



Report No.: TW2007248E File reference No.: 2020-07-30

Applicant: Shenzhen Swetz Sound Technology Co.,Limited

Product: TWS Earphone

Model No.: IAEBT600B, IAEBT600IND, TW039N

Trademark: N/A

Test Standards: FCC Part 15.247

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.10, FCC Part 15.247 for the

evaluation of electromagnetic compatibility

Approved By

# Jack Chung

Jack Chung

Manager

Dated: July 30, 2020

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

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# **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 meets 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

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# **Test Report Conclusion**

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#### 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

# 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: IAEBT600B

Additional Model Number: IAEBT600IND, TW039N

Type of Modulation GFSK, 月/4DQPSK, 8DPSK for Bluetooth

Frequency range 2402-2480MHz for Bluetooth

Channel Spacing 1MHz for Bluetooth

Frequency Selection By software

Channel Number 79 channels for Bluetooth

Antenna: Integral Antenna. The gain of the antennas is 0.45dBi (from the antenna

specification provided the applicant)

Input Voltage: DC5.0V

Battery: DC3.7V, 30mAh Li-ion battery

# 1.4 Submitted Sample: 2 Samples

#### 1.5 Test Duration

2020-07-21 to 2020-07-30

# 1.6 Test Uncertainty

The report refers only to the sample tested and does not apply to the bulk.

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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%

1.7 Test Engineer

Terry Tang The sample tested by

Print Name: Terry Tang

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2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ESPI Test Receiver R&S		100379	2020-06-23	2021-06-22
TWO Line-V-NETW	R&S	EZH3-Z5	100294	2020-06-23	2021-06-22
TWO Line-V-NETW	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	2020-06-23	2021-06-22
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	2019-08-22	2020-08-21
Power sensor	Anritsu	MA2491A	32263	2019-08-22	2020-08-21
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2018-07-04	2021-07-03
9*6*6 Anechoic			N/A	2018-02-07	2021-02-06
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	2020-01-18	2021-01-17
RF Cable	Zhengdi	ZT26-NJ-NJ-8 M/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	2020-01-07	2021-01-06

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#### 3.0 **Technical Details**

#### 3.1 **Summary of test results**

The EUT has been tested according to the following specifications:

Requirement	CFR 47 Section	Result	Notes
Antenna Requirement	15.203, 15.247(b)(4)	PASS	Complies
Maximum Peak Out Power	15.247 (b)(1), (4)	PASS	Complies
Carrier Frequency Separation	15.247(a)(1)	PASS	Complies
20dB Channel Bandwidth	15.247 (a)(1)	PASS	Complies
Number of Hopping Channels	15.247(a)(iii), 15.247(b)(1)	PASS	Complies
Time of Occupancy (Dwell Time)	15.247(a)(iii)	PASS	Complies
Spurious Emission, Band Edge, and Restricted bands	15.247(d),15.205(a), 15.209 (a),15.109	PASS	Complies
Conducted Emissions	15.207(a), 15.107	PASS	Complies
RF Exposure	15.247(i), 1.1307(b)(1)	PASS	Complies

#### 3.2 **Test Standards**

FCC Part 15 Subpart & Subpart C, Paragraph 15.247

#### 4.0 **EUT Modification**

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES.

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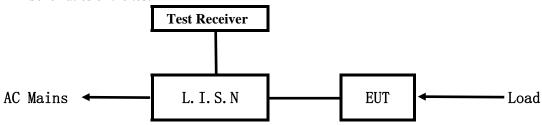
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#### 5. Power Line Conducted Emission Test

#### 5.1 Schematics of the test

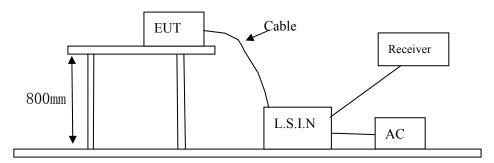


EUT: Equipment Under Test

# 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.

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### A. EUT

Device	Manufacturer	Model	FCC ID
TWS Earphone	Shenzhen Swetz Sound Technology	IAEBT600B,	2AOKX-TW039N
i ws carpnone	Co.,Limited	IAEBT600IND, TW039N	2AUKA-1 WU39N

#### B. Internal Device

Device	Manufacturer	Model	Rating

# 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 15.107, 15.207

	Frequency	Class A Lim	its (dB µ V)	Class B Limits (dB \( \mu \)		
	(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level	
0.1	15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*	
0.5	50 ~ 5.00	73.0	60.0	56.0	46.0	
5.0	$00 \sim 30.00$	73.0	60.0	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

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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

# **EUT Operating Environment**

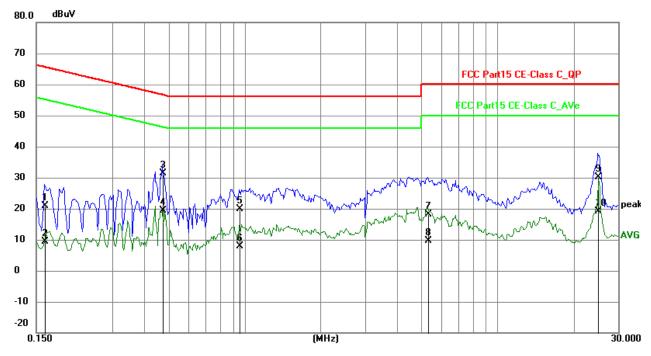
Temperature: 26℃ Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Charging + Keep Bluetooth Transmitting** 

**Equipment Level: Class B** 

**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	0.1617	11.21	9.78	20.99	65.38	-44.39	QP	Р
2	0.1617	-0.34	9.78	9.44	55.38	-45.94	AVG	Р
3	0.4737	21.67	9.77	31.44	56.45	-25.01	QP	Р
4	0.4737	9.49	9.77	19.26	46.45	-27.19	AVG	Р
5	0.9534	10.00	9.79	19.79	56.00	-36.21	QP	Р
6	0.9534	-1.87	9.79	7.92	46.00	-38.08	AVG	Р
7	5.3127	8.29	9.94	18.23	60.00	-41.77	QP	Р
8	5.3127	-0.25	9.94	9.69	50.00	-40.31	AVG	Р
9	25.0194	19.18	10.99	30.17	60.00	-29.83	QP	Р
10	25.0194	8.13	10.99	19.12	50.00	-30.88	AVG	Р

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

**EUT Operating Environment** 

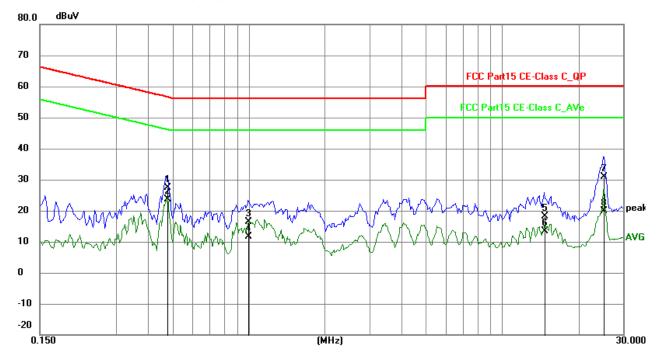
Humidity: 65%RH Atmospheric Pressure: 101 KPa Temperature: 26°C

**EUT set Condition: Charging + Keep Bluetooth Transmitting** 

**Equipment Level: Class B** 

**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	0.4776	17.64	9.77	27.41	56.38	-28.97	QP	Р
2	0.4776	13.94	9.77	23.71	46.38	-22.67	AVG	Р
3	0.9963	6.65	9.79	16.44	56.00	-39.56	QP	Р
4	0.9963	1.84	9.79	11.63	46.00	-34.37	AVG	Р
5	14.6718	7.74	10.37	18.11	60.00	-41.89	QP	Р
6	14.6718	2.97	10.37	13.34	50.00	-36.66	AVG	Р
7	25.1871	19.99	11.00	30.99	60.00	-29.01	QP	Р
8	25.1871	8.87	11.00	19.87	50.00	-30.13	AVG	Р

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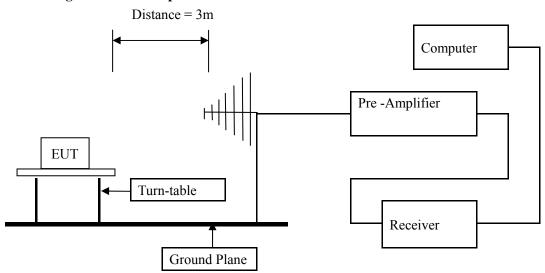
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#### 6 Radiated Emission Test

- 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 25GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. 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) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization: Vertical polarization and Horizontal polarization.

# **Block diagram of Test setup**



- 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.

The report refers only to the sample tested and does not apply to the bulk.

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### 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:

# Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ 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 higher limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. 8DPSK was the worse case because it has highest output power
- 5. 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.

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# Test result

# General Radiated Emission Data and Harmonics Radiated Emission Data

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

EUT set Condition: Keep Bluetooth Transmitting

**Results: Pass** 

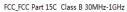
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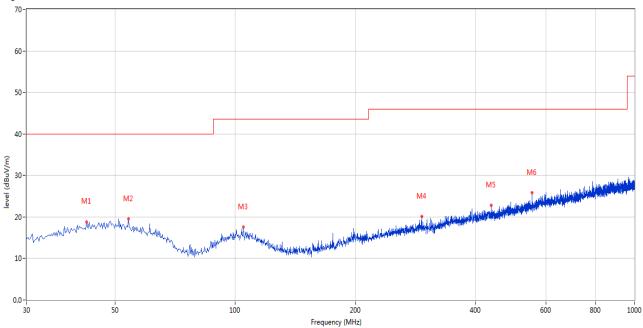
Date: 2020-07-30



Test Figure:

H





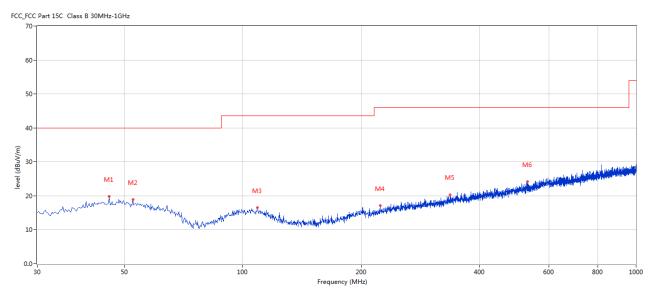
No.	Frequency	Results	Factor (dB)	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)		(dBuV/m)	(dB)		(o)	(cm)		
1	42.364	18.83	-11.59	40.0	-21.17	Peak	360.00	100	Н	Pass
2	54.001	19.51	-11.54	40.0	-20.49	Peak	0.00	200	Н	Pass
3	104.671	17.52	-13.25	43.5	-25.98	Peak	0.00	200	Н	Pass
4	293.047	20.11	-11.27	46.0	-25.89	Peak	339.00	100	Н	Pass
5	437.541	22.82	-8.03	46.0	-23.18	Peak	0.00	200	Н	Pass
6	553.669	25.84	-6.19	46.0	-20.16	Peak	70.00	200	Н	Pass

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# Test Figure:



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	45.759	19.84	-11.40	40.0	-20.16	Peak	0.00	100	V	Pass
2	52.547	18.89	-11.46	40.0	-21.11	Peak	0.00	200	V	Pass
3	108.793	16.49	-13.50	43.5	-27.01	Peak	65.00	200	V	Pass
4	223.467	17.09	-13.14	46.0	-28.91	Peak	43.00	100	V	Pass
5	336.443	20.35	-9.89	46.0	-25.65	Peak	360.00	100	V	Pass
6	529.668	24.12	-6.46	46.0	-21.88	Peak	286.00	200	V	Pass

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# Operation Mode: Transmitting under Low Channel (2402MHz)

	8	, ,	
Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dB \( \mu \)V/m)
4804		Н	74(Peak)/ 54(AV)
4804		V	74(Peak)/ 54(AV)
7206		H/V	74(Peak)/ 54(AV)
9608		H/V	74(Peak)/ 54(AV)
12010		H/V	74(Peak)/ 54(AV)
14412		H/V	74(Peak)/ 54(AV)
16814		H/V	74(Peak)/ 54(AV)
19216		H/V	74(Peak)/ 54(AV)
21618		H/V	74(Peak)/ 54(AV)
24020		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

# Operation Mode: Transmitting g under Middle Channel (2441MHz)

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
4882	-	Н	74(Peak)/ 54(AV)
4882		V	74(Peak)/ 54(AV)
7323		H/V	74(Peak)/ 54(AV)
9764		H/V	74(Peak)/ 54(AV)
12205		H/V	74(Peak)/ 54(AV)
14646		H/V	74(Peak)/ 54(AV)
17087		H/V	74(Peak)/ 54(AV)
19528		H/V	74(Peak)/ 54(AV)
21969		H/V	74(Peak)/ 54(AV)
24410	-	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

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# Operation Mode: Transmitting under High Channel (2480MHz)

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \( \mu \)V/m)
4960		Н	74(Peak)/ 54(AV)
4960		V	74(Peak)/ 54(AV)
7440		H/V	74(Peak)/ 54(AV)
9920		H/V	74(Peak)/ 54(AV)
12400		H/V	74(Peak)/ 54(AV)
14880		H/V	74(Peak)/ 54(AV)
17360		H/V	74(Peak)/ 54(AV)
19840		H/V	74(Peak)/ 54(AV)
22320		H/V	74(Peak)/ 54(AV)
24800		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

<sup>2.</sup> Remark "---" means that the emissions level is too low to be measured

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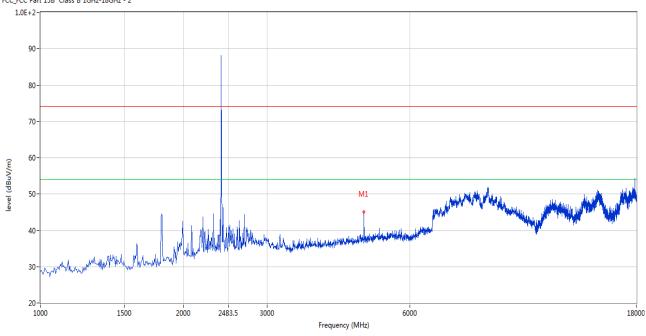
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# Please refer to the following test plots for details:

# **Low Channel: Vertical**

FCC\_FCC Part 15B Class B 1GHz-18GHz - 2



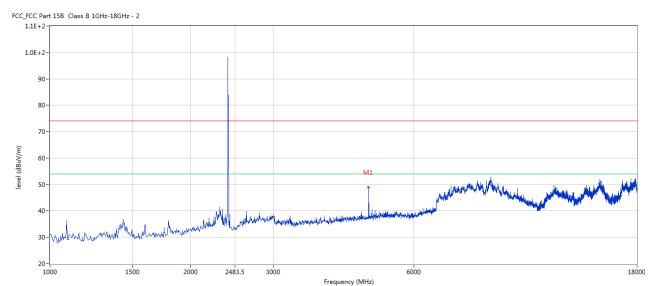
No.	Frequency	Results	Factor (dB)	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)		(dBuV/m)	(dB)		(o)	(cm)		
1	4802.799	45.05	3.12	54.0	-8.95	Peak	95.00	100	V	Pass

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# **Low Channel: Horizontal**



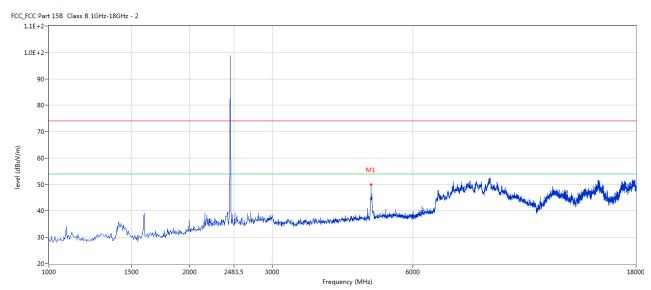
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	4802.799	49.89	3.12	54.0	-4.11	Peak	214.00	100	Н	Pass

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### **Middle Channel: Horizontal**



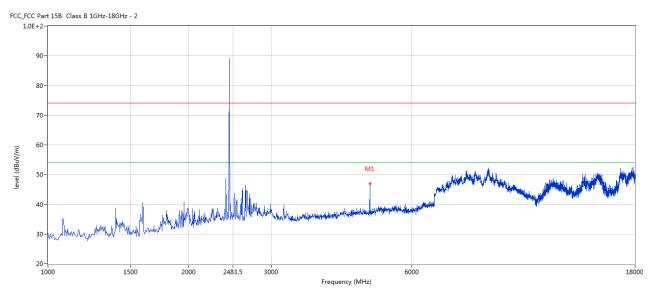
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	4879.280	50.04	3.20	54.0	-3.96	Peak	224.00	100	Н	Pass

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# **Middle Channel: Vertical**



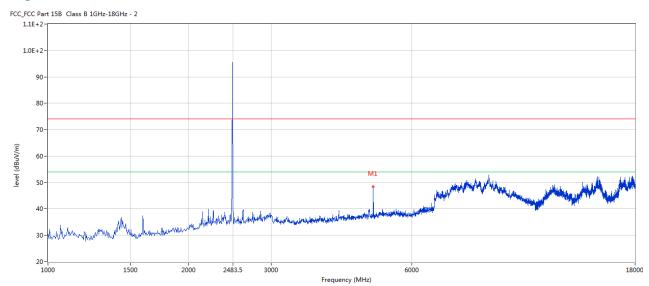
No.	Frequency	Results	Factor	Limit	Over	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	Limit (dB)			(cm)		
1	4883.529	46.89	3.20	54.0	-7.11	Peak	180.00	100	٧	Pass

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# **High Channel: Horizontal**



No	).	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1		4960.010	49.31	3.36	54.0	-4.69	Peak	234.00	100	Н	Pass

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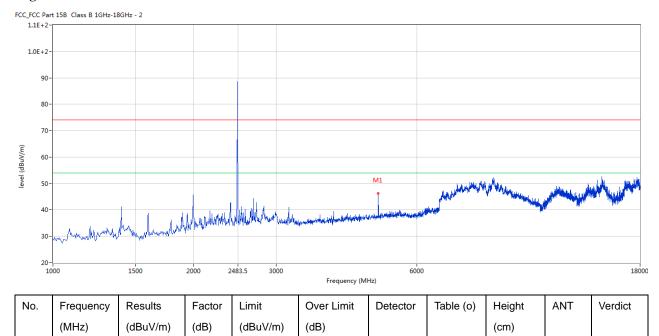


# **High Channel: Vertical**

4960.010

46.31

3.36



Note: 1. for the radiated emissions above 18G and below 30MHz, it is the floor noise.

54.0

2. the measured PK radiated emissions level less than the AV limit, so no necessary to take down the AV result

-7.69

Peak

166.00

100

٧

Pass

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#### 7.0 20dB Bandwidth Measurement

# 7.1 Regulation

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, 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.

# 7.2 Limits of 20dB Bandwidth Measurement

N/A

# 7.3 Test Procedure.

- 1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span =3MHz, RBW =30 kHz, VBW=100 kHz, Sweep = auto Detector function = peak, Trace = max hold
- 3. Measure the highest amplitude appearing on spectral display and record the level to calculate results. 6. Repeat above procedures until all frequencies measured were complete.

# 7.4 Test Result

#### **Type of Modulation: GFSK**

Type of Modulation. Of Six								
EUT	TW	S Earphone	Model	IAEBT600B				
Mode	Keep	Transmitting	Input Voltage	DC3.7V				
Temperat	ure 2	4 deg. C,	Humidity	56% RH				
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass/ Fail				
Low	2402	830		Pass				
Middle	2441	830		Pass				
High	2480	836		Pass				

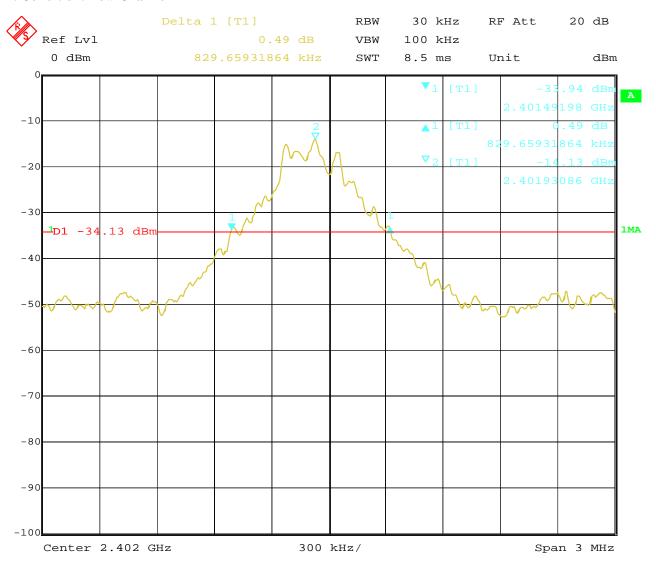
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# Test Figure:

# 1. Condition: Low Channel



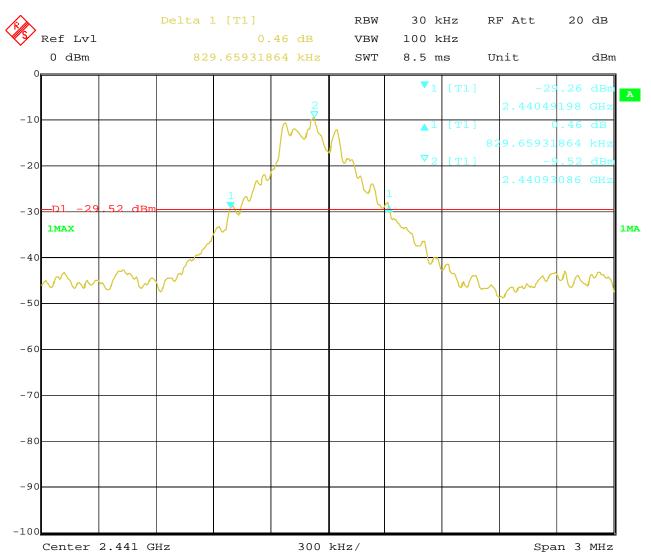
Date: 30.JUL.2020 15:35:48

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# 2. Condition: Middle Channel



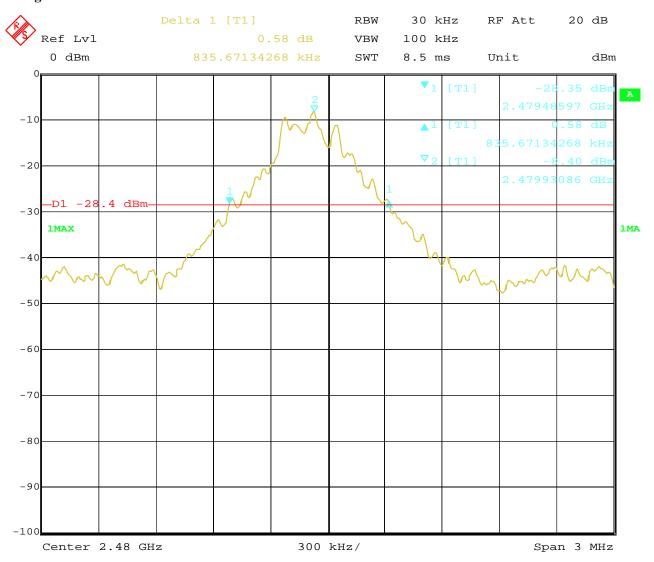
30.JUL.2020 15:38:16 Date:

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# 3. High Channel



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# **Test Result**

Type of Modulation: JI/4DQPSK

EUT	TW	/S Earphone	Model	IAEBT600B
Mode	Keep	Transmitting	Input Voltage	DC3.7V
Temperature	2	24 deg. C,	Humidity	56% RH
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail
Low	2402	1220		Pass
Middle	2441	1220		Pass
High	2480	1214		Pass

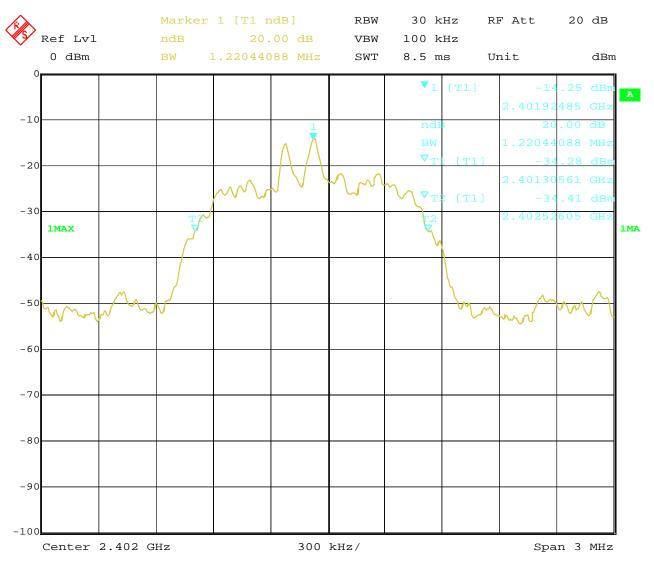
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# Test Figure:

# 1. Condition: Low Channel



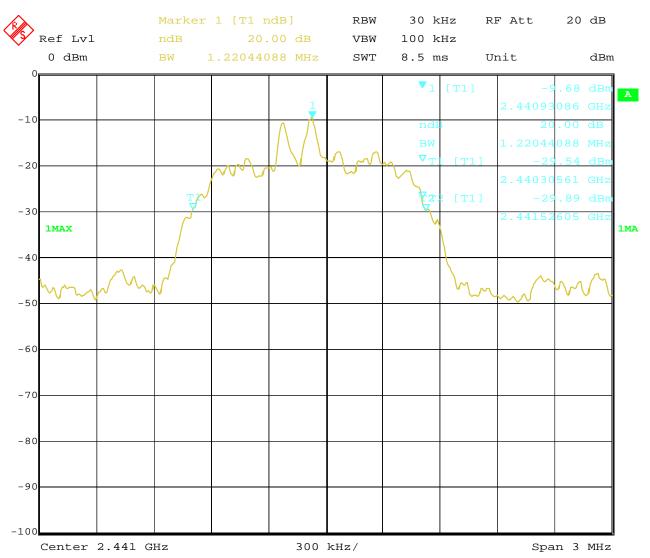
Date: 30.JUL.2020 15:28:20

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# 2. Condition: Middle Channel



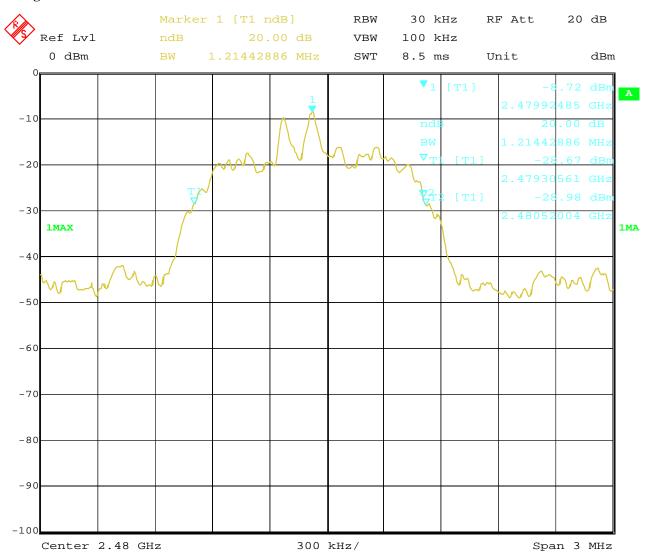
30.JUL.2020 Date: 15:19:15

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# 3. High Channel



30.JUL.2020 15:16:54 Date:

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# **Test Result**

# **Type of Modulation: 8DPSK**

EUT	TW	S Earphone	Model	IAEBT600B
Mode	Keep	Transmitting	Input Voltage	DC3.7V
Temperature	24	4 deg. C,	Humidity	56% RH
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail
Low	2402	1214		Pass
Middle	2441	1214		Pass
High	2480	1214		Pass

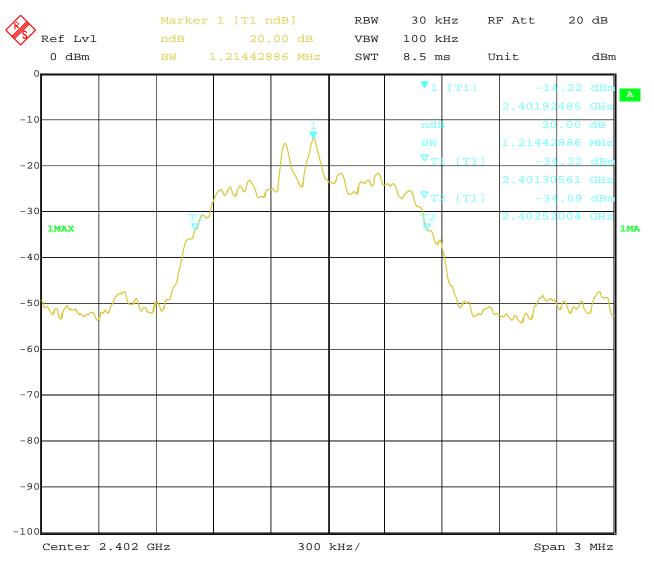
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# Test Figure:

# 1. Condition: Low Channel



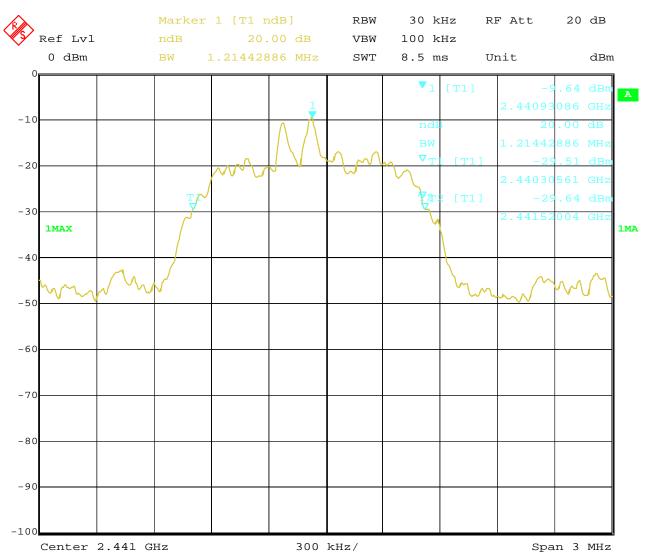
Date: 30.JUL.2020 15:27:21

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# 2. Condition: Middle Channel



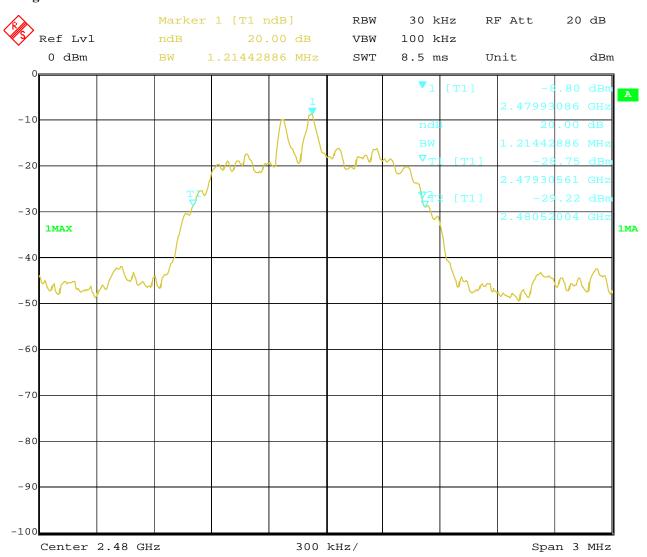
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# 3. High Channel



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# 8. Maximum Output Power

## 8.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5MHz band:0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **8.2 Limits of Maximum Output Power**

The Maximum Output Power Measurement is 30dBm.

#### 8.3 Test Procedure

- 1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel; RBW > the 20 dB bandwidth of the emission being measured; VBW = RBW=3MHz; Sweep = 60s; Detector function = PK; Trace = max hold
- 3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
- 4. Repeat above procedures until all frequencies measured were complete.

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#### **8.4Test Results**

## Type of Modulation: GFSK

TWS Earphone		Model	IAEBT600B
Keep Transmitting		Input Voltage	DC3.7V
	24 deg. C,	Humidity	56% RH
Channel Frequency (MHz)	Max. Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
I eak		20	Dogg
			Pass Pass
			Pass
	Kee	Keep Transmitting  24 deg. C,  Channel Frequency (MHz)  Max. Power Output (dBm)  Peak  2402  -13.11  2441  -8.37	Keep Transmitting         Input Voltage           24 deg. C,         Humidity           Channel Frequency (MHz)         Max. Power Output (dBm)         Peak Power Limit (dBm)           2402         -13.11         30           2441         -8.37         30

Note: 1. the result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

- 2. The worse case was recorded
- 3. The **Peak** power was measured

## 

EUT		TWS Earphone	Model	IAEBT600B	
Mode		Keep Transmitting	Input Voltage	DC3.7V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency	Max. Power Output (dBm)	Peak Power Limit	Pass/ Fail	
	(MHz)	Peak	(dBm)		
Low	2402	-12.70	21	Pass	
Middle	2441	-7.99	21	Pass	
High	2480	-6.89	21	Pass	

Note: 1. the result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

- 2. The worse case was recorded
- 3. The **Peak** power was measured

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## **Type of Modulation: 8DPSK**

EUT	Г	TWS Earphone		IAEBT600B
Mode	Ke	Keep Transmitting		DC3.7V
Temperature	e	24 deg. C,		56% RH
Channel	Channel Frequency	Max. Power Output (dBm)	Peak Power Limit	Pass/ Fail
Chamier	(MHz)	Peak	(dBm)	
Low	2402	-12.70	21	Pass
Middle	2441	2441 -7.95		Pass
High	2480	-6.83	21	Pass

Note: 1. the result basic equation calculation as follow:

Max. Power Output = Power Reading + Cable loss + Attenuator

- 2. The worse case was recorded
- 3. The **Peak** power was measured

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## 9. Carrier Frequency Separation

## 9.1 Regulation

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

# 9.2 Limits of Carrier Frequency Separation

The Maximum Power Spectral Density Measurement is 25kHz or two-thirds of the 20dB bandwidth of the hopping Channel which is great.

#### 9.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels: Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span; Video (or Average) Bandwidth (VBW)  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Measure the separation between the peaks of the adjacent channels using the marker-delta function.
- 4. Repeat above procedures until all frequencies measured were complete.

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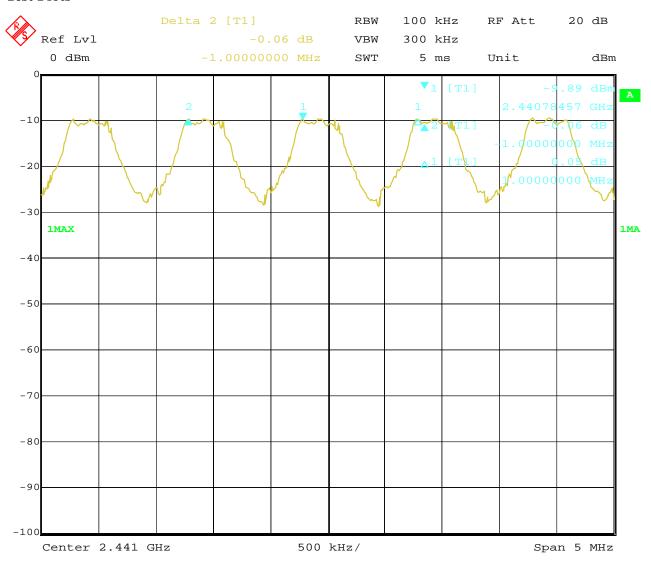


#### 9.4Test Result

## Type of Modulation: GFSK

EUT	TWS Earpho	Model	IA	AEBT600B	
Mode	Hopping On		Input Voltage		DC3.7V
Temperature	24 deg. C,		Humidity	56% RH	
Carrier I	Frequency Separation		Limit		Pass/ Fail
	1.000MHz	≥ 25 kHz or 2/3	of the 20 dB ban	dwidth	Pass

## **Test Plots**



30.JUL.2020 09:37:38 Date:

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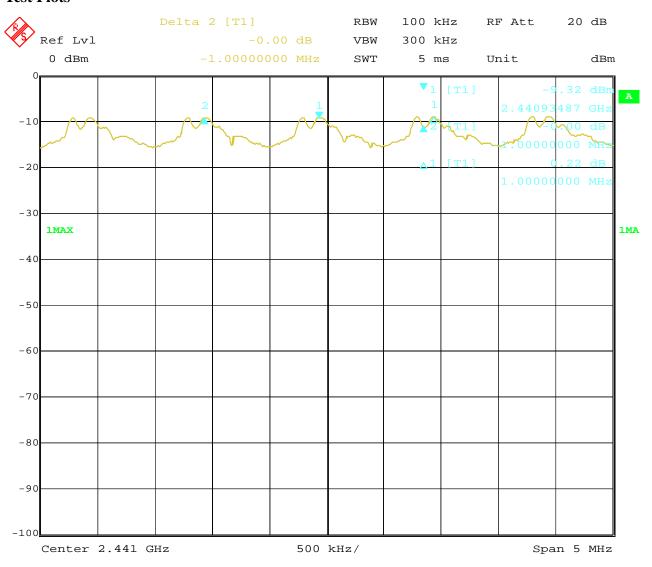
Date: 2020-07-30



## Type of Modulation: Л/4DQPSK

EUT	TWS Earpho	Model	IA	AEBT600B	
Mode	Hopping O	Input Voltage		DC3.7V	
Temperature	24 deg. C,		Humidity	56% RH	
Carrier I	Frequency Separation		Limit		Pass/ Fail
	1.000MHz	≥ 25 kHz or 2	/3 of 20 dB bandy	vidth	Pass

### **Test Plots**



30.JUL.2020 10:38:31

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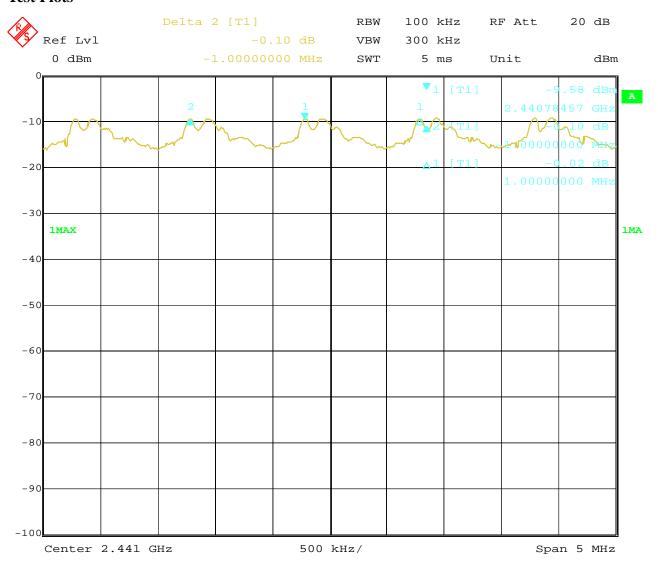
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## **Type of Modulation: 8DPSK**

EUT	TWS Earpho	Model	IA	AEBT600B	
Mode	Hopping On I		Input Voltage		DC3.7V
Temperature	24 deg. C,		Humidity	56% RH	
Carrier I	Frequency Separation		Limit		Pass/ Fail
	1.000MHz	≥ 25 kHz or 2	2/3 of 20 dB bandy	width	Pass

## **Test Plots**



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## 10. Number of Hopping Channels

## 10.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

## **10.2 Limits of Number of Hopping Channels**

The frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

#### **10.3 Test Procedure**

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW=100 kHz, VBW=300 kHz; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Record the number of hopping channels.

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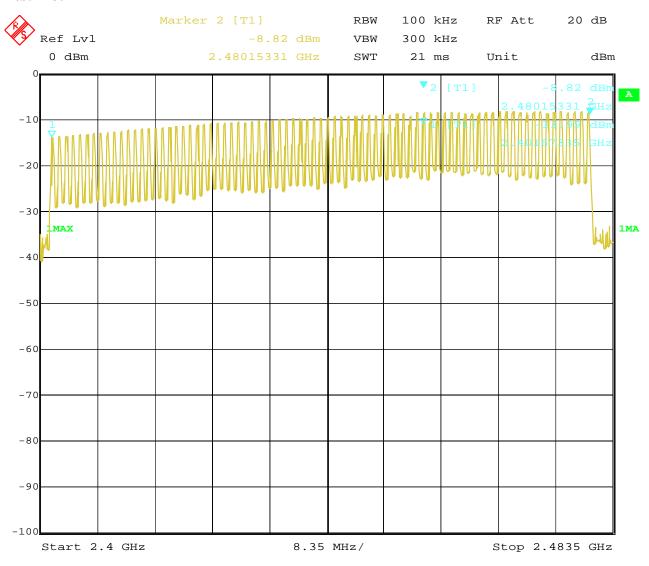


#### 10.4Test Result

## Type of Modulation: GFSK

EUT	TWS Earphone		Model	IAEBT600B	
Mode	Hopping On		Input Voltage	DC3.7V	
Temperature	24 deg. C,		Humidity	56% RH	
Operating Frequency		Number of hopping channels		Limit	Pass/ Fail
2402-2480MHz		79		≥ 15	Pass

## **Test Plot**



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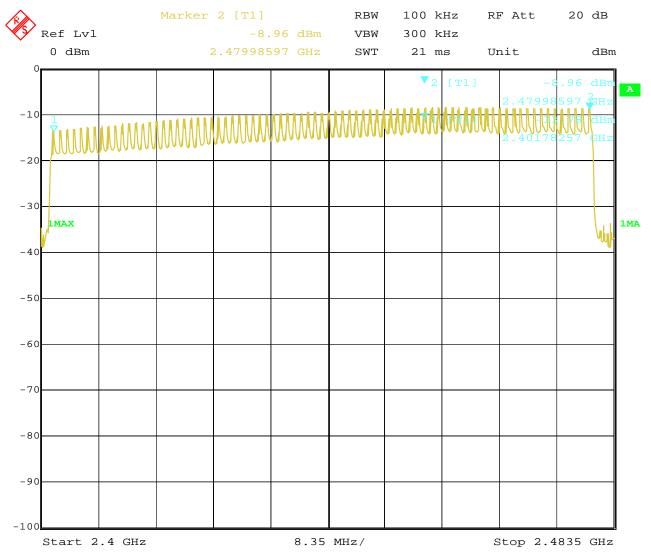
Date: 2020-07-30



## Type of Modulation: $\sqrt{1/4}$ DQPSK

EUT	TWS Earphone		Mode	Model		AEBT600B
Mode	Hopping On		Input Voltage		DC3.7V	
Temperature	24 deg. C,		Hum	dity		56% RH
Operating Frequency		Number of hopping channels		Lin	nit	Pass/ Fail
2402-2480MHz		79		<u>&gt;</u>	15	Pass

### **Test Plot**



Date: 30.JUL.2020 11:15:07

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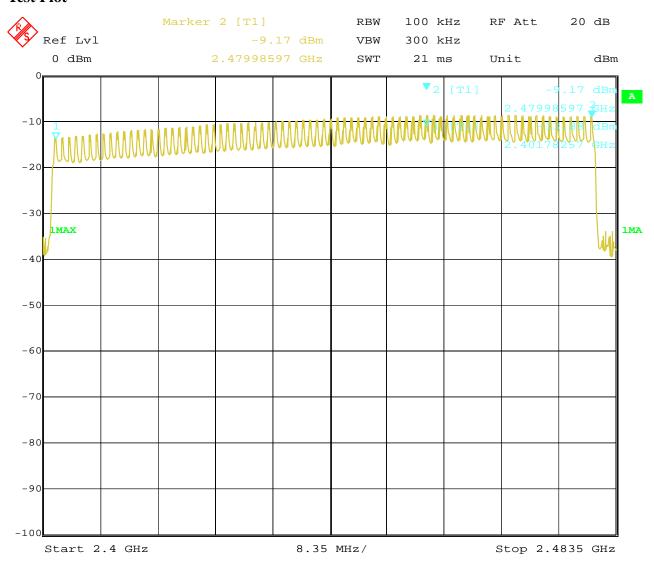
Date: 2020-07-30



## **Type of Modulation: 8DPSK**

EUT	TWS Earphone		Model			IAEBT600B
Mode	Hopping On		Input V	oltage		DC3.7V
Temperature	24 deg. C,		Humidi	ty	56% RH	
Operating Frequency		Number of hopp channels	oing	Liı	mit	Pass/ Fail
2402-2480MHz		79		>	15	Pass

### **Test Plot**



30.JUL.2020 11:26:07 Date:

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# 11. Time of Occupancy (Dwell Time)

## 11.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 11.2 Limits of Carrier Frequency Separation

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed

#### 11.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW  $\geq$  RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold
- 3. Measure the dwell time using the marker-delta function.
- 4. Repeat above procedures until all frequencies measured were complete.
- 5. Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

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#### 11.4 Test Result

## Type of Modulation: GFSK

EUT	TWS I	TWS Earphone		IA	EBT600B				
Mode	Keep Tr	ansmitting	Input Voltage	I	DC3.7V				
Temperatur	e 24 d	leg. C,	Humidity	5	56% RH				
Channel	Reading	Hopin	g Rate	Actual	Limit				
	DH5								
Middle	3.006ms	266.66	7 hop/s	0.321s	0.4s				
			DH3						
Middle	1.743ms	400 l	nop/s	0.279s	0.4s				
			DH1						
Middle	0.461ms	800 l	nop/s	0.148s	0.4s				

Actual = Reading  $\times$  (Hopping rate / Number of channels)  $\times$  Test period, Test period = 0.4 [seconds / channel]  $\times$  79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 $\mu$ s with 79 channels.

A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

A DH3 Packet needs 3 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 400 hops per second with 79 channels.

A DH1 Packet needs 1 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 800 hops per second with 79 channels.

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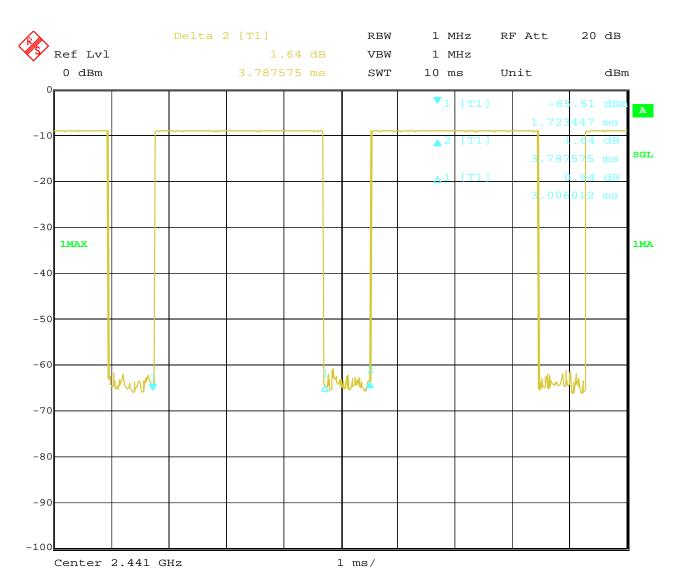
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Test Plots:

DH5

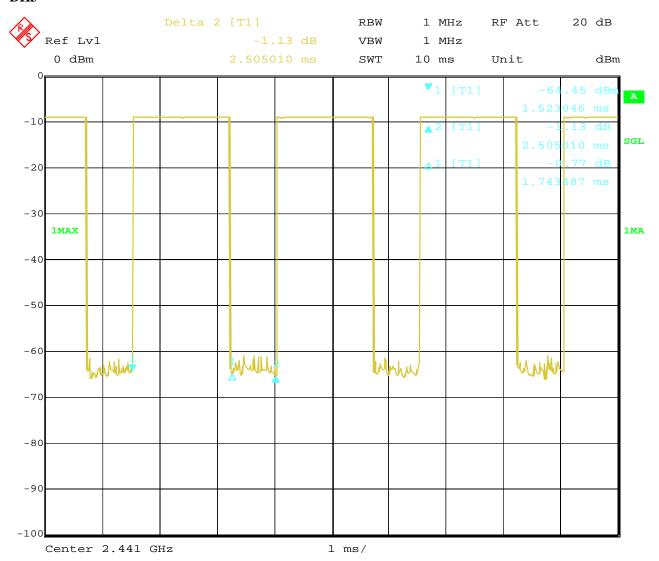


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### DH3



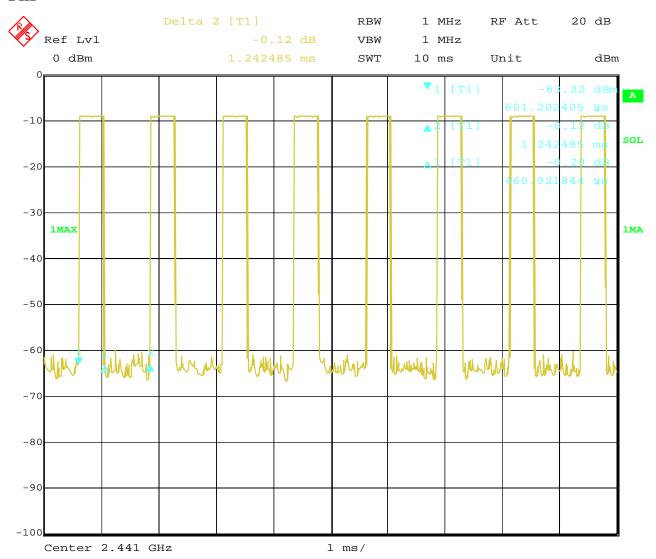
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### DH1



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#### **Test Result**

## 

EUT	TWS I	TWS Earphone		IAI	EBT600B				
Mode	Keep Tr	ansmitting	Input Voltage	Ε	OC3.7V				
Temperature	e 24 d	24 deg. C,		5	6% RH				
Channel	Reading	Hoping	Hoping Rate		Limit				
	2DH5								
Middle	2.986ms	266.66	7 hop/s	0.319s	0.4s				
			2DH3						
Middle	1.743ms	400 l	nop/s	0.279s	0.4s				
	2DH1								
Middle	0.481ms	800 h	nop/s	0.154s	0.4s				

Actual = Reading  $\times$  (Hopping rate / Number of channels)  $\times$  Test period, Test period = 0.4 [seconds / channel]  $\times$  79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 $\mu$ s with 79 channels.

A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

A DH3 Packet needs 3 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 400 hops per second with 79 channels.

A DH1 Packet needs 1 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 800 hops per second with 79 channels.

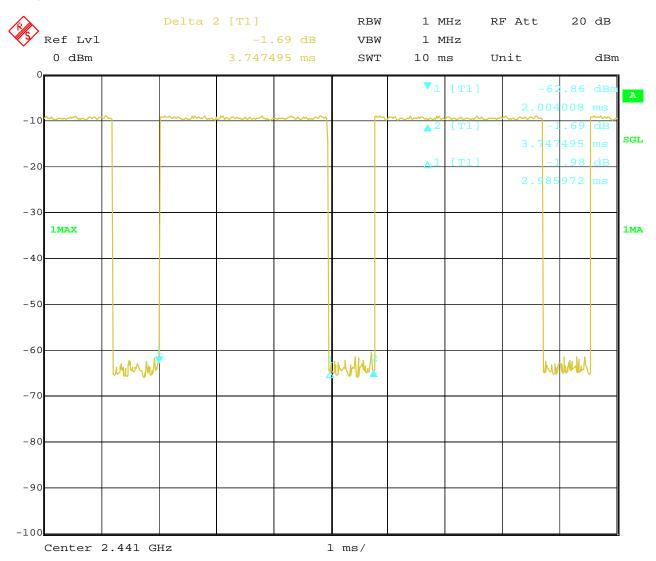
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#### Test Plots:

## **2DH5**

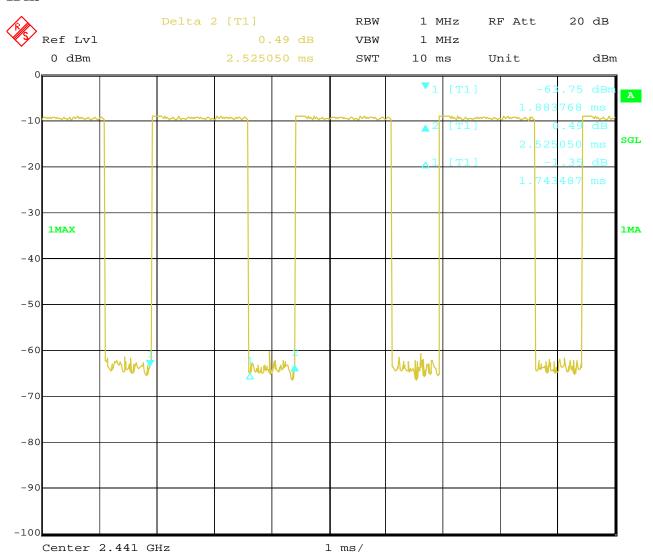


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### **2DH3**



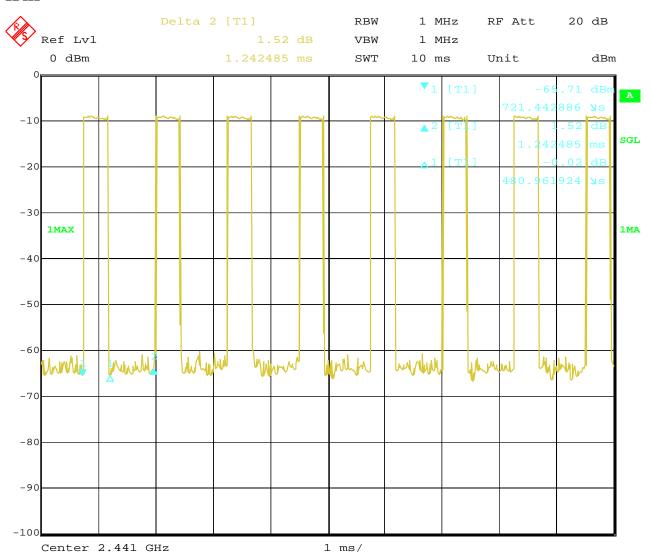
30.JUL.2020 16:09:27 Date:

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### **2DH1**



30.JUL.2020 16:08:45 Date:

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## **Type of Modulation: 8DPSK**

EUT	TWS Earphone		Model	IAE	BT600B			
Mode	Keep Tr	ansmitting	Input Voltage	DC3.7V				
Temperature	24 d	24 deg. C,		56	5% RH			
Channel	Reading	Hopin	Hoping Rate		Limit			
3DH5								
Middle	2.986ms	266.66	7 hop/s	0.319s	0.4s			
			3DH3					
Middle	1.723ms	400 l	nop/s	0.276s	0.4s			
3DH1								
Middle	0.481ms	800 1	nop/s	0.154s	0.4s			

Actual = Reading  $\times$  (Hopping rate / Number of channels)  $\times$  Test period, Test period = 0.4 [seconds / channel]  $\times$  79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 $\mu$ s with 79 channels.

A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

A DH3 Packet needs 3 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 400 hops per second with 79 channels.

A DH1 Packet needs 1 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 800 hops per second with 79 channels.

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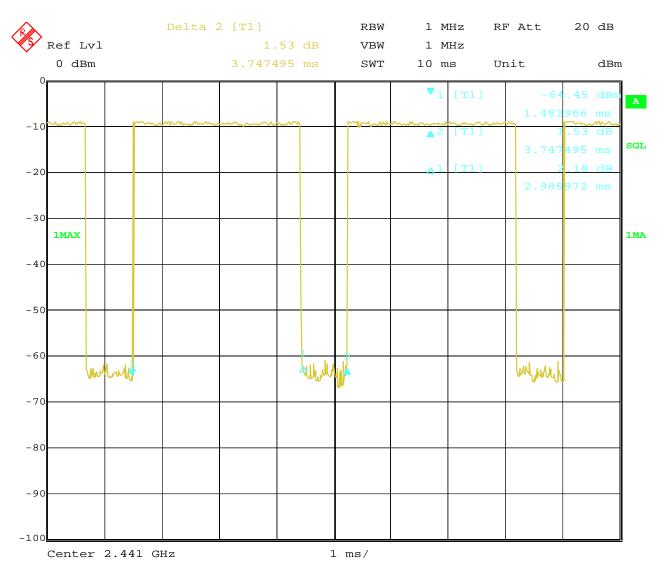
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Test Plots:

## **3DH5**

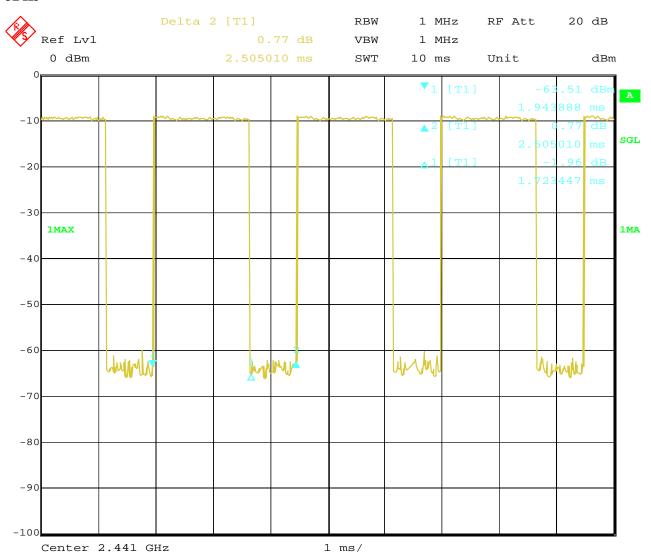


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### **3DH3**



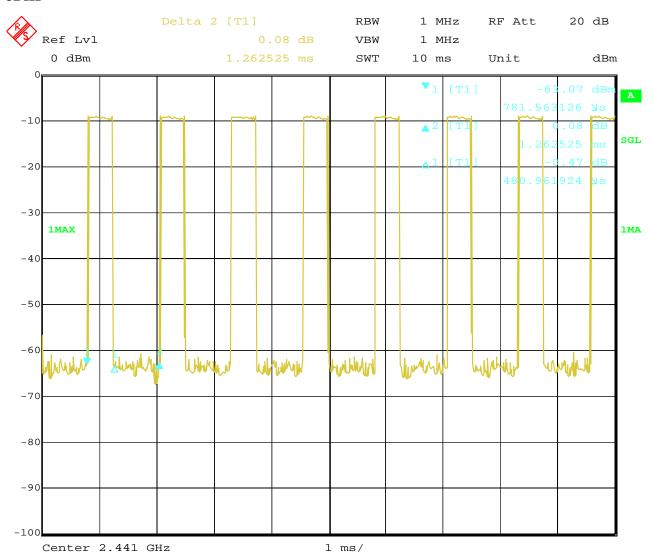
30.JUL.2020 16:09:48 Date:

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### 3DH1



30.JUL.2020 16:08:21 Date:

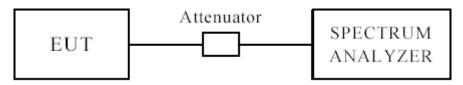
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## 12 Out of Band Measurement

## 12.1 Test Setup



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

#### 12.2 Limits of Out of Band Emissions Measurement

- 1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

#### 12.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test. Peak values with RBW=VBW=1MHz and PK detector.

For bandage test, the spectrum set as follows: RBW=100kHz, VBW=300 kHz. A conducted measurement used

Note: 1. For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

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.

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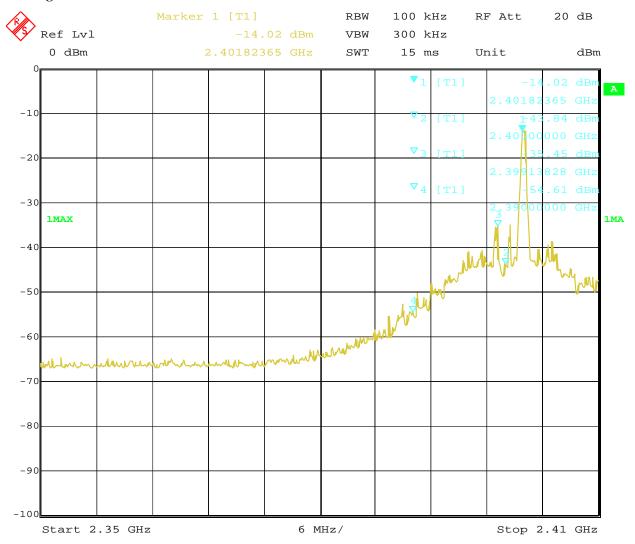


## Type of Modulation: GFSK

#### Band Edge Test Result 12.4

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



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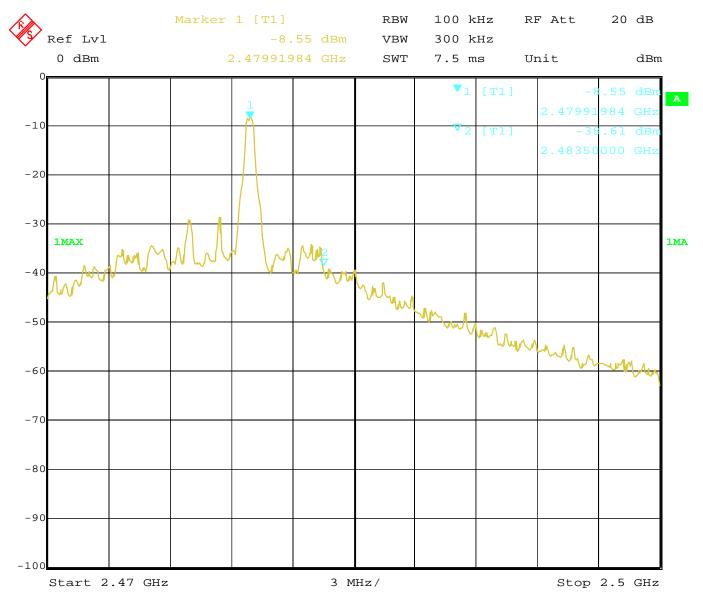


## Type of Modulation: GFSK

#### 12.4 Band Edge Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



30.JUL.2020 15:05:42 Date:

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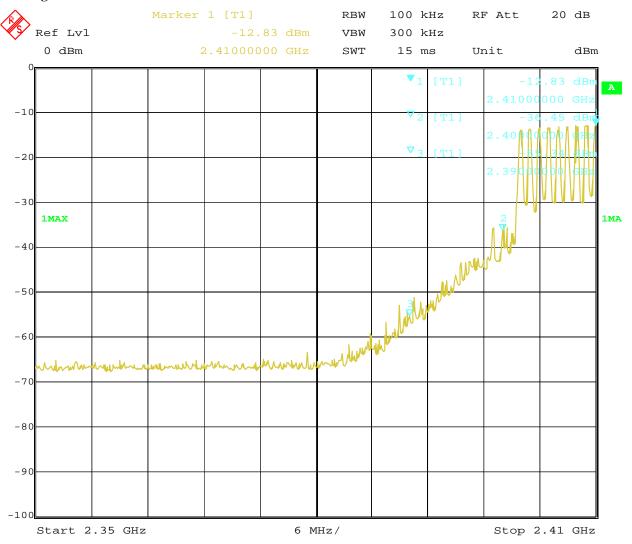


## Type of Modulation: GFSK

# Band Edge Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



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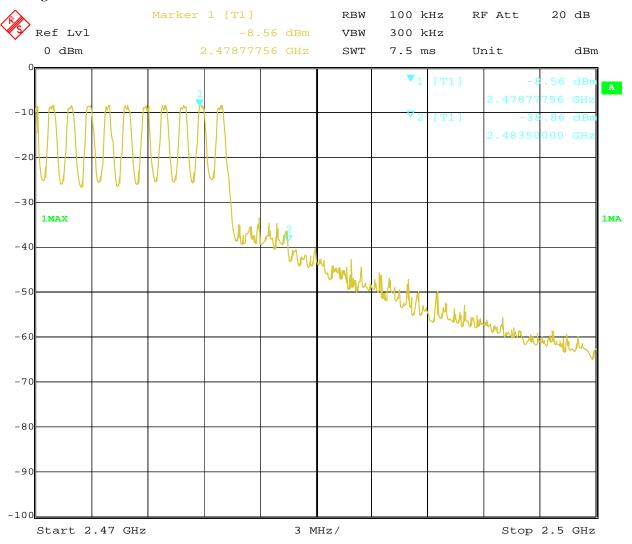


## Type of Modulation: GFSK

# Band Edge Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



Date: 30.JUL.2020 13:45:28

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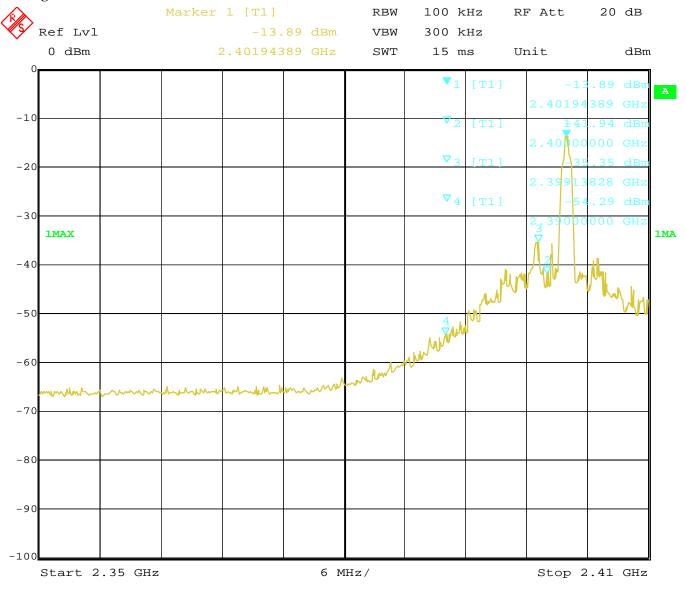


# Type of Modulation: Л/4DQPSK

#### 12.4 Out of Band Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



Date: 30.JUL.2020 14:04:56

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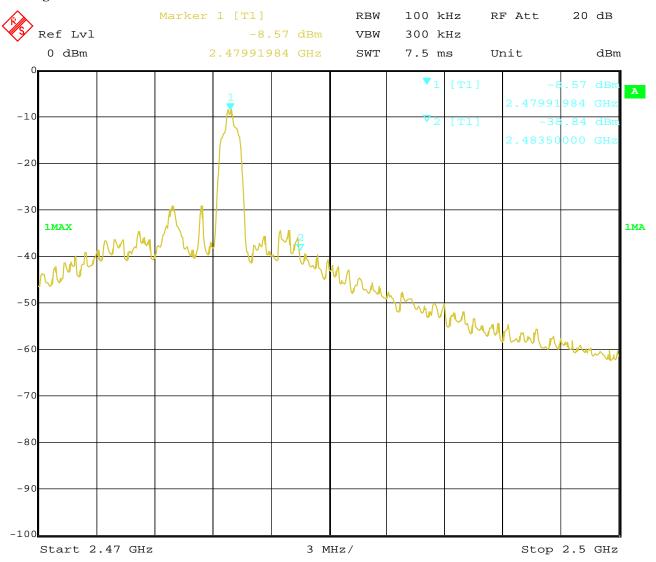


## Type of Modulation: $\sqrt{1/4}$ DQPSK

# **12.4** Band Edge Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



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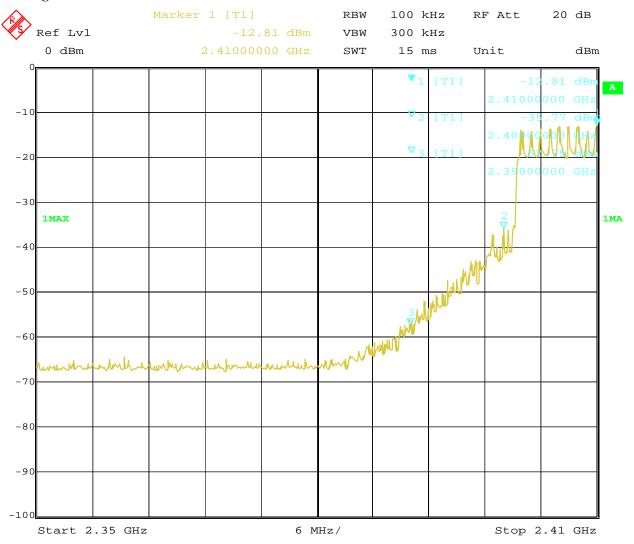


# Type of Modulation: Л/4DQPSK

# Out of Band Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



Date: 30.JUL.2020 13:49:27

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Date: 2020-07-30

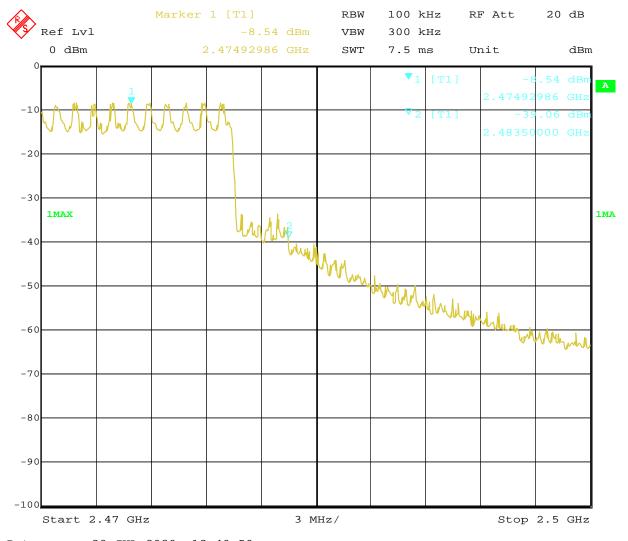


# Type of Modulation: Л/4DQPSK

# Out of Band Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



Date: 30.JUL.2020 13:40:59

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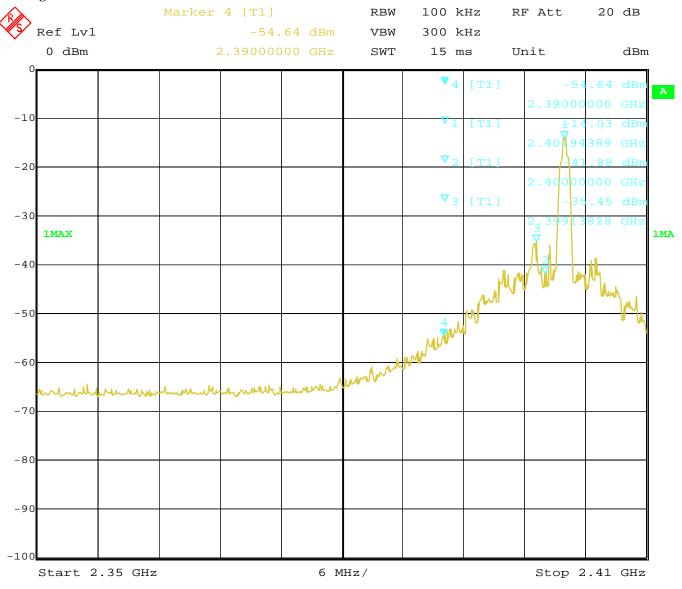


## **Type of Modulation: 8DPSK**

#### 12.4 Band Edge Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



Date: 30.JUL.2020 13:57:34

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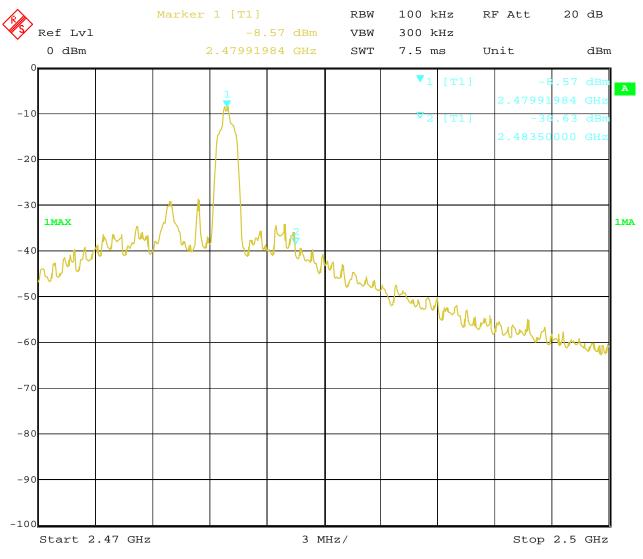


## **Type of Modulation: 8DPSK**

#### 12.4 Band Edge Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Keeping Transmitting	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



Date: 30.JUL.2020 15:13:59

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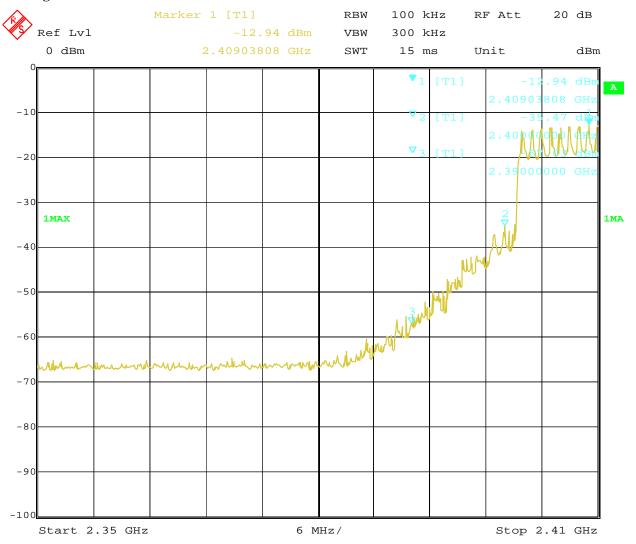


## **Type of Modulation: 8DPSK**

# Band Edge Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

## **Test Figure:**



Date: 30.JUL.2020 13:51:55

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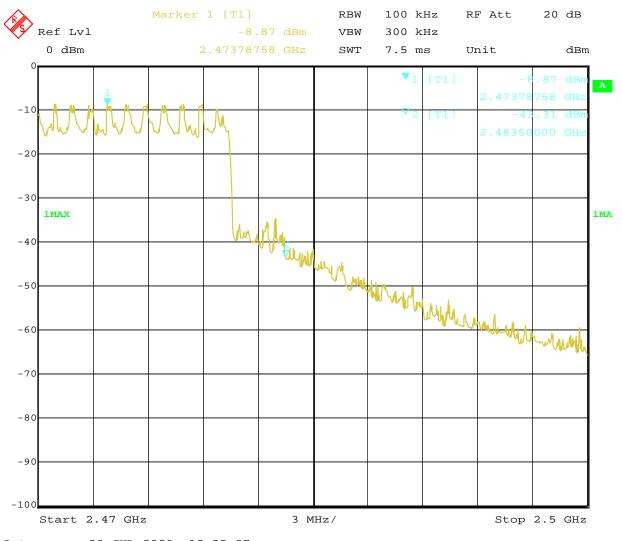


### **Type of Modulation: 8DPSK**

## Band Edge Test Result

Product:	TWS Earphone	Test Mode:	IAEBT600B
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

### **Test Figure:**



30.JUL.2020 13:35:27 Date:

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#### Doctrict Dand Massurament

2.	-	Restrict B									
	]	EUT	TW	S Earph	one	Mo	del		IAE	EBT600B	
	N	Mode	Keep	Transmi	tting	Input V	oltage		D	C3.7V	
-	Гет	perature	2.	4 deg. C	,	Hum	idity		50	6% RH	
-	Test	t Result:		Pass		Modulati	on Type		8	DPSK	
_		15B Class B 1GHz-1	BGHz - 2		<u>'</u>			•			
1.	1E+2-										
1.	0E+2-									$\wedge$	
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	80-									/ \	
									/		
	70-									<u> </u>	
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	30-										
	20-	<u></u>									
	23	50				Frequency (M	Hz)				2410
_	23	50				Frequency (M	Hz)				2410
_ No		Frequency	Results	Factor	Limit	Frequency (M	Detector	Table (o)	Height	ANT	Verdict
- No			Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	· · ·	Γ	Table (o)	Height (cm)	ANT	T

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#### 12.4 Restrict Band Measurement

Date: 2020-07-30

	]	EUT	,	TWS Ea	rphone		Model		IA	EBT600I	3
	N	Mode	Keep Transmitting 24 deg. C,		Inp		DC3.7V				
,	Tem	perature			ŀ	Humidity		56% RH			
	Test	t Result:		Pas	SS	Mod	ulation Typ	pe		8DPSK	
		15B Class B 1GHz-1	8GHz - 2			•					
1.	.1E+2-										
1.	.0E+2-										
	90-										
	80-									$/ \setminus$	
										<del>/ \</del>	
Œ	70-									/ \	
level (dBuV/m)	60-								/	· \	
eve	50-							. I. M1	/		
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	30-							MANAGER AND AND STREET	A. Markathar		ANAT
	30-										
	20 - 23	50									2410
						Frequency (M	Hz)				
_			T	1							
No	0.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
					i e	1	l .	1			

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#### 12.4 Restrict Band Measurement

۷.			and Measur								
		EUT	TV	VS Earpho	one		odel		I.A	AEBT6001	3
	N	Mode	Keep	p Transmi	tting	Input	Voltage			DC3.7V	
,	Tem	perature	2	24 deg. C,	,	Hui	nidity			56% RH	
	Test	t Result:		Pass		Modula	tion Type			8DPSK	
		t 15B Class B 1GHz-1	8GHz - 2								
1.	.1E+2-										
1.	.0E+2-										
	90-			/							
	80-										
					M.						
	70-										
level (dBuV/m)	60-	J									
evel (d	50-		- January Marie Ma	,		4					
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	30-										
	20 - 1 24										
	247	70				2483.5 Frequency (M	Hz)				2500
_											
No	o.	Frequency	Results	Factor	Limit	Over	Detector	Table (o)	Height	ANT	Verdict
l -		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	Limit (dB)		(2)	(cm)		
		(····· · <b>-</b> /	(3237,)		, ,						
1		2483.5	49.54	-3.57	54.0	-4.46	Peak	64.00	100	H	Pass

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#### 12.4 Restrict Band Measurement

	EUT	TV	VS Earpl	none	Me	odel		lA	EBT600E	3
	Mode	Kee	p Transm	nitting	Input	Voltage		]	DC3.7V	
Te	mperature		24 deg. C,		Humidity			56% RH		
Te	st Result:		Pass		Modula	tion Type			8DPSK	
CC_FCC P	art 15B Class B 1GHz-1	8GHz - 2								
1.0E+	2-									
9	0-									
8	0-			<u> </u>						
			<i></i>							
7	0-		/	λ.						
Ê	0-		A CONTRACTOR OF THE PARTY OF TH	<i>\</i>						
	0-	Ulde 184 Jahrlet Jamesker	Jan	<u> </u>	A John Market William Mark					
level (dBuV/m)	0-		Jan	<i>\</i>	Andrew Market Ma					
level (dBuV/m)	0-	Maria de la la descriptora de la composição de la composi		<i>\</i>	A Mark Market Williams			yk-yk-klakkyklak		
(m/\mu/\mu)   6-6   6   5   5   4   3	0-		y de la constantina della cons	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	2483.5 Frequency (N	1Hz)		ya di da		2500
(m/\mu/\mu)   6-6   6   5   5   4   3	0-		ph.	\ \ 		1Hz)				2500
level (dBuV/m)	0-	Results	Factor	Limit		1Hz)	Table (o)	Height	ANT	2500
(ω/(μ)   6 (βn/(μ)   5 (βn/(μ)   3 (βn/(μ)   2 (βn/(μ)   4 (βn/(μ	0-	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Frequency (N	1	Table (o)	Height (cm)	ANT	T

Note: 1. For Restricted band test, only the worst case was reported and 8DPSK was the worst case

2. The measured PK radiated emissions level less than the AV limit, so no necessary to take down the AV result

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### 13.0 Antenna Requirement

### 13.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

#### 13.2 Antenna Connected constructions

Integral antenna used. The gain is 0.45dBi.

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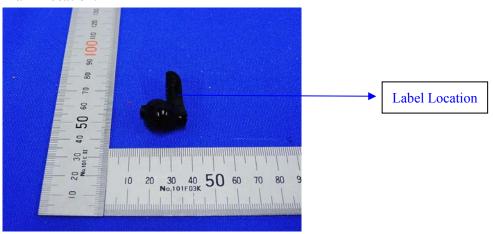


#### 14.0 FCC ID Label

### FCC ID: 2AOKX-TW039N

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:**



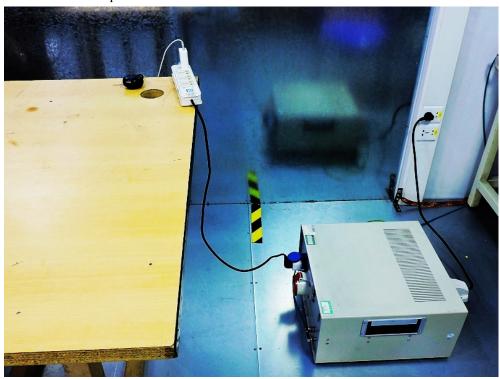
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#### 15.0 Photo of testing

Conducted Emission Test Setup:



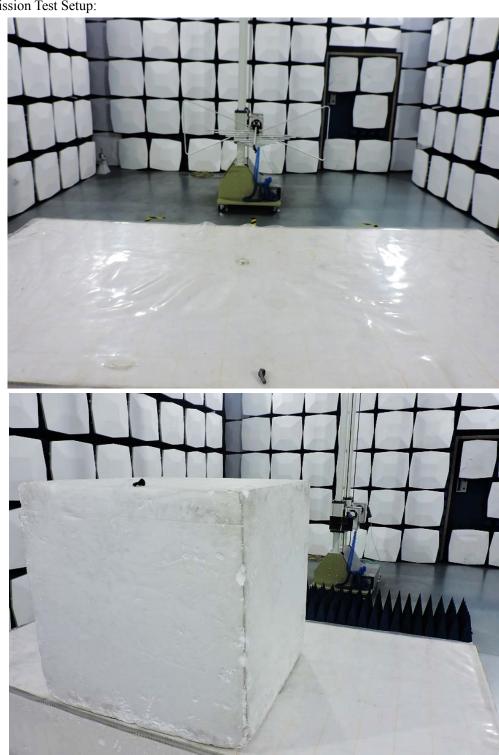
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### Radiated Emission Test Setup:



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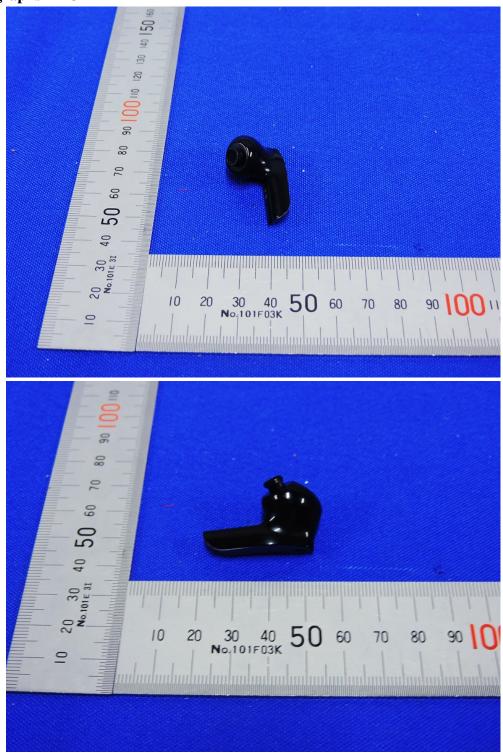
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## Photographs - EUT



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adopt any other remedies which may be appropriate.

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## Photographs - EUT



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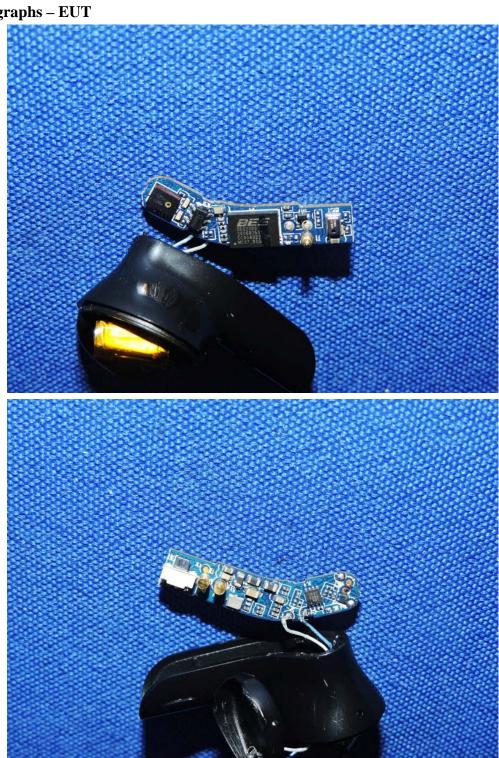
adopt any other remedies which may be appropriate.

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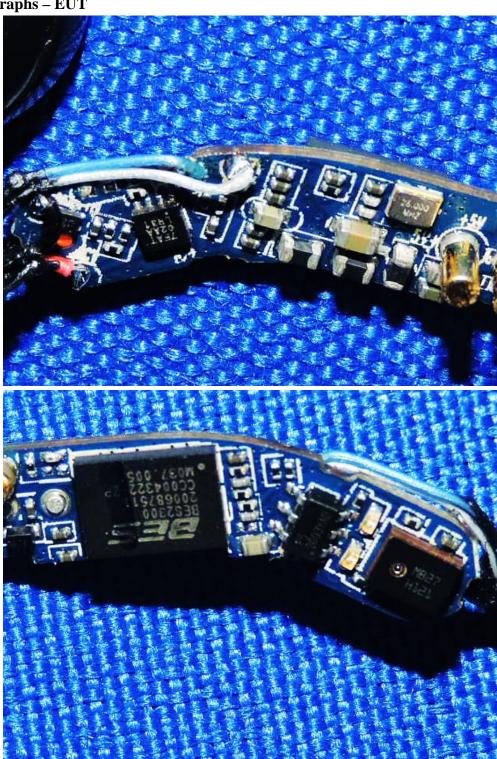


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**End of Report**