



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-R1
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 CFR47 Part 27C (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

Number	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Isotropic Radiated Power	2.1046/27.50(h)(2)	PASS
2	Radiated Spurious Emission	2.1053 /27.53(m)	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 Isotropic Radiated Power also re evaluated. Other test items refer to the LTE Module report (Report No.: R2001A0008-R1V1, 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 measurements.

A2LA (Certificate Number: 3857.01)

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

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China
City: Shanghai
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E-mail: xukai@ta-shanghai.com

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
	2520	-0.3
	2540	-0.7
	2560	-0.5
	2580	-0.3
	2600	0.6
	2620	0.4
	2640	0.5
	2660	0.7
	2680	1.2
	2700	1.3
Test Mode(s)	LTE Band 41;	
Test Modulation	QPSK, 16QAM, 64QAM;	
LTE Category	6	
Maximum E.I.R.P.	23.42 dBm	
Rated Power Supply Voltage	3.8V	
Operating Voltage	Minimum: 3.7V Maximum: 4.4V	



Report No. RA22122003-02			
Operating Temperature	Lowest: -20°C Highest: +60°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 41	2496 ~ 2690	2496 ~ 2690
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 CFR47 Part 27C (2022)

FCC CFR47 Part 2 (2022)

Reference standard:

ANSI C63.26-2015

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.

The following testing in different Bandwidth is set to detail in the following table:

Test modes are chosen to be reported as the worst case configuration below for LTE Band 41:

Test items	Modes	Bandwidth (MHz)				Modulation		RB			Test Channel		
		5	10	15	20	QPSK	16QAM/64QAM	1	50%	100%	L	M	H
RF Power Output and Effective Isotropic Radiated Power	LTE 41	O	O	O	O	O	O	O	O	O	O	O	O
Radiated Spurious Emission	LTE 41	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

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

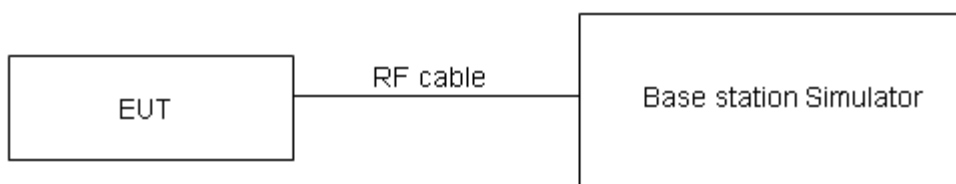
During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

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

No specific RF power output requirements in part 2.1046.

Rule Part 27.50(h) (2) specifies that “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.”

Part 27.50(h)(2) Limit	$\leq 2 \text{ W}$ (33 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 $k = 2$, $U=0.4 \text{ dB}$ for RF power output, $k = 2$, $U= 1.19 \text{ dB}$ for ERP/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

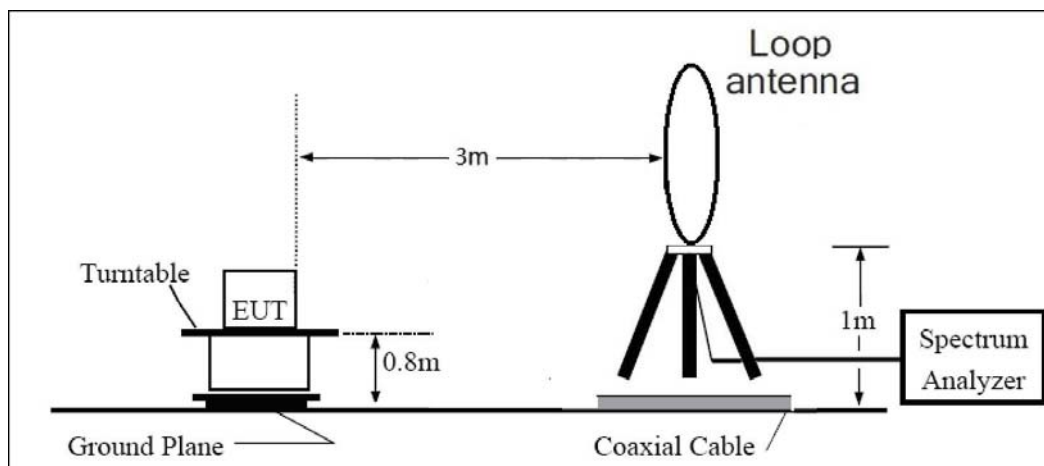
1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26-2015.
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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=100kHz, VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, 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 dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dB}$.

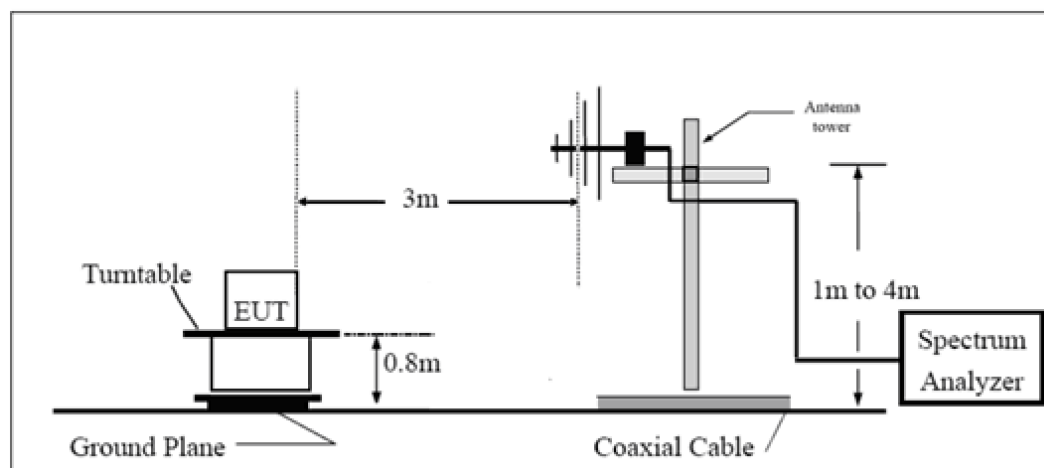
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

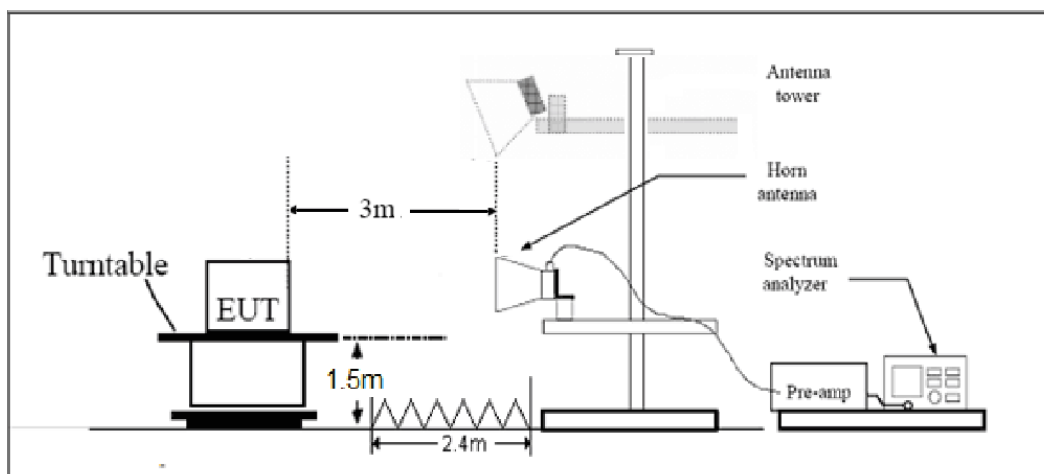
9KHz~ 30MHz



30MHz~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m



Limits

Rule Part 27.53(m) $55 + 10 \log (P)$ 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)(4) of this section.

Part 27.53(m) Limit	-25 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 $k = \pm 1.96$, $U = \pm 3.55$ 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 41	5M	QPSK	39675	1RB#0	23.18	22.98
LTE Band 41	5M	QPSK	39675	1RB#13	23.40	23.20
LTE Band 41	5M	QPSK	39675	1RB#24	23.24	23.04
LTE Band 41	5M	QPSK	39675	12RB#0	22.69	22.49
LTE Band 41	5M	QPSK	39675	12RB#6	22.68	22.48
LTE Band 41	5M	QPSK	39675	12RB#13	22.54	22.34
LTE Band 41	5M	QPSK	39675	25RB#0	22.57	22.37
LTE Band 41	5M	QPSK	40620	1RB#0	22.43	23.03
LTE Band 41	5M	QPSK	40620	1RB#13	22.65	23.25
LTE Band 41	5M	QPSK	40620	1RB#24	22.49	23.09
LTE Band 41	5M	QPSK	40620	12RB#0	21.74	22.34
LTE Band 41	5M	QPSK	40620	12RB#6	21.73	22.33
LTE Band 41	5M	QPSK	40620	12RB#13	21.58	22.18
LTE Band 41	5M	QPSK	40620	25RB#0	21.60	22.20
LTE Band 41	5M	QPSK	41565	1RB#0	21.86	23.06
LTE Band 41	5M	QPSK	41565	1RB#13	21.88	23.08
LTE Band 41	5M	QPSK	41565	1RB#24	21.82	23.02
LTE Band 41	5M	QPSK	41565	12RB#0	21.33	22.53
LTE Band 41	5M	QPSK	41565	12RB#6	21.32	22.52
LTE Band 41	5M	QPSK	41565	12RB#13	21.07	22.27
LTE Band 41	5M	QPSK	41565	25RB#0	21.09	22.29
LTE Band 41	5M	16QAM	39675	1RB#0	21.19	20.99
LTE Band 41	5M	16QAM	39675	1RB#13	21.23	21.03
LTE Band 41	5M	16QAM	39675	1RB#24	21.15	20.95
LTE Band 41	5M	16QAM	39675	12RB#0	20.43	20.23
LTE Band 41	5M	16QAM	39675	12RB#6	20.43	20.23
LTE Band 41	5M	16QAM	39675	12RB#13	20.18	19.98
LTE Band 41	5M	16QAM	39675	25RB#0	20.16	19.96
LTE Band 41	5M	16QAM	40620	1RB#0	22.21	22.81
LTE Band 41	5M	16QAM	40620	1RB#13	22.65	23.25
LTE Band 41	5M	16QAM	40620	1RB#24	22.63	23.23
LTE Band 41	5M	16QAM	40620	12RB#0	21.53	22.13
LTE Band 41	5M	16QAM	40620	12RB#6	21.52	22.12



LTE Band 41	5M	16QAM	40620	12RB#13	21.50	22.10
LTE Band 41	5M	16QAM	40620	25RB#0	21.39	21.99
LTE Band 41	5M	16QAM	41565	1RB#0	21.56	22.76
LTE Band 41	5M	16QAM	41565	1RB#13	21.93	23.13
LTE Band 41	5M	16QAM	41565	1RB#24	21.85	23.05
LTE Band 41	5M	16QAM	41565	12RB#0	20.54	21.74
LTE Band 41	5M	16QAM	41565	12RB#6	20.53	21.73
LTE Band 41	5M	16QAM	41565	12RB#13	20.50	21.70
LTE Band 41	5M	16QAM	41565	25RB#0	20.40	21.60
LTE Band 41	5M	64QAM	39750	1RB#0	21.77	21.57
LTE Band 41	5M	64QAM	39750	1RB#50	21.97	21.77
LTE Band 41	5M	64QAM	39750	1RB#99	21.83	21.63
LTE Band 41	5M	64QAM	39750	50RB#0	20.89	20.69
LTE Band 41	5M	64QAM	39750	50RB#25	20.89	20.69
LTE Band 41	5M	64QAM	39750	50RB#50	20.73	20.53
LTE Band 41	5M	64QAM	39750	100RB#0	20.78	20.58
LTE Band 41	5M	64QAM	40620	1RB#0	20.30	20.90
LTE Band 41	5M	64QAM	40620	1RB#50	20.30	20.90
LTE Band 41	5M	64QAM	40620	1RB#99	20.24	20.84
LTE Band 41	5M	64QAM	40620	50RB#0	19.52	20.12
LTE Band 41	5M	64QAM	40620	50RB#25	19.52	20.12
LTE Band 41	5M	64QAM	40620	50RB#50	19.24	19.84
LTE Band 41	5M	64QAM	40620	100RB#0	19.24	19.84
LTE Band 41	5M	64QAM	41490	1RB#0	20.66	21.86
LTE Band 41	5M	64QAM	41490	1RB#50	21.04	22.24
LTE Band 41	5M	64QAM	41490	1RB#99	21.01	22.21
LTE Band 41	5M	64QAM	41490	50RB#0	19.79	20.99
LTE Band 41	5M	64QAM	41490	50RB#25	19.79	20.99
LTE Band 41	5M	64QAM	41490	50RB#50	19.80	21.00
LTE Band 41	5M	64QAM	41490	100RB#0	19.57	20.77
LTE Band 41	10M	QPSK	39700	1RB#0	23.01	22.81
LTE Band 41	10M	QPSK	39700	1RB#25	23.19	22.99
LTE Band 41	10M	QPSK	39700	1RB#49	23.02	22.82
LTE Band 41	10M	QPSK	39700	25RB#0	22.35	22.15
LTE Band 41	10M	QPSK	39700	25RB#13	22.34	22.14
LTE Band 41	10M	QPSK	39700	25RB#25	22.28	22.08
LTE Band 41	10M	QPSK	39700	50RB#0	22.31	22.11
LTE Band 41	10M	QPSK	40620	1RB#0	22.39	22.99
LTE Band 41	10M	QPSK	40620	1RB#25	22.57	23.17
LTE Band 41	10M	QPSK	40620	1RB#49	22.39	22.99



LTE Band 41	10M	QPSK	40620	25RB#0	21.49	22.09
LTE Band 41	10M	QPSK	40620	25RB#13	21.49	22.09
LTE Band 41	10M	QPSK	40620	25RB#25	21.44	22.04
LTE Band 41	10M	QPSK	40620	50RB#0	21.40	22.00
LTE Band 41	10M	QPSK	41540	1RB#0	21.92	23.12
LTE Band 41	10M	QPSK	41540	1RB#25	21.92	23.12
LTE Band 41	10M	QPSK	41540	1RB#49	21.95	23.15
LTE Band 41	10M	QPSK	41540	25RB#0	20.96	22.16
LTE Band 41	10M	QPSK	41540	25RB#13	20.95	22.15
LTE Band 41	10M	QPSK	41540	25RB#25	20.91	22.11
LTE Band 41	10M	QPSK	41540	50RB#0	20.94	22.14
LTE Band 41	10M	16QAM	39700	1RB#0	20.98	20.78
LTE Band 41	10M	16QAM	39700	1RB#25	21.04	20.84
LTE Band 41	10M	16QAM	39700	1RB#49	21.03	20.83
LTE Band 41	10M	16QAM	39700	25RB#0	20.06	19.86
LTE Band 41	10M	16QAM	39700	25RB#13	20.06	19.86
LTE Band 41	10M	16QAM	39700	25RB#25	20.01	19.81
LTE Band 41	10M	16QAM	39700	50RB#0	20.00	19.80
LTE Band 41	10M	16QAM	40620	1RB#0	22.18	22.78
LTE Band 41	10M	16QAM	40620	1RB#25	22.26	22.86
LTE Band 41	10M	16QAM	40620	1RB#49	22.61	23.21
LTE Band 41	10M	16QAM	40620	25RB#0	20.87	21.47
LTE Band 41	10M	16QAM	40620	25RB#13	20.86	21.46
LTE Band 41	10M	16QAM	40620	25RB#25	21.22	21.82
LTE Band 41	10M	16QAM	40620	50RB#0	21.11	21.71
LTE Band 41	10M	16QAM	41540	1RB#0	20.98	22.18
LTE Band 41	10M	16QAM	41540	1RB#25	21.11	22.31
LTE Band 41	10M	16QAM	41540	1RB#49	21.46	22.66
LTE Band 41	10M	16QAM	41540	25RB#0	19.88	21.08
LTE Band 41	10M	16QAM	41540	25RB#13	19.89	21.09
LTE Band 41	10M	16QAM	41540	25RB#25	20.26	21.46
LTE Band 41	10M	16QAM	41540	50RB#0	20.13	21.33
LTE Band 41	10M	64QAM	39750	1RB#0	21.51	21.31
LTE Band 41	10M	64QAM	39750	1RB#50	21.66	21.46
LTE Band 41	10M	64QAM	39750	1RB#99	21.50	21.30
LTE Band 41	10M	64QAM	39750	50RB#0	20.75	20.55
LTE Band 41	10M	64QAM	39750	50RB#25	20.74	20.54
LTE Band 41	10M	64QAM	39750	50RB#50	20.69	20.49
LTE Band 41	10M	64QAM	39750	100RB#0	20.66	20.46
LTE Band 41	10M	64QAM	40620	1RB#0	20.13	20.73



LTE Band 41	10M	64QAM	40620	1RB#50	20.14	20.74
LTE Band 41	10M	64QAM	40620	1RB#99	20.15	20.75
LTE Band 41	10M	64QAM	40620	50RB#0	19.26	19.86
LTE Band 41	10M	64QAM	40620	50RB#25	19.26	19.86
LTE Band 41	10M	64QAM	40620	50RB#50	19.20	19.80
LTE Band 41	10M	64QAM	40620	100RB#0	19.22	19.82
LTE Band 41	10M	64QAM	41490	1RB#0	20.68	21.88
LTE Band 41	10M	64QAM	41490	1RB#50	20.84	22.04
LTE Band 41	10M	64QAM	41490	1RB#99	21.28	22.48
LTE Band 41	10M	64QAM	41490	50RB#0	19.20	20.40
LTE Band 41	10M	64QAM	41490	50RB#25	19.19	20.39
LTE Band 41	10M	64QAM	41490	50RB#50	19.64	20.84
LTE Band 41	10M	64QAM	41490	100RB#0	19.39	20.59
LTE Band 41	15M	QPSK	39725	1RB#0	23.20	23.00
LTE Band 41	15M	QPSK	39725	1RB#38	23.07	22.87
LTE Band 41	15M	QPSK	39725	1RB#74	23.08	22.88
LTE Band 41	15M	QPSK	39725	36RB#0	22.21	22.01
LTE Band 41	15M	QPSK	39725	36RB#18	22.21	22.01
LTE Band 41	15M	QPSK	39725	36RB#39	22.03	21.83
LTE Band 41	15M	QPSK	39725	75RB#0	22.08	21.88
LTE Band 41	15M	QPSK	40620	1RB#0	22.59	23.19
LTE Band 41	15M	QPSK	40620	1RB#38	22.38	22.98
LTE Band 41	15M	QPSK	40620	1RB#74	22.49	23.09
LTE Band 41	15M	QPSK	40620	36RB#0	21.33	21.93
LTE Band 41	15M	QPSK	40620	36RB#18	21.33	21.93
LTE Band 41	15M	QPSK	40620	36RB#39	21.17	21.77
LTE Band 41	15M	QPSK	40620	75RB#0	21.20	21.80
LTE Band 41	15M	QPSK	41515	1RB#0	22.04	23.24
LTE Band 41	15M	QPSK	41515	1RB#38	21.79	22.99
LTE Band 41	15M	QPSK	41515	1RB#74	22.09	23.29
LTE Band 41	15M	QPSK	41515	36RB#0	20.90	22.10
LTE Band 41	15M	QPSK	41515	36RB#18	20.89	22.09
LTE Band 41	15M	QPSK	41515	36RB#39	20.96	22.16
LTE Band 41	15M	QPSK	41515	75RB#0	20.90	22.10
LTE Band 41	15M	16QAM	39725	1RB#0	21.10	20.90
LTE Band 41	15M	16QAM	39725	1RB#38	20.91	20.71
LTE Band 41	15M	16QAM	39725	1RB#74	21.17	20.97
LTE Band 41	15M	16QAM	39725	36RB#0	20.00	19.80
LTE Band 41	15M	16QAM	39725	36RB#18	19.99	19.79
LTE Band 41	15M	16QAM	39725	36RB#39	20.06	19.86



LTE Band 41	15M	16QAM	39725	75RB#0	19.98	19.78
LTE Band 41	15M	16QAM	40620	1RB#0	22.00	22.60
LTE Band 41	15M	16QAM	40620	1RB#38	22.00	22.60
LTE Band 41	15M	16QAM	40620	1RB#74	22.82	23.42
LTE Band 41	15M	16QAM	40620	36RB#0	20.71	21.31
LTE Band 41	15M	16QAM	40620	36RB#18	20.70	21.30
LTE Band 41	15M	16QAM	40620	36RB#39	21.08	21.68
LTE Band 41	15M	16QAM	40620	75RB#0	20.97	21.57
LTE Band 41	15M	16QAM	41515	1RB#0	20.93	22.13
LTE Band 41	15M	16QAM	41515	1RB#38	21.09	22.29
LTE Band 41	15M	16QAM	41515	1RB#74	21.79	22.99
LTE Band 41	15M	16QAM	41515	36RB#0	19.70	20.90
LTE Band 41	15M	16QAM	41515	36RB#18	19.71	20.91
LTE Band 41	15M	16QAM	41515	36RB#39	20.12	21.32
LTE Band 41	15M	16QAM	41515	75RB#0	20.01	21.21
LTE Band 41	15M	64QAM	39750	1RB#0	21.91	21.71
LTE Band 41	15M	64QAM	39750	1RB#50	21.69	21.49
LTE Band 41	15M	64QAM	39750	1RB#99	21.78	21.58
LTE Band 41	15M	64QAM	39750	50RB#0	20.63	20.43
LTE Band 41	15M	64QAM	39750	50RB#25	20.63	20.43
LTE Band 41	15M	64QAM	39750	50RB#50	20.47	20.27
LTE Band 41	15M	64QAM	39750	100RB#0	20.50	20.30
LTE Band 41	15M	64QAM	40620	1RB#0	20.43	21.03
LTE Band 41	15M	64QAM	40620	1RB#50	20.13	20.73
LTE Band 41	15M	64QAM	40620	1RB#99	20.38	20.98
LTE Band 41	15M	64QAM	40620	50RB#0	19.25	19.85
LTE Band 41	15M	64QAM	40620	50RB#25	19.25	19.85
LTE Band 41	15M	64QAM	40620	50RB#50	19.27	19.87
LTE Band 41	15M	64QAM	40620	100RB#0	19.19	19.79
LTE Band 41	15M	64QAM	41490	1RB#0	20.32	21.52
LTE Band 41	15M	64QAM	41490	1RB#50	20.36	21.56
LTE Band 41	15M	64QAM	41490	1RB#99	21.16	22.36
LTE Band 41	15M	64QAM	41490	50RB#0	18.98	20.18
LTE Band 41	15M	64QAM	41490	50RB#25	18.97	20.17
LTE Band 41	15M	64QAM	41490	50RB#50	19.41	20.61
LTE Band 41	15M	64QAM	41490	100RB#0	19.28	20.48
LTE Band 41	20M	QPSK	39750	1RB#0	23.09	22.89
LTE Band 41	20M	QPSK	39750	1RB#50	22.92	22.72
LTE Band 41	20M	QPSK	39750	1RB#99	22.85	22.65
LTE Band 41	20M	QPSK	39750	50RB#0	22.27	22.07



LTE Band 41	20M	QPSK	39750	50RB#25	22.27	22.07
LTE Band 41	20M	QPSK	39750	50RB#50	22.09	21.89
LTE Band 41	20M	QPSK	39750	100RB#0	22.14	21.94
LTE Band 41	20M	QPSK	40620	1RB#0	22.30	22.90
LTE Band 41	20M	QPSK	40620	1RB#50	22.13	22.73
LTE Band 41	20M	QPSK	40620	1RB#99	22.09	22.69
LTE Band 41	20M	QPSK	40620	50RB#0	21.40	22.00
LTE Band 41	20M	QPSK	40620	50RB#25	21.40	22.00
LTE Band 41	20M	QPSK	40620	50RB#50	21.22	21.82
LTE Band 41	20M	QPSK	40620	100RB#0	21.24	21.84
LTE Band 41	20M	QPSK	41490	1RB#0	21.96	23.16
LTE Band 41	20M	QPSK	41490	1RB#50	21.82	23.02
LTE Band 41	20M	QPSK	41490	1RB#99	22.01	23.21
LTE Band 41	20M	QPSK	41490	50RB#0	20.92	22.12
LTE Band 41	20M	QPSK	41490	50RB#25	20.92	22.12
LTE Band 41	20M	QPSK	41490	50RB#50	20.99	22.19
LTE Band 41	20M	QPSK	41490	100RB#0	20.89	22.09
LTE Band 41	20M	16QAM	39750	1RB#0	20.97	20.77
LTE Band 41	20M	16QAM	39750	1RB#50	20.85	20.65
LTE Band 41	20M	16QAM	39750	1RB#99	20.98	20.78
LTE Band 41	20M	16QAM	39750	50RB#0	19.99	19.79
LTE Band 41	20M	16QAM	39750	50RB#25	19.99	19.79
LTE Band 41	20M	16QAM	39750	50RB#50	20.05	19.85
LTE Band 41	20M	16QAM	39750	100RB#0	19.99	19.79
LTE Band 41	20M	16QAM	40620	1RB#0	21.75	22.35
LTE Band 41	20M	16QAM	40620	1RB#50	21.91	22.51
LTE Band 41	20M	16QAM	40620	1RB#99	22.71	23.31
LTE Band 41	20M	16QAM	40620	50RB#0	20.58	21.18
LTE Band 41	20M	16QAM	40620	50RB#25	20.63	21.23
LTE Band 41	20M	16QAM	40620	50RB#50	21.04	21.64
LTE Band 41	20M	16QAM	40620	100RB#0	20.89	21.49
LTE Band 41	20M	16QAM	41490	1RB#0	20.33	21.53
LTE Band 41	20M	16QAM	41490	1RB#50	20.57	21.77
LTE Band 41	20M	16QAM	41490	1RB#99	21.40	22.60
LTE Band 41	20M	16QAM	41490	50RB#0	19.68	20.88
LTE Band 41	20M	16QAM	41490	50RB#25	19.67	20.87
LTE Band 41	20M	16QAM	41490	50RB#50	20.16	21.36
LTE Band 41	20M	16QAM	41490	100RB#0	19.96	21.16
LTE Band 41	20M	64QAM	39750	1RB#0	21.63	21.43
LTE Band 41	20M	64QAM	39750	1RB#50	21.47	21.27



LTE Band 41	20M	64QAM	39750	1RB#99	21.50	21.30
LTE Band 41	20M	64QAM	39750	50RB#0	20.73	20.53
LTE Band 41	20M	64QAM	39750	50RB#25	20.73	20.53
LTE Band 41	20M	64QAM	39750	50RB#50	20.57	20.37
LTE Band 41	20M	64QAM	39750	100RB#0	20.55	20.35
LTE Band 41	20M	64QAM	40620	1RB#0	20.33	20.93
LTE Band 41	20M	64QAM	40620	1RB#50	20.12	20.72
LTE Band 41	20M	64QAM	40620	1RB#99	20.29	20.89
LTE Band 41	20M	64QAM	40620	50RB#0	19.29	19.89
LTE Band 41	20M	64QAM	40620	50RB#25	19.29	19.89
LTE Band 41	20M	64QAM	40620	50RB#50	19.29	19.89
LTE Band 41	20M	64QAM	40620	100RB#0	19.25	19.85
LTE Band 41	20M	64QAM	41490	1RB#0	19.74	20.94
LTE Band 41	20M	64QAM	41490	1RB#50	19.92	21.12
LTE Band 41	20M	64QAM	41490	1RB#99	20.84	22.04
LTE Band 41	20M	64QAM	41490	50RB#0	19.04	20.24
LTE Band 41	20M	64QAM	41490	50RB#25	19.03	20.23
LTE Band 41	20M	64QAM	41490	50RB#50	19.48	20.68
LTE Band 41	20M	64QAM	41490	100RB#0	19.27	20.47



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 41 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5181.00	-47.46	3.20	12.50	Vertical	-38.16	-25.00	13.16	135
3	7771.50	-44.07	4.40	12.30	Vertical	-36.17	-25.00	11.17	224
4	10362.00	-40.58	4.70	11.80	Vertical	-33.48	-25.00	8.48	25
5	12952.50	-52.73	5.40	14.00	Vertical	-44.13	-25.00	19.13	134
6	15543.00	-57.94	6.10	16.80	Vertical	-47.24	-25.00	22.24	12
7	18071.55	--	--	--	--	--	--	--	--
8	20653.20	--	--	--	--	--	--	--	--
9	23234.85	--	--	--	--	--	--	--	--
10	25816.50	--	--	--	--	--	--	--	--
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 Vertical position.									

LTE Band 41 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5166.00	-47.28	3.20	12.50	Vertical	-37.98	-25.00	12.98	48
3	7749.00	-43.71	4.40	12.30	Vertical	-35.81	-25.00	10.81	13
4	10336.20	-42.33	4.70	11.80	Vertical	-35.23	-25.00	10.23	12
5	12915.00	-47.62	5.40	14.00	Vertical	-39.02	-25.00	14.02	114
6	15498.00	-55.13	6.10	16.80	Vertical	-44.43	-25.00	19.43	142
7	18081.00	--	--	--	--	--	--	--	--
8	20664.00	--	--	--	--	--	--	--	--
9	23247.00	--	--	--	--	--	--	--	--
10	25830.00	--	--	--	--	--	--	--	--
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 Vertical 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
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.