



# TEST REPORT

No. I14Z45769-GTE03

for

**TCT Mobile Limited**

**CDMA EVDO BC0/BC1 mobile phone**

**Model Name: Yaris-5 NA**

**Marketing Name: A564C**

**FCC ID: RAD476**

with

**Hardware Version: PIO**

**Software Version: 4FAJ**

**Issued Date : 2014-06-17**

**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:**

**DAR accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01**

**FCC 2.948 Listed: No.733176**

**IC O.A.T.S listed: No.6629B**

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## 1. Test Laboratory

### 1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: 3/F Shou Xiang Technology Building, No.51 Xueyuan Road, Hai  
Dian District, Beijing, P. R. China  
Postal Code: 100191  
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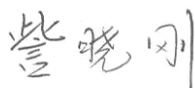
### 1.2. Testing Environment

Normal Temperature: 15-35°C  
Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: 2014-05-12  
Testing End Date: 2014-05-23

### 1.4. Signature



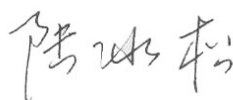
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**Zi Xiaogang**  
**(Prepared this test report)**



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



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**Lu Bingsong**  
**Deputy Director of the laboratory**  
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## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
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### **2.2. Manufacturer Information**

Company Name: TCT Mobile Limited  
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Pudong Area Shanghai, P.R. China.  
City: Shanghai  
Postal Code: 201203  
Country: China  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

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

#### **3.1. About EUT**

Description	CDMA EVDO BC0/BC1 mobile phone
Model Name	Yaris-5 NA
Marketing Name	A564C
FCC ID	RAD476
Antenna	Integrated
Output power	24.90dBm maximum EIRP measured for CDMA BC1
Extreme vol. Limits	3.5VDC to 4.35VDC (nominal: 3.8VDC)
Extreme temp. Tolerance	-30°C to +50°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

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

<b>EUT ID*</b>	<b>IMEI</b>	<b>HW Version</b>	<b>SW Version</b>
UT06a	270113183512683419	PIO	4FAJ
UT03a	270113183512683417	PIO	4FAJ

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

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

<b>AE ID*</b>	<b>Description</b>	<b>SN</b>	<b>Remarks</b>
AE1	Battery	/	1445769BA009
AE2	Battery	/	1445769BA006
AE3	Travel charger	/	1445769CH010
AE4	Travel charger	/	1445769CH003
AE5	USB cable	/	1445769DC005
AE6	USB cable	/	1445769DC001
AE7	USB cable	/	/

AE1, AE2

Model	CAB2000013C2
Manufacturer	SCUD
Capacitance	2000 mAh
Nominal voltage	3.8V

AE3,AE4

Model	CBA3000AG0C1
Manufacturer	TEN PAO
Length of cable	/

AE5, AE6

Model	CDA3122002C1
Manufacturer	Juwei
Length of cable	99cm

AE7

Model	CDA3122002C2
Manufacturer	Shenhua
Length of cable	/

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

#### **3.4. Normal Accessory setting**

Fully charged battery was used during the test.

#### **3.5. General Description**

The Equipment Under Test (EUT) is a model of CDMA EVDO BC0/BC1 mobile phone with integrated antenna. It consists of normal options: lithium battery, charger. Manual and specifications of the EUT were provided to fulfil the test.

## 4. Reference Documents

### 4.1. Reference Documents for testing

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

<b>Reference</b>	<b>Title</b>	<b>Version</b>
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-13 Edition
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-13 Edition
ANSI/TIA-603-C	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2004
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003
KDB971168 D01	Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems	2011

## 5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. =20 %, Max. = 80 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω

**Fully-anechoic chamber 2** (8.6 meters×6.1 meters×3.85 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 1 Ω
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

**Semi-anechoic chamber 2 / Fully-anechoic chamber 3** (10 meters×6.7 meters×6.15 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3 m distance
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz



## 6. SUMMARY OF TEST RESULTS

### CDMA BC0

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	§2.1046(a),22.913(a)	A.1	P
2	Emission Limit	22.917, 2.1051	A.2	P
3	CONDUCTED EMISSION	15.107/15.207	A.3	P
4	Frequency Stability	22.235, 2.1055	A.4	P
5	Occupied Bandwidth	2.1049(h)(i)	A.5	P
6	Emission Bandwidth	22.917(b)	A.6	P
7	Band Edge Compliance	22.917(b)	A.7	P
8	Conducted Spurious Emission	22.917, 2.1057	A.8	P

### CDMA BC1

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	24.232(c)	A.1	P
2	Emission Limit	24.238,2.1051	A.2	P
3	CONDUCTED EMISSION	15.107/15.207	A.3	P
4	Frequency Stability	24.235,2.1055	A.4	P
5	Occupied Bandwidth	2.1049(h)(i)	A.5	P
6	Emission Bandwidth	24.238(b)	A.6	P
7	Band Edge Compliance	24.238(b)	A.7	P
8	Conducted Spurious Emission	24.238,2.1057	A.8	P

## 7. Test Equipments Utilized

NO.	Description	TYPE	series number	MANUFACTURE	CAL DUE DATE
1	Test Receiver	ESCI	100344	R&S	2015-03-03
2	Test Receiver	ESU26	100376	R&S	2014-11-05
3	EMI Antenna	VULB 9163	514	Schwarzbeck	2014-11-10
4	EMI Antenna	3117	00139065	ETS-Lindgren	2014-07-31
5	LISN	NV216	101200	R&S	2014-07-11
6	Universal Radio Communication Tester	CMU200	102228	R&S	2014-06-23
7	Universal Radio Communication Tester	E5515C	MY48361083	Agilent	2015-02-27
8	Spectrum Analyzer	E4440A	MY48250642	Agilent	2015-02-27
9	EMI Antenna	9117	177	Schwarzbeck	2014-06-29
10	EMI Antenna	VULB 9163	9163 175	Schwarzbeck	2014-07-13
11	EMI Antenna	3117	00119024	ETS-Lindgren	2016-01-20
12	Signal Generator	N5183A	MY49060052	Agilent	2015-03-02
13	Climate chamber	SH-241	92007454	ESPEC	2015-12-14
14	Loop Antenna	HFH2-Z2	829324/007	R&S	2014-12-12

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 OUTPUT POWER**

#### **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. These measurements were done at 3 frequencies of CDMA BC0&BC1 (bottom, middle and top of operational frequency range).

#### **CDMA BC0**

##### **Measurement result**

Channel	Frequency(MHz)	Channel power(dBm)
1013	824.70	24.14
384	836.52	24.25
777	848.31	24.08

#### **CDMA BC1**

##### **Measurement result**

Channel	Frequency(MHz)	Channel power(dBm)
25	1851.25	24.29
600	1880.00	24.24
1175	1908.75	24.34

### A.1.3 Radiated

#### A.1.3.1 Description

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

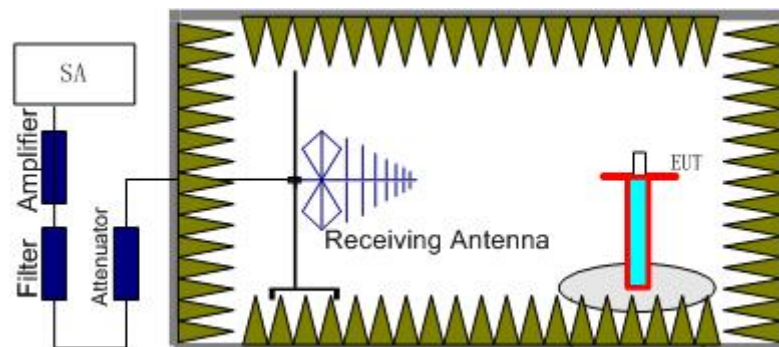
Rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Rule Part 22.913(a) specifies " The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

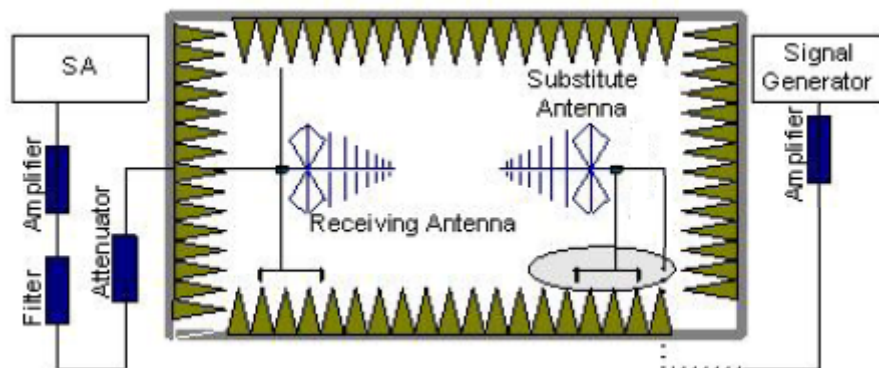
#### A.1.3.2 Method of Measurement

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

1. 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 EUT 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 EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is

connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power ( $P_{Mea}$ ) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded ( $P_r$ ). The power of signal source ( $P_{Mea}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna.

The cable loss ( $P_{cl}$ ), the Substitution Antenna Gain ( $G_a$ ) and the Amplifier Gain ( $P_{Ag}$ ) should be recorded after test.

The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{Mea} - P_{Ag} - P_{cl} - G_a$$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15\text{dBi}$ .

### CDMA BC0-ERP

#### Limits

	Burst Peak ERP (dBm)
CDMA BC0	≤38.45dBm (7W)

#### Measurement result

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	Correction (dB)	ERP(dBm)	Limit(dBm)	Margin(dB)	Polarization
824.70	-27.36	2.07	-53.00	0.84	2.15	<b>20.58</b>	38.45	17.87	V
836.52	-28.47	2.08	-53.00	0.90	2.15	19.40	38.45	19.05	V
848.31	-29.86	2.09	-53.00	0.95	2.15	17.95	38.45	20.50	V

Frequency: 824.70MHz

Peak ERP(dBm)= P<sub>Mea</sub>(-27.36dBm)- P<sub>cl</sub>(2.07dB)-P<sub>Ag</sub>(-53.00dB)-G<sub>a</sub> (0.84dB)-2.15dB=20.58dBm

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

### CDMA BC1-EIRP

#### Limits

	Burst Peak EIRP (dBm)
CDMA BC1	≤33dBm (2W)

#### Measurement result

Frequency(MHz)	P <sub>Mea</sub> (dBm)	P <sub>cl</sub> (dB)	P <sub>Ag</sub> (dB)	G <sub>a</sub> Antenna Gain(dB)	EIRP(dBm)	Limit(dBm)	Margin(dB)	Polarization
1851.25	-27.02	3.18	-50.00	-4.55	24.35	33.00	8.65	H
1880.00	-26.51	3.11	-50.00	-4.43	24.81	33.00	8.19	H
1908.75	-26.22	3.18	-50.00	-4.30	<b>24.90</b>	33.00	8.10	H

Frequency: 1908.75MHz

Peak EIRP(dBm)= P<sub>Mea</sub>(-26.22dBm)- P<sub>cl</sub>(3.18dB)- P<sub>Ag</sub>(-50.00dB)-G<sub>a</sub>(-4.30dB) =24.90dBm

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

## A.2 EMISSION LIMIT

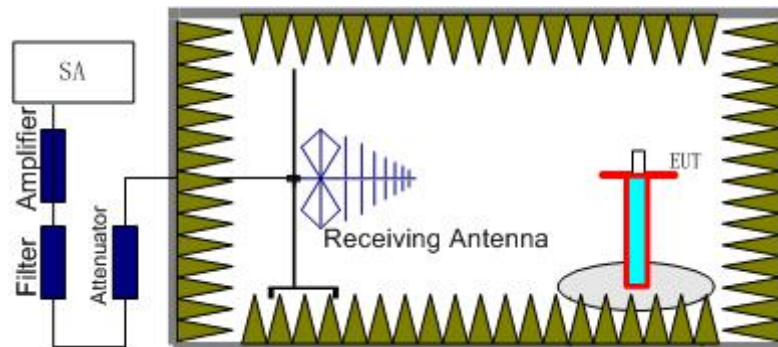
### A.2.1 Measurement Method

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

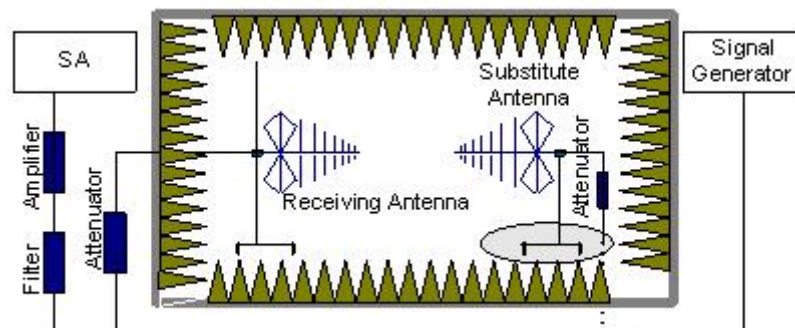
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set as outlined in Part 24.238 and Part 24.917. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of CDMA BC0 and BC1.

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

1. 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 EUT 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 EUT through 360° 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.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as ( $P_r$ ).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power ( $P_{Mea}$ ) is applied to the input of the

substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded ( $P_r$ ). The power of signal source ( $P_{Mea}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss ( $P_{pl}$ ) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain ( $G_a$ ) should be recorded after test.

A amplifier should be connected in for the test.

The Path loss ( $P_{pl}$ ) is the summation of the cable loss and the gain of the amplifier.

The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{Mea} - P_{pl} - G_a$$

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15\text{dBi}$ .



### **A.2.2 Measurement Limit**

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

### **A.2.3 Measurement Results**

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of CDMA BC0 and BC1. 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 CDMA BC0 and BC1 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.

**A.2.4 Measurement Results Table**

Frequency	Channel	Frequency Range	Result
CDMA BC0	Low	30MHz-10GHz	Pass
	Middle	30MHz-10GHz	Pass
	High	30MHz-10GHz	Pass
CDMA BC1	Low	30MHz-20GHz	Pass
	Middle	30MHz-20GHz	Pass
	High	30MHz-20GHz	Pass

**A.2.5 Sweep Table**

Working Frequency	Subrange (GHz)	RBW	VBW	Sweep time (s)
CDMA BC0	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~10	1 MHz	3 MHz	3
CDMA BC1	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	18~20	1 MHz	3 MHz	2

**CDMA BC0 Channel 1013/824.7MHz**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1796.47	-58.05	3.05	-4.80	2.15	-58.45	-13.00	45.45	V
3203.18	-60.30	4.10	-7.19	2.15	-59.36	-13.00	46.36	H
4439.27	-60.04	4.81	-8.76	2.15	-58.24	-13.00	45.24	H
5521.65	-60.62	5.47	-10.01	2.15	-58.23	-13.00	45.23	H
6639.89	-57.31	6.08	-10.74	2.15	-54.80	-13.00	41.80	H
7461.72	-57.45	6.56	-11.38	2.15	-54.78	-13.00	41.78	V

**CDMA BC0 Channel 384/836.52MHz**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
1709.87	-61.16	2.96	-5.18	2.15	-61.09	-13.00	48.09	H
3281.35	-61.27	4.21	-7.38	2.15	-60.25	-13.00	47.25	V
4346.46	-58.33	4.85	-8.71	2.15	-56.62	-13.00	43.62	H
5996.13	-59.72	5.62	-10.20	2.15	-57.29	-13.00	44.29	H
6710.16	-59.10	6.07	-10.81	2.15	-56.51	-13.00	43.51	H
7925.87	-59.49	7.00	-11.83	2.15	-56.81	-13.00	43.81	V

**CDMA BC0 Channel 777/848.31MHz**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Margin(dB)	Polarization
2249.34	-55.69	3.46	-4.65	2.15	-56.65	-13.00	43.65	H
3104.48	-59.81	4.01	-6.95	2.15	-59.02	-13.00	46.02	H
4204.51	-59.95	4.73	-8.62	2.15	-58.21	-13.00	45.21	H
5872.59	-61.01	5.62	-10.15	2.15	-58.63	-13.00	45.63	V
7152.09	-59.03	6.36	-11.19	2.15	-56.35	-13.00	43.35	V
8743.66	-60.13	7.30	-12.39	2.15	-57.19	-13.00	44.19	H

**CDMA BC1 Channel 25/1851.25MHz**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Margin(dB)	Polarization
3766.92	-60.45	4.51	-8.22	-56.74	-13.00	43.74	H
4372.20	-61.20	4.89	-8.72	-57.37	-13.00	44.37	V
6879.30	-58.83	6.07	-10.98	-53.92	-13.00	40.92	V
10136.69	-56.38	7.94	-12.43	-51.89	-13.00	38.89	V
12539.27	-54.87	8.96	-12.75	-51.08	-13.00	38.08	H
13570.08	-52.89	9.22	-13.83	-48.28	-13.00	35.28	V

**CDMA BC1 Channel 600/1880.00MHz**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Margin(dB)	Polarization
3305.09	-59.26	4.18	-7.43	-56.01	-13.00	43.01	V
4919.05	-58.45	5.12	-9.55	-54.02	-13.00	41.02	V
8796.91	-58.78	7.43	-12.44	-53.77	-13.00	40.77	V
10095.37	-58.54	8.23	-12.42	-54.35	-13.00	41.35	H
13501.73	-51.85	9.22	-13.80	-47.27	-13.00	34.27	V
14358.54	-52.78	9.40	-13.71	-48.47	-13.00	35.47	V

**CDMA BC1 Channel 1175/1908.75MHz**

Frequency(MHz)	P <sub>Mea</sub> (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Margin(dB)	Polarization
3172.05	-58.57	4.04	-7.11	-55.50	-13.00	42.50	H
4676.97	-58.52	4.93	-9.12	-54.33	-13.00	41.33	V
6090.26	-60.69	5.80	-10.27	-56.22	-13.00	43.22	V
8080.44	-60.86	6.95	-11.95	-55.86	-13.00	42.86	H
9804.51	-57.44	7.73	-12.48	-52.69	-13.00	39.69	V
13706.11	-53.50	9.04	-13.88	-48.66	-13.00	35.66	H

### **A.3 CONDUCTED EMISSION**

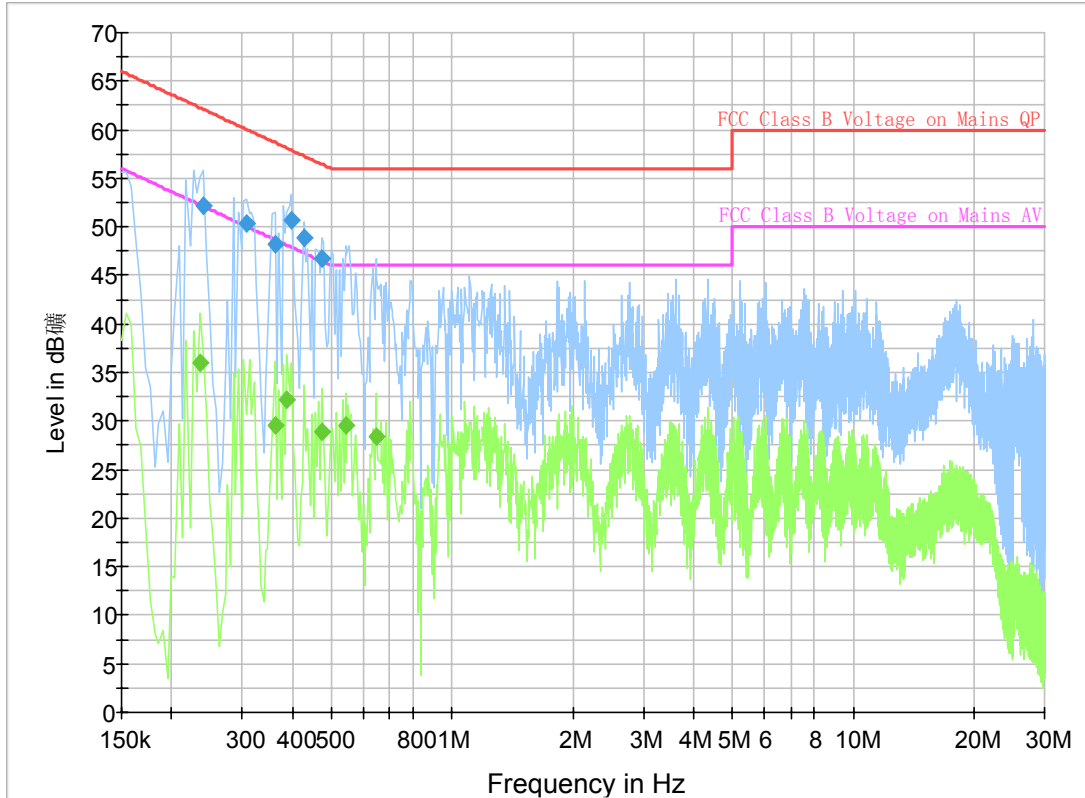
The measurement procedure in ANSI C63.4-1003 is used. Conducted Emission is measured with travel charger.

#### **A.3.1 Limit**

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	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**  
**CDMA BC0**



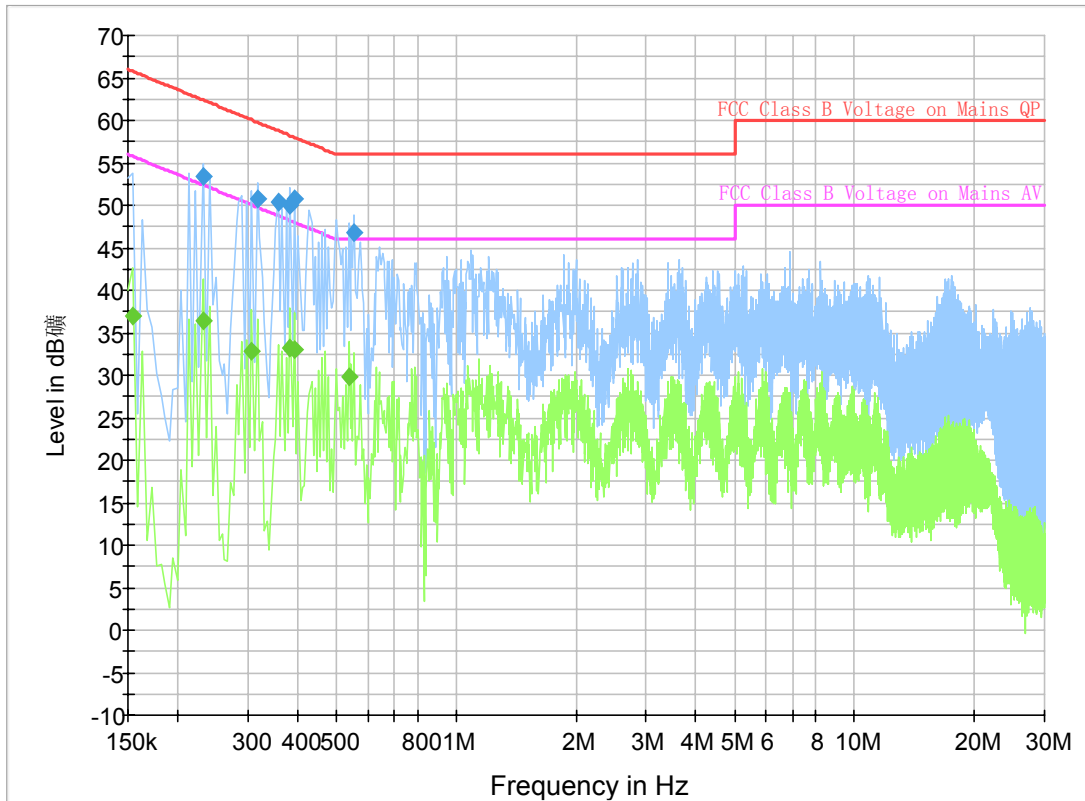
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.240000	52.1	GND	L1	9.8	10.0	62.1
0.307500	50.4	GND	L1	9.8	9.6	60.0
0.361500	48.2	GND	L1	9.8	10.5	58.7
0.397500	50.7	GND	L1	9.8	7.3	57.9
0.429000	48.9	GND	L1	9.8	8.4	57.3
0.474000	46.8	GND	N	9.8	9.7	56.4

**Final Result 2**

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.235500	36.0	GND	N	9.8	16.3	52.3
0.361500	29.5	GND	L1	9.8	19.1	48.7
0.388500	32.1	GND	N	9.8	16.0	48.1
0.474000	28.8	GND	N	9.8	17.6	46.4
0.541500	29.5	GND	N	9.8	16.5	46.0
0.645000	28.4	GND	N	9.8	17.6	46.0

CDMA BC1



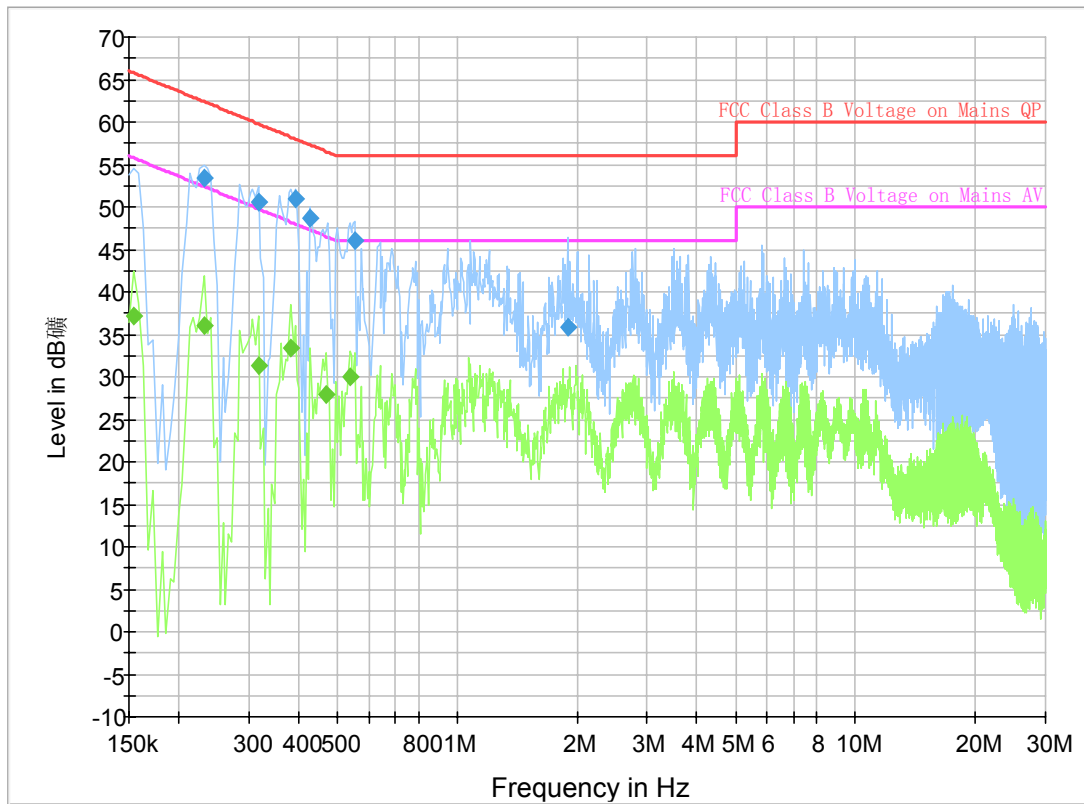
**Final Result 1**

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.231000	53.5	GND	N	9.8	9.0	62.4
0.316500	50.8	GND	N	9.8	9.0	59.8
0.357000	50.5	GND	N	9.8	8.3	58.8
0.384000	50.1	GND	N	9.8	8.1	58.2
0.393000	50.8	GND	N	9.8	7.2	58.0
0.555000	46.7	GND	L1	9.8	9.3	56.0

**Final Result 2**

Frequency (MHz)	Average (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.154500	37.0	GND	L1	9.8	18.8	55.8
0.231000	36.4	GND	L1	9.8	16.0	52.4
0.307500	32.9	GND	L1	9.8	17.2	50.0
0.384000	33.2	GND	N	9.8	15.0	48.2
0.393000	33.0	GND	L1	9.8	15.0	48.0
0.537000	29.8	GND	N	9.8	16.2	46.0

MP3



Final Result 1

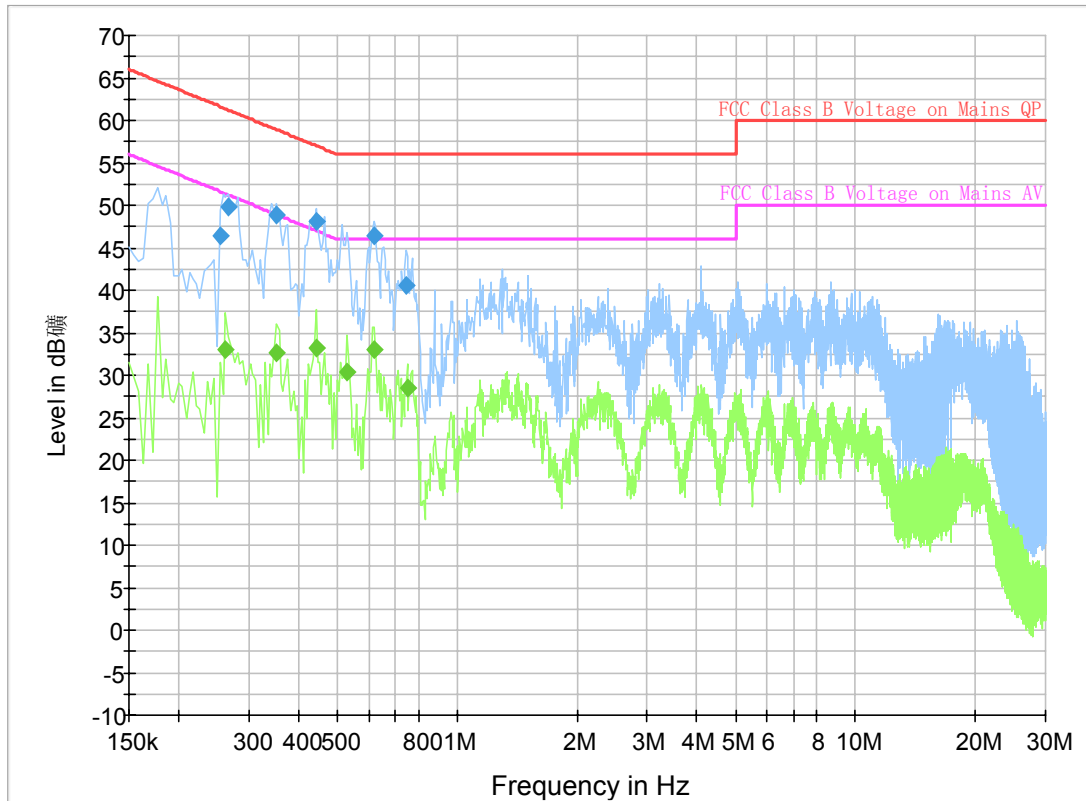
Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.231000	53.4	GND	N	9.8	9.0	62.4
0.316500	50.6	GND	N	9.8	9.2	59.8
0.393000	51.0	GND	L1	9.8	7.0	58.0
0.429000	48.6	GND	L1	9.8	8.7	57.3
0.555000	46.0	GND	N	9.8	10.0	56.0
1.891500	35.8	GND	L1	9.7	20.2	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	37.1	GND	N	9.8	18.7	55.8
0.231000	36.1	GND	N	9.8	16.3	52.4
0.316500	31.4	GND	N	9.8	18.4	49.8
0.384000	33.3	GND	N	9.8	14.9	48.2
0.469500	28.0	GND	N	9.8	18.5	46.5
0.537000	30.0	GND	N	9.8	16.0	46.0



CAMERA



**Final Result 1**

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.253500	46.5	GND	N	9.8	15.1	61.6
0.267000	49.9	GND	L1	9.8	11.3	61.2
0.352500	48.9	GND	L1	9.8	10.0	58.9
0.442500	48.2	GND	N	9.8	8.8	57.0
0.618000	46.3	GND	L1	9.8	9.7	56.0
0.744000	40.5	GND	L1	9.8	15.5	56.0

**Final Result 2**

Frequency (MHz)	Average (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.262500	32.9	GND	N	9.8	18.4	51.4
0.352500	32.6	GND	L1	9.8	16.3	48.9
0.442500	33.2	GND	N	9.8	13.9	47.0
0.528000	30.3	GND	N	9.8	15.7	46.0
0.618000	33.1	GND	L1	9.8	12.9	46.0
0.748500	28.5	GND	N	9.8	17.5	46.0

## **A.4 FREQUENCY STABILITY**

### **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°C.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on mid channel of CDMA BC0 and BC1, 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 the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C increments from +50°C to -30°C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

### **A.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 3.5VDC and 4.35VDC, 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

##### CDMA BC0

##### Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	2	0.002
3.8	-16	0.019
4.35	-1	0.001

##### Frequency Error vs Temperature

temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-30	1	0.001
-20	2	0.002
-10	4	0.005
0	-3	0.004
10	-4	0.005
20	-3	0.004
30	1	0.001
40	3	0.004
50	2	0.002

##### CDMA BC1

##### Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	7	0.004
3.8	6	0.003
4.35	8	0.004

##### Frequency Error vs Temperature

temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-30	8	0.004
-20	4	0.002
-10	6	0.003
0	5	0.003
10	9	0.005
20	6	0.003
30	5	0.003
40	-2	0.001
50	5	0.003

## A.5 OCCUPIED BANDWIDTH

### 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 CDMA frequency band. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

#### Test Condition

RBW	VBW	Span	Sweptime	Detector	Trace Mode
20KHz	50KHz	5MHz	40ms	Peak	Max Hold

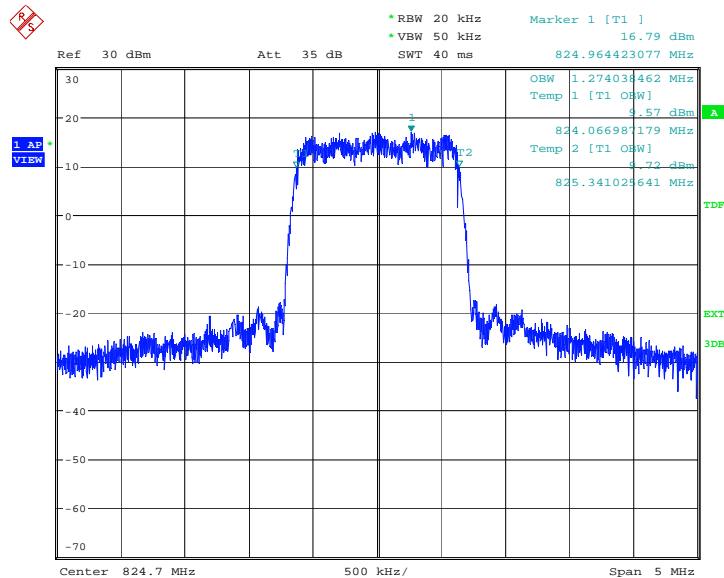
The EUT was set up for the max output power with pseudo random data modulation. Use the Occupied Bandwidth function of SA to measure the 99% bandwidth.

#### CDMA 800 (99% BW)

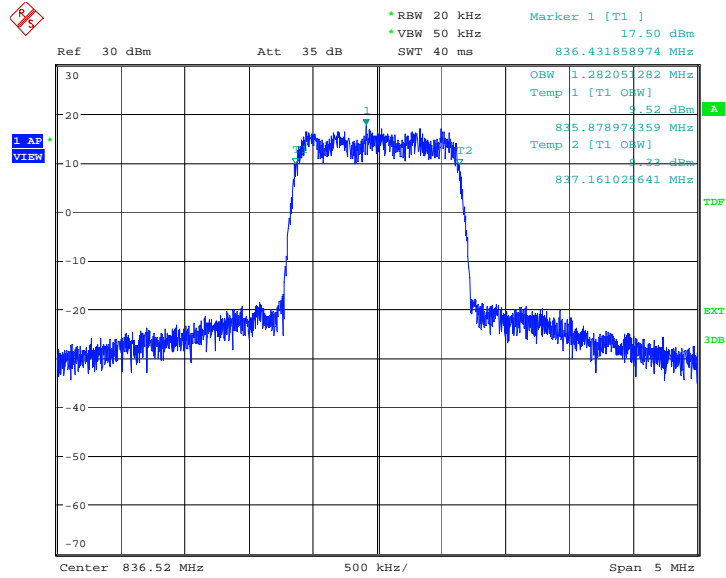
Channel	Occupied Bandwidth (99% BW)( MHz)
1013	1.274
384	1.282
777	1.282

#### CDMA 800

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

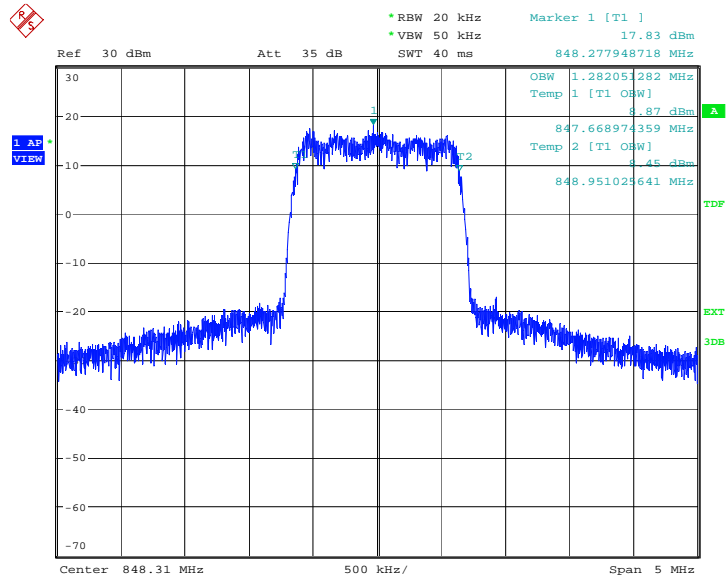


### Channel 384-Occupied Bandwidth (99% BW)



Date: 23.MAY.2014 15:02:13

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



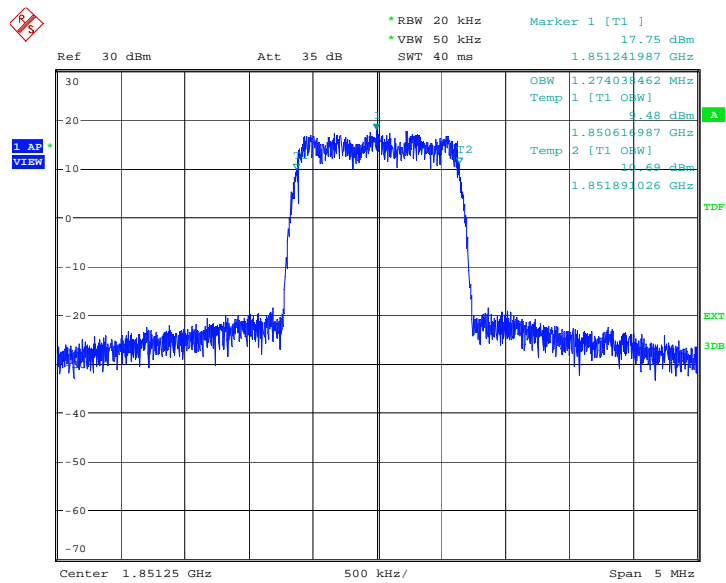
Date: 23.MAY.2014 15:53:32

**CDMA 1900 (99% BW)**

Channel	Occupied Bandwidth (99% BW)( MHz)
25	1.274
600	1.282
1175	1.282

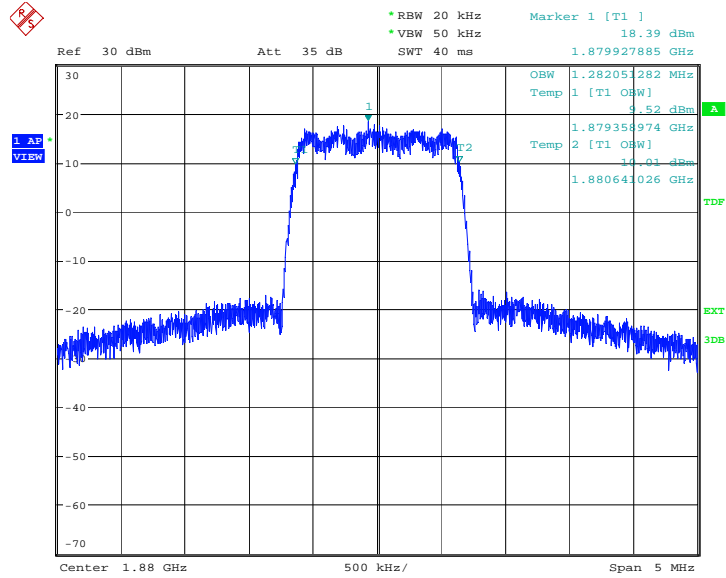
**CDMA 1900**

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



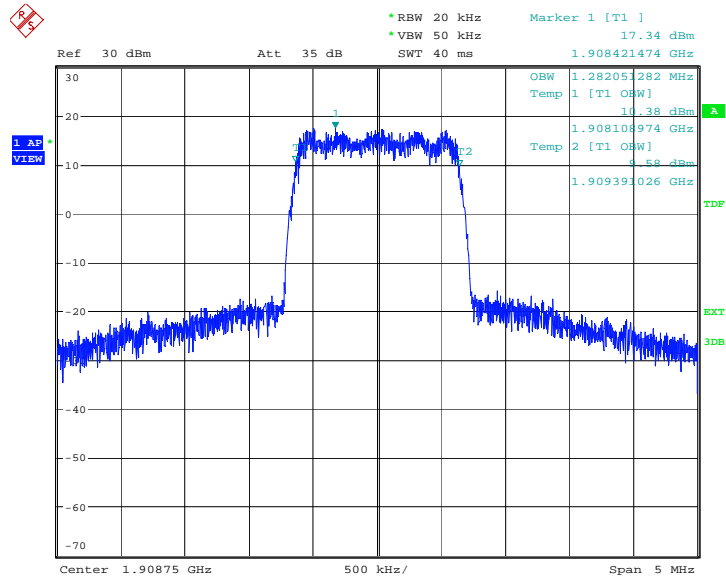
Date: 23.MAY.2014 15:48:35

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



Date: 23.MAY.2014 15:35:35

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



Date: 23.MAY.2014 15:30:43

## A.6 EMISSION BANDWIDTH

### A.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 CDMA frequency band. Table below lists the measured 100% BW. Spectrum analyzer plots are included on the following pages.

#### Test Condition

RBW	VBW	Span	Sweptime	Detector	Trace Mode
20KHz	50KHz	5MHz	40ms	Peak	Max Hold

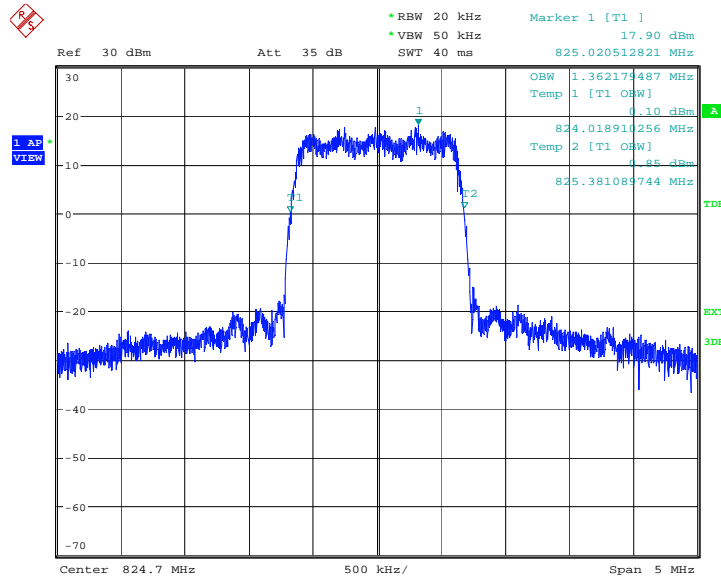
The EUT was set up for the max output power with pseudo random data modulation. Use the Occupied Bandwidth function of SA to measure the 100% bandwidth.

#### CDMA 800 (100% BW)

Channel	Emission Bandwidth (100% BW)( MHz)
1013	1.362
384	1.378
777	1.378

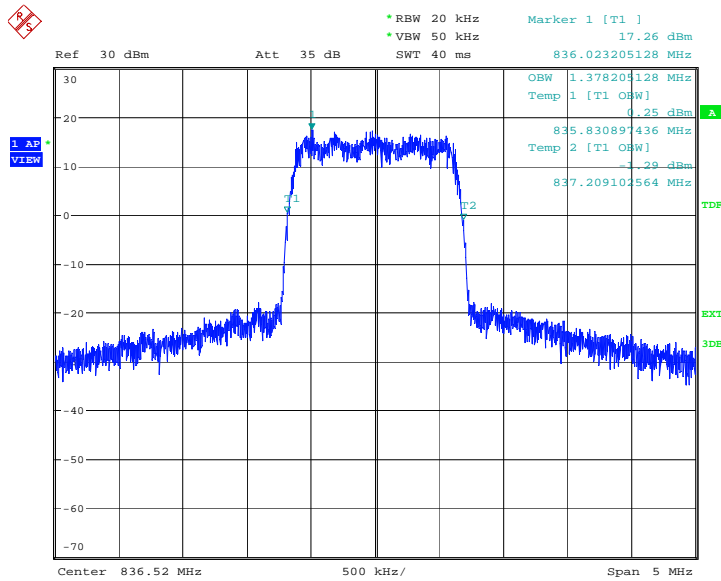
#### CDMA 800

#### Channel 1013-Emission Bandwidth (100% BW)



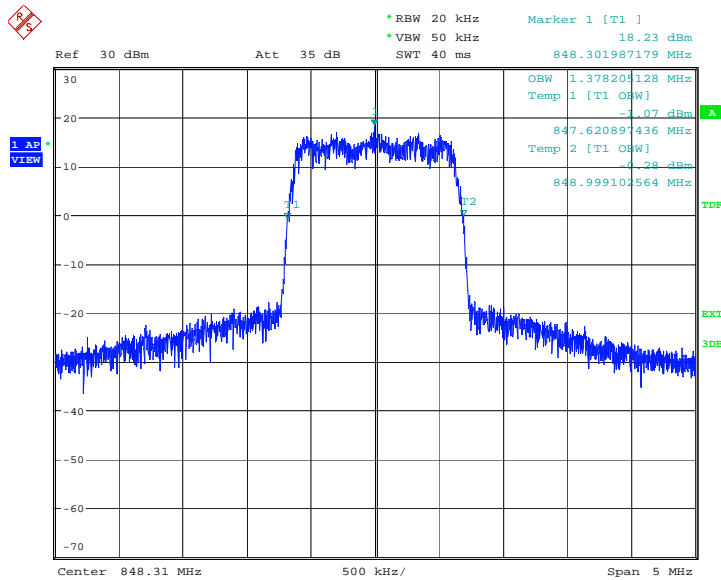


### Channel 384-Emission Bandwidth (100% BW)



Date: 23.MAY.2014 15:02:51

### Channel 777-Emission Bandwidth (100% BW)



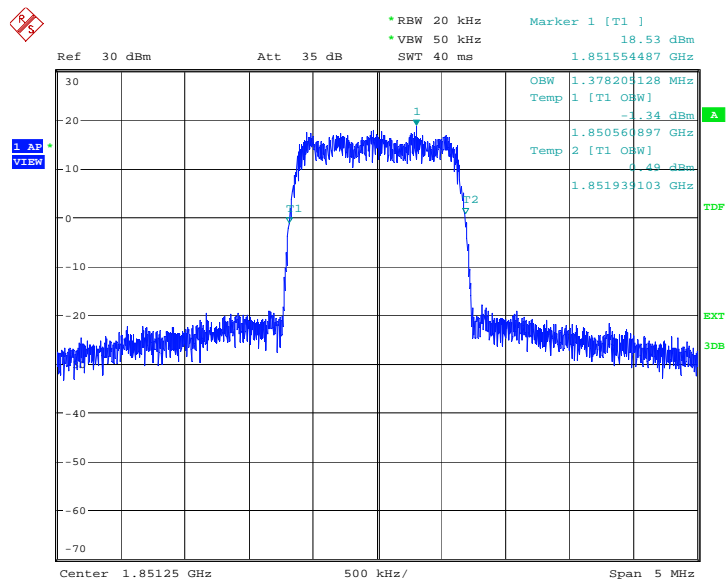
Date: 23.MAY.2014 15:54:10

**CDMA 1900 (100% BW)**

Channel	Emission Bandwidth (100% BW)( MHz)
25	1.378
600	1.386
1175	1.386

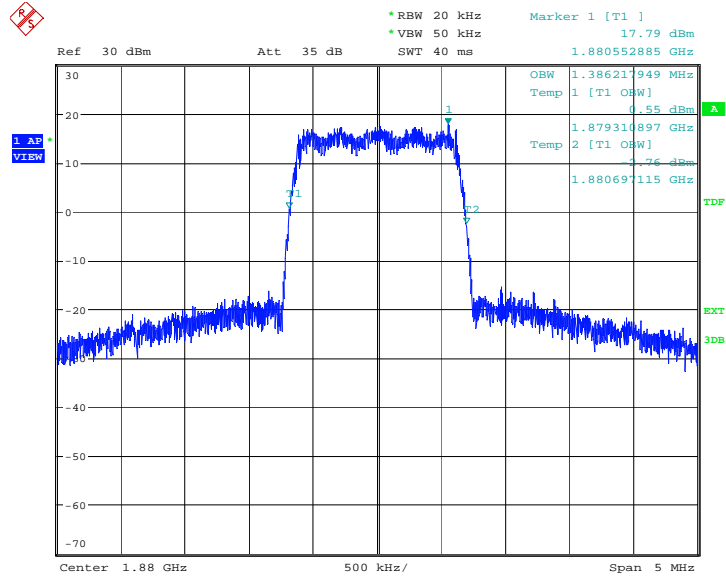
**CDMA 1900**

**Channel 25-Emission Bandwidth (100% BW)**



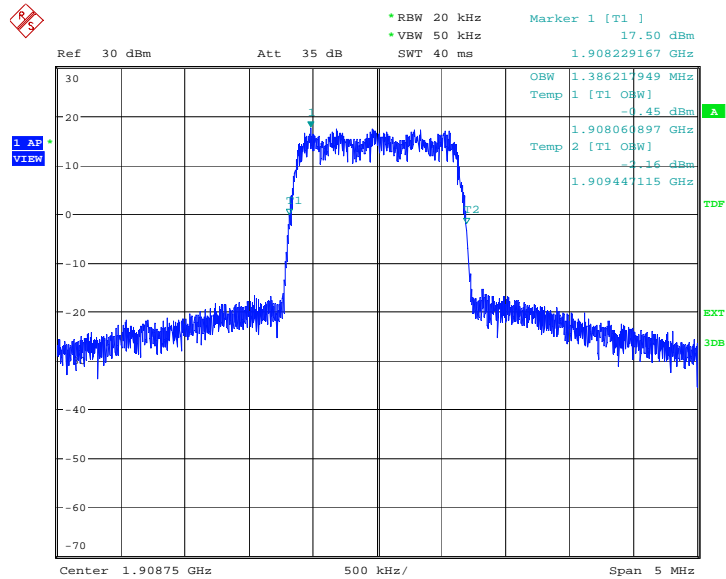
Date: 23.MAY.2014 15:49:13

### Channel 600-Emission Bandwidth (100% BW)



Date: 23.MAY.2014 15:36:13

### Channel 1175-Emission Bandwidth (100% BW)



Date: 23.MAY.2014 15:31:21

## A.7 BAND EDGE COMPLIANCE

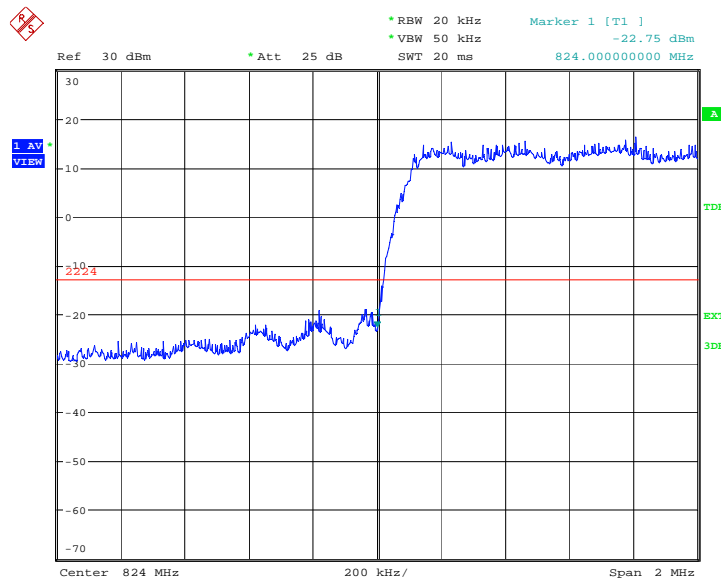
### Test Condition

RBW	VBW	Span	Sweptime	Detector	Trace Mode
20KHz	50KHz	2MHz	20ms	Average	Max Hold

Search the peak marker below low frequency for low band edge or above high frequency for high band edge.

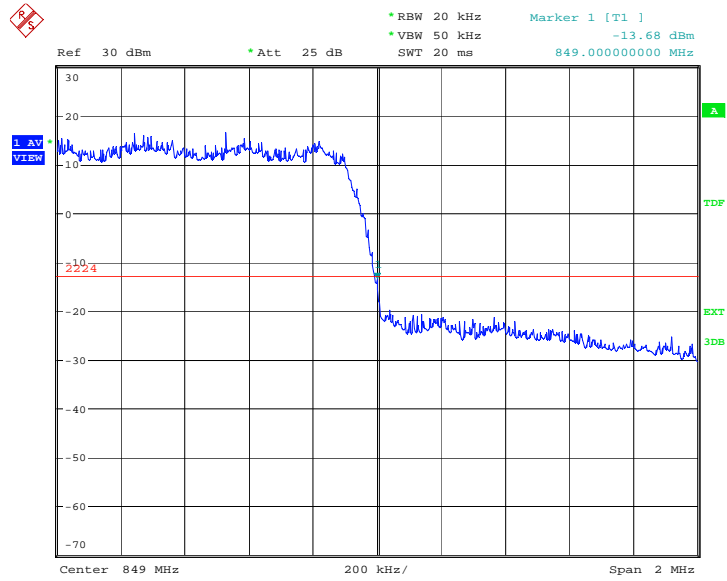
### CDMA 800

#### BAND EDGE BLOCK-Channel 1013



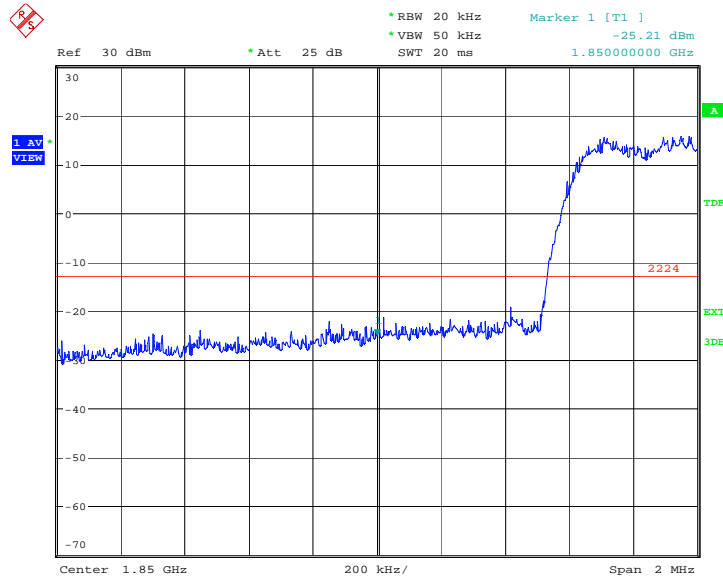
Date: 23.MAY.2014 16:29:46

### HIGH BAND EDGE BLOCK-Channel 777



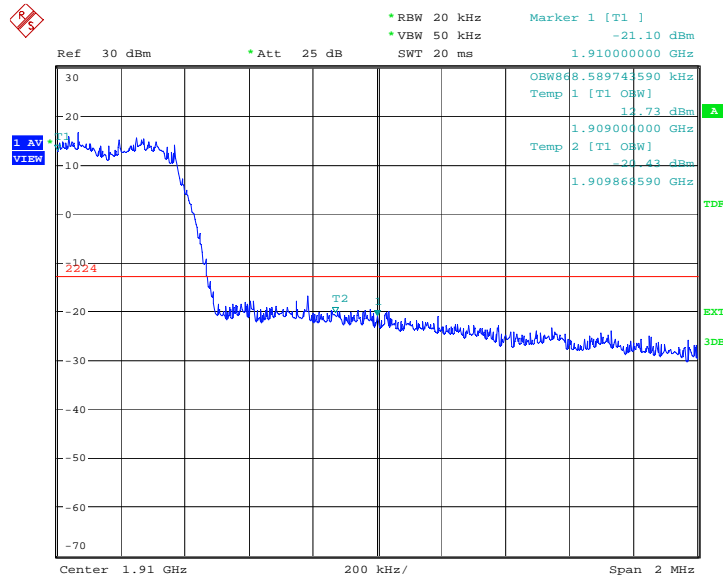
Date: 23.MAY.2014 16:30:59

**CDMA 1900  
BAND EDGE BLOCK-Channel 25**



Date: 23.MAY.2014 16:34:40

**HIGH BAND EDGE BLOCK-Channel 1175**



Date: 23.MAY.2014 15:31:33

## **A.8 CONDUCTED SPURIOUS EMISSION**

### **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 CDMA1900, , data taken from 30 MHz to 20 GHz. For CDMA800, data taken from 30 MHz to 10GHz.
2. The sweep time is set automatically by instrument itself. That should be the optimal sweep time for the span and the RBW. If the sweep time is too short, that is sweep is too fast, the sweep result is not accurate; If the sweep time is too long, that is sweep is too low, some frequency components may be lost. The instrument will give a optimal sweep time according the selected span and RBW.
3. The procedure to get the conducted spurious emission is as follows:  
The trace mode is set to MaxHold to get the highest signal at each frequency;  
Wait 25 seconds;  
Get the result.
4. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

#### **CDMA 800 Transmitter**

Channel	Frequency (MHz)
1013	824.70
384	836.52
777	848.31

#### **CDMA 1900 Transmitter**

Channel	Frequency (MHz)
25	1851.25
600	1880.00
1175	1908.75

### **A. 8.2 Measurement Limit**

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

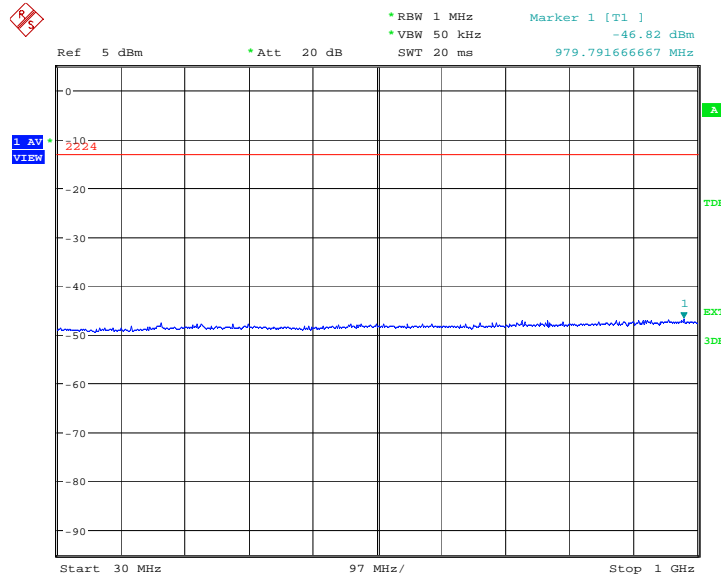
The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

### A.8.3 Measurement result

#### CDMA 1900

##### A. 8.3.1 Channel 25: 30MHz –1GHz

Spurious emission limit –13dBm.

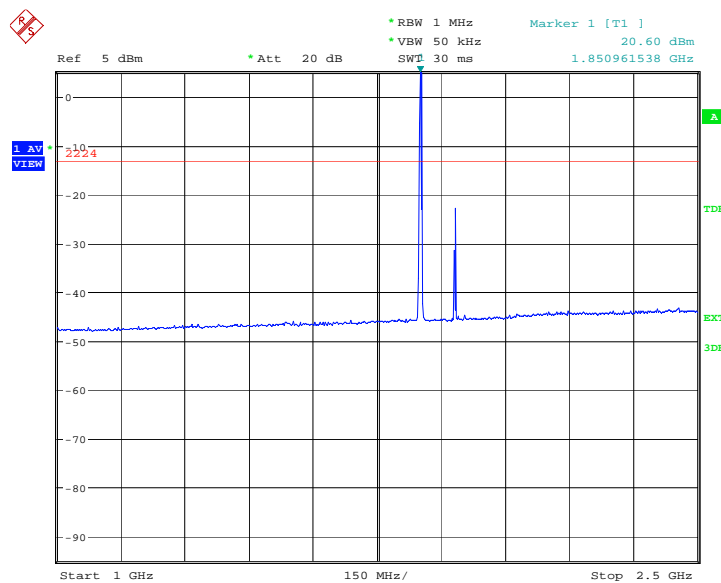


Date: 23.MAY.2014 15:49:52

##### A.8.3.2 Channel 25: 1GHz –2.5GHz

Spurious emission limit –13dBm.

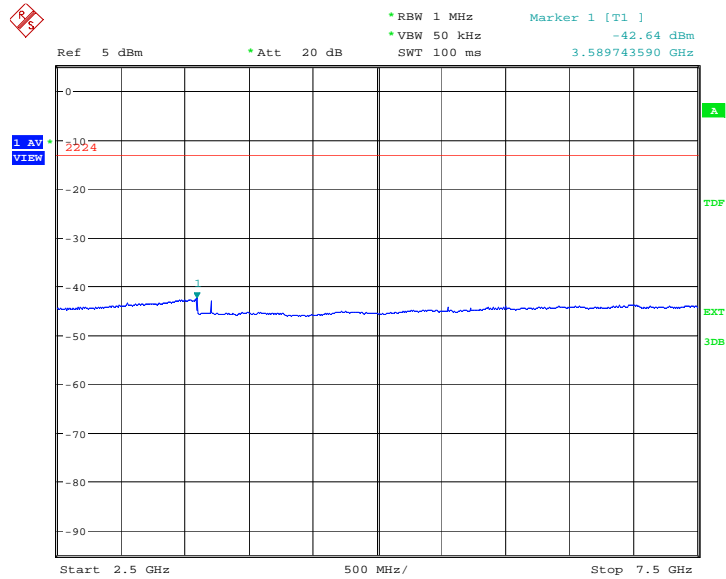
**NOTE: peak above the limit line is the carrier frequency.**



Date: 23.MAY.2014 15:50:19

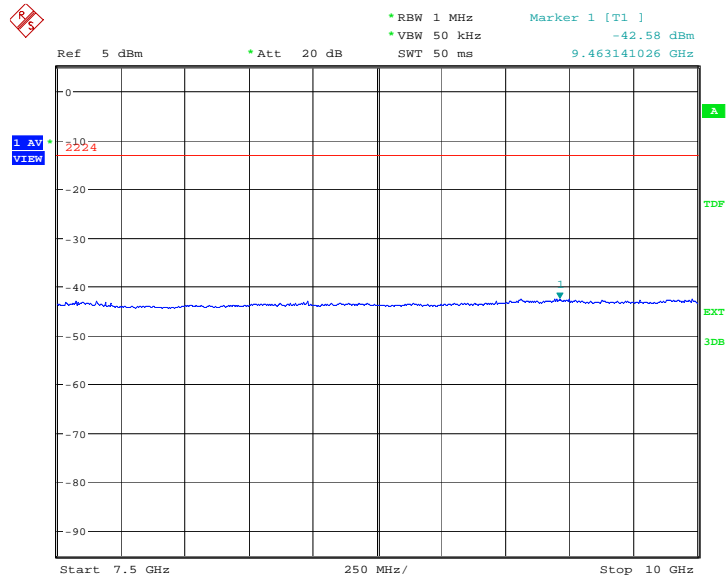


**A.8.3.3 Channel 25: 2.5GHz –7.5GHz**  
Spurious emission limit –13dBm.



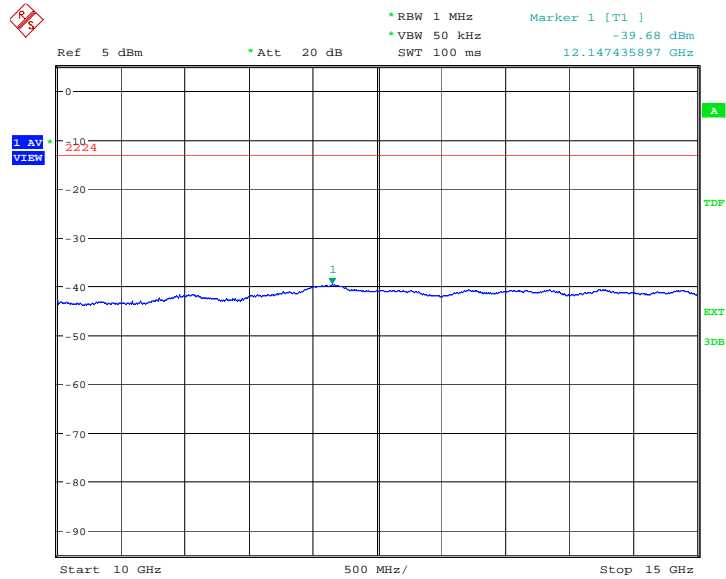
Date: 23.MAY.2014 15:50:46

**A.8.3.4 Channel 25: 7.5GHz –10GHz**  
Spurious emission limit –13dBm.



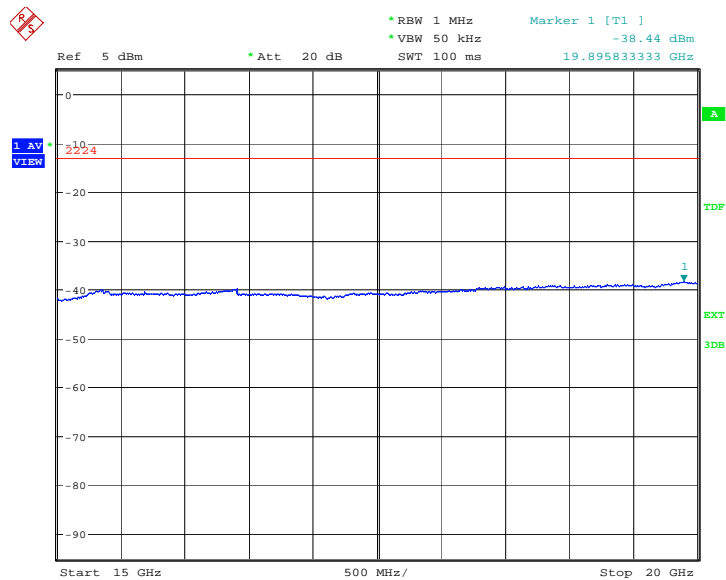
Date: 23.MAY.2014 15:51:13

**A.8.3.5 Channel 25: 10GHz –15GHz**  
Spurious emission limit –13dBm.



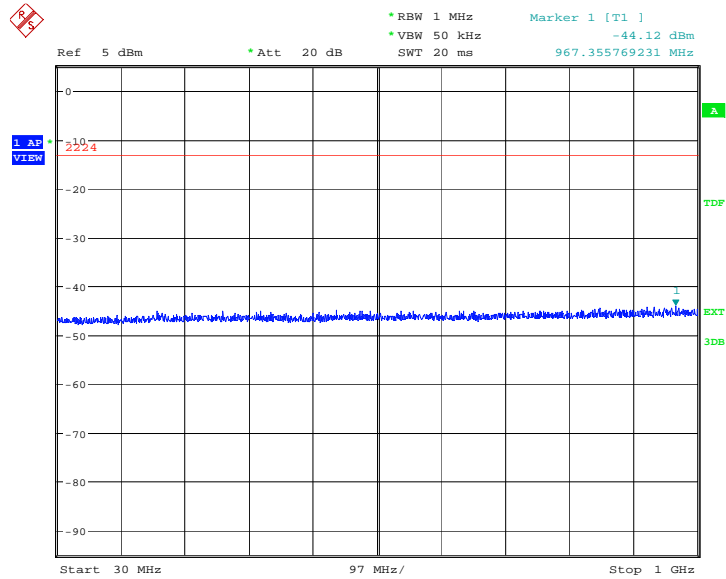
Date: 23.MAY.2014 15:51:40

**A.8.3.6 Channel 25: 15GHz –20GHz**  
Spurious emission limit –13dBm.



Date: 23.MAY.2014 15:52:07

**A. 8.3.7 Channel 600: 30MHz –1GHz**  
Spurious emission limit –13dBm.

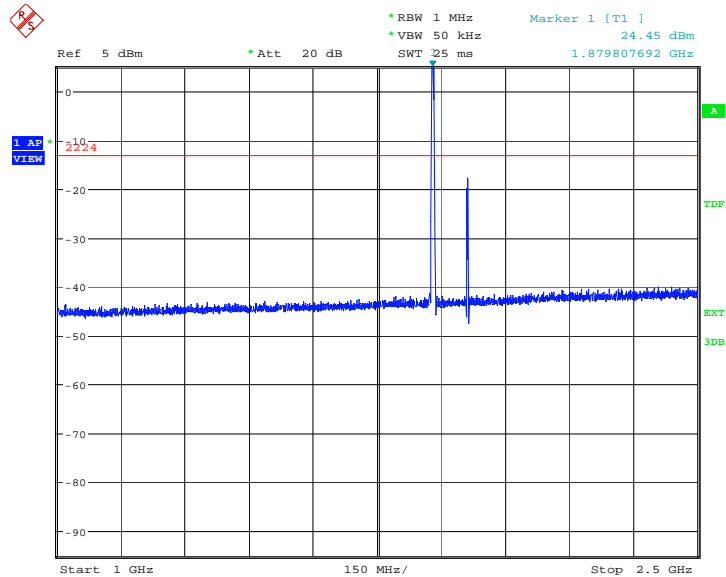


Date: 23.MAY.2014 15:36:40

**A.8.3.8 Channel 600: 1GHz –2.5GHz**

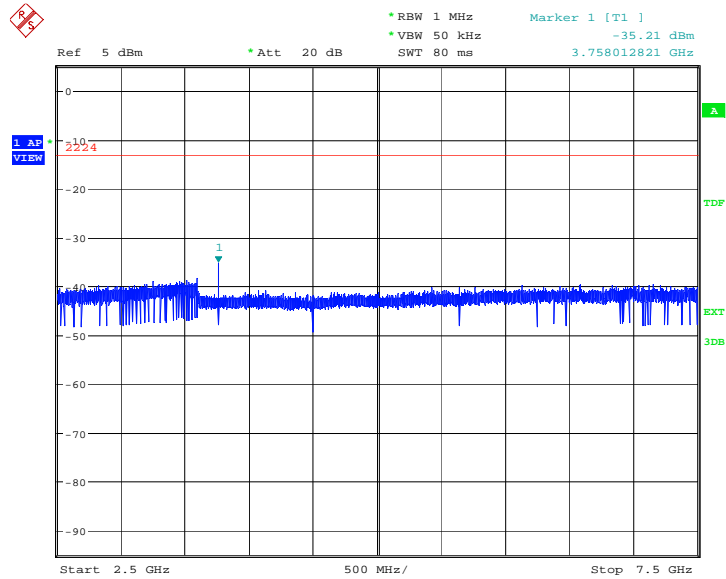
Spurious emission limit –13dBm.

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



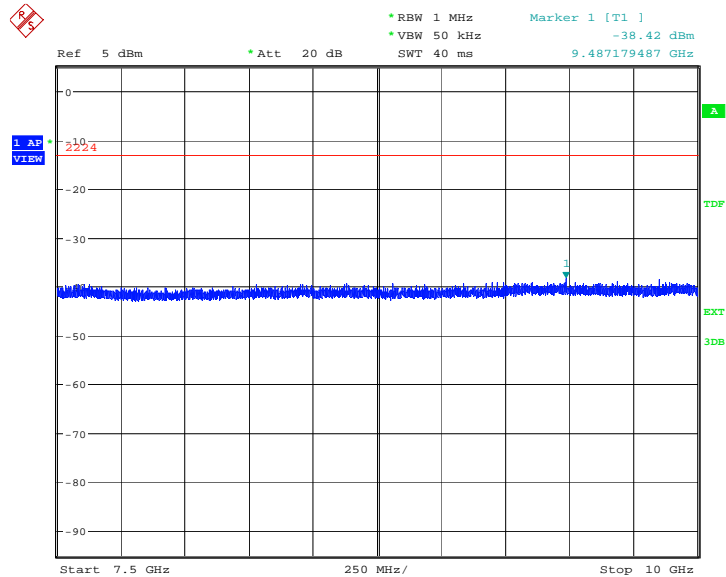
Date: 23.MAY.2014 15:37:07

**A.8.3.9 Channel 600: 2.5GHz –7.5GHz**  
Spurious emission limit –13dBm.



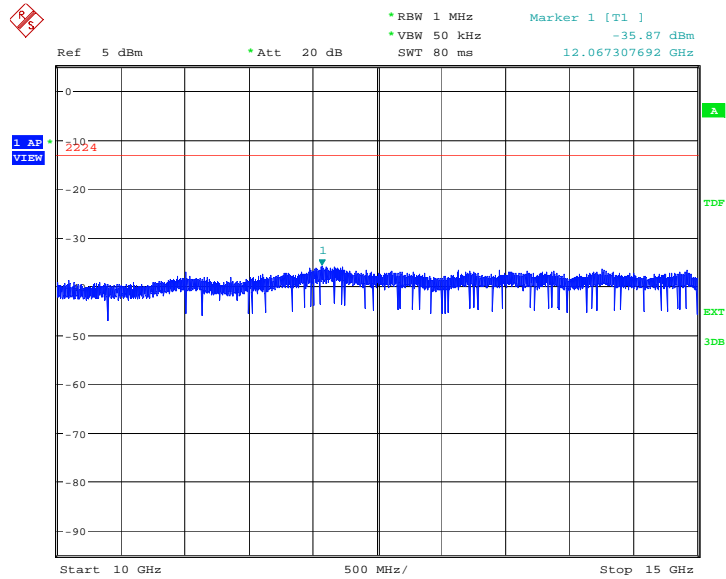
Date: 23.MAY.2014 15:37:34

**A.8.3.10 Channel 600: 7.5GHz –10GHz**  
Spurious emission limit –13dBm.



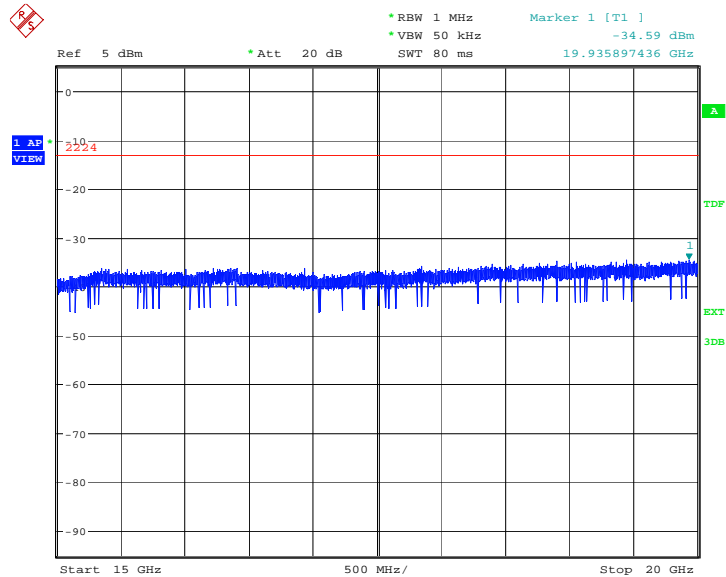
Date: 23.MAY.2014 15:38:01

**A.8.3.11 Channel 600: 10GHz –15GHz**  
Spurious emission limit –13dBm.



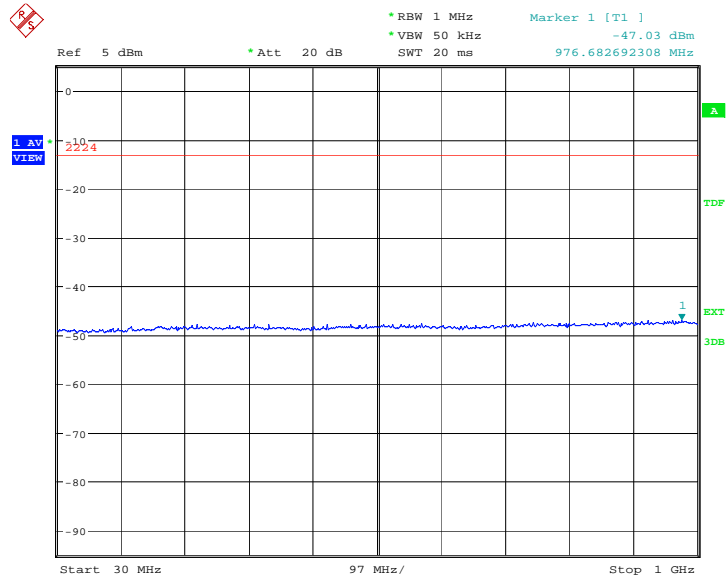
Date: 23.MAY.2014 15:38:28

**A.8.3.12 Channel 600: 15GHz –20GHz**  
Spurious emission limit –13dBm.



Date: 23.MAY.2014 15:38:55

**A. 8.3.13 Channel 1175: 30MHz –1GHz**  
Spurious emission limit –13dBm.

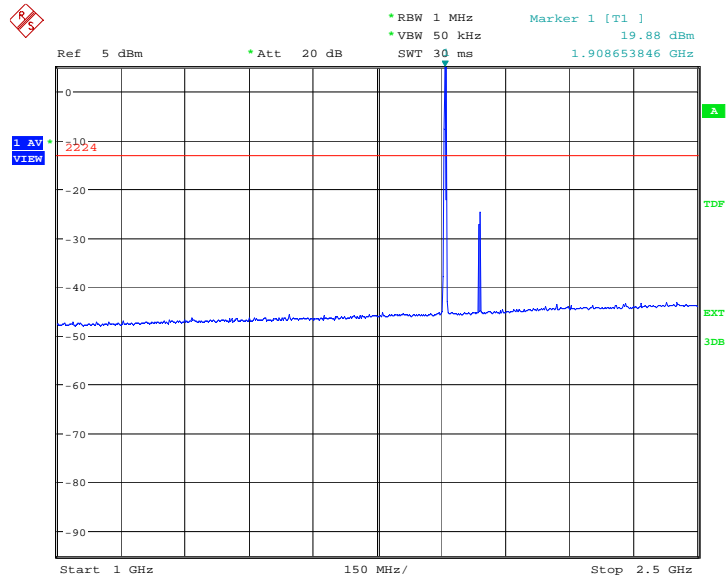


Date: 23.MAY.2014 15:32:00

**A.8.3.14 Channel 1175: 1GHz –2.5GHz**

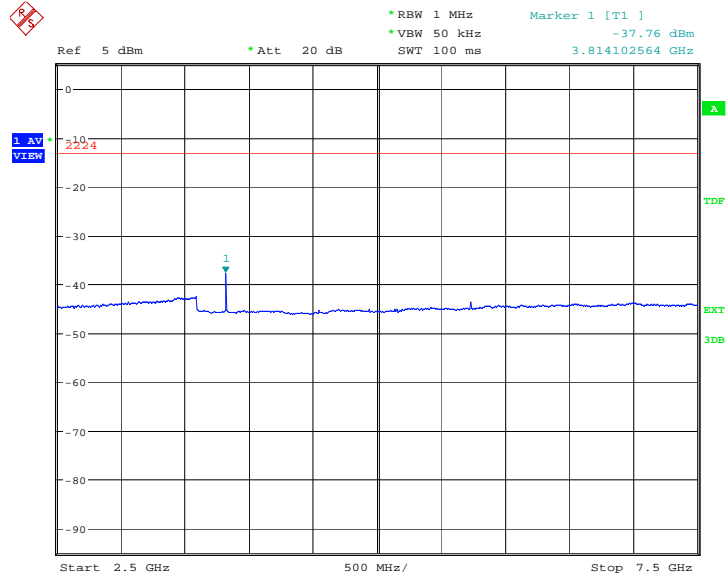
Spurious emission limit –13dBm.

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



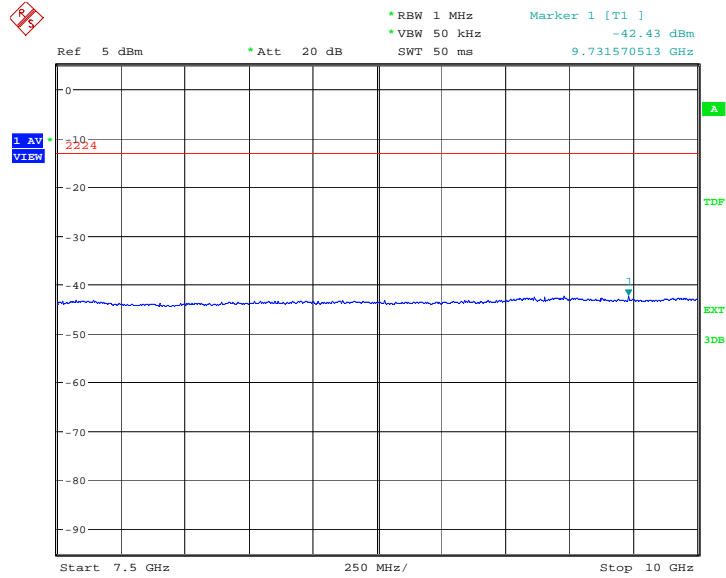
Date: 23.MAY.2014 15:32:27

**A.8.3.15 Channel 1175: 2.5GHz –7.5GHz**  
Spurious emission limit –13dBm.



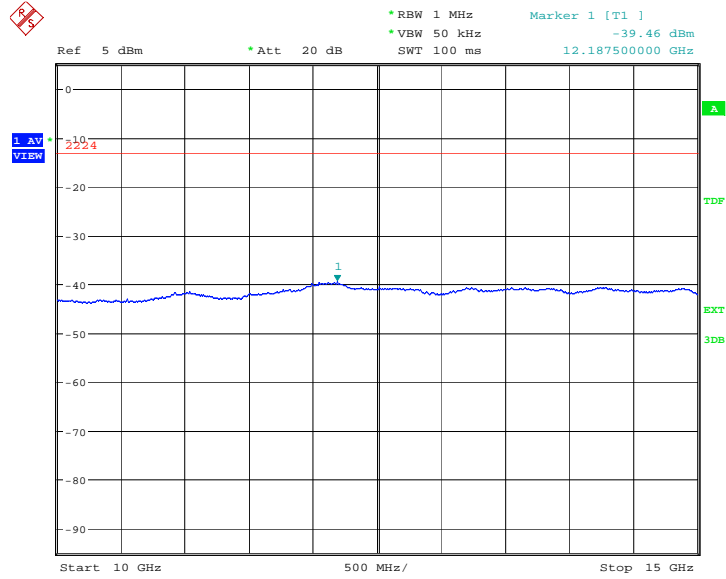
Date: 23.MAY.2014 15:32:54

**A.8.3.16 Channel 1175: 7.5GHz –10GHz**  
Spurious emission limit –13dBm.



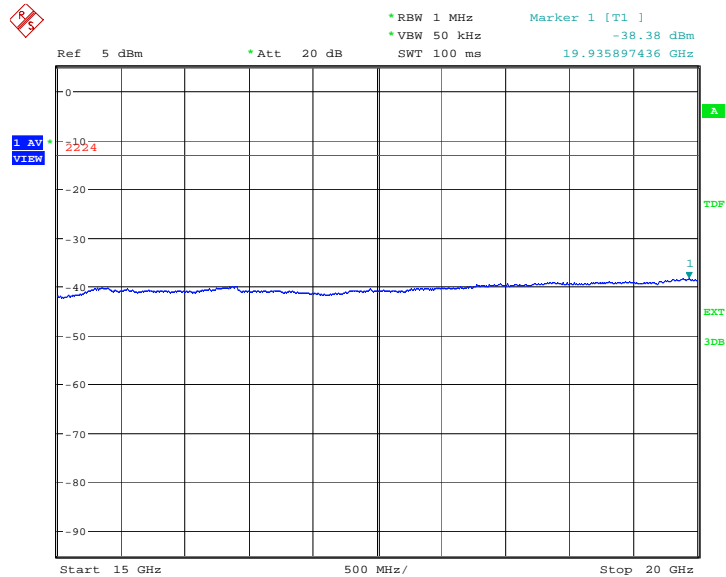
Date: 23.MAY.2014 15:33:21

**A.8.3.17 Channel 1175: 10GHz –15GHz**  
Spurious emission limit –13dBm.



Date: 23.MAY.2014 15:33:48

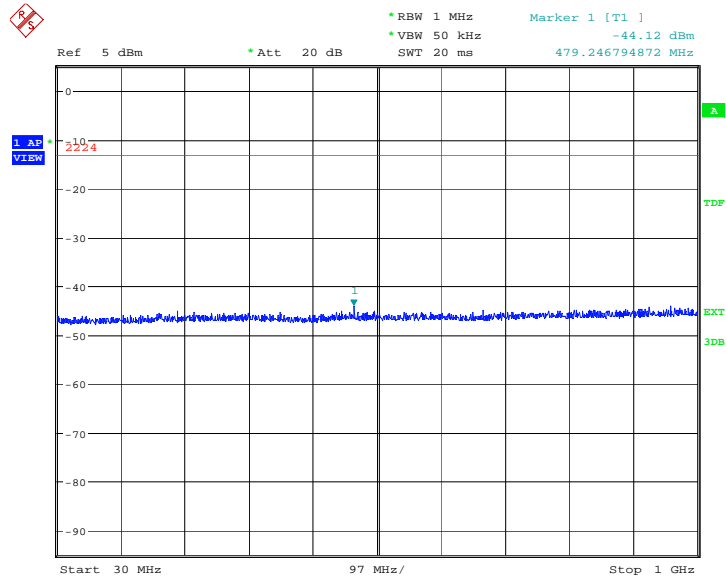
**A.8.3.18 Channel 1175: 15GHz –20GHz**  
Spurious emission limit –13dBm.



Date: 23.MAY.2014 15:34:15

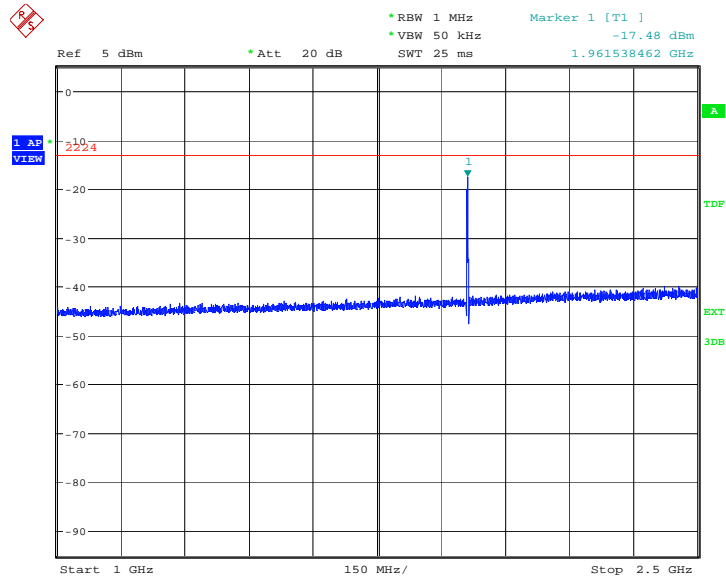


**A. 8.3.19 Idle mode: 30MHz –1GHz**  
Spurious emission limit –13dBm.



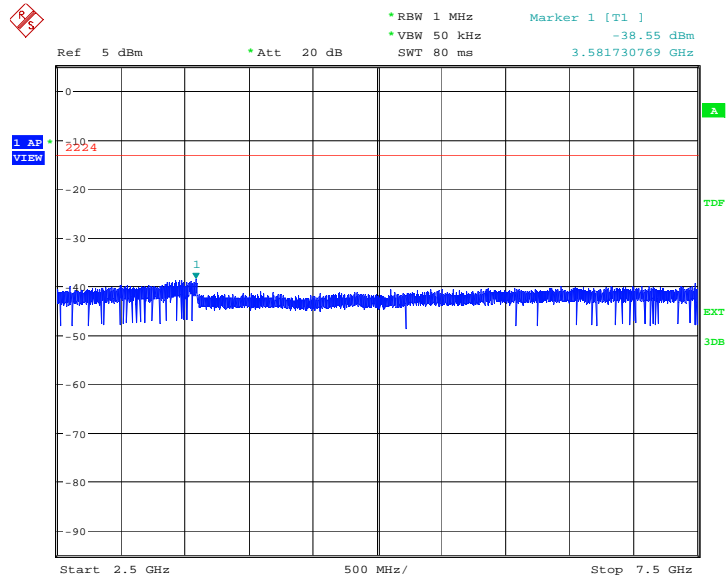
Date: 23.MAY.2014 15:40:15

**A.8.3.20 Idle mode: 1GHz –2.5GHz**  
Spurious emission limit –13dBm.



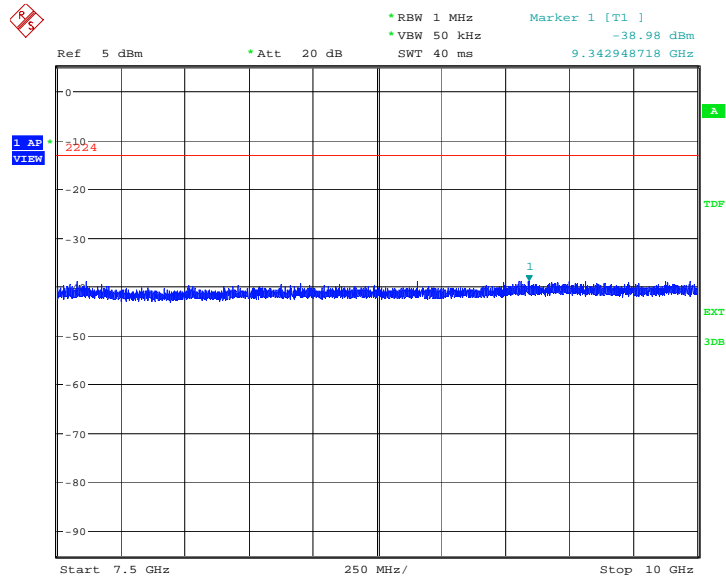
Date: 23.MAY.2014 15:40:42

**A.8.3.21 Idle mode: 2.5GHz –7.5GHz**  
Spurious emission limit –13dBm.



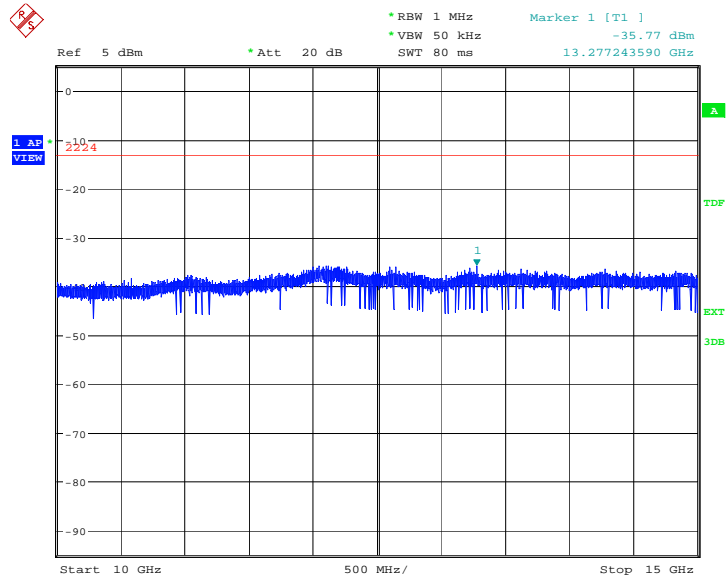
Date: 23.MAY.2014 15:41:09

**A.8.3.22 Idle mode: 7.5GHz –10GHz**  
Spurious emission limit –13dBm.



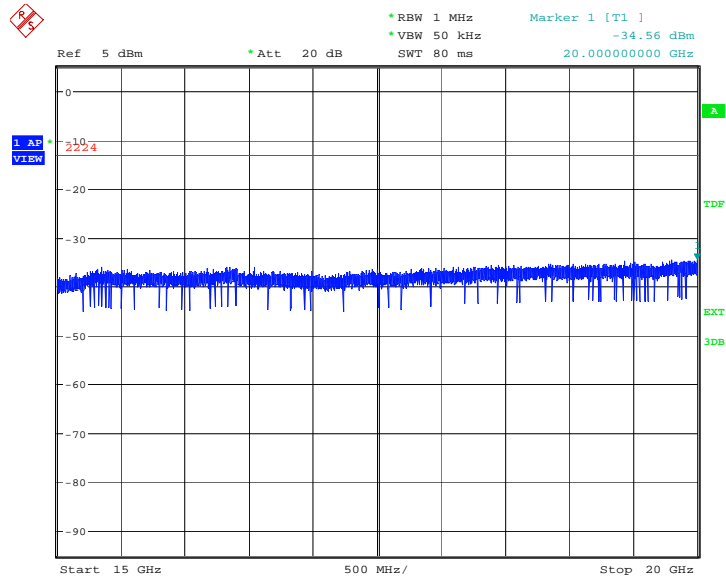
Date: 23.MAY.2014 15:41:36

**A.8.3.23 Idle mode: 10GHz –15GHz**  
Spurious emission limit –13dBm.



Date: 23.MAY.2014 15:42:02

**A.8.3.24 Idle mode: 15GHz –20GHz**  
Spurious emission limit –13dBm.



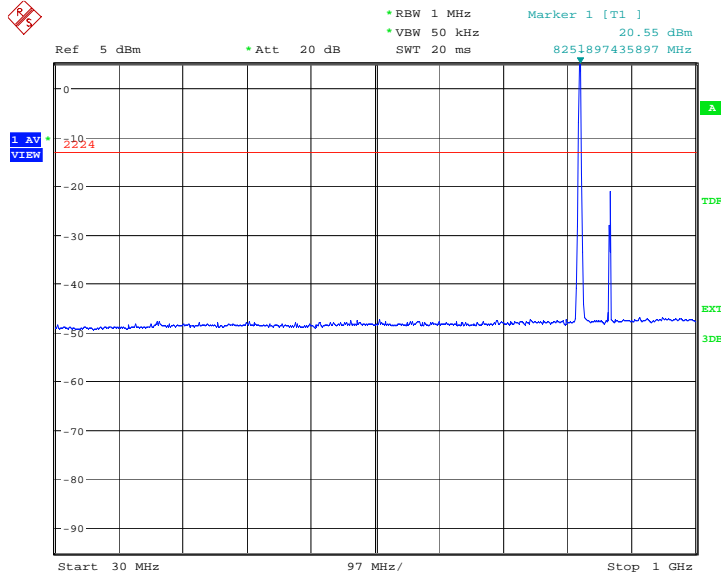
Date: 23.MAY.2014 15:42:29

**CDMA 800**

**A. 8.3.25 Channel 1013: 30MHz –1GHz**

Spurious emission limit –13dBm.

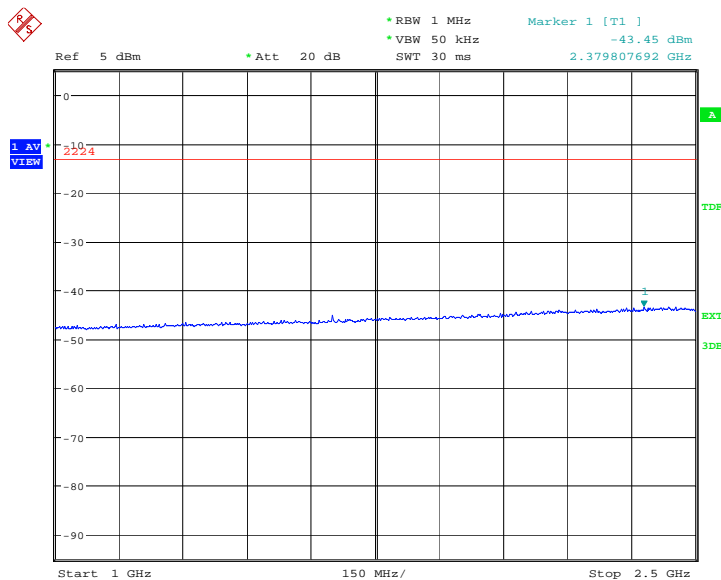
**NOTE: peak above the limit line is the carrier frequency.**



Date: 23.MAY.2014 14:59:28

**A. 8.3.26 Channel 1013: 1GHz – 2.5GHz**

Spurious emission limit –13dBm.

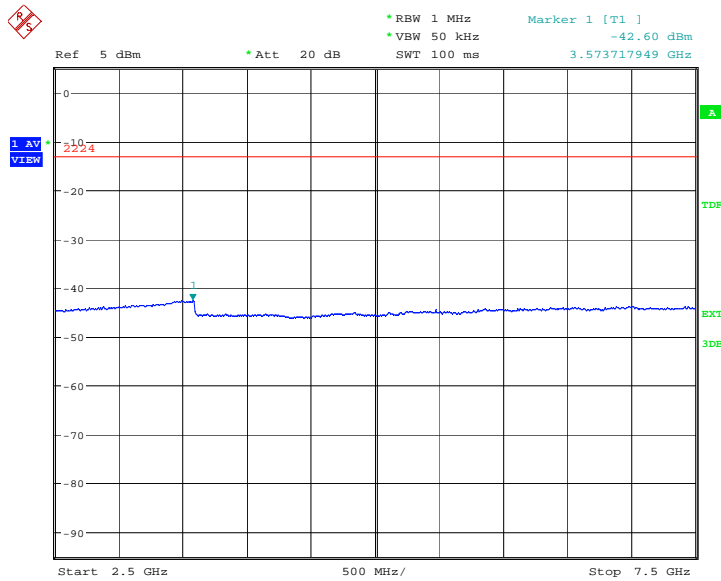


Date: 23.MAY.2014 14:59:55

**A. 8.3.27 Channel 1013: 2.5GHz –7.5GHz**

Spurious emission limit –13dBm.

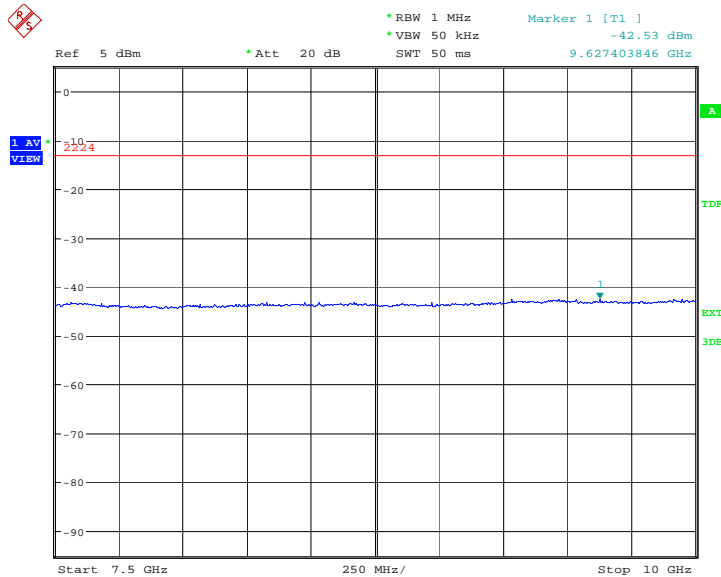
**NOTE: peak above the limit line is the carrier frequency.**



Date: 23.MAY.2014 15:00:22

**A. 8.3.28 Channel 1013: 7.5GHz – 10GHz**

Spurious emission limit –13dBm.

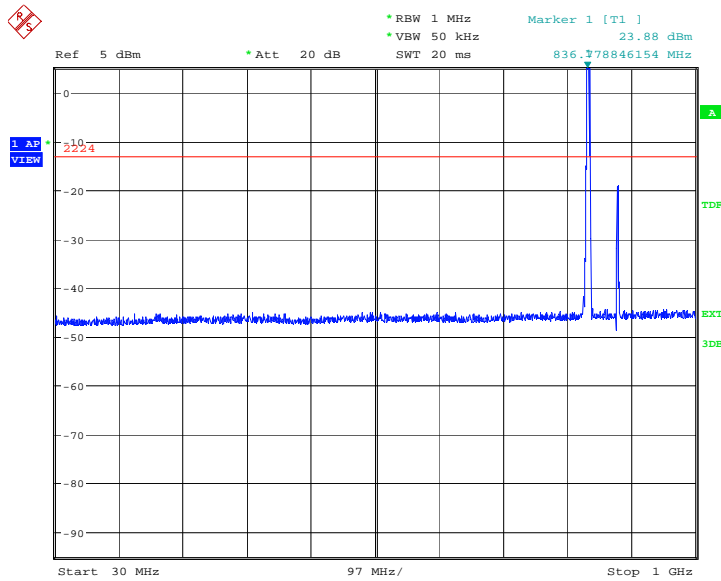


Date: 23.MAY.2014 15:00:49

**A. 8.3.29 Channel 384: 30MHz –1GHz**

Spurious emission limit –13dBm.

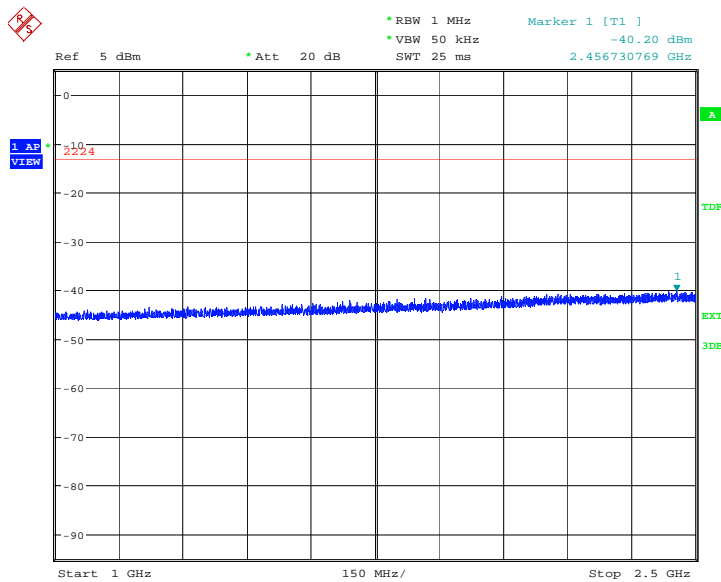
**NOTE: peak above the limit line is the carrier frequency.**



Date: 23.MAY.2014 15:03:18

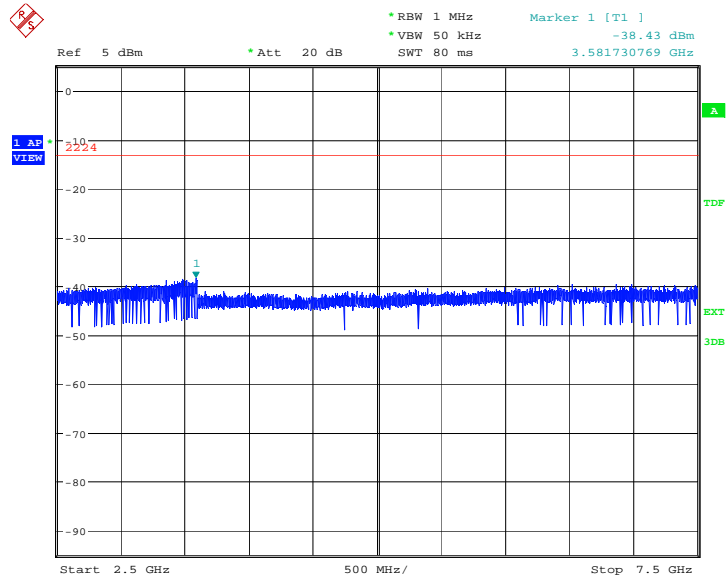
**A.8.3.30 Channel 384: 1GHz – 2.5GHz**

Spurious emission limit –13dBm.



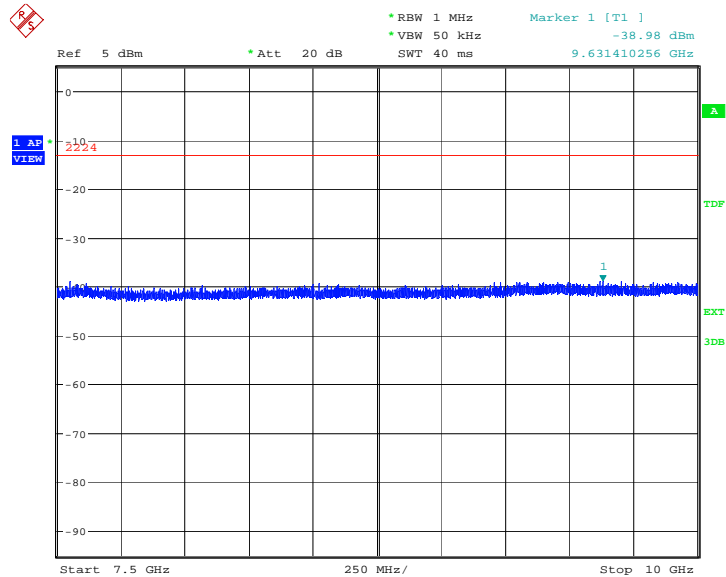
Date: 23.MAY.2014 15:03:45

**A. 8.3.31 Channel 384: 2.5GHz –7.5GHz**  
Spurious emission limit –13dBm.



Date: 23.MAY.2014 15:04:12

**A. 8.3.32 Channel 384: 7.5GHz – 10GHz**  
Spurious emission limit –13dBm.

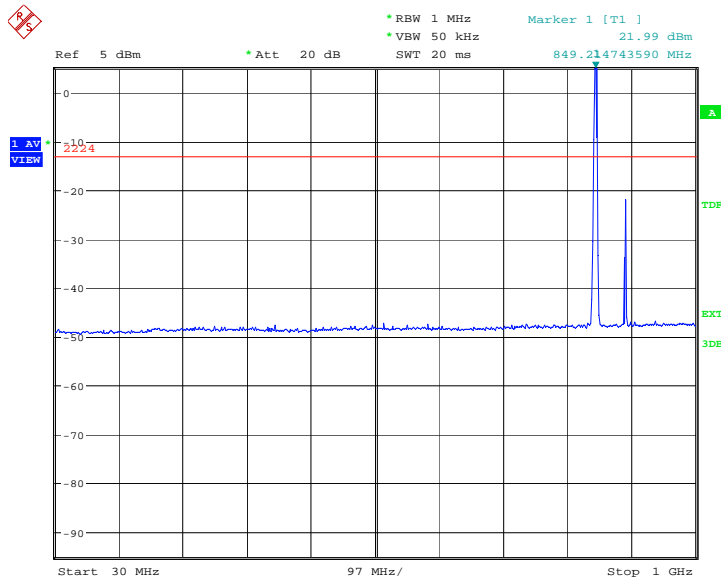


Date: 23.MAY.2014 15:04:39

**A. 8.3.33 Channel 777: 30MHz –1GHz**

Spurious emission limit –13dBm.

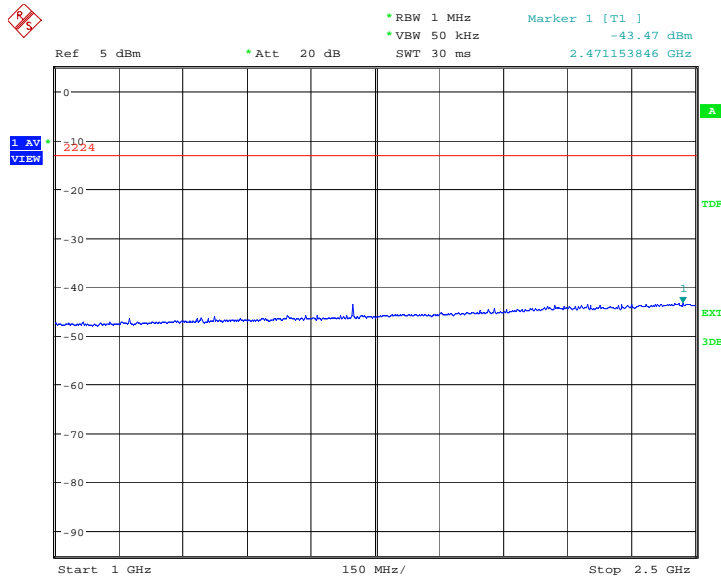
**NOTE: peak above the limit line is the carrier frequency.**



Date: 23.MAY.2014 15:54:49

**A. 8.3.34 Channel 777: 1GHz – 2.5GHz**

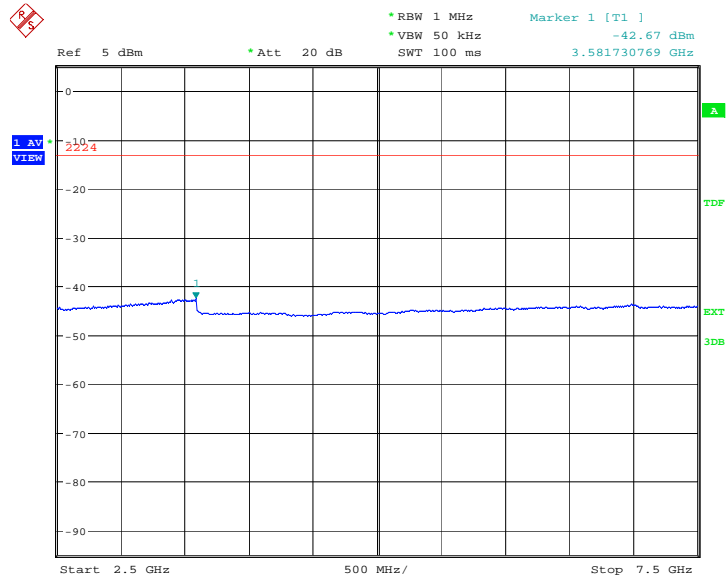
Spurious emission limit –13dBm.



Date: 23.MAY.2014 15:55:16

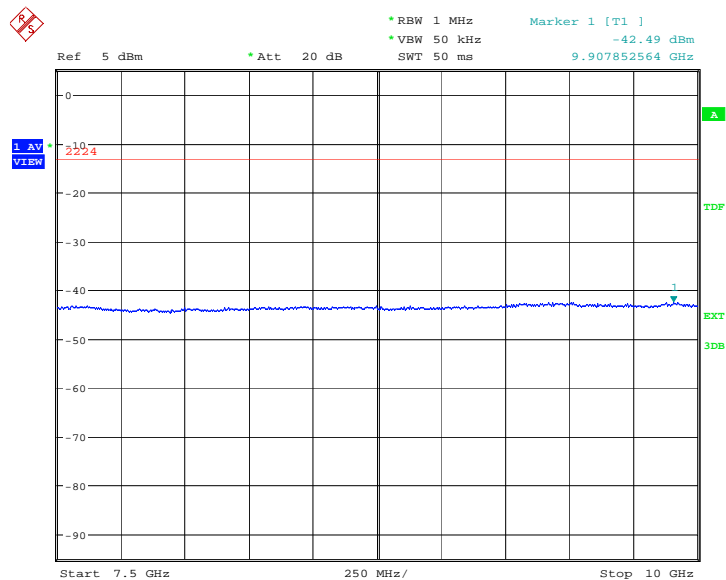


**A. 8.3.35 Channel 777: 2.5GHz –7.5GHz**  
Spurious emission limit –13dBm.



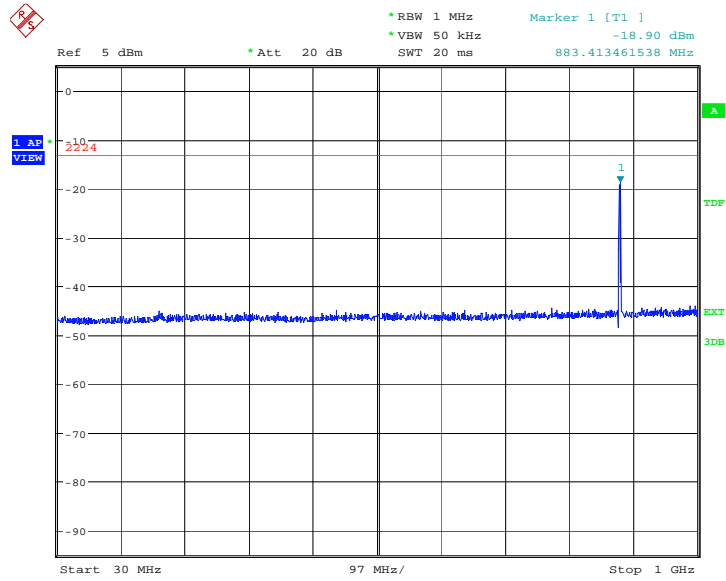
Date: 23.MAY.2014 15:55:43

**A. 8.3.36 Channel 777: 7.5GHz – 10GHz**  
Spurious emission limit –13dBm.



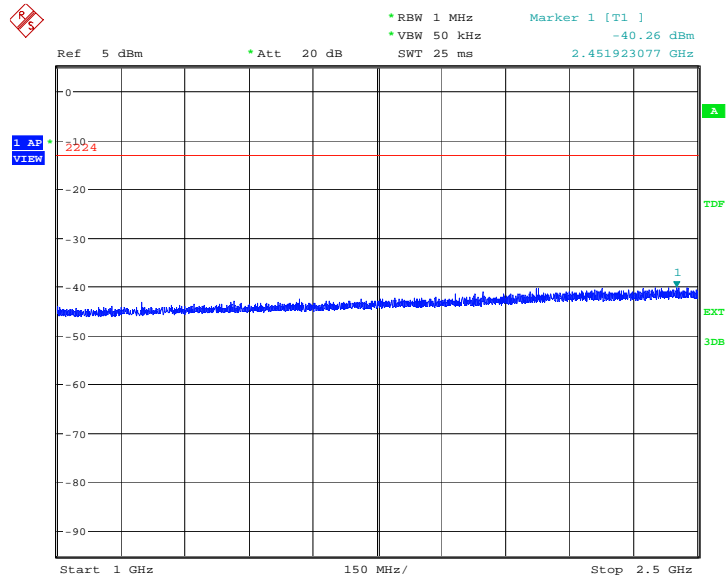
Date: 23.MAY.2014 15:56:10

**A. 8.3.37 Idle mode: 30MHz – 1GHz**  
Spurious emission limit -13dBm.



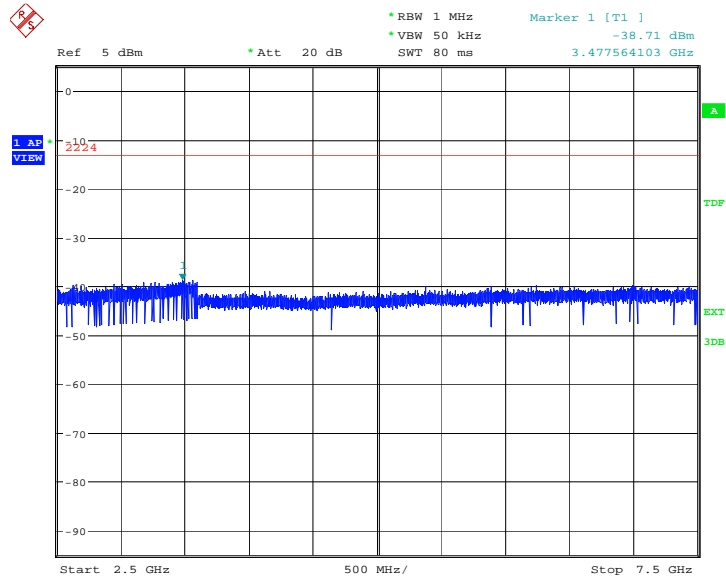
Date: 23.MAY.2014 15:05:38

**A.8.3.38 Idle mode: 1GHz – 2.5GHz**  
Spurious emission limit -13dBm.



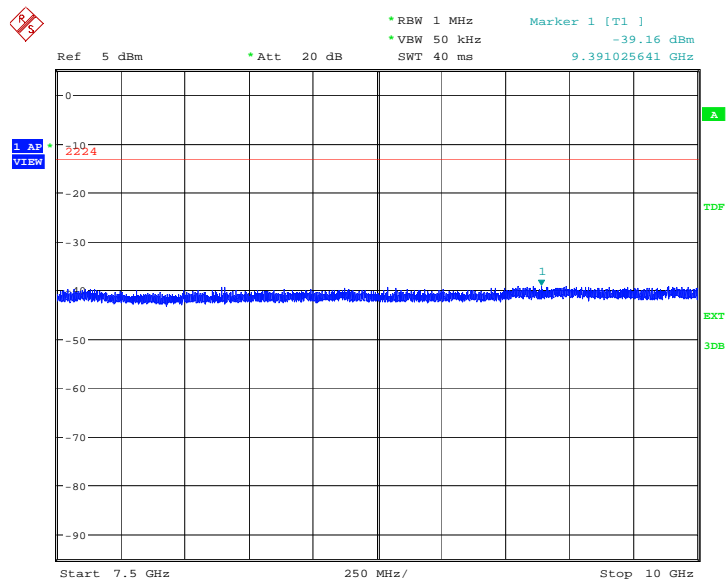
Date: 23.MAY.2014 15:06:05

**A.8.3.39 Idle mode: 2.5GHz – 7.5GHz**  
Spurious emission limit -13dBm.



Date: 23.MAY.2014 15:06:32

**A.8.3.40 Idle mode: 7.5GHz – 10GHz**  
Spurious emission limit -13dBm.



Date: 23.MAY.2014 15:06:59

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