FCC TEST REPORT Co-Location	
Report Reference No	G0M-2102-9617-TFCCOLOC-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	SKAN Deutschland GmbH
Address	Nickrischer Straße 2 02827 Görlitz/Hagenwerder GERMANY
Test Specification	47 CFR Part 15C RSS-247, Issue 2, 2017-02 RSS-310, Issue 5, 2020-01
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Glove Tester
Model(s)	WirelessGT 2
Additional Model(s)	None
Brand Name(s)	SKAN wGT
Hardware Version(s)	WirelessGT Evo 2
Software Version(s)	v2.0.0
FCC ID	2AXZXSKANWGT2XD
IC	26652-SKANWGT02
Test Result	**PASSED**

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of receipt of test item	2021-03-30	
Report:		
Compiled by	Florian Voigt	
Tested by (+ signature) (Responsible for Test)	Florian Voigt	F. Vogt .....
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn	T. J .....
Date of Issue	2021-11-08	
Total number of pages	43	
General Remarks:		
The test results presented in this report relate only to the object tested. **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.** This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		
Transmitter is not active when EUT is connected to its dedicated AC/DC adapter. Tests were conducted without an AC/DC adapter.		

ADDITIONAL VARIANTS

Additional Variants (not tested and not evaluated variants)		
Not-tested Variant	**Description**	
1	Product Type Description	Glove Tester
	Model name	SKAN Evolution 2
	Brand name	SKAN wGT
	Hardware Version	WirelessGT Evo 2
	Software Version	v2.0.0
2	Product Type Description	Glove Tester
	Model name	SKAN Evo 2
	Brand name	SKAN wGT
	Hardware Version	WirelessGT Evo 2
	Software Version	v2.0.0
3	Product Type Description	Glove Tester
	Model name	SKAN Globe
	Brand name	SKAN wGT
	Hardware Version	WirelessGT Evo 2
	Software Version	v2.0.0
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.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2021-11-08	Initial Release	

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
RBW	Resolution bandwidth
RMS	Root mean square
VBW	Video bandwidth
V_{NOM}	Nominal supply voltage

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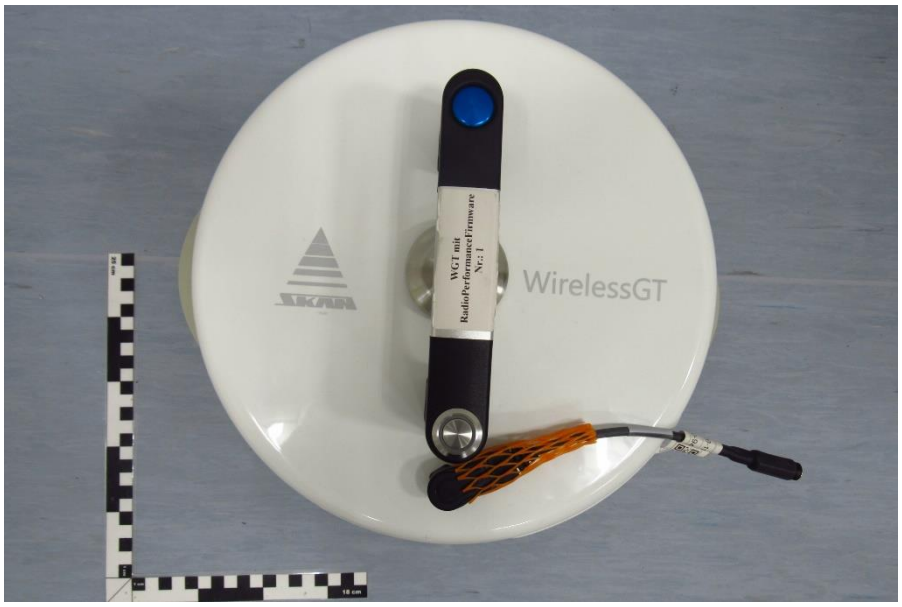
1 Equipment (Test Item) Under Test

Description	Glove Tester	
Model	WirelessGT 2	
Additional Model(s)	None	
Brand Name(s)	SKAN wGT	
Serial Number(s)	30029475.011	
Hardware Version(s)	WirelessGT Evo 2	
Software Version(s)	v2.0.0	
PMN	Wireless Glove Tester	
HVIN	WirelessGT 2	
FVIN	26710700	
HMN	n/a	
FCC ID	2AXZXSKANWGT2XD	
IC	26652-SKANWGT02	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	RFID: 9-490 kHz IEEE 802.15.4: 2400.0 MHz - 2483.5 MHz	
Radio technologies	RFID + IEEE 802.15.4	
Modulation	RFID: ASK IEEE 802.15.4: O-QPSK	
Number of modules	0	
Antenna RFID	Type	Integrated coil
	Model	ANT-033
	Manufacturer	ELATEC
	Gain	N/A
Antenna IEEE 802.15.4	Type	Integrated antenna
	Model	FXP74.07.0100A
	Manufacturer	taoglas
	Gain	4 dBi
Supply Voltage	V_{NOM}	15 VDC
AC/DC-Adaptor	Model	GST90A24-P1M
	Vendor	Mean Well
	Input	90 ~ 264VAC 127 ~ 370VDC
	Output	24 VDC
Manufacturer	SKAN Deutschland GmbH Nickrischer Straße 2 02827 Görlitz/Hagenwerder GERMANY	

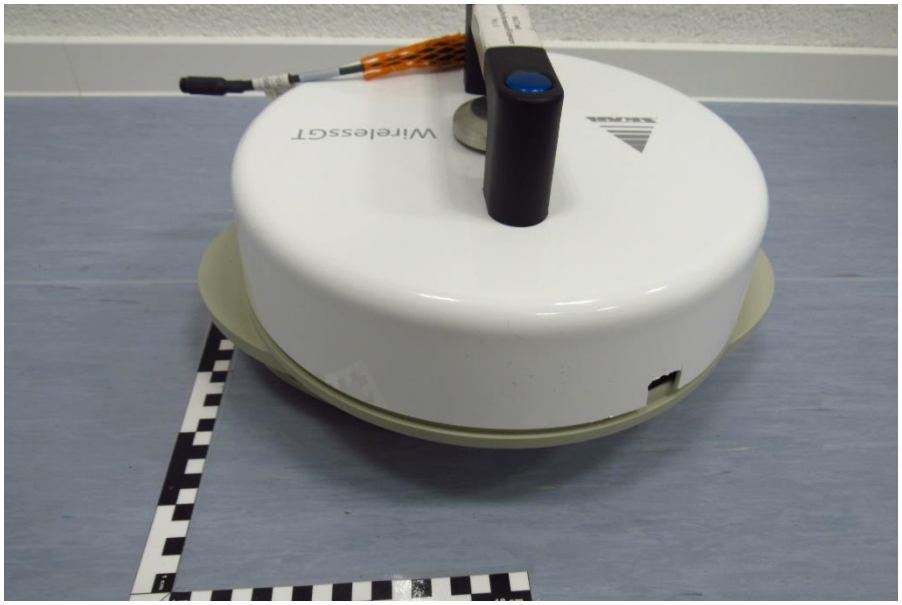
1.1 Photos – Equipment External

EUT WITH ACDC-ADAPTOR IN PERSPECTIVE

Top side view


Side view A

Side view B

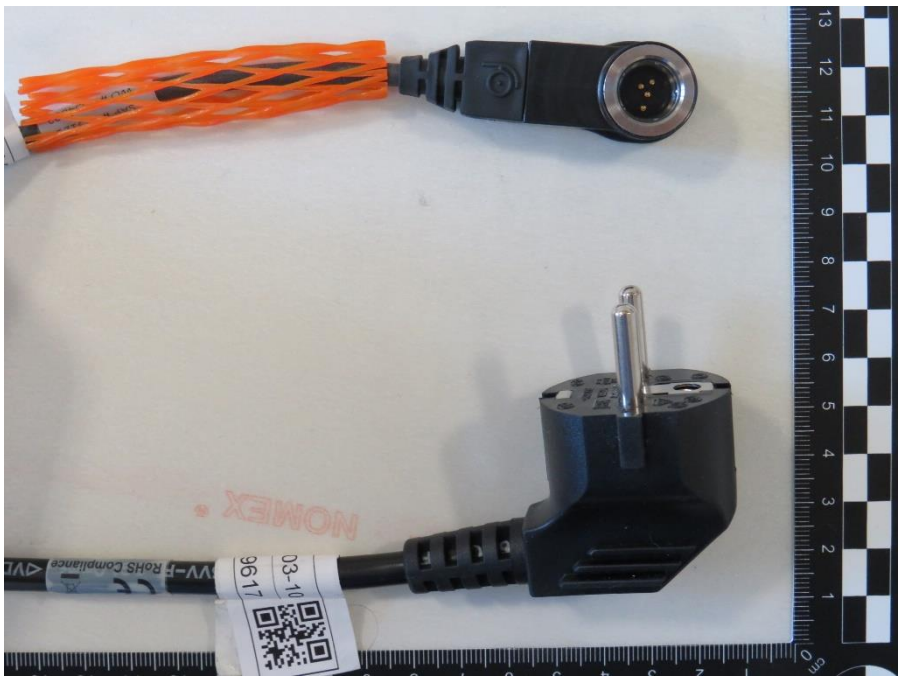
Side view C


Side view D

Bottom side view

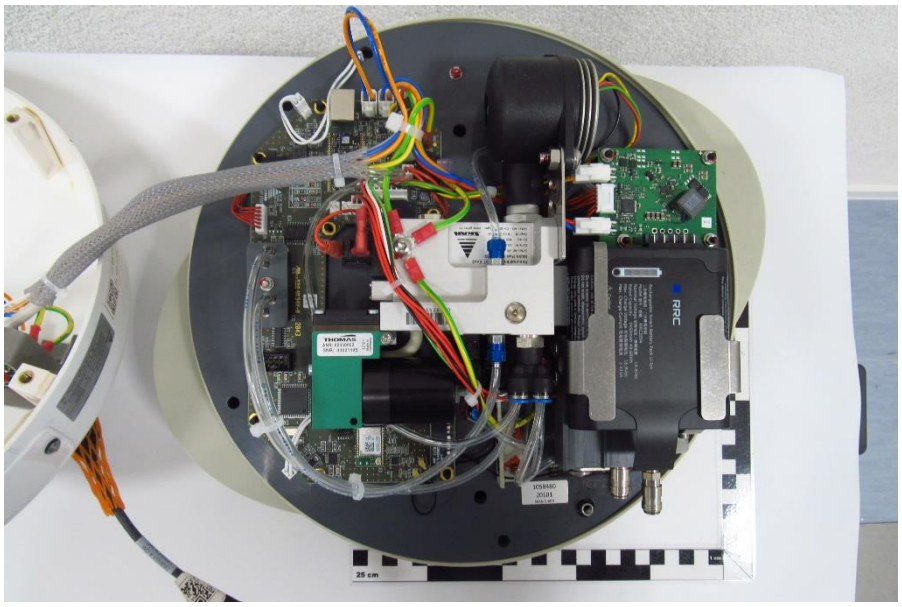
EUT LABEL

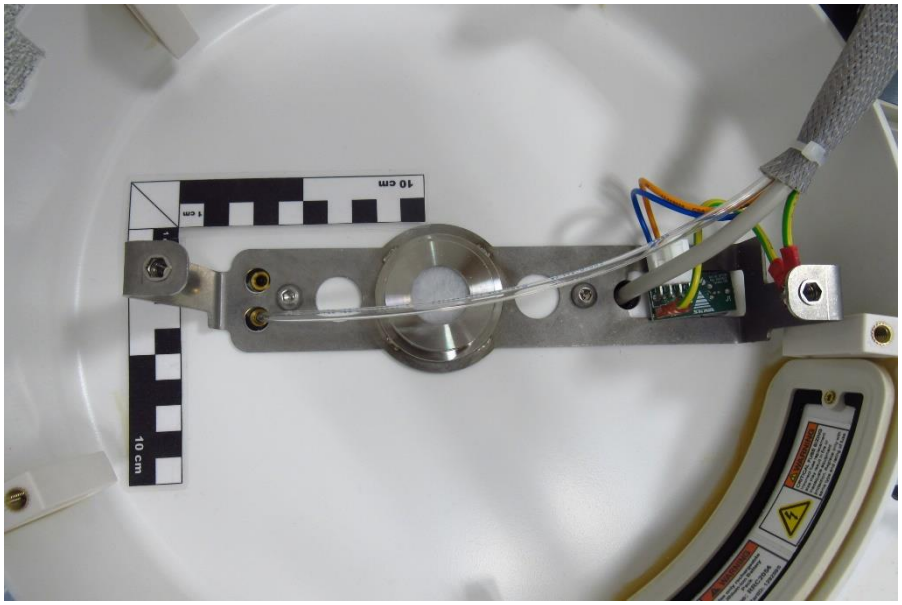
ACDC-ADAPTOR CONNECTORS

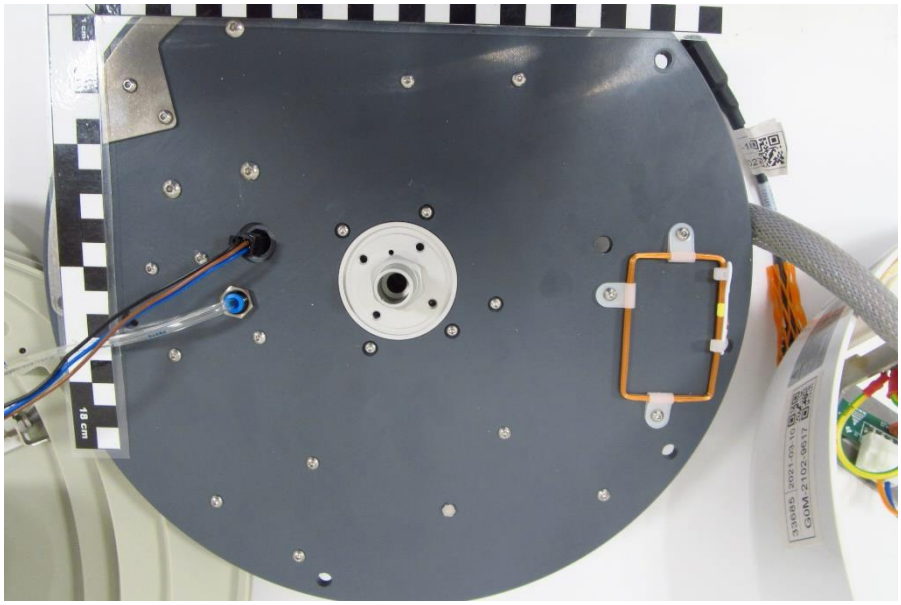


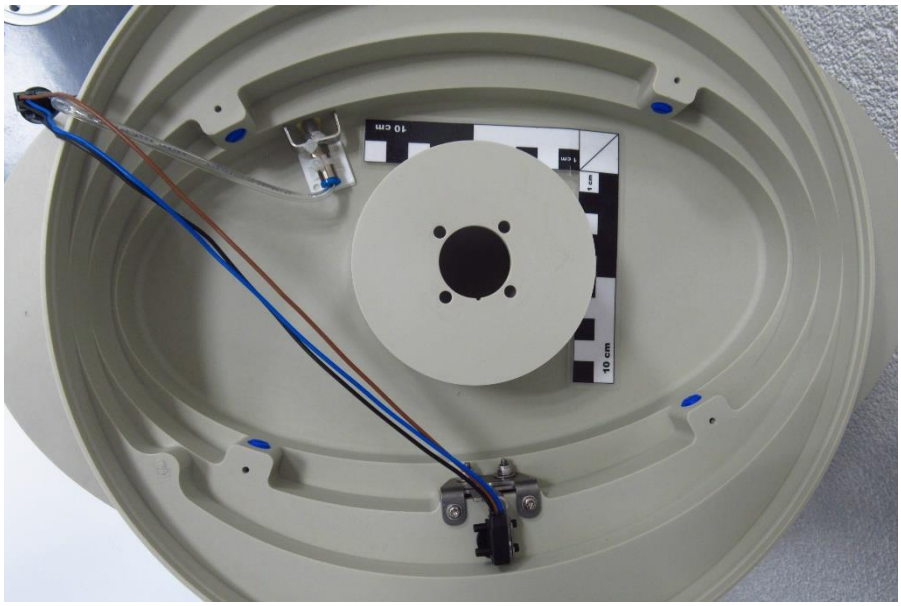
ACDC-ADAPTOR LABEL

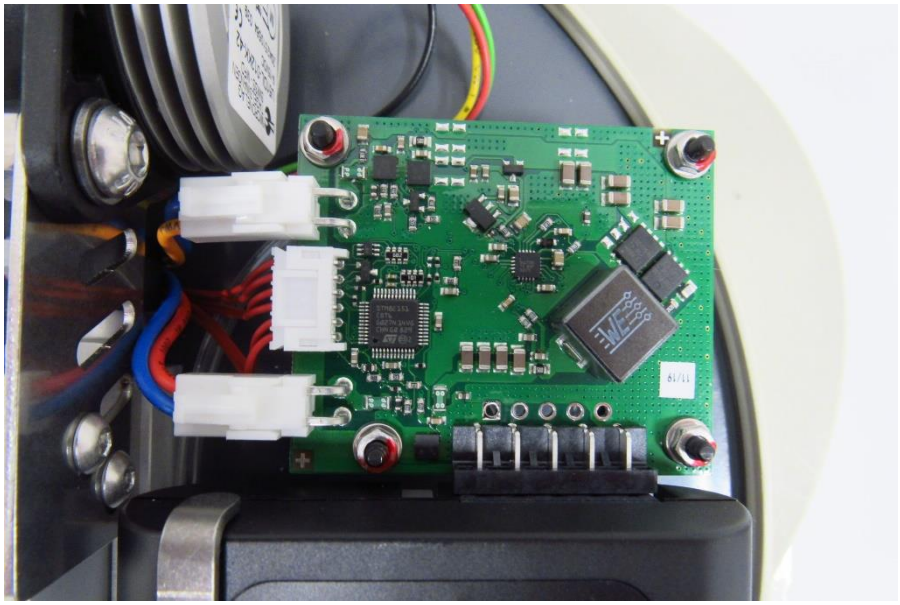
1.2 Photos – Equipment Internal

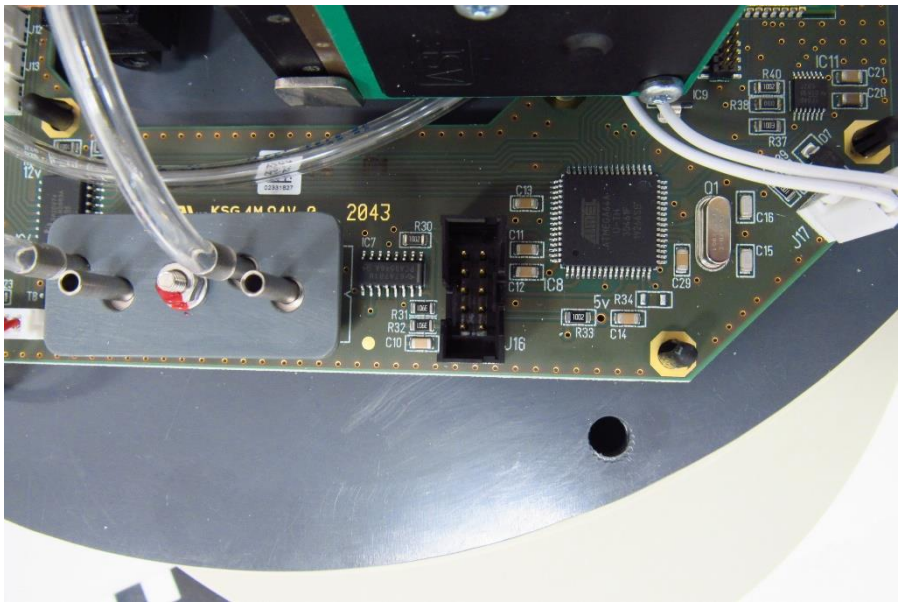
Interior view A


Interior view B


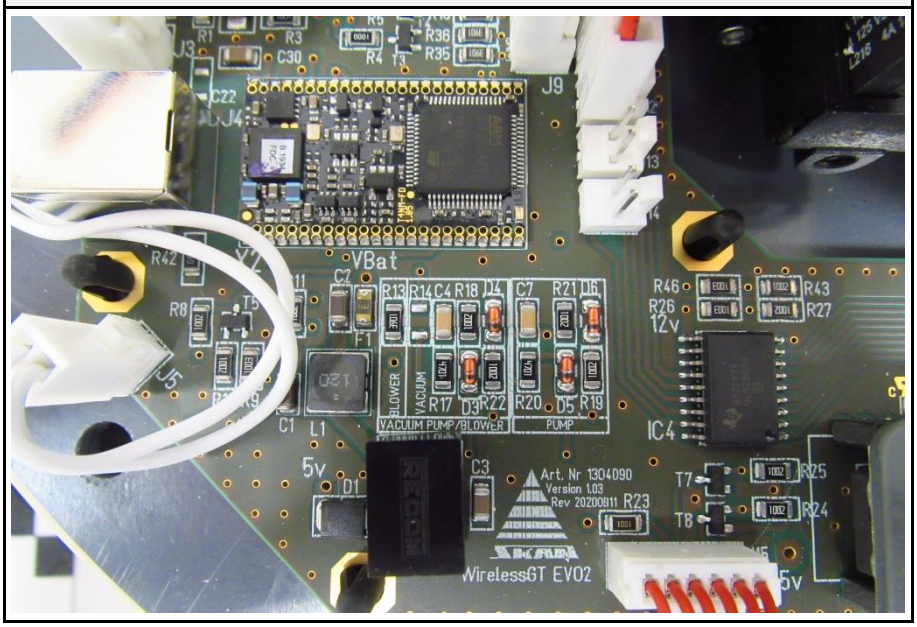
Interior view C


Interior view D


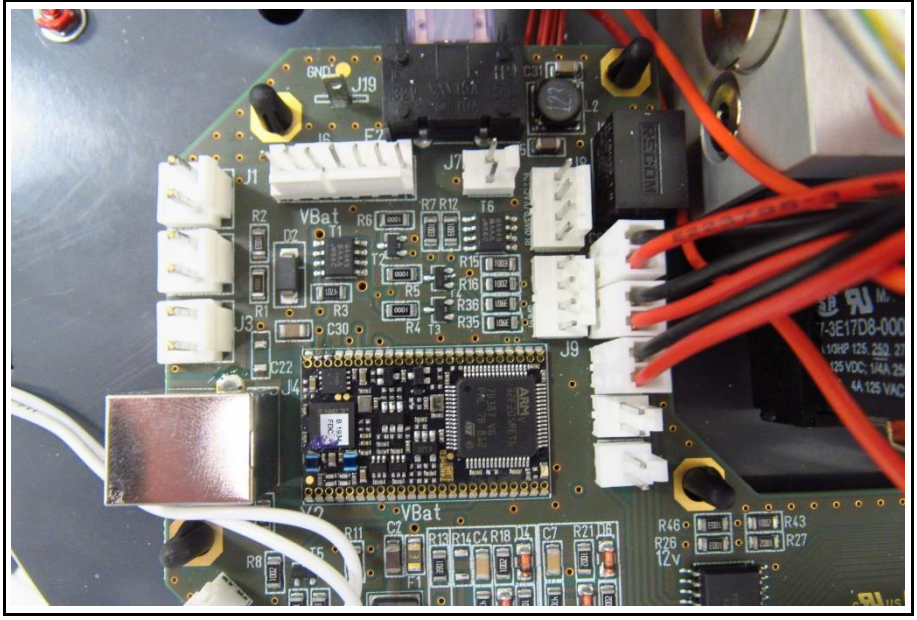
PCB top view A


PCB top view B


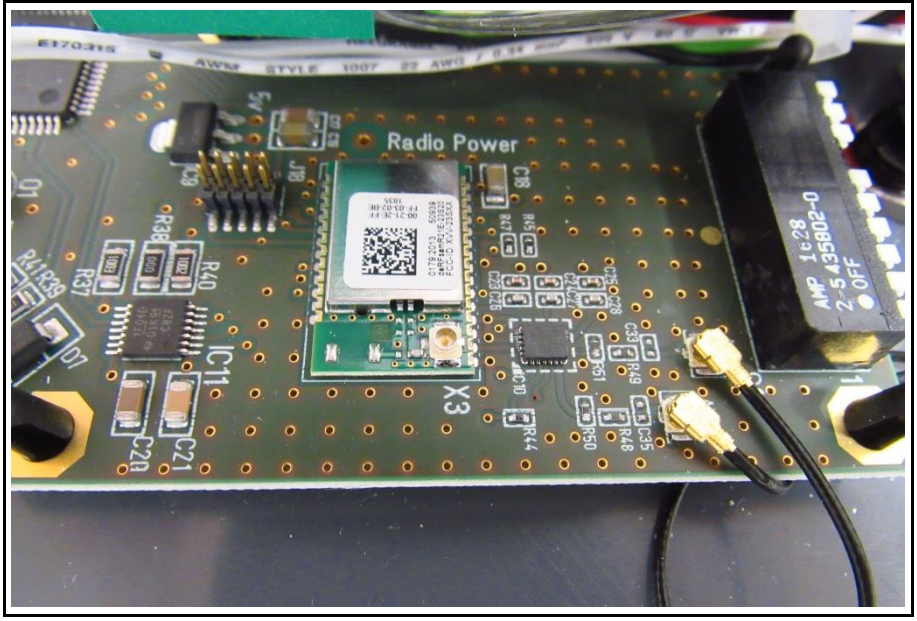
PCB top view C



PCB top view D

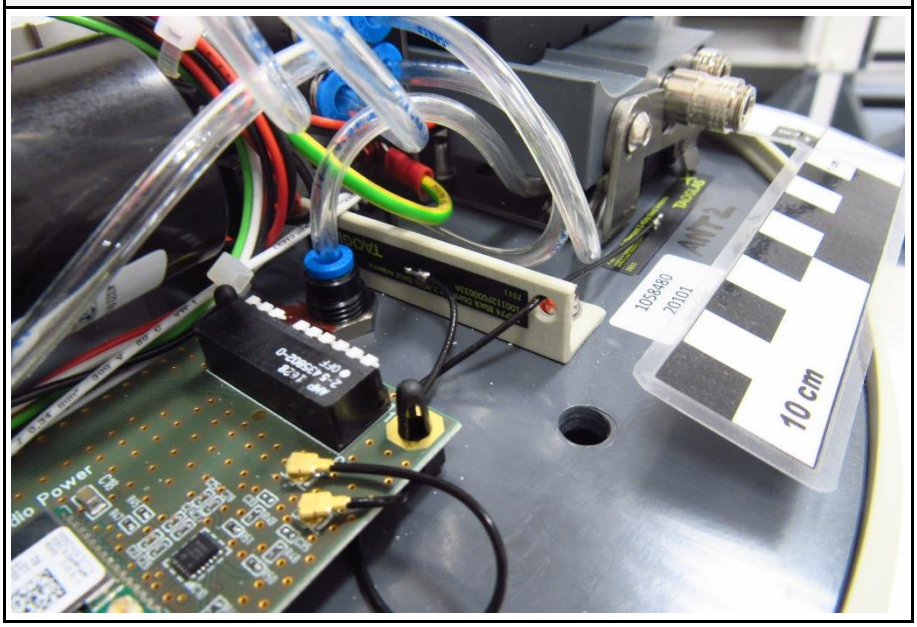


PCB view radio part

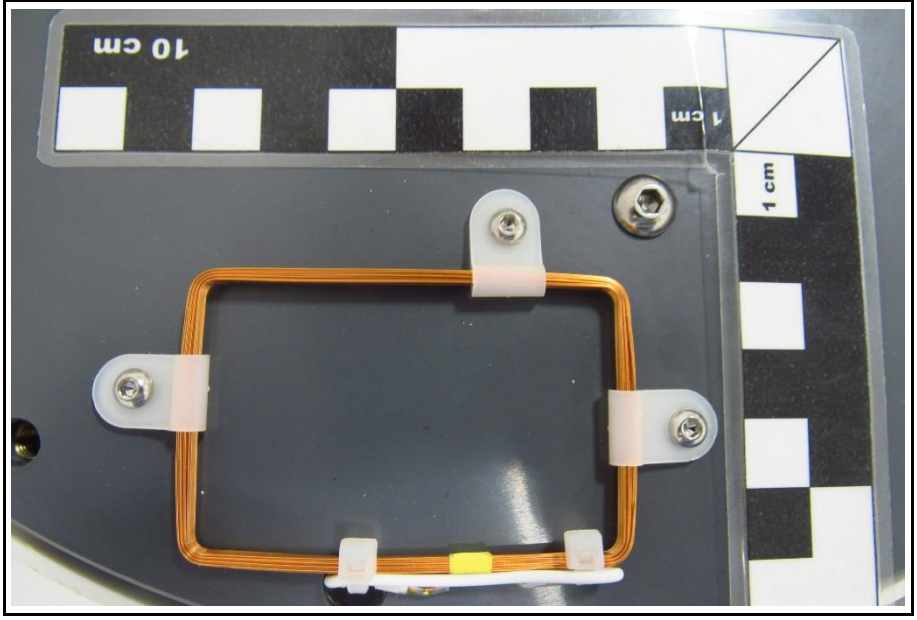


ZB Antenna view A

ZB Antenna view B

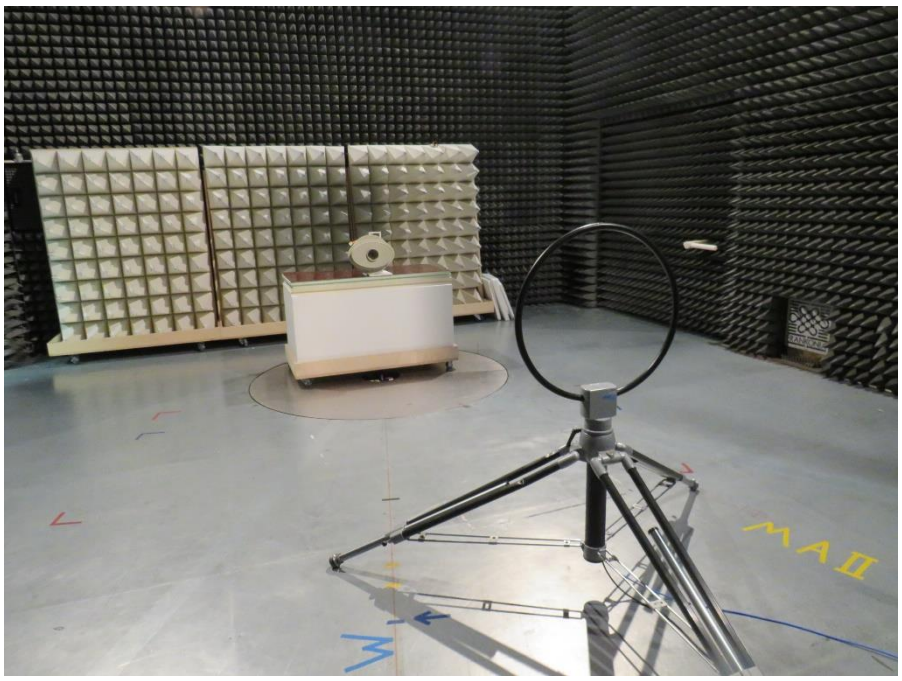


RFID antenna view

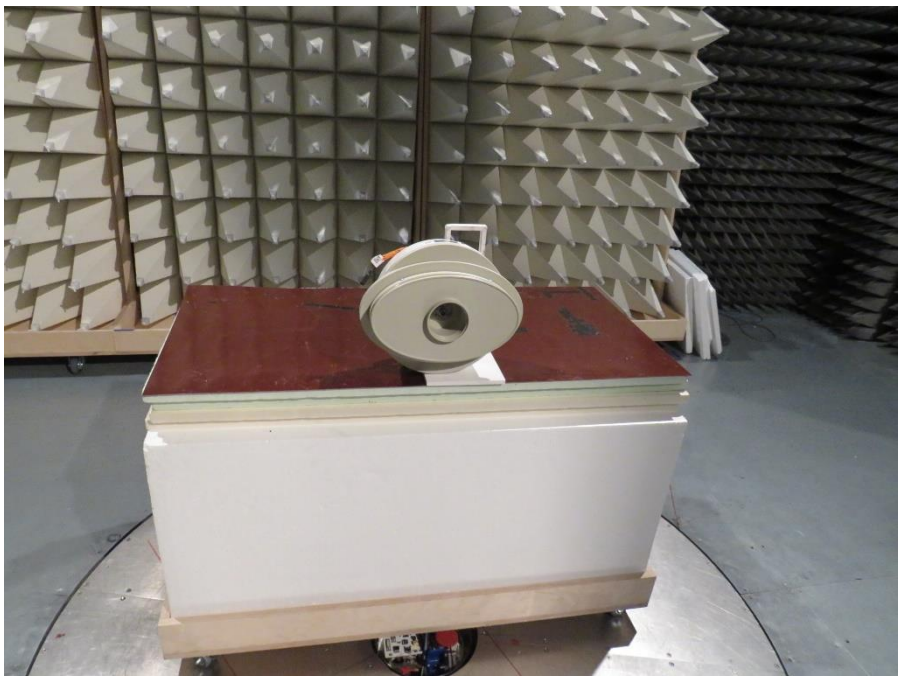


1.3 Photos – Test Setup

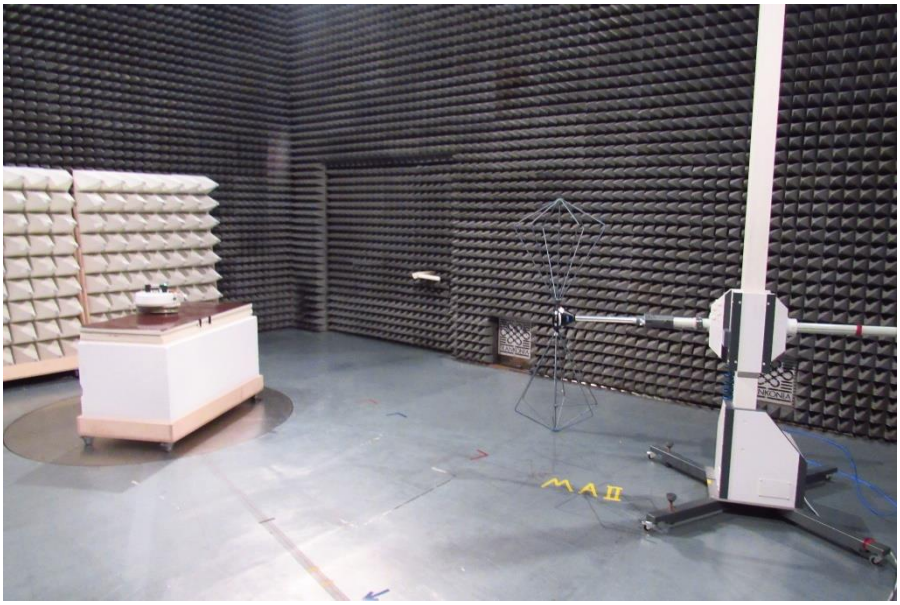
Setup 0.009 to 30 MHz



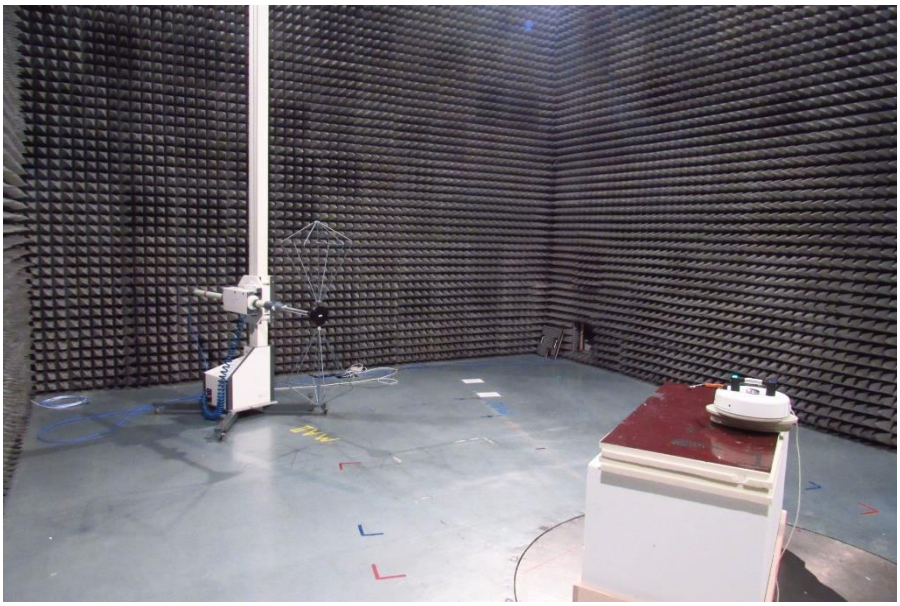
Setup EUT view below 30 MHz



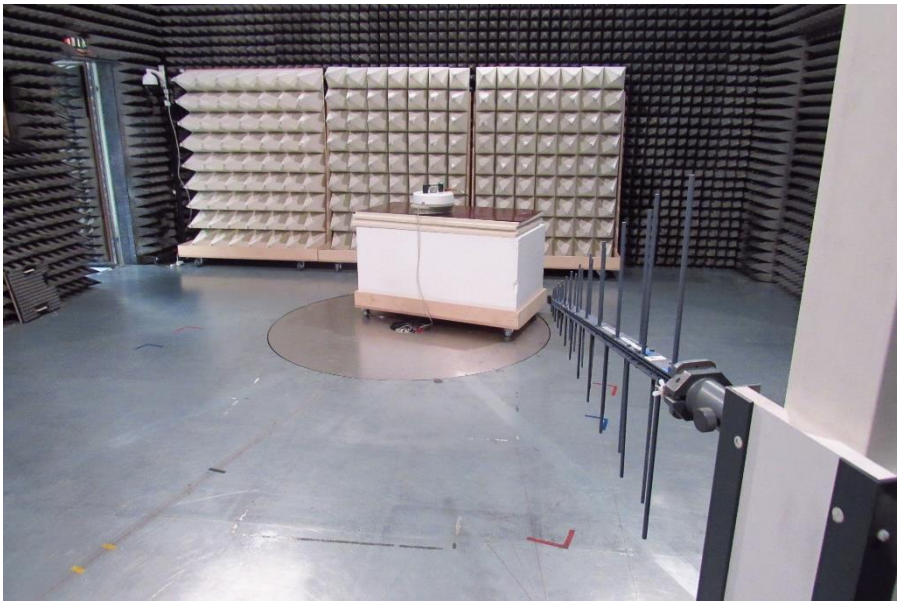
Setup 30 - 200MHz A



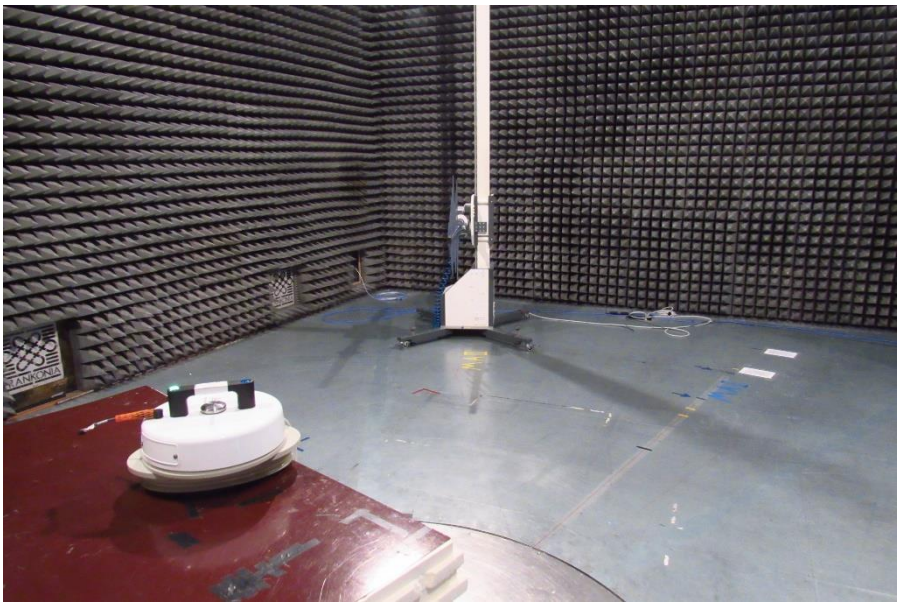
Setup 30 - 200MHz B



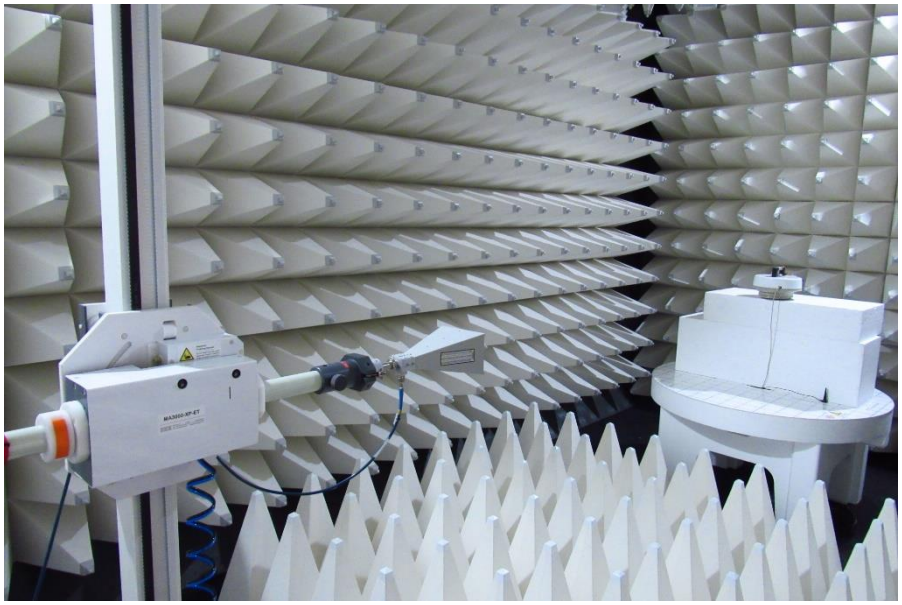
Setup 200 - 1000MHz A



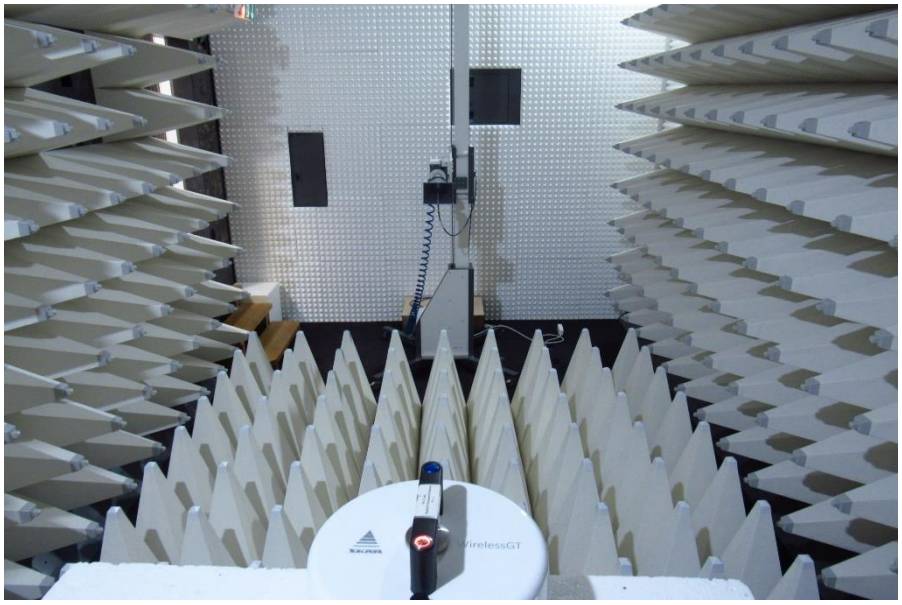
Setup 200 - 1000MHz B



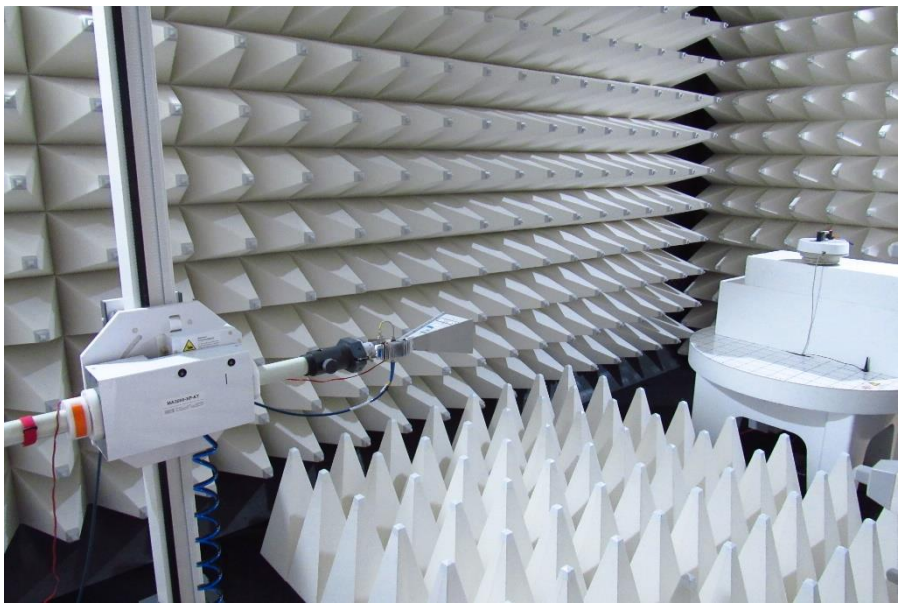
Setup 1 - 8 GHz A



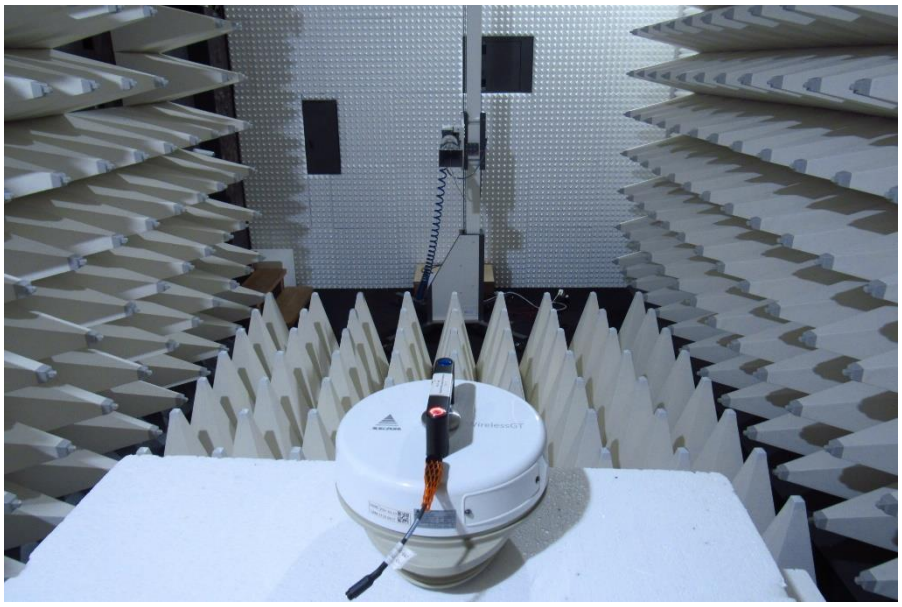
Setup 1 - 8 GHz B



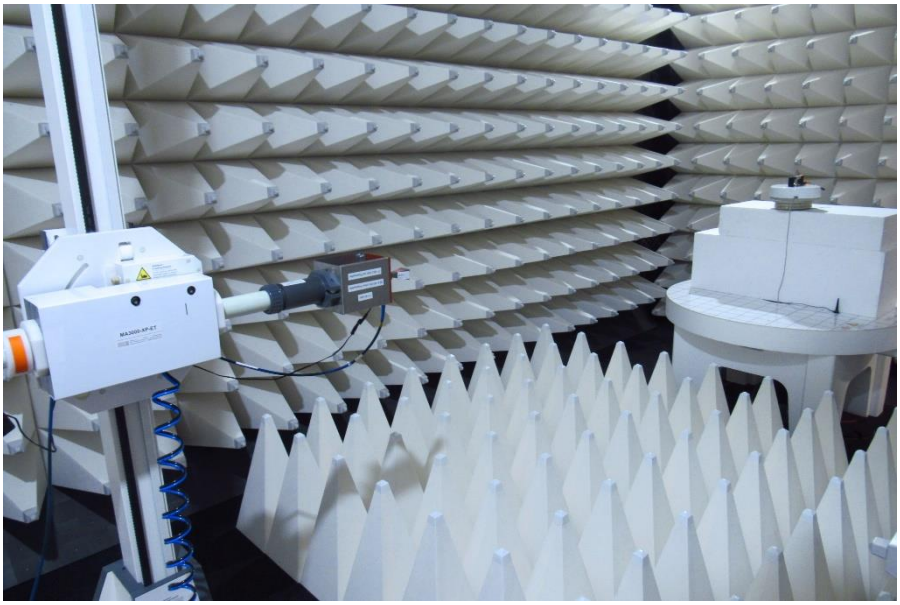
Setup 8 - 18 GHz A



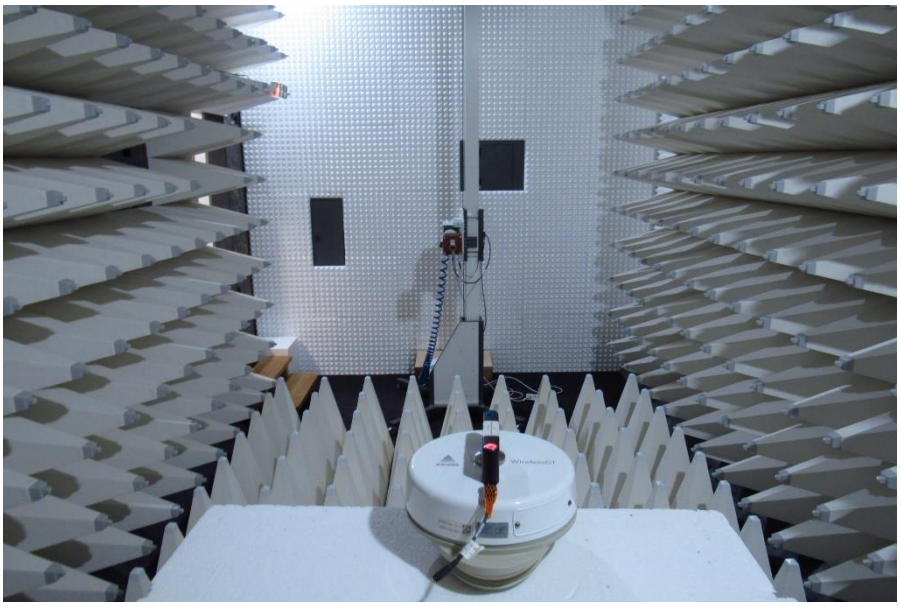
Setup 8 - 18 GHz B



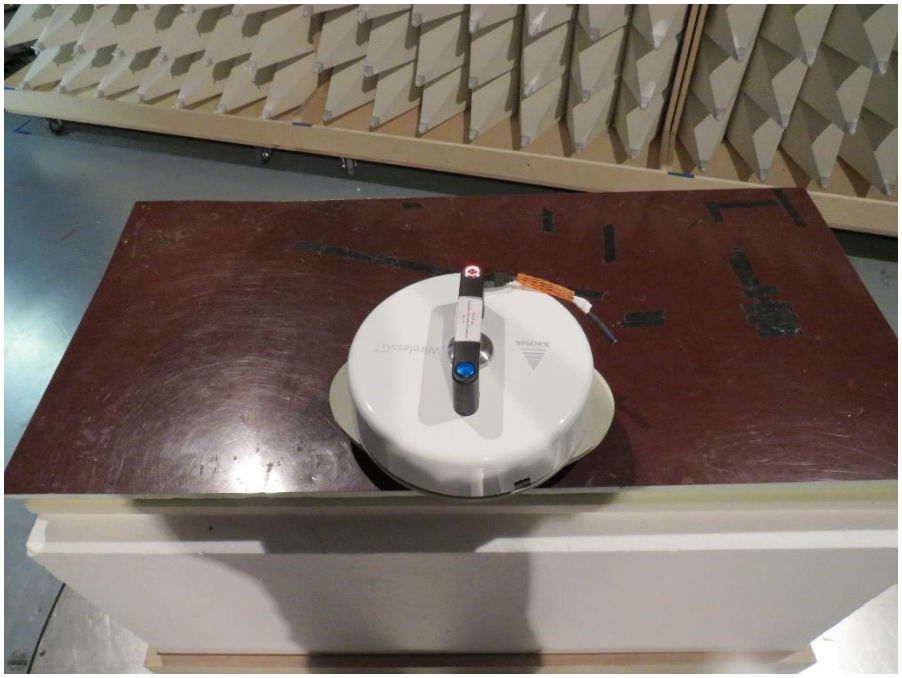
Setup above 18 GHz A



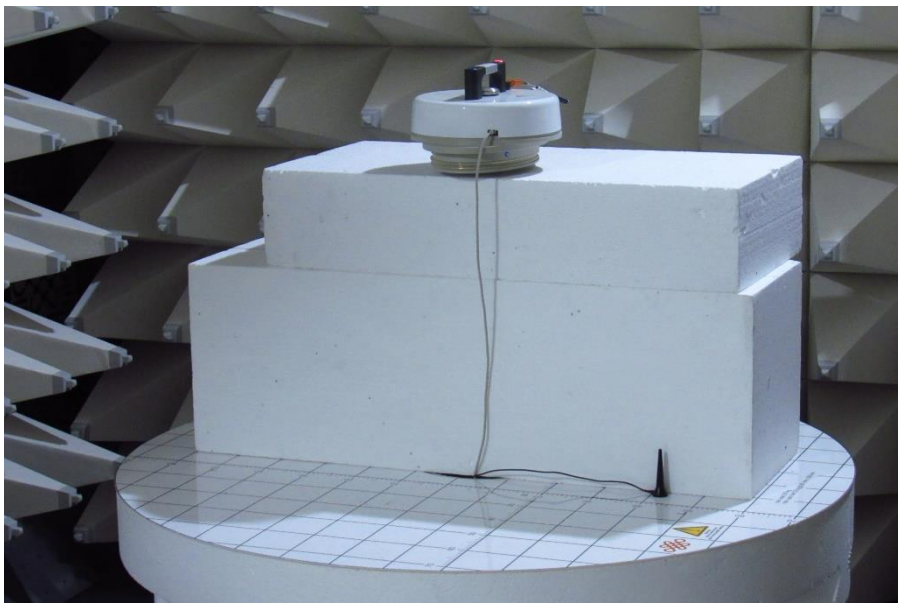
Setup above 18 GHz B



Setup EUT view below 1 GHz



Setup EUT view above 1 GHz



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	Lenovo	T440	
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.5 Test Modes

Mode	Description
DSSS O-QPSK	Mode = Transmit Modulation = O-QPSK Spreading = DSSS Data rate = 250 kbps Chip rate = 2000 kbps Antenna = 0 Duty cycle = 100%
RFID TX	Mode = Transmit Modulation = ASK Duty cycle = 0.068 %
Comment: Test modes “DSSS O-QPSK“ and “RFID TX” were tested simultaneously.	

1.6 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx	N/A	0.125
F2	Tx	24	2470
Comment: Test frequencies F1 and F2 were concurrently emitted by the EUT. Channel 24 was selected for the highest conducted output power from test report G0M-2102-9617-TFC247ZB-V01, issued by Eurofins Product Service GmbH on 2021-11-09.			

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 analyzer in dBµV. Any external preamplifiers used are taken into account through internal analyzer 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 analyzer. 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:

Reading on Analyzer (dBµV) + A.F. (dB/m) = Net field strength (dBµV/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:

Limit (dBµV/m) = 20*log (µV/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

FCC 47 CFR Part 15C, RSS-247				
Product Standard Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
FCC § 15.247(d) ISED RSS-247 § 5.5 Issue 2	Transmitter radiated spurious emissions	ANSI C63.10-2013	PASS	
Comment: Tested compliance according to standard FCC § 15.247 and RSS-247 § 5.5 Issue 2 for all radio technologies as those standards allow the highest spurious emission.				

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

3 Test Conditions and Results

3.1 Test Conditions and Results - Transmitter radiated emissions

3.1.1 Information

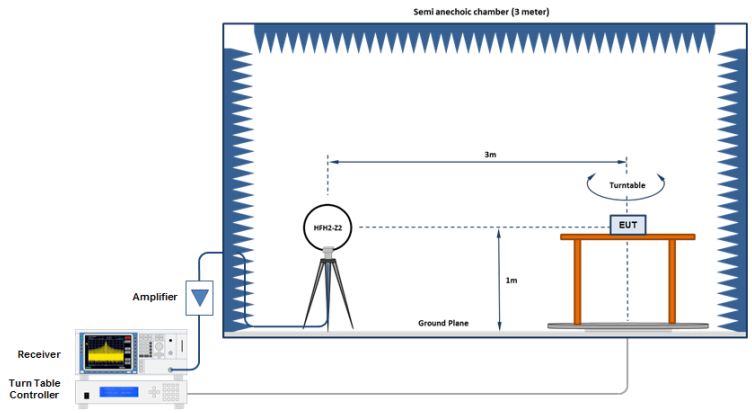
Test Information	
Reference	FCC § 15.247(d), ISED RSS-247 § 5.5 Issue 2
Measurement Method	ANSI C63.10-2013
Measurement Uncertainty	± 5.95 dB
Operator	Florian Voigt
Date	2021-06-30 + 2021-07-01

3.1.2 Limits

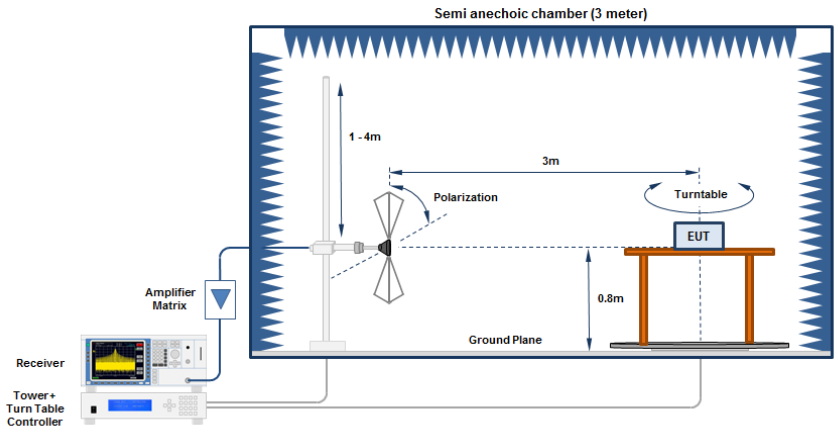
Limits			
Frequency range [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
0.009 - 0.09	Average	2400/F[kHz]	300
0.09 - 0.110	Quasi-Peak	2400/F[kHz]	300
0.110 - 0.490	Average	2400/F[kHz]	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	30
1.705 - 30.0	Quasi-Peak	30	30
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.1.3 Setup

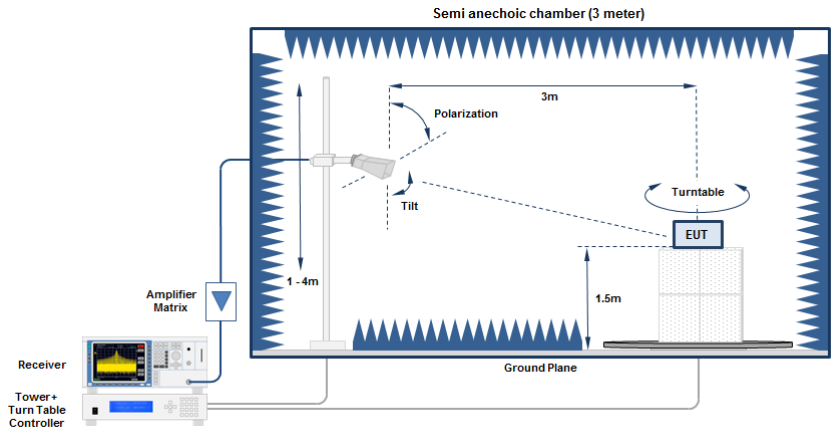
Test Setup < 30 MHz



Test Setup 30 - 1000 MHz



Test Setup > 1 GHz



3.1.4 Equipment

Test Equipment < 30 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
EMI Test Receiver	R&S	ESR7	EF00943	2020-07	2021-07
Loop Antenna	R&S	HFH2-Z2	EF00184	2021-01	2024-01

Test Equipment 30 MHz - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Antenna	R&S	HK 116	EF00030	2021-05	2024-05
Antenna	R&S	HL 223	EF00187	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC2	EF01616	2021-05	2022-05
Spectrum analyzer	R&S	FSU43	EF01631	2021-07	2022-07
Antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2022-03
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2022-03
Antenna	Amplifier Research	AT4560	EF00302	2021-06	2023-06

3.1.5 Procedure

Test Procedure < 30 MHz
1. EUT set to test mode 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector 4. Markers are set to maximum emission levels

Test Procedure 30 - 1000 MHz
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

Test Procedure > 1 GHz
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

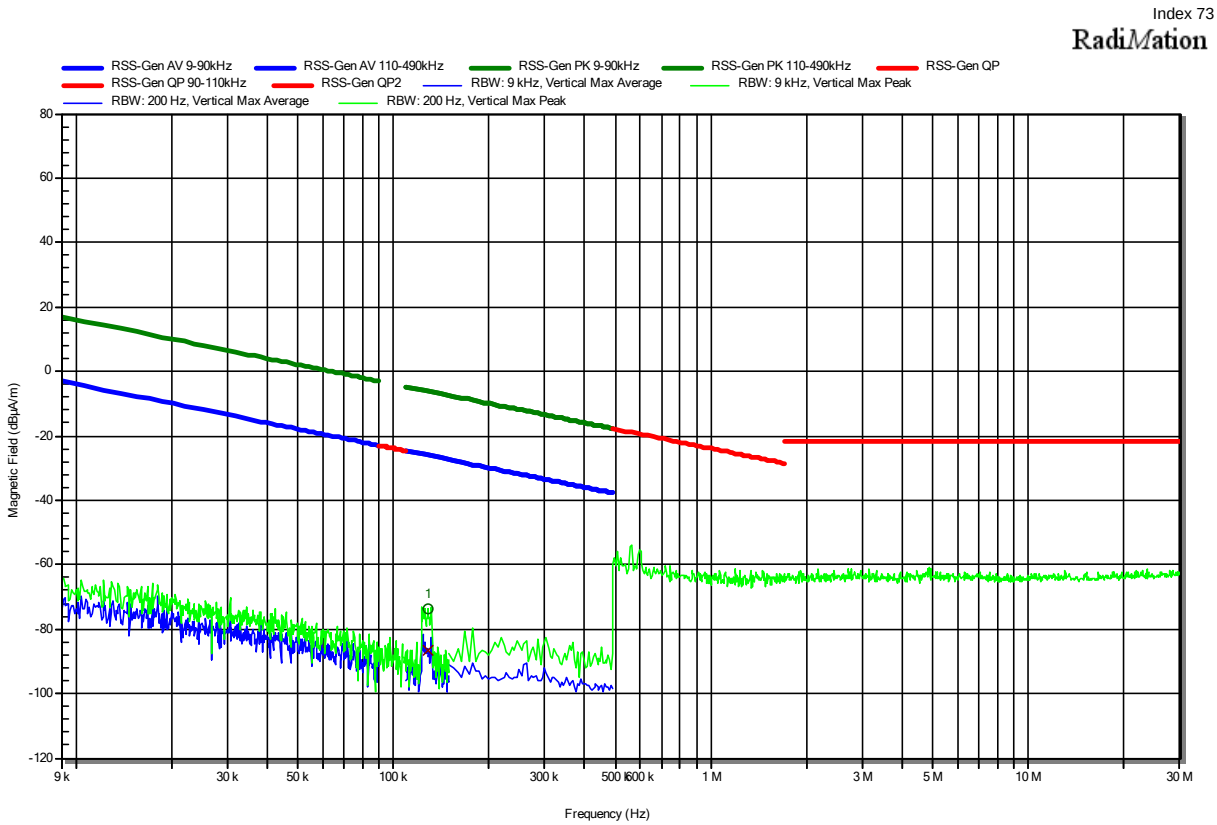
3.1.6 Results

Test Results							
Frequency [MHz]	Modes	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
0.125; 2470	DSSS O-QPSK RFID TX	2484	44.24	pk	hor	74.00	-29.76
0.125; 2470	DSSS O-QPSK RFID TX	2484	39.31	avg	hor	54.00	-14.69
0.125; 2470	DSSS O-QPSK RFID TX	4941	48.94	pk	hor	74.00	-25.06
0.125; 2470	DSSS O-QPSK RFID TX	4941	41.35	avg	hor	54.00	-12.65
0.125; 2470	DSSS O-QPSK RFID TX	7411	49.57	pk	ver	74.00	-24.43
0.125; 2470	DSSS O-QPSK RFID TX	7411	40.13	avg	ver	54.00	-13.87

ANNEX A Transmitter sprurious emissions

Radiated Spurious Emissions according to RSS-310 Issue 5

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Rohde & Schwarz HFH 2-Z2
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-07-01
Note:	

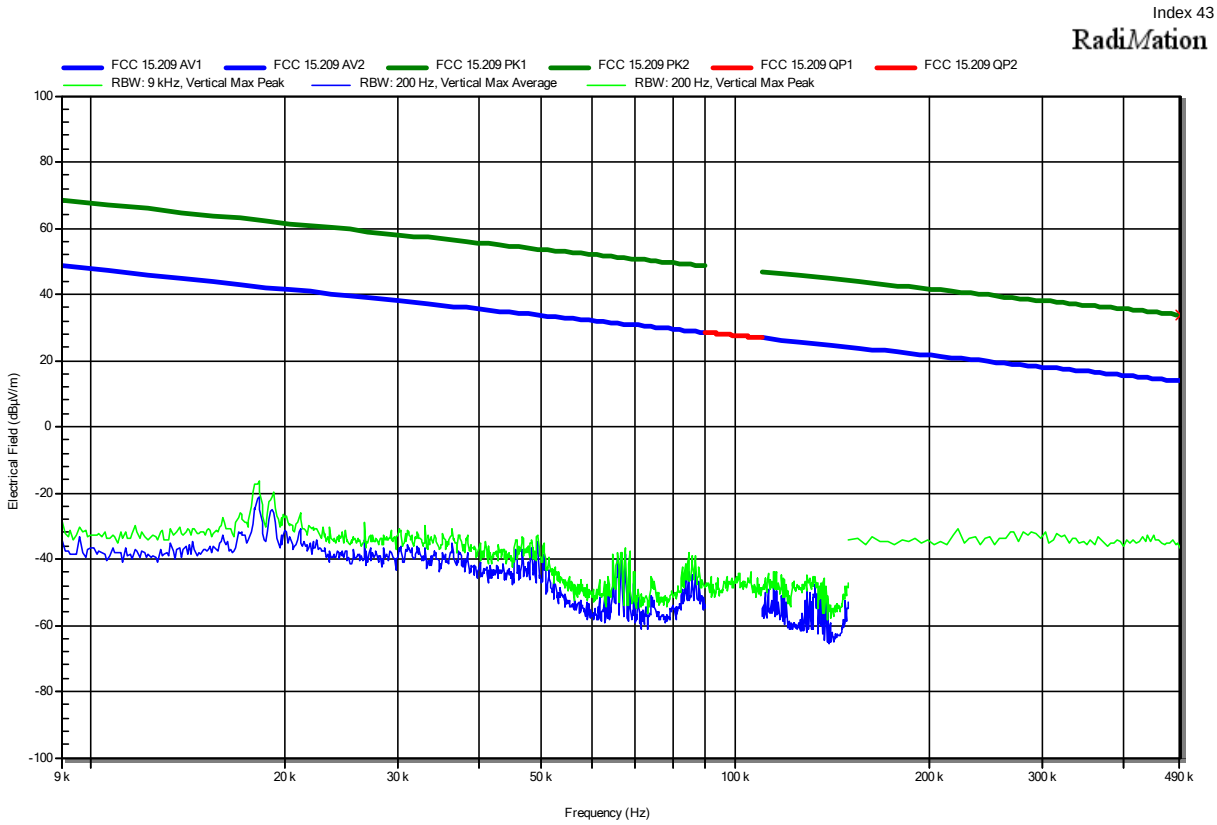


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
128.3 kHz	-73.7 dBµA/m	-6.1 dBµA/m	-67.59 dB	Pass

Frequency	Average	Average Limit	Average Difference	Average Status
128.3 kHz	-86.7 dBµA/m	-26.1 dBµA/m	-60.66 dB	Pass

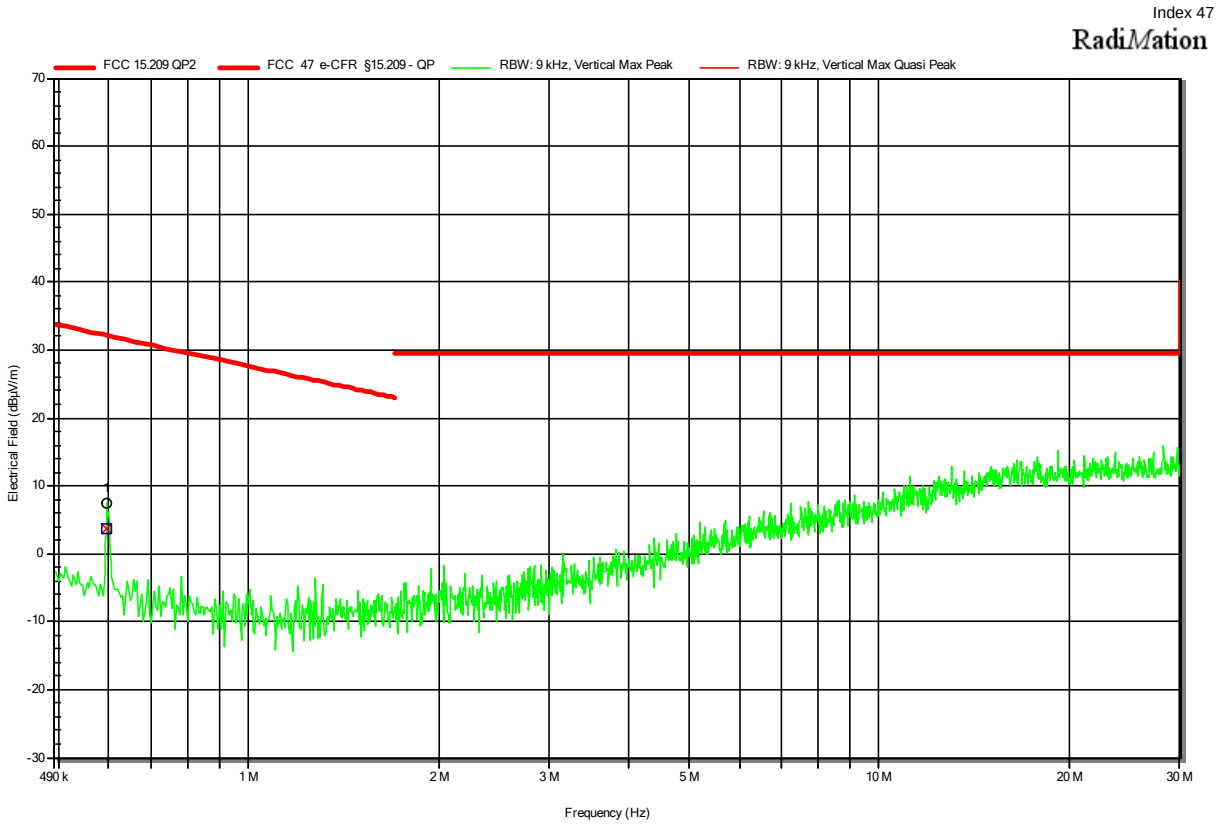
Radiated Spurious Emissions according to 47 CFR § 15.209

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Rohde & Schwarz HFH 2-Z2
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-06-30
Note:	



Radiated Spurious Emissions according to 47 CFR § 15.209

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Rohde & Schwarz HFH 2-Z2
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-06-30
Note:	

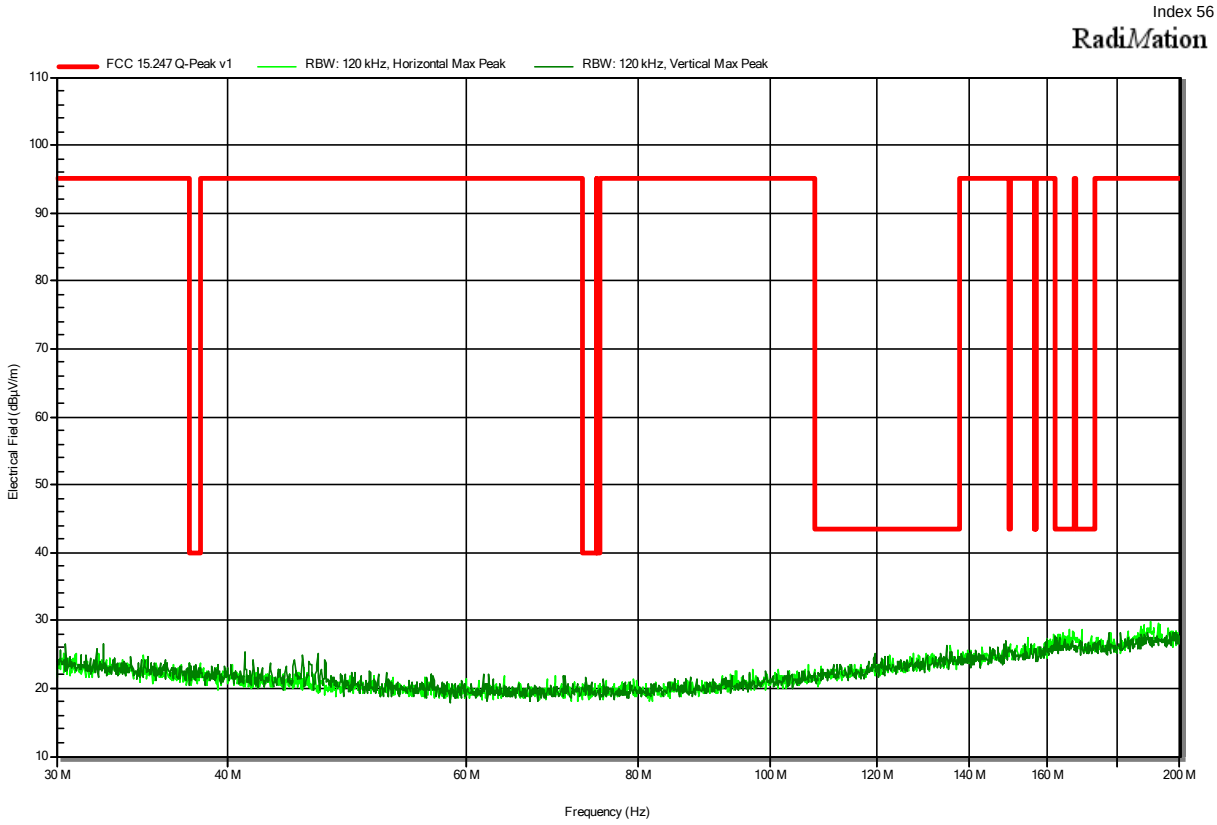


Frequency	Peak	Peak Limit	Peak Difference	Peak Status
596.663 kHz	7.4 dBµV/m	32.1 dBµV/m	-24.72 dB	Pass

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
596.663 kHz	3.6 dBµV/m	32.1 dBµV/m	-28.45 dB	Pass

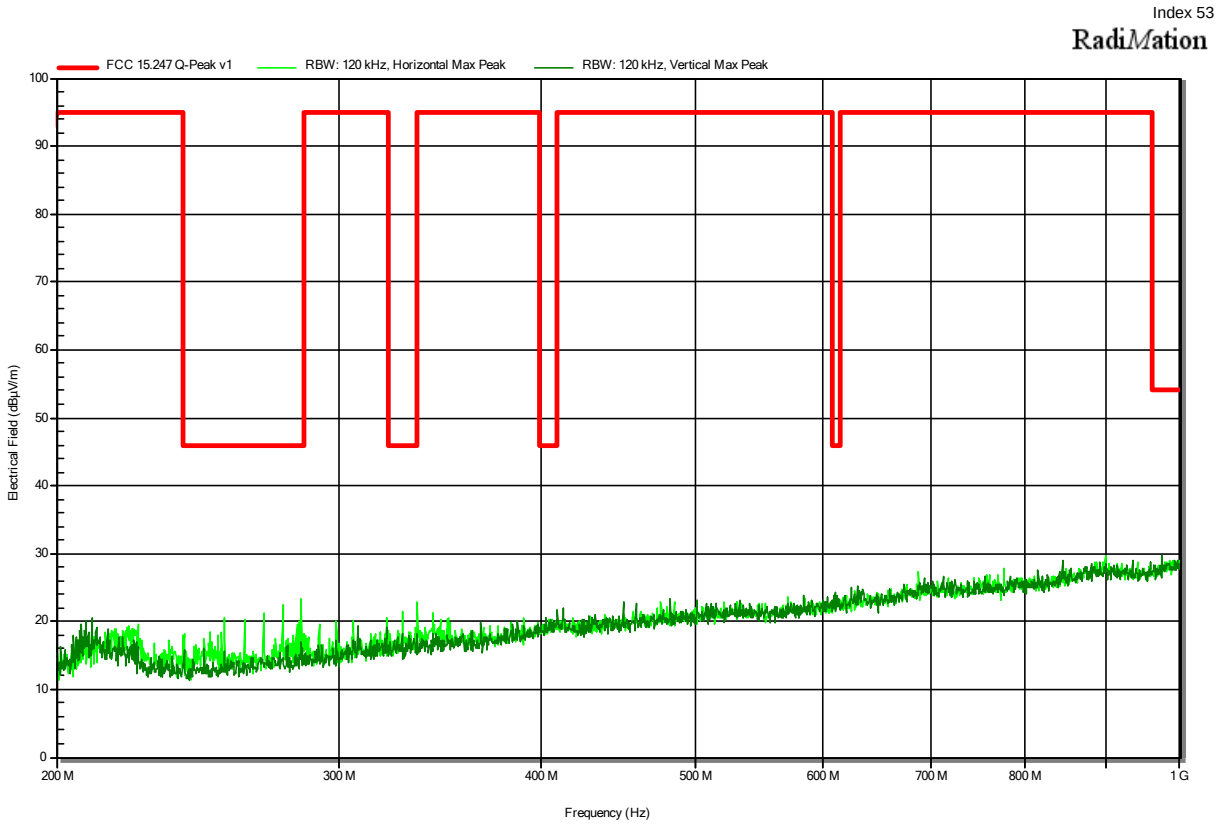
Radiated Spurious Emissions according to RSS-247 Issue 2, 47 CFR § 15.247

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-10-14
Note:	



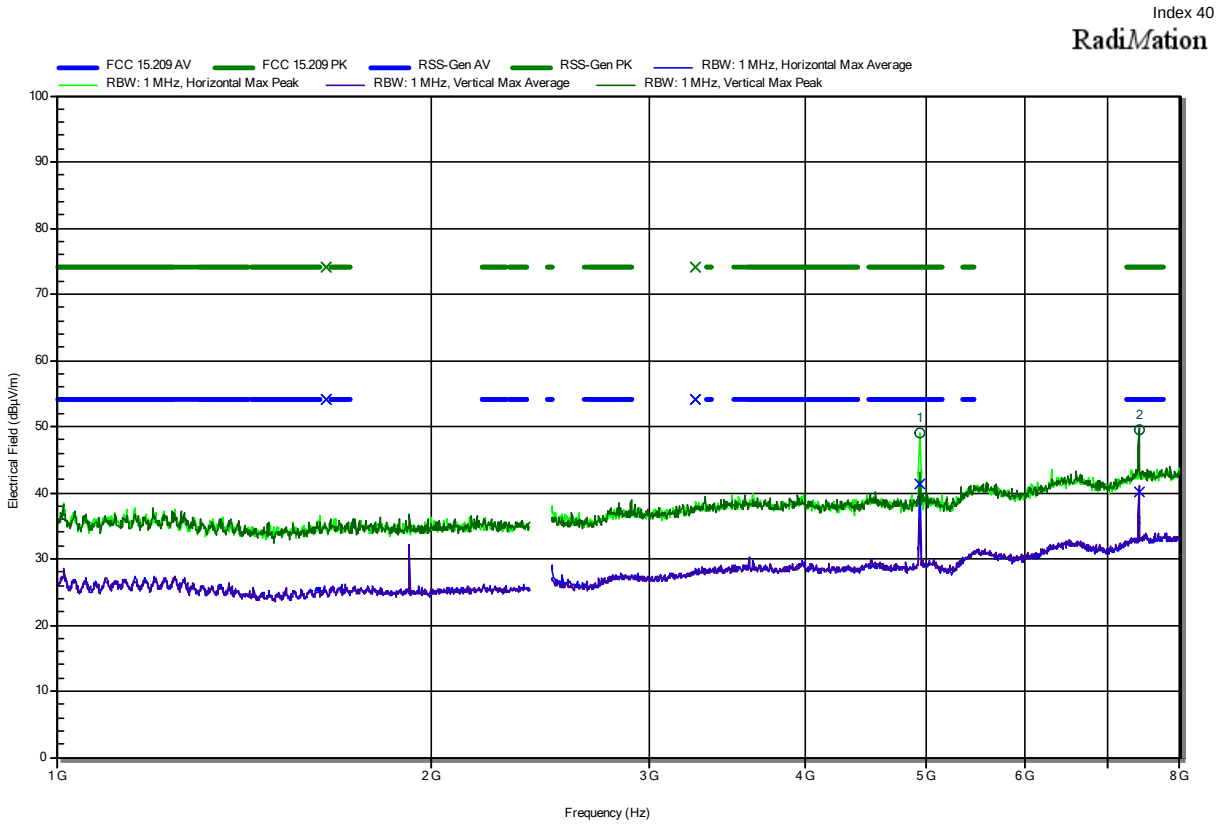
Radiated Spurious Emissions according to RSS-247 Issue 2, 47 CFR § 15.247

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-10-14
Note:	



Radiated Spurious Emissions according to RSS-247 Issue 2, 47 CFR § 15.247

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-10-13
Note:	

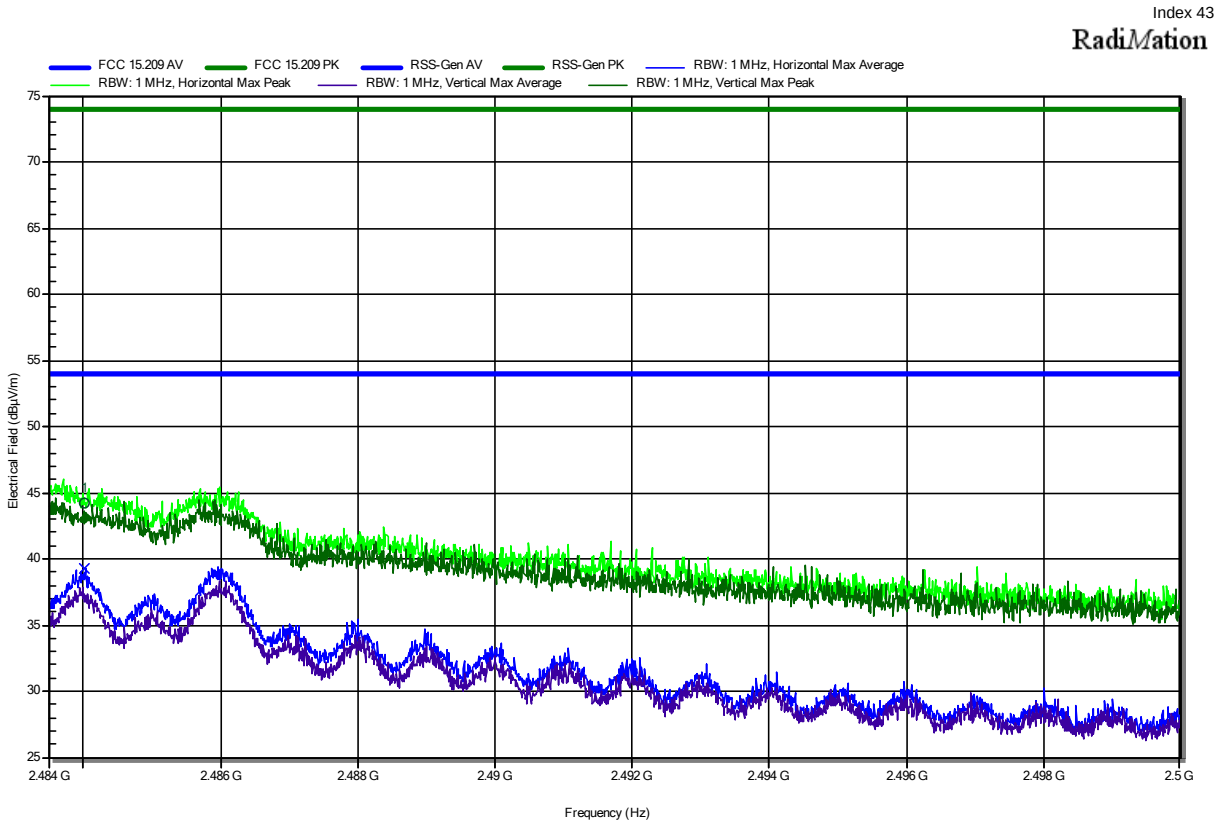


Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.941 GHz	48.94 dBµV/m	74 dBµV/m	-25.06 dB	Pass	Horizontal
7.411 GHz	49.57 dBµV/m	74 dBµV/m	-24.43 dB	Pass	Vertical

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
4.941 GHz	41.35 dBµV/m	54 dBµV/m	-12.65 dB	Pass	Horizontal
7.411 GHz	40.13 dBµV/m	54 dBµV/m	-13.87 dB	Pass	Vertical

Radiated Spurious Emissions according to RSS-247 Issue 2, 47 CFR § 15.247

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-10-13
Note:	upper bandedge

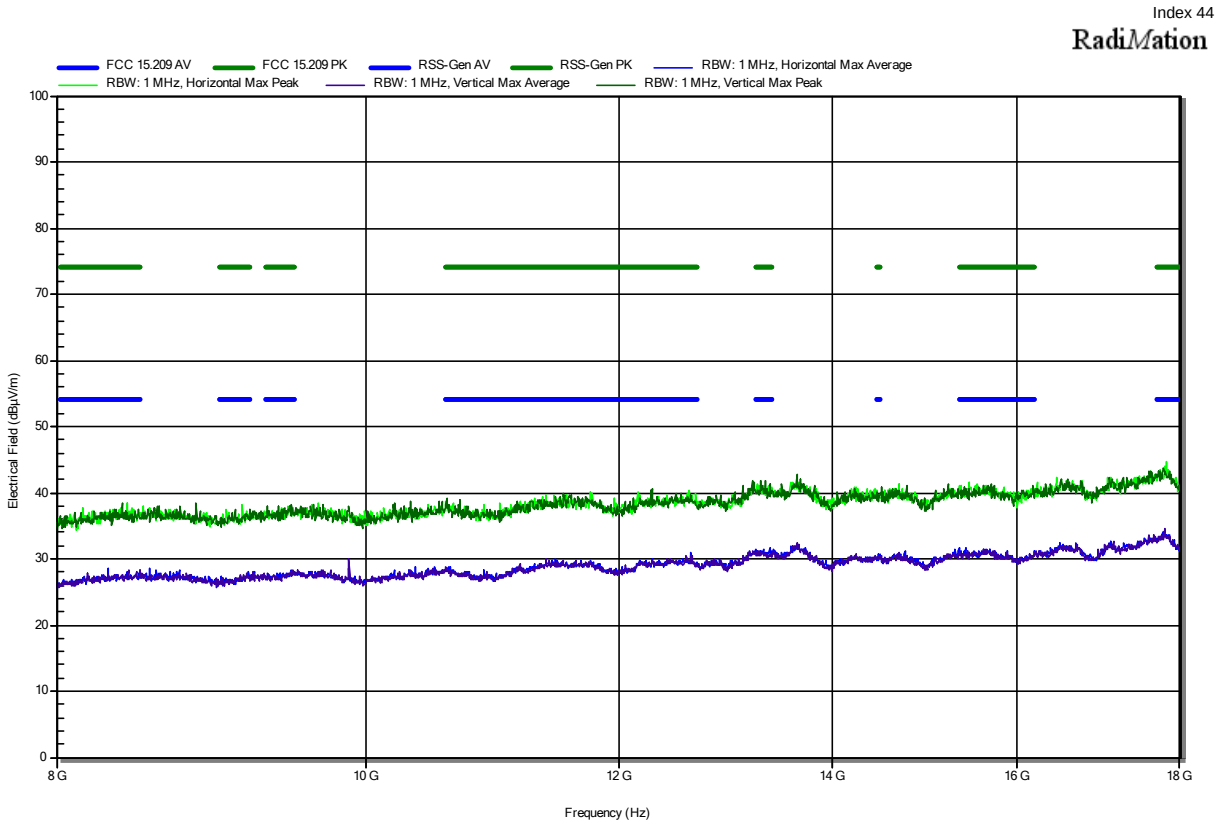


Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.484 GHz	44.24 dBµV/m	74 dBµV/m	-29.76 dB	Pass	Horizontal

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.484 GHz	39.31 dBµV/m	54 dBµV/m	-14.69 dB	Pass	Horizontal

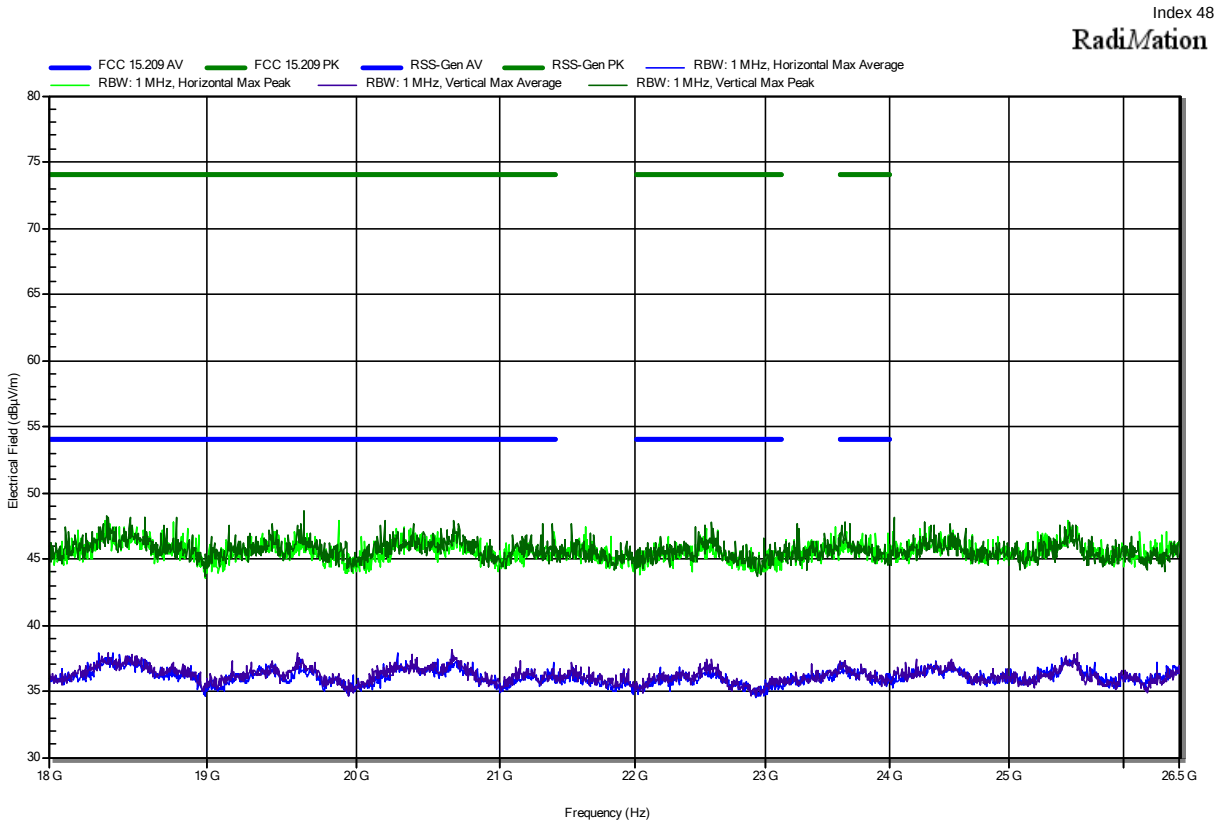
Radiated Spurious Emissions according to RSS-247 Issue 2, 47 CFR § 15.247

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-10-13
Note:	



Radiated Spurious Emissions according to RSS-247 Issue 2, 47 CFR § 15.247

Project Number:	G0M-2102-9617
Applicant:	SKAN Deutschland GmbH
Model Description:	Glove Tester
Model:	WirelessGT-2
Test Sample ID:	33685
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Voigt
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 22 °Celsius, Vnom: 15.0 VDC
Antenna:	Amplifier Research AT4560
Measurement distance:	3 m
Mode:	Tx; 2470MHz, DSSS O-QPSK; 125kHz, RFID TX
Test Date:	2021-10-14
Note:	



=== End of test report ===