



NSAI

ECE TYPE-APPROVAL CERTIFICATE

E24

Concerning⁽²⁾:

Approval granted
~~Approval extended~~
~~Approval refused~~
~~Approval withdrawn~~
~~Production definitively discontinued~~

of a type of electrical/electronic sub-assembly⁽²⁾ with regard to Regulation No. 10

Approval No: **E24*10R06/03*7176*00**



1. Make (trade name of manufacturer):
2. Type and general commercial description:
RIV1220PU-235
Pure Sine Wave Inverter With Transfer Switch
3. Means of identification of type, if marked on the vehicle/component/separate technical unit⁽²⁾
Approval mark
Printed on a label, stuck on the enclosure, See Drawings
- 3.1 Location of that marking:
4. Category of vehicle:
N/A
5. Name and address of manufacturer:
Enerblok Co., Ltd
98 Huicheng Road, Changan Street, Huishan District, Wuxi City, Jiangsu Province, China
6. In the case of components and separate technical units, location and method of affixing of the approval mark:
Printed on a label, stuck on the enclosure, See Drawings
7. Address(es) of assembly plant(s):
Enerblok Co., Ltd
98 Huicheng Road, Changan Street, Huishan District, Wuxi City, Jiangsu Province, China

⁽¹⁾ Distinguishing number of the country which has granted/extended/refused/withdrawn an approval (see approval provisions in the Regulation).

⁽²⁾ Strike out what does not apply



Approval No: E24*10R06/03*7176*00

8. Additional information (where applicable): *See appendix below*
9. Technical service responsible for carrying out the tests: **CETOC TECHNICAL SERVICE S.R.L.**
Via della Bufalotta, 374
00139 - Roma (RM) Italy
10. Date of test report: *17.07.2025*
11. Number of test report: *CN-112-17-453-COM25-33129-IR*
12. Remarks (if any): *See appendix below*
13. Place: *Dublin*
14. Date: *18th September, 2025*
15. Signature: 
16. The index to the information package lodged with the approval authority, which may be obtained on Request, is attached.
17. Reasons for extension: *N/A*





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Appendix

**Appendix to Type Approval Communication Form No E24*10R06/03*7176*00
Concerning the Type Approval of an Electrical/Electronic Sub-assembly under
UN Regulation No. 10**

1. Additional information
 - 1.1. Electrical system rated voltage: *DC 12 V ~~pos~~/neg ground⁽¹⁾*
 - 1.2. This ESA can be used on any vehicle type with the following restrictions: *See manufacturer's specifications.*
 - 1.2.1 Installation conditions, if any: *See manufacturer's specifications.*
 - 1.3. This ESA can be used only on the following vehicle types: *N/A*
 - 1.3.1 Installation conditions, if any: *N/A*
 - 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):
*Bulk Current Injection Method:
Frequency: (20 – 400 MHz)
Absorber Chamber Test:
Frequency: (400 – 2000 MHz)*
 - 1.5. Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for carrying out the tests: *CETOC TECHNICAL SERVICE S.R.L.*
2. Remarks: *N/A*

⁽¹⁾ Strike out what does not apply



Approval No: **E24*10R06/03*7176*00**

Index to the Information Package

Date of issue:	<i>18th September, 2025</i>
Date of latest amendment:	<i>N/A</i>
Reason for extension/revision:	<i>N/A</i>
1. Additional conditions, and advisory notes on legal alternatives.	
2. Test report(s)	
- numbers(s):	<i>CN-112-17-453-COM25-33129-IR</i>
- date of issue:	<i>17.07.2025</i>
- date of latest amendment:	<i>N/A</i>
3. Information document	
- number(s):	<i>RIV1220PU-235-00</i>
- date of issue:	<i>27.04.2025</i>
- date of latest amendment:	<i>N/A</i>
Documentation:	<i>27 pages</i>



Approval No: E24*10R06/03*7176*00

Appendix: **Additional conditions, and advisory notes on legal alternatives**

A: Additional conditions:

1. The attached technical report, with any of its attachments, forms part of this Type Approval certificate.
2. Each device from series production shall be to the measurements specified in the attached drawings, and shall be manufactured only from the materials specified in the Approval documents.
3. Changes in the type are permitted only with the explicit permission of NSAI. Breaches of this requirement will lead to a withdrawal of the Type Approval, and in addition may be subject to criminal prosecution.
4. At regular intervals, any tests or associated checks prescribed by the applicable legislation to verify continued conformity with the approved type shall be carried out. The manufacturer shall demonstrate compliance with this by submitting to NSAI evidence of adequate arrangements and documented control plans for each type approved.
5. Any set of samples or test pieces showing evidence of non-conformity shall give rise to further sampling and testing and all steps shall be taken to restore conformity of production.
6. This Type Approval will expire when it is surrendered by the holder, or withdrawn by NSAI, or when the approved type no longer conforms to legal requirements. The recall of the Type Approval can be issued by NSAI when the conditions required for the issuing or continuation of the Type Approval are no longer current, or when the Approval holder is in breach of the duties attached to the Type Approval, or when it is established that the approved type no longer meets the requirements of traffic safety.
7. Changes in the company name, address or manufacturing site, as well as in any of the sales or other agents specified in the issuing of the approval must immediately be notified to NSAI.
8. The duties imposed by the issuing of this certificate are not transferable. The legal protection of third parties is not affected by this certificate.
9. When the manufacture or sale of the system, component or separate technical unit has not been started within one year of the date of issue of this certificate, then NSAI is to be informed. This requirement also applies when the manufacture or sale has been halted for more than one year, or when it ought to have been halted for more than one year. The initial commencement of manufacture or sale, or the resumption of manufacture or sale, shall then be notified to NSAI within one month of commencement or resumption.

B: Legal Options:

Any objection to the requirements set out in this certificate shall be made within one month of the date of issue. The objection shall be made, in writing, to NSAI in Dublin.

Electromagnetic Compatibility – ESA

0. Legislation:

0.1. Requirements according to : UNECE Regulation 10.06 to Supplement 3

1. General

1.1. Reason for Inspection Report : New approval / ~~Extension of approval~~ / ~~Test report only~~ / COP
1.2. Manufacturer's Representative(s) : No attendance
1.3. CETOC TS Representative(s) : Xiaoli Li
1.4. Location of Test : GuangZhou ShunTai Quality Technical Service Co., Ltd.
Room 206A, 2F, 4# Plant, No.63 Punan Road, Huangpu District,
Guangzhou, China, 510760
1.5. Date of test : 08/06/2025

2. Manufacturer Details

2.1. Make : 
2.2. Type : RIV1220PU-235
2.3. Variant/Version : N/A
2.4. Commercial Name : Pure Sine Wave inverter With Transfer Switch
2.5. Category : Component
2.6. Name and Address of manufacturer : Enerblok Co., Ltd
98 Huicheng Road, Changan Street, Huishan District, Wuxi City,
Jiangsu Province, China

3. Conclusion:

3.1. Final conclusion of the inspection: : The above mentioned type was tested in accordance with the above mentioned legislation and was found to comply in all respects. This Inspection report relates only to the items tested.

Signature :

Name : Xiaoli Li

Position : Type Approval Engineer

Place and date : Guangzhou, 17/07/2025



Marco Pagliari

Tech. Mgr.

Roma, 17/07/2025

4. List of appendices:

Appendix Nr.	Page Nr.	Subject
Appendix 1	2	: Test report history
Appendix 2	2	: General specification
Appendix 3	4	: Inspection results
Appendix 4	12	: Test results

APPENDIX 1 - TEST REPORT HISTORY

List this report and previous reports, with extension details.

Inspection Report Number	Reason for Extension	Date of Issue
CN-112-17-453-COM25-33129-IR	N/A	17/07/2025

APPENDIX 2 – GENERAL SPECIFICATION

1. **Worst Case Rationale** : Single specification

2. **Significant Interpretations, Alternative Test Methods, New Technologies** : N/A

3. **Summary of test results**

	PASS	FAIL	N/A	COVERED PREVIOUS EXTENSION	See approval/Report Nr.
Radiated Emissions:	☒	☐	☐	☐	
Radiated Immunity:	☒	☐	☐	☐	
BCI Immunity:	☒	☐	☐	☐	
Free Field Immunity:	☒	☐	☐	☐	
150 mm Stripline Immunity:	☐	☐	☒	☐	
800 mm Stripline Immunity:	☐	☐	☒	☐	
Transient Testing:	☒	☐	☐	☐	

4. **Component Specification**

Component Part Number:	RIV1220PU-235
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5. **Facility and Equipment Checks**

- 5.1. Calibration certificates checked and valid, recorded in the following table : Conform
- 5.2. All instruments are equipped with identification label : Yes
- 5.3. Calibration certificates are complete of calibration-chain with detailed information regarding primary used. : Yes
- 5.4. Is the anechoic/semi-anechoic chamber correctly set up in all its electrical/mechanical parts to ensure the validity of the measurements? : Yes

Equipment	Serial / Certificate No.	Calibration due*
ALSE ROOM	CN J202409054254A-0002-G1	17/09/2025
Injection probe	CN 2GB240719117044-0020	04/08/2025
L.I.S.N.	CN 2GB240719117044-0023	04/08/2025
L.I.S.N.	CN 2GB240719117044-0024	04/08/2025
Biconical antenna	CN 1GA240826126734-0001	24/08/2025
Log-periodic antenna	CN 1GA240719117044-0022	08/08/2025
Supply Voltage Change Simulator	CN Q12526510001	19/06/2026
Load dump wave simulator	CN Q12526510002	19/06/2026
Transient pulse disturbance simulator	CN Q12526510003	19/06/2026
Scanning receiver	CN J202412276795-01-0001	22/01/2026
Digital phosphor oscilloscope	CN J202412276795A-0009	08/01/2026

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

APPENDIX 3 – INSPECTION RESULTS

		PASS	FAIL	N/A
Radiated Emissions				
CISPR25, 4.5.	Measuring equipment complies with CISPR 16-1-4 (2010).	☒	☐	☐
Test Location				
Ann 7, 3.1.	Test performed in:	☒	☐	☐
Ann 7, 3.3.	- A.L.S.E (Absorber-lined Shielded Enclosure)* - O.A.T.S (Open Area Test Site)* <i>*Strikethrough, as appropriate.</i>	☒	☐	☐
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.	☐	☐	☒
Ann 7, 3.3.	Measuring equipment is outside 15 m minimum radius circle.	☐	☐	☒
Ann 7, 3.4.	Ambient noise is at least 6 dB below reference limits, in either case.	☒	☐	☐
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.	☒	☐	☐
CISPR25, 6.1.1.	Ground plane is 900 ± 50 mm high and made from 0.5 mm thick copper, brass or galvanised steel.	☒	☐	☐
CISPR25, 6.1.1.	Ground plane is at least 2,000 mm length x 1,000 mm width.	☒	☐	☐
CISPR25, 6.4.2.3.	ESA and harness are supported at 50 ± 5 mm above the ground plane on low relative permittivity material.	☒	☐	☐
CISPR25, 6.4.2.3.	Face of the ESA is within 200 mm ± 10 mm from the edge of the ground plane.	☒	☐	☐
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.	☒	☐	☐
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.	☒	☐	☐
CISPR25, 6.1.2.	Power supply is Artificial Network (AN) rated at 5 Ω/50 μH.	☒	☐	☐
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* <i>*Strikethrough, as appropriate.</i>	☒	☐	☐
CISPR25, 6.1.2.	Case of the ESA is: - Grounded, simulating actual vehicle configuration* - Not grounded, simulating actual vehicle configuration* <i>*Strikethrough, as appropriate.</i>	☒	☐	☐
CISPR25, 6.1.2.	AN is electrically bonded to the ground plane.	☒	☐	☐

Antenna

<i>CISPR25, 6.4.2.6.</i>	Height of the phase centre is 100 ± 10 mm above the ground plane.	☒	☐	☐
<i>CISPR25, 6.4.2.6.</i>	No part of any antenna radiating element is closer than 250 mm to the floor.	☒	☐	☐
<i>CISPR25, 6.4.2.6.</i>	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.	☒	☐	☐
<i>CISPR25, 6.4.2.6.</i>	Phase centre (for biconical) or tip (for log-periodic) is $1,000 \pm 50$ mm from the harness.	☒	☐	☐
<i>CISPR25, 6.4.2.6.</i>	Antenna calibrated for this distance to correct measuring point (phase centre or tip).	☒	☐	☐
<i>CISPR25, 6.4.2.6.</i>	Phase centre of the antenna is in line with the centre of the longitudinal part of the wiring harness.	☒	☐	☐
<i>Ann 7, Ann 8, 4.3.</i>	Pre-test sweep supplied to show compliance throughout frequency range 30 to 1,000 MHz.	☒	☐	☐
<i>Ann 7, Ann 8, 4.3.</i>	Test frequencies chosen from pre-test data.	☒	☐	☐

Narrowband Test Results

<i>Ann 8, 2.</i>	Operational mode of ESA: Normal operation	☒	☐	☐
<i>Ann 8, 4.2.</i>	Detector used and bandwidth: Average, 120kHz	☒	☐	☐
<i>6.6.2.</i>	ESA meets narrowband emissions limits, with both vertical and horizontal polarisations.	☒	☐	☐

Broadband Test Results

<i>Ann 7, 2.</i>	Operational mode of ESA: Normal operation	☒	☐	☐
<i>Ann 7, 4.2.</i>	Detector used and bandwidth: Peak, 120kHz	☒	☐	☐
<i>6.5.2.</i>	ESA meets broadband emissions limits, with both vertical and horizontal polarisations.	☒	☐	☐

Radiated Immunity

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

<i>ISO11452-4</i>	BCI frequency range between 20 and 400 MHz:	☒	☐	☐
<i>ISO11452-2</i>	Free field frequency range between 400 and 2,000 MHz:	☒	☐	☐
<i>ISO11452-3</i>	TEM cell frequency range between 20 and 200 MHz:	☐	☐	☒
<i>ISO11452-5</i>	150 mm stripline frequency range between 20 and 400 MHz:	☐	☐	☒
<i>ISO11452-5</i>	800 mm stripline frequency range between 20 and 2,000 MHz:	☐	☐	☒

Maximum frequency step sizes do not exceed:

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

Test Arrangements (General)

Ann 9, 2.2.	Operational mode of ESA:	☒	☐	☐
	Normal operation			
Ann 9, 2.3.	Extraneous equipment in place during calibration.	☒	☐	☐
Ann 9, 2.4.	Test equipment used is the same as for calibration.	☒	☐	☐
Ann 9, 2.5.	Loads and actuators are as realistic as possible.	☒	☐	☐
Ann 9, 2.5.	Case of ESA is:	☒	☐	☐
	- Grounded, simulating actual vehicle configuration*			
	- Not grounded, simulating actual vehicle configuration*			
	*Strikethrough, as appropriate.			
Ann 9, 3.1.	Test frequency range is 20 to 2,000 MHz.	☒	☐	☐
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 μ s, period 4,600 μ s) in the 800 - 2,000 MHz band.	☒	☐	☐
6.8.2.1.	Pre-test sweep supplied to show compliance throughout frequency range 20 to 2,000 MHz.	☒	☐	☐
Ann 9, 3.2.	Test frequencies chosen from pre-test data.	☒	☐	☐
6.8.2.2.	No degradation of immunity related functions during the tests.	☒	☐	☐

BCI Immunity

ISO11452-4, 5.	Shielded area used:	☒	☐	☐
	Yes			
ISO11452-4, 8.3.2.1.	Forward power used to achieve specified current.	☒	☐	☐

Installation of ESA under Test

Ann 9, 4.3.2.	Current probe located 150 ± 10 mm from ESA connectors.	☒	☐	☐
Ann 9, 4.3.2.	ESA installed:	☒	☐	☐
	- In a vehicle, as per ISO 11451-4*			
	- On a ground plane, as per ISO 11452-4*			
	*Strikethrough, as appropriate.			
ISO11452-4, 7.1.	Ground plane is made from at least 0.5 mm thick copper, brass or galvanised steel.	☒	☐	☐
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.	☒	☐	☐

ISO11452-4, 7.1.	Height of the ground plane is 900 ± 100 mm.	☒	☐	☐
ISO11452-4, 7.1.	Ground plane is bonded to the shielded enclosure, with the straps at a distance no greater than 300 mm apart.	☒	☐	☐
ISO11452-4, 7.2.	<p>- 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)*</p> <p>- ESA locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required, for the positive supply*</p> <p><i>*Strikethrough, as appropriate.</i></p>			
ISO11452-4, 7.2.	Power supply is Artificial Network (AN) rated at $50 \Omega/5 \mu\text{H}$.	☒	☐	☐
ISO11452-4, 7.3.	ESA and harness supported 50 ± 5 mm above ground plane, on low relative permittivity material.	☒	☐	☐
ISO11452-4, 7.3.	Face of the ESA within 100 mm from the edge of the ground plane.	☒	☐	☐
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).	☒	☐	☐
ISO11452-4, 7.4.	Length of test harness is $1,700 + 300$ mm, unless specified.	☒	☐	☐
BCI Test Results				
6.8.2.1.	No malfunction at 60 mA.	☒	☐	☐
Free Field Immunity				
ISO11452-2, 8.3.1.	<p>Test field defined by:</p> <p>- Forward power*</p> <p>- Another parameter, directly related*</p> <p><i>*Strikethrough, as appropriate.</i></p>	☒	☐	☐
ISO11452-2, 8.3.2.	Antenna is at a distance of $1,000 \pm 10$ mm from the reference point.	☒	☐	☐
ISO11452-2, 8.3.2.	Reference point is 150 ± 10 mm above the ground plane.	☒	☐	☐
ISO11452-2, 8.3.2.	Reference point is 100 ± 10 mm from the edge of the ground plane.	☒	☐	☐
ISO11452-2, 8.3.2.	For frequencies from 80 - 1,000 MHz, the reference point is in the centre of the harness.	☒	☐	☐
ISO11452-2, 8.3.2.	For frequencies from 1,000 - 2,000 MHz, the reference point is in line with the ESA.	☒	☐	☐
Test Arrangements				
ISO11452-2, 7.1.	Ground plane is made from at least 0.5 mm thick copper, brass or galvanised steel.	☒	☐	☐
ISO11452-2, 7.1.	Minimum width of the ground plane is 1,000 mm and the minimum length is 2,000 mm.	☒	☐	☐
ISO11452-2, 7.1.	Height of the ground plane is 900 ± 100 mm.	☒	☐	☐

ISO11452-2, 7.1.	Bonding straps are at a distance no greater than 300 mm apart.	☒	☐	☐
ISO11452-2, 7.2.	Power supply is Artificial Network (AN) rated at 50 $\Omega/5 \mu\text{H}$.	☒	☐	☐
ISO11452-2, 7.2.	<div> <div>- 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)*</div> <div>- ESA locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required, for the positive supply*</div> <div>*Strikethrough, as appropriate.</div> </div>			
ISO11452-2, 7.3.	AN mounted directly on the ground plane and cases bonded to the ground plane.	☒	☐	☐
ISO11452-2, 7.3.	ESA and harness supported 50 ± 5 mm above table, on low relative permittivity material.	☒	☐	☐
ISO11452-2, 7.3.	Face of the ESA located 200 ± 10 mm from the edge of the ground plane.	☒	☐	☐
ISO11452-2, 7.4.	Test harness parallel to the front edge of the ground plane.	☒	☐	☐
ISO11452-2, 7.4.	Total length of harness does not exceed 2,000 mm.	☒	☐	☐
ISO11452-2, 7.4.	Actual wiring harness length:	☐	☐	☒
	or Length is $1,500 \pm 75$ mm between ECU and AN.	☒	☐	☐
ISO11452-2, 7.4.	Harness is at a distance of 100 ± 10 mm from the edge of the ground plane.	☒	☐	☐
ISO11452-2, Fig 1	Front face of ESA is at least 1.0 m from all other conductive structures.	☒	☐	☐
ISO11452-2, Fig 1	ESA harness is at least 2.0 m forward from the chamber wall.	☒	☐	☐

Antenna Type(s) and Frequency Range(s)

Ann 9, 4.1.2.	Antenna is vertically polarised.	☒	☐	☐
ISO11452-2, 7.6.	Antenna is in the same position as the calibration.	☒	☐	☐
ISO11452-2, 7.6.	Phase centre is 100 ± 10 mm above the ground plane.	☒	☐	☐
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.	☒	☐	☐
ISO11452-2, 7.6.	Distance between wiring harness and antenna is $1,000 \text{ mm} \pm 10 \text{ mm}$, measured from the phase-centre of the biconical antenna, or the nearest part of the log-periodic and horn antennas.	☒	☐	☐
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.	☒	☐	☐

Free Field Immunity Test Results

6.8.2.	No malfunction at 30 V/m.	☒	☐	☐
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150 mm Stripline Immunity

ISO11452-5, 5.3.1.	Stripline housed in a shielded room.	☐	☐	☒
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ISO11452-5, 6.2.2. Test field defined by: ☐ ☐ ☒

- Forward power*
- Another parameter, directly related*
- *Strikethrough, as appropriate.

ISO11452-5, 6.2.3. Field probe in the centre of stripline.

Installation of ESA under Test

ISO11452-5, 5.3.1. ESA is 200 + 20 - 0 mm from the edge of the active conductor. ☐ ☐ ☒

ISO11452-5, 5.3.1. Peripherals are a minimum of 200 mm from the edge of the active conductor. ☐ ☐ ☒

ISO11452-5, 5.3.1. Harness supported 50 mm above the ground plane and is placed in the centre of the stripline. ☐ ☐ ☒

ISO11452-5, 5.3.1. Actual wiring harness length: N/A m ☐ ☐ ☒
or
Minimum length under stripline is 1,000 mm. ☐ ☐ ☒

ISO11452-5, 5.3.1. All wires in the harness are terminated or open, according to the vehicle application. ☐ ☐ ☒

ISO11452-5, 5.3.1. Device and peripherals connected to the ground plane, as specified by the vehicle installation. ☐ ☐ ☒

ISO11452-5, 5.3.1. Power supply is Artificial Network (AN) rated at 50 Ω/5 μH. ☐ ☐ ☒

ISO11452-5, 5.3.1.

- 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.

150 mm Stripline Test Results

6.8.2. No malfunction at 50 V/m. ☐ ☐ ☒

800 mm Stripline Immunity

Ann 9, 4.5.2.1. Stripline housed in a screened room. ☐ ☐ ☒

Ann 9, 4.5.2.1. Stripline positioned a minimum of 2,000 mm from the walls or metallic enclosure. ☐ ☐ ☒

Ann 9, 4.5.2.1. Stripline placed on non-conducting supports at least 400 mm above the floor. ☐ ☐ ☒

Ann 9, 4.5.2.2. Field probe positioned within the central one-third of the longitudinal, vertical and transverse dimensions of the space between the parallel plates, with the system under test absent. ☐ ☐ ☒

Ann 9, 4.5.2.2. Test field defined by: ☐ ☐ ☒

- Forward power*
- Another parameter, directly related*
- *Strikethrough, as appropriate.

Installation of ESA under Test

Ann 9, 4.5.2.3.	ESA is within the central one-third of the stripline.	☐	☐	☒
Ann 9, 4.5.2.3.	ESA is supported on non-conducting material.	☐	☐	☒
Ann 9, 4.5.2.4.	Wiring loom is arranged as per Appendix 1, Figure 3.	☐	☐	☒
Ann 9, 4.5.2.4.	Associated equipment is a minimum of 1,000 mm from stripline.	☐	☐	☒

800 mm Stripline Test Results

Frequency Suggested (MHz)	Frequency (MHz)	Forward Power		Output Level		Field Strength (V/m)
		Cal. (w)	Test (w)	Cal. (dBm)	Test (dBm)	
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A

6.8.2.	No malfunction at 15 V/m.	☐	☐	☒
--------	---------------------------	--------------------------	--------------------------	-------------------------------------

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).	☒	☐	☐
Ann 10, 2.	Supply lines and other lines, which may be connected to supply lines, are tested.	☒	☐	☐
	Test voltage and time parameters are within allowed envelopes.	☒	☐	☐
	Test pulses and duration according to the following:	☒	☐	☐

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

ESA operational after the tests, according to the above classification.	☒	☐	☐
---	-------------------------------------	--------------------------	--------------------------

Emission of Conducted Disturbances

6.9.1.	Test set up according to ISO 7637-2.	☒	☐	☐
Ann 10, 3.	Supply lines and other lines, which may be connected to supply lines, are tested.	☒	☐	☐
	Slow pulses and fast pulses tested on both powering up and powering down.	☒	☐	☐

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

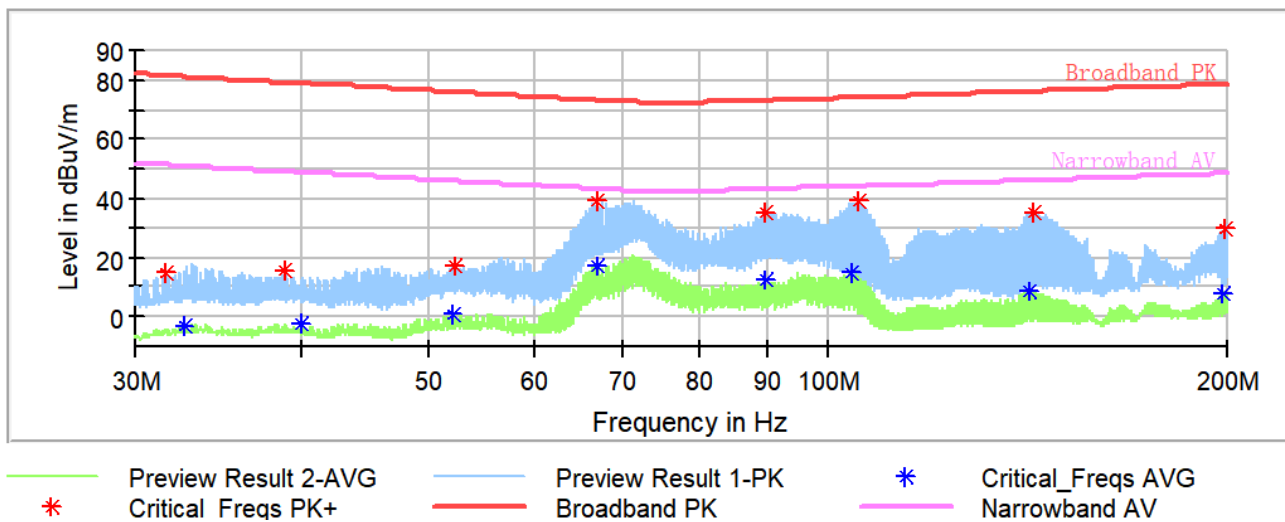
Note: CETOC TS apply measurement uncertainty to calibrated items but not test results.

APPENDIX 4 – TEST RESULTS

APPENDIX 4.1 Radiated Emissions

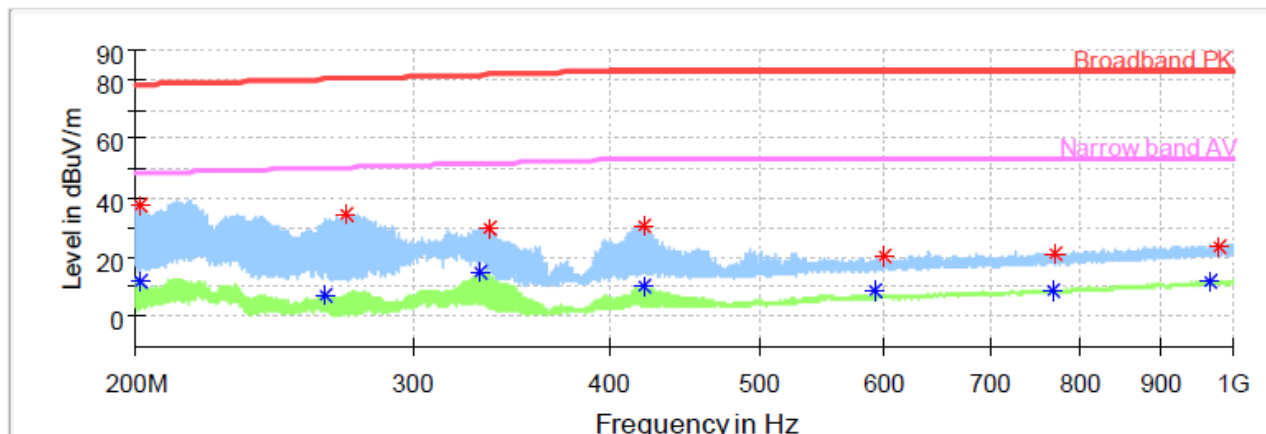
Vehicles with 12V systems

Horizontal Polarisation
30MHz to 1GHz



Test Date

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB/m)
31.650000	14.78	---	81.42	66.64	5.0	120.000	H	-14.8
32.600000	---	-2.98	51.09	54.07	5.0	120.000	H	-14.8
38.950000	15.69	---	79.15	63.46	5.0	120.000	H	-15.0
39.950000	---	-2.28	48.87	51.15	5.0	120.000	H	-15.0
52.150000	---	0.87	45.97	45.10	5.0	120.000	H	-15.9
52.300000	17.44	---	75.93	58.49	5.0	120.000	H	-15.9
66.900000	---	17.43	43.25	25.82	5.0	120.000	H	-17.4
66.900000	38.95	---	73.25	34.30	5.0	120.000	H	-17.4
89.550000	35.19	---	73.17	37.98	5.0	120.000	H	-16.1
89.550000	---	12.61	43.17	30.56	5.0	120.000	H	-16.1
104.050000	---	14.94	44.15	29.21	5.0	120.000	H	-15.5
105.550000	39.46	---	74.25	34.79	5.0	120.000	H	-15.5
141.800000	---	8.89	46.19	37.30	5.0	120.000	H	-13.0
142.650000	35.41	---	76.23	40.81	5.0	120.000	H	-13.0
198.450000	---	7.71	48.39	40.68	5.0	120.000	H	-10.0
198.950000	30.04	---	78.41	48.37	5.0	120.000	H	-9.9

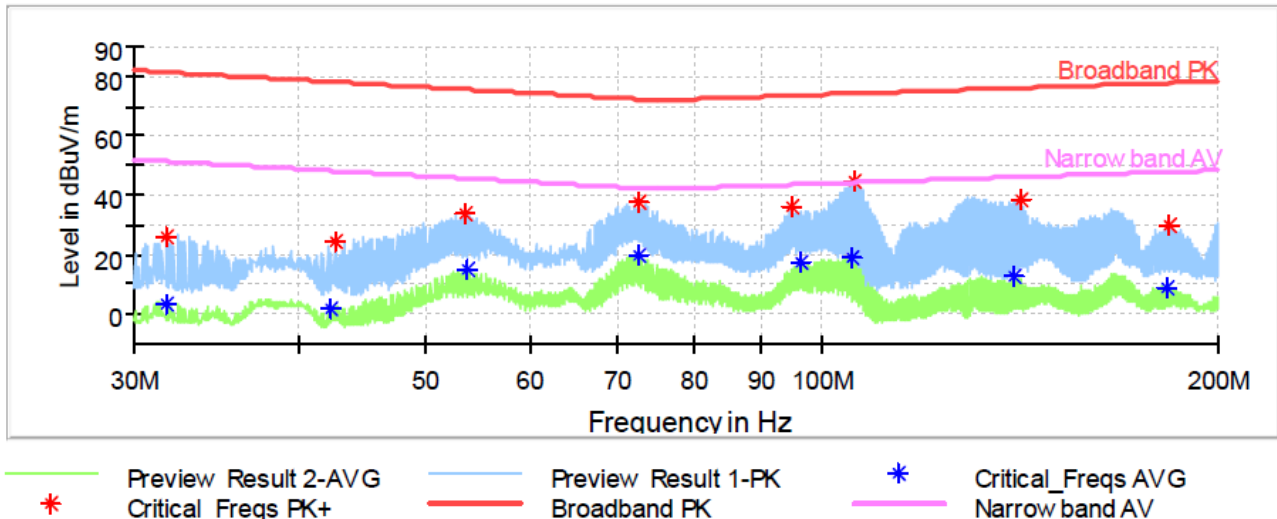


* Preview Result 2-AVG Critical Freqs PK+
 — Preview Result 1-PK
 * Critical_Freqs AVG
 — Broadband PK
 — Broadband PK

Test Date

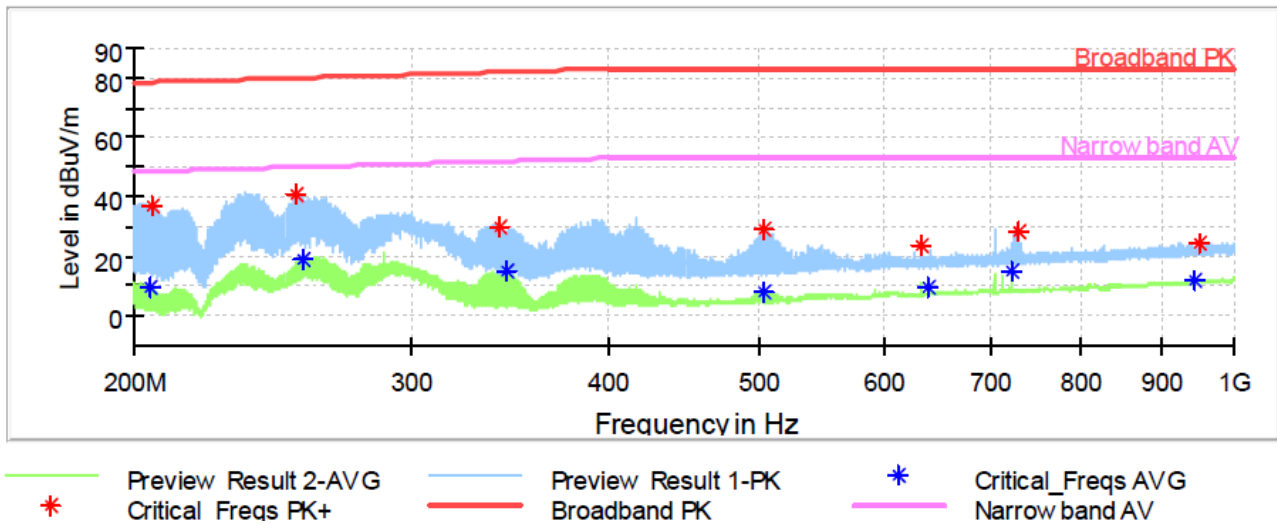
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB/m)
201.050000	---	12.19	48.48	36.29	5.0	120.000	H	-12.2
201.200000	37.86	---	78.49	40.62	5.0	120.000	H	-12.2
263.700000	---	7.39	50.26	42.87	5.0	120.000	H	-10.2
272.150000	34.36	---	80.47	46.11	5.0	120.000	H	-10.0
331.350000	---	14.91	51.76	36.85	5.0	120.000	H	-8.2
335.550000	29.88	---	81.85	51.97	5.0	120.000	H	-8.1
421.200000	---	10.50	53.00	42.50	5.0	120.000	H	-5.8
421.200000	30.94	---	83.00	52.06	5.0	120.000	H	-5.8
592.050000	---	8.64	53.00	44.36	5.0	120.000	H	-2.5
599.100000	20.40	---	83.00	62.60	5.0	120.000	H	-2.2
766.650000	---	8.96	53.00	44.04	5.0	120.000	H	-0.5
769.200000	21.18	---	83.00	61.82	5.0	120.000	H	-0.5
965.700000	---	11.82	53.00	41.18	5.0	120.000	H	1.5
978.250000	23.95	---	83.00	59.05	5.0	120.000	H	1.6

Vertical Polarisation
30MHz to 1GHz



Test Date

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB/m)
31.750000	25.62	---	81.38	55.76	5.0	120.000	V	-14.8
31.750000	---	3.23	51.38	48.15	5.0	120.000	V	-14.8
42.400000	---	1.69	48.22	46.53	5.0	120.000	V	-15.0
42.750000	24.61	---	78.14	53.52	5.0	120.000	V	-15.0
53.500000	33.45	---	75.69	42.24	5.0	120.000	V	-15.8
53.850000	---	14.83	45.62	30.79	5.0	120.000	V	-15.8
72.500000	---	19.37	42.37	23.00	5.0	120.000	V	-17.2
72.500000	37.74	---	72.37	34.63	5.0	120.000	V	-17.2
94.750000	35.81	---	73.54	37.73	5.0	120.000	V	-16.0
96.600000	---	17.16	43.66	26.50	5.0	120.000	V	-15.8
105.300000	---	19.21	44.23	25.02	5.0	120.000	V	-15.6
105.950000	44.85	---	74.27	29.42	5.0	120.000	V	-15.4
139.800000	---	12.73	46.09	33.36	5.0	120.000	V	-13.1
141.450000	38.35	---	76.17	37.82	5.0	120.000	V	-13.0
182.750000	---	9.03	47.85	38.82	5.0	120.000	V	-10.7
183.900000	29.91	---	77.89	47.98	5.0	120.000	V	-10.6



Test Date

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB/m)
204.550000	---	9.43	48.59	39.16	5.0	120.000	V	-12.0
205.200000	37.19	---	78.61	41.42	5.0	120.000	V	-12.0
253.950000	40.51	---	80.02	39.50	5.0	120.000	V	-10.6
255.750000	---	19.27	50.06	30.79	5.0	120.000	V	-10.5
341.500000	29.95	---	81.96	52.01	5.0	120.000	V	-8.1
345.000000	---	14.61	52.03	37.42	5.0	120.000	V	-8.0
502.500000	---	8.27	53.00	44.73	5.0	120.000	V	-4.2
503.500000	29.01	---	83.00	53.99	5.0	120.000	V	-4.2
633.850000	23.94	---	83.00	59.06	5.0	120.000	V	-1.8
640.350000	---	9.86	53.00	43.14	5.0	120.000	V	-1.5
721.900000	---	14.91	53.00	38.09	5.0	120.000	V	-0.8
728.600000	28.22	---	83.00	54.78	5.0	120.000	V	-0.8
943.200000	---	11.67	53.00	41.33	5.0	120.000	V	1.2
952.000000	24.60	---	83.00	58.40	5.0	120.000	V	1.4

APPENDIX 4.2 Radiated Immunity

Frequency (MHz)	Level (V/m)	Modulation	Polarity	Accept Status	Test Result	
					Vehicles with 12V systems	Vehicles with 24V systems
400-800	30	AM (1kHz,80%)	V	I	A	N/A
800-1000	30	PM	V	I	A	N/A
1000-2000	30	PM	V	I	A	N/A

APPENDIX 4.3 BCI Immunity

Frequency (MHz)	Level (mA)	Modulation	Injection place	Test Result	
				Vehicles with 12V systems	Vehicles with 24V systems
20-400	60	AM (1kHz,80%)	150mm	A	N/A

APPENDIX 4.4 Transient Immunity

Test Pulse	Immunity Test Level	Functional Status for Systems		Test results	
		Related to Immunity-related Functions	Not Related to Immunity-related Functions	Vehicles with 12V systems	Vehicles with 24V systems
1	III	C	⊘	C	N/A
2a	III	B	⊘	A	N/A
2b	III	C	⊘	C	N/A
3a	III	A	⊘	A	N/A
3b	III	A	⊘	A	N/A
4	III	C	⊘	C	N/A

APPENDIX 4.5 Emission of Conducted Disturbances

Vehicles with 12V systems

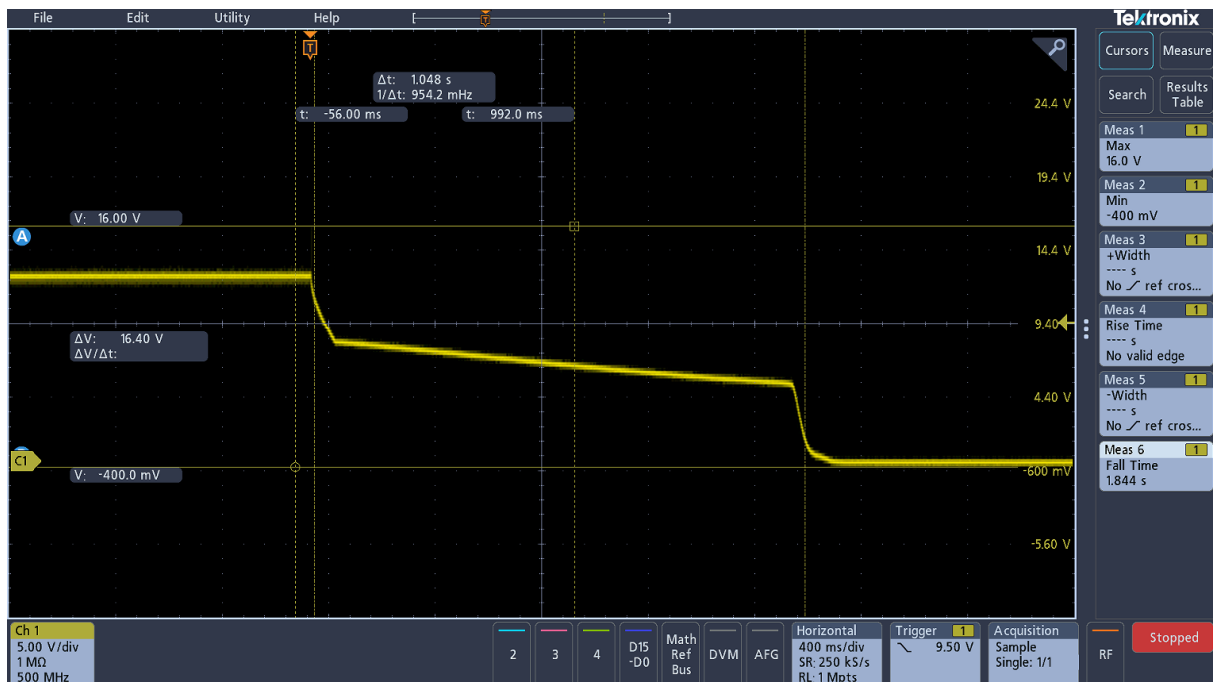
Test results:

Switch Configuration	Connection Disconnection Permanent	Vmax (V)	Vmin (V)	Maximum allowed pulse amplitude	Result
Slow	Switch on	14.4	0.4	+75 V -100 V	PASS/ FAIL
	Switch off	16.0	0.4		PASS/ FAIL
Fast	Switch on	14.2	0.4	+75 V -100 V	PASS/ FAIL
	Switch off	14.6	0.4		PASS/ FAIL

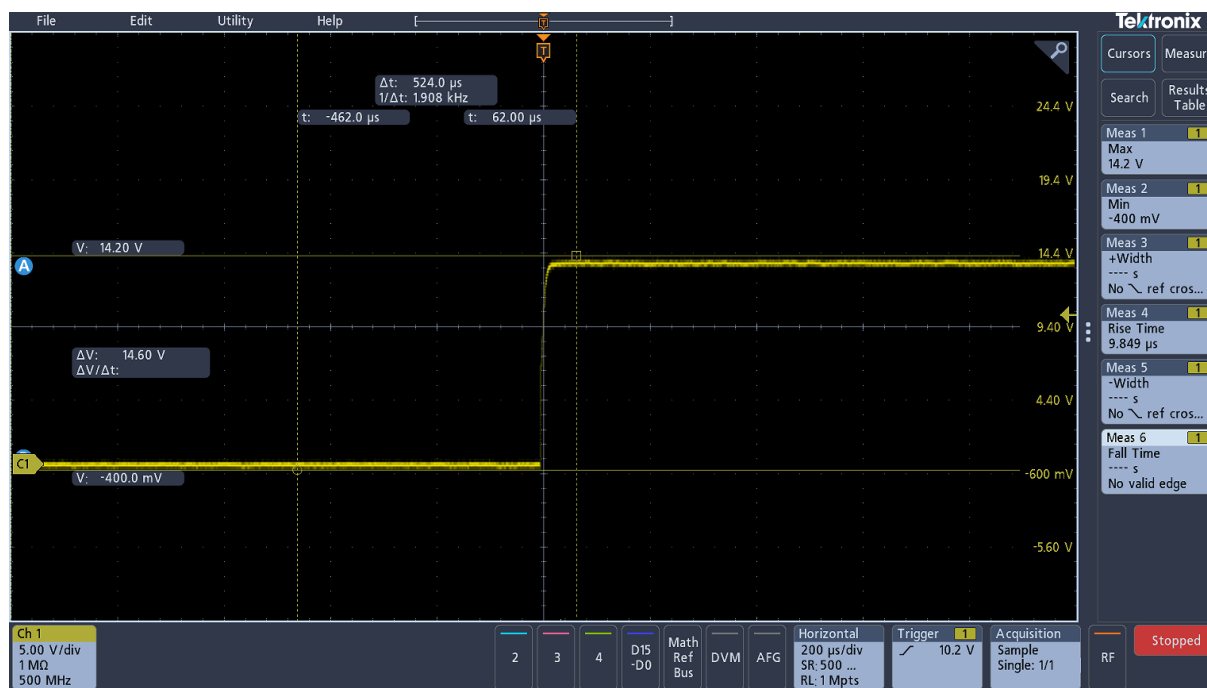
Slow Pulse: OFF-->ON Data Graph



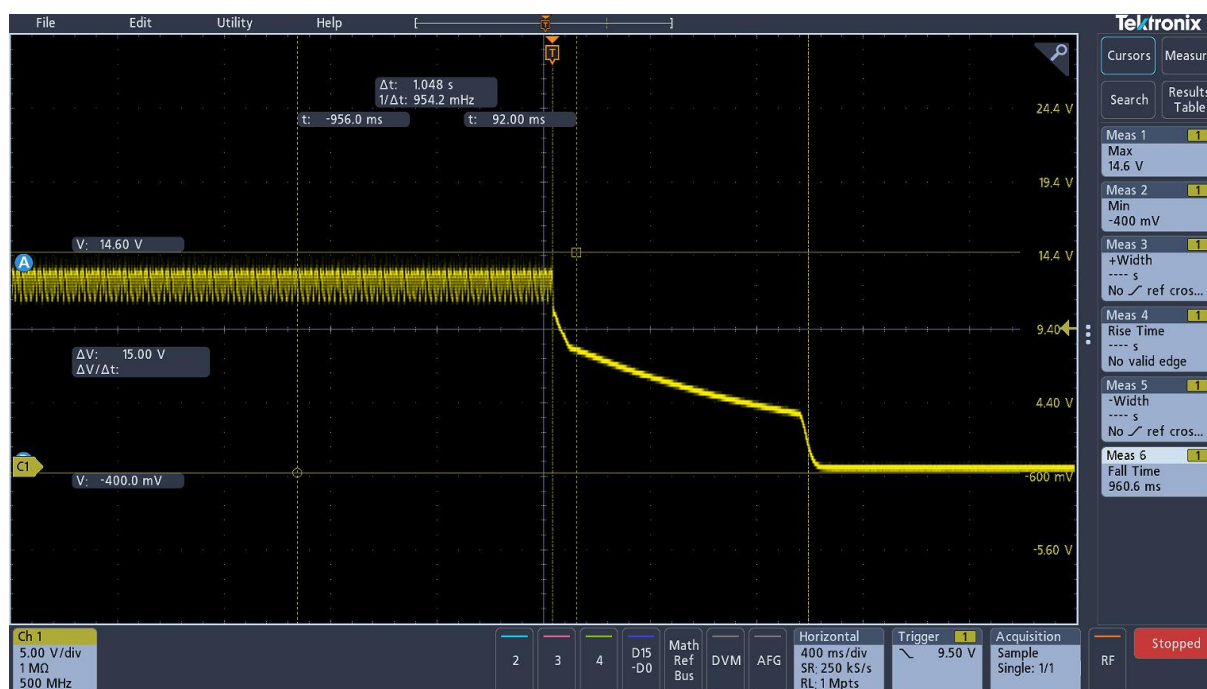
Slow Pulse: ON-->OFF Data Graph



Fast Pulse: OFF-->ON Data Graph



Fast Pulse: ON-->OFF Data Graph



**Information document no. RIV1220PU-235-00 relating to type-approval of an
electronic subassembly with respect to electromagnetic compatibility
(ECE Regulation 10.06 to Supplement 3)**

Type : RIV1220PU-235
Manufacturer : Enerblok Co., Ltd
Date : 27/04/2025

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2	Index
3	General
5	Drawings of the ESA
6	Electronic block diagram
8	List of components constituting the ESA

GENERAL

1. Make (trade name of manufacturer):



2. Type: **RIV1220PU-235**

General commercial description(s):
Pure Sine Wave Inverter With Transfer Switch

3. Means of identification of type, if marked on the component/separate technical unit:
Approval mark

- 3.1 Location of that marking:
Printed on a label, stuck on the enclosure, See Drawings of the ESA.

4. Name and address of manufacturer:
Enerblok Co., Ltd
98 Huicheng Road, Changan Street, Huishan District, Wuxi City, Jiangsu Province, China

Name and address of authorised representative, if any: **N/A**

5. In the case of components and separate technical units, location and method of affixing of the approval mark:
Printed on a label, stuck on the enclosure, See Drawings of the ESA.

6. Address(es) of assembly plant(s):
Enerblok Co., Ltd
98 Huicheng Road, Changan Street, Huishan District, Wuxi City, Jiangsu Province, China

7. This ESA shall be approved as a component.

8. Any restrictions of use and conditions for fitting:
N/A

9. Electrical system rated voltage:
DC 12 V, negative ground.

Appendix 1: Description of the ESA chosen to represent the type (electronic block diagram and list of main component constituting the ESA (e.g. make and type of microprocessor, crystal, etc.).
See electronic block diagram and list of main component constituting the ESA for details.

Appendix 2: Relevant test report(s) supplied by the manufacturer from a test laboratory accredited to ISO 17025 and recognized by the Type Approval Authority for the purpose of drawing up the type approval certificate.

N/A

Only applicable for charging systems: **N/A**

10. Charger:

N/A

11. Charging current:

N/A

12. Maximal nominal current (in each mode if necessary):

N/A

13. Nominal charging voltage:

N/A

14. Basic ESA interface functions:

N/A

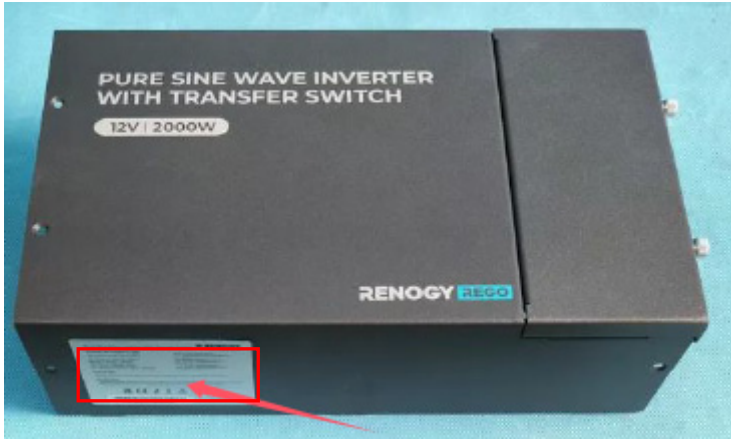
15. Minimum R_{Sce} value (see paragraph 7.11. of this Regulation):

N/A

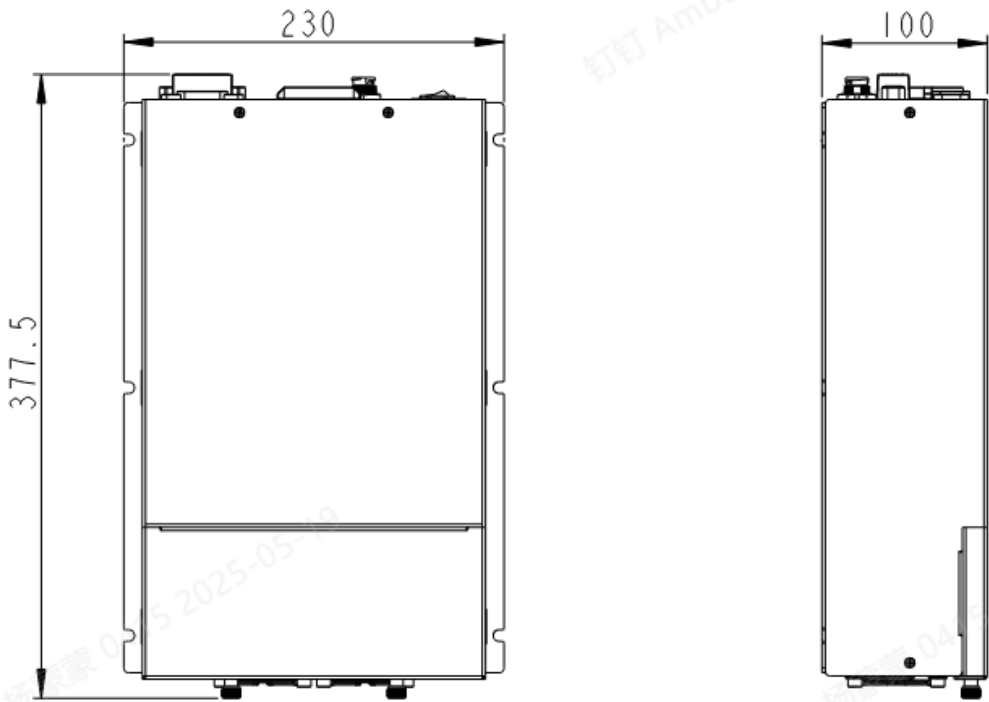
Drawings of the ESA

Location of the ECE approval mark

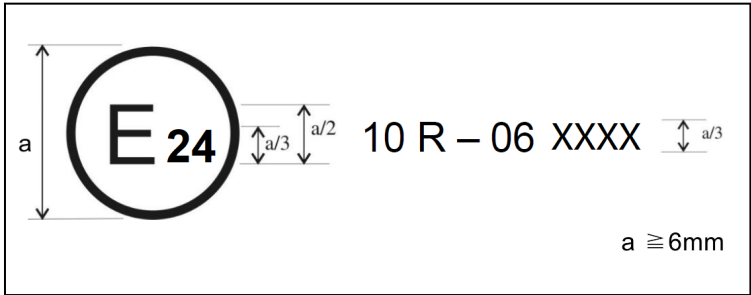
Unit:mm

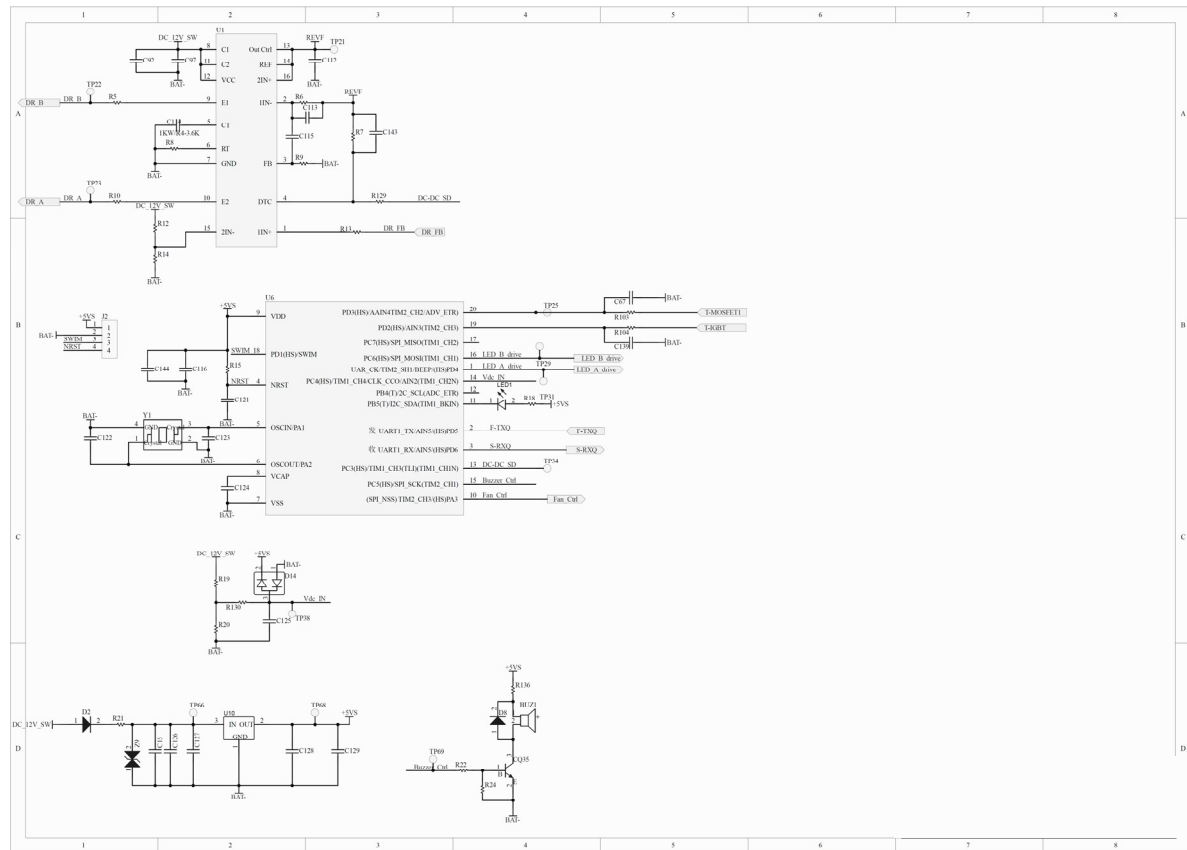


Position of approval mark



Example of approval mark





List of main component constituting the ESA

Name	Part name	Specification	Qty.
Varistor	621KD20	385VAC, -40°C~+105°C	3
Y-CAPACITORS	MKP63	4.7nF, 300Vac, Y2, -40°C~110°C	2
Y-CAPACITORS	MKP63	2.2nF, 300Vac, Y2, -40°C~110°C	2
Y-CAPACITORS	MKP63	10nF, 300Vac, Y2, -40°C~110°C	4
X-CAPACITORS	MKP61	2.2uF, 305Vac, X2, -40°C~110°C	1
RELAY	HF140FF-u-vwoWyzq(456)p	250VAC, 16 ^a , -40°C~85°C	1
Second source	793-P-X1-X2-X3 series	250VAC, 16 ^a , -40°C~70°C	2
RELAY	835 Serie(s)	250VAC, 10 ^a , 85°C	1
DC FAN	DFx1x2x3yz	DC 12V,260mA, 6000RPM, 32.7CFM, 70°C	2
AC OUTPUT CONNECTOR	KF55 series	300VAC, 30 ^a , -40°C~105°C	1
PHOTO COUPLER	LTV-816	DTI≥0.4mm, external Cl.=Cr≥7mm, -55°C~110°C	3
Second source	EL817	Dti. ≥ 0.4mm, Cl.=Cr. ≥ 7.6mm, -55°C~110°C	3
485 ISOLATOR	CA-IS308(0;2;6;8;9)(C)W(N)X	CLR≥8mm, 125°C	1
Second source	NSI83085E-DSWR	CLR≥8mm, 105°C	1
AC OUTPUT CONNECTOR	LC-D01	16 ^a , 250VAC	1
Second source	LC-E01	13 ^a , 250VAC	1
AC INPUT CONNECTOR	DB-14-Serie(s)	10 ^a , 250VAC	1
Switch	RS601H Serie(s)	250Vac, 6.0A	1
Plug	YG-102	16 ^a , 250VAC	1
Second source	UBL 8008	13 ^a , 250VAC	1
Power cord	H05VV-F	3G0.75mm ²	1
Appliance couplers	YG-11	10 ^a , 250VAC	1