



RF TEST REPORT

Applicant	Shanghai Smawave Technology Co. ,Ltd
FCC ID	2AU8HSTP310
Product	Tablet
Brand	Smawave
Model	STP310
Report No.	R2001A0024-R1V2
Issue Date	May 19, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2019)/ FCC CFR 47 Part 96E (2019)**. 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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Approved by: Kai Xu

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Summary of measurement results

No.	Test Type	Clause in FCC rules	Verdict
1	RF power output	2.1046/ 96.41(b)	PASS
2	Maximum Effective Isotropic Radiated Power	96.41(b)	PASS
3	Radiates Spurious Emission	2.1051 / 96.41(e)	PASS
Date of Testing: April 5, 2020 ~ April 27, 2020			
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.			

There is only tested RF power output, Maximum Effective Isotropic Radiated Power and Radiates Spurious Emission in this report. For other conducted test results, please refers to the module report(Report No.: R2003A0164-R1).

Note: This revised report (Report No. R2001A0024-R1V2) supersedes and replaces the previously issued report (Report No. R2001A0024-R1V1). Please discard or destroy the previously issued report and dispose of it accordingly.



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.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
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Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.3. 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

2.4. General Information

EUT Description			
Model	STP310		
IMEI	863134038148881		
Hardware Version	dt863-mb-v0.4		
Software Version	P701_DT863_STP310_20200416_V 9.1		
Power Supply	External power supply		
Antenna Type	Internal Antenna		
Antenna Gain	1.5dBi		
Test Mode(s)	LTE Band 48;		
Test Modulation	QPSK 16QAM 64QAM;		
LTE Category	6		
Maximum E.I.R.P	LTE Band 48:	22.15dBm	
Rated Power Supply Voltage	7.4V		
Extreme Voltage	Minimum: 6.8V Maximum: 8.7V		
Extreme Temperature	Lowest: -40°C Highest: +70°C		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	LTE Band 48	3550-3700	3550-3700
EUT Accessory			
Adapter	Manufacturer: Stiger International Trade Investment Co.,Ltd Model: STK-CPQ024W4-F103-1U		
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.			



3. Applied Standards

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

Test standards:

FCC 47 CFR Part 96E (2019)

ANSI / TIA-603-E

Reference standard:

FCC 47 CFR Part 2 (2019)

FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01

4. Test Configuration

There is more than one SIM card slot, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1) will be recorded in this report.

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 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:

Test modes are chosen as the worst case configuration below for LTE Band 48.

Test items	Bandwidth (MHz)				Modulation			RB			Test Channel		
	5	10	15	20	QPSK	16QAM	64QAM	1	50%	100%	L	M	H
RF power output	O	O	O	O	O	O	O	O	O	O	O	O	O
Maximum Effective Isotropic Radiated Power	O	O	O	O	O	O	O	O	-	-	O	O	O
Radiates Spurious Emission	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

Ambient condition

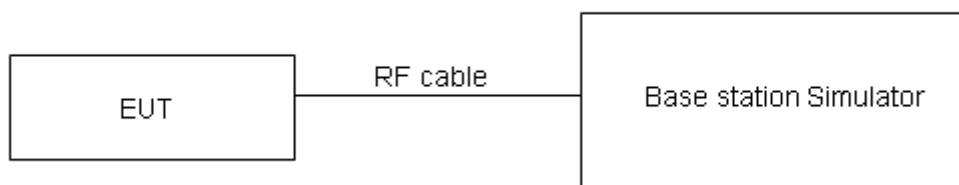
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of 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.

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.

Test Setup



A transmitter port of EUT is connected to the input of a signal analyzer. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4$ dB.

**Test Results**

BAND	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power(dBm)	EIRP(dBm)
Band48	5M	QPSK	55265	1RB#0	20.45	21.95
Band48	5M	QPSK	55265	1RB#13	20.25	21.75
Band48	5M	QPSK	55265	1RB#24	20.57	22.07
Band48	5M	QPSK	55265	12RB#0	18.70	20.20
Band48	5M	QPSK	55265	12RB#6	18.57	20.07
Band48	5M	QPSK	55265	12RB#13	18.79	20.29
Band48	5M	QPSK	55265	25RB#0	18.72	20.22
Band48	5M	QPSK	55990	1RB#0	20.33	21.83
Band48	5M	QPSK	55990	1RB#13	20.19	21.69
Band48	5M	QPSK	55990	1RB#24	20.57	22.07
Band48	5M	QPSK	55990	12RB#0	18.95	20.45
Band48	5M	QPSK	55990	12RB#6	19.02	20.52
Band48	5M	QPSK	55990	12RB#13	19.07	20.57
Band48	5M	QPSK	55990	25RB#0	18.96	20.46
Band48	5M	QPSK	56715	1RB#0	20.28	21.78
Band48	5M	QPSK	56715	1RB#13	20.42	21.92
Band48	5M	QPSK	56715	1RB#24	20.65	22.15
Band48	5M	QPSK	56715	12RB#0	18.98	20.48
Band48	5M	QPSK	56715	12RB#6	19.06	20.56
Band48	5M	QPSK	56715	12RB#13	19.02	20.52
Band48	5M	QPSK	56715	25RB#0	18.91	20.41
Band48	5M	16QAM	55265	1RB#0	19.31	20.81
Band48	5M	16QAM	55265	1RB#13	19.61	21.11
Band48	5M	16QAM	55265	1RB#24	19.44	20.94
Band48	5M	16QAM	55265	12RB#0	18.00	19.50
Band48	5M	16QAM	55265	12RB#6	17.96	19.46
Band48	5M	16QAM	55265	12RB#13	18.13	19.63
Band48	5M	16QAM	55265	25RB#0	18.11	19.61
Band48	5M	16QAM	55990	1RB#0	19.27	20.77
Band48	5M	16QAM	55990	1RB#13	19.44	20.94
Band48	5M	16QAM	55990	1RB#24	19.67	21.17
Band48	5M	16QAM	55990	12RB#0	18.32	19.82
Band48	5M	16QAM	55990	12RB#6	18.48	19.98
Band48	5M	16QAM	55990	12RB#13	17.92	19.42
Band48	5M	16QAM	55990	25RB#0	18.31	19.81
Band48	5M	16QAM	56715	1RB#0	19.32	20.82
Band48	5M	16QAM	56715	1RB#13	19.47	20.97
Band48	5M	16QAM	56715	1RB#24	19.65	21.15
Band48	5M	16QAM	56715	12RB#0	18.36	19.86



Band48	5M	16QAM	56715	12RB#6	18.51	20.01
Band48	5M	16QAM	56715	12RB#13	17.97	19.47
Band48	5M	16QAM	56715	25RB#0	18.35	19.85
Band48	5M	64QAM	55265	1RB#0	19.02	20.52
Band48	5M	64QAM	55265	1RB#50	19.34	20.84
Band48	5M	64QAM	55265	1RB#99	19.21	20.71
Band48	5M	64QAM	55265	50RB#0	17.95	19.45
Band48	5M	64QAM	55265	50RB#25	17.89	19.39
Band48	5M	64QAM	55265	50RB#50	18.09	19.59
Band48	5M	64QAM	55265	100RB#0	18.14	19.64
Band48	5M	64QAM	55990	1RB#0	19.15	20.65
Band48	5M	64QAM	55990	1RB#50	19.17	20.67
Band48	5M	64QAM	55990	1RB#99	19.41	20.91
Band48	5M	64QAM	55990	50RB#0	18.31	19.81
Band48	5M	64QAM	55990	50RB#25	18.43	19.93
Band48	5M	64QAM	55990	50RB#50	17.94	19.44
Band48	5M	64QAM	55990	100RB#0	18.44	19.94
Band48	5M	64QAM	56715	1RB#0	19.06	20.56
Band48	5M	64QAM	56715	1RB#50	19.21	20.71
Band48	5M	64QAM	56715	1RB#99	19.46	20.96
Band48	5M	64QAM	56715	50RB#0	18.34	19.84
Band48	5M	64QAM	56715	50RB#25	18.44	19.94
Band48	5M	64QAM	56715	50RB#50	17.87	19.37
Band48	5M	64QAM	56715	100RB#0	18.36	19.86
Band48	10M	QPSK	55290	1RB#0	20.40	21.90
Band48	10M	QPSK	55290	1RB#25	20.19	21.69
Band48	10M	QPSK	55290	1RB#49	20.50	22.00
Band48	10M	QPSK	55290	25RB#0	18.63	20.13
Band48	10M	QPSK	55290	25RB#13	18.53	20.03
Band48	10M	QPSK	55290	25RB#25	18.72	20.22
Band48	10M	QPSK	55290	50RB#0	18.70	20.20
Band48	10M	QPSK	55990	1RB#0	20.20	21.70
Band48	10M	QPSK	55990	1RB#25	20.15	21.65
Band48	10M	QPSK	55990	1RB#49	20.49	21.99
Band48	10M	QPSK	55990	25RB#0	18.91	20.41
Band48	10M	QPSK	55990	25RB#13	18.98	20.48
Band48	10M	QPSK	55990	25RB#25	18.99	20.49
Band48	10M	QPSK	55990	50RB#0	18.88	20.38
Band48	10M	QPSK	56690	1RB#0	20.22	21.72
Band48	10M	QPSK	56690	1RB#25	20.36	21.86
Band48	10M	QPSK	56690	1RB#49	20.55	22.05
Band48	10M	QPSK	56690	25RB#0	18.92	20.42
Band48	10M	QPSK	56690	25RB#13	19.01	20.51



Band48	10M	QPSK	56690	25RB#25	19.03	20.53
Band48	10M	QPSK	56690	50RB#0	18.92	20.42
Band48	10M	16QAM	55290	1RB#0	19.28	20.78
Band48	10M	16QAM	55290	1RB#25	19.59	21.09
Band48	10M	16QAM	55290	1RB#49	19.42	20.92
Band48	10M	16QAM	55290	25RB#0	17.97	19.47
Band48	10M	16QAM	55290	25RB#13	17.93	19.43
Band48	10M	16QAM	55290	25RB#25	18.08	19.58
Band48	10M	16QAM	55290	50RB#0	18.09	19.59
Band48	10M	16QAM	55990	1RB#0	19.24	20.74
Band48	10M	16QAM	55990	1RB#25	19.39	20.89
Band48	10M	16QAM	55990	1RB#49	19.60	21.10
Band48	10M	16QAM	55990	25RB#0	18.29	19.79
Band48	10M	16QAM	55990	25RB#13	18.43	19.93
Band48	10M	16QAM	55990	25RB#25	17.92	19.42
Band48	10M	16QAM	55990	50RB#0	18.31	19.81
Band48	10M	16QAM	56690	1RB#0	19.27	20.77
Band48	10M	16QAM	56690	1RB#25	19.43	20.93
Band48	10M	16QAM	56690	1RB#49	19.61	21.11
Band48	10M	16QAM	56690	25RB#0	18.32	19.82
Band48	10M	16QAM	56690	25RB#13	18.45	19.95
Band48	10M	16QAM	56690	25RB#25	17.94	19.44
Band48	10M	16QAM	56690	50RB#0	18.33	19.83
Band48	10M	64QAM	55290	1RB#0	18.97	20.47
Band48	10M	64QAM	55290	1RB#50	19.28	20.78
Band48	10M	64QAM	55290	1RB#99	19.14	20.64
Band48	10M	64QAM	55290	50RB#0	17.88	19.38
Band48	10M	64QAM	55290	50RB#25	17.85	19.35
Band48	10M	64QAM	55290	50RB#50	18.02	19.52
Band48	10M	64QAM	55290	100RB#0	18.12	19.62
Band48	10M	64QAM	55990	1RB#0	19.02	20.52
Band48	10M	64QAM	55990	1RB#50	19.13	20.63
Band48	10M	64QAM	55990	1RB#99	19.33	20.83
Band48	10M	64QAM	55990	50RB#0	18.27	19.77
Band48	10M	64QAM	55990	50RB#25	18.39	19.89
Band48	10M	64QAM	55990	50RB#50	17.86	19.36
Band48	10M	64QAM	55990	100RB#0	18.36	19.86
Band48	10M	64QAM	56690	1RB#0	19.00	20.50
Band48	10M	64QAM	56690	1RB#50	19.15	20.65
Band48	10M	64QAM	56690	1RB#99	19.36	20.86
Band48	10M	64QAM	56690	50RB#0	18.28	19.78
Band48	10M	64QAM	56690	50RB#25	18.39	19.89
Band48	10M	64QAM	56690	50RB#50	17.88	19.38



Band48	10M	64QAM	56690	100RB#0	18.37	19.87
Band48	15M	QPSK	55315	1RB#0	20.39	21.89
Band48	15M	QPSK	55315	1RB#38	20.17	21.67
Band48	15M	QPSK	55315	1RB#74	20.47	21.97
Band48	15M	QPSK	55315	36RB#0	18.61	20.11
Band48	15M	QPSK	55315	36RB#18	18.50	20.00
Band48	15M	QPSK	55315	36RB#39	18.69	20.19
Band48	15M	QPSK	55315	75RB#0	18.68	20.18
Band48	15M	QPSK	55990	1RB#0	20.16	21.66
Band48	15M	QPSK	55990	1RB#38	20.14	21.64
Band48	15M	QPSK	55990	1RB#74	20.44	21.94
Band48	15M	QPSK	55990	36RB#0	18.87	20.37
Band48	15M	QPSK	55990	36RB#18	18.93	20.43
Band48	15M	QPSK	55990	36RB#39	18.96	20.46
Band48	15M	QPSK	55990	75RB#0	18.84	20.34
Band48	15M	QPSK	56665	1RB#0	20.20	21.70
Band48	15M	QPSK	56665	1RB#38	20.33	21.83
Band48	15M	QPSK	56665	1RB#74	20.51	22.01
Band48	15M	QPSK	56665	36RB#0	18.89	20.39
Band48	15M	QPSK	56665	36RB#18	18.97	20.47
Band48	15M	QPSK	56665	36RB#39	18.99	20.49
Band48	15M	QPSK	56665	75RB#0	18.87	20.37
Band48	15M	16QAM	55315	1RB#0	19.23	20.73
Band48	15M	16QAM	55315	1RB#38	19.57	21.07
Band48	15M	16QAM	55315	1RB#74	19.39	20.89
Band48	15M	16QAM	55315	36RB#0	17.94	19.44
Band48	15M	16QAM	55315	36RB#18	17.90	19.40
Band48	15M	16QAM	55315	36RB#39	18.06	19.56
Band48	15M	16QAM	55315	75RB#0	18.06	19.56
Band48	15M	16QAM	55990	1RB#0	19.22	20.72
Band48	15M	16QAM	55990	1RB#38	19.36	20.86
Band48	15M	16QAM	55990	1RB#74	19.56	21.06
Band48	15M	16QAM	55990	36RB#0	18.27	19.77
Band48	15M	16QAM	55990	36RB#18	18.38	19.88
Band48	15M	16QAM	55990	36RB#39	17.88	19.38
Band48	15M	16QAM	55990	75RB#0	18.26	19.76
Band48	15M	16QAM	56665	1RB#0	19.25	20.75
Band48	15M	16QAM	56665	1RB#38	19.41	20.91
Band48	15M	16QAM	56665	1RB#74	19.58	21.08
Band48	15M	16QAM	56665	36RB#0	18.29	19.79
Band48	15M	16QAM	56665	36RB#18	18.41	19.91
Band48	15M	16QAM	56665	36RB#39	17.91	19.41
Band48	15M	16QAM	56665	75RB#0	18.29	19.79



Band48	15M	64QAM	55315	1RB#0	18.96	20.46
Band48	15M	64QAM	55315	1RB#50	19.26	20.76
Band48	15M	64QAM	55315	1RB#99	19.11	20.61
Band48	15M	64QAM	55315	50RB#0	17.86	19.36
Band48	15M	64QAM	55315	50RB#25	17.82	19.32
Band48	15M	64QAM	55315	50RB#50	17.99	19.49
Band48	15M	64QAM	55315	100RB#0	18.10	19.60
Band48	15M	64QAM	55990	1RB#0	18.98	20.48
Band48	15M	64QAM	55990	1RB#50	19.12	20.62
Band48	15M	64QAM	55990	1RB#99	19.28	20.78
Band48	15M	64QAM	55990	50RB#0	18.23	19.73
Band48	15M	64QAM	55990	50RB#25	18.34	19.84
Band48	15M	64QAM	55990	50RB#50	17.83	19.33
Band48	15M	64QAM	55990	100RB#0	18.32	19.82
Band48	15M	64QAM	56665	1RB#0	18.98	20.48
Band48	15M	64QAM	56665	1RB#50	19.12	20.62
Band48	15M	64QAM	56665	1RB#99	19.32	20.82
Band48	15M	64QAM	56665	50RB#0	18.25	19.75
Band48	15M	64QAM	56665	50RB#25	18.35	19.85
Band48	15M	64QAM	56665	50RB#50	17.84	19.34
Band48	15M	64QAM	56665	100RB#0	18.32	19.82
Band48	20M	QPSK	55340	1RB#0	20.36	21.86
Band48	20M	QPSK	55340	1RB#50	20.16	21.66
Band48	20M	QPSK	55340	1RB#99	20.45	21.95
Band48	20M	QPSK	55340	50RB#0	18.58	20.08
Band48	20M	QPSK	55340	50RB#25	18.48	19.98
Band48	20M	QPSK	55340	50RB#50	18.66	20.16
Band48	20M	QPSK	55340	100RB#0	18.65	20.15
Band48	20M	QPSK	55990	1RB#0	20.12	21.62
Band48	20M	QPSK	55990	1RB#50	20.10	21.60
Band48	20M	QPSK	55990	1RB#99	20.43	21.93
Band48	20M	QPSK	55990	50RB#0	18.82	20.32
Band48	20M	QPSK	55990	50RB#25	18.89	20.39
Band48	20M	QPSK	55990	50RB#50	18.91	20.41
Band48	20M	QPSK	55990	100RB#0	18.79	20.29
Band48	20M	QPSK	56640	1RB#0	20.17	21.67
Band48	20M	QPSK	56640	1RB#50	20.31	21.81
Band48	20M	QPSK	56640	1RB#99	20.48	21.98
Band48	20M	QPSK	56640	50RB#0	18.85	20.35
Band48	20M	QPSK	56640	50RB#25	18.94	20.44
Band48	20M	QPSK	56640	50RB#50	18.95	20.45
Band48	20M	QPSK	56640	100RB#0	18.83	20.33
Band48	20M	16QAM	55340	1RB#0	19.21	20.71



Band48	20M	16QAM	55340	1RB#50	19.53	21.03
Band48	20M	16QAM	55340	1RB#99	19.37	20.87
Band48	20M	16QAM	55340	50RB#0	17.91	19.41
Band48	20M	16QAM	55340	50RB#25	17.87	19.37
Band48	20M	16QAM	55340	50RB#50	18.03	19.53
Band48	20M	16QAM	55340	100RB#0	18.04	19.54
Band48	20M	16QAM	55990	1RB#0	19.18	20.68
Band48	20M	16QAM	55990	1RB#50	19.34	20.84
Band48	20M	16QAM	55990	1RB#99	19.53	21.03
Band48	20M	16QAM	55990	50RB#0	18.23	19.73
Band48	20M	16QAM	55990	50RB#25	18.36	19.86
Band48	20M	16QAM	55990	50RB#50	17.83	19.33
Band48	20M	16QAM	55990	100RB#0	18.22	19.72
Band48	20M	16QAM	56640	1RB#0	19.20	20.70
Band48	20M	16QAM	56640	1RB#50	19.37	20.87
Band48	20M	16QAM	56640	1RB#99	19.56	21.06
Band48	20M	16QAM	56640	50RB#0	18.26	19.76
Band48	20M	16QAM	56640	50RB#25	18.38	19.88
Band48	20M	16QAM	56640	50RB#50	17.87	19.37
Band48	20M	16QAM	56640	100RB#0	18.26	19.76
Band48	20M	64QAM	56340	1RB#0	18.93	20.43
Band48	20M	64QAM	56340	1RB#50	19.25	20.75
Band48	20M	64QAM	56340	1RB#99	19.09	20.59
Band48	20M	64QAM	56340	50RB#0	17.83	19.33
Band48	20M	64QAM	56340	50RB#25	17.80	19.30
Band48	20M	64QAM	56340	50RB#50	17.96	19.46
Band48	20M	64QAM	56340	100RB#0	18.07	19.57
Band48	20M	64QAM	56490	1RB#0	18.94	20.44
Band48	20M	64QAM	56490	1RB#50	19.08	20.58
Band48	20M	64QAM	56490	1RB#99	19.27	20.77
Band48	20M	64QAM	56490	50RB#0	18.18	19.68
Band48	20M	64QAM	56490	50RB#25	18.30	19.80
Band48	20M	64QAM	56490	50RB#50	17.78	19.28
Band48	20M	64QAM	56490	100RB#0	18.27	19.77
Band48	20M	64QAM	56640	1RB#0	18.95	20.45
Band48	20M	64QAM	56640	1RB#50	19.10	20.60
Band48	20M	64QAM	56640	1RB#99	19.29	20.79
Band48	20M	64QAM	56640	50RB#0	18.21	19.71
Band48	20M	64QAM	56640	50RB#25	18.32	19.82
Band48	20M	64QAM	56640	50RB#50	17.80	19.30
Band48	20M	64QAM	56640	100RB#0	18.28	19.78

5.2. Maximum Effective Isotropic Radiated Power

Ambient condition

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

Methods of Measurement

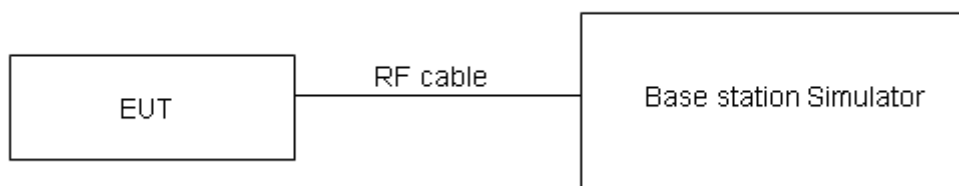
The testing follows procedure in Section 5.2 of ANSI C63.26-2015 and KDB 940660 D01 Section 3.2(b)(2).

Determine the EIRP by adding the effective antenna gain to the measured average conducted power level.

The EIRP of mobile transmitters must not exceed 23 dBm /10 megahertz for Band 48.

The testing follows ANSI C63.26-2015 Section 5.2.5.5

Test Setup



A transmitter port of EUT is connected to the input of a signal analyzer. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Limits

EIRP for End User Device equipment as below tabel:

Device	Maximum EIRP (dBm/10MHz)
End User Device	23

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 1.19$ dB

**Test Results:**

The measurement is performed for both of horizontal and vertical antenna Polarization, and only the data of worst mode is recorded in this report.

BAND	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power(10M/dBm)	EIRP (10M/dBm)	Limit (dBm/10MHz)
Band48	5M	QPSK	55265	1RB#0	20.45	21.95	23
Band48	5M	QPSK	55990	1RB#0	20.33	21.83	23
Band48	5M	QPSK	56715	1RB#0	20.28	21.78	23
Band48	5M	16QAM	55265	1RB#0	19.31	20.81	23
Band48	5M	16QAM	55990	1RB#0	19.27	20.77	23
Band48	5M	16QAM	56715	1RB#0	19.32	20.82	23
Band48	5M	64QAM	55265	1RB#0	19.02	20.52	23
Band48	5M	64QAM	55990	1RB#0	19.15	20.65	23
Band48	5M	64QAM	56715	1RB#0	19.06	20.56	23
Band48	10M	QPSK	55290	1RB#0	20.40	21.90	23
Band48	10M	QPSK	55990	1RB#0	20.20	21.70	23
Band48	10M	QPSK	56690	1RB#0	20.22	21.72	23
Band48	10M	16QAM	55290	1RB#0	19.28	20.78	23
Band48	10M	16QAM	55990	1RB#0	19.24	20.74	23
Band48	10M	16QAM	56690	1RB#0	19.27	20.77	23
Band48	10M	64QAM	55290	1RB#0	18.97	20.47	23
Band48	10M	64QAM	55990	1RB#0	19.02	20.52	23
Band48	10M	64QAM	56690	1RB#0	19.00	20.50	23
Band48	15M	QPSK	55315	1RB#0	20.39	21.89	23
Band48	15M	QPSK	55990	1RB#0	20.16	21.66	23
Band48	15M	QPSK	56665	1RB#0	20.20	21.70	23
Band48	15M	16QAM	55315	1RB#0	19.23	20.73	23
Band48	15M	16QAM	55990	1RB#0	19.22	20.72	23
Band48	15M	16QAM	56665	1RB#0	19.25	20.75	23
Band48	15M	64QAM	55315	1RB#0	18.96	20.46	23
Band48	15M	64QAM	55990	1RB#0	18.98	20.48	23
Band48	15M	64QAM	56665	1RB#0	18.98	20.48	23
Band48	20M	QPSK	55340	1RB#0	20.36	21.86	23
Band48	20M	QPSK	55990	1RB#0	20.12	21.62	23
Band48	20M	QPSK	56640	1RB#0	20.17	21.67	23
Band48	20M	16QAM	55340	1RB#0	19.21	20.71	23
Band48	20M	16QAM	55990	1RB#0	19.18	20.68	23
Band48	20M	16QAM	56640	1RB#0	19.20	20.70	23
Band48	20M	64QAM	56340	1RB#0	18.93	20.43	23
Band48	20M	64QAM	56490	1RB#0	18.94	20.44	23
Band48	20M	64QAM	56640	1RB#0	18.95	20.45	23

5.3. Radiates 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=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz ,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:

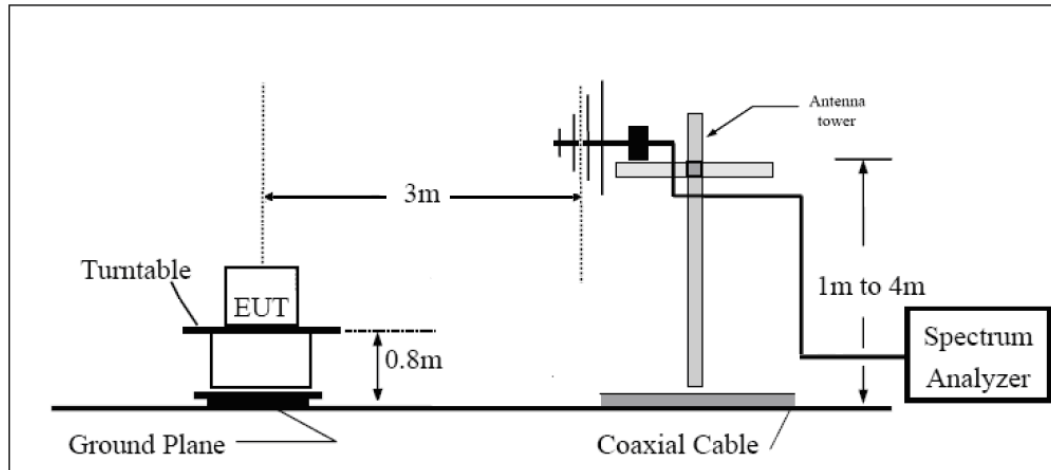
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi)

and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

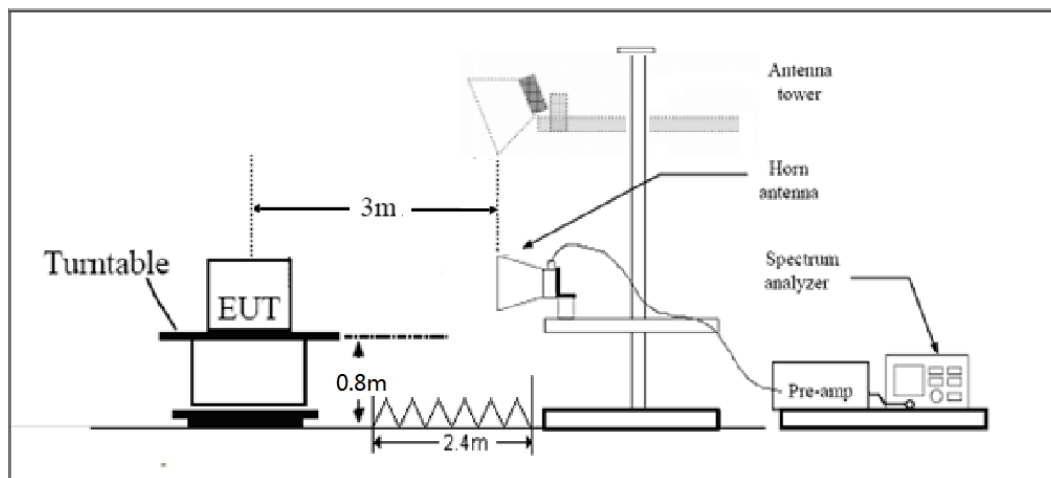
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side: 2.4mX3.6m

Limits

Rule Part 96.41(e) (2) specifies that “*Additional protection levels.* Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz , and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz .”

Measurement Uncertainty

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

**Test Result**

LTE Band 48 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	7250.0	-53.97	2.50	11.35	Vertical	-45.12	-40.00	5.12	135
3	10875.0	-49.12	4.20	12.05	Vertical	-41.27	-40.00	1.27	270
4	14500.0	-51.97	5.50	14.23	Vertical	-43.24	-40.00	3.24	315
5	18125.0	--	--	--	--	--	--	--	--
6	21735.0	--	--	--	--	--	--	--	--
7	25357.5	--	--	--	--	--	--	--	--
8	28980.0	--	--	--	--	--	--	--	--
9	32602.5	--	--	--	--	--	--	--	--
10	36225.0	--	--	--	--	--	--	--	--

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 48 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	7332.0	-54.34	2.50	11.35	Vertical	-45.49	-40.00	5.49	45
3	10998.8	-48.59	4.20	12.05	Vertical	-40.74	-40.00	0.74	135
4	14462.0	-51.95	5.50	14.23	Vertical	-43.22	-40.00	3.22	90
5	18125.0	--	--	--	--	--	--	--	--
6	21693.0	--	--	--	--	--	--	--	--
7	25308.5	--	--	--	--	--	--	--	--
8	28924.0	--	--	--	--	--	--	--	--
9	32539.5	--	--	--	--	--	--	--	--
10	36155.0	--	--	--	--	--	--	--	--

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.

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113824	2019-05-19	2020-05-18
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2019-05-19	2020-05-18
Signal Analyzer	R&S	FSV30	100815	2019-12-15	2020-12-14
Signal Analyzer	R&S	FSV40	15195-01-00	2019-05-19	2020-05-18
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2020-09-25
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
Standard Gain Horn	STEATITE	QSH-SL-26-40-K-15	16779	2019-07-19	2021-07-18
Signal generator	R&S	SMB 100A	102594	2019-05-19	2020-05-18
Climatic Chamber	ESPEC	SU-242	93000506	2017-12-17	2020-12-16
Preamplifier	R&S	SCU18	102327	2019-05-19	2020-05-18
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2019-05-19	2020-05-18
RF Cable	Agilent	SMA 15cm	0001	2019-12-13	2020-06-12
Software	R&S	EMC32	9.26.0	/	/

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