TEST REPORT

No. FCC-PART24-2005006

Test name	FCC Test
Product	GSM Mobile Station
Model	T728
Client	TCL Mobile Communication Co.,Ltd

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 Mobile Station	**Model** / **Trade mark**	T728
Client	TCL Mobile Communication Co.,Ltd		
Manufacturer	TCL Mobile Communication Co.,Ltd	**Arrival Date of sample**	Jun,22 2005
Place of sampling	(Blank)	**Carrier of the samples**	Luo Jian
Quantity of the samples	3	**Date of product**	/
Base of the samples	(Blank)	**Items of test**	8
Series number	355995001000423		
Standard(s)	FCC Part 24, FCC Part 22		
Conclusion	**Final Judgment: Pass** (Stamp) **Date of issue:** Jul 15, 2005		
Comment	The test result only relates to the tested sample.		

Approved by (Lu Minniu) **Reviewed by** (Zhang Rui) **Performed by** (Song Chongwen)

TABLE OF CONTENT

1 COMPETENCE AND WARRANTIES

Telecommunication Metrology Center of Ministry of Information Industry is a test laboratory accredited by DAR (DATech) – Deutschen Akkreditierungs Rat (Deutsche Akkreditierungsstelle Technik), for the tests indicated in the Certificate No. **DAT-P-114/01-10**.

Telecommunication Metrology Center of Ministry of Information Industry 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**.

Telecommunication Metrology Center of Ministry of Information Industry has been accepted by the CETECOM Competent Body for the EMC test reports since April 2000.

Telecommunication Metrology Center of Ministry of Information Industry is a testing laboratory competent to carry out the tests described in this report.

Telecommunication Metrology Center of Ministry of Information Industry 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 **Telecommunication Metrology Center of Ministry of Information Industry** at the time of execution of the test.

Telecommunication Metrology Center of Ministry of Information Industry 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 GENERAL CONDITIONS

2.1 This report only refers to the item that has undergone the test.

2.2 This report standalone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities.

2.3 This document is only valid if complete; no partial reproduction can be made without written approval of Telecommunication Metrology Center of Ministry of Information Industry.

2.4 This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of Telecommunication Metrology Center of Ministry of Information Industry and the Accreditation Bodies, if it applies.

3 ABOUT EUT

3.1 Addressing Information Related to EUT

Table 1: Applicant's details (The Client)

Name or Company	TCL Mobile Communication Co.,Ltd
Address/Post	No.23 Zone,Zhongkai High Technology Development Zone,Huizhou,guangdong
City	Huizhou
Postal Code	516006
Country	China
Telephone	0752- 2636729
Fax	0752- 2636525

Table 2: Manufacturer's details

Name or Company	TCL Mobile Communication Co.,Ltd
Address/Post	No.23 Zone,Zhongkai High Technology Development Zone,Huizhou,guangdong
City	Huizhou
Postal Code	516006
Country	China
Telephone	0752- 2636729
Fax	0752- 2636525

3.2 Equipment under test (EUT)

Model	T728
Description	GSM mobile station
IMEI	EUT1: 355995001000423;
Hardware status	V2.0
Software status	W04.49
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	External
Power supply	Battery or Charger (AC Adaptor)
Output power	30.88dBm(1.22W) maximum ERP measured for GSM 850 32.89dBm(1.95W) maximum EIRP measured for PCS 1900
Extreme vol. Limits	3.4VDC to 4.2VDC (nominal: 3.7 VDC)
Extreme temp. Tolerance	-30°C to +50°C

3.3 Photographs of Equipment under test

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

4 LABORATORY 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

5 SUMMARY OF TEST RESULTS

Abbreviations used in this clause:	
P	Pass
NA	Not applicable
F	Fail

Clause	List	Clause in FCC rules	Verdict
1	POWER OUTPUT	22.913(a)/24.232(b)	P
2	FREQUENCY STABILITY	2.1055/24.235	P
3	OCCUPIED BANDWIDTH	2.1049(h)(i)	P
4	EMISSION BANDWIDTH	22.917(b)/24.238(b)	P
5	EMISSION LIMIT	2.1051/22.917/24.238	P
6	BAND EDGE COMPLIANCE	22.917(b)/24.238(b)	P
7	CONDUCTED SPURIOUS EMISSIONS	2.1057/22.917/24.238	P
8	CONDUCTED EMISSIONS	15.107/207	P

6 MAIN TEST INSTRUMENTS

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

7 TEST PERIOD

The performed test started on Jul,5, 2005 and finished on Jul, 15, 2005.

8 TEST LOCATION

Safety & EMC laboratory of Telecommunication Metrology Center of Ministry of Information Industry.

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 paragraph contains Burst Average conducted 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: 355995001000423;

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	5	31.86
836.6	5	32.26
848.8	5	32.43

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: 355995001000423;

Frequency(MHz)	Power Step	Peak output power(dBm)
1850.2	0	29.77
1880.0	0	28.99
1909.8	0	28.66

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

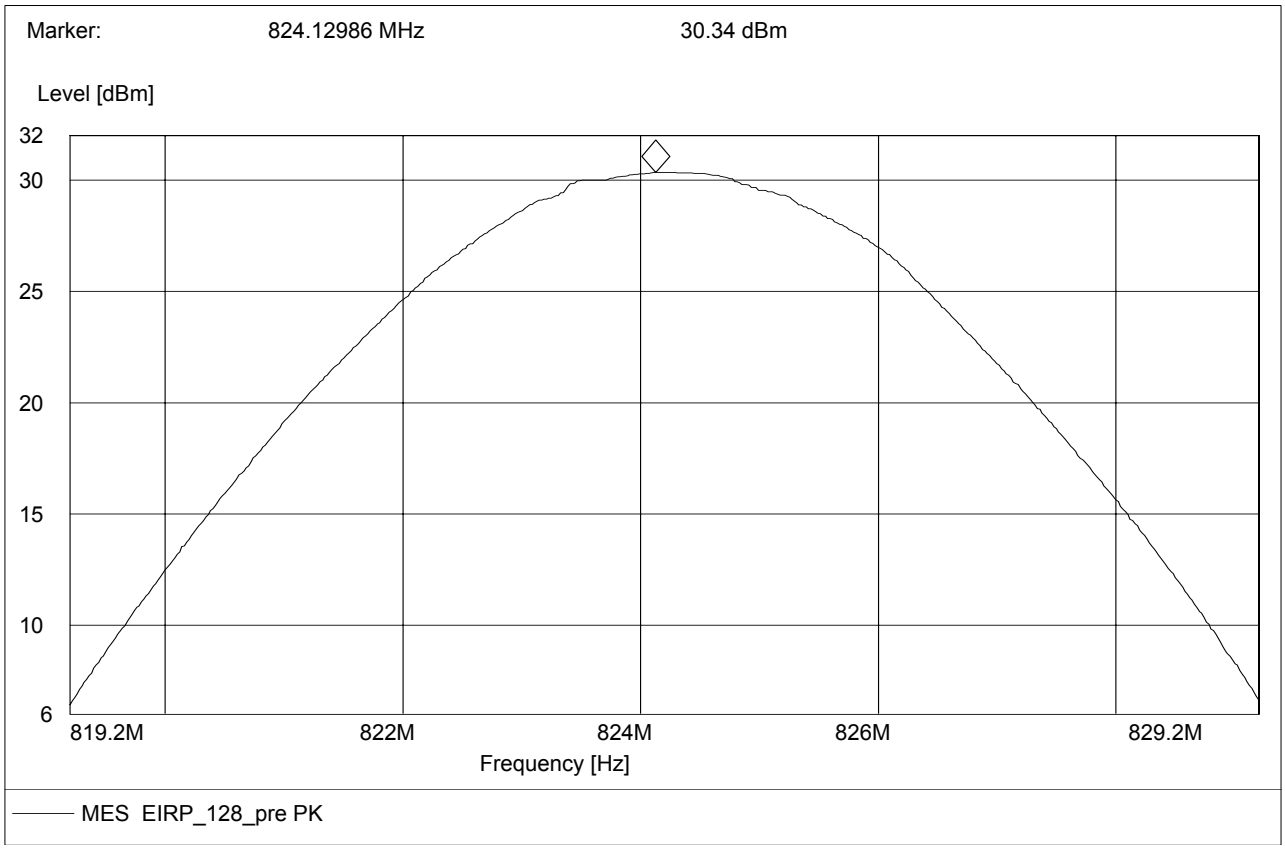
Power Step	Burst Peak ERP (dBm)
5	≤38.45dBm (7W)

Measurement result

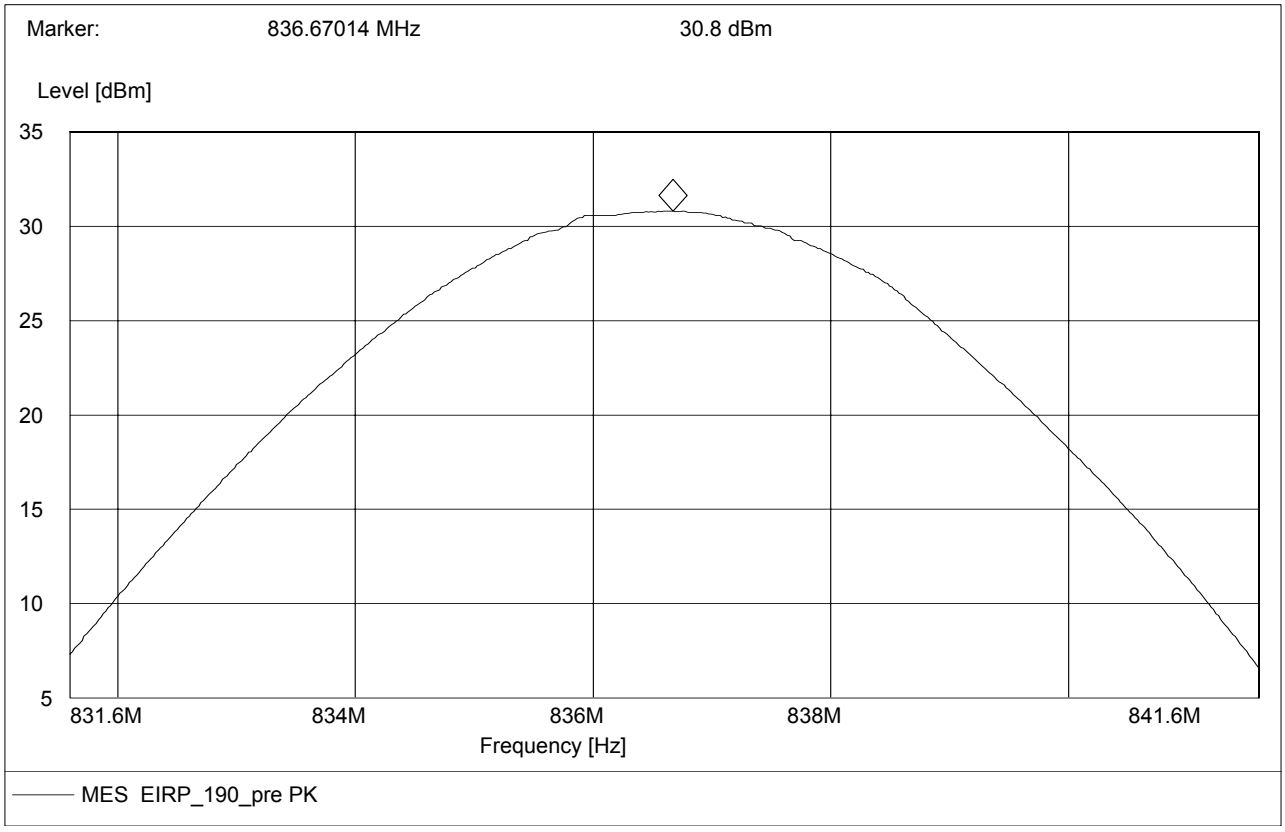
Frequency(MHz)	Power Step	Peak ERP(dBm)
824.2	5	30.34
836.6	5	30.80
848.8	5	30.88

ANALYZER SETTINGS: RBW = VBW = 3MHz

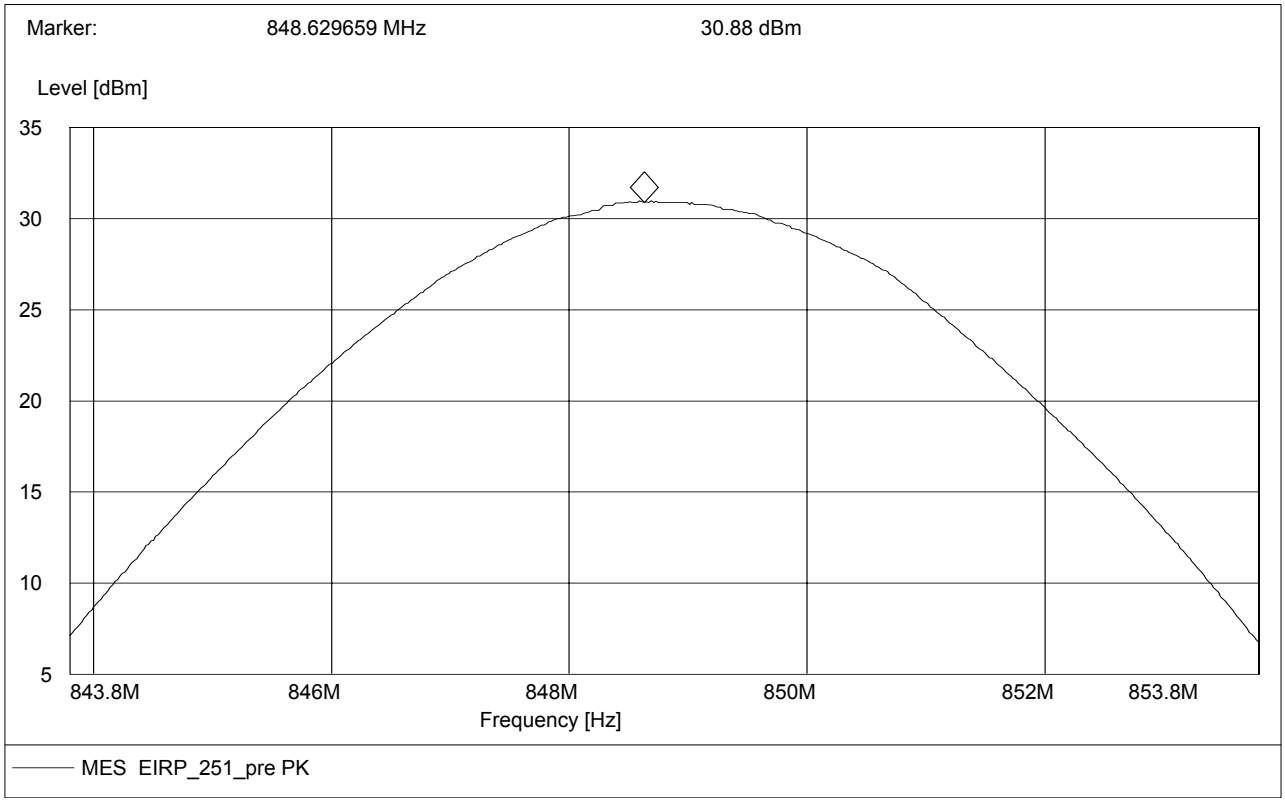
ERP- channel 128



ERP- channel 190



ERP- channel 251



PCS1900-EIRP 24.232(b)

Limits

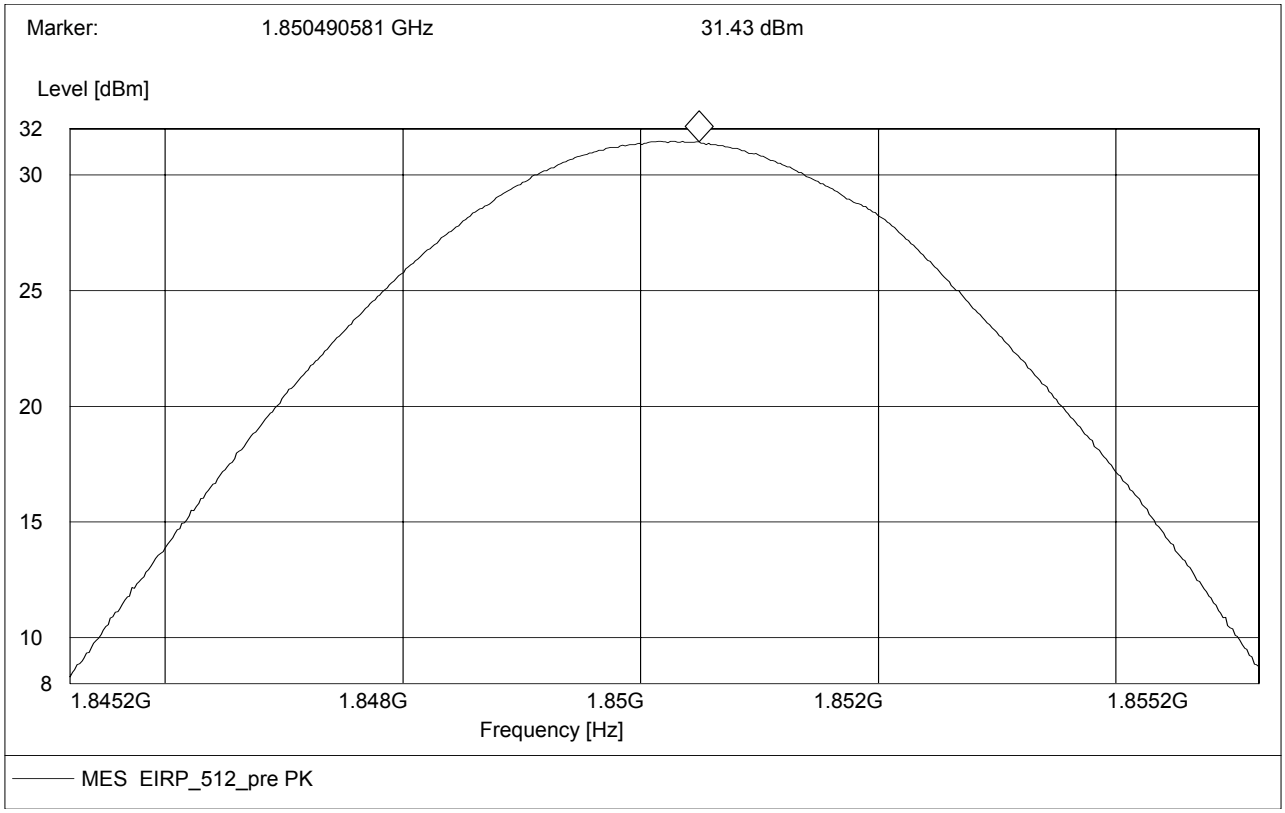
Power Step	Burst Peak EIRP (dBm)
0	≤33dBm (2W)

Measurement result

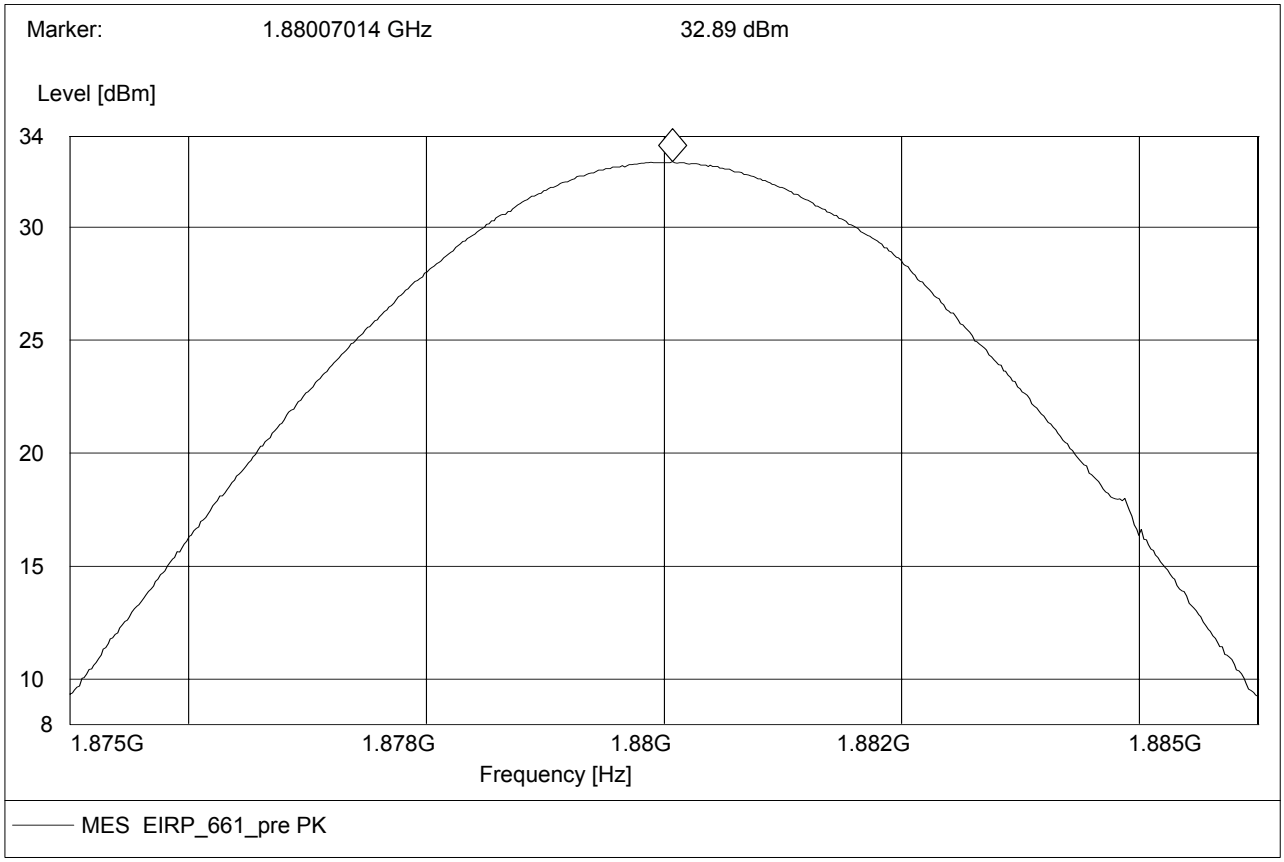
Frequency(MHz)	Power Step	Peak EIRP(dBm)
1850.2	0	31.43
1880.0	0	32.89
1909.8	0	28.22

ANALYZER SETTINGS: RBW = VBW = 3MHz

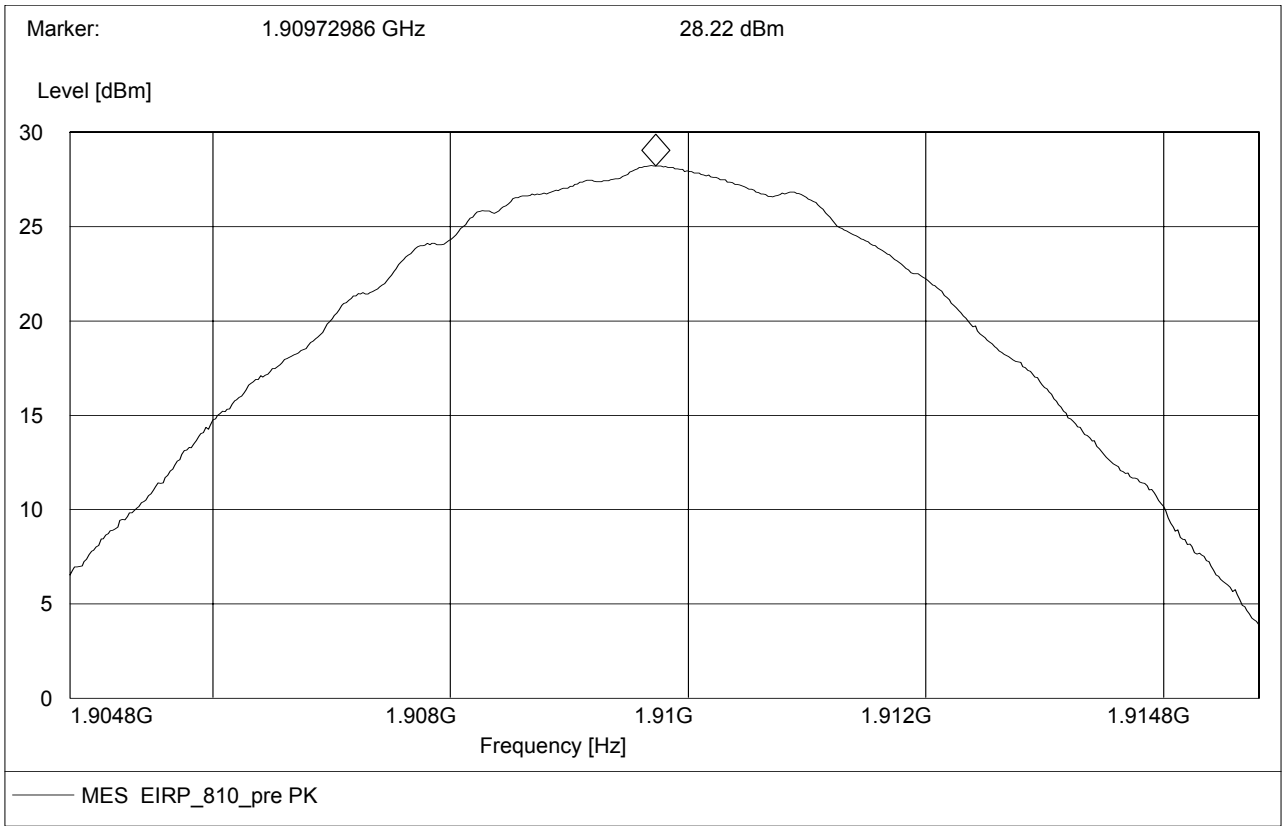
A.1.3.4.1 EIRP CHANNEL 512



A.1.3.4.2 EIRP CHANNEL 661



A.1.3.4.3 EIRP CHANNEL 810



A.2 FREQUENCY STABILITY (§2.1055/§24.235)

A.2.1 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°C.
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°C increments from -30°C to +50°C. 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°C.
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°C to -30°C. 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°C during the measurement procedure.

A.2.2 Measurement Limit

A.2.2.1 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 3.4VDC and 4.2VDC, with a nominal voltage of 3.7VDC. 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 -8.1 % and +13.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

A.2.2.1 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.2.3 Measurement results

GSM 850

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.4	21	0.025
3.7	18	0.022
4.2	21	0.025

Frequency Error vs Temperature

temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-30	32	0.038
-20	27	0.032
-10	29	0.035
0	28	0.033
10	26	0.031
20	21	0.025
30	18	0.022
40	19	0.023
50	15	0.018

PCS 1900

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.4	19	0.010
3.7	10	0.005
4.2	21	0.011

Frequency Error vs Temperature

temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-30	38	0.020
-20	37	0.020
-10	34	0.018
0	33	0.018
10	30	0.016
20	37	0.020
30	39	0.021
40	41	0.022
50	36	0.019

A.3 OCCUPIED BANDWIDTH (§2.1049(h)(i))

A.3.1 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)

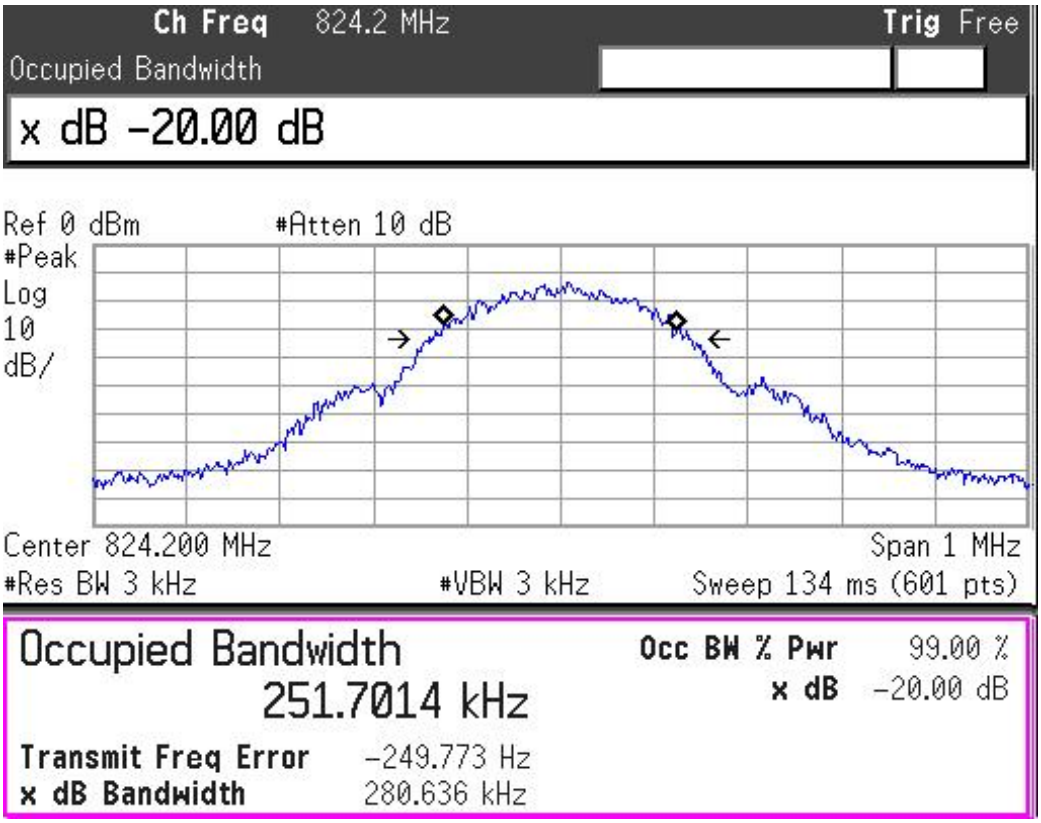
EUT1: 355995001000423

Frequency(MHz)	Occupied Bandwidth (–20dBc BW)(kHz)
824.2	280.636
836.6	271.557
848.8	274.686

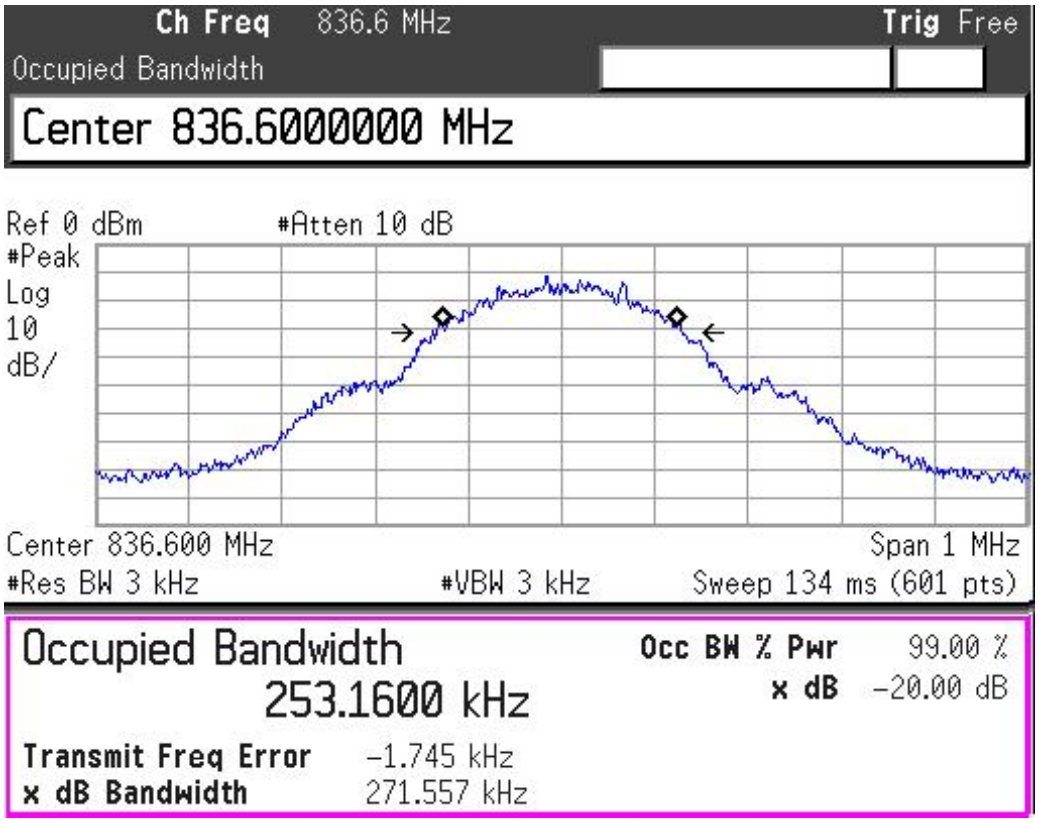
ANALYZER SETTINGS: RBW=VBW=3kHz

GSM 850

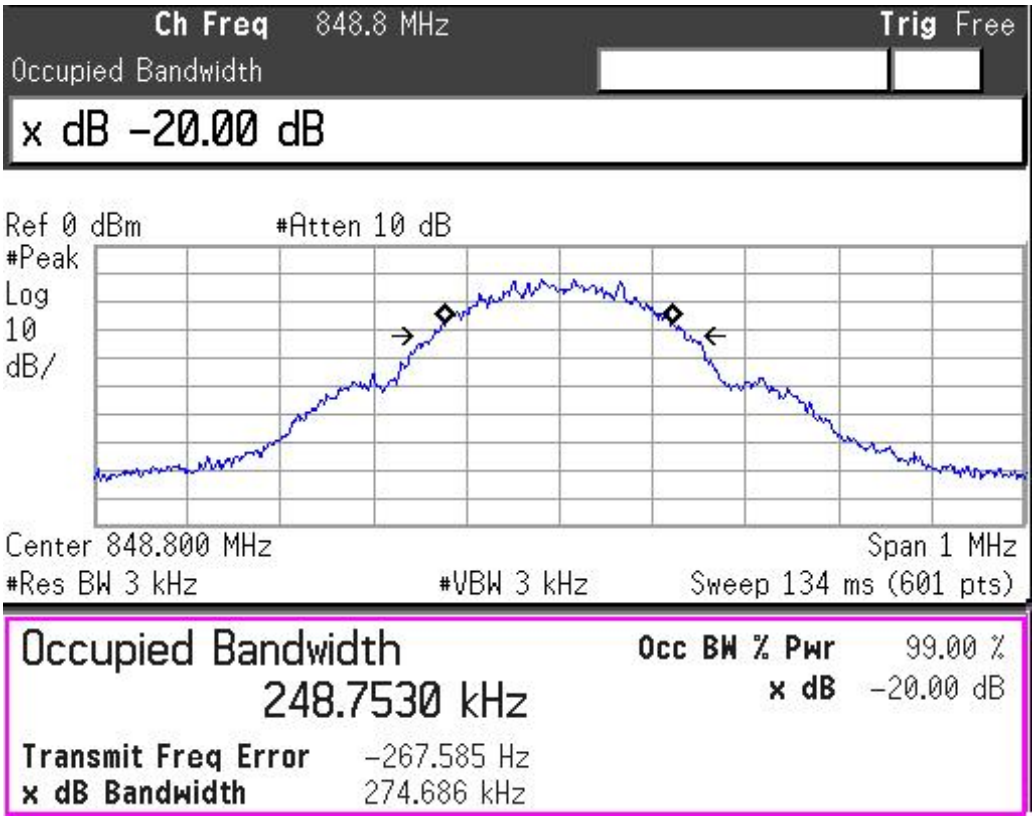
Channel 128-Occupied Bandwidth (-20dBc BW)



Channel 190-Occupied Bandwidth (-20dBc BW)



Channel 251-Occupied Bandwidth (-20dBc BW)



PCS 1900(-20dBc)

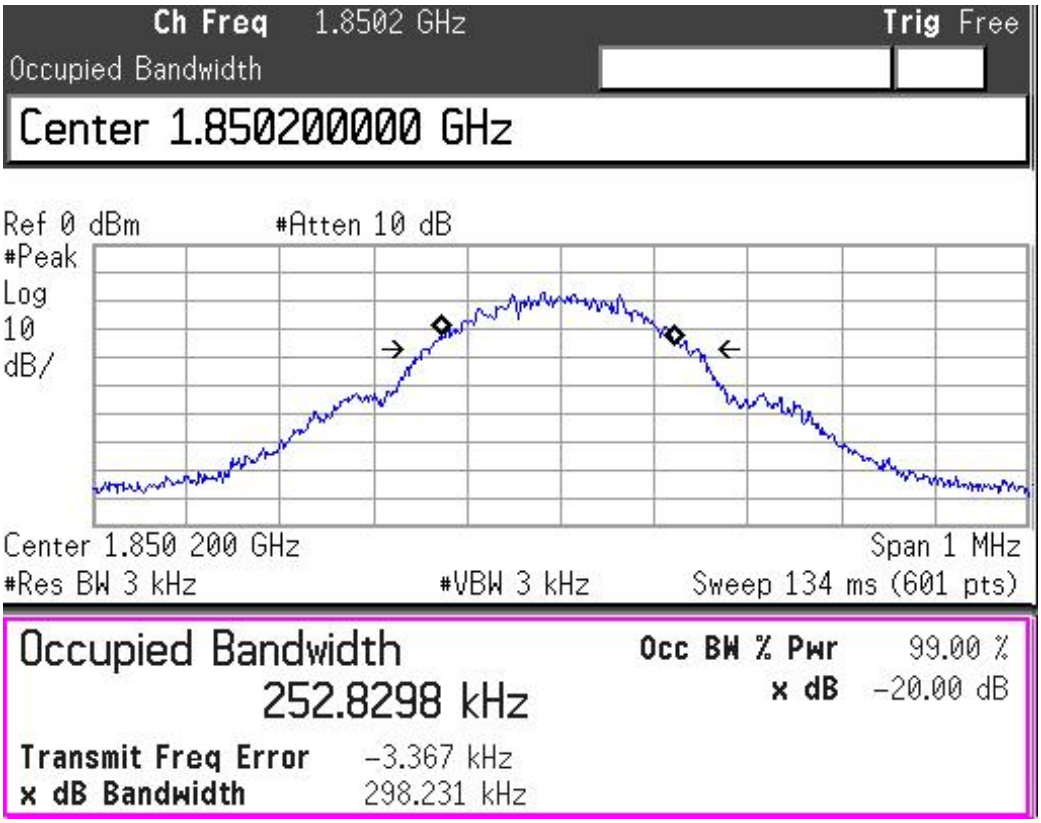
EUT1: 355995001000423

Frequency(MHz)	Occupied Bandwidth (–20dBc BW)(kHz)
1850.2	298.231
1880.0	274.081
1909.8	269.248

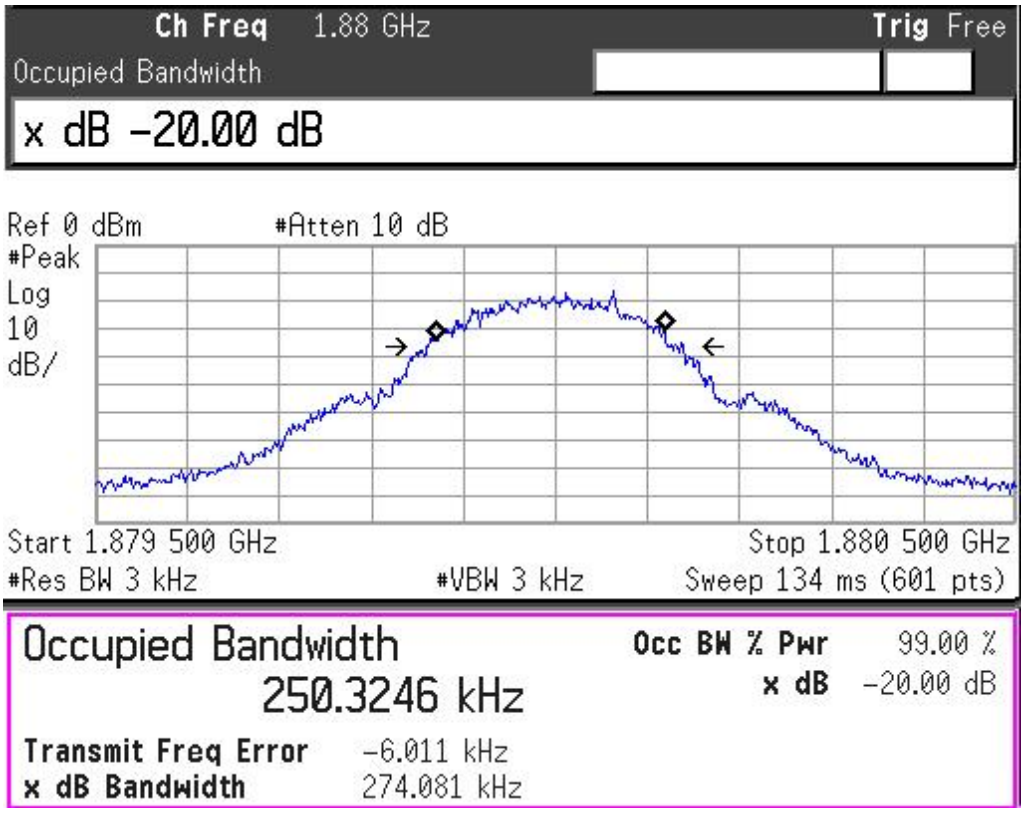
ANALYZER SETTINGS: RBW=VBW=3kHz

PCS 1900

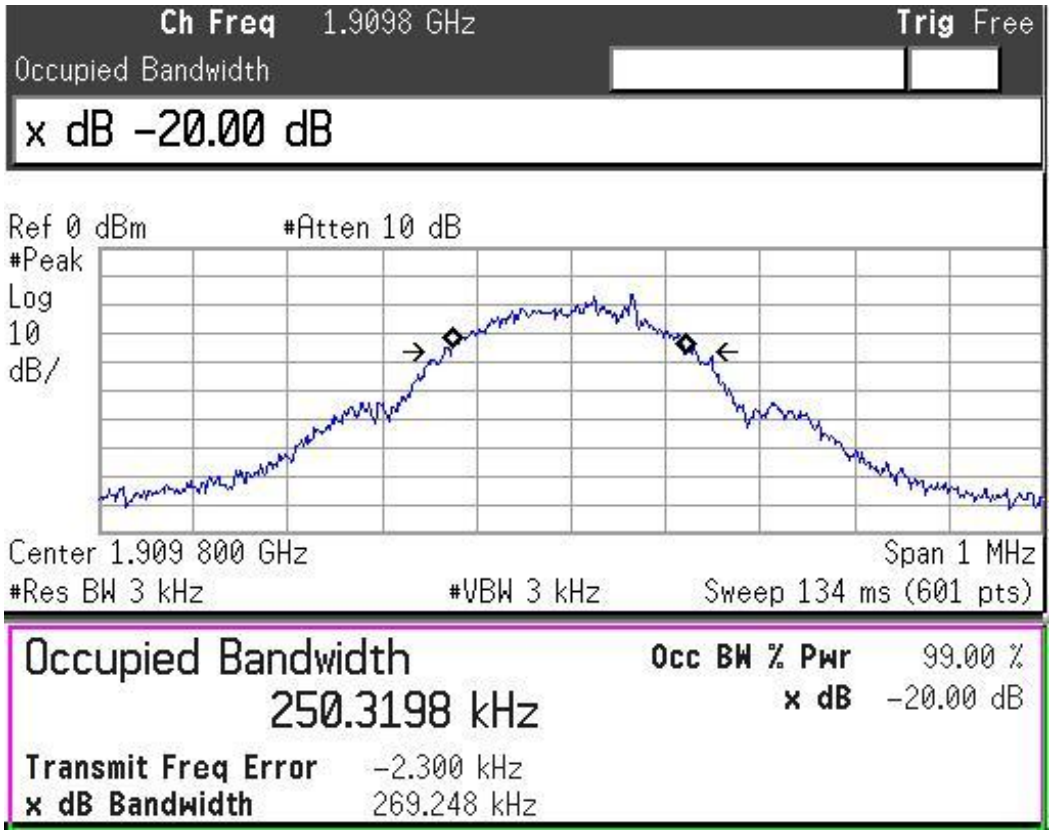
Channel 512-Occupied Bandwidth (-20dBc BW)



Channel 661-Occupied Bandwidth (-20dBc BW)



Channel 810-Occupied Bandwidth (-20dBc BW)



A.4 EMISSION BANDWIDTH (§22.917(b)/§24.238(b))

A.4.1Emission 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)

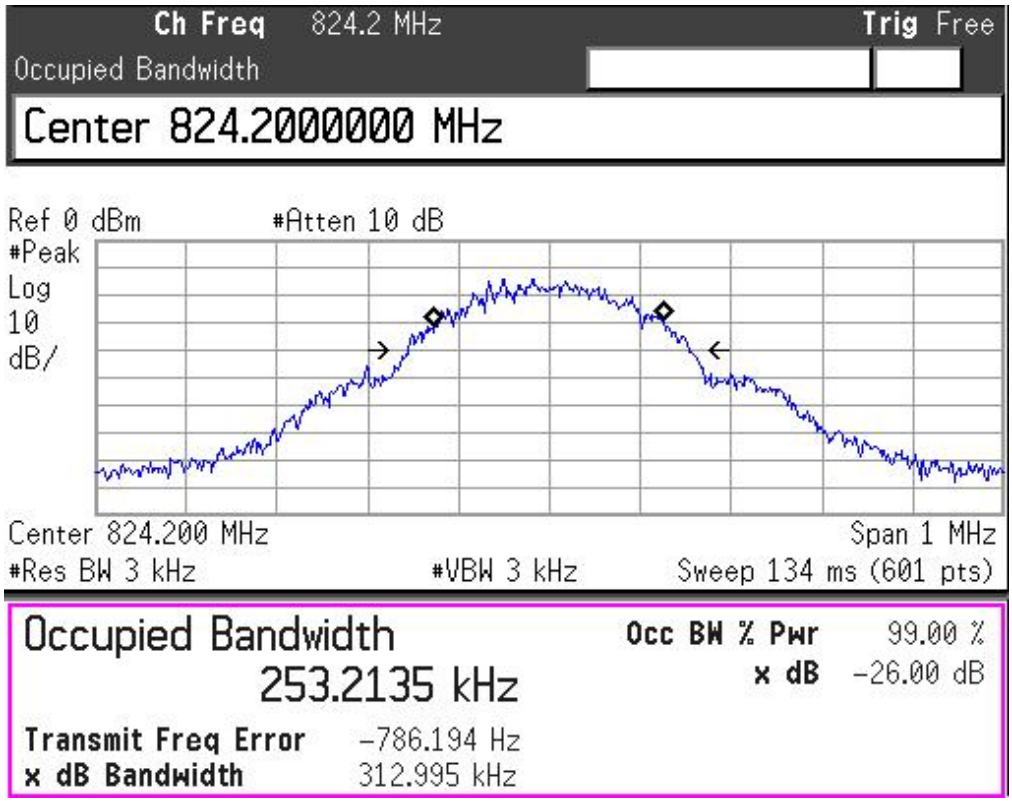
EUT1: 355995001000423

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	312.995
836.6	310.425
848.8	311.704

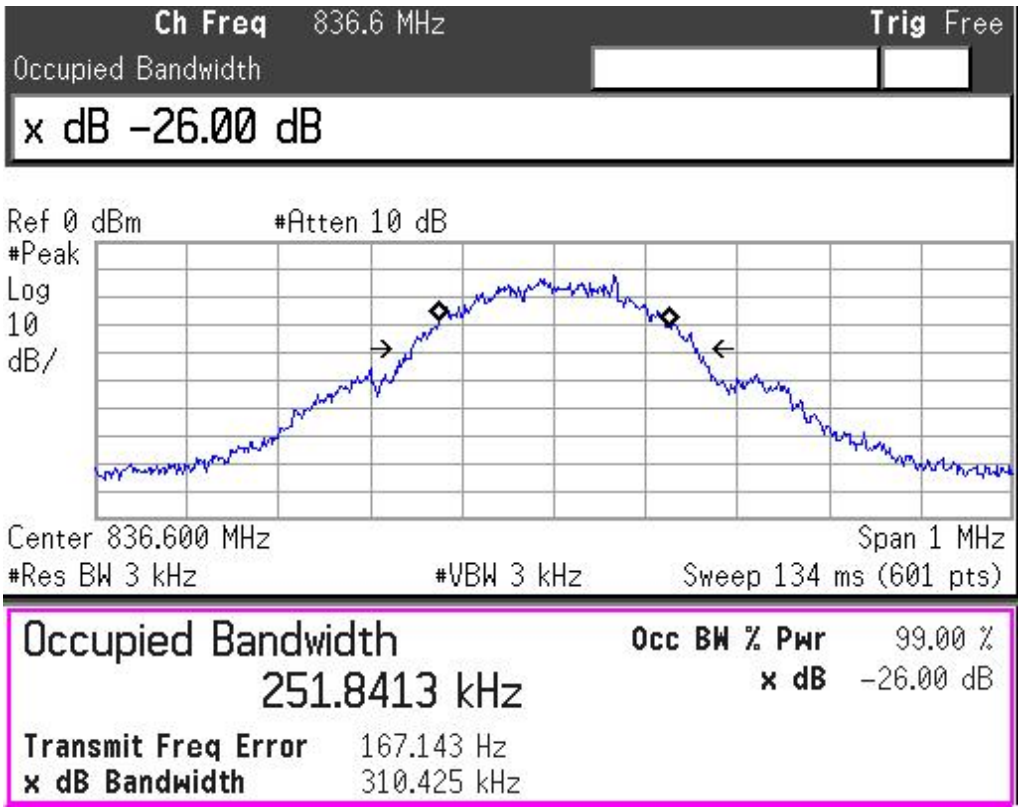
ANALYZER SETTINGS: RBW=VBW=3kHz

GSM 850

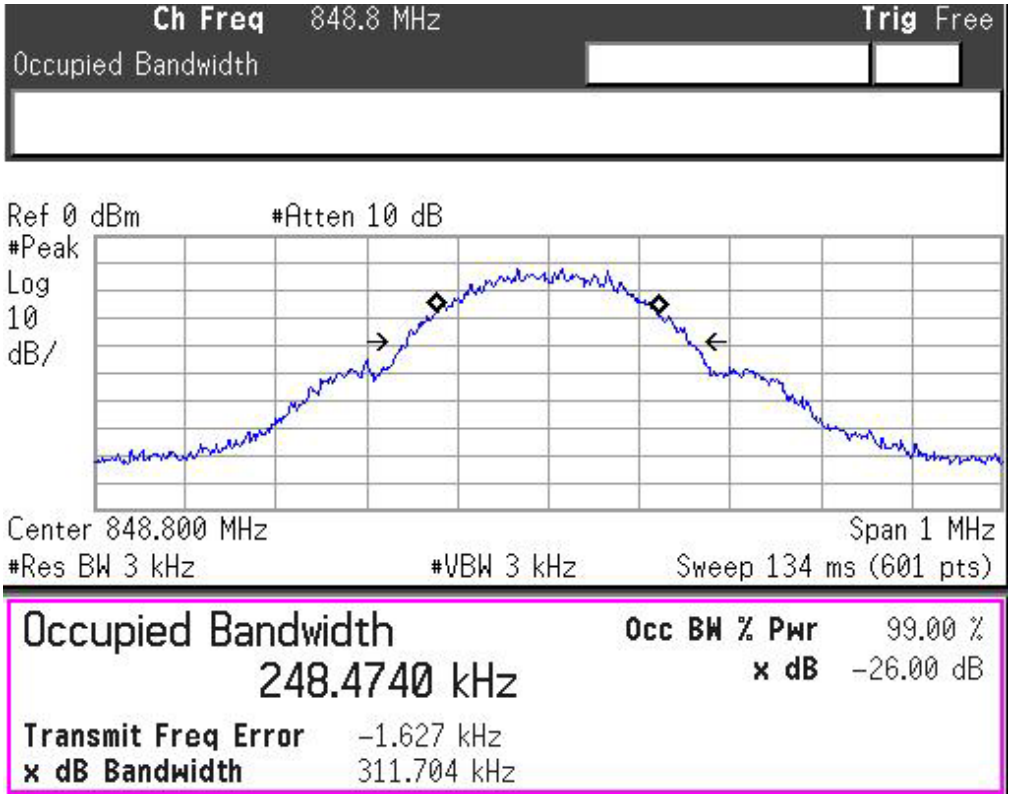
Channel 128-Occupied Bandwidth (-26dBc BW)



Channel 190-Occupied Bandwidth (-26dBc BW)



Channel 251-Occupied Bandwidth (-26dBc BW)



PCS 1900(-26dBc)

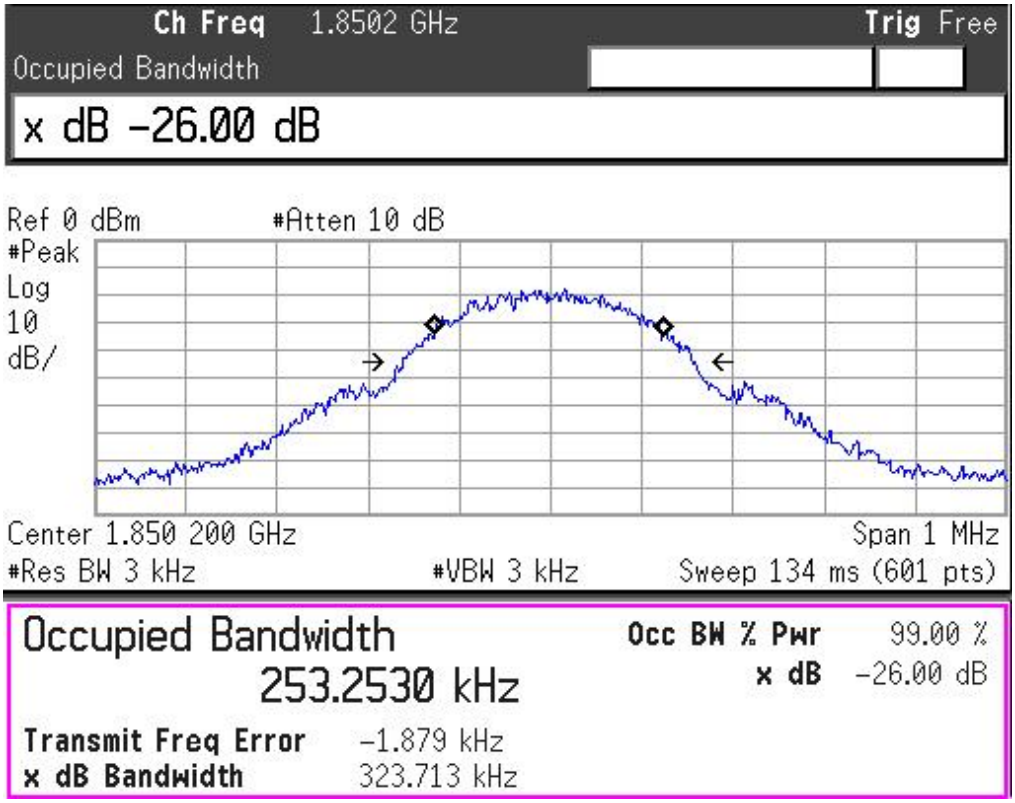
EUT1: 355995001000423

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
1850.2	323.713
1880.0	313.884
1909.8	313.793

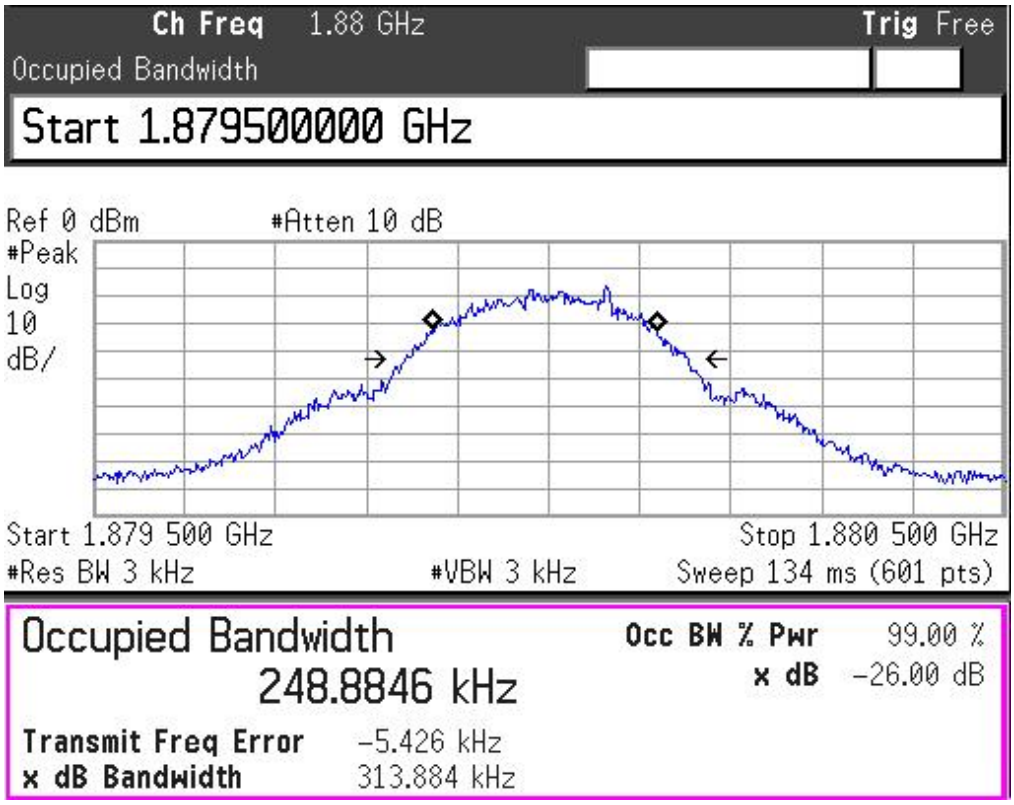
ANALYZER SETTINGS: RBW=VBW=3kHz;

PCS 1900

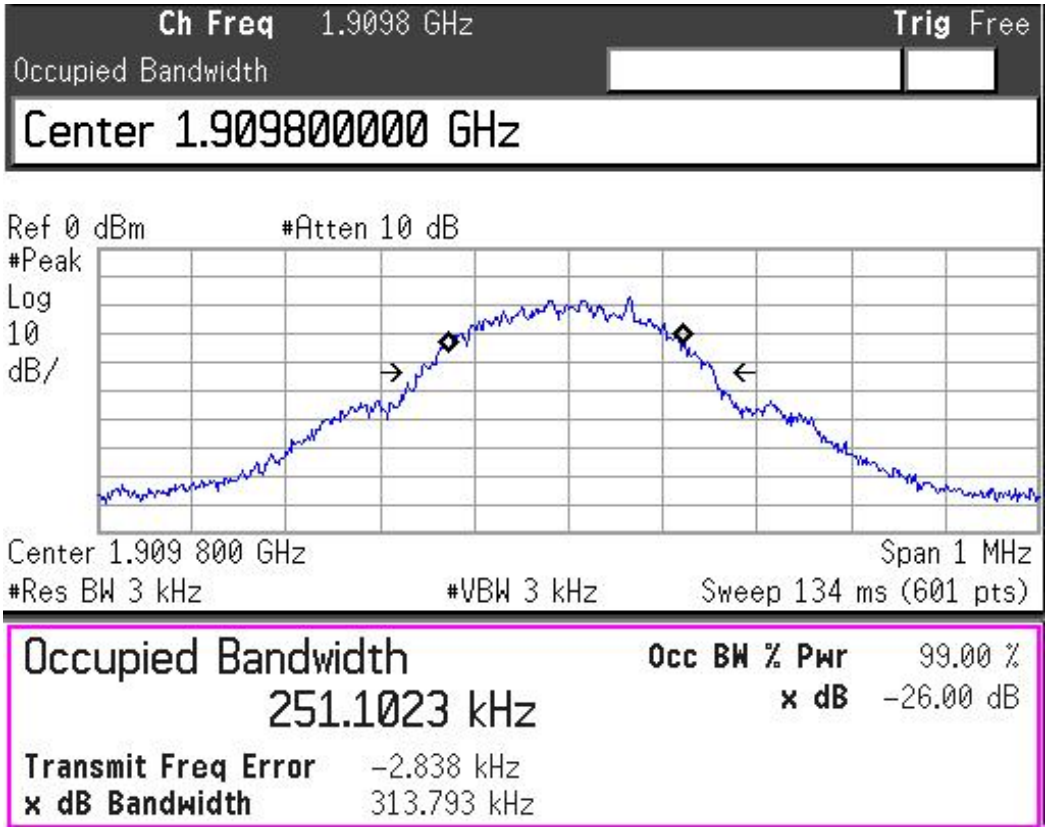
Channel 512-Occupied Bandwidth (-26dBc BW)



Channel 661-Occupied Bandwidth (-26dBc BW)



Channel 810-Occupied Bandwidth (-26dBc BW)



A.5 EMISSION LIMIT (§2.1051/§24.238)

A.5.1 Measurement Method

The site is constructed in accordance with ANSI C63.4 – 1992 requirements and is recognized by the FCC. 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.

A.5.2 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.5.3 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 band 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.

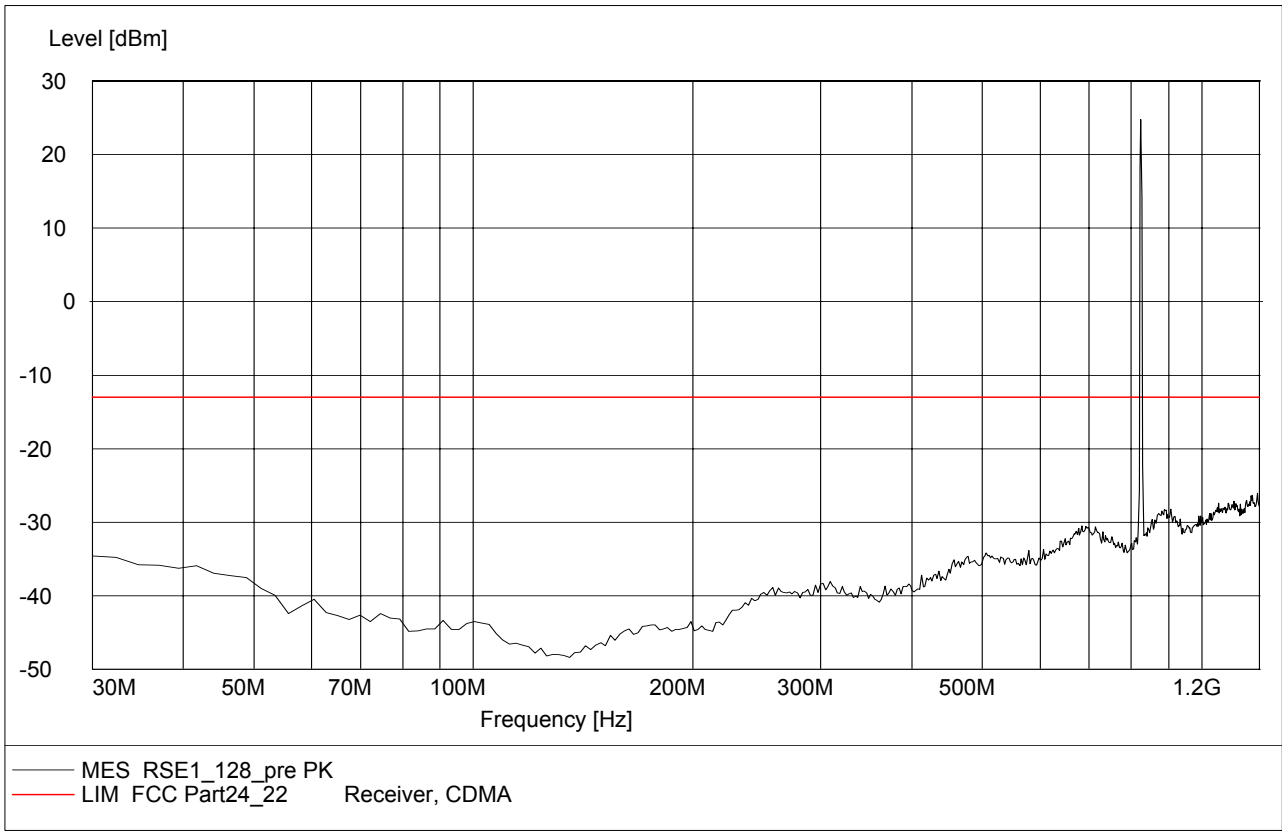
NOTE: The spurious emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels.

GSM 850

A.5.3.1 RADIATED SPURIOUS EMISSIONS-Channel 128: 30MHz –1.2GHz

Radiated spurious emission limit :-13dBm.

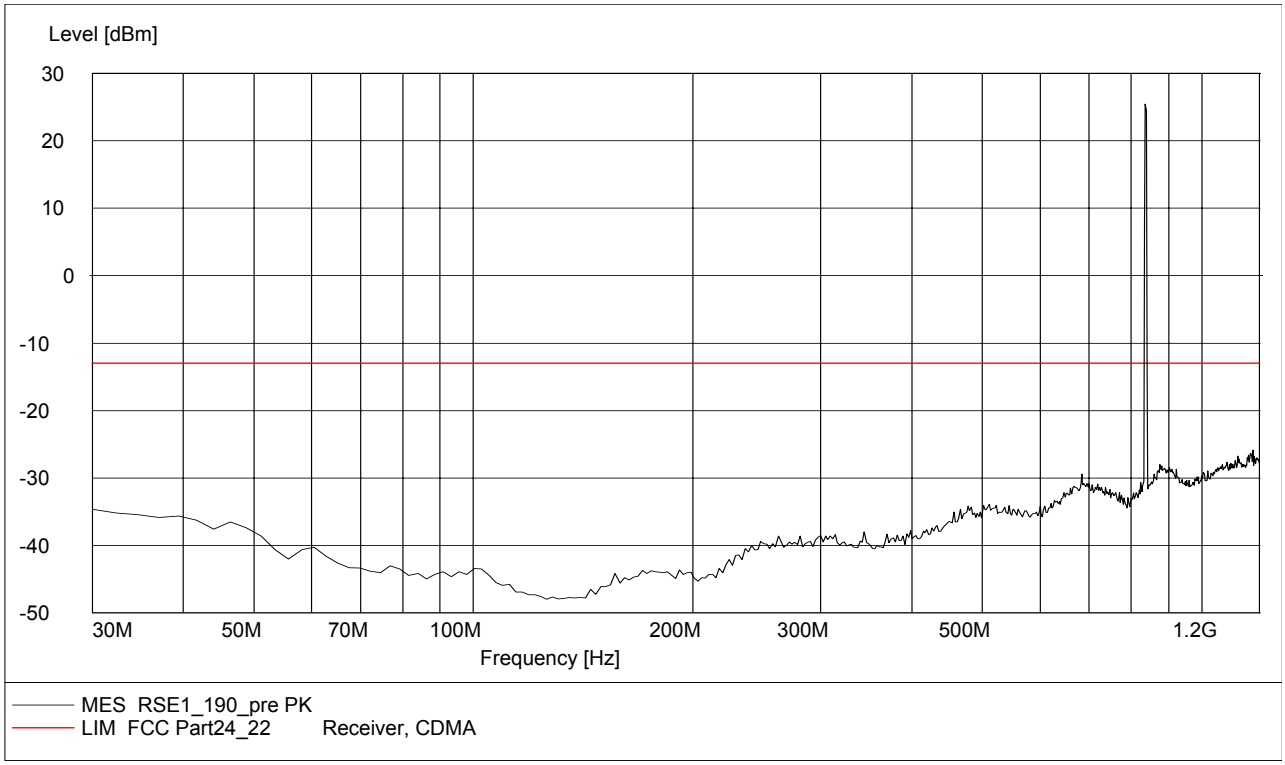
NOTE: peak above the limit line is the Carrier frequency @ ch-128



A.5.3.2 RADIATED SPURIOUS EMISSIONS-Channel 190: 30MHz – 1.2GHz

Radiated spurious emission limit :-13dBm.

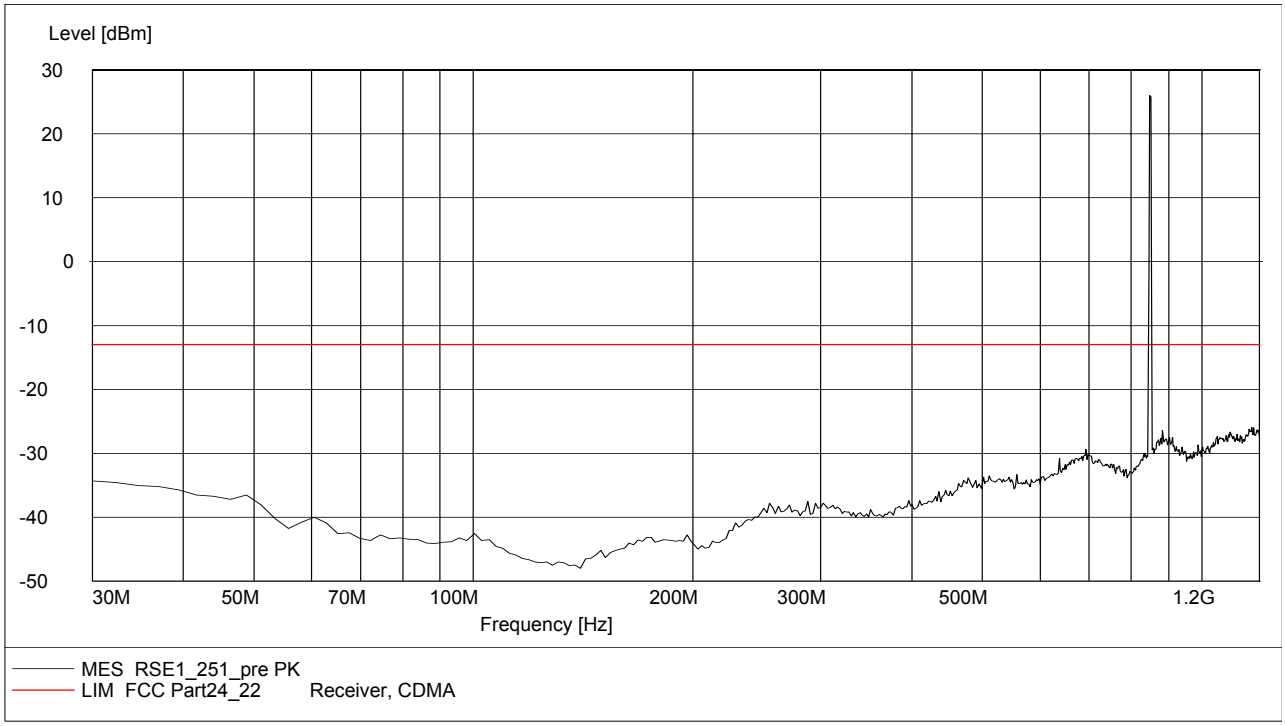
NOTE: peak above the limit line is the Carrier frequency @ ch-190



A.5.3.3 RADIATED SPURIOUS EMISSIONS-Channel 251: 30MHz – 1.2GHz

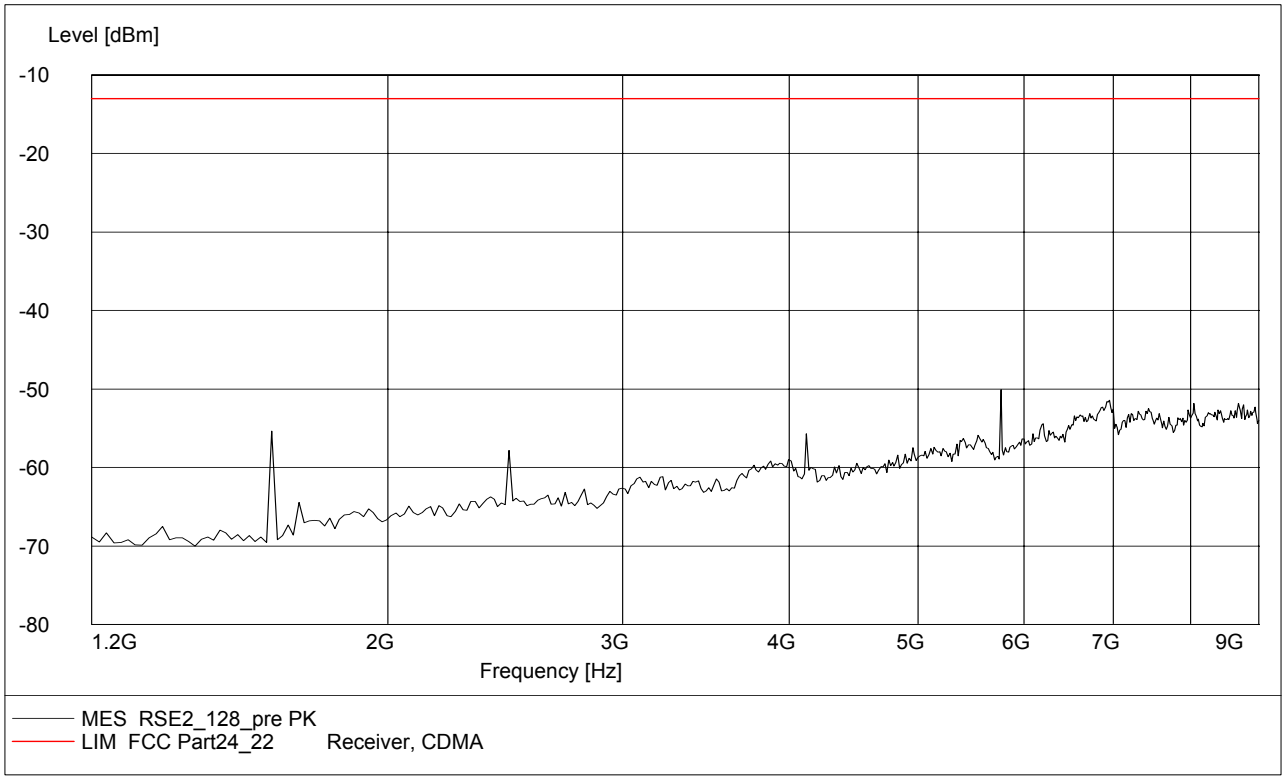
Radiated spurious emission limit :-13dBm.

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



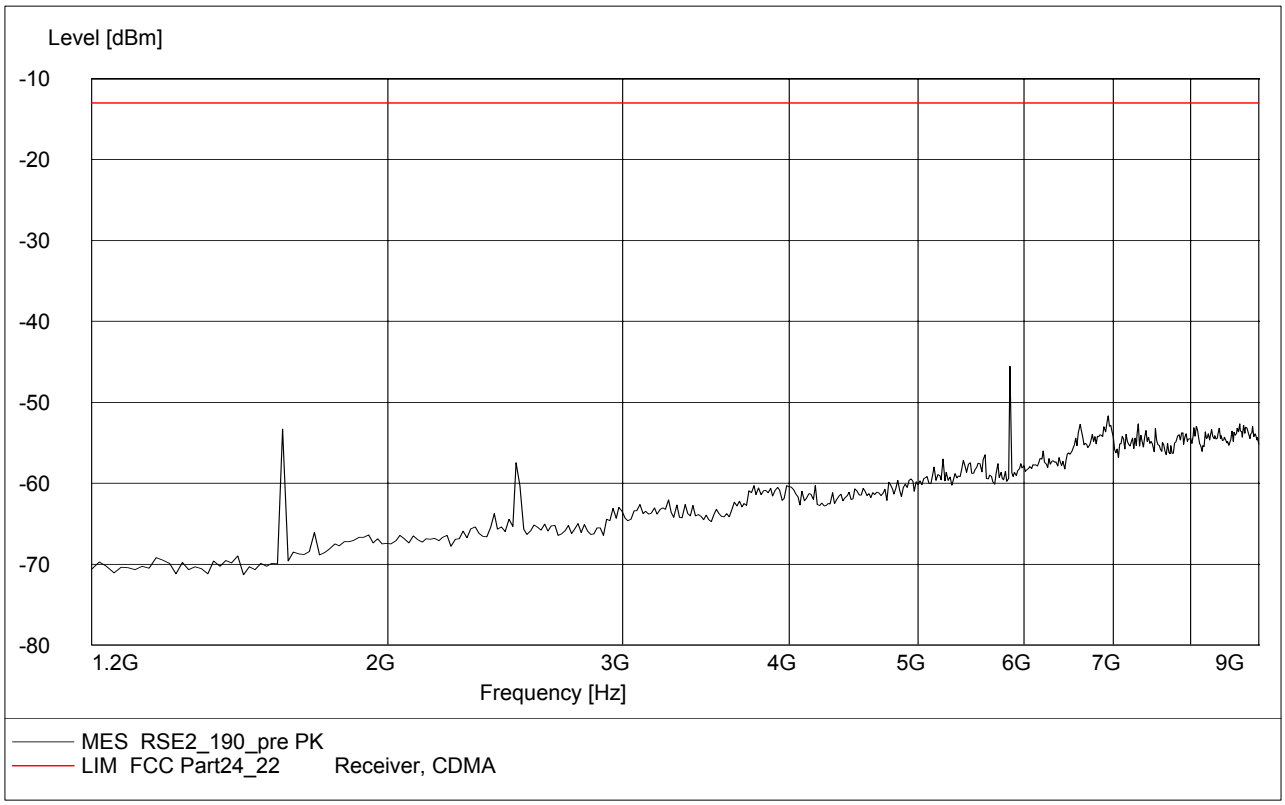
A.5.3.4 RADIATED SPURIOUS EMISSIONS-Channel 128: 1.2GHz – 9GHz

Radiated spurious emission limit :-13dBm.



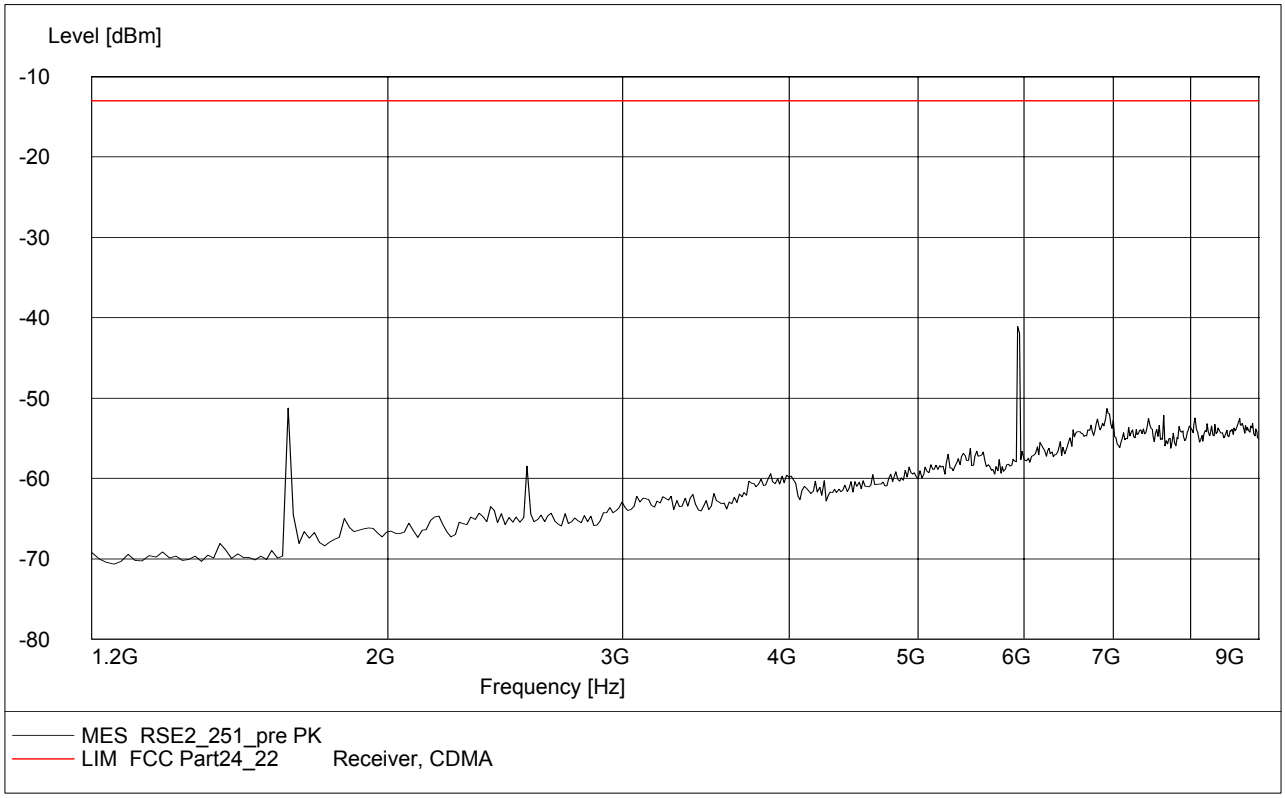
A5.3.5 RADIATED SPURIOUS EMISSIONS-Channel 190: 1.2GHz – 9GHz

Radiated spurious emission limit :-13dBm.



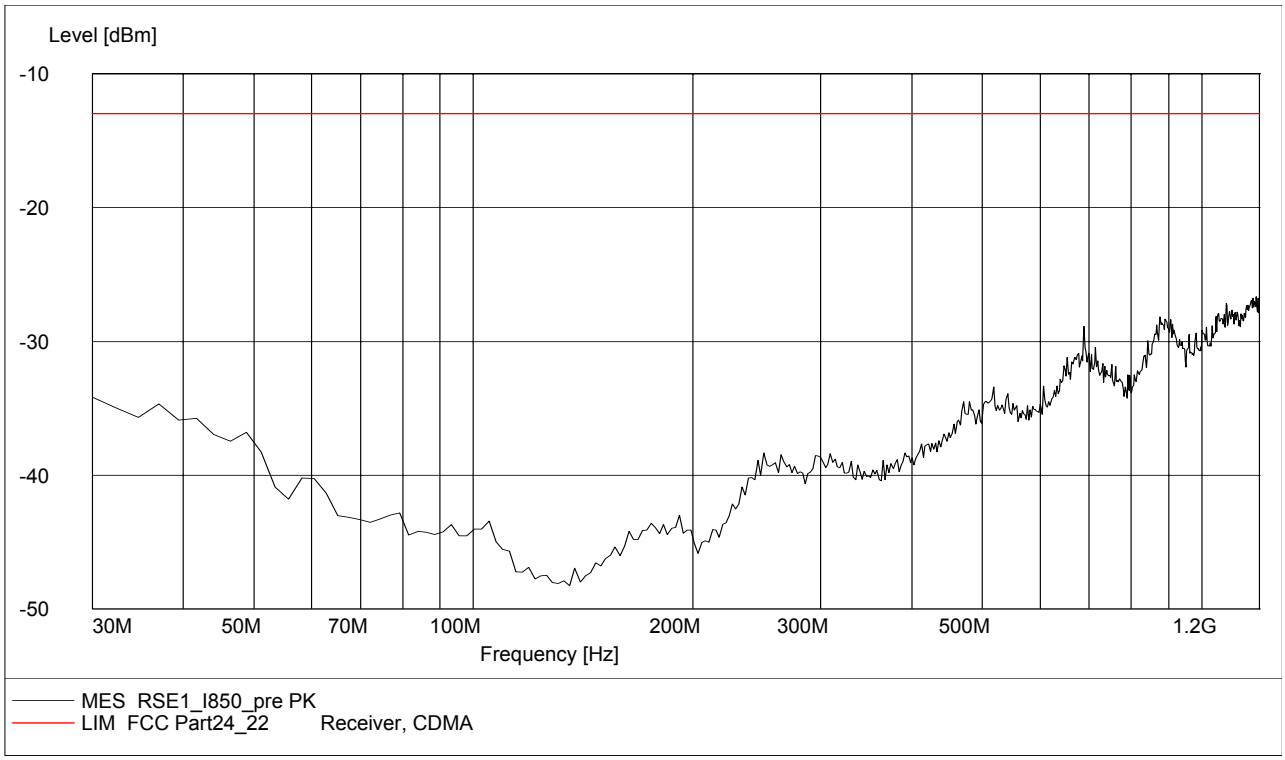
A.5.3.6 RADIATED SPURIOUS EMISSIONS-Channel 251: 1.2GHz – 9GHz

Radiated spurious emission limit :-13dBm.



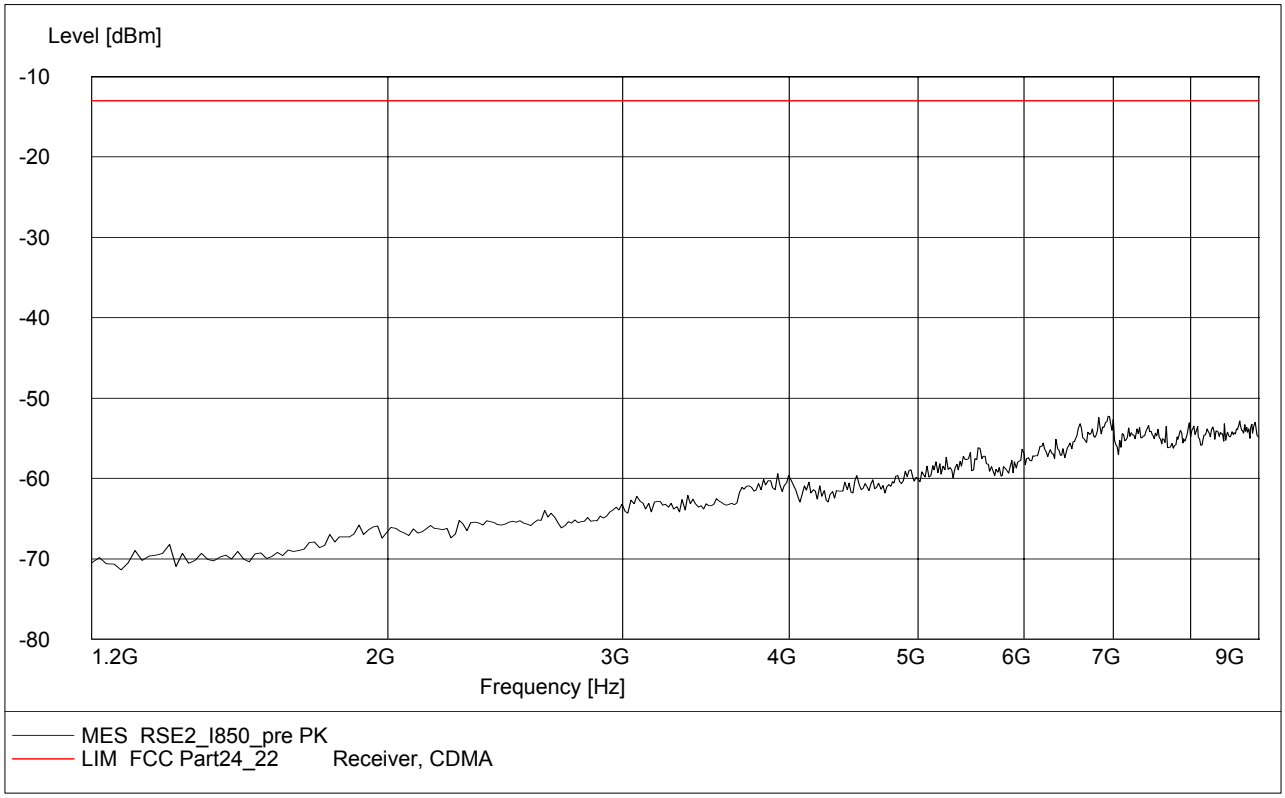
A.5.3.7 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 1.2GHz

Radiated spurious emission limit :-13dBm.



A.5.3.8 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 1.2GHz – 9GHz

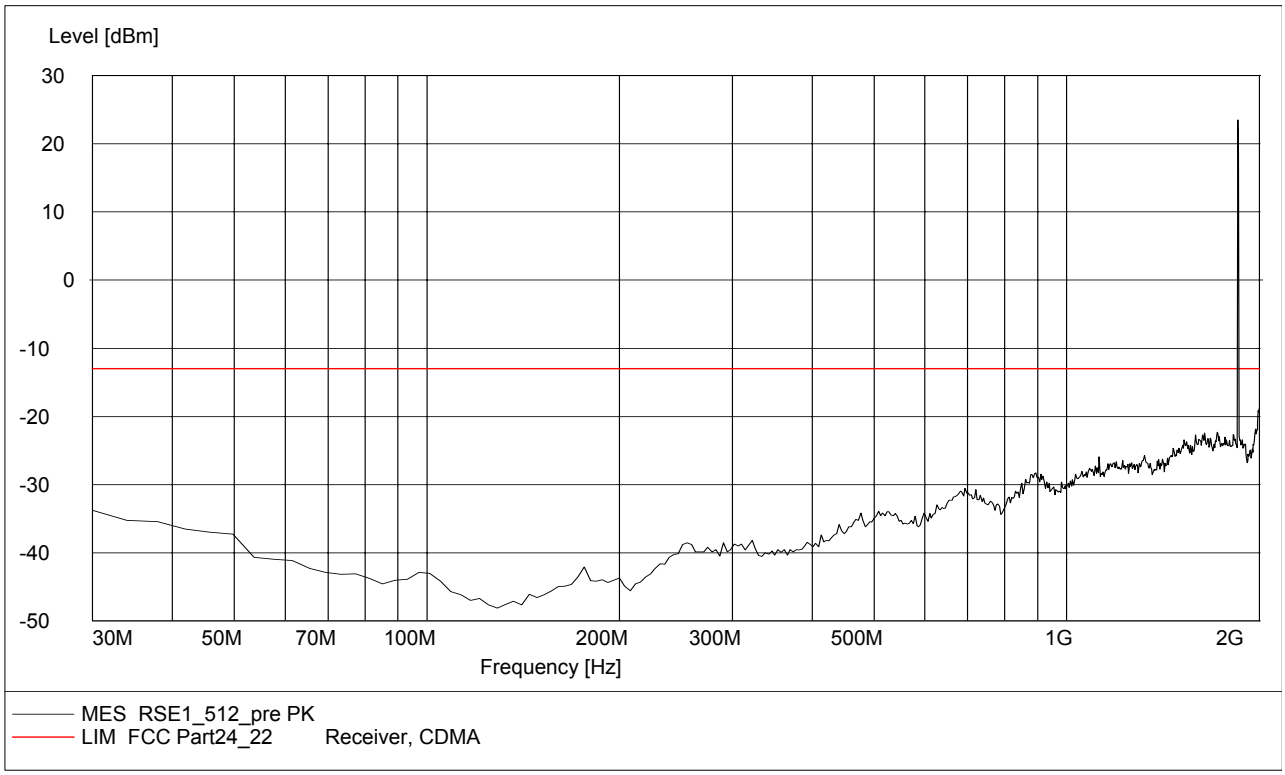
Radiated spurious emission limit :-13dBm.



PCS 1900

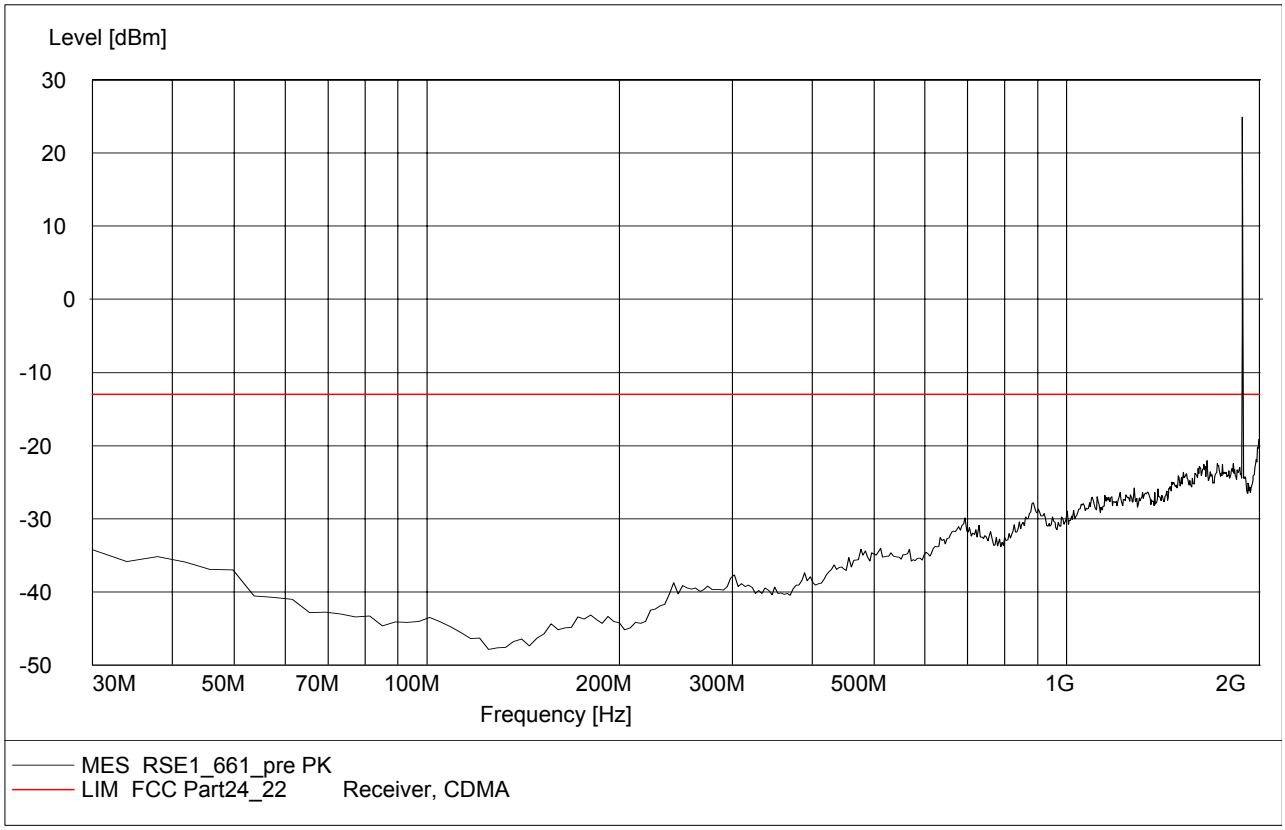
A.5.3.9 RADIATED SPURIOUS EMISSIONS-Channel 512: 30MHz – 2GHz

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



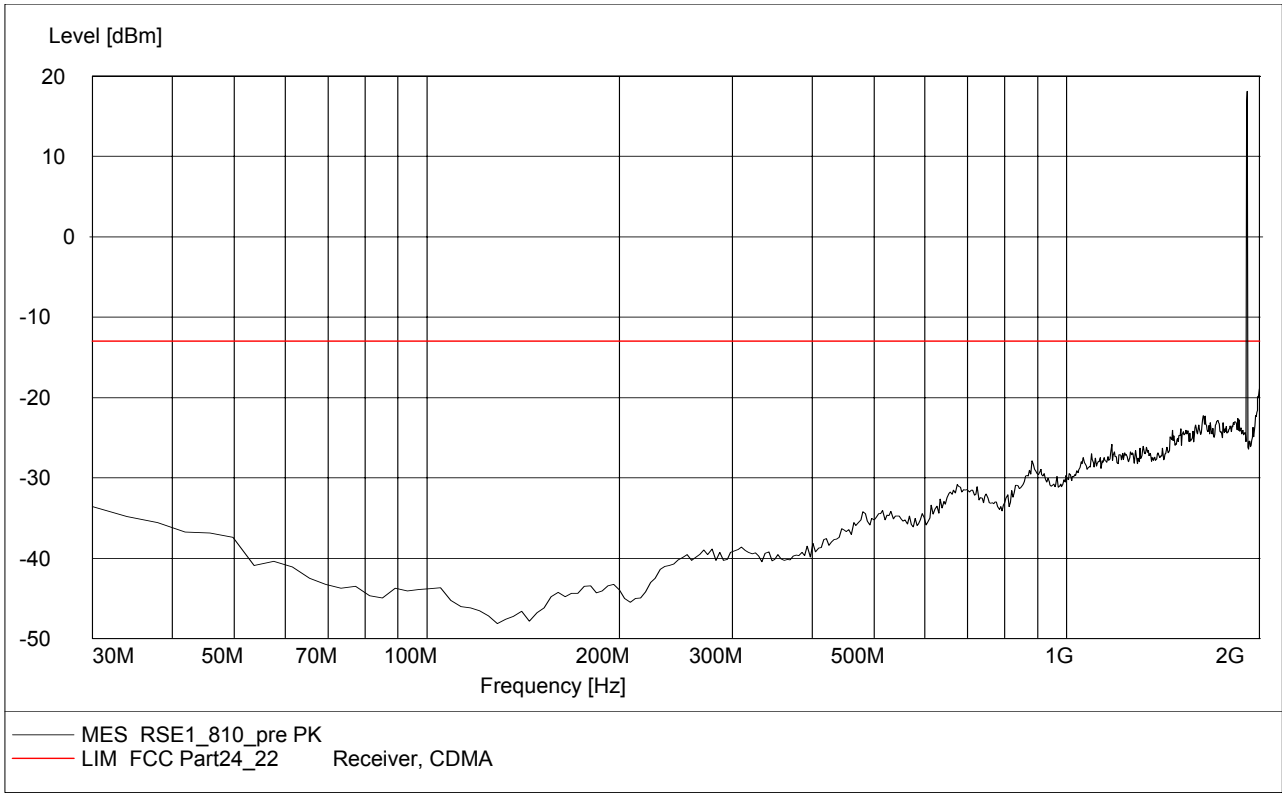
A.5.3.10 RADIATED SPURIOUS EMISSIONS-Channel 661: 30MHz – 2GHz

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

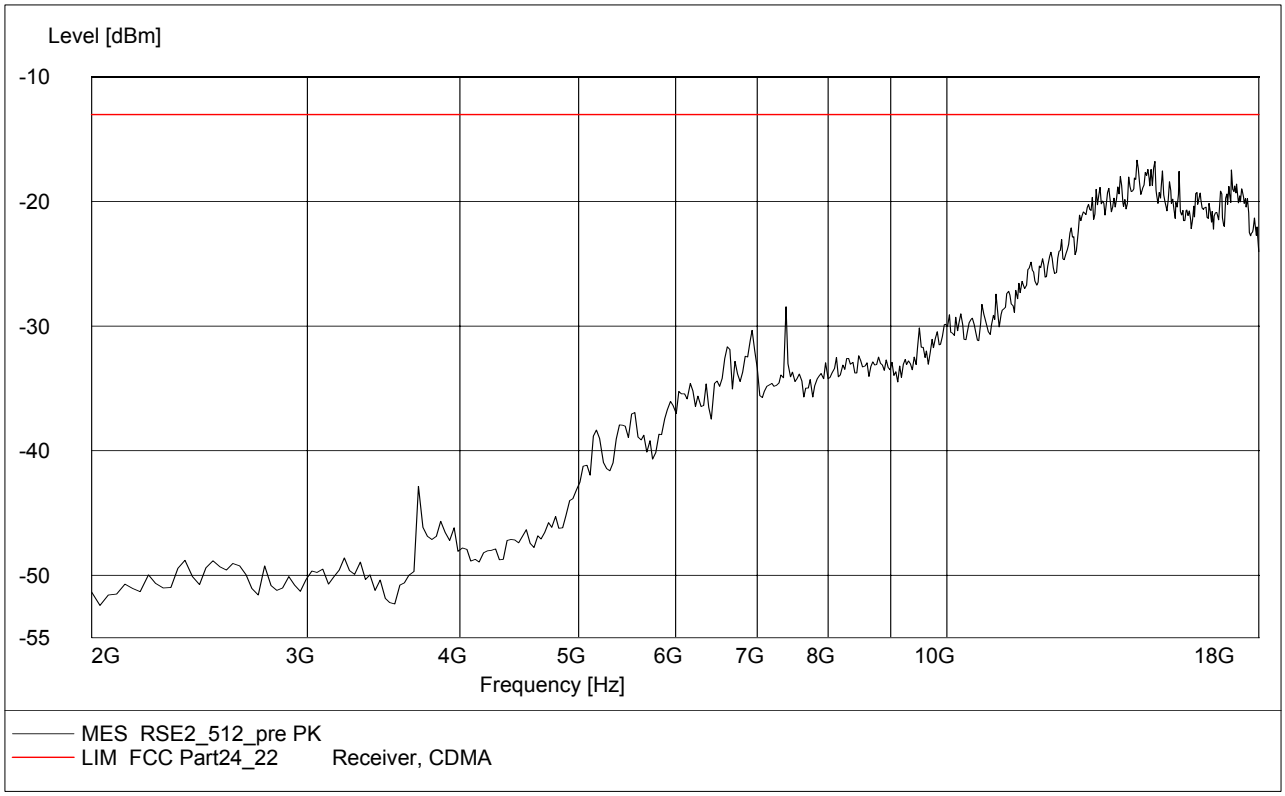


A.5.3.11 RADIATED SPURIOUS EMISSIONS-Channel 810: 30MHz – 2GHz

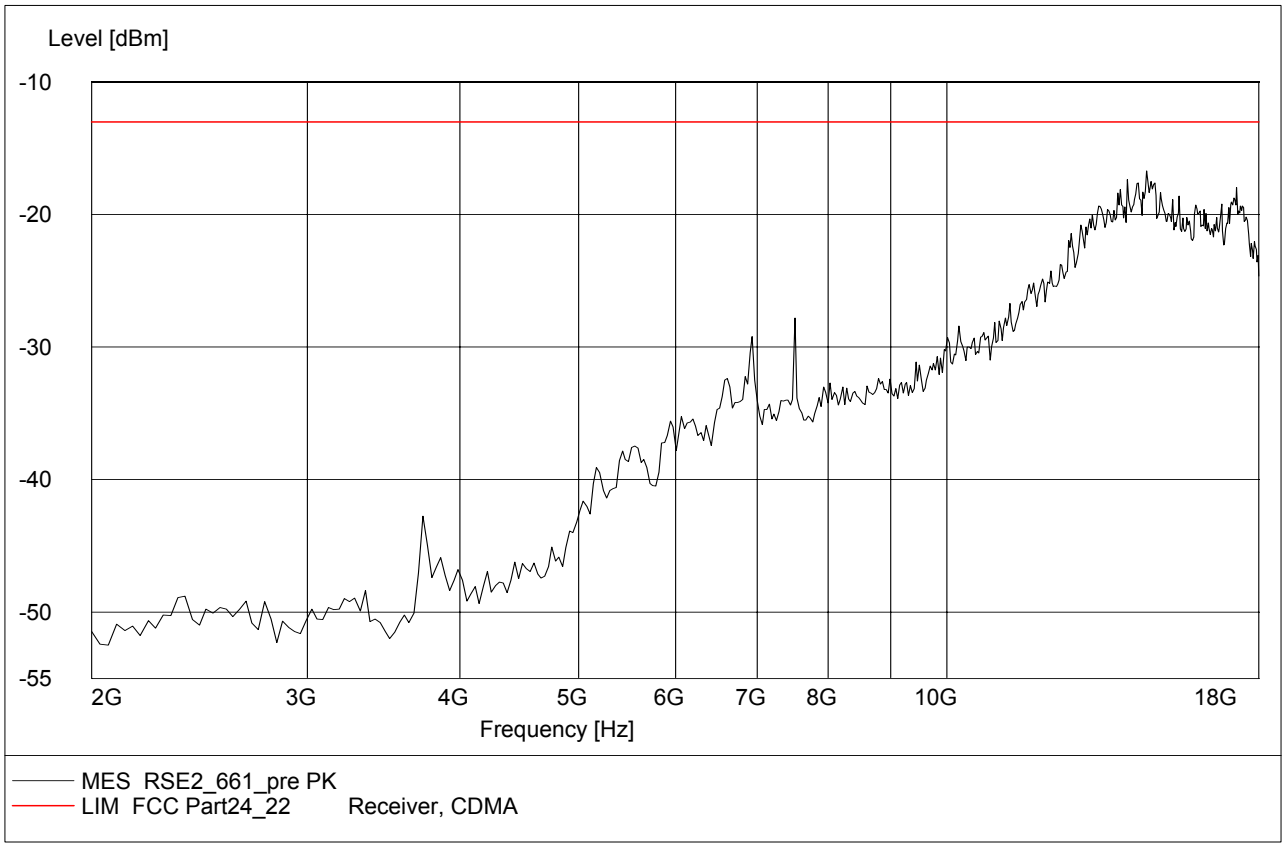
NOTE: peak above the limit line is the Carrier frequency @ ch-810



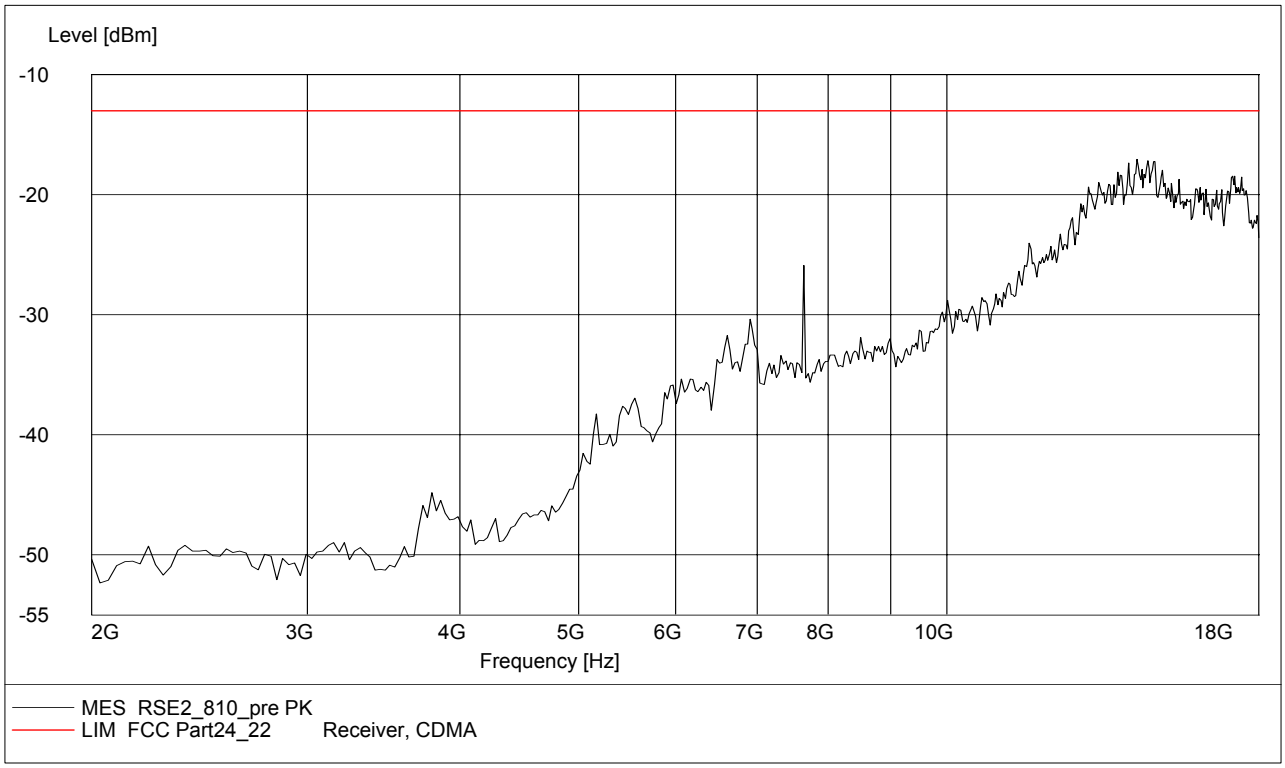
A.5.3.12 RADIATED SPURIOUS EMISSIONS-Channel 512: 2GHz – 18GHz



A5.3.13 RADIATED SPURIOUS EMISSIONS-Channel 661: 2GHz – 18GHz

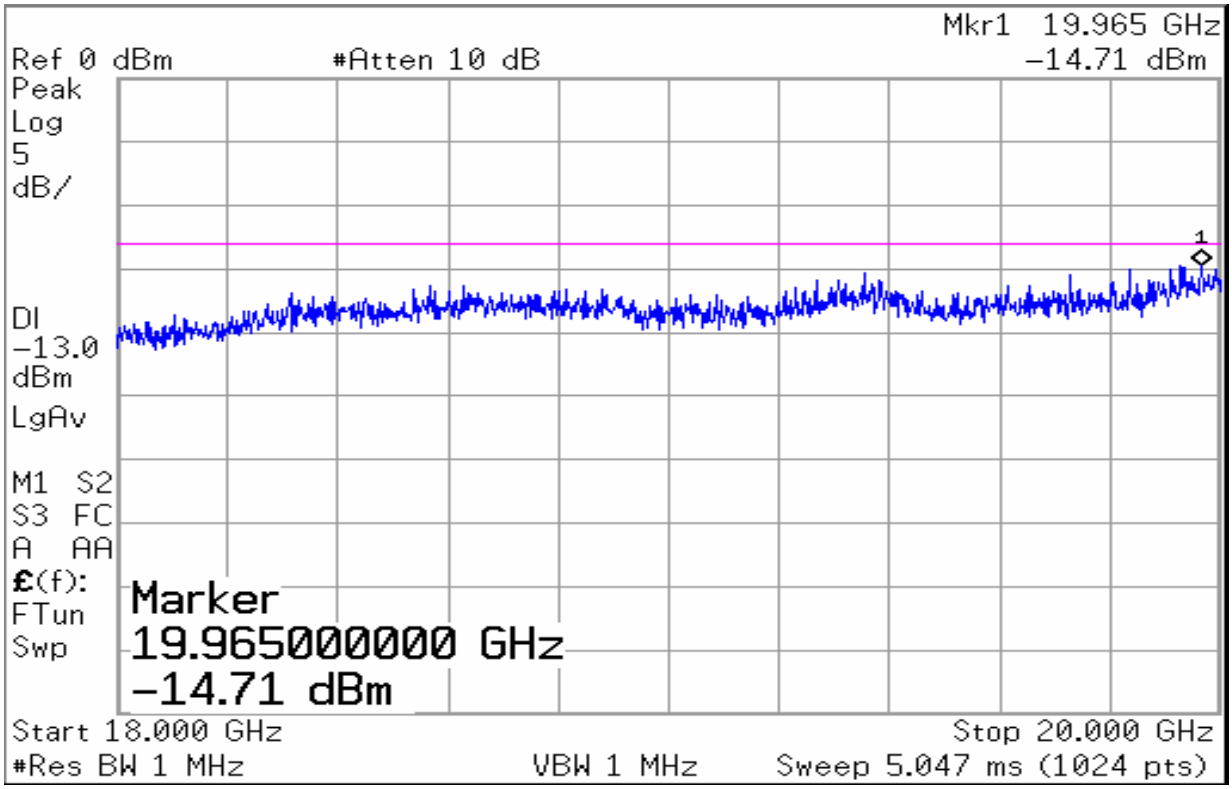


A.5.3.14 RADIATED SPURIOUS EMISSIONS-Channel 810: 2GHz – 18GHz

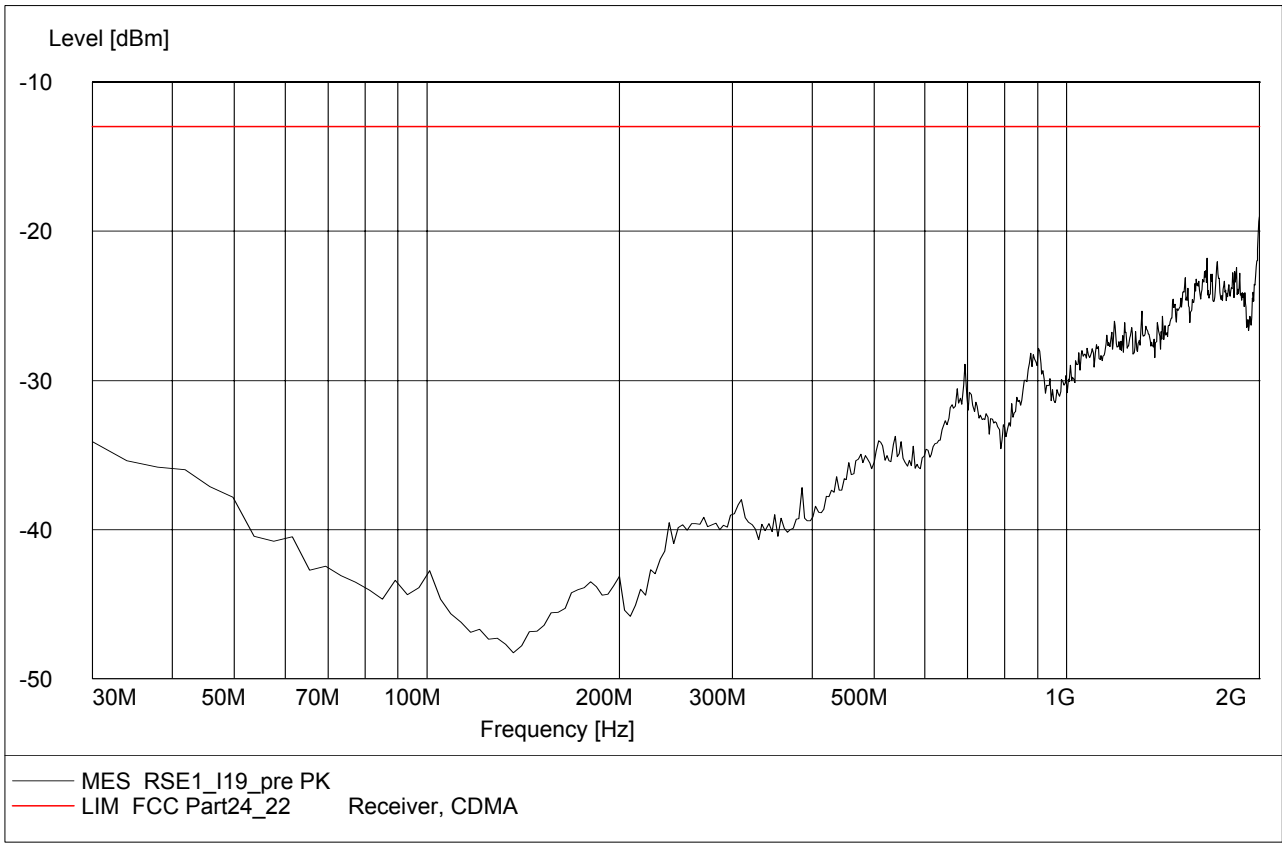


A.5.3.15 Radiated spurious emission (18GHz-20GHz)

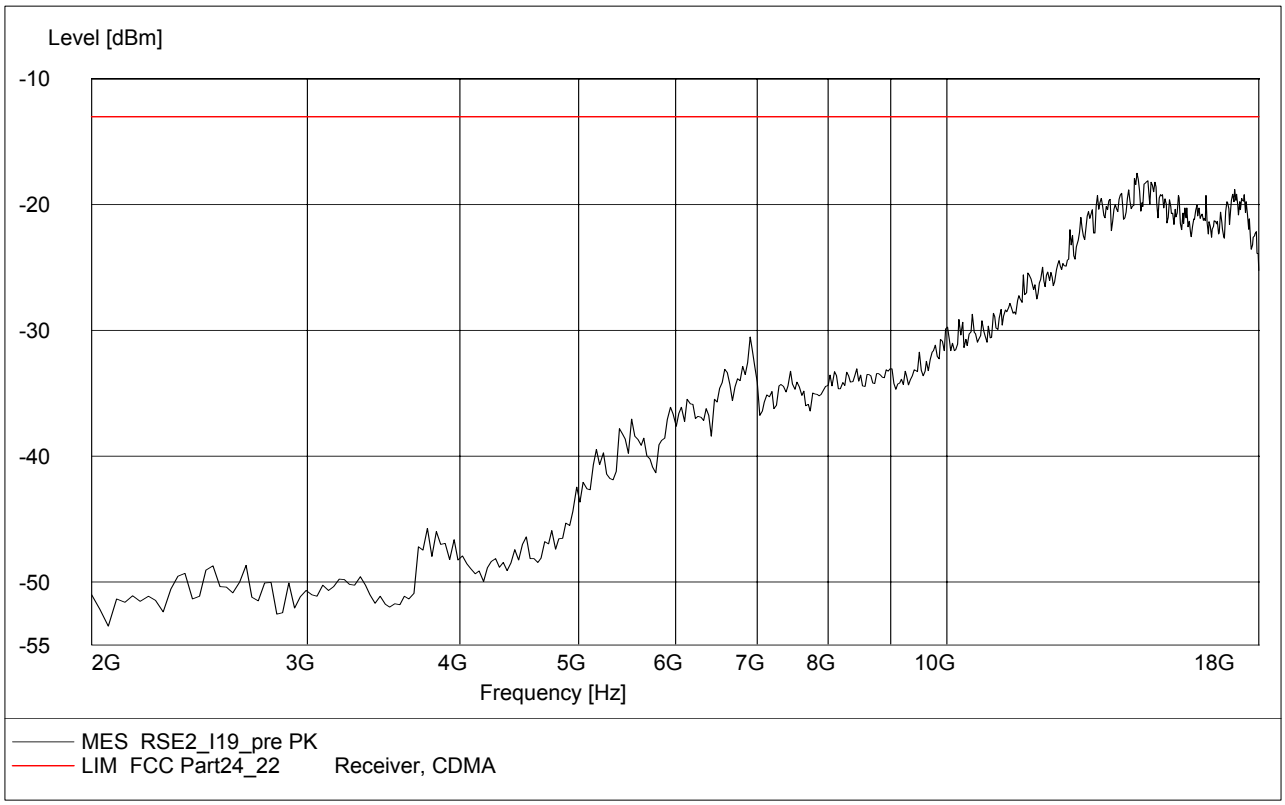
Note: This plot is valid for low, mid & high channels (worst-case plot). It is same as the floor noise.



A.5.3.16 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 2GHz

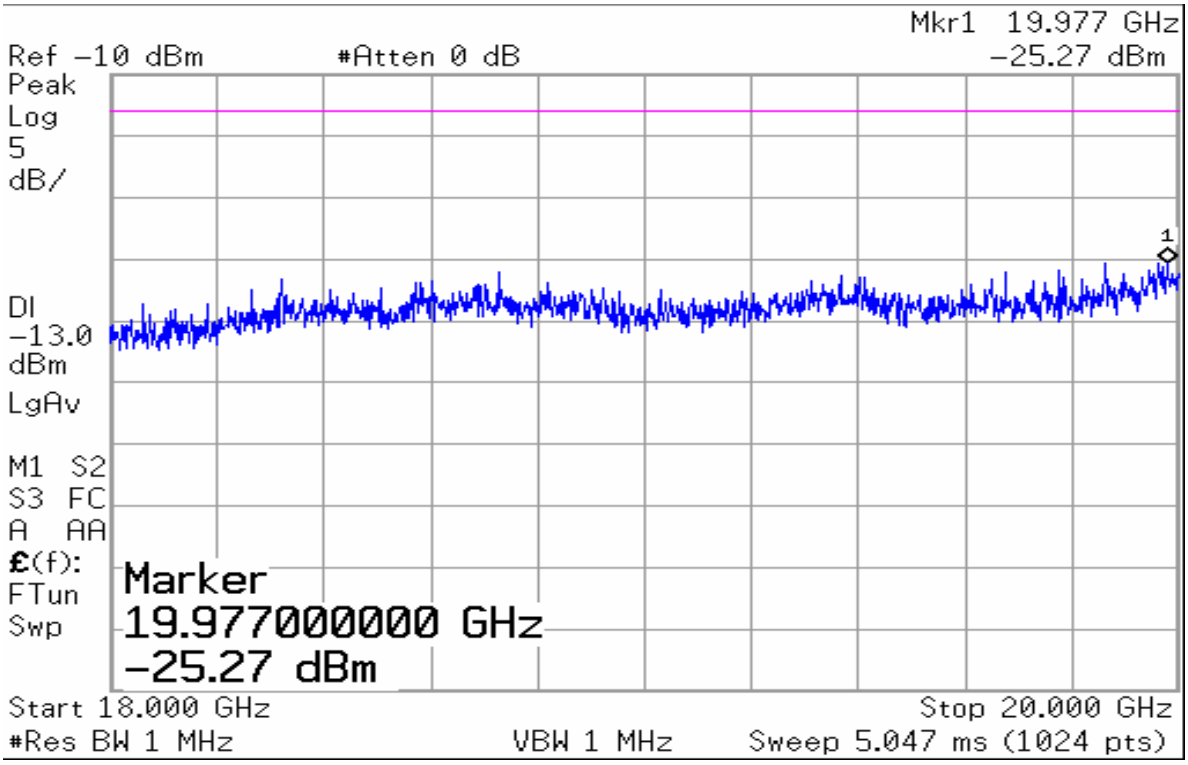


A.5.3.17 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 2GHz – 18GHz



A.5.3.18 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 18GHz – 20GHz

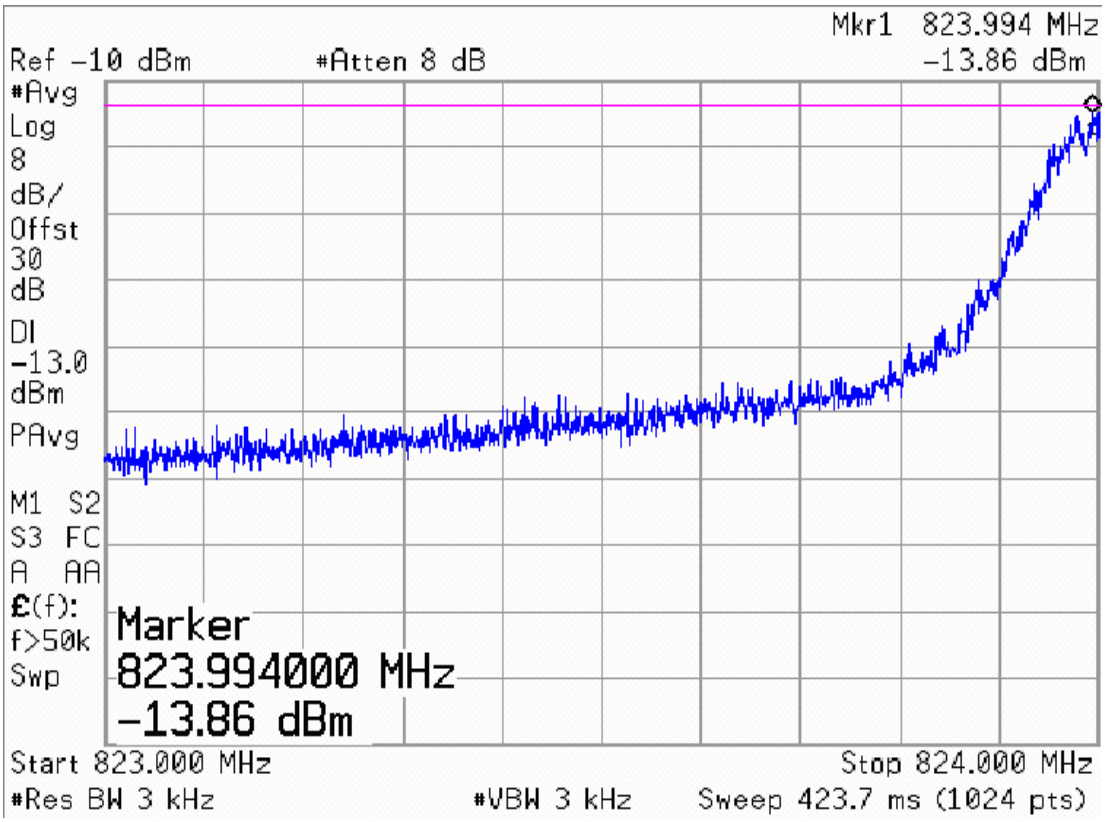
Note: It is same as the floor noise.



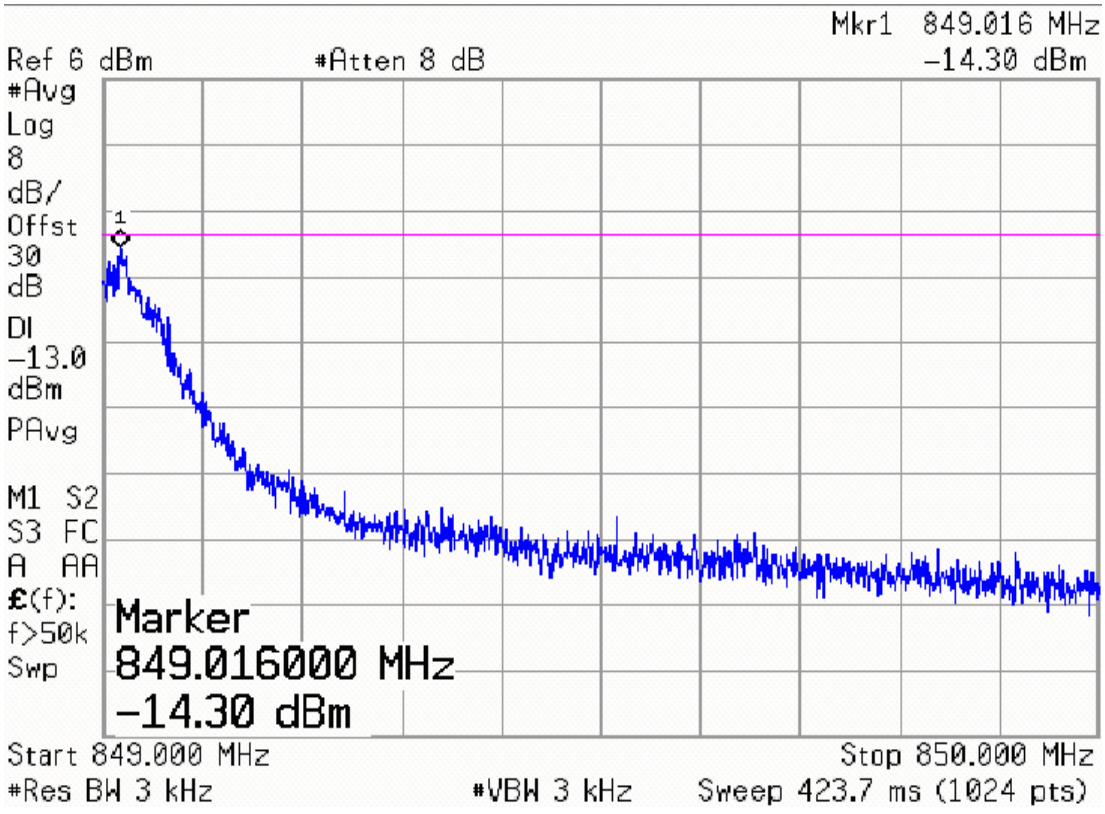
A.6 BAND EDGE COMPLIANCE (§22.917(b)/§24.238(b))

GSM850

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

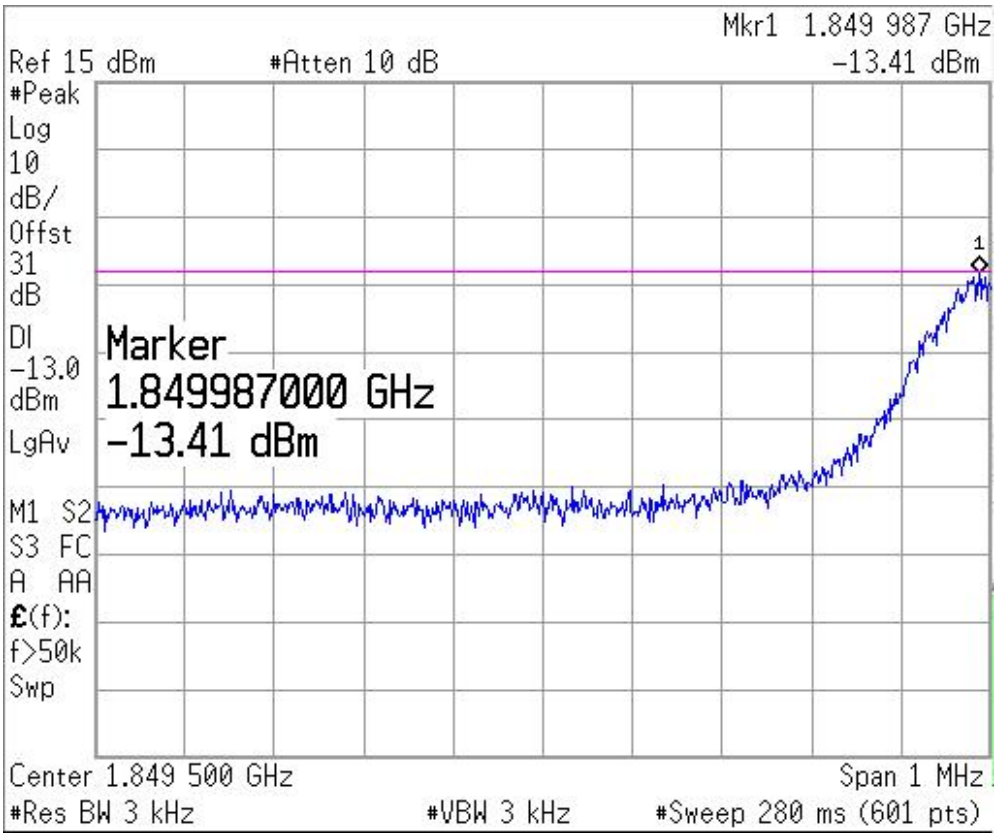


HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251

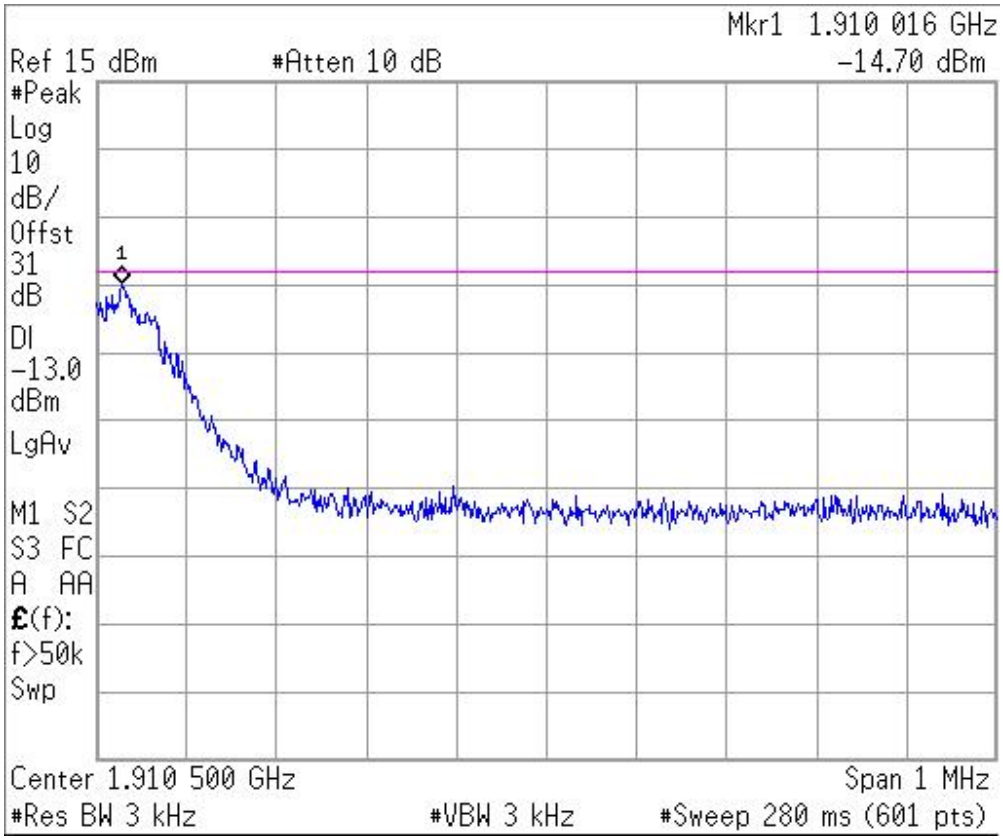


PCS 1900

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



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



A.7 CONDUCTED SPURIOUS EMISSION (§2.1057/§22.917/§24.238)

A.7.1 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.7.2 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.7.3 Measurement result

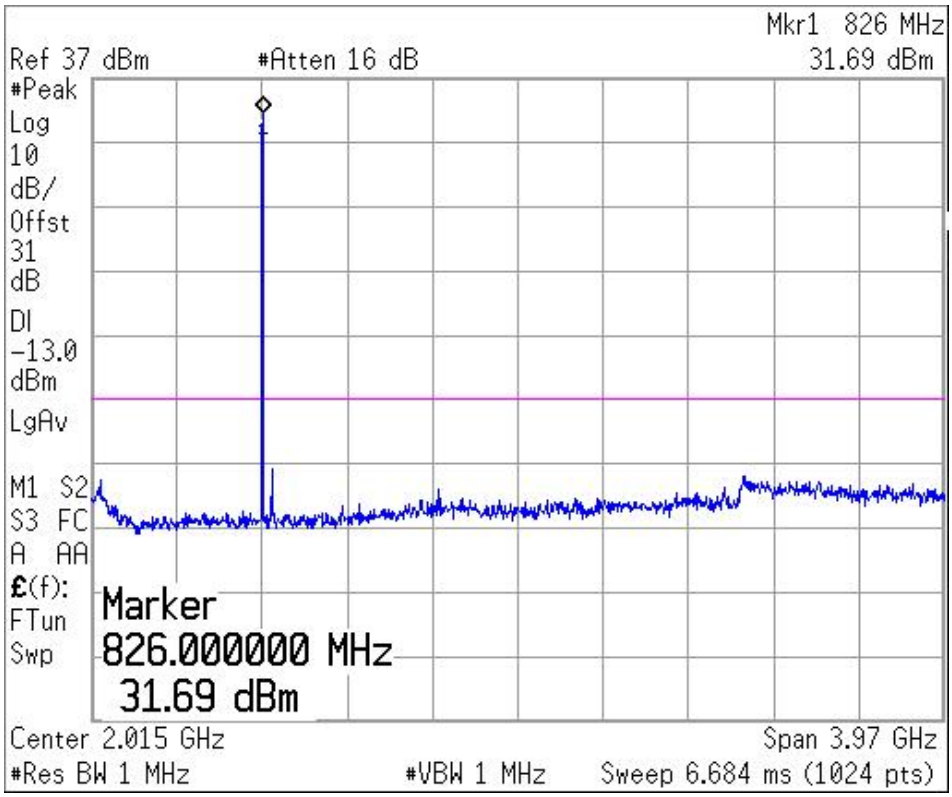
GSM850

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.7.3.1 Channel 128: 30MHz – 4GHz

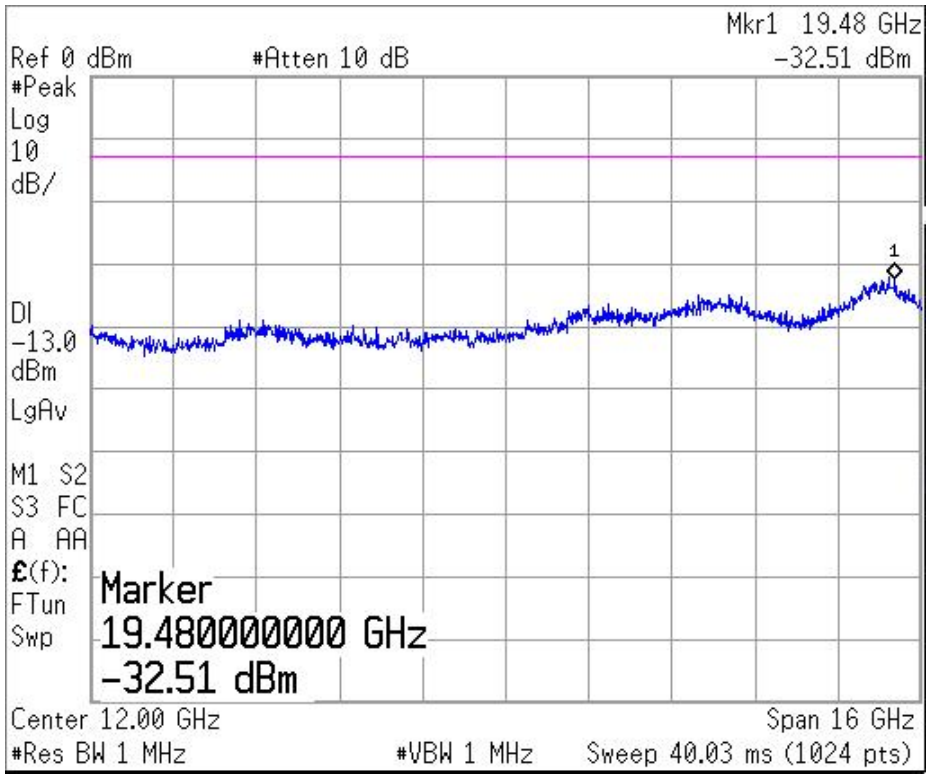
Spurious emission limit –13dBm.

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



A.7.3.2 Channel 128: 4GHz – 20GHz

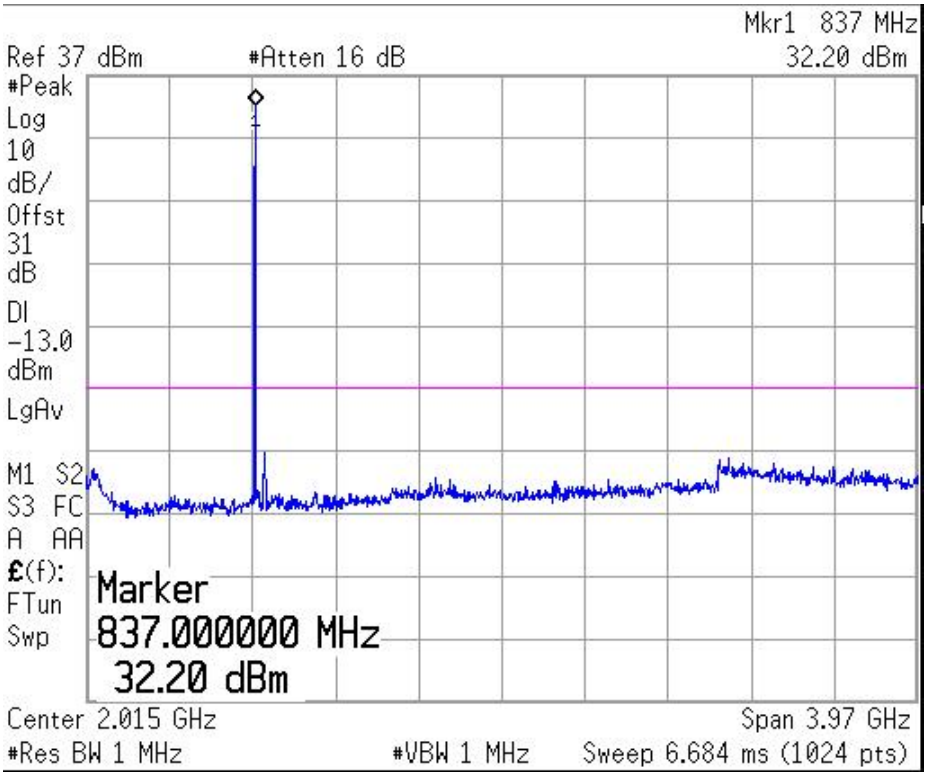
Spurious emission limit –13dBm.



A.7.3.3 Channel 190: 30MHz – 4GHz

Spurious emission limit –13dBm

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



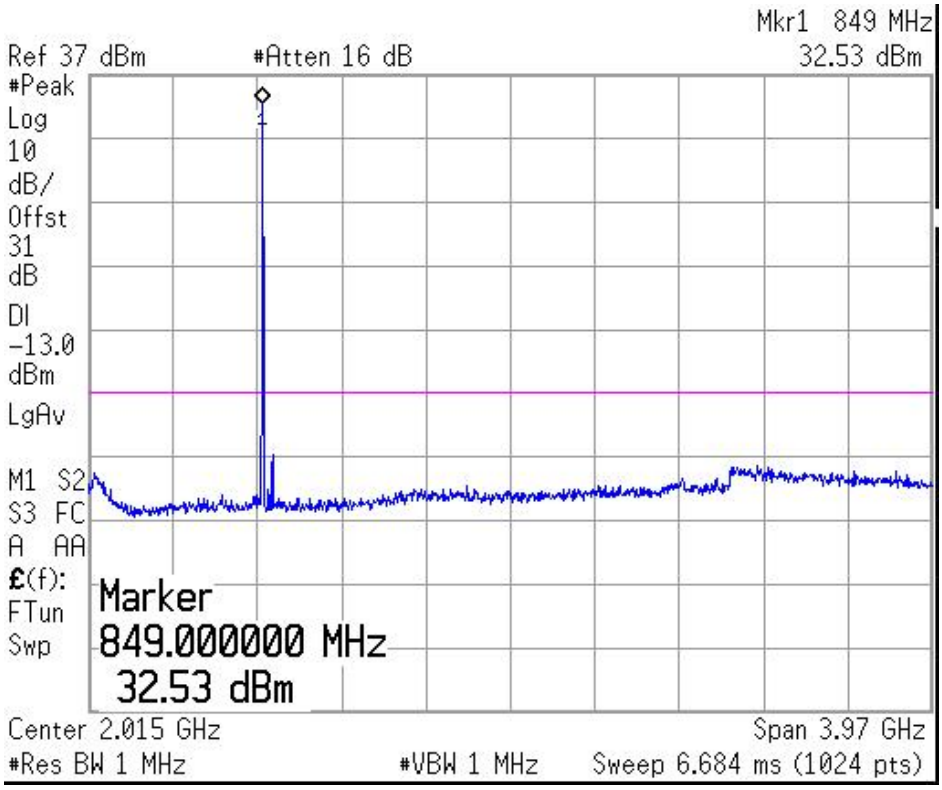
A.7.3.4 Channel 190: 4GHz –20GHz

Spurious emission limit –13dBm

A.7.3.5 Channel 251: 30MHz – 4GHz

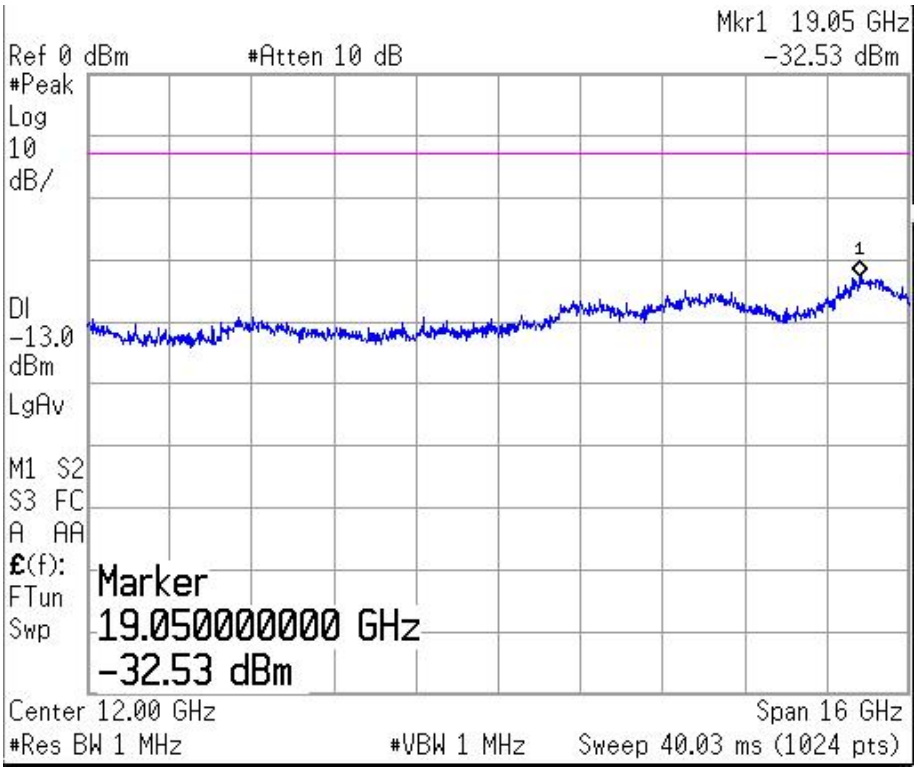
Spurious emission limit –13dBm.

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



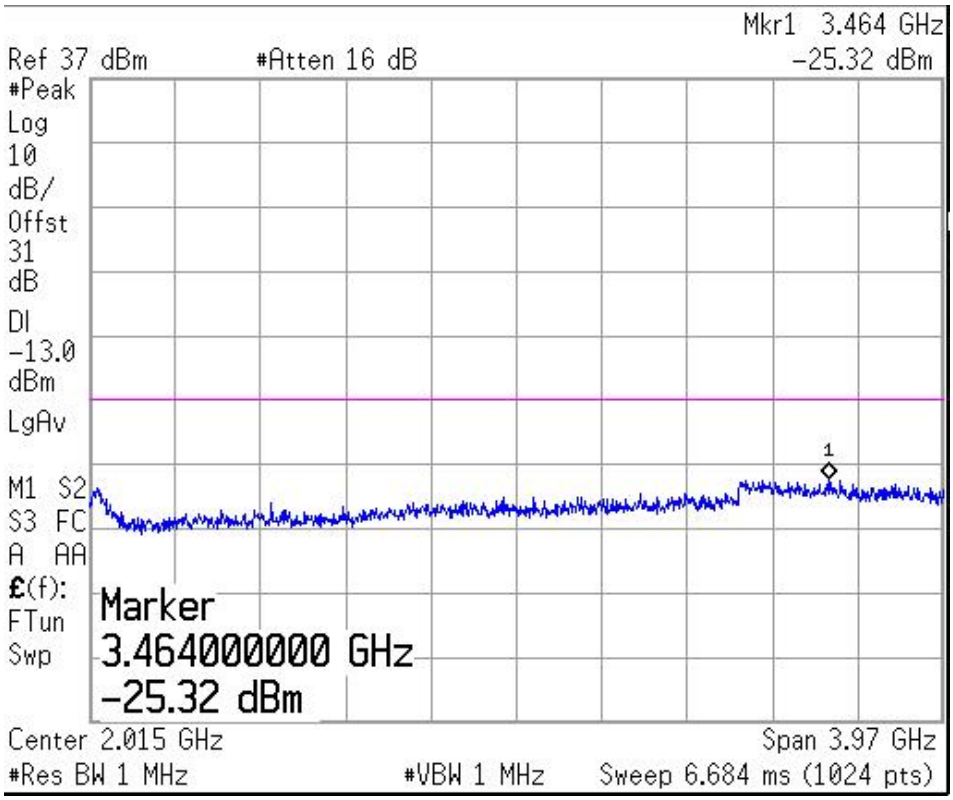
A.7.3.6 Channel 251: 4GHz – 20GHz

Spurious emission limit –13dBm.



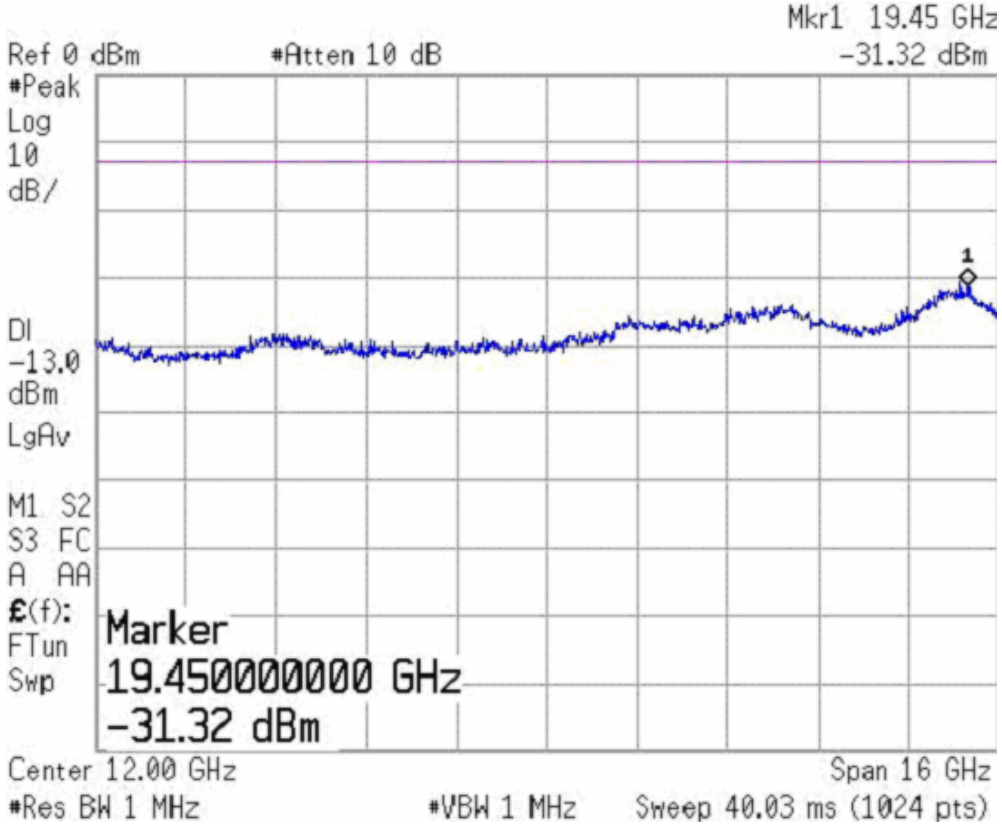
A.7.3.7 Idle mode: 30MHz – 4GHz

Spurious emission limit –13dBm.



A.7.3.8 Idle mode: 4GHz – 20GHz

Spurious emission limit –13dBm.



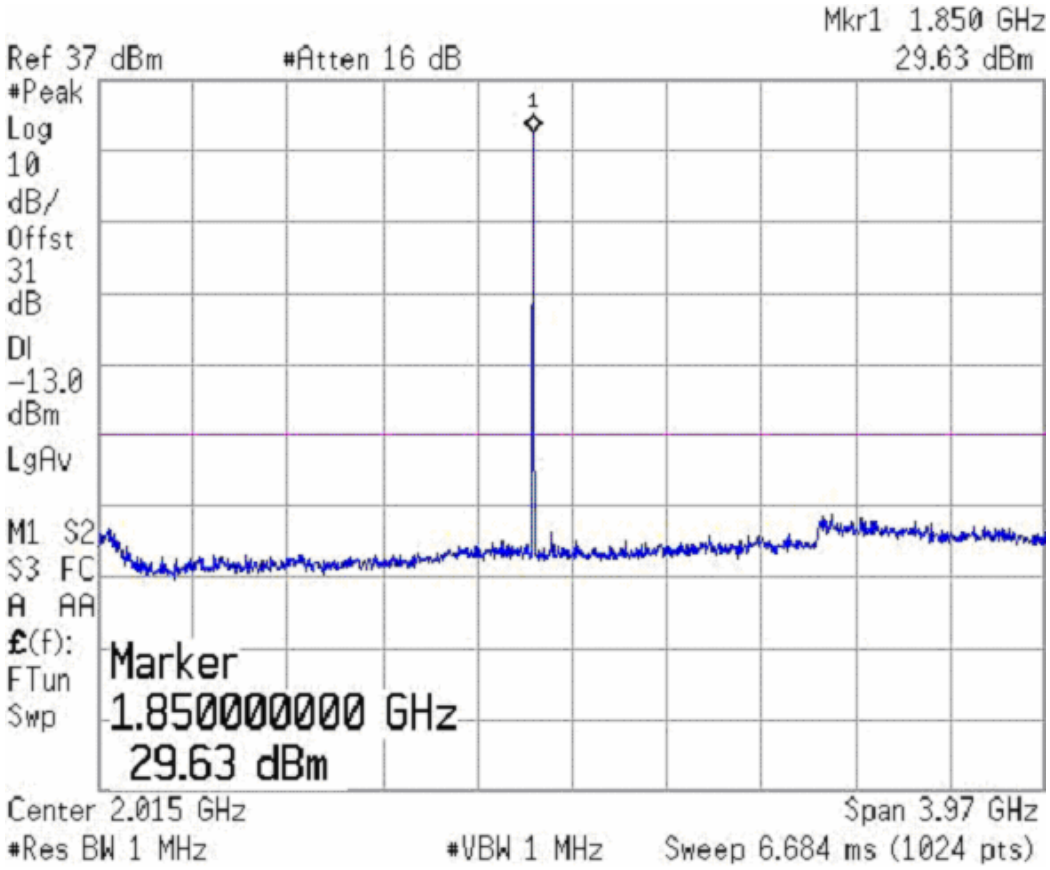
PCS1900

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.7.3.9 Channel 512: 30MHz – 4GHz

Spurious emission limit –13dBm.

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



A.7.3.10 Channel 512: 4GHz – 20GHz

Spurious emission limit –13dBm.

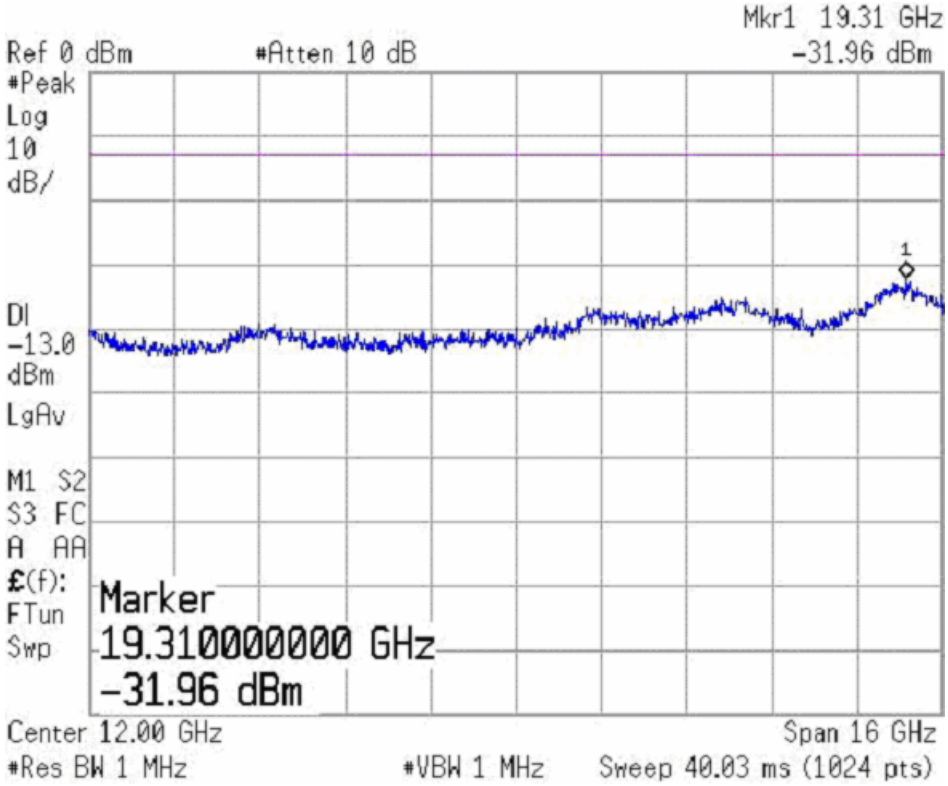
A.7.3.11 Channel 661: 30MHz – 4GHz

Spurious emission limit –13dBm

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

A.7.3.12 Channel 661: 4GHz –20GHz

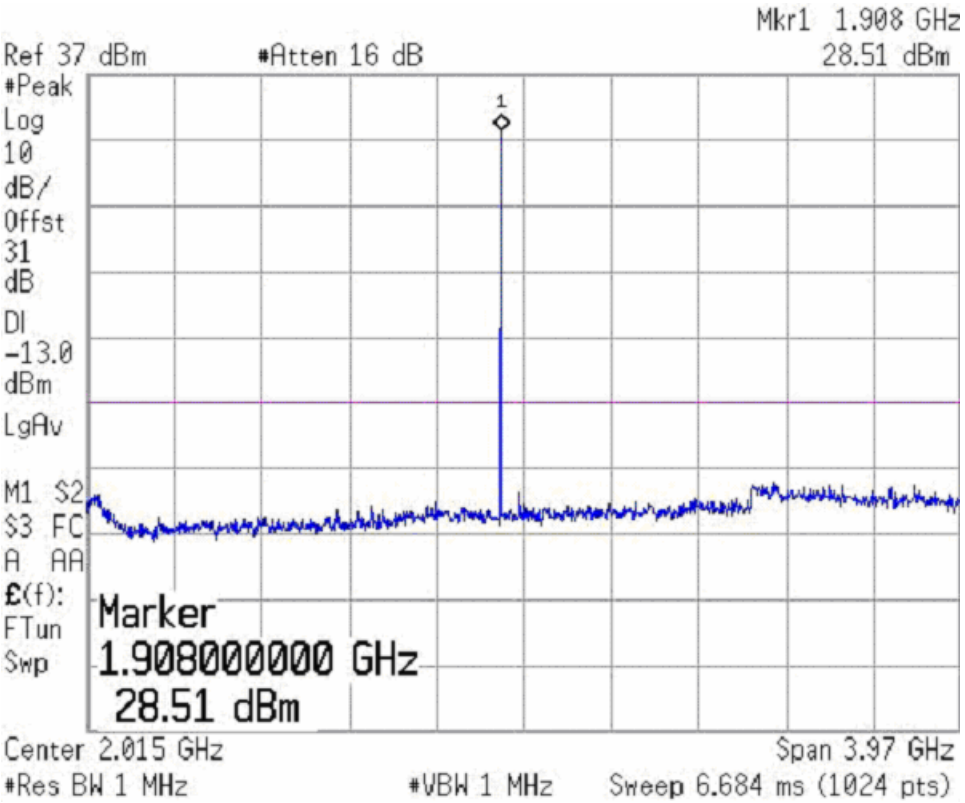
Spurious emission limit –13dBm



A.7.3.13 Channel 810: 30MHz – 4GHz

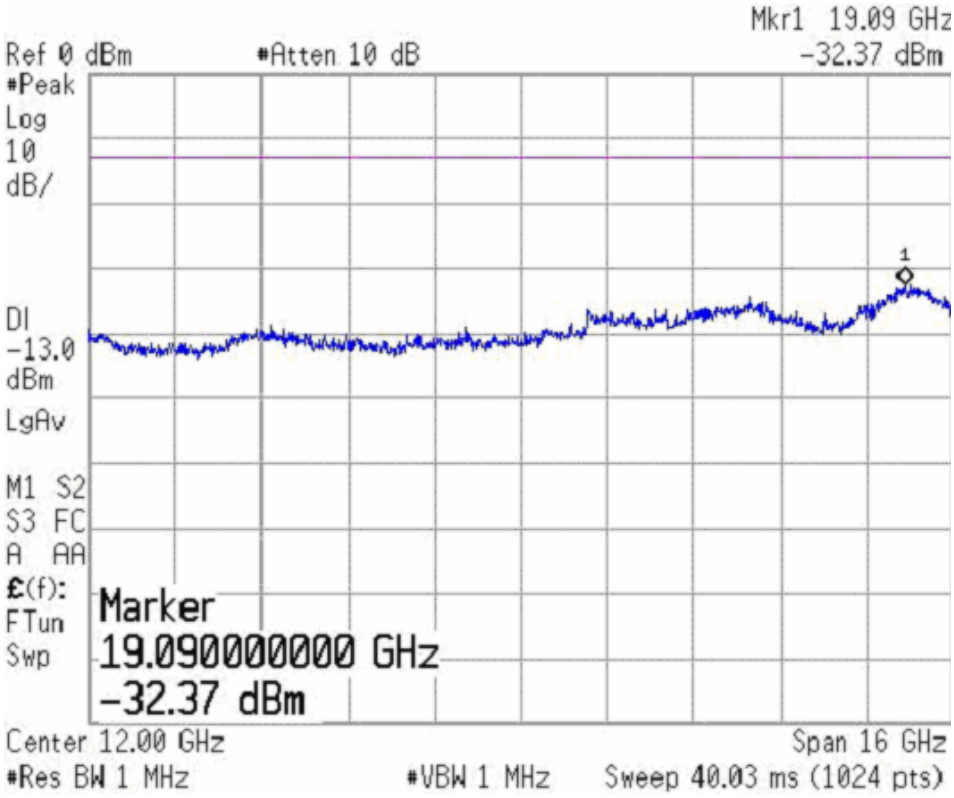
Spurious emission limit –13dBm.

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



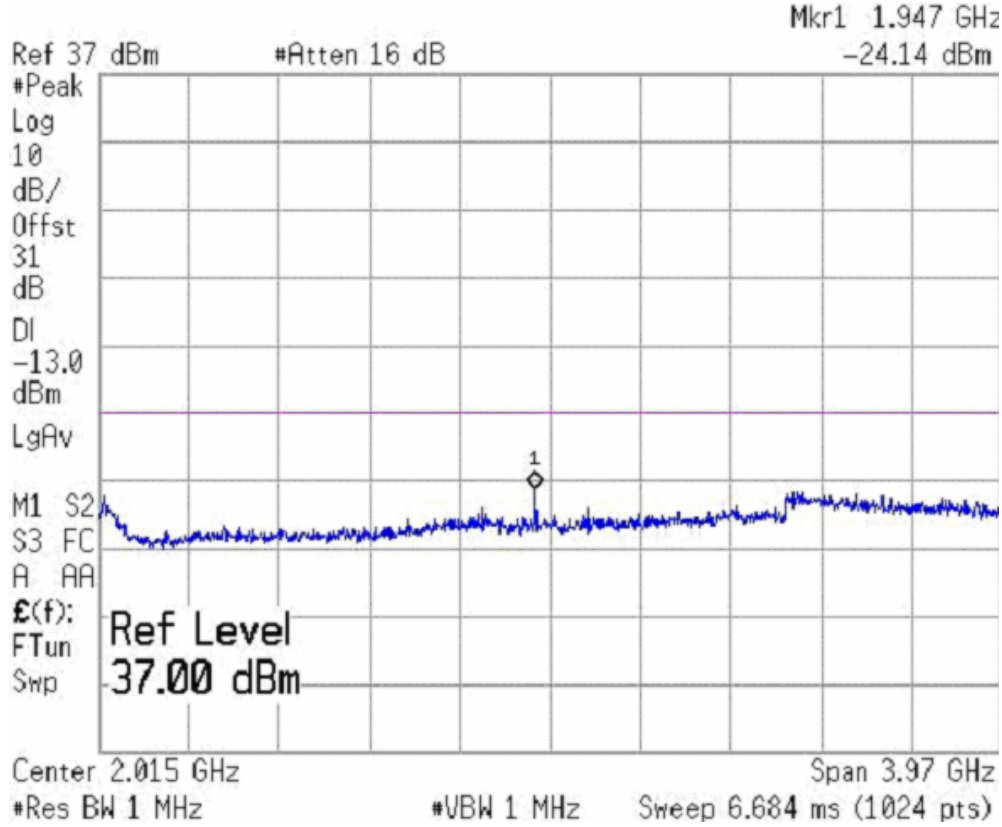
A.7.3.14 Channel 810: 4GHz – 20GHz

Spurious emission limit –13dBm.



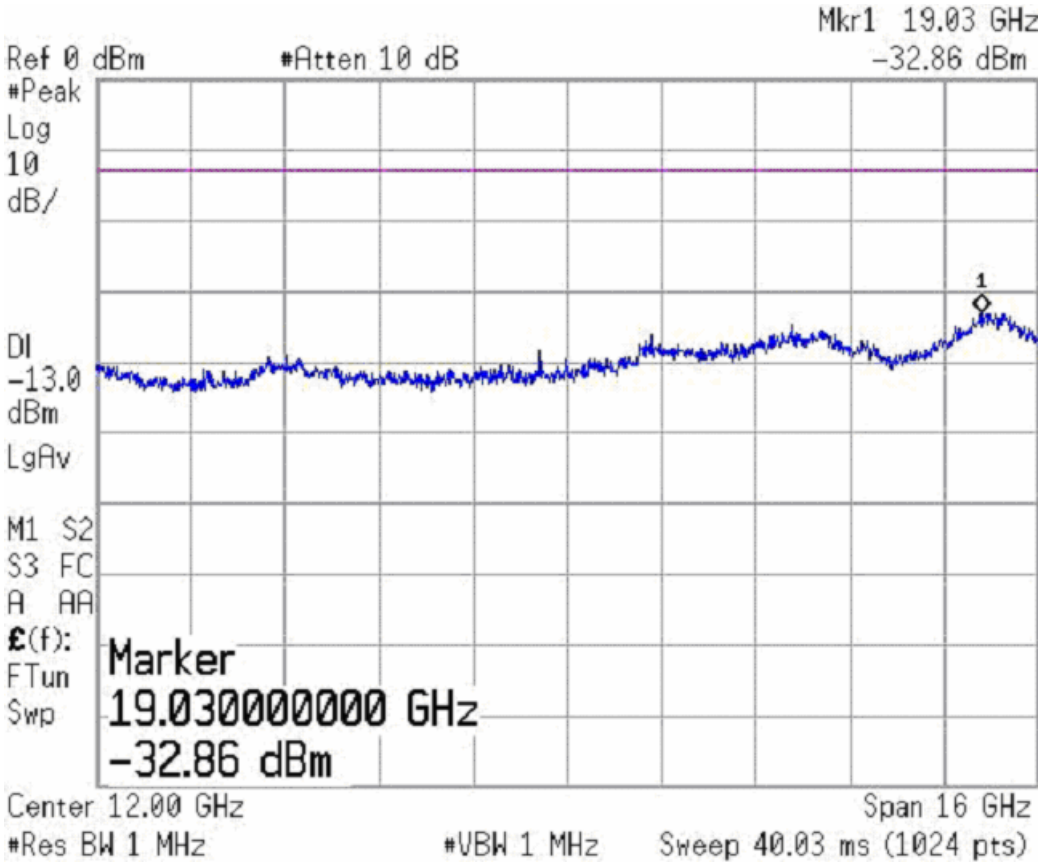
A.7.3.15 Idle mode: 30MHz – 4GHz

Spurious emission limit –13dBm.



A.7.3.16 Idle mode: 4GHz – 20GHz

Spurious emission limit –13dBm.

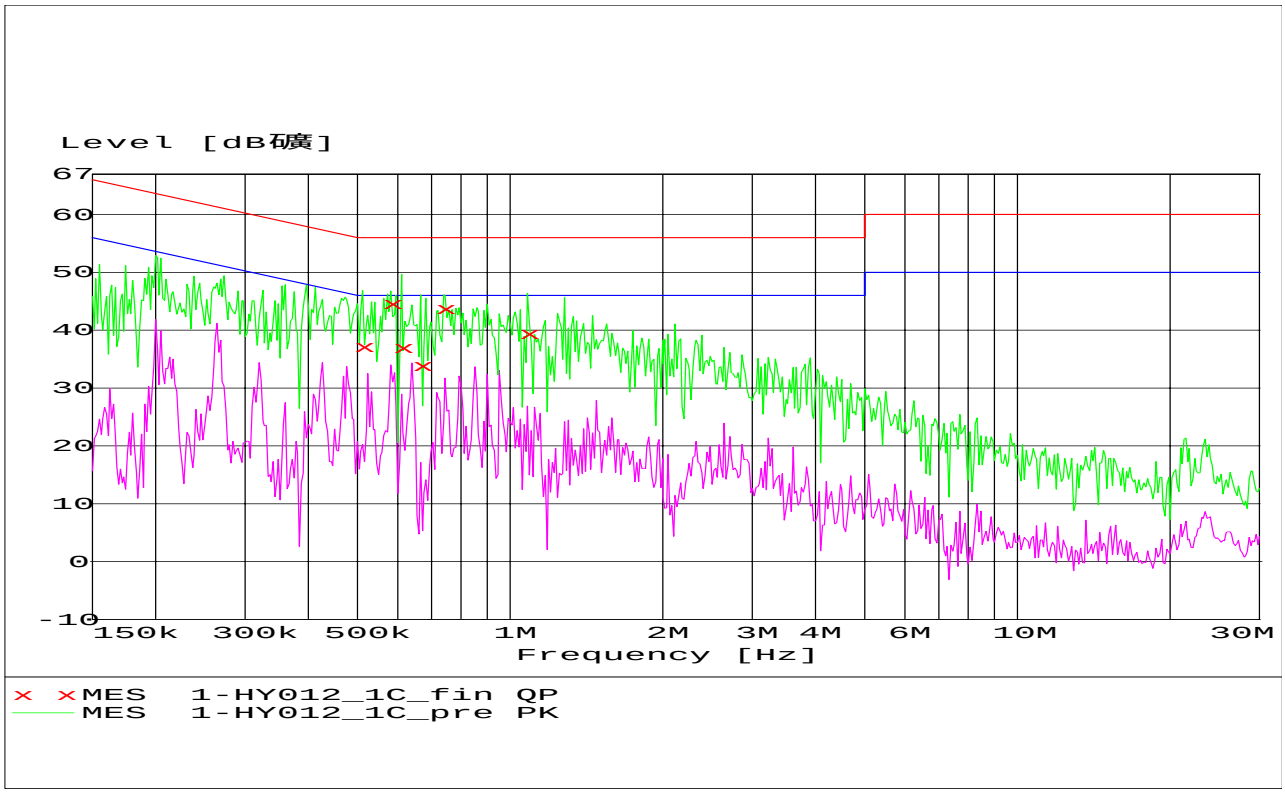


A.8 CONDUCTED EMISSION (§15.107/§207)

A.8.1 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		

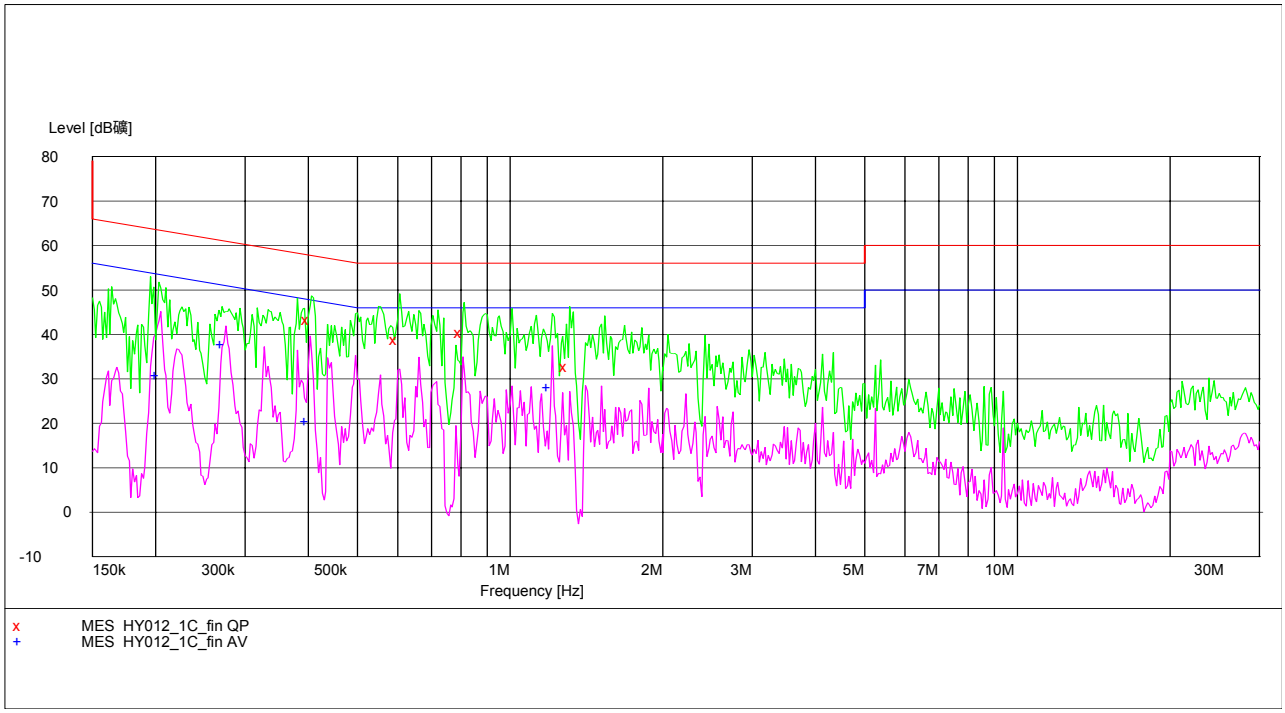
A.8.2 Measurement result



MEASUREMENT RESULT: "1-HY012_1C_fin QP"

6/28/2005 20:06

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.511697	37.10	10.1	56	18.9	N	GND
0.581275	44.60	10.1	56	11.4	L1	GND
0.609740	37.00	10.1	56	19.0	L1	FLO
0.665596	33.90	10.1	56	22.1	N	GND
0.738240	43.70	10.1	56	12.3	L1	GND
1.082189	39.30	10.1	56	16.7	N	FLO



MEASUREMENT RESULT: "HY012_1C_fin QP"

6/23/05 16:30

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.406123	43.40	10.1	58	14.4	L1	GND
0.604901	38.80	10.1	56	17.2	N	GND
0.812314	40.30	10.1	56	15.7	L1	FLO
1.310256	32.70	10.1	56	23.3	N	FLO

MEASUREMENT RESULT: "HY012_1C_fin AV"

6/23/05 16:30

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.204669	30.80	10.1	53	22.7	L1	GND
0.274847	37.60	10.1	51	13.4	N	FLO
0.402900	20.50	10.1	48	27.3	N	FLO
1.209903	28.10	10.2	46	17.9	L1	GND

ANNEX B PHOTOGRAPH OF EUT

External Photo

Mobile Phone

Mobile Phone

Mobile Phone

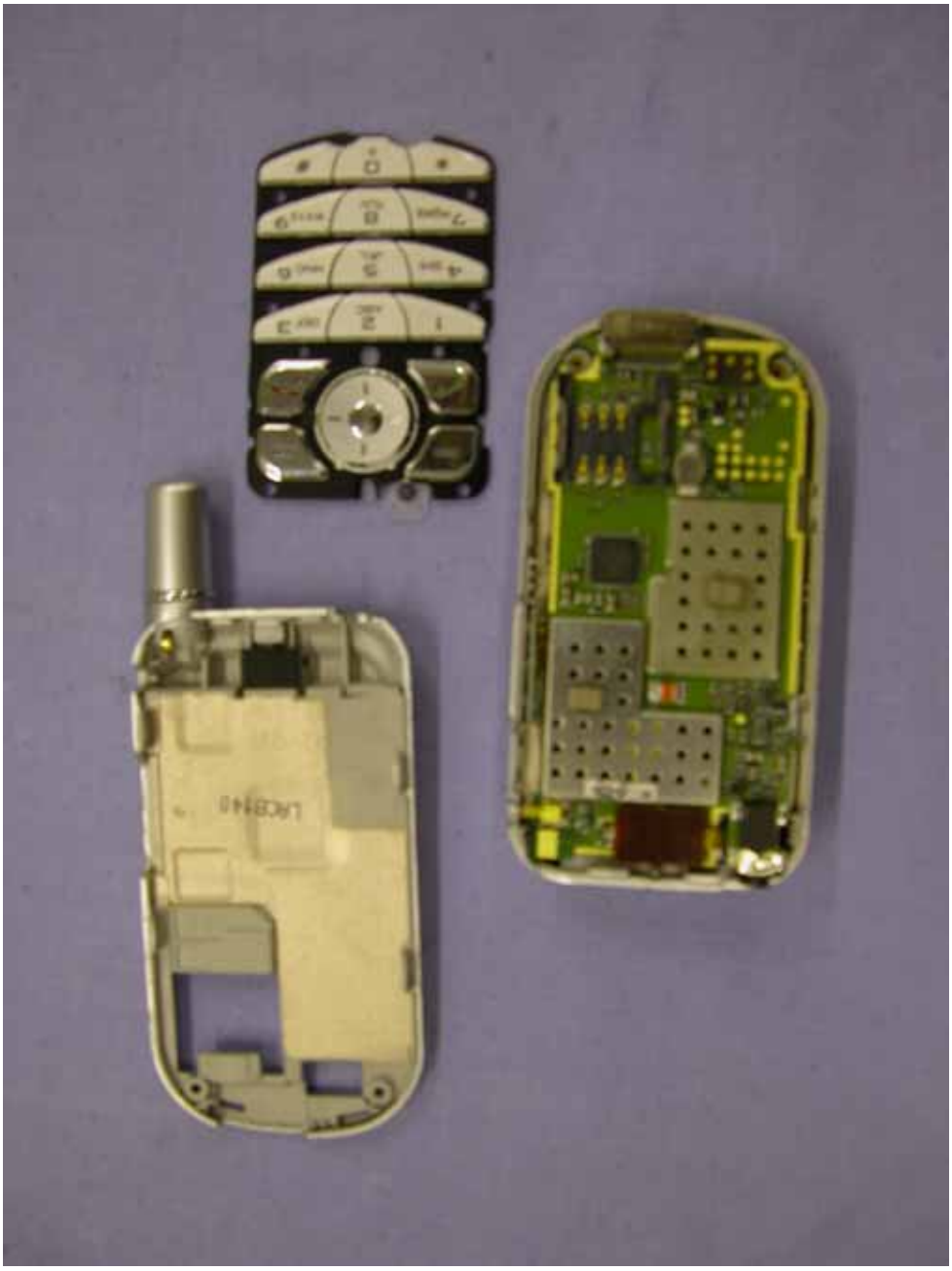
Mobile Phone

Mobile phone

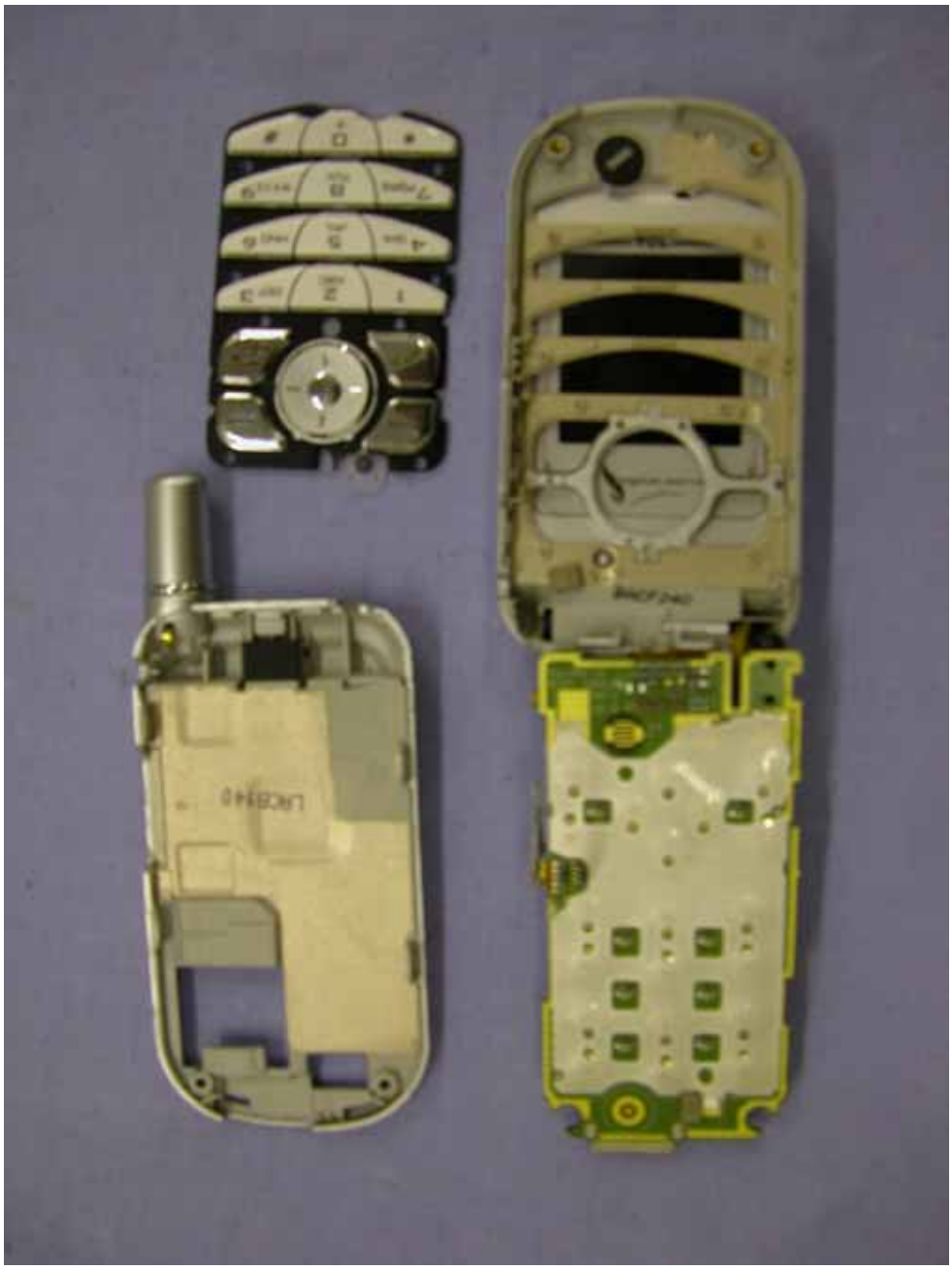
Charger (AC/DC Adapter)

Charger (AC/DC Adapter)

Internal Photo

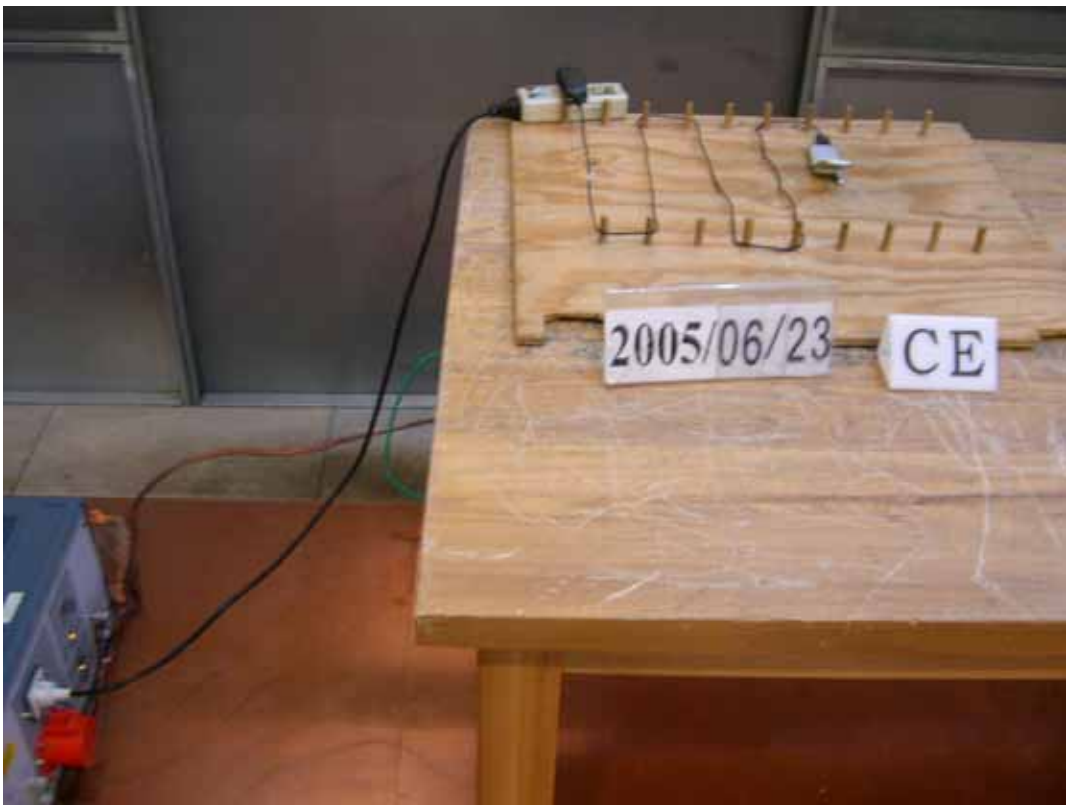


Mobile phone Disassembly



mobile phone PCB front view

ANNEX C TEST LAYOUT



Pic1 Conducted Emission

Pic2 Radiated Spurious Emission

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