

RF EXPOSURE EVALUATION REPORT

Product Name: Soundbar speaker and Wireless subwoofer

Trade Mark:



or PHILIPS

Model No. / HVIN: TAB7207SO/37

Add. Model No.: TAB7207, TAB7207SO, TAB7207/10,
TAB7207SO/10, TAB7207/98,
TAB7207SO/98, TAB7207/37,
TAB7207xx/yy (x=A-Z or nil, yy =00-99 for
country code)

Report Number: 220310002RFC-4

Test Standards: FCC 47 CFR Part 1 Subpart I
RSS-102 Issue 5

FCC ID: 2AR2STAB7207

IC: 24589-TAB7207

Test Result: PASS

Date of Issue: April 22, 2022

Prepared for:

MMD Hong Kong Holding Limited

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UTTR-RF-RSS102-V1.1

Version

Version No.	Date	Description
V1.0	April 22, 2022	Original



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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	MMD Hong Kong Holding Limited
Address of Applicant:	Unit 1006, 10th Floor, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong
Manufacturer:	MMD Hong Kong Holding Limited
Address of Manufacturer:	Unit 1006, 10th Floor, C-Bons International Center, 108 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

1.2 EUT INFORMATION

Product Name:	Soundbar speaker and Wireless subwoofer		
Model No. / HVIN:	TAB7207SO/37		
Add. Model No.:	TAB7207, TAB7207SO, TAB7207/10, TAB7207SO/10, TAB7207/98, TAB7207SO/98, TAB7207/37, TAB7207xx/yy (x=A-Z or nil, yy =00-99 for country code)		
Trade Mark:	 or PHILIPS		
DUT Stage:	Production Unit		
EUT Supports Function: (Provided by the customer)	2.4 GHz ISM Band:	Bluetooth 5.0	
	General 2.4GHz Technique		
Software Version:	V1.0 (Provided by the customer)		
Hardware Version:	V1.0 (Provided by the customer)		
Note: The additional model TAB7207, TAB7207SO, TAB7207/10, TAB7207SO/10, TAB7207/98, TAB7207SO/98, TAB7207/37, TAB7207xx/yy (x=A-Z or nil, yy =00-99 for country code) is identical with the test model TAB7207SO/37 except the model number for marketing purpose.			

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

For BT_LE	
Frequency Band:	2400 MHz to 2483.5 MHz
Frequency Range:	2402 MHz to 2480 MHz
Bluetooth Version:	Bluetooth LE
Type of Modulation:	GFSK
Number of Channels:	40
Channel Separation:	2 MHz
Antenna Type:	PCB Antenna
Antenna Gain: (Provided by the customer)	1 dBi
Maximum Peak Power:	3.64 dBm

For BT_EDR	
Frequency Band:	2400 MHz to 2483.5 MHz
Frequency Range:	2402 MHz to 2480 MHz
Bluetooth Version:	Bluetooth BR + EDR
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Type of Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels:	79
Channel Separation:	1 MHz
Antenna Type:	PCB Antenna
Antenna Gain: (Provided by the customer)	1 dBi
Maximum Peak Power:	10.35 dBm

For General 2.4GHz Technique	
Frequency Band:	2400 MHz to 2483.5 MHz
Frequency Range:	2405 MHz to 2479 MHz
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Type of Modulation:	GFSK
Number of Channels:	16
Channel Separation:	5 MHz
Antenna Type:	FPCB Antenna (TX) PCB Antenna (RX)
Antenna Gain: (Provided by the customer)	0 dBi
Maximum Field Strength:	83.68 dB μ V/m

1.4 OTHER INFORMATION

Test channels for BT_LE				
Type of Modulation	Tx/Rx Frequency	Test RF Channel Lists		
GFSK	2402 MHz to 2480 MHz	Lowest(L)	Middle(M)	Highest(H)
		Channel 0	Channel 19	Channel 39
		2402 MHz	2440 MHz	2480 MHz

Test channels for BT_EDR				
Mode	Tx/Rx Frequency	Test RF Channel Lists		
GFSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Lowest(L)	Middle(M)	Highest(H)
		Channel 0	Channel 39	Channel 78
$\pi/4$ DQPSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Channel 0	Channel 39	Channel 78
		2402 MHz	2441 MHz	2480 MHz
8DPSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Channel 0	Channel 39	Channel 78
		2402 MHz	2441 MHz	2480 MHz

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Test channels for General 2.4GHz					
Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2405 MHz	1	2409 MHz	2	2414 MHz
3	2419 MHz	4	2424 MHz	5	2429 MHz
6	2434 MHz	7	2439 MHz	8	2444 MHz
9	2449 MHz	10	2454 MHz	11	2459 MHz
12	2464 MHz	13	2469 MHz	14	2474 MHz
15	2479 MHz	-	-	-	-

1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC 47 CFR Part 1 Subpart I
RSS-102 Issue 5

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

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

2. EQUIPMENT LIST

Please refer to the RF test report.

3. MPE EVALUATION

3.1 REFERENCE DOCUMENTS FOR EVALUATION

No.	Identity	Document Title
1	FCC 47 CFR Part 1 Subpart I	PROCEDURES IMPLEMENTING THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969
2	RSS-102 Issue 5	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
3	KDB 447498 D01 General RF Exposure Guidance v06	RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES

3.2 MPE COMPLIANCE REQUIREMENT

3.2.1 Limits

3.2.1.1 FCC 47 CFR Part 1 Subpart I

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: * = Plane-wave equivalents power density.

3.2.1.2 RSS-102 Issue 5

According to RSS-102 Issue 5, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

According to RSS-102 Issue 5, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz⁶ and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

3.2.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3.3 MPE CALCULATION METHOD

FCC 47 CFR Part 1 Subpart I

$$S = PG/4\pi R^2 = EIRP/4\pi R^2$$

S = power density (in appropriate units, e.g., mw/cm²)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

3.4 MPE CALCULATION RESULTS

Note: For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.4.1 For BT

For BT_LE function, operating at 2402MHz to 2480 MHz for GFSK and

For BT_EDR function, operating at 2402MHz to 2480 MHz for GFSK, $\pi/4$ DQPSK, 8DPSK

3.4.2 For General 2.4GHz Technique

For General 2.4GHz Technique function, operating at 2405 MHz to 2479 MHz for GFSK

3.4.2.1 Antenna Type:

BT: PCB Antenna

General 2.4GHz Technique: FPCB Antenna (TX), PCB Antenna (RX)

3.4.2.2 Antenna Gain:

BT: 2402MHz to 2480 MHz: 1 dBi

General 2.4GHz : 2405 MHz to 2479 MHz: 0dbi

3.4.2.3 Results for FCC 47 CFR Part 1 Subpart I

Operating Mode	Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(mW)	(mW/cm ²)	
LE	2402-2480	3	2	1	6	3.9811	1	0.0008
EDR	2402-2480	7	2	1	10	10.0000	1	0.0020
GFSK(TX)	2405-2479	-12	2	0	-10	0.1	1	0.00002

3.4.2.4 Results for RSS-102 Issue 5

Operating Mode	Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	Limit
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(W)	(W)
LE	2402-2480	3	2	1	6	0.0040	2.6764
EDR	2402-2480	7	2	1	10	0.0100	2.6764
GFSK(TX)	2405-2479	-12	2	0	-10	0.0001	2.6787

3.4.3 Simultaneous Multi-band Transmission MPE Analysis

3.4.4.1 List of Mode for Simultaneous Multi-band Transmission

No.	Configurations	Support/Not Support
1	2.4G TX + BT	Support

3.4.4.2 Results for transmit simultaneously

No.	Configurations	Maximum MPE Value (mw/cm ²)			Limits (mw/cm ²)
		BT	2.4G TX	Transmit simultaneously	
1	2.4G TX + BT	0.002	0.00002	0.00202	1

Note 1: According to KDB 447498 D01 General RF Exposure Guidance v06, At the transmit simultaneously calculation method is as follows:

Transmit simultaneously MPE = Σ of MPE ratios

MPE ratios = Field strengths or power density / MPE limit at the test frequency

APPENDIX 1 PHOTOS OF TEST SETUP

N/A

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal Photos.

*** End of Report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.
