RF – TEST REPORT

- FCC Part 15.247, RSS-247 -

Type / Model Name	:	795C
Product Description	:	Remote Control with BLE
Applicant	:	ruwido austria GmbH
Address	:	Köstendorfer Straße 8
		5202 Neumarkt, AUSTRIA
Manufacturer	:	ruwido austria GmbH
Address	:	Köstendorfer Straße 8
		5202 Neumarkt, AUSTRIA

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

Test Report No. :	**80124569-01 Rev_1**	03. August 2022 Date of issue

Deutsche Akkreditierungsstelle
D-PL-12030-01-03
D-PL-12030-01-04

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FCC ID: XYN795C

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (September 2021)

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (September 2021)

Part 15, Subpart C, Section 15.203	Antenna requirement
Part 15, Subpart C, Section 15.204 modifications	External radio frequency power amplifiers and antenna
Part 15, Subpart C, Section 15.205	Restricted bands of operation
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 15.247	Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz

ANSI C63.10: 2013	Testing Unlicensed Wireless Devices
ETSI TR 100 028 V1.3.1: 2001-03,	Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Uncertainties in the Measurement of Mobile Radio Equipment Characteristics—Part 1 and Part 2
KDB 558074 D01 v05r02	Guidance for compliance measurements on DTS; FHSS and hybrid system devices operating under Section 15.247 of the FCC rules, April 2, 2019.

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2 EQUIPMENT UNDER TEST

2.1 Information provided by the Client

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

2.2 Sampling

The customer is responsible for the choice of sample. Sample configuration, start-up and operation is carried out by the customer or according his/her instructions.

2.3 General remarks

2.4 Photo documentation of the EUT – Detailed photos see ATTACHMENT A

2.5 Equipment type

BLE device

2.6 Short description of the equipment under test (EUT)

The EUT is a wireless remote control with Bluetooth Low Energy.

Number of tested samples:	1 conducted	1 radiated
Serial number:	prototype	168955
Firmware version:	0.0.50	0.0.50

2.7 Variants of the EUT

There are no variants.

2.8 Operation frequency and channel plan

The operating frequency is 2400 MHz to 2483.5 MHz.

Channel plan:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	18	2442
0	2404	19	2444
1	2406	20	2446
2	2408	21	2448
3	2410	22	2450
4	2412	23	2452
5	2414	24	2454
6	2416	25	2456
7	2418	26	2458
8	2420	27	2460
9	2422	28	2462
10	2424	29	2464
38	2426	30	2466
11	2428	31	2468
12	2430	32	2470
13	2432	33	2472
14	2434	34	2474
15	2436	35	2476
16	2438	36	2478
17	2440	39	2480

Note: the marked frequencies are determined for final testing.

2.9 Transmit operating modes

The EUT uses GFSK modulation and may provide following data rates:

- 1 Mbps
- 2 Mbps

(Mbps = *kilobits per second)*

2.10 Antenna

A single PCB antenna is used within the system. The EUT has only one integrated antenna, no temporary connector and no external antenna can be connected.

2.11 Power supply system utilised

Power supply voltage, V_{nom} : 1.5 V_{dc} (AAA Battery)

2.12 Peripheral devices and interface cables

No peripheral devices and interface cables are connected during the measurements:

2.13 Determination of worst-case conditions for final measurement

Preliminary tests are performed in all three orthogonal axes of the EUT to locate at which position and at what setting of the EUT produce the maximum of the emissions. For the further measurement the EUT is set in Y position.

The tests are carried out in the following frequency band:

2400 MHz – 2483.5 MHz

For the final test the following channels and test modes are selected:

Wireless system	Available channel	Tested channels	Power setting	Modulation	Modulation type	Data rate
802.15.1	0 - 39	37, 18, 39	default	DSSS	GFSK	1000 kbps
802.15.1	0 - 39	37, 18, 39	default	DSSS	GFSK	2000 kbps

2.13.1 Test jig

No test jig is used.

2.13.2 Test software

The provided test samples have a special software that allows to set continuous transmission in 3 channel with 2 different data rates.

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3 TEST RESULT SUMMARY

FCC Rule Part	RSS Rule Part	Description	Result
15.207(a)	RSS-Gen, 8.8	AC power line conducted emissions	not applicable
15.247(a)(2)	RSS-247, 6.2.4(1)	-6 dB EBW	passed
15.247(b)(3)	RSS-247, 6.2.4(1)	Maximum peak conducted output power	passed
15.247(b)(4)	-	Defacto limit	passed
15.247(d)	RSS-247, 6.2.4(2)	Out-of-band emission, radiated	passed
15.247(d)	RSS-Gen, 8.9	Emissions in restricted bands	passed
15.247(e)	RSS-247, 6.2.4(1)	PSD	passed
15.35(c)	RSS-Gen, 6.10	Pulsed operation	passed
15.203	RSS-Gen, 6.6	Antenna requirement	passed
-	RSS-Gen, 6.11	Transmitter frequency stability	passed
-	RSS-Gen, 6.6	99 % Bandwidth	passed

AC power line conducted emissions is not applicable because the EUT is battery powered.

The mentioned new RSS Rule Parts in the above table are related to:
RSS-Gen, Issue 5 + Amendment 1 + Amendment 2, March 2019
RSS-247, Issue 2, February 2017

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80124569-01	0	28 June 2022	Initial test report
80124569-01	1	03 August 2022	Corrected typing error in the DTS-BW table (1 Mbps, CH37).

The test report with the highest revision number replaces the previous test reports.

3.2 Final assessment

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

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

Testing commenced on : 31 May 2022

Testing concluded on : 03 June 2022

Checked by:

Jürgen Pessinger
2022.08.03 15:29:10
+02'00'

Jürgen Pessinger
Radio Team

Tested by:

L. Scheuermann
2022.08.03 15:00:22
+02'00'

Lukas Scheuermann
Radio Team

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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 on basis of the ETSI Technical Report TR 100 028 Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1 and Part 2. The results are documented in the quality system acc. to DIN EN ISO/IEC 17025. 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.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
20 dB Bandwidth	Center frequency of EUT	95%	$\pm 2.5 \times 10^{-7}$
99% Occupied Bandwidth	Center frequency of EUT	95%	$\pm 2.5 \times 10^{-7}$
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	± 3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	± 3.71 dB
Radiated Spurious Emissions	1000 MHz to 10000 MHz	95%	± 2.34 dB
Peak conducted output power	902 MHz to 928 MHz	95%	± 0.35 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB

4.4 Conformity Decision Rule

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule (w = 0).
Details can be found in the procedure CSA_B_V50_29.

4.5 Measurement protocol for FCC and ISED

4.5.1 General information

CSA Group Bayern GmbH is recognized as wireless testing laboratory under the CAB identifier:

FCC: DE 0011
ISED: DE0009

4.5.2 General Standard information

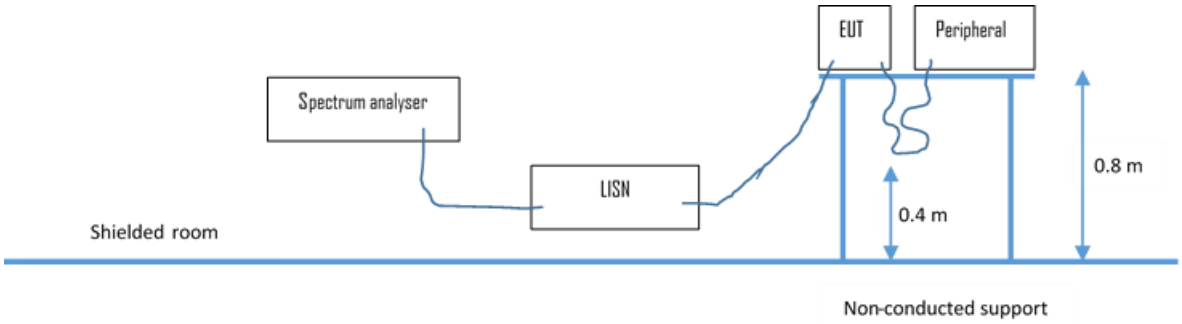
The test methods used comply with ANSI C63.10 - "Testing Unlicensed Wireless Devices".

4.5.2.1 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions.

4.5.3 Details of test procedures

4.5.3.1 Conducted emission
Test setup according ANSI C63.10



The final level, expressed in dBµV, is arrived at by taking the reading directly from the Spectrum analyser. This level is compared to the limit.

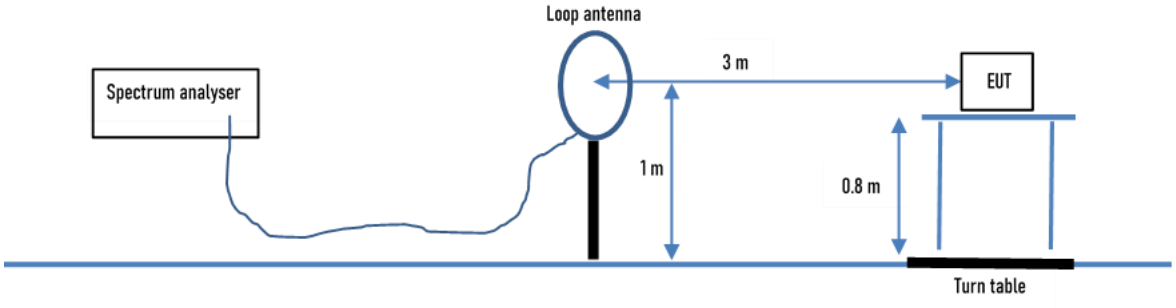
To convert between dBµV and µV, the following conversions apply:

dBµV = 20(log µV)
µV = Inverse log(dBµV/20)

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50 Ω / 50 µH (CISPR 16) characteristics. The receiver is protected by means of an impedance matched pulse limiter connected directly to the RF input. Table top equipment is placed on a non-conducting table 80 centimetres above the floor and is positioned 40 centimetres from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emission is re-measured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

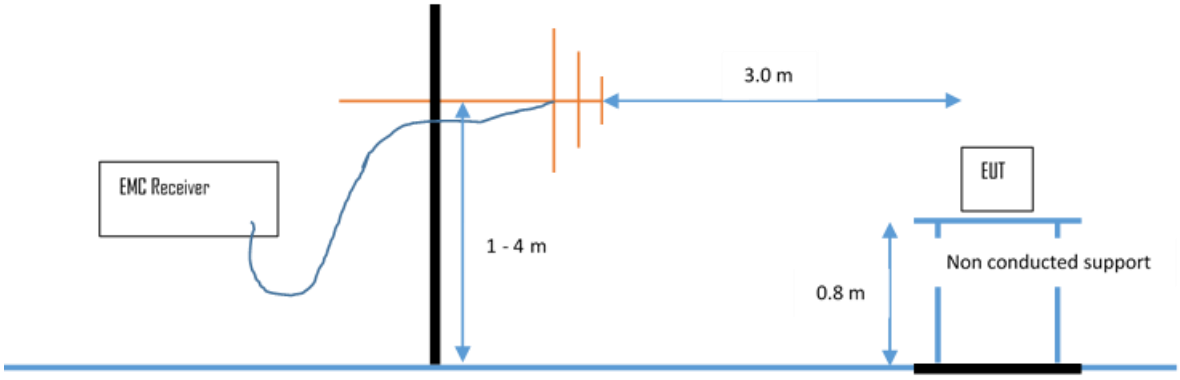
4.5.3.2 Radiated emission

4.5.3.2.1 OATS1 test site (9 kHz - 30 MHz):
Test setup according ANSI C63.10



Emissions from the EUT are measured in the frequency range of 9 MHz to 30 MHz using a tuned receiver and a calibrated loop antenna. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Cables to simulators/testers (if used in this test) are routed through the centre of the table and to a screened room located outside the test area. The antenna is positioned 3, 10 or 30 metres horizontally from the EUT and is repeated vertically. To locate maximum emissions from the test sample the antenna is varied along the site axis and the EUT is rotated 360 degrees.

4.5.3.2.2 OATS1 test site (30 MHz - 1 GHz):
Test setup according ANSI C63.10.



Spurious emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarised antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 m non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Cables to simulators/testers (if used in this test) are routed through the centre of the table and to a screened room located outside the test area. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 metres and the EUT is rotated 360 degrees. The final level in dBµV/m is calculated by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (dB). The FCC limit is subtracted from this result in order to provide the limit margin listed in the measurement protocol.

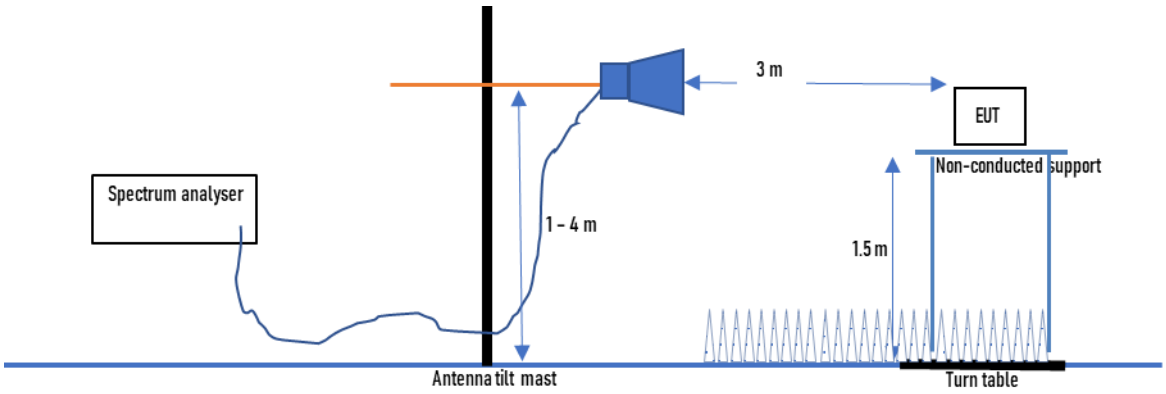
The resolution bandwidth setting:
30 MHz – 1000 MHz: RBW: 120 kHz

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	-	Limit (dBµV/m)	=	Delta (dB)
719.0	75.0	+	32.6	=	107.6	-	110.0	=	-2.4

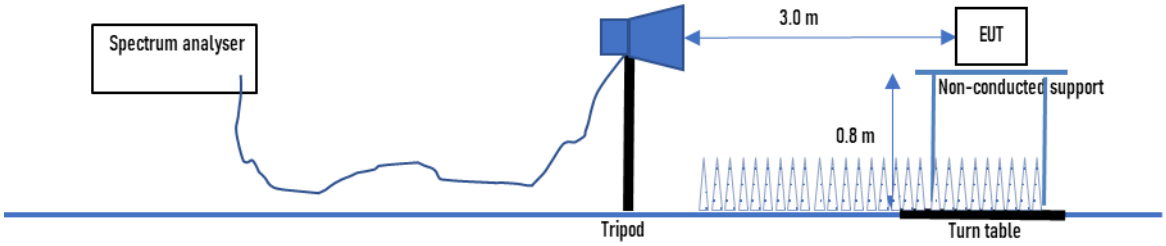
4.5.3.2.3 Anechoic chamber 1 (1000 MHz – 18000 MHz)

Test setup according ANSI C63.10.



Radiated emissions from the EUT are measured in the frequency range 1 GHz up to 18 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 1.5 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the centre, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements.

4.5.3.2.4 Anechoic chamber 1 (18 GHz – 40 GHz)



Emissions from the EUT are measured in the frequency range 18 GHz up to 40 GHz as specified in 47 CFR Part 15, Subpart A, Section 15.33, using a spectrum analyser and appropriate linearly polarized antennas. Table top equipment is placed on a non-conducting table, 0.8 metre above the ground plane. The turntable is fully covered with the appropriate absorber (Type VHP-12). Any controlling device is positioned such that it does not significantly influence the measurement results. Interconnecting cables that hang closer than 40 cm to the ground plane are folded back and forth in the centre, forming a bundle 30 cm to 40 cm long. Measurements are made in in three orientations of the EUT and the horizontal and vertical polarization planes of measurement antenna in a fully anechoic room. The measurement antenna is adjusted and the EUT orientated to permit the measurement of the maximum emission from the EUT. The conditions determined as worst-case will then be used for the final measurements. Where appropriate, the test distance may be reduced in order to detect emissions under better uncertainty. The limit is adopted.

5 TEST CONDITIONS AND RESULTS

5.1 DTS Bandwidth and OBW

For test instruments and accessories used see section 6 Part **CPC 3**.

5.1.1 Description of the test location

Test location: Shielded Room S6

5.1.2 Photo documentation of the test set-up

See ATTACHMENT B.

5.1.3 Applicable standard

According to FCC Part 15, Section 15.247(a)(2) & RSS-247 5.2(a):
The minimum 6 dB bandwidth shall be at least 500 kHz.

According to RSS-Gen 6.7:
The occupied bandwidth (99% emission bandwidth) shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

5.1.4 Description of Measurement

The DTS bandwidth is measured at an amplitude level reduced from the reference level of a modulated channel by a ratio of -6 dB. The reference level is the level of the highest signal amplitude observed at the transmitter at either the fundamental frequency or the first order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

For the 99% OBW the OBW-function at the spectrum analyser is used.

Spectrum analyser settings for DTS-BW:
RBW: 100 kHz, VBW: 300 kHz, Detector: Max peak, Sweep time: 5 s, Span: 2 DTS-BW;
Spectrum analyser settings for OBW:
RBW: 1-5% OBW, VBW: 3 RBW, Detector: Max peak, Sweep time: 5 s, Span: 2 OBW;

5.1.5 Test result

FCC §15.247 (a)(2) | RSS-247 5.2 (a)				
Modulation	Channel	Frequency	DTS-BW	min. Limit
		MHz	MHz	MHz
1 Mbps	CH37	2402	0.724	0.5
	CH18	2442	0.724	0.5
	CH39	2480	0.709	0.5
2 Mbps	CH37	2402	1.431	0.5
	CH18	2442	1.444	0.5
	CH39	2480	1.424	0.5

RSS-Gen 6.7			
Modulation	Channel	Frequency	OBW99
		MHz	MHz
1 Mbps	CH37	2402	1.063
	CH18	2442	1.072
	CH39	2480	1.071
2 Mbps	CH37	2402	2.082
	CH18	2442	2.123
	CH39	2480	2.109

The requirements are **FULFILLED.**

Remarks: For detailed test result please see test protocols in ATTACHMENT C.

5.2 Maximum peak output power

For test instruments and accessories used see section 6 Part **CPC 3** & **CPR 3**.

5.2.1 Description of the test location

Test location: Shielded Room S6

Test location: Anechoic chamber 1
Test distance: 3 m

5.2.2 Photo documentation of the test set-up

See ATTACHMENT B.

5.2.3 Applicable standard

According to FCC Part 15, Section 15.247(b)(3):
The maximum peak conducted output power of the intentional radiator shall not exceed the following:
For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

5.2.4 Description of Measurement

The maximum peak radiated output power is measured using a spectrum analyser following the procedure set out in ANSI C63.10, item 11.9.2.2. The EUT is set in TX continuous mode while measuring. The radiated measurement was performed in terms of fieldstrength. Therefore, the formula set out in ANSI C63.10, item 9.5 (Equation 22) is changed into the following term:

$$E = EIRP - (20*\log_{10}(3)) + 104.7$$

5.2.5 Test result

Conducted Measurement					
FCC §15.247 (b)(3) | RSS-247 5.4 (d)					
Modulation	**Channel**	**Frequency**	**Measured Conducted TX Power**	**Conducted Tx-Power Limit**	**Margin**
		MHz	dBm	dBm	dB
1 Mbps	CH37	2402	1.2	30.0	-28.8
	CH18	2442	0.5	30.0	-29.5
	CH39	2480	0.2	30.0	-29.8
2 Mbps	CH37	2402	1.1	30.0	-28.9
	CH18	2442	0.5	30.0	-29.5
	CH39	2480	0.2	30.0	-29.8

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Radiated Measurement						
FCC §15.247 (b)(3 & 4) | RSS-247 5.4 (d)						
Modulation	**Channel**	**Frequency**	**Measured fieldstrength**	**Calculated EIRP**	**EIRP Limit**	**Margin**
		MHz	dB(µV/m)	dBm	dBm	dB
1 Mbps	CH37	2402	91.30	-3.9	36	-39.9
	CH18	2442	94.70	-0.5	36	-36.5
	CH39	2480	93.49	-1.7	36	-37.7
2 Mbps	CH37	2402	94.80	-0.4	36	-36.4
	CH18	2442	94.02	-1.2	36	-37.2
	CH39	2480	93.04	-2.2	36	-38.2

Peak Power Limit according to FCC Part 15, Section 15.247(b)(3) & RSS-247 5.4(d):

Frequency (MHz)	Conducted Peak Power Limit	
	(dBm)	(W)
902-928	30	1.0
2400-2483.5	**30**	**1.0**
5725-5850	30	1.0

Frequency (MHz)	Radiated Peak Power Limit	
	(dBm)	(W)
902-928	36	4.0
2400-2483.5	**36**	**4.0**
5725-5850	36	4.0

The requirements are **FULFILLED.**

Remarks: For detailed test result please see test protocols in ATTACHMENT C.

5.3 Power spectral density

For test instruments and accessories used see section 6 Part **CPC 3**.

5.3.1 Description of the test location

Test location: Shielded Room S6

5.3.2 Photo documentation of the test set-up

See ATTACHMENT B.

5.3.3 Applicable standard

According to FCC Part 15, Section 15.247(e):
For digitally modulated systems, the power spectral density radiated from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the radiated output power shall be used to determine the power spectral density.

5.3.4 Description of Measurement

The measurement is performed using the procedure set out in 11.10 of ANSI C63.10. The power measurement was done as peak power measurement. Therefore, the PKPSD is measured. The max peak was located and with the spectrum analyser and a marker set to peak.

Spectrum analyser settings:
RBW: 3 kHz, VBW: 10 kHz, Detector: Peak, Sweep time: Auto

5.3.5 Test result

Conducted Measurement					
FCC §15.247 (e) | RSS-247 5.2 (b)					
Modulation	**Channel**	**Frequency**	**Measured Conducted PSD**	**Conducted PSD Limit**	**Margin**
		MHz	dBm/3kHz	dBm/3kHz	dB
1 Mbps	CH37	2402	-9.0	8.0	-17.0
	CH18	2442	-9.5	8.0	-17.5
	CH39	2480	-9.9	8.0	-17.9
2 Mbps	CH37	2402	-12.6	8.0	-20.6
	CH18	2442	-12.9	8.0	-20.9
	CH39	2480	-13.8	8.0	-21.8

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Power spectral density limit according to FCC Part 15, Section 15.247(e):

Frequency (MHz)	Power spectral density limit (dBm/3 kHz)
2400 - 2483.5	8

The requirements are **FULFILLED.**

Remarks: For detailed test result please see test protocols in ATTACHMENT C.

5.4 Radiated emissions in restricted bands

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

5.4.1 Description of the test location

Test location: OATS 1
Test location: AREA1
Test distance: 3 m

5.4.2 Photo documentation of the test set-up

See ATTACHMENT B.

5.4.3 5.4.3 Applicable standard

According to FCC Part 15, Section 15.205(a):
In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limit specified in Section 15.209(a).

5.4.4 Description of Measurement

The restricted bands are measured radiated. The span of the spectrum analyser is set wide enough to capture the restricted band and measure the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation. The restricted bands are measured falling emissions into it and the nearest restricted band are checked for emissions also the restricted band for the harmonics of the carrier.

Test receiver settings for SER2:
RBW: 120 MHz, Detector: Quasi peak, Mes. Time: 1 s,

Spectrum analyser settings for SER3:
RBW: 1 MHz, VBW: 3 MHz, Detector: Max. peak, Trace: Max. hold, Sweep: Auto

5.4.5 Test result

5.4.5.1 Test protocols radiated emissions in restricted bands f < 1000 MHz

Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
30.00	9.0	-4.8	15.5	17.1	24.5	12.3	40.0	-15.5
150.00	-3.7	-3.9	19.6	18.8	15.9	14.9	43.5	-27.6
300.00	2.9	0.0	20.2	20.7	23.1	20.7	46.0	-22.9
450.00	-1.4	0.6	24.4	24.8	23.0	25.4	46.0	-20.6
750.00	-3.3	-3.4	30.5	30.9	27.2	27.5	46.0	-18.5
900.00	-2.5	-2.6	32.6	33.2	30.1	30.6	46.0	-15.4

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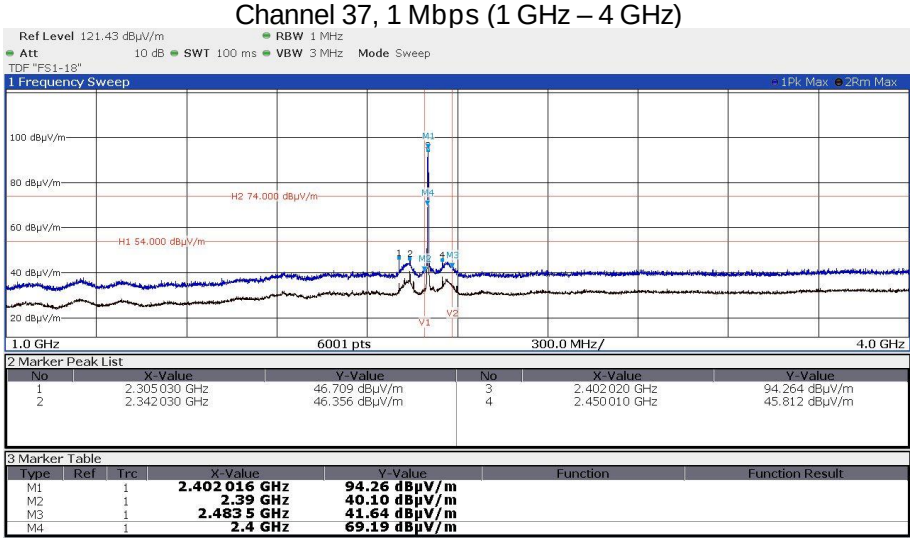
5.4.5.2 Test protocols radiated emissions in restricted bands 1 GHz > f > 18 GHz

Channel 37, 1 Mbps (1 GHz – 4 GHz)



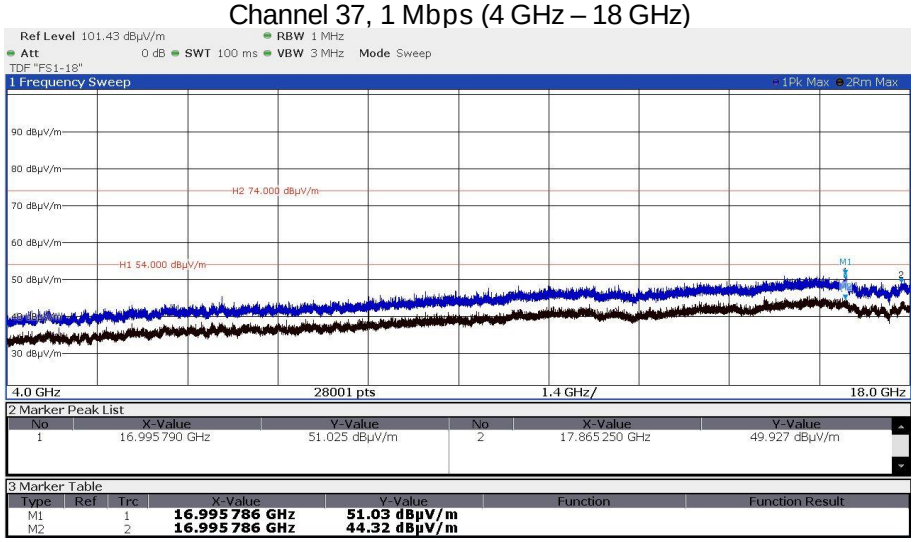
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	2.305 030 GHz	46.709 dBµV/m	3	2.402 020 GHz	94.264 dBµV/m
2	2.342 030 GHz	46.356 dBµV/m	4	2.450 010 GHz	45.812 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**2.402 016 GHz**	**94.26 dBµV/m**		
M2		1	**2.39 GHz**	**40.10 dBµV/m**		
M3		1	**2.483 5 GHz**	**41.64 dBµV/m**		
M4		1	**2.4 GHz**	**69.19 dBµV/m**		

Channel 37, 1 Mbps (4 GHz – 18 GHz)



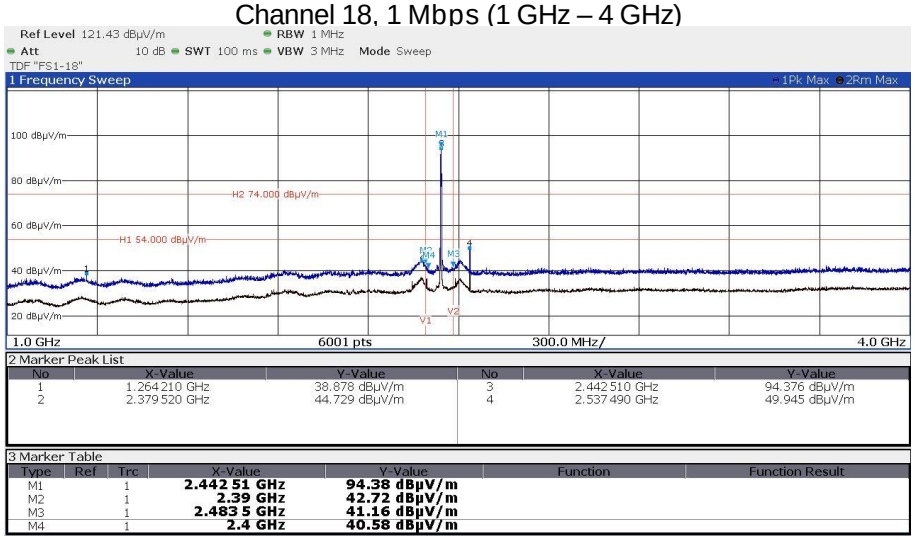
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	16.995 790 GHz	51.025 dBµV/m	2	17.865 250 GHz	49.927 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**16.995 786 GHz**	**51.03 dBµV/m**		
M2		2	**16.995 786 GHz**	**44.32 dBµV/m**		

Channel 18, 1 Mbps (1 GHz – 4 GHz)



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	1.264 210 GHz	38.878 dBµV/m	3	2.442 510 GHz	94.376 dBµV/m
2	2.379 520 GHz	44.729 dBµV/m	4	2.537 490 GHz	49.945 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**2.442 51 GHz**	**94.38 dBµV/m**		
M2		1	**2.39 GHz**	**42.72 dBµV/m**		
M3		1	**2.483 5 GHz**	**41.16 dBµV/m**		
M4		1	**2.4 GHz**	**40.58 dBµV/m**		

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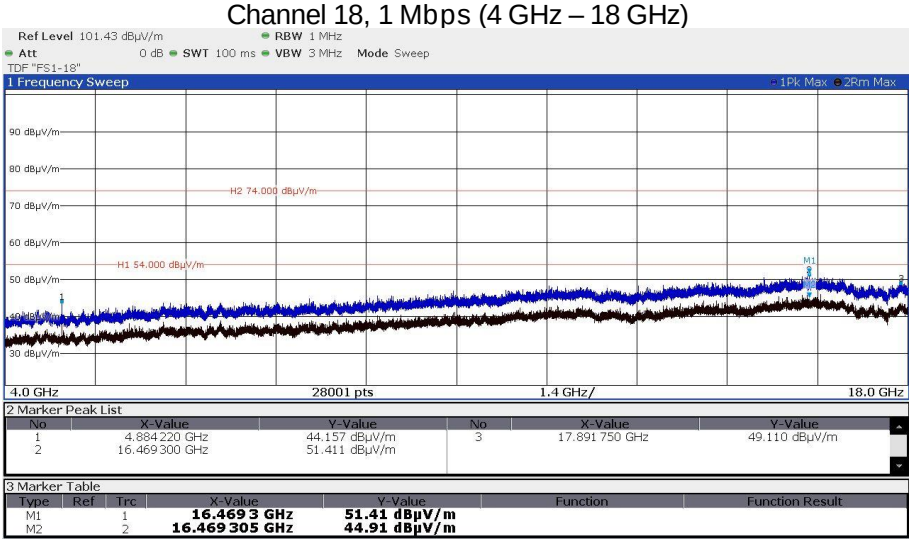
Channel 18, 1 Mbps (4 GHz – 18 GHz)



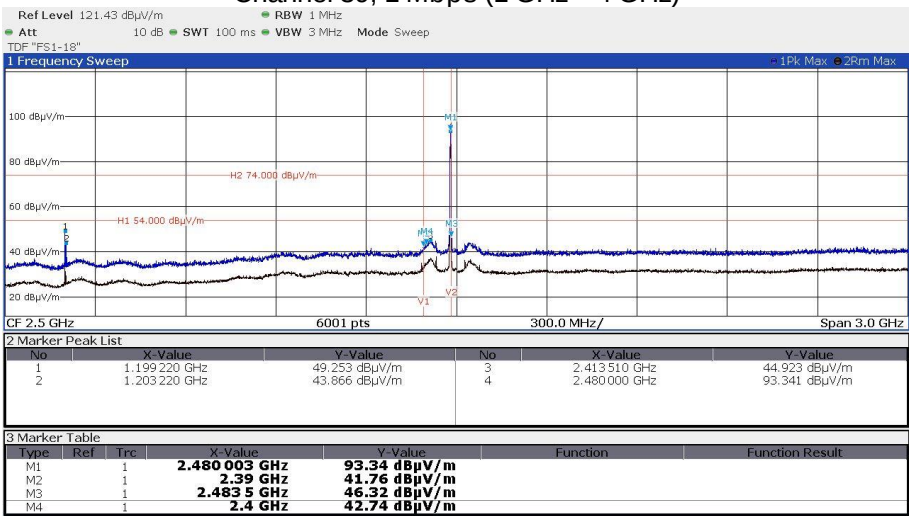
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	4.884 220 GHz	44.157 dBµV/m	3	17.891 750 GHz	49.110 dBµV/m
2	16.469 300 GHz	51.411 dBµV/m			

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**16.469 3 GHz**	**51.41 dBµV/m**		
M2		2	**16.469 305 GHz**	**44.91 dBµV/m**		

Channel 39, 1 Mbps (1 GHz – 4 GHz)



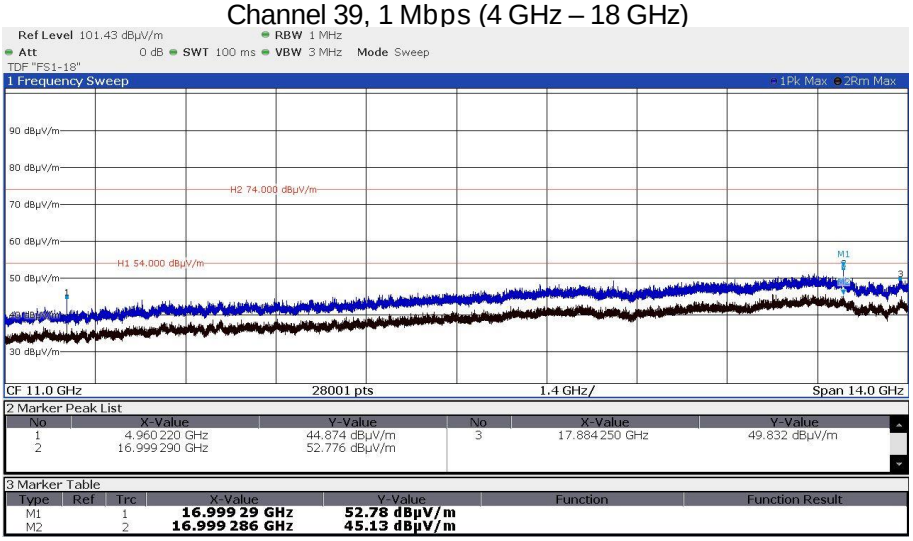
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	1.199 220 GHz	49.253 dBµV/m	3	2.413 510 GHz	44.923 dBµV/m
2	1.203 220 GHz	43.866 dBµV/m	4	2.480 000 GHz	93.341 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**2.480 003 GHz**	**93.34 dBµV/m**		
M2		1	**2.39 GHz**	**41.76 dBµV/m**		
M3		1	**2.483 5 GHz**	**46.32 dBµV/m**		
M4		1	**2.4 GHz**	**42.74 dBµV/m**		

Channel 39, 1 Mbps (4 GHz – 18 GHz)



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	4.960 220 GHz	44.874 dBµV/m	3	17.884 250 GHz	49.832 dBµV/m
2	16.999 290 GHz	52.776 dBµV/m			

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**16.999 29 GHz**	**52.78 dBµV/m**		
M2		2	**16.999 286 GHz**	**45.13 dBµV/m**		

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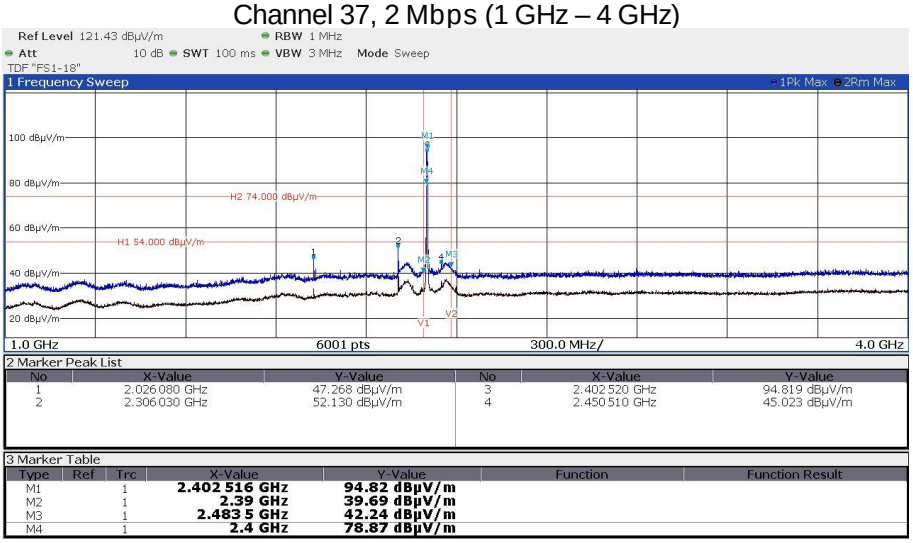
Channel 37, 2 Mbps (1 GHz – 4 GHz)



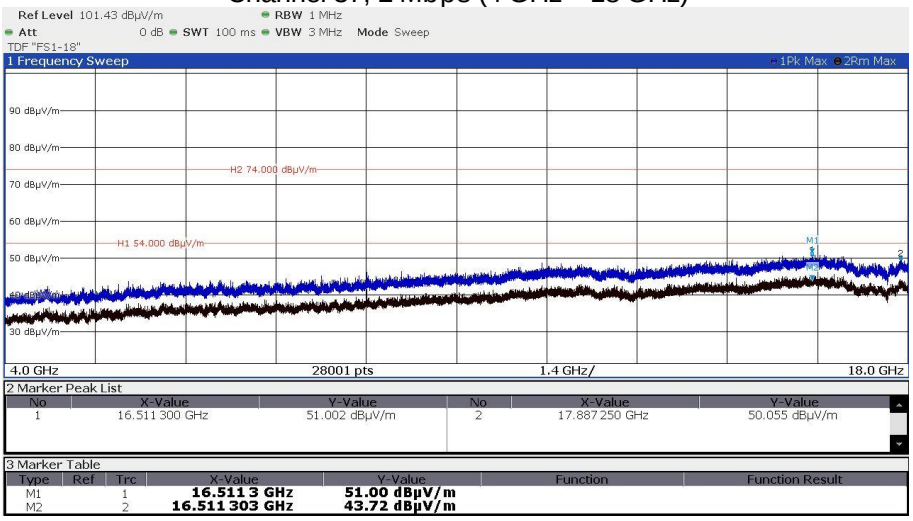
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	2.026 080 GHz	47.268 dBµV/m	3	2.402 520 GHz	94.819 dBµV/m
2	2.306 030 GHz	52.130 dBµV/m	4	2.450 510 GHz	45.023 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**2.402 516 GHz**	**94.82 dBµV/m**		
M2		1	**2.39 GHz**	**39.69 dBµV/m**		
M3		1	**2.483 5 GHz**	**42.24 dBµV/m**		
M4		1	**2.4 GHz**	**78.87 dBµV/m**		

Channel 37, 2 Mbps (4 GHz – 18 GHz)



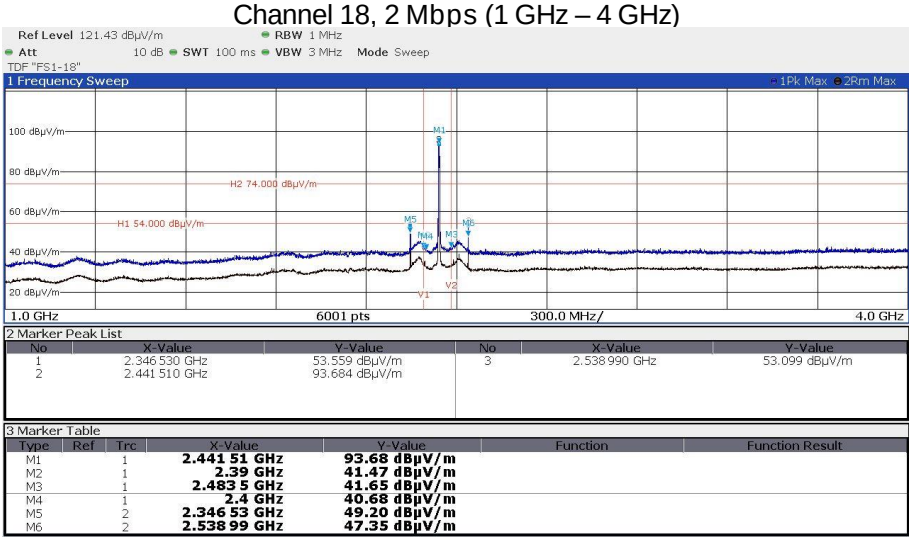
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	16.511 300 GHz	51.002 dBµV/m	2	17.887 250 GHz	50.055 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**16.511 3 GHz**	**51.00 dBµV/m**		
M2		2	**16.511 303 GHz**	**43.72 dBµV/m**		

Channel 18, 2 Mbps (1 GHz – 4 GHz)



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	2.346 530 GHz	53.559 dBµV/m	3	2.538 990 GHz	53.099 dBµV/m
2	2.441 510 GHz	93.684 dBµV/m			

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**2.441 51 GHz**	**93.68 dBµV/m**		
M2		1	**2.39 GHz**	**41.47 dBµV/m**		
M3		1	**2.483 5 GHz**	**41.65 dBµV/m**		
M4		1	**2.4 GHz**	**40.68 dBµV/m**		
M5		2	**2.346 53 GHz**	**49.20 dBµV/m**		
M6		2	**2.538 99 GHz**	**47.35 dBµV/m**		

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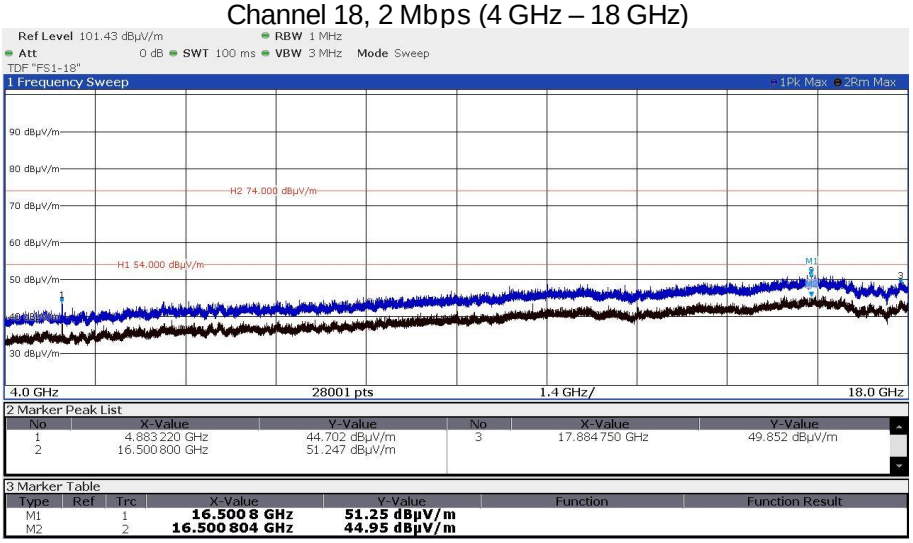
Channel 18, 2 Mbps (4 GHz – 18 GHz)



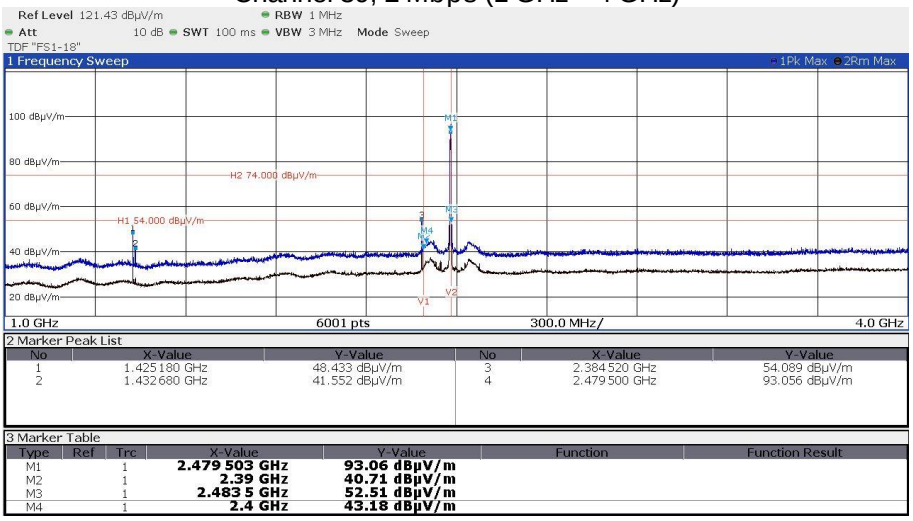
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	4.883 220 GHz	44.702 dBµV/m	3	17.884 750 GHz	49.852 dBµV/m
2	16.500 800 GHz	51.247 dBµV/m			

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**16.500 8 GHz**	**51.25 dBµV/m**		
M2		2	**16.500 804 GHz**	**44.95 dBµV/m**		

Channel 39, 2 Mbps (1 GHz – 4 GHz)



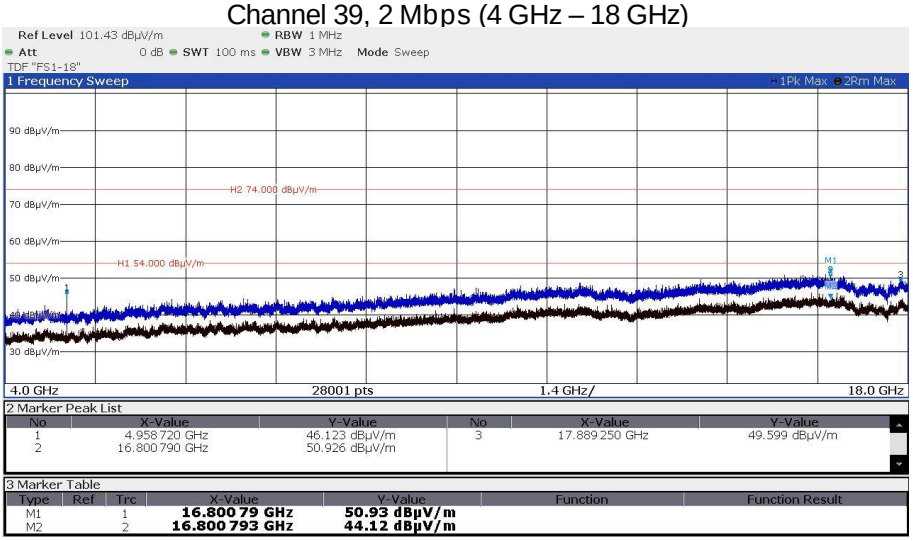
2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	1.425 180 GHz	48.433 dBµV/m	3	2.384 520 GHz	54.089 dBµV/m
2	1.432 680 GHz	41.552 dBµV/m	4	2.479 500 GHz	93.056 dBµV/m

3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**2.479 503 GHz**	**93.06 dBµV/m**		
M2		1	**2.39 GHz**	**40.71 dBµV/m**		
M3		1	**2.483 5 GHz**	**52.51 dBµV/m**		
M4		1	**2.4 GHz**	**43.18 dBµV/m**		

Channel 39, 2 Mbps (4 GHz – 18 GHz)



2 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	4.958 720 GHz	46.123 dBµV/m	3	17.889 250 GHz	49.599 dBµV/m
2	16.800 790 GHz	50.926 dBµV/m			

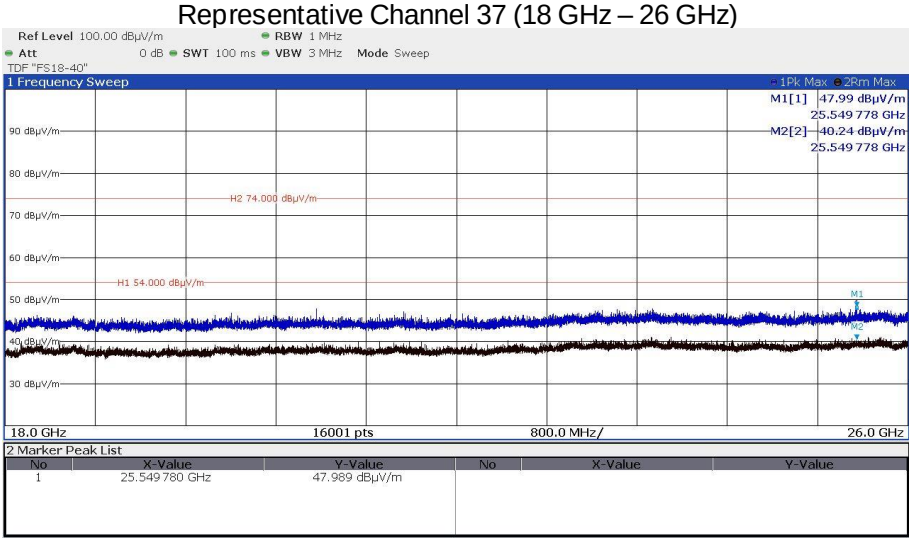
3 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	**16.800 79 GHz**	**50.93 dBµV/m**		
M2		2	**16.800 793 GHz**	**44.12 dBµV/m**		

FCC ID: XYN795C

5.4.5.3 Test protocols radiated emissions in restricted bands f > 18 GHz

Representative Channel 37 (18 GHz – 26 GHz)



Note: No emissions were identified above 18 GHz in any channel.

Radiated limits according to FCC Part 15 Section 15.209(a) for spurious emissions which fall in restricted bands:

Frequency	Field strength of spurious emissions		Measurement distance
(MHz)	(µV/m)	dB(µV/m)	(metres)
0.009-0.490	2400/F (kHz)		300
0.490-1.705	24000/F (kHz)		30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Restricted bands of operation:

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	Above 38.6

FCC ID: XYN795C

RSS-Gen, Table 6 – Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	12.57675 - 12.57725	399.9 - 410	7.250 - 7.750
0.495 - 0.505	13.36 - 13.41	608 - 614	8.025 – 8.500
2.1735 - 2.1905	16.42 - 16.423	960 - 1427	9.0 - 9.2
3.020 - 3.026	16.69475 - 16.69525	1435 - 1626.5	9.3 - 9.5
4.125 - 4.128	16.80425 - 16.80475	1645.5 - 1646.5	10.6 - 12.7
4.17725 - 4.17775	25.5 - 25.67	1660 - 1710	13.25 - 13.4
4.20725 - 4.20775	37.5 - 38.25	1718.8 - 1722.2	14.47 - 14.5
5.677 - 5.683	73 - 74.6	2200 - 2300	15.35 - 16.2
6.215 - 6.218	74.8 - 75.2	2310 - 2390	17.7 - 21.4
6.26775 - 6.26825	108 – 138	2483.5 - 2500	22.01 - 23.12
6.31175 - 6.31225	149.9 - 150.05	2655 - 2900	23.6 - 24.0
8.291 - 8.294	156.52475 - 156.52525	3260 – 3267	31.2 - 31.8
8.362 - 8.366	156.7 - 156.9	3332 - 3339	36.43 - 36.5
8.37625 - 8.38675	162.0125 - 167.17	3345.8 - 3358	Above 38.6
8.41425 - 8.41475	167.72 - 173.2	3500 - 4400	
12.29 - 12.293	240 – 285	4500 - 5150	
12.51975 - 12.52025	322 - 335.4	5350 - 5460	

The requirements are **FULFILLED.**

Remarks: The measurement was performed up to the 10th harmonic. Only the worst-case plots are listed.

No emissions below 1 GHz and above 18 GHz could be detected. Only noise values are stated.

5.5 Spurious emissions radiated

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

5.5.1 Description of the test location

Test location: Anechoic chamber 1
Test distance: 3 m

5.5.2 Photo documentation of the test set-up

See ATTACHMENT B.

5.5.3 Applicable standard

According to FCC Part 15, Section 15.247(d):
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

5.5.4 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.10. If the emission level of the EUT in peak mode complies with the average limit is 20 dB lower, then testing will be stopped and peak values of the EUT will be reported, otherwise the emission will be measured in average mode again and reported.

Test receiver settings for SER2:
RBW: 120 MHz, Detector: Quasi peak, Mes. Time: 1 s,

Spectrum analyser settings for SER3:
RBW: 100 kHz, VBW: 300 kHz, Detector: Max. peak, Trace: Max. hold, Sweep: Auto

5.5.5 Test result

Limit according to FCC Part 15, Section 15.247(d) for emissions falling not in restricted bands:
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. Attenuation below the general limits specified in Section 15.209(a) is not required.

Frequency (MHz)	Spurious emission limit
Below 1000	20 dB below the highest level of the desired power
Above 1000	20 dB below the highest level of the desired power

The requirements are **FULFILLED.**

Remarks: Listed test protocols in ATTACHMENT C show compliance at the band edges.

Further compliance outside the shown frequency band is shown in chapter 5.4.

5.6 Antenna application

5.6.1 Applicable standard

According to FCC Part 15C, Section 15.203:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit that broken antennas can be replaced by the user, but the use of a standard antenna jack is prohibited.

The EUT has an integrated antenna. No other antenna can be used with the device.

The supplied antenna meets the requirements of part 15.203 and 15.204.

Remarks: None.

5.7 Defacto EIRP-Limit

5.7.1 Applicable standard

According to FCC Part 15C, Section 15.247(b)(4):
The conducted output power limit specified in paragraph (b) of 15.247 is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from intentional radiator shall be reduced below the stated values in paragraph (b)(1), (b)(2) and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Defacto EIRP-Limit:

$$Pout = 30 - (Gx - 6);$$

The antenna is < 6 dBi gain, no Defacto limit applies.

The requirements are **FULFILLED.**

Remarks: None.

FCC ID: XYN795C

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.
CPC 3	FSW43	02-02/11-15-001	22/04/2023	22/04/2022		
	minibend KR-16	02-02/50-16-011				
CPR 3	FSW43	02-02/11-15-001	22/04/2023	22/04/2022		
	AMF-6D-01002000-22-10P	02-02/17-15-004				
	3117	02-02/24-05-009	28/06/2022	28/06/2021		
	BAM 4.5-P	02-02/50-17-024				
	NCD	02-02/50-17-025				
	KK-SF106-2X11N-6,5M	02-02/50-18-016				
	BAT-EMC 3.21.0.24	02-02/68-13-001				
SER 2	ESVS 30	02-02/03-05-006	09/07/2022	09/07/2021		
	VULB 9168	02-02/24-05-005	20/12/2022	20/12/2021	07/07/2022	07/07/2021
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
	50F-003N3dB	02-02/50-21-010				
SER 3	FSW43	02-02/11-15-001	22/04/2023	22/04/2022		
	AMF-6D-01002000-22-10P	02-02/17-15-004				
	3117	02-02/24-05-009	28/06/2022	28/06/2021		
	BAM 4.5-P	02-02/50-17-024				
	NCD	02-02/50-17-025				
	KK-SF106-2X11N-6,5M	02-02/50-18-016				
	BAT-EMC 3.21.0.24	02-02/68-13-001				