TEST REPORT

No.I19Z62263-WMD05

for

Shenzhen Tinno Mobile Technology Corp.

Smart Phone

Model Name: Wiko U520AS

FCC ID: XD6U520AS

with

Hardware Version: V1.0

Software Version: U520ASV01.16.10

Issued Date: 2020-03-06

Note:

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

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z62263-WMD05	Rev.0	1st edition	2020-03-06

Note: the latest revision of the test report supersedes all previous version.

CONTENTS

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Location 1: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-80%

1.4. Project data

Testing Start Date: 2020-01-15

Testing End Date: 2020-03-05

1.5. Signature

Dong Yuan

(Prepared this test report)

Zhang Yufeng

(Reviewed this test report)

Zhao Hui Lin

Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Shenzhen Tinno Mobile Technology Corp.
Address /Post:	4/F, H-3 Building,OCT Eastern Industrial Park. NO.1 XiangShan East Road, Nan Shan District,Shenzhen, P.R.China
Contact Person:	xiaoping.li
Contact Email:	xiaoping.li@tinno.com
Telephone:	0755-86095550
	NA

2.2. Manufacturer Information

Company Name:	Shenzhen Tinno Mobile Technology Corp.
Address /Post:	4/F, H-3 Building,OCT Eastern Industrial Park. NO.1 XiangShan East Road, Nan Shan District,Shenzhen, P.R.China
Contact Person:	xiaoping.li
Contact Email:	xiaoping.li@tinno.com
Telephone:	0755-86095550
	NA

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

3.1. About EUT

Description	smart phone
Model	Wiko U520AS
FCC ID	XD6U520AS
Frequency	CDMA2ND800MHz(BC10)
Antenna	Embedded
Extreme vol. Limits	3.5VDC to 4.35VDC (nominal: 3.8VDC)
Extreme temp. Tolerance	-10°C to +55°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Date of receipt
UT18a	860055040005954	V1.0	U520ASV01.16.10	2019-12-16

*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

AE1

Model	LT25H446077J
Manufacturer	Ningbo Veken Battery Co., Ltd.
Capacitance	2500mAh

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

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 90	PRIVATE LAND MOBILE RADIO SERVICES	10-1-19 Edition
FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS;GENERAL RULES AND REGULATIONS	10-1-19 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
KDB971168 D01	Measurement Guidance for Certification of Licensed Digital Transmitters	v03r01

5. LABORATORY ENVIRONMENT

Shielding chamber did not exceed following limits along the RF testing:

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. =20 %, Max. = 80 %

6. SUMMARY OF 错误!未找到引用源。

Items	List	Clause in FCC rules	Verdict
1	Output Power	90.635	Pass
2	Frequency Stability	2.1055/90.213	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Emission Bandwidth	90.1215	Pass
5	Conducted Spurious Emission	90.691	Pass

7. Test Equipments Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CALIBRATION INTERVAL	CAL DUE DATE
1	Spectrum Analyzer	FSV30	101576	R&S	1 Year	2020-05-03
2	Wireless Communications Test Set	8960(E5515C)	MY48360950	Agilent	2 Years	2020-08-29
3	Climatic chamber	SH-641	92009050	ESPEC	3 Years	2020-12-21

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

A.1.1 Summary

During the process of testing, the EUT was controlled via Agilent Wireless Communications Test Set (8960(E5515C)) to ensure max power transmission and proper modulation.

This result is peak output power conducted measurements for the EUT. In all cases, output power is within the specified limits.

A.1.2 Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.

The power was measured with Rhode & Schwarz Spectrum Analyzer FSV30 (average).

These measurements were done at 2 frequencies of CDMA BC10 (bottom and top of operational frequency range) for 1x RTT and 1xEVDO.

a) Set span to at least 1.5 times the OBW.

b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.

c) Set VBW ≥ 3 × RBW.

d) Set number of points in sweep ≥ 2 × span / RBW.

e) Sweep time = auto-couple.

f) Detector = RMS (power averaging).

g) If the EUT can be configured to transmit continuously (i.e., burst duty cycle ≥ 98%), then set the trigger to free run.

h) If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98 %), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.

i) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

A.1.3 Measurement results

CDMA BC10

Measurement result

Channel	Frequency(MHz)	Channel power(dBm)		
		1xRTT	1xEVDO	
			Rel0	RevA
476	817.9	24.17	23.95	24.04
684	823.1	24.22	23.92	23.95

A.2 FREQUENCY STABILITY

A.2.1 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 Agilent 8960(E5515C) Wireless Communications Test Set.

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 8960(E5515C) and in a simulated call on mid channel of CDMA BC10, 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 8960(E5515C) and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C decrements from +50℃ to -10℃. 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.2.2 Measurement Limit

A.2.2.1 For Hand carried battery powered equipment

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5VDC and 4.35VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress.

A.2.2.2 For equipment powered by primary supply voltage

For Part 90.213, the frequency stability of the transmitter shall be maintained within ±2.5ppm of the center frequency. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

A.2.3 Measurement results

CDMA BC 10

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	817.183	823.818	3.00	0.0036
50				4.20	0.0051
40				3.60	0.0044
30				4.10	0.005
10				3.30	0.004
0				3.70	0.0045
-10				4.20	0.0051
-20				3.50	0.0043
-30					

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	817.183	823.818	3.60	0.0044
4.4				4.50	0.0055

A.3 OCCUPIED BANDWIDTH

Reference

FCC: CFR Part 2.1049(h)(i)

A.3.1 Occupied Bandwidth Results

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

The measurement method is from KDB 971168 v02r01 4.2:

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

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

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

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

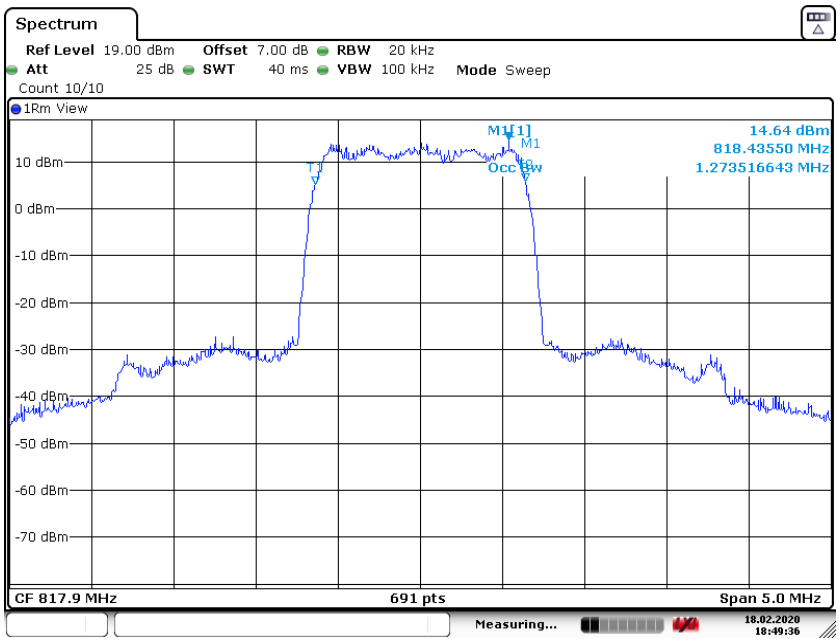
e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

CDMA BC10 (99% BW)

Channel	Occupied Bandwidth (99% BW)(MHz)
476	1.274
684	1.267

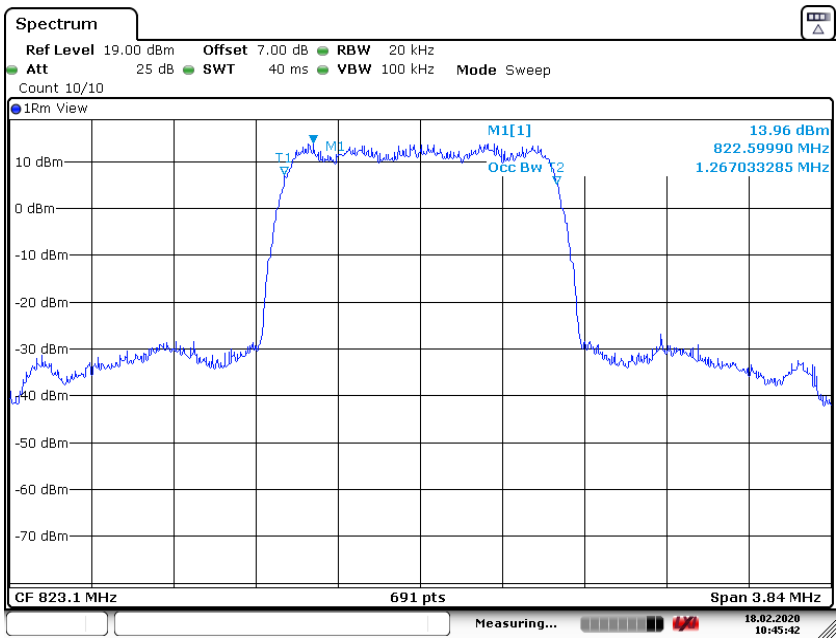
CDMA BC10

Channel 476-Occupied Bandwidth (99% BW)



Date: 18.FEB.2020 18:49:36

Channel 684-Occupied Bandwidth (99% BW)



Date: 18.FEB.2020 10:45:42

A.4 EMISSION BANDWIDTH

A.4.1Emission Bandwidth Results

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

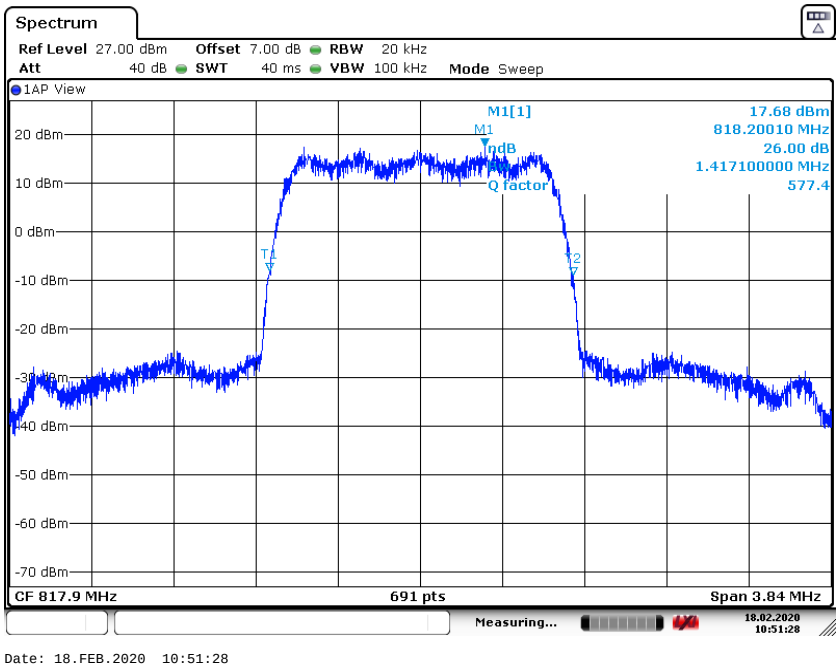
Similar to conducted emissions; Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies. Table below lists the measured 100% BW. Spectrum analyzer plots are included on the following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

CDMA BC10 (100% BW)

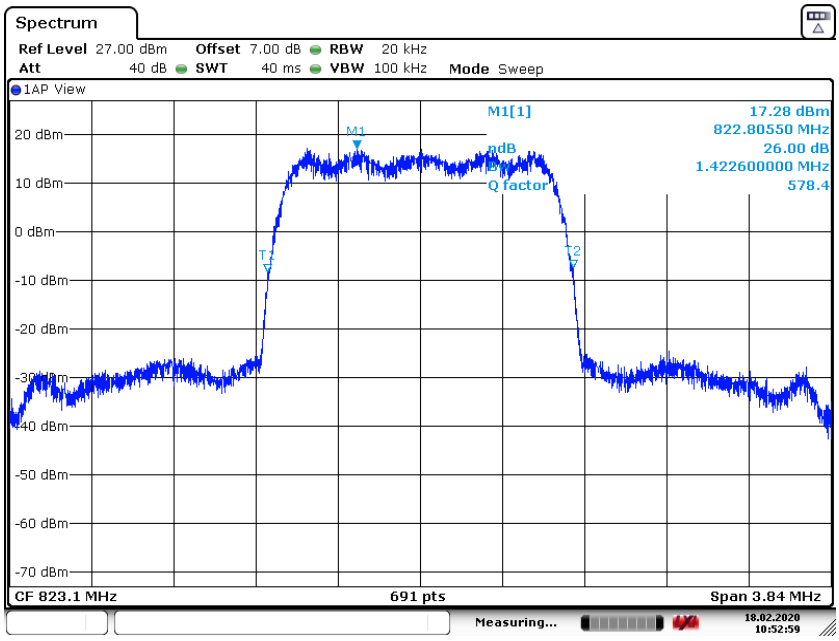
Channel	Emission Bandwidth (100% BW) (MHz)
476	1.417
684	1.423

CDMA BC10

Channel 476- Emission Bandwidth (100% BW)



Channel 684- Emission Bandwidth (100% BW)



Date: 18.FEB.2020 10:52:59

A.5 CONDUCTED SPURIOUS EMISSION

A.5.1 Measurement Method

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 CDMA BC10, data taken from 30 MHz to 10GHz.

Out-of-band emission requirement shall apply only to the ‘‘outer’’ channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

For any frequency removed from the EA licensee’s frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116\text{Log}_{10}(f/6.1)$ decibels or $50 + 10\ \text{Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

For any frequency removed from the EA licensee’s frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\text{Log}_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

CDMA BC10 Transmitter

Channel	Frequency (MHz)
476	817.9
684	823.1

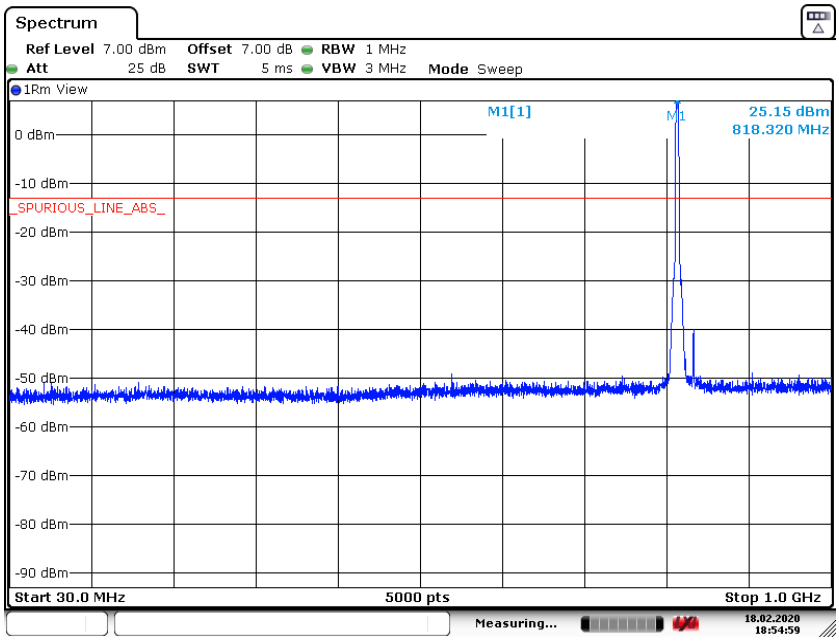
A.5.2 Measurement result

CDMA BC10

Channel 476: 30MHz –1GHz

Spurious emission limit –13dBm.

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



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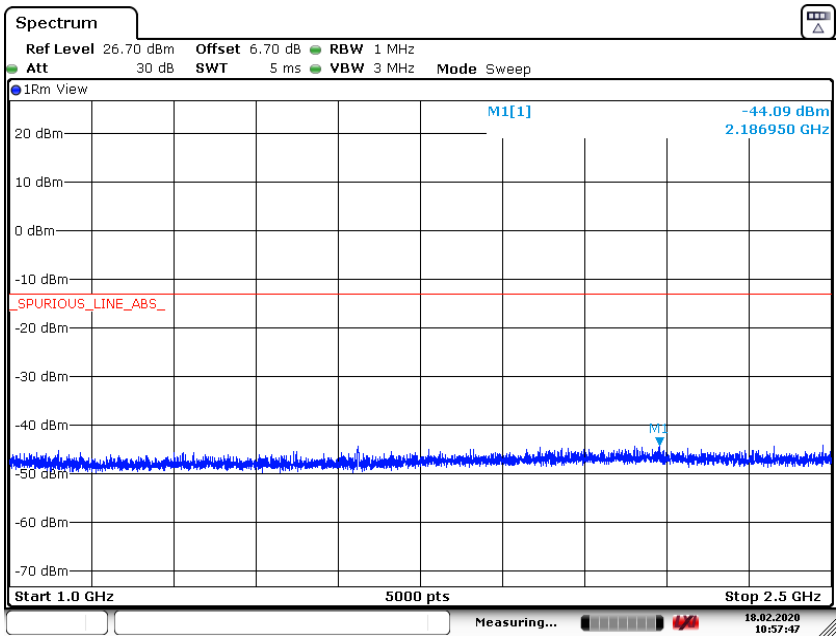
Channel 476: 1GHz –2.5GHz

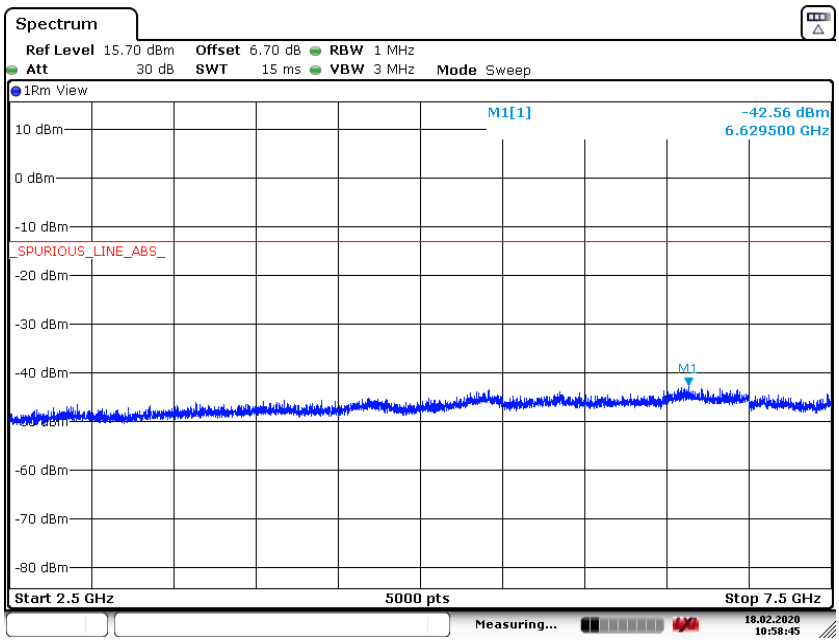
Spurious emission limit –13dBm.



Date: 18.FEB.2020 10:57:47

Channel 476: 2.5GHz –7.5GHz

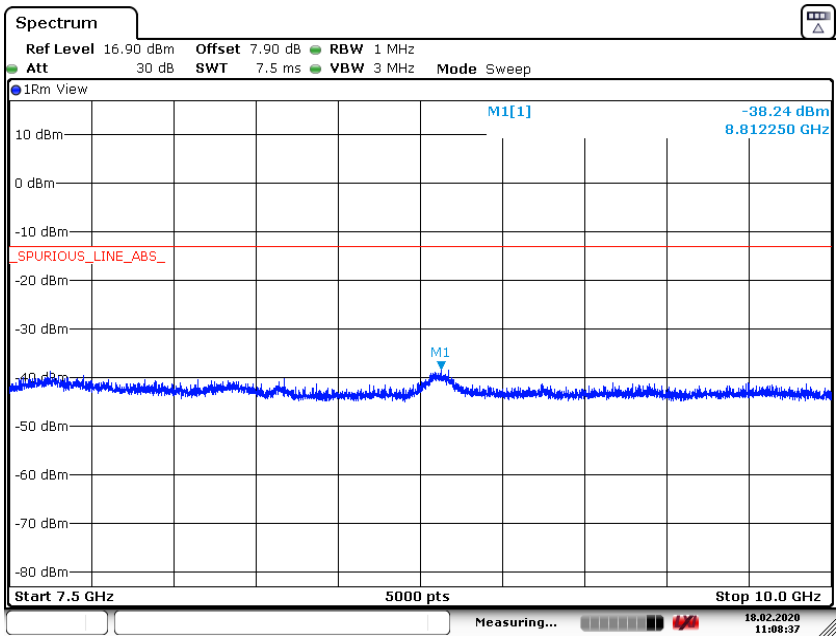
Spurious emission limit –13dBm.



Date: 18.FEB.2020 10:58:45

Channel 476: 7.5GHz –10GHz

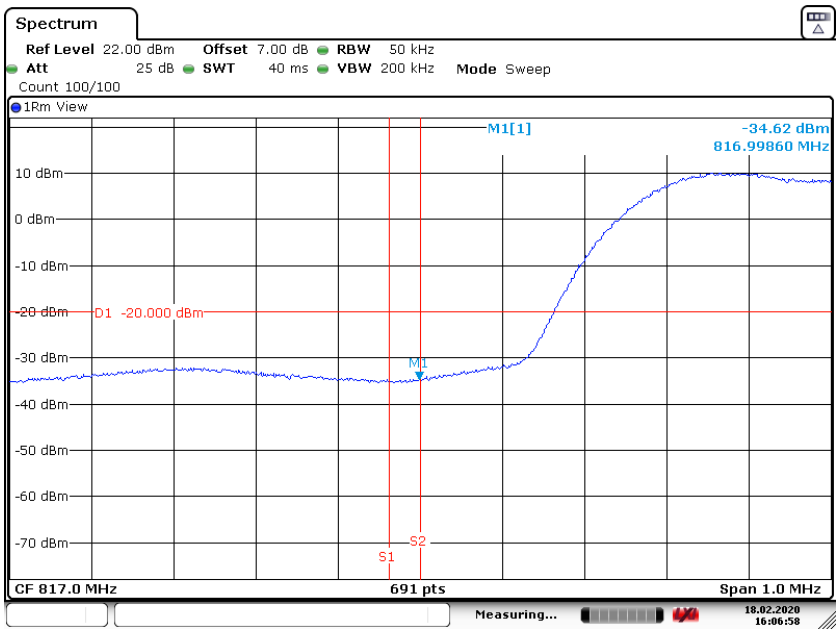
Spurious emission limit –13dBm.



Date: 18.FEB.2020 11:08:37

Channel 476: Band Edge

Spurious emission limit –20dBm.



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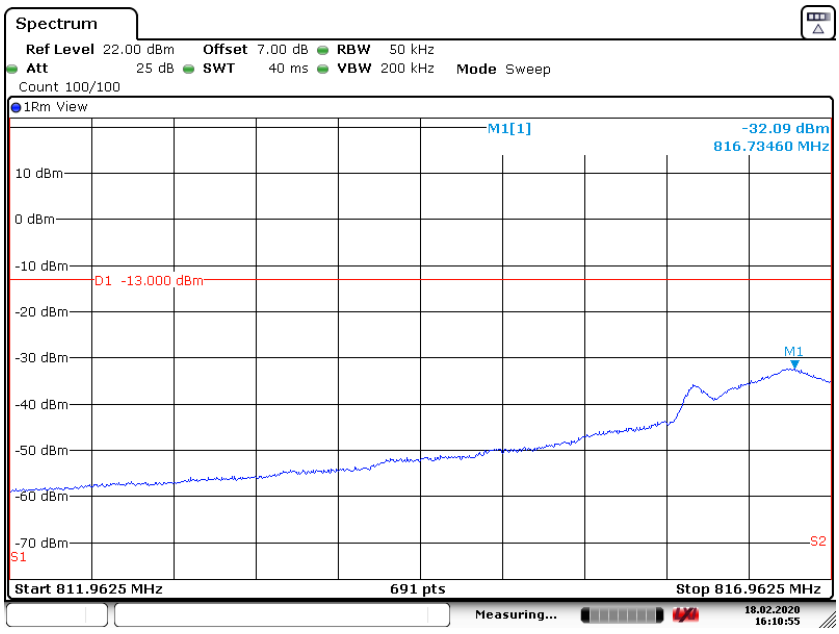
Channel 476: Outer Extended Band Edge

Spurious emission limit –13dBm.



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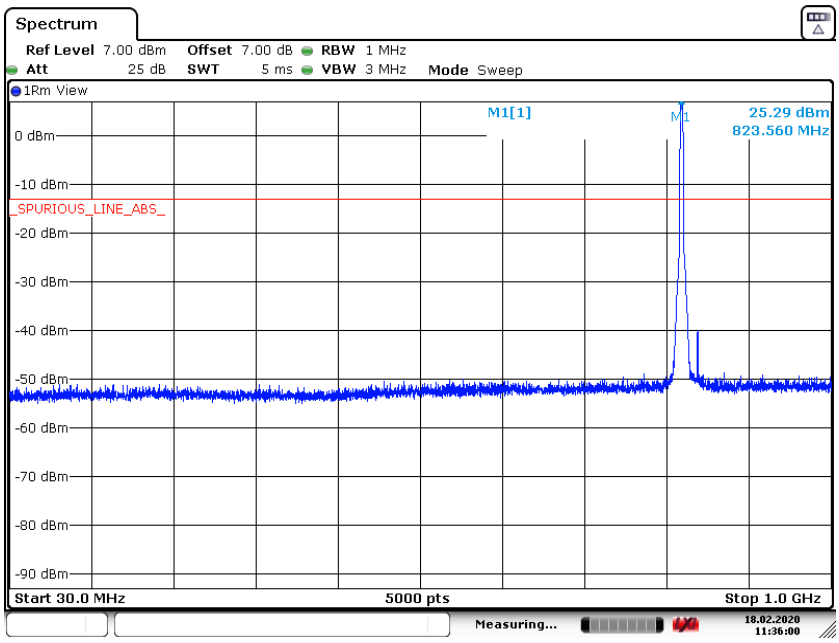
Channel 684: 30MHz –1GHz

Spurious emission limit –13dBm.



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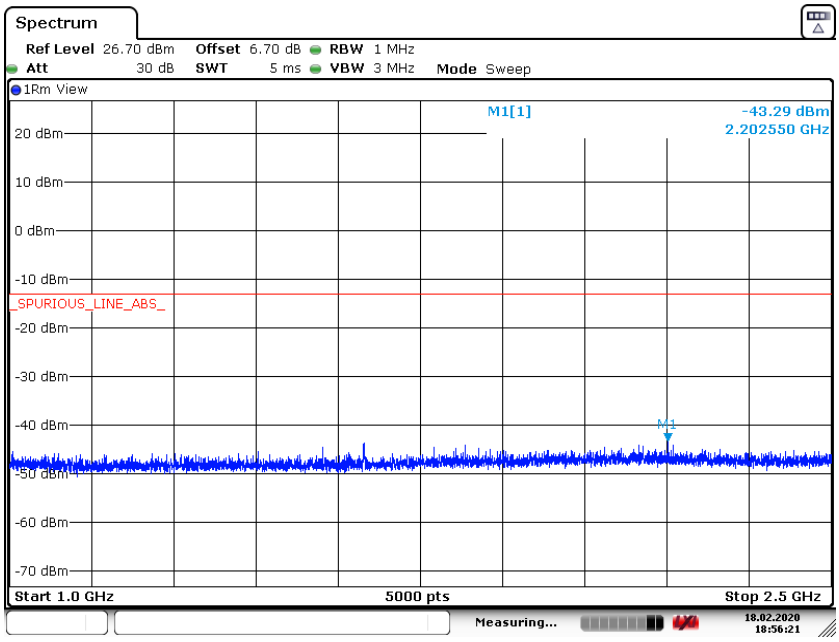
Channel 684: 1GHz –2.5GHz

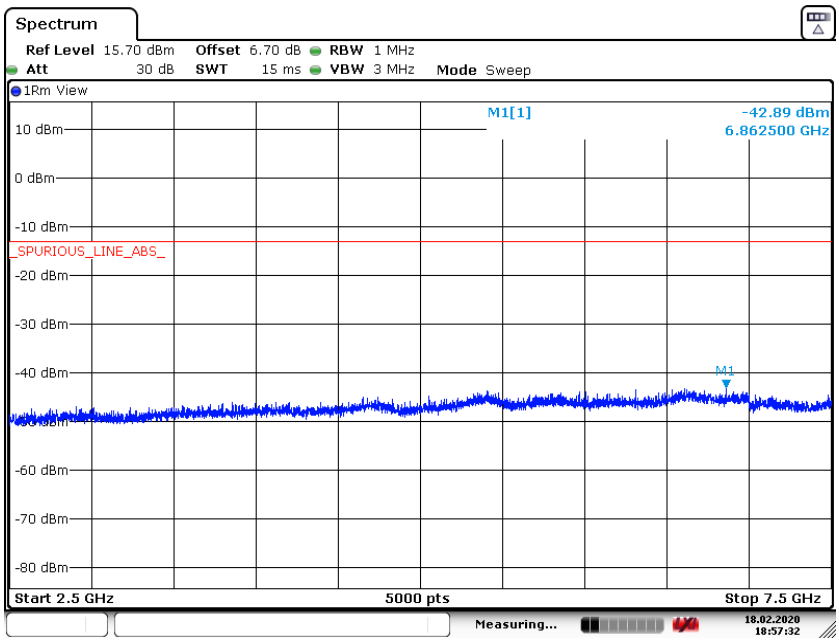
Spurious emission limit –13dBm.



Date: 18.FEB.2020 18:56:21

Channel 684: 2.5GHz –7.5GHz

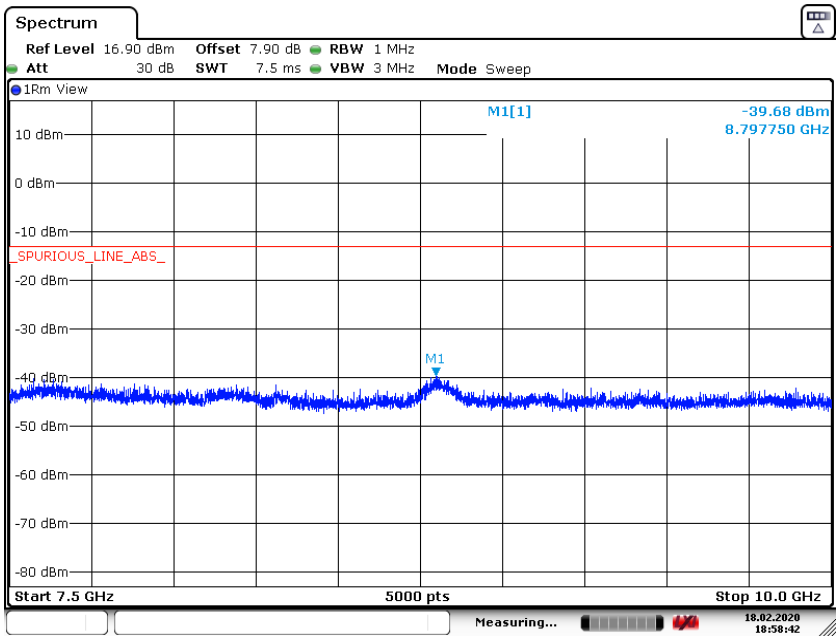
Spurious emission limit –13dBm.



Date: 18.FEB.2020 18:57:32

Channel 684: 7.5GHz –10GHz

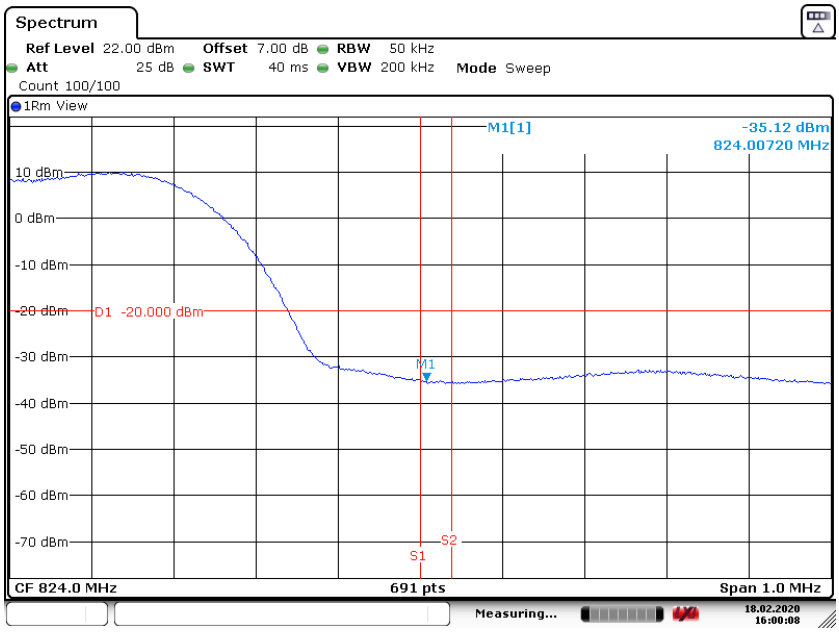
Spurious emission limit –13dBm.



Date: 18.FEB.2020 18:58:42

Channel 684: Band Edge

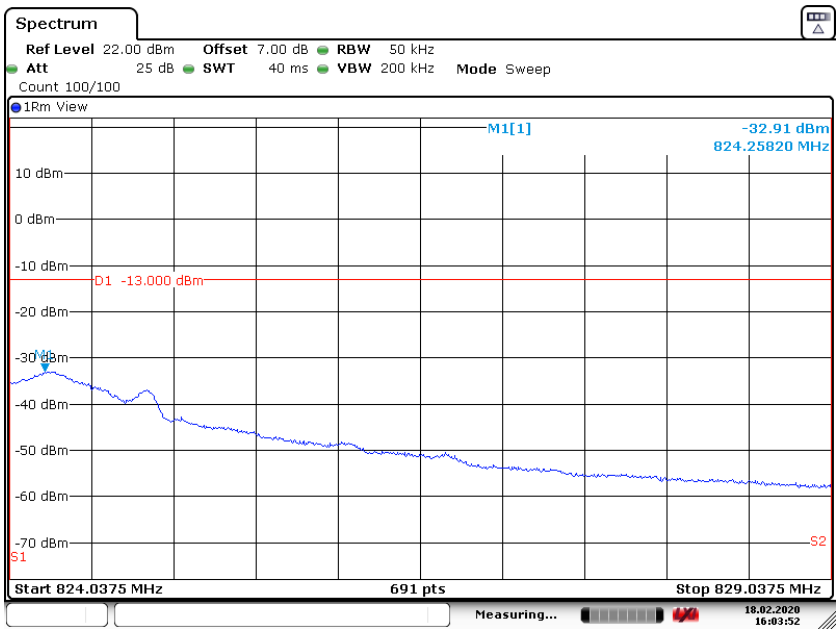
Spurious emission limit –20dBm.



Date: 18.FEB.2020 16:00:08

Channel 684: Outer Extended Band Edge

Spurious emission limit –13dBm.



Date: 18.FEB.2020 16:03:52

ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2019-09-26 through 2020-09-30
Effective Dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Voluntary Laboratory Accreditation Program

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