Jiangsu Midea Cleaning Appliances Co., Ltd.

MPE ASSESSMENT REPORT

Report Type:
FCC MPE assessment report

Model:
M3LDS, VCR21, Tornado, CFR08, NER600, M6

REPORT NUMBER:
201101813SHA-003

ISSUE DATE:
May 11, 2021

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TEST REPORT

Report no.: 201101813SHA-003

Applicant:	Jiangsu Midea Cleaning Appliances Co., Ltd. No.39 Caohu Avenue, Xiangcheng Economic Development Zone, Suzhou, Jiangsu, China
Manufacturer:	Jiangsu Midea Cleaning Appliances Co., Ltd. No.39 Caohu Avenue, Xiangcheng Economic Development Zone, Suzhou, Jiangsu, China
FCC ID:	2AWUS-MD002

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:
KDB447498 D01 General RF Exposure Guidance v06 FCC Part2.1091, FCC Part2.1093 FCC Part1.1307(b)

PREPARED BY:	**REVIEWED BY:**
Teddy yin	Daniel Zhao
Project Engineer Teddy Yin	Reviewer Daniel Zhao

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Revision History

Report No.	Version	Description	Issued Date
201101813SHA-003	Rev. 01	Initial issue of report	May 11, 2021

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1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	Robot vacuum cleaner
Type/Model:	M3LDS, VCR21, Tornado, CFR08, NER600, M6
Description of EUT:	The EUT is automatically battery-powered cleaner and dry pick up for household indoor use only. M3LDS, VCR21, NER600, M6 and CFR08 are same appliance except for the model name. Tornado is same as M3LDS except for different appearance. M3LDS was tested as representative. The EUT contains WIFI mode and BLE mode.
Rating:	DC 14,4V Docking station(I5-DS): Class II Input: 100-240V~, 50/60Hz, 24W; Output:17.2V d.c., 1A
Category of EUT:	Class B
EUT type:	☐ Table top ☒ Floor standing
Software Version:	/
Hardware Version:	/
Sample received date:	Jun 3, 2020
Date of test:	Jun 3~Nov 19, 2020

1.2 Technical Specification

WIFI

Frequency Range:	2412MHz ~ 2462MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20
Type of Modulation:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Channel Number:	11 Channels for 802.11b, 802.11g and 802.11n(HT20)
Data Rate:	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS7
Channel Separation:	5 MHz
Antenna Information:	2.6dBi, PIFA antenna

BLE

Frequency Range:	2402-2480MHz
Support Standards:	Bluetooth LE 4.2
Type of Modulation:	GFSK

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Channel Number:	40
Data Rate:	1Mbps
Channel Separation:	2MHz
Antenna Information:	2.6dBi, PIFA antenna

1.3 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN1175
	IC Registration Lab CAB identifier.: CN0051
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

2 MPE Assessment

Test result: Pass

2.1 MPE Assessment Limit

Mobile device exposure for standalone operations:

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (uT)	Equivalent plane wave power density S_{eq} (W/m^2)
0-1 Hz	-	$3,2 \times 10^4$	4×10^4	-
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	-
8-25 Hz	10 000	4 000/f	5 000/f	-
0,025-0,8 kHz	250/f	4/f	5/f	-
0,8-3 kHz	250/f	5	6,25	-
3-150 kHz	87	5	6,25	-
0,15-1 MHz	87	0,73/f	0,92/f	-
1-10 MHz	$87/f^{1/2}$	0,73/f	0,92/f	-
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375\ f^{1/2}$	$0,0037\ f^{1/2}$	$0,0046\ f^{1/2}$	f/200
2-300 GHz	61	0,16	0,20	10

Mobile device exposure for simultaneous transmission operations: **the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0**

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2.2 Assessment Results

Power density (S) is calculated according to the formula:

$S = PG / (4\pi R^2)$

Where S = power density in mW/cm^2

P = Radiated transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

As we can see from the test report 201101813SHA-001:
The maximum radiated power = 22.11dBm = 162.55 mW;
Here R is chosen to be 20cm,

$S = PG / (4\pi R^2) = 162.55/ (4 * 3.14 * 20 * 20) = 0.0323 mW/cm^2$

As we can see from the test report 201101813SHA-002:
The maximum radiated power = 7.37dBm = 5.458 mW;
Here R is chosen to be 20cm,

$S = PG / (4\pi R^2) = 5.458/ (4 * 3.14 * 20 * 20) = 0.0011 mW/cm^2$

$0.0323+0.0011=0.0334\ mW/cm^2 < 1\ mW/cm^2$

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Appendix I

Definition below must be outlined in the User Manual:

To satisfy FCC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.
To ensure compliance, operations at closer than this distance is not recommended.

********** END **********