

FCC CFR47 PART 27 CERTIFICATION TEST REPORT FCC ID: WF5-BPR-10IIA

Product: Android Rugged Tablet
Trade Mark: SEWOO
Model Number: BPR-10IIA
Family Model: BPR-10IIW, BPR-08A, BPR-08W
Report No.: N25070102605E
Issue Date: Aug. 20, 2025

Prepared for

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TEST RESULT CERTIFICATION

Applicant's name : Aroot Co., Ltd.

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Manufacturer's Name : Aroot Co., Ltd.

Address : 28-6, Gajangsaneopdong-ro, Osan-si, Gyeonggi-do, Republic of Korea.

Product name : Android Rugged Tablet

Trade Mark : SEWOO

Model and/or type reference : BPR-10IIA

Family Model : BPR-10IIW, BPR-08A, BPR-08W

Test Sample number : S2507070121-1#

Date of Test : Jul. 01, 2025 ~ Aug. 20, 2025

Standards : FCC CFR 47 Part 27

Test procedure ANSI C63.26:2015

ANSI/TIA-603-E-2016

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Equipment	Android Rugged Tablet
Trade Mark	SEWOO
Model Name	BPR-10IIA
Family Model	BPR-10IIW, BPR-08A, BPR-08W
Model Difference	All models have the same circuit and RF module, except for model names.
FCC ID:	WF5-BPR-10IIA
Frequency Bands:	U.S. Bands: ☒ NR TDD Band 41 Uplink & Downlink: 2496 MHz to 2690 MHz ☒ NR TDD Band 78 Uplink/Downlink: 3450 MHz to 3550 MHz
Frequency Range:	NR FDD: n41, n78
Type of Modulation:	DFT-s-OFDM: PI/2 BPSK/QPSK/16-QAM/64QAM/256QAM CP-OFDM: QPSK/16-QAM/64QAM/256QAM
Subcarrier spacing	☒ 15KHz, ☒ 30KHz, ☐ 60KHz
NR architecture	☒ SA, ☐ NSA
Antenna:	PIFA Antenna
Antenna gain:	N41: -0.7 dBi; N78: -0.39 dBi;
Adapter	Model: J151-0503000EX Input: 100-240V~50/60Hz 0.6A Max Output: 5.0V---3.0A 15W
Battery	DC 3.8V, 12000mAh, 45.6Wh
Power supply	DC 3.8V from battery or DC 5V from adapter
Extreme Vol. Limits:	DC 4.37V to DC 3.23V (Nominal DC 3.8V) (Note 1)
HW Version	P872_MB_V2
FW Version	Android 15
SW Version	N/A
** Note1: The High Voltage 4.37V and Low Voltage 3.23V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: WF5-BPR-10IIA** filing to comply with the FCC Part 27.

1.3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI/TIA-603-E-2016, FCC CFR 47 Part 2, Part 27, ANSI C63.26:2015.

1.4 TEST FACILITY

The test site used to collect the radiated data is located at:

ShenZhen NTEK Testing Technology Co., Ltd.

No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.26:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A,

CNAS Registration No.:L5516

1.5 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement, 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	Uncertainty
1	Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.5dB

1.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.7 WORST-CASE CONFIGURATION AND MODE

The worst-case scenario for all measurements is based on the investigation results.

The device has NR Bands of: Band 41/78.

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.

For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientations of the EUT alone. After the investigations the worst case was determined to be at X orientation for all LTE bands.

1.8 SUMMARY OF TEST RESULTS

FCC Part27, Subpart L, KDB 971168 D01 Power Meas License Digital Systems v03			
FCC Rule	Test Item	Verdict	Remark
2.1046	Conducted Output Power	PASS	
27.50(d)(5) KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 27.53(c), (g), (h) KDB 971168 D01 Clause 6	Band Edge	PASS	
27.50(b)(10), (c)(10) KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
27.50(h)(2), (d)(4) KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 7	Field Strength of Spurious Radiation	PASS	
2.1055 27.54 KDB 971168 D01 Clause 9	Frequency Stability for Temperature & Voltage	PASS	
2.1051 27.53(c)(g)(h)(m) KDB 971168 D01 Clause 6	Conducted Emission	PASS	
Remark: 1. "N/A" denotes test is not applicable in this Test Report. 2. All test items were verified and recorded according to the standards and without any deviation during the test. 3. No modifications are made to the EUT during all test items.			

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF EUT SYSTEM

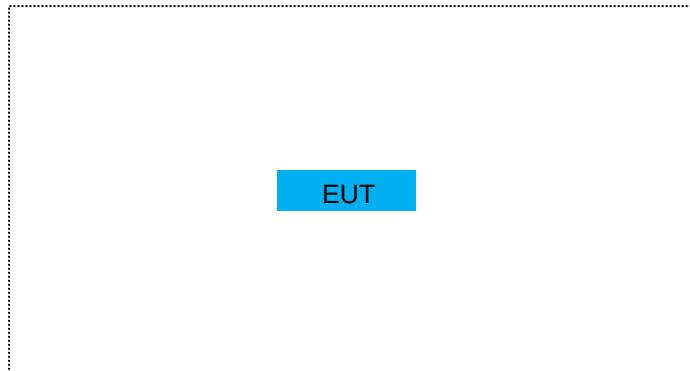
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Android Rugged Tablet	BPR-10IIA	FCC ID: WF5-BPR-10IIA	EUT

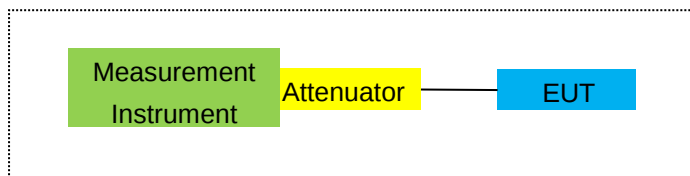
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

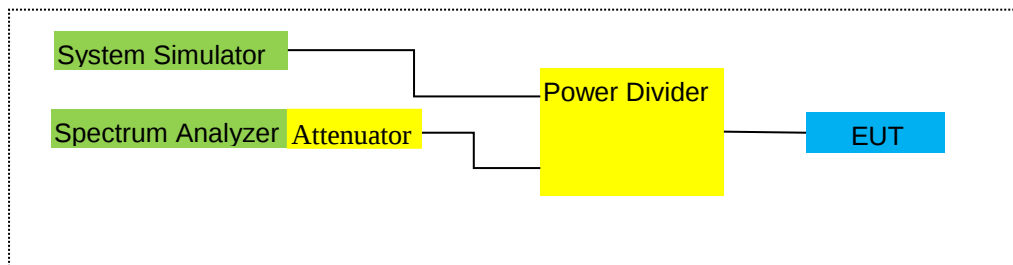
For Radiated Test Cases



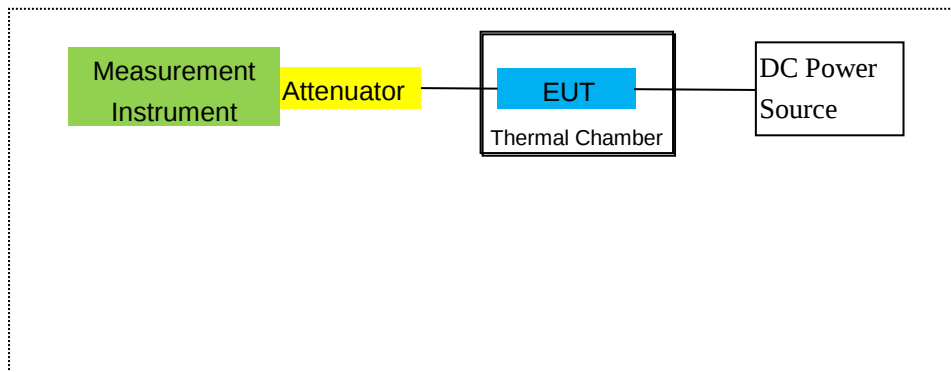
For Conducted Output Power



For Peak-to Average Ratio, Occupied Bandwidth, Conducted Band edge and Conducted Spurious Emission



For Frequency Stability



Note: EUT built-in battery-powered, the battery is fully-charged.

3.TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2025.04.17	2026.04.16	1 year
2	Test Receiver	R&S	ESPI	101318	2025.04.17	2026.04.16	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2025.04.17	2026.04.16	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
5	Horn Antenna	EM	EM-AH-10180	2011071402	2024.05.12	2027.05.11	3 year
6	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2024.05.12	2027.05.11	3 year
7	Amplifier	EM	EM-30180	060538	2025.04.17	2026.04.16	1 year
8	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	055	2024.05.17	2027.05.16	3 year
9	Power Meter	R&S	NRVS	100696	2025.04.17	2026.04.16	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2025.04.17	2026.04.16	1 year
11	Test Cable	N/A	R-01	N/A	2023.06.17	2026.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2023.06.17	2026.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2023.06.17	2026.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2025.04.17	2026.04.16	1 year
15	LISN	R&S	ENV216	101313	2025.04.17	2026.04.16	1 year
16	LISN	EMCO	3816/2	00042990	2025.04.17	2026.04.16	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
18	Field strength probe	narda	EP601	711WX81278	2025.04.17	2026.04.16	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Attenuator	MCE	24-10-34	BN9258	N/A	N/A	N/A
23	Spectrum Analyzer	Agilent	E4440A	MY41000130	2025.04.17	2026.04.16	1 year
24	EMI Test Receiver	R&S	ESCI	101160	2025.04.17	2026.04.16	1 year
25	Universal Radio Communication Tester	R&S	CMU200	105747	2025.04.17	2026.04.16	1 year

26	High and Low Temperature Box	WEISS	WT 20/40 EMC Simpac	58226119460030	2024.05.30	2027.05.29	3 year
27	DC Power Source	N/A	PS-6005D	20170402923	2024.04.25	2027.04.24	3 year
28	MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2025.04.17	2026.04.16	1 year
29	Communication Tester	R&S	CMW500	148500	2025.05.06	2026.05.05	1 year
30	Radio Communication Analyzer	Anritsu	MT8821C	SN 6262186364	2025.04.17	2026.04.16	1 year
31	Radio Communication Test Station	Anritsu	MT8000A	SN 6262192315	2025.04.17	2026.04.16	1 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& DC Power Source which is scheduled for calibration every 3 years.

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFTtest	MTS 8200 NR	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	raditeq	RadiMation	2023.1.3	RadiatedTest
4	Farad	EZ-EMC_CE	AIT-03A	AC Conducted Test

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

NR Measurement Procedure:

All NR bands conducted power peak and average are obtained from the MT8821C telecommunication test set. The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS 38.521-1 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table Table 6.2.2.3-1: of the 3GPP TS 38.521-1 (V15.3.0) (07-2019).

Table 6.2.2.3-1: UE Power Class

EUTRA band	Class 1 (dBm)	Tolerance (dB)	Class 2 (dBm)	Tolerance (dB)	Class 3 (dBm)	Tolerance (dB)	Class 4 (dBm)	Tolerance (dB)
1					23	±2		
2					23	±2 ²		
3					23	±2 ²		
4					23	±2		
5					23	±2		
6					23	±2		
7					23	±2		
8					23	±2		
9					23	±2		
10					23	±2		
11					23	±2		
12					23	±2		
13					23	±2		
14					23	±2		
15					23	±2		
16					23	±2		
17					23	±2		
18					23	±2		
19					23	±2		
20					23	±2		
21					23	±2		
22					23	±2		
23					23	±2		
24					23	±2		
25					23	±2		
26			26	±2	23	±2		
27					23	±2		
28					23	±2		
29					23	±2		
30					23	±2		
31					23	±2		
32					23	±2		
33					23	±2		
34					23	±2		
35					23	±2		
36					23	±2		
37					23	±2		
38					23	±2		
39					23	±2		
40					23	±2		
41					23	±2 ²		
42					23	+2/-3		
43					23	+2/-3		
44					23	+2/[-3]		
45					23	±2		
46					23	±2		
47			26	±2	23	±2		

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS 38.521-1 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".3

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

MODES TESTED

NR Band 41/78

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §27.53(c)(g)(h)(m)

FCC: §2.1046,

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.

The minimum permissible attenuation level for Band 7 is as following.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is $65 + 10\log_{10}(P) = -35\text{dBm}$ in a 6.25kHz bandwidth.

Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth.

TEST PROCEDURE

The transmitter output was connected to a CMW500Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

Set a marker to point the corresponding band edge frequency in each test case.

Set display line

Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

NR Band 41/78

RESULTS

Test data reference attachment.

Note: Both DFT-s-OFDM:PI/2 BPSK/QPSK/16-QAM/64QAM/256QAM

CP-OFDM: QPSK/16-QAM/64QAM/256QAM has been tested, the worst case is CP_QPSK mode, the report just reported the worst case.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §27.53(c)(g)(h)(m)

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.

The minimum permissible attenuation level for Band 7 is as following.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c.5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c.4) is $65 + 10\log_{10}(P) = -35\text{dBm}$ in a 6.25kHz bandwidth.

Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

Set display line

Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

MODES TESTED

NR Band 41/78

MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

Test data reference attachment.

Note: Both DFT-s-OFDM:PI/2 BPSK/QPSK/16-QAM/64QAM/256QAM

CP-OFDM: QPSK/16-QAM/64QAM/256QAM has been tested, the worst case is CP_QPSK mode, the report just reported the worst case.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §27.50 (h)(2), (b)(10), (c)(10), (d)(4)

LIMITS:

27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.

27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

27.50 (h)(2) Mobile and other user stations in the 2500–2570 MHz and 2620–2690 MHz bands. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

KDB 971168 v02r01 RF power output using broadband peak and average power meter method.

KDB 971168 D01 Power Meas License Digital Systems v02r01, “Measurement Guidance for Certification of Licensed Digital Transmitters”

MODES TESTED

NR Band 41/78

RESULTS

Pass

8.2 NR BAND 41

Radiated Power (EIRP) for N41 /SCS (30kHz)										
Mode	RB/ RB Position	Frequency	Result						Limit	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	W	
10.0MHz DFT_QPSK	1@1	2501.01	18.00	5.12	9.00	21.88	154.170	Horizontal	2	Pass
		2592.99	17.02	5.18	9.00	20.84	121.339	Horizontal	2	Pass
		2685	16.17	5.23	9.00	19.94	98.628	Horizontal	2	Pass
15.0MHz DFT_QPSK	1@1	2503.5	17.26	5.12	9.00	21.14	130.017	Horizontal	2	Pass
		2592.99	16.08	5.18	9.00	19.9	97.724	Horizontal	2	Pass
		2682.48	17.22	5.22	9.00	21	125.893	Horizontal	2	Pass
20.0MHz DFT_QPSK	1@1	2506.02	16.29	5.13	9.00	20.16	103.753	Horizontal	2	Pass
		2592.99	17.20	5.18	9.00	21.02	126.474	Horizontal	2	Pass
		2679.99	17.84	5.21	9.00	21.63	145.546	Horizontal	2	Pass
30.0MHz DFT_QPSK	1@1	2511	16.75	5.13	9.00	20.62	115.345	Horizontal	2	Pass
		2592.99	15.96	5.18	9.00	19.78	95.060	Horizontal	2	Pass
		2674.98	16.31	5.21	9.00	20.1	102.329	Horizontal	2	Pass
40.0MHz DFT_QPSK	1@1	2516.01	17.25	5.14	9.00	21.11	129.122	Horizontal	2	Pass
		2592.99	17.84	5.18	9.00	21.66	146.555	Horizontal	2	Pass
		2670	17.25	5.2	9.00	21.05	127.350	Horizontal	2	Pass
50.0MHz DFT_QPSK	1@1	2521.02	16.57	5.14	9.00	20.43	110.408	Horizontal	2	Pass
		2592.99	16.56	5.18	9.00	20.38	109.144	Horizontal	2	Pass
		2664.99	15.84	5.19	9.00	19.65	92.257	Horizontal	2	Pass
60.0MHz DFT_QPSK	1@1	2526	16.33	5.14	9.00	20.19	104.472	Horizontal	2	Pass
		2592.99	16.44	5.18	9.00	20.26	106.170	Horizontal	2	Pass
		2659.98	16.41	5.19	9.00	20.22	105.196	Horizontal	2	Pass
70.0MHz DFT_QPSK	1@1	2531.01	16.70	5.14	9.00	20.56	113.763	Horizontal	2	Pass
		2592.99	16.60	5.18	9.00	20.42	110.154	Horizontal	2	Pass
		2655	17.52	5.19	9.00	21.33	135.831	Horizontal	2	Pass
80.0MHz DFT_QPSK	1@1	2536.02	17.95	5.14	9.00	21.81	151.705	Horizontal	2	Pass
		2592.99	15.82	5.18	9.00	19.64	92.045	Horizontal	2	Pass
		2649.99	16.94	5.19	9.00	20.75	118.850	Horizontal	2	Pass
90.0MHz DFT_QPSK	1@1	2541	16.86	5.14	9.00	20.72	118.032	Horizontal	2	Pass
		2592.99	16.43	5.18	9.00	20.25	105.925	Horizontal	2	Pass
		2644.98	16.92	5.19	9.00	20.73	118.304	Horizontal	2	Pass

100.0MHz DFT_QPSK	1@1	2546.01	16.91	5.14	9.00	20.77	119.399	Horizontal	2	Pass
		2592.99	16.92	5.18	9.00	20.74	118.577	Horizontal	2	Pass
		2640	18.57	5.19	9.00	22.38	172.982	Horizontal	2	Pass

Radiated Power (EIRP) for N41 /SCS (30kHz)										
Mode	RB/ RB Position	Frequency	Result						Limit	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	W	
10.0MHz DFT_QPSK	1@1	2501.01	17.31	5.12	9.00	21.19	131.522	Vertical	2	Pass
		2592.99	17.89	5.18	9.00	21.71	148.252	Vertical	2	Pass
		2685	18.40	5.23	9.00	22.17	164.816	Vertical	2	Pass
15.0MHz DFT_QPSK	1@1	2503.5	17.73	5.12	9.00	21.61	144.877	Vertical	2	Pass
		2592.99	18.47	5.18	9.00	22.29	169.434	Vertical	2	Pass
		2682.48	18.60	5.22	9.00	22.38	172.982	Vertical	2	Pass
20.0MHz DFT_QPSK	1@1	2506.02	17.67	5.13	9.00	21.54	142.561	Vertical	2	Pass
		2592.99	17.35	5.18	9.00	21.17	130.918	Vertical	2	Pass
		2679.99	18.09	5.21	9.00	21.88	154.170	Vertical	2	Pass
30.0MHz DFT_QPSK	1@1	2511	17.28	5.13	9.00	21.15	130.317	Vertical	2	Pass
		2592.99	17.94	5.18	9.00	21.76	149.968	Vertical	2	Pass
		2674.98	17.78	5.21	9.00	21.57	143.549	Vertical	2	Pass
40.0MHz DFT_QPSK	1@1	2516.01	17.74	5.14	9.00	21.6	144.544	Vertical	2	Pass
		2592.99	16.90	5.18	9.00	20.72	118.032	Vertical	2	Pass
		2670	18.11	5.2	9.00	21.91	155.239	Vertical	2	Pass
50.0MHz DFT_QPSK	1@1	2521.02	17.57	5.14	9.00	21.43	138.995	Vertical	2	Pass
		2592.99	18.08	5.18	9.00	21.9	154.882	Vertical	2	Pass
		2664.99	17.30	5.19	9.00	21.11	129.122	Vertical	2	Pass
60.0MHz DFT_QPSK	1@1	2526	18.14	5.14	9.00	22	158.489	Vertical	2	Pass
		2592.99	18.09	5.18	9.00	21.91	155.239	Vertical	2	Pass
		2659.98	17.08	5.19	9.00	20.89	122.744	Vertical	2	Pass
70.0MHz DFT_QPSK	1@1	2531.01	18.50	5.14	9.00	22.36	172.187	Vertical	2	Pass
		2592.99	17.95	5.18	9.00	21.77	150.314	Vertical	2	Pass
		2655	18.25	5.19	9.00	22.06	160.694	Vertical	2	Pass
80.0MHz DFT_QPSK	1@1	2536.02	18.19	5.14	9.00	22.05	160.325	Vertical	2	Pass
		2592.99	18.13	5.18	9.00	21.95	156.675	Vertical	2	Pass
		2649.99	18.61	5.19	9.00	22.42	174.582	Vertical	2	Pass
90.0MHz DFT_QPSK	1@1	2541	17.00	5.14	9.00	20.86	121.899	Vertical	2	Pass
		2592.99	17.98	5.18	9.00	21.8	151.356	Vertical	2	Pass
		2644.98	18.76	5.19	9.00	22.57	180.717	Vertical	2	Pass
100.0MHz	1@1	2546.01	18.80	5.14	9.00	22.66	184.502	Vertical	2	Pass

DFT_QPSK		2592.99	17.25	5.18	9.00	21.07	127.938	Vertical	2	Pass
		2640	17.53	5.19	9.00	21.34	136.144	Vertical	2	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Factor Gain (dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

8.2 NR BAND 78

Radiated Power (EIRP) for N78 /SCS (30kHz)										
Mode	RB/ RB Position	Frequency	Result						Limit	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	W	
10.0MHz DFT_QPSK	1@1	3455	22.16	5.12	11	28.04	636.796	Horizontal	1	Pass
		3500	21.92	5.18	11	27.74	594.292	Horizontal	1	Pass
		3545	21.91	5.23	11	27.68	586.138	Horizontal	1	Pass
15.0MHz DFT_QPSK	1@1	3457.5	21.97	5.12	11	27.85	609.537	Horizontal	1	Pass
		3500	21.92	5.18	11	27.74	594.292	Horizontal	1	Pass
		3542.5	21.91	5.22	11	27.69	587.489	Horizontal	1	Pass
20.0MHz DFT_QPSK	1@1	3460	21.97	5.13	11	27.84	608.135	Horizontal	1	Pass
		3500	21.92	5.18	11	27.74	594.292	Horizontal	1	Pass
		3540	21.89	5.21	11	27.68	586.138	Horizontal	1	Pass
40.0MHz DFT_QPSK	1@1	3470	21.98	5.13	11	27.85	609.537	Horizontal	1	Pass
		3500	21.92	5.18	11	27.74	594.292	Horizontal	1	Pass
		3530	21.90	5.21	11	27.69	587.489	Horizontal	1	Pass
50.0MHz DFT_QPSK	1@1	3475	21.98	5.14	11	27.84	608.135	Horizontal	1	Pass
		3500	21.93	5.18	11	27.75	595.662	Horizontal	1	Pass
		3525	21.90	5.2	11	27.7	588.844	Horizontal	1	Pass
60.0MHz DFT_QPSK	1@1	3480	21.99	5.14	11	27.85	609.537	Horizontal	1	Pass
		3500	21.92	5.18	11	27.74	594.292	Horizontal	1	Pass
		3520	21.88	5.19	11	27.69	587.489	Horizontal	1	Pass
80.0MHz DFT_QPSK	1@1	3490	21.95	5.14	11	27.81	603.949	Horizontal	1	Pass
		3500	21.93	5.18	11	27.75	595.662	Horizontal	1	Pass
		3510	21.92	5.19	11	27.73	592.925	Horizontal	1	Pass
90.0MHz DFT_QPSK	1@1	3495	21.96	5.14	11	27.82	605.341	Horizontal	1	Pass
		3500	21.93	5.18	11	27.75	595.662	Horizontal	1	Pass
		3505	21.90	5.19	11	27.71	590.201	Horizontal	1	Pass
100.0MHz DFT_QPSK	1@1	3500	22.30	5.14	11	28.16	654.636	Horizontal	1	Pass

	Radiated Power (EIRP) for N78 /SCS (30kHz)									
Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Factor Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	Limit	
									W	
10.0MHz DFT_QPSK	1@1	3455	17.61	5.12	11	23.49	223.357	Vertical	1	Pass
		3500	18.13	5.18	11	23.95	248.313	Vertical	1	Pass
		3545	19.02	5.23	11	24.79	301.301	Vertical	1	Pass
15.0MHz DFT_QPSK	1@1	3457.5	18.31	5.12	11	24.19	262.422	Vertical	1	Pass
		3500	19.00	5.18	11	24.82	303.389	Vertical	1	Pass
		3542.5	18.68	5.22	11	24.46	279.254	Vertical	1	Pass
20.0MHz DFT_QPSK	1@1	3460	18.60	5.13	11	24.47	279.898	Vertical	1	Pass
		3500	17.87	5.18	11	23.69	233.884	Vertical	1	Pass
		3540	19.04	5.21	11	24.83	304.089	Vertical	1	Pass
40.0MHz DFT_QPSK	1@1	3470	17.33	5.13	11	23.2	208.930	Vertical	1	Pass
		3500	18.79	5.18	11	24.61	289.068	Vertical	1	Pass
		3530	18.51	5.21	11	24.3	269.153	Vertical	1	Pass
50.0MHz DFT_QPSK	1@1	3475	18.04	5.14	11	23.9	245.471	Vertical	1	Pass
		3500	17.82	5.18	11	23.64	231.206	Vertical	1	Pass
		3525	18.22	5.2	11	24.02	252.348	Vertical	1	Pass
60.0MHz DFT_QPSK	1@1	3480	18.18	5.14	11	24.04	253.513	Vertical	1	Pass
		3500	18.12	5.18	11	23.94	247.742	Vertical	1	Pass
		3520	17.44	5.19	11	23.25	211.349	Vertical	1	Pass
80.0MHz DFT_QPSK	1@1	3490	18.79	5.14	11	24.65	291.743	Vertical	1	Pass
		3500	18.67	5.18	11	24.49	281.190	Vertical	1	Pass
		3510	17.42	5.19	11	23.23	210.378	Vertical	1	Pass
90.0MHz DFT_QPSK	1@1	3495	18.91	5.14	11	24.77	299.916	Vertical	1	Pass
		3500	18.85	5.18	11	24.67	293.089	Vertical	1	Pass
		3505	18.81	5.19	11	24.62	289.734	Vertical	1	Pass
100.0MHz DFT_QPSK	1@1	3500	19.83	5.14	11	25.69	370.681	Vertical	1	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Factor Gain (dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1051, §27.53(c)(g)(h)(m)

LIMIT

For Band 7, the minimum permissible attenuation level of any spurious emission is $55 + \log_{10}(P)$ [Watts]).

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

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB at the channel edges and $55 + 10 \log_{10}(p)$ at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

MODES TESTED

NR Band 41/78

RESULTS

PASS

9.1 NR N41

QPSK NR N41 10MHZ SCS 30kHz

Test Results for Low Channel 2501.01MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5002.02	-52.27	2.63	28.37	-26.53	-25	-1.53	Horizontal
5002.02	-54.52	2.63	28.37	-28.78	-25	-3.78	Vertical
7503.03	-52.63	3.38	28.25	-27.76	-25	-2.76	Vertical
7503.03	-53.75	3.38	28.25	-28.88	-25	-3.88	Horizontal
186.3	-46.19	0.61	15.10	-31.70	-25	-6.70	Vertical
357.3	-46.85	1.38	15.45	-32.78	-25	-7.78	Horizontal
Test Results for Mid Channel 2592.99MHz							
5185.98	-56.01	2.65	28.33	-30.33	-25	-5.33	Horizontal
5185.98	-57.45	2.65	28.33	-31.77	-25	-6.77	Vertical
7778.97	-51.09	4.14	28.26	-26.97	-25	-1.97	Vertical
7778.97	-52.28	4.14	28.26	-28.16	-25	-3.16	Horizontal
152.7	-48.91	0.62	16.35	-33.18	-25	-8.18	Vertical
357.2	-49.87	1.39	15.55	-35.71	-25	-10.71	Horizontal
Test Results for High Channel 2685MHz							
5370	-56.88	2.65	28.41	-31.12	-25	-6.12	Horizontal
5370	-52.73	2.65	28.41	-26.97	-25	-1.97	Vertical
8055	-49.81	5.23	28.15	-26.89	-25	-1.89	Vertical
8055	-54.09	5.23	28.89	-30.43	-25	-5.43	Horizontal
154.2	-48.64	0.65	15.20	-34.09	-25	-9.09	Vertical
486.3	-51.56	1.10	15.16	-37.50	-25	-12.50	Horizontal

QPSK NR N41 100MHZ SCS 30kHz

Test Results for Mid Channel 2546.01MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5092.02	-52.38	2.63	28.37	-26.64	-25	-1.64	Horizontal
5092.02	-54.45	2.63	28.37	-28.71	-25	-3.71	Vertical
7638.03	-52.71	3.38	28.25	-27.84	-25	-2.84	Vertical
7638.03	-52.84	3.38	28.25	-27.97	-25	-2.97	Horizontal
200.2	-45.59	0.61	15.10	-31.10	-25	-6.10	Vertical
359.6	-46.93	1.38	15.45	-32.86	-25	-7.86	Horizontal
Test Results for Mid Channel 2592.99MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5185.98	-55.93	2.65	28.33	-30.25	-25	-5.25	Horizontal
5185.98	-57.82	2.65	28.33	-32.14	-25	-7.14	Vertical
7778.97	-50.28	4.14	28.26	-26.16	-25	-1.16	Vertical
7778.97	-52.30	4.14	28.26	-28.18	-25	-3.18	Horizontal
168.9	-48.73	0.62	16.35	-33.00	-25	-8.00	Vertical
362.8	-49.25	1.39	15.55	-35.09	-25	-10.09	Horizontal
Test Results for Mid Channel 2640MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5280	-56.99	2.65	28.41	-31.23	-25	-6.23	Horizontal
5280	-52.39	2.65	28.41	-26.63	-25	-1.63	Vertical
7920	-50.19	5.23	28.15	-27.27	-25	-2.27	Vertical
7920	-53.90	5.23	28.89	-30.24	-25	-5.24	Horizontal
154.7	-48.54	0.65	15.20	-33.99	-25	-8.99	Vertical
486.3	-50.86	1.10	15.16	-36.80	-25	-11.80	Horizontal

16QAM NR N41 10MHZ SCS 30kHz

Test Results for Low Channel 2501.01MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5002.02	-52.07	2.63	28.37	-26.33	-25	-1.33	Horizontal
5002.02	-54.84	2.63	28.37	-29.10	-25	-4.10	Vertical
7503.03	-52.12	3.38	28.25	-27.25	-25	-2.25	Vertical
7503.03	-53.01	3.38	28.25	-28.14	-25	-3.14	Horizontal
186.3	-45.86	0.61	15.10	-31.37	-25	-6.37	Vertical
357.3	-47.01	1.38	15.45	-32.94	-25	-7.94	Horizontal
Test Results for Mid Channel 2592.99MHz							
5185.98	-55.87	2.65	28.33	-30.19	-25	-5.19	Horizontal
5185.98	-57.72	2.65	28.33	-32.04	-25	-7.04	Vertical
7778.97	-51.07	4.14	28.26	-26.95	-25	-1.95	Vertical
7778.97	-52.09	4.14	28.26	-27.97	-25	-2.97	Horizontal
152.7	-48.52	0.62	16.35	-32.79	-25	-7.79	Vertical
357.2	-49.77	1.39	15.55	-35.61	-25	-10.61	Horizontal
Test Results for High Channel 2685MHz							
5370	-57.11	2.65	28.41	-31.35	-25	-6.35	Horizontal
5370	-53.14	2.65	28.41	-27.38	-25	-2.38	Vertical
8055	-50.13	5.23	28.15	-27.21	-25	-2.21	Vertical
8055	-53.81	5.23	28.89	-30.15	-25	-5.15	Horizontal
154.2	-48.10	0.65	15.20	-33.55	-25	-8.55	Vertical
486.3	-50.71	1.10	15.16	-36.65	-25	-11.65	Horizontal

16QAM NR N41 100MHZ SCS 30kHz

Test Results for Mid Channel 2546.01MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5092.02	-52.84	2.63	28.37	-27.10	-25	-2.10	Horizontal
5092.02	-54.87	2.63	28.37	-29.13	-25	-4.13	Vertical
7638.03	-52.73	3.38	28.25	-27.86	-25	-2.86	Vertical
7638.03	-53.83	3.38	28.25	-28.96	-25	-3.96	Horizontal
200.2	-46.43	0.61	15.10	-31.94	-25	-6.94	Vertical
359.6	-47.78	1.38	15.45	-33.71	-25	-8.71	Horizontal
Test Results for Mid Channel 2592.99MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5185.98	-56.33	2.65	28.33	-30.65	-25	-5.65	Horizontal
5185.98	-58.25	2.65	28.33	-32.57	-25	-7.57	Vertical
7778.97	-51.25	4.14	28.26	-27.13	-25	-2.13	Vertical
7778.97	-52.33	4.14	28.26	-28.21	-25	-3.21	Horizontal
168.9	-49.24	0.62	16.35	-33.51	-25	-8.51	Vertical
362.8	-50.16	1.39	15.55	-36.00	-25	-11.00	Horizontal
Test Results for Mid Channel 2640MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5280	-57.15	2.65	28.41	-31.39	-25	-6.39	Horizontal
5280	-53.32	2.65	28.41	-27.56	-25	-2.56	Vertical
7920	-50.44	5.23	28.15	-27.52	-25	-2.52	Vertical
7920	-54.71	5.23	28.89	-31.05	-25	-6.05	Horizontal
154.7	-48.82	0.65	15.20	-34.27	-25	-9.27	Vertical
486.3	-51.62	1.10	15.16	-37.56	-25	-12.56	Horizontal

9.2 NR N78

QPSK NR N78 10MHZ SCS 30kHz

Test Results for Low Channel 3455MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
6910	-45.58	2.63	28.37	-19.84	-13	-6.84	Horizontal
6910	-49.28	2.63	28.37	-23.54	-13	-10.54	Vertical
10365	-45.65	3.38	28.25	-20.78	-13	-7.78	Vertical
10365	-52.07	3.38	28.25	-27.2	-13	-14.2	Horizontal
175.5	-53.50	0.58	16.1	-37.98	-13	-24.98	Vertical
342.5	-45.30	1.14	16.59	-29.85	-13	-16.85	Horizontal
Test Results for Mid Channel 3500 MHz							
7000	-45.96	2.65	28.33	-20.28	-13	-7.28	Horizontal
7000	-51.38	2.65	28.33	-25.7	-13	-12.7	Vertical
10500	-51.11	4.14	28.26	-26.99	-13	-13.99	Vertical
10500	-49.09	4.14	28.26	-24.97	-13	-11.97	Horizontal
175.6	-45.43	0.59	16.07	-29.95	-13	-16.95	Vertical
346.3	-47.62	1.15	16.64	-32.13	-13	-19.13	Horizontal
Test Results for High Channel 3545MHz							
7090	-43.68	2.65	28.41	-17.92	-13	-4.92	Horizontal
7090	-46.35	2.65	28.41	-20.59	-13	-7.59	Vertical
10635	-45.32	5.23	28.15	-22.4	-13	-9.4	Vertical
10635	-49.8	5.23	28.89	-26.14	-13	-13.14	Horizontal
196.3	-50.33	0.65	15.11	-35.87	-13	-22.87	Vertical
335.1	-50.31	1.12	16.33	-35.1	-13	-22.1	Horizontal

QPSK NR N78 100MHZ SCS 30kHz

Test Results for Mid Channel 3500MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
7000	-45.95	2.63	28.33	-20.25	-13	-7.25	Horizontal
7000	-45.56	2.63	28.33	-19.86	-13	-6.86	Vertical
10500	-49.51	3.38	28.26	-24.63	-13	-11.63	Vertical
10500	-44.65	3.38	28.26	-19.77	-13	-6.77	Horizontal
209.5	-47.26	0.7	16.09	-31.87	-13	-18.87	Vertical
438.6	-51.52	1.46	16.73	-36.25	-13	-23.25	Horizontal

16QAM NR N78 10MHZ SCS 30kHz

Test Results for Low Channel 3455MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
6910	-46.01	2.63	28.37	-20.27	-13	-7.27	Horizontal
6910	-43.77	2.63	28.37	-18.03	-13	-5.03	Vertical
10365	-47.89	3.38	28.25	-23.02	-13	-10.02	Vertical
10365	-44.2	3.38	28.25	-19.33	-13	-6.33	Horizontal
187.8	-46.23	0.63	15.18	-31.68	-13	-18.68	Vertical
260.5	-49.89	0.87	16.15	-34.61	-13	-21.61	Horizontal
Test Results for Mid Channel 3500 MHz							
7000	-44.28	2.65	28.33	-18.6	-13	-5.6	Horizontal
7000	-44.69	2.65	28.33	-19.01	-13	-6.01	Vertical
10500	-51.55	4.14	28.26	-27.43	-13	-14.43	Vertical
10500	-52.05	4.14	28.26	-27.93	-13	-14.93	Horizontal
203.1	-48.23	0.68	15.13	-33.78	-13	-20.78	Vertical
439.4	-50.02	1.46	15.05	-36.43	-13	-23.43	Horizontal
Test Results for High Channel 3545MHz							
7090	-45.88	2.65	28.41	-20.12	-13	-7.12	Horizontal
7090	-49.75	2.65	28.41	-23.99	-13	-10.99	Vertical
10635	-48.12	5.23	28.15	-25.2	-13	-12.2	Vertical
10635	-45.26	5.23	28.89	-21.6	-13	-8.6	Horizontal
201.7	-43.61	0.67	16.23	-28.05	-13	-15.05	Vertical
301.4	-47.66	1	15.55	-33.11	-13	-20.11	Horizontal

16QAM NR N78 100MHZ SCS 30kHz

Test Results for Mid Channel 3500MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
7000	-46.87	2.63	28.33	-21.17	-13	-8.17	Horizontal
7000	-46.7	2.63	28.33	-21	-13	-8	Vertical
10500	-46.28	3.38	28.26	-21.4	-13	-8.4	Vertical
10500	-46.55	3.38	28.26	-21.67	-13	-8.67	Horizontal
198	-51.1	0.66	16.06	-35.7	-13	-22.7	Vertical
345.9	-47.1	1.15	16.65	-31.6	-13	-18.6	Horizontal

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §27.54

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

Temp. = -30° to $+50^{\circ}\text{C}$

Voltage = low voltage, DC 3.23V, Normal, DC 3.8V and High voltage, DC 4.37V.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to -30°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

NR Band 41/78

RESULTS

See the following pages.

10.1 NR BAND 41

N41 QPSK, (100MHz CH 518598 RB Allocation 24@0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2592.99	3.31	0.001277	2.5
3.80	2592.99	6.26	0.002414	2.5
4.37	2592.99	5.36	0.002067	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2592.99	4.15	0.001600	2.5
Extreme (50C)	2592.99	4.72	0.001820	2.5
Extreme (40C)	2592.99	0.96	0.000370	2.5
Extreme (30C)	2592.99	1.83	0.000706	2.5
Extreme (10C)	2592.99	2.38	0.000918	2.5
Extreme (0C)	2592.99	5.19	0.002002	2.5
Extreme (-10C)	2592.99	3.28	0.001265	2.5
Extreme (-20C)	2592.99	2.09	0.000806	2.5
Extreme (-30C)	2592.99	3.26	0.001257	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

N41 16QAM, (100MHz CH 518598 RB Allocation 24@0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	2592.99	2.63	0.001014	2.5
3.80	2592.99	1.39	0.000536	2.5
4.37	2592.99	2.53	0.000976	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2592.99	6.58	0.002538	2.5
Extreme (50C)	2592.99	6.53	0.002518	2.5
Extreme (40C)	2592.99	5.74	0.002214	2.5
Extreme (30C)	2592.99	1.26	0.000486	2.5
Extreme (10C)	2592.99	2.29	0.000883	2.5
Extreme (0C)	2592.99	1.16	0.000447	2.5
Extreme (-10C)	2592.99	0.91	0.000351	2.5
Extreme (-20C)	2592.99	1.47	0.000567	2.5
Extreme (-30C)	2592.99	3.74	0.001442	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.2 NR BAND 78

N78 QPSK, (100MHz CH 633333 RB Allocation 135@67)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	3500	3.24	0.000926	2.5
3.80	3500	6.07	0.001734	2.5
4.37	3500	5.2	0.001486	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	3500	4.82	0.001377	2.5
Extreme (50C)	3500	5.66	0.001617	2.5
Extreme (40C)	3500	0.86	0.000246	2.5
Extreme (30C)	3500	1.89	0.000540	2.5
Extreme (10C)	3500	2.33	0.000666	2.5
Extreme (0C)	3500	5.14	0.001469	2.5
Extreme (-10C)	3500	3.24	0.000926	2.5
Extreme (-20C)	3500	2.02	0.000577	2.5
Extreme (-30C)	3500	3.11	0.000889	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

N78 16QAM, (100MHz CH 633333 RB Allocation 135@67)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.23	3500	2.3	0.000657	2.5
3.80	3500	1.36	0.000389	2.5
4.37	3500	2.46	0.000703	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	3500	6.07	0.001734	2.5
Extreme (50C)	3500	6.24	0.001783	2.5
Extreme (40C)	3500	5.01	0.001431	2.5
Extreme (30C)	3500	0.98	0.000280	2.5
Extreme (10C)	3500	2.11	0.000603	2.5
Extreme (0C)	3500	1.05	0.000300	2.5
Extreme (-10C)	3500	0.88	0.000251	2.5
Extreme (-20C)	3500	1.44	0.000411	2.5
Extreme (-30C)	3500	3.69	0.001054	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

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

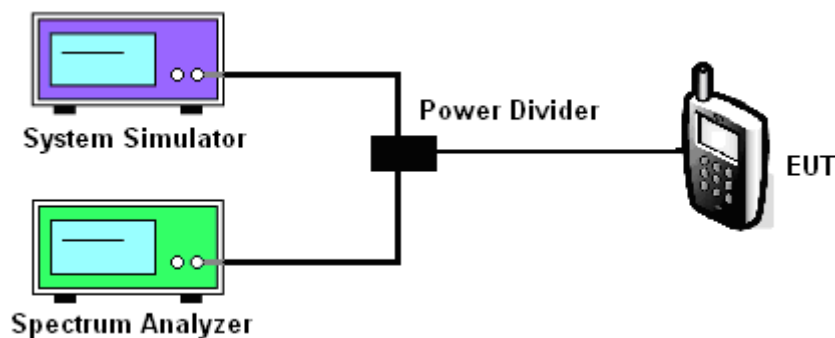
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For GSM/EGPRS operating modes:
 - a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
 - b. Set EUT in maximum power output, and triggered the burst signal.
 - c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

11.4 Test Setup



11.5 MODES TESTED

NR Band 41/78

Test data reference attachment.

----END OF REPORT----