



## TEST REPORT nr. R18273701

### Federal Communication Commission (FCC)

#### Test item

Description.....: TRANSCEIVER UNIT  
Trademark.....: AUTEC  
Model/Type .....: Model J2F Type NZ322  
FCC ID .....: OQA-J2FNZ322

#### Test Specification

Standard.....: KDB 447498 D01 General RF Exposure Guidance v06

**Client's name** .....: AUTEC S.r.l.  
Address .....: Via Pomaroli, 65 – 36030 Caldogno (VI) – ITALY

**Manufacturer's name** : Same as client  
Address .....: --

#### Report

Tested by .....: G. Gandini  
Approved by .....: R. Beghetto – Laboratory Manager  
Date of issue .....: 17.01.19  
Contents.....: 16 pages

*Giovanni Gandini*  
.....  
*R. Beghetto*  
.....

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The test results presented in this report relate only to the item tested.



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## 1. Summary

Standard:

KDB 447498 D01 General RF Exposure Guidance v06

| Test specifications  | Environmental Phenomena | Tests sequence | Result   |
|----------------------|-------------------------|----------------|----------|
| KDB 447498 D01 cl. 4 | RF Exposure Analysis    | 1              | Complies |

The Test Report was given to the Client representatives for necessary documentation of ratification of the tested equipment and it is valid for the FCC certification

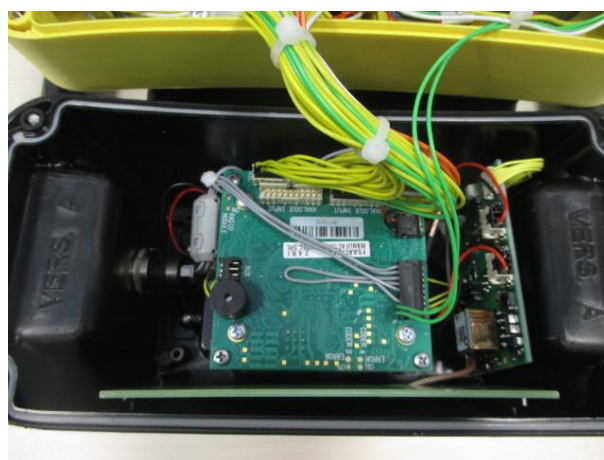
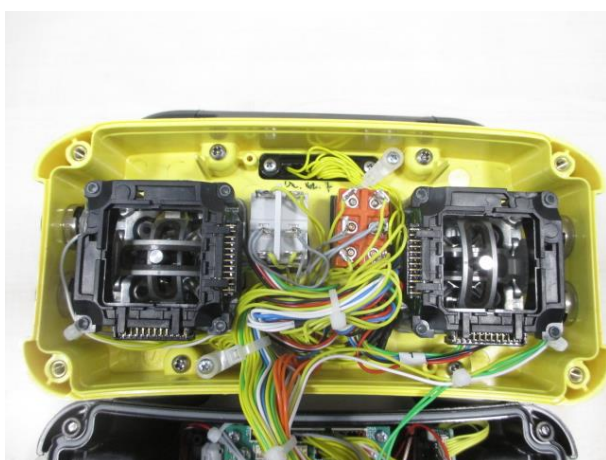


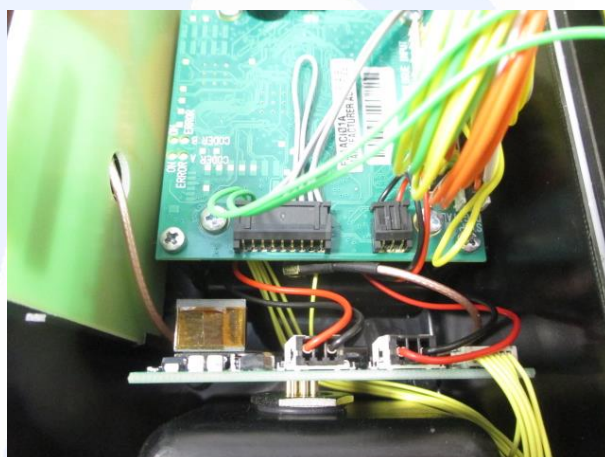


## 5. Photograph(s) of EUT

### 5.1 Photograph(s) of EUT









## 6. Equipment list

| <i>Id. number</i> | <i>Manufacturer</i> | <i>Model</i> | <i>Description</i>     | <i>Serial number</i> | <i>Last calibration</i> | <i>Due date calibration</i> |
|-------------------|---------------------|--------------|------------------------|----------------------|-------------------------|-----------------------------|
| CMC S227          | Rohde & Schwarz     | ESR7         | EMI Test Receiver 7GHz | 101121               | January '18             | January '19                 |





## 7. Measurement uncertainty

| Test                                                     | Test Setup | Expanded uncertainty     | Note |
|----------------------------------------------------------|------------|--------------------------|------|
| Conducted emission CISPR 16<br>LISN 50uH 0,009-0,0150MHz | PE001_01   | 3,4 dB                   | 1    |
| Conducted emission CISPR 16<br>LISN 50uH 0,150-30,0MHz   | PE001_01   | 2,9 dB                   | 1    |
| Conducted emission CISPR 16<br>Voltage Probe 0,15-30MHz  | PE001_02   | 2,9 dB                   | 1    |
| Conducted emission CISPR 16<br>Current Probe 0,15-30MHz  | PE001_03   | 2,5 dB                   | 1    |
| Conducted emission CISPR 16<br>ISN 0,15-30MHz            | PE001_04   | 4,7 dB                   | 1    |
| Clic CISPR 16<br>LISN 50uH 0,150-30,0MHz                 | PE001_05   | 3,3 dB                   | 1    |
| Disturbance Power<br>30-300 MHz                          | PE002_01   | 3,6 dB                   | 1    |
| Radiated Emission LAS<br>0,15-30MHz                      | PE003_01   | 2,0 dB                   | 1    |
| Radiated Emission CISPR 16<br>Loop Ant. 0,15-30MHz       | PE004_01   | 4,0 dB                   | 1    |
| Radiated Emission CISPR 16<br>Bicon. Ant. 30-300MHz      | PE004_02   | 3,9 dB                   | 1    |
| Radiated Emission CISPR 16<br>LogP. Ant. 300-1000MHz     | PE004_03   | 3,8 dB                   | 1    |
| Radiated Emission CISPR 16<br>Horn Ant. 1-18GHz          | PE004_04   | 4,2 dB                   | 1    |
| Human Exposure to electromagnetic fields                 | PE005_01   | 23,6 %                   | 1    |
| Harmonic current emissions test                          | PE006_01   | 10 mA + 2,6 %            | 1    |
| Voltage fluctuation and flicker test                     | PE007_01   | 4,8 %                    | 1    |
| Radiated Immunity<br>80MHz-6GHz                          | PE102_XX   | 2,1 dB 0,82 V/m a 3V/m   | 1    |
| Conducted Immunity<br>0,15-230MHz                        | PE105_XX   | 1,2 dB 0,44 V a 3V       | 1    |
| AC Magnetic field                                        | PE106_01   | 1,55 % 0,15 A/m a 10A/m  | 1    |
| Pulse Magnetic field                                     | PE107_01   | 6,24 % 18,7 A/m a 300A/m | 1    |
| Dumped Magnetic field                                    | PE108_01   | 6,24 % 1,87 A/m a 30A/m  | 1    |
| Common mode conducted immunity                           | PE112_01   | 2,20 % 0,22 V a 10V      | 1    |



| Test                                       | Test Setup  | Expanded uncertainty | Note |
|--------------------------------------------|-------------|----------------------|------|
| Power/Spurious<br>9kHz-30MHz               | PR001_01    | 4,0 dB               | 1    |
| Power/Spurious ERP<br>30-1000MHz d=10m     | PR001_02+03 | 4,7 dB               | 1    |
| Misura della potenza EIRP<br>1-18GHz d=3m  | PR001_04    | 4,7 dB               | 1    |
| Misura della potenza EIRP<br>18-40GHz d=3m | PR001_05    | 5,4 dB               | 1    |
| Frequency error                            | PR002_01+02 | < 1x10 <sup>-7</sup> | 1    |
| Timing zero span (1001pts.)                | PR002_01+02 | 0,2 % SWT            | 1    |
| Modulation bandwidth                       | PR002_01+02 | < 1x10 <sup>-7</sup> | 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    |
| Rev_18_02 date 31/10/2018                        |            |                      |      |

**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



## 8. Reference documents

| Reference no.                                      | Description                                                                                                                                                      |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KDB 447498 D01 General RF Exposure Guidance v06    | RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES                                                                      |
| FCC Rules and Regulation Title 47 part 15:2017     | --                                                                                                                                                               |
| ANSI C63.4:2014                                    | American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz |
| ANSI C63.10:2013                                   | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                                                                   |
| Internal Procedure PM001 rev. 3.0 (Quality Manual) | Measure Procedure                                                                                                                                                |
| Internal procedure INC_M rev. 9.1 (Quality Manual) | Measurement uncertainty calculation                                                                                                                              |



## 9. Deviation from test specification

None

## 10. Test case verdicts

Test case does not apply to the test object ..... : N.A.

Test item does meet the requirement ..... : Complies

Test item does not meet the requirement ..... : Does not comply

Test not performed ..... : N.E.

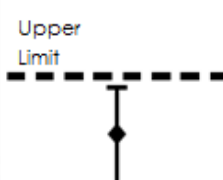
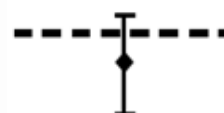


## 11. Results

In this clause tests results are reported.

Measurement uncertainty is in accordance with document CMC INC\_M rev. 9.1.

*Judgement of compliance:*

| Case 1                                                                                                            | Case 2                                                                                                                                                   | Case 3                                                                                                                                               | Case 4                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|                                  |                                                                         |                                                                    |                                 |
| The sample complies with the requirement.                                                                         | The sample complies with the requirement.                                                                                                                | The sample does not comply with the requirement.                                                                                                     | The sample does not comply with the requirement.                                                                   |
| 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: 03/2009 Guidelines on the Reporting of Compliance with Specification.



## 11.1 RF Exposure Analysis

### Test set-up and execution

- KDB 447498 D01 cl. 4
- ANSI C63.10
- Internal procedure PM001
- See clause 4 of this test report

### Test configuration and test method

Test site:  
Laboratory

Auxiliary equipment:  
See clause 4 of this test report

### EUT exercising

See clause 4 of this test report

### Test equipment used

CMC S227  
Measurement uncertainty: See clause 7 of this test report

### Test specification

Port: Enclosure

### Environmental conditions

| Temperature<br>(°C) | Atmospheric pressure<br>(kPa) | Relative humidity<br>(%) |
|---------------------|-------------------------------|--------------------------|
| 22                  | 100                           | 42                       |

### 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  $\leq 50$  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<br>Exclusion<br>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

| Transmission channel (MHz) | Transmitting cycle duration (ms) | Transmission time (ms) | Graph     | Duty cycle |
|----------------------------|----------------------------------|------------------------|-----------|------------|
| 924,65                     | 99,9                             | 20,8                   | G18273701 | 0,208      |

| Transmission channel (MHz) | Conducted measured level (dBm) | Antenna gain (dBi) | Tolerance (dB) | Maximum ERP level (mW) | Maximum ERP Average level (mW) |
|----------------------------|--------------------------------|--------------------|----------------|------------------------|--------------------------------|
| 915,068910                 | 18,69                          | 2                  | 1,1            | 151,01                 | 31,41                          |
| 921,418810                 | 18,68                          | 2                  | 1,1            | 150,66                 | 31,34                          |
| 927,818010                 | 18,71                          | 2                  | 1,1            | 151,71                 | 31,56                          |

**Remarks:** the measured level levels has been reported on Test Report nr. R18197401. The maximum ERP level is the conducted measured level plus the antenna gain and the tolerance, converted in mW. The maximum ERP average level is the maximum ERP level multiplied by the duty cycle value.

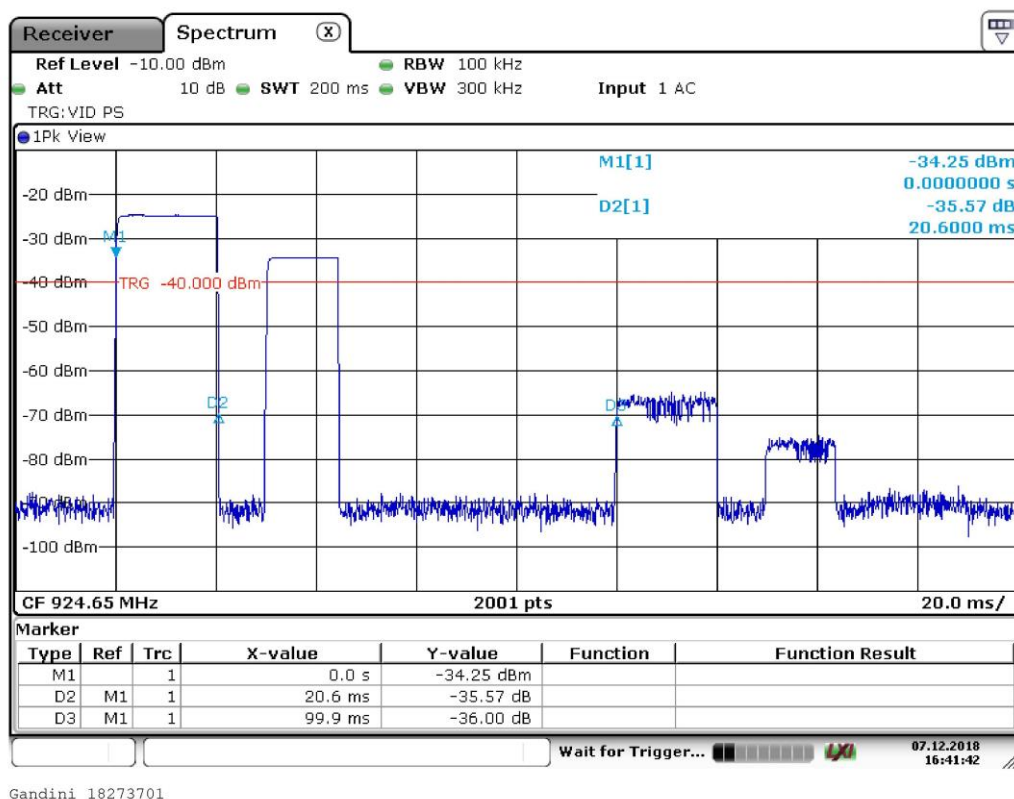
Using separation distance of 20 mm with the formula above results:

$$(31,56 \text{ mW} / 20 \text{ mm}) * \sqrt{0,927818010 \text{ GHz}} = 1,52 \leq 3$$

Thus for portable use the SAR exclusion condition is fulfilled and SAR evaluation is not required for separation distance of 20 mm or more



## Graphs



Gandini 18273701

**Result:** The requirements are met