



# TEST REPORT

**APPLICANT** : Bullitt Group

**PRODUCT NAME** : 4G Mobile Phone

**MODEL NAME** : S62

**BRAND NAME** : CAT

**FCC ID** : ZL5S62

**STANDARD(S)** : 47 CFR Part 2  
47 CFR Part 90, Subpart S&R

**RECEIPT DATE** : 2021-06-04

**TEST DATE** : 2021-07-04 to 2021-08-18

**ISSUE DATE** : 2021-08-20

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# DIRECTORY

- 1. Technical Information ..... 3**
- 1.1. Applicant and Manufacturer Information ..... 3**
- 1.2. Equipment Under Test (EUT) Description ..... 3**
- 1.3. Maximum E.R.P./E.I.R.P. and Emission Designator ..... 5**
- 1.4. Test Standards and Results ..... 6**
- 1.5. Environmental Conditions ..... 6**
- 2. 47 CFR Part 2, Part 90S&R Requirements ..... 7**
- 2.1. Transmitter Conducted Output Power and E.R.P./E.I.R.P. .... 7**
- 2.2. Radiated Spurious Emissions ..... 20**
- Annex A Test Uncertainty ..... 24**
- Annex B Testing Laboratory Information ..... 25**

Change History		
Version	Date	Reason for change
1.0	2021-08-20	First edition



# 1. Technical Information

**Note:** Provide by applicant.

## 1.1. Applicant and Manufacturer Information

<b>Applicant:</b>	Bullitt Group
<b>Applicant Address:</b>	One Valpy, Valpy Street, Reading, Berkshire, RG1 1AR, United Kingdom
<b>Manufacturer:</b>	Bullitt Group
<b>Manufacturer Address:</b>	One Valpy, Valpy Street, Reading, Berkshire, RG1 1AR, United Kingdom

## 1.2. Equipment Under Test (EUT) Description

<b>Product Name:</b>	4G Mobile Phone	
<b>Sample No.:</b>	1#	
<b>Hardware Version:</b>	Q190_V1	
<b>Software Version:</b>	LTE_S02111.10_N_S62_0	
<b>Modulation Type:</b>	QPSK, 16QAM, 64QAM	
<b>Operation Band:</b>	Band 14 / 26	
<b>Frequency Range:</b>	LTE Band 14	Tx: 788MHz–798MHz Rx: 758MHz–768MHz
	LTE Band 26	Tx: 814MHz–824MHz Rx: 859MHz–869MHz
	LTE Band 14	5MHz, 10MHz
	LTE Band 26	1.4MHz, 3MHz, 5MHz, 10MHz
<b>Channel Bandwidth</b>	LTE Band 14	5MHz, 10MHz
<b>Antenna Type:</b>	Fixed Internal Antenna	
<b>Antenna Gain:</b>	LTE Band 14	-2.90dBi
	LTE Band 26	-1.10dBi

<b>Accessory Information:</b>	Battery	
	Brand Name:	Gaoyuan Battery
	Model No.:	XQ6602G
	Serial No.:	N/A
	Capacity:	4000mAh
	Rated Voltage:	3.8V
	Charge Limit:	4.35V
	Manufacturer:	Hunan Gaoyuan Battery Co., Ltd.
	AC Adapter 1	
	Brand Name:	AOHAI
	Model No.:	A138-120150C-US1
	Serial No.:	N/A
	Rated Output:	5V=3A, 9V=2A, 12V=1.5A 3.3-5.9V=3A, 3.3-11V=2A
	Rated Input:	100-240V~50/60Hz, 0.5A
	Manufacturer:	Jiangxi Jian Aohai Technology Co.,Ltd.
	AC Adapter 2	
	Brand Name:	N/A
	Model No.:	ZSS-018U120150
	Serial No.:	N/A
	Rated Output:	5V=3A, 9V=2A, 12V=1.5A 3.3-5.9V=3A, 3.3-11V=2A
Rated Input:	100-240V~50/60Hz, 0.5A	
Manufacturer:	Zhuzhou Zopose Technology Co., Ltd	

**Note 1:** This is a variant report to request a Class II Permissive change for the original report (Report No.: XM20070009W03, FCC ID: ZL5S62) which issued on Feb 19, 2021 by XIAMEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

Based on the similarity between before, modify the antenna and add an adapter. Antenna optimization, antenna pattern, antenna matching and antenna gain are different. The antenna type remains unchanged. Due to the above changes, we have evaluated and retested conducted power and worst case of radiated spurious emissions, the test results are better than before, all other test items are no need to be retested. We only recorded the conducted power, E.I.P.R./E.R.P. and worse case of radiated spurious emissions in this report.

**Note 2:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



### 1.3. Maximum E.R.P./E.I.R.P. and Emission Designator

LTE Band 14	Maximum E.R.P./E.I.R.P. (W)		
BW(MHz)	QPSK	16QAM	64QAM
10	0.043	0.036	0.035
5	0.043	0.036	0.035
LTE Band 26	Maximum E.R.P./E.I.R.P. (W)		
BW(MHz)	QPSK	16QAM	64QAM
10	0.091	0.081	0.075
5	0.090	0.080	0.075
3	0.089	0.079	0.075
1.4	0.087	0.077	0.073

## 1.4. Test Standards and Results

The objective of the report is to perform testing according to Part 2 and Part 90 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 90	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are as below:

Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
2.1046, 90.635(b) 90.542(a)(7)	Transmitter Conducted Output Power and E.R.P./E.I.R.P.	Aug 17&18, 2021	Liang Yumei Huang Zhiye	PASS	No deviation
2.1051, 90.691(a) 90.543(e)(f)	Radiated Spurious Emissions	Jul 04, 2021	Lin Jiayong	PASS	No deviation

**Note 1:** The test results of all test items please refer to the original test report (Report No.: XM20070009W03, FCC ID: ZL5S62) which issued on Feb 19, 2021 by XIAMEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

**Note 2:** Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

**Note 3:** When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

## 1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

## 2.47 CFR Part 2, Part 90S&R Requirements

### 2.1. Transmitter Conducted Output Power and E.R.P./E.I.R.P.

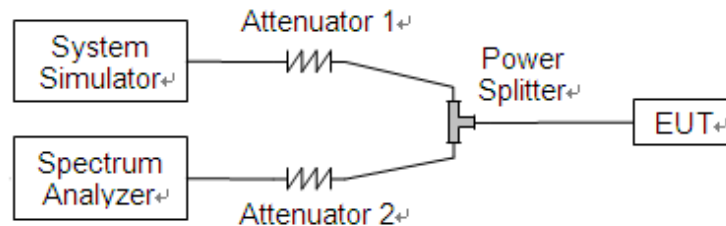
#### 2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

According to FCC section 90.542(a)(7) for LTE Band 14, portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

According to FCC section 90.635(b) for LTE Band 26, the maximum output power of the transmitter for mobile stations is 100 watts.

#### 2.1.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

#### 2.1.3. Test procedure

KDB 971168 D01v03 Section 5.2 and ANSI/TIA-603-E-2016.

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

$ERP \text{ (dBm)} = EIPR \text{ (dBm)} - 2.15$

**2.1.4. Result****Conducted Output Power**

LTE Band 14						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				/	23330	/
Frequency (MHz)				/	793	/
10	QPSK	1	0	/	21.36	/
10	QPSK	1	25	/	21.28	/
10	QPSK	1	49	/	21.13	/
10	QPSK	25	0	/	20.34	/
10	QPSK	25	12	/	20.27	/
10	QPSK	25	25	/	20.20	/
10	QPSK	50	0	/	20.16	/
10	16QAM	1	0	/	20.58	/
10	16QAM	1	25	/	20.47	/
10	16QAM	1	49	/	20.42	/
10	16QAM	25	0	/	19.73	/
10	16QAM	25	12	/	19.65	/
10	16QAM	25	25	/	19.58	/
10	16QAM	50	0	/	19.51	/
10	64QAM	1	0	/	20.55	/
10	64QAM	1	25	/	20.50	/
10	64QAM	1	49	/	20.41	/
10	64QAM	25	0	/	19.54	/
10	64QAM	25	12	/	19.40	/
10	64QAM	25	25	/	19.30	/
10	64QAM	50	0	/	19.24	/





LTE Band 14						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				23305	23330	23355
Frequency (MHz)				790.5	793	795.5
5	QPSK	1	0	21.28	21.34	21.27
5	QPSK	1	12	21.23	21.25	21.17
5	QPSK	1	24	21.07	21.11	21.01
5	QPSK	12	0	20.29	20.30	20.21
5	QPSK	12	7	20.22	20.25	20.16
5	QPSK	12	13	20.14	20.16	20.07
5	QPSK	25	0	20.09	20.14	20.06
5	16QAM	1	0	20.51	20.56	20.43
5	16QAM	1	12	20.41	20.44	20.33
5	16QAM	1	24	20.39	20.38	20.30
5	16QAM	12	0	19.69	19.71	19.61
5	16QAM	12	7	19.58	19.63	19.56
5	16QAM	12	13	19.51	19.54	19.46
5	16QAM	25	0	19.45	19.49	19.41
5	64QAM	1	0	20.51	20.51	20.44
5	64QAM	1	12	20.44	20.47	20.36
5	64QAM	1	24	20.34	20.40	20.30
5	64QAM	12	0	19.49	19.53	19.41
5	64QAM	12	7	19.30	19.37	19.28
5	64QAM	12	13	19.24	19.28	19.19
5	64QAM	25	0	19.18	19.22	19.13



LTE Band 26						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				/	26740	/
Frequency (MHz)				/	819.0	/
10	QPSK	1	0	/	22.84	/
10	QPSK	1	25	/	22.77	/
10	QPSK	1	49	/	22.61	/
10	QPSK	25	0	/	21.92	/
10	QPSK	25	12	/	21.84	/
10	QPSK	25	25	/	21.80	/
10	QPSK	50	0	/	21.72	/
10	16QAM	1	0	/	22.35	/
10	16QAM	1	25	/	22.23	/
10	16QAM	1	49	/	22.13	/
10	16QAM	25	0	/	21.11	/
10	16QAM	25	12	/	21.03	/
10	16QAM	25	25	/	20.86	/
10	16QAM	50	0	/	20.86	/
10	64QAM	1	0	/	22.02	/
10	64QAM	1	25	/	22.02	/
10	64QAM	1	49	/	22.01	/
10	64QAM	25	0	/	21.12	/
10	64QAM	25	12	/	21.13	/
10	64QAM	25	25	/	21.02	/
10	64QAM	50	0	/	20.94	/



LTE Band 26						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				26715	26740	26765
Frequency (MHz)				816.5	819.0	821.5
5	QPSK	1	0	22.77	22.66	22.73
5	QPSK	1	12	22.73	22.67	22.69
5	QPSK	1	24	22.53	22.51	22.46
5	QPSK	12	0	21.89	21.89	21.80
5	QPSK	12	7	21.83	21.71	21.75
5	QPSK	12	13	21.77	21.70	21.71
5	QPSK	25	0	21.69	21.64	21.65
5	16QAM	1	0	22.29	22.29	22.30
5	16QAM	1	12	22.17	22.05	22.17
5	16QAM	1	24	22.12	22.11	22.00
5	16QAM	12	0	21.10	21.10	21.09
5	16QAM	12	7	20.98	20.90	20.93
5	16QAM	12	13	20.79	20.70	20.79
5	16QAM	25	0	20.84	20.86	20.73
5	64QAM	1	0	21.99	21.98	21.99
5	64QAM	1	12	22.00	21.93	22.00
5	64QAM	1	24	21.99	21.93	21.94
5	64QAM	12	0	21.05	20.94	20.99
5	64QAM	12	7	21.06	21.02	21.04
5	64QAM	12	13	20.94	20.89	20.95
5	64QAM	25	0	20.92	20.93	20.86



LTE Band 26						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				26705	26740	26775
Frequency (MHz)				815.5	819.0	822.5
3	QPSK	1	0	22.73	22.71	22.72
3	QPSK	1	8	22.66	22.55	22.60
3	QPSK	1	14	22.49	22.42	22.49
3	QPSK	8	0	21.85	21.86	21.82
3	QPSK	8	4	21.76	21.68	21.71
3	QPSK	8	7	21.76	21.68	21.72
3	QPSK	15	0	21.62	21.63	21.58
3	16QAM	1	0	22.22	22.20	22.10
3	16QAM	1	8	22.15	22.07	22.03
3	16QAM	1	14	22.05	21.93	22.05
3	16QAM	8	0	21.06	21.08	20.97
3	16QAM	8	4	20.91	20.92	20.89
3	16QAM	8	7	20.72	20.72	20.72
3	16QAM	15	0	20.82	20.72	20.71
3	64QAM	1	0	21.92	21.89	21.91
3	64QAM	1	8	21.93	21.90	21.89
3	64QAM	1	14	21.98	21.87	21.94
3	64QAM	8	0	20.97	20.97	20.92
3	64QAM	8	4	21.00	21.00	20.94
3	64QAM	8	7	20.87	20.89	20.79
3	64QAM	15	0	20.87	20.88	20.82



LTE Band 26						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				26697	26740	26783
Frequency (MHz)				814.7	819.0	823.3
1.4	QPSK	1	0	22.66	22.63	22.54
1.4	QPSK	1	3	22.59	22.47	22.48
1.4	QPSK	1	5	22.44	22.34	22.32
1.4	QPSK	3	0	21.79	21.73	21.76
1.4	QPSK	3	1	21.71	21.63	21.63
1.4	QPSK	3	3	21.69	21.68	21.58
1.4	QPSK	6	0	21.60	21.50	21.52
1.4	16QAM	1	0	22.14	22.11	22.06
1.4	16QAM	1	3	22.14	22.06	22.14
1.4	16QAM	1	5	21.98	21.96	22.00
1.4	16QAM	3	0	21.00	21.00	20.90
1.4	16QAM	3	1	20.83	20.74	20.77
1.4	16QAM	3	3	20.71	20.65	20.59
1.4	16QAM	6	0	20.81	20.72	20.71
1.4	64QAM	1	0	21.86	21.78	21.86
1.4	64QAM	1	3	21.89	21.79	21.90
1.4	64QAM	1	5	21.97	21.89	21.85
1.4	64QAM	3	0	20.96	20.95	20.90
1.4	64QAM	3	1	20.98	20.87	20.88
1.4	64QAM	3	3	20.81	20.69	20.71
1.4	64QAM	6	0	20.85	20.86	20.84



**Effective Radiated Power and Effective Isotropic Radiated Power:**

LTE Band 14				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				/		23330		/	
Frequency (MHz)				/		793		/	
				/	/	dBm	W	/	/
10	QPSK	1	0	/	/	16.31	0.043	/	/
10	QPSK	1	25	/	/	16.23	0.042	/	/
10	QPSK	1	49	/	/	16.08	0.041	/	/
10	QPSK	25	0	/	/	15.29	0.034	/	/
10	QPSK	25	12	/	/	15.22	0.033	/	/
10	QPSK	25	25	/	/	15.15	0.033	/	/
10	QPSK	50	0	/	/	15.11	0.032	/	/
10	16QAM	1	0	/	/	15.53	0.036	/	/
10	16QAM	1	25	/	/	15.42	0.035	/	/
10	16QAM	1	49	/	/	15.37	0.034	/	/
10	16QAM	25	0	/	/	14.68	0.029	/	/
10	16QAM	25	12	/	/	14.60	0.029	/	/
10	16QAM	25	25	/	/	14.53	0.028	/	/
10	16QAM	50	0	/	/	14.46	0.028	/	/
10	64QAM	1	0	/	/	15.50	0.035	/	/
10	64QAM	1	25	/	/	15.45	0.035	/	/
10	64QAM	1	49	/	/	15.36	0.034	/	/
10	64QAM	25	0	/	/	14.49	0.028	/	/
10	64QAM	25	12	/	/	14.35	0.027	/	/
10	64QAM	25	25	/	/	14.25	0.027	/	/
10	64QAM	50	0	/	/	14.19	0.026	/	/



LTE Band 14				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				23205		23230		23255	
Frequency (MHz)				779.5		782		784.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	16.23	0.042	16.29	0.043	16.22	0.042
5	QPSK	1	12	16.18	0.041	16.20	0.042	16.12	0.041
5	QPSK	1	24	16.02	0.040	16.06	0.040	15.96	0.039
5	QPSK	12	0	15.24	0.033	15.25	0.033	15.16	0.033
5	QPSK	12	7	15.17	0.033	15.20	0.033	15.11	0.032
5	QPSK	12	13	15.09	0.032	15.11	0.032	15.02	0.032
5	QPSK	25	0	15.04	0.032	15.09	0.032	15.01	0.032
5	16QAM	1	0	15.46	0.035	15.51	0.036	15.38	0.035
5	16QAM	1	12	15.36	0.034	15.39	0.035	15.28	0.034
5	16QAM	1	24	15.34	0.034	15.33	0.034	15.25	0.033
5	16QAM	12	0	14.64	0.029	14.66	0.029	14.56	0.029
5	16QAM	12	7	14.53	0.028	14.58	0.029	14.51	0.028
5	16QAM	12	13	14.46	0.028	14.49	0.028	14.41	0.028
5	16QAM	25	0	14.40	0.028	14.44	0.028	14.36	0.027
5	64QAM	1	0	15.46	0.035	15.46	0.035	15.39	0.035
5	64QAM	1	12	15.39	0.035	15.42	0.035	15.31	0.034
5	64QAM	1	24	15.29	0.034	15.35	0.034	15.25	0.033
5	64QAM	12	0	14.44	0.028	14.48	0.028	14.36	0.027
5	64QAM	12	7	14.25	0.027	14.32	0.027	14.23	0.026
5	64QAM	12	13	14.19	0.026	14.23	0.026	14.14	0.026
5	64QAM	25	0	14.13	0.026	14.17	0.026	14.08	0.026



LTE Band 26				Measured E.R.P.			
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.	Middle Ch. / Freq.		High Ch. / Freq.
Channel				/	26740		/
Frequency (MHz)				/	819		/
				/	dBm	W	/
10	QPSK	1	0	/	19.59	0.091	/
10	QPSK	1	25	/	19.52	0.090	/
10	QPSK	1	49	/	19.36	0.086	/
10	QPSK	25	0	/	18.67	0.074	/
10	QPSK	25	12	/	18.59	0.072	/
10	QPSK	25	25	/	18.55	0.072	/
10	QPSK	50	0	/	18.47	0.070	/
10	16QAM	1	0	/	19.10	0.081	/
10	16QAM	1	25	/	18.98	0.079	/
10	16QAM	1	49	/	18.88	0.077	/
10	16QAM	25	0	/	17.86	0.061	/
10	16QAM	25	12	/	17.78	0.060	/
10	16QAM	25	25	/	17.61	0.058	/
10	16QAM	50	0	/	17.61	0.058	/
10	64QAM	1	0	/	18.77	0.075	/
10	64QAM	1	25	/	18.77	0.075	/
10	64QAM	1	49	/	18.76	0.075	/
10	64QAM	25	0	/	17.87	0.061	/
10	64QAM	25	12	/	17.88	0.061	/
10	64QAM	25	25	/	17.77	0.060	/
10	64QAM	50	0	/	17.69	0.059	/





LTE Band 26				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				26715		26740		26765	
Frequency (MHz)				816.5		819.0		821.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	19.52	0.090	19.41	0.087	19.48	0.089
5	QPSK	1	12	19.48	0.089	19.42	0.087	19.44	0.088
5	QPSK	1	24	19.28	0.085	19.26	0.084	19.21	0.083
5	QPSK	12	0	18.64	0.073	18.64	0.073	18.55	0.072
5	QPSK	12	7	18.58	0.072	18.46	0.070	18.50	0.071
5	QPSK	12	13	18.52	0.071	18.45	0.070	18.46	0.070
5	QPSK	25	0	18.44	0.070	18.39	0.069	18.40	0.069
5	16QAM	1	0	19.04	0.080	19.04	0.080	19.05	0.080
5	16QAM	1	12	18.92	0.078	18.80	0.076	18.92	0.078
5	16QAM	1	24	18.87	0.077	18.86	0.077	18.75	0.075
5	16QAM	12	0	17.85	0.061	17.85	0.061	17.84	0.061
5	16QAM	12	7	17.73	0.059	17.65	0.058	17.68	0.059
5	16QAM	12	13	17.54	0.057	17.45	0.056	17.54	0.057
5	16QAM	25	0	17.59	0.057	17.61	0.058	17.48	0.056
5	64QAM	1	0	18.74	0.075	18.73	0.075	18.74	0.075
5	64QAM	1	12	18.75	0.075	18.68	0.074	18.75	0.075
5	64QAM	1	24	18.74	0.075	18.68	0.074	18.69	0.074
5	64QAM	12	0	17.80	0.060	17.69	0.059	17.74	0.059
5	64QAM	12	7	17.81	0.060	17.77	0.060	17.79	0.060
5	64QAM	12	13	17.69	0.059	17.64	0.058	17.70	0.059
5	64QAM	25	0	17.67	0.058	17.68	0.059	17.61	0.058



LTE Band 26				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				26705		26740		26775	
Frequency (MHz)				815.5		819.0		822.5	
				dBm	W	dBm	W	dBm	W
3	QPSK	1	0	19.48	0.089	19.46	0.088	19.47	0.089
3	QPSK	1	8	19.41	0.087	19.30	0.085	19.35	0.086
3	QPSK	1	14	19.24	0.084	19.17	0.083	19.24	0.084
3	QPSK	8	0	18.60	0.072	18.61	0.073	18.57	0.072
3	QPSK	8	4	18.51	0.071	18.43	0.070	18.46	0.070
3	QPSK	8	7	18.51	0.071	18.43	0.070	18.47	0.070
3	QPSK	15	0	18.37	0.069	18.38	0.069	18.33	0.068
3	16QAM	1	0	18.97	0.079	18.95	0.079	18.85	0.077
3	16QAM	1	8	18.90	0.078	18.82	0.076	18.78	0.076
3	16QAM	1	14	18.80	0.076	18.68	0.074	18.80	0.076
3	16QAM	8	0	17.81	0.060	17.83	0.061	17.72	0.059
3	16QAM	8	4	17.66	0.058	17.67	0.058	17.64	0.058
3	16QAM	8	7	17.47	0.056	17.47	0.056	17.47	0.056
3	16QAM	15	0	17.57	0.057	17.47	0.056	17.46	0.056
3	64QAM	1	0	18.67	0.074	18.64	0.073	18.66	0.073
3	64QAM	1	8	18.68	0.074	18.65	0.073	18.64	0.073
3	64QAM	1	14	18.73	0.075	18.62	0.073	18.69	0.074
3	64QAM	8	0	17.72	0.059	17.72	0.059	17.67	0.058
3	64QAM	8	4	17.75	0.060	17.75	0.060	17.69	0.059
3	64QAM	8	7	17.62	0.058	17.64	0.058	17.54	0.057
3	64QAM	15	0	17.62	0.058	17.63	0.058	17.57	0.057



LTE Band 26				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				26697		26740		26783	
Frequency (MHz)				814.7		819.0		823.3	
				dBm	W	dBm	W	dBm	W
1.4	QPSK	1	0	19.41	0.087	19.38	0.087	19.29	0.085
1.4	QPSK	1	3	19.34	0.086	19.22	0.084	19.23	0.084
1.4	QPSK	1	5	19.19	0.083	19.09	0.081	19.07	0.081
1.4	QPSK	3	0	18.54	0.071	18.48	0.070	18.51	0.071
1.4	QPSK	3	1	18.46	0.070	18.38	0.069	18.38	0.069
1.4	QPSK	3	3	18.44	0.070	18.43	0.070	18.33	0.068
1.4	QPSK	6	0	18.35	0.068	18.25	0.067	18.27	0.067
1.4	16QAM	1	0	18.89	0.077	18.86	0.077	18.81	0.076
1.4	16QAM	1	3	18.89	0.077	18.81	0.076	18.89	0.077
1.4	16QAM	1	5	18.73	0.075	18.71	0.074	18.75	0.075
1.4	16QAM	3	0	17.75	0.060	17.75	0.060	17.65	0.058
1.4	16QAM	3	1	17.58	0.057	17.49	0.056	17.52	0.056
1.4	16QAM	3	3	17.46	0.056	17.40	0.055	17.34	0.054
1.4	16QAM	6	0	17.56	0.057	17.47	0.056	17.46	0.056
1.4	64QAM	1	0	18.61	0.073	18.53	0.071	18.61	0.073
1.4	64QAM	1	3	18.64	0.073	18.54	0.071	18.65	0.073
1.4	64QAM	1	5	18.72	0.074	18.64	0.073	18.60	0.072
1.4	64QAM	3	0	17.71	0.059	17.70	0.059	17.65	0.058
1.4	64QAM	3	1	17.73	0.059	17.62	0.058	17.63	0.058
1.4	64QAM	3	3	17.56	0.057	17.44	0.055	17.46	0.056
1.4	64QAM	6	0	17.60	0.058	17.61	0.058	17.59	0.057

## 2.2. Radiated Spurious Emissions

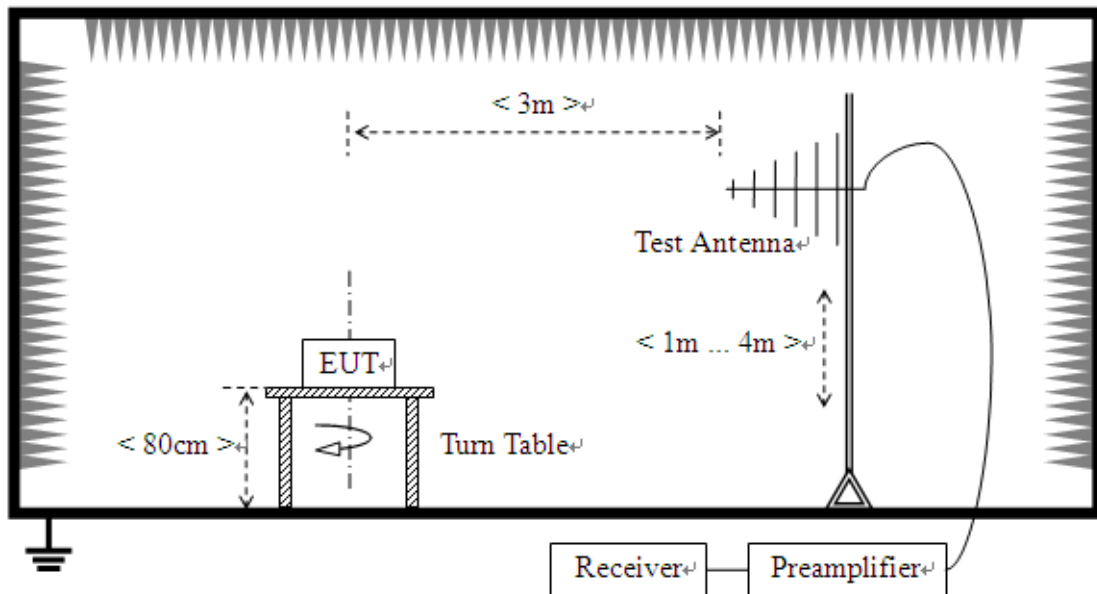
### 2.2.1. Requirement

According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43+10*\log(P)$ dB. This calculated to be -13dBm.

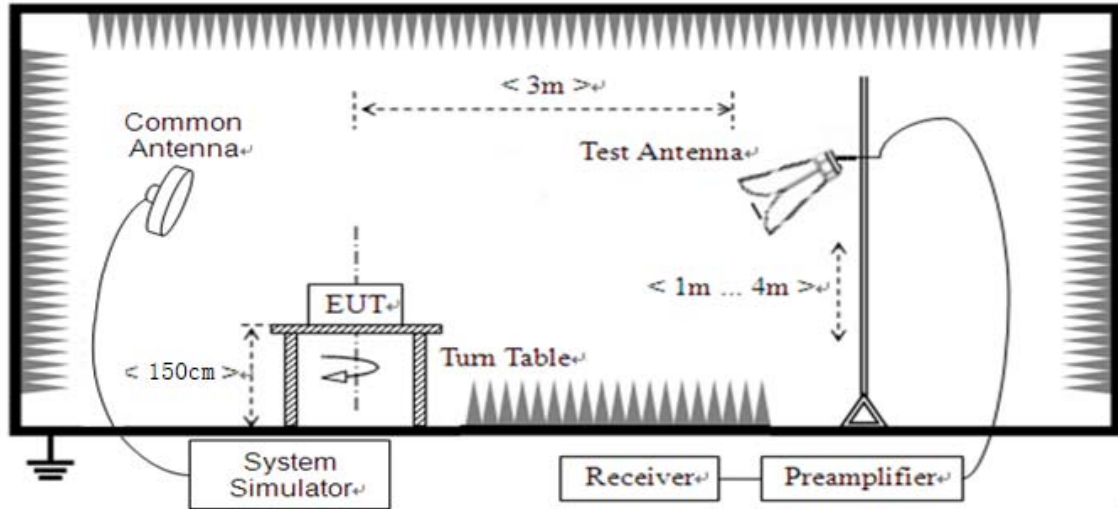
Additional requirement for Band 14

According to FCC section 90.543(f), for operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. This calculated to be -40dBm.

### 2.2.2. Test Description



(For the test frequency from 30MHz to1GHz)



(For the test frequency above 1GHz)

The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading. A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360° to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

**Note:** when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

### 2.2.3. Test procedure

KDB 971168 D01v03 Section 5.8 and ANSI/TIA-603-E-2016.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements.



#### 2.2.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST\_TX}} - P_{\text{SUBST\_RX}} - L_{\text{SUBST\_CABLES}} + G_{\text{SUBST\_TX\_ANT}}$$

$$A_{\text{TOT}} = L_{\text{CABLES}} + A_{\text{SUBST}}$$

Where  $A_{\text{SUBST}}$  is the final substitution correction including receive antenna gain.

$P_{\text{SUBST\_TX}}$  is signal generator level,

$P_{\text{SUBST\_RX}}$  is receiver level,

$L_{\text{SUBST\_CABLES}}$  is cable losses including TX cable,

$G_{\text{SUBST\_TX\_ANT}}$  is substitution antenna gain.

$A_{\text{TOT}}$  is total correction factor including cable loss and substitution correction

During the test, the data of  $A_{\text{TOT}}$  was added in the test spectrum analyze, so spectrum analyze reading is the final values which contain the data of  $A_{\text{TOT}}$ .

**Note 1:** The power of the EUT transmitting frequency should be ignored.

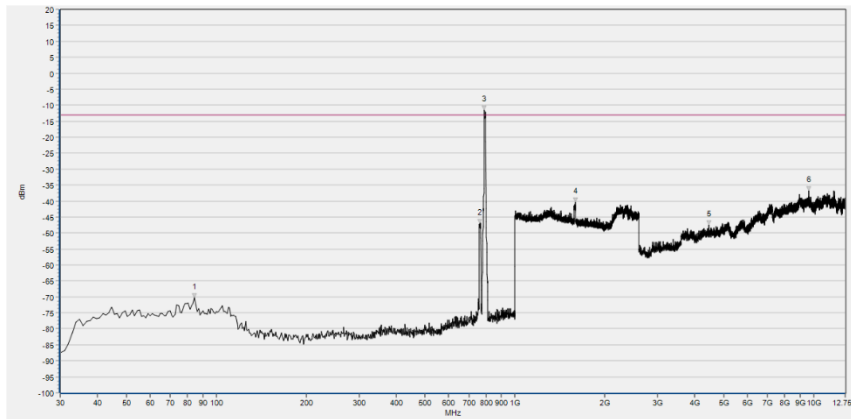
**Note 2:** All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

**Note 3:** All bandwidth and modulation were considered and evaluated respectively by performing full test for each band, only the worst cases (Max Bandwidth and QPSK mode) were recorded in this test report.

**Note 4:** N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.



LTE Band 14, 5MHz BW, Mid Channel, QPSK



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	84.374	-70.36	-13.00	Horizontal	PASS
2	764.054	-47.11	-13.00	Horizontal	N/A
3	789.299	-11.50	-13.00	Horizontal	N/A
4	1594.331	-40.39	-13.00	Horizontal	PASS
5	4457.822	-47.55	-13.00	Horizontal	PASS
6	9649.570	-36.84	-13.00	Horizontal	PASS



## Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test Items	Uncertainty
Output Power	$\pm 2.22$ dB
Equivalent Isotropic Radiated Power	$\pm 2.22$ dB
Radiated Spurious Emissions	$\pm 6$ dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .





## Annex B Testing Laboratory Information

### 1. Identification of the Responsible Testing Laboratory

<b>Laboratory Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Laboratory Address:</b>	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
<b>Telephone:</b>	+86 755 36698555
<b>Facsimile:</b>	+86 755 36698525

### 2. Identification of the Responsible Testing Location

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Address:</b>	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

### 3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.



#### 4. Test Equipments Utilized

##### 4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Power Splitter	NW521	1506A	Weinschel	N/A	N/A
Attenuator 1	(N/A.)	10dB	Resnet	N/A	N/A
Attenuator 2	(N/A.)	3dB	Resnet	N/A	N/A
EXA Signal Analyzer	MY51511149	N9020A	Agilent	2020.07.27	2021.07.26
				2021.07.26	2022.07.25
USB Power Sensor	MY54210011	U2021XA	Agilent	2020.10.23	2021.10.22
System Simulator	6200995016	MT8820C	Anritsu	2020.10.28	2021.10.27
System Simulator	6261830572	MT8821C	Anritsu	2021.02.25	2022.02.24
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial Cable	CB02	RF02	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Temperature Chamber	20171112102	HZ-2019	Dongguan Lixian Instrument Technology Co., Ltd	2020.10.26	2021.10.25
Computer	T430i	Think Pad	Lenovo	N/A	N/A

##### 4.2 List of Software Used

Description	Manufacturer	Software Version
Morlab FCC Test System	MORLAB	V2.8
MORLAB EMCR V1.2	MORLAB	V1.0



**4.3 Radiated Test Equipments**

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
System Simulator	152038	CMW500	R&S	2020.11.19	2021.11.18
System Simulator	6200995016	MT8820C	Anritsu	2020.10.28	2021.10.27
Receiver	MY54130016	N9038A	Agilent	2020.07.21	2021.07.20
				2021.07.16	2022.07.15
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2019.07.26	2022.07.25
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2019.07.26	2022.07.25
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-40GHz)	CB05	EMC05	Morlab	N/A	N/A
1-18GHz pre-Amplifier	61171/61172	S020180L3203	Tonscend	2020.07.21	2021.07.20
				2021.07.15	2022.07.14
18-26.5GHz pre-Amplifier	46732	S10M100L3802	Tonscend	2020.07.21	2021.07.20
				2021.07.15	2022.07.14
26-40GHz pre-Amplifier	56774	S40M400L4002	Tonscend	2020.07.21	2021.07.20
				2021.07.15	2022.07.14
Notch Filter	N/A	WRCGV-LTE 14	Wainwright	2020.07.21	2021.07.20
				2021.07.15	2022.07.14
Notch Filter	N/A	WRCGV-LTE 26	Wainwright	2020.07.21	2021.07.20
				2021.07.15	2022.07.14



REPORT No.: SZ21050064W07

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Anechoic Chamber	N/A	9m*6m*6m	CRT	2019.07.13	2022.07.12

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