TECHNICAL REPORT

Report No.:	TW2106158E
File reference No.:	2021-06-22
Applicant:	Shenzhen Swetz Sound Technology Co., Limited
Product:	TWS Earphone
Model No.:	TW056B, MIUONO T1
Brand Name:	N/A
Test Standards:	FCC Part 15.249
Test result:	It is herewith confirmed and found to comply with the requirements set up by ANSI C63.10 &FCC Part 15 Subpart C, Paragraph 15.249 regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Manager

Dated: June 22, 2021

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 744189

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 744189.

Industry Canada (IC) —Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

A2LA (Certification Number:5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

Test Report Conclusion

Content

1.0 General Details

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Telephone: (755) 83448688

Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 744189

For 3m Anechoic Chamber

1.2 Applicant Details

Applicant: Shenzhen Swetz Sound Technology Co., Limited

Address: No.18, Xiantian Road, Xinsheng Community, Longgang Street, Longgang District, Shenzhen, China

Telephone: --

Fax: --

1.3 Description of EUT

Product:	TWS Earphone
Manufacturer:	Shenzhen Swetz Sound Technology Co., Limited
Address:	No.18, Xiantian Road, Xinsheng Community, Longgang Street, Longgang District, Shenzhen, China
Brand Name:	N/A
Model Number:	TW056B
Additional Model Name	MIUONO T1
Hardware Version:	V1.1
Software Version:	V1.0
Rating:	DC5V input or Built-in DC3.7V, 50mAh Li-ion battery for Earphone; DC5V input or Built-in DC3.7V, 300mAh Li-ion battery for charger base
Modulation Type:	GFSK, Pi/4D-QPSK
Operation Frequency:	2402-2480MHz
Channel Separate:	1MHz
Channel Number:	79
Antenna Designation	PCB antenna with gain 0.45dBi Max for left earbud and 0.60dBi for right earbud (Get from the antenna specification provided by the applicant)

1.4 Submitted Sample: 2 pcs

1.5 Test Duration

2021-06-11 to 2021-06-23

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions below 1GHz Uncertainty =4.7dB

Radiated Emissions above 1GHz Uncertainty =6.0dB

Conducted Power Uncertainty =6.0dB

Occupied Channel Bandwidth Uncertainty =5%

Conducted Emissions Uncertainty =3.6dB

Note: The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

1.7 Test Engineer

The sample tested by

Print Name: Terry Tang

2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2020-06-23	2021-06-22
LISN	R&S	EZH3-Z5	100294	2020-06-23	2021-06-22
LISN	R&S	EZH3-Z5	100253	2020-06-23	2021-06-22
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2020-06-23	2021-06-22
Loop Antenna	EMCO	6507	00078608	2018-06-25	2021-06-24
Spectrum	R&S	FSIQ26	100292	2020-06-23	2021-06-22
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2020-06-23	2021-06-22
Horn Antenna	R&S	BBHA 9120D	9120D-631	2018-07-09	2021-07-08
Power meter	Anritsu	ML2487A	6K00003613	2020-06-23	2021-06-22
Power sensor	Anritsu	MA2491A	32263	2020-06-23	2021-06-22
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2018-07-04	2021-07-03
9*6*6 Anechoic	--	--	N/A	2020-07-06	2021-07-05
EMI Test Receiver	RS	ESVB	826156/011	2020-06-23	2021-06-22
EMI Test Receiver	RS	ESH3	860904/006	2020-06-23	2021-06-22
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2020-06-23	2021-06-22
Spectrum	HP/Agilent	E4407B	MY50441392	2020-06-23	2021-06-22
Spectrum	RS	FSP	1164.4391.38	2021-01-16	2022-01-15
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA	--	2020-06-23	2021-06-22
RF Cable	Zhengdi	7m	--	2020-06-23	2021-06-22
RF Switch	EM	EMSW18	060391	2020-06-23	2021-06-22
Pre-Amplifier	Schwarebeck	BBV9743	#218	2020-06-23	2021-06-22
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2020-06-23	2021-06-22
LISN	SCHAFFNER	NNB42	00012	2021-01-06	2022-01-05

2.2 Automation Test Software

For Conducted Emission Test

Name	Version
EZ-EMC	Ver.EMC-CON 3A1.1

For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit	Field Strength of Fundamental	PASS	Complies
FCC Part 15, Paragraph 15.209	Radiated Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	PASS	Complies

3.2 Test Standards

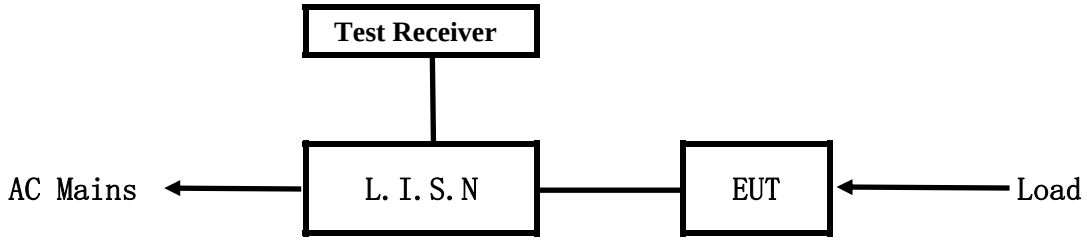
FCC Part 15 Subpart C, Paragraph 15.249 , ANSI C63.4 :2014 and ANSI C63.10 :2013

4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

5. Power Line Conducted Emission Test

5.1 Schematics of the test



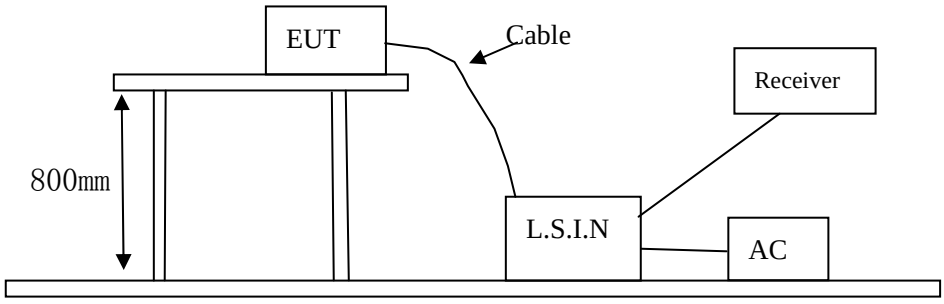
EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013.The Frequency spectrum from 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10 –2013.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



5.3 Configuration of the EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID
TWS Earphone	Shenzhen Swetz Sound Technology Co., Limited	TW056B, MIUONO T1	2AOKX-TW056B

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	KEYU	KA23-0502000DEU	Input: 100-240V~, 50/60Hz, 0.35A; Output: DC5V, 2A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10-2013

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency (MHz)	Limits (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ～ 0.50	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	56.0	46.0
5.00 ～ 30.00	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results:

Pass

A: Conducted Emission on Live Terminal (150kHz to 30MHz)

EUT Operating Environment

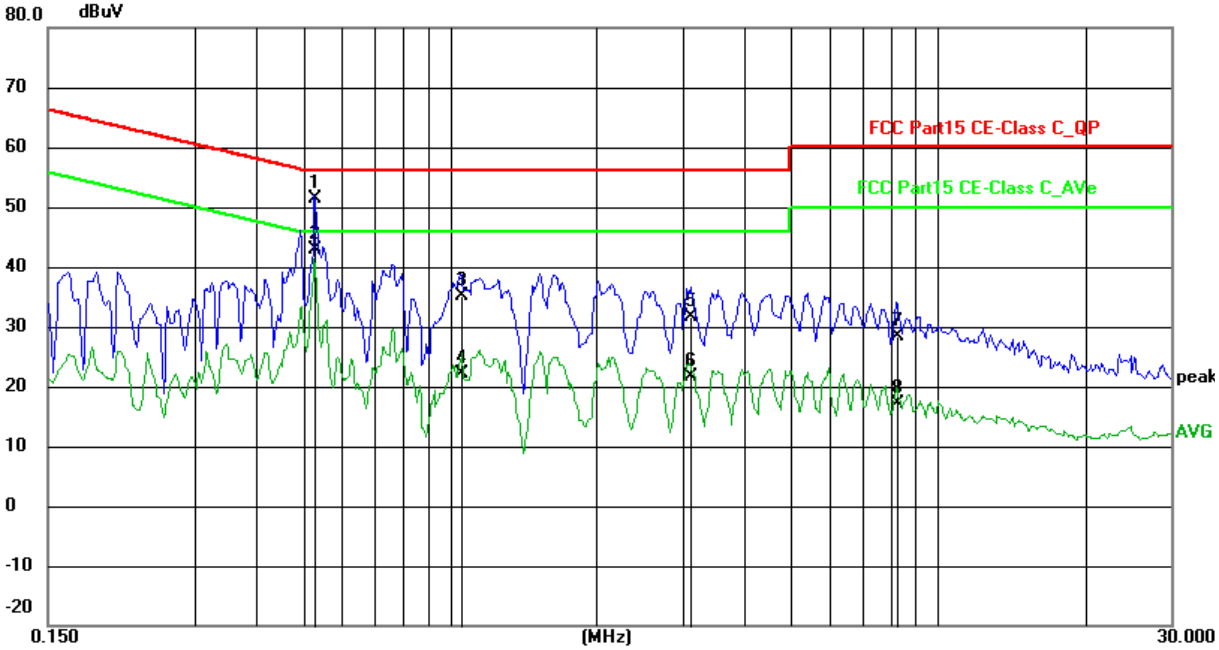
Temperature: 25℃ Humidity: 65%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging and Communication by BT

Model: TW056B

Results: PASS

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.5283	41.49	9.77	51.26	56.00	-4.74	QP	P
2	0.5283	33.05	9.77	42.82	46.00	-3.18	AVG	P
3	1.0509	25.39	9.79	35.18	56.00	-20.82	QP	P
4	1.0509	12.27	9.79	22.06	46.00	-23.94	AVG	P
5	3.1170	21.90	9.85	31.75	56.00	-24.25	QP	P
6	3.1170	11.88	9.85	21.73	46.00	-24.27	AVG	P
7	8.2260	18.19	10.07	28.26	60.00	-31.74	QP	P
8	8.2260	7.05	10.07	17.12	50.00	-32.88	AVG	P

B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

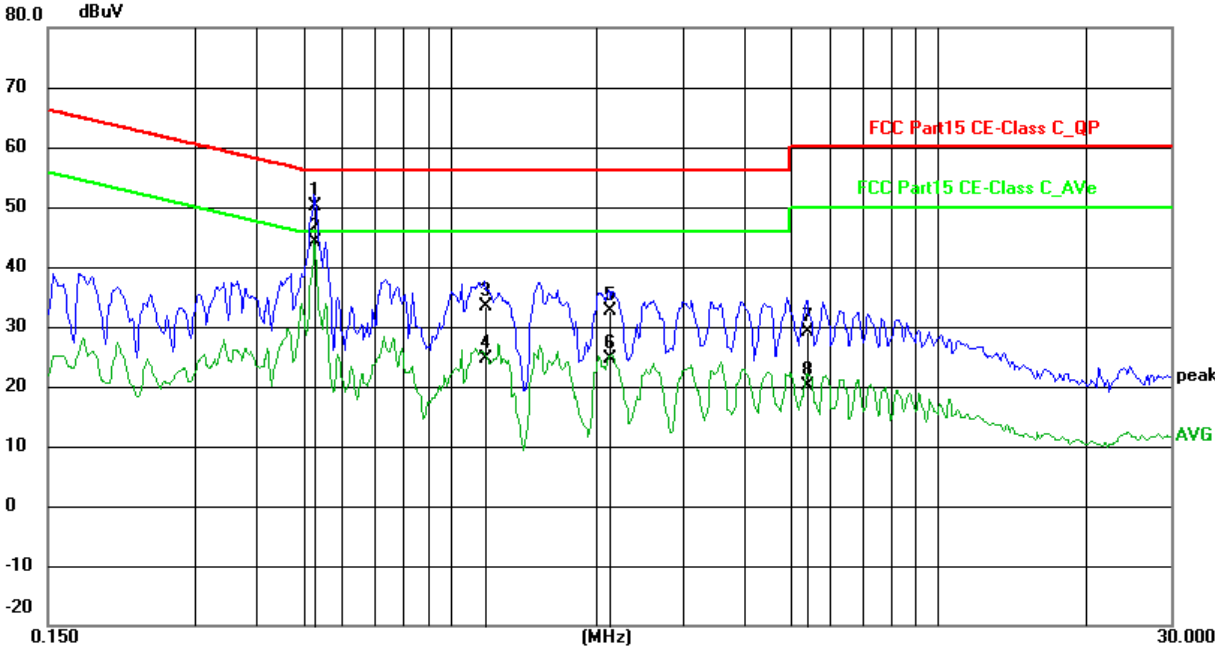
Temperature: 25℃ Humidity: 65%RH Atmospheric Pressure: 101 kPa

EUT set Condition: Charging and Communication by BT

Model: TW056B

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.5283	40.27	9.77	50.04	56.00	-5.96	QP	P
2	0.5283	34.35	9.77	44.12	46.00	-1.88	AVG	P
3	1.1835	23.57	9.79	33.36	56.00	-22.64	QP	P
4	1.1835	14.76	9.79	24.55	46.00	-21.45	AVG	P
5	2.1195	22.78	9.81	32.59	56.00	-23.41	QP	P
6	2.1195	14.84	9.81	24.65	46.00	-21.35	AVG	P
7	5.3868	19.17	9.95	29.12	60.00	-30.88	QP	P
8	5.3868	10.23	9.95	20.18	50.00	-29.82	AVG	P

6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189

(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.

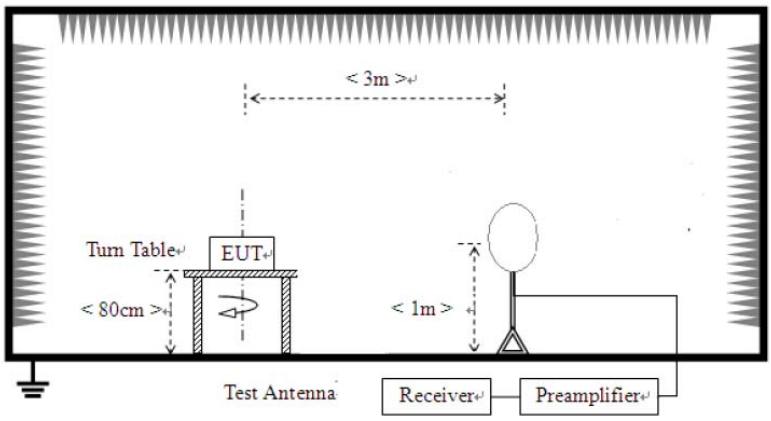
(3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz (Note: for Fundamental frequency radiated emission measurement, RBW=3MHz, VBW=10MHz). Measurements were made at 3 meters.

(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

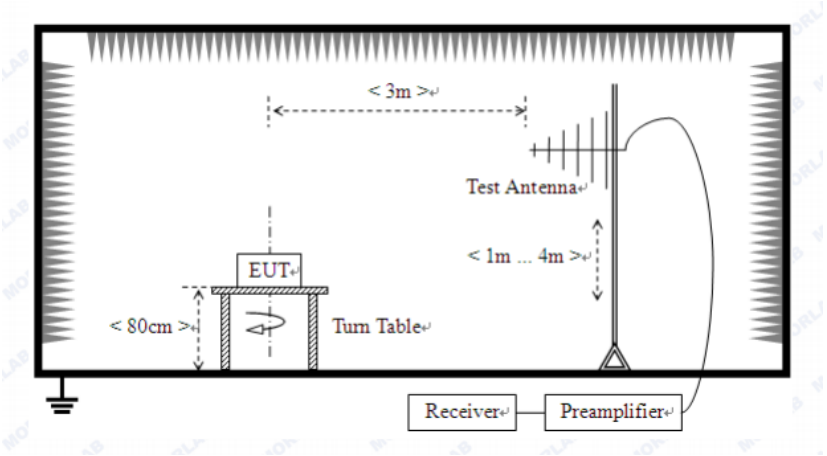
(5) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup

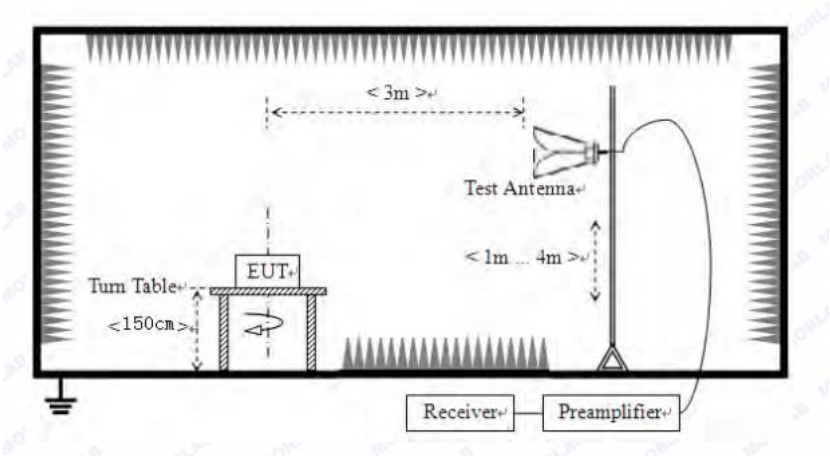
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

A FCC Part 15 Subpart C Paragraph 15.249(a) Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental (3m)			Field Strength of Harmonics (3m)		
	mV/m	**dBuV/m**		**uV/m**	**dBuV/m**	
2400-2483.5	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)

Note: 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)

2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

5. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK. For fundamental measurement, PK detector used.

6. Battery full charged during tests.

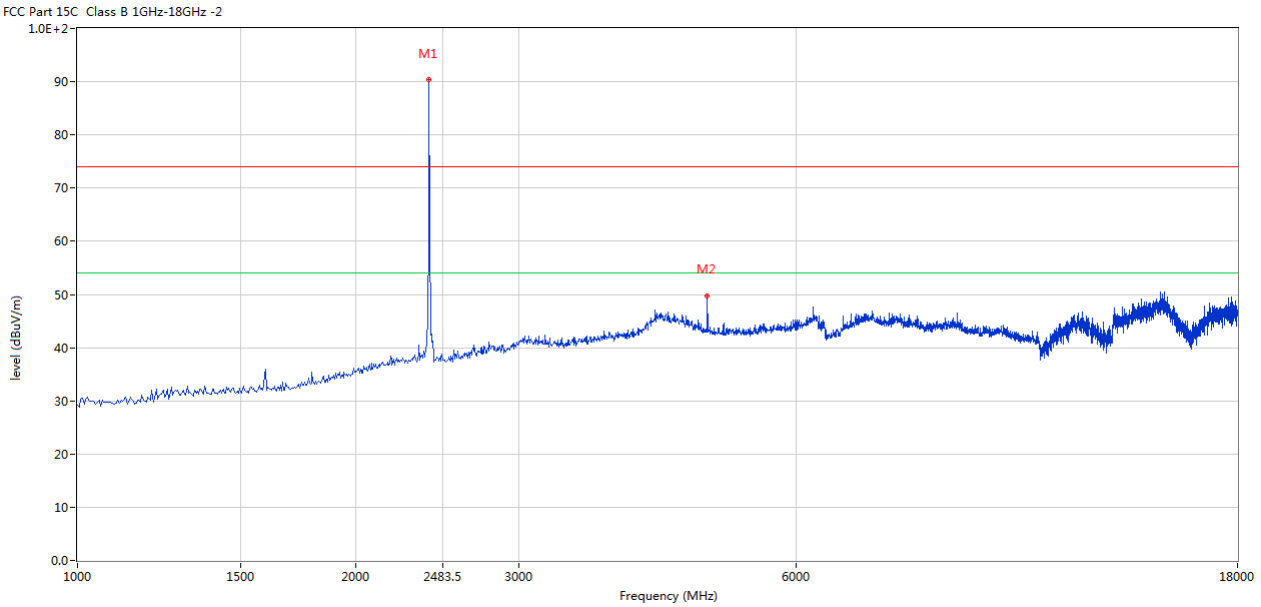
7. The two modulation modes of GFSK and Pi/4D-QPSK were tested. And only the worst case was recorded in the test report. GFSK was the worst case.

6.5 Test result

A Fundamental & Harmonics Radiated Emission Data - Left Earphone

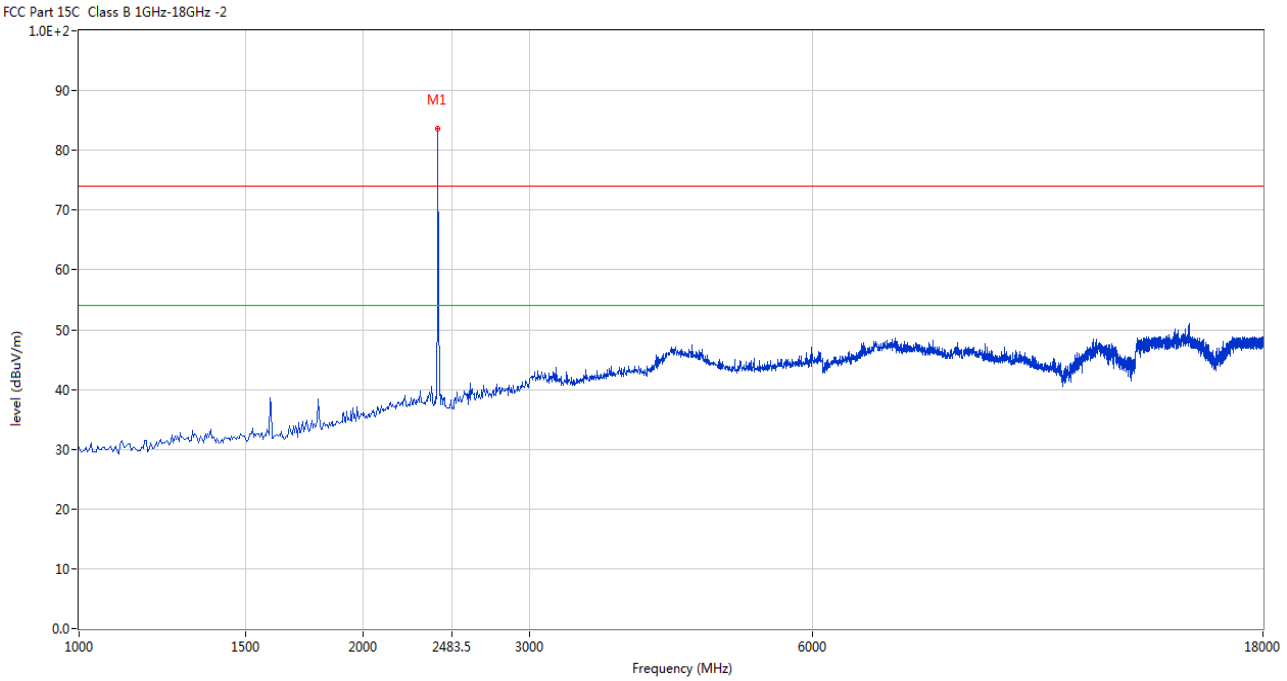
Please refer to the following test plots for details: Low Channel-2402MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2402.149	90.34	-3.57	114.0	-23.66	Peak	111.00	100	Horizontal	Pass
2	4802.799	49.63	3.12	74.0	-24.37	Peak	312.00	100	Horizontal	Pass

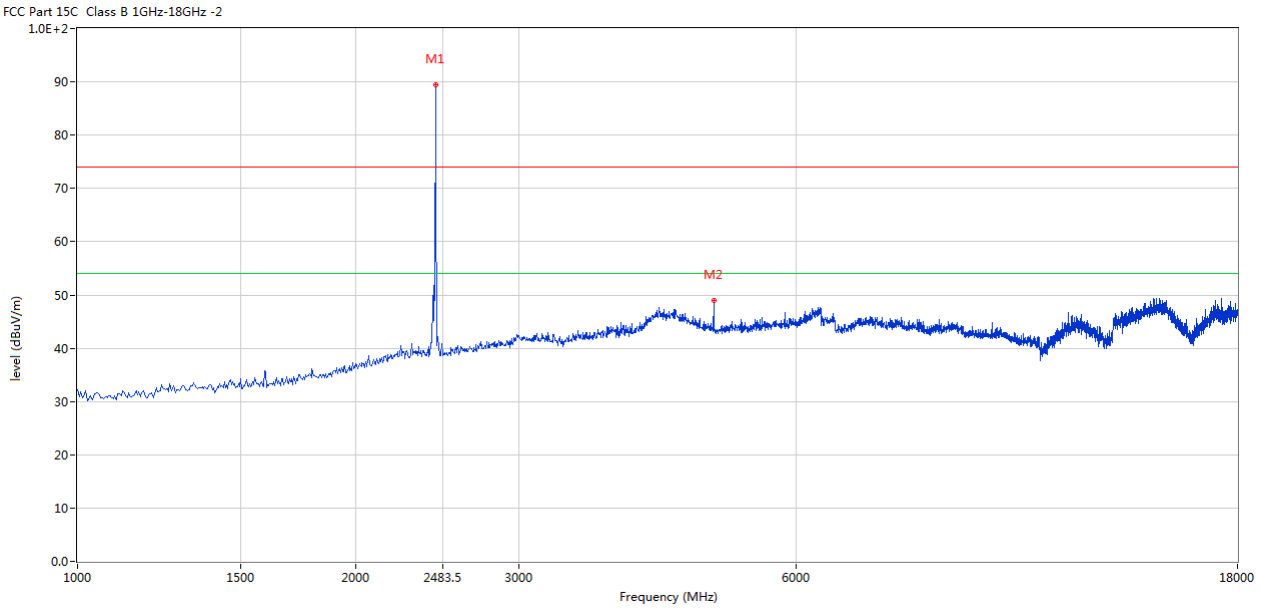
Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2402.149	83.59	-3.57	114.0	-30.41	Peak	328.00	100	Vertical	Pass

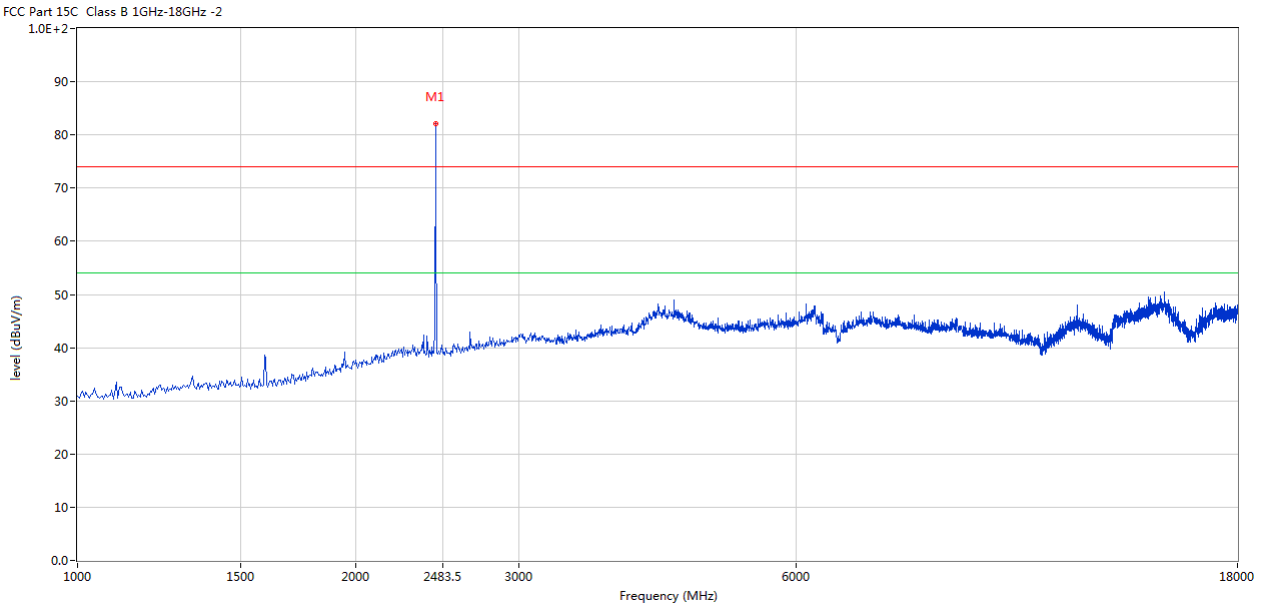
Please refer to the following test plots for details: Middle Channel-2441MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2440.390	89.41	-3.57	114.0	-24.59	Peak	109.00	100	Horizontal	Pass
2	4879.280	49.02	3.20	74.0	-24.98	Peak	304.00	100	Horizontal	Pass

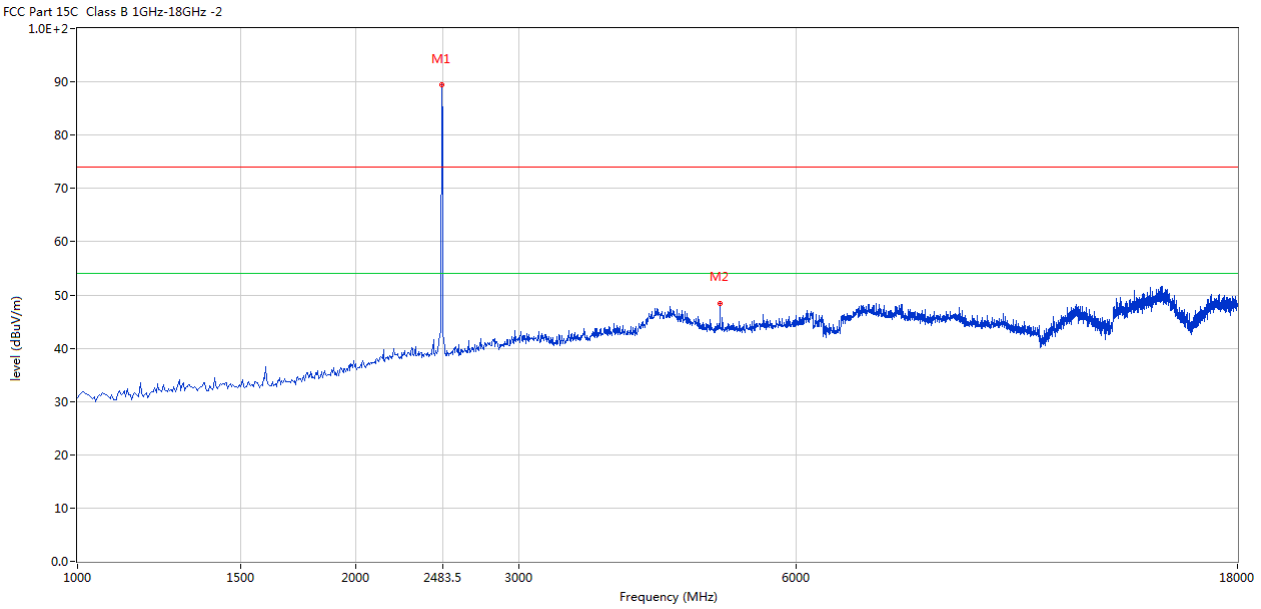
Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2440.390	82.11	-3.57	114.0	-31.89	Peak	105.00	100	Vertical	Pass

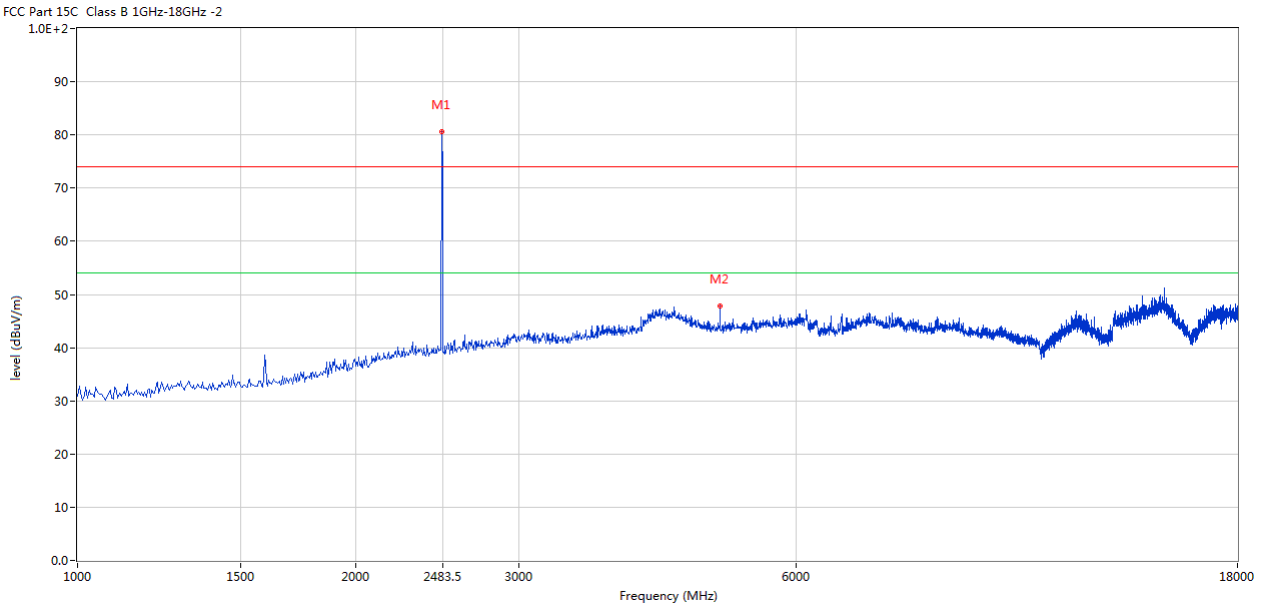
Please refer to the following test plots for details: High Channel-2480MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2479.630	89.44	-3.57	114.0	-24.56	Peak	301.00	100	Horizontal	Pass
2	4960.010	48.45	3.36	74.0	-25.55	Peak	161.00	100	Horizontal	Pass

Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2479.630	80.70	-3.57	114.0	-33.3	Peak	32.00	100	Vertical	Pass
2	4960.010	47.89	3.36	74.0	-26.11	Peak	69.00	100	Vertical	Pass

Note: (2) Emission Level = Reading Level + Antenna Factor + Cable Loss-Amplifier

(3) Margin=Emission-Limits

(4) According to section 15.35(b), the peak limit is 20dB higher than the average limit

(5) For test purpose, keep EUT continuous transmitting

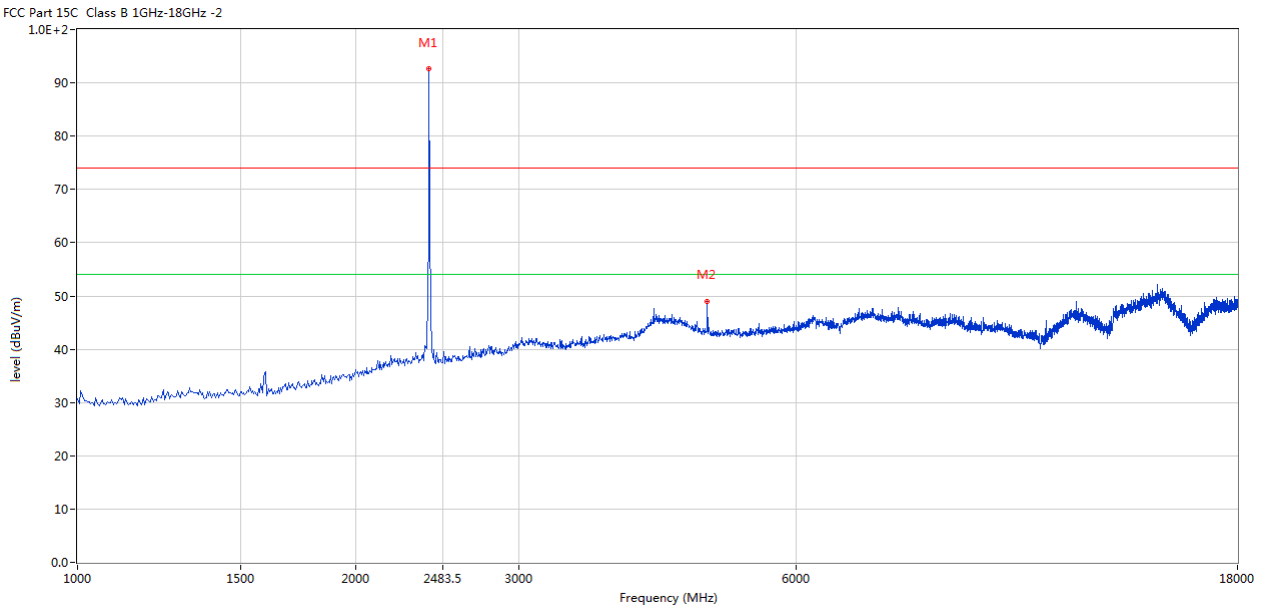
(5) For emission above 18GHz and Below 30MHz, It is only the floor noise. No necessary to take down.

(6) the measured PK value less than the AV limit.

A Fundamental & Harmonics Radiated Emission Data - Right Earphone

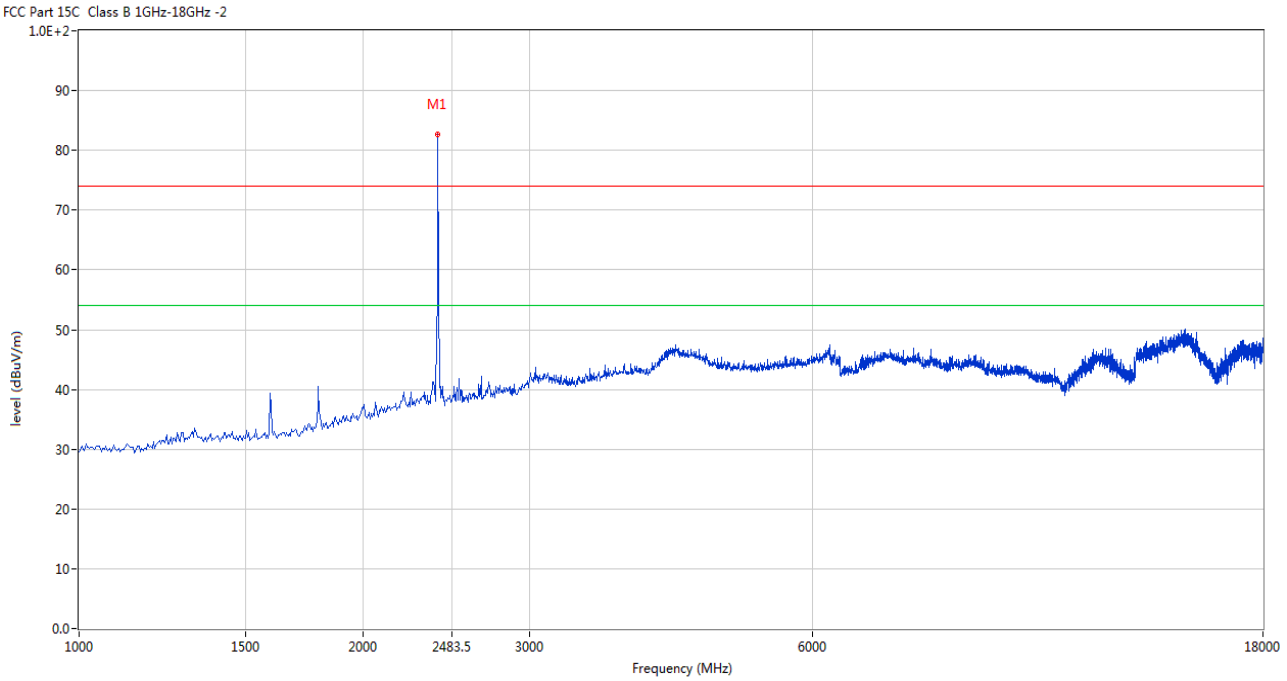
Please refer to the following test plots for details: Low Channel-2402MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2402.149	92.58	-3.57	114.0	-21.42	Peak	312.00	100	Horizontal	Pass
2	4802.799	49.05	3.12	74.0	-24.95	Peak	327.00	100	Horizontal	Pass

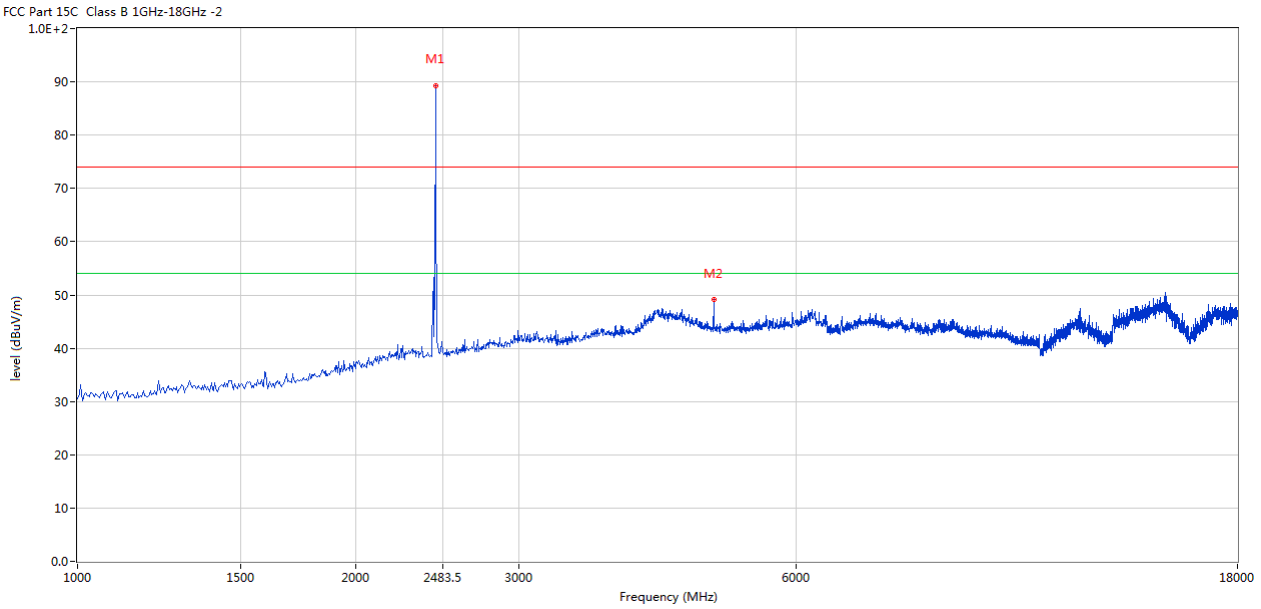
Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2402.149	82.70	-3.57	114.0	-31.3	Peak	331.00	100	Vertical	Pass

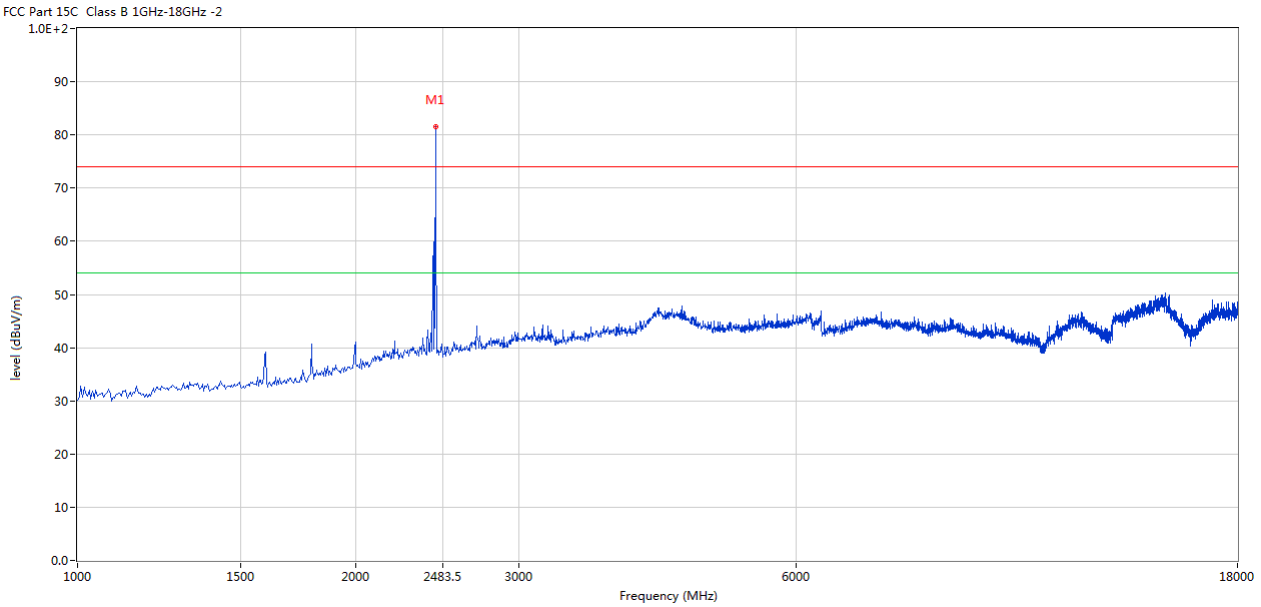
Please refer to the following test plots for details: Middle Channel-2441MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2440.390	89.30	-3.57	114.0	-24.7	Peak	299.00	100	Horizontal	Pass
2	4883.529	49.18	3.20	74.0	-24.82	Peak	110.00	100	Horizontal	Pass

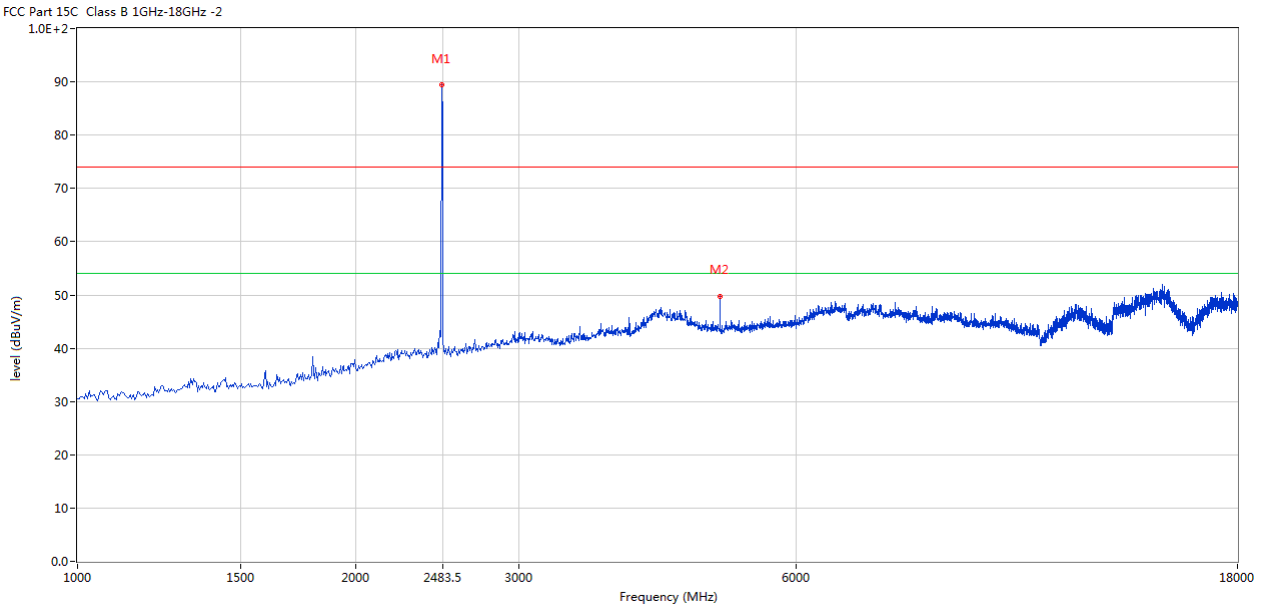
Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2440.390	81.55	-3.57	114.0	-32.45	Peak	106.00	100	Vertical	Pass

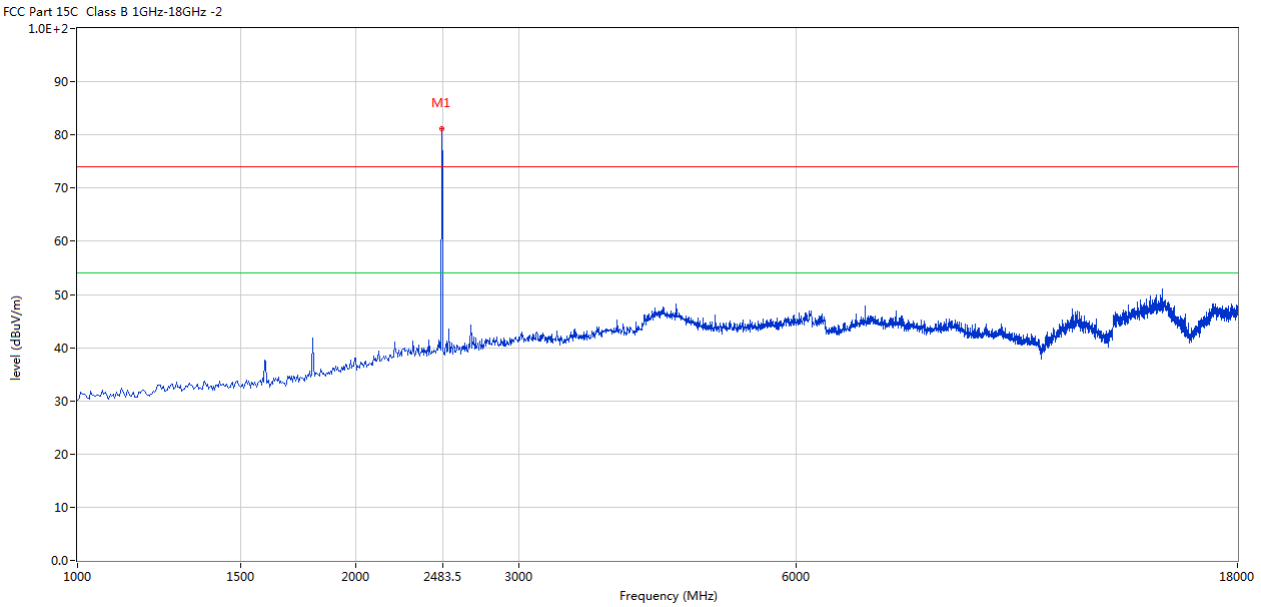
Please refer to the following test plots for details: High Channel-2480MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2479.630	89.37	-3.57	114.0	-24.63	Peak	305.00	100	Horizontal	Pass
2	4960.010	49.73	3.36	74.0	-24.27	Peak	230.00	100	Horizontal	Pass

Vertical



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	2479.630	81.09	-3.57	114.0	-32.91	Peak	222.00	100	Vertical	Pass

Note: (2) Emission Level = Reading Level + Antenna Factor + Cable Loss-Amplifier

(3) Margin=Emission-Limits

(4) According to section 15.35(b), the peak limit is 20dB higher than the average limit

(5) For test purpose, keep EUT continuous transmitting

(5) For emission above 18GHz and Below 30MHz, It is only the floor noise. No necessary to take down.

(6) the measured PK value less than the AV limit.

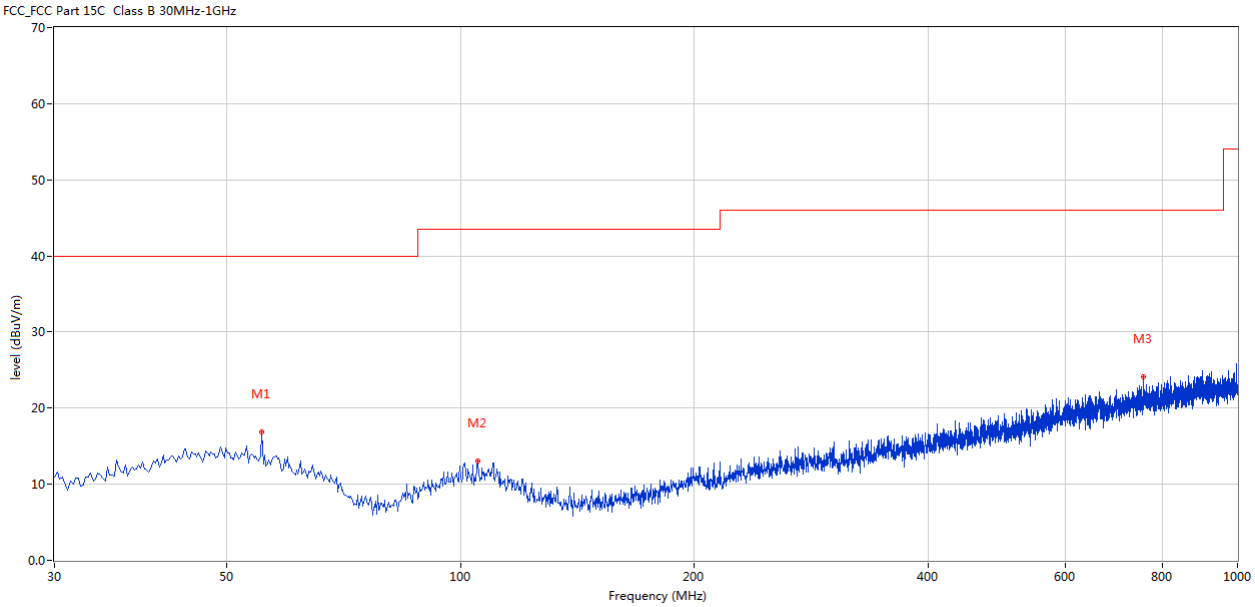
B. **General Radiated Emission Data - Left Earphone**

Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



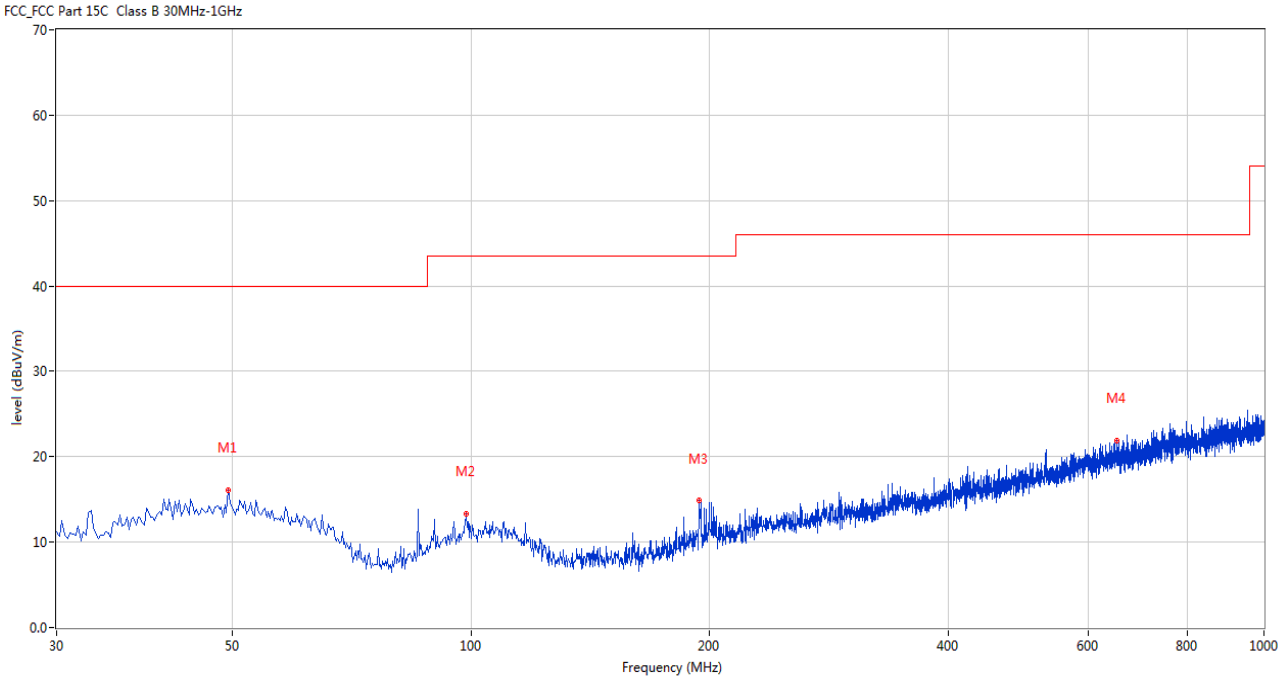
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	55.456	16.85	-11.89	40.0	-23.15	Peak	0.00	100	Horizontal	Pass
2	105.156	13.10	-13.23	43.5	-30.40	Peak	40.00	100	Horizontal	Pass
3	757.318	24.19	-3.32	46.0	-21.81	Peak	73.00	100	Horizontal	Pass

Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	49.395	16.04	-11.28	40.0	-23.96	Peak	276.00	100	Vertical	Pass
2	98.610	13.29	-13.70	43.5	-30.21	Peak	313.00	100	Vertical	Pass
3	194.131	14.84	-13.84	43.5	-28.66	Peak	325.00	100	Vertical	Pass
4	651.857	21.90	-4.68	46.0	-24.10	Peak	300.00	100	Vertical	Pass

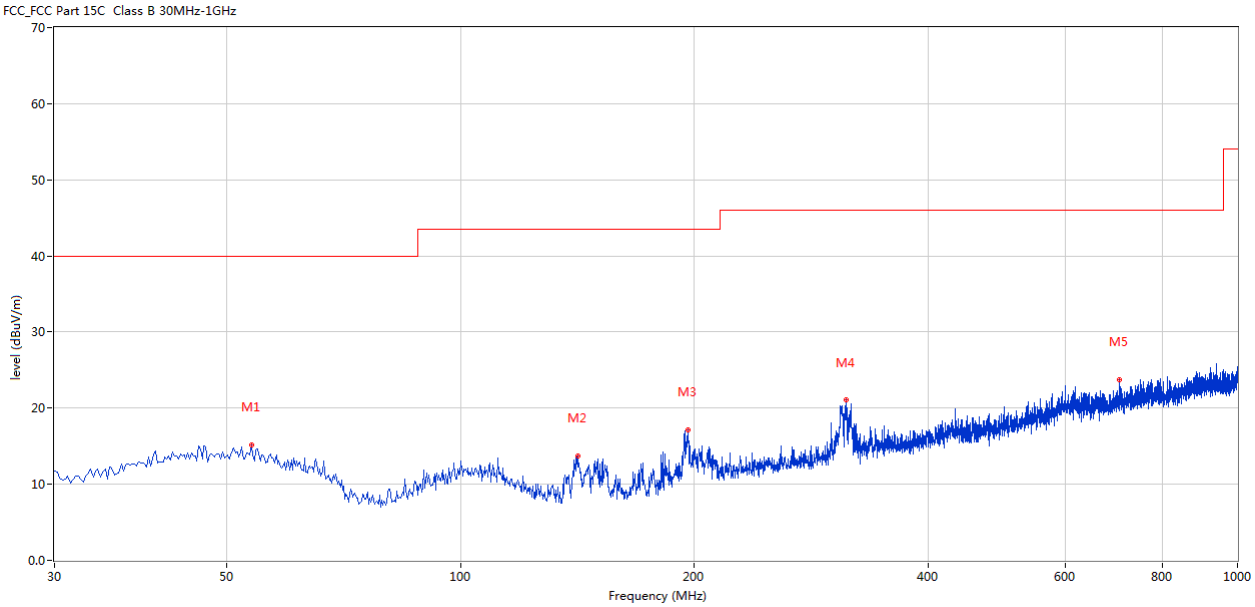
B. **General Radiated Emission Data - Right Earphone**

Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



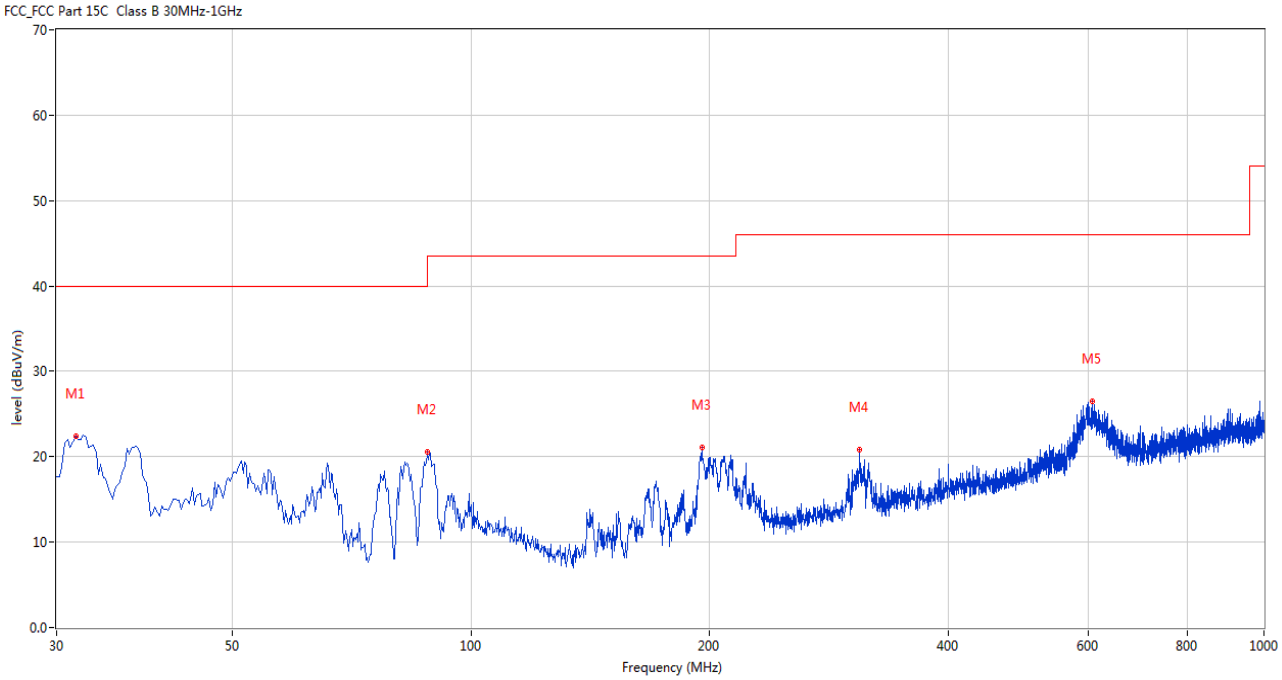
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	53.759	15.19	-11.53	40.0	-24.81	Peak	30.00	100	Horizontal	Pass
2	141.522	13.67	-17.28	43.5	-29.83	Peak	188.00	100	Horizontal	Pass
3	196.313	17.11	-13.59	43.5	-26.39	Peak	113.00	100	Horizontal	Pass
4	313.169	21.03	-10.82	46.0	-24.97	Peak	103.00	100	Horizontal	Pass
5	704.466	23.69	-4.16	46.0	-22.31	Peak	170.00	100	Horizontal	Pass

Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	31.455	21.77	-14.57	40.0	-18.23	Peak	360.00	100	Vertical	Pass
2	88.185	20.56	-15.59	43.5	-22.94	Peak	232.00	100	Vertical	Pass
3	195.344	21.06	-13.74	43.5	-22.44	Peak	339.00	100	Vertical	Pass
4	308.805	20.79	-10.85	46.0	-25.21	Peak	309.00	100	Vertical	Pass
5	607.248	26.52	-5.05	46.0	-19.48	Peak	177.00	100	Vertical	Pass

7. Band Edge

7.1 Test Method and test Procedure:

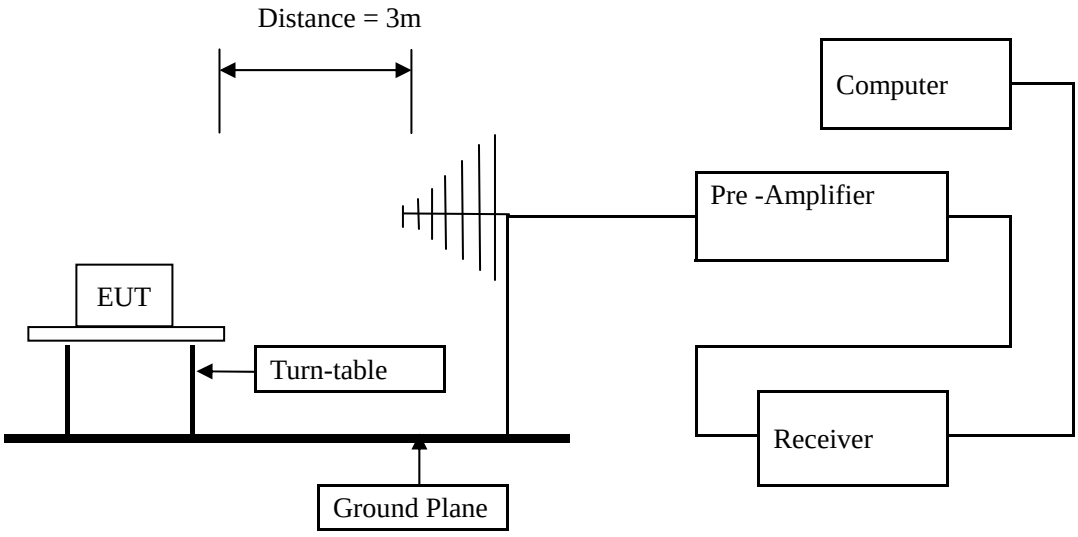
(1) The EUT was tested according to ANSI C63.10–2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189

(2) Set Spectrum as RBW=1MHz, VBW=3MHz and Peak detector used for PK value. RBW=1MHz, VBW=10Hz and Peak detector used for AV value.

(3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(4) The antenna polarization: Vertical polarization and Horizontal polarization.

7. 2 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing

7.3 Configuration of The EUT

Same as section 5.3 of this report

7.4 EUT Operating Condition

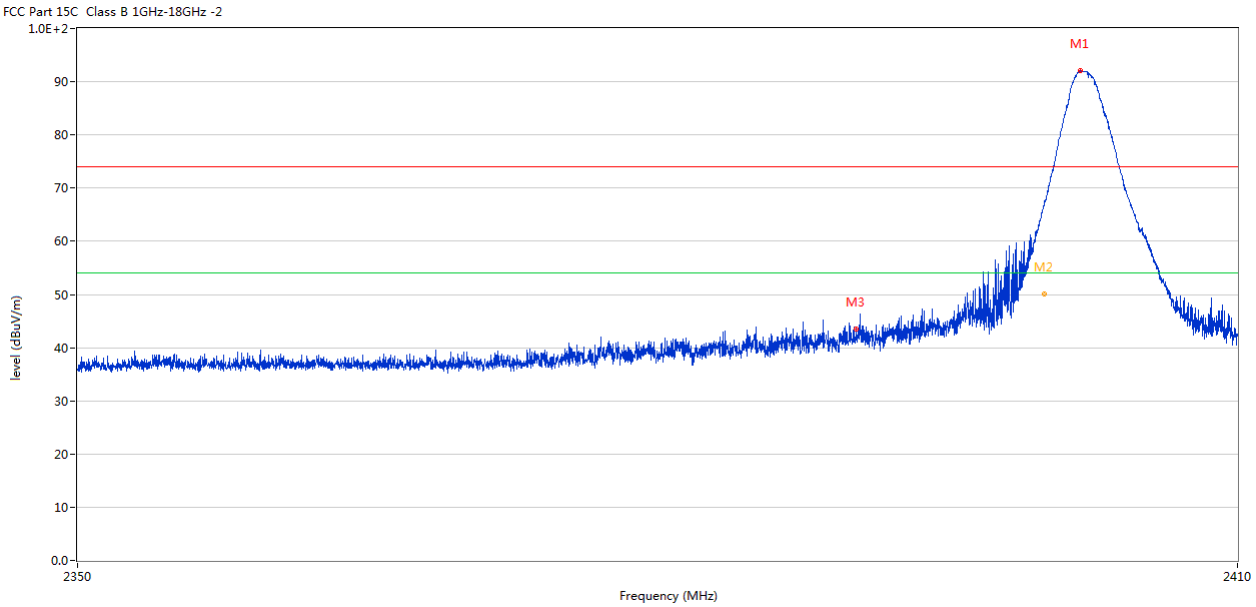
Same as section 5.4 of this report.

7.5 Band Edge Limit

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 Section 15.209, whichever is the lesser attenuation.

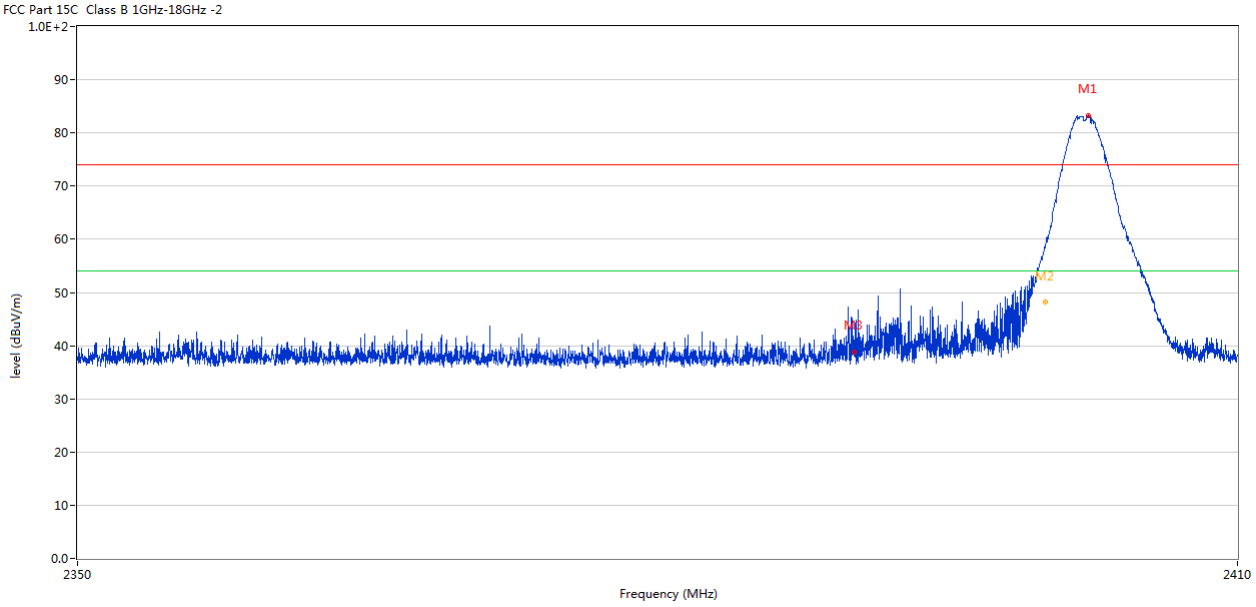
7.6 Test Result **Left Earphone**

Product:	TWS Earphone	Polarity	Horizontal
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	--	--



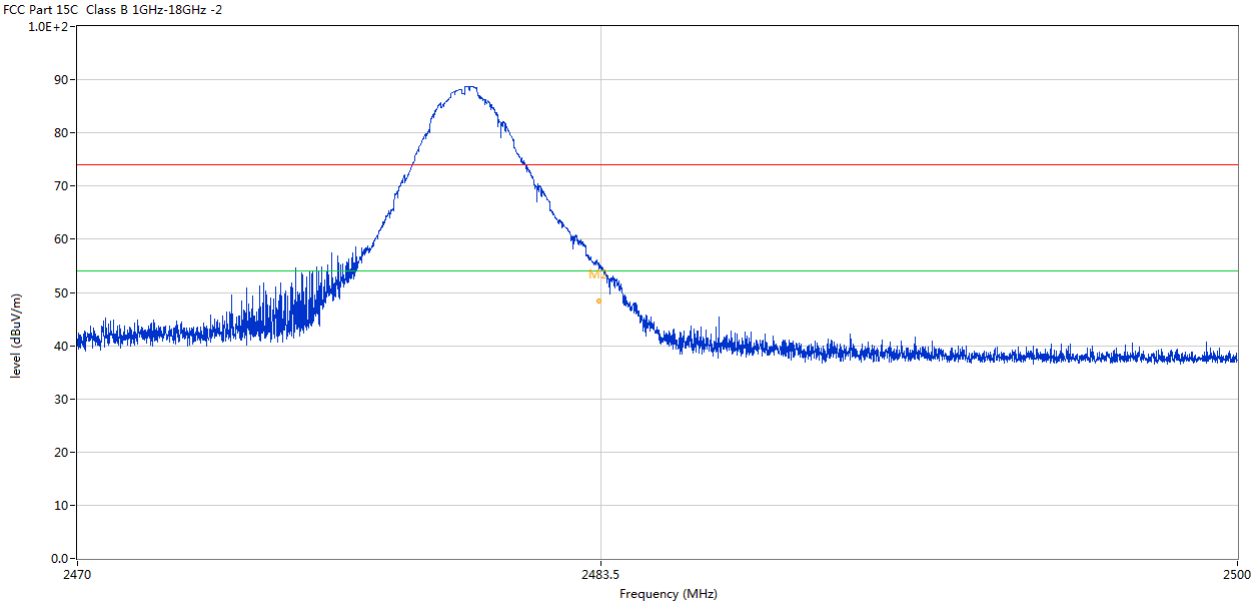
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
2	2399.993	64.52	-3.57	74.0	-9.48	Peak	313.00	100	Horizontal	Pass
2**	2399.993	50.18	-3.57	54.0	-3.82	AV	313.00	100	Horizontal	Pass
3	2390.115	43.44	-3.53	74.0	-30.56	Peak	313.00	100	Horizontal	Pass

Product:	TWS Earphone	Detector	Vertical
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	--	--



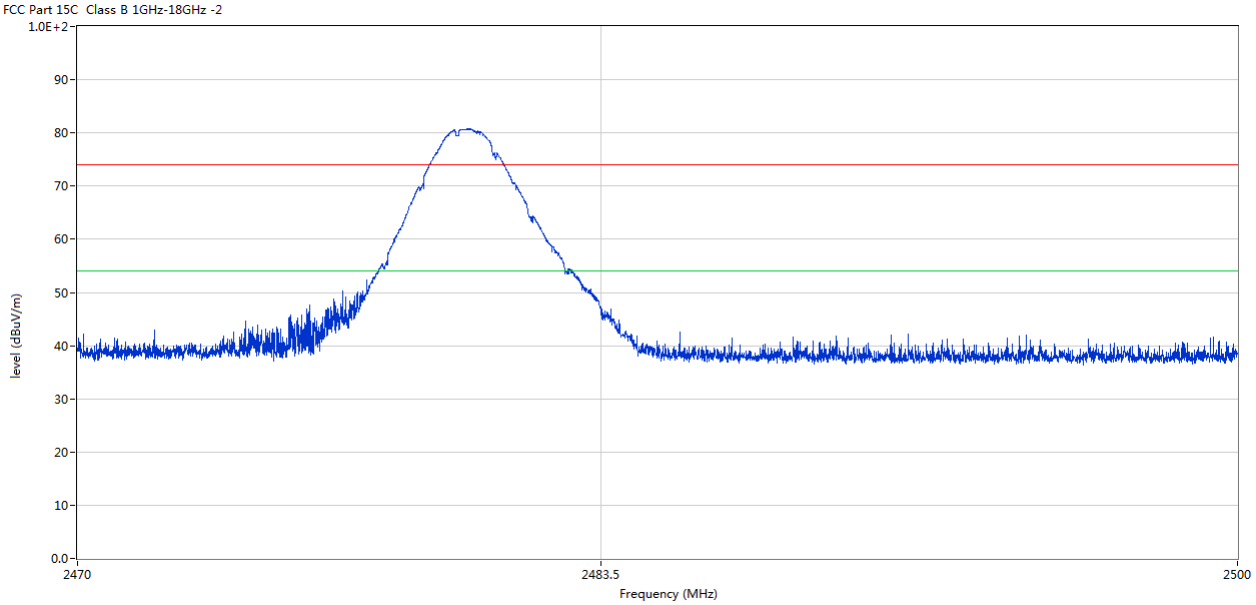
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
2	2399.988	58.04	-3.57	74.0	-15.96	Peak	215.00	100	Vertical	Pass
2**	2399.988	48.30	-3.57	54.0	-5.70	AV	215.00	100	Vertical	Pass
3	2390.010	38.76	-3.53	74.0	-35.24	Peak	206.00	100	Vertical	Pass

Product:	TWS Earphone	Polarity	Horizontal
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	--	--



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
2	2483.437	55.56	-3.57	74.0	-18.44	Peak	303.00	100	Horizontal	Pass
2**	2483.437	48.32	-3.57	54.0	-5.68	AV	303.00	100	Horizontal	Pass

Product:	TWS Earphone	Detector	Vertical
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	--	--



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
2	2483.234	50.75	-3.57	74.0	-23.25	Peak	217.00	100	Vertical	Pass

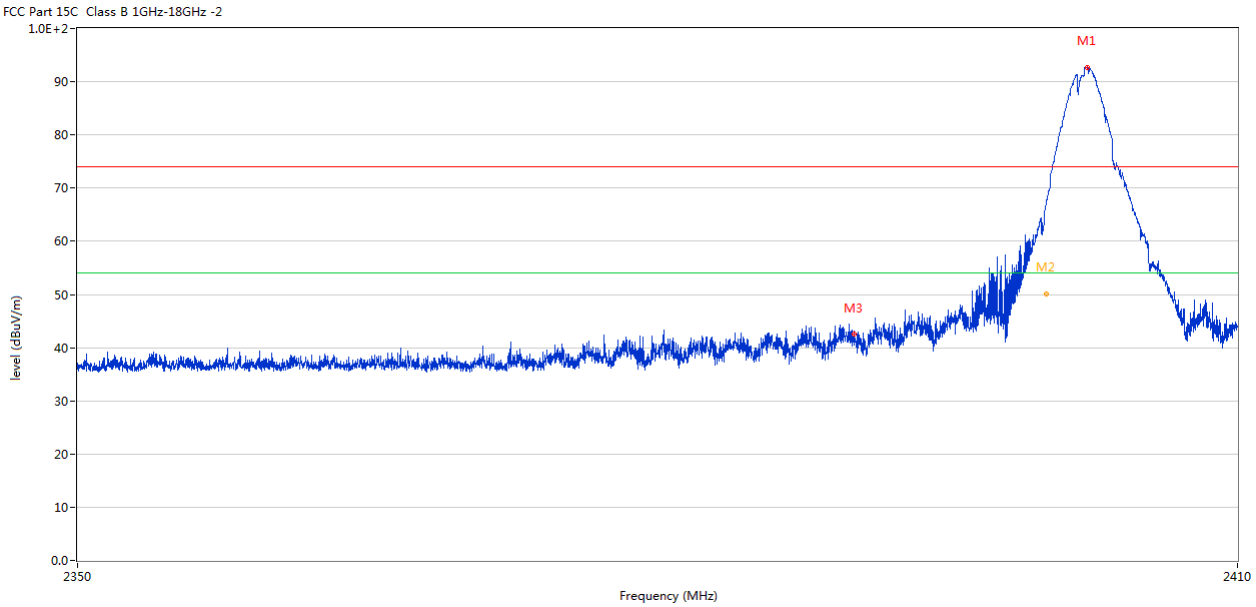
Note: 1. The PK emission level less than the AV limit. No necessary to record the AV emission level.

2. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

3. The two modulation modes of GFSK and Pi/4D-QPSK were tested. And only the worst case was recorded in the test report. GFSK was the worst case.

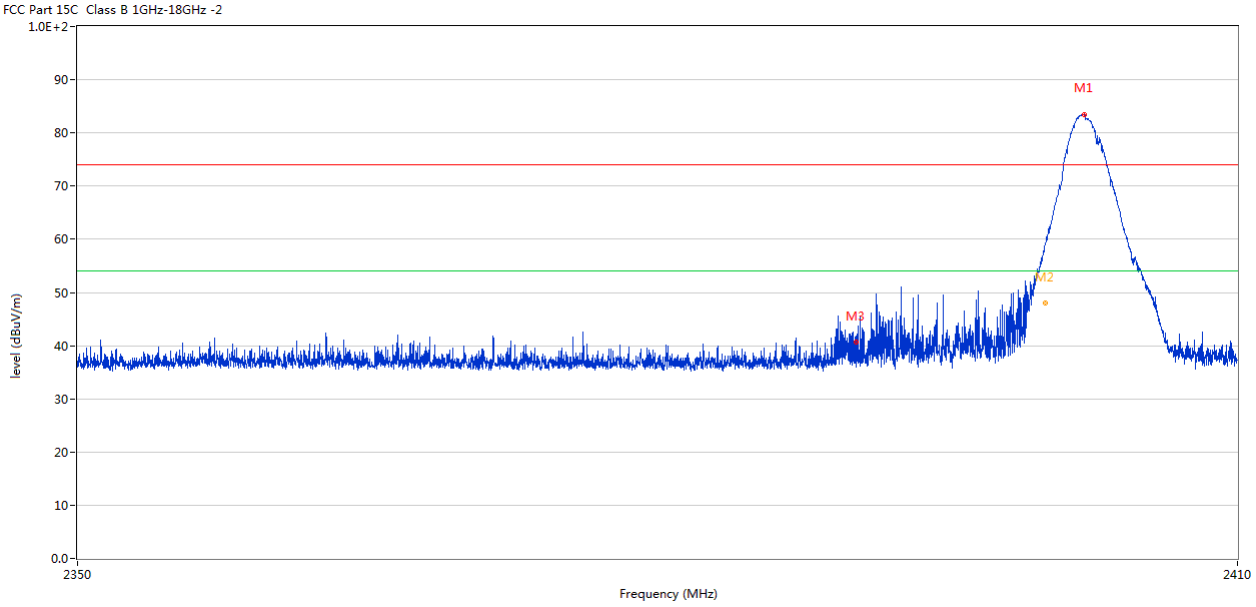
Test Result **Right Earphone**

Product:	TWS Earphone	Polarity	Horizontal
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	--	--



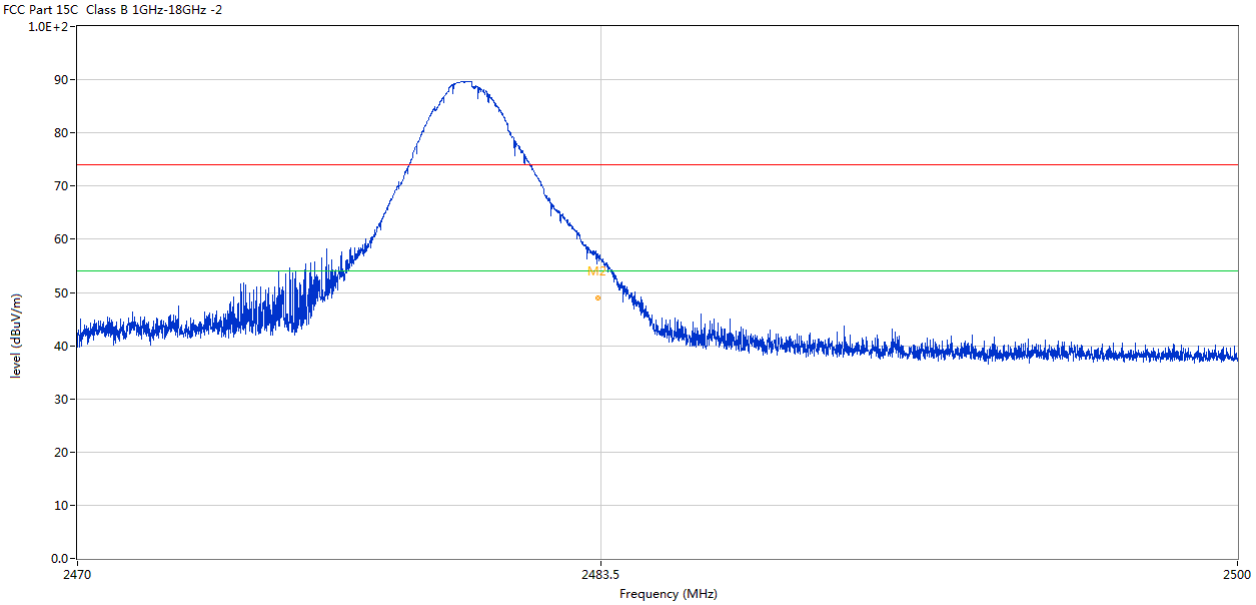
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
2	2399.993	63.96	-3.57	74.0	-10.04	Peak	324.00	100	Horizontal	Pass
2**	2399.993	50.09	-3.57	54.0	-3.91	AV	324.00	100	Horizontal	Pass
3	2390.010	42.59	-3.53	74.0	-31.41	Peak	310.00	100	Horizontal	Pass

Product:	TWS Earphone	Detector	Vertical
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	--	--



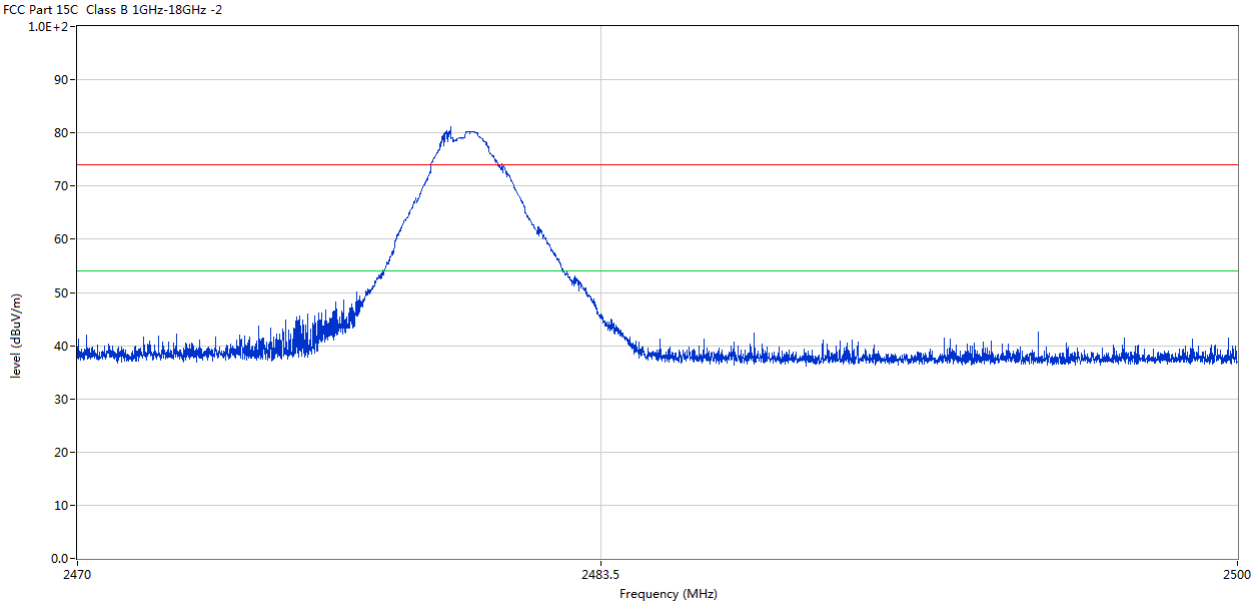
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
2	2399.989	57.21	-3.57	74.0	-16.79	Peak	331.00	100	Vertical	Pass
2**	2399.989	48.07	-3.57	54.0	-5.93	AV	331.00	100	Vertical	Pass
3	2390.115	40.64	-3.53	74.0	-33.36	Peak	360.00	100	Vertical	Pass

Product:	TWS Earphone	Polarity	Horizontal
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	--	--



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
2	2483.407	57.29	-3.57	74.0	-16.71	Peak	300.00	100	Horizontal	Pass
2**	2483.407	48.92	-3.57	54.0	-5.08	AV	300.00	100	Horizontal	Pass

Product:	TWS Earphone	Detector	Vertical
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	--	--



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
2	2483.242	49.20	-3.57	74.0	-24.80	Peak	106.00	100	Vertical	Pass

Note: 1. The PK emission level less than the AV limit. No necessary to record the AV emission level.

2. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

3. The three modulation modes of GFSK and Pi/4D-QPSKwere tested. And only the worst case was recorded in the test report. GFSK was the worst case.

8.0 Antenna Requirement

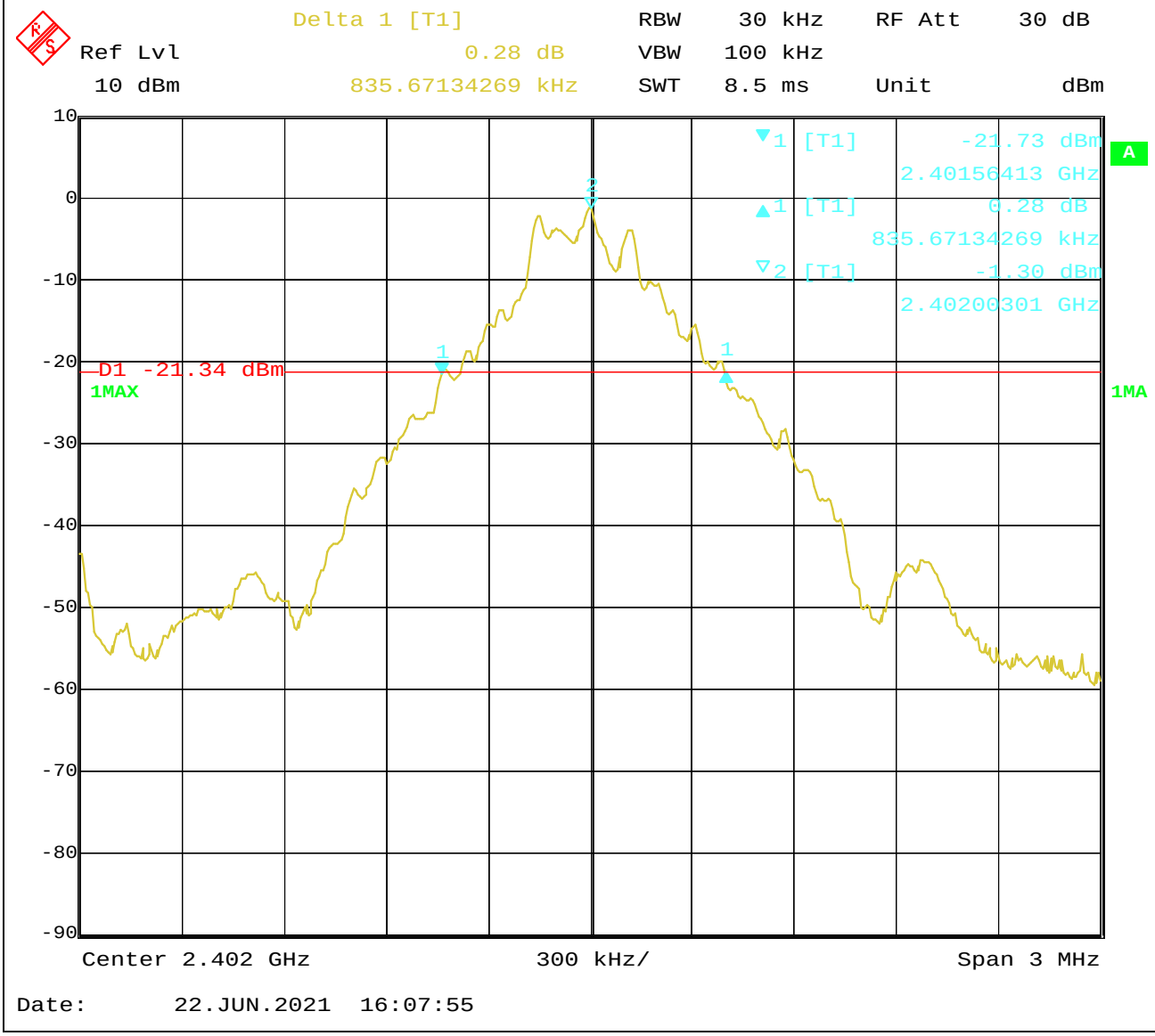
Applicable Standard

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

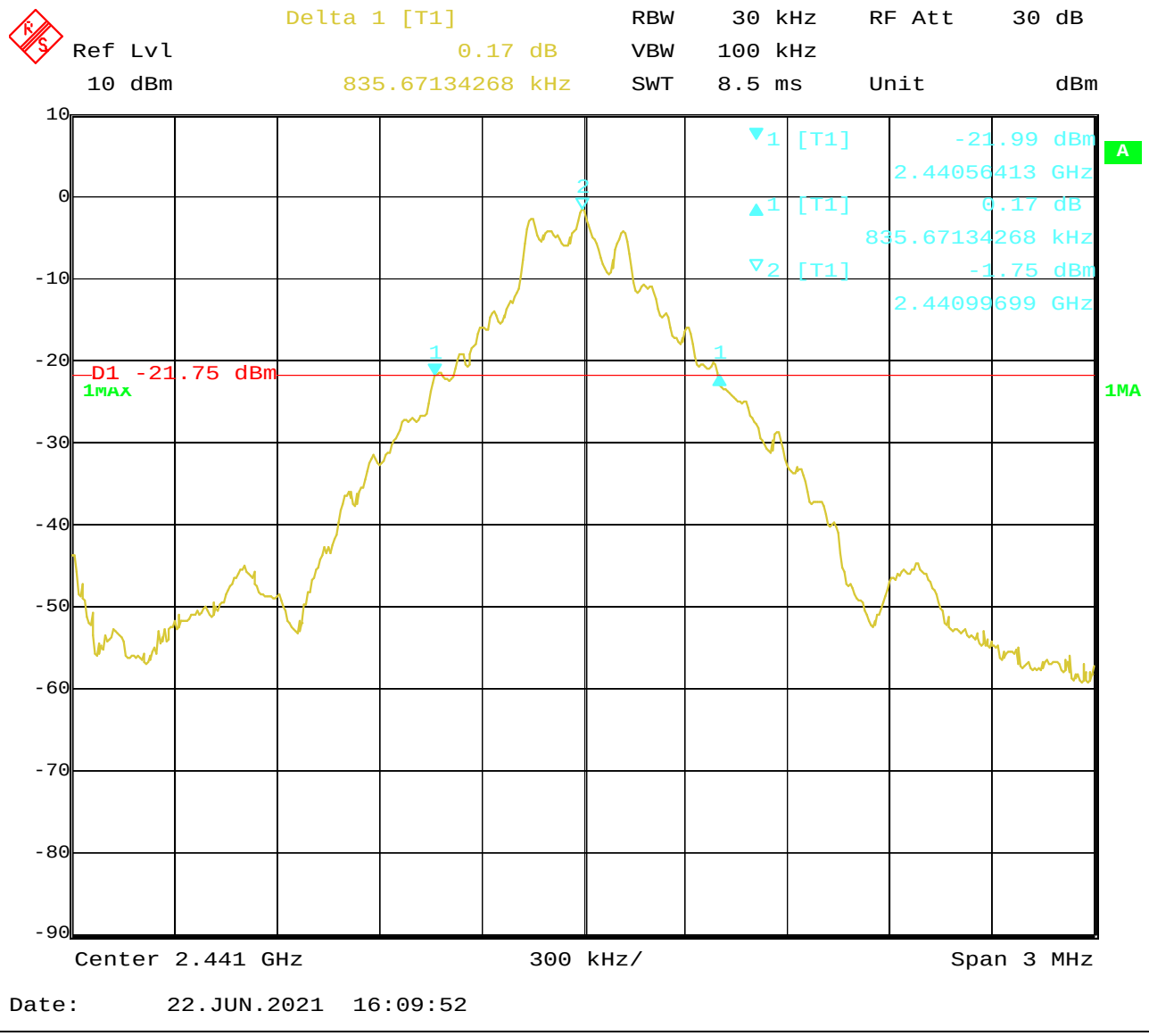
This product has a PCB antenna with gain 0.45dBi Max for left earbud and 0.60dBi for right earbud. It fulfills the requirement of this section.

Test Result: Pass

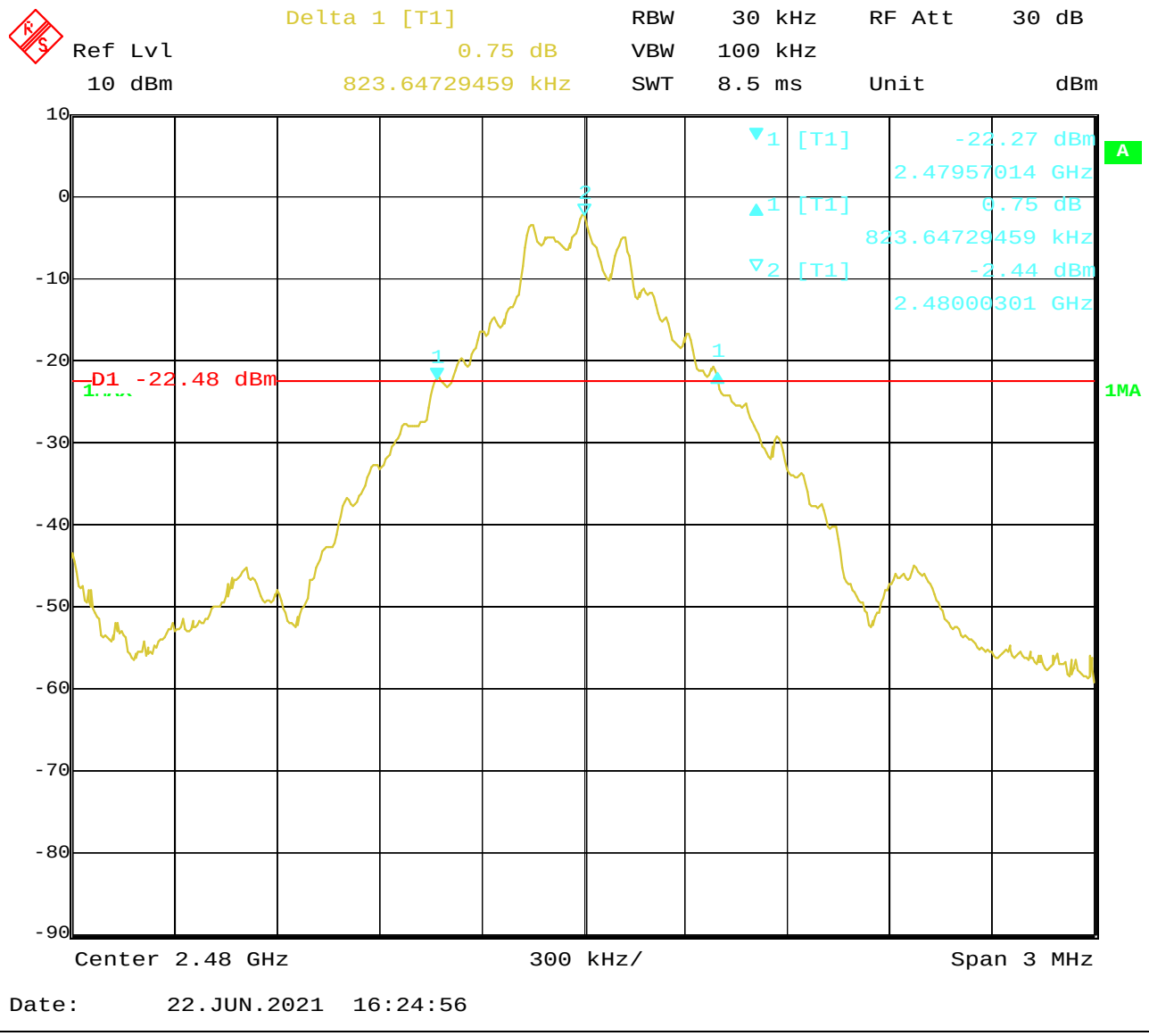
9.0 20dB Bandwidth Measurement			
GFSK Modulation - Left Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	835.67kHz	--	--



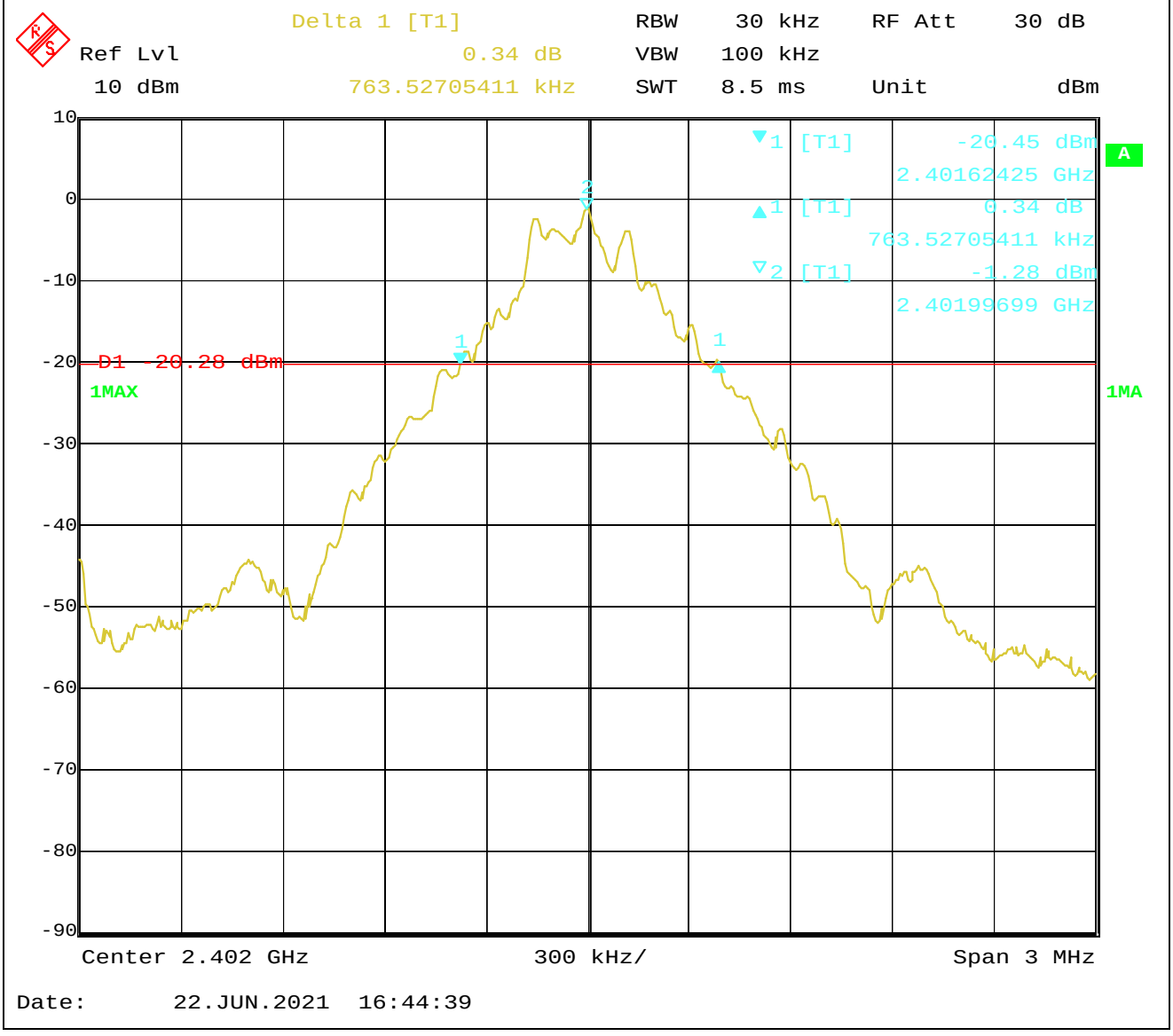
GFSK Modulation - Left Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	835.67kHz	--	--



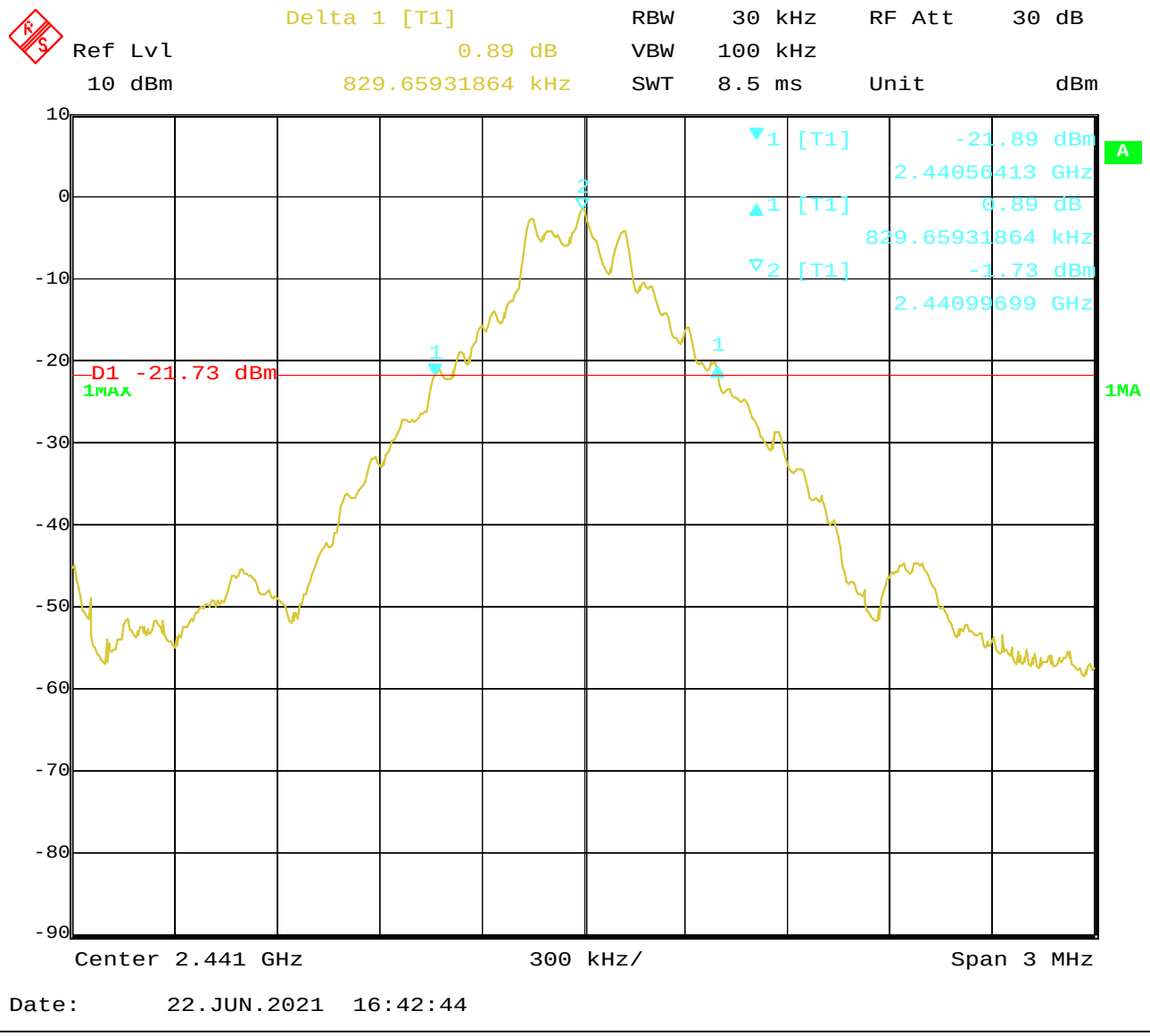
GFSK Modulation - Left Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	823.65kHz	--	--



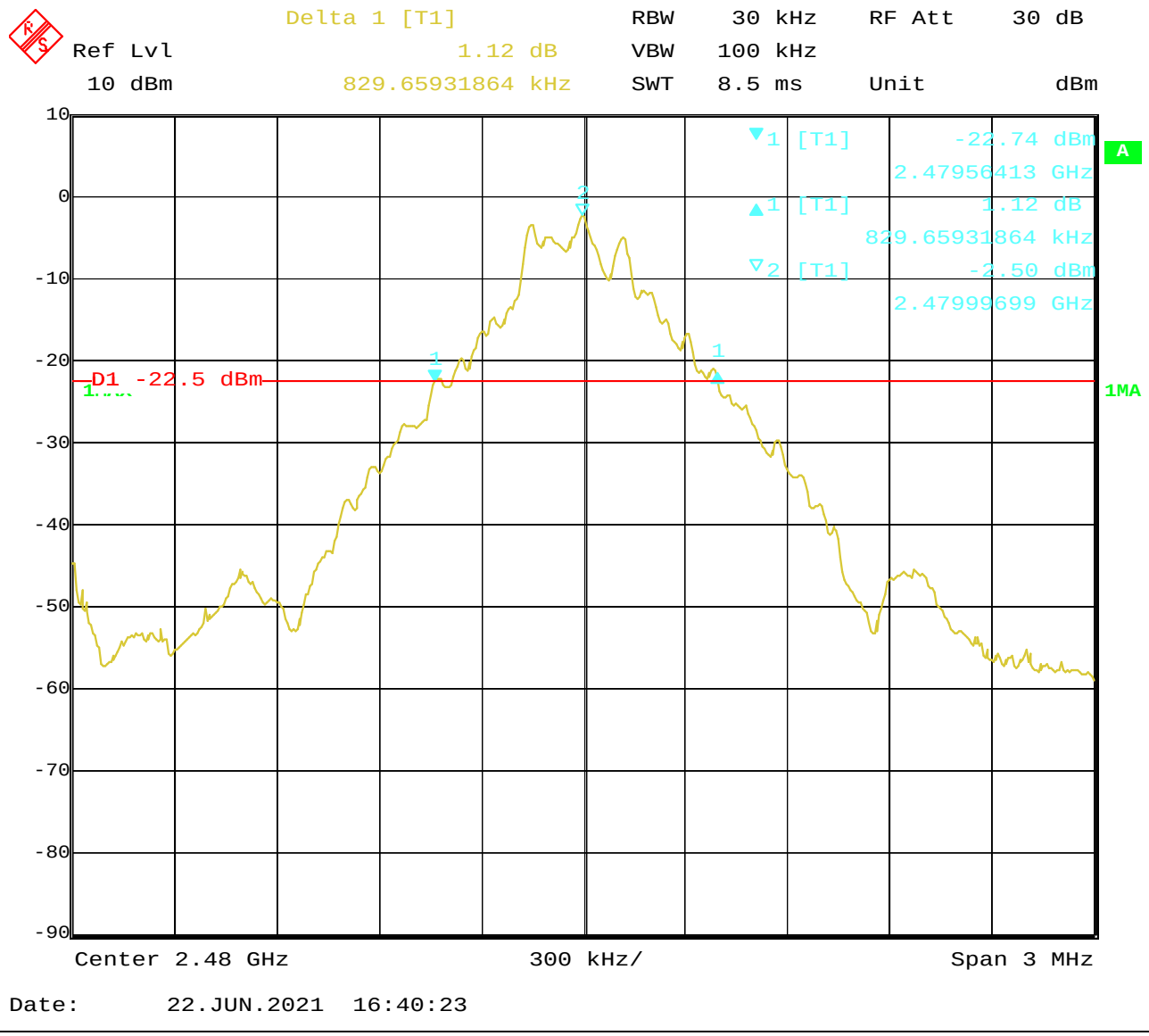
GFSK Modulation - Right Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	763.53kHz	--	--



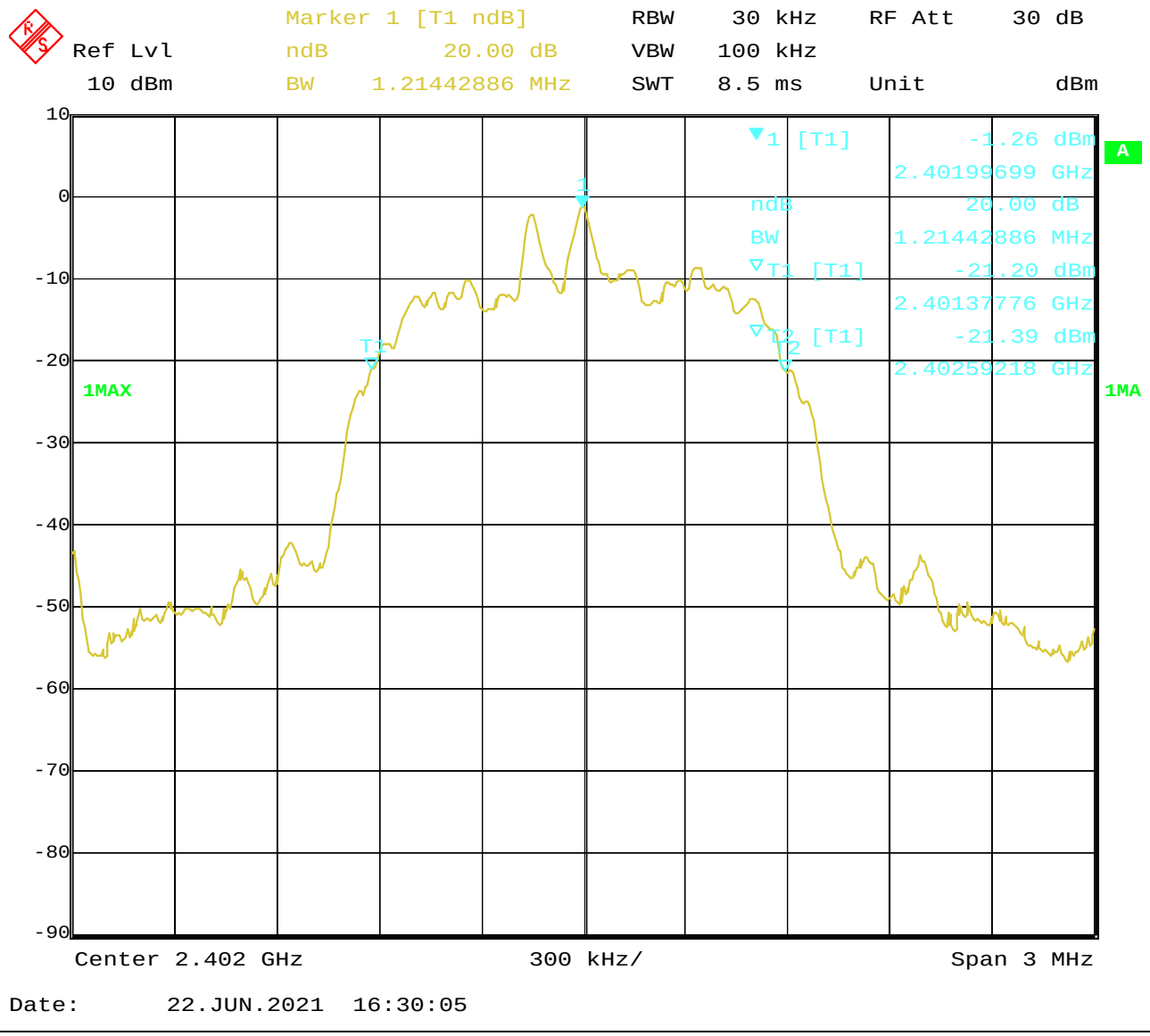
GFSK Modulation - Right Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	829.66kHz	--	--



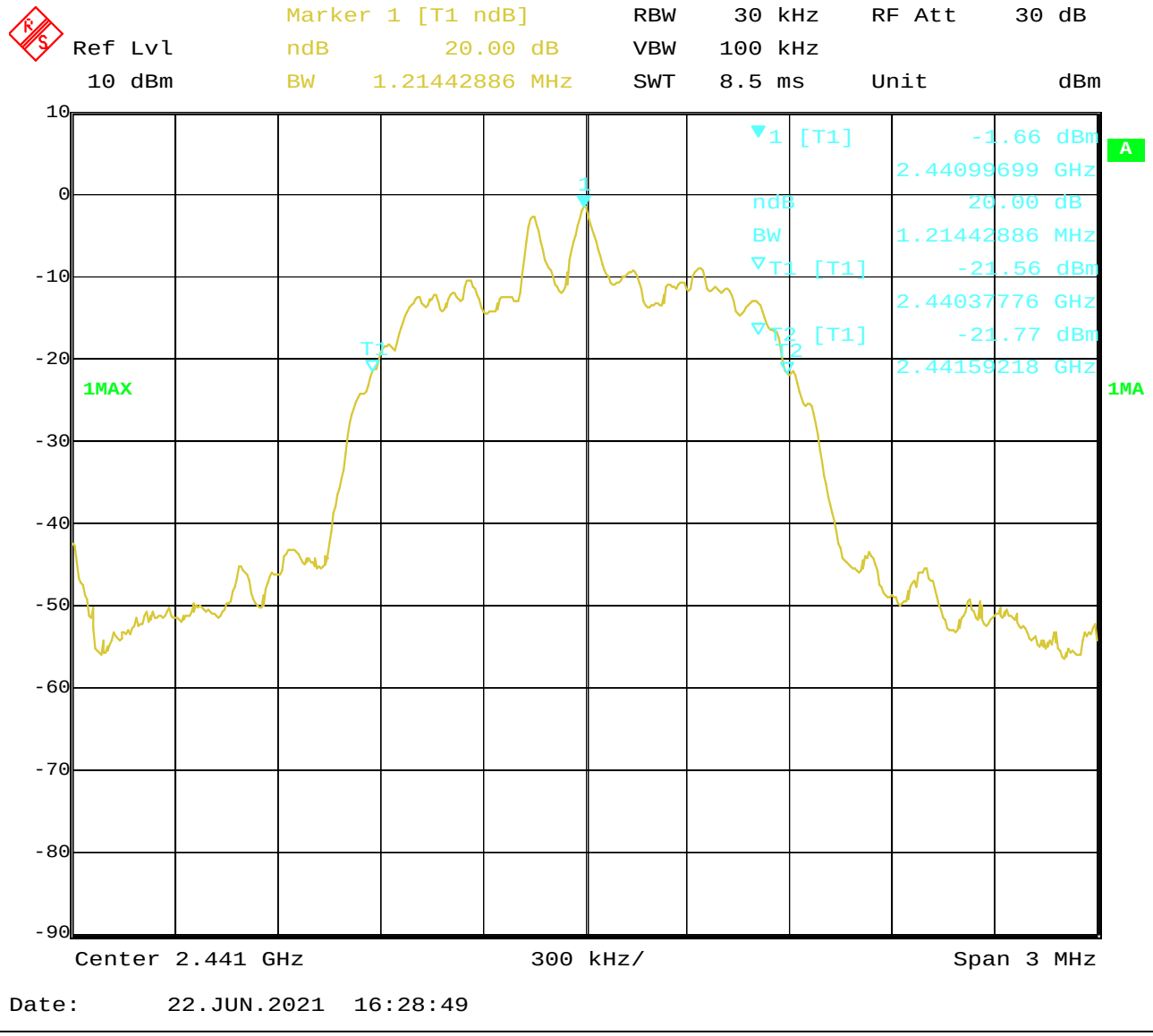
GFSK Modulation - Right Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	829.66kHz	--	--



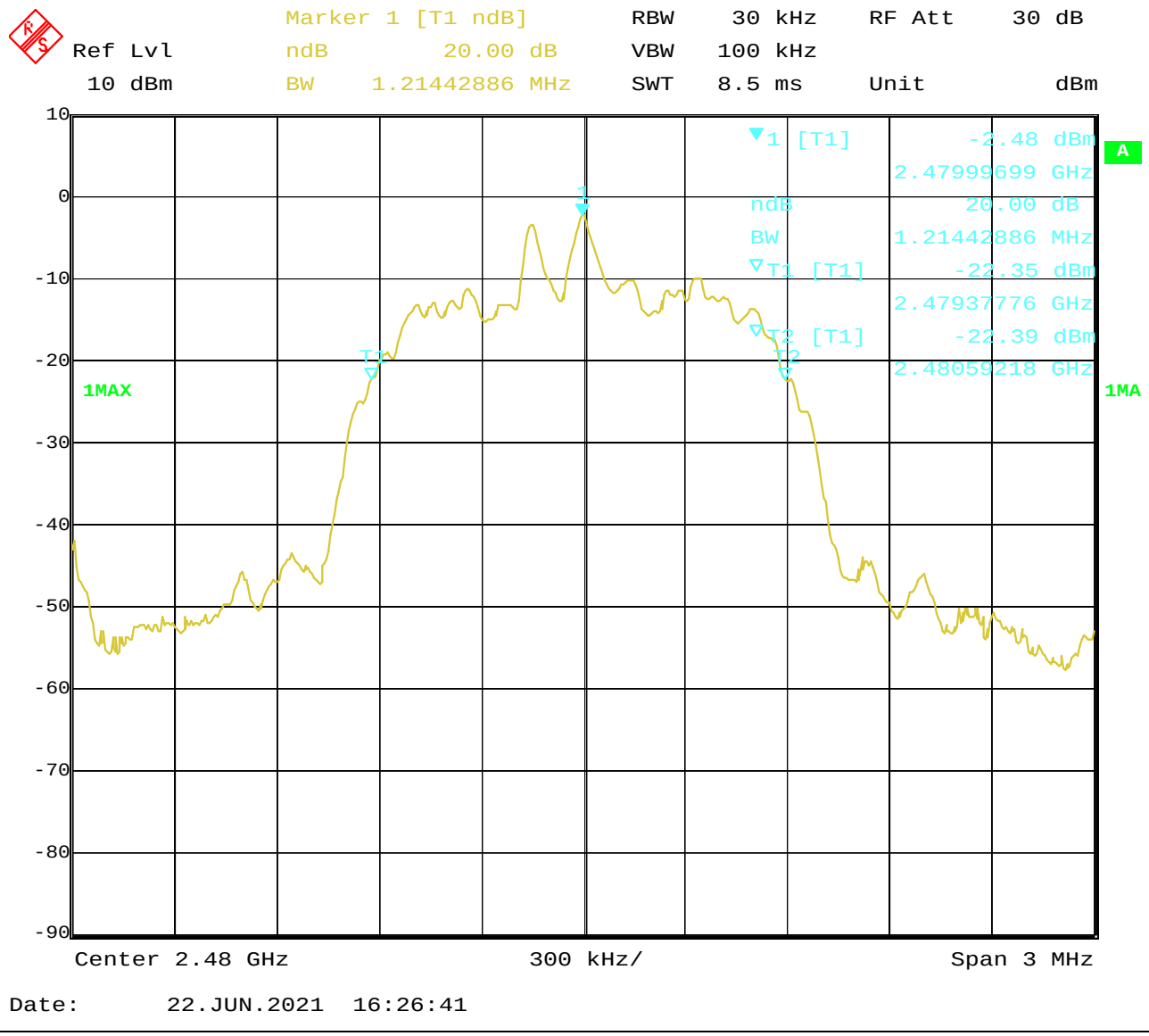
Pi/4D-QPSK Modulation - Left Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1.214MHz	--	--



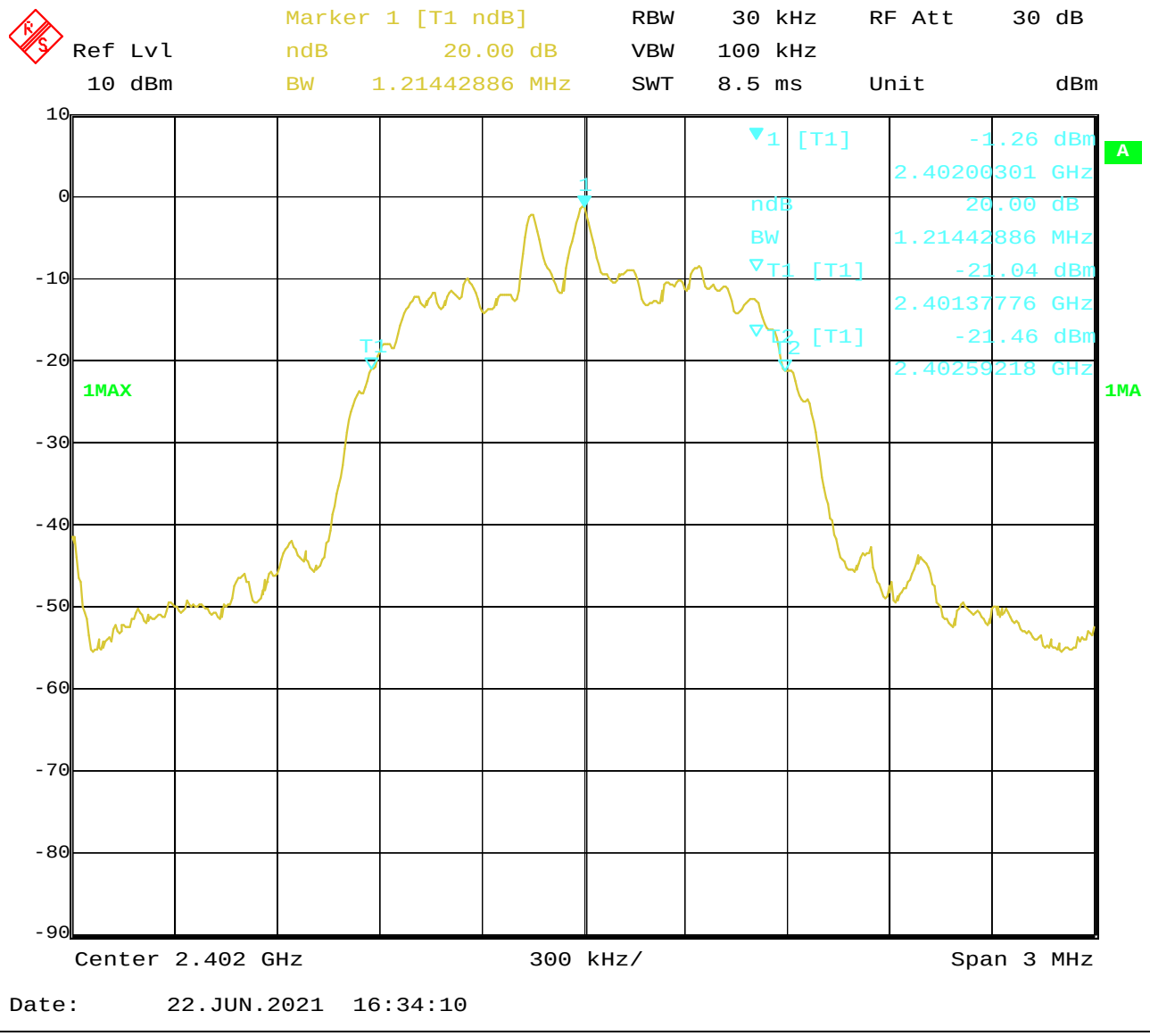
Pi/4D-QPSK Modulation - Left Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1.214MHz	--	--



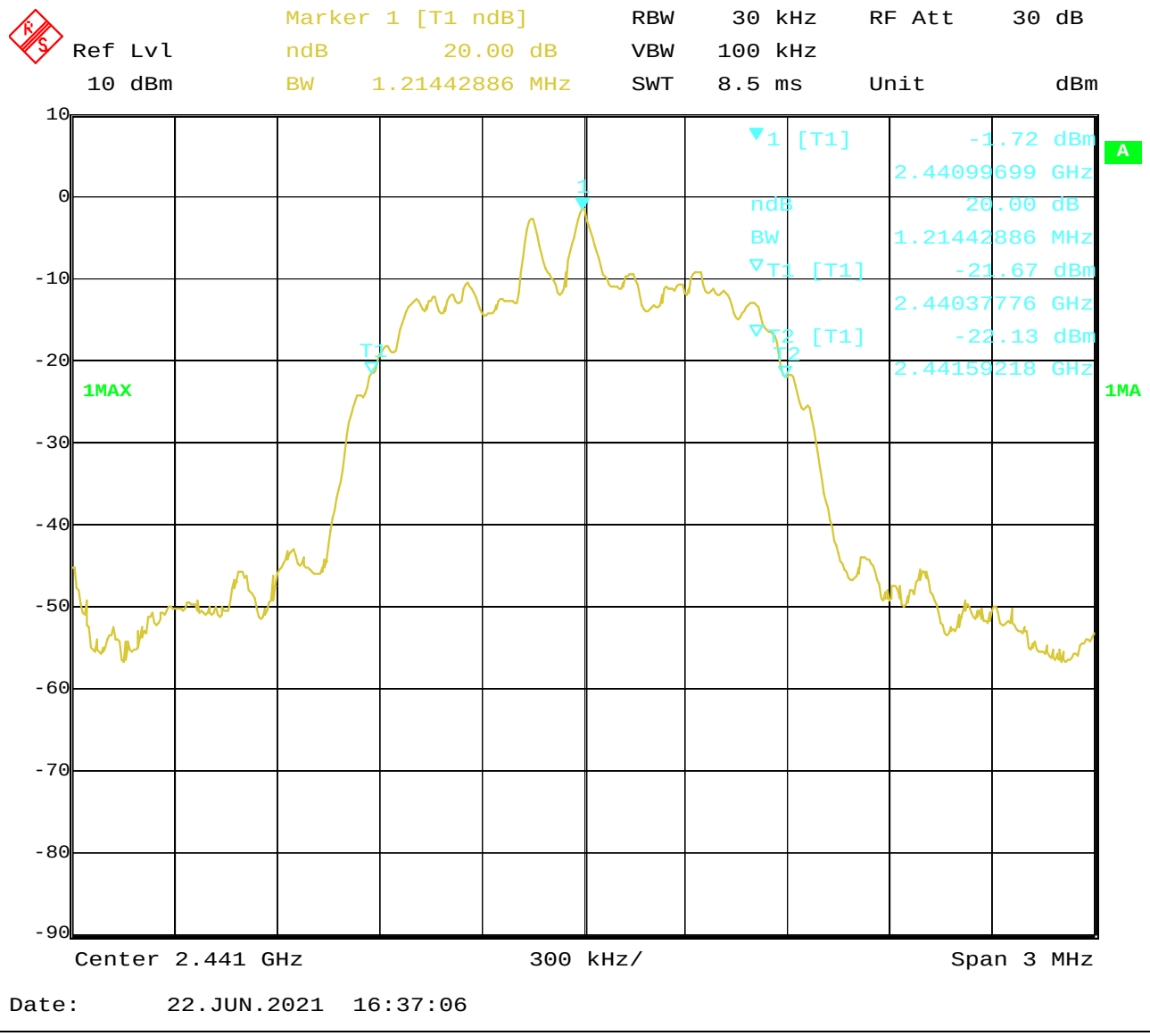
Pi/4D-QPSK Modulation - Left Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1.214MHz	--	--



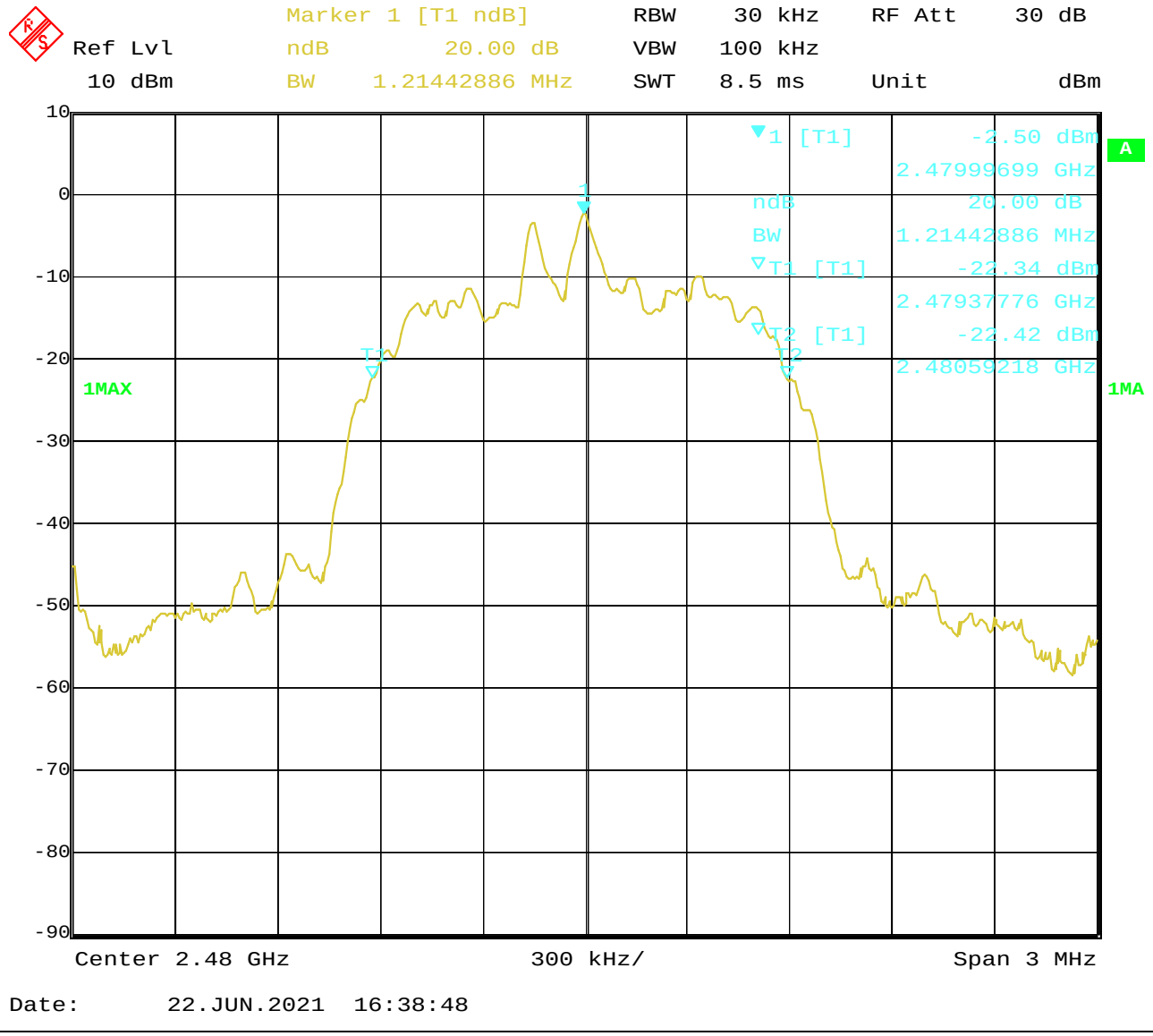
Pi/4D-QPSK Modulation - Right Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1.214MHz	--	--



Pi/4D-QPSK Modulation - Right Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1.214MHz	--	--



Pi/4D-QPSK Modulation - Right Earphone			
Product:	TWS Earphone	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1.214MHz	--	--

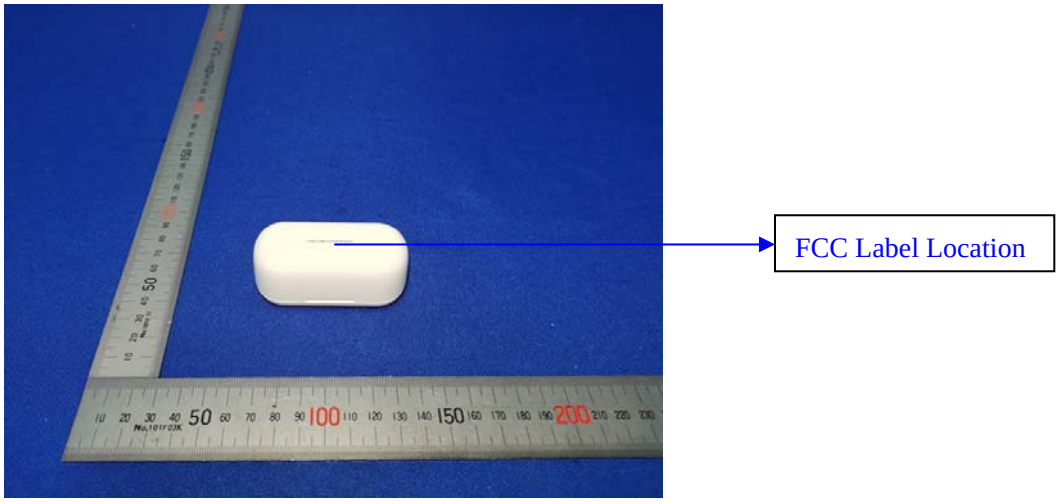


10.0 FCC ID Label

FCC ID: 2AOKX-TW056B

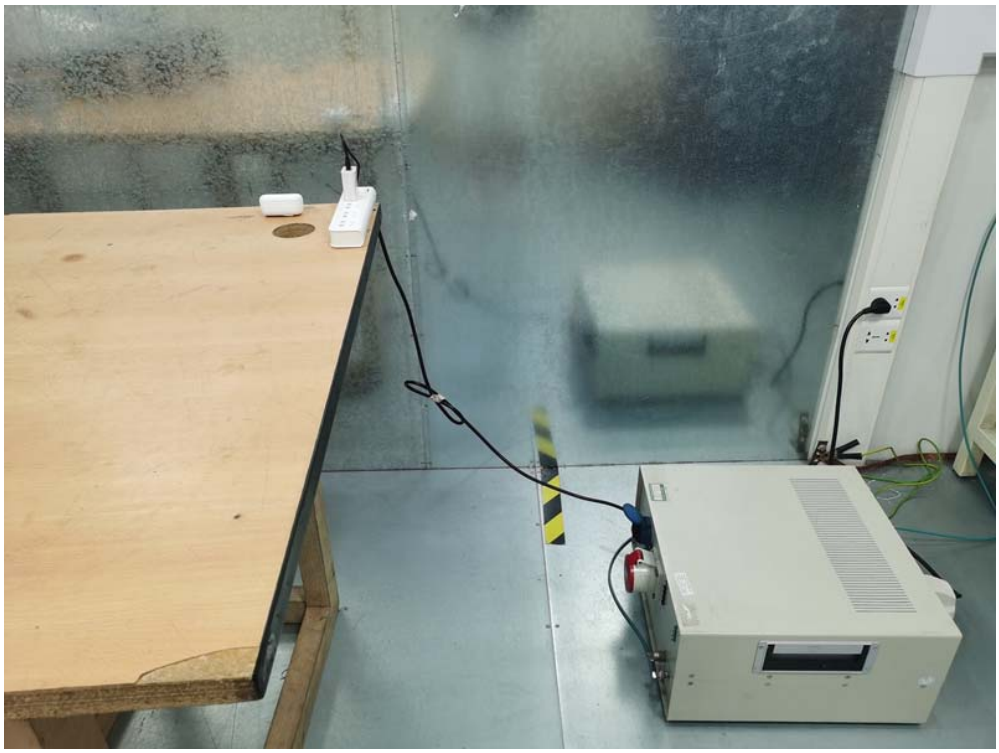
The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:

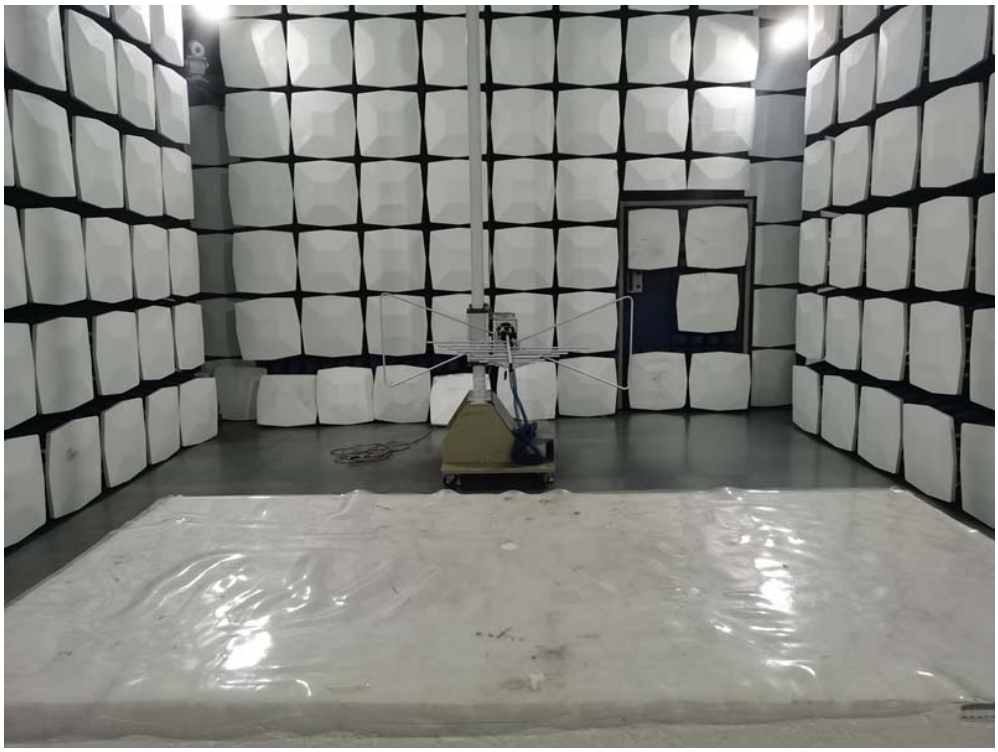


11.0 Photo of testing

11.1 Conducted test View--

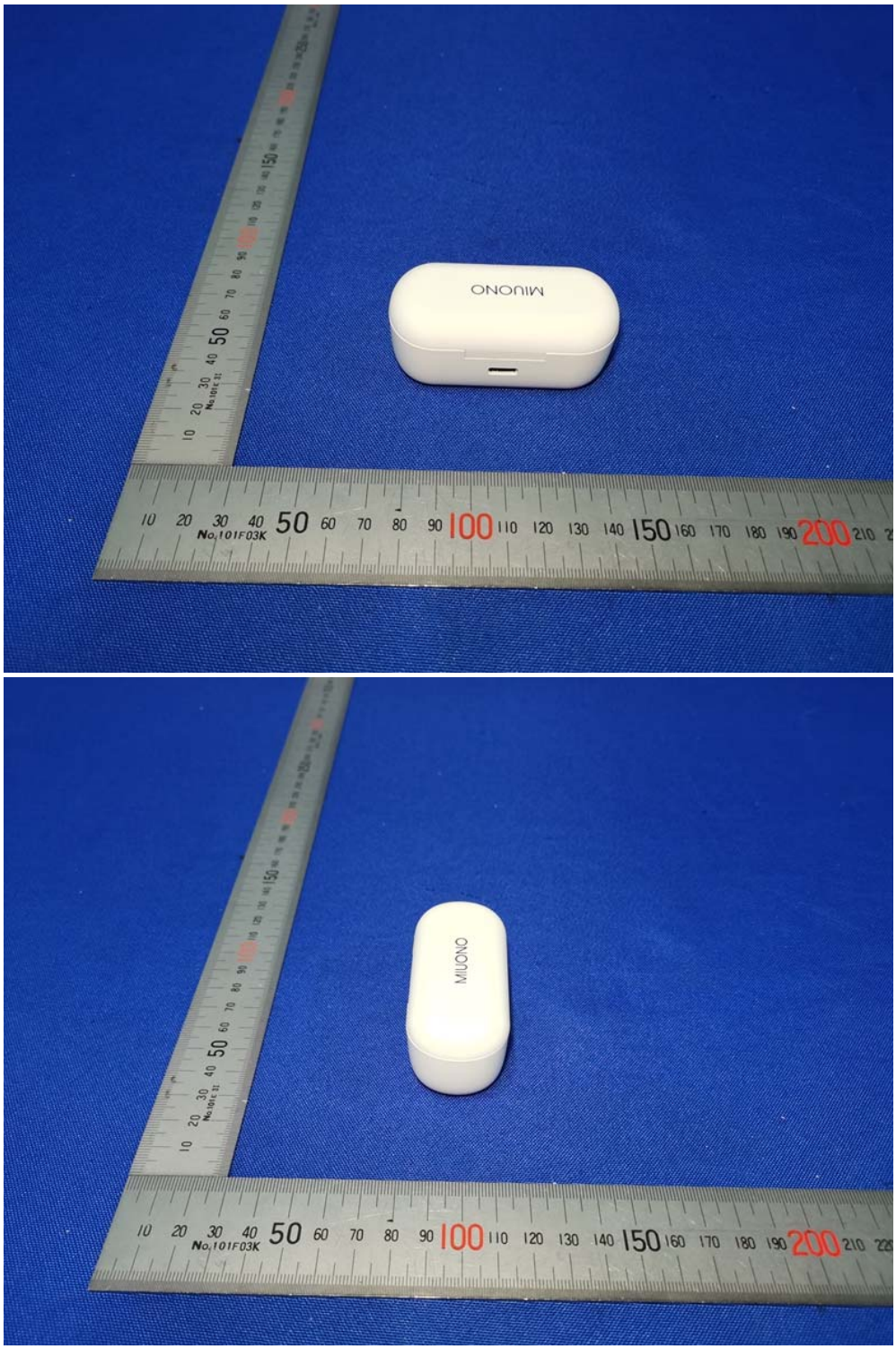


Radiated emission test view



11.2 Photographs – EUT

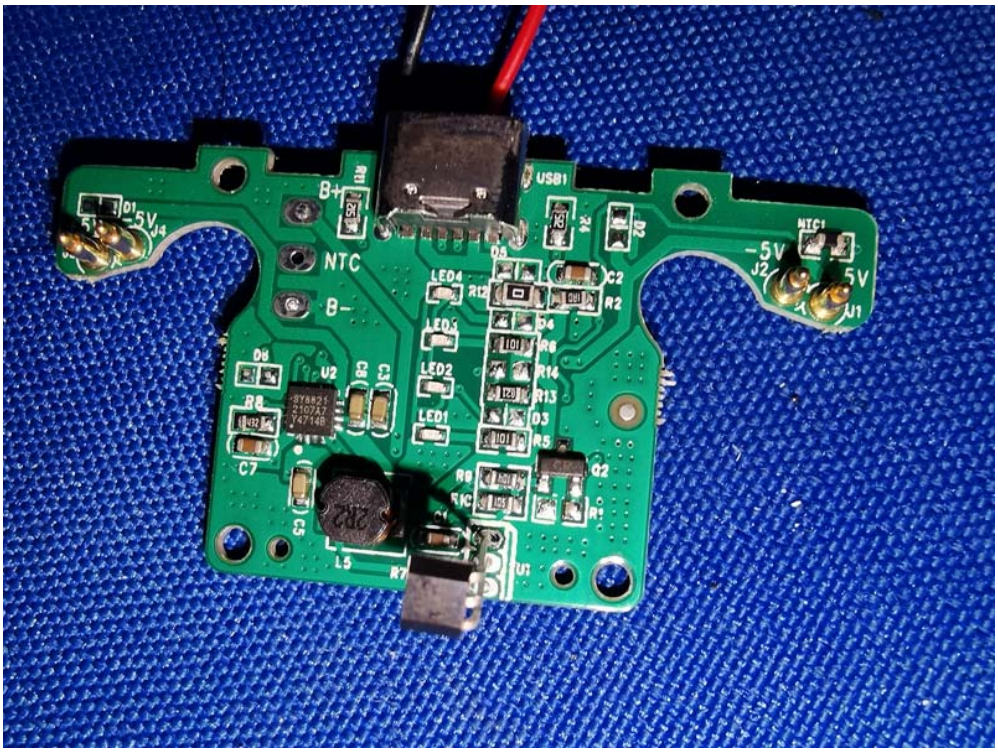
Outside View-Charger Base

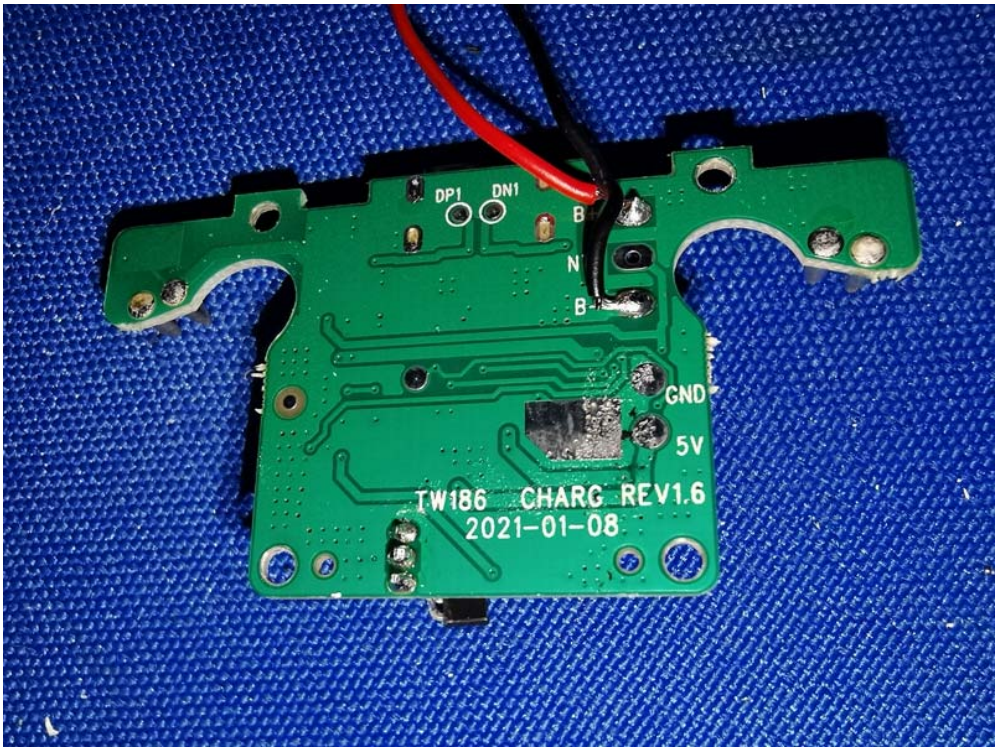


Photographs – EUT

Outside View-Charger Base

Inside View-Charger Base

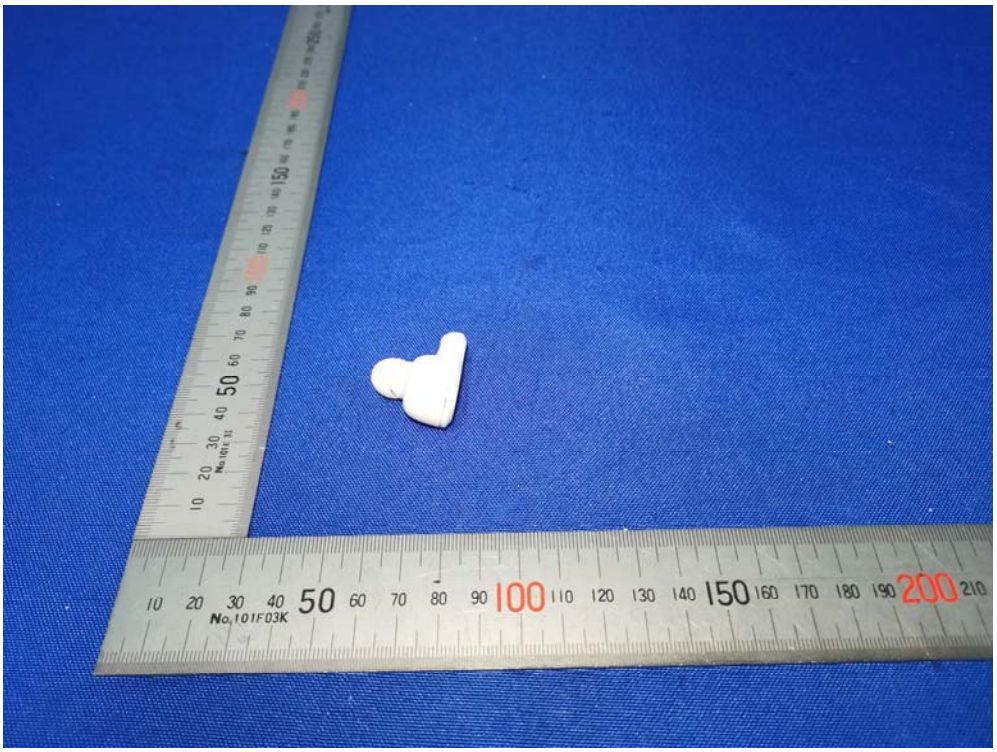




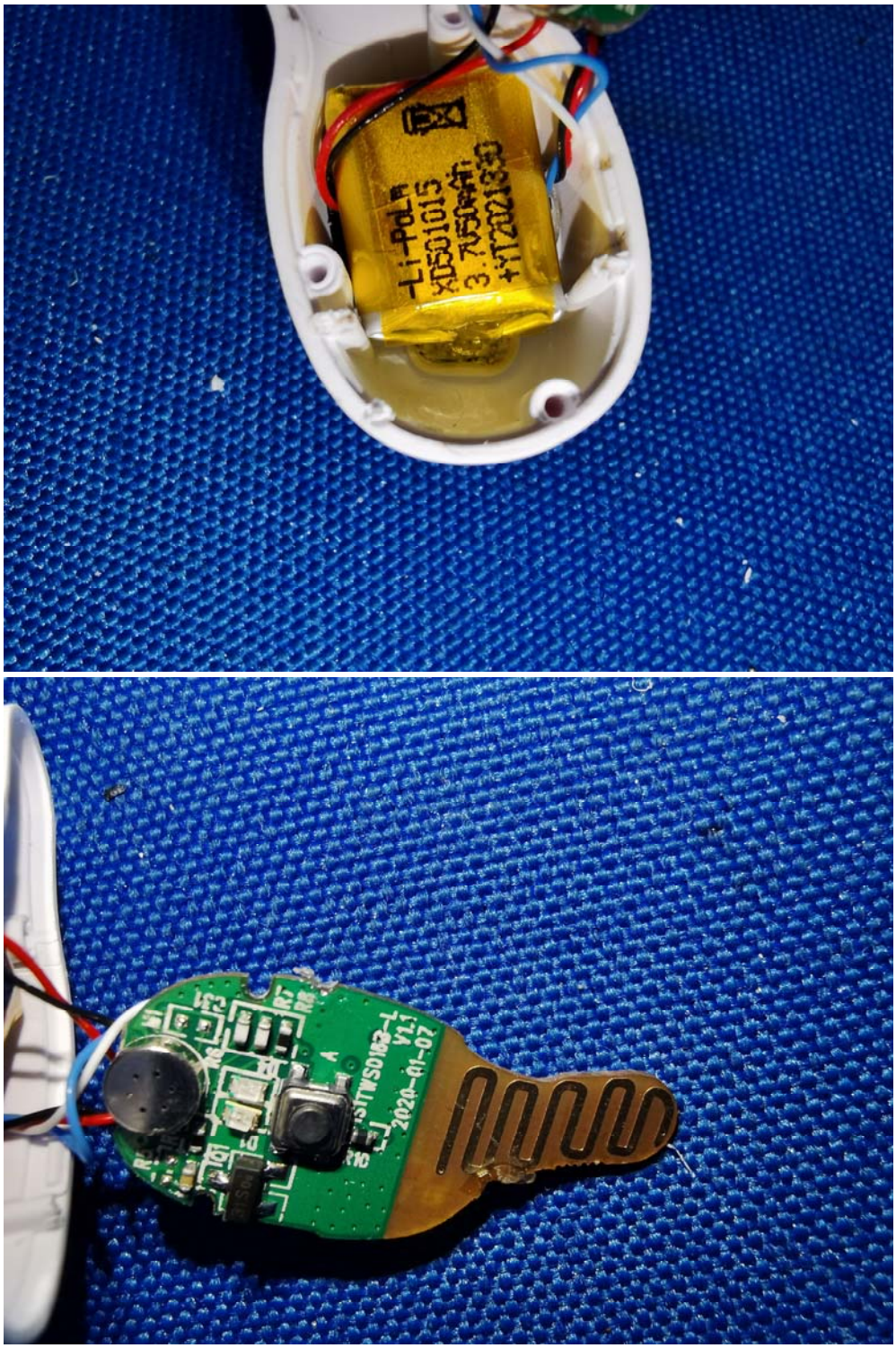
Inside View-Charger Base

Outside View - Left Earphone

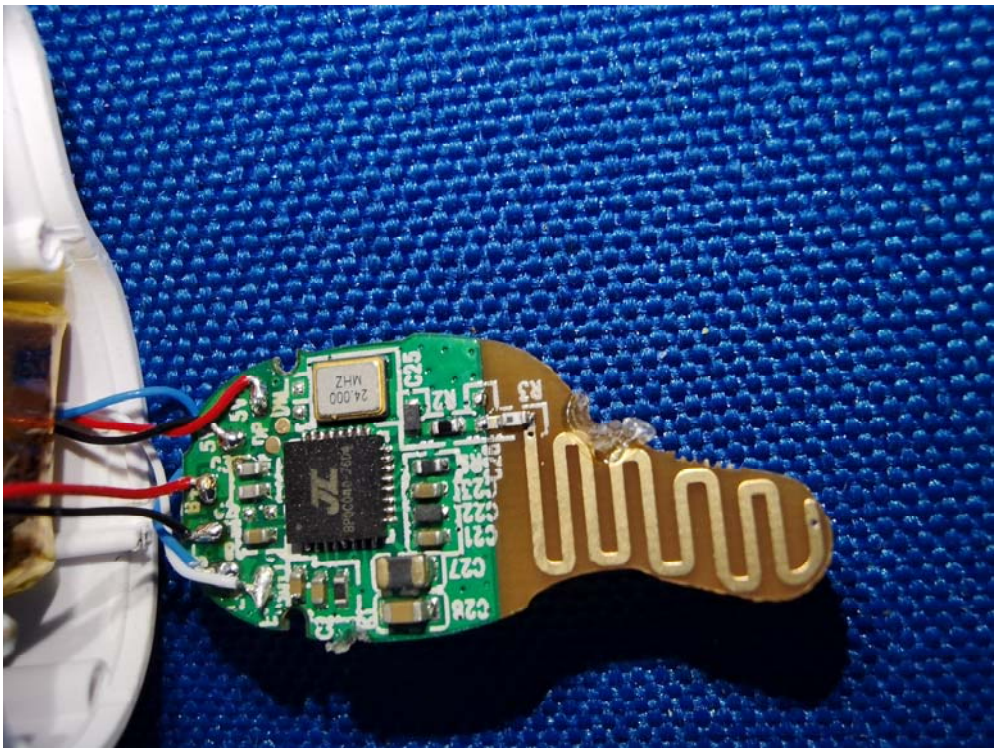
Outside View - Left Earphone



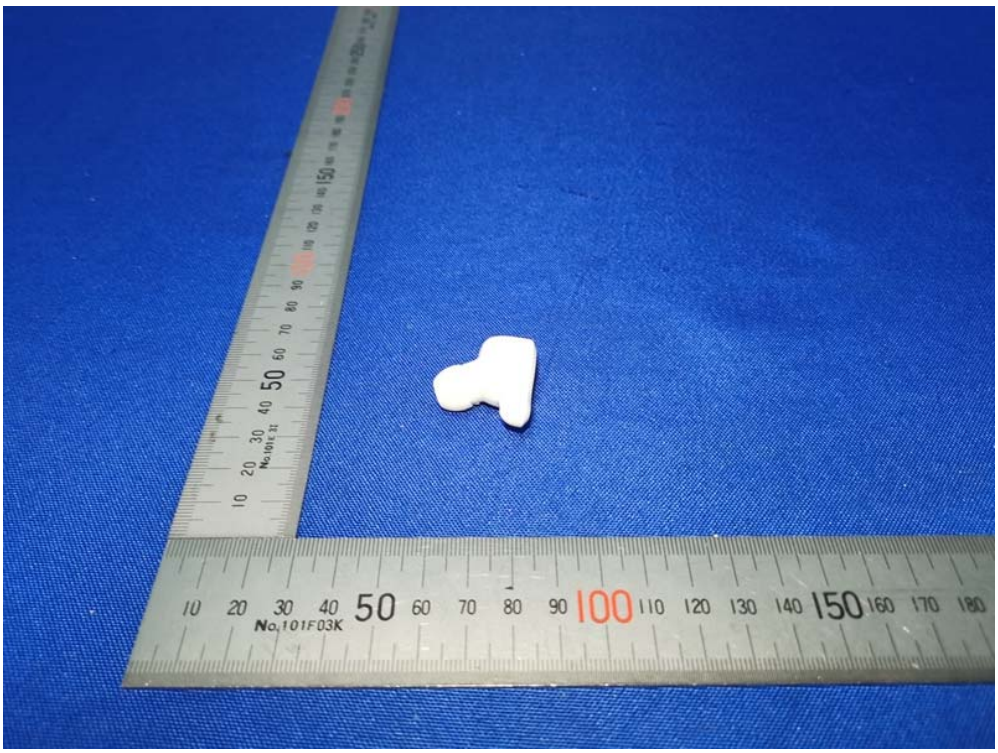
Inside view - Left Earphone



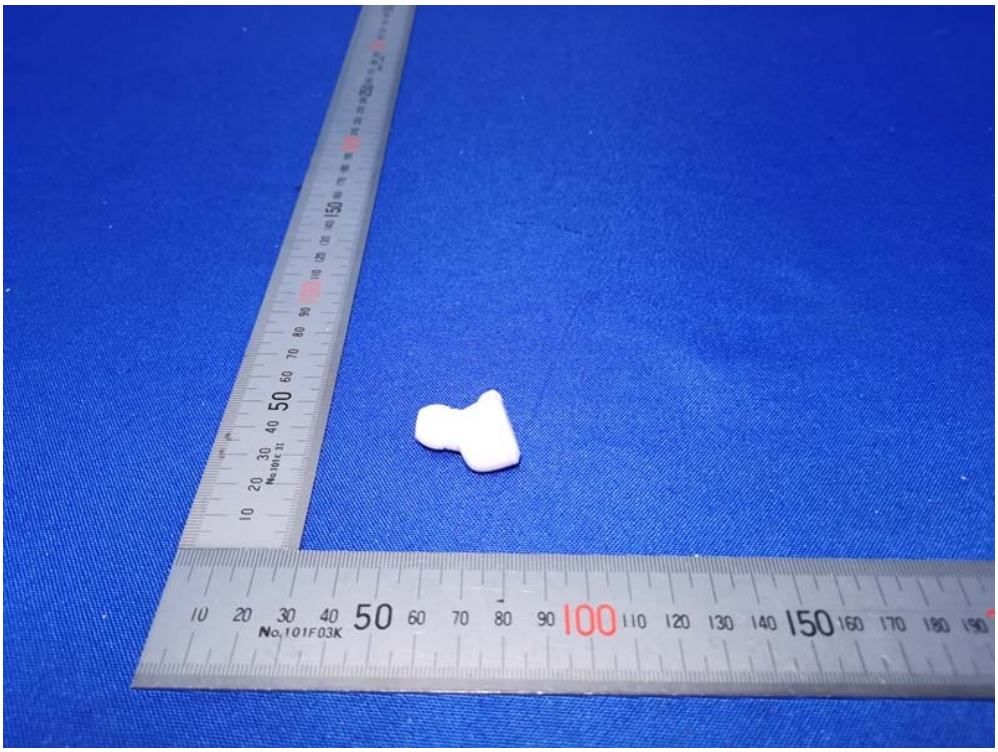
Inside view - Left Earphone



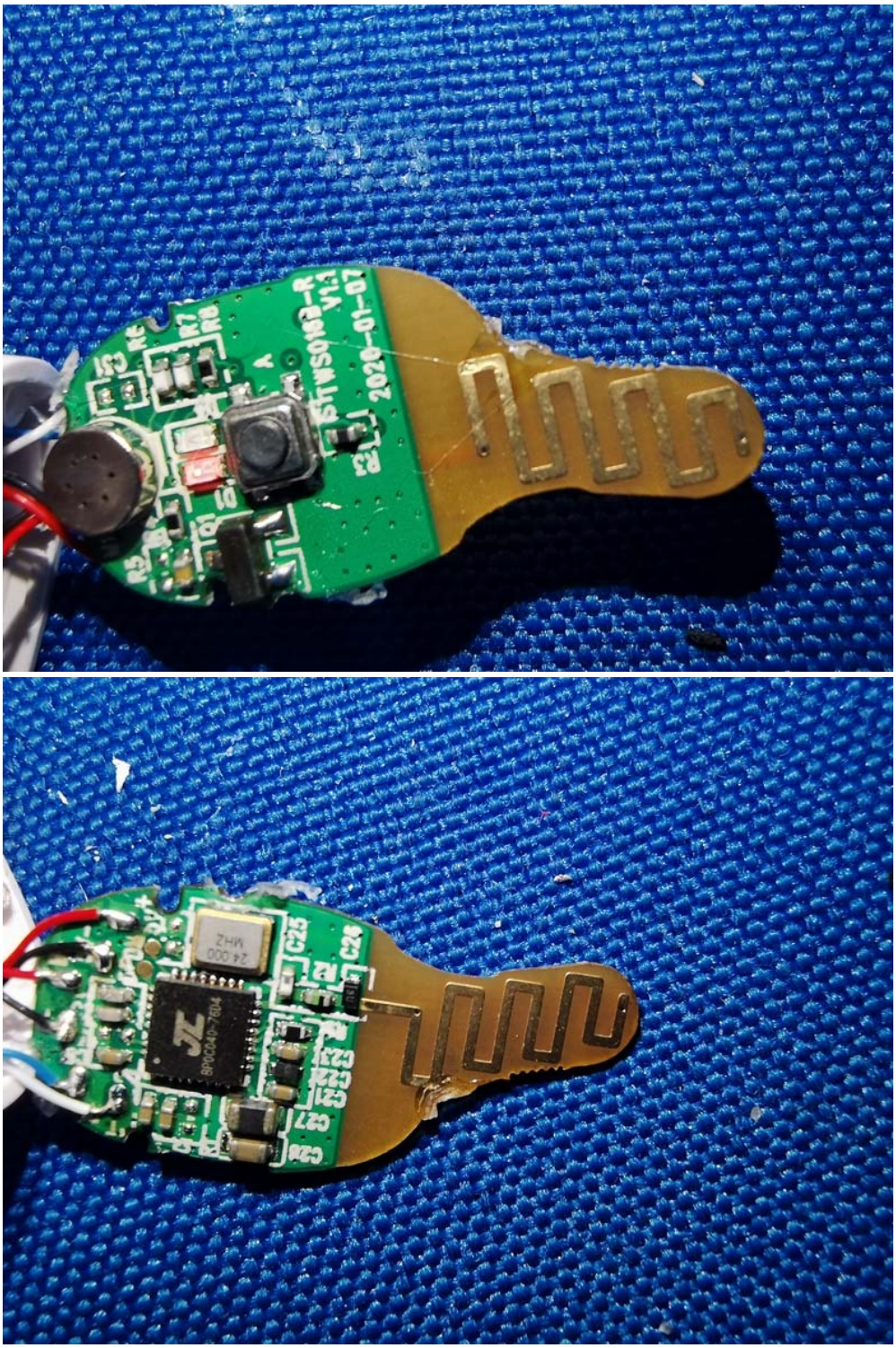
Outside View - Right Earphone



Outside View - Right Earphone



Inside view - Right Earphone



--End of the report--