

EMC TEST REPORT FCC 47 CFR Part 15B, ISED ICES-003 Issue 6	
Report Reference No	G0M-2007-9162-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, 180 mm lens distance, without IO connector
Model(s)	EH702
Additional Model(s)	None
Brand Name(s)	APS-180E
Hardware Version(s)	EH702
Software Version(s)	1.12
FCC-ID	2ASWU-PS7
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	2020-07-27	
Report:		
Compiled by	Stefan Dose	
Tested by (+ signature) (Responsible for Test)	Stefan Dose	
Approved by (+ signature) (Deputy Head of Lab)	Jens Marquardt	
Date of Issue	2020-08-14	
Total number of pages	32	
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	2020-08-14	Initial Release	-

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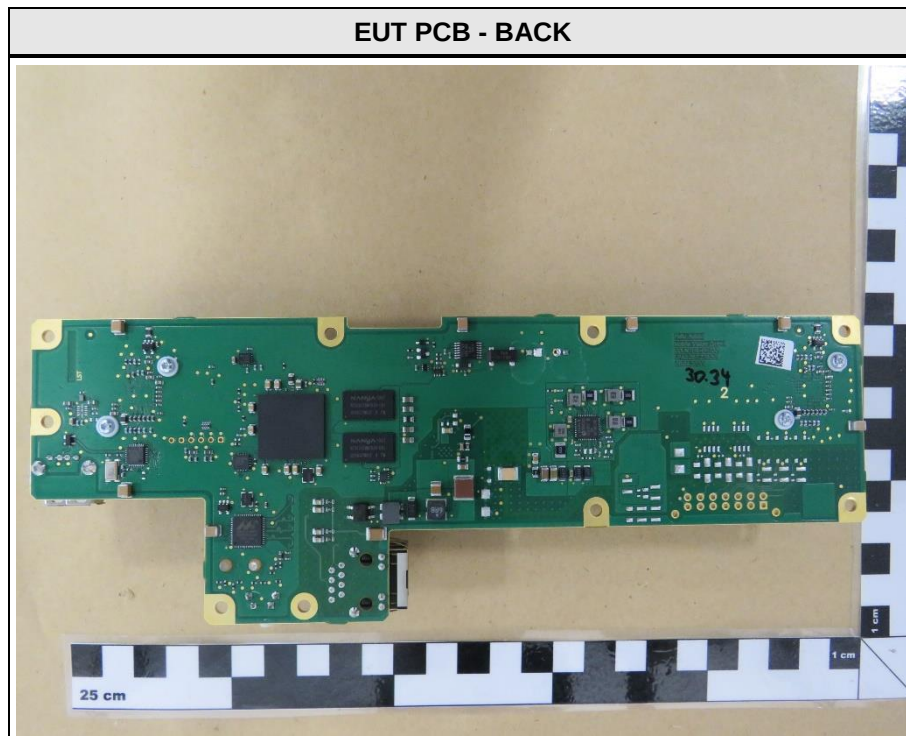
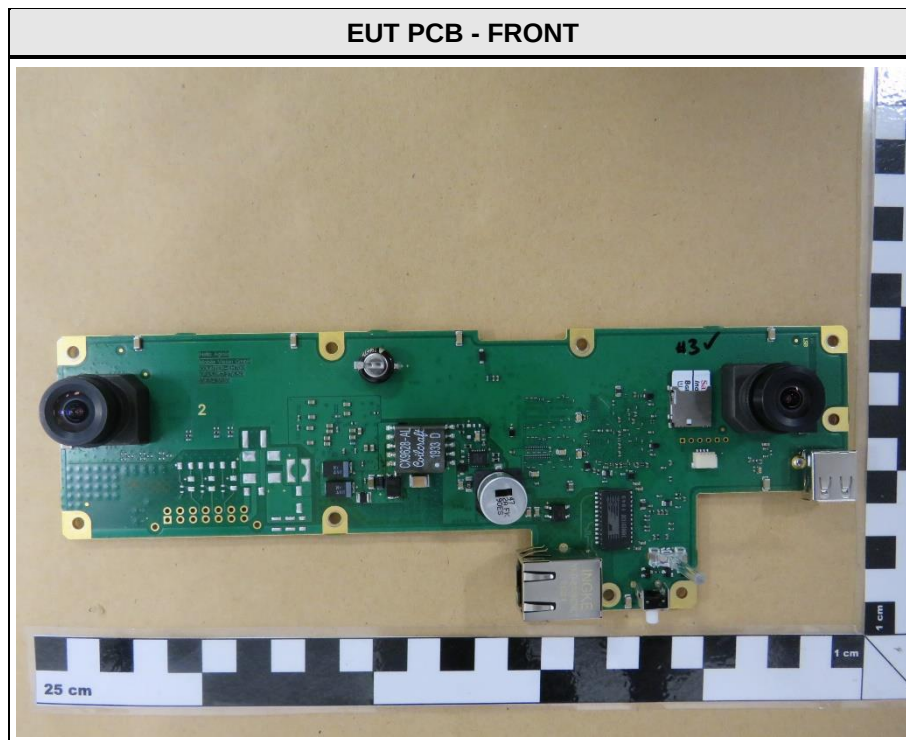
1 Equipment (Test Item) Under Test

Description	Advanced People Sensor, 180 mm lens distance, without IO connector	
Model	EH702	
Additional Model(s)	None	
Brand Name(s)	APS-180E	
Serial Number(s)	000B91804001	
Hardware Version(s)	EH702	
Software Version(s)	1.12	
FCC-ID	2ASWU-PS7	
IC	N/A	
Class	Class B	
Equipment type	Table top	
Highest internal frequency [MHz]	666	
Radio Module	none	
Supply Voltage	V _{NOM}	48 VDC (PoE)
AC/DC-Adaptor	none	
Manufacturer	Hella Aglaia Mobile Vision GmbH Ullsteinstraße 140 12109 Berlin GERMANY	

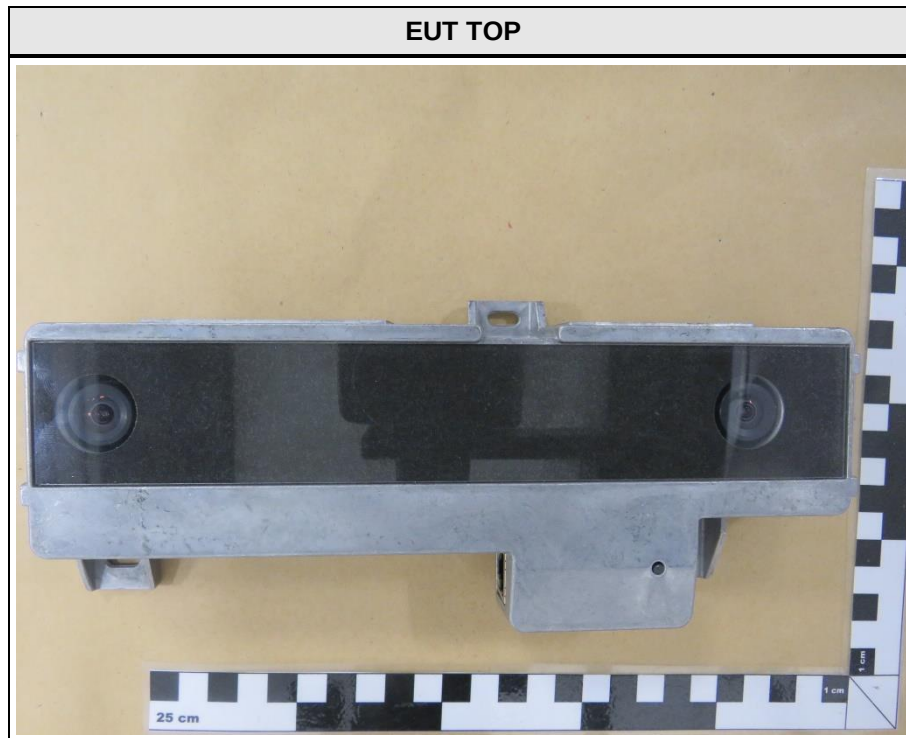
1.1 Equipment Ports

Name	Type	Attributes	Comment
Ethernet/PoE	IO, DC	Count: 1 Direction: IO Service only: no	-
USB	IO	Count: 1 Direction: IO Service only: no	-
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



1.3 Equipment Photos - External



EUT SIDE WITH ETHERNET AND USB SOCKET



EUT BACK



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	HP	Elitebook 8470p	for monitoring
AE	USB-stick	-	Eurofins	-
AE	PoE Injector	TP-Link	TL-POE150S	-
AE	AC/DC-Adaptor	Intertek	MU24-1480050-CS	adaptor for injector
CBL	Ethernet Cat6 S-FTP	-	-	-
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				

1.5 Operational Modes

Mode #	Description
1	EUT is powered up and connected via Ethernet cable to Laptop. USB-Stick is plugged into USB-port. With the help of the laptop, the camera is accessed and the recorded video feed is displayed.
Comment:	

1.6 EUT Configuration

Configuration #	Description
1	EUT powered via Ethernet (PoE), 48VDC
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:

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

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

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:				

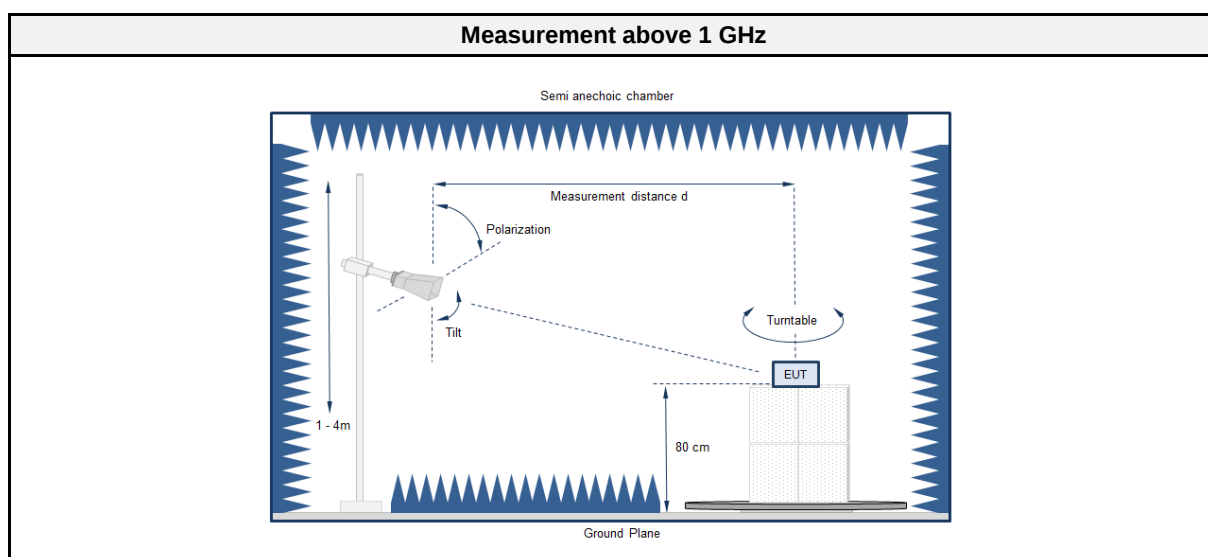
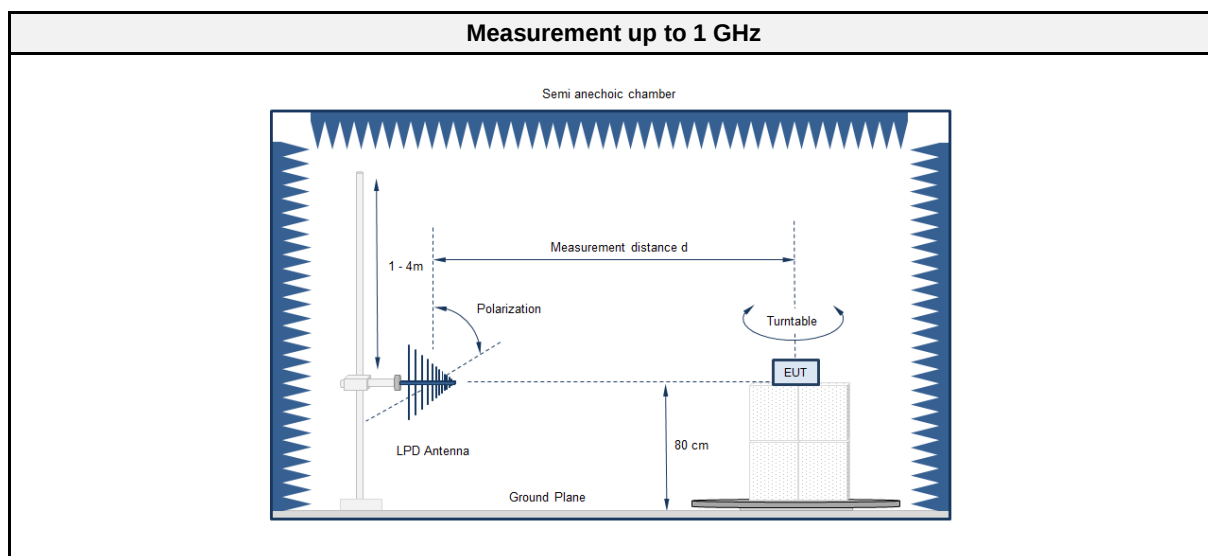
Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

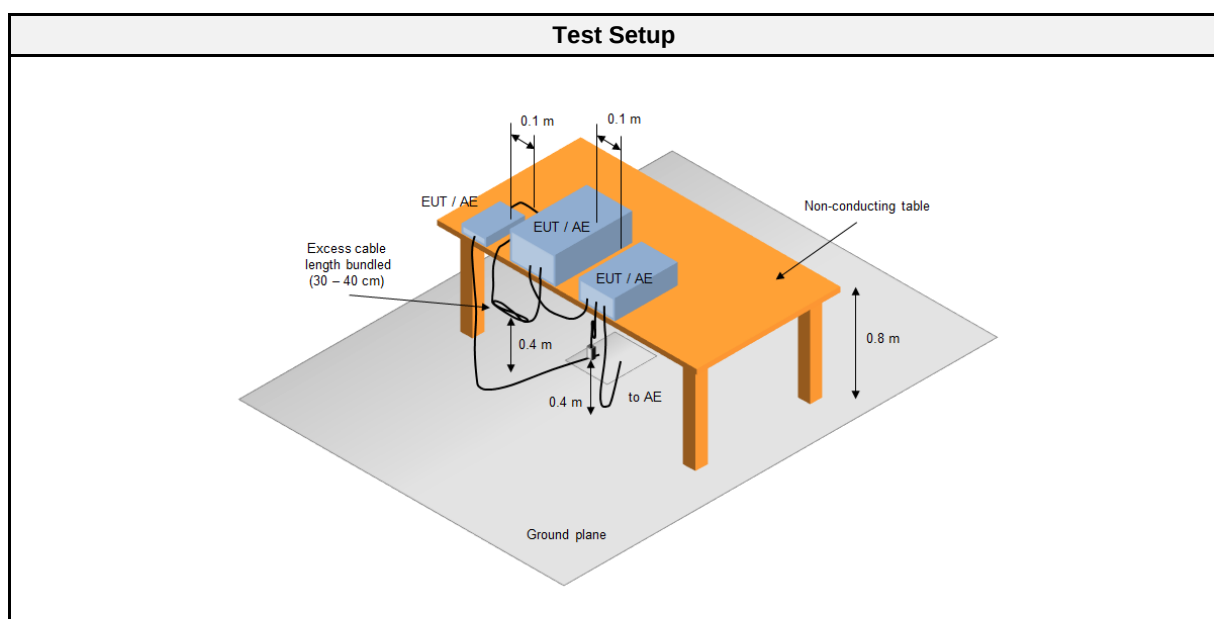
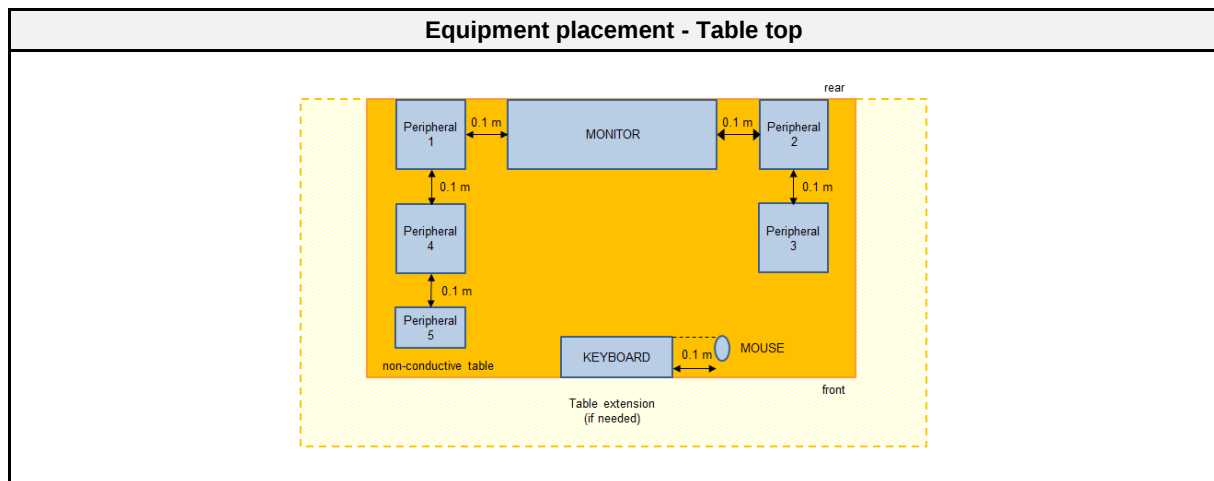
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

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]	23 ±3
Humidity [%]	55 ±5
Operator	Stefan Dose
Date	2020-07-27

2.1.2 Setup





2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2016.1.10

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.	2800100000254 17E	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 1.3

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

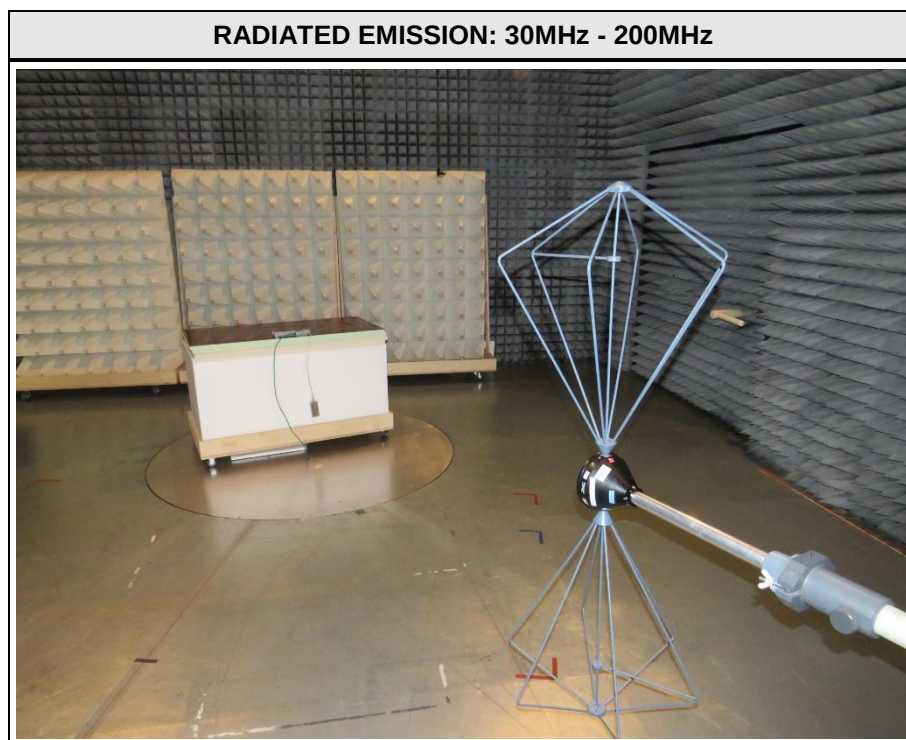
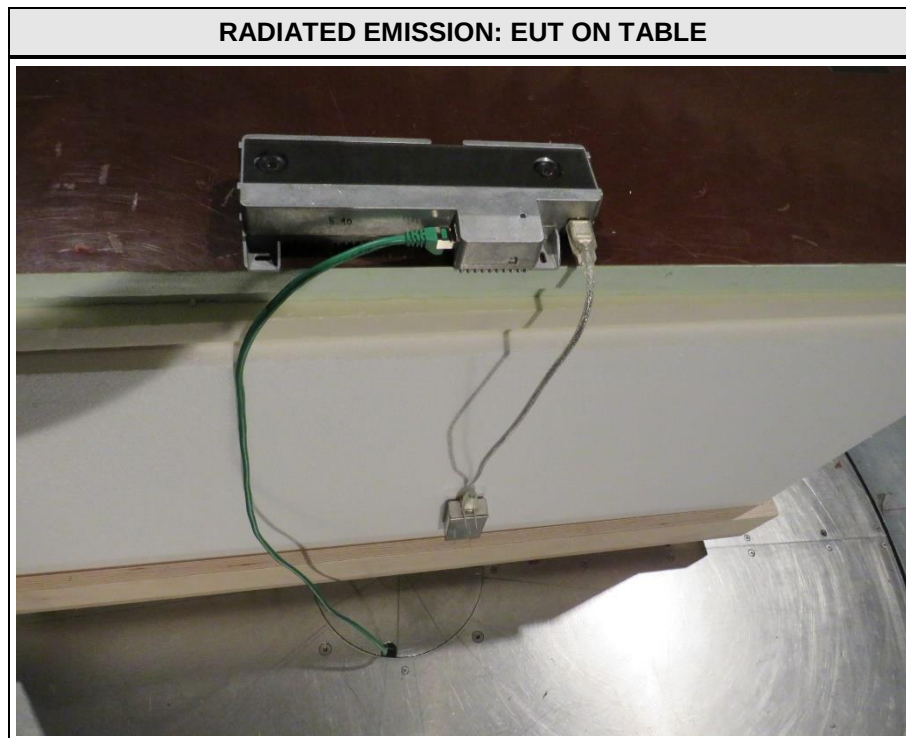
Class B @ 3 m		
Frequency [MHz]	Detector	Limit [dBμV/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak	74
	Average	54

Class A @ 10 m		
Frequency [MHz]	Detector	Limit [dBμV/m]
30 - 88	Quasi-peak	39
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46.5
960 - 1000	Quasi-peak	49.5
> 1000	Peak	69.5
	Average	49.5

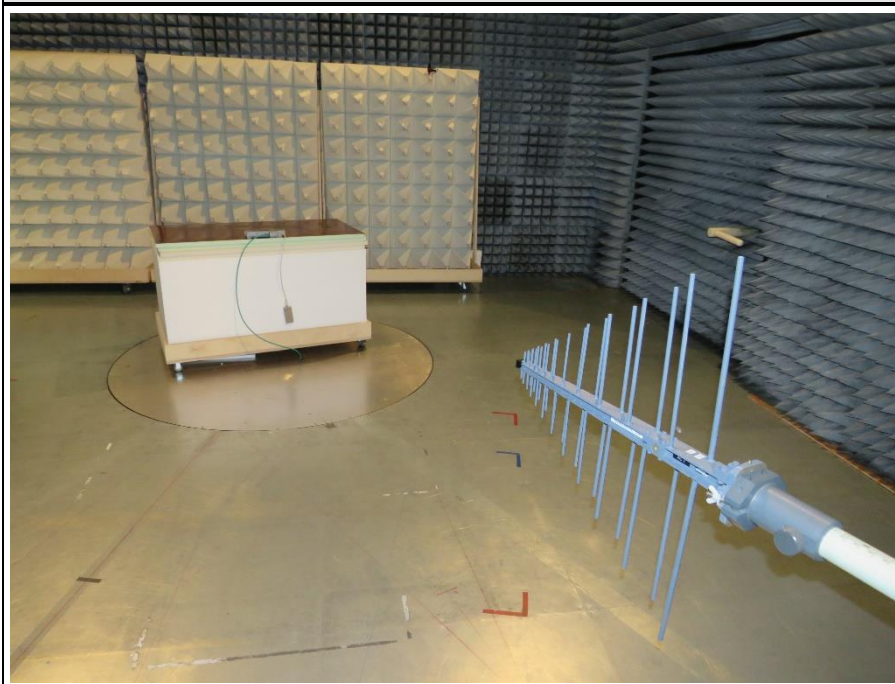
2.1.6 Results

Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	-

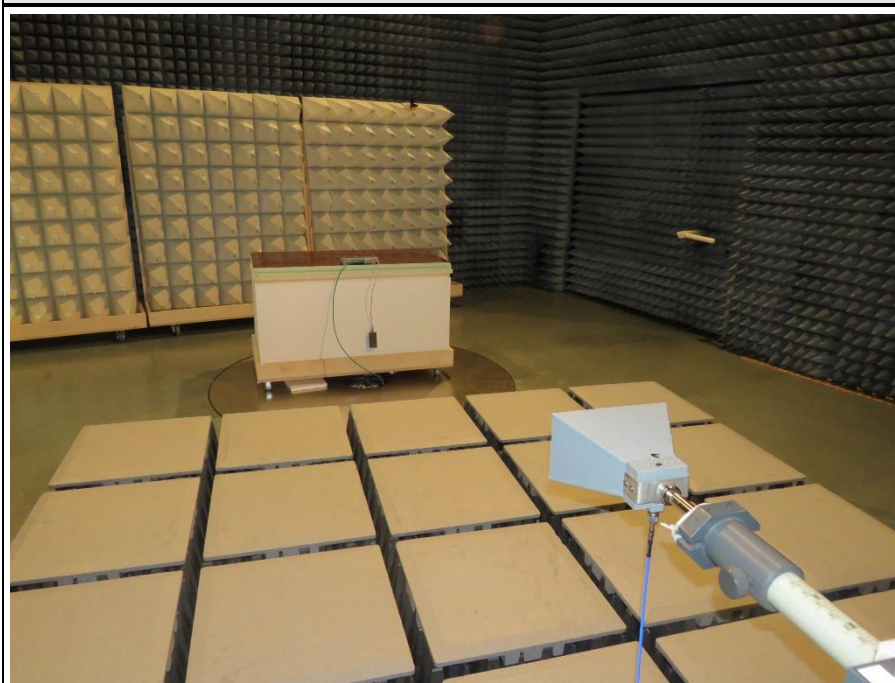
2.1.7 Setup Photos



RADIATED EMISSION: 200 MHz - 1000MHz



RADIATED EMISSION: 1GHz - 5GHz

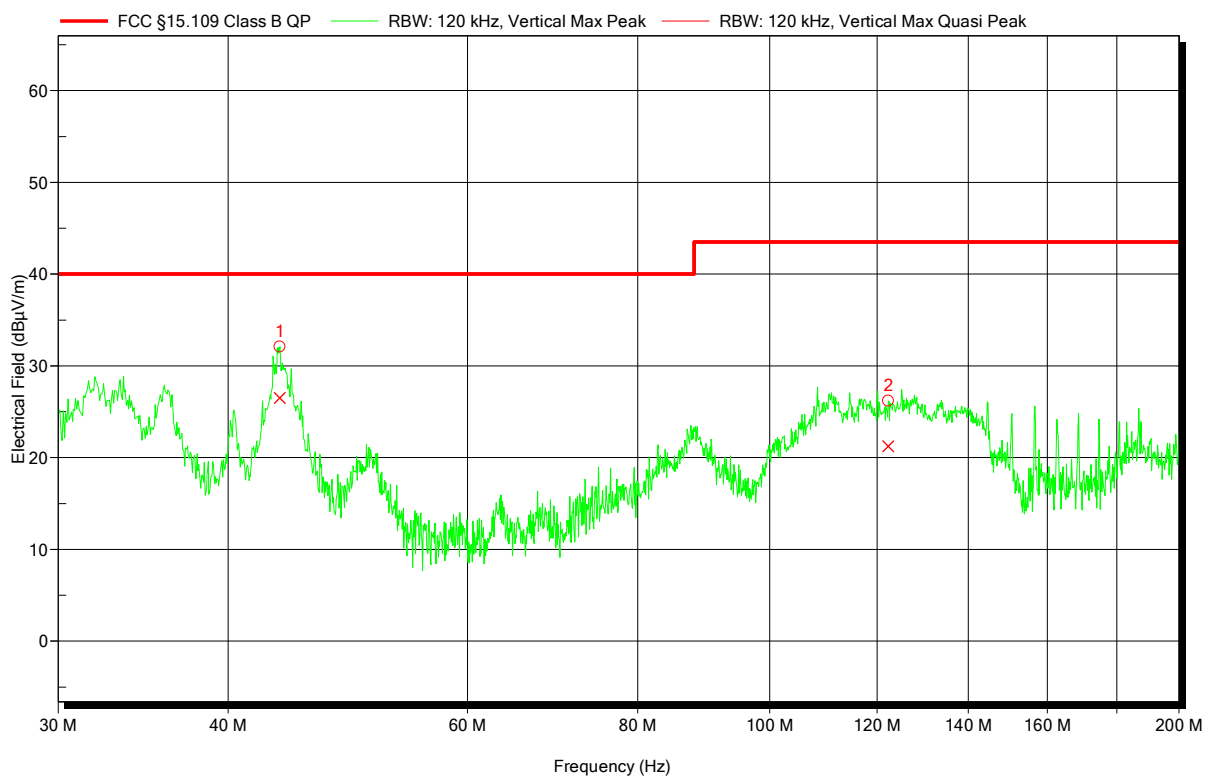


2.1.8 Records

Radiated emissions according to FCC part 15B

Project Number: G0M-2007-9162
 Applicant: Hella Aglaia Mobile Vision GmbH
 Model Description: Advanced People Sensor, 180 mm lens distance, without IO connector
 Model: EH702
 Test Sample ID: 30420
 Test Site: Eurofins Product Service Germany
 Operator: Mr. Dose
 Test Date: 2020-07-27
 Operating Conditions: ambient temperature: 22°C
 power input: 48VDC
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement Distance: 3m
 Mode: 1

Index 1

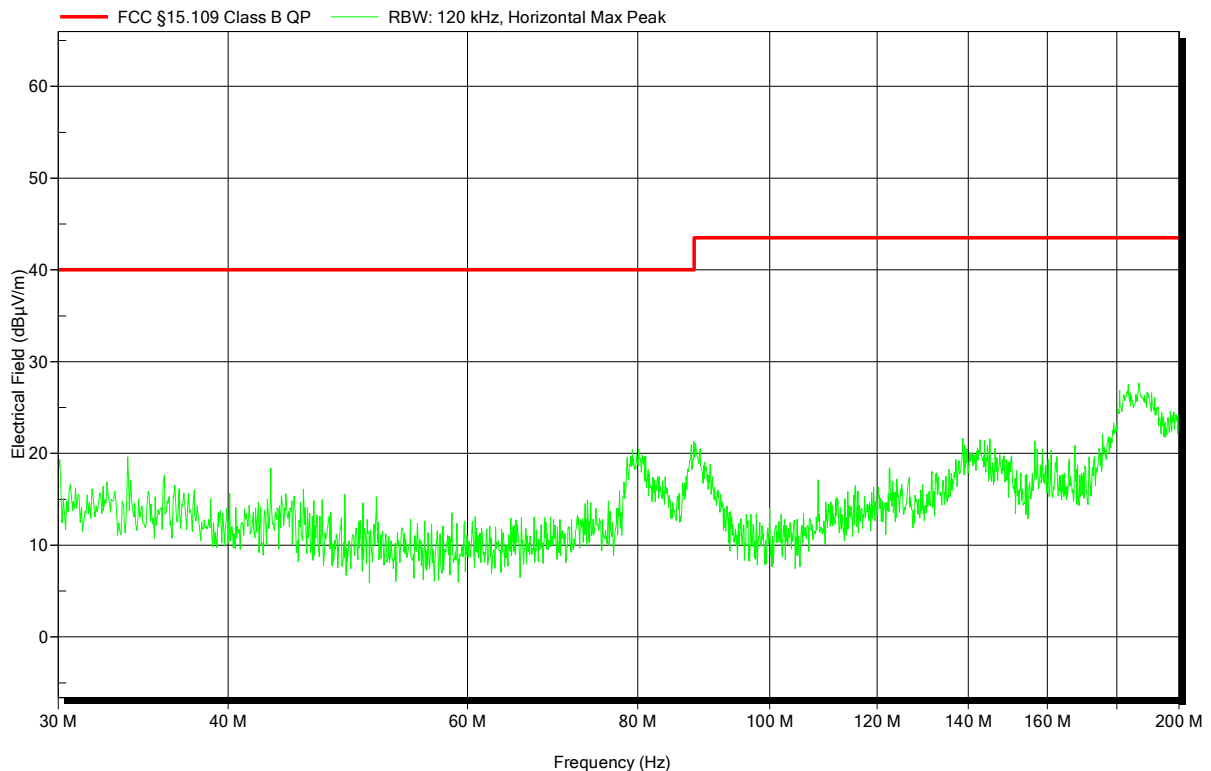


Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	43.661 MHz	26.49 dBμV/m	40 dBμV/m	-13.51 dB	Pass	20 Degree	1 m
2	122.278 MHz	21.22 dBμV/m	43.52 dBμV/m	-22.3 dB	Pass	20 Degree	1 m

Radiated emissions according to FCC part 15B

Project Number: G0M-2007-9162
 Applicant: Hella Aglaia Mobile Vision GmbH
 Model Description: Advanced People Sensor, 180 mm lens distance, without IO connector
 Model: EH702
 Test Sample ID: 30420
 Test Site: Eurofins Product Service Germany
 Operator: Mr. Dose
 Test Date: 2020-07-27
 Operating Conditions: ambient temperature: 22°C
 power input: 48VDC
 Antenna: Rohde & Schwarz HK 116, Horizontal
 Measurement Distance: 3m
 Mode: 1

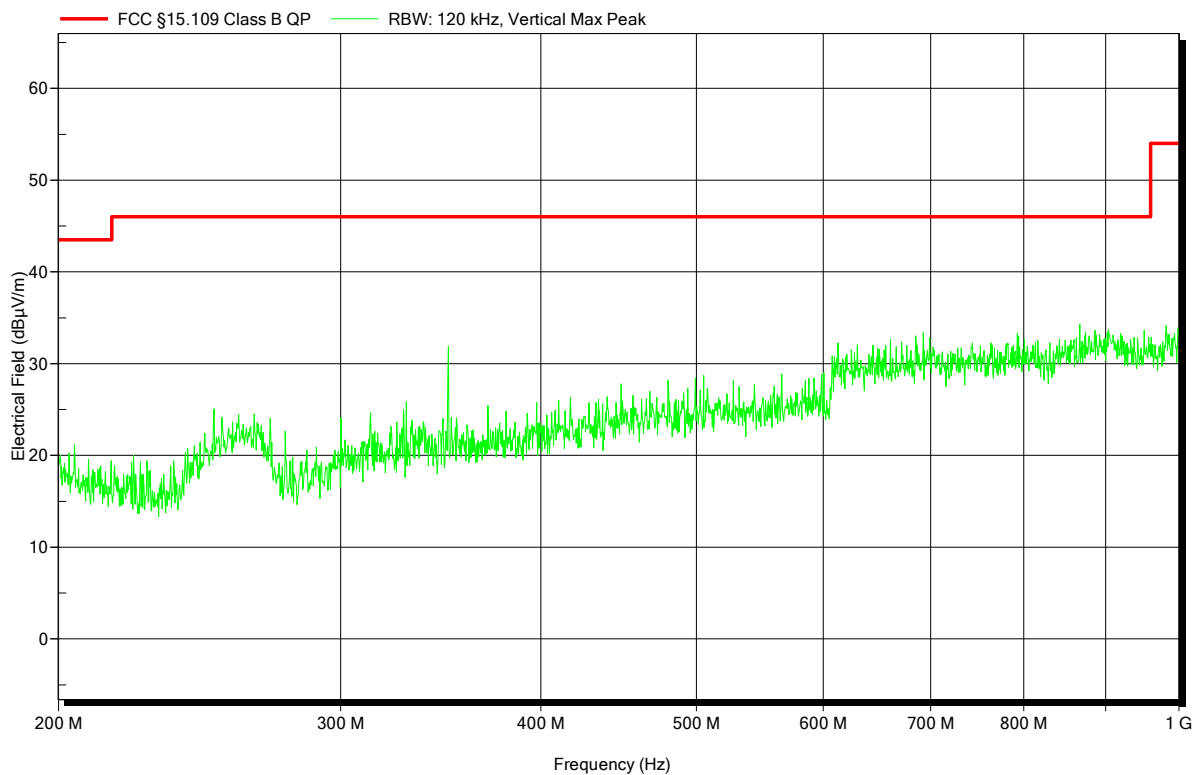
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Radiated emissions according to FCC part 15B

Project Number: G0M-2007-9162
 Applicant: Hella Aglaia Mobile Vision GmbH
 Model Description: Advanced People Sensor, 180 mm lens distance, without IO connector
 Model: EH702
 Test Sample ID: 30420
 Test Site: Eurofins Product Service Germany
 Operator: Mr. Dose
 Test Date: 2020-07-27
 Operating Conditions: ambient temperature: 22°C
 power input: 48VDC
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement Distance: 3m
 Mode: 1

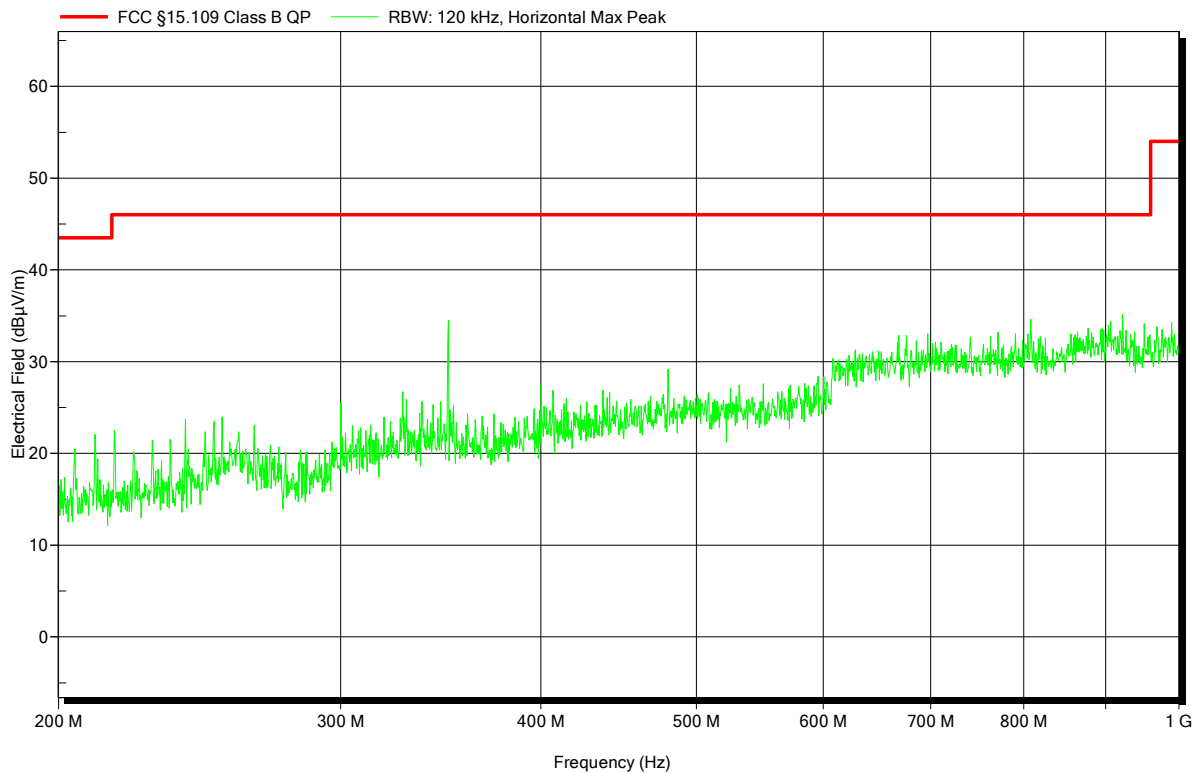
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Radiated emissions according to FCC part 15B

Project Number: G0M-2007-9162
 Applicant: Hella Aglaia Mobile Vision GmbH
 Model Description: Advanced People Sensor, 180 mm lens distance, without IO connector
 Model: EH702
 Test Sample ID: 30420
 Test Site: Eurofins Product Service Germany
 Operator: Mr. Dose
 Test Date: 2020-07-27
 Operating Conditions: ambient temperature: 22°C
 power input: 48VDC
 Antenna: Rohde & Schwarz HL 223, Horizontal
 Measurement Distance: 3m
 Mode: 1

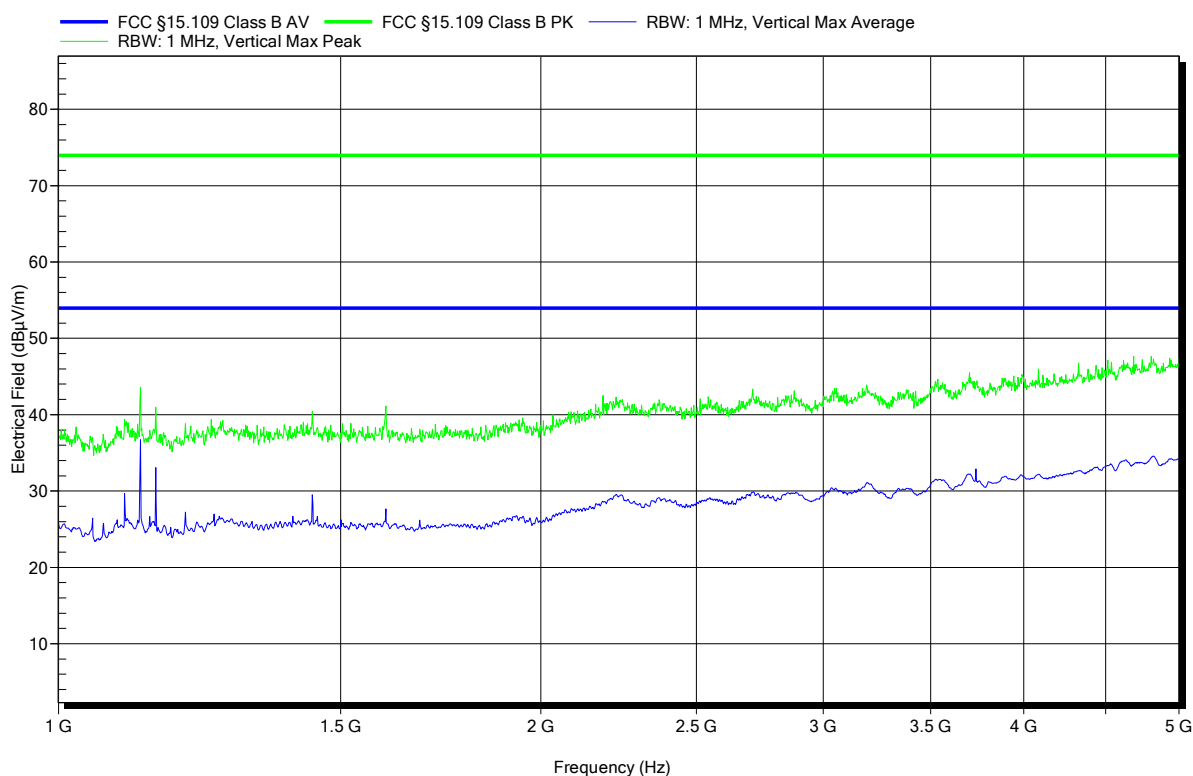
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Radiated emissions according to FCC part 15B

Project Number: G0M-2007-9162
 Applicant: Hella Aglaia Mobile Vision GmbH
 Model Description: Advanced People Sensor, 180 mm lens distance, without IO connector
 Model: EH702
 Test Sample ID: 30420
 Test Site: Eurofins Product Service Germany
 Operator: Mr. Dose
 Test Date: 2020-07-27
 Operating Conditions: ambient temperature: 23°C
 power input: 48VDC
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement Distance: 3m
 Mode: 1

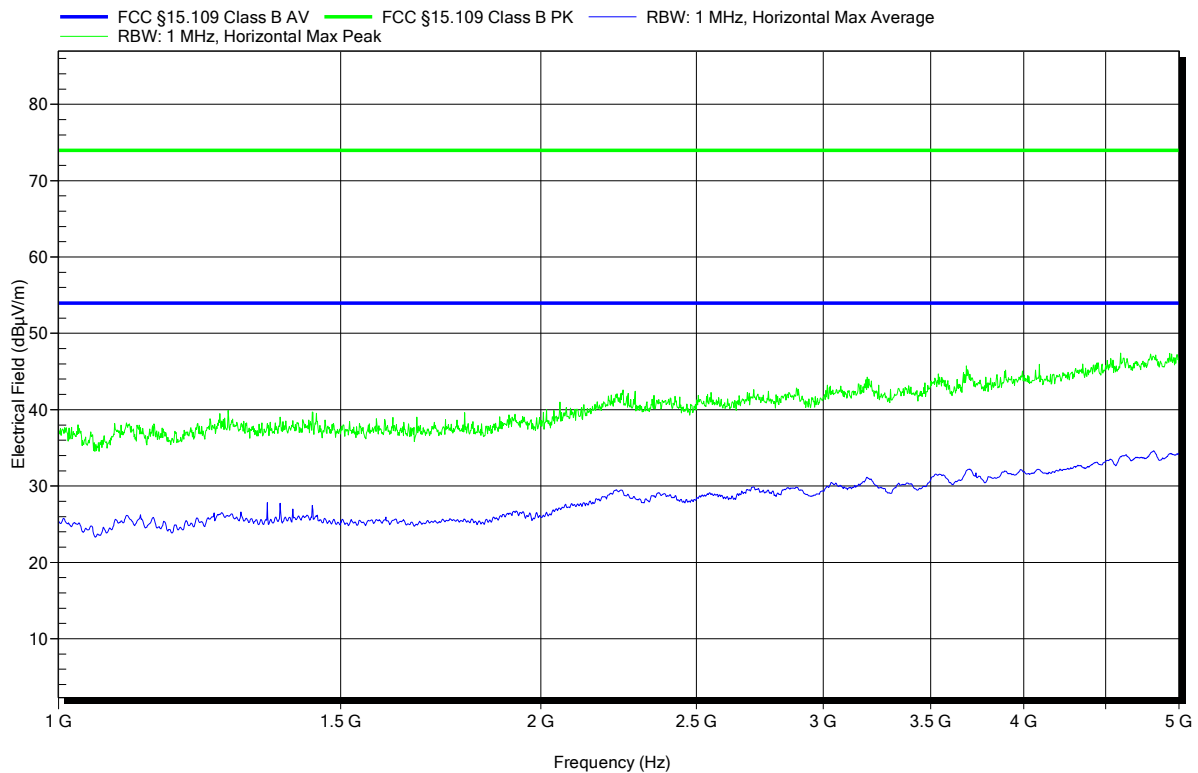
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Radiated emissions according to FCC part 15B

Project Number: G0M-2007-9162
 Applicant: Hella Aglaia Mobile Vision GmbH
 Model Description: Advanced People Sensor, 180 mm lens distance, without IO connector
 Model: EH702
 Test Sample ID: 30420
 Test Site: Eurofins Product Service Germany
 Operator: Mr. Dose
 Test Date: 2020-07-27
 Operating Conditions: ambient temperature: 23°C
 power input: 48VDC
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement Distance: 3m
 Mode: 1

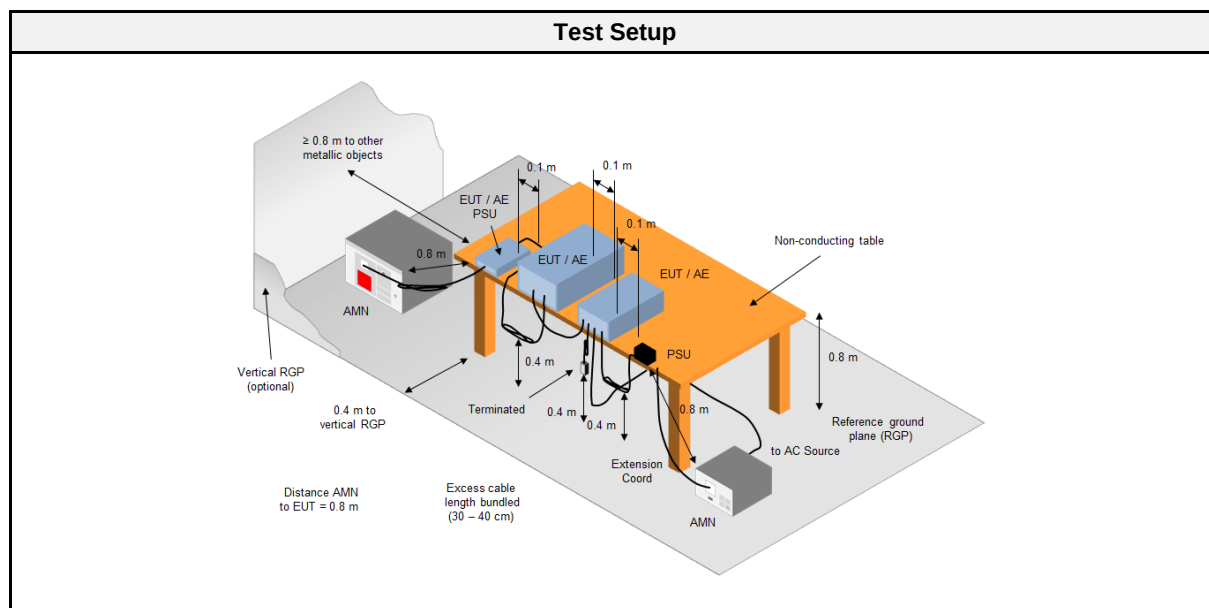
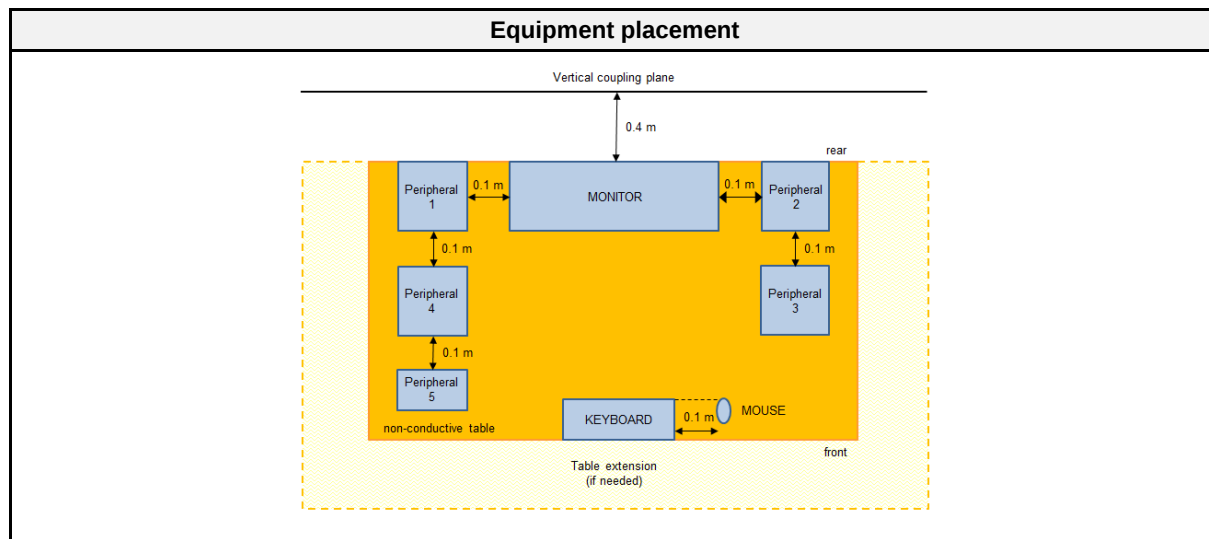
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2.2.1 Information

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]	23 ±3
Humidity [%]	55 ±5
Operator	Stefan Dose
Date	2020-07-27

2.2.2 Setup



2.2.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2016.1.10

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 1.3

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

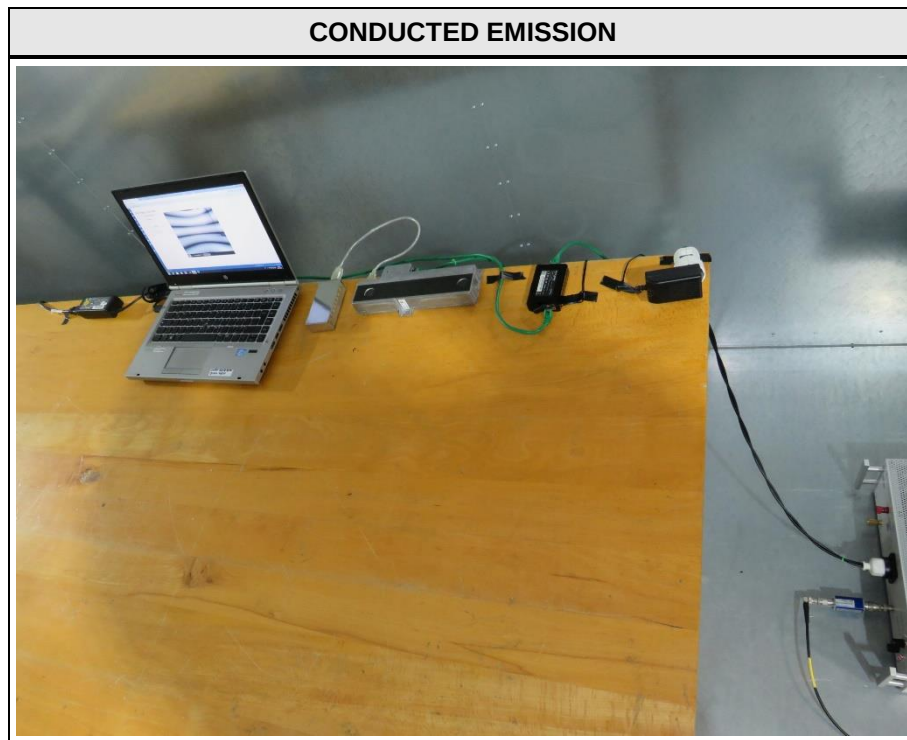
2.2.5 Limits

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
Ethernet/PoE	AMN	1	1	PASS	-

2.2.7 Setup Photos

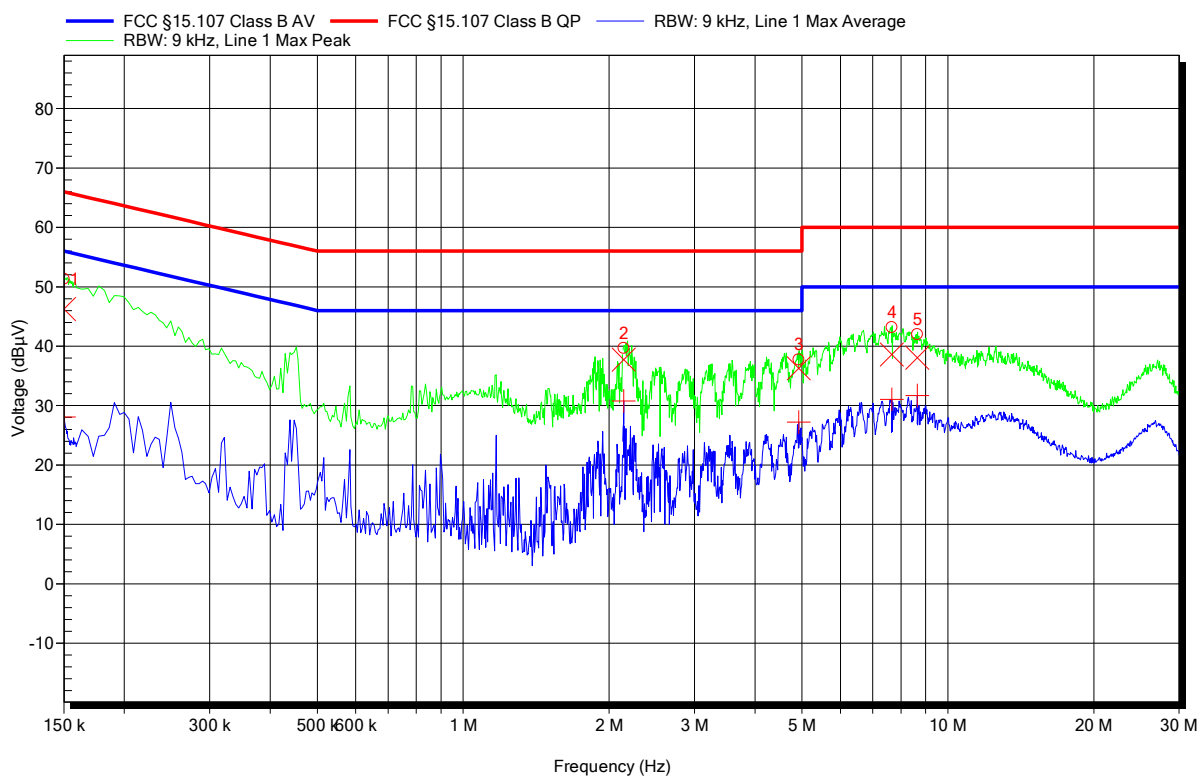


2.2.8 Records

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

Project Number: G0M-2007-9162
 Applicant: Hella Aglaia Mobile Vision GmbH
 Model Description: Advanced People Sensor, 180 mm lens distance, without IO connector
 Model: EH702
 Test Sample ID: 30420
 Test Site: Eurofins Product Service Germany
 Operator: Mr. Dose
 Test Date: 2020-07-27
 Operating Conditions: ambient temperature: 23°C
 power input: 120 VAC (48VDC via POE injector)
 LISN: Schwarzbeck NSLK 8127 RC L
 Mode: 1
 Applied to Port: ac mains

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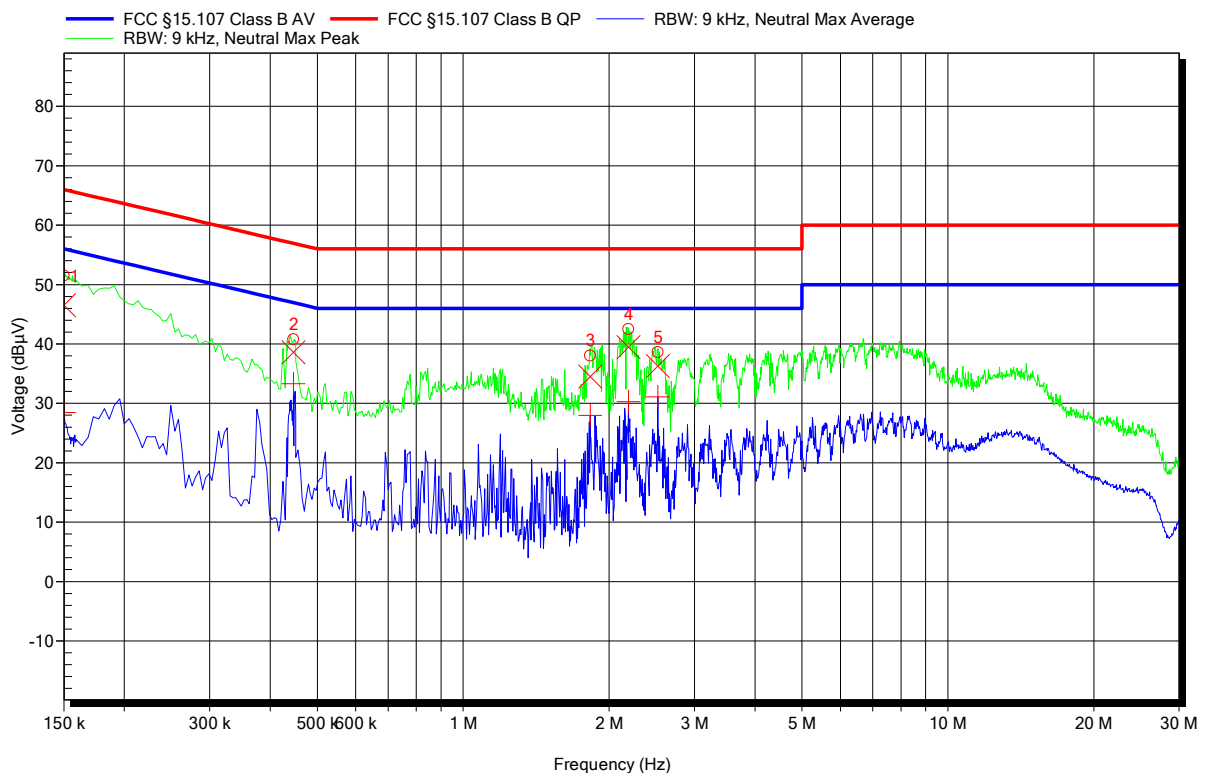
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	150 kHz	46.27 dBµV	66 dBµV	-19.73 dB	Pass	Line 1
2	2.144 MHz	37.71 dBµV	56 dBµV	-18.29 dB	Pass	Line 1
3	4.925 MHz	36.28 dBµV	56 dBµV	-19.72 dB	Pass	Line 1
4	7.667 MHz	38.6 dBµV	60 dBµV	-21.4 dB	Pass	Line 1
5	8.652 MHz	38.07 dBµV	60 dBµV	-21.93 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	150 kHz	28.05 dBµV	56 dBµV	-27.95 dB	Pass	Line 1
2	2.144 MHz	30.75 dBµV	46 dBµV	-15.25 dB	Pass	Line 1
3	4.925 MHz	27.23 dBµV	46 dBµV	-18.77 dB	Pass	Line 1
4	7.667 MHz	31.05 dBµV	50 dBµV	-18.95 dB	Pass	Line 1
5	8.652 MHz	31.71 dBµV	50 dBµV	-18.29 dB	Pass	Line 1

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

Project Number: G0M-2007-9162
 Applicant: Hella Aglaia Mobile Vision GmbH
 Model Description: Advanced People Sensor, 180 mm lens distance, without IO connector
 Model: EH702
 Test Sample ID: 30420
 Test Site: Eurofins Product Service Germany
 Operator: Mr. Dose
 Test Date: 2020-07-27
 Operating Conditions: ambient temperature: 23°C
 power input: 120 VAC (48VDC via POE injector)
 LISN: Schwarzbeck NSLK 8127 RC N
 Mode: 1
 Applied to Port: ac mains

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Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	150 kHz	46.53 dBμV	66 dBμV	-19.47 dB	Pass	Neutral
2	446.61 kHz	38.59 dBμV	56.94 dBμV	-18.34 dB	Pass	Neutral
3	1.829 MHz	34.51 dBμV	56 dBμV	-21.49 dB	Pass	Neutral
4	2.192 MHz	39.45 dBμV	56 dBμV	-16.55 dB	Pass	Neutral
5	2.522 MHz	36.26 dBμV	56 dBμV	-19.74 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	150 kHz	28.47 dBμV	56 dBμV	-27.53 dB	Pass	Neutral
2	446.61 kHz	33.34 dBμV	46.94 dBμV	-13.6 dB	Pass	Neutral
3	1.829 MHz	27.96 dBμV	46 dBμV	-18.04 dB	Pass	Neutral
4	2.192 MHz	30.29 dBμV	46 dBμV	-15.71 dB	Pass	Neutral
5	2.522 MHz	31.12 dBμV	46 dBμV	-14.88 dB	Pass	Neutral