

EMI - TEST REPORT

- FCC Part 15.249 -

Type / Model Name : UART-RF-Stick-915

Product Description : Radio Module

Applicant : Elero GmbH

Address : Linsenhofer Straße 65

72660 Beuren

GERMANY

Manufacturer : Elero GmbH

Address : Linsenhofer Straße 65

72660 Beuren

GERMANY

Test Result according to the standards listed in clause 1 test standards:

POSITIVE

Test Report No. : **T40733-02-00JP**

10. March 2017

Date of issue



Deutsche
Akkreditierungsstelle
D-PL-12030-01-01
D-PL-12030-01-02

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

Contents

| | | |
|----------|---|-----------|
| 1 | <u>TEST STANDARDS</u> | 3 |
| 2 | <u>EQUIPMENT UNDER TEST</u> | 4 |
| 2.1 | Photo documentation of the EUT | 4 |
| 2.2 | Equipment category | 4 |
| 2.3 | Short description of the equipment under test (EUT) | 4 |
| 2.4 | Transmit operating modes | 4 |
| 2.5 | Antenna | 4 |
| 2.6 | Power supply system utilised | 4 |
| 2.7 | Peripheral devices and interface cables | 4 |
| 3 | <u>TEST RESULT SUMMERY</u> | 5 |
| 3.1 | Final assessment | 5 |
| 4 | <u>TEST ENVIRONMENT</u> | 6 |
| 4.1 | Address of the test laboratory | 6 |
| 4.2 | Environmental conditions | 6 |
| 4.3 | Statement of the measurement uncertainty | 6 |
| 4.4 | Measurement protocol for FCC and IC | 7 |
| 5 | <u>TEST CONDITIONS AND RESULTS</u> | 8 |
| 5.1 | AC power line conducted emissions | 8 |
| 5.2 | Field strength of fundamental | 20 |
| 5.3 | Out-of-band emission, radiated | 21 |
| 5.4 | 20dB bandwidth | 24 |
| 6 | <u>USED TEST EQUIPMENT AND ACCESSORIES</u> | 26 |

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (January 2017)

FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (January, 2017)

| | |
|------------------------------------|--|
| Part 15, Subpart C, Section 15.207 | Conducted limits |
| Part 15, Subpart C, Section 15.209 | Radiated emission limits, general requirements |
| Part 15, Subpart C, Section 15.249 | Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz |
| ANSI C63.10: 2013 | Testing Unlicensed Wireless Devices |

2 EQUIPMENT UNDER TEST

2.1 Photo documentation of the EUT

Pictures of EuT:
Refer to document T40733-02JP Attachment B

Pictures of Host:
Refer to document T40733-02JP Attachment C

2.2 Equipment category

RF module for integration in motors

2.3 Short description of the equipment under test (EUT)

The EuT is a RF-module intended for integration in actors and controls for intelligent building technology like tubular motors, venetian blind motors, curtain motors, lights, heatings and controls. The RF modul allows radio control of the motor. The RF module has unidirectional operation mode on the frequency 915.3 MHz acting as receiver. Bidirectional operation mode on the frequency 918.3 MHz acting as transceiver.

Number of tested samples: 1
Serial number: 00434
Firmware Version: V10

EUT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

2.4 Transmit operating modes

In unidirectional operation mode (receiving 915.3 MHz) FSK modulation is used. Bidirectional mode (transceiving 918.3 MHz) uses GFSK modulation.

2.5 Antenna

The module has an integral antenna.

2.6 Power supply system utilised

Power supply voltage, V_{nom} : 3V DC via host device

2.7 Peripheral devices and interface cables

The following peripheral devices and interface cables are connected during the measurements:

- Host motor _____ Model : Silent Gliss Model 9060

3 TEST RESULT SUMMERY

| FCC Rule Part | Description | Result |
|--------------------|-----------------------------------|--------|
| 15.207(a) | AC power line conducted emissions | passed |
| 15.215(c) | 20 dB Bandwidth | passed |
| 15.249(a) | Field strength of fundamental | passed |
| 15.249(d) & 15.209 | Out-of-band emission, radiated | passed |

3.1 Final assessment

The equipment under test fulfills the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 03 March 2016


Testing concluded on : 19 January 2017

Checked by:


 Klaus
 Gegenfurtner
 2017.03.10
 08:10:38 +01'00'

 Klaus Gegenfurtner
 Teamleader Radio

Tested by:


 Jürgen Pessinger
 2017.03.10
 08:05:57 +01'00'

 Jürgen Pessinger

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

**CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY**

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor $k = 2$. The true value is located in the corresponding interval with a probability of 95 %. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 / 11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, CSA Group Bayern GmbH, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Measurement protocol for FCC and IC

4.4.1 General information

4.4.1.1 Test methodology

Conducted and radiated disturbance testing is performed according to the procedures set out by the International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

The Open Area test site is a listed Open Site under the Canadian Test-Sites File-No:

IC 3009A-1

In compliance with RSS 210 testing for RSS compliance may be achieved by following the procedures set out in ANSI C63.10 and applying the CISPR 22 limits.

4.4.1.2 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.1.3 Details of test procedures

The test methods used comply with CISPR Publication 22, EN 55022 - "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.10 and applying the CISPR 22 limits.

5 TEST CONDITIONS AND RESULTS

5.1 AC power line conducted emissions

For test instruments and accessories used see section 6 Part A 4.

5.1.1 Description of the test location

Test location: Shielded Room S2

5.1.2 Photo documentation of the test set-up

Refer to document T40733-02JP Attachment A

5.1.3 Applicable standard

According to FCC Part 15, Section 15.207(a):

5.1.4 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin 11.0 dB at 0.15 MHz

Limit according to FCC Part 15, Section 15.207(a):

| Frequency of Emission (MHz) | Conducted Limit (dB μ V) | |
|--------------------------------|------------------------------|------------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency

The requirements are **FULFILLED**.

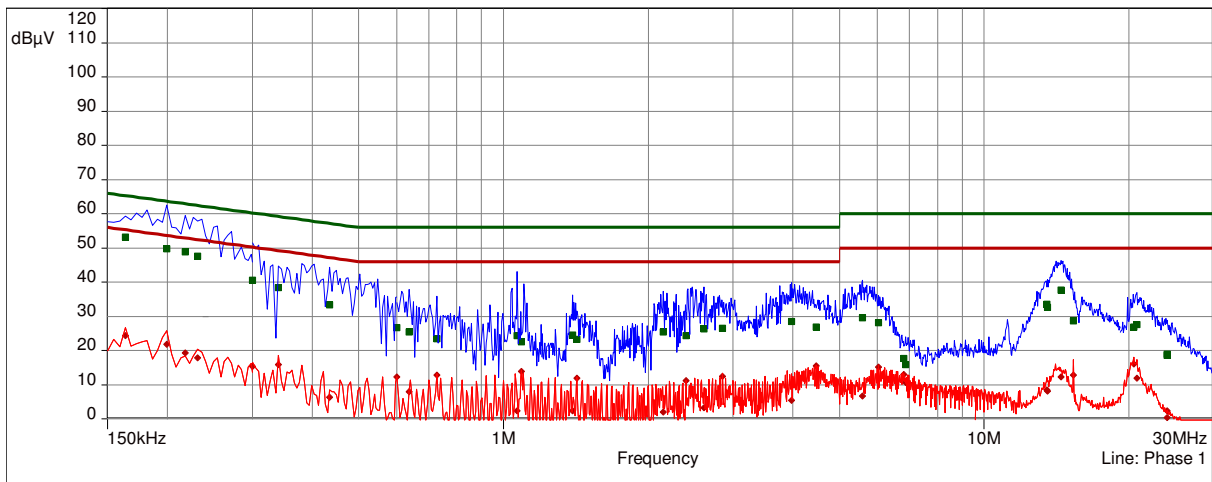
Remarks: Test was performed on AC input of the host device.

5.1.5 Test protocol

Test point: L1
 Operation mode: RX mode (918.3MHz, bidirectional)
 Remarks: none

Result: PASS

- CISPR 22/CISPR22 B - Average/
- CISPR 22/CISPR22 B - QPeak/
- Meas.Peak (Phase 1)
- Meas.Avg (Phase 1)
- QuasiPeak (Finals) (Phase 1)
- ◆ Average (Finals) (Phase 1)



CISPR 22/CISPR22B

| freq MHz | QP dB(µV) | margin dB | limit dB | AV dB(µV) | margin dB | limit dB | line | corr dB |
|-------------|--------------|--------------|-------------|--------------|--------------|-------------|---------|------------|
| 0.1635 | 53.09 | 12.19 | 65.28 | 24.38 | 30.90 | 55.28 | Phase 1 | 9.82 |
| 0.1995 | 49.68 | 13.95 | 63.63 | 21.75 | 31.89 | 53.63 | Phase 1 | 9.82 |
| 0.2175 | 48.88 | 14.04 | 62.91 | 19.31 | 33.61 | 52.91 | Phase 1 | 9.81 |
| 0.231 | 47.51 | 14.90 | 62.41 | 17.85 | 34.56 | 52.41 | Phase 1 | 9.81 |
| 0.3 | 40.48 | 19.76 | 60.24 | 15.28 | 34.97 | 50.24 | Phase 1 | 9.80 |
| 0.3405 | 38.39 | 20.81 | 59.19 | 15.83 | 33.36 | 49.19 | Phase 1 | 9.80 |
| 0.435 | 33.32 | 23.84 | 57.16 | 6.40 | 40.75 | 47.16 | Phase 1 | 9.80 |
| 0.6 | 26.60 | 29.40 | 56.00 | 12.31 | 33.69 | 46.00 | Phase 1 | 9.80 |
| 0.636 | 25.47 | 30.53 | 56.00 | 7.89 | 38.11 | 46.00 | Phase 1 | 9.80 |
| 0.726 | 23.48 | 32.52 | 56.00 | 12.82 | 33.18 | 46.00 | Phase 1 | 9.79 |
| 1.068 | 24.32 | 31.68 | 56.00 | 2.36 | 43.64 | 46.00 | Phase 1 | 9.80 |
| 1.0905 | 22.47 | 33.53 | 56.00 | 13.94 | 32.06 | 46.00 | Phase 1 | 9.80 |
| 1.3935 | 24.55 | 31.45 | 56.00 | 2.37 | 43.63 | 46.00 | Phase 1 | 9.78 |
| 1.4205 | 23.22 | 32.78 | 56.00 | 11.87 | 34.13 | 46.00 | Phase 1 | 9.78 |
| 2.1495 | 25.40 | 30.60 | 56.00 | 2.00 | 44.00 | 46.00 | Phase 1 | 9.80 |
| 2.4 | 24.25 | 31.75 | 56.00 | 11.25 | 34.75 | 46.00 | Phase 1 | 9.79 |
| 2.6115 | 26.34 | 29.66 | 56.00 | 3.32 | 42.68 | 46.00 | Phase 1 | 9.78 |
| 2.859 | 26.52 | 29.48 | 56.00 | 12.37 | 33.63 | 46.00 | Phase 1 | 9.79 |
| 3.9705 | 28.47 | 27.53 | 56.00 | 5.39 | 40.61 | 46.00 | Phase 1 | 9.81 |
| 4.479 | 26.84 | 29.16 | 56.00 | 15.43 | 30.57 | 46.00 | Phase 1 | 9.81 |
| 5.583 | 29.65 | 30.35 | 60.00 | 6.64 | 43.36 | 50.00 | Phase 1 | 9.83 |
| 6.0375 | 28.06 | 31.94 | 60.00 | 15.15 | 34.85 | 50.00 | Phase 1 | 9.84 |
| 6.798 | 17.74 | 42.26 | 60.00 | 13.08 | 36.92 | 50.00 | Phase 1 | 9.84 |
| 6.8745 | 15.93 | 44.07 | 60.00 | 10.66 | 39.34 | 50.00 | Phase 1 | 9.84 |

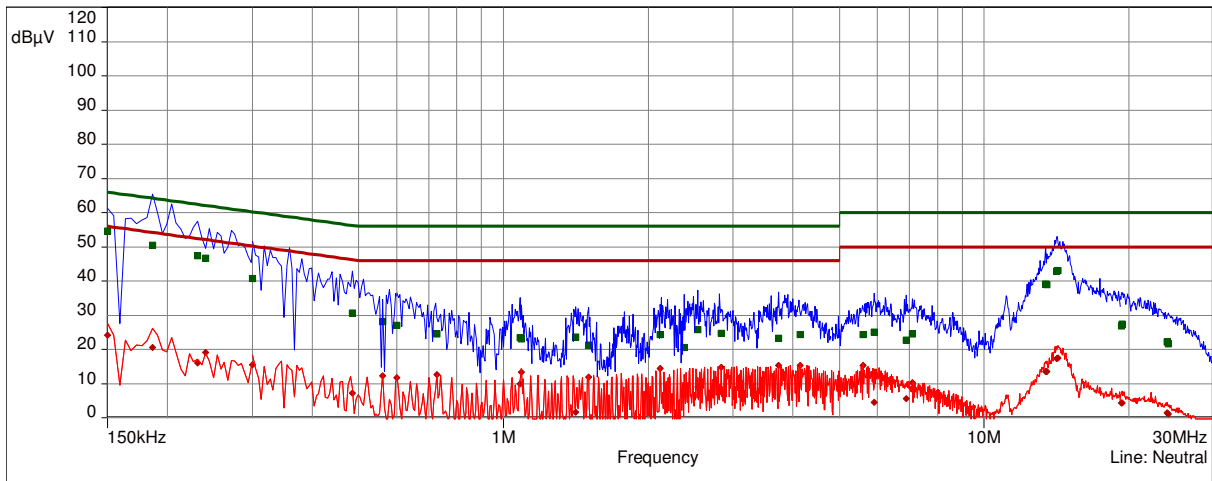
FCC ID: YBU28010X9X3

| freq | QP | margin | limit | AV | margin | limit | line | corr |
|---------|--------------|--------|-------|--------------|--------|-------|---------|-------|
| MHz | dB(μ V) | dB | dB | dB(μ V) | dB | dB | | dB |
| 13.5015 | 33.52 | 26.48 | 60.00 | 8.55 | 41.45 | 50.00 | Phase 1 | 10.04 |
| 13.542 | 32.68 | 27.32 | 60.00 | 8.11 | 41.89 | 50.00 | Phase 1 | 10.05 |
| 14.469 | 37.69 | 22.31 | 60.00 | 12.36 | 37.64 | 50.00 | Phase 1 | 10.10 |
| 15.351 | 28.63 | 31.37 | 60.00 | 12.76 | 37.24 | 50.00 | Phase 1 | 10.14 |
| 20.469 | 26.79 | 33.21 | 60.00 | 16.10 | 33.90 | 50.00 | Phase 1 | 10.34 |
| 20.775 | 27.63 | 32.37 | 60.00 | 11.88 | 38.12 | 50.00 | Phase 1 | 10.34 |
| 24.006 | 18.62 | 41.38 | 60.00 | 2.31 | 47.69 | 50.00 | Phase 1 | 10.35 |
| 24.042 | 19.00 | 41.00 | 60.00 | 0.36 | 49.64 | 50.00 | Phase 1 | 10.35 |

Test point: N
 Operation mode: RX mode (918.3MHz, bidirectional)
 Remarks: none

Result: PASS

- CISPR 22/CISPR22 B - Average/
- CISPR 22/CISPR22 B - QPeak/
- Meas.Peak (Neutral)
- Meas.Avg (Neutral)
- QuasiPeak (Finals) (Neutral)
- ◆ Average (Finals) (Neutral)



CISPR 22/CISPR22B

| freq MHz | QP dB(µV) | margin dB | limit dB | AV dB(µV) | margin dB | limit dB | line | corr dB |
|-------------|--------------|--------------|-------------|--------------|--------------|-------------|---------|------------|
| 0.15 | 54.62 | 11.38 | 66.00 | 24.14 | 31.86 | 56.00 | Neutral | 9.83 |
| 0.186 | 50.52 | 13.69 | 64.21 | 20.58 | 33.64 | 54.21 | Neutral | 9.83 |
| 0.231 | 47.42 | 14.99 | 62.41 | 16.04 | 36.38 | 52.41 | Neutral | 9.83 |
| 0.24 | 46.77 | 15.33 | 62.10 | 19.13 | 32.96 | 52.10 | Neutral | 9.82 |
| 0.3 | 40.82 | 19.42 | 60.24 | 15.57 | 34.67 | 50.24 | Neutral | 9.80 |
| 0.4845 | 30.68 | 25.58 | 56.26 | 7.22 | 39.04 | 46.26 | Neutral | 9.80 |
| 0.561 | 28.19 | 27.81 | 56.00 | 12.26 | 33.74 | 46.00 | Neutral | 9.81 |
| 0.6 | 26.96 | 29.04 | 56.00 | 11.77 | 34.23 | 46.00 | Neutral | 9.80 |
| 0.726 | 24.57 | 31.43 | 56.00 | 12.58 | 33.42 | 46.00 | Neutral | 9.79 |
| 1.0815 | 23.39 | 32.61 | 56.00 | 9.93 | 36.07 | 46.00 | Neutral | 9.80 |
| 1.0905 | 23.10 | 32.90 | 56.00 | 13.40 | 32.60 | 46.00 | Neutral | 9.80 |
| 1.4115 | 23.64 | 32.36 | 56.00 | 1.58 | 44.42 | 46.00 | Neutral | 9.78 |
| 1.5015 | 21.28 | 34.72 | 56.00 | 11.96 | 34.04 | 46.00 | Neutral | 9.77 |
| 2.118 | 24.36 | 31.64 | 56.00 | 14.35 | 31.65 | 46.00 | Neutral | 9.80 |
| 2.3745 | 20.64 | 35.36 | 56.00 | 8.05 | 37.95 | 46.00 | Neutral | 9.78 |
| 2.535 | 25.75 | 30.25 | 56.00 | 9.10 | 36.90 | 46.00 | Neutral | 9.78 |
| 2.841 | 24.72 | 31.28 | 56.00 | 14.75 | 31.25 | 46.00 | Neutral | 9.78 |
| 3.7365 | 23.19 | 32.81 | 56.00 | 15.31 | 30.69 | 46.00 | Neutral | 9.81 |
| 4.137 | 24.42 | 31.58 | 56.00 | 15.34 | 30.66 | 46.00 | Neutral | 9.80 |
| 5.5965 | 24.40 | 35.60 | 60.00 | 15.32 | 34.68 | 50.00 | Neutral | 9.81 |
| 5.9025 | 25.11 | 34.89 | 60.00 | 4.61 | 45.39 | 50.00 | Neutral | 9.82 |
| 6.8835 | 22.77 | 37.23 | 60.00 | 5.61 | 44.39 | 50.00 | Neutral | 9.81 |
| 7.095 | 24.47 | 35.53 | 60.00 | 10.27 | 39.73 | 50.00 | Neutral | 9.82 |

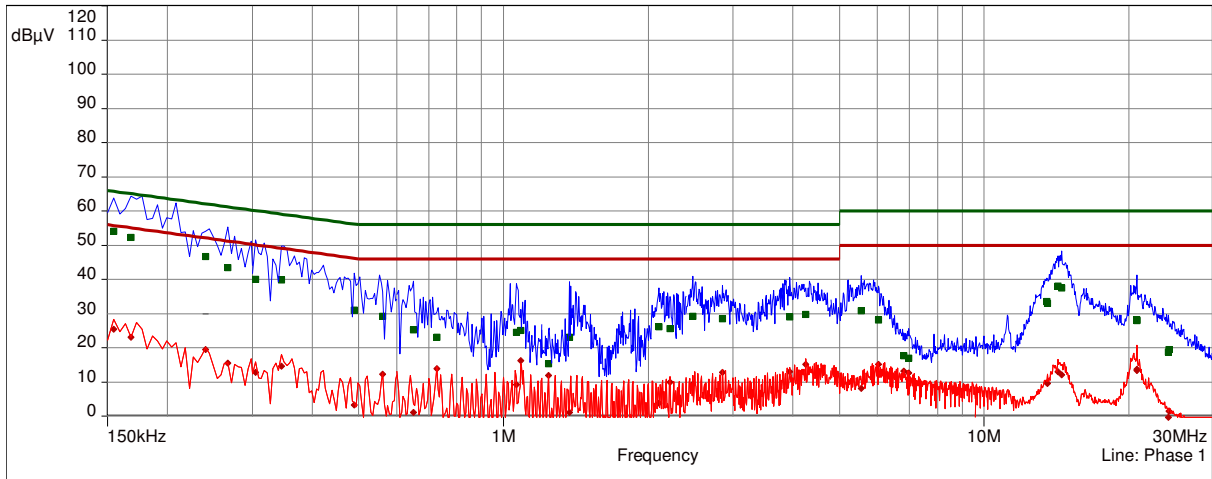
FCC ID: YBU28010X9X3

| freq | QP | margin | limit | AV | margin | limit | line | corr |
|---------|--------------|--------|-------|--------------|--------|-------|---------|-------|
| MHz | dB(μ V) | dB | dB | dB(μ V) | dB | dB | | dB |
| 13.425 | 39.10 | 20.90 | 60.00 | 13.47 | 36.53 | 50.00 | Neutral | 9.90 |
| 13.524 | 38.84 | 21.16 | 60.00 | 13.44 | 36.56 | 50.00 | Neutral | 9.90 |
| 14.181 | 42.83 | 17.17 | 60.00 | 17.30 | 32.70 | 50.00 | Neutral | 9.92 |
| 14.2395 | 43.12 | 16.88 | 60.00 | 17.52 | 32.48 | 50.00 | Neutral | 9.92 |
| 19.344 | 26.86 | 33.14 | 60.00 | 4.31 | 45.69 | 50.00 | Neutral | 10.10 |
| 19.3665 | 27.39 | 32.61 | 60.00 | 4.36 | 45.64 | 50.00 | Neutral | 10.10 |
| 24.042 | 22.18 | 37.82 | 60.00 | 1.54 | 48.46 | 50.00 | Neutral | 9.97 |
| 24.1905 | 21.57 | 38.43 | 60.00 | 1.16 | 48.84 | 50.00 | Neutral | 9.97 |

Test point: L1
 Operation mode: TX mode (918.3MHz, bidirectional)
 Remarks: none

Result: PASS

- CISPR 22/CISPR22 B - Average/
- CISPR 22/CISPR22 B - QPeak/
- Meas.Peak (Phase 1)
- Meas.Avg (Phase 1)
- QuasiPeak (Finals) (Phase 1)
- Average (Finals) (Phase 1)



CISPR 22/CISPR22B

| freq MHz | QP dB(µV) | margin dB | limit dB | AV dB(µV) | margin dB | limit dB | line | corr dB |
|-------------|--------------|--------------|-------------|--------------|--------------|-------------|---------|------------|
| 0.1545 | 54.15 | 11.61 | 65.75 | 25.36 | 30.39 | 55.75 | Phase 1 | 9.83 |
| 0.168 | 52.35 | 12.71 | 65.06 | 23.00 | 32.06 | 55.06 | Phase 1 | 9.82 |
| 0.24 | 46.64 | 15.45 | 62.10 | 19.55 | 32.54 | 52.10 | Phase 1 | 9.81 |
| 0.267 | 43.52 | 17.69 | 61.21 | 15.48 | 35.73 | 51.21 | Phase 1 | 9.81 |
| 0.3045 | 39.93 | 20.19 | 60.12 | 12.88 | 37.24 | 50.12 | Phase 1 | 9.80 |
| 0.345 | 39.87 | 19.21 | 59.08 | 14.54 | 34.54 | 49.08 | Phase 1 | 9.80 |
| 0.489 | 30.93 | 25.25 | 56.18 | 3.26 | 42.93 | 46.18 | Phase 1 | 9.80 |
| 0.561 | 29.19 | 26.81 | 56.00 | 12.23 | 33.77 | 46.00 | Phase 1 | 9.81 |
| 0.6495 | 25.15 | 30.85 | 56.00 | 1.04 | 44.96 | 46.00 | Phase 1 | 9.80 |
| 0.726 | 23.12 | 32.88 | 56.00 | 13.89 | 32.11 | 46.00 | Phase 1 | 9.79 |
| 1.0635 | 24.60 | 31.40 | 56.00 | 9.17 | 36.83 | 46.00 | Phase 1 | 9.80 |
| 1.086 | 25.11 | 30.89 | 56.00 | 16.22 | 29.78 | 46.00 | Phase 1 | 9.80 |
| 1.2405 | 15.40 | 40.60 | 56.00 | 11.87 | 34.13 | 46.00 | Phase 1 | 9.79 |
| 1.371 | 23.12 | 32.88 | 56.00 | 1.09 | 44.91 | 46.00 | Phase 1 | 9.78 |
| 2.1045 | 26.11 | 29.89 | 56.00 | 3.88 | 42.12 | 46.00 | Phase 1 | 9.80 |
| 2.2215 | 25.67 | 30.33 | 56.00 | 9.95 | 36.05 | 46.00 | Phase 1 | 9.79 |
| 2.481 | 29.29 | 26.71 | 56.00 | 9.31 | 36.69 | 46.00 | Phase 1 | 9.78 |
| 2.859 | 28.43 | 27.57 | 56.00 | 12.81 | 33.19 | 46.00 | Phase 1 | 9.79 |
| 3.939 | 28.97 | 27.03 | 56.00 | 13.00 | 33.00 | 46.00 | Phase 1 | 9.81 |
| 4.2585 | 29.82 | 26.18 | 56.00 | 15.16 | 30.84 | 46.00 | Phase 1 | 9.81 |
| 5.5515 | 30.79 | 29.21 | 60.00 | 8.09 | 41.91 | 50.00 | Phase 1 | 9.83 |
| 6.0375 | 28.14 | 31.86 | 60.00 | 15.15 | 34.85 | 50.00 | Phase 1 | 9.84 |
| 6.798 | 17.70 | 42.30 | 60.00 | 13.14 | 36.86 | 50.00 | Phase 1 | 9.84 |
| 6.978 | 16.92 | 43.08 | 60.00 | 12.66 | 37.34 | 50.00 | Phase 1 | 9.85 |

FCC ID: YBU28010X9X3

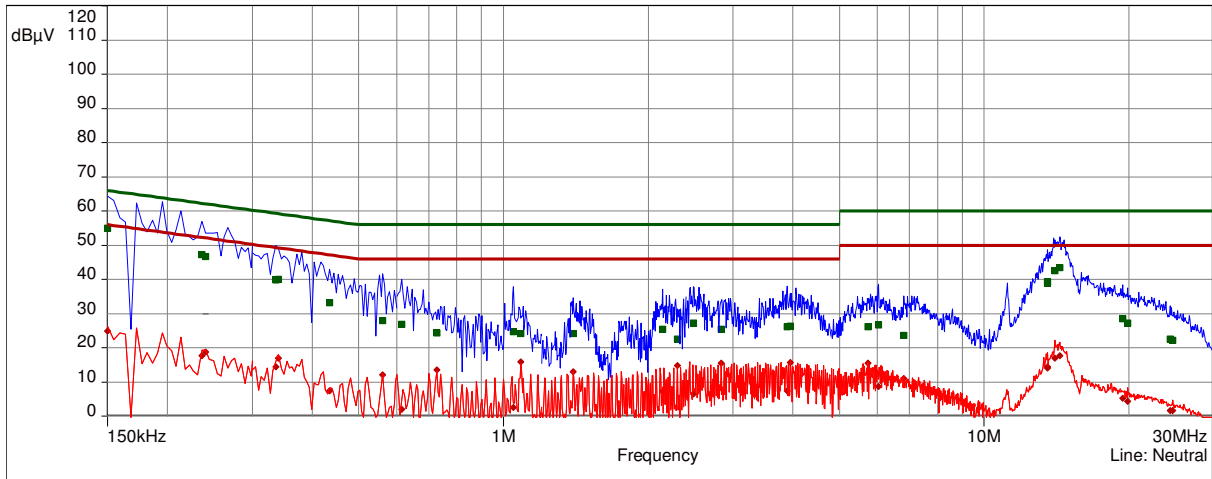
| freq | QP | margin | limit | AV | margin | limit | line | corr |
|---------|--------|--------|-------|--------|--------|-------|---------|-------|
| MHz | dB(μV) | dB | dB | dB(μV) | dB | dB | | dB |
| 13.515 | 33.46 | 26.54 | 60.00 | 9.72 | 40.28 | 50.00 | Phase 1 | 10.05 |
| 13.551 | 32.98 | 27.02 | 60.00 | 9.60 | 40.40 | 50.00 | Phase 1 | 10.05 |
| 14.253 | 38.03 | 21.97 | 60.00 | 13.00 | 37.00 | 50.00 | Phase 1 | 10.08 |
| 14.505 | 37.54 | 22.46 | 60.00 | 12.11 | 37.89 | 50.00 | Phase 1 | 10.10 |
| 20.7705 | 28.10 | 31.90 | 60.00 | 13.70 | 36.30 | 50.00 | Phase 1 | 10.34 |
| 20.7795 | 28.01 | 31.99 | 60.00 | 13.38 | 36.62 | 50.00 | Phase 1 | 10.34 |
| 24.2175 | 18.79 | 41.21 | 60.00 | -0.30 | 50.30 | 50.00 | Phase 1 | 10.35 |
| 24.2265 | 19.56 | 40.44 | 60.00 | 1.40 | 48.60 | 50.00 | Phase 1 | 10.35 |

FCC ID: YBU28010X9X3

Test point: N
 Operation mode: TX mode (918.3MHz, bidirectional)
 Remarks: none

Result: PASS

- CISPR 22/CISPR22 B - Average/
- CISPR 22/CISPR22 B - QPeak/
- Meas.Peak (Neutral)
- Meas.Avg (Neutral)
- QuasiPeak (Finals) (Neutral)
- Average (Finals) (Neutral)



CISPR 22/CISPR22B

| freq MHz | QP dB(µV) | margin dB | limit dB | AV dB(µV) | margin dB | limit dB | line | corr dB |
|-------------|--------------|--------------|-------------|--------------|--------------|-------------|---------|------------|
| 0.15 | 54.91 | 11.09 | 66.00 | 24.79 | 31.21 | 56.00 | Neutral | 9.83 |
| 0.2355 | 47.25 | 15.01 | 62.25 | 17.66 | 34.59 | 52.25 | Neutral | 9.82 |
| 0.24 | 46.67 | 15.43 | 62.10 | 18.84 | 33.26 | 52.10 | Neutral | 9.82 |
| 0.336 | 39.92 | 19.38 | 59.30 | 14.36 | 34.94 | 49.30 | Neutral | 9.80 |
| 0.3405 | 40.06 | 19.13 | 59.19 | 16.91 | 32.28 | 49.19 | Neutral | 9.80 |
| 0.435 | 33.19 | 23.97 | 57.16 | 7.48 | 39.68 | 47.16 | Neutral | 9.80 |
| 0.561 | 27.96 | 28.04 | 56.00 | 12.13 | 33.87 | 46.00 | Neutral | 9.81 |
| 0.6135 | 26.92 | 29.08 | 56.00 | 1.99 | 44.01 | 46.00 | Neutral | 9.80 |
| 0.726 | 24.35 | 31.65 | 56.00 | 13.44 | 32.56 | 46.00 | Neutral | 9.79 |
| 1.05 | 24.69 | 31.31 | 56.00 | 2.51 | 43.49 | 46.00 | Neutral | 9.80 |
| 1.086 | 24.15 | 31.85 | 56.00 | 15.94 | 30.06 | 46.00 | Neutral | 9.80 |
| 1.398 | 24.23 | 31.77 | 56.00 | 12.94 | 33.06 | 46.00 | Neutral | 9.78 |
| 2.1405 | 25.40 | 30.60 | 56.00 | 7.24 | 38.76 | 46.00 | Neutral | 9.80 |
| 2.298 | 22.52 | 33.48 | 56.00 | 14.75 | 31.25 | 46.00 | Neutral | 9.79 |
| 2.4855 | 27.23 | 28.77 | 56.00 | 6.41 | 39.59 | 46.00 | Neutral | 9.78 |
| 2.8365 | 25.41 | 30.59 | 56.00 | 15.47 | 30.53 | 46.00 | Neutral | 9.78 |
| 3.8985 | 26.22 | 29.78 | 56.00 | 7.34 | 38.66 | 46.00 | Neutral | 9.81 |
| 3.957 | 26.26 | 29.74 | 56.00 | 15.61 | 30.39 | 46.00 | Neutral | 9.81 |
| 5.736 | 26.19 | 33.81 | 60.00 | 15.56 | 34.44 | 50.00 | Neutral | 9.81 |
| 6.033 | 26.67 | 33.33 | 60.00 | 8.73 | 41.27 | 50.00 | Neutral | 9.82 |
| 6.816 | 23.63 | 36.37 | 60.00 | 11.02 | 38.98 | 50.00 | Neutral | 9.81 |
| 13.542 | 39.20 | 20.80 | 60.00 | 14.03 | 35.97 | 50.00 | Neutral | 9.90 |
| 13.551 | 38.95 | 21.05 | 60.00 | 14.38 | 35.62 | 50.00 | Neutral | 9.90 |
| 14.055 | 42.52 | 17.48 | 60.00 | 17.00 | 33.00 | 50.00 | Neutral | 9.91 |
| 14.379 | 43.41 | 16.59 | 60.00 | 17.68 | 32.32 | 50.00 | Neutral | 9.93 |

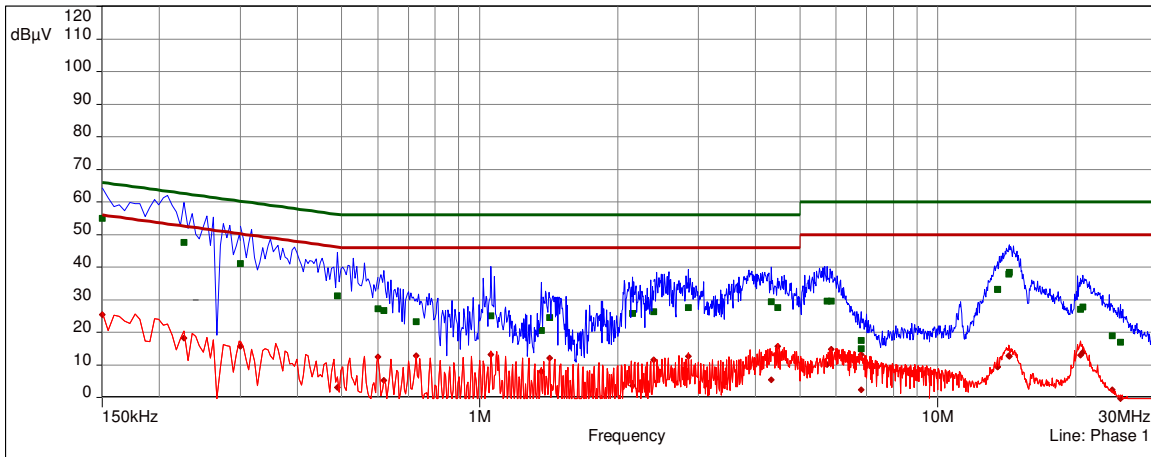
FCC ID: YBU28010X9X3

| freq | QP | margin | limit | AV | margin | limit | line | corr |
|---------|--------------|--------|-------|--------------|--------|-------|---------|-------|
| MHz | dB(μ V) | dB | dB | dB(μ V) | dB | dB | | dB |
| 19.4205 | 28.41 | 31.59 | 60.00 | 5.21 | 44.79 | 50.00 | Neutral | 10.10 |
| 19.902 | 27.27 | 32.73 | 60.00 | 4.40 | 45.60 | 50.00 | Neutral | 10.13 |
| 24.3795 | 22.45 | 37.55 | 60.00 | 1.64 | 48.36 | 50.00 | Neutral | 9.96 |
| 24.699 | 22.16 | 37.84 | 60.00 | 1.56 | 48.44 | 50.00 | Neutral | 9.95 |

Test point: L1
 Operation mode: RX mode (915.3MHz, unidirectional)
 Remarks: none

Result: PASS

- CISPR 22/CISPR22 B - Average/
- CISPR 22/CISPR22 B - QPeak/
- Meas.Peak (Phase 1)
- Meas.Avg (Phase 1)
- QuasiPeak (Finals) (Phase 1)
- Average (Finals) (Phase 1)



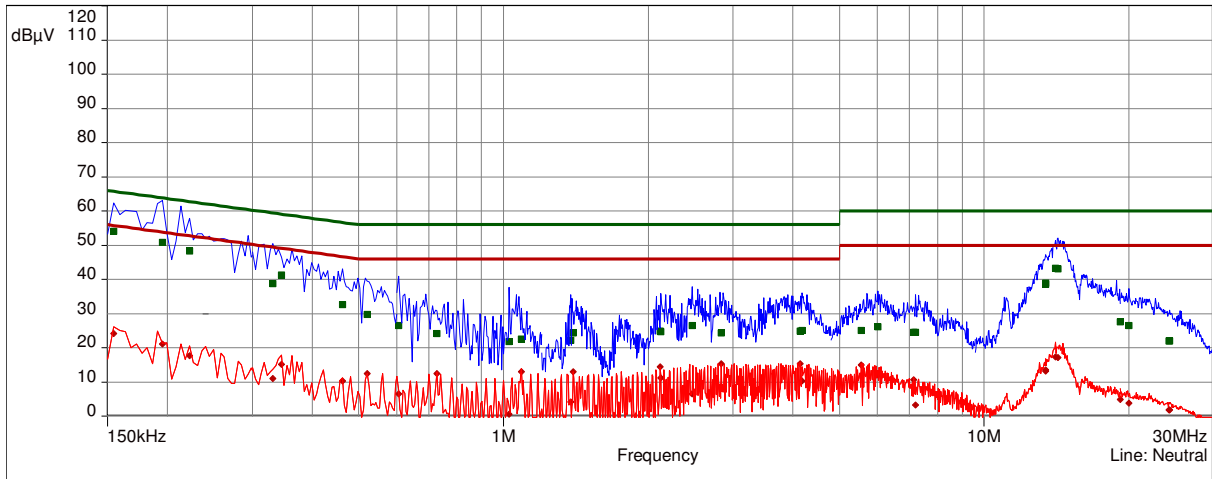
CISPR 22/CISPR22B

| freq MHz | QP dB(µV) | margin dB | limit dB | AV dB(µV) | margin dB | limit dB | line | corr dB |
|-------------|--------------|--------------|-------------|--------------|--------------|-------------|---------|------------|
| 0.15 | 54.97 | 11.03 | 66.00 | 25.48 | 30.52 | 56.00 | Phase 1 | 9.83 |
| 0.2265 | 47.65 | 14.93 | 62.58 | 18.26 | 34.32 | 52.58 | Phase 1 | 9.81 |
| 0.3 | 41.10 | 19.15 | 60.24 | 15.61 | 34.64 | 50.24 | Phase 1 | 9.80 |
| 0.489 | 31.21 | 24.97 | 56.18 | 3.14 | 43.05 | 46.18 | Phase 1 | 9.80 |
| 0.6 | 27.28 | 28.72 | 56.00 | 12.48 | 33.52 | 46.00 | Phase 1 | 9.80 |
| 0.618 | 26.63 | 29.37 | 56.00 | 5.20 | 40.80 | 46.00 | Phase 1 | 9.80 |
| 0.726 | 23.21 | 32.79 | 56.00 | 12.72 | 33.28 | 46.00 | Phase 1 | 9.79 |
| 1.059 | 24.97 | 31.03 | 56.00 | 13.10 | 32.90 | 46.00 | Phase 1 | 9.80 |
| 1.362 | 20.55 | 35.45 | 56.00 | 7.87 | 38.13 | 46.00 | Phase 1 | 9.78 |
| 1.4205 | 24.55 | 31.45 | 56.00 | 12.03 | 33.97 | 46.00 | Phase 1 | 9.78 |
| 2.154 | 25.70 | 30.30 | 56.00 | 3.61 | 42.39 | 46.00 | Phase 1 | 9.80 |
| 2.4 | 26.33 | 29.67 | 56.00 | 11.60 | 34.40 | 46.00 | Phase 1 | 9.79 |
| 2.859 | 27.52 | 28.48 | 56.00 | 12.56 | 33.44 | 46.00 | Phase 1 | 9.79 |
| 4.326 | 29.34 | 26.66 | 56.00 | 5.51 | 40.49 | 46.00 | Phase 1 | 9.81 |
| 4.479 | 27.59 | 28.41 | 56.00 | 15.72 | 30.28 | 46.00 | Phase 1 | 9.81 |
| 5.7405 | 29.49 | 30.51 | 60.00 | 10.04 | 39.96 | 50.00 | Phase 1 | 9.83 |
| 5.8575 | 29.51 | 30.49 | 60.00 | 14.75 | 35.25 | 50.00 | Phase 1 | 9.84 |
| 6.798 | 17.53 | 42.47 | 60.00 | 13.24 | 36.76 | 50.00 | Phase 1 | 9.84 |
| 6.8115 | 15.06 | 44.94 | 60.00 | 2.29 | 47.71 | 50.00 | Phase 1 | 9.84 |
| 13.5105 | 33.20 | 26.80 | 60.00 | 9.35 | 40.65 | 50.00 | Phase 1 | 10.05 |
| 13.515 | 33.21 | 26.79 | 60.00 | 9.33 | 40.67 | 50.00 | Phase 1 | 10.05 |
| 14.289 | 37.93 | 22.07 | 60.00 | 12.82 | 37.18 | 50.00 | Phase 1 | 10.09 |
| 14.3295 | 38.34 | 21.66 | 60.00 | 12.69 | 37.31 | 50.00 | Phase 1 | 10.09 |
| 20.496 | 27.10 | 32.90 | 60.00 | 12.98 | 37.02 | 50.00 | Phase 1 | 10.34 |
| 20.7075 | 27.70 | 32.30 | 60.00 | 13.89 | 36.11 | 50.00 | Phase 1 | 10.34 |
| 24.006 | 18.98 | 41.02 | 60.00 | 2.38 | 47.62 | 50.00 | Phase 1 | 10.35 |
| 25.0815 | 16.96 | 43.04 | 60.00 | -1.04 | 51.04 | 50.00 | Phase 1 | 10.36 |

Test point: N
 Operation mode: RX mode (915.3MHz, unidirectional)
 Remarks: none

Result: PASS

- CISPR 22/CISPR22 B - Average/
- CISPR 22/CISPR22 B - QPeak/
- Meas.Peak (Neutral)
- Meas.Avg (Neutral)
- QuasiPeak (Finals) (Neutral)
- Average (Finals) (Neutral)



CISPR 22/CISPR22B

| freq | QP | margin | limit | AV | margin | limit | line | corr |
|--------|--------|--------|-------|--------|--------|-------|---------|------|
| MHz | dB(µV) | dB | dB | dB(µV) | dB | dB | | dB |
| 0.1545 | 54.00 | 11.75 | 65.75 | 24.19 | 31.56 | 55.75 | Neutral | 9.83 |
| 0.195 | 50.85 | 12.98 | 63.82 | 21.04 | 32.78 | 53.82 | Neutral | 9.83 |
| 0.222 | 48.22 | 14.52 | 62.74 | 17.63 | 35.12 | 52.74 | Neutral | 9.83 |
| 0.3315 | 38.73 | 20.69 | 59.41 | 10.99 | 38.42 | 49.41 | Neutral | 9.80 |
| 0.345 | 41.35 | 17.73 | 59.08 | 15.12 | 33.97 | 49.08 | Neutral | 9.80 |
| 0.462 | 32.70 | 23.96 | 56.66 | 10.32 | 36.33 | 46.66 | Neutral | 9.80 |
| 0.5205 | 29.77 | 26.23 | 56.00 | 12.51 | 33.49 | 46.00 | Neutral | 9.80 |
| 0.6045 | 26.49 | 29.51 | 56.00 | 6.42 | 39.58 | 46.00 | Neutral | 9.80 |
| 0.726 | 24.18 | 31.82 | 56.00 | 12.48 | 33.52 | 46.00 | Neutral | 9.79 |
| 1.0275 | 21.76 | 34.24 | 56.00 | 0.59 | 45.41 | 46.00 | Neutral | 9.80 |
| 1.0905 | 22.49 | 33.51 | 56.00 | 12.98 | 33.02 | 46.00 | Neutral | 9.80 |
| 1.38 | 22.11 | 33.89 | 56.00 | 4.20 | 41.80 | 46.00 | Neutral | 9.78 |
| 1.398 | 24.34 | 31.66 | 56.00 | 12.95 | 33.05 | 46.00 | Neutral | 9.78 |
| 2.118 | 24.88 | 31.12 | 56.00 | 14.37 | 31.63 | 46.00 | Neutral | 9.80 |
| 2.1225 | 24.61 | 31.39 | 56.00 | 11.16 | 34.84 | 46.00 | Neutral | 9.80 |
| 2.472 | 26.43 | 29.57 | 56.00 | 6.45 | 39.55 | 46.00 | Neutral | 9.78 |
| 2.8365 | 24.36 | 31.64 | 56.00 | 15.40 | 30.60 | 46.00 | Neutral | 9.78 |
| 4.137 | 24.95 | 31.05 | 56.00 | 15.41 | 30.59 | 46.00 | Neutral | 9.80 |
| 4.182 | 25.00 | 31.00 | 56.00 | 10.27 | 35.73 | 46.00 | Neutral | 9.80 |
| 5.556 | 25.07 | 34.93 | 60.00 | 14.98 | 35.02 | 50.00 | Neutral | 9.81 |
| 6.0195 | 26.08 | 33.92 | 60.00 | 12.11 | 37.89 | 50.00 | Neutral | 9.82 |
| 7.1355 | 24.51 | 35.49 | 60.00 | 10.72 | 39.28 | 50.00 | Neutral | 9.82 |
| 7.2075 | 24.54 | 35.46 | 60.00 | 3.28 | 46.72 | 50.00 | Neutral | 9.82 |
| 13.416 | 38.52 | 21.48 | 60.00 | 13.25 | 36.75 | 50.00 | Neutral | 9.90 |
| 13.434 | 39.00 | 21.00 | 60.00 | 13.50 | 36.50 | 50.00 | Neutral | 9.90 |

FCC ID: YBU28010X9X3

| freq | QP | margin | limit | AV | margin | limit | line | corr |
|---------|--------------|--------|-------|--------------|--------|-------|---------|-------|
| MHz | dB(μ V) | dB | dB | dB(μ V) | dB | dB | | dB |
| 14.1 | 43.22 | 16.78 | 60.00 | 17.31 | 32.69 | 50.00 | Neutral | 9.91 |
| 14.262 | 43.07 | 16.93 | 60.00 | 17.15 | 32.85 | 50.00 | Neutral | 9.92 |
| 19.2135 | 27.58 | 32.42 | 60.00 | 4.81 | 45.19 | 50.00 | Neutral | 10.09 |
| 20.0145 | 26.47 | 33.53 | 60.00 | 3.84 | 46.16 | 50.00 | Neutral | 10.13 |
| 24.2715 | 21.96 | 38.04 | 60.00 | 1.75 | 48.25 | 50.00 | Neutral | 9.96 |
| 24.3345 | 22.02 | 37.98 | 60.00 | 1.82 | 48.18 | 50.00 | Neutral | 9.96 |

5.2 Field strength of fundamental

For test instruments and accessories used see section 6 Part CPR 2.

5.2.1 Description of the test location

Test location: OATS 3
Test distance: 3 m

5.2.2 Photo documentation of the test set-up

Refer to document T40733-02JP Attachment A

5.2.1 Applicable standard

According to FCC Part 15C, Section 15.249(a):

5.2.2 Test result

| Frequency (MHz) | Reading QP Vert. (dB μ V) | Reading QP Hor. (dB μ V) | Correct. Vert. (dB) | Correct. Hor. (dB) | Level QP Vert. (dB μ V/m) | Level QP Hor. (dB μ V/m) | QP Limit (dB μ V/m) | Dlimit (dB) |
|-----------------|-------------------------------|------------------------------|---------------------|--------------------|-------------------------------|------------------------------|-------------------------|-------------|
| 918,30 | 60,2 | 66,7 | 27,0 | 27,0 | 87,2 | 93,7 | 94,0 | -0,3 |

Note: The correction factor includes cable loss and antenna factor.

Limit according to FCC Part 15C, Section 15.249(a):

| Frequency (MHz) | Field strength of fundamental | |
|------------------|-------------------------------|----------------|
| | (mV/m) | dB(μ V/m) |
| 902 - 928 | 50 | 94 |
| 2400 - 2483.5 | 50 | 94 |
| 5725-5875 | 50 | 94 |
| 24000 - 24250 | 250 | 108 |

The requirements are **FULFILLED**.

Remarks: Measurement was made in all three orthogonal axes. Module integrated in host.

No TX functionality in the frequency band 915,3MHz.

5.3 Out-of-band emission, radiated

For test instruments and accessories used see section 6 Part SER 2 and SER 3.

5.3.1 Description of the test location

Test location: OATS 3
 Test location: Anechoic chamber 1
 Test distance: 3 m

5.3.2 Photo documentation of the test set-up

Refer to document T40733-02JP Attachment A

5.3.3 Applicable standard

According to FCC Part 15C, Section 15.249 (d) and FCC Part 15C, Section 15.209

5.3.4 RX mode (918.3MHz, bidirectional)

5.3.4.1 Test result f < 1 GHz

| Frequency (MHz) | Reading QP Vert. (dBµV) | Reading QP Hor. (dBµV) | Correct. Vert. (dB) | Correct. Hor. (dB) | Level QP Vert. (dBµV/m) | Level QP Hor. (dBµV/m) | QP Limit (dBµV/m) | Dlimit (dB) |
|-----------------|-------------------------|------------------------|---------------------|--------------------|-------------------------|------------------------|-------------------|-------------|
| 48,25 | 6,0 | -0,8 | 15,3 | 15,3 | 21,3 | 14,5 | 40,0 | -18,7 |
| 78,53 | 9,2 | 6,1 | 11,0 | 11,0 | 20,2 | 17,1 | 40,0 | -19,8 |
| 143,98 | 10,1 | 5,8 | 10,7 | 10,7 | 20,8 | 16,5 | 43,5 | -22,7 |
| 231,25 | 11,0 | 9,4 | 14,6 | 14,6 | 25,6 | 24,0 | 46,0 | -20,4 |

5.3.4.2 Test result f > 1 GHz

| Frequency (MHz) | Reading PK Vert. (dBµV) | Reading PK Hor. (dBµV) | Correct. Vert. (dB) | Correct. Hor. (dB) | Level PK Vert. (dBµV/m) | Level PK Hor. (dBµV/m) | Limit AV (dBµV/m) | Dlimit (dB) |
|-----------------|-------------------------|------------------------|---------------------|--------------------|-------------------------|------------------------|-------------------|-------------|
| 1888,00 | -- | 58,8 | -- | -11,2 | -- | 47,6 | 54,0 | -6,4 |
| 1990,00 | 50,0 | 58,0 | -11,8 | -11,8 | 38,1 | 46,2 | 54,0 | -7,8 |
| 4144,00 | 44,4 | 45,1 | 2,9 | 2,9 | 47,3 | 48,0 | 54,0 | -6,0 |

5.3.5 TX mode (918.3MHz, bidirectional)
5.3.5.1 Test result f < 1 GHz

| Frequency (MHz) | Reading QP Vert. (dBµV) | Reading QP Hor. (dBµV) | Correct. Vert. (dB) | Correct. Hor. (dB) | Level QP Vert. (dBµV/m) | Level QP Hor. (dBµV/m) | QP Limit (dBµV/m) | Dlimit (dB) |
|-----------------|-------------------------|------------------------|---------------------|--------------------|-------------------------|------------------------|-------------------|-------------|
| 48,25 | 5,2 | -1,2 | 15,3 | 15,3 | 20,5 | 14,1 | 40,0 | -19,5 |
| 143,98 | 9,3 | 5,7 | 10,7 | 10,7 | 20,0 | 16,4 | 43,5 | -23,5 |
| 231,25 | 10,4 | 8,7 | 14,6 | 14,6 | 25,0 | 23,3 | 46,0 | -21,0 |

5.3.5.2 Test result f > 1 GHz

| Frequency (MHz) | Reading PK Vert. (dBµV) | Reading PK Hor. (dBµV) | Correct. Vert. (dB) | Correct. Hor. (dB) | Level PK Vert. (dBµV/m) | Level PK Hor. (dBµV/m) | Limit AV (dBµV/m) | Dlimit (dB) |
|-----------------|-------------------------|------------------------|---------------------|--------------------|-------------------------|------------------------|-------------------|-------------|
| 1836,60 | 64,0 | 62,3 | -11,7 | -11,7 | 52,3 | 50,6 | 54,0 | -1,7 |
| 2026,00 | 56,8 | -- | -12,1 | -- | 44,7 | -- | 54,0 | -9,3 |
| 5509,80 | 49,2 | 46,1 | 4,5 | 4,5 | 53,7 | 50,6 | 54,0 | -0,3 |
| 6428,10 | 46,8 | 44,7 | 6,7 | 6,7 | 53,5 | 51,4 | 54,0 | -0,5 |
| 7346,40 | -- | 45,0 | -- | 7,1 | -- | 52,1 | 54,0 | -1,9 |

5.3.6 RX mode (915.3MHz, unidirectional)
5.3.6.1 Test result f < 1 GHz

| Frequency (MHz) | Reading QP Vert. (dBµV) | Reading QP Hor. (dBµV) | Correct. Vert. (dB) | Correct. Hor. (dB) | Level QP Vert. (dBµV/m) | Level QP Hor. (dBµV/m) | QP Limit (dBµV/m) | Dlimit (dB) |
|-----------------|-------------------------|------------------------|---------------------|--------------------|-------------------------|------------------------|-------------------|-------------|
| 48,25 | 6,3 | -0,5 | 15,3 | 15,3 | 21,6 | 14,8 | 40,0 | -18,4 |
| 78,53 | 10,1 | 6,4 | 11,0 | 11,0 | 21,1 | 17,4 | 40,0 | -18,9 |
| 143,98 | 10,0 | 5,8 | 10,7 | 10,7 | 20,7 | 16,5 | 43,5 | -22,8 |
| 231,25 | 11,1 | 9,3 | 14,6 | 14,6 | 25,7 | 23,9 | 46,0 | -20,3 |

5.3.6.2 Test result f > 1 GHz

| Frequency (MHz) | Reading PK Vert. (dBµV) | Reading PK Hor. (dBµV) | Correct. Vert. (dB) | Correct. Hor. (dB) | Level PK Vert. (dBµV/m) | Level PK Hor. (dBµV/m) | Limit AV (dBµV/m) | Dlimit (dB) |
|-----------------|-------------------------|------------------------|---------------------|--------------------|-------------------------|------------------------|-------------------|-------------|
| 1888,00 | -- | 58,2 | -- | -11,2 | -- | 47,0 | 54,0 | -7,0 |
| 1990,00 | 49,7 | 58,3 | -11,8 | -11,8 | 37,9 | 46,5 | 54,0 | -7,5 |
| 4144,00 | 43,6 | 45,8 | 2,9 | 2,9 | 46,5 | 48,7 | 54,0 | -5,3 |

FCC ID: YBU28010X9X3

Limit according to FCC Part 15C, Section 15.209:

| Frequency (MHz) | Limit ($\mu\text{V/m}$) | Measurement distance (m) |
|-----------------|---------------------------|--------------------------|
| 0.009 - -0.49 | 2400/f(kHz) | 300 |
| 0.49 - 1.705 | 24000/f(kHz) | 30 |
| 1.705 - 30.0 | 30 | 30 |
| 30 - 88 | 100 | 3 |
| 88 - 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

Limit according to FCC Part 15C, Section 15.249(a):

| Fundamental frequency (MHz) | Field strength of harmonics | |
|-----------------------------|-----------------------------|-----------------------|
| | ($\mu\text{V/m}$) | dB($\mu\text{V/m}$) |
| 902 - 928 | 500 | 54 |
| 2400 - 2483.5 | 500 | 54 |
| 5725 - 5875 | 500 | 54 |
| 24000 - 24250 | 2500 | 68 |

The requirements are **FULFILLED**.

Remarks: The measurement was performed up to the 10th harmonic (10GHz).
All peak values were below average limit, therefore no average measurement was performed.
Measurement was made in all three orthogonal axes.

5.4 20dB bandwidth

For test instruments and accessories used see section 6 Part MB.

5.4.1 Description of the test location

Test location: AREA4

5.4.2 Photo documentation of the test set-up

Refer to document T40733-02JP Attachment A

5.4.3 Applicable standard

According to FCC Part 15, Section 15.215(c):

5.4.4 Test result

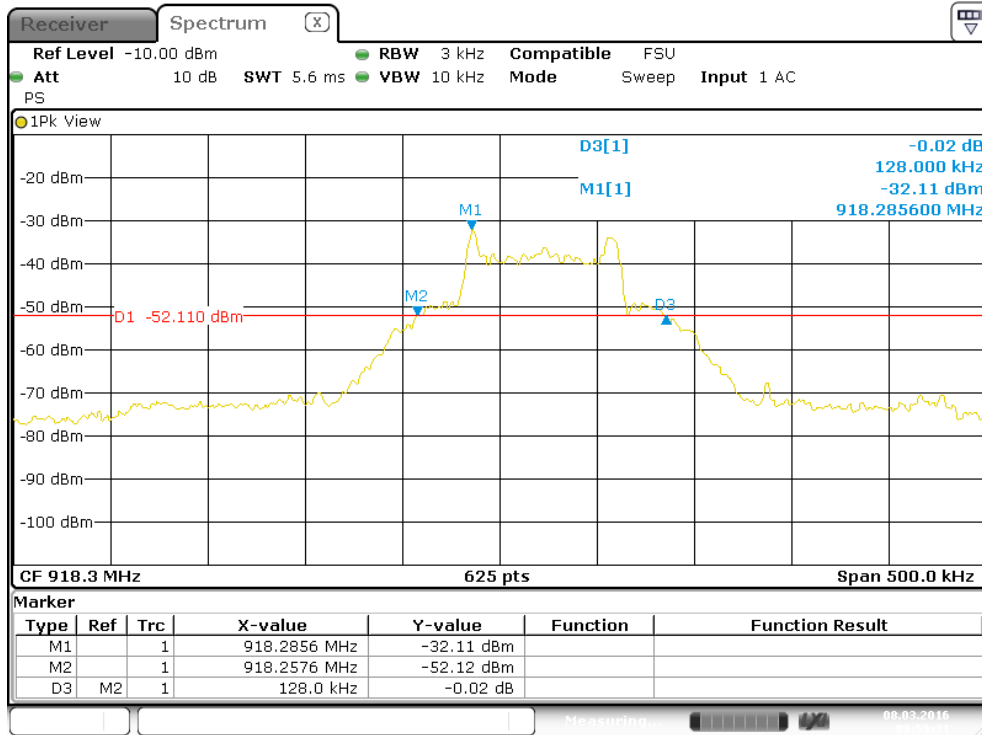
| TX frequency (MHz) | 20 dB Bandwidth (MHz) |
|-----------------------|--------------------------|
| 918.3 | 0.128 |

The requirements are **FULFILLED**.

Remarks: Module integrated in host.

5.4.5 Test protocols

20 dB bandwidth



6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

| Test ID | Model Type | Equipment No. | Next Calib. | Last Calib. | Next Verif. | Last Verif. |
|----------------|--------------------------------|----------------------|--------------------|--------------------|--------------------|--------------------|
| A 4 | ESCI | 02-02/03-05-004 | 12/09/2017 | 12/09/2016 | | |
| | ESH 2 - Z 5 | 02-02/20-05-004 | 26/10/2017 | 26/10/2015 | 24/05/2017 | 24/11/2016 |
| | N-4000-BNC | 02-02/50-05-138 | | | | |
| | N-1500-N | 02-02/50-05-140 | | | | |
| | ESH 3 - Z 2 | 02-02/50-05-155 | 18/11/2019 | 18/11/2016 | 18/05/2017 | 18/11/2016 |
| CPR 2 | VULB 9163 | 01-02/24-01-006 | 17/11/2017 | 17/11/2014 | 07/01/2017 | 07/07/2016 |
| | N-40000-N | 01-02/50-05-043 | | | | |
| | N-30000-N | 01-02/50-05-044 | | | | |
| | ESVS 30 | 02-02/03-05-006 | 04/07/2017 | 04/07/2016 | | |
| MB | ESR 7 | 02-02/03-13-001 | 15/06/2017 | 15/06/2016 | | |
| SER 2 | VULB 9163 | 01-02/24-01-006 | 17/11/2017 | 17/11/2014 | 07/01/2017 | 07/07/2016 |
| | N-40000-N | 01-02/50-05-043 | | | | |
| | N-30000-N | 01-02/50-05-044 | | | | |
| | ESVS 30 | 02-02/03-05-006 | 04/07/2017 | 04/07/2016 | | |
| SER 3 | FSP 30 | 02-02/11-05-001 | 06/10/2017 | 06/10/2016 | | |
| | AFS5-12001800-18-10P-6 | 02-02/17-06-002 | | | | |
| | AFS4-01000400-10-10P-4 | 02-02/17-13-002 | | | | |
| | AMF-4F-04001200-15-10P 3117 | 02-02/17-13-003 | | | | |
| | Sucoflex N-2000-SMA | 02-02/24-05-009 | 24/05/2017 | 24/05/2016 | | |
| | SF104/11N/11N/1500MM | 02-02/50-05-075 | | | | |
| | | | 02-02/50-13-015 | | | |