Radio Testing of the

Masimo Masimo Wireless Charger

In accordance with

# 47CFR15.205, 47CFR15.207, 47CFR15.209 and RSS-216 Issue 2 January 2016

Masimo 52 Discovery Irvine, CA 92618

### COMMERCIAL-IN-CONFIDENCE

Date: June 2022 Document Number: 72180289D Issue 01 | Version Number: 01

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Authorized Signatory	Omar Castillo	June 20, 2022	How Constates

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

#### **EXECUTIVE SUMMARY**

The EUT in general was confirmed to be in compliance with 47CFR15.205 ,47CFR15.207, 47CFR15.209 and RSS-216 Issue 2 January 2016.



A2LA Cert. No. 2955.13

#### DISCLAIMER AND COPYRIGHT

This report has been prepared by TÜV SÜD America with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD America. No part of this document may be reproduced without the prior written approval of TÜV SÜD America. © 2016 TÜV SÜD America.

ACCREDITATION

Our A2LA Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our A2LA Accreditation.

TÜV SÜD America, Inc. 10040 Mesa Rim Road San Diego, CA 92121-2912 TÜV SÜD America, Inc. Rancho Bernardo Facility 16936 Via Del Campo San Diego, CA 92127

Phone: 858 678 1400 www.tuv-sud-america.com





TÜV®



TÜV SÜD America Inc., 10040 Mesa Rim Road, San Diego, CA 92121 Tel: (858) 678-1400. Website: <u>www.TUVamerica.com</u>

**REPORT ON** 

Radio Testing of the Masimo Masimo Wireless Charger

**TEST REPORT NUMBER** 

72180289D

TEST REPORT DATE

PREPARED FOR

CONTACT PERSON

June 2022

Masimo 52 Discovery Irvine, CA 92618

Alex Chang Senior Manager, EMC (949) 405-3950 alex.chang@masimo.com

PREPARED BY

Ferdinand S. Custodio Name Authorized Signatory Title: Senior EMC Test Engineer / Wireless Team Lead

Honor Cook the

**Omar Castillo** 

APPROVED BY

Name Authorized Signatory Title: Senior EMC/Wireless Test Engineer

DATED

June 10, 2022



TÜV SÜD America Inc., 10040 Mesa Rim Road, San Diego, CA 92121 Tel: (858) 678-1400. Website: <u>www.TUVamerica.com</u>

### **Revision History**

72180289D Masimo Masimo Wireless Charger					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
06/20/2022		Initial Release			Omar Castillo



## CONTENTS

#### Section

### Page No

1	REPORT SUMMARY	4
1.1	Introduction	5
1.2	Brief Summary Of Results	6
1.3	Product Information	7
1.5	Deviations From The Standard	10
1.6	Modification Record	10
1.7	Test Methodology	10
1.8	Test Facility Location	10
1.9	Test Facility Registration	10
2	TEST DETAILS	12
2.1	Conducted Limits (AC Conducted Emissions Verifications)	13
2.2	Radiated Emission Limits (Radiated Emissions Verification)	17
2.3	Transmitter 20 dB Bandwidth	20
3	TEST EQUIPMENT USED	23
3.1	Test Equipment Used	24
3.2	Measurement Uncertainty	25
4	DIAGRAM OF TEST SETUP	26
4.1	Test Setup Diagram	27
5	ACCREDITATION, DISCLAIMERS AND COPYRIGHT	29
5.1	Accreditation, Disclaimers and Copyright	



### **SECTION 1**

### **REPORT SUMMARY**

Radio Testing of the Masimo Masimo Wireless Charger



#### 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Masimo Wireless Charger to the requirements of 47CFR15.205 and Innovation, Science and Economic Development Canada RSS-Gen.

Objective	To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the test specification, for the series of tests carried out.	
Manufacturer	Masimo	
Model Name	Masimo Wireless Charger	
Model Number(s)	28671	
Serial Number(s)	N/A	
Number of Samples Tested	1	
FCC ID	VKF-MASIW1CG	
IC Number	7362A-MASIW1CG	
Highest Frequency Generated or Used	190kHz	
Test Specification/Issue/Date	<ul> <li>47CFR15.205, 47CFR15.207 and 47CFR15.209 (October 1, 2021)</li> <li>RSS-216 Issue 2 January 2016 Wireless Power Transfer Devices</li> <li>ICES-001 Issue 5 July 2020 Industrial, Scientific and Medical (ISM) Equipment</li> <li>RSS-Gen Issue 5 April 2018 General Requirements for Compliance of Radio Apparatus</li> </ul>	
Start of Test	May 26, 2022	
Finish of Test	June 11, 2022	
Name of Engineer(s)	Ferdinand Custodio	
Related Document(s)	None. Supporting documents for EUT certification are separate exhibits.	



#### 1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with 47CFR15.205, 47CFR15.207 and 47CFR15.209 with cross-reference to Innovation, Science and Economic Development Canada RSS-216 Issue 2 January 2016 is shown below:

Part 15	RSS-Gen	Test Description	Result	Comments/ Base Standard
§15.207(a)	Clause 8.8	Conducted Limits	Compliant	RSS-216 and ICES-001
§15.209(a)	Clause 8.9	Radiated Emission Limits	Compliant	RSS-216 and ICES-001
§15.215(c)	Clause 6.7	Transmitter 20 dB Bandwidth	For Reference Only	

There are no emissions observed associated with the WPT operation, only the fundamental and during radiated emissions verification only. The EUT as a whole is verified against the general limits of §15.207/209 and RSS-Gen to address the modulation on the power transfer frequency for transmitting intelligent communication.



#### 1.3 **PRODUCT INFORMATION**

#### 1.3.1 EUT General Description

The Equipment Under Test (EUT) was a Masimo Wireless Charger as shown in the photograph below. The EUT is a 190kHz wireless charger designed to charge the manufacturer's W1 Wrist Worn Device.



EUT



### 1.3.1 EUT General Description

EUT Description	Masimo Wireless Charger
Model Number(s)	28671
Rated Voltage	5VDC via USB
Primary Unit (EUT)	Production
	⊠ Pre-Production
WPT Classification (RSS-216)	Type 1 (Interference-causing Equipment)
	Type 2 (Category II)
	⊠ Type 3 (Category I)
Frequency (Capability)	190 kHz Inductive
Mode Verified	190 kHz Inductive
Size	33.64 mm diameter x 9.42 mm height
Weight	31g with ferrite



#### 1.4 EUT TEST CONFIGURATION

#### 1.4.1 Test Configuration Description

Test Configuratio	n Description
Default	EUT is continuously charging a depleted (<15% charge level) W1 Wrist Worn Device (Watch)

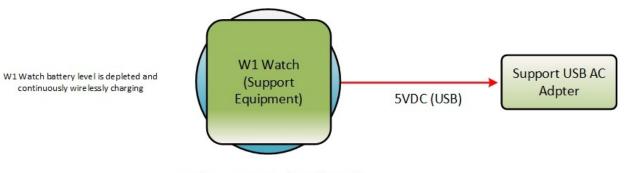
#### 1.4.2 EUT Exercise Software

None

#### 1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
GlobTek, Inc.	Support USB AC Adapter (representative only)	Model: GTM41078-0605-USB P/N WR9QA1200USBNMEDRVW Output: 5V@1.2A
Lenovo	Support Laptop for E/H Field Analyzer	Model: Thinkpad T440S Serial Number: PC-03BBGR

#### 1.4.4 Simplified Test Configuration Diagram



EUT (Masimo Wireless Charger)



#### 1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

#### 1.6 MODIFICATION RECORD

Description of Modifications	Modification Fitted By	Date Modification Fitted		
Serial Number: N/A				
None	—	—		

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

#### 1.7 TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

For conducted and radiated emissions, the equipment under test (EUT) was configured to measure its highest possible emission level. This level was based on the maximized cable configuration from exploratory testing per ANSI C63.10-2013. The test modes were adapted according to the Operating Instructions provided by the manufacturer/client.

#### 1.8 TEST FACILITY LOCATION

#### 1.8.1 TÜV SÜD America Inc. (Mira Mesa)

10040 Mesa Rim Road, San Diego, CA 92121-2912 (32.901268,-117.177681). Phone: (858) 678-1400 Fax: (858) 546-0364.

#### 1.8.2 TÜV SÜD America Inc. (Rancho Bernardo)

16936 Via Del campo, San Diego, CA 92127-1708 (33.018644,-117.092409). Phone: (858) 678-1400 Fax: (858) 546-0364.

#### **1.9 TEST FACILITY REGISTRATION**

#### 1.9.1 FCC – Designation No.: US1146

TÜV SÜD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.948 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Designation is US1146.



## 1.9.2 Innovation, Science and Economic Development Canada (ISED) Registration No.: 3067A-1 & 22806-1

The 10m Semi-anechoic chamber of TÜV SÜD America Inc. (San Diego Rancho Bernardo) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 3067A-1.

The 3m Semi-anechoic chamber of TÜV SÜD America Inc. (San Diego Mira Mesa) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 22806-1.

#### 1.9.3 BSMI – Laboratory Code: SL2-IN-E-028R (US0102)

TÜV Product Service Inc. (San Diego) is a recognized EMC testing laboratory by the BSMI under the MRA (Mutual Recognition Arrangement) with the United States. Accreditation includes CNS 13438 up to 6GHz.

#### 1.9.4 NCC (National Communications Commission - US0102)

TÜV SÜD America Inc. (San Diego) is listed as a Foreign Recognized Telecommunication Equipment Testing Laboratory and is accredited to ISO/IEC 17025 (A2LA Certificate No.2955.13) which under APEC TEL MRA Phase 1 was designated as a Conformity Assessment Body competent to perform testing of equipment subject to the Technical Regulations covered under its scope of accreditation including RTTE01, PLMN01 and PLMN08 for TTE type of testing and LP0002 for Low-Power RF Device type of testing.

#### 1.9.5 VCCI – Registration No. A-0280 and A-0281

TÜV SÜD America Inc. (San Diego) is a VCCI registered measurement facility which includes radiated field strength measurement, radiated field strength measurement above 1GHz, mains port interference measurement and telecommunication port interference measurement.

#### 1.9.6 RRA – Identification No. US0102

TÜV SÜD America Inc. (San Diego) is National Radio Research Agency (RRA) recognized laboratory under Phase I of the APEC Tel MRA.

#### 1.9.7 OFCA – U.S. Identification No. US0102

TÜV SÜD America Inc. (San Diego) is recognized by Office of the Communications Authority (OFCA) under Appendix B, Phase I of the APEC Tel MRA.



### **SECTION 2**

### **TEST DETAILS**

Radio Testing of the Masimo Masimo Wireless Charger



#### 2.1 CONDUCTED LIMITS (AC CONDUCTED EMISSIONS VERIFICATIONS)

#### 2.1.1 Specification Reference

Part 15 Subpart C §15.207(a) and RSS-Gen Clause 8.8

#### 2.1.2 Standard Applicable

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

	Conducted limit (dBµV)		
Frequency of emission (MHz)	Quasi-peak	Average	
0.15–0.5	66 to 56*	56 to 46*	
0.5–5	56	46	
5–30	60	50	

\*Decreases with the logarithm of the frequency.

#### 2.1.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

#### 2.1.4 Date of Test/Initial of test personnel who performed the test

June 03, 2022 / FSC

#### 2.1.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

#### 2.1.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Mira Mesa facility

Ambient Temperature	21.9 °C
Relative Humidity	45.0 %
ATM Pressure	100.3 kPa



#### 2.1.7 Additional Observation

Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.1.8 for sample computation.

#### 2.1.8 Sample Computation (Conducted Emission – Quasi Peak)

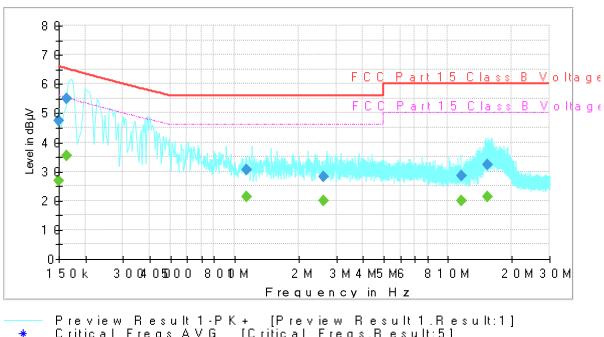
Measuring equipment raw measurement (dbµV) @ 150kHz			5.5
Correction Factor (dB)	Asset# 8607 (20 dB attenuator)	19.9	20.7
	Asset# 1177 (cable)	0.15	
	Asset# 1176 (cable)	0.35	
	Asset# 7568 (LISN)	0.30	
Reported QuasiPeak Final Measurement (dbµV) @ 150kHz			26.2

#### 2.1.9 Test Results

Compliant. See attached plots and tables.



#### 2.1.10 Representative USB AC Adapter Line 1



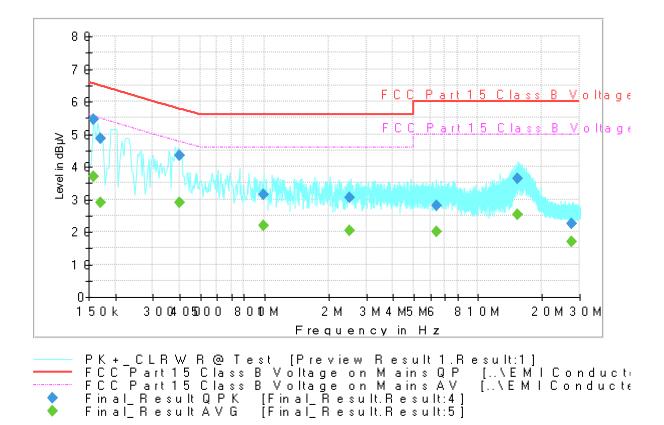
Full Spectrum

 Preview Result 1-PK+ [Preview Result 1.Result:1]
 Critical\_Freqs AVG [Critical\_Freqs.Result:5]
 FCC Part 15 Class B Voltage on Mains QP [..\EMI Conduct( FCC Part 15 Class B Voltage on Mains AV [..\EMI Conducte Final\_Result QPK [Final\_Result.Result:4]
 Final\_Result AVG [Final\_Result.Result:5]

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit - QPK (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	47.39		66.00	18.61	1000.0	9.000	L1	20.6
0.150000		26.76	56.00	29.24	1000.0	9.000	L1	20.6
0.163500	54.93		65.23	10.30	1000.0	9.000	L1	20.5
0.163500		35.50	55.22	19.72	1000.0	9.000	L1	20.5
1.143500		21.45	46.00	24.55	1000.0	9.000	L1	20.4
1.143500	30.69		56.00	25.31	1000.0	9.000	L1	20.4
2.631500		19.99	46.00	26.01	1000.0	9.000	L1	20.4
2.631500	28.13		56.00	27.87	1000.0	9.000	L1	20.4
11.554000		19.96	50.00	30.04	1000.0	9.000	L1	20.5
11.554000	28.36		60.00	31.64	1000.0	9.000	L1	20.5
15.401000		21.32	50.00	28.68	1000.0	9.000	L1	20.8
15.401000	32.28		60.00	27.72	1000.0	9.000	L1	20.8

FCC ID: VKF-MASIW1CG IC: 7362A-MASIW1CG Report No. 72180289D





### 2.1.11 Representative USB AC Adapter Line 2

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit - QPK (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.159000		36.95	55.47	18.52	1000.0	9.000	L2	20.6
0.159000	54.44		65.48	11.04	1000.0	9.000	L2	20.6
0.171000		28.83	54.81	25.98	1000.0	9.000	L2	20.5
0.171000	48.59		64.83	16.24	1000.0	9.000	L2	20.5
0.399000		28.79	47.73	18.94	1000.0	9.000	L2	20.4
0.399000	43.36		57.75	14.39	1000.0	9.000	L2	20.4
0.994005		21.74	46.00	24.26	1000.0	9.000	L2	20.4
0.994005	31.27		56.00	24.73	1000.0	9.000	L2	20.4
2.508983		20.21	46.00	25.79	1000.0	9.000	L2	20.5
2.508983	30.37		56.00	25.63	1000.0	9.000	L2	20.5
6.409563		19.98	50.00	30.02	1000.0	9.000	L2	20.5
6.409563	28.11		60.00	31.89	1000.0	9.000	L2	20.5
15.391473		25.26	50.00	24.74	1000.0	9.000	L2	20.8
15.391473	36.37		60.00	23.63	1000.0	9.000	L2	20.8
27.534880		16.97	50.00	33.03	1000.0	9.000	L2	20.8
27.534880	22.58		60.00	37.42	1000.0	9.000	L2	20.8



#### 2.2 RADIATED EMISSION LIMITS (RADIATED EMISSIONS VERIFICATION)

#### 2.2.1 Specification Reference

Part 15 Subpart C §15.209(a) and RSS-Gen Clause 8.9

### 2.2.2 Standard Applicable

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency of emission (MHz)	Field Strength (microvolts/meter)
0.009-0.490	2400/F(kHz) @ 300 meters
0.490-1.705	24000/F(kHz) @ 30 meters
1.705-30.0	30 @ 30 meters
30-88	100 (40.0 dBµV/m @ 3 meters)
88-216	150 (43.5 dBµV/m @ 3 meters)
216-960	200 (46.0 dBµV/m @ 3 meters)
Above 960	500 (54.0 dBµV/m @ 3 meters)

#### 2.2.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

#### 2.2.4 Date of Test/Initial of test personnel who performed the test

June 06, 2022 / FSC

#### 2.2.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

#### 2.2.6 Environmental Conditions (Mira Mesa Facility)

Ambient Temperature	23.1°C
Relative Humidity	28.3 %
ATM Pressure	100.1kPa



#### 2.2.7 Additional Observations

- The spectrum was searched up to 30MHz covering 10x of the fundamental (190kHz).
- The EUT complies with RSS-Gen general field strength limits (only limit presented). There
  are no emissions observed associated with the WPT that are subject to ICES-001 limits other
  than the fundamental. The WPT fundamental complies with the ICES-001 limits with 24.82dB
  margin (64.48dBµV/m measured against 89.3dBµV/m limit).
- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.2.8 for sample computation.

#### 2.2.8 Sample Computation (Radiated Emission)

Measuring equipment raw meas	24.4		
	Asset# 1066 (cable)	0.3	
	Asset# 1172 (cable)	0.3	
Correction Factor (dB)	Asset# 1016 (preamplifier)	-30.7	-12.6
	Asset# 1175(cable)	0.3	
	Asset# 1002 (antenna)	17.2	
Reported QuasiPeak Final Me		11.8	

#### 2.2.9 Test Results

Compliant. See attached plot and table.



#### Full Spectrum 130 120 110 100 90-FCC Part 15.209 Electric Field Strength 3m 80-Level in dBµV/m 70-60 Why Ardenny 50 40 • 30-20-10 0-9k 20 30 50 100k 200 300 500 1M 2M 3M 5M 10M 20 30M Frequency in Hz

#### 2.2.10 **Below 30MHz Radiated Emission**

Preview Result 1V-PK+ [Preview Result 1V.Result:2] FCC Part 15.209 Electric Field Strength 3m [..\EMI Radiated\] Final\_Result QPK [Final\_Result.Result4]

#### Quasi-Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)
0.018789	64.28	122.12	57.84	1000.0	0.200	80.0	Н	352.0	22
0.066543	55.20	111.14	55.94	1000.0	0.200	80.0	Н	185.0	20
0.182500	64.48	102.38	37.89	1000.0	9.000	80.0	Н	88.0	20
0.550490	44.21	72.79	28.58	1000.0	9.000	80.0	Н	53.0	20
0.918540	35.41	68.34	32.93	1000.0	9.000	80.0	Н	53.0	20
1.970767	26.08	69.50	43.42	1000.0	9.000	80.0	Н	33.0	20
14.543423	33.90	69.50	35.61	1000.0	9.000	80.0	Н	263.0	22
29.983060	27.03	69.50	42.47	1000.0	9.000	80.0	Н	214.0	25



#### 2.3 TRANSMITTER 20 DB BANDWIDTH

#### 2.3.1 Specification Reference

Part 15 Subpart C §15.215(c) and and RSS-Gen Clause 6.7

#### 2.3.2 Standard Applicable

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

#### 2.3.3 Equipment Under Test and Modification State

Serial No: N/A / Default Test Configuration

#### 2.3.4 Date of Test/Initial of test personnel who performed the test

June 11, 2022 / FSC

#### 2.3.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

#### 2.3.6 Environmental Conditions (Mira Mesa Facility)

Ambient Temperature	27.8°C
Relative Humidity	29.7%
ATM Pressure	100.1kPa

#### 2.3.7 Additional Observations

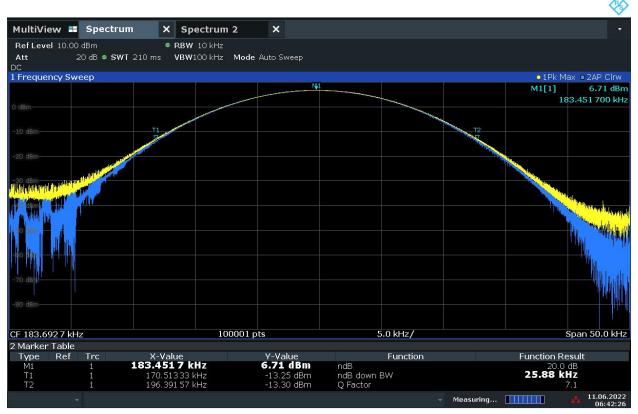
- 20dB data presented is for reference only as the EUT does not operate under §§ 15.217 through 15.257 and in subpart E of Part 15.
- Standard RBW for band is used (10kHz, Spectrum Analyzer limitation) as 1% to 5% RBW rule for OBW measurement is not practical at the measurement frequency.



#### 2.3.8 Test Results

Frequency	20dB Bandwidth	99% OBW
190 kHz	25.88 kHz	22.02 kHz

#### 2.3.9 Test Result Plots



06:42:26 11.06.2022

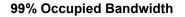
20dB Bandwidth

#### FCC ID: VKF-MASIW1CG IC: 7362A-MASIW1CG Report No. 72180289D





06:41:36 11.06.2022





### **SECTION 3**

### **TEST EQUIPMENT USED**



#### 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

ID Number (SDGE/SDRB)	Test Equipment	Туре	Serial Number	Manufacturer	Cal Date	Cal Due Date			
AC Conducted	AC Conducted Emissions								
1049	EMI Test Receiver	ESU40	100133	Rohde & Schwarz	10/01/21	10/01/22			
7567	LISN	FCC-LISN- 50-25-2-10	120304	Fischer Custom Comm.	03/28/22	03/28/23			
8870	Bi-Directional Attenuator	34-20-34	BP8030	MCE / Weinschel	02/28/22	02/28/23			
Radiated Emiss	sions								
6628	Loop Antenna	HFH 2 –Z2	880 458/25	Rohde & Schwarz	5/22/20	06/22/22			
Miscellaneous									
7619	Barometer/ Temperature/Humidity Transmitter	iBTHX-W	15250268	Omega	05/27/22	05/27/23			
	Test Software	EMC32	V10.50.40	Rohde & Schwarz	N/	A			



#### 3.2 MEASUREMENT UNCERTAINTY

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

#### 3.2.1 AC Conducted Emissions

	Input Quantity (Contribution) Xi	Value		Prob. Dist.	Divisor	ui(x)	ui(x)2		
1	Receiver reading	0.10	dB	Normal, k=1	1.000	0.10	0.01		
2	LISN-receiver attenuation	0.10	dB	Normal, k=2	2.000	0.05	0.00		
3	LISN voltage division factor	0.30	dB	Normal, k=2	2.000	0.15	0.02		
4	Receiver sinewave accuracy	0.36	dB	Normal, k=2	2.000	0.18	0.03		
5	Receiver pulse amplitude	1.50	dB	Rectangular	1.732	0.87	0.75		
6	Receiver pulse repetition rate	1.50	dB	Rectangular	1.732	0.87	0.75		
7	Noise floor proximity	0.00	dB	Rectangular	1.732	0.00	0.00		
8	AMN VDF frequency interpolation	0.10	dB	Rectangular	1.732	0.06	0.00		
9	Mismatch	0.07	dB	U-shaped	1.414	0.05	0.00		
10	LISN impedance	2.65	dB	Triangular	2.449	1.08	1.17		
11	Effect of mains disturbance	0.00	dB			0.00	0.00		
12	Effect of the environment								
	Combined standard uncertainty			Normal	1.66	dB			
	Expanded uncertainty			Normal, k=2	3.31	dB			

#### 3.2.2 Radiated Emission Measurements (Below 30MHz)

	Input Quantity (Contribution) Xi	Value		Prob. Dist.	Divisor	ui(x)	ui(x)2
1	Receiver reading	0.10	dB	Normal, k=1	1.000	0.10	0.01
2	Attenuation: antenna-receiver	0.20	dB	Normal, k=2	2.000	0.10	0.01
3	Antenna factor AF	0.44	dB	Normal, k=2	2.000	0.22	0.05
4	Receiver sinewave accuracy	0.15	dB	Normal, k=2	2.000	0.08	0.01
5	Receiver pulse amplitude	1.50	dB	Rectangular	1.732	0.87	0.75
6	Receiver pulse repetition rate	1.50	dB	Rectangular	1.732	0.87	0.75
7	Noise floor proximity	0.50	dB	Rectangular	1.732	0.29	0.08
8	Mismatch: antenna-receiver	0.95	dB	U-shaped	1.414	0.67	0.45
9	AF frequency interpolation	0.30	dB	Rectangular	1.732	0.17	0.03
10	AF height deviations	0.10	dB	Rectangular	1.732	0.06	0.00
11	Directivity difference at 10 m	3.12	dB	Rectangular	1.732	1.80	3.24
12	Phase center location at 10 m	1.00	dB	Rectangular	1.732	0.58	0.33
13	Cross-polarisation	0.90	dB	Rectangular	1.732	0.52	0.27
14	Balance	0.00	dB	Rectangular	1.732	0.00	0.00
15	Site imperfections	0.00	dB	Triangular	2.449	0.00	0.00
16	Separation distance at 10 m	0.30	dB	Rectangular	1.732	0.17	0.03
17	Effect of setup table material	0.00	dB	Rectangular	1.732	0.00	0.00
18	Table height at 10 m	0.10	dB	Normal, k=2	2.000	0.05	0.00
19	Near-field effects	0.00	dB	Triangular	2.449	0.00	0.00
20	Effect of ambient noise on OATS	0.00	dB				0.00
	Combined standard uncertainty			Normal	2.45	dB	
	Expanded uncertainty			Normal, k=2	4.91	dB	



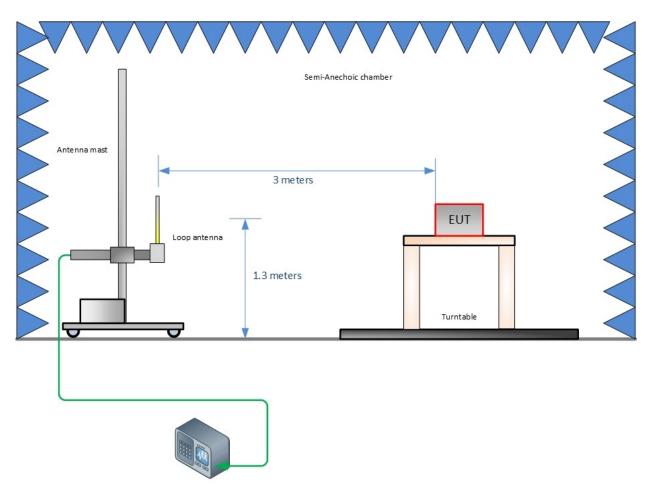
### **SECTION 4**

### **DIAGRAM OF TEST SETUP**

FCC ID: VKF-MASIW1CG IC: 7362A-MASIW1CG Report No. 72180289D



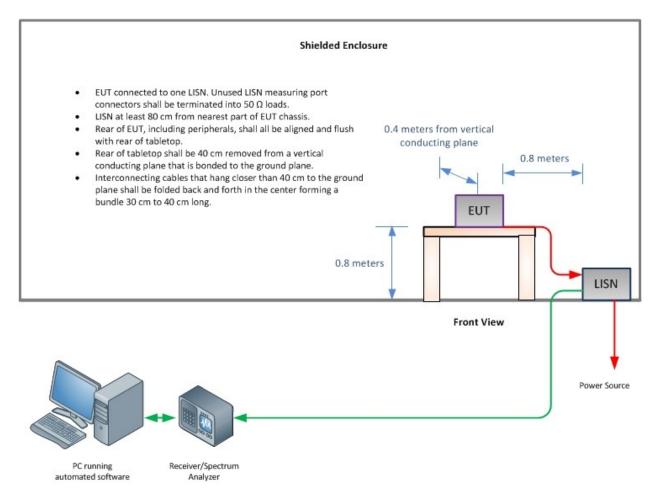
#### 4.1 TEST SETUP DIAGRAM



Receiver/Spectrum Analyzer

Radiated Emission Test Setup (Below 30MHz)





#### **Conducted Emission Test Setup**



### **SECTION 5**

### ACCREDITATION, DISCLAIMERS AND COPYRIGHT



#### 5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

TÜV SÜD America Inc.'s reports apply only to the specific sample tested under stated test conditions. It is the manufacturer's responsibility to assure the continued compliance of production units of this model. TÜV SÜD America, Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America, Inc.'s issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and TÜV SÜD America, Inc., extracts from the test report shall not be reproduced, except in full without TÜV SÜD America, Inc.'s written approval.

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal government.

TÜV SÜD America, Inc. and its professional staff hold government and professional organization certifications for AAMI, ACIL, AEA, ANSI, IEEE, A2LA, NIST and VCCI.

