EMC TEST REPORT

FCC 47 CFR Part 15B, ISED ICES-003 Issue 6

Report Reference No	G0M-2101-9550-EF0115B-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-2 DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Hella Aglaia Mobile Vision GmbH
Address	Ullsteinstraße 140 12109 Berlin GERMANY
Test Specification Standard(s)	47 CFR Part 15 Subpart B ISED ICES-003 Issue 6 ANSI C63.4:2014+A1:2017
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Advanced People Sensor; 90 mm lens distance; without IO connector
Model(s)	GH604
Additional Model(s)	None
Brand Name(s)	APS-90E
Hardware Version(s)	GH604
Software Version(s)	1.19.1.0
FCC-ID	2ASWU-PS8
IC	N/A
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	2021-01-27	
Report:		
Compiled by	Matthias Handrik	
Tested by (+ signature) (Responsible for Test)	Matthias Handrik	.....
Approved by (+ signature) (Test Lab Engineer)	Andreas Pflug	.....
Date of Issue	2021-02-03	
Total number of pages	34	
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:		

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	2021-02-03	Initial Release	-

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1 Equipment (Test Item) Under Test

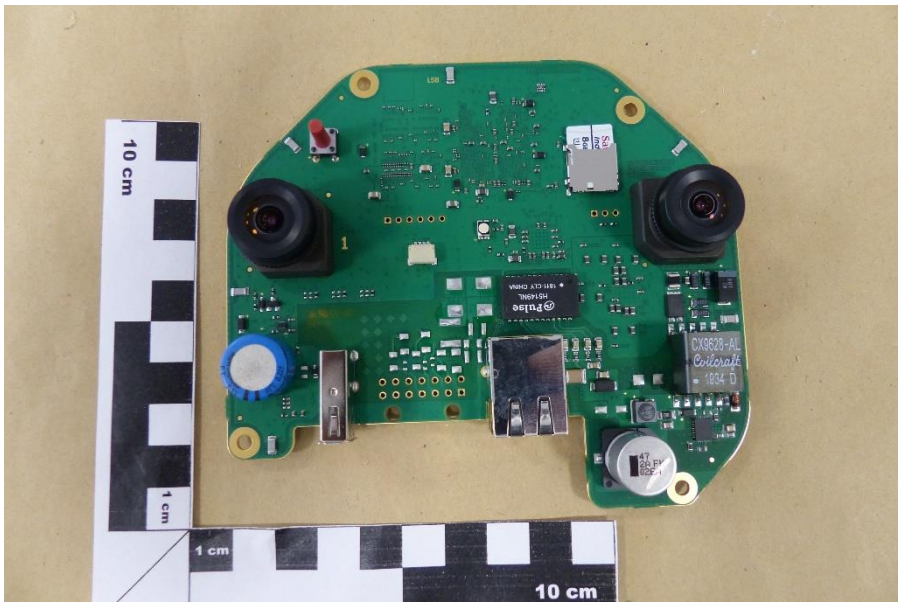
Description	Advanced People Sensor; 90 mm lens distance; without IO connector	
Model	GH604	
Additional Model(s)	None	
Brand Name(s)	APS-90E	
Serial Number(s)	MAC: 00:0B:91:90:92:0D	
Hardware Version(s)	GH604	
Software Version(s)	1.19.1.0	
EUT Dimension [cm]	16.0 x 16.0 x 4.2	
FCC-ID	2ASWU-PS8	
IC	N/A	
Class	Class B	
Equipment type	Table top	
Highest internal frequency [MHz]	666	
Supply Voltage	V_{NOM}	48 VDC via PoE
AC/DC-Adaptor	None	
Manufacturer	Hella Aglaia Mobile Vision GmbH Ullsteinstraße 140 12109 Berlin GERMANY	

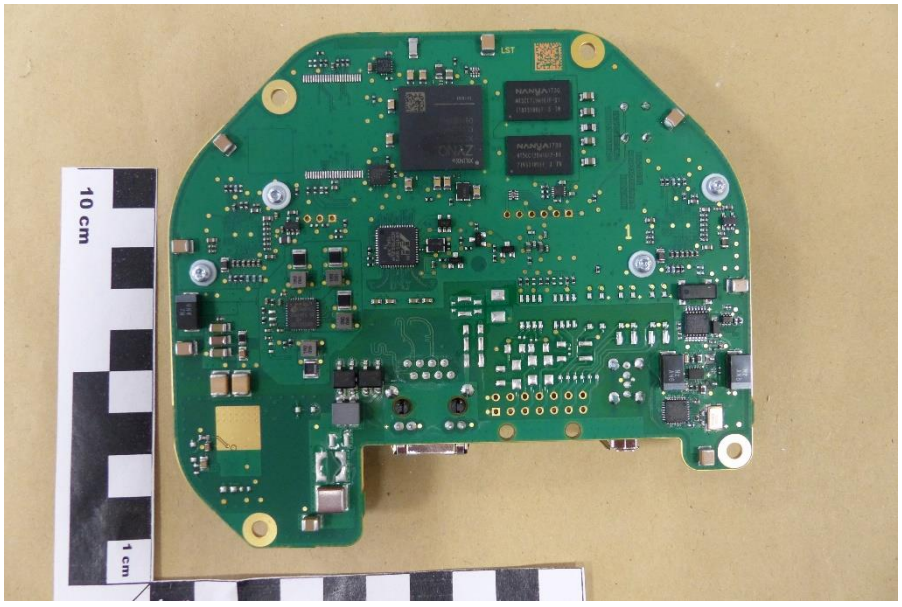
1.1 Equipment Ports

Name	Type	Attributes	Comment
Ethernet	DC;IO	Count: 1 Direction: IO Max. cable length [m]: 100 Connected to outdoor: No Shielded: Yes Service only: No	SFTP CAT6 4x2xAWG 27/7 Grounded via PoE Injector
USB	IO	Count: 1 Direction: IO Max. cable length [m]: <3 Connected to outdoor: No Shielded: Yes Service only: No	USB 2.0; Highspeed

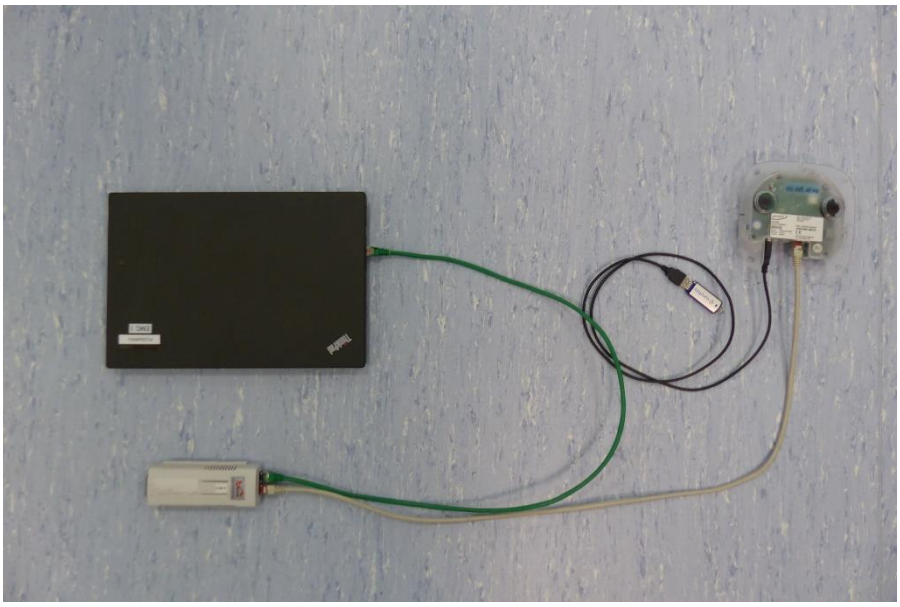
Description:	
AC	AC mains power input/output port
DC	DC power input/output port
BAT	DC power input port connected to external battery
IO	Input/Output port
TP	Telecommunication port
NE	Non-electrical port

1.2 Equipment Photos - Internal

EUT PCB TOP


EUT PCB BOTTOM


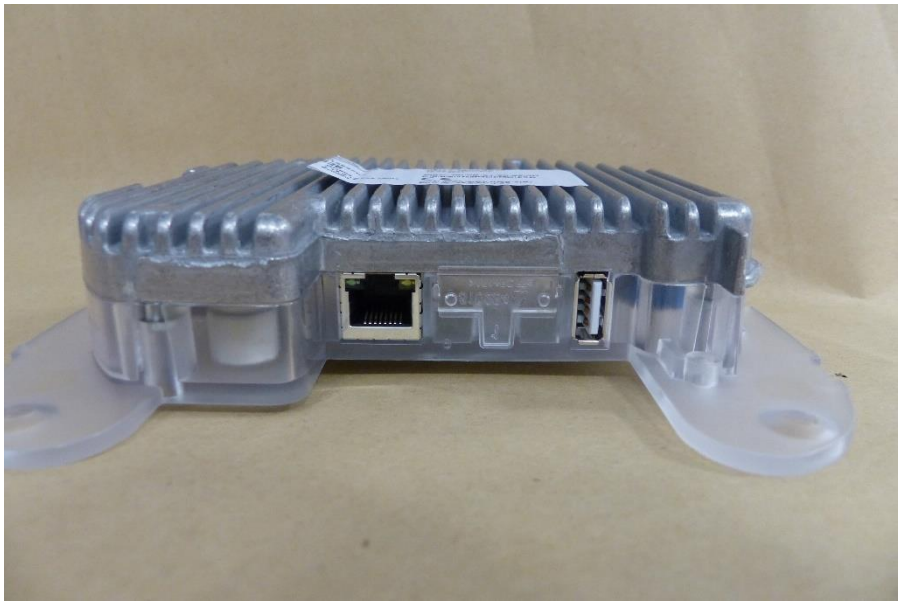
1.3 Equipment Photos - External

EUT + accessory equipment


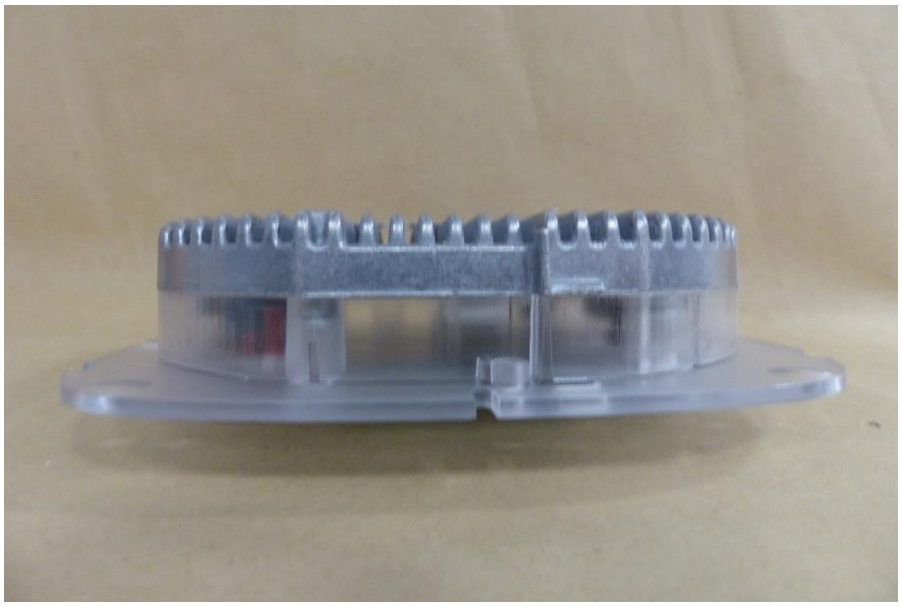
EUT TOP

EUT BOTTOM

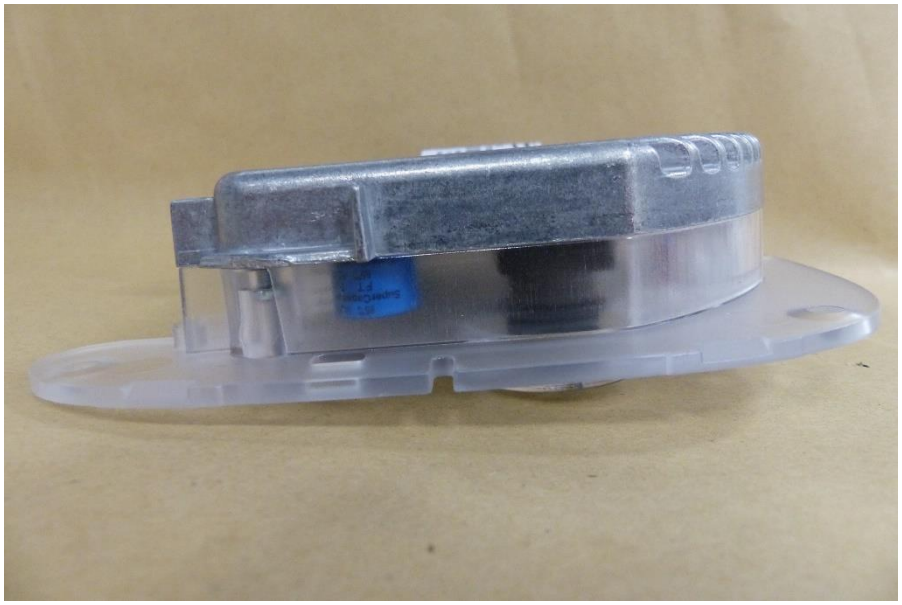
EUT BACK



EUT RIGHT

EUT FRONT


EUT LEFT



EUT LABEL

1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	lenovo	ThinkPad T450	-
AE	PoE Injector	PowerDsine	PowerDsine 3001	100-250V AC 50/60 Hz
AE	USB Stick	Flashby	unspecified	-
CBL	USB	unspecified	USB A extension 1.2m	shielded
CBL	Ethernet	unspecified	SFTP CAT6 4x2xAWG 27/7 1m	-
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				

1.5 Operational Modes

Mode #	Description
1	counting mode (counts people coming in or going out). Life video shown in Web Browser on laptop.
Comment:	

1.6 EUT Configuration

Configuration #	Description
1	EUT assembled with USB stick via 1.20m extension wire. EUT assembled with Ethernet wire. PoE injector powered the EUT. Grounded via PoE Injector.
Comment:	

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:

Reading on Analyser (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 15B, ISED ICES-003 Issue 6				
Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
Emission				
FCC 15.109 ICES-003, 6.2	Radiated emissions	ANSI C63.4:2014 +A1:2017	PASS	-
FCC 15.107 ICES-003, 6.1	AC power line conducted emissions	ANSI C63.4:2014 +A1:2017	PASS	-
Comment:				

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

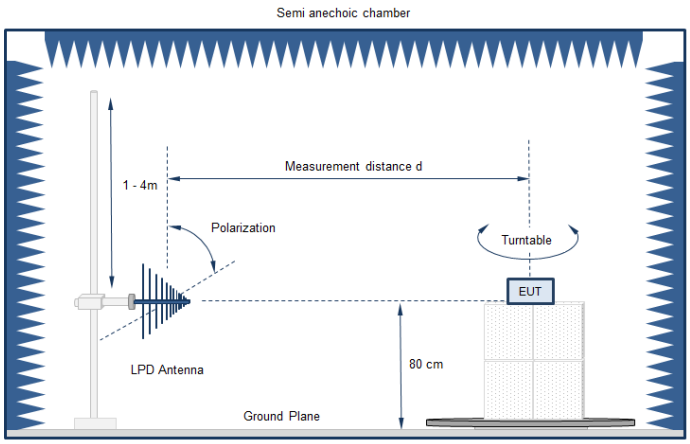
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

2.1.1 Information

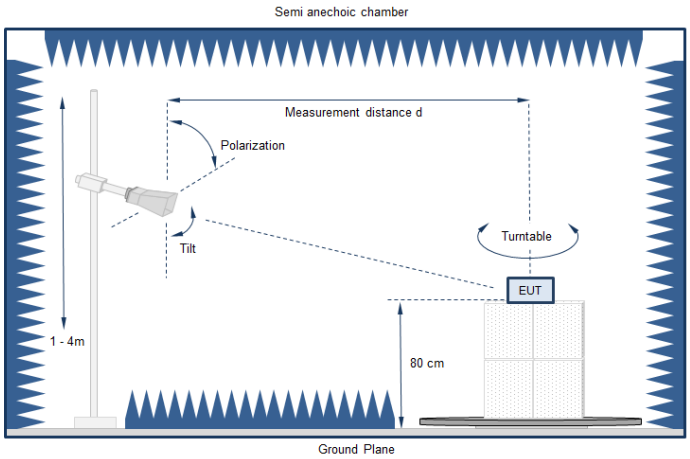
Test Information	
Reference	FCC 15.109, ICES-003, 6.2
Reference method	ANSI C63.4:2014+A1:2017 Section 8
Equipment class	Class B
Equipment type	Table top
Highest internal frequency [MHz]	666
Measurement range	30 MHz to 5 GHz
Temperature [°C]	22 ±3
Humidity [%]	27 ±
Operator	Matthias Handrik
Date	2021-01-27

2.1.2 Setup

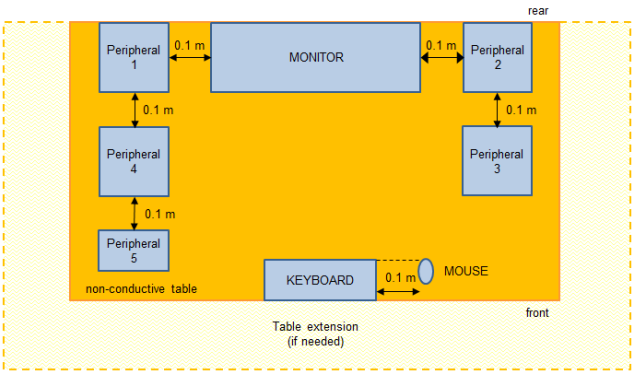
Measurement up to 1 GHz



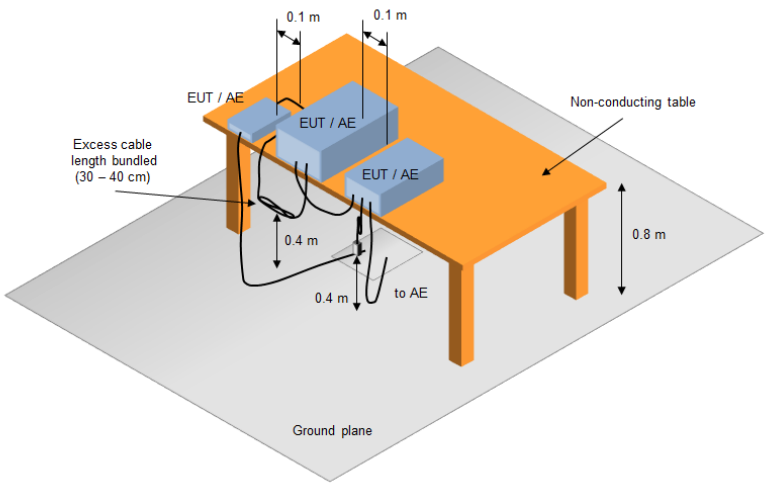
Measurement above 1 GHz



Equipment placement - Table top



Test Setup



2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC1	EF00062	2018-07	2021-07
EMI Test Receiver	Keysight	N9038A-526/WXP	EF01070	2020-06	2021-06
Biconical Antenna	R&S	HK 116	EF00030	2019-04	2022-04
LPD Antenna	R&S	HL 223	EF00187	2019-05	2022-05
Horn Antenna	Schwarzbeck	BBHA9120D	EF00018	2019-10	2022-10
Climatic Sensor	Embedded Data Systems, LLC.	280010000025417E	EF01054	2020-03	2021-03

2.1.4 Procedure

Exploratory measurement
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 or 10 m. 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
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 biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 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.

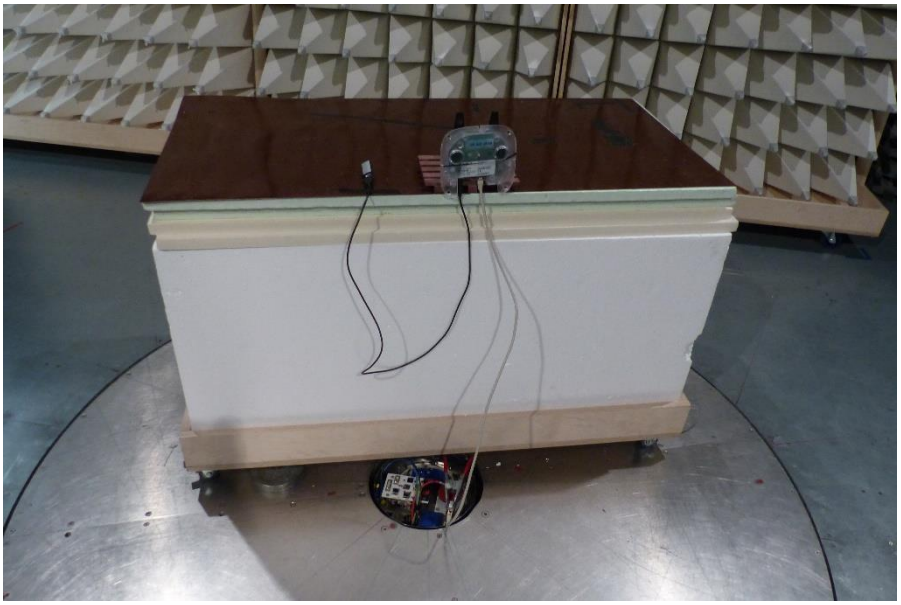
2.1.5 Limits

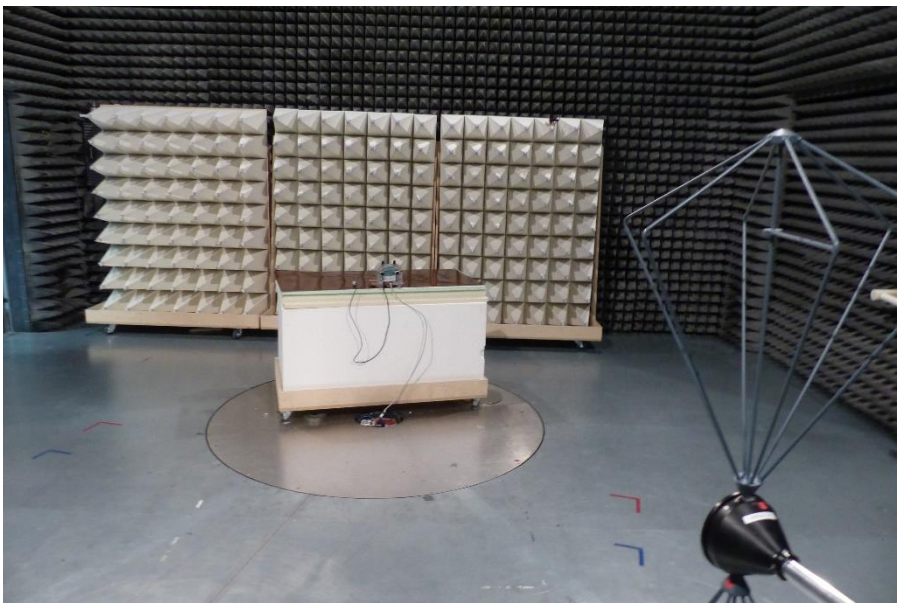
Class B @ 3 m		
Frequency [MHz]	Detector	Limit [dBµV/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak Average	74 54

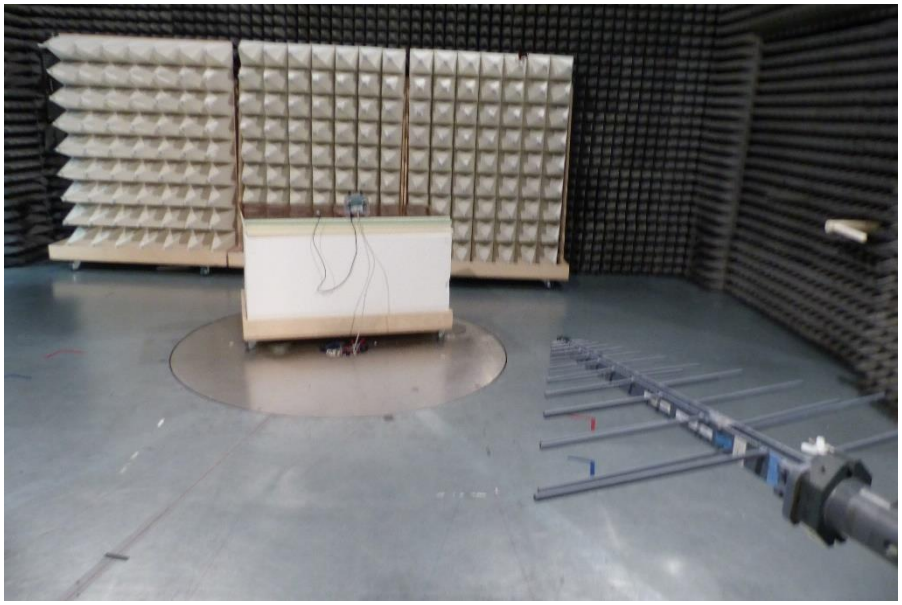
2.1.6 Results

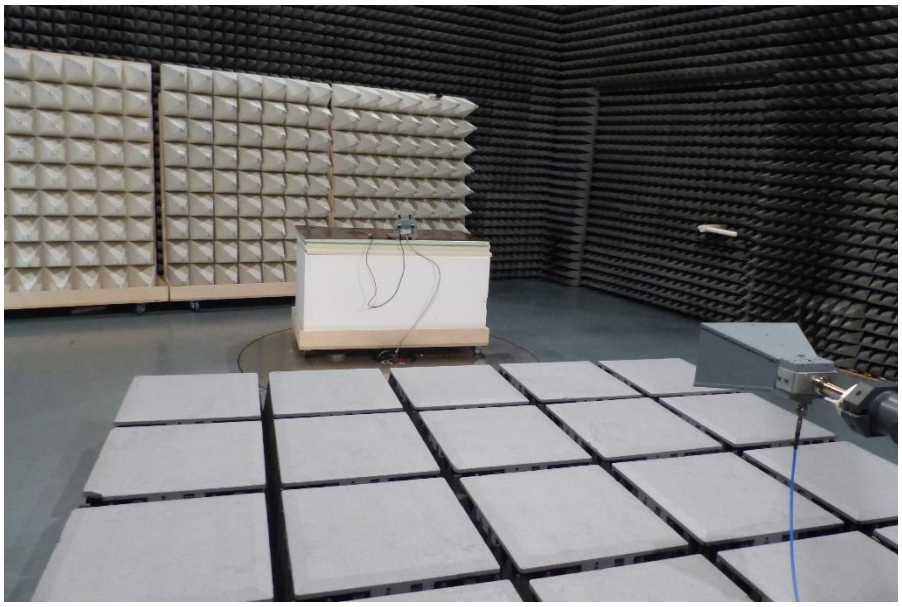
Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	-
Comment: Ethernet shield was connected to measurement chamber ground direct under the measurement table.			

2.1.7 Setup Photos

Test Setup


Test Setup 30-200MHz


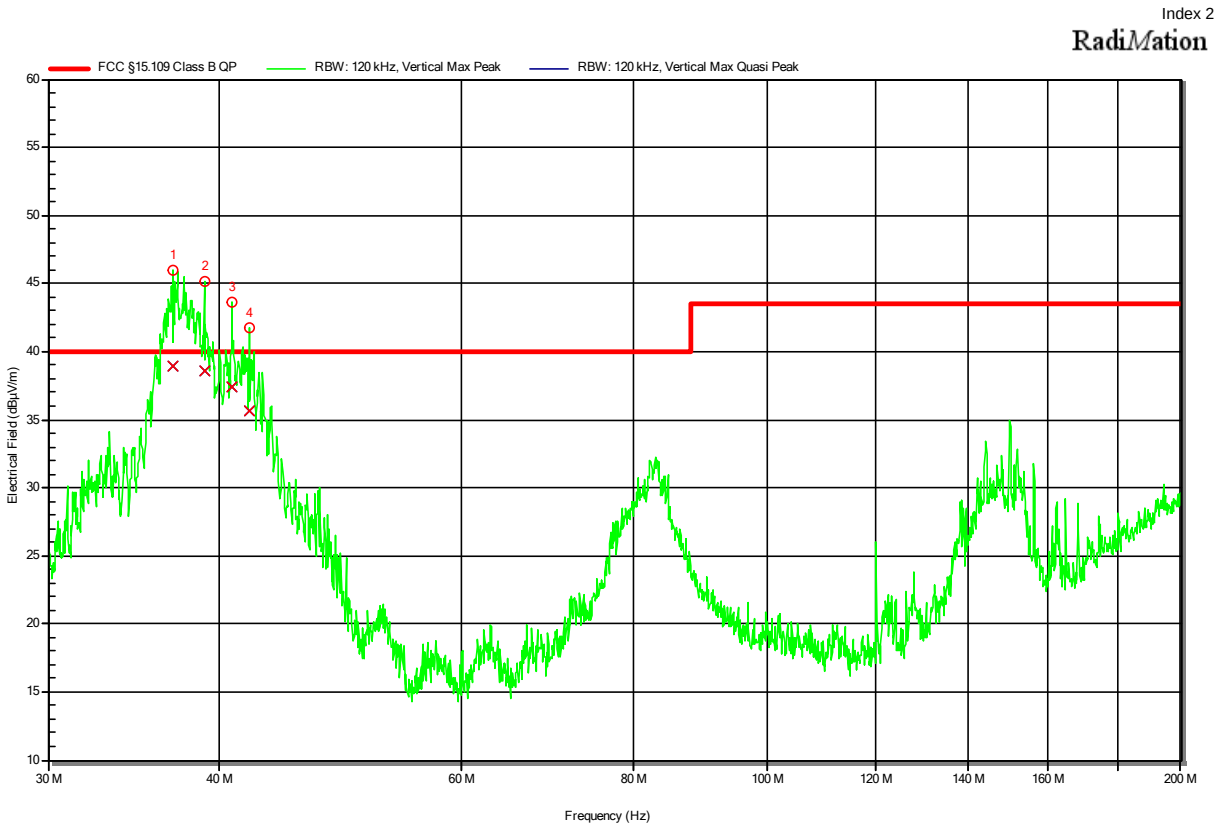
Test Setup 200-1000MHz


Test Setup 1-5GHz


2.1.8 Records

Radiated emissions
according to FCC part 15B

Project Number:	G0M-2101-9550
Applicant:	Hella Aglaia Mobile Vision GmbH
Model Description:	Advanced People Sensor; 90 mm lens distance; without IO connector
Model:	GH604
Test Sample ID:	33106
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2021-01-27
Operating Conditions:	ambient temperature: 22 °Celsius power input: 48V DC via PoE
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational mode 1 EUT configuration 1
Note 1:	



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	37.025 MHz	38.98 dBµV/m	40 dBµV/m	-1.02 dB	Pass	117 degrees	1.2 m
2	38.967 MHz	38.6 dBµV/m	40 dBµV/m	-1.4 dB	Pass	-126 degrees	1.1 m
3	40.854 MHz	37.4 dBµV/m	40 dBµV/m	-2.6 dB	Pass	-198 degrees	1.1 m
4	42.087 MHz	35.6 dBµV/m	40 dBµV/m	-4.4 dB	Pass	-198 degrees	1.1 m

Radiated emissions
according to FCC part 15B

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Operator:	Mr. Handrik
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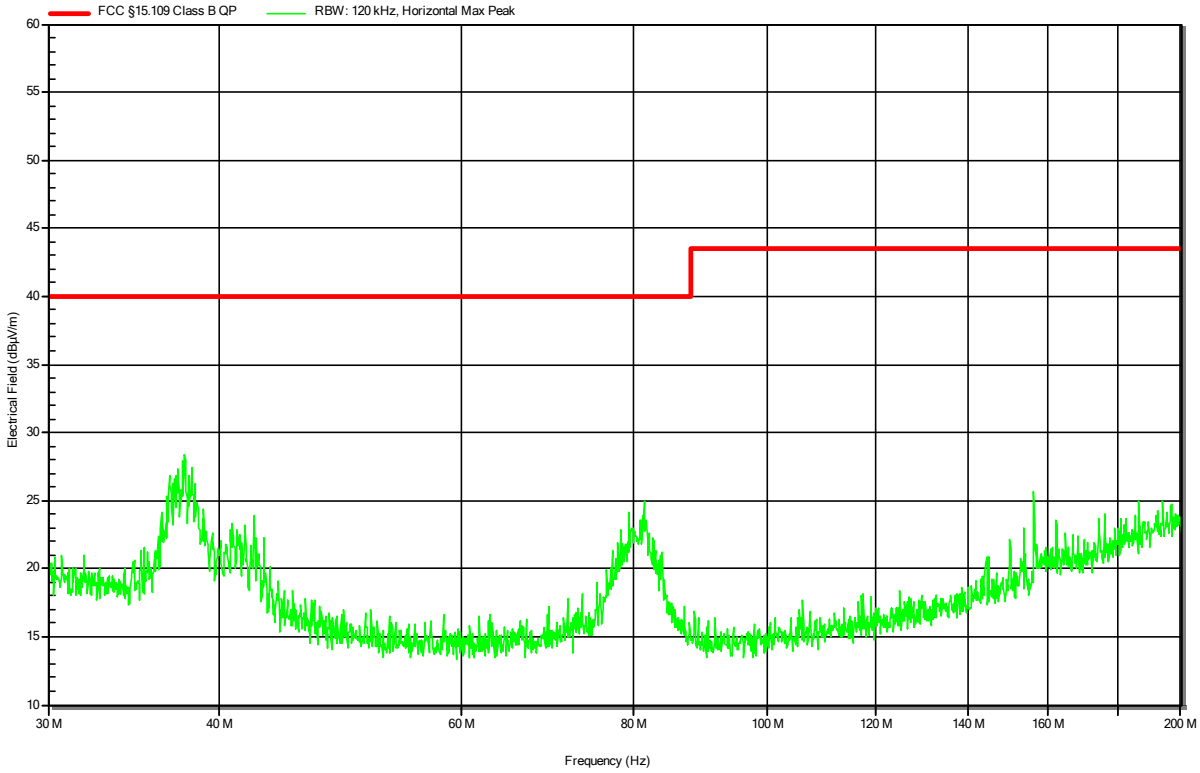
Operating Conditions:	ambient temperature: 22 °Celsius power input: 48V DC via PoE
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational mode 1 EUT configuration 1
Note 1:	

Index 3

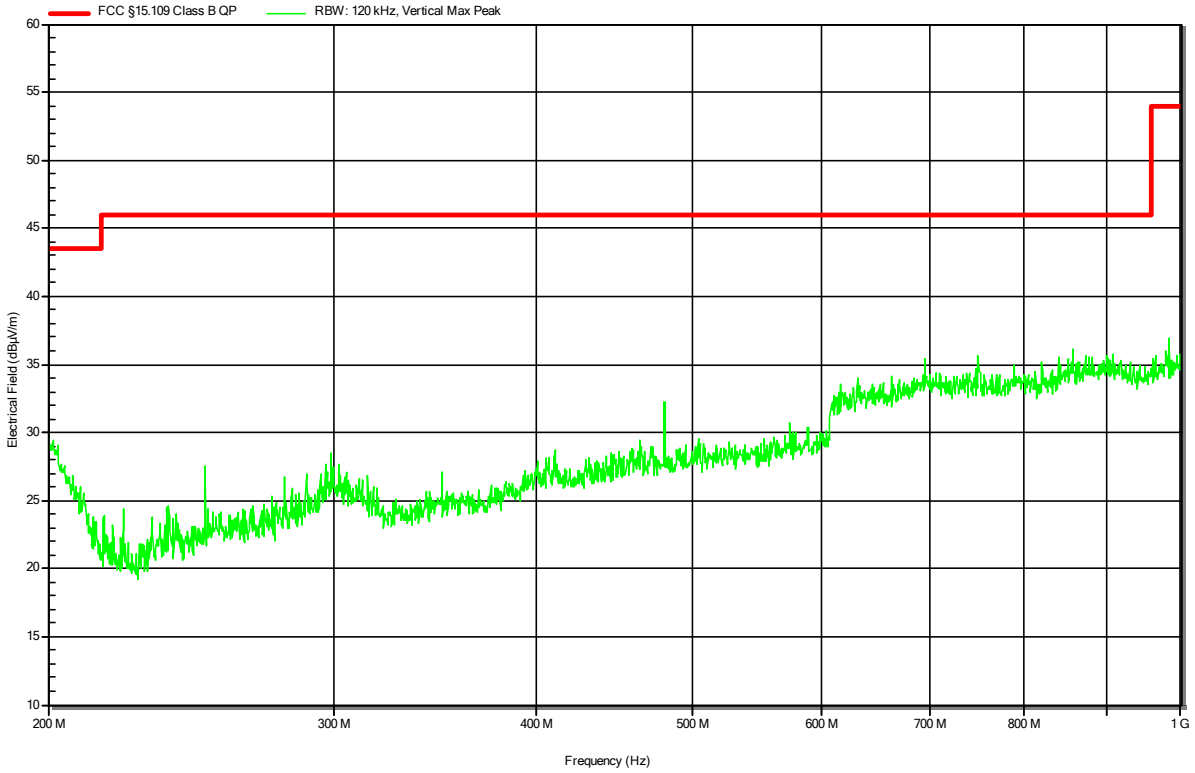


Radiated emissions
according to FCC part 15B

Project Number:	G0M-2101-9550
Applicant:	Hella Aglaia Mobile Vision GmbH
Model Description:	Advanced People Sensor; 90 mm lens distance; without IO connector
Model:	GH604
Test Sample ID:	33106
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2021-01-27
Operating Conditions:	ambient temperature: 22 °Celsius power input: 48V DC via PoE
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational mode 1 EUT configuration 1
Note 1:	

Index 4

RadiMation



Radiated emissions
according to FCC part 15B

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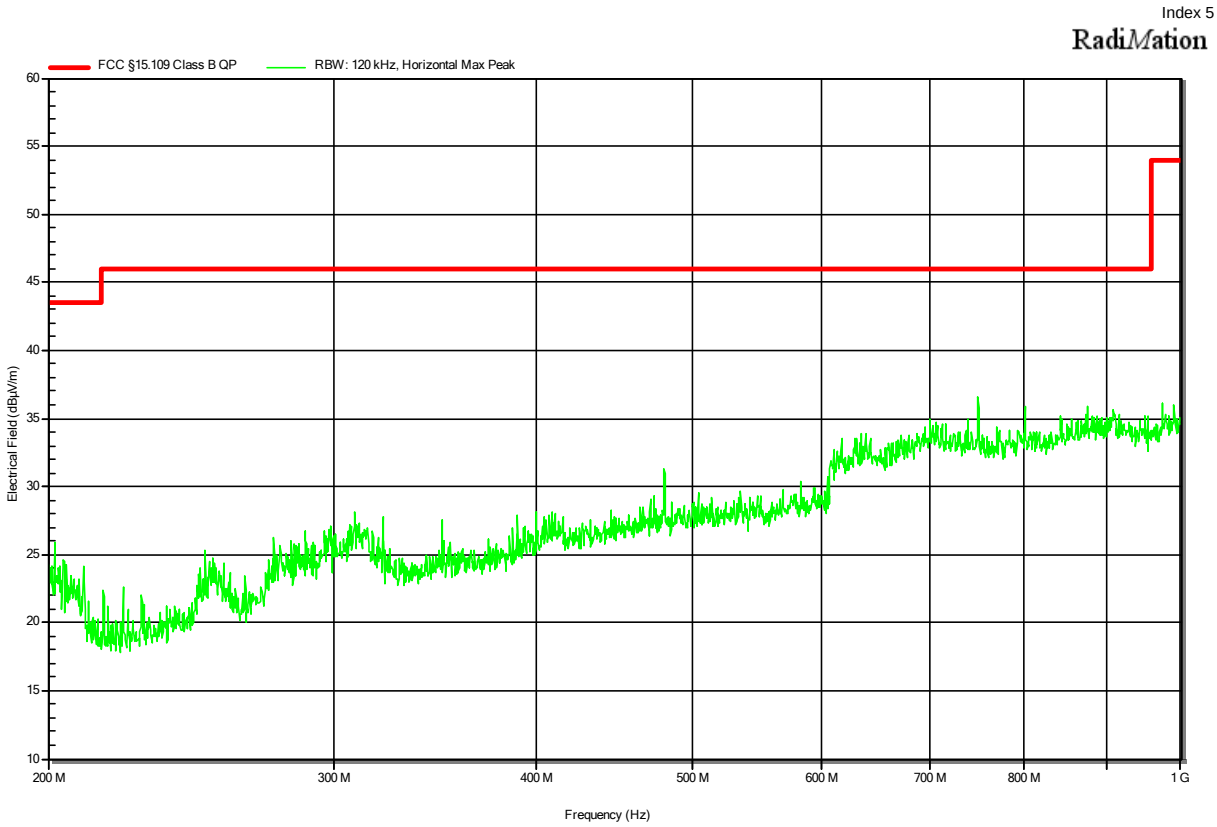
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational mode 1 EUT configuration 1
Note 1:	



Radiated emissions
according to FCC part 15B

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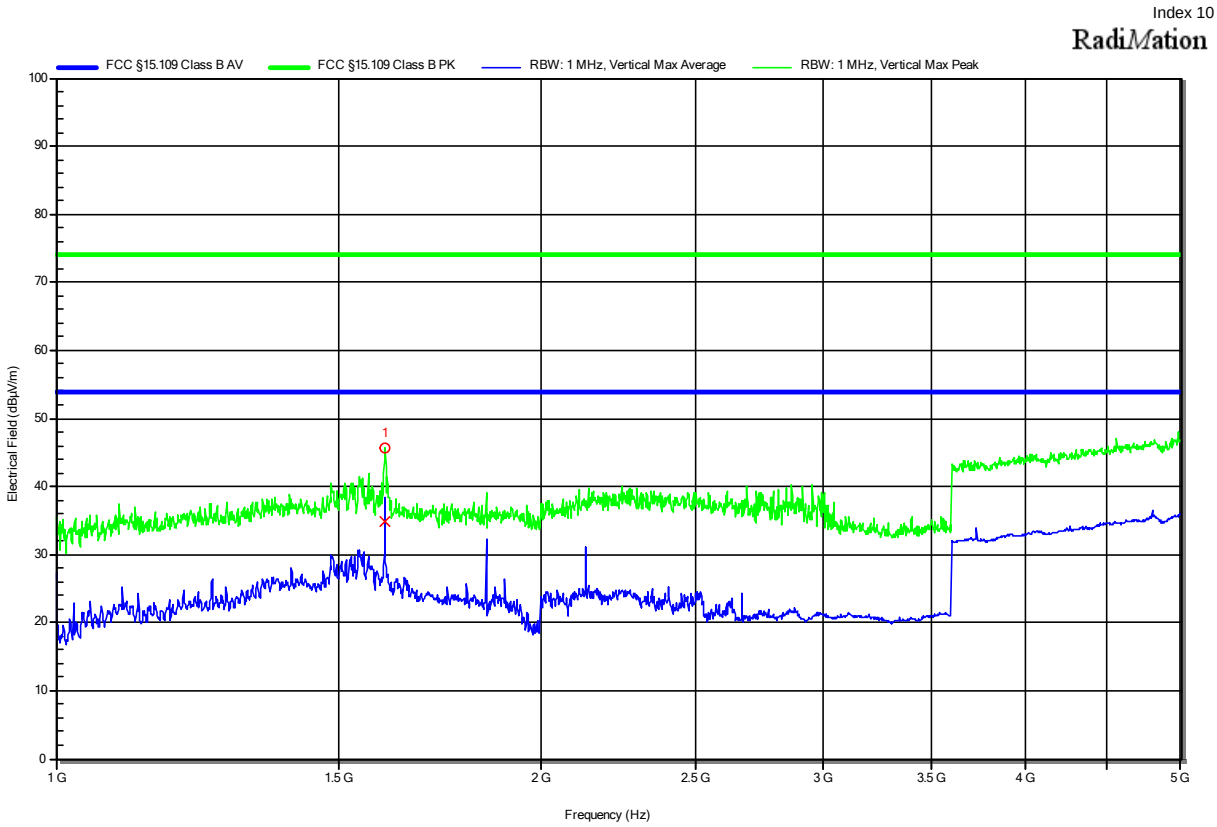
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2021-01-27
Operating Conditions:	ambient temperature: 22 °Celsius power input: 48V DC via PoE
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational mode 1 EUT configuration 1
Note 1:	



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.6 GHz	45.73 dBµV/m	73.98 dBµV/m	-28.25 dB	Pass	0 degrees	1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.6 GHz	34.8 dBµV/m	53.98 dBµV/m	-19.18 dB	Pass	0 degrees	1 m

Radiated emissions
according to FCC part 15B

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Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode & EUT Configuration:	Operational mode 1 EUT configuration 1
Note 1:	

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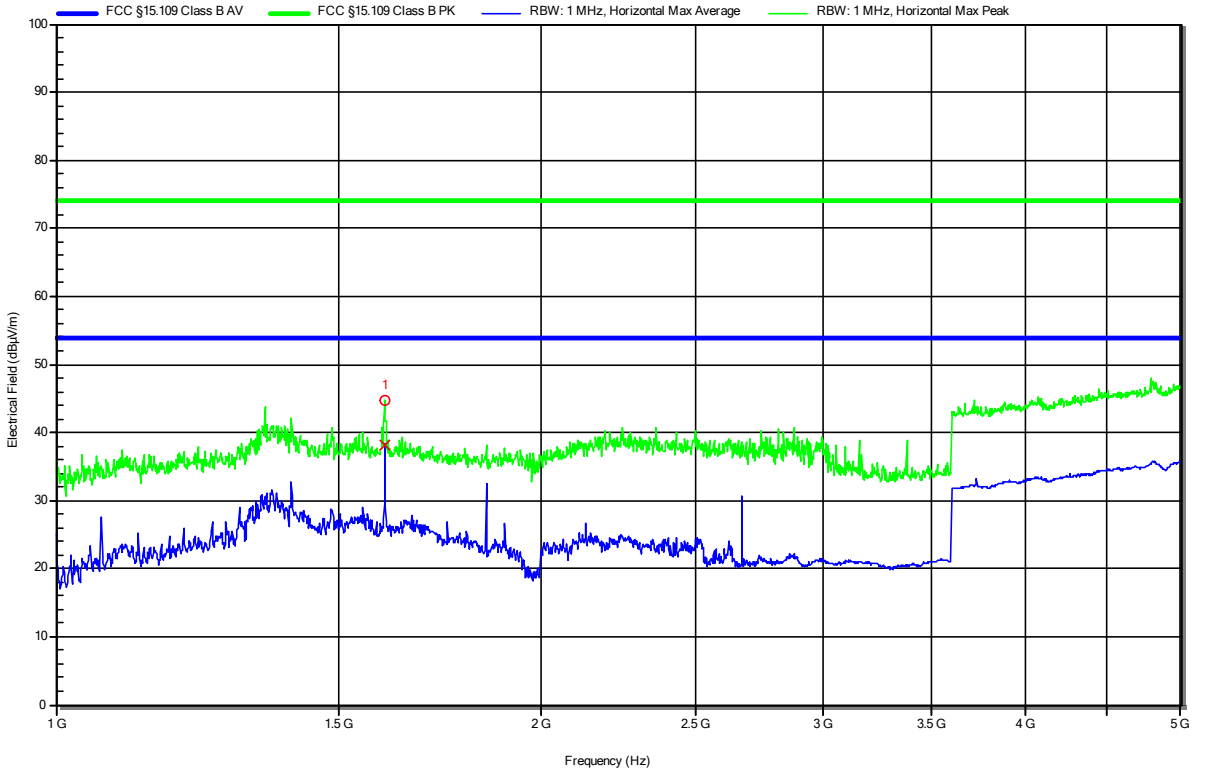


Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.6 GHz	44.62 dBµV/m	73.98 dBµV/m	-29.36 dB	Pass	-144 degrees	1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.6 GHz	38.1 dBµV/m	53.98 dBµV/m	-15.88 dB	Pass	-144 degrees	1 m

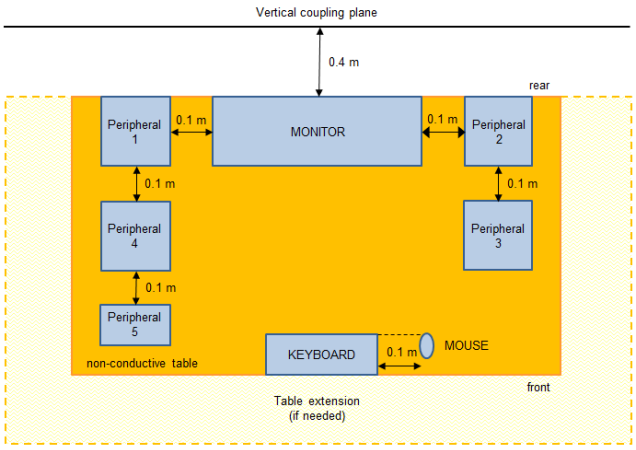
2.2 Test Conditions and Results - Conducted emissions acc. to ANSI C63.4

2.2.1 Information

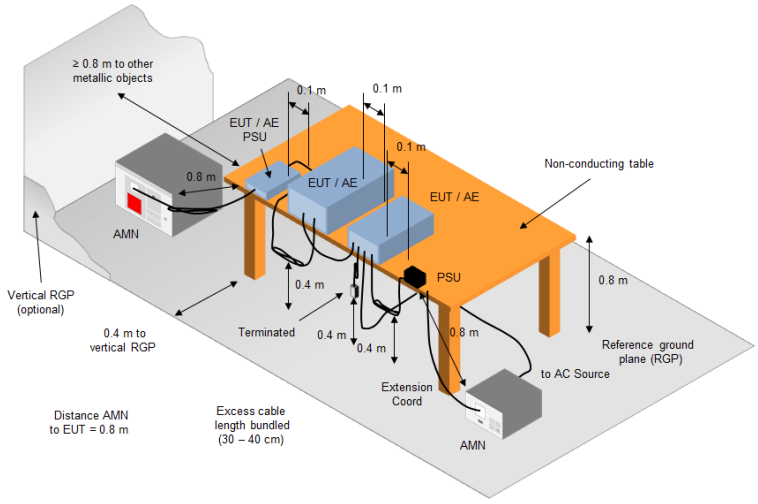
Test Information	
Reference	FCC 15.107, ICES-003, 6.1
Reference method	ANSI C63.4:2014+A1:2017 Section 12
Measurement range	150 kHz to 30 MHz
Equipment class	Class B
Equipment type	Table top
Temperature [°C]	22 ±3
Humidity [%]	27 ±3
Operator	Matthias Handrik
Date	2021-01-27

2.2.2 Setup

Equipment placement



Test Setup



2.2.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	Schwarzbeck	NSLK 8127	EF01592	2020-07	2021-07
Pulse Limiter	R&S	ESH3-Z2	EF01063	2020-07	2021-07
EMI Test Receiver	R&S	ESR 7	EF00943	2020-07	2021-07
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2020-03	2021-03

2.2.4 Procedure

Exploratory measurement

1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1)
2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).
4. The LISN measurement port was connected to a measurement receiver
5. I/O cables were bundled not longer than 0.4 m
6. Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor
7. To maximize the emissions the cable positions were manipulated
8. The worst configuration of EUT and cables is shown on a test setup picture at item 2.2.2

Final measurement

1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1)
2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length).
4. The LISN measurement port was connected to a measurement receiver
5. The EUT and cable arrangement were based on the exploratory measurement results
6. The test data of the worst-case conditions were recorded and shown on the next pages

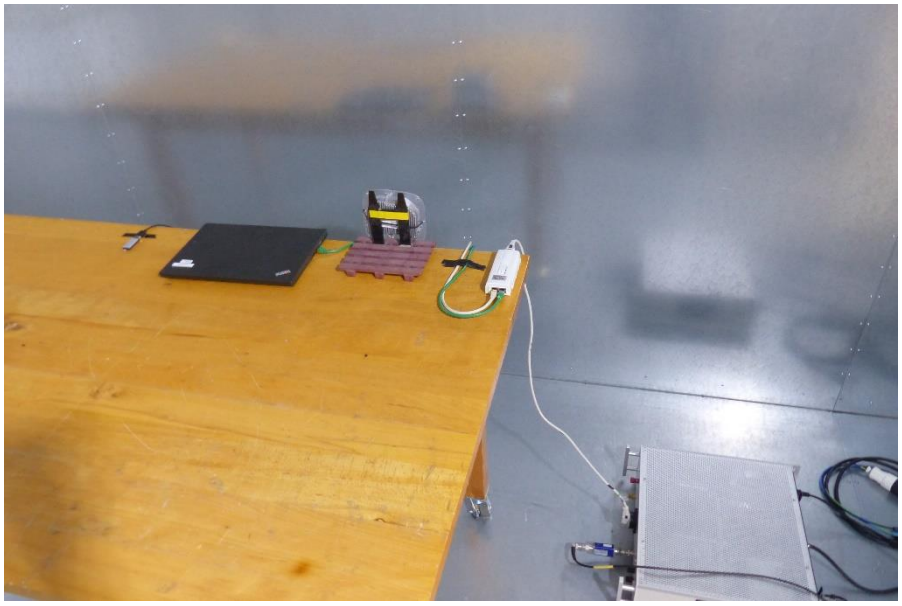
2.2.5 Limits

Class B		
Frequency [MHz]	Quasi-peak Limit [dBµV]	Average Limit [dBµV]
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5	56	46
5 - 30	60	50
* Decreases with the logarithm of the frequency		

2.2.6 Results

AC power line conducted emissions					
Port	Coupling	Operational mode	EUT Configuration	Verdict	Remark
AC (Ethernet/ via PoE)	AMN	1	1	PASS	-

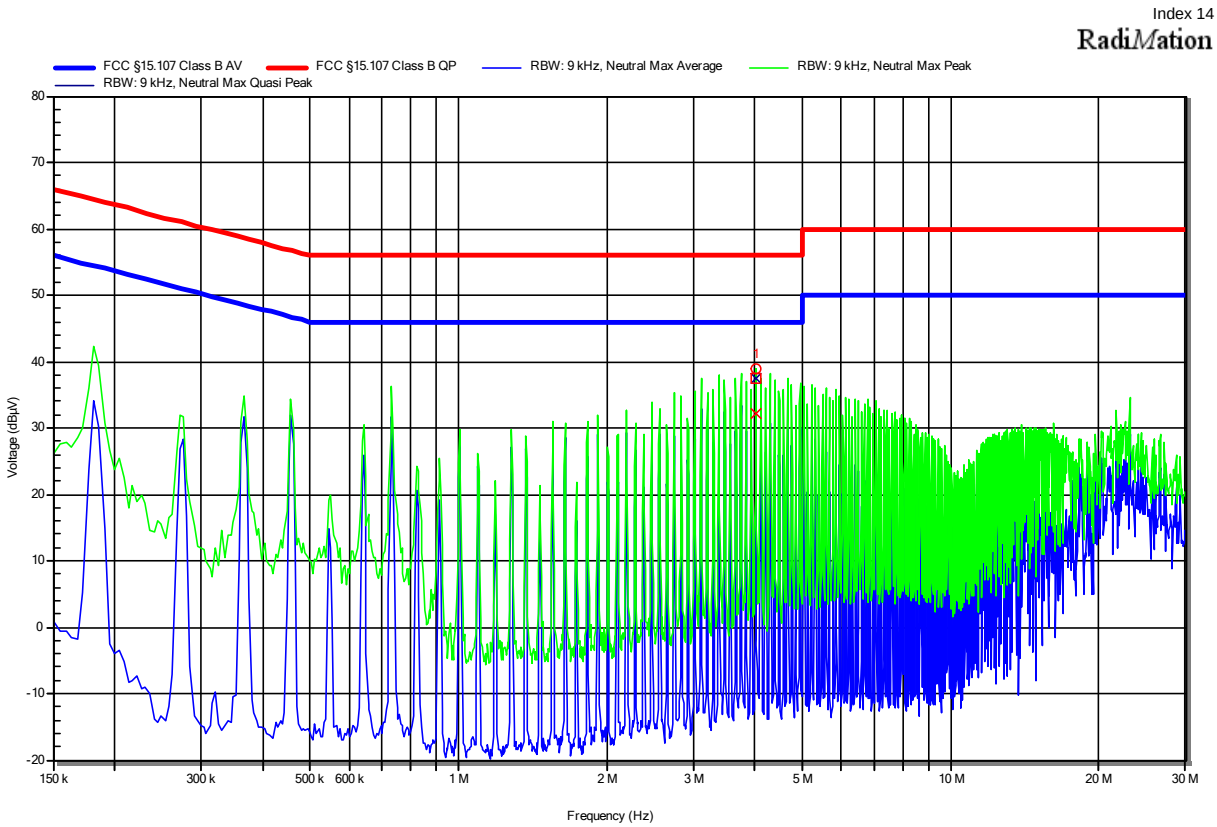
2.2.7 Setup Photos

Test setup


2.2.8 Records

Conducted emissions at the mains power port according to FCC part 15B

Project Number:	G0M-2101-9550
Applicant:	Hella Aglaia Mobile Vision GmbH
Model Description:	Advanced People Sensor; 90 mm lens distance; without IO connector
Model:	GH604
Test Sample ID:	33106
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2021-01-27
Operating Conditions:	ambient temperature: 22 °Celsius power input: 120V AC; 60Hz
LISN:	Schwarzbeck NSLK 8127 RC, N
Operational Mode & EUT Configuration:	Operational mode 1 EUT configuration 1
Applied to Port:	AC mains
Note 1:	

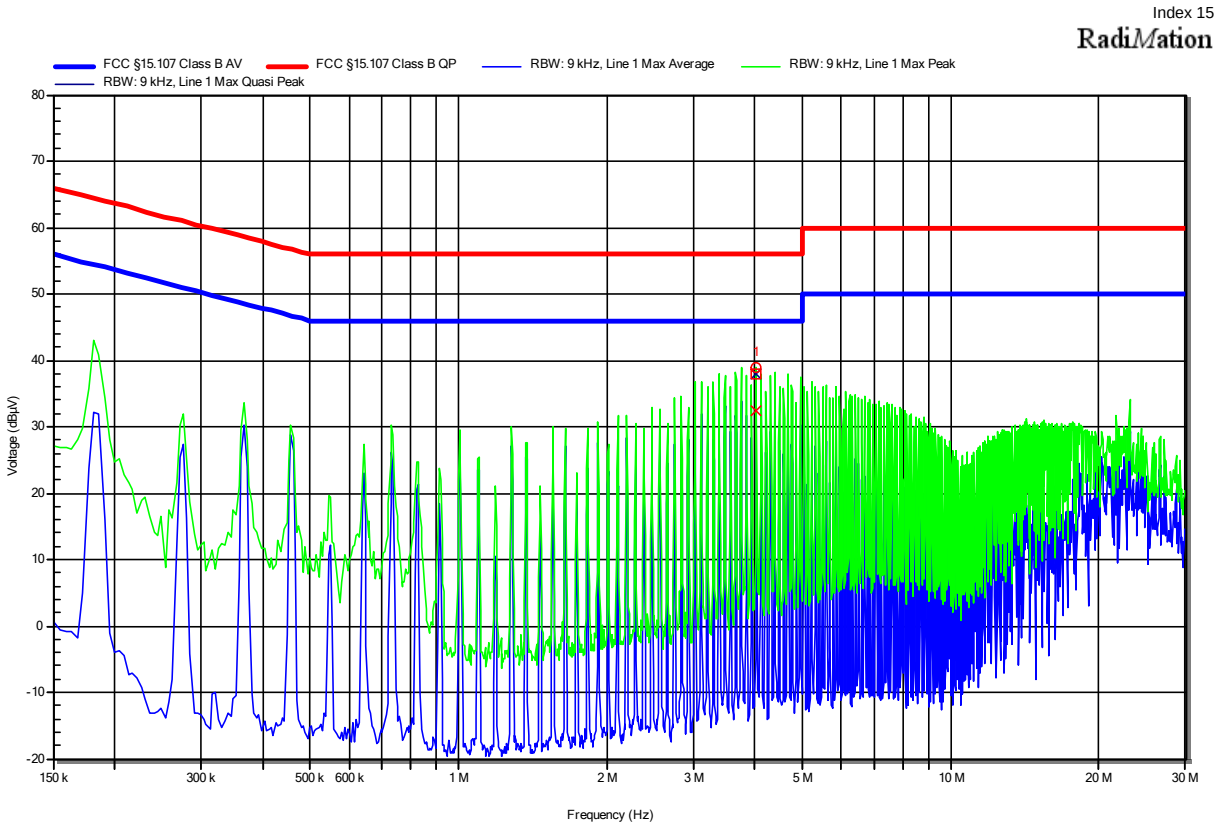


Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	4.022 MHz	37.46 dBµV	56 dBµV	-18.54 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	4.022 MHz	32.12 dBµV	46 dBµV	-13.88 dB	Pass	Neutral

Conducted emissions at the mains power port
according to FCC part 15B

Project Number:	G0M-2101-9550
Applicant:	Hella Aglaia Mobile Vision GmbH
Model Description:	Advanced People Sensor; 90 mm lens distance; without IO connector
Model:	GH604
Test Sample ID:	33106
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Date:	2021-01-27
Operating Conditions:	ambient temperature: 22 °Celsius power input: 120V AC; 60Hz
LISN:	Schwarzbeck NSLK 8127 RC, L1
Operational Mode & EUT Configuration:	Operational mode 1 EUT configuration 1
Applied to Port:	AC mains
Note 1:	



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	4.028 MHz	37.98 dBµV	56 dBµV	-18.02 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	4.028 MHz	32.47 dBµV	46 dBµV	-13.53 dB	Pass	Line 1