

# TEST REPORT FOR CDMA TESTING

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Report No.: SRTC2020-9004(F)-20050801(P)

Product Name: On-board Terminal (Telematics BOX)

Product Model: SR10006

Applicant: SiRun (Beijing) Technology Co., Ltd.

Manufacturer: SiRun (Beijing) Technology Co., Ltd.

Specification: FCC Part 24E, Part 22H, Part 2, Part 27 (2019)

FCC ID: 2AWCT-SR10006

The State Radio\_monitoring\_center Testing Center (SRTC)

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## 1. GENERAL INFORMATION

### 1.1 Notes of the test report

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### 1.2 Information about the testing laboratory

|                    |  |
|--------------------|--|
| Company:           | The State Radio_monitoring_center Testing Center (SRTC)              |
| Address:           | 15th Building, No.30 Shixing Street, Shijingshan District, P.R.China |
| City:              | Beijing  |
| Country or Region: | P.R.China  |
| Contacted person:  | Liu Jia  |
| Tel:               | +86 10 57996183  |
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| Email:             | liujiaf@srtc.org.cn  |

### 1.3 Applicant's details

|                    |  |
|--------------------|--|
| Company:           | SiRun (Beijing) Technology Co., Ltd.   |
| Address:           | F16, Block A, Building 2, No.2 Auto Museum East Road, Fengtai District, Beijing, China |
| City:              | Beijing  |
| Country or Region: | China  |
| Contacted person:  | Lingrong Zhou  |
| Tel:               | 15010875309  |
| Fax:               | ---  |
| Email:             | lingrong.zhou@sirun.net  |

### 1.4 Manufacturer's details

|                    |  |
|--------------------|--|
| Company:           | SiRun (Beijing) Technology Co., Ltd.   |
| Address:           | F16, Block A, Building 2, No.2 Auto Museum East Road, Fengtai District, Beijing, China |
| City:              | Beijing  |
| Country or Region: | China  |
| Contacted person:  | Lingrong Zhou  |
| Tel:               | 15010875309  |
| Fax:               | ---  |
| Email:             | lingrong.zhou@sirun.net  |

## 1.5 Test Environment

|   |            |
|---|------------|
| Date of Receipt of test sample at SRTC: | 2020-05-08 |
| Testing Start Date:                     | 2020-05-08 |
| Testing End Date:                       | 2020-05-21 |

| Environmental Data: | Temperature (°C) | Humidity (%) |
|---------------------|------------------|--------------|
| Ambient             | 25               | 30           |
| Maximum Extreme     | 70               | ---          |
| Minimum Extreme     | -30              | ---          |

|  |      |
|--|------|
| Normal Supply Voltage (V d.c.):          | 12.0 |
| Maximum Extreme Supply Voltage (V d.c.): | 18.0 |
| Minimum Extreme Supply Voltage (V d.c.): | 9.0  |

## **2 DESCRIPTION OF THE DEVICE UNDER TEST**

### **2.1 Final Equipment Build Status**

|                     |  |
|---------------------|--|
| Frequency Range     | BC0:<br>Tx:824.70~848.31MHz Rx:869.70~893.31MHz      |
| Mode                | CDMA2000 1x Advanced<br>CDMA2000 1x EVDO Rel.0/Rev.A |
| Emission Designator | 4M50F9W  |
| Duplex Mode         | FDD  |
| Duplex Spacing      | 45MHz  |
| Antenna Type        | Fixed external Antenna                               |
| Antenna Gain        | 0dBi   |
| Power Supply        | DC Power   |
| Hardware Version    | V3.01  |
| Software Version    | V3.02  |
| ICCID               | 898602F2101950003613                                 |

### **2.2 Support Equipment**

The following support equipment was used to exercise the DUT during testing:  
NA

### **2.3 Summary table.**

| FCC Rule Part | Mode     | Frequency Range(MHz) | ERP/ EIRP (dBm) | ERP/ EIRP (W) | Frequency Tolerance (ppm) | Emission Designator |
|---------------|----------|----------------------|-----------------|---------------|---------------------------|---------------------|
| 22H           | CDMA BC0 | 824.70-848.31        | 24.59           | 0.288         | -0.093                    | 1M27F9W             |

### **3 REFERENCE SPECIFICATION**

| Specification  | Version       | Title   |
|----------------|---------------|---|
| FCC Part2      | 2019          | Frequency allocations and radio treaty matters; general rules and regulations                     |
| FCC Part22     | 2019          | Public mobile services  |
| FCC Part24     | 2019          | Personal communications services  |
| FCC Part27     | 2019          | Miscellaneous wireless communications services  |
| ANSI C63.26    | 2015          | American national standard for compliance testing of transmitters used in licensed radio services |
| KDB 971168 D01 | April 9, 2018 | Measurement guidance for certification of licensed digital transmitters                           |
| TIA-603-E-2016 | March 2016    | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards               |

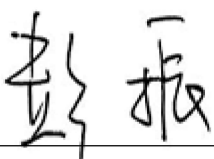

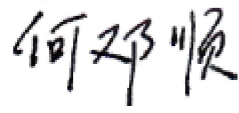
### **4 KEY TO NOTES AND RESULT CODES**

The following are the definition of the test result.

| Code | Meaning  |
|------|--|
| PASS | Test result shows that the requirements of the relevant specification have been met.     |
| FAIL | Test result shows that the requirements of the relevant specification have not been met. |
| NT   | Normal Temperature   |
| NV   | Nominal voltage  |
| HV   | High voltage   |
| LV   | Low voltage  |

## 5 RESULT SUMMARY

| No. | Test case  | FCC reference                       | Verdict |
|-----|--|-------------------------------------|---------|
| 1   | RF Power Output  | 2.1046                              | Pass    |
| 2   | Effective Radiated Power and<br>Effective Isotropic Radiated Power | 22.913(a),24.232(c),27.50(d)( 4)    | Pass    |
| 3   | Occupied Bandwidth   | 2.1049                              | Pass    |
| 4   | Emission Bandwidth   | 2.1049                              | Pass    |
| 5   | Spurious Emissions at antenna<br>terminal                          | 2.1051,22.917(a),24.238(a),27.53(h) | Pass    |
| 6   | Band Edges Compliance  | 2.1051,22.917(a),24.238(b),27.53(h) | Pass    |
| 7   | Frequency Stability  | 2.1055,22.355,24.235,27.54          | Pass    |
| 8   | Radiated Spurious Emissions  | 2.1053,22.917(a),24.238(a),27.53(h) | Pass    |
| 9   | Peak-Average Ratio   | 24.232(d),27.50(d) (5)              | Pass    |

|  |   |
|--|---|
| This Test Report Is Issued by:<br>Mr. Peng Zhen<br> | Checked by:<br>Mr. Li Bin<br> |
| Tested by:<br>Mr. He Dengshun<br>                   | Issued date:<br><br>20200522  |

## **6 TEST RESULT**

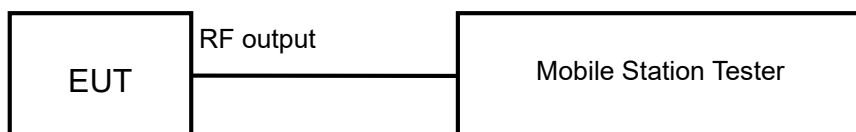
### **6.1 RF Power Output**

Rule Part(s):  
2.1046

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test Setup:



Test procedure:

After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. Then the test data can be read at the tester screen. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration. The measurement will be conducted at three channels (Low, middle and High channels).

Limits: Limits: No specific conduct power requirements in part 2.1046.

Test result:

The test results are shown in Appendix A.



## 6.2 Effective Radiated Power and Effective Isotropic Radiated Power

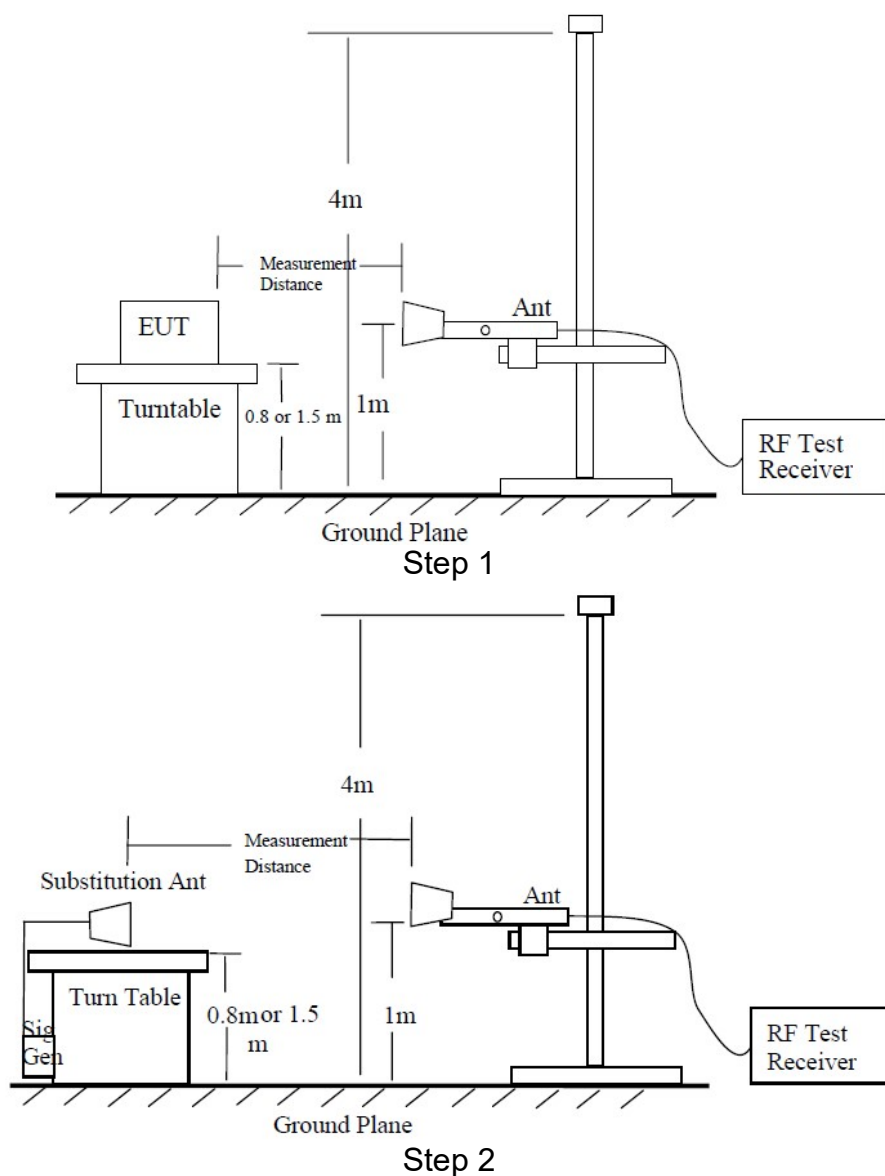
Rule Part(s):

FCC: 22.913(a) (5), 24.232(c), 27.50(d) (4)

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test setup:



#### Test procedure:

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

##### Step 1:

The measurement is carried out in the chamber. EUT was placed on a 0.8m ( $f < 1\text{GHz}$ )/1.5m ( $f > 1\text{GHz}$ ) high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna from 1m to 4m and varies in certain range to find the maximum power value. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used and RBW is set to 100KHz( $f < 1\text{GHz}$ )/1MHz ( $f > 1\text{GHz}$ ). The antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. And the maximum value of the receiver should be recorded as (Pr).

##### Step 2:

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator. To repeat the same procedure as step1 and the level of signal generator will be adjusted till the same power value on the spectrum analyzer or receiver. The ERP/EIRP of the EUT can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna.

A power ( $P_{mea}$ ) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). 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.

A "reference path loss" should be calculated after test. The attenuation of "reference path loss" is the cable loss between the Signal Source with the Substitution Antenna ( $P_{ca}$ ) and the Substitution Antenna Gain ( $G_a$ ).

The measurement results are obtained as described below:

Power (EIRP) =  $P_{mea} + P_{ca} + G_a$

#### **ERP/EIRP LIMIT**

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15 \text{ (dB)}$ .

##### 22.913(a) (5)

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

##### 24.232(c)

Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

##### 27.50(d) (4)

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications

#### Test result:

The test results are shown in Appendix B.

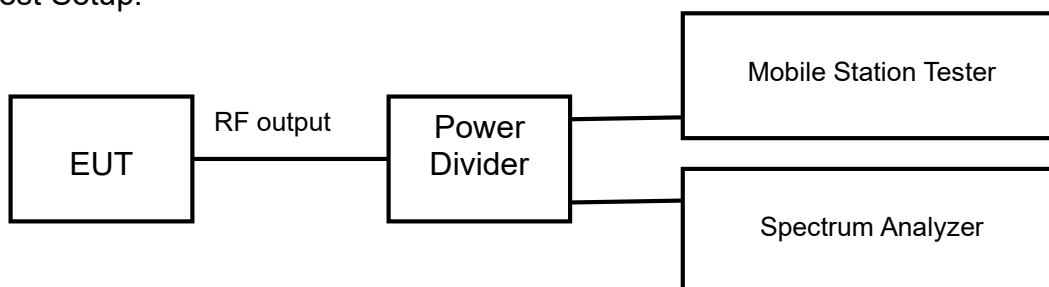
## 6.3 Occupied Bandwidth

Rule Part(s):  
FCC: 2.1049

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test Setup:



Test procedure:  
KDB 971168 D01 v03r01 – Section 4.2

### Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:  
The test results are shown in Appendix A.

## 6.4 Emission Bandwidth

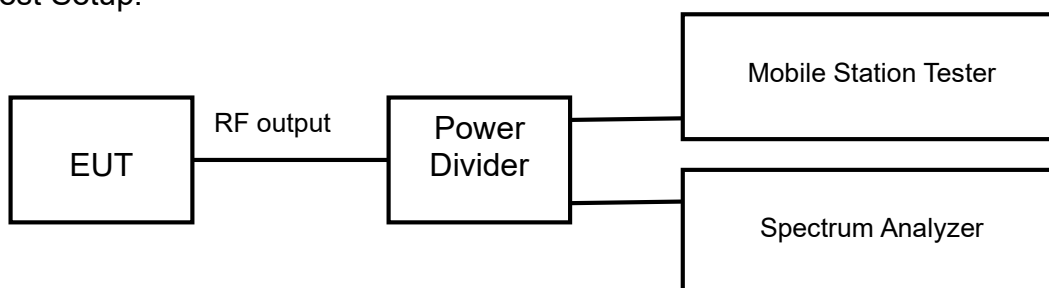
Rule Part(s):

FCC: 2.1049

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 26dB occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the emission bandwidth observed in Step 7

Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

The test results are shown in Appendix A.

## 6.5 Spurious Emissions at antenna terminal

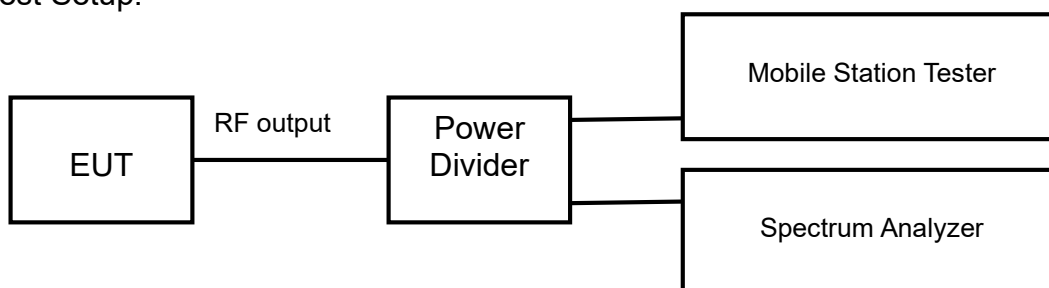
Rule Part(s):

FCC: 2.1051, 22.917(a), 24.238(a), 27.53(h)

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 10GHz for Cell, 20GHz for PCS
2. RBW=100 kHz (For below 1GHz), 1MHz (For above 1GHz)
3. VBW  $\geq 3 \times$  RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Limits:

The minimum permissible attenuation level of any spurious emission is  $43 + \log_{10}(P_{\text{[Watts]}})$ , where P is the transmitter power in Watts.

Test result:

The test results are shown in Appendix A.

## 6.6 Band Edges Compliance

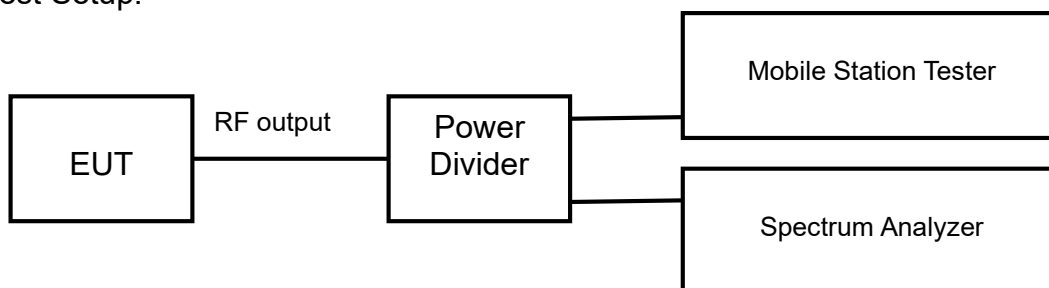
Rule Part(s)

FCC: 2.1051, 22.917(a), 24.238(a), 27.53(c)

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span=2MHz
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Limit: The minimum permissible attenuation level of any spurious emission is  $43 + \log_{10}(P)$  [Watts]), where P is the transmitter power in Watts.

Test result:

The test results are shown in Appendix A.

## 6.7 Frequency Stability

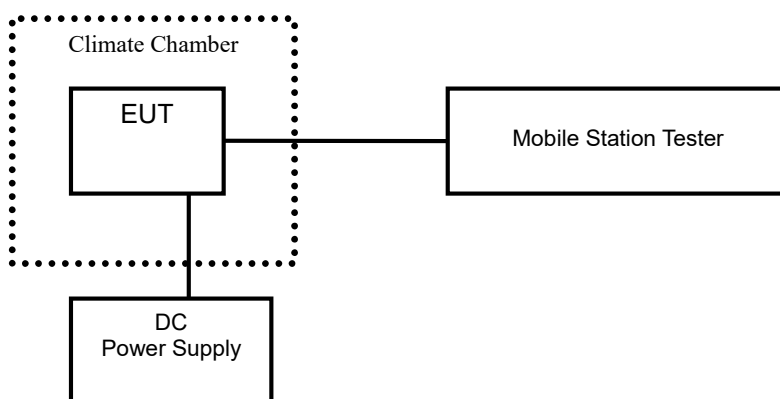
Rule Part(s)

FCC: 2.1055, 22.355, 24.235, 27.54

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test setup:



Test Procedure:

ANSI/TIA-603-E-2016

### Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C (The temperature range can be declared by the manufacturer). A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Limits: For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency. For Part 24, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test result:

The test results are shown in Appendix A.

## 6.8 Radiated Spurious Emissions

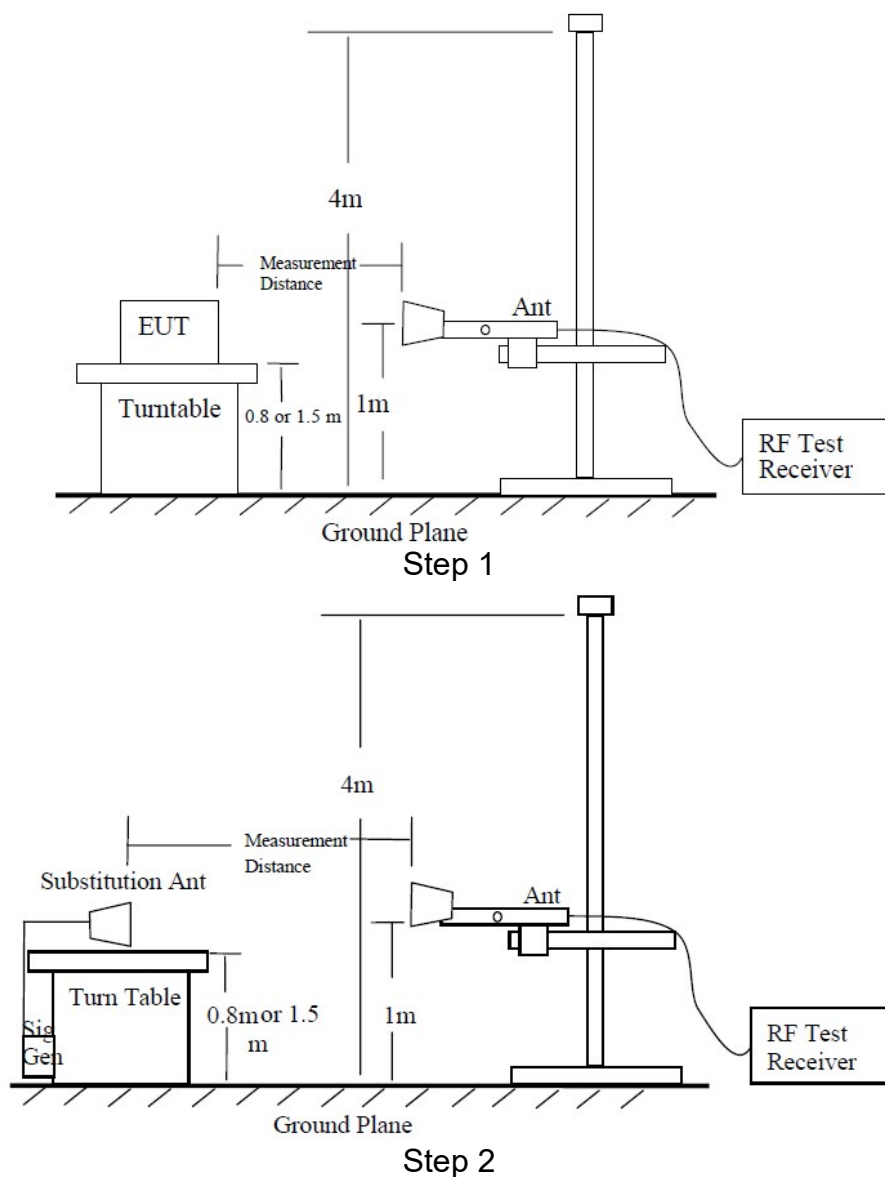
Rule Part(s)

FCC: 2.1053, 22.917(a), 24.238(a), 27.53(h)

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test Setup:





#### Test procedure:

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

The spectrum was scanned from 30MHz to the 10th harmonic of the highest frequency generated within the equipment.

#### Step 1:

The measurement is carried out in the chamber. EUT was placed on a 0.8m ( $f < 1\text{GHz}$ )/1.5m ( $f > 1\text{GHz}$ ) high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna from 1m to 4m and varies in certain range to find the maximum power value. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used and RBW is set to 100 kHz ( $f < 1\text{GHz}$ )/1MHz ( $f > 1\text{GHz}$ ). The antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. The spectrum analyzer scans from 30MHz to 10th harmonic of the carrier. A notch filter is necessary in the band near to the carrier frequency. A high pass filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.

#### Step 2:

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

A power ( $P_{\text{mea}}$ ) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded ( $P_r$ ). The power of signal source ( $P_{\text{mea}}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

A "reference path loss" should be calculated after test. The attenuation of "reference path loss" is the cable loss between the Signal Source with the Substitution Antenna ( $P_{\text{ca}}$ ) and the Substitution Antenna Gain ( $G_a$ ).

#### Calculation procedure:

The data of cable loss and antenna gain has been calibrated in full testing frequency range before the testing.

The power of the Radiated Spurious Emissions is calculated by adding the cable loss and antenna gain. The basic equation with a sample calculation is as followed:

$$\text{Power (EIRP)} = P_{\text{mea}} + P_{\text{ca}} + G_a$$

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15 \text{ (dB)}$ .

Assumed the power of signal source record is -20dBm. A cable loss of -30dB, and an antenna gain of 11dB are added.

$$P = P_{\text{mea}} + P_{\text{ca}} + G_a = (-20\text{dBm}) + (-30\text{dB}) + (11\text{dB}) = -39\text{dBm}$$

#### Test result:

The test results are shown in Appendix B.

## 6.9 Peak-Average Ratio

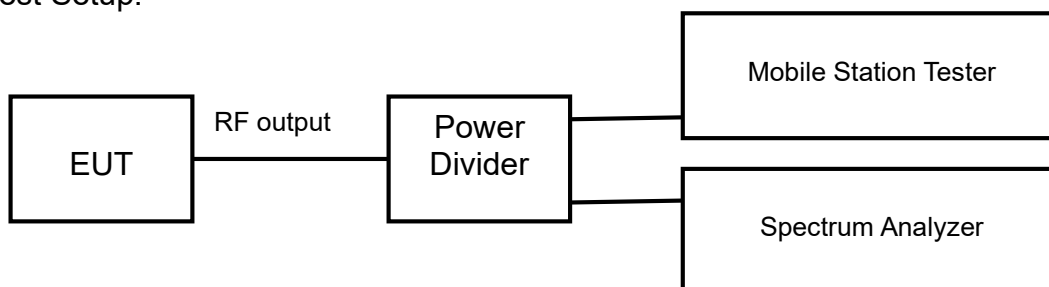
Rule Part(s)

FCC: 24.232(d), 27.50(d) (5)

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 25°C        | 30%               | 101.9kPa |

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 5.7.1

Test settings:

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Limits: the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Test result:

The test results are shown in Appendix A

## **7 MEASUREMENT UNCERTAINTIES**

| Items                 | Uncertainty |         |
|-----------------------|-------------|---------|
| RF Power Output       | U=0.6 dB    |         |
| Occupied Bandwidth    | 3kHz        |         |
| Spurious Emissions    | 9kHz~2GHz   | U=1.2dB |
|                       | 2G~3.6GHz   | U=1.4dB |
|                       | 3.6G~8GHz   | U=2.2dB |
|                       | 8G~12.75GHz | U=2.7dB |
| Band Edges Compliance | 1.2dB       |         |
| Frequency Stability   | U=48 Hz     |         |

## 8 TEST EQUIPMENTS

| No. | Name/Model                                  | Manufacturer | S/N          | Calibration Date | Calibration Due Date |
|-----|---|--------------|--------------|------------------|----------------------|
| 1   | E5515C(8960) Mobile Station Tester          | Agilent      | MY50266302   | 2019.08.20       | 2020.08.19           |
| 2   | N9020A Spectrum Analyzer                    | Agilent      | MY48010771   | 2019.08.20       | 2020.08.19           |
| 3   | 6007 Power Divider                          | Weinschel    | 6007-GJ-1    | 2019.08.20       | 2020.08.19           |
| 4   | DC Power Supply E3645A                      | Agilent      | MY40000741   | 2020.03.01       | 2021.02.28           |
| 5   | Temperature chamber SH241                   | ESPEC        | 92013758     | 2019.08.20       | 2020.08.19           |
| 6   | 12.65m×8.03m×7.50m Fully-Anechoic Chamber   | FRANKONIA    | -----        | -----            | -----                |
| 7   | 23.18m×16.88m×9.60m Semi-Anechoic Chamber   | FRANKONIA    | ---          | -----            | -----                |
| 8   | Turn table Diameter:1m                      | FRANKONIA    | -----        | -----            | -----                |
| 9   | Turn table Diameter:5m                      | FRANKONIA    | -----        | -----            | -----                |
| 10  | Antenna master FAC(MA4.0)                   | MATURO       | -----        | -----            | -----                |
| 11  | Antenna master SAC(MA4.0)                   | MATURO       | -----        | -----            | -----                |
| 12  | 9.080m×5.255m×3.525m Shielding room         | FRANKONIA    | -----        | -----            | -----                |
| 13  | HF 907 Double-Ridged Waveguide Horn Antenna | R&S          | 100512       | 2019.08.20       | 2020.08.19           |
| 14  | HF 907 Double-Ridged Waveguide Horn Antenna | R&S          | 100513       | 2019.08.20       | 2020.08.19           |
| 15  | HL562 Ultra log antenna                     | R&S          | 100016       | 2019.08.20       | 2020.08.19           |
| 16  | 3160-09 Receive antenna                     | SCHWARZ-BECK | 002058-002   | 2019.08.20       | 2020.08.19           |
| 17  | ESI 40 EMI test receiver                    | R&S          | 100015       | 2019.08.20       | 2020.08.19           |
| 18  | ESCS30 EMI test receiver                    | R&S          | 100029       | 2019.08.20       | 2020.08.19           |
| 19  | HL562 Receive antenna                       | R&S          | 100167       | 2019.08.20       | 2020.08.19           |
| 20  | ENV216 AMN                                  | R&S          | 3560.6550.12 | 2019.08.20       | 2020.08.19           |

## **APPENDIX A – TEST DATA OF CONDUCTED EMISSION**

### **RF Power Output**

CDMA BC0

| Mode          | Radio Configuration (RC)            | Service Option (SO)  | Carrier frequency (MHz) | Channel No. | RF Power Output (dBm) |
|---------------|-------------------------------------|----------------------|-------------------------|-------------|-----------------------|
| 1xAdvanced    | RC11                                | 2 (Loopback)         | 824.70                  | 1013        | 23.79                 |
|               |                                     |                      | 836.52                  | 384         | 23.84                 |
|               |                                     |                      | 848.31                  | 777         | 23.68                 |
|               |                                     | 75 (Loopback)        | 824.70                  | 1013        | 23.76                 |
|               |                                     |                      | 836.52                  | 384         | 23.82                 |
|               |                                     |                      | 848.31                  | 777         | 23.75                 |
| 1xEVDO Rel. 0 | FTAP Rate: 307.2kbps (2 slot, QPSK) | RTAP Rate: 153.6kbps | 824.70                  | 1013        | 23.83                 |
|               |                                     |                      | 836.52                  | 384         | 23.87                 |
|               |                                     |                      | 848.31                  | 777         | 23.81                 |
| 1xEVDO Rev. A | FETAP:307.2k, QPSK/ ACK             | RETAP: 4096          | 824.70                  | 1013        | 23.87                 |
|               |                                     |                      | 836.52                  | 384         | 23.88                 |
|               |                                     |                      | 848.31                  | 777         | 23.84                 |

## Occupied Bandwidth

CDMA BC0 1xEVDO Rev. A

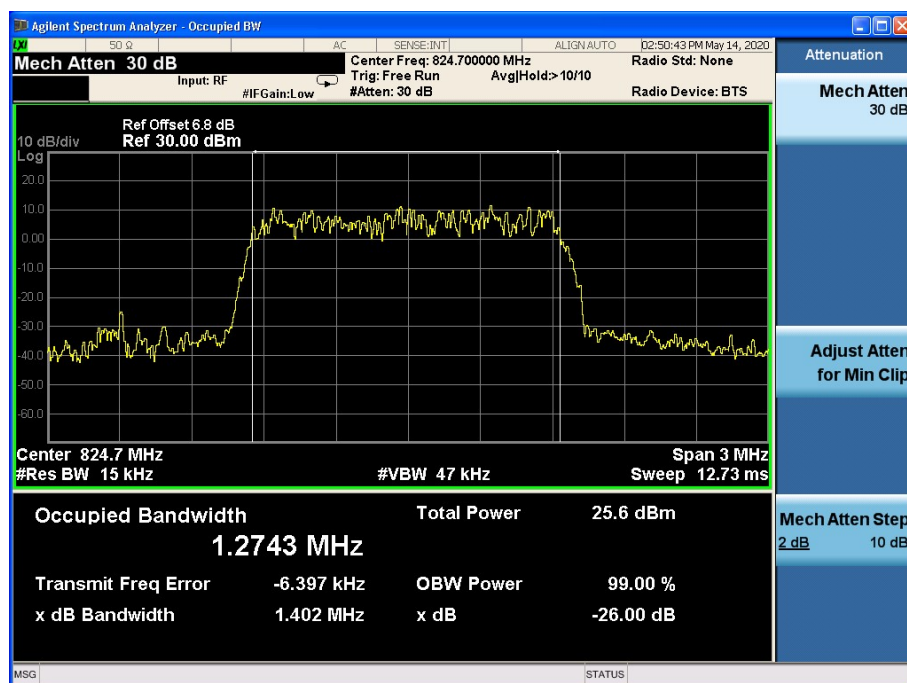
| Carrier frequency (MHz) | Channel No. | Bandwidth of 99% Power (MHz) |
|-------------------------|-------------|------------------------------|
| 824.70                  | 1013        | 1.2743                       |
| 836.52                  | 384         | 1.2693                       |
| 848.31                  | 777         | 1.2755                       |

## Emission Bandwidth

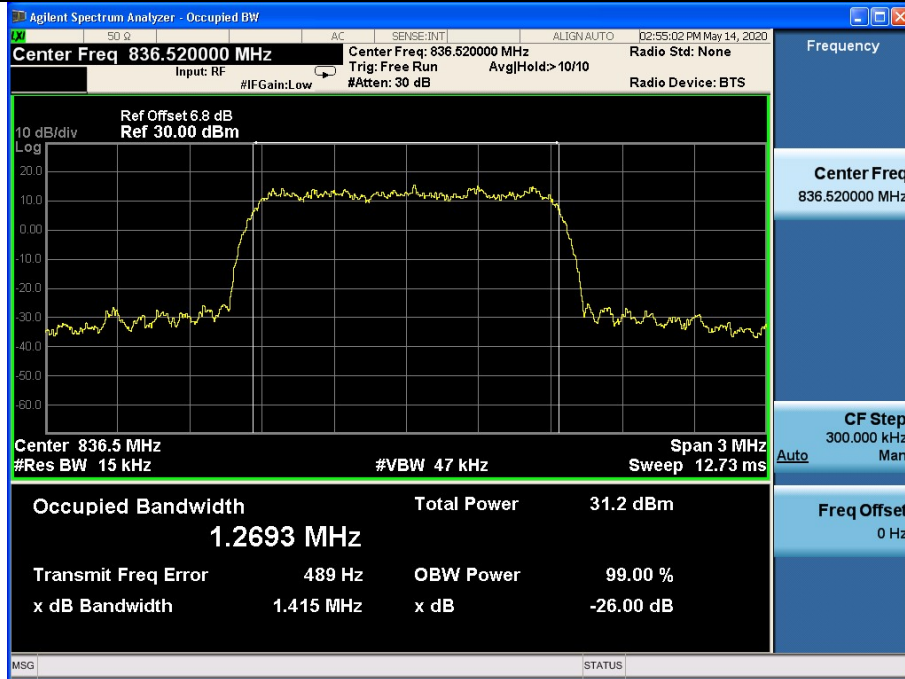
CDMA BC0 1xEVDO Rev. A

| Carrier frequency (MHz) | Channel No. | Bandwidth of -26dB transmitter power (MHz) |
|-------------------------|-------------|--|
| 824.70                  | 1013        | 1.402                                      |
| 836.52                  | 384         | 1.415                                      |
| 848.31                  | 777         | 1.411                                      |

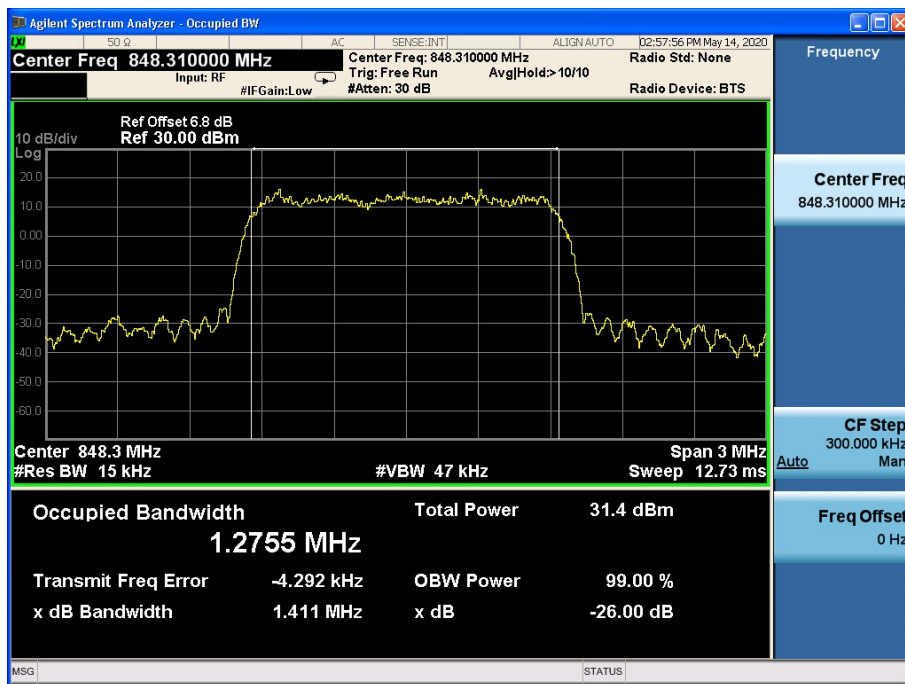
CDMA BC0



Channel 1013



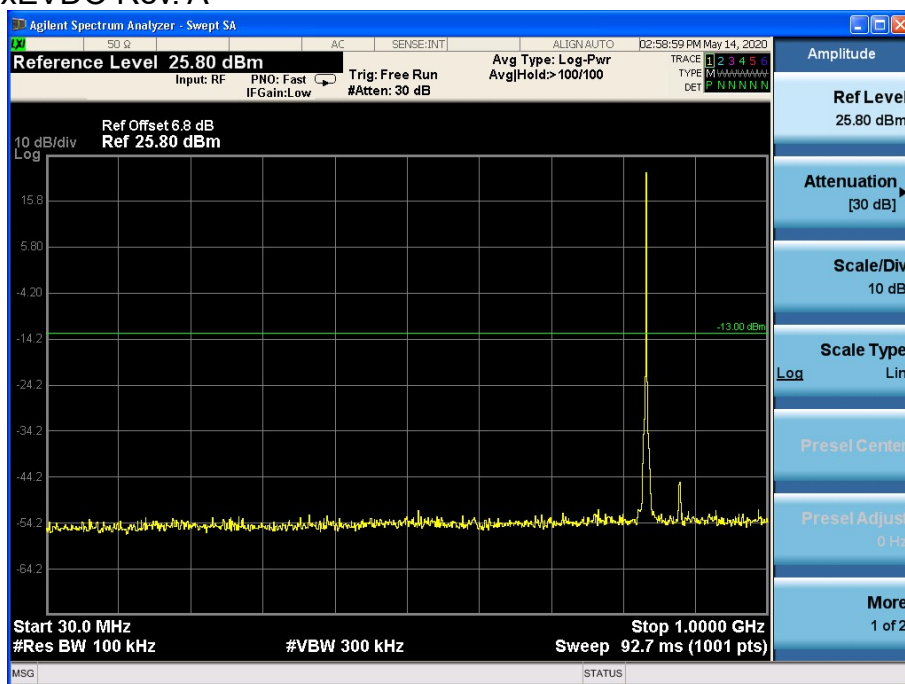
Channel 384



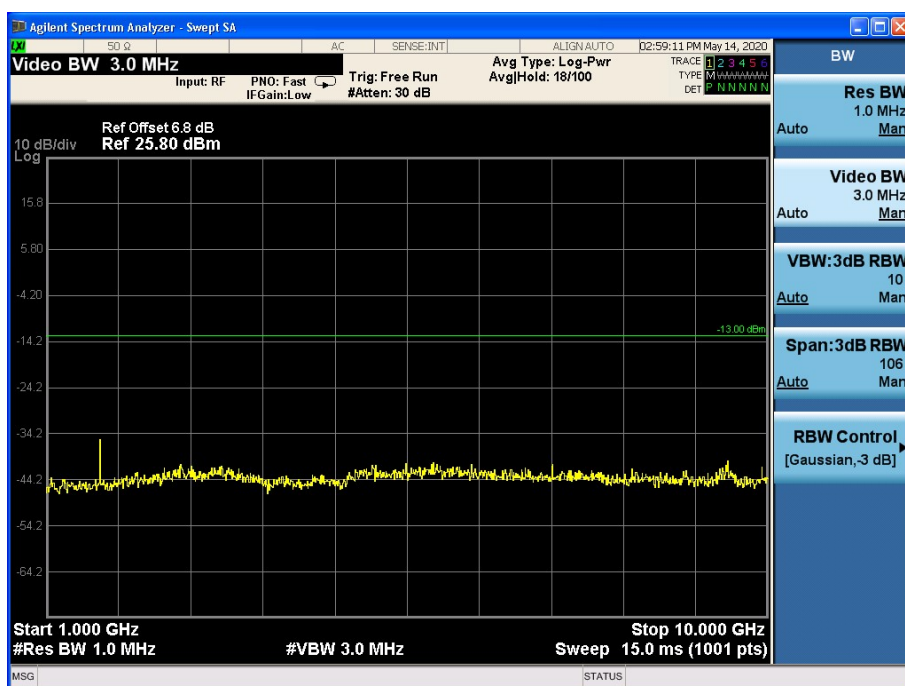
Channel 777

## Spurious Emissions at antenna terminal

### CDMA BC0 1xEVDO Rev. A



Channel 384, 30MHz~1GHz

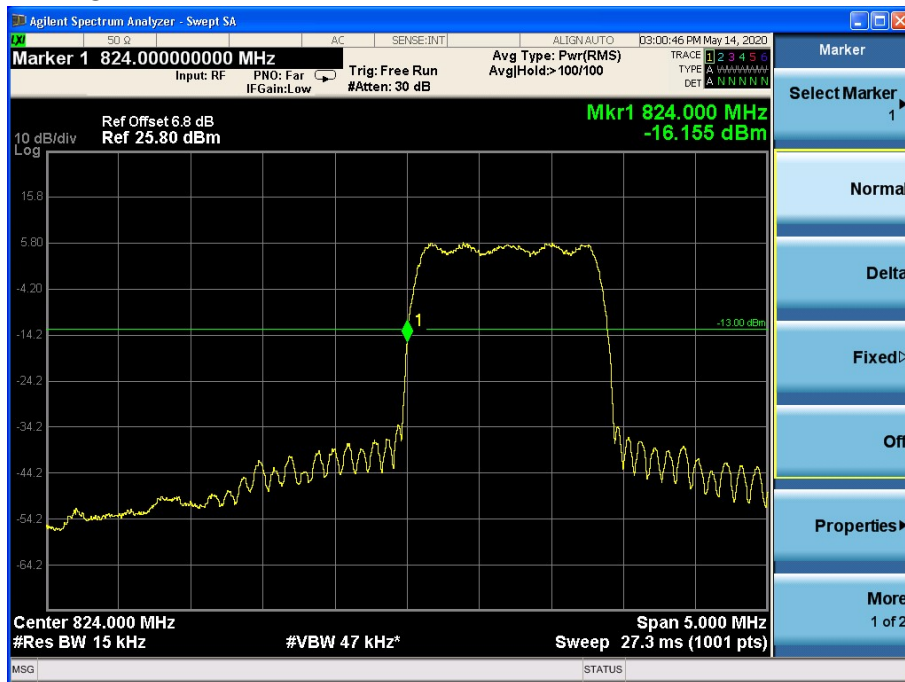


Channel 384, 1GHz~10GHz

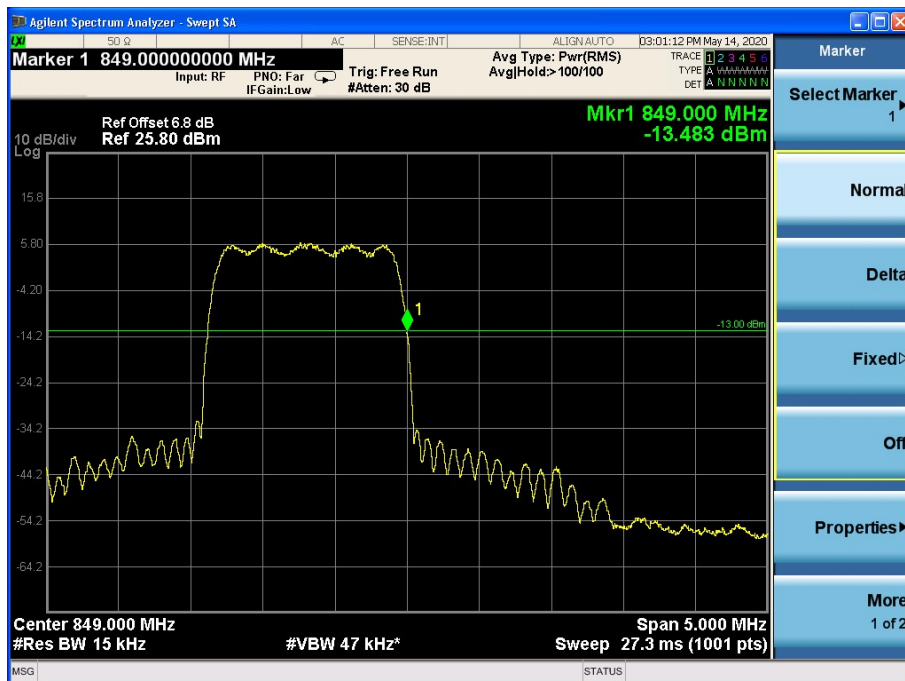


## Band Edges Compliance

### CDMA BC0 1xEVDO Rev. A



Channel 1013



Channel 777

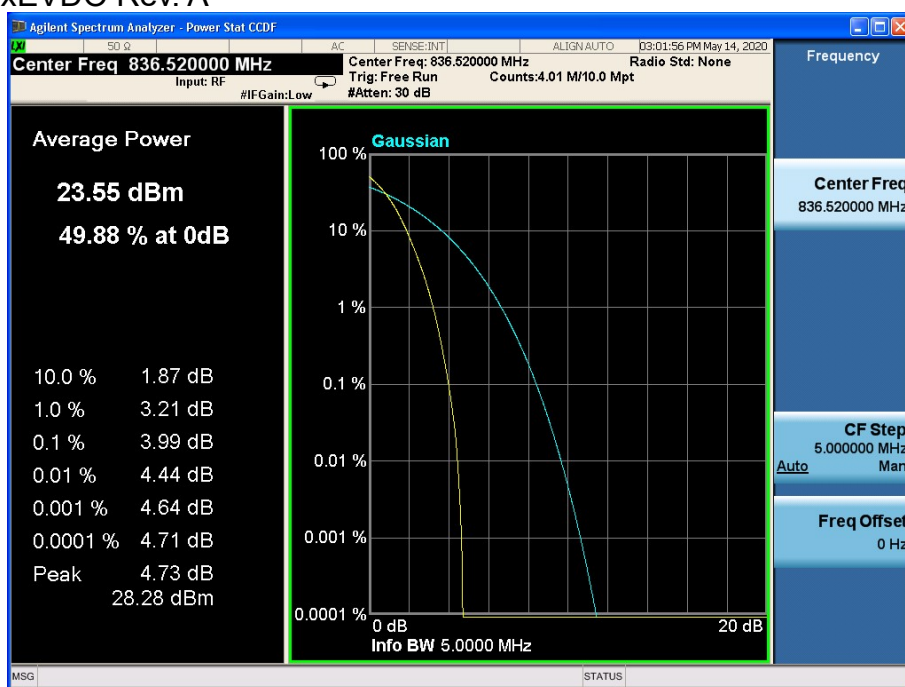
## Frequency Stability

CDMA BC0 1xEVDO Rev. A

| Temperature(°C) | Test Result (ppm)@NV |             |             |
|-----------------|----------------------|-------------|-------------|
|                 | Channel 1013         | Channel 384 | Channel 777 |
| -30             | -0.056               | 0.044       | 0.051       |
| -20             | -0.022               | -0.045      | 0.004       |
| -10             | -0.022               | -0.091      | -0.062      |
| 0               | -0.081               | 0.025       | -0.024      |
| +10             | -0.021               | -0.091      | -0.093      |
| +20             | 0.000                | 0.000       | 0.000       |
| +30             | -0.005               | -0.065      | -0.041      |
| +40             | -0.065               | 0.035       | 0.007       |
| +50             | 0.044                | -0.026      | -0.061      |
| +60             | -0.071               | 0.063       | 0.053       |
| +70             | 0.003                | 0.070       | -0.088      |
| LV@20°C         | -0.038               | -0.062      | -0.020      |
| HV@20°C         | -0.022               | -0.091      | -0.062      |

## Peak-Average Ratio

CDMA BC0 1xEVDO Rev. A



## APPENDIX B – TEST DATA OF RADIATED EMISSION

The measurement results are obtained as described below:

Peak ERP = Pmea + Pca Cable loss+ Ga Antenna Gain- Correction

Sample calculation: (23.87 dBm) = (21.12 dBm) + (-3.4 dB) + (8.3 dB)- (2.15 dB), the corresponding frequency is 824.70MHz.

| Frequency (MHz) | Peak ERP (dBm) | Pca Cable loss(dB) | Ga Antenna Gain (dB) | Correction (dB) | Pmea (dBm) | Polarization |
|-----------------|----------------|--------------------|----------------------|-----------------|------------|--------------|
| 824.70          | 23.87          | -3.4               | 8.3                  | 2.15            | 21.12      | Vertical     |

BC0 Test result:

1X RTT BC0:

| Frequency (MHz) | Peak ERP (dBm) | Pca Cable loss(dB) | Ga Antenna Gain (dB) | Correction (dB) | Pmea (dBm) | Polarization |
|-----------------|----------------|--------------------|----------------------|-----------------|------------|--------------|
| 824.70          | 23.87          | -3.4               | 8.3                  | 2.15            | 21.12      | Vertical     |
| 836.52          | 24.59          | -3.4               | 8.3                  | 2.15            | 21.84      | Vertical     |
| 848.31          | 23.86          | -3.4               | 8.3                  | 2.15            | 21.11      | Vertical     |

1X EVDO R0 BC0:

| Frequency (MHz) | Peak ERP (dBm) | Pca Cable loss(dB) | Ga Antenna Gain (dB) | Correction (dB) | Pmea (dBm) | Polarization |
|-----------------|----------------|--------------------|----------------------|-----------------|------------|--------------|
| 824.70          | 23.97          | -3.4               | 8.3                  | 2.15            | 21.22      | Vertical     |
| 836.52          | 24.17          | -3.4               | 8.3                  | 2.15            | 21.42      | Vertical     |
| 848.31          | 24.14          | -3.4               | 8.3                  | 2.15            | 21.39      | Vertical     |

1X EVDO RA BC0:

| Frequency (MHz) | Peak ERP (dBm) | Pca Cable loss(dB) | Ga Antenna Gain (dB) | Correction (dB) | Pmea (dBm) | Polarization |
|-----------------|----------------|--------------------|----------------------|-----------------|------------|--------------|
| 824.70          | 24.16          | -3.4               | 8.3                  | 2.15            | 21.41      | Vertical     |
| 836.52          | 24.06          | -3.4               | 8.3                  | 2.15            | 21.31      | Vertical     |
| 848.31          | 23.95          | -3.4               | 8.3                  | 2.15            | 21.20      | Vertical     |

Test result:  
1X RTT BC0  
Channel 384:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1648.28         | -52.64      | -13           | Vertical     |
| 1665.04         | -51.17      | -13           | Vertical     |
| 2534.02         | -44.72      | -13           | Vertical     |
| 2579.13         | -43.98      | -13           | Vertical     |
| 8963.42         | -39.78      | -13           | Vertical     |
| 9973.61         | -35.91      | -13           | Vertical     |

Channel 777:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1646.54         | -52.93      | -13           | Vertical     |
| 1666.57         | -51.46      | -13           | Vertical     |
| 2534.85         | -44.67      | -13           | Vertical     |
| 2577.93         | -43.78      | -13           | Vertical     |
| 8961.07         | -39.25      | -13           | Vertical     |
| 9973.51         | -36.22      | -13           | Vertical     |

Channel 1013:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1649.32         | -53.08      | -13           | Vertical     |
| 1665.77         | -51.37      | -13           | Vertical     |
| 2535.81         | -44.01      | -13           | Vertical     |
| 2577.58         | -43.74      | -13           | Vertical     |
| 8963.70         | -39.03      | -13           | Vertical     |
| 9971.91         | -36.86      | -13           | Vertical     |

1X EVDO R0 BC0:  
Channel 384:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1648.93         | -53.28      | -13           | Vertical     |
| 1665.64         | -51.17      | -13           | Vertical     |
| 2536.01         | -43.90      | -13           | Vertical     |
| 2577.63         | -43.97      | -13           | Vertical     |
| 8961.90         | -39.51      | -13           | Vertical     |
| 9973.62         | -36.33      | -13           | Vertical     |

Channel 777:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1650.43         | -52.98      | -13           | Vertical     |
| 1666.42         | -51.34      | -13           | Vertical     |
| 2532.66         | -44.34      | -13           | Vertical     |
| 2577.55         | -44.66      | -13           | Vertical     |
| 8961.79         | -39.98      | -13           | Vertical     |
| 9971.35         | -36.45      | -13           | Vertical     |

Channel 1013:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1647.05         | -52.99      | -13           | Vertical     |
| 1667.27         | -50.82      | -13           | Vertical     |
| 2536.04         | -44.44      | -13           | Vertical     |
| 2576.11         | -44.63      | -13           | Vertical     |
| 8960.91         | -39.46      | -13           | Vertical     |
| 9973.17         | -36.32      | -13           | Vertical     |

1X EVDO RA BC0:

Channel 384:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1649.32         | -52.71      | -13           | Vertical     |
| 1666.44         | -51.28      | -13           | Vertical     |
| 2535.31         | -44.61      | -13           | Vertical     |
| 2579.03         | -44.03      | -13           | Vertical     |
| 8964.55         | -39.32      | -13           | Vertical     |
| 9972.81         | -36.48      | -13           | Vertical     |

Channel 777:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1647.71         | -53.22      | -13           | Vertical     |
| 1666.42         | -51.34      | -13           | Vertical     |
| 2533.12         | -44.06      | -13           | Vertical     |
| 2577.54         | -43.92      | -13           | Vertical     |
| 8963.50         | -39.36      | -13           | Vertical     |
| 9970.38         | -36.11      | -13           | Vertical     |

Channel 1013:

| Frequency (MHz) | Power (dBm) | Limited (dBm) | Polarization |
|-----------------|-------------|---------------|--------------|
| 1646.61         | -53.39      | -13           | Vertical     |
| 1668.46         | -50.97      | -13           | Vertical     |
| 2532.93         | -44.27      | -13           | Vertical     |
| 2576.28         | -44.08      | -13           | Vertical     |
| 8960.85         | -39.58      | -13           | Vertical     |
| 9970.65         | -36.55      | -13           | Vertical     |

---The end of the test report---