



FCC RADIO TEST REPORT

FCC ID : QYLEM9190F
Equipment : WWAN Module
Brand Name : Getac
Model Name : EM9190
Applicant : Getac Technology Corporation.
5F., Building A, No. 209, Sec.1, Nangang Rd.,Nangang
Dist., Taipei City 11568, Taiwan, R.O.C.
Standard : FCC 47 CFR Part 2, 22(H), 24(E), 27

The product was received on Aug. 26, 2021 and testing was started from Sep. 13, 2021 and completed on Sep. 20, 2021 We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FG182625C	01	Initial issue of report	Oct. 25, 2021
FG182625C	02	Revise remark description in section 2.1	Oct. 26, 2021



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
	§22.913 (a)(5)	Effective Radiated Power (n5)	Pass	
	§27.50 (c)(10)	Effective Radiated Power (n71)		
	§24.232 (c)	Equivalent Isotropic Radiated Power (n2)		
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power (n66)		
-	§24.232 (d) §27.50 (d)(5)	Peak-to-Average Ratio	-	See Note
-	§2.1049	Occupied Bandwidth	-	See Note
-	§2.1051 §22.917 (a) §24.238 (a) §27.53 (g) §27.53 (h)	Conducted Band Edge Measurement (n2) (n5) (n66) (n71)	-	See Note
-	§2.1051 §22.917 (a) §24.238 (a) §27.53 (g) §27.53 (h)	Conducted Spurious Emission (n2) (n5) (n66) (n71)	-	See Note
-	§2.1055 §22.355 §24.235 §27.54	Frequency Stability Temperature & Voltage	-	See Note



Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
4.2	§2.1053 §22.917 (a) §24.238 (a) §27.53 (g) §27.53 (h)	Radiated Spurious Emission (n2) (n5) (n66) (n71)	Pass	Under limit 24.79 dB at 2546.000 MHz

Note: The module (Model: EM9190) makes no difference after verifying output power, this report reuses test data from the module report.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Yun Huang

Report Producer: Celery Wei



1 General Description

1.1 Product Feature of Equipment Under Test

WCDMA/LTE/5G NR and GNSS

Product Specification subjective to this standard	
Sample 1	EUT with Host 1
Sample 2	EUT with Host 2
Antenna Type	WWAN: <Main>: PIFA Antenna <Aux.>: PIFA Antenna GPS / Glonass / BDS / Galileo: PATCH Antenna
Antenna Gain	<Main>: n2: 0.41 dBi n5: -0.21 dBi n66: 0.35 dBi n71: -4.58 dBi <Aux.>: n2: 0.04 dBi n5: -2.26 dBi

Remark: The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.



The product was installed into Tablet PC (Brand Name: Getac, Model Name: F110, F110G6, F110-Ex, F110-631) during test, and the host information was recorded in the following table.

Host Information	
Host 1	Host with SKU A
Host 2	Host with SKU B

SKU	SKU A	SKU B
CPU	i5-1135G7 (Non Vpro)	i7-1165G7 (Vpro)
DDR	Kingston DDR4-3200 32GB	Kingston DDR4-3200 32GB
SSD	512GB	1TB
PANEL	Full HD AUO	Full HD AUO
DIGITIZER	N/A	EMRright Digitizer
OPTION BAY	2D Barcode Reader	RS232 + LAN
Expansion Bay	Smart Card	Smart Card
Right side option	NXP RFID(PN7462)	Finger Print
WLAN/BT	Intel AX201	Intel AX201
WWAN(4G)	EM9190	EM9190
GPS/GNS	EM9190	EM9190
Rear 8M Camera	Support	Support
Webcam FHD	Not Support	Not Support
IR Webcam	Support	Support
USB3.2 Gen2 x 1 Type-A	Support	Support
Type-C (thunder bolt)	Support	Support
Audio/MIC	Support	Support

1.2 Modification of EUT

No modifications are made to the EUT during all test items.



1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. TH03-HY
Test Engineer	Sherry Wu
Temperature	24.1°C
Relative Humidity	50.1%

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH15-HY (TAF Code: 3786)
Test Engineer	Leo Li, Mancy Chou and Bigshow Wang
Temperature	22.5~24.5°C
Relative Humidity	45~55%
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW3786



1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H), 24(E), 27
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. The TAF code is not including all the FCC KDB listed without accreditation.



2 Test Configuration of Equipment Under Test

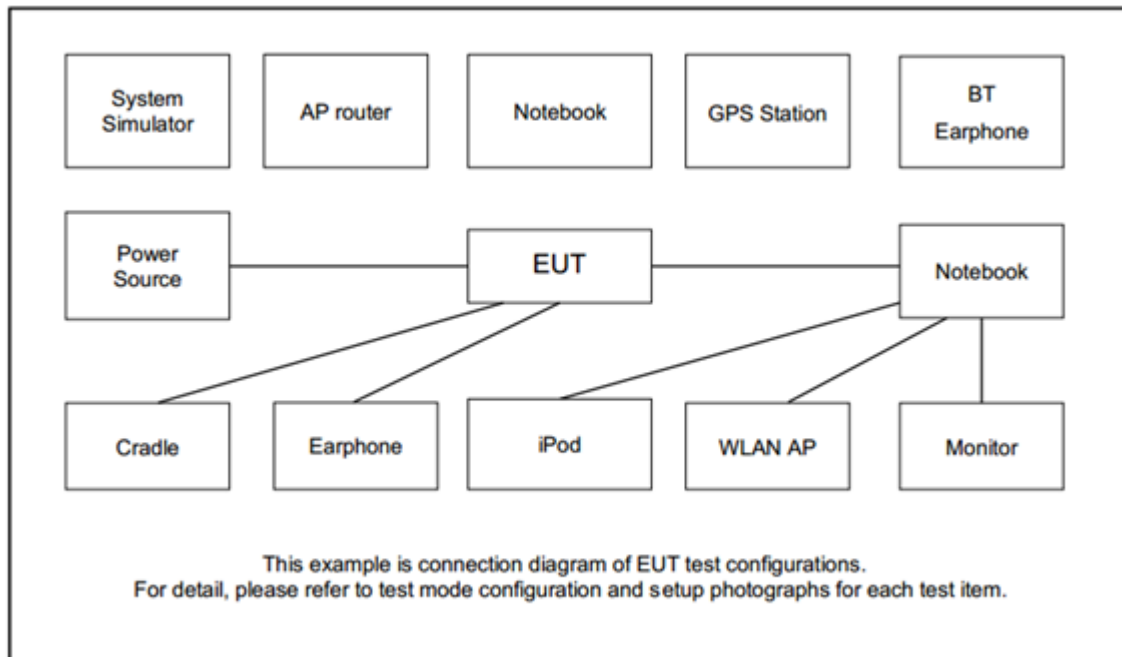
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and find X Plane for ENDC 7A_n5A, 7A_n71A; Y Plane for ENDC 12A_n2A, 5A_n66A as worst plane.

Test Items	NR	Bandwidth (MHz)						Modulation					RB #			Test Channel		
		5	10	15	20	40	50	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	n2	v	v		v	-	-	v	v	v	v	v	v	v	v	v	v	v
	n5	v	v		v	-	-	v	v	v	v	v	v	v	v	v	v	v
	n66	v	v		v	-	-	v	v	v	v	v	v	v	v	v	v	v
	n71	v	v		v	-	-	v	v	v	v	v	v	v	v	v	v	v
E.R.P / E.I.R.P	n2	v	v		v	-	-	v	v	v	v	v	Max Power					
	n5	v	v		v	-	-	v	v	v	v							
	n66	v	v		v	-	-	v	v	v	v							
	n71	v	v		v	-	-	v	v	v	v							
Radiated Spurious Emission	n2				v	-	-	v					v					v
	n5				v	-	-	v					v					v
	n66				v	-	-	v					v			v	v	v
	n71				v	-	-	v					v					v
Remark	<ol style="list-style-type: none"> The mark "v " means that this configuration is chosen for testing The mark "- " means that this bandwidth is not supported. The device is investigated from 30GHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. Test combination are EN-DC 7A_n5A, EN-DC 12A-n2A, EN-DC 5A-n66A, and EN-DC 7A-n71A. For radiated measurement, pre-scanned in two modes, DFT-s OFDM and CP OFDM. The worst cases (DFT-s OFDM) were recorded in this report. All the radiated test cases were performed with Adapter 1 and Sample 2. 																	

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
2.	5G Wireless Test Platform	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A



2.4 Frequency List of Low/Middle/High Channels

5G NR Band n2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	372000	376000	380000
	Frequency	1860	1880	1900
15	Channel	371500	376000	380500
	Frequency	1857.5	1880	1902.5
10	Channel	371000	376000	381000
	Frequency	1855	1880	1905
5	Channel	370500	376000	381500
	Frequency	1852.5	1880	1907.5

5G NR n5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	166800	167300	167800
	Frequency	834	836.5	839
15	Channel	166300	167300	168300
	Frequency	831.5	836.5	841.5
10	Channel	165800	167300	168800
	Frequency	829	836.5	844
5	Channel	165300	167300	169300
	Frequency	826.5	836.5	846.5

5G NR Band n66 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	344000	346500	349000
	Frequency	1720	1732.5	1745
10	Channel	343000	346500	350000
	Frequency	1715	1732.5	1750
5	Channel	342500	346500	350500
	Frequency	1712.5	1732.5	1752.5



5G NR Band n71 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	134600	136100	137600
	Frequency	673	680.5	688
15	Channel	134100	136100	138100
	Frequency	670.5	680.5	690.5
10	Channel	133600	136100	138600
	Frequency	668	680.5	693
5	Channel	133100	136100	139100
	Frequency	665.5	680.5	695.5

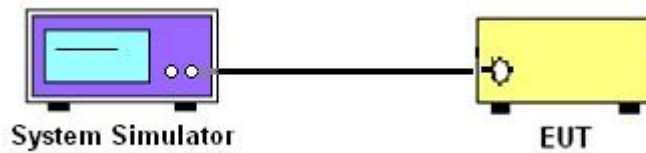
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Test Result of Conducted Test

Please refer to Appendix A.



3.2 Conducted Output Power and ERP/EIRP

3.2.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for 5G NR n5

The ERP of mobile transmitters must not exceed 3 Watts for 5G NR n71

The EIRP of mobile transmitters must not exceed 2 Watts for 5G NR n2.

The EIRP of mobile transmitters must not exceed 1 Watts for 5G NR n66

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

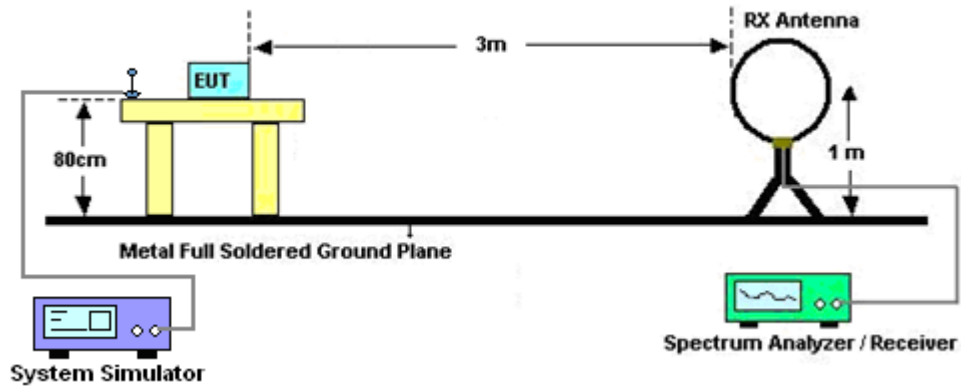
4 Radiated Test Items

4.1 Measuring Instruments

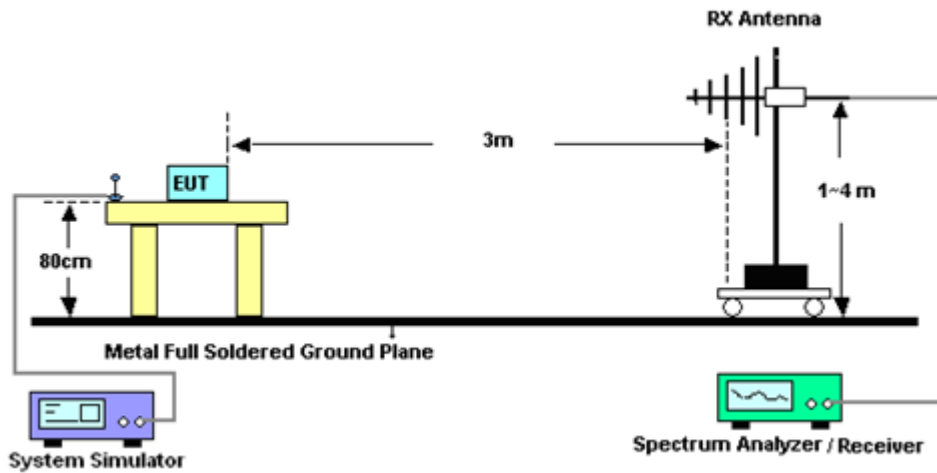
See list of measuring instruments of this test report.

4.1.1 Test Setup

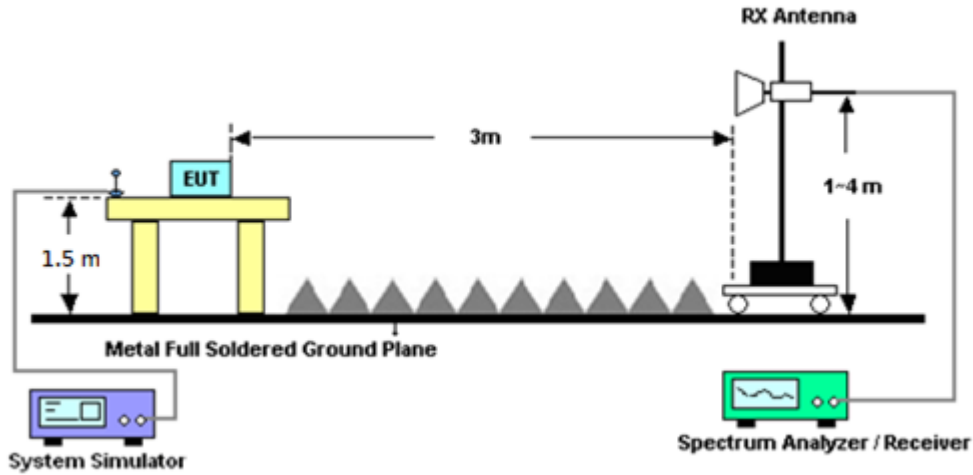
For radiated test below 30MHz



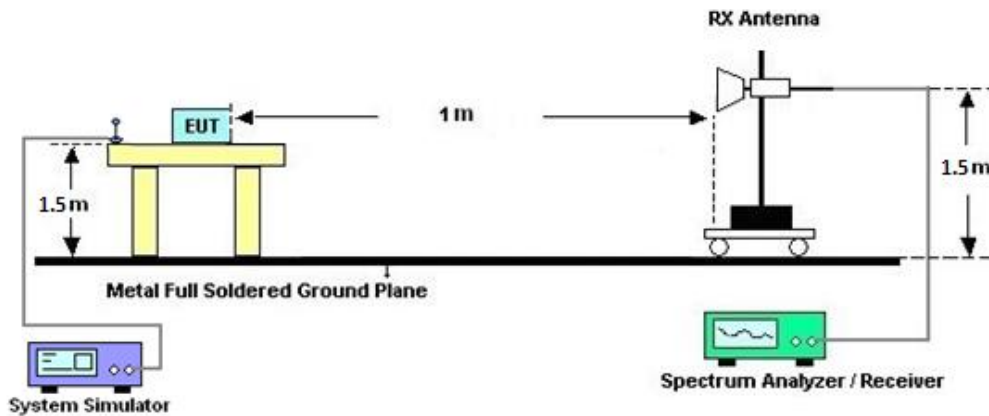
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



4.2 Radiated Spurious Emission Measurement

4.2.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)



5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H11	3489324	NA	Jan. 18, 2021	Sep. 13, 2021	Jan. 17, 2022	Conducted (TH03-HY)
Base Station (Measure)	Anritsu	MT8821C	6261849015	LTE	Sep. 18, 2020	Sep. 13, 2021	Sep. 17, 2021	Conducted (TH03-HY)
Base Station (Measure)	Anritsu	MT8000A	6261940327	FR1	Sep. 23, 2020	Sep. 13, 2021	Sep. 22, 2021	Conducted (TH03-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Sep. 17, 2021~ Sep. 20, 2021	Jan. 03, 2022	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D & 00800N1D01 N-06	37059 & 01	30MHz~1GHz	Oct. 11, 2020	Sep. 17, 2021~ Sep. 20, 2021	Oct. 10, 2021	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D&0 0800N1D01N-06	41912&05	30MHz to 1GHz	Feb. 08, 2021	Sep. 17, 2021~ Sep. 20, 2021	Feb. 07, 2022	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 28, 2020	Sep. 17, 2021~ Sep. 20, 2021	Dec. 27, 2021	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-01620	1-18GHz	Nov. 03, 2020	Sep. 17, 2021~ Sep. 20, 2021	Nov. 02, 2021	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz~18GHz	Nov. 03, 2020	Sep. 17, 2021~ Sep. 20, 2021	Nov. 02, 2021	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	18GHz- 40GHz	Dec. 02, 2020	Sep. 17, 2021~ Sep. 20, 2021	Dec. 01, 2021	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-303	17100018000 55006	1GHz~18GHz	May 06, 2021	Sep. 17, 2021~ Sep. 20, 2021	May 05, 2022	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY53270195	1GHz~26.5GHz	Aug. 19, 2021	Sep. 17, 2021~ Sep. 20, 2021	Aug. 18, 2022	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 11, 2020	Sep. 17, 2021~ Sep. 20, 2021	Dec. 10, 2021	Radiation (03CH15-HY)
Spectrum Analyzer	Keysight	N9038A	MY54130085	20MHz~8.4GHz	Nov. 02, 2020	Sep. 17, 2021~ Sep. 20, 2021	Nov. 01, 2021	Radiation (03CH15-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz~44GHz	Mar. 05, 2021	Sep. 17, 2021~ Sep. 20, 2021	Mar. 04, 2022	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Sep. 17, 2021~ Sep. 20, 2021	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Sep. 17, 2021~ Sep. 20, 2021	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k5)	RK-000451	N/A	N/A	Sep. 17, 2021~ Sep. 20, 2021	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/4, MY9838/4PE, 508405/2E	30MHz~18G	Nov. 16, 2020	Sep. 17, 2021~ Sep. 20, 2021	Nov. 15, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 22, 2021	Sep. 17, 2021~ Sep. 20, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 22, 2021	Sep. 17, 2021~ Sep. 20, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 11, 2021	Sep. 17, 2021~ Sep. 20, 2021	Mar. 10, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40S S	SN12	1.53GHz Low Pass Filter	Sep. 14, 2021	Sep. 17, 2021~ Sep. 20, 2021	Sep. 13, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-935-1000-15000-40ST	SN1	1GHz High Pass Filter	Apr. 29, 2021	Sep. 17, 2021~ Sep. 20, 2021	Apr. 28, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN4	3GHz High Pass Filter	Sep. 15, 2021	Sep. 17, 2021~ Sep. 20, 2021	Sep. 14, 2022	Radiation (03CH15-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Jan. 31, 2021	Sep. 17, 2021~ Sep. 20, 2021	Jan. 30, 2022	Radiation (03CH15-HY)



6 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.98
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.31
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.91
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power) and ERP/EIRP

NR n2 Maximum Average Power [dBm] (GT - LC = 0.41 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
5	1	1	PI/2 BPSK	22.81	22.74	22.41	23.41	0.2193
5	1	23		23.00	22.75	22.45		
5	12	6		22.94	22.82	22.41		
5	1	0		22.31	22.19	21.90		
5	1	24		22.43	22.20	21.91		
5	25	0		22.43	22.25	21.93		
5	1	1	QPSK	22.86	22.69	22.37		
5	1	23		22.88	22.71	22.40		
5	12	6		22.94	22.76	22.44		
5	1	0		21.91	21.65	21.36		
5	1	24		21.90	21.71	21.36		
5	25	0		21.95	21.80	21.43		
5	1	1	16-QAM	22.00	21.80	21.47	22.41	0.1742
5	1	1	64-QAM	20.15	20.15	19.78		
5	1	1	256-QAM	18.00	17.88	17.56		
Limit	EIRP < 2W			Result			Pass	

NR n2 Maximum Average Power [dBm] (GT - LC = 0.41 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
10	1	1	PI/2 BPSK	23.01	22.82	22.47	23.42	0.2198
10	1	50		23.01	22.79	22.41		
10	25	12		22.98	22.80	22.54		
10	1	0		22.51	22.24	21.99		
10	1	51		22.45	22.22	21.86		
10	50	0		22.22	22.31	22.01		
10	1	1	QPSK	22.01	22.75	22.43		
10	1	50		22.30	22.75	22.38		
10	25	12		22.79	22.87	22.56		
10	1	0		22.38	21.79	21.46		
10	1	51		22.36	21.79	21.34		
10	50	0		22.79	21.82	21.49		
10	1	1	16-QAM	22.59	21.87	21.60	23.00	0.1995
10	1	1	64-QAM	20.93	20.05	19.71		
10	1	1	256-QAM	18.41	17.89	17.59		
Limit	EIRP < 2W			Result			Pass	

NR n2 Maximum Average Power [dBm] (GT - LC = 0.41 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
20	1	1	PI/2 BPSK	23.09	22.94	22.74	23.58	0.2280
20	1	104		22.96	22.78	22.54		
20	50	25		23.17	22.99	22.68		
20	1	0		22.57	22.43	22.16		
20	1	105		22.47	22.19	22.01		
20	100	0		22.58	22.41	22.17		
20	1	1	QPSK	23.08	22.80	22.70	23.58	0.2280
20	1	104		22.97	22.75	22.54		
20	50	25		23.12	22.97	22.68		
20	1	0		22.10	21.84	21.74		
20	1	105		22.01	21.70	21.53		
20	100	0		22.09	21.99	21.69		
20	1	1	16-QAM	22.14	21.93	21.81	22.55	0.1799
20	1	1	64-QAM	20.25	20.29	19.96		
20	1	1	256-QAM	18.13	17.98	17.79		
Limit	EIRP < 2W			Result			Pass	



NR n5 Maximum Average Power [dBm] (GT - LC = -0.21 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP(W)
5	1	1	PI/2 BPSK	23.01	22.87	22.64	20.65	0.1161
5	1	23		22.88	22.63	22.45		
5	12	6		22.96	22.74	22.55		
5	1	0		22.51	22.29	22.14		
5	1	24		22.39	22.09	21.93		
5	25	0		22.49	22.27	22.07		
5	1	1	QPSK	22.97	22.81	22.61		
5	1	23		22.80	22.65	22.35		
5	12	6		22.95	22.78	22.53		
5	1	0		22.01	21.81	21.61		
5	1	24		21.81	21.62	21.41		
5	25	0		21.97	21.82	21.58		
5	1	1	16-QAM	22.09	22.06	21.78	19.73	0.0940
5	1	1	64-QAM	20.42	20.22	20.03		
5	1	1	256-QAM	18.23	18.06	17.82		
Limit	ERP < 7W			Result			Pass	

NR n5 Maximum Average Power [dBm] (GT - LC = -0.21 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP(W)
10	1	1	PI/2 BPSK	22.95	22.84	22.59	20.64	0.1159
10	1	50		22.83	22.67	22.49		
10	25	12		22.94	22.83	22.66		
10	1	0		22.37	22.29	22.05		
10	1	51		22.30	22.17	21.95		
10	50	0		22.43	22.30	22.16		
10	1	1	QPSK	22.89	22.77	22.56		
10	1	50		22.79	22.60	22.35		
10	25	12		23.00	22.81	22.64		
10	1	0		21.90	21.79	21.52		
10	1	51		21.77	21.64	21.40		
10	50	0		21.91	21.83	21.63		
10	1	1	16-QAM	22.07	21.91	21.67	19.71	0.0935
10	1	1	64-QAM	20.22	20.26	20.25		
10	1	1	256-QAM	18.06	17.96	17.77		
Limit	ERP < 7W			Result			Pass	

NR n5 Maximum Average Power [dBm] (GT - LC = -0.21 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP(W)
20	1	1	PI/2 BPSK	22.85	22.90	22.87	20.55	0.1135
20	1	104		22.63	22.66	22.59		
20	50	25		22.87	22.91	22.80		
20	1	0		22.32	22.33	22.33		
20	1	105		22.07	22.08	22.05		
20	100	0		22.33	22.32	22.30		
20	1	1	QPSK	22.87	22.86	22.79		
20	1	104		22.65	22.58	22.54		
20	50	25		22.85	22.89	22.81		
20	1	0		21.87	21.87	21.80		
20	1	105		21.66	21.63	21.50		
20	100	0		21.85	21.86	21.82		
20	1	1	16-QAM	22.05	22.06	21.96	19.70	0.0933
20	1	1	64-QAM	20.18	20.45	20.58		
20	1	1	256-QAM	18.01	18.09	17.96		
Limit	ERP < 7W			Result			Pass	



NR n66 Maximum Average Power [dBm] (GT - LC = 0.35 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
5	1	1	PI/2 BPSK	22.90	22.74	23.04	23.40	0.2188
5	1	23		22.83	22.79	23.00		
5	12	6		22.90	22.74	23.05		
5	1	0		22.31	22.18	22.49		
5	1	24		22.27	22.30	22.48		
5	25	0		22.36	22.25	22.51		
5	1	1	QPSK	22.80	22.67	22.95		
5	1	23		22.83	22.76	22.97		
5	12	6		22.89	22.75	23.02		
5	1	0		21.80	21.64	21.92		
5	1	24		21.80	21.78	21.92		
5	25	0		21.90	21.73	22.09		
5	1	1	16-QAM	21.98	21.77	22.14	22.49	0.1774
5	1	1	64-QAM	20.25	20.09	20.34		
5	1	1	256-QAM	18.01	17.89	18.18		
Limit	EIRP < 1W			Result			Pass	

NR n66 Maximum Average Power [dBm] (GT - LC = 0.35 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
10	1	1	PI/2 BPSK	22.97	22.73	23.11	23.51	0.2244
10	1	50		22.86	22.82	23.05		
10	25	12		23.06	22.82	23.16		
10	1	0		22.42	22.18	22.53		
10	1	51		22.32	22.24	22.44		
10	50	0		22.50	22.30	22.64		
10	1	1	QPSK	22.93	22.70	23.05		
10	1	50		22.80	22.74	22.97		
10	25	12		23.00	22.90	23.12		
10	1	0		21.94	21.70	22.02		
10	1	51		21.79	21.72	21.92		
10	50	0		21.97	21.83	22.08		
10	1	1	16-QAM	22.09	21.84	22.22	22.57	0.1807
10	1	1	64-QAM	20.69	20.02	20.39		
10	1	1	256-QAM	18.12	17.83	18.23		
Limit	EIRP < 1W			Result			Pass	

NR n66 Maximum Average Power [dBm] (GT - LC = 0.35 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
20	1	1	PI/2 BPSK	22.10	22.85	22.88	23.34	0.2158
20	1	104		22.81	22.91	22.86		
20	50	25		22.76	22.79	22.97		
20	1	0		22.35	22.27	22.29		
20	1	105		22.23	22.30	22.31		
20	100	0		22.36	22.25	22.44		
20	1	1	QPSK	22.90	22.85	22.90	23.34	0.2158
20	1	104		22.81	22.86	22.84		
20	50	25		22.90	22.83	22.99		
20	1	0		21.89	21.81	22.85		
20	1	105		21.79	21.87	21.85		
20	100	0		21.84	21.79	21.96		
20	1	1	16-QAM	21.99	21.94	22.01	22.36	0.1722
20	1	1	64-QAM	20.34	20.06	20.15		
20	1	1	256-QAM	18.01	17.88	17.96		
Limit	EIRP < 1W			Result			Pass	



NR n71 Maximum Average Power [dBm] (GT - LC = -4.58 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP(W)
5	1	1	PI/2 BPSK	22.70	22.59	22.36	15.97	0.0395
5	1	23		22.67	22.30	22.14		
5	12	6		22.69	22.46	22.29		
5	1	0		22.31	22.13	21.94		
5	1	24		22.17	21.88	21.68		
5	25	0		22.29	22.07	21.86		
5	1	1	QPSK	22.65	22.48	22.33		
5	1	23		22.53	22.35	22.10		
5	12	6		22.39	22.47	22.26		
5	1	0		21.77	21.63	21.45		
5	1	24		21.67	21.49	21.19		
5	25	0		21.90	21.57	21.36		
5	1	1	16-QAM	22.01	21.73	21.54	15.28	0.0337
5	1	1	64-QAM	20.26	20.21	20.00		
5	1	1	256-QAM	18.15	17.87	17.71		
Limit	ERP < 3W			Result			Pass	

NR n71 Maximum Average Power [dBm] (GT - LC = -4.58 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP(W)
10	1	1	PI/2 BPSK	22.72	22.40	22.42	15.99	0.0397
10	1	50		22.54	22.36	22.15		
10	25	12		22.70	22.51	22.37		
10	1	0		22.26	22.01	21.94		
10	1	51		22.05	21.94	21.66		
10	50	0		22.26	22.12	21.93		
10	1	1	QPSK	22.61	22.42	22.32		
10	1	50		22.48	22.33	22.07		
10	25	12		22.65	22.54	22.35		
10	1	0		21.71	21.51	21.42		
10	1	51		21.59	21.41	21.17		
10	50	0		21.77	21.61	21.38		
10	1	1	16-QAM	21.88	21.70	21.57	15.15	0.0327
10	1	1	64-QAM	20.60	20.02	19.80		
10	1	1	256-QAM	17.99	17.85	17.64		
Limit	ERP < 3W			Result			Pass	

NR n71 Maximum Average Power [dBm] (GT - LC = -4.58 dB)										
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP(W)		
20	1	1	PI/2 BPSK	22.72	22.72	22.56	15.99	0.0397		
20	1	104		22.38	22.38	22.17				
20	50	25		22.65	22.66	22.37				
20	1	0		22.37	22.29	22.16				
20	1	105		21.92	21.94	21.75				
20	100	0		22.21	22.22	21.97				
20	1	1	QPSK	22.70	22.67	22.60			15.31	0.034
20	1	104		22.36	22.38	22.09				
20	50	25		22.67	22.69	22.38				
20	1	0		21.89	21.78	21.58				
20	1	105		21.47	21.46	21.23				
20	100	0		21.73	21.74	21.48				
20	1	1	16-QAM	22.04	22.01	21.72	15.31	0.034		
20	1	1	64-QAM	20.23	20.27	20.08				
20	1	1	256-QAM	17.99	18.01	17.89				
Limit	ERP < 3W			Result			Pass			



Appendix B. Test Results of Radiated Test

EN-DC 12A-n2A

EN-DC 12A-n2A / 20MHz / PI/2 BPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Highest	3819	-56.12	-13	-43.12	-77.37	-65.69	2.80	12.36	H
	5730	-45.61	-13	-32.61	-71.14	-55.50	3.51	13.40	H
	7639	-49.91	-13	-36.91	-78.98	-57.34	4.05	11.48	H
									H
									H
									H
									H
	3819	-56.62	-13	-43.62	-78.26	-66.19	2.80	12.36	V
	5730	-48.06	-13	-35.06	-73.82	-57.95	3.51	13.40	V
	7639	-49.52	-13	-36.52	-79.13	-56.95	4.05	11.48	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



EN-DC 5A-n66A

EN-DC 5A-n66A / 20MHz / PI/2 BPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3420	-59.51	-13	-46.51	-78.99	-69.43	2.68	12.60	H
	5133	-55.85	-13	-42.85	-80.26	-64.96	3.32	12.43	H
	6835	-51.73	-13	-38.73	-79.91	-60.27	3.86	12.40	H
									H
									H
									H
									H
	3420	-59.24	-13	-46.24	-79.11	-69.16	2.68	12.60	V
	5133	-55.47	-13	-42.47	-80.43	-64.58	3.32	12.43	V
	6835	-51.37	-13	-38.37	-79.94	-59.91	3.86	12.40	V
									V
									V
									V
									V
Middle	3469	-59.64	-13	-46.64	-79.5	-69.46	2.71	12.52	H
	5208	-56.07	-13	-43.07	-80.67	-65.59	3.34	12.86	H
	6945	-50.64	-13	-37.64	-79.22	-58.75	3.89	12.00	H
									H
									H
									H
									H
	3469	-59.07	-13	-46.07	-79.32	-68.89	2.71	12.52	V
	5208	-55.76	-13	-42.76	-80.84	-65.28	3.34	12.86	V
	6945	-50.43	-13	-37.43	-79.05	-58.54	3.89	12.00	V
									V
									V
									V
									V



Highest	3525	-58.80	-13	-45.80	-78.97	-68.37	2.73	12.30	H
	5283	-55.73	-13	-42.73	-80.29	-65.69	3.37	13.33	H
	7045	-50.22	-13	-37.22	-79.03	-57.93	3.92	11.63	H
									H
									H
									H
									H
	3525	-58.18	-13	-45.18	-78.73	-67.75	2.73	12.30	V
	5283	-55.38	-13	-42.38	-80.29	-65.34	3.37	13.33	V
	7045	-50.43	-13	-37.43	-79.22	-58.14	3.92	11.63	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



EN-DC 7A-n71A

EN-DC 7A-n71A / 20MHz / PI/2 BPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Highest	1396	-53.88	-13	-40.88	-65.27	-59.06	1.68	6.87	H
	2093	-52.85	-13	-39.85	-67.45	-60.33	2.07	9.56	H
	2791	-60.02	-13	-47.02	-77.62	-68.80	2.39	11.16	H
									H
									H
									H
									H
	1396	-64.11	-13	-51.11	-75.68	-69.29	1.68	6.87	V
	2093	-57.70	-13	-44.70	-72.76	-65.18	2.07	9.56	V
	2791	-59.99	-13	-46.99	-77.87	-68.77	2.39	11.16	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



EN-DC 7A-n5A

EN-DC 7A-n5A / 20MHz / PI/2 BPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Highest	1698	-61.69	-13	-48.69	-74.13	-67.27	1.86	9.59	H
	2546	-41.04	-13	-28.04	-57.68	-47.41	2.28	10.80	H
	3395	-60.58	-13	-47.58	-79.02	-68.37	2.67	12.61	H
	4244	-57.63	-13	-44.63	-79.51	-65.21	2.97	12.70	H
									H
									H
									H
	1698	-62.33	-13	-49.33	-75.25	-67.91	1.86	9.59	V
	2546	-37.79	-13	-24.79	-54.76	-44.16	2.28	10.80	V
	3395	-60.13	-13	-47.13	-78.95	-67.92	2.67	12.61	V
	4244	-56.09	-13	-43.09	-78.57	-63.67	2.97	12.70	V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.