

Report on the FCC and IC Testing of the Siemens Healthcare GmbH

Model: 10096788

In accordance with
FCC 47 CFR Part 1.1310 and Part 2.1093 &
ISED RSS-GEN Issue 5, section 3.4 and ISED RSS-102,
Issue 5, section 2.5

Prepared for: Siemens Healthcare GmbH
Henri-Dunant-Str. 50
91058 Erlangen



Product Service

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Date: 2022-07-28

Document Number: TR-43516-07324-25 | Issue: 05

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Michael Ingerl	2022-07-28	 SIGN-ID 681054
Authorised Signatory	Matthias Stumpe	2022-07-28	 SIGN-ID 681340

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 1.1310 and Part 2.1093 & ISED RSS-GEN Issue 5, section 3.4 and ISED RSS-102, Issue 5, section 2.5. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	
Testing	Michael Ingerl	2022-07-28	 SIGN-ID 681054

Laboratory Accreditation
DAkkS Reg. No. D-PL-11321-11-02
DAkkS Reg. No. D-PL-11321-11-03

Laboratory recognition
Registration No. BNetzA-CAB-16/21-15

ISED Canada test site registration
3050A-2

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 1.1310 and Part 2.1093 & ISED RSS-GEN Issue 5, section 3.4 and ISED RSS-102, Issue 5, section 2.5

Contains FCC ID: S5H-WRC3
IC: 267AO- WRC3

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Trade Register Munich
HRB 85742
VAT ID No. DE129484267
Information pursuant to Section 2(1)
DL-InfoV (Germany) at
www.tuev-sued.com/im

Managing Directors:
Walter Reithmaier (CEO)
Dr. Jens Butenandt
Patrick van Welij

Phone: +49 (0) 9421 55 22-0
Fax: +49 (0) 9421 55 22-99
www.tuev-sued.de

TÜV SÜD Product Service GmbH
Äußere Frühlingstraße 45
94315 Straubing
Germany

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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	2022-03-07
2	Added "Contains FCC IC ID" Added at chapter 2.1.4 the antenna gain	2022-06-01
3	Changed Maximum Radiated Power at chapter 2.1.4	2022-06-08
4	Changed Maximum Radiated Power at chapter 2.1.4	2022-06-23
5	Changed Maximum Radiated Power at chapter 2.1.4 Changed Model Number (Misunderstanding)	2022-07-28

Table 1

1.2 Introduction

Applicant	Siemens Healthcare GmbH
Manufacturer	Siemens Healthcare GmbH
Model Number(s)	10096788
Serial Number(s)	11193
Hardware Version(s)	00
Software Version(s)	VA00E
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 1.1310 and Part 2.1093 & ISED RSS-GEN Issue 5, section 3.4 and ISED RSS-102, Issue 5, section 2.5
Test Plan/Issue/Date	---
Order Number	5422660
Date of Receipt of EUT	2021-03-12
Start of Test	2022-07-22
Finish of Test	2022-07-22
Name of Engineer(s)	Michael Ingerl
Related Document(s)	KDB 447498 D01 General RF Exposure Guidance v06 ANSI C63.10 (2013)



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 1.1310 and Part 2.1093 & ISED RSS-GEN Issue 5, section 3.4 and ISED RSS-102, Issue 5, section 2.5 is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: 24V DC Power supply – Transmitting continuously				
2.1	1.1310	Exposure of Humans to RF Fields	Pass	KDB 447498 D01 v06

Table 2

1.4 Basic information of EUT

Equipment characteristics	
Type designation:	10096788
Type of equipment:	WRC NRF Receiver cpl.
Application ¹ :	Wideband transmission systems
Equipment class:	Equipment for fixed use
Kind of equipment	Transceiver
Frequency band:	3 b
Frequency range:	2400 – 2483.5 MHz
Channel spacing:	Wideband
Number of RF channels	40
Antenna:	Siemens PCB Antenna
Antenna gain:	2.2 dBi
Highest internal frequency:	22.1148 MHz
Temperature Range:	10 C to 40 C
Power supply:	DC Power supply
	Nominal: 24 V
	Minimum: 19.2 V
	Maximum: 28.8 V
	Nominal frequency: DC

¹ Classification according to CEPT/ERC Recommendation 70-03

1.5 EUT Modification Record

The table below details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	Not Applicable	Not Applicable
1	Software Setting of RF Output set to 0dBm	Customer	2022-07-20

Table 3

1.6 Test Location

TÜV SÜD Product Service conducted the following tests at our Straubing Test Laboratory.

Test Name	Name of Engineer(s)
Configuration and Mode: 24V DC Power supply – Transmitting continuously	
Exposure of Humans to RF Fields	Michael Ingerl

Table 4

Office Address:

Äußere Frühlingstraße 45
94315 Straubing
Germany



2 Test Details

2.1 Exposure of Humans to RF Fields

2.1.1 Specification Reference

FCC 47 CFR Part 1.1310 and Part 2.1093 &
ISED RSS-GEN Issue 5, section 3.4 and ISED RSS-102, Issue 5, section 2.5
KDB 447498 D01 General RF Exposure Guidance v06, chapter 4.3.1

2.1.2 Equipment Under Test and Modification State

10096788, S/N: 11193 - Modification State 1

2.1.3 Date of Test

2022-07-22

2.1.4 Evaluation Results

acc. to KDB 447498 D01:

Maximum Radiated Power (EIRP) Pmax:

1.65 dBm = 1.46 mW

(See at TR-43516-07324-13 plus antenna gain 2.2 dB_i)

Compliance Boundary d:

5 mm

Frequency f:

2480 MHz = 2.480 GHz

Numeric Threshold (Pmax / d) (f)^{0.5}

0.46

Numeric Threshold Limit (1 g SAR):

3.00

ISED RSS-GEN Issue 5, section 3.2 and ISED RSS-102, Issue 5, section 2.5 :

Exposure of Humans to RF Fields		Applicable	Declared by applicant	Measured	Exemption
The antenna is					
<input type="checkbox"/> detachable					
The conducted output power (CP in watts) is measured at the antenna connector: $CP =$					
The effective isotropic radiated power (EIRP in watts) is calculated using <input type="checkbox"/> the numerical antenna gain: $G =$ $EIRP = G \cdot CP \Rightarrow EIRP =$					
<input type="checkbox"/> the field strength ² in V/m: $FS = \dots \text{V/m}$ $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP = \text{mW}$ with: Distance between the antennas in m: $D = \text{mm}$					
<input checked="" type="checkbox"/> not detachable					
A field strength measurement is used to determine the effective isotropic radiated power (EIRP in watts) given by: $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP = \text{mW}$ (See at TR-43516-07324-13 plus antenna gain 2.2 dBi)					
with: Field strength in V/m: $FS =$ $=$ Distance between the two antennas in m: $D =$					
Selection of output power					
The output power TP is the higher of the conducted or effective isotropic radiated power (e.i.r.p.): $TP = 1.46 \text{ mW}$					

² The conversion formula is valid only for properly matched antennas. In other cases the transmitter output power may have to be measured by a terminated measurement when applying the exemption clauses. If an open area test site is used for field strength measurement, the effect due to the metal ground reflecting plane should be subtracted from the maximum field strength value in order to reference it to free space, before calculating TP.



Exposure of Humans to RF Fields (continued)		Applicable	Declared by applicant	Measured	Exemption
Separation distance between the user and the transmitting device is					
<input checked="" type="checkbox"/> less than or equal to 20 cm		<input type="checkbox"/> greater than 20 cm		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Transmitting device is					
<input type="checkbox"/> in the vicinity of the human head		<input type="checkbox"/> body-worn		<input type="checkbox"/>	<input type="checkbox"/>

SAR evaluation										
Frequency (MHz)	Exemption limits (mW) ³ at separation distance of									
	≤5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	≥50 mm
450	52	70	88	106	123	141	159	177	195	213
835	17	30	42	55	67	80	92	105	117	130
1900	7	10	18	34	60	99	153	225	316	431
2450	4	7	15	30	52	83	123	173	235	309
3500	2	6	16	32	55	86	124	170	225	290
5800	1	6	15	27	41	56	71	85	97	106
Carrier frequency:	$f = 2480 \text{ MHz}$									
Distance:	$d = 5 \text{ mm}$									
Transmitter output power:	$TP = 1.46 \text{ mW}$									
Limit:	$TP_{limit} = 4.00 \text{ mW}$									

³ The exemption limit in the table are based on measurements and simulations on half-wave dipole antennas at separation distances of 5 mm to 25 mm from a flat phantom, providing a SAR value of approximately 0.4 W/kg for 1 g of tissue. For low frequencies (300 MHz to 835 MHz), the exemption limits are derived from a linear fit. For high frequencies (1900 MHz and above), the exemption limits are derived from a third order polynomial fit.

3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Radio Testing			
Test Name	kp	Expanded Uncertainty	Note
Occupied Bandwidth	2.0	$\pm 1.14 \%$	2
RF-Frequency error	1.96	$\pm 1 \cdot 10^{-7}$	7
RF-Power. conducted carrier	2	$\pm 0.079 \text{ dB}$	2
RF-Power uncertainty for given BER	1.96	$+0.94 \text{ dB} / -1.05$	7
RF power. conducted. spurious emissions	1.96	$+1.4 \text{ dB} / -1.6 \text{ dB}$	7
RF power. radiated			
25 MHz – 4 GHz	1.96	$+3.6 \text{ dB} / -5.2 \text{ dB}$	8
1 GHz – 18 GHz	1.96	$+3.8 \text{ dB} / -5.6 \text{ dB}$	8
18 GHz – 26.5 GHz	1.96	$+3.4 \text{ dB} / -4.5 \text{ dB}$	8
40 GHz – 170 GHz	1.96	$+4.2 \text{ dB} / -7.1 \text{ dB}$	8
Spectral Power Density. conducted	2.0	$\pm 0.53 \text{ dB}$	2
Maximum frequency deviation			
300 Hz – 6 kHz	2	$\pm 2.89 \%$	2
6 kHz – 25 kHz	2	$\pm 0.2 \text{ dB}$	2
Maximum frequency deviation for FM	2	$\pm 2.89 \%$	2
Adjacent channel power 25 MHz – 1 GHz	2	$\pm 2.31 \%$	2
Temperature	2	$\pm 0.39 \text{ K}$	4
(Relative) Humidity	2	$\pm 2.28 \%$	2
DC- and low frequency AC voltage			
DC voltage	2	$\pm 0.01 \%$	2
AC voltage up to 1 kHz	2	$\pm 1.2 \%$	2
Time	2	$\pm 0.6 \%$	2

Table 5

Radio Interference Emission Testing			
Test Name	kp	Expanded Uncertainty	Note
Conducted Voltage Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
100 kHz to 200 MHz (50Ω/5µH AMN)	2	± 3.6 dB	1
Discontinuous Conducted Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
Conducted Current Emission			
9 kHz to 200 MHz	2	± 3.5 dB	1
Magnetic Fieldstrength			
9 kHz to 30 MHz (with loop antenna)	2	± 3.9 dB	1
9 kHz to 30 MHz (large-loop antenna 2 m)	2	± 3.5 dB	1
Radiated Emission			
Test distance 1 m (ALSE)			
9 kHz to 150 kHz	2	± 4.6 dB	1
150 kHz to 30 MHz	2	± 4.1 dB	1
30 MHz to 200 MHz	2	± 5.2 dB	1
200 MHz to 2 GHz	2	± 4.4 dB	1
2 GHz to 3 GHz	2	± 4.6 dB	1
Test distance 3 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 5.0 dB	1
1 GHz to 6 GHz	2	± 4.6 dB	1
Test distance 10 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 4.9 dB	1
Radio Interference Power			
30 MHz to 300 MHz	2	± 3.5 dB	1
Harmonic Current Emissions			4
Voltage Changes. Voltage Fluctuations and Flicker			4

Table 6

Immunity Testing			
Test Name	kp	Expanded Uncertainty	Note
Electrostatic Discharges			4
Radiated RF-Field			
Pre-calibrated field level	2	+32.2 / -24.3 %	5
Dynamic feedback field level	2.05	+21.2 / -17.5 %	3
Electrical Fast Transients (EFT) / Bursts			4
Surges			4
Conducted Disturbances. induced by RF-Fields			
via CDN	2	+15.1 / -13.1 %	6
via EM clamp	2	+42.6 / -29.9 %	6
via current clamp	2	+43.9 / -30.5 %	6
Power Frequency Magnetic Field	2	+20.7 / -17.1 %	2
Pulse Magnetic Field			4
Voltage Dips. Short Interruptions and Voltage Variations			4
Oscillatory Waves			4
Conducted Low Frequency Disturbances			
Voltage setting	2	\pm 0.9 %	2
Frequency setting	2	\pm 0.1 %	2
Electrical Transient Transmission in Road Vehicles			4

Table 7

Note 1:

The expanded uncertainty reported according to CISPR 16-4-2:2003-11 is based on a standard uncertainty multiplied by a coverage factor of kp = 2. providing a level of confidence of p = 95.45%

Note 2:

The expanded uncertainty reported according to UKAS Lab 34 (Edition 1. 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2. providing a level of confidence of p = 95.45%

Note 3:

The expanded uncertainty reported according to UKAS Lab 34 (Edition 1. 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2.05. providing a level of confidence of p = 95.45%

Note 4:

It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95%confidence.

Note 5:

The expanded uncertainty reported according to IEC 61000-4-3 is based on a standard uncertainty multiplied by a coverage factor of kp = 2. providing a level of confidence of p = 95.45%

Note 6:

The expanded uncertainty reported according to IEC 61000-4-6 is based on a standard uncertainty multiplied by a coverage factor of kp = 2. providing a level of confidence of p = 95.45%

Note 7:

The expanded uncertainty reported according ETSI TR 100 028 V1.4.1 (all parts) to is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96. providing a level of confidence of p = 95.45%

Note 8:

The expanded uncertainty reported according to ETSI TR 102 273 V1.2.1 (all parts) is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96. providing a level of confidence of p = 95.45%