



FCC TEST REPORT

Test report
On Behalf of
Shenzhen Guli Tech Co., Ltd
For
GuliKit KingKong PRO Controller

Model No.: NS09, NS08
FCC ID: 2AQNP-NS09

Prepared for: Shenzhen Guli Tech Co., Ltd

A603, G4 building, TCL International E-city, Nanshan District, Shenzhen, 518052,

China

Prepared By: Shenzhen HUAK Testing Technology Co., Ltd.

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Bao'an District, Shenzhen City, China

Date of Test: Nov. 05, 2019 ~Nov. 11, 2019

Date of Report: Nov. 11, 2019

Report Number: HK1910282792-1E



TEST RESULT CERTIFICATION

Applicant's name:	Shenzhen Guli Tech Co., Ltd.
Address:	A603, G4 building, TCL International E-city, Nanshan District, Shenzhen, 518052, China
Manufacture's Name:	Shenzhen Guli Tech Co., Ltd.
Address:	A603, G4 building, TCL International E-city, Nanshan District, Shenzhen, 518052, China
Product description	
Trade Mark:	N/A
Product name:	GuliKit KingKong PRO Controller
Model and/or type reference :	NS09, NS08
Standards:	FCC Rules and Regulations Part 15 Subpart C Section 15.249 ANSI C63.10: 2013
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Test Result....:

Pass

(Gary Qian)

Technical Manager: Edan Mu

(Eden Hu)

Authorized Signatory: Jason 2/100

(Jason Zhou)





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1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

FCC PART 15.249		
CONDUCTED EMISSIONS TEST	§15.207	PASS
RADIATED EMISSION TEST	§15.249 (a) (d)/ §15.209	PASS
out of Band Emissions	§15.249 (d)/ §15.205	PASS
OCCUPIED BANDWIDTH MEASUREMENT	§15.215 (c)	PASS
ANTENNA REQUIREMENT	§15.203	PASS

1.2 TEST FACILITY

Test Firm	:	Shenzhen HUAK Testing Technology Co., Ltd.
Address	:	1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai
		Street, Bao'an District, Shenzhen City, China
Designation Number	••	CN1229

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty		
Conducted Emission Expanded Uncertainty	II	2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.06dB, k=2



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	GuliKit KingKong PRO Controller
Model Name	NS09
Serial No	NS08
Model Difference	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: NS09
FCC ID	2AQNP-NS09
Antenna Type	PCB Antenna
Antenna Gain	0dBi
BT Operation frequency	2402-2480MHz
Number of Channels	79CH
Modulation Type	GFSK, π/4DQPSK, 8DPSK
Power Source	DC 3.7V From Battery or DC 5V from Micro USB
Power Rating	DC 3.7V From Battery or DC 5V from Micro USB





2.1.1 Carrier Frequency of Channels

Channel List									
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)				
00	2402	27	2429	54	2456				
01	2403	28	2430	55	2457				
02	2404	29	2431	56	2458				
03	2405	30	2432	57	2459				
04	2406	31	2433	58	2460				
05	2407	32	2434	59	2461				
06	2408	33	2435	60	2462				
07	2409	34	2436	61	2463				
08	2410	35	2437	62	2464				
09	2411	36	2438	63	2465				
10	2412	37	2439	64	2466				
11	2413	38	2440	65	2467				
12	2414	39	2441	66	2468				
13	2415	40	2442	67	2469				
14	2416	41	2443	68	2470				
15	2417	42	2444	69	2471				
16	2418	43	2445	70	2472				
17	2419	44	2446	71	2473				
18	2420	45	2447	72	2474				
19	2421	46	2448	73	2475				
20	2422	47	2449	74	2476				
21	2423	48	2450	75	2477				
22	2424	49	2451	76	2478				
23	2425	50	2452	77	2479				
24	2426	51	2453	78	2480				
25	2427	52	2454						
26	2428	53	2455						

2.2 Operation of EUT during testing

Operating Mode The mode is used: **Transmitting mode**

Low Channel: 2402MHz Middle Channel: 2441MHz High Channel: 2480MHz



2.3 DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing and Radiation testing:							
	AC Plug	PC		EUT			
Operation of EUT Above1GI	Hz Radiation testir	ıg:					
	EUT						
The sample was placed (0.8	Im helow 1GHz 1	5m above 1GF	dz) above	the around	nlane of 3m		

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position



2.4 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Dec. 27, 2018	1 Year
2.	Receiver	R&S	ESCI 7	HKE-010	Dec. 27, 2018	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 27, 2018	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Dec. 27, 2018	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2018	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Dec. 27, 2018	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Dec. 27, 2018	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Dec. 27, 2018	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 27, 2018	1 Year
10.	Horn Antenna	Schewarzbeck	9120D	HKE-013	Dec. 27, 2018	1 Year
11.	Pre-amplifier	EMCI	EMC051845 SE	HKE-015	Dec. 27, 2018	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Dec. 27, 2018	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	Dec. 27, 2018	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Dec. 27, 2018	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2018	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Dec. 27, 2018	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Dec. 27, 2018	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 27, 2018	3 Year
19.	Horn Antenna	Schewarzbeck	BBHA 9170	HKE-017	Dec. 27, 2018	1 Year



CONDUCTED EMISSIONS TEST

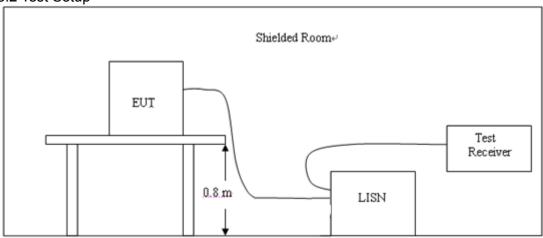
3.1 Conducted Power Line Emission Limit

For intentional device, according to § 15.207(a) Line Conducted Emission Limits is as following

Eroguanov	Maximum RF Line Voltage (dΒμV)					
Frequency (MHz)	CLAS	SS A	CLASS B			
(111112)	Q.P.	Ave.	Q.P.	Ave.		
0.15 - 0.50	79	66	66-56*	56-46*		
0.50 - 5.00	73	60	56	46		
5.00 - 30.0	73	60	60	50		

^{*} Decreasing linearly with the logarithm of the frequency

3.2 Test Setup



3.3 Test Procedure

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4,If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hzpower through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

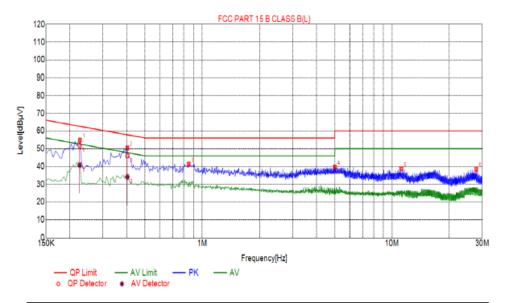


3.4 Test Result

PASS

All the test modes completed for test. only the worst result of GFSK High Channel was reported as below:

Test Specification: Line



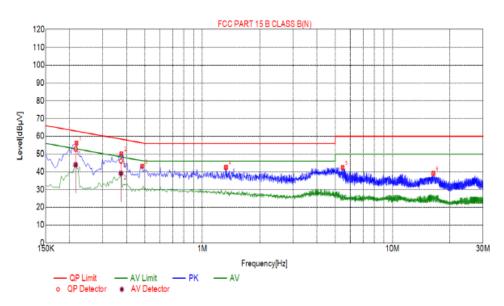
Susp	Suspected List									
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector				
1	0.2265	54.78	10.03	62.58	7.80	PK				
2	0.4020	50.41	10.04	57.81	7.40	PK				
3	0.8475	41.40	10.06	56.00	14.60	PK				
4	4.9965	39.59	10.26	56.00	16.41	PK				
5	11.1975	38.77	10.01	60.00	21.23	PK				
6	27.8205	38.42	10.26	60.00	21.58	PK				

Final	Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	
1	0.2258	10.04	51.81	62.60	10.79	40.79	52.60	11.81	
2	0.4023	10.03	46.07	57.81	11.74	34.06	47.81	13.75	

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss Level=Test receiver reading + correction factor

Test Specification: Neutral



Susp	Suspected List									
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector				
1	0.2175	56.19	10.05	62.91	6.72	PK				
2	0.3750	50.21	10.05	58.39	8.18	PK				
3	0.4830	43.09	10.04	56.29	13.20	PK				
4	1.3290	42.50	10.10	56.00	13.50	PK				
5	5.4600	42.40	10.26	60.00	17.60	PK				
6	16.4085	39.13	9.99	60.00	20.87	PK				

Final	Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]		
1	0.2153	10.05	52.86	63.00	10.14	43.88	53.00	9.12		
2	0.3733	10.05	46.06	58.43	12.37	39.11	48.43	9.32		

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor



4 RADIATED EMISSION TEST

4.1 Radiation Limit

For intentional device, according to § 15.209(a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

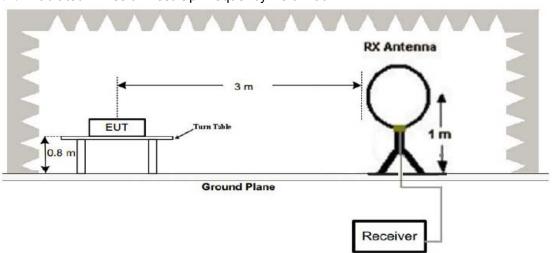
§15.249(a) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental	Field strength of harmonics
requericy	(millivolts/meter)	(microvolts/meter)
2400-2483.5 MHz	50	500

§15.249(e) – As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

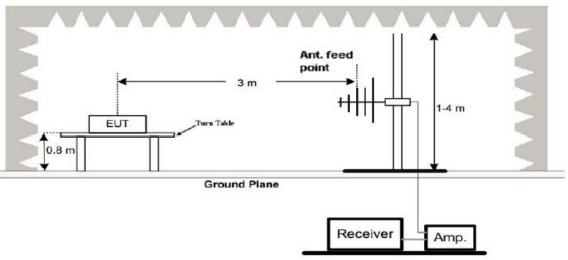
4.2 Test Setup

(1) Radiated Emission Test-Up Frequency Below 30MHz

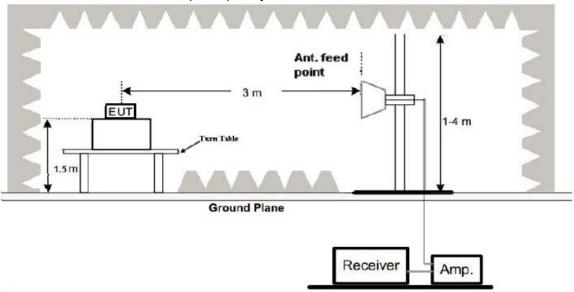


(2) Radiated Emission Test-Up Frequency 30MHz~1GHz





(3) Radiated Emission Test-Up Frequency Above 1GHz



4.3 Test Procedure

- 1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level..
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until the measurements for all frequencies are complete.
- 7. The test frequency range from 9KHz to25GHz per FCC PART 15.33(a).

Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 Test Result

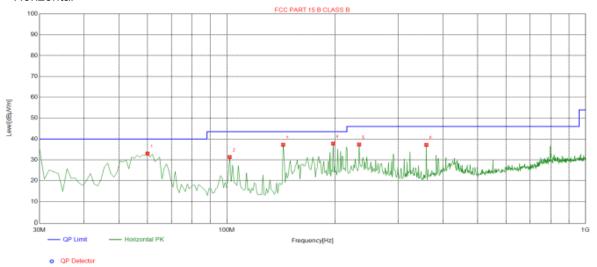


About 30MHz-1GHz

Note:

All the test modes completed for test. only the worst result of GFSK High Channel was reported as below:

Horizontal



Susp	Suspected List								
NO	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dalarita	
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity	
1	60.0700	33.03	-15.18	40.00	6.97	100	95	Horizontal	
2	101.780	31.37	-15.41	43.50	12.13	100	348	Horizontal	
3	143.490	37.27	-19.10	43.50	6.23	100	165	Horizontal	
4	197.810	37.83	-15.27	43.50	5.67	100	0	Horizontal	
5	233.700	37.38	-14.15	46.00	8.62	100	230	Horizontal	
6	359.800	37.20	-11.35	46.00	8.80	100	313	Horizontal	

Remark:

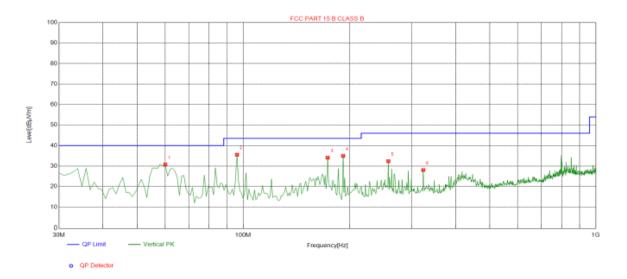
Margin = Limit – Level

Level=Test receiver reading + factor

Factor= Antenna factor + cable loss- Amp factor



Vertical



Susp	ected List							
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity
1	60.0700	30.75	-15.18	40.00	9.25	100	193	Vertical
2	95.9600	35.58	-16.07	43.50	7.92	100	161	Vertical
3	173.560	34.12	-17.14	43.50	9.38	100	171	Vertical
4	191.990	34.98	-15.82	43.50	8.52	100	359	Vertical
5	257.950	32.39	-13.50	46.00	13.61	100	183	Vertical
6	323.910	28.07	-11.90	46.00	17.93	100	329	Vertical

Remark:

Margin = Limit – Level

Level=Test receiver reading + factor

Factor = Antenna factor + cable loss- Amp factor

Harmonics and Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBµV/m)	Limit@3m (dBµV/m)

Note: 1. Emission Level=Reading+ Cable loss+ Antenna factor-Amp factor

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement



Above 1 GHz Test Results:

CH Low (2402MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	5		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type		
2402	111.14	-5.81	105.33	114.00	-8.67	peak		
2402	87.03	-5.81	81.22	94.00	-12.78	AVG		
4804	55.36	-3.65	51.71	74.00	-22.29	peak		
4804	51.24	-3.65	47.59	54.00	-6.41	AVG		
7206	57.48	-0.95	56.53	74.00	-17.47	peak		
7206	40.22	-0.95	39.27	54.00	-14.73	AVG		
Remark: Facto	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin			
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type		
2402	110.47	-5.81	104.66	114.00	-9.34	peak		
2402	83.02	-5.81	77.21	94.00	-16.79	AVG		
4804	58.16	-3.65	54.51	74.00	-19.49	peak		
4804	46.78	-3.65	43.13	54.00	-10.87	AVG		
7206	59.07	-0.95	58.12	74.00	-15.88	peak		
7206	42.36	-0.95	41.41	54.00	-12.59	AVG		
Remark: Facto	emark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



CH Middle (2441MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	5
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
2441.00	107.16	-5.73	101.43	114.00	-12.57	peak
2441.00	85.08	-5.73	79.35	94.00	-14.65	AVG
4882.00	56.22	-3.54	52.68	74.00	-21.32	peak
4882.00	46.74	-3.54	43.20	54.00	-10.80	AVG
7323.00	55.39	-0.81	54.58	74.00	-19.42	peak
7323.00	40.83	-0.81	40.02	54.00	-13.98	AVG
Remark: Facto	or = Antenna Fac	ctor + Cable Lo	ss – Pre-amplifier.			

Vertical:

Reading Result	Factor	Emission Level	Limits	Margin	D . ((
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
107.14	-5.73	101.41	114.00	-12.59	peak
85.25	-5.73	79.52	94.00	-14.48	AVG
58.76	-3.54	55.22	74.00	-18.78	peak
46.13	-3.54	42.59	54.00	-11.41	AVG
58.45	-0.81	57.64	74.00	-16.36	peak
38.77	-0.81	37.96	54.00	-16.04	AVG
	(dBμV) 107.14 85.25 58.76 46.13 58.45	(dBμV) (dB) 107.14 -5.73 85.25 -5.73 58.76 -3.54 46.13 -3.54 58.45 -0.81	(dBμV) (dB) (dBμV/m) 107.14 -5.73 101.41 85.25 -5.73 79.52 58.76 -3.54 55.22 46.13 -3.54 42.59 58.45 -0.81 57.64	(dBμV) (dB) (dBμV/m) (dBμV/m) 107.14 -5.73 101.41 114.00 85.25 -5.73 79.52 94.00 58.76 -3.54 55.22 74.00 46.13 -3.54 42.59 54.00 58.45 -0.81 57.64 74.00	(dBμV) (dB) (dBμV/m) (dBμV/m) (dBμV/m) 107.14 -5.73 101.41 114.00 -12.59 85.25 -5.73 79.52 94.00 -14.48 58.76 -3.54 55.22 74.00 -18.78 46.13 -3.54 42.59 54.00 -11.41 58.45 -0.81 57.64 74.00 -16.36

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



CH High (2480MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin			
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type		
2480	109.16	-5.63	103.53	114.00	-10.47	peak		
2480	86.37	-5.63	80.74	94.00	-13.26	AVG		
4960	55.16	-3.43	51.73	74.00	-22.27	peak		
4960	46.28	-3.44	42.84	54.00	-11.16	AVG		
7440	57.03	-0.77	56.26	74.00	-17.74	peak		
7440	38.56	-0.77	37.79	54.00	-16.21	AVG		
Remark: Facto	emark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
2480	110.17	-5.63	104.54	114.00	-9.46	peak
2480	81.44	-5.63	75.81	94.00	-18.19	AVG
4960	56.96	-3.43	53.53	74.00	-20.47	peak
4960	49.57	-3.44	46.13	54.00	-7.87	AVG
7440	53.12	-0.77	52.35	74.00	-21.65	peak
7440	39.28	-0.77	38.51	54.00	-15.49	AVG

Remark:

(1) Measuring frequencies from 1 GHz to the 25 GHz.

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown "--- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 9KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHzand video bandwidth is 3MHz for peak measurement with peak detectorat frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHzand video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed. (7)All modes of operation were investigated and the worst-case(GFSK) emissions is reported.



5 out of Band Emissions

5.1 Limits

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

5.2 Test Procedure

The out of band emission should be measured by following guidance in ANSI C63.10:2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization ect.

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz.

5.3 Test Result

PASS

All the test modes completed for test. The worst case of Band Edge is GFSK mode; the test data of this mode was reported.

Radiated Band Edge Test:

Operation Mode: TX CH Low (2402MHz)

Horizontal (Worst case):

HOHZOHIAI (V	voisi case).						
Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	
2310.00	59.33	-5.81	53.52	74	-20.48	peak	
2310.00	40.52	-5.81	34.71	54	-19.29	AVG	
2390.00	55.03	-5.84	49.19	74	-24.81	peak	
2390.00	44.87	-5.84	39.03	54	-14.97	AVG	
2400.00	54.16	-5.84	48.32	74	-25.68	peak	
2400.00	39.32	-5.84	33.48	54	-20.52	AVG	

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Vertical:

Reading Result	Factor	Emission Level	Limits	Margin	Detector
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
62.07	-5.81	56.26	74	-17.74	peak
42.11	-5.81	36.3	54	-17.7	AVG
57.89	-5.84	52.05	74	-21.95	peak
43.56	-5.84	37.72	54	-16.28	AVG
53.19	-5.84	47.35	74	-26.65	peak
39.48	-5.84	33.64	54	-20.36	AVG
	Result (dBµV) 62.07 42.11 57.89 43.56 53.19	Result Factor (dBμV) (dB) 62.07 -5.81 42.11 -5.81 57.89 -5.84 43.56 -5.84 53.19 -5.84	Result Factor Emission Level (dBμV) (dB) (dBμV/m) 62.07 -5.81 56.26 42.11 -5.81 36.3 57.89 -5.84 52.05 43.56 -5.84 37.72 53.19 -5.84 47.35	Result Factor Emission Level Limits (dBμV) (dB) (dBμV/m) (dBμV/m) 62.07 -5.81 56.26 74 42.11 -5.81 36.3 54 57.89 -5.84 52.05 74 43.56 -5.84 37.72 54 53.19 -5.84 47.35 74	Result Factor Emission Level Limits Margin (dBμV) (dB) (dBμV/m) (dBμV/m) (dB) 62.07 -5.81 56.26 74 -17.74 42.11 -5.81 36.3 54 -17.7 57.89 -5.84 52.05 74 -21.95 43.56 -5.84 37.72 54 -16.28 53.19 -5.84 47.35 74 -26.65

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: TX CH High (2480MHz)

Horizontal (Worst case)

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	
2483.50	55.17	-5.81	49.36	74	-24.64	peak	
2483.50	1	-5.81	1	54	1	AVG	
2500.00	52.36	-6.06	46.3	74	-27.7	peak	
2500.00	1	-6.06	1	54	1	AVG	

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2483.50	54.15	-5.81	48.34	74	-25.66	peak
2483.50	1	-5.81	1	54	/	AVG
2500.00	51.63	-6.06	45.57	74	-28.43	peak
2500.00	1	-6.06	1	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.



6 OCCUPIED BANDWIDTH MEASUREMENT

6.1 Test Setup

Same as Radiated Emission Measurement

6.2 Test Procedure

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. Set EUT as normal operation.
- 3. Based on ANSI C63.10 section 6.9.2: RBW= 30KHz. VBW= 100 KHz, Span=2MHz.
- 4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

6.3 Measurement Equipment Used

Same as Radiated Emission Measurement

6.4 Test Result

PASS

Test Mode	Frequency	20dB Bandwidth (MHz)	Result
	2402 MHz	1.036	PASS
GFSK	2441 MHz	1.033	PASS
	2480 MHz	1.036	PASS
	2402 MHz	1.286	PASS
π/4DQPSK	2441 MHz	1.283	PASS
	2480 MHz	1.284	PASS
	2402 MHz	1.284	PASS
8DPSK	2441 MHz	1.283	PASS
	2480 MHz	1.299	PASS



Test Mode: GFSK

CH: 2402MHz



CH: 2441MHz







CH: 2480MHz



Test Mode: π/4DQPSK

CH: 2402MHz







CH: 2441MHz



CH: 2480MHz





Test Mode: 8DPSK

CH: 2402MHz



CH: 2441MHz





CH: 2480MHz





7 ANTENNA REQUIREMENT

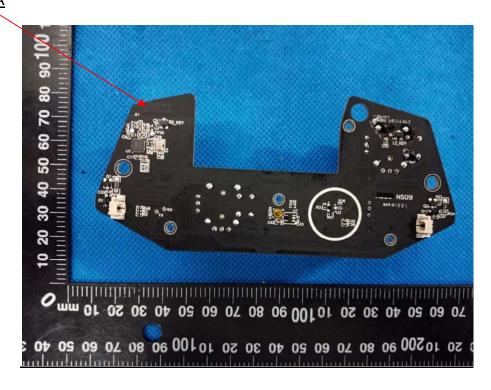
Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.249, if transmitting antennas of directional gain greater than6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Antenna Connected Construction

The antenna used in this product is a PCB Antenna, The directional gains of antenna used for transmitting is 0dBi.

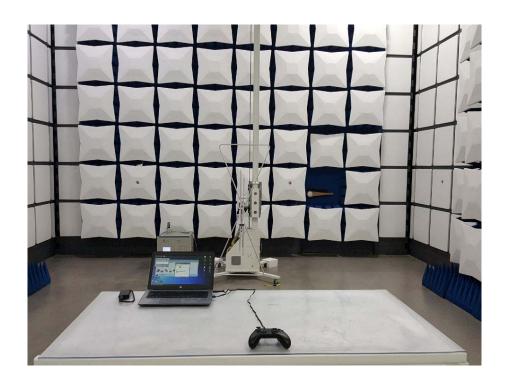
ANTENNA

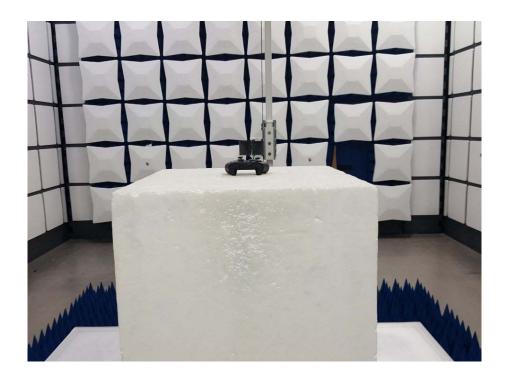




8 PHOTOGRAPH OF TEST

8.1 Radiated Emission







8.2 Conducted Emission





9 PHOTOGRAPH OF TEST

Reference to the report: ANNEX A of external photos and ANNEX B of PCB photos
End of test report