

TEST REPORT

Applicant:	ARKON ELECTRONICS (HUIZHOU) CO., LIMITED.
Address:	NO.4 Taihao Road, High-tech Industrial Park, Sandong Town, Huicheng District, Huizhou, Guangdong, China

Manufacturer or Supplier	ARKON ELECTRONICS (HUIZHOU) CO., LIMITED.
Address	NO.4 Taihao Road, High-tech Industrial Park, Sandong Town, Huicheng District, Huizhou, Guangdong, China
Product:	2.4GHz Digital Wireless Headphone
Brand Name:	ARKON, ARTISTE, EMERSON, DAYSNEW, Avantree, Naxa, Victor
Model:	DH1000K
Additional Model & Model Difference	EE-9000; DH1000J; D1000AJ ; DH1000T ; DH1000L ; D1 ; WSHT-280 ; Item 12281; EE-9000-YY, VE-9000-YY, NE-9000-YY(YY means unit color, it can be A to Z or N/A) (Only different for model name , appearance color and trademark for trade purpose)
Date of tests:	Sep. 09, 2023 ~ Sep. 27, 2023

the tests have been carried out according to the requirements of the following standard:

☒ FCC Part 15, Subpart C, Section 15.249

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Lucas Chen Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	
	Date: Oct. 27, 2023

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2310WDG0050	Original release	Oct. 27, 2023

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used
§15.207 (a)	Conducted Emission	PASS	Compliant
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant

2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emission	0.15MHz ~ 30MHz	2.66 dB
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	3.47dB
	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	4.67dB

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

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	2.4GHz Digital Wireless Headphone
MODEL NO.	DH1000K
ADDITIONAL MODEL	EE-9000; DH1000J; D1000AJ; DH1000T; DH1000L; D1; WSHT-280; Item 12281; EE-9000-YY、VE-9000-YY、 NE-9000-YY(YY means unit color, it can be A to Z or N/A)
FCC ID	2APBSDH1001E-001T
NOMINAL VOLTAGE	Pedestal Transmitter: DC 5V from adapter
MODULATION TECHNOLOGY	GFSK
OPERATING FREQUENCY	2400MHz ~ 2483.5 MHz
ANTENNA TYPE	PCB Antenna, with -2.2 dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTES:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
- Please refer to the EUT photo document (Reference No.: 2310WDG0050) for detailed product photo.
- Mode difference: The models are only different for model name, appearance color and trademark for trade purpose.
- The transmitter can be powered by adapter as list as the following:

Adapter (fixed plug)	
BRAND:	N/A
Model:	YLJXA-T050055
Input:	100-240Vac 50/60Hz 0.5A Max
Output:	5Vdc, 0.55A
DC Line	Unshielded, Non-detachable, 1.9m

3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type.

The worst case was found when the EUT was positioned on Y axis for radiated emission. The EUT was tested under the following mode.

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	√	√	DC 5V from adapter

Where **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz
BW: 20db bandwidth

Following channel(s) was (were) selected for the test as listed below.

TESTED CHANNEL	TESTED FREQUENCY
Low	2404 MHz
Middle	2440 MHz
High	2477 MHz

Channel List

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2404	10	2424	20	2442	30	2459	40	2477
1	2406	11	2425	21	2444	31	2460		
2	2408	12	2426	22	2446	32	2462		
3	2410	13	2428	23	2448	33	2464		
4	2412	14	2430	24	2449	34	2466		
5	2414	15	2432	25	2450	35	2468		
6	2416	16	2434	26	2452	36	2470		
7	2418	17	2436	27	2454	37	2472		
8	2420	18	2438	28	2456	38	2474		
9	2422	19	2440	29	2458	39	2476		

Note: The more detailed channel, please refer to the product specifications

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (Adapter)	TESTED BY
RE	24deg. C, 55%RH	AC 120V/60Hz	Hua
BW	25deg. C, 56%RH	AC 120V/60Hz	Dragon
PLC	25deg. C, 56%RH	AC 120V/60Hz	Dragon

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.249

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	HUAWEI	NbD-WFH9	EUEPM21725002655	N/A
2	N/A	N/A	N/A	N/A	N/A

NO.	DESCRIPTCION OF THE ABOVE SUPPORT UNITS
1	USB cord Unshielded,1.8m
2	USB extension cord Unshielded, 1.0m

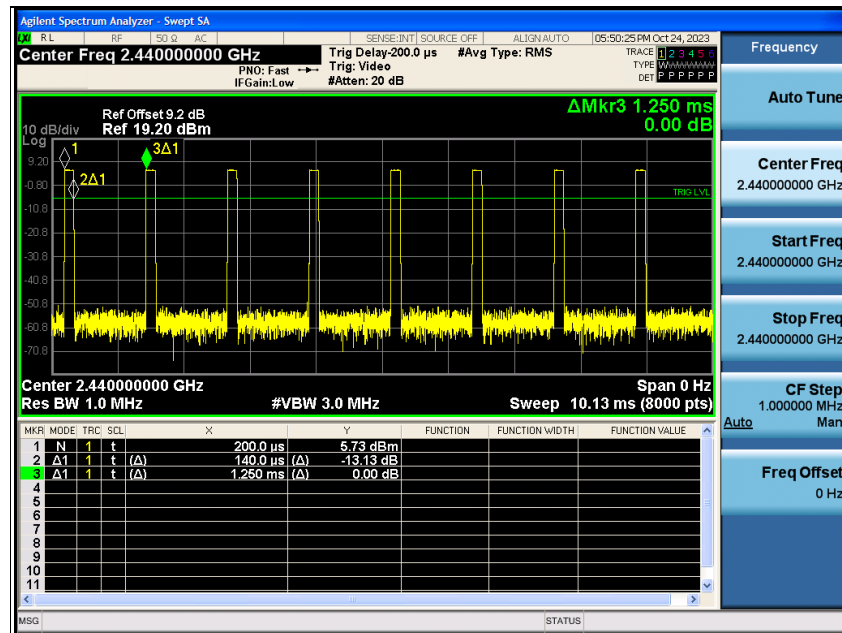
3.5 DUTY CYCLE OF TESET SIGNAL

$T_p = 1.25\text{ms}$

$T_{on} = 0.14\text{ms}$

Duty Cycle $= 0.14 / 1.25 = 0.112$

AV factor $= 20 \text{ Log (Duty cycle)} = 20 \text{ Log}(0.112) \approx -19.016\text{dB}$.



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTES:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR 7	101962	2023-12-27
Artificial Mains Network	Rohde&Schwarz	ENV216	3560.6550.15	2023-12-27
Test software	FARAD	EZ_EMV V1.1.4.2	N/A	N/A
Broadcast test system	R&S	SFU	100410	2024-08-06

- NOTES:**
1. The test was performed in shielded room 743 in Hwa-Hsing (Dongguan) Testing Co., Ltd.
 2. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to GRGT/CHINA.
 3. The FCC Site Registration No. is 915896.
 4. Test site: No. 101, Building N1, Yuyuan 2 Road, Yuyuan Industrial Park, HuangJiang Town, Dongguan City, People's Republic of China.

4.1.3 TEST PROCEDURES

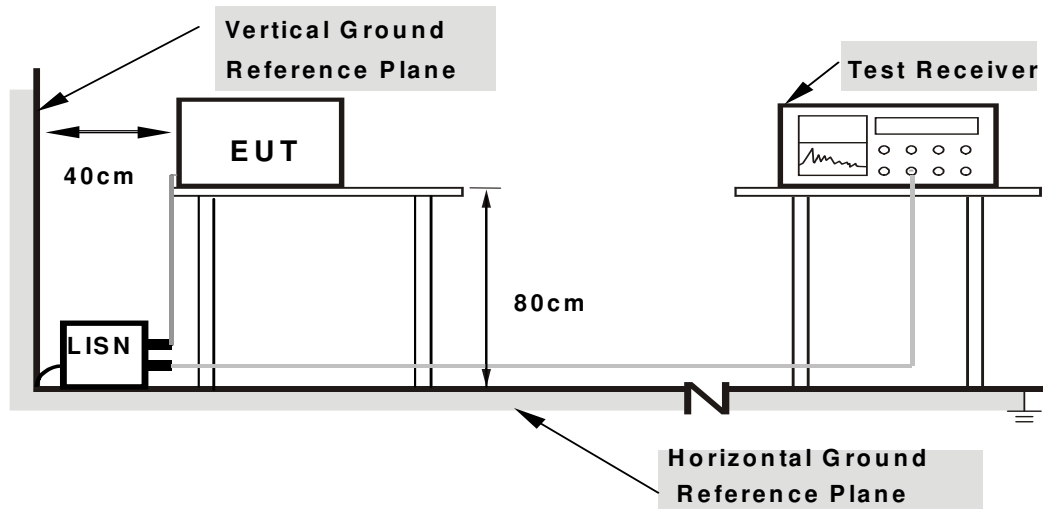
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



**Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80
from other units and other metal planes**

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

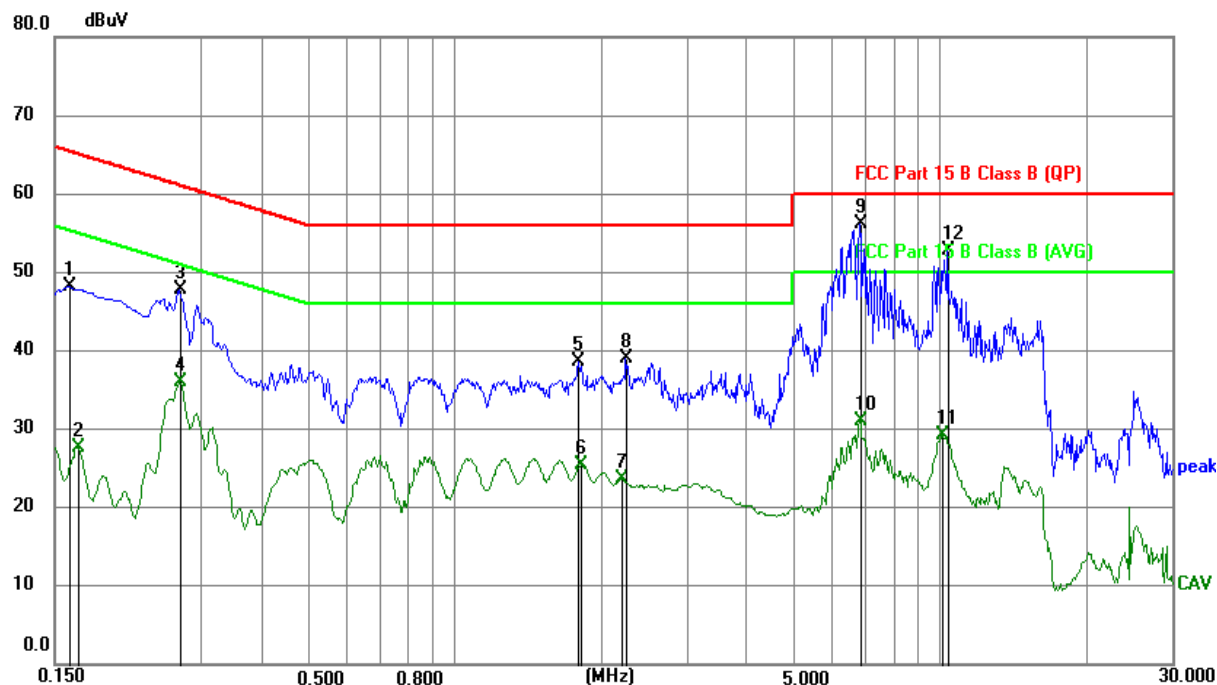
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA:

FREQUENCY RANDE	150KHz~30MHz	DETECTOR FUNCTION&RESOLUT ION BANDWIDTH	QUASI-PEAK(QP)/ AVERAGE(AV),9KHz
ENVIRONMENTAL CONDITIONS	25.3deg.C, 73% RH	PHASE	Line (L)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.1612	10.17	38.00	17.42	48.17	27.59	65.40	55.40	-17.23	-27.810
2	0.2714	10.18	37.53	25.80	47.71	35.98	61.07	51.07	-13.36	-15.09
3	1.8082	10.08	28.58	15.28	38.66	25.36	56.00	46.00	-17.34	-20.64
4	2.2200	10.09	28.97	13.54	39.06	23.63	56.00	46.00	-16.94	-22.37
5	6.8190	10.02	46.18	21.02	56.20	31.04	60.00	50.00	-3.80	-18.96
6	10.1197	10.10	42.73	19.10	52.84	29.20	60.00	50.00	-7.16	-20.80

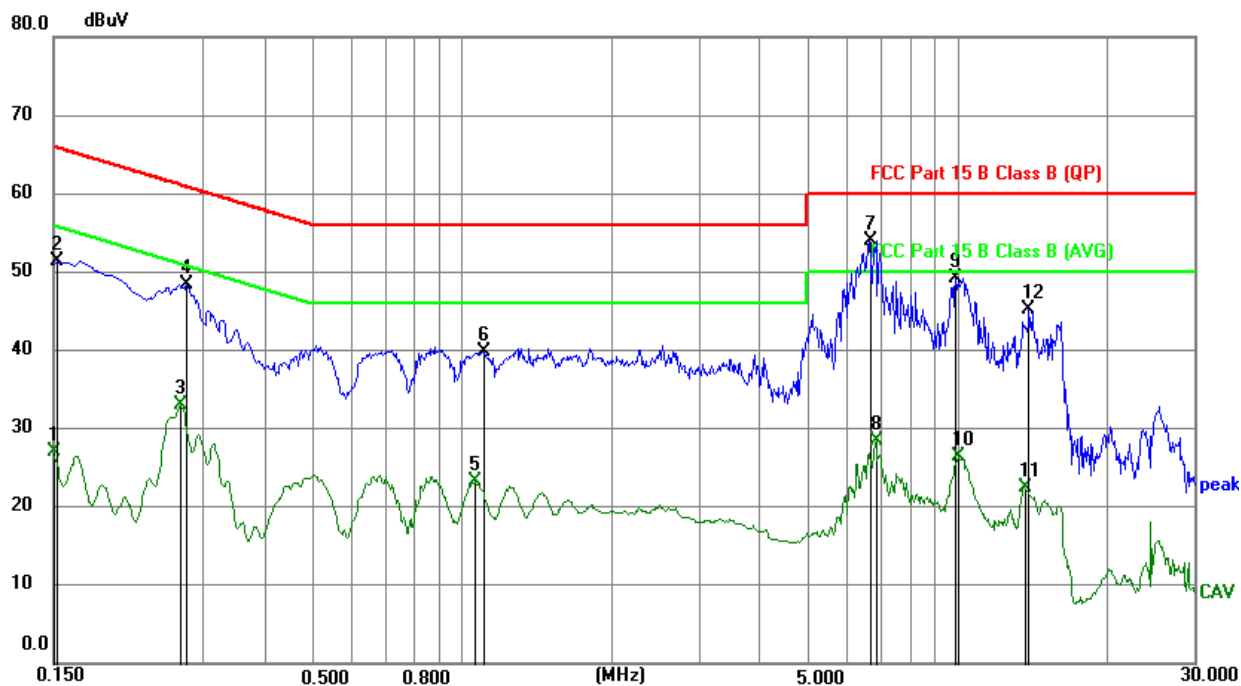
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



FREQUENCY RANDE	150KHz~30MHz	DETECTOR FUNCTION&RESOLUT ION BANDWIDTH	QUASI-PEAK(QP)/ AVERAGE(AV),9KHz
ENVIRONMENTAL CONDITIONS	25.3deg.C, 73% RH	PHASE	Neutral (N)

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.1500	10.19	41.22	16.76	51.40	26.95	66.00	56.00	-19.99	-24.31
2	0.2714	10.17	38.29	22.76	48.46	32.93	61.07	51.07	-27.16	-28.10
3	1.0611	10.05	29.80	13.16	39.85	23.21	56.09	46.09	-17.45	-12.93
4	6.6278	10.03	43.99	18.49	54.02	28.52	60.00	50.00	-23.91	-19.41
5	9.9645	10.11	39.14	16.35	49.25	26.46	60.00	50.00	-34.76	-31.40
6	13.6298	10.25	34.97	12.12	45.22	22.37	60.00	50.00	-20.43	-15.80

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

According to §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 (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

NOTES:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver (9kHz~3GHz)	Rohde&Schwarz	ESPI 7	101978	2023-12-27
Broadband antenna (25MHz~2500MHz)	Schwarzbeck	VULB 9168	937	2024-08-18
3m Semi-anechoic Chamber	MAORUI	9m*6m*6m	HS-2018037	2026-03-12**
Signal Amplifier (30MHz~1000MHz)	Com-power	PAM-103	18020051	2024-08-06
Attenuator	R&S	TS2GA-6dB	18101101	N/A
Test software	FARAD	EZ EMCV1.1. 4.2	N/A	N/A
Digital Multimeter	FLUKE	15B+	54990003WS	2024-08-07
Horn Antenna	Schwarzbeck	BBHA 9170	979	2024-05-03*
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2023-12-27
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	25	2024-08-06
Pre-Amplifier	EMCI	EMC 184045SE	9870709	2023-12-27
Spectrum	Keysight	N9020A	MY51240612	2024-08-06

NOTES:

1. The test was performed in 966 Chamber in Hwa-Hsing (Dongguan) Testing Co., Ltd.
2. The calibration interval of the above test instruments is 12/24*/36**months and the calibrations are traceable to GRGT/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 915896.
5. Test site: No. 101, Building N1, Yuyuan 2 Road, Yuyuan Industrial Park, HuangJiang Town, Dongguan City, People's Republic of China

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1.3m above the ground.
- g. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTES:

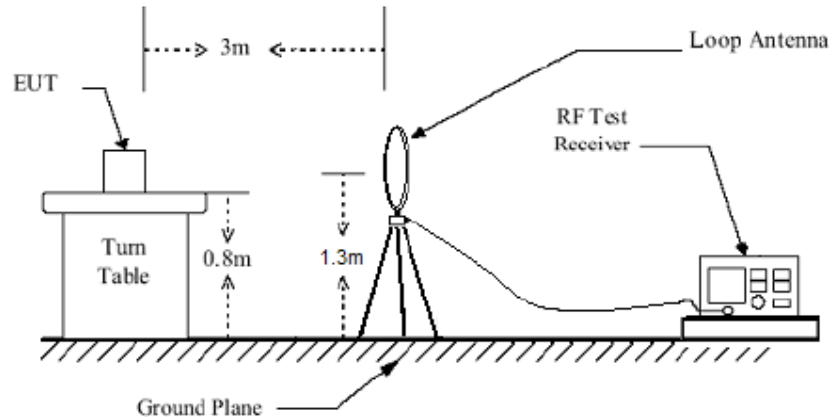
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. Average value =PK Emission +AV Factor.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

4.2.4 DEVIATION FROM TEST STANDARD

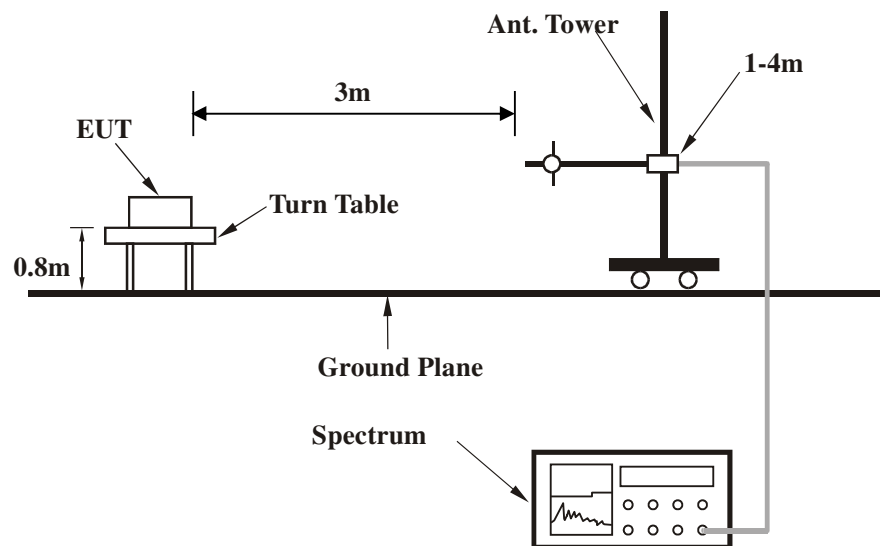
No deviation.

4.2.5 TEST SETUP

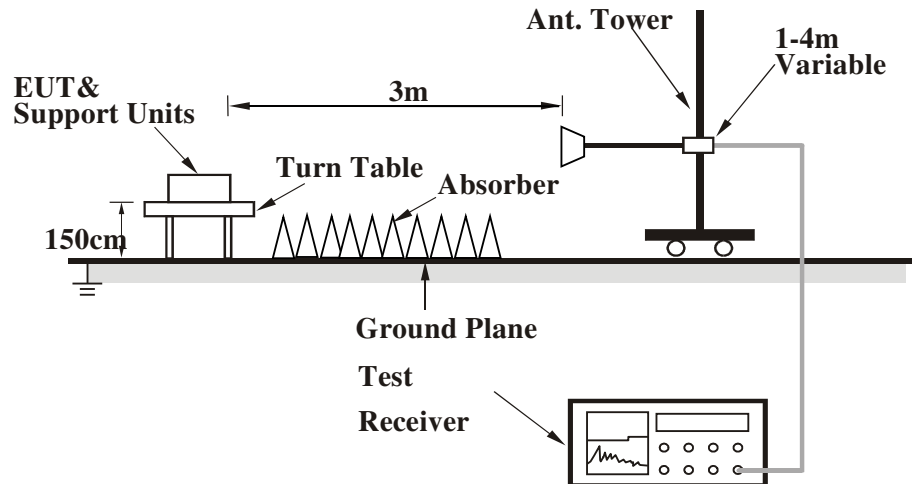
Below 30MHz test setup



Below 1GHz test setup



Above 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

- c) Turned on the power of all equipment.
- d) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

4.2.7 TEST RESULTS

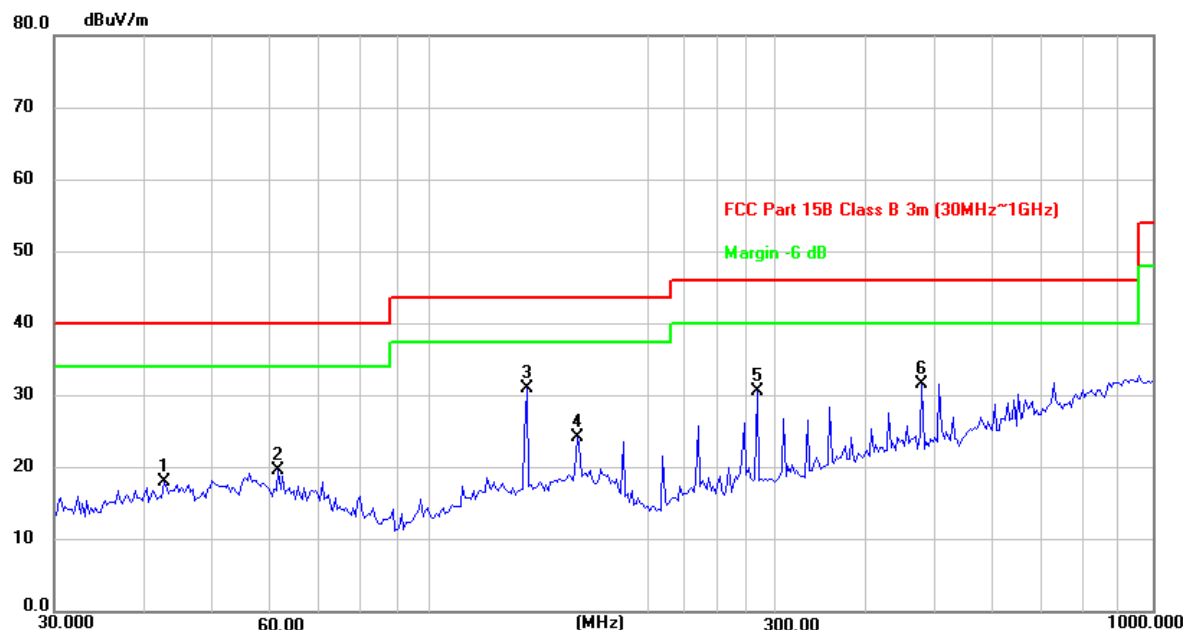
BELOW 1GHz WORST-CASE DATA

CHANNEL	TX Low Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	Frequency. (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	42.6000	32.88	-14.84	18.04	40.00	-21.96	peak	221	236
2	61.3463	34.15	-14.56	19.59	40.00	-20.41	peak	185	315
3	135.5062	45.33	-14.39	30.94	43.50	-12.56	peak	167	64
4	159.2251	36.60	-12.38	24.22	43.50	-19.28	peak	214	182
5	282.9852	44.49	-13.93	30.56	46.00	-15.44	peak	163	104
6	478.8456	39.75	-8.15	31.60	46.00	-14.40	peak	204	112

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.

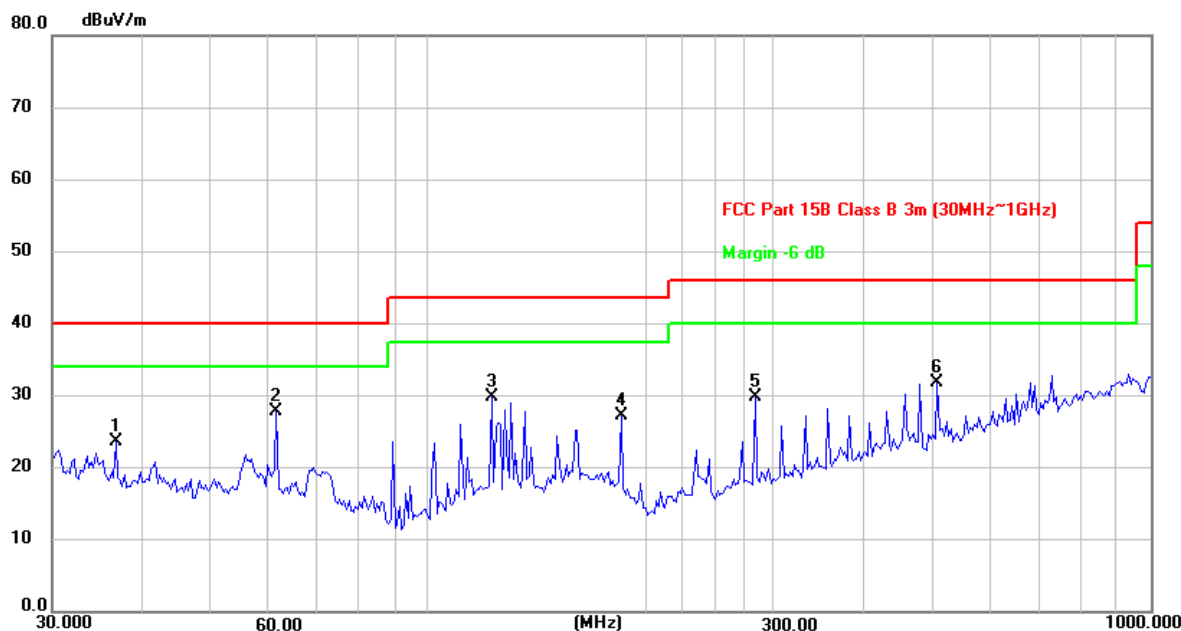


CHANNEL	TX Low Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
NO.	Frequency. (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	36.7662	39.95	-16.40	23.55	40.00	-16.45	peak	150	24
2	61.3463	42.35	-14.56	27.79	40.00	-12.21	peak	124	196
3	121.9755	44.50	-14.68	29.82	43.50	-13.68	peak	132	305
4	184.4898	42.41	-15.25	27.16	43.50	-16.34	peak	157	274
5	282.9852	43.77	-13.93	29.84	46.00	-16.16	peak	116	118
6	506.4791	39.12	-7.27	31.85	46.00	-14.15	peak	100	165

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.



ABOVE 1GHz WORST-CASE DATA:

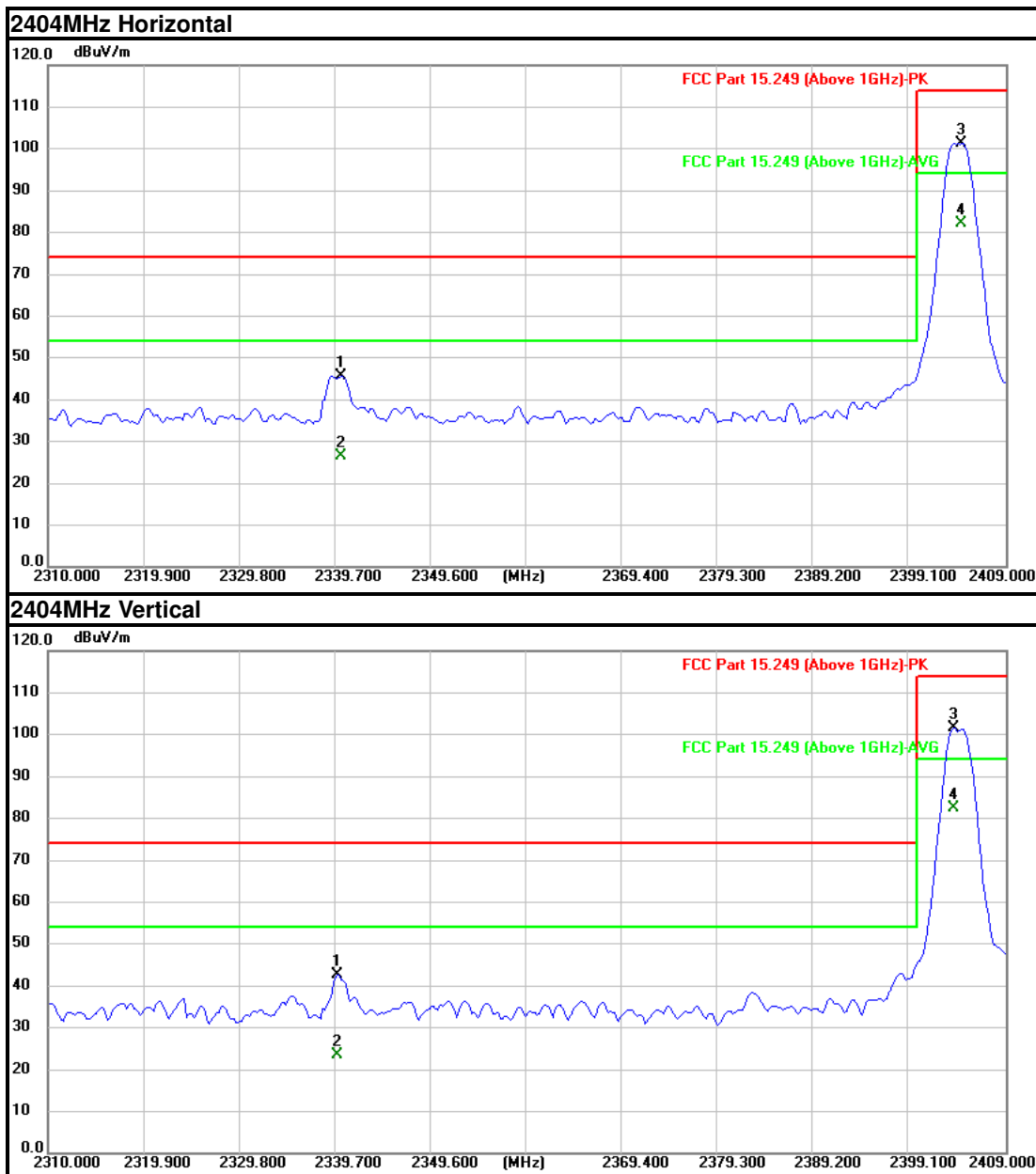
CHANNEL	TX Low Channel	DETECTOR	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz	FUNCTION	Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	*2404.000	101.99	-0.73	101.26	114.00	-12.74	peak	115	198
2	*2404.000	82.97	-0.73	82.24	94.00	-11.76	AVG	115	198
3	2340.355	46.52	-0.92	45.60	74.00	-28.40	peak	115	198
4	2340.355	27.5	-0.92	26.58	54.00	-27.42	AVG	115	198
5	4808.000	46.90	5.40	52.30	74.00	-21.70	peak	195	254
6	4808.000	27.88	5.40	33.28	54.00	-20.72	AVG	195	254
7	7212.000	43.27	11.77	55.04	74.00	-18.96	peak	245	241
8	7212.000	24.25	11.77	36.02	54.00	-17.98	AVG	245	241
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
NO.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	*2404.000	102.27	-0.74	101.53	114.00	-12.47	peak	120	226
2	*2404.000	83.25	-0.74	82.51	94.00	-11.49	AVG	120	226
3	2339.958	43.49	-0.92	42.57	74.00	-31.43	peak	120	226
4	2339.958	24.47	-0.92	23.55	54.00	-30.45	AVG	120	226
5	4808.000	43.08	5.40	48.48	74.00	-25.52	peak	134	343
6	4808.000	29.63	5.40	29.46	54.00	-18.97	AVG	134	343
7	7212.000	40.97	11.77	52.74	74.00	-21.26	peak	100	33
8	7212.000	28.54	11.77	33.72	54.00	-13.69	AVG	100	33

REMARK:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. Average value = PK Emission + 20*log(duty cycle) Where the duty factor is calculated from following formula: $20 \log (\text{Duty cycle}) = 20 \log (0.112) = -19.016 \text{ dB}$, Please see page 9 for plotted duty.

Band edge Plot



CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	Frequency. (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	*2440.000	105.04	-0.64	104.40	114.00	-9.60	peak	292	216
2	*2440.000	86.02	-0.64	85.38	94.00	-8.62	AVG	292	216
3	4880.000	46.46	6.24	52.70	74.00	-21.30	peak	194	223
4	4880.000	27.44	6.24	33.68	54.00	-20.32	AVG	194	223
5	7320.000	41.79	12.13	53.92	74.00	-20.08	peak	202	263
6	7320.000	22.77	12.13	34.90	54.00	-19.10	AVG	202	263
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
NO.	Frequency. (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	*2440.000	102.90	-0.64	102.26	114.00	-11.74	peak	100	206
2	*2440.000	83.88	-0.64	83.24	94.00	-10.76	AVG	100	206
3	4880.000	43.38	6.24	49.62	74.00	-24.38	peak	350	258
4	4880.000	24.36	6.24	30.60	54.00	-23.40	AVG	350	258
5	7320.000	40.05	12.13	52.18	74.00	-21.82	peak	126	334
6	7320.000	21.03	12.13	33.16	54.00	-20.84	AVG	126	334

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. Average value = PK Emission + 20*log(duty cycle) Where the duty factor is calculated from following formula: 20 log (Duty cycle) = 20Log(0.112) = -19.016dB, Please see page 9 for plotted duty.

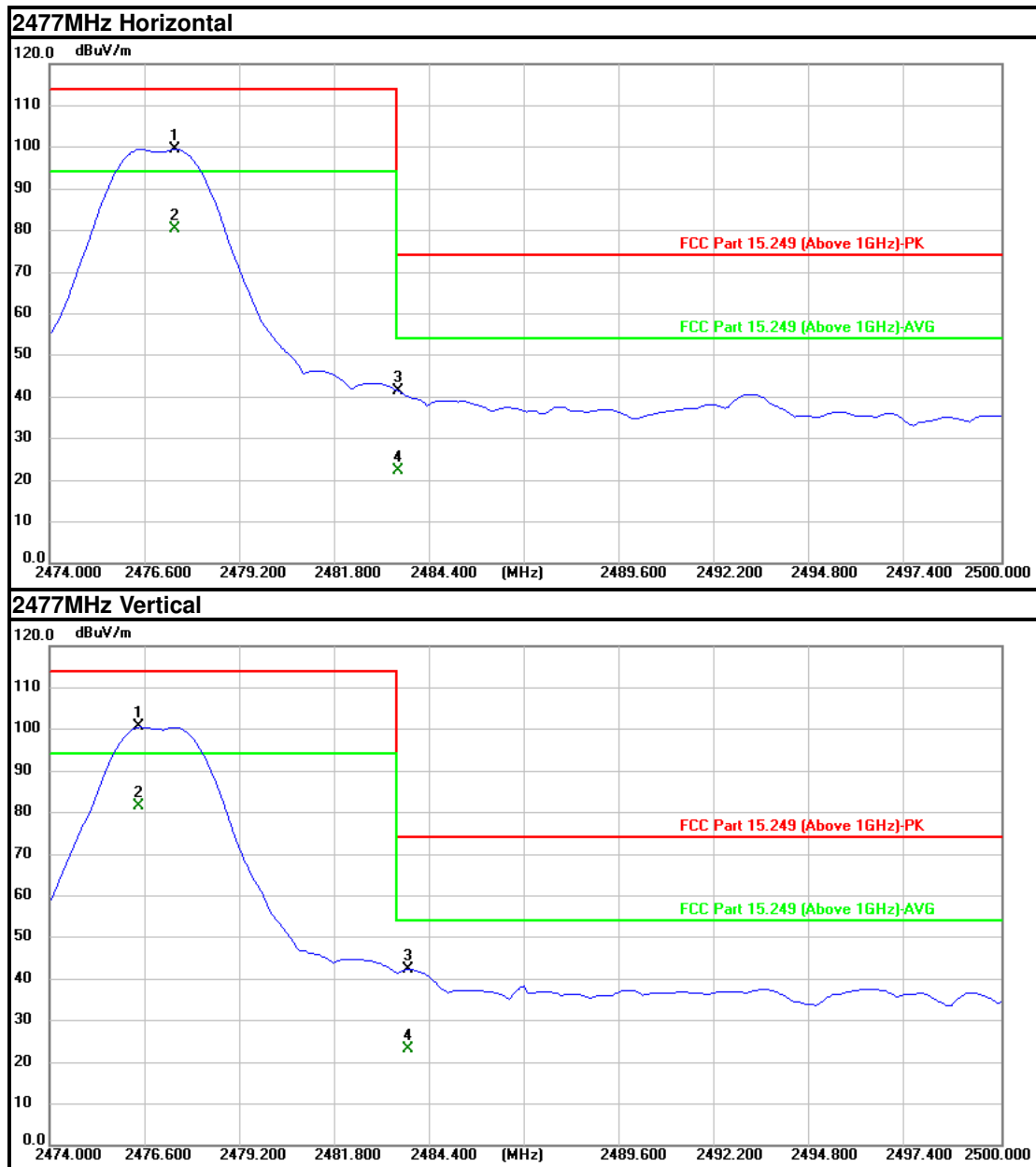
CHANNEL	TX High Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	Frequency. (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	*2477.000	100.03	-0.53	99.50	114.00	-14.50	peak	195	333
2	*2477.000	81.01	-0.53	80.48	94.00	-13.52	AVG	195	333
3	2483.535	41.92	-0.51	41.41	74.00	-32.59	peak	195	333
4	2483.535	22.90	-0.51	22.39	54.00	-31.61	AVG	195	333
5	4954.000	44.85	6.13	50.98	74.00	-23.02	peak	298	222
6	4954.000	25.83	6.13	31.96	54.00	-22.04	AVG	298	222
7	7431.000	41.56	12.51	54.07	74.00	-19.93	peak	246	252
8	7431.000	22.54	12.51	35.05	54.00	-18.95	AVG	246	252
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M									
NO.	Frequency. (MHz)	Reading (dBuV)	Correct Factor (dB)	Emission Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Height (cm)	Table Angle (Degree)
1	*2477.000	101.08	-0.53	100.55	114.00	-13.45	peak	107	67
2	*2477.000	82.06	-0.53	81.53	94.00	-12.47	AVG	107	67
3	2483.796	42.83	-0.51	42.32	74.00	-31.68	peak	107	67
4	2483.796	23.81	-0.51	23.30	54.00	-30.70	AVG	107	67
5	4954.000	43.89	6.13	50.02	74.00	-23.98	peak	378	271
6	4954.000	24.87	6.13	31.00	54.00	-23.00	AVG	378	271
7	7431.000	39.63	12.51	52.14	74.00	-21.86	peak	100	19
8	7431.000	20.61	12.51	33.12	54.00	-20.88	AVG	100	19

REMARK:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. Average value = PK Emission + 20*log(duty cycle) Where the duty factor is calculated from following formula: 20 log (Duty cycle) = 20Log(0.112) = -19.016dB, Please see page 9 for plotted duty.

Band edge Plot



4.3 20dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.Date
Spectrum	Keysight	N9020A	MY51240612	2024-08-06
Power Meter 10Hz~18GHz	Tonscend	JS0806-2	188060126	2024-08-06
Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101783	2023-12-27
Signal generator	Keysight	E4421	GB40051020	2024-03-15
Universal Switch Control Unit	Rohde&Schwarz	CMW500	12010002k50	2023-12-27
Humidity tester	Jingchuang	GSP-8A	CMA22B000592	2024-01-15
Test Software	Tonscend	JS0806-2	NA	NA

NOTES:

1. The test was performed in RF Test Shielded Room in Hwa-Hsing (Dongguan) Testing Co., Ltd.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to GRGT/CHINA.
3. Test site: No. 101, Building N1, Yuyuan 2 Road, Yuyuan Industrial Park, HuangJiang Town, Dongguan City, People's Republic of China

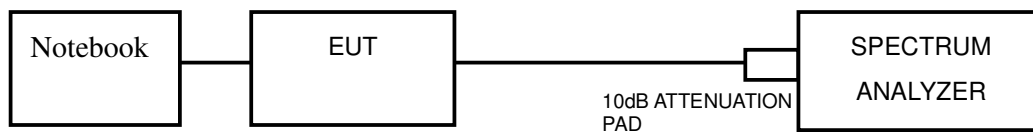
4.3.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

4.3.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2404	2.105
Middle	2440	2.100
High	2477	2.100

Test Data: Low channel



Test Data: Middle channel



Test Data: High channel



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---