TEST REPORT

No. 2012TAR588

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS triband / GSM quadband mobile phone

Model Name: Beetle 2SIM US

Marketing Name: ONE TOUCH 4030E

FCC ID: RAD316

with

Hardware Version: Ptoto

Software Version: vFA2

Issued Date: Dec 21, 2012

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

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

3/F Shou Xiang Technology Building, No.51 Xueyuan Road, Hai Dian District, Beijing, P. R. China,100191.

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CONTENTS

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
Telephone:	00861062304633
Fax:	00861062304793

1.2. Testing Environment

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

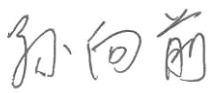
1.3. Project data

Testing Start Date:	Dec 14, 2012
Testing End Date:	Dec 21, 2012

1.4. Signature

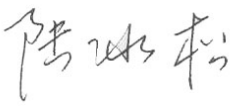
Zi Xiaogang

(Prepared this test report)



Sun Xiangqian

(Reviewed this test report)



Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

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, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Country:	China
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

2.2. Manufacturer Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Country:	China
Telephone:	0086-21-61460890
Fax:	0086-21-61460602

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

3.1. About EUT

Description	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Model Name	Beetle 2SIM US
Marketing Name	ONE TOUCH 4030E
FCC ID	RAD316
Frequency	GSM 850MHz; PCS 1900MHz; WCDMA Band II; WCDMA Band V
Antenna	Internal
Power supply	Battery or Charger (AC Adaptor)
Output power	26.08dBm maximum EIRP measured for WCDMA Band II
Extreme vol. Limits	3.5VDC to 4.2VDC (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.
Note: The EUT is a variant model of ONE TOUCH 4030A. Only RSE/EIRP had been tested. The other result is coming from the initial model.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
N07	013459000000755	Ptoto	vFA2
N20	013460000050139	Ptoto	vFA2

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	Battery	
AE2	Battery	
AE3	Charger	
AE4	Charger	

AE1

Model	CAB60B0000C2
Manufacturer	BAK
Capacitance	1400mAh
Nominal Voltage	3.7V

AE2

Model	CAB60B0000C1
Manufacturer	BYD

Capacitance	1400mAh
Nominal Voltage	3.7V
AE3	
Model	CBA3007AG0C1
Manufacturer	BYD
Length of DC line	97mm
AE4	
Model	CBA3007AG0C3
Manufacturer	Yingju
Length of DC line	97mm

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

3.4. General Description

The Equipment under Test (EUT) is a model of HSUPA/HSDPA/UMTS triband/GSM quadband 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. Samples undergoing test were selected by the Client.

4. Reference Documents

4.1. Reference Documents for testing

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

Reference	Title	Version
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	V 10.1.09
FCC Part 22	PUBLIC MOBILE SERVICES	V 10.1.09
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

Items	List	Clause in FCC rules	Verdict
1	Output Power	22.913(a)/24.232(c)	P
2	Emission Limit	2.1051/22.917/24.238	P
3	Conducted Emission	15.107/15.207	P
4	Frequency Stability	2.1055/24.235	P
5	Occupied Bandwidth	2.1049(h)(i)	P
6	Emission Bandwidth	22.917(b)/24.238(b)	P
7	Band Edge Compliance	22.917(b)/24.238(b)	P
8	Conducted Spurious Emission	2.1057/22.917/24.238	P

7. Test Equipments Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL DUE DATE
1	Test Receiver	ESCI	100344	R&S	2013-03-28
2	Test Receiver	ESU26	100376	R&S	2013-11-08
3	BiLog Antenna	VULB 9163	514	Schwarzbeck	2014-11-10
4	BiLog Antenna	3117	00139065	ETS-Lindgren	2014-07-31
5	Signal Generator	SMB100A	102063	R&S	2013-04-05
6	LISN	ESH2-Z5	829991/012	R&S	2013-04-16
7	Universal Radio Communication Tester	CMU200	102228	R&S	2013-07-06
8	Universal Radio Communication Tester	E5515C	MY48361083	Agilent	2013-03-16
9	Spectrum Analyzer	E4440A	MY48250642	Agilent	2013-03-04
10	EMI Antenna	9117	177	Schwarzbeck	2013-06-28
11	EMI Antenna	VULB 9163	482	Schwarzbeck	2014-02-17
12	EMI Antenna	3117	00119024	ETS-Lindgren	2014-02-02
13	EMI Antenna	3117	00058889	ETS-Lindgren	2014-02-02
14	Signal Generator	N5183A	MY49060052	Agilent	2013-03-19
15	Climatic chamber	PL-2G	343074	ESPEC	2013-05-12
16	Spectrum Analyzer	FSU26	200030	R&S	2013-06-19

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.
The power was measured with Rhode & Schwarz Spectrum Analyzer FSU (peak)
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. (bottom, middle and top of operational frequency range).

Limit

According to FCC§2.1046.

A.1.2.2 Test Condition

RBW	VBW	Sweep Time	Span
10MHz	10MHz	800ms	50MHz

WCDMA Band II

Measurement result

	CH	Frequency(MHz)	output power(dBm)
WCDMA (Band II)	9262	1852.4	**23.41**
	9400	1880.0	23.28
	9538	1907.6	23.26

WCDMA Band V

Measurement result

	CH	Frequency(MHz)	output power(dBm)
WCDMA (Band V)	4132	826.4	**23.54**
	4183	836.6	23.36
	4233	846.6	23.34

A.1.3 Radiated

A.1.3.1 Description

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

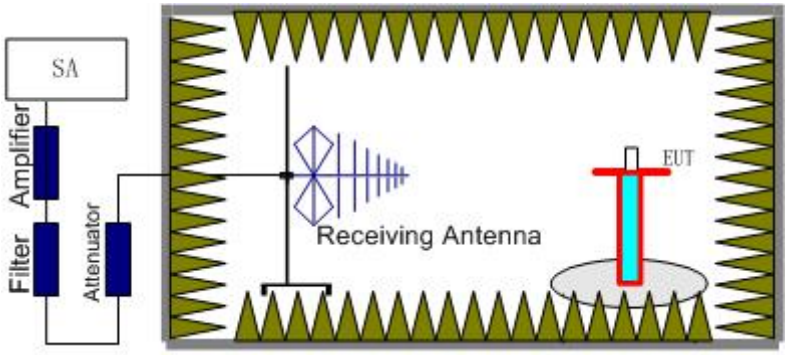
Rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

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

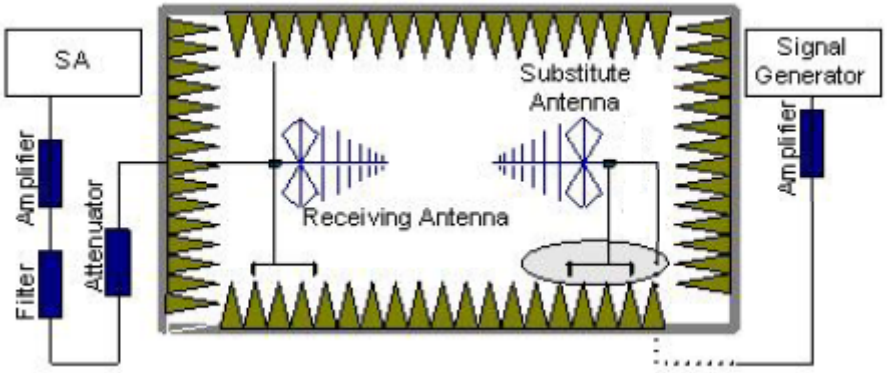
A.1.3.2 Method of Measurement

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:
   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)	Polarization
1852.40	-24.78	6.02	-50.00	-4.55	23.75	H
1880.00	-23.16	7.05	-50.00	-4.43	24.22	H
1907.60	-19.33	8.90	-50.00	-4.31	26.08	H

Frequency**:** 1907.60MHz

Peak EIRP(dBm)= P_{Mea}(-19.33dBm)- P_{cl}(8.90dB)- P_{Ag}(-50.00dB)-G_a (-4.31dB) =26.08dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

WCDMA Band V-ERP

Limits

	Burst Peak EIRP (dBm)
WCDMA Band V	≤38.45dBm

Measurement result

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)	P_{Ag}(dB)	G_a Antenna Gain(dB)	Correction (dBm)	ERP(dBm)	Polarization
826.40	-26.07	2.25	-53.00	0.85	2.15	21.68	H
836.60	-24.78	2.26	-53.00	0.90	2.15	22.91	H
846.60	-24.85	2.26	-53.00	0.94	2.15	22.80	H

Frequency**:** 836.60MHz

Peak ERP(dBm)= P_{Mea}(-24.78dBm)- P_{cl}(2.26dB)- P_{Ag}(-53.00dB)-G_a (-0.90dB)-2.15dBm=22.91dBm

ANALYZER SETTINGS: RBW = VBW = 3MHz

A.2 EMISSION LIMIT

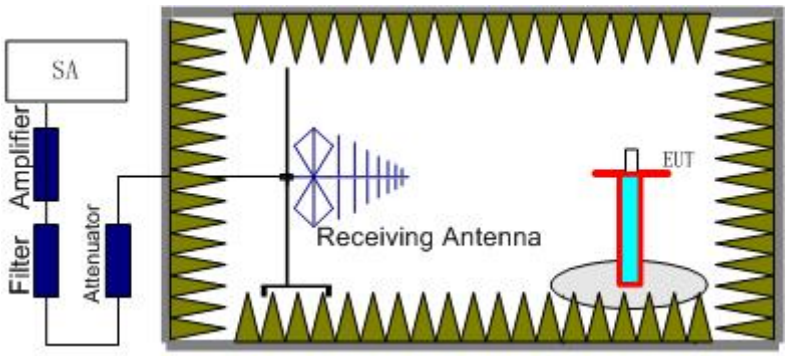
A.2.1 Measurement Method

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

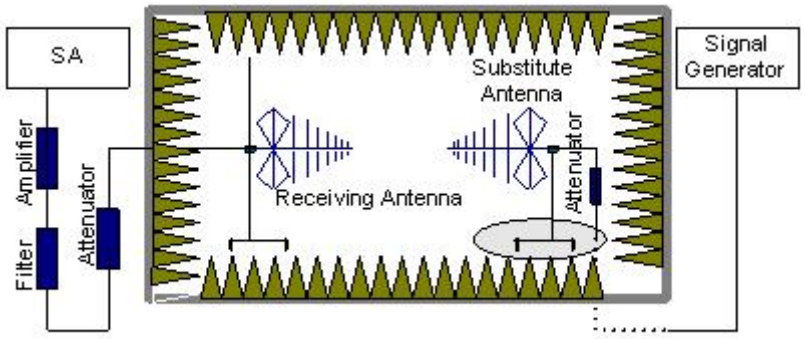
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set as outlined in Part 24.238 and Part 24.917. The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and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

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 (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. 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 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 the WCDMA Band II (1852.4 MHz, 1880.0MHz and 1907.6MHz) and WCDMA Band V (826.4MHz, 836.6MHz and 846.6MHz) . 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 and WCDMA Band V 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
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

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 II Mode Channel 9262/1852.4MHz

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Polarization
3762.49	-56.82	5.91	-8.21	-54.52	-13.00	H
5643.68	-45.13	9.74	-10.06	-44.81	-13.00	H
7135.03	-66.55	8.52	-11.18	-63.89	-13.00	H
9399.27	-60.06	8.23	-12.60	-55.69	-13.00	H
12061.23	-63.55	9.65	-12.52	-60.68	-13.00	H
13230.70	-64.49	10.34	-13.53	-61.30	-13.00	V

WCDMA BAND II Mode Channel 9400/1880MHz

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Polarization
3762.49	-56.82	5.91	-8.21	-54.52	-13.00	H
5643.68	-45.13	9.74	-10.06	-44.81	-13.00	H
7135.03	-66.55	8.52	-11.18	-63.89	-13.00	H
9399.27	-60.06	8.23	-12.60	-55.69	-13.00	H
12061.23	-63.55	9.65	-12.52	-60.68	-13.00	H
13230.70	-64.49	10.34	-13.53	-61.30	-13.00	V

WCDMA BAND II Mode Channel 9538/1907.6MHz

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Polarization
3816.54	-52.06	5.61	-8.28	-49.39	-13.00	V
5722.49	-44.09	10.07	-10.09	-44.07	-13.00	V
8965.64	-72.12	7.90	-12.57	-67.45	-13.00	H
10222.58	-64.44	8.59	-12.44	-60.59	-13.00	H
12514.25	-66.13	9.72	-12.72	-63.13	-13.00	V
15528.29	-63.22	11.00	-13.38	-60.84	-13.00	V

WCDMA BAND V Mode Channel 4132/826.4MHz

Frequency(MHz)	PMea(dBm)	Path Loss	Antenna Gain	Correction (dBm)	Peak ERP(dBm)	Limit （dBm）	Polarization
1655.41	-51.15	3.49	-5.42	2.15	-51.37	-13.00	V
3302.25	-51.74	4.93	-7.43	2.15	-51.39	-13.00	V
4714.45	-67.95	6.32	-9.19	2.15	-67.23	-13.00	H
5623.10	-67.07	9.15	-10.05	2.15	-68.32	-13.00	V
6818.79	-61.65	7.62	-10.92	2.15	-60.50	-13.00	H
9127.51	-72.02	7.95	-12.60	2.15	-69.52	-13.00	V

WCDMA BAND V Mode Channel 4183/836.6MHz

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Correction (dBm)	Peak ERP(dBm)	Limit （dBm）	Polarization
1671.74	-53.18	3.42	-5.34	2.15	-53.41	-13.00	V
3412.23	-68.33	5.00	-7.69	2.15	-67.79	-13.00	H
4317.37	-67.25	6.11	-8.69	2.15	-66.82	-13.00	V
5507.68	-69.45	8.66	-10.00	2.15	-70.26	-13.00	V
6613.20	-66.43	7.45	-10.71	2.15	-65.32	-13.00	V
8617.61	-68.60	7.93	-12.29	2.15	-66.39	-13.00	V

WCDMA BAND V Mode Channel 4233/846.6MHz

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Correction (dBm)	Peak ERP(dBm)	Limit （dBm）	Polarization
1690.97	-45.39	3.60	-5.26	2.15	-45.88	-13.00	V
3383.19	-61.17	5.04	-7.62	2.15	-60.74	-13.00	H
4616.20	-69.15	6.27	-9.01	2.15	-68.56	-13.00	V
5583.25	-64.60	8.84	-10.03	2.15	-65.56	-13.00	V
7083.17	-68.02	8.46	-11.15	2.15	-67.48	-13.00	V
8632.15	-69.00	7.83	-12.31	2.15	-66.67	-13.00	H

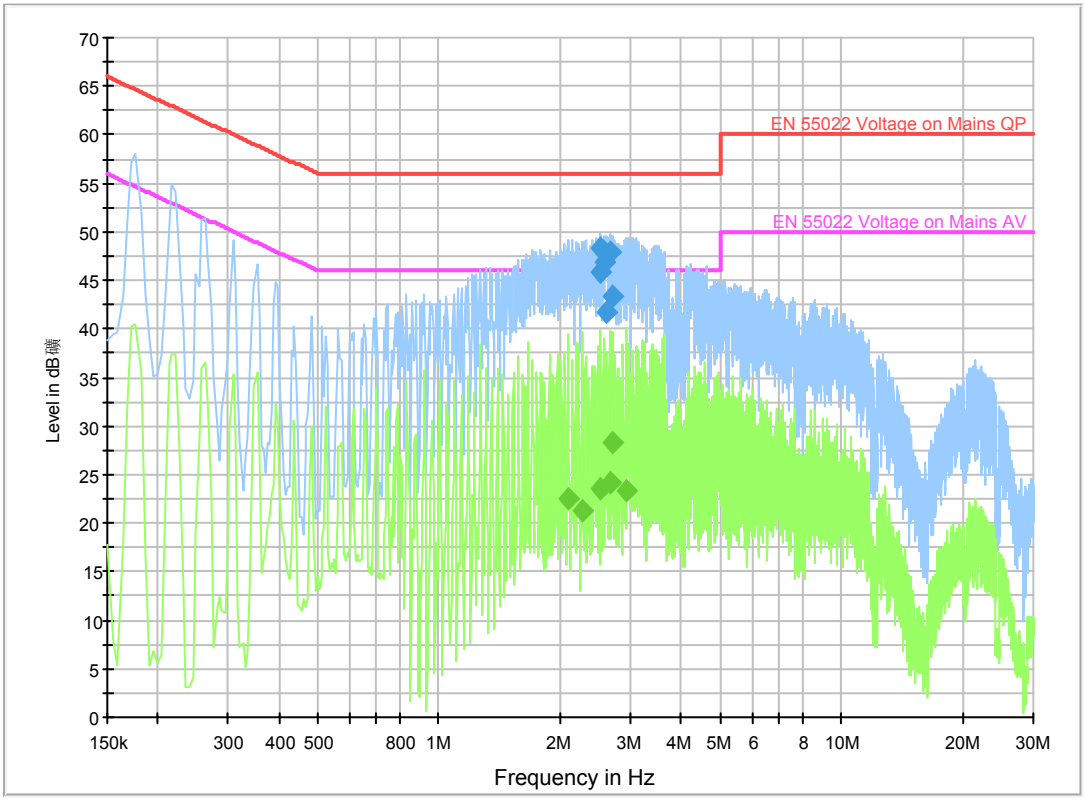
A.3 CONDUCTED EMISSION

The measurement procedure in ANSI C63.4-2003 is used. Conducted Emission is measured with travel charger.

A.3.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi -Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50
* Decreases with logarithm of the frequency		

A.3.2 Measurement result
WCDMA Band II-AE3



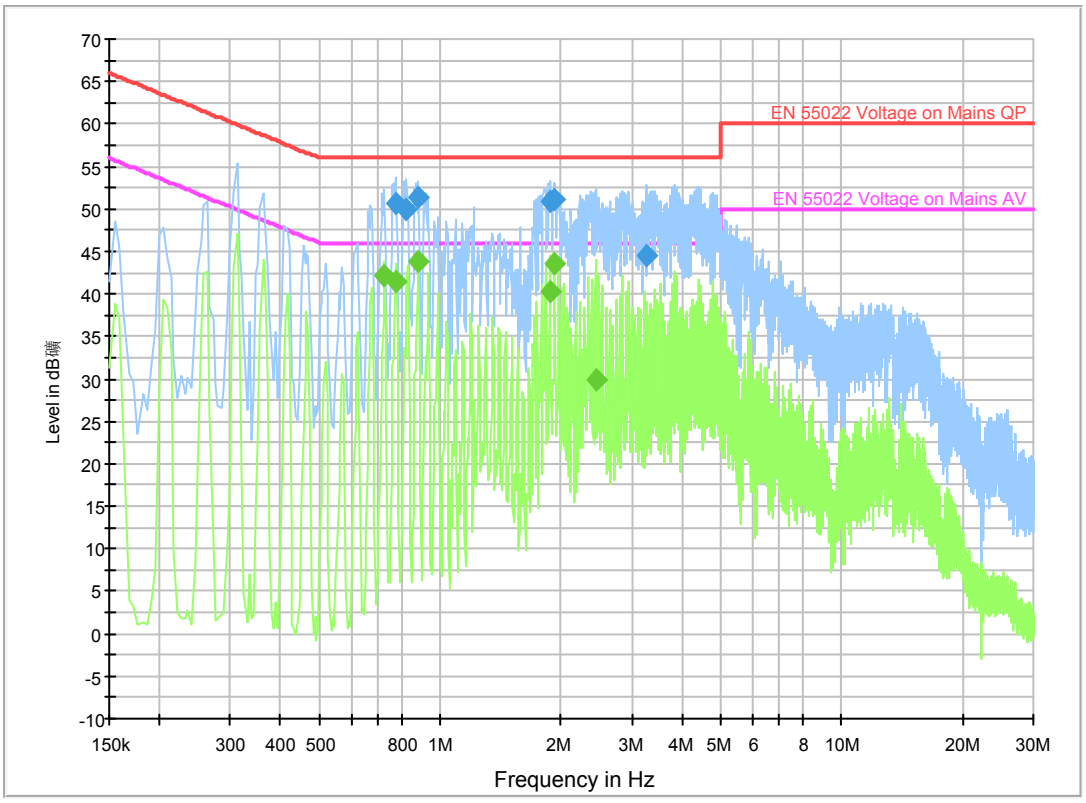
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.517000	48.4	GND	L1	10.0	7.6	56.0
2.526000	45.8	GND	L1	10.0	10.2	56.0
2.566500	46.8	GND	L1	10.0	9.2	56.0
2.598000	41.7	GND	L1	10.0	14.3	56.0
2.656500	47.9	GND	L1	10.0	8.1	56.0
2.697000	43.3	GND	L1	10.0	12.7	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.098500	22.5	GND	L1	10.0	23.6	46.0
2.269500	21.2	GND	L1	10.0	24.8	46.0
2.526000	23.5	GND	L1	10.0	22.5	46.0
2.656500	24.2	GND	L1	10.0	21.8	46.0
2.697000	28.2	GND	L1	10.0	17.8	46.0
2.913000	23.4	GND	L1	10.0	22.6	46.0

WCDMA Band II-AE4



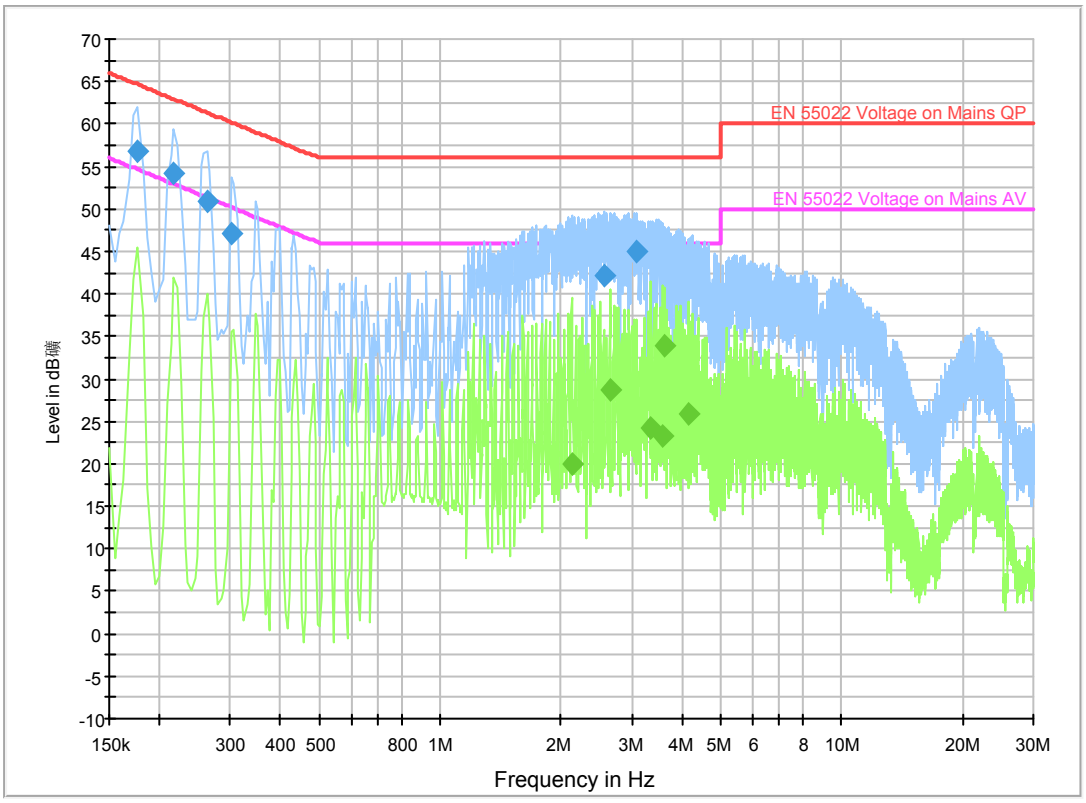
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.775500	50.6	GND	L1	10.0	5.4	56.0
0.825000	49.8	GND	L1	10.0	6.2	56.0
0.883500	51.5	GND	L1	10.0	4.5	56.0
1.878000	50.8	GND	L1	10.0	5.2	56.0
1.927500	51.0	GND	L1	10.0	5.0	56.0
3.277500	44.5	GND	N	10.0	11.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.726000	42.2	GND	L1	10.0	3.8	46.0
0.775500	41.3	GND	L1	10.0	4.7	46.0
0.883500	43.9	GND	L1	10.0	2.1	46.0
1.878000	40.1	GND	L1	10.0	5.9	46.0
1.927500	43.6	GND	L1	10.0	2.4	46.0
2.436000	30.0	GND	L1	10.0	16.0	46.0

WCDMA Band V-AE3



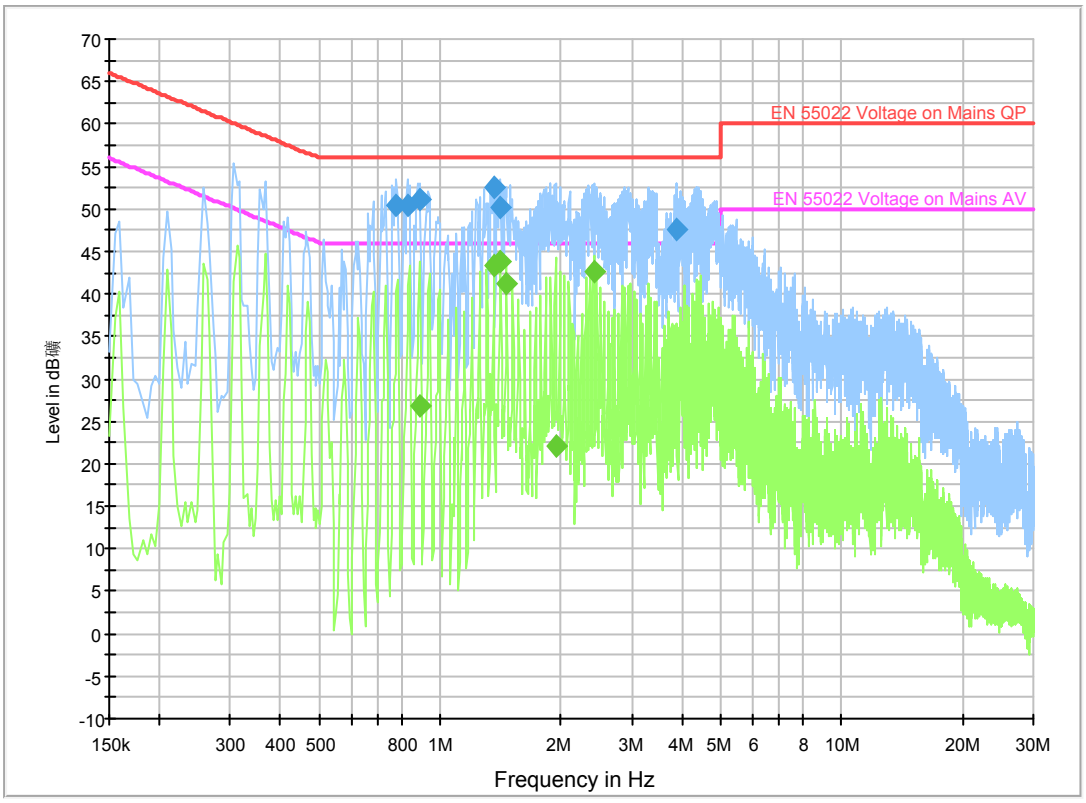
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	56.8	GND	L1	10.0	7.8	64.6
0.217500	54.2	GND	L1	10.0	8.7	62.9
0.262500	50.9	GND	L1	10.0	10.5	61.4
0.303000	47.1	GND	L1	10.0	13.1	60.2
2.553000	42.1	GND	L1	10.0	13.9	56.0
3.093000	45.1	GND	L1	10.0	10.9	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.125500	19.9	GND	L1	10.0	26.1	46.0
2.652000	28.8	GND	L1	10.0	17.2	46.0
3.327000	24.2	GND	L1	10.0	21.8	46.0
3.570000	23.3	GND	L1	10.0	22.7	46.0
3.615000	34.0	GND	L1	10.0	12.0	46.0
4.146000	25.8	GND	L1	10.0	20.2	46.0

WCDMA Band V-AE4



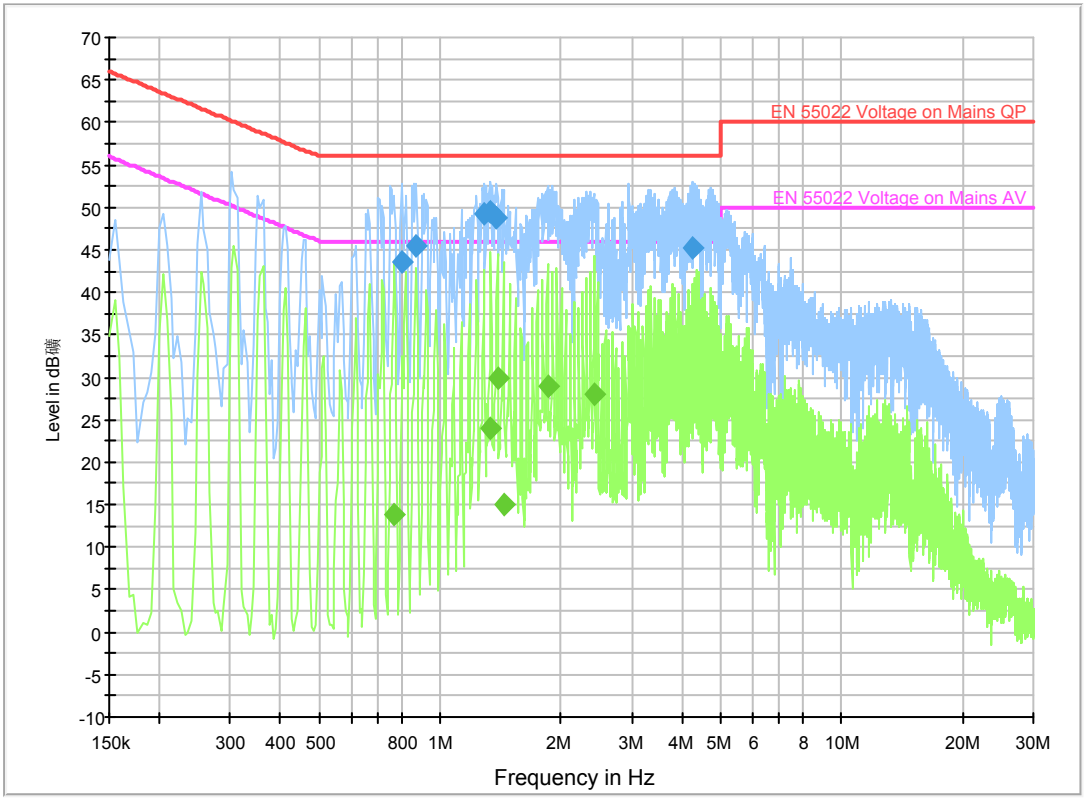
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.780000	50.5	GND	L1	10.0	5.5	56.0
0.829500	50.4	GND	L1	10.0	5.6	56.0
0.888000	51.1	GND	L1	10.0	4.9	56.0
1.360500	52.6	GND	L1	10.0	3.4	56.0
1.405500	50.2	GND	L1	10.0	5.8	56.0
3.880500	47.7	GND	N	10.0	8.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.888000	26.9	GND	L1	10.0	19.1	46.0
1.360500	43.3	GND	L1	10.0	2.7	46.0
1.414500	43.9	GND	L1	10.0	2.1	46.0
1.464000	41.3	GND	L1	10.0	4.7	46.0
1.936500	22.2	GND	L1	10.0	23.8	46.0
2.409000	42.7	GND	L1	10.0	3.3	46.0

MP3



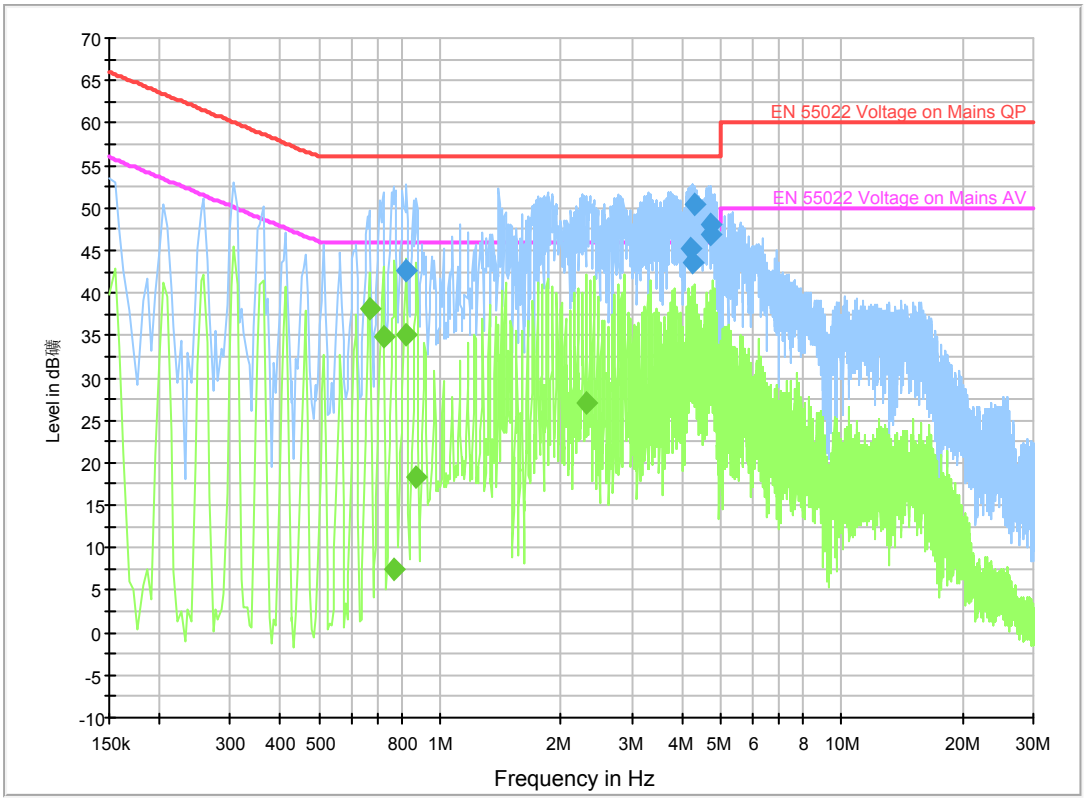
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.802500	43.7	GND	L1	10.0	12.3	56.0
0.874500	45.6	GND	L1	10.0	10.4	56.0
1.284000	49.2	GND	L1	10.0	6.8	56.0
1.333500	49.4	GND	L1	10.0	6.6	56.0
1.383000	48.7	GND	L1	10.0	7.3	56.0
4.267500	45.2	GND	L1	10.0	10.8	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.771000	13.9	GND	L1	10.0	32.1	46.0
1.338000	23.9	GND	L1	10.0	22.1	46.0
1.387500	30.0	GND	L1	10.0	16.0	46.0
1.437000	14.9	GND	L1	10.0	31.1	46.0
1.851000	29.0	GND	L1	10.0	17.0	46.0
2.418000	28.0	GND	L1	10.0	18.0	46.0

Camera



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.825000	42.6	GND	L1	10.0	13.4	56.0
4.209000	45.2	GND	L1	10.0	10.8	56.0
4.267500	43.5	GND	L1	10.0	12.5	56.0
4.299000	50.3	GND	L1	10.0	5.7	56.0
4.708500	48.1	GND	L1	10.0	7.9	56.0
4.717500	47.0	GND	L1	10.0	9.0	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.667500	38.0	GND	L1	10.0	8.0	46.0
0.721500	34.8	GND	L1	10.0	11.2	46.0
0.771000	7.6	GND	L1	10.0	38.4	46.0
0.825000	35.1	GND	L1	10.0	10.9	46.0
0.874500	18.4	GND	L1	10.0	27.6	46.0
2.314500	27.0	GND	L1	10.0	19.0	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℃.
3. With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on mid channel of WCDMA Band II and WCDMA Band V, 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.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 3.5VDCand 4.2VDC with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

A.4.2.2 For equipment powered by primary supply voltage

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the

fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

A.4.3 Measurement results

WCDMA Band Ⅱ

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	6	0.003
3.8	-5	0.003
4.2	3	0.002

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	-9	0.005
-20	6	0.003
-10	8	0.004
0	-7	0.004
10	6	0.003
20	-8	0.004
30	6	0.003
40	8	0.004
50	-8	0.004

WCDMA Band Ⅴ

Frequency Error vs Voltage

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	6	0.007
3.8	4	0.005
4.2	3	0.004

Frequency Error vs Temperature

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	-2	0.002
-20	-4	0.005
-10	5	0.006
0	-4	0.005
10	-6	0.007
20	-5	0.006
30	4	0.005
40	2	0.002
50	4	0.005

A.5 OCCUPIED BANDWIDTH

A.5.1 Occupied Bandwidth Results

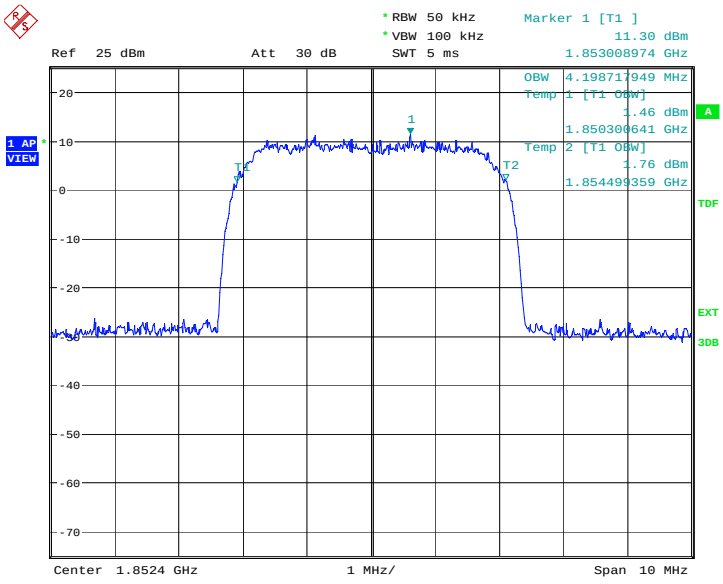
Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of WCDMA Band II and WCDMA Band V. The table below lists the measured -20dBc BW. Spectrum analyzer plots are included on the following pages.

WCDMA Band II(-20dBc)

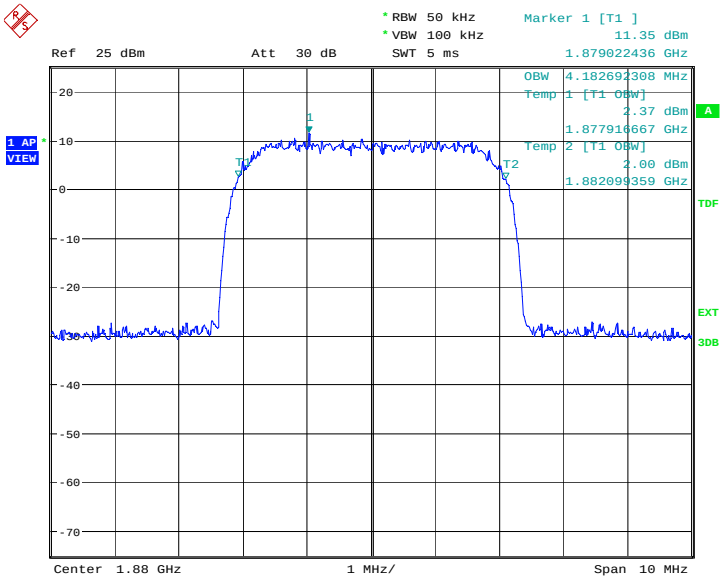
Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(MHz)
1852.4	4.199
1880.0	4.183
1907.6	4.183

WCDMA Band Ⅱ

Channel 9262-Occupied Bandwidth (-20dBc BW)

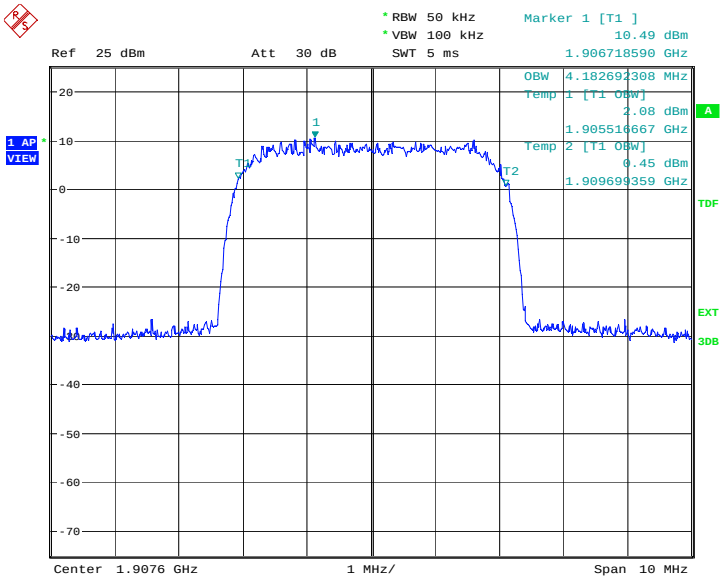


Channel 9400-Occupied Bandwidth (-20dBc BW)



Date: 14.DEC.2012 06:56:40

Channel 9538-Occupied Bandwidth (-20dBc BW)



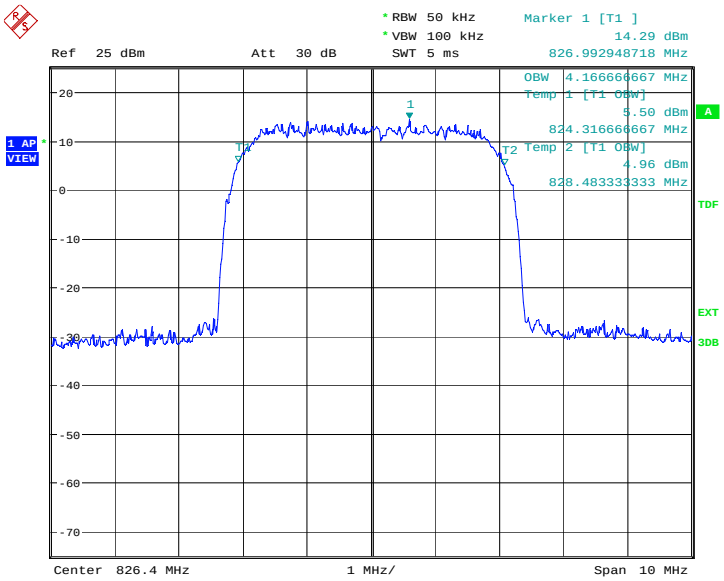
Date: 14.DEC.2012 06:57:14

WCDMA Band V(-20dBc)

Frequency(MHz)	Occupied Bandwidth (-20dBc BW)(MHz)
826.4	4.167
836.6	4.183
846.6	4.167

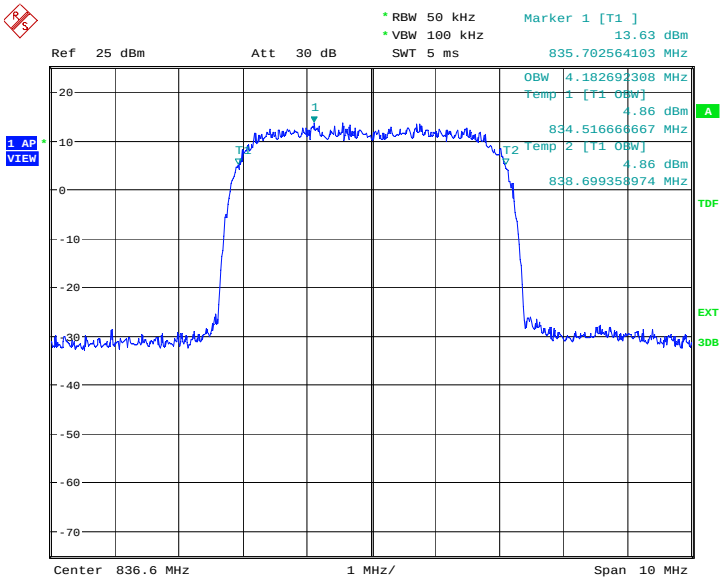
WCDMA Band V

Channel 4132-Occupied Bandwidth (-20dBc BW)



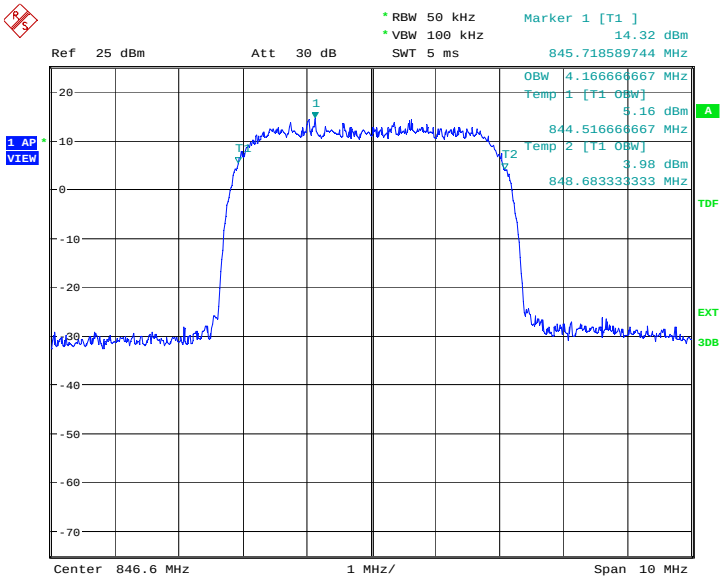
Date: 14.DEC.2012 07:29:12

Channel 4183-Occupied Bandwidth (-20dBc BW)



Date: 14.DEC.2012 07:29:46

Channel 4233-Occupied Bandwidth (-20dBc BW)



Date: 14.DEC.2012 07:30:21

A.6 EMISSION BANDWIDTH

A.6.1Emission Bandwidth Results

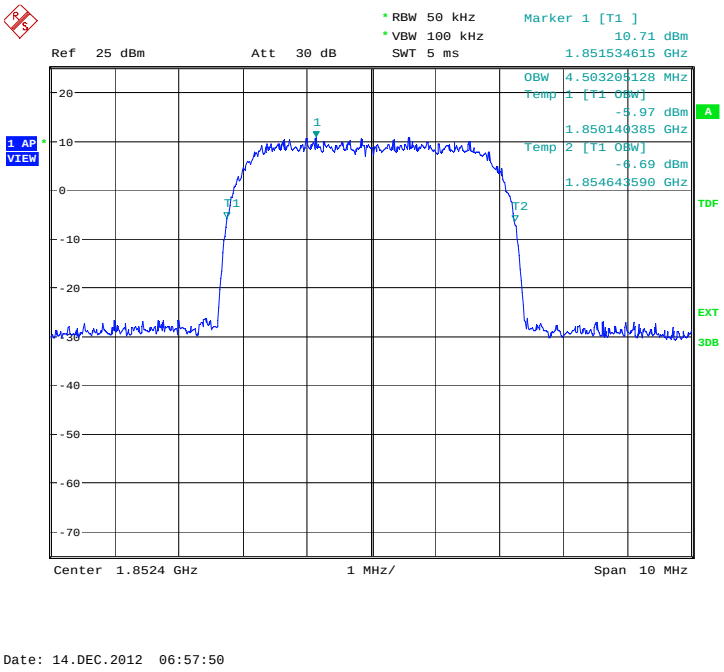
Similar to conducted emissions; Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of WCDMA Band II and WCDMA Band V. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

WCDMA Band II(-26dBc)

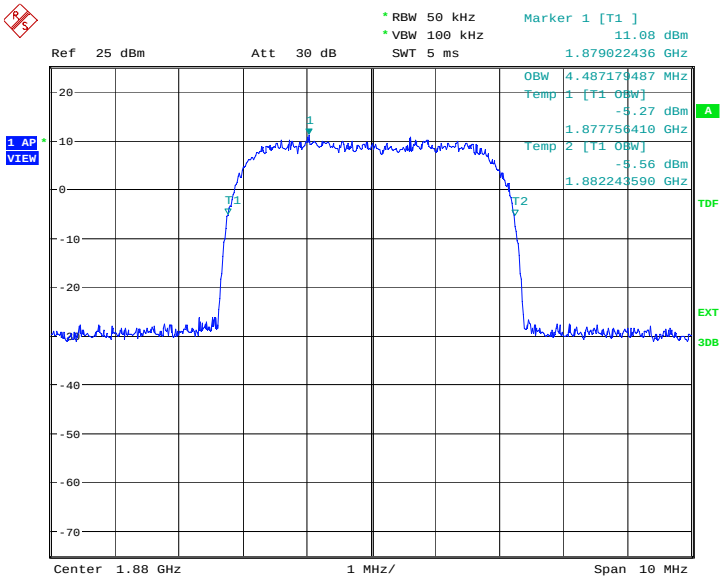
Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(MHz)
1852.4	4.503
1880.0	4.487
1907.6	4.487

WCDMA Band II

Channel 9262-Occupied Bandwidth (-26dBc BW)

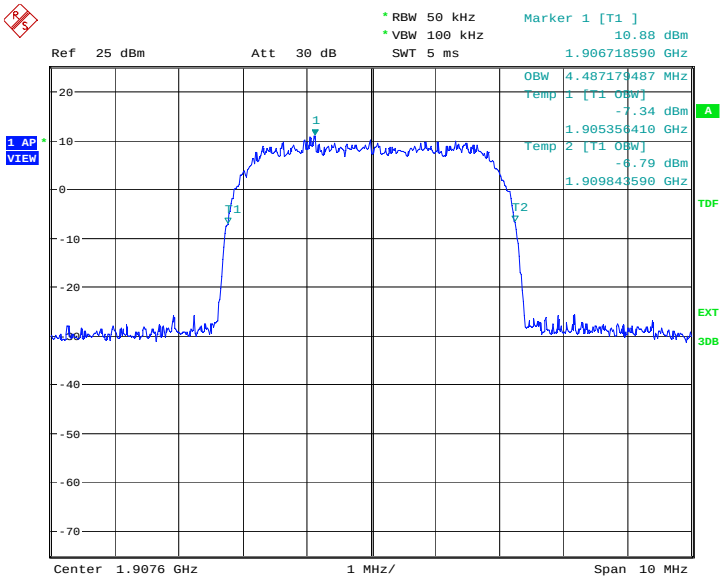


Channel 9400-Occupied Bandwidth (-26dBc BW)



Date: 14.DEC.2012 06:58:25

Channel 9538-Occupied Bandwidth (-26dBc BW)



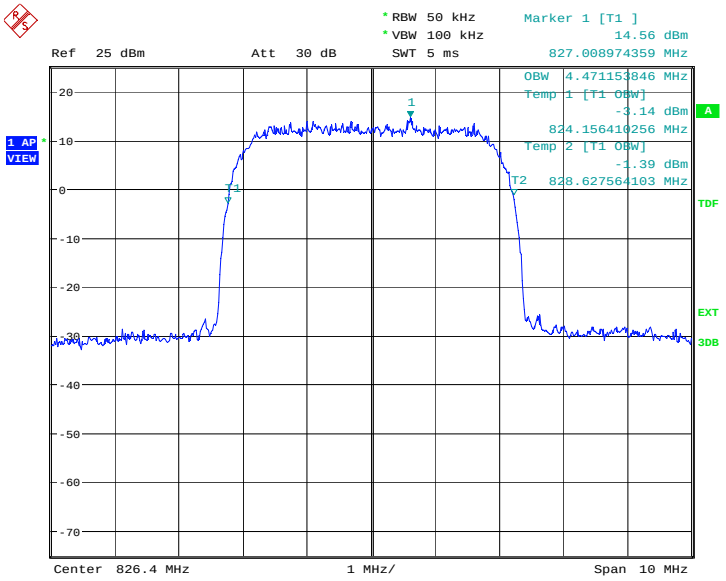
Date: 14.DEC.2012 06:58:59

WCDMA Band V(-26dBc)

Frequency(MHz)	Occupied Bandwidth (–26dBc BW)(MHz)
826.40	4.471
836.60	4.471
846.60	4.471

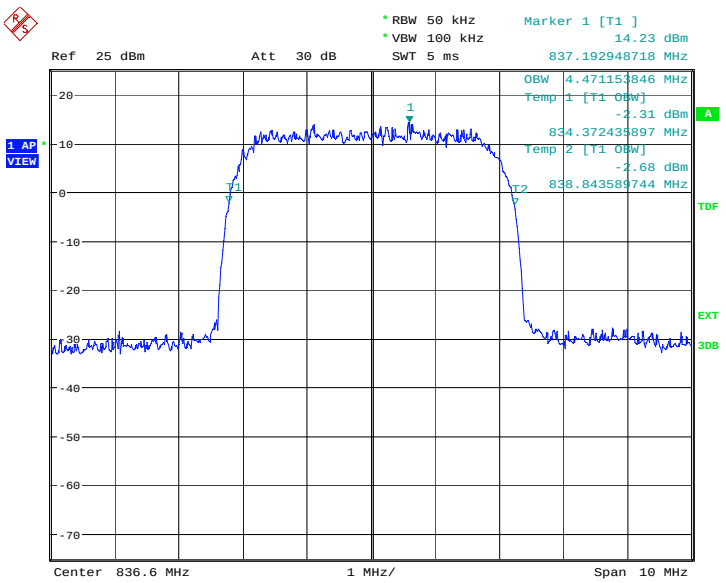
WCDMA Band V

Channel 4132-Occupied Bandwidth (-26dBc BW)



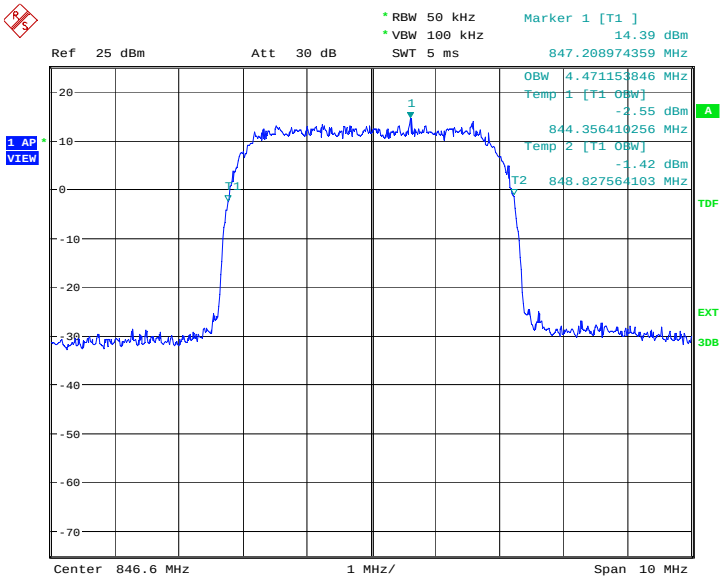
Date: 14.DEC.2012 07:30:57

Channel 4183-Occupied Bandwidth (-26dBc BW)



Date: 14.DEC.2012 07:31:31

Channel 4233-Occupied Bandwidth (-26dBc BW)

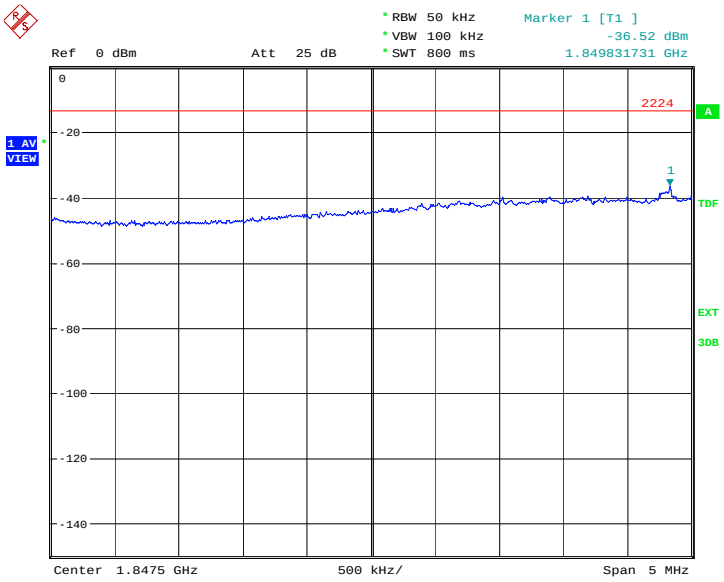


Date: 14.DEC.2012 07:32:06

A.7 BAND EDGE COMPLIANCE

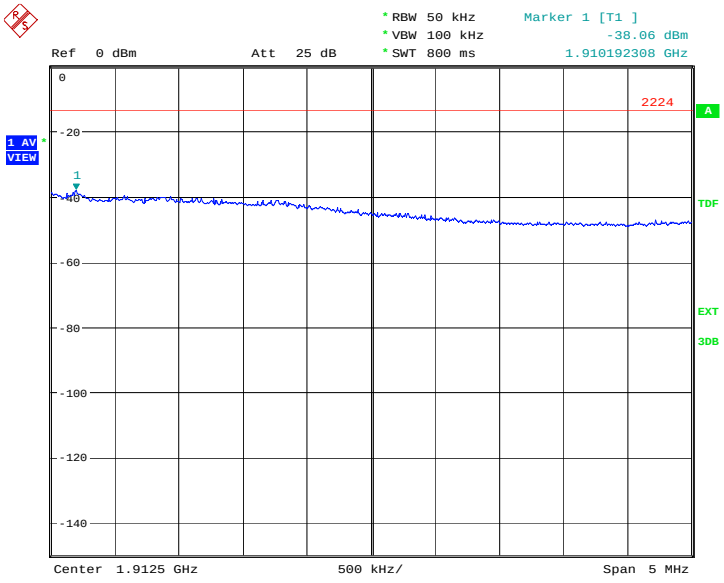
WCDMA Band Ⅱ

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



Date: 14.DEC.2012 06:59:11

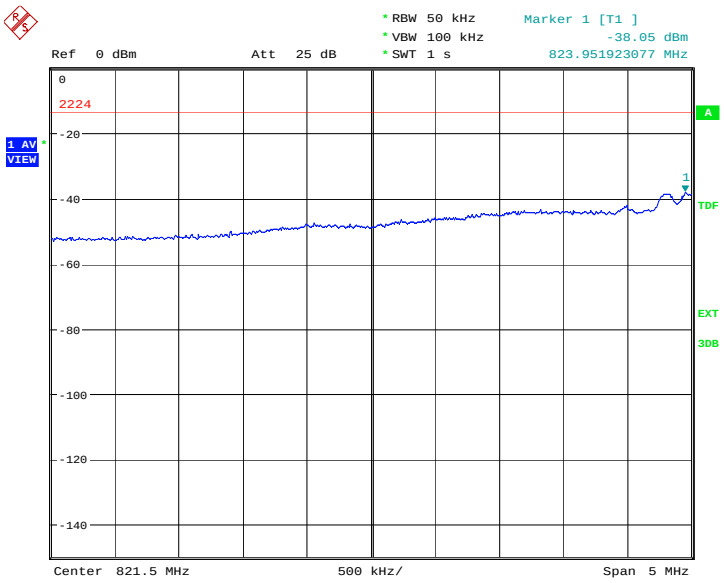
HIGH BAND EDGE BLOCK-C (WCDMA Band Ⅱ) –Channel 9538



Date: 14.DEC.2012 06:59:22

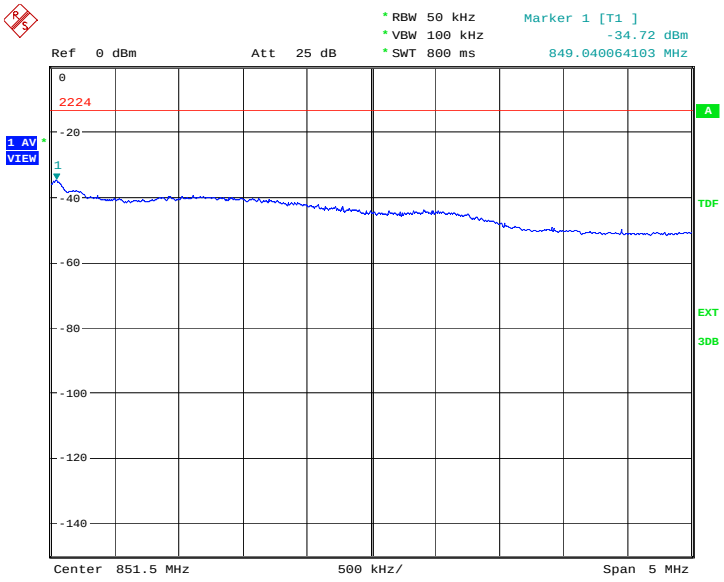
WCDMA Band Ⅴ

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



Date: 14.DEC.2012 07:32:17

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



Date: 14.DEC.2012 07:32:28

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 WCDMA Band II, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For WCDMA Band V, 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.

WCDMA Band Ⅱ Transmitter

Channel	Frequency (MHz)
9262	1852.40
9400	1880.00
9538	1907.60

WCDMA Band Ⅴ Transmitter

Channel	Frequency (MHz)
4132	826.40
4183	836.60
4233	846.60

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.

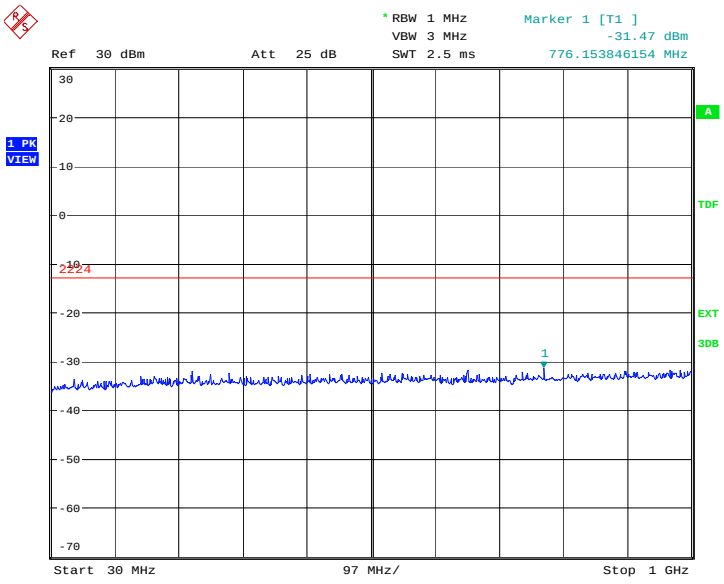
The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm.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

WCDMA Band Ⅱ

A. 8.3.1 Channel 9262: 30MHz –1GHz

Spurious emission limit –13dBm.

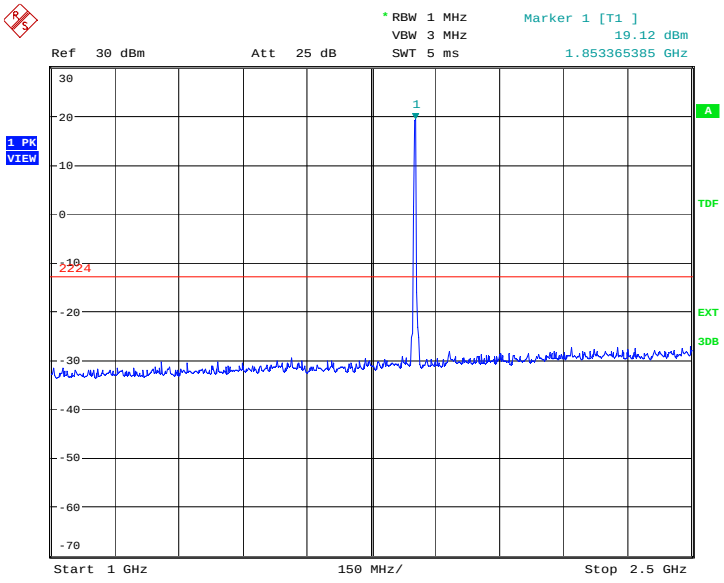


Date: 14.DEC.2012 06:59:53

A.8.3.2 Channel 9262: 1GHz –2.5GHz

Spurious emission limit –13dBm.

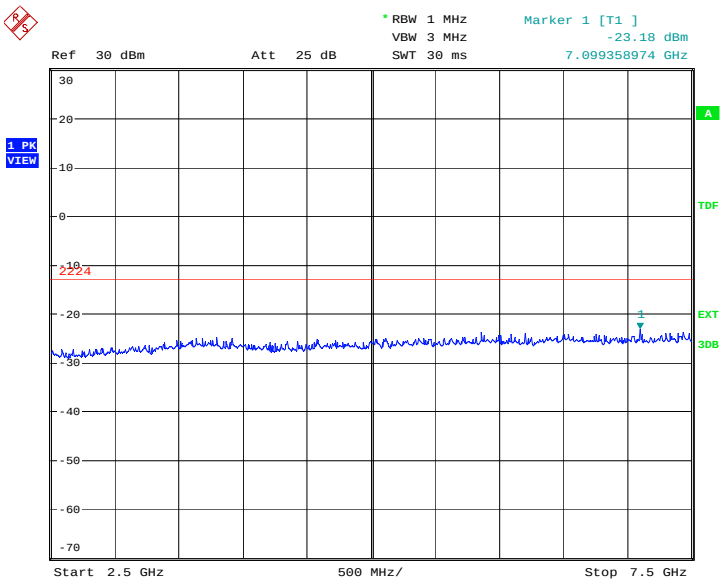
NOTE: peak above the limit line is the carrier frequency.



Date: 14.DEC.2012 07:00:21

A.8.3.3 Channel 9262: 2.5GHz –7.5GHz

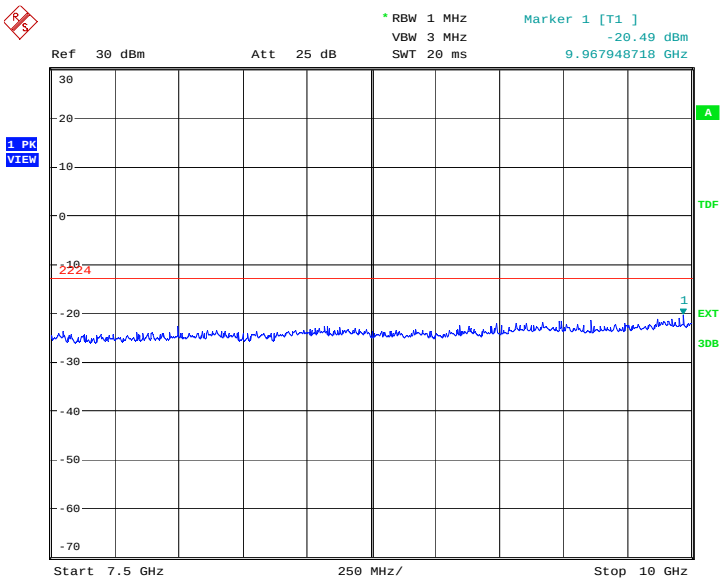
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:00:49

A.8.3.4 Channel 9262: 7.5GHz –10GHz

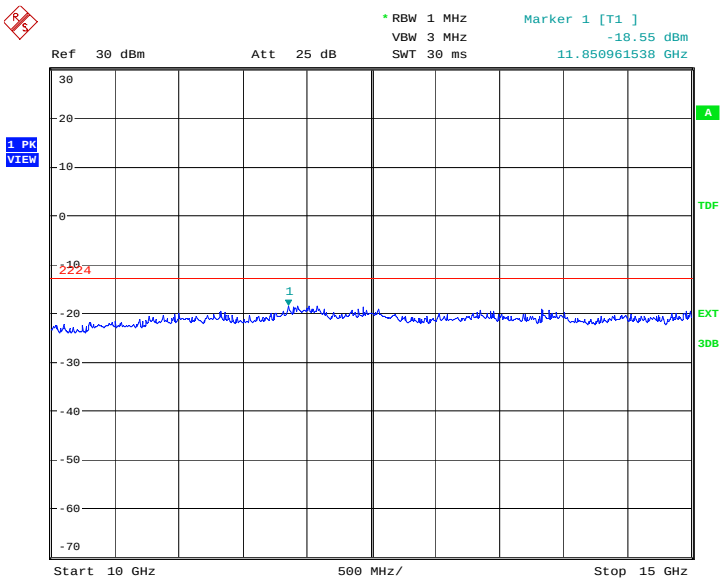
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:01:17

A.8.3.5 Channel 9262: 10GHz –15GHz

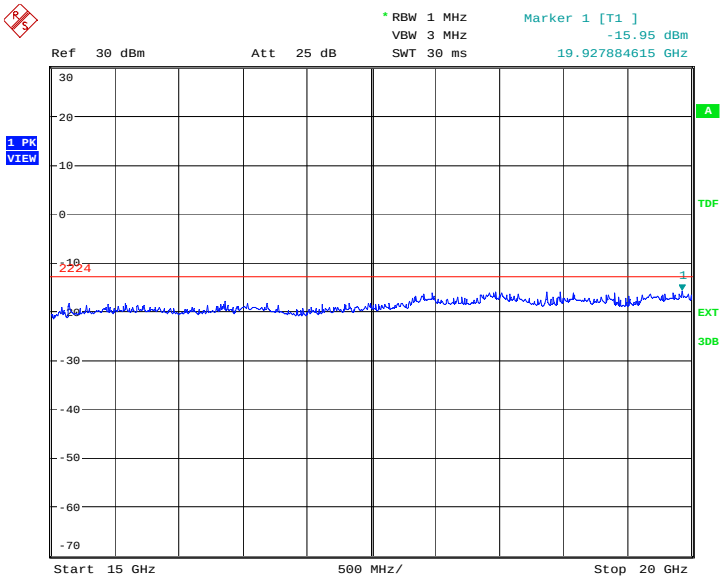
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:01:46

A.8.3.6 Channel 9262: 15GHz –20GHz

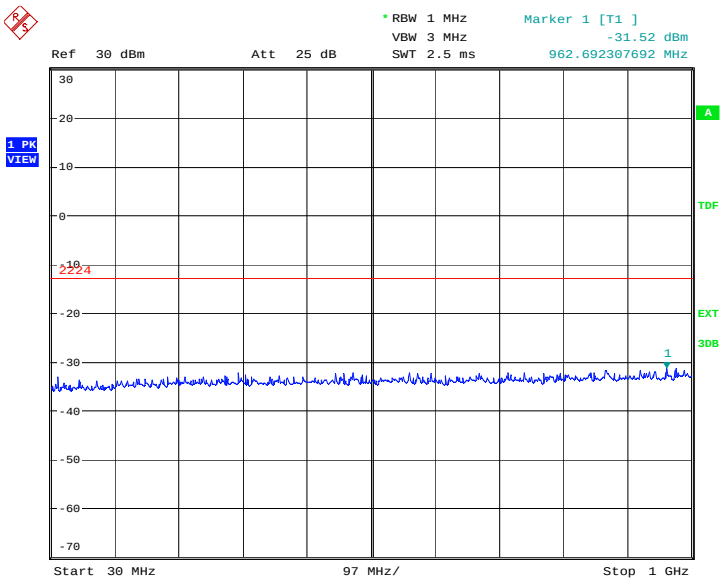
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:02:14

A. 8.3.7 Channel 9400: 30MHz –1GHz

Spurious emission limit –13dBm.

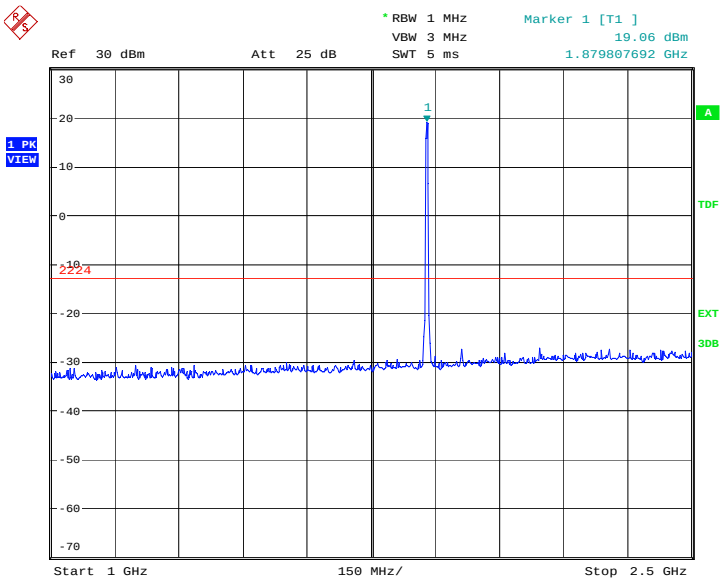


Date: 14.DEC.2012 07:02:45

A.8.3.8 Channel 9400: 1GHz –2.5GHz

Spurious emission limit –13dBm.

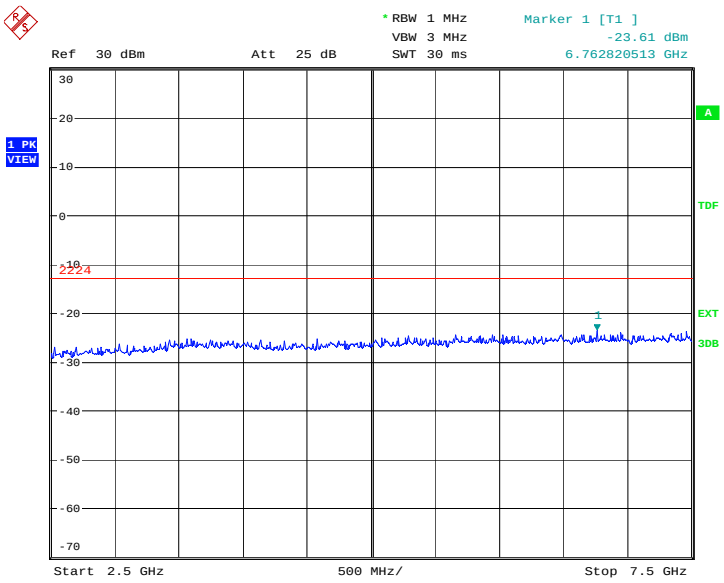
NOTE: peak above the limit line is the carrier frequency.



Date: 14.DEC.2012 07:03:13

A.8.3.9 Channel 9400: 2.5GHz –7.5GHz

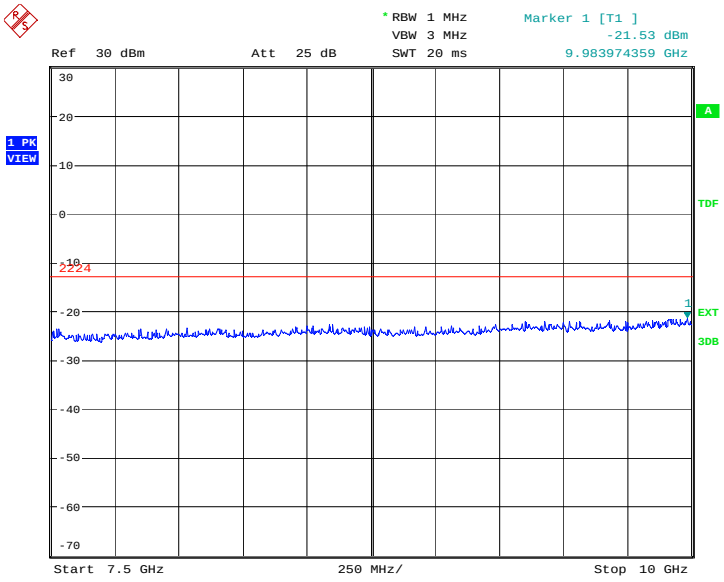
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:03:41

A.8.3.10 Channel 9400: 7.5GHz –10GHz

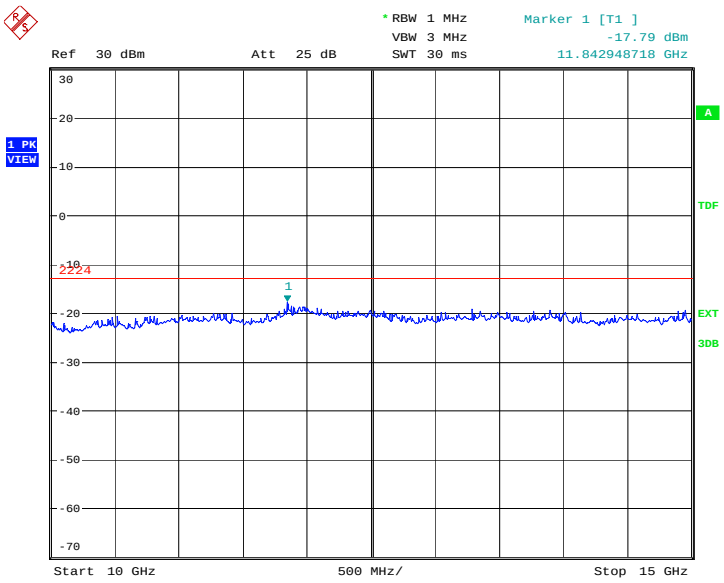
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:04:10

A.8.3.11 Channel 9400: 10GHz –15GHz

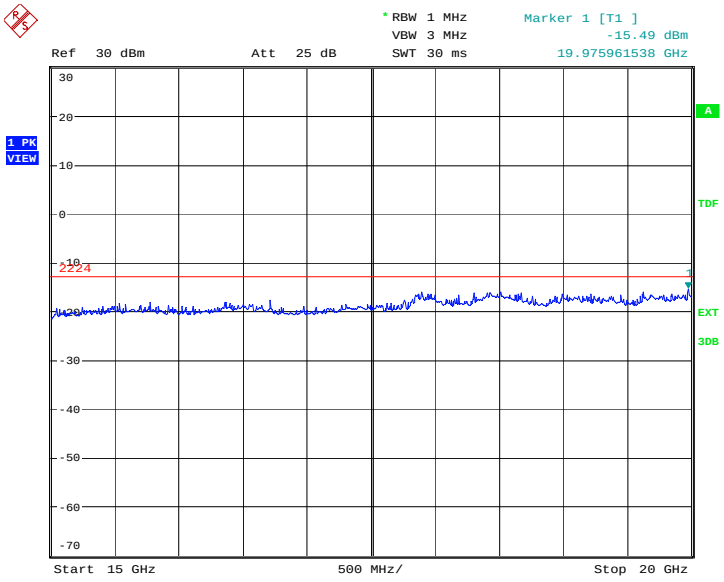
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:04:38

A.8.3.12 Channel 9400: 15GHz –20GHz

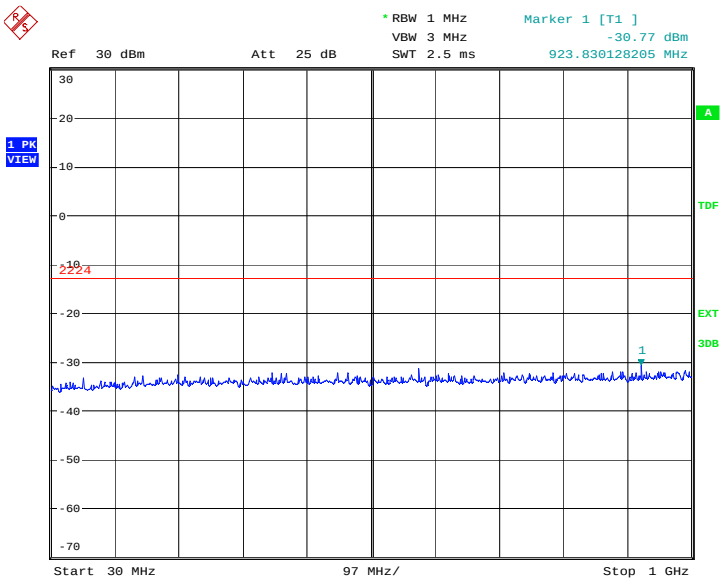
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:05:06

A. 8.3.13 Channel 9538: 30MHz –1GHz

Spurious emission limit –13dBm.

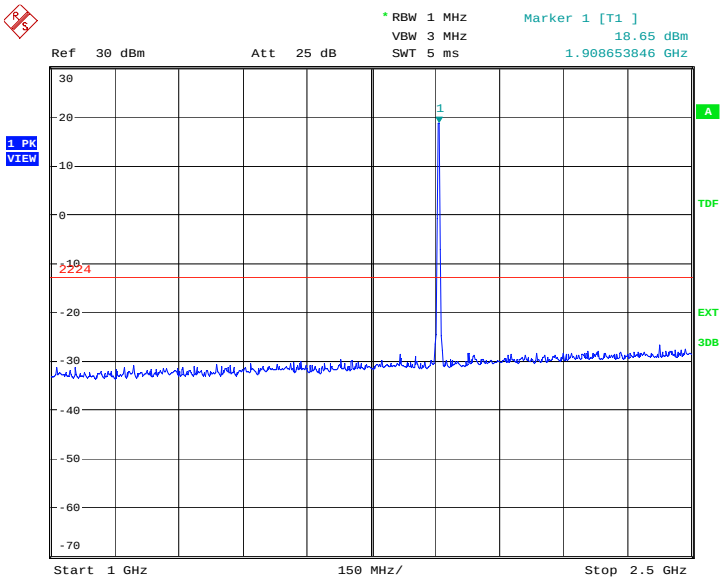


Date: 14.DEC.2012 07:05:37

A.8.3.14 Channel 9538: 1GHz –2.5GHz

Spurious emission limit –13dBm.

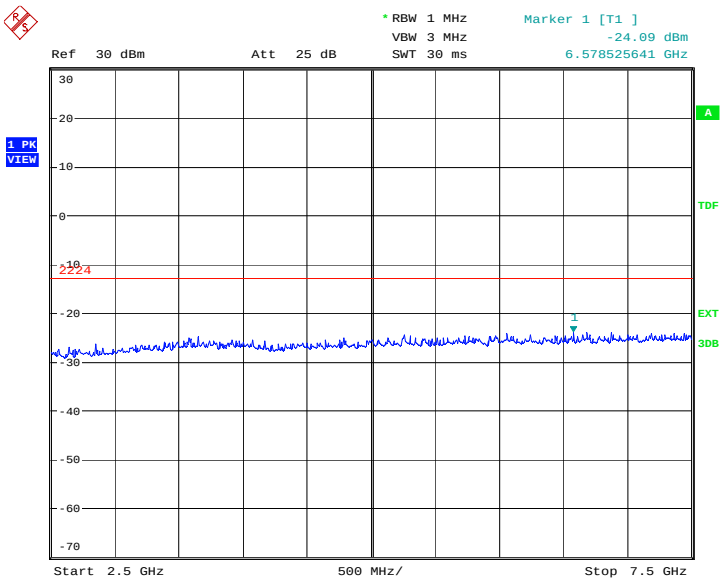
NOTE: peak above the limit line is the carrier frequency.



Date: 14.DEC.2012 07:06:06

A.8.3.15 Channel 9538: 2.5GHz –7.5GHz

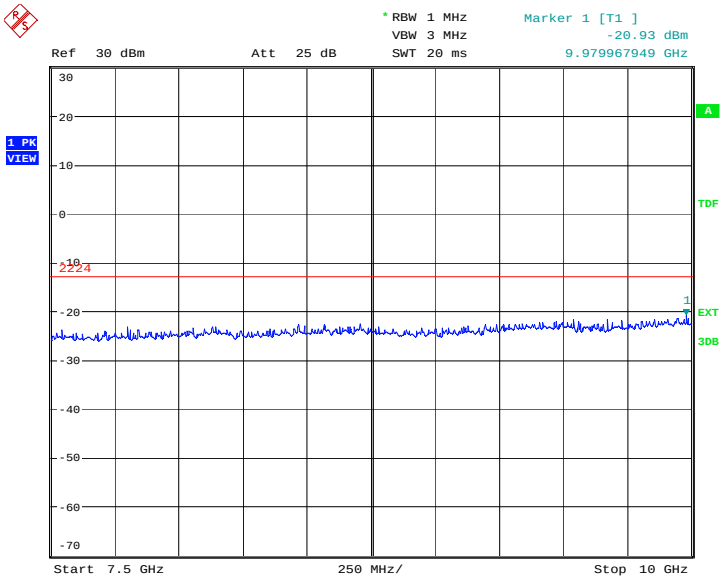
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:06:34

A.8.3.16 Channel 9538: 7.5GHz –10GHz

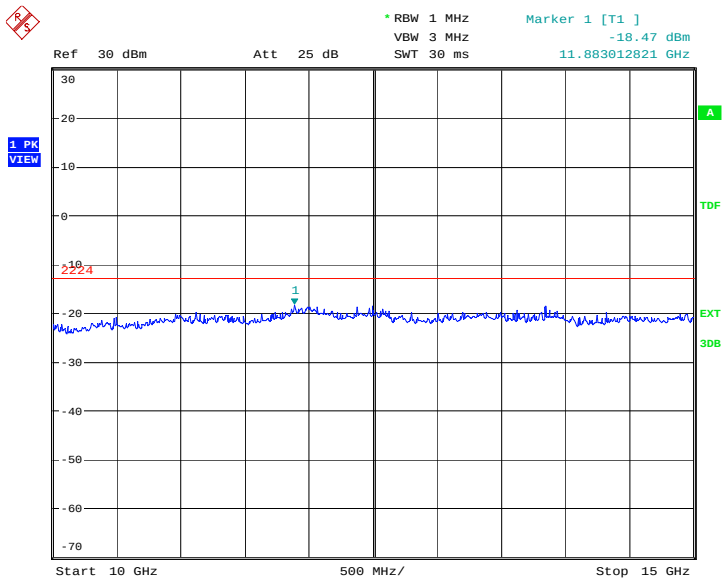
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:07:02

A.8.3.17 Channel 9538: 10GHz –15GHz

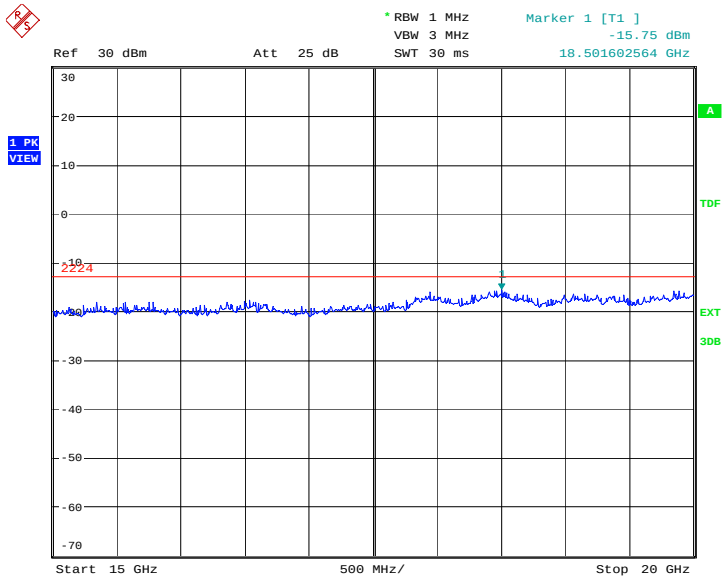
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:07:30

A.8.3.18 Channel 9538: 15GHz –20GHz

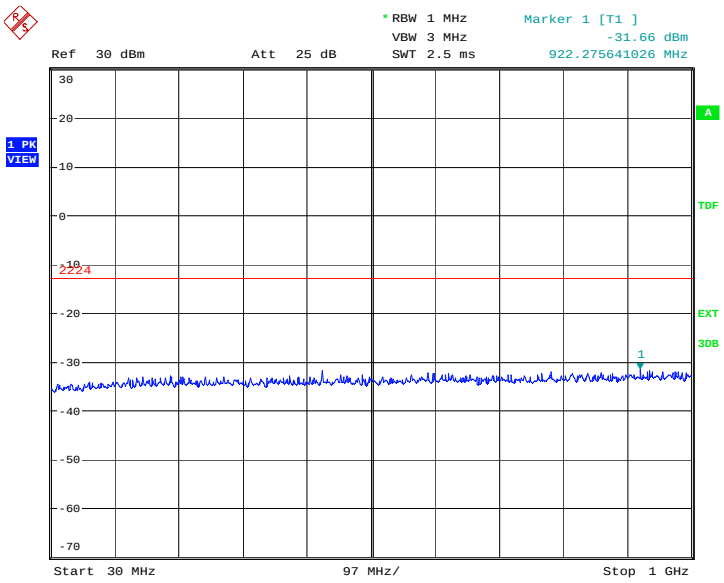
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:07:58

A. 8.3.19 Idle mode: 30MHz –1GHz

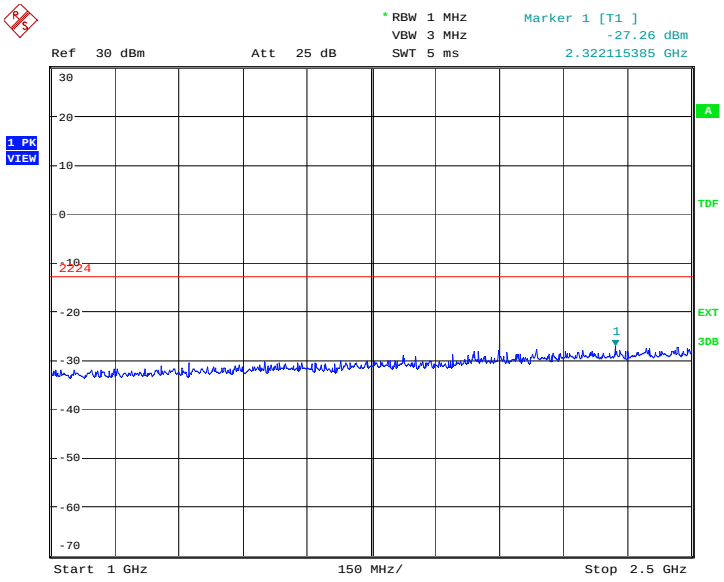
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:08:28

A.8.3.20 Idle mode: 1GHz –2.5GHz

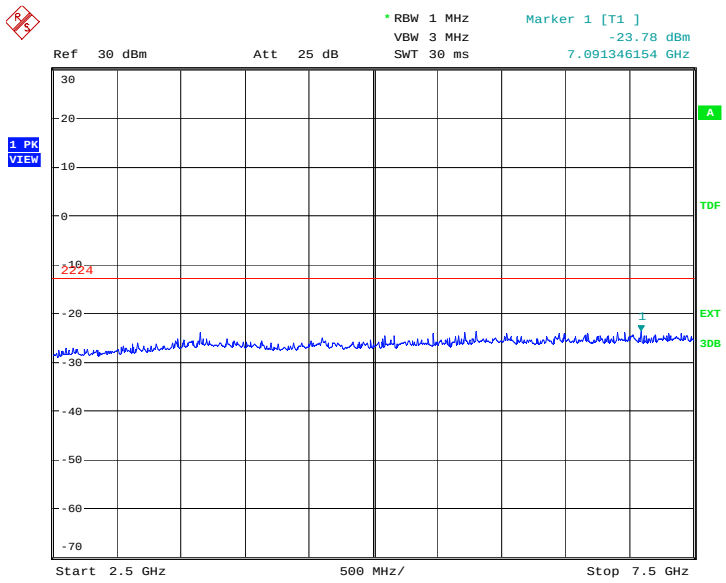
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:08:56

A.8.3.21 Idle mode: 2.5GHz –7.5GHz

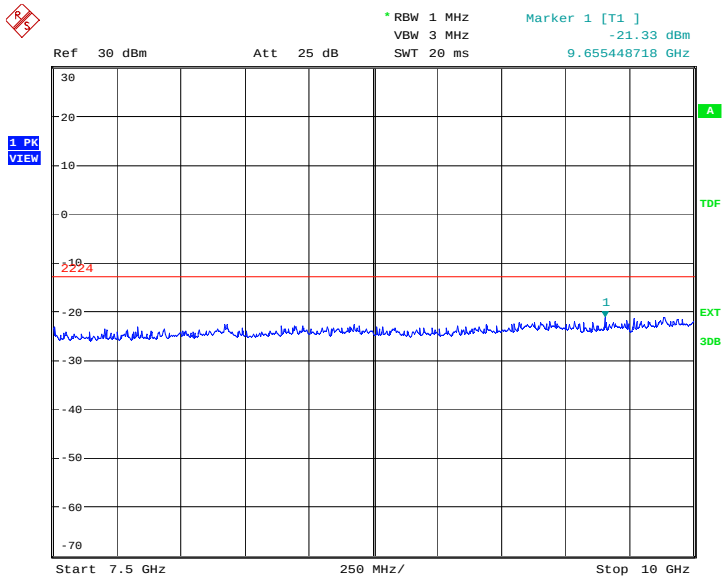
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:09:24

A.8.3.22 Idle mode: 7.5GHz –10GHz

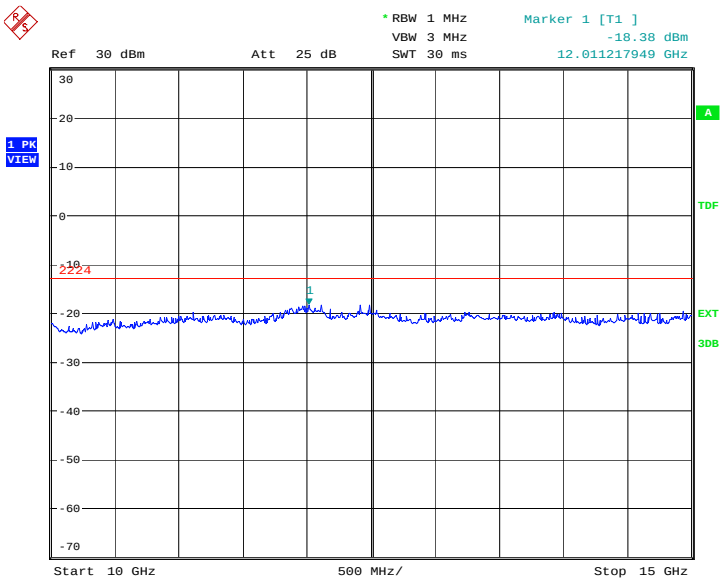
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:09:52

A.8.3.23 Idle mode: 10GHz –15GHz

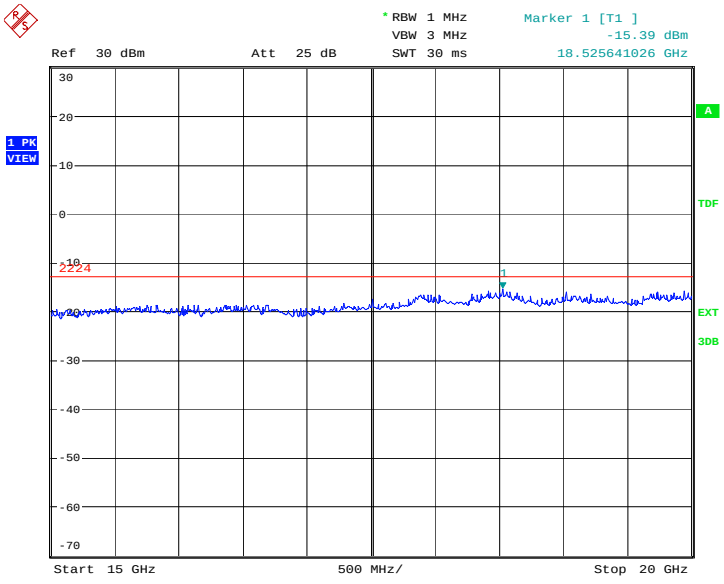
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:10:20

A.8.3.24 Idle mode: 15GHz –20GHz

Spurious emission limit –13dBm.



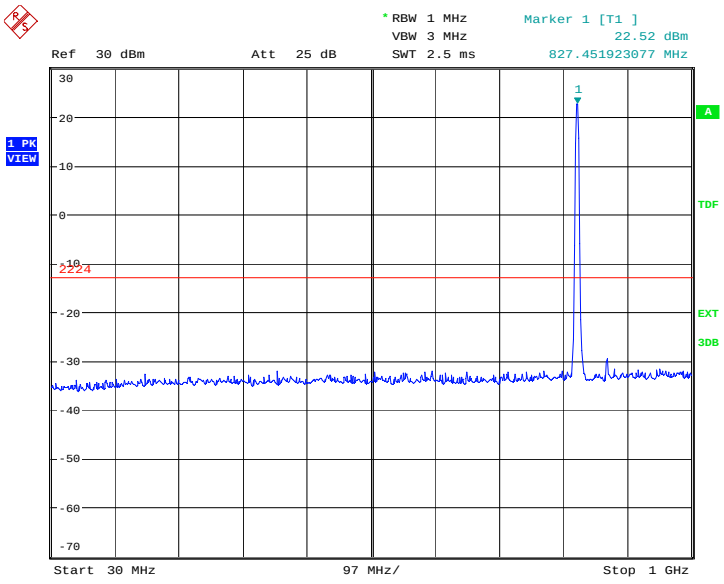
Date: 14.DEC.2012 07:10:49

WCDMA Band Ⅴ

A. 8.3.25 Channel 4132: 30MHz –1GHz

Spurious emission limit –13dBm.

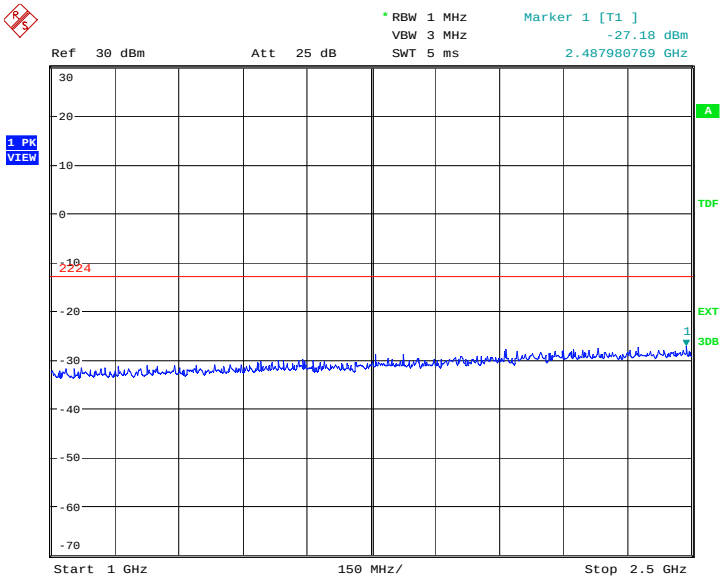
NOTE: peak above the limit line is the carrier frequency.



Date: 14.DEC.2012 07:32:59

A. 8.3.26 Channel 4132: 1GHz – 2.5GHz

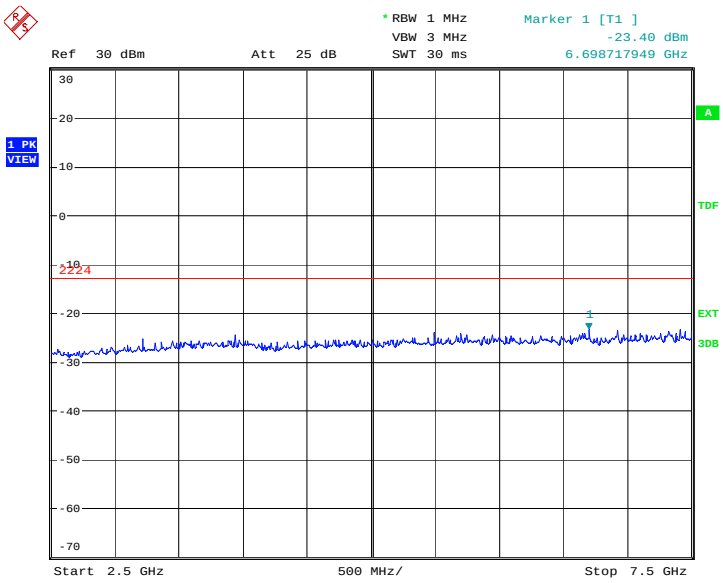
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:33:27

A. 8.3.27 Channel 4132: 2.5GHz –7.5GHz

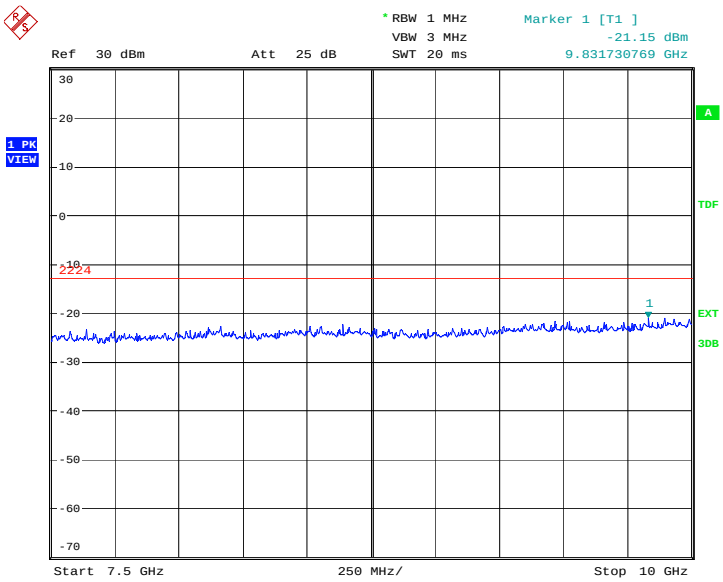
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:33:55

A. 8.3.28 Channel 4132: 7.5GHz – 10GHz

Spurious emission limit –13dBm.

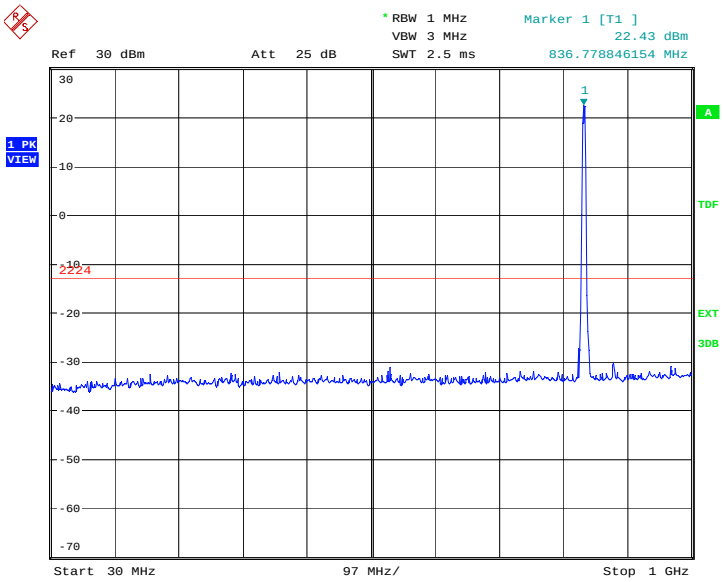


Date: 14.DEC.2012 07:34:24

A. 8.3.29 Channel 4183: 30MHz –1GHz

Spurious emission limit –13dBm.

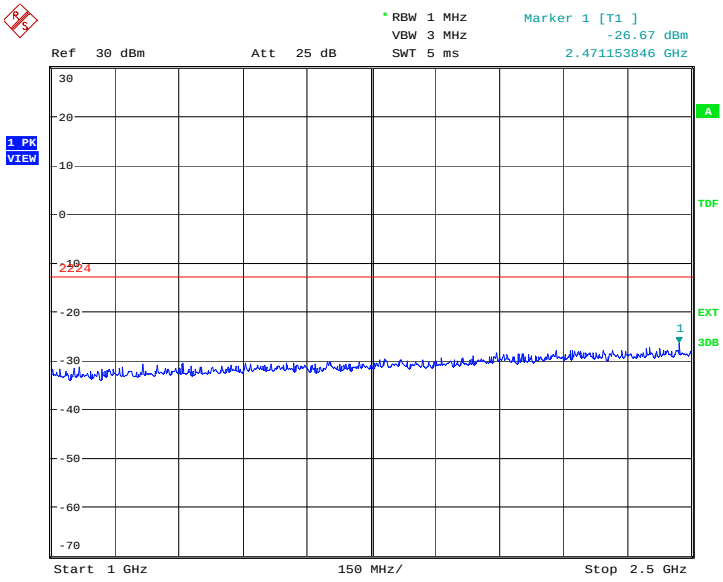
NOTE: peak above the limit line is the carrier frequency.



Date: 14.DEC.2012 07:34:55

A.8.3.30 Channel 4183: 1GHz – 2.5GHz

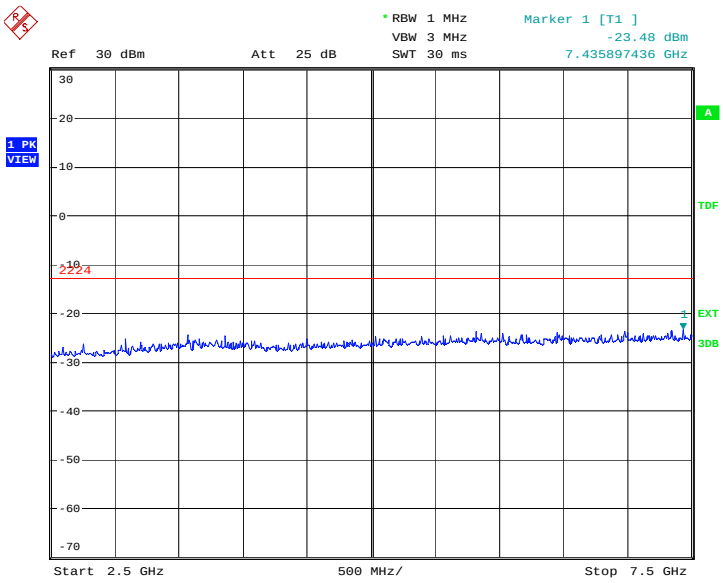
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:35:23

A. 8.3.31 Channel 4183: 2.5GHz –7.5GHz

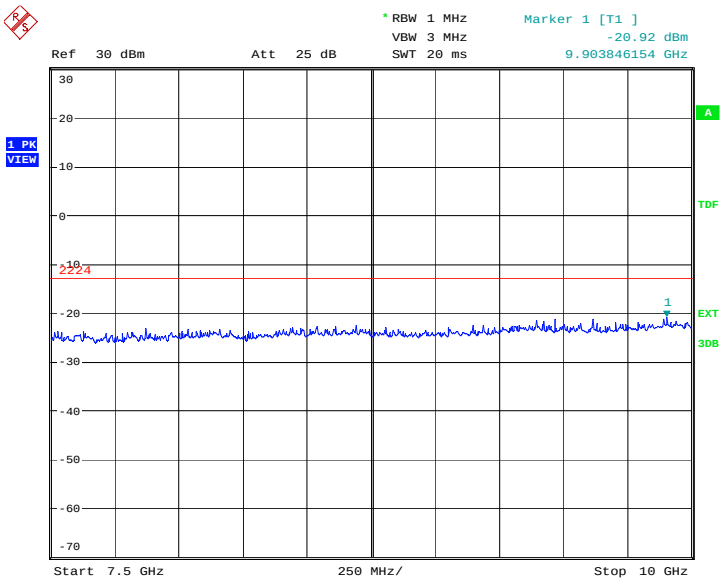
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:35:51

A. 8.3.32 Channel 4183: 7.5GHz – 10GHz

Spurious emission limit –13dBm.

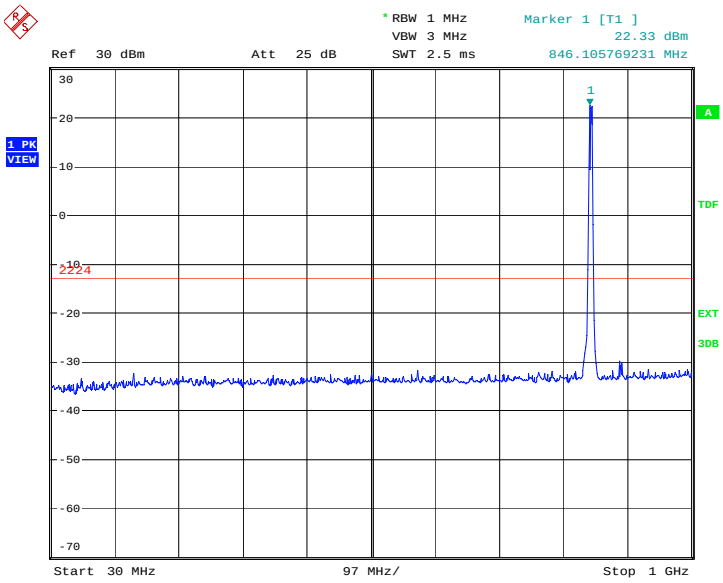


Date: 14.DEC.2012 07:36:19

A. 8.3.33 Channel 4233: 30MHz –1GHz

Spurious emission limit –13dBm.

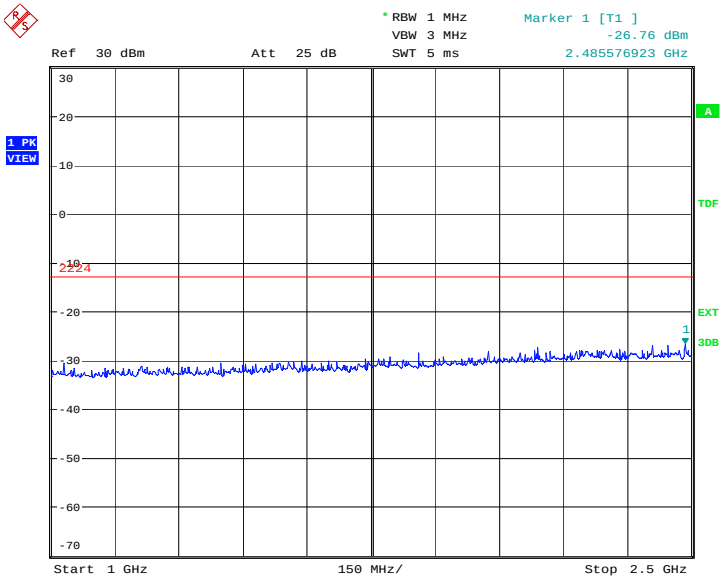
NOTE: peak above the limit line is the carrier frequency.



Date: 14.DEC.2012 07:36:50

A. 8.3.34 Channel 4233: 1GHz – 2.5GHz

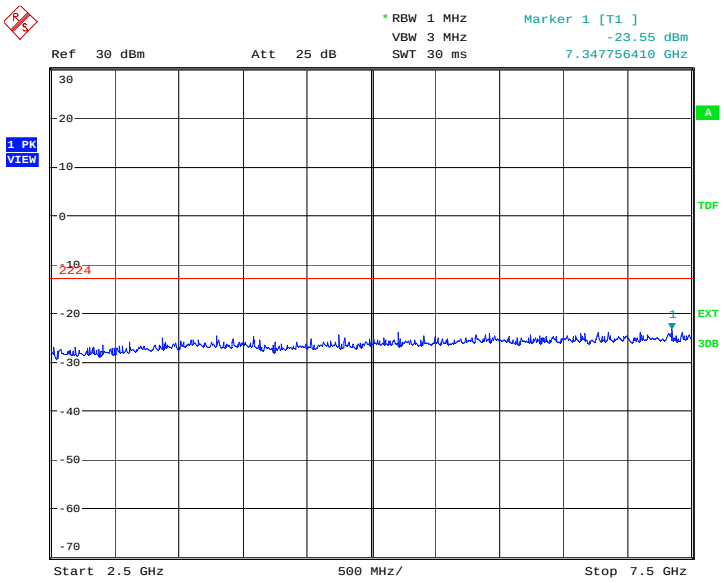
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:37:19

A. 8.3.35 Channel 4233: 2.5GHz –7.5GHz

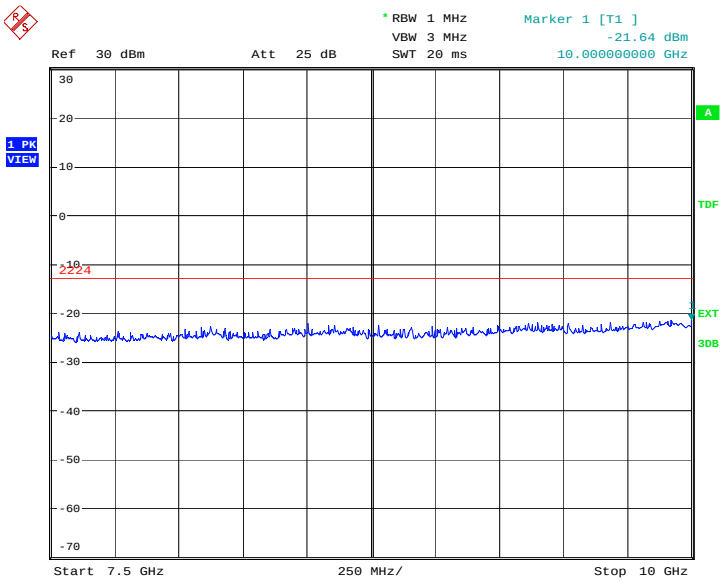
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:37:47

A. 8.3.36 Channel 4233: 7.5GHz – 10GHz

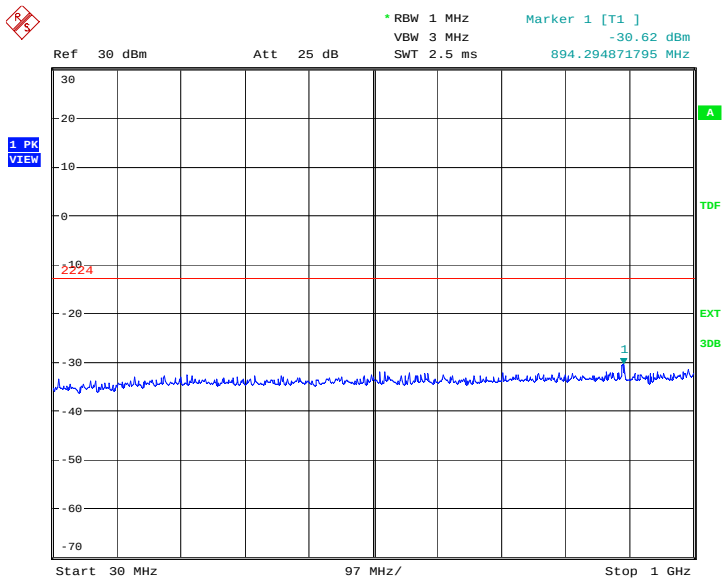
Spurious emission limit –13dBm.



Date: 14.DEC.2012 07:38:15

A. 8.3.37 Idle mode: 30MHz – 1GHz

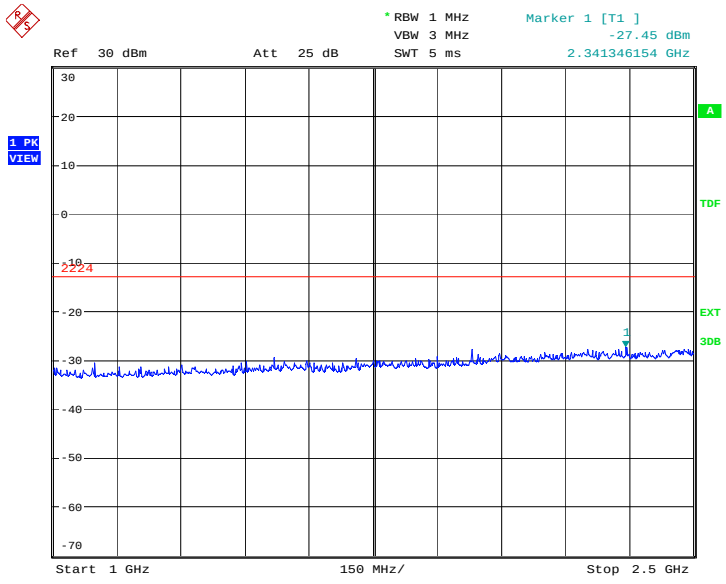
Spurious emission limit -13dBm.



Date: 14.DEC.2012 07:38:44

A.8.3.38 Idle mode: 1GHz – 2.5GHz

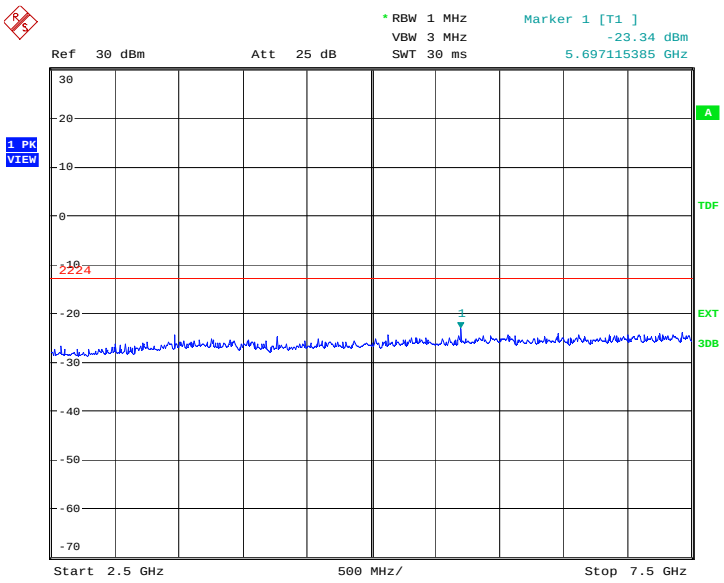
Spurious emission limit -13dBm.



Date: 14.DEC.2012 07:39:12

A.8.3.39 Idle mode: 2.5GHz – 7.5GHz

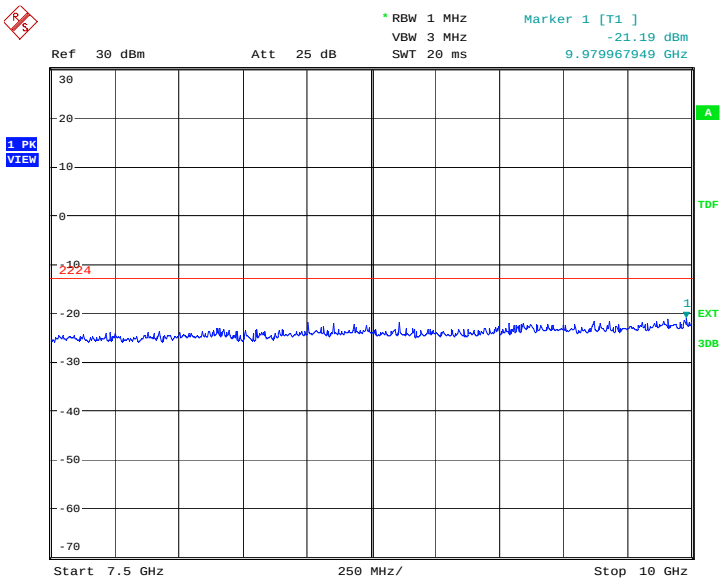
Spurious emission limit -13dBm.



Date: 14.DEC.2012 07:39:41

A.8.3.40 Idle mode: 7.5GHz – 10GHz

Spurious emission limit -13dBm.



Date: 14.DEC.2012 07:40:09

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