TEST REPORT

No. I18N01345-RF-UMTS

for

DAIMLER AG

CTPDIN

Model Name: CTP2019DTNA

FCC ID: 2AKC8CTP13933001

with

Hardware Version: A66-13933-001

Software Version: 127.011.800

Issued Date: 2018-11-29

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 SAICT.

Test Laboratory:

Designation Number: CN1210

SAICT, Shenzhen Academy of Information and Communications Technology

Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518026.

Tel: +86(0)755-33322000, Fax: +86(0)755-33322001

Email: yewu@caict.ac.cn, website: www.cszit.com

©Copyright. All rights reserved by SAICT.

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I18N01345-RF-UMTS	Rev.0	1st edition	2018-11-29

©Copyright. All rights reserved by SAICT.

CONTENTS

1. TEST LABORATORY 4
1.1. TESTING LOCATION 4
1.2. TESTING ENVIRONMENT 4
1.3. PROJECT DATA 4
1.4. SIGNATURE 4
2. CLIENT INFORMATION 5
2.1. APPLICANT INFORMATION 5
2.2. MANUFACTURER INFORMATION 5
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) 6
3.1. ABOUT EUT 6
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST 6
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST 6
3.4. GENERAL DESCRIPTION 6
4. REFERENCE DOCUMENTS 7
4.1. REFERENCE DOCUMENTS FOR TESTING 7
5. LABORATORY ENVIRONMENT 8
6. SUMMARY OF TEST RESULTS 9
7. TEST EQUIPMENTS UTILIZED 11
ANNEX A: MEASUREMENT RESULTS 12
A.1 OUTPUT POWER 12
A.2 FIELD STRENGTH OF SPURIOUS RADIATION 20
A.3 FREQUENCY STABILITY 37
A.4 OCCUPIED BANDWIDTH 41
A.5 EMISSION BANDWIDTH 54
A.6 BAND EDGE COMPLIANCE 66
A.7 CONDUCTED SPURIOUS EMISSION 70
A.8 PEAK-TO-AVERAGE POWER RATIO 95

©Copyright. All rights reserved by SAICT.

1. Test Laboratory

1.1. Testing Location

Company Name:	Shenzhen Academy of Information and Communications Technology
Address:	Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China
Postal Code:	518026
Telephone:	+86(0)755-33322000
Fax:	+86(0)755-33322001

1.2. Testing Environment

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

1.3. Project data

Testing Start Date:	2018-09-04
Testing End Date:	2018-11-18

1.4. Signature

Lai Minghua
(Prepared this test report)

Huang Qiuqin
(Reviewed this test report)

Zhang Hao
(Approved this test report)

©Copyright. All rights reserved by SAICT.

2. Client Information

2.1. Applicant Information

Company Name:	DAIMLER AG
Address /Post:	Mercedesstraße 137, 70327 Stuttgart, Germany
Contact Person:	Jan Waldmann
Contact Email	jan.waldmann@daimler.com
Telephone:	+49-711-17-40099
Fax:	+49-711-3052-148458

2.2. Manufacturer Information

Company Name:	Bosch Car Multimedia Portugal, S.A.
Address /Post:	Rua Max Grundig, 35 – Lomar, 4705-820 Braga, Portugal
Contact Person:	Eliseu Vieira
Contact Email	Eliseu.Vieira@pt.bosch.com
Telephone:	+351(253)30-6307
Fax:	/

©Copyright. All rights reserved by SAICT.

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

3.1. About EUT

Description	CTPDIN
Model Name	CTP2019DTNA
FCC ID	2AKC8CTP13933001
Frequency Bands	WCDMA Band 2,4,5
Antenna	Integrated
Extreme vol. Limits	9.6VDC to 16VDC (nominal: 12VDC)
Extreme temp. Tolerance	-40°C to +80°C
Condition of EUT as received	No abnormality in appearance

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Sample Arrival Date
UT04aa	352254061609159	A66-13933-001	127.011.800	2018-09-04

*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	Charger

AE1

Model	/
Manufacturer	/
Capacitance	/

AE2

Model	/
Manufacturer	/

*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 LTE-FDD telematic platform with external antenna. It consists of normal options: power line, RF cable and external antenna. Manual and specifications of the EUT were provided to fulfil the test.

©Copyright. All rights reserved by SAICT.

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 22	PUBLIC MOBILE SERVICES	10-1-17 Edition
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-17 Edition
FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	10-1-17 Edition
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-17 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016

©Copyright. All rights reserved by SAICT.

5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio （VSWR）	≤ 6 dB, from 1 to 18 GHz，3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

©Copyright. All rights reserved by SAICT.

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Verdict Column	P	Pass
	F	Fail
	NA	Not applicable
	NM	Not measured
Location Column	A/B/C/D	The test is performed in test location A, B, C or D which are described in section 1.1 of this report

WCDMA Band II

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/24.232	A.1	P
2	Field Strength of Spurious Radiation	2.1053/24.238	A.2	P
3	Frequency Stability	2.1055/24.235	A.3	P
4	Occupied Bandwidth	2.1049/24.238	A.4	P
5	Emission Bandwidth	2.1049/24.238	A.5	P
6	Band Edge Compliance	2.1051/24.238	A.6	P
7	Conducted Spurious Emission	2.1051/24.238	A.7	P
8	Peak-to-Average Power Ratio	24.232	A.8	P

WCDMA Band V

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/22.913	A.1	P
2	Field Strength of Spurious Radiation	2.1053/22.917	A.2	P
3	Frequency Stability	2.1055/22.355	A.3	P
4	Occupied Bandwidth	2.1049/22.917	A.4	P
5	Emission Bandwidth	2.1049/22.917	A.5	P
6	Band Edge Compliance	2.1051/22.917	A.6	P
7	Conducted Spurious Emission	2.1051/22.917	A.7	P

©Copyright. All rights reserved by SAICT.

WCDMA Band IV

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/27.50(d)	A.1	P
2	Field Strength of Spurious Radiation	2.1053/27.53(h)	A.2	P
3	Frequency Stability	2.1055/27.54	A.3	P
4	Occupied Bandwidth	2.1049/27.53(g)	A.4	P
5	Emission Bandwidth	2.1049/27.53(g)	A.5	P
6	Band Edge Compliance	2.1051/27.53(h)	A.6	P
7	Conducted Spurious Emission	2.1051/27.53(h)	A.7	P
8	Peak-to-Average Power Ratio	27.50(d)	A.8	P

©Copyright. All rights reserved by SAICT.

7. Test Equipments Utilized

NO.	Description	TYPE	Manufacture	series number	CAL DUE DATE
1	Test Receiver	ESR7	R&S	101676	2018-11-29
2	BiLog Antenna	3142E	ETS	00224831	2021-05-17
3	Horn Antenna	3117	ETS-lindgren	00066577	2019-04-05
4	Horn Antenna	QSH-SL-18-26-S-20	Q-par	17013	2020-01-15
5	Antenna	3117	ETS-lindgren	00110312	2019-09-01
6	Antenna	VUBA 9117	Schwarzbeck	9117-321	2019-09-01
7	Antenna	QWH-SL-18-40-K-SG	Q-par	15979	2020-01-16
8	preamplifier	83017A	Agilent	MY39501110	/
9	Signal Generator	SMB100A	R&S	179725	2018-11-29
10	Fully Anechoic Chamber	FACT3-2.0	ETS-Lindgren	1285	2020-07-20
11	Spectrum Analyzer	FSV40	R&S	101192	2019-05-22
12	Universal Radio Communication Tester	CMW500	R&S	152499	2019-07-19
13	Universal Radio Communication Tester	CMU200	R&S	123210	2018-12-13
14	Spectrum Analyzer	FSU	R&S	200679	2018-12-13
15	Temperature Chamber	SH-241	ESPECs	92007516	2019-11-13
16	DC Power Supply	U3606A	Agilent Technologies	MY50450012	2019-11-13

Test software

Item	Name	Vesion
Radiated	EMC32	Version 10.01.00

©Copyright. All rights reserved by SAICT.

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

Reference

FCC: CFR Part 2.1046, 22.913, 24.232, 27.50(d)

A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMU-200 or CMW500) 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, 1740.0MHz and 1752.6MHz for WCDMA Band IV (bottom, middle and top of operational frequency range).

Limit

According to FCC Part 2.1046

WCDMA Band II

A.1.2.2 Measurement result

QPSK

	CH	Frequency(MHz)	output power(dBm)
WCDMA (Band II)	9262	1852.4	21.35
	9400	1880.0	22.34
	9538	1907.6	22.61

16QAM

	CH	Frequency(MHz)	output power(dBm)
WCDMA (Band II)	9262	1852.4	20.66
	9400	1880.0	21.45
	9538	1907.6	21.68

©Copyright. All rights reserved by SAICT.

WCDMA Band V

Measurement result

QPSK

	CH	Frequency(MHz)	output power(dBm)
WCDMA (Band V)	4132	826.4	22.63
	4183	836.6	22.77
	4233	846.6	22.63

16QAM

	CH	Frequency(MHz)	output power(dBm)
WCDMA (Band V)	4132	826.4	21.75
	4183	836.6	21.83
	4233	846.6	21.72

WCDMA Band IV

Measurement result

QPSK

	CH	Frequency(MHz)	output power(dBm)
WCDMA (Band IV)	1312	1712.4	22.42
	1450	1740.0	22.82
	1513	1752.6	22.14

16QAM

	CH	Frequency(MHz)	output power(dBm)
WCDMA (Band IV)	1312	1712.4	21.56
	1450	1740.0	21.94
	1513	1752.6	21.18

Note: Expanded measurement uncertainty is U = 0.488dB, k = 1.96

©Copyright. All rights reserved by SAICT.

A.1.3 Radiated

A.1.3.1 Description

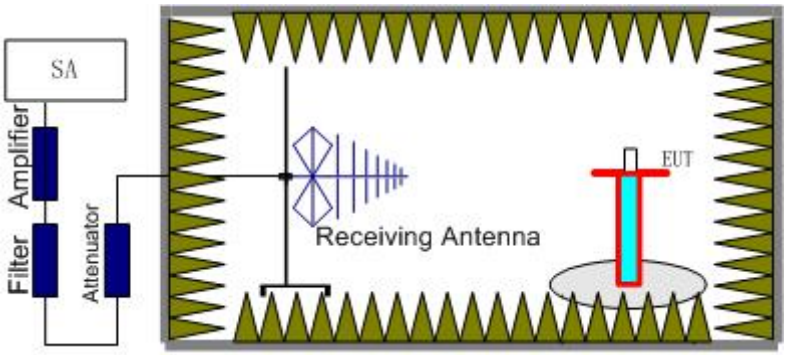
This is the test for the maximum radiated power from the EUT.

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."

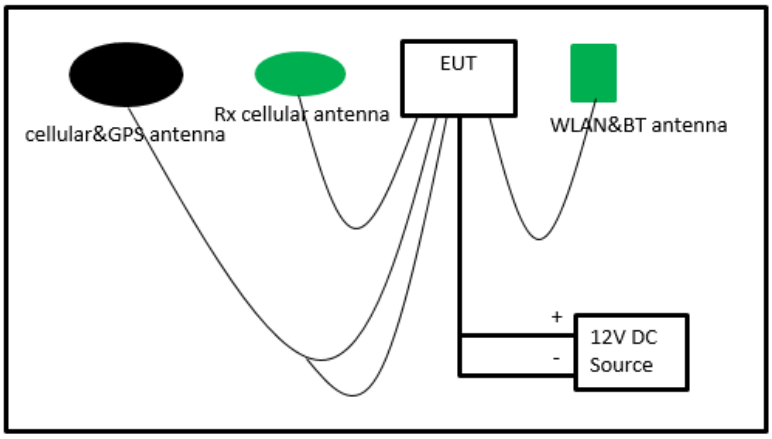
A.1.3.2 Method of Measurement

The measurements procedures in TIA-603-E-2016 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.

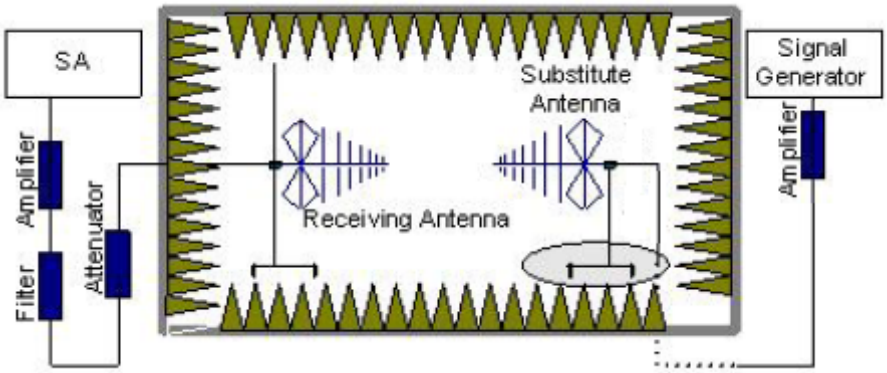


2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr). The placement of EUT and AE is shown in the figure below, what's more, The EUT was tested in two states, horizontal and vertical.as show in the attachment.



3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.

©Copyright. All rights reserved by SAICT.



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(dBi) (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 -2.15dB.

©Copyright. All rights reserved by SAICT.

EUT-Horizontal

WCDMA Band II-EIRP

Limits

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

Measurement result

QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1852.40	-11.59	-32.86	-4.20	17.07	33.00	H
1880.00	**-9.41**	**-32.77**	**-4.27**	**19.09**	**33.00**	**H**
1907.60	-11.34	-32.66	-4.17	17.15	33.00	H

16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1852.40	-13.18	-32.86	-4.20	15.48	33.00	H
1880.00	-11.21	-32.77	-4.27	17.29	33.00	H
1907.60	-11.53	-32.66	-4.17	16.96	33.00	H

Frequency: 1880.0MHz

Peak EIRP(dBm)= PMea(-9.41dBm)-(Pcl+PAg)(-32.77dB)+Ga (-4.27dB) =19.09dBm

ANALYZER SETTINGS: RBW = VBW = 5MHz

WCDMA Band V-ERP

Limits

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

Measurement result

QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction(dB)	ERP(dBm)	Limit(dBm)	Polarization
826.40	-12.84	-33.60	0.28	2.15	18.89	38.45	H
836.60	-12.13	-33.50	0.25	2.15	19.47	38.45	H
846.60	**-10.40**	**-33.50**	**0.21**	**2.15**	**21.16**	**38.45**	**H**

16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
826.40	-14.98	-33.60	0.28	2.15	16.75	38.45	H
836.60	-13.14	-33.50	0.25	2.15	18.46	38.45	H
846.60	-13.06	-33.50	0.21	2.15	18.50	38.45	H

Frequency: 846.60MHz

Peak ERP(dBm)= PMea(-10.40dBm)-(Pcl+PAg)(-33.50dB)+Ga (0.21dB)-2.15dB=21.16dBm

ANALYZER SETTINGS: RBW = VBW = 5MHz

©Copyright. All rights reserved by SAICT.

WCDMA Band IV-EIRP

Limits

	Burst Peak EIRP (dBm)
WCDMA Band IV	≤30.00dBm

Measurement result

QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.40	-11.16	-33.13	-4.06	17.91	30.00	H
1740.00	-10.28	-33.11	-4.19	18.64	30.00	H
1752.60	-12.56	-33.11	-4.19	16.36	30.00	H

16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.40	-11.15	-33.13	-4.06	17.92	30.00	H
1740.00	**-10.21**	**-33.11**	**-4.19**	**18.71**	**30.00**	**H**
1752.60	-11.66	-33.11	-4.19	17.26	30.00	H

Frequency: 1740.00MHz

Peak EIRP(dBm)= PMea(-10.21dBm)-(Pcl+PAg)(-33.11dB)+Ga (-4.19dB)=18.71dBm

ANALYZER SETTINGS: RBW = VBW = 5MHz

Note: The maximum value of expanded measurement uncertainty for this test item is *U* = 2.44dB(30MHz-3GHz)/4.04dB(3GHz-18GHz)/4.6dB(18GHz-40GHz), *k* = 2

©Copyright. All rights reserved by SAICT.

EUT- Vertical

WCDMA Band II-EIRP

Limits

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

Measurement result

QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1852.40	-8.31	-32.86	-4.20	20.35	33.00	V
1880.00	-7.31	-32.77	-4.27	21.19	33.00	V
1907.60	-7.48	-32.66	-4.17	21.01	33.00	V

16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1852.40	-8.58	-32.86	-4.20	20.08	33.00	V
1880.00	-7.56	-32.77	-4.27	20.94	33.00	V
1907.60	**-6.85**	**-32.66**	**-4.17**	**21.64**	**33.00**	**V**

Frequency: 1907.60MHz

Peak EIRP(dBm)= PMea(-6.85dBm)-(Pcl+PAg)(-32.66dB)+Ga (-4.17dB) =21.64dBm

ANALYZER SETTINGS: RBW = VBW = 5MHz

WCDMA Band V-ERP

Limits

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

Measurement result

QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction(dB)	ERP(dBm)	Limit(dBm)	Polarization
826.40	-11.56	-33.60	0.28	2.15	20.17	38.45	V
836.60	-12.17	-33.50	0.25	2.15	19.43	38.45	V
846.60	-10.92	-33.50	0.21	2.15	20.64	38.45	V

16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
826.40	-11.43	-33.60	0.28	2.15	20.30	38.45	V
836.60	**-9.68**	**-33.50**	**0.25**	**2.15**	**21.92**	**38.45**	**V**
846.60	-10.07	-33.50	0.21	2.15	21.49	38.45	V

Frequency: 836.60MHz

Peak ERP(dBm)= PMea(-9.68dBm)-(Pcl+PAg)(-33.50dB)+Ga (0.25dB)-2.15dB=21.92dBm

ANALYZER SETTINGS: RBW = VBW = 5MHz

©Copyright. All rights reserved by SAICT.

WCDMA Band IV-EIRP

Limits

	Burst Peak EIRP (dBm)
WCDMA Band IV	≤30.00dBm

Measurement result

QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.40	-10.14	-33.13	-4.06	18.93	30.00	V
1740.00	**-7.57**	**-33.11**	**-4.19**	**21.35**	**30.00**	**V**
1752.60	-8.91	-33.11	-4.19	20.01	30.00	V

16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.40	-9.82	-33.13	-4.06	19.25	30.00	V
1740.00	-7.60	-33.11	-4.19	21.32	30.00	V
1752.60	-8.42	-33.11	-4.19	20.50	30.00	V

Frequency: 1740.00MHz

Peak EIRP(dBm)= PMea(-7.57dBm)-(Pcl+PAg)(-33.11dB)+Ga (-4.19dB)=21.35dBm

ANALYZER SETTINGS: RBW = VBW = 5MHz

Note: The maximum value of expanded measurement uncertainty for this test item is *U* = 2.44dB(30MHz-3GHz)/4.04dB(3GHz-18GHz)/4.6dB(18GHz-40GHz), *k* = 2

©Copyright. All rights reserved by SAICT.

A.2 FIELD STRENGTH OF SPURIOUS RADIATION

Reference

FCC: CFR 2.1053, 22.917, 24.238, 27.53(h).

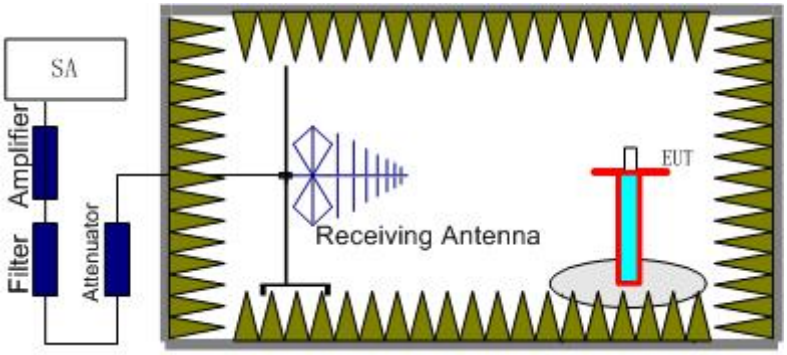
A.2.1 Measurement Method

The measurements procedures in TIA-603-E-2016 are used.

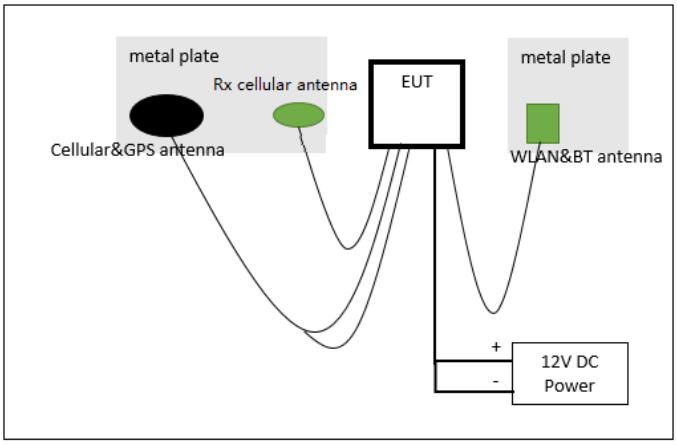
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set as outlined in Part 24.238, Part 22.917 and Part 27.50.The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to 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 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.

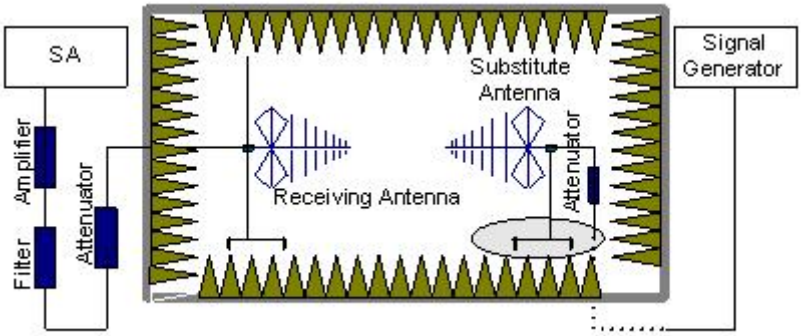


2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr). The placement of EUT is shown in the figure below：



©Copyright. All rights reserved by SAICT.

3. The EUT was tested in two states, horizontal and vertical.as show in the attachment. Additionally, during the testing, the WLAN which worked on 802.11b channel 6 (Power level is 14 and modulation group is 0) was continuously launched, and GNSS function was on.
4. 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.

5. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain(dBi) (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
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dB.

©Copyright. All rights reserved by SAICT.

A.2.2 Measurement Limit

Part 24.238 , Part 22.917 and Part 27.50 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 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, 1740.0MHz 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 IV 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.

©Copyright. All rights reserved by SAICT.

A.2.4 Measurement Results Table

EUT- Horizontal

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

EUT- Vertical

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

©Copyright. All rights reserved by SAICT.

	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	3

©Copyright. All rights reserved by SAICT.

EUT-Horizontal

WCDMA BAND II Mode Channel 9262/1852.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
2938.13	-42.31	5.83	-5.16	-53.30	-13.00	H
4873.50	-36.68	7.47	-5.34	-49.49	-13.00	V
13000.50	-24.95	12.57	-9.93	-47.45	-13.00	H
13980.00	-25.19	12.97	-9.07	-47.23	-13.00	H
15286.50	-22.89	13.55	-8.77	-45.21	-13.00	H
16668.50	-21.22	14.22	-8.19	-43.63	-13.00	H

WCDMA BAND II Mode Channel 9400/1880MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
2924.53	-42.26	5.83	-5.16	-53.25	-13.00	H
4874.00	-36.17	7.47	-5.34	-48.98	-13.00	V
12547.50	-24.82	12.23	-10.12	-47.17	-13.00	H
14031.00	-25.03	12.97	-9.02	-47.02	-13.00	H
15187.50	-23.32	13.51	-8.74	-45.57	-13.00	V
16567.00	-21.76	14.19	-8.43	-44.38	-13.00	V

WCDMA BAND II Mode Channel 9538/1907.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
2904.53	-42.47	5.83	-5.16	-53.46	-13.00	H
4873.50	-35.73	7.47	-5.34	-48.54	-13.00	V
12946.00	-24.36	12.54	-10.00	-46.90	-13.00	V
14501.50	-24.20	13.19	-8.69	-46.08	-13.00	H
16061.50	-21.91	13.96	-8.76	-44.63	-13.00	H
17400.00	-20.56	14.63	-7.88	-43.07	-13.00	V

©Copyright. All rights reserved by SAICT.

WCDMA BAND II Mode Channel 9262/1852.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2928.00	-28.75	5.83	-5.16	-39.74	-13.00	H
4874.00	-37.35	7.47	-5.34	-50.16	-13.00	V
14383.50	-25.49	13.23	-8.80	-47.52	-13.00	H
15031.50	-24.23	13.38	-8.88	-46.49	-13.00	H
15910.50	-23.07	13.80	-8.62	-45.49	-13.00	V
16862.50	-21.60	14.52	-8.23	-44.35	-13.00	H

WCDMA BAND II Mode Channel 9400/1880MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2927.47	-28.73	5.83	-5.16	-39.72	-13.00	H
4873.50	-37.90	7.47	-5.34	-50.71	-13.00	V
14569.50	-24.52	13.19	-8.76	-46.47	-13.00	V
15871.00	-23.93	13.80	-8.71	-46.44	-13.00	V
16715.50	-22.15	14.22	-8.23	-44.60	-13.00	H
17560.50	-21.84	14.74	-7.87	-44.45	-13.00	V

WCDMA BAND II Mode Channel 9538/1907.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2922.40	-28.77	5.83	-5.16	-39.76	-13.00	H
4873.50	-37.74	7.47	-5.34	-50.55	-13.00	V
12755.50	-25.29	12.54	-10.04	-47.87	-13.00	V
14197.50	-25.76	13.14	-9.03	-47.93	-13.00	V
15608.50	-23.77	13.78	-8.81	-46.36	-13.00	V
17267.00	-22.02	14.52	-8.12	-44.66	-13.00	V

©Copyright. All rights reserved by SAICT.

WCDMA BAND V Mode Channel 4132/826.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2899.47	-42.44	5.83	-5.16	-55.58	-13.00	H
4873.50	-36.60	7.47	-5.34	-51.56	-13.00	V
12145.50	-26.28	12.14	-10.06	-50.63	-13.00	V
14426.50	-24.60	13.23	-8.74	-48.72	-13.00	H
16247.00	-23.12	14.05	-8.40	-47.72	-13.00	V
17881.00	-20.59	14.82	-7.52	-45.08	-13.00	V

WCDMA BAND V Mode Channel 4183/836.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2918.13	-42.45	5.83	-5.16	-55.59	-13.00	H
4873.50	-35.52	7.47	-5.34	-50.48	-13.00	V
12270.00	-26.15	12.21	-10.10	-50.61	-13.00	V
13778.00	-25.49	12.94	-9.30	-49.88	-13.00	H
15982.50	-23.32	13.96	-8.66	-48.09	-13.00	H
17023.00	-21.64	14.43	-8.04	-46.26	-13.00	V

WCDMA BAND V Mode Channel 4233/846.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2900.80	-42.44	5.83	-5.16	-55.58	-13.00	V
4873.50	-36.99	7.47	-5.34	-51.95	-13.00	V
10696.50	-27.57	11.34	-9.36	-50.42	-13.00	H
13111.50	-25.27	12.55	-9.90	-49.87	-13.00	H
14795.50	-24.49	13.30	-8.69	-48.63	-13.00	V
17090.00	-21.90	14.43	-8.17	-46.65	-13.00	V

©Copyright. All rights reserved by SAICT.

WCDMA BAND V Mode Channel 4132/826.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2942.40	-28.98	5.83	-4.95	-41.91	-13.00	H
13222.50	-25.08	12.21	-9.78	-49.22	-13.00	V
14218.00	-24.70	13.14	-9.03	-49.02	-13.00	V
15383.00	-24.43	13.74	-8.95	-49.27	-13.00	H
16717.00	-22.88	14.22	-8.23	-47.48	-13.00	V
17858.00	-21.05	14.82	-7.52	-45.54	-13.00	V

WCDMA BAND V Mode Channel 4183/836.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2917.60	-28.82	5.83	-5.16	-41.96	-13.00	H
4873.50	-37.21	7.47	-5.34	-52.17	-13.00	V
14088.00	-24.75	13.08	-8.99	-48.97	-13.00	V
14884.00	-24.43	13.30	-8.74	-48.62	-13.00	H
16278.00	-23.25	14.05	-8.40	-47.85	-13.00	H
17128.50	-21.12	14.43	-8.19	-45.89	-13.00	H

WCDMA BAND V Mode Channel 4233/846.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2917.87	-28.75	5.83	-5.16	-41.89	-13.00	H
4873.50	-37.26	7.47	-5.34	-52.22	-13.00	V
14264.50	-25.10	13.14	-8.97	-49.36	-13.00	H
15251.50	-23.86	13.55	-8.72	-48.28	-13.00	H
16111.00	-23.60	13.96	-8.76	-48.47	-13.00	V
17126.50	-21.35	14.43	-8.19	-46.12	-13.00	H

©Copyright. All rights reserved by SAICT.

WCDMA BAND IV Mode Channel 1312/1712.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2928.27	-42.30	5.83	-5.16	-53.29	-13.00	H
3427.00	-35.48	6.28	-4.82	-46.58	-13.00	V
4873.50	-37.36	7.47	-5.34	-50.17	-13.00	V
12812.50	-24.82	12.54	-10.02	-47.38	-13.00	H
15024.50	-24.41	13.38	-8.88	-46.67	-13.00	H
16775.50	-21.27	14.22	-8.31	-43.80	-13.00	H

WCDMA BAND IV Mode Channel 1450/1740.0MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2894.13	-42.61	5.83	-5.16	-53.60	-13.00	V
3466.50	-32.53	6.32	-4.89	-43.74	-13.00	V
4873.00	-38.02	7.47	-5.34	-50.83	-13.00	V
13279.00	-25.53	12.67	-9.73	-47.93	-13.00	H
15516.50	-22.20	13.78	-8.81	-44.79	-13.00	H
17531.50	-21.65	14.74	-7.90	-44.29	-13.00	V

WCDMA BAND IV Mode Channel 1513/1752.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2925.60	-42.30	5.83	-5.16	-53.29	-13.00	H
4874.00	-36.81	7.47	-5.34	-49.62	-13.00	V
13344.00	-25.27	12.67	-9.71	-47.65	-13.00	H
14859.00	-24.98	13.30	-8.72	-47.00	-13.00	V
16250.50	-23.01	14.05	-8.50	-45.56	-13.00	V
17030.00	-21.17	14.43	-8.04	-43.64	-13.00	V

©Copyright. All rights reserved by SAICT.

WCDMA BAND IV Mode Channel 1312/1712.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2912.80	-28.80	5.76	-5.16	-39.72	-13.00	H
3427.00	-31.82	6.28	-4.82	-42.92	-13.00	V
13975.50	-25.06	12.97	-9.07	-47.10	-13.00	V
15075.00	-24.55	13.51	-8.87	-46.93	-13.00	V
16096.50	-23.04	13.96	-8.76	-45.76	-13.00	V
17782.50	-22.47	14.94	-7.57	-44.98	-13.00	V

WCDMA BAND IV Mode Channel 1450/1740.0MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2895.20	-28.93	5.76	-5.26	-39.95	-13.00	V
3467.50	-31.41	6.32	-4.89	-42.62	-13.00	V
12635.00	-26.26	12.35	-10.08	-48.69	-13.00	H
13650.50	-25.81	12.80	-9.53	-48.14	-13.00	V
15267.50	-24.53	13.55	-8.77	-46.85	-13.00	H
17075.00	-22.14	14.43	-8.17	-44.74	-13.00	H

WCDMA BAND IV Mode Channel 1513/1752.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2930.93	-28.58	5.83	-5.16	-39.57	-13.00	H
3503.50	-31.99	6.32	-4.91	-43.22	-13.00	V
13956.00	-25.91	12.97	-9.07	-47.95	-13.00	V
14879.50	-23.25	13.30	-8.74	-45.29	-13.00	V
16102.50	-22.82	13.96	-8.76	-45.54	-13.00	V
17559.00	-21.74	14.74	-7.87	-44.35	-13.00	V

Note: The maximum value of expanded measurement uncertainty for this test item is U = 2.44dB(30MHz-3GHz)/4.04dB(3GHz-18GHz)/4.6dB(18GHz-40GHz), k = 2

©Copyright. All rights reserved by SAICT.

EUT-Vertical

WCDMA BAND II Mode Channel 9262/1852.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2938.13	-42.29	5.83	-5.16	-53.28	-13.00	H
4873.50	-36.75	7.47	-5.34	-49.56	-13.00	V
12242.00	-24.53	12.21	-10.08	-46.82	-13.00	H
14405.00	-24.11	13.23	-8.80	-46.14	-13.00	V
16047.00	-22.90	13.96	-8.70	-45.56	-13.00	H
17853.00	-22.09	14.82	-7.52	-44.43	-13.00	H

WCDMA BAND II Mode Channel 9400/1880MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2935.73	-42.23	5.83	-5.16	-53.22	-13.00	H
4873.50	-36.32	7.47	-5.34	-49.13	-13.00	V
12002.00	-25.95	11.99	-10.04	-47.98	-13.00	H
13498.00	-25.81	12.77	-9.67	-48.25	-13.00	V
15546.00	-23.19	13.78	-8.77	-45.74	-13.00	V
16790.50	-21.35	14.22	-8.32	-43.89	-13.00	H

WCDMA BAND II Mode Channel 9538/1907.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2932.80	-42.22	5.83	-5.16	-53.21	-13.00	H
4873.50	-36.53	7.47	-5.34	-49.34	-13.00	V
13000.00	-25.19	12.57	-9.93	-47.69	-13.00	H
14515.50	-24.04	13.19	-8.69	-45.92	-13.00	H
15522.50	-23.47	13.78	-8.81	-46.06	-13.00	V
17134.50	-21.91	14.52	-8.19	-44.62	-13.00	H

©Copyright. All rights reserved by SAICT.

WCDMA BAND II Mode Channel 9262/1852.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2928.80	-28.77	5.83	-5.16	-39.76	-13.00	H
4873.50	-32.47	7.47	-5.34	-45.28	-13.00	V
14035.00	-25.45	12.97	-8.96	-47.38	-13.00	V
15060.00	-23.44	13.51	-8.87	-45.82	-13.00	H
16021.50	-22.90	13.96	-8.70	-45.56	-13.00	V
17498.50	-21.86	14.74	-7.89	-44.49	-13.00	V

WCDMA BAND II Mode Channel 9400/1880MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2909.07	-28.94	5.76	-5.16	-39.86	-13.00	H
14335.50	-25.23	13.23	-8.92	-47.38	-13.00	H
14867.00	-24.51	13.30	-8.74	-46.55	-13.00	V
15866.50	-23.48	13.80	-8.71	-45.99	-13.00	H
16830.50	-21.60	14.52	-8.31	-44.43	-13.00	H
17968.00	-23.01	14.96	-7.38	-45.35	-13.00	H

WCDMA BAND II Mode Channel 9538/1907.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2902.93	-28.57	5.76	-5.16	-39.49	-13.00	H
13421.00	-24.97	12.77	-9.69	-47.43	-13.00	V
14286.50	-25.27	13.14	-8.97	-47.38	-13.00	H
15246.00	-23.97	13.55	-8.72	-46.24	-13.00	V
16383.00	-21.75	14.16	-8.56	-44.47	-13.00	V
17137.00	-21.16	14.52	-8.19	-43.87	-13.00	H

©Copyright. All rights reserved by SAICT.

WCDMA BAND V Mode Channel 4132/826.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit （dBm）	Polarization
2909.33	-42.48	5.83	-5.16	-55.62	-13.00	H
4873.50	-36.65	7.47	-5.34	-51.61	-13.00	V
12717.50	-25.46	12.54	-10.03	-50.18	-13.00	H
14815.00	-24.46	13.30	-8.69	-48.60	-13.00	V
16265.00	-23.00	14.05	-8.40	-47.60	-13.00	H
17431.00	-22.66	14.63	-7.88	-47.32	-13.00	V

WCDMA BAND V Mode Channel 4183/836.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit （dBm）	Polarization
2925.33	-42.29	5.83	-5.16	-55.43	-13.00	H
4874.00	-36.58	7.47	-5.34	-51.54	-13.00	V
13031.50	-24.70	12.57	-9.96	-49.38	-13.00	V
14794.50	-24.24	13.30	-8.69	-48.38	-13.00	V
15867.50	-22.53	13.80	-8.71	-47.19	-13.00	V
17048.00	-21.46	14.43	-8.04	-46.08	-13.00	V

WCDMA BAND V Mode Channel 4233/846.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit （dBm）	Polarization
2926.67	-42.31	5.83	-5.16	-55.45	-13.00	H
4874.00	-36.30	7.47	-5.34	-51.26	-13.00	V
12062.00	-26.24	11.99	-10.04	-50.42	-13.00	V
13369.00	-24.79	12.77	-9.71	-49.42	-13.00	H
15088.50	-23.77	13.51	-8.87	-48.30	-13.00	H
16957.50	-21.30	14.43	-8.04	-45.92	-13.00	H

©Copyright. All rights reserved by SAICT.

WCDMA BAND V Mode Channel 4132/826.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2919.47	-28.78	5.83	-5.16	-41.92	-13.00	H
13379.50	-24.98	12.77	-9.71	-49.61	-13.00	H
13978.00	-25.53	12.97	-9.07	-49.72	-13.00	V
15139.50	-24.56	13.51	-8.80	-49.02	-13.00	H
16114.00	-22.69	13.96	-8.76	-47.56	-13.00	V
17325.00	-22.75	14.63	-8.03	-47.56	-13.00	H

WCDMA BAND V Mode Channel 4183/836.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2933.60	-28.89	5.83	-5.16	-42.03	-13.00	H
13929.50	-26.62	12.97	-9.16	-50.90	-13.00	H
15074.00	-22.85	13.51	-8.87	-47.38	-13.00	H
15998.50	-22.31	13.96	-8.66	-47.08	-13.00	H
16683.50	-21.25	14.22	-8.19	-45.81	-13.00	V
17823.50	-22.42	14.94	-7.52	-47.03	-13.00	H

WCDMA BAND V Mode Channel 4233/846.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak ERP(dBm)	Limit（dBm）	Polarization
2928.80	-28.77	5.83	-5.16	-41.91	-13.00	H
14415.50	-24.77	13.23	-8.80	-48.95	-13.00	H
15294.00	-24.08	13.55	-8.77	-48.55	-13.00	H
15855.50	-23.65	13.80	-8.83	-48.43	-13.00	V
16827.50	-21.91	14.52	-8.31	-46.89	-13.00	H
17792.00	-22.56	14.94	-7.57	-47.22	-13.00	H

©Copyright. All rights reserved by SAICT.

WCDMA BAND IV Mode Channel 1312/1712.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
2929.87	-42.20	5.83	-5.16	-53.19	-13.00	H
3427.00	-37.10	6.28	-4.82	-48.20	-13.00	V
4874.00	-36.99	7.47	-5.34	-49.80	-13.00	V
14433.50	-24.79	13.23	-8.74	-46.76	-13.00	H
16132.00	-22.52	13.96	-8.76	-45.24	-13.00	H
17641.50	-22.12	14.74	-7.71	-44.57	-13.00	H

WCDMA BAND IV Mode Channel 1450/1740.0MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
2928.27	-42.28	5.83	-5.16	-53.27	-13.00	H
3467.00	-34.97	6.32	-4.89	-46.18	-13.00	V
4874.00	-36.29	7.47	-5.34	-49.10	-13.00	V
12683.50	-25.65	12.35	-10.06	-48.06	-13.00	V
15066.00	-24.13	13.51	-8.87	-46.51	-13.00	V
16976.00	-21.28	14.43	-8.04	-43.75	-13.00	H

WCDMA BAND IV Mode Channel 1513/1752.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（QPSK）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit （dBm）	Polarization
2934.40	-42.21	5.83	-5.16	-53.20	-13.00	H
4874.00	-36.55	7.47	-5.34	-49.36	-13.00	V
11765.50	-26.63	11.91	-9.95	-48.49	-13.00	H
13514.50	-25.27	12.78	-9.66	-47.71	-13.00	V
15256.00	-23.55	13.55	-8.72	-45.82	-13.00	H
16782.50	-21.62	14.22	-8.32	-44.16	-13.00	H

©Copyright. All rights reserved by SAICT.

WCDMA BAND IV Mode Channel 1312/1712.4MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2923.20	-28.70	5.83	-5.16	-39.69	-13.00	H
3426.50	-32.25	6.28	-4.82	-43.35	-13.00	H
12641.50	-26.07	12.35	-10.08	-48.50	-13.00	H
13999.00	-25.40	12.97	-9.02	-47.39	-13.00	H
15514.50	-23.57	13.78	-8.81	-46.16	-13.00	H
16708.50	-22.34	14.22	-8.23	-44.79	-13.00	V

WCDMA BAND IV Mode Channel 1450/1740.0MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2923.47	-28.66	5.83	-5.16	-39.65	-13.00	H
3467.50	-33.15	6.32	-4.89	-44.36	-13.00	H
14373.00	-25.42	13.23	-8.87	-47.52	-13.00	H
15099.00	-24.37	13.51	-8.87	-46.75	-13.00	H
16126.00	-23.25	13.80	-8.76	-45.81	-13.00	V
17285.00	-22.77	14.52	-8.12	-45.41	-13.00	V

WCDMA BAND IV Mode Channel 1513/1752.6MHz with GNSS function was on and WLAN was continuously launched (WLAN was worked on 802.11b channel 6,power level is 14 and modulation group is 0)（16QAM）

Frequency(MHz)	P_{Mea}(dBm)	Path loss	Antenna Gain(dBi)	Peak EIRP(dBm)	Limit（dBm）	Polarization
2931.73	-28.77	5.83	-5.16	-39.76	-13.00	H
3506.00	-37.63	6.32	-4.91	-48.86	-13.00	H
14850.50	-24.17	13.30	-8.72	-46.19	-13.00	H
15979.00	-22.90	13.96	-8.64	-45.50	-13.00	V
16813.00	-21.49	14.52	-8.32	-44.33	-13.00	V
17890.50	-21.82	14.82	-7.52	-44.16	-13.00	V

Note: The maximum value of expanded measurement uncertainty for this test item is U = 2.44dB(30MHz-3GHz)/4.04dB(3GHz-18GHz)/4.6dB(18GHz-40GHz), k = 2

©Copyright. All rights reserved by SAICT.

A.3 FREQUENCY STABILITY

Reference

FCC: CFR Part 2.1055, 22.355, 24.235, 27.54

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℃ 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 9.6VDC and 16VDC, with a nominal voltage of 12VDC. 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.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.

©Copyright. All rights reserved by SAICT.

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-QPSK

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
9.6	8	0.004
12	-10	0.005
16	-7	0.004

Frequency Error vs Temperature-QPSK

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	-5	0.003
-20	6	0.003
-10	-7	0.004
0	8	0.004
10	-6	0.003
20	6	0.003
30	12	0.006
40	11	0.006
50	7	0.004

Frequency Error vs Voltage-16QAM

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
9.6	6	0.003
12	5	0.003
16	-7	0.004

Frequency Error vs Temperature-16QAM

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	-5	0.003
-20	8	0.004
-10	7	0.004
0	12	0.006
10	7	0.004
20	-4	0.002
30	4	0.002
40	7	0.004
50	-11	0.006

©Copyright. All rights reserved by SAICT.

WCDMA Band V

Frequency Error vs Voltage-QPSK

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
9.6	7	0.008
12	9	0.010
16	8	0.010

Frequency Error vs Temperature-QPSK

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	7	0.008
-20	7	0.008
-10	9	0.011
0	9	0.011
10	6	0.008
20	12	0.015
30	8	0.010
40	10	0.012
50	7	0.008

Frequency Error vs Voltage-16QAM

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
9.6	-3	0.004
12	4	0.005
16	-5	0.006

Frequency Error vs Temperature-16QAM

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	-4	0.005
-20	-3	0.003
-10	-4	0.004
0	-3	0.004
10	-4	0.005
20	4	0.005
30	2	0.002
40	-3	0.004
50	-4	0.005

©Copyright. All rights reserved by SAICT.

WCDMA Band IV

Frequency Error vs Voltage-QPSK

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
9.6	8	0.005
12	6	0.004
16	10	0.006

Frequency Error vs Temperature-QPSK

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	9	0.005
-20	11	0.006
-10	7	0.004
0	9	0.005
10	10	0.006
20	6	0.003
30	3	0.002
40	6	0.003
50	5	0.003

Frequency Error vs Voltage-16QAM

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
9.6	5	0.003
12	-9	0.005
16	-9	0.005

Frequency Error vs Temperature-16QAM

temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-30	-6	0.004
-20	-6	0.003
-10	-12	0.007
0	-8	0.005
10	-5	0.003
20	-8	0.005
30	3	0.002
40	-5	0.003
50	-5	0.003

Expanded measurement uncertainty is 10Hz, k = 2

©Copyright. All rights reserved by SAICT.

A.4 OCCUPIED BANDWIDTH

Reference

FCC: CFR Part 2.1049, 22.917, 24.238, 27.53(g).

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.

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.

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

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

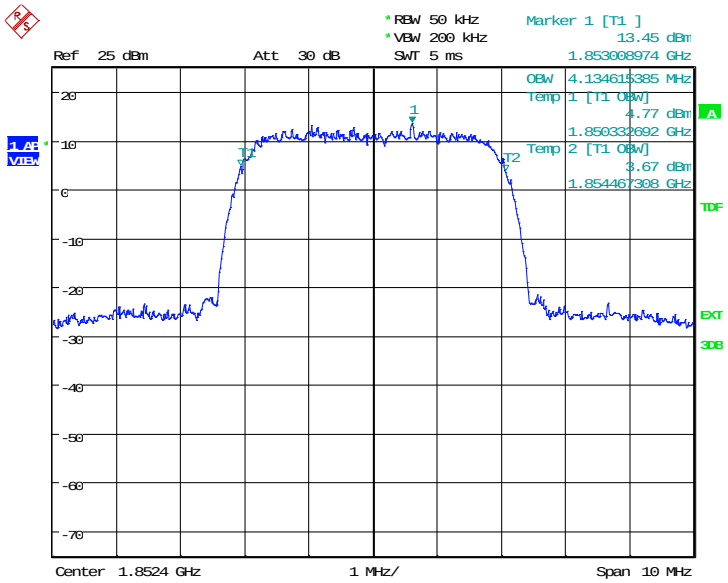
©Copyright. All rights reserved by SAICT.

WCDMA Band II (99% BW)-QPSK

Frequency(MHz)	Occupied Bandwidth (99% BW)(MHz)
1852.4	4.13
1880.0	4.13
1907.6	4.13

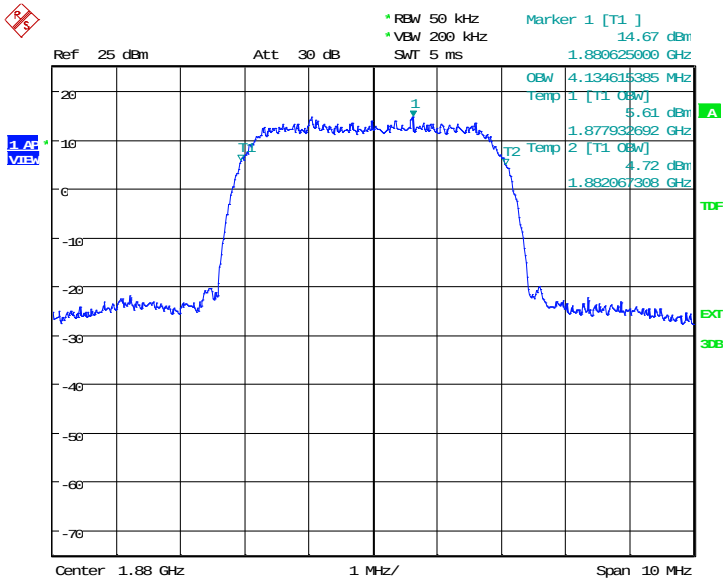
WCDMA Band Ⅱ

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



Date: 7.SEP.2018 06:02:20

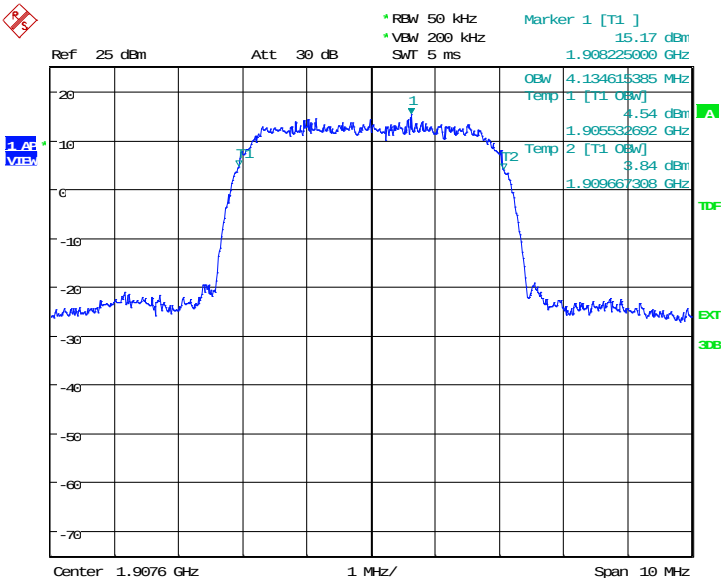
Channel 9400-Occupied Bandwidth (99% BW)-QPSK



Date: 7.SEP.2018 06:02:54

©Copyright. All rights reserved by SAICT.

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



Date: 7.SEP.2018 06:03:27

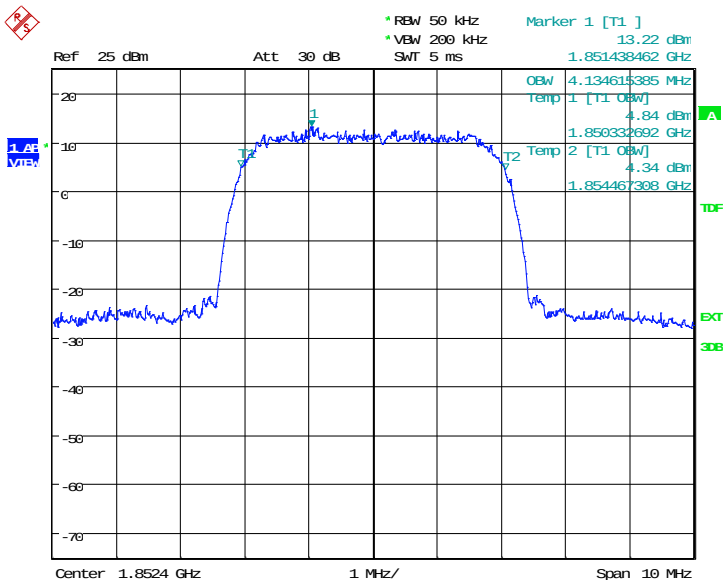
©Copyright. All rights reserved by SAICT.

WCDMA Band II (99% BW)-16QAM

Frequency(MHz)	Occupied Bandwidth (99% BW)(MHz)
1852.4	4.13
1880.0	4.13
1907.6	4.13

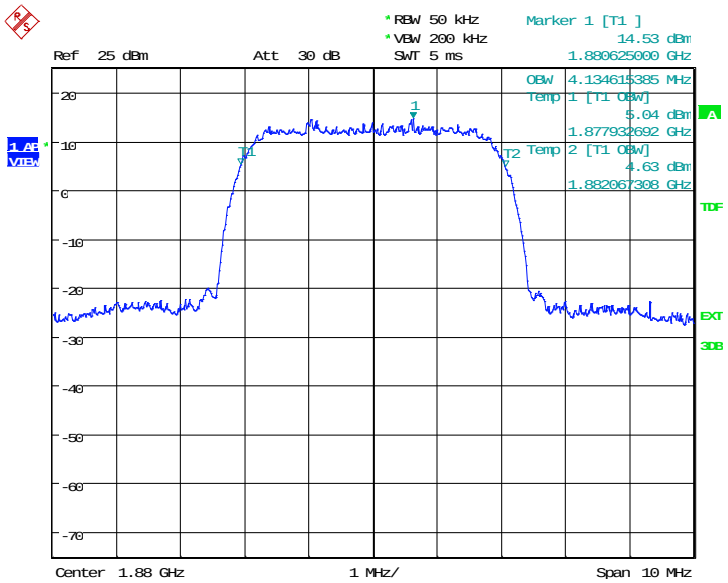
WCDMA Band Ⅱ

Channel 9262-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 06:32:42

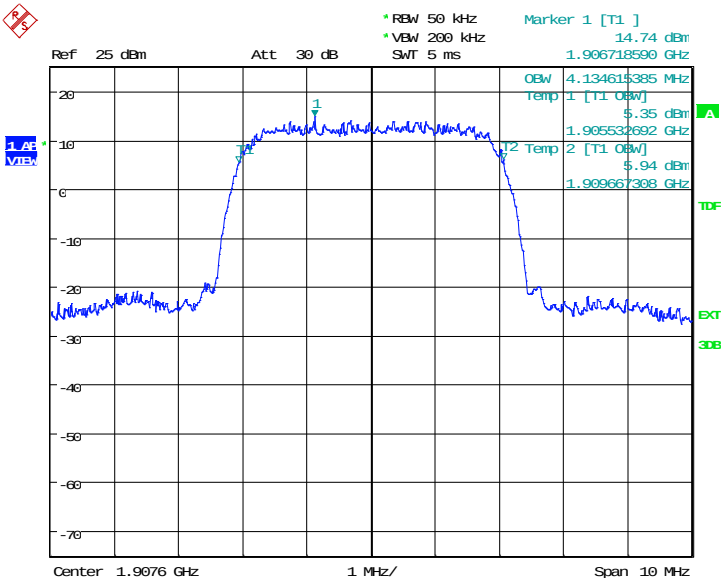
Channel 9400-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 06:33:16

©Copyright. All rights reserved by SAICT.

Channel 9538-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 06:33:50

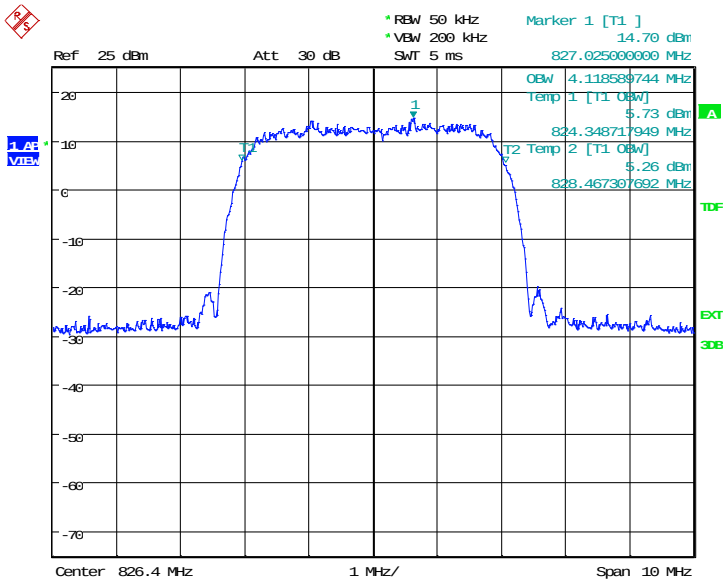
©Copyright. All rights reserved by SAICT.

WCDMA Band V(99% BW)-QPSK

Frequency(MHz)	Occupied Bandwidth (99% BW)(MHz)
826.4	4.12
836.6	4.13
846.6	4.13

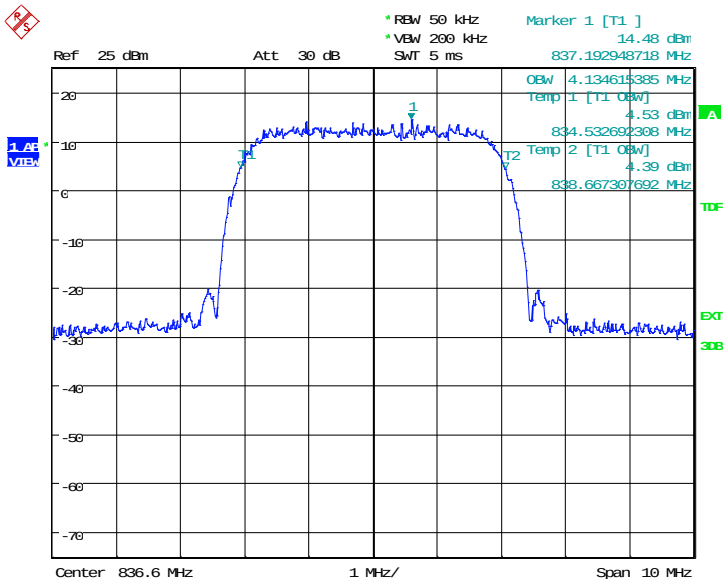
WCDMA Band V

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



Date: 7.SEP.2018 08:01:03

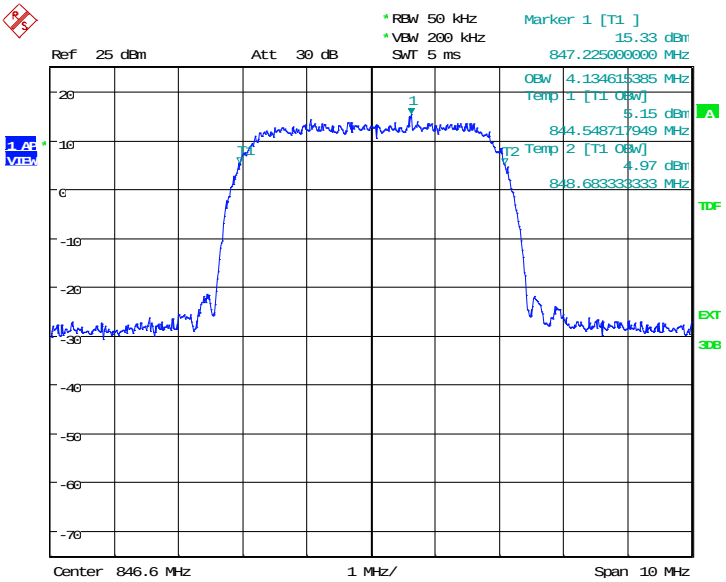
Channel 4183-Occupied Bandwidth (99% BW)-QPSK



Date: 7.SEP.2018 08:01:36

©Copyright. All rights reserved by SAICT.

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



Date: 7.SEP.2018 08:02:10

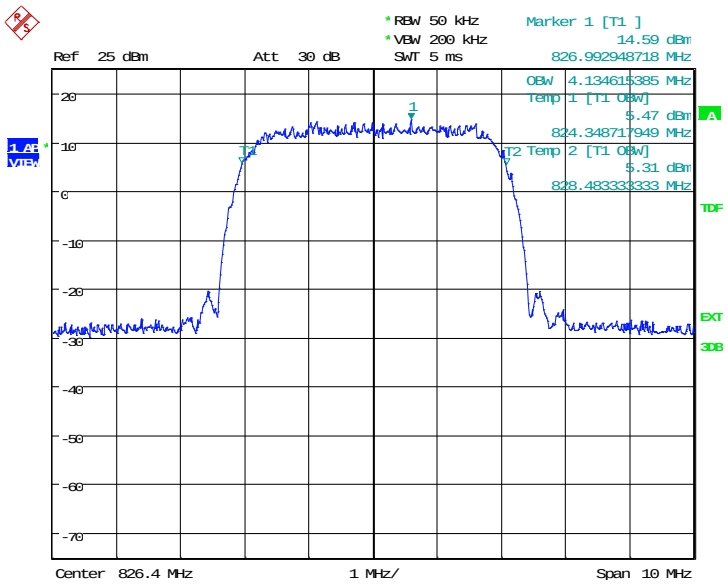
©Copyright. All rights reserved by SAICT.

WCDMA Band V(99% BW)-16QAM

Frequency(MHz)	Occupied Bandwidth (99% BW)(MHz)
826.4	4.13
836.6	4.13
846.6	4.13

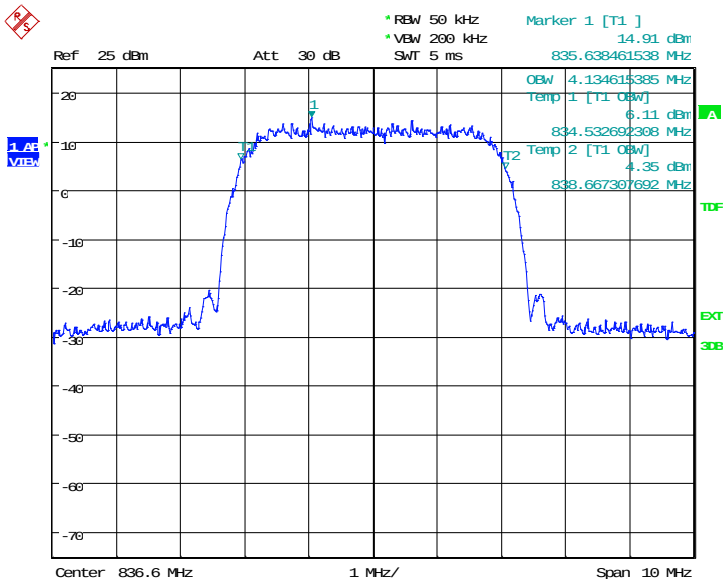
WCDMA Band V

Channel 4132-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 08:37:40

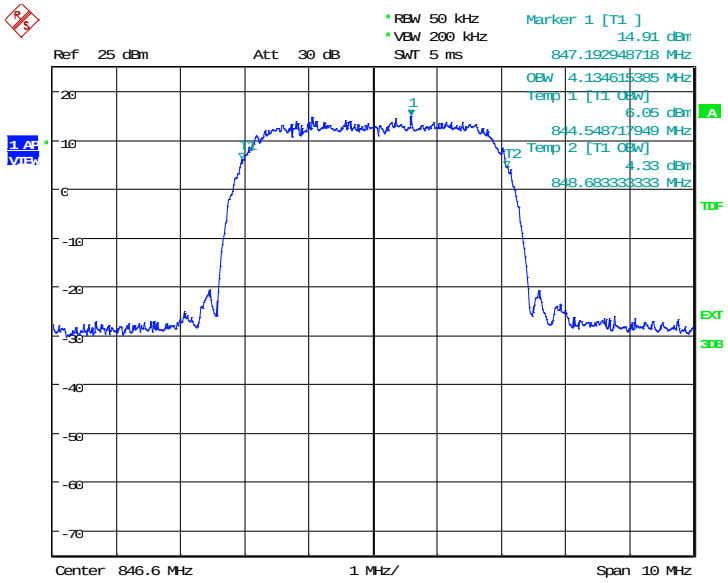
Channel 4183-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 08:38:14

©Copyright. All rights reserved by SAICT.

Channel 4233-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 08:38:48

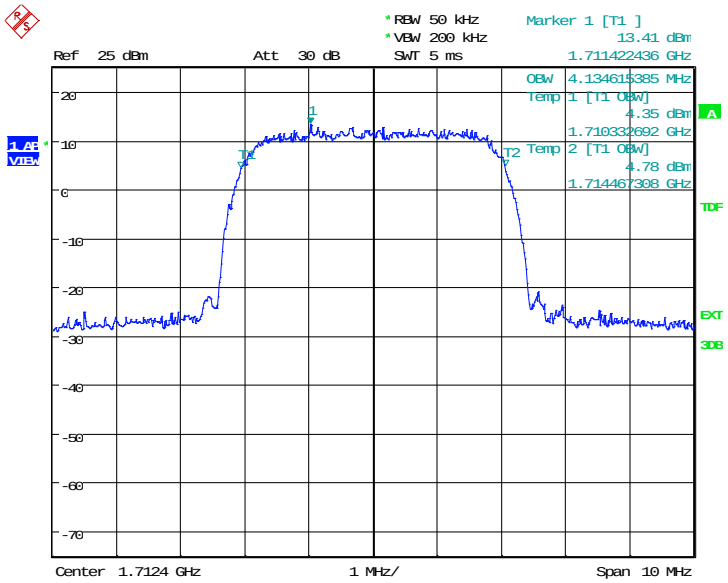
©Copyright. All rights reserved by SAICT.

WCDMA Band IV(99% BW)-QPSK

Frequency(MHz)	Occupied Bandwidth (99% BW)(MHz)
1712.4	4.13
1740.0	4.13
1752.6	4.12

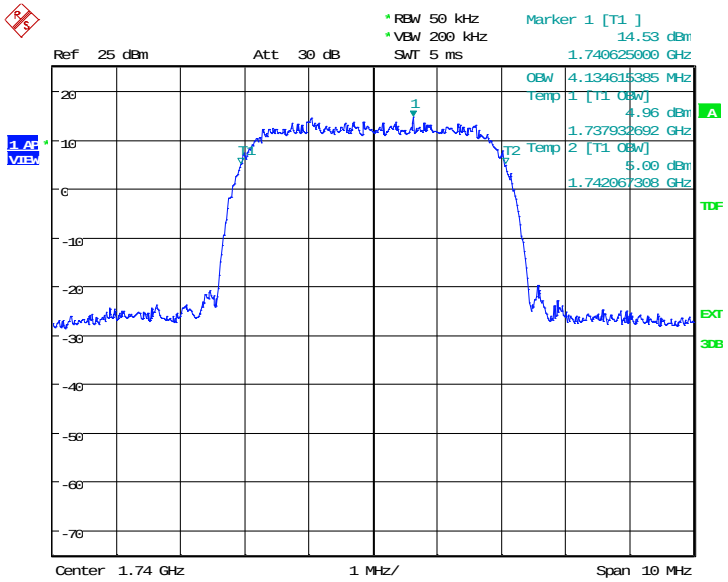
WCDMA Band IV

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



Date: 7.SEP.2018 07:19:09

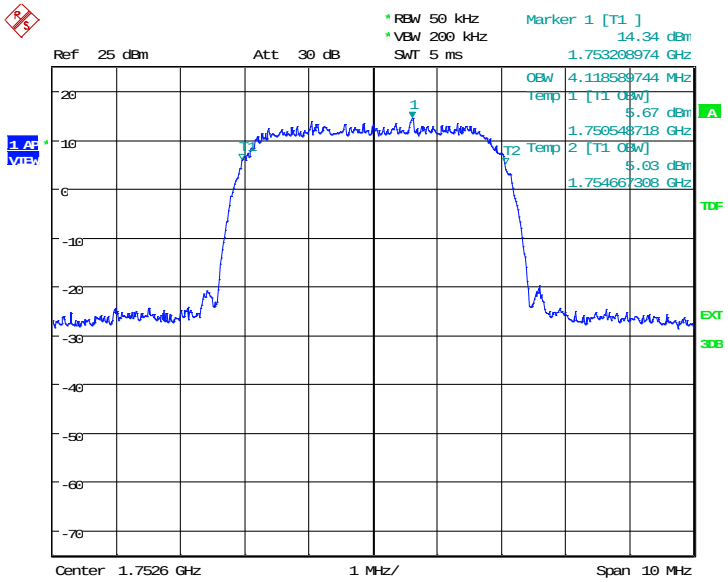
Channel 1450-Occupied Bandwidth (99% BW)-QPSK



Date: 7.SEP.2018 07:19:42

©Copyright. All rights reserved by SAICT.

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



Date: 7.SEP.2018 07:20:16

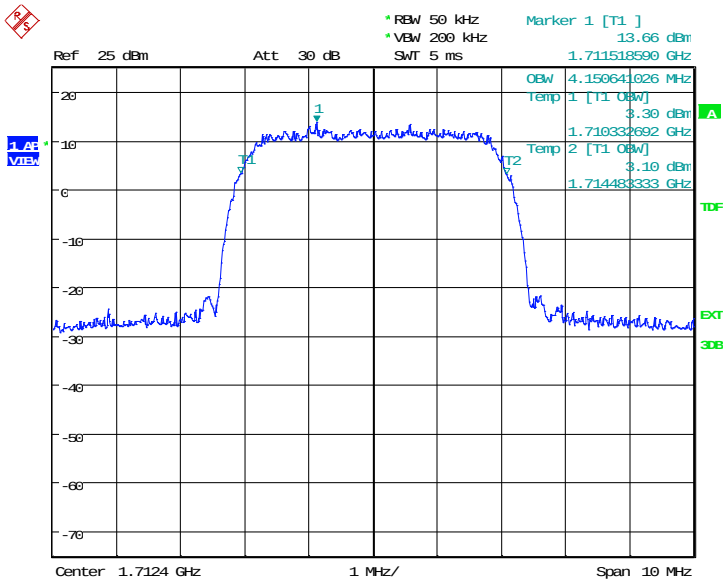
©Copyright. All rights reserved by SAICT.

WCDMA Band IV(99% BW)-16QAM

Frequency(MHz)	Occupied Bandwidth (99% BW)(MHz)
1712.4	4.15
1740.0	4.13
1752.6	4.13

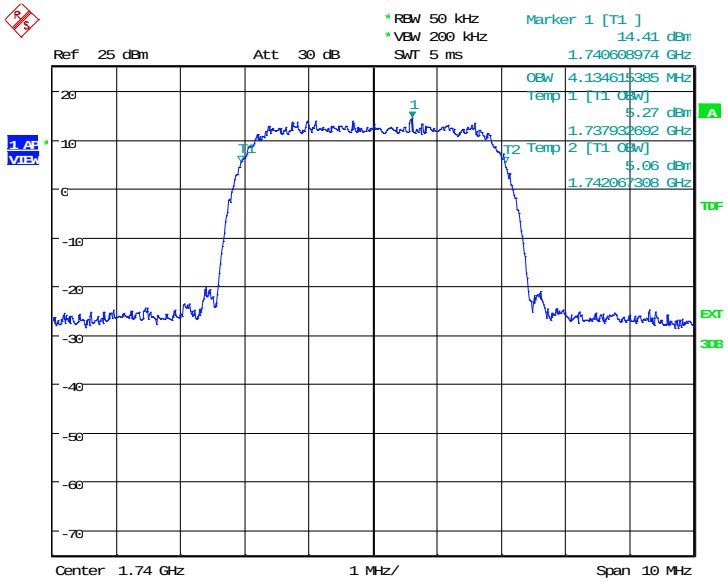
WCDMA Band IV

Channel 1312-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 07:45:56

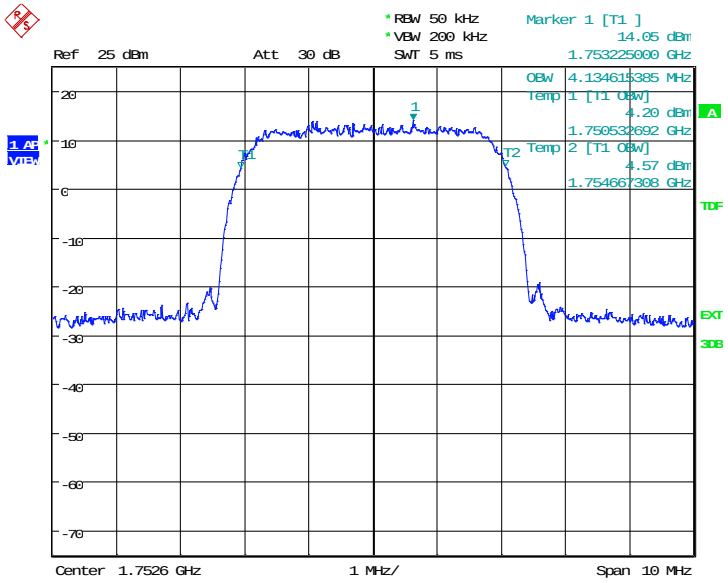
Channel 1450-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 07:46:30

©Copyright. All rights reserved by SAICT.

Channel 1513-Occupied Bandwidth (99% BW)-16QAM



Date: 7.SEP.2018 07:47:05

Note: Expanded measurement uncertainty is U = 3428Hz, k = 2

©Copyright. All rights reserved by SAICT.

A.5 EMISSION BANDWIDTH

Reference

FCC: CFR Part 2.1049, 22.917, 24.238, 27.53(g).

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.

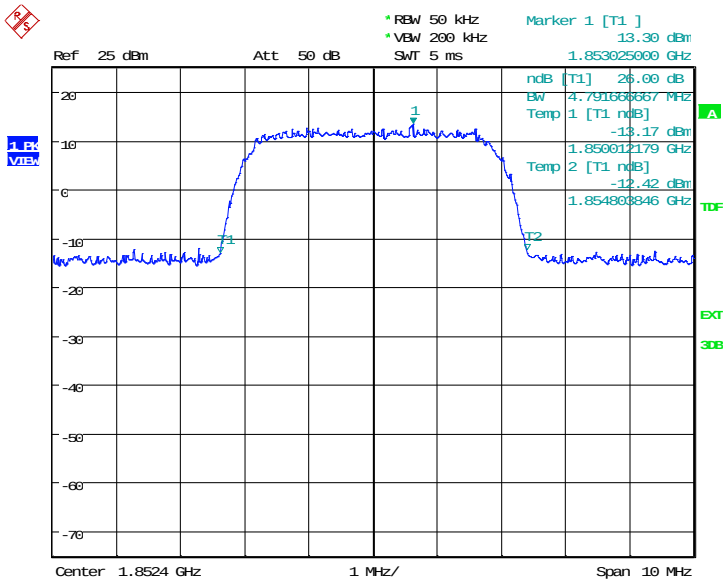
Similar to conducted emissions; Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies. Table below lists the measured -26 dB BW. Spectrum analyzer plots are included on the following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

WCDMA Band II (-26 dB BW)-QPSK

Frequency(MHz)	Emission Bandwidth (-26 dB BW)(MHz)
1852.4	4.79
1880.0	4.79
1907.6	4.74

WCDMA Band II

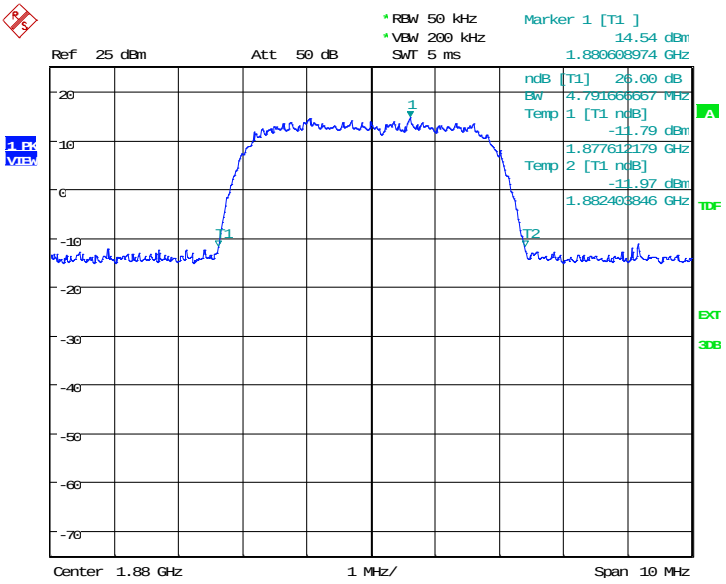
Channel 9262-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 06:04:37

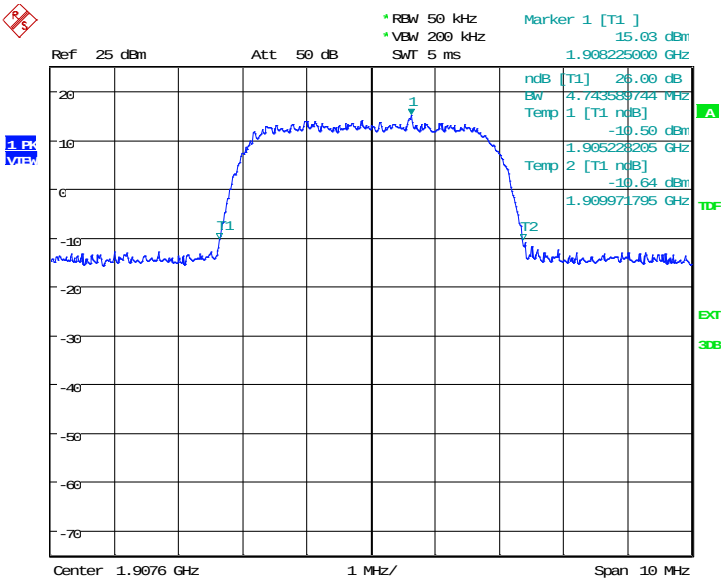
©Copyright. All rights reserved by SAICT.

Channel 9400-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 06:05:46

Channel 9538-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 06:06:55

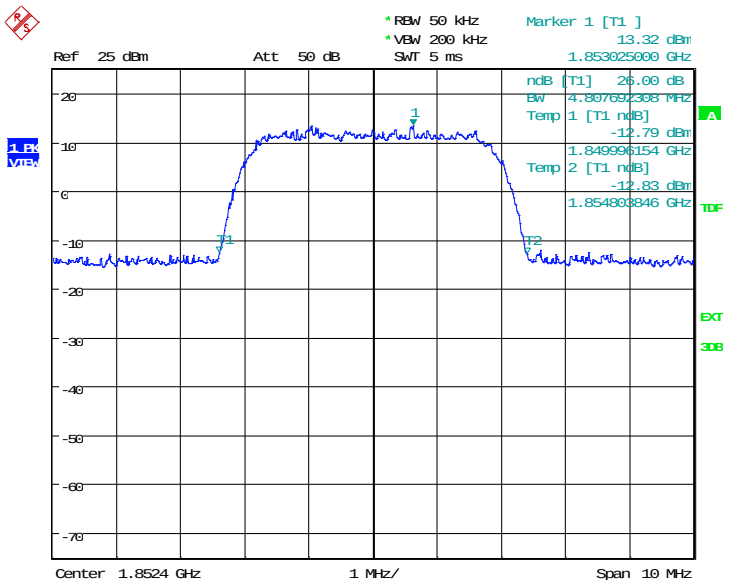
©Copyright. All rights reserved by SAICT.

WCDMA Band II (-26 dB BW)-16QAM

Frequency(MHz)	Emission Bandwidth (-26 dB BW)(MHz)
1852.4	4.81
1880.0	4.76
1907.6	4.76

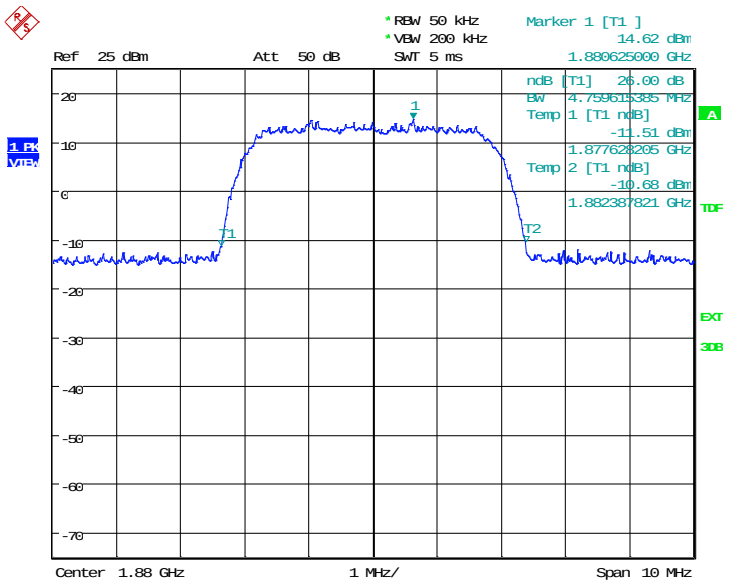
WCDMA Band II

Channel 9262-Emission Bandwidth (-26 dB BW)-16QAM



Date: 7.SEP.2018 06:35:00

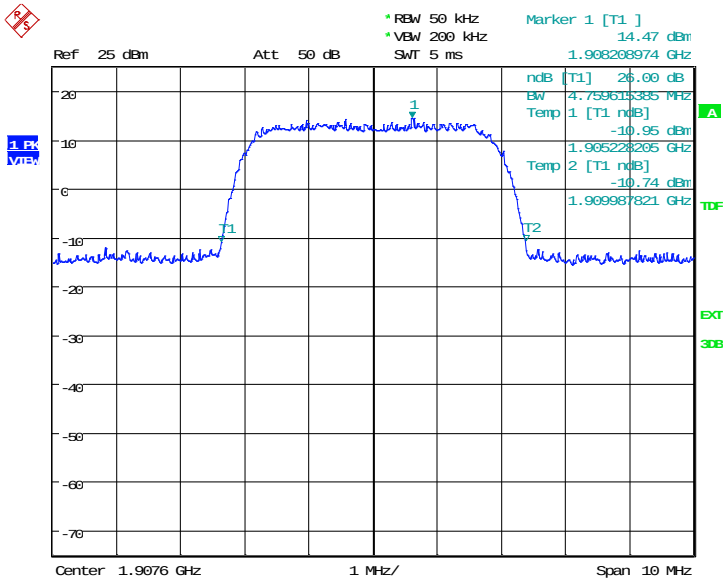
Channel 9400-Emission Bandwidth (-26 dB BW)-16QAM



Date: 7.SEP.2018 06:36:09

©Copyright. All rights reserved by SAICT.

Channel 9538-Emission Bandwidth (-26 dB BW)-16QAM



Date: 7.SEP.2018 06:37:18

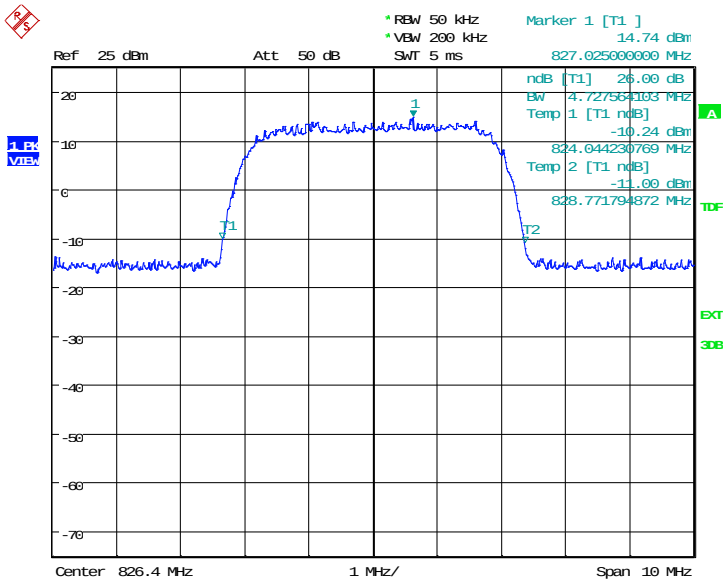
©Copyright. All rights reserved by SAICT.

WCDMA Band V(-26 dB BW)-QPSK

Frequency(MHz)	Emission Bandwidth (-26 dB BW)(MHz)
826.40	4.73
836.60	4.73
846.60	4.73

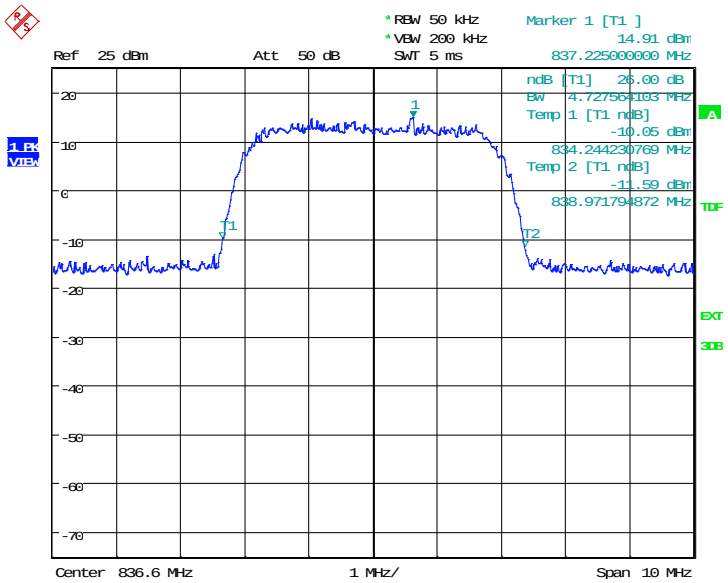
WCDMA Band V

Channel 4132-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 08:03:20

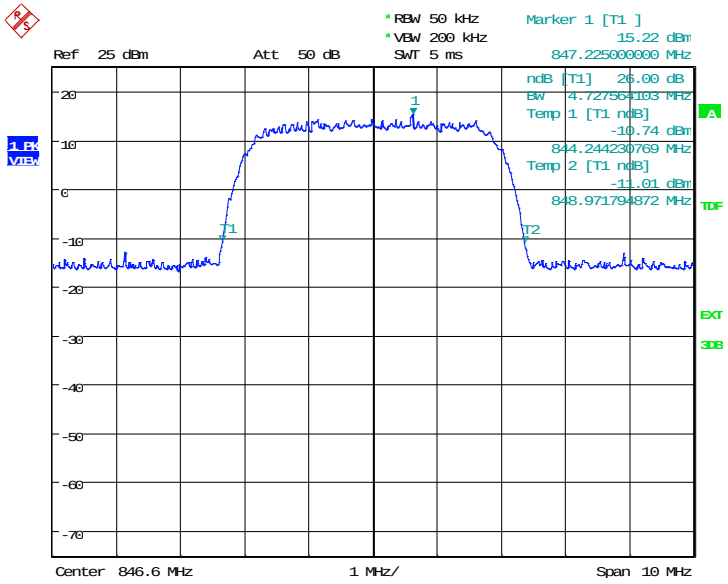
Channel 4183-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 08:04:30

©Copyright. All rights reserved by SAICT.

Channel 4233-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 08:05:38

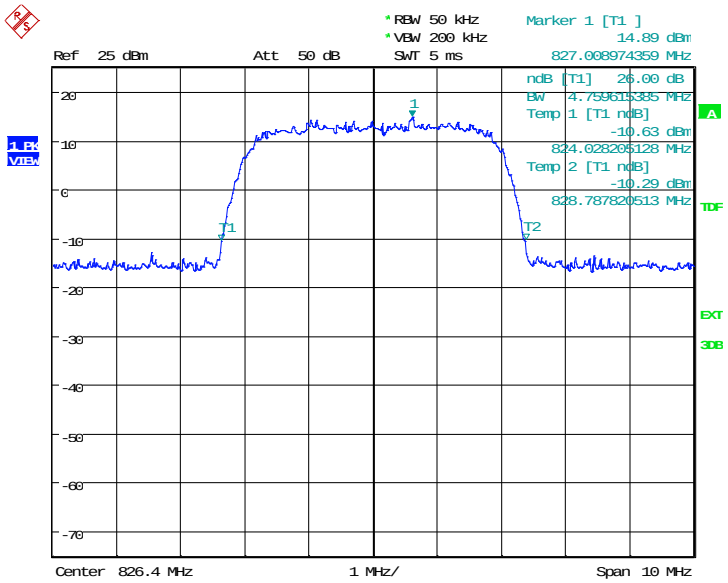
©Copyright. All rights reserved by SAICT.

WCDMA Band V(-26 dB BW)-16QAM

Frequency(MHz)	Emission Bandwidth (-26 dB BW)(MHz)
826.40	4.76
836.60	4.74
846.60	4.76

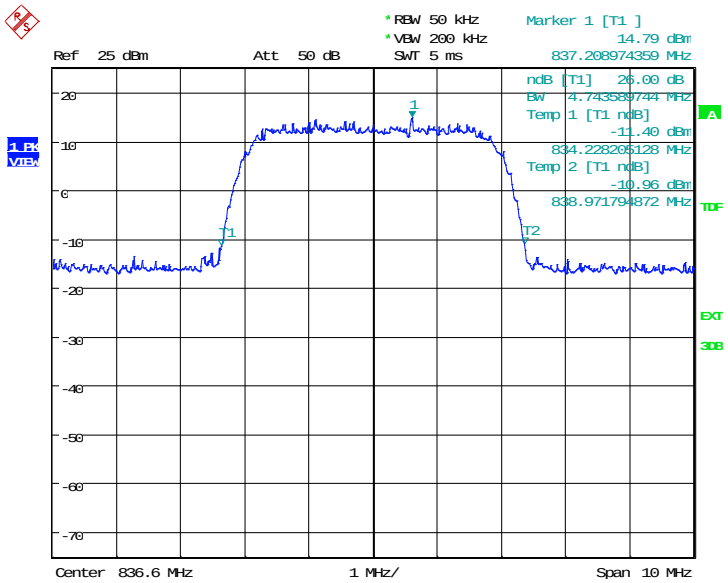
WCDMA Band V

Channel 4132-Emission Bandwidth (-26 dB BW)-16QAM



Date: 7.SEP.2018 08:39:58

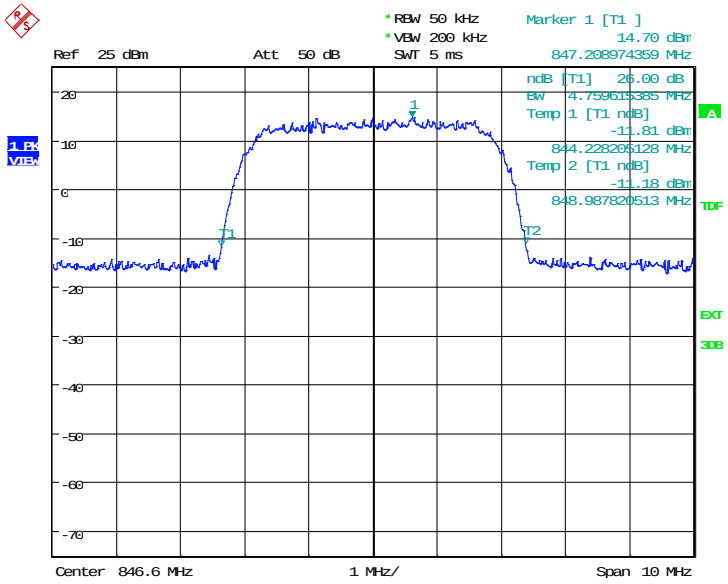
Channel 4183-Emission Bandwidth (-26 dB BW)-16QAM



Date: 7.SEP.2018 08:41:07

©Copyright. All rights reserved by SAICT.

Channel 4233-Emission Bandwidth (-26 dB BW)-16QAM



Date: 7.SEP.2018 08:42:16

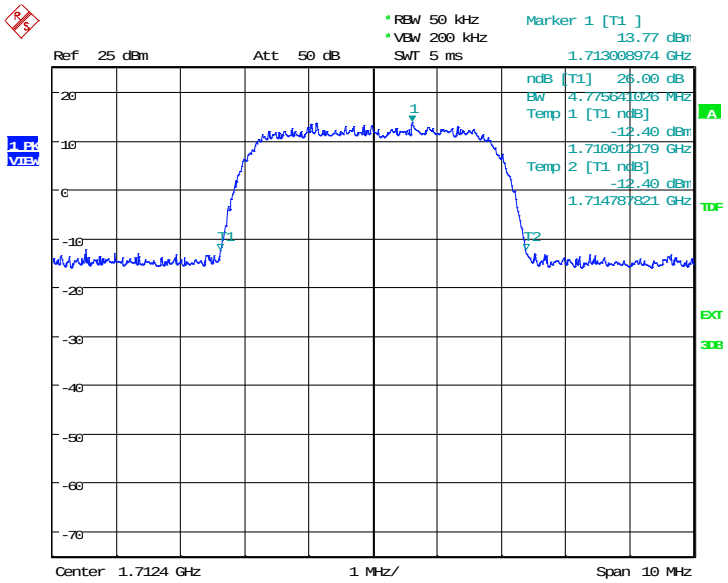
©Copyright. All rights reserved by SAICT.

WCDMA Band IV(-26 dB BW)-QPSK

Frequency(MHz)	Emission Bandwidth (-26 dB BW)(MHz)
1712.4	4.78
1740.0	4.78
1752.6	4.76

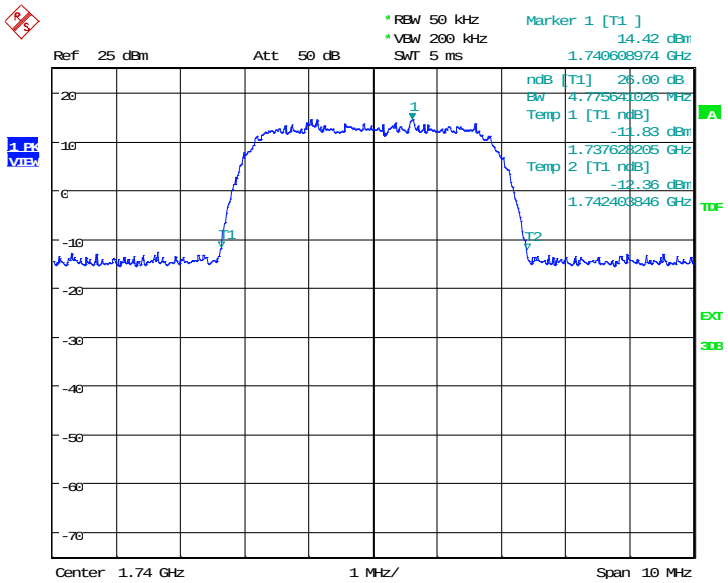
WCDMA Band IV

Channel 1312-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 07:21:26

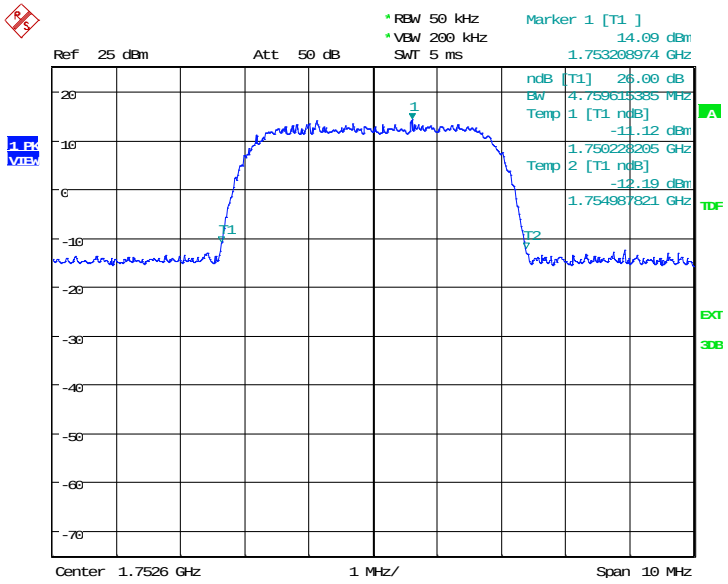
Channel 1450-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 07:22:35

©Copyright. All rights reserved by SAICT.

Channel 1513-Emission Bandwidth (-26 dB BW)-QPSK



Date: 7.SEP.2018 07:23:45

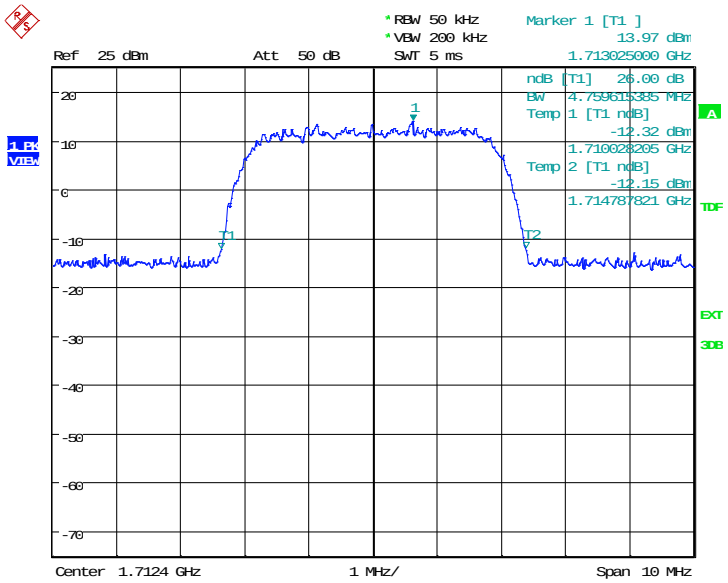
©Copyright. All rights reserved by SAICT.

WCDMA Band IV(-26 dB BW)-16QAM

Frequency(MHz)	Emission Bandwidth (-26 dB BW)(MHz)
1712.4	4.76
1740.0	4.74
1752.6	4.76

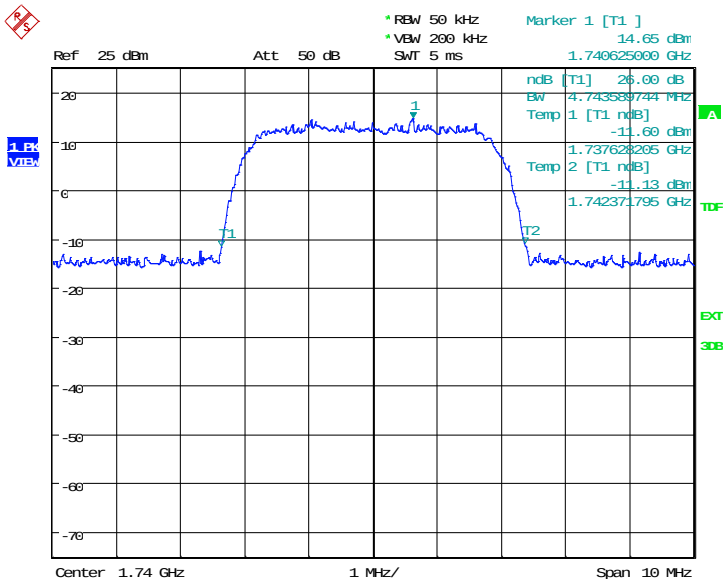
WCDMA Band IV

Channel 1312-Emission Bandwidth (-26 dB BW)-16QAM



Date: 7.SEP.2018 07:48:15

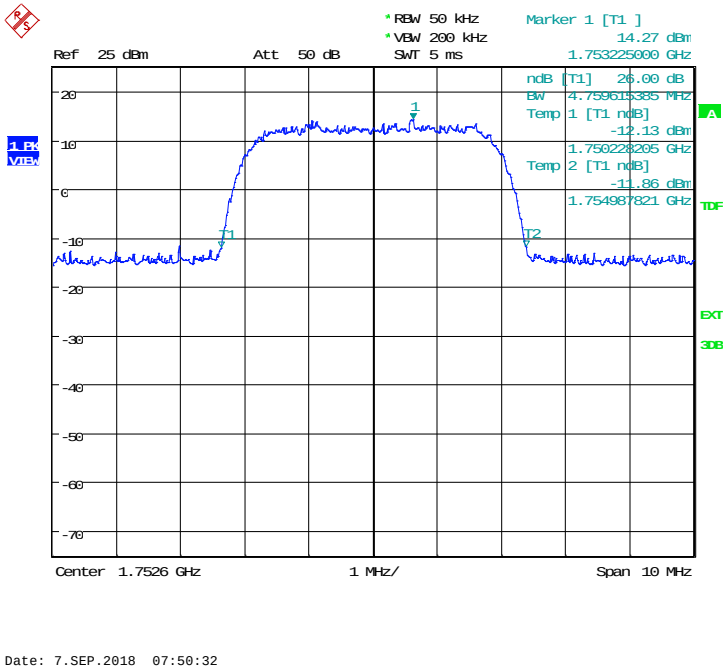
Channel 1450-Emission Bandwidth (-26 dB BW)-16QAM



Date: 7.SEP.2018 07:49:24

©Copyright. All rights reserved by SAICT.

Channel 1513-Emission Bandwidth (-26 dB BW)-16QAM



Note: Expanded measurement uncertainty is U = 3428Hz, k = 2

©Copyright. All rights reserved by SAICT.

A.6 BAND EDGE COMPLIANCE

Reference

FCC: CFR Part 2.1051, 22.917, 24.238, 27.53(h).

A.6.1 Measurement limit

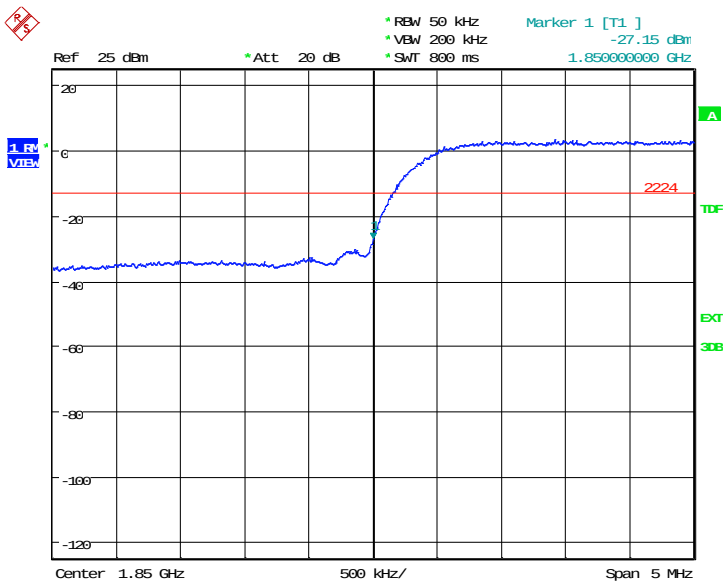
On any frequency outside frequency band of the US Cellular/PCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log (P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm. A relaxation of 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

Only worst case result is given below

WCDMA Band Ⅱ

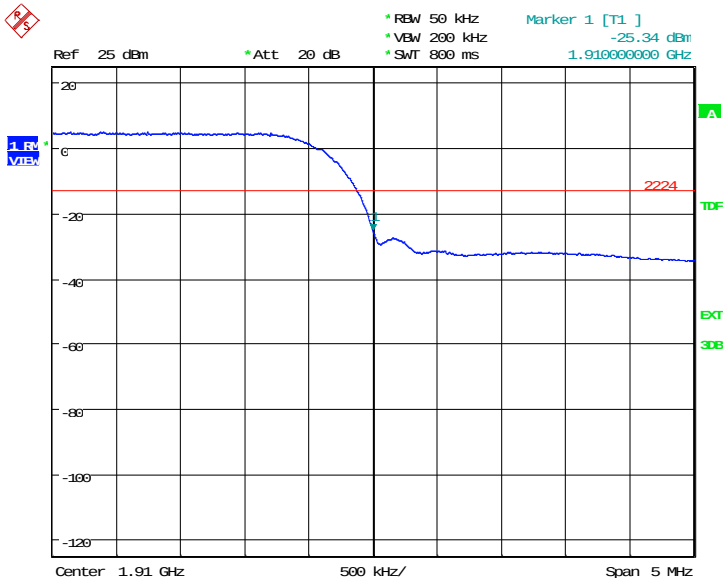
LOW BAND EDGE BLOCK-A (WCDMA Band Ⅱ)-Channel 9262



Date: 7.SEP.2018 06:07:06

©Copyright. All rights reserved by SAICT.

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

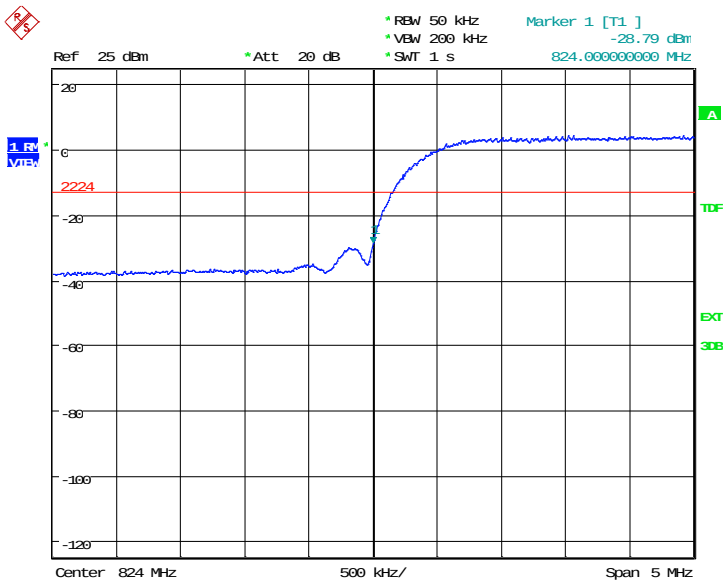


Date: 7.SEP.2018 06:09:11

©Copyright. All rights reserved by SAICT.

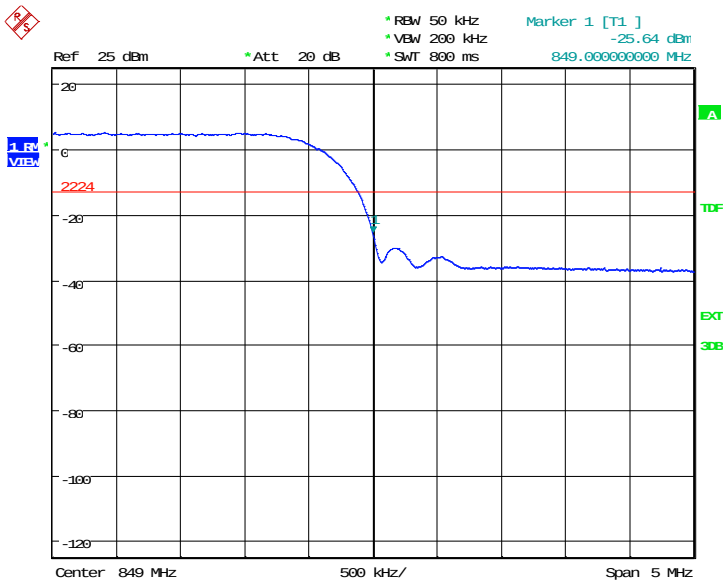
WCDMA Band Ⅴ

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



Date: 7.SEP.2018 08:05:49

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

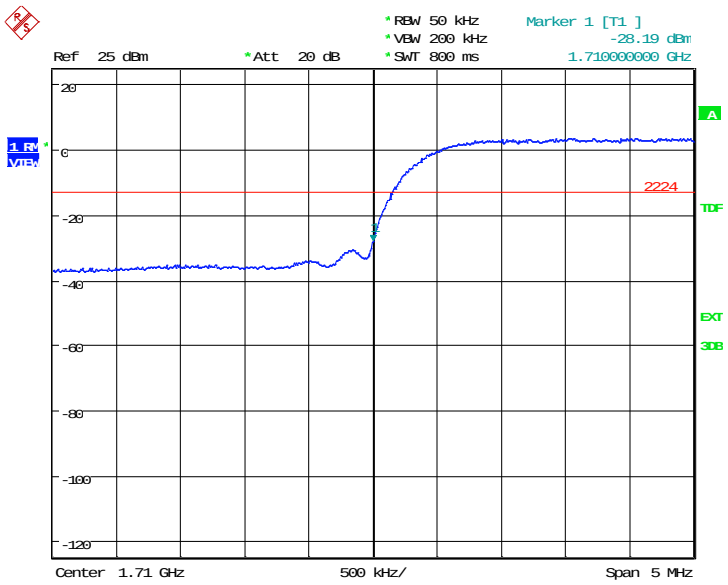


Date: 7.SEP.2018 08:07:54

©Copyright. All rights reserved by SAICT.

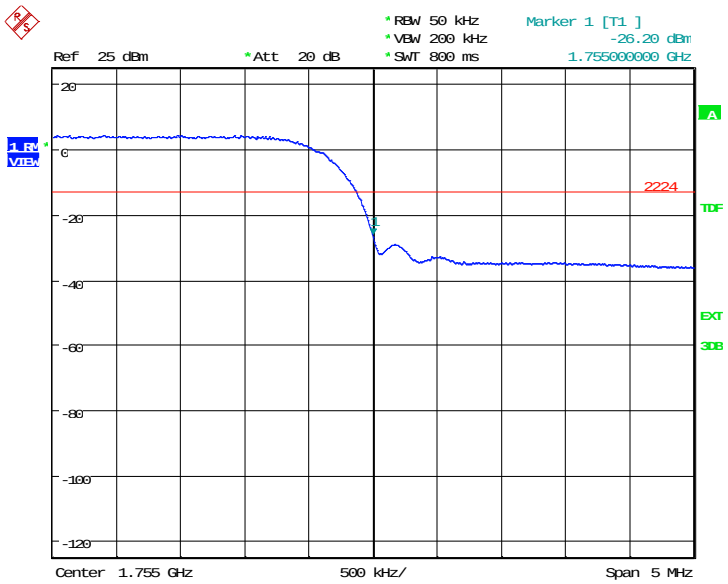
WCDMA Band Ⅳ

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



Date: 7.SEP.2018 07:23:55

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



Date: 7.SEP.2018 07:25:59

Note: Expanded measurement uncertainty is U = 0.488dB(100KHz-2GHz)/1.211dB(2GHz-26.5GHz), k = 1.96

©Copyright. All rights reserved by SAICT.

A.7 CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 2.1051, 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 2.1051 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.

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

WCDMA Band IV Transmitter

Channel	Frequency (MHz)
1312	1712.4
1450	1740.0
1513	1752.6

A.7.2 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.

©Copyright. All rights reserved by SAICT.

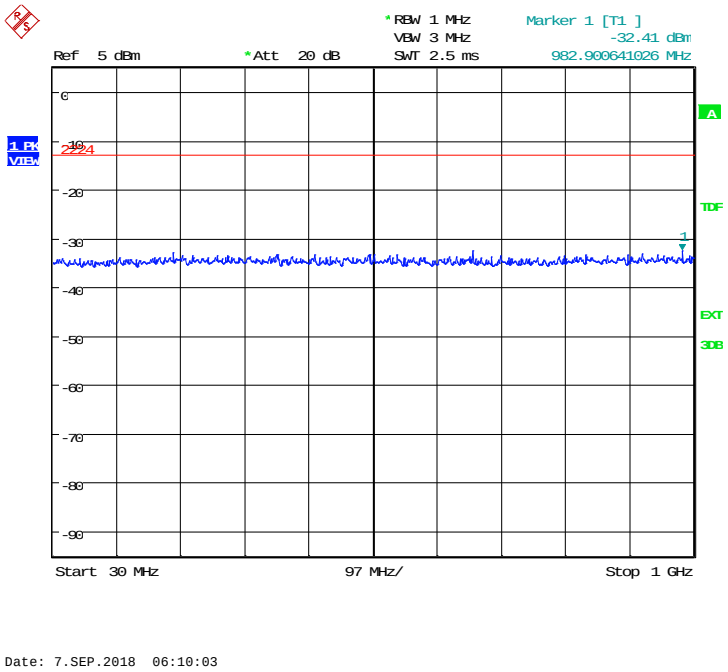
A.7.3 Measurement result

Only worst case result is given below

WCDMA Band Ⅱ

Channel 9262: 30MHz –1GHz

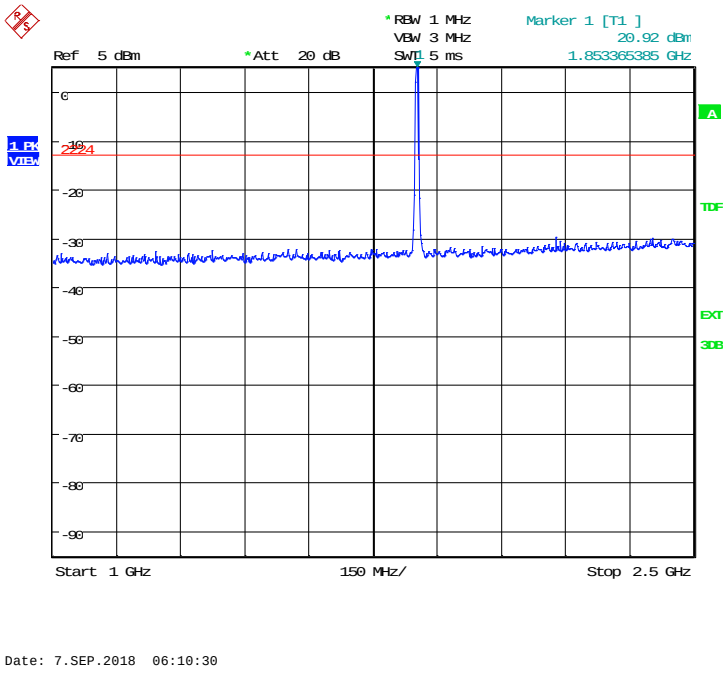
Spurious emission limit –13dBm.



Channel 9262: 1GHz –2.5GHz

Spurious emission limit –13dBm.

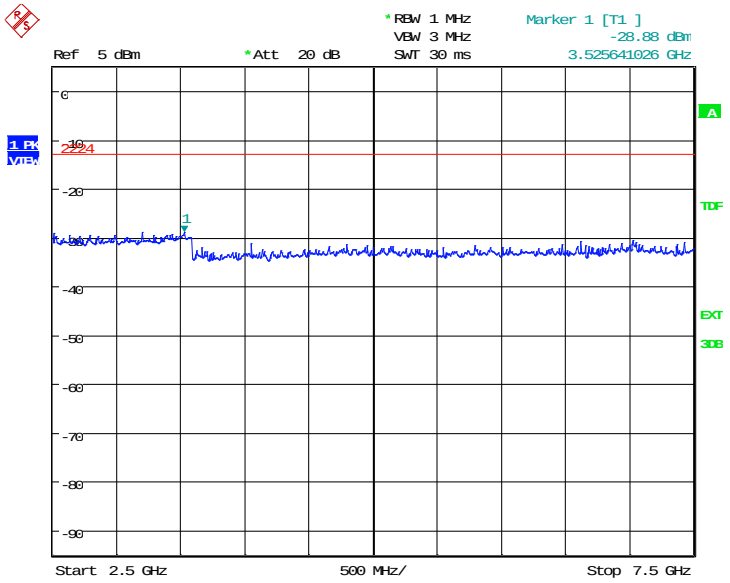
NOTE: peak above the limit line is the carrier frequency.



©Copyright. All rights reserved by SAICT.

Channel 9262: 2.5GHz –7.5GHz

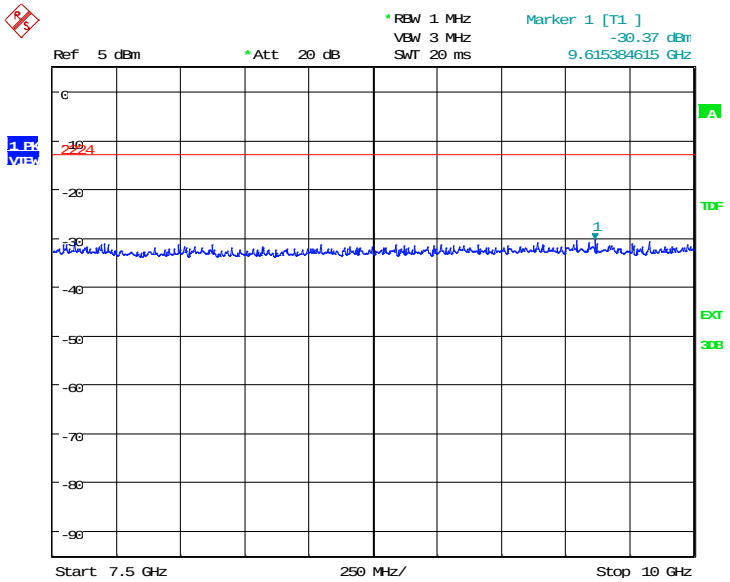
Spurious emission limit –13dBm.



Date: 7.SEP.2018 06:10:57

Channel 9262: 7.5GHz –10GHz

Spurious emission limit –13dBm.

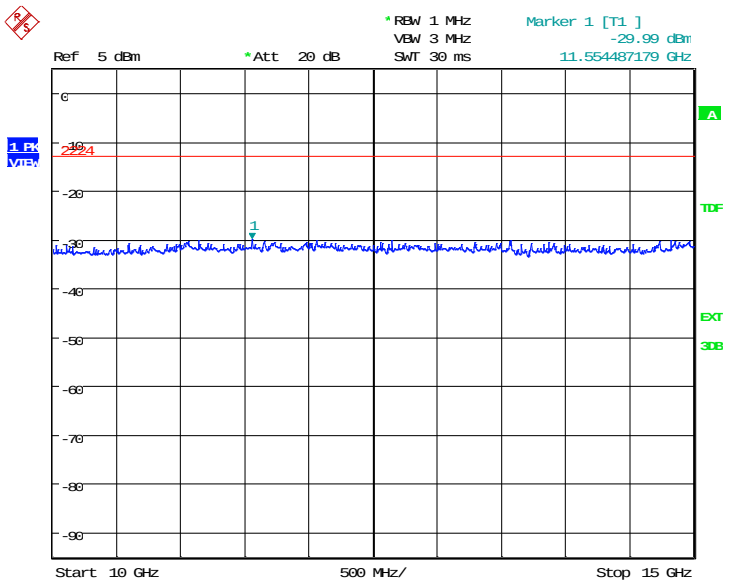


Date: 7.SEP.2018 06:11:24

©Copyright. All rights reserved by SAICT.

Channel 9262: 10GHz –15GHz

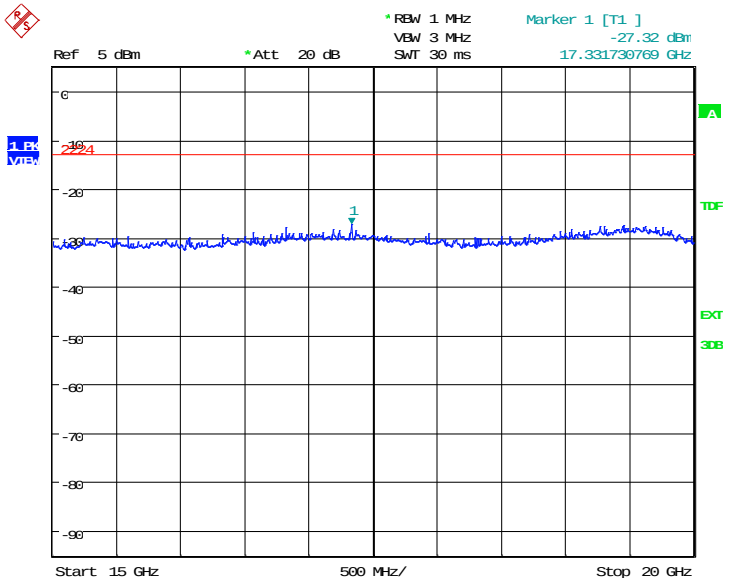
Spurious emission limit –13dBm.



Date: 7.SEP.2018 06:11:50

Channel 9262: 15GHz –20GHz

Spurious emission limit –13dBm.

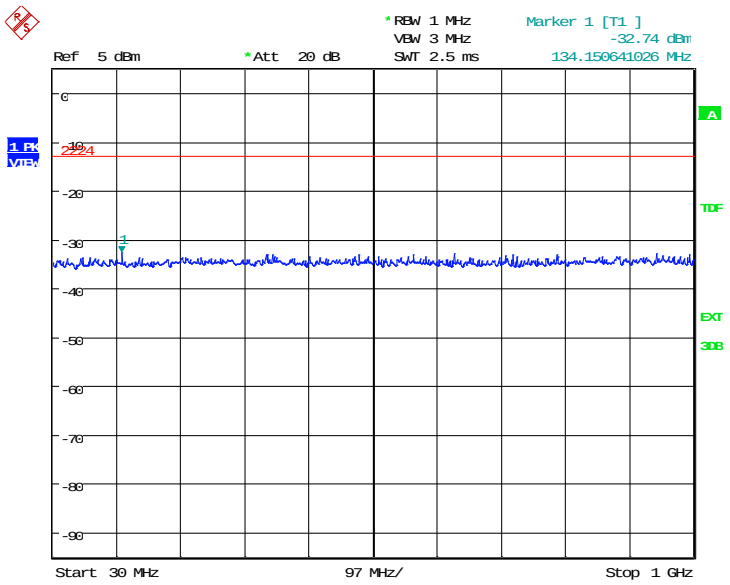


Date: 7.SEP.2018 06:12:17

©Copyright. All rights reserved by SAICT.

Channel 9400: 30MHz –1GHz

Spurious emission limit –13dBm.

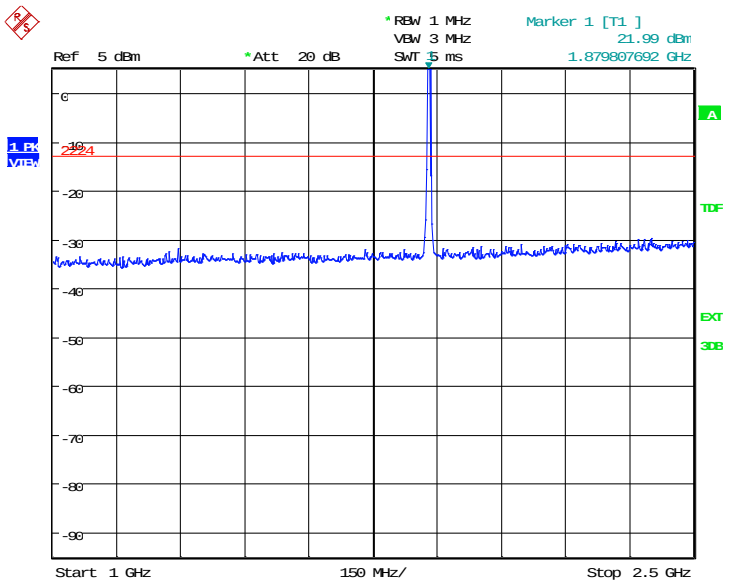


Date: 7.SEP.2018 06:12:47

Channel 9400: 1GHz –2.5GHz

Spurious emission limit –13dBm.

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

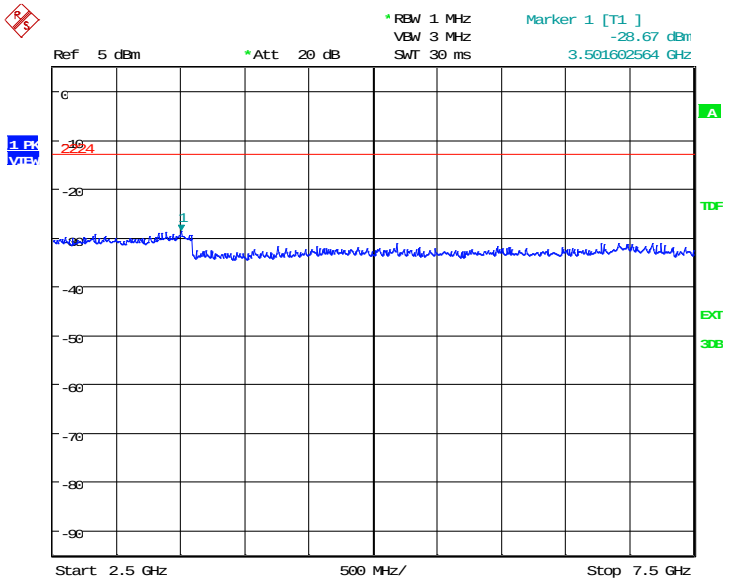


Date: 7.SEP.2018 06:13:14

©Copyright. All rights reserved by SAICT.

Channel 9400: 2.5GHz –7.5GHz

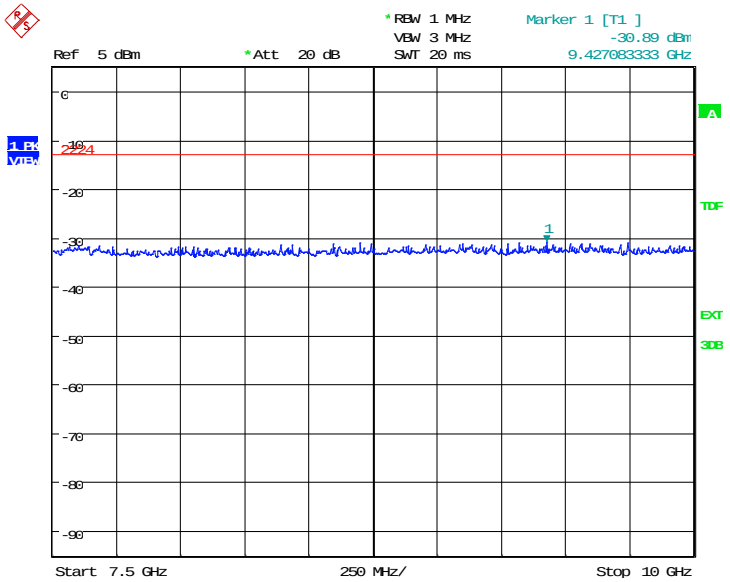
Spurious emission limit –13dBm.



Date: 7.SEP.2018 06:13:41

Channel 9400: 7.5GHz –10GHz

Spurious emission limit –13dBm.

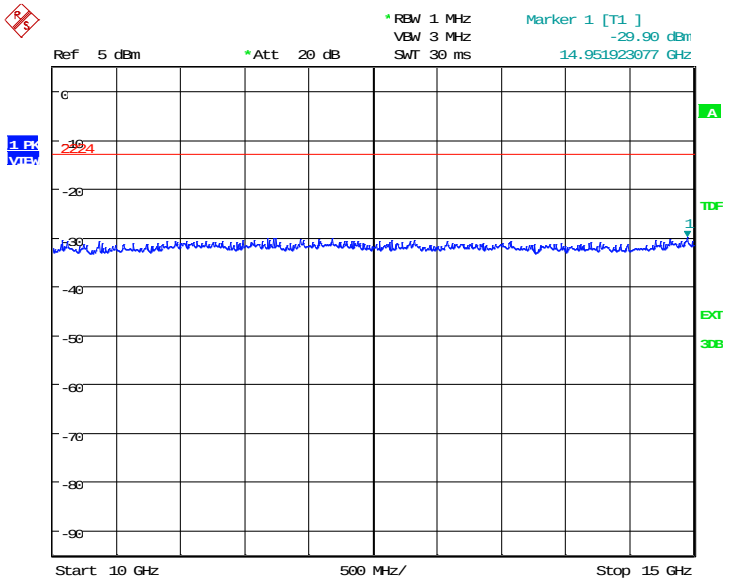


Date: 7.SEP.2018 06:14:08

©Copyright. All rights reserved by SAICT.

Channel 9400: 10GHz –15GHz

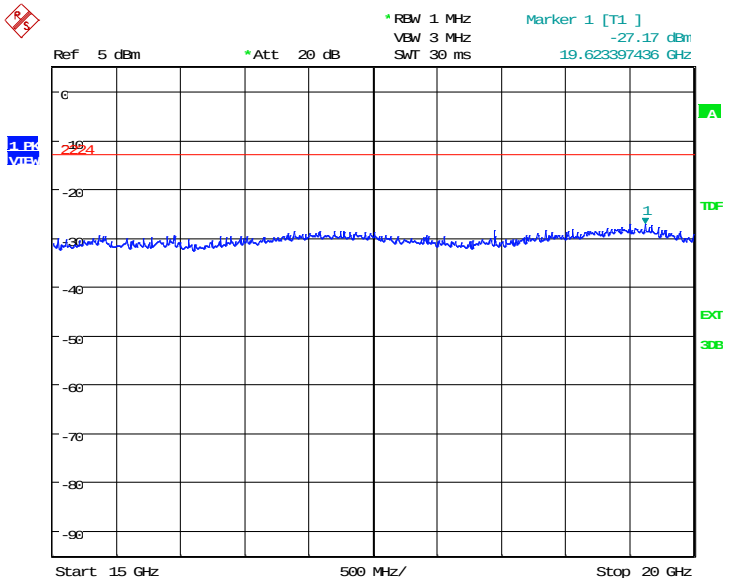
Spurious emission limit –13dBm.



Date: 7.SEP.2018 06:14:34

Channel 9400: 15GHz –20GHz

Spurious emission limit –13dBm.

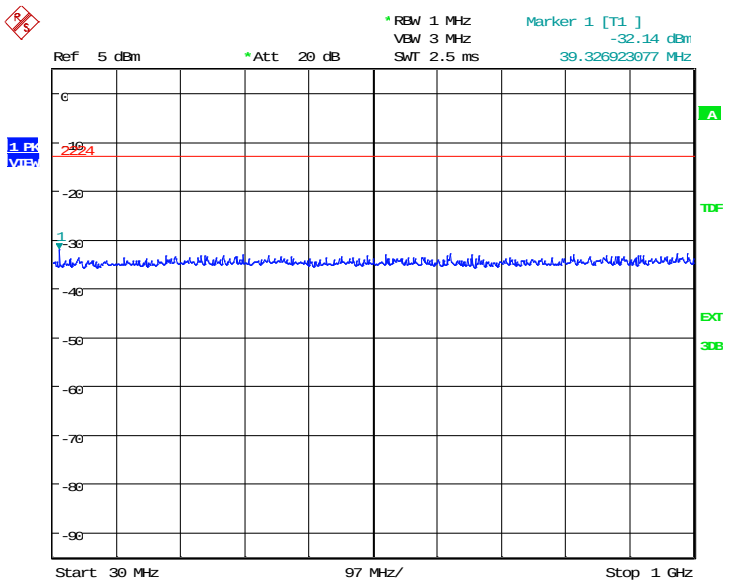


Date: 7.SEP.2018 06:15:01

©Copyright. All rights reserved by SAICT.

Channel 9538: 30MHz –1GHz

Spurious emission limit –13dBm.

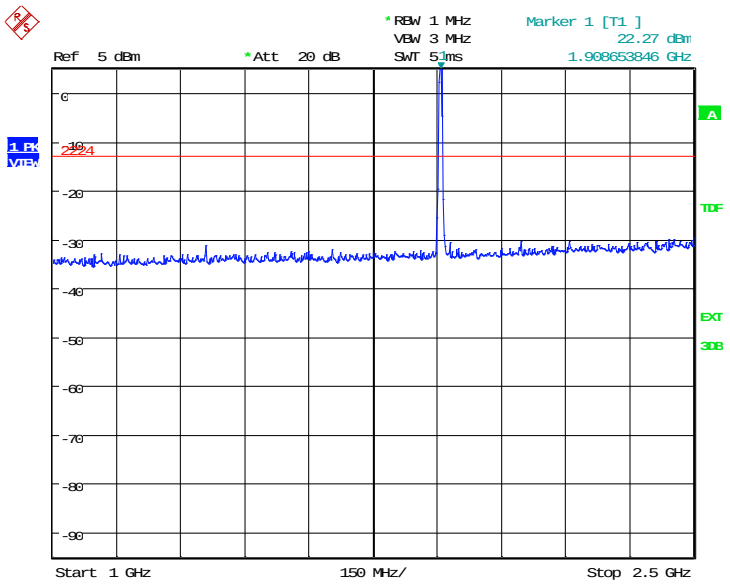


Date: 7.SEP.2018 06:15:31

Channel 9538: 1GHz –2.5GHz

Spurious emission limit –13dBm.

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

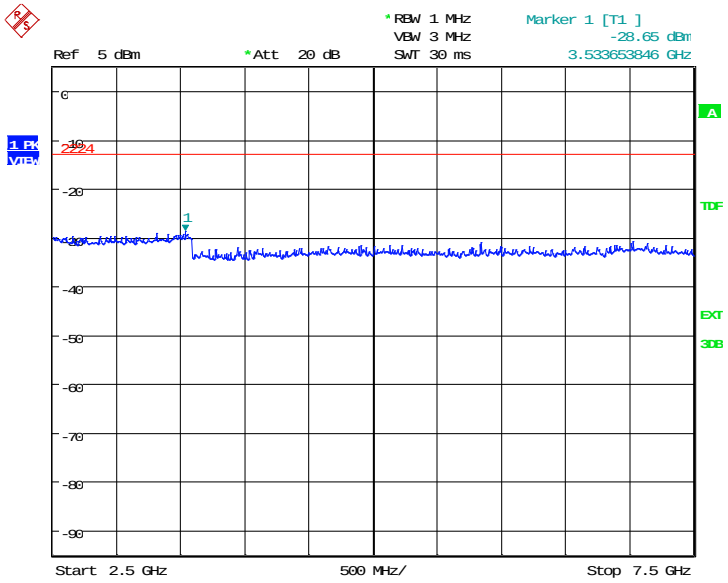


Date: 7.SEP.2018 06:15:58

©Copyright. All rights reserved by SAICT.

Channel 9538: 2.5GHz –7.5GHz

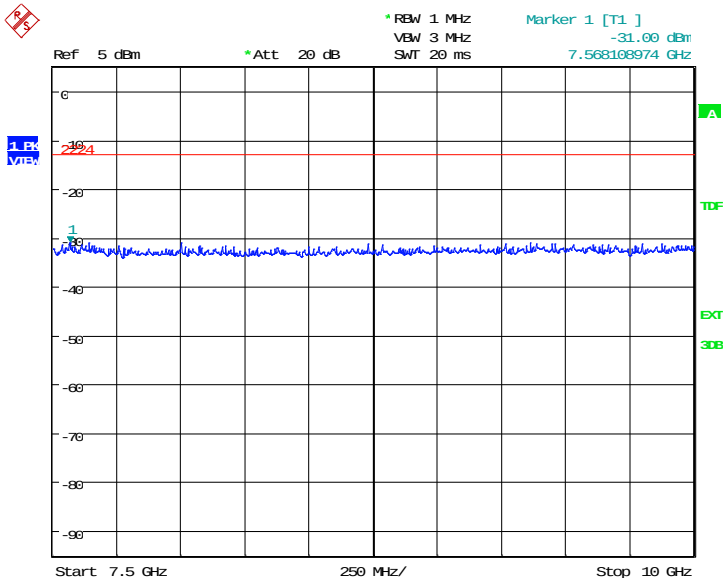
Spurious emission limit –13dBm.



Date: 7.SEP.2018 06:16:25

Channel 9538: 7.5GHz –10GHz

Spurious emission limit –13dBm.

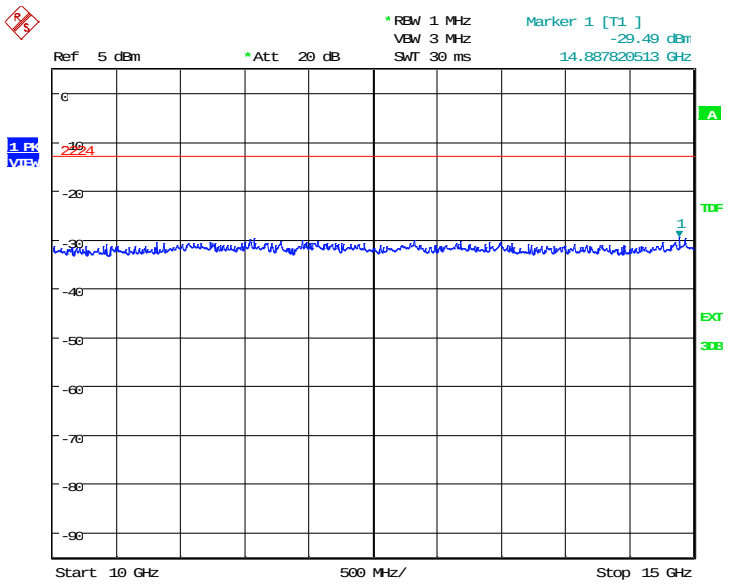


Date: 7.SEP.2018 06:16:52

©Copyright. All rights reserved by SAICT.

Channel 9538: 10GHz –15GHz

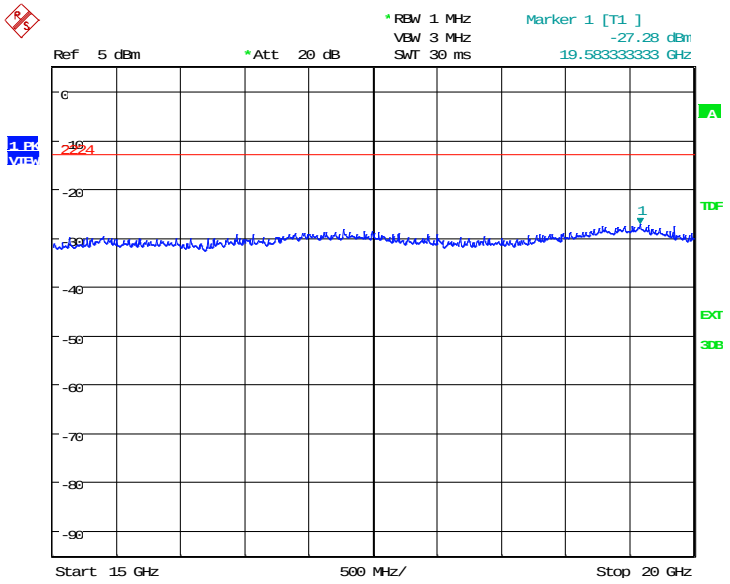
Spurious emission limit –13dBm.



Date: 7.SEP.2018 06:17:19

Channel 9538: 15GHz –20GHz

Spurious emission limit –13dBm.



Date: 7.SEP.2018 06:17:45

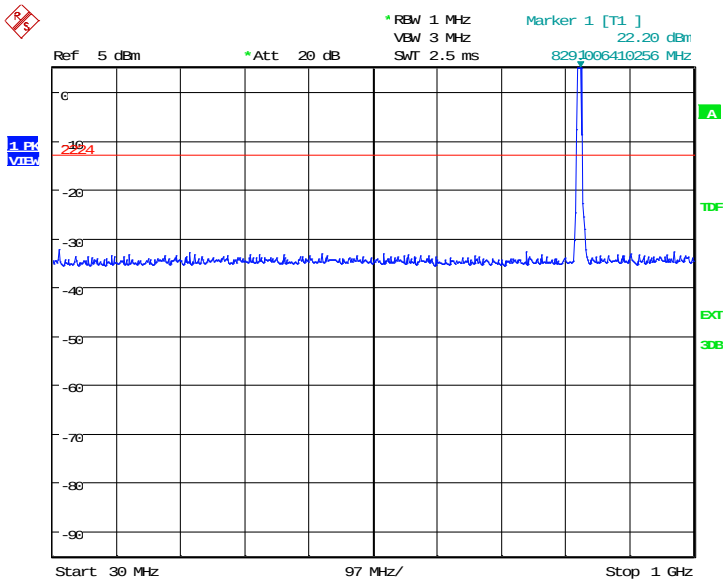
©Copyright. All rights reserved by SAICT.

WCDMA Band Ⅴ

Channel 4132: 30MHz –1GHz

Spurious emission limit –13dBm.

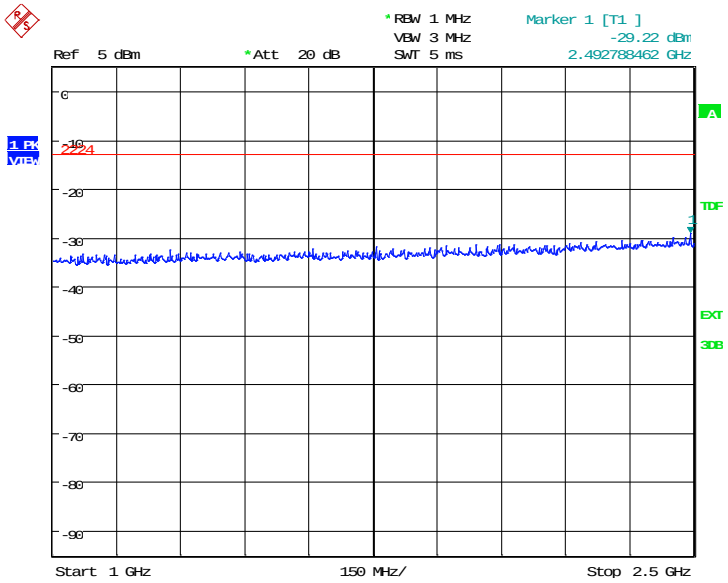
NOTE: peak above the limit line is the carrier frequency.



Date: 7.SEP.2018 08:08:24

Channel 4132: 1GHz – 2.5GHz

Spurious emission limit –13dBm.

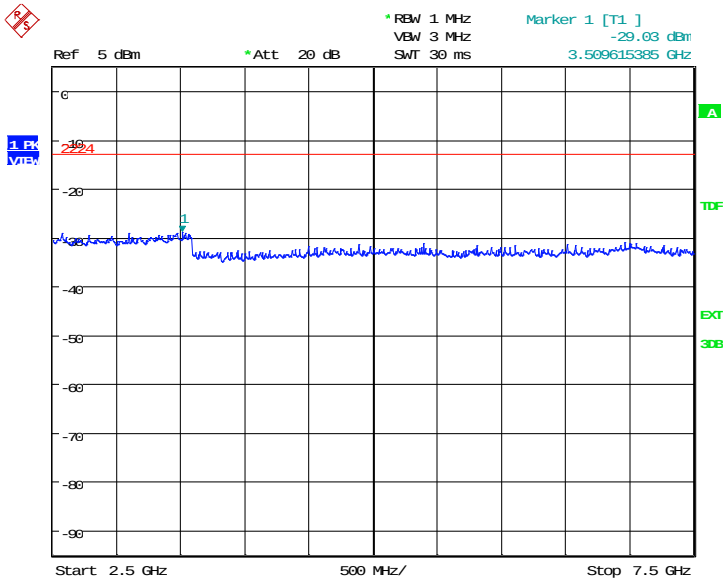


Date: 7.SEP.2018 08:08:50

©Copyright. All rights reserved by SAICT.

Channel 4132: 2.5GHz –7.5GHz

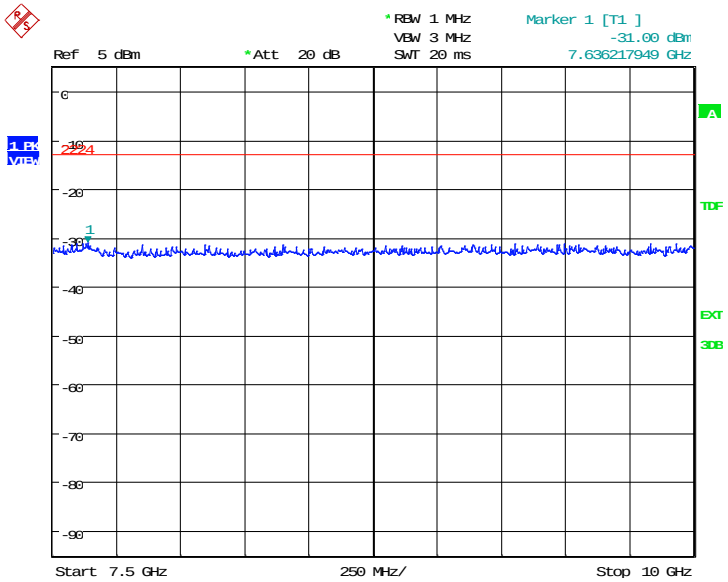
Spurious emission limit –13dBm.



Date: 7.SEP.2018 08:09:17

Channel 4132: 7.5GHz – 10GHz

Spurious emission limit –13dBm.



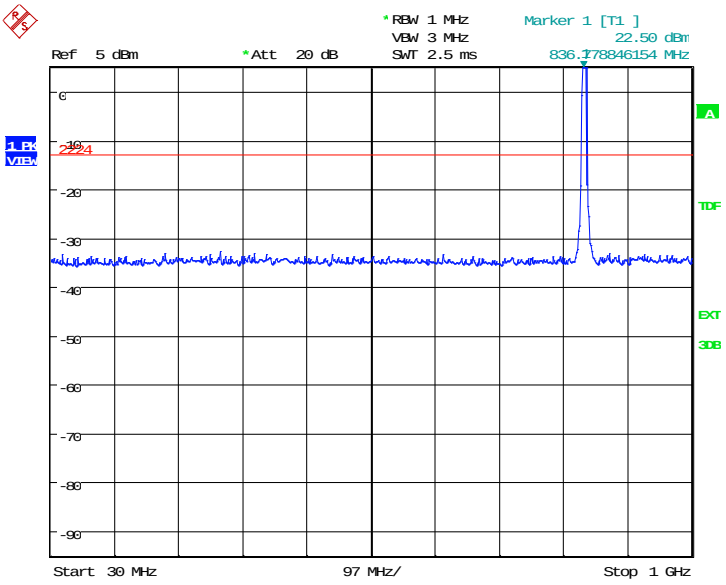
Date: 7.SEP.2018 08:09:44

©Copyright. All rights reserved by SAICT.

Channel 4183: 30MHz –1GHz

Spurious emission limit –13dBm.

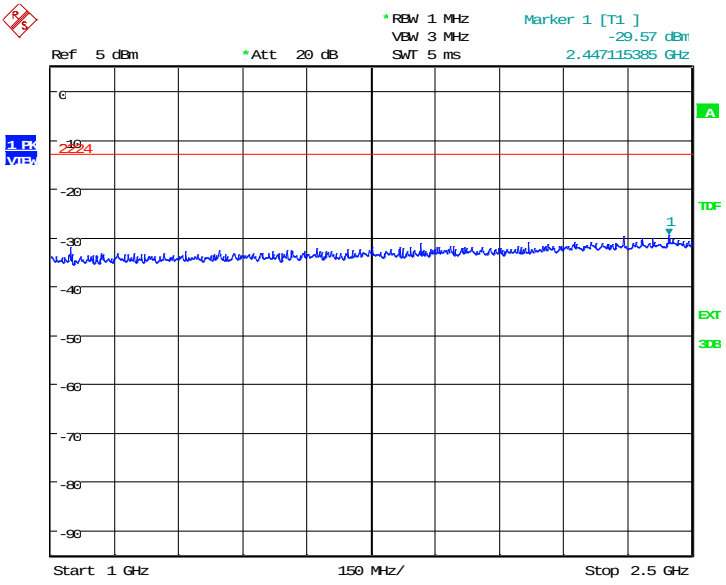
NOTE: peak above the limit line is the carrier frequency.



Date: 7.SEP.2018 08:10:14

Channel 4183: 1GHz – 2.5GHz

Spurious emission limit –13dBm.

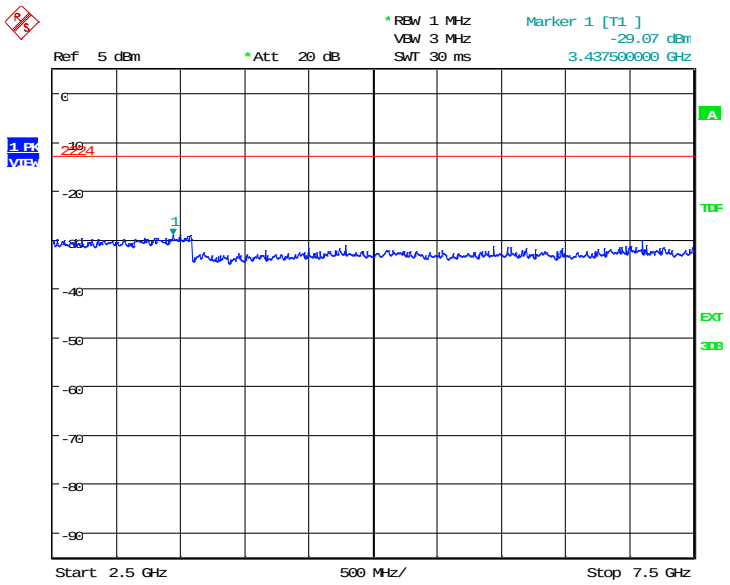


Date: 7.SEP.2018 08:10:41

©Copyright. All rights reserved by SAICT.

Channel 4183: 2.5GHz –7.5GHz

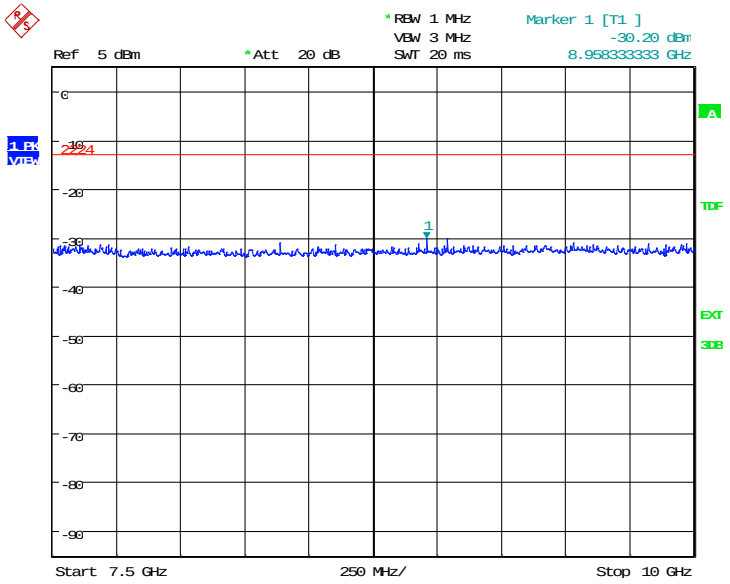
Spurious emission limit –13dBm.



Date: 7.SEP.2018 08:11:08

Channel 4183: 7.5GHz – 10GHz

Spurious emission limit –13dBm.



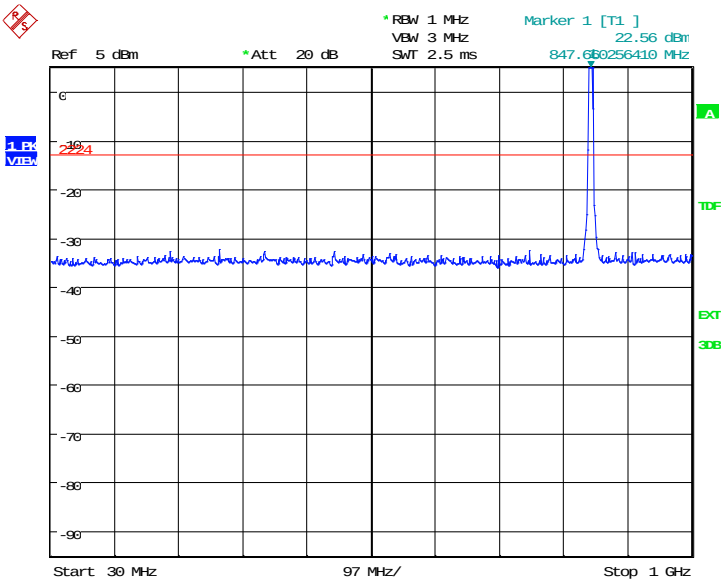
Date: 7.SEP.2018 08:11:34

©Copyright. All rights reserved by SAICT.

Channel 4233: 30MHz –1GHz

Spurious emission limit –13dBm.

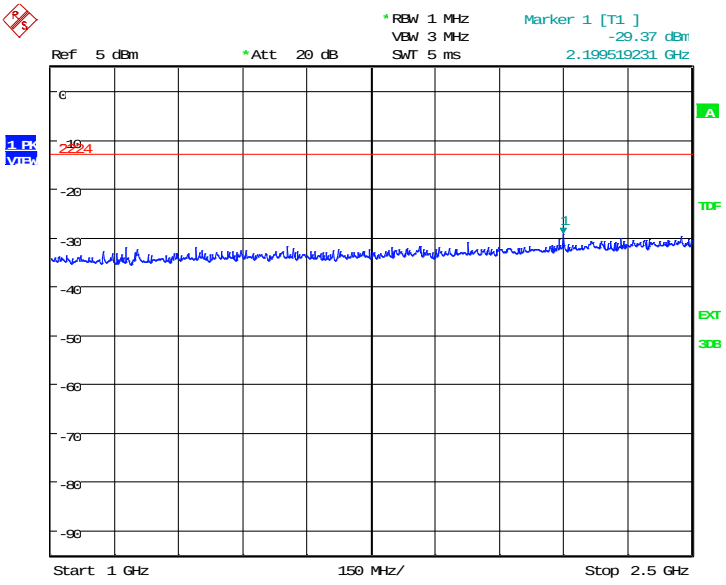
NOTE: peak above the limit line is the carrier frequency.



Date: 7.SEP.2018 08:12:04

Channel 4233: 1GHz – 2.5GHz

Spurious emission limit –13dBm.

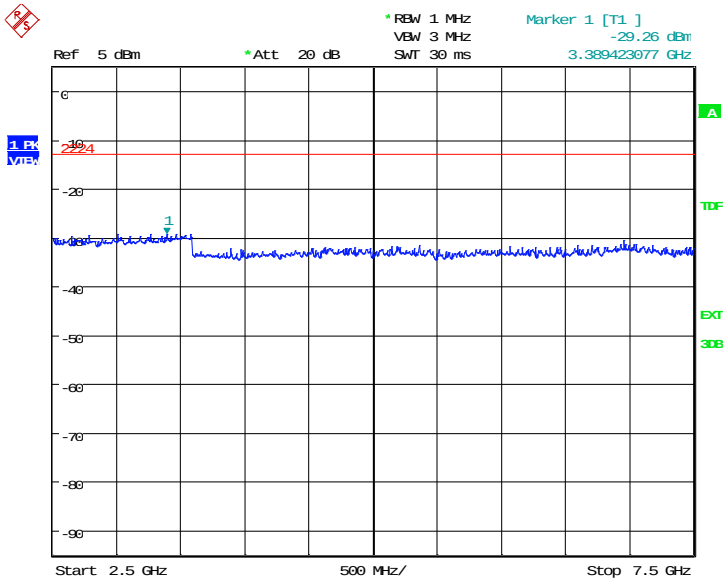


Date: 7.SEP.2018 08:12:31

©Copyright. All rights reserved by SAICT.

Channel 4233: 2.5GHz –7.5GHz

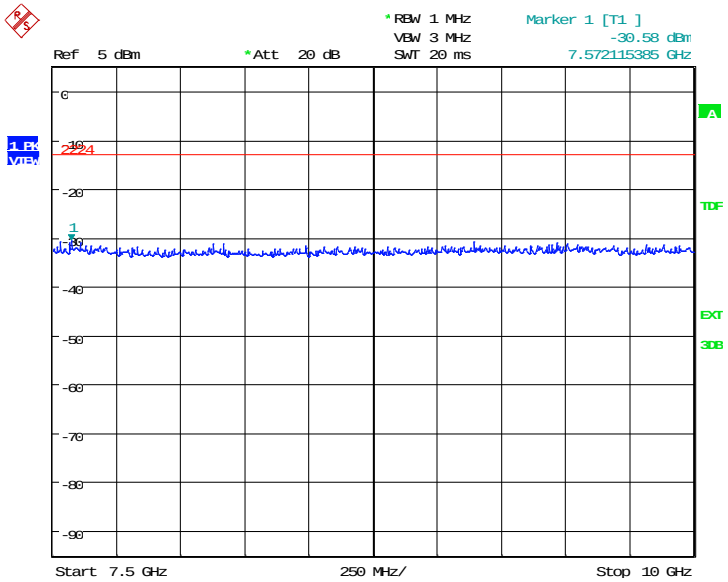
Spurious emission limit –13dBm.



Date: 7.SEP.2018 08:12:58

Channel 4233: 7.5GHz – 10GHz

Spurious emission limit –13dBm.



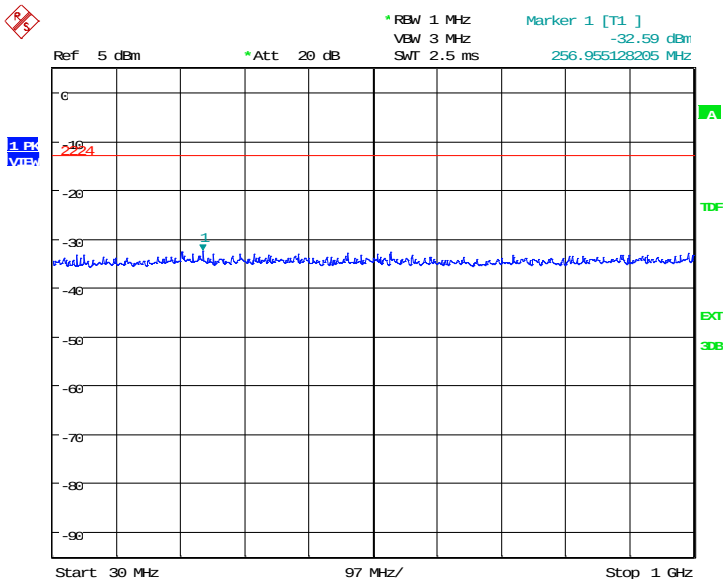
Date: 7.SEP.2018 08:13:25

©Copyright. All rights reserved by SAICT.

WCDMA Band Ⅳ

Channel 1312: 30MHz –1GHz

Spurious emission limit –13dBm.

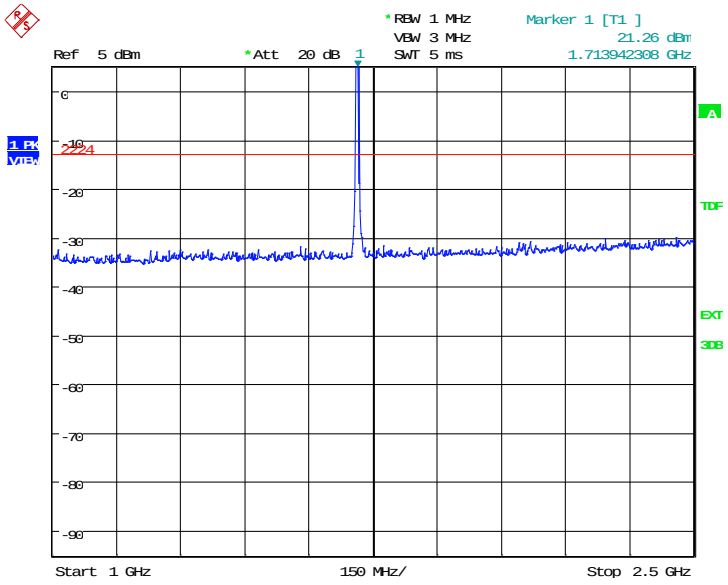


Date: 7.SEP.2018 07:26:52

Channel 1312: 1GHz –2.5GHz

Spurious emission limit –13dBm.

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

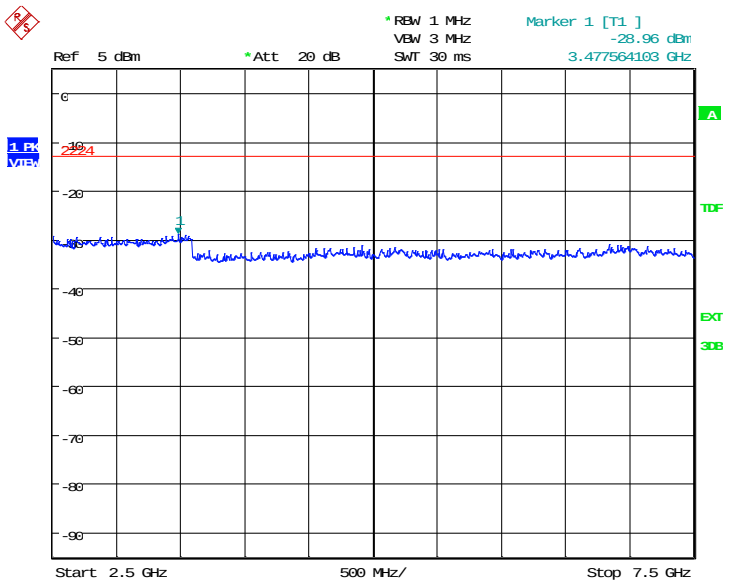


Date: 7.SEP.2018 07:27:19

©Copyright. All rights reserved by SAICT.

Channel 1312: 2.5GHz –7.5GHz

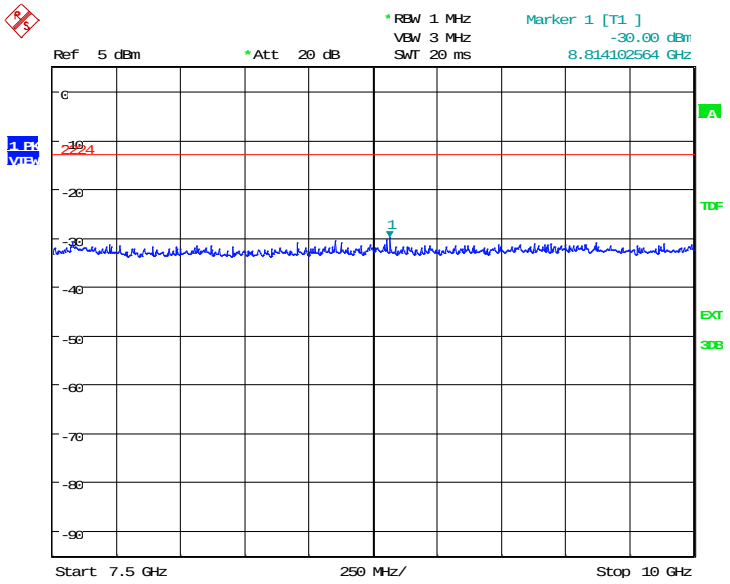
Spurious emission limit –13dBm.



Date: 7.SEP.2018 07:27:46

Channel 1312: 7.5GHz –10GHz

Spurious emission limit –13dBm.

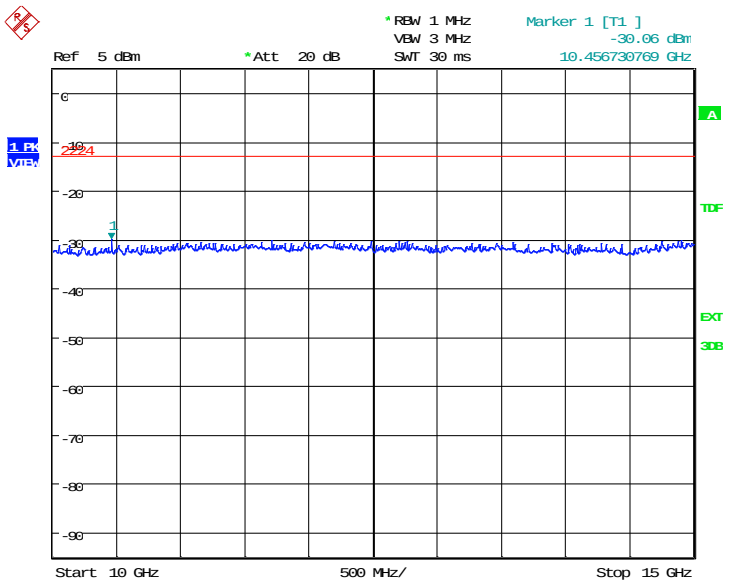


Date: 7.SEP.2018 07:28:13

©Copyright. All rights reserved by SAICT.

Channel 1312: 10GHz –15GHz

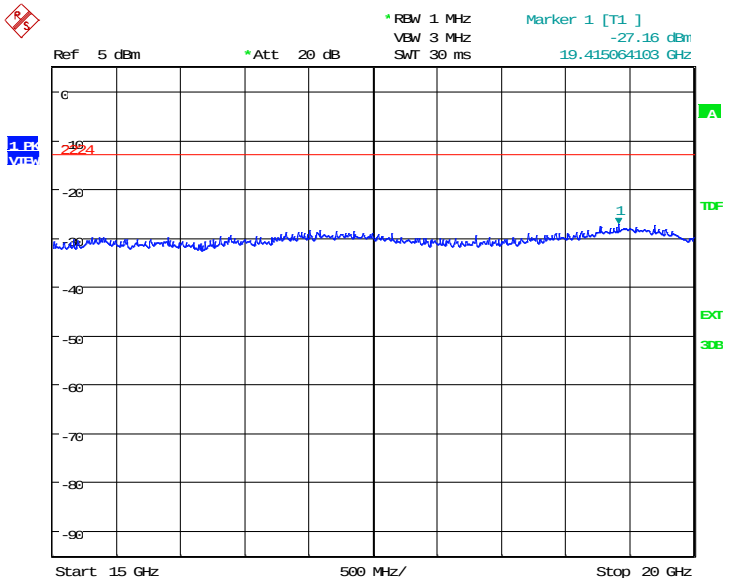
Spurious emission limit –13dBm.



Date: 7.SEP.2018 07:28:40

Channel 1312: 15GHz –20GHz

Spurious emission limit –13dBm.

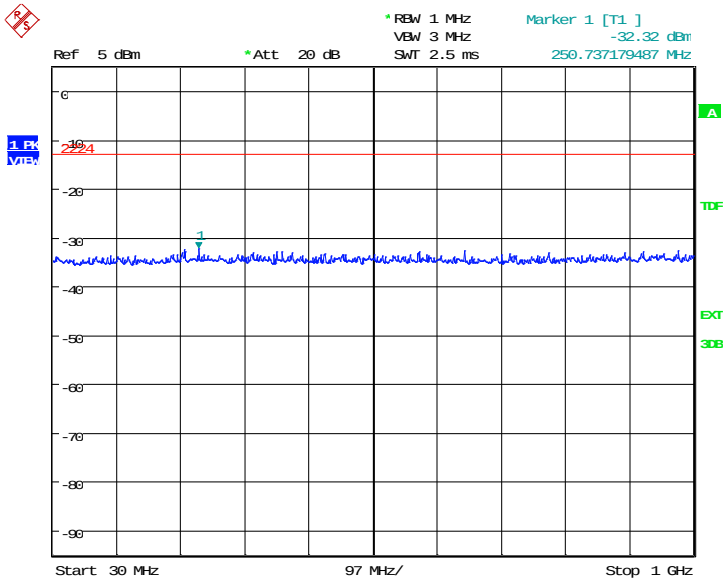


Date: 7.SEP.2018 07:29:06

©Copyright. All rights reserved by SAICT.

Channel 1450: 30MHz –1GHz

Spurious emission limit –13dBm.

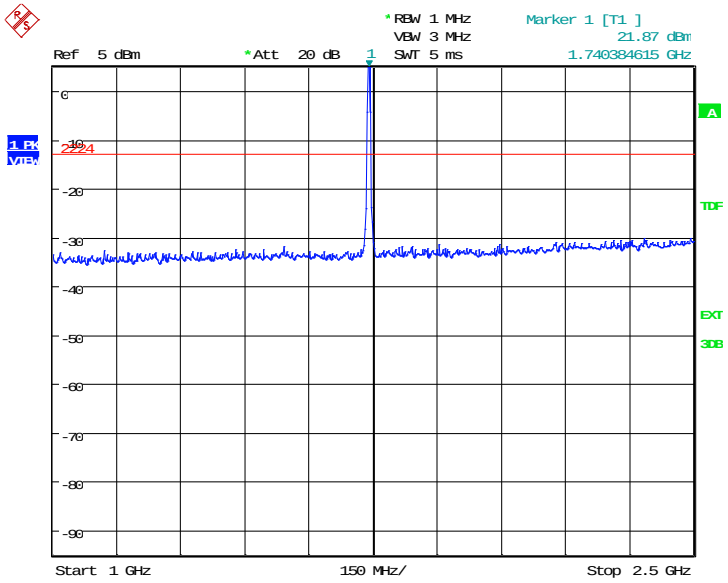


Date: 7.SEP.2018 07:29:36

Channel 1450: 1GHz –2.5GHz

Spurious emission limit –13dBm.

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

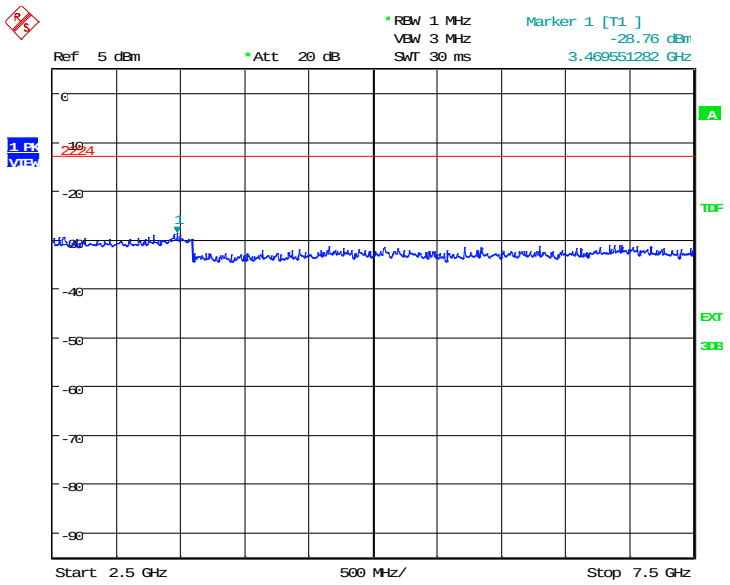


Date: 7.SEP.2018 07:30:03

©Copyright. All rights reserved by SAICT.

Channel 1450: 2.5GHz –7.5GHz

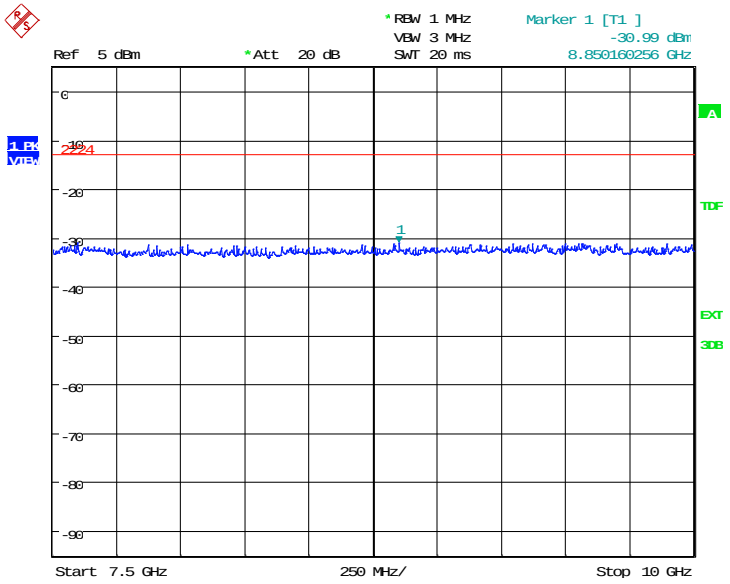
Spurious emission limit –13dBm.



Date: 7.SEP.2018 07:30:30

Channel 1450: 7.5GHz –10GHz

Spurious emission limit –13dBm.

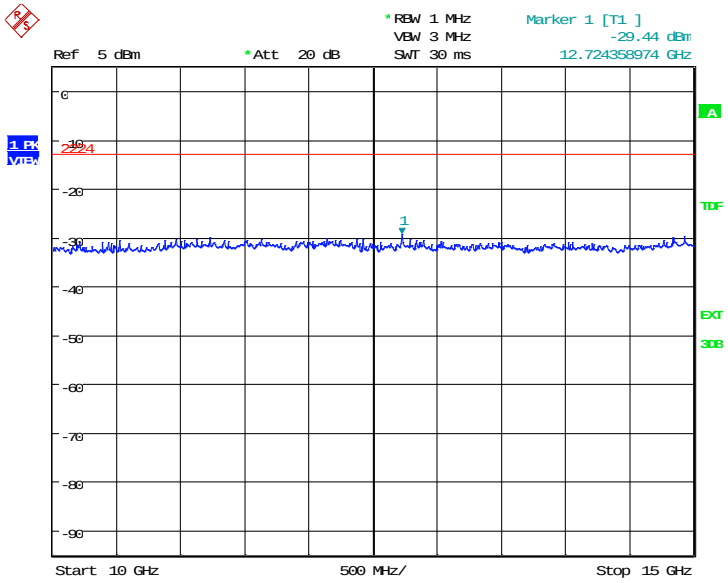


Date: 7.SEP.2018 07:30:57

©Copyright. All rights reserved by SAICT.

Channel 1450: 10GHz –15GHz

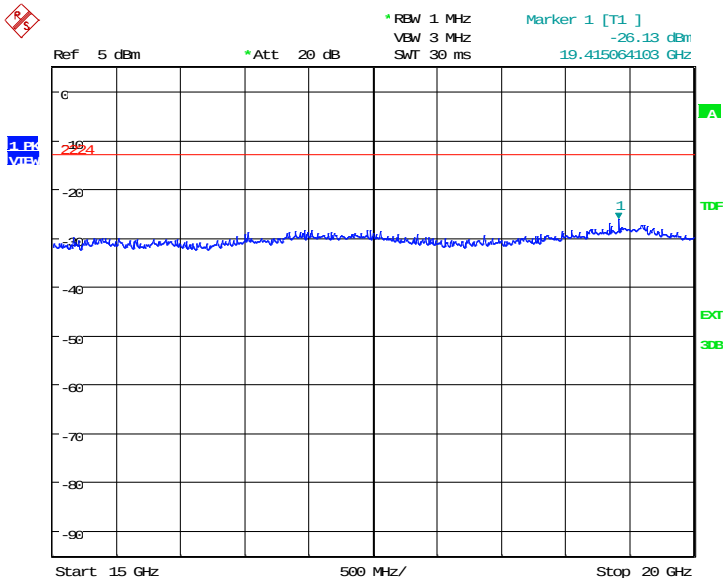
Spurious emission limit –13dBm.



Date: 7.SEP.2018 07:31:23

Channel 1450: 15GHz –20GHz

Spurious emission limit –13dBm.

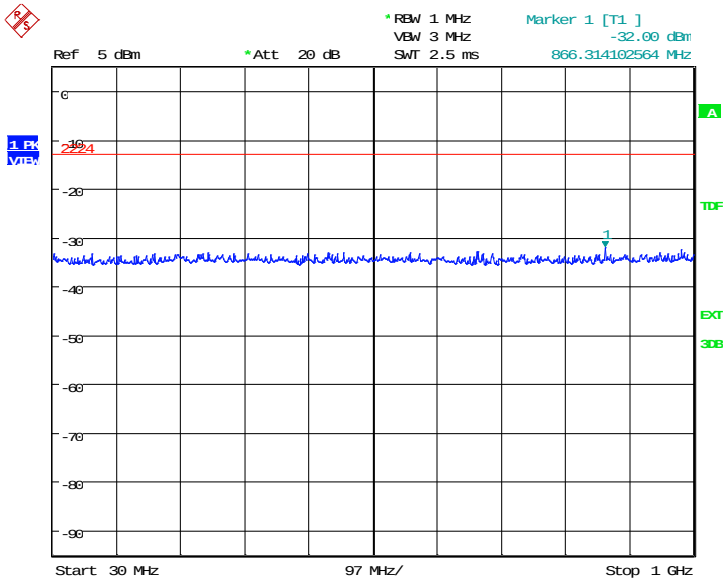


Date: 7.SEP.2018 07:31:50

©Copyright. All rights reserved by SAICT.

Channel 1513: 30MHz –1GHz

Spurious emission limit –13dBm.

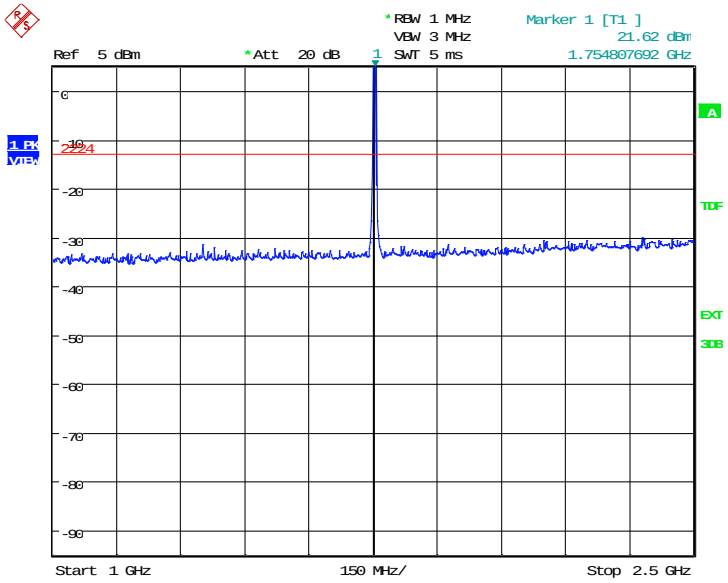


Date: 7.SEP.2018 07:32:20

Channel 1513: 1GHz –2.5GHz

Spurious emission limit –13dBm.

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

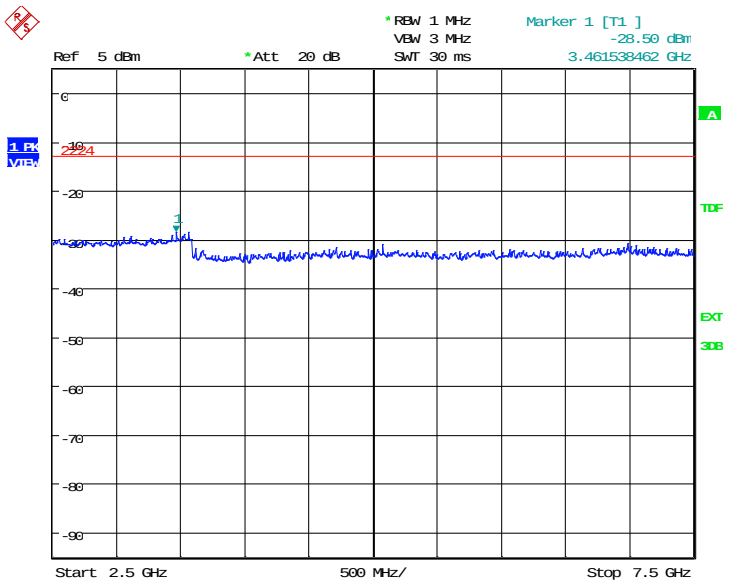


Date: 7.SEP.2018 07:32:47

©Copyright. All rights reserved by SAICT.

Channel 1513: 2.5GHz –7.5GHz

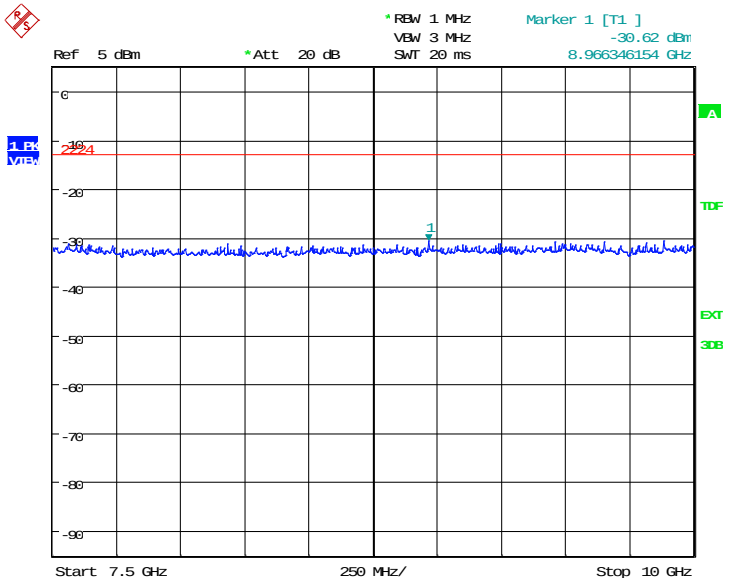
Spurious emission limit –13dBm.



Date: 7.SEP.2018 07:33:14

Channel 1513: 7.5GHz –10GHz

Spurious emission limit –13dBm.

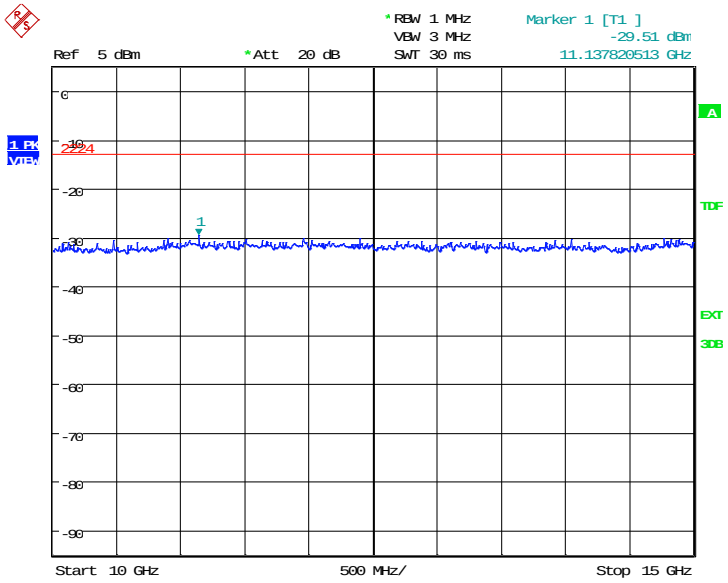


Date: 7.SEP.2018 07:33:41

©Copyright. All rights reserved by SAICT.

Channel 1513: 10GHz –15GHz

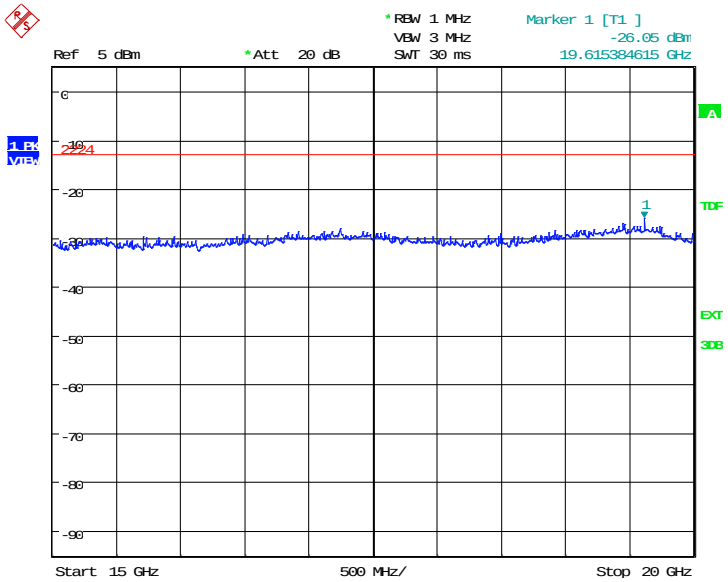
Spurious emission limit –13dBm.



Date: 7.SEP.2018 07:34:08

Channel 1513: 15GHz –20GHz

Spurious emission limit –13dBm.



Date: 7.SEP.2018 07:34:35

Note: Expanded measurement uncertainty is U = 0.488dB(100KHz-2GHz)/1.211dB(2GHz-26.5GHz), k = 1.96

©Copyright. All rights reserved by SAICT.

A.8 PEAK-TO-AVERAGE POWER RATIO

Reference

FCC: CFR Part 24.232, 27.50(d)

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.

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-QPSK

	CH	Frequency(MHz)	PAPR(dB)
WCDMA (Band II)	9262	1852.4	4.68
	9400	1880.0	4.46
	9538	1907.6	4.36

Measurement result-16QAM

	CH	Frequency(MHz)	PAPR(dB)
WCDMA (Band II)	9262	1852.4	4.71
	9400	1880.0	4.52
	9538	1907.6	4.39

WCDMA Band IV

Measurement result-QPSK

	CH	Frequency(MHz)	PAPR(dB)
WCDMA (Band IV)	1312	1712.4	4.55
	1450	1740.0	4.36
	1513	1752.6	4.58

Measurement result-16QAM

	CH	Frequency(MHz)	PAPR(dB)
WCDMA (Band IV)	1312	1712.4	4.42
	1450	1740.0	4.29
	1513	1752.6	4.46

Note: Expanded measurement uncertainty is U = 0.483, k = 2

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

©Copyright. All rights reserved by SAICT.