

Test report No:
 NIE: 62699RAN.002A1

Assessment report

RF EXPOSURE REPORT ACCORDING TO FCC 47 CFR Part 2.1091 FCC 47 CFR Part 2.1093

(*) Identification of item under evaluation	Ultra Wide Band (UWB) Radar sensor module
(*) Trademark	Novelda
(*) Model and /or type reference	X4C007
Other identification of the product	FCC ID: 2AD9Q-X4C007 IC: 22782-X4C007 HW version: Rev. 4.0 SW version: 12c04720
(*) Features	N/A
Manufacturer	Novelda AS Garverivegen 2, NO-3850 Kviteseid, Norway
Test method requested, standard	FCC 47 CFR Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices. FCC 47 CFR Part 2.1093. Radiofrequency radiation exposure evaluation: portable devices. IEEE Std C95.3™ -2002 (R2008). IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz–300 GHz
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López EMC Consumer & RF Lab. Manager
Date of issue	2020-06-11
Report template No	FAN36_01 (*) "Data provided by the client"

Index

Competences and guarantees	3
General conditions	3
Data provided by the client.....	3
Identification of the client.....	3
Document history	3
General description of the device under evaluation.....	4
RF Exposure Assessment result and verdict.....	4
Appendix A: FCC RF Exposure information	5
FCC RF Exposure evaluation	6

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Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested).
2. Maximum output power and maximum antenna gain information.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Identification of the client

Novelda AS
Garverivegen 2, NO-3850 Kviteseid, Norway

Document history

Report number	Date	Description
62669RAN.002	2020-03-25	First release
62699RAN.002A1	2020-06-11	Second release. Maximum output power and antenna gain updated. Assessment evaluation updated according to CB requirements.

This modification test report cancels and replaces the test report 62669RAN.002.

General description of the device under evaluation

The device under evaluation consists of an Ultra Wide Band (UWB) Radar sensor module.

The equipment specifications declared by the manufacturer for the supported technology are:

Technology	Band	Frequency (MHz)	Maximum Conducted Output Power RMS Frame (dBm)	Antenna peak gain (dBi)	Maximum E.I.R.P. (dBm)	Maximum E.I.R.P. (mW)
UWB	UWB Radar Band	7490 - 8450	-9.11	-0.9	-10.01	0.1

Table 1: Equipment specifications

RF Exposure Assessment result and verdict

The worst-case use condition has been assessed to justify test exclusion for the RF Exposure evaluation according to the maximum output power transmission value of the device:

Maximum Permissible Exposure limit based on Power density (mW/cm²) according to FCC Part 1.1310 for the applicable 7.490-8.450 GHz frequency is 1 mW/cm².

Maximum output power = - 9.11 dBm = 0.12 mW

Maximum antenna gain = -0.9 dBi

Maximum E.I.R.P = -10.01 dBm = 0.1 mW

Device antenna dimensions = 3.12 x 0.31 cm = 0.967 cm²

Maximum output power distributed over the antenna area:

$$0.1 \text{ mW} / 0.967 \text{ cm}^2 = 0.103 \text{ mW/cm}^2$$

FCC Part 1.1310 Maximum Exposure Limit has to be averaged over 1 cm² and averaged over 30 minutes exposure period, assuming 30 minutes of continuous exposure:

$$0.103/1 \times (30 \text{ minutes}/30 \text{ minutes}) = \mathbf{0.103 \text{ mW/cm}^2} < \mathbf{1 \text{ mW/cm}^2} \text{ FCC Part 1.1310 MPE limit}$$

This worst-case value has been calculated taking into account that all power from the antenna will be directly radiated to a user by the complete antenna area, being the user infinitely close to the antenna during the whole evaluation time. Assuming a possible separation between the antenna and nearby users during the evaluation time, the field will normally disperse over a larger area and the exposure expected would be much lower.

As this worst-case use condition is far below the applicable MPE limit, further near field testing is not expected to be required to assess compliance.

Appendix A: FCC RF Exposure information

FCC RF Exposure evaluation

When a device qualifies for the categorical exclusion provision of § 2.1091(c), the minimum test separation distance may be estimated, when applicable, by simple calculations according to plane-wave equivalent conditions, to ensure the transmitter and its antenna(s) can operate in manners that meet or exceed the estimated distance. The source-based time-averaged maximum radiated power, according to the maximum antenna gain, must be applied to calculate the field strength and power density required to establish the minimum test separation distance. When the estimated test separation distance becomes overly conservative and does not support compliance, MPE measurement or computational modeling may be used to determine the required minimum separation distance.

According to §1.1310 Radiofrequency radiation exposure limits, paragraph (e), the limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields are:

TABLE 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)
(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

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