



FCC TEST REPORT

Test report
On Behalf of
Shenzhen Xinzhengyu Technology Co.,Ltd
For

Wireless bluetooth headset Model No.: U-legend, O-yeah, U-Air, T22, T33, T21

FCC ID: 2AKR3-T22

Prepared for: Shenzhen Xinzhengyu Technology Co.,Ltd

5F, 4 Building, Haitianlanyu Industrial Park, Shiyan Street, Bao'an

District, Shenzhen City, Guangdong province, China

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

1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street,

Bao'an District, Shenzhen City, China

Date of Test: June 13, 2019 ~ June 24, 2019

Date of Report: June 24, 2019

Report Number: HK1906181369-E



TEST RESULT CERTIFICATION

Applicant's name:	Shenzhen Xinzhengyu Technology Co.,Ltd
Address:	5F, 4 Building, Haitianlanyu Industrial Park, Shiyan Street, Bao'an District, Shenzhen City, Guangdong province, China
Manufacture's Name:	Shenzhen Xinzhengyu Technology Co.,Ltd
Address:	5F, 4 Building, Haitianlanyu Industrial Park, Shiyan Street, Bao'an District, Shenzhen City, Guangdong province, China
Product description	
Trade Mark:	Aminy
Product name:	Wireless bluetooth headset
Model and/or type reference :	U-legend, O-yeah, U-Air, T22, T33, T21
Standards:	FCC Rules and Regulations Part 15 Subpart C Section 15.249 ANSI C63.10: 2013
the Shenzhen HUAK Testing source of the material. Shenzhe	:
Date of Issue	
Test Result	June 24, 2017
Testing Engine	Good Aigal
	(Gary Qian)
Technical Man	nager: Edan Hu
	(Eden Hu)
Authorized Sig	natory: Jason Zhou

(Jason Zhou)

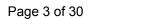




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1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT
CONDUCTED EMISSIONS TEST	COMPLIANT
RADIATED EMISSION TEST	COMPLIANT
BAND EDGE	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT
ANTENNA REQUIREMENT	COMPLIANT

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

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 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	Wireless bluetooth headset
Model Name	U-legend
Serial Model	O-yeah, U-Air, T22, T33, T21
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: U-legend.
FCC ID	2AKR3-T22
Antenna Type	Internal Antenna
Antenna Gain	2dBi
BT Operation frequency	2402-2480MHz
Number of Channels	79CH
Modulation Type	GFSK, π/4DQPSK , 8DPSK
Power Source	DC 3.7V From battery DC 5V from USB
Power Rating	DC 3.7V From battery DC 5V from USB





2.1.1 Carrier Frequency of Channels

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

2.2 Operation of EUT during testing

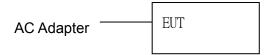
Operating Mode The mode is used: **Transmitting mode**

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

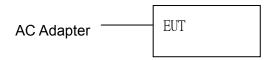


2.3 DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing and Radiation testing:



Operation of EUT during Above1GHz Radiation testing:



 Adapter information Model: WA-36A12R

Input: AC10-240V, 50-60Hz, 0.9A Max.

Output: 5VDC, 1A



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



CONDUCTED EMISSIONS TEST

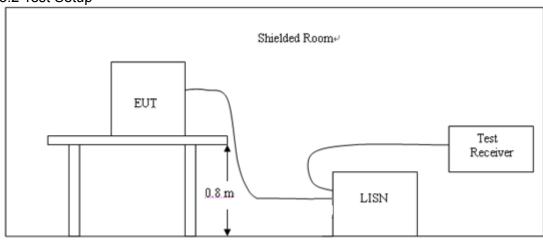
3.1 Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Fragueney	M	Maximum RF Line Voltage (dBμV)					
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
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

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/60Hz power 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 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected 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.

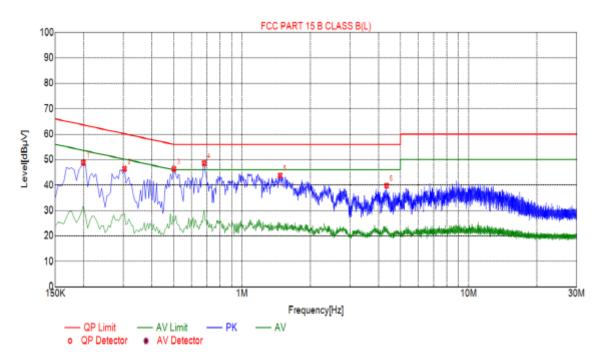
3.4 Test Result

PASS

All the test modes completed for test. only the worst result of of AC240V/60Hz (GFSK High Channel) was reported as below:



Test Specification: Line

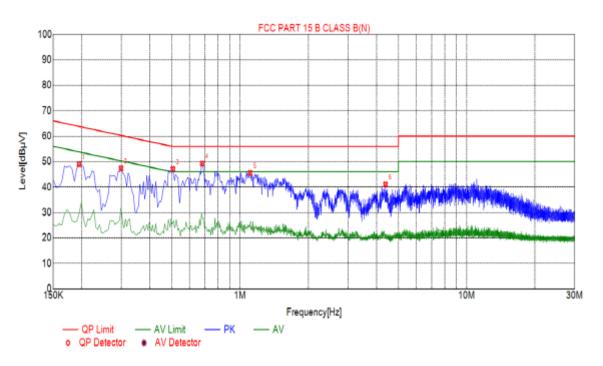


Suspected List										
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector				
1	0.1995	48.75	10.03	63.63	14.88	PK				
2	0.3030	46.44	10.04	60.16	13.72	PK				
3	0.5010	46.37	10.04	56.00	9.63	PK				
4	0.6810	48.56	10.05	56.00	7.44	PK				
5	1.4730	43.75	10.10	56.00	12.25	PK				
6	4.3440	39.72	10.25	56.00	16.28	PK				

Remark: Margin = Limit – Level



Test Specification: Neutral



Suspected List									
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector			
1	0.1950	48.92	10.03	63.82	14.90	PK			
2	0.2985	47.35	10.04	60.28	12.93	PK			
3	0.5055	47.07	10.04	56.00	8.93	PK			
4	0.6810	49.20	10.05	56.00	6.80	PK			
5	1.1085	45.54	10.08	56.00	10.46	PK			
6	4.3845	41.05	10.25	56.00	14.95	PK			

Remark: Margin = Limit – Level



4 RADIATED EMISSION TEST

4.1 Radiation Limit

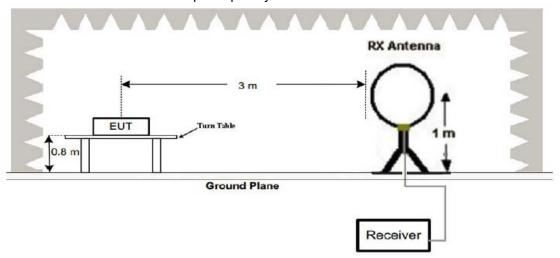
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

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

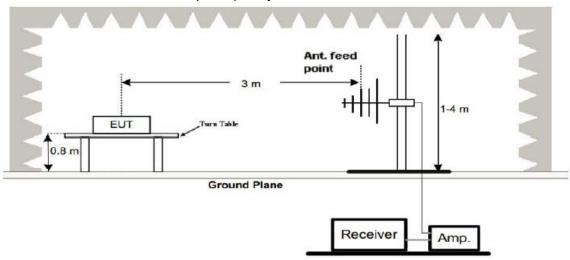
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

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

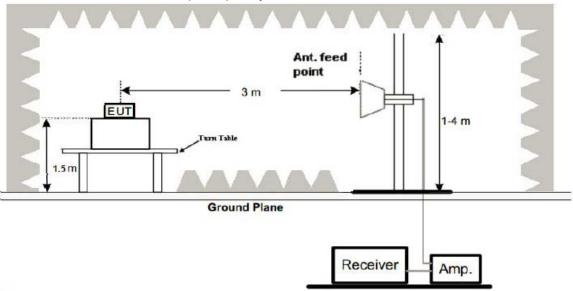


(2) Radiated Emission Test-Up Frequency 30MHz~1GHz





(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 to 25GHz per FCC PART 15.33(a).

Note

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

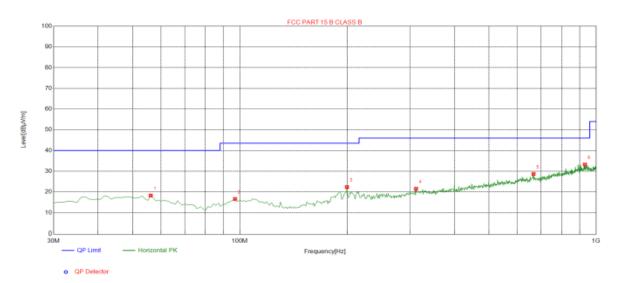
4.4 Test Result

PASS

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



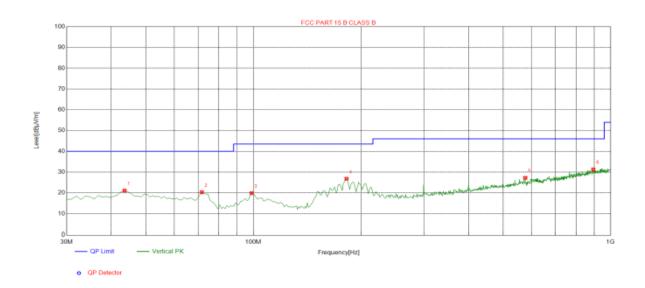
Below 1GHz Test Results: Antenna polarity: H



Susp	Suspected List								
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity	
	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	rolanty	
1	56.1900	18.28	-14.58	40.00	21.72	100	100	Horizontal	
2	96.9300	16.60	-15.91	43.50	26.90	100	113	Horizontal	
3	199.750	22.39	-15.08	43.50	21.11	100	278	Horizontal	
4	312.270	21.55	-12.49	46.00	24.45	100	155	Horizontal	
5	667.290	28.68	-4.73	46.00	17.32	100	291	Horizontal	
6	930.160	33.23	-1.84	46.00	12.77	100	175	Horizontal	

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level





Susp	Suspected List							
NO	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity
1	43.5800	21.12	-13.90	40.00	18.88	100	18	Vertical
2	71.7100	20.31	-17.98	40.00	19.69	100	111	Vertical
3	98.8700	19.85	-15.59	43.50	23.65	100	338	Vertical
4	182.290	26.79	-16.66	43.50	16.71	100	266	Vertical
5	577.080	27.24	-6.53	46.00	18.76	100	312	Vertical
6	894.270	31.31	-1.84	46.00	14.69	100	36	Vertical

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

Remark:

- (1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.
- (2) * 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.
- (3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.



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	113.68	-5.81	107.87	114.00	-6.13	peak	
2402	87.07	-5.81	81.26	94.00	-12.74	AVG	
4804	57.31	-3.65	53.66	74.00	-20.34	peak	
4804	47.80	-3.65	44.15	54.00	-9.85	AVG	
7206	52.56	-0.95	51.61	74.00	-22.39	peak	
7206	41.09	-0.95	40.14	54.00	-13.86	AVG	
Remark: Facto	temark: 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	111.02	-5.81	105.21	114.00	-8.79	peak	
2402	83.44	-5.81	77.63	94.00	-16.37	AVG	
4804	53.74	-3.65	50.09	74.00	-23.91	peak	
4804	44.72	-3.65	41.07	54.00	-12.93	AVG	
7206	56.51	-0.95	55.56	74.00	-18.44	peak	
7206	41.48	-0.95	40.53	54.00	-13.47	AVG	
Remark: Facto	Remark: 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	108.63	-5.73	102.90	114.00	-11.10	peak		
2441.00	84.30	-5.73	78.57	94.00	-15.43	AVG		
4882.00	57.50	-3.54	53.96	74.00	-20.04	peak		
4882.00	43.05	-3.54	39.51	54.00	-14.49	AVG		
7323.00	53.03	-0.81	52.22	74.00	-21.78	peak		
7323.00	35.51	-0.81	34.70	54.00	-19.30	AVG		
Remark: Facto	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Datastas		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type		
2441.00	106.58	-5.73	100.85	114.00	-13.15	peak		
2441.00	86.75	-5.73	81.02	94.00	-12.98	AVG		
4882.00	55.81	-3.54	52.27	74.00	-21.73	peak		
4882.00	45.03	-3.54	41.49	54.00	-12.51	AVG		
7323.00	54.08	-0.81	53.27	74.00	-20.73	peak		
7323.00	37.42	-0.81	36.61	54.00	-17.39	AVG		
Remark: Facto	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							





CH High (2480MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	<u> </u>
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
2480	103.69	-5.63	98.06	114.00	-15.94	peak
2480	82.95	-5.63	77.32	94.00	-16.68	AVG
4960	55.80	-3.43	52.37	74.00	-21.63	peak
4960	46.27	-3.44	42.83	54.00	-11.17	AVG
7440	53.39	-0.77	52.62	74.00	-21.38	peak
7440	37.68	-0.77	36.91	54.00	-17.09	AVG

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
2480	103.12	-5.63	97.49	114.00	-16.51	peak
2480	81.34	-5.63	75.71	94.00	-18.29	AVG
4960	55.09	-3.43	51.66	74.00	-22.34	peak
4960	43.78	-3.44	40.34	54.00	-13.66	AVG
7440	52.40	-0.77	51.63	74.00	-22.37	peak
7440	37.19	-0.77	36.42	54.00	-17.58	AVG

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

Remark:

- (1) Measuring frequencies from 1 GHz to the 25 GHz •
- (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 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and 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 emissions are reported.



5 BAND EDGE

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 band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 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 etc. Set RBW to 100KHz and VBM to 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength. The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBW to 300 KHz, to measure the conducted peak band edge.

5.3 Test Result

PASS

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

Radiated Band Edge Test:

Operation Mode: TX CH Low (2402MHz)

Horizontal (Worst case)

Horizontal (Worst case):

Horizontal (Worst case).						
Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2310.00	56.4	-5.81	50.59	74	-23.41	peak
2310.00	1	-5.81	1	54	1	AVG
2390.00	55.92	-5.84	50.08	74	-23.92	peak
2390.00	1	-5.84	1	54	1	AVG
2400.00	52.41	-5.84	46.57	74	-27.43	peak
2400.00	1	-5.84	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		
2310.00	58.17	-5.81	52.36	74	-21.64	peak		
2310.00	1	-5.81	1	54	1	AVG		
2390.00	54.04	-5.84	48.2	74	-25.8	peak		
2390.00	1	-5.84	1	54	1	AVG		
2400.00	51.60	-5.84	45.76	74	-28.24	peak		
2400.00	1	-5.84	1	54	1	AVG		
Remark: Facto	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	55.9	-5.81	50.09	74	-23.91	peak
2483.50	1	-5.81	1	54	1	AVG
2500.00	52.71	-6.06	46.65	74	-27.35	peak
2500.00	1	-6.06	1	54	1	AVG
	, , , –		/ Dec	-	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	56.66	-5.81	50.85	74	-23.15	peak
2483.50	1	-5.81	1	54	1	AVG
2500.00	52.84	-6.06	46.78	74	-27.22	peak
2500.00	1	-6.06	1	54	1	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	0.8333	PASS
GFSK	2441 MHz	0.8325	PASS
	2480 MHz	0.8324	PASS
	2402 MHz	1.123	PASS
π/4DQPSK	2441 MHz	1.115	PASS
	2480 MHz	1.120	PASS
	2402 MHz	1.131	PASS
8DPSK	2441 MHz	1.142	PASS
	2480 MHz	1.150	PASS



Test Mode: GFSK

CH: 2402MHz



CH: 2441MHz







CH: 2480MHz

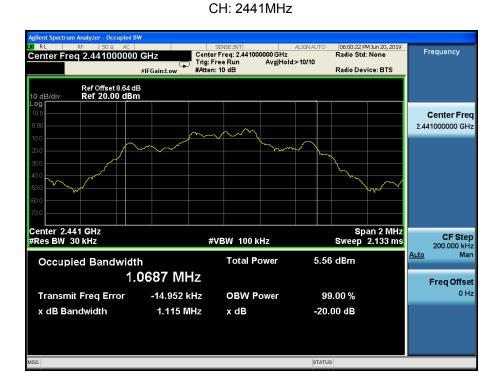


Test Mode: π/4DQPSK

CH: 2402MHz







CH: 2480MHz



Test Mode: 8DPSK

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CH: 2402MHz



CH: 2441MHz



CH: 2480MHz





7 ANTENNA REQUIREMENT

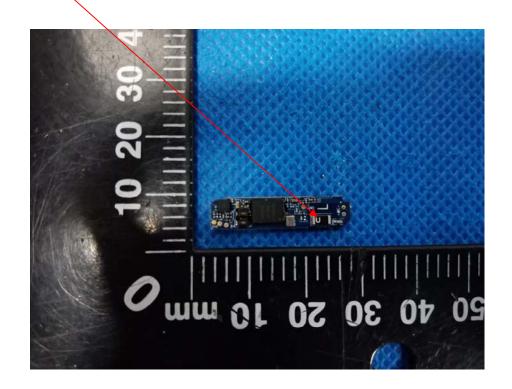
Standard Applicable

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 than 6dBi 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 Internal Antenna, The directional gains of antenna used for transmitting is 2dBi.

ANTENNA





8 PHOTOGRAPH OF TEST

8.1 Radiated Emission







8.2 Conducted Emission





9 PHOTOS OF THE EUT Reference to the report: ANNEX A of external photos and ANNEX B of internal photos

-----End of test report-----