

RF Exposure Evaluation Report

Report Reference No...... : **MTEB23040071-H**

FCC ID..... : **2ABD3-MA336K**

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Date of issue..... : **April 26,2022**

Representative Laboratory Name.: **Shenzhen Most Technology Service Co., Ltd.**

Address..... : No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park,
Nanshan, Shenzhen, Guangdong, China.

Applicant's name..... : Ocean Digital Technology Ltd.

Address..... : Flat B, 12/F., Yeung Yiu Chung (No.8) Ind. Bldg., 20 Wang Hoi
Road, Kowloon Bay, Hong Kong

Test specification/ Standard..... : **47 CFR Part 1.1307**

47 CFR Part 1.1310

KDB447498D01 General RF Exposure Guidance v06

TRF Originator..... : Shenzhen Most Technology Service Co., Ltd.

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Test item description..... : Internet Radio

Trade Mark..... : N/A

Manufacturer..... : Ocean Digital Technology Ltd.

Model/Type reference..... : MA-336K

Listed Models : MA-336KP, WR-336K, WR-336KP, PR-100,SB-100

Modulation Type..... : GFSK/ CCK/DSSS/ OFDM

Operation Frequency..... : 2402MHz to 2480MHz, 2412MHz-2462MHz

Hardware Version..... : MA-336K_Main_PCB_Rev 1.1

Software Version..... : N/A

Rating..... : DC 3.7V(by battery)

DC 5V(by Adapter)

Result..... : **PASS**

TEST REPORT

Equipment under Test : Internet Radio

Model /Type : MA-336K

Listed Models : MA-336KP, WR-336K, WR-336KP, PR-100,SB-100

Remark : Only the model name and appearance are different.

Applicant : Ocean Digital Technology Ltd.

Address : Flat B, 12/F., Yeung Yiu Chung (No.8) Ind. Bldg., 20 Wang Hoi Road, Kowloon Bay, Hong Kong

Manufacturer : Ocean Digital Technology Ltd.

Address : Flat B, 12/F., Yeung Yiu Chung (No.8) Ind. Bldg., 20 Wang Hoi Road, Kowloon Bay, Hong Kong

Test Result:	PASS
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

1. Revision History

Revision	Issue Date	Revisions	Revised By
00	2023.04.26	Initial Issue	Alisa Luo

2. SAR Evaluation

2.1 RF Exposure Compliance Requirement

2.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

2.1.2 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$ Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.1.3 EUT RF Exposure

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.4 in linear scale. Output Power Into Antenna & RF Exposure Evaluation Distance:

BT classic

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	1.776	1.776 ± 1	2.776
Middle(2440MHz)	1.354	1.354 ± 1	2.354
Highest(2480MHz)	1.314	1.314 ± 1	2.314

$\pi/4$ DQPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	2.693	2.693 ± 1	3.693
Middle(2440MHz)	2.297	2.297 ± 1	3.297
Highest(2480MHz)	2.152	2.152 ± 1	3.152

8DPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	3.278	3.278 ± 1	4.278
Middle(2440MHz)	2.938	2.938 ± 1	3.938
Highest(2480MHz)	-0.659	-0.659 ± 1	0.341

Worst case:8DPSK						
Channel	Maximum tune-up Power (dBm)	Maximum Peak Conducted Output Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Lowest (2402MHz)	4.278	2.68	-0.68	0.00049	1.0	Pass

Note: 1) Refer to report **MTEB23040071-R1** for EUT test Max Conducted average Output Power value.Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (2.68 \cdot 0.86) / (4 \cdot 3.1416 \cdot 20^2) = 0.00049$

WIFI 2.4G

802.11b			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	7.75	7.75 ± 1	8.75
Middle(2437MHz)	8.23	8.23 ± 1	9.23
Highest(2462MHz)	5.97	5.97 ± 1	6.97

802.11g			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	8.58	8.58 ± 1	9.58
Middle(2437MHz)	9.47	9.47 ± 1	10.47
Highest(2462MHz)	6.72	6.72 ± 1	7.72

802.11n(H20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	8.64	8.64 ± 1	9.64
Middle(2437MHz)	9.56	9.56 ± 1	10.56
Highest(2462MHz)	6.52	6.52 ± 1	7.52

802.11n(H40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2422MHz)	7.35	7.35 ± 1	8.35
Middle(2437MHz)	9.10	9.10 ± 1	10.10
Highest(2452MHz)	6.52	6.52 ± 1	7.52

WIFI 2.4G

Worst case:802.11n(H20)						
Channel	Maximum tune-up Power (dBm)	Maximum Peak Conducted Output Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm2)	Limit	Result
Middle(2437MHz)	10.56	9.04	0	0.0023	1.0	Pass

Note: 1) Refer to report **MTEB23040071-R2** for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (9.04 * 1) / (4 * 3.1416 * 20^2) = 0.0023$

.....THE END OF REPORT.....