

FCC CFR47 PART 22H, 24E, 27 CERTIFICATION TEST REPORT

FCC ID: 2BBNY-X4200

Product: Spatial Computing Box

Trade Mark: XREAL

Model Number: X4200

Family Model: N/A

Report No.: S24080507317006

Issue Date: Dec. 13, 2024

Prepared for

Xreal Inc.

440N. Wolfe Rd. Unit E417 Sunnyvale, CA 94085

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name: Xreal Inc.

Address: 440N. Wolfe Rd. Unit E417 Sunnyvale, CA 94085

Manufacturer's Name: Xreal Inc

Address: 440N. Wolfe Rd. Unit E417 Sunnyvale, CA 94085

Product name: Spatial Computing Box

Trade Mark : XREAL

Model and/or type reference : X4200

Family Model: N/A

Test Sample number.....: S240805073018

Date of Test: Aug. 05, 2024 ~ Dec. 13, 2024

Standards: FCC CFR 47 Part 22H, 24E, 27

Test procedure ANSI C63.46:2015

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	Spatial Computing Box
Trade Mark	XREAL
Model Name	X4200
Family Model	N/A
Model Difference	N/A
FCC ID:	2BBNY-X4200
Frequency Bands:	U.S. Bands: ☒ NR FDD Band 2, 5, 7, 12, 25, 66 ☒ NR TDD Band 41, 77, 78
Frequency Range:	NR FDD Band 2 Uplink: 1850MHz-1910MHz, Downlink: 1930MHz-1990MHz, NR FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz, NR FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz; NR FDD Band 12 Uplink: 699MHz-716MHz, Downlink: 729MHz-746MHz, NR FDD Band 25 Uplink: 1850MHz-1915MHz, Downlink: 1930MHz-1995MHz, NR TDD Band 41 Uplink/Downlink: 2496MHz-2690MHz, NR FDD Band 66 Uplink: 1710MHz-1780MHz, Downlink: 2110MHz-2200MHz, NR TDD Band 77 Uplink/Downlink: 3700 MHz - 3980 MHz, NR TDD Band 78 Uplink/Downlink: 3450 MHz - 3550 MHz
EN-DC Band: Note 2	DC_2A_n5a, DC_2A_n7a, DC_2A_n12A, DC_2A_n41A, DC_2A_n66A, DC_2A_n77A, DC_2A_n78A DC_4A_n41A, DC_4A_n78A DC_5A_n2A, DC_5A_n7A, DC_5A_n66A, DC_5A_n77A, DC_5A_n78A DC_7A_n2A, DC_7A_n5A, DC_7A_n66A, DC_7A_n71A, DC_7A_n77A, DC_7A_n78A DC_12A_n2A, DC_12A_n25A, DC_12A_n41A, DC_12A_n66A, DC_12A_n77A, DC_12A_n78A DC_13A_n2A, DC_13A_n66A, DC_13A_n77A, DC_13A_n78A DC_14A_n2A, DC_14A_n66A, DC_14A_n77A DC_25A_n41A, DC_25A_n77A, DC_25A_n78A, DC_26A_n41a DC_66A_n2A, DC_66A_n5a, DC_66A_n7A, DC_66A_n12A, DC_66A_n25A DC_66A_n41A, DC_66A_n71A, DC_66A_n77A, DC_66A_n78A DC_71A_n2A, DC_71A_n41A, DC_71A_n66A, DC_71A_n78A
Type of Modulation:	DFT-s-OFDM: PI/2 BPSK/QPSK/16-QAM/64QAM/256QAM CP-OFDM: QPSK/16-QAM/64QAM/256QAM
Subcarrier spacing Note 3	☒ 15KHz, ☒ 30KHz, ☐ 60KHz
NR architecture	☒ SA, ☒ NSA
Antenna:	PIFA Antenna
Antenna gain:	N 2: -3.87dBi, N 5: -2.33dBi, N 7: -0.1dBi, N 12: -2.31dBi, N 25: -3.87dBi, N 41: 0.25dBi, N 66: -1.49dBi, N 77: 1.09dBi, N 78: 1.09dBi

Adapter	N/A
Battery	DC 3.87V, 4300mAh
Power supply	DC 3.87V from battery or DC 5V from Type-C port
Extreme Vol. Limits:	DC 3.29V to DC 4.45V (Nominal DC 3.87V) (Note 1)
HW Version	X4200_DVT2
SW Version	N/A
** Note1: The High Voltage 4.45V and Low Voltage 3.29V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage. Note 2: For EN-DC mode, 5G NR FR1 bands are tested in this report, all the other RF bands are tested in the other reports separately. Note 3:FDD Band support SCS15kHz, TDD Band support SCS30kHz,	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2BBNY-X4200** 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 C63.46:2015.

1.4 TEST FACILITY

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

ShenZhen NTEK Testing Technology Co., Ltd.

1&5/F, Building C, 1&2/F, Building E, Fenda Science Park,

Sanwei Community, Hangcheng Street, Baoan District, Shenzhen ,Guangdong, China

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.46:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

1.5 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement, where expended 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 2 / 5 / 7 / 12 / 25 / 41 / 66 / 77 / 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 Part22, Subpart H/ FCC Part24, Subpart E, FCC Part27 KDB 971168 D01 Power Meas License Digital Systems v03r01			
FCC Rule	Test Item	Verdict	Remark
2.1046	Conducted Output Power	PASS	
22.913(d) 24.232(d) 27.50(d)(5) KDB 971168 D01 Clause 5.7	Peak-to-Average Ratio	PASS	
2.1049 22.917(b) 24.238(b) KDB 971168 D01 Clause 4.2	Occupied Bandwidth	PASS	
2.1051 22.917(a) 24.238(a) 27.53(g), (h), (m) KDB 971168 D01 Clause 6	Band Edge	PASS	
22.913(a)(2) 27.50(b)(10), (c)(10) KDB 971168 D01 Clause 5.6	Effective Radiated Power	PASS	
24.232(c) 27.50(h)(2), (d)(4) KDB 971168 D01 Clause 5.6	Equivalent Isotropic Radiated Power	PASS	
2.1053 22.917(a) 24.238(a) 27.53(g), (h), (m) KDB 971168 D01 Clause 7	Field Strength of Spurious Radiation	PASS	
2.1055 22.355 24.235 27.54 KDB 971168 D01 Clause 9	Frequency Stability for Temperature & Voltage	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. 4. The worst-case scenario for all measurements is based on an engineering evaluation made on different modulations. Then, QPSK and 16QAM were observed as the worst mode to LTE bands respectively and set for all conducted and radiated. Output power measurements were measured on QPSK, 16QAM, and 64QAM modulations, and tests other than output power are performed only in worse-case QPSK and 16QAM modulations.			

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

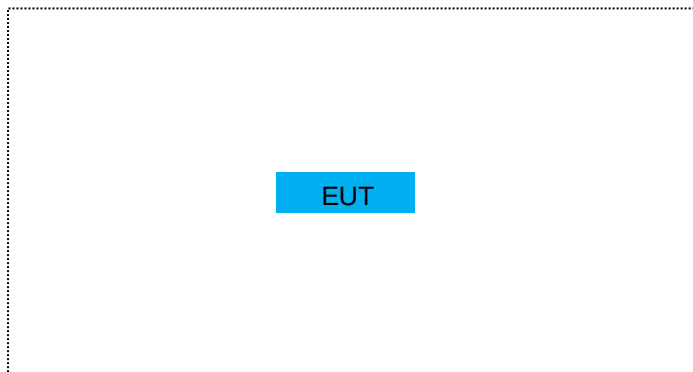
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Spatial Computing Box	X4200	FCC ID: 2BBNY-X4200	EUT

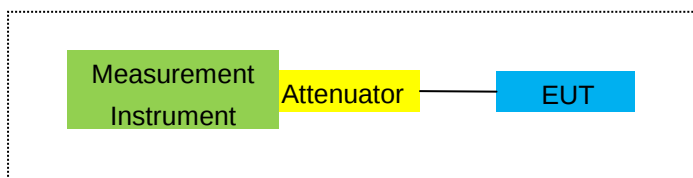
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

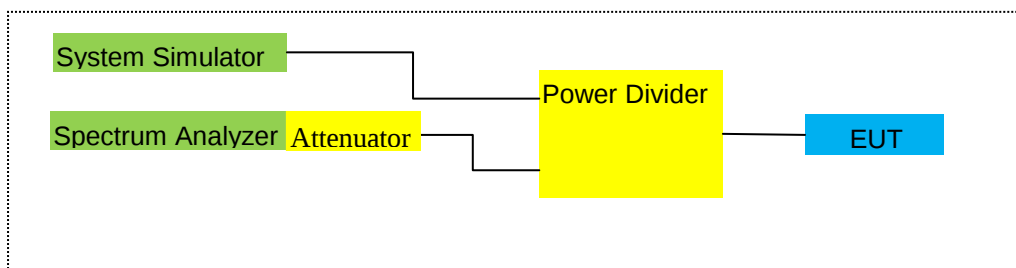
For Radiated Test Cases



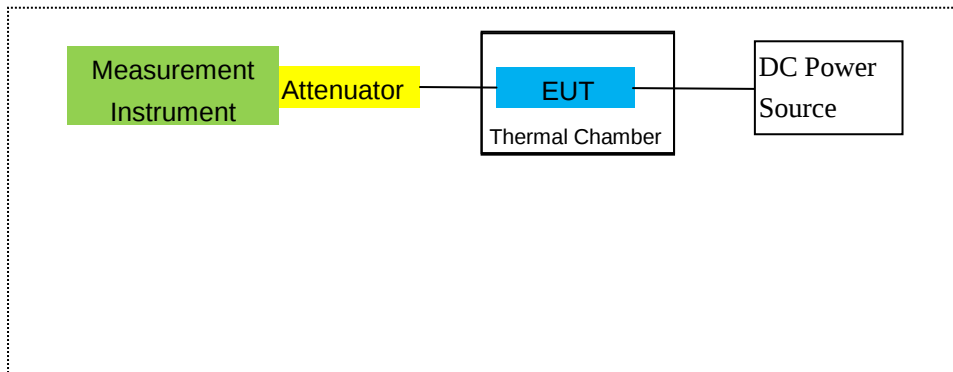
For Conducted Output Power



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	2024.04.25	2025.04.24	1 year
2	Test Receiver	R&S	ESPI	101318	2024.04.26	2025.04.25	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2024.05.12	2025.05.11	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	2024.04.26	2025.04.25	1 year
8	Loop Antenna	ARA	PLA-1030/B	1029	2024.03.12	2025.03.11	1 year
9	Power Meter	R&S	NRVS	100696	2024.04.26	2025.04.25	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2024.04.26	2025.04.25	1 year
11	Test Cable	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2024.04.26	2025.04.25	1 year
15	LISN	R&S	ENV216	101313	2024.04.25	2025.04.24	1 year
16	LISN	EMCO	3816/2	00042990	2024.04.25	2025.04.24	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2024.03.12	2025.03.11	1 year
18	Passive Voltage Probe	R&S	ESH2-Z3	100196	2024.03.12	2025.03.11	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	2024.03.12	2025.03.11	1 year
23	Spectrum Analyzer	agilent	e4440a	us44300399	2024.03.12	2025.03.11	1 year
24	test receiver	R&S	ESCI	a0304218	2024.03.12	2025.03.11	1 year
25	Communication Tester	R&S	CMU200	A0304247	2024.04.26	2025.04.25	1 year
26	Thermal Chamber	Ten Billion	TTC-B3C	TBN-960502	2024.03.12	2025.03.11	1 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	2024.04.25	2025.04.24	1 year
29	Communication Tester	R&S	CMW500	148500	2024.05.30	2025.05.29	1 year
30	Radio Communication Analyzer	Anritsu	MT8821C	SN 6262186364	2024.04.25	2025.04.24	1 year
31	Radio Communication Test Station	Anritsu	MT8000A	SN 6262192315	2024.04.25	2025.04.24	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	$\pm 2^2$		
3					23	$\pm 2^2$		
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	$\pm 2^2$		
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 2 / 5 / 7 / 12 / 25 / 41 / 66 / 77 / 78

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53,

FCC: §22.359

LIMITS

FCC: §22.917, §24.238, §27.53

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.

(m)(4) For mobile digital stations, 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 as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Show citation box.

(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

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 CMW500 Test 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 2 / 5 / 7 / 12 / 25 / 41 / 66 / 77 / 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, §22.901, §22.917, §24.238, §27.53

LIMITS

1. 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.
2. The Band 7/41 emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \log (P)$ dB.

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 2 / 5 / 7 / 12 / 25 / 41 / 66 / 77 / 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, §22.913, §24.232, §27.50

LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

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

27.50 (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. 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 2 / 5 / 7 / 12 / 25 / 41 / 66 / 77 / 78

RESULTS

Pass

8.2 NR BAND 2

Radiated Power (EIRP) for N2 /SCS (15kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_QP SK	1@1	1852.5	17.25	5.12	8.90	21.03	126.765	Horizontal	Pass
		1880	18.58	5.18	8.90	22.3	169.824	Horizontal	Pass
		1907.5	19.03	5.23	8.90	22.7	186.209	Horizontal	Pass
10.0MHz DFT_QP SK	1@1	1855	19.02	5.12	8.90	22.8	190.546	Horizontal	Pass
		1880	18.79	5.18	8.90	22.51	178.238	Horizontal	Pass
		1905	17.86	5.22	8.90	21.54	142.561	Horizontal	Pass
15.0MHz DFT_QP SK	1@1	1857.5	18.62	5.13	8.90	22.39	173.380	Horizontal	Pass
		1880	18.58	5.18	8.90	22.3	169.824	Horizontal	Pass
		1902.5	18.76	5.21	8.90	22.45	175.792	Horizontal	Pass
20.0MHz DFT_QP SK	1@1	1860	18.97	5.13	8.90	22.74	187.932	Horizontal	Pass
		1880	19.09	5.18	8.90	22.81	190.985	Horizontal	Pass
		1900	17.10	5.21	8.90	20.79	119.950	Horizontal	Pass

Radiated Power (EIRP) for N2 /SCS (15kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_16 QAM	1@1	1852.5	17.57	5.12	8.90	21.35	136.458	Vertical	Pass
		1880	17.64	5.18	8.90	21.36	136.773	Vertical	Pass
		1907.5	17.27	5.23	8.90	20.94	124.165	Vertical	Pass
10.0MHz DFT_16 QAM	1@1	1855	17.33	5.12	8.90	21.11	129.122	Vertical	Pass
		1880	17.64	5.18	8.90	21.36	136.773	Vertical	Pass
		1905	17.88	5.22	8.90	21.56	143.219	Vertical	Pass
15.0MHz DFT_16 QAM	1@1	1857.5	17.77	5.13	8.90	21.54	142.561	Vertical	Pass
		1880	17.79	5.18	8.90	21.51	141.579	Vertical	Pass
		1902.5	17.50	5.21	8.90	21.19	131.522	Vertical	Pass
20.0MHz DFT_16 QAM	1@1	1860	17.85	5.13	8.90	21.62	145.211	Vertical	Pass
		1880	18.27	5.18	8.90	21.99	158.125	Vertical	Pass
		1900	17.35	5.21	8.90	21.04	127.057	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

ERP(dBm)=EIRP-2.15

8.3 NR BAND 5

Radiated Power (EIRP) for N5 /SCS (15kHz)										
Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP (dBm)	Max. ERP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_QPSK	1@1	826.5	23.45	5.12	5.30	2.15	21.48	140.605	Horizontal	Pass
		836.5	23.53	5.18	5.30	2.15	21.5	141.254	Horizontal	Pass
		846.5	23.38	5.23	5.70	2.15	21.7	147.911	Horizontal	Pass
10.0MHz DFT_QPSK	1@1	829	24.45	5.12	5.30	2.15	22.48	177.011	Horizontal	Pass
		836.5	24.38	5.18	5.30	2.15	22.35	171.791	Horizontal	Pass
		844	23.72	5.22	5.70	2.15	22.05	160.325	Horizontal	Pass
15.0MHz DFT_QPSK	1@1	831.5	23.30	5.13	5.30	2.15	21.32	135.519	Horizontal	Pass
		836.5	24.55	5.18	5.30	2.15	22.52	178.649	Horizontal	Pass
		841.5	24.10	5.21	5.70	2.15	22.44	175.388	Horizontal	Pass
20.0MHz DFT_QPSK	1@1	834	23.30	5.13	5.30	2.15	21.32	135.519	Horizontal	Pass
		836.5	24.71	5.18	5.30	2.15	22.68	185.353	Horizontal	Pass
		839	22.89	5.21	5.70	2.15	21.23	132.739	Horizontal	Pass

Radiated Power (EIRP) for N5 /SCS (15kHz)										
Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP (dBm)	Max. ERP (mW)	Polarization Of Max. ERP	
10.0MHz DFT_16QAM	1@1	826.5	24.03	5.12	5.30	2.15	22.06	160.694	Vertical	Pass
		836.5	24.18	5.18	5.30	2.15	22.15	164.059	Vertical	Pass
		846.5	23.25	5.23	5.70	2.15	21.57	143.549	Vertical	Pass
15.0MHz DFT_16QAM	1@1	829	23.87	5.12	5.30	2.15	21.9	154.882	Vertical	Pass
		836.5	24.34	5.18	5.30	2.15	22.31	170.216	Vertical	Pass
		844	23.39	5.22	5.70	2.15	21.72	148.594	Vertical	Pass
20.0MHz DFT_16QAM	1@1	831.5	24.08	5.13	5.30	2.15	22.1	162.181	Vertical	Pass
		836.5	23.63	5.18	5.30	2.15	21.6	144.544	Vertical	Pass
		841.5	23.81	5.21	5.70	2.15	22.15	164.059	Vertical	Pass
40.0MHz DFT_16QAM	1@1	834	24.06	5.13	5.30	2.15	22.08	161.436	Vertical	Pass
		836.5	24.39	5.18	5.30	2.15	22.36	172.187	Vertical	Pass
		839	23.23	5.21	5.70	2.15	21.57	143.549	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

ERP(dBm)=EIRP-2.15

8.4 NR BAND 7

Radiated Power (EIRP) for N7 /SCS (15kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_QPSK	1@1	2502.5	18.07	5.12	9.00	21.95	156.675	Horizontal	Pass
		2535	18.77	5.18	9.00	22.59	181.552	Horizontal	Pass
		2567.5	17.88	5.23	9.00	21.65	146.218	Horizontal	Pass
10.0MHz DFT_QPSK	1@1	2505	18.25	5.12	9.00	22.13	163.305	Horizontal	Pass
		2535	18.18	5.18	9.00	22	158.489	Horizontal	Pass
		2695	18.51	5.22	9.00	22.29	169.434	Horizontal	Pass
15.0MHz DFT_QPSK	1@1	2507.5	17.68	5.13	9.00	21.55	142.889	Horizontal	Pass
		2535	18.21	5.18	9.00	22.03	159.588	Horizontal	Pass
		2692.5	17.81	5.21	9.00	21.6	144.544	Horizontal	Pass
20.0MHz DFT_QPSK	1@1	2510	17.58	5.13	9.00	21.45	139.637	Horizontal	Pass
		2535	18.00	5.18	9.00	21.82	152.055	Horizontal	Pass
		2690	19.31	5.21	9.00	23.1	204.174	Horizontal	Pass

Radiated Power (EIRP) for N7 /SCS (15kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_16QAM	1@1	2502.5	16.99	5.12	9.00	20.87	122.180	Vertical	Pass
		2535	16.68	5.18	9.00	20.50	112.202	Vertical	Pass
		2567.5	16.99	5.23	9.00	20.76	119.124	Vertical	Pass
10.0MHz DFT_16QAM	1@1	2505	16.54	5.12	9.00	20.42	110.154	Vertical	Pass
		2535	16.59	5.18	9.00	20.41	109.901	Vertical	Pass
		2565	16.45	5.22	9.00	20.23	105.439	Vertical	Pass
15.0MHz DFT_16QAM	1@1	2507.5	16.93	5.13	9.00	20.80	120.226	Vertical	Pass
		2535	16.22	5.18	9.00	20.04	100.925	Vertical	Pass
		2562.5	16.28	5.21	9.00	20.07	101.625	Vertical	Pass
20.0MHz DFT_16QAM	1@1	2510	17.08	5.13	9.00	20.95	124.451	Vertical	Pass
		2535	17.54	5.18	9.00	21.36	136.773	Vertical	Pass
		2560	16.58	5.21	9.00	20.37	108.893	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.5 NR BAND 12

Radiated Power (EIRP) for N12 /SCS (15kHz)										
Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP (dBm)	Max. ERP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_QPSK	1@1	701.5	23.81	5.12	5.60	2.15	22.14	163.682	Horizontal	Pass
		707.5	24.70	5.18	5.70	2.15	23.07	202.768	Horizontal	Pass
		713.5	24.74	5.23	5.80	2.15	23.16	207.014	Horizontal	Pass
10.0MHz DFT_QPSK	1@1	704	23.80	5.12	5.60	2.15	22.13	163.305	Horizontal	Pass
		707.5	24.21	5.18	5.70	2.15	22.58	181.134	Horizontal	Pass
		711	24.72	5.22	5.80	2.15	23.15	206.538	Horizontal	Pass
15.0MHz DFT_QPSK	1@1	706.5	24.82	5.13	5.60	2.15	23.14	206.063	Horizontal	Pass
		707.5	24.91	5.18	5.70	2.15	23.28	212.814	Horizontal	Pass
		708.5	24.73	5.21	5.80	2.15	23.17	207.491	Horizontal	Pass

Radiated Power (EIRP) for N12/SCS (15kHz)										
Mode	RB/ RB Position	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP (dBm)	Max. ERP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_16QAM	1@1	826.5	24.03	5.12	5.30	2.15	22.06	160.694	Vertical	Pass
		836.5	24.18	5.18	5.30	2.15	22.13	163.305	Vertical	Pass
		846.5	23.25	5.23	5.70	2.15	21.57	143.549	Vertical	Pass
10.0MHz DFT_16QAM	1@1	829	23.87	5.12	5.30	2.15	21.9	154.882	Vertical	Pass
		836.5	24.34	5.18	5.30	2.15	21.35	136.458	Vertical	Pass
		844	23.39	5.22	5.70	2.15	21.72	148.594	Vertical	Pass
15.0MHz DFT_16QAM	1@1	831.5	24.08	5.13	5.30	2.15	22.1	162.181	Vertical	Pass
		836.5	23.63	5.18	5.30	2.15	21.6	144.544	Vertical	Pass
		841.5	23.81	5.21	5.70	2.15	22.15	164.059	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

ERP(dBm)=EIRP-2.15

8.6 NR BAND 25

Radiated Power (EIRP) for N25 /SCS (15kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_QPSK	1@1	1852.5	18.64	5.12	8.90	22.42	174.582	Horizontal	Pass
		1882.5	18.78	5.18	8.90	22.5	177.828	Horizontal	Pass
		1912.5	17.80	5.23	8.90	21.47	140.281	Horizontal	Pass
10.0MHz DFT_QPSK	1@1	1855	17.61	5.12	8.90	21.39	137.721	Horizontal	Pass
		1882.5	17.95	5.18	8.90	21.67	146.893	Horizontal	Pass
		1910	19.17	5.22	8.90	22.85	192.752	Horizontal	Pass
15.0MHz DFT_QPSK	1@1	1857.5	18.50	5.13	8.90	22.27	168.655	Horizontal	Pass
		1882.5	18.45	5.18	8.90	22.17	164.816	Horizontal	Pass
		1907.5	18.67	5.21	8.90	22.36	172.187	Horizontal	Pass
20.0MHz DFT_QPSK	1@1	1857.5	17.69	5.13	8.90	21.46	139.959	Horizontal	Pass
		1882.5	19.33	5.18	8.90	23.05	201.837	Horizontal	Pass
		1907.5	17.57	5.21	8.90	21.26	133.660	Horizontal	Pass

Radiated Power (EIRP) for N25 /SCS (15kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_16QAM	1@1	2502.5	17.17	5.12	8.90	20.95	124.451	Vertical	Pass
		2535	17.62	5.18	8.90	21.34	136.144	Vertical	Pass
		2567.5	17.46	5.23	8.90	21.13	129.718	Vertical	Pass
10.0MHz DFT_16QAM	1@1	2505	17.43	5.12	8.90	21.21	132.130	Vertical	Pass
		2535	17.42	5.18	8.90	21.14	130.017	Vertical	Pass
		2565	17.47	5.22	8.90	21.15	130.317	Vertical	Pass
15.0MHz DFT_16QAM	1@1	2507.5	17.40	5.13	8.90	21.17	130.918	Vertical	Pass
		2535	16.27	5.18	8.90	19.99	99.770	Vertical	Pass
		2562.5	16.91	5.21	8.90	20.6	114.815	Vertical	Pass
20.0MHz DFT_16QAM	1@1	2502.5	17.51	5.12	8.90	21.29	134.586	Vertical	Pass
		2535	17.97	5.18	8.90	21.69	147.571	Vertical	Pass
		2567.5	17.17	5.23	8.90	20.84	121.339	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.7 NR BAND 41

Radiated Power (EIRP) for N41 /SCS (30kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. EIRP	
10.0MHz DFT_QPSK	1@1	2501.01	18.79	5.12	9.00	22.67	184.927	Horizontal	Pass
		2592.99	17.21	5.18	9.00	21.03	126.765	Horizontal	Pass
		2685	19.10	5.23	9.00	22.87	193.642	Horizontal	Pass
15.0MHz DFT_QPSK	1@1	2503.5	18.97	5.12	9.00	22.85	192.752	Horizontal	Pass
		2592.99	19.11	5.18	9.00	22.93	196.336	Horizontal	Pass
		2682.48	18.83	5.22	9.00	22.61	182.390	Horizontal	Pass
20.0MHz DFT_QPSK	1@1	2506.01	18.90	5.13	9.00	22.77	189.234	Horizontal	Pass
		2592.99	19.16	5.18	9.00	22.98	198.609	Horizontal	Pass
		2679.99	18.83	5.21	9.00	22.62	182.810	Horizontal	Pass
30.0MHz DFT_QPSK	1@1	2511	18.72	5.13	9.00	22.59	181.552	Horizontal	Pass
		2592.99	18.91	5.18	9.00	22.73	187.499	Horizontal	Pass
		2674.98	18.56	5.21	9.00	22.35	171.791	Horizontal	Pass
40.0MHz DFT_QPSK	1@1	2516.01	19.13	5.14	9.00	22.99	199.067	Horizontal	Pass
		2592.99	19.23	5.18	9.00	23.05	201.837	Horizontal	Pass
		2670	19.22	5.2	9.00	23.02	200.447	Horizontal	Pass
50.0MHz DFT_QPSK	1@1	2521.02	18.31	5.14	9.00	22.17	164.816	Horizontal	Pass
		2592.99	18.95	5.18	9.00	22.77	189.234	Horizontal	Pass
		2664.99	19.30	5.19	9.00	23.11	204.644	Horizontal	Pass
60.0MHz DFT_QPSK	1@1	2526	19.01	5.14	9.00	22.87	193.642	Horizontal	Pass
		2592.99	19.13	5.18	9.00	22.95	197.242	Horizontal	Pass
		2659.98	19.22	5.19	9.00	23.03	200.909	Horizontal	Pass
80.0MHz DFT_QPSK	1@1	2536.02	19.03	5.14	9.00	22.89	194.536	Horizontal	Pass
		2592.99	18.71	5.18	9.00	22.53	179.061	Horizontal	Pass
		2649.99	18.35	5.19	9.00	22.16	164.437	Horizontal	Pass
90.0MHz DFT_QPSK	1@1	2541	19.03	5.14	9.00	22.89	194.536	Horizontal	Pass
		2592.99	18.71	5.18	9.00	22.53	179.061	Horizontal	Pass
		2644.98	18.33	5.19	9.00	22.14	163.682	Horizontal	Pass
100.0MHz DFT_QPSK	1@1	2546.01	19.03	5.14	9.00	22.89	194.536	Horizontal	Pass
		2592.99	18.71	5.18	9.00	22.53	179.061	Horizontal	Pass
		2640	19.58	5.19	9.00	23.39	218.273	Horizontal	Pass

Radiated Power (EIRP) for N41 /SCS (30kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. EIRP	
10.0MHz DFT_16Q AM	1@1	2501.01	17.14	5.12	9.00	21.02	126.474	Vertical	Pass
		2592.99	16.60	5.18	9.00	20.42	110.154	Vertical	Pass
		2685	16.73	5.23	9.00	20.5	112.202	Vertical	Pass
15.0MHz DFT_16Q AM	1@1	2503.5	17.16	5.12	9.00	21.04	127.057	Vertical	Pass
		2592.99	17.25	5.18	9.00	21.07	127.938	Vertical	Pass
		2682.48	17.08	5.22	9.00	20.86	121.899	Vertical	Pass
20.0MHz DFT_16Q AM	1@1	2506.01	17.15	5.13	9.00	21.02	126.474	Vertical	Pass
		2592.99	17.07	5.18	9.00	20.89	122.744	Vertical	Pass
		2679.99	16.36	5.21	9.00	20.15	103.514	Vertical	Pass
30.0MHz DFT_16Q AM	1@1	2511	17.21	5.13	9.00	21.08	128.233	Vertical	Pass
		2592.99	17.56	5.18	9.00	21.38	137.404	Vertical	Pass
		2674.98	17.25	5.21	9.00	21.04	127.057	Vertical	Pass
40.0MHz DFT_16Q AM	1@1	2516.01	16.96	5.14	9.00	20.82	120.781	Vertical	Pass
		2592.99	17.61	5.18	9.00	21.43	138.995	Vertical	Pass
		2670	16.58	5.2	9.00	20.38	109.144	Vertical	Pass
50.0MHz DFT_16Q AM	1@1	2521.02	17.11	5.14	9.00	20.97	125.026	Vertical	Pass
		2592.99	17.76	5.18	9.00	21.58	143.880	Vertical	Pass
		2664.99	17.38	5.19	9.00	21.19	131.522	Vertical	Pass
60.0MHz DFT_16Q AM	1@1	2526	16.78	5.14	9.00	20.64	115.878	Vertical	Pass
		2592.99	17.20	5.18	9.00	21.02	126.474	Vertical	Pass
		2659.98	16.87	5.19	9.00	20.68	116.950	Vertical	Pass
80.0MHz DFT_16Q AM	1@1	2536.02	17.54	5.14	9.00	21.4	138.038	Vertical	Pass
		2592.99	16.99	5.18	9.00	20.81	120.504	Vertical	Pass
		2649.99	17.71	5.19	9.00	21.52	141.906	Vertical	Pass
90.0MHz DFT_16Q AM	1@1	2541	17.69	5.14	9.00	21.55	142.889	Vertical	Pass
		2592.99	17.47	5.18	9.00	21.29	134.586	Vertical	Pass
		2644.98	17.06	5.19	9.00	20.87	122.180	Vertical	Pass
90.0MHz DFT_16Q AM	1@1	2546.01	17.57	5.14	9.00	21.43	138.995	Vertical	Pass
		2592.99	17.61	5.18	9.00	21.43	138.995	Vertical	Pass
		2640	17.84	5.19	9.00	21.65	146.218	Vertical	Pass

Note:

SG Level= Signal generator output

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

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

8.8 NR BAND 66

Radiated Power (EIRP) for N66 /SCS (15kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_QPSK	1@1	1712.5	18.64	5.12	8.90	22.42	174.582	Horizontal	Pass
		1745	18.78	5.18	8.90	22.5	177.828	Horizontal	Pass
		1777.5	17.80	5.23	8.90	21.47	140.281	Horizontal	Pass
20.0MHz DFT_QPSK	1@1	1720	17.61	5.12	8.90	21.39	137.721	Horizontal	Pass
		1745	17.95	5.18	8.90	21.67	146.893	Horizontal	Pass
		1770	19.17	5.22	8.90	22.85	192.752	Horizontal	Pass
40.0MHz DFT_QPSK	1@1	1730	17.69	5.13	8.90	21.46	139.959	Horizontal	Pass
		1745	19.33	5.18	8.90	23.05	201.837	Horizontal	Pass
		1760	17.57	5.21	8.90	21.26	133.660	Horizontal	Pass

Radiated Power (EIRP) for N66 /SCS (15kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
5.0MHz DFT_16QAM	1@1	1712.5	18.64	5.12	8.90	22.42	174.582	Horizontal	Pass
		1745	18.78	5.18	8.90	22.5	177.828	Horizontal	Pass
		1777.5	17.80	5.23	8.90	21.47	140.281	Horizontal	Pass
20.0MHz DFT_16QAM	1@1	1720	17.61	5.12	8.90	21.39	137.721	Horizontal	Pass
		1745	17.95	5.18	8.90	21.67	146.893	Horizontal	Pass
		1770	19.17	5.22	8.90	22.85	192.752	Horizontal	Pass
40.0MHz DFT_16QAM	1@1	1730	17.69	5.13	8.90	21.46	139.959	Horizontal	Pass
		1745	19.33	5.18	8.90	23.05	201.837	Horizontal	Pass
		1760	17.57	5.21	8.90	21.26	133.660	Horizontal	Pass

Note:

SG Level= Signal generator output

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

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

8.9 NR BAND 77

Radiated Power (EIRP) for N77 /SCS (30kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
10.0MHz DFT_QPSK	1@1	3705	15.86	5.12	11	21.74	149.279	Horizontal	Pass
		3840	16.29	5.18	11	22.11	162.555	Horizontal	Pass
		3975	16.88	5.23	11	22.65	184.077	Horizontal	Pass
15.0MHz DFT_QPSK	1@1	3707.5	16.57	5.12	11	22.45	175.792	Horizontal	Pass
		3840	16.55	5.18	11	22.37	172.584	Horizontal	Pass
		3972.5	16.35	5.22	11	22.13	163.305	Horizontal	Pass
20.0MHz DFT_QPSK	1@1	3710	16.07	5.13	11	21.94	156.315	Horizontal	Pass
		3840	16.29	5.18	11	22.11	162.555	Horizontal	Pass
		3970	16.30	5.21	11	22.09	161.808	Horizontal	Pass
40.0MHz DFT_QPSK	1@1	3720	16.56	5.13	11	22.43	174.985	Horizontal	Pass
		3840	16.70	5.18	11	22.52	178.649	Horizontal	Pass
		3960	15.93	5.21	11	21.72	148.594	Horizontal	Pass
50.0MHz DFT_QPSK	1@1	3725	16.39	5.14	11	22.25	167.880	Horizontal	Pass
		3840	16.65	5.18	11	22.47	176.604	Horizontal	Pass
		3955	16.40	5.2	11	22.2	165.959	Horizontal	Pass
60.0MHz DFT_QPSK	1@1	3730	15.61	5.14	11	21.47	140.281	Horizontal	Pass
		3840	16.47	5.18	11	22.29	169.434	Horizontal	Pass
		3950	15.45	5.19	11	21.26	133.660	Horizontal	Pass
70.0MHz DFT_QPSK	1@1	3735	16.84	5.14	11	22.7	186.209	Horizontal	Pass
		3840	15.71	5.18	11	21.53	142.233	Horizontal	Pass
		3945	16.69	5.19	11	22.5	177.828	Horizontal	Pass
80.0MHz DFT_QPSK	1@1	3740	16.25	5.14	11	22.11	162.555	Horizontal	Pass
		3840	16.59	5.18	11	22.41	174.181	Horizontal	Pass
		3940	16.85	5.19	11	22.66	184.502	Horizontal	Pass
90.0MHz DFT_QPSK	1@1	3745	16.51	5.14	11	22.37	172.584	Horizontal	Pass
		3840	16.33	5.18	11	22.15	164.059	Horizontal	Pass
		3935	15.55	5.19	11	21.36	136.773	Horizontal	Pass
100.0MHz DFT_QPSK	1@1	3750	16.20	5.14	11	22.06	160.694	Horizontal	Pass
		3840	16.11	5.18	11	21.93	155.955	Horizontal	Pass
		3930	16.90	5.19	11	22.71	186.638	Horizontal	Pass

Radiated Power (EIRP) for N77/SCS (30kHz)									
Mode	RB/ RB Positi on	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenn a Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
10.0MHz DFT_16QAM	1@1	3705	15.70	5.12	11	21.58	143.880	Vertical	Pass
		3840	15.09	5.18	11	20.91	123.310	Vertical	Pass
		3975	14.65	5.23	11	20.42	110.154	Vertical	Pass
15.0MHz DFT_16QAM	1@1	3707.5	14.97	5.12	11	20.85	121.619	Vertical	Pass
		3840	15.08	5.18	11	20.90	123.027	Vertical	Pass
		3972.5	14.62	5.22	11	20.40	109.648	Vertical	Pass
20.0MHz DFT_16QAM	1@1	3710	14.59	5.13	11	20.46	111.173	Vertical	Pass
		3840	15.24	5.18	11	21.06	127.644	Vertical	Pass
		3970	15.13	5.21	11	20.92	123.595	Vertical	Pass
40.0MHz DFT_16QAM	1@1	3720	15.40	5.13	11	21.27	133.968	Vertical	Pass
		3840	15.44	5.18	11	21.26	133.660	Vertical	Pass
		3960	15.72	5.21	11	21.51	141.579	Vertical	Pass
50.0MHz DFT_16QAM	1@1	3725	15.01	5.14	11	20.87	122.180	Vertical	Pass
		3840	15.45	5.18	11	21.27	133.968	Vertical	Pass
		3955	14.68	5.2	11	20.48	111.686	Vertical	Pass
60.0MHz DFT_16QAM	1@1	3730	15.09	5.14	11	20.95	124.451	Vertical	Pass
		3840	15.64	5.18	11	21.46	139.959	Vertical	Pass
		3950	15.71	5.19	11	21.52	141.906	Vertical	Pass
70.0MHz DFT_16QAM	1@1	3735	15.41	5.14	11	21.27	133.968	Vertical	Pass
		3840	15.46	5.18	11	21.28	134.276	Vertical	Pass
		3945	15.17	5.19	11	20.98	125.314	Vertical	Pass
80.0MHz DFT_16QAM	1@1	3740	15.65	5.14	11	21.51	141.579	Vertical	Pass
		3840	15.40	5.18	11	21.22	132.434	Vertical	Pass
		3940	15.75	5.19	11	21.56	143.219	Vertical	Pass
90.0MHz DFT_QPSK	1@1	3745	16.79	5.14	11	22.65	184.077	Horizontal	Pass
		3840	16.03	5.18	11	21.85	153.109	Horizontal	Pass
		3935	16.35	5.19	11	22.16	164.437	Horizontal	Pass
100.0MHz DFT_QPSK	1@1	3750	16.53	5.14	11	22.39	173.380	Horizontal	Pass
		3840	17.16	5.18	11	22.98	198.609	Horizontal	Pass
		3930	17.14	5.19	11	22.95	197.242	Horizontal	Pass

Note:

SG Level= Signal generator output

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

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

8.10 NR BAND 78

Radiated Power (EIRP) for N78 /SCS (30kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
10.0MHz DFT_QPSK	1@1	3455	18.49	5.12	11	24.37	273.527	Horizontal	Pass
		3500	18.85	5.18	11	24.67	293.089	Horizontal	Pass
		3545	18.92	5.23	11	24.69	294.442	Horizontal	Pass
15.0MHz DFT_QPSK	1@1	3457.5	18.33	5.12	11	24.21	263.633	Horizontal	Pass
		3500	18.72	5.18	11	24.54	284.446	Horizontal	Pass
		3542.5	18.65	5.22	11	24.43	277.332	Horizontal	Pass
20.0MHz DFT_QPSK	1@1	3460	17.99	5.13	11	23.86	243.220	Horizontal	Pass
		3500	18.64	5.18	11	24.46	279.254	Horizontal	Pass
		3540	18.52	5.21	11	24.31	269.774	Horizontal	Pass
40.0MHz DFT_QPSK	1@1	3470	18.07	5.13	11	23.94	247.742	Horizontal	Pass
		3500	18.30	5.18	11	24.12	258.226	Horizontal	Pass
		3530	18.47	5.21	11	24.26	266.686	Horizontal	Pass
50.0MHz DFT_QPSK	1@1	3475	18.16	5.14	11	24.02	252.348	Horizontal	Pass
		3500	18.31	5.18	11	24.13	258.821	Horizontal	Pass
		3525	18.35	5.2	11	24.15	260.016	Horizontal	Pass
60.0MHz DFT_QPSK	1@1	3480	17.91	5.14	11	23.77	238.232	Horizontal	Pass
		3500	18.71	5.18	11	24.53	283.792	Horizontal	Pass
		3520	18.47	5.19	11	24.28	267.917	Horizontal	Pass
70.0MHz DFT_QPSK	1@1	3485	18.06	5.14	11	23.92	246.604	Horizontal	Pass
		3500	18.85	5.18	11	24.67	293.089	Horizontal	Pass
		3515	18.23	5.19	11	24.04	253.513	Horizontal	Pass
80.0MHz DFT_QPSK	1@1	3490	18.46	5.14	11	24.32	270.396	Horizontal	Pass
		3500	18.13	5.18	11	23.95	248.313	Horizontal	Pass
		3510	17.76	5.19	11	23.57	227.510	Horizontal	Pass
90.0MHz DFT_QPSK	1@1	3495	18.35	5.14	11	24.21	263.633	Horizontal	Pass
		3500	18.57	5.18	11	24.39	274.789	Horizontal	Pass
		3505	18.55	5.19	11	24.36	272.898	Horizontal	Pass
100.0MHz DFT_QPSK	1@1	3500	18.97	5.14	11	24.83	304.089	Horizontal	Pass

Radiated Power (EIRP) for N77/SCS (30kHz)									
Mode	RB/ RB Position	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dBi)	Max. EIRP (dBm)	Max. EIRP (mW)	Polarization Of Max. ERP	
10.0MHz DFT_16QAM	1@1	3455	15.98	5.12	11	21.86	153.462	Vertical	Pass
		3500	16.25	5.18	11	22.07	161.065	Vertical	Pass
		3545	16.27	5.23	11	22.04	159.956	Vertical	Pass
15.0MHz DFT_16QAM	1@1	3457.5	15.78	5.12	11	21.66	146.555	Vertical	Pass
		3500	15.82	5.18	11	21.64	145.881	Vertical	Pass
		3542.5	15.71	5.22	11	21.49	140.929	Vertical	Pass
20.0MHz DFT_16QAM	1@1	3460	16.01	5.13	11	21.88	154.170	Vertical	Pass
		3500	16.51	5.18	11	22.33	171.002	Vertical	Pass
		3540	16.38	5.21	11	22.17	164.816	Vertical	Pass
40.0MHz DFT_16QAM	1@1	3470	15.85	5.13	11	21.72	148.594	Vertical	Pass
		3500	16.46	5.18	11	22.28	169.044	Vertical	Pass
		3530	16.39	5.21	11	22.18	165.196	Vertical	Pass
50.0MHz DFT_16QAM	1@1	3475	15.98	5.14	11	21.84	152.757	Vertical	Pass
		3500	16.59	5.18	11	22.41	174.181	Vertical	Pass
		3525	15.59	5.2	11	21.39	137.721	Vertical	Pass
60.0MHz DFT_16QAM	1@1	3480	16.53	5.14	11	22.39	173.380	Vertical	Pass
		3500	16.63	5.18	11	22.45	175.792	Vertical	Pass
		3520	16.35	5.19	11	22.16	164.437	Vertical	Pass
70.0MHz DFT_16QAM	1@1	3485	15.64	5.14	11	21.5	141.254	Vertical	Pass
		3500	16.01	5.18	11	21.83	152.405	Vertical	Pass
		3515	15.88	5.19	11	21.69	147.571	Vertical	Pass
80.0MHz DFT_16QAM	1@1	3490	15.97	5.14	11	21.83	152.405	Vertical	Pass
		3500	16.38	5.18	11	22.2	165.959	Vertical	Pass
		3510	16.33	5.19	11	22.14	163.682	Vertical	Pass
90.0MHz DFT_16QAM	1@1	3495	17.81	5.14	11	23.67	232.809	Horizontal	Pass
		3500	17.66	5.18	11	23.48	222.844	Horizontal	Pass
		3505	17.78	5.19	11	23.59	228.560	Horizontal	Pass
100.0MHz DFT_16QAM	1@1	3500	17.82	5.14	11	23.68	233.346	Horizontal	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna 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: §2.1053, §22.917, §24.238, §27.53

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.

§22.917 (e) and §24.238 and §90.691 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

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 2 / 5 / 7 / 12 / 25 / 41 / 66 / 77 / 78

RESULTS

PASS

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.

9.1 NR BAND 2

QPSK EIRP POWER FOR NR BAND 2 (5.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 1852.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3701.4	-47.44	4.04	33.51	-17.97	-13	-4.97	Horizontal
3701.4	-50.42	4.04	33.51	-20.95	-13	-7.95	Vertical
5557.5	-57.83	5.24	35.84	-27.23	-13	-14.23	Vertical
5557.5	-56.85	5.24	35.84	-26.25	-13	-13.25	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-47.96	4.04	33.56	-18.44	-13	-5.44	Horizontal
3760	-47.08	4.04	33.56	-17.56	-13	-4.56	Vertical
5640	-55.94	5.24	35.91	-25.27	-13	-12.27	Vertical
5640	-57.31	5.24	35.91	-26.64	-13	-13.64	Horizontal
Test Results for High Channel 1907.5MHz							
3815	-50.60	4.04	34.00	-20.64	-13	-7.64	Horizontal
3815	-51.17	4.04	34.00	-21.21	-13	-8.21	Vertical
5722.5	-49.48	5.24	36.04	-18.68	-13	-5.68	Vertical
5722.5	-50.63	5.24	36.04	-19.83	-13	-6.83	Horizontal

QPSK EIRP POWER FOR NR BAND 41 (100.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 2546.01MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720	-53.26	4.07	33.54	-23.79	-13	-10.79	Horizontal
3720	-54.48	4.07	33.54	-25.01	-13	-12.01	Vertical
5580	-53.26	5.28	35.86	-22.68	-13	-9.68	Vertical
5580	-55.72	5.28	35.86	-25.14	-13	-12.14	Horizontal
Test Results for Mid Channel 2592.99MHz							
3760	-49.97	4.04	33.56	-20.45	-13	-7.45	Horizontal
3760	-48.32	4.04	33.56	-18.80	-13	-5.80	Vertical
5640	-53.59	5.24	35.91	-22.92	-13	-9.92	Vertical
5640	-52.65	5.24	35.91	-21.98	-13	-8.98	Horizontal
Test Results for High Channel 2640MHz							
3800	-54.45	4.04	34.00	-24.49	-13	-11.49	Horizontal
3800	-49.46	4.04	34.00	-19.50	-13	-6.50	Vertical
5700	-56.46	5.24	36.04	-25.66	-13	-12.66	Vertical
5700	-53.62	5.24	36.04	-22.82	-13	-9.82	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)
 . Over Limit= : P_{Mea}(dBm)-Limit(dBm)

9.2 NR BAND 5

QPSK EIRP POWER FOR NR BAND 5 (5.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 826.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1653	-48.42	2.78	27.50	-23.70	-13	-10.70	Horizontal
1653	-54.59	2.78	27.50	-29.87	-13	-16.87	Vertical
2479.5	-56.21	2.90	27.80	-31.31	-13	-18.31	Vertical
2479.5	-49.63	2.90	27.80	-24.73	-13	-11.73	Horizontal
Test Results for Mid Channel 836.5MHz							
1673	-50.77	2.78	27.48	-26.07	-13	-13.07	Horizontal
1673	-49.10	2.78	27.48	-24.40	-13	-11.40	Vertical
2509.5	-57.31	2.91	27.70	-32.52	-13	-19.52	Vertical
2509.5	-50.18	2.91	27.70	-25.39	-13	-12.39	Horizontal
Test Results for High Channel 846.5MHz							
1693	-47.38	2.78	27.43	-22.73	-13	-9.73	Horizontal
1693	-49.99	2.78	27.43	-25.34	-13	-12.34	Vertical
2539.5	-54.59	2.92	27.74	-29.77	-13	-16.77	Vertical
2539.5	-53.82	2.92	27.74	-29.00	-13	-16.00	Horizontal

QPSK EIRP POWER FOR NR BAND5 (20.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 834MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1668	-49.03	2.78	27.50	-24.31	-13	-11.31	Horizontal
1668	-50.62	2.78	27.50	-25.90	-13	-12.90	Vertical
2502	-52.35	2.90	27.80	-27.45	-13	-14.45	Vertical
2502	-49.91	2.90	27.80	-25.01	-13	-12.01	Horizontal
Test Results for Mid Channel 836.5MHz							
1673	-48.86	2.78	27.48	-24.16	-13	-11.16	Horizontal
1673	-48.89	2.78	27.48	-24.19	-13	-11.19	Vertical
2509.5	-49.25	2.91	27.70	-24.46	-13	-11.46	Vertical
2509.5	-56.94	2.91	27.70	-32.15	-13	-19.15	Horizontal
Test Results for High Channel 839MHz							
1678	-51.27	2.78	27.43	-26.62	-13	-13.62	Horizontal
1678	-48.86	2.78	27.43	-24.21	-13	-11.21	Vertical
2517	-52.39	2.92	27.74	-27.57	-13	-14.57	Vertical
2517	-51.57	2.92	27.74	-26.75	-13	-13.75	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)
 . Over Limit= : P_{Mea}(dBm)-Limit(dBm)

9.3 NR BAND 7

QPSK EIRP POWER FOR NR BAND 7 (5.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5005	-59.89	5.23	35.81	-29.31	-25	-4.31	Horizontal
5005	-60.70	5.23	35.81	-30.12	-25	-5.12	Vertical
7507.5	-59.86	5.67	36.85	-28.68	-25	-3.68	Vertical
7507.5	-64.90	5.67	36.85	-33.72	-25	-8.72	Horizontal
Test Results for Mid Channel 2535MHz							
5185.98	-49.08	6.15	27.32	-27.91	-13	-14.91	Horizontal
5185.98	-44.73	6.15	27.32	-23.56	-13	-10.56	Vertical
7778.97	-47.36	6.61	28.51	-25.46	-13	-12.46	Vertical
7778.97	-52.48	6.61	28.51	-30.58	-13	-17.58	Horizontal
Test Results for High Channel 2657.5MHz							
5135	-60.78	5.24	35.83	-30.19	-25	-5.19	Horizontal
5135	-58.37	5.24	35.83	-27.78	-25	-2.78	Vertical
7702.5	-59.90	5.68	36.87	-28.71	-25	-3.71	Vertical
7702.5	-63.83	5.68	36.87	-32.64	-25	-7.64	Horizontal

QPSK EIRP POWER FOR NR BAND 7 (20.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5020	-59.44	5.23	35.82	-28.85	-25	-3.85	Horizontal
5020	-57.52	5.23	35.82	-26.93	-25	-1.93	Vertical
7530	-64.78	5.67	36.86	-33.59	-25	-8.59	Vertical
7530	-63.14	5.67	36.86	-31.95	-25	-6.95	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-58.29	5.23	35.82	-27.70	-25	-2.70	Horizontal
5070	-58.42	5.23	35.82	-27.83	-25	-2.83	Vertical
7605	-62.13	5.67	36.85	-30.95	-25	-5.95	Vertical
7605	-60.80	5.67	36.85	-29.62	-25	-4.62	Horizontal
Test Results for High Channel 2690MHz							
5120	-61.93	5.24	35.83	-31.34	-25	-6.34	Horizontal
5120	-59.03	5.24	35.83	-28.44	-25	-3.44	Vertical
7680	-64.19	5.70	36.88	-33.01	-25	-8.01	Vertical
7680	-60.76	5.70	36.88	-29.58	-25	-4.58	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)
 . Over Limit= : P_{Mea}(dBm)-Limit(dBm)

9.4 NR BAND 12

QPSK EIRP POWER FOR NR BAND 12 (5.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 701.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1399.4	-53.33	2.60	27.2	-28.73	-13	-15.73	Horizontal
1399.4	-48.11	2.60	27.2	-23.51	-13	-10.51	Vertical
2099.1	-54.73	2.85	27.54	-30.04	-13	-17.04	Vertical
2099.1	-56.90	2.85	27.54	-32.21	-13	-19.21	Horizontal
Test Results for Mid Channel 707.5MHz							
1415	-50.69	2.61	27.28	-26.02	-13	-13.02	Horizontal
1415	-48.15	2.61	27.28	-23.48	-13	-10.48	Vertical
2122.5	-55.47	2.87	27.59	-30.75	-13	-17.75	Vertical
2122.5	-56.87	2.87	27.59	-32.15	-13	-19.15	Horizontal
Test Results for High Channel 713.5MHz							
1430.6	-54.86	2.63	27.28	-30.21	-13	-17.21	Horizontal
1430.6	-47.21	2.63	27.28	-22.56	-13	-9.56	Vertical
2145.9	-55.59	2.88	27.60	-30.87	-13	-17.87	Vertical
2145.9	-50.45	2.88	27.60	-25.73	-13	-12.73	Horizontal

QPSK EIRP POWER FOR NR BAND12 (15.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1408	-48.59	2.61	27.26	-23.94	-13	-10.94	Horizontal
1408	-53.36	2.61	27.26	-28.71	-13	-15.71	Vertical
2112	-54.54	2.87	27.58	-29.83	-13	-16.83	Vertical
2112	-54.01	2.87	27.58	-29.30	-13	-16.30	Horizontal
Test Results for Mid Channel 707.5MHz							
1415	-54.19	2.61	27.28	-29.52	-13	-16.52	Horizontal
1415	-52.16	2.61	27.28	-27.49	-13	-14.49	Vertical
2122.5	-57.39	2.87	27.59	-32.67	-13	-19.67	Vertical
2122.5	-57.75	2.87	27.59	-33.03	-13	-20.03	Horizontal
Test Results for High Channel 708.5MHz							
1422	-51.57	2.62	27.28	-26.91	-13	-13.91	Horizontal
1422	-47.83	2.62	27.28	-23.17	-13	-10.17	Vertical
2133	-53.18	2.87	27.60	-28.45	-13	-15.45	Vertical
2133	-57.02	2.87	27.60	-32.29	-13	-19.29	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)
 . Over Limit= : P_{Mea}(dBm)-Limit(dBm)

9.5 NR BAND 25

QPSK EIRP POWER FOR NR BAND 25 (5.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 1852.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3705	-48.83	2.61	27.26	-24.18	-13	-11.18	Horizontal
3705	-48.33	2.61	27.26	-23.68	-13	-10.68	Vertical
5557.5	-49.38	2.87	27.58	-24.67	-13	-11.67	Vertical
5557.5	-55.92	2.87	27.58	-31.21	-13	-18.21	Horizontal
Test Results for Mid Channel 1882.5MHz							
3765	-48.20	2.63	27.28	-23.55	-13	-10.55	Horizontal
3765	-54.80	2.63	27.28	-30.15	-13	-17.15	Vertical
5647.5	-52.90	2.88	27.62	-28.16	-13	-15.16	Vertical
5647.5	-54.05	2.88	27.62	-29.31	-13	-16.31	Horizontal
Test Results for High Channel 1912.5MHz							
3825	-49.57	2.65	27.28	-24.94	-13	-11.94	Horizontal
3825	-50.36	2.65	27.28	-25.73	-13	-12.73	Vertical
5737.5	-52.24	2.88	27.70	-27.42	-13	-14.42	Vertical
5737.5	-57.71	2.88	27.70	-32.89	-13	-19.89	Horizontal

QPSK EIRP POWER FOR NR BAND 25 (20.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3720	-54.21	2.62	27.30	-29.53	-13	-16.53	Horizontal
3720	-49.32	2.62	27.30	-24.64	-13	-11.64	Vertical
5580	-55.75	2.87	27.62	-31.00	-13	-18.00	Vertical
5580	-54.34	2.87	27.62	-29.59	-13	-16.59	Horizontal
Test Results for Mid Channel 1882.5MHz							
3765	-50.30	2.64	27.33	-25.61	-13	-12.61	Horizontal
3765	-53.46	2.64	27.33	-28.77	-13	-15.77	Vertical
5647.5	-49.23	2.88	27.67	-24.44	-13	-11.44	Vertical
5647.5	-51.60	2.88	27.67	-26.81	-13	-13.81	Horizontal
Test Results for High Channel 1905MHz							
3810	-53.53	2.64	27.33	-28.84	-13	-15.84	Horizontal
3810	-49.40	2.64	27.33	-24.71	-13	-11.71	Vertical
5715	-57.36	2.88	27.67	-32.57	-13	-19.57	Vertical
5715	-53.81	2.88	27.67	-29.02	-13	-16.02	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)
 . Over Limit= : P_{Mea}(dBm)-Limit(dBm)

9.6 NR BAND 41

QPSK EIRP POWER FOR NR BAND 41 (10.0MHZ BANDWIDTH/ SCS (30kHz))

Test Results for Low Channel 2546.01MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5092.02	-53.69	2.63	27.30	-29.02	-25	-4.02	Horizontal
5092.02	-55.65	2.63	27.30	-30.98	-25	-5.98	Vertical
7638.03	-59.93	2.67	27.62	-34.98	-25	-9.98	Vertical
7638.03	-56.32	2.67	27.62	-31.37	-25	-6.37	Horizontal
Test Results for Mid Channel 2592.99MHz							
5185.98	-57.22	2.62	27.33	-32.51	-25	-7.51	Horizontal
5185.98	-56.32	2.62	27.33	-31.61	-25	-6.61	Vertical
7778.97	-56.21	2.85	27.67	-31.39	-25	-6.39	Vertical
7778.97	-59.46	2.85	27.67	-34.64	-25	-9.64	Horizontal
Test Results for High Channel 2685MHz							
5370	-55.83	2.64	27.28	-31.19	-25	-6.19	Horizontal
5370	-56.00	2.64	27.28	-31.36	-25	-6.36	Vertical
8055	-55.14	2.85	27.70	-30.29	-25	-5.29	Vertical
8055	-58.89	2.85	27.70	-34.04	-25	-9.04	Horizontal

QPSK EIRP POWER FOR NR BAND 41 (100.0MHZ BANDWIDTH/ SCS (30kHz))

Test Results for Low Channel 2546.01MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5092.02	-53.69	2.63	27.30	-29.02	-25	-4.02	Horizontal
5092.02	-55.65	2.63	27.30	-30.98	-25	-5.98	Vertical
7638.03	-59.93	2.67	27.62	-34.98	-25	-9.98	Vertical
7638.03	-56.32	2.67	27.62	-31.37	-25	-6.37	Horizontal
Test Results for Mid Channel 2592.99MHz							
5185.98	-57.22	2.62	27.33	-32.51	-25	-7.51	Horizontal
5185.98	-56.32	2.62	27.33	-31.61	-25	-6.61	Vertical
7778.97	-56.21	2.85	27.67	-31.39	-25	-6.39	Vertical
7778.97	-59.46	2.85	27.67	-34.64	-25	-9.64	Horizontal
Test Results for High Channel 2640MHz							
5280	-53.68	2.64	27.33	-28.99	-25	-3.99	Horizontal
5280	-54.34	2.64	27.33	-29.65	-25	-4.65	Vertical
7920	-59.74	2.85	27.67	-34.92	-25	-9.92	Vertical
7920	-56.42	2.85	27.67	-31.60	-25	-6.60	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)
 . Over Limit= : P_{Mea}(dBm)-Limit(dBm)

9.5 NR BAND 66

QPSK EIRP POWER FOR NR BAND 66 (5.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 1712.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3425	-48.98	2.61	27.28	-24.31	-13	-11.31	Horizontal
3425	-51.62	2.61	27.28	-26.95	-13	-13.95	Vertical
5137.5	-54.41	2.87	27.59	-29.69	-13	-16.69	Vertical
5137.5	-57.12	2.87	27.59	-32.40	-13	-19.40	Horizontal
Test Results for Mid Channel 1745MHz							
3490	-53.79	2.62	27.3	-29.11	-13	-16.11	Horizontal
3490	-48.59	2.62	27.3	-23.91	-13	-10.91	Vertical
5235	-50.80	2.87	27.62	-26.05	-13	-13.05	Vertical
5235	-57.23	2.87	27.62	-32.48	-13	-19.48	Horizontal
Test Results for High Channel 1777.5MHz							
3555	-49.65	2.66	27.28	-25.03	-13	-12.03	Horizontal
3555	-52.69	2.66	27.28	-28.07	-13	-15.07	Vertical
5332.5	-51.78	2.88	27.6	-27.06	-13	-14.06	Vertical
5332.5	-51.87	2.88	27.6	-27.15	-13	-14.15	Horizontal

QPSK EIRP POWER FOR NR BAND 66 (40.0MHZ BANDWIDTH/ SCS (15kHz))

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3440	-53.86	2.62	27.3	-29.18	-13	-16.18	Horizontal
3440	-51.94	2.62	27.3	-27.26	-13	-14.26	Vertical
5160	-55.39	2.87	27.62	-30.64	-13	-17.64	Vertical
5160	-57.51	2.87	27.62	-32.76	-13	-19.76	Horizontal
Test Results for Mid Channel 1882.5MHz							
3490	-51.36	2.62	27.3	-26.68	-13	-13.68	Horizontal
3490	-47.26	2.62	27.3	-22.58	-13	-9.58	Vertical
5235	-50.45	2.87	27.62	-25.70	-13	-12.70	Vertical
5235	-57.40	2.87	27.62	-32.65	-13	-19.65	Horizontal
Test Results for High Channel 1905MHz							
3520	-51.09	2.62	27.3	-26.41	-13	-13.41	Horizontal
3520	-52.70	2.62	27.3	-28.02	-13	-15.02	Vertical
5280	-54.65	2.87	27.62	-29.90	-13	-16.90	Vertical
5280	-54.23	2.87	27.62	-29.48	-13	-16.48	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)
 . Over Limit= : P_{Mea}(dBm)-Limit(dBm)

9.7 NR BAND 77

QPSK EIRP POWER FOR NR BAND 77 (10.0MHZ BANDWIDTH/ 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
7410	-50.10	2.63	28.37	-24.36	-13	-11.36	Horizontal
7410	-54.45	2.63	28.37	-28.71	-13	-15.71	Vertical
11115	-49.06	3.38	28.25	-24.19	-13	-11.19	Vertical
11115	-57.29	3.38	28.25	-32.42	-13	-19.42	Horizontal
Test Results for Mid Channel 3500MHz							
7680	-49.10	2.65	28.33	-23.42	-13	-10.42	Horizontal
7680	-48.99	2.65	28.33	-23.31	-13	-10.31	Vertical
11520	-50.18	4.14	28.26	-26.06	-13	-13.06	Vertical
11520	-51.83	4.14	28.26	-27.71	-13	-14.71	Horizontal
Test Results for High Channel 3975MHz							
7950	-54.80	2.65	28.41	-29.04	-13	-16.04	Horizontal
7950	-50.33	2.65	28.41	-24.57	-13	-11.57	Vertical
11925	-57.59	5.23	28.15	-34.67	-13	-21.67	Vertical
11925	-51.39	5.23	28.89	-27.73	-13	-14.73	Horizontal

QPSK EIRP POWER FOR NR BAND 77 (100.0MHZ BANDWIDTH/ SCS (30kHz))

Test Results for Mid Channel 3750MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
7500	-53.76	2.63	28.37	-28.02	-13	-15.02	Horizontal
7500	-54.50	2.63	28.37	-28.76	-13	-15.76	Vertical
11250	-53.02	3.38	28.25	-28.15	-13	-15.15	Vertical
11250	-53.51	3.38	28.25	-28.64	-13	-15.64	Horizontal
Test Results for Mid Channel 3840MHz							
7680	-47.02	2.65	28.33	-21.34	-13	-8.34	Horizontal
7680	-48.42	2.65	28.33	-22.74	-13	-9.74	Vertical
11520	-52.57	4.14	28.26	-28.45	-13	-15.45	Vertical
11520	-49.94	4.14	28.26	-25.82	-13	-12.82	Horizontal
Test Results for High Channel 3930MHz							
7860	-50.42	2.65	28.41	-24.66	-13	-11.66	Horizontal
7860	-50.40	2.65	28.41	-24.64	-13	-11.64	Vertical
11250	-52.44	5.23	28.15	-29.52	-13	-16.52	Vertical
11250	-54.88	5.23	28.89	-31.22	-13	-18.22	Horizontal

9.8 NR BAND 78

QPSK EIRP POWER FOR NR BAND 78 (10.0MHZ BANDWIDTH/ 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	-54.03	2.63	28.33	-28.33	-13	-15.33	Horizontal
6910	-49.96	2.63	28.33	-24.26	-13	-11.26	Vertical
10365	-56.27	3.38	28.26	-31.39	-13	-18.39	Vertical
10365	-56.63	3.38	28.26	-31.75	-13	-18.75	Horizontal
Test Results for Mid Channel 3500MHz							
7000	-49.54	2.63	28.33	-23.84	-13	-10.84	Horizontal
7000	-52.78	2.63	28.33	-27.08	-13	-14.08	Vertical
10500	-50.79	3.38	28.26	-25.91	-13	-12.91	Vertical
10500	-54.67	3.38	28.26	-29.79	-13	-16.79	Horizontal
Test Results for High Channel 3545MHz							
7090	-51.41	2.63	28.33	-25.71	-13	-12.71	Horizontal
7090	-50.03	2.63	28.33	-24.33	-13	-11.33	Vertical
10635	-50.46	3.38	28.26	-25.58	-13	-12.58	Vertical
10635	-53.62	3.38	28.26	-28.74	-13	-15.74	Horizontal

QPSK EIRP POWER FOR NR BAND 78 (100.0MHZ BANDWIDTH/ 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	-49.85	2.63	28.33	-24.15	-13	-11.15	Horizontal
7000	-51.91	2.63	28.33	-26.21	-13	-13.21	Vertical
10500	-50.63	3.38	28.26	-25.75	-13	-12.75	Vertical
10500	-57.35	3.38	28.26	-32.47	-13	-19.47	Horizontal

Note: $P_{Mea}(dBm) = Power(dBm) + ARpl(dBm)$

Over Limit = $P_{Mea}(dBm) - Limit(dBm)$

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Test Results for Low Channel							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
6910	-45.57	2.63	28.37	-19.83	-13	-6.83	Horizontal
6910	-44.59	2.63	28.37	-18.85	-13	-5.85	Vertical
10365	-49.83	3.38	28.25	-24.96	-13	-11.96	Vertical
10365	-46.75	3.38	28.25	-21.88	-13	-8.88	Horizontal
1653.0	-48.37	2.78	27.51	-23.64	-13	-6.83	Horizontal
1653.0	-52.25	2.78	27.51	-27.52	-13	-13.73	Vertical
2479.5	-46.33	2.90	27.81	-21.42	-13	-9.43	Vertical
2479.5	-51.93	2.90	27.81	-27.02	-13	-13.43	Horizontal
178.3	-53.42	0.59	16.18	-37.83	-13	-24.83	Vertical
327.8	-51.18	1.09	15.03	-37.24	-13	-24.24	Horizontal
Test Results for Mid Channel							
7000	-48.80	2.65	28.33	-23.12	-13	-10.12	Horizontal
7000	-49.11	2.65	28.33	-23.43	-13	-10.43	Vertical
10500	-49.06	4.14	28.26	-24.94	-13	-11.94	Vertical
10500	-53.08	4.14	28.26	-28.96	-13	-15.96	Horizontal
1673	-48.15	2.78	27.51	-23.42	-13	-6.83	Horizontal
1673	-47.03	2.78	27.51	-22.30	-13	-13.73	Vertical
2509.5	-49.34	2.92	27.76	-24.50	-13	-9.43	Vertical
2509.5	-50.76	2.92	27.76	-25.92	-13	-13.43	Horizontal
212.1	-44.80	0.71	15.25	-30.26	-13	-17.26	Vertical
405.0	-45.36	1.35	16.71	-30.00	-13	-17.00	Horizontal
Test Results for High Channel							
7090	-47.93	2.65	28.41	-22.17	-13	-9.17	Horizontal
7090	-47.65	2.65	28.41	-21.89	-13	-8.89	Vertical
10635	-48.49	5.23	28.15	-25.57	-13	-12.57	Vertical
10635	-45.87	5.23	28.89	-22.21	-13	-9.21	Horizontal
1693	-45.33	2.81	27.51	-20.63	-13	-6.83	Horizontal
1693	-53.19	2.81	27.51	-28.49	-13	-13.73	Vertical
2539.5	-48.07	2.93	27.77	-23.23	-13	-9.43	Vertical
2539.5	-48.94	2.93	27.77	-24.10	-13	-13.43	Horizontal
202.2	-47.41	0.67	16.19	-31.89	-13	-18.89	Vertical
359.5	-50.69	1.20	15.22	-36.67	-13	-23.67	Horizontal

EN-DC 16QAM B5 10M+N78 100M SCS 30kHz

Test Results for Low Channel 3350.01MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
7000	-51.13	2.63	28.33	-25.43	-13	-12.43	Horizontal
7000	-52.66	2.63	28.33	-26.96	-13	-13.96	Vertical
10500	-48.30	3.38	28.26	-23.42	-13	-10.42	Vertical
10500	-46.56	3.38	28.26	-21.68	-13	-8.68	Horizontal
40900	-51.04	2.78	27.50	-26.32	-13	-13.32	Horizontal
40900	-53.76	2.78	27.50	-29.04	-13	-16.04	Vertical
61350	-48.16	2.90	27.80	-23.26	-13	-10.26	Vertical
61350	-50.04	2.90	27.80	-25.14	-13	-12.14	Horizontal
177.7	-45.66	0.59	16.13	-30.12	-13	-17.12	Vertical
394.2	-52.92	1.31	16.20	-38.03	-13	-25.03	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(dBm)-Limit(dBm)

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §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 3.29V, Normal, DC 3.87V and High voltage, DC 4.45V.

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 2 / 5 / 7 / 12 / 25 / 41 / 66 / 77 / 78

RESULTS

See the following pages.

10.1 NR BAND 2

N2 QPSK, (20MHz CH 376000 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1880	15	0.007979	2.5
3.87	1880	4	0.002128	2.5
4.45	1880	14	0.007447	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	8	0.004255	2.5
Extreme (50C)	1880	24	0.012766	2.5
Extreme (40C)	1880	12	0.006383	2.5
Extreme (30C)	1880	14	0.007447	2.5
Extreme (10C)	1880	21	0.011170	2.5
Extreme (0C)	1880	5	0.002660	2.5
Extreme (-10C)	1880	13	0.006915	2.5
Extreme (-20C)	1880	6	0.003191	2.5
Extreme (-30C)	1880	2	0.001064	2.5

n 2 QPSK, (20MHz CH 376000 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1880	11	0.005851	2.5
3.87	1880	14	0.007447	2.5
4.45	1880	1	0.000532	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1880	5	0.002660	2.5
Extreme (50C)	1880	12	0.006383	2.5
Extreme (40C)	1880	3	0.001596	2.5
Extreme (30C)	1880	8	0.004255	2.5
Extreme (10C)	1880	15	0.007979	2.5
Extreme (0C)	1880	19	0.010106	2.5
Extreme (-10C)	1880	2	0.001064	2.5
Extreme (-20C)	1880	10	0.005319	2.5
Extreme (-30C)	1880	22	0.011702	2.5

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

10.2 NR BAND 5

N5 QPSK, (20MHz CH 167300 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	836.5	9	0.010759	2.5
3.87	836.5	6	0.007173	2.5
4.45	836.5	24	0.028691	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	18	0.021518	2.5
Extreme (50C)	836.5	2	0.002391	2.5
Extreme (40C)	836.5	6	0.007173	2.5
Extreme (30C)	836.5	26	0.031082	2.5
Extreme (10C)	836.5	23	0.027496	2.5
Extreme (0C)	836.5	18	0.021518	2.5
Extreme (-10C)	836.5	12	0.014345	2.5
Extreme (-20C)	836.5	21	0.025105	2.5
Extreme (-30C)	836.5	7	0.008368	2.5

n 5 QPSK, (20MHz CH 167300 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	836.5	4	0.004782	2.5
3.87	836.5	14	0.016736	2.5
4.45	836.5	1	0.001195	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	4	0.004782	2.5
Extreme (50C)	836.5	14	0.016736	2.5
Extreme (40C)	836.5	18	0.021518	2.5
Extreme (30C)	836.5	13	0.015541	2.5
Extreme (10C)	836.5	18	0.021518	2.5
Extreme (0C)	836.5	9	0.010759	2.5
Extreme (-10C)	836.5	15	0.017932	2.5
Extreme (-20C)	836.5	8	0.009564	2.5
Extreme (-30C)	836.5	20	0.023909	2.5

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

10.3 NR BAND 7

N7 QPSK, (20MHz CH 507000 RB Allocation 1@1 SCS 30K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2535	17	0.006706	2.5
3.87	2535	4	0.001578	2.5
4.45	2535	13	0.005128	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	13	0.005128	2.5
Extreme (50C)	2535	18	0.007101	2.5
Extreme (40C)	2535	8	0.003156	2.5
Extreme (30C)	2535	20	0.007890	2.5
Extreme (10C)	2535	16	0.006312	2.5
Extreme (0C)	2535	6	0.002367	2.5
Extreme (-10C)	2535	9	0.003550	2.5
Extreme (-20C)	2535	11	0.004339	2.5
Extreme (-30C)	2535	15	0.005917	2.5

n 7 QPSK, (20MHz CH 507000 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	2535	11	0.004339	2.5
3.87	2535	13	0.005128	2.5
4.45	2535	8	0.003156	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2535	3	0.001183	2.5
Extreme (50C)	2535	13	0.005128	2.5
Extreme (40C)	2535	12	0.004734	2.5
Extreme (30C)	2535	24	0.009467	2.5
Extreme (10C)	2535	4	0.001578	2.5
Extreme (0C)	2535	25	0.009862	2.5
Extreme (-10C)	2535	1	0.000394	2.5
Extreme (-20C)	2535	19	0.007495	2.5
Extreme (-30C)	2535	2	0.000789	2.5

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

10.4 NR BAND 12

N12 QPSK, (15MHz CH 141500 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	707.5	11	0.015548	2.5
3.87	707.5	7	0.009894	2.5
4.45	707.5	7	0.009894	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	1	0.001413	2.5
Extreme (50C)	707.5	2	0.002827	2.5
Extreme (40C)	707.5	1	0.001413	2.5
Extreme (30C)	707.5	26	0.036749	2.5
Extreme (10C)	707.5	22	0.031095	2.5
Extreme (0C)	707.5	4	0.005654	2.5
Extreme (-10C)	707.5	8	0.011307	2.5
Extreme (-20C)	707.5	22	0.031095	2.5
Extreme (-30C)	707.5	8	0.011307	2.5

n 12 QPSK, (15MHz CH 141500 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	707.5	6	0.008481	2.5
3.87	707.5	25	0.035336	2.5
4.45	707.5	19	0.026855	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	707.5	15	0.021201	2.5
Extreme (50C)	707.5	3	0.004240	2.5
Extreme (40C)	707.5	24	0.033922	2.5
Extreme (30C)	707.5	10	0.014134	2.5
Extreme (10C)	707.5	8	0.011307	2.5
Extreme (0C)	707.5	23	0.032509	2.5
Extreme (-10C)	707.5	24	0.033922	2.5
Extreme (-20C)	707.5	22	0.031095	2.5
Extreme (-30C)	707.5	5	0.007067	2.5

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

10.5 NR BAND 25

N25 QPSK, (20MHz CH 370500 RB Allocation 1@1 SCS 30K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1882.5	10	0.005312	2.5
3.87	1882.5	2	0.001062	2.5
4.45	1882.5	19	0.010093	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1882.5	6	0.003187	2.5
Extreme (50C)	1882.5	22	0.011687	2.5
Extreme (40C)	1882.5	24	0.012749	2.5
Extreme (30C)	1882.5	3	0.001594	2.5
Extreme (10C)	1882.5	10	0.005312	2.5
Extreme (0C)	1882.5	9	0.004781	2.5
Extreme (-10C)	1882.5	18	0.009562	2.5
Extreme (-20C)	1882.5	15	0.007968	2.5
Extreme (-30C)	1882.5	16	0.008499	2.5

n 25 QPSK, (20MHz CH 370500 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1882.5	9	0.004781	2.5
3.87	1882.5	25	0.013280	2.5
4.45	1882.5	21	0.011155	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1882.5	27	0.014343	2.5
Extreme (50C)	1882.5	22	0.011687	2.5
Extreme (40C)	1882.5	26	0.013811	2.5
Extreme (30C)	1882.5	11	0.005843	2.5
Extreme (10C)	1882.5	13	0.006906	2.5
Extreme (0C)	1882.5	22	0.011687	2.5
Extreme (-10C)	1882.5	9	0.004781	2.5
Extreme (-20C)	1882.5	8	0.004250	2.5
Extreme (-30C)	1882.5	27	0.014343	2.5

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

10.6 NR BAND 41

N41 QPSK, (100MHz CH 518598 RB Allocation 1@1 SCS 30K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
6.58	2592.99	19	0.007327	2.5
7.74	2592.99	6	0.002314	2.5
8.90	2592.99	13	0.005013	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2592.99	15	0.005785	2.5
Extreme (50C)	2592.99	9	0.003471	2.5
Extreme (40C)	2592.99	9	0.003471	2.5
Extreme (30C)	2592.99	20	0.007713	2.5
Extreme (10C)	2592.99	22	0.008484	2.5
Extreme (0C)	2592.99	15	0.005785	2.5
Extreme (-10C)	2592.99	7	0.002700	2.5
Extreme (-20C)	2592.99	11	0.004242	2.5
Extreme (-30C)	2592.99	13	0.005013	2.5

N41 16QAM, (100MHz CH 518598 RB Allocation 1@1 SCS 30K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
6.58	2592.99	4	0.001543	2.5
7.74	2592.99	9	0.003471	2.5
8.90	2592.99	13	0.005013	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	2592.99	14	0.005399	2.5
Extreme (50C)	2592.99	9	0.003471	2.5
Extreme (40C)	2592.99	20	0.007713	2.5
Extreme (30C)	2592.99	15	0.005785	2.5
Extreme (10C)	2592.99	24	0.009256	2.5
Extreme (0C)	2592.99	15	0.005785	2.5
Extreme (-10C)	2592.99	14	0.005399	2.5
Extreme (-20C)	2592.99	3	0.001157	2.5
Extreme (-30C)	2592.99	18	0.006942	2.5

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

10.7 NR BAND 66

N66 QPSK, (40MHz CH 349000 RB Allocation 135@67 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1745	21	0.012034	2.5
3.87	1745	11	0.006304	2.5
4.45	1745	1	0.000573	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	8	0.004585	2.5
Extreme (50C)	1745	12	0.006877	2.5
Extreme (40C)	1745	13	0.007450	2.5
Extreme (30C)	1745	19	0.010888	2.5
Extreme (10C)	1745	1	0.000573	2.5
Extreme (0C)	1745	3	0.001719	2.5
Extreme (-10C)	1745	17	0.009742	2.5
Extreme (-20C)	1745	10	0.005731	2.5
Extreme (-30C)	1745	4	0.002292	2.5

n66 QPSK, (40MHz CH 349000 RB Allocation 1@1 SCS 15K)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.29	1745	16	0.009169	2.5
3.87	1745	21	0.012034	2.5
4.45	1745	15	0.008596	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	1745	12	0.006877	2.5
Extreme (50C)	1745	6	0.003438	2.5
Extreme (40C)	1745	23	0.013181	2.5
Extreme (30C)	1745	25	0.014327	2.5
Extreme (10C)	1745	7	0.004011	2.5
Extreme (0C)	1745	15	0.008596	2.5
Extreme (-10C)	1745	23	0.013181	2.5
Extreme (-20C)	1745	5	0.002865	2.5
Extreme (-30C)	1745	2	0.001146	2.5

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

10.8 NR BAND 77

N77 16QAM, (100MHz CH 656000 RB Allocation 1@1)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.31	3840	12	0.003125	2.5
3.89	3840	25	0.006510	2.5
4.47	3840	22	0.005729	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	3840	5	0.001302	2.5
Extreme (50C)	3840	8	0.002083	2.5
Extreme (40C)	3840	20	0.005208	2.5
Extreme (30C)	3840	16	0.004167	2.5
Extreme (10C)	3840	7	0.001823	2.5
Extreme (0C)	3840	12	0.003125	2.5
Extreme (-10C)	3840	22	0.005729	2.5
Extreme (-20C)	3840	21	0.005469	2.5
Extreme (-30C)	3840	8	0.002083	2.5

N77 16QAM, (100MHz CH 656000 RB Allocation 1@1)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.31	3840	24	0.006250	2.5
3.89	3840	7	0.001823	2.5
4.47	3840	11	0.002865	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	3840	20	0.005208	2.5
Extreme (50C)	3840	16	0.004167	2.5
Extreme (40C)	3840	19	0.004948	2.5
Extreme (30C)	3840	2	0.000521	2.5
Extreme (10C)	3840	17	0.004427	2.5
Extreme (0C)	3840	15	0.003906	2.5
Extreme (-10C)	3840	14	0.003646	2.5
Extreme (-20C)	3840	15	0.003906	2.5
Extreme (-30C)	3840	16	0.004167	2.5

10.9 NR BAND 78

N78 QPSK, (100MHz CH 633334 RB Allocation 1@1)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
6.58	3500	13	0.003714	2.5
7.74	3500	3	0.000857	2.5
8.90	3500	5	0.001429	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	3500	11	0.003143	2.5
Extreme (50C)	3500	7	0.002000	2.5
Extreme (40C)	3500	5	0.001429	2.5
Extreme (30C)	3500	2	0.000571	2.5
Extreme (10C)	3500	14	0.004000	2.5
Extreme (0C)	3500	16	0.004571	2.5
Extreme (-10C)	3500	18	0.005143	2.5
Extreme (-20C)	3500	12	0.003429	2.5
Extreme (-30C)	3500	3	0.000857	2.5

N78 16QAM, (100MHz CH 633334 RB Allocation 1@1)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
6.58	3500	8	0.002286	2.5
7.74	3500	1	0.000286	2.5
8.90	3500	11	0.003143	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 78 DFT_QAM16, (CH 518598 1@1 100MHz BANDWIDTH)				
Normal (25C)	3500	16	0.004571	2.5
Extreme (50C)	3500	11	0.003143	2.5
Extreme (40C)	3500	19	0.005429	2.5
Extreme (30C)	3500	6	0.001714	2.5
Extreme (10C)	3500	8	0.002286	2.5
Extreme (0C)	3500	12	0.003429	2.5
Extreme (-10C)	3500	22	0.006286	2.5
Extreme (-20C)	3500	16	0.004571	2.5
Extreme (-30C)	3500	15	0.004286	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.

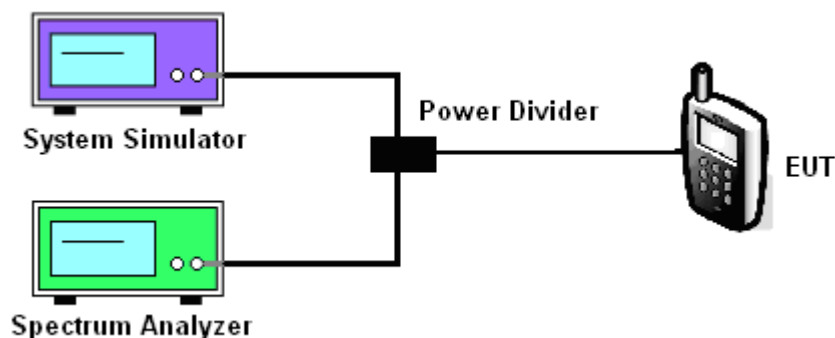
11.2 Measuring Instruments

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 Band2 / 5 / 7 / 12 / 25 / 41 / 66 / 77 / 78
- ☐

Test data reference attachment.

----END OF REPORT----