TEST REPORT
Nr. R23172201

Federal Communication Commission (FCC)

Report Reference No. .....:	R23172201
Date of issue: .....:	16.05.2024
Total number pages: .....:	14
Customer name .....:	Elca S.r.l.
Address .....:	Via del Commercio, 7/B – 36065 Mussolente (VI) – Italy
Test specification:	
Standard(s) .....:	KDB 447498 D01 General RF Exposure Guidance v06
Non-standard test method .....:	N/A
Test Report Form No. .....:	15-247_HoppingDEKRA
Test Report Form(s) Originator ...:	DEKRA Testing and Certification S.r.l.
Master TRF .....:	2024-05

General disclaimer:

The test results presented in this report relate only to the object tested.
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(*) Test item description .....:	Transceiver unit
(*) Trademark .....:	Elca
(*) Manufacturer .....:	Elca S.r.l.
(*) Model / Type reference .....:	AR E29-MINI
(*) FCC ID .....:	2ABS7-ARE29MINI
(*) Rating(s) .....:	12-30 Vdc

Report

Tested by (name + signature) .....:	G. Gandini	.....
Approved by (name + signature) .....:	F. Marenda	.....

(*) information provided by the customer

1 Summary

2 Reference standard(s)	
KDB 447498 D01 General RF Exposure Guidance v06	RF exposure procedures and equipment authorization policies for mobile and portable devices
3 List of attachments	
Attachment 1: Measurement uncertainty, judgement of compliance and quality manual references	
4 Deviation(s) from test specification	
None	
5 Testing location	
DEKRA Testing and Certification S.r.l. Via della Fisica, 20 – 36016 Thiene (VI) – Italy Test site facility's FCC registration number: 182474	

Revision index	***Date***	***Change history***
1.0	16.05.2024	--

Testing and sampling:	
Date of receipt of test item .....:	27.09.2023
Testing start date .....:	16.05.2024
Testing end date .....:	16.05.2024
Sampling procedure .....:	Sample used for testing chosen by the customer; DEKRA Testing and Certification S.r.l. cannot be considered responsible for the selection of the sample
Internal identification .....:	Adhesive label with the product number P230851
General remarks:	
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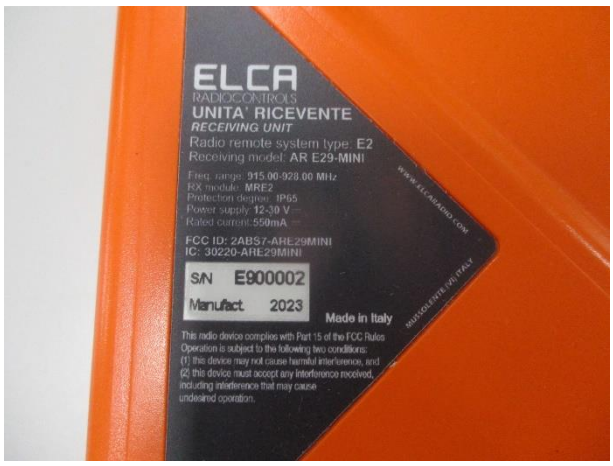
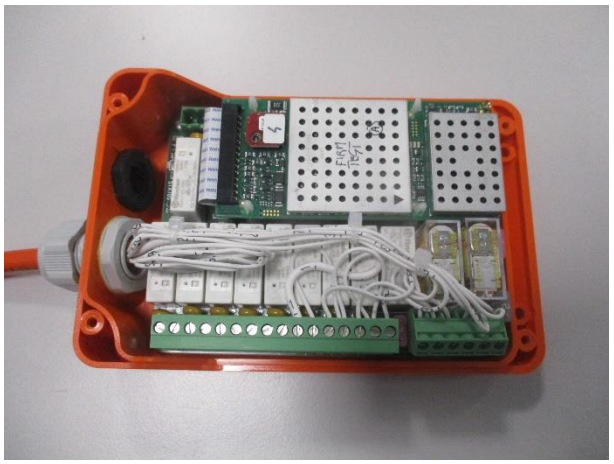
Possible test case verdicts:	
Test case does not apply to the test object:	N/A (Not Applicable)
Test object meets the requirement:	P (Pass)
Test object does not meet the requirement:	F (Fail)
Test object was not evaluated for the requirement:	N/E (Not Executed)
Definition of symbols used in this test report:	
☒ Indicates that the listed condition, standard or equipment is applicable for this report. ☐ Indicates that the listed condition, standard or equipment is not applicable for this report.	

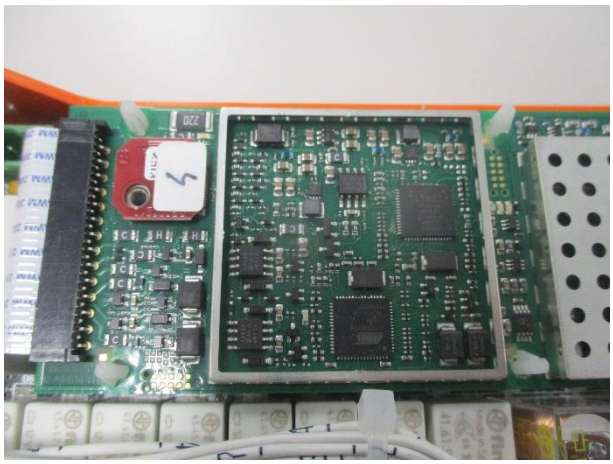
6 General description of test item(s)

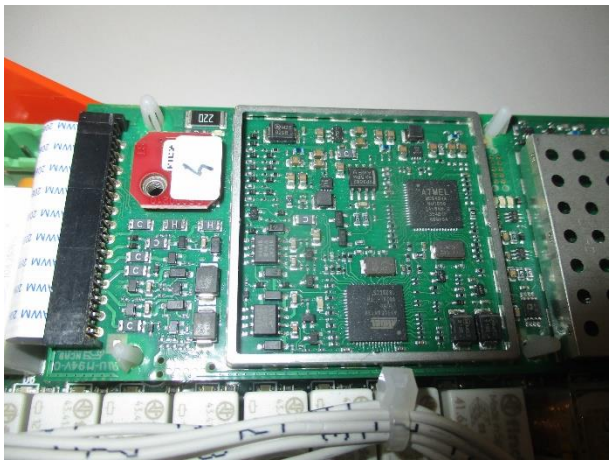
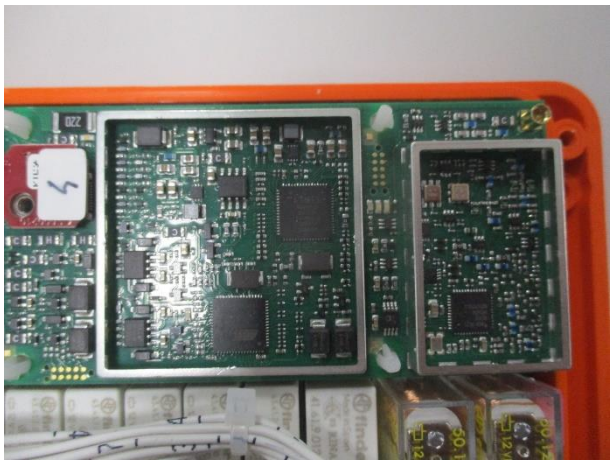
Description ..... :	Transceiver unit						
Model Number ..... :	AR E29-MINI						
FCC ID ..... :	2ABS7-ARE29MINI						
Serial Number ..... :	E900002						
Brand name ..... :	Elca						
Frequency band ..... :	902 – 928 MHz						
Nominal frequencies ..... :	F_L: 915,05 MHz	F_M: 921,40 MHz	F_H: 927,80 MHz				
Test power supply ..... :		Voltage and Frequency	Reference poles				
			N	L1	L2	L3	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 30 V					☐
Type of equipment ..... :	☑ Transmitter unit ☑ Receiver unit						
Type of station ..... :	❑ Portable station ☑ Mobile station						
Test arrangements of EUT ..... :	*Intended operational arrangement(s) of EUT*		*Test arrangement (see basic standard)*				
	❑ Table-top only		Table-top				
	❑ Floor-standing only		Floor-standing				
	❑ Can be floor-standing or table-top		Table-top				
	❑ Rack mounted		In rack or table-top				
	☑ Other, for example wall mounted, ceiling mounted, handheld, body worn		Table-top				
Operating modes ..... :	No.	Operating mode of test item					
	1	EUT in continuous transmission at maximum power					
Declination of responsibility ..... :	Information relating to the description of the sample, components list, and software/hardware version (if reported) are provided by the customer. DEKRA Testing and Certification S.r.l. cannot be considered responsible for this information, for any other document sent by the customer and for any difference between the software version present in the tested sample and that present in the object intended for final sale. In some cases, the software in the tested sample is in a version dedicated exclusively to the test, and therefore does not represent the software installed in the final version of the product.						

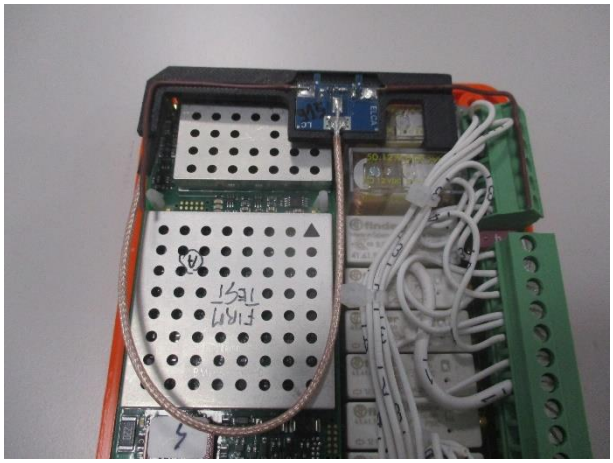
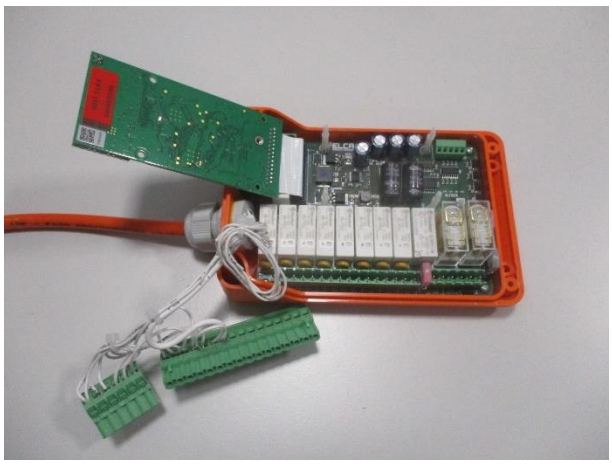
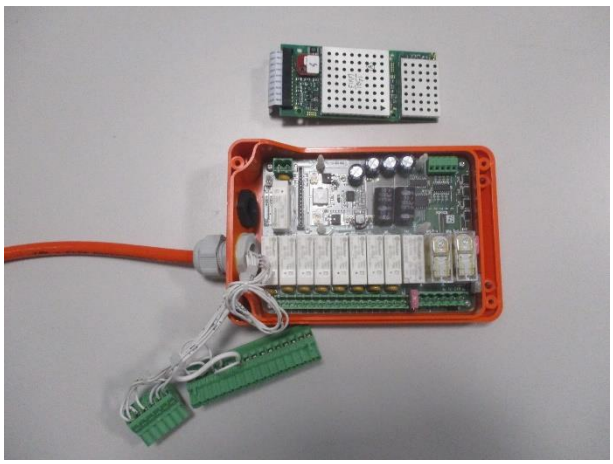
6.1 Photos of the test item

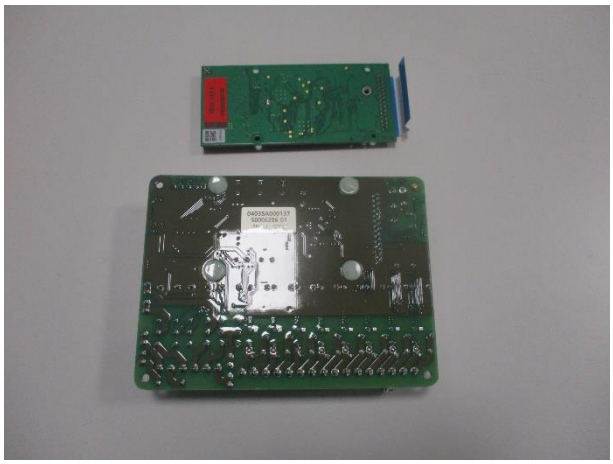








7 Verdict summary section

KDB 447498 D01 General RF Exposure Guidance v06			
Clause	**Requirement – Test case**	**Basic standard**	**Verdict**
7.1	RF Exposure Analysis	--	**P**

8 Test conditions

8.1 General

<table>
<tr><td>Environmental reference conditions.....:</td><td>The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.
The climatic conditions during the tests were within the following limits:
<table>
<tr><th>Temperature</th><th>Humidity</th><th>Atmospheric pressure</th></tr>
<tr><td>15 °C – 35 °C</td><td>30 % - 60 %</td><td>800 hPa – 1060 hPa</td></tr>
</table>
If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.
Environmental conditions have been monitored with the following instrument.
<table>
<tr><th>Id. Number</th><th>Manufacturer</th><th>Model</th><th>Serial number</th><th>Description</th><th>Last calibration date</th><th>Calibration expiration</th></tr>
<tr><td>CMC S302</td><td>Testo</td><td>175H1</td><td>40370182 610</td><td>Data Logger</td><td>May 2023</td><td>May 2024</td></tr>
</table>
</td></tr>
<tr><td>Measurement uncertainties .....:</td><td>Attachment 1</td></tr>
</table>

9 Test results

9.1 RF Exposure Analysis

Tested by .....:	G. Gandini
Test date .....:	16.05.2024
Test location (stand) .....:	Laboratory
Reference standards.....:	KDB 447498 D01 cl. 4 ANSI C63.10
Supplementary information.....:	--

Acceptance limits
For mobile devices operating at frequency f between 300 kHz and 6 GHz the power density limit at 20 cm is f(MHz)/1500 mW/cm^2 according to FCC Part 1.1310(e)(1) Table 1

Result

Transmission channel (MHz)	*Peak Output Power (dBm)*	*Peak Output Power (mW)*	*Power Density at 20 cm (mW/cm^2)*	*Power Density Limit (mW/cm^2)*
915,05	16,60	45,71	0,010	0,610
921,40	16,42	43,85	0,009	0,614
927,80	16,27	42,36	0,009	0,619

Remarks: Power Density = (P x G) / (4πR^2)
Where:
P = the power in mW
G = the numeric gain of the transmitting antenna: 1,047 (0,2 dBi)
R = the reference distance (20 cm)

Attachment 1

Measurement uncertainty

Test	*Test Setup*	*Expanded uncertainty*				*Note*
Conducted emission CISPR 16 LISN 50uH 0,009-0,0150 MHz	PE001_01			3,6	dB	1
Conducted emission CISPR 16 LISN 50uH 0,150-30,0 MHz	PE001_01			2,9	dB	1
Conducted emission CISPR 16 Voltage Probe 0,15-30 MHz	PE001_02			2,3	dB	1
Conducted emission CISPR 16 Current Probe 0,15-30 MHz	PE001_03			2,5	dB	1
Conducted emission CISPR 16 ISN 0,15-30 MHz	PE001_04			4,7	dB	1
Clic CISPR 16 LISN 50uH 0,150-30,0 MHz	PE001_05			2,9	dB	1
Radiated Emission CDNE 30-300 MHz	PE001_06			3,3	dB	1
Disturbance Power 30-300 MHz	PE002_X1			3,8	dB	1
Radiated Emission LAS 0,15-30 MHz	PE003_01			2,0	dB	1
Radiated Emission CISPR 16 Loop Ant. 0,15-30 MHz	PE004_X1			4,1	dB	1
Radiated Emission CISPR 16 Bicon. Ant. 30-300 MHz	PE004_X2			4,7	dB	1
Radiated Emission CISPR 16 LogP. Ant. 300-1000 MHz	PE004_X3			4,6	dB	1
Radiated Emission CISPR 16 Horn Ant. 1-18 GHz	PE004_X4			4,7	dB	1
Human Exposure to electromagnetic fields	PE005_01			14,2	%	1
Harmonics	PE006_01	10 mA	+	2,9	%	1
Flicker	PE007_01			3,40	%	1
Radiated Immunity 80 MHz - 6 GHz	PE102_XX	2,26	dB	0,89	V/m a 3V/m	1
Conducted Immunity 0,15 - 230 MHz	PE105_XX	1,26	dB	0,47	V a 3V	1
AC Magnetic field	PE106_01	1,55	%	0,15	A/m a 10A/m	1
Pulse Magnetic field	PE107_01	6,21	%	18,6	A/m a 300A/m	1
Dumped Magnetic field	PE108_01	6,21	%	1,86	A/m a 30A/m	1
Common mode conducted immunity	PE112_01	2,11	%	0,21	V a 10V	1

Attachment 1

Test	*Test Setup*	*Expanded uncertainty*	*Note*
Power/Spurious 9kHz-30MHz	PR001_X1	4,1 dB	1
Power/Spurious ERP 30-1000MHz d=10m/3m	PR001_X2+X3	4,8 dB	1
Misura della potenza EiRP 1-18GHz d=3m	PR001_X4+X5	4,7 dB	1
Misura della potenza EiRP 18-40GHz d=3m	PR001_X6	5,1 dB	1
Frequency error	PR002_01+02	< 1x10-7	1
Timing zero span (1001pts.)	PR002_01+02	0,2 % SWT	1
Modulation bandwidth	PR002_01+02	< 1x10-7	1
Conducted RF power and spurious emission	PR002_01+02	1,1 dB	1
Adjacent channel power	PR002_01+02	1,1 dB	1
Blocking	PR002_01+02	1,1 dB	1

Test	*Test Setup*	*Expanded uncertainty*	*Note*
Electrostatic discharge immunity test	PE101_0X		2
Electrical fast transients / burst immunity test	PE103_0X		2
Surge immunity test	PE104_0X		2
Short interruption immunity test	PE109_01		2
Ring Wave immunity test	PE110_01		2
Low frequency immunity test	PE111_01		2
Dumped Oscillotary immunity test	PE113_01		2
Rev_24_01 date 03/02/2024			

Note 1:

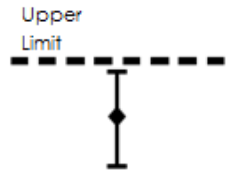
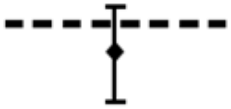
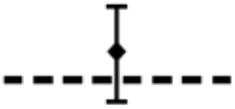
The expanded uncertainty reported according to the document EA-4-02 is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of p = 95%

Note 2:

It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95% confidence, covering factor k=2

Attachment 1

Judgement of compliance

Case 1	Case 2	Case 3	Case 4
			
The sample complies with the requirements.	The sample complies with the requirements.	The sample does not comply with the requirements.	The sample does not comply with the requirements.
The measurement results is within the specification limit when the measurement uncertainty is taken into account.	It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty although the measurement result is below the limit.	It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty also the measurement result is upper the limit.	The measurement results is outside the specification limit when the measurement uncertainty is taken into account.

In agreement with ILAC-G8:09/2019 cl.4.2.1 Guidelines on Decision Rules and Statements of Conformity

Quality manual references – Internal procedure

Internal Procedure PM001 rev. 4.0 (Quality Manual)	Measure procedure
Internal Procedure INC_M rev. 10.0 (Quality Manual)	Measurement uncertainty calculation