

RF Exposure Evaluation Report


Prepared for: Communication Systems Solutions

Address: 665 RESEARCH DRIVE
LINCOLN NE, 68521

Model: 410-476-000

Test Report No.: RFE230228-20-M1

Approved By:



Fox Lane,
EMC Test Engineer

Date: January 17, 2024

Total Pages: 7

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Revision Page

Rev. No.	Date	Description
Original	14 November 2023	Issued by FLane Prepared by FLane

Regulatory Requirements:

FCC Part 1.1310, 2.1091, 2.1093
KDB 447498 D01
RSS-102, Issue 5

Summary:

The purpose of this report is to evaluate the EUT's transmitter for exemption from routine SAR testing.

EUT:

Model:	410-476-000
FCC ID:	2AUHWET400
IC:	4246BET300

MPE Lab	Nebraska Center for Excellence in Electronics
MPE Labs FCC Cab Designation:	US1060
MPE Labs ISED Cab Designation:	US0177

FCC Limits, Part 1.1310

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 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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

Occupational/Controlled		<input type="checkbox"/>						
General Population/uncontrolled		<input checked="" type="checkbox"/>						
FCC Power Density Calculations								
Frequency	Conducted Power	Antenna Gain	Peak Power EIRP	Peak Power EIRP +25% for Tolerance	Power Density	Limit at specified distance	% of limit	Result
MHz	mW	numerical	mW	mW	mW/cm ²	mW/cm ²	%	
902.30	7.04	3.58	25.23	31.53	0.006	0.60	1.043	PASS
908.60	6.98	3.58	25.01	31.27	0.006	0.61	1.027	PASS
914.90	6.89	3.58	24.69	30.86	0.006	0.61	1.007	PASS

Distance (d)	20	cm
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$S = (P \times G)/(4 \times \pi \times d^2)$ – used to calculate exposure at "d" cm

$EIRP = P \times G$, measured as field strength

$d = \sqrt{(S/(P \times G) \times 4 \times \pi)}$ – used to calculate minimum distance to meet limits

S = power density (mW/cm²)

P = transmitter conducted power (in mW)

G = antenna numeric gain (Numerical)

d = distance to radiation center (cm)

Limits:

FCC Limit according to FCC Part 1.1310

$10W/m^2 = 1mW/cm^2$

Complies

Note:

The user's manual will stipulate that a 20cm distance from the user is to be maintained.

EIRP values in mW were multiplied by 1.1 to account for a 10% tolerance.

April 2021 TCB Workshop Training

Canada's new localized limits > 6 GHz

- February 2021, Health Canada introduced new localized (basic restrictions and reference levels) PD limits
 - < 30 GHz → harmonized w/ ICNIRP-2020 (averaged over 4-cm²)
 - > 30 GHz → spatial peak instead 1 cm² average
- New limits are now in effect

RSS 102, Issue 5, Section 2.5.2

2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF 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, except when the device operates as follows:

- below 20 MHz⁶ and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. 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 e.i.r.p. 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 e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. 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 e.i.r.p. was derived.

ISED Power Density Calculations						
Frequency	Conducted Power	Antenna Gain	Peak EIRP Power	EIRP +25% Tolerance	Exemption Limit	Result
MHz	mW	Num.	mW	mW	mW	
902.30	7.04	3.58	25.23	31.53	5000.00	PASS
908.60	6.98	3.58	25.01	31.27	5000.00	PASS
914.90	6.89	3.58	24.69	30.86	5000.00	PASS

Result:

The EUT was found to be exempt from routine SAR testing and **COMPLIANT** with FCC and ISED RF exposure requirements.

REPORT END