

TEST REPORT

Nr. R24159201

Federal Communication Commission (FCC)

Report Reference No.	R24159201
Date of issue:	17.09.2024
Total number pages:	21
Customer name	Autec S.r.l.
Address	Via Pomaroli, 65 - 36030 Caldogno (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	2024-07
General disclaimer:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of DEKRA Testing and Certification S.r.l.	
(*) Test item description	Remote station
(*) Trademark	Autec
(*) Manufacturer	Autec S.r.l.
(*) Model / Type reference	Model J9A Type VZ9QH
(*) FCC ID	OQA-J9AVZ0QH
(*) Rating(s)	7,2 V battery supplied
Report	
Tested by (name + signature)	G. Gandini
Approved by (name + signature)	F. Marenda

(*) information provided by the customer

1	Summary	
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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	17.09.2024	

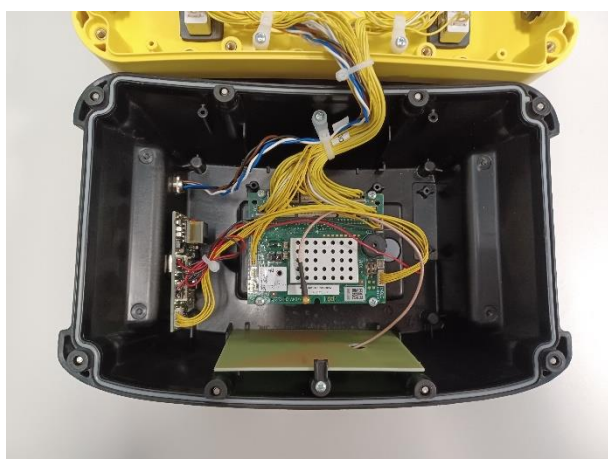
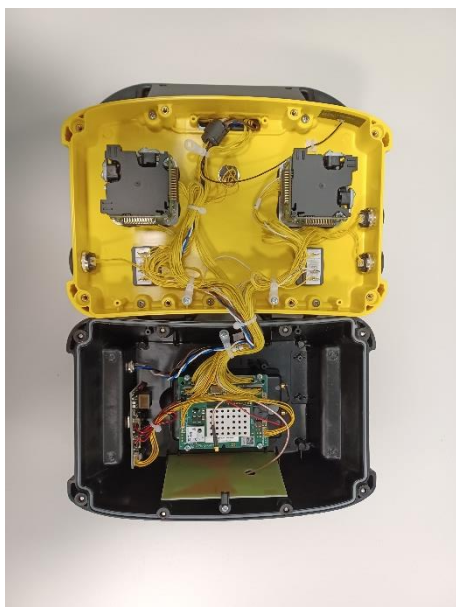
Testing and sampling:	
Date of receipt of test item	31.05.2024
Testing start date	17.09.2024
Testing end date	17.09.2024
Sampling procedure	Sample used for testing chosen by the customer; DEKRA Testing and Certification S.r.l. cannot be considered responsible for the selection of the sample
Internal identification	Adhesive label with the product number P240537
General remarks:	
<p>This report shall not be reproduced, except in full, without the written approval of DEKRA Testing and Certification S.r.l.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>“(see appended table)”: refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p>	
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:	
<input checked="" type="checkbox"/> Indicates that the listed condition, standard or equipment is applicable for this report. <input type="checkbox"/> Indicates that the listed condition, standard or equipment is not applicable for this report.	

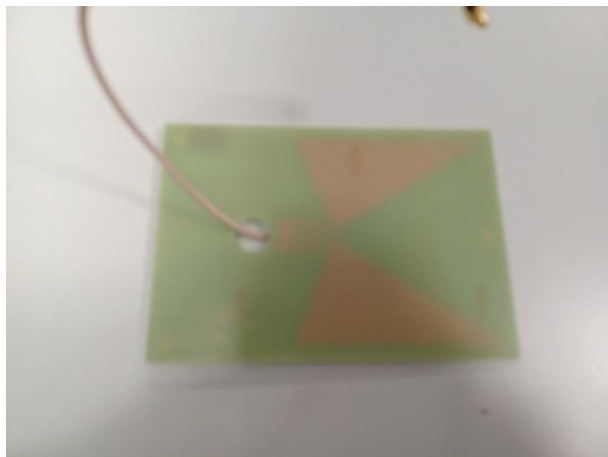
6 General description of tested item and testing condition(s)

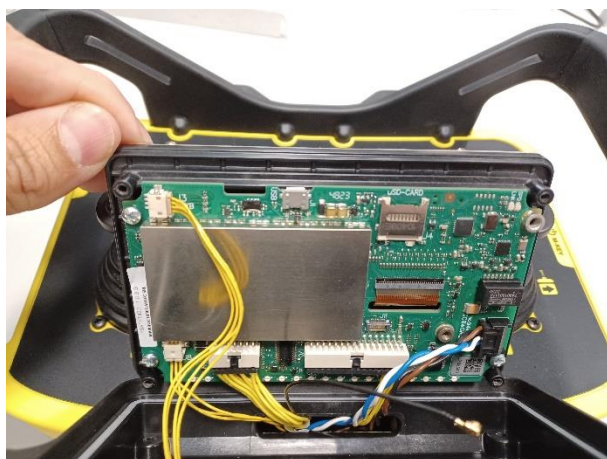
Description	Remote station						
Model Number	Model J9A, Type VZ9QH						
FCC ID	OQA-J9AVZ0QH						
Serial Number	--						
Brand name	Autec						
Frequency band	902 – 928 MHz						
Nominal frequencies	FL: 915,050 MHz		FM: 921,400 MHz		FH: 927,800 MHz		
Test power supply.....		Voltage and Frequency	Reference poles				
			N	L1	L2	L3	PE
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	DC: 7,2 V battery supplied					<input type="checkbox"/>
Type of equipment	<input checked="" type="checkbox"/> Transmitter unit <input checked="" type="checkbox"/> Receiver unit						
Type of station	<input checked="" type="checkbox"/> Portable station <input type="checkbox"/> Mobile station						
Test arrangements of EUT	<i>Intended operational arrangement(s) of EUT</i>			<i>Test arrangement (see basic standard)</i>			
	<input type="checkbox"/>	Table-top only		Table-top			
	<input type="checkbox"/>	Floor-standing only		Floor-standing			
	<input type="checkbox"/>	Can be floor-standing or table-top		Table-top			
	<input type="checkbox"/>	Rack mounted		In rack or table-top			
	<input checked="" type="checkbox"/>	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	<p>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.</p> <p>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.</p>						

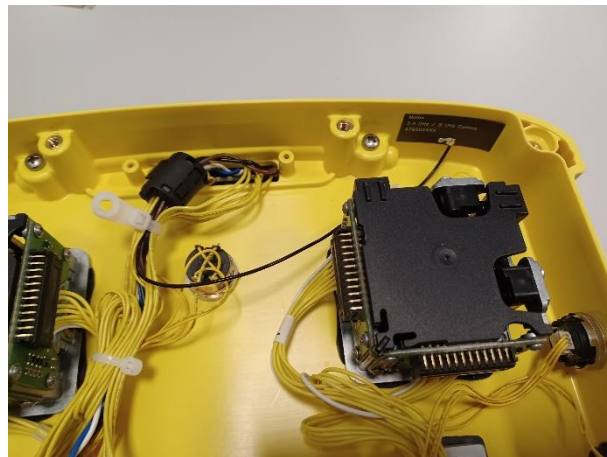
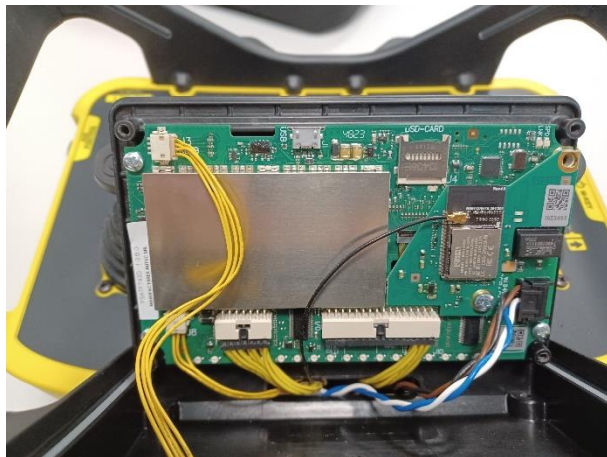
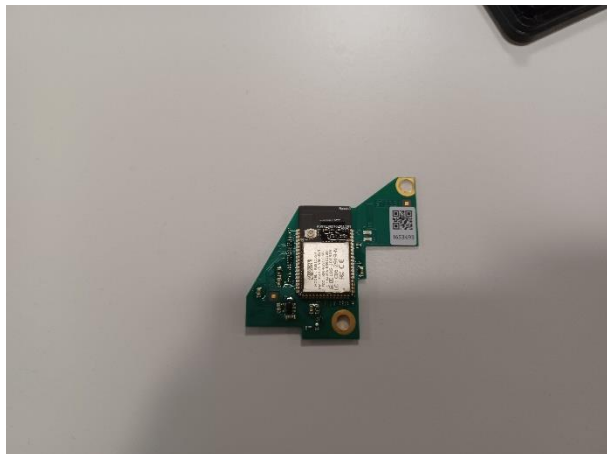
6.1 Photos of the test item













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

Environmental reference conditions..... :	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:																				
	Temperature		Humidity		Atmospheric pressure																
	15 °C – 35 °C		30 % - 60 %		800 hPa – 1060 hPa																
	If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.																				
Measurement uncertainties :	Environmental conditions have been monitored with the following instrument.																				
	<table><tr><td><i>Id. Number</i></td><td><i>Manufacturer</i></td><td><i>Model</i></td><td><i>Serial number</i></td><td><i>Description</i></td><td><i>Last calibration date</i></td><td><i>Calibration expiration</i></td></tr><tr><td>CMC S302</td><td>Testo</td><td>175H1</td><td>40370182610</td><td>Data Logger</td><td>May 2024</td><td>May 2025</td></tr></table>							<i>Id. Number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Serial number</i>	<i>Description</i>	<i>Last calibration date</i>	<i>Calibration expiration</i>	CMC S302	Testo	175H1	40370182610	Data Logger	May 2024	May 2025
	<i>Id. Number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Serial number</i>	<i>Description</i>	<i>Last calibration date</i>	<i>Calibration expiration</i>														
CMC S302	Testo	175H1	40370182610	Data Logger	May 2024	May 2025															
Attachment 1																					

9 Test results

9.1 RF Exposure Analysis

Tested by	G. Gandini
Test date	17.09.2024
Test location (stand)	Laboratory
Basic standard(s)	KDB 447498 D01 cl. 7.1 ANSI C63.10
Supplementary information	--

Acceptance limits

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition(s), listed below, is (are) satisfied.

For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. separation distance, mm})] \times (\sqrt{f(\text{GHz})}) \leq 3$ for 1-g SAR and $\leq 7,5$ for 10-g SAR

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

10-g Extremity SAR Test Exclusion Power Thresholds are 2,5 times higher than the 1-g SAR Test Exclusion Thresholds indicated above.

Result

Duty cycle evaluation

Transmission channel (MHz)	Transmitting cycle duration (ms)	Transmission time (ms)	Graph	Duty cycle
921,05	23,5	55,8	G24159201	0,42

Standalone operation

FCC ID	Transmission channel (MHz)	Measured level (dBm)	Corrected level (dBm)	Corrected level (mW)
OQA-J9AVZ0QH	915,050	15,82	12,05	16,03
OQA-J9AVZ0QH	921,400	15,63	11,86	15,35
OQA-J9AVZ0QH	927,800	15,51	11,74	14,93
XF6-RS9113SB	2412 (802.11 b, 1 Mbps)	12,05	7,10	5,13
XF6-RS9113SB	2442 (802.11 b, 1 Mbps)	16,62	11,67	14,69
XF6-RS9113SB	2462 (802.11 b, 1 Mbps)	12,25	7,30	5,37
XF6-RS9113SB	2412 (802.11 b, 11 Mbps)	12,20	7,25	5,31
XF6-RS9113SB	2442 (802.11 b, 11 Mbps)	16,47	11,52	14,19
XF6-RS9113SB	2462 (802.11 b, 11 Mbps)	14,89	9,94	9,86
XF6-RS9113SB	2412 (802.11 g, 6 Mbps)	7,67	2,72	1,87
XF6-RS9113SB	2442 (802.11 g, 6 Mbps)	16,21	11,26	13,37
XF6-RS9113SB	2462 (802.11 g, 6 Mbps)	7,48	2,53	1,79
XF6-RS9113SB	2412 (802.11 g, 24 Mbps)	7,62	2,67	1,85
XF6-RS9113SB	2442 (802.11 g, 24 Mbps)	16,33	11,38	13,74
XF6-RS9113SB	2462 (802.11 g, 24 Mbps)	7,50	2,55	1,80
XF6-RS9113SB	2412 (802.11 g, 54 Mbps)	7,68	2,73	1,87
XF6-RS9113SB	2442 (802.11 g, 54 Mbps)	16,47	11,52	14,19
XF6-RS9113SB	2462 (802.11 g, 54 Mbps)	7,58	2,63	1,83

Standalone operation

FCC ID	Transmission channel (MHz)	Measured level (dBm)	Corrected level (dBm)	Corrected level (mW)
XF6-RS9113SB	2412 (802.11 n, 6,5 Mbps)	6,96	2,01	1,59
XF6-RS9113SB	2442 (802.11 n, 6,5 Mbps)	16,61	11,66	14,66
XF6-RS9113SB	2462 (802.11 n, 6,5 Mbps)	6,91	1,96	1,57
XF6-RS9113SB	2412 (802.11 n, 39 Mbps)	6,82	1,87	1,54
XF6-RS9113SB	2442 (802.11 n, 39 Mbps)	16,72	11,77	15,03
XF6-RS9113SB	2462 (802.11 n, 39 Mbps)	6,93	1,98	1,58
XF6-RS9113SB	2412 (802.11 n, 65 Mbps)	6,82	1,87	1,54
XF6-RS9113SB	2442 (802.11 n, 65 Mbps)	16,47	11,52	14,19
XF6-RS9113SB	2462 (802.11 n, 65 Mbps)	6,66	1,71	1,48

Remarks: the corrected levels are obtained by applying a correction factor calculated from the duty cycle using the formula $10\log(\text{duty cycle})$.

For 915 MHz (FCC ID OQA-J9AVZ0QH) the measured duty cycle is 42%, so applying the formula $10\log(0,42)$ results in a correction factor of -3,77 dB.

For Wi-Fi (FCC ID XF6-RS9113SB) the declared duty cycle is 32%, so applying the formula $10\log(0,32)$ results in a correction factor of -4,95 dB.

- Wi-Fi standalone 1-g head or body:**

Using separation distance of 154,92 mm with the formula above results:

$$(15,03 \text{ mW} / 154,92 \text{ mm}) * \sqrt{2,442 \text{ GHz}} = 0,15 \leq 3$$

Thus for portable use the SAR exclusion condition is fulfilled and SAR evaluation is not required for separation distance of 154,92 mm or more.

Estimated SAR = 0,4 W/kg (according to cl. 4.3.2.b of KDB 447498 D01).

- **Wi-Fi standalone 10-g extremity:**

Using separation distance of 4,30 mm with the formula above results:

$$(15,03 \text{ mW} / 4,30 \text{ mm}) * \sqrt{2,442 \text{ GHz}} = 5,46 \leq 7,5$$

Thus for portable use the SAR exclusion condition is fulfilled and SAR evaluation is not required for separation distance of 4,30 mm or more.

$$\text{Estimated SAR} = [(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \times [\sqrt{f(\text{GHz})} / 18,75] \text{ W/kg} = (15,03 / 4,30) \times (\sqrt{2,442} / 18,75) = 0,29 \text{ W/kg}$$

Remarks: the Wi-Fi measured levels have been derived from Test Report nr. 19660127 001.

- **915 MHz standalone 1-g head or body:**

Using separation distance of 114,63 mm with the formula above results:

$$(20,18 \text{ mW} / 114,63 \text{ mm}) * \sqrt{0,91505 \text{ GHz}} = 0,17 \leq 3$$

Thus for portable use the SAR exclusion condition is fulfilled and SAR evaluation is not required for separation distance of 114,63 mm or more.

$$\text{Estimated SAR} = 0,4 \text{ W/kg (according to cl. 4.3.2.b of KDB 447498 D01).}$$

- **915 MHz standalone 10-g extremity:**

Using separation distance of 12,13 mm with the formula above results:

$$(20,18 \text{ mW} / 12,13 \text{ mm}) * \sqrt{0,91505 \text{ GHz}} = 1,59 \leq 7,5$$

Thus for portable use the SAR exclusion condition is fulfilled and SAR evaluation is not required for separation distance of 12,13 mm or more.

$$\text{Estimated SAR} = [(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \times [\sqrt{f(\text{GHz})} / 18,75] \text{ W/kg} = (20,18 / 12,13) \times (\sqrt{0,91505} / 18,75) = 0,08 \text{ W/kg.}$$

Remarks: the 915 MHz measured levels have been derived from Test Report nr. R24159101, including the tune-up tolerance of 1,1 dB.

- **1-g head or body SAR evaluation for simultaneous transmission:**

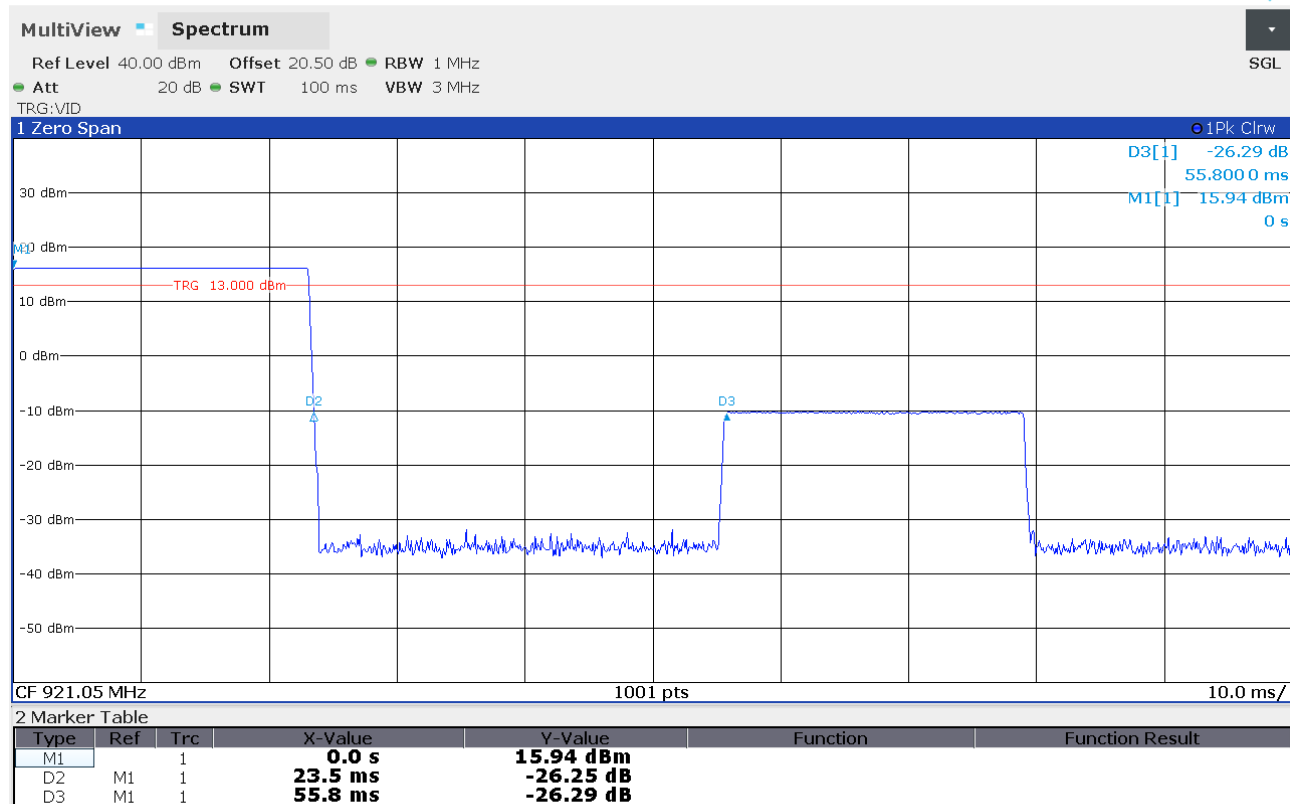
The sum of the estimated SAR is 0,8 W/kg, which is below the limit of 1,6 W/kg.

- **10-g extremity SAR evaluation for simultaneous transmission:**

The sum of the estimated SAR is 0,37 W/kg, which is below the limit of 4 W/kg.

Graphs

Gandini 24159201



08:35:58 10/15/2024

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

<i>Test</i>	<i>Test Setup</i>	<i>Expanded uncertainty</i>	<i>Note</i>
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

<i>Test</i>	<i>Test Setup</i>	<i>Expanded uncertainty</i>	<i>Note</i>
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 Oscillatory immunity test	PE113_01		2
Rev_24_01 date 03/02/2024			

Note 1:

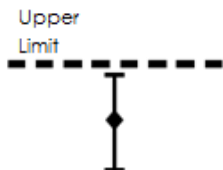
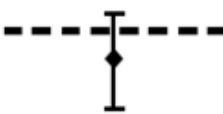


The expanded uncertainty reported according to the document EA-4-02 is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of p = 95%

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

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