REPORT ON EXPOSURE TO ELECTROMAGNETIC FIELDS

No. 1906290STO-002, Ed. 2

EQUIPMENT

Equipment:	Radio module
Type/Model:	HE1074-915
Manufacturer:	Hartvik Engineering AB
Tested by request of:	Hartvik Engineering AB

SUMMARY

Based on the assessment in this statement, the equipment is determined to **comply** with the following requirements without testing:

CFR 47 §1.1307, §1.1310
RSS-102 Issue 5

Date of issue: 2019-09-16

Tested by: Robert Hietala

Approved by: Matti Virkki

Revision History

Edition	Date	Description	Changes
1	2019-05-20	First release	--
2	2019-09-16	Second release	Updated duty cycle reference

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1 CLIENT INFORMATION

This assessment has been done by request of:

Company	Hartvik Engineering AB Fridhemsvägen 4 755 97 Uppsala Sweden
Name of contact	Johan Hartvik

2 EQUIPMENT

2.1 Identification of the equipment

Equipment:	Radio module
Type/Model:	HE1074-915
Additional model:	Hartvik Engineering AB
Brand name:	915-639, 915-640, 915-642 and 915-643
Manufacturer:	Hartvik Engineering AB
Transmitter frequency range:	902.2 – 925 MHz
Measured output power to antenna*:	+19 dBm
Declared output power to antenna:	+19.6 dBm
Antenna gain:	+1.2 dBi
Measured duty cycle*:	6.1 %
User separation distance:	5 mm
Exposure conditions:	☒ Controlled environment (occupational) ☐ Uncontrolled environment (general population)
Region of body:	☒ Head or trunk ☐ Limbs

*Reference for measurement: Test report 1906290STO-001 Ed. 2

3 TEST SPECIFICATIONS

3.1 Standards

CFR 47: Code of Federal Regulations Title 47: Telecommunications §1.1307, §1.1310
KDB447498 D01 v06

RSS-102: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

3.2 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standards.

4 SUMMARY

The evaluation has been carried out at the Intertek Semko AB premises in Kista, Sweden.
The results in this report apply only to sample tested:

Test	Result
RF Exposure, single transmitter	PASS
RF Exposure, multiple simultaneous transmitters	NA[1]

1. EUT only has a single transmitter or transmitters can't operate simultaneously

5 RF EXPOSURE, SINGLE TRANSMITTER

Result:	PASS

5.1 Limits

Reference: CFR 47 §1.1307, §1.1310

KDB 447498 D01 General RF Exposure Guidance v06

Section 4.3.1, 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz.

Reference: RSS-102 – Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

Section 2.5.1, Table 1: SAR evaluation – Exemptions limits for routine evaluation based on frequency and separation distance

	Exemptions limits				
Frequency	**At separation distance of ≤5 mm**	**At separation distance of 10 mm**	**At separation distance of 15 mm**	**At separation distance of 20 mm**	**At separation distance of 25 mm**
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

	Exemptions limits				
Frequency	**At separation distance of 30 mm**	**At separation distance of 35 mm**	**At separation distance of 40 mm**	**At separation distance of 45 mm**	**At separation distance of ≥50 mm**
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

For limb-worn devices where the 10-g value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5.

5.2 Calculations

EIRP: $Power\ to\ antenna\ (dBm) + Antenna\ gain\ (dBi) = EIRP\ dBm$
Declared EIRP = 19.6 dBm
Measured EIRP = 20.2 dBm

Conversion dBm to W:

Conducted: $1\ mW * 10^{\left(Power\frac{dBm}{10}\right)} = 79.4\ mW$

EIRP: $1\ mW * 10^{\left(EIRP\frac{dBm}{10}\right)} = 104.7\ mW$

Time averaged maximum power:

Conducted: $EIRP\ mW * Duty\ cycle = 4.8\ mW$

EIRP: $EIRP\ mW * Duty\ cycle = 6.4\ mW$

Low power exclusion limit:

KDB447498 D01 v06: $\frac{EIRP\ mW}{Separation\ distance\ mm} * \sqrt{Operating\ frequency\ GHz} = 2.0$

5.3 Results

Standard	Reference for limit	Value	Unit	Limit	Result
§1.1310	KDB 447498	2.0	NA	< 3	PASS
RSS-102	RSS-102	6.4	mW	< 17	PASS