

FCC SAR Exclusion Report

Product name : 95-1300-0200
Applicant : TMSi BV
FCC ID : 2A8DA-APEX01

Test report No. : P000207337 003 Ver 2.00

Laboratory information

Accreditation

Telefication 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 L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie).

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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 Telefication Netherlands.

Testing Location

Test Site	Kiwa Telefication BV
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	15-11-2022	Draft	KK
V1.00	09-12-2022	Initial release	KK
V2.00	17-01-2023	Section 2.1, Note 2 has been added Section 2.2, threshold power levels are re-calculated	KK

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1 General Description

1.1 Applicant

Client name:	TMSi BV
Address:	Zutphenstraat 57, Oldenzaal Netherlands
Telephone:	+31 541216643
E-mail:	sake.kroondijk@tmsi.com
Contact name:	Sake Kroondijk

1.2 Manufacturer

Manufacturer name:	TMSi BV
Address:	Zutphenstraat 57, Oldenzaal Netherlands
Telephone:	+31 541216643
E-mail:	sake.kroondijk@tmsi.com
Contact name:	Sake Kroondijk

1.3 Tested Equipment Under Test (EUT)

Product name:	95-1300-0200
Brand name:	TMSi BV
Product type:	EEG amplifier
FCC ID:	2A8DA-APEX01
Software version:	1.0
Hardware version:	V2-Rev2

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 specifications stated in paragraph 1.4 of this report.

The results of the test as stated in this report, are exclusively applicable to the product items as identified in this report. Telefication accepts no responsibility for any properties of product items in this test report, which are not supported by the tests as specified in paragraph 1.4 *"Applicable standards"*.

Assessment is performed by:

Name : Koray Korcum, MSc

Review of assessment methods and report by:

Name : Roy van Barneveld

The above conclusions have been verified by the following signatory:

Date : 21-02-2023

Name : R. van Barneveld

Function : Test engineer

Signature :



2 SAR exclusion Evaluation

2.1 Transmitter specifications

Transmitter 1

Variable (unit)	Value	Symbol
Conducted time-averaged output power (mW)	8.128	P
Time-averaged output power ERP (mW)	12.48	P_{ERP}
Operating frequency range (MHz)	2402	f
Separation distance (cm)	2	d
Separation distance (m)	0.02	R

Transmitter 2

Variable (unit)	Value	Symbol
Conducted time-averaged output power (mW)	8.128	P
Time-averaged output power ERP (mW)	12.48	P_{ERP}
Operating frequency range (MHz)	2402	f
Separation distance (cm)	2	D
Separation distance (m)	0.02	R

Note1: Since the EUT using the pre-certified radio modules with dedicated antenna, RF power values taken from the certification of the radio module (report number RF191225C12-1 with FCC ID: QOQ-GM220P).

Note2: EUT contains of two identical radio module and can be use simultaneously.

2.2 Evaluation calculations

Transmitter 1

Transmitter 1 is evaluated according to method B of KDB 447498 D04 v01

Method B:

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

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:

$P_{th} = 38.52 \text{ mW}$

P or $P_{ERP} = 12.48 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR based exemption requirement.

Transmitter 2

Transmitter 2 is evaluated according to method B of KDB 447498 D04 v01

Method B:

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

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:

$P_{th} = 38.52 \text{ mW}$

P or $P_{ERP} = 12.48 \text{ mW}$ which is less than the calculated P_{th} so the EUT complies with the SAR 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.

$$\frac{12.48}{38.52} + \frac{12.48}{38.52} = 0.64 \leq 1$$

2.3 Conclusion

Since the EUT does not cause exposure in excess of the general population limit, no additional mitigation actions are required.