

RADIO TEST REPORT – APFWL

Project ID Report ID

PRJ0030546 REP017507

Type of assessment:

MPE Exemption report

Manufacturer: Equipment description:

Define Design Deploy Corp. dba

D3 Short range radar

Product Marketing Name (PMN): Model Number:

AWR1843 AOP Module RS-1843AOPU

FCC ID: ISED certification number:

2ASVZ-01 IC: 30644-01

Specification:

FCC 47 CFR Part 1 Subpart I, §§1.1307, 1.1310

- FCC 47 CFR Part 2 Subpart J, §2.1091
- FCC KDB 447498 D04 Interim General RF Exposure Guidance v01
- ISED Canada RSS-102 Issue 6 (December 15, 2023)

Declaration of RF exposure compliance for exemption from routine evaluation limits

RSS-102 Annex C - Attestation:

I attest that the radiocommunication apparatus meets the exemption from the routine evaluation limits in Section 2.5 of RSS-102 standard; 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: June 17, 2024

Hossein Zamani, EMC/RF Lab Manager

Prepared by

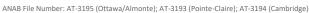


Signature

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Lab locations		

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Test site identifier	Organization	Ottawa/Almonte	Montreal	Cambridge	
	FCC: ISED:	CA2040 2040A-4	CA2041 2040G-5	CA0101 24676	
Website	www.nemko.cor	<u>n</u>			

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 contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Section 1 Evaluation summary

Section 1:

1.1 MPE exemption for standalone transmission

1.1.1 References, definitions and limits

FCC §2.1091(c)

(3) Unless otherwise specified in this chapter, any other single mobile or multiple mobile and portable RF source(s) associated with a device is exempt from routine environmental evaluation for RF exposure prior to equipment authorization or use, except as specified in § 1.1307(c) and (d) of this chapter.

1.1307(b)(3)(i)(C)

A single RF source is exempt if using the table below and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in table below to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R².
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .

RSS-102, Section 6.6

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below at or above 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 5 W (adjusted for tune-up tolerance)
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 4.49/f^{0.5} W (adjusted for tune-up tolerance), where f is in MHz
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance)
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 0.0131 f^{0.6834} W (adjusted for tune-up tolerance), where f is in MHz
- at or above 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 5 W (adjusted for tune-up tolerance)

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the EIRP was derived.





EUT technical information 1.1.2

Operational frequency	76–81 GHz	
Antenna type	Type – Patch Antenna Manufacturer – Texas Instruments (TI) Model – 1843 Antenna On Package (AOP)	
Antenna gain	4 dBi	
Number of antennas	1	
Maximum transmitter EIRP	35.09 dBm	
FCC power threshold	19.2×0.2^2 (where 0.2 is the minimum distance in m) = 0.768 W Minimum R of 0.2 m is more than $\lambda/2\pi$, which is 0.617 mm, where λ for 77 GHz is approximately 3.88 mm	

1.1.3 MPE exemption calculation

Fundamental transmit (prediction) frequency: 77081 MHz Maximum measured conducted peak output power: 31.09 dBm Cable and/or jumper loss: 0 dB Maximum peak power at antenna input terminal: 31.09 dBm Duty cycle (protocol based): 7 % 89.97007 mW Maximum calculated average power at antenna input terminal: Single Antenna gain (typical): 4 dBi Number of antennae: 1 4.00 dBi Total system gain:

> FCC limit **ISED limit** 5.0000 W 768.000 mW MPE exemption threshold limit:

1.86 dBd

Average EIRP/ERP at prediction frequency: 225.995 mW 138.070 mW 0.226 W 0.138 W

> Margin of Compliance: 13.45 dB 7.45 dB

1.1.4 Verdict

The calculation of EIRP is below the exemption limit; therefore, the product is passing the RF Exposure exemption requirements.

End of the test report



