

TEST REPORT

No. FCC-PART24-2005007

Test name	FCC Test
Product	GSM Mobile Station
Model	T218
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

**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 3 of 54

Product	GSM Mobile Station	Model	T218
		Trade mark	
Client	TCL Mobile Communication Co.,Ltd		
Manufacturer	TCL Mobile Communication Co.,Ltd	Arrival Date of sample	Jul,31 2005
Place of sampling	(Blank)	Carrier of the samples	Luo Jian
Quantity of the samples	6	Date of product	/
Base of the samples	(Blank)	Items of test	8
Series number	356835000010000		
Standard(s)	FCC Part 24, FCC Part 22		
Conclusion	<p>Final Judgment: Pass</p> <div style="text-align: right;">  (Stamp) Date of issue: Aug 22, 2005 </div>		
Comment	The test result relates only to the tested sample.		

Approved by 张牛 Reviewed by 张锐 Performed by 宋崇文
 (Lu Minniu) (Zhang Rui) (Song Chongwen)

TABLE OF CONTENT

1	COMPETENCE AND WARRANTIES	5
2	GENERAL CONDITIONS	5
3	ABOUT EUT	5
4	LABORATORY ENVIRONMENT	6
5	SUMMARY OF TEST RESULTS	7
6	MAIN TEST INSTRUMENTS	8
7	TEST PERIOD	8
8	TEST LOCATION	8
	ANNEX A MEASUREMENT RESULTS.....	9
	ANNEX B PHOTOGRAPH OF EUT	48
	ANNEX C TEST LAYOUT	54

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

**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 6 of 54

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	T218
Description	GSM mobile station
IMEI	EUT1: 356835000010000;
Hardware status	V3.3
Software status	01.00.03N
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	29.70dBm(0.93W) maximum ERP measured for GSM 850 28.73dBm(0.75W) 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

**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 7 of 54

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

**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 8 of 54

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 Aug, 3, 2005 and finished on Aug, 19, 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 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: 356835000010000;

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	5	32.96
836.6	5	32.98
848.8	5	32.87

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: 356835000010000;

Frequency(MHz)	Power Step	Peak output power(dBm)
1850.2	0	30.09
1880.0	0	29.35
1909.8	0	29.29

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 (P_{in}) is applied to the input of the dipole, and the power received (P_r) at the chamber's probe antenna is recorded.
2. A "reference path loss" is established as $P_{in} + 2.15 - P_r$.
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 (P_{in}).
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	$\leq 38.45dBm$ (7W)

Measurement result

Frequency(MHz)	Power Step	Peak ERP(dBm)
824.2	5	29.70
836.6	5	29.68
848.8	5	29.48

ANALYZER SETTINGS: RBW = VBW = 3MHz

**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 11 of 54

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	28.73
1880.0	0	26.98
1909.8	0	25.19

ANALYZER SETTINGS: RBW = VBW = 3MHz

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	9	0.011
3.7	7	0.008
4.2	9	0.011

Frequency Error vs Temperature

temperature()	Frequency error(Hz)	Frequency error(ppm)
-30	19	0.023
-20	19	0.023
-10	17	0.020
0	19	0.023
10	14	0.017
20	15	0.018
30	11	0.013
40	12	0.014
50	16	0.019

PCS 1900

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.4	21	0.011
3.7	16	0.009
4.2	14	0.007

**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 13 of 54

Frequency Error vs Temperature

temperature()	Frequency error(Hz)	Frequency error(ppm)
-30	26	0.014
-20	23	0.012
-10	24	0.013
0	22	0.012
10	18	0.010
20	19	0.010
30	19	0.010
40	21	0.011
50	19	0.010

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: 356835000010000

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
824.2	267.979
836.6	280.310
848.8	264.872

ANALYZER SETTINGS: RBW=VBW=3kHz

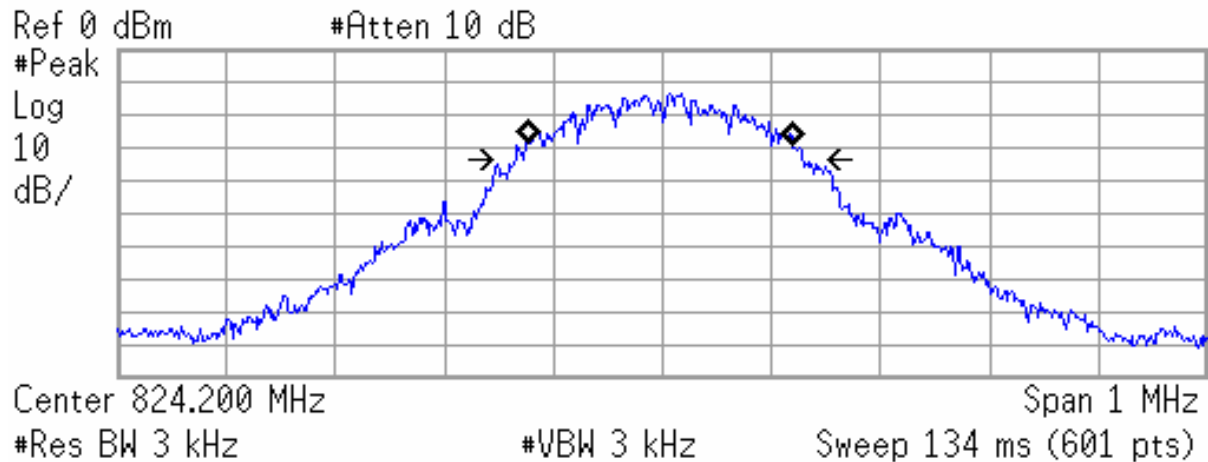
Telecommunication Metrology Center
of Ministry of Information Industry

No. FCC-PART-24-2005007

Page 14 of 54

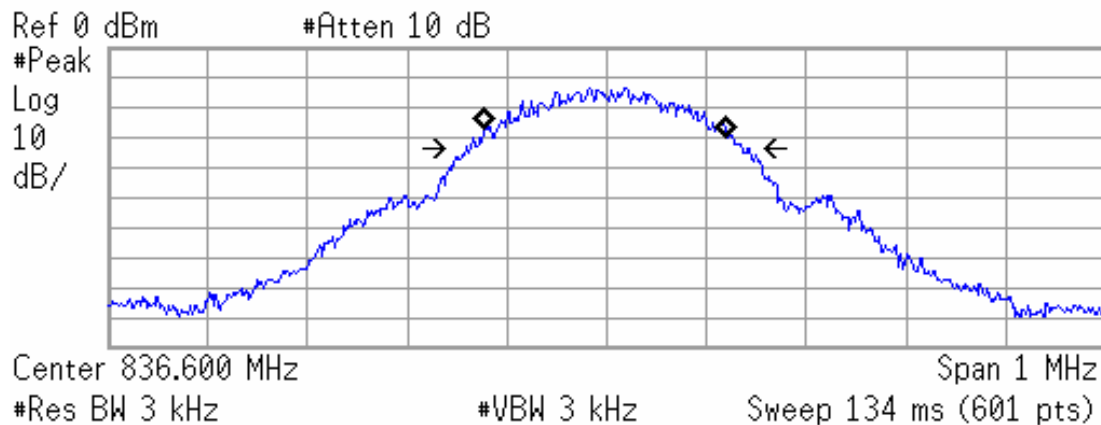
GSM 850

Channel 128-Occupied Bandwidth (-20dBc BW)



Occupied Bandwidth	Occ BW % Pwr	99.00 %
246.2545 kHz	x dB	-20.00 dB
Transmit Freq Error	-1.944 kHz	
x dB Bandwidth	267.979 kHz	

Channel 190-Occupied Bandwidth (-20dBc BW)



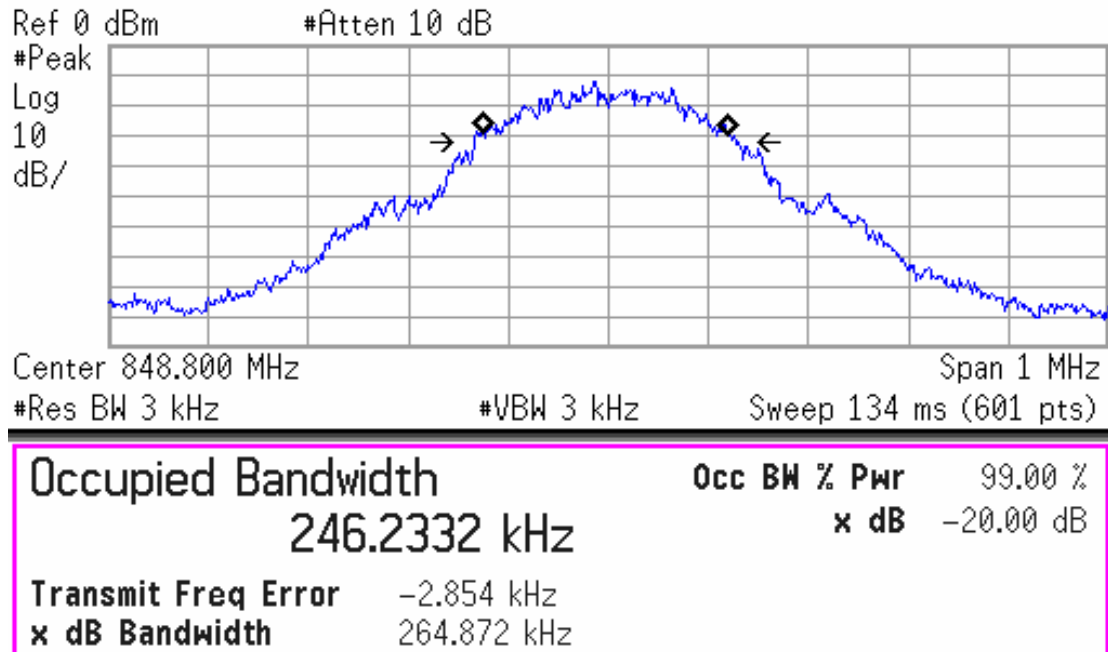
Occupied Bandwidth	Occ BW % Pwr	99.00 %
246.2703 kHz	x dB	-20.00 dB
Transmit Freq Error	-1.211 kHz	
x dB Bandwidth	280.310 kHz	

**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 15 of 54

Channel 251-Occupied Bandwidth (-20dBc BW)



PCS 1900(-20dBc)

EUT1: 356835000010000

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(kHz)
1850.2	275.289
1880.0	271.310
1909.8	273.561

ANALYZER SETTINGS: RBW=VBW=3kHz

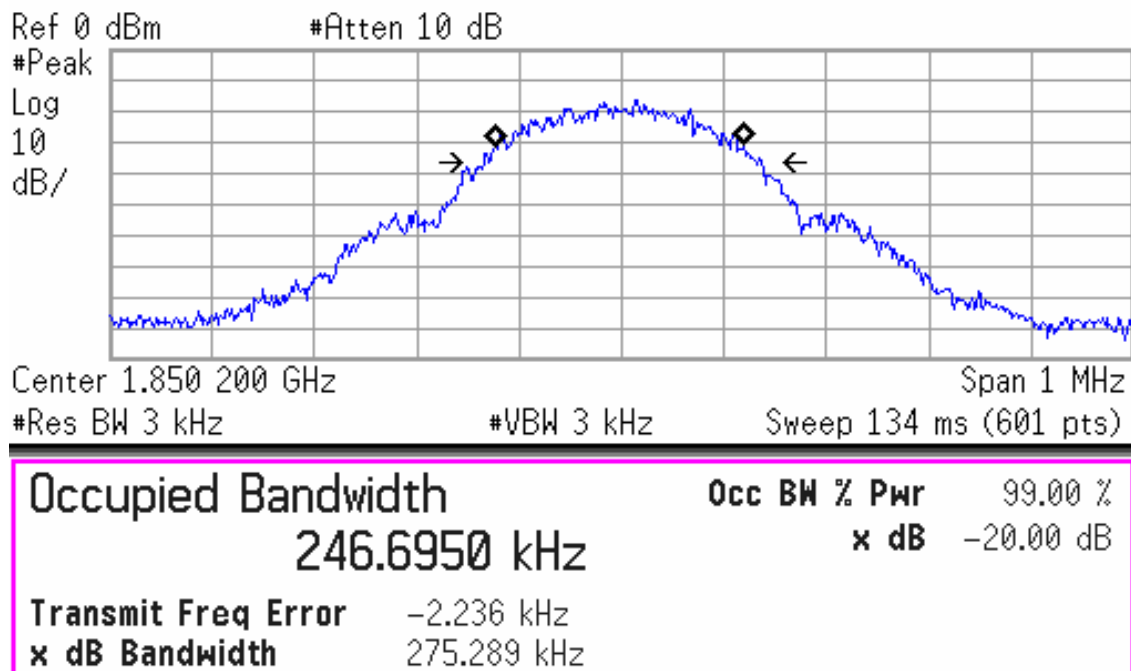
Telecommunication Metrology Center
of Ministry of Information Industry

No. FCC-PART-24-2005007

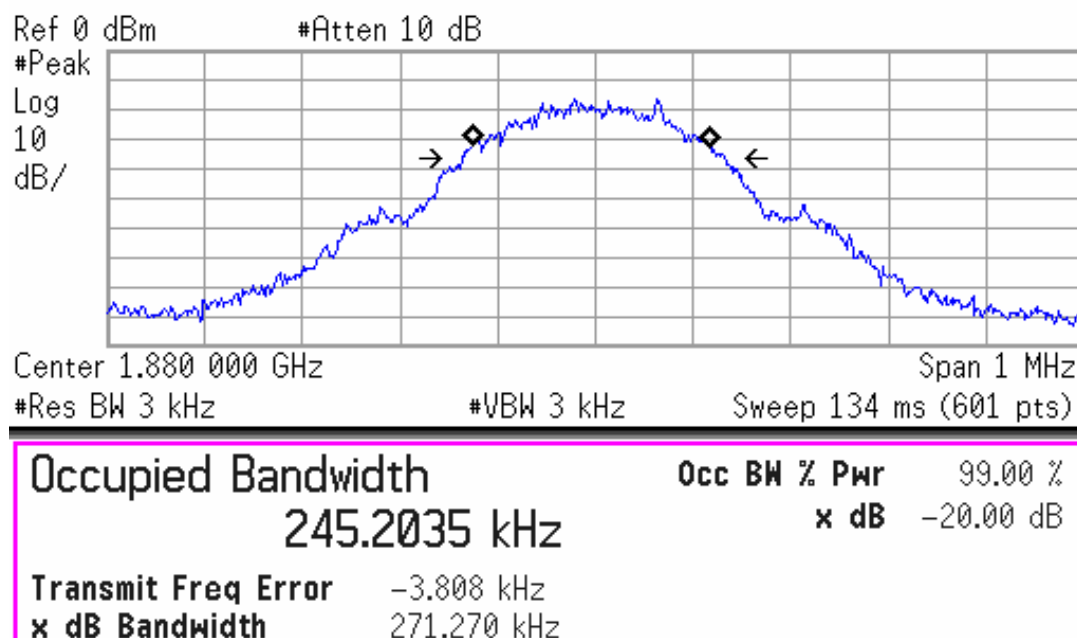
Page 16 of 54

PCS 1900

Channel 512-Occupied Bandwidth (-20dBc BW)



Channel 661-Occupied Bandwidth (-20dBc BW)

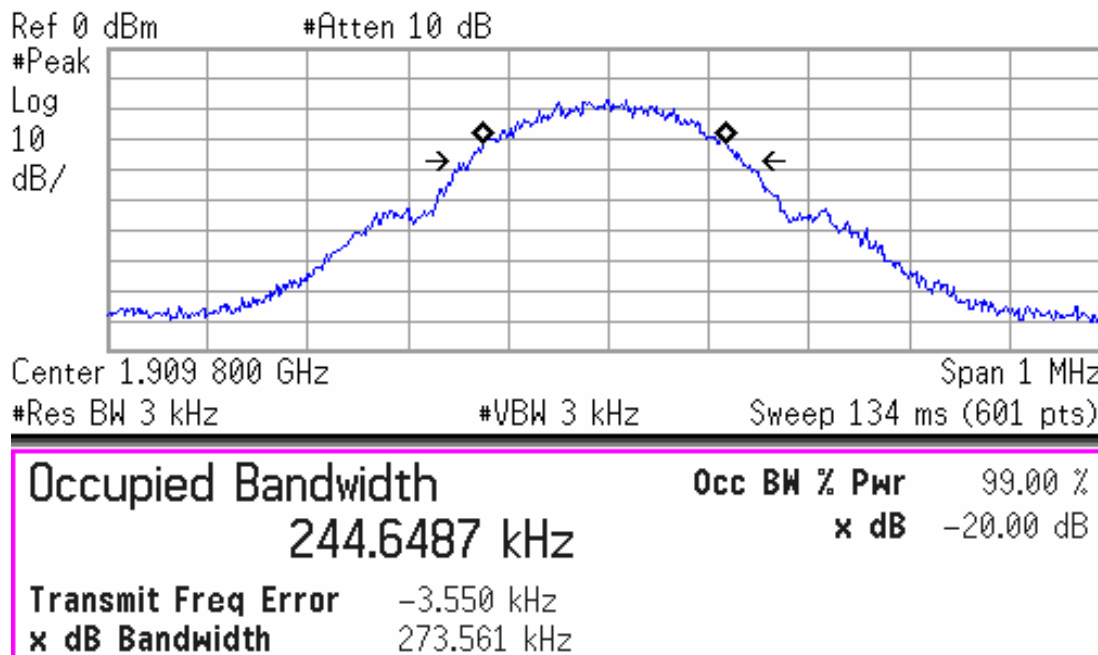


**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 17 of 54

Channel 810-Occupied Bandwidth (-20dBc BW)



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

A.4.1 Emission 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: 356835000010000

Frequency(MHz)	Occupied Bandwidth (-26dBc BW)(kHz)
824.2	313.886
836.6	315.192
848.8	314.660

ANALYZER SETTINGS: RBW=VBW=3kHz

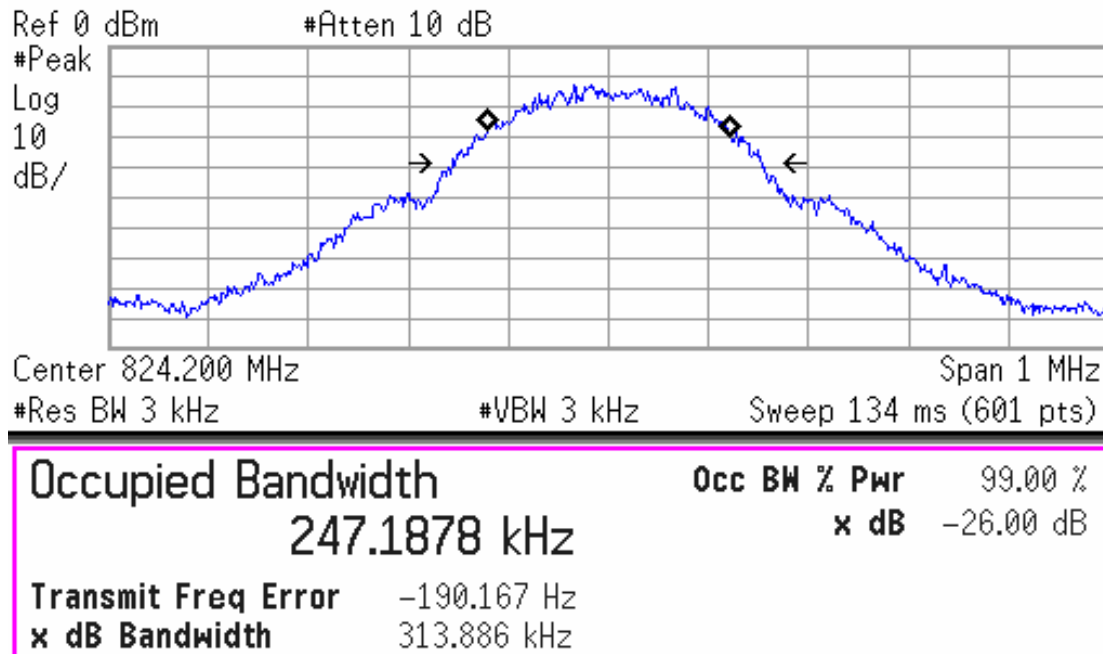
Telecommunication Metrology Center
of Ministry of Information Industry

No. FCC-PART-24-2005007

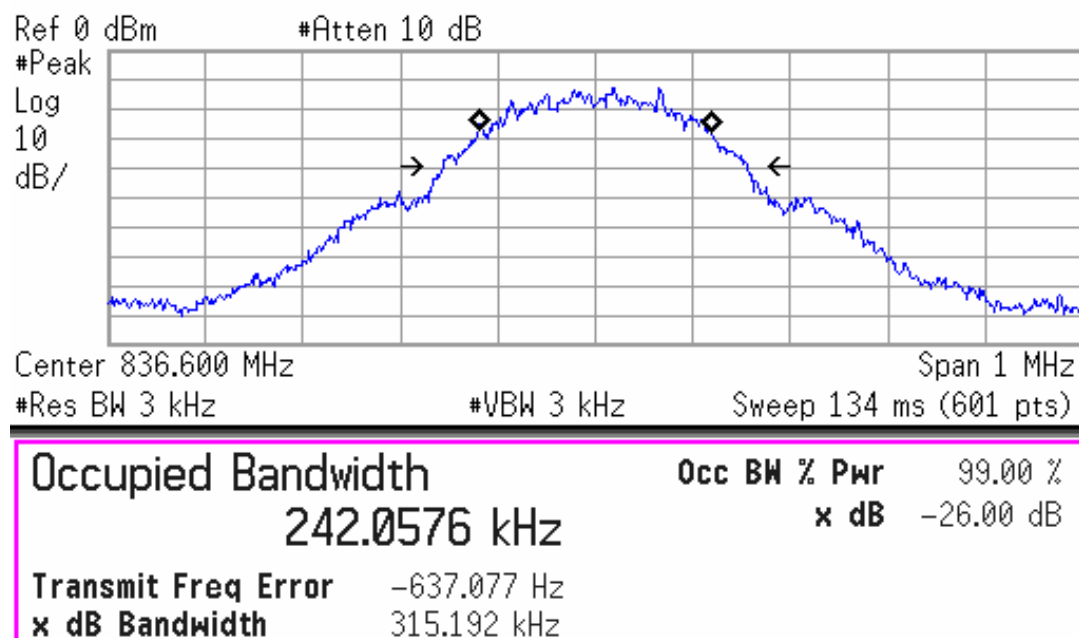
Page 18 of 54

GSM 850

Channel 128-Occupied Bandwidth (-26dBc BW)



Channel 190-Occupied Bandwidth (-26dBc BW)

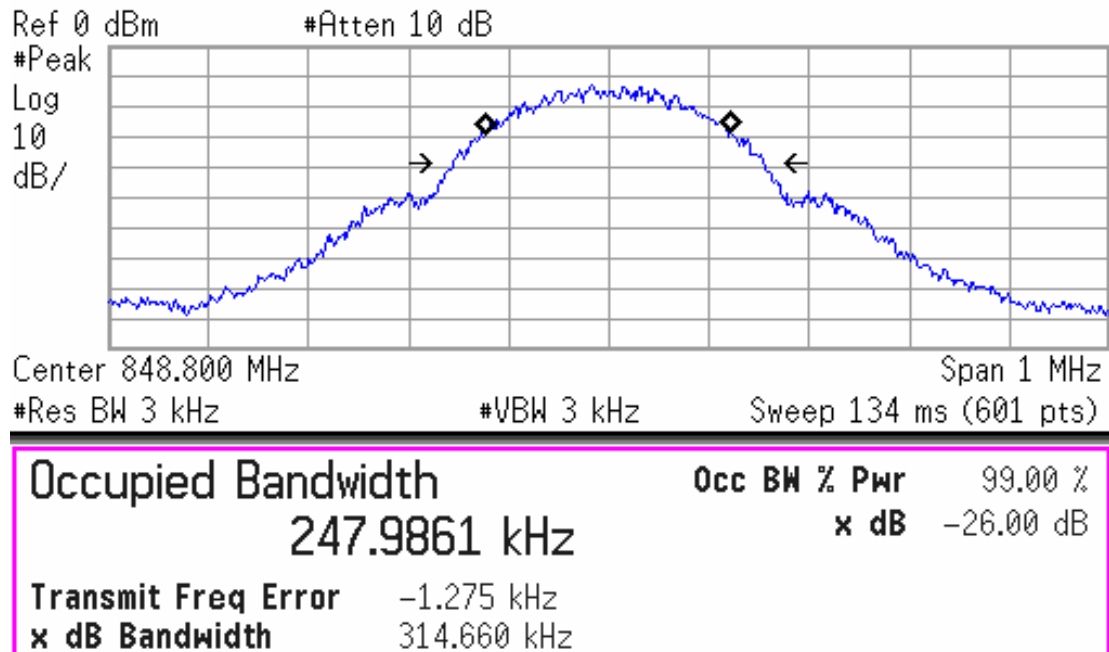


**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 19 of 54

Channel 251-Occupied Bandwidth (-26dBc BW)



PCS 1900(-26dBc)

EUT1: 356835000010000

Frequency(MHz)	Occupied Bandwidth (-26dBc BW)(kHz)
1850.2	315.540
1880.0	312.143
1909.8	308.288

ANALYZER SETTINGS: RBW=VBW=3kHz;

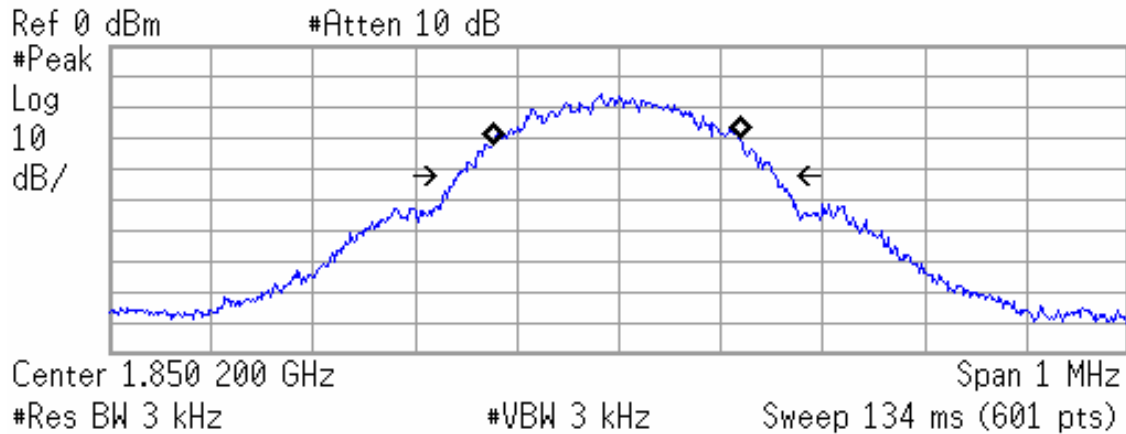
Telecommunication Metrology Center
of Ministry of Information Industry

No. FCC-PART-24-2005007

Page 20 of 54

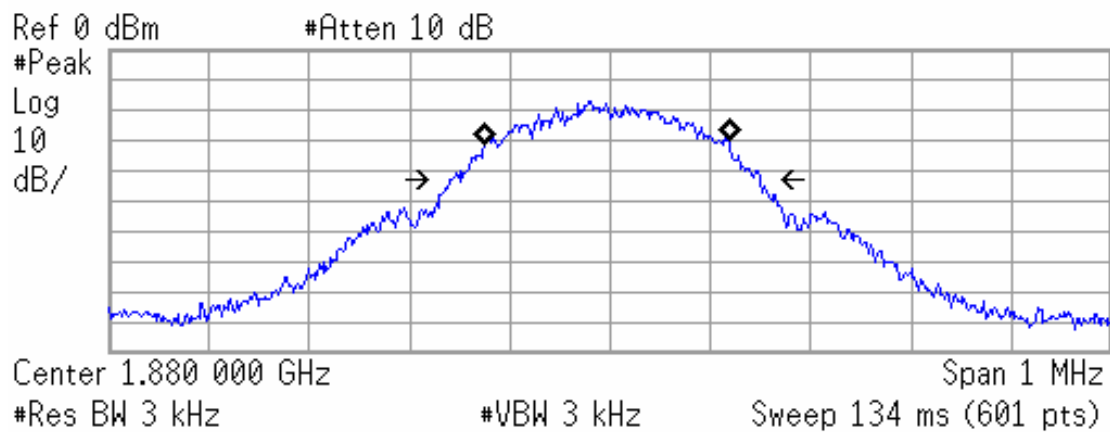
PCS 1900

Channel 512-Occupied Bandwidth (-26dBc BW)



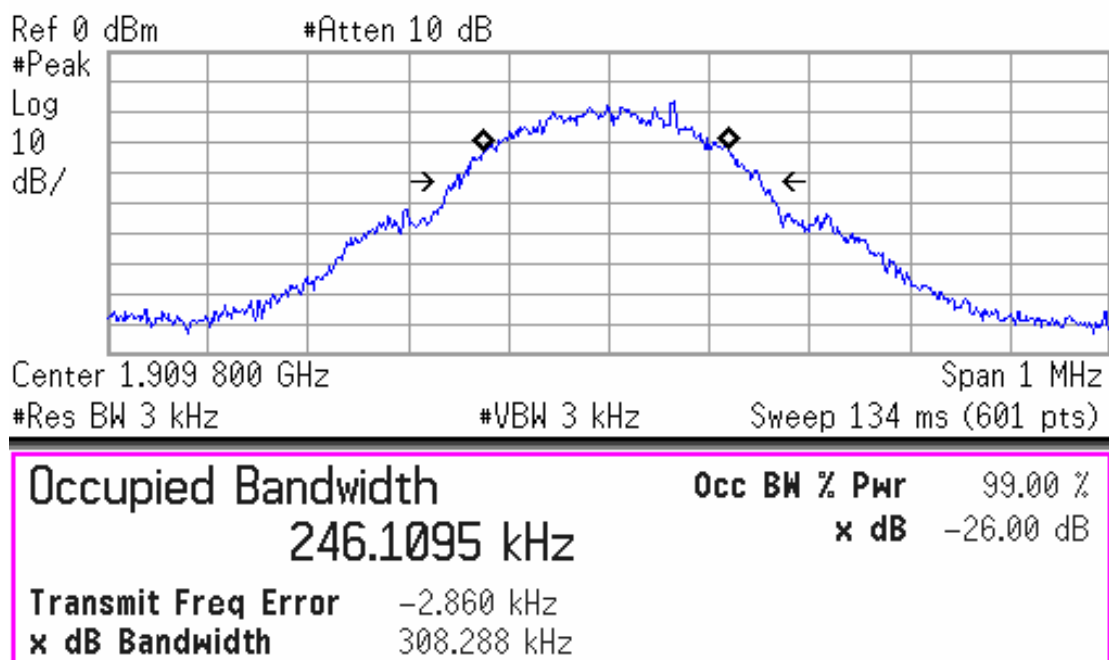
Occupied Bandwidth	Occ BW % Pwr	99.00 %
246.4497 kHz	x dB	-26.00 dB
Transmit Freq Error	-2.471 kHz	
x dB Bandwidth	315.540 kHz	

Channel 661-Occupied Bandwidth (-26dBc BW)



Occupied Bandwidth	Occ BW % Pwr	99.00 %
246.0758 kHz	x dB	-26.00 dB
Transmit Freq Error	-3.700 kHz	
x dB Bandwidth	312.143 kHz	

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.

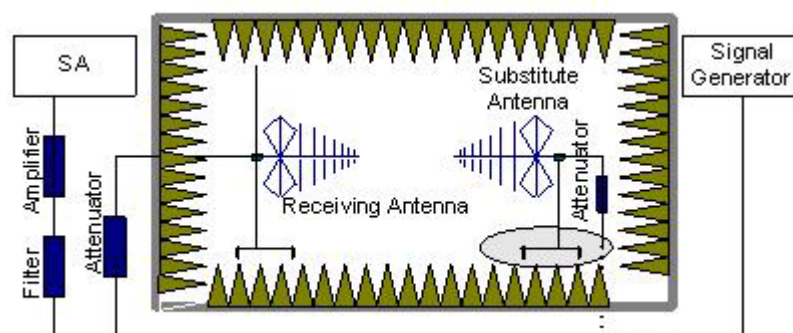
The procedure of radiated spurious emissions is as follows:

a) Pre-calibration

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

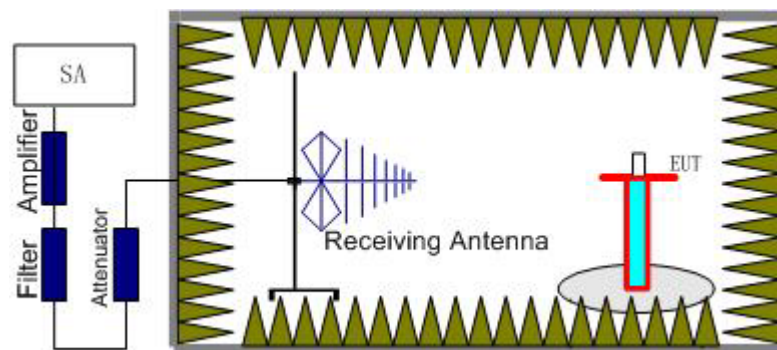
$$RSE = Rx \text{ (dBuV)} + CL \text{ (dB)} + SA \text{ (dB)} + Gain \text{ (dBi)} - 107 \text{ (dBuV to dBm)}$$

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.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 $43 + 10 \log(P)$ 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

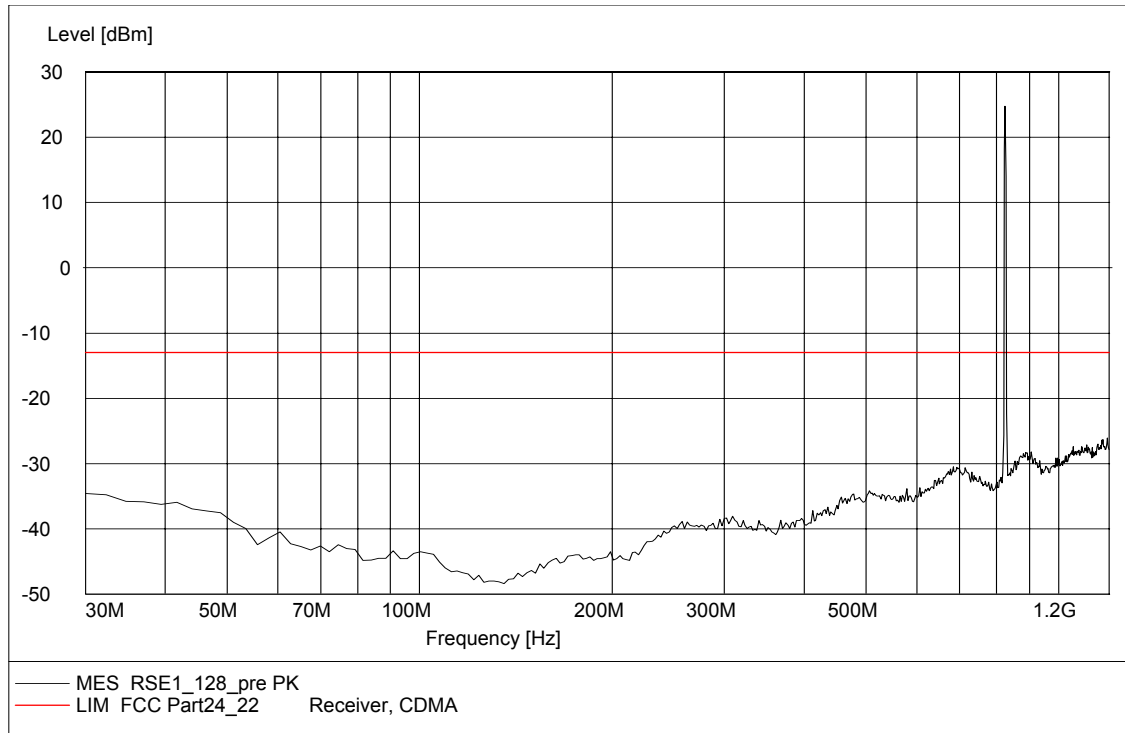
relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels.

GSM 850

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

Radiated spurious emission limit :-13dBm.

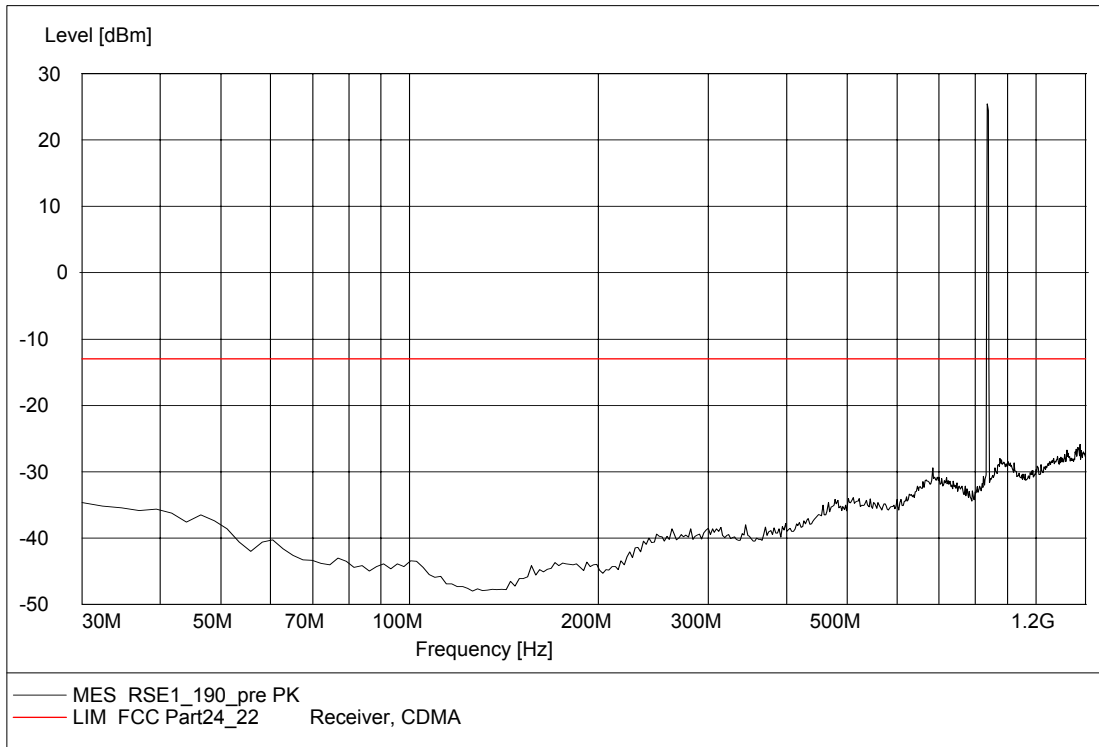
NOTE: peak above the limit line is the Carrier frequency @ ch-128



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

Radiated spurious emission limit :-13dBm.

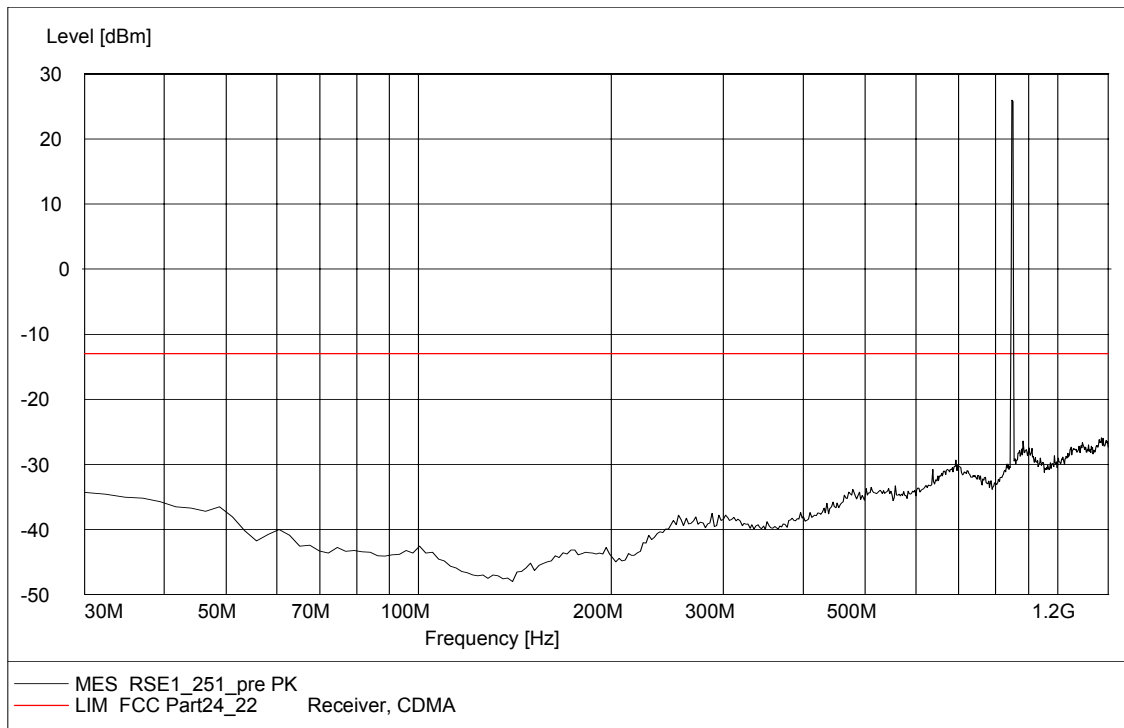
NOTE: peak above the limit line is the Carrier frequency @ ch-190



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

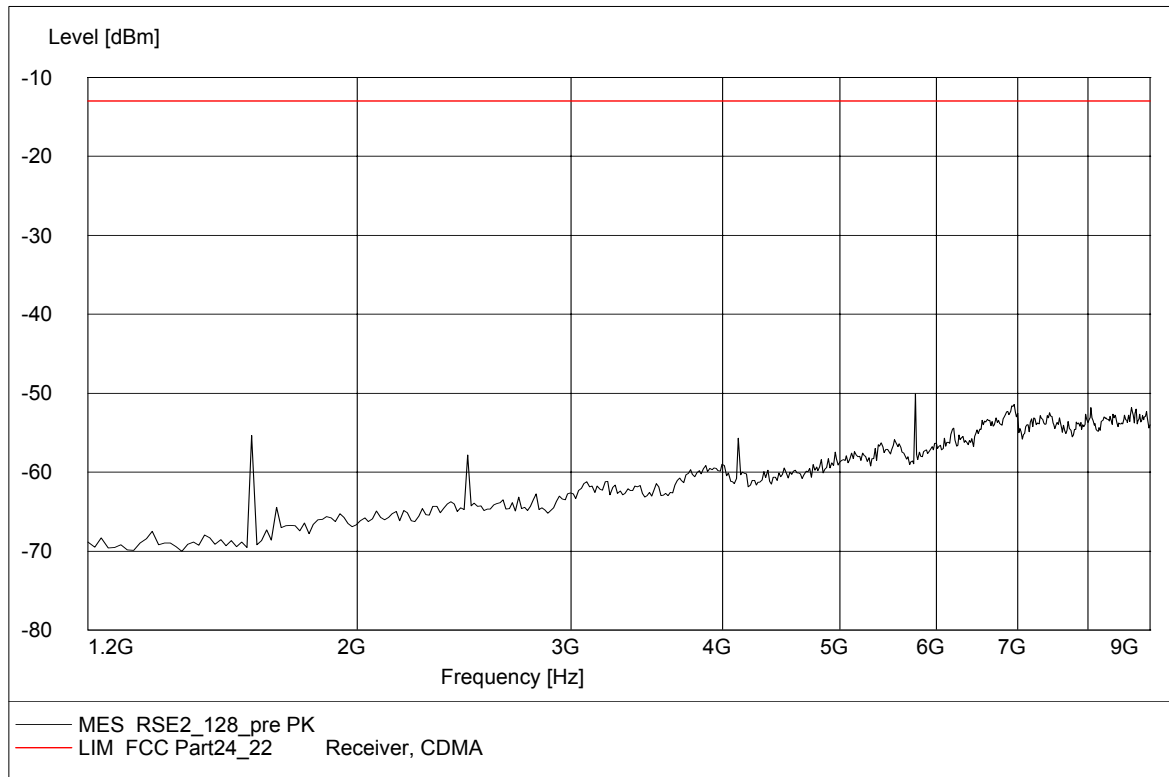
Radiated spurious emission limit :-13dBm.

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



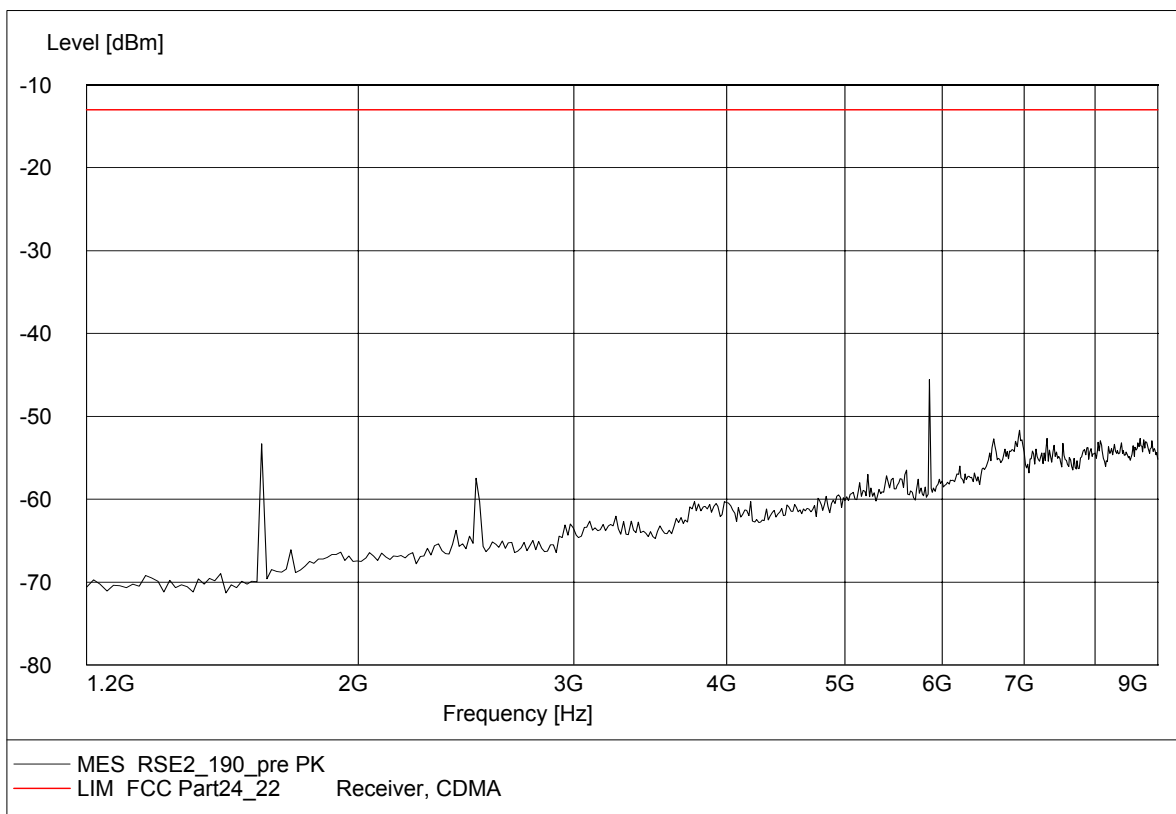
A.5.3.4 RADIATED SPURIOUS EMISSIONS-Channel 128: 1.2GHz – 9GHz

Radiated spurious emission limit :-13dBm.



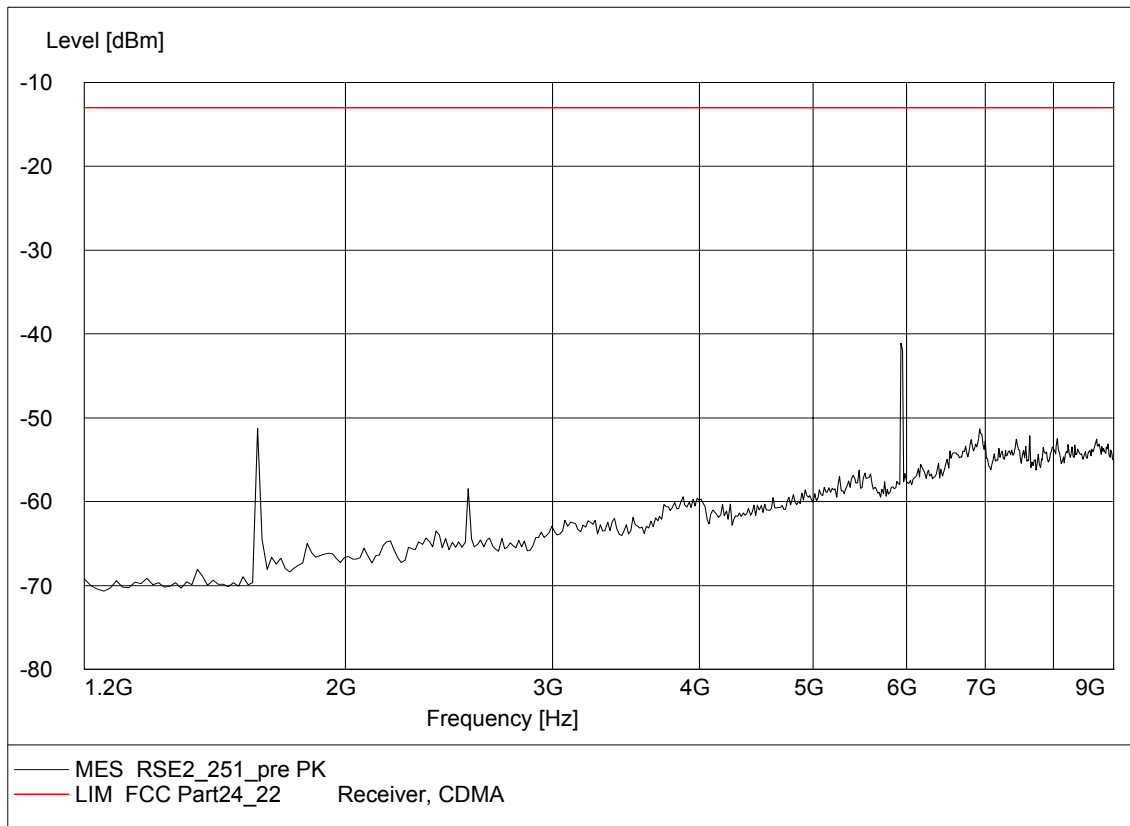
A5.3.5 RADIATED SPURIOUS EMISSIONS-Channel 190: 1.2GHz – 9GHz

Radiated spurious emission limit :-13dBm.



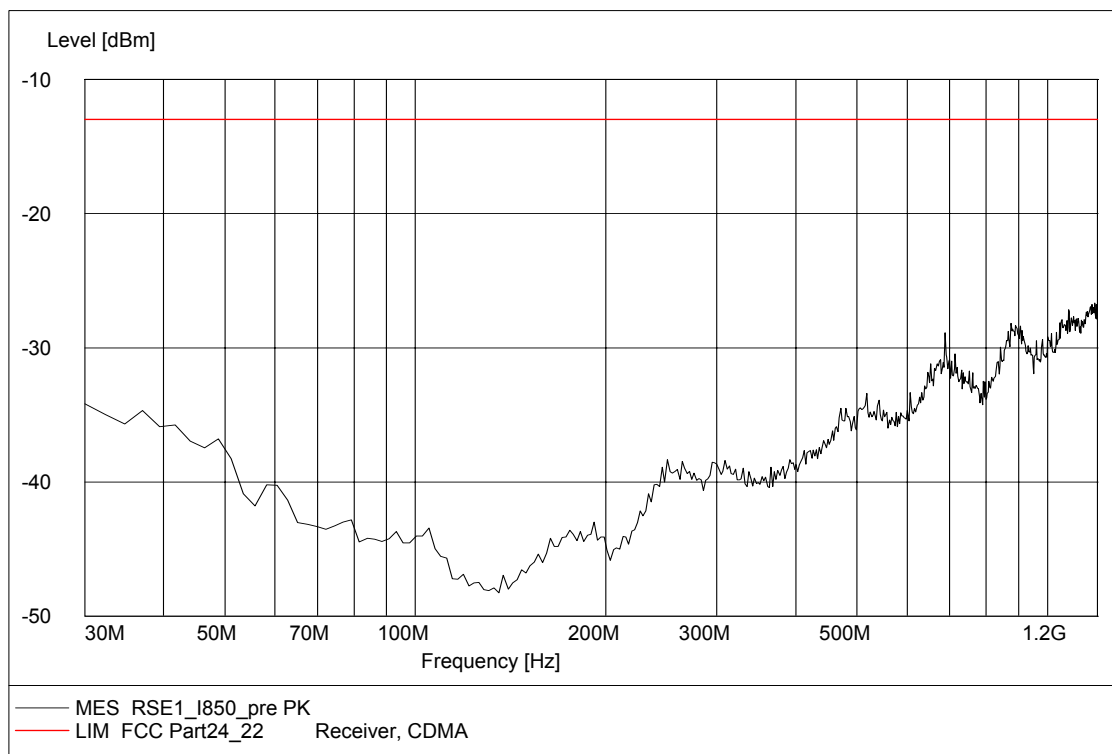
A.5.3.6 RADIATED SPURIOUS EMISSIONS-Channel 251: 1.2GHz – 9GHz

Radiated spurious emission limit :-13dBm.



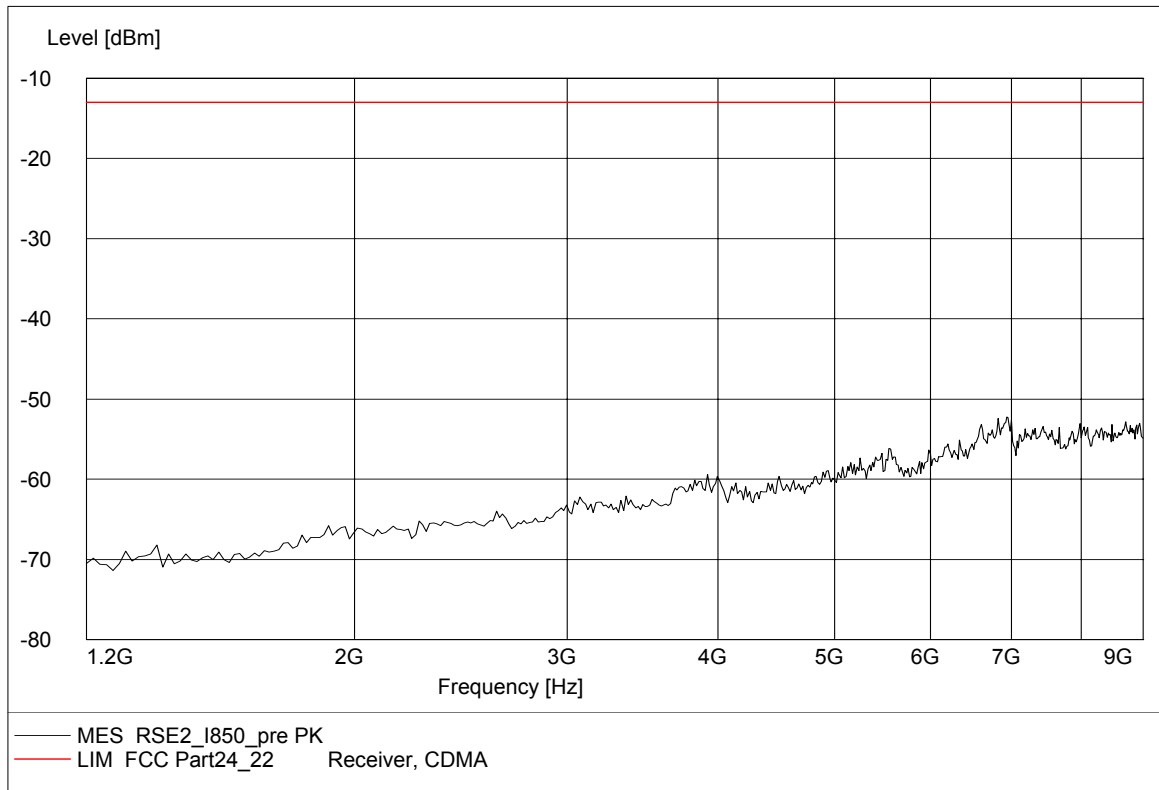
A.5.3.7 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 1.2GHz

Radiated spurious emission limit :-13dBm.



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

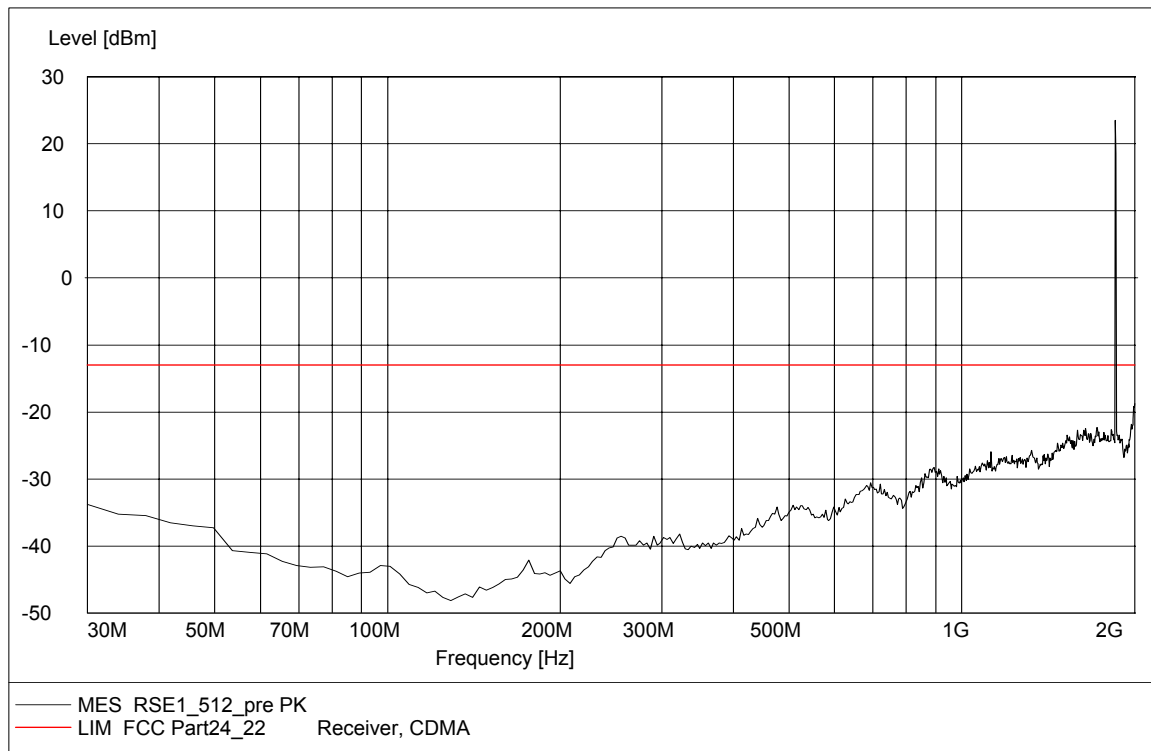
Radiated spurious emission limit :-13dBm.



PCS 1900

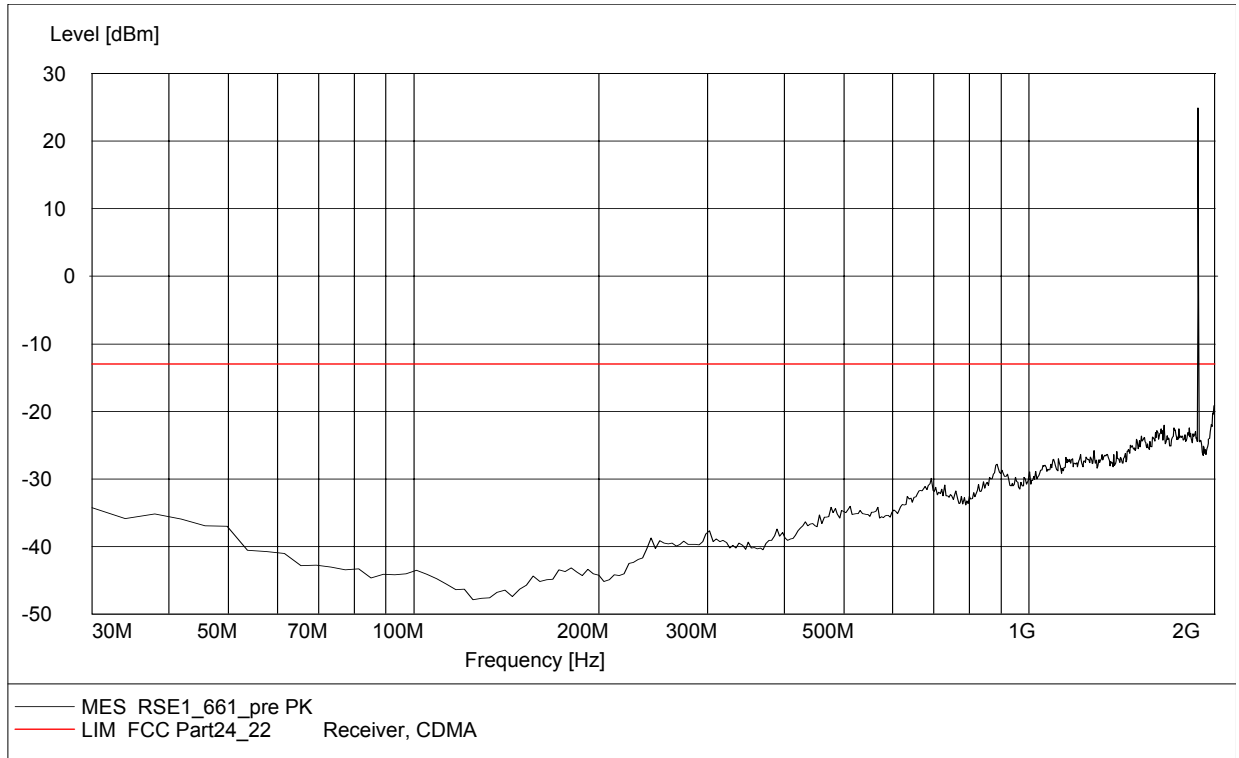
A.5.3.9 RADIATED SPURIOUS EMISSIONS-Channel 512: 30MHz – 2GHz

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



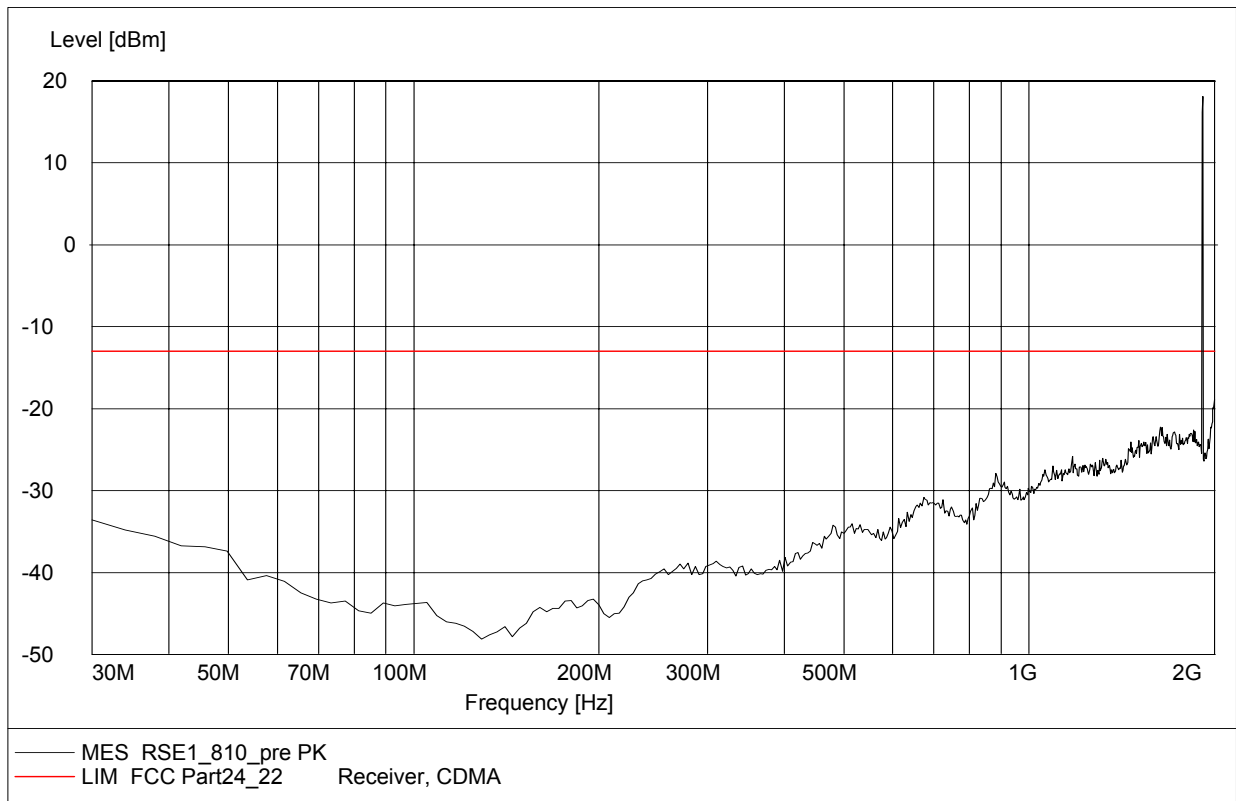
A.5.3.10 RADIATED SPURIOUS EMISSIONS-Channel 661: 30MHz – 2GHz

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

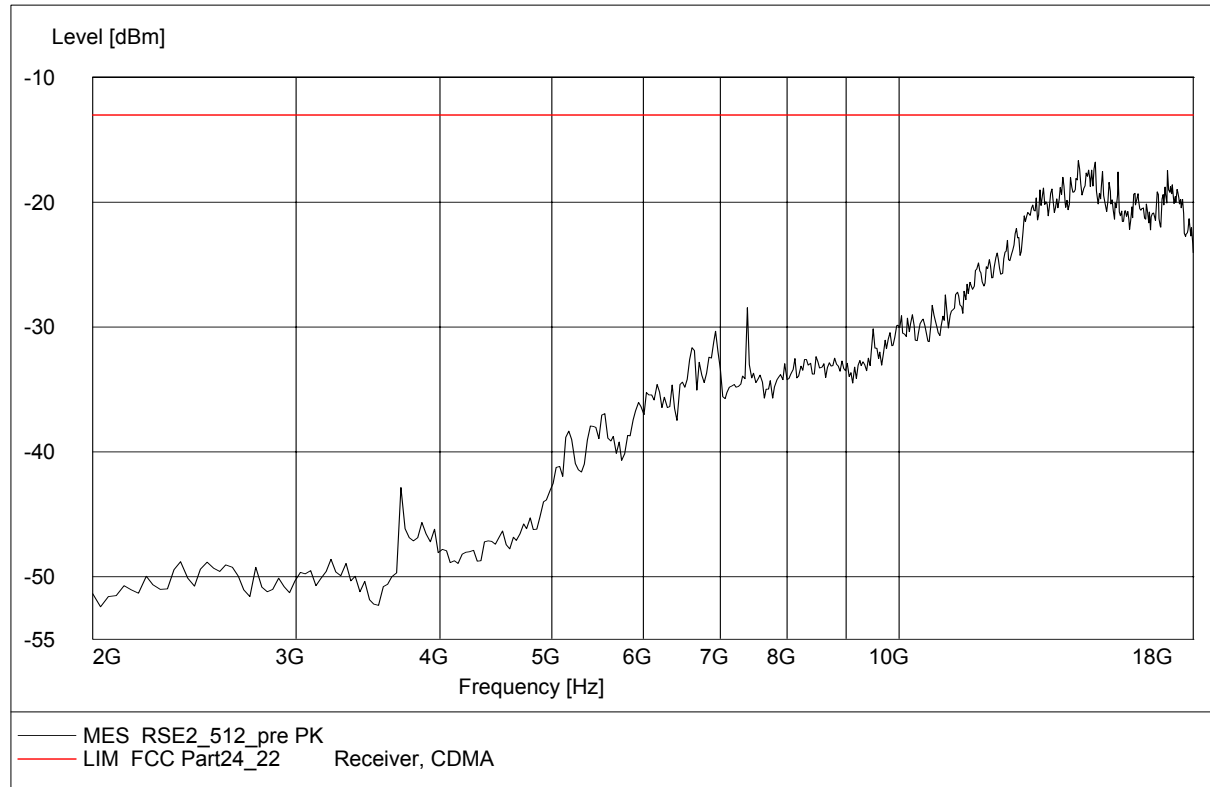


A.5.3.11 RADIATED SPURIOUS EMISSIONS-Channel 810: 30MHz – 2GHz

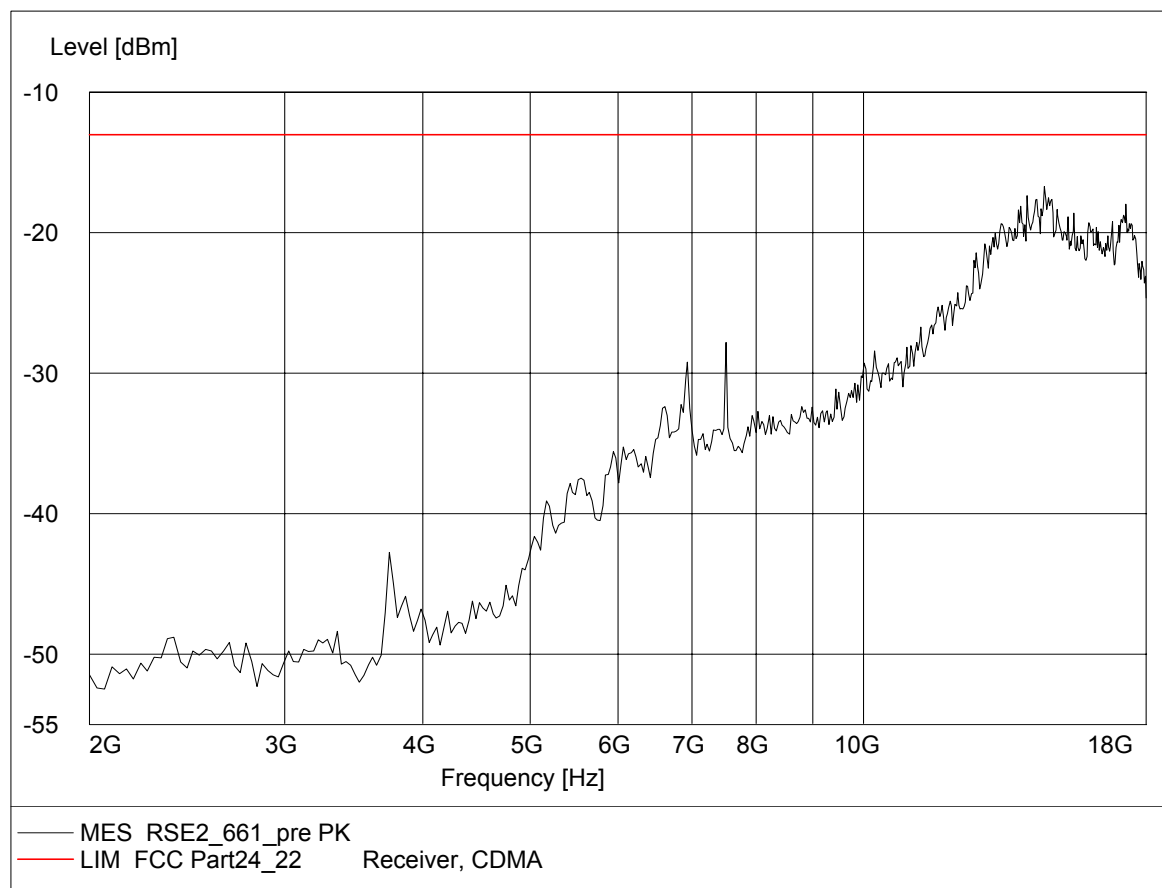
NOTE: peak above the limit line is the Carrier frequency @ ch-810



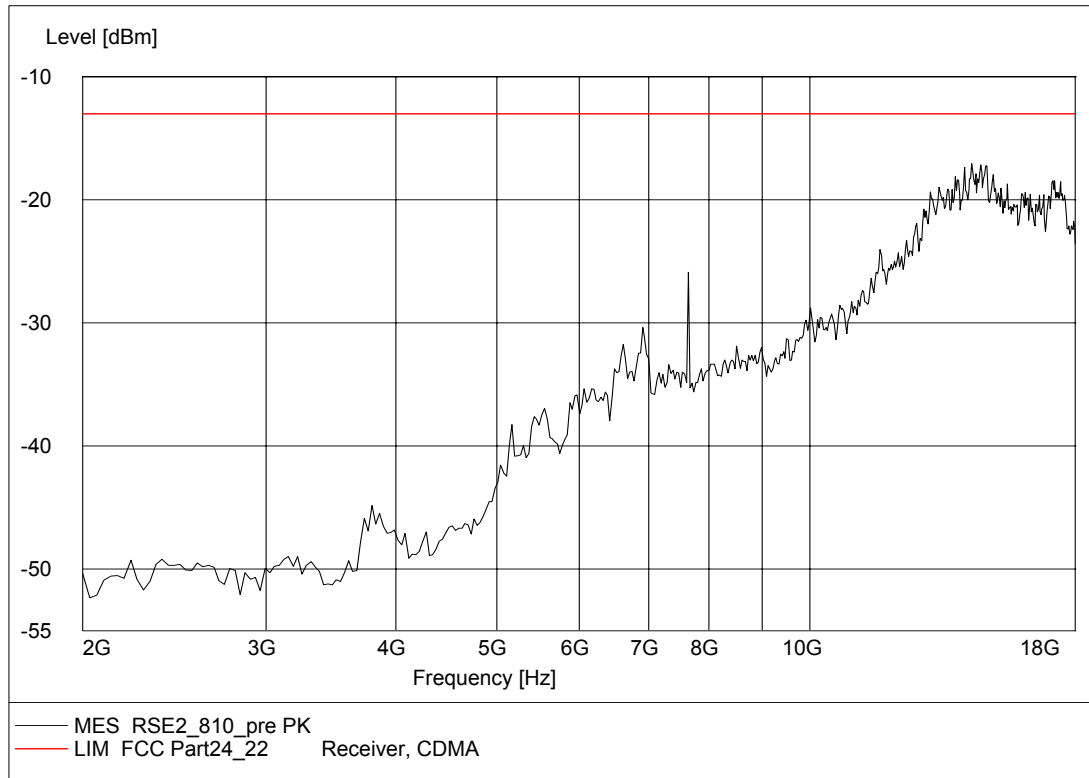
A.5.3.12 RADIATED SPURIOUS EMISSIONS-Channel 512: 2GHz – 18GHz



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

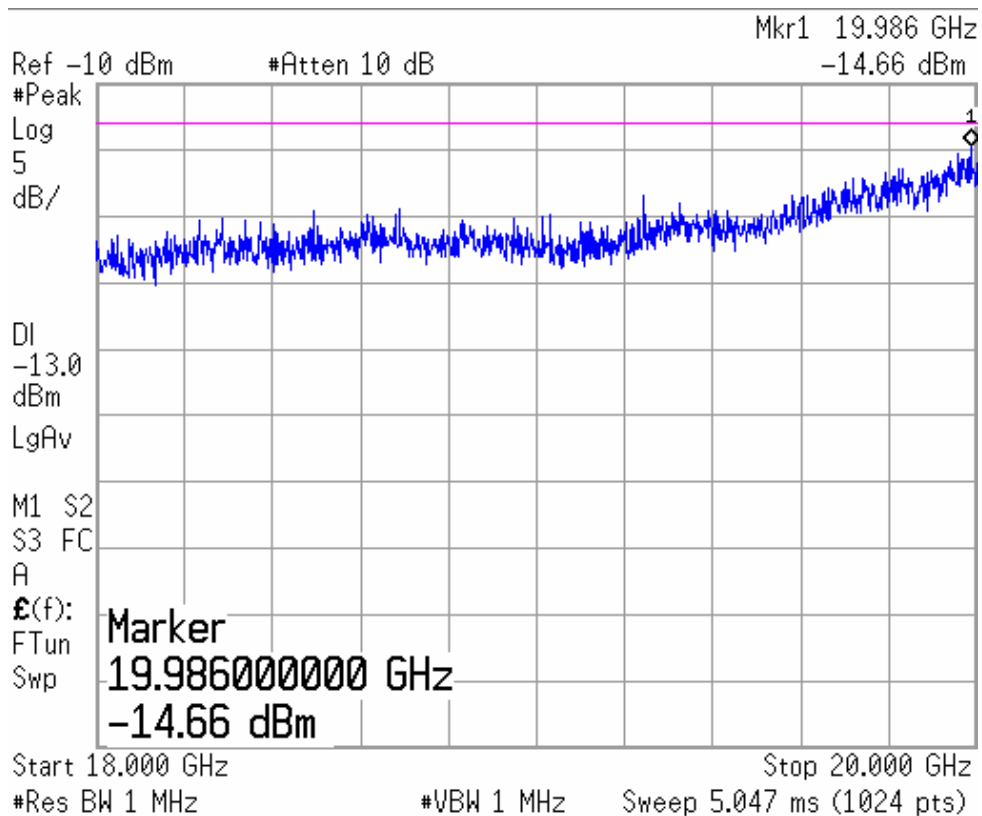


A.5.3.14 RADIATED SPURIOUS EMISSIONS-Channel 810: 2GHz – 18GHz

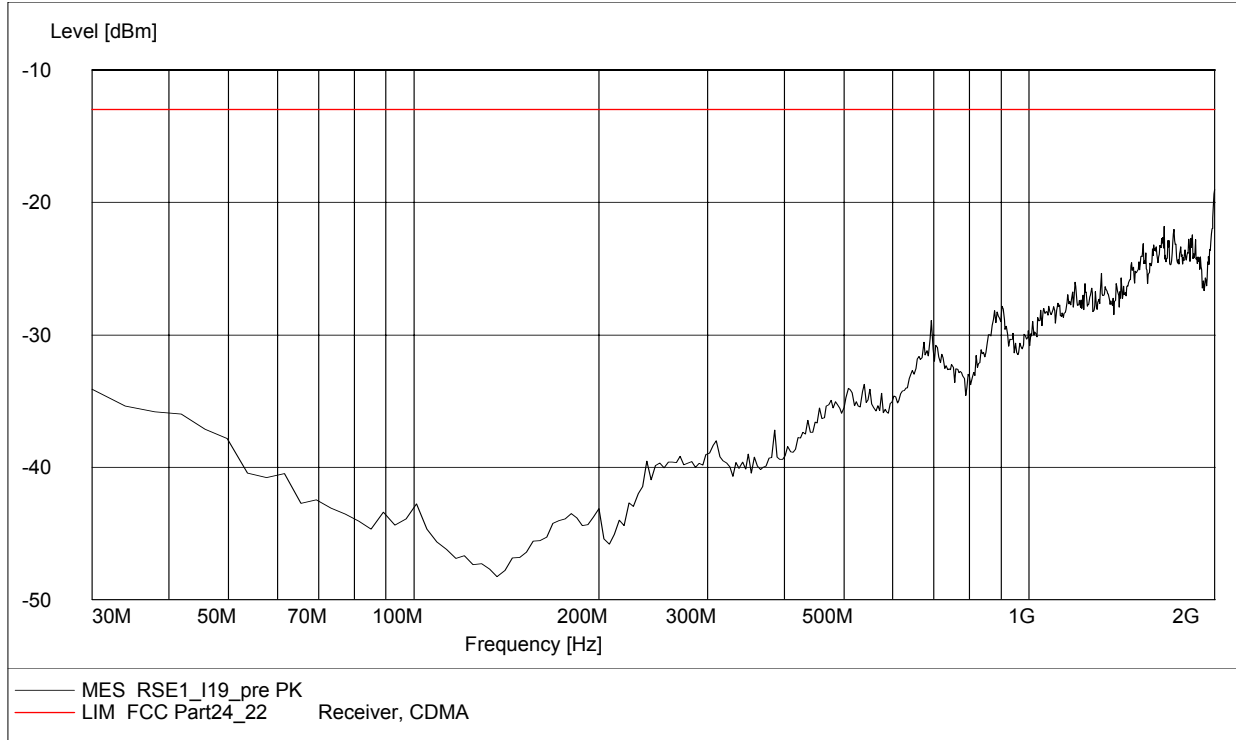


A.5.3.15 Radiated spurious emission (18GHz-20GHz)

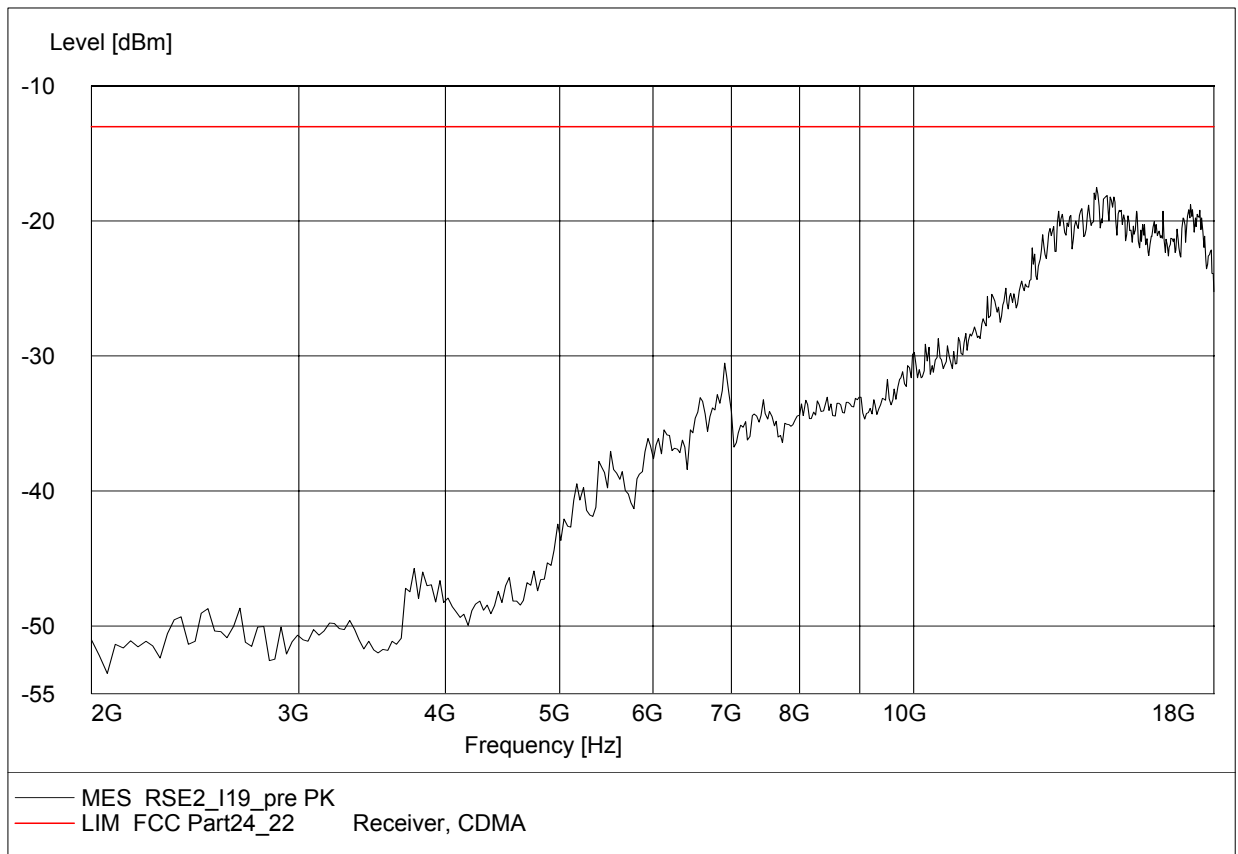
Note: This plot is valid for low, mid & high channels (worst-case plot). It is same as the floor noise.



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



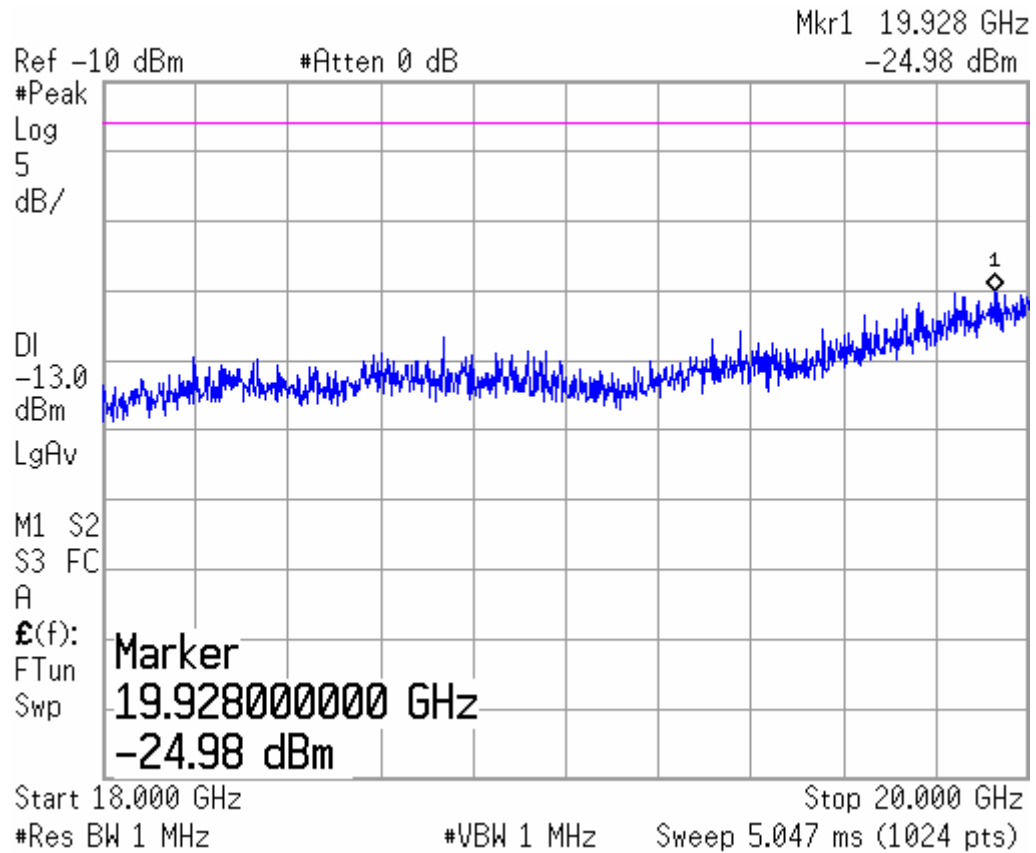
Telecommunication Metrology Center
of Ministry of Information Industry

No. FCC-PART-24-2005007

Page 32 of 54

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

Note: It is same as the floor noise.



**Telecommunication Metrology Center
of Ministry of Information Industry**

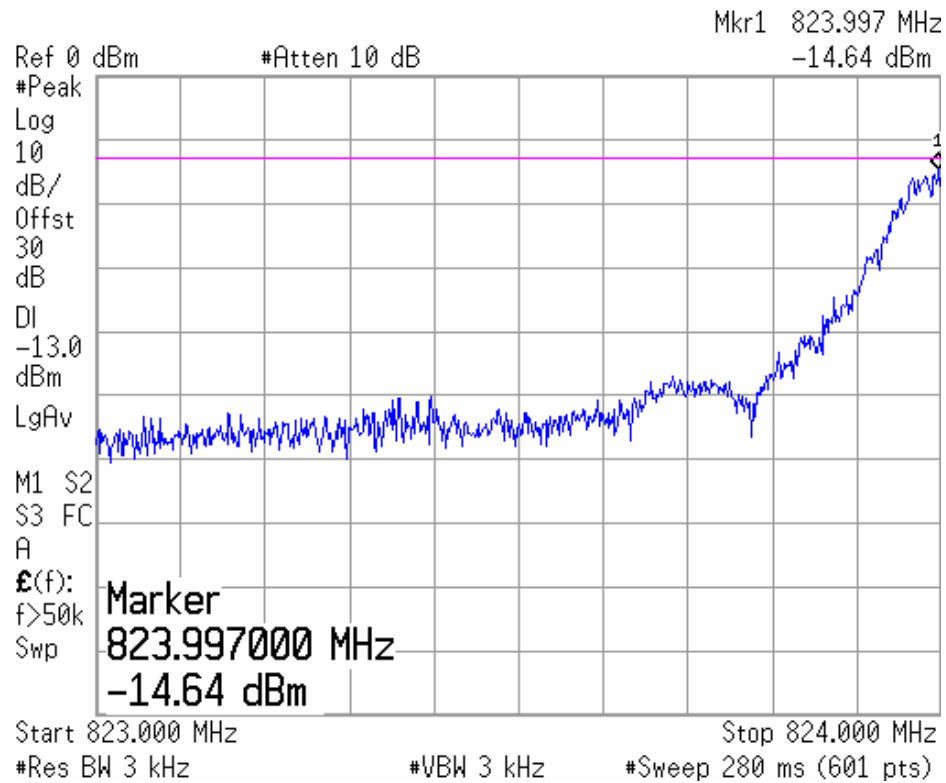
No. FCC-PART-24-2005007

Page 33 of 54

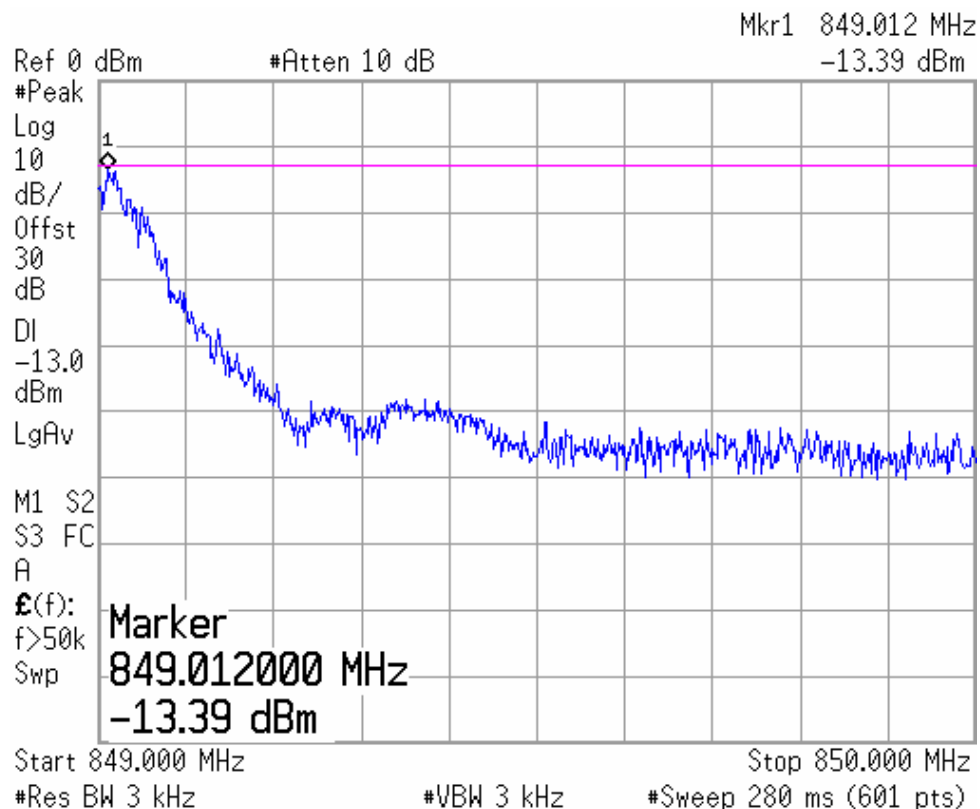
A.6 BAND EDGE COMPLIANCE (§22.917(b)/§24.238(b))

GSM850

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



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



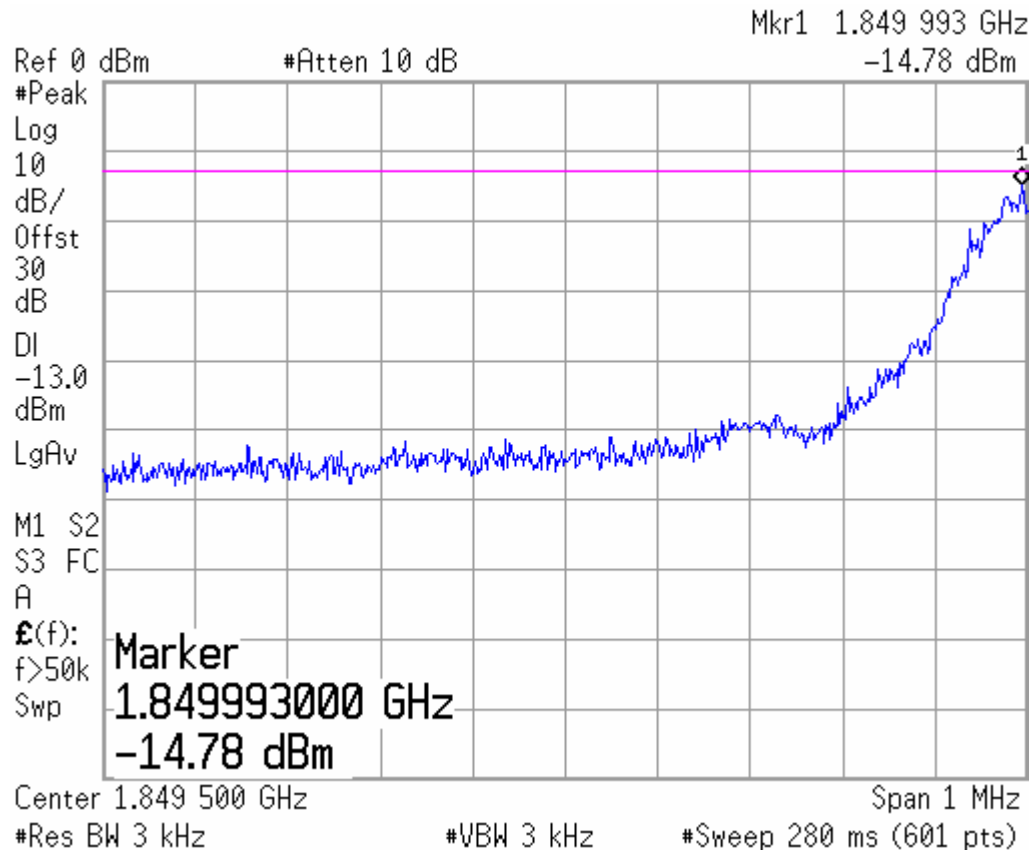
Telecommunication Metrology Center
of Ministry of Information Industry

No. FCC-PART-24-2005007

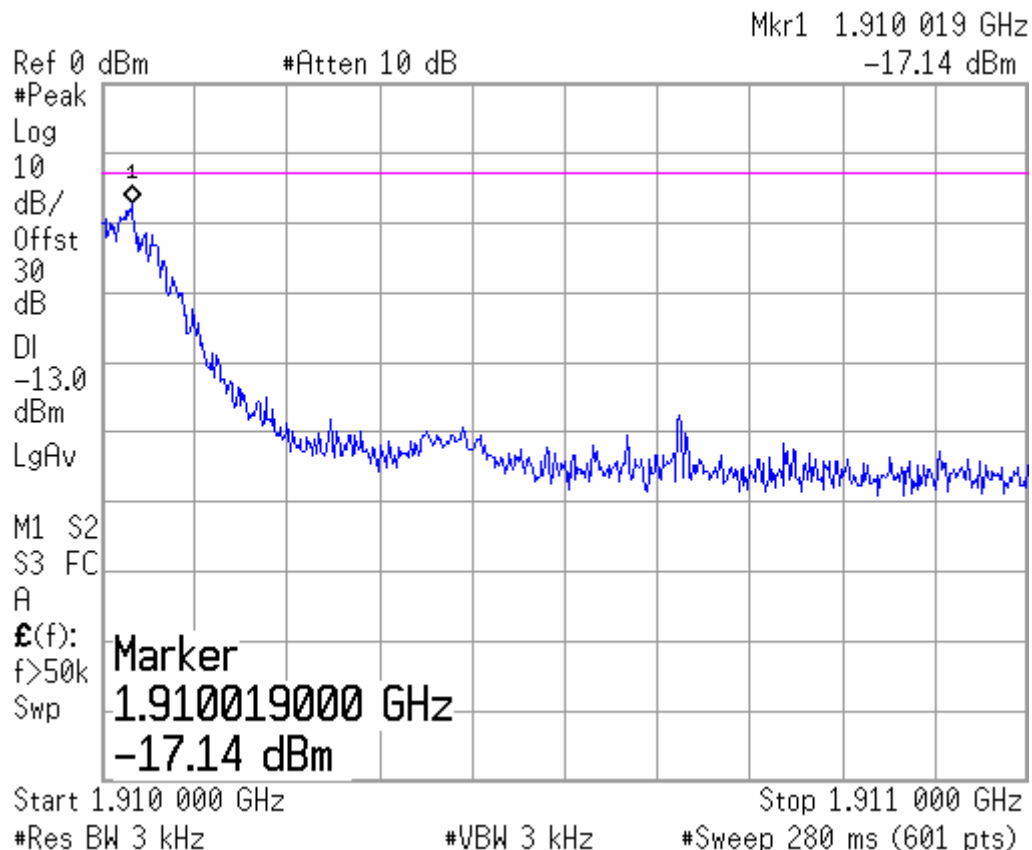
Page 34 of 54

PCS 1900

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



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



Telecommunication Metrology Center of Ministry of Information Industry

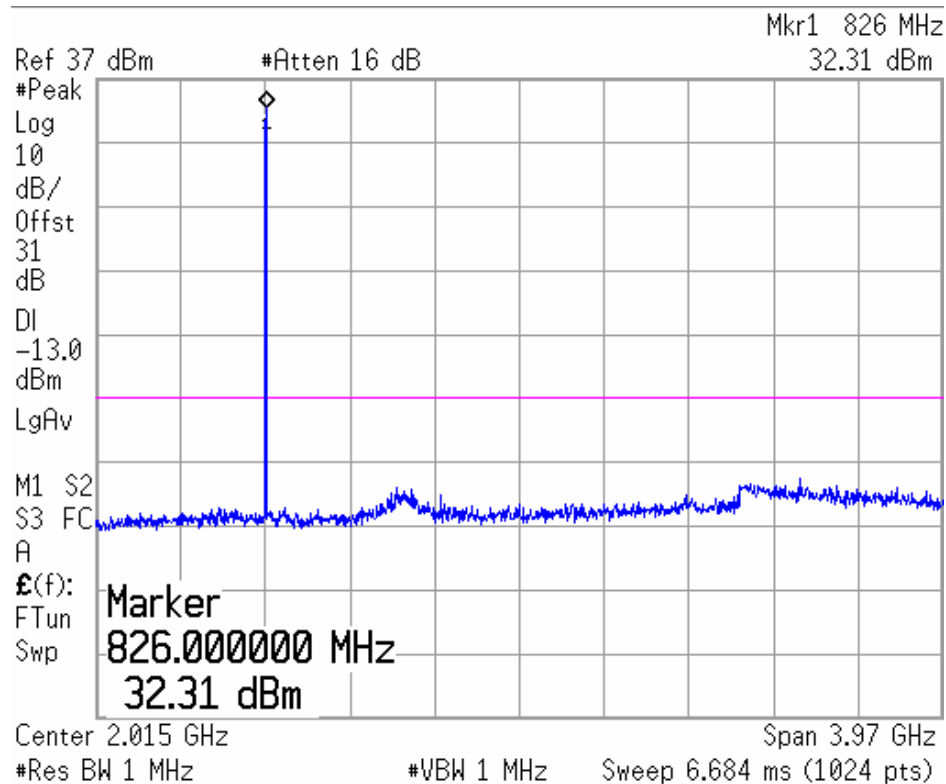
No. FCC-PART-24-2005007

Page 36 of 54

A.7.3.1 Channel 128: 30MHz – 4GHz

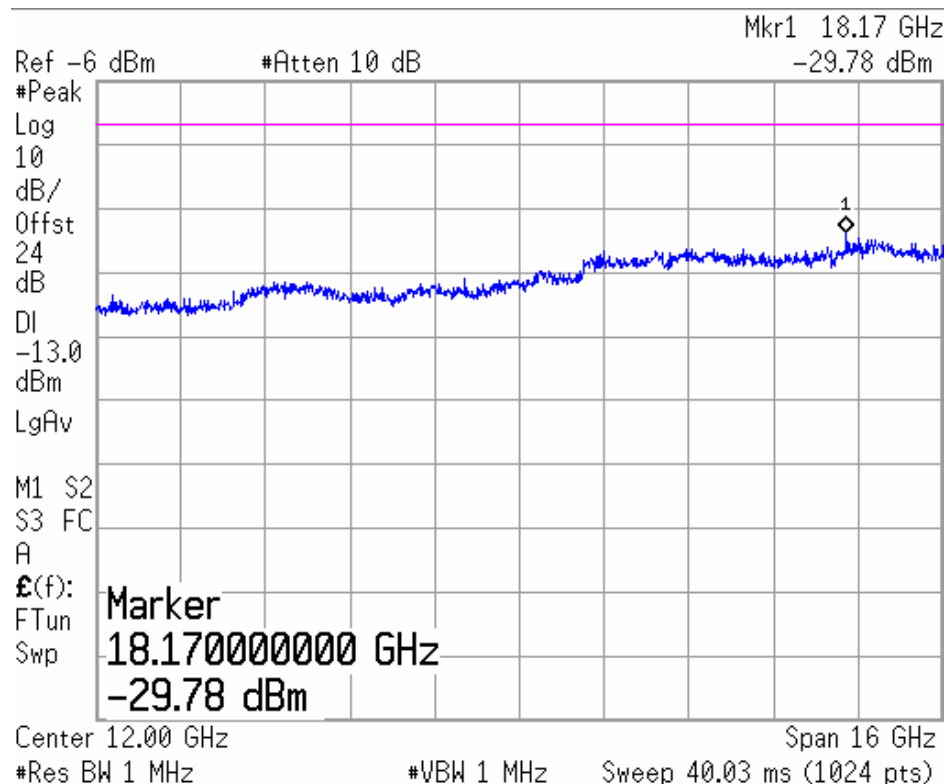
Spurious emission limit –13dBm.

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



A.7.3.2 Channel 128: 4GHz – 20GHz

Spurious emission limit –13dBm.



**Telecommunication Metrology Center
of Ministry of Information Industry**

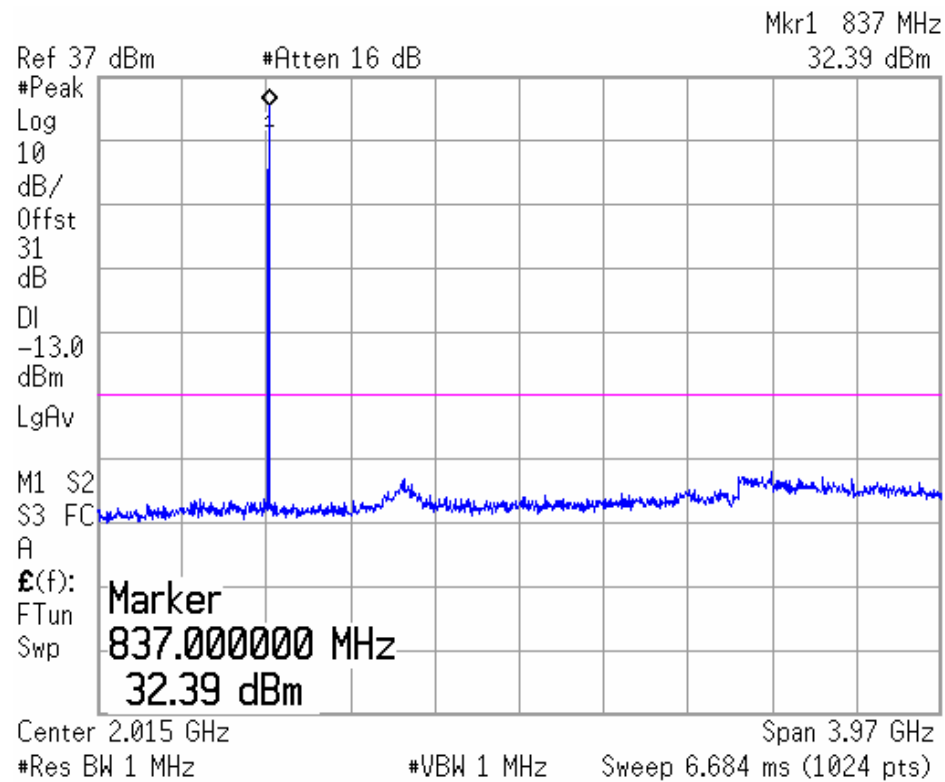
No. FCC-PART-24-2005007

Page 37 of 54

A.7.3.3 Channel 190: 30MHz – 4GHz

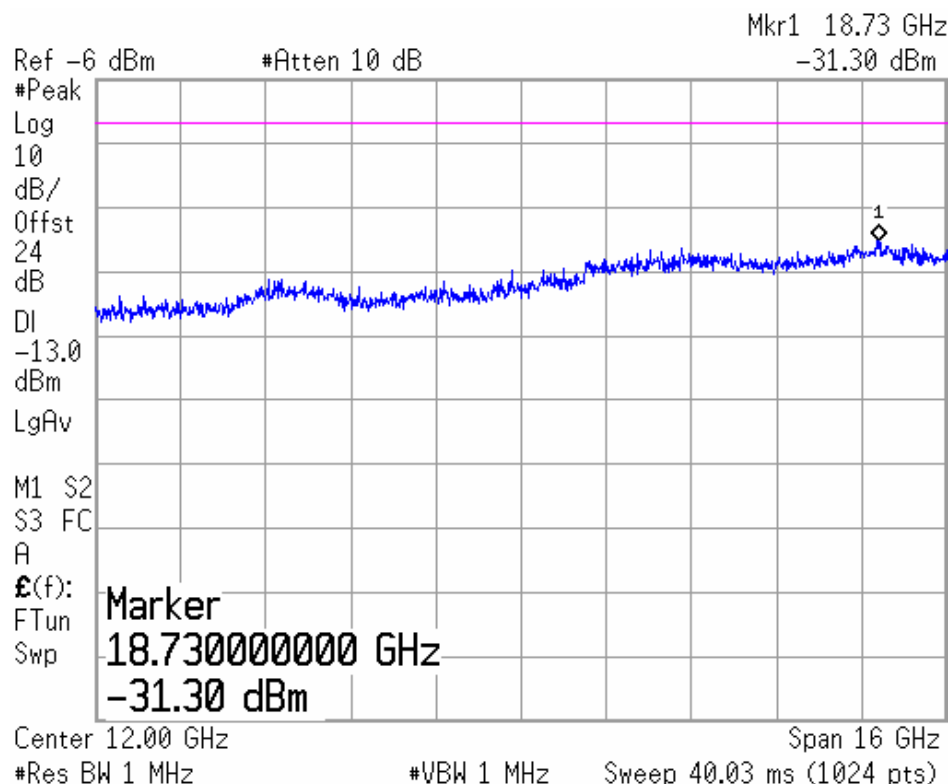
Spurious emission limit –13dBm

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



A.7.3.4 Channel 190: 4GHz –20GHz

Spurious emission limit –13dBm



**Telecommunication Metrology Center
of Ministry of Information Industry**

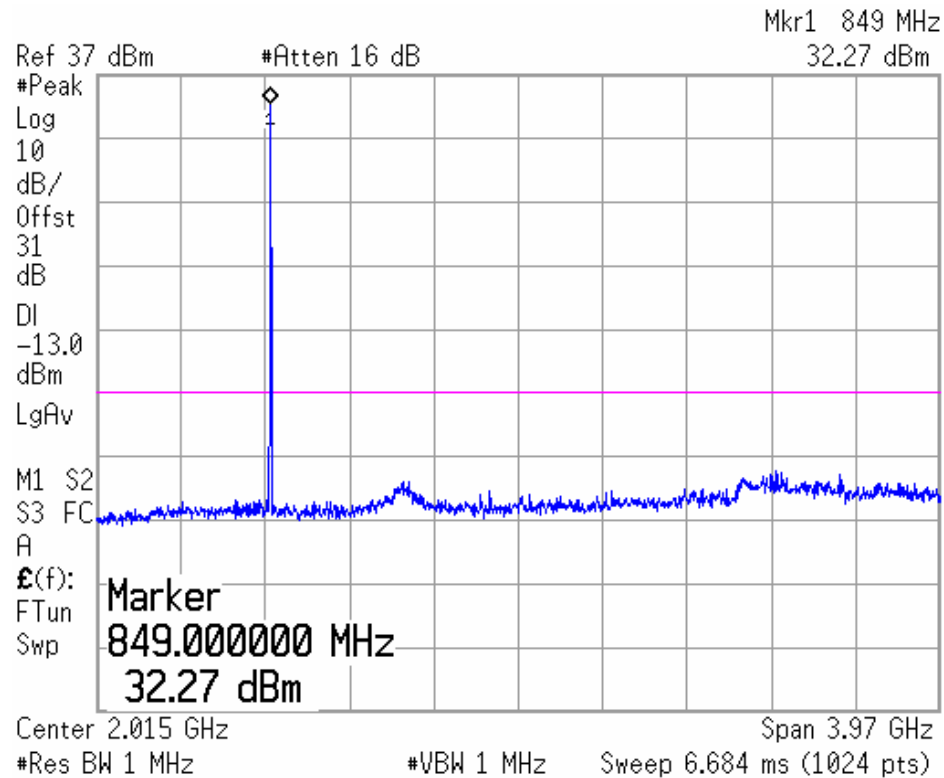
No. FCC-PART-24-2005007

Page 38 of 54

A.7.3.5 Channel 251: 30MHz – 4GHz

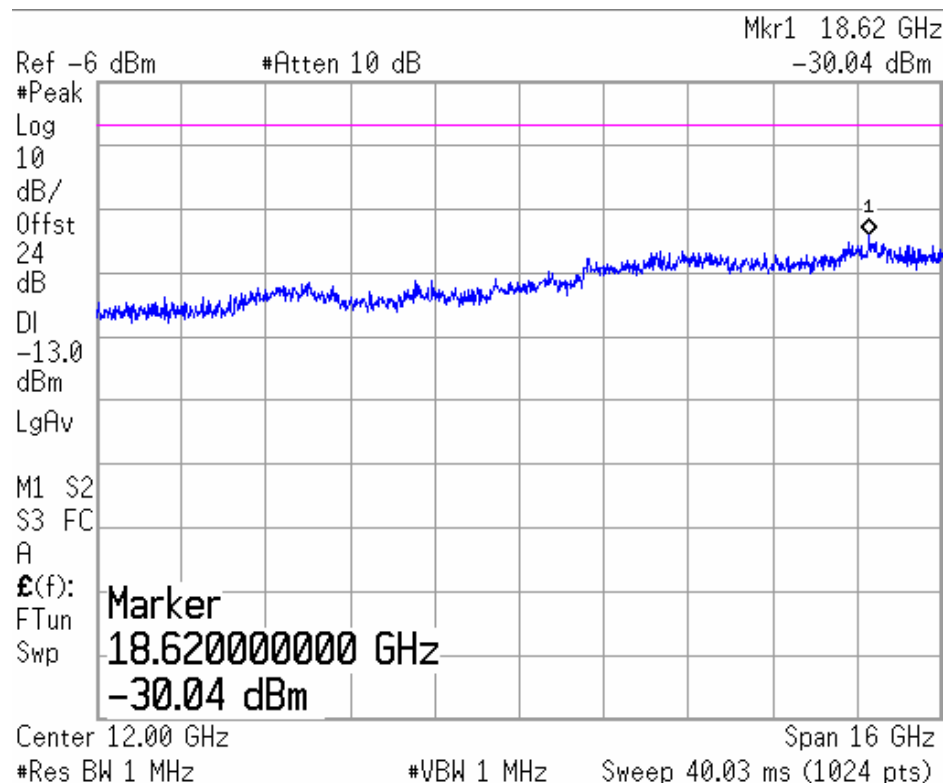
Spurious emission limit –13dBm.

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



A.7.3.6 Channel 251: 4GHz – 20GHz

Spurious emission limit –13dBm.



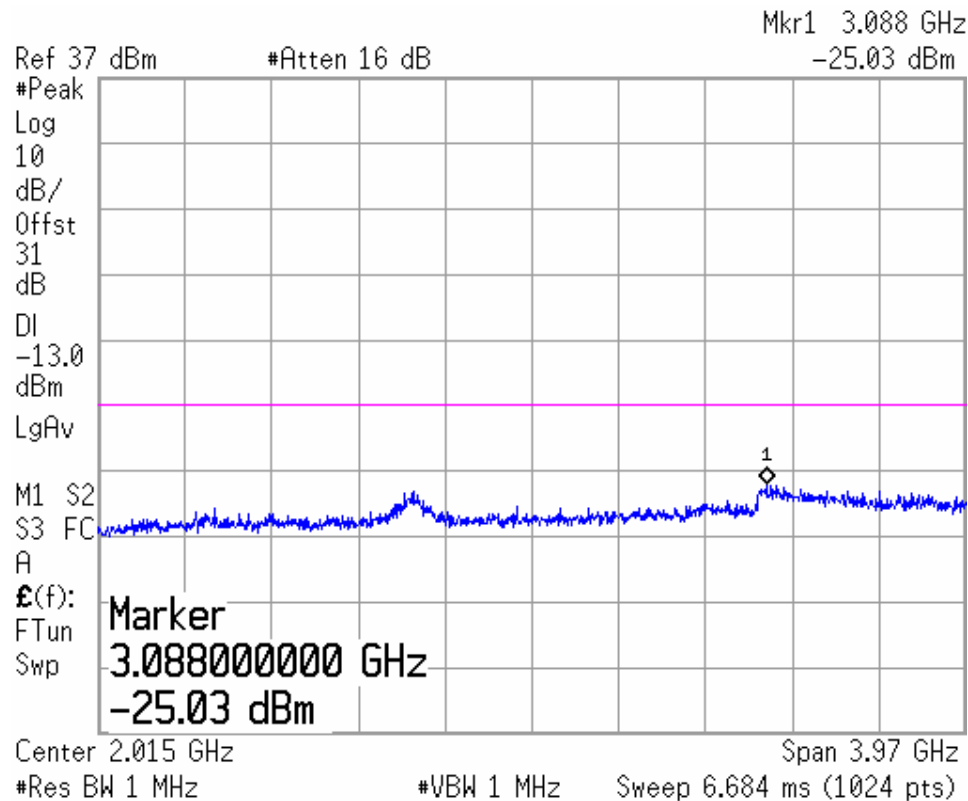
Telecommunication Metrology Center of Ministry of Information Industry

No. FCC-PART-24-2005007

Page 39 of 54

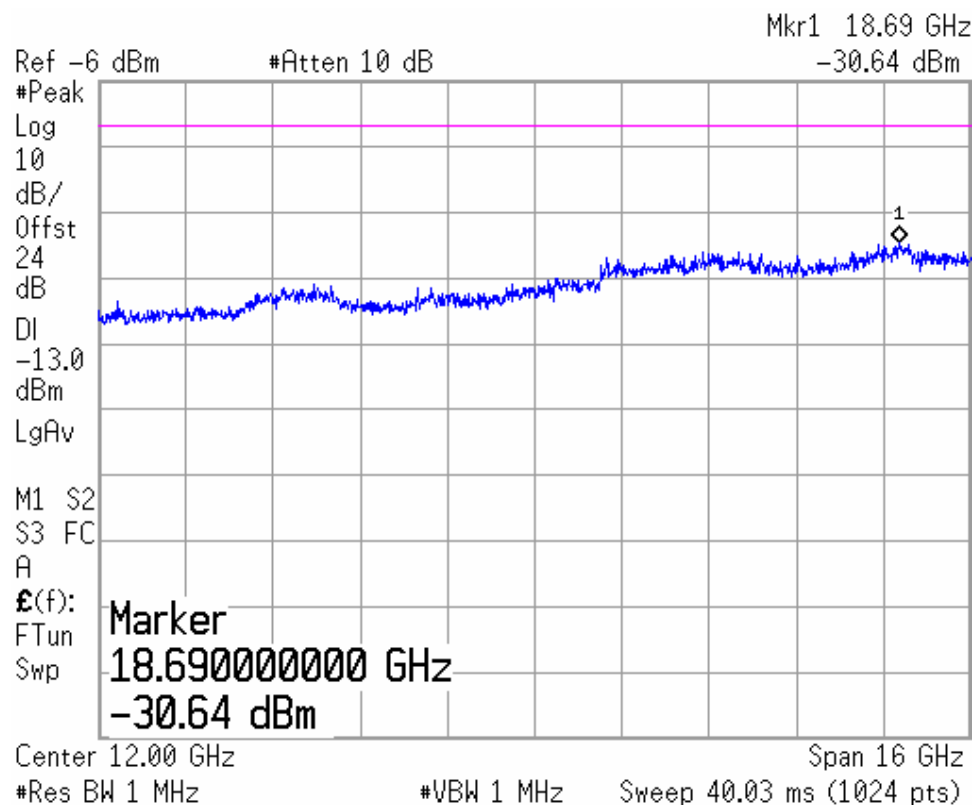
A.7.3.7 Idle mode: 30MHz – 4GHz

Spurious emission limit –13dBm.



A.7.3.8 Idle mode: 4GHz – 20GHz

Spurious emission limit –13dBm.



**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 40 of 54

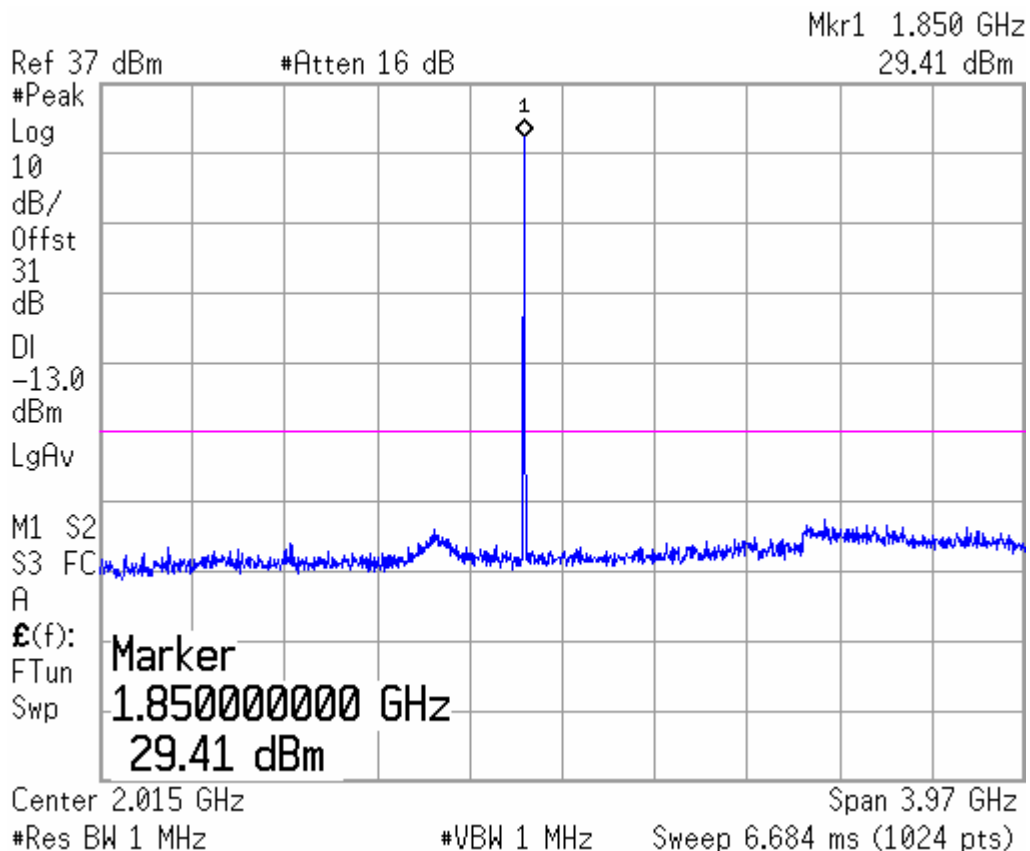
PCS1900

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.



**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 41 of 54

A.7.3.10 Channel 512: 4GHz – 20GHz

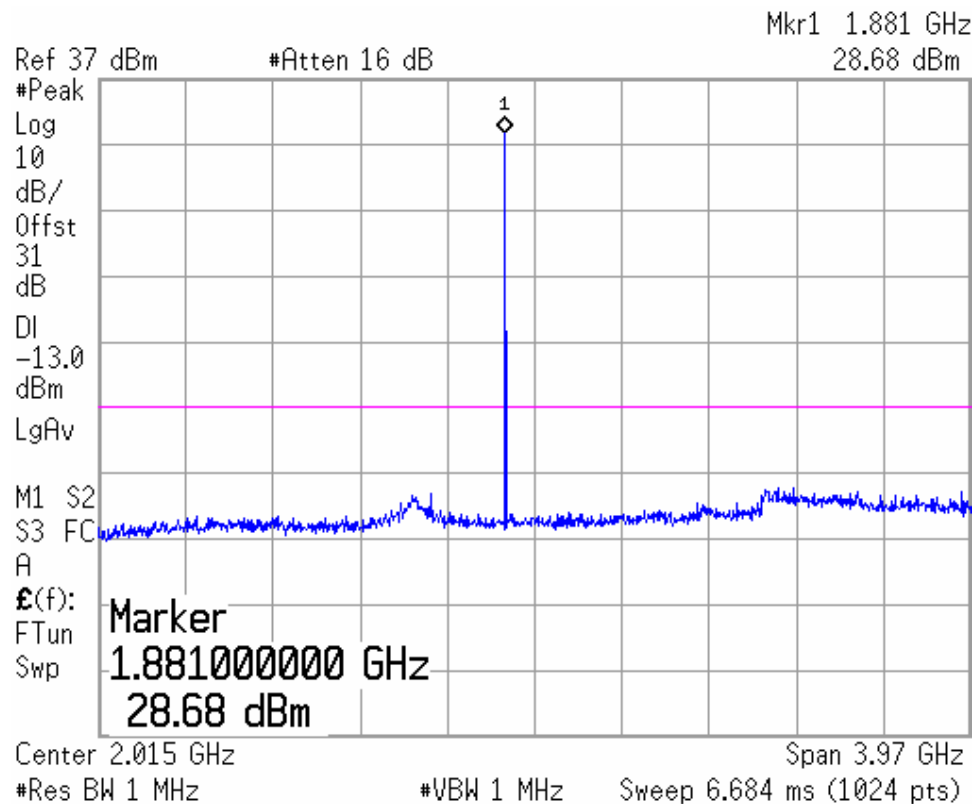
Spurious emission limit –13dBm.



A.7.3.11 Channel 661: 30MHz – 4GHz

Spurious emission limit –13dBm

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



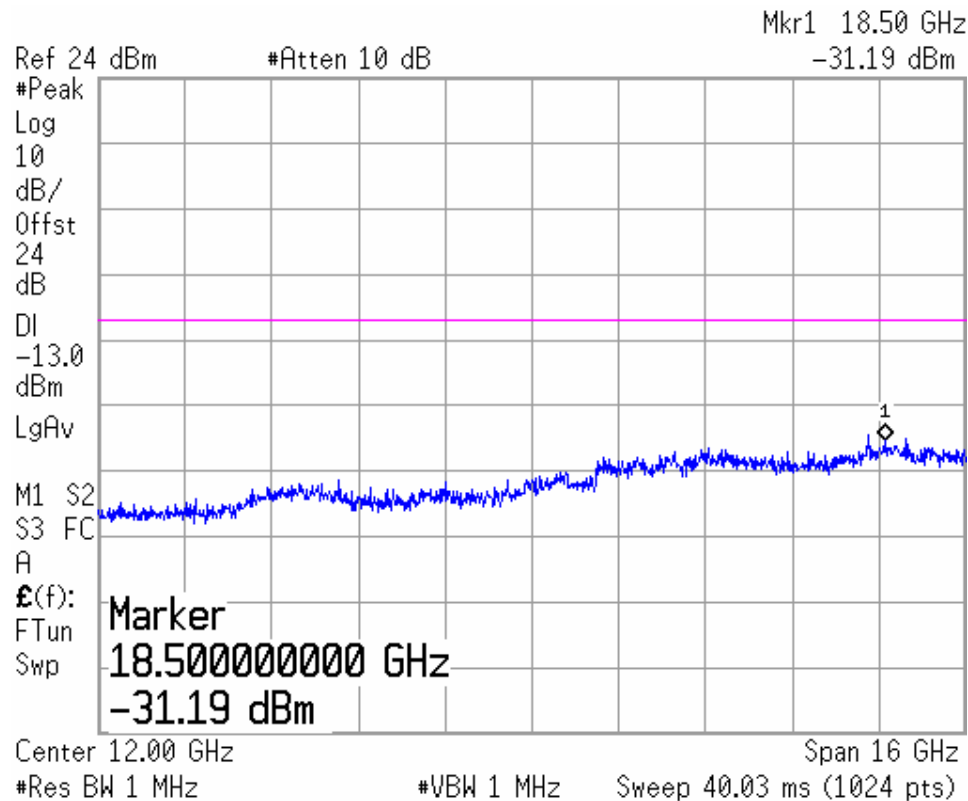
**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 42 of 54

A.7.3.12 Channel 661: 4GHz – 20GHz

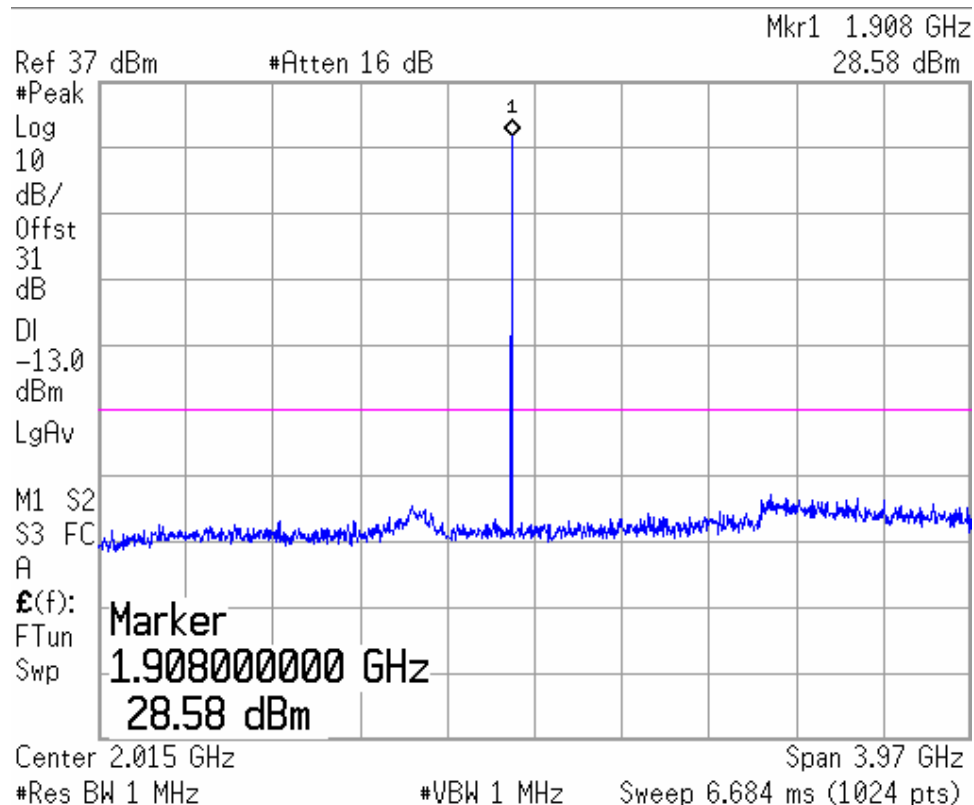
Spurious emission limit –13dBm



A.7.3.13 Channel 810: 30MHz – 4GHz

Spurious emission limit –13dBm.

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



**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 43 of 54

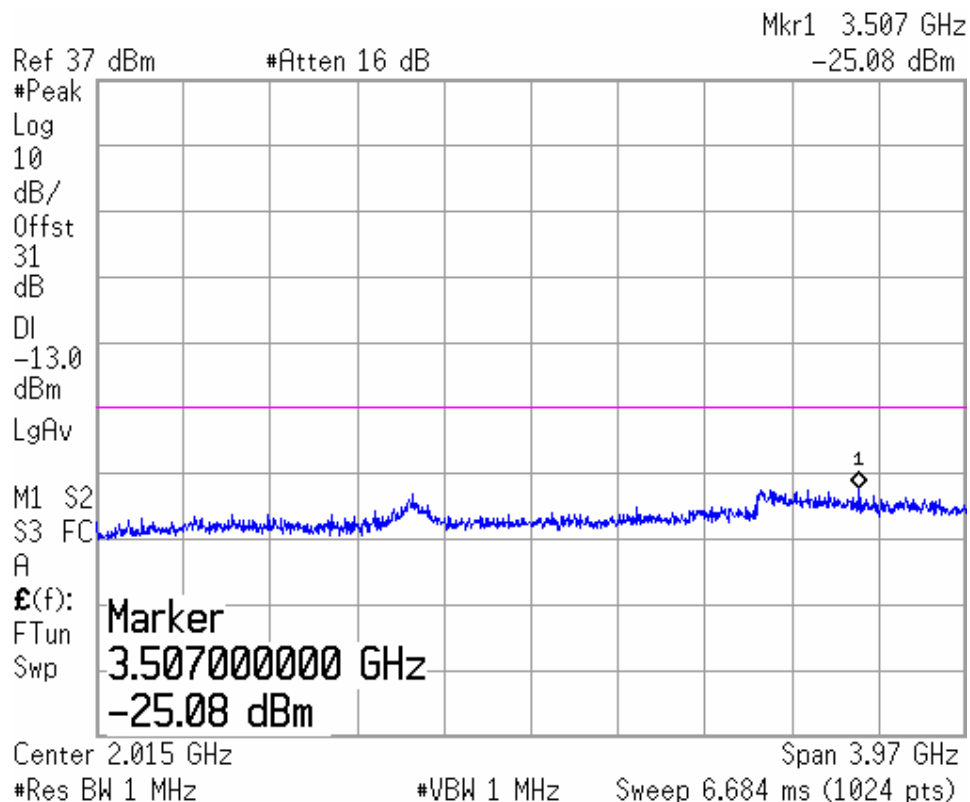
A.7.3.14 Channel 810: 4GHz – 20GHz

Spurious emission limit –13dBm.



A.7.3.15 Idle mode: 30MHz – 4GHz

Spurious emission limit –13dBm.



**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 44 of 54

A.7.3.16 Idle mode: 4GHz – 20GHz

Spurious emission limit –13dBm.



**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 45 of 54

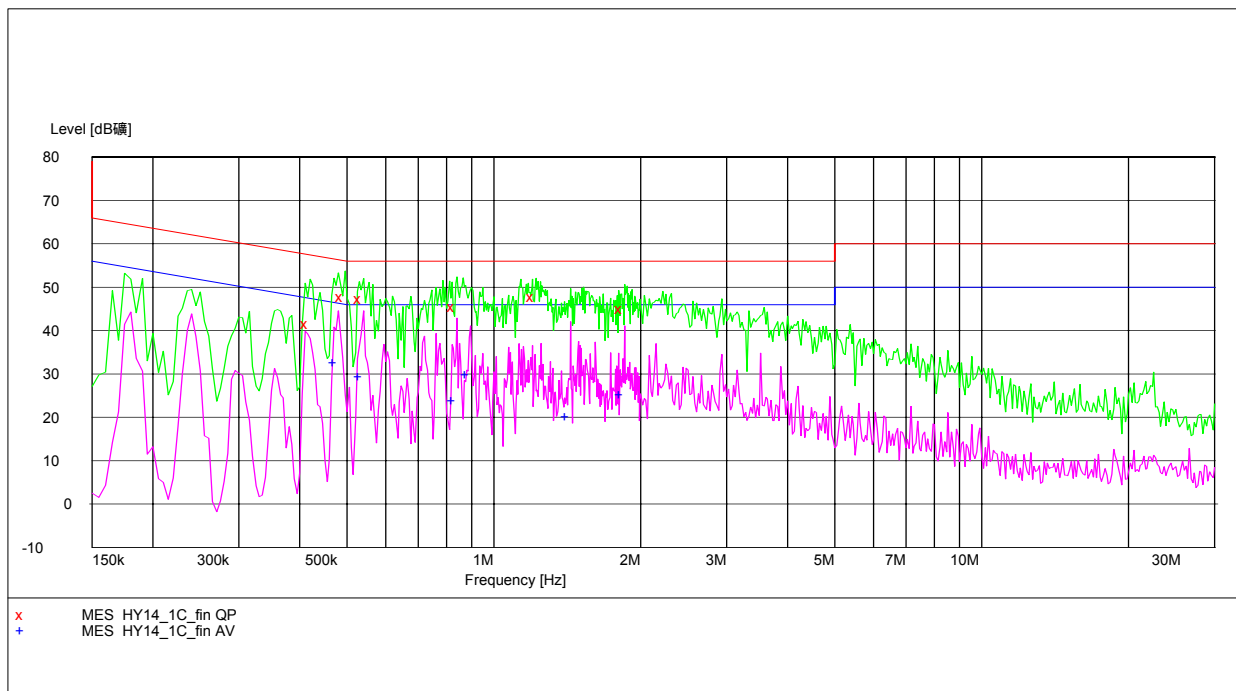
A.8 CONDUCTED EMISSION (§15.107/§207)

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: "HY14_1C_fin QP"

8/8/05 15:45

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.420000	41.70	10.1	57	15.7	N	FLO
0.495000	47.90	10.1	56	8.2	L1	GND
0.540000	47.30	10.1	56	8.7	L1	GND
0.840000	45.60	10.1	56	10.4	L1	GND
1.220000	47.70	10.2	56	8.3	L1	GND
1.855000	45.00	10.1	56	11.0	L1	GND

**Telecommunication Metrology Center
of Ministry of Information Industry**

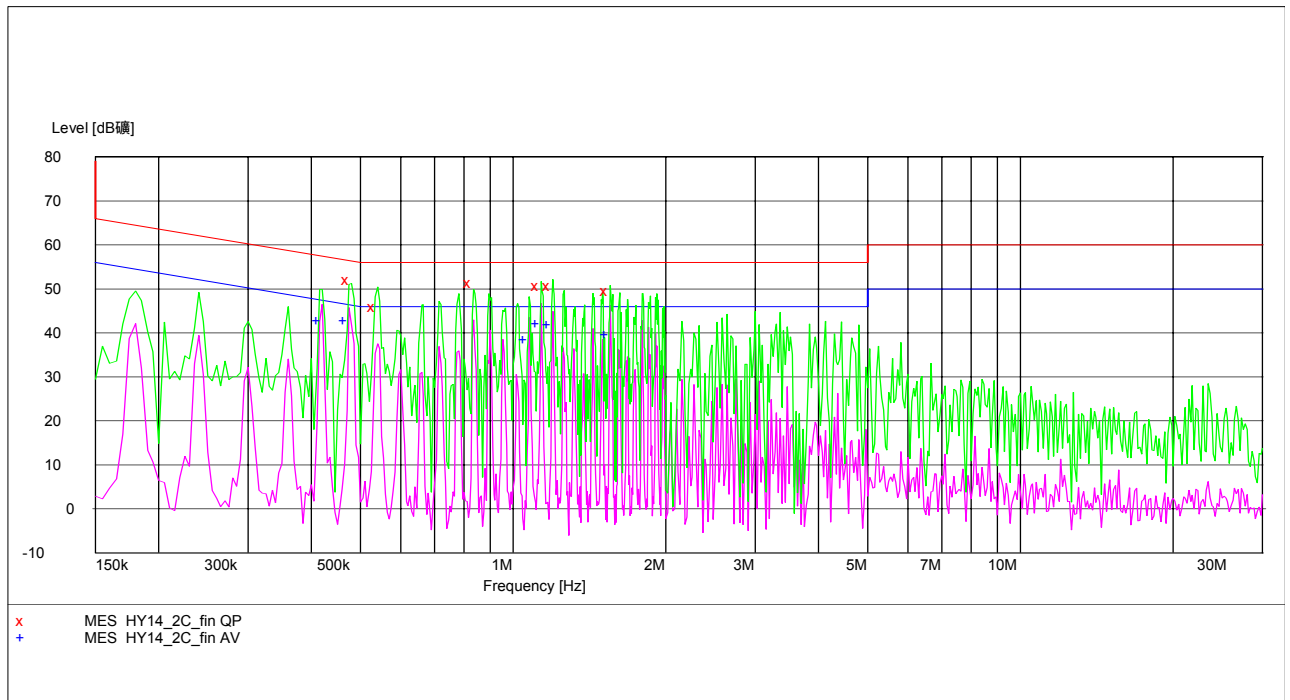
No. FCC-PART-24-2005007

Page 46 of 54

MEASUREMENT RESULT: "HY14_1C_fin AV"

8/8/05 15:45

Frequency MHz	Level dBμV	Transd dB	Limit dB	Margin dBμV	Line dB	PE
0.480000	32.60	10.1	46	13.8	L1	FLO
0.540000	29.40	10.1	46	16.6	L1	GND
0.840000	23.80	10.1	46	22.2	N	FLO
0.895000	29.80	10.1	46	16.2	N	FLO
1.435000	20.10	10.2	46	25.9	L1	GND
1.855000	25.20	10.1	46	20.8	N	FLO



MEASUREMENT RESULT: "HY14_2C_fin QP"

8/8/05 16:01

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.480000	52.20	10.1	56	4.1	L1	GND
0.540000	46.00	10.1	56	10.0	N	GND
0.835000	51.30	10.1	56	4.7	L1	GND
1.135000	50.80	10.2	56	5.3	L1	GND
1.195000	50.80	10.1	56	5.2	L1	GND
1.555000	49.50	10.2	56	6.5	L1	GND

**Telecommunication Metrology Center
of Ministry of Information Industry**

No. FCC-PART-24-2005007

Page 47 of 54

MEASUREMENT RESULT: "HY14_2C_fin AV"

8/8/05 16:01

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.420000	42.70	10.1	47	4.7	L1	GND
0.475000	42.70	10.1	46	3.8	L1	GND
1.075000	38.40	10.1	46	7.6	L1	FLO
1.135000	42.10	10.2	46	4.0	L1	GND
1.195000	41.90	10.1	46	4.1	L1	GND
1.555000	39.70	10.2	46	6.3	L1	GND

ANNEX B PHOTOGRAPH OF EUT

External Photo



Mobile Phone



Mobile Phone



Mobile Phone



Mobile phone



Charger (AC/DC Adapter)



Charger (AC/DC Adapter)

Internal Photo

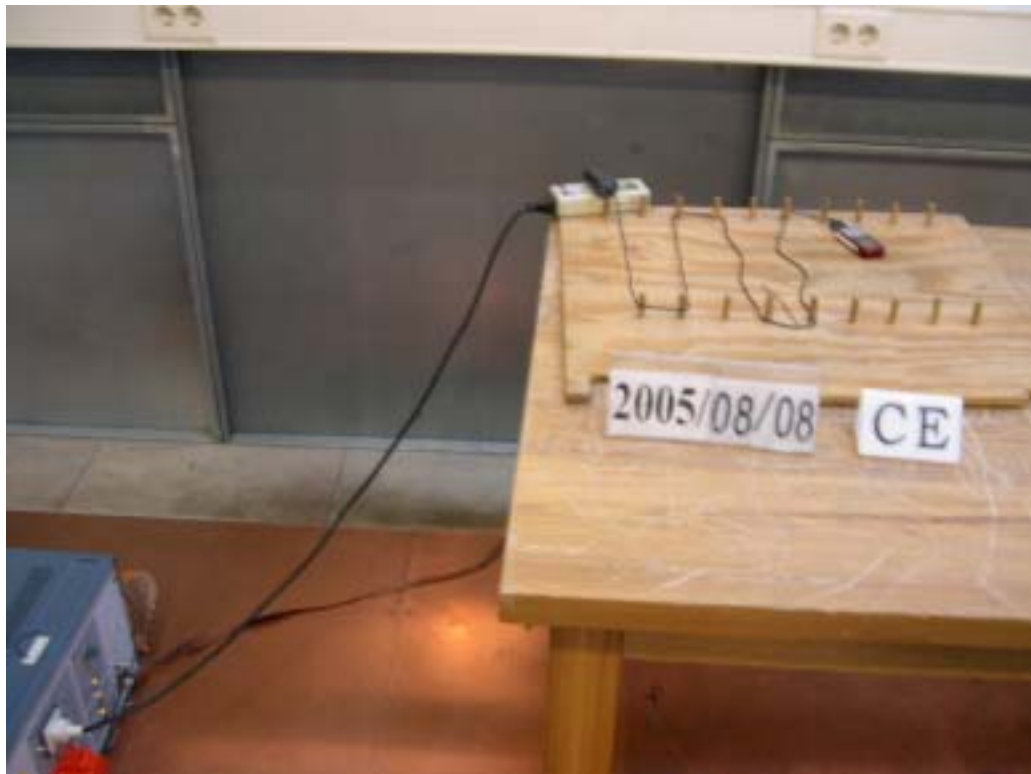


Mobile phone Disassembly



mobile phone PCB front view

ANNEX C TEST LAYOUT



Pic1 Conducted Emission



Pic2 Radiated Spurious Emission

END OF REPORT BODY