

RF Exposure Evaluation Report

Report Reference No......: **MTEB24090291-H**

FCC ID.....: **2BGXP-MSH103**

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

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Applicant's name.....: **Huizhou Mingsuheng Industrial Co., Ltd**

Address.....: No. 11, Zhiyuan Industrial Park, Jinpanwei, Xiaojin Management
Area, Luoyang Town, Boluo County

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.....: 9 Digital Wall Clock

Trade Mark.....: N/A

Model/Type reference.....: MSH103

Listed Models: N/A

Modulation Type.....: GFSK, $\pi/4$ DQPSK, 8DPSK

Operation Frequency.....: From 2402MHz to 2480MHz

Hardware Version.....: V2.1

Software Version.....: V2.1

Rating.....: DC 5V by Adapter

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

TEST REPORT

Equipment under Test : 9 Digital Wall Clock

Model /Type : MSH103

Listed Models : N/A

Remark : N/A

Applicant : Huizhou Mingsuheng Industrial Co., Ltd

Address : No. 11, Zhiyuan Industrial Park, Jinpanwei, Xiaojin Management Area, Luoyang Town, Boluo County

Manufacturer : Huizhou Mingsuheng Industrial Co., Ltd

Address : No. 11, Zhiyuan Industrial Park, Jinpanwei, Xiaojin Management Area, Luoyang Town, Boluo County

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	2024.09.24	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

BT classic

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	-1.293	-1.293 ± 1	-0.293
Middle(2441MHz)	-1.378	-1.378 ± 1	-0.378
Highest(2480MHz)	-1.705	-1.705 ± 1	-0.705

$\pi/4$ DQPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	-0.436	-0.436 ± 1	0.564
Middle(2441MHz)	-0.547	-0.547 ± 1	0.453
Highest(2480MHz)	-0.818	-0.818 ± 1	0.182

8DPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	0.007	0.007 ± 1	1.007
Middle(2441MHz)	-0.092	-0.092 ± 1	0.908
Highest(2480MHz)	-0.398	-0.398 ± 1	0.602

Worst case: 8DPSK						
Channel	Maximum tune-up Power (dBm)	Maximum tune-up Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Lowest(2402MHz)	1.007	1.26	-0.68	0.00022	1.0	Pass

Note: 1) Refer to report MTEB24090291-R for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (1.26 \cdot 0.86) / (4 \cdot 3.1416 \cdot 20^2) = 0.00022$

Note: 3) EUT's Bluetooth module is more than 20cm away from the human body.

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