



RF TEST REPORT

Applicant Shanghai Smawave Technology Co. ,Ltd
FCC ID 2AU8HSPH320-AQ
Product Industrial smart handheld terminal
Brand Smawave
Model SPH320-aq
Report No. R2212A1268-R3
Issue Date January 12, 2023

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2022)/ FCC CFR 47 Part 25 (2022)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Isotropic Radiated Power	25.149 (4) (iii)	PASS
2	Radiated Spurious Emission	2.1053	PASS
Date of Testing: December 15, 2022 ~ December 16, 2022 Date of Sample Received: December 12, 2022			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

Only Radiated Spurious Emission is tested for SPH320-aq in this report, and because of the change of antenna gain, Effective Radiated Power also re evaluated. Other test items refer to the LTE Module report (Report No.: R2001A0008-R2V1, FCC ID: 2AU8HMGM5607A).

1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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City: Shanghai
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2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Shanghai Smawave Technology Co. ,Ltd
Applicant address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China
Manufacturer	Shanghai Smawave Technology Co. ,Ltd
Manufacturer address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China

2.2. General information

EUT Description			
Model	SPH320-aq		
IMEI	862165040696625		
Hardware Version	V1.0.2		
Software Version	20230106_01_SPHX20-aq_NDAC_V1.0.23		
Power Supply	Battery / AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	Frequency (MHz)	Gain (dBi)	
	2480	-1.1	
	2500	-0.2	
Test Mode(s)	LTE Band 53;		
Test Modulation	QPSK, 16QAM, 64QAM;		
LTE Category	6		
Maximum E.I.R.P	21.73 dBm		
Rated Power Supply Voltage	3.8V		
Operating Voltage	Minimum: 3.7V Maximum: 4.4V		
Operating Temperature	Lowest: -20°C Highest: +60°C		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	LTE Band 53	2483.5 ~ 2495	2483.5 ~ 2495
EUT Accessory			
Adapter	Manufacturer: Zhuzhou Dachuan Electronic Technology Co.,Ltd Model: DCT12W050200ZZ-H1 (Adapters: 94001-00001-EU; 94001-00002-UK; 94001-00003-US)		
Battery	Manufacturer: GuangDong FengHua New Energy Co., Ltd. Model: FHPK626263P		
Note:			
1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.			
2. There is more than one Adapter, each one should be applied throughout the compliance test respectively, and however, only the worst case (94001-00003-US) will be recorded in this report.			

3. Applied Standards

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

Test standards:

FCC CFR 47 Part 25 (2022)

ANSI C63.26 (2015)

Reference standard:

FCC CFR47 Part 2 (2022)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4. Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, vertical polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in LTE is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below for LTE Band 53:

Test items	Bandwidth (MHz)				Modulation		RB			Test Channel		
	1.4	3	5	10	QPSK	16QAM/ 64QAM	1	50%	100%	L	M	H
RF power output and Effective Isotropic Radiated power	O	O	O	O	O	O	O	O	O	O	O	O
Radiated Spurious Emission	O	-	O	O	O	-	O	-	-	O	O	O
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.											

5. Test Case Results

5.1. RF Power Output and Effective Isotropic Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

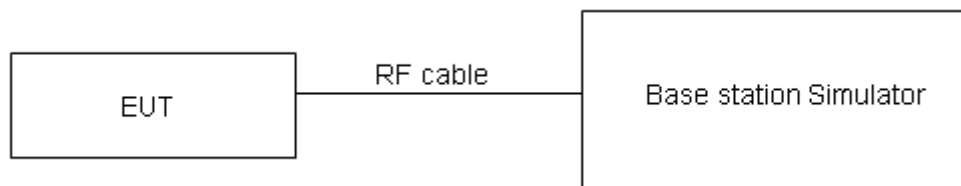
During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

ERP can then be calculated as follows:

$EIRP \text{ (dBm)} = \text{Output Power (dBm)} + \text{Antenna Gain (dBi)}$

$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$

Test Setup



Limits

The maximum transmit power is no more than 1 W with a peak EIRP of no more than 6 dBW;

power Limit	$\leq 1 \text{ W}$ (30 dBm)
peak EIRP Limit	$\leq 6 \text{ dBW}$ (36dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4 \text{ dB}$ for RF power output, $k = 2$, $U = 1.19 \text{ dB}$ for EIRP.

Test Results

Refer to the section 6.1 of this report for test data.

5.2. Radiated Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:

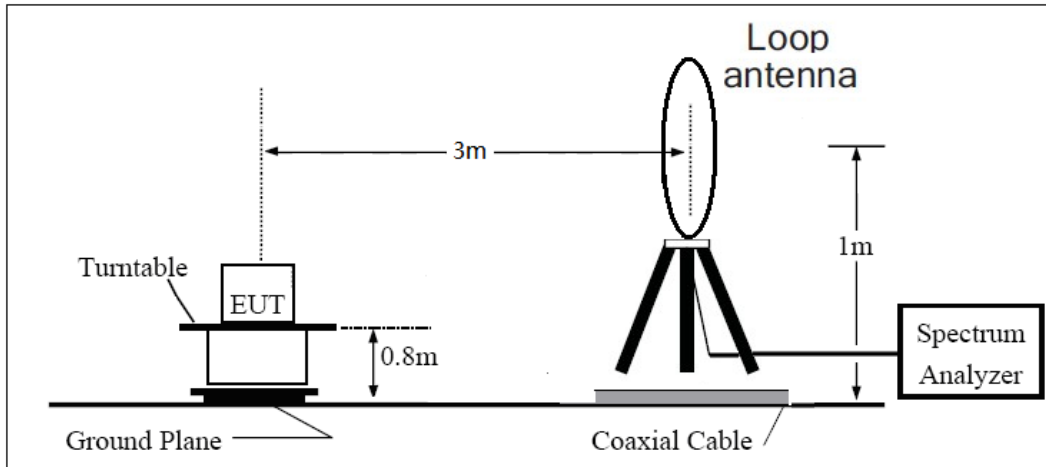
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.

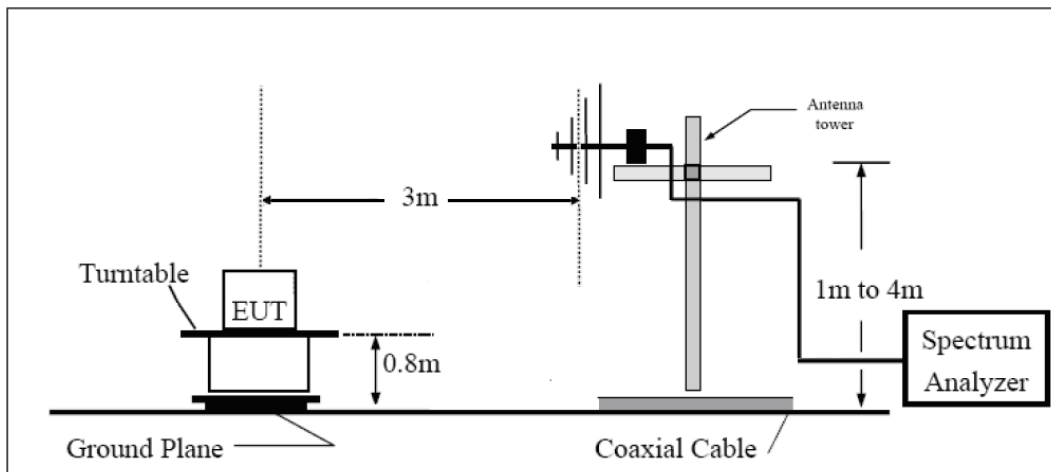
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

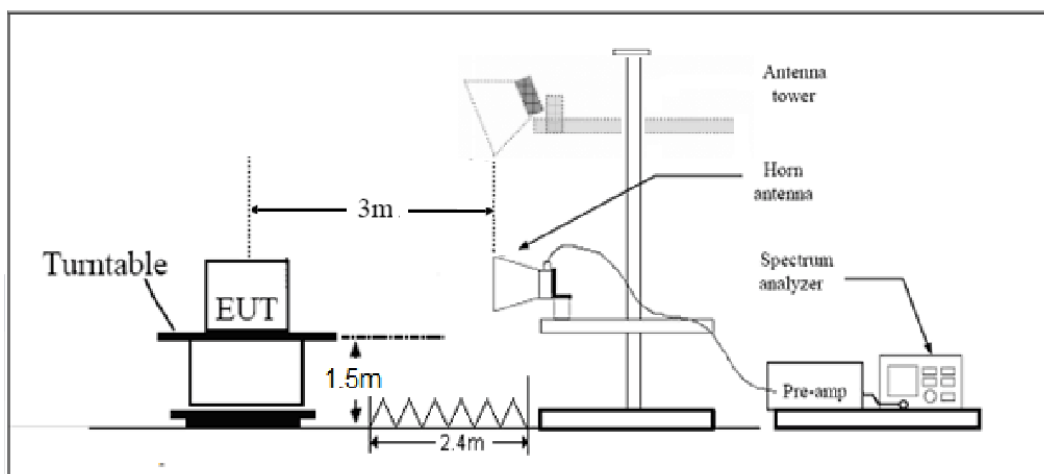
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side: 2.4mX3.6m

Limits

On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB."

Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 3.55$ dB.

Test Results

Refer to the section 6.2 of this report for test data.

6. Test Results

6.1. RF Power Output and Effective Isotropic Radiated Power

Band	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power (dBm)	EIRP (dBm)
LTE Band 53	1.4M	QPSK	60147	1RB#0	21.53	20.43
LTE Band 53	1.4M	QPSK	60147	1RB#2	21.82	20.72
LTE Band 53	1.4M	QPSK	60147	1RB#5	21.75	20.65
LTE Band 53	1.4M	QPSK	60147	3RB#0	20.61	19.51
LTE Band 53	1.4M	QPSK	60147	3RB#2	20.66	19.56
LTE Band 53	1.4M	QPSK	60147	3RB#3	20.86	19.76
LTE Band 53	1.4M	QPSK	60147	6RB#0	20.67	19.57
LTE Band 53	1.4M	QPSK	60197	1RB#0	21.57	20.47
LTE Band 53	1.4M	QPSK	60197	1RB#2	21.88	20.78
LTE Band 53	1.4M	QPSK	60197	1RB#5	21.69	20.59
LTE Band 53	1.4M	QPSK	60197	3RB#0	20.61	19.51
LTE Band 53	1.4M	QPSK	60197	3RB#2	20.76	19.66
LTE Band 53	1.4M	QPSK	60197	3RB#3	20.84	19.74
LTE Band 53	1.4M	QPSK	60197	6RB#0	20.86	19.76
LTE Band 53	1.4M	QPSK	60248	1RB#0	21.54	21.34
LTE Band 53	1.4M	QPSK	60248	1RB#2	21.79	21.59
LTE Band 53	1.4M	QPSK	60248	1RB#5	21.80	21.60
LTE Band 53	1.4M	QPSK	60248	3RB#0	20.70	20.50
LTE Band 53	1.4M	QPSK	60248	3RB#2	20.81	20.61
LTE Band 53	1.4M	QPSK	60248	3RB#3	20.90	20.70
LTE Band 53	1.4M	QPSK	60248	6RB#0	20.86	20.66
LTE Band 53	1.4M	16QAM	60147	1RB#0	21.51	20.41
LTE Band 53	1.4M	16QAM	60147	1RB#2	21.82	20.72
LTE Band 53	1.4M	16QAM	60147	1RB#5	21.65	20.55
LTE Band 53	1.4M	16QAM	60147	3RB#0	20.56	19.46
LTE Band 53	1.4M	16QAM	60147	3RB#2	20.72	19.62
LTE Band 53	1.4M	16QAM	60147	3RB#3	20.83	19.73
LTE Band 53	1.4M	16QAM	60147	6RB#0	20.70	19.60
LTE Band 53	1.4M	16QAM	60197	1RB#0	21.71	20.61
LTE Band 53	1.4M	16QAM	60197	1RB#2	21.99	20.89
LTE Band 53	1.4M	16QAM	60197	1RB#5	21.83	20.73
LTE Band 53	1.4M	16QAM	60197	3RB#0	20.71	19.61
LTE Band 53	1.4M	16QAM	60197	3RB#2	20.86	19.76

LTE Band 53	1.4M	16QAM	60197	3RB#3	21.01	19.91
LTE Band 53	1.4M	16QAM	60197	6RB#0	20.99	19.89
LTE Band 53	1.4M	16QAM	60248	1RB#0	21.33	21.13
LTE Band 53	1.4M	16QAM	60248	1RB#2	21.67	21.47
LTE Band 53	1.4M	16QAM	60248	1RB#5	21.67	21.47
LTE Band 53	1.4M	16QAM	60248	3RB#0	20.60	20.40
LTE Band 53	1.4M	16QAM	60248	3RB#2	20.66	20.46
LTE Band 53	1.4M	16QAM	60248	3RB#3	20.75	20.55
LTE Band 53	1.4M	16QAM	60248	6RB#0	20.79	20.59
LTE Band 53	1.4M	64QAM	60147	1RB#0	20.65	19.55
LTE Band 53	1.4M	64QAM	60147	1RB#2	20.86	19.76
LTE Band 53	1.4M	64QAM	60147	1RB#5	20.88	19.78
LTE Band 53	1.4M	64QAM	60147	3RB#0	19.74	18.64
LTE Band 53	1.4M	64QAM	60147	3RB#2	19.78	18.68
LTE Band 53	1.4M	64QAM	60147	3RB#3	19.92	18.82
LTE Band 53	1.4M	64QAM	60147	6RB#0	19.81	18.71
LTE Band 53	1.4M	64QAM	60197	1RB#0	20.74	19.64
LTE Band 53	1.4M	64QAM	60197	1RB#2	21.04	19.94
LTE Band 53	1.4M	64QAM	60197	1RB#5	20.93	19.83
LTE Band 53	1.4M	64QAM	60197	3RB#0	19.81	18.71
LTE Band 53	1.4M	64QAM	60197	3RB#2	19.76	18.66
LTE Band 53	1.4M	64QAM	60197	3RB#3	19.94	18.84
LTE Band 53	1.4M	64QAM	60197	6RB#0	20.02	18.92
LTE Band 53	1.4M	64QAM	60248	1RB#0	20.62	20.42
LTE Band 53	1.4M	64QAM	60248	1RB#2	20.93	20.73
LTE Band 53	1.4M	64QAM	60248	1RB#5	21.05	20.85
LTE Band 53	1.4M	64QAM	60248	3RB#0	19.88	19.68
LTE Band 53	1.4M	64QAM	60248	3RB#2	19.89	19.69
LTE Band 53	1.4M	64QAM	60248	3RB#3	19.94	19.74
LTE Band 53	1.4M	64QAM	60248	6RB#0	20.01	19.81
LTE Band 53	3M	QPSK	60155	1RB#0	21.55	20.45
LTE Band 53	3M	QPSK	60155	1RB#7	21.85	20.75
LTE Band 53	3M	QPSK	60155	1RB#14	21.78	20.68
LTE Band 53	3M	QPSK	60155	8RB#0	20.69	19.59
LTE Band 53	3M	QPSK	60155	8RB#4	20.76	19.66
LTE Band 53	3M	QPSK	60155	8RB#7	20.94	19.84
LTE Band 53	3M	QPSK	60155	15RB#0	20.70	19.60
LTE Band 53	3M	QPSK	60197	1RB#0	21.61	20.51
LTE Band 53	3M	QPSK	60197	1RB#7	21.93	20.83
LTE Band 53	3M	QPSK	60197	1RB#14	21.74	20.64

LTE Band 53	3M	QPSK	60197	8RB#0	20.71	19.61
LTE Band 53	3M	QPSK	60197	8RB#4	20.84	19.74
LTE Band 53	3M	QPSK	60197	8RB#7	20.93	19.83
LTE Band 53	3M	QPSK	60197	15RB#0	20.90	19.80
LTE Band 53	3M	QPSK	60240	1RB#0	21.57	21.37
LTE Band 53	3M	QPSK	60240	1RB#7	21.83	21.63
LTE Band 53	3M	QPSK	60240	1RB#14	21.84	21.64
LTE Band 53	3M	QPSK	60240	8RB#0	20.81	20.61
LTE Band 53	3M	QPSK	60240	8RB#4	20.91	20.71
LTE Band 53	3M	QPSK	60240	8RB#7	20.98	20.78
LTE Band 53	3M	QPSK	60240	15RB#0	20.89	20.69
LTE Band 53	3M	16QAM	60155	1RB#0	21.54	20.44
LTE Band 53	3M	16QAM	60155	1RB#7	21.85	20.75
LTE Band 53	3M	16QAM	60155	1RB#14	21.67	20.57
LTE Band 53	3M	16QAM	60155	8RB#0	20.65	19.55
LTE Band 53	3M	16QAM	60155	8RB#4	20.81	19.71
LTE Band 53	3M	16QAM	60155	8RB#7	20.91	19.81
LTE Band 53	3M	16QAM	60155	15RB#0	20.73	19.63
LTE Band 53	3M	16QAM	60197	1RB#0	21.73	20.63
LTE Band 53	3M	16QAM	60197	1RB#7	22.04	20.94
LTE Band 53	3M	16QAM	60197	1RB#14	21.87	20.77
LTE Band 53	3M	16QAM	60197	8RB#0	20.82	19.72
LTE Band 53	3M	16QAM	60197	8RB#4	20.97	19.87
LTE Band 53	3M	16QAM	60197	8RB#7	21.11	20.01
LTE Band 53	3M	16QAM	60197	15RB#0	21.03	19.93
LTE Band 53	3M	16QAM	60240	1RB#0	21.36	21.16
LTE Band 53	3M	16QAM	60240	1RB#7	21.71	21.51
LTE Band 53	3M	16QAM	60240	1RB#14	21.70	21.50
LTE Band 53	3M	16QAM	60240	8RB#0	20.70	20.50
LTE Band 53	3M	16QAM	60240	8RB#4	20.76	20.56
LTE Band 53	3M	16QAM	60240	8RB#7	20.86	20.66
LTE Band 53	3M	16QAM	60240	15RB#0	20.82	20.62
LTE Band 53	3M	64QAM	60155	1RB#0	20.67	19.57
LTE Band 53	3M	64QAM	60155	1RB#7	20.89	19.79
LTE Band 53	3M	64QAM	60155	1RB#14	20.91	19.81
LTE Band 53	3M	64QAM	60155	8RB#0	19.82	18.72
LTE Band 53	3M	64QAM	60155	8RB#4	19.88	18.78
LTE Band 53	3M	64QAM	60155	8RB#7	20.00	18.90
LTE Band 53	3M	64QAM	60155	15RB#0	19.84	18.74
LTE Band 53	3M	64QAM	60197	1RB#0	20.78	19.68

LTE Band 53	3M	64QAM	60197	1RB#7	21.09	19.99
LTE Band 53	3M	64QAM	60197	1RB#14	20.98	19.88
LTE Band 53	3M	64QAM	60197	8RB#0	19.91	18.81
LTE Band 53	3M	64QAM	60197	8RB#4	19.84	18.74
LTE Band 53	3M	64QAM	60197	8RB#7	20.03	18.93
LTE Band 53	3M	64QAM	60197	15RB#0	20.06	18.96
LTE Band 53	3M	64QAM	60240	1RB#0	20.65	20.45
LTE Band 53	3M	64QAM	60240	1RB#7	20.97	20.77
LTE Band 53	3M	64QAM	60240	1RB#14	21.09	20.89
LTE Band 53	3M	64QAM	60240	8RB#0	19.99	19.79
LTE Band 53	3M	64QAM	60240	8RB#4	19.99	19.79
LTE Band 53	3M	64QAM	60240	8RB#7	20.02	19.82
LTE Band 53	3M	64QAM	60240	15RB#0	20.04	19.84
LTE Band 53	5M	QPSK	60165	1RB#0	21.59	20.49
LTE Band 53	5M	QPSK	60165	1RB#13	21.92	20.82
LTE Band 53	5M	QPSK	60165	1RB#24	21.84	20.74
LTE Band 53	5M	QPSK	60165	12RB#0	20.76	19.66
LTE Band 53	5M	QPSK	60165	12RB#6	20.81	19.71
LTE Band 53	5M	QPSK	60165	12RB#13	21.01	19.91
LTE Band 53	5M	QPSK	60165	25RB#0	20.78	19.68
LTE Band 53	5M	QPSK	60197	1RB#0	21.73	20.63
LTE Band 53	5M	QPSK	60197	1RB#13	21.98	20.88
LTE Band 53	5M	QPSK	60197	1RB#24	21.81	20.71
LTE Band 53	5M	QPSK	60197	12RB#0	20.75	19.65
LTE Band 53	5M	QPSK	60197	12RB#6	20.89	19.79
LTE Band 53	5M	QPSK	60197	12RB#13	21.03	19.93
LTE Band 53	5M	QPSK	60197	25RB#0	20.99	19.89
LTE Band 53	5M	QPSK	60230	1RB#0	21.62	21.42
LTE Band 53	5M	QPSK	60230	1RB#13	21.90	21.70
LTE Band 53	5M	QPSK	60230	1RB#24	21.93	21.73
LTE Band 53	5M	QPSK	60230	12RB#0	20.87	20.67
LTE Band 53	5M	QPSK	60230	12RB#6	20.95	20.75
LTE Band 53	5M	QPSK	60230	12RB#13	20.98	20.78
LTE Band 53	5M	QPSK	60230	25RB#0	20.90	20.70
LTE Band 53	5M	16QAM	60165	1RB#0	21.56	20.46
LTE Band 53	5M	16QAM	60165	1RB#13	21.87	20.77
LTE Band 53	5M	16QAM	60165	1RB#24	21.69	20.59
LTE Band 53	5M	16QAM	60165	12RB#0	20.69	19.59
LTE Band 53	5M	16QAM	60165	12RB#6	20.83	19.73
LTE Band 53	5M	16QAM	60165	12RB#13	20.96	19.86

LTE Band 53	5M	16QAM	60165	25RB#0	20.76	19.66
LTE Band 53	5M	16QAM	60197	1RB#0	21.75	20.65
LTE Band 53	5M	16QAM	60197	1RB#13	22.11	21.01
LTE Band 53	5M	16QAM	60197	1RB#24	21.94	20.84
LTE Band 53	5M	16QAM	60197	12RB#0	20.86	19.76
LTE Band 53	5M	16QAM	60197	12RB#6	21.01	19.91
LTE Band 53	5M	16QAM	60197	12RB#13	21.11	20.01
LTE Band 53	5M	16QAM	60197	25RB#0	21.04	19.94
LTE Band 53	5M	16QAM	60230	1RB#0	21.40	21.20
LTE Band 53	5M	16QAM	60230	1RB#13	21.75	21.55
LTE Band 53	5M	16QAM	60230	1RB#24	21.73	21.53
LTE Band 53	5M	16QAM	60230	12RB#0	20.75	20.55
LTE Band 53	5M	16QAM	60230	12RB#6	20.81	20.61
LTE Band 53	5M	16QAM	60230	12RB#13	20.89	20.69
LTE Band 53	5M	16QAM	60230	25RB#0	20.83	20.63
LTE Band 53	5M	64QAM	60165	1RB#0	20.71	19.61
LTE Band 53	5M	64QAM	60165	1RB#13	20.96	19.86
LTE Band 53	5M	64QAM	60165	1RB#24	20.97	19.87
LTE Band 53	5M	64QAM	60165	12RB#0	19.89	18.79
LTE Band 53	5M	64QAM	60165	12RB#6	19.93	18.83
LTE Band 53	5M	64QAM	60165	12RB#13	20.07	18.97
LTE Band 53	5M	64QAM	60165	25RB#0	19.92	18.82
LTE Band 53	5M	64QAM	60197	1RB#0	20.90	19.80
LTE Band 53	5M	64QAM	60197	1RB#13	21.14	20.04
LTE Band 53	5M	64QAM	60197	1RB#24	21.05	19.95
LTE Band 53	5M	64QAM	60197	12RB#0	19.95	18.85
LTE Band 53	5M	64QAM	60197	12RB#6	19.89	18.79
LTE Band 53	5M	64QAM	60197	12RB#13	20.13	19.03
LTE Band 53	5M	64QAM	60197	25RB#0	20.15	19.05
LTE Band 53	5M	64QAM	60230	1RB#0	20.70	20.50
LTE Band 53	5M	64QAM	60230	1RB#13	21.04	20.84
LTE Band 53	5M	64QAM	60230	1RB#24	21.18	20.98
LTE Band 53	5M	64QAM	60230	12RB#0	20.05	19.85
LTE Band 53	5M	64QAM	60230	12RB#6	20.03	19.83
LTE Band 53	5M	64QAM	60230	12RB#13	20.02	19.82
LTE Band 53	5M	64QAM	60230	25RB#0	20.05	19.85
LTE Band 53	10M	QPSK	60190	1RB#0	21.50	20.40
LTE Band 53	10M	QPSK	60190	1RB#25	21.83	20.73
LTE Band 53	10M	QPSK	60190	1RB#49	21.72	20.62
LTE Band 53	10M	QPSK	60190	25RB#0	20.64	19.54

LTE Band 53	10M	QPSK	60190	25RB#13	20.72	19.62
LTE Band 53	10M	QPSK	60190	25RB#25	20.88	19.78
LTE Band 53	10M	QPSK	60190	50RB#0	20.71	19.61
LTE Band 53	10M	QPSK	60197	1RB#0	21.52	20.42
LTE Band 53	10M	QPSK	60197	1RB#25	21.89	20.79
LTE Band 53	10M	QPSK	60197	1RB#49	21.67	20.57
LTE Band 53	10M	QPSK	60197	25RB#0	20.62	19.52
LTE Band 53	10M	QPSK	60197	25RB#13	20.76	19.66
LTE Band 53	10M	QPSK	60197	25RB#25	20.87	19.77
LTE Band 53	10M	QPSK	60197	50RB#0	20.82	19.72
LTE Band 53	10M	QPSK	60205	1RB#0	21.51	21.31
LTE Band 53	10M	QPSK	60205	1RB#25	21.79	21.59
LTE Band 53	10M	QPSK	60205	1RB#49	21.76	21.56
LTE Band 53	10M	QPSK	60205	25RB#0	20.74	20.54
LTE Band 53	10M	QPSK	60205	25RB#13	20.83	20.63
LTE Band 53	10M	QPSK	60205	25RB#25	20.91	20.71
LTE Band 53	10M	QPSK	60205	50RB#0	20.82	20.62
LTE Band 53	10M	16QAM	60190	1RB#0	21.46	20.36
LTE Band 53	10M	16QAM	60190	1RB#25	21.79	20.69
LTE Band 53	10M	16QAM	60190	1RB#49	21.62	20.52
LTE Band 53	10M	16QAM	60190	25RB#0	20.60	19.50
LTE Band 53	10M	16QAM	60190	25RB#13	20.74	19.64
LTE Band 53	10M	16QAM	60190	25RB#25	20.86	19.76
LTE Band 53	10M	16QAM	60190	50RB#0	20.69	19.59
LTE Band 53	10M	16QAM	60197	1RB#0	21.66	20.56
LTE Band 53	10M	16QAM	60197	1RB#25	22.01	20.91
LTE Band 53	10M	16QAM	60197	1RB#49	21.80	20.70
LTE Band 53	10M	16QAM	60197	25RB#0	20.77	19.67
LTE Band 53	10M	16QAM	60197	25RB#13	20.89	19.79
LTE Band 53	10M	16QAM	60197	25RB#25	21.02	19.92
LTE Band 53	10M	16QAM	60197	50RB#0	20.95	19.85
LTE Band 53	10M	16QAM	60205	1RB#0	21.28	21.08
LTE Band 53	10M	16QAM	60205	1RB#25	21.65	21.45
LTE Band 53	10M	16QAM	60205	1RB#49	21.64	21.44
LTE Band 53	10M	16QAM	60205	25RB#0	20.65	20.45
LTE Band 53	10M	16QAM	60205	25RB#13	20.68	20.48
LTE Band 53	10M	16QAM	60205	25RB#25	20.79	20.59
LTE Band 53	10M	16QAM	60205	50RB#0	20.74	20.54
LTE Band 53	10M	64QAM	60190	1RB#0	20.62	19.52
LTE Band 53	10M	64QAM	60190	1RB#25	20.87	19.77

LTE Band 53	10M	64QAM	60190	1RB#49	20.85	19.75
LTE Band 53	10M	64QAM	60190	25RB#0	19.77	18.67
LTE Band 53	10M	64QAM	60190	25RB#13	19.84	18.74
LTE Band 53	10M	64QAM	60190	25RB#25	19.94	18.84
LTE Band 53	10M	64QAM	60190	50RB#0	19.85	18.75
LTE Band 53	10M	64QAM	60197	1RB#0	20.69	19.59
LTE Band 53	10M	64QAM	60197	1RB#25	21.05	19.95
LTE Band 53	10M	64QAM	60197	1RB#49	20.91	19.81
LTE Band 53	10M	64QAM	60197	25RB#0	19.82	18.72
LTE Band 53	10M	64QAM	60197	25RB#13	19.76	18.66
LTE Band 53	10M	64QAM	60197	25RB#25	19.97	18.87
LTE Band 53	10M	64QAM	60197	50RB#0	19.98	18.88
LTE Band 53	10M	64QAM	60205	1RB#0	20.59	20.39
LTE Band 53	10M	64QAM	60205	1RB#25	20.93	20.73
LTE Band 53	10M	64QAM	60205	1RB#49	21.01	20.81
LTE Band 53	10M	64QAM	60205	25RB#0	19.92	19.72
LTE Band 53	10M	64QAM	60205	25RB#13	19.91	19.71
LTE Band 53	10M	64QAM	60205	25RB#25	19.95	19.75
LTE Band 53	10M	64QAM	60205	50RB#0	19.97	19.77

6.2. Radiated Spurious Emission

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

LTE Band 53 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	4977.00	-48.40	2.00	10.15	Horizontal	-40.25	-13.00	27.25	172
3	7465.50	-49.93	2.50	11.35	Horizontal	-41.08	-13.00	28.08	38
4	9954.00	-51.44	4.20	12.05	Horizontal	-43.59	-13.00	30.59	0
5	12442.50	-55.22	5.20	14.85	Horizontal	-45.57	-13.00	32.57	17
6	14931.00	-52.00	5.50	13.23	Horizontal	-44.27	-13.00	31.27	42
7	17419.50	-57.24	6.80	14.25	Horizontal	-49.79	-13.00	36.79	221
8	19908.00	/	/	/	/	/	/	/	/
9	22396.50	/	/	/	/	/	/	/	/
10	24885.00	/	/	/	/	/	/	/	/
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

LTE Band 53 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	4973.40	-51.50	2.00	10.15	Horizontal	-43.35	-13.00	30.35	214
3	7460.10	-48.60	2.50	11.35	Horizontal	-39.75	-13.00	26.75	18
4	9946.80	-48.85	4.20	12.05	Horizontal	-41.00	-13.00	28.00	0
5	12433.50	-55.67	5.20	14.85	Horizontal	-46.02	-13.00	33.02	42
6	14920.20	-51.95	5.50	13.23	Horizontal	-44.22	-13.00	31.22	78
7	17406.90	-51.47	6.80	14.25	Horizontal	-44.02	-13.00	31.02	157
8	19893.60	/	/	/	/	/	/	/	/
9	22380.30	/	/	/	/	/	/	/	/
10	24867.00	/	/	/	/	/	/	/	/
Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor. 2. The worst emission was found in the antenna is Horizontal position.									

LTE Band 53 10MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	4968.40	-52.09	2.00	10.15	Horizontal	-43.94	-13.00	30.94	172
3	7452.60	-53.18	2.50	11.35	Horizontal	-44.33	-13.00	31.33	113
4	9936.80	-47.64	4.20	12.05	Horizontal	-39.79	-13.00	26.79	214
5	12421.00	-56.79	5.20	14.85	Horizontal	-47.14	-13.00	34.14	76
6	14905.20	-52.15	5.50	13.23	Horizontal	-44.42	-13.00	31.42	124
7	17389.40	-50.50	6.80	14.25	Horizontal	-43.05	-13.00	30.05	114
8	19873.60	/	/	/	/	/	/	/	/
9	22357.80	/	/	/	/	/	/	/	/
10	24842.00	/	/	/	/	/	/	/	/

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

7. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Signal Analyzer	R&S	FSV30	100815	2022-12-10	2023-12-09
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	391	2022-09-29	2025-09-28
Horn Antenna	Schwarzbeck	BBHA 9120D	1594	2020-12-17	2023-12-16
Horn Antenna	ETS-Lindgren	3160-09	00102643	2021-10-10	2024-10-09
Software	R&S	EMC32	9.26.0	/	/

*****END OF REPORT *****

ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.