Report on the FCC and IC Testing of the Agrident GmbH

Model: ASR650

In accordance with FCC 47 CFR Part 15C and Industry Canada RSS-210 and Industry Canada RSS-GEN

Prepared for: Agrident GmbH
Steinklippenstraße 10
D-30890 Barsinghausen

FCC ID: QG2ASR650
IC: 6252A-ASR650

COMMERCIAL-IN-CONFIDENCE

Date: 2018-08-30
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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Michael Ingerl	2018-08-30	
Authorised Signatory	Markus Biberger	2018-08-30	

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 15C and Industry Canada RSS-210 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Michael Ingerl	2018-08-30	

Laboratory Accreditation	Laboratory recognition	Industry Canada test site registration
DAkkS Reg. No. D-PL-11321-11-02	Registration No. BNetzA-CAB-16/21-15	3050A-2

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN:2016, Issue 09 (08-2016) and Issue 04 (11-2014).

Trade Register Munich
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Product Service

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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	2018-07-26
2	Chapter “2.4 Field Strength of any Emission” corrected.	2018-07-31
3	Added SPR-002 in Exposure of Humans to RF Fields Test	2018-08-30

Table 1

1.2 Introduction

Applicant	Agrident GmbH
Manufacturer	Agrident GmbH
Model Number(s)	ASR650
Serial Number(s)	2128002028
Hardware Version(s)	---
Software Version(s)	---
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN:2016, Issue 09 (08-2016) and Issue 04 (11-2014)
Test Plan/Issue/Date	---
Order Number	2128
Date of Receipt of EUT	2018-07-11
Start of Test	2018-07-19
Finish of Test	2018-07-31
Name of Engineer(s)	Michael Ingerl, Matthias Stumpe
Related Document(s)	ANSI C63.10 (2013)

Product Service

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C and Industry Canada RSS-210 and Industry Canada RSS-GEN is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: 12 V DC power supply - Transmitting continuously and waiting for tags				
2.1	15.215 (c), N/A and 6.6	20 dB Bandwidth	Pass	ANSI C63.10 (2013)
2.2	15.207, N/A and 8.8	AC Power Line Conducted Emissions	Pass	ANSI C63.10 (2013)
2.3	15.205, 4.1 and 8.10	Restricted Band Edges	Pass	ANSI C63.10 (2013)
2.4	15.209, 4.3 and 6.13	Field Strength of any Emission	Pass	ANSI C63.10 (2013)
2.5	15.107 and 6.1	Exposure of Humans to RF Fields	Pass	ANSI C63.4: 2014
2.6	15.35 and 4.5	Pulse Train	Pass	ANSI C63.4: 2014

Table 2

Product Service

1.4 Product Information

1.4.1 Technical Description

RFID Reader for electronic animal identification.

1.5 Deviations from the Standard

none

1.6 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
S/N: 2128002028			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.7 Test Location

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

Test Name	Name of Engineer(s)
Configuration and Mode: 12 V DC power supply - Transmitting continuously and waiting for tags	
20 dB Bandwidth	Michael Ingerl
AC Power Line Conducted Emissions	Michael Ingerl
Restricted Band Edges	Michael Ingerl
Field Strength of any Emission	Michael Ingerl, Matthias Stumpe
Exposure of Humans to RF Fields	Michael Ingerl
Pulse Train	Michael Ingerl

Table 4

Office Address:

Äußere Frühlingstraße 45
94315 Straubing
Germany

Product Service

2 Test Details

2.1 20 dB Bandwidth

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.215 (c), N/A and 6.6

2.1.2 Equipment Under Test and Modification State

ASR650, S/N: --- - Modification State 0

2.1.3 Date of Test

2018-07-26

2.1.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.9.1.

2.1.5 Environmental Conditions

Ambient Temperature	23,0 °C
Relative Humidity	38,0 %

2.1.6 Test Results

12 V DC power supply - Transmitting continuously and waiting for tags

Frequency (kHz)	20 dB Bandwidth (kHz)	99% Occupied Bandwidth (kHz)	F_{LOWER} (kHz)	F_{UPPER} (kHz)
134.2	0.8937	2.4462	133.7426	134.6362

Product Service

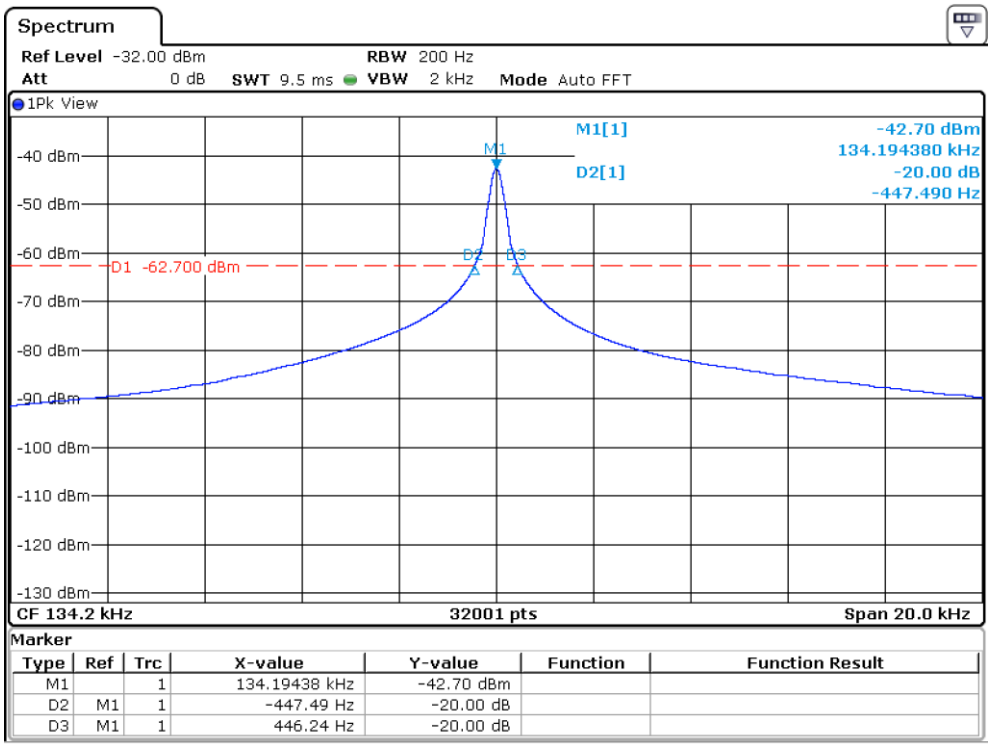

Figure 1 - 20 dB Bandwidth

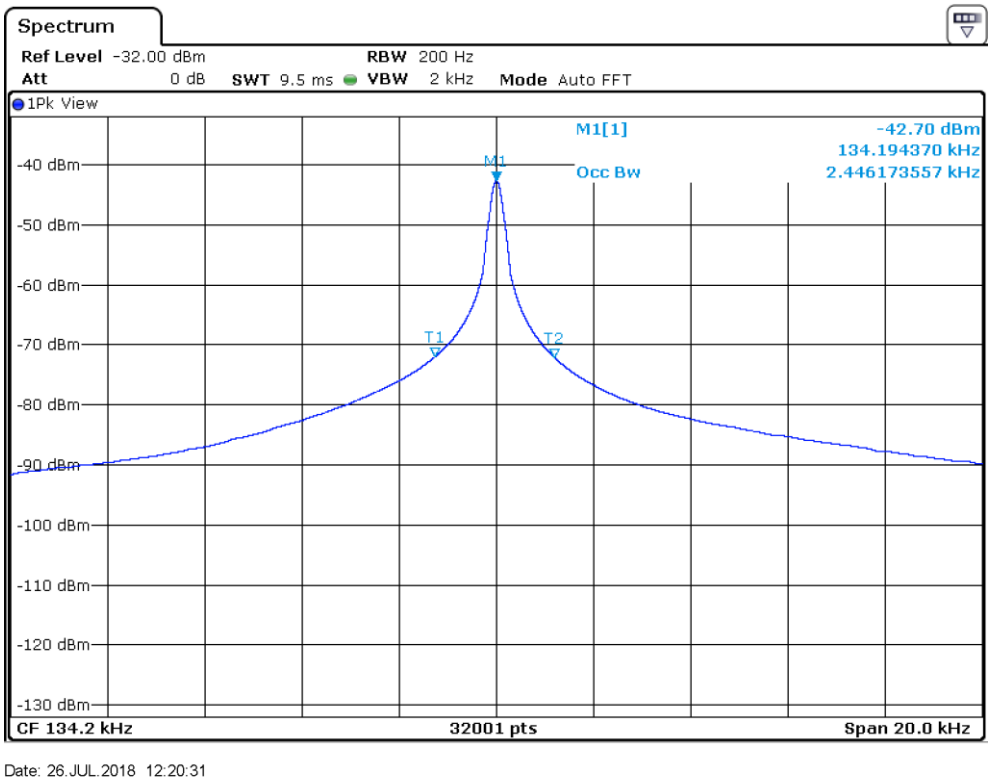

Figure 2 - 99% Occupied Bandwidth

Product Service

2.1.7 Test Location and Test Equipment Used

This test was carried out in Non shielded room.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSV40	20219	12	2019-01-31
Climatic test chamber	ESPEC	PL-2J	18843	24	2019-03-31

Table 5

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.2 AC Power Line Conducted Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.207, N/A and 8.8

2.2.2 Equipment Under Test and Modification State

ASR650, S/N: --- - Modification State 0

2.2.3 Date of Test

2018-07-27

2.2.4 Test Method

2.2.5 Environmental Conditions

Ambient Temperature	25,0 °C
Relative Humidity	34,0 %

2.2.6 Test Results

12 V DC power supply - Transmitting continuously and waiting for tags

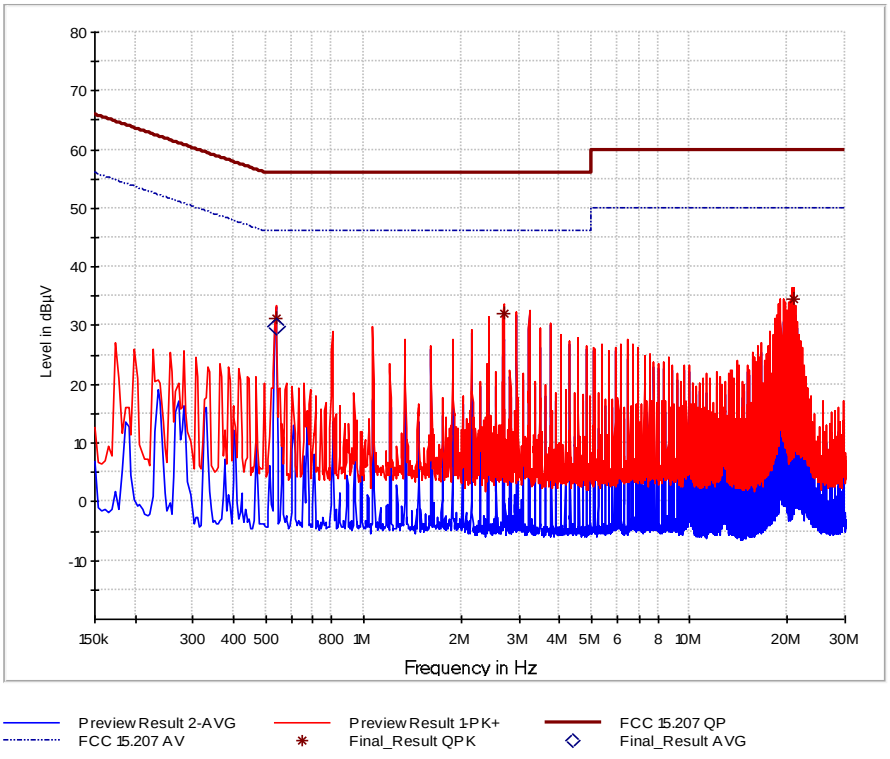

Figure 3 – Plus + Minus Line - 150 kHz to 30 MHz

Frequency *MHz*	*QuasiPeak* *dBµV*	*Average* *dBµV*	*Limit* *dBµV*	*Margin* *dB*	*Meas. Time* *ms*	*Bandwidth* *kHz*	*Line*	*PE*	*Corr.* *dB*
0,538000	0,00	29,99	46,00	16,01	1000,0	9,000	Plus	GND	0,0
0,538000	31,33	0,00	56,00	24,67	1000,0	9,000	Plus	GND	0,0
2,686000	31,96	0,00	56,00	24,04	1000,0	9,000	Minus	GND	0,1
20,938000	34,67	0,00	60,00	25,33	1000,0	9,000	Minus	GND	0,4

Plus + Minus Line Emissions Results

FCC 47 CFR Part 15, Limit Clause 15.207 and Industry Canada RSS-GEN, Limit Clause 8.8

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

Table 6

*Decreases with the logarithm of the frequency.

2.2.7 Test Location and Test Equipment Used

This test was carried out in Shielded room - cabin no. 4.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI test receiver	Rohde & Schwarz	100008	19730	12	2018-10-31
V-network	Rohde & Schwarz	894785/005	18919	36	2019-10-31

Table 7

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.3 Restricted Band Edges

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.205, 4.1 and 8.10

2.3.2 Equipment Under Test and Modification State

ASR650, S/N: --- - Modification State 0

2.3.3 Date of Test

2018-07-26

2.3.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.13.1.

Plots for average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.3.

Final average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.2.

2.3.5 Environmental Conditions

Ambient Temperature	23,0 °C
Relative Humidity	38,0 %

2.3.6 Test Results

<u>12 V DC power supply - Transmitting continuously and waiting for tags</u>

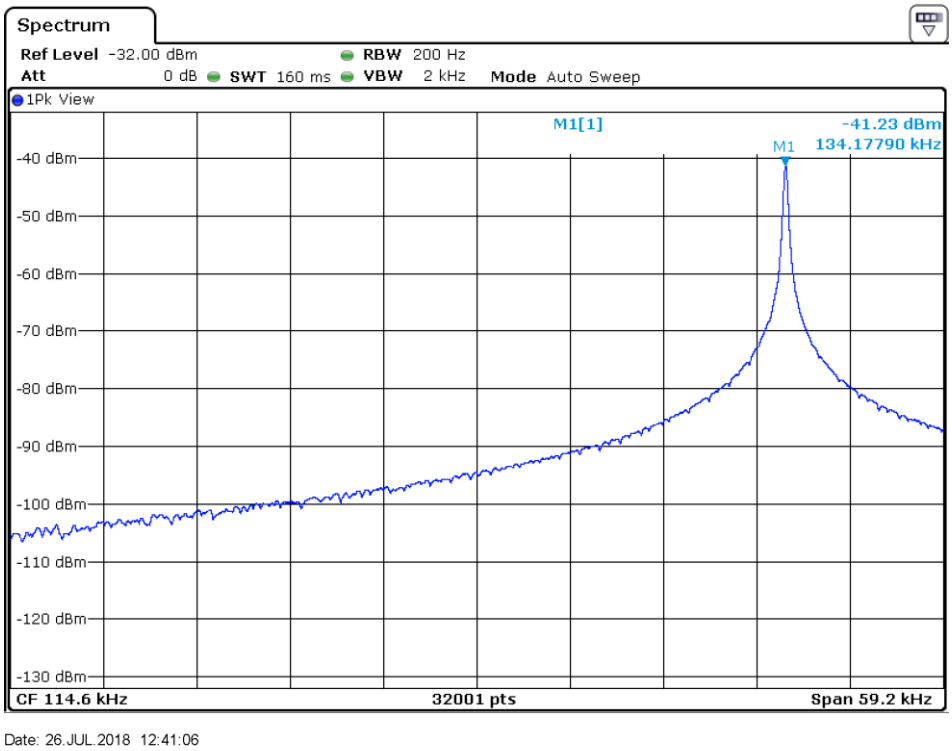

Figure 4 – Restricted Band Edges

Product Service

2.3.7 Test Location and Test Equipment Used

This test was carried out in Non shielded room.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSV40	20219	12	2019-01-31
Climatic test chamber	ESPEC	PL-2J	18843	24	2019-03-31

Table 8

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.4 Field Strength of any Emission

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.209, 4.3 and 6.13

2.4.2 Equipment Under Test and Modification State

ASR650, S/N: --- - Modification State 0

2.4.3 Date of Test

2018-07-19 and 2018-07-31

2.4.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.5. and Industry Canada RSS-Gen clause 6.13.
Measurements were made at a distance of 10 m. The limit lines shown on the plot were extrapolated from either 300 m or 30 m to the measurement distance of 10 m in accordance with ANSI C63.10 Clause 6.4.4.2.
For any emissions detected within 20 dB of the limit, a final measurement was made at 5 m and 30 m test distance. Final result was calculated in acc. with ANSI C63.10 Clause 6.4.4.6 and recorded in the table below. The detector used for these measurements was a quasi-peak detector except for emissions within the bands 9 kHz to 90 kHz and 110 kHz to 490 kHz where a CISPR average detector was used.

2.4.5 Environmental Conditions

Ambient Temperature	21,0 °C
Relative Humidity	31,0 %

Product Service

2.4.6 Test Results

12 V DC power supply - Transmitting continuously and waiting for tags

Frequency	Distance			Reading Value		Correction	Extrapolation		Final	Limit	Margin
	d1	d2	d	d1	d2	Factor	Factor		Value		
(MHz)	(m)	(m)	(m)	(dBµV)	(dBµV)	(dB/m)	(dB/dec)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
0,13420	5	30	300	95,7	48,6	20,0	-60,5	-60,5	8,1	25,0	17,0

Table 9

Sample calculation of final values:

$$\text{Extrapolation Factor (dB/decade)} = \begin{cases} -40 \text{ (dB/decade)} & \text{if } d_1 = d_2 \\ \dfrac{\text{Reading Value } d_2 \text{ (dBµV)} - \text{Reading Value } d_1 \text{ (dBµV)}}{\text{Log}(d_2) - \text{Log}(d_1)} & \text{if } d_1 \neq d_2 \end{cases}$$

$$\text{Extrapolation Factor (dB)} = (\text{Log}(d) - \text{Log}(d_2)) \cdot \text{Extrapolation Factor (dB/decade)}$$

$$\text{Final Value (dBµV/m)} = \text{Reading Value } d_2 \text{ (dBµV)} + \text{Correction Factor (dB/m)} + \text{Extrapolation Factor (dB)}$$

Note: Extrapolation factor (dB) and final value (dBµV/m) are relating to distance d.

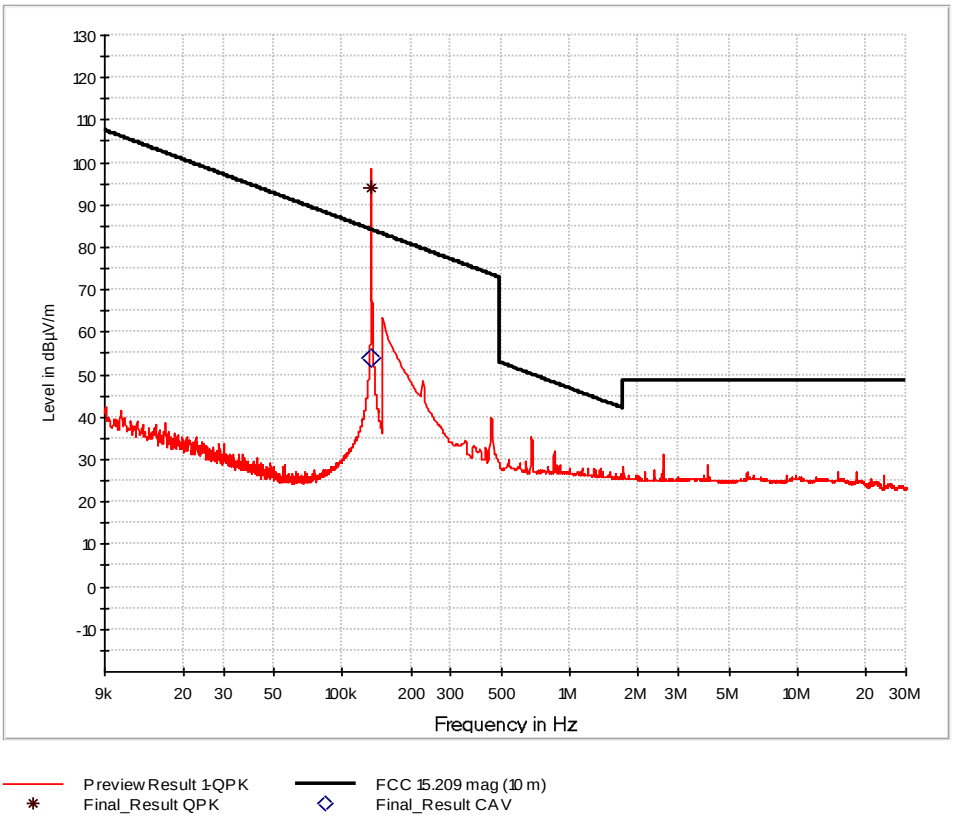

Figure 5 - ***9 kHz to 30 MHz***

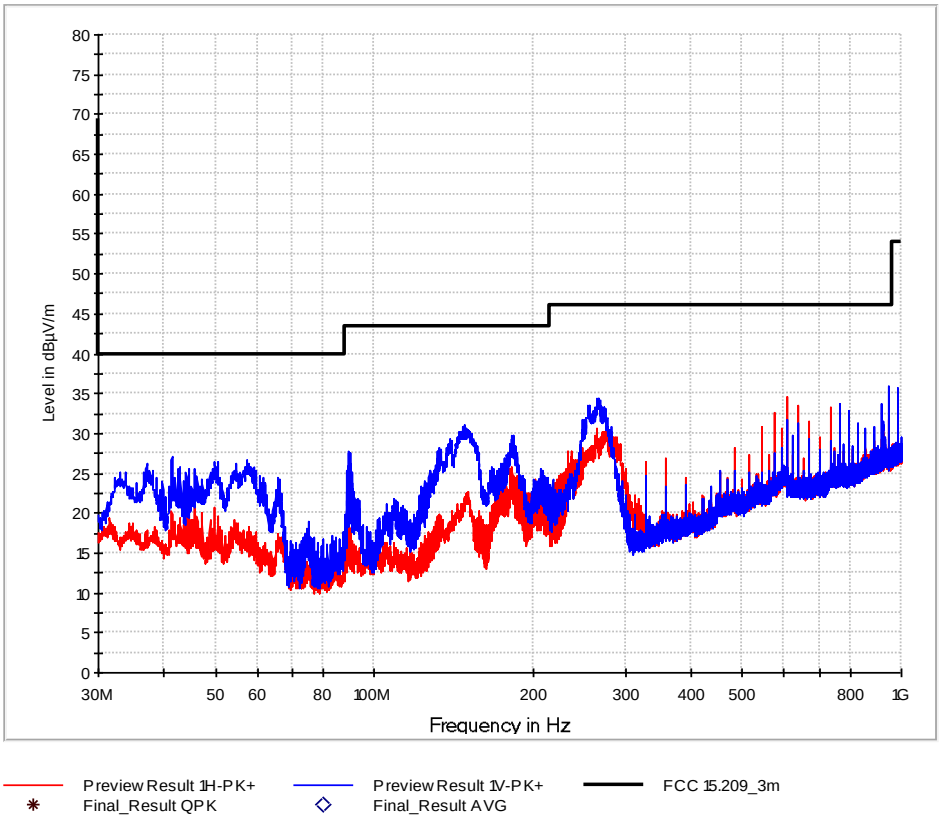

Figure 6 - ***30 MHz to 1 GHz***

Product Service

2.4.7 Test Location and Test Equipment Used

This test was carried out in Semi anechoic room - cabin no. 8 and
Open area test site for fundamental emission level test.

Instrument	Manufacturer	Type No	T-ID	Calibration Period (months)	Calibration Due
Loop Antenna	Rohde & Schwarz	HFH2-Z2	18876	36	2019-07-31
Double ridged horn antenna	Rohde & Schwarz	HF907	19933	24	2019-06-30
TRILOG Antenna	Schwarzbeck	VULB 9163	19691	24	2020-12-31
EMI test receiver	Rohde & Schwarz	ESW26	28268	12	2019-05-31

Table 10

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.5 Exposure of Humans to RF Fields

2.5.1 Specification Reference

FCC 47 CFR Part 15B and ICES-003, Clause 15.107 and 6.1

2.5.2 Guide

IC RSS-102 Issue 5, section 2.5

2.5.3 Equipment Under Test and Modification State

ASR650, S/N: --- - Modification State 0

2.5.4 Date of Test

2018-07-27

2.5.5 Test Results

12 V DC power supply - Transmitting continuously and waiting for tags

Exposure of Humans to RF Fields	Applicable	Declared by applicant	Measured	Exemption
The antenna is				
☐ detachable				
The conducted output power (CP in watts) is measured at the antenna connector: CP = ... **W**			☐	
The effective isotropic radiated power (EIRP in watts) is calculated using				
☐ the numerical antenna gain: G = ... $EIRP = G \cdot CP \Rightarrow EIRP$ = ... **W**		☐		
☐ the field strength[1] in V/m: FS = ... **V/m** $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = ... **W**			☐	
with: Distance between the antennas in m: D = ... **m**			☐	
☒ not detachable				
A field strength measurement is used to determine the effective isotropic radiated				

[1] 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.

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power (EIRP in watts) given by: $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = **2.63 mW** with: Field strength in V/m: FS **= 2,81** Distance between the two antennas in m: D = **0.10**			☒ ☒	
Selection of output power				
The output power TP is the higher of the conducted or effective isotropic radiated power (e.i.r.p.): TP = **2.63 mW**				

Exposure of Humans to RF Fields (continued)		Applicable	Declared by applicant	Measured	Exemption
Separation distance between the user and the transmitting device is					
☒ less than or equal to 20 cm	☐ greater than 20 cm		☐		
Transmitting device is					
☐ in the vicinity of the human head	☐ body-worn		☐		

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SAR evaluation														
SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in the table. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in the table are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in the table are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in the table, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required. For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.														
Frequency (MHz)	Exemption limits (mW)[2] at separation distance of													
	≤5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	≥50 mm				
≤300 [3]	71	101	132	162	193	223	254	284	315	345				
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				

[2] The exemption limit in the table are based on measurements and simulations on half-wave dipole antennas at separaton 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 alinear fit. For high frequencies (1900 MHz and above), the exemption limits are derived from athird order polynomial fit.

[3] Transmitters operating between 3 kHz and 10 MHz, meeting the exemption from routine SAR evaluation, shall demonstrate compliance to the instantaneous limits in IC RSS-102, issue 5, section 4.

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Carrier frequency:	*f*	=	**134.2 kHz**			
Distance:	*d*	=	**5 mm**			
Transmitter output power:	*TP*	=	**2.63 mW**			
Limit:	TP_{limit}	=	**71 mW**			☒
☐ SAR evaluation is documented in test report no. …						

Specifications:	RSS-102, Issue 5, Section 4, Table 4, Uncontrolled Environment SPR-002, Issue 1
Operation mode:	12 V DC power supply - Transmitting continuously and waiting for tags
Comment:	The nerve stimulation exposure limit is defined for the frequency range 3 kHz to 10 MHz, only. Thus, the carrier at 134.2 kHz was evaluated, only.

Test procedure:	IEC 62236-1, Section 4.2 “Measurement to show accordance to the reference levels”
Test distance:	Direct contact to EUT
Limit:	*Frequency Range (MHz)* / *Electric Field (V/m_{rms})* / *Magnetic Field (A/m_{rms})* / *Peference Periode (min)* 0.003 – 10 / 83 / 90 / Instantaneous 0.1 – 10 / --- / 0.73 / f / 6 1.1 - 10 / $87/f^{0.5}$ / --- / 6 *f* in MHz
Test positions:	All surfaces: The antenna was moved all over the equipment under test using a test distance as stated above.

Measured maximum value (V/m)	*Maximum Limit at 134.2 kHz (V/m)*	*Margin to reference value (V/m)*
5.24	83.00	77.76

Measured maximum value (A/m)	*Maximum Limit at 134.2 kHz (A/m)*	*Margin to reference value (A/m)*
0.46	90.00	89.54

Measured average value (A/m)	*Average Limit at 134.2 kHz (A/m)*	*Margin to reference value (A/m)*
0.24	5.84	5.60

Product Service

2.5.6 Test Location and Test Equipment Used

This test was carried out in a Shielded room - cabin no. 4.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Electromagnetic radiation meter	Narda Safety	EMR-200	19590	36	2019-10-31
Electric field probe	Narda Safety	Type 8.3	19591	36	2019-10-31
Magnetic field probe	Narda Safety	Type 12.1	19592	36	2019-10-31
Exposure level tester	Narda Safety	ELT-400	19725	24	2020-06-30

Table 11

Product Service

2.6 Pulse Train

2.6.1 Specification Reference

CFR 47 Part 15, section 15.35(c)
IC RSS-Gen Issue 3, section 4.5

2.6.2 Equipment Under Test and Modification State

ASR650, S/N: --- - Modification State 0

2.6.3 Date of Test

2018-07-26

2.6.4 Test Method

This test was performed in accordance with ANSI C63.4

2.6.5 Environmental Conditions

Ambient Temperature	23,0 °C
Relative Humidity	38,0 %

2.6.6 Test Results

12 V DC power supply - Transmitting continuously and waiting for tags

Calculation of pulse train correction:

TX-On-Time (worst case):	T_{on}	=	49.938 ms
Pulse Train Time:	T_{pt}	=	70.006 ms
Period Time:	T_{period}	=	70.006 ms
Pulse Train Correction:	C_{pt}	=	$20 \cdot \text{Log}(T_{on} / T_{period})$ dB
		=	**-2.934 dB**

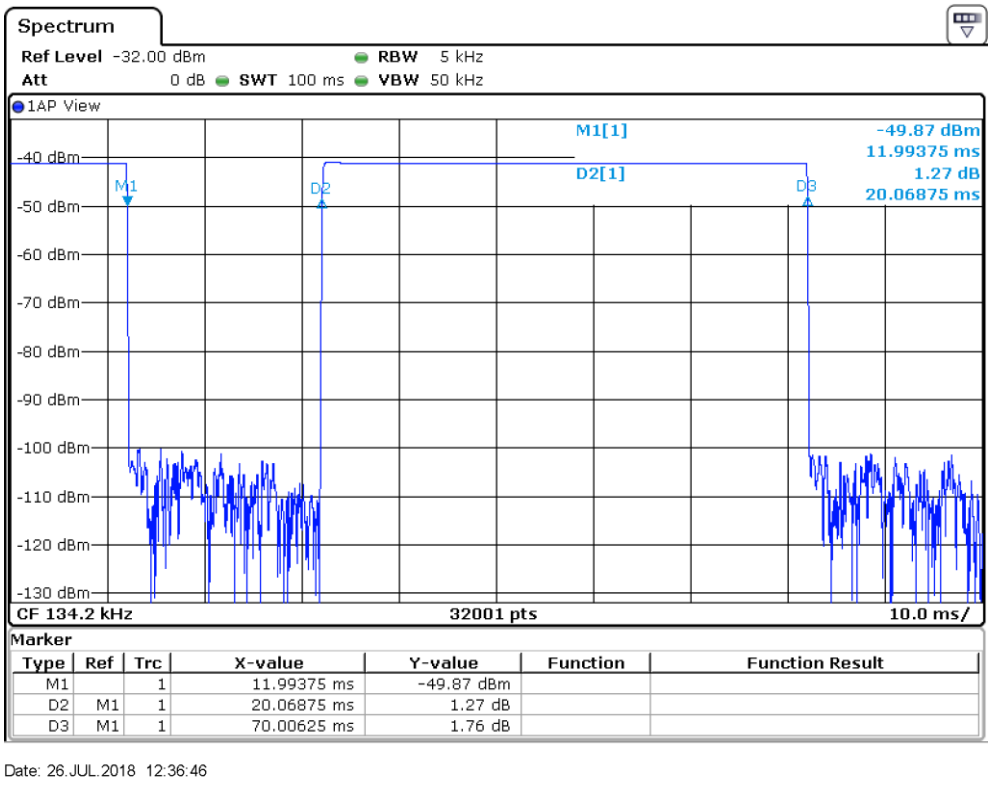


Figure 7 – Pulse Train

2.6.7 Test Location and Test Equipment Used

This test was carried out in Non shielded room.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSV40	20219	12	2019-01-31
Climatic test chamber	ESPEC	PL-2J	18843	24	2019-03-31

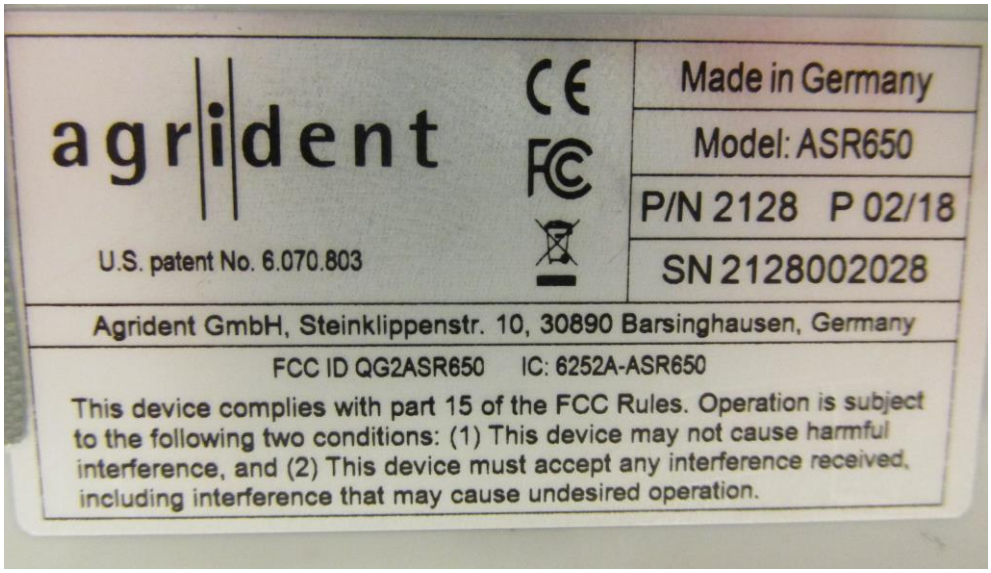
Table 12

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

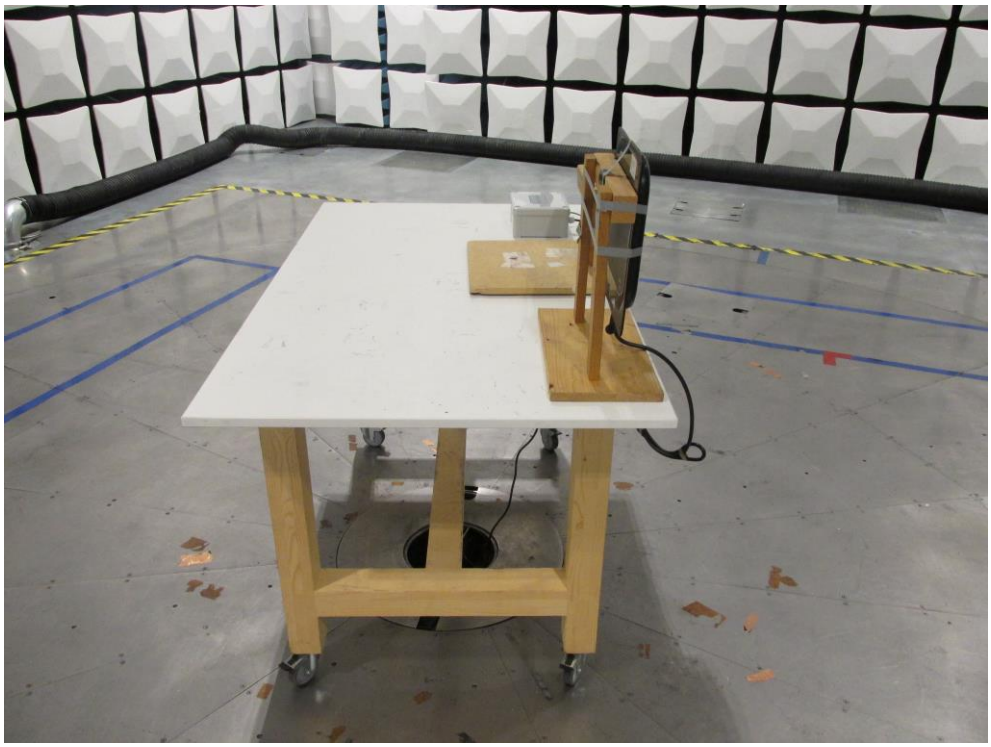
Product Service

3 Photographs

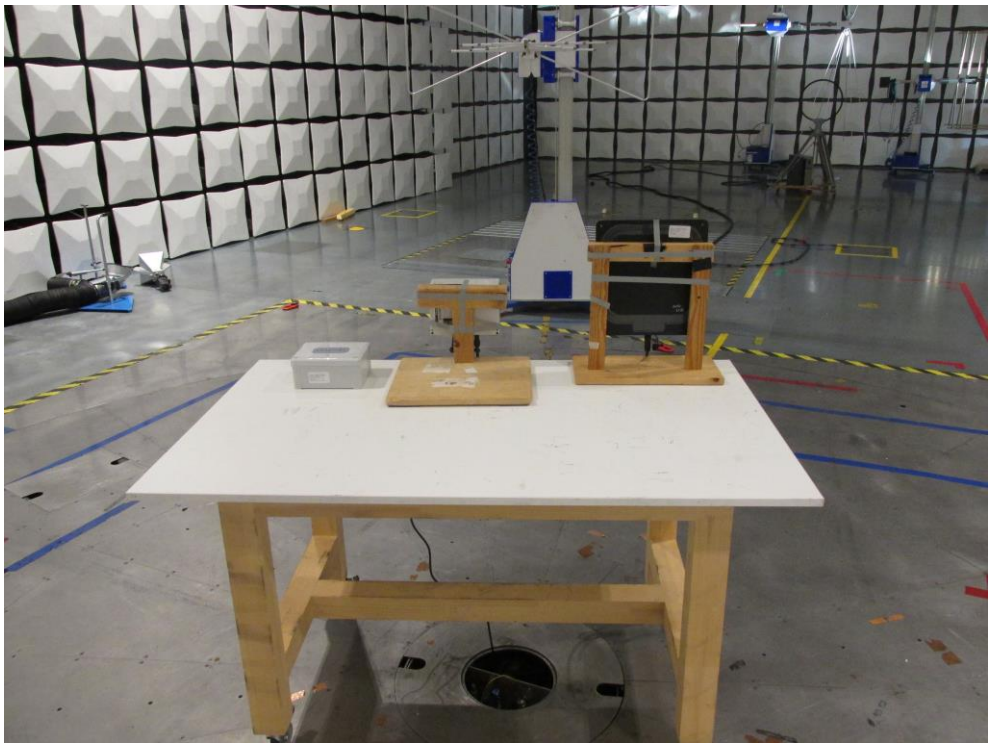
3.1 Equipment Under Test (EUT)

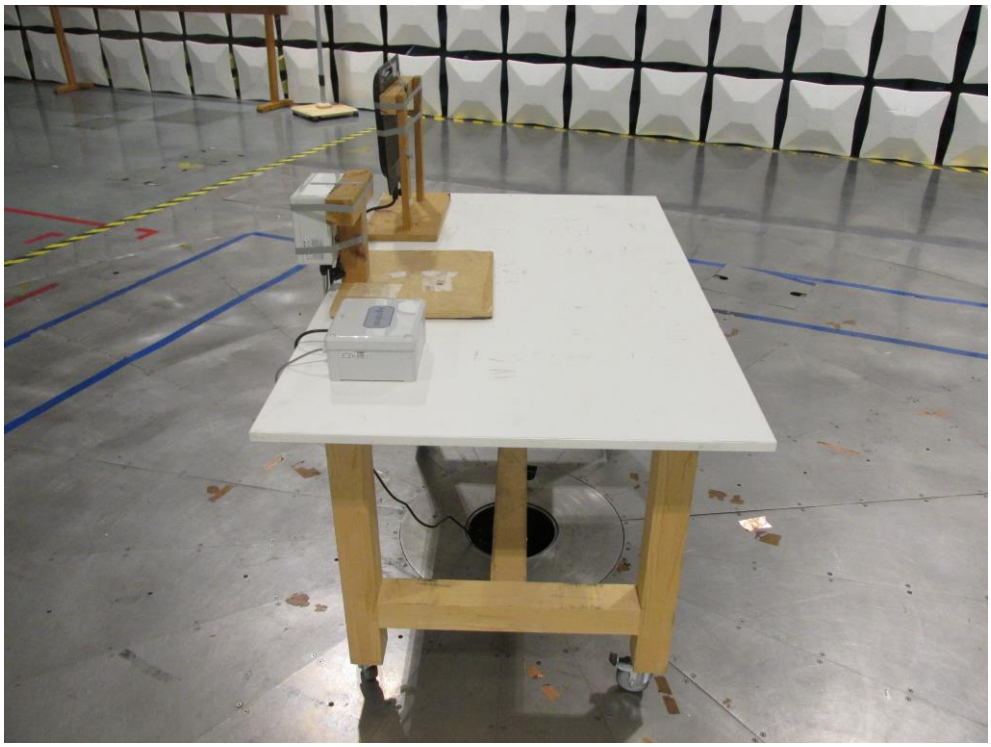


Product Service

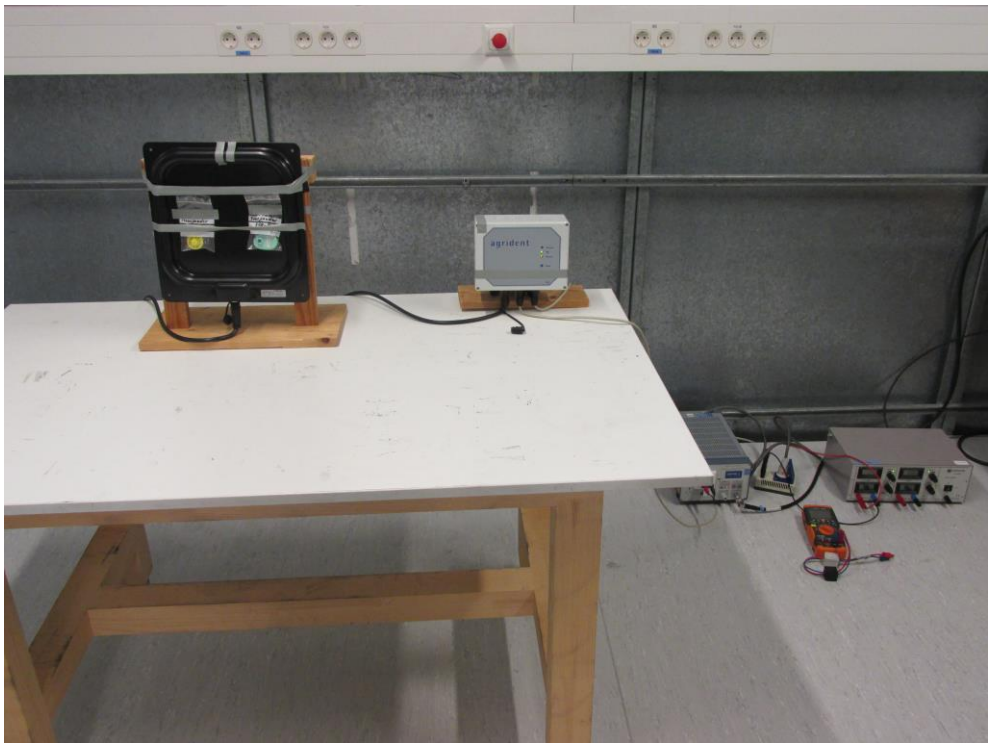


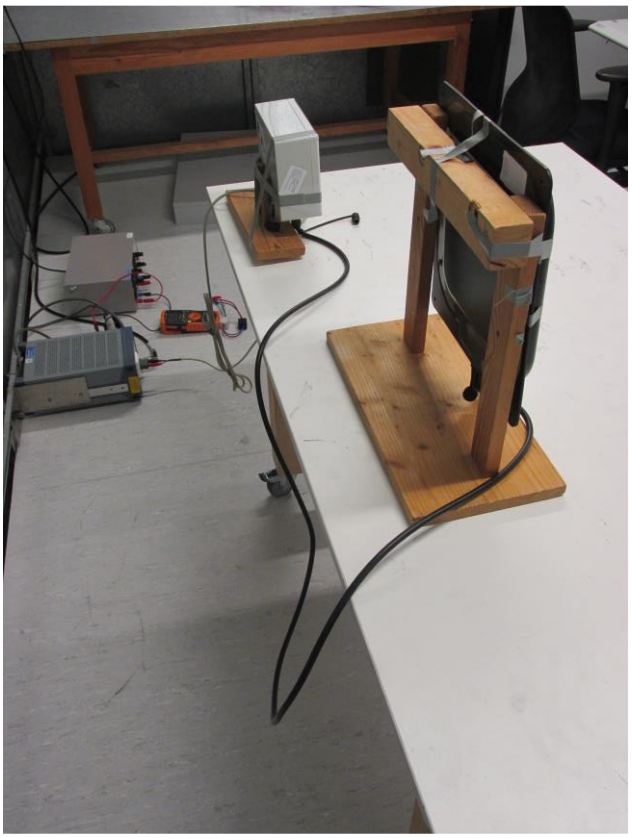
Product Service





Product Service





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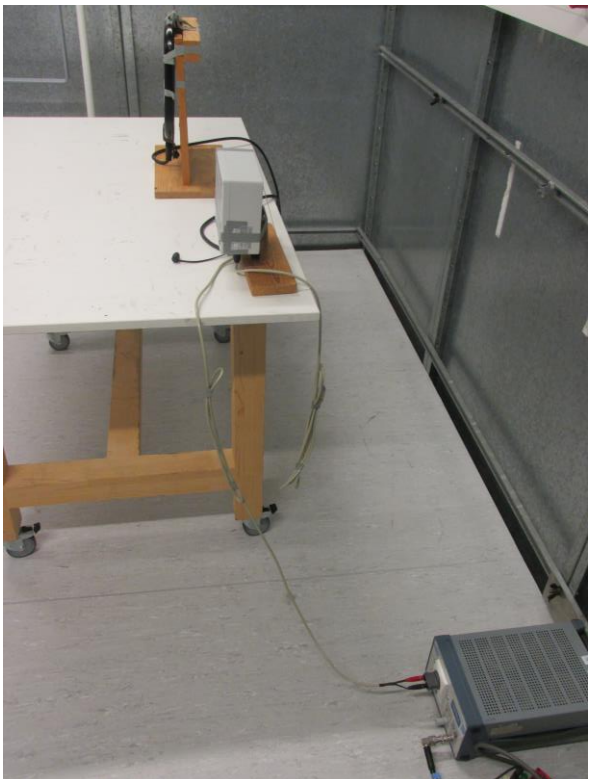

Product Service

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4 Test Equipment Information

4.1 General Test Equipment Used

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSV40	20219	12	2019-01-31
Climatic test chamber	ESPEC	PL-2J	18843	24	2019-03-31
EMI test receiver	Rohde & Schwarz	100008	19730	12	2018-10-31
V-network	Rohde & Schwarz	894785/005	18919	36	2019-10-31
Double ridged horn antenna	Rohde & Schwarz	HF907	19933	24	2019-06-30
TRILOG Antenna	Schwarzbeck	VULB 9163	19691	24	2020-12-31
EMI test receiver	Rohde & Schwarz	ESW26	28268	12	2019-05-31
Electromagnetic radiation meter	Narda Safety	EMR-200	19590	36	2019-10-31
Electric field probe	Narda Safety	Type 8.3	19591	36	2019-10-31
Magnetic field probe	Narda Safety	Type 12.1	19592	36	2019-10-31
Exposure level tester	Narda Safety	ELT-400	19725	24	2020-06-30

Table 13

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

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5 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	±1.14 %	2
RF-Frequency error	1.96	±1 · 10-7	7
RF-Power, conducted carrier	2	±0.079 dB	2
RF-Power uncertainty for given BER	1.96	+0.94 dB / -1.05	7
RF power, conducted, spurious emissions	1.96	+1.4 dB / -1.6 dB	7
RF power, radiated			
25 MHz – 4 GHz	1.96	+3.6 dB / -5.2 dB	8
1 GHz – 18 GHz	1.96	+3.8 dB / -5.6 dB	8
18 GHz – 26.5 GHz	1.96	+3.4 dB / -4.5 dB	8
40 GHz – 170 GHz	1.96	+4.2 dB / -7.1 dB	8
Spectral Power Density, conducted	2.0	±0.53 dB	2
Maximum frequency deviation			
300 Hz – 6 kHz	2	±2,89 %	2
6 kHz – 25 kHz	2	±0.2 dB	2
Maximum frequency deviation for FM	2	±2,89 %	2
Adjacent channel power 25 MHz – 1 GHz	2	±2.31 %	2
Temperature	2	±0.39 K	4
(Relative) Humidity	2	±2.28 %	2
DC- and low frequency AC voltage			
DC voltage	2	±0.01 %	2
AC voltage up to 1 kHz	2	±1.2 %	2
Time	2	±0.6 %	2

Table 14

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 15

Product Service

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	± 0.9 %	2
Frequency setting	2	± 0.1 %	2
Electrical Transient Transmission in Road Vehicles			4

Table 16

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%