

Assessment Report

REP015157-1ARFWL

Type of assessment:

MPE Calculation report

Manufacturer:

MatrixSpace Inc.

Model:

MS01100

Product Marketing Name (PMN):

**High Performance Millimeter Wave
Radar**

Model variant(s):

None

FCC ID:

2BAC9MS0110001

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**



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	September 26, 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.

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Section 1 Evaluation summary

1.1 MPE calculation for standalone transmission

1.1.1 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 1.1-1: 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.



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)

1.1.2 EUT technical information

Prediction frequency	24,490 MHz
Antenna type	Integrated, non-detachable phased array
Antenna gain	17 dBi
Number of antennas	1 (phased array)
Maximum transmitter conducted power	32 dBm (1584.89 mW)
Prediction distance	80 cm

Note: Maximum transmitter conducted power taken rated maximum EIRP (80W / 49 dBm) minus the declared antenna gain of 17 dBi = 32 dBm.

1.1.3 MPE calculation

Fundamental transmit (prediction) frequency:	24490 MHz
Maximum measured conducted peak output power:	32 dBm
Cable and/or jumper loss:	0 dB
Maximum peak power at antenna input terminal:	32 dBm
Tx On time:	1.000 ms
Tx period time:	1.000 ms
Average factor:	100 %
Maximum calculated average power at antenna input terminal:	1584.893192 mW
Single Antenna gain (typical):	17 dBi
Number of antennae:	1
Total system gain:	17.00 dBi
FCC limit:	
MPE limit for uncontrolled exposure at prediction frequency:	1.000000 mW/cm ²
	10.000000 W/m ²
Minimum calculated prediction distance for compliance:	80 cm
Typical (declared) distance:	80 cm
Average power density at prediction frequency:	0.987666 mW/cm ²
	9.876661 W/m ²
Margin of Compliance:	0.05 dB
Maximum allowable antenna gain:	17.05 dBi

1.1.4 Verdict

The calculation is below the limit; therefore, the product is passing the RF Exposure requirements for the declared distance is 80 cm.

End of the test report