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

Contents

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 (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

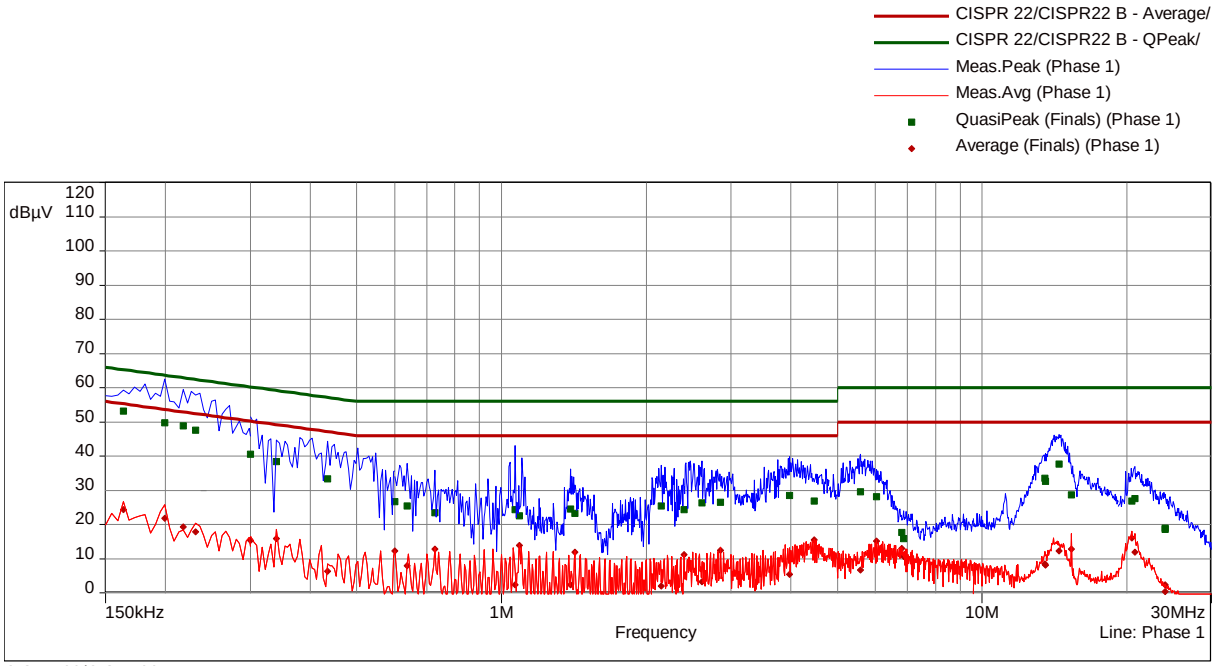
* Decreases with the logarithm of the frequency

The requirements are **FULFILLED.**

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

5.1.5 Test protocol

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

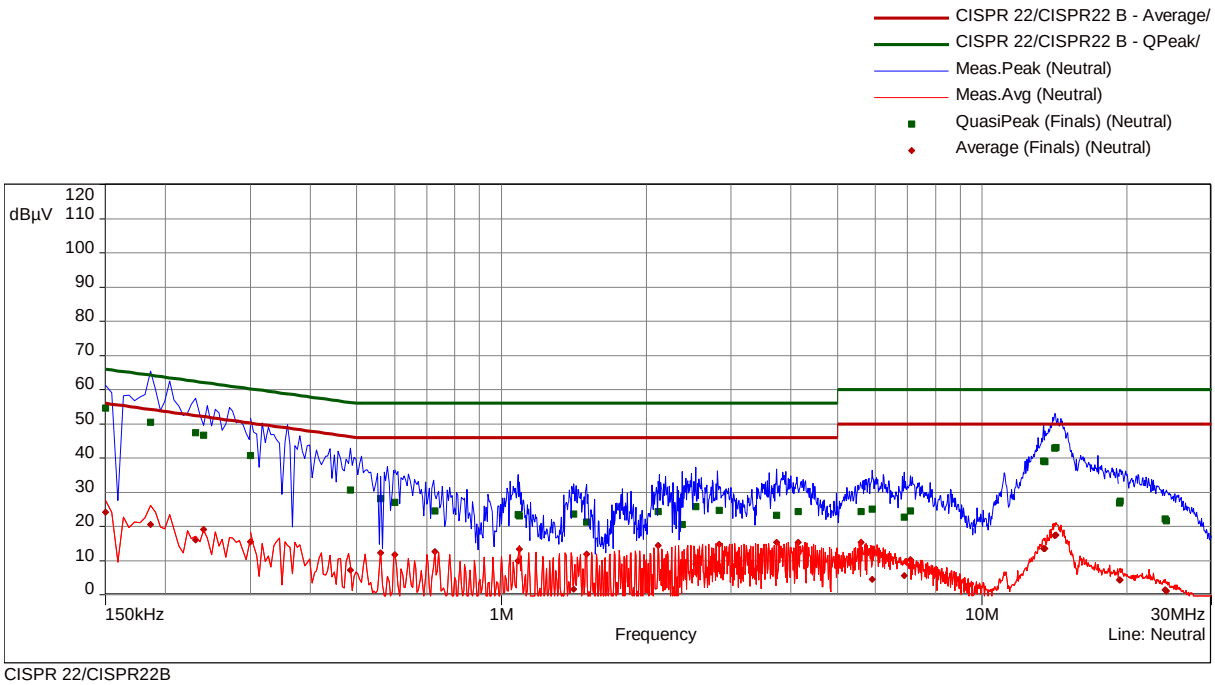


CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		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

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	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 Result: PASS
Operation mode: RX mode (918.3MHz, bidirectional)
Remarks: none



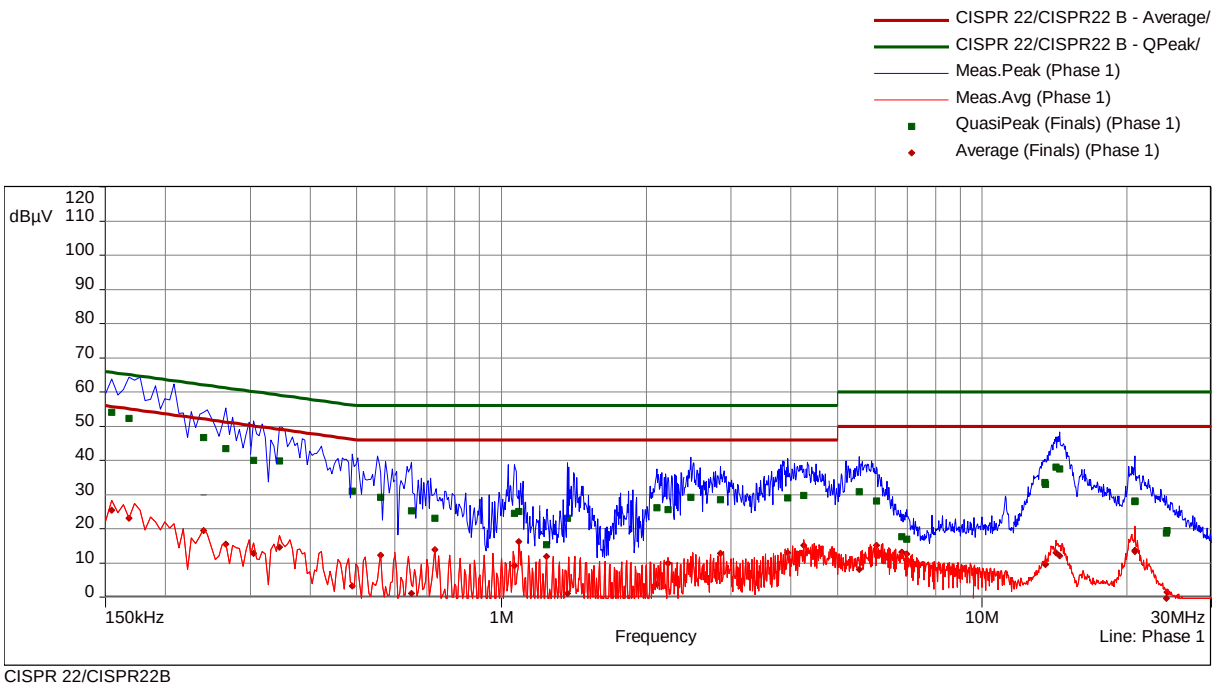
CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		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

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	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

FCC ID: YBU28010X9X3

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



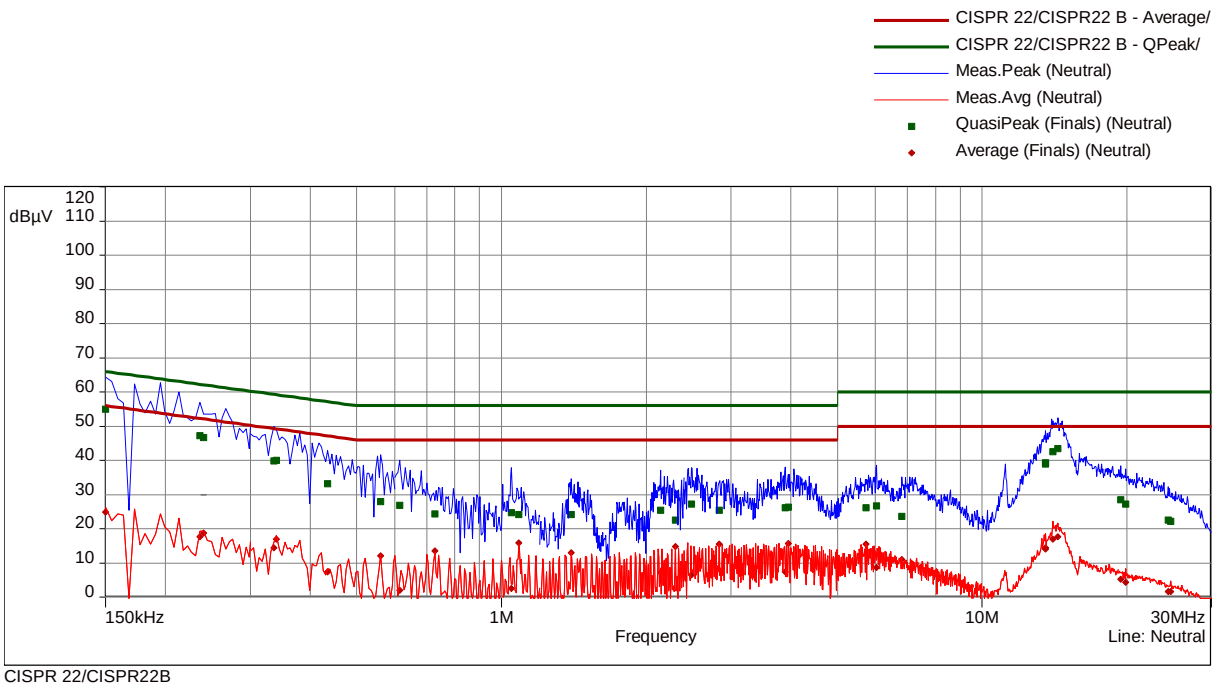
CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		dB
0.1545	54.15	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

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 Result: PASS
Operation mode: TX mode (918.3MHz, bidirectional)
Remarks: none

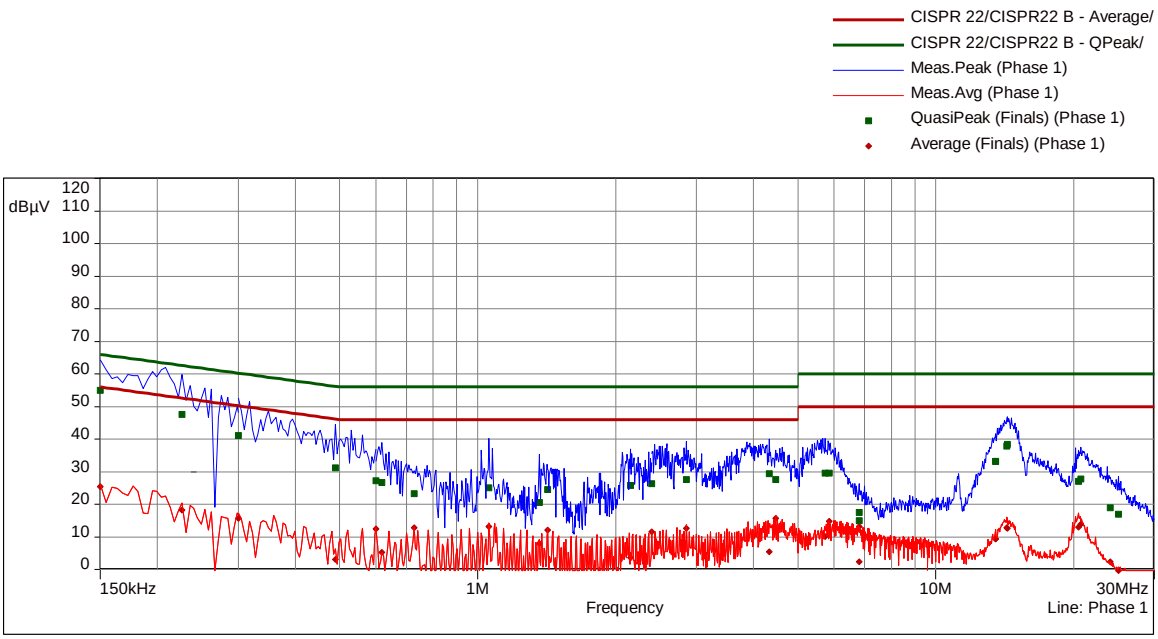


CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		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

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	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

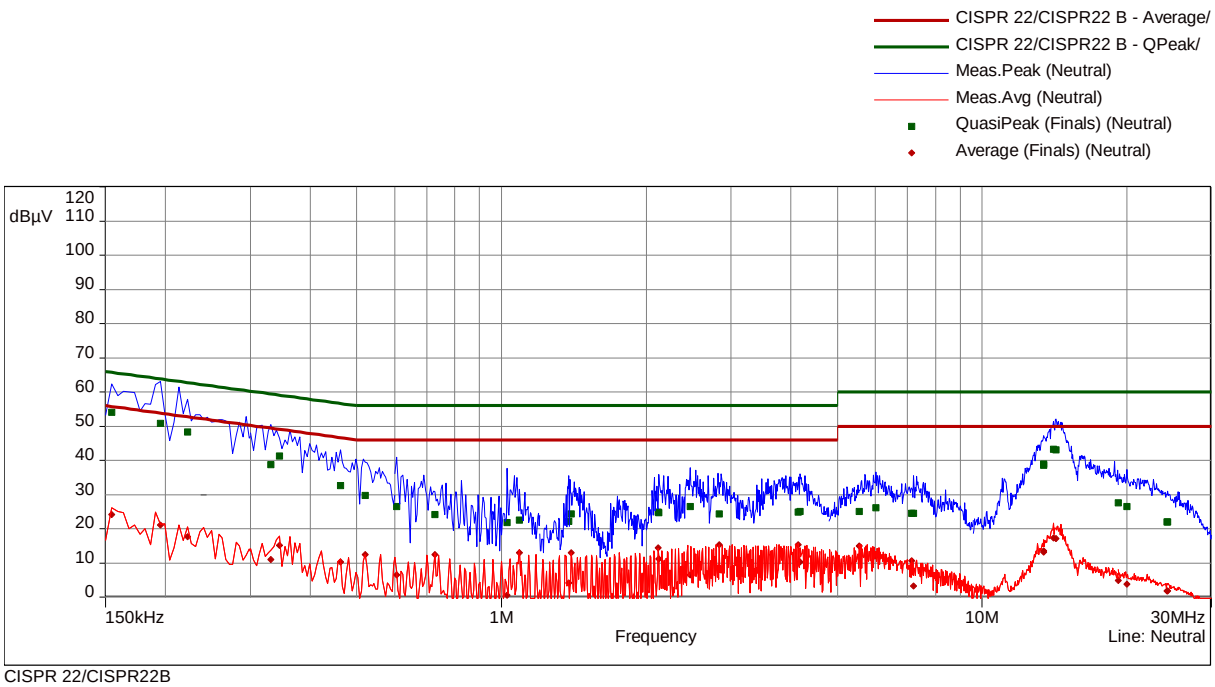
Test point L1 Result: PASS
Operation mode: RX mode (915.3MHz, unidirectional)
Remarks: none



CISPR 22/CISPR22B

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB		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 Result: PASS
Operation mode: RX mode (915.3MHz, unidirectional)
Remarks: none



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

freq	QP	margin	limit	AV	margin	limit	line	corr
MHz	dB(µV)	dB	dB	dB(µV)	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. (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)
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	Field strength of fundamental	
(MHz)	(mV/m)	dB(µV/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

Limit according to FCC Part 15C, Section 15.209:

Frequency (MHz)	Limit (µV/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	Field strength of harmonics	
(MHz)	(µV/m)	dB(µV/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

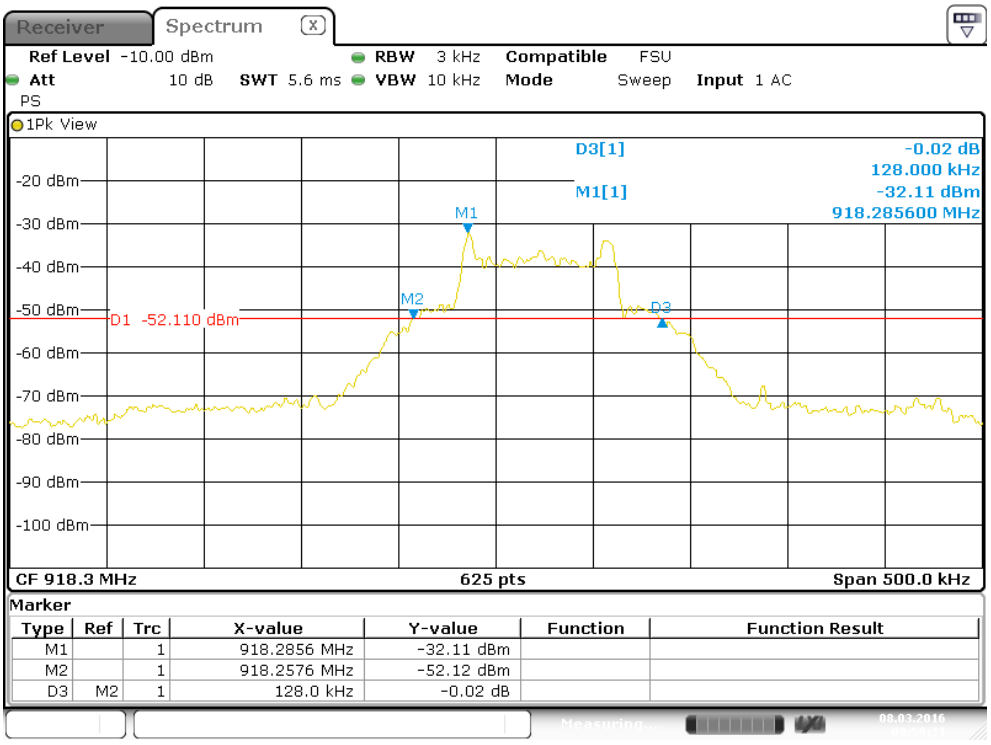
TX frequency (MHz)	20 dB Bandwidth (MHz)
918.3	0.128

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	02-02/17-13-003				
	3117	02-02/24-05-009	24/05/2017	24/05/2016		
	Sucoflex N-2000-SMA	02-02/50-05-075				
	SF104/11N/11N/1500MM	02-02/50-13-015				