

Assessment Report

REP001909-3R2ARFWL

Type of assessment:

MPE Calculation report

Manufacturer:

Motorola Solutions, Inc.

Model:

DHS1100BMPAA

Product description:

DH300

Product marketing name(s)

DH300

FCC ID:

AZ499FT7177

ISED certification number:

109U-99FT7177

Specification:

- ◆ FCC 47 CFR Part 1 Subpart I, §§1.1307, 1.1310
- ◆ FCC 47 CFR Part 2 Subpart J, §2.1091
- ◆ FCC KDB 447498 D01 General RF Exposure Guidance v06
- ◆ ISED Canada RSS-102 Issue 5 Amendment 1, (February 2021)
- ◆ FCC OET Bulletin 65



Lab locations=

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FCC Site Number	Test Firm Registration Number: 392943 Designation Number: US5058
ISED Test Site	2040B-3

Prepared by	James Cunningham, EMC/WL Manager
Date	August 29, 2023
Signature	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

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Section 1 Declaration

Description of product:	DH300 CURVE DIGITAL HUB 1W 900MHZ (BRUS/BRCAN)
Model(s) / HVIN:	DHS1100BMPAA
Product marketing name (PMN):	DH300
Firmware Version Identification Number (FVIN):	1.5.0
Host Marketing Name (HMN):	DH300

RSS-102 Annex B - Declaration of RF Exposure Compliance

ATTESTATION: I attest that the information provided is correct; that the Technical Brief was prepared and the information contained therein is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed; and that the device meets the SAR and/or RF field strength limits of RSS-102.

Date of issue: August 21, 2023

James Cunningham, EMC/WL Manager

Prepared by

Signature

Section 2 Evaluation summary

2.1 MPE calculation for standalone transmission

2.1.1 References, definitions, and limits

FCC §2.1091(d)

- (2) For operations within the frequency range of 300 kHz and 6 GHz (inclusive), the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in Table 1 in paragraph (e)(1) of this section, may be used instead of whole-body SAR limits as set forth in paragraphs (a) through (c) of this section to evaluate the environmental impact of human exposure to RF radiation as specified in §1.1307(b) of this part, except for portable devices as defined in §2.1093 of this chapter as these evaluations shall be performed according to the SAR provisions in §2.1093.

Table 2.1-1: Table 1 to §1.1310(e)(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)
(i) Limits for Occupational/Controlled Exposure				
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
1500–100000			5	<6
(ii) 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
1500–100000			1.0	<30

Notes: f = frequency in MHz. * = Plane-wave equivalent power density.

RSS-102, Section 4

For the purpose of this standard, Industry Canada has adopted the SAR and RF field strength limits established in Health Canada's RF exposure guideline, Safety Code 6:

Table 2.1-2: Table 4 to RSS-102— RF Field Strength Limits

Frequency range (MHz)	Electric field strength (V/m rms)	Magnetic field strength (A/m rms)	Power density (W/m ²)	Reference Period (minutes)
Limits for Controlled Environment				
10–20	61.4	0.163	10	6
20–48	129.8 / f ^{0.25}	0.3444 / f ^{0.25}	44.72 / f ^{0.5}	6
48–100	49.33	0.1309	6.455	6
100–6000	15.60 f ^{0.25}	0.04138 f ^{0.25}	0.6455 f ^{0.5}	6
6000–15000	137	0.364	50	6
Limits for Uncontrolled Environment				
10–20	27.46	0.0728	2	6
20–48	58.07 / f ^{0.25}	0.1540 / f ^{0.25}	8.944 / f ^{0.5}	6
48–300	22.06	0.05852	1.291	6
300–6000	3.142 f ^{0.3417}	0.008335 f ^{0.3417}	0.02619 f ^{0.6834}	6
6000–15000	61.4	0.163	10	6

Notes: f = frequency in MHz.



Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (mW/cm² or W/m²)
 P = power input to the antenna (mW or W)
 G = power gain of the antenna in the direction of interest relative to an isotropic radiator
 R = distance to the center of radiation of the antenna (cm or m)

2.1.2 EUT technical information

Notes:

1. EUT contains a dual-band 2.4 / 5 GHz Wi-Fi transmitter. This transmitter module is already certified (FCC ID: 2ACBCB-RPI4B, ISED Certification number: 20953-RPI4B). Applicant declares that the Wi-Fi module will not transmit simultaneously with the 900 MHz transmitter. Therefore, no co-location assessment is required. For RF exposure related to the Wi-Fi transmitter, please refer to the original Wi-Fi module certification.
2. Maximum conducted power as documented in Nemko report REP013204-1R1TRFWL is 29.08 dBm. Per applicant's request, a value of 30 dBm (1 Watt) is used for MPE calculation as a worst-case assessment.

Prediction frequency	927.525 MHz
Antenna type	Integrated
Antenna gain	3.9 dBi (taken from antenna data sheet)
Number of antennas	1
Maximum transmitter conducted power	30 dBm (1 W) declared nominal power
Prediction distance	20 cm

2.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	<u>927.525</u> MHz	
Maximum measured conducted peak output power:	<u>30</u> dBm	
Cable and/or jumper loss:	<u>0</u> dB	
Maximum peak power at antenna input terminal:	<u>30</u> dBm	
Duty cycle:	<u>100</u> %	
Maximum calculated average power at antenna input terminal:	<u>1000</u> mW	
Single Antenna gain (typical):	<u>3.9</u> dBi	
Number of antennae:	<u>1</u>	
Total system gain:	<u>3.90</u> dBi	
	FCC limit:	ISED limit:
MPE limit for <u>uncontrolled</u> exposure at prediction frequency:	<u>0.618350</u> mW/cm ²	<u>0.279258</u> mW/cm ²
	<u>6.183500</u> W/m ²	<u>2.792581</u> W/m ²
MPE limit for <u>controlled</u> exposure at prediction frequency:	<u>3.091750</u> mW/cm ²	<u>1.965889</u> mW/cm ²
	<u>30.917500</u> W/m ²	<u>19.658893</u> W/m ²
Minimum calculated prediction distance for compliance:	<u>20</u> cm	<u>20</u> cm
Typical (declared) distance:	<u>20</u> cm	<u>80</u> cm
Average power density at prediction frequency:	<u>0.488349</u> mW/cm ²	<u>0.030522</u> mW/cm ²
	<u>4.883488</u> W/m ²	<u>0.305218</u> W/m ²
Margin of Compliance for uncontrolled environment:	<u>1.03</u> dB	<u>9.61</u> dB
with Maximum permitted antenna gain:	<u>4.93</u> dBi	<u>13.51</u> dBi
Margin of Compliance for controlled environment:	<u>8.01</u> dB	<u>18.09</u> dB
with Maximum permitted antenna gain:	<u>41.91</u> dBi	<u>51.99</u> dBi

2.1.4 Verdict

The calculation is below the limit; therefore, the product is passing the RF Exposure requirements for the declared distance.