





EMC TEST REPORT FCC CFR Title 47 / Chapter I / Subchapter A / Part 15 / Subpart B ISED ICES-003 Issue 7	
Report Reference No	G0M-2405-2567-EF0115B-V02
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	    <p> A2LA - Registration number: 1983.01 (ISED) ISED wireless device testing laboratory: CN 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970 </p>
Applicant	SREINER-Optik GmbH
Address	Dr.-Hans-Frisch-Str. 9 95448 Bayreuth Germany
Test Specification Standard(s)	FCC CFR Title 47 / Chapter I / Subchapter A / Part 15 / Subpart B ISED ICES-Gen Issue 1 ; Amendment 1 (February 2021) ISED ICES-003 Issue 7 ANSI C63.4:2014+A1:2017
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Scope with Bluetooth and Display
Model(s)	STEINER eRanger8 2-16x50
Additional Model(s)	None
Brand Name(s)	N/A
Hardware Version(s)	v1.0; CYBLE-416045-02
Software Version(s)	v0.0.16
FCC-ID	2BDTF-EP8
IC	33789-EP8
Test Result	PASSED

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	N/R	
required by standard but not appl. to test object	N/A	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Date of receipt of test item	2024-06-19	
Report:		
Compiled by	Muhammad Samik Farhat	
Tested by (+ signature) (Responsible for Test)	Muhammad Samik Farhat	
Approved by (+ signature) (Senior EMC Technician)	Matthias Handrik	
Date of Issue	2025-05-19	
Total number of pages	33	
General Remarks:		
<p>The test results presented in this report relate only to the object tested.</p> <p>The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p>		
<p>Statement concerning the uncertainty of the measurement systems used for decisions on conformity (decision rule):</p> <p>The Decision Rule is applied on the basis of CISPR 16-4-2 and/or IEC 61000-4-x (TR 61000-1-6) and their national publications. These standards provide guidance on how to calculate and apply measurement uncertainty whilst providing maximum uncertainties allowance. In all cases due consideration will be given to ILAC-G8:09/2019.</p> <p>Compliance or non-compliance with a disturbance limit is determined in the following manner.</p> <ul style="list-style-type: none"> - If U_{lab} is less than or equal to U_{cispr}, then: compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit. - If U_{lab} is greater than U_{cispr}, then: compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit; non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit. <p>Where appropriate for the test, for example for EMC pulsed immunity tests, the laboratory has demonstrated, by calibrating its equipment and facilities, that it complies with the above requirements and therefore no allowance of uncertainties has been given to the tolerances.</p>		
Additional Comments:		
None		

Additional Variants (Not tested and Not evaluated variants)		
Not-tested Variant	Description	
1	Product Type Description	Scope with Bluetooth and Display
	Model name	STEINER eRanger8 3-24x56
	Brand name	N/A
	Hardware Version	v1.0; CYBLE-416045-02
	Software Version	v0.0.16
2	Product Type Description	Scope with Bluetooth and Display
	Model name	STEINER eRanger8 4-32x56
	Brand name	N/A
	Hardware Version	v1.0; CYBLE-416045-02
	Software Version	v0.0.16
3	Product Type Description	Scope with Bluetooth and Display
	Model name	STEINER ePredator8 3-24x50
	Brand name	N/A
	Hardware Version	v1.0; CYBLE-416045-02
	Software Version	v0.0.16
4	Product Type Description	Scope with Bluetooth and Display
	Model name	STEINER ePredator8 2-16x42
	Brand name	N/A
	Hardware Version	v1.0; CYBLE-416045-02
	Software Version	v0.0.16
Comment: Those named additional variants above have not been tested. Those additional variants of the series have been declared by the manufacturer. The test report explicitly states that those variants were neither tested nor assessed nor evaluated.		

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
T _{NOM}	Nominal operating temperature
V _{NOM}	Nominal supply voltage

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2024-11-06	Initial Release	-
02	2025-05-19	Replaced document: G0M-2405-2567-EF0115B-V01 Replaced by: G0M-2405-2567-EF0115B-V02 Changes: Page 1 and 7: • Add FCC-ID and IC	St. Liebich

REPORT INDEX

1	Equipment (Test Item) Under Test.....	7
1.1	Equipment Ports.....	8
1.2	Equipment Photos - Internal.....	9
1.3	Equipment Photos - External.....	11
1.4	Support Equipment.....	18
1.5	Operational Modes.....	19
1.6	EUT Configuration.....	19
1.7	Sample emission level calculation.....	20
2	Result Summary.....	21
2.1	Test Conditions and Results - Radiated emissions acc. to ANSI C63.4.....	22
3	Measurement Uncertainty	33

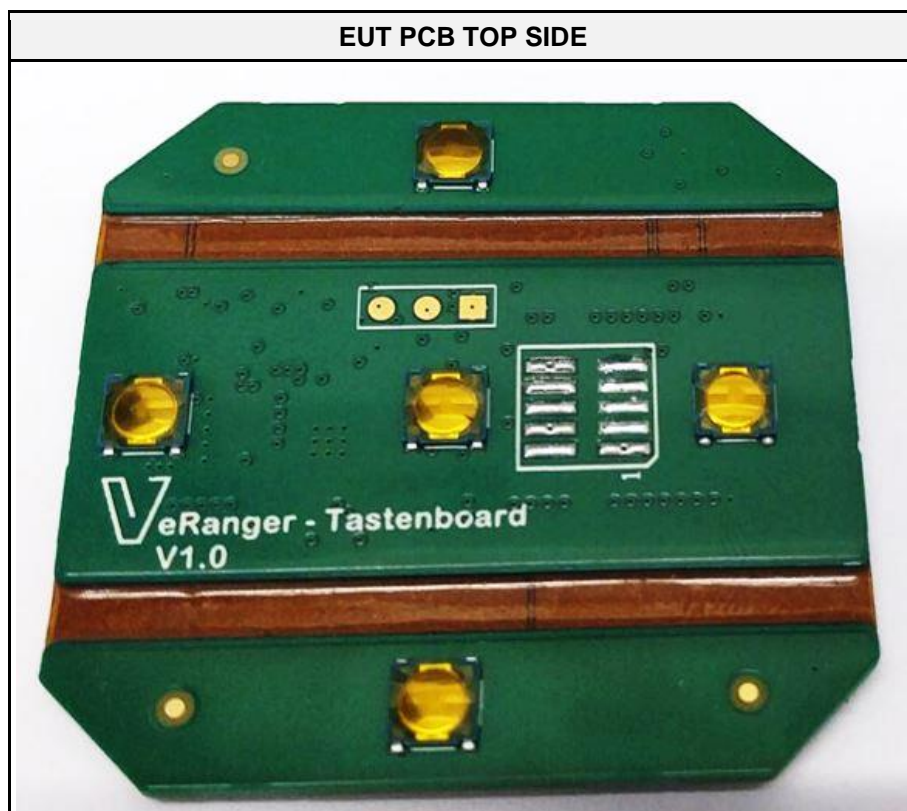
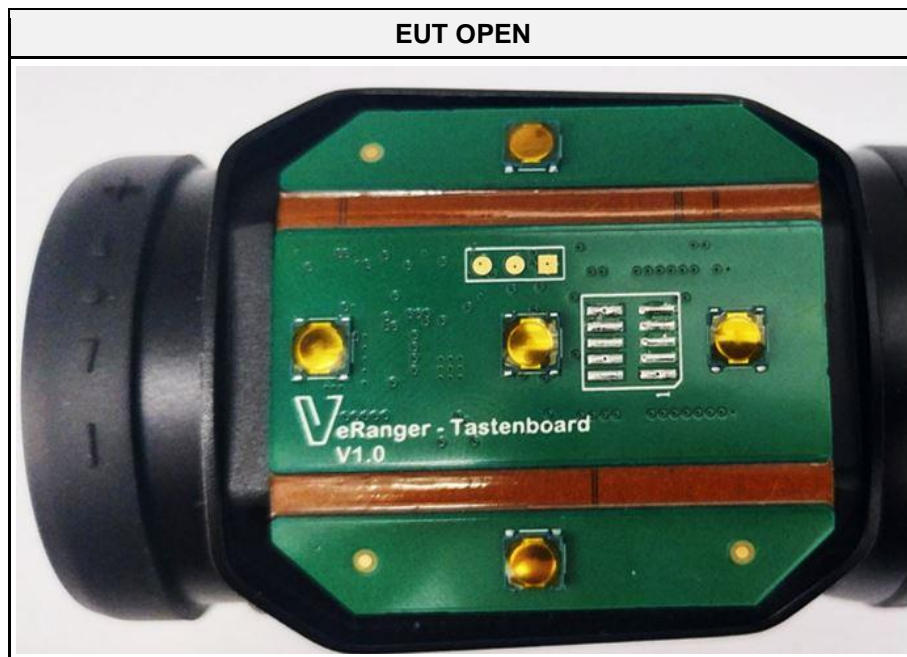
1 Equipment (Test Item) Under Test

Description	Scope with Bluetooth and Display		
Intended Use	The eRanger 8's technology allows to shoot accurately, even at long distances and in the most difficult conditions. Thanks to the advanced connectivity with the Steiner Connect App 2.0, the eRanger 8 becomes an intelligent companion on every hunt. With the app there can easily save personal ballistic data and make individual adjustments for a wide range of hunting situations.		
Model	STEINER eRanger8 2-16x50		
Additional Model(s)	None		
Brand Name(s)	N/A		
Hardware Version(s)	v1.0; CYBLE-416045-02		
Software Version(s)	v0.0.16		
Number of tested samples	1		
Sample Identification	EUT #	Sample-ID	Serial Number
	EUT 1	48944	2540300136
EUT Dimensions [cm]	35 x 10.2 x 6.8		
FCC-ID	2BDTF-EP8		
IC	33789-EP8		
Class	Class B		
Equipment type	Table top		
Highest internal frequency [MHz]	48 (Clock) 2483.5 (RF frequency)		
Protective Earth	No		
Functional Earth	No		
Radio Module	Type	Bluetooth Low Energy Module	
	Model	CYBLE-416045-02	
	Manufacturer	Infineon	
	FCC-ID	WAP6045	
	IC	7922A-6045	
Supply Voltage	V _{NOM}	3.0 V DC via non-rechargeable Lithium CR123A battery	
Manufacturer	Infineon Technologies AG Am Campeon 1-15 85579 Neubiberg Germany		

1.1 Equipment Ports

Name	Type	Attributes	Comment
None			
Description:			
AC	AC mains power input/output port		
DC	DC power input/output port		
BAT	DC power input port connected to external battery		
IO	Input/Output port		
TP	Telecommunication port		
NE	Non-electrical port		
GND	Functional Earth		

1.2 Equipment Photos - Internal



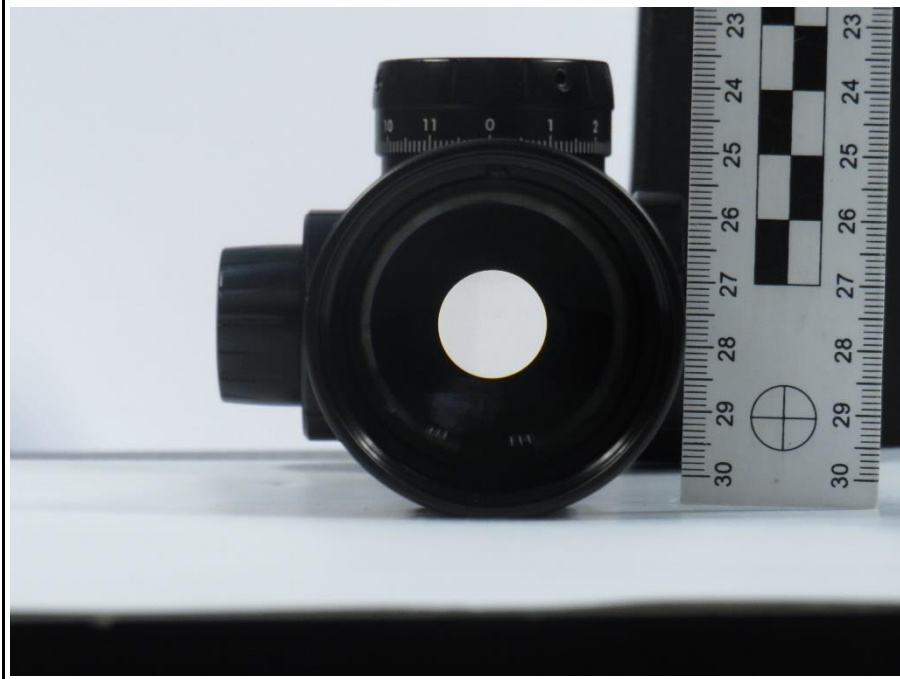
EUT PCB BOTTOM SIDE



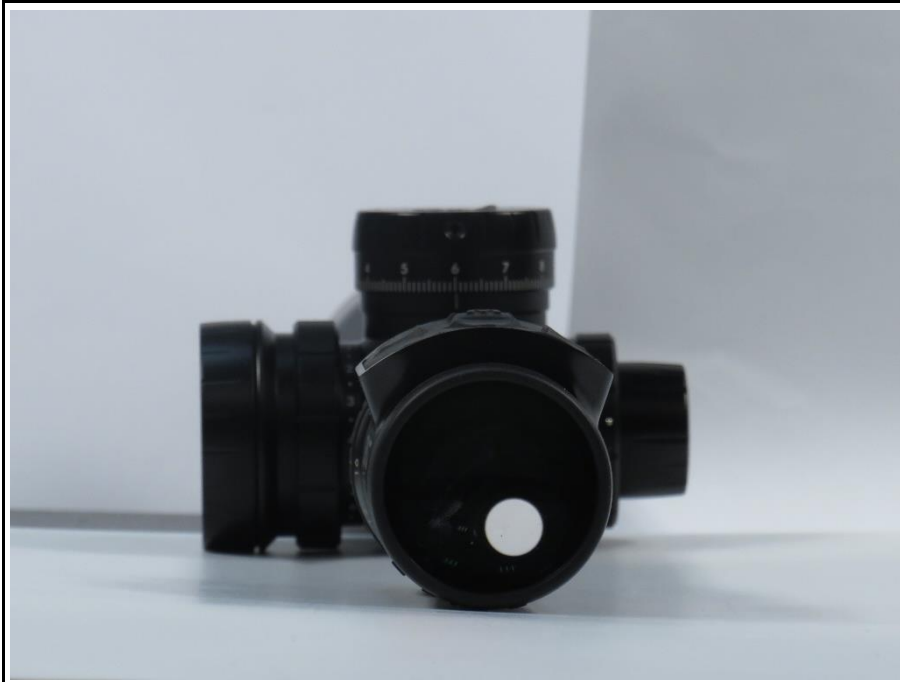
1.3 Equipment Photos - External



EUT FRONT SIDE



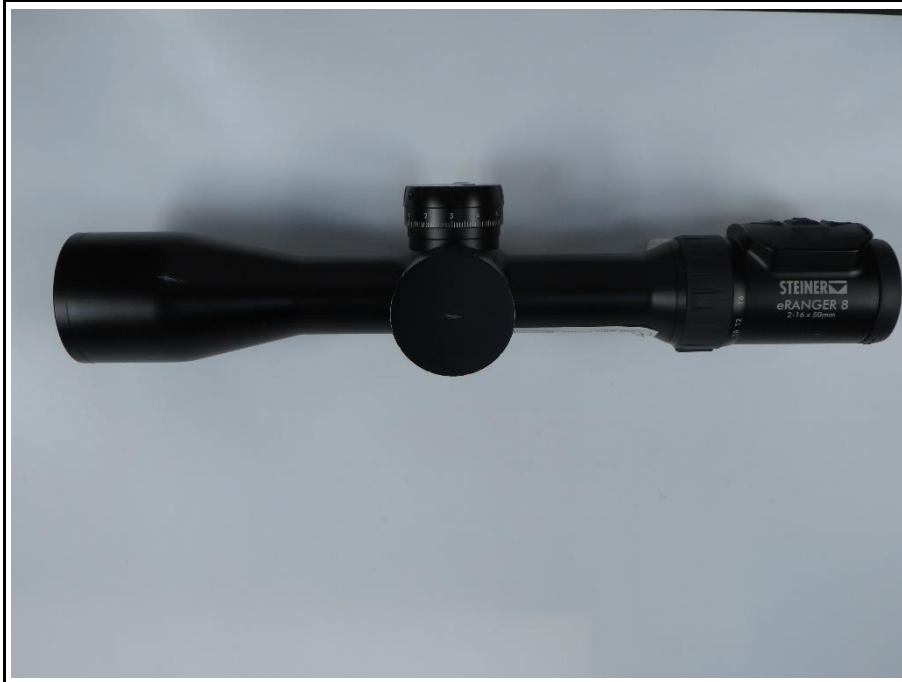
EUT REAR SIDE



EUT RIGHT SIDE



EUT LEFT SIDE



EUT TOP SIDE



EUT BOTTOM SIDE



EUT LABEL I



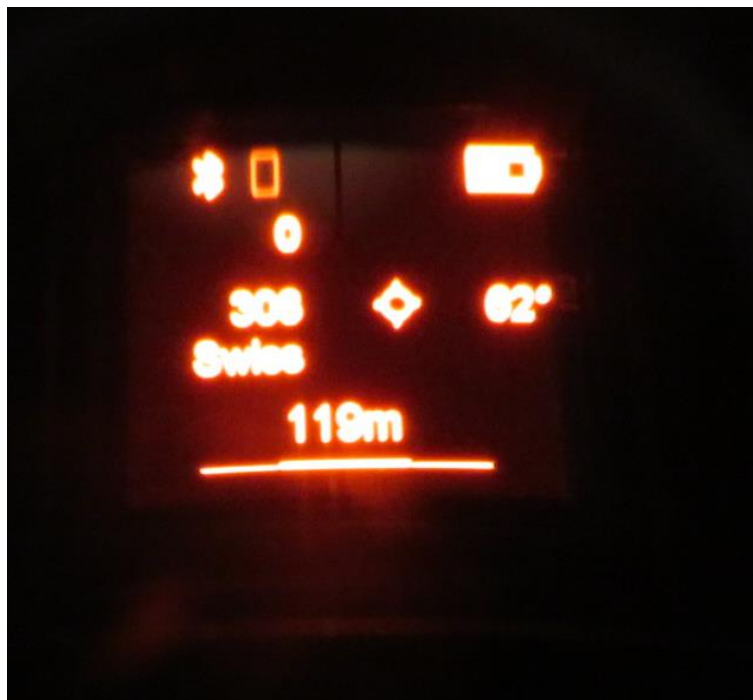
EUT LABEL II



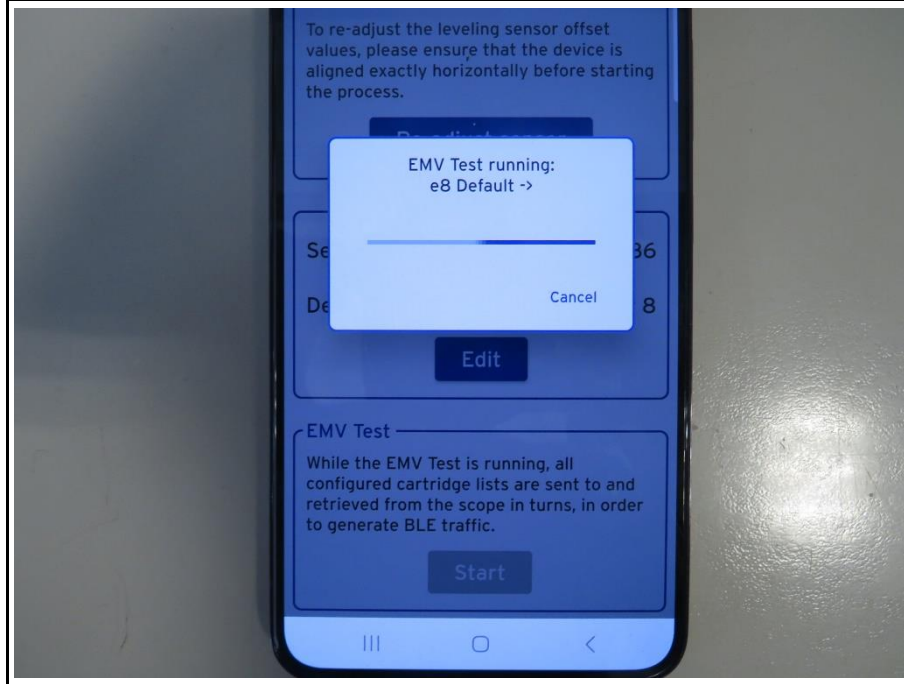
EUT WITH ALL ACCESSORIES



EUT SCOPE DISPLAY



CONTINUOUS DATA TRANSMIT FROM EUT- SOFTWARE DISPLAY



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
MON	Smartphone	Samsung	Samsung S7	Customer Support Equipment SN: R5CW2BBTQB
SW	Application	STEINER-Optik GmbH	Steiner Connect 2.0	Customer Support Equipment Version: 0.0.15-19
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
SW	Software			
Comment: None				

1.5 Operational Modes

Mode #	Description
1	EUT is connected via Bluetooth Low Energy to Smartphone. EUT is sending permanent status information (ballistic data) to Smartphone via Bluetooth Low Energy connection.
Comment: None	

1.6 EUT Configuration

Configuration #	Description
1	EUT powered with 3 V DC via non-rechargeable CR123A battery.
Comment: None	

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyser in dBµV. Any external preamplifiers used are taken into account through internal analyser settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyser. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyser (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log(\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dBµV + 26 dB/m	= 47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

Title 47 CFR Part 15B, ISED ICES-003 Issue 7				
Reference	Requirement	Reference Method	Result	Remarks
Emission				
FCC 15.109 ICES-003, 3.2.2	Radiated emissions	ANSI C63.4:2014 +A1:2017	PASS	None
FCC 15.107 ICES-003, 3.2.1	AC power line conducted emissions	ANSI C63.4:2014 +A1:2017	N/R	No relevant port
Comment: None				

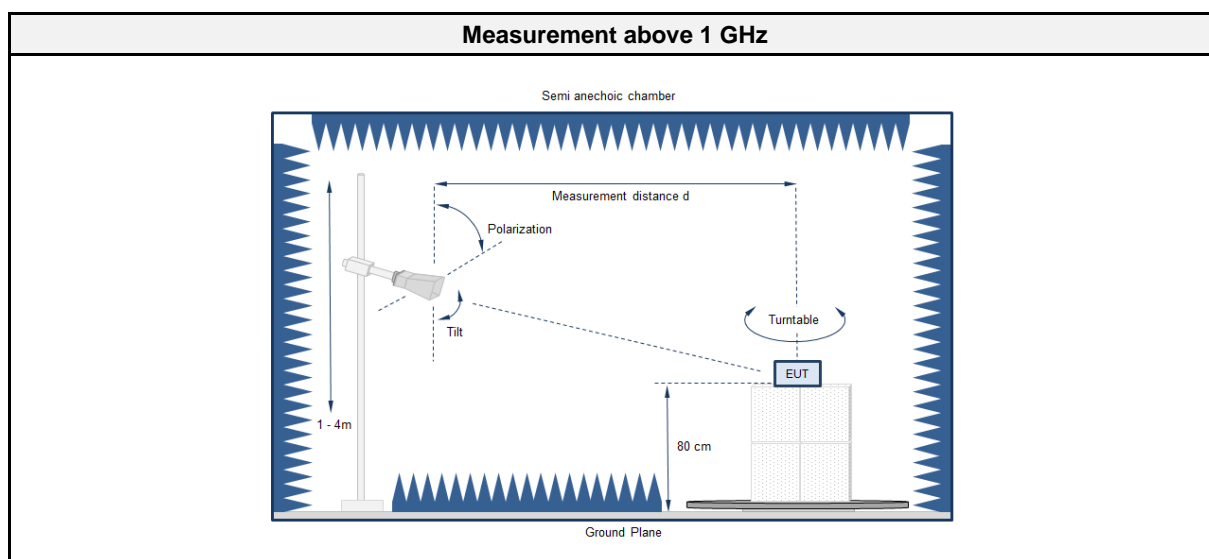
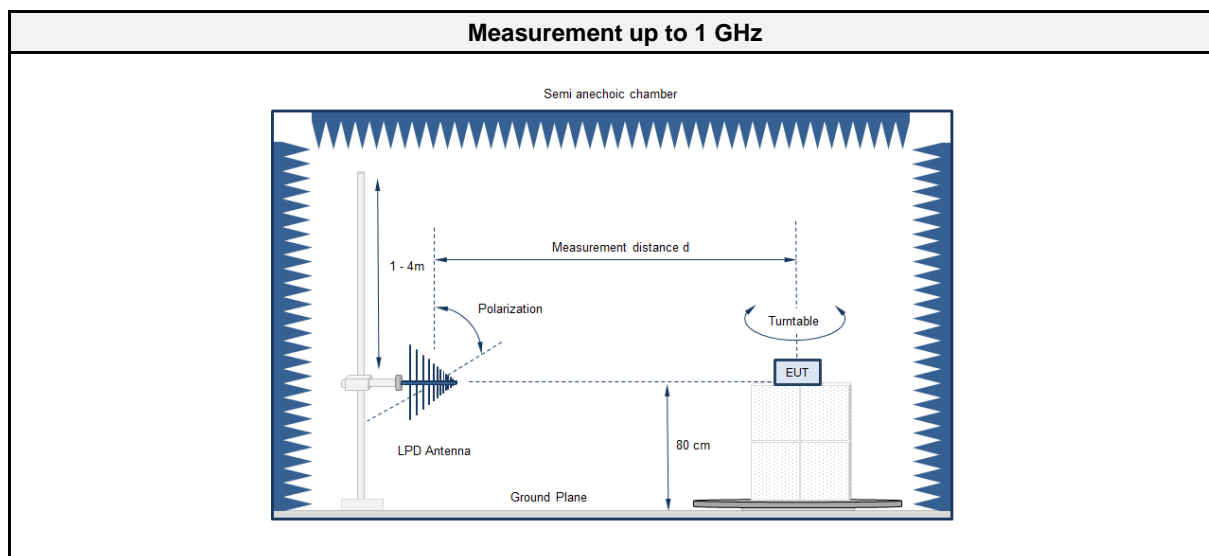
Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

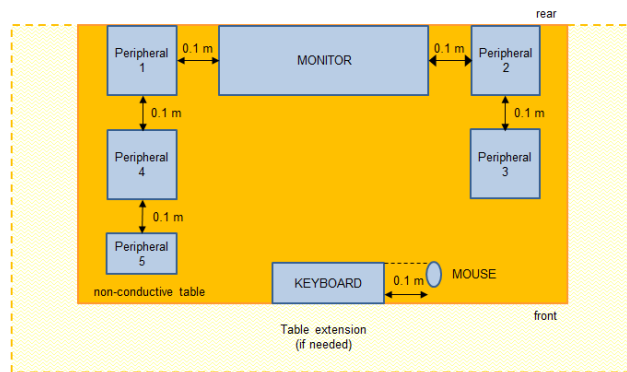
2.1.1 Information

Test Information	
Reference	FCC 15.109, ICES-003, 3.2.2
Reference method	ANSI C63.4 Section 8
Equipment class	Class B
Equipment type	Table top
Highest internal frequency [MHz]	2483.5 MHz
Measurement range	30 MHz to 13000 MHz
Temperature [°C]	22 ± 2
Humidity [%]	47 ± 3
Operator	Muhammad Samik Farhat
Date	2024-09-27
EUT #	EUT 1

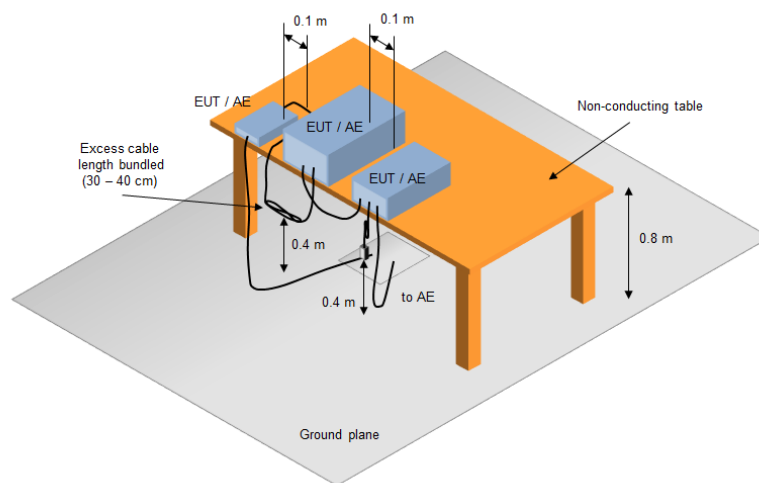
2.1.2 Setup *Table top*:



Equipment placement - Table top



Test Setup



2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2023.2.6

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-Anechoic chamber (NSA)	Frankonia Germany EMC Solutions GmbH	AC 1	EF00062	2024-07	2027-07
Semi-Anechoic chamber (SVSWR)	Frankonia Germany EMC Solutions GmbH	AC 1	EF01011	2024-07	2027-07
Test Receiver	Rohde & Schwarz GmbH & Co. KG - Vertrieb Berlin	ESW44	EF01856	2024-04	2025-04
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	EF01824	2022-10	2025-10
Horn antenna	Schwarzbeck	BBHA 9120D (1-18GHz)	EF00018	2022-12	2025-12
Temperature/Humidity Sensor	Embedded Data Systems, LLC.	OW-ENV-THR	EF01054	2023-07	2026-07

2.1.4 Procedure

Exploratory measurement Table top	
1.	The EUT was placed on a non-conductive table at a height of 0.8m.
2.	The EUT and support equipment, if needed, were set up to simulate typical usage.
3.	Cables, of type and length specified by the manufacturer, were connected to at least one port of each type and were terminated by a device or simulating load of actual usage.
4.	The antenna was placed at a distance of 3.
5.	The received signal was monitored at the measurement receiver.
6.	This procedure has to be performed in both antenna polarizations, horizontal and vertical.
7.	The arrangement of the equipment with the maximum emission level is shown on the setup picture at item 2.1.2

Final measurement 3m Table top	
1.	The EUT was placed on a 0.8 m non-conductive table at a 3 m distance from the receive antenna. The antenna output was connected to the measurement receiver.
2.	A broadband hybrid antenna was used for the frequency range 30 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast.
3.	The EUT and cable arrangement were based on the exploratory measurement results.
4.	Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded.
5.	The test data of the worst-case conditions were recorded and shown on the next pages.

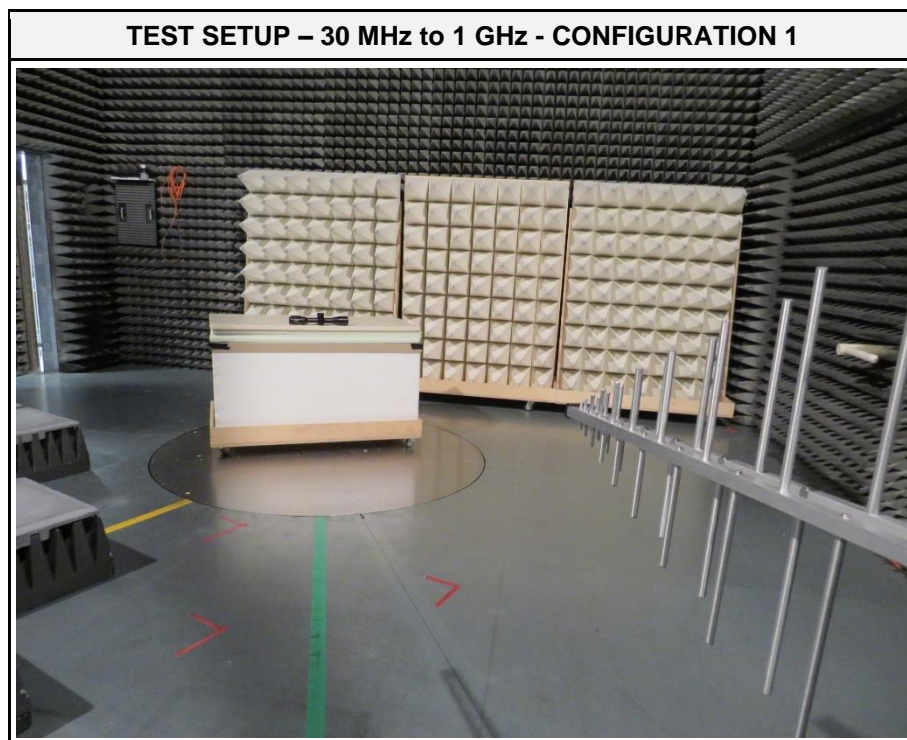
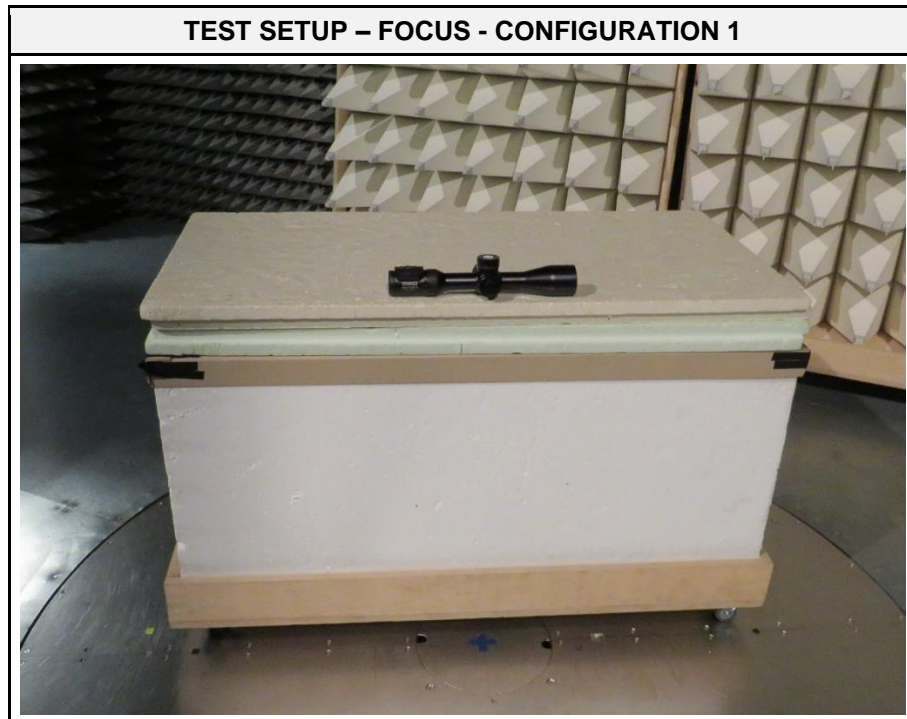
2.1.5 Limits

Class B @ 3 m		
Frequency [MHz]	Detector	Limit [dBμV/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak	74
	Average	54

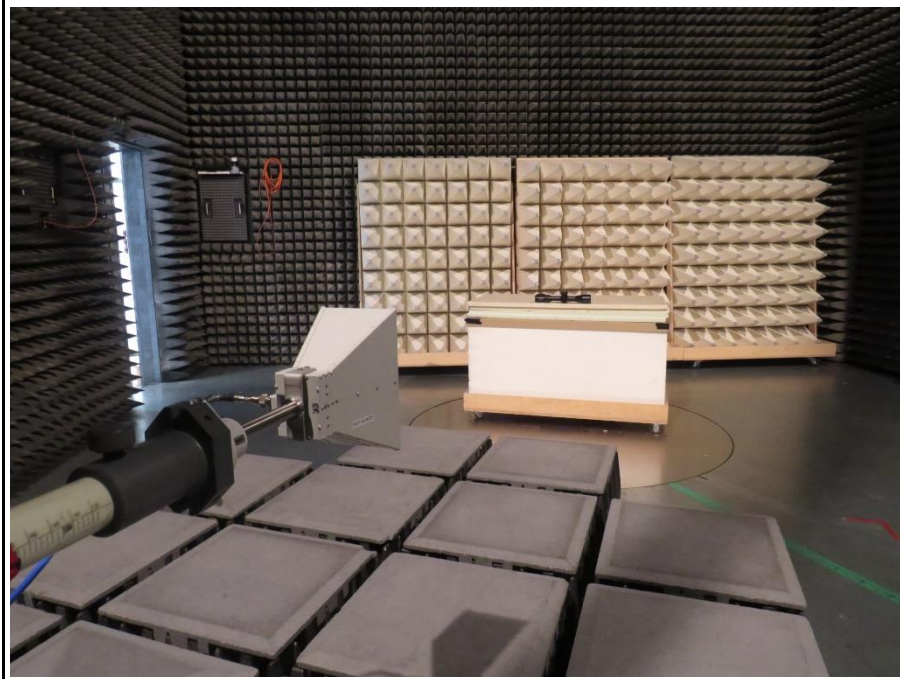
2.1.6 Results

Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	Battery Powered
Note: None			

2.1.7 Setup Photos

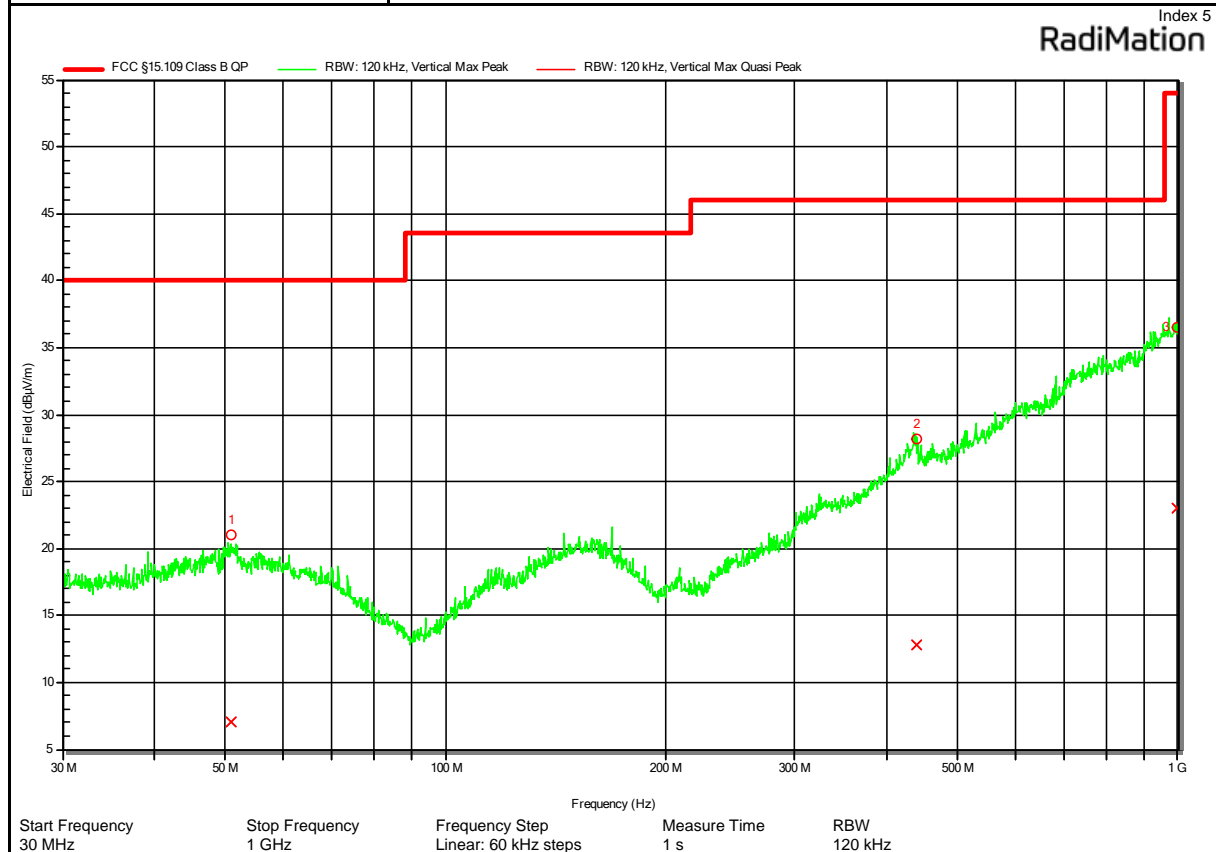


TEST SETUP – 1 GHz to 13 GHz - CONFIGURATION 1



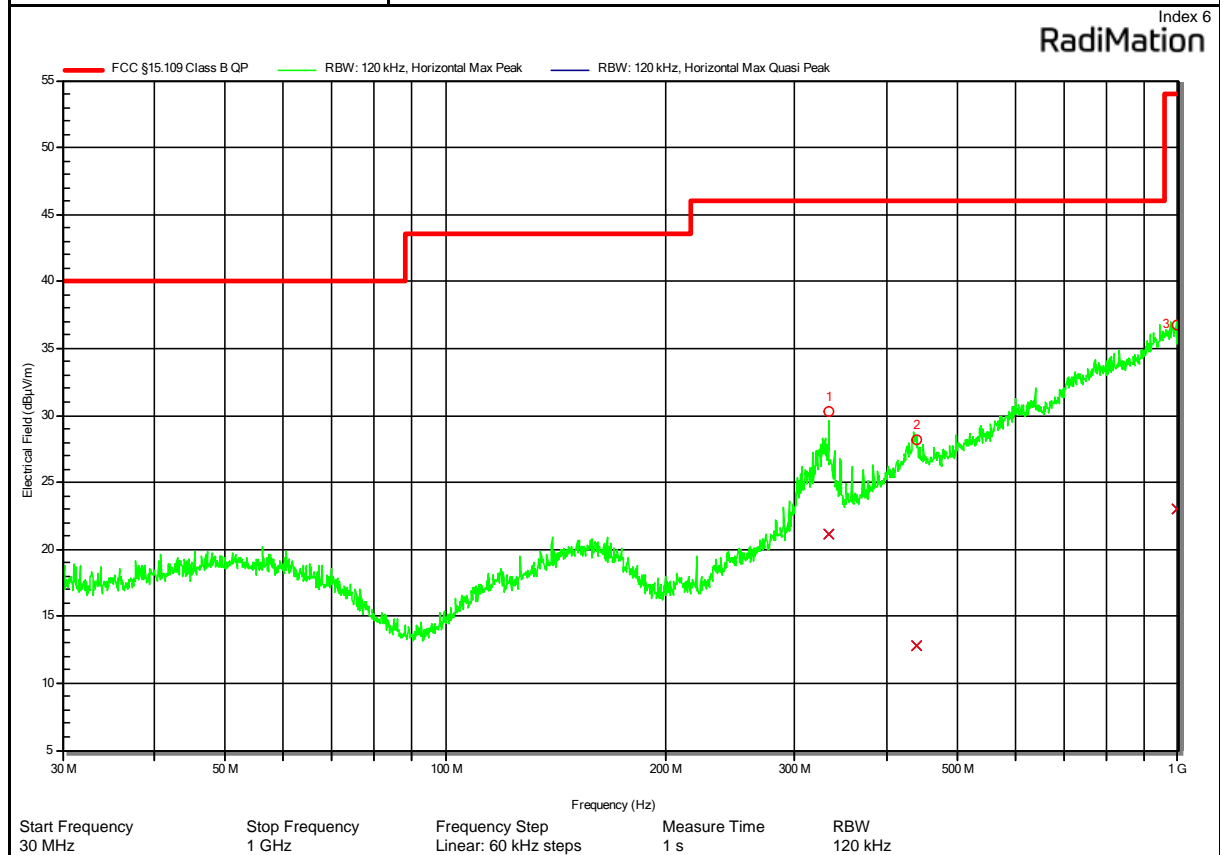
2.1.8 Records

Radiated emissions according to FCC part 15B	
Project Number:	G0M-2405-2567
Applicant:	STEINER-Optik GmbH
Model Description:	Scope with Bluetooth and Display
Model:	STEINER eRanger8 2-16x50
Test Sample ID:	48944
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Farhat
Test Date & Time:	2024-09-27
Operating Conditions:	ambient temperature: 24 °Celsius power input: 3 V DC
Antenna:	Schwarzbeck VULB 9168, Vertical
Measurement Distance:	3m
Operational Mode:	1
DUT Configuration:	1



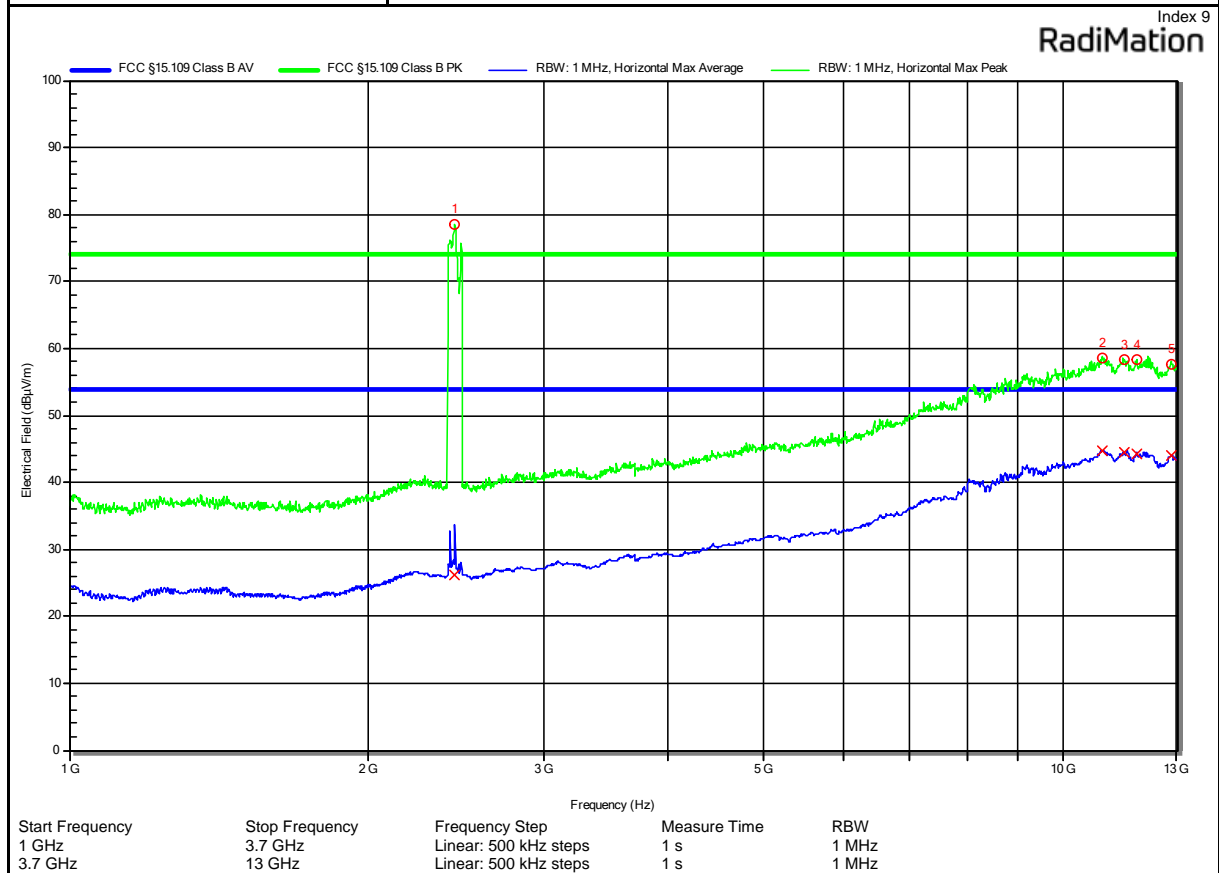
Peak Number	Frequency (MHz)	Quasi-Peak (dBµV/m)	Quasi-Peak Limit (dBµV/m)	Quasi-Peak Difference (dB)	Quasi-Peak Status	Angle (degrees)	Height (m)
1	50.88	7.1	40	-32.9	Pass	-48	1
2	439.62	12.85	46.02	-33.17	Pass	-48	1
3	996.9	23.02	54	-30.98	Pass	-48	1

Radiated emissions according to FCC part 15B	
Project Number:	G0M-2405-2567
Applicant:	STEINER-Optik GmbH
Model Description:	Scope with Bluetooth and Display
Model:	STEINER eRanger8 2-16x50
Test Sample ID:	48944
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Farhat
Test Date & Time:	2024-09-27
Operating Conditions:	ambient temperature: 24 °Celsius power input: 3 V DC
Antenna:	Schwarzbeck VULB 9168, Horizontal
Measurement Distance:	3m
Operational Mode:	1
DUT Configuration:	1



Peak Number	Frequency (MHz)	Quasi-Peak (dBµV/m)	Quasi-Peak Limit (dBµV/m)	Quasi-Peak Difference (dB)	Quasi-Peak Status	Angle (degrees)	Height (m)
1	333.3	21.11	46.02	-24.91	Pass	-48	1
2	439.86	12.82	46.02	-33.21	Pass	-48	1
3	996.12	23.01	54	-30.99	Pass	-48	1

Radiated emissions according to FCC part 15B	
Project Number:	G0M-2405-2567
Applicant:	STEINER-Optik GmbH
Model Description:	Scope with Bluetooth and Display
Model:	STEINER eRanger8 2-16x50
Test Sample ID:	48944
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Farhat
Test Date & Time:	2024-09-27
Operating Conditions:	ambient temperature: 24 °Celsius power input: 3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode:	1
DUT Configuration:	1



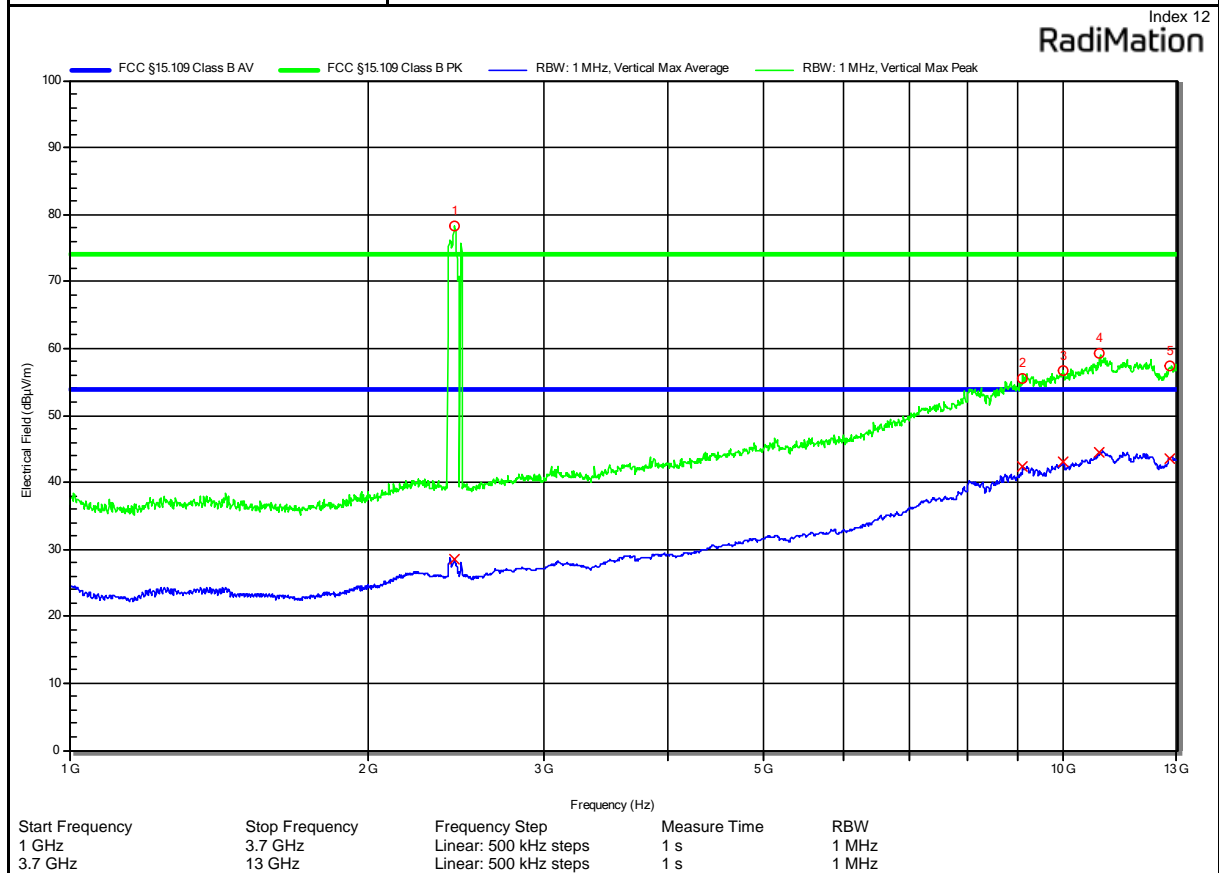
Peak Number	Frequency (MHz)	Peak (dBµV/m)	Peak Limit (dBµV/m)	Peak Difference (dB)	Peak Status	Angle (degrees)	Height (m)
1	2438				Bluetooth Low Energy Carrier		
2	10956.5	58.61	73.98	-15.36	Pass	0	1
3	11496	58.23	73.98	-15.75	Pass	0	1
4	11853.5	58.38	73.98	-15.6	Pass	0	1
5	12857.5	57.6	73.98	-16.38	Pass	0	1

Peak Number	Frequency (MHz)	Average (dBµV/m)	Average Limit (dBµV/m)	Average Difference (dB)	Average Status	Angle (degrees)	Height (m)
1	2438				Bluetooth Low Energy Carrier		
2	10956.5	44.77	53.98	-9.2	Pass	0	1
3	11496	44.51	53.98	-9.47	Pass	0	1
4	11853.5	44.35	53.98	-9.63	Pass	0	1
5	12857.5	43.96	53.98	-10.02	Pass	0	1

Test Report No.: G0M-2405-2567-EF0115B-V02

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B	
Project Number:	G0M-2405-2567
Applicant:	STEINER-Optik GmbH
Model Description:	Scope with Bluetooth and Display
Model:	STEINER eRanger8 2-16x50
Test Sample ID:	48944
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Farhat
Test Date & Time:	2024-09-27
Operating Conditions:	ambient temperature: 24 °Celsius power input: 3 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode:	1
DUT Configuration:	1



Peak Number	Frequency (MHz)	Peak (dBµV/m)	Peak Limit (dBµV/m)	Peak Difference (dB)	Peak Status	Angle (degrees)	Height (m)
1	2438				Bluetooth Low Energy Carrier		
2	9098	55.49	73.98	-18.49	Pass	0	1
3	9998	56.61	73.98	-17.37	Pass	0	1
4	10877.5	59.17	73.98	-14.81	Pass	0	1
5	12777	57.35	73.98	-16.63	Pass	0	1

Peak Number	Frequency (MHz)	Average (dBµV/m)	Average Limit (dBµV/m)	Average Difference (dB)	Average Status	Angle (degrees)	Height (m)
1	2438				Bluetooth Low Energy Carrier		
2	9098	42.31	53.98	-11.67	Pass	0	1
3	9998	42.97	53.98	-11.01	Pass	0	1
4	10877.5	44.57	53.98	-9.41	Pass	0	1
5	12777	43.65	53.98	-10.33	Pass	0	1

Test Report No.: G0M-2405-2567-EF0115B-V02

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

3 Measurement Uncertainty

All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2.

Test Name	Measurement Uncertainty
Conducted emissions at the mains power port	150 kHz to 30 MHz, 3.35dB
Radiated Emission	30 MHz to 200 MHz @ 3m, 5.1dB 200 MHz to 1G Hz @ 3m, 5.3dB >1G Hz to 13 GHz @3m, 5.95dB