



# TEST REPORT

No. 2008TAR014

for

**Cal-Comp Electronics(Suzhou) CO.,LTD.**

**CDMA MOBILE PHONE**

**Type:AV110**

with

**Hardware Version: P3.1**

**Software Version: IT892.0.0.1.US.AV**

**Issued Date: Jun 18th, 2008**



**No. DAT-P-114/01-01**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

**Test Laboratory:**

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## **1. Test Laboratory**

### **1.1. Testing Location**

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

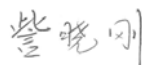
### **1.2. Testing Environment**

Normal Temperature: 15-35℃  
Relative Humidity: 20-75%

### **1.3. Project data**


Testing Start Date: May 4th, 2008  
Testing End Date: Jun 8th, 2008

### **1.4. Signature**



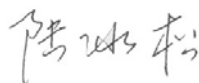
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**Zi Xiaogang**  
**(Prepared this test report)**



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**Sun Xiangqian**  
**(Reviewed this test report)**



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**Lu Bingsong**  
**Deputy Director of the laboratory**  
**(Approved this test report)**

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: Cal-Comp Electronics(Suzhou) CO.,LTD.  
Address /Post: No.2288,Jiangxing East Rd, Wu-jiang Economic Development Zone,  
Jiang-Su, China.  
City: Su zhou  
Postal Code: 215200  
Country: China  
Telephone: +86-21-64850963, Ext. 15701  
Fax: +86-21-64953995

### **2.2. Manufacturer Information**

Company Name: Cal-Comp Electronics(Suzhou) CO.,LTD.  
Address /Post: No.2288,Jiangxing East Rd, Wu-jiang Economic Development Zone,  
Jiang-Su, China.  
City: Su zhou  
Postal Code: 215200  
Country: China  
Telephone: +86-21-64850963, Ext. 15701  
Fax: +86-21-64953995

### 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1. About EUT

Description	CDMA MOBILE PHONE
Model	AV110
FCC ID	VR2AV110
Frequency	1851.25MHz-1908.75MHz for PCS CDMA; 824.70MHz - 848.31MHz for CDMA
Antenna	Internal
Power supply	Battery or Charger (AC Adaptor)
Output power	19.99dBm maximum EIRP measured for PCS 1900 (CDMA) 21.65dBm maximum ERP measured for CDMA
Extreme vol. Limits	3.6VDC to 4.2VDC (nominal: 3.7 VDC)
Extreme temp. Tolerance	-30°C to +50°C

Note: Photographs of EUT are shown in ANNEX A of this test report. Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MII of People's Republic of China.

#### 3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	LQ0184B00024	P3.1	IT892.0.0.1.US.AV

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

#### 3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	Battery	0815B02019000024
AE2	Travel Adapter	GBVGJ88B007

##### AE1

Model	AV110
Manufacturer	SUZHOU C-TECH CO., LTD
Capacitance	800mAh
Nominal Voltage	3.7V

##### AE2

Model	TL0520550D-08
Manufacturer	Shen Zhen TaiLing Technology Co., Ltd.
Length of DC line	180cm

\*AE ID: is used to identify the test sample in the lab internally.

### 3.4. General Description

The Equipment Under Test (EUT) is a model of CDMA Phone with integrated antenna. It consists of Hand Telephone Set and normal options: lithium battery, charger. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the Client.

### 3.5. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1	--
Set.2	EUT1+ AE1+AE2	--

## 4. Reference Documents

### 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	V 10.1.06
FCC Part 22	PUBLIC MOBILE SERVICES	V 10.1.06

## 5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 °C, Max. = 30 °C
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 80 to 2000 MHz

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

Temperature	Min. = 15 °C, Max. = 35 °C
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 °C, Max. = 30 °C
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 °C, Max. = 30 °C
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 80 to 2000 MHz

## 6. 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

## 7. Test Equipments Utilized

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	FSU26	200030	R&S
9.	Universal Radio Communication Tester	CMU200	100680s	R&S
10.	Dual-Ridge Waveguide Horn Antenna	3115	9906-5827	EMCO
11.	Dual-Ridge Waveguide Horn	3116	2663	EMCO

	Antenna			
12.	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO
13.	Climatic chamber	PL-2G	343074	ESPEC



**ANNEX A: EUT photograph**

**External Photo**



**Mobile Phone**



**Mobile Phone**



Charger (AC/DC Adapter)

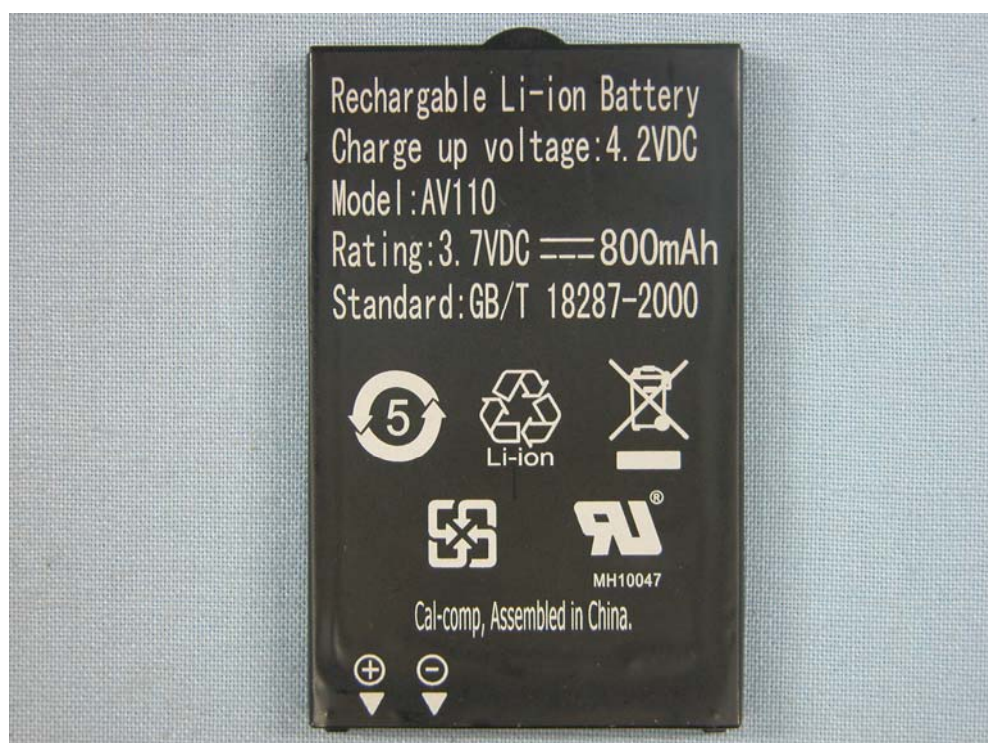


Label of Charger (AC/DC Adapter)





**Battery**



**Battery**

**Internal Photo**



**Mobile phone Disassembly**

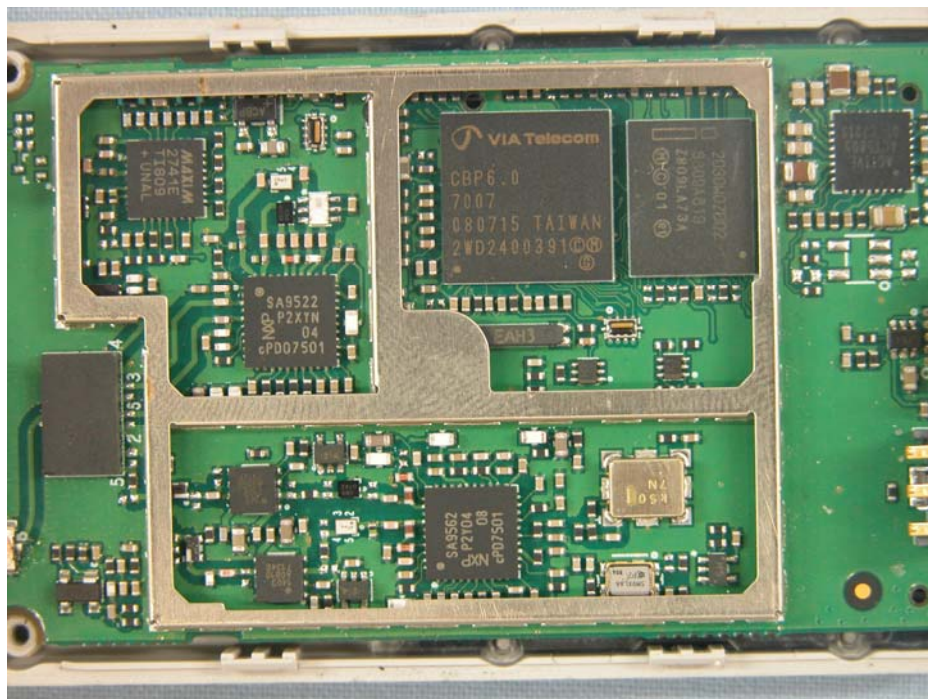


**Mobile phone Disassembly**





Mobile phone Disassembly



Mobile phone Disassembly

## **ANNEX B: MEASUREMENT RESULTS**

### **B.1 OUTPUT POWER** (§22.913(a)/§24.232(b))

#### **B.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.

#### **B.1.2 Conducted**

##### **B.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 Rhode & Schwarz Spectrum Analyzer FSU (peak)

These measurements were done at 3 frequencies, 1851.25 MHz, 1880.0 MHz and 1909.75 MHz for PCS CDMA band, 824.7MHz, 836.52MHz and 848.31MHz for CDMA band (bottom, middle and top of operational frequency range).

#### **CDMA**

##### **Measurement result**

EUT1: Set.1

Channel	Frequency(MHz)	Channel power(dBm)
1013	824.70	23.39
384	836.52	23.03
777	848.31	25.39

#### **PCS CDMA**

##### **Measurement result**

EUT1: Set.1

Channel	Frequency(MHz)	Channel power(dBm)
25	1851.25	22.63
600	1880.00	22.66
1175	1908.75	22.69

#### **B.1.3 Radiated**

##### **B.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."

### B.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,  $ERP = EIRP - 2.15dBi$ .

### CDMA-ERP 22.913(a)

#### Measurement result

EUT1: Set.1

Channel	Frequency(MHz)	Peak ERP(dBm)
1013	824.70	19.97
384	836.52	21.65
777	848.31	21.12

**ANALYZER SETTINGS: RBW = VBW = 3MHz**

### PCS CDMA-EIRP 24.232(b)

#### Measurement result

EUT1: Set.1

Channel	Frequency(MHz)	Peak EIRP(dBm)
25	1851.25	18.71
600	1880.00	19.82
1175	1908.75	19.99

**ANALYZER SETTINGS: RBW = VBW = 3MHz**

## **B.2 EMISSION LIMIT** (§2.1051/§24.238)

### **B.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 .

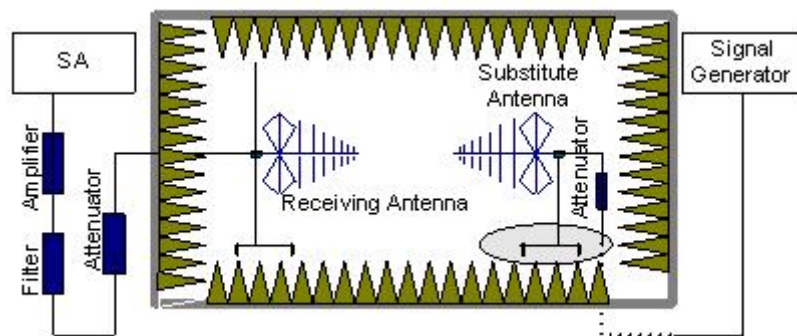
**The procedure of radiated spurious emissions is as follows:**

a) Pre-calibration

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

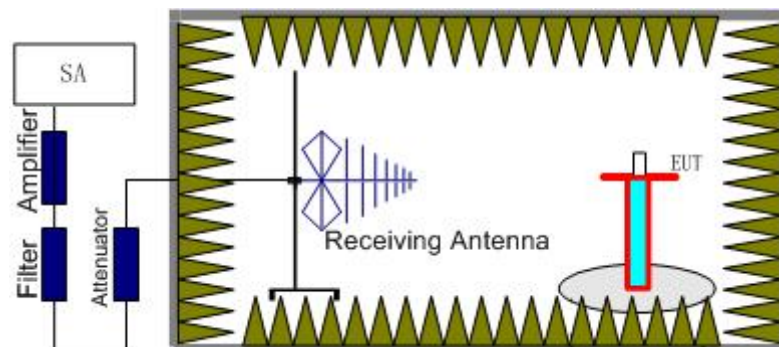
$$RSE = R_x \text{ (dBuV)} + CL \text{ (dB)} + SA \text{ (dB)} + \text{Gain (dBi)} - 107 \text{ (dBuV to dBm)}$$

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.





### B.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  $43 + 10 \log(P)$  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.

### B.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS CDMA band (1851.25 MHz, 1880 MHz and 1908.75 MHz) and CDMA band (824.7MHz, 836.52MHz, 848.31MHz). 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 PCS CDMA and CDMA 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.

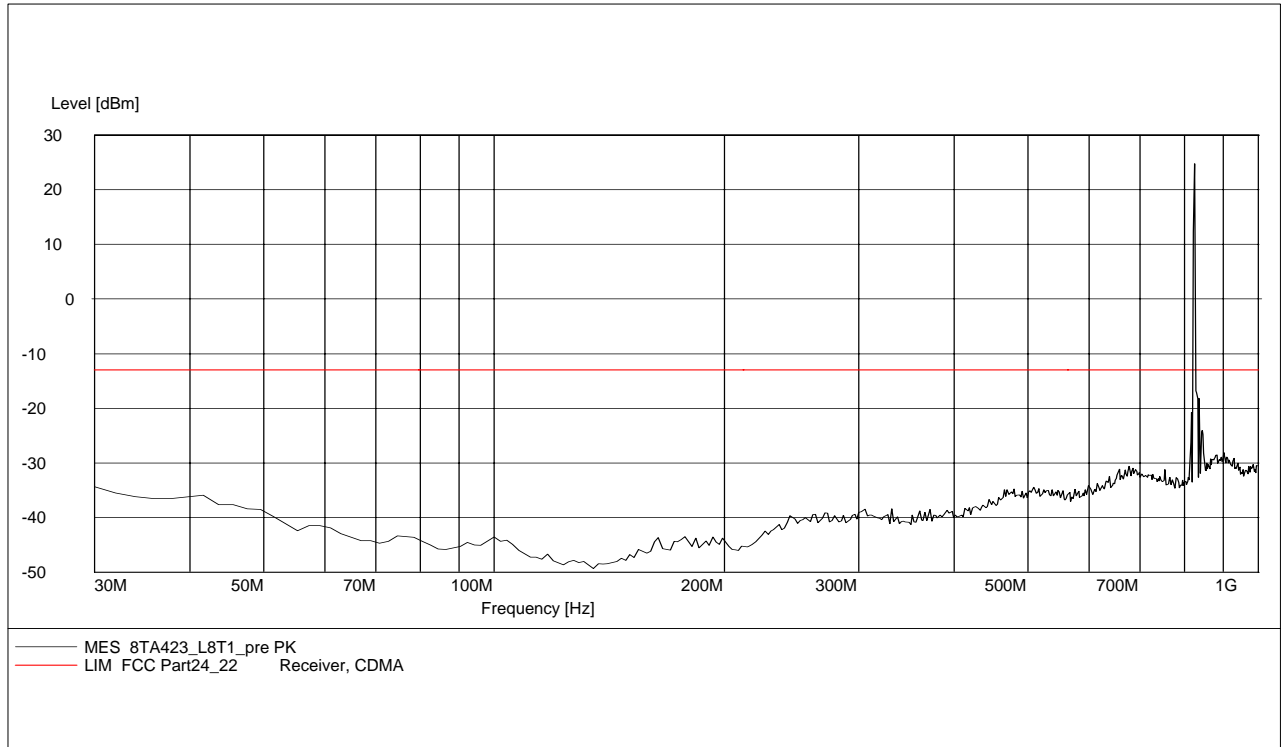
**NOTE: The spurious emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges. This is the reason that the graphs show different noise levels.**

## CDMA

### B.2.3.1 RADIATED SPURIOUS EMISSIONS-Channel 1013: 30MHz –1GHz Set.1

Radiated spurious emission limit :-13dBm.

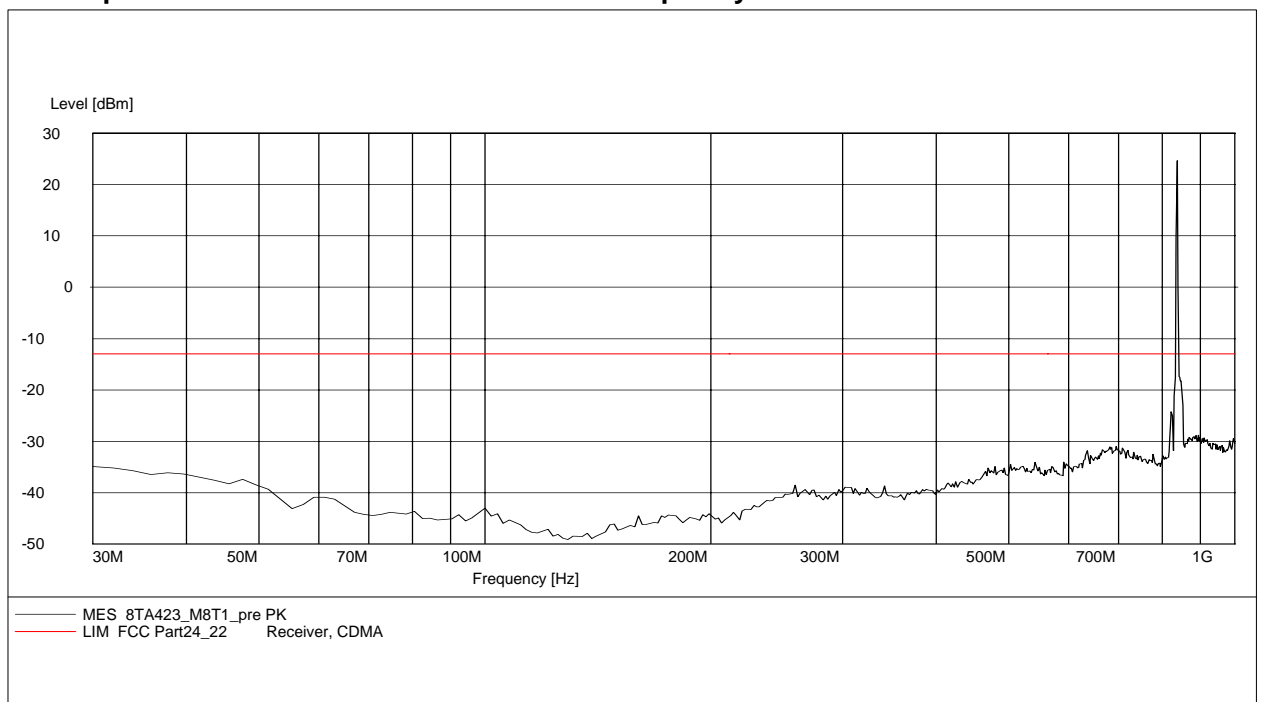
NOTE: peak above the limit line is the Carrier frequency @ ch-1013



### B.2.3.2 RADIATED SPURIOUS EMISSIONS-Channel 384: 30MHz – 1GHz Set.1

Radiated spurious emission limit :-13dBm.

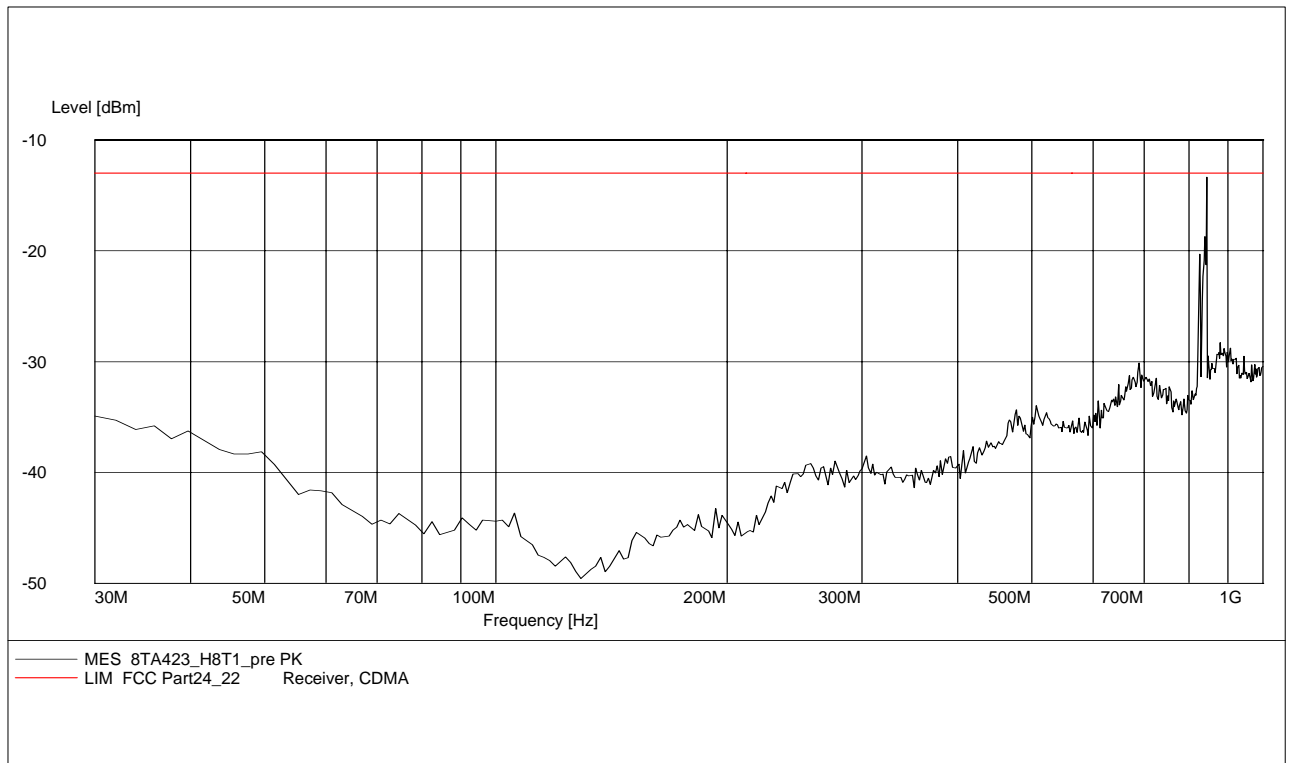
NOTE: peak above the limit line is the Carrier frequency @ ch-384



### B.2.3.3 RADIATED SPURIOUS EMISSIONS-Channel 777: 30MHz – 1GHz Set.1

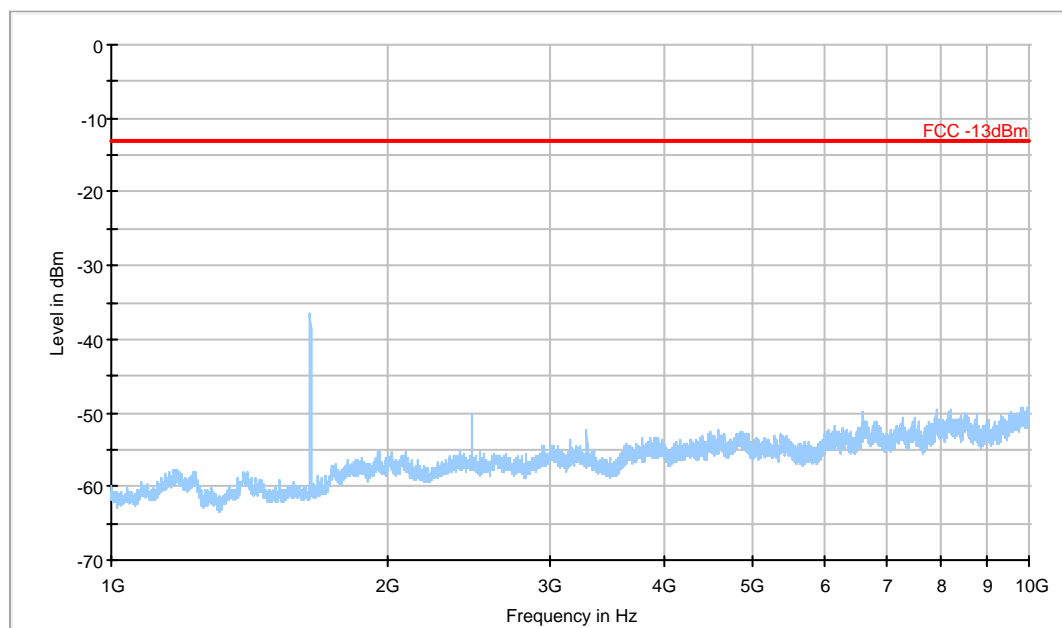
Radiated spurious emission limit :-13dBm.

NOTE: peak above the limit line is the Carrier frequency @ ch-777



### B.2.3.4 RADIATED SPURIOUS EMISSIONS-Channel 1013: 1GHz – 10GHz Set.1

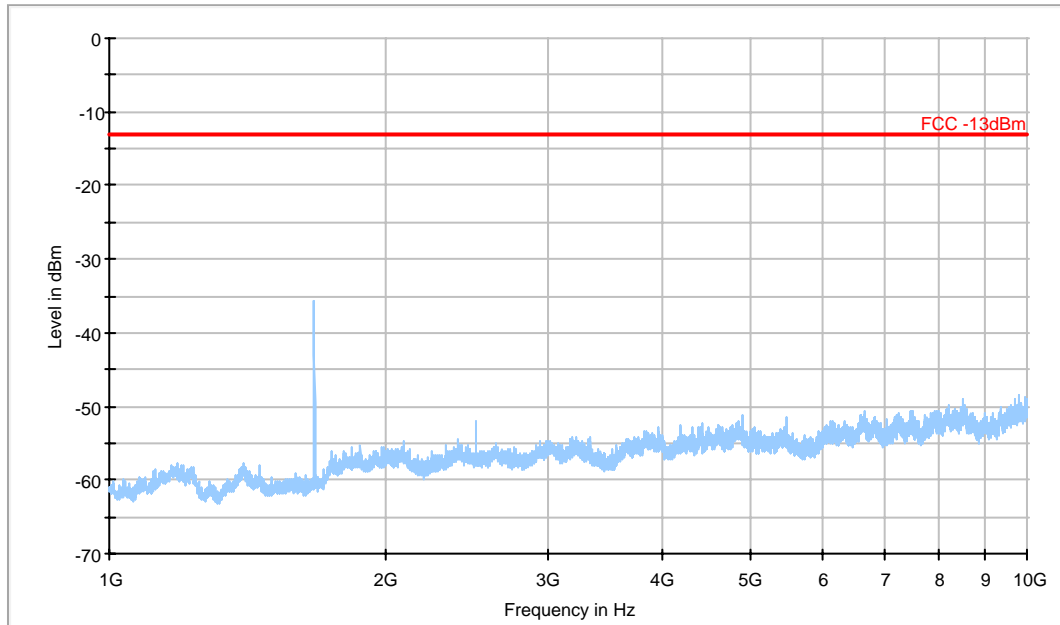
Radiated spurious emission limit :-13dBm.



FCC -13dBm Preview Measurement Detector 1

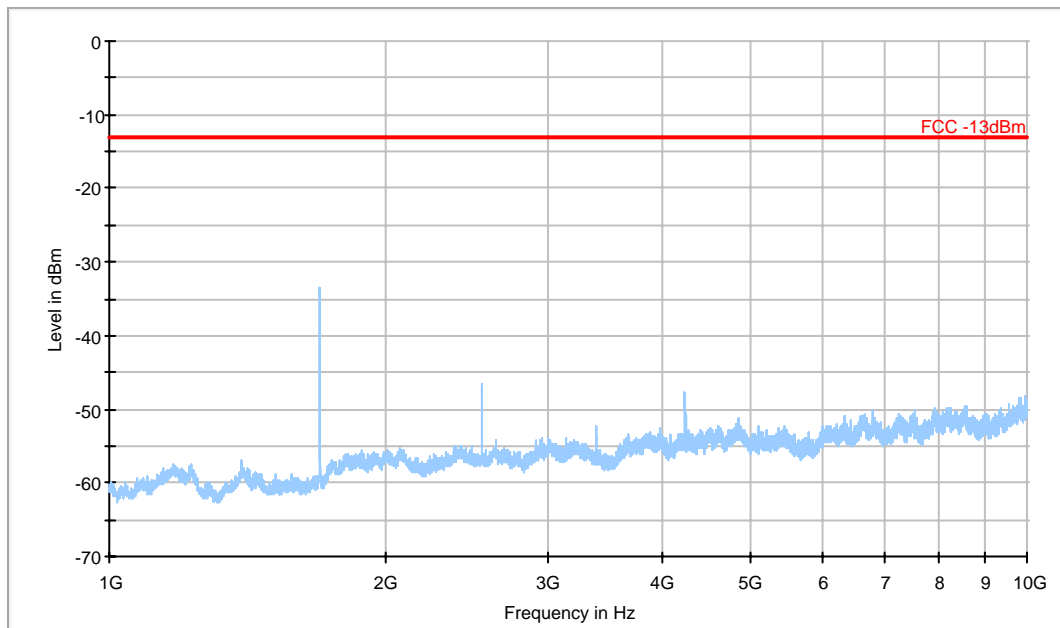
### B.2.3.5 RADIATED SPURIOUS EMISSIONS-Channel 384: 1GHz – 10GHz Set.1

Radiated spurious emission limit :-13dBm.



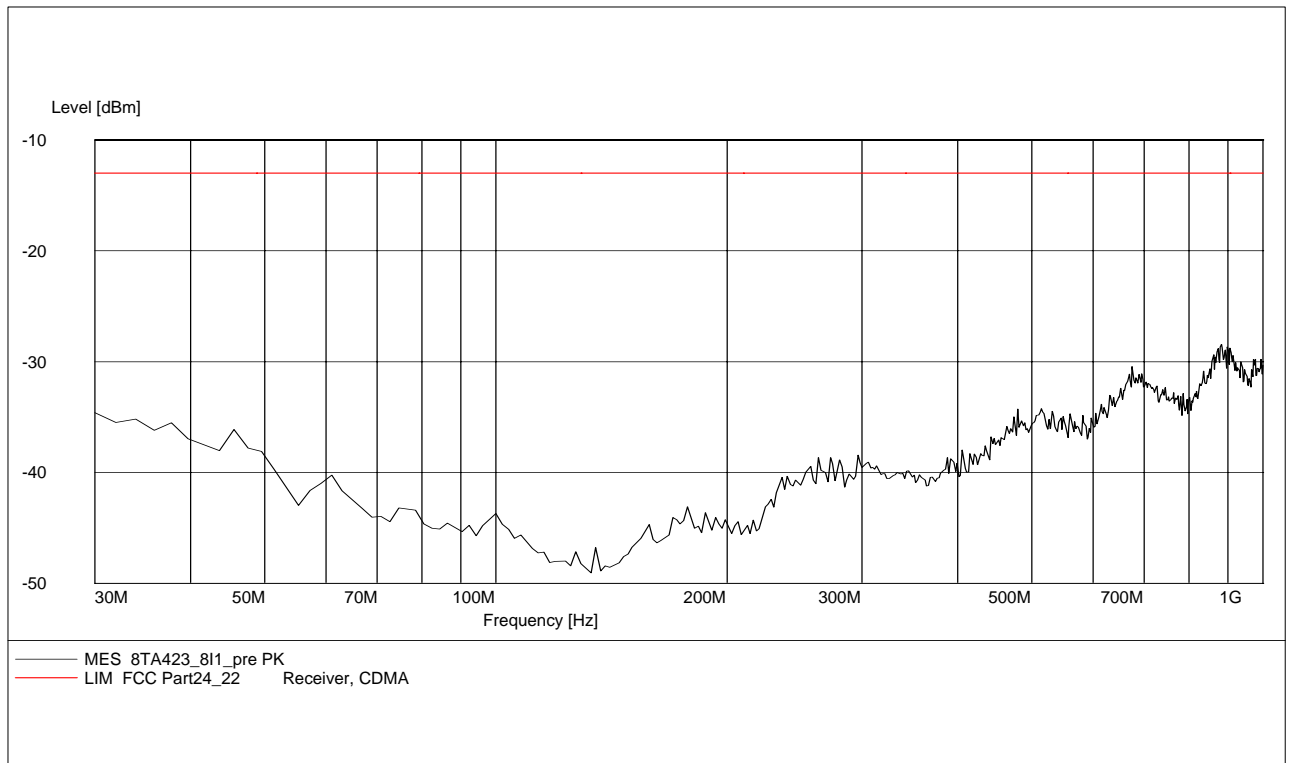
### B.2.3.6 RADIATED SPURIOUS EMISSIONS-Channel 777: 1GHz – 10GHz Set.1

Radiated spurious emission limit :-13dBm.



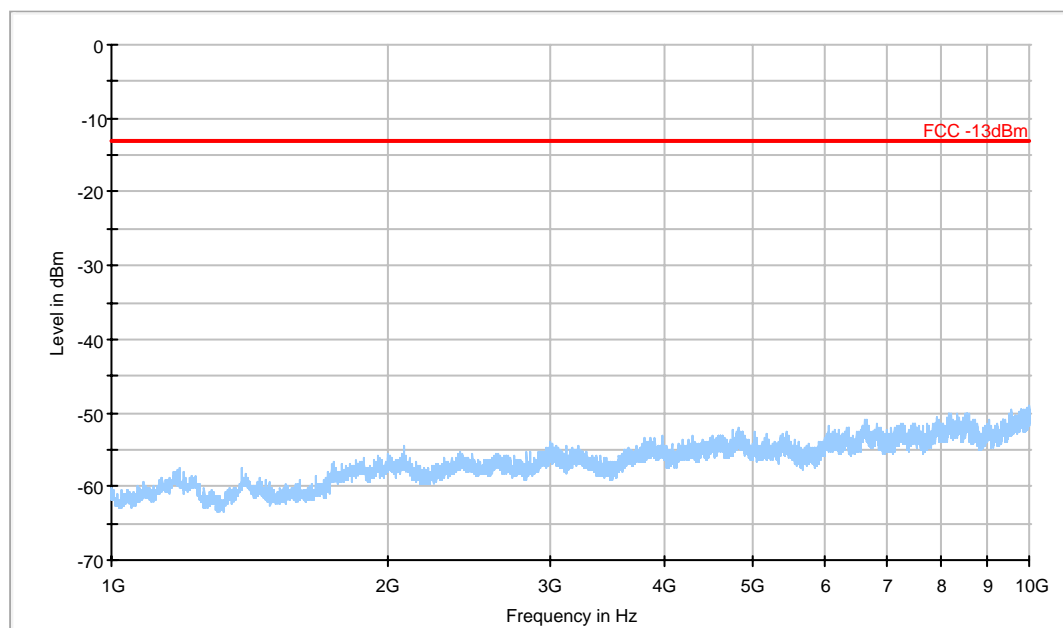
### B.2.3.7 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 1GHz Set.1

Radiated spurious emission limit :-13dBm.



### B.2.3.8 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 1GHz – 10GHz Set.1

Radiated spurious emission limit :-13dBm.

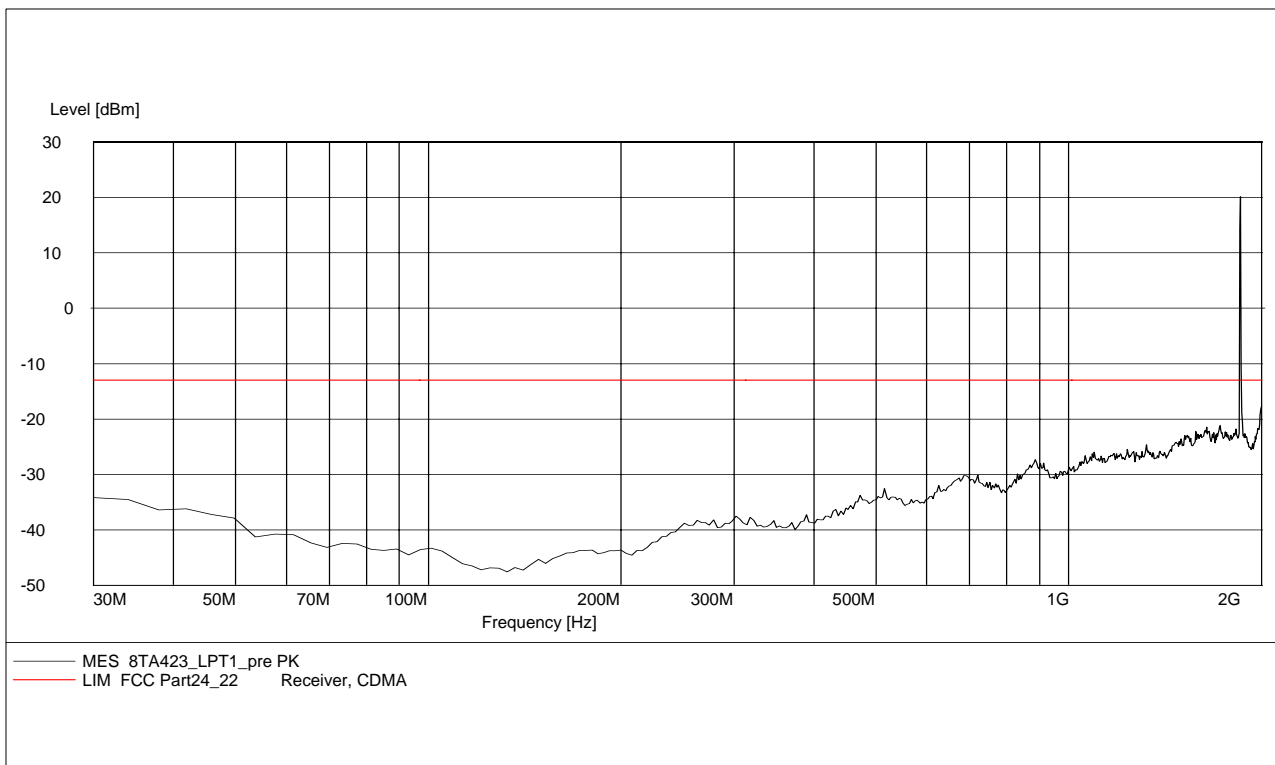


— FCC -13dBm — Preview Measurement Detector 1

## PCS CDMA

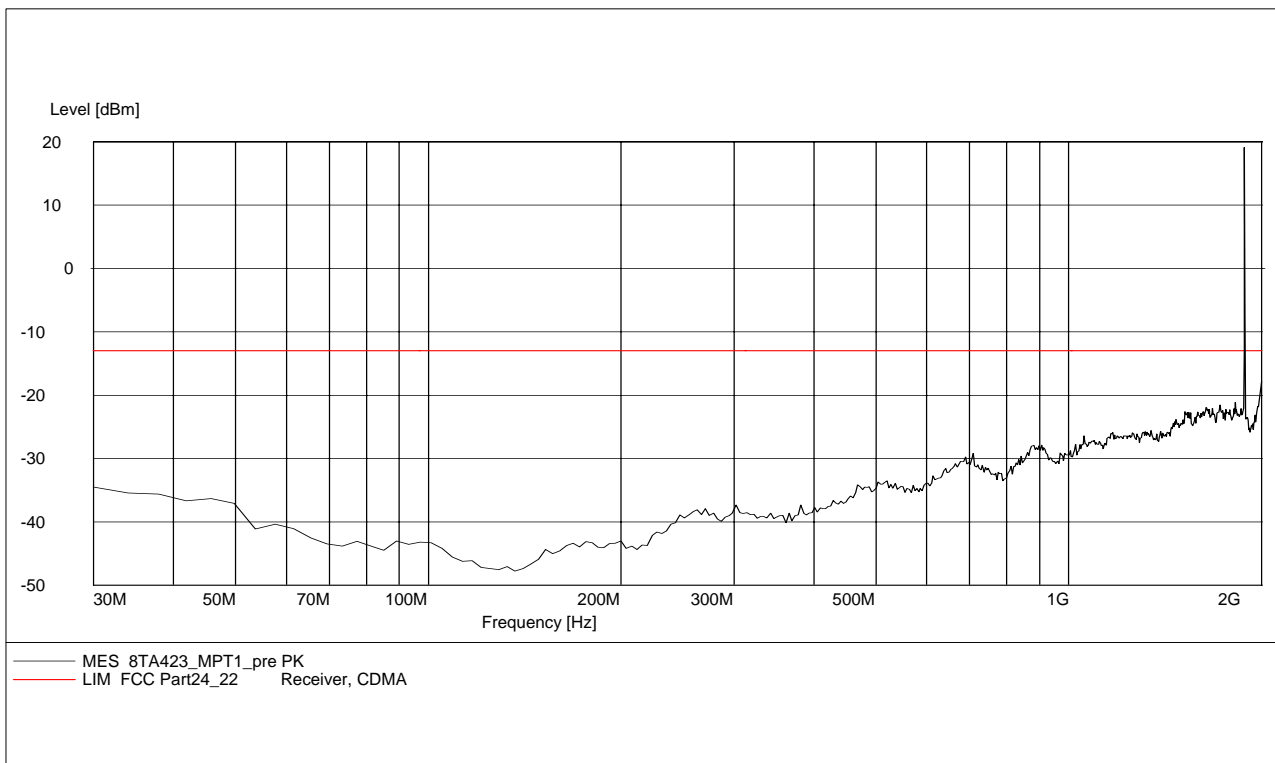
### B.2.3.9 RADIATED SPURIOUS EMISSIONS-Channel 25: 30MHz – 2GHz Set.1

NOTE: peak above the limit line is the Carrier frequency @ ch-25



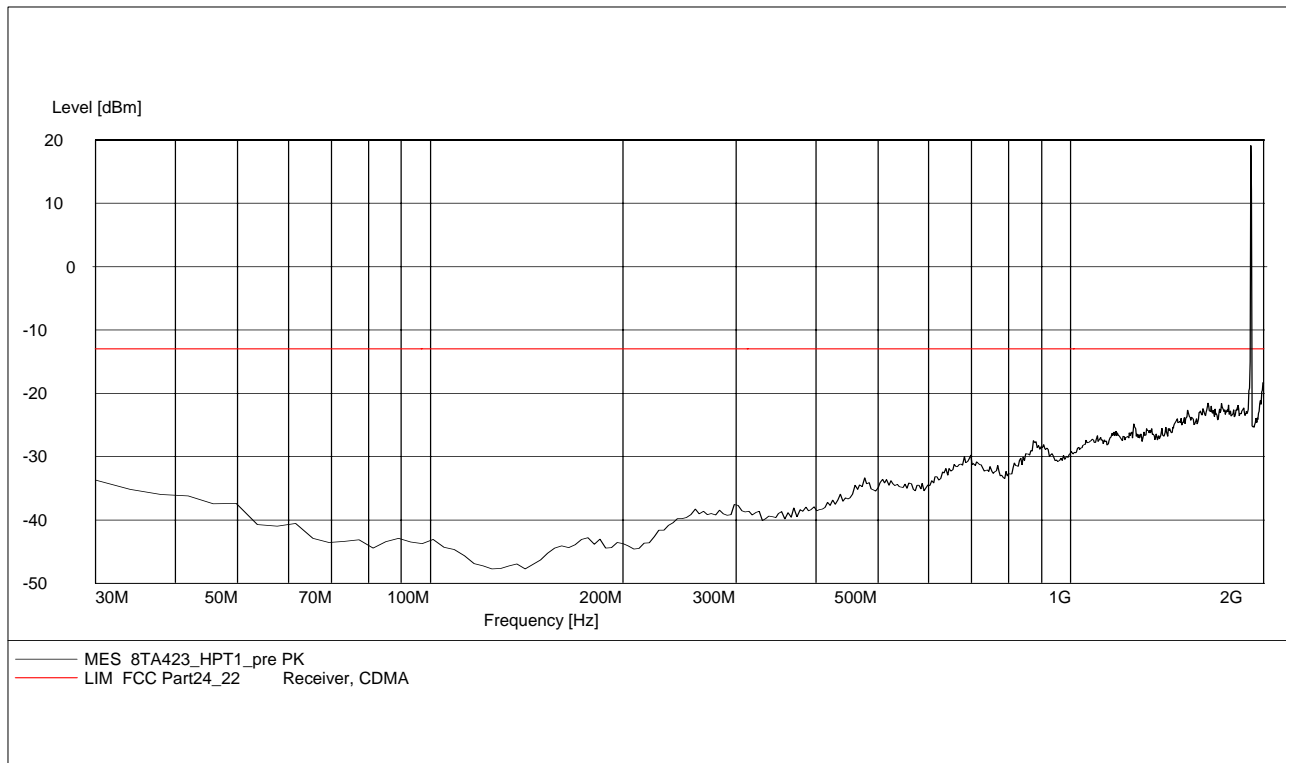
### B.2.3.10 RADIATED SPURIOUS EMISSIONS-Channel 600: 30MHz – 2GHz Set.1

NOTE: peak above the limit line is the Carrier frequency @ ch-600

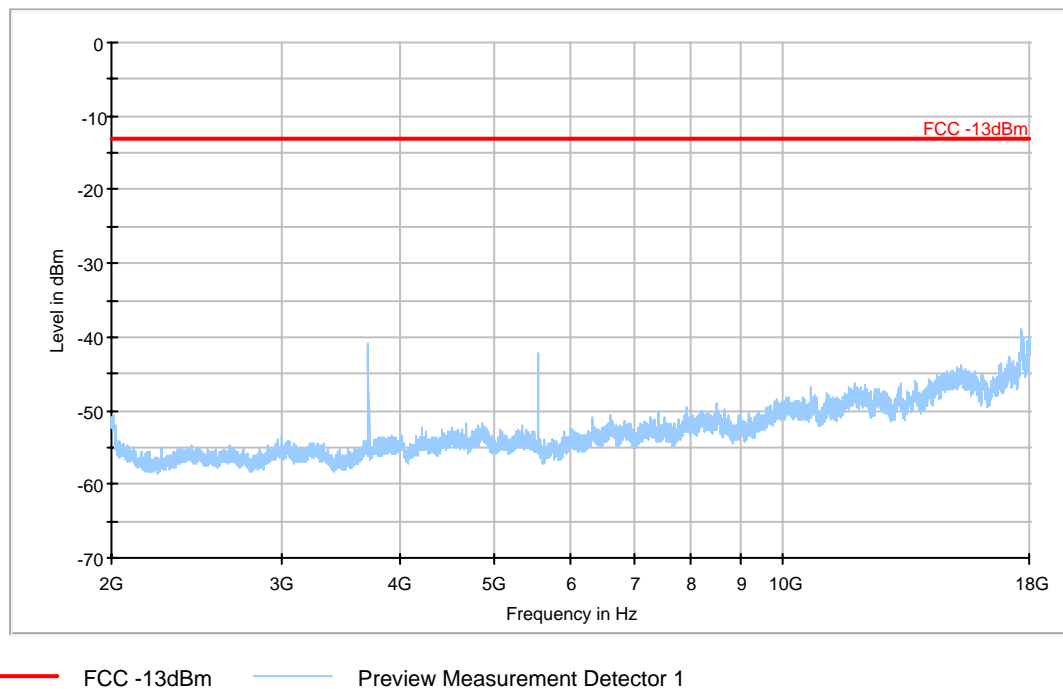


### B.2.3.11 RADIATED SPURIOUS EMISSIONS-Channel 1175: 30MHz – 2GHz Set.1

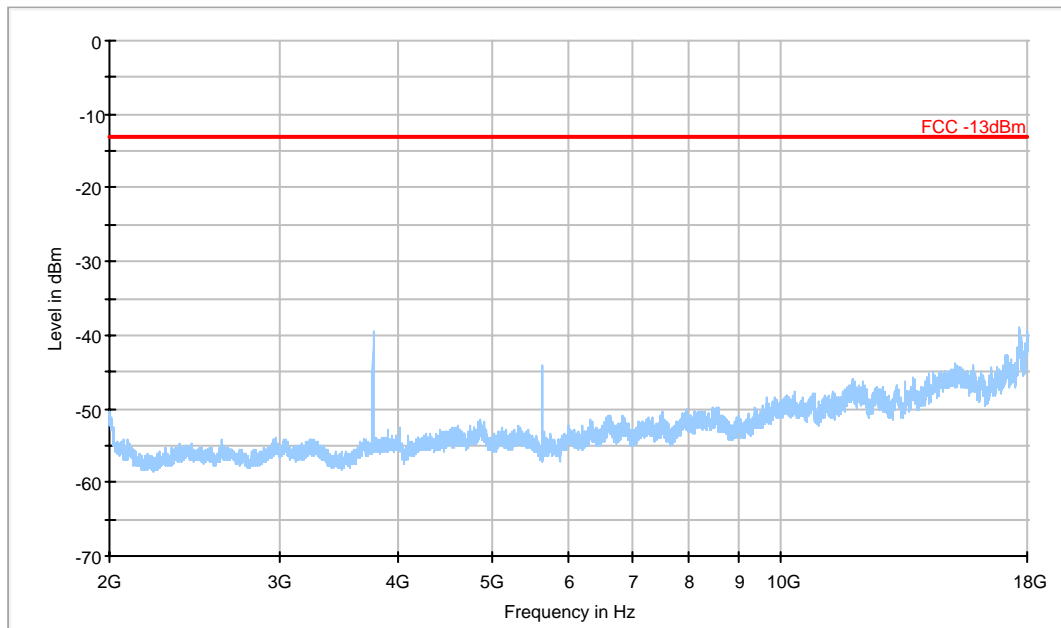
NOTE: peak above the limit line is the Carrier frequency @ ch-1175



### B.2.3.12 RADIATED SPURIOUS EMISSIONS-Channel 25: 2GHz – 18GHz Set.1

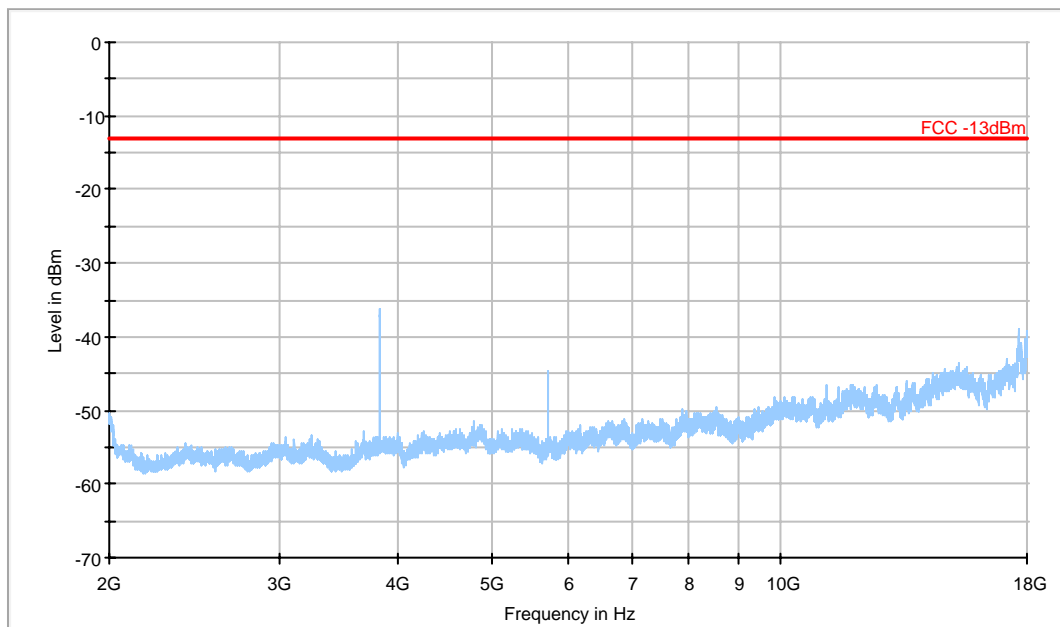


### B.2.3.13 RADIATED SPURIOUS EMISSIONS-Channel 600: 2GHz – 18GHz Set.1



— FCC -13dBm      — Preview Measurement Detector 1

### B.2.3.14 RADIATED SPURIOUS EMISSIONS-Channel 1175: 2GHz – 18GHz Set.1

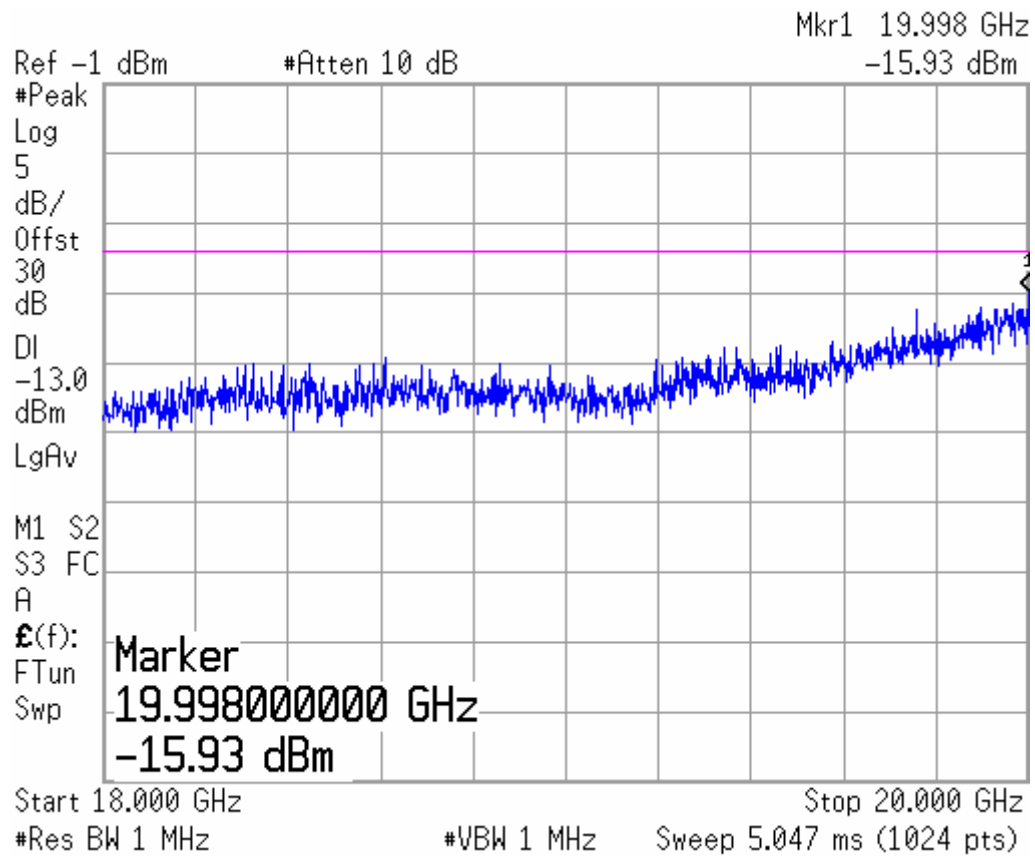


— FCC -13dBm      — Preview Measurement Detector 1

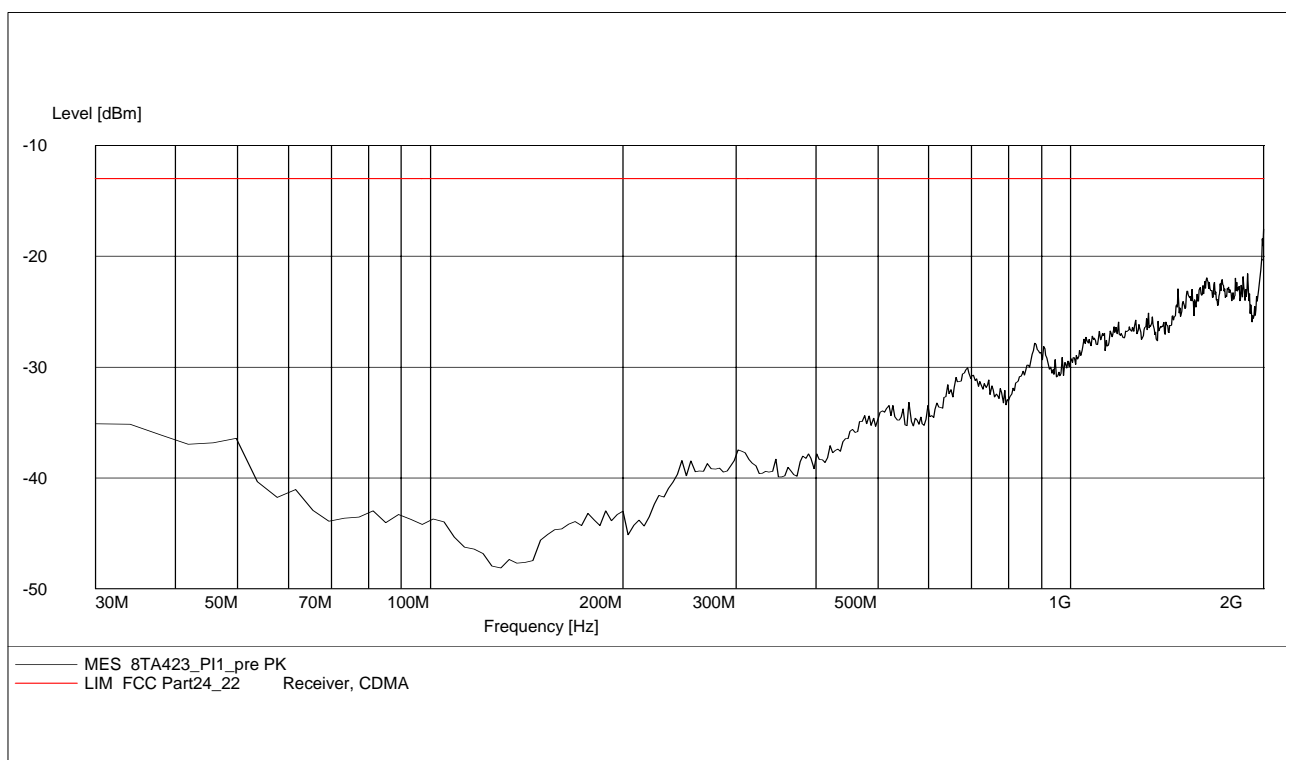


### B.2.3.15 Radiated spurious emission (18GHz-20GHz) Set.1

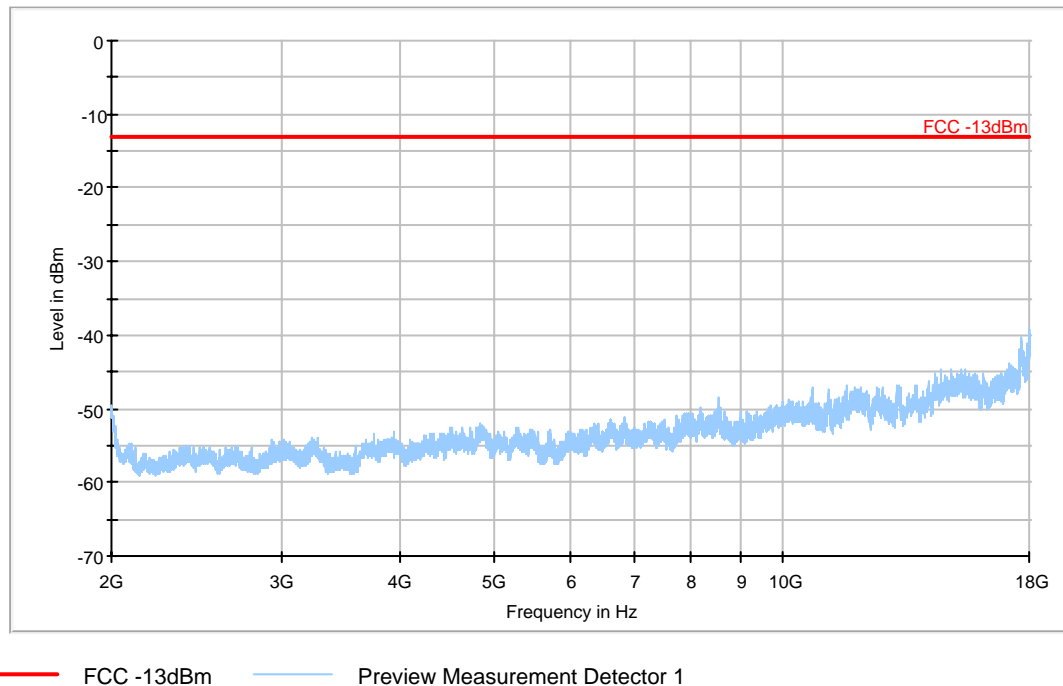
**Note:** This plot is valid for low, mid & high channels. It is same as the floor noise.



### B.2.3.16 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 30MHz – 2GHz Set.1

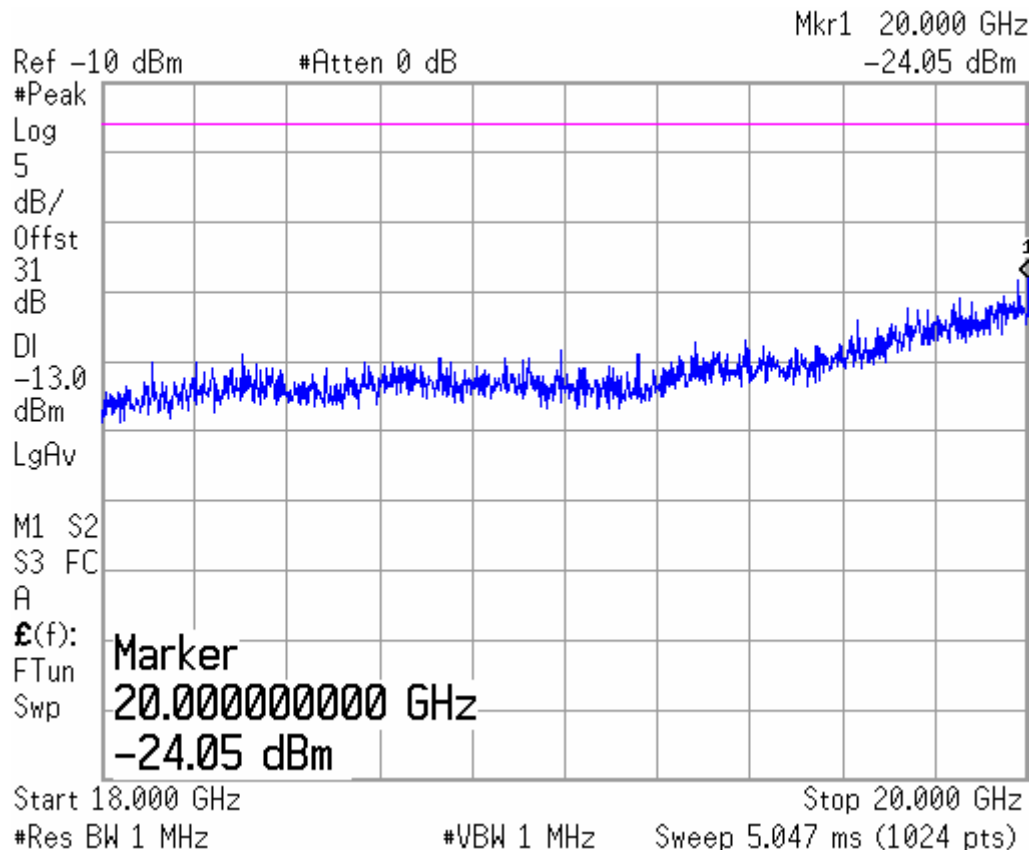


### B.2.3.17 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 2GHz – 18GHz Set.1



### B.2.3.18 RADIATED SPURIOUS EMISSIONS-EUT in Idle Mode: 18GHz – 20GHz Set.1

Note: It is same as the floor noise.



### **B.3 CONDUCTED EMISSION**      **(§15.107§15.207)**

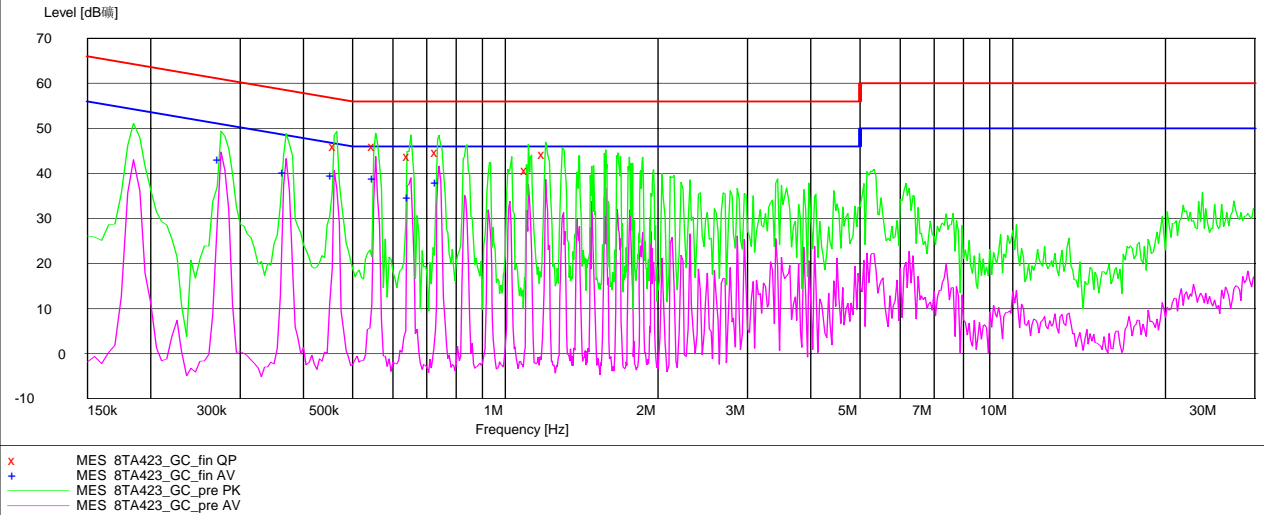
The measurement procedure in ANSI C63.4-1003 is used. Conducted Emission is measured with travel charger.

#### **B.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		

### B.3.2 Measurement result

#### CDMA Set.2



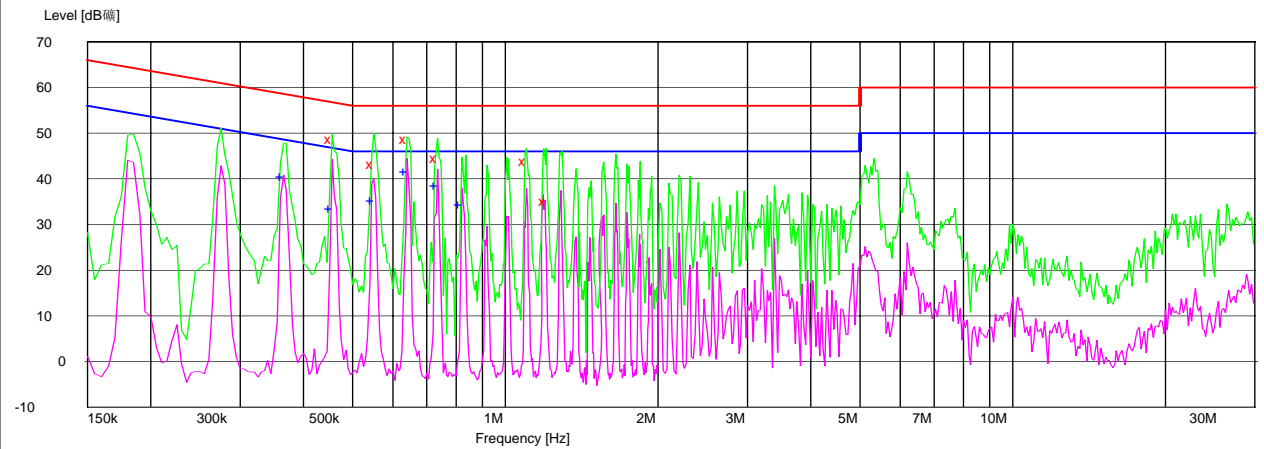
#### MEASUREMENT RESULT: "8TA423\_GC\_fin QP"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.465000	46.00	10.1	57	10.6	N	FLO
0.555000	46.00	10.1	56	10.0	L1	GND
0.650000	43.90	10.1	56	12.1	L1	GND
0.740000	44.70	10.1	56	11.3	L1	FLO
1.110000	40.60	10.1	56	15.4	L1	FLO
1.200000	44.20	10.1	56	11.8	L1	FLO

#### MEASUREMENT RESULT: "8TA423\_GC\_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.275000	43.20	10.1	51	7.8	L1	FLO
0.370000	40.20	10.1	49	8.3	L1	FLO
0.460000	39.60	10.1	47	7.1	L1	FLO
0.555000	38.90	10.1	46	7.1	L1	FLO
0.650000	34.70	10.1	46	11.3	L1	FLO
0.740000	38.00	10.1	46	8.0	L1	GND

## PCS CDMA Set.2



### MEASUREMENT RESULT: "8TA423\_Pc\_fin QP"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.455000	48.70	10.1	57	8.1	L1	FLO
0.550000	43.30	10.1	56	12.7	N	GND
0.640000	48.60	10.1	56	7.4	L1	FLO
0.735000	44.50	10.1	56	11.5	L1	GND
1.100000	43.80	10.1	56	12.2	L1	GND
1.205000	35.00	10.1	56	21.0	N	GND

### MEASUREMENT RESULT: "8TA423\_Pc\_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.365000	40.70	10.1	49	7.9	L1	FLO
0.455000	33.60	10.1	47	13.2	N	GND
0.550000	35.40	10.1	46	10.6	N	GND
0.640000	41.80	10.1	46	4.2	L1	FLO
0.735000	38.60	10.1	46	7.4	L1	GND
0.820000	34.50	10.1	46	11.5	L1	FLO

## **B.4 FREQUENCY STABILITY** (§2.1055/§24.235)

### **B.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°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.

### **B.4.2 Measurement Limit**

#### **B.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.

#### **B.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.

#### B.4.3 Measurement results

##### CDMA Set.1

##### Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	17	0.020
3.7	15	0.018
4.2	16	0.019

##### Frequency Error vs Temperature

temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-30	22	0.026
-20	21	0.025
-10	19	0.023
0	19	0.023
10	17	0.020
20	16	0.019
30	17	0.020
40	19	0.023
50	20	0.024

##### PCS CDMA Set.1

##### Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	27	0.014
3.7	24	0.013
4.2	28	0.015

##### Frequency Error vs Temperature

temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-30	31	0.016
-20	30	0.016
-10	28	0.015
0	27	0.014
10	24	0.013
20	25	0.013
30	27	0.014
40	29	0.015
50	30	0.016

## **B.5 OCCUPIED BANDWIDTH (§2.1049(h)(i))**

### **B.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%BW). Spectrum analyzer plots are included on the following pages.

#### **CDMA(99% BW)**

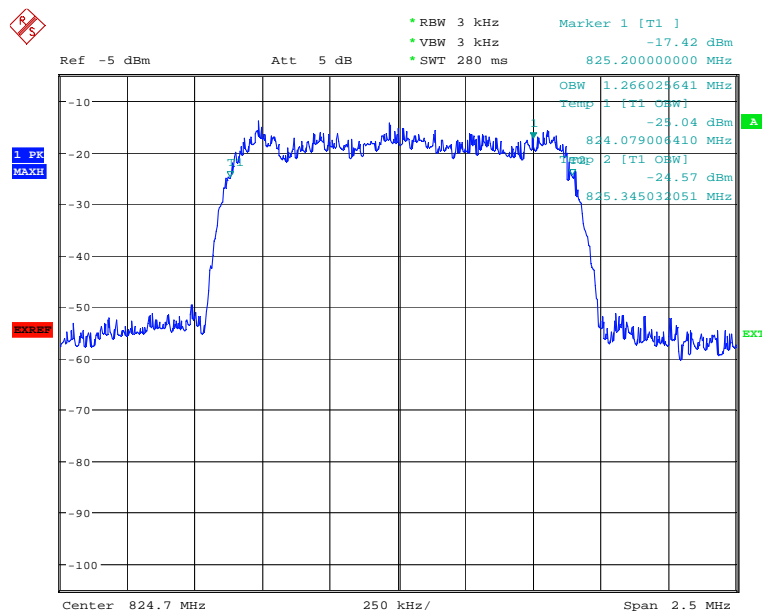
EUT1: Set.1

Channel	Occupied Bandwidth (-20dBc BW)( MHz)
1013	1.266
384	1.270
777	1.262

**ANALYZER SETTINGS: RBW=VBW=3kHz**

#### **CDMA**

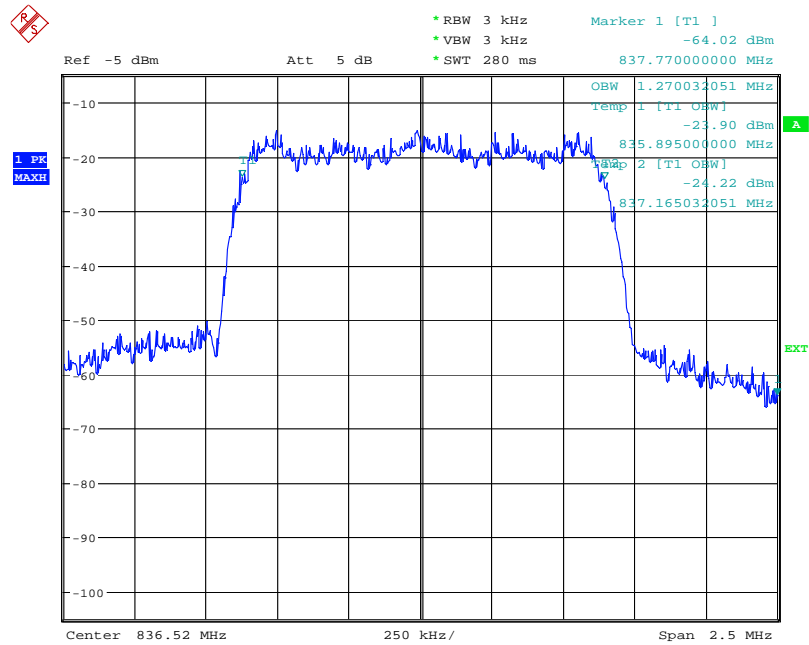
#### **Channel 1013-Occupied Bandwidth (99% BW)**



Date: 18.JUN.2008 04:02:26

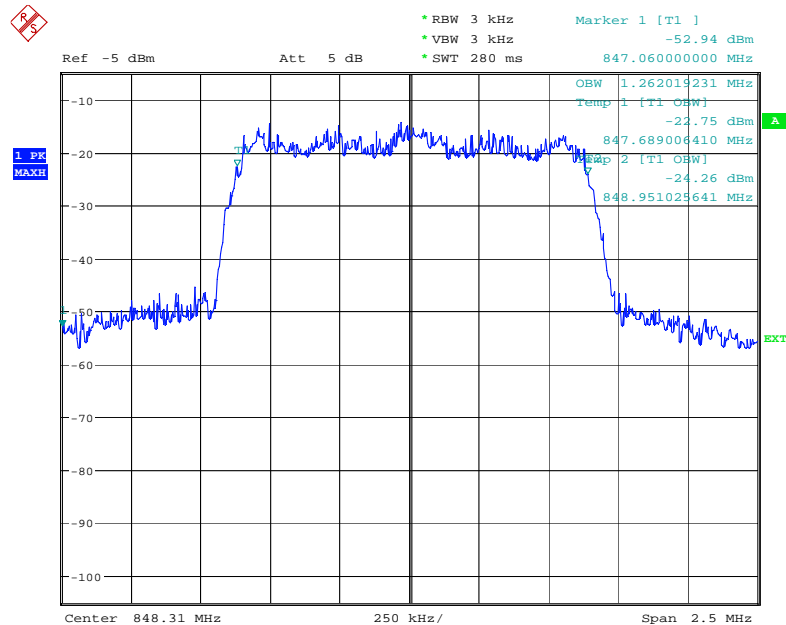


### Channel 384-Occupied Bandwidth (99% BW)



Date: 18.JUN.2008 04:05:01

### Channel 777-Occupied Bandwidth (99% BW)



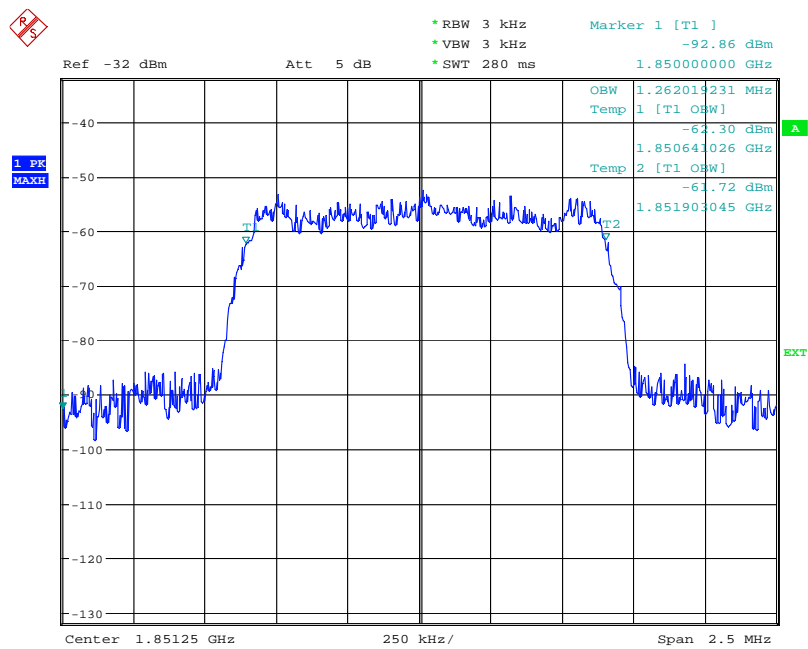
Date: 18.JUN.2008 04:05:56

**PCS CDMA(99% BW)**  
EUT1: Set.1

Channel	Occupied Bandwidth (-20dBc BW)( MHz)
25	1.262
600	1.270
1175	1.270

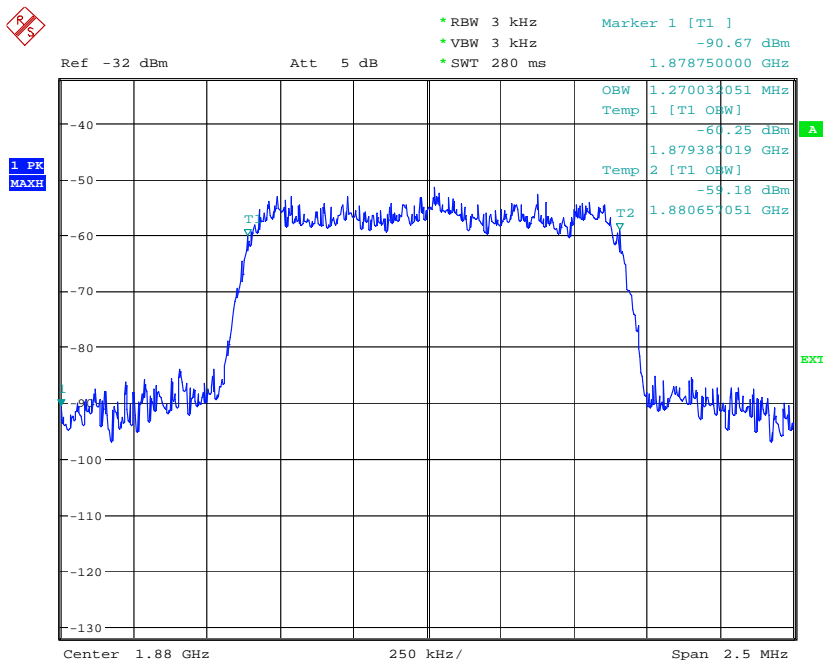
**ANALYZER SETTINGS: RBW=VBW=3kHz**

**PCS CDMA**  
**Channel 25-Occupied Bandwidth (99% BW)**



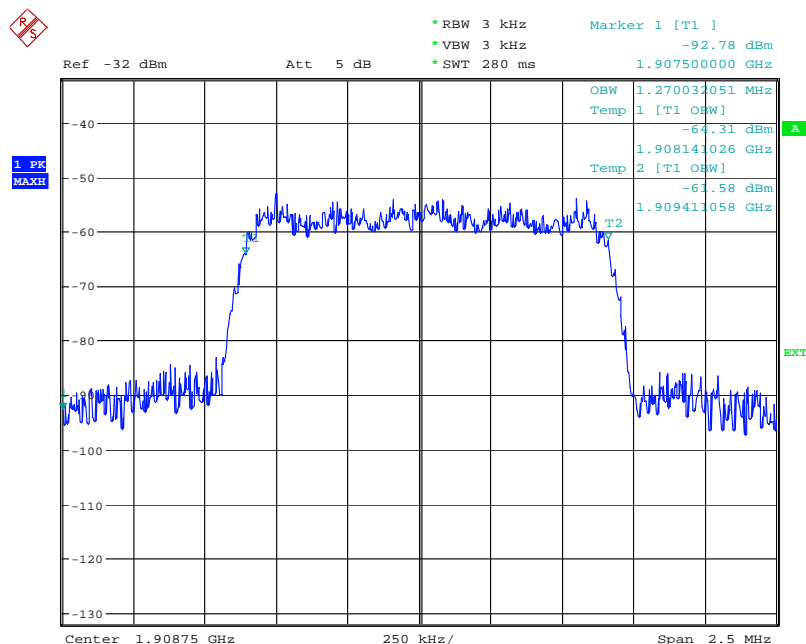
Date: 18.JUN.2008 04:07:42

### Channel 600-Occupied Bandwidth (99% BW)



Date: 18.JUN.2008 04:08:48

### Channel 1175-Occupied Bandwidth (99% BW)



Date: 18.JUN.2008 04:09:56

## **B.6 EMISSION BANDWIDTH** (§22.917(b)/§24.238(b))

### **B.6.1 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 PCS CDMA band and CDMA band. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

#### **CDMA(-26dBc)**

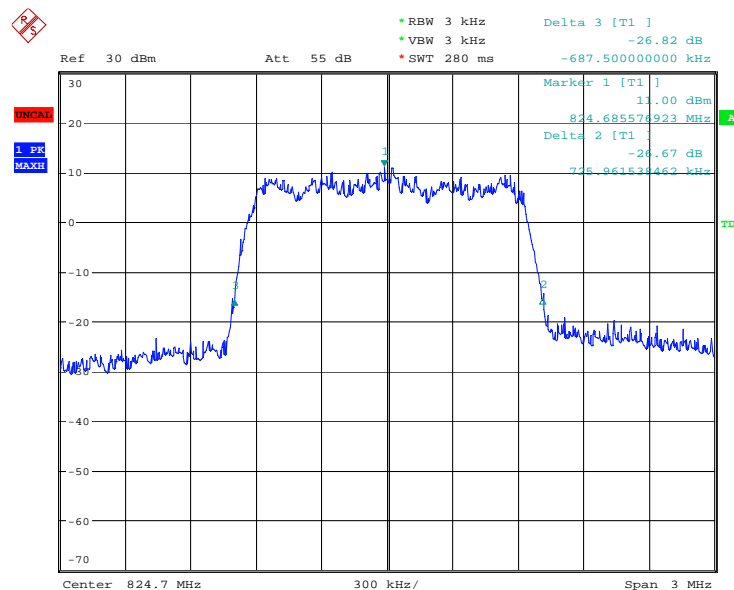
EUT1: Set.1

Channel	Occupied Bandwidth (-26dBc BW)( MHz)
1013	1.423
384	1.408
777	1.394

**ANALYZER SETTINGS: RBW=VBW=3kHz**

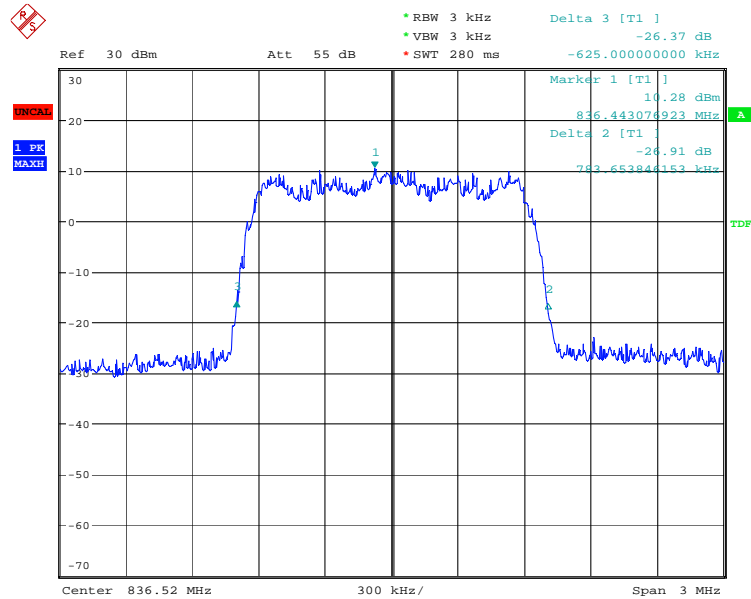
#### **CDMA**

#### **Channel 1013-Occupied Bandwidth (-26dBc BW)**



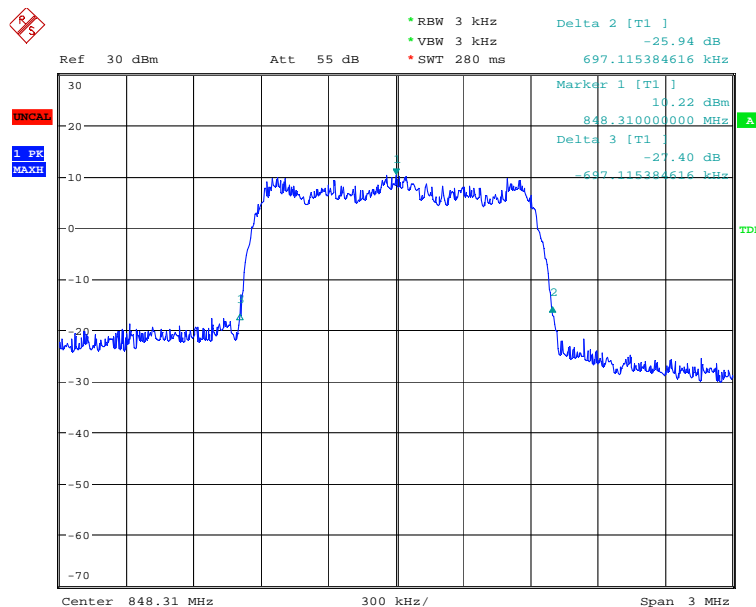
Date: 8.MAY.2008 02:38:05

### Channel 384-Occupied Bandwidth (-26dBc BW)



Date: 8.MAY.2008 02:40:23

### Channel 777-Occupied Bandwidth (-26dBc BW)



Date: 8.MAY.2008 02:42:50

## PCS CDMA(-26dBc)

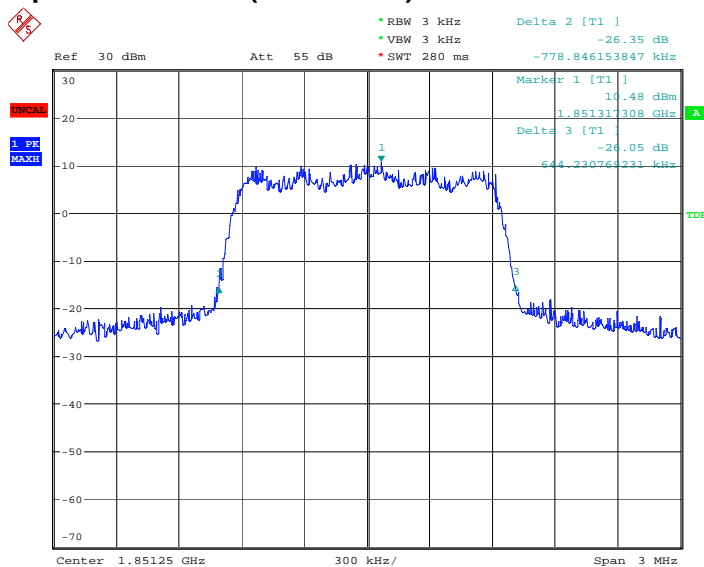
EUT1: Set.1

Channel	Occupied Bandwidth (-26dBc BW)( MHz)
25	1.423
600	1.450
1175	1.423

**ANALYZER SETTINGS: RBW=VBW=3kHz;**

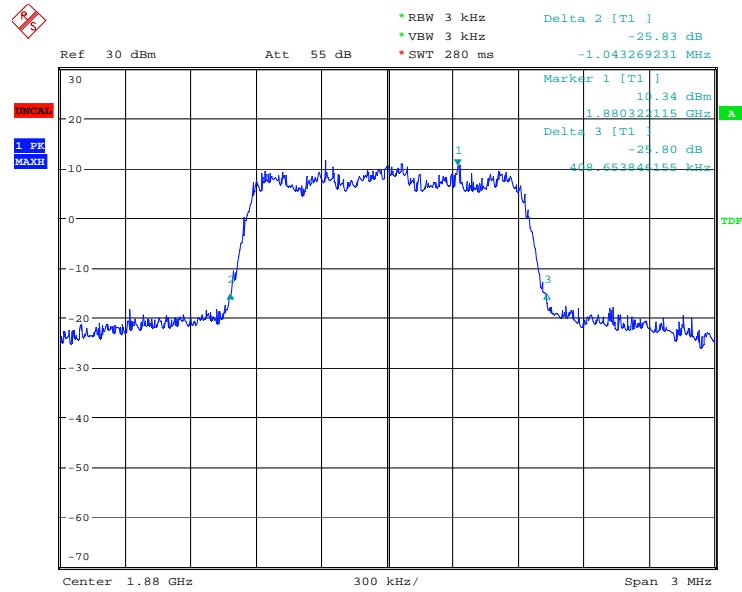
## PCS CDMA

### Channel 25-Occupied Bandwidth (-26dBc BW)



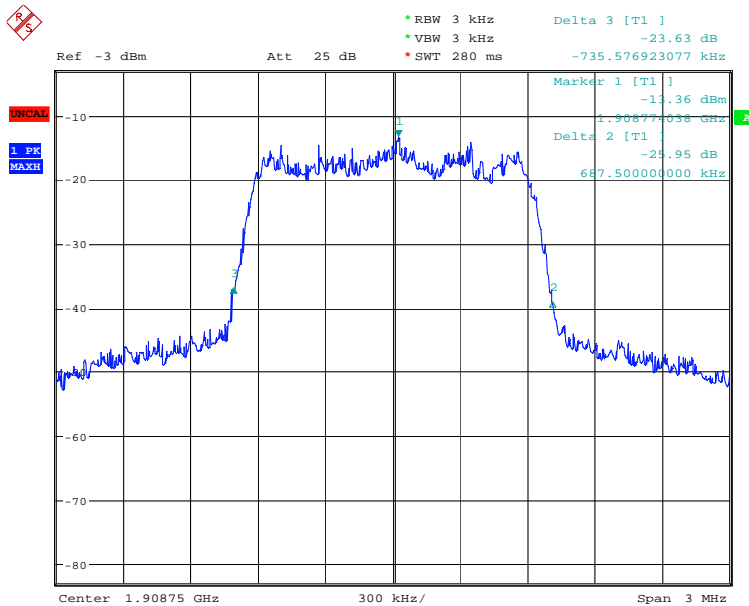
Date: 8.MAY.2008 02:46:14

### Channel 600-Occupied Bandwidth (-26dBc BW)



Date: 8.MAY.2008 02:53:30

### Channel 1175-Occupied Bandwidth (-26dBc BW)

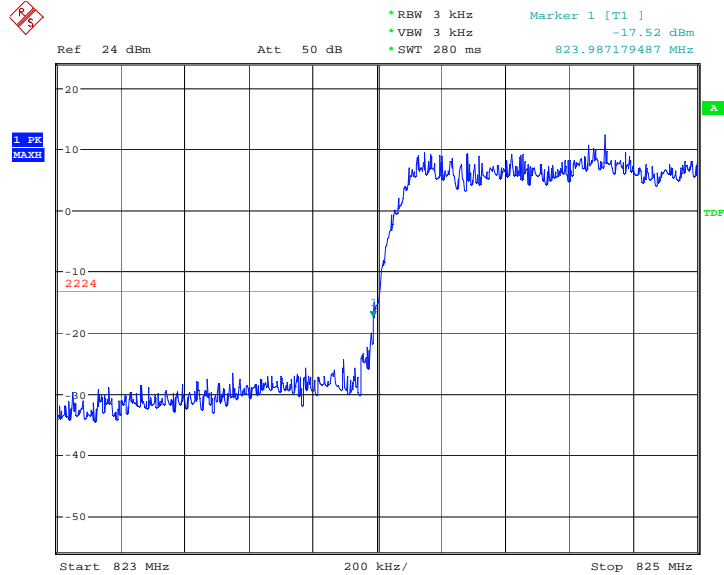


Date: 8.MAY.2008 02:57:15

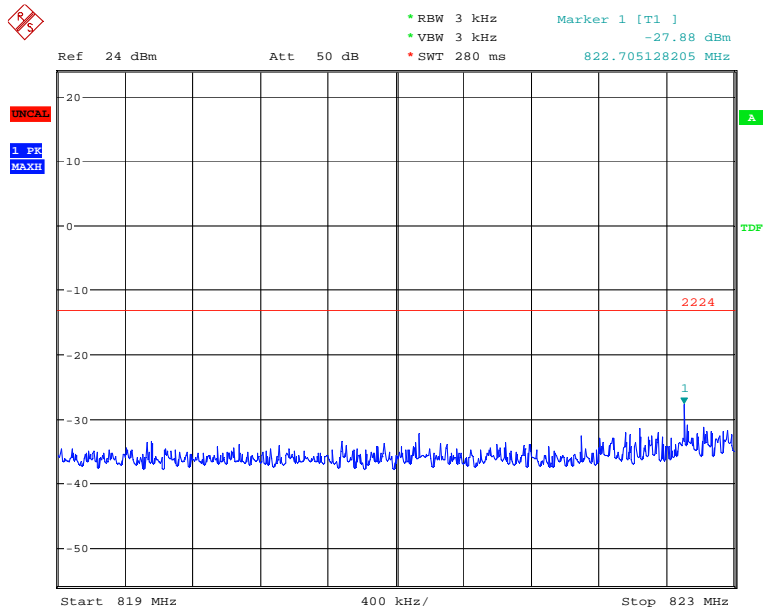
## B.7 BAND EDGE COMPLIANCE (§22.917(b)/§24.238(b))

CDMA

BAND EDGE BLOCK-Channel 1013



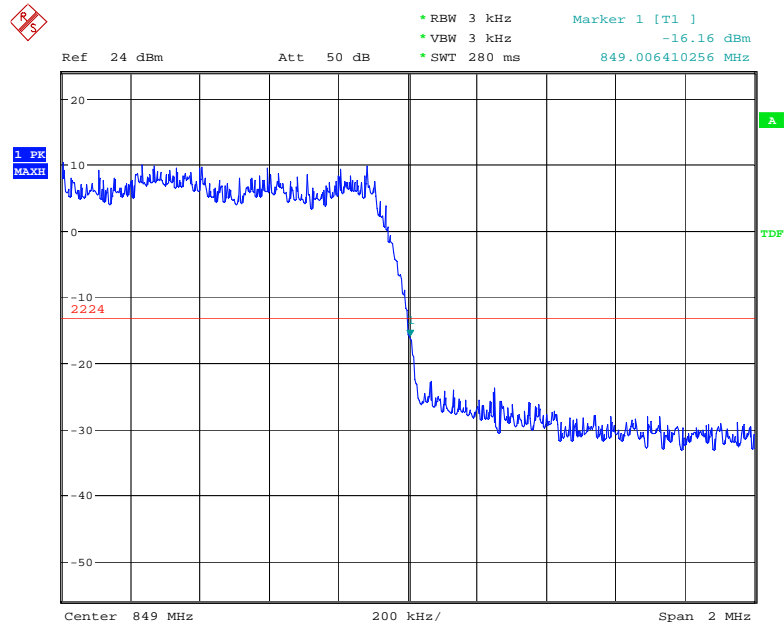
Date: 8.MAY.2008 03:21:58



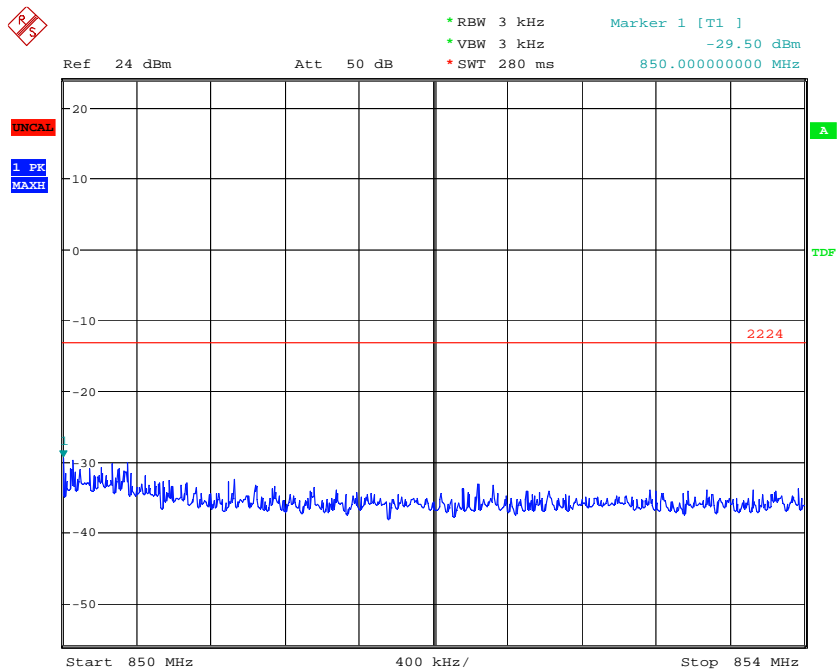
Date: 8.MAY.2008 03:23:49



## BAND EDGE BLOCK-Channel 777

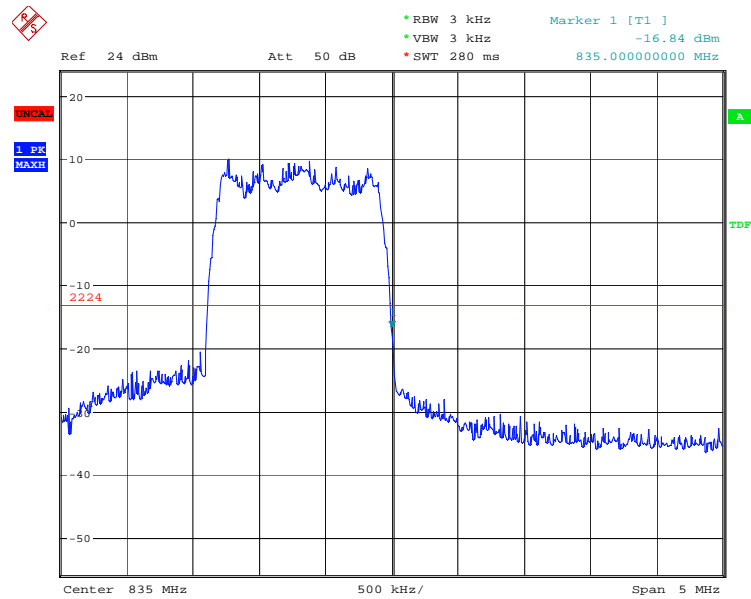


Date: 8.MAY.2008 03:25:07



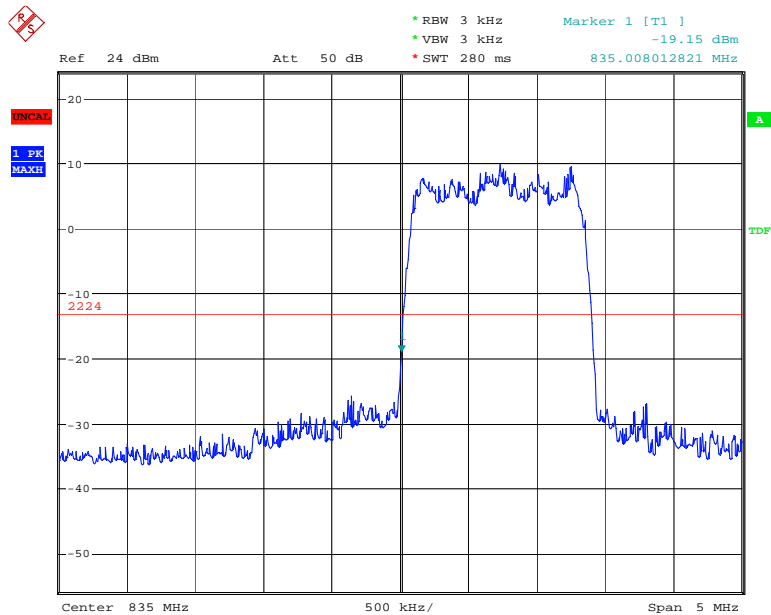
Date: 8.MAY.2008 03:25:55

## BAND EDGE BLOCK-Channel 310



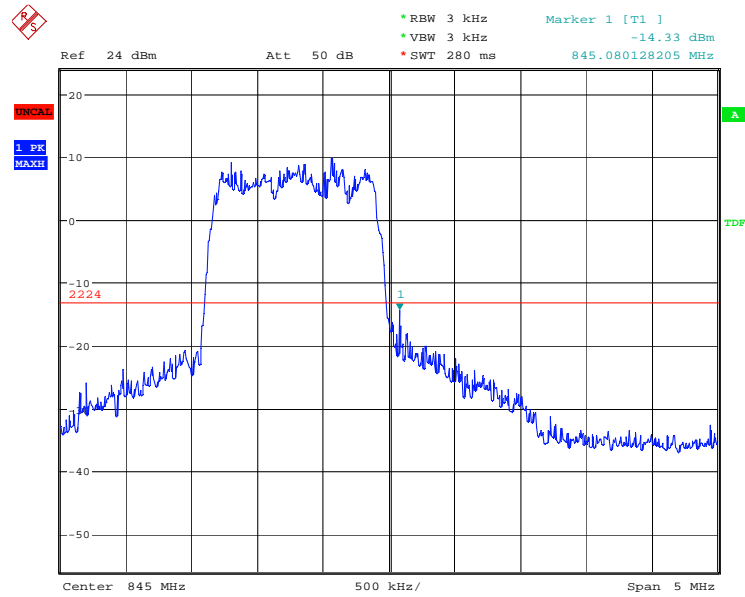
Date: 8.MAY.2008 03:28:16

## BAND EDGE BLOCK-Channel 357

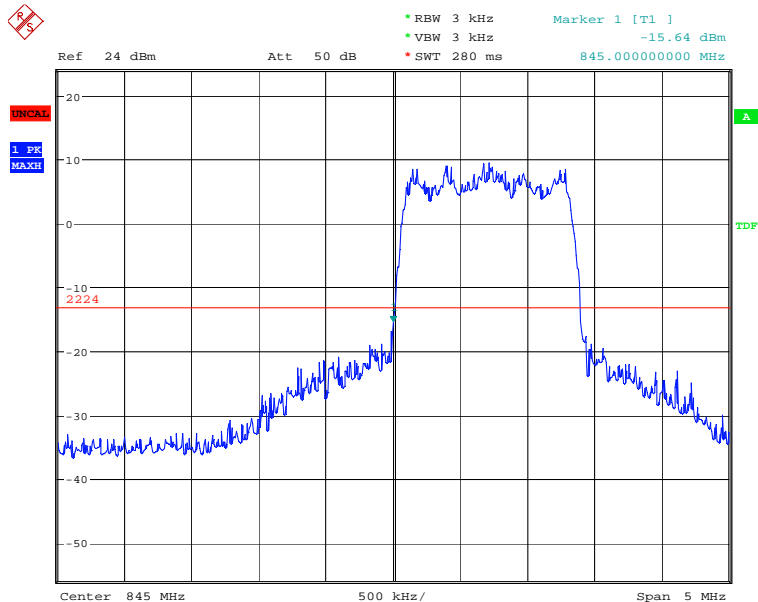


Date: 8.MAY.2008 03:29:36

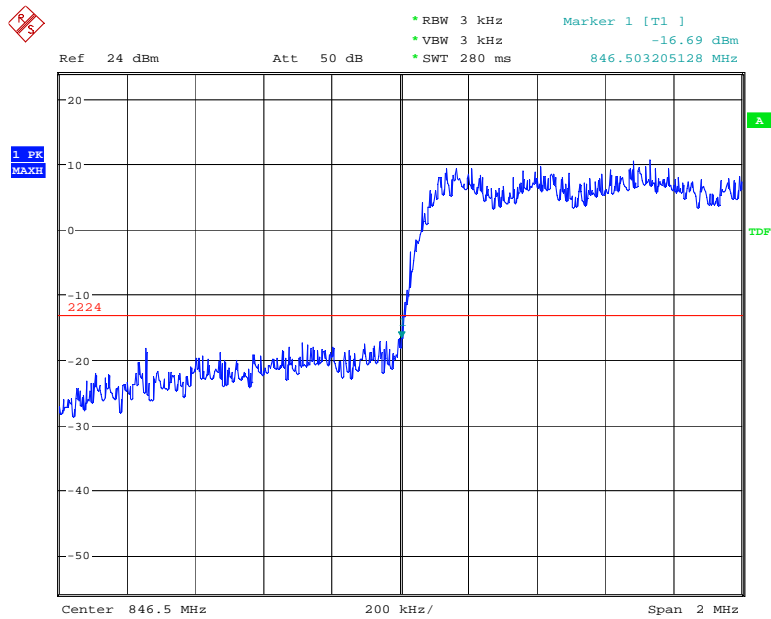
### BAND EDGE BLOCK-Channel 643



### BAND EDGE BLOCK-Channel 690

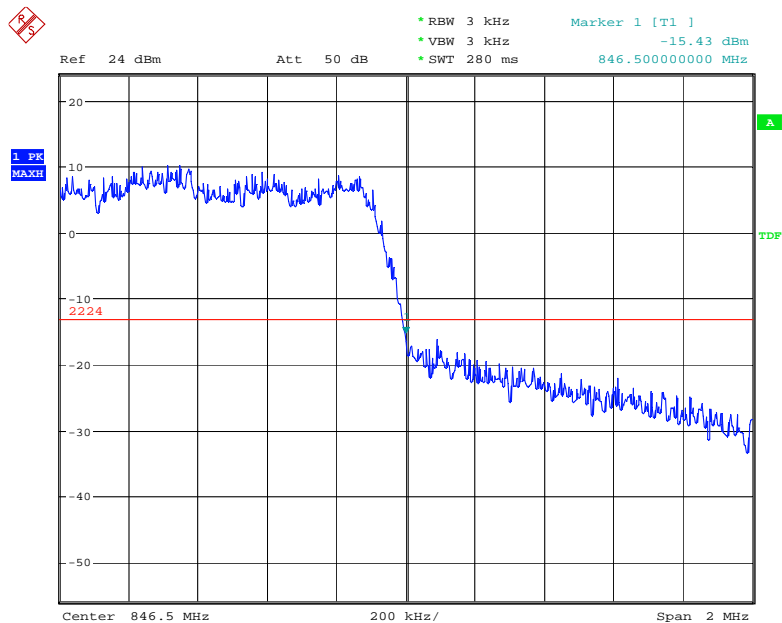


## BAND EDGE BLOCK-Channel 740



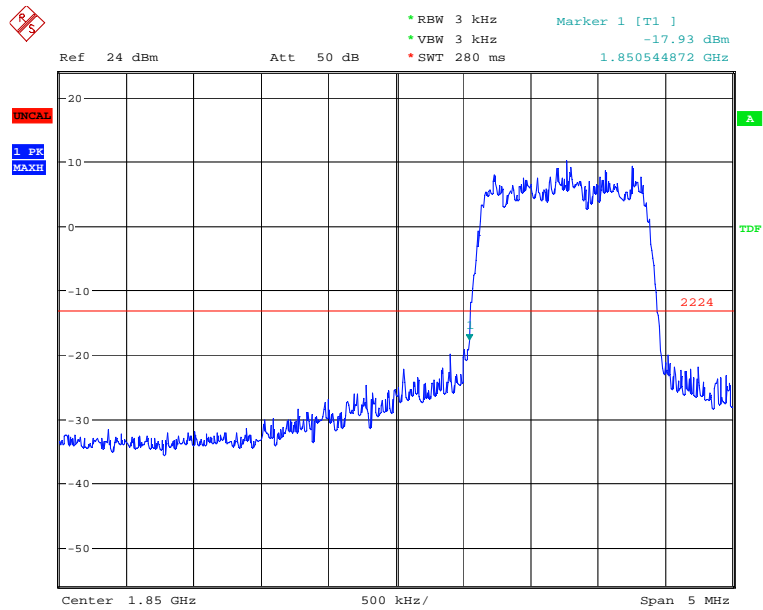
Date: 8.MAY.2008 03:33:19

## BAND EDGE BLOCK-Channel 693

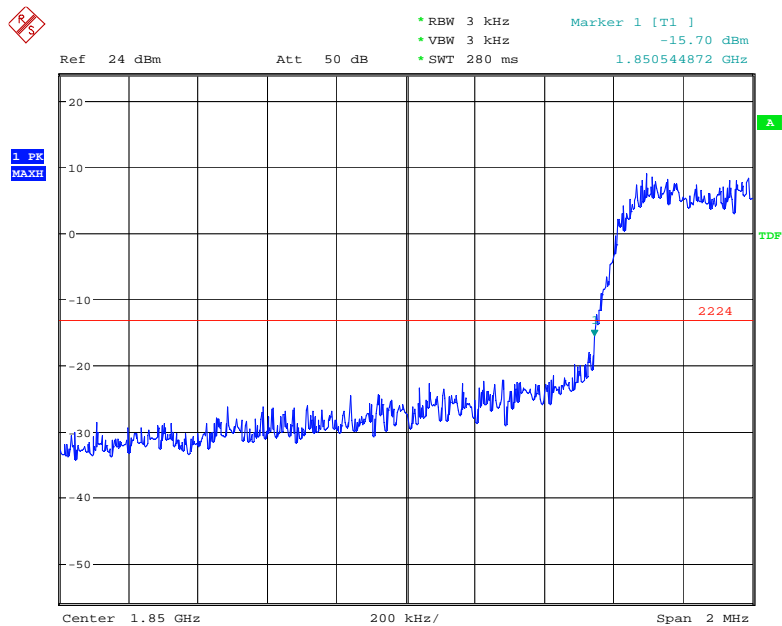


Date: 8.MAY.2008 03:34:28

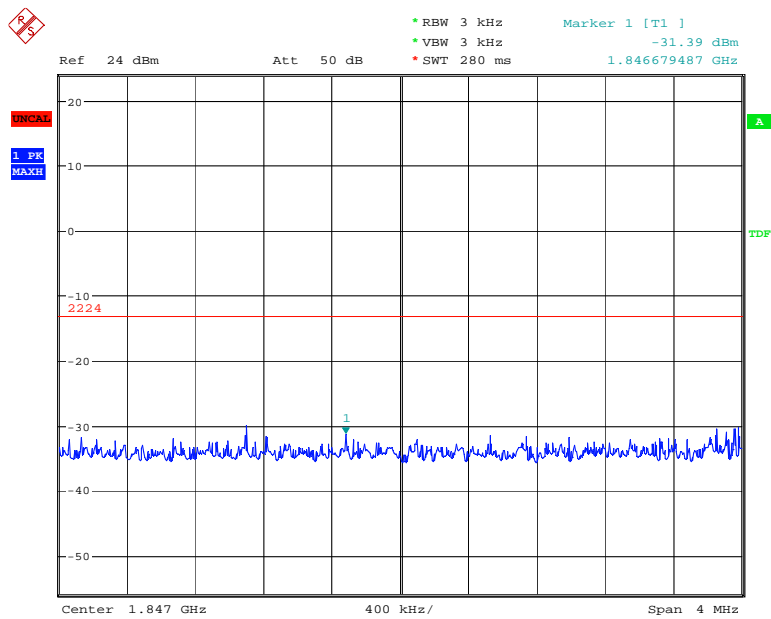
# PCS CDMA BAND EDGE BLOCK-Channel 25



Date: 8.MAY.2008 03:35:54

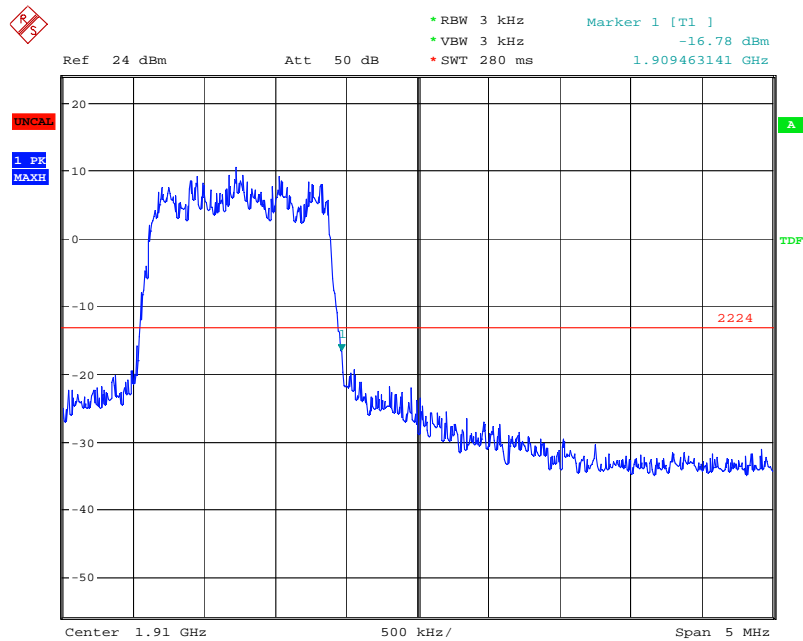


Date: 8.MAY.2008 03:36:46

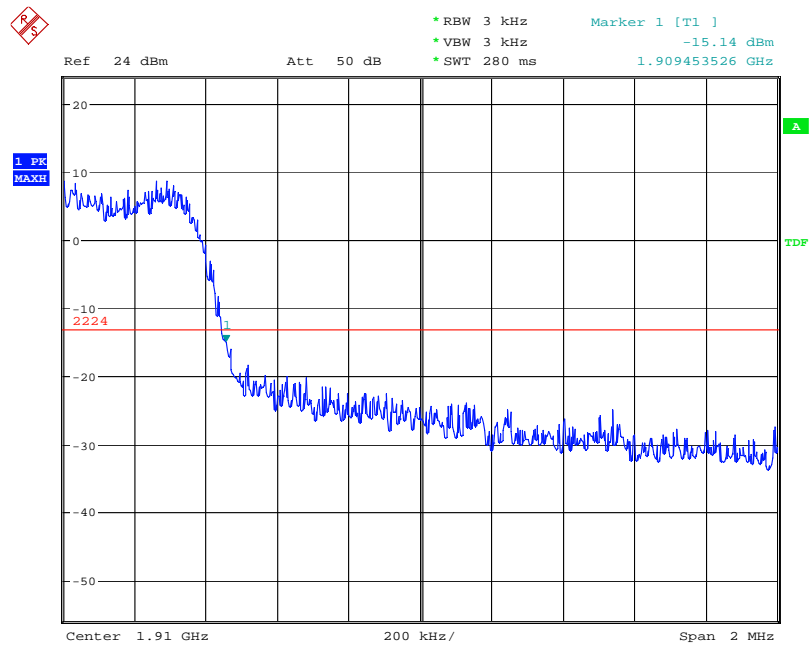


Date: 8.MAY.2008 03:37:29

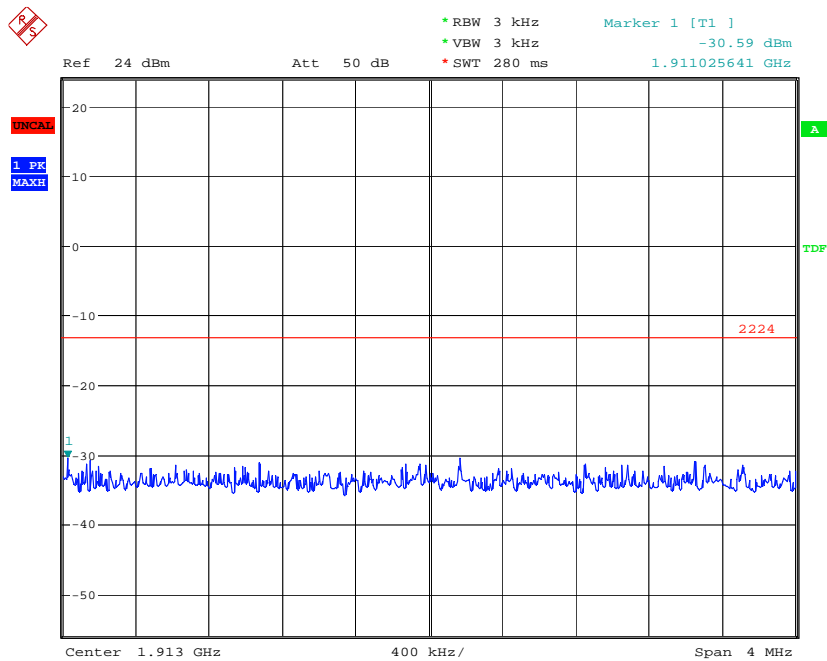
## BAND EDGE BLOCK-Channel 1175



Date: 8.MAY.2008 03:38:31

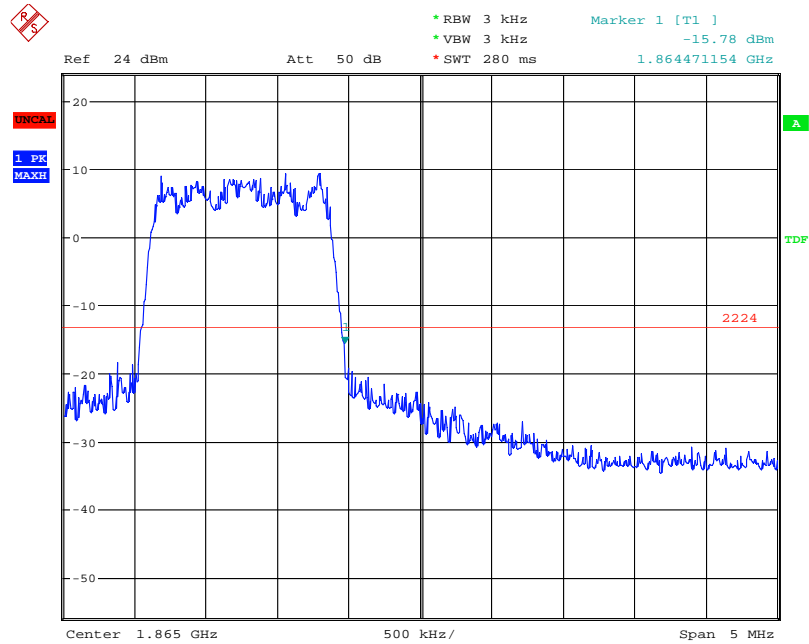


Date: 8.MAY.2008 03:39:22



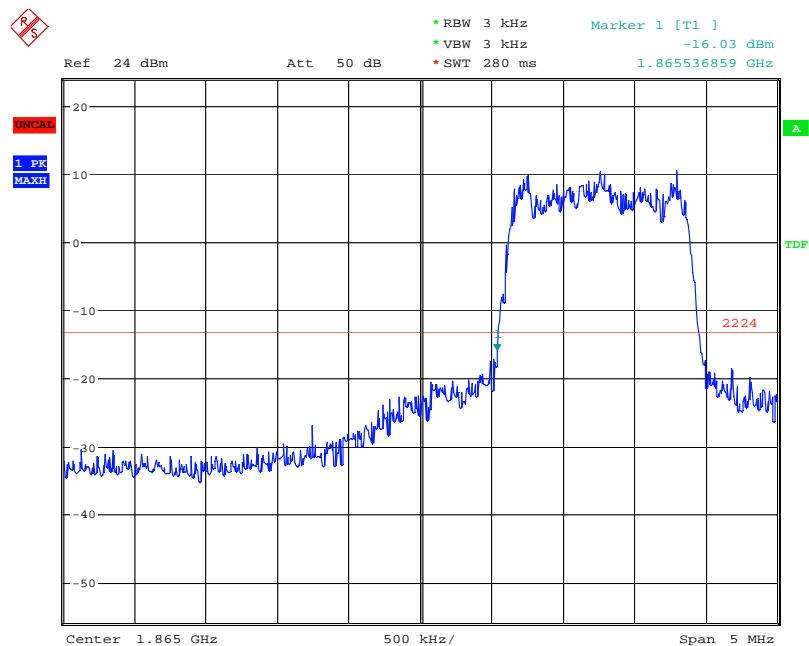
Date: 8.MAY.2008 03:40:05

## BAND EDGE BLOCK-Channel 275



Date: 8.MAY.2008 03:41:51

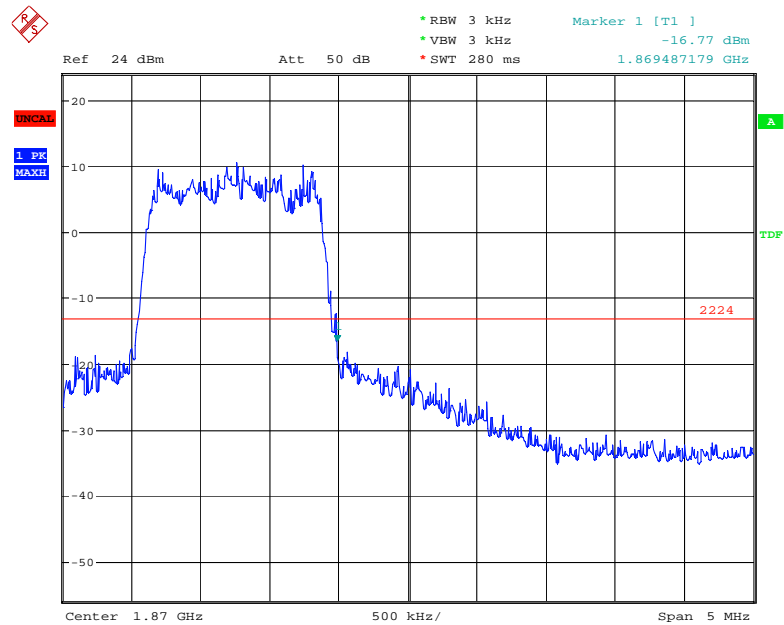
## BAND EDGE BLOCK-Channel 325



Date: 8.MAY.2008 03:43:01

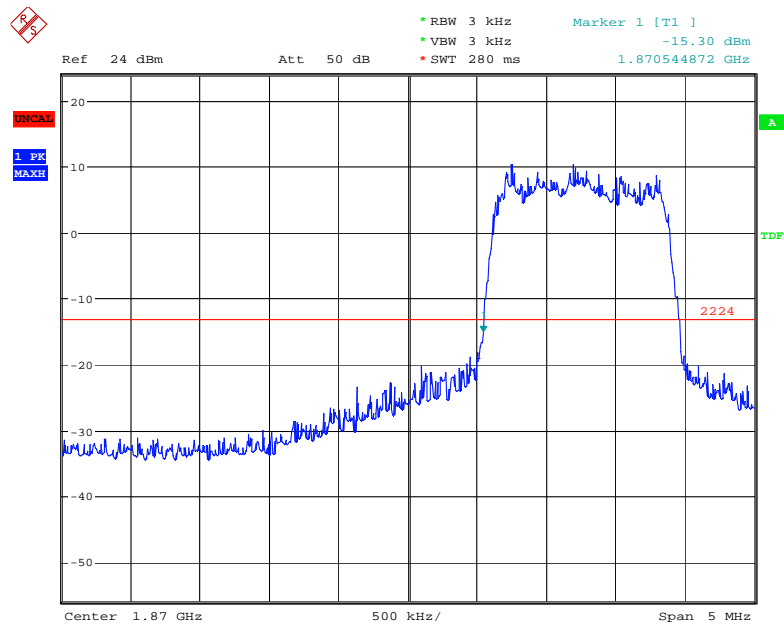


## BAND EDGE BLOCK-Channel 375



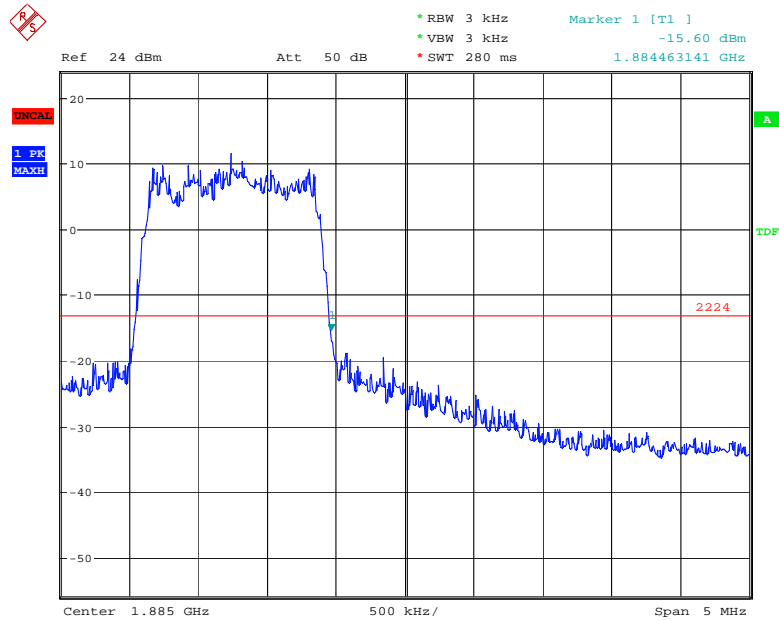
Date: 8.MAY.2008 03:43:59

## BAND EDGE BLOCK-Channel 425



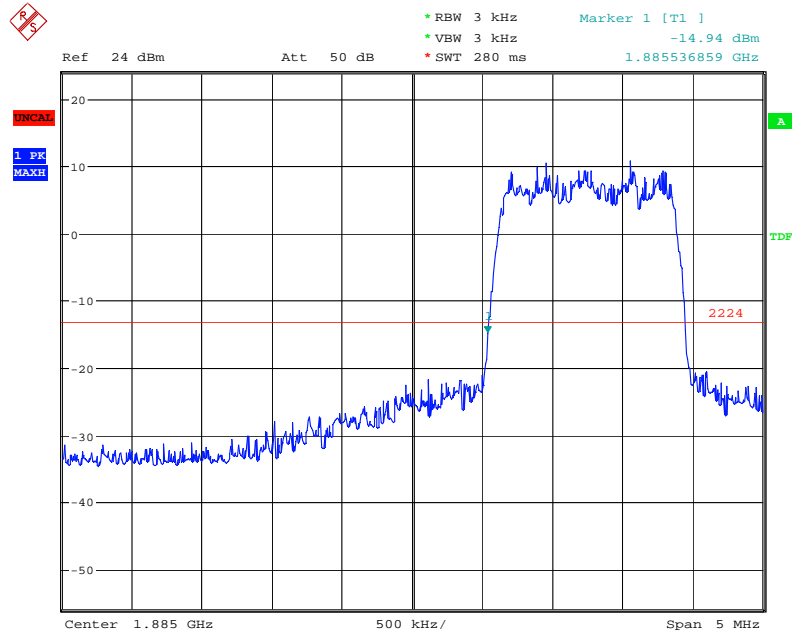
Date: 8.MAY.2008 03:45:25

### BAND EDGE BLOCK-Channel 675



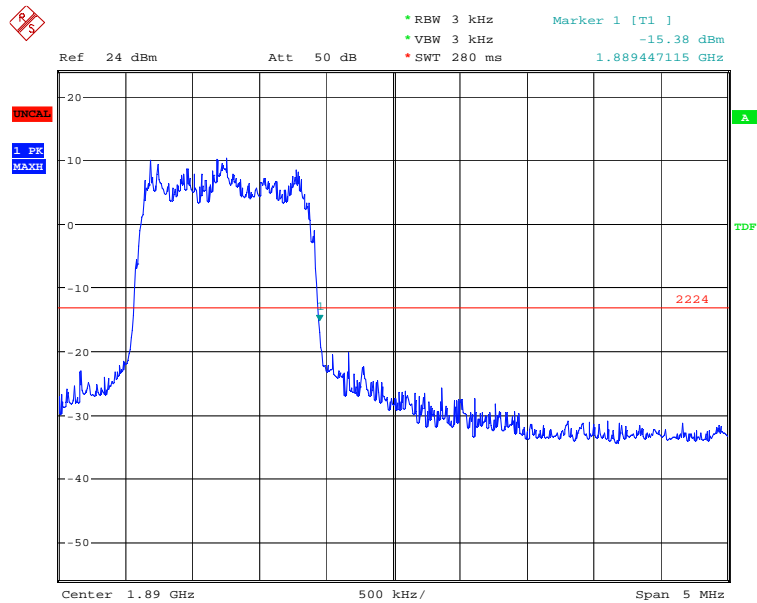
Date: 8.MAY.2008 03:46:44

### BAND EDGE BLOCK-Channel 725



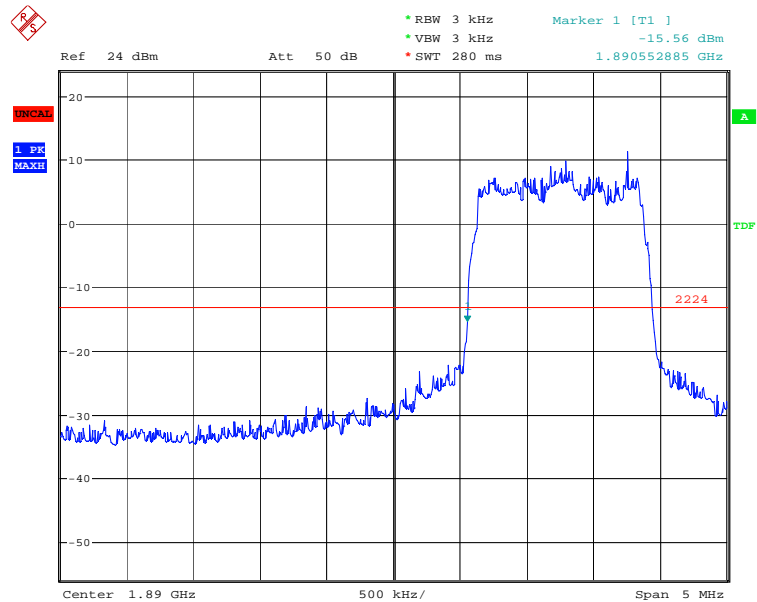
Date: 8.MAY.2008 03:47:41

## BAND EDGE BLOCK-Channel 775



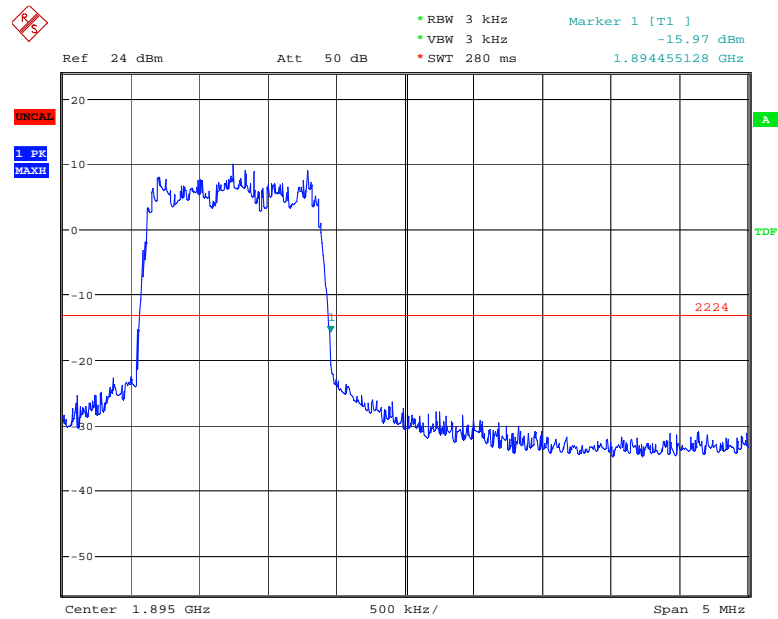
Date: 8.MAY.2008 03:48:56

## BAND EDGE BLOCK-Channel 825



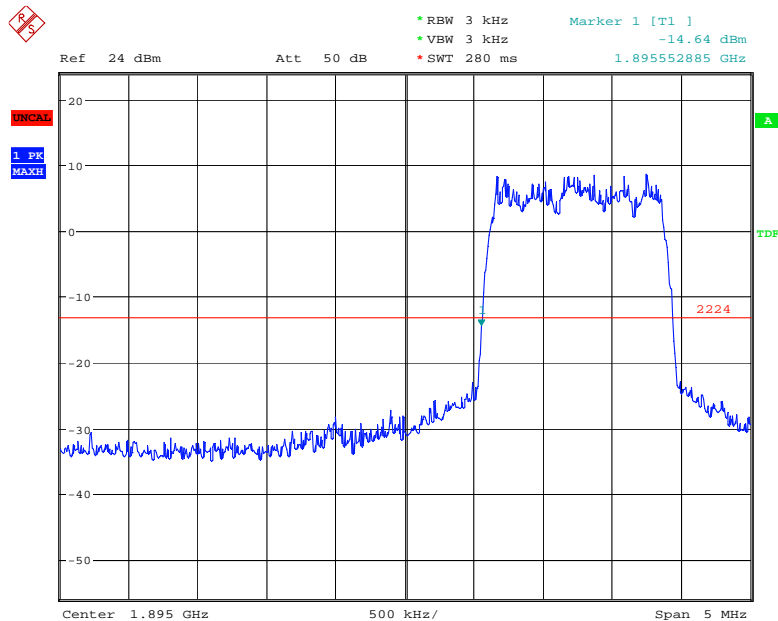
Date: 8.MAY.2008 03:49:52

## BAND EDGE BLOCK-Channel 875



Date: 8.MAY.2008 03:51:03

## BAND EDGE BLOCK-Channel 925



Date: 8.MAY.2008 03:52:07

## **B.8 CONDUCTED SPURIOUS EMISSION** (§2.1057/§22.917/§24.238)

### **B.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.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

#### **CDMA Transmitter**

Channel	Frequency (MHz)
1013	824.70
384	836.52
777	848.31

#### **PCS CDMA Transmitter**

Channel	Frequency (MHz)
25	1851.25
600	1880.00
1175	1909.75

### **B. 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  $43+10\log(P)$  dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

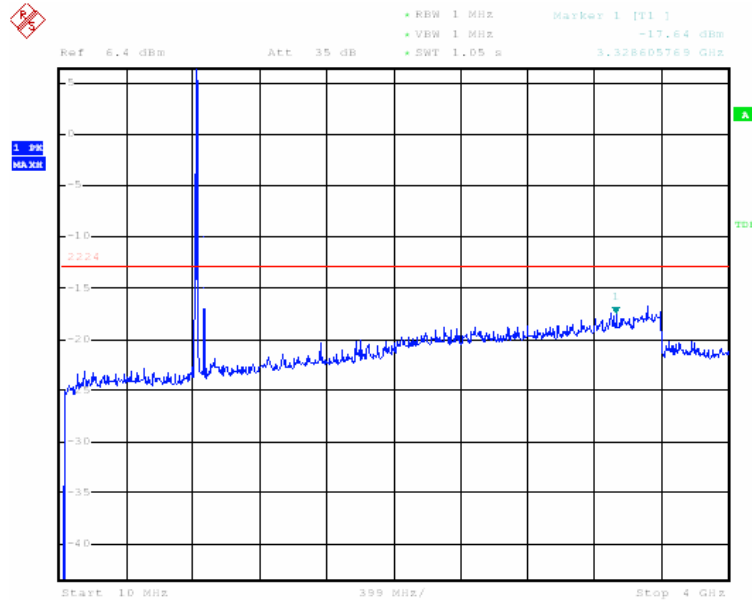
## B. 8.3 Measurement result

### CDMA

#### B.8.3.1 Channel 1013: 10MHz – 4GHz Set.1

Spurious emission limit –13dBm.

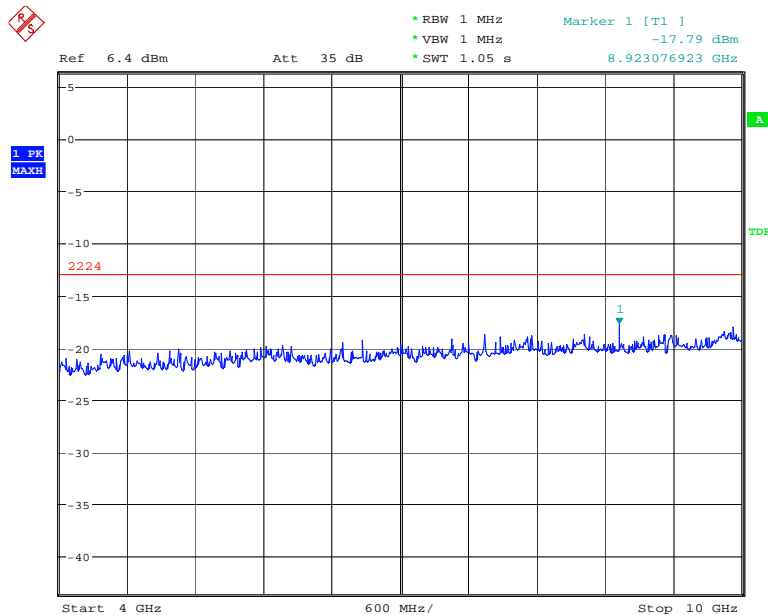
**NOTE: peak above the limit line is the carrier frequency.**



Date: 8.MAY.2008 03:05:38

#### B.8.3.2 Channel 1013: 4GHz – 10GHz Set.1

Spurious emission limit –13dBm.

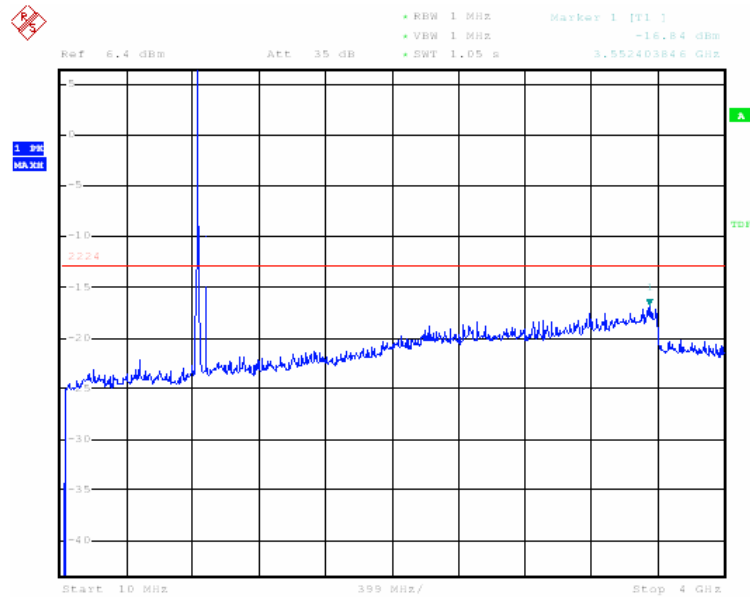


Date: 8.MAY.2008 03:03:03

### B.8.3.3 Channel 384: 10MHz – 4GHz Set.1

Spurious emission limit –13dBm

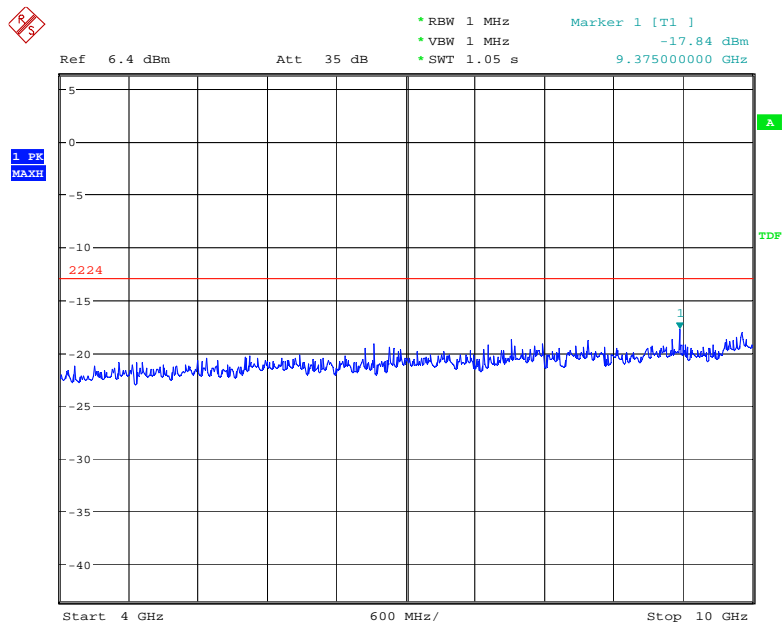
**NOTE: peak above the limit line is the carrier frequency.**



Date: 8.MAY.2008 03:10:35

### B.8.3.4 Channel 384: 4GHz –10GHz Set.1

Spurious emission limit –13dBm

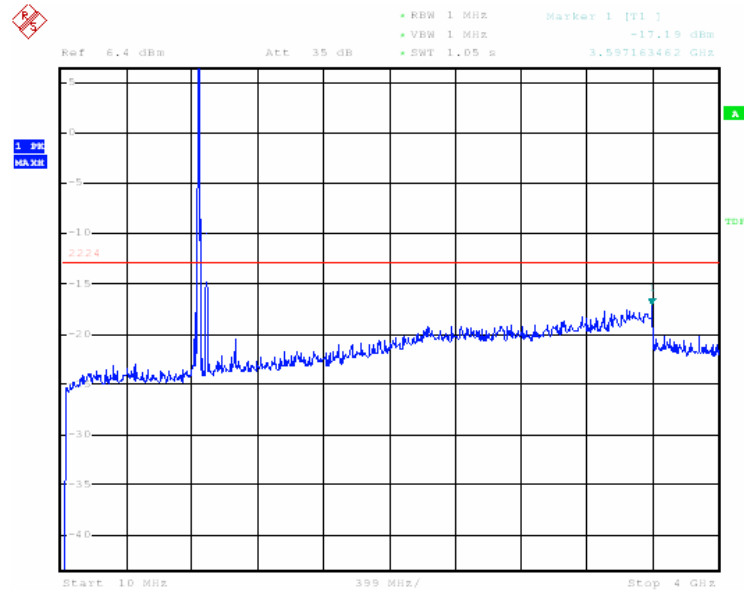


Date: 8.MAY.2008 03:11:03

### B.8.3.5 Channel 777: 10MHz – 4GHz Set.1

Spurious emission limit –13dBm.

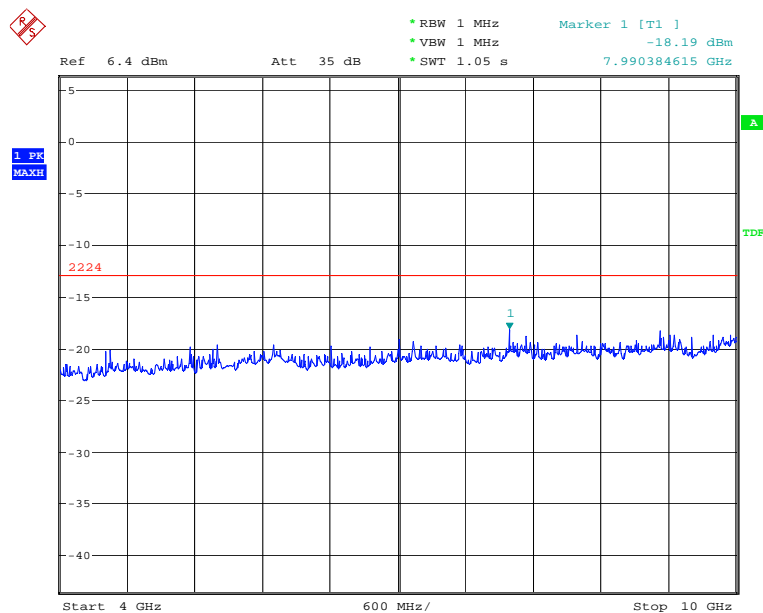
**NOTE: peak above the limit line is the carrier frequency.**



Date: 8.MAY.2008 03:12:42

### B.8.3.6 Channel 777: 4GHz – 10GHz Set.1

Spurious emission limit –13dBm.

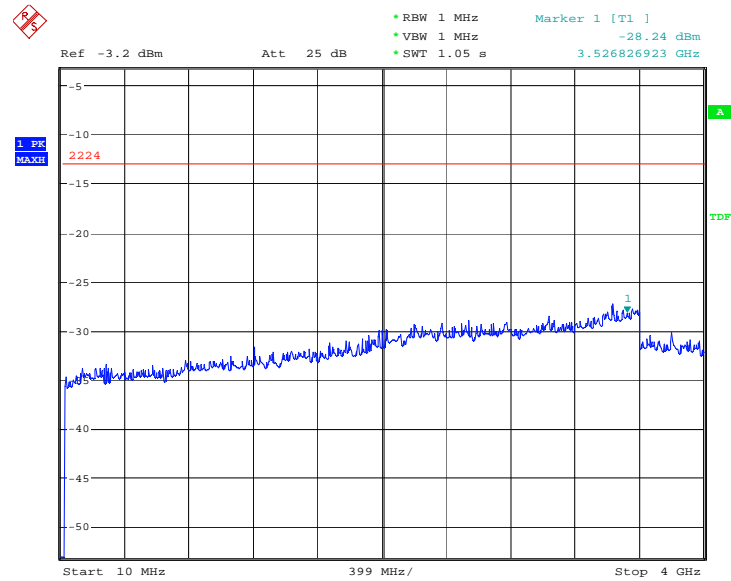


Date: 8.MAY.2008 03:11:45



### B.8.3.7 Idle mode: 10MHz – 4GHz Set.1

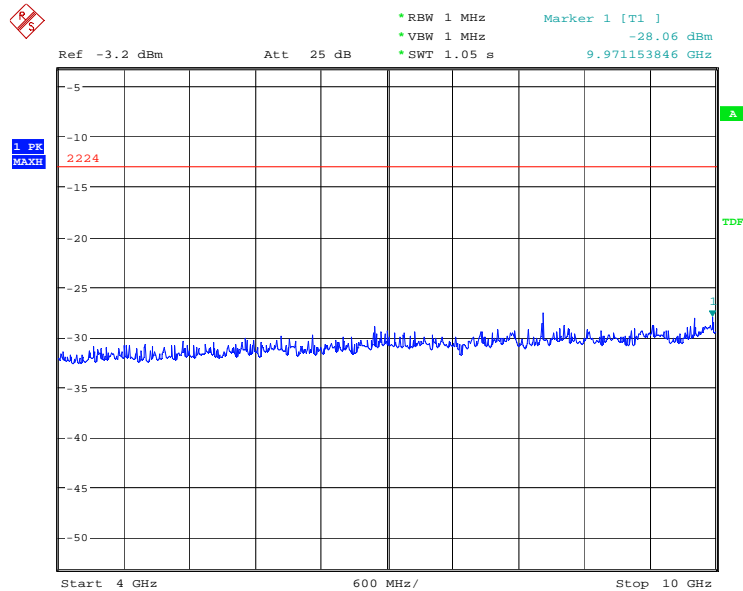
Spurious emission limit –13dBm.



Date: 8.MAY.2008 03:54:51

### B.8.3.8 Idle mode: 4GHz – 10GHz Set.1

Spurious emission limit –13dBm.



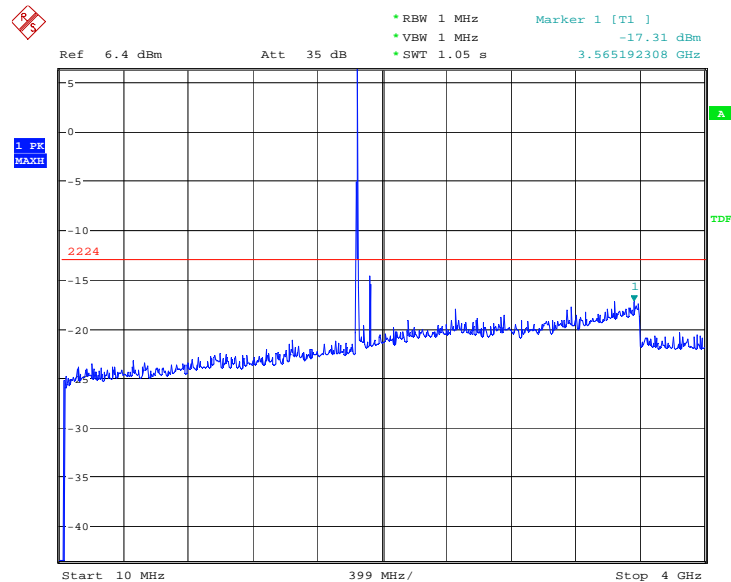
Date: 8.MAY.2008 03:55:30

## PCS CDMA

### B. 8.3.9 Channel 25: 10MHz – 4GHz Set.1

Spurious emission limit –13dBm.

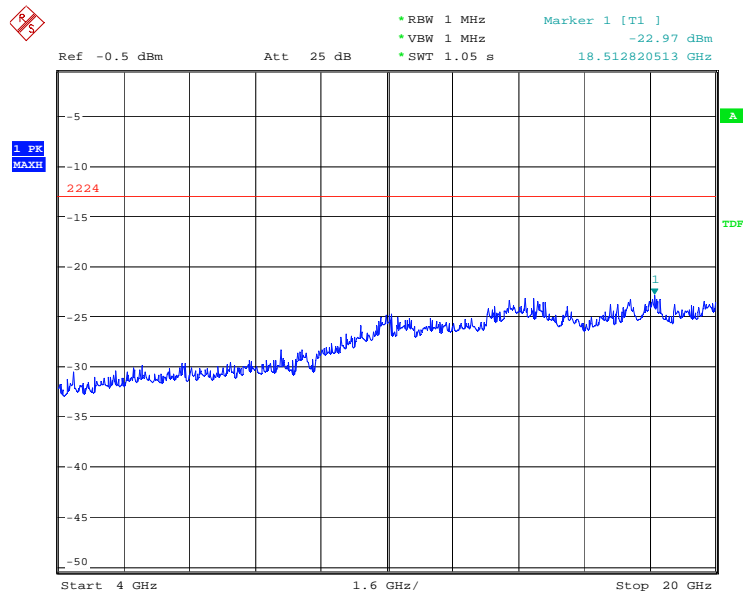
**NOTE: peak above the limit line is the carrier frequency.**



Date: 8.MAY.2008 03:14:37

### B. 8.3.10 Channel 25: 4GHz – 20GHz Set.1

Spurious emission limit –13dBm.

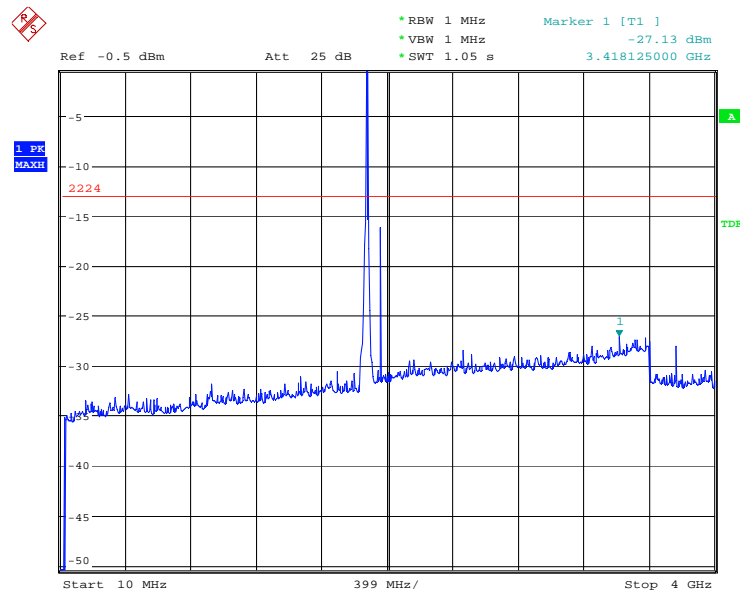


Date: 8.MAY.2008 03:15:26

### B. 8.3.11 Channel 600: 10MHz – 4GHz Set.1

Spurious emission limit –13dBm

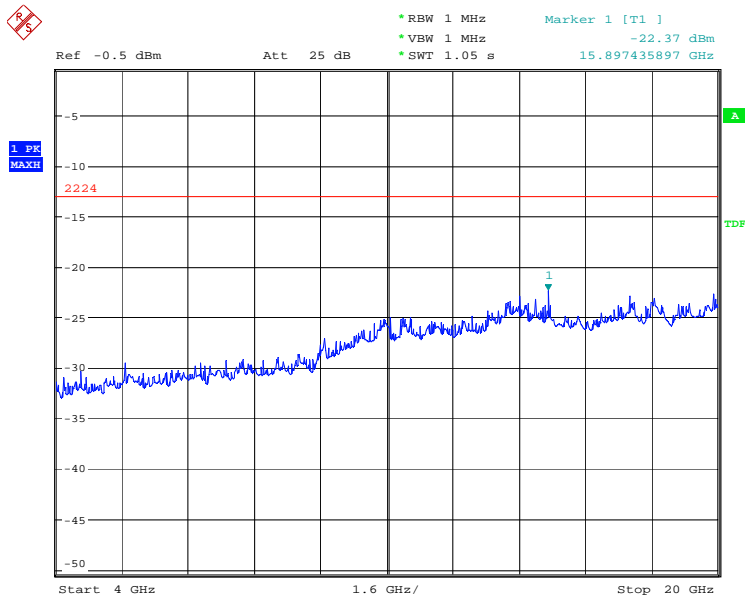
**NOTE: peak above the limit line is the carrier frequency.**



Date: 8.MAY.2008 03:16:56

### B. 8.3.12 Channel 600: 4GHz –20GHz Set.1

Spurious emission limit –13dBm

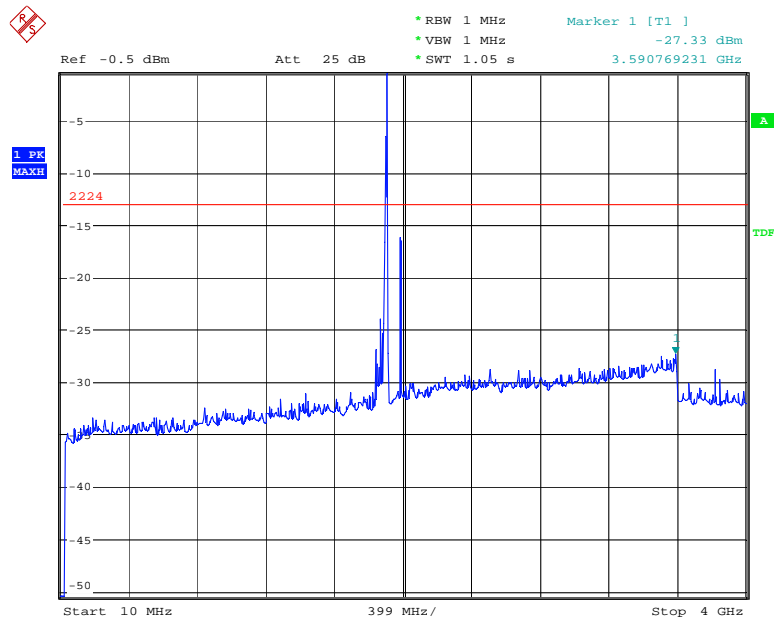


Date: 8.MAY.2008 03:16:06

### B. 8.3.13 Channel 1175: 10MHz – 4GHz Set.1

Spurious emission limit –13dBm.

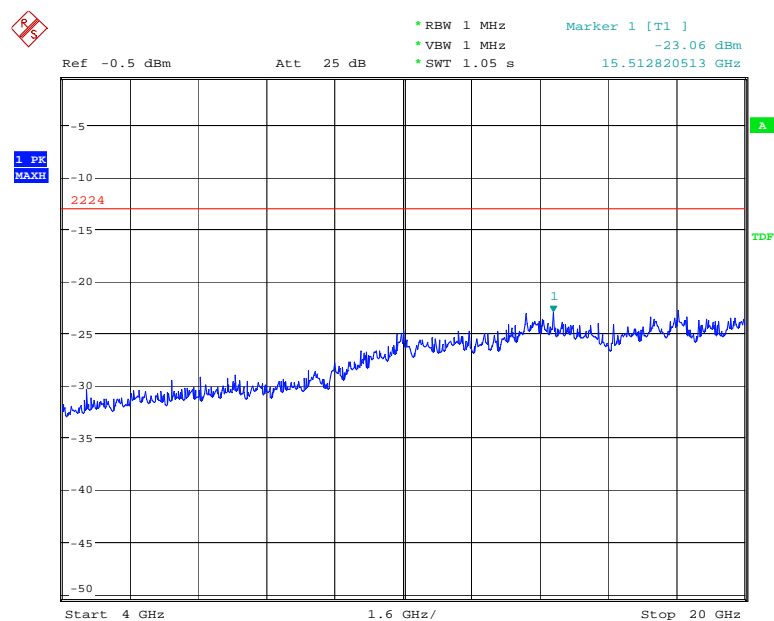
**NOTE: peak above the limit line is the carrier frequency.**



Date: 8.MAY.2008 03:17:49

### B. 8.3.14 Channel 1175: 4GHz – 20GHz Set.1

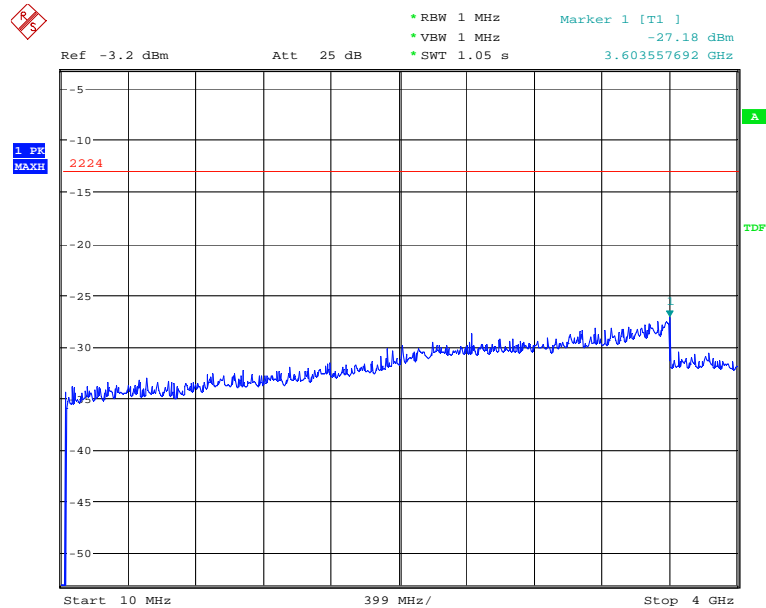
Spurious emission limit –13dBm.



Date: 8.MAY.2008 03:18:22

### B. 8.3.15 Idle mode: 10MHz – 4GHz Set.1

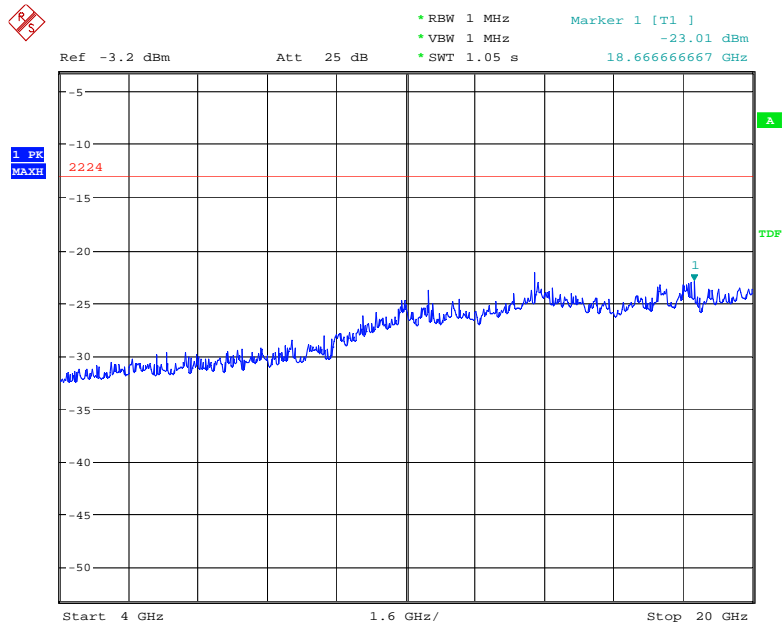
Spurious emission limit -13dBm.



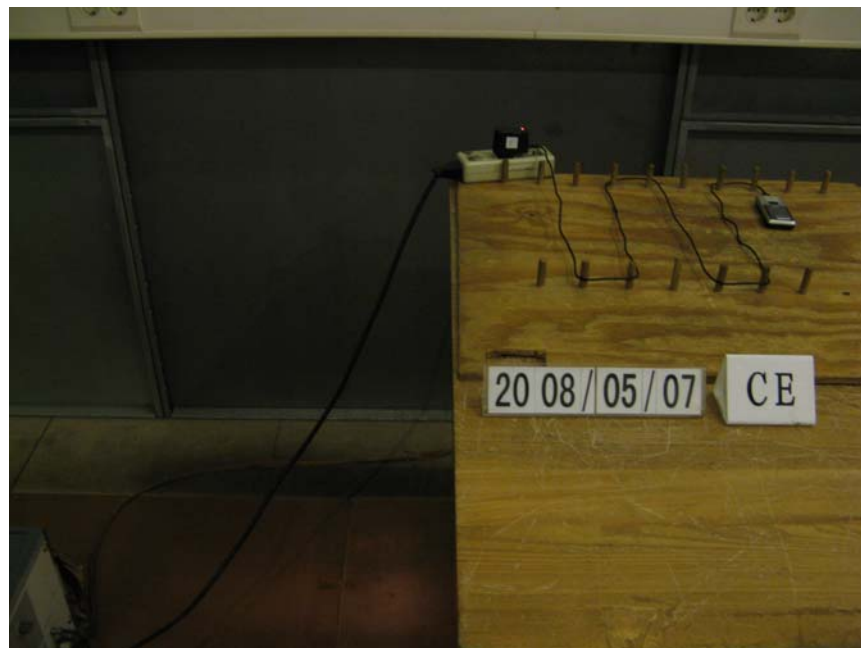
Date: 8.MAY.2008 03:56:21

### B. 8.3.16 Idle mode: 4GHz – 20GHz Set.1

Spurious emission limit -13dBm.



Date: 8.MAY.2008 03:56:51

**ANNEX C: TEST LAYOUT**

**Pic C-1 Conducted Emission**



**Pic C-2 Radiated Spurious Emission**

**\*\*\*END OF REPORT\*\*\***