# TEST REPORT

## No. I16Z40480-GTE02

**for**

**TCL Communication Ltd.**

**GSM Quad-band/UMTS Tri-band / LTE Tri-band mobile phone**

**Model Name: 5056N，5056W**

**FCC ID: 2ACCJB062**

**with**

**Hardware Version: 02**

**Software Version: VUB5M**

**Issued Date: 2016-05-13**

**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 CTTL.

**Test Laboratory:**

***FCC 2.948 Listed: No.525429***

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

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# REPORT HISTORY

| Report Number | Revision | Description | Issue Date |
|---|---|---|---|
| I16Z40480-GTE02 | Rev.0 | 1st edition | 2016-05-13 |

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# 1. Test Laboratory

## 1.1. Testing Location

| | |
|---|---|
| Company Name: | CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT |
| Address: | No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191. |

## 1.2. Testing Environment

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

## 1.3. Project data

| | |
|---|---|
| Testing Start Date: | 2016-04-26 |
| Testing End Date: | 2016-05-11 |

## 1.4. Signature

沈忆

**Shen Yi**

**(Prepared this test report)**

钟楠

**Zhong Nan**

**(Reviewed this test report)**

孙向前

**Sun Xiang Qian**

**Deputy Director of the laboratory**

**(Approved this test report)**

# 2. Client Information

## 2.1. Applicant Information

| | |
|---|---|
| Company Name: | TCL Communication Ltd. |
| Address /Post: | 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203 |
| Contact Person: | Gong Zhizhou |
| Contact Email | zhizhou.gong@tcl.com |
| Telephone: | 0086-21-31363544 |
| Fax: | 0086-21-61460602 |

## 2.2. Manufacturer Information

| | |
|---|---|
| Company Name: | TCL Communication Ltd. |
| Address /Post: | 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203 |
| Contact Person: | Gong Zhizhou |
| Contact Email | zhizhou.gong@tcl.com |
| Telephone: | 0086-21-31363544 |
| Fax: | 0086-21-61460602 |

# 3. Equipment UnderTest (EUT) and Ancillary Equipment (AE)

## 3.1. About EUT

| | |
|---|---|
| Description | GSM Quad-band/UMTS Tri-band / LTE Tri-band mobile phone |
| Model Name | 5056N，5056W |
| FCC ID | 2ACCJB062 |
| Antenna | Integrated |
| Output power | 23.42dBm maximum EIRP measured for WCDMA Band IV |
| Extreme vol. Limits | 3.55VDC 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 CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

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

| EUT ID* | IMEI | HW Version | SW Version |
|---|---|---|---|
| UT23a | 014650000100475 | 02 | VUB5M |
| UT28a | 014650000100368 | 02 | VUB5M |

*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 |
|---|---|
| AE1 | Battery |
| AE2 | Travel charger |

AE1

| | |
|---|---|
| Model | TLp025C2 |
| Manufacturer | SCUD |
| Capacitance | 2500mAh |

AE2

| | |
|---|---|
| Model | CBA0058AGAC2 |
| Manufacturer | TENPAO |

*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 GSM Quad-band/UMTS Tri-band / LTE Tri-band mobile phone with integrated antenna. 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.

| Reference | Title | Version |
|---|---|---|
| FCC Part 24 | PERSONAL COMMUNICATIONS SERVICES | 10-1-15 Edition |
| FCC Part 22 | PUBLIC MOBILE SERVICES | 10-1-15 Edition |
| FCC Part 27 | MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES | 10-1-15 Edition |
| ANSI/TIA-603-D | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards | 2015 |
| 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 | 2014 |
| KDB 971168 D01 | MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS | v02r02 |

# 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

**WCDMA Band II**

| Items | Test Name | Clause in FCC rules | Verdict |
|---|---|---|---|
| 1 | Output Power | 24.232(c) | P |
| 2 | Emission Limit | 24.238, 2.1051 | P |
| 3 | Frequency Stability | 24.235, 2.1055 | P |
| 4 | Occupied Bandwidth | 2.1049(h)(i) | P |
| 5 | Emission Bandwidth | 24.238(b) | P |
| 6 | Band Edge Compliance | 24.238(b) | P |
| 7 | Conducted Spurious Emission | 24.238, 2.1057 | P |
| 8 | Peak-to-Average Power Ratio | 24.232(d) | P |

**WCDMA Band V**

| Items | Test Name | Clause in FCC rules | Verdict |
|---|---|---|---|
| 1 | Output Power | §2.1046(a), 22.913(a) | P |
| 2 | Emission Limit | 22.917, 2.1051 | P |
| 3 | Frequency Stability | 22.235, 2.1055 | P |
| 4 | Occupied Bandwidth | 2.1049(h)(i) | P |
| 5 | Emission Bandwidth | 22.917(b) | P |
| 6 | Band Edge Compliance | 22.917(b) | P |
| 7 | Conducted Spurious Emission | 22.917, 2.1057 | P |

**WCDMA Band IV**

| Items | Test Name | Clause in FCC rules | Verdict |
|---|---|---|---|
| 1 | Output Power | 27.50(d)(4) | P |
| 2 | Emission Limit | 27.53(h), 2.1051 | P |
| 3 | Frequency Stability | 27.54, 2.1055 | P |
| 4 | Occupied Bandwidth | 2.1049(h)(i) | P |
| 5 | Emission Bandwidth | 27.53(h) | P |
| 6 | Band Edge Compliance | 27.53(h) | P |
| 7 | Conducted Spurious Emission | 27.53(h), 2.1057 | P |
| 8 | Peak-to-Average Power Ratio | 27.50(a) | P |

## 7. TestEquipments Utilized

| NO. | Description | TYPE | series number | MANUFACTURE | CAL DUE DATE | Calibration interval |
|---|---|---|---|---|---|---|
| 1 | Test Receiver | ESU26 | 100235 | R&S | 2017-03-02 | 1 year |
| 2 | Test Receiver | ESU26 | 100376 | R&S | 2016-10-29 | 1 year |
| 3 | EMI Antenna | VULB 9163 | 302 | Schwarzbeck | 2017-01-03 | 3 year |
| 4 | EMI Antenna | 3117 | 00119024 | ETS-Lindgren | 2017-01-20 | 3 year |
| 5 | LISN | ENV216 | 101200 | R&S | 2016-07-07 | 1 year |
| 6 | Universal Radio Communication Tester | CMU200 | 108646 | R&S | 2016-10-27 | 1 year |
| 7 | Universal Radio Communication Tester | E5515C | MY48361083 | Agilent | 2016-07-06 | 1 year |
| 8 | Spectrum Analyzer | E4440A | MY48250642 | Agilent | 2017-03-02 | 1 year |
| 9 | EMI Antenna | 9117 | 177 | Schwarzbeck | 2017-06-25 | 3 year |
| 10 | EMI Antenna | VULB9163 | 9163-234 | Schwarzbeck | 2016-09-15 | 3 year |
| 11 | Signal Generator | N5183A | MY49060052 | Agilent | 2017-03-07 | 1 year |
| 12 | Climate chamber | SH-241 | 92007454 | ESPEC | 2017-12-14 | 2 year |
| 13 | Loop Antenna | HFH2-Z2 | 829324/007 | R&S | 2017-12-10 | 3 year |

# 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, 1852.4 MHz, 1880.0MHz and 1907.6MHz for WCDMA Band II;826.4MHz, 836.6MHz and 846.6MHz for WCDMA Band V and 1712.4MHz, 1740MHz, and 1752.6MHz for WCDMA Band IV(bottom, middle and top of operational frequency range).

**Limit**

According to FCC§2.1046.

**WCDMA Band II**

**Measurement result**

| | CH | Frequency(MHz) | output power(dBm) |
|---|---|---|---|
| WCDMA (Band II) | 9262 | 1852.4 | 22.81 |
| | 9400 | 1880.0 | 22.79 |
| | 9538 | 1907.6 | 22.86 |

**WCDMA Band V**

**Measurement result**

| | CH | Frequency(MHz) | output power(dBm) |
|---|---|---|---|
| WCDMA (Band V) | 4132 | 826.4 | 22.79 |
| | 4183 | 836.6 | 22.85 |
| | 4233 | 846.6 | 22.77 |

**WCDMA Band IV**

**Measurement result**

| | CH | Frequency(MHz) | output power(dBm) |
|---|---|---|---|
| WCDMA (Band IV) | 1312 | 1712.4 | 22.90 |
| | 1450 | 1740.0 | 22.89 |
| | 1513 | 1752.6 | 22.83 |

**A.1.3 Radiated**

**A.1.3.1 Description**

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

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

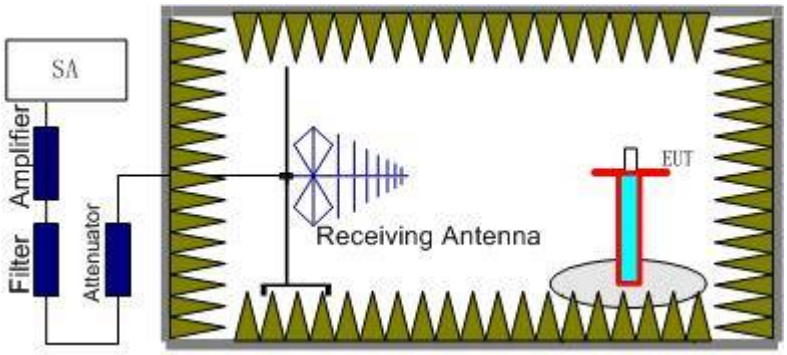
Rule Part 22.913(a) specifies ” The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

Rule Part 27.50(d)(2) specifies, "Fixed, mobile, and portable (handheld)stations operating in the 1710–1755MHz band are limited to a peak EIRPof 1 watt.”

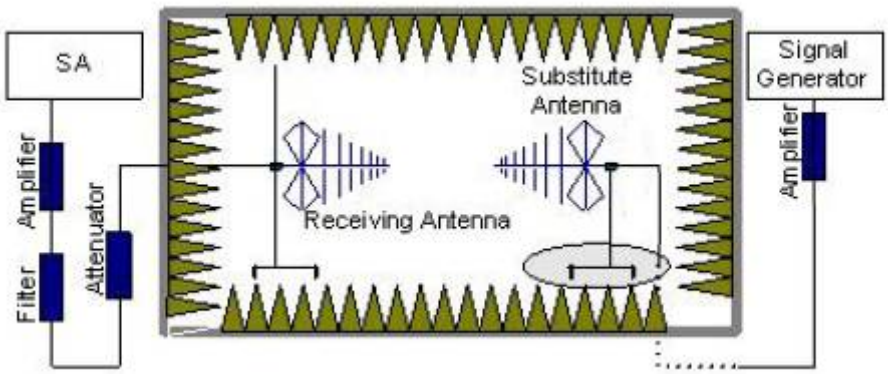
**A.1.3.2 Method of Measurement**

The measurements procedures in TIA-603D-2015 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 EUTthrough 360°and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequenciesin 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, ansubstitution 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 thesignal generator output until the value of the receiver reach thepreviously 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:
   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 -2.15dBi.

**WCDMA Band II-EIRP**

**Limits**

| | Burst Peak EIRP (dBm) |
|---|---|
| WCDMA Band II | 33dBm (2W) |

**Measurement result**

| Frequency(MHz) | $P_{Mea}$(dBm) | $P_{cl}$(dB) | $P_{Ag}$(dB) | $G_a$ Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1852.40 | -23.68 | 2.84 | -43.75 | -4.87 | 22.10 | 33.00 | 10.90 | V |
| 1880.00 | -23.29 | 2.85 | -43.75 | -4.82 | **22.43** | 33.00 | 10.57 | H |
| 1907.60 | -23.77 | 2.88 | -43.77 | -4.77 | 21.89 | 33.00 | 11.11 | H |

Frequency: 1880.00MHz

Peak EIRP(dBm)= $P_{Mea}$(-23.29dBm)-$P_{cl}$(2.85dB)-$P_{Ag}$(-43.75dB)- $G_a$ (-4.82dB)=22.43dBm

**ANALYZER SETTINGS: RBW = VBW = 5MHz**

**WCDMA Band V-ERP**

**Limits**

| | Burst Peak ERP (dBm) |
|---|---|
| WCDMA Band V | 38.45dBm (7W) |

**Measurement result**

| Frequency(MHz) | $P_{Mea}$(dBm) | $P_{cl}$(dB) | $P_{Ag}$(dB) | $G_a$ Antenna Gain(dB) | Correction (dB) | ERP(dBm) | Limit(dBm) | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|---|
| 826.40 | -25.22 | 2.25 | -45.76 | -0.93 | 2.15 | 17.07 | 38.45 | 21.38 | H |
| 836.60 | -24.39 | 2.26 | -45.66 | -0.82 | 2.15 | **17.68** | 38.45 | 20.77 | V |
| 846.60 | -24.98 | 2.26 | -45.56 | -0.81 | 2.15 | 16.98 | 38.45 | 21.47 | V |

Frequency: 836.60MHz

Peak ERP(dBm)= $P_{Mea}$(-24.39dBm)-$P_{cl}$(2.15dB)-$P_{Ag}$(-45.66dB)-$G_a$ (-0.82dB)-2.15dB=17.68dBm

**ANALYZER SETTINGS: RBW = VBW = 5MHz**

**WCDMA Band IV-EIRP**

**Limits**

| | Burst Peak EIRP (dBm) |
|---|---|
| WCDMA Band IV | 30dBm (1W) |

**Measurement result**

| Frequency(MHz) | $P_{Mea}$(dBm) | $P_{cl}$(dB) | $P_{Ag}$(dB) | $G_a$ Antenna Gain(dB) | EIRP(dBm) | Limit(dBm) | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1712.40 | -22.14 | 3.66 | -44.10 | -5.12 | **23.42** | 30.00 | 6.58 | H |
| 1740.00 | -23.69 | 4.36 | -44.15 | -5.07 | 21.17 | 30.00 | 8.83 | V |
| 1752.60 | -23.63 | 3.85 | -44.14 | -5.05 | 21.71 | 30.00 | 8.29 | V |

Frequency**:** 1712.40MHz

Peak EIRP(dBm)= $P_{Mea}$(-22.14dBm)-$P_{cl}$(3.66dB)-$P_{Ag}$(-44.10dB)- $G_a$ (-5.12dB)= 23.42dBm

**ANALYZER SETTINGS: RBW = VBW = 5MHz**

## A.2 EMISSION LIMIT

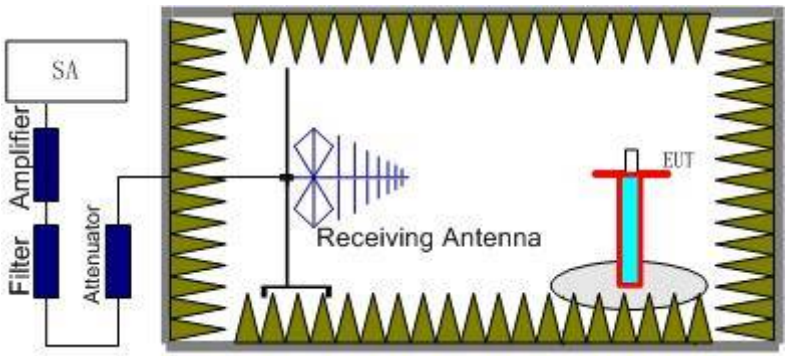
### A.2.1 Measurement Method

The measurements procedures in TIA-603D-2015 are used.

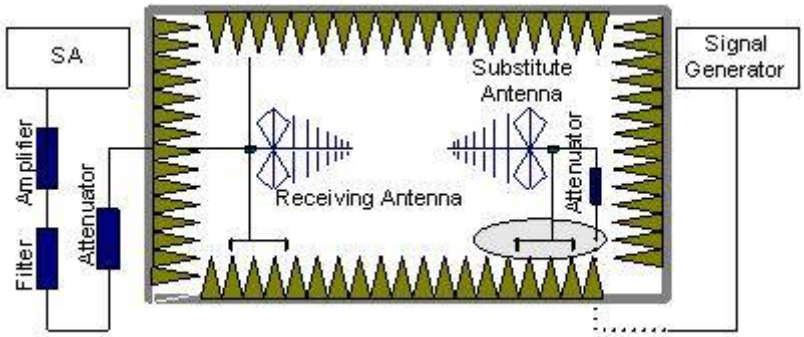
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set as outlined in Part 24.238, Part 22.917 and Part 27.53. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of WCDMA Band II, WCDMA Band V and WCDMA Band IV.

**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 EUTthrough 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 (Pr).
3. The EUT shall be replaced by a substitution antenna.The test setup refers to figure below.




In the chamber, ansubstitution 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 thesignal generator output until the value of the receiver reach thepreviously 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:
   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 -2.15dBi.

**A.2.2 Measurement Limit**

Part 24.238 , Part 22.917 and Part 27.53 specify that the powerof any emission outside of the authorizedoperating frequency ranges mustbe attenuated below the transmittingpower (P) by a factor of at least 43 + 10log(P) dB.

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

**A.2.3 Measurement Results**

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of WCDMA Band II (1852.4 MHz, 1880.0MHz and 1907.6MHz),WCDMA Band V(826.4MHz, 836.6MHz and 846.6MHz)and WCDMA Band IV(1712.4MHz, 1740MHz and 1752.6MHz). 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 WCDMA Band II,WCDMA Band V and WCDMA Band IVinto 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 |
|---|---|---|---|
| WCDMA Band V | Low | 30MHz-10GHz | Pass |
| | Middle | 30MHz-10GHz | Pass |
| | High | 30MHz-10GHz | Pass |
| WCDMA Band II | Low | 30MHz-20GHz | Pass |
| | Middle | 30MHz-20GHz | Pass |
| | High | 30MHz-20GHz | Pass |
| WCDMA Band IV | 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) |
|---|---|---|---|---|
| WCDMA Band V | 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 |
| WCDMA Band II | 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 |
| WCDMA Band IV | 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 |

**WCDMA BAND II Mode Channel 9262/1852.4MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3702.15 | -62.05 | 5.35 | -8.48 | -58.92 | -13.00 | 45.92 | V |
| 5564.95 | -59.02 | 6.58 | -10.59 | -55.01 | -13.00 | 42.01 | H |
| 7419.63 | -57.45 | 7.26 | -12.10 | -52.61 | -13.00 | 39.61 | V |
| 9273.74 | -56.52 | 8.34 | -13.26 | -51.60 | -13.00 | 38.60 | H |
| 11161.43 | -53.89 | 8.52 | -13.17 | -49.24 | -13.00 | 36.24 | H |
| 12963.43 | -53.38 | 9.51 | -13.48 | -49.41 | -13.00 | 36.41 | V |

**WCDMA BAND II Mode Channel 9400/1880MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3760.88 | -61.09 | 5.14 | -8.57 | -57.66 | -13.00 | 44.66 | H |
| 5640.20 | -60.90 | 6.85 | -10.57 | -57.18 | -13.00 | 44.18 | H |
| 7516.54 | -57.67 | 7.53 | -12.21 | -52.99 | -13.00 | 39.99 | V |
| 9401.11 | -55.76 | 7.98 | -13.34 | -50.40 | -13.00 | 37.40 | H |
| 11283.45 | -55.46 | 9.19 | -13.14 | -51.51 | -13.00 | 38.51 | V |
| 13158.00 | -52.21 | 9.71 | -13.72 | -48.20 | -13.00 | 35.20 | V |

**WCDMA BAND II Mode Channel 9538/1907.6MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3816.82 | -60.65 | 5.44 | -8.64 | -57.45 | -13.00 | 44.45 | H |
| 5715.68 | -59.64 | 6.73 | -10.56 | -55.81 | -13.00 | 42.81 | V |
| 7635.06 | -55.89 | 7.54 | -12.31 | -51.12 | -13.00 | 38.12 | H |
| 9538.61 | -56.78 | 8.25 | -13.36 | -51.67 | -13.00 | 38.67 | V |
| 11442.42 | -55.34 | 8.92 | -13.11 | -51.15 | -13.00 | 38.15 | H |
| 13345.61 | -49.60 | 9.72 | -13.98 | -45.34 | -13.00 | 32.34 | V |

**WCDMA BAND V Mode Channel 4132/826.4MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Correction (dB) | Peak ERP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1865.26 | -73.00 | 3.55 | -4.84 | 2.15 | -73.86 | -13.00 | 60.86 | V |
| 2685.54 | -65.31 | 4.64 | -6.43 | 2.15 | -65.67 | -13.00 | 52.67 | H |
| 3406.53 | -60.37 | 5.51 | -7.98 | 2.15 | -60.05 | -13.00 | 47.05 | H |
| 4217.12 | -61.06 | 6.04 | -9.12 | 2.15 | -60.13 | -13.00 | 47.13 | H |
| 5043.94 | -57.95 | 6.41 | -9.96 | 2.15 | -56.55 | -13.00 | 43.55 | V |
| 5884.92 | -58.06 | 6.92 | -10.52 | 2.15 | -56.61 | -13.00 | 43.61 | V |

**WCDMA BAND V Mode Channel 4183/836.6MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Correction (dB) | Peak ERP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1865.26 | -72.41 | 3.55 | -4.84 | 2.15 | -73.27 | -13.00 | 60.27 | V |
| 2755.61 | -62.27 | 4.68 | -6.56 | 2.15 | -62.54 | -13.00 | 49.54 | V |
| 3374.19 | -60.05 | 5.30 | -7.90 | 2.15 | -59.60 | -13.00 | 46.60 | H |
| 4137.14 | -59.50 | 5.77 | -9.04 | 2.15 | -58.38 | -13.00 | 45.38 | V |
| 5009.42 | -59.32 | 6.25 | -9.91 | 2.15 | -57.81 | -13.00 | 44.81 | H |
| 5818.76 | -59.30 | 6.61 | -10.54 | 2.15 | -57.52 | -13.00 | 44.52 | V |

**WCDMA BAND V Mode Channel 4233/846.6MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Correction (dB) | Peak ERP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 1695.32 | -58.88 | 3.45 | -5.15 | 2.15 | -59.33 | -13.00 | 46.33 | V |
| 2598.43 | -61.26 | 4.59 | -6.28 | 2.15 | -61.72 | -13.00 | 48.72 | V |
| 3211.81 | -60.01 | 5.25 | -7.51 | 2.15 | -59.90 | -13.00 | 46.90 | V |
| 4033.36 | -58.26 | 5.62 | -8.93 | 2.15 | -57.10 | -13.00 | 44.10 | V |
| 4858.57 | -59.04 | 6.32 | -9.76 | 2.15 | -57.75 | -13.00 | 44.75 | H |
| 5653.49 | -57.39 | 6.80 | -10.57 | 2.15 | -55.77 | -13.00 | 42.77 | V |

**WCDMA BAND IV Mode Channel 1312/1712.4MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3352.19 | -59.47 | 5.26 | -7.85 | -56.88 | -13.00 | 43.88 | V |
| 5062.06 | -58.71 | 6.43 | -9.99 | -55.15 | -13.00 | 42.15 | H |
| 6822.75 | -57.57 | 7.14 | -11.39 | -53.32 | -13.00 | 40.32 | V |
| 8453.10 | -56.83 | 7.88 | -12.96 | -51.75 | -13.00 | 38.75 | V |
| 10320.03 | -54.85 | 8.57 | -13.03 | -50.39 | -13.00 | 37.39 | H |
| 11934.15 | -53.63 | 9.09 | -13.01 | -49.71 | -13.00 | 36.71 | V |

**WCDMA BAND IV Mode Channel 1450/1740MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3311.90 | -58.99 | 5.25 | -7.75 | -56.49 | -13.00 | 43.49 | V |
| 5080.38 | -59.52 | 6.41 | -10.01 | -55.92 | -13.00 | 42.92 | V |
| 6860.37 | -56.81 | 6.69 | -11.43 | -52.07 | -13.00 | 39.07 | V |
| 8526.03 | -60.70 | 7.78 | -13.01 | -55.47 | -13.00 | 42.47 | H |
| 10188.60 | -57.24 | 8.53 | -12.98 | -52.79 | -13.00 | 39.79 | H |
| 11933.46 | -53.95 | 9.10 | -13.01 | -50.04 | -13.00 | 37.04 | V |

**WCDMA BAND IV Mode Channel 1513/1752.6MHz**

| Frequency(MHz) | $P_{Mea}$(dBm) | Path Loss | Antenna Gain | Peak EIRP(dBm) | Limit （dBm） | Margin(dB) | Polarization |
|---|---|---|---|---|---|---|---|
| 3470.21 | -59.95 | 5.41 | -8.13 | -57.23 | -13.00 | 44.23 | H |
| 5134.30 | -60.49 | 6.40 | -10.09 | -56.80 | -13.00 | 43.80 | V |
| 6690.78 | -57.78 | 7.23 | -11.23 | -53.78 | -13.00 | 40.78 | V |
| 8404.34 | -58.15 | 7.99 | -12.92 | -53.22 | -13.00 | 40.22 | H |
| 10215.58 | -55.66 | 8.39 | -12.99 | -51.06 | -13.00 | 38.06 | H |
| 11836.74 | -53.90 | 9.08 | -13.03 | -49.95 | -13.00 | 36.95 | H |

## A.3 FREQUENCY STABILITY

### A.3.1 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on mid channel of WCDMA Band II,WCDMA Band V, and WCDMA BAND IV, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on 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℃ to -30℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

### A.3.2 Measurement Limit

#### A.3.2.1 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 3.55VDC 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. For the purposes of measuring frequency stability these voltage limits are to be used.

#### A.3.2.2 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.3.3 Measurement results**

**WCDMA Band Ⅱ**

**Frequency Error vs Voltage**

| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| 3.55 | -4 | 0.002 |
| 3.8 | -2 | 0.001 |
| 4.35 | -6 | 0.003 |

**Frequency Error vs Temperature**

| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| -30 | -4 | 0.002 |
| -20 | 4 | 0.002 |
| -10 | 12 | 0.006 |
| 0 | 3 | 0.002 |
| 10 | -5 | 0.002 |
| 20 | -4 | 0.002 |
| 30 | 5 | 0.003 |
| 40 | -5 | 0.003 |
| 50 | 5 | 0.003 |

**WCDMA Band Ⅴ**

**Frequency Error vs Voltage**

| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| 3.55 | 6 | 0.007 |
| 3.8 | 4 | 0.005 |
| 4.35 | -5 | 0.006 |

**Frequency Error vs Temperature**

| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| -30 | 4 | 0.005 |
| -20 | -4 | 0.005 |
| -10 | 5 | 0.005 |
| 0 | -4 | 0.004 |
| 10 | -4 | 0.005 |
| 20 | -3 | 0.004 |
| 30 | -6 | 0.007 |
| 40 | -2 | 0.002 |
| 50 | 3 | 0.004 |

**WCDMA BandIV**

**Frequency Error vs Voltage**

| Voltage(V) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| 3.55 | 8 | 0.005 |
| 3.8 | -6 | 0.003 |
| 4.35 | -8 | 0.004 |

**Frequency Error vs Temperature**

| temperature(℃) | Frequency error(Hz) | Frequency error(ppm) |
|---|---|---|
| -30 | -8 | 0.005 |
| -20 | -6 | 0.003 |
| -10 | -6 | 0.004 |
| 0 | -6 | 0.003 |
| 10 | -7 | 0.004 |
| 20 | -7 | 0.004 |
| 30 | -7 | 0.004 |
| 40 | -8 | 0.005 |
| 50 | -6 | 0.004 |

## A.4 OCCUPIED BANDWIDTH

**Reference**

FCC: CFR Part 2.1049(h)(i)

**A.4.1 Occupied Bandwidth Results**

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 US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

The measurement method is from KDB 971168:

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) Set the detection mode to peak, and the trace mode to max hold.

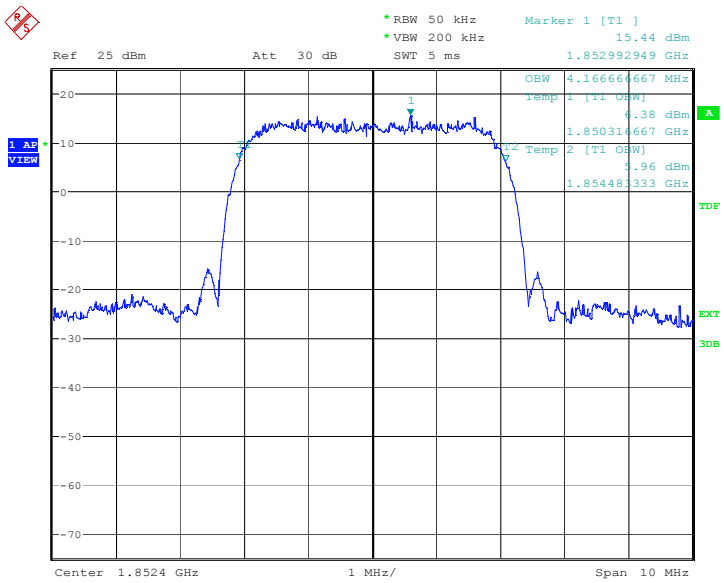
e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

**WCDMA Band II(99% BW)**

| Frequency(MHz) | Occupied Bandwidth (99% BW)( MHz) |
|---|---|
| 1852.4 | 4.167 |
| 1880.0 | 4.167 |
| 1907.6 | 4.167 |

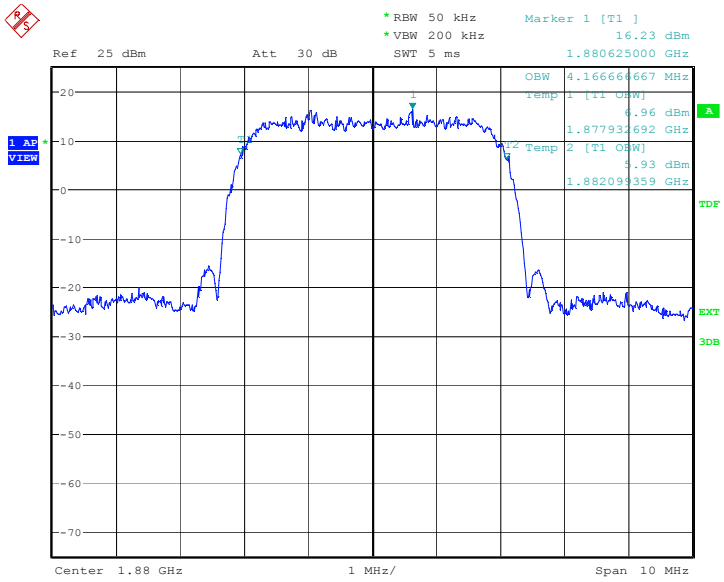
**WCDMA Band II**

**Channel 9262-Occupied Bandwidth (99% BW)**



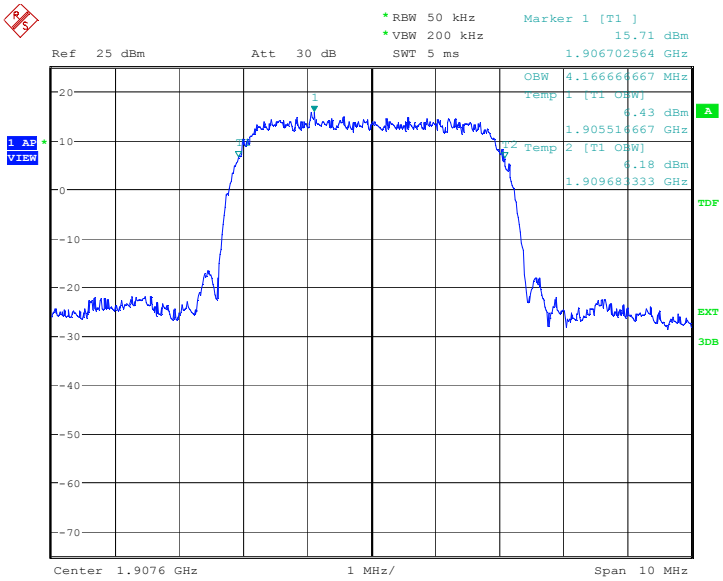

Date: 7.MAY.2016 03:34:42

**Channel 9400-Occupied Bandwidth (99% BW)**




Date: 7.MAY.2016 03:35:16

## Channel 9538-Occupied Bandwidth (99% BW)



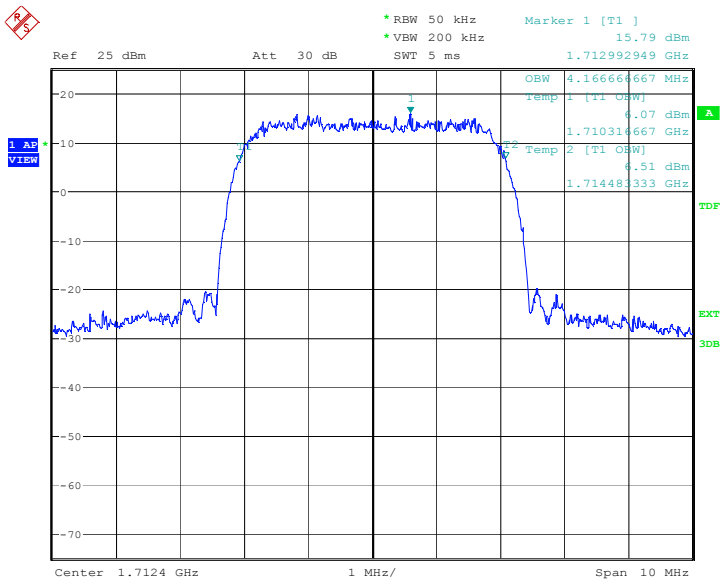

Date: 7.MAY.2016 03:35:51

**WCDMA Band IV(99% BW)**

| Frequency(MHz) | Occupied Bandwidth (99% BW)( MHz) |
|---|---|
| 1712.4 | 4.167 |
| 1740.0 | 4.167 |
| 1752.6 | 4.167 |

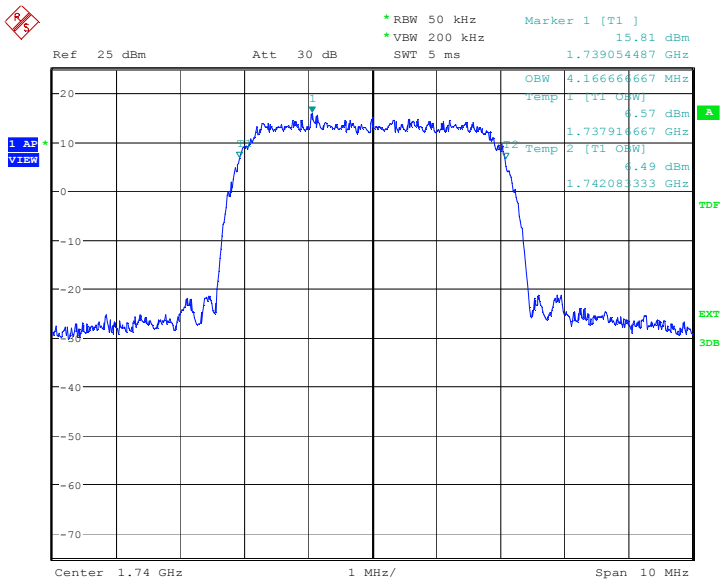
**WCDMA Band IV**

**Channel 1312-Occupied Bandwidth (99% BW)**



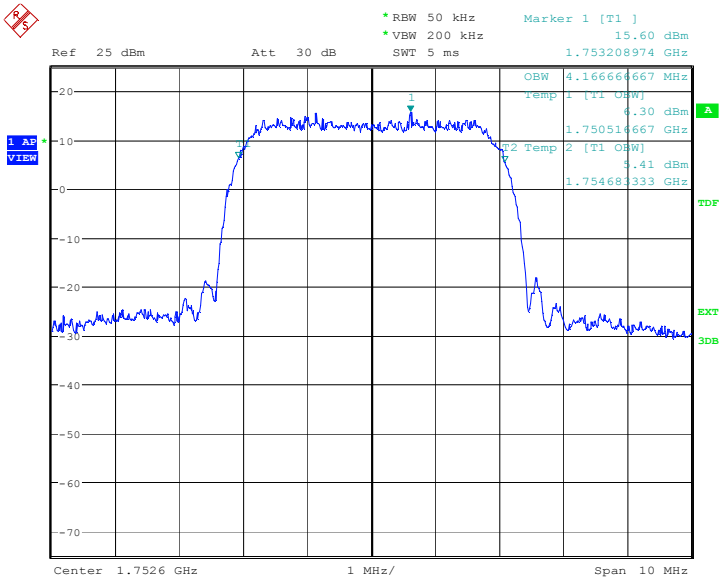

Date: 7.MAY.2016 04:11:20

**Channel 1450-Occupied Bandwidth (99% BW)**




Date: 7.MAY.2016 04:11:54

## Channel 1513-Occupied Bandwidth (99% BW)



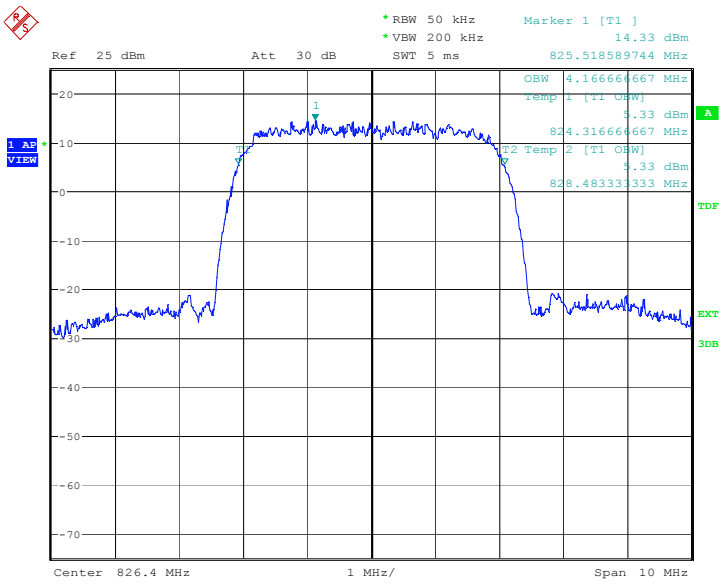

Date: 7.MAY.2016 04:12:29

**WCDMA Band V(99% BW)**

| Frequency(MHz) | Occupied Bandwidth (99% BW)( MHz) |
|---|---|
| 826.4 | 4.167 |
| 836.6 | 4.119 |
| 846.6 | 4.135 |

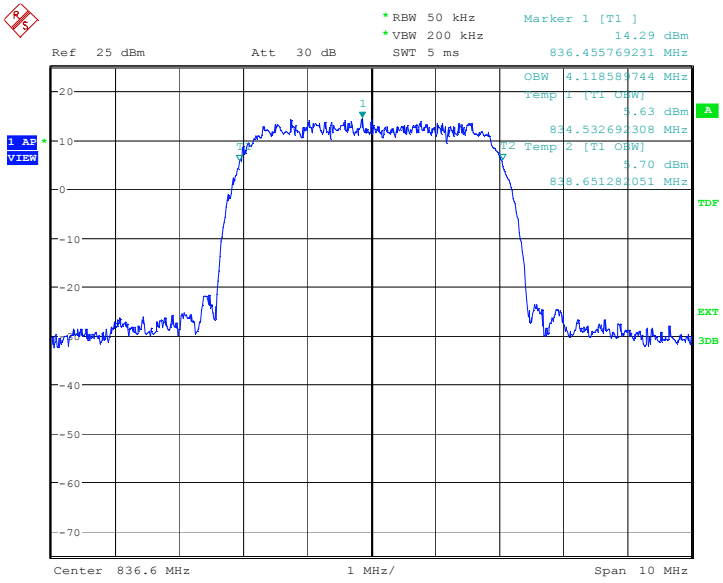
**WCDMA Band V**

**Channel 4132-Occupied Bandwidth (99% BW)**



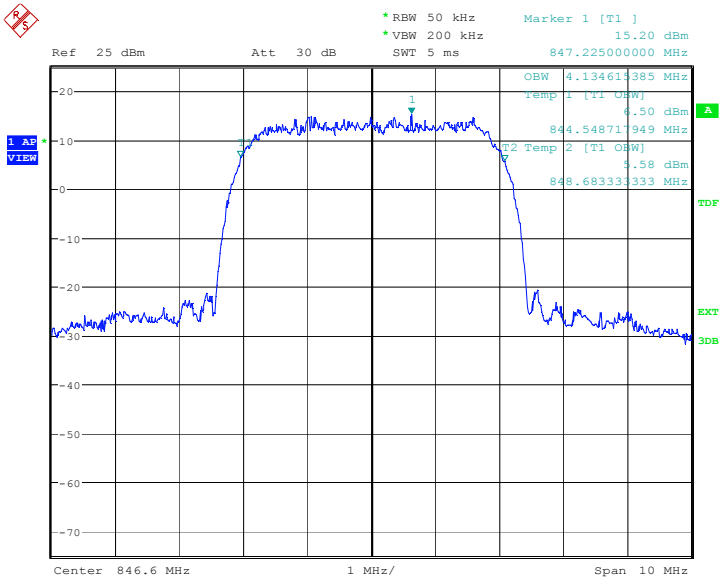

Date: 7.MAY.2016 05:20:46

**Channel 4183-Occupied Bandwidth (99% BW)**




Date: 7.MAY.2016 05:21:21

## Channel 4233-Occupied Bandwidth (99% BW)




Date: 7.MAY.2016 05:21:56

## A.5 EMISSION BANDWIDTH

**Reference**

FCC: CFR Part 22.917(b), 24.238(a), 27.53(h)

### A.5.1Emission Bandwidth Results

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

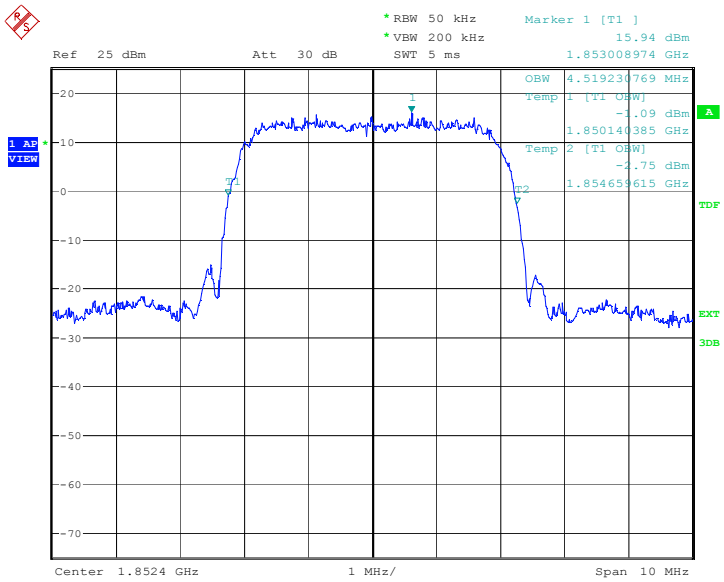
Similar to conducted emissions; Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies. Table below lists the measured 100% BW. Spectrum analyzer plots are included on the following pages.

**WCDMA Band II(100% BW)**

| Frequency(MHz) | Emission Bandwidth (100% BW)( MHz) |
|---|---|
| 1852.4 | 4.519 |
| 1880.0 | 4.535 |
| 1907.6 | 4.519 |

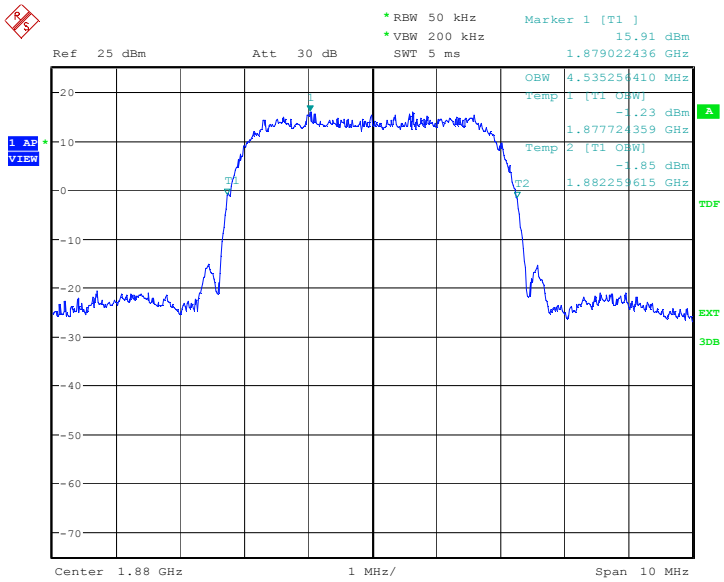
**WCDMA Band II**

**Channel 9262-Emission Bandwidth (100% BW)**



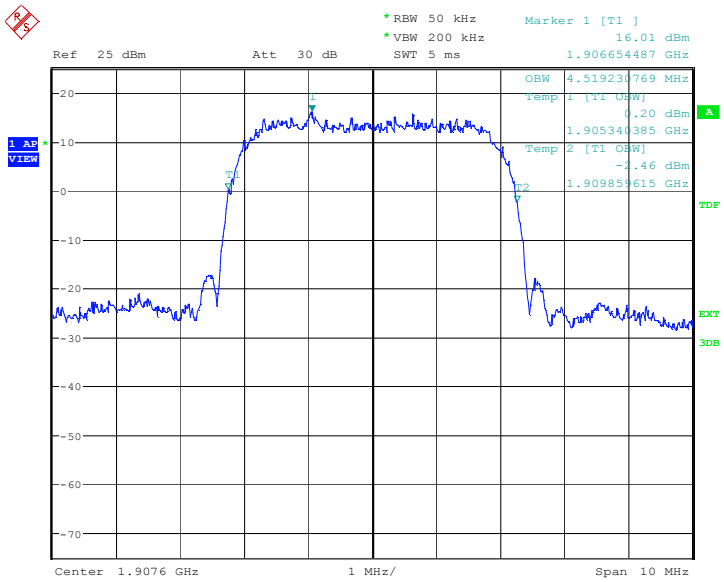

Date: 7.MAY.2016 03:36:27

## Channel 9400-Emission Bandwidth (100% BW)




Date: 7.MAY.2016 03:37:01

## Channel 9538-Emission Bandwidth (100% BW)



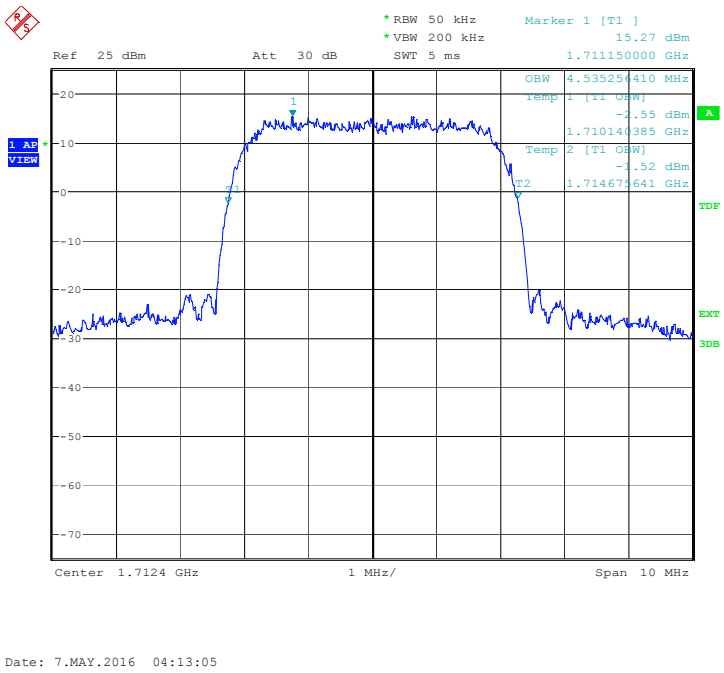

Date: 7.MAY.2016 03:37:36

**WCDMA Band IV(100% BW)**

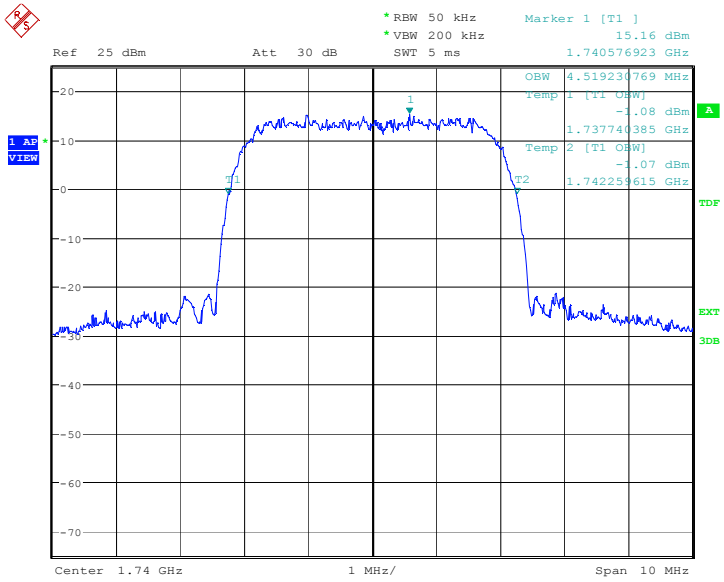
| Frequency(MHz) | Emission Bandwidth (100% BW)( MHz) |
|---|---|
| 1712.4 | 4.535 |
| 1740 | 4.519 |
| 1752.6 | 4.519 |

**WCDMA Band IV**

**Channel 1312-Emission Bandwidth (100% BW)**

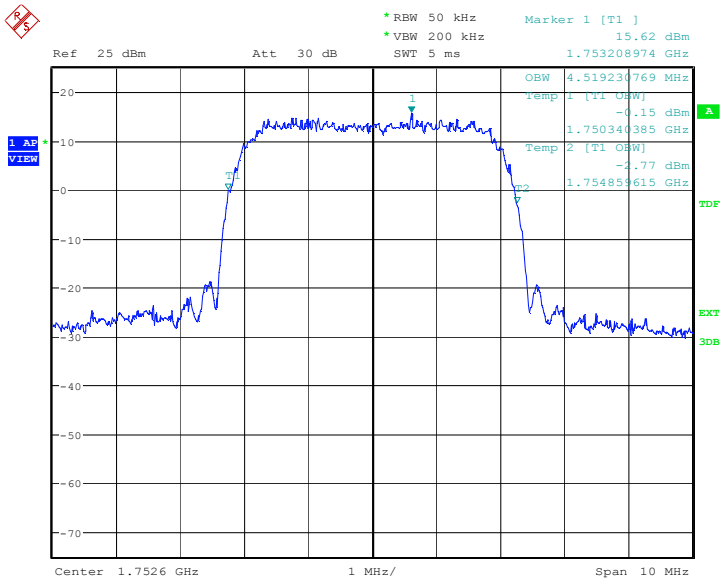


## Channel 1450-Emission Bandwidth (100% BW)




Date: 7.MAY.2016 04:13:40

## Channel 1513-Emission Bandwidth (100% BW)



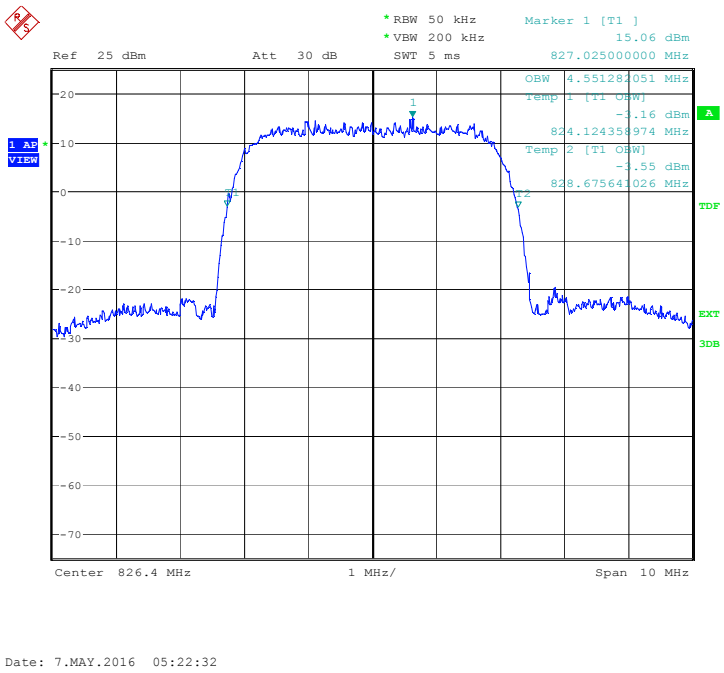

Date: 7.MAY.2016 04:14:14

**WCDMA Band V(100% BW)**

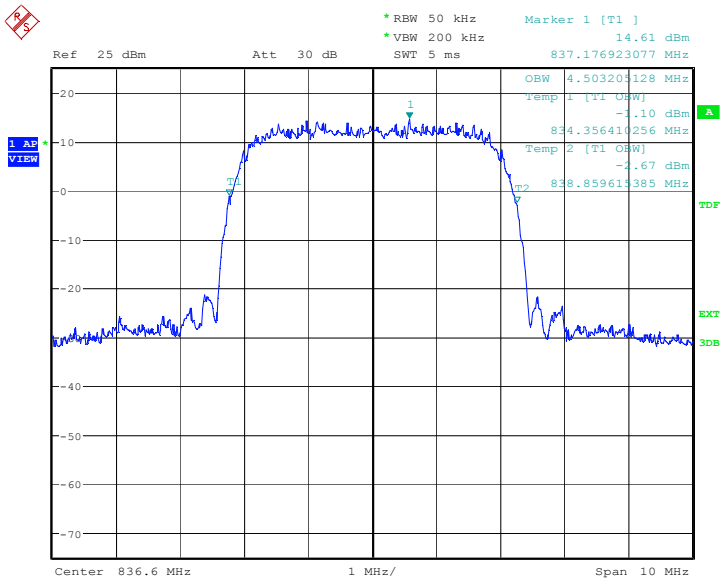
| Frequency(MHz) | Emission Bandwidth (100% BW)( MHz) |
|---|---|
| 826.40 | 4.551 |
| 836.60 | 4.503 |
| 846.60 | 4.519 |

**WCDMA Band V**

**Channel 4132-Emission Bandwidth (100% BW)**

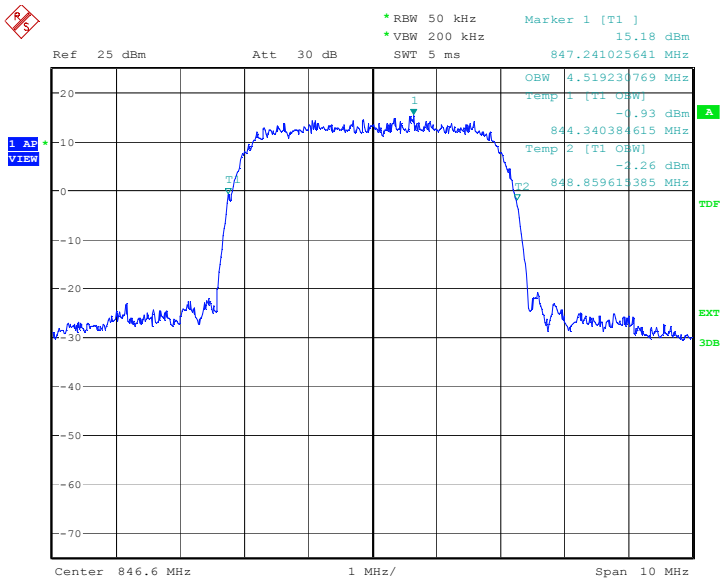


## Channel 4183-Emission Bandwidth (100% BW)




Date: 7.MAY.2016 05:23:06

## Channel 4233-Emission Bandwidth (100% BW)




Date: 7.MAY.2016 05:23:41

## A.6 BAND EDGE COMPLIANCE

**Reference**

FCC: CFR Part 22.917(b), 24.238(a), 27.53(h).

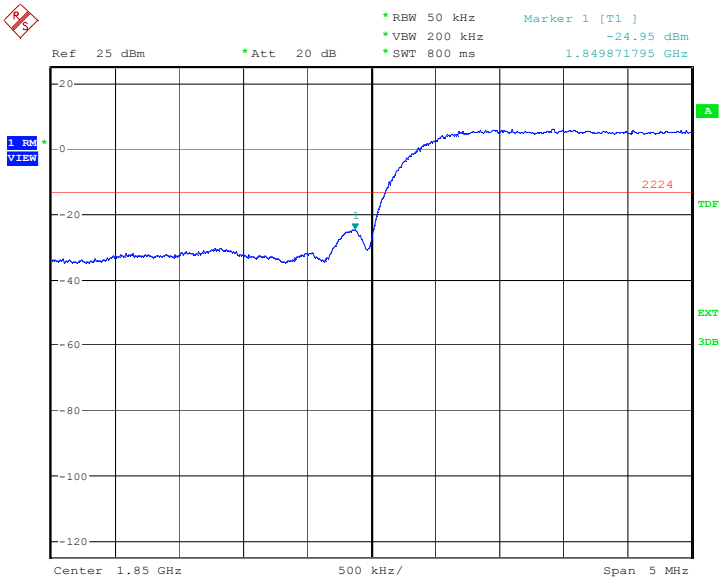
### A.6.1 Measurement limit

On any frequency outside frequency band of the US Cellular/PCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log (P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm. According to KDB 971168, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

### A.6.2 Measurement result

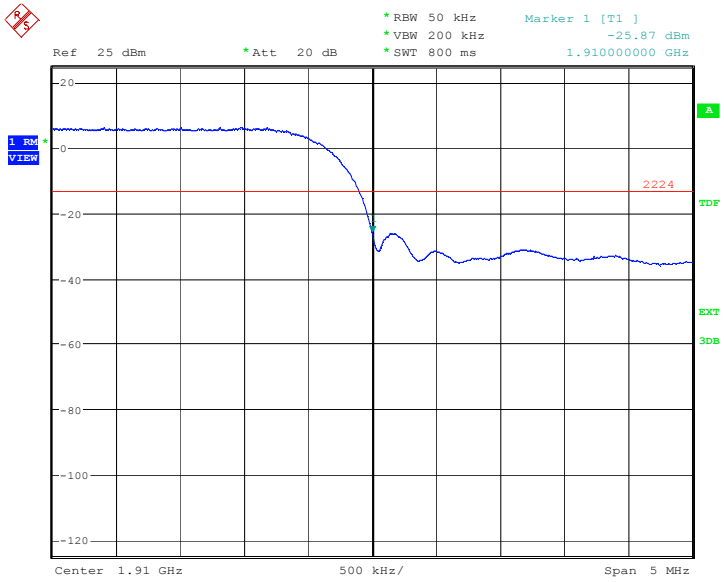
**WCDMA Band Ⅱ**

**LOW BAND EDGE BLOCK-A (WCDMA Band Ⅱ)-Channel 9262**




Date: 7.MAY.2016 03:41:18

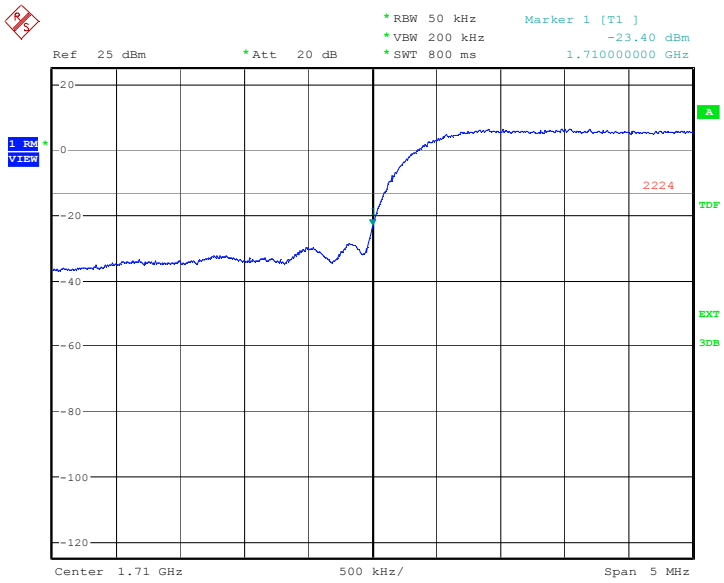
## HIGH BAND EDGE BLOCK-C (WCDMA Band Ⅱ) –Channel 9538




Date: 7.MAY.2016 03:43:24

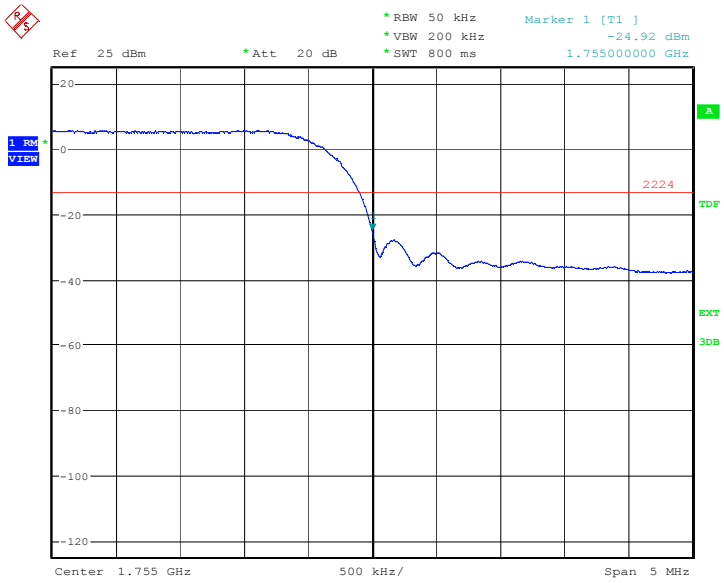
## WCDMA Band IV

## LOW BAND EDGE BLOCK-A (WCDMA Band IV)-Channel 1312




Date: 7.MAY.2016 04:17:57

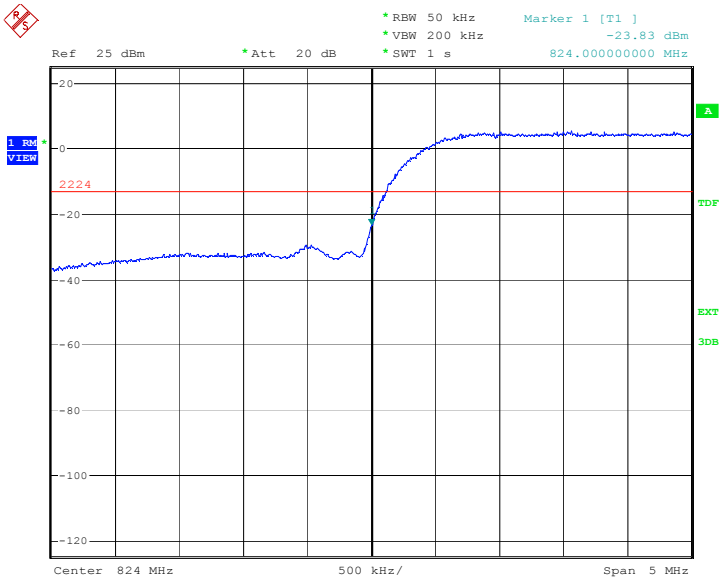
## HIGH BAND EDGE BLOCK-C (WCDMA Band IV) –Channel 1513




Date: 7.MAY.2016 04:20:03

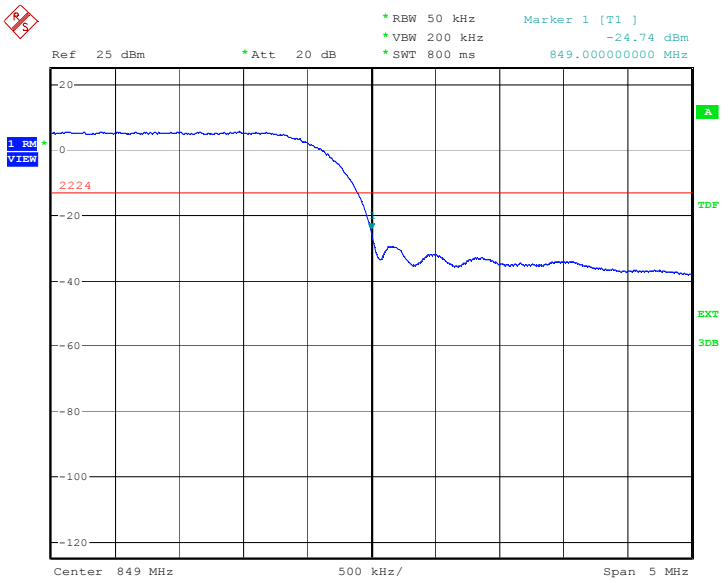
## WCDMA Band Ⅴ

## LOW BAND EDGE BLOCK-A (WCDMA Band Ⅴ)-Channel 4132




Date: 7.MAY.2016 05:27:23

## HIGH BAND EDGE BLOCK-C (WCDMA Band Ⅴ) –Channel 4233




Date: 7.MAY.2016 05:29:29

## A.7 CONDUCTED SPURIOUS EMISSION

**Reference**

FCC: CFR Part 2.1057, 22.917, 24.238, 27.53(h).

**A.7.1 Measurement Method**

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. According to KDB 971168, the applicable rule part specifies the reference bandwidth for measuring unwanted emission levels (typically, 100 kHz if the authorized frequency band/block is at or below 1 GHz and 1 MHz if the authorized frequency band/block is above 1 GHz)

**WCDMA Band Ⅱ Transmitter**

| Channel | Frequency (MHz) |
|---|---|
| 9262 | 1852.40 |
| 9400 | 1880.00 |
| 9538 | 1907.60 |

**WCDMA Band IV Transmitter**

| Channel | Frequency (MHz) |
|---|---|
| 1312 | 1712.40 |
| 1450 | 1740.00 |
| 1513 | 1752.60 |

**WCDMA Band Ⅴ Transmitter**

| Channel | Frequency (MHz) |
|---|---|
| 4132 | 826.40 |
| 4183 | 836.60 |
| 4233 | 846.60 |

**A. 7.2 Measurement Limit**

Part 24.238, Part 22.917 and Part 27.53(h) 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.

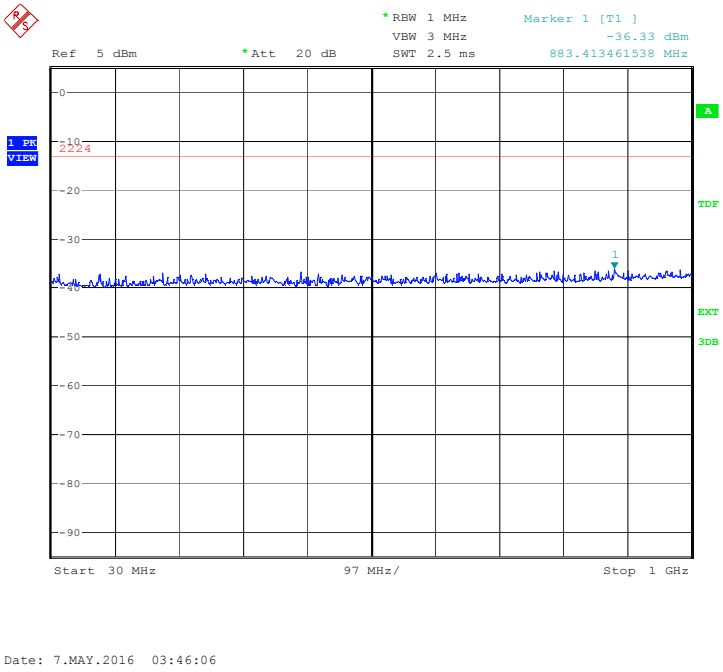
The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. 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.7.3 Measurement result

**WCDMA Band Ⅱ**

**Channel 9262: 30MHz –1GHz**

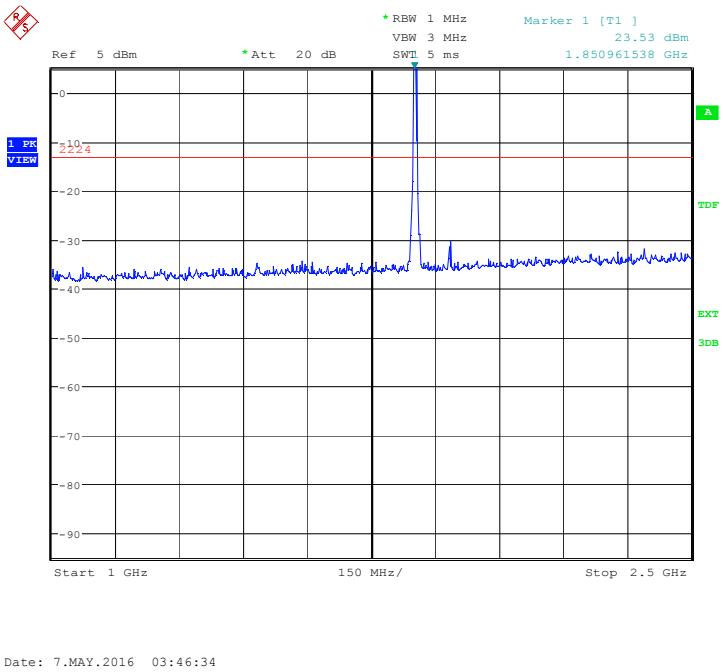
Spurious emission limit –13dBm.




**Channel 9262: 1GHz –2.5GHz**

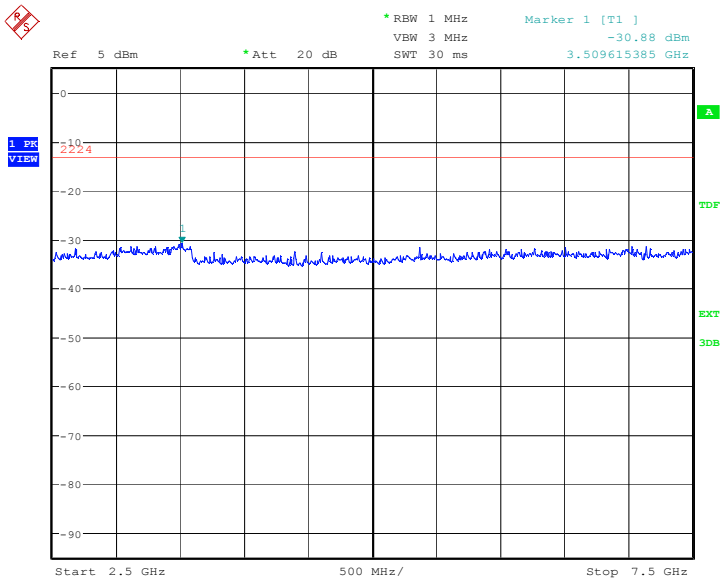
Spurious emission limit –13dBm.

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



**Channel 9262: 2.5GHz –7.5GHz**

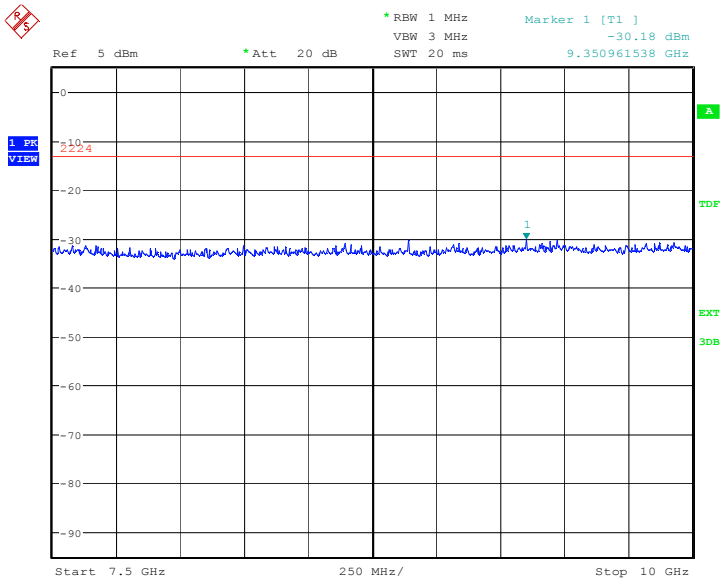
Spurious emission limit –13dBm.




Date: 7.MAY.2016 03:47:02

**Channel 9262: 7.5GHz –10GHz**

Spurious emission limit –13dBm.

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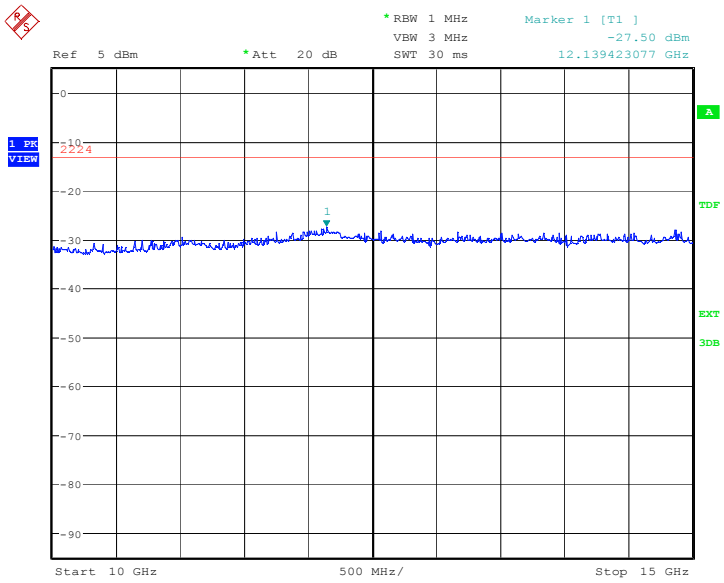
**Channel 9262: 10GHz –15GHz**

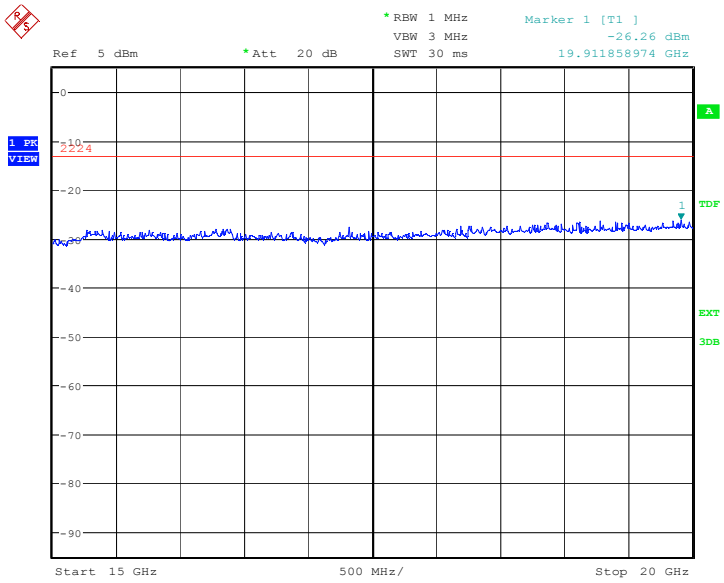
Spurious emission limit –13dBm.




Date: 7.MAY.2016 03:47:58

**Channel 9262: 15GHz –20GHz**

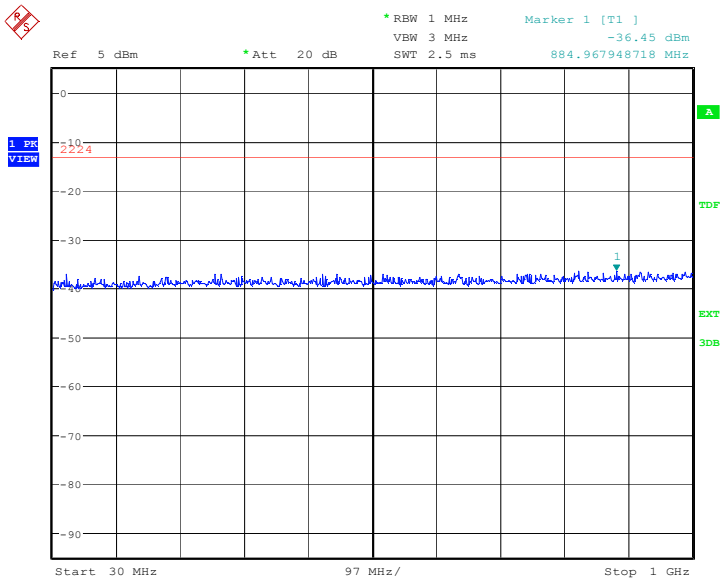
Spurious emission limit –13dBm.




Date: 7.MAY.2016 03:48:26

**Channel 9400: 30MHz –1GHz**

Spurious emission limit –13dBm.

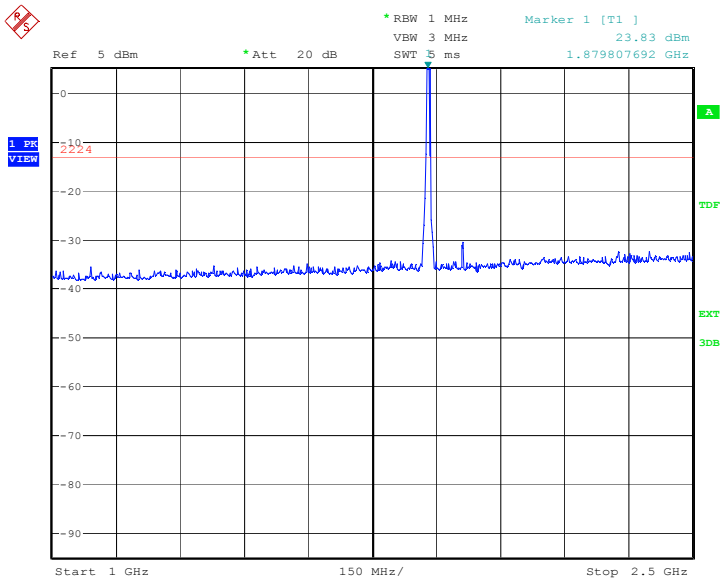



Date: 7.MAY.2016 03:48:57

**Channel 9400: 1GHz –2.5GHz**

Spurious emission limit –13dBm.

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

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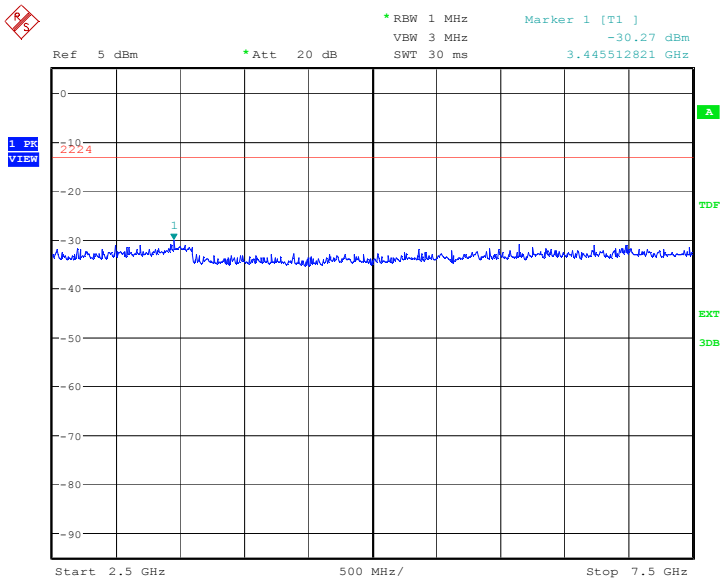
**Channel 9400: 2.5GHz –7.5GHz**

Spurious emission limit –13dBm.

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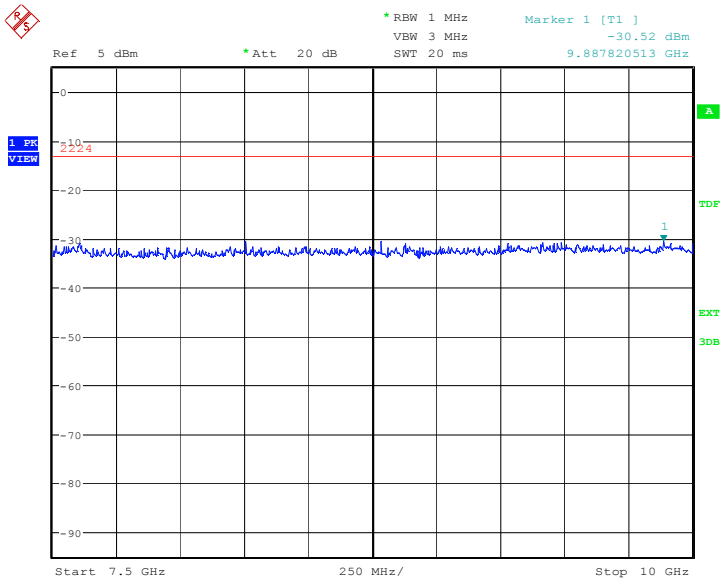
**Channel 9400: 7.5GHz –10GHz**

Spurious emission limit –13dBm.

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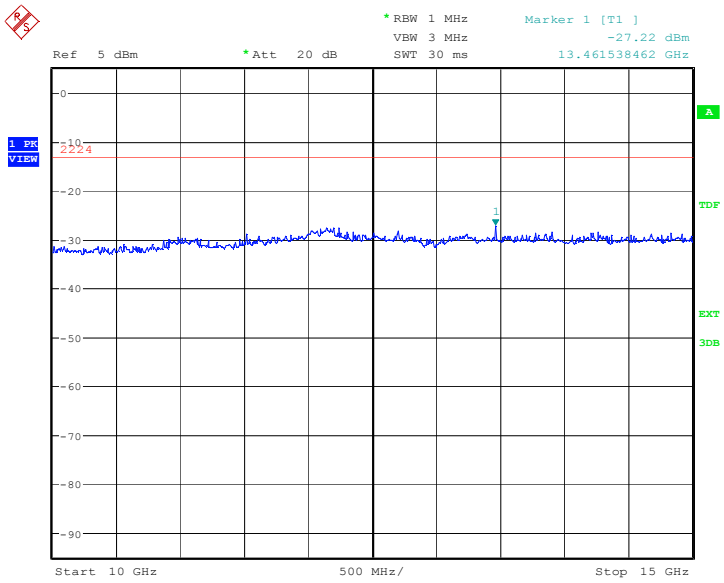
**Channel 9400: 10GHz –15GHz**

Spurious emission limit –13dBm.

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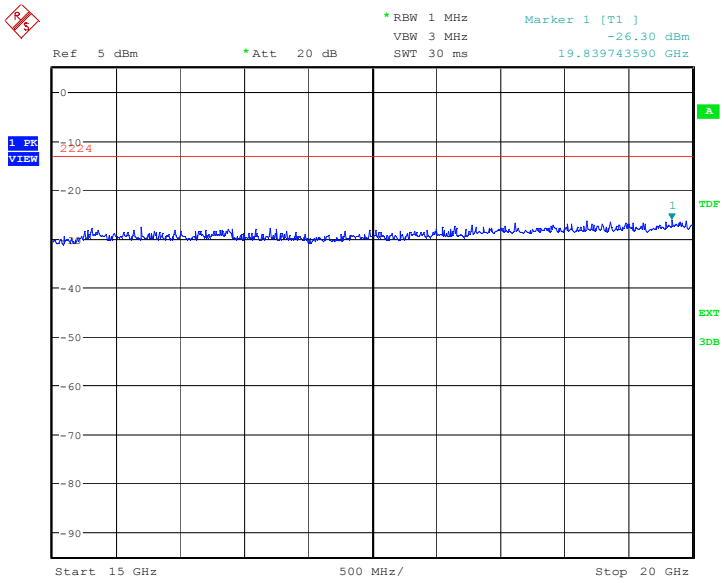
**Channel 9400: 15GHz –20GHz**

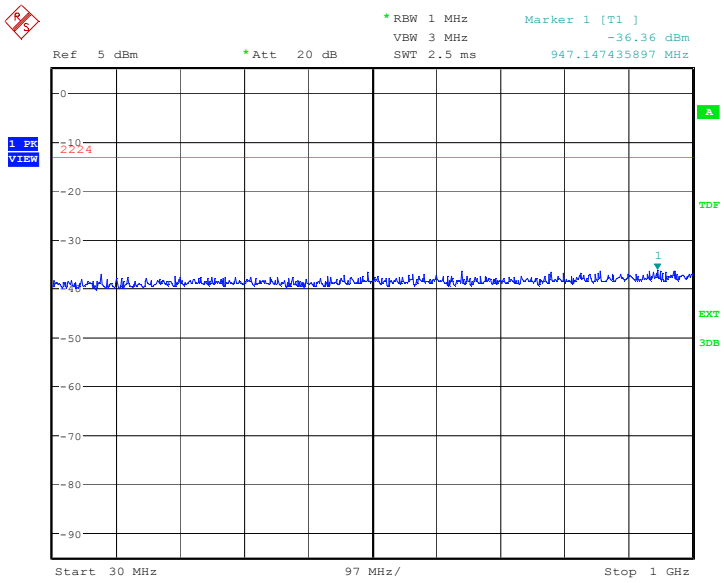
Spurious emission limit –13dBm.




Date: 7.MAY.2016 03:51:18

**Channel 9538: 30MHz –1GHz**

Spurious emission limit –13dBm.

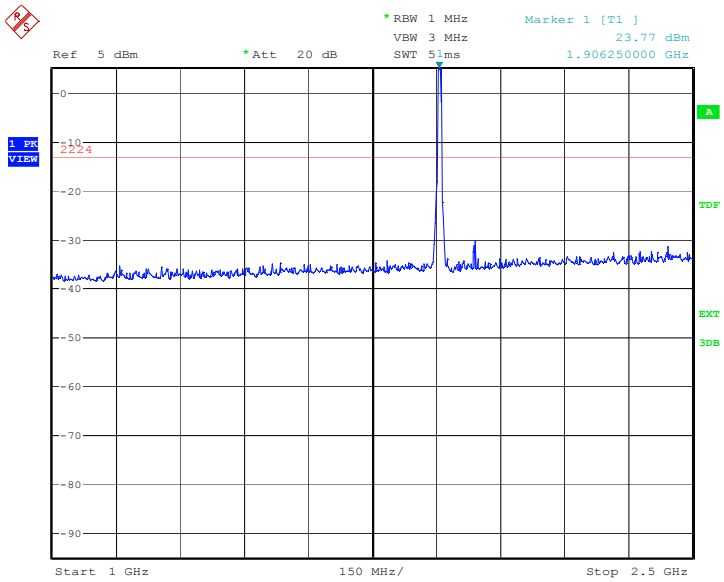



Date: 7.MAY.2016 03:51:49

**Channel 9538: 1GHz –2.5GHz**

Spurious emission limit –13dBm.

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

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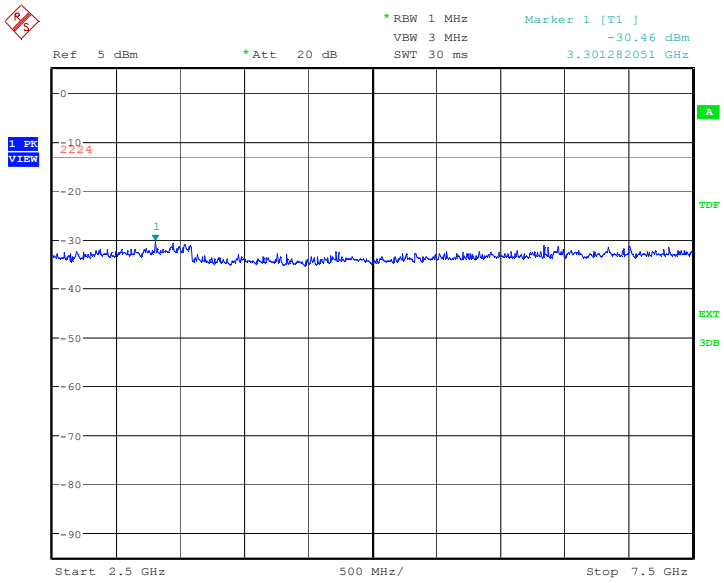
**Channel 9538: 2.5GHz –7.5GHz**

Spurious emission limit –13dBm.

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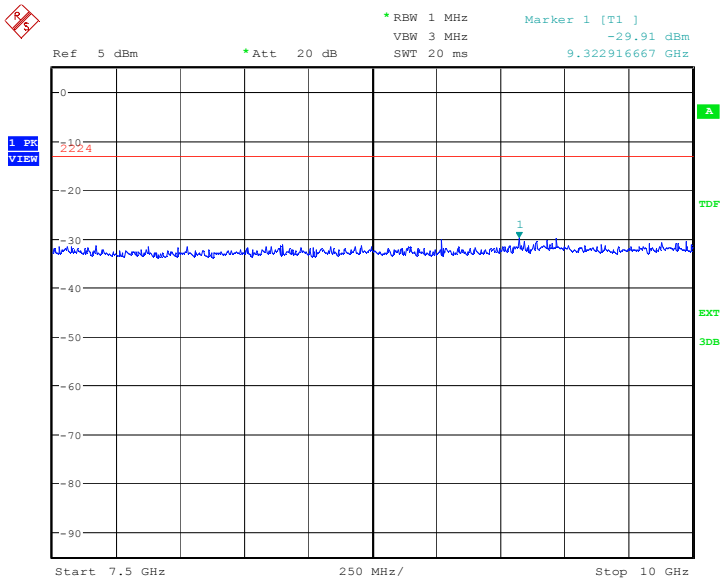
**Channel 9538: 7.5GHz –10GHz**

Spurious emission limit –13dBm.

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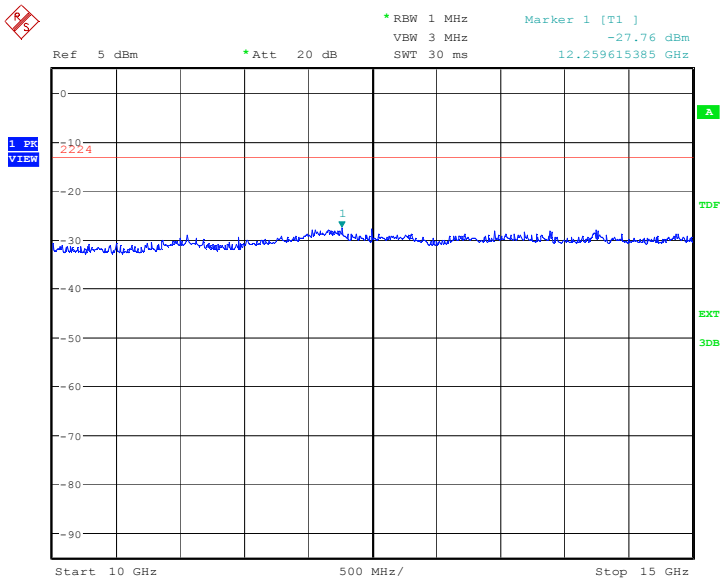
**Channel 9538: 10GHz –15GHz**

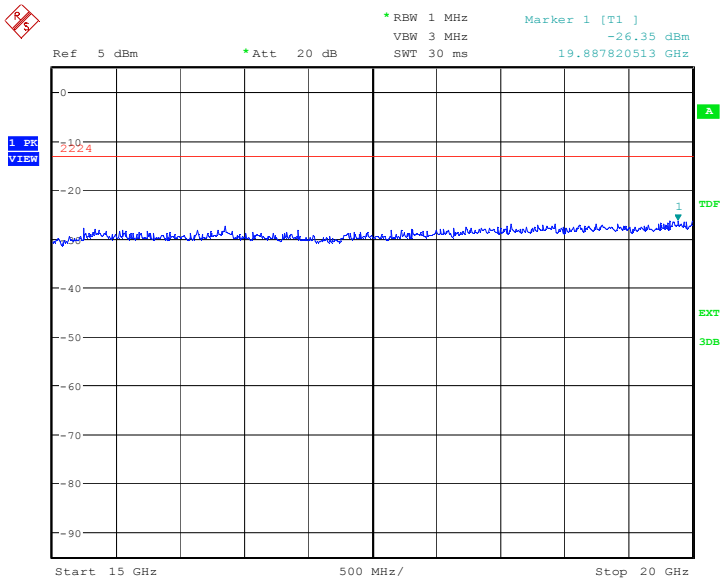
Spurious emission limit –13dBm.




Date: 7.MAY.2016 03:53:42

**Channel 9538: 15GHz –20GHz**

Spurious emission limit –13dBm.

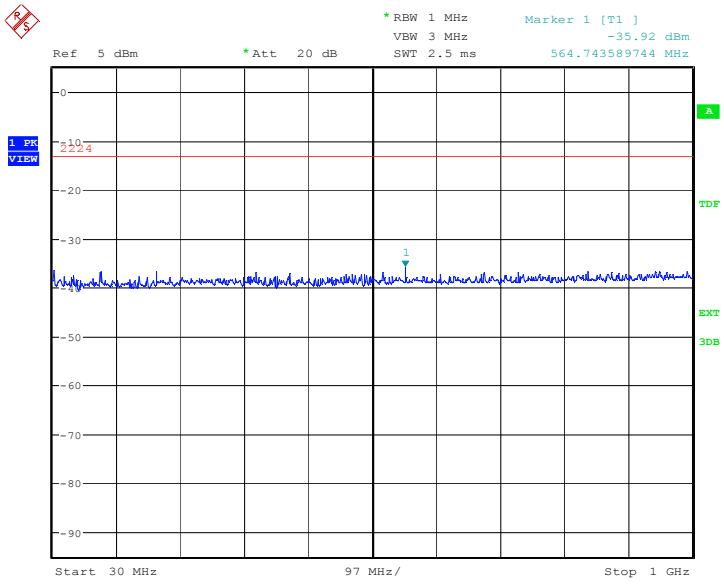



Date: 7.MAY.2016 03:54:10

**WCDMA Band IV**

**Channel 1312: 30MHz –1GHz**

Spurious emission limit –13dBm.

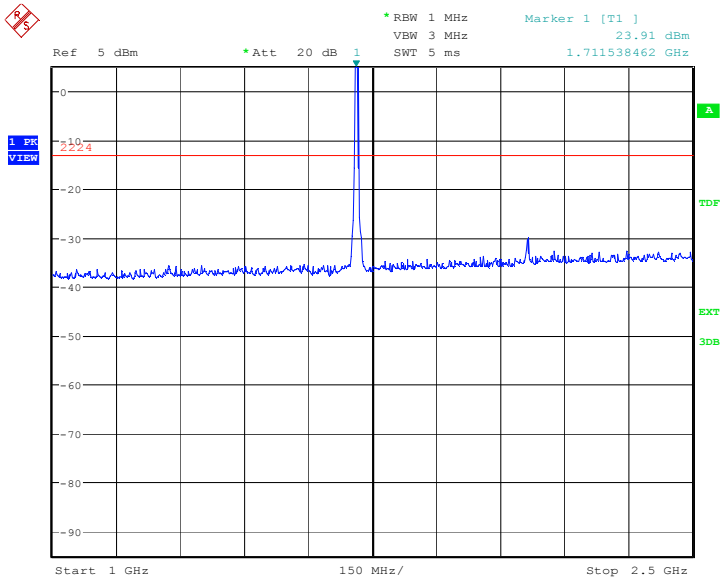



Date: 7.MAY.2016 04:22:44

**Channel 1312: 1GHz –2.5GHz**

Spurious emission limit –13dBm.

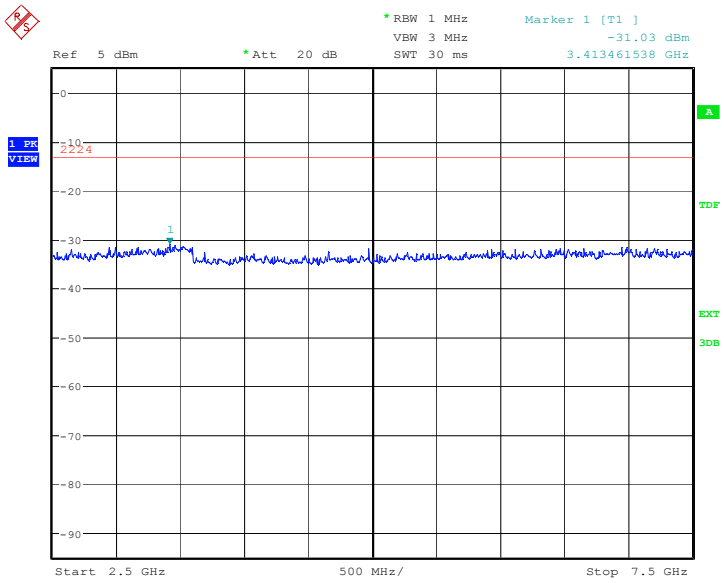
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.MAY.2016 04:23:12

**Channel 1312: 2.5GHz –7.5GHz**

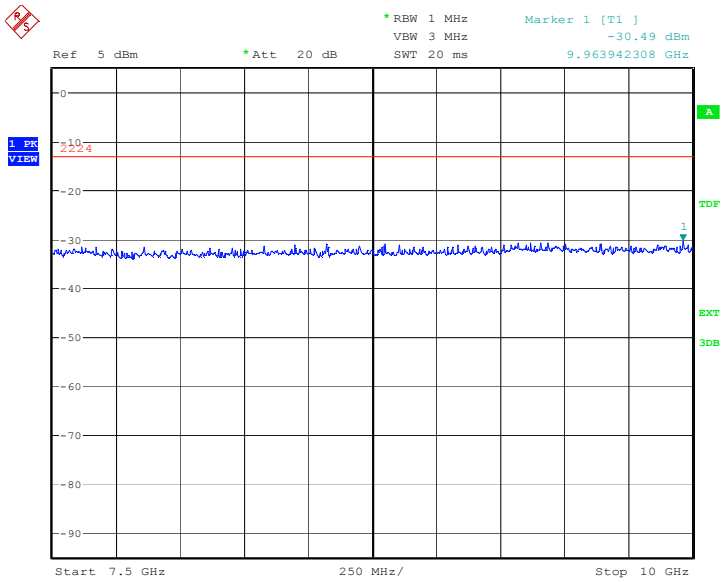
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:23:40

**Channel 1312: 7.5GHz –10GHz**

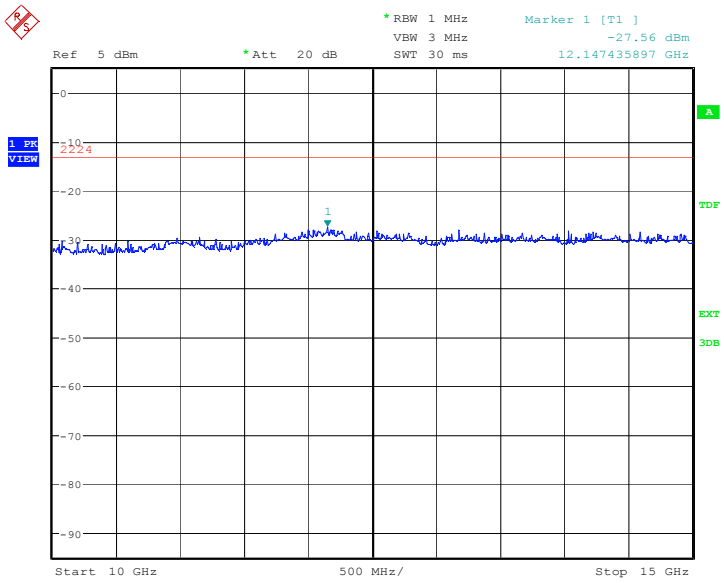
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:24:08

**Channel 1312: 10GHz –15GHz**

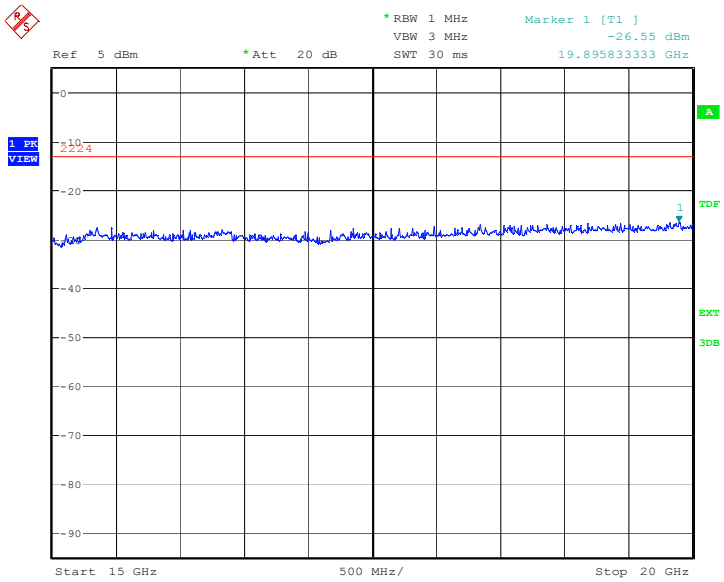
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:24:37

**Channel 1312: 15GHz –20GHz**

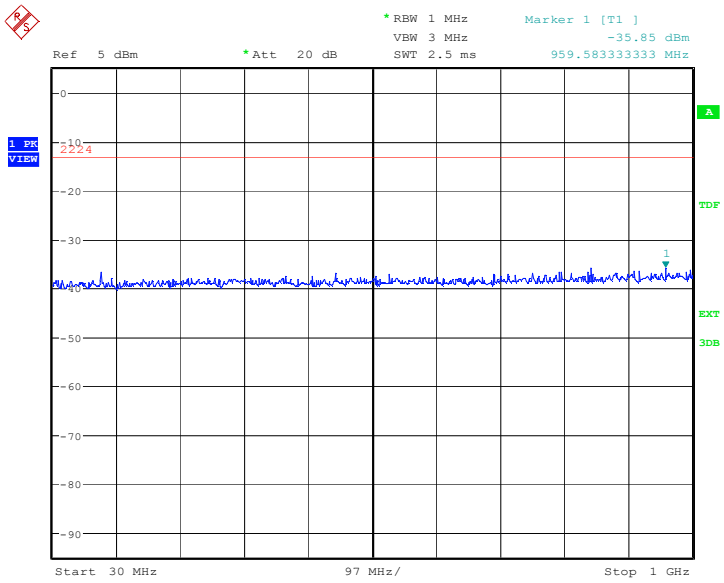
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:25:05

**Channel 1450: 30MHz –1GHz**

Spurious emission limit –13dBm.

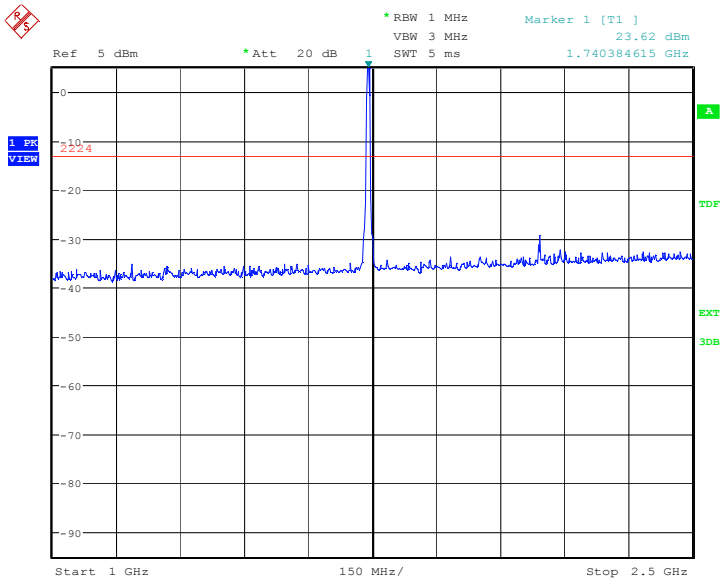



Date: 7.MAY.2016 04:25:36

**Channel 1450: 1GHz –2.5GHz**

Spurious emission limit –13dBm.

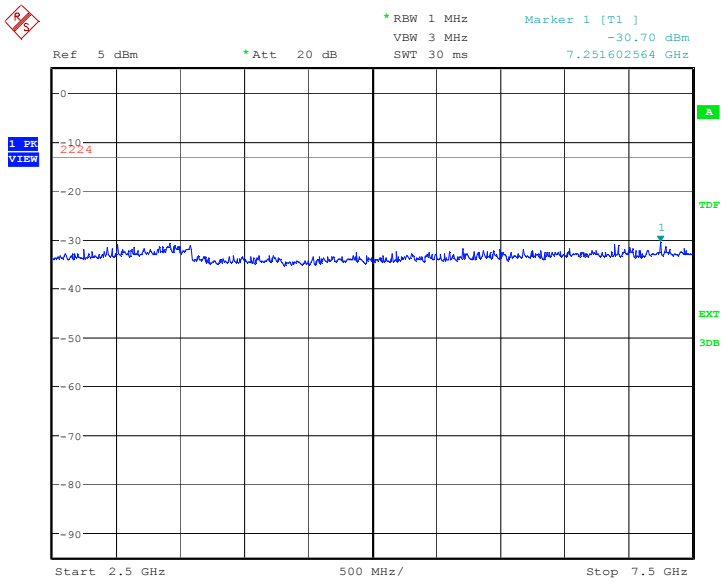
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.MAY.2016 04:26:04

**Channel 1450: 2.5GHz –7.5GHz**

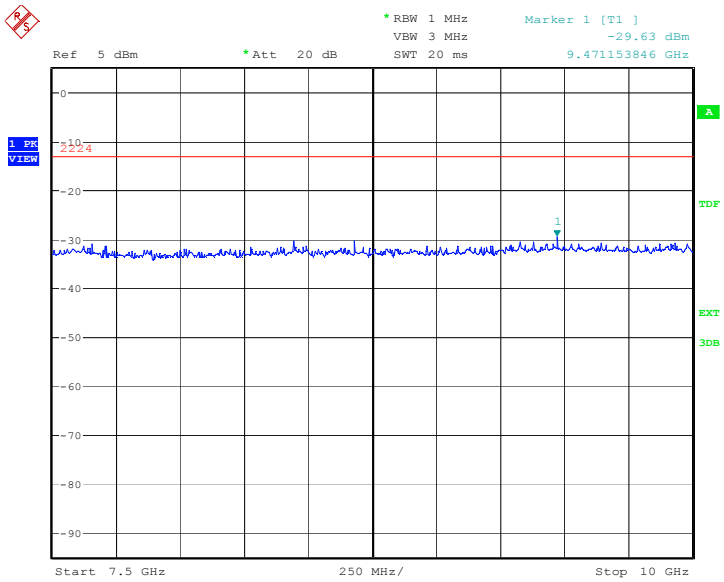
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:26:32

**Channel 1450: 7.5GHz –10GHz**

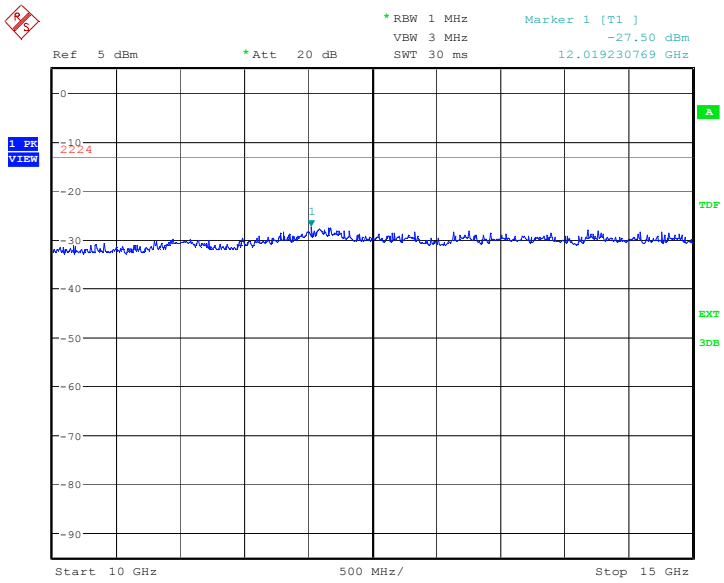
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:27:00

**Channel 1450: 10GHz –15GHz**

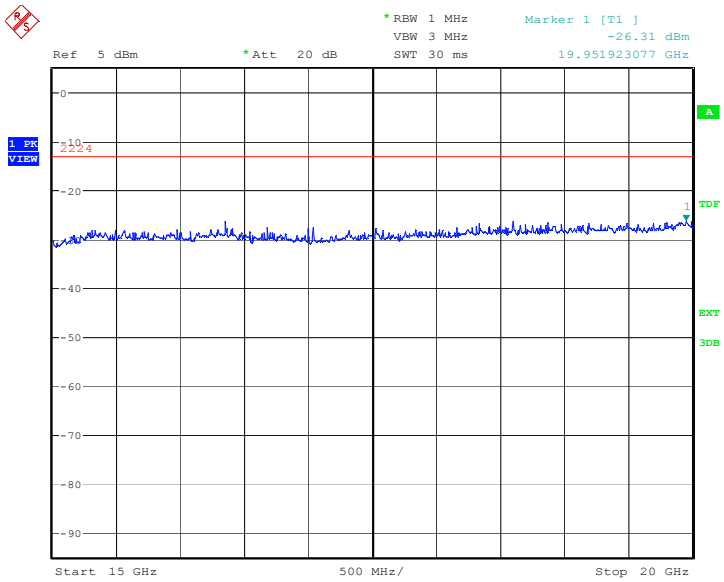
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:27:28

**Channel 1450: 15GHz –20GHz**

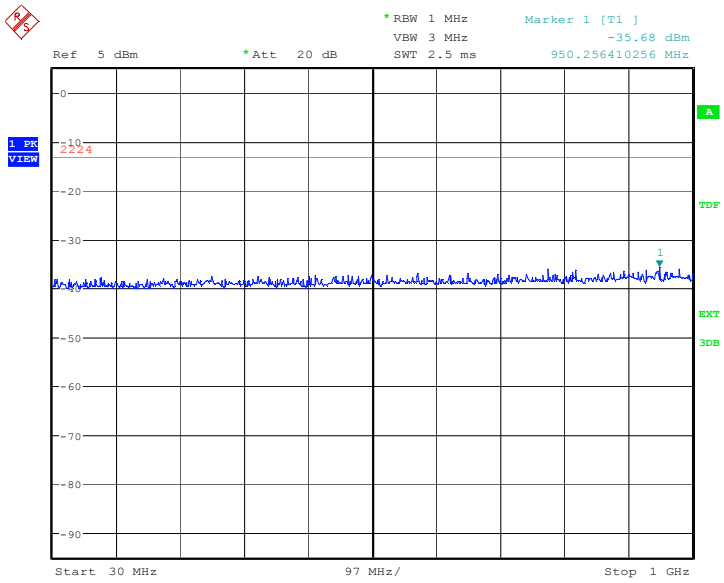
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:27:56

**Channel 1513: 30MHz –1GHz**

Spurious emission limit –13dBm.

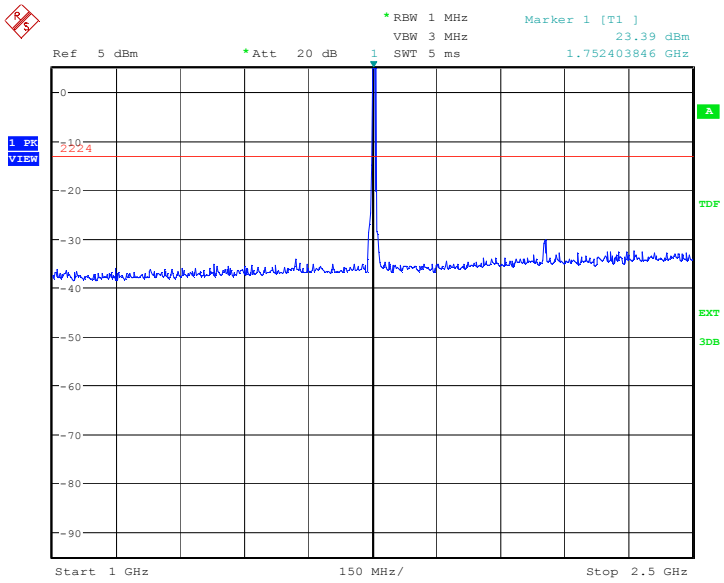



Date: 7.MAY.2016 04:28:28

**Channel 1513: 1GHz –2.5GHz**

Spurious emission limit –13dBm.

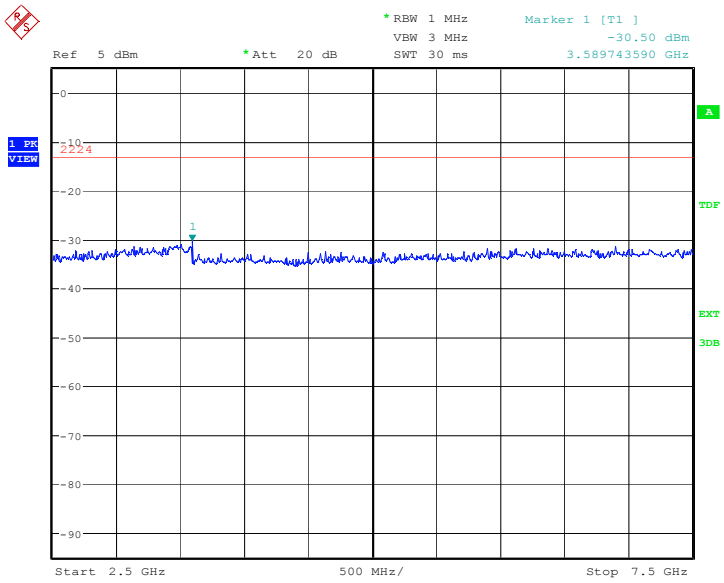
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.MAY.2016 04:28:56

**Channel 1513: 2.5GHz –7.5GHz**

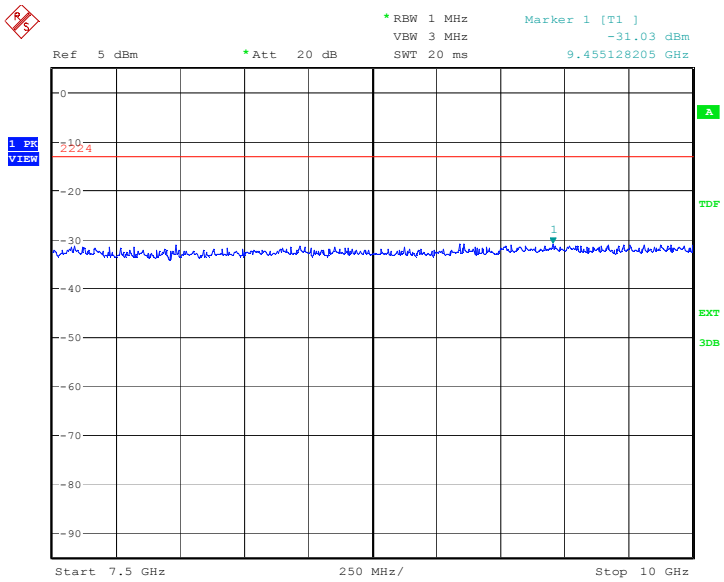
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:29:24

**Channel 1513: 7.5GHz –10GHz**

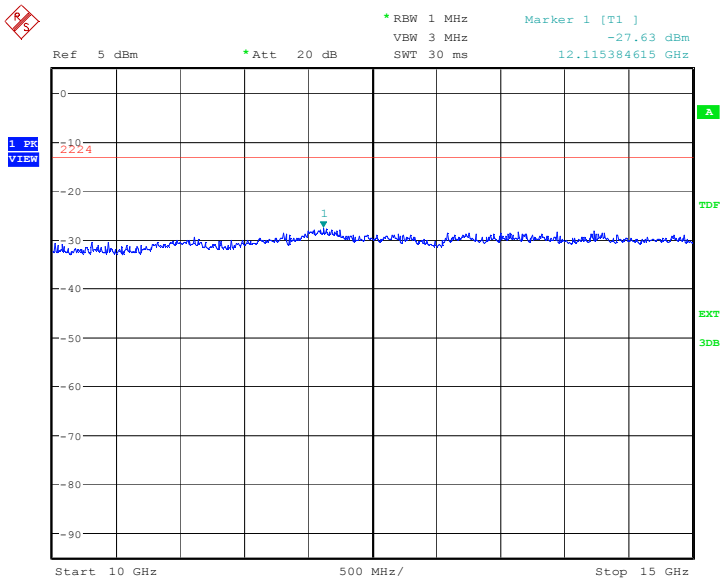
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:29:52

**Channel 1513: 10GHz –15GHz**

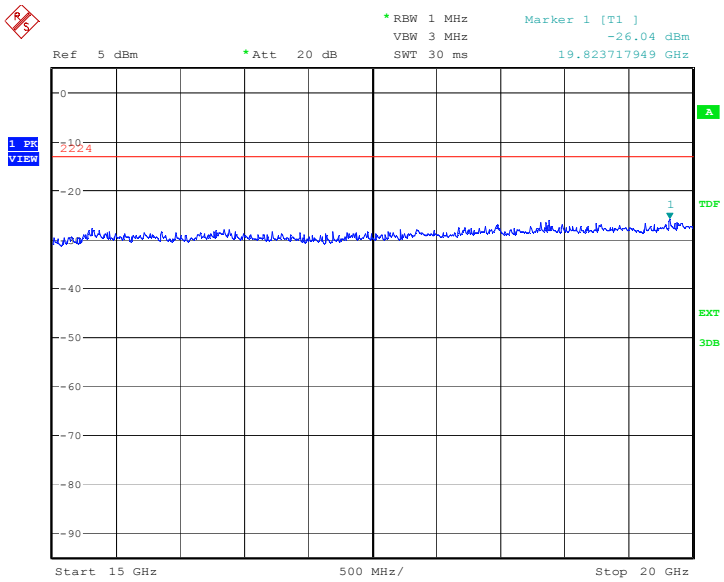
Spurious emission limit –13dBm.




Date: 7.MAY.2016 04:30:20

**Channel 1513: 15GHz –20GHz**

Spurious emission limit –13dBm.



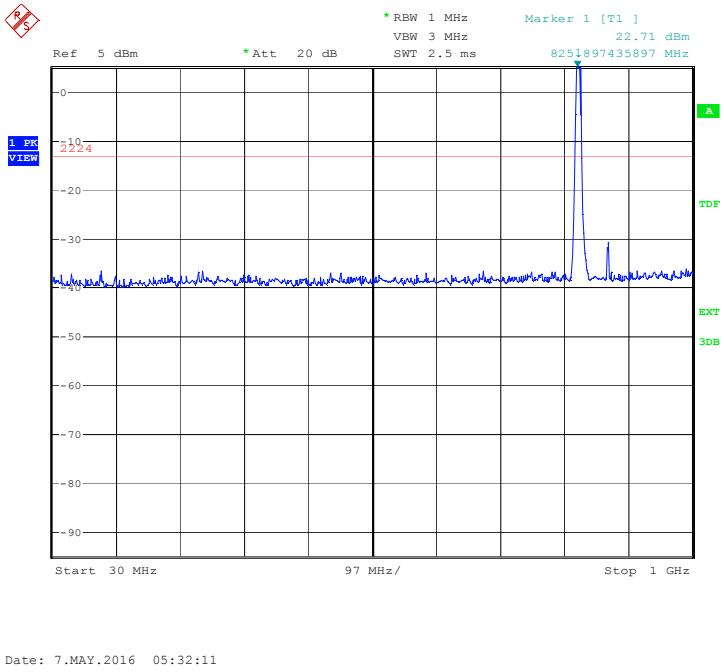

Date: 7.MAY.2016 04:30:48

**WCDMA Band Ⅴ**

**Channel 4132: 30MHz –1GHz**

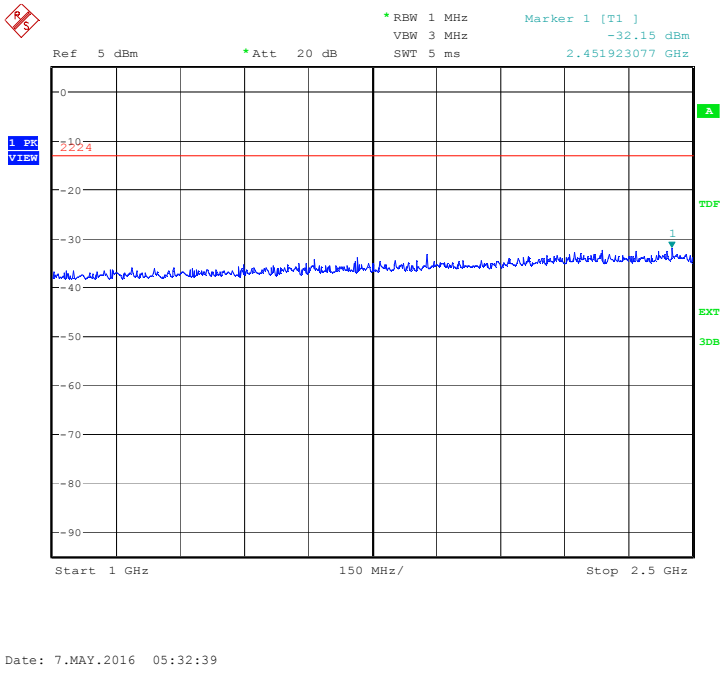
Spurious emission limit –13dBm.

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



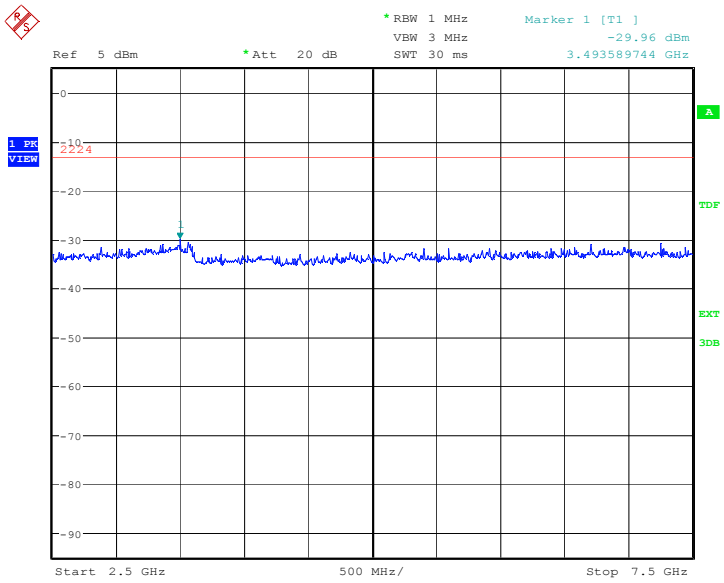

**Channel 4132: 1GHz – 2.5GHz**

Spurious emission limit –13dBm.



**Channel 4132: 2.5GHz –7.5GHz**

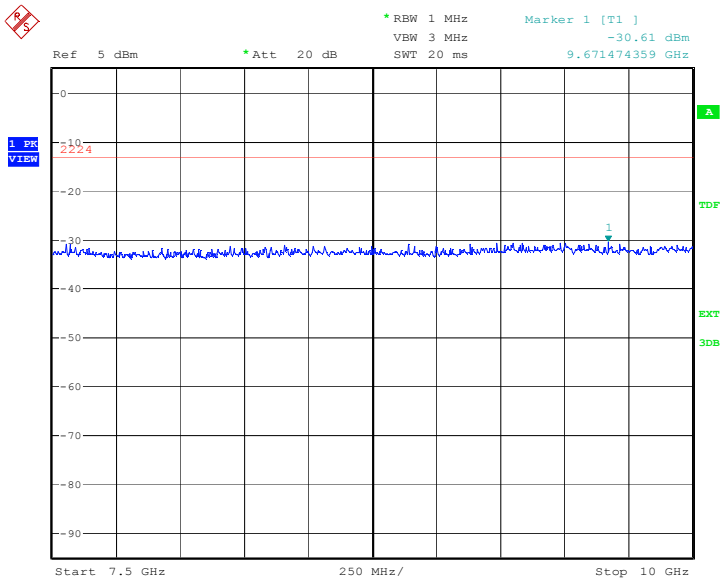
Spurious emission limit –13dBm.




Date: 7.MAY.2016 05:33:07

**Channel 4132: 7.5GHz – 10GHz**

Spurious emission limit –13dBm.

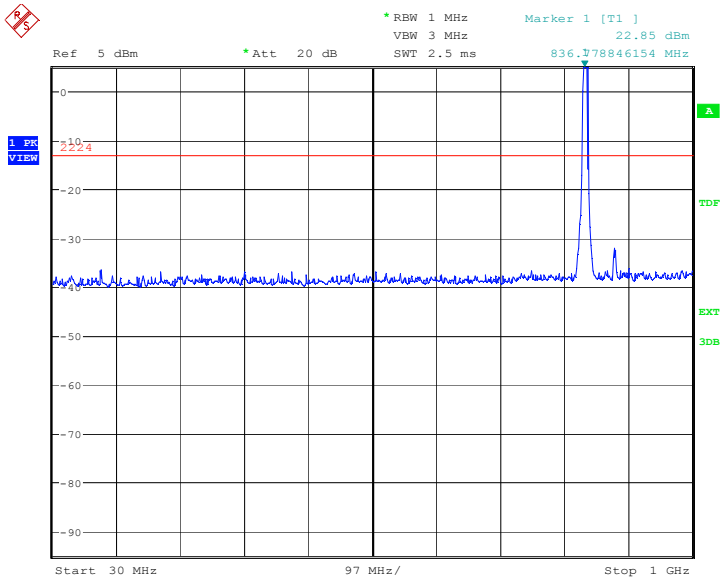



Date: 7.MAY.2016 05:33:35

**Channel 4183: 30MHz –1GHz**

Spurious emission limit –13dBm.

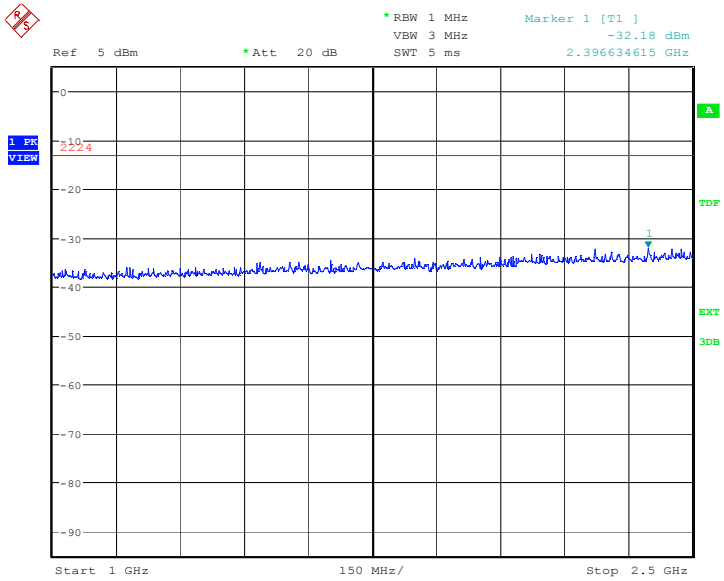
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.MAY.2016 05:34:06

**Channel 4183: 1GHz – 2.5GHz**

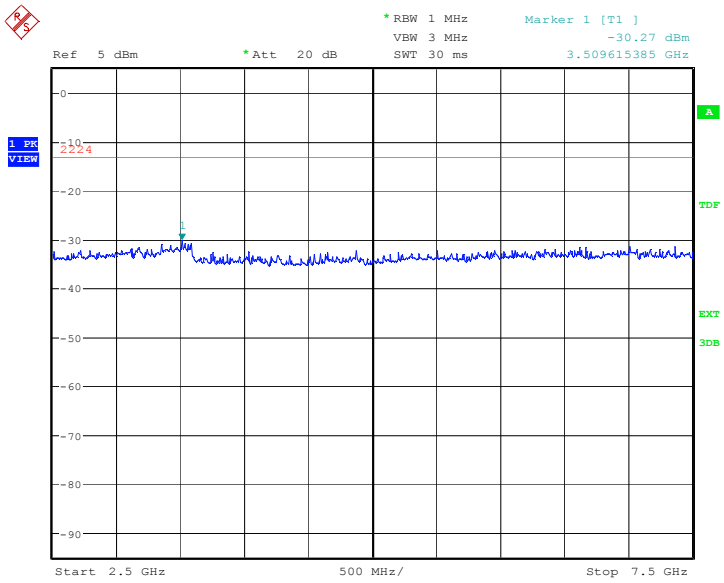
Spurious emission limit –13dBm.




Date: 7.MAY.2016 05:34:34

**Channel 4183: 2.5GHz –7.5GHz**

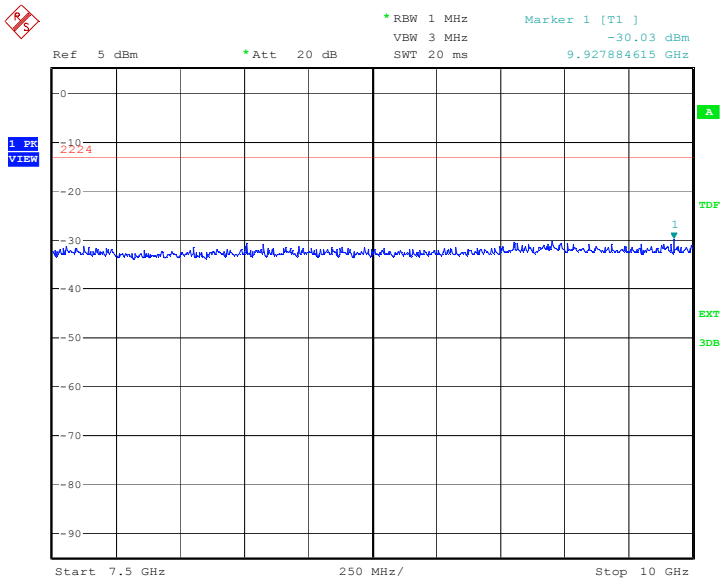
Spurious emission limit –13dBm.




Date: 7.MAY.2016 05:35:02

**Channel 4183: 7.5GHz – 10GHz**

Spurious emission limit –13dBm.

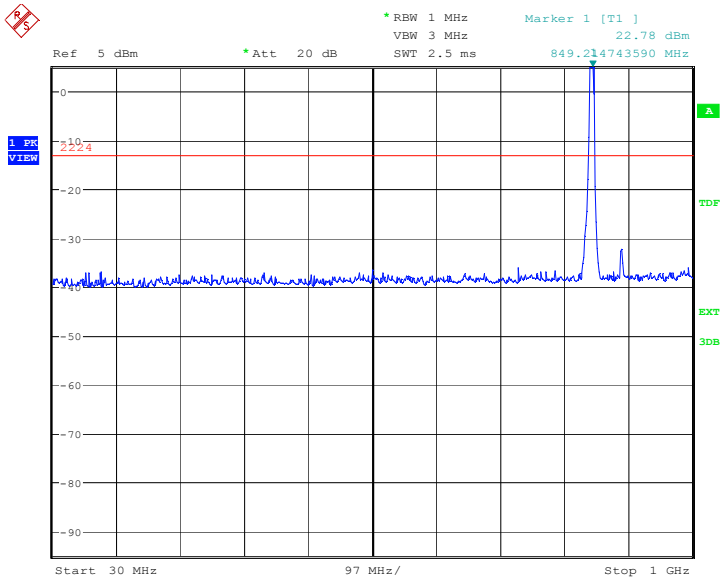



Date: 7.MAY.2016 05:35:30

**Channel 4233: 30MHz –1GHz**

Spurious emission limit –13dBm.

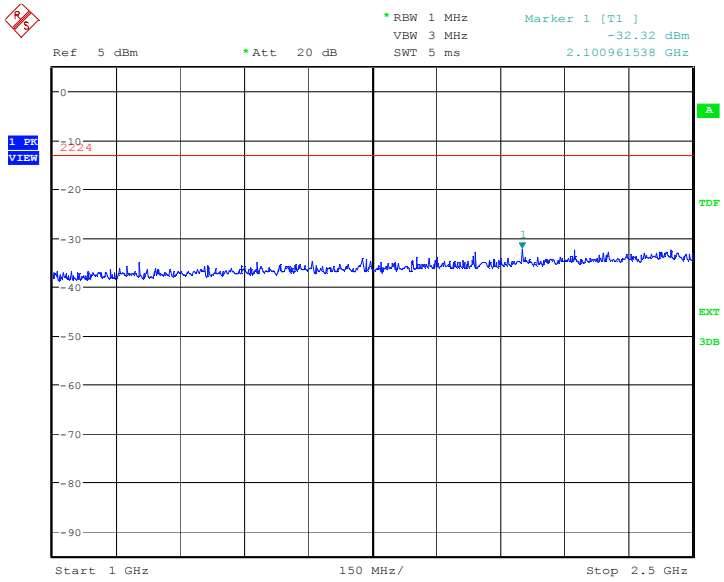
**NOTE: peak above the limit line is the carrier frequency.**




Date: 7.MAY.2016 05:36:02

**Channel 4233: 1GHz – 2.5GHz**

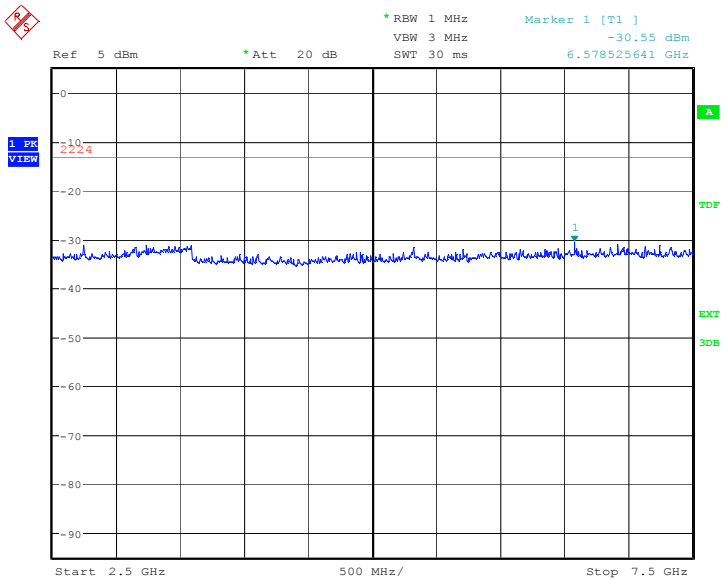
Spurious emission limit –13dBm.




Date: 7.MAY.2016 05:36:30

**Channel 4233: 2.5GHz –7.5GHz**

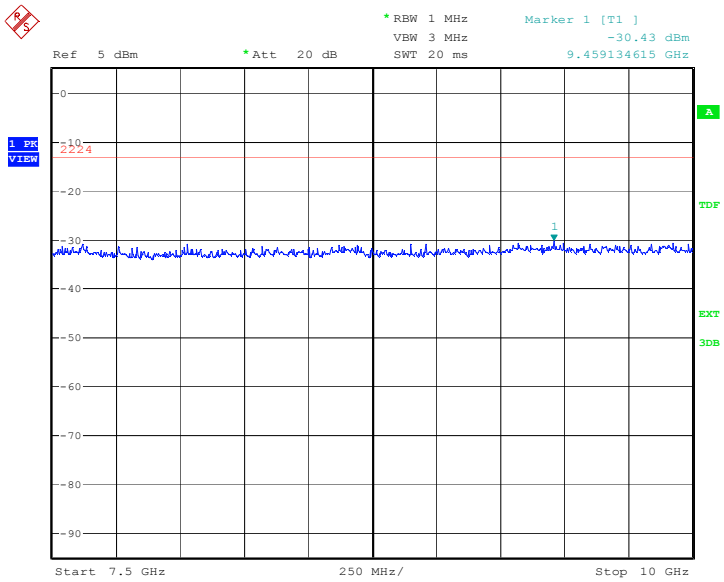
Spurious emission limit –13dBm.




Date: 7.MAY.2016 05:36:57

**Channel 4233: 7.5GHz – 10GHz**

Spurious emission limit –13dBm.




Date: 7.MAY.2016 05:37:25

## A.8 PEAK-TO-AVERAGE POWER RATIO

**Reference**

FCC: CFR Part 24.232 (d), 27.50(a)

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168:

a)Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth ≥ signal' s occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval to 1 ms

e)Record the maximum PAPR level associated with a probability of 0.1%

### A.8.1 Measurement limit

not exceed 13 dB

### A.8.2 Measurement results

**WCDMA Band II**

**Measurement result**

| | CH | Frequency(MHz) | PAPR(dB) |
|---|---|---|---|
| WCDMA (Band II) | 9262 | 1852.4 | 3.62 |
| | 9400 | 1880.0 | 3.81 |
| | 9538 | 1907.6 | 3.62 |

**WCDMA Band IV**

**Measurement result**

| | CH | Frequency(MHz) | PAPR(dB) |
|---|---|---|---|
| WCDMA (Band IV) | 1312 | 1712.4 | 3.33 |
| | 1450 | 1740.0 | 3.33 |
| | 1513 | 1752.6 | 3.56 |

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