FCC PART 22H

MEASUREMENT AND TEST REPORT

For

TekConnec Inc

39H, LA ROSSA A, 12 TUNG CHUNG WATERFRONT ROAD, TUNG CHUNG, LANTAU, NT, HONGKONG

FCC ID: 2AMVH-WI-208

Report Type:	Product Type:
Original Report	Smartphone

Test Engineer:	Ada Yu
Report Number:	RKS170707004-00D
Report Date:	2017-07-24
Reviewed By:	Oscar Ye RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu province, China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION 3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 3
OBJECTIVE 3
RELATED SUBMITTAL(S)/GRANT(S) 3
TEST METHODOLOGY 3
MEASUREMENT UNCERTAINTY 4
TEST FACILITY 4
SYSTEM TEST CONFIGURATION 5
JUSTIFICATION 5
EQUIPMENT MODIFICATIONS 5
SUPPORT EQUIPMENT LIST AND DETAILS 5
EXTERNAL I/O CABLE 5
BLOCK DIAGRAM OF TEST SETUP 6
SUMMARY OF TEST RESULTS 7
TEST EQUIPMENT LIST 8
FCC §1.1307(B) & §2.1093 - RF EXPOSURE INFORMATION 9
APPLICABLE STANDARD 9
TEST RESULT 9
FCC §2.1047 - MODULATION CHARACTERISTIC 10
FCC §2.1046; § 22.913 (A) - RF OUTPUT POWER 11
APPLICABLE STANDARDS 11
TEST PROCEDURE 11
TEST DATA 11
FCC §2.1049, §22.917, §22.905 - OCCUPIED BANDWIDTH 13
APPLICABLE STANDARDS 13
TEST PROCEDURE 13
TEST DATA 13
FCC § 2.1051; § 22.917 (A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 15
APPLICABLE STANDARDS 15
TEST PROCEDURE 15
TEST DATA 15
FCC § 2.1053; § 22.917 (A) - SPURIOUS RADIATED EMISSIONS 18
APPLICABLE STANDARDS 18
TEST PROCEDURE 18
TEST DATA 19
FCC § 22.917 (A) - BAND EDGES 20
APPLICABLE STANDARDS 20
TEST PROCEDURE 20
TEST DATA 20
FCC § 2.1055; § 22.355 - FREQUENCY STABILITY 23
APPLICABLE STANDARDS 23
TEST PROCEDURE 23
TEST DATA 24

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	TekConnec Inc
Tested Model	WI-208
Product Type	Smartphone
Dimension	146.0 mm(L)×72.2 mm(W)×8.4 mm(H)
Power Supply	DC 3.8V from battery or DC 5.0V charging by adapter

Adapter Information:
Model: ASTCA
Input: AC 100-240V, 50/60 Hz, 0.4A
Output: DC 5.0V, 1.0A

**All measurement and test data in this report was gathered from production sample serial number: 20170707004 (Assigned by the BACL. The EUT supplied by the applicant was received on 2017-07-07)*

Objective

This type approval report is prepared on behalf of TekConnec Inc in accordance with Part 2, Part 22-Subpart H of the Federal Communication Commission's rules.

The objective is to determine the compliance of EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, and band edge.

Related Submittal(s)/Grant(s)

FCC Part15.247 DTS & DSS and Part 15B JBP submissions with FCC ID: 2AMVH-WI-208.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-Part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services

Applicable Standards: TIA/EIA 603-D.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	5.91dB
	Above 1GHz	4.92dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road,Kunshan,Jiangsu province,China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-D.

The final qualification test was performed with the EUT operating at normal mode.

Equipment Modifications

No modifications were made to the EUT.

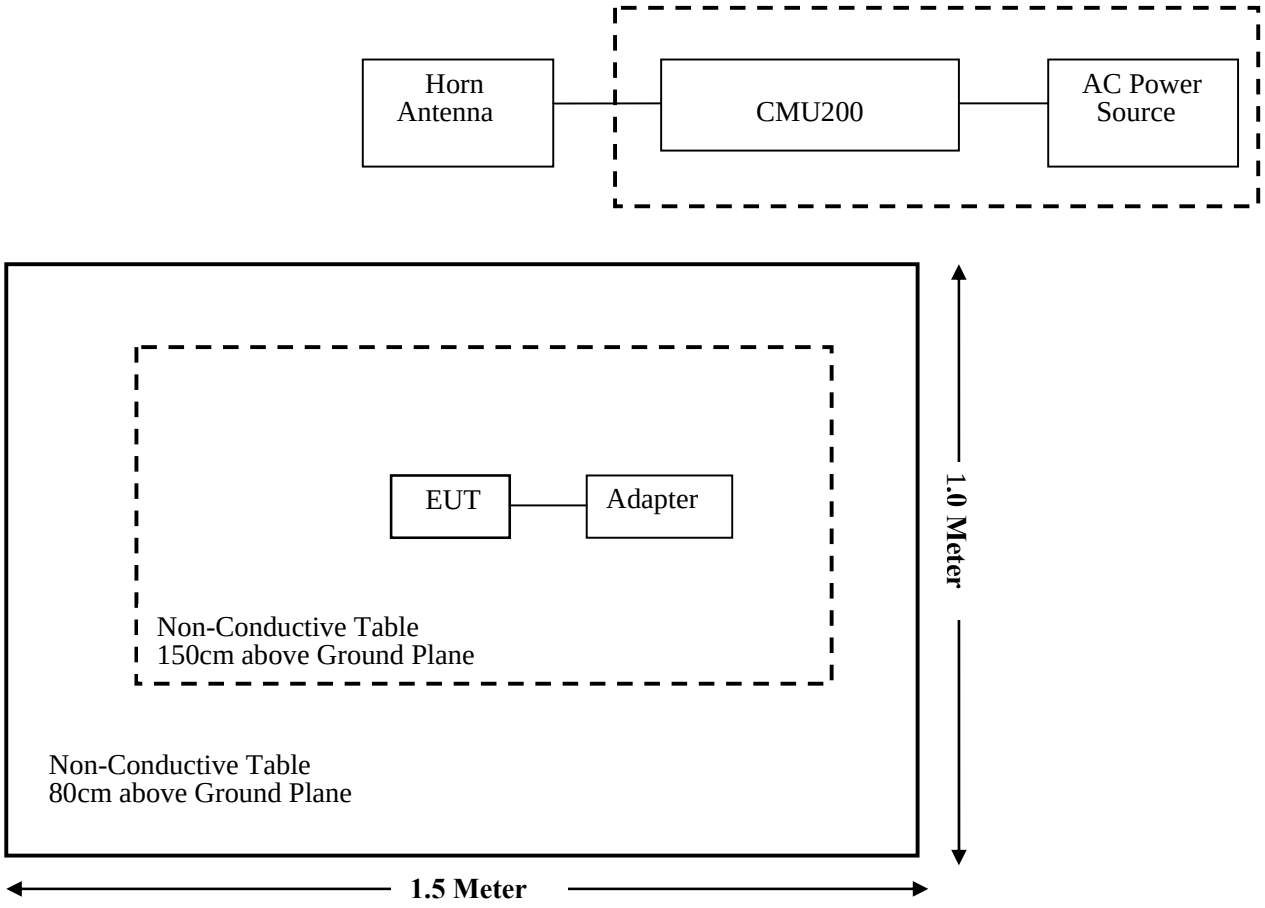
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Shielding Type	Length (m)	From Port	To
USB Cable	Unshielding	0.8	EUT	Adapter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307(b) & §2.1093	RF Exposure Information	Compliance (See Note 1)
§2.1046; § 22.913 (a)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a)	Spurious Radiated Emissions	Compliance
§ 22.917 (a)	Band Edge	Compliance
§ 2.1055; § 22.355	Frequency Stability	Compliance

Note 1: Please refer to SAR report released by BACL (Kunshan), report number: RKS170707004-20.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-24
HP	Signal Generator	8341B	DE23437	2016-08-29	2017-08-28
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-24
Sunol Sciences	Broadband Antenna	JB3	A040914-2	2016-01-09	2019-01-08
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2016-01-11	2019-01-10
ETS-LINDGREN	Horn Antenna	3115	6229	2016-01-11	2019-01-10
Sonoma Instrunent	Pre-amplifier	330	171377	2016-12-12	2017-12-11
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-12-12	2017-12-11
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
Haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-11
Haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-11
Haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-11
MICRO-COAX	Coaxial Cable	Cable-7	007	2016-12-12	2017-12-11
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2016-09-21	2017-09-20
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605	2016-11-25	2017-11-24
BACL	Temperature & Humidity Chamber	BTH-150	30023	2016-10-10	2017-10-09
TekConnec	RF Cable	/	/	2017-07-10	2018-07-09

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1307, §2.1093.

Test Result

Please refer to the SAR report: RKS170707004-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d) , Part 22H there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC §2.1046; § 22.913 (a) - RF OUTPUT POWER

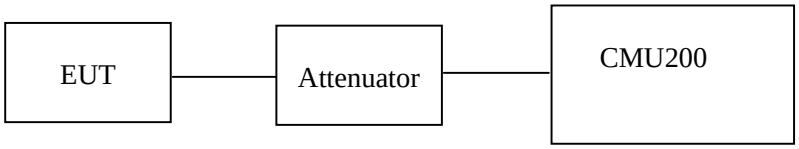
Applicable Standards

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMU200 through sufficient attenuation.



Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Ada Yu on 2017-07-10.

Conducted Power

CDMA BC0 1xRTT Mode

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			RC1+SO55	RC3+SO55	RC3+SO32 (FCH)	RC3+SO32 (SCH)
BC0	1013	824.70	24.05	24.02	24.29	24.67
	283	836.52	24.56	24.81	24.67	24.36
	777	848.31	24.83	24.36	24.56	24.72

CDMA BC0 EVDO Mode

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)	
			RTAP 153.6kbps Subtype 0	RETAP 4096bps Subtype 2
BC0	1013	824.70	23.86	23.25
	283	836.52	24.61	24.72
	777	848.31	24.18	24.63

Peak-to-average ratio (PAR)

Mode	Channel	PAR (dB)	Limit (dB)
CDMA (1xRTT)	Low	2.25	13
	Middle	2.34	13
	High	2.37	13
CDMA (EvDO)	Low	2.96	13
	Middle	2.46	13
	High	2.57	13

Radiated Power

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
CDMA BC0 1xRTT RC1+SO55, Middle Channel (836.52)										
836.52	110.27	269	215	H	15.52	0.30	4.86	20.08	38.50	18.42
836.52	109.45	304	109	V	17.07	0.30	4.86	21.63	38.50	16.87
CDMA BC0 1xEvDO RTAP 153.6kbps, Middle Channel (836.52)										
836.52	111.06	309	134	H	16.31	0.30	4.86	20.87	38.50	17.63
836.52	110.19	132	149	V	17.81	0.30	4.86	22.37	38.50	16.13

Note:
All above data were tested with no amplifier.
Absolute Level = Submitted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FCC §2.1049, §22.917, §22.905 - OCCUPIED BANDWIDTH

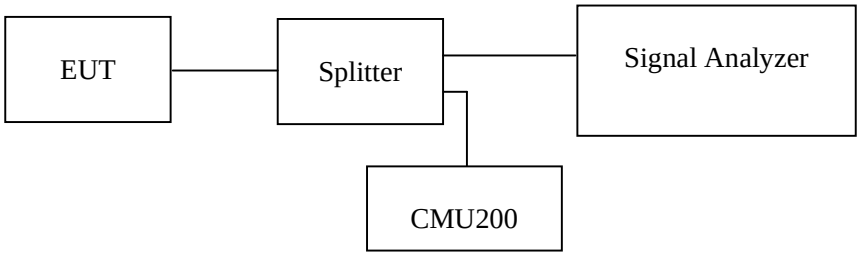
Applicable Standards

FCC 47 §2.1049, §22.917, §22.905

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 5 kHz (Cellular /PCS) & 100 kHz (CDMA) and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Ada Yu on 2017-07-10.

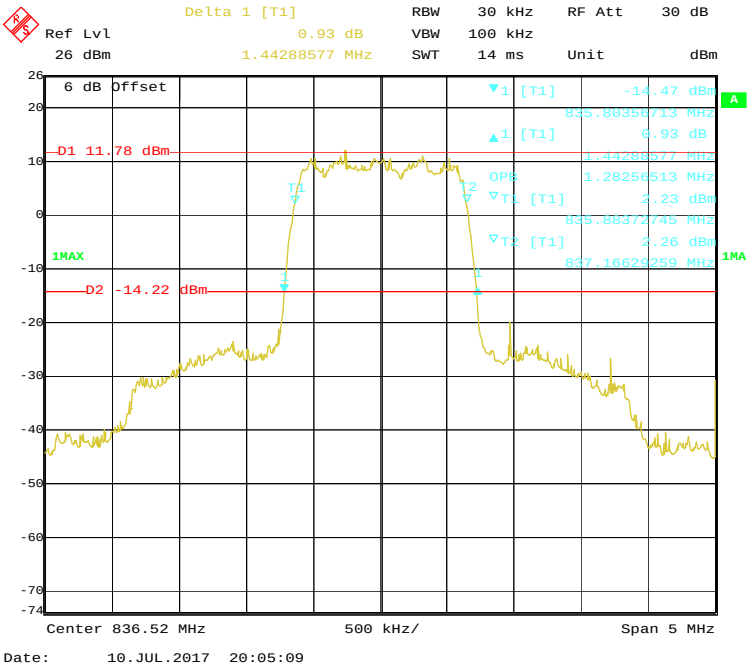
EUT operation mode: Transmitting

Test Result: Compliance.

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
CDMA BC0 (1xRTT)	836.52	1.28	1.44
CDMA BC0 (EvDO)	836.52	1.28	1.44

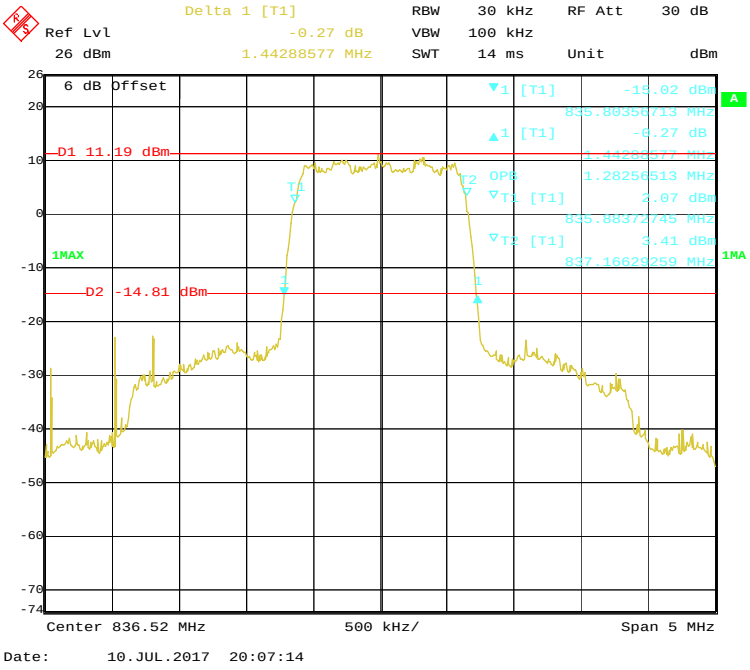
CDMA BC0 1xRTT Mode

99% Occupied & 26 dB Emissions Bandwidth



CDMA BC0 EvDO Mode

99% Occupied & 26 dB Emissions Bandwidth



FCC § 2.1051; § 22.917 (a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

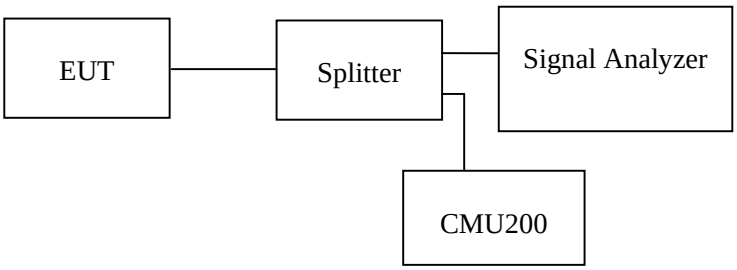
Applicable Standards

FCC §2.1051, §22.917(a)

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.



Test Data

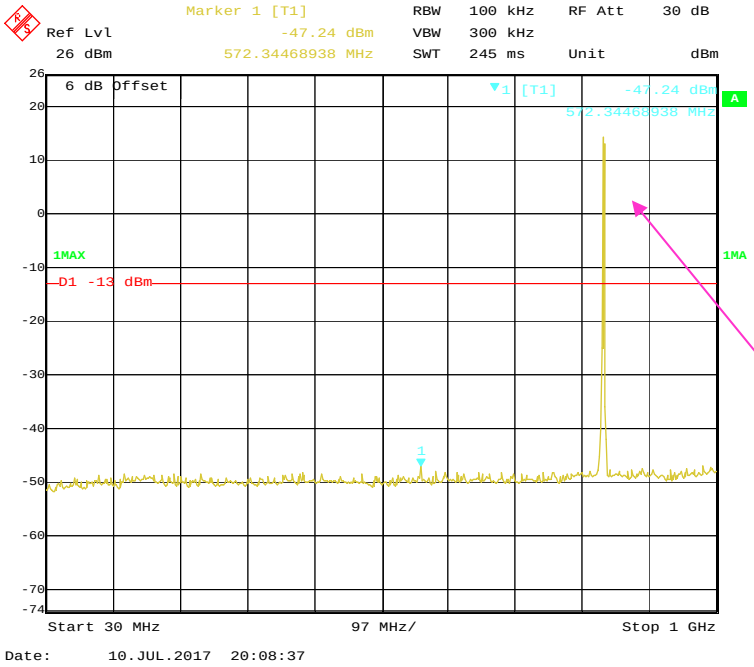
Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Ada Yu on 2017-07-10.

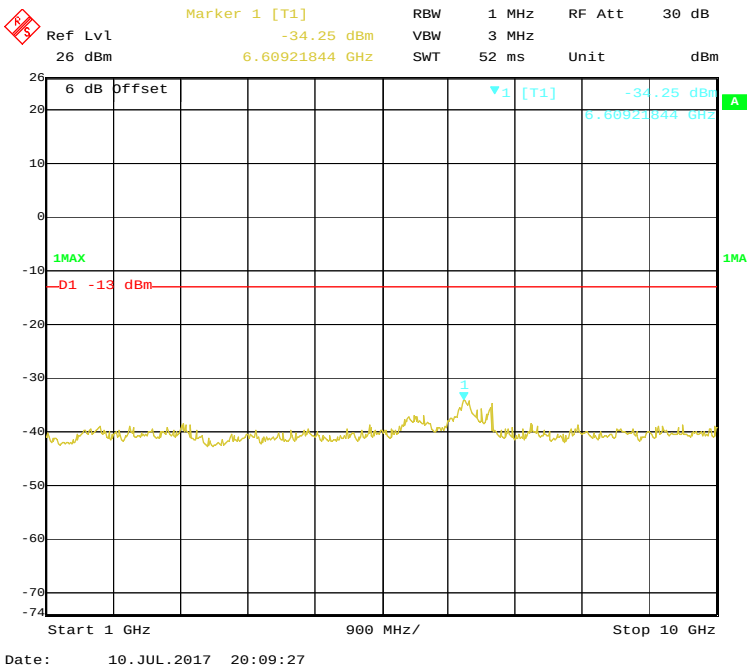
CDMA BC0 1xRTT Mode

30 MHz – 1 GHz



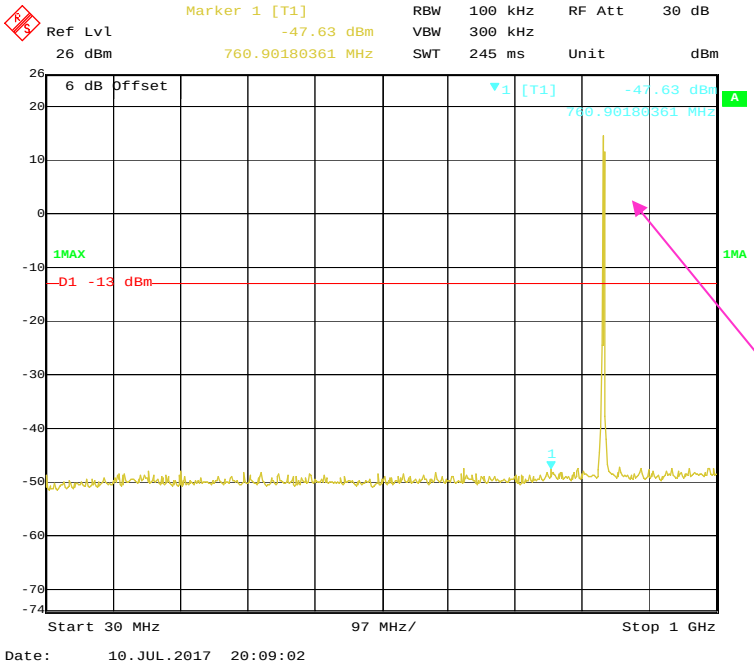
Fundamental test

1 GHz – 10 GHz



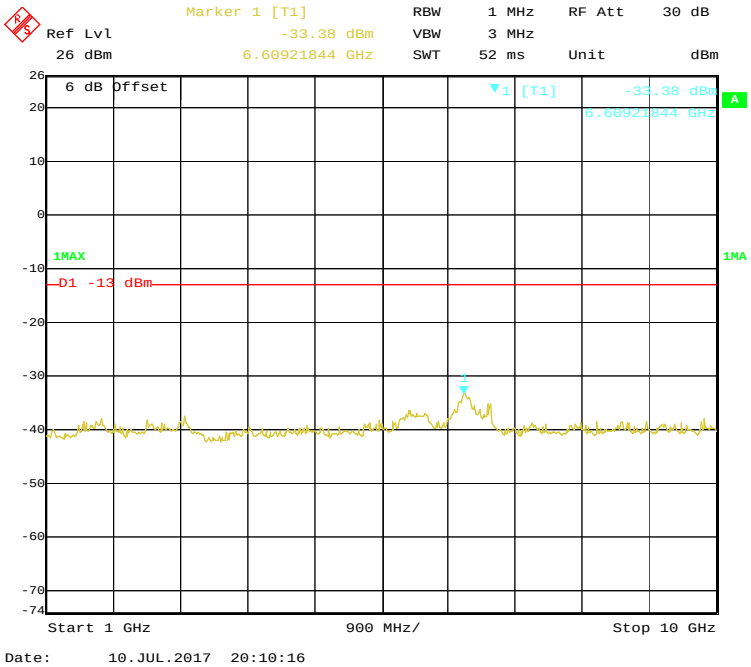
CDMA BC0 EvDO Mode

30 MHz – 1 GHz



Fundamental test

1 GHz – 10 GHz



FCC § 2.1053; § 22.917 (a) - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053, §22.917(a)

22.917 (a) Out of band emissions. 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.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TX pwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Ada Yu on 2017-07-10.

Test mode: Transmitting (Pre-scan with Low, Middle, High channel, and the worse case data as below)

30 MHz ~ 10 GHz:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
CDMA BC0 1xRTT Mode, Middle channel										
429.34	36.27	202	156	H	-64.83	0.30	4.47	-60.66	-13	47.66
429.34	35.01	293	158	V	-63.91	0.30	4.47	-59.74	-13	46.74
1673.04	41.56	317	226	H	-68.60	0.39	8.48	-60.51	-13	47.51
1673.04	42.38	247	245	V	-69.72	0.39	8.48	-61.63	-13	48.63
2509.56	42.17	35	178	H	-68.74	0.49	10.09	-59.14	-13	46.14
2509.56	42.69	187	212	V	-68.93	0.49	10.09	-59.33	-13	46.33
CDMA BC0 EvDO Mode, Middle channel										
429.34	36.89	136	130	H	-64.21	0.30	4.47	-60.04	-13.00	47.04
429.34	35.26	90	114	V	-63.66	0.30	4.47	-59.49	-13.00	46.49
1673.04	41.41	130	103	H	-68.75	0.39	8.48	-60.66	-13.00	47.66
1673.04	42.62	12	161	V	-69.48	0.39	8.48	-61.39	-13.00	48.39
2509.56	42.26	190	208	H	-68.65	0.49	10.09	-59.05	-13.00	46.05
2509.56	42.93	15	167	V	-68.69	0.49	10.09	-59.09	-13.00	46.09

FCC § 22.917 (a) - BAND EDGES

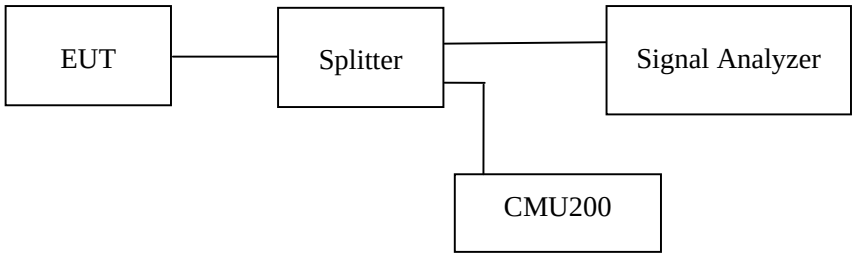
Applicable Standards

According to § 22.917(a), the power of any emissions 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.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency



Test Data

Environmental Conditions

Temperature:	23.1 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2kPa

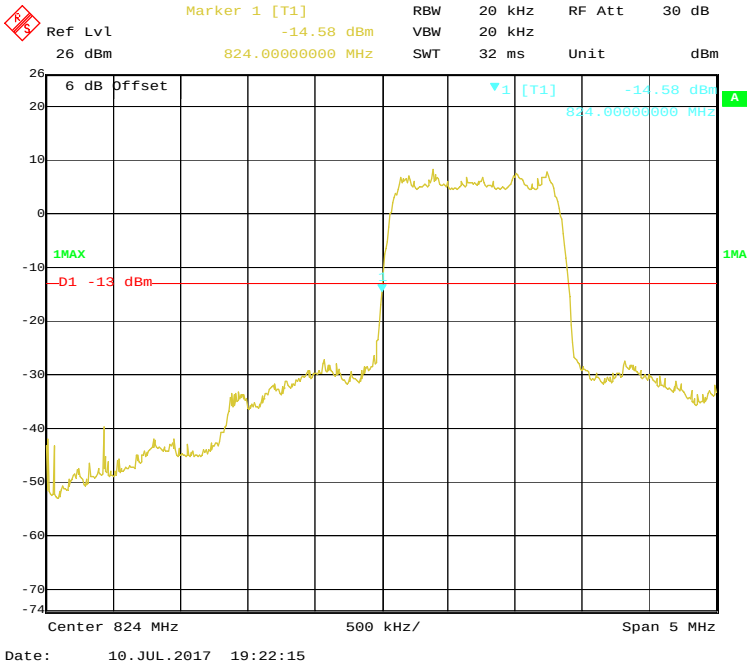
The testing was performed by Ada Yu on 2017-07-10.

EUT operation mode: Transmitting

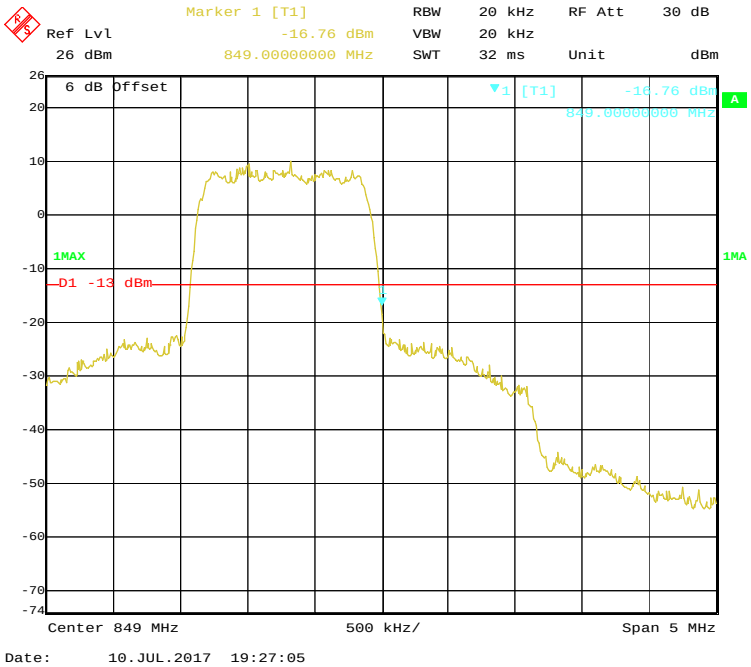
Test Result: Compliance.

CDMA BC0 1xRTT Mode

Left Side

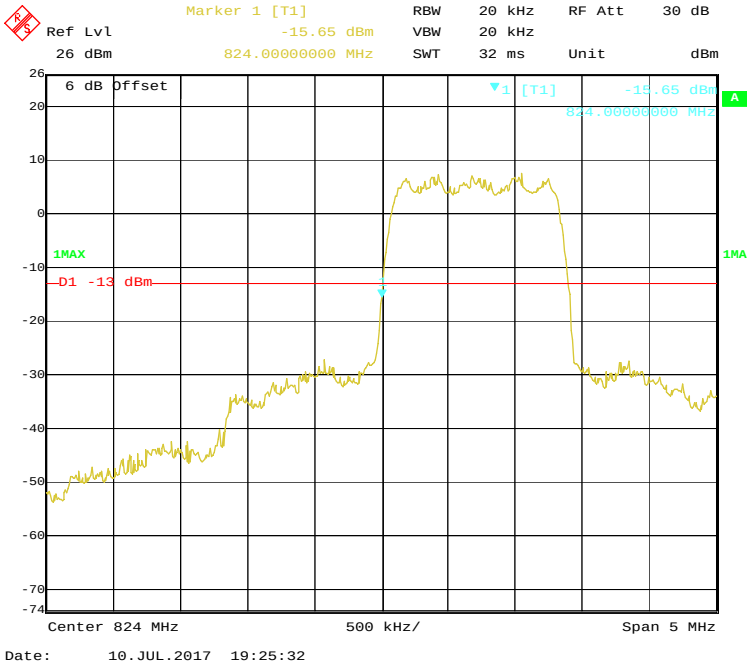


CDMA BC0: Right Side

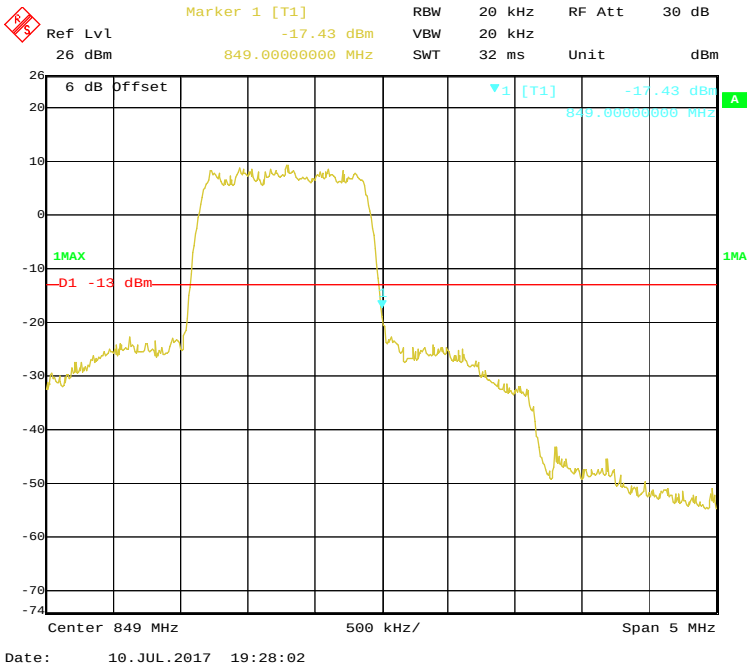


CDMA BC0 EvDO Mode

Left Side



Right Side



FCC § 2.1055; § 22.355 - FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055, §22.355

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

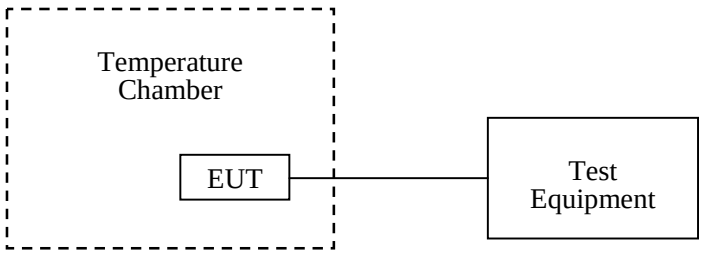
Frequency Range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

Test Procedure

Frequency Stabilities. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stabilities. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	101.2 kPa

The testing was performed by Ada Yu on 2017-07-10.

EUT operation mode: Transmitting

Test Result: Compliance.

CDMA BC0 1xRTT Mode

Middle Channel, fo =836.52 MHz				
Temperature (℃)	**Power Supplied (VDC)**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	2.5	0.00299	2.5
-20		0.7	0.00084	2.5
-10		-0.9	-0.00108	2.5
0		3.7	0.00442	2.5
10		-1.2	-0.00143	2.5
20		1.1	0.00131	2.5
30		-1	-0.00120	2.5
40		0.7	0.00084	2.5
50		1.6	0.00191	2.5
25	V min.= 3.6	3.7	0.00442	2.5
25	V max.= 4.2	1.8	0.00215	2.5

CDMA BC0 EvDO Mode

Middle Channel, fo =836.52 MHz				
Temperature (℃)	**Power Supplied (VDC)**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	3.8	3.2	0.00383	2.5
-20		-0.4	-0.00048	2.5
-10		-0.6	-0.00072	2.5
0		2.2	0.00263	2.5
10		3.9	0.00466	2.5
20		1.1	0.00131	2.5
30		3.3	0.00394	2.5
40		0	0.00000	2.5
50		0.2	0.00024	2.5
25	V min.= 3.6	-1.6	-0.00191	2.5
25	V max.= 4.2	4.1	0.00490	2.5

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