FCC Test Report

Applicant	:	**Shanghai Jianrong Intelligent Information Technology Co., Ltd.**
Address	:	**Room 201, Unit 6, No. 159, Tianzhou Road, Xuhui District, Shanghai, China**
Product Name	:	**D10 Rugged Tablet**
Report Date	:	**Aug. 26, 2024**

Shenzhen Anbotek Compliance Laboratory Limited

Contents

1. General Information 6
1.1. Client Information 6
1.2. Description of Device (EUT) 6
1.3. Auxiliary Equipment Used During Test 7
1.4. Operation State 7
1.5. Environmental Conditions 7
1.6. Test Equipment List 8
1.7. Measurement Uncertainty 9
1.8. Description of Test Facility 9
1.9. Disclaimer 10
2. Summary of Test 11
2.1. Summary of test result 11
3. Conducted Output Power Test 12
3.1. Test Standard and Limit 12
3.2. Test Setup 12
3.3. Test Procedure 12
3.4. Test Data 12
4. Peak-Average Ratio 13
4.1. Test Standard and Limit 13
4.2. Test Setup 13
4.3. Test Procedure 13
4.4. Test Data 13
5. Modulation Characteristic 14
6. 99% Occupied Bandwidth & 26 dB Bandwidth 15
6.1. Test Standard and Limit 15
6.2. Test Setup 15
6.3. Test Procedure 15
6.4. Test Data 15
7. Band Edge 16
7.1. Test Standard and Limit 16
7.2. Test Setup 16
7.3. Test Procedure 16
7.4. Test Data 16
8. Conducted Spurious Emission 17
8.1. Test Standard and Limit 17
8.2. Test Setup 17
8.3. Test Procedure 17
8.4. Test Data 17
9. Radiated Spurious Emission 18
9.1. Test Standard and Limit 18

9.2. Test Setup 18
9.3. Test Procedure 18
9.4. Test Data 19
10. ERP and EIRP 22
10.1. Test Standard and Limit 22
10.2. Test Setup 22
10.3. Test Procedure 22
10.4. Test Data 24
11. Frequency stability VS Voltage measurement 25
11.1. Test Standard and Limit 25
11.2. Test Setup 25
11.3. Test Procedure 25
11.4. Test Data 25
12. Frequency stability VS Temperature measurement 26
12.1. Test Standard and Limit 26
12.2. Test Setup 26
12.3. Test Procedure 26
12.4. Test Data 26
APPENDIX I -- TEST SETUP PHOTOGRAPH 27
APPENDIX II -- EXTERNAL PHOTOGRAPH 27
APPENDIX III -- INTERNAL PHOTOGRAPH 27

TEST REPORT

Applicant	:	Shanghai Jianrong Intelligent Information Technology Co., Ltd.
Manufacturer	:	Shanghai Jianrong Intelligent Information Technology Co., Ltd.
Product Name	:	D10 Rugged Tablet
Model No.	:	D10, Ut58 rugged tablet, N10G, Qpad X10, P10A tablet, LT1000
Trade Mark	:	JANRONG
Rating(s)	:	Input: 5V⎓ 3A; 9V⎓ 2A Battery Capacity: DC 3.8V, 9000mAh
Test Standard(s)	**:**	**47 CFR Part 2, 47 CFR Part 22(H), 47 CFR Part 24(E)**
Test Method(s)	**:**	**ANSI C63.26-2015** **KDB 971168 D01 Power Meas License Digital Systems v03r01**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the 47 CFR Part 22, 47 CFR Part 24 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt		Jul. 18, 2024
Date of Test :	:	Jul. 20, 2024 to Aug. 08, 2024
Prepared by :	:	TuTu Hong (TuTu Hong)
Approved & Authorized Signer :	:	Edward pan (Edward Pan)

Address: Sogood Industrial Zone Laboratory & 1/F. of Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Subdistrict, Bao'an District, Shenzhen, Guangdong, China.
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Revision History

Report Version	Description	Issued Date
R00	Original Issue.	Aug. 26, 2024

1. General Information

1.1. Client Information

Applicant	:	Shanghai Jianrong Intelligent Information Technology Co., Ltd.
Address	:	Room 201, Unit 6, No. 159, Tianzhou Road, Xuhui District, Shanghai, China
Manufacturer	:	Shanghai Jianrong Intelligent Information Technology Co., Ltd.
Address	:	Room 201, Unit 6, No. 159, Tianzhou Road, Xuhui District, Shanghai, China
Factory	:	SHENZHEN 3NOD ELECTRONICS CO., LTD
Address	:	2F, No.74 , Yangchong Road, Tangxiachong Community, Yanluo Street, Bao'an District, Shenzhen

1.2. Description of Device (EUT)

Product Name	:	D10 Rugged Tablet
Test Model No.	:	D10, Ut58 rugged tablet, N10G, Qpad X10, P10A tablet, LT1000 (Note: All samples are the same except the model number, so we prepare "D10" for test only.)
Trade Mark	:	JANRONG
Test Power Supply	:	DC 3.8V battery inside
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	Model: QC0181A Input: 100-240~50/60Hz 0.5A Max Output: 5.0V⎓ 3.0A; 9.0V⎓ 2.0A
RF Specification		
Support Band	:	☒GSM850 ☒PCS1900
Support Network	:	GSM, GPRS, EGPRS
Transmit Frequency	:	GSM 850: 824.2MHz~848.8 MHz PCS 1900: 1850.2MHz~1909.8 MHz
Receive Frequency	:	GSM 850: 869.20MHz~893.80MHz PCS 1900: 1930.20MHz-1989.80MHz
Modulation Type	:	GMSK for GSM/GPRS 8PSK for EGPRS
GPRS Multislot Class	:	12
EGPRS Multislot Class	:	12
Antenna Type	:	FPC Antenna
Antenna Gain(Peak):		GSM 850: 0.91dBi PCS 1900: 0.91dBi

Remark: 1) All of the RF specification are provided by customer. 2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.3. Auxiliary Equipment Used During Test

Title	Manufacturer	Model No.	Serial No.
/	/	/	/

1.4. Operation State

Test frequency list:

GSM850		PCS1900	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
190	836.60	661	1880.00
251	848.80	810	1909.80

Test mode:

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03 and ANSI C63.26-2015 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

30 MHz to 10th harmonic for GSM850, PCS1900.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test modes		
Band	Radiated	Conducted
GSM 850	■ GSM link ■ GPRS Class 8 link ■ EGPRS Class 8 link	■ GSM link ■ GPRS Class 8 link ■ EGPRS Class 8 link
PCS 1900	■ GSM link ■ GPRS Class 8 link ■ EGPRS Class 8 link	■ GSM link ■ GPRS Class 8 link ■ EGPRS Class 8 link

1.5. Environmental Conditions

Temperature range:	21-25℃
Humidity range:	40-75%
Pressure range:	86-106kPa

1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Preamplifier	SKET Electronic	LNPA-0118G-45	SKET-PA-002	Jan. 17, 2024	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Jan. 23, 2024	1 Year
3.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year
4.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	345	Oct. 23, 2022	3 Year
5.	Pre-amplifier	SONOMA	310N	186860	Jan. 17, 2024	1 Year
6.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
7.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 12, 2023	1 Year
8.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 12, 2023	1 Year
9.	DC Power Supply	LW	TPR-6420D	374470	Oct. 20, 2023	1 Year
10.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 16, 2023	1 Year
11.	Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	167336	Feb. 04, 2024	1 Year
12.	High-Pass Filter	CDKMV	ZHPF-BM1100-4000-0730	B2015094550	Oct. 20, 2023	1 Year
13.	High-Pass Filter	CDKMV	ZHPF-M3.5-18G-3834	1307006523	Oct. 20, 2023	1 Year
14.	Bilog Broadband Antenna	SCHWARZBECK	VULB 9163	01109	Oct. 16, 2022	3 Year
15.	Double Ridged Horn Antenna	Chengyi Electronics Co., Ltd.	GTH-0118	351600	Nov. 02, 2022	2 Year

1.7. Measurement Uncertainty

Parameter	Uncertainty
Occupied Bandwidth	925Hz
Conducted Output Power	0.76dB
Conducted Spurious Emission	1.24dB
Radiated spurious emissions (30MHz~1GHz)	Horizontal: 3.92dB; Vertical: 4.52dB
Radiated spurious emissions (above 1GHz)	1G-6GHz: 4.78dB; 6G-18GHz: 4.88dB 18G-40GHz: 5.68dB
The measurement uncertainty and decision risk evaluated according to AB/WI-RF-F-032. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

1.8. Description of Test Facility

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

FCC-Registration No.: 434132

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 434132.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
Sogood Industrial Zone Laboratory & 1/F. of Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Subdistrict, Bao'an District, Shenzhen, Guangdong, China.

1.9. Disclaimer

1. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
2. The test report is invalid if there is any evidence and/or falsification.
3. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
4. This document may not be altered or revised in any way unless done so by Anbotek and all revisions are duly noted in the revisions section.
5. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
6. The authenticity of the information provided by the customer is the responsibility of the customer and the laboratory is not responsible for its authenticity.

The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2. Summary of Test

2.1. Summary of test result

FCC Rules	Description of Test	Result
Part 2.1046 Part 22.913(a) Part 24.232(c)	Conducted Output Power	Compliance
Part 24.232	Peak-Average Ratio	Compliance
§ 2.1047	Modulation Characteristics	N/A
Part 2.1049	99% Occupied Bandwidth & 26 dB Bandwidth	Compliance
Part 2.1051 Part 22.917 Part 24.238	Conducted Spurious Emission	Compliance
Part 2.1051 Part 22.917 Part 24.238	Band Edge	Compliance
Part 2.1055(a)(1)(b) Part 22.355 Part 24.235	Frequency stability VS. temperature	Compliance
Part 2.1055(d)(1)(2) Part 22.355 Part 24.235	Frequency stability VS. voltage	Compliance
Part 2.1046 Part 22.913(a) Part 24.232(c)	ERP and EIRP	Compliance
Part 2.1053 Part 22.917 Part 24.238	Radiated Spurious Emission	Compliance

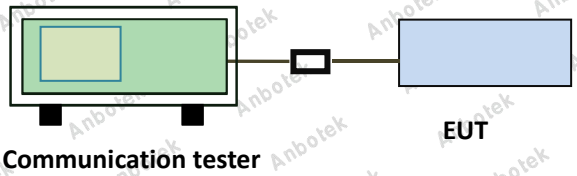
Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

3. Conducted Output Power Test

3.1. Test Standard and Limit

Applicable Standard:	Part 2.1046 Part 22.913(a) Part 24.232(c)
Limit:	N/A

3.2. Test Setup



3.3. Test Procedure

1. The EUT output port was connected to communication tester.
2. Set EUT at maximum power through communication tester.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure the maximum burst average power.

3.4. Test Data

Pass

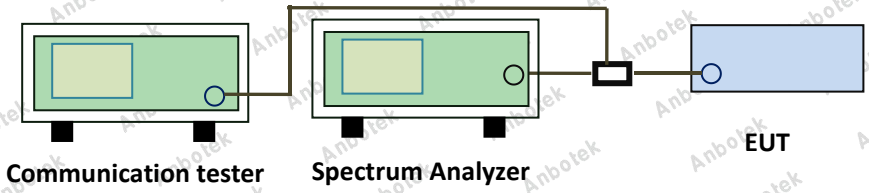
Please refer to Appendix A of the Appendix Test Data.

4. Peak-Average Ratio

4.1. Test Standard and Limit

Applicable Standard:	Part 24.232
Limit:	13dB

4.2. Test Setup



4.3. Test Procedure

According with KDB 971168 D01 Section 5.7:

1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter.
2. Set EUT in maximum power output.
3. Center Frequency = Carrier frequency, RBW > 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.

i. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

ii. 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

6. Record the maximum PAPR level associated with a probability of 0.1%.

4.4. Test Data

Pass

Please refer to Appendix B of the Appendix Test Data.

5. Modulation Characteristic

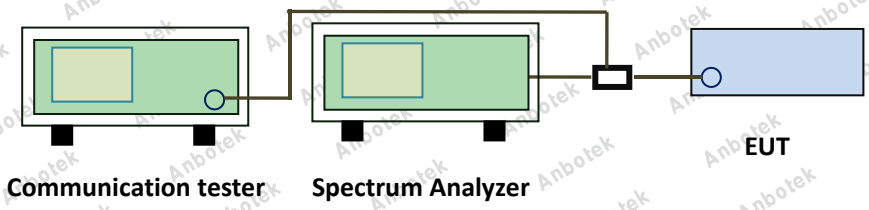
According to FCC § 2.1047(d), Part 22H, Part 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

6. 99% Occupied Bandwidth & 26 dB Bandwidth

6.1. Test Standard and Limit

Applicable Standard:	Part 2.1049
Limit:	N/A

6.2. Test Setup



6.3. Test Procedure

1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter.
2. Set EUT in maximum power output.
3. Spectrum analyzer setting as follow:
   Center Frequency= Carrier frequency, RBW=1% to 5% of anticipated OBW, VBW= 3 * RBW, Detector=Peak,
   Trace maximum hold.
4. Record the value of 99% Occupied bandwidth and -26dB bandwidth.

6.4. Test Data

Pass

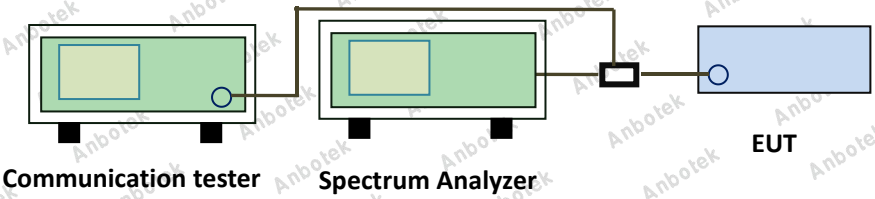
Please refer to Appendix C of the Appendix Test Data.

7. Band Edge

7.1. Test Standard and Limit

Applicable Standard:	Part 2.1051 Part 22.917 Part 24.238
Limit:	Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

7.2. Test Setup



7.3. Test Procedure

1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter.
2. Set EUT in maximum power output.
3. The band edges of low and high channels were measured.
4. Spectrum analyzer setting as follow:
   RBW=5.1kHz, VBW = 15kHz, Sweep time= Auto
5. Record the test plot.

7.4. Test Data

Pass

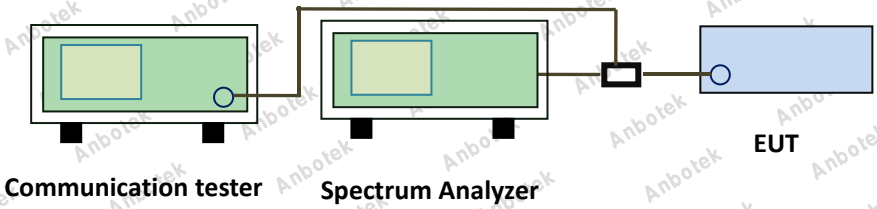
Please refer to Appendix D of the Appendix Test Data.

8. Conducted Spurious Emission

8.1. Test Standard and Limit

Applicable Standard:	Part 2.1051 Part 22.917 Part 24.238
Limit:	Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

8.2. Test Setup



8.3. Test Procedure

1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter.
2. Set EUT in maximum power output.
3. Spectrum analyzer setting as follow:
   Below 1GHz, RBW=100kHz, VBW = 300kHz, Detector=Peak, Sweep time= Auto
   Above 1GHz, RBW=1MHz, VBW=3MHz, Detector=Peak, Sweep time= Auto
   Scan frequency range up to 10th harmonic.
4. Record the test plot.

8.4. Test Data

Pass

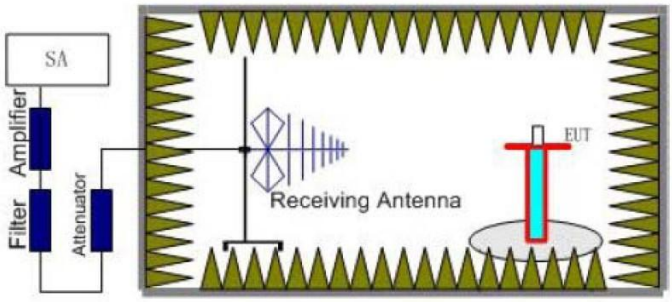
Please refer to Appendix E of the Appendix Test Data.

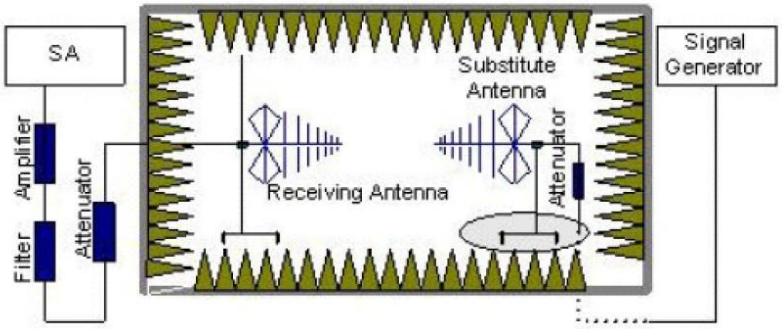
9. Radiated Spurious Emission

9.1. Test Standard and Limit

Applicable Standard:	Part 2.1053 Part 22.917 Part 24.238
Limit:	-13dBm

9.2. Test Setup





9.3. Test Procedure

1. Place the EUT in the center of the turntable.
   a) For radiated emissions measurements performed at frequencies less than or equal to 1 GHz, the EUT shall be placed on a RF-transparent table at a nominal height of 80 cm above the reference ground plane
   b) For radiated measurements performed at frequencies above 1 GHz, the EUT shall be placed on an RF transparent table at a nominal height of 1.5 m above the ground plane.
2. Unless the EUT uses an integral antenna, the EUT shall be terminated with a non-radiating transmitter load. In cases where the EUT uses an adjustable antenna, the antenna shall be adjusted through typical positions and lengths to maximize emissions levels.
3. The EUT shall be tested while operating on the frequency per manufacturer specification. Set the transmitter to operate in continuous transmit mode.
4. Receiver or Spectrum set as follow:

   Below 1GHz, RBW=100kHz, VBW=300kHz, Detector=Peak, Sweep time=Auto
   Above 1GHz, RBW=1MHz, VBW=3MHz, Detector=Peck, Sweep time=Auto
5. Each emission under consideration shall be evaluated:

a) Raise and lower the measurement antenna from 1 m to 4 m, as necessary to enable detection of the maximum emission amplitude relative to measurement antenna height.

b) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.

c) Return the turntable to the azimuth where the highest emission amplitude level was observed.

d) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated with the maximum emission amplitude.

e) Record the measured emission amplitude level and frequency

6. Repeat step 5 for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.
7. Set-up the substitution measurement with the reference point of the substitution antenna located as near as possible to where the center of the EUT radiating element was located during the initial EUT measurement.
8. Maintain the previous measurement instrument settings and test set-up, with the exception that the EUT is removed and replaced by the substitution antenna.
9. Connect a signal generator to the substitution antenna; locate the signal generator so as to minimize any potential influences on the measurement results. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.
10. For each emission that was detected and measured in the initial test

    a) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude.

    b) Adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the amplitude level of the emission previously measured directly in step 5 and step 6.

    c) Record the output power level of the signal generator when equivalence is achieved in step b).
11. Repeat step 8 through step 10 with the measurement antenna oriented in the opposite polarization.
12. Calculate the emission power in dBm referenced to a half-wave dipole using the following equation:

    Pe = Ps(dBm) − cable loss (dB) + antenna gain (dBd)

    where

    Pe = equivalent emission power in dBm

    Ps = source (signal generator) power in dBm

    NOTE—dBd refers to the measured antenna gain in decibels relative to a half-wave dipole.
13. Correct the antenna gain of the substitution antenna if necessary to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from:

    gain (dBd) = gain (dBi) − 2.15 dB.

    If necessary, the antenna gain can be calculated from calibrated antenna factor information
14. Provide the complete measurement results as a part of the test report.

9.4. Test Data

Pass

Note: Worst case at GSM850/PCS1900

GSM850							
Channel	Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
		Polarization	Reading (dBm)	Factor (dB)	Level (dBm)		
128	1648.40	Vertical	-41.11	5.32	-35.79	<-13.00	PASS
	2472.60	V	-48.81	9.32	-39.49		
	3296.80	V	-53.00	12.48	-40.52		
	1648.40	Horizontal	-42.38	5.32	-37.06	<-13.00	PASS
	2472.60	H	-49.95	9.26	-40.69		
	3296.80	H	-54.03	12.49	-41.54		
190	1673.20	Vertical	-40.16	5.33	-34.83	<-13.00	PASS
	2509.80	V	-47.75	9.16	-38.59		
	3346.40	V	-52.16	12.49	-39.67		
	1673.20	Horizontal	-41.23	5.34	-35.89	<-13.00	PASS
	2509.80	H	-49.00	9.26	-39.74		
	3346.40	H	-53.32	12.68	-40.64		
251	1697.60	Vertical	-38.76	5.56	-33.20	<-13.00	PASS
	2546.40	V	-46.39	9.28	-37.11		
	3395.20	V	-50.91	12.65	-38.26		
	1697.60	Horizontal	-40.99	5.67	-35.32	<-13.00	PASS
	2546.40	H	-48.56	9.36	-39.20		
	3395.20	H	-52.87	12.69	-40.18		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. The emission levels of not record in the report are very lower than the limit and not show in test report.

PCS1900							
Channel	Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
		Polarization	Reading (dBm)	Factor (dB)	Level (dBm)		
512	3700.40	Vertical	-46.81	13.45	-33.36	<-13.00	PASS
	5550.60	V	-54.55	16.61	-37.94		
	7400.80	V	-58.44	17.92	-40.52		
	3700.40	Horizontal	-48.11	13.45	-34.66	<-13.00	PASS
	5550.60	H	-55.77	16.61	-39.16		
	7400.80	H	-59.59	17.92	-41.67		
661	3760.00	Vertical	-45.77	13.49	-32.28	<-13.00	PASS
	5640.00	V	-53.62	16.69	-36.93		
	7520.00	V	-57.63	18.06	-39.57		
	3760.00	Horizontal	-47.25	13.49	-33.76	<-13.00	PASS
	5640.00	H	-55.01	16.69	-38.32		
	7520.00	H	-58.94	18.06	-40.88		
810	3819.60	Vertical	-44.13	13.12	**-31.01**	<-13.00	PASS
	5729.40	V	-52.76	17.03	-35.73		
	7639.20	V	-56.54	18.09	-38.45		
	3819.60	Horizontal	-45.82	13.12	-32.70	<-13.00	PASS
	5729.40	H	-54.36	17.03	-37.33		
	7639.20	H	-58.04	18.09	-39.95		

Remark:

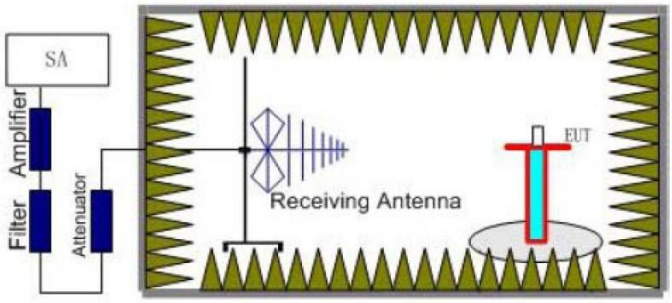
3. The emission behaviour belongs to narrowband spurious emission.
4. The emission levels of not record in the report are very lower than the limit and not show in test report.

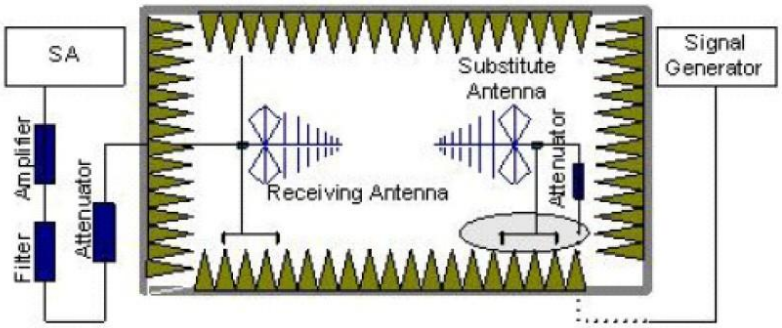
10. ERP and EIRP

10.1. Test Standard and Limit

Applicable Standard:	Part 2.1046 Part 22.913(a) Part 24.232(c)
Limit:	GSM850: 7W (38.45dBm) ERP PCS1900: 2W (33dBm) EIRP

10.2. Test Setup





10.3. Test Procedure

1. Place the EUT in the center of the turntable.
   a) For radiated emissions measurements performed at frequencies less than or equal to 1 GHz, the EUT shall be placed on a RF-transparent table at a nominal height of 80 cm above the reference ground plane
   b) For radiated measurements performed at frequencies above 1 GHz, the EUT shall be placed on an RF transparent table at a nominal height of 1.5 m above the ground plane.
2. Unless the EUT uses an integral antenna, the EUT shall be terminated with a non-radiating transmitter load. In cases where the EUT uses an adjustable antenna, the antenna shall be adjusted through typical positions and lengths to maximize emissions levels.
3. The EUT shall be tested while operating on the frequency per manufacturer specification. Set the transmitter to operate in continuous transmit mode.
4. Receiver or Spectrum set as follow:

   Below 1GHz, RBW=100kHz, VBW=300kHz, Detector=Peak, Sweep time=Auto

Above 1GHz, RBW=1MHz, VBW=3MHz, Detector=Peck, Sweep time=Auto

5. Each emission under consideration shall be evaluated:
   a) Raise and lower the measurement antenna from 1 m to 4 m, as necessary to enable detection of the maximum emission amplitude relative to measurement antenna height.
   b) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.
   c) Return the turntable to the azimuth where the highest emission amplitude level was observed.
   d) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated with the maximum emission amplitude.
   e) Record the measured emission amplitude level and frequency
6. Repeat step 5 for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.
7. Set-up the substitution measurement with the reference point of the substitution antenna located as near as possible to where the center of the EUT radiating element was located during the initial EUT measurement.
8. Maintain the previous measurement instrument settings and test set-up, with the exception that the EUT is removed and replaced by the substitution antenna.
9. Connect a signal generator to the substitution antenna; locate the signal generator so as to minimize any potential influences on the measurement results. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.
10. For each emission that was detected and measured in the initial test
    a) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude.
    b) Adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the amplitude level of the emission previously measured directly in step 5 and step 6.
    c) Record the output power level of the signal generator when equivalence is achieved in step b).
11. Repeat step 8 through step 10 with the measurement antenna oriented in the opposite polarization.
12. Calculate the emission power in dBm referenced to a half-wave dipole using the following equation:

    Pe = Ps(dBm) − cable loss (dB) + antenna gain (dBd)

    where

    Pe = equivalent emission power in dBm

    Ps = source (signal generator) power in dBm

    NOTE—dBd refers to the measured antenna gain in decibels relative to a half-wave dipole.
13. Correct the antenna gain of the substitution antenna if necessary to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from:

    gain (dBd) = gain (dBi) − 2.15 dB.

    If necessary, the antenna gain can be calculated from calibrated antenna factor information
14. Provide the complete measurement results as a part of the test report.

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10.4. Test Data

Pass

Mode	Channel	ERP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
GSM850	128	**32.07**	29.07	<38.45	PASS
	190	31.04	27.98		
	251	31.41	28.24		
GPRS850	128	27.17	25.57	<38.45	PASS
	190	25.79	24.82		
	251	25.56	24.58		
EGPRS850	128	26.02	28.03	<38.45	PASS
	190	25.07	25.28		
	251	25.39	26.29		

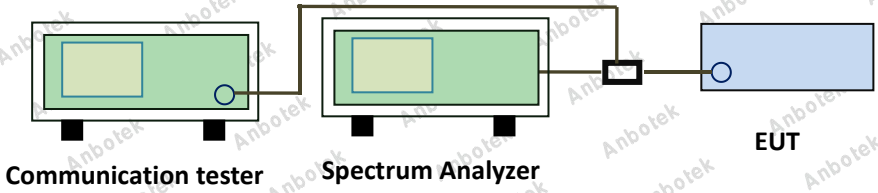
Mode	Channel	EIRP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
PCS1900	512	27.85	20.69	<33.00	PASS
	661	**27.93**	21.03		
	810	27.65	20.73		
GPRS1900	512	22.89	18.22	<33.00	PASS
	661	23.35	18.40		
	810	23.43	18.46		
EGPRS1900	512	27.18	20.68	<33.00	PASS
	661	27.57	21.13		
	810	26.64	20.37		

11. Frequency stability VS Voltage measurement

11.1. Test Standard and Limit

Applicable Standard:	Part 2.1055(d)(1)(2) Part 22.355 Part 24.235
Limit:	2.5ppm

11.2. Test Setup



11.3. Test Procedure

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. The EUT output port was connected to communication tester.
3. The EUT was placed inside the temperature chamber at 25°C.
4. The power supply voltage to the EUT was varied ±15% of the nominal value measured at the input to the EUT.
5. Record the maximum frequency change.

11.4. Test Data

Pass

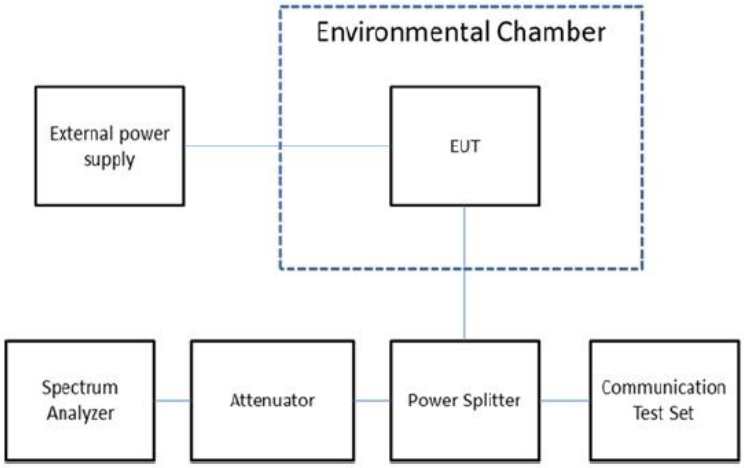
Please refer to Appendix F of the Appendix Test Data.

12. Frequency stability VS Temperature measurement

12.1. Test Standard and Limit

Applicable Standard:	Part 2.1055(a)(1)(b) Part 22.355 Part 24.235
Limit:	2.5ppm

12.2. Test Setup



12.3. Test Procedure

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. The EUT output port was connected to communication tester.
3. The EUT was placed inside the temperature chamber.
4. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
5. Repeat step 4 measure with 10°C increased per stage until the highest temperature of +50°C reached.

12.4. Test Data

Pass

Please refer to Appendix G of the Appendix Test Data.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph_Licensed

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

---------- End of Report ----------