

NCC RADIO TEST REPORT

Product name

藍牙耳機

Applicant

明熙國際有限公司

Manufacture

CARDO SYSTEMS LTD.

Rating(s)

DC 5V via micro-USB, DC 3.7V via battery

Trademark

Cardo

Model and/or type reference

PACKTALK BOLD

Standard

LP0002:2020

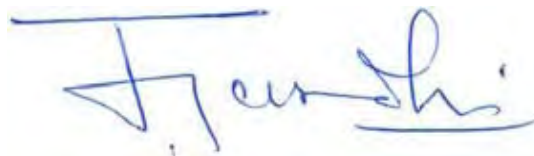
Test Result

Pass

Date of receipt : 08-18-2021

Signature :

Date of Issue : 08-28-2021



NCC RADIO TEST REPORT

Report Reference No..... M80620J924-2

Compiled by (+ signature) Kevin Bothmann



Approved by (+ signature) Jay Gandhi



Date of issue..... 08-28-2021

Applicant's name 明熙國際有限公司

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Manufacture's Name CARDO SYSTEMS LTD.

Address 101 E. Park Blvd., Suite 600, Plano, TX 75074, USA

Test specification:

Standard LP0002: 2020

Test procedure EIA 603、ANSI、FCC/47 CFR/2.1046、2.1047、2.1049、2.1051、2.1053 and 2.1055

Non-standard test method..... N/A

Test item description

Product name 藍牙耳機

Brand name Cardo

Model and/or type reference PACKTALK BOLD

Rating(s)..... DC 5V via micro-USB, DC 3.7V via battery

Testing Laboratory information

Testing Laboratory Name Electro Magnetic Test, Inc.

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CAB Identifier Number US0036

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Testing.....

Date of receipt of test item..... Aug. 18, 2021

Date (s) of performance of tests..... Aug. 18, 2021~ Aug. 28, 2021

Date of Issue Aug. 28, 2021

Test Result Pass

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Electro Magnetic Test, Inc., which is an independent testing and consulting firm. The test report is based on testing performed Electro Magnetic Test, Inc. personnel according to the measurement procedure described in the test specification given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full.

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Federal Government.

Electro Magnetic Test, Inc. is recognized by the following agencies for performing EMI/EMC testing:

COUNTRY	AGENCY	IDENTIFYING #
USA	Federal Communications Commission (FCC) (EMT's test site is recognized by the FCC)	Registration Number: 90576
USA, Canada, Taiwan, Australia/New Zealand, European Community	National Voluntary Lab Accreditation Program (NVLAP) (EMT is accredited by NVLAP. A copy of the NVLAP Scope Of Accreditation is available upon request.)	Lab Code: 200147-0
Canada	Industry Canada	File No.: IC 2804
Japan	Voluntary Control Council For Interference (VCCI)	A-0118
	Open Field Test Site "A"	-
	Mains Conducted Emissions Test Site "A"	-
	Telecom Conducted Emissions Test Site "A"	-
	3 Meter Semi-Anechoic Chamber Site "E"	-
	3 Meter Semi-Anechoic Chamber Site "E" (1GHz – 6GHz)	-
	Mains Conducted Emissions Test Site "E"	-
	Telecom Conducted Emissions Test Site "E"	-
Korea	Ministry of Information and Communication's Radio Research Laboratory (RRL) under the Asia Pacific Economic Cooperation (APEC) Mutual Recognition Arrangement (A copy of the Scope Of Accreditation is available upon request)	US0036
Taiwan	Bureau Of Standards, Metrology and Inspection (BSMI)	Reference Number: SL2-IN-E-1024
Australia / New Zealand	Australian Communications Authority (AUSTEL)	*

***THESE AGENCIES DO NOT ISSUE AN IDENTIFYING NUMBER TO TEST LABS.**

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

LP0002 : 2020			
Standard Section	Test Item	Judgment	Remark
3.3	Conducted Emission	PASS	None
4.10.1.5/3.6	Radiated Spurious Emission	PASS	None
4.10.1.2	Peak Output Power	PASS	None
4.10.1.6	6dB Occupied Bandwidth	PASS	None
4.10.1.6	Power Density	PASS	None
4.10.1.5/3.6	Restricted Bands	PASS	None
4.10.1.3	Antenna Requirement	PASS	None

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

1.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	1.38dB
2	Radiated Emission Test	3.17dB
3	RF power,conducted	0.16dB
4	Spurious emissions,conducted	0.21dB
5	All emissions,radiated(<1G)	4.68dB
6	All emissions,radiated(>1G)	4.89dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	藍牙耳機	
Brand Name	Cardo	
Model Name	PACKTALK BOLD	
Serial Model Name	PACKTALK BLACK	
OEM Brand/Model Name	N/A	
Product Description	The EUT is a 藍牙耳機.	
	Operation Frequency:	2402~2480 MHz
	Modulation Type:	GFSK
	Bit Rate of Transmitter	1Mbps, 2Mbps
	Number Of Channel	40
	Antenna Designation:	Please see Note 3.
	Antenna Gain(Peak)	1.7dBi
Channel List	Please refer to the Note 2.	
Rating	Input: DC 5V via micro-USB, DC 3.7V via battery	
Connecting I/O Port(s)	Please refer to the User's Manual	
Products Covered	N/A	
EUT Modification(s)	N/A	
Model difference	僅外觀顏色不同，其內部機板構造皆相同，工程判定免評估+/-2dB	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Description of Channel:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	21	2442
02	2404	22	2444
03	2406	23	2446
04	2408	24	2448
05	2410	25	2450
06	2412	26	2452
07	2414	27	2454
08	2416	28	2456
09	2418	29	2458
10	2420	30	2460
11	2422	31	2462
12	2424	32	2464
13	2426	33	2466
14	2428	34	2468
15	2430	35	2470
16	2432	36	2472
17	2434	37	2474
18	2436	38	2476
19	2438	39	2478
20	2440	40	2480

3.

Table for Filed Antenna

	Trade Name	Model Name	Antenna Type	Connector	Gain (dBi)
1	 fractus Optimised Antennas for Wireless Devices	FR05-S1-N-0-1 02	Chip Antenna	N/A	1.7 dBi

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	GFSK

For Conducted Emission	
Final Test Mode	Description
Mode 1	GFSK

For Radiated Emission	
Final Test Mode	Description
Mode 1	GFSK

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) For all tests the worst-case was selected as the table above, the data of the worst-case is shown in the report.

2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters.

RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	Power Class	Software For Testing
BLE	BLE	GFSK	1.7	Default	BlueSuite V2.6.4

1. Connect the computer with USB ports.
2. Open the “BlueSuite V2.6.4” test software.
3. Set the commands and click "ENTER" transmitter.

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Block diagram of EUT configuration

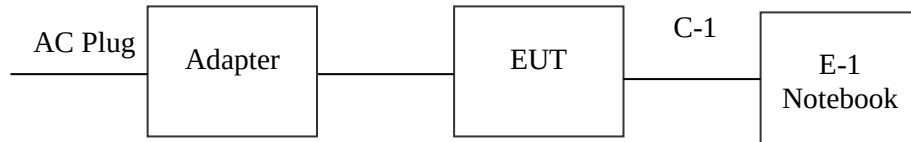
CONDUCTED EMISSION

Test mode: mode 1

Non-Conductive Table

80 cm above Ground Plane

CONDUCTED EMISSION Test Set



Block diagram of EUT configuration

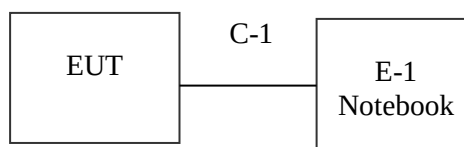
RADIATED EMISSION

Test mode: mode 1

Non-Conductive Table

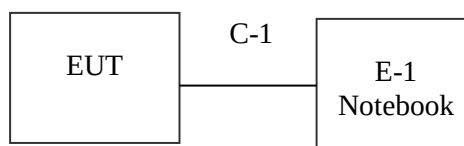
80 cm above Ground Plane

Below 1 GHz Radiation Test Set



150 cm above Ground Plane

Above 1 GHz Radiation Test Set



2.5 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

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.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
/	Adapter	FLYPOWER	PS10J050K2000CU	N/A	N/A	support units*.

EUT						
Item	Equipment	Mfr/Brand	Model/Type No.	BSMI ID	Series No.	Note
1.	Micro USB Cable	Hailink	HC.US 21-2279	N/A	N/A	N/A
2	麥克風	Velcro	Wire Mic	N/A	N/A	N/A
3	耳機	Cardo	40mm JBL speaker	N/A	N/A	N/A
4	電池	CARDO SYSTEMS, INC.	BAT00007	N/A	N/A	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” means “shielded” or “with ferrite core”; “NO” means “unshielded” or “without ferrite core”
- (4) “*”: In this report, the applicant did not provide the accompanying accessories with the equipment. The accessories were provided by the laboratory (or the applicant) and inspected simultaneously.

2.5.1 EQUIPMENTS LIST FOR ALL TEST ITEMS

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Spectrum Analyzer	Keysight	N9020A	MY53300466	April 29, 2021	1 Year
RF Preselector	Hewlett Packard	85685A	3010A01157	April 29, 2021	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650	2521A00584	April 29, 2021	1 Year
Preamplifier	Com Power	PA-102	1482	April 29, 2021	1 Year
RF Attenuator	Mini-Circuits	CAT-10	Asset #1000	December 08, 2020	1 Year
LISN	Com Power	LI-200	12012	September 09, 2020	1 Year
LISN	Com Power	LI-200	12214	September 09, 2020	1 Year
LISN	Com Power	LI-200	1767	September 09, 2020	1 Year
LISN	Com Power	LI-200	1768	September 09, 2020	1 Year
Biconical Antenna	Com Power	AB-100	01557	December 29, 2020	1 Year
Log Periodic Antenna	Com Power	AL-100	16037	December 22, 2020	1 Year
Horn Antenna	Com Power	AHA-118	711054	December 22, 2020	1 Year
Antenna Mast	Com Power	AM-400	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Computer	Dell, Inc.	DHS	DNSV641	N/A	N/A

EMI Test Equipment (Continued)

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
EMI Receiver	Rohde & Schwarz	ESU40	100127	June 12, 2021	1 Year
BiConiLog Antenna	ETS-Lindgren	3142D	00102183	August 13, 2020	1 Year
Horn Antenna (1GHz-18GHz)	ETS-Lindgren	3117	00109294	May 6, 2021	1 Year
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	May 6, 2021	1 Year
Preamplifier	Rohde & Schwarz	TS-PR18	100056	June 12, 2021	1 Year
Pre-Amplifier	Agilent	8449B	3008A00409	June 12, 2021	1 Year
Antenna Mast	ETS-Lindgren	2175	00095727	N/A	N/A
Turntable	ETS-Lindgren	2187-3.0	00118231	N/A	N/A
Computer	Acer	Aspire 8930	85100050123	N/A	N/A
Multi-Function Controller	ETS-Lindgren	2090	00102270	N/A	N/A
Loop Antenna	ARA	PLA-1030/B	1029	May 19, 2021	1 Year

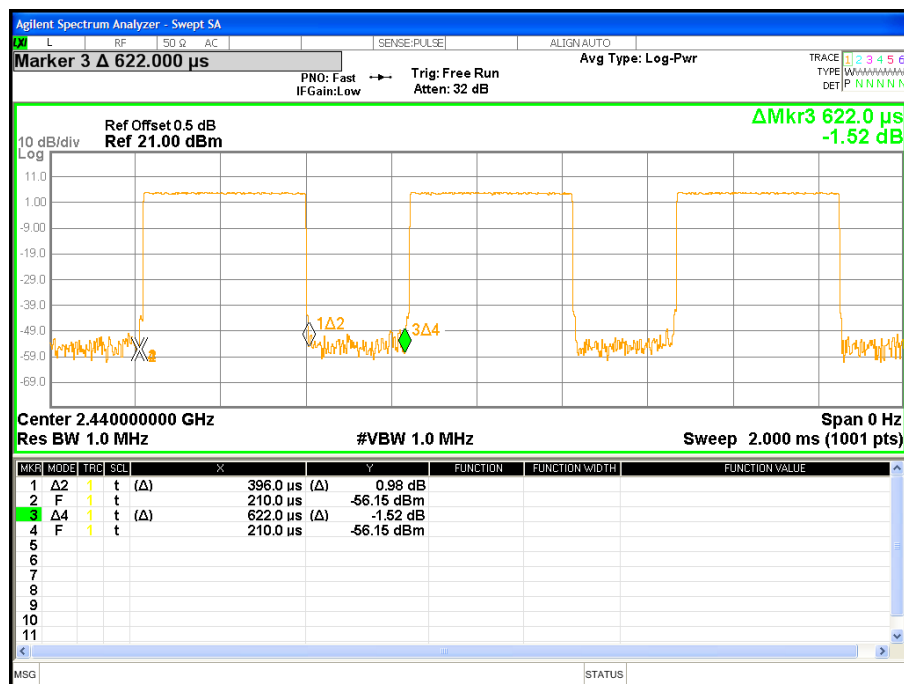
3. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

3.1 LIMITS

None; for reporting purposes only.

3.2 ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	10log(1/x)Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
BLE	0.396	0.622	0.6367	63.67%	1.961	2.525



4. TRANSMITTER EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150kHz-30MHz)

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	LP0002
0.50 -5.0	56.00	46.00	LP0002
5.0 -30.0	60.00	50.00	LP0002

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

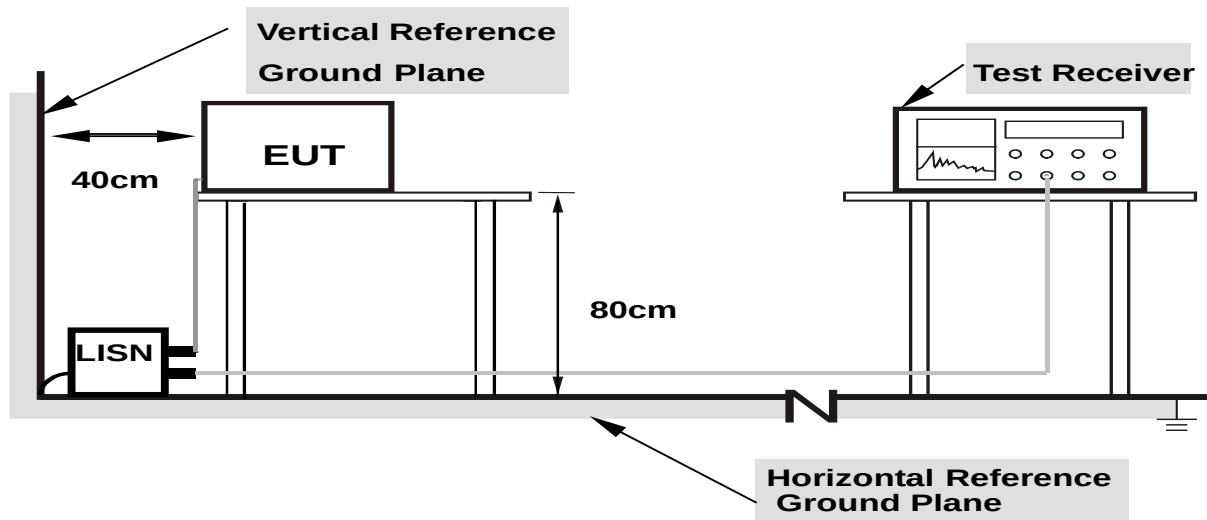
4.1.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP

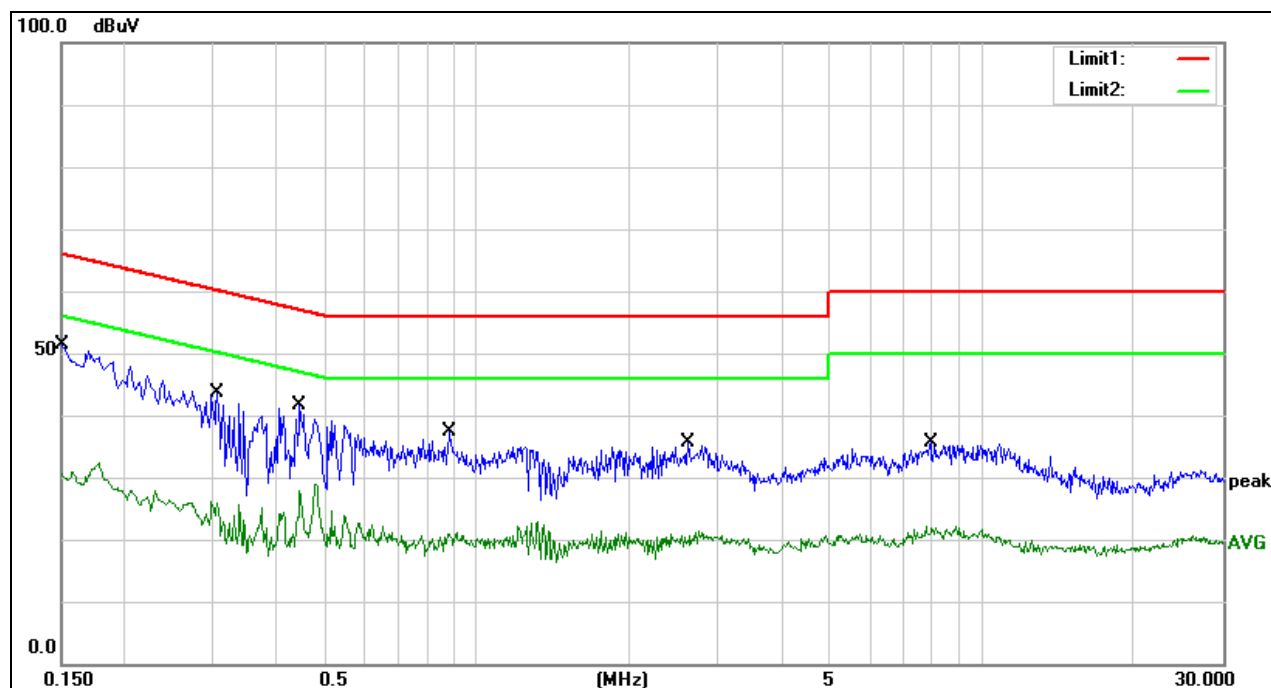


Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.5 TEST RESULTS

EUT :	藍牙耳機	Model Name. :	PACKTALK BOLD
Temperature :	26.0 °C	Relative Humidity :	59%
Pressure :	1010hPa	Test Date :	2021-08-25
Test Mode :	Mode 1	Phase :	L
Test Voltage :	AC 110V/60Hz		

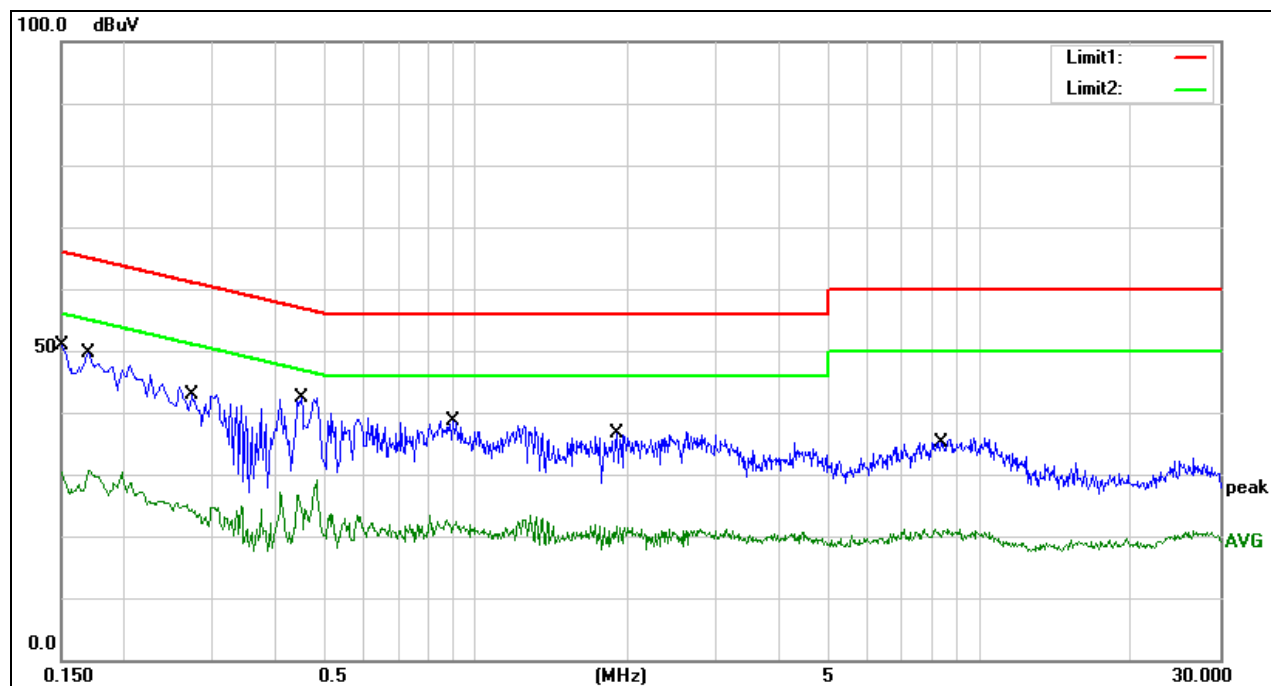


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. '*' means the worst case

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	31.03	20.33	51.36	66.00	-14.64	QP
2	0.1500	12.10	20.33	32.43	56.00	-23.57	AVG
3	0.3060	22.92	20.74	43.66	60.08	-16.42	QP
4	0.3060	5.29	20.74	26.03	50.08	-24.05	AVG
5	0.4460	21.09	20.54	41.63	56.95	-15.32	QP
6	0.4460	8.31	20.54	28.85	46.95	-18.10	AVG
7	0.8820	16.98	20.32	37.30	56.00	-18.70	QP
8	0.8820	0.83	20.32	21.15	46.00	-24.85	AVG
9	2.6100	15.37	20.33	35.70	56.00	-20.30	QP
10	2.6100	1.04	20.33	21.37	46.00	-24.63	AVG
11	7.9140	14.83	20.76	35.59	60.00	-24.41	QP
12	7.9140	1.44	20.76	22.20	50.00	-27.80	AVG

EUT :	藍牙耳機	Model Name. :	PACKTALK BOLD
Temperature :	26.0 °C	Relative Humidity :	59%
Pressure :	1010hPa	Test Date :	2021-08-25
Test Mode :	Mode 1	Phase :	AC 110V/60Hz
Test Voltage :	DC 3.7V		



Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. '*' means the worst case

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	30.49	20.33	50.82	66.00	-15.18	QP
2	0.1700	10.30	20.33	30.63	54.96	-24.33	AVG
3	0.2740	22.33	20.63	42.96	61.00	-18.04	QP
4	0.2740	5.02	20.63	25.65	51.00	-25.35	AVG
5	0.4500	21.85	20.54	42.39	56.88	-14.49	QP
6	0.4500	8.49	20.54	29.03	46.88	-17.85	AVG
7	0.9020	18.24	20.32	38.56	56.00	-17.44	QP
8	0.9020	3.12	20.32	23.44	46.00	-22.56	AVG
9	1.8980	16.31	20.30	36.61	56.00	-19.39	QP
10	1.8980	1.20	20.30	21.50	46.00	-24.50	AVG
11	8.3740	14.34	20.86	35.20	60.00	-24.80	QP
12	8.3740	0.38	20.86	21.24	50.00	-28.76	AVG

Test result: The unit does meet the NCC requirements.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 3.5, then the 3.6 limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	LIMITS (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to LP0002.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Frequency measurement range:

1 The spectrum shall be measured from the lowest radio frequency signal generated in the device (without going below 9 kHz), and the upper limit of the measurement range shall be decided according to the maximum operating frequency.

1.1 Maximum operating frequency less than 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

1.2 Maximum operating frequency between 10 GHz~30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

1.3 Maximum operating frequency over 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower.

2 Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.

Spectrum Parameter		Setting	
Attenuation		Auto	
Start Frequency		1000 MHz	
Stop Frequency		10th carrier harmonic	
Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3MHz
AV	$\geq 98\%$	1MHz	10Hz
	$< 98\%$	1MHz	1/T

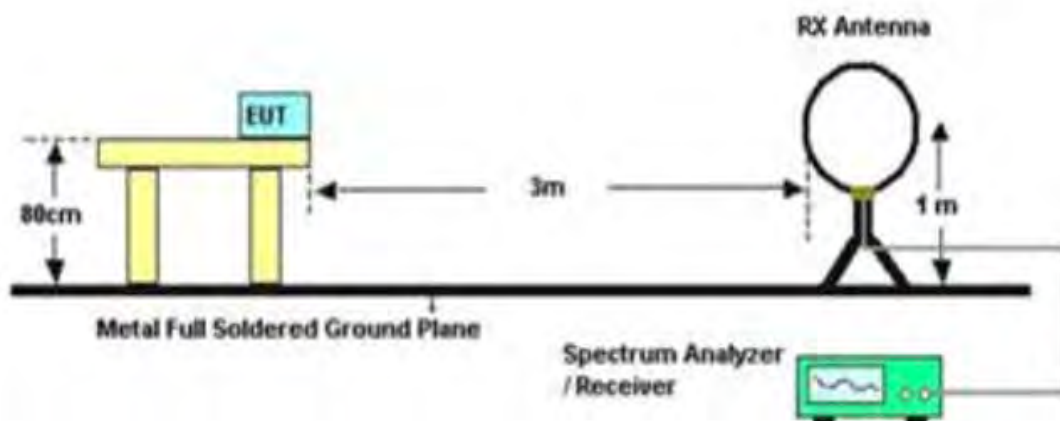
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2.2 TEST PROCEDURE

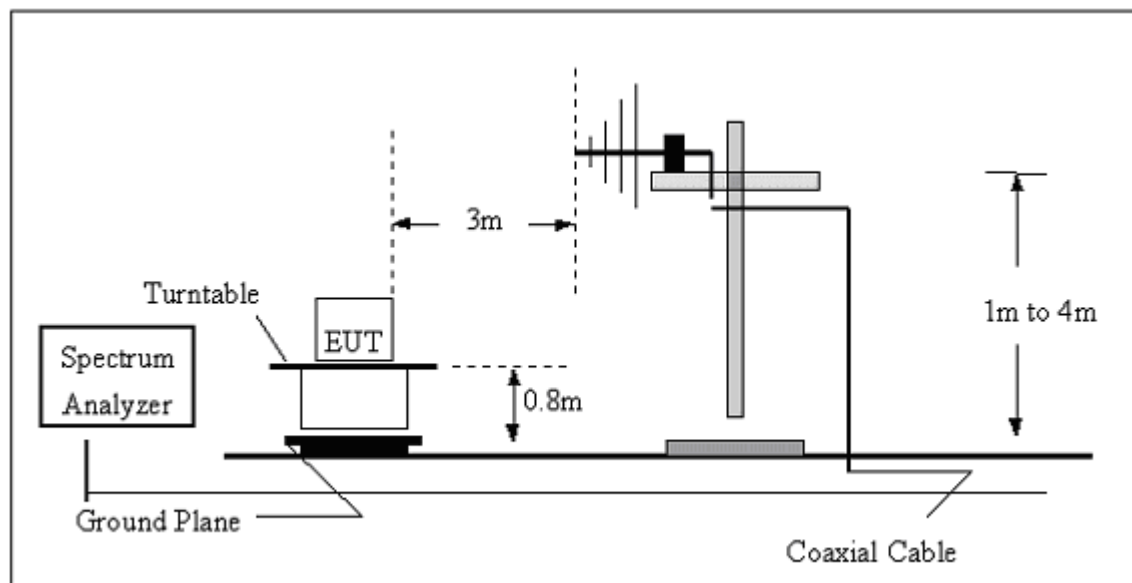
- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters (For frequencies above 1GHz, table 1.5 meters) above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 TEST SETUP

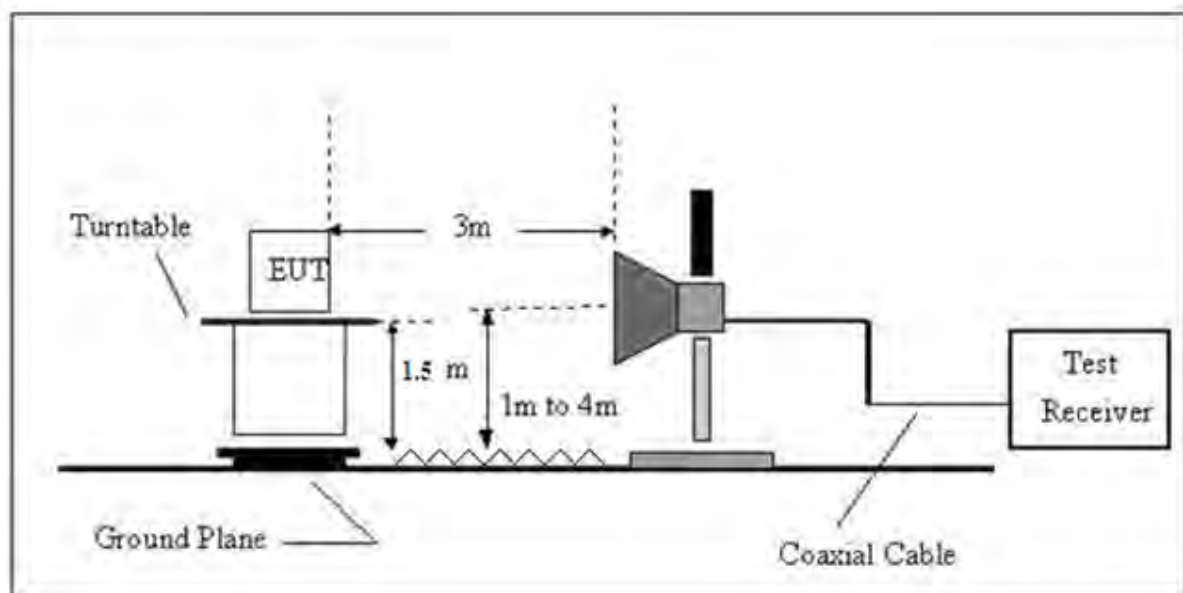
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



4.2.4 EUT OPERATING CONDITIONS

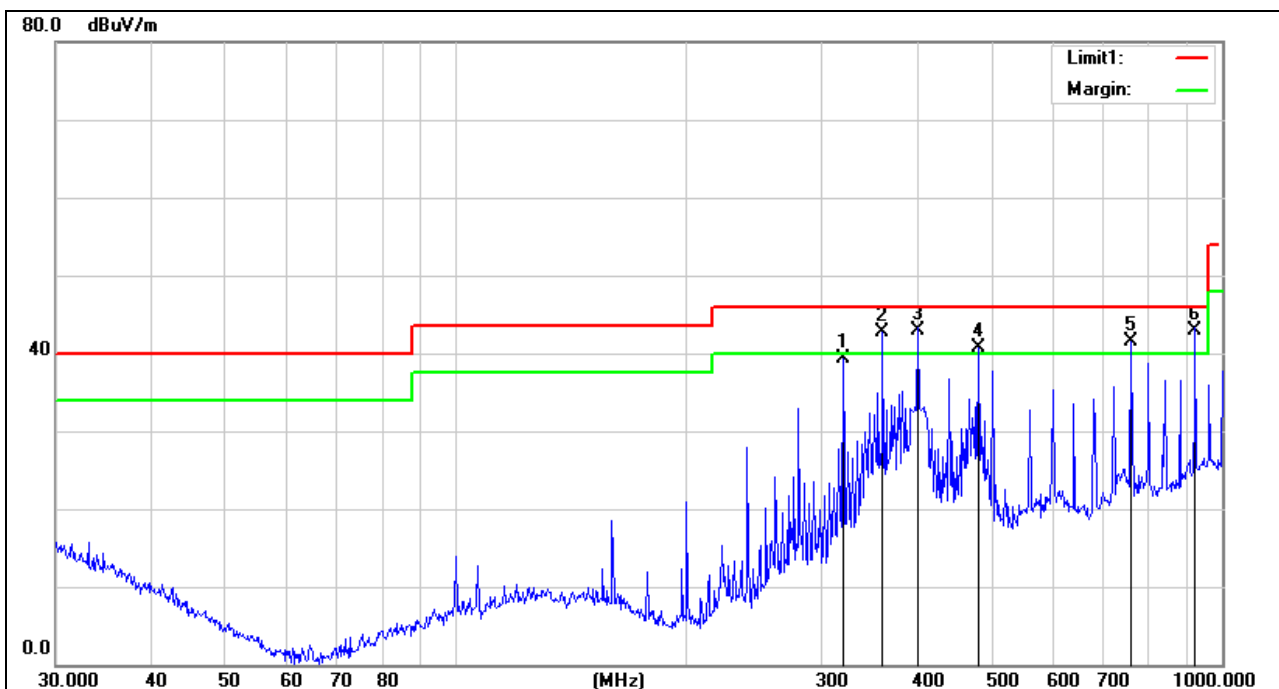
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.5 TEST RESULTS (BLOW 30MHZ)

There is not detected blow 30MHz.

4.2.6 TEST RESULTS (BETWEEN30 – 1000 MHZ)

EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2021-08-25
Test Mode :	TX 2440MHz (1M PHY)	Polarization :	Horizontal
Test Power :	DC 3.7V		

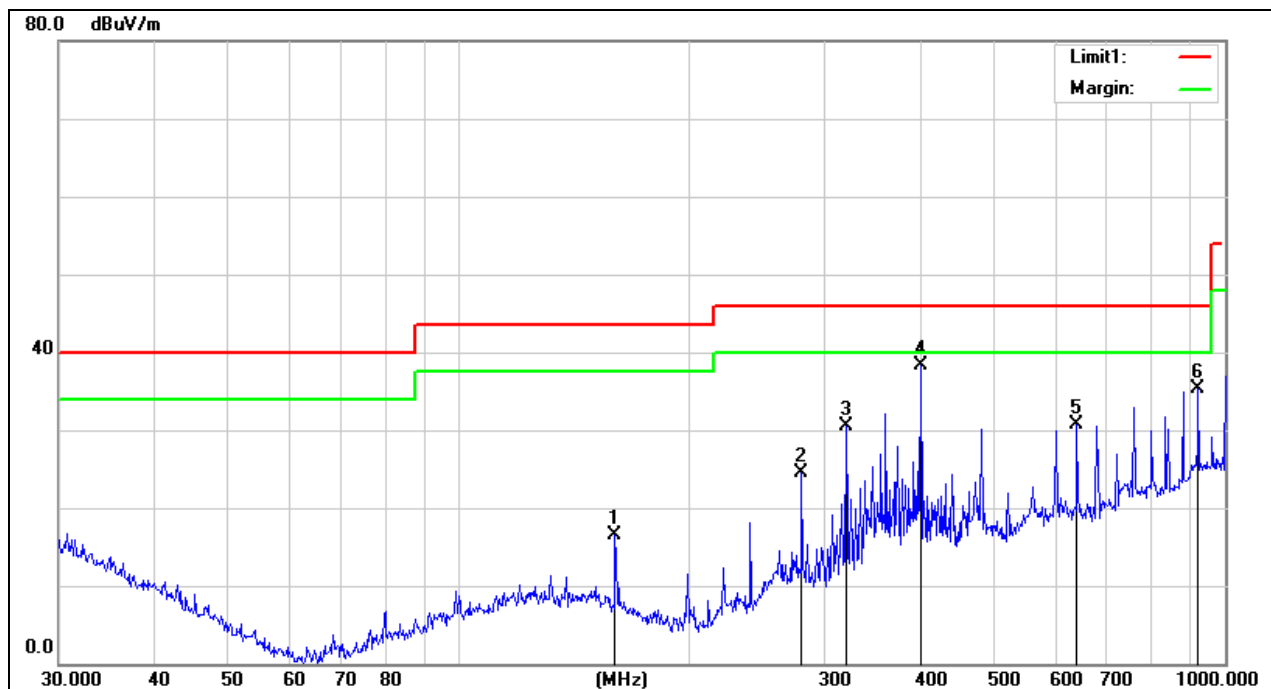


Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	319.9370	54.08	-14.73	39.35	46.00	-6.65	QP
2	360.4476	56.94	-14.20	42.74	46.00	-3.26	QP
3	400.4318	56.02	-13.17	42.85	46.00	-3.15	QP
4	480.5276	51.61	-11.00	40.61	46.00	-5.39	QP
5	760.7036	47.04	-5.53	41.51	46.00	-4.49	QP
6	922.5157	45.66	-2.67	42.99	46.00	-3.01	QP

EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2021-08-25
Test Mode :	TX 2440MHz (1M PHY)	Polarization :	Vertical
Test Power :	DC 3.7V		



Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	159.7844	35.26	-18.66	16.60	43.50	-26.90	QP
2	280.0237	40.29	-15.75	24.54	46.00	-21.46	QP
3	319.9370	45.19	-14.73	30.46	46.00	-15.54	QP
4	400.4320	51.50	-13.17	38.33	46.00	-7.67	QP
5	640.6110	38.78	-8.10	30.68	46.00	-15.32	QP
6	922.5157	38.01	-2.67	35.34	46.00	-10.66	QP

Test result: The unit does meet the NCC requirements.

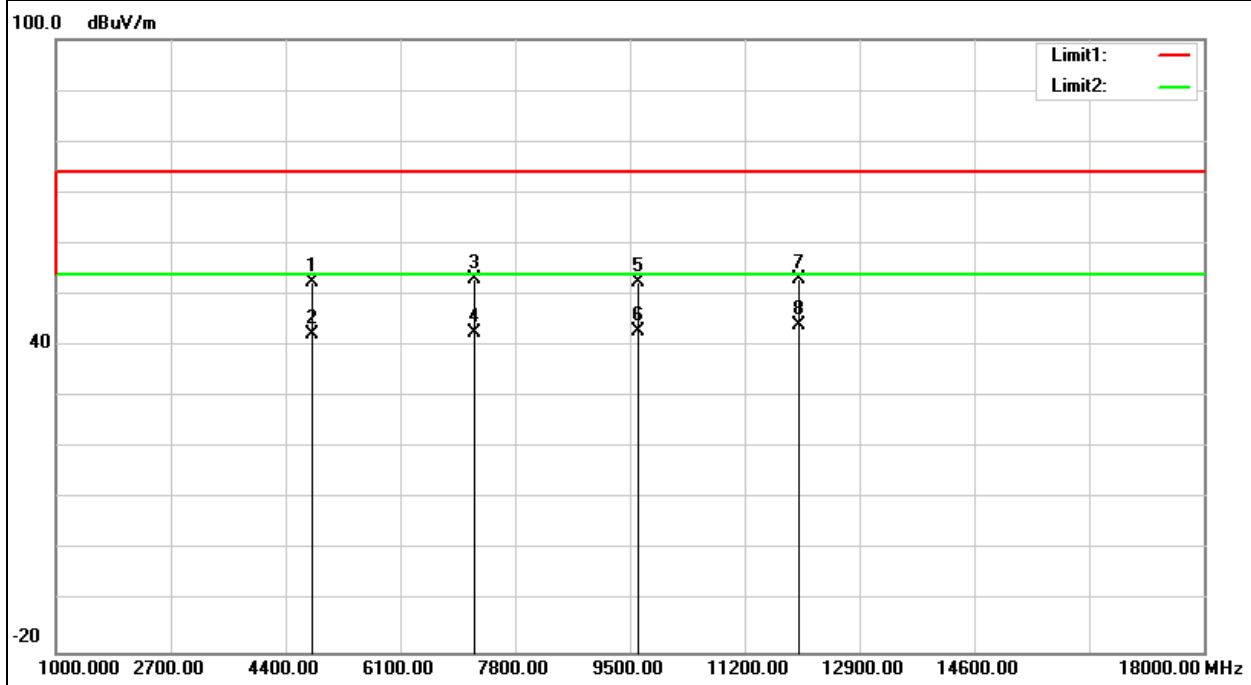
4.2.7 TEST RESULTS (ABOVE 1000 MHZ)

EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2021-08-25
Test Mode :	TX CH01 (1M PHY)	Polarization :	Horizontal
Test Power :	DC 3.7V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4807.000	59.56	-7.20	52.36	74.00	-21.64	peak
4807.000	49.49	-7.20	42.29	54.00	-11.71	AVG
7209.000	52.41	0.56	52.97	74.00	-21.03	peak
7209.000	42.05	0.56	42.61	54.00	-11.39	AVG
9631.000	49.17	3.20	52.37	74.00	-21.63	peak
9631.000	39.74	3.20	42.94	54.00	-11.06	AVG
12014.000	47.33	5.80	53.13	74.00	-20.87	peak
12014.000	38.14	5.80	43.94	54.00	-10.06	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

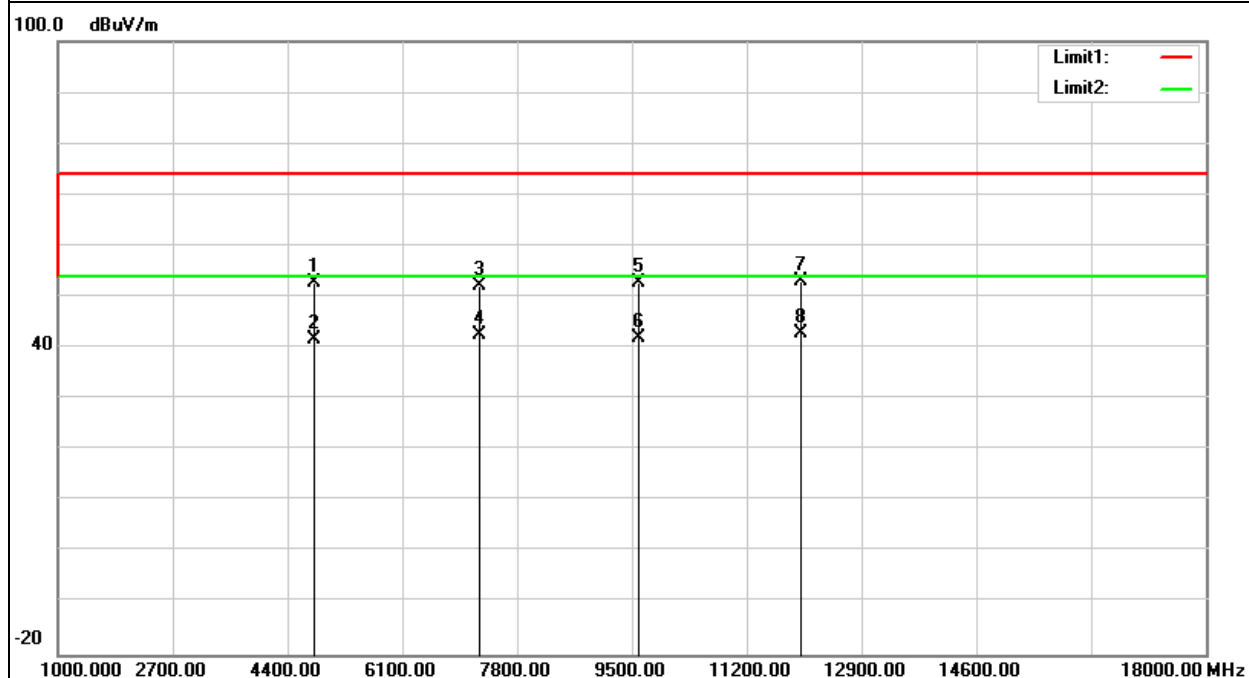


EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2021-08-25
Test Mode :	TX CH01 (1M PHY)	Polarization :	Vertical
Test Power :	DC 3.7V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4805.000	59.81	-7.20	52.61	74.00	-21.39	peak
4805.000	48.72	-7.20	41.52	54.00	-12.48	AVG
7236.000	51.49	0.66	52.15	74.00	-21.85	peak
7236.000	41.99	0.66	42.65	54.00	-11.35	AVG
9608.000	49.66	3.19	52.85	74.00	-21.15	peak
9608.000	38.89	3.19	42.08	54.00	-11.92	AVG
12014.000	47.11	5.80	52.91	74.00	-21.09	peak
12014.000	36.95	5.80	42.75	54.00	-11.25	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

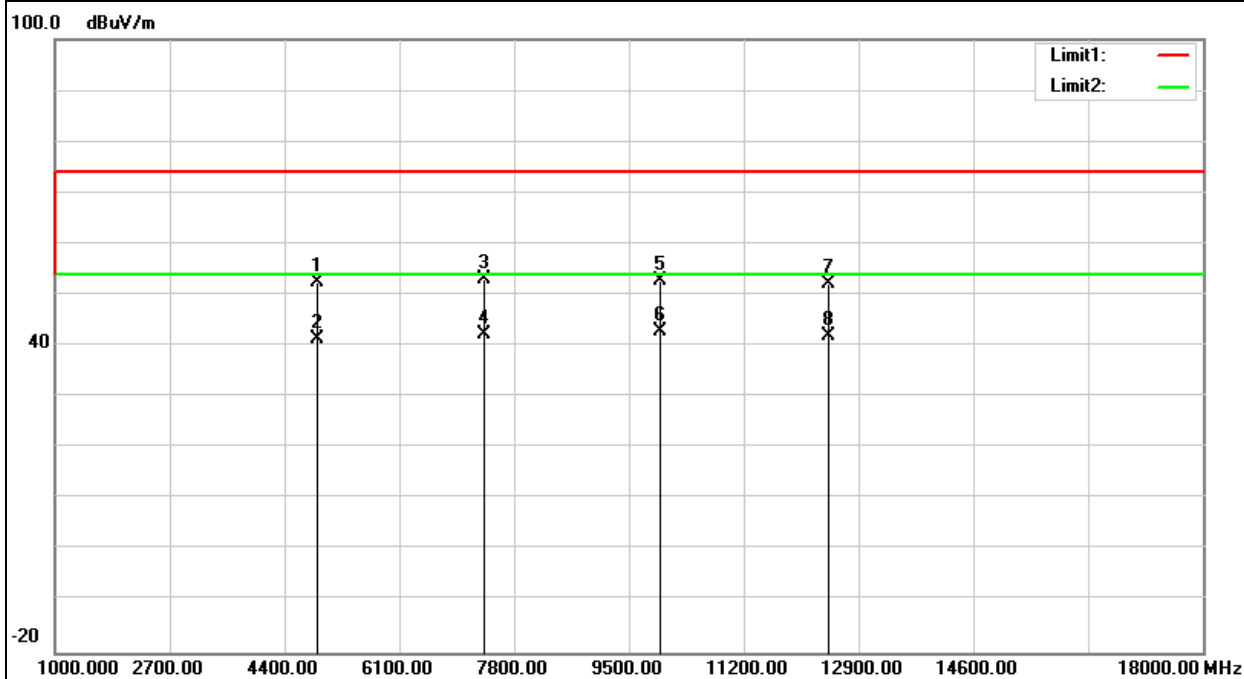


EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2021-08-25
Test Mode :	TX CH20 (1M PHY)	Polarization :	Horizontal
Test Power :	DC 3.7V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4885.000	59.24	-6.90	52.34	74.00	-21.66	peak
4885.000	48.30	-6.90	41.40	54.00	-12.60	AVG
7369.000	51.79	1.15	52.94	74.00	-21.06	peak
7369.000	41.09	1.15	42.24	54.00	-11.76	AVG
9965.000	49.29	3.35	52.64	74.00	-21.36	peak
9965.000	39.62	3.35	42.97	54.00	-11.03	AVG
12455.000	46.42	5.83	52.25	74.00	-21.75	peak
12455.000	36.18	5.83	42.01	54.00	-11.99	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

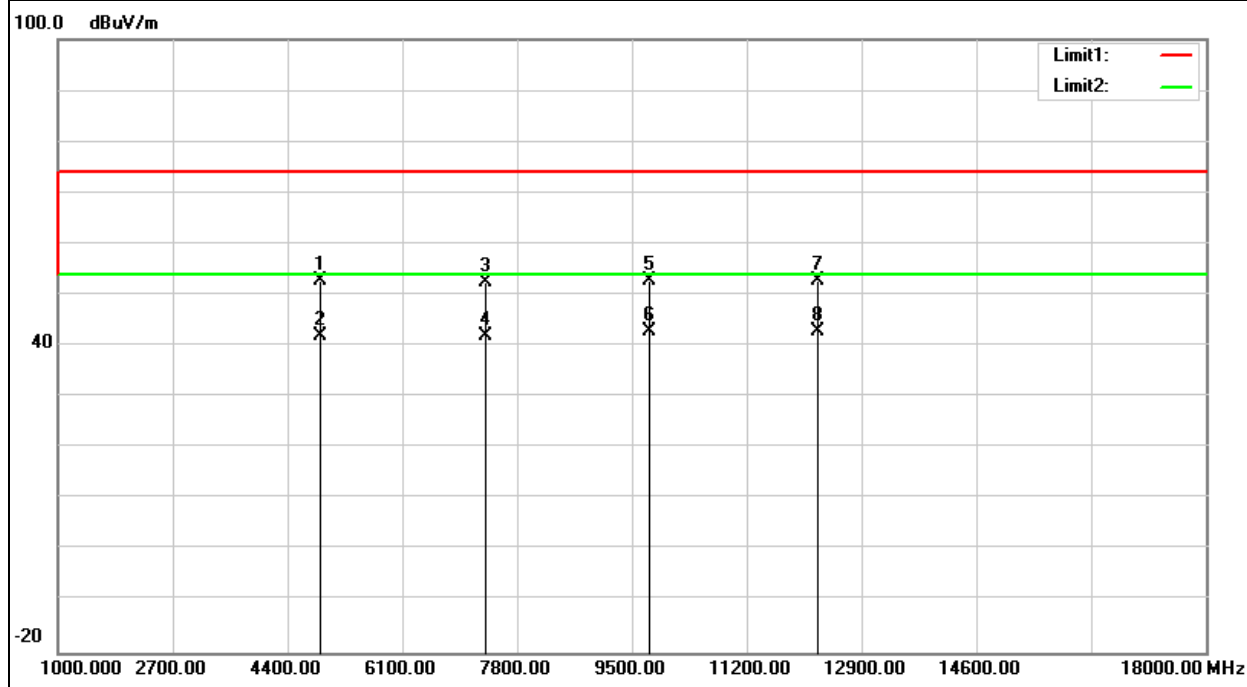


EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2021-08-25
Test Mode :	TX CH20 (1M PHY)	Polarization :	Vertical
Test Power :	DC 3.7V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4887.000	59.50	-6.89	52.61	74.00	-21.39	peak
4887.000	48.91	-6.89	42.02	54.00	-11.98	AVG
7325.000	51.35	0.99	52.34	74.00	-21.66	peak
7325.000	41.06	0.99	42.05	54.00	-11.95	AVG
9758.000	49.39	3.25	52.64	74.00	-21.36	peak
9758.000	39.70	3.25	42.95	54.00	-11.05	AVG
12254.000	46.86	5.82	52.68	74.00	-21.32	peak
12254.000	37.05	5.82	42.87	54.00	-11.13	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

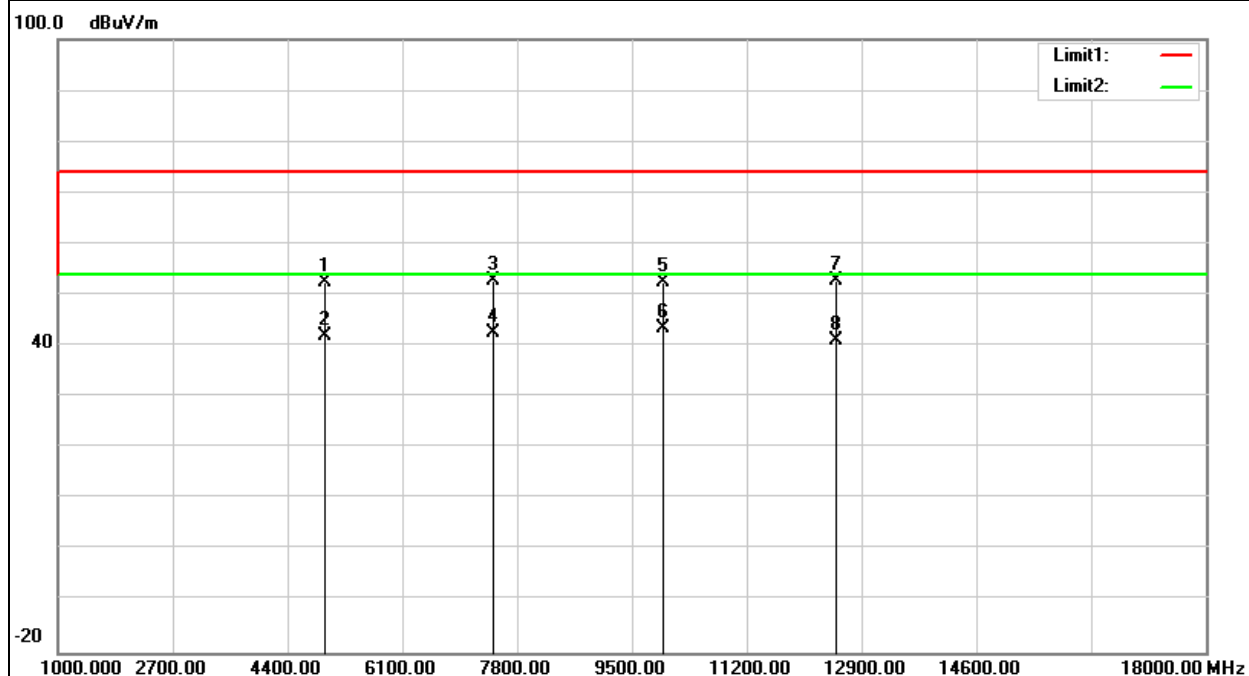


EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2021-08-25
Test Mode :	TX CH40 (1M PHY)	Polarization :	Horizontal
Test Power :	DC 3.7V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4962.000	58.75	-6.44	52.31	74.00	-21.69	peak
4962.000	48.46	-6.44	42.02	54.00	-11.98	AVG
7445.000	51.21	1.43	52.64	74.00	-21.36	peak
7445.000	41.21	1.43	42.64	54.00	-11.36	AVG
9965.000	48.96	3.35	52.31	74.00	-21.69	peak
9965.000	40.21	3.35	43.56	54.00	-10.44	AVG
12533.000	46.88	5.88	52.76	74.00	-21.24	peak
12533.000	35.18	5.88	41.06	54.00	-12.94	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

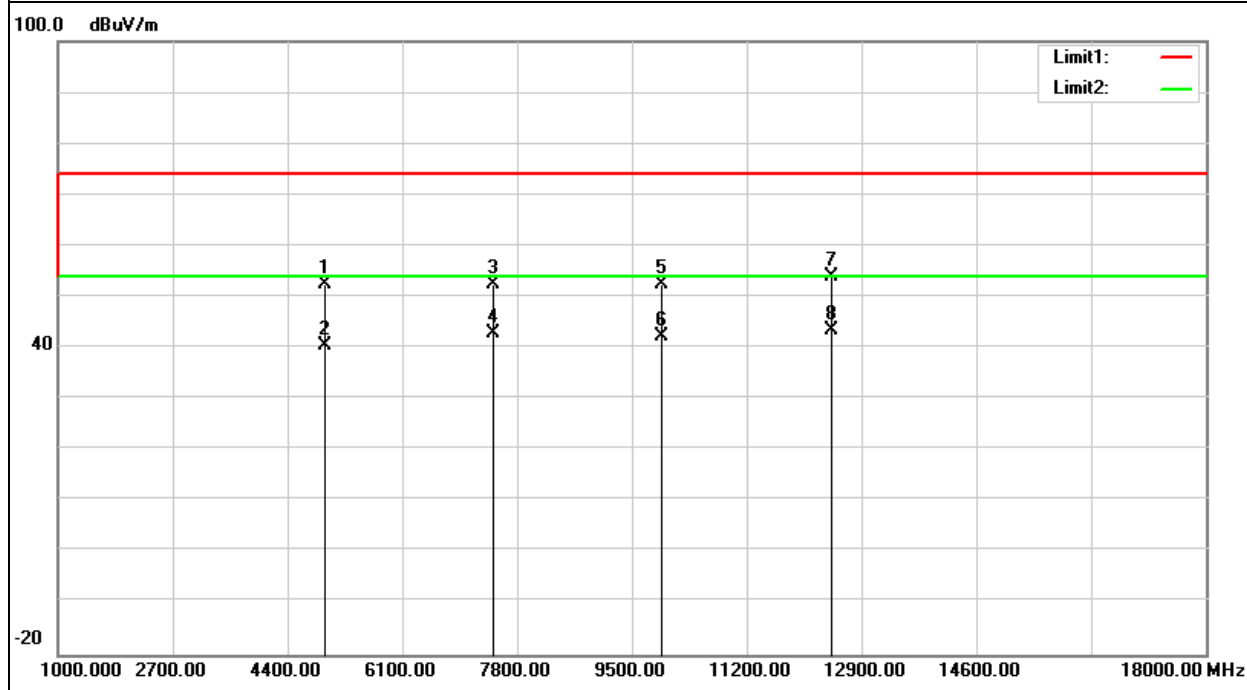


EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	23.1 °C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2021-08-25
Test Mode :	TX CH40 (1M PHY)	Polarization :	Vertical
Test Power :	DC 3.7V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4966.000	58.72	-6.41	52.31	74.00	-21.69	peak
4966.000	46.79	-6.41	40.38	54.00	-13.62	AVG
7441.000	50.95	1.41	52.36	74.00	-21.64	peak
7441.000	41.54	1.41	42.95	54.00	-11.05	AVG
9932.000	48.98	3.33	52.31	74.00	-21.69	peak
9932.000	38.87	3.33	42.20	54.00	-11.80	AVG
12455.000	48.12	5.83	53.95	74.00	-20.05	peak
12455.000	37.68	5.83	43.51	54.00	-10.49	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



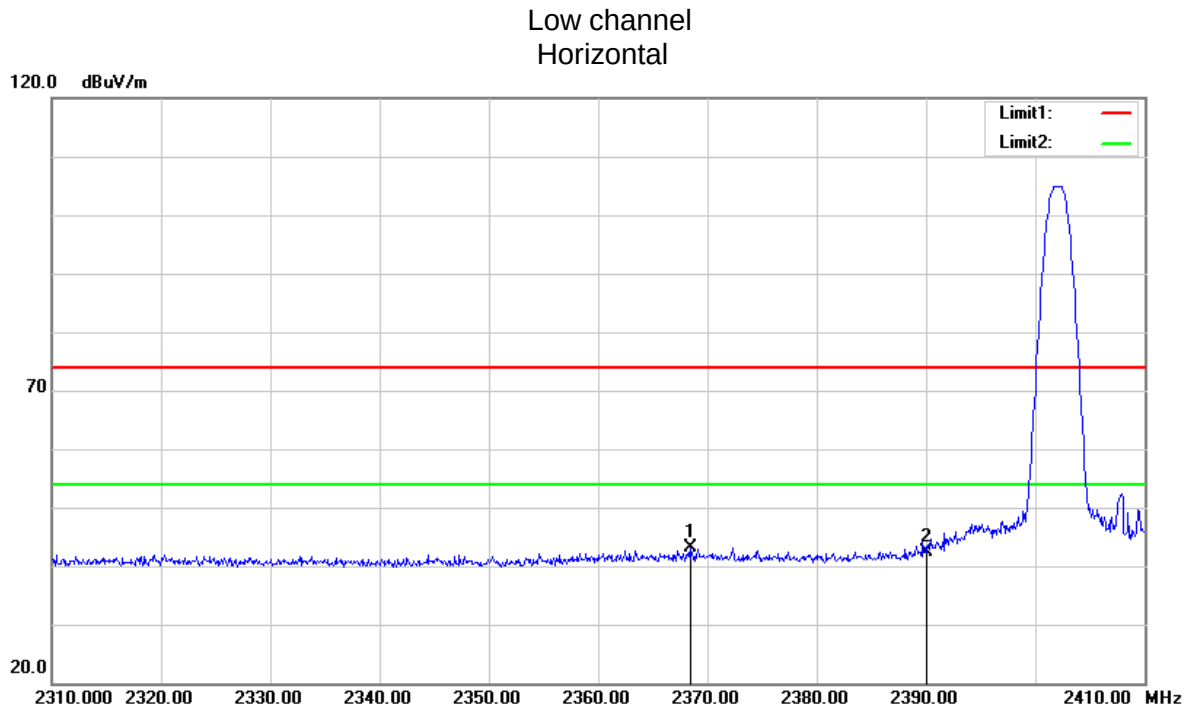
Remark:

All the modes had been tested, but only the worst data recorded in the report.

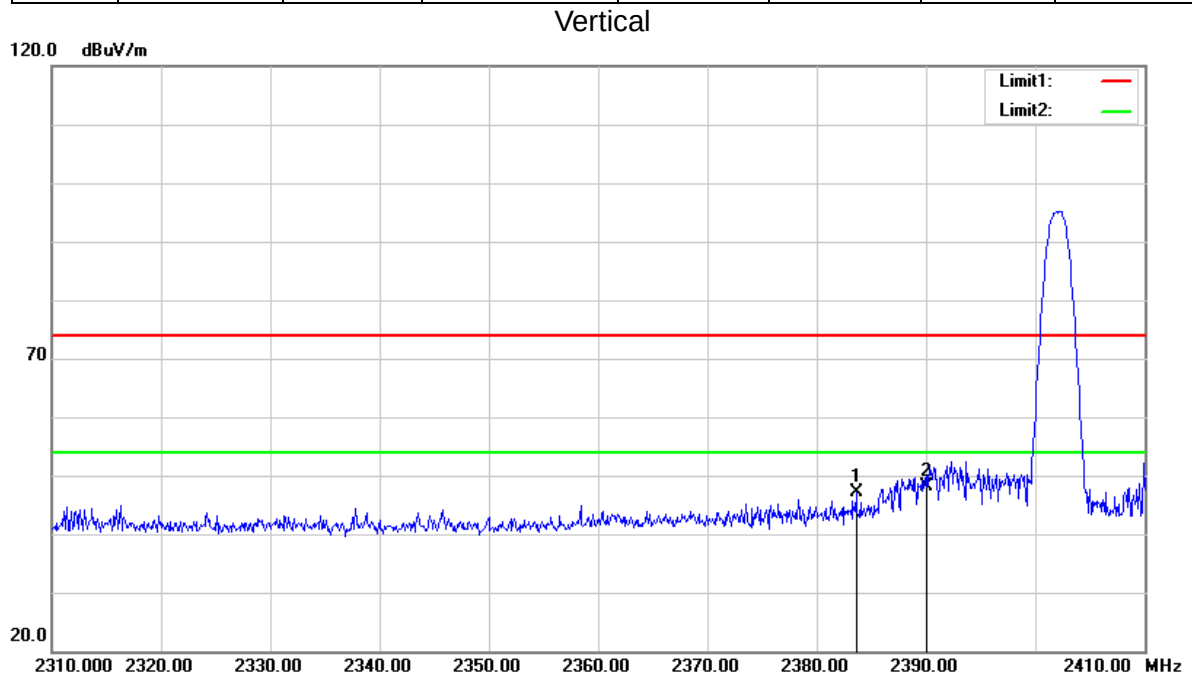
No any other emissions detected which are tested to compliance with the limit. No recording in the test report.

Test result: The unit does meet the NCC requirements.

4.2.8 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

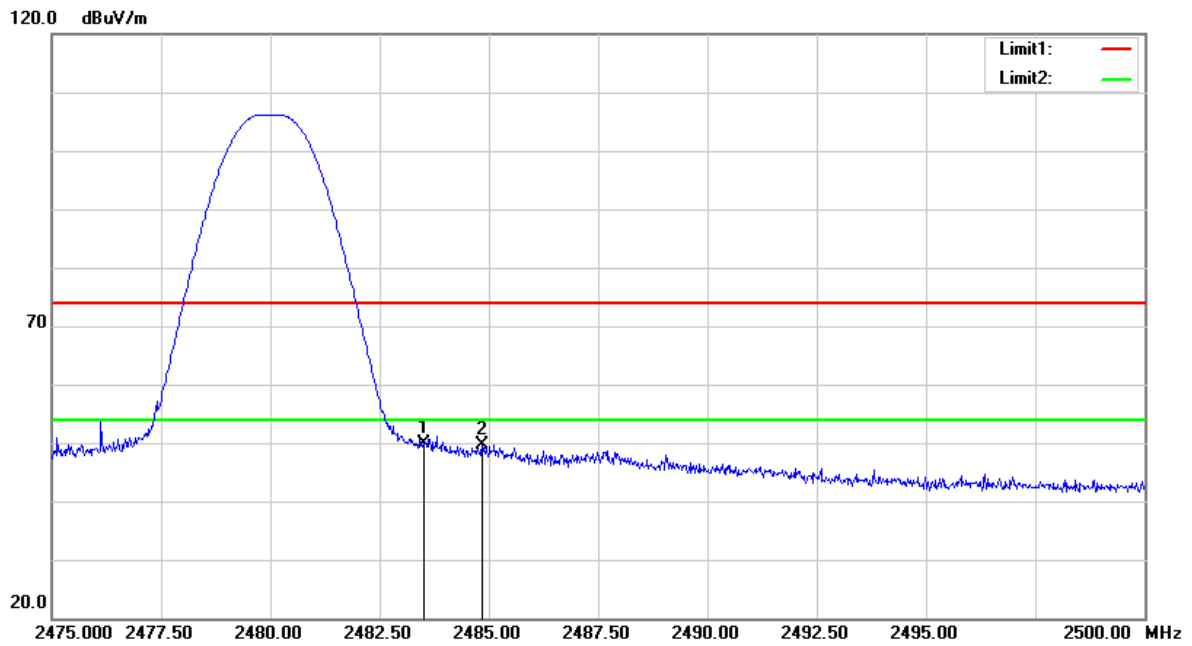


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2368.400	39.17	4.01	43.18	74.00	-30.82	peak
2	2390.000	38.09	4.34	42.43	74.00	-31.57	peak



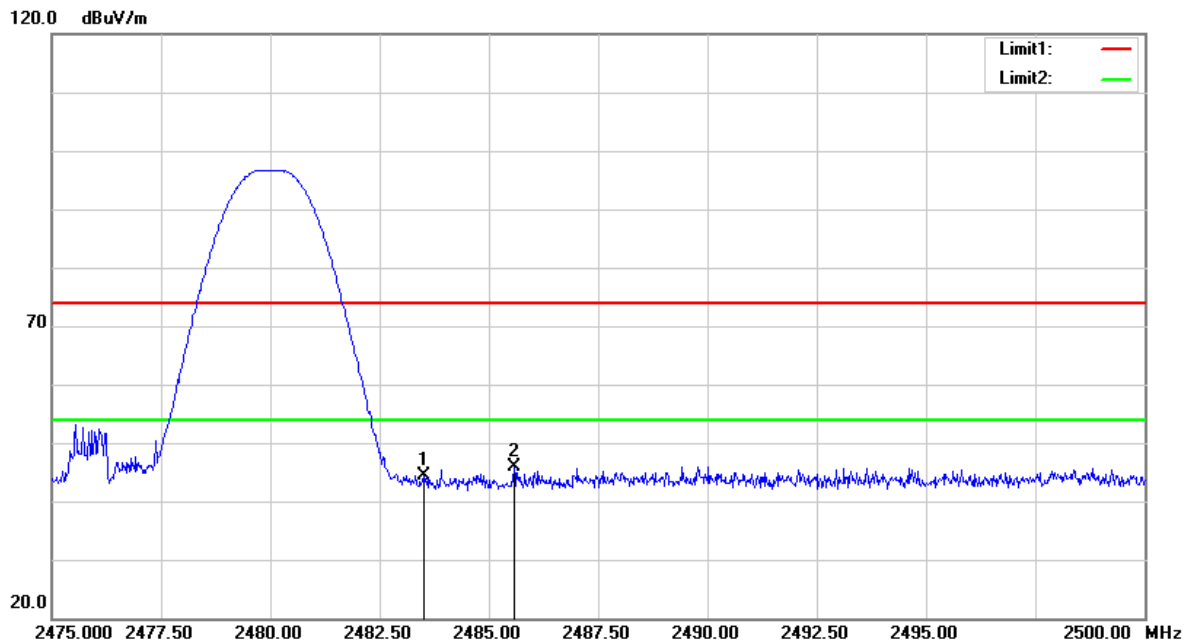
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2383.600	42.89	4.24	47.13	74.00	-26.87	peak
2	2390.000	43.84	4.34	48.18	74.00	-25.82	peak

High channel Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	45.29	4.60	49.89	74.00	-24.11	peak
2	2484.850	45.02	4.61	49.63	74.00	-24.37	peak

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	39.85	4.60	44.45	74.00	-29.55	peak
2	2485.575	41.35	4.61	45.96	74.00	-28.04	peak

Test result: The unit does meet the NCC requirements.

5. OCCUPIED BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

LP0002				
Section	Test Item	Limit	Frequency Range (MHz)	Result
4.10.1(6.2.1)	Bandwidth	$\geq 500\text{kHz}$ (6dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	$>$ Measurement Bandwidth or Channel Separation
RB	100 kHz (6dB Bandwidth) / 100 kHz (Channel Separation)
VB	300 kHz (6dB Bandwidth) / 300 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW= 100kHz, VBW=300kHz, Sweep time = Auto.

5.1.2 TEST SETUP



5.1.3 EUT OPERATION CONDITIONS

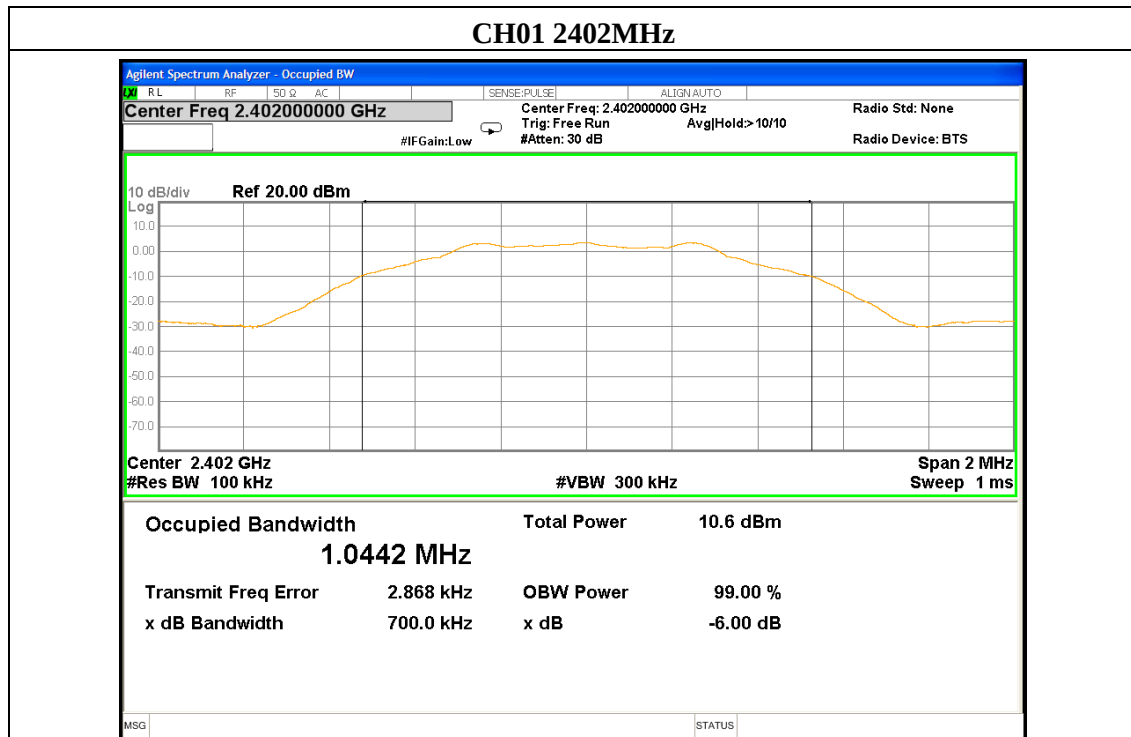
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.4 TEST RESULTS

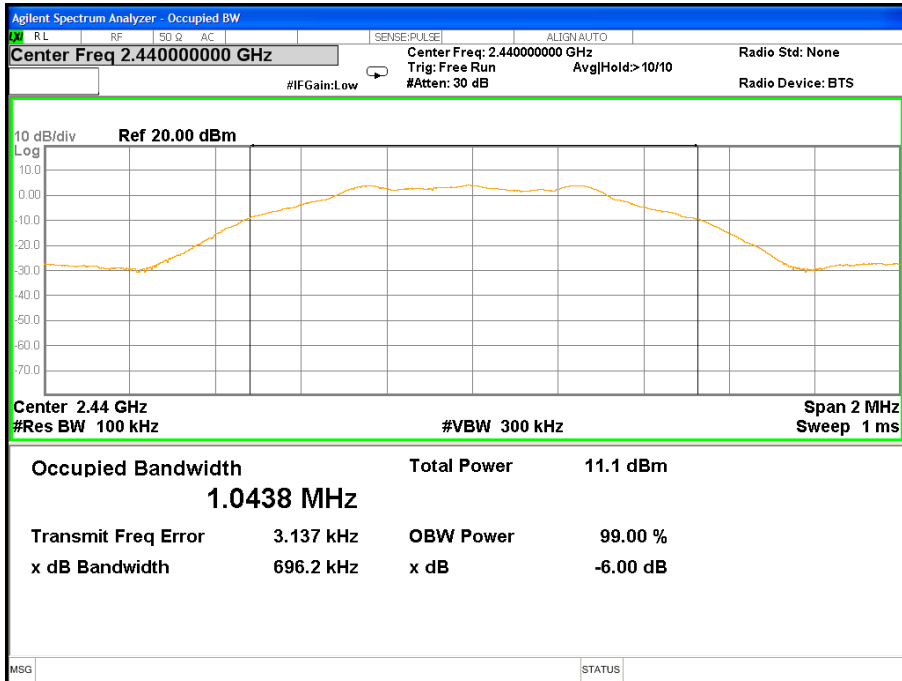
1M PHY

EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Power :	DC 3.7V
Test Mode :	Mode 1		
Test Date :	2021-08-25		

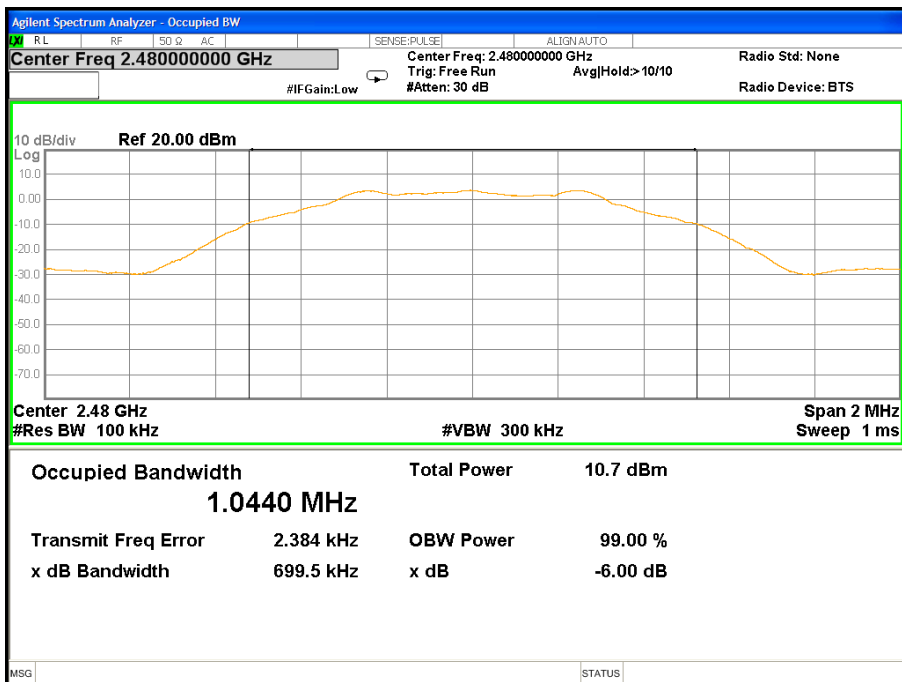
Test Mode	Test Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Limit (kHz)
Mode 1	CH01	2402	700.0	≥ 500
	CH20	2440	696.2	≥ 500
	CH40	2480	699.5	≥ 500



CH20 2440MHz



CH40 2480MHz



6. POWER DENSITY

6.1 APPLIED PROCEDURES / LIMIT

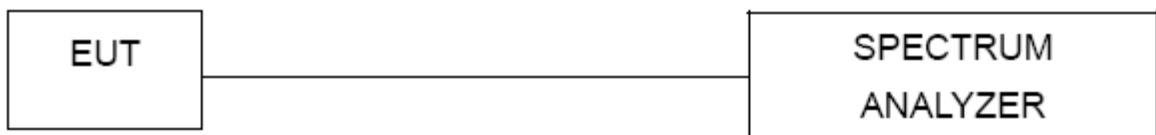
LP0002				
Section	Test Item	Limit	Frequency Range (MHz)	Result
4.10.1(6.2.2)	Power density	8dBm	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	1.5 times the DTS bandwidth
RB	3 kHz
VB	10 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 3kHz, VBW=10kHz.

6.1.2 TEST SETUP



6.1.3 EUT OPERATION CONDITIONS

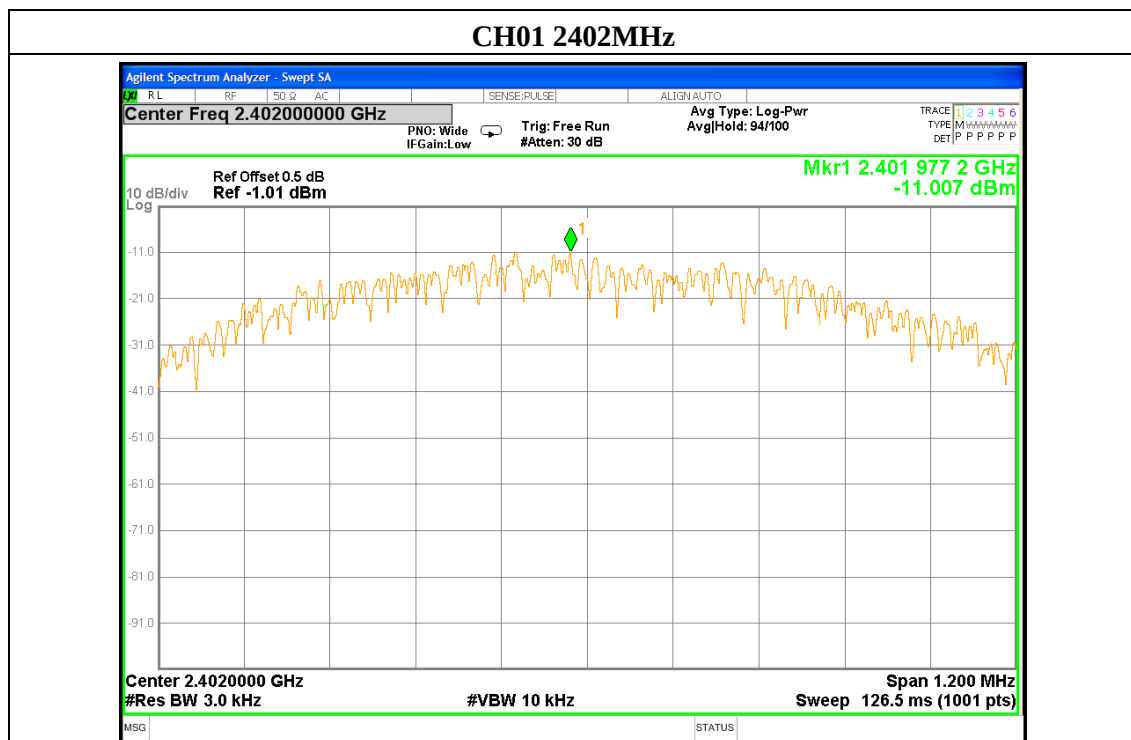
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.4 TEST RESULTS

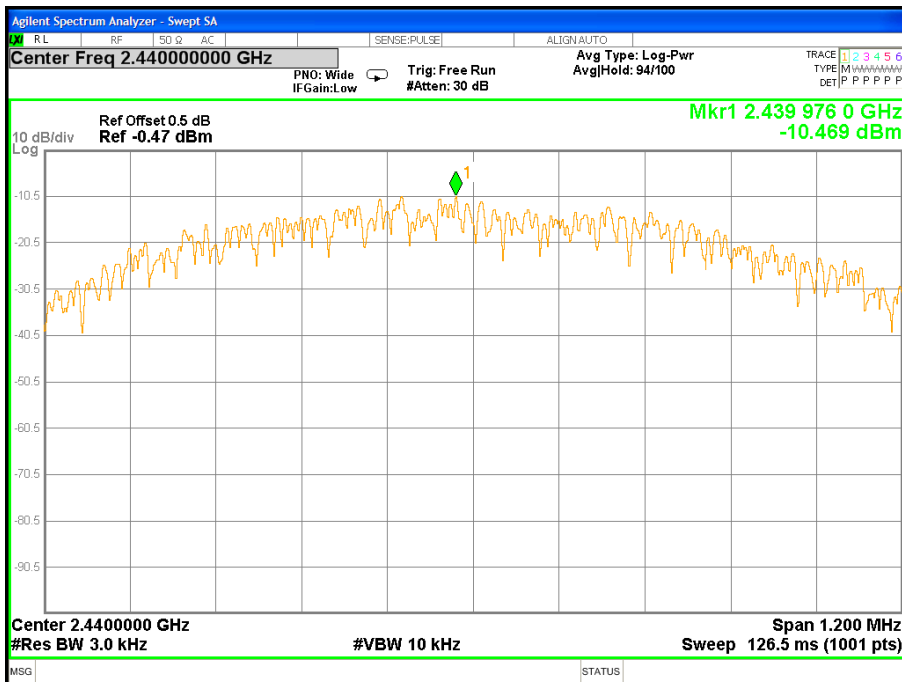
1M PHY

EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Power :	DC 3.7V
Test Mode :	Mode 1		
Test Date :	2021-08-25		

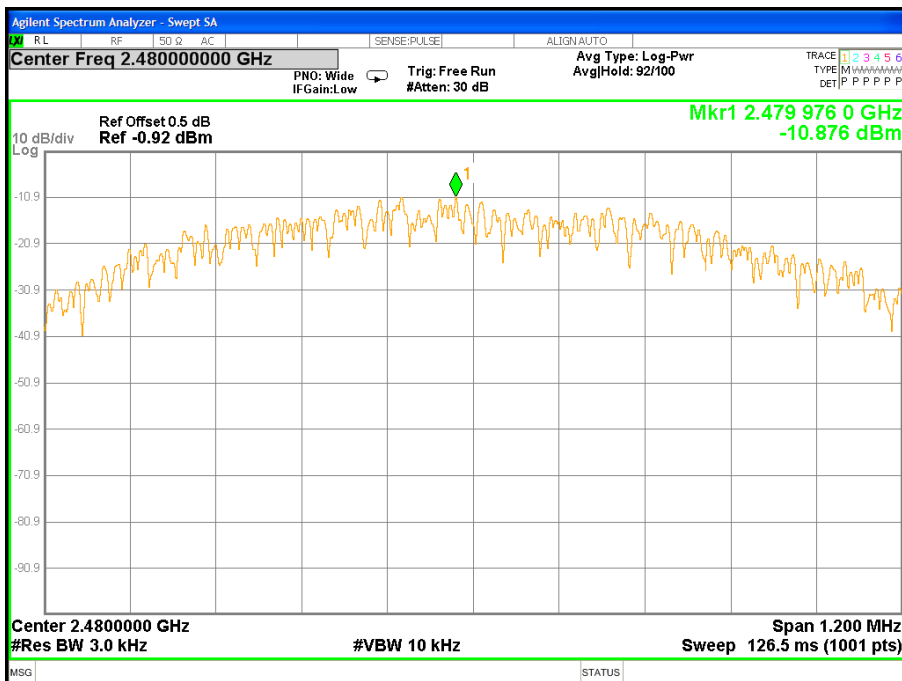
Test Channel	Frequency(MHz)	Power Density(dBm)	LIMIT(dBm)
CH01	2402 MHz	-11.007	8.00
CH20	2440 MHz	-10.469	8.00
CH40	2480 MHz	-10.876	8.00



CH20 2440MHz



CH40 2480MHz



7. OUTPUT POWER TEST

7.1 APPLIED PROCEDURES / LIMIT

LP0002				
Section	Test Item	Limit	Frequency Range (MHz)	Result
4.10.1(2)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

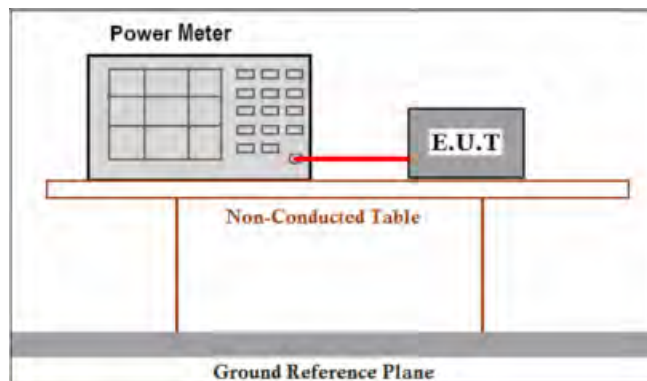
7.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 TEST RESULTS

1M PHY

EUT :	藍牙耳機	Model Name :	PACKTALK BOLD
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Power :	DC 3.7V
Test Mode :	Mode 1		
Test Date :	2021-08-25		

Test Channel	Frequency (MHz)	Output Power (dBm)	Limit(dBm)	Result
CH01	2402 MHz	6.90	30	PASS
CH20	2440MHz	6.55	30	PASS
CH40	2480 MHz	6.43	30	PASS

8. ANTENNA CONDUCTED SPURIOUS EMISSION

8.1 APPLIED PROCEDURES / LIMIT

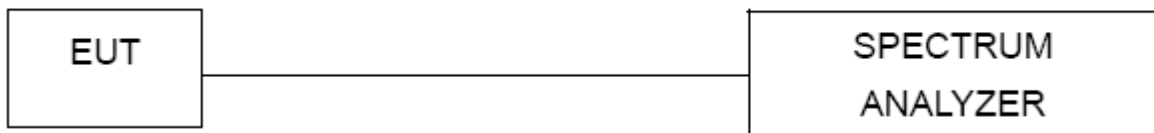
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in Section 3.6.

Frequencies (MHz)	Field Strength (micorvolts/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

8.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100kHz, VBW=300kHz, Sweep time = Auto.

8.1.2 TEST SETUP



8.1.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

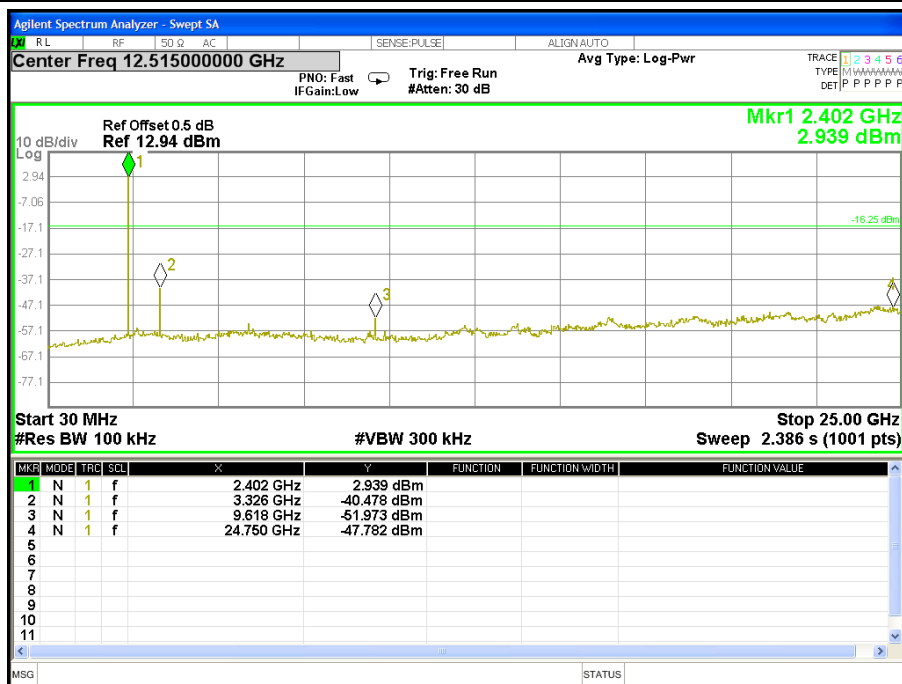
8.1.4 TEST RESULTS

1M PHY

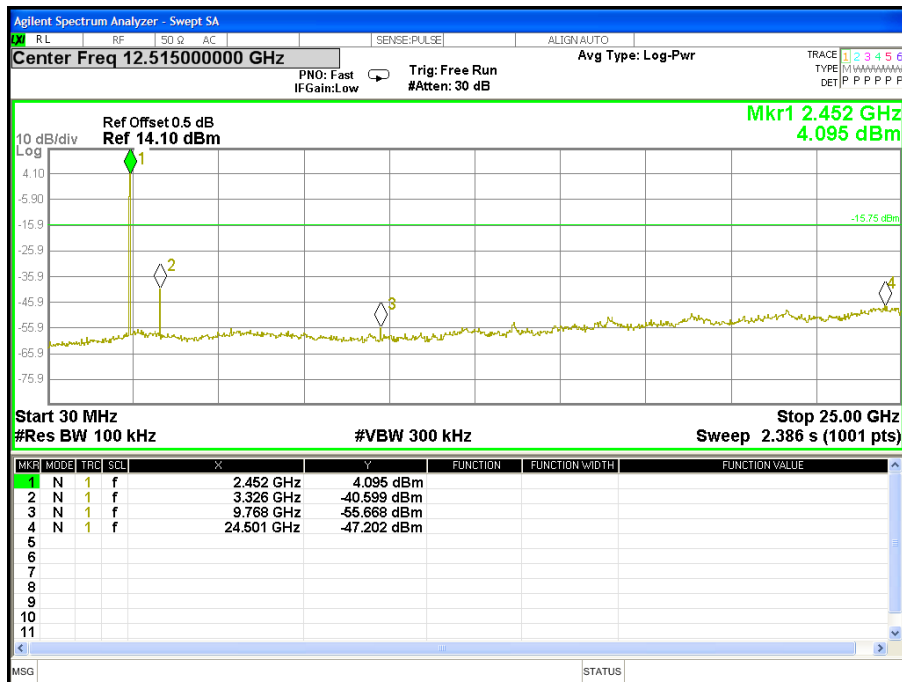
EUT :	PACKTALK BOLD	Model Name :	PACKTALK BOLD
Temperature :	25.1 °C	Relative Humidity :	52%
Pressure :	1010 hPa	Test Power :	DC 3.7V
Test Mode:	Mode 1		
Test Date :	2021-08-25		

in any 100kHz bandwidth outside the low frequency band	in any 100 kHz bandwidth outside the high frequency band
Pass	Pass
Result	
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.	

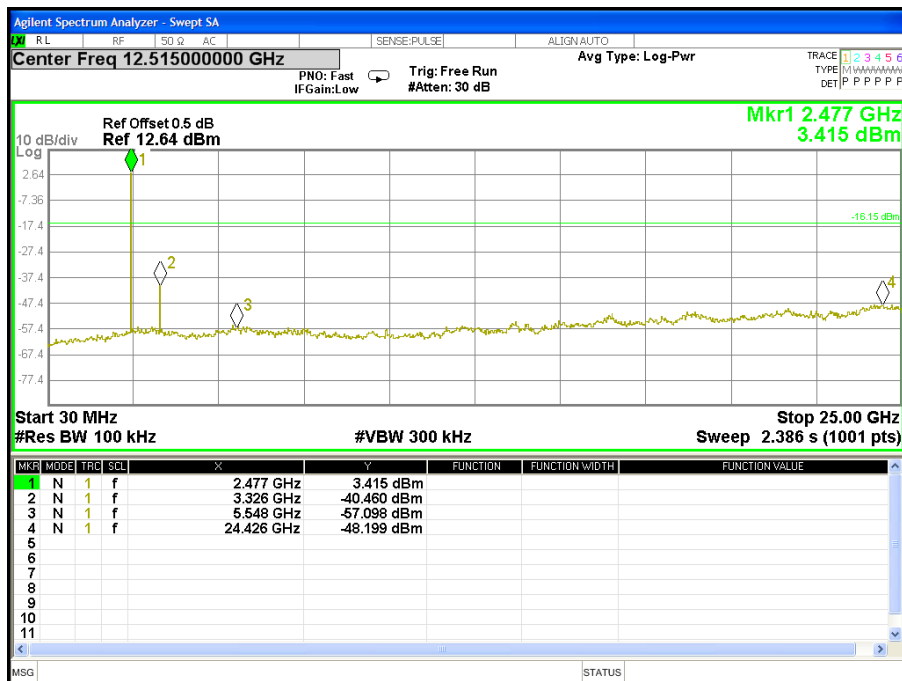
CH01 (Lower)



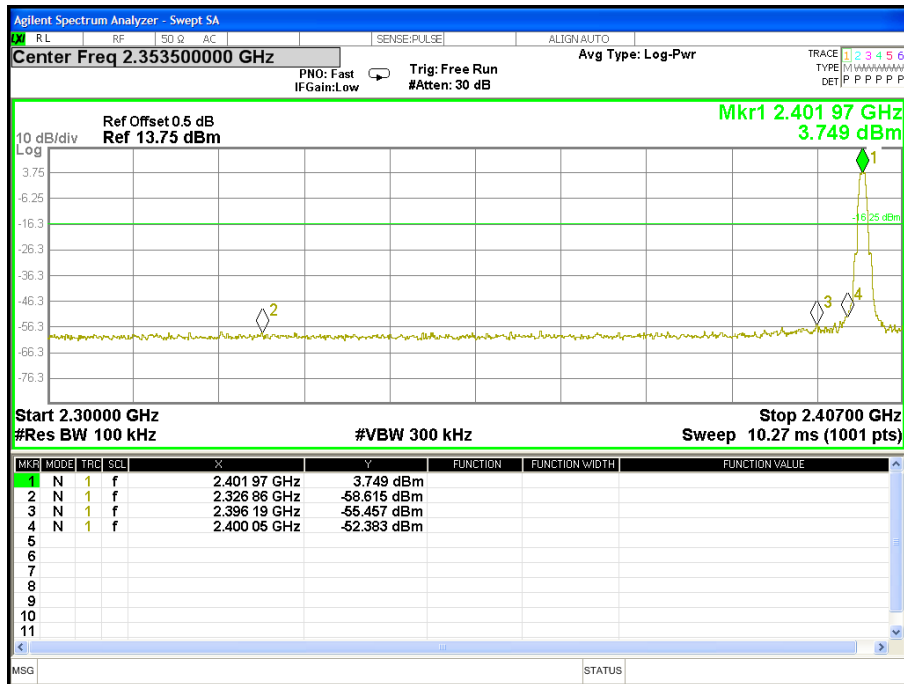
CH20 (Middle)



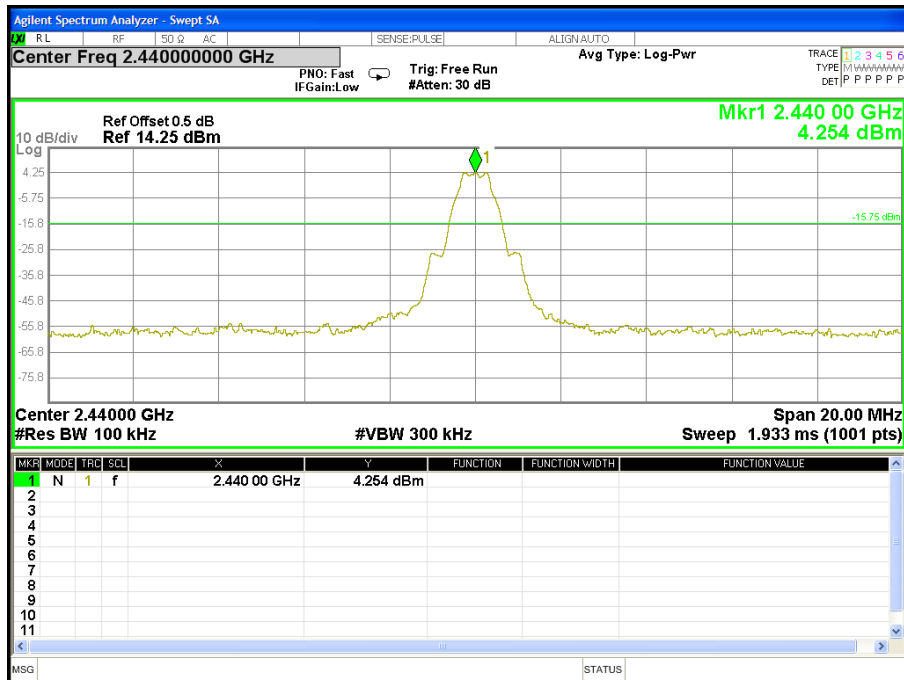
CH40 (Upper)



CH01



CH20



Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO Avg Type: Log-Pwr

Center Freq 2.48750000 GHz

PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB

TRACE 1 2 3 4 5 6
TYPE [f] [d] [m] [w] [h] [v]
DET P P P P P P

Ref Offset 0.5 dB
Ref 13.85 dBm

Mkr1 2.480 025 GHz 3.853 dBm

Start 2.47500 GHz Stop 2.50000 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 2.400 ms (1001 pts)

MKR	MODE	TRG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 025 GHz	3.853 dBm			
2	N	1	f	2.483 500 GHz	-54.905 dBm			
3	N	1	f	2.485 025 GHz	-55.612 dBm			
4	N	1	f	2.493 350 GHz	-57.418 dBm			

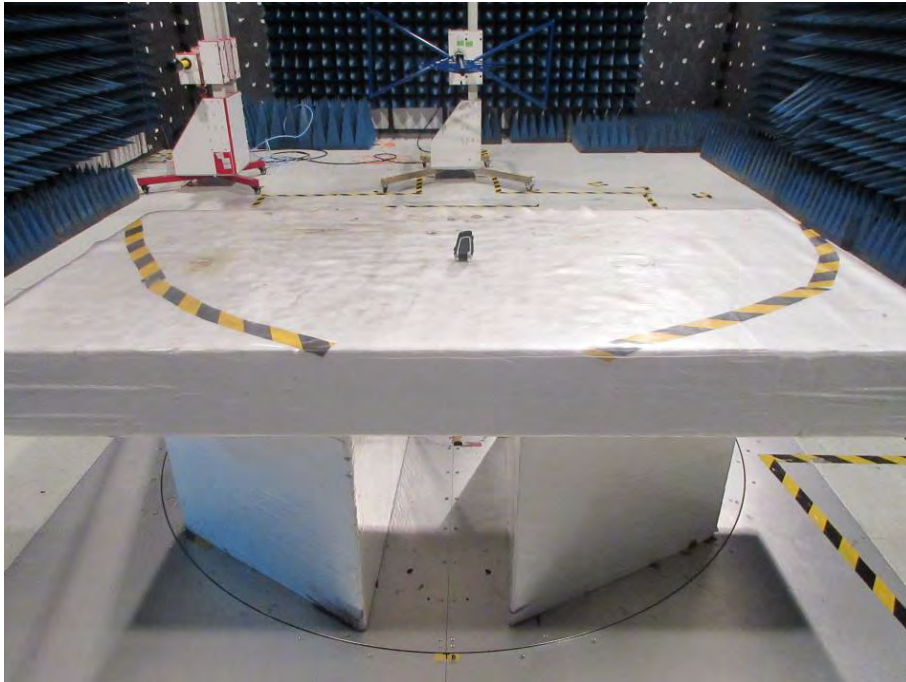
8. ANTENNA REQUIREMENT

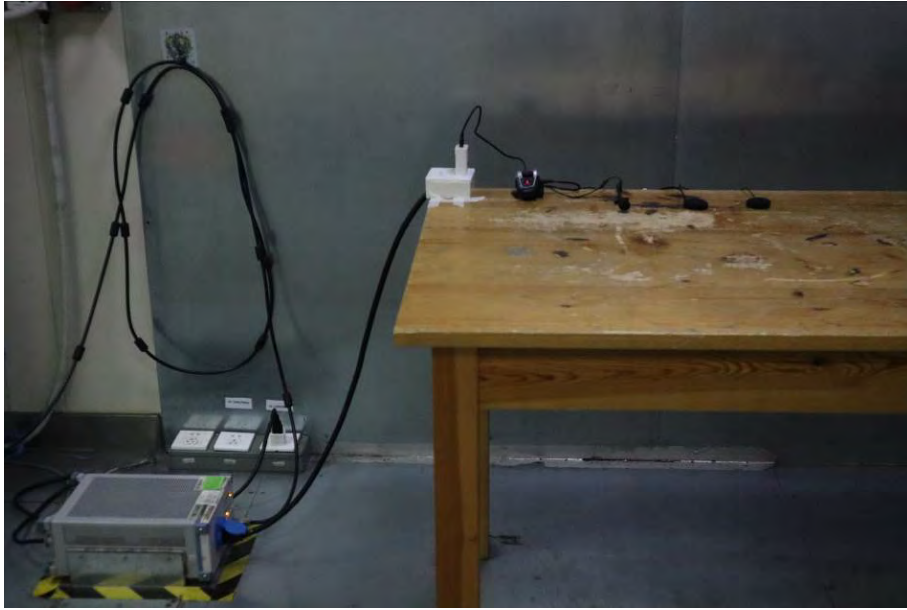
8.1 STANDARD REQUIREMENT

4.10.3.1.1 requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

8.2 EUT ANTENNA

The antenna is a Chip Antenna and no consideration of replacement. Antenna max gain is 1.7 dBi from 2.4GHz to 2.5GHz.

9. EUT TEST PHOTO**Radiated Measurement Photos
30MHz-1GHz****Radiated Measurement Photos
Above 1GHz**

Conducted Measurement Photos

10. APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

Please refer to **APPENDIX**.

****End of the report****