

FCC - TEST REPORT

Report Number : **60.790.19.025.01R01** Date of Issue : August 27, 2019

Model : SHD8850/27, SHD8850/37, SHD8850/07

Product Type : Indoor Wireless Headphones

Applicant : MMD Hong Kong Holding Limited.

Address : Units 1006-1007 10th Floor, C-Bons International Center,
108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

Production Facility : ARKON ELECTRONICS (HUIZHOU) CO., LIMITED

Address : NO. 4 Taihao Road, High-tech Industrial Park, Sandong Town,
Huicheng District, Huizhou, Guangdong, China

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 26

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2 Description of Equipment Under Test

Description of the Equipment Under Test

Product: Indoor Wireless Headphones

Model no.: SHD8850/27, SHD8850/37, SHD8850/07

FCC ID: 2AR2SSHD8850

Rating: 120-240V AC 50/60Hz, 0.5A
5.0V DC, 550mA

Frequency: 2406-2472MHz

Antenna gain: -2.2 dBi

Number of operated channel: 31

Modulation: GFSK

Auxiliary Equipment and Software Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	S/N
/	/	/	/

Auxiliary Software Used during Test:

DESCRIPTION	SOFTWARE NAME	VERSION	REMARK
/	/	/	/

3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-18 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Intentional Radiators

All the tests were performed using the procedures from ANSI C63.4(2014) and ANSI C63.10 (2013).

4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13 Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2,
Shenzhen 518052, P.R.China
FCC Registration Number: 514049

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 & 15.249 Radiated Emission	Site 1
FCC Title 47 Part 15.207 Conduct Emission	Site 1
FCC Title 47 Part 15.215 20dB and 99% Bandwidth	Site 1
FCC Title 47 Part 15.203 Antenna Requirements	Site 1

4.1 Test Equipment Site List

Radiated emission Test – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2020-6-28
Signal Analyzer	Rohde & Schwarz	FSV40	101031	2020-6-28
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100398	2020-7-7
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2020-7-5
Horn Antenna	Rohde & Schwarz	HF907	102294	2020-6-22
Wideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	12827	2020-7-5
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2020-6-28
Pre-amplifier	Rohde & Schwarz	SCU 40A	100432	2020-6-28
Attenuator	Agilent	8491A	MY39264334	2020-6-28
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

20dB and 99% Bandwidth, Transmission Time – Site 1

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2020-6-28
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2020-6-28

4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.46dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.91dB; Vertical: 4.89dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.80dB; Vertical: 4.79dB;
Uncertainty for Conducted Emission at AC Power Line 150kHz-30MHz	3.21dB
Uncertainty for Conducted RF test	2.13dB
Uncertainty for Frequency RF test	0.6×10^{-7}

5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.205, 15.209 & 15.249 Radiated Emission	12-15	☒	☐	☐
FCC Title 47 Part 15.207 Conduct Emission	16-17	☒	☐	☐
FCC Title 47 Part 15.215 20dB and 99% Bandwidth	18-20	☒	☐	☐
FCC Title 47 Part 15.203 Antenna Requirement	21	☒	☐	☐

6 General Remarks

Remarks

Client informs that the **SHD8850/07**, **SHD8850/37** have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction with **Indoor Wireless Headphones, SHD8850/27**, The difference lies only in the outlook/color of different models (Client's conformation letter shown at appendix A)

EMC tests were performed on model: **SHD8850/27**.

This submittal(s) (test report) is intended for **FCC ID: 2AR2SSHD8850**, complies with Section 15.205, 15.207, 15.209, 15.249 of the FCC Part 15, Subpart C rules.

The TX frequency is 2406-2472MHz.

SUMMARY:

- All tests according to the regulations cited on page 5 were

☒ - Performed

☐ - **Not** Performed

- The Equipment Under Test

☒ - **Fulfills** the general approval requirements.

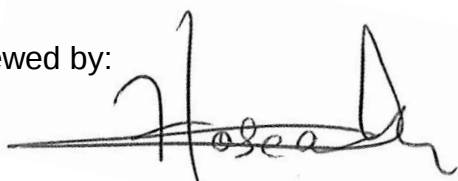
☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: July 24, 2019

Testing Start Date: July 29, 2019

Testing End Date: August 14, 2019

Reviewed by:



Hosea CHAN
EMC Project Engineer

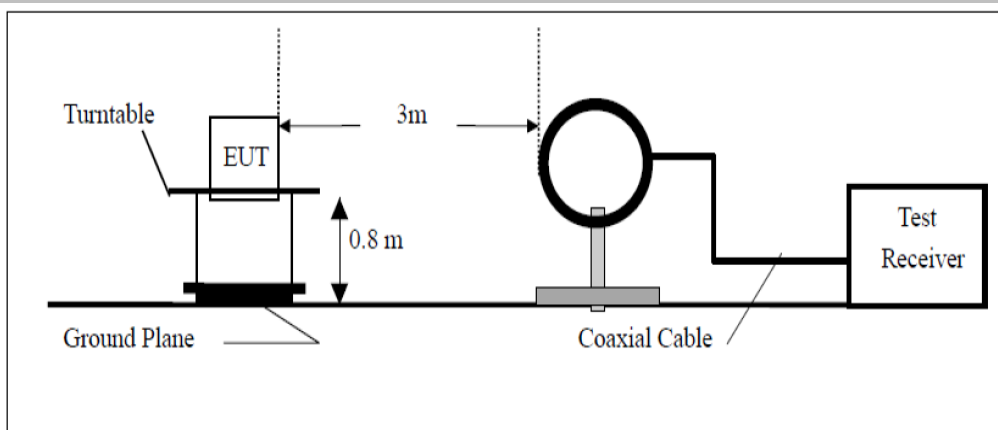
Prepared by:



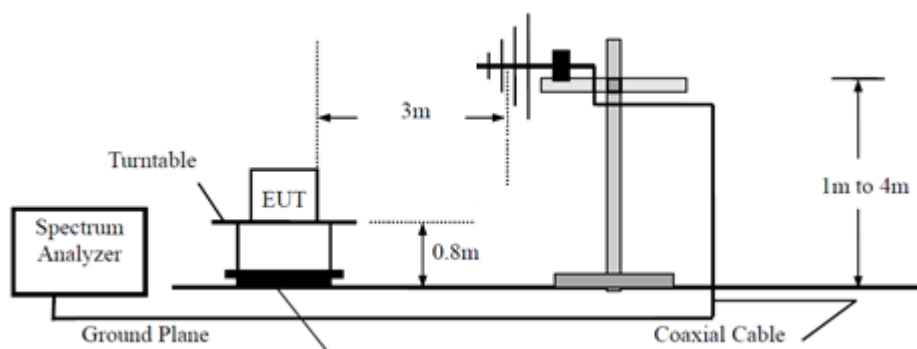
Eric LI
EMC Senior Project Engineer

7 Test Setups

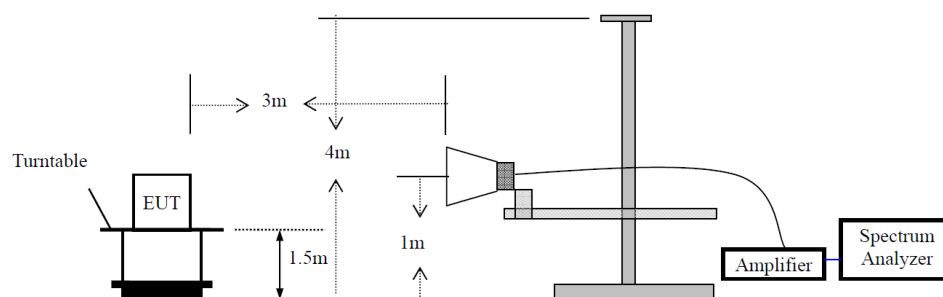
7.1 Radiated test setups 9kHz-30MHz



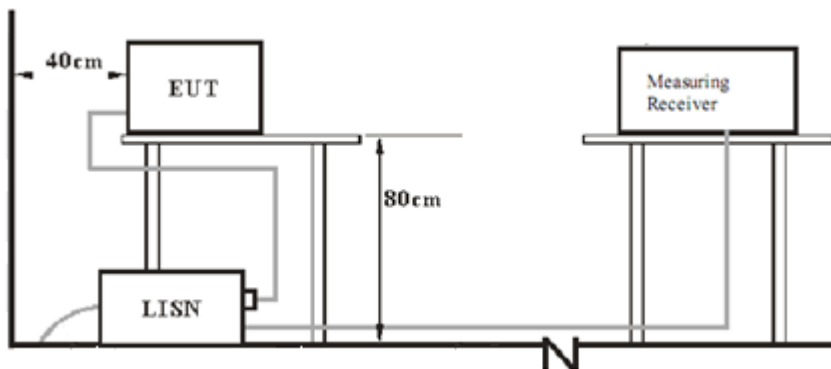
7.2 Radiated test setups Below 1GHz



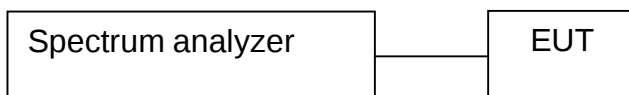
7.3 Radiated test setups Above 1GHz



7.4 AC Power Line Conducted Emission test setups



7.5 Conducted RF test setups



8 Emission Test Results

8.1 Spurious Radiated Emission

EUT: SHD8850/27
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.205, 15.209 & 15.249(a)
 Comment: 120V AC
 Remark: 9kHz to 1GHz

Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
50.100556	21.33	40.00	-18.67	Peak	H	-24.6
110.671667	18.67	43.50	-24.83	Peak	H	-27.2
943.255000	37.90	46.00	-8.10	Peak	H	-15.3
44.065000	21.94	40.00	-18.06	Peak	V	-24.8
60.608889	21.06	40.00	-18.94	Peak	V	-27.0
943.255000	39.69	46.00	-6.31	Peak	V	-15.3

Spurious Radiated Emission

EUT: SHD8850/27
 Op Condition: Operated, TX Mode (2406MHz)
 Test Specification: FCC15.205, 15.209 & 15.249(a)
 Comment: 120V AC
 Remark: 1GHz to 25GHz

Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
1203.062500	36.18	54.00	-17.82	PK	H	-12.3
1660.000000	28.59	54.00	-25.41	PK	H	-10.5
2406.000000	104.31	114.00	-9.69	PK	H	-5.9
2406.000000	61.23	94.00	-32.77	AV	H	-5.9
4812.187500	37.68	54.00	-16.32	PK	H	2.8
7483.125000	38.66	54.00	-15.34	PK	H	6.1
9622.968750	42.43	54.00	-11.57	PK	H	8.5
17970.937500	49.58	54.00	-4.42	PK	H	21.6
1203.062500	31.28	54.00	-22.72	PK	V	-12.3
1260.812500	32.15	54.00	-21.85	PK	V	-12.0
2406.000000	101.29	114.00	-12.71	PK	V	-5.9
2406.000000	58.75	94.00	-35.25	AV	V	-5.9
4839.375000	36.96	54.00	-17.04	PK	V	2.9
7415.156250	38.51	54.00	-15.49	PK	V	6.0
9421.875000	41.37	54.00	-12.63	PK	V	8.8
17631.562500	49.07	54.00	-4.93	PK	V	21.2

Spurious Radiated Emission

EUT: SHD8850/27
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.205, 15.209 & 15.249(a)
 Comment: 120V AC
 Remark: 1GHz to 25GHz

Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
1219.875000	36.43	54.00	-17.57	PK	H	-12.2
2135.000000	34.40	54.00	-19.6	PK	H	-8.0
2440.000000	103.13	114.00	-10.87	PK	H	-5.6
2440.000000	60.68	94.00	-33.32	AV	H	-5.6
4860.000000	35.24	54.00	-18.76	PK	H	2.9
7436.250000	37.75	54.00	-16.25	PK	H	6.0
9758.906250	40.03	54.00	-13.97	PK	H	7.8
17390.625000	49.29	54.00	-4.71	PK	H	20.5
1260.125000	31.49	54.00	-22.51	PK	V	-12.0
2135.312500	31.79	54.00	-22.21	PK	V	-8.0
2440.000000	100.42	114.00	-13.58	PK	V	-5.6
2440.000000	61.03	94.00	-32.97	AV	V	-5.6
4840.312500	35.87	54.00	-18.13	PK	V	2.9
7403.906250	38.07	54.00	-15.93	PK	V	5.9
17518.125000	49.44	54.00	-4.56	PK	V	21.0

Spurious Radiated Emission

EUT: SHD8850/27
 Op Condition: Operated, TX Mode (2472MHz)
 Test Specification: FCC15.205, 15.209 & 15.249(a)
 Comment: 120V AC
 Remark: 1GHz to 25GHz

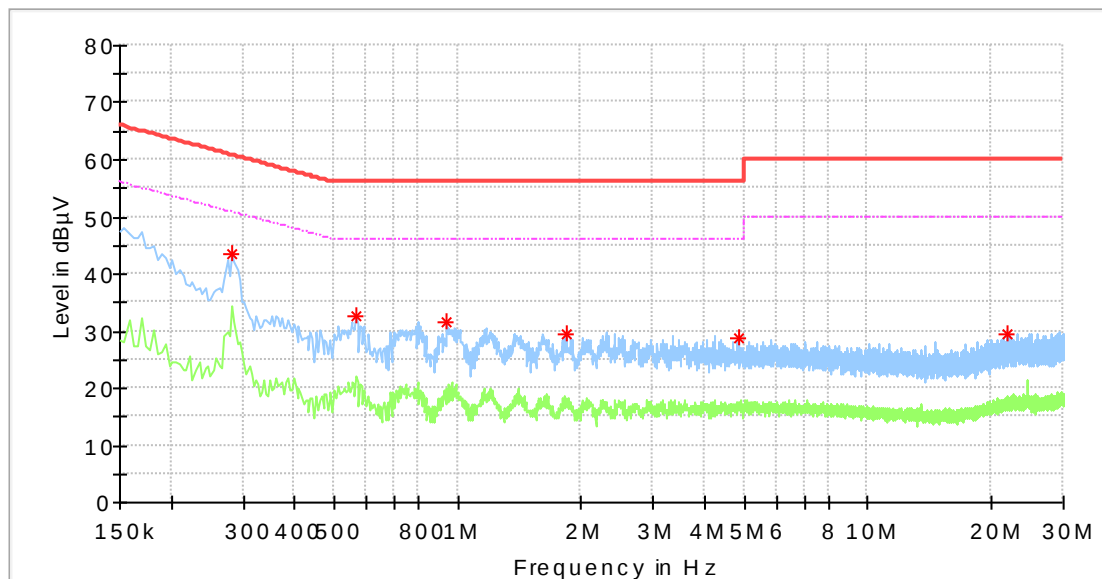
Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector PK/QP/AV	Ant. Polarity H/V	Corr. (dB)
1236.000000	35.81	54.00	-18.19	PK	H	-12.0
1771.875000	28.88	54.00	-25.12	PK	H	-10.1
2472.000000	101.98	114.00	-12.02	PK	H	-5.3
2472.000000	59.42	94.00	-34.58	AV	H	-5.3
4840.781250	36.11	54.00	-17.89	PK	H	2.9
7208.906250	37.71	54.00	-16.29	PK	H	5.0
9886.875000	44.28	54.00	-9.72	PK	H	8.0
17635.781250	49.57	54.00	-4.43	PK	H	21.2
1264.625000	31.81	54.00	-22.19	PK	V	-12.0
2240.000000	29.98	54.00	-24.02	PK	V	-7.2
2472.000000	100.59	114.00	-13.41	PK	V	-5.3
2472.000000	58.24	94.00	-35.76	AV	V	-5.3
4867.500000	35.46	54.00	-18.54	PK	V	2.9
9886.875000	43.47	54.00	-10.53	PK	V	8.0
17633.437500	49.12	54.00	-4.88	PK	V	21.2

8.2 Conducted Emission at AC Power line

EUT: SHD8850/27
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.207
 Comment: 120V AC
 Remark: L Line

Test Result

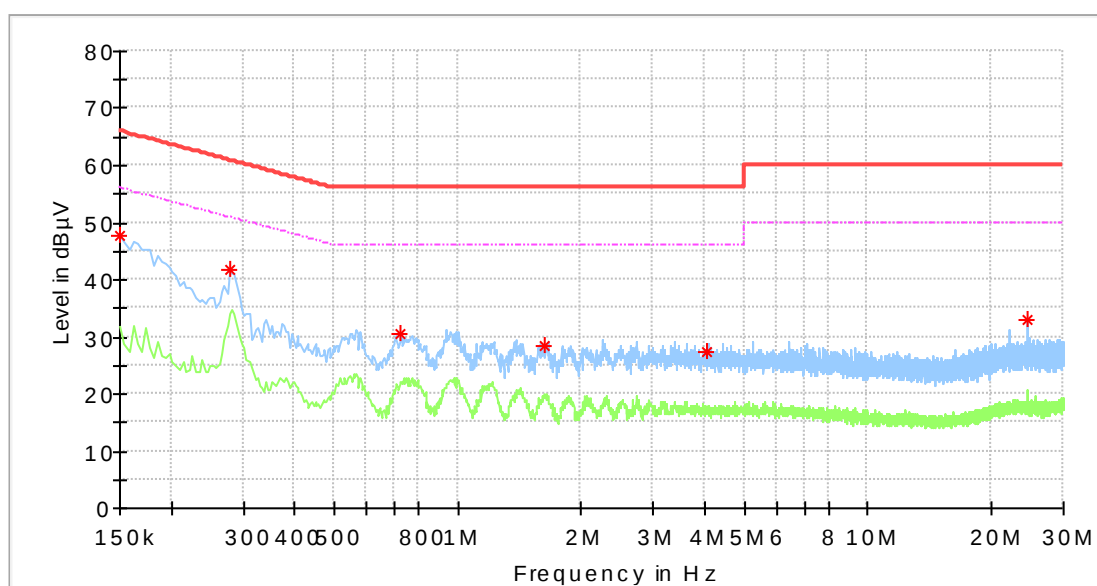
☒ Passed☐ Not Passed

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.282000	43.67	---	60.76	-17.09	10.2
0.566000	32.69	---	56.00	-23.31	10.3
0.942000	31.42	---	56.00	-24.58	10.3
1.846000	29.55	---	56.00	-26.45	10.3
4.834000	28.79	---	56.00	-27.21	10.4
21.878000	29.33	---	60.00	-30.67	11.0

Conducted Emission at AC Power line

EUT: SHD8850/27
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.207
 Comment: 120V AC
 Remark: N Line

Test Result
☒ Passed
☐ Not Passed

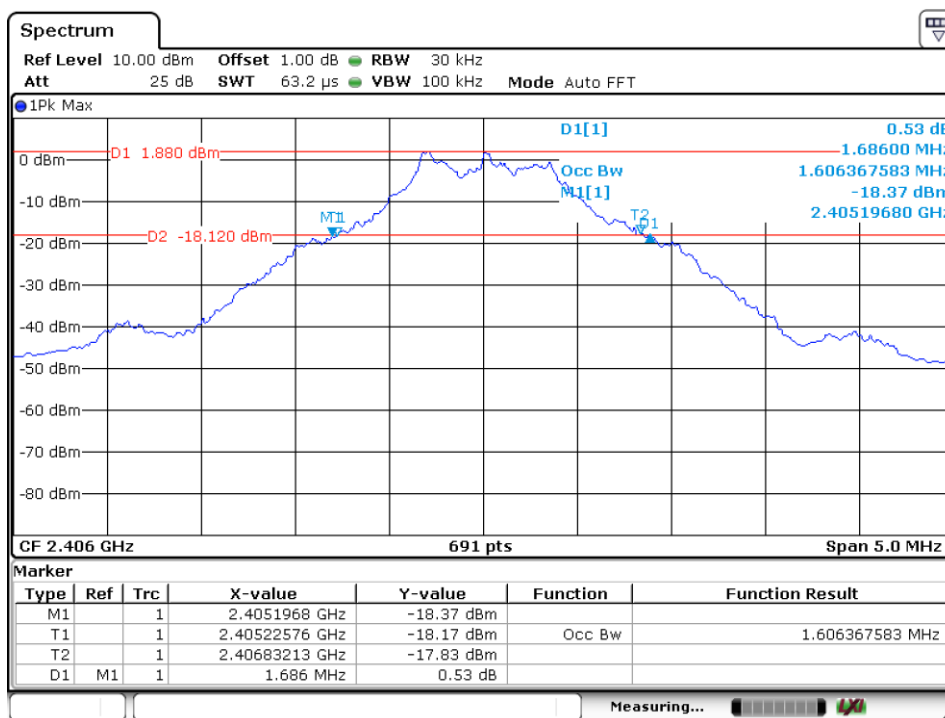


Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Corr. (dB)
0.150000	47.76	---	66.00	-18.24	10.5
0.278000	41.81	---	60.88	-19.07	10.2
0.726000	30.52	---	56.00	-25.48	10.3
1.626000	28.56	---	56.00	-27.44	10.3
4.046000	27.38	---	56.00	-28.62	10.4
24.578000	32.85	---	60.00	-27.15	11.2

8.3 20dB and 99% Bandwidth

EUT: SHD8850/27
 Op Condition: Operated, TX Mode (2406MHz)
 Test Specification: FCC15.15 20dB and 99% Bandwidth
 Comment: 120V AC

Test Result

☒ Passed☐ Not Passed

Date: 10.AUG.2019 17:55:35

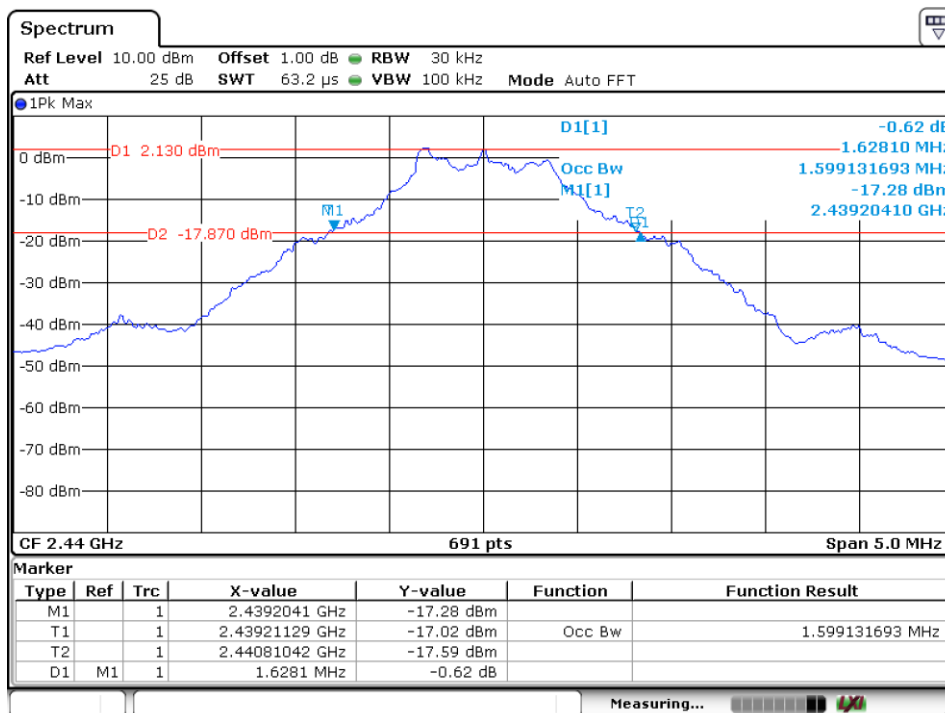
Bandwidth	Measured Value (MHz)
20dB BW	1.686
99% OBW	1.606

20dB and 99% Bandwidth

EUT: SHD8850/27
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.15 20dB and 99% Bandwidth
 Comment: 120V AC

Test Result

☒ Passed
☐ Not Passed



Date: 10.AUG.2019 17:53:16

Bandwidth	Measured Value (MHz)
20dB BW	1.628
99% OBW	1.599

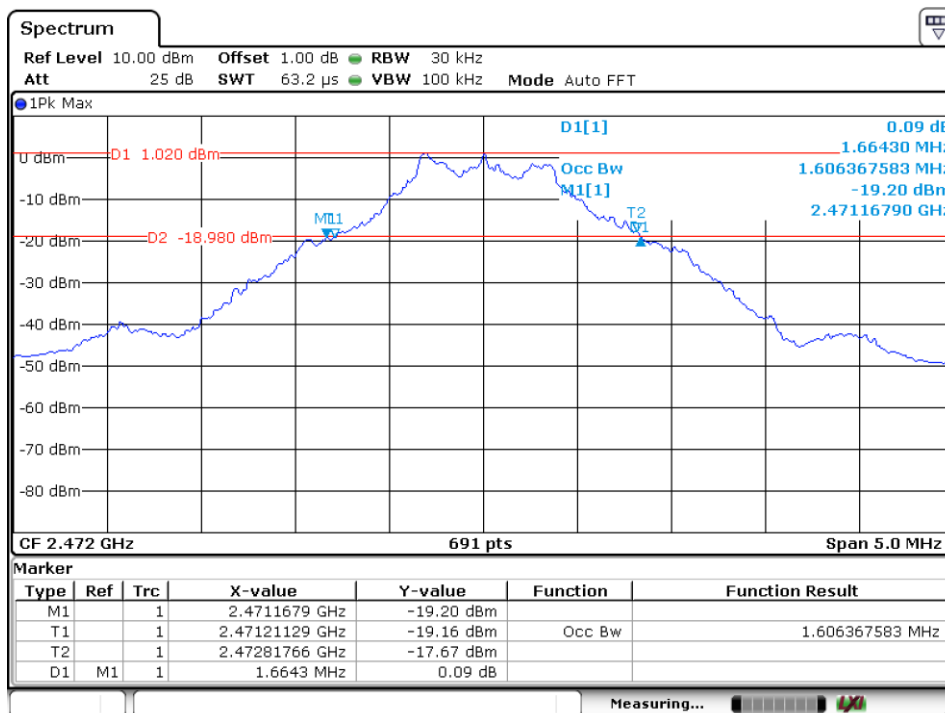
Conducted Emission at AC Power line

EUT: SHD8850/27
 Op Condition: Operated, TX Mode (2472MHz)
 Test Specification: FCC15.15 20dB and 99% Bandwidth
 Comment: 120V AC

Test Result

☒ Passed

☐ Not Passed



Date: 10.AUG.2019 17:54:27

Bandwidth	Measured Value (MHz)
20dB BW	1.664
99% OBW	1.606

8.4 Antenna Requirements

EUT: SHD8850/27
Op Condition: Operated, TX Mode
Test Specification: FCC15.203
Comment: 120V AC

Test Result

☒ Passed

☐ Not Passed

Limit

For intentional device, according to FCC Title 47 Part 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.

Antenna Connector Construction

The antenna used in this product is PIFA antenna, which is embedded permanently on PCB and no consideration of replacement. The maximum antenna gain is -2.2dBi.

9 Appendix A - General Product Information

Radiofrequency radiation exposure evaluation

This exposure evaluation is intended for **FCC ID: 2AR2SSHD8850**.

According to KDB 447498 D01v06 section 4.3.1, For frequencies between 100 MHz to 6GHz and test separation distances ≤ 50 mm, the Numeric threshold is determined as:

Step a)

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR

>> The fundamental frequency of the EUT is 2402-2472MHz,
the test separation distance is ≤ 50 mm.
(Manufacturer specified the separation distance is: 20mm)

Step a)

>> Numeric threshold (2406MHz), $\text{mW} / 20\text{mm} \cdot \sqrt{2.406\text{GHz}} \leq 3.0$
Numeric threshold (2406MHz) $\leq 38.681\text{W}$

>> Numeric threshold (2440MHz), $\text{mW} / 20\text{mm} \cdot \sqrt{2.440\text{GHz}} \leq 3.0$
Numeric threshold (2440MHz) $\leq 38.411\text{mW}$

>> Numeric threshold (2472MHz), $\text{mW} / 20\text{mm} \cdot \sqrt{2.472\text{GHz}} \leq 3.0$
Numeric threshold (2472MHz) $\leq 38.146\text{mW}$

>> The power of EUT measured (2406MHz) is: 2.60dBm = 1.820mW
The power of EUT measured (2440MHz) is: 2.58dBm = 1.811mW
The power of EUT measured (2470MHz) is: 1.74dBm = 1.493mW

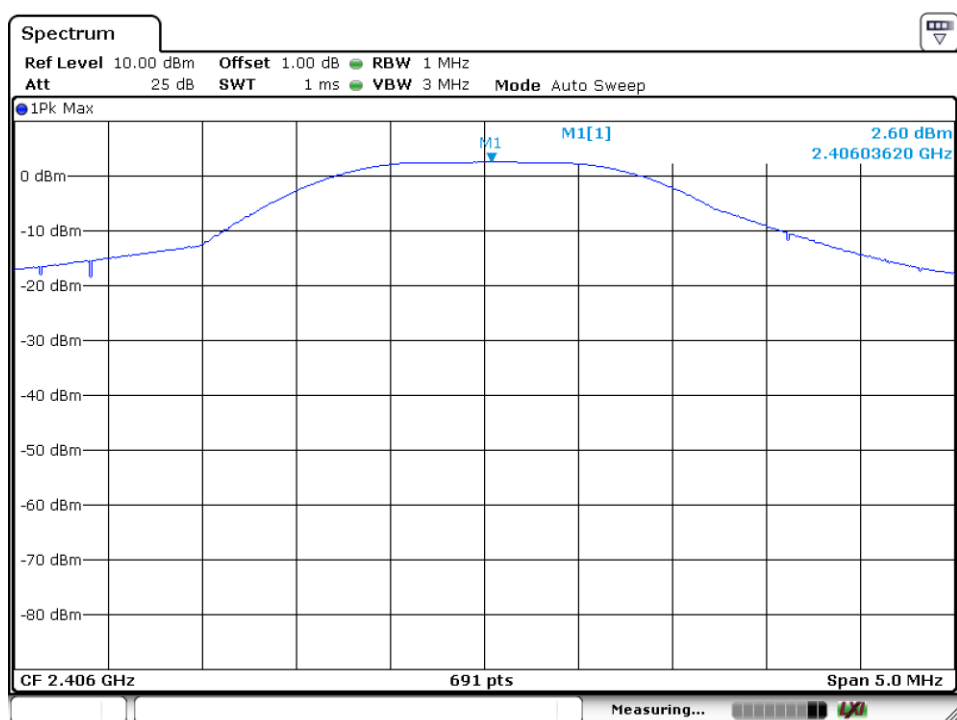
Which is smaller than the Numeric threshold.

Therefore, the device is exempt from stand-alone SAR test requirements.

General Product Information

EUT: SHD8850/27
Op Condition: Operated, TX Mode (2406MHz)
Comment: 120V AC
Remark: Conducted power

Test Result

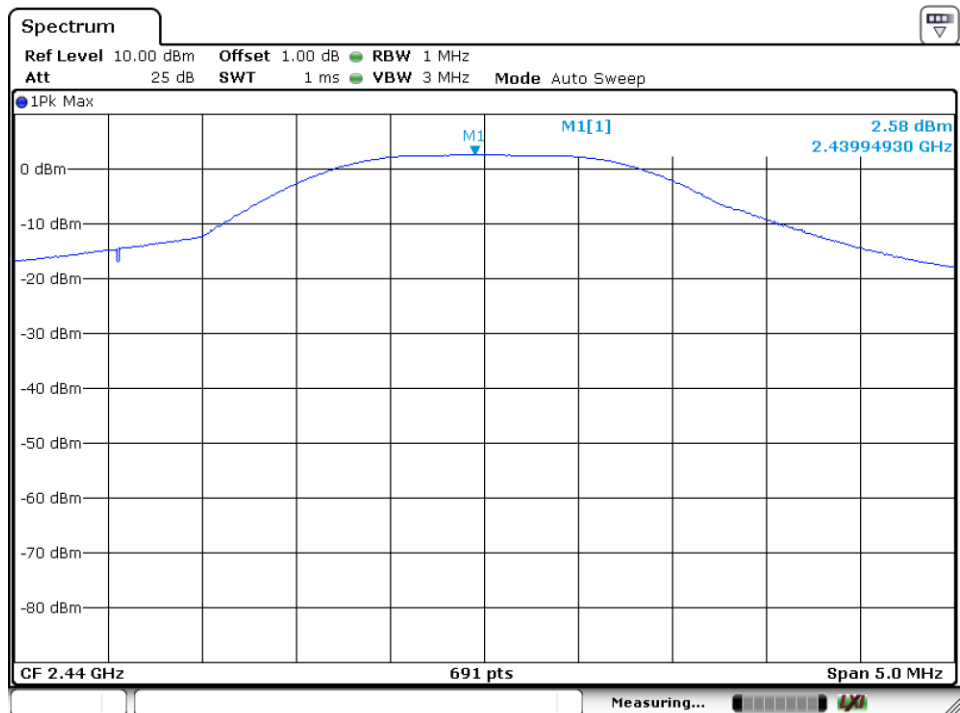
☒ Passed☐ Not Passed

Date: 10.AUG.2019 17:50:13

General Product Information

EUT: SHD8850/27
Op Condition: Operated, TX Mode (2440MHz)
Comment: 120V AC
Remark: Conducted power

Test Result

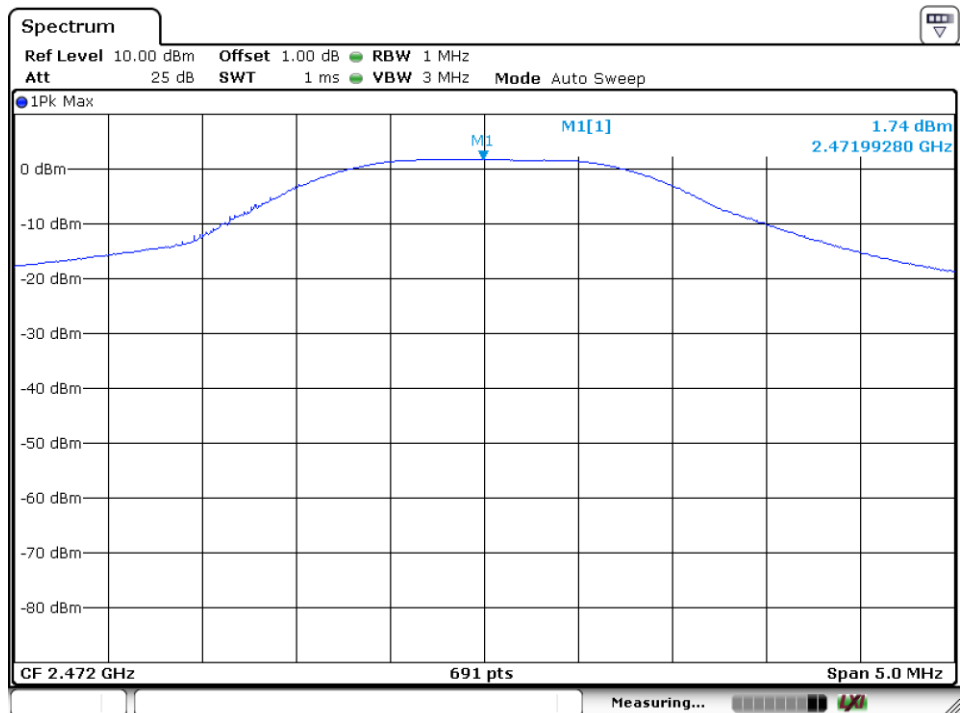
☒ Passed☐ Not Passed

Date: 10.AUG.2019 17:51:12

General Product Information

EUT: SHD8850/27
Op Condition: Operated, TX Mode (2472MHz)
Comment: 120V AC
Remark: Conducted power

Test Result

☒ Passed☐ Not Passed

Date: 10.AUG.2019 17:49:33

General Product Information

Declaration Letter of Model Difference

MMD

HONG KONG HOLDING LIMITED

To: TÜV SÜD Hong Kong Limited

Attention:

From:

Date: August 13, 2019

Fax No:

Total Page (Cover Included): 1

Project No.:

Subject: Declaration letter

We: MMD Hong Kong Holding Limited

Units 1006-1007, 10th Floor, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

Officially notify TÜV SÜD Hong Kong Limited that the <<Model A>> have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with <<PRODUCT>>, <<Model B>>. The difference lies only in the outlook/color of the different models.

<<Model A>>: SHD8850/07, SHD8850/37

<<Model B>>: SHD8850/27

<<Product>>: Indoor Wireless Headphones

Applicant: MMD Hong Kong Holding Limited

2019/08/13
(Date)

Andy Chen



(Applicant's authorized signature and company Chop)