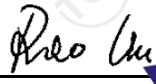




TEST REPORT

FCC ID. :	2AHZ5X70	
Test Report No..... :	TCT230423E059	
Date of issue..... :	May 29, 2023	
Testing laboratory	SHENZHEN TONGCE TESTING LAB	
Testing location/ address:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name..... :	Shenzhen Huafurui Technology Co., Ltd	
Address..... :	Unit 1401 14/F, Jin qi zhi gu mansion Liu xian, street, Xili, Nan shan district, Shenzhen, China	
Manufacturer's name ... :	Shenzhen Huafurui Technology Co., Ltd	
Address..... :	Unit 1401 14/F, Jin qi zhi gu mansion Liu xian, street, Xili, Nan shan district, Shenzhen, China	
Standard(s)	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part22 FCC CFR Title 47 Part24	
Test item description	Smartphone	
Trade Mark	CUBOT	
Model/Type reference..... :	X70	
Rating(s)..... :	Adapter Information: Model: HJ-FC018K7-US Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 5.0V, 2.0A or DC 7.0V, 2.0A or DC 9.0V, 2.0A, 18.0W Rechargeable Li-ion Battery DC 3.87V	
Date of receipt of test item	Apr. 23, 2023	
Date (s) of performance of test..... :	Apr. 23, 2023 - May 29, 2023	
Tested by (+signature) ... :	Rleo LIU	
Check by (+signature).... :	Beryl ZHAO	
Approved by (+signature):	Tomsin	

General disclaimer:

This report shall not be reproduced except in full, without the written approval of SHENZHEN TONGCE TESTING LAB. This document may be altered or revised by SHENZHEN TONGCE TESTING LAB personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

Table of Contents

1. General Product Information	3
1.1. EUT description	3
1.2. Model(s) list.....	3
1.3. Operation Frequency	4
2. Test Result Summary	5
3. General Information.....	6
3.1. Test environment and mode.....	6
3.2. Description of Support Units.....	7
3.3. Configuration of Tested System	8
3.4. Measurement Results Explanation Example.....	8
4. Facilities and Accreditations	9
4.1. Facilities	9
4.2. Location	9
4.3. Measurement Uncertainty.....	9
5. Test Results and Measurement Data	10
5.1. Conducted Output Power Measurement	10
5.2. Peak to Average Ratio.....	12
5.3. 99% Occupied Bandwidth and 26dB Bandwidth Measurement	14
5.4. Band Edge and Conducted Spurious Emission Measurement	18
5.5. Effective Radiated Power and Effective Isotropic Radiated Power Measurement	21
5.6. Field Strength of Spurious Radiation Measurement	30
5.7. Frequency Stability Measurement	36
Appendix A: Photographs of Test Setup	
Appendix B: Photographs of EUT	

1. General Product Information

1.1. EUT description

Test item description	Smartphone
Model/Type reference.....	X70
Sample Number.....	TCT230423E022-0102
Tx Frequency	CDMA BC0: 824.70MHz ~ 848.31MHz CDMA BC1: 1851.25MHz ~ 1908.75MHz
Rx Frequency	CDMA BC0: 869.70MHz ~ 893.31MHz CDMA BC1: 1931.25MHz ~ 1988.75MHz
Maximum Output Power to Antenna.....	CDMA BC0: 23.71dBm CDMA BC1: 23.44dBm
99% Occupied Bandwidth.....	CDMA BC0: 1M28F9W CDMA BC1: 1M28F9W
Type of Modulation.....	1xRTT: QPSK 1xEV-DO: QPSK/8PSK
Antenna Type.....	FPC Antenna
Antenna Gain.....	CDMA BC0: -0.64dBi CDMA BC1: 0.97dBi
Rating(s).....	Adapter Information: Model: HJ-FC018K7-US Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 5.0V, 2.0A or DC 7.0V, 2.0A or DC 9.0V, 2.0A, 18.0W Rechargeable Li-ion Battery DC 3.87V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

None.

1.3. Operation Frequency

CDMA BC0		CDMA BC1	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
1013	824.70	25	1851.25
1014	824.73	26	1851.28
....
383	836.49	599	1879.97
384	836.52	600	1880
385	836.55	601	1880.03
...
776	848.28	1174	1908.72
777	848.31	1175	1908.75

2. Test Result Summary

Requirement	CFR 47 Section	Result
Conducted Output Power	§22.913; §2.1046 §24.232	PASS
Peak-to-Average Ratio	§2.1046; §22.913 §24.232(d)	PASS
Effective Radiated Power	§2.1046; §22.913(a) §24.232	PASS
Equivalent Isotropic Radiated Power	§2.1046; §22.913(a) §24.232	PASS
Occupied Bandwidth	§2.1049	PASS
Band Edge	§2.1051 §22.917(a) §24.238(a)	PASS
Conducted Spurious Emission	§2.1051; §22.917 §24.238	PASS
Field Strength of Spurious Radiation	§2.1053; §22.917(a) §24.238	PASS
Frequency Stability for Temperature & Voltage	§2.1055; §22.355 §24.235	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. General Information

3.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar

Keep the EUT in communication with CMU200 and select channel with modulation
All modes and data rates and positions were investigated.
Test modes are chosen to be reported as the worst case configuration below:

Test Mode		
Band	Radiated TCs	Conducted TCs
CDMA BC0	1xRTT Link	1xRTT Link
CDMA BC1	1xRTT Link	1xRTT Link

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power. Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission. The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarization. The emissions worst-case (Z axis) are shown in Test Results of the following pages.

3.2. Description of Support Units

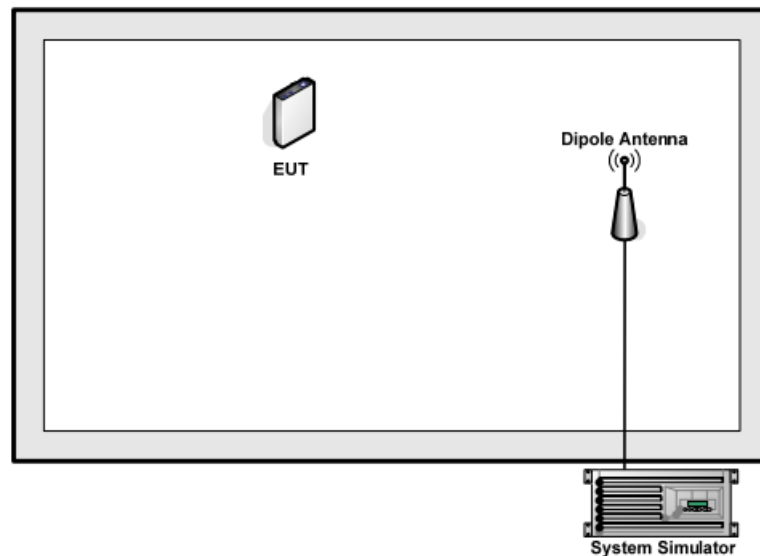
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3.3. Configuration of Tested System



3.4. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level. The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 3 dB and a 5dB attenuator.

Example: $\text{Offset (dB)} = \text{RF cable loss (dB)} + \text{attenuator factor (dB)}$
 $= 8(\text{dB})$

4. Facilities and Accreditations

4.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

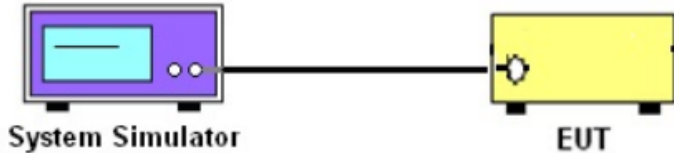
The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB
7	Temperature	$\pm 0.1^{\circ}\text{C}$
8	Humidity	$\pm 1.0\%$

5. Test Results and Measurement Data

5.1. Conducted Output Power Measurement

5.1.1. Test Specification

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC KDB 971168 D01 v03r01
Operation mode:	Refer to item 3.1
Limits:	CDMA BC0: 7W CDMA BC1: 2W
Test Setup:	 <p>The diagram illustrates the test setup. On the left is a purple box labeled 'System Simulator' with a screen and two buttons. A black line connects it to a yellow box on the right labeled 'EUT' (Equipment Under Test), which has a circular port on its side.</p>
Test Procedure:	<ol style="list-style-type: none">1. The transmitter output port was connected to the system simulator.2. Set EUT at maximum power through system simulator.3. Select lowest, middle, and highest channels for each band and different modulation.4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.
Test Result:	PASS

5.1.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	110188	Jul. 04, 2023
Combiner Box	Ascentest	AT890-RFB	/	/

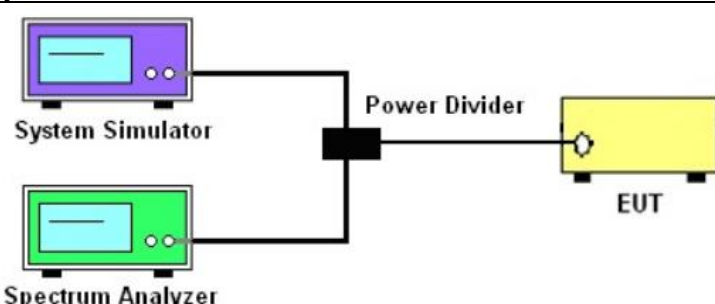
5.1.3. Test data

Conducted Power Measurement Results:

Average Conducted Power (*Unit: dBm)						
Band	CDMA BC0			CDMA BC1		
Channel	1013	384	777	25	600	1175
Frequency(MHz)	824.70	836.52	848.31	1851.25	1880	1908.75
1XRTT RC1 SO55	23.67	23.66	23.71	23.35	23.37	23.44
1XRTT RC3 SO55	23.65	23.63	23.67	23.32	23.36	23.41
1XEV-DO RTAP 153.6Kbps	23.35	23.31	23.42	23.24	23.27	23.27
1XEV-DO RETAP 4096bITS	23.32	23.27	23.40	23.20	23.23	23.22

5.2. Peak to Average Ratio

5.2.1. Test Specification

Test Requirement:	FCC part 22.913; FCC part 24.232(d)
Test Method:	ANSI C63.26:2013
Operation mode:	Refer to item 3.1
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test Setup:	 <p>The diagram shows a System Simulator (purple box) and a Spectrum Analyzer (green box) connected to a Power Divider (black box). The Power Divider is then connected to the EUT (yellow box).</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 D01v03r01 Section 5.7.1. 2. The EUT was connected to spectrum analyzer and system simulator via a power divider. 3. Set EUT to transmit at maximum output power. 4. For GSM/EGPRS operating modes, signal gating is implemented on the spectrum analyzer by triggering from the system simulator. 5. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.
Test Result:	PASS

5.2.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	110188	Jul. 04, 2023
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 04, 2023
Combiner Box	Ascentest	AT890-RFB	/	/

5.2.3. Test Data

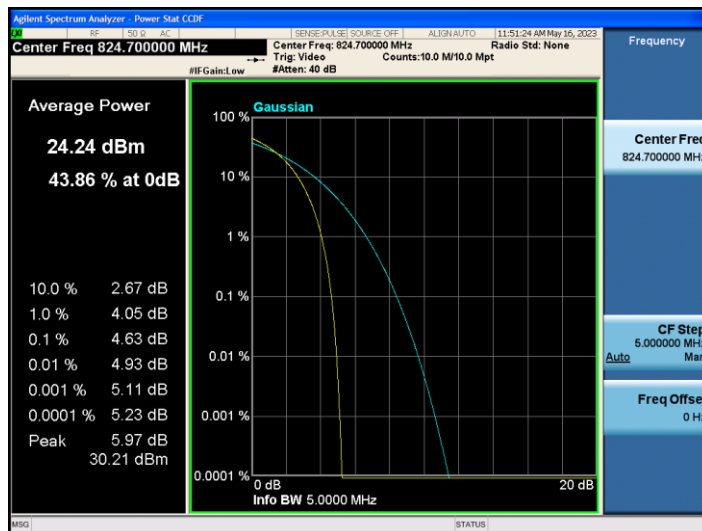
Cellular Band			
Mode	CDMA BC0		
Channel	1013	384	777
Frequency (MHz)	824.70	836.52	848.31
Peak-to-Average Ratio (dB)	4.63	4.95	4.75

Cellular Band			
Mode	CDMA BC1		
Channel	25	600	1175
Frequency (MHz)	1851.25	1880	1908.75
Peak-to-Average Ratio (dB)	4.13	4.32	3.78

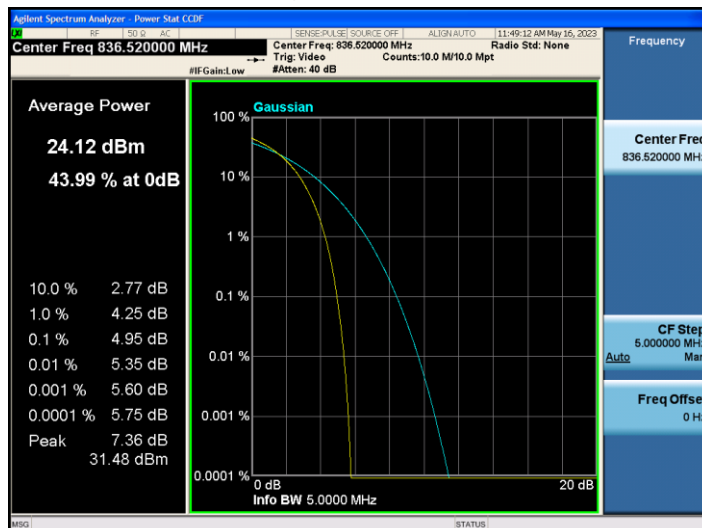
Test plots as follows:

CDMA BC0

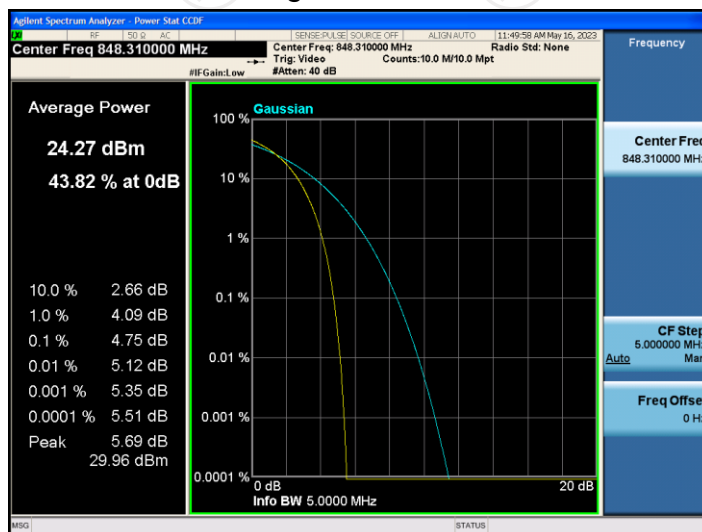
Peak-to-Average Ratio on Channel 1013



Peak-to-Average Ratio on Channel 384

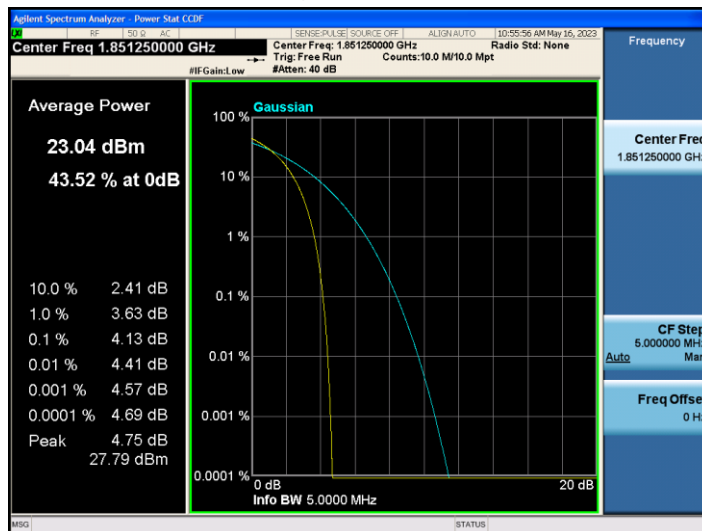


Peak-to-Average Ratio on Channel 777

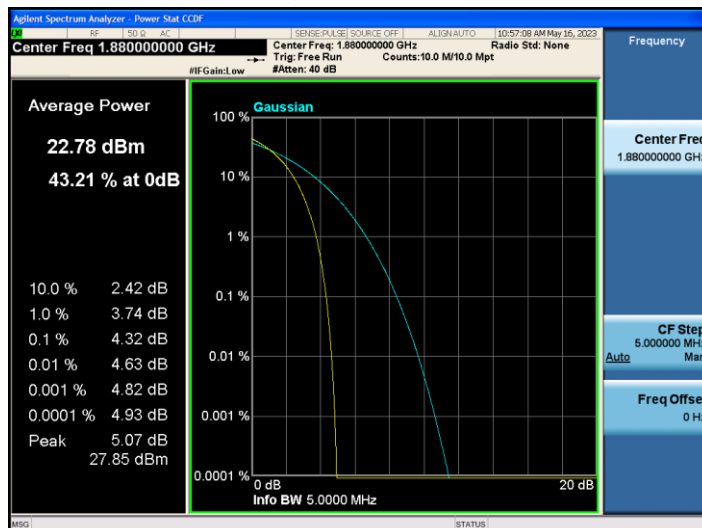


CDMA BC1

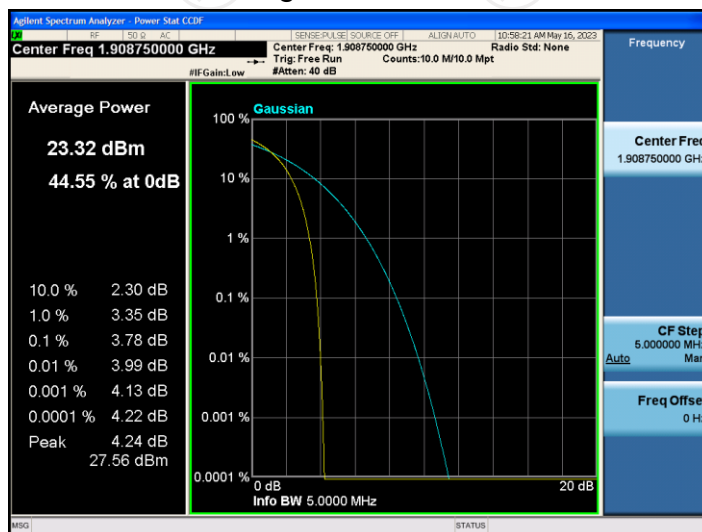
Peak-to-Average Ratio on Channel 25



Peak-to-Average Ratio on Channel 600

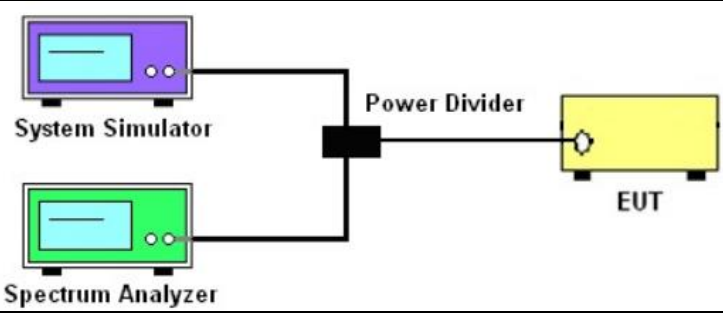


Peak-to-Average Ratio on Channel 1175



5.3. 99% Occupied Bandwidth and 26dB Bandwidth Measurement

5.3.1. Test Specification

Test Requirement:	FCC part 2.1049
Test Method:	FCC KDB 971168 D01v03r01
Operation mode:	Refer to item 3.1
Limit:	N/A
Test Setup:	
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 D01v03r01 Section 4.2. 2. The EUT was connected to the spectrum analyzer and system simulator via a power divider. 3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold. 5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.
Test Result:	PASS

5.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	110188	Jul. 04, 2023
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 04, 2023
Combiner Box	Ascentest	AT890-RFB	/	/

5.3.3. Test data

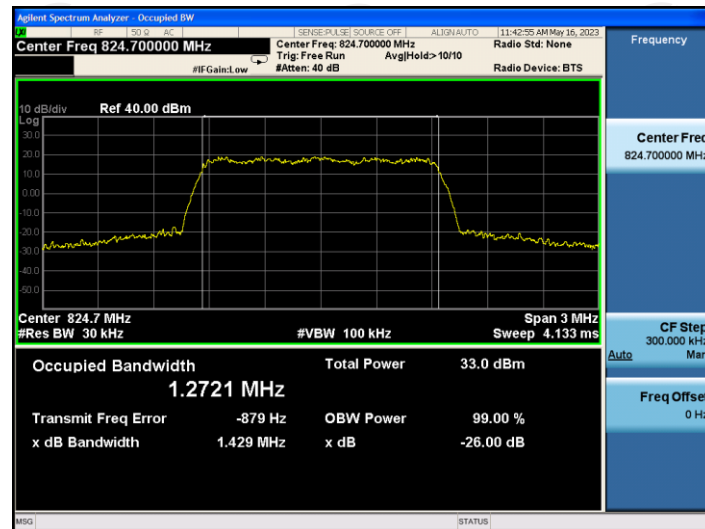
Cellular Band			
Mode	CDMA BC0		
Channel	1013	384	777
Frequency (MHz)	824.70	836.52	848.31
99% OBW (kHz)	1272.1	1275.2	1276.7
26dB BW (kHz)	1429	1426	1417

Cellular Band			
Mode	CDMA BC1		
Channel	25	600	1175
Frequency (MHz)	1851.25	1880	1908.75
99% OBW (kHz)	1275.2	1275.0	1280.0
26dB BW (kHz)	1430	1432	1447

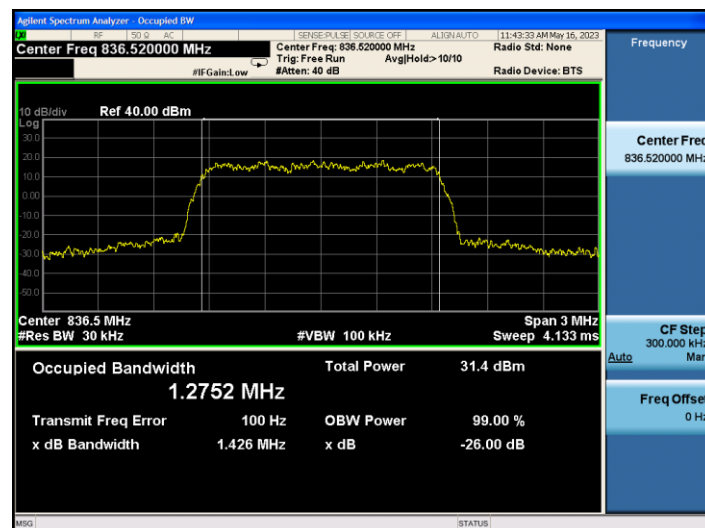
Test plots as follows:

Band:	CDMA BC0	Test Mode:	1xRTT Link
-------	----------	------------	------------

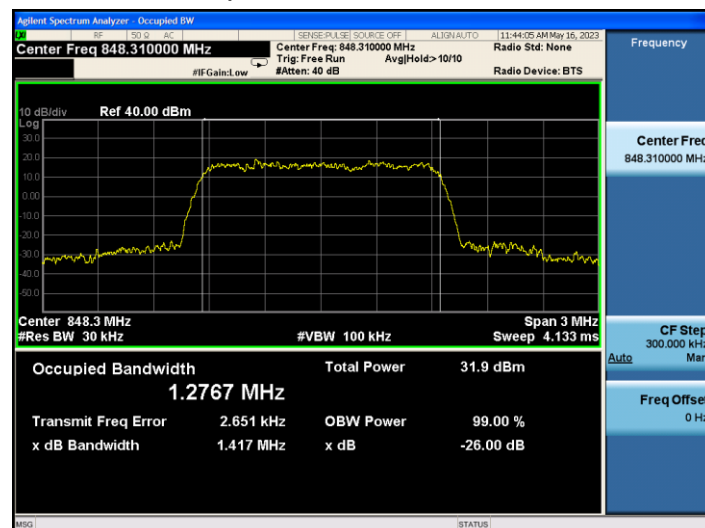
26dB&99% Occupied Bandwidth Plot on Channel 1013



26dB&99% Occupied Bandwidth Plot on Channel 384

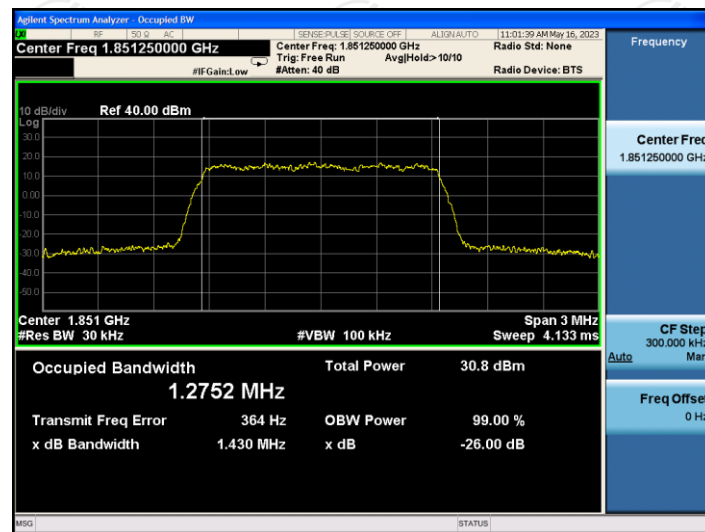


26dB&99% Occupied Bandwidth Plot on Channel 777

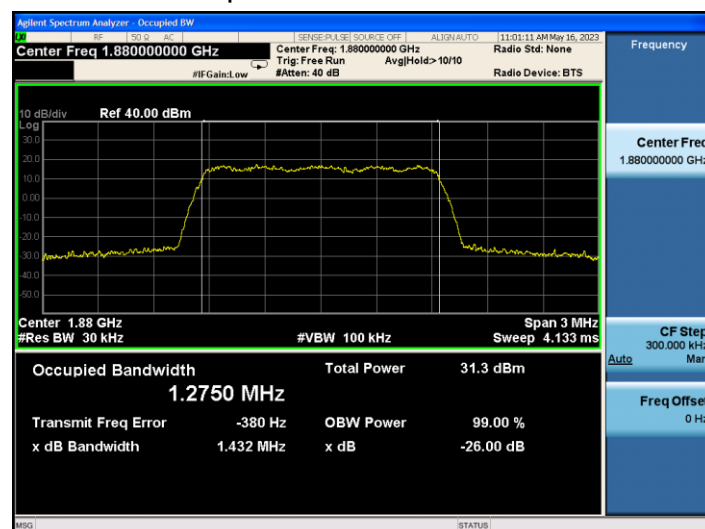


Band:	CDMA BC1	Test Mode:	1xRTT Link
-------	----------	------------	------------

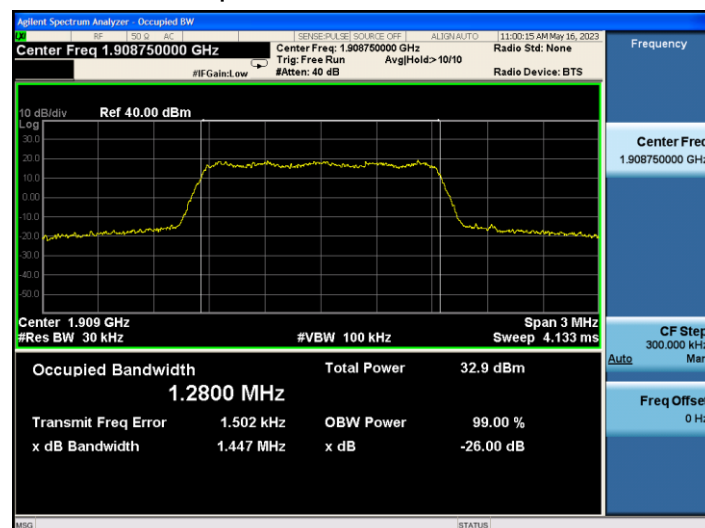
26dB&99% Occupied Bandwidth Plot on Channel 25



26dB&99% Occupied Bandwidth Plot on Channel 600

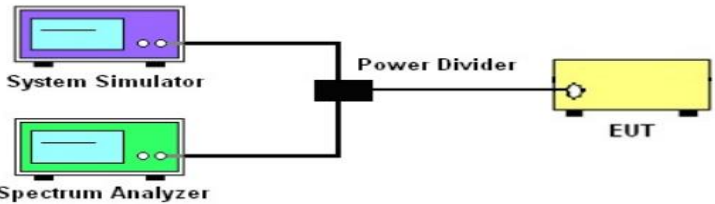


26dB&99% Occupied Bandwidth Plot on Channel 1175



5.4. Band Edge and Conducted Spurious Emission Measurement

5.4.1. Test Specification

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC KDB 971168 D01v03r01
Operation mode:	Refer to item 3.1
Limit:	-13dBm
Test Setup:	 <p>The diagram shows a System Simulator (purple box) and a Spectrum Analyzer (green box) connected to a Power Divider (black box). The Power Divider is also connected to the EUT (yellow box).</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 D01v03r01 Section 6.0. 2. The EUT was connected to the spectrum analyzer and system simulator via a power divider. 3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement. 4. The band edges of low and high channels for the highest RF powers were measured. 5. The conducted spurious emission for the whole frequency range was taken. 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band. 7. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power $P(\text{Watts}) = P(\text{W}) - [43 + 10\log(P)] (\text{dB}) = [30 + 10\log(P)] (\text{dBm}) - [43 + 10\log(P)] (\text{dB}) = -13\text{dBm}.$
Test Result:	PASS

5.4.2. Test Instruments

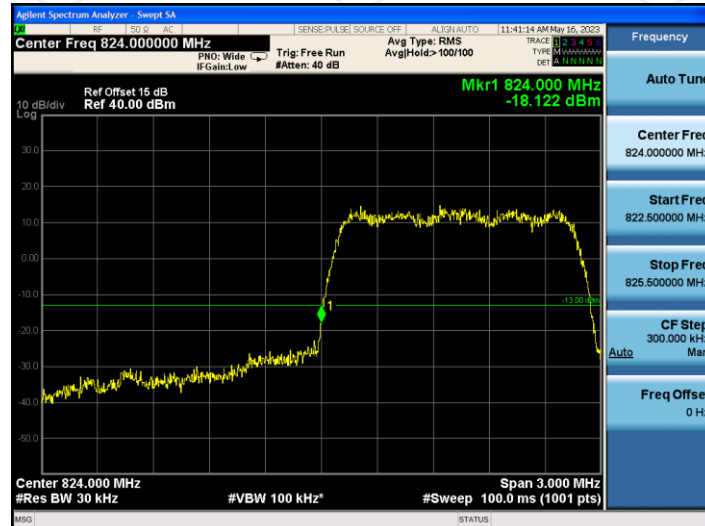
Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	110188	Jul. 04, 2023
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 04, 2023
Combiner Box	Ascentest	AT890-RFB	/	/

5.4.3. Test data

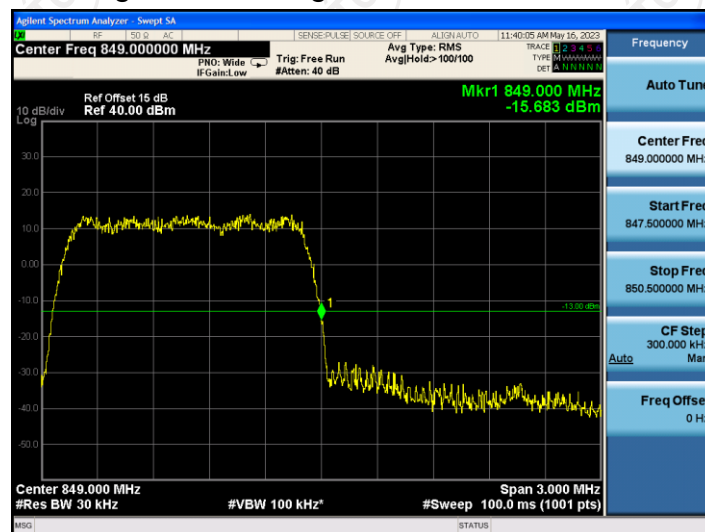
Test plots as follows:

Band:	CDMA BC0	Test Mode:	1xRTT Link
-------	----------	------------	------------

Lower Band Edge Plot on Channel 1013

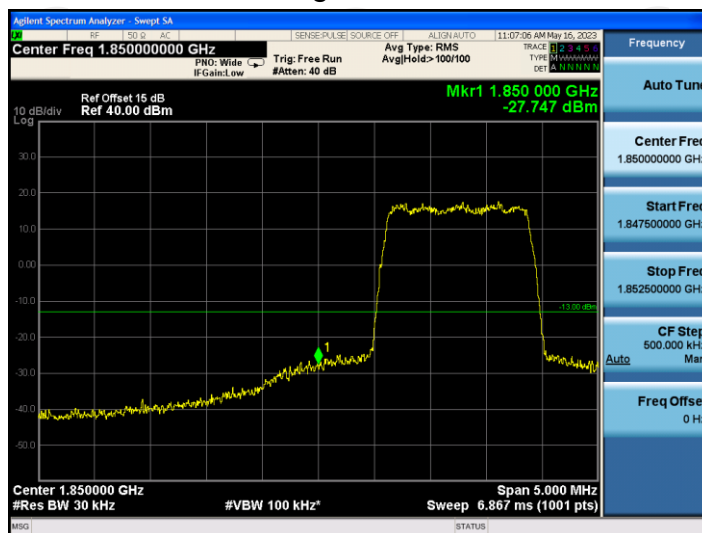


Higher Band Edge Plot on Channel 777

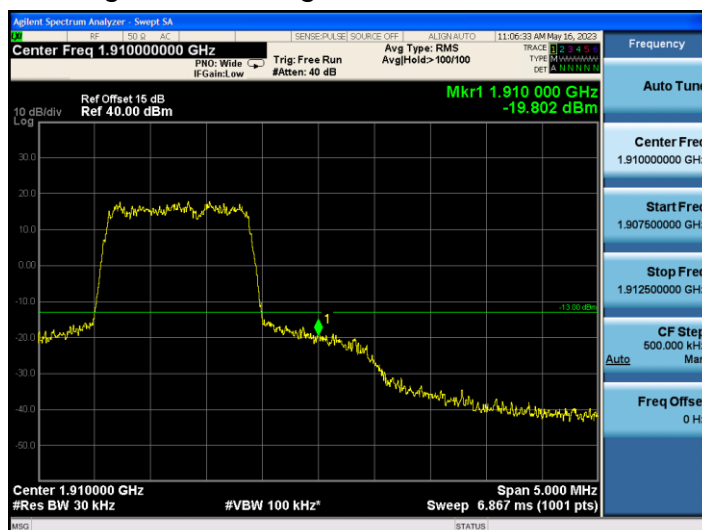


Band:	CDMA BC1	Test Mode:	1xRTT Link
-------	----------	------------	------------

Lower Band Edge Plot on Channel 25

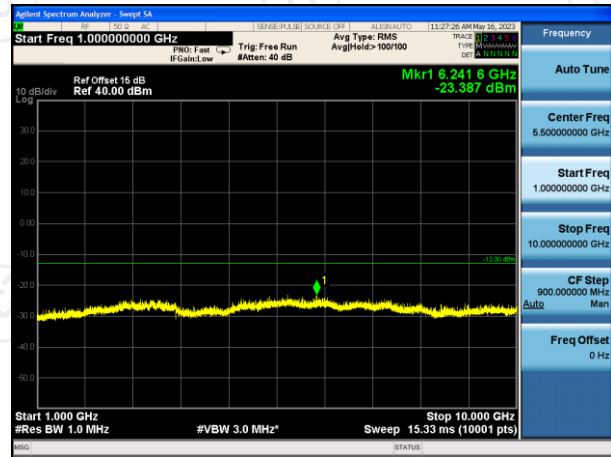
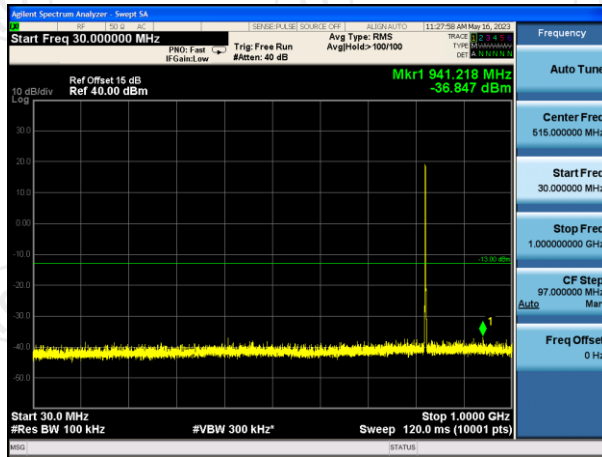


Higher Band Edge Plot on Channel 1175

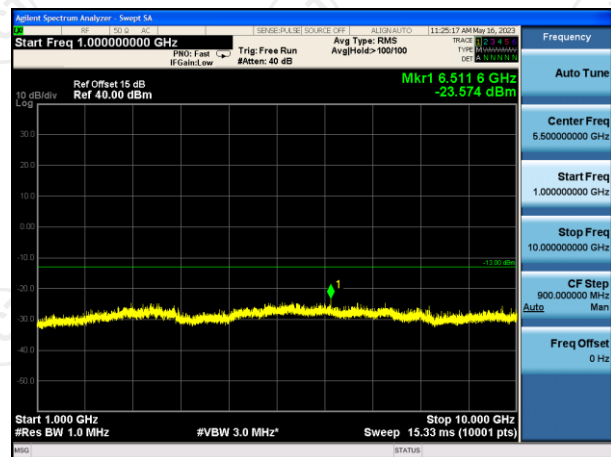
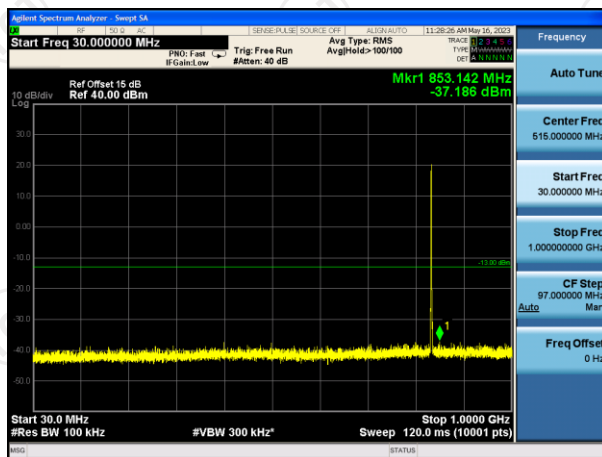


Band:	CDMA BC0	Test Mode:	1xRTT Link
-------	----------	------------	------------

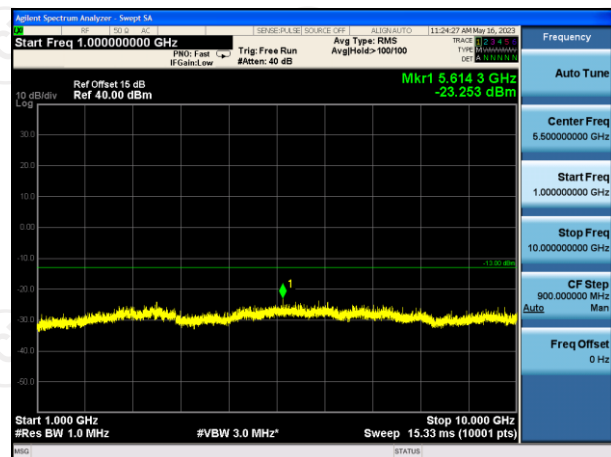
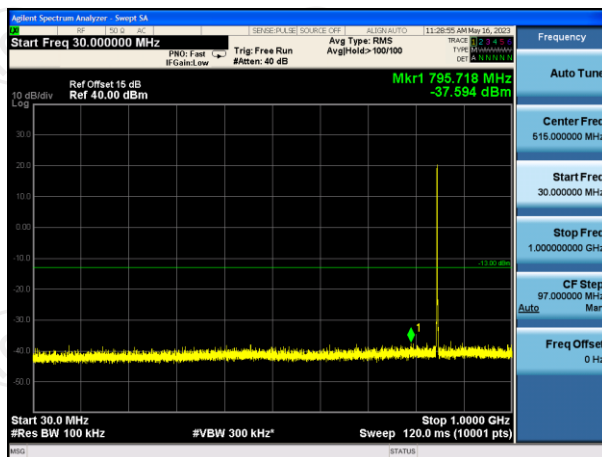
Conducted Spurious Emission on Channel 1013



Conducted Spurious Emission on Channel 384

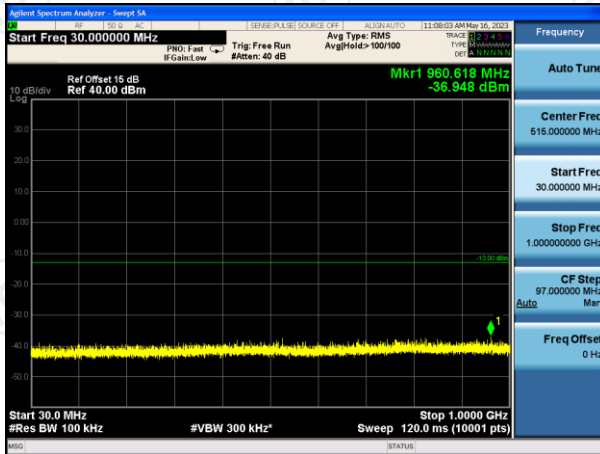


Conducted Spurious Emission on Channel 777

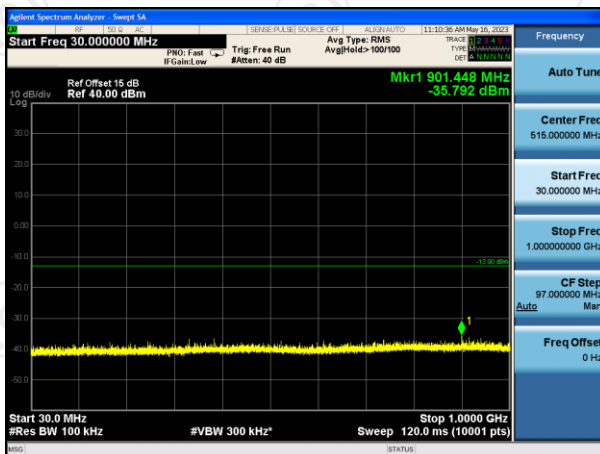


Band:	CDMA BC1	Test Mode:	1xRTT Link
-------	----------	------------	------------

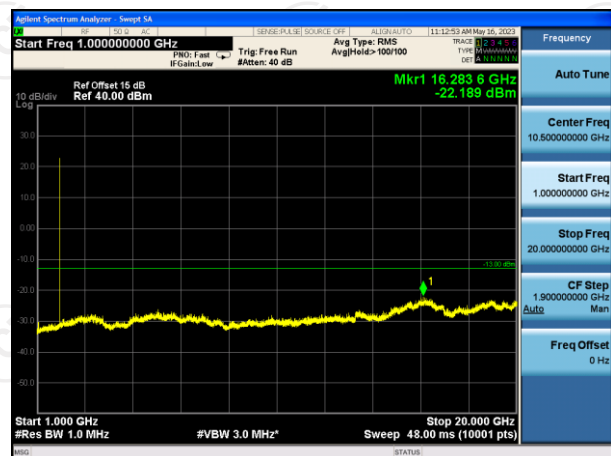
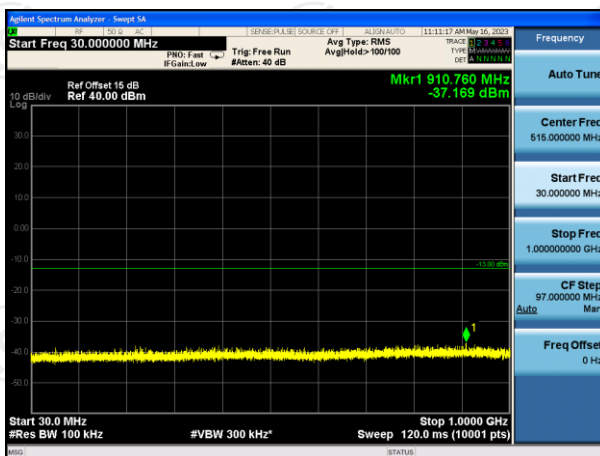
Conducted Spurious Emission on Channel 25



Conducted Spurious Emission on Channel 600

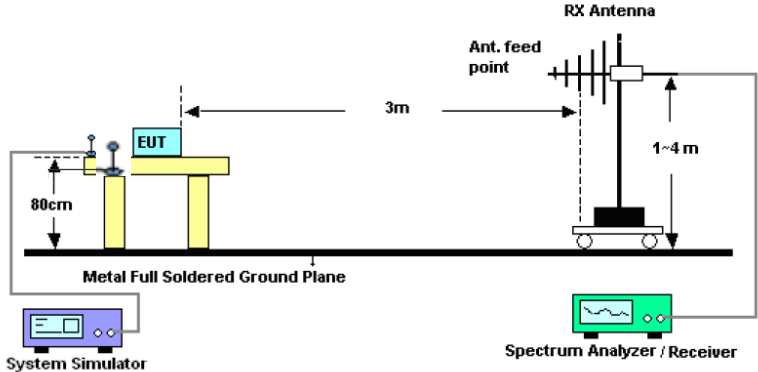
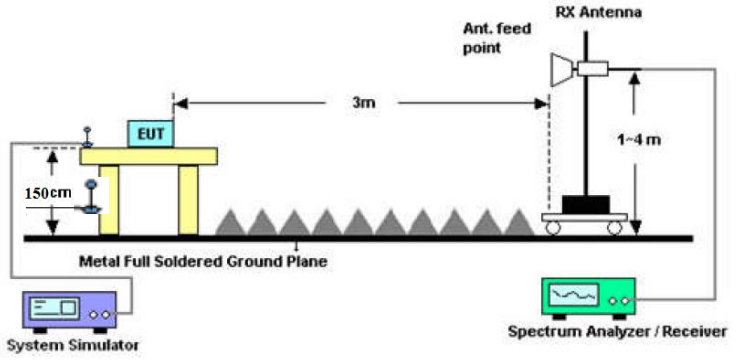


Conducted Spurious Emission on Channel 1175



5.5. Effective Radiated Power and Effective Isotropic Radiated Power Measurement

5.5.1. Test Specification

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(c)		
Test Method:	FCC KDB 971168 D01v03r01		
Receiver Setup:		GSM/GPRS/EDGE	WCDMA/HSPA
	SPAN	500kHz	10MHz
	RBW	10kHz	100kHz
	VBW	30kHz	300kHz
	Detector	RMS	RMS
	Trace	Average	Average
	Average Type	Power	Power
	Sweep Count	100	100
Limit:	CDMA BC0: 7W ERP CDMA BC1: 2W EIRP		
Test Setup:	From 30MHz to 1GHz		
	 <p>Above 1GHz</p> 		
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 D01v03r01 Section 5.8. and ANSI / TIA-603-D-2010 Section 2.2.17. 2. The EUT was placed on a non-conductive rotating 		

	<p>platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01v03.</p> <ol style="list-style-type: none"> 3. Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. 4. Replace the transmitter under test with a substitution antenna. The center of the antenna should be at the same location as the center of the antenna under test. 5. Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading. LOSS = Generator Output Power (dBm) – Analyzer reading (dBm) 6. Determine the effective radiated output power at each angular position from the readings in steps 3) and 5) using the following equation: ERP (dBm) = LVL (dBm) + LOSS (dB) 7. The maximum ERP is the maximum value determined in the preceding step. 8. Calculating ERP: ERP (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBd) Antenna Gain (dBd) = Antenna Gain (dBi) - 2.15 EIRP = ERP + 2.15
Test results:	PASS

5.5.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 04, 2023
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 03, 2023
Signal Generator	HP	83623B	3614A00396	Feb. 24, 2024
Broadband Antenna	Schwarzbeck	VULB9163	340	Jul. 05, 2023
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Jul. 05, 2023
Broadband Antenna	Schwarzbeck	VULB9163	412	Jul. 05, 2023
Horn Antenna	Schwarzbeck	BBHA 9120D	1201	Jul. 05, 2023
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Feb. 24, 2024
Coaxial cable	SKET	RC-18G-N-M	/	Feb. 24, 2024
Coaxial cable	SKET	RC_40G-K-M	/	Feb. 24, 2024
Antenna Mast	Keleto	RE-AM	/	/
EMI Test Software	Shurple Technology	EZ-EMC	/	/

5.5.3. Test Data

Test Result of ERP

CDMA BC0 Radiated Power ERP					
Horizontal Polarization (Antenna Pol.)					
Frequency (MHz)	(EUT Pol.)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.70	H	1.39	21.66	20.90	0.12
836.52	H	1.05	21.54	20.44	0.11
848.31	H	0.89	21.46	20.20	0.10
Vertical Polarization (Antenna Pol.)					
Frequency (MHz)	(EUT Pol.)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.70	H	1.06	21.66	20.57	0.11
836.52	H	1.34	21.54	20.73	0.12
848.31	H	1.54	21.46	20.85	0.12

Note: * $ERP = LVL (dBm) + Correction Factor (dB) - 2.15$
Correction Factor= S.G. Power - Cable loss + Antenna Gain- SPA. Reading

Test Result of EIRP

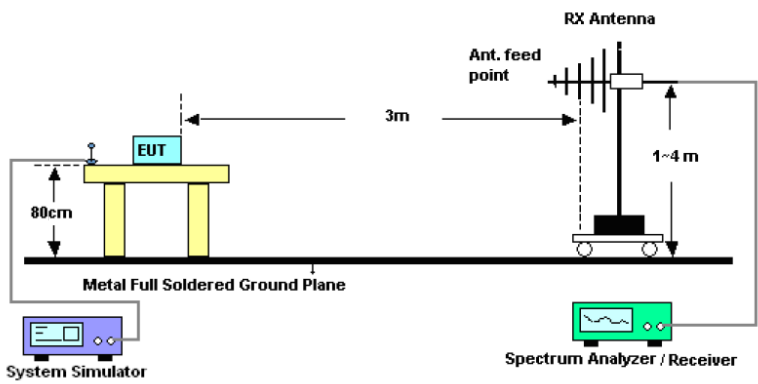
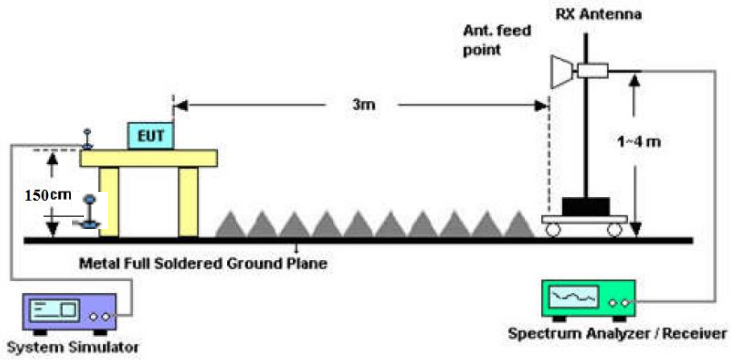
CDMA BC1 Radiated Power EIRP					
Horizontal Polarization (Antenna Pol.)					
Frequency (MHz)	(EUT Pol.)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
1851.25	H	0.89	21.66	22.55	0.18
1880	H	1.37	21.54	22.91	0.20
1908.75	H	0.99	21.46	22.45	0.18
Vertical Polarization (Antenna Pol.)					
Frequency (MHz)	(EUT Pol.)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
1851.25	H	1.42	21.66	23.08	0.20
1880	H	1.32	21.54	22.86	0.19
1908.75	H	1.28	21.46	22.74	0.19

Note: * EIRP = LVL (dBm) + Correction Factor (dB)

Correction Factor = S.G. Power - Cable loss + Antenna Gain - SPA. Reading

5.6. Field Strength of Spurious Radiation Measurement

5.6.1. Test Specification

Test Requirement:	FCC part 22.917(a) and FCC part 24.238(a)
Test Method:	FCC KDB 971168 D01v03r01
Operation mode:	Refer to item 3.1
Limit:	-13dBm
Test setup:	<p>For 30MHz~1GHz</p>  <p>Above 1GHz</p> 
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 D01v03r01 Section 6 and ANSI / TIA-603-D-2010 Section 2.2.12. 2. The EUT was placed on a rotatable wooden table 0.8 meters above the ground. 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower. 4. The table was rotated 360 degrees to determine the position of the highest spurious emission. 5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations. 6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of

	<p>maximum spurious emission.</p> <p>7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.</p> <p>8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.</p> <p>9. Taking the record of output power at antenna port.</p> <p>10. Repeat step 7 to step 8 for another polarization.</p> <p>11. $EIRP\ (dBm) = S.G.\ Power - Tx\ Cable\ Loss + Tx\ Antenna\ Gain$</p> <p>12. $ERP\ (dBm) = EIRP - 2.15$</p> <p>13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.</p> <p>14. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)</p> <p>$= P(W) - [43 + 10\log(P)]\ (dB)$</p> <p>$= [30 + 10\log(P)]\ (dBm) - [43 + 10\log(P)]\ (dB)$</p> <p>$= -13dBm.$</p>
Test results:	PASS
Remark:	All modulations have been tested, but only the worst modulation show in this test item.

5.6.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 04, 2023
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 03, 2023
Signal Generator	HP	83623B	3614A00396	Feb. 24, 2024
Broadband Antenna	Schwarzbeck	VULB9163	340	Jul. 05, 2023
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Jul. 05, 2023
Broadband Antenna	Schwarzbeck	VULB9163	412	Jul. 05, 2023
Horn Antenna	Schwarzbeck	BBHA 9120D	1201	Jul. 05, 2023
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Feb. 24, 2024
Coaxial cable	SKET	RC-18G-N-M	/	Feb. 24, 2024
Coaxial cable	SKET	RC_40G-K-M	/	Feb. 24, 2024
Antenna Mast	Keleto	RE-AM	/	/
EMI Test Software	Shurple Technology	EZ-EMC	/	/

5.6.3. Test Data

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dB μ V/m)	Limit@3m (dB μ V/m)
--	--	--
--	--	--
--	--	--
--	--	--

Note: 1. Emission Level=Reading+ Cable loss+Antenna factor-Amp factor

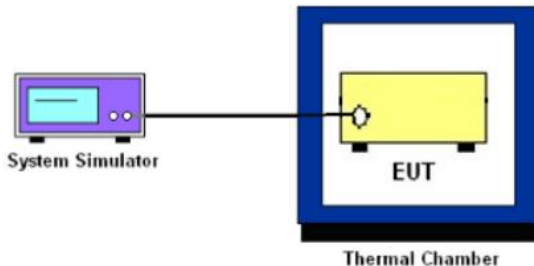
2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

Band	CDMA BC0		Test channel:	Lowest
Test mode:			Temperature:	25°C
			Relative Humidity:	56%
Note:	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.			
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1649.40	Vertical	-44.14	-13.00	PASS
2474.10	V	-41.46		
3298.80	V	-52.73		
1649.40	Horizontal	-44.12		
2474.10	H	-39.60		
3298.80	H	-52.45		
Band	CDMA BC0		Test channel:	Middle
Test mode:			Temperature:	25°C
			Relative Humidity:	56%
Note:	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.			
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.04	Vertical	-43.92	-13.00	PASS
2509.56	V	-46.51		
3346.08	V	-53.98		
1673.04	Horizontal	-43.16		
2509.56	H	-40.94		
3346.08	H	-54.04		
Band	CDMA BC0		Test channel:	Highest
Test mode:			Temperature:	25°C
			Relative Humidity:	56%
Note:	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.			
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1696.62	Vertical	-42.31	-13.00	PASS
2544.93	V	-46.29		
3393.24	V	-54.89		
1696.62	Horizontal	-43.99		
2544.93	H	-42.42		
3393.24	H	-53.67		

Band	CDMA BC1		Test channel:	Lowest
Test mode:			Temperature:	25°C
			Relative Humidity:	56%
Note:	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.			
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3702.50	Vertical	-44.34	-13.00	PASS
5553.75	V	-40.93		
7405	V	-52.88		
3702.50	Horizontal	-44.65		
5553.75	H	-39.67		
7405	H	-52.98		
Band	CDMA BC1		Test channel:	Middle
Test mode:			Temperature:	25°C
			Relative Humidity:	56%
Note:	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.			
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760	Vertical	-43.90	-13.00	PASS
5640	V	-46.54		
7520	V	-53.56		
3760	Horizontal	-42.64		
5640	H	-41.21		
7520	H	-54.23		
Band	CDMA BC1		Test channel:	Highest
Test mode:			Temperature:	25°C
			Relative Humidity:	56%
Note:	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.			
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3817.50	Vertical	-42.04	-13.00	PASS
5726.25	V	-46.14		
7635	V	-54.80		
3817.50	Horizontal	-43.49		
5726.25	H	-42.12		
7635	H	-54.02		

5.7. Frequency Stability Measurement

5.7.1. Test Specification

Test Requirement:	FCC Part 2.1055; FCC Part 22.355; FCC Part 24.235
Test Method:	FCC KDB 971168 D01v03r01
Operation mode:	Refer to item 3.1
Limit:	FCC Part 22.355: ± 2.5 ppm FCC Part 24.235 : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
Test Setup:	 <p>The diagram illustrates the test setup. On the left, a 'System Simulator' is represented by a purple box with a screen and buttons. A line connects it to a yellow box labeled 'EUT' (Equipment Under Test). The EUT is placed inside a blue square frame labeled 'Thermal Chamber'.</p>
Test Procedure:	<p>Test Procedures for Temperature Variation</p> <ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 D01v03r01 Section 9.0. 2. The EUT was set up in the thermal chamber and connected with the system simulator. 3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute. 4. With power OFF, the temperature was raised in 10°C steps up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute. <p>Test Procedures for Voltage Variation</p> <ol style="list-style-type: none"> 1. The testing follows FCC KDB 971168 D01v03r01 Section 9.0. 2. The EUT was placed in a temperature chamber at $25 \pm 5^{\circ}\text{C}$ and connected with the system simulator. 3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT. 4. The variation in frequency was measured for the worst case.
Test Result:	PASS
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.

5.7.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 04, 2023
Programable tempratuce and humidity chamber	JQ	JQ-2000	/	Jul. 04, 2023
DC power supply	Kingrang	KR3005K	/	Jul. 04, 2023
Combiner Box	AT890-RFB	Ascentest	/	/

5.7.3. Test Data

Test Result of Temperature Variation

Band:	CDMA BC0	Channel:	384
Limit (ppm):	2.5	Frequency:	836.52MHz
Temperature (°C)	Deviation (ppm)	Result	
50	0.017	PASS	
40	0.015		
30	0.014		
20	0.013		
10	0.012		
0	0.014		
-10	0.015		
-20	0.016		
-30	0.018		

Band:	CDMA BC1	Channel:	600
Limit (ppm):	Note	Frequency:	1880MHz
Temperature (°C)	Deviation (ppm)	Result	
50	0.018	PASS	
40	0.016		
30	0.014		
20	0.011		
10	0.012		
0	0.013		
-10	0.017		
-20	0.019		
-30	0.020		

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Deviation (ppm)	Limit (ppm)	Result
CDMA BC0	CDMA	4.35	+0.015	2.5	PASS
		3.87	+0.014		
		BEP	+0.017		
CDMA BC1	CDMA	4.35	+0.014	(Note 3.)	PASS
		3.87	+0.017		
		BEP	+0.016		

Note:

1. Normal Voltage = 3.87V.
2. Battery End Point (BEP) = 3.5V.
3. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

Appendix A: Photographs of Test Setup

Refer to the test report No. TCT230423E058

Appendix B: Photographs of EUT

Refer to the test report No. TCT230423E022

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