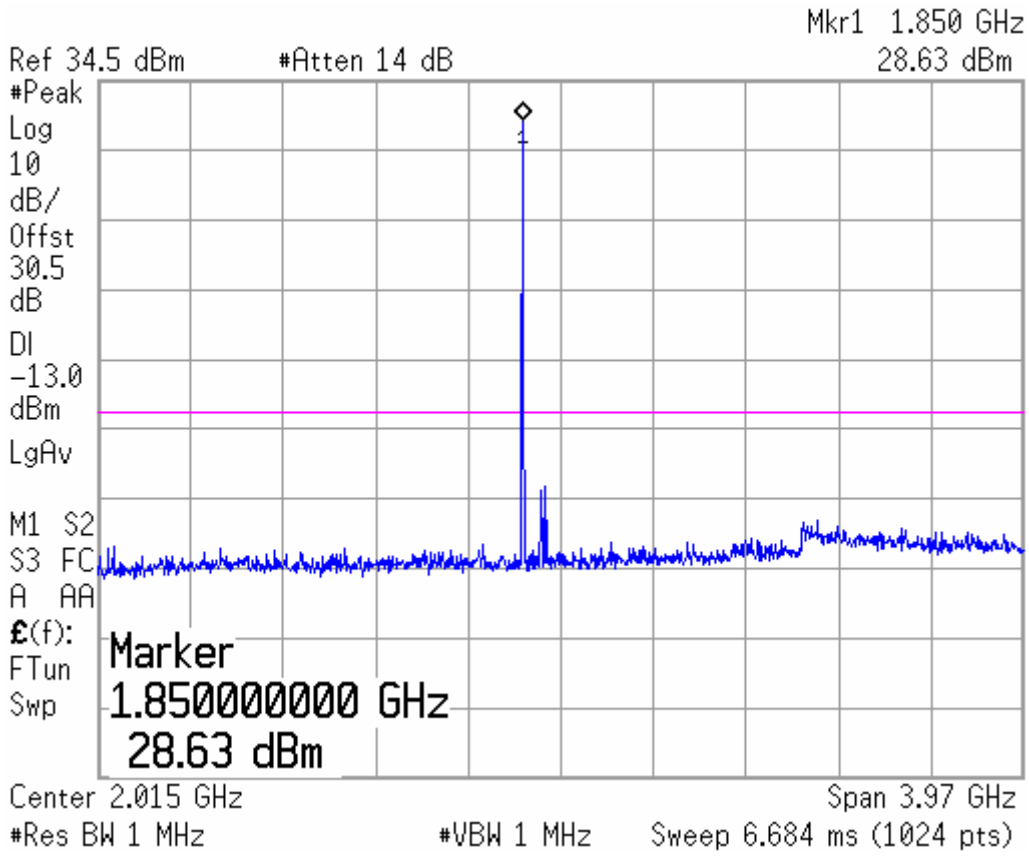
PCS1900

Harmonic	Tx ch. 512 Freq. (MHz)	Level (dBm)	Tx ch. 661 Freq. (MHz)	Level (dBm)	Tx ch. 810 Freq. (MHz)	Level (dBm)
2	3700.4	nf	3760	nf	3819.6	nf
3	5550.6	nf	5640	nf	5729.4	nf
4	7400.8	nf	7520	nf	7639.2	nf
5	9251.0	nf	9400	nf	9549.0	nf
6	11101.2	nf	11280	nf	11458.8	nf
7	12951.4	nf	13160	nf	13368.6	nf
8	14801.6	nf	15040	nf	15278.4	nf
9	16651.8	nf	16920	nf	17188.2	nf
10	18502.0	nf	18800	nf	19098.0	nf
nf: Noise floor						

A. 8.3.9 Channel 512: 30MHz – 4GHz

Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.



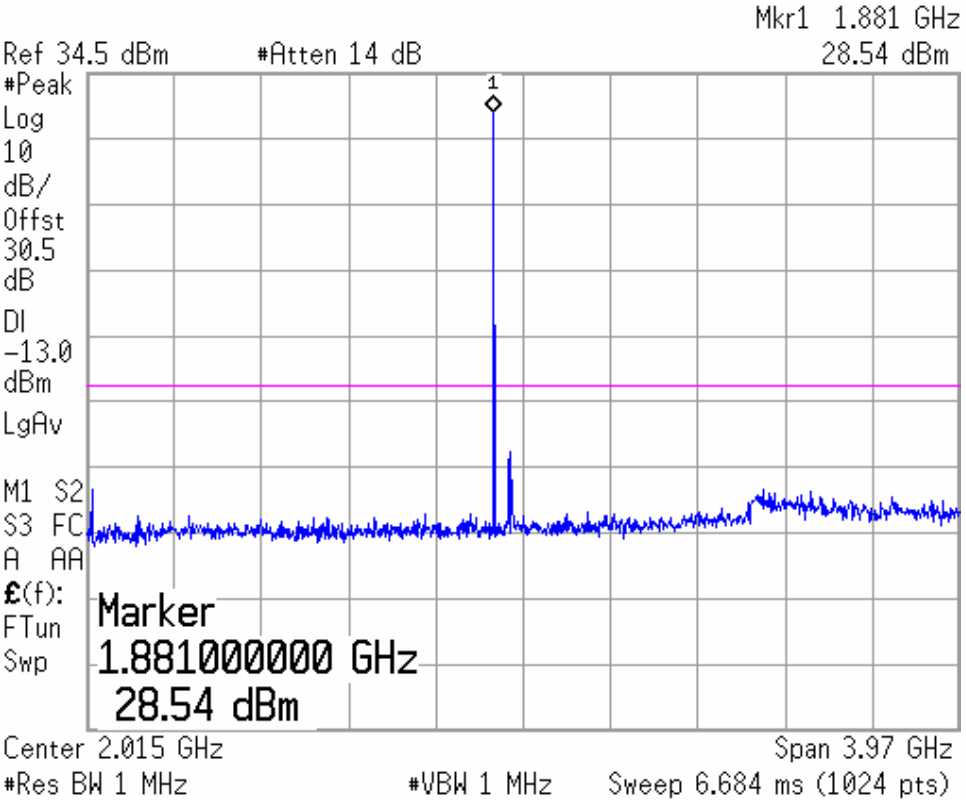
A. 8.3.10 Channel 512: 4GHz – 20GHz

Spurious emission limit –13dBm.

A. 8.3.11 Channel 661: 30MHz – 4GHz

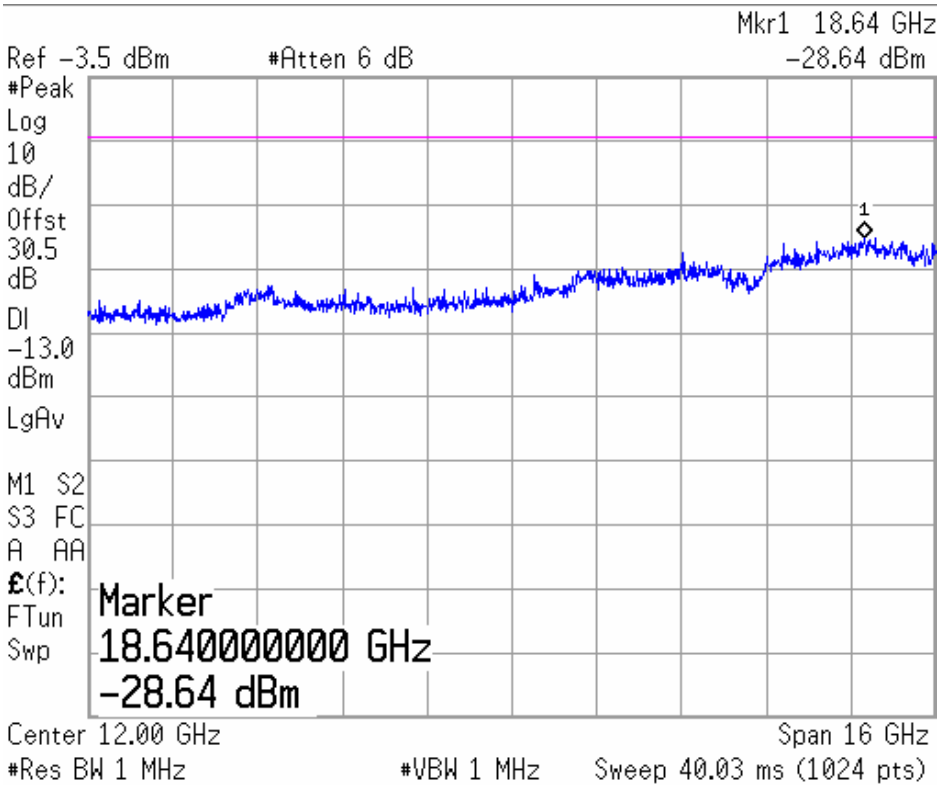
Spurious emission limit –13dBm

NOTE: peak above the limit line is the carrier frequency.



A. 8.3.12 Channel 661: 4GHz –20GHz

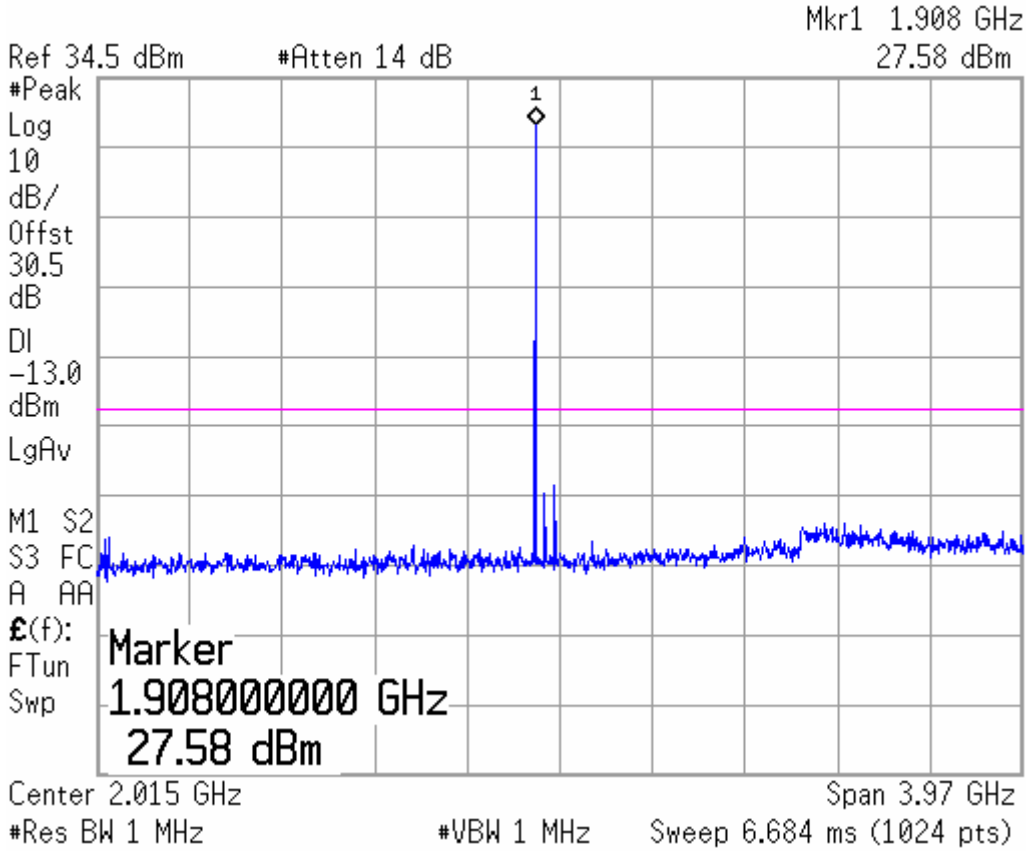
Spurious emission limit –13dBm



A. 8.3.13 Channel 810: 30MHz – 4GHz

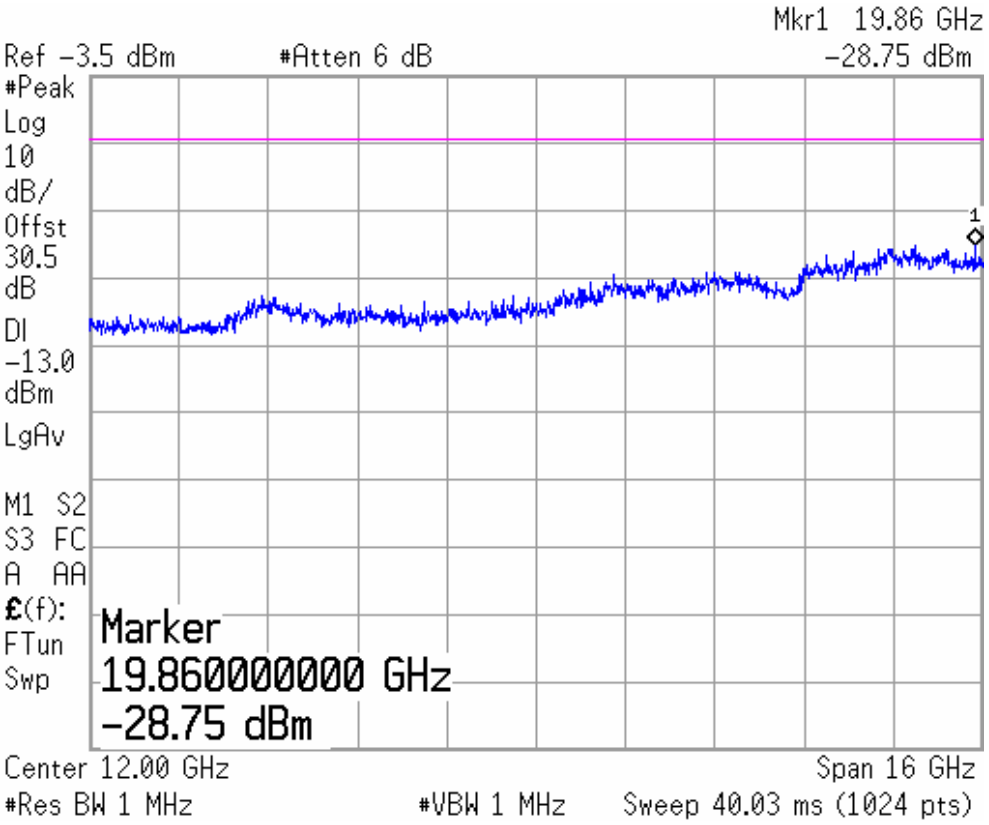
Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.



A. 8.3.14 Channel 810: 4GHz – 20GHz

Spurious emission limit –13dBm.

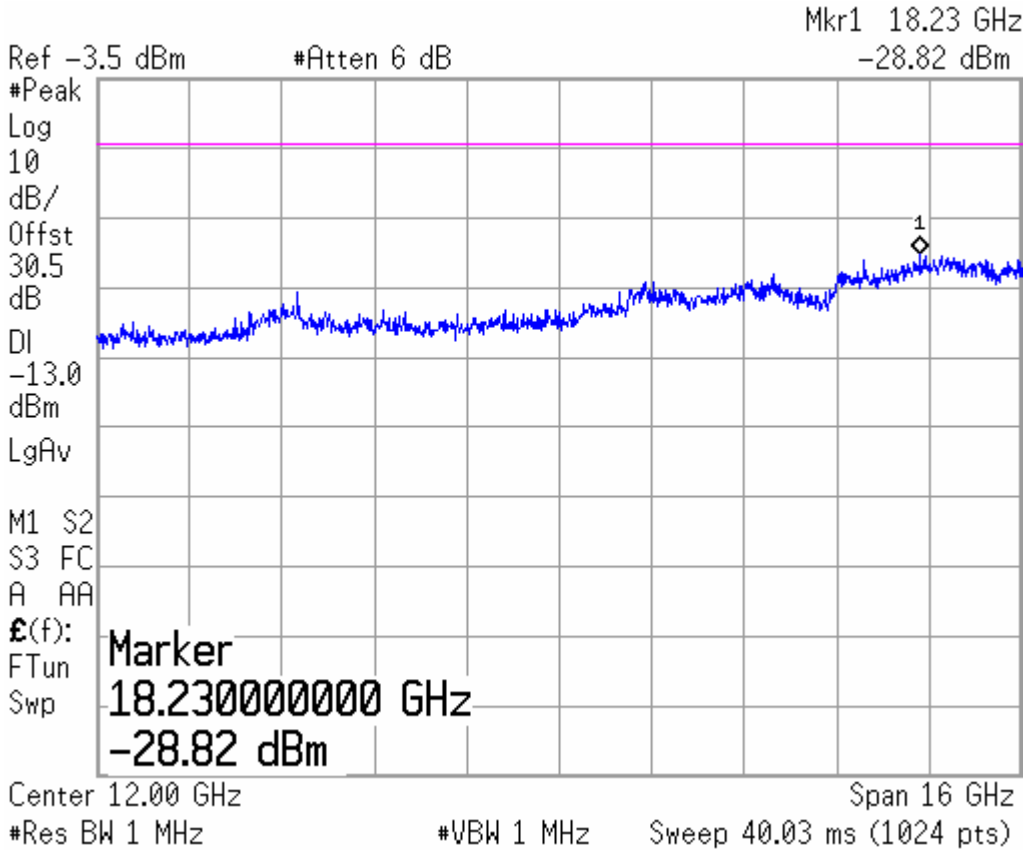


A. 8.3.15 Idle mode: 30MHz – 4GHz

Spurious emission limit –13dBm.

A. 8.3.16 Idle mode: 4GHz – 20GHz

Spurious emission limit -13dBm.



ANNEX B PHOTOGRAPHS OF EUT

External Photo

Mobile Phone

Mobile Phone

Charger (AC/DC Adapter)

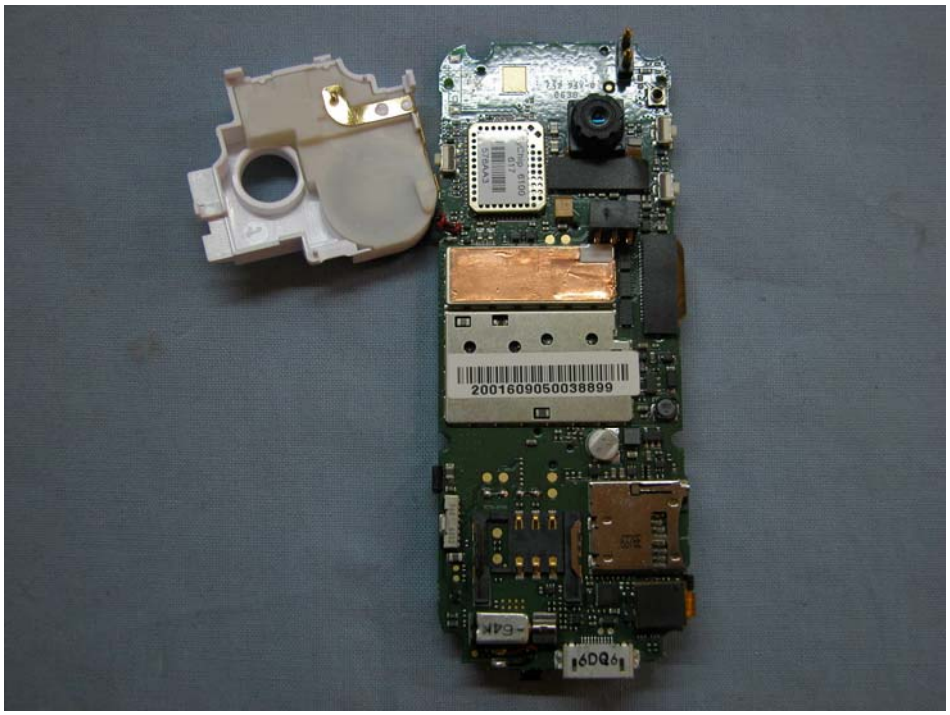
Internal Photo

Mobile phone Disassembly

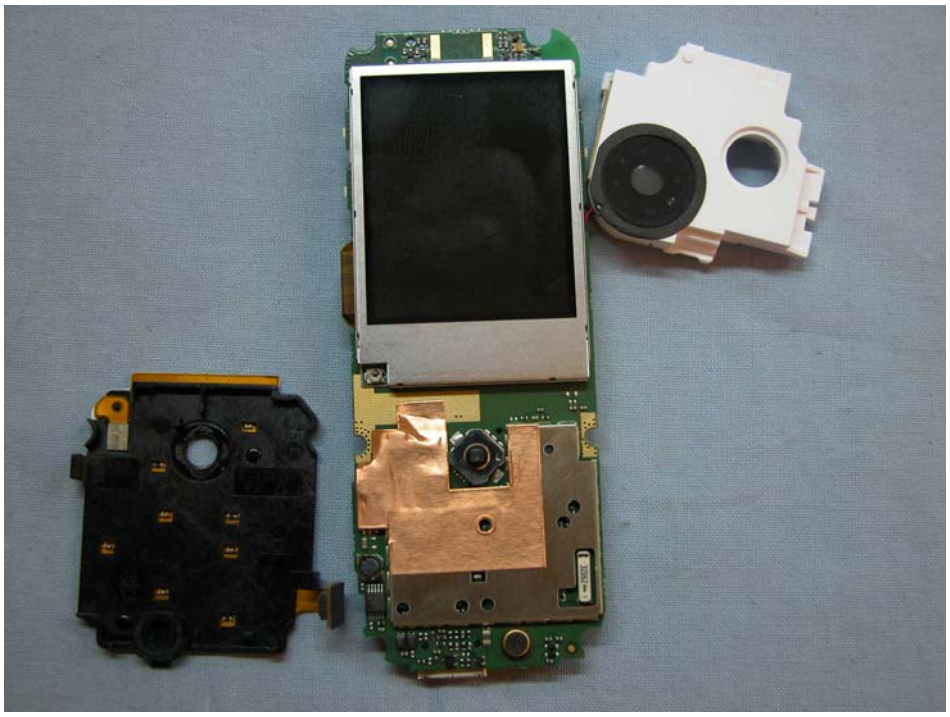
Mobile phone Disassembly

Mobile phone Disassembly

Mobile phone Disassembly

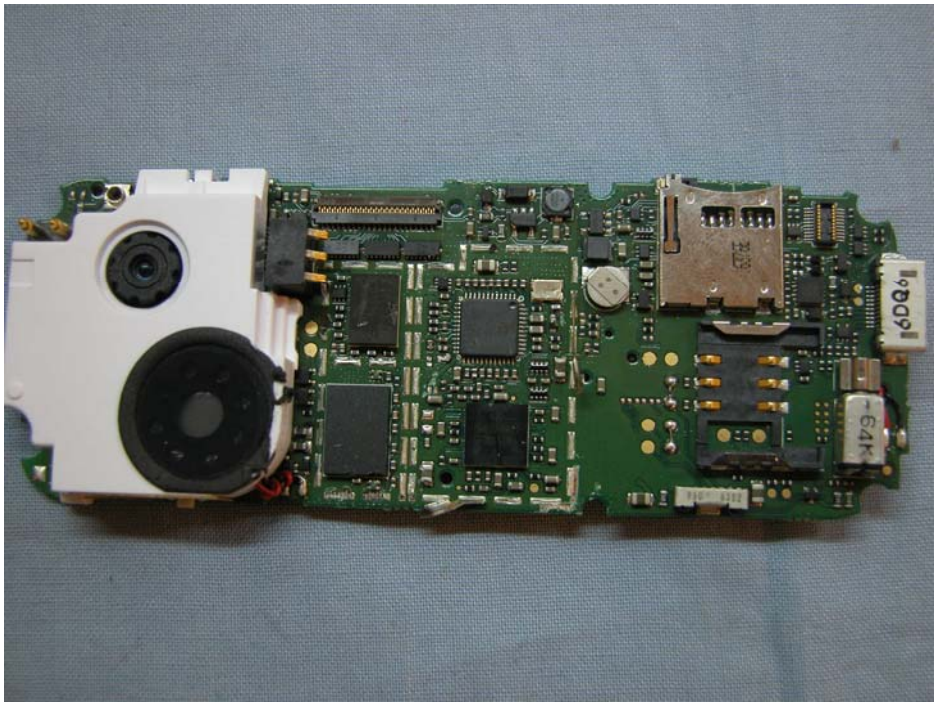


Mobile phone Disassembly

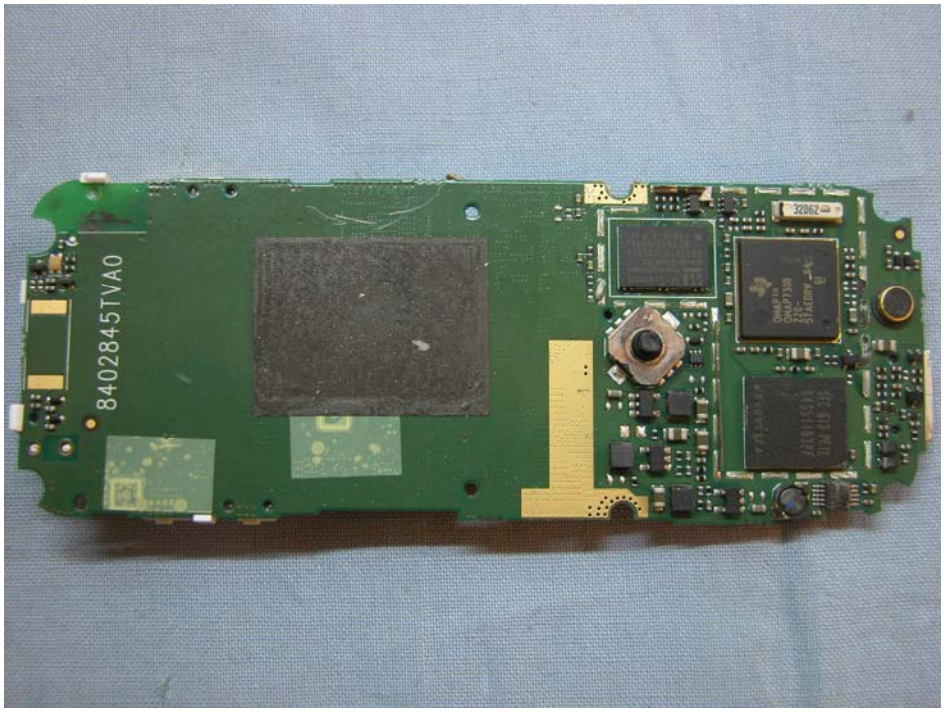


Mobile phone Disassembly

Mobile phone Disassembly

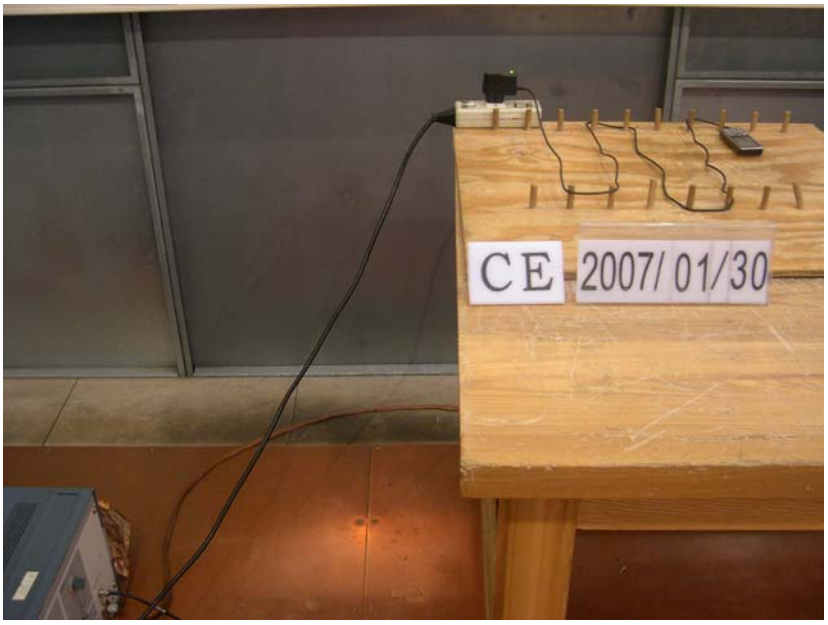


Mobile phone Disassembly



Mobile phone Disassembly

ANNEX C TEST LAYOUT



Pic1 Conducted Emission

Pic2 Radiated Spurious Emission

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