TEST   REPORT

No. 2007TAR013

Test name	FCC Test
Product	OT-C717A
Model	C7SA
Client	T&A Mobile Phones

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

Product	OT-C717A	Model	C7SA
		Trade mark	
Client	T&A Mobile Phones		
Manufacturer	T&A Mobile Phones	Arrival Date of sample	July 16th, 2007
Place of sampling	/	Carrier of the samples	Ying Kong
Quantity of the samples	2	Date of product	/
Base of the samples	(Blank)	Items of test	8
Series number	EUT1: 011095000001468 EUT2: 011095000001807		
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: July 27th, 2007		
Comment	The test result relates only to the tested samples.		

Approved by _____ Reviewed by _____ Performed by _____

(Lu Bingsong)   (Song Chongwen)   (Zi Xiaogang)

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

TABLE OF CONTENT

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:	July 18,2007
Testing End Date:	July 26,2007

3. Applicant Information

3.1 Client Information

Name or Company	T&A Mobile Phones
Address/Post	4F, South Building, No.2966, JinKe Road, Zhangjiang High-Tech Park
City	Shanghai
Postal Code	201203
Country	China
Telephone	0086-21-61460853
Fax	0086-21-61460602

3.2 Manufacturer Information

Name or Company	T&A Mobile Phones
Address/Post	4F, South Building, No.2966, JinKe Road, Zhangjiang High-Tech Park
City	Shanghai
Postal Code	201203
Country	China
Telephone	0086-21-61460853
Fax	0086-21-61460602

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

4.1 About EUT

Model	C7SA
FCC ID:	RAD055
Description	OT-C717A
Frequency	PCS 1900 MHz；GSM 850 MHz
Antenna	Internal
Power supply	Battery or Charger (AC Adaptor)
Output power	30.32dBm maximum EIRP measured for GSM 850
Extreme vol. Limits	3.5VDC 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	011095000001468	PIO	V521
EUT2	011095000001807	PIO	V521

*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	2008-4-20
7	LISN	ESH2-Z5	829991/012	R&S	2007-8
8	Spectrum Analyzer	FSU	MY41000262	Agilent	2008-4-18
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	2008-5-15

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 FSU (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:

Frequency(MHz)	Power Step	Peak output power(dBm)
824.2	5	32.1
836.6	5	32.3
848.8	5	32.2

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:

Frequency(MHz)	Power Step	Peak EIRP(dBm)
1850.2	0	29.7
1880.0	0	29.8
1909.8	0	29.9

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	30.12
836.6	5	30.32
848.8	5	30.27

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	26.73
1880.0	0	27.42
1909.8	0	27.19

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.
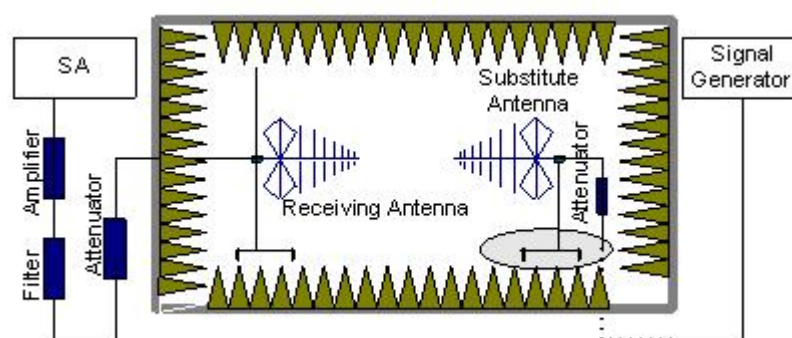
b) EUT test

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.
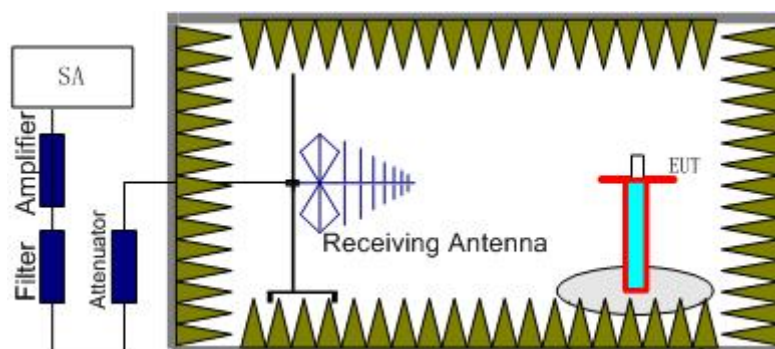
A.2.2 Measurement Limit

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
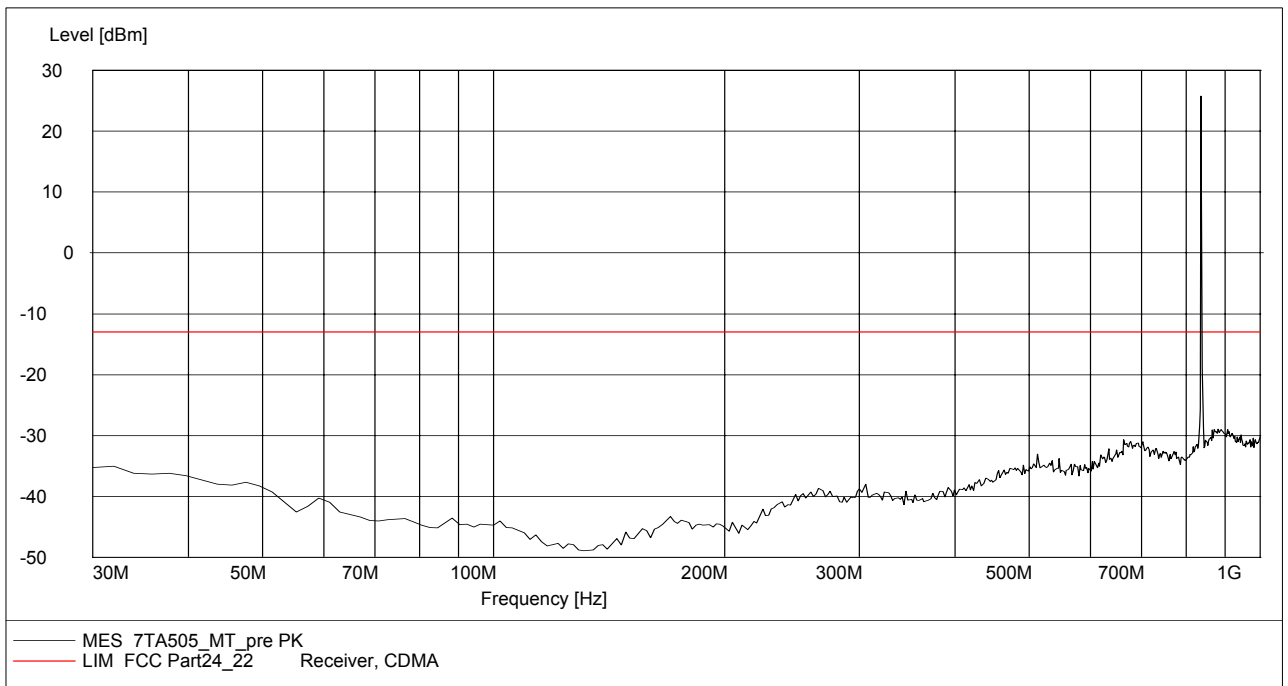
Radiated spurious emission limit :-13dBm.

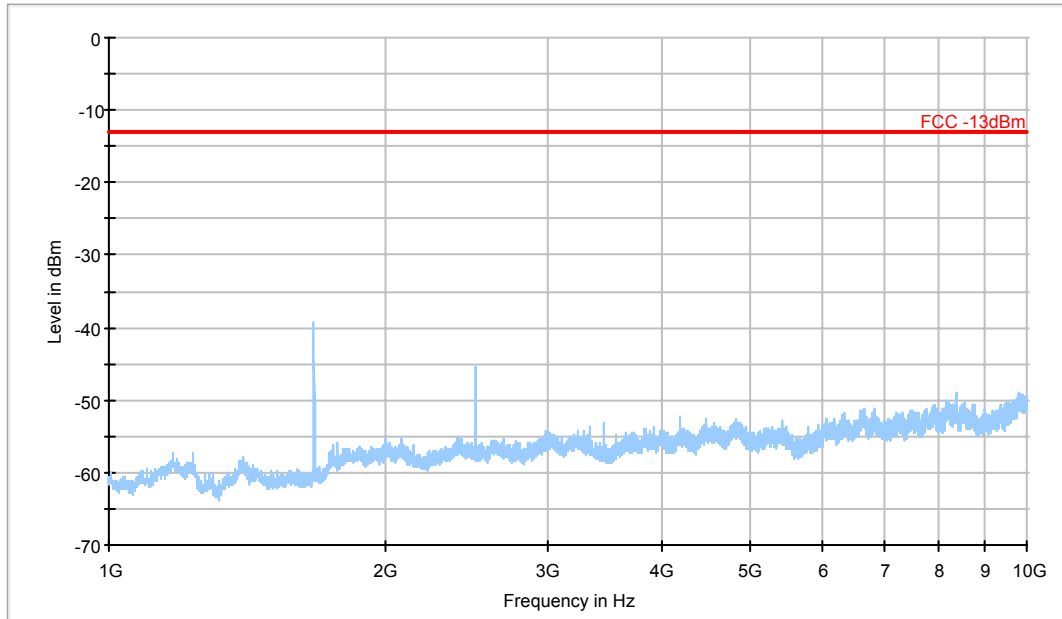**NOTE: peak above the limit line is the Carrier frequency @ ch-128**

MES 7TA505_LT_pre PK
LIM FCC Part24_22   Receiver, CDMA
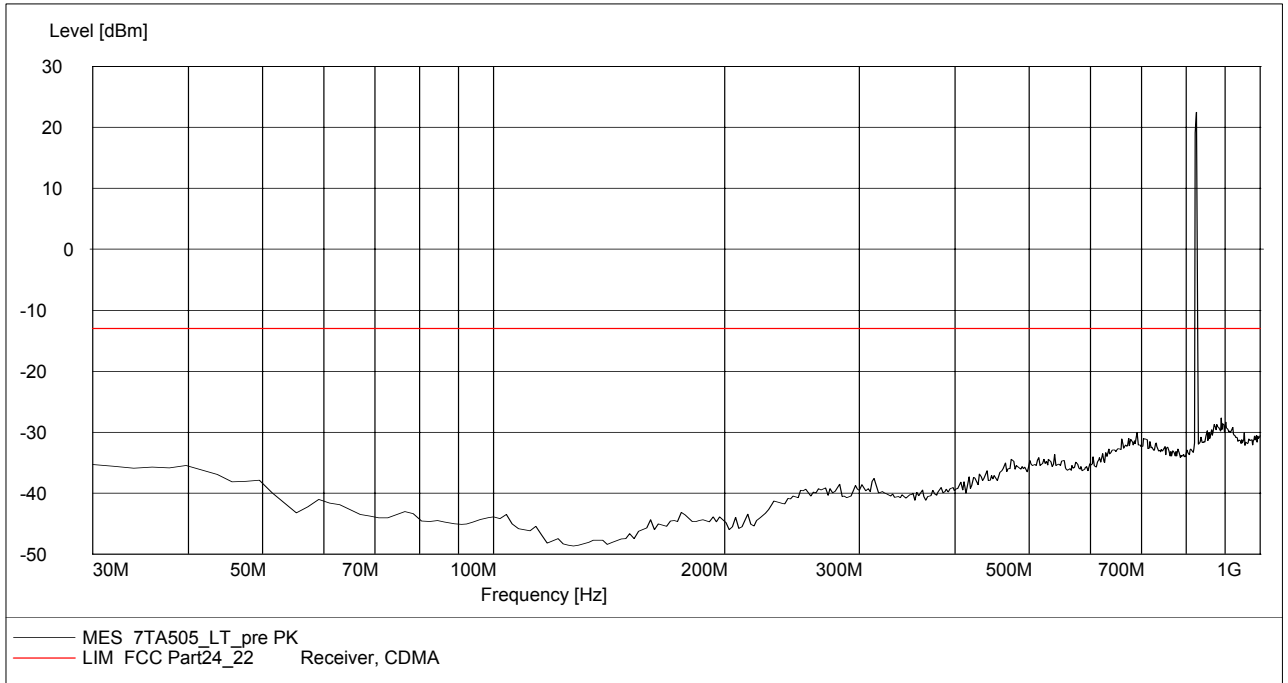
A.2.3.2 RADIATED SPURIOUS EMISSIONS-Channel 190: 30MHz – 1GHz

Radiated spurious emission limit :-13dBm.

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

MES 7TA505_MT_pre PK
LIM FCC Part24_22   Receiver, CDMA

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

MES 7TA505_HT_pre PK
LIM FCC Part24_22   Receiver, CDMA
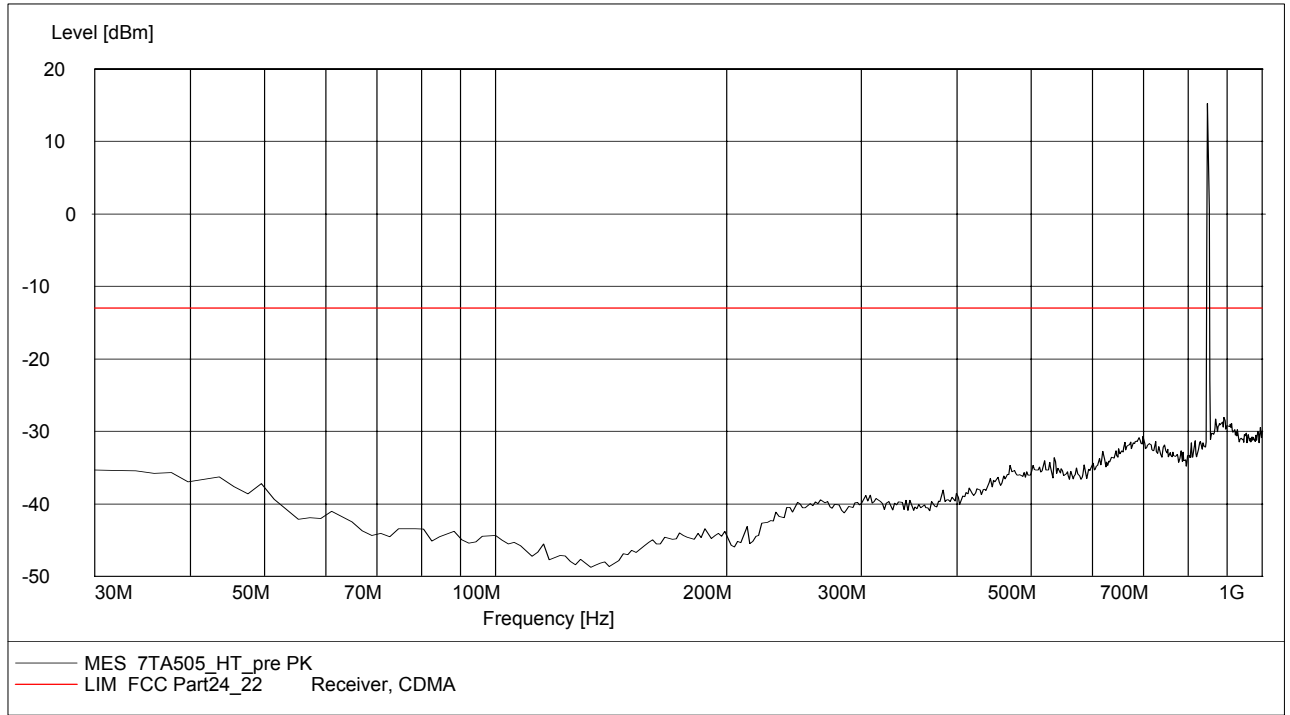
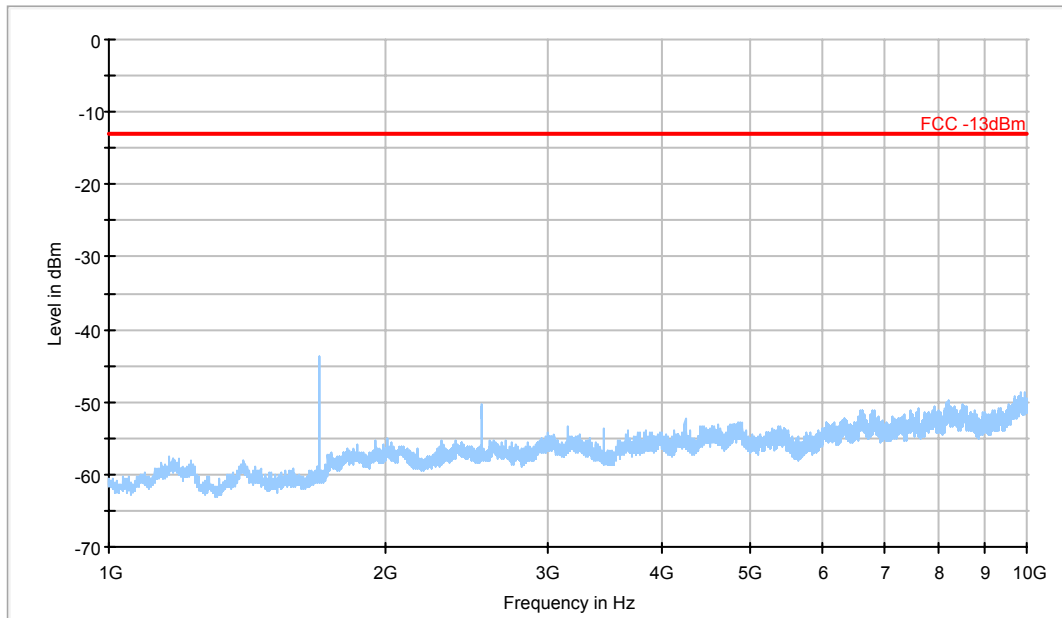**A.2.3.4 RADIATED SPURIOUS EMISSIONS-Channel 128: 1GHz – 10GHz**

Radiated spurious emission limit :-13dBm.

FCC -13dBm   Preview Measurement Detector 1
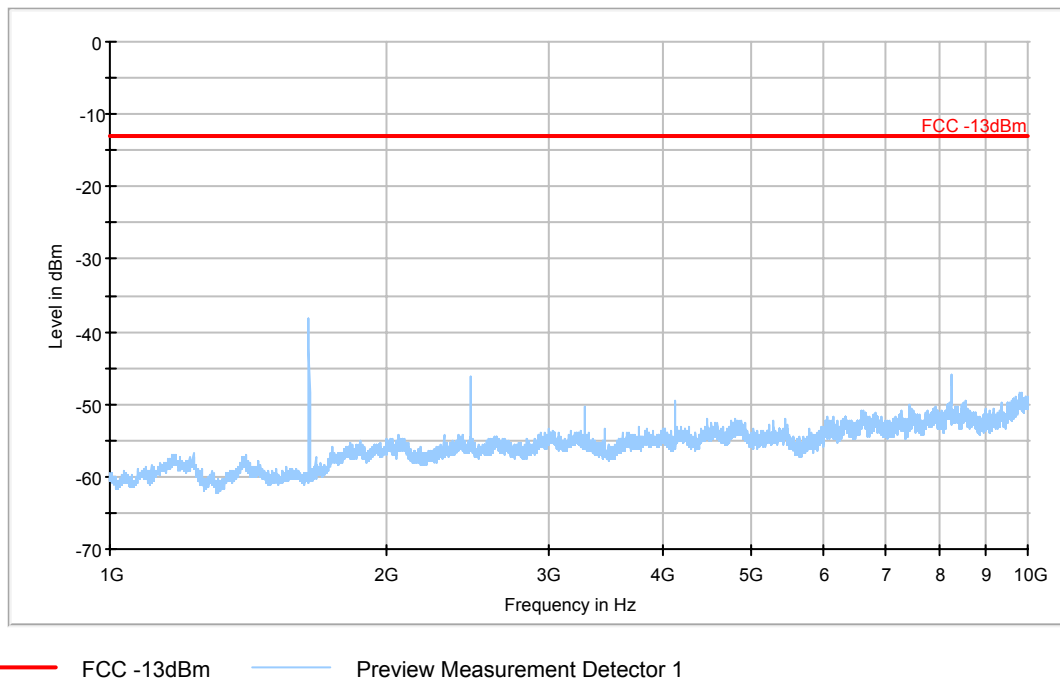
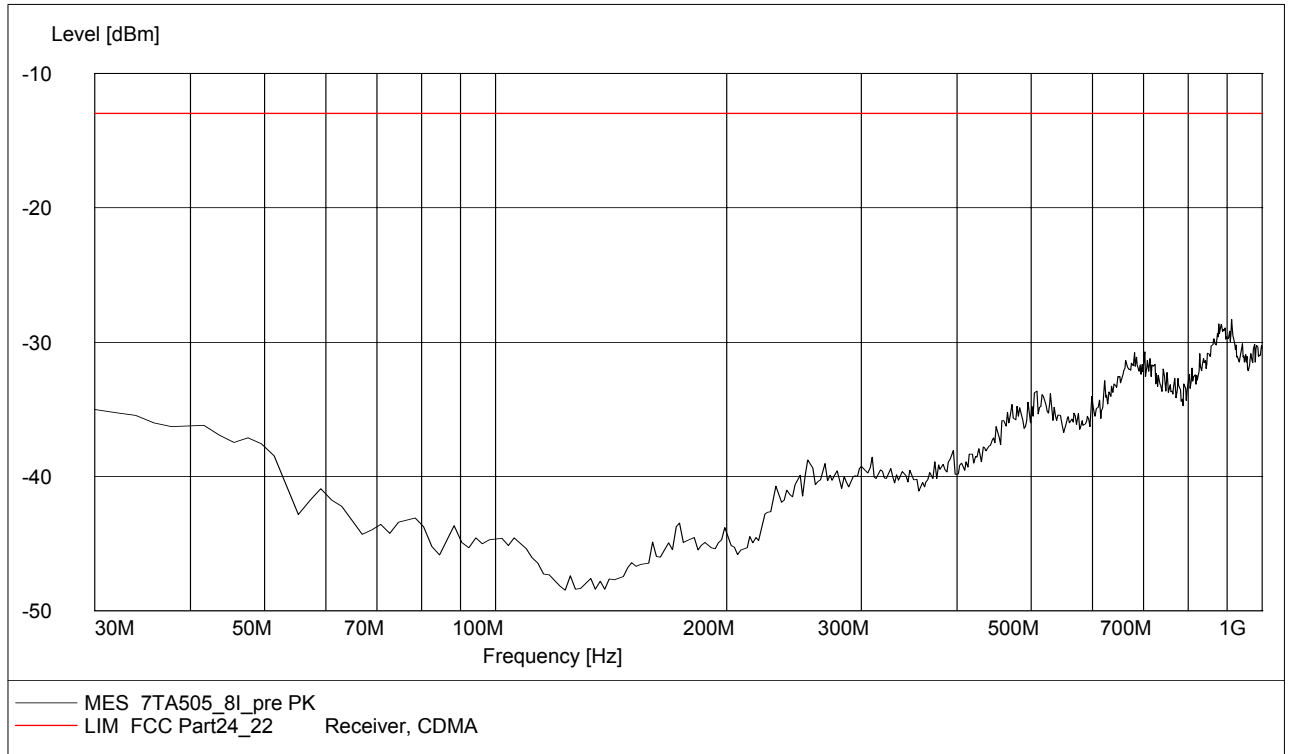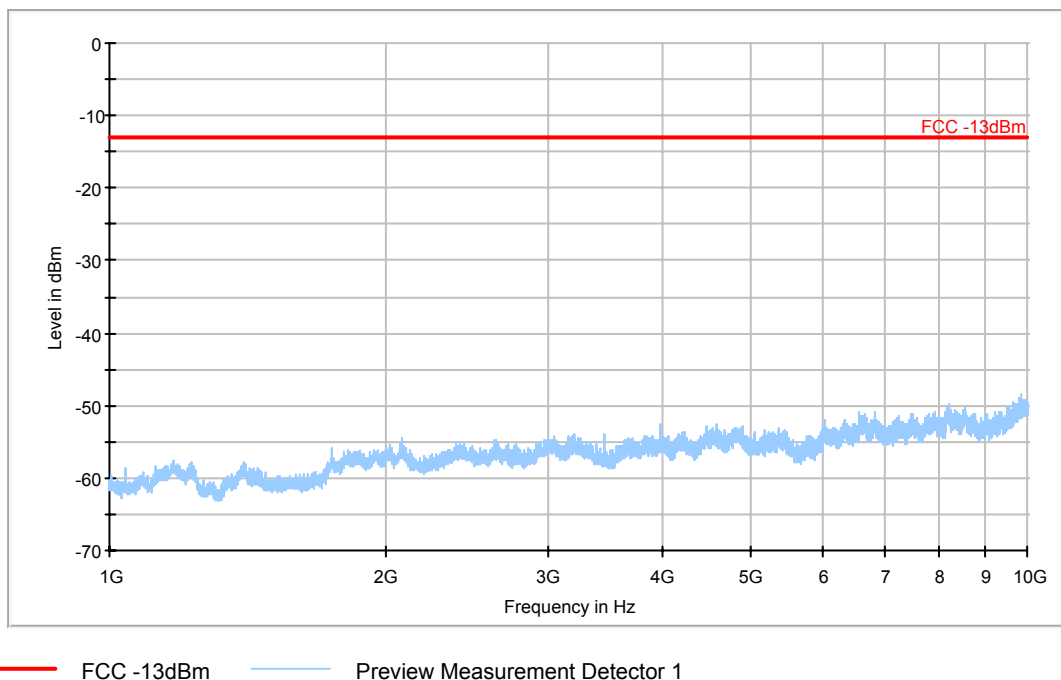**A.2.3.5 RADIATED SPURIOUS EMISSIONS-Channel 190: 1GHz – 10GHz**

Radiated spurious emission limit :-13dBm.

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

Radiated spurious emission limit :-13dBm.

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

Radiated spurious emission limit :-13dBm.

MES 7TA505_8I_pre PK
LIM FCC Part24_22   Receiver, CDMA

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

Radiated spurious emission limit :-13dBm.
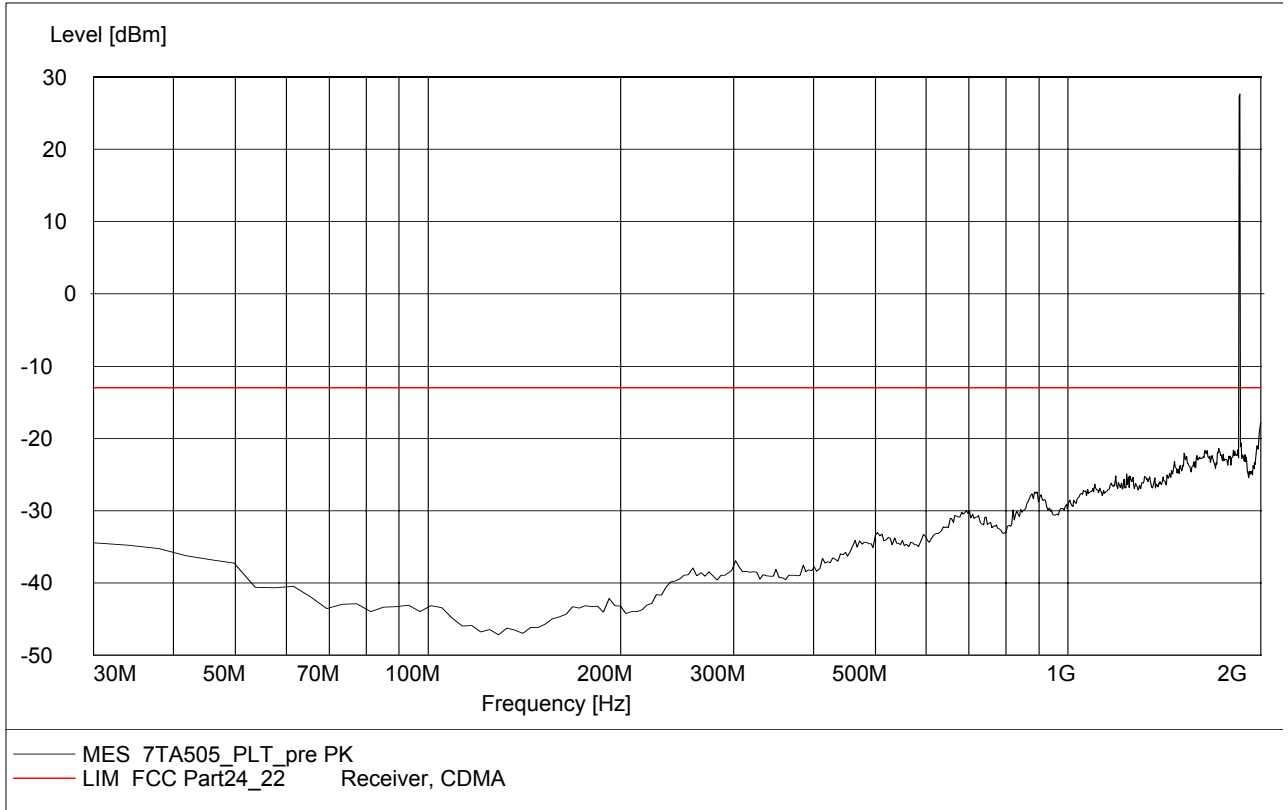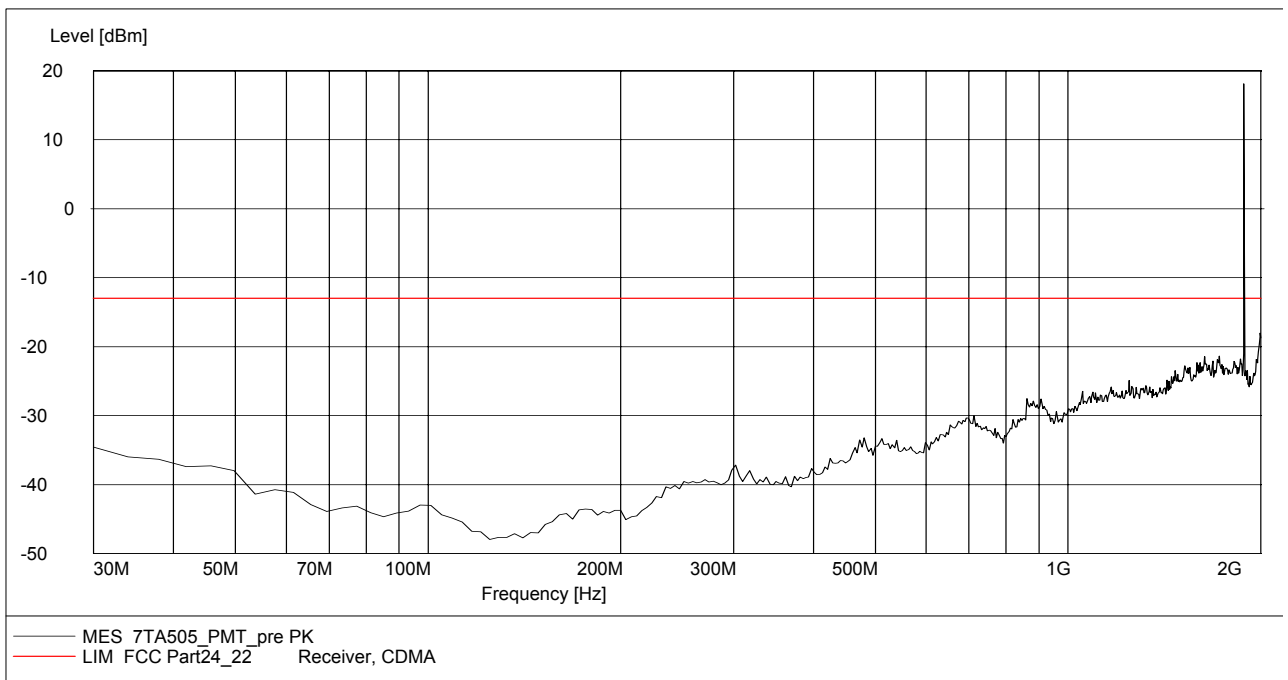

FCC -13dBm   Preview Measurement Detector 1

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**


```
MES  7TA505_PLT_pre PK
LIM  FCC Part24_22      Receiver, CDMA
```

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

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


```
MES  7TA505_PMT_pre PK
LIM  FCC Part24_22      Receiver, CDMA
```

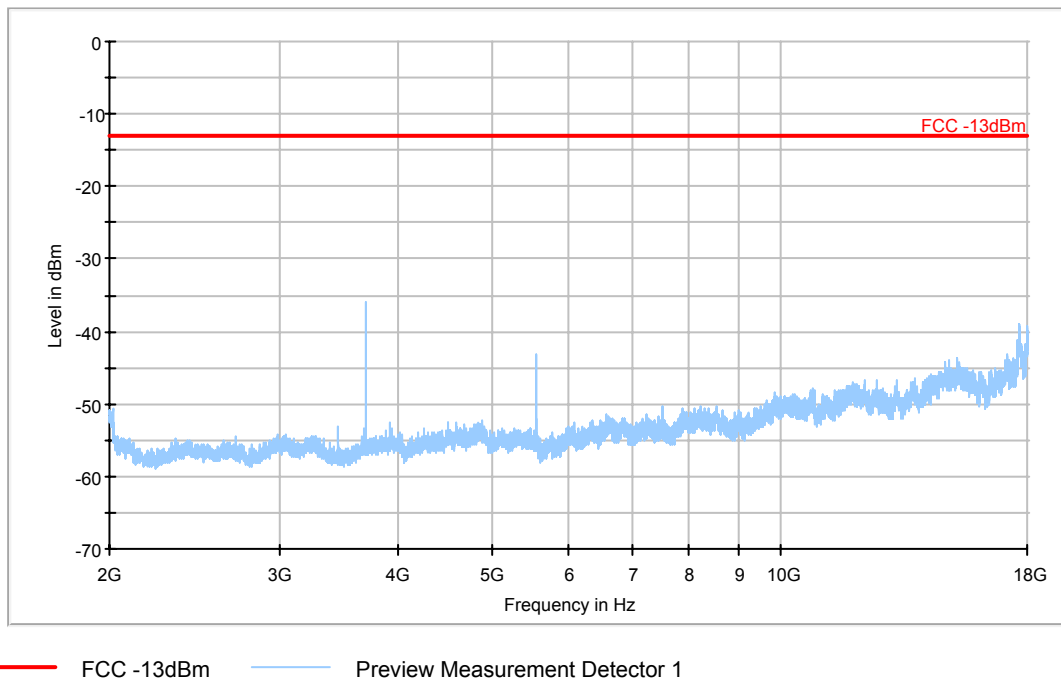### A.2.3.11 RADIATED SPURIOUS EMISSIONS-Channel 810: 30MHz – 2GHz
NOTE: peak above the limit line is the Carrier frequency @ ch-810

Level [dBm]

MES 7TA505_PHT_pre PK
LIM FCC Part24_22   Receiver, CDMA
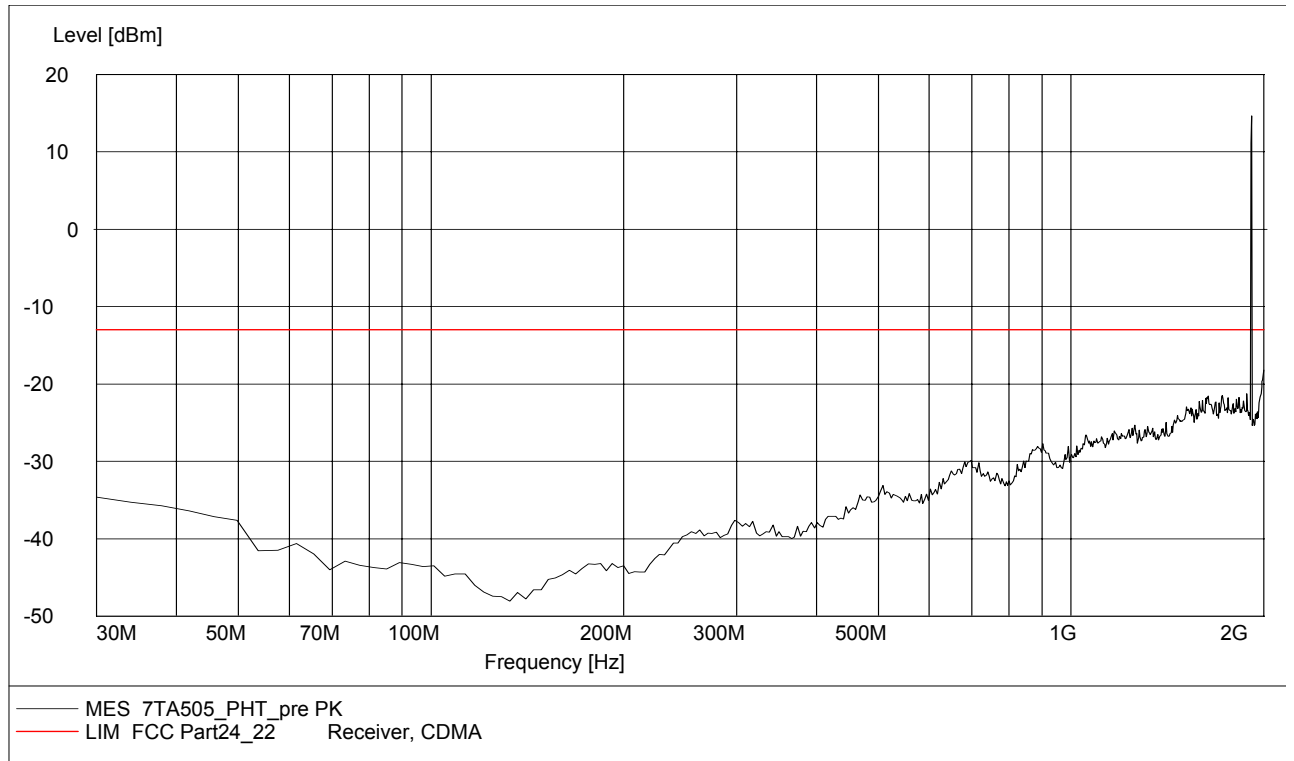
A.2.3.12 RADIATED SPURIOUS EMISSIONS-Channel 512: 2GHz – 18GHz
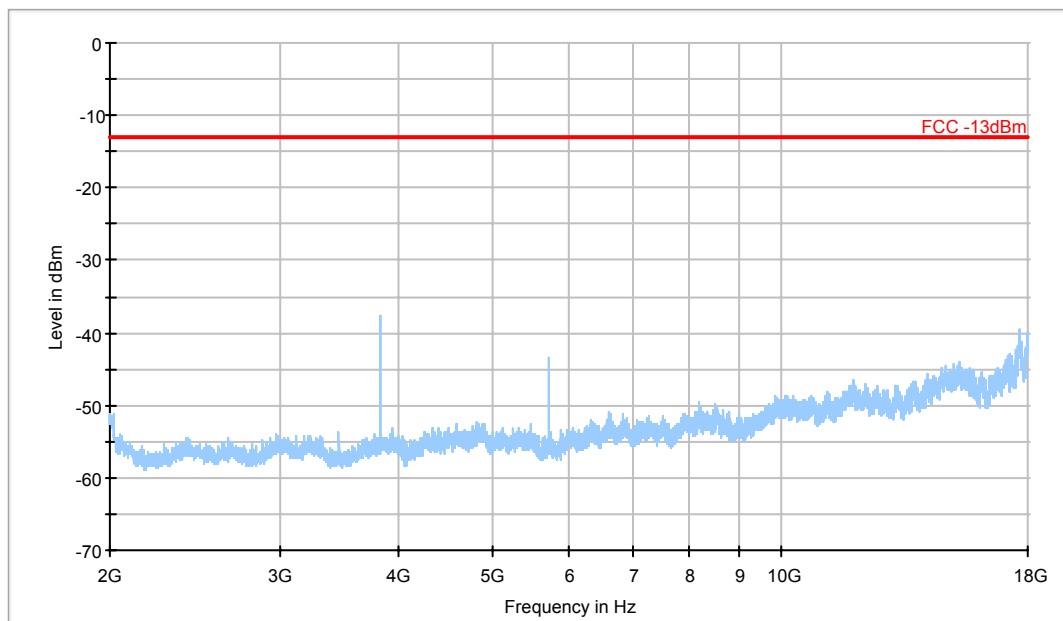
FCC -13dBm   Preview Measurement Detector 1

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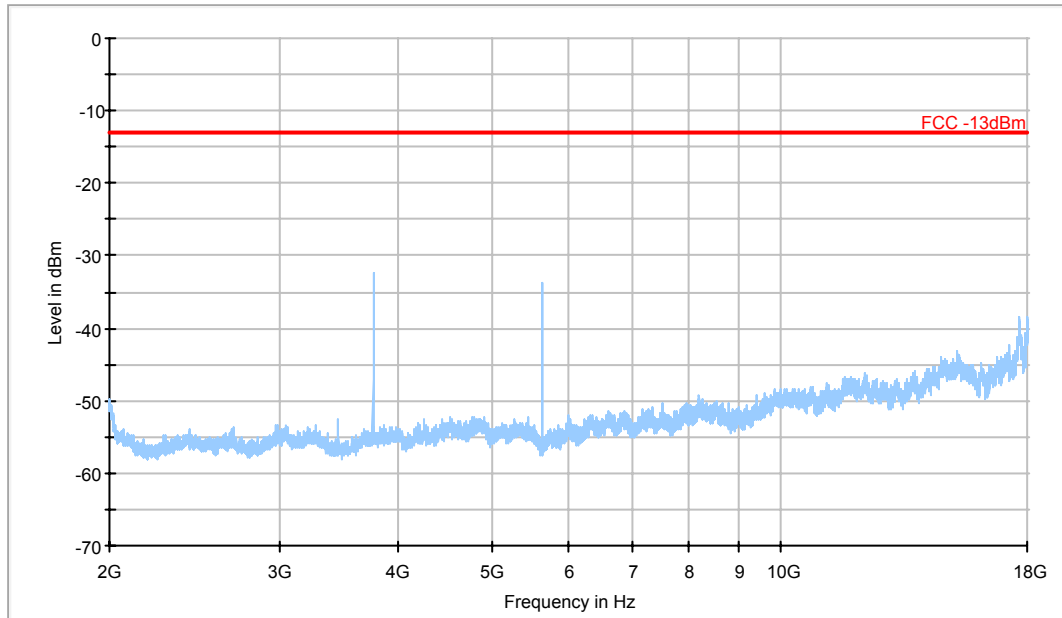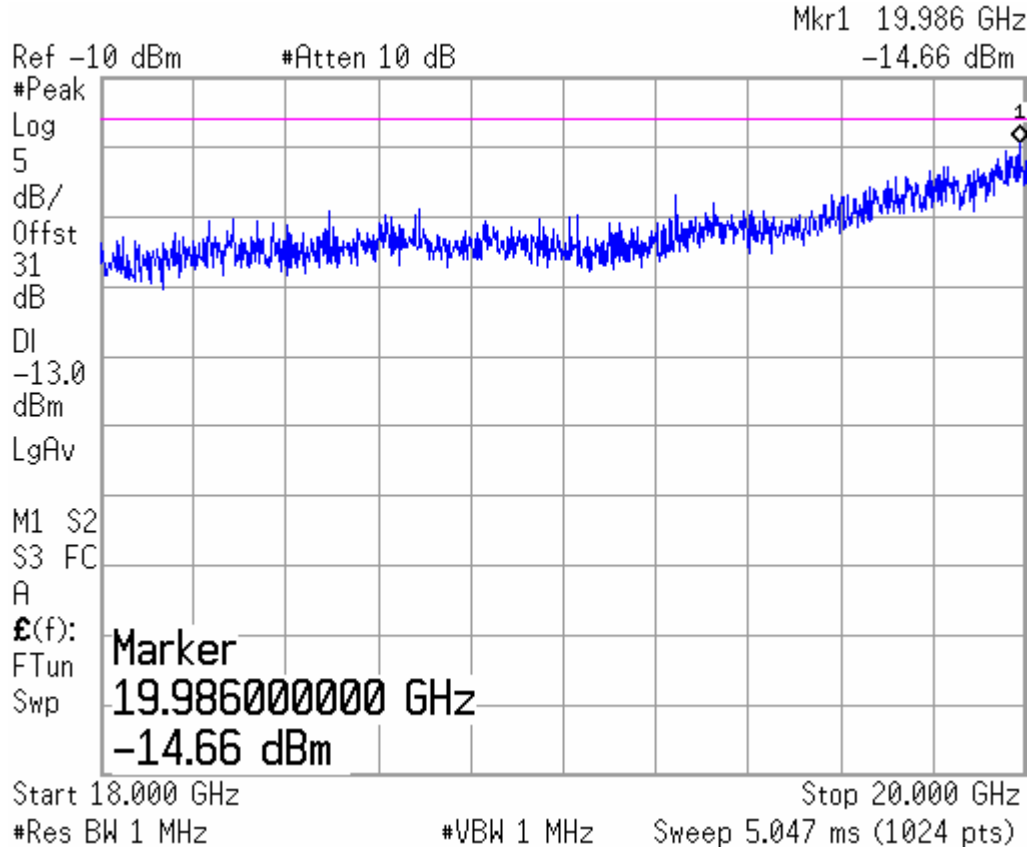

FCC -13dBm   Preview Measurement Detector 1

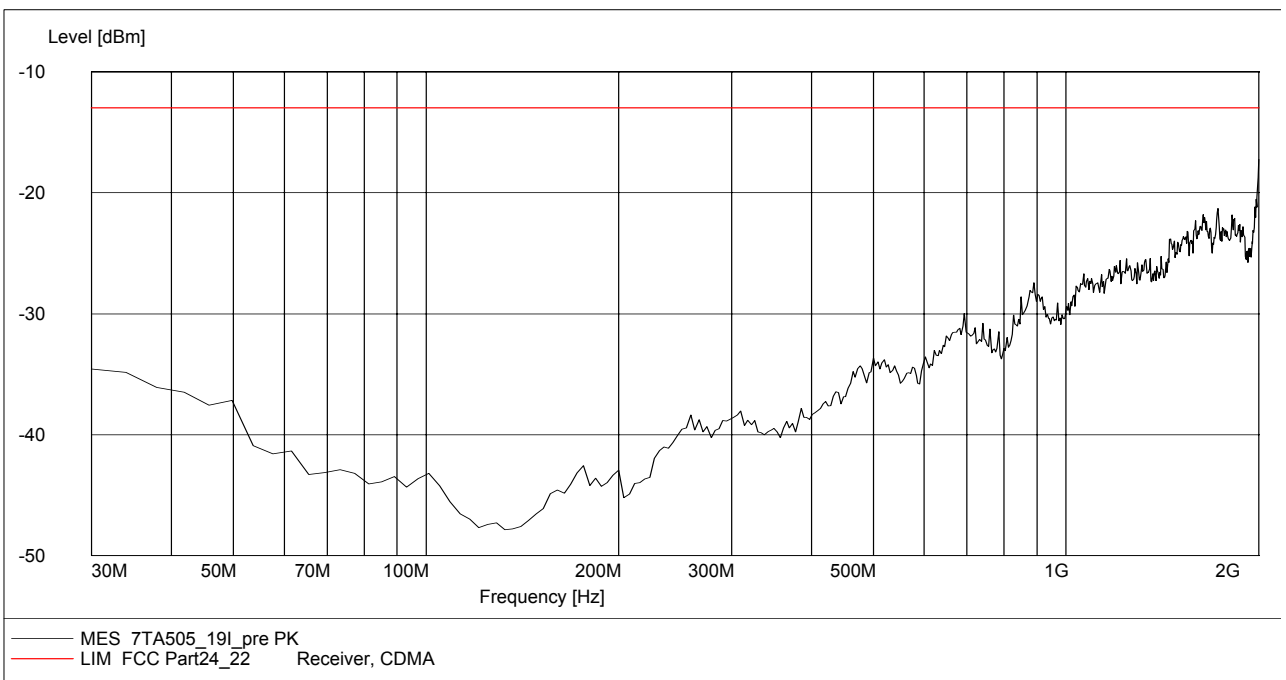## A.2.3.14 RADIATED SPURIOUS EMISSIONS-Channel 810: 2GHz – 18GHz

FCC -13dBm   Preview Measurement Detector 1

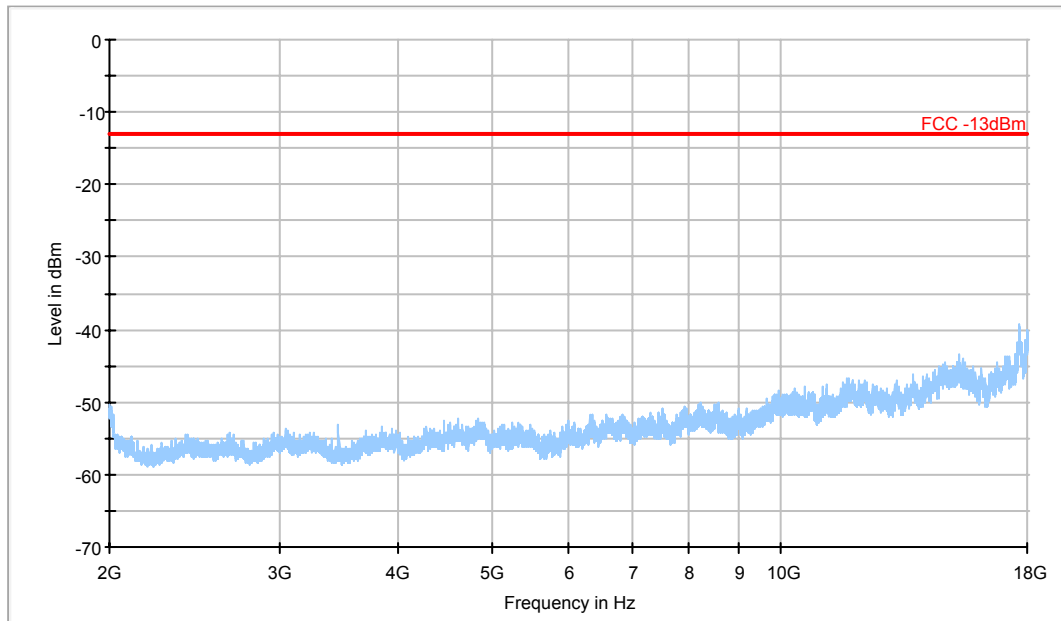**A.2.3.15 Radiated spurious emission (18GHz-20GHz)**

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

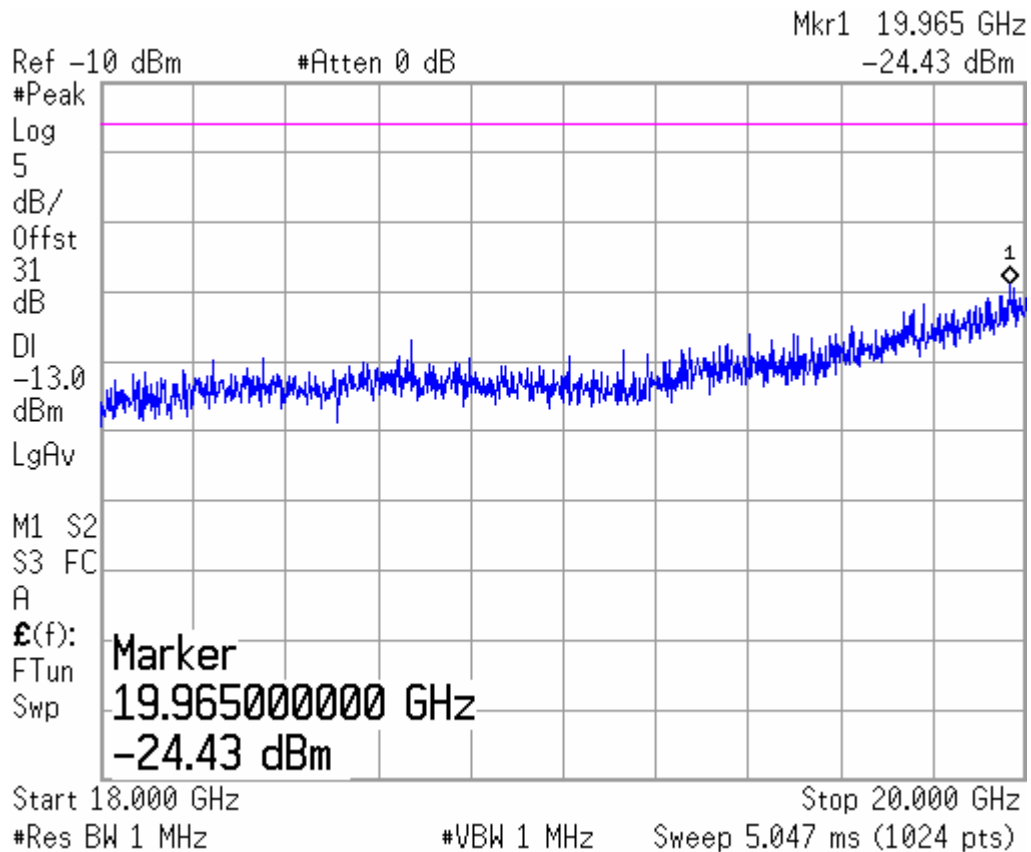**A.2.3.16 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 2GHz**

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.

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

×	M E S	7TAS0S_GC_fin QP
+	M E S	7TAS0S_GC_fin AV
	M E S	7TAS0S_GC_pre PK
	M E S	7TAS0S_GC_pre AV
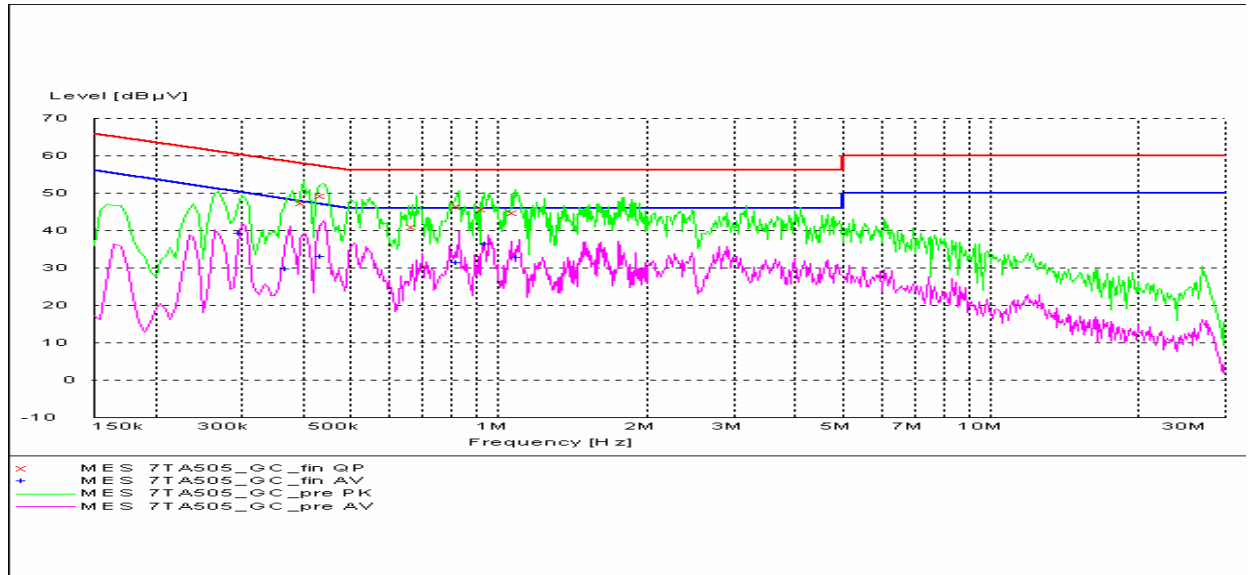
MEASUREMENT RESULT: "7TA505_GC_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.400000	47.30	10.1	58	10.6	N	GND
0.440000	49.30	10.1	57	7.8	L1	FLO
0.675000	40.90	10.1	56	15.1	L1	FLO
0.825000	46.30	10.1	56	9.7	L1	GND
0.935000	45.70	10.1	56	10.4	L1	GND
1.080000	44.80	10.1	56	11.3	L1	GND

MEASUREMENT RESULT: "7TA505_GC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.300000	39.30	10.1	50	11.0	L1	GND
0.375000	29.60	10.1	48	18.8	L1	FLO
0.440000	33.00	10.1	47	14.1	L1	GND
0.830000	31.40	10.1	46	14.6	N	FLO

PCS 1900MHz
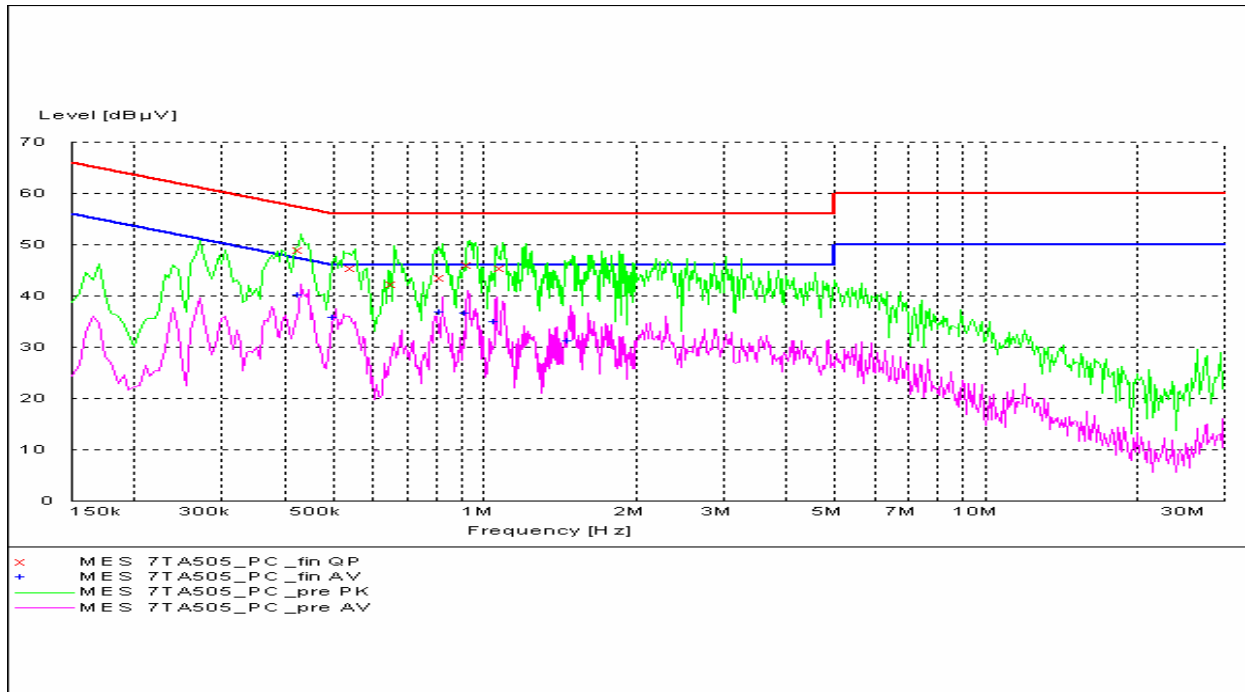
MEASUREMENT RESULT: "7TA505_PC_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.430000	49.00	10.1	57	8.3	L1	GND
0.550000	45.40	10.1	56	10.6	L1	GND
0.660000	42.30	10.1	56	13.7	L1	GND
0.820000	43.60	10.1	56	12.4	N	GND
0.930000	46.00	10.1	56	10.0	L1	FLO
1.085000	45.30	10.1	56	10.7	L1	GND

MEASUREMENT RESULT: "7TA505_PC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.430000	40.20	10.1	47	7.1	L1	GND
0.505000	35.80	10.1	46	10.2	L1	GND
0.820000	36.80	10.1	46	9.2	L1	GND
0.925000	36.70	10.1	46	9.3	L1	FLO

Camera
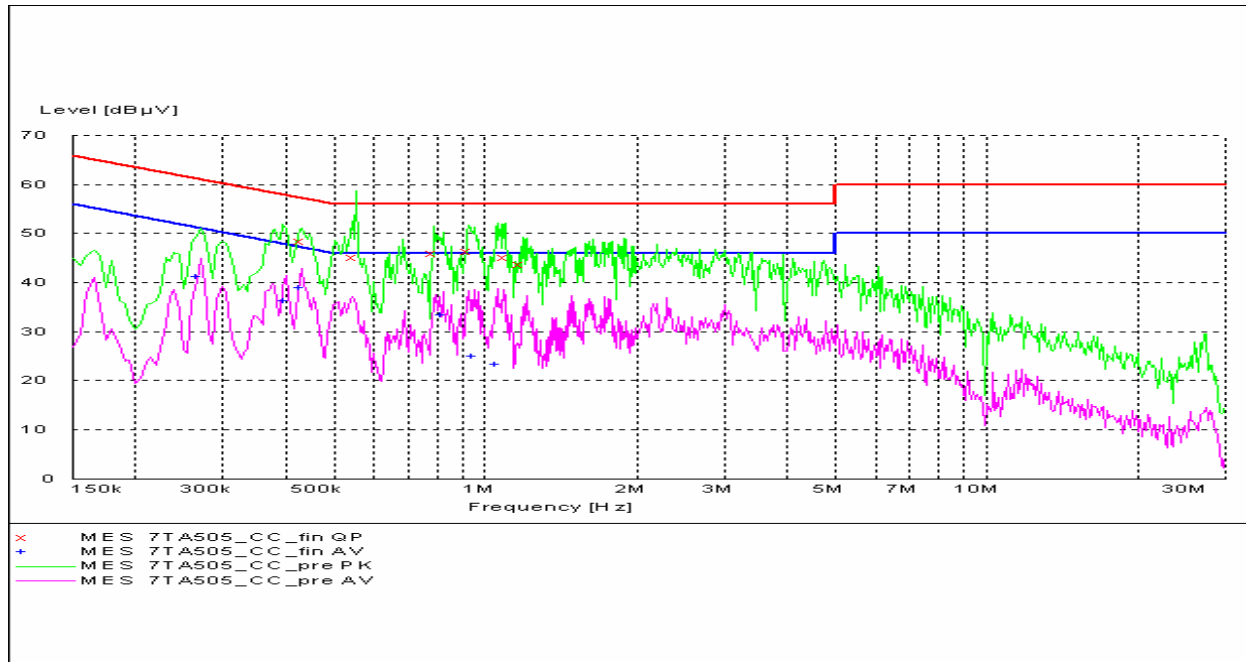
MEASUREMENT RESULT: "7TA505_CC_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.430000	48.40	10.1	57	8.9	L1	FLO
0.550000	45.20	10.1	56	10.8	L1	FLO
0.790000	46.00	10.1	56	10.0	L1	GND
0.925000	46.50	10.1	56	9.5	L1	FLO
1.095000	45.20	10.1	56	10.8	L1	FLO
1.185000	43.60	10.1	56	12.4	L1	FLO

MEASUREMENT RESULT: "7TA505_CC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.270000	41.20	10.1	51	9.9	L1	GND
0.400000	36.40	10.1	48	11.4	N	FLO
0.430000	39.10	10.1	47	8.2	L1	FLO
0.820000	33.30	10.1	46	12.7	N	FLO

MP3
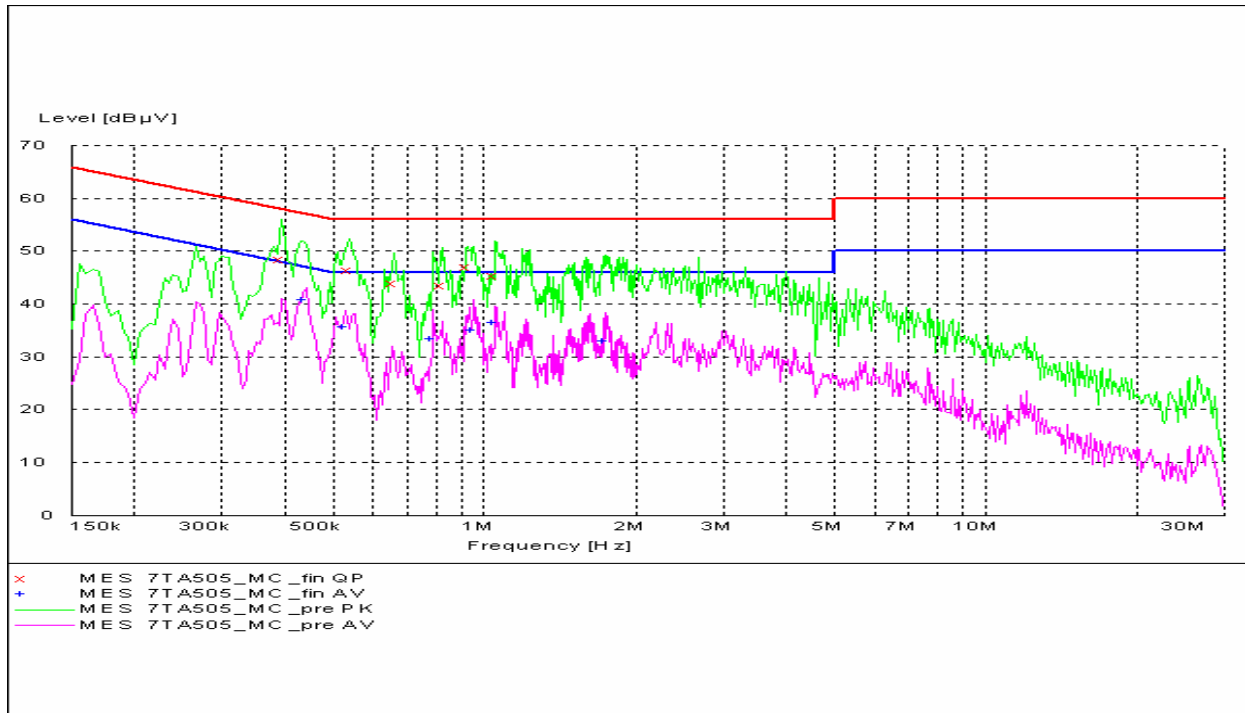
MEASUREMENT RESULT: "7TA505_MC_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.395000	48.40	10.1	58	9.6	N	GND
0.535000	46.30	10.1	56	9.7	N	GND
0.660000	44.00	10.1	56	12.0	L1	FLO
0.825000	43.40	10.1	56	12.6	N	FLO
0.925000	46.90	10.1	56	9.1	L1	GND
1.050000	45.50	10.1	56	10.5	L1	FLO

MEASUREMENT RESULT: "7TA505_MC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.440000	40.80	10.1	47	6.3	L1	GND
0.530000	35.70	10.1	46	10.3	N	GND
0.790000	33.30	10.1	46	12.7	L1	GND
0.955000	35.10	10.1	46	10.9	N	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)
3.4	9	0.011
3.7	10	0.012
4.2	8	0.010

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	14	0.017
-20	11	0.013
-10	11	0.013
0	12	0.014
10	11	0.013
20	12	0.014
30	12	0.014
40	11	0.013
50	14	0.017

PCS 1900
Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.4	18	0.010
3.7	16	0.009
4.2	19	0.010

Frequency Error vs Temperature

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

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.
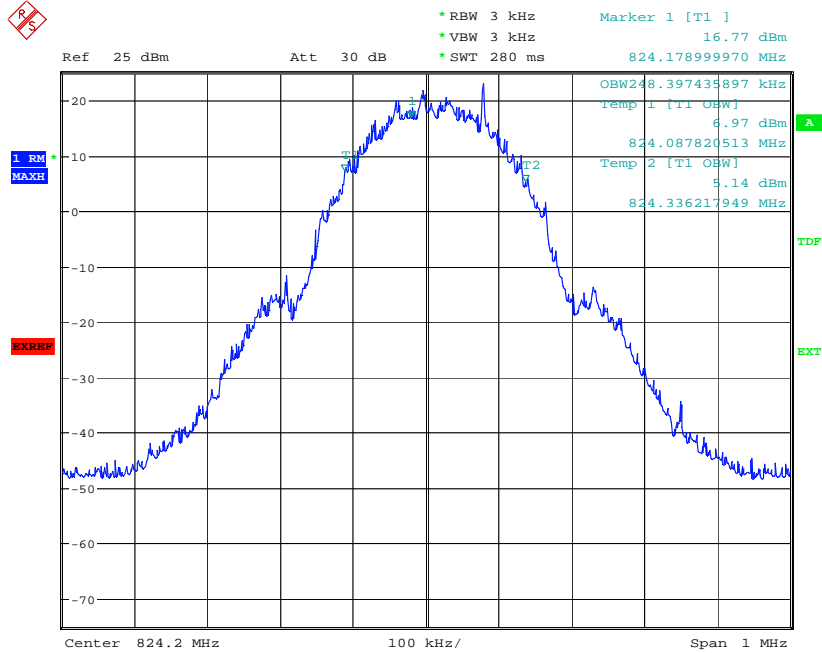
GSM 850(-20dBc)

EUT1:

Frequency(MHz)	Occupied Bandwidth (–20dBc BW)(kHz)
824.2	248.397
836.6	253.205
848.8	251.603

ANALYZER SETTINGS: RBW=VBW=3kHz

GSM 850
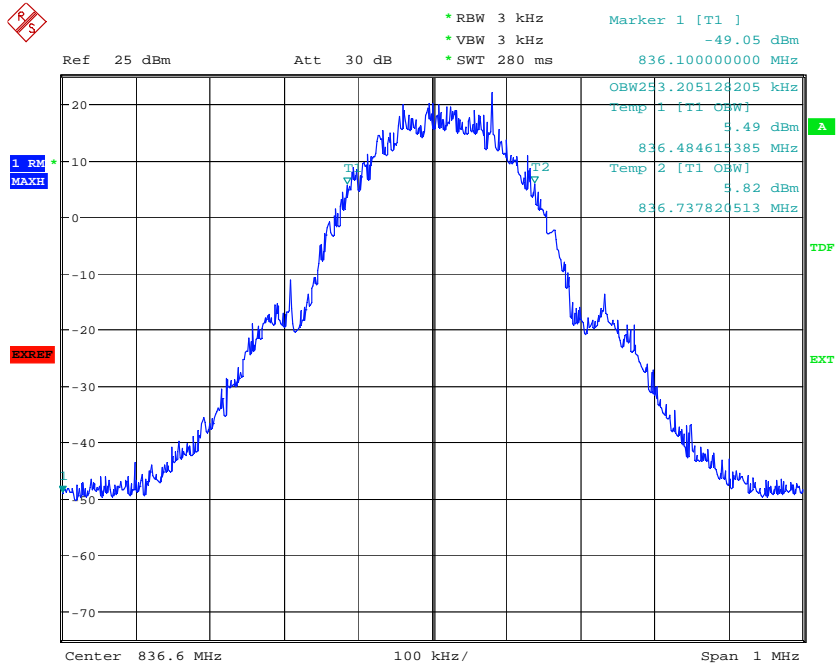### Channel 128-Occupied Bandwidth (-20dBc BW)

Date: 23.JUL.2007 03:46:56
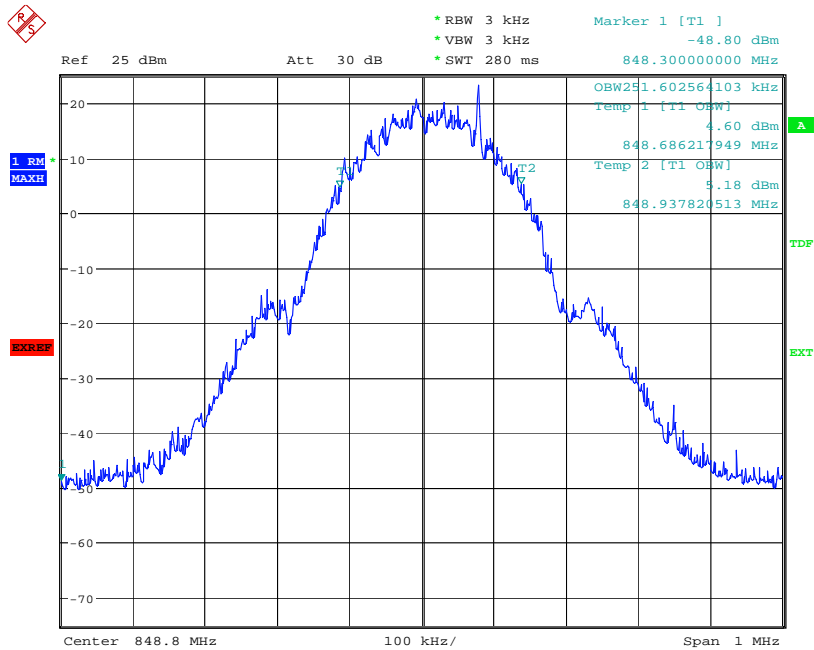
2

Channel 190-Occupied Bandwidth (-20dBc BW)

Date: 23.JUL.2007 03:48:30

Channel 251-Occupied Bandwidth (-20dBc BW)

Date: 23.JUL.2007 03:50:00

PCS 1900(-20dBc)

Frequency(MHz)	Occupied Bandwidth (–20dBc BW)(kHz)
1850.2	250.000
1880.0	250.000
1909.8	253.205

ANALYZER SETTINGS: RBW=VBW=3kHz
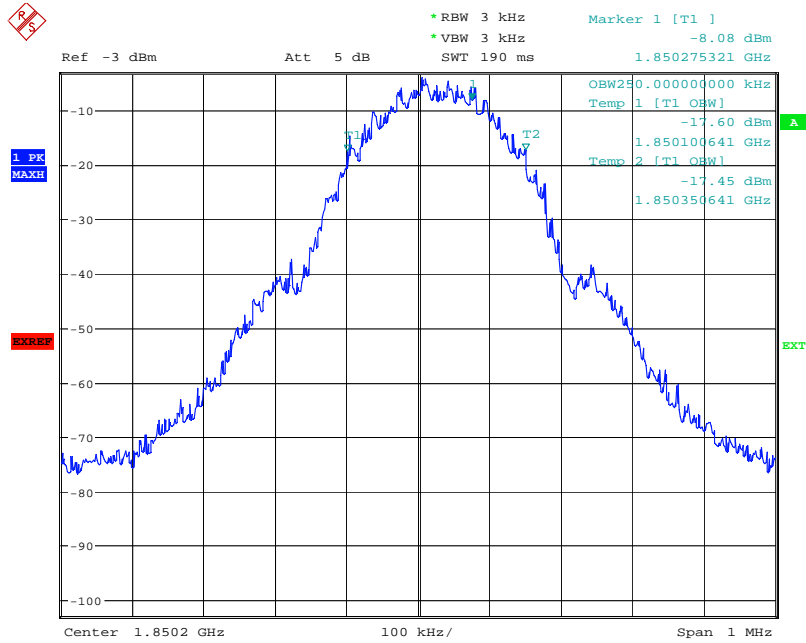
PCS 1900

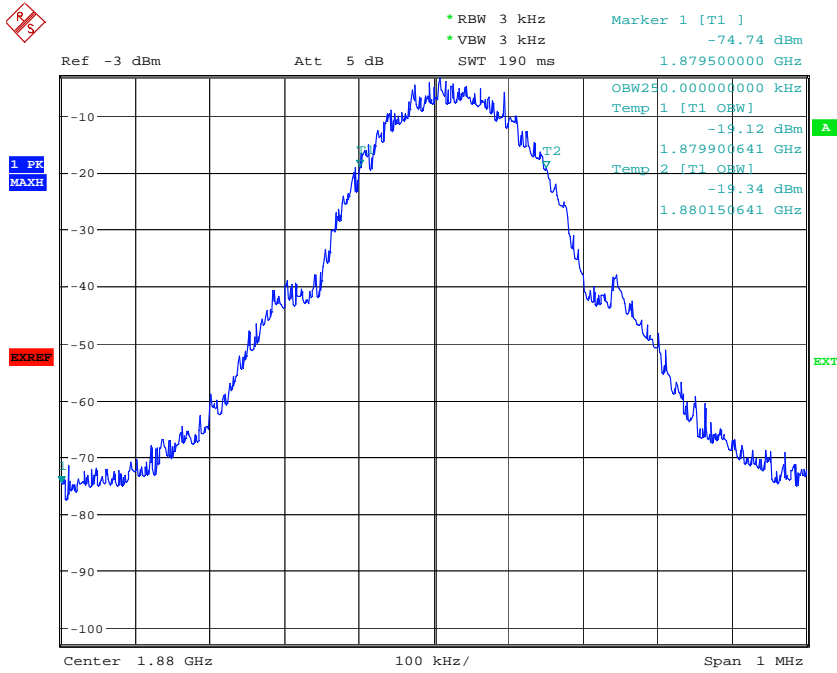**Channel 512-Occupied Bandwidth (-20dBc BW)**

Date: 23.JUL.2007 03:53:40

Channel 661-Occupied Bandwidth (-20dBc BW)


```
                                    *RBW 3 kHz          Marker 1 [T1 ]
                                    *VBW 3 kHz                  -74.74 dBm
Ref -3 dBm          Att 5 dB        SWT 190 ms            1.879500000 GHz

1 PK                                                OBW250.000000000 kHz
MAXH                                                Temp 1 [T1 OBW]
                                                          -19.12 dBm A
                                                     1.879900641 GHz
                                                    Temp 2 [T1 OBW]
                                                          -19.34 dBm
EXREF                                                1.880150641 GHz
                                                                    EXT

Center 1.88 GHz              100 kHz/              Span 1 MHz
```

Date: 23.JUL.2007 03:54:44

Channel 810-Occupied Bandwidth (-20dBc BW)


```
                                    *RBW 3 kHz          Marker 1 [T1 ]
                                    *VBW 3 kHz                  -73.03 dBm
Ref -3 dBm          Att 5 dB        SWT 190 ms            1.909300000 GHz

IFOVL                                               OBW253.205128205 kHz
1 PK                                                Temp 1 [T1 OBW]
MAXH                                                      -18.03 dBm A
                                                     1.909699038 GHz
                                                    Temp 2 [T1 OBW]
                                                          -20.76 dBm
EXREF                                                1.909952244 GHz
                                                                    EXT

Center 1.9098 GHz            100 kHz/              Span 1 MHz
```
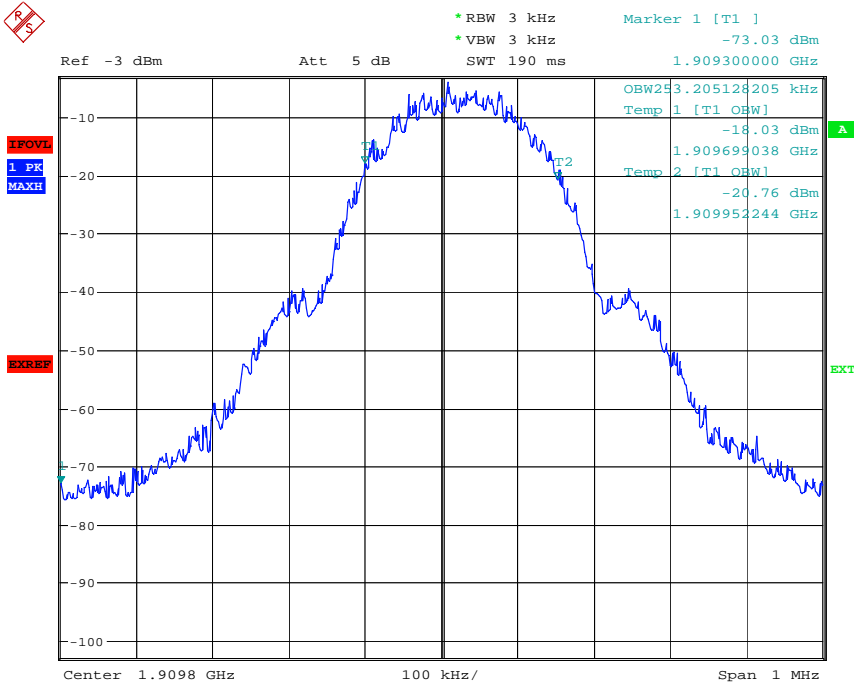
Date: 23.JUL.2007 03:55:53

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.
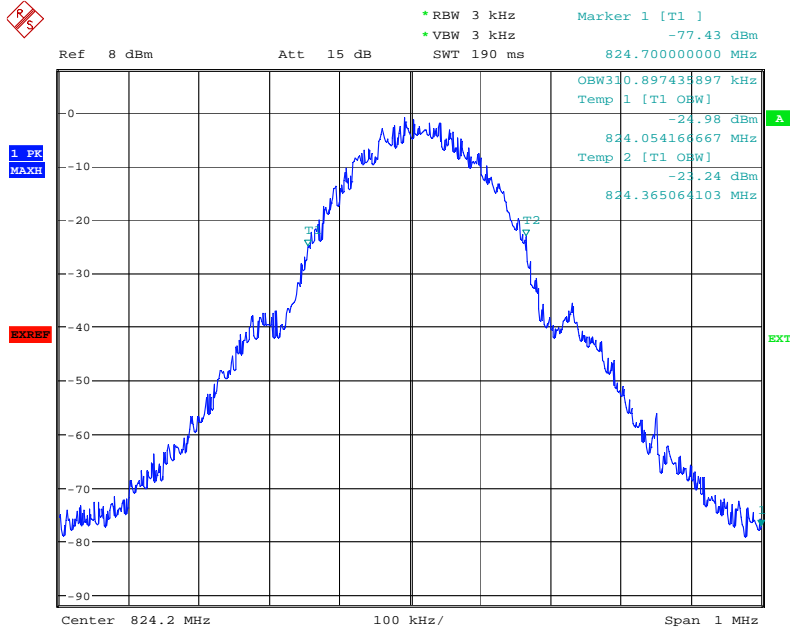
GSM 850(-26dBc)

EUT1:

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
824.2	310.897
836.6	310.897
848.8	312.500

ANALYZER SETTINGS: RBW=VBW=3kHz

GSM 850

Channel 128-Occupied Bandwidth (-26dBc BW)

Date: 23.JUL.2007 04:00:45

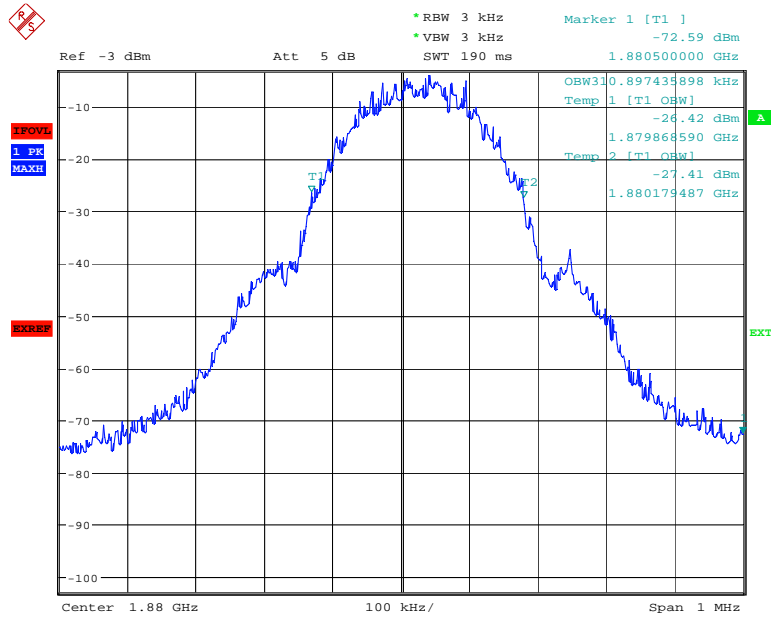### Channel 190-Occupied Bandwidth (-26dBc BW)
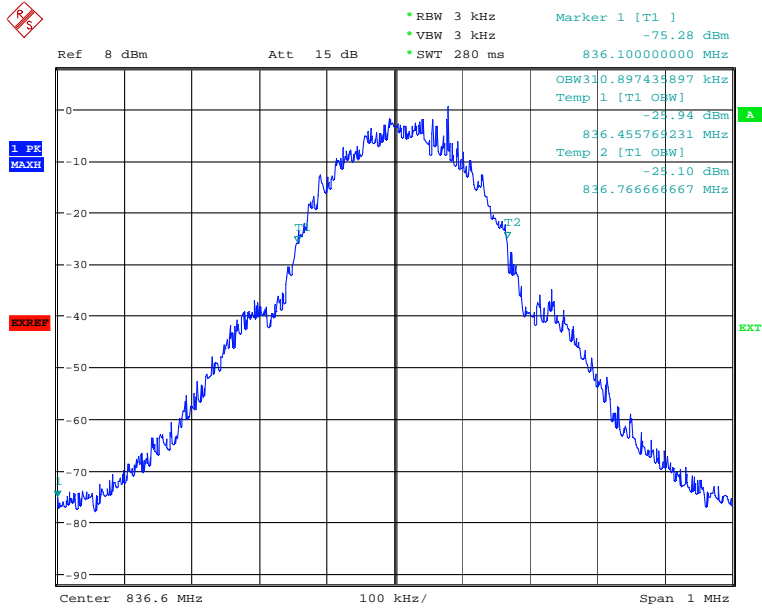
Date: 23.JUL.2007 04:01:59

Channel 251-Occupied Bandwidth (-26dBc BW)
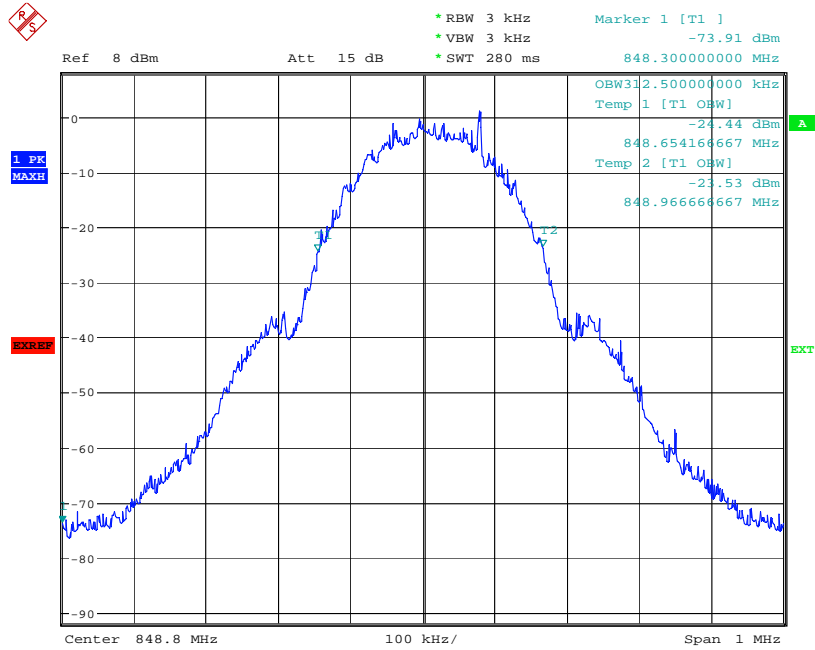
Date: 23.JUL.2007 04:04:11

PCS 1900(-26dBc)

EUT1:

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(kHz)
1850.2	309.295
1880.0	310.897
1909.8	312.500

ANALYZER SETTINGS: RBW=VBW=3kHz;

PCS 1900

Channel 512-Occupied Bandwidth (-26dBc BW)
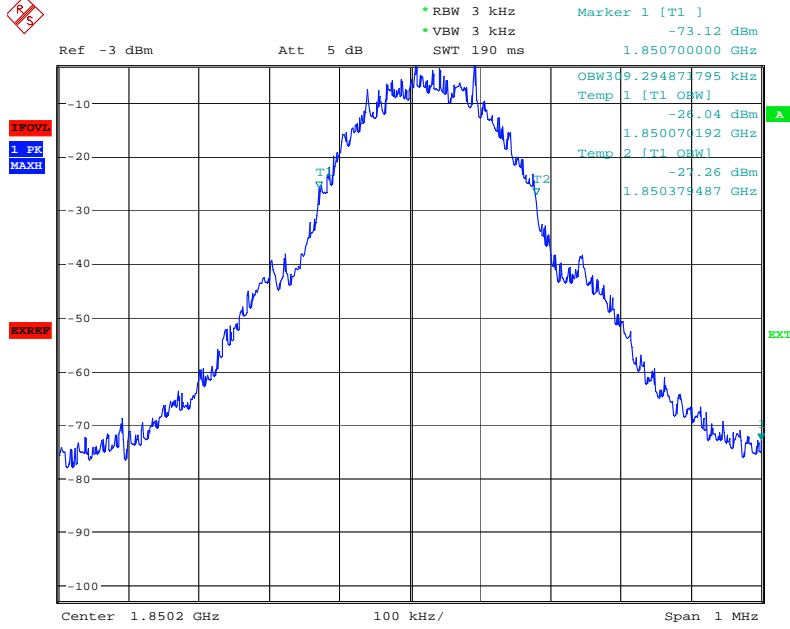
Date: 23.JUL.2007 03:59:03

Channel 661-Occupied Bandwidth (-26dBc BW)

Date: 23.JUL.2007 03:58:04

Channel 810-Occupied Bandwidth (-26dBc BW)
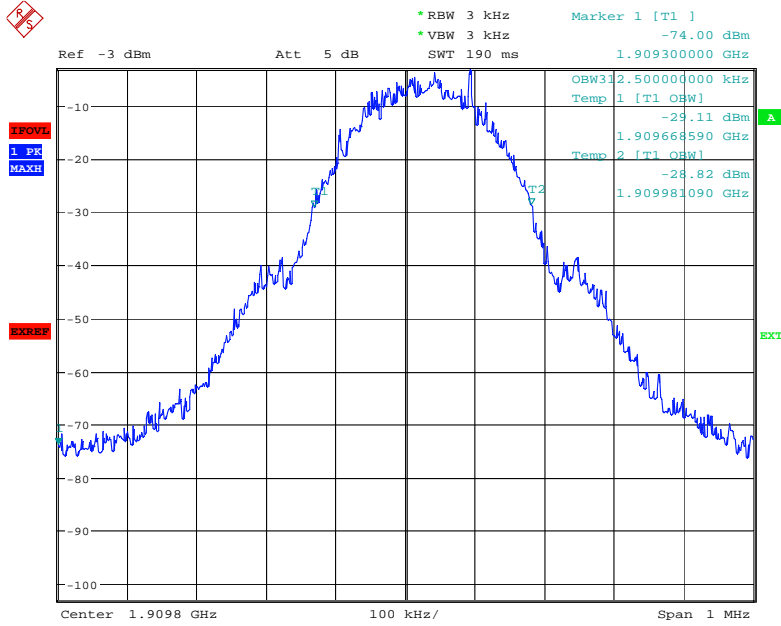
Date: 23.JUL.2007 03:57:08
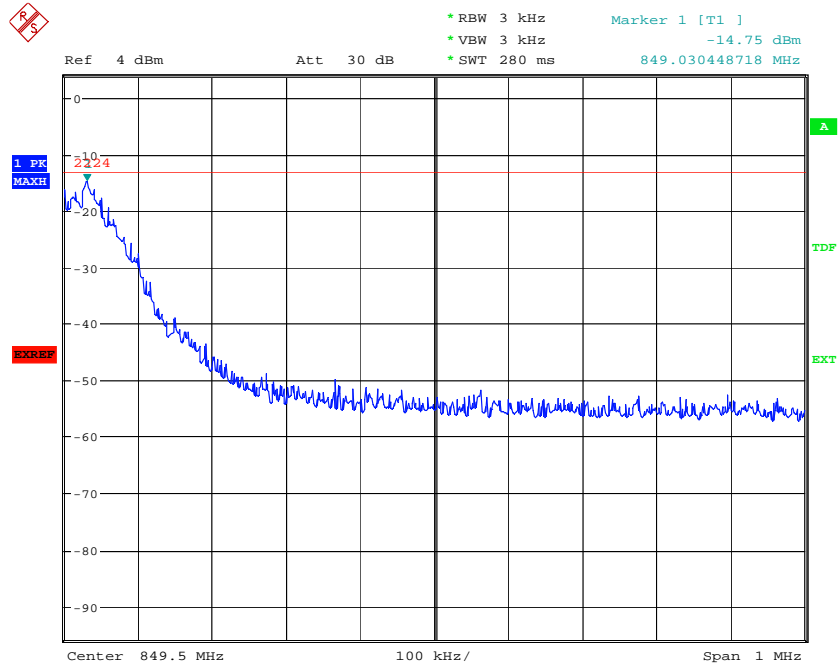
A.7 BAND EDGE COMPLIANCE   (§22.917(b)/§24.238(b))

GSM850
LOW BAND EDGE BLOCK-A (GSM850)-Channel 128
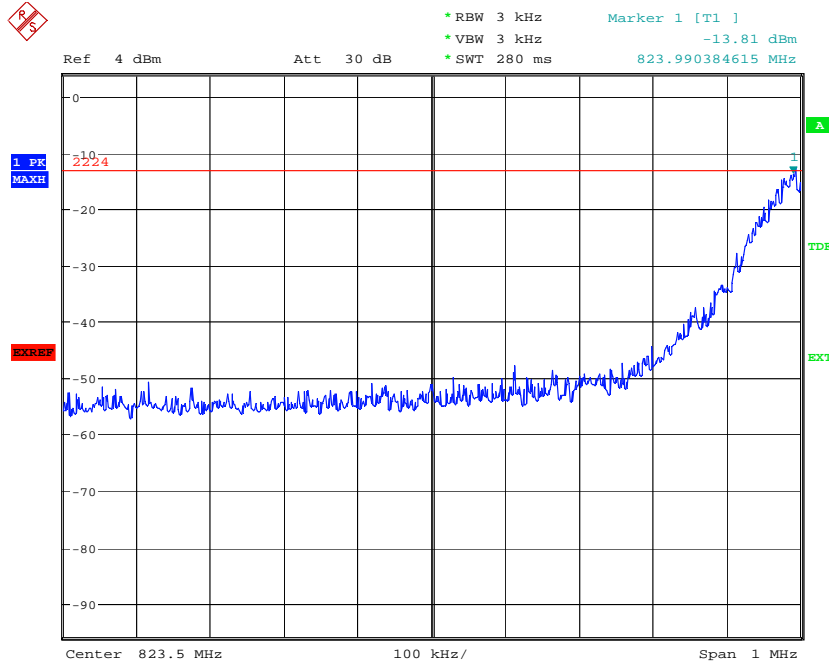
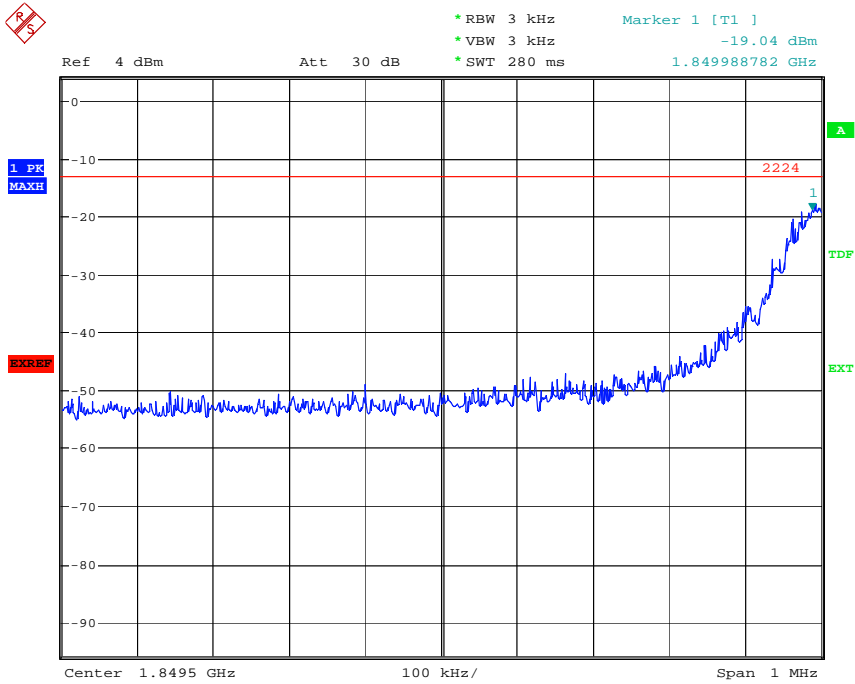Date: 23.JUL.2007 04:15:42

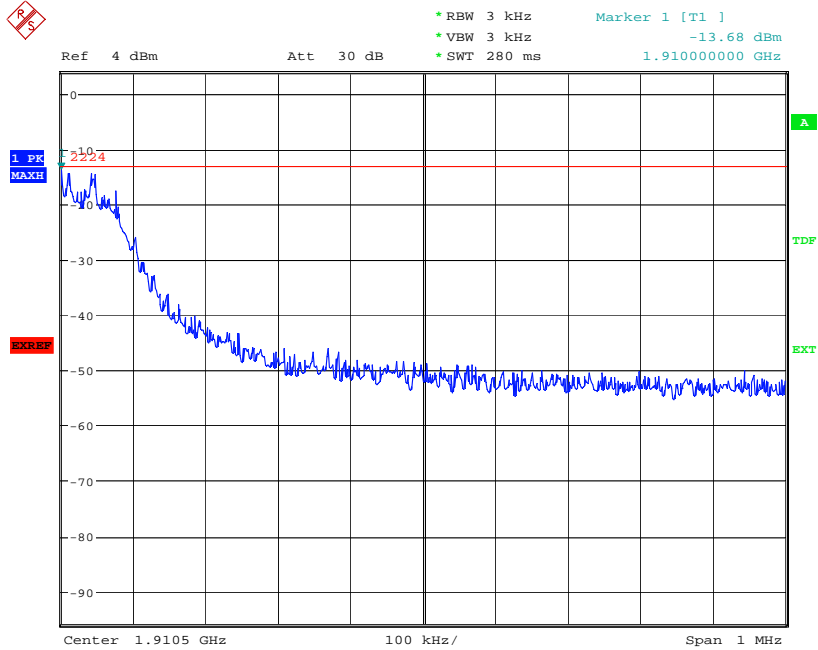## HIGH BAND EDGE BLOCK-C (GSM850) –Channel 251

Date: 23.JUL.2007 04:17:42

PCS 1900

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

Date: 23.JUL.2007 04:19:09

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


```
                                          * RBW  3 kHz      Marker 1 [T1 ]
                                          * VBW  3 kHz                 -13.68 dBm
       Ref   4 dBm          Att   30 dB   * SWT 280 ms        1.910000000 GHz
```

Date: 23.JUL.2007 04:20:23

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
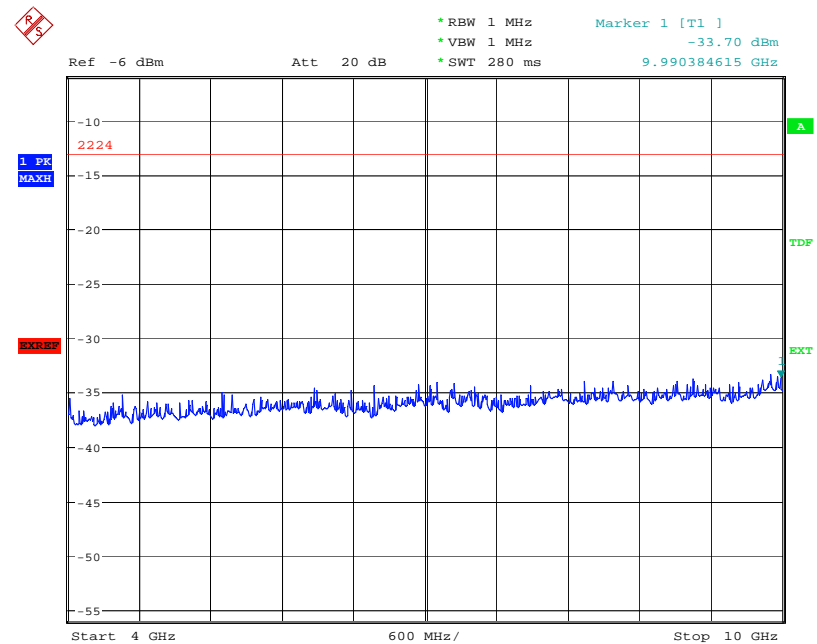
Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.
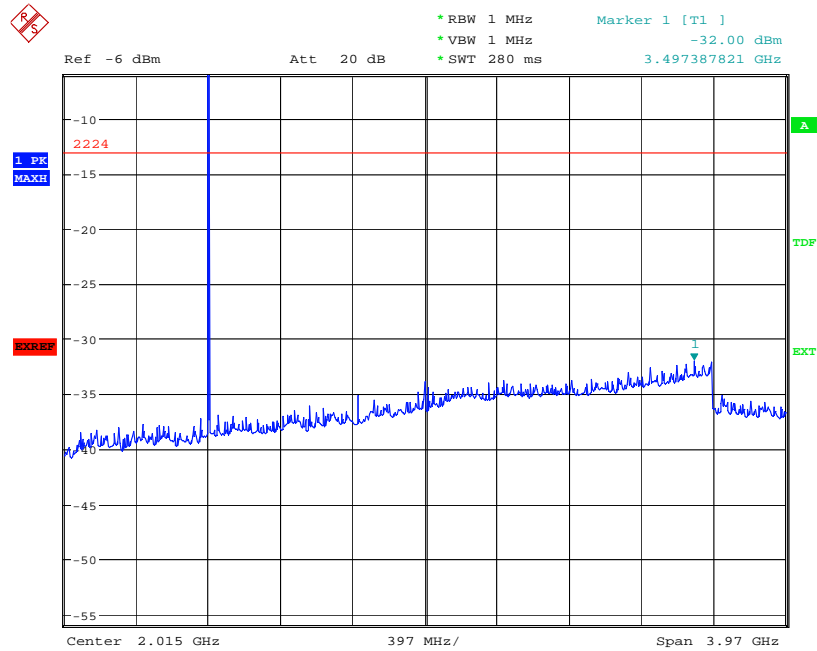
Date: 23.JUL.2007 04:29:12

A.8.3.2 Channel 128: 4GHz – 10GHz
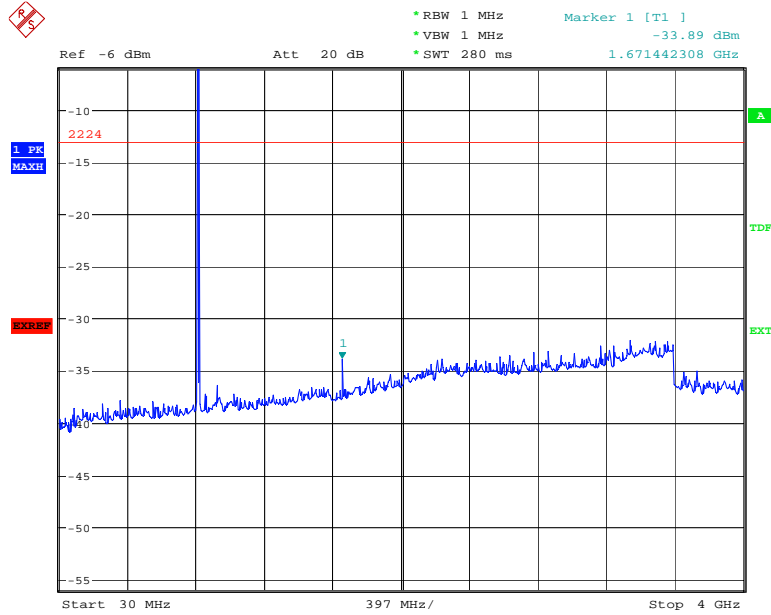
Spurious emission limit –13dBm.

Date: 23.JUL.2007 04:33:56

A.8.3.3 Channel 190: 30MHz – 4GHz
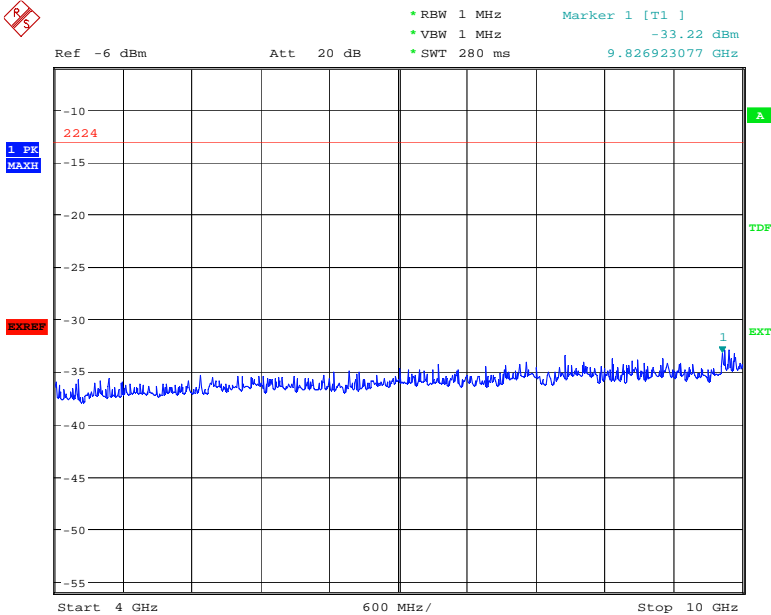
Spurious emission limit –13dBm

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

Date: 23.JUL.2007 04:31:55

A.8.3.4 Channel 190: 4GHz –10GHz
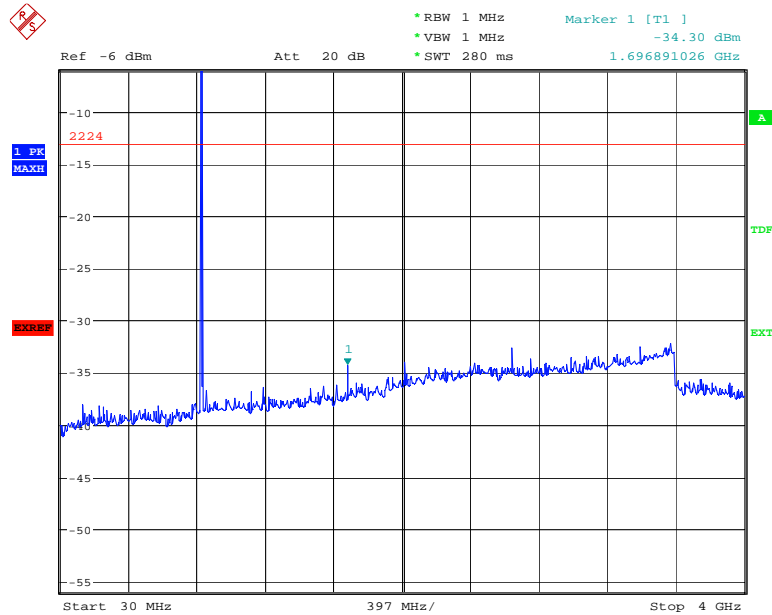
Spurious emission limit –13dBm

Date: 23.JUL.2007 04:32:33

A.8.3.5 Channel 251: 30MHz – 4GHz
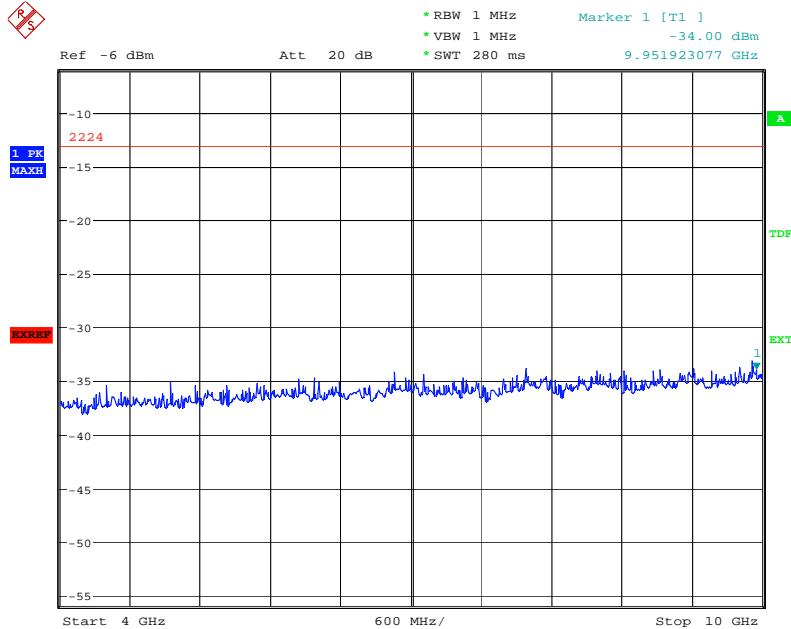
Spurious emission limit –13dBm.

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

Date: 23.JUL.2007 04:34:56

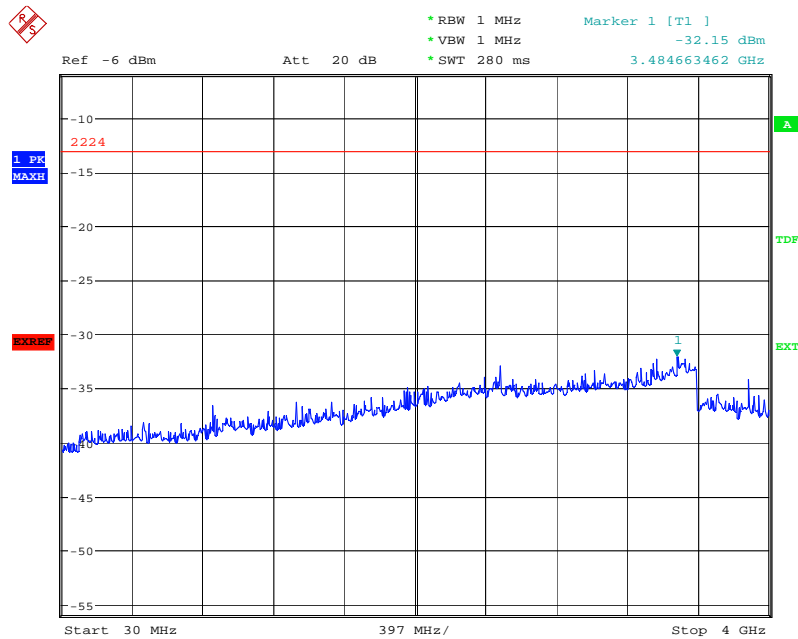### A.8.3.6 Channel 251: 4GHz – 20GHz

Spurious emission limit –13dBm.

Date: 23.JUL.2007 04:35:35
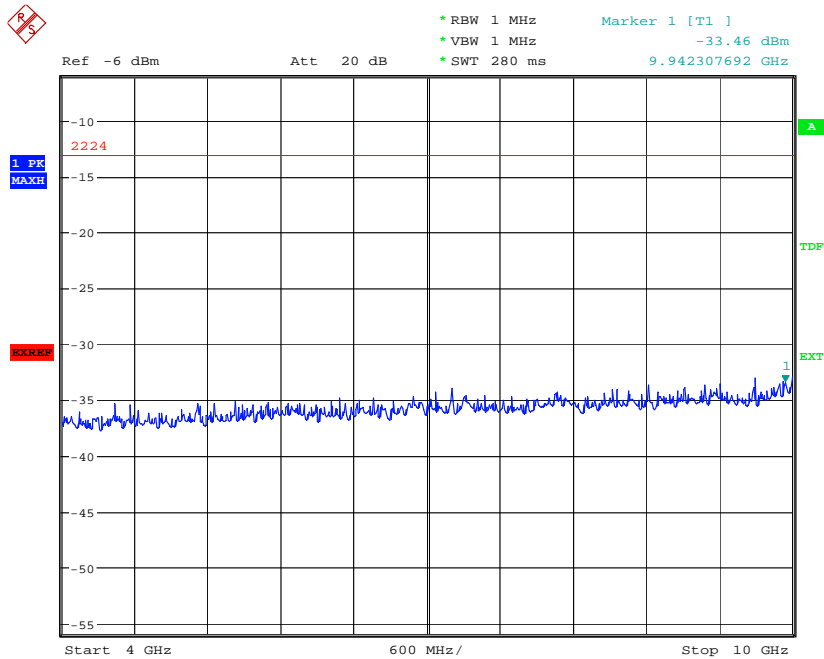
A.8.3.7 Idle mode: 30MHz – 4GHz

Spurious emission limit –13dBm.

Date: 23.JUL.2007 04:36:23

A.8.3.8 Idle mode: 4GHz – 20GHz

Spurious emission limit –13dBm.

Date: 23.JUL.2007 04:37:13

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
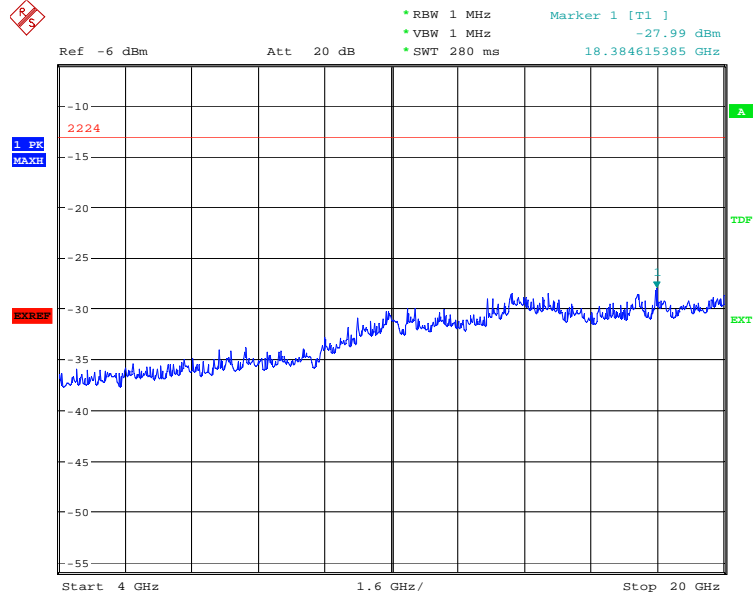
Spurious emission limit –13dBm.

NOTE: peak above the limit line is the carrier frequency.
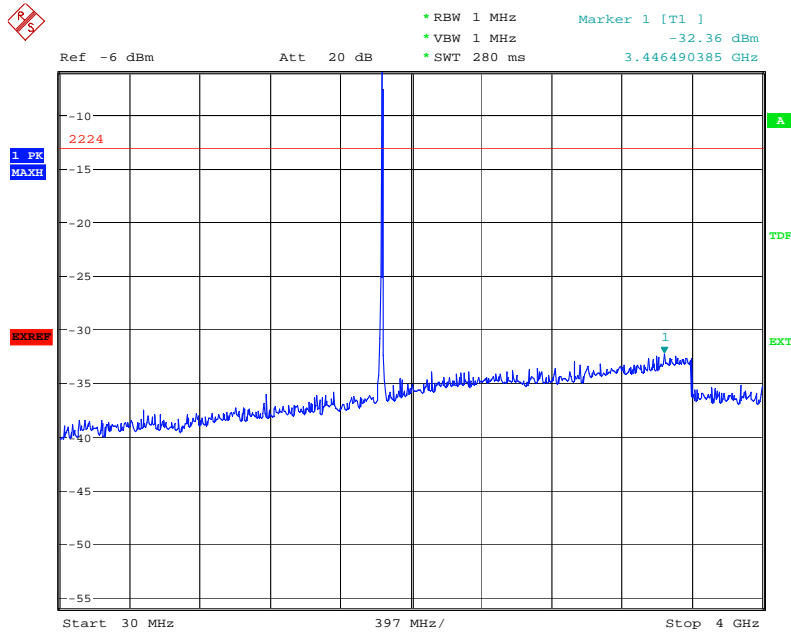
Date: 23.JUL.2007 04:39:35

A. 8.3.10 Channel 512: 4GHz – 20GHz
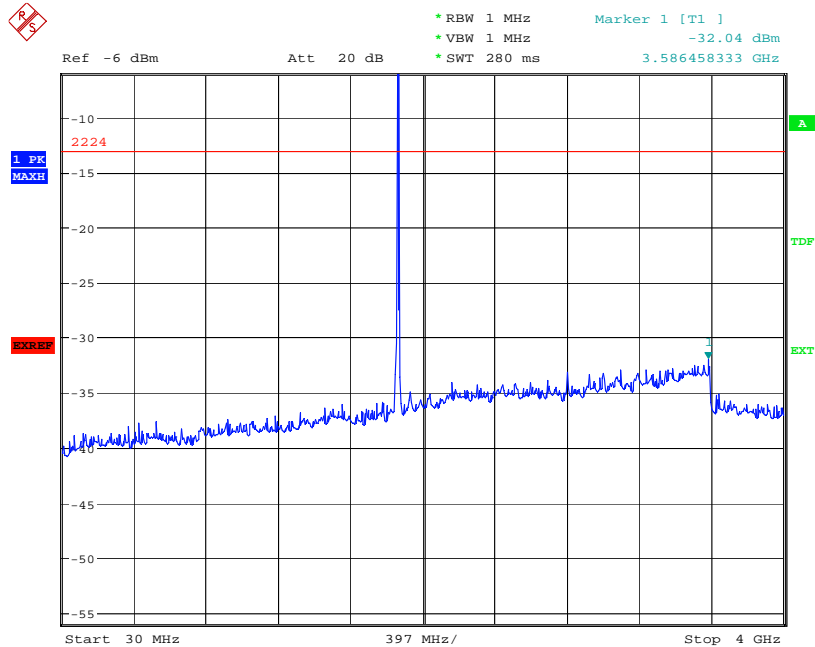
Spurious emission limit –13dBm.

Date: 23.JUL.2007 04:40:09

A. 8.3.11 Channel 661: 30MHz – 4GHz
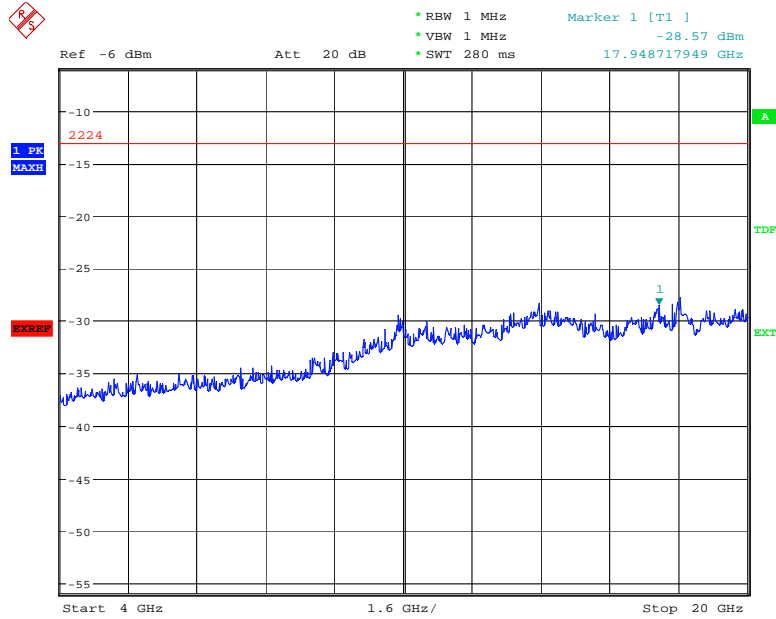
Spurious emission limit –13dBm

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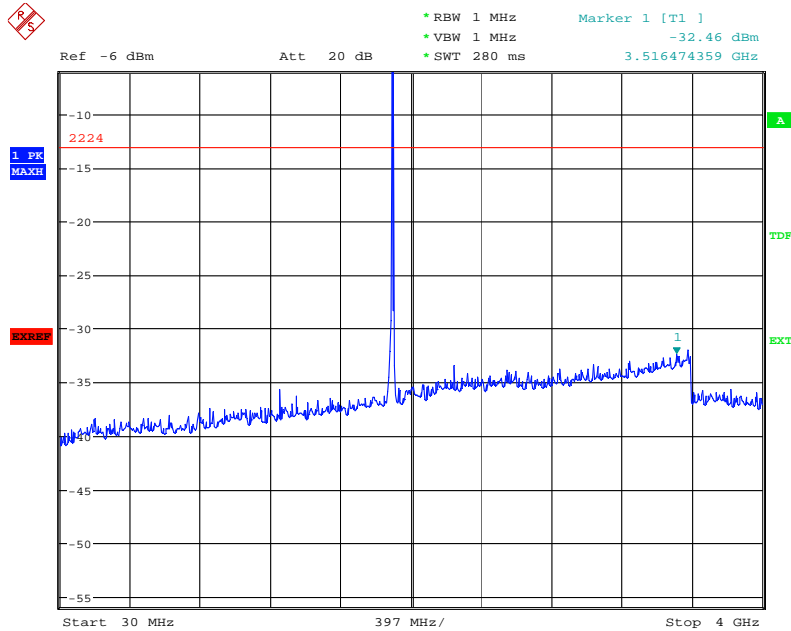

Date: 23.JUL.2007 04:41:21

A. 8.3.12 Channel 661: 4GHz –20GHz

Spurious emission limit –13dBm

Date: 23.JUL.2007 04:41:49

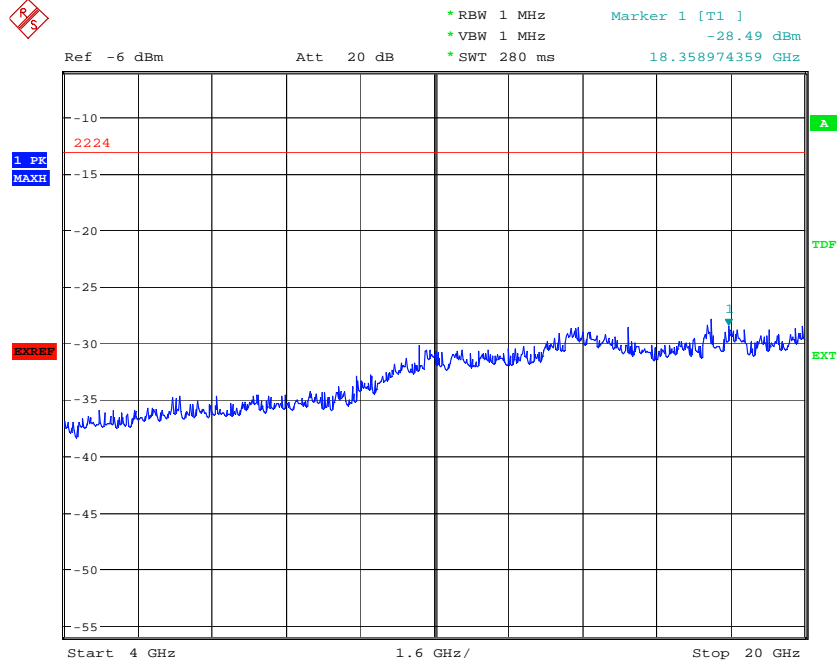### A. 8.3.13 Channel 810: 30MHz – 4GHz

Spurious emission limit –13dBm.

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

Date: 23.JUL.2007 04:42:42

A. 8.3.14 Channel 810: 4GHz – 20GHz

Spurious emission limit –13dBm.

```
                                        * RBW 1 MHz      Marker 1 [T1 ]
                                        * VBW 1 MHz            -28.49 dBm
   Ref  -6 dBm           Att  20 dB     * SWT 280 ms      18.358974359 GHz
```



```
   Start 4 GHz              1.6 GHz/              Stop 20 GHz
```

Date: 23.JUL.2007 04:43:11

A. 8.3.15 Idle mode: 30MHz – 4GHz

Spurious emission limit –13dBm.

```
                                        * RBW 1 MHz      Marker 1 [T1 ]
                                        * VBW 1 MHz            -32.64 dBm
   Ref  -6 dBm           Att  20 dB     * SWT 280 ms      3.592820513 GHz
```



```
   Start 30 MHz             397 MHz/              Stop 4 GHz
```
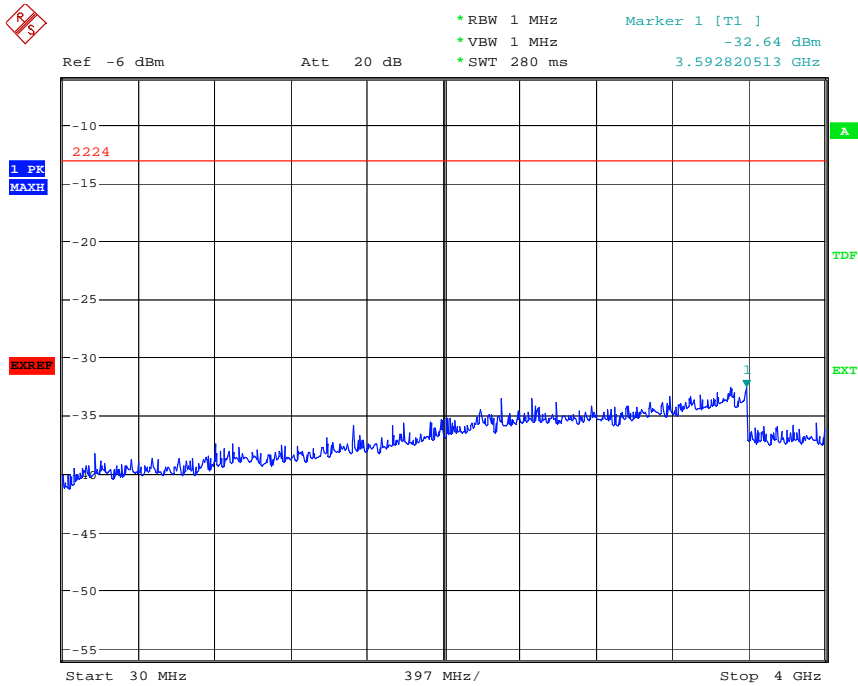
Date: 23.JUL.2007 04:44:30

A. 8.3.16 Idle mode: 4GHz – 20GHz

Spurious emission limit -13dBm.

```
                                          * RBW  1 MHz       Marker 1 [T1 ]
                                          * VBW  1 MHz              -28.94 dBm
            Ref  -6 dBm      Att  20 dB   * SWT 280 ms       17.923076923 GHz

              -10                                                              A
            2224
  1 PK       -15
  MAXH
              -20                                                              TDF

              -25
                                                                          1
  EXREF      -30                                                               EXT

              -35

              -40

              -45

              -50

              -55
            Start  4 GHz              1.6 GHz/              Stop  20 GHz
```
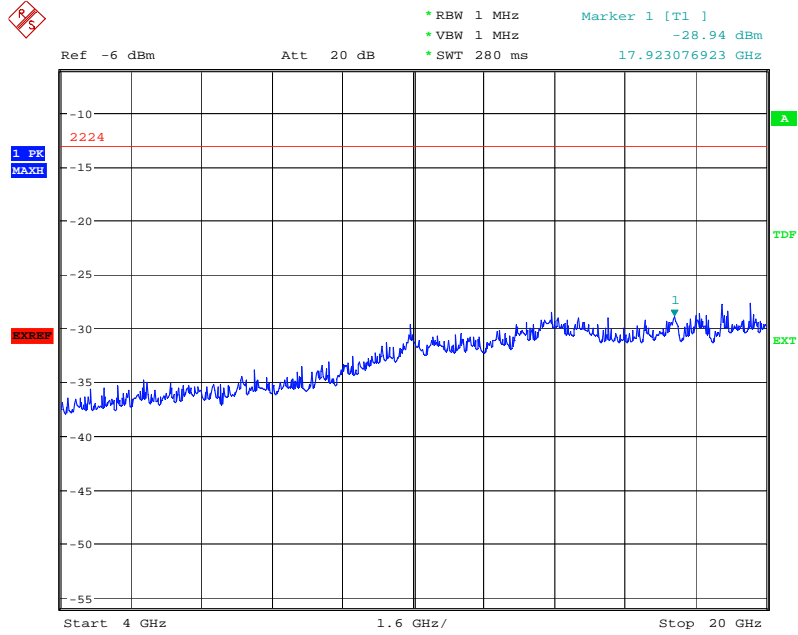
Date: 23.JUL.2007 04:44:56

ANNEX B PHOTOGRAPHS OF EUT

External Photo

Mobile Phone

Mobile Phone

Mobile Phone

Charger (AC/DC Adapter)

Label of Charger (AC/DC Adapter)

USB Cable

Headset

Internal Photo

Mobile phone Disassembly

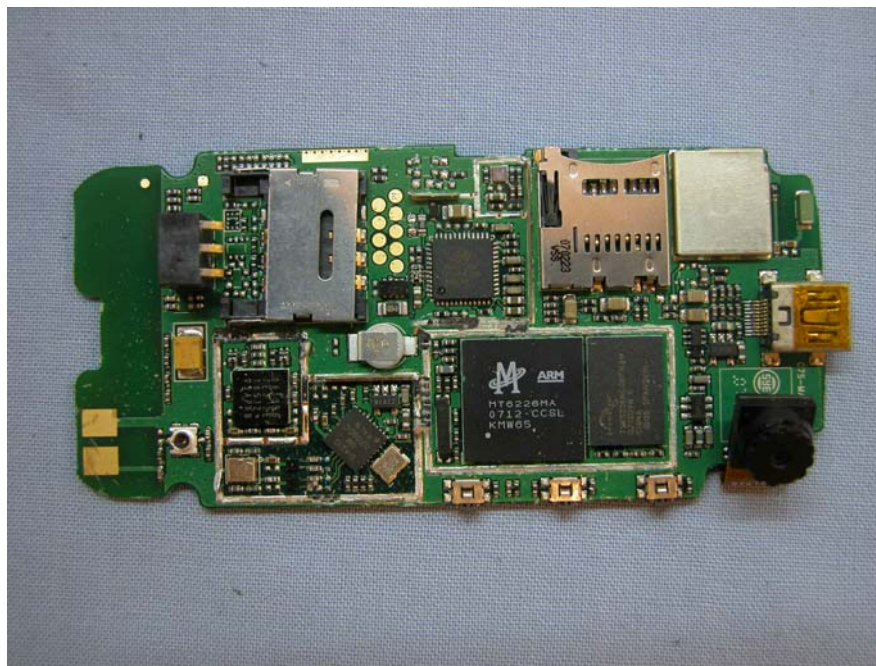

Mobile phone Disassembly

Mobile phone Disassembly

Mobile phone Disassembly
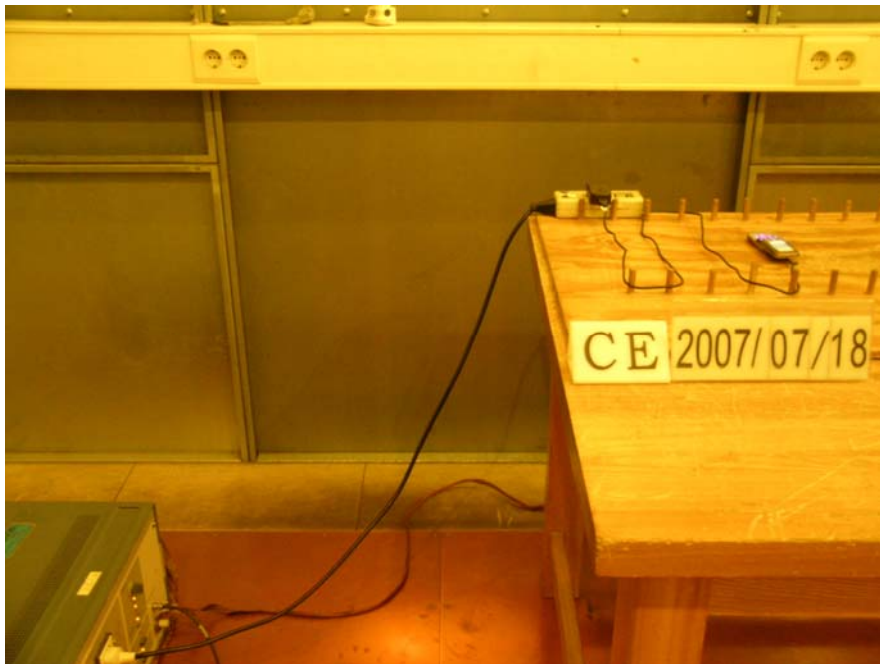
Mobile phone Disassembly

Mobile phone Disassembly

Mobile phone Disassembly

ANNEX C TEST LAYOUT

Pic1 Conducted Emission

Pic2 Radiated Spurious Emission
END OF REPORT BODY