FCC RF Test Report

APPLICANT	:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
EQUIPMENT	:	Portable Tablet Computer
BRAND NAME	:	Lenovo
MODEL NAME	:	TB360ZJ
FCC ID	:	O57TB360ZJ
STANDARD	:	47 CFR Part 2, 96
CLASSIFICATION	:	Citizens Band End User Devices (CBE)
EQUIPMENT TYPE	:	End User Equipment
TEST DATE(S)	:	Mar. 30, 2023 ~ Apr. 11, 2023

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

Sporton International Inc. (Kunshan)

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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History of this test report

Report No.	Version	Description	Issued Date
FG312017D	01	Initial issue of report	May 15, 2023

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
3.3	§96.41	Maximum E.I.R.P	Pass	-
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	Under limit 19.64 dB at 14316.000 MHz

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.

1 General Description

1.1 Applicant

ASUSTeK COMPUTER INC.
Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone

1.2 Manufacturer

Lenovo PC HK Limited
23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Portable Tablet Computer
Brand Name	Lenovo
Model Name	TB360ZJ
FCC ID	O57TB360ZJ
Tx/Rx Frequency	5G NR n77/n78: 3550 MHz ~ 3700 MHz
Bandwidth	n77: 20MHz/40MHz/100MHz n78: 60MHz/100MHz
Antenna Type	PIFA Antenna
Antenna Gain	**<Ant. 3>:** n77: 0.32 dBi n78: 0.32 dBi **<Ant. 4>:** n77: 0.09 dBi n78: 0.09 dBi **<Ant. 7>:** n77: 0.13 dBi n78: 0.13 dBi **<Ant. 11>:** n77: -2.11 dBi n78: -2.11 dBi
Type of Modulation	DFT-s-OFDM (PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM) CP-OFDM (QPSK / 16QAM / 64QAM / 256QAM)
IMEI Code	Conducted: 861392060006920 Radiation: 861392060006946
HW Version	TB360ZJ
SW Version	TB360ZJ_RF01_0316
EUT Stage	Identical Prototype

Remark:

1. The device supports n77/n78(1T4R) SRS resources on Ant.3/4/7/11, only the worst test data of Antenna 3 is showed in the report.
2. 5G NR support SA (n77) mode and NSA(n77/n78) mode, and supports power class 3 only.
3. The EN-DC mode combination could be referred to the product spec.

1.4 Re-use of Measured Data

1.4.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: TB360ZJ, FCC ID: O57TB360ZJ) is electrically identical to the reference device (Model: TB360ZU, FCC ID: O57TB360ZU) for the portions of the circuitry corresponding to the data being re-used. Based on their similarity, the 47 CFR Part 2, 96 (equipment class: CBE) reuse the original model's result and do spot-check, following the FCC KDB 484596 D01 v01.

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID: O57TB360ZJ.

1.4.2 Model Difference Information

The **main** difference between FCC ID: O57TB360ZU and FCC ID: O57TB360ZJ is as below:

- Remove GSM850/1900, WCDMA Band II/IV, LTE B2/4/7/12/13/25/38/66, 5G NR n5/7/38/41/66/71, 5G NR n78 SA mode.
- Add n77 NSA mode; LTE B41 support HPUE mode;

Other differences and all the details of similarity and difference can be found in the confidential documents (TB360ZJ_Operational Description of Product Equality Declaration).

1.4.3 Reference detail Section:

Rule Part	Equipment Class	Frequency Band (MHz)	Reference FCC ID (Parent)	Reference Title	Report Title/Section
Part96	CBE (NR)	n77/n78	O57TB360ZU	FG311926J	All sections applicable for n77 SA mode except Power

1.4.4 Spot Check Verification Data Section

Conducted power test and radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model

Summary for power and RSE spot check for each rule entry and technology is listed as below:

Test Item	Mode	O57TB360ZU Parent Worst Result	O57TB360ZJ Variant Check Result	Difference (dB)
Conducted Power (dBm)	Part96 n77	19.24	19.00	-0.24
Radiated Spurious Emission (dBm)	Part96 N77 BW=100M	-19.27	-19.24	0.03

Conclusion:
Conducted Power and Radiated spurious emission test against the variant model based on the worst-case condition from the original model was performed in this filing to demonstrate the test data from original model remains representative for the variant model.

Based on the spot check test result, the test data from the original model is representative for the variant model. The power level and RSE spot check are shown within expected level compliant to limit line.

The same Part 96 EUD mechanism/software is used in the variant. Hence, there is no spot check data for Part 96 EUD hand-shaking mechanism.

We confirm that the test data reuse policy of FCC KDB 484596 D01 Referencing Test Data v01 has been followed and the test data as referenced from the parent model report represents compliance with new FCC ID.

1.5 Maximum EIRP Power and Emission Designator

5G NR n77		PI/2 BPSK / QPSK	16QAM / 64QAM / 256QAM
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Maximum EIRP(W)
100	3600.00 ~ 3649.98	0.0855	0.0845

ENDC B41A_n78		PI/2 BPSK / QPSK	16QAM / 64QAM / 256QAM
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Maximum EIRP(W)
100	3600.00 ~ 3649.98	0.0841	0.0839

Note:

1. According to the maximum power between 5G NR n77 and 5G NR n78, 5G NR n77 covers 5G NR n78 mode for conducted test items.
2. All modulations have been tested, and only the worst test results of PSK & QAM are shown in the report.

1.6 Testing Site

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS TH01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24al

1.8 Applied Standards

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

- ANSI C63.26-2015
- 47 CFR Part 2, 96
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 940660 D01 Part 96 CBRS v03
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

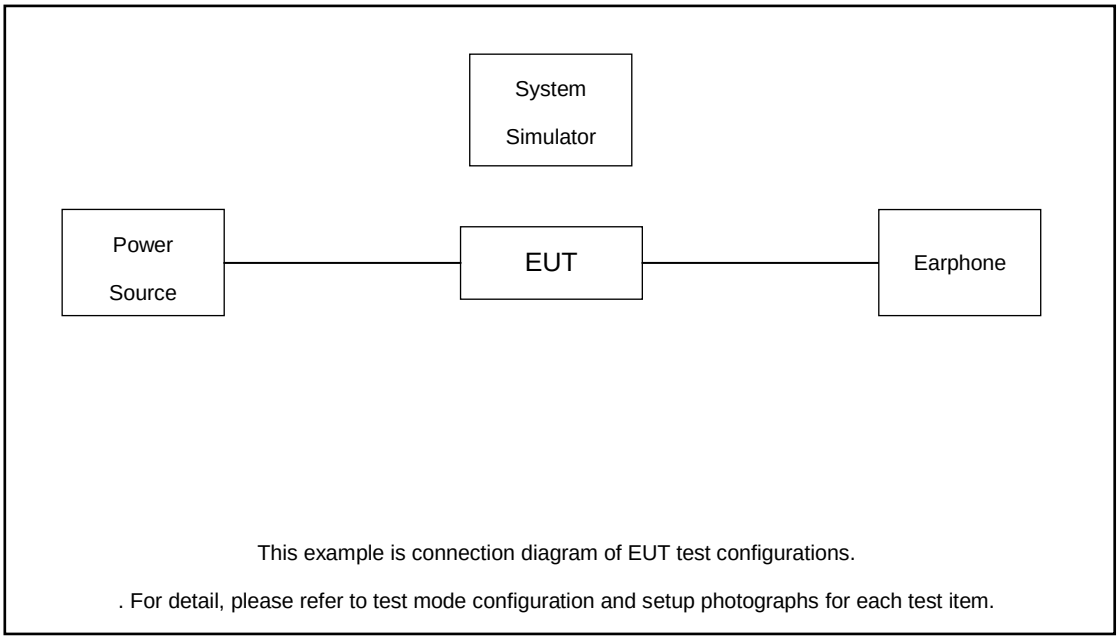
2.1 Test Mode

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, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

Test Items	5G NR	Bandwidth (MHz)									Modulation					RB #		Test Channel		
		20	30	40	50	60	70	80	90	100	PI/2 BPSK	QPSK	16QAM	64QAM	256 QAM	1	Full	L	M	H
Max. Output Power	n77	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	n78	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
E.I.R.P	n77	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	n78	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v
Radiated Spurious Emission	n77	Worst Case																	v	
	n78	Worst Case																	v	
Note	1. The mark "**v** " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz 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. 4. Based on engineering evaluation, only the worst modulations test results are shown in the report. 5. Frequency Stability：Normal Voltage = 3.86V ；Low Voltage =3.60V.；High Voltage =4.43V																			

2.2 Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	NR Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m
4.	Earphone	N/A	N/A	N/A	N/A	N/A

2.4 Frequency List of Low/Middle/High Channels

5G n77/n78 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	640000	641666	643332
	Frequency	3600	3624.99	3649.98
40	Channel	638000	641666	645332
	Frequency	3570	3624.99	3679.98
20	Channel	637334	641666	646000
	Frequency	3560.01	3624.99	3690

5G n77/n78 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	640000	641666	643332
	Frequency	3600	3624.99	3649.98
60	Channel	638668	641666	644666
	Frequency	3580.02	3624.99	3669.99

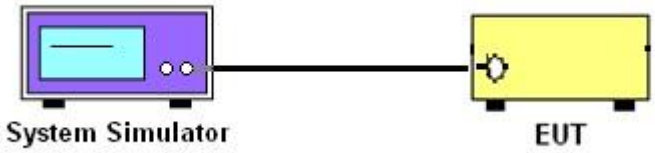
3 Conducted Test Items

3.1 Measuring Instruments

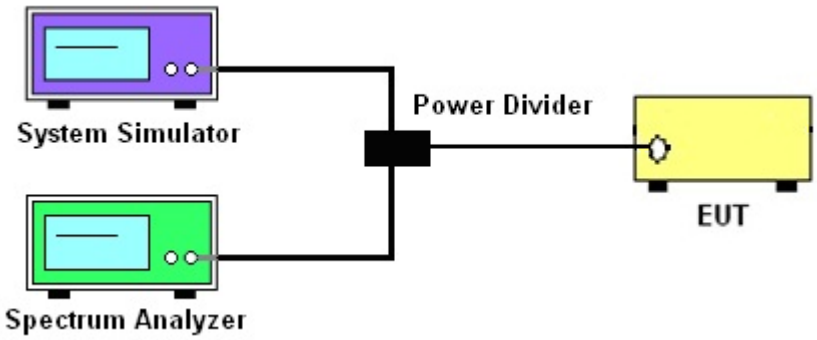
See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 EIRP



3.1.4 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Description of the Conducted Output Power 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.

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.

3.3 EIRP

3.3.1 Description of the EIRP Measurement

EIRP limits for CBRS equipment as below table:

Device		Maximum EIRP (dBm/10 MHz)	Maximum PSD (dBm/MHz)
Applied	**End User Device**	23	n/a
☐	**Category A CBSD**	30	20
☐	**Category B CBSD**	47	37

Remark: The worst case EIRP shown in this section is found with LTE operating only using 1RB. As such, the EIRP/10MHz and full channel EIRP values will be identical since 1RB is fully contained within all available channel bandwidths for LTE Band 48 (i.e. 5, 10, 15, 20MHz)

3.3.2 Test Procedures for EIRP

1. Establishing a communications link with the call box (Base station) to measure the Maximum conducted power, the parameters were set to force the EUT transmitting at maximum output power level. Use the average power measurement function to measure total channel power of each channel bandwidth (per ANSI C63.26-2015 Section 5.2.1)

2. Determining ERP and/or EIRP from conducted RF output power measurements (Per ANSI C63.26-2015 Section 5.2.5.5)

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

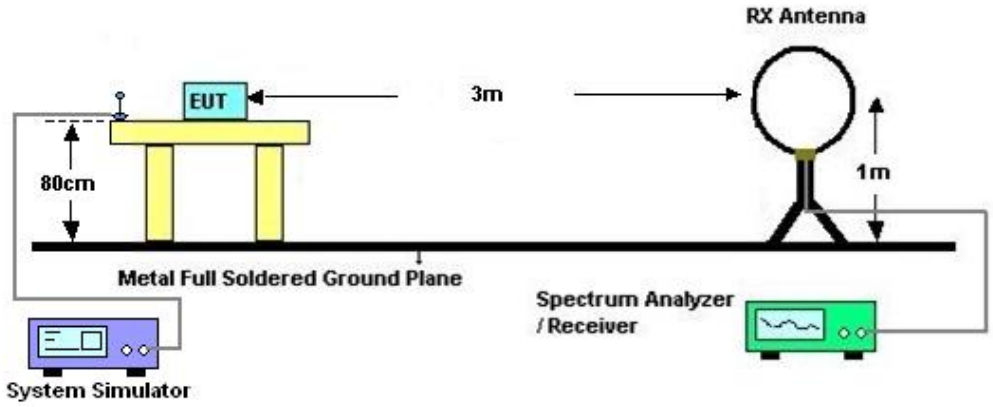
4 Radiated Test Items

4.1 Measuring Instruments

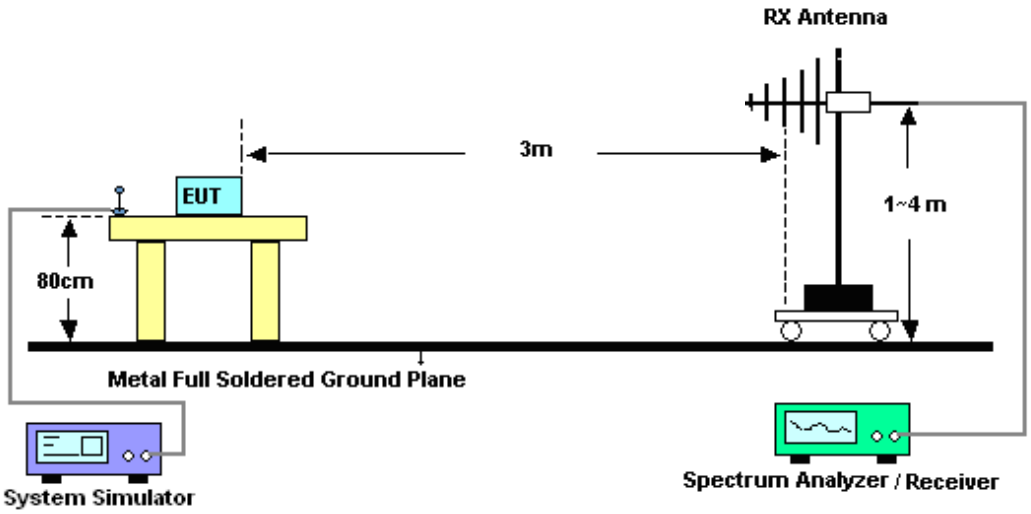
See list of measuring instruments of this test report.

4.2 Test Setup

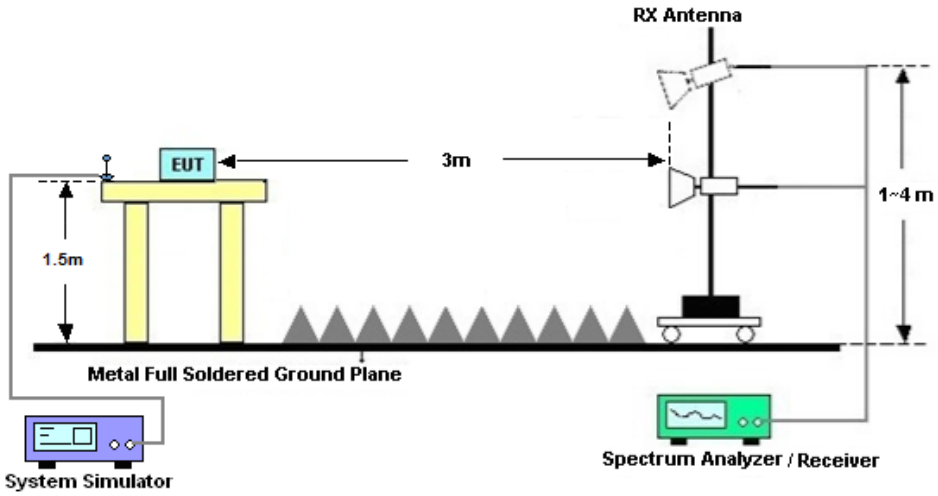
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

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.

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI C63.26. 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 -40dBm / MHz.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna 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 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
   Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
   EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
   ERP (dBm) = EIRP - 2.15
8. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
   The limit line is −40dBm/MHz

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 12, 2022	Apr. 11, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Apr. 11, 2023	NCR	Conducted (TH01-KS)
Temperature &humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 15, 2022	Apr. 11, 2023	Jul. 14, 2023	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 12, 2022	Mar. 30, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	Mar. 30, 2023	Oct. 15, 2023	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	May 24, 2022	Mar. 30, 2023	May 23, 2023	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Jan. 04, 2023	Mar. 30, 2023	Jan. 03, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 04, 2023	Mar. 30, 2023	Jan. 03, 2024	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Jan. 04, 2023	Mar. 30, 2023	Jan. 03, 2024	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 04, 2023	Mar. 30, 2023	Jan. 03, 2024	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 12, 2022	Mar. 30, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 12, 2022	Mar. 30, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 30, 2023	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 30, 2023	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 30, 2023	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required.

6 Uncertainty of Evaluation

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	±0.46 dB
Conducted Emissions	±0.48 dB
Occupied Channel Bandwidth	±0.1 %

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.3dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.8dB

---------- THE END ----------

Appendix A. Test Results of Conducted Test

Test Engineer :	Simle Wang	**Temperature :**	22~23℃
		Relative Humidity :	40~42%

FR1 N77(Ant3)

Transmitter Conducted Output Power And EIRP, (G_T-L_C)=0.32dB

NR Band	SCS	BandWidth	Arfcn	Freq(MHz)	Modulation	RB	Conducted Power(dBm)	EIRP(dBm)	EIRP(W)
77	30	20	637334	3560.01	DFT-s-OFDM PI/2 BPSK	1@1	18.85	19.17	0.0826
77	30	20	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@1	18.45	18.77	0.0753
77	30	20	646000	3690	DFT-s-OFDM PI/2 BPSK	1@1	18.82	19.14	0.0820
77	30	40	638000	3570	DFT-s-OFDM PI/2 BPSK	1@1	18.87	19.19	0.0830
77	30	40	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@1	18.79	19.11	0.0815
77	30	40	645332	3679.98	DFT-s-OFDM PI/2 BPSK	1@1	17.66	18.99	0.0793
77	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	135@67	18.53	18.85	0.0767
77	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	1@1	18.67	17.98	0.0628
77	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	1@271	18.42	18.74	0.0748
77	30	100	640000	3600	DFT-s-OFDM QPSK	135@67	18.66	18.98	0.0791
77	30	100	640000	3600	DFT-s-OFDM QPSK	1@1	18.46	18.78	0.0755
77	30	100	640000	3600	DFT-s-OFDM QPSK	1@271	18.44	18.76	0.0752
77	30	100	640000	3600	DFT-s-OFDM 16 QAM	135@67	18.65	18.97	0.0789
77	30	100	640000	3600	DFT-s-OFDM 16 QAM	1@1	18.64	18.96	0.0787
77	30	100	640000	3600	DFT-s-OFDM 16 QAM	1@271	18.48	18.8	0.0759
77	30	100	640000	3600	DFT-s-OFDM 64 QAM	135@67	18.68	19	0.0794
77	30	100	640000	3600	DFT-s-OFDM 64 QAM	1@1	18.39	18.71	0.0743
77	30	100	640000	3600	DFT-s-OFDM 64 QAM	1@271	18.51	18.83	0.0764
77	30	100	640000	3600	DFT-s-OFDM 256 QAM	135@67	18.6	18.92	0.0780
77	30	100	640000	3600	DFT-s-OFDM 256 QAM	1@1	18.4	18.72	0.0745
77	30	100	640000	3600	DFT-s-OFDM 256 QAM	1@271	18.34	18.66	0.0735
77	30	100	640000	3600	CP-OFDM QPSK	1@1	18.37	18.69	0.0740
77	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	135@67	18.48	18.8	0.0759
77	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@1	19	19.32	0.0855
77	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@271	18.78	19.1	0.0813
77	30	100	641666	3624.99	DFT-s-OFDM QPSK	135@67	18.33	18.65	0.0733
77	30	100	641666	3624.99	DFT-s-OFDM QPSK	1@1	18.73	19.05	0.0804
77	30	100	641666	3624.99	DFT-s-OFDM QPSK	1@271	18.39	18.71	0.0743
77	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	135@67	18.33	18.65	0.0733
77	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	1@1	18.78	19.1	0.0813
77	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	1@271	18.49	18.81	0.0760
77	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	135@67	18.5	18.82	0.0762
77	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	1@1	18.38	18.7	0.0741
77	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	1@271	18.39	18.71	0.0743
77	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	135@67	18.43	18.75	0.0750
77	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	1@1	18.45	18.77	0.0753
77	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	1@271	18.47	18.79	0.0757
77	30	100	641666	3624.99	CP-OFDM QPSK	1@1	18.57	18.89	0.0774

77	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	135@67	18.54	18.86	0.0769
77	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	1@1	18.68	19	0.0794
77	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	1@271	18.41	18.73	0.0746
77	30	100	643332	3649.98	DFT-s-OFDM QPSK	135@67	18.56	18.88	0.0773
77	30	100	643332	3649.98	DFT-s-OFDM QPSK	1@1	18.9	19.22	0.0836
77	30	100	643332	3649.98	DFT-s-OFDM QPSK	1@271	18.39	18.71	0.0743
77	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	135@67	18.48	18.8	0.0759
77	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	1@1	18.95	19.27	0.0845
77	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	1@271	18.46	18.78	0.0755
77	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	135@67	18.62	18.94	0.0783
77	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	1@1	18.61	18.93	0.0782
77	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	1@271	18.7	19.02	0.0798
77	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	135@67	18.55	18.87	0.0771
77	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	1@1	18.76	19.08	0.0809
77	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	1@271	18.21	18.53	0.0713
77	30	100	643332	3649.98	CP-OFDM QPSK	1@1	18.78	19.1	0.0813

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Transmitter Conducted Output Power And EIRP, (G_T-L_C)=0.32dB

NR Band	SCS	BandWidth	Arfcn	Freq(MHz)	Modulation	RB	Conducted Power(dBm)	EIRP(dBm)	EIRP(W)
77	30	20	637334	3560.01	DFT-s-OFDM PI/2 BPSK	1@1	18.86	19.18	0.0828
77	30	20	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@1	18.94	19.26	0.0843
77	30	20	646000	3690	DFT-s-OFDM PI/2 BPSK	1@1	18.96	19.28	0.0847
77	30	40	638000	3570	DFT-s-OFDM PI/2 BPSK	1@1	18.88	19.2	0.0832
77	30	40	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@1	18.92	19.24	0.0839
77	30	40	645332	3679.98	DFT-s-OFDM PI/2 BPSK	1@1	18.94	19.26	0.0843
77	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	135@67	18.84	19.16	0.0824
77	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	1@1	18.52	18.84	0.0766
77	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	1@271	18.71	19.03	0.0800
77	30	100	640000	3600	DFT-s-OFDM QPSK	135@67	18.83	19.15	0.0822
77	30	100	640000	3600	DFT-s-OFDM QPSK	1@1	18.46	18.78	0.0755
77	30	100	640000	3600	DFT-s-OFDM QPSK	1@271	18.69	19.01	0.0796
77	30	100	640000	3600	DFT-s-OFDM 16 QAM	135@67	18.85	19.17	0.0826
77	30	100	640000	3600	DFT-s-OFDM 16 QAM	1@1	18.8	19.12	0.0817
77	30	100	640000	3600	DFT-s-OFDM 16 QAM	1@271	18.93	19.25	0.0841
77	30	100	640000	3600	DFT-s-OFDM 64 QAM	135@67	18.9	19.22	0.0836
77	30	100	640000	3600	DFT-s-OFDM 64 QAM	1@1	18.76	19.08	0.0809
77	30	100	640000	3600	DFT-s-OFDM 64 QAM	1@271	18.89	19.21	0.0834

77	30	100	640000	3600	DFT-s-OFDM 256 QAM	135@67	18.83	19.15	0.0822
77	30	100	640000	3600	DFT-s-OFDM 256 QAM	1@1	18.23	18.55	0.0716
77	30	100	640000	3600	DFT-s-OFDM 256 QAM	1@271	18.42	18.74	0.0748
77	30	100	640000	3600	CP-OFDM QPSK	1@1	18.48	18.8	0.0759
77	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	135@67	18.8	19.12	0.0817
77	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@1	18.77	19.09	0.0811
77	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@271	18.9	19.22	0.0836
77	30	100	641666	3624.99	DFT-s-OFDM QPSK	135@67	18.79	19.11	0.0815
77	30	100	641666	3624.99	DFT-s-OFDM QPSK	1@1	18.84	19.16	0.0824
77	30	100	641666	3624.99	DFT-s-OFDM QPSK	1@271	18.89	19.21	0.0834
77	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	135@67	18.8	19.12	0.0817
77	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	1@1	18.97	19.29	0.0849
77	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	1@271	18.91	19.23	0.0838
77	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	135@67	18.78	19.1	0.0813
77	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	1@1	18.92	19.24	0.0839
77	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	1@271	18.96	19.28	0.0847
77	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	135@67	18.85	19.17	0.0826
77	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	1@1	18.63	18.95	0.0785
77	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	1@271	18.78	19.1	0.0813
77	30	100	641666	3624.99	CP-OFDM QPSK	1@1	18.83	19.15	0.0822
77	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	135@67	18.88	19.2	0.0832
77	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	1@1	18.95	19.27	0.0845
77	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	1@271	18.58	18.9	0.0776
77	30	100	643332	3649.98	DFT-s-OFDM QPSK	135@67	18.84	19.16	0.0824
77	30	100	643332	3649.98	DFT-s-OFDM QPSK	1@1	18.94	19.26	0.0843
77	30	100	643332	3649.98	DFT-s-OFDM QPSK	1@271	18.55	18.87	0.0771
77	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	135@67	18.9	19.22	0.0836
77	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	1@1	18.97	19.29	0.0849
77	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	1@271	18.84	19.16	0.0824
77	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	135@67	18.84	19.16	0.0824
77	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	1@1	18.97	19.29	0.0849
77	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	1@271	18.9	19.22	0.0836
77	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	135@67	18.84	19.16	0.0824
77	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	1@1	18.88	19.2	0.0832
77	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	1@271	18.32	18.64	0.0731
77	30	100	643332	3649.98	CP-OFDM QPSK	1@1	18.95	19.27	0.0845

FR1 B41_N78(Ant3)

Transmitter Conducted Output Power And EIRP, (G_T-L_C)=0.32dB

NR Band	SCS	BandWidth	Arfcn	Freq(MHz)	Modulation	RB	Conducted Power(dBm)	EIRP(dBm)	EIRP(W)
78	30	60	638668	3580.02	DFT-s-OFDM PI/2 BPSK	1@1	18.55	18.87	0.0771
78	30	60	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@1	18.78	19.10	0.0813
78	30	60	644666	3669.99	DFT-s-OFDM PI/2 BPSK	1@1	18.83	19.15	0.0822
78	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	135@67	18.84	19.16	0.0824
78	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	1@1	18.46	18.78	0.0755
78	30	100	640000	3600	DFT-s-OFDM PI/2 BPSK	1@271	18.7	19.02	0.0798
78	30	100	640000	3600	DFT-s-OFDM QPSK	135@67	18.8	19.12	0.0817
78	30	100	640000	3600	DFT-s-OFDM QPSK	1@1	18.41	18.73	0.0746
78	30	100	640000	3600	DFT-s-OFDM QPSK	1@271	18.66	18.98	0.0791
78	30	100	640000	3600	DFT-s-OFDM 16 QAM	135@67	18.86	19.18	0.0828
78	30	100	640000	3600	DFT-s-OFDM 16 QAM	1@1	18.73	19.05	0.0804
78	30	100	640000	3600	DFT-s-OFDM 16 QAM	1@271	18.92	19.24	0.0839
78	30	100	640000	3600	DFT-s-OFDM 64 QAM	135@67	18.85	19.17	0.0826
78	30	100	640000	3600	DFT-s-OFDM 64 QAM	1@1	18.65	18.97	0.0789
78	30	100	640000	3600	DFT-s-OFDM 64 QAM	1@271	18.89	19.21	0.0834
78	30	100	640000	3600	DFT-s-OFDM 256 QAM	135@67	18.84	19.16	0.0824
78	30	100	640000	3600	DFT-s-OFDM 256 QAM	1@1	18.29	18.61	0.0726
78	30	100	640000	3600	DFT-s-OFDM 256 QAM	1@271	18.53	18.85	0.0767
78	30	100	640000	3600	CP-OFDM QPSK	1@1	18.47	18.79	0.0757
78	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	135@67	18.75	19.07	0.0807
78	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@1	18.85	19.17	0.0826
78	30	100	641666	3624.99	DFT-s-OFDM PI/2 BPSK	1@271	18.92	19.24	0.0839
78	30	100	641666	3624.99	DFT-s-OFDM QPSK	135@67	18.79	19.11	0.0815
78	30	100	641666	3624.99	DFT-s-OFDM QPSK	1@1	18.78	19.1	0.0813
78	30	100	641666	3624.99	DFT-s-OFDM QPSK	1@271	18.9	19.22	0.0836
78	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	135@67	18.75	19.07	0.0807
78	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	1@1	18.91	19.23	0.0838
78	30	100	641666	3624.99	DFT-s-OFDM 16 QAM	1@271	18.9	19.22	0.0836
78	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	135@67	18.72	19.04	0.0802
78	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	1@1	18.89	19.21	0.0834
78	30	100	641666	3624.99	DFT-s-OFDM 64 QAM	1@271	18.91	19.23	0.0838
78	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	135@67	18.74	19.06	0.0805
78	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	1@1	18.61	18.93	0.0782
78	30	100	641666	3624.99	DFT-s-OFDM 256 QAM	1@271	18.67	18.99	0.0793
78	30	100	641666	3624.99	CP-OFDM QPSK	1@1	18.8	19.12	0.0817
78	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	135@67	18.8	19.12	0.0817

78	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	1@1	18.93	19.25	0.0841
78	30	100	643332	3649.98	DFT-s-OFDM PI/2 BPSK	1@271	18.6	18.92	0.0780
78	30	100	643332	3649.98	DFT-s-OFDM QPSK	135@67	18.81	19.13	0.0818
78	30	100	643332	3649.98	DFT-s-OFDM QPSK	1@1	18.86	19.18	0.0828
78	30	100	643332	3649.98	DFT-s-OFDM QPSK	1@271	18.53	18.85	0.0767
78	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	135@67	18.88	19.2	0.0832
78	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	1@1	18.90	19.22	0.0836
78	30	100	643332	3649.98	DFT-s-OFDM 16 QAM	1@271	18.77	19.09	0.0811
78	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	135@67	18.85	19.17	0.0826
78	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	1@1	18.91	19.23	0.0838
78	30	100	643332	3649.98	DFT-s-OFDM 64 QAM	1@271	18.83	19.15	0.0822
78	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	135@67	18.9	19.22	0.0836
78	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	1@1	18.67	18.99	0.0793
78	30	100	643332	3649.98	DFT-s-OFDM 256 QAM	1@271	18.4	18.72	0.0745
78	30	100	643332	3649.98	CP-OFDM QPSK	1@1	18.88	19.20	0.0832

Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	Carry Xu	**Temperature :**	22~25℃
		Relative Humidity :	48~52%

RSE Pre-scanned harmonic for the different antenna combinations, we choose the worst antenna mode to perform final test.

EN-DC_41A_n77A / LTE 10MHz + NR 100MHz / QPSK / ANT2 (LTE) & ANT3(NR)								
Channel	**Frequency (MHz)**	**EIRP (dBm)**	**Limit (dBm)**	**Over Limit (dB)**	**S.G. Power (dBm)**	**TX Cable loss (dB)**	**TX Antenna Gain (dBi)**	**Polarization (H/V)**
Middle	7164	-62.31	-40	-22.31	-73.77	2.84	14.30	H
	10740	-60.56	-40	-20.56	-70.50	3.49	13.43	H
	14316	-59.65	-40	-19.65	-69.89	3.85	14.09	H
	7164	-62.59	-40	-22.59	-74.05	2.84	14.30	V
	10740	-60.50	-40	-20.50	-70.44	3.49	13.43	V
	14316	-59.64	-40	-19.64	-69.88	3.85	14.09	V

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

Appendix D. Reference Report

Please refer to Sporton report number FG311926J which is issued separately.