



TEST REPORT

APPLICANT : Xiamen Four-Faith Communication
Technology Co., Ltd.

PRODUCT NAME : IoT RTU IP Camera

MODEL NAME : F-SC241

BRAND NAME : Four-Faith

FCC ID : 2A8OE-F-SC241

STANDARD(S) : 47 CFR Part 2
47 CFR Part 24, Subpart E
47 CFR Part 27, Subpart L

RECEIPT DATE : 2022-09-15

TEST DATE : 2022-09-22 to 2022-09-28

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Edited by: Peng Mi
Peng Mi (Rapporteur)

Approved by: Shen Junsheng
Shen Junsheng (Supervisor)

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Change History		
Version	Date	Reason for change
1.0	2022-11-21	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Xiamen Four-Faith Communication Technology Co., Ltd.
Applicant Address:	11th Floor, A-06 Area, No.370, Chengyi Street, Jimei District, Xiamen City, Fujian Province, China
Manufacturer:	Xiamen Four-Faith Communication Technology Co., Ltd.
Manufacturer Address:	11th Floor, A-06 Area, No.370, Chengyi Street, Jimei District, Xiamen City, Fujian Province, China

1.2. Equipment Under Test (EUT) Description

Product Name:	IoT RTU IP Camera	
Sample No.:	3#	
Hardware Version:	V1.0.1.0	
Software Version:	FFIPC_11.1.0.6-r29	
Modulation Type:	QPSK, 16QAM, 64QAM, 256QAM	
Carrier Aggregation:	Not Support	
Operation Band:	Band 2 / 4	
Frequency Range:	LTE Band 2	Tx: 1850MHz–1910MHz
		Rx: 1930MHz–1990MHz
	LTE Band 4	Tx: 1710MHz–1755MHz
		Rx: 2110MHz–2155MHz
Channel Bandwidth:	LTE Band 2	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
	LTE Band 4	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
Antenna Type:	Fixed External Antenna	
Antenna Gain:	LTE Band 2	2.42dBi
	LTE Band 4	0.75dBi

Note 1: The test results of all conducted test items please refer to the module FCC test report (FCC ID: ZMOFM160NA, Report No.: SUZR/2022/1002201), which issued on May 16, 2022 by SGS-CSTC Standards Technical Services (Suzhou) Co.,Ltd. We only recorded the radiated test result 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.

LTE Band 2		Maximum E.R.P./E.I.R.P. (W)			
BW(MHz)	QPSK	16QAM	64QAM	256QAM	
20	0.447	0.378	0.290	0.144	
15	0.440	0.361	0.285	0.145	
10	0.443	0.366	0.302	0.146	
5	0.444	0.372	0.294	0.147	
3	0.439	0.359	0.294	0.145	
1.4	0.436	0.359	0.363	0.144	
LTE Band 4		Maximum E.R.P./E.I.R.P. (W)			
BW(MHz)	QPSK	16QAM	64QAM	256QAM	
20	0.173	0.161	0.115	0.056	
15	0.173	0.144	0.118	0.060	
10	0.173	0.149	0.121	0.059	
5	0.173	0.147	0.126	0.058	
3	0.173	0.152	0.121	0.059	
1.4	0.173	0.146	0.122	0.058	



1.4. Test Standards and Results

The objective of the report is to perform testing according to Part 2, Part 22, Part 24 and Part 27 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 24	Personal Communications Services
3	47 CFR Part 27	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 24.232(c) 27.50(d)(4)	Transmitter Conducted Output Power	N/A	N/A	N/A ^{Note1}	N/A
2.1046 24.232(c) 27.50(d)(4)	Transmitter Radiated Power (EIPR/E.R.P.)	Sep. 22, 2022	Li Huaijie	PASS	No deviation
2.1049	Occupied Bandwidth	N/A	N/A	N/A ^{Note1}	N/A
2.1055 22.355 24.235 27.54	Frequency Stability	N/A	N/A	N/A ^{Note1}	N/A
24.232(d), 27.50(d)(5)	Peak to Average Radio	N/A	N/A	N/A ^{Note1}	N/A
2.1051 24.238(a) 27.53(h)	Conducted Spurious Emissions	N/A	N/A	N/A ^{Note1}	N/A
2.1051 24.238(a) 27.53(h)	Band Edge	N/A	N/A	N/A ^{Note1}	N/A
2.1051	Radiated	Sep. 28, 2022	Gao Jianrou	PASS	No deviation



24.238(a) 27.53(h)	Spurious Emissions				
<p>Note 1: The test results of all conducted test items please refer to the module FCC test report (FCC ID: ZMOFM160NA, Report No.: SUZR/2022/1002201), which issued on May 16, 2022 by SGS-CSTC Standards Technical Services (Suzhou) Co.,Ltd. We only recorded the radiated test result in this report.</p> <p>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.</p> <p>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.</p>					

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 24E, Part 27 L Requirements

2.1.E.R.P./E.I.R.P.

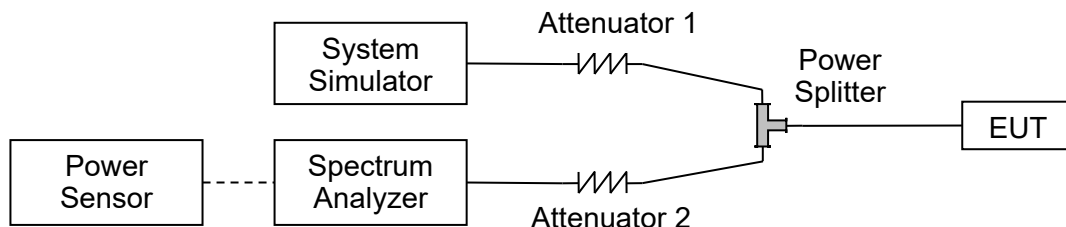
2.1.1. Requirement

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 24.232 (c) for LTE Band 2, Mobile and portable stations are limited to 2 watts E.I.R.P. and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to FCC section 27.50 (d)(4) for LTE Band 4, Fixed, mobile and portable (hand-held) stations in the 1710-1755MHz band are limited to 1wat E.I.R.P.

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.

E.I.R.P. (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

E.R.P. (dBm) = E.I.R.P. (dBm) - 2.15



2.1.4. Result

Effective Radiated Power and Effective Isotropic Radiated Power

LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18700		18900		19100	
Frequency (MHz)				1860		1880		1900	
				dBm	W	dBm	W	dBm	W
20	QPSK	1	0	26.50	0.447	26.38	0.435	26.40	0.437
20	QPSK	1	49	26.41	0.438	26.35	0.432	26.23	0.420
20	QPSK	1	99	26.46	0.443	25.92	0.391	26.15	0.412
20	QPSK	100	0	25.38	0.345	25.32	0.340	25.31	0.340
20	16QAM	1	0	25.28	0.337	25.32	0.340	25.13	0.326
20	16QAM	1	49	25.41	0.348	25.77	0.378	25.41	0.348
20	16QAM	1	99	25.44	0.350	24.92	0.310	25.40	0.347
20	16QAM	100	0	24.38	0.274	24.33	0.271	24.30	0.269
20	64QAM	1	0	24.45	0.279	24.63	0.290	23.95	0.248
20	64QAM	1	49	24.36	0.273	24.39	0.275	24.22	0.264
20	64QAM	1	99	24.48	0.281	24.01	0.252	24.51	0.282
20	64QAM	100	0	23.41	0.219	23.35	0.216	23.35	0.216
20	256QAM	1	0	21.39	0.138	21.38	0.137	21.30	0.001
20	256QAM	1	49	21.28	0.134	21.58	0.144	21.34	0.001
20	256QAM	1	99	21.38	0.137	21.36	0.137	21.24	0.001
20	256QAM	100	0	21.42	0.139	21.41	0.138	21.30	0.001



LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18675		18900		19125	
Frequency (MHz)				1857.5		1880		1902.5	
				dBm	W	dBm	W	dBm	W
15	QPSK	1	0	26.35	0.432	25.38	0.345	25.05	0.320
15	QPSK	1	38	26.40	0.437	26.43	0.440	26.24	0.421
15	QPSK	1	74	26.29	0.426	26.23	0.420	26.22	0.419
15	QPSK	75	0	25.37	0.344	25.38	0.345	25.19	0.330
15	16QAM	1	0	25.41	0.348	25.57	0.361	25.20	0.331
15	16QAM	1	38	25.44	0.350	25.51	0.356	25.33	0.341
15	16QAM	1	74	25.45	0.351	25.30	0.339	25.42	0.348
15	16QAM	75	0	24.40	0.275	24.36	0.273	24.31	0.270
15	64QAM	1	0	24.55	0.285	24.38	0.274	24.35	0.272
15	64QAM	1	38	24.40	0.275	24.55	0.285	24.35	0.272
15	64QAM	1	74	24.52	0.283	24.29	0.269	24.30	0.269
15	64QAM	75	0	23.39	0.218	23.40	0.219	23.32	0.215
15	256QAM	1	0	21.41	0.138	21.36	0.137	21.27	0.001
15	256QAM	1	37	21.40	0.138	21.61	0.145	21.37	0.001
15	256QAM	1	74	21.37	0.137	21.42	0.139	21.38	0.001
15	256QAM	75	0	21.43	0.139	21.26	0.134	21.32	0.001



LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18650		18900		19150	
Frequency (MHz)				1855		1880		1905	
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	26.39	0.436	26.42	0.439	26.27	0.424
10	QPSK	1	24	26.46	0.443	26.43	0.440	26.38	0.435
10	QPSK	1	49	26.40	0.437	26.25	0.422	26.35	0.432
10	QPSK	50	0	25.51	0.356	25.41	0.348	25.42	0.348
10	16QAM	1	0	25.60	0.363	25.48	0.353	25.33	0.341
10	16QAM	1	24	25.50	0.355	25.63	0.366	25.33	0.341
10	16QAM	1	49	25.47	0.352	25.48	0.353	25.36	0.344
10	16QAM	50	0	24.53	0.284	24.37	0.274	24.38	0.274
10	64QAM	1	0	24.57	0.286	24.80	0.302	24.38	0.274
10	64QAM	1	24	24.53	0.284	24.74	0.298	24.70	0.295
10	64QAM	1	49	24.58	0.287	24.43	0.277	24.53	0.284
10	64QAM	50	0	23.49	0.223	23.46	0.222	23.38	0.218
10	256QAM	1	0	21.58	0.144	21.57	0.144	21.36	0.001
10	256QAM	1	25	21.60	0.145	21.63	0.146	21.50	0.001
10	256QAM	1	49	21.49	0.141	21.51	0.142	21.34	0.001
10	256QAM	50	0	21.56	0.143	21.43	0.139	21.39	0.001



LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18625		18900		19175	
Frequency (MHz)				1852.5		1880		1907.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	26.44	0.441	25.94	0.393	26.05	0.403
5	QPSK	1	12	26.47	0.444	26.43	0.440	26.32	0.429
5	QPSK	1	24	26.37	0.434	26.43	0.440	26.20	0.417
5	QPSK	25	0	25.46	0.352	25.29	0.338	25.31	0.340
5	16QAM	1	0	25.52	0.356	25.66	0.368	25.42	0.348
5	16QAM	1	12	25.61	0.364	25.57	0.361	25.35	0.343
5	16QAM	1	24	25.50	0.355	25.71	0.372	25.37	0.344
5	16QAM	25	0	24.45	0.279	24.40	0.275	24.31	0.270
5	64QAM	1	0	24.56	0.286	24.57	0.286	24.44	0.278
5	64QAM	1	12	24.69	0.294	24.64	0.291	24.56	0.286
5	64QAM	1	24	24.55	0.285	24.56	0.286	24.37	0.274
5	64QAM	25	0	23.46	0.222	23.37	0.217	23.40	0.219
5	256QAM	1	0	21.54	0.143	21.47	0.140	21.49	0.001
5	256QAM	25	0	21.47	0.140	21.42	0.139	21.42	0.001



LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18615		18900		19185	
Frequency (MHz)				1851.5		1880		1908.5	
				dBm	W	dBm	W	dBm	W
3	QPSK	1	0	26.42	0.439	25.54	0.358	25.66	0.368
3	QPSK	1	8	26.38	0.435	26.37	0.434	26.21	0.418
3	QPSK	1	14	26.33	0.430	26.24	0.421	26.13	0.410
3	QPSK	15	0	25.43	0.349	25.33	0.341	25.28	0.337
3	16QAM	1	0	25.55	0.359	25.53	0.357	25.29	0.338
3	16QAM	1	8	25.50	0.355	25.50	0.355	25.30	0.339
3	16QAM	1	14	25.45	0.351	25.35	0.343	25.35	0.343
3	16QAM	15	0	24.46	0.279	24.39	0.275	24.39	0.275
3	64QAM	1	0	24.52	0.283	24.53	0.284	24.68	0.294
3	64QAM	1	8	24.61	0.289	24.63	0.290	24.50	0.282
3	64QAM	1	14	24.43	0.277	24.55	0.285	24.31	0.270
3	64QAM	15	0	23.48	0.223	23.44	0.221	23.32	0.215
3	256QAM	1	0	21.49	0.141	21.47	0.140	21.48	0.001
3	256QAM	1	8	21.60	0.145	21.49	0.141	21.50	0.001
3	256QAM	1	14	21.41	0.138	21.33	0.136	21.34	0.001
3	256QAM	15	0	21.49	0.141	21.41	0.138	21.31	0.001



LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18607		18900		19193	
Frequency (MHz)				1850.7		1880		1909.3	
				dBm	W	dBm	W	dBm	W
1.4	QPSK	1	0	26.34	0.431	25.63	0.366	25.83	0.383
1.4	QPSK	1	2	26.39	0.436	26.35	0.432	26.26	0.423
1.4	QPSK	1	5	26.33	0.430	26.33	0.430	26.14	0.411
1.4	QPSK	6	0	25.46	0.352	25.40	0.347	25.30	0.339
1.4	16QAM	1	0	25.53	0.357	25.44	0.350	25.38	0.345
1.4	16QAM	1	3	25.54	0.358	25.55	0.359	25.29	0.338
1.4	16QAM	1	5	25.35	0.343	25.43	0.349	25.26	0.336
1.4	16QAM	6	0	24.44	0.278	24.44	0.278	24.31	0.270
1.4	64QAM	1	0	25.60	0.363	24.61	0.289	24.48	0.281
1.4	64QAM	1	3	24.57	0.286	24.47	0.280	24.35	0.272
1.4	64QAM	1	5	24.54	0.284	24.45	0.279	24.37	0.274
1.4	64QAM	6	0	23.45	0.221	23.45	0.221	23.24	0.211
1.4	256QAM	1	0	21.50	0.141	21.43	0.139	21.32	0.001
1.4	256QAM	1	3	21.43	0.139	21.57	0.144	21.41	0.001
1.4	256QAM	1	5	21.54	0.143	21.59	0.144	21.34	0.001
1.4	256QAM	6	0	21.48	0.141	21.38	0.137	21.36	0.001



LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				20050		20175		20300	
Frequency (MHz)				1720		1732.5		1745	
				dBm	W	dBm	W	dBm	W
20	QPSK	1	0	22.18	0.165	21.30	0.135	22.36	0.172
20	QPSK	1	49	22.28	0.169	22.20	0.166	22.29	0.169
20	QPSK	1	99	22.38	0.173	22.38	0.173	22.34	0.171
20	QPSK	100	0	21.40	0.138	21.41	0.138	21.46	0.140
20	16QAM	1	0	21.35	0.136	21.41	0.138	21.43	0.139
20	16QAM	1	49	21.71	0.148	21.51	0.142	22.06	0.161
20	16QAM	1	99	21.58	0.144	21.53	0.142	21.76	0.150
20	16QAM	100	0	20.39	0.109	20.43	0.110	20.44	0.111
20	64QAM	1	0	20.40	0.110	20.51	0.112	20.37	0.109
20	64QAM	1	49	20.62	0.115	20.60	0.115	20.41	0.110
20	64QAM	1	99	20.62	0.115	20.45	0.111	20.57	0.114
20	64QAM	100	0	19.37	0.086	19.40	0.087	19.46	0.088
20	256QAM	1	0	17.28	0.053	17.34	0.054	17.64	0.001
20	256QAM	1	49	17.23	0.053	17.51	0.056	17.38	0.001
20	256QAM	1	99	17.52	0.056	17.51	0.056	17.36	0.001
20	256QAM	100	0	17.48	0.056	17.36	0.054	17.42	0.001



LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				20025		20175		20325	
Frequency (MHz)				1717.5		1732.5		1747.5	
				dBm	W	dBm	W	dBm	W
15	QPSK	1	0	22.15	0.164	22.30	0.170	22.35	0.172
15	QPSK	1	38	22.38	0.173	22.38	0.173	22.24	0.167
15	QPSK	1	74	22.31	0.170	22.11	0.163	22.32	0.171
15	QPSK	75	0	21.47	0.140	21.28	0.134	21.45	0.140
15	16QAM	1	0	21.39	0.138	21.50	0.141	21.42	0.139
15	16QAM	1	38	21.59	0.144	21.39	0.138	21.47	0.140
15	16QAM	1	74	21.57	0.144	21.52	0.142	21.51	0.142
15	16QAM	75	0	20.49	0.112	20.32	0.108	20.43	0.110
15	64QAM	1	0	20.36	0.109	20.51	0.112	20.60	0.115
15	64QAM	1	38	20.54	0.113	20.49	0.112	20.36	0.109
15	64QAM	1	74	20.71	0.118	20.65	0.116	20.62	0.115
15	64QAM	75	0	19.38	0.087	19.34	0.086	19.45	0.088
15	256QAM	1	0	17.53	0.057	17.50	0.056	17.60	0.001
15	256QAM	1	37	17.28	0.053	17.75	0.060	17.41	0.001
15	256QAM	1	74	17.57	0.057	17.52	0.056	17.51	0.001
15	256QAM	75	0	17.34	0.054	17.34	0.054	17.43	0.001



LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				20000		20175		20350	
Frequency (MHz)				1715		1732.5		1750	
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	22.36	0.172	22.37	0.173	22.30	0.170
10	QPSK	1	24	22.35	0.172	22.36	0.172	22.37	0.173
10	QPSK	1	49	22.33	0.171	22.30	0.170	22.25	0.168
10	QPSK	50	0	21.55	0.143	21.51	0.142	21.55	0.143
10	16QAM	1	0	21.50	0.141	21.52	0.142	21.51	0.142
10	16QAM	1	24	21.69	0.148	21.59	0.144	21.72	0.149
10	16QAM	1	49	21.44	0.139	21.59	0.144	21.53	0.142
10	16QAM	50	0	20.55	0.114	20.52	0.113	20.51	0.112
10	64QAM	1	0	20.55	0.114	20.67	0.117	20.59	0.115
10	64QAM	1	24	20.81	0.121	20.58	0.114	20.64	0.116
10	64QAM	1	49	20.63	0.116	20.73	0.118	20.66	0.116
10	64QAM	50	0	19.48	0.089	19.55	0.090	19.52	0.090
10	256QAM	1	0	17.58	0.057	17.50	0.056	17.51	0.001
10	256QAM	1	25	17.53	0.057	17.74	0.059	17.67	0.001
10	256QAM	1	49	17.48	0.056	17.49	0.056	17.41	0.001
10	256QAM	50	0	17.57	0.057	17.49	0.056	17.54	0.001



LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				19975		20175		20375	
Frequency (MHz)				1712.5		1732.5		1752.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	22.30	0.170	22.35	0.172	22.38	0.173
5	QPSK	1	12	22.37	0.173	22.10	0.162	22.37	0.173
5	QPSK	1	24	22.25	0.168	22.11	0.163	22.30	0.170
5	QPSK	25	0	21.46	0.140	21.44	0.139	21.50	0.141
5	16QAM	1	0	21.67	0.147	21.48	0.141	21.60	0.145
5	16QAM	1	12	21.53	0.142	21.55	0.143	21.61	0.145
5	16QAM	1	24	21.63	0.146	21.55	0.143	21.68	0.147
5	16QAM	25	0	20.54	0.113	20.47	0.111	20.52	0.113
5	64QAM	1	0	20.47	0.111	20.66	0.116	20.61	0.115
5	64QAM	1	12	20.78	0.120	20.72	0.118	21.00	0.126
5	64QAM	1	24	20.50	0.112	20.65	0.116	20.60	0.115
5	64QAM	25	0	19.52	0.090	19.47	0.089	19.48	0.089
5	256QAM	1	0	17.61	0.058	17.56	0.057	17.53	0.001
5	256QAM	25	0	17.45	0.056	17.39	0.055	17.55	0.001



LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				19965		20175		20385	
Frequency (MHz)				1711.5		1732.5		1753.5	
				dBm	W	dBm	W	dBm	W
3	QPSK	1	0	22.30	0.170	22.28	0.169	21.37	0.137
3	QPSK	1	8	22.24	0.167	22.38	0.173	22.38	0.173
3	QPSK	1	14	22.39	0.173	22.27	0.169	22.37	0.173
3	QPSK	15	0	21.47	0.140	21.51	0.142	21.50	0.141
3	16QAM	1	0	21.74	0.149	21.49	0.141	21.52	0.142
3	16QAM	1	8	21.67	0.147	21.52	0.142	21.81	0.152
3	16QAM	1	14	21.55	0.143	21.51	0.142	21.48	0.141
3	16QAM	15	0	20.50	0.112	20.56	0.114	20.49	0.112
3	64QAM	1	0	20.49	0.112	20.57	0.114	20.52	0.113
3	64QAM	1	8	20.62	0.115	20.62	0.115	20.77	0.119
3	64QAM	1	14	20.63	0.116	20.66	0.116	20.83	0.121
3	64QAM	15	0	19.46	0.088	19.58	0.091	19.51	0.089
3	256QAM	1	0	17.50	0.056	17.52	0.056	17.36	0.001
3	256QAM	1	8	17.62	0.058	17.70	0.059	17.69	0.001
3	256QAM	1	14	17.54	0.057	17.47	0.056	17.58	0.001
3	256QAM	15	0	17.47	0.056	17.53	0.057	17.47	0.001



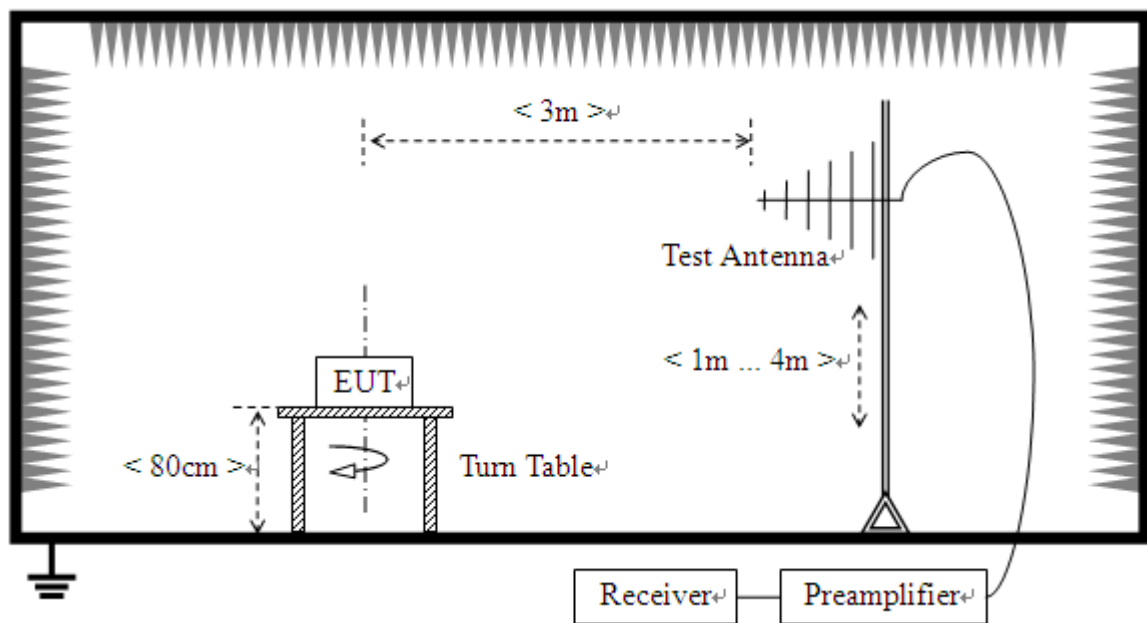
LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				19957		20175		20393	
Frequency (MHz)				1710.7		1732.5		1754.3	
				dBm	W	dBm	W	dBm	W
1.4	QPSK	1	0	22.29	0.169	22.22	0.167	22.38	0.173
1.4	QPSK	1	2	22.25	0.168	22.30	0.170	22.37	0.173
1.4	QPSK	1	5	22.35	0.172	22.24	0.167	22.15	0.164
1.4	QPSK	6	0	21.37	0.137	21.56	0.143	21.38	0.137
1.4	16QAM	1	0	21.34	0.136	21.53	0.142	21.50	0.141
1.4	16QAM	1	3	21.50	0.141	21.61	0.145	21.58	0.144
1.4	16QAM	1	5	21.64	0.146	21.52	0.142	21.42	0.139
1.4	16QAM	6	0	20.49	0.112	20.48	0.112	20.41	0.110
1.4	64QAM	1	0	20.50	0.112	20.55	0.114	20.76	0.119
1.4	64QAM	1	3	20.64	0.116	20.74	0.119	20.85	0.122
1.4	64QAM	1	5	20.57	0.114	20.57	0.114	20.46	0.111
1.4	64QAM	6	0	19.50	0.089	19.59	0.091	19.47	0.089
1.4	256QAM	1	0	17.60	0.058	17.38	0.055	17.54	0.001
1.4	256QAM	1	3	17.47	0.056	17.62	0.058	17.57	0.001
1.4	256QAM	1	5	17.65	0.058	17.44	0.055	17.39	0.001
1.4	256QAM	6	0	17.44	0.055	17.48	0.056	17.45	0.001

2.2. Radiated Spurious Emissions

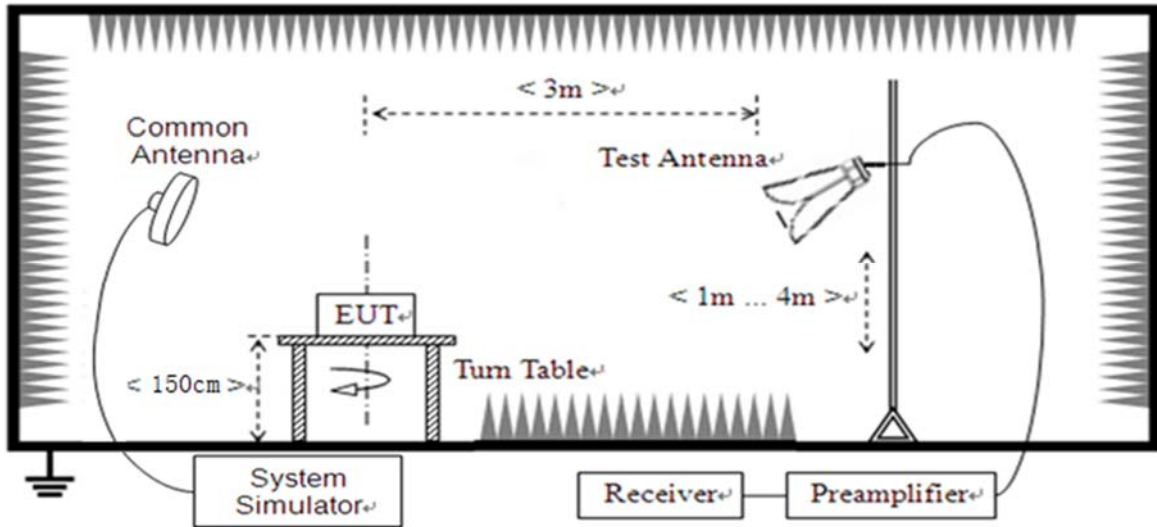
2.2.1. Requirement

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.

2.2.2. Test Description



(For the test frequency from 30MHz to 1GHz)



(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 (exclude 1559-1610 MHz) 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_{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_{TOT} is total correction factor including cable loss and substitution correction

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

Note1: The power of the EUT transmitting frequency should be ignored.

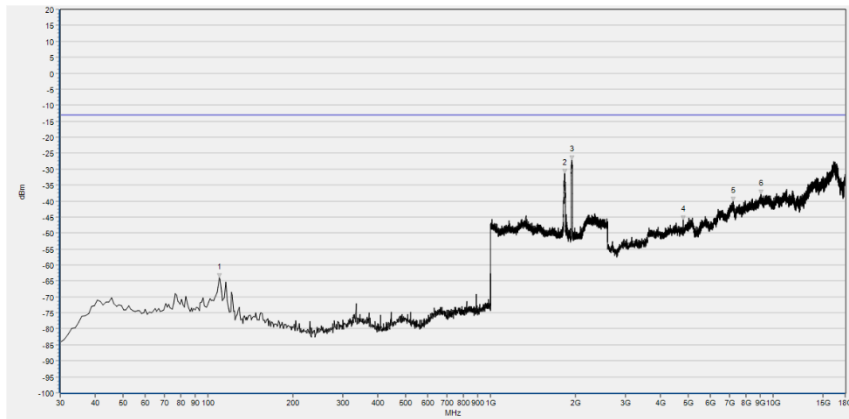
Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note3: 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.

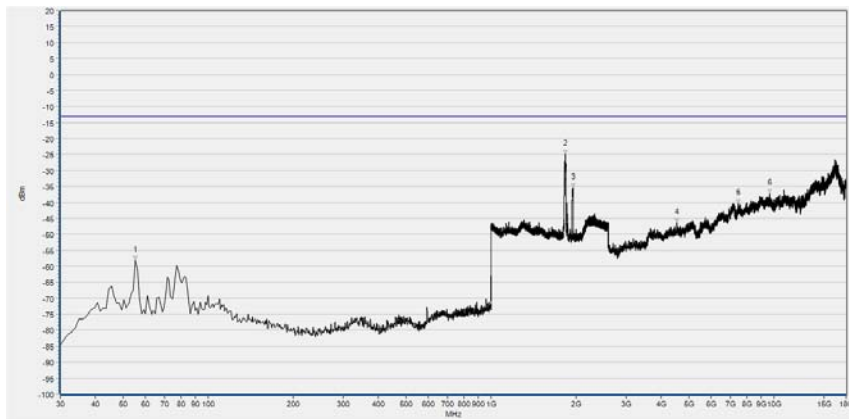
Note 4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.



LTE Band 2, 20MHz BW, Low Channel, QPSK

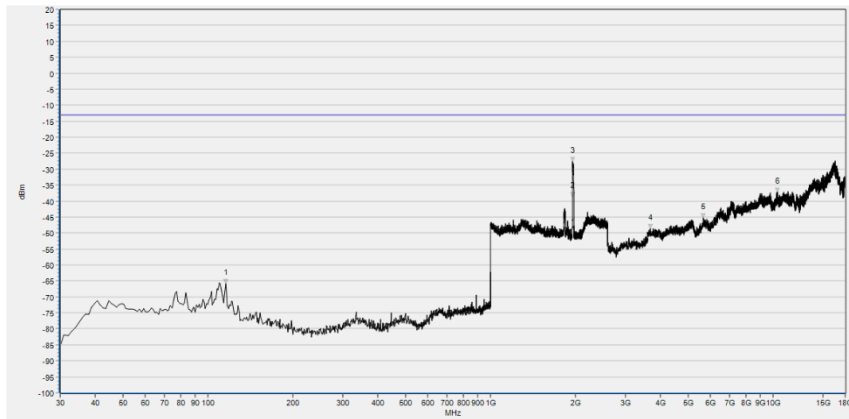


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.540	-64.00	-13.00	Horizontal	PASS
2	1831.693	-31.37	-13.00	Horizontal	N/A
3	1937.975	-27.18	-13.00	Horizontal	N/A
4	4804.001	-45.97	-13.00	Horizontal	PASS
5	7237.643	-40.01	-13.00	Horizontal	PASS
6	9060.775	-37.87	-13.00	Horizontal	PASS

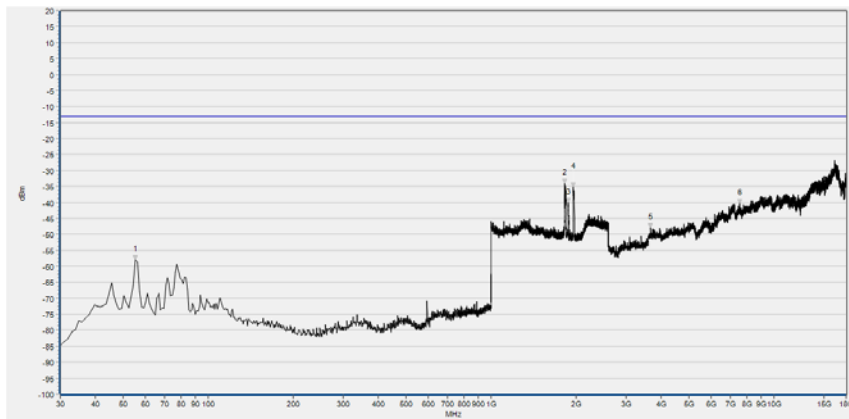


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	55.220	-58.30	-13.00	Vertical	PASS
2	1832.973	-24.96	-13.00	Vertical	N/A
3	1946.939	-35.48	-13.00	Vertical	N/A
4	4543.553	-46.35	-13.00	Vertical	PASS
5	7492.490	-40.38	-13.00	Vertical	PASS
6	9685.288	-37.18	-13.00	Vertical	PASS

LTE Band 2, 20MHz BW, Mid Channel, QPSK

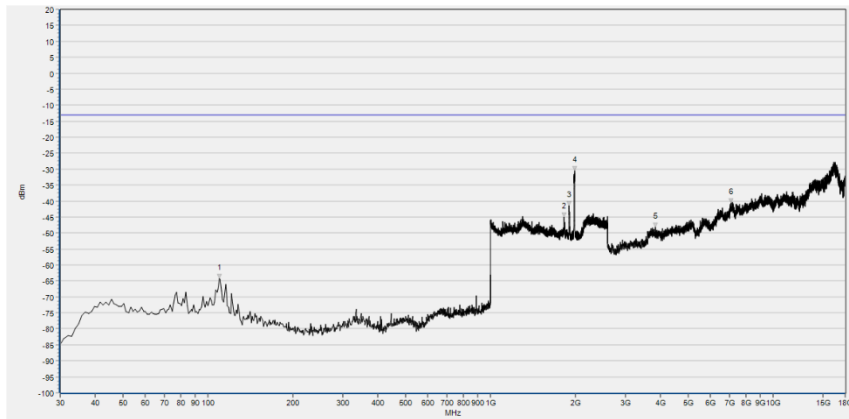


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	115.360	-65.89	-13.00	Horizontal	PASS
2	1950.140	-38.53	-13.00	Horizontal	N/A
3	1955.262	-27.64	-13.00	Horizontal	N/A
4	3669.795	-48.62	-13.00	Horizontal	PASS
5	5672.159	-45.22	-13.00	Horizontal	PASS
6	10354.610	-37.11	-13.00	Horizontal	PASS

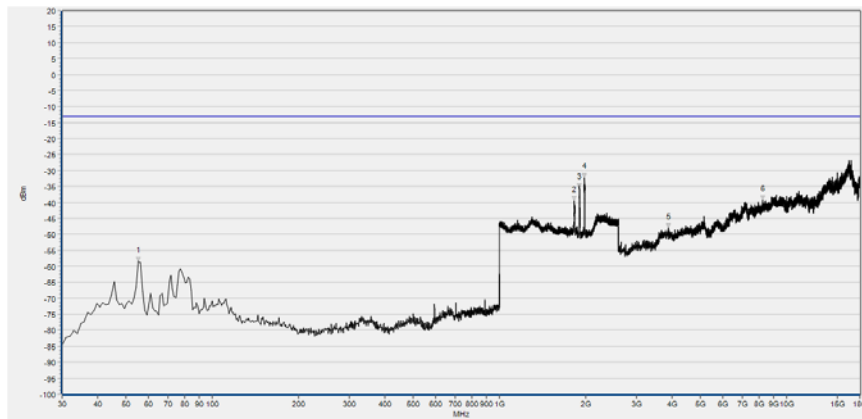


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	55.220	-58.09	-13.00	Vertical	PASS
2	1821.449	-34.06	-13.00	Vertical	PASS
3	1874.590	-40.03	-13.00	Vertical	N/A
4	1954.622	-35.19	-13.00	Vertical	N/A
5	3666.994	-47.91	-13.00	Vertical	PASS
6	7568.103	-40.35	-13.00	Vertical	PASS

LTE Band 2, 20MHz BW, High Channel, QPSK

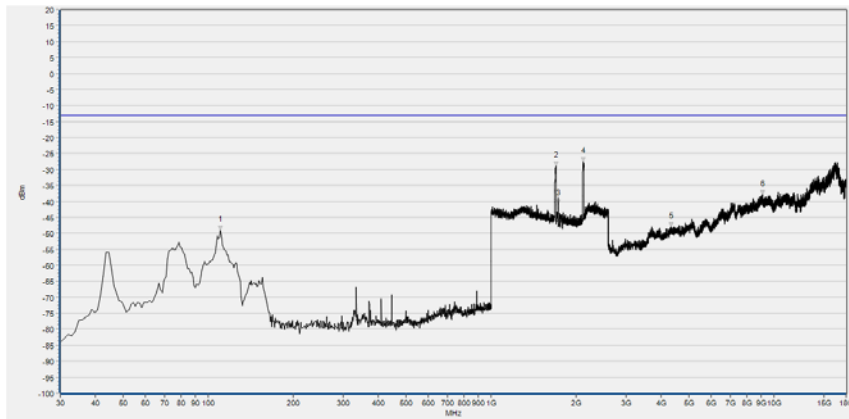


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.540	-64.18	-13.00	Horizontal	PASS
2	1824.650	-44.97	-13.00	Horizontal	PASS
3	1900.200	-41.40	-13.00	Horizontal	N/A
4	1981.513	-30.44	-13.00	Horizontal	N/A
5	3832.224	-48.21	-13.00	Horizontal	PASS
6	7086.416	-40.65	-13.00	Horizontal	PASS

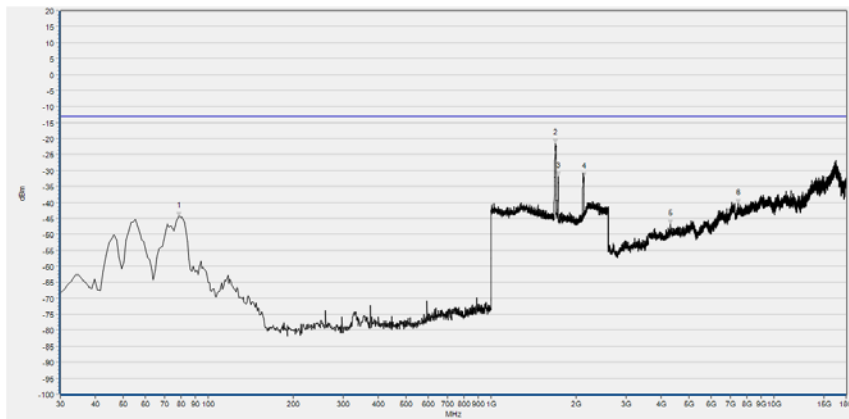


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	55.220	-58.44	-13.00	Vertical	PASS
2	1824.650	-39.47	-13.00	Vertical	PASS
3	1898.279	-35.53	-13.00	Vertical	N/A
4	1979.592	-32.34	-13.00	Vertical	N/A
5	3871.431	-47.98	-13.00	Vertical	PASS
6	8262.630	-39.30	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, Low Channel, QPSK

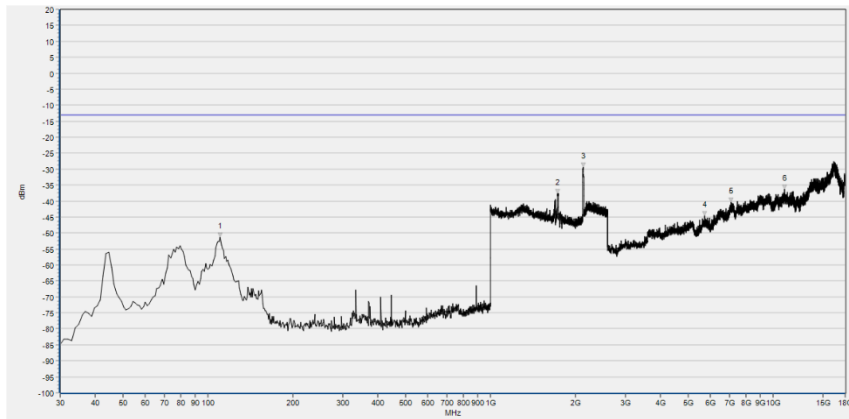


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	110.591	-49.16	-13.00	Horizontal	PASS
2	1693.147	-28.90	-13.00	Horizontal	N/A
3	1725.163	-40.80	-13.00	Horizontal	N/A
4	2119.760	-27.71	-13.00	Horizontal	N/A
5	4335.356	-48.02	-13.00	Horizontal	PASS
6	9107.585	-37.83	-13.00	Horizontal	PASS

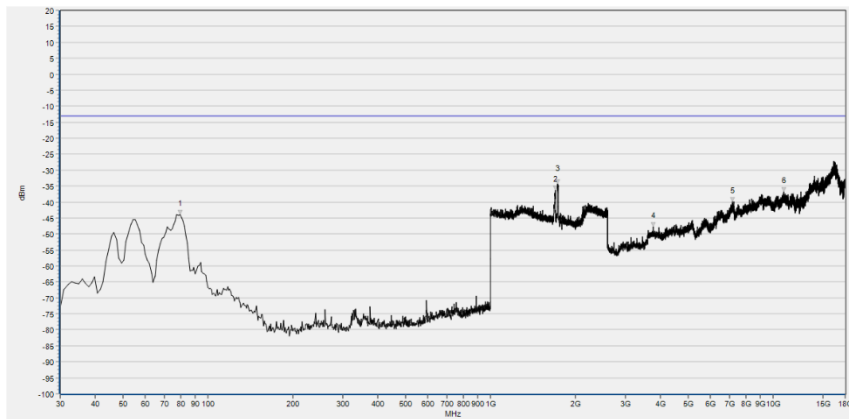


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	78.549	-44.30	-13.00	Vertical	PASS
2	1692.346	-21.61	-13.00	Vertical	N/A
3	1728.364	-31.81	-13.00	Vertical	N/A
4	2125.363	-32.15	-13.00	Vertical	N/A
5	4304.551	-46.92	-13.00	Vertical	PASS
6	7490.315	-40.43	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, Mid Channel, QPSK

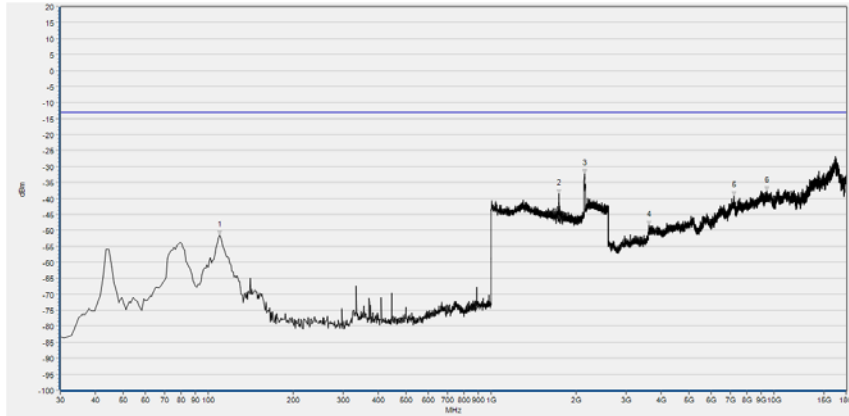


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	110.591	-51.25	-13.00	Horizontal	PASS
2	1729.965	-37.69	-13.00	Horizontal	N/A
3	2125.363	-29.35	-13.00	Horizontal	N/A
4	5734.422	-44.49	-13.00	Horizontal	PASS
5	7112.952	-40.41	-13.00	Horizontal	PASS
6	10976.429	-36.21	-13.00	Horizontal	PASS

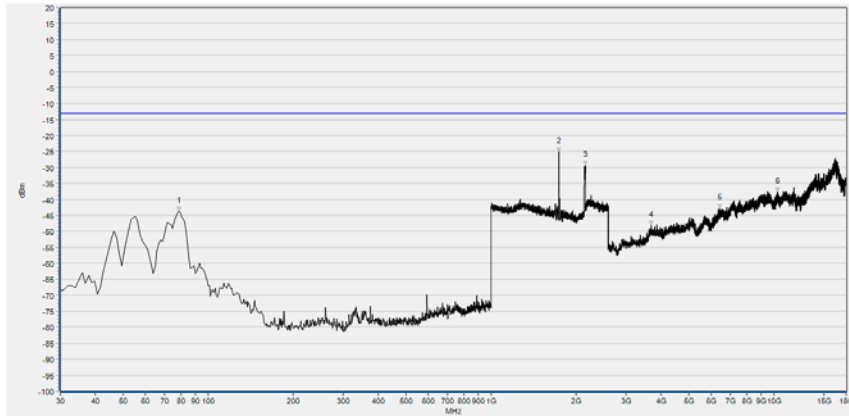


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	79.520	-43.91	-13.00	Vertical	PASS
2	1693.947	-36.31	-13.00	Vertical	N/A
3	1728.364	-34.29	-13.00	Vertical	N/A
4	3770.595	-47.65	-13.00	Vertical	PASS
5	7189.965	-39.93	-13.00	Vertical	PASS
6	10927.655	-36.67	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, High Channel, QPSK



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.620	-51.59	-13.00	Horizontal	PASS
2	1736.368	-38.62	-13.00	Horizontal	N/A
3	2136.568	-32.26	-13.00	Horizontal	N/A
4	3606.301	-48.38	-13.00	Horizontal	PASS
5	7228.471	-39.17	-13.00	Horizontal	PASS
6	9451.575	-37.74	-13.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	78.549	-43.76	-13.00	Vertical	PASS
2	1736.368	-25.21	-13.00	Vertical	N/A
3	2151.776	-29.49	-13.00	Vertical	N/A
4	3688.448	-48.13	-13.00	Vertical	PASS
5	6430.105	-42.87	-13.00	Vertical	PASS
6	10306.418	-37.69	-13.00	Vertical	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
Equivalent Isotropic Radiated Power	± 2.22 dB
Radiated Spurious Emissions	± 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

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

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	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 List of Software Used

Description	Manufacturer	Software Version
MORLAB EMCR V1.2	MORLAB	V1.0

4.2 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
System Simulator	152038	CMW500	R&S	2021.10.21	2022.10.20
System Simulator	6200995016	MT8820C	Anritsu	2021.10.21	2022.10.20
Receiver	MY54130016	N9038A	Agilent	2022.07.07	2023.07.06
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2022.02.25	2025.02.24
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2022.05.23	2025.05.24
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2022.07.13	2025.07.12
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	S020180L32 03	Tonscend	2022.07.08	2023.07.07
18-26.5GHz pre-Amplifier	46732	S10M100L38 02	Tonscend	2022.07.08	2023.07.07
26-40GHz pre-Amplifier	56774	S40M400L40 02	Tonscend	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE B2	Wainwright	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE B4	Wainwright	2022.07.08	2023.07.07



Notch Filter	N/A	WRCGV -LTE B5	Wainwright	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE B12	Wainwright	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE B13	Wainwright	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE B66	Wainwright	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE 71	Wainwright	2022.07.08	2023.07.07
Anechoic Chamber	N/A	9m*6m*6m	CRT	2020.01.06	2023.01.05

_____ END OF REPORT _____