

FCC SAR Exclusion Report



The RvA is signatory to ILAC - MRA



Product name : Locator One
Applicant : Basetime BV
FCC ID : 2BD5V-LOCONE
IC ID : 31799-LOCONE

Test report No. : P000344688 006 Ver 1.0

Laboratory information

Accreditation

Kiwa Nederland B.V. complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2017. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L248 and is granted by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie).

Kiwa Nederland B.V. is designated by the FCC as an Accredited Test Firm for compliance testing of equipment subject to Certification under Parts 15 & 18. The Designation number is: NL0001.

Kiwa Nederland B.V. is a Wireless Device Testing laboratory recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements.
The Industry Canada company number for Kiwa Nederland B.V. is: 4173A. The CABID is NL0001.

Kiwa Nederland B.V. is a registered Conformity Assessment body (CAB) under the Japan-EC MRA (Agreement on Mutual Recognition between Japan and the European Community). The registration number is: 201.

Documentation

The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at Kiwa Nederland B.V.

Testing Location

Test Site	Kiwa Nederland B.V.
Test Site location	Wilmersdorf 50 7327 AC Apeldoorn The Netherlands Tel. +31 88998 3393
Test Site FCC	NL0001
CABID	NL0001

Revision History

Version	Date	Remarks	By
v0.50	02-04-2024	First draft	GG
v1.00	10-07-2024	Final release	GG

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1 General Description

1.1 Applicant

Client name:	Basetime BV
Address:	Lichtschip 75A, Houten 3991 CP, The Netherlands
Telephone:	+31 30 249 6 149
E-mail:	eltjo.keijer@basetime.nl
Contact name:	E.J. Keijer

1.2 Manufacturer

Manufacturer name:	Basetime BV
Address:	Lichtschip 75A, Houten 3991 CP, The Netherlands
Telephone:	+31 30 249 6 149
E-mail:	eltjo.keijer@basetime.nl
Contact name:	E.J. Keijer

1.3 Tested Equipment Under Test (EUT)

Product name:	Locator One
Brand name:	Basetime BV
FCC ID:	2BD5V-LOCONE
IC:	31799-LOCONE
Product description:	RADAR base monitoring device.
Variant model(s):	--
Batch and/or serial No.	--
Software version:	--
Hardware version:	V2.2
Date of receipt	20-02-2024
Tests started:	21-02-2024
Testing ended:	28-03-2024

1.4

Applicable standards

47 CFR § 1.1307 (b)(1)(i)(A)

1.5 Conclusions

The sample of the product showed **NO NON-COMPLIANCES** to the RF exposure requirement.

The results of the test as stated in this report, are exclusively applicable to the product items as identified in this report. Kiwa Nederland accepts no responsibility for any properties of product items in this test report, which are not supported by RSS-102, issue 6.

Assessment is performed by:

Name : ing. M.H. Khan

Review of test methods and report by:

Name : P. van Wanrooij, BASc

The above conclusions have been verified by the following signatory:

Date : 11-07-2024

Name : P. van Wanrooij

Function : Test Engineer

Signature :

2 SAR exclusion Evaluation

2.1 Transmitter specifications

Variable (unit)	Value	Symbol
Conducted time-averaged output power (mW)	LTE Band 2: 199.526, LTE Band 4: 199.526, LTE Band 5: 199.526, LTE Band 12: 199.526 LTE Band 13: 199.526, LTE Band 14: 199.526, LTE Band 17: 199.526, LTE Band 25: 199.526, LTE Band 26: 199.526, LTE Band 66: 199.526 Radar: 223.872	P
Time-averaged output power ERP (mW)	LTE Band 2, LTE Band 25: 1584.49 LTE Band 4, LTE Band 66: 794.328 LTE Band 5: 1023.29 LTE Band 12, LTE Band 17: 912.011 LTE Band 13, LTE Band 14: 977.237 LTE Band 26: 1000 Radar: 223.872	P _{ERP}
Operating frequency range (MHz)	LTE Band 2: 1850-1910, 1930-1990 MHz LTE Band 4: 1710-1755, 2110-2155 MHz LTE Band 5: 824-849, 896-894 MHz LTE Band 12: 699-716, 729-746 MHz LTE Band 13: 777-787, 746-756 MHz LTE Band 14: 788-798, 758-768 MHz LTE Band 17: 704-716, 734-756 MHz LTE Band 25: 1850-1915, 1930-1995 MHz LTE Band 26: 824-849, 869-894 MHz LTE Band 66: 1710-1780, 2110-2180 MHz Radar: 60.5 GHz	f
Separation distance (cm)	20	d
Separation distance (m)	0.2	R

2.2 Evaluation calculations

LTE Band 2, LTE Band 25

LTE Band 2 and LTE Band 25 are evaluated according to method B of KDB 447498 D04 v01:

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm} \right)^x & d \leq 20 \text{ cm} \\ ERP_{20cm} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} * \sqrt{f}} \right)$$

$$ERP_{20cm}(mW) = \begin{cases} 2040 * f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6.0 \text{ GHz} \end{cases}$$

Filling in the values of d (cm) and f (GHz) as reported in clause 2.1 in the equations above gives the result:

$P_{th} = 3060 \text{ mW}$

P or $P_{ERP} = 1584.49 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

LTE Band 4, LTE Band 66

LTE Band 4 and LTE Band 66 are evaluated according to method B of KDB 447498 D04 v01:

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm} \right)^x & d \leq 20 \text{ cm} \\ ERP_{20cm} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} * \sqrt{f}} \right)$$

$$ERP_{20cm}(mW) = \begin{cases} 2040 * f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6.0 \text{ GHz} \end{cases}$$

Filling in the values of d (cm) and f (GHz) as reported in clause 2.1 in the equations above gives the result:

$P_{th} = 3060 \text{ mW}$

P or $P_{ERP} = 794.328 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

LTE Band 5

LTE Band 5 is evaluated according to method B of KDB 447498 D04 v01

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm} \right)^x & d \leq 20 \text{ cm} \\ ERP_{20cm} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} * \sqrt{f}} \right)$$

$$ERP_{20cm}(mW) = \begin{cases} 2040 * f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6.0 \text{ GHz} \end{cases}$$

Filling in the values of d (cm) and f (GHz) as reported in clause 2.1 in the equations above gives the result:

$P_{th} = 1681 \text{ mW}$

P or $P_{ERP} = 1023.29 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

LTE Band 12

LTE Band 12 is evaluated according to method B of KDB 447498 D04 v01

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm} \right)^x & d \leq 20 \text{ cm} \\ ERP_{20cm} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} * \sqrt{f}} \right)$$

$$ERP_{20cm}(mW) = \begin{cases} 2040 * f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6.0 \text{ GHz} \end{cases}$$

Filling in the values of d (cm) and f (GHz) as reported in clause 2.1 in the equations above gives the result:

$P_{th} = 1426 \text{ mW}$

P or $P_{ERP} = 912.011 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

LTE Band 13

LTE Band 13 is evaluated according to method B of KDB 447498 D04 v01

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm} \right)^x & d \leq 20 \text{ cm} \\ ERP_{20cm} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} * \sqrt{f}} \right)$$

$$ERP_{20cm}(mW) = \begin{cases} 2040 * f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6.0 \text{ GHz} \end{cases}$$

Filling in the values of d (cm) and f (GHz) as reported in clause 2.1 in the equations above gives the result:

$P_{th} = 1585 \text{ mW}$

P or $P_{ERP} = 977.237 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

LTE Band 14

LTE Band 14 is evaluated according to method B of KDB 447498 D04 v01

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm} \right)^x & d \leq 20 \text{ cm} \\ ERP_{20cm} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} * \sqrt{f}} \right)$$

$$ERP_{20cm}(mW) = \begin{cases} 2040 * f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6.0 \text{ GHz} \end{cases}$$

Filling in the values of d (cm) and f (GHz) as reported in clause 2.1 in the equations above gives the result:

$P_{th} = 1608 \text{ mW}$

P or $P_{ERP} = 977.237 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

LTE Band 17

LTE Band 17 is evaluated according to method B of KDB 447498 D04 v01

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm} \right)^x & d \leq 20 \text{ cm} \\ ERP_{20cm} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} * \sqrt{f}} \right)$$

$$ERP_{20cm}(mW) = \begin{cases} 2040 * f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6.0 \text{ GHz} \end{cases}$$

Filling in the values of d (cm) and f (GHz) as reported in clause 2.1 in the equations above gives the result:

$P_{th} = 1436 \text{ mW}$

P or $P_{ERP} = 912.011 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

LTE Band 26

LTE Band 26 is evaluated according to method B of KDB 447498 D04 v01

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm} \right)^x & d \leq 20 \text{ cm} \\ ERP_{20cm} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where:

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} * \sqrt{f}} \right)$$

$$ERP_{20cm}(mW) = \begin{cases} 2040 * f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6.0 \text{ GHz} \end{cases}$$

Filling in the values of d (cm) and f (GHz) as reported in clause 2.1 in the equations above gives the result:

$P_{th} = 1681 \text{ mW}$

P or $P_{ERP} = 1000 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

Radar

Radar is evaluated according to method C of KDB 447498 D04 v01

Method C:

Transmitter frequency (MHz)	Threshold ERP (mW)
0.3 – 1.34	$1920 * R^2 * 1000$
1.34 – 30	$3450 * R^2 / f^2 * 1000$
30 – 300	$3830 * R^2$
300 – 1500	$12.8 * R^2 * f$
1500 – 100 GHz	$19200 * R^2$

Filling in the values of R (m) and f (MHz) as reported in clause 2.1 in the threshold calculation equations in the table above gives the result:

$$P_{th} = 768 \text{ mW}$$

$P_{ERP} = 223.872 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the MPE-based exemption requirement.

Assessment for multiple transmitters capable of transmitting simultaneously

In the case of RF sources operating in the same time averaging period, evaluate if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\frac{P_1}{P_{th1}} + \frac{P_2}{P_{th2}} + \dots + \frac{P_n}{P_{thn}} \leq 1$$

Where P_x is the calculated power and P_{thx} the calculated limit for each transmitter.

Only one LTE band can transmit at the same time as the Radar and LTE Band 12 delivers the worst case ratio:

$$\frac{223.872}{768} + \frac{912.011}{1426} = 0.2915 + 0.6396 = 0.9311 \leq 1$$

2.3 Conclusion

Since the EUT does not cause exposure in excess of the general population limit (defined in 47 CFR 1.1310 e) (ii)), no additional mitigation actions are required.

<<END OF REPORT>>