Vehicle Certification Agency

THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

COMMUNICATION CONCERNING APPROVAL GRANTED OF A TYPE OF ELECTRONIC SUB-ASSEMBLY WITH REGARD TO REGULATION NO. 10.06

E11 Approval No: E11*10R06/01*11872*00

1. Make (trade name of manufacturer): MOVON CORPORATION

2. Type and general commercial description(s): MDSM-22 (Driver Safety Monitoring System) / MDSM-22

3. Means of identification of type, if marked on the component: MDSM-22

3.1. Location of that marking: Bottom side of product

4. Category of vehicle: Not applicable

5. Name and address of manufacturer:

Movon Corporation
Hyunjuk Bldg., 7
Seolleung-ro 94-gil
Gangnam-gu
Seoul
Korea

6. In the case of components and separate technical units, location and method of affixing of the approval mark: Label on the bottom side of product

KSA578361

UK Approval Authority Vehicle Certification Agency
21-Nov-22

7. Address(es) of assembly plant(s):

Qingdao Movon Electronics Co., Ltd.
No.70 Building-B
Song Hua Jlang Road
Qingdao Economic & Technical Development
Shan-Dong
China

8. Additional information (where applicable): See Appendix below

9. Technical Service responsible for carrying out the tests: Vehicle Certification Agency

10. Date of test report: 17 OCTOBER 2022

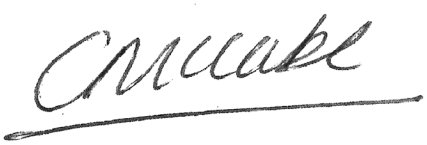
11. No. of test report: KSA578361 (11872)

12. Remarks (if any): See Appendix below

13. Place: BRISTOL

14. Date: 21 NOVEMBER 2022

15. Signature:



C McCABE
Chief Technical and Statutory Operations Officer

16. The index to the information package lodged with the Approval Authority, which may be obtained on request, is attached.

17. Reasons for extension:

Not applicable

Appendix

to type approval communication form No. E11*10R06/01*11872*00
concerning the type approval of an electrical/electronic sub-assembly under UN Regulation No. 10.06

1. Additional information:

1.1. Electrical system rated voltage: DC 10V ~ 36 V. neg ground

1.2. This ESA can be used on any vehicle type with the following restrictions: 12V and 24V negative earth vehicles only

1.2.1. Installation conditions, if any:

See the manufacturer's documentation, Page 3

1.3. This ESA can be used only on the following vehicle types: Not applicable

1.3.1. Installation conditions, if any:

Not applicable

1.4. The specific test method(s) used and the frequency ranges covered to determine immunity were: (Please specify precise method used from Annex 9):

BCI method(20-80MHz), Free field method(80-2000MHz)

1.5. Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for carrying out the tests: DEKRA EMC Test Lab.

2. Remarks: None

Vehicle Certification Agency

THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

APPROVAL NUMBER: E11*10R06/01*11872*00

INFORMATION PACKAGE CONTENTS

INDEX REVISION NUMBER: Not applicable

Conformity of Production (COP) Declaration	**COP Confirmed**	
Assessment Method	**COP Audit**	
Date of Initial Clearance	**January**	**2017**
Date of Last Clearance	**July**	**2022**

Total number of sheets: 15 (Fifteen)

Reasons for Revision: Not applicable

Revision Date
&
Office Stamp

UK Approval Authority | Vehicle Certification Agency
21-Nov-22

KSA578361

MOVON CORPORATION	Information document no. 10R-0611872-00 for type-approval of an electrical/electronic sub-assembly with respect to electromagnetic compatibility ECE R10.06 ESA Type : MDSM-22	Page: 1

1.	Make (trade name of manufacturer)	: MOVON CORPORATION
2.	Type	: MDSM-22 (Driver Safety Monitoring System)
3.	Means of identification of type, if marked on the component	: MDSM-22
3.1.	Location of that marking	: Bottom side of product
4.	Name and address of manufacturer	: Movon Corporation Hyunjuk Bldg., 7, Seolleung-ro 94-gil, Gangnam-gu, Seoul, Korea
	Name and address of authorized representative, if any	: Not Applicable
5.	In the case of components, location and method of affixing of the approval mark	: Label on the bottom side of product
6.	Address (es) of assembly plant(s)	: Qingdao Movon Electronics Co., Ltd. No.70 Building-B, Song Hua Jlang Road, Qingdao Economic & Technical Development, Shan-Dong, China
7.	This ESA shall be approved as a component	
8.	Any restriction of use and conditions for fitting	: Manufacturer's instructions to be followed, 12V and 24V negative earth vehicles only
9.	Electrical system rated voltage	: DC 10V ~ DC 36V , negative ground
10.	Charger	: Not Applicable
11.	Charging Current	: Not Applicable

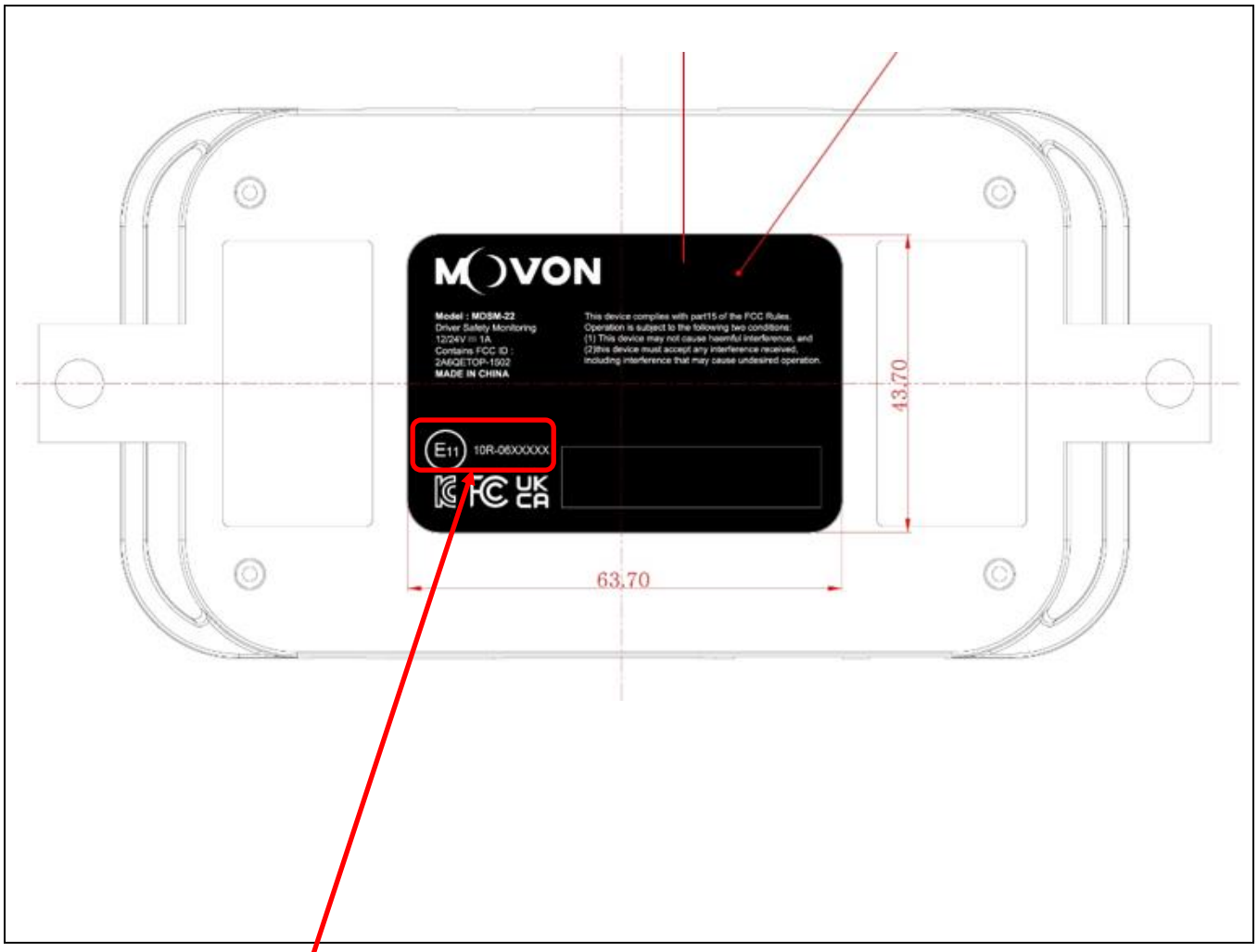
12.	Maximal nominal current (in each mode if necessary)	: Not Applicable
13.	Nominal charging voltage	: Not Applicable
14.	Basic ESA interface functions	: Not Applicable
15.	Minimum Rsce value	: Not Applicable

List of contents

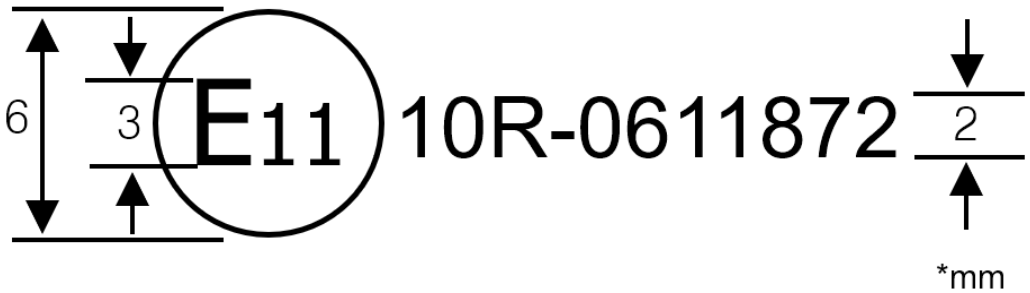
This information document consists of pages 1 to 15 including Appendix and Attachments.

Item		Description	Note
Processor		ARM Cortex A7 Quad-Core	
Internal Memory	NAND Flash	4Gb (512Mbyte) SLC NAND Flash	
	SDRAM	DDR3 4Gb * 2 (512MByte)	
Record		30fps H.264	
Audio	Audio Out	1W, 8Ω, 90dB±3dB, 23Ø x 4.3T	
	Audio In	-42dB MEMS-MIC	
Interface	USB-C	USB 2.0 Device (For Calibration)	
	CAN	CAN 2.0 (Support Version A,B)	
	GPIO	Input 1 Port (IGN/ACC) B+ Level Output 1 Port (For Warning Signal)	
ETC.	GMAC/EMAC	RGMII PHY(10/100/1000Mbps)	
	GPS	NMEA0183 Protocol Support	
	SD/MMC	MicroSD Memory Interface default 32Gbyte class10 / Max 128Gbyte Support	
Operating Temperature		-20~70˚C	
Storage Temperature		-40~85˚C	
Input Voltage		DC 12V & 24V (DC 10V ~ 36V)	

Label View



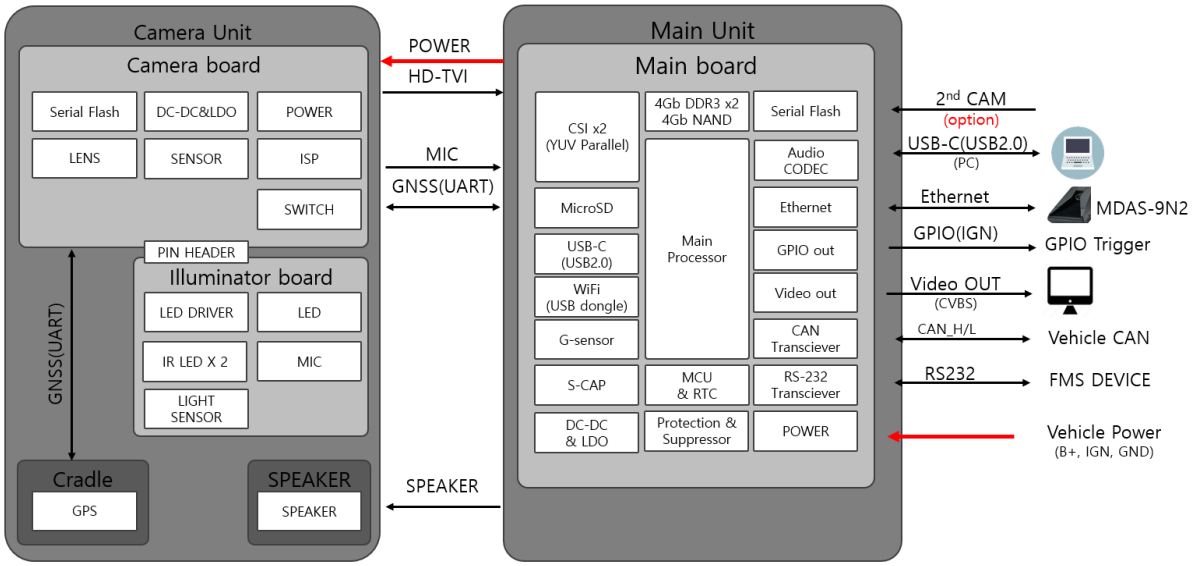
Location of E-mark and Type Designation



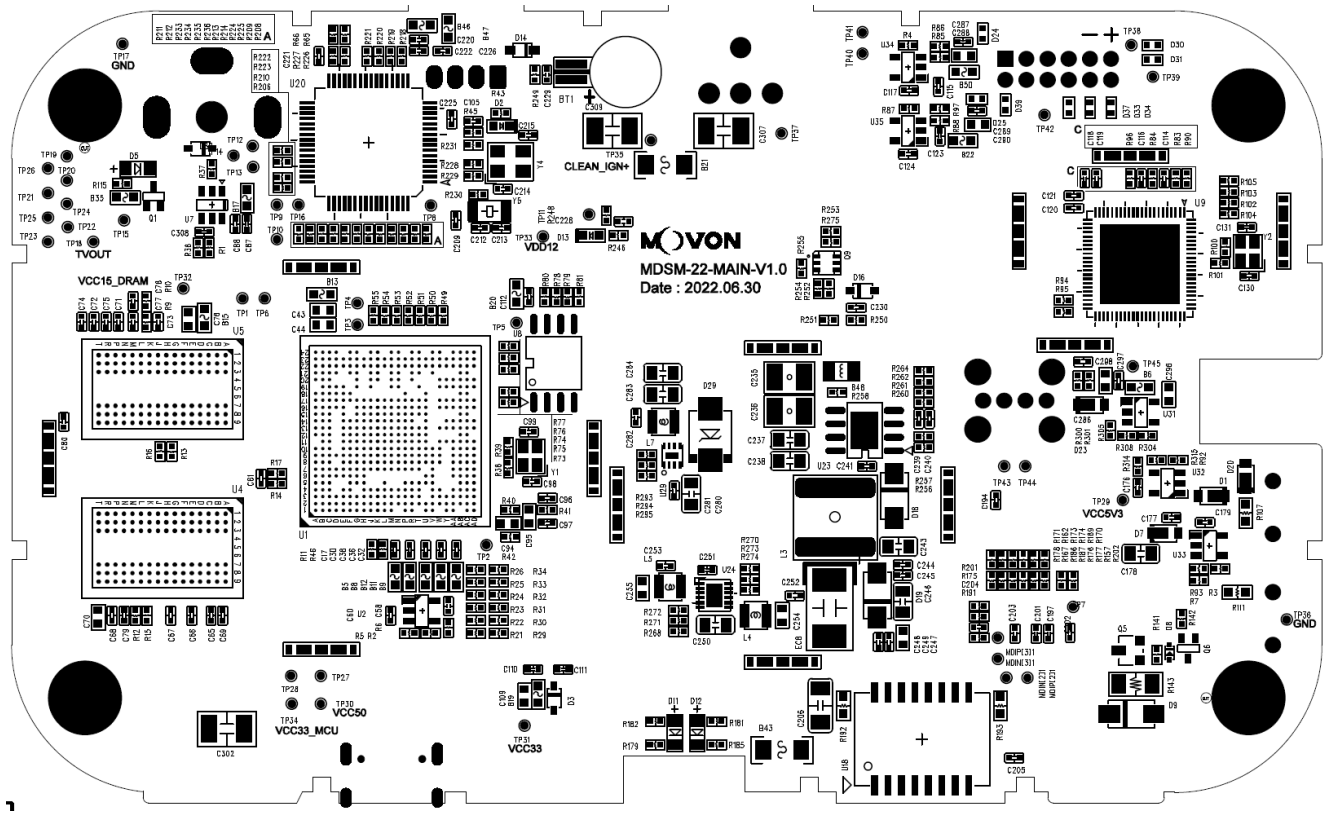
Main Unit

Camera Unit

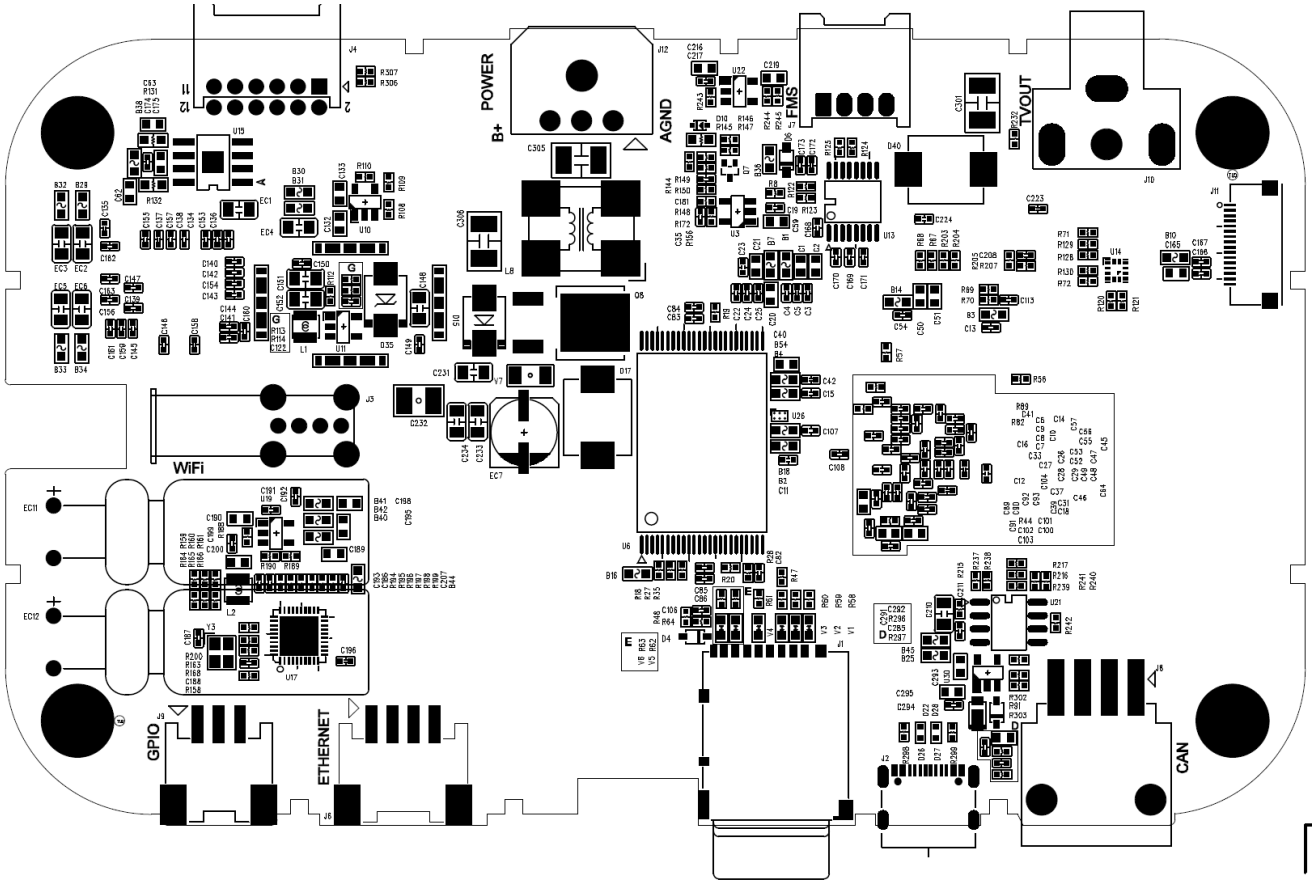
Block Diagram



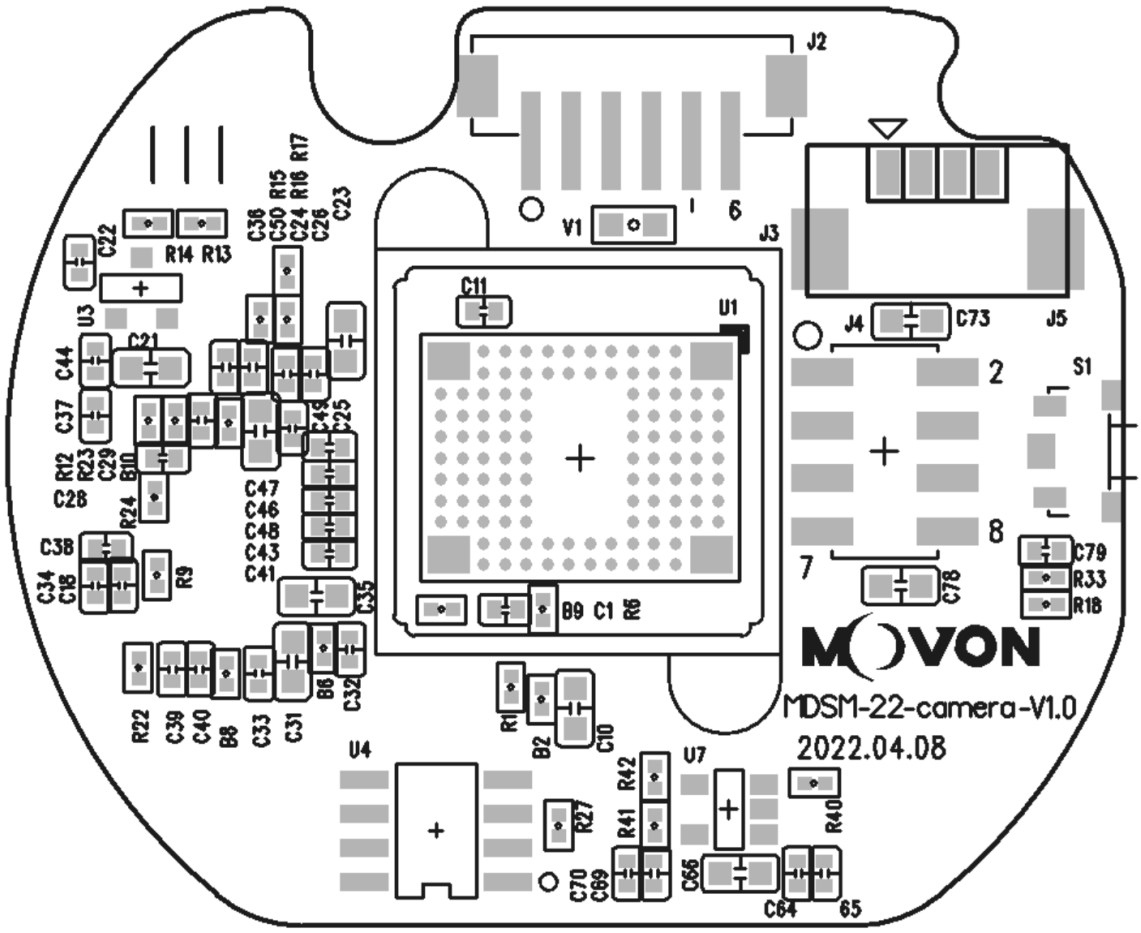
TOP of MAIN PCB



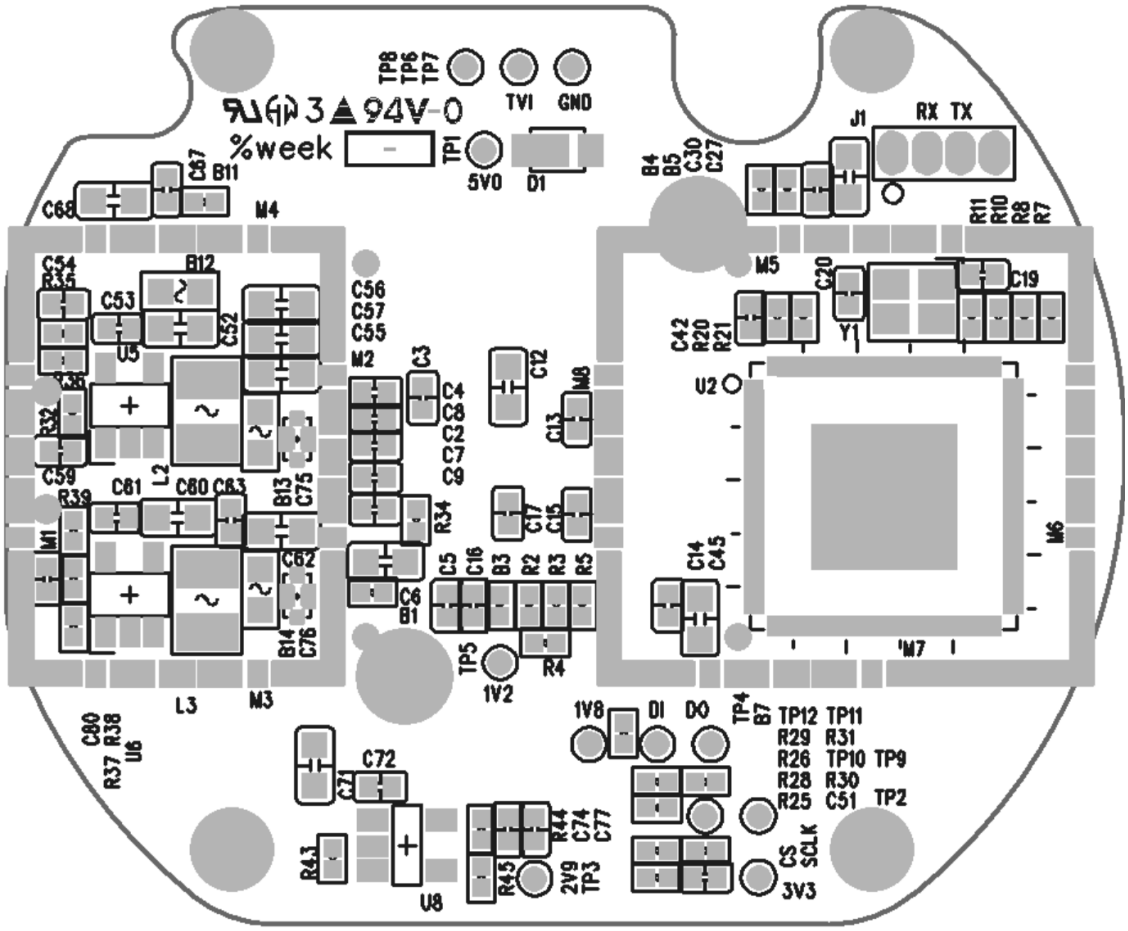
BOTTOM of MAIN PCB



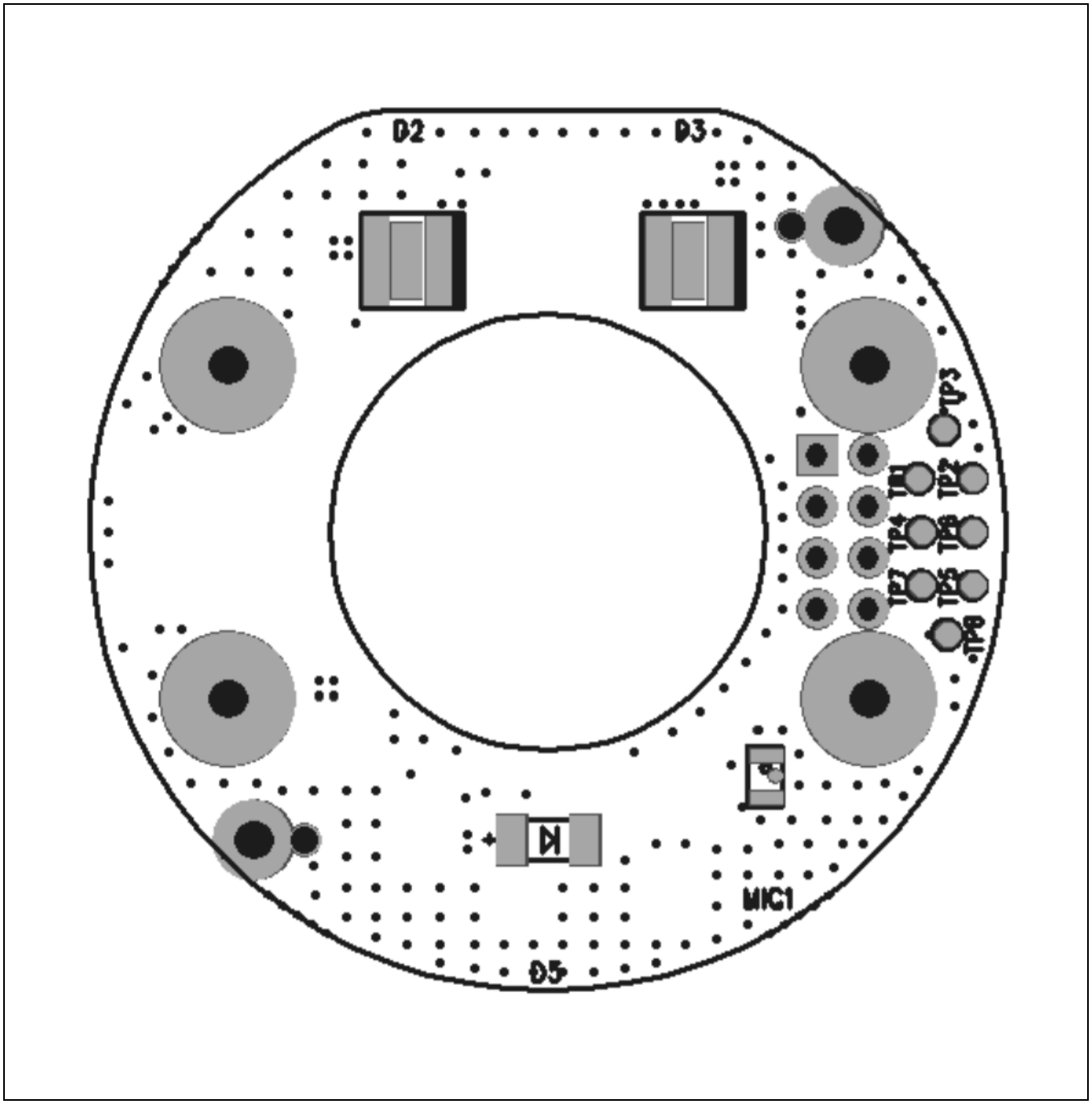
TOP of CAMERA PCB



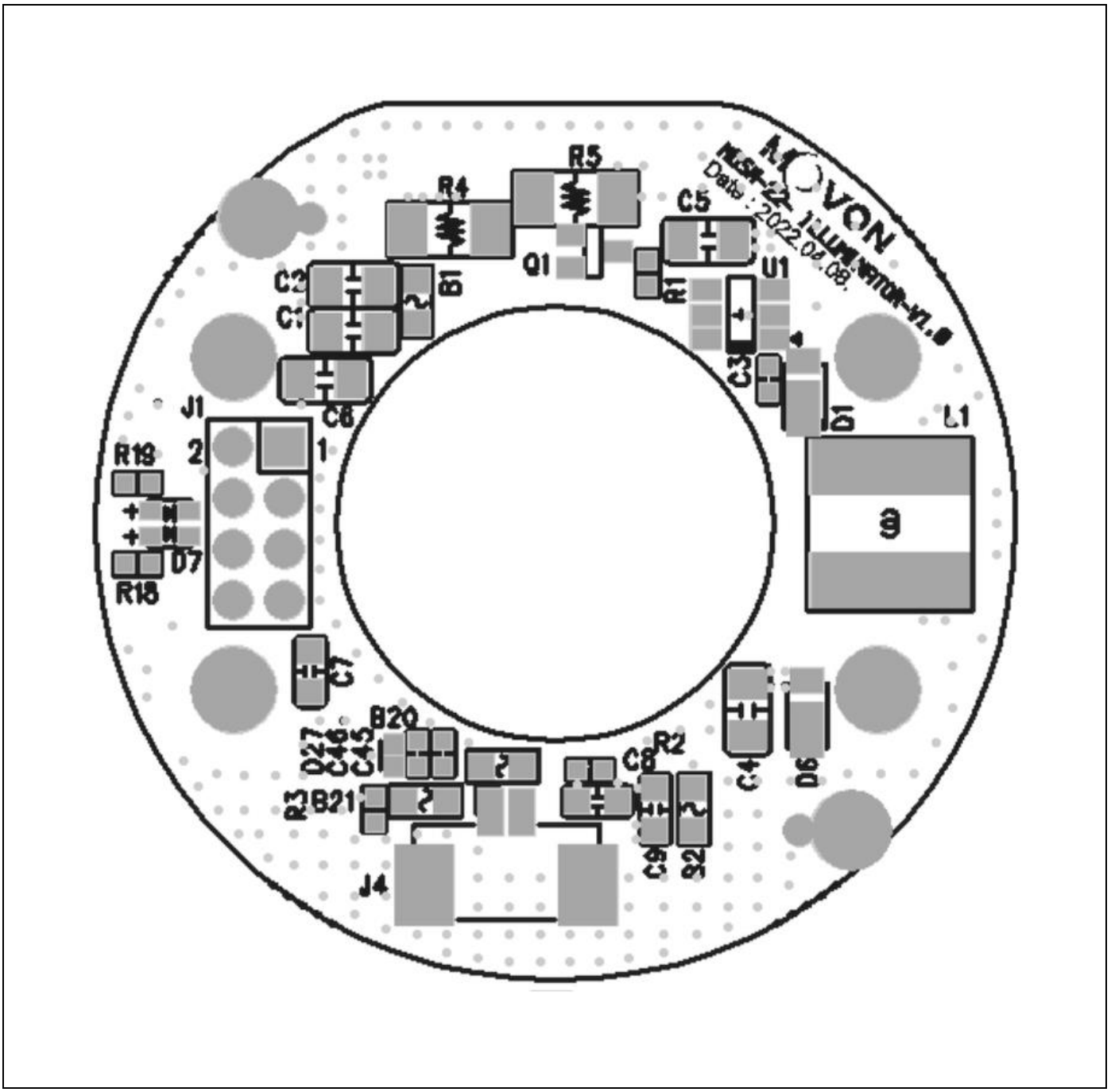
BOTTOM of CAMERA PCB



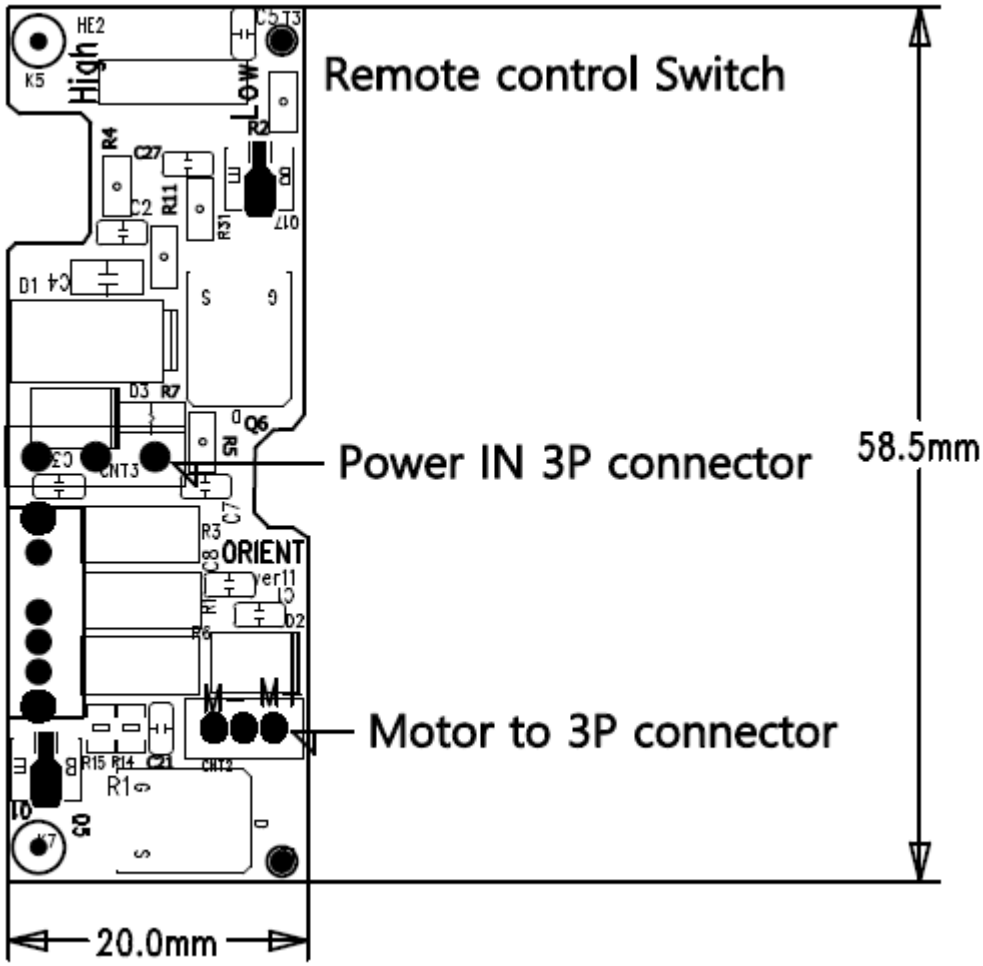
TOP of ILLUMINATOR PCB



BOTTOM of ILLUMINATOR PCB



TOP of Vibrator PCB



Component	Make / Manufacturer	Type / Model	Comment
CPU	Allwinner	A40i	@1008/1152/1200MHz
Memory	Samsung	K4B4G1646E-BCNB	@1066MHz
Image Sensor	SONY	IMX307	
ISP	Techpoint	TP3811	@27MHz
Crystal	Hosonic	E2SB24E00000RE	24Mhz
Crystal	Hosonic	E3FB8E0000000E	8Mhz
Crystal	Hosonic	ETST00327000LE	32.768Khz
Crystal	Hosonic	E2SB25E00000UE	25MHz
Crystal	Hosonic	E2SB27E00000RE	27MHz

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk |
www.vehicle-certification-agency.gov.uk |
+44(0) 300 330 5797

Vehicle Certification Agency

Report Number: KSA578361 (11872) Issue: 0

Inspection/Test Report: Electromagnetic Compatibility – ESA

Legislation

UNECE Regulation 10.06 to Supplement 1

Inspection/Test Details

Location of Inspection/Test:	DEKRA EMC Test Lab.
Date of Inspection/Test:	17 October 2022
VCA Representative(s):	Seung-Hwan Kim
Inspectors office location:	VCA Korea
Manufacturer's Representative(s):	Jae Cheol, Jeong
Reason for Test Report:	New approval / ~~Extension of approval / Report only~~

Manufacturer Details

Name and Address:	Movon Corporation Hyunjuk Bldg., 7, Seolleung-ro 94-gil, Gangnam-gu, Seoul, Korea
Type:	MDSM-22 (Driver Safety Monitoring System)
Commercial Description:	MDSM-22
Category:	Component

Conclusion

The above mentioned component was tested in accordance with the above mentioned legislation and was found to comply in all respects. This report relates only to the items tested.

Witness Engineer/Test Engineer
Signature:

Name:	Seung-Hwan Kim
Position:	Type Approval Engineer
Date:	17 October 2022

List of Annexes

Annex	No of Pages	Subject
I	4	Diagrams of BroadBand and NarrowBand radiated emissions, Horizontal and Vertical pol.
II	2	ISO 7637-2 test results

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk |
www.vehicle-certification-agency.gov.uk |
+44(0) 300 330 5797

Vehicle Certification Agency

Report Number: KSA578361 (11872) Issue: 0

Issue Record

Issue 0 is original report

Worst Case Rationale

1) The ESA is related to immunity related functions.
-. RE(Radiated Emission) and RI(Radiated Immunity) tests are carried out.
-. CTI/CTE tests are done by ISO7637-2.

Note: Include information on variants and versions this report covers, as applicable. Supporting documents may be annexed to this report

Significant Interpretations, Alternative Test Methods, New Technologies

Not applicable

Inspection/Tests Required

	Yes, NA, See Report … / Approval … / Annex …
Radiated Emissions:	Yes
Radiated Immunity	Yes
BCI Immunity:	Yes
Free Field Immunity:	Yes
150 mm Stripline Immunity:	NA
800 mm Stripline Immunity:	NA
Transient Testing:	Yes

Component Specification

Component Part Number:	Not applicable

Manufacturer's Documentation

Manufacturer's documentation is complete and reflects the agreed specification for the component tested, and covers all variants and versions agreed in the worst case rationale. Information document uploaded to job folder and identified by job number.	Yes

Facility and Equipment Checks

Calibration certificates checked and valid, recorded in the following table:	Yes

Equipment	Serial / Certificate No.	Calibration due*
EMI Receiver	101196	22 November 2022
Pre Amplifier	10014	24 June 2023
Biconical Antenna	920491	01 July 2023
Logperiodic Antenna	105707	01 July 2023
Artificial Network	100233	24 June 2023
Artificial Network	100234	24 June 2023
Thermo-hygrometer	NA	28 June 2023

Amplifier	312399	NA
Bulk current injection probe	79	NA
Signal generator	101530	22 November 2022
Power sensor	100075	22 November 2022
Power sensor	100076	22 November 2022
Directional Coupler	311676	22 November 2022
3dB ATTNENUATOR	NA	22 November 2022
LISN	0563101	24 June 2023
LISN	0563102	24 June 2023
DC Power Supply	0826A01240	24 June 2023
Thermo-hygrometer	NA	28 June 2023
Amplifier	355643	NA
Amplifier	356253	NA
Amplifier	0352556	NA
Signal generator	108798	22 November 2022
Biconical Antenna	131146	NA
Logperiodic Antenna	00060199	NA
Horn Antenna	0325308	NA
Power Meter	17-779997-C	23 November 2022
Power Sensor	103680	23 November 2022
Power Sensor	104182	23 November 2022
Directional Coupler	356184	22 November 2022
Directional Coupler	356198	22 November 2022
Directional Coupler	351717	22 November 2022
LISN	0563104	24 June 2023
LISN	056399	24 June 2023
Thermo-hygrometer	NA	28 June 2023
EM Test (Rack)	P1251107179	24 June 2023
EM Test (Rack)	P1339124777	24 June 2023
EM Test (Rack)	P1951236225	22 November 2022
DC Power Supply	0826A01240	24 June 2023
Thermo-hygrometer	17Y6A	28 June 2023
Sigle line Artificial Network	P1651189897	24 June 2023
Electronic Switch	P1706192662	24 June 2023
Shunt Resistor	P1647187622	24 June 2023
Oscilloscope	C011634	24 June 2023
DC Power Supply	0826A01240	24 June 2023
Thermo-hygrometer	17Y6A	28 June 2023

**Specify calibrated date + (interval) or calibration due date.*

Inspection/Test Requirements		Complies Yes / NA
Radiated Emissions		
CISPR25, 4.5.	Measuring equipment complies with CISPR 16-1-4 (2010).	Yes
	Types and calibration date: See the above table	
	Test Location	
	Test performed in:	Yes
Ann 7, 3.1.	- A.L.S.E (Absorber-lined Shielded Enclosure)*	
Ann 7, 3.3.	~~- O.A.T.S (Open Area Test Site)*~~	
	**Strikethrough, as appropriate.*	
Ann 7, 3.3.	O.A.T.S level is a clear area, free from electromagnetic reflecting surfaces, within a circle of 15 m minimum radius.	NA
Ann 7, 3.3.	Measuring equipment is outside 15 m minimum radius circle.	NA
Ann 7, 3.4.	Ambient noise is at least 6 dB below reference limits, in either case.	Yes
	Test Arrangements	
CISPR25, 4.4.2.	EUT and antenna are more than 2 m from the walls and ceiling, and 1 m from the nearest absorber material.	Yes
CISPR25, 6.1.1.	Ground plane is 900 ± 50 mm high and made from 0.5 mm thick copper, brass or galvanised steel.	Yes
CISPR25, 6.1.1.	Ground plane is at least 2,000 mm length x 1,000 mm width.	Yes
CISPR25, 6.4.2.3.	ESA and harness are supported at 50 ± 5 mm above the ground plane on low relative permittivity material.	Yes
CISPR25, 6.4.2.3.	Face of the ESA is within 200 mm ± 10 mm from the edge of the ground plane.	Yes
CISPR25, 6.4.2.4.	Length of test harness, parallel to the front of the ground plane, is 1,500 ± 75 mm and does not exceed 2,000 mm.	Yes
CISPR25, 6.4.2.4.	Long segment of test harness is located parallel to the edge of the ground plane, facing the antenna at a distance of 100 ± 10 mm from the edge.	Yes
CISPR25, 6.1.2.	Power supply is Artificial Network (AN) rated at 50 Ω/50 µH.	Yes

CISPR25, 6.1.2.	EUT is: - Remotely grounded (vehicle power return line longer than 200 mm): two artificial networks are required, one for the positive supply line and one for the power return line* ~~- Locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required for the positive supply*~~ **Strikethrough, as appropriate.*	Yes
CISPR25, 6.1.2.	Case of the ESA is: ~~- Grounded, simulating actual vehicle configuration*~~ - Not grounded, simulating actual vehicle configuration* **Strikethrough, as appropriate.*	Yes
CISPR25, 6.1.2.	AN is electrically bonded to the ground plane.	Yes
	Antenna Types and calibration date: See the above table	
CISPR25, 6.4.2.6.	Height of the phase centre is 100 ± 10 mm above the ground plane.	Yes
CISPR25, 6.4.2.6.	No part of any antenna radiating element is closer than 250 mm to the floor.	Yes
CISPR25, 6.4.2.6.	Radiating elements of the measuring antenna are not closer than 1,000 mm to any absorber material, except that used on the floor, and are not closer than 2,000 mm to the walls or ceiling of the shielded enclosure.	Yes
CISPR25, 6.4.2.6.	Phase centre (for biconical) or tip (for log-periodic) is 1,000 ± 50 mm from the harness.	Yes
CISPR25, 6.4.2.6.	Antenna calibrated for this distance to correct measuring point (phase centre or tip).	Yes
CISPR25, 6.4.2.6.	Phase centre of the antenna is in line with the centre of the longitudinal part of the wiring harness.	Yes
Ann 7, Ann 8, 4.3.	Pre-test sweep supplied to show compliance throughout frequency range 30 to 1,000 MHz.	Yes
Ann 7, Ann 8, 4.3.	Test frequencies chosen from pre-test data.	NA
	Narrowband Test Results	
Ann 8, 2.	Operational mode of ESA: Normal operational at each input voltage	

Ann 8, 2. Detector used and bandwidth:
Average detector with 120kHz bandwidth

6.6.2. ESA meets narrowband emissions limits, with both vertical and horizontal polarisations. Yes

Broadband Test Results

Ann 7, 2. Operational mode of ESA:
Normal operational at each input voltage

Ann 7, 2. Detector used and bandwidth:
Peak detector with 120KHz bandwidth (for initial scan)
Quasi-peak detector with 120kHz bandwidth (for inspection)

6.5.2. ESA meets broadband emissions limits, with both vertical and horizontal polarisations. Yes

Radiated Immunity

Test Method(s) used and Frequency Range(s)

ISO11452-4	BCI frequency range between 20 and 400 MHz:	20 – 80	MHz	Yes
ISO11452-2	Free field frequency range between 80 and 2,000 MHz:	80 - 2,000	MHz	Yes
ISO11452-3	TEM cell frequency range between 20 and 200 MHz:		MHz	NA
ISO11452-5	150 mm stripline frequency range between 20 and 400 MHz:		MHz	NA
ISO11452-5	800 mm stripline frequency range between 20 and 2,000 MHz:		MHz	NA

Maximum frequency step sizes do not exceed:

Frequency Band (MHz)	Linear Steps (MHz)	Log Steps (%)	Actual Steps Used	
20 - 200	5	5	5	Yes
200 - 400	10	5	10	Yes
400 - 1000	20	2	20	Yes
1000 - 2000	40	2	40	Yes

Test Arrangements (General)

Ann 9, 2.2.	Operational mode of ESA: Normal operational at each input voltage	
Ann 9, 2.3.	Extraneous equipment in place during calibration.	Yes
Ann 9, 2.4.	Test equipment used is the same as for calibration.	Yes
Ann 9, 2.5.	Loads and actuators are as realistic as possible.	Yes
Ann 9, 2.5.	Case of ESA is: ~~- Grounded, simulating actual vehicle configuration*~~ - Not grounded, simulating actual vehicle configuration* **Strikethrough, as appropriate.*	Yes
Ann 9, 3.1.	Test frequency range is 20 to 2,000 MHz.	Yes
Ann 9, 3.1.	Test signal is R.F. sine wave amplitude, modulated by a 1 kHz sine wave at a modulation depth of 0.8 ± 0.04, in the 20 - 800 MHz band and pulse modulation (time on 577 µs, period 4,600 µs) in the 800 – 2,000 MHz band.	Yes
6.8.2.1.	Pre-test sweep supplied to show compliance throughout frequency range 20 to 2,000 MHz.	Yes
Ann 9, 3.2.	Test frequencies chosen from pre-test data.	Yes
6.8.2.2.	No degradation of immunity related functions during the tests.	Yes

BCI Immunity

	Calibration date: See the above table	
ISO11452-4, 5.	Shielded area used: Shielded area used	
	Comments: None	
ISO11452-4, 8.3.2.1.	Forward power used to achieve specified current.	Yes

Installation of ESA under Test

Ann 9, 4.3.2.	Current probe located 150 ± 10 mm from ESA connectors.	Yes
Ann 9, 4.3.2.	ESA installed: ~~- In a vehicle, as per ISO 11451-4*~~ - On a ground plane, as per ISO 11452-4*	Yes

**Strikethrough, as appropriate.*

ISO11452-4, 7.1.	Ground plane is made from at least 0.5 mm thick copper, brass or galvanised steel.	Yes
ISO11452-4, 7.1.	Minimum width of the ground plane is 1,000 mm and the minimum length is 1,500 mm, or length of the entire underneath of equipment plus 200 mm, whichever is greater.	Yes
ISO11452-4, 7.1.	Height of the ground plane is 900 ± 100 mm.	Yes
ISO11452-4, 7.1.	Ground plane is bonded to the shielded enclosure, with the straps at a distance no greater than 300 mm apart.	Yes
ISO11452-4, 7.2.	- ESA remotely grounded (vehicle power return line longer than 200 mm): two artificial networks are required, one for the positive supply line and one for the power return line)* ~~- ESA locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required, for the positive supply*~~	

**Strikethrough, as appropriate.*

ISO11452-4, 7.2.	Power supply is Artificial Network (AN) rated at 50 Ω/5 µH.	Yes
ISO11452-4, 7.3.	ESA and harness supported 50 ± 5 mm above ground plane, on low relative permittivity material.	Yes
ISO11452-4, 7.3.	Face of the ESA within 100 mm from the edge of the ground plane.	Yes
ISO11452-4, 7.3.	Distance of at least 500 mm between ESA and any metal parts, such as the walls of the shielded enclosure (exception is ground plane).	Yes
ISO11452-4, 7.4.	Length of test harness is 1,000 ± 100 mm, unless specified.	NA
	Actual wiring harness length: 1.5 m	Yes

BCI Test Results

6.8.2.1.	No malfunction at 60 mA or below.	Yes

Comments:

None

Free Field Immunity

Calibration date:

See above table

ISO11452-2, 5. Semi-anechoic chamber used:

Semi-anechoic chamber used

UK Approval Authority | Vehicle Certification Agency

21-Nov-22

ISO11452-2, 8.3.1.	Test field defined by: - Forward power* ~~- Another parameter, directly related*~~ **Strikethrough, as appropriate.*	Yes
ISO11452-2, 8.3.2.	Antenna is at a distance of 1,000 ± 10 mm from the reference point.	Yes
ISO11452-2, 8.3.2.	Reference point is 150 ± 10 mm above the ground plane.	Yes
ISO11452-2, 8.3.2.	Reference point is 100 ± 10mm from the edge of the ground plane.	Yes
ISO11452-2, 8.3.2.	For frequencies from 80 - 1,000 MHz, the reference point is in the centre of the harness.	Yes
ISO11452-2, 8.3.2.	For frequencies from 1,000 - 2,000 MHz, the reference point is in line with the ESA.	Yes
	Test Arrangements	
ISO11452-2, 7.1.	Ground plane is made from at least 0.5 mm thick copper, brass or galvanised steel.	Yes
ISO11452-2, 7.1.	Minimum width of the ground plane is 1,000 mm and the minimum length is 2,000 mm.	Yes
ISO11452-2, 7.1.	Height of the ground plane is 900 ± 100 mm.	Yes
ISO11452-2, 7.1.	Bonding straps are at a distance no greater than 300 mm apart.	Yes
ISO11452-2, 7.2.	Power supply is Artificial Network (AN) rated at 50 Ω/5 µH.	Yes
ISO11452-2, 7.2.	- ESA remotely grounded (vehicle power return line longer than 200 mm): two artificial networks are required, one for the positive supply line and one for the power return line)* ~~- ESA locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required, for the positive supply*~~ **Strikethrough, as appropriate.*	
ISO11452-2, 7.3.	AN mounted directly on the ground plane and cases bonded to the ground plane.	Yes
ISO11452-2, 7.3.	ESA and harness supported 50 ± 5 mm above table, on low relative permittivity material.	Yes
ISO11452-2, 7.3.	Face of the ESA located 200 ± 10 mm from the edge of the ground plane.	Yes

ISO11452-2, 7.4.	Test harness parallel to the front edge of the ground plane.	Yes
ISO11452-2, 7.4.	Total length of harness does not exceed 2,000 mm.	Yes
ISO11452-2, 7.4.	Actual wiring harness length: [ ] m or Length is 1,500 ± 75 mm between ECU and AN.	NA Yes
ISO11452-2, 7.4.	Harness is at a distance of 100 ± 10 mm from the edge of the ground plane.	Yes
ISO11452-2, Fig 1	Front face of ESA is at least 1.0 m from all other conductive structures.	Yes
ISO11452-2, Fig 1	ESA harness is at least 2.0 m forward from the chamber wall.	Yes

Antenna Type(s) and Frequency Range(s)

Ann 9, 4.1.2.	Antenna is vertically polarised.	Yes
ISO11452-2, 7.6.	Antenna is in the same position as the calibration.	Yes
ISO11452-2, 7.6.	Phase centre is 100 ± 10 mm above the ground plane.	Yes
ISO11452-2, 7.6.	Antenna elements are no closer than 250 mm to the floor of the facility, no closer than 0.5 m to any radio absorbent material, and no closer than 1.5 m to the wall of the facility.	Yes
ISO11452-2, 7.6.	Distance between wiring harness and antenna is 1,000 mm ± 10 mm, measured from the phase-centre of the biconical antenna, or the nearest part of the log-periodic and horn antennas.	Yes
Ann 9, 3.1.	Test signal modulation is: - AM, 1 kHz modulation, 80 % depth in 20 - 800 MHz frequency range; - PM, ton 577 μs, period 4,600 μs in 800 - 2,000 MHz frequency range.	Yes

Free Field Immunity Test Results

6.8.2.	No malfunction at 25 V/m or below. Comments: None	Yes

150 mm Stripline Immunity : Not applicable_Section removed for clarity

800 mm Stripline Immunity : Not applicable_Section removed for clarity

UK Approval Authority | Vehicle Certification Agency
21-Nov-22

Transient Testing

Case of ESA is:
~~- Grounded, simulating actual vehicle configuration*~~
- Not grounded, simulating actual vehicle configuration*

**Strikethrough, as appropriate.*

Transient Immunity

6.9.1. Test set up according to ISO 7637-2 (second edition 2004 and Amd.1:2008). — Yes

Ann 10, 2. Supply lines and other lines, which may be connected to supply lines, are tested. — Yes

Test voltage and time parameters are within allowed envelopes. — Yes

Test pulses and duration according to the following: — Yes

Test Pulse	Immunity Test Level	Functional Status for Systems		Test Duration	12V(24V) mode
		Related to Immunity-related Functions	~~Not Related to Immunity-related Functions~~		
1	III	C	~~D~~	5000 pulses	C(C)
2a	III	B	~~D~~	5000 pulses	A(A)
2b	III	C	~~D~~	10 pulses	C(C)
3a	III	A	~~D~~	1 hour	A(A)
3b	III	A	~~D~~	1 hour	A(A)
4	III	B *(for ESA, which must be operational during engine start, or C, for other ESA)*	~~D~~	1 pulse	C(C)

ESA operational after the tests, according to the above classification. — Yes

Emission of Conducted Disturbances

6.9.1. Test set up according to ISO 7637-2. — Yes

Ann 10, 3. Supply lines and other lines, which may be connected to supply lines, are tested. — Yes

Comments:

None

Slow pulses and fast pulses tested on both powering up and powering down.	Yes

Polarity of Pulse Amplitude	Maximum Allowed Pulse Amplitude	
	Vehicles with 12 V systems	Vehicles with 24 V system
Positive	+ 75 V	+ 150 V
Negative	- 100 V	- 450 V

Remarks

None

Note: VCA apply measurement uncertainty to calibrated items but not test results.

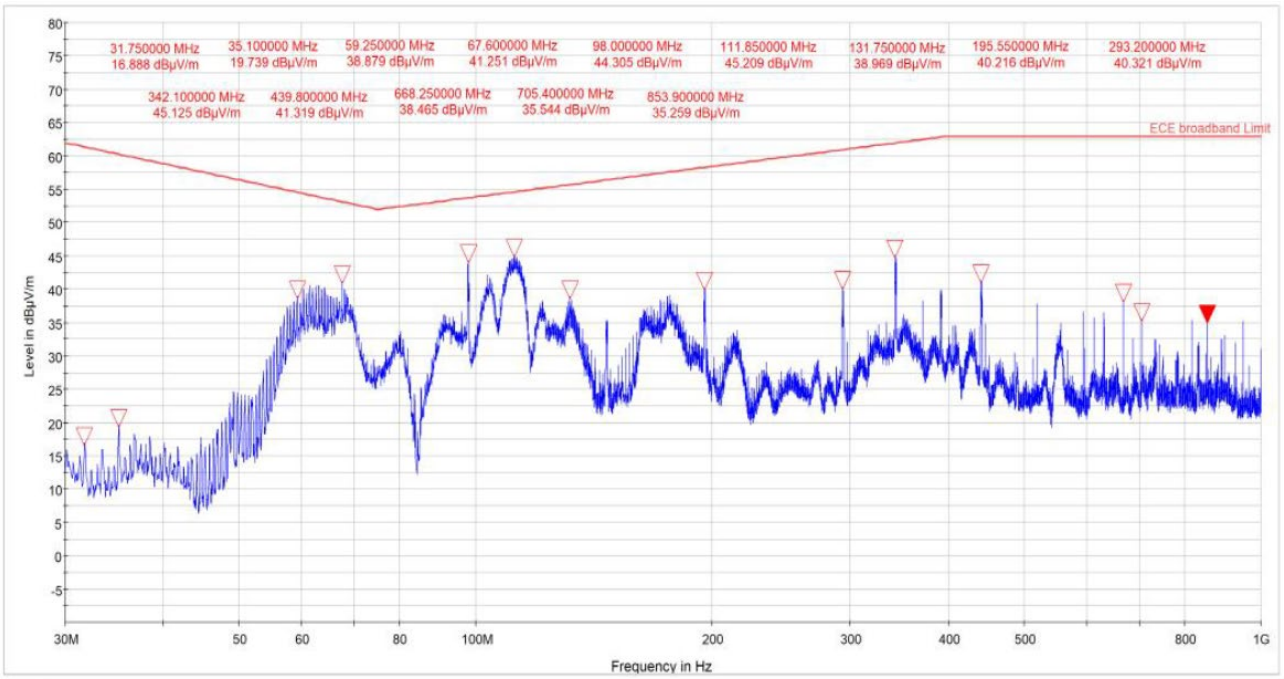
VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk |
www.vehicle-certification-agency.gov.uk |
+44(0) 300 330 5797

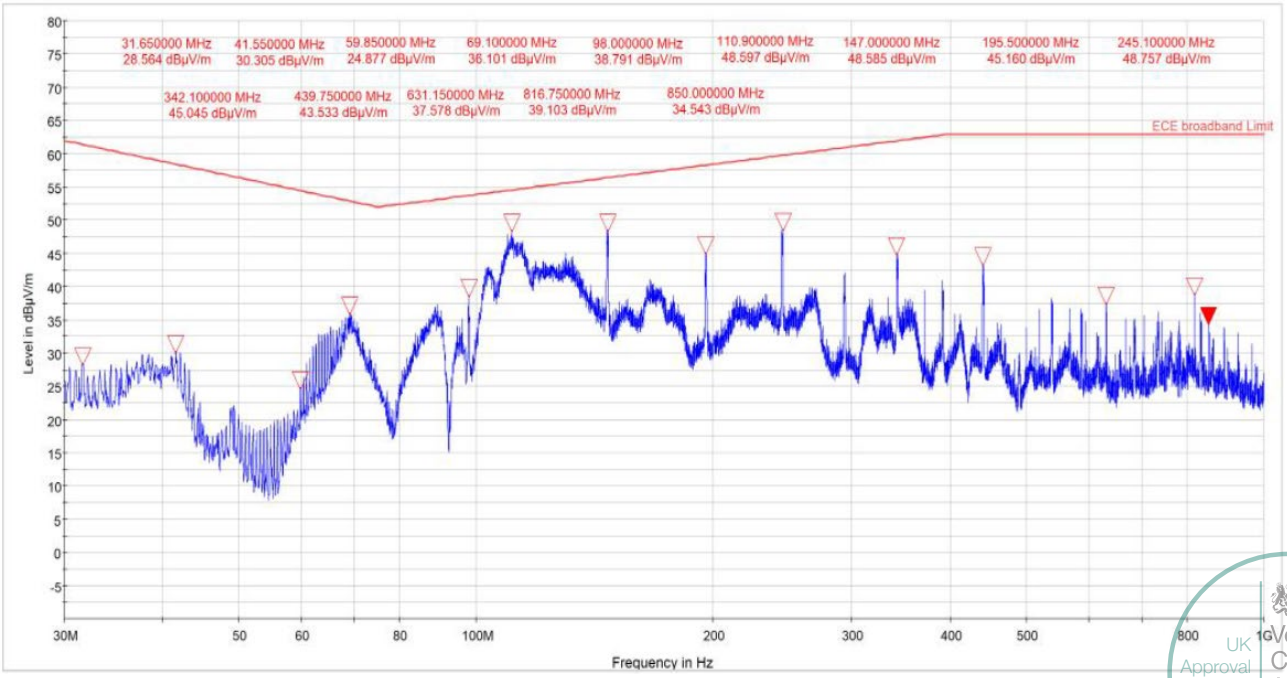
Report Number: KSA578361 (11872) Issue: 0

Annex I
Diagrams of BroadBand radiated emissions

Test lab. : DEKRA EMC Test Lab.
Test product : MDSM-22 (Driver Safety Monitoring System)
Test date : 17 October 2022

Horizontal and Vertical antenna polarization_12V Mode



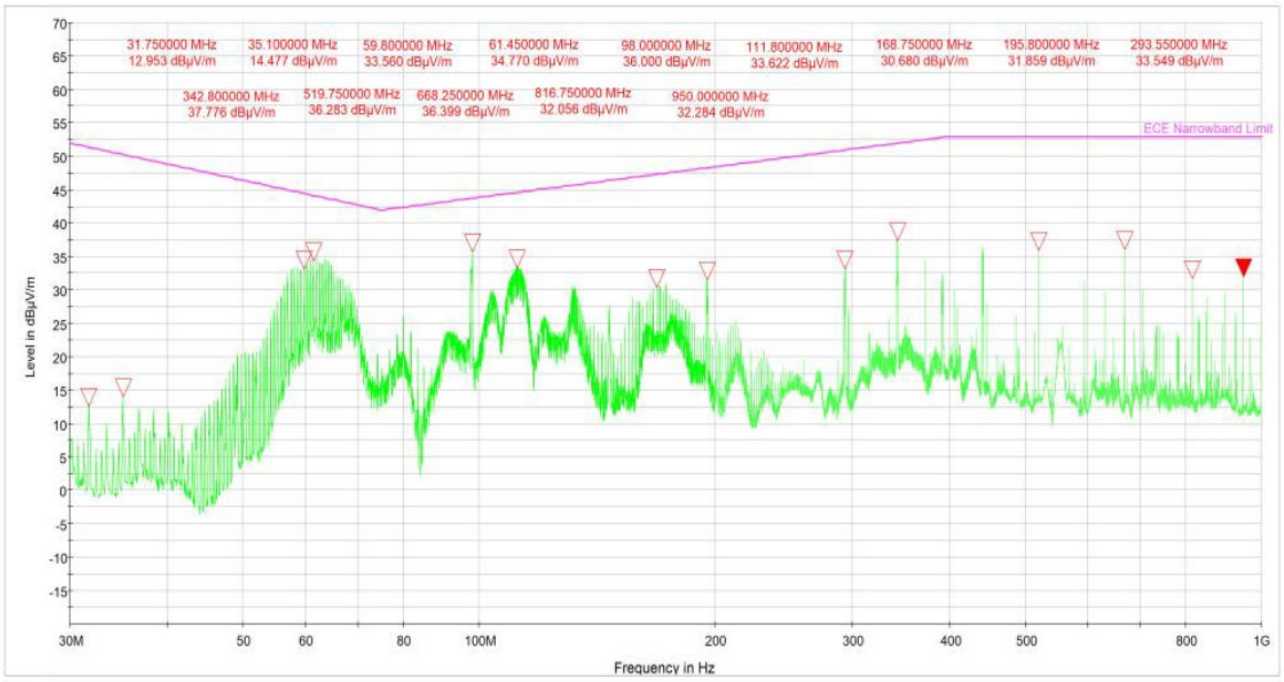


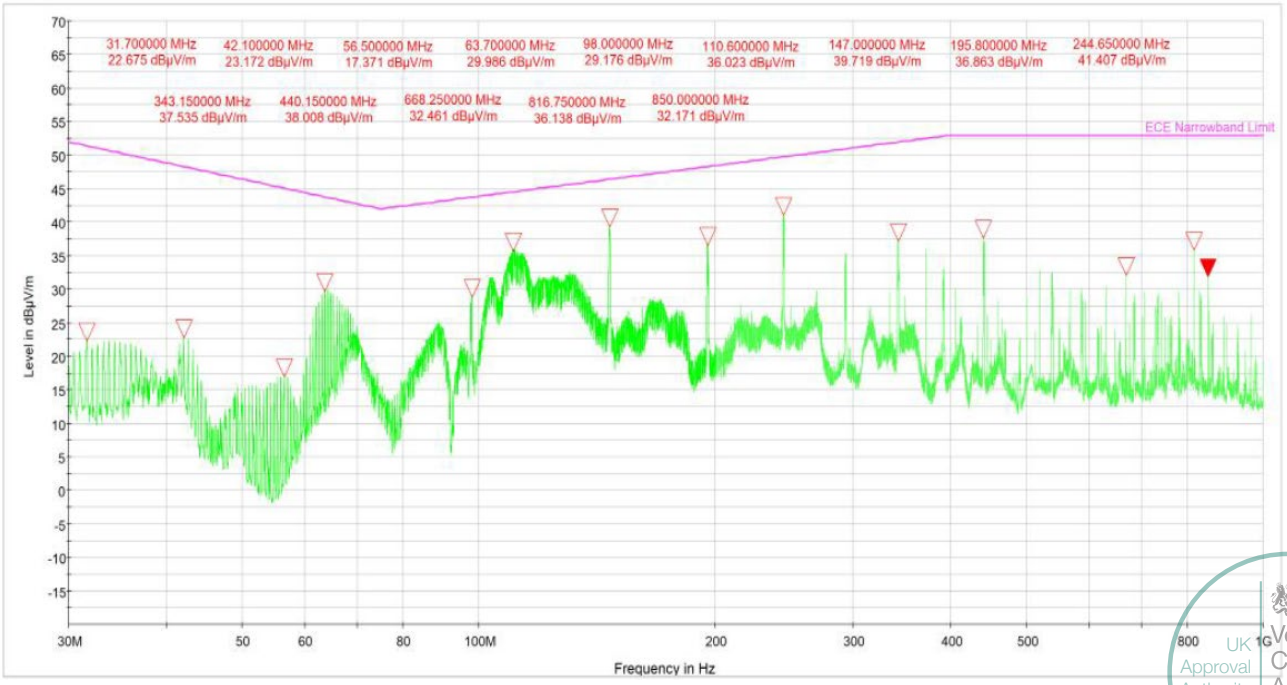
VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk |
www.vehicle-certification-agency.gov.uk |
+44(0) 300 330 5797

Annex I
Diagrams of NarrowBand radiated emissions

Test lab. : DEKRA EMC Test Lab.
Test product : MDSM-22 (Driver Safety Monitoring System)
Test date : 17 October 2022

Horizontal and Vertical antenna polarization_12V Mode

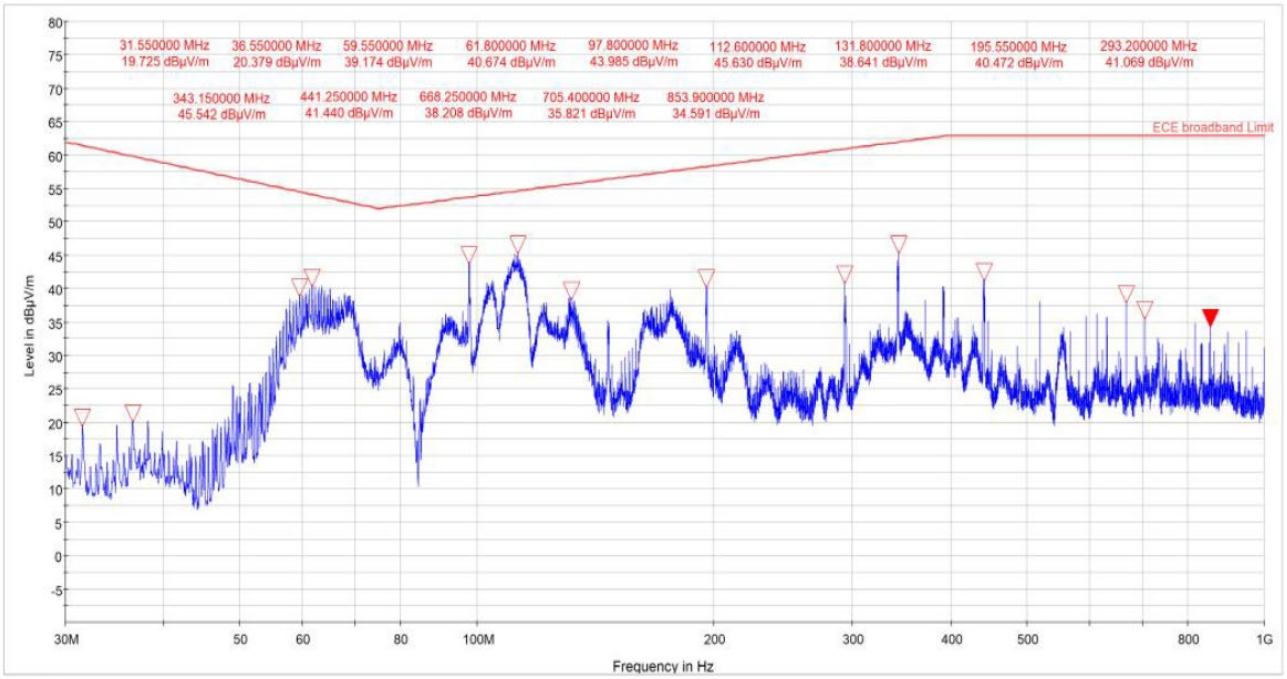


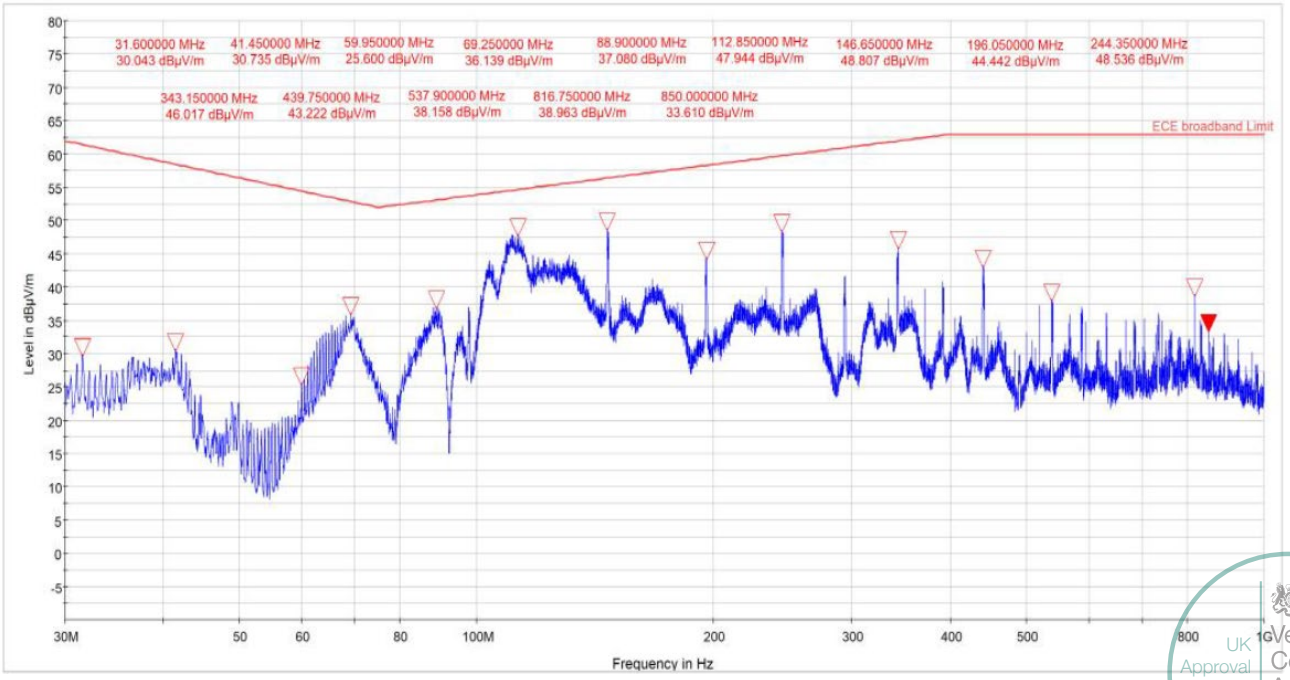


Annex I
Diagrams of BroadBand radiated emissions

Test lab. : DEKRA EMC Test Lab.
Test product : MDSM-22 (Driver Safety Monitoring System)
Test date : 17 October 2022

Horizontal and Vertical antenna polarization_24V Mode



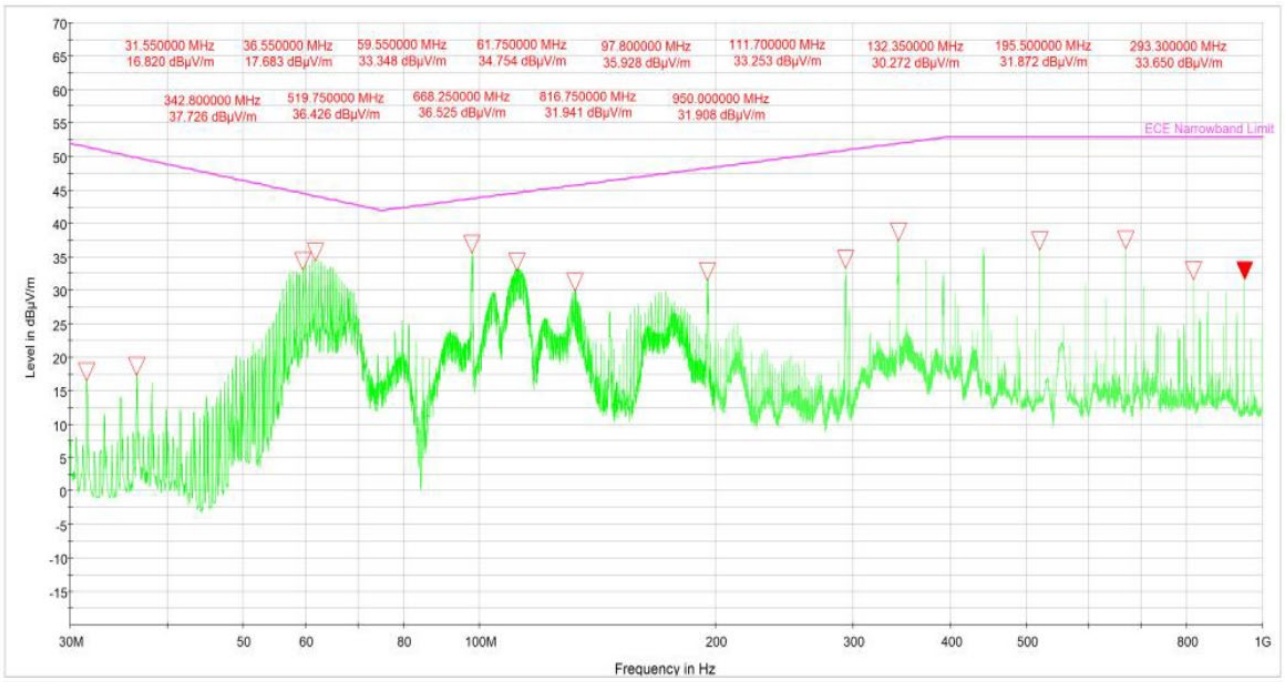


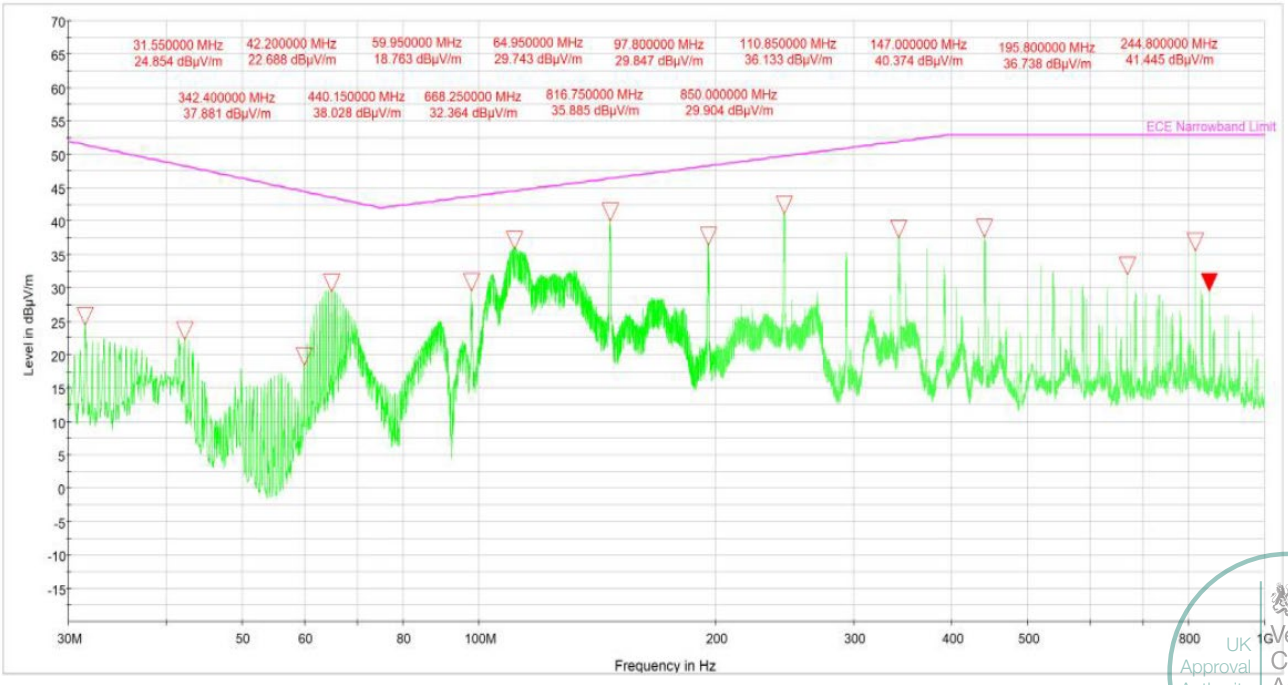
VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk |
www.vehicle-certification-agency.gov.uk |
+44(0) 300 330 5797

Annex I
Diagrams of NarrowBand radiated emissions

Test lab. : DEKRA EMC Test Lab.
Test product : MDSM-22 (Driver Safety Monitoring System)
Test date : 17 October 2022

Horizontal and Vertical antenna polarization_24V Mode





Vehicle Certification Agency

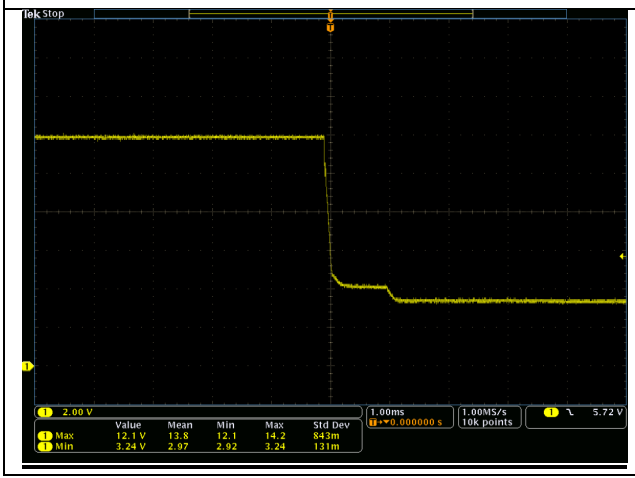
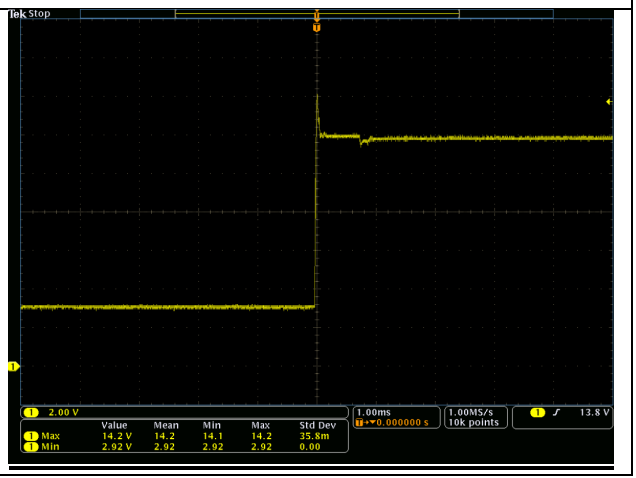
VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk |
www.vehicle-certification-agency.gov.uk |
+44(0) 300 330 5797

Report Number: KSA578361 (11872) Issue: 0

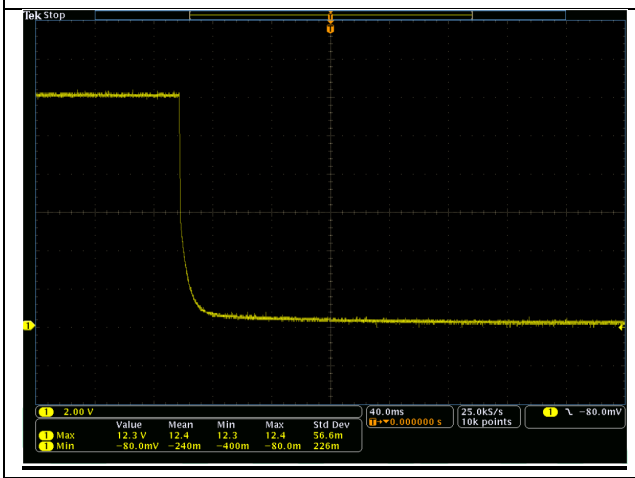
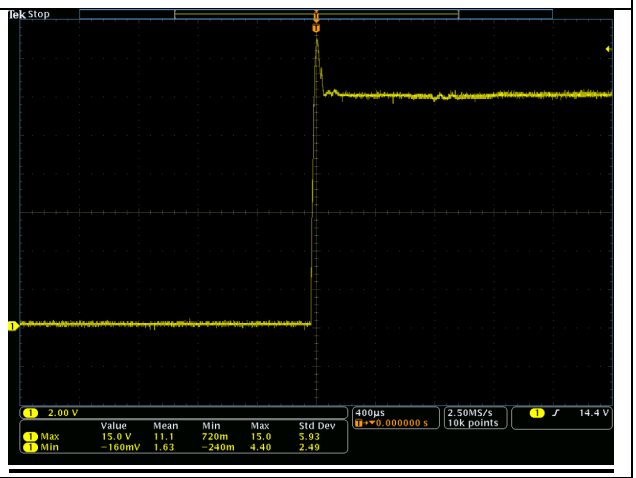
Annex II
ISO 7637-2 test results

Test lab. : DEKRA EMC Test Lab.
Test product : MDSM-22 (Driver Safety Monitoring System)
Test date : 17 October 2022

1. Slow pulse (12V Mode)

On - Off	Off - On
	

2. Fast pulse (12V Mode)

On - Off	Off - On
	

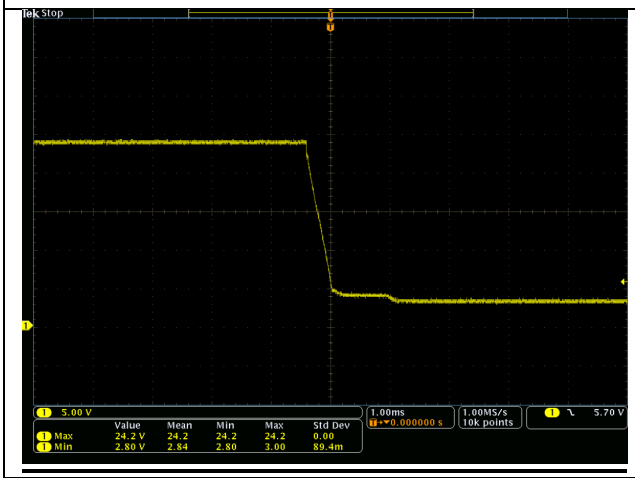
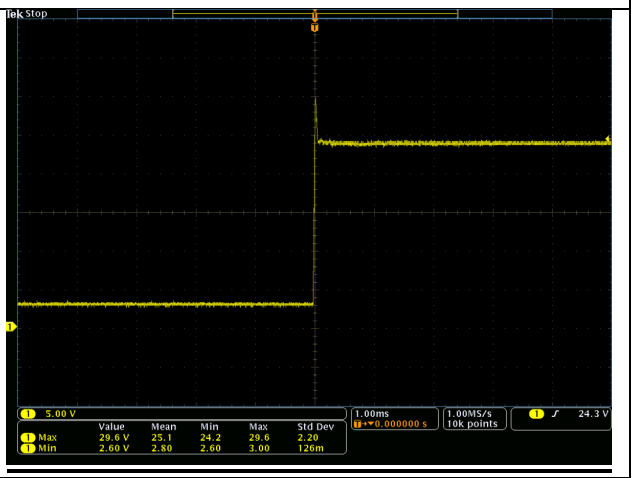
Vehicle Certification Agency

VCA, 1 Eastgate Office Centre,
Eastgate Road, Bristol, BS5 6XX, United Kingdom
enquiries@vca.gov.uk |
www.vehicle-certification-agency.gov.uk |
+44(0) 300 330 5797

Annex II
ISO 7637-2 test results

Test lab. : DEKRA EMC Test Lab.
Test product : MDSM-22 (Driver Safety Monitoring System)
Test date : 17 October 2022

1. Slow pulse (24V Mode)

On - Off	Off - On
	

2. Fast pulse (24V Mode)

On - Off	Off - On