

Test report

according to ISO/IEC 17025:2017

FCC (Federal Communications Commission) Test Firm Registration Number: 768032 Designation Number DE0022

ISED (Inovation, Science and Economic Development) CAB identifier: DE0012 ISED#: 6155A

Electromagnetic compatibility

Intentional Radiators



DAkkS

Deutsche Akkreditierungsstelle D-PL-17379-01-00 D-PL-17379-01-02 D-PL-17379-01-03 Bundesnetzagentur

BNetzA-CAB-18/21-19



STC Germany GmbH Ohmstrasse 1 84160 Frontenhausen, Germany Tel.: + 49 (0) 8732 6381 Fax: + 49 (0) 8732 2345 E-mail: grstc@stc.group

Test report no .:

20/01-0030-A

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Location of test facility:



STC Germany GmbH Ohmstrasse 1 84160 Frontenhausen Germany

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1. Client information

Name:	Vestel Elektronik San ve Tic. A.S.
Address:	Organize Sanayi Bölgesi Vestel City, High-End 45030 MANISA TURKEY
Name of contact:	Mr. Andac Pamuk
Telephone:	+90 236 2332582
Fax:	+90 236 2332584
E-mail:	Andac.pamuk@vestel.com.tr

2. Equipment under test (EUT)

2.1 Identification of the EUT	
Equipment:	WIFI Module
Model:	17WFM21
Brand name:	-/-
Serial no.:	-/-
Manufacturer:	Vestel Elektronik San ve Tic. A.S., Organize Sanayi Bölgesi, Vestel City, High-End, 45030 MANISA, TURKEY
Country of origin:	TURKEY
Power rating:	
Highest frequency generated or used in the device or on which the device operates or tunes (MHz):	5.70 GHz
Date Sample Received:	16.01.2020, 25.03.2020
Tests were performed:	01.04.2020 - 08.04.2020

2.2 Additional information about the EUT:

The EUT can also operate as 5 GHz Wifi module, but not simultaneously to the 2.4 Ghz RF-function. The 5 GHz is not documented in this Report.

To duplicate parts of this test report needs the written confirmation of the test laboratory.

The test results relate only to the above mentioned test sample(s).

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3. Description of the Equipment under test and test conditions

FCC-ID:	2AVQS-17WFM21			
IC:	25888-17WFM21			
HVIN:	260419-R3			
Firmware version:	3.4.1			
Software to control EUT:	MT7662 QA tool (V1.0.3.24)			
Power:	nominal 5 V =, +/-	5 %		
Cables:	USB cable	100 cm		
	Cable to test adap	tor 30 cm		
Approx. Size (I x w x h):	(70 x 25 x 4.5) mm			
Test conditions:	The "WIFI Module	– 17WFM21" (= eq	uipment under test	– FUT) had been
	tested, where appl (1) 802.11b: Tx (2) 802.11b: Tx	icable, in the follow mode BW 20MHz (mode BW 20MHz (ing modes: CCK 1MBps 2412 M CCK 1MBps 2437 M	1Hz 1Hz
	(3) 802.11b: Tx (4) 802.11g: Tx	mode BW 20MHz (mode BW 20MHz (CCK 1MBps 2462 M DFDM 6MBps 2412	1Hz MHz
	(5) 802.11g: IX	mode BW 20MHz (MHZ MHZ
	(6) 802.119.1X	mode BW 2011172 (mode BW 2011172 (JFDIVI 61V1BPS 2462	IVITIZ Bas 2/12 MHz
	(7) 802.111.1X	mode BW 20MHz F	TT Greenfield 6 5M	Bps 2412 MHz Bps 2437 MHz
	(9) 802.11n: Tx	mode BW 20MHz H	T Greenfield 6.5M	Bps 2462MHz
	(10) 802.11n: Tx	mode BW 40MHz H	HT Greenfield 15ME	Bps 2422 MHz
	(11) 802.11n: Tx	mode BW 40MHz H	HT Greenfield 15ME	Bps 2437 MHz
	(12) 802.11n: Tx	mode BW 40MHz H	HT Greenfield 15ME	Bps 2452 MHz
	with an active WLA	AN connection as w	ell as controlled by	a test software
	with maximum RF-	output power and o	different data rate in	order to find the
	worst case.			
RF Module Model Number:	17WFM21			
Frequency range:	2.400 GHz – 2.483	3,5 GHz	1	
Type of modulation:	802.11 b	802.11 g	802.11 n [20]	802.11 n [40]
Operating frequencies [MHz]:	2412 - 2462	2412 - 2462	2412 - 2462	2422 - 2452
6 dB Bandwidth [MHz]:	10.07	16.30	17.06	34.46
Emission classification:	12M9G1D	16M6D1D	17M6D1D	36M2D1D
I ransmission protocol:	CCK	OFDM	OFDM	OFDM
Number of choose do.	4 44	4 44	(HI Greenfield)	(HI Greenfield)
Number of channels:	[] -]] 50.04 dDu\//m	1 - 11 45.00 dDu\//m	1 - 11	3-9 5254 dDuV/m
Spunous Emissions:	50.24 αBμ V/m	45.88 αBμ V/m	48.00 αθμ v/m @ 2m	03.04 авµ v/m @ 2m
Max conducted RE output	11.86 dBm	11 51 dBm	1/ 30 dBm	13 75 dBm
Power [dBm / mW]	15.35 mW	14.16 mW	27 45 mW	23 74 mW
TX Power setting:	19	19	19	19
Duty Cycle:	≥98%	≥ 98%	≥ 98%	≥ 98%
Module Tranmission Type	WI AN (1TX 1RX)	/ WI AN (2TX 2RX	()	_ 00/0
Transmission protocol			$\frac{9}{8-0}$ 1 MBpc $-M$	CS - 11: 11 MBpc
Specification:		MC	S=0, TIMBPS - M S=0; 6 MBpc M	CS = 11, $T1$ MDps CS = -7; 54 MPps
Specification.			S=0, O INIDUS - ININ	CS = 7, 54 MBps
				CS = 9, 20 MBpS
Environmental conditions during	Ambient temperatu	ire 20°	C	
tests:	Relative humitity	40 %	%	
	Atmospheric press	ure 962	mbar	
Antenna specification:	Model: Printed PC	B Antennas		
	Antenna 1 Gain: m	ax. 3.4 dBi		
	Antenna 2 Gain: max 2.12 dBi			
	Type: 🗌 Externa	al (with accessible a	antenna socket)	
	🛛 Interna	I (integrated, PCB a	antenna)	

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Test standard:	 e-CFR Title 47 Chapter I Subchapter A Pa Operation within the bands 902-928 MHz, 2 and 5725-5850 MHz RSS-247 issue 02 February 2017 Digital Transmission Systems (DTSs), Freq (FHSs) and Licence-Exempt Local Area Ne 	art 15 Subpart C §15.247: 400-2483.5 MHz, uency Hopping Systems twork

Channel List

2.4 GHz Band

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

20 MHz bandwith systems, use Channel 1 – Channel 11 / TX Power setting: 19

40 MHz bandwith systems, use Channel 3 – Channel 9 / TX Power setting: 19

The EUT has two antennas which can be used for transmitting and receiving simultaneously as 2TX and 2RX

The EUT can also operate as 5 GHz Wifi module, but not simultaneously to the 2.4 Ghz RF-function.

4. Performed measurements and results

The complete list of measurements required in e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C §15.247 is given below.

Standard:	Standard:	Test Method:		Tes	at requi applic fulfil	remen able: led:	ts:
§ 15.207	RSS-Gen issue 5	ANSI 63.10 Section 6.2	AC Mains Conducted Emissions	\boxtimes		\boxtimes	
§ 15.209	RSS-Gen issue 5	ANSI 63.10 Section 6.3 - 6.6	Radiated Emissions	\boxtimes		\boxtimes	
§15.247	RSS-247 issue 2	ANSI 63.10 Section 11.8.1	6 dB DTS Bandwidth	\boxtimes		\boxtimes	
§15.247	RSS-247 issue 2	ANSI 63.10 Section 11.9.2	Output Power of Fundamental Emissions	\boxtimes		\boxtimes	
§15.247	RSS-247 issue 2	ANSI 63.10 Section 11.10.3	Maximum Power Spectral Density	\boxtimes		\boxtimes	
§15.247	RSS-247 issue 2	ANSI 63.10 Section 11.13.2	Band Edges Measurement	\boxtimes		\boxtimes	
	RSS-Gen issue 5	ANSI 63.10 Section 6.9.3	99% Power Bandwidth	\boxtimes		\boxtimes	
	RSS-Gen issue 5		Antenna requirement	\boxtimes		\boxtimes	

All required / applicable tests according to the following standards were performed under Ref-No. 20/01-0030.

- e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C §15.247 with test Method according to ANSI C63.10-2013

-RSS-247 issue 02 February 2017 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

- e-CFR data is current as of February 06, 2020

Remark: -/-



5. AC Mains conducted emissions

Applied standards

-e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C, § 15.207 Conducted limits -RSS-Gen issue 05 section 8.8

Test site

Measurements of conducted emission from EUT was made in the shielded chamber (DC - 10GHz) located in the test facility.

Test equipment and test set up

Test equipment used for conducted measurements on Mains as given in clause Test equipment of this report. Test setup used for conducted measurements on Mains as given in clause Test setups of this report.

Detector function selection and bandwidth

In conducted emissions measurement CISPR quasi-peak- and average-detector were used. The bandwidth of the detector of instrument is 10 kHz over the frequency range of 150 kHz to 30 MHz.

Frequency range to be scanned

For conducted emission measurements, the spectrum in the range of 150 kHz to 30 MHz was investigated.

Test conditions and configuration of EUT

The EUT was configured and operated with conditions as mentioned under "Test conditions" in clause 3 above.

All modes are investigated by operating the EUT in a range of typical modes of operation, with typical cable positions, and with a typical system equipment configuration and arrangement. For each mode of operation and for each ac power current-carrying conductor, cable manipulation are performed within the range of likely configurations. The highest values measured are shown in the table below. The corresponding configuration is shown in the "Photo(s) of test setup".

The EUT was placed on a 80 cm high non metallic table. Measurements were performed on the AC terminals of the Host AC-Adaptor (Laptop), on neutral (N)- and live (L1)-wire had been performed.

Requirements

Frequency Range	Quasi-Peak Limits	Average Limits		
[MHz]	[dBµV]	[dBµV]		
0.15 - 0.5	66 to 56 ^{Note 1}	56 to 46 ^{Note 1}		
0.5 - 5.0	56	46		
5.0 - 30.0 60 50				
Note 1: The level decreases linearly with the logarithm of the frequency				

Measurement

Measruement performened on 08.04.2020

As worst cases the mode No. 3. with conditions as mentioned under "Test conditions" in clause 3 was found and documented in this report

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The six highest emissions for each port (L/N)/detector are as following:

Frequency [MHz]	Reading of test receiver [dBµV]	Detector	Port	loss of cable between LISN and test receiver [dB]	LISN correction [dB]	AC power line conducted emission [dBuV]	Limit [dBµV]	Result
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
-/-	-/-	QP	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	Ν	0.10	0.10	-/-	-/-	Pass
0.44	33.2	AV	Ν	0.10	0.10	33.4	47.1	Pass
0.47	29.7	AV	Ν	0.10	0.10	29.9	46.5	Pass
-/-	-/-	AV	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	AV	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	AV	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	AV	Ν	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	L1	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	L1	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	L1	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	L1	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	L1	0.10	0.10	-/-	-/-	Pass
-/-	-/-	QP	L1	0.10	0.10	-/-	-/-	Pass
0.43	34.6	AV	L1	0.10	0.10	34.8	47.4	Pass
0.42	32.5	AV	L1	0.10	0.10	32.7	47.5	Pass
0.91	29.9	AV	L1	0.10	0.10	30.1	46.0	Pass
1.02	29.5	AV	L1	0.10	0.10	29.7	46.0	Pass
0.48	27.6	AV	L1	0.10	0.10	27.8	46.4	Pass
1.07	27.6	AV	L1	0.10	0.10	27.8	46.0	Pass

(1) = test frequency

(2) = Reading of test receiver in $dB\mu V$ without correction factors

(3) = used detector

(4) = tested port Phase (live, L1) or Neutral (N)

(5) = loss of cable between LISN and test receiver in dB

(6) = correction factor of LISN in dB

(7) = Reading of test receiver [dBµV] (2) + loss of cable between Line impedance stabilisation network (LISN) and test receiver (dB) (5) + LISN correction [dB] (6)

(8) = relevant limit in $dB\mu V$

(9) = comparison between Limit $[dB\mu V]$ (7) / (8) and AC power line conducted emission $[dB\mu V]$

Result 0.15 MHz – 30 MHz

All emissions in the frequency range 0.15 MHz – 30 MHz are at least 20 dB below the relevant limit.

Results

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the **Conducted Emission**.



6. Radiated emission measurements

Test site

Measurement of radiated emissions from EUT was made in the semi-anechoic chamber SAC3 (DC to 40 GHz) located in the test facility.

Test equipment and test set up

Test equipment used for radiated measurements as given in clause Test equipment of this report. Test setup used for radiated measurements as given in clause Test setups of this report.

Detector function selection and bandwidth

In radiated emissions measurement, an EMI test receiver that have CISPR detectors was used.

Frequency range	Resolution Bandwidth
9KHz – 150kHz (Quasi Peak & Average* Detector)	200Hz
150KHz – 30MHz (Quasi Peak & Average* Detector)	9kHz
30MHz – 1GHz (Quasi Peak Detector)	120kHz
Above 1GHz (Peak & Average Detector)	1MHz

*Average Detector only in specify frequency range.

Antennas

Measurements were made using a calibrated loop antenna in the range 9 kHz – 30 MHz, as well as a calibrated bilog antenna in the range of 30 to 1000 MHz to determine the emission characteristics of the EUT. Measurements were also made for both horizontal and vertical polarization.

The horizontal distance between the receiving antenna and the EUT was 3 meters.

In the range of 1 GHz to 26 GHz measurements were made using a calibrated horn antenna to determine the emission characteristics of the EUT. Measurements were also made for both horizontal and vertical polarization. The horizontal distance between the receiving antenna and the EUT was 3 meters.

Frequency range to be scanned

For radiated emissions measurements, the spectrum in the range of 9kHz MHz to 40 GHz was investigated as the highest frequency generated in the EUT is 5.7 GHz.

Test conditions and configuration of EUT

The EUT was configured and operated with conditions as mentioned under "Test conditions" in clause 3 above.

During test the EUT was operated as specified in the user manual of the EUT. For frequencies below 1000 MHz the EUT was placed on a 80 cm and for frequencies above 1000 MHz the RF Transmitter modul was placed on a 150 cm high non metallic table placed on the turntable. The EUT was rotated and the antenna height was varied between 1 m to 4 m to find the maximum RF energy generated from EUT. The procedure according to ANSI C63.10:2013 is used and all modes are investigated by operating the EUT in a range of typical modes of operation, with typical cable positions, and with a typical system equipment configuration and arrangement. For each mode of operation, cable manipulation are performed within the range of likely configurations. The highest values measured are shown in the table below.

As worst cases the mode No. 3 and 4 with conditions as mentioned under "Test conditions" in clause 3 were found and documented in this report

Remarks:

-Correction factor included antenna factor and cable attenuation.

-In the frequency range 1 GHz – 7 GHz the Band Reject Filter 2,4 GHz (ID11243) was used to attenuate the fundamental emission.

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Applied standards

-e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C, § 15.209 Radiated emission limits -RSS-Gen issue 05 section 8.9

Requirements:

acc. e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C, § 15.209 Radiated emission limits

Frequency MHz	Limits [µV/m] Quasi-peak	Limits [dBµV/m] Quasi-peak	Limits [µV/m] Average	Limits [dBµV/m] Average	Test distance [m]
0.009 – 0.090	-/-	-/-	2400/F (kHz)	48.5 – 28.5	300
0.090 - 0.110	2400/F (kHz)	28.5 – 26.8	-/-	-/-	300
0.110 – 0.490	-/-	-/-	2400/F (kHz)	26.8 – 13.8	300
0.490 - 1.705	24000/F (kHz)	33.8 – 23.0	-/-	-/-	30
1.705 - 30.0	30	29.5	-/-	-/-	30

acc. RSS-Gen issue 05 section 8.9

Frequency MHz	Limits [µA/m] Quasi-peak	Limits [dBµA/m] Quasi-peak	Limits [µA/m] Average	Limits [dBµA/m] Average	Test distance [m]
0.009 - 0.090	-/-	-/-	6.37/F (kHz)	-3 – -23.0	300
0.090 - 0.110	6.37/F (kHz)	-23.0 – -24.7	-/-	-/-	300
0.110 – 0.490	-/-	-/-	6.37/F (kHz)	-24.7 – -37.7	300
0.490 - 1.705	63.7/F (kHz)	-17.7 – -28.5	-/-	-/-	30
1.705 - 30.0	0.08	-22	-/-	-/-	30

acc. e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C, § 15.209 Radiated emission limits and RSS-Gen issue 05 section 8.9

Frequency MHz	Limits [µV/m] Quasi-peak	Limits [dBµV/m] Quasi-peak	Limits [µV/m] Average	Limits [dBµV/m] Average	Test distance [m]
30 - 88	100	40	-/-	-/-	3
88 - 216	150	43.5	-/-	-/-	3
216 - 960	200	46	-/-	-/-	3
960 - 1000	500	54	-/-	-/-	3
Above 1000	-/-	-/-	500	54	3

Measurements

The Measurement was performed on: 07.04.2020

Result 9 kHz – 30 MHz

In the frequency range 9 kHz – 30 MHz the EUT had been scanned in a distance of 3 m and the Limit were corrected to the test distance of 3 m using a factor with 40 dB/decade acc. to § 15.31 (f)(2).

All emissions in the frequency range 9 kHz – 30 MHz are at least 20 dB below the relevant limit.

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Result 30 MHz – 1000 MHz

Operation Mode: Mode No.: 4 WLAN 802.11g 20MHz CH1



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Frequency [MHz]	Detector	Antenna polarization	Radiated emission [dBµV/m]	Radiated emission [µV/m]	Limit [dBµV/m] (3 m)	Limit [µV/m] (3 m)	Result
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
941.92	QP	V	35.21	57.61	46.00	200	Pass
949.00	QP	V	35.14	57.15	46.00	200	Pass
916.96	QP	V	34.99	56.17	46.00	200	Pass
906.16	QP	V	34.84	55.21	46.00	200	Pass
889.24	QP	V	34.61	53.77	46.00	200	Pass
-/-	QP	V	-/-	-/-	-/-	-/-	-/-
954.72	QP	Н	35.31	58.28	46.00	200	Pass
946.84	QP	Н	35.17	57.35	46.00	200	Pass
921.76	QP	Н	35.05	56.56	46.00	200	Pass
912.88	QP	Н	34.94	55.85	46.00	200	Pass
882.00	QP	Н	34.68	54.20	46.00	200	Pass
-/-	QP	Н	-/-	-/-	-/-	-/-	-/-

The six highest emissions for each polarization (H/V) in the frequency range 30 MHz - 1000 MHz are as following:

(1) = test frequency

(2) = used detector - quasi peak (QP), peak, average (AV)

(3) = polarization of the test antenna (Horizontal/Vertical)

(4) = Reading of test receiver [dBµV] + correction factor

(5) = 10 ^ ((Radiated emission [dBµV/m] (5))/20)

(6) = relevant limit in $dB\mu V/m$

(7) = relevant limit in μ V/m

(8) = comparison between Limit $[dB\mu V/m]$ (6) and Radiated emission $[dB\mu V/m]$ (4)

TED

Result 1 GHz – 7 GHz

Mode No.: 3 with 802.11b 20MHz

TESTED	MANY	 Interfer acc. to FCC	T 5/6 ence radiation § 15.209 / RSS-Gen	BSTC
RefNo.:	20/01-0030			
Product:	Transmitting/	Receiving System	ı	
Sample:	01			
Date:	07.04.2020			
Operator:	BI			pass fail
Remarks:	Both ANT. OI	N; Band Stop Filte	er (2.4GHz / 11244) used	Result:
Operation mo	de: WLAN CH.	11; BW = 20MHz	; CCK; 802.11b; Power le	evel 19
				m
Spectrum	Receiver	(X)		
Input 1 AC	Att 0 dB	MI 15 Preamp OFF Ste	IIS6-1-6GHZ.ID	 -
Scan ⊜1Av	Max o 2Pk Max		·	
Limit Che	eck	PASS		
90 dBjrv/m 150	-1-76HZ-PEAK-P	GG-CLAS PASS		
80 dBµV/m				
IT56-1-7GHZ-PE	EAK-FCC-Class B.LIN	N N		
т 70 авру/ш—				
60 dBµV/m				
	/ FOO Olassi D. I. M.			
1156-1-76HZ-AN	7-FUU-Class B.LIN			. men with motion
10 10 11/-			and and and the second second	Note Marken Marken Marken
40 dBµV/m—	٨	when my when	Contraction of the second seco	the work to the the standard
30 dBuV/m-	And the second second second	m	M. manan	
	han	montromen		
20 dBµV/m—	Contraction of the second s			
10 40 11/1				
10 dBµV/m				
01-11-0-011		TF		01
Start 1.0 GH	Z			Stop 7.0 GHz

Polarisation: V									
				Detector Peak					
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
4,8740	48,82	-5,18	54,00	pass	1-7	-/-	>20	74,00	pass
6,9880	38,80	-15,20	54,00	pass					
6,7708	38,63	-15,37	54,00	pass					
4,8770	38,56	-15,44	54,00	pass					
4,8660	38,17	-15,83	54,00	pass					
4,8710	37,96	-16,04	54,00	pass					

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RefNo.: 20/01-0030			
Operation mode: WLAN CH	.11; BW = 20MHz; CCK; 802	2.11b; Power level 19	_
Spectrum Receiver	x		
RBW (EMI) 1 MHz	MT 1s	IT56-1-6GHz.TDF	
Input 1 AC Att 0 dB	Preamp OFF Step TD Scan		
Limit Check	PASS		
Line IT56-1-7GHZ-AV-FC	C-Class B PASS		
90 dBjrv/mT56-1-7CHZ-PEAK-	FGG-GLAE PAEE		
80 dBµV/m			
IT56-1-7GHZ-PEAK-FCC-Class B.LI 70 ubpv/III	N		
60 dBuV/m			
IT56-1-7GHZ-AV-FCC-Class B.LIN			
35 0500			- menten when how how how how how how how have
40 dB: 0/m	set have	and the second s	
	manufamout V north		the
be do with the hard and and	an Am	anonto managhana	and the
30 UBHV/m	man hourse	~~~~	
the second second	with		
20 aBHA/W			
10 dBµV/m			
			TE
Start 1.0 GHz			Stop 7.0 GHz

Polarisation: H									
	Detector Average						Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
4,8740	50,24	-3,76	54,00	pass	1-7	-/-	>20	74,00	pass
4,8710	39,65	-14,35	54,00	pass					
6,9913	39,11	-14,89	54,00	pass					
4,8820	38,66	-15,34	54,00	pass					
4,8770	38,64	-15,36	54,00	pass					
4,8660	37,84	-16,16	54,00	pass					

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IN GERMANY	Interference radiation	EDIL
	according to FCC §15.209 RSS-Gen	

Ref.-No.: 18/11-0061

Operation mode: Tx 2.4GHz (802.11b 20MHz/CH11 - 2462MHz); BPF 2,4GHz (ID11243) used

Receiver	
RBW (EMI) 1 MHz MT 1 s	IT56-1-6GHz.TDF
Input 1 AC Att 0 dB Preamp OFF Step TD Scan	
Scan 🔵 1 Av Max 😋 2 Pk Max	
Limit Check PASS	
Line IT56-1-7GHZ-AV-FCC-Class B PASS	
90 dBjrv/m t56-1-7cHz-reak-Fgg-gla8 - Pass	
80 dBuV/m	
IT56-1-7GHZ-PEAK-FCC-CLASS B	
70 uspv/m	
60 dBµV/m	
IT56-1-7GHZ-AV-FCC-Class B	
	+ manufacture manufacture
(# Munu	white manufacture
AQ dBuV/m	and the second
When a summer and a summer of the liste	a manufacture and a second
30 dBuV/m	and more thank
and the second second	
Mummum mutant	
20 dBµV/m	
10 dBµV/m	
	TF
Start 1.0 GHz	Stop 7.0 GHz

Polarisation: H									
Detector Average							Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
4,9240	49,95	-4,05	54,00	pass	1 - 7	/	>20	74	pass
3,2828	47,45	-6,55	54,00	pass					
2,3340	43,64	-10,36	54,00	pass					
2,3305	43,07	-10,93	54,00	pass					
2,3075	42,53	-11,47	54,00	pass					
2,3050	42,19	-11,81	54,00	pass					

Result 7GHz – 40GHz

All emissions in the frequency range 7 GHz – 40 GHz are at least 20 dB below the relevant limit

Results

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the **Radiated Emissions**.



7. Operation within the band 902-928 MHz, 2400-2483,5 MHz and 5725-5850 MHz

Applied standards

-e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C §15.247 -RSS-247 issue 2

7.1. 6 dB DTS Bandwidth Measurement

Applied standards

-e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C §15.247 (a) (2) -RSS-247 issue 2 Section 5.2 (a)

Limit

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test equipment and test set up

Test equipment used for conducted measurements as given in clause Test equipment of this report. Test setup used for conducted measurements as given in clause Test setups of this report.

Description

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Measurement

The Measurement was performed on: 01.04.2020 and 02.04.2020

Conducted measurement data

Image: Strep
--

Lowest operating frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 1



Middle Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 1



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Test report no.: 20/01-0030-A

Highest Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 1



Lowest operating frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2



RISTC	TESTED
	IN GERMANY

Middle Operating Frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 2



Highest Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2



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Lowest operating frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 1



Middle Operating Frequency - 802.11g / OFDM - MCS=0; 6 MBps / Antenna 1

MultiView	Spectrum	🖾 Spe	ctrum 2 [Spectru	m 3 🗐	1			
Ref Level 30.0	0 dBm	* RBW 1	00 kHz						_
1 Frequency Sv	veep	OAIMS VEW 3	00 kH2 Mode Au	to.sweep					IPK Max
20 dBm-								D3[1] M1[1]	0.30 dt 16.3040 MH 0.16 dBn .4357210 GH
10 dbm									
0 dBm-		M	Van Marchar	Manutary p	and ministration	when the sta	n		
-10 d8m									
-20 d8m		1					1		
-30 d8m-		K.					Mr.		
Mannan	N. MORENE AND						- No	rying Associate	www.how
-50 d8m									
CF 2.437 GHz			1001 pts			0 MHz/	2	S	pan 40.0 MHz
2 Marker Table Type Ref M1	Trc 1 2	X-Value 435721 GHz	γ. 1 γ.	Value 6 dBm		Function		Function Re	sult
M2 D3 M2	1 2	428808 GH2 16.304 MH2	-5.6	1 dBm .30 dB					
Channel	Frequen	cy [MHz]	6 d	B Bandwi	dth [MHz]		Limit [MHz	2] Re	sult
6	24	37		16.30)4		0.5	Р	ass

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Highest Operating Frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 1



Lowest operating frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 2

MultiView	Spectrum	III Sp	ectrum 2	E Spect	rum 3 🔅				
Ref Level 30.0	0 dBm	* RBW	100 kHz			-			_
Att I Frequency Sy	40 dB SWT 1 /eep	.04 ms VBW	308 kHz Mod	e Auto Sweep					IPK Max
	14054212							D3[1]	0.38 dt
1975								100000000	16.3040 MH
20 dBm-			-	-		-		M1[1]	1.21 dBm
									2,4107210 GH
10 dbm						-			-
				MI					
0 dBm			1 1 1	1 Acres	A. A. A				-
-	0144-250 alles		follow lines www	e Water and a source and	Manuer with a sufficient	good hand hand h	*		
-10 d8m-			<u></u>	1.	4		1		
		1					1		
-20 dBm-		and the second s					20		
		1					20		
-30 d8mi-		F					1		
1909-0000		A.					h	1.5	
40 -0	ARMYNANA	when.					'W'	Ling have	
A WWWWWW	WI0							Mershy	What was
NVN STATE									www
-50 dem-						1			
									_
CF 2.412 GHz		ė	1001 pt	s	<u> </u>	1.0 MHz/	28	0/ ş	Span 40.0 MHz
2 Marker Table	1 Tax 1	W. Mahar	1	N. Walar	1	Friedland	1	Frank Street F	have de
MI Ker	1 2	.410721 GI	1z	1.21 dBm		Function		Punction F	cesuit
M2	1 2	.403808 GH	iz ·	4.77 dBm					
Ob ann al	1	10.304 MI	12	0.38 dB			L Sec. 14 FRALLS	1 0	l(
Channel	Frequer	ICY [MHZ]		6 dB Bandy	width [MHz]			zj R	esult
1	24	412		16.	304		0.5		Pass

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Middle Operating Frequency - 802.11g / OFDM - MCS=0; 6 MBps / Antenna 2



Highest Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2

MultiView	Spectrum 🖂	Spectrum 2	Spectrum :	3 🖾		
Ref Level 30.0	00 dBm • 1	RBW 100 kHz		<u> </u>		
L Frequency S	Ween	ARM 300 KHZ MO	de Auto Sweep			EPK Max
						D3[1] 0.28 dt 16,3040 MH
20 dBm						M1[1] 0.03 dBn 2.4607210 GH
10 dBm						
0 dBm		29 A A. A.	Mr. Marghundham mard	andral day 1	-	
-10 dBm-		A	The second secon	- The Second Schools	1	
-20 dBm	j	1	-		6	
-30 d8m	/		-		1	
-40 sten A a rahvan	Mrs. Mary manut				Jan	manna and
-50 d8m						
CF 2.462 GHz		1001	ots	4.0 MHz/		Span 40.0 MHz
2 Marker Table Type Ref	e Trc X-Vali	ie l	Y-Value	Function		Function Result
M1 M2 D3 M2	1 2.460721 1 2.453808 1 16.304	GHZ GHZ MHZ	-0.03 dBm -6.12 dBm 0.28 dB		W.	
Channel	Frequency [MHz]		6 dB Bandwidth [M	/Hz]	Limit [MHz]	Result
11	2462		16.304		0.5	Pass

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Lowest operating frequency - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Middle Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



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Highest Operating Frequency - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Lowest operating frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2

MultiView	Spectrum	II 5	pectrum 2	E Spect	um 3 [
Ref Level 30.0	0 dBm	* RBV	V 100 kHz						_
Att Energiency St	AD dB SWI :	LOA ms VBV	300 RHZ MO	de Auto Sweep					PK Max
								D3f11	-0.04 dB
			11					10000 M	16,9030 MHz
20 dBm			-					M1[1]	1.08 dBm
									2,4132390 GHz
10 dBat			1				-		
Mennal.					100				
					T				
6.dBm		N.	N. A. A.	Marchine	man man mad	A A	03		
	11 + 4.900 dijis	y	Har Michigan and	MP		aph a survey rower in	1 acres		1
-10 d8m		- (<u></u>	-		-	-
		1					6		
-20 d8m-		1	-	_		-			
		p.	1				X		
		1					7		
- 3u dem	- 10	1. 1					1		
		map					MAN	about and	10
40 - 40 - 50 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 -	White the Kare							the electrony of the	All Dawn &
Margara			1						Leas Mar Mary
-50 d8m									
_									
CE 2 412 CH2			1001 -			LO MUNZ			Spap 40.0 MHz
2 Marker Table			10011	15		1.0 MIT27			span 40.0 Minz
Type Ref	Trc	X-Value		Y-Value	-	Function	-	Function R	esult
ML	1	2.413239 G	Hz	1.08 dBm			10		
M2 D3 M2	1 7	16.903 M	HZ	-4.88 dBm -0.04 dB					
Channel	Freque	ncy [MHz]		6 dB Band	width [MHz]		Limit [MHz	z] R	esult

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	IN GERMANY

Middle Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2

MultiView	Spectrum	🖾 Spe	ctrum 2	Spect	rum 3 [
Ref Level 30.0	0 dBm	* RBW	LOO kHz			-			_
1 Frequency Sy	Neces	1.04 ms VBW C	SOURIE MOD	e Auto Sweep					IPK Max
111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111 - 111								D3[1]	-0.76 dB
								10-000-545	17.0630 MHz
20 dBm								M1[1]	0.67 dBm
								3	2,4357210 GHz
10 dBm						-			
012753)				1105					
				M1	1 Not 198 202				
0.dBm		M2	A A. A	Real march 1990	marchard	A A A	153		
	41-1-130 Marc	1 Martin	And a service with	Allowers of Asia a second	and the set of the party	14-419-414 Jordan 10	AP. AN	-	-
-10 d8m		1		-	4				-
		1							
-20 d8m-		1				-	1		
							1		
20.42		1				-	6		
-3u dem-		and a					1		
	ALLANDA A	Mulla					you	Maria	
-40 dem 1 4000	WANTANT						Y	- Show An	Malake
MAAAAA								CARGE FORCE WERE	and MMAN
-50 d8m-									
_									
AP 10 10 1 (1) (1001	ļ	L				
CF 2.437 GHZ			1001 pt	5		NU MHZ/			pan 40.0 MHz
Type Ref	Tec	X-Value		V-Value	1	Function	-	Eunction Re	sult
ML	1 2	2.435721 GH	z	0.67 dBm	1	1. Sat Particular	1	T di Periori T Ti	a study to
M2 M2	1	17.063 MH		-4.68 dBm					
Channel	Freque	ncy [MHz]		6 dB Band	width [MHz]		Limit [MHz	l Re	esult
6	2	/37		17	063		0.5		266
U	2	437	1	17.	.003		0.5	P	a33

Highest Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2

MultiView	Spectrum 🗵	Spectrum 2	Spectru	m 3 🛛	9		
RefLevel 30.0	00 dBm 😐	RBW 100 kHz					
Att	40 dB SW1 1.04 ms	VBW 300 RH2 MO	de Auto Sweep				PE Max
	VAUCADESC ST						M2[1] -4.83 dBm
							2.4534490 GHz
20 dBm			+ +		-		M1[1] 0.73-dBm
							2.4632390 GHz
10 dbm			-		-		
0103233				8,8541			
		2003 10 10	10. 10	T	1.15		
0.dkm		Mr. A. A.	Auguar a	montment	A A A	03	
-		Manucipinan			part crown refrest of	here	
+10 dbm			1 1			1	
		1				5	
-20 dBm-		1			-	-	
						1	
-30 d8mi-						4	
8255252	in Anol					1.00	
	wanth and want					1444	Man Marken
and have	and at.						Man
-50 d8m			1 1		-		
CE 2,462 GHz		1001 r	its		.0 MHz/		Spap 40.0 MHz
2 Marker Table		10000	1010		and the second secon		
Type Ref	Trc X-Va	lue	Y-Value	-	Function		Function Result
M1	1 2.46323	9 GHZ	0.73 dBm				
-D3 M2	1 17.02	3 MHz	-0.29 dB				
Channel	Frequency [MHz]		6 dB Bandwidth	n [MHz]		Limit [MHz]] Result
11	2462		17.023			0.5	Pass

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Lowest operating frequency - 802.11n 40MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Middle Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



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Highest Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



Lowest operating frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



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	IN GERMANY

Middle Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Highest Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Results

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the **6 dB Bandwidth**.



7.2. Output Power of Fundamental Emissions Maximum Conducted Output Power

Applied standards

-e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C §15.247 (b) (3) -RSS-247 Issue 2 section 5.4 (d)

Limits for Peak Output Power of Fundamental

The maximum peak conducted output power of the intentional radiator shall not exceeded: 1 Watt As an alternative to the maximum peak conducted output power the average output power is measured to show compliance to the limit.

Test equipment and test set up

Test equipment used for conducted measurements as given in clause Test equipment of this report. Test setup used for conducted measurements as given in clause Test setups of this report.

Description

For the conducted measurement, the RF output of the EUT was connected to the Analyzer. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in Watt.

In addition, the EIRP was calculated taking into account the antenna gain.

Measurement

The Measurement was performed on: 01.04.2020 and 02.04.2020

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Lowest operating frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 1



Middle Operating Frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 1



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Highest Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 1



Maximum output power conducted measurement: 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 1								
Channel	Frequency	Reading of Analyzer	Cable Loss	Output	Output Power		Limit	
	נועורובן	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[mW]	
1	2412	10.52	1.2	11.72	14.86	30	1000	Pass
6	2437	10.60	1.2	11.80	15.14	30	1000	Pass
11	2462	10.44	1.2	11.64	14.59	30	1000	Pass

Calculated EIRP:

802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 1

Channel Frequency		Output Power		Output Power EIRP		Limit		Result
	נועורובן	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1	2412	11.72	14.86	15.1	32.51	36	4000	Pass
6	2437	11.80	15.14	15.2	33.11	36	4000	Pass
11	2462	11.64	14.59	15.0	31.92	36	4000	Pass
Formula: [Output Power] + [Antenna Gain] = [EIRP]								
Antenna 1 Gain: max. 3.4dBi								
Antenna 2 Gain: max. 2.12dBi								

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Lowest operating frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 2



Middle Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2


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Highest Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2



Maximum output power conducted measurement: 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 2 Channel Frequency [MHz] Reading of Analyzer [dBm] Cable Loss [dBm] Output Power Limit 1 2412 10.66 1.2 11.86 15.35 30

Channel		Analyzer	Loss					Result
	נויורבן	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[mW]	
1	2412	10.66	1.2	11.86	15.35	30	1000	Pass
6	2437	10.65	1.2	11.85	15.31	30	1000	Pass
11	2462	10.64	1.2	11.84	15.28	30	1000	Pass

Calculated EIRP:

802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2

Channel Frequency		Output Power		Output I EIR	Limit		Result	
	נועורובן	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1	2412	11.86	15.35	14.0	25.00	36	4000	Pass
6	2437	11.85	15.31	14.0	24.95	36	4000	Pass
11	2462	11.84	15.28	14.0	24.89	36	4000	Pass
Formula: [Output Power] + [Antenna Gain] = [EIRP]								
Antenna 1 Gain: max. 3.4dBi								
Antenna 2	2 Gain: max. 2	2.12dBi						

Lowest operating frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 1



Middle Operating Frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 1



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Highest Operating Frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 1



Maximum output power conducted measurement: 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 1

Channel	Frequency	Analyzer	Loss	Output	Power	Lii	nit	Result	
	נויודבן	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[mW]		
1	2412	9.48	1.2	10.68	11.69	30	1000	Pass	l
6	2437	9.80	1.2	11.00	12.59	30	1000	Pass	
11	2462	9.89	1.2	11.09	12.85	30	1000	Pass	

Calculated EIRP:

802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 1

Channel	Frequency	ency Output Power		Output I EIR	Limit		Result	
	נועודיבן	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1	2412	10.68	11.69	14.1	25.59	36	4000	Pass
6	2437	11.00	12.59	14.4	27.54	36	4000	Pass
11	2462	11.09	12.85	14.5	28.12	36	4000	Pass
Formula: [Output Power] + [Antenna Gain] = [EIRP]								
Antenna 1 Gain: max. 3.4dBi								
Antenna	2 Gain: max. 2	2.12dBi						

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Lowest operating frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2



Middle Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2



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Highest Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2



Maximum output power conducted measurement: 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 2 Reading of Cable Frequency **Output Power** Limit Channel Analyzer Loss Result [MHz] [dBm] [dBm] [mW] [dBm] [dB] [mW] 2412 1 10.31 1.2 11.51 14.16 30 1000 Pass 2437 1.2 1000 6 9.75 10.95 12.45 30 Pass 11 2462 1000 9.17 1.2 10.37 10.89 30 Pass

Calculated EIRP:

802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2

Channel	Frequency	Frequency Output Power		Output F EIR	Limit		Result	
	נועורובן	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1	2412	11.51	14.16	13.6	23.07	36	4000	Pass
6	2437	10.95	12.45	13.1	20.28	36	4000	Pass
11	2462	10.37	10.89	12.5	17.74	36	4000	Pass
Formula: [Output Power] + [Antenna Gain] = [EIRP]								
Antenna 1 Gain: max. 3.4dBi								
Antenna 2	Antenna 2 Gain: max. 2.12dBi							

Lowest operating frequency - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Middle Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



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Highest Operating Frequency - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Maximum output power conducted measurement: 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1									
Channel	Frequency	Reading of Analyzer	Cable Loss	Output Power		Limit		Result	
	[101112]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[mW]		
1	2412	9.50	1.2	10.70	11.75	30	1000	Pass	
6	2437	9.56	1.2	10.76	11.91	30	1000	Pass	
11	2462	9.19	1.2	10.39	10.94	30	1000	Pass	

Lowest operating frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Middle Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



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Highest Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Maximum output power conducted measurement: 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2									
Channel	Frequency	Reading of Analyzer	Cable Loss	Output Power		Limit		Result	
		[dBm]	[dB]	[dBm]	[mW]	[dBm]	[mW]		
1	2412	10.76	1.2	11.96	15.70	30	1000	Pass	
6	2437	10.26	1.2	11.46	14.00	30	1000	Pass	
11	2462	10.24	1.2	11.44	13.93	30	1000	Pass	

Maximum output power conducted measurement:										
802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1 + Antenna 2										
Channel	Frequency	Output Antenna 1	Output Antenna 2	Total Output Power		Limit		Result		
	נויודבן	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]			
1	2412	11.75	15.70	14.39	27.45	30	1000	Pass		
6	2437	11.91	14.00	14.13	25.91	30	1000	Pass		
11	2462	10.94	13.93	13.96	24.87	30	1000	Pass		
According	to KDB 6629	11 D01								

Calculated EIRP: 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1 + Antenna 2 **Total Output Power Total Output Power** Frequency Limit Channel EIRP Result [MHz] [dBm] [dBm] [mW] [mW] [mW] [dBm] 2412 20.19 4000 1 14.39 27.45 104.47 36 Pass 4000 2437 25.91 98.40 36 Pass 6 14.13 19.93 19.76 4000 11 2462 13.96 24.87 94.62 36 Pass Formula: [Total Output Power] + [DirectionI Gain] = [EIRP] Antenna 1 Gain: max. 3.4dBi Antenna 2 Gain: max. 2.12dBi **Directionl Gain: 5.8dBi** According to KDB 662911 D01

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Lowest operating frequency - 802.11n 40MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Middle Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



Highest Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



Maximum output power conducted measurement: 802.11n 40MHz / HT Greenfield – MCS=0; 15 MBps / Antenna 1								
Channel	Frequency [MHz]	Reading of Analyzer	Output Power		Limit		Result	
	-	[αΒΜ]	[αΒ]	[aBm]	[mvv]	[αΒΜ]	[mvv]	
3	2422	9.32	1.2	10.52	11.27	30	1000	Pass
6	2437	9.01	1.2	10.21	10.50	30	1000	Pass
9	2452	9.26	1.2	10.46	11.12	30	1000	Pass

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Lowest operating frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Middle Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Highest Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Maximum output power conducted measurement: 802.11n 40MHz / HT Greenfield – MCS=0; 15 MBps / Antenna 2									
Channel	Frequency	Reading of Cable Analyzer Loss	Output Power		Limit		Result		
	נאורוצן	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[mW]		
3	2422	9.71	1.2	10.91	12.33	30	1000	Pass	
6	2437	10.02	1.2	11.22	13.24	30	1000	Pass	
9	2452	9.54	1.2	10.74	11.86	30	1000	Pass	

Maximum output power conducted measurement: 802.11n 40MHz / HT Greenfield – MCS=0; 15 MBps / Antenna 1 + Antenna 2									
Channel	Frequency	ency Hz] Output Antenna 1 [mW]	Output Antenna 2 [mW]	Total Output Power		Limit		Result	
	[IVIHZ]			[dBm]	[mW]	[dBm]	[mW]		
3	2422	11.27	12.33	13.73	23.60	30	1000	Pass	
6	2437	10.50	13.24	13.75	23.74	30	1000	Pass	
9	2452	11.12	11.86	13.61	22.98	30	1000	Pass	
According	to KDB 6629	11 D01							

Calculate 802.11n	ed EIRP: 40MHz / HT (Greenfield – MCS=	0; 15 MBps / Ant	tenna 1 + Ante	enna 2			
Channel	Frequency	Total Output Power		Total Output Power EIRP		Limit		Result
	[INIHZ]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	1
1	2412	13.73	23.60	19.53	89.74	36	4000	Pass
6	2437	13.75	23.74	19.55	90.16	36	4000	Pass
11	2452	13.61	22.98	19.41	87.30	36	4000	Pass
Formula:	[Total Output	Power] + [Direction	Gain] = [EIRP]					
Antenna [•]	1 Gain: max. 3	3.4dBi						
Antenna	2 Gain: max. 2	2.12dBi						
Direction	l Gain: 5.8dBi							
Accordin	g to KDB 6629	911 D01						

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Results

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements of **Output Power of Fundamental Emissions**.



7.3. Power Spectral Density

Applied standards

-e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C §15.247 (e) -RSS-247 issue 2 Section 5.2 (b)

Limit

For digitally modulated systems, the power spectral density conducted 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.

Test equipment and test set up

Test equipment used for conducted measurements as given in clause Test equipment of this report. Test setup used for conducted measurements as given in clause Test setups of this report.

Description

The maximum average conducted output power was used to determine compliance to the fundamental output power limit. So the maximum average conducted PSD level is measured with a power averaging (rms) detector.

Measurement

The Measurement was performed on: 01.04.2020 and 02.04.2020

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Lowest operating frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 1



Middle Operating Frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 1



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Highest Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 1



Maximum power spectral density 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 1									
Channel	Frequency [MHz]	Reading of Analyzer [dBm / 3 kHz]	Cable Loss [dB]	Power Spectral Density [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Result			
1	2412	-22.71	1.2	-21.51	8	Pass			
6	2437	-22.51	1.2	-21.31	8	Pass			
11	2462	-22.59	1.2	-21.39	8	Pass			

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Lowest operating frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2



Middle Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2



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Highest Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2



Maximum power spectral density 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2									
Channel	Frequency [MHz]	Reading of Analyzer [dBm / 3 kHz]	Cable Loss [dB]	Power Spectral Density [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Result			
1	2412	-21.86	1.2	-20.66	8	Pass			
6	2437	-22.55	1.2	-21.35	8	Pass			
11	2462	-22.99	1.2	-21.79	8	Pass			

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Lowest operating frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 1

MultiView	Spectrum		Spectrum 2	Spectr	'um 3 🔅	3			
Ref Level 10.00 Att 2	dBm DdB SWT 4.	19 ms (~46	 RBW 3 ki ms) VBW 10 ki 	iz Iz Mode Auto F	भा			s	GL ount 200/200
1 Frequency Swe	ep							M1[1]	-24.16 dBm
0 dBm			-						11105000 011
-10 dBm									
-20 d8m				T.	0.0.722				
-30 dBm		-	WWWWWW	ANNANNA	MWW MM	WWWWWW	1	-	
-40 dam		7	1	1			k		
-50 d8m		ľ	_				1		
-60.d8m		1					1		
WWWWWW	WWWWW	W	-		0		W	WWWWWWWW	www.
-80 d8mi-	-								
CF 2.412 GHz			30001 p	ts	4	.0 MHz/	~	5	ipan 40.0 MHz
2 Marker Table Type Ref MI	Trc	X-Value	GHz -	Y-Value 24.16 dBm	1	Function	E	Function Re	esult

Middle Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 1



Highest Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 1



Maximum power spectral density 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 1									
Channel	Frequency [MHz]	Reading of Analyzer [dBm / 3 kHz]	Cable Loss [dB]	Power Spectral Density [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Result			
1	2412	-24.16	1.2	-22.96	8	Pass			
6	2437	-24.43	1.2	-23.23	8	Pass			
11	2462	-24.17	1.2	-22.97	8	Pass			

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Lowest operating frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2

MultiView	Spectrum 🔟	Spectrum 2	E Specta	'um 3 [2	3			
Ref Level 10.00	dBm Down ewr as a well	RBW 3k	iz Mada Auto I	96T			s	GL
1 Frequency Sw	eep	WO HIS? WOR TO IS	12 MIDAGE MIDIOT	71.				1Rm Ave
	0240.0	1					M1[1]	-22.87 dBm
0 dBm							<u>.</u>	TILIOUTU UNA
-10 dBm					· · · ·			
-20 dBm				*	(a. 2010)			
-30 d8m		MMMMMM	www.www	wwwww	WWWWWWW	1		
-40 dam		1	63	i i		1		
-50 d8m		<u>/</u>				M		
-60 dBm		0				1	1.12	
ANNAWAWA	MMMMMM WA					, MM	WWWWWW	WWWWWWW
-80 d8m								- THE WAY
CF 2,412 GHz		30001 n	ts	4	-0 MHz/			ipan 40.0 MHz
2 Marker Table Type Ref	Trc X-Val	ue 57 GHz -	Y-Value 22.87 dBm	1	Function	F	Function Re	sult

Middle Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2



Highest Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2



Maximum power spectral density 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2								
ChannelFrequency [MHz]Reading of AnalyzerCable LossPower Spectral 								
1	2412	-22.87	1.2	-21.67	8	Pass		
6	2437	-24.42	1.2	-23.22	8	Pass		
11	2462	-24.28	1.2	-23.08	8	Pass		

Lowest operating frequency - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Middle Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



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Highest Operating Frequency - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Maximum power spectral density 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1									
Channel Frequency [MHz] Reading of Analyzer Cable Loss Power Spectral Density Limit [dBm / 3 kHz] Reading [dBm / 3 kHz]									
1	2412	-24.33	1.2	-23.13	8	Pass			
6	2437	-24.23	1.2	-23.03	8	Pass			
11	2462	-24.54	1.2	-23.34	8	Pass			

Lowest operating frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2

MultiView	Spectrum	II S	pectrum 2	Specta	rum 3 🔅	Z)			
Ref Level 10.00	18m	-	RBW 3k	Hz				S	GL
Att 20	DIDE SWI-4.	.19 ms (~46 r	ns) VBW 10 k	HZ: Mode Auto I	PE			c	ount 200/200
	2010							M1[1]	-23,16 dBm
0 dBm			-					2.	40980140 GHz
-10 dBm			-						
-20 d8m				Alg	100 C 100 C 100 C				
+30 d8m		A	www.MWWW	www.	WWW WWW	AMMMAMA	M		
-40 dām		-	-	-	N				
-50 d6m		N		-			Y		
+60 dBm-		VIN	-	-			1.1		
ANAMAMA	WWWW						V.	MMMMM	WWWWWWW
-80 d8m									
CF 2.412 GHz			30001	ots	4	1.0 MHz/		5	ipan 40.0 MHz
2 Marker Table Type Ref M1	Trc 2.	X-Value 4098014	GHz	Y-Value 23.16 dBm	1	Function		Function Re	sult

Middle Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



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Highest Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Maximum power spectral density 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2									
Channel Frequency [MHz] Reading of Analyzer Cable Loss Power Spectral Density Limit [dBm / 3 kHz] Result									
1	2412	-23.16	1.2	-21.96	8	Pass			
6	2437	-23.94	1.2	-22.74	8	Pass			
11	2462	-24.34	1.2	-23.14	8	Pass			

Maximum power spectral density 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1 + Antenna 2								
Channel	Frequency [MHz]	Highest PSD of Ant 1 or Ant 2 [dBm/3kHz]	PSD calculated * Ant1 + Ant 2 [dBm/3kHz]	Limit [dBm/3kHz]	Result			
1	2412	-21.96	-18.95	8	Pass			
6	2437	-22.74	-19.73	8	Pass			
11	2462	-23.14	-20.13	8	Pass			
*According	*According to KDB 662911 D01, add 10 log (N _{ANT}) dB, N = 2							

Lowest operating frequency - 802.11n 40MHz / HT Greenfield - MCS=0; 15 MBps / Antenna 1



Middle Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 15 MBps / Antenna 1



Highest Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 15 MBps / Antenna 1



Maximum 802.11n 4	n power spec 0MHz / HT G	ctral density Greenfield – MCS	=0; 15 MBps	s / Antenna 1		
Channel	Frequency [MHz]	Reading of Analyzer [dBm / 3 kHz]	Cable Loss [dB]	Power Spectral Density [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Result
3	2422	-25.82	1.2	-24.62	8	Pass
6	2437	-25.88	1.2	-24.68	8	Pass
9	2452	-25.66	1.2	-24.46	8	Pass

Lowest operating frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 15 MBps / Antenna 2



Middle Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 15 MBps / Antenna 2



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Highest Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 15 MBps / Antenna 2



Maximum 802.11n 4	n power spec 0MHz / HT C	ctral density Greenfield – MCS	=0; 15 MBps	s / Antenna 2		
Channel	Limit [dBm / 3 kHz]	Result				
3	2422	-25.13	1.2	-23.93	8	Pass
6	2437	-25.06	1.2	-23.86	8	Pass
9	2452	-25.20	1.2	-24.00	8	Pass

Maximum 802.11n 4	n power spec 0MHz / HT G	ctral density Greenfield – MCS=0; 15 M	Bps / Antenna 1 + Ante	nna 2	
Channel	Frequency [MHz]	Highest PSD of Ant 1 or Ant 2 [dBm/3kHz]	PSD calculated * Ant1 + Ant 2 [dBm/3kHz]	Limit [dBm/3kHz]	Result
3	2422	-23.93	-20.92	8	Pass
6	2437	-23.86	-20.85	8	Pass
9	2452	-24.00	-20.99	8	Pass
*According	g to KDB 6629	911 D01, add 10 log (N _{ANT}) d	B, N = 2		

Results

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the **Power Spectral Density**.



7.4. Band-Edges Measurement

Applied standards

-e-CFR Title 47 Chapter I Subchapter A Part 15 Subpart C §15.247 (d) -RSS-247 issue 2 Section 5.5

Limit

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 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Emissions which fall in the restricted bands, as defined in §15.205 Restricted Bands of operation as well as in restricted bands of the RSS-Gen Issue 5 (see Section 8.10 Restricted Frequency Bands) and must also comply with the radiated emission limits specified in §15.209 Radiated emission limits as well as the limits specified in RSS-Gen Table 5.

Test equipment and test set up

Test equipment used for Band Edge measurements as given in clause Test equipment of this report. Test setup used for Band Edge measurements as given in clause Test setups of this report.

Description

The band edge is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. In the Restricted Bands defined in § 15.205 the compliance with the §15.209 and RSS-Gen Radiated emission limits is investigate.

Detector function selection and bandwidth

For the measurement, an EMI test receiver that have CISPR peak and avearge detector was used.

Frequency range:	Bandwidth	
See measurement graph	RBW:	100 kHz
	VBW:	300 kHz

Measurement

The Measurement was performed on: 07.04.2020

Lower Band Edge - 802.11b 20MHz / CCK - MCS=0; 1 MBps / both antennas are active

TESTED IN GERMANY	FCC Band edge (accordin 247 RSS-247 F	B STC	
Def No : 20/01 0030	211,100 211,1	00 310.200 1100 0	
RelNo 20/01-0030			
Operation mode: WLAN CH.01; BV	V = 20MHz; CCł	<; 802.11b; Low edge	9
			Ē
Spectrum Receiver *			
RBW (EMI) 1 MHz MT Input 1 AC Att 0 dB Prea	ls mnOFF StenTD	IT56-1-7GHz ohn Scan	e AmpTDF
Scan Olav MaxO2Pk Max	inpoint occprib	00011	
Limit Check	PASS	D2[2]	-33.89 dB
120 UBW/M56-1-6CHZ-AV-WLAN-2-			-15.750000 MHz
LINE IT SO- 1-OGHZ-PEAK-WLAN-	2-4 PA55	0.000 s	2.414750000 GHz
110 dBµV/m			
		The second se	
100 dBµV/m		/ ¥	
80 dBi 4/m		<i>µ</i>	
80 dBuV/m			
T56-1-6GHZ-PEAK-WLAN-2-4GHZ_FCC.LIN	4	D2	
70 dBµV/m			
	** **		
60.dBpV/m			
T56-1-6GHZ-AV-WLAN-2-4GHZ_FCC.LIN			ľ Λ I
50 dBµý/m	+ A	_ ∧~	
	- how i	V	
40 dBµV/m			
30 dBµV/m		F1	
Start 2.343 GHz			Stop 2.443 GHz

				Polarisat	ion: V				
Detector Average					Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,3870	48,05	-5,95	54,00	pass	2,3883	67,11	-6,89	74,00	pass
2,3863	44,84	-9,16	54,00	pass	2,3863	66,63	-7,37	74,00	pass
					2,3823	64,92	-9,08	74,00	pass
					2,3795	64,84	-9,16	74,00	pass

|--|--|



FCC 3 Band edge emission according to



according to FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.01; BW = 20MHz; CCK; 802.11b; Low edge

Spectrum Receiver 🔆 🛞						ſ	
RBW (EMI) 1 MHz MT	1 s	II	F56-1-7GHz	ohne Amp	TDF		
Input 1 AC Att 0 dB Preamp	OFF Step	TD Scan					
Scan 🔵 1Av Max 🎯 2Pk Max							
Limit Check	PASS		M1[2]		10	06.00 dBµV,	/m
120 HB1W/m56-1-6CHZ-AV-WLAN-2-1CH	PASS		-0.000 s		2.40	09250000 G	Hz
Line IT56-1-6GHZ-PEAK-WLAN-2-4	PASS		D2[2]			-31.16	dB
110 dBuV/m			0.000 s		-1	0.250000 M	Hz
			X	mm			
100 dBuV/m							
				* _}∖			
90 dBµV/m			P -				
			Λ				
80 dBµV/m		D2					
IT56-1-6GHZ-PEAK-WLAN-2-4GHZ_FCC.LIN		A					
70 dBµV/m		~					
	××					~~~~	\sim
60 dBµV/m							
IT56-1-6GHZ-AV-WLAN-2-4GHZ_FCC.LIN		\sim	~~		٧Ŋ		
50 dBµV/m		A port					_
	mont	\mathbb{N}			- ~~	$\mathcal{M}_{\mathcal{M}}$	4
40 dBµV/m							
30 dBµV/m		F	1		L		
				Т	-	an 0.440.01	_
Start 2.343 GHZ					St	op 2.443 GF	1Z

	Polarisation: H										
Detector Average							Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result		
2,3883	45,57	-8,43	54,00	pass	2,3895	68,11	-5,89	74,00	pass		
					2,3858	67,36	-6,64	74,00	pass		
					2,3828	65,96	-8,04	74,00	pass		
					2,3790	65,46	-8,54	74,00	pass		

TESTED

2,4908

2,5330

2,5220

42,60

42,60

42,28

-11,40

-11,40

-11,72

54,00

54,00

54,00

pass

pass

pass

74,00

74,00

74,00

Higher Band Edge - 802.11b 20MHz / CCK - MCS=0; 1 MBps / both antennas are active

TESTE IN GE	D RMANY	ECC &	Ban 15 247 DS	FCC	3 nission to	00 PSS G		足ら	TC
		1003	15.247,10	0-247,10	0 910.20	<u>55 N00-06</u>			
RefNo.:	20/01-	-0030							
Product:	Transn	nitting/Red	eiving Sys	tem					
Sample:	01								
Date:	07.04.2	2020							
Operator:	BI							pass	fail
Remarks:	DAC 0	(ANT1); E	DAC1 (ANT	2) Both A	ntennas	ON	Res	ult: 🔀	
Operation i	mode: WLA	N CH.11;	BW = 20M	Hz; CCK;	802.11b;	High edge	9		
Spectrum	Rec	eiver ($\overline{\mathbf{x}}$						Ē
opoonan	RBW (EMI))1 MHz MI	 Г 1 s		IT56-	1-7GHz ohne	AmpTDF		(^Δ
Input 1 AC	Att	OdB Pr	eamp OFF	Step TD So	an				
IT56-Lifentia	REAK-WLAN-	viax 2-4GHZ_FCC	PAS	3					
120 HBµ/V/M	56-1-6CHZ-	AV-WIAN-	2-161 PAS						
	50-1-0GHZ-	PEAK-WLA	N-2-4 PAS	`					
110 dBµV/m									
100 dBuV/m			2						
90 dBµV/m-									
			N						
80 dBµV/m-	- 7	1							
70 dBuV/m-									
				\sim	**	×			
60 dBµy/m-	~					~~~~~	<u>~~</u> +	~~~ +~	~~
~~	~		M						
50 dBµV/m-	N			MAL A					
40 dBuV/m-	J-				~**	****	+ * ~~		*+>
30 dBµV/m-							TF		
Start 2.43	3 GHz	•		•				Stop 2	2.533 GHz
				Polarisati	on: V]
		Detector Average					Detector Peak		
Frequ.	Level	Margin	Limit	Result	Frequ.	Level	Margin	Limit	Result
[GHz]	[dBµV/m]	to Limit [dB]	[dBµV/m]		[GHz]	[dBµV/m]	to Limit [dB]	[dBµV/m]	
2,4888	43,39	-10,61	54,00	pass	2,4845	67,86	-6,14	74,00	pass
2,5095	42,64	-11,36	54,00	pass	2,4878	66,73	-7,27	74,00	pass
2,5098	42,61	-11,39	54,00	pass	2,4898	65,26	-8,74	74,00	pass

pass

pass

pass

2,4948

2,4965

2,5033

64,24

62,69

62,47

-9,76

-11,31

-11,53

BSTC	TESTED
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TESTED IN GERMANY	FCC 3 Band edge emission	ESTC
	according to	

FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.11; BW = 20MHz; CCK; 802.11b; High edge

Spectrum Receiver 🗴)					
RBW (EMI) 1 MHz MT	1 s	II	56-1-7GHz	ohne Amp	TDF	
Input 1 AC Att 0 dB Prea	mp OFF Step	TD Scan				
Scan 🔵 1Av Max 😡 2Pk Max						
IT56-LINGHOREAK-WLAN-2-4GHZ_FCC	PASS					
120 HBUW/M56-1-66HZ-AV-WLAN-2-						
Line IT56-1-66HZ-PEAK-WLAN-	2-4 PASS					
110 dBµV/m						
100 dBµV/m						
	<u>\</u>					
90 dBµV/m	8					
80 dBµV/m	<u></u>					
70 dBµV/m		- XXX				
60 dBµy/m			~~~×~	~ <u>**</u> ~x~	- **	× .
	L				×	
50 dBµV/m	- h					
	Wh	m				town
40 dBμV/m						
20 db. //m						
Start 2.433 GHz					St	op 2.533 GHz

	Polarisation: H									
Detector Average							Detector Peak			
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	
2,5220	44,04	-9,96	54,00	pass	2,4840	65,50	-8,50	74,00	pass	
2,4883	43,24	-10,76	54,00	pass	2,4885	64,35	-9,65	74,00	pass	
2,5330	42,68	-11,32	54,00	pass	2,4903	63,27	-10,73	74,00	pass	
2,5100	42,54	-11,46	54,00	pass	2,4980	62,76	-11,24	74,00	pass	
2,5095	42,53	-11,47	54,00	pass	2,4963	61,93	-12,07	74,00	pass	
2,4898	42,53	-11,47	54,00	pass	2,5033	61,72	-12,28	74,00	pass	
ACTC	TESTED									
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ESIL	IN GERMANY									

Lower Band Edge - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / both antennas are active

TESTED	FCC 3 Band edge emission	团STC
	according to	
	FCC §15.247, RSS-247, FCC §15.209 RSS-Gen	

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.01; BW = 20MHz; OFDM; 802.11g; Low edge

Spectrum Receiver 💥 🕱				
RBW (EMI) 1 MHz MT	1 s	IT56-1-7GHz o	hne AmpTDF	· · · ·
Input 1 AC Att 0 dB Preamp	OFF Step TD Scan			
Scan				
Limit Check	PASS	D2[2]		-34.55 dB
120 HBW/M56-1-6CH7-AV-WI AN-2-4CH	PASS	-0.000 s		-15.500000 MHz
Line IT56-1-6GHZ-PEAK-WLAN-2-4	PASS	M1[2]		105.47 dBµV/m
		0.000 s		2.409250000 GHz
110 dBµV/m-		M		
100 d0.4/m			\tilde{v}	
90 dBu V/m		A		
90 dbpv/m				
			N	
ITS0-I-00HZ-PEAK-WLAN-2-40HZ_FCC.LIN	D2			
70 dBµV/m		7		
	**			
60 dB#V/m + + + + + + + + + + + + + + + + + + +				
IT56-1-6GHZ-AV-WLAN-2-4GHZ_FCC.LIN		$\sqrt{\gamma}$	- IV	
50 dBµV/m		+ +	V	
				mar and a start of the start of
40 dBµV/m		+ +		
30 dBuV/m		F1		
TF				
Start 2.343 GHz				Stop 2.443 GHz

	Polarisation: V								
Detector Average					Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
all emissions are 10dB below limit		pass	2,3895	68,04	-5,96	74,00	pass		
					2,3863	66,74	-7,26	74,00	pass
					2,3828	64,03	-9,97	74,00	pass

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according to FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.01; BW = 20MHz; OFDM; 802.11g; Low edge

Spectrum Receiver 🔆 🖲							
RBW (EMI) 1 MHz MT	1 s	II	56-1-7GHz	ohne Amp	TDF		_
Input 1 AC Att 0 dB Preamp	OFF Step	TD Scan					
Scan 🔵 1Av Max 😡 2Pk Max							
Limit Check	PASS		D2[2]			-33.13 d	dВ
120 HBUN/M56-1-66HZ-AV-WLAN-2-16H	PASS		-0.000 s		-1	0.250000 MH	Ηz
Line IT56-1-66HZ-PEAK-WLAN-2-4	PASS		M1[2]		10)2.56 dBµV∕	m
110 dBuV/m			0.000 s		2.4	09250000 GH	dz.
			М				
			, j				
100 dBµV/m			1				
				V			
90 dBµV/m			<u> </u>				_
			ľ	۷			
80.JBuV/m							
IT56-1-6GHZ-PEAK-WLAN-2-4GHZ_ECCLIN			1				
		02			~		
70 dBµV/m	×						_
	×						1
					<u> </u>		_
IT56-1-6GHZ-AV-WLAN-2-4GHZ_FCC.LIN			- N				
50 dBu//m			~~		<u>ч</u>		
	I .	$\sim \sim$					
	\square	\sim					2
40 dBµV/m							_
30 dBµV/m		F	1				_
Ptart 2 242 CHz					C+	on 2 442 CU	
					ઠા	up 2.443 GH	۷

Polarisation:	Η
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Detector Average							Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,3870	44,87	-9,13	54,00	pass	2,3883	66,92	-7,08	74,00	pass
					2,3835	65,49	-8,51	74,00	pass
					2,3828	64,83	-9,17	74,00	pass

Higher Band Edge - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / both antennas are active

TESTED	FCC 3	RCTC
IN GERMANY	Band edge emission	
	according to	
	ECC §15 247 RSS-247 ECC §15 209 RSS-Gen	

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.11; BW = 20MHz; OFDM; 802.11g; High edge

Spectrum Receiver 🗵						[
RBW (EMI) 1 MHz MT	1 5	IT	56-1-7GHz	ohne Amp	TDF		
Input 1 AC Att 0 dB Preamp	OFF Step	TD Scan					
Scan 😑 1Av Max 😑 2Pk Max							
IT56-LIGGHCREAK-WLAN-2-4GHZ_FCC	PASS						
120 出版如/而 56-1-66HZ-AV-WLAN-2-46H	PASS						
Line IT56-1-6GHZ-PEAK-WLAN-2-4	PASS						
110 dBuV/m							
100 dB: ///m							
	N .						
90 dBµV/m							
80 dBµý/m							
	$\parallel \Sigma$						
70 dBuV/m	$1 \sim$						
50 down	$ \rangle$		×				
	m		- And	X	~×~	\sim	
						$\sim \times \sim$	×-
50 dBµV/m=	-	\sim					
~			~ · ·				
40 dBµV/m						+-+	
30 dBµV/m							
				L T			
E Start 2.433 GHZ					St	op 2.533 GI	ΠZ

Polarisation: V									
Detector Average							Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,4865	45,88	-8,12	54,00	pass	2,4878	62,44	-11,56	74,00	pass
2,4900	44,23	-9,77	54,00	pass	2,4915	62,14	-11,86	74,00	pass
2,5095	42,94	-11,06	54,00	pass	2,4930	59,41	-14,59	74,00	pass
2,5098	42,90	-11,10	54,00	pass	2,4978	59,22	-14,78	74,00	pass
2,4935	42,69	-11,31	54,00	pass	2,5033	59,04	-14,96	74,00	pass
2,5163	42,57	-11,43	54,00	pass	2,5015	58,69	-15,31	74,00	pass

TESTED IN GERMANY



FCC 3 Band edge emission according to



according to FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.11; BW = 20MHz; OFDM; 802.11g; High edge

Spectrum Receiver 🗴							
RBW (EMI) 1 MHz MT	1 5	IT	56 1 7GHz	ohne Amp"	тог		_
Input 1 AC Att 0 dB Preamp	OFF Step	TD Scan					_
Scan 🔵 1Av Max 😡 2Pk Max							٦
IT56-LIAGHCREAK-WLAN-2-4GHZ_FCC	PASS						٦
120 HB1W/m56-1-66HZ-AV-WLAN-2-46H	PASS						\neg
Line IT56-1-6GHZ-PEAK-WLAN-2-4	PASS						
110 dBµV/m							_
m							
100 dBµV/m							_
	1/ 1						
00 dBr0/m	N						
	11						
80 dBu //m							
	$ \zeta $						
	$ \setminus $						
	H^{m}						
		×€					
60 dBµV/m				~			-
	~~~			Jon Xy	<u> </u>	XXX	
50 dBuV/m		<u> </u>			m n n		1
		~~~					
						++++	_
40 ashv/m							_
30 dBµV/m							\neg
Start 2.433 GHz					St	op 2.533 GH	z

	Polarisation: H										
		Detector Average					Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result		
2,4868	44,69	-9,31	54,00	pass	2,4838	65,28	-8,72	74,00	pass		
2,4898	43,42	-10,58	54,00	pass	2,4898	61,35	-12,65	74,00	pass		
2,5098	42,74	-11,26	54,00	pass	2,4895	61,24	-12,76	74,00	pass		
2,5158	42,62	-11,38	54,00	pass	2,4975	59,17	-14,83	74,00	pass		
2,5095	42,59	-11,41	54,00	pass	2,4998	58,52	-15,48	74,00	pass		
2,4938	42,41	-11,59	54,00	pass	2,4930	58,14	-15,86	74,00	pass		

	BSTC	TESTED
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Lower Band Edge - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / both antennas are active

TE:	STED
IN	GERMANY

FCC 3 Band edge emission according to FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.01; BW = 20MHz; Greenfield; 802.11n; Low edge

Spectrum Receiver 🔆 🖲						
RBW (EMI) 1 MHz MT	1 s	II	56-1-7GHz	ohne Amp	TDF	
InputIAC Att 0 dB Preamp	OFF Step T	D Scan				
Scan						
Limit Check	PASS		M1[2]		1()4.39 dBµV/m
Line IT56-1-6GHZ-PEAK-WLAN-2-4	PASS		D2[2]		2.7	-34.62 dB
110 dBµV/m			0.000 S	M1	-1	4.230000 MHZ
100 dBuV/m			(ř			
				$ \wedge \rangle$		
90 dBµV/m			1	4		
80 dBµV/m						
IT56-1-6GHZ-PEAK-WLAN-2-4GHZ_FCC.LIN			Λ			
70 dBµV/m					~~~	
60 dBuV/m	~~~	~				\sim
IT56-1-6GHZ-AV-WLAN-2-4GHZ_FCC.LIN			\sim		$M_{\rm h}$	
50 dBµV/m					V L	
40 dBuV/m	from	4				\sim
30 dBµV/m-		TF	1			
Start 2.343 GHz					St	op 2.443 GHz

				Polarisati	on: V				
Detector Average							Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
all emissions are 10dB below limit				pass	all	emissions are	10dB belov	w limit	pass

BSTC	TESTED
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TESTED	FCC 3	RISTC
	Band edge emission	
	according to	
	FCC §15.247, RSS-247, FCC §15.209 RSS-Gen	

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.01; BW = 20MHz; Greenfield; 802.11n; Low edge

Spectrum Receiver 🔆 🖲						ſ	
RBW (EMI) 1 MHz MT	1 s	II	56-1-7GHz	ohne Amp	TDF		
Input 1 AC Att 0 dB Preamp	OFF Step	TD Scan					
Scan 🔵 1 Av Max 🎯 2 Pk Max							
Limit Check	PASS		M1[2]		10)6.22 dBµV,	/m
120 HBUW/M56-1-6CHZ-AV-WLAN-2-1CH	PASS		-0.000 s		2.4	09250000 G	Hz
Line IT56-1-66HZ-PEAK-WLAN-2-4	PASS		D2[2]			-34.62	dB
110 dBuV/m-			0.000 s		-	9.750000 M	Hz
				10			
90 dBµV/m-			ſ	1			
80 dBµV/m			Λ				_
IT56-1-6GHZ-PEAK-WLAN-2-4GHZ_FCC.LIN		D2					
		مسمر					
60 dBµV/m	$\sim \sim \sim$		ar		10.	$r \sim d$	
IT56-1-6GHZ-AV-WLAN-2-4GHZ_FCC.LIN-		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~ *		۳ <i>ک</i> ړ ۲		
50 dBµV/m		\bigwedge^{\prime}				M_	
40 dBuV/m		V				~~~	\sim
.30 dBµV/m		F	1				
Start 2.343 GHz	1				St	op 2.443 GF	١z

	Polarisation: H									
Detector Average						Detector Peak				
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	
2,3883	45,17	-8,83	54,00	pass	all emissions are 10dB below limit			pass		

TESTED	Test report no.:	
IN GERMANY	20/01-0030-A	

Higher Band Edge - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / both antennas are active

TESTED	FCC 3 Band edge emission	匠STC
	according to	
	FCC §15.247, RSS-247, FCC §15.209 RSS-Gen	

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.11; BW = 20MHz; Greenfield; 802.11n; High edge

Spectrum Receiver 🙁						
RBW (EMI) 1 MHz MT	1 s	II	[56-1-7GHz	ohne Amp	TDF	
Input 1 AC Att 0 dB Preamp	OFF Step	TD Scan				
Scan 🔵 1Av Max 🎯 2Pk Max						
IT56-LIGGHOREAK-WLAN-2-4GHZ_FCC	PASS					
120 HBUW/M56-1-6CHZ-AV-WLAN-2-1CH	PASS					
Line IT56-1-66HZ-PEAK-WLAN-2-4	PASS					
110 dBµV/m						
100 dBµV/m						
90 dBuV/m						
	\mathbb{N}					
70 dBµV/m						
60 dBuV/m	\square	· 1				
	4	🗠 🗠				
50 dBuV/m	~		m		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
		- the second	L			
40 dBµV/m				+*		***
30 dBµV/m						
Start 2.433 GHz	I	1	I	1	St	op 2.533 GHz

				Polarisati	on: V				
		Detector Average					Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,4840	45,53	-8,47	54,00	pass	2,4893	55,93	-18,07	74,00	pass
2,4868	43,27	-10,73	54,00	pass	2,4898	54,76	-19,24	74,00	pass
2,5098	42,68	-11,32	54,00	pass					
2,5095	42,60	-11,40	54,00	pass					
2,4898	42,43	-11,57	54,00	pass					
2,4950	42,41	-11,59	54,00	pass					

TESTED IN GERMANY	FCC 3 Band edge emission	匠STC
	according to	

FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.11; BW = 20MHz; Greenfield; 802.11n; High edge

Spectrum Receiver X							
RBW (EMI) 1 MHz MT	1 s	II	56-1-7GHz	ohne Amp	TDF		_
Input 1 AC Att 0 dB Preamp	OFF Step	TD Scan					_
Scan 🕒 1Av Max 🕒 2Pk Max							
IT56-LIAGHCREAK-WLAN-2-4GHZ_FCC	PASS						
120 ዘክ/// /////////////////////////////////	PASS						—
Line IT56-1-66HZ-PEAK-WLAN-2-4	PASS						
110 dBµV/m							
mon	1						
100 dBuV/m	Λ						
	11						
90 dBuV/m	11						_
]]]						
80 dBµV/m	+11						-
	$ _{\mathcal{N}}$						_
70 dBµV/m	\square						
SU BBUV/M	2	X	Xox	× ×	X.		
50 dBuW/m	~	<u> </u>	1 Jun	m	· ·····	man	5
		-					
40 dBuV/m			-+-+-	k+	* * *	++	~
TF							-
Start 2.433 GHz					St	op 2.533 GH	z

				Polarisati	on: H				
		Detector Average					Detector Peak		
Frequ . [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,4865	45,02	-8,98	54,00	pass	2,4865	58,33	-15,67	74,00	pass
2,4900	43,76	-10,24	54,00	pass	2,5105	55,76	-18,24	74,00	pass
2,5105	43,06	-10,94	54,00	pass	2,4905	54,99	-19,01	74,00	pass
2,4930	42,65	-11,35	54,00	pass	2,4940	54,41	-19,59	74,00	pass
2,5095	42,52	-11,48	54,00	pass	2,5053	54,40	-19,60	74,00	pass
2,5135	42,42	-11,58	54,00	pass	2,5095	54,03	-19,97	74,00	pass

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Lower Band Edge - 802.11n 40MHz / HT Greenfield - MCS=0; 6.5 MBps / both antennas are active

TESTED	FCC 3 Band edge emission	围STC
	Duna cage chilission	
	according to	
	FCC §15.247, RSS-247, FCC §15.209 RSS-Gen	

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.03; BW = 40MHz; Greenfield; 802.11n40; Low edge

RBW (EMI) 1 MHz MT 1 s IT56-1-7GHz ohne AmpTDF Input 1 AC Att 0 dB Preamp OFF Step TD Scan Scan 1Av Max@2Pk Max
Input 1 AC Att 0 dB Preamp OFF Step TD Scan Scan 1Av Max@2Pk Max
Scan ● 1Av Max ● 2Pk Max Linit Check PASS D2[2] -35.80 d 120 HBpv/m556-1-6CH7-AV-VLAN-2-4CL PASS 0.000 s -16.750000 MH Lina IT56-1-6CHZ-PEAK-WLAN-2-4 PASS M1[2] 103.66 dBpV/r 110 dBpV/m 0.000 s 2.415750000 GH
Linit Check PASS D2[2] -35.80 d 120 HBpv/M556-1-6CH7-AV-VLAN-2-4CE PASS 0.000 s -16.750000 MH Lina IT56-1-6CH7-PEAK-WLAN-2-4 PASS MI[2] 103.66 dBpV/r 110 dBpV/m 0.000 s 2.415750000 GH 110 dBpV/m M1 M1
120 Hbμv/m556-1-6CHZ-AV-3/4 AV-2-4CL PA88 -0.000 s -16.750000 MH Lina IT56-1-6CHZ-PEAR-WLAN-2-4 PASS MI[2] 103.66 dBμV/r 110 dBμV/m 0.000 s 2.415750000 GH 110 dBμV/m M1
Line IT56-1-6GHZ-PEAK-WLAN-2-4 PASS M1[2] 103.66 dBµV/r 110 dBµV/m 100 dBµV/m 100 dBµV/m
110 dBµV/m
100 down white
90 dBµV/m
IT50-I-0GHZ-PEAK-WLAN-2-4GHZ FCC
60 dBµV/m
1156-1-66H7-AV-WI AN-2-46H7_FCC-
40 dBpv/m
30 dBµý/m
Start 2,343 GHz Stor 2,443 GHz

				Polaris	ation: V				
		Detector Average					Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,3883	50,87	-3,13	54,00	pass	all e	missions are	10dB below	limit	pass
2,3863	50,30	-3,70	54,00	pass					
2,3828	47,44	-6,56	54,00	pass					
2,3785	45,85	-8,15	54,00	pass					
2,3760	44,44	-9,56	54,00	pass					

BSTC	TESTED
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FCC 3 Band edge emission according to



FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.03; BW = 40MHz; Greenfield; 802.11n40; Low edge

Spectrum Receiver 🔆 🗵						
RBW (EMI) 1 MHz MT	1 s	I	T56-1-7GHz	ohne Amp	TDF	
Input 1 AC Att 0 dB Preamp	OFF Step 1	TD Scan				
Scan 🔵 1Av Max 🕒 2Pk Max						
Limit Check	PASS		D2[2]			-36.23 dB
120 HBW/M56-1-6CHZ-AV-WLAN-2-4CH	PASS		-0.000 s		-2	1.500000 MHz
Line IT56-1-6GHZ-PEAK-WLAN-2-4	PASS		M1[2]		10	04.90 dBµV/m
110 - 0. 47/			0.000 s		2.43	20500000 GHz
110 dBpV/m				1	11	
				mon	1 mm	
100 dBµV/m					\bigvee	man
						l ì
00 d8:4//m			m	~~~~~	h	hann
					V	
					V V	
80 dBµV/m			+/1			\
IT56-1-6GHZ-PEAK-WLAN-2-4GHZ_FCC			1/1			
70 dBu 4//m		na na				
		A				
	~~~~	m				\
60 dBµV/m	~~~~		./			$  \rangle$
IT56-1-6GHZ-AV-WLAN-2-4GHZ_FCC		$ \sim$	ſ			
50 dBuV/m		~~~~				
+ + +++						
40 dBpV/m						
30 dBuV/m		F	1			
		TF				
Start 2.343 GHz					St	op 2.443 GHz

Po	larisation:	н

Detector Average							Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,3895	52,28	-1,72	54,00	pass	all	emissions are	e 10dB belov	w limit	pass
2,3860	51,61	-2,39	54,00	pass					
2,3810	48,29	-5,71	54,00	pass					
2,3768	47,62	-6,38	54,00	pass					
2,3758	47,49	-6,51	54,00	pass					
2,3710	46,16	-7,84	54,00	pass					

RETC	TESTED
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Higher Band Edge - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / both antennas are active

TESTED FCC 3 IN GERMANY Band edge emission according to FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

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Operation mode: WLAN CH.09; BW = 40MHz; Greenfield; 802.11n40; High edge

Spectrum	Receiver	×						(	
R	BW (EMI) 1 MHz	: MT	1 s	I	F56-1-7GHz	ohne Amp	TDF		
Input 1 AC A	tt OdB	Preamp	OFF Step	TD Scan					_
🛾 Scan 😑 1Av M	lax©2Pk Max								
IT56-LIAGH2AR66	SK-WLAN-2-4GHZ	FCC	PASS						
120 HBp#//m <del>56-</del>	1-6CHZ-AV-WI	AN-2-1GF	PASS						
Line IT56-	1-6GHZ-PEAK-	WLAN-2-4	PASS						
110 dBµV/m									
100 dBuV/m		~~~~ <u>~</u>							
/									
			Λ						
90 dBµV/m	V		1						
80 dBµV/m			$\mathbb{H}$						
70 dBµý/m			$\square$						
					× ××				
60 dBuV/m					~	~~×~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	××	× *	
			M.				ľ v	$\sim$	
E0 d0 Alles				month.					
50 uвµv/m——				· · · ·	the second secon				
						met and		+++	
40 dBµV/m									
20 dBµV/m									
Start 2.433 GI	Hz		1	1	1	1	St	op 2.533 Gi	Hz

Pol	aris	atio	n:	v
F UI	ans	auo		v

Detector Average							Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,4850	51,78	-2,22	54,00	pass	2,4860	67,79	-6,21	74,00	pass
2,4865	51,33	-2,67	54,00	pass	2,4865	66,94	-7,06	74,00	pass
2,4898	49,68	-4,32	54,00	pass	2,4950	65,32	-8,68	74,00	pass
2,4930	48,05	-5,95	54,00	pass	2,4910	65,16	-8,84	74,00	pass
2,4965	46,52	-7,48	54,00	pass	2,4965	64,88	-9,12	74,00	pass
2,4998	44,75	-9,25	54,00	pass	2,4998	62,85	-11,15	74,00	pass

BSTC	TESTED
	IN GERMANT

TESTED	FCC 3	RISTC
	Band edge emission	
	according to	

FCC §15.247, RSS-247, FCC §15.209 RSS-Gen

Ref.-No.: 20/01-0030

Operation mode: WLAN CH.09; BW = 40MHz; Greenfield; 802.11n40; High edge

Spectrum Receiver 🗵							(	
RBW (EMI) 1 MHz MT	1 s		IT	56 1 7GHz	ohne Amp	тог		
Input 1 AC Att 0 dB Preamp	OFF Step	TD Scar	n					
Scan 🕤 1Av Max 🎯 2Pk Max								
IT56-LIAGHCREAK-WLAN-2-4GHZ_FCC	PASS							
120 LBMW/M22-1-6CHZ-AV-WLAN-2-1CH	PASS							
Line IT56-1-6GHZ-PEAK-WLAN-2-4	PASS							
110 dBµV/m			_					-
180 dBpV/m		+						$\vdash$
	A l							
90 dBuV/m	11							
	N .							
80 dB+4//m								
	$\mathbb{R} \setminus \mathbb{R}$							
70 dBµV/m	H Mr		~					
	$  \rangle$	$\Gamma \sim \Gamma$	1	MXx				
60 dBµV/m	$\neg \gamma$			~~``````\~\$	← <del>××</del>			
	1 ~	┢┈╘╻	_		1	× marco	X X	
50 dBµV/m			****	-				
					<u></u>			
40 dBi 0//m						++-~	+++	
To dep y/m								
30 dBµV/m								
Start 2.433 GHz						St	op 2.533 G	Hz

	Polarisation: H								
	Detector Average						Detector Peak		
Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result	Frequ. [GHz]	Level [dBµV/m]	Margin to Limit [dB]	Limit [dBµV/m]	Result
2,4858	53,54	-0,46	54,00	pass	2,4863	68,54	-5,46	74,00	pass
2,4865	52,43	-1,57	54,00	pass	2,4870	68,52	-5,48	74,00	pass
2,4898	50,37	-3,63	54,00	pass	2,4900	66,20	-7,80	74,00	pass
2,4930	49,20	-4,80	54,00	pass	2,4918	65,53	-8,47	74,00	pass
2,4965	48,06	-5,94	54,00	pass	2,4940	63,55	-10,45	74,00	pass
2,4998	45,78	-8,22	54,00	pass	2,4965	62,42	-11,58	74,00	pass

#### Results

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the **Band Edges Emission**.



# 7.5. 99% Power Bandwidth

#### **Applied standards**

-RSS-Gen issue 5 Section 6.7

#### Test equipment and test set up

Test equipment used for conducted measurements as given in clause Test equipment of this report. Test setup used for conducted measurements as given in clause Test setups of this report.

#### Description

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The 99% power bandwidth function of the instrument was used for the measurement.

#### Measurement:

The Measurement was performed on: 01.04.2020 and 02.04.2020

FACTO	TESTED
BSIC	IN GERMANY

#### Lowest operating frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 1



# Middle Operating Frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 1



RSTC	TESTED
BOIL	IN GERMANY

### Highest Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 1



### Lowest operating frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2



Bere	■ TESTED
BSIL	IN GERMANY

#### Middle Operating Frequency - 802.11b 20MHz / CCK - MCS=0; 1 MBps / Antenna 2



# Highest Operating Frequency - 802.11b 20MHz / CCK – MCS=0; 1 MBps / Antenna 2



ECTC	TESTED
EDIC	IN GERMANY

#### Lowest operating frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 1



### Middle Operating Frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 1



	■ TESTED
BSIL	IN GERMANY

### Highest Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 1



#### Lowest operating frequency - 802.11g 20MHz / OFDM - MCS=0; 6 MBps / Antenna 2



BCTC	TESTED
ESIL	IN GERMANY

## Middle Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2



# Highest Operating Frequency - 802.11g 20MHz / OFDM – MCS=0; 6 MBps / Antenna 2

MultiView	Spectrum	1 🔳 S(	pectrum 2	Spectr	um 3 🤇	22			
Ref Level 20.0	0 dBm	· RBW	/ 200 kHz	5 0.5					
Att Counted Bat	30 dB SWT:	1.01 ms • VBW	1 MHz Mo	ide: Auto Sweep				(P)	12.610
			1					M1[1] 1.0 2.463239	16 dBn 90 GHs
10 dBm				-					0800
				Contract exercises of	ML				
0 dBm		7	mount	MARINA	man	monimu	Ne.		
-10 d8m-							1		
-20 dBas-		1					Y		
		N					1		
-30 dām		hart					LA		
-40 cal she	Wer phopenet			-				mon Alexand	
providence -									my
-S0 dam-									
CF 2.462 GHz			1001	pts		4.0 MHz/		Span 40.	0 MHz
2 Marker Table	Tec	V. Value	1	V. Value	-1	Euroction	î.	Function Deput	
MI T1 T2	1 1 1	2.463239 0 2.4536819 2.4702693	iHz GHz GHz	1.06 dBm -6.82 dBm -6.58 dBm	Occ Bw Occ Bw C Occ Bw Pr	entroid reg Offset	16	587322824 MHz 2.461975599 GHz -24.401310014 kHz	2
Channel	Freque	ncy [MHz]	99	9% Power Ba	ndwidth [N	/Hz]	Limit [MHz]	Result	
11	2	462		16.587322824			-/-	Pass	

Bere	<b>TESTED</b>
BSIL	IN GERMANY

## Lowest operating frequency - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



#### Middle Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



BCTC	<b>TESTED</b>
BAL	IN GERMANY

#### Highest Operating Frequency - 802.11n 20MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



## Lowest operating frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2

MultiView	Spectru	m 🔟 :	Spectrum 2	Spectr	'um 3 🤅	22			
Ref Level 20.0	i0 dBm	• RB	W 200 kHz						
Att Connoied Bar	30 dB SW1	1.01 ms • VB	W IMHE M	ode: Auto:Sweep					IPK Max
								M1[1]	2.25 dBm 2.4132390 GHz
10 dBm					-			-	Contracted wa
1.00000					M1.				
0 dBm	-	-	monorman	warmand	portanna	monum	marszz		
-10 d8m							1		
-20 dBas-				-			1		-
-30 dbm	Alv	WAW					Mrc	Mun , Art	
Manasamhunty	hall							manny	MM MAN
-50 dBm			-	-					
CF 2.412 GHz			1001	pts		4.0 MHz/			Span 40.0 MHz
2 Marker Table Type Ref MI T1 T2	Trc	X-Value 2.413239 2.403182 2.420777	GHz 3 GHz 6 GHz	Y-Value 2.25 dBm -4.76 dBm -5.13 dBm	Occ Bw Occ Bw C Occ Bw F	Function entroid reg Offset	( ₎	Function F 17.5953174 2.4119 -20.0692	tesult 194 MHz 79931 GHz 62304 kHz
Channel	Freque	ency [MHz]	9	9% Power Ba	ndwidth [N	MHz]	Limit [MH	z] R	esult
1		2412		17.595317494			-/- F		Pass

RETE	TESTED
ESIC	IN GERMANY

## Middle Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



Highest Operating Frequency - 802.11n 20MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2

MultiView	Spectrum	n 🗷 Sp	ectrum 2	Spectr	um 3				
Ref Level 20.0	00 dBm	• RBW	200 kHz	5 73					
Att	30 dB SWT	1.01 ms • VBW	1 MHz Mo	de Auto Sweep					The Max
								M1[1]	1.88 dBm 2.4632390 GHJ
10 dBm	-								10000000000000
					MI				
0 dBm		- In	- manual and	mound	mono	monorma	profe		
-10 d8m						-			
-20 dBm						_	1		
		1					1		
-30 dam	man	amp					pm	ministering	1
MAD COM COLOR	a cartor d								- hast from
-50 dam		-		1			-		
CF 2.462 GHz			1001 g	ots		4.0 MHz/			Span 40.0 MHz
2 Marker Table Type Ref	Trc	X-Value 2.463239 G	Hz	Y-Value 1.88 dBm	L Occ Bw	Function	1	Function R 7.6183084	esult 97 MHz
12	1	2.4531671 ( 2.4707854 (	anz anz	-5.06 d8m -5,20 d8m	Occ BW C	reg Offset		-23.77087	6229 GHz 8092 kHz
Channel	Freque	ency [MHz]	99	% Power Ba	ndwidth [l	MHz]	Limit [MHz	2] R	esult
11	2462		17.6183	17.618308497 -/- Pas				ass	

BCTC	<b>TESTED</b>
BAL	IN GERMANY

## Lowest operating frequency - 802.11n 40MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 1



Middle Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1

MultiView	Spectrum	n 🗏 Spec	trum 2	Spectr	'um 3 🔅				
Ref Level 20.0	0 dBm	· RBW S	00 kHz	200 <b>8 - 11</b>					
Att	30 dB SWI	1.01 ms . VBW	2 MHZ Mode	Auto.Sweep					TEC Mark
								M1[1]	2.37 dBm 2.4396370 GHz
10 d8m	-					-	-		
		200	A Arter of All	hauguhara	Mr. Jorash	8050 U.S. 1			
D dun-		Providence		1	J		and the second second		
-10 d8m								1	
-20 dbm	J.	-						1	
- 30 dam-	. I							A.	6.37
Nor HAMAN MAN	14M							o trik	alman particular
-40 dbm									
CF 2.437 GHz			1001 pts		6	5.0 MHz/			Span 60.0 MHz
2 Marker Table Type   Ref M1 T1	•   Trc   1 1	X-Value 2.439637 GH 2.4188429 GH	2 <b>2</b>	Y-Value .37 dBm -3.53 dBm	Occ Bw Occ Bw Ce	Function	3	Function R 5.1891819 2.43693	esult 31 MHz 7471 GHz
Channel	Freque	2 4550321 GH	99%	Power Ba	ndwidth [M	Hz]	Limit [MHz]	-62.52868	esult
6		2437		36.189	181931	-	-/-	P	ass

ПСТС	TESTED
BOIL	IN GERMANY

### Highest Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 1



Lowest operating frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



RISTC	TESTED
	IN GERMANY

### Middle Operating Frequency - 802.11n 40MHz / HT Greenfield – MCS=0; 6.5 MBps / Antenna 2



#### Highest Operating Frequency - 802.11n 40MHz / HT Greenfield - MCS=0; 6.5 MBps / Antenna 2



#### Results

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the **99% Power Bandwidth**.



# 8. Test equipment

# Test equipment used for radiated Measurements:

Kind of equipment	Manufacturer	Туре	Ident no.	Serial no.	Calibrated on (y-m)	Calibration interval
Signal Spectrum Analyzer 2Hz – 26.5 GHz	Rohde & Schwarz	FSW 26 Instrument FW 2.60	11571	102047	2019-Jan.	3 years
ESR7 EMI Testreceiver 7GHz	Rohde & Schwarz	ESR7	11676	101694	2018-March	3 years
Test-Receiver	Rohde & Schwarz	ESVS30	10572	833825/010	2020-April	3 years
Antenna 9 kHz – 30 MHz	EMCO	6502	10546	2018	2017-Nov.	3 years
Antenna 30 MHz – 1 GHz	Chase	CBL6111C	10022	1064	2019-Dec.	3 years
Antenna 1GHz – 18 GHz	Electro Metric	RGA50/60	10273	2753	2017-Nov.	3 years
Broadband- Hornantenne 15 - 26,5 (40) GHz	Schwarzbeck	BBHA 9170	11580	BBHA91706 21	2019-Dec.	3 years
Broadband- Preamplifier 1-18 GHz	Schwarzbeck	BBV9718	11231	9718-002	2017-Oct.	3 years
Preamplifier 18 - 40 GHz	CERNEX	CBM18403523	11679	29711	2019 - July	3 years
Cable	el-spec GmbH	FlexCore-SMA11- SMA11-8000-ARM	11625	-/-	2017-Dec.	3 years
Shielded room/Chamber	Frankonia	SAC3 "SEMI- ANECHOIC- CHAMBER"	11609	004/16	2019-March	3 years
Band Reject Filter	Telemeter	BRF-2450-150- 7-N (0441)	11243	-/-	-/-	-/-
		Above 26 GHz Substitu	ition procedu	ire		
Spectrum Analyzer	Rohde & Schwarz	FSMS 26	10481	839014/004	-/-	-/-
Spectrum-Analyzer Display	Rohde & Schwarz	FSMS 26	10482	838509/010	-/-	-/-
Harmonic Mixer	Rohde & Schwarz	FS-Z40	10779	842529/003	-/-	-/-
Harmonic Mixer LO-Amp.	Rohde & Schwarz	FS-Z30	10780	624413/005	-/-	-/-
Phase3 Ultra Low Loss Cable Assembley	TECH-INTER	GC12-K1K1-197	11718	1GVT4 19047702 001	-/-	-/-
Preamplifier 18 - 40 GHz	CERNEX	CBM18403523	11679	29711	2019 - July	3 years
A-INFO Braodband Horn Antenna	EMCO Elektronik GmbH	LB-180400-KF	11716	J211060840	-/-	-/-
Signal-Generator 100 KHz - 40 GHz	Rohde & Schwarz	SMB100A	11563	177769	2019-Jan.	3 years
Broadband- Hornantenne 15 - 26,5 (40) GHz	Schwarzbeck	BBHA 9170	11580	BBHA91706 21	2019-Dec.	3 years

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#### Test equipment used for Band Edge Measurements:

Kind of equipment	Manufacturer	Туре	ldent no.	Serial no.	Calibrated on (y-m)	Calibration interval
ESR7 EMI Testreceiver 7GHz	Rohde & Schwarz	ESR7	11676	101694	2018-March	3 years
Antenna 1GHz – 18 GHz	Electro Metric	RGA50/60	10273	2753	2017-Nov.	3 years
Cable	el-spec GmbH	FlexCore-SMA11- SMA11-8000-ARM	11625	-/-	2017-Dec.	3 years
Shielded room/Chamber	Frankonia	SAC3 "SEMI- ANECHOIC- CHAMBER"	11609	004/16	2019-March	3 years

### Test equipment used for conducted measurements:

Kind of equipment	Manufacturer	Туре	Ident no.	Serial no.	Calibrated on (y-m)	Calibration interval
Signal Spectrum Analyzer 2Hz – 26.5 GHz	Rohde & Schwarz	FSW 26 Instrument FW 2.60	11571	102047	2019 - Jan.	3 years
EMI-Test-Receiver	Rohde & Schwarz	ESR7 Instrument FW 3.36	11505	101103	2017 - Nov.	3 years
Automatisation unit RF switch and power meter	Rohde & Schwarz	OSP120 and OSP B157	11573	101282	2017 - Dec.	3 years
Cable	el-spec GmbH	FlexCore-SMA11- SMA11-8000-ARM	11625	-/-	2017 - Dec.	3 years

#### Test equipment used for Conducted Mains emissions:

Kind of equipment	Manufacturer	Туре	Ident no.	Serial no.	Calibrated on (y-m)	Calibration interval
Test-Receiver	Rohde & Schwarz	ESHS30	10571	842053/008	2019 – Mar.	3 years
Software	PKM	PKM U5/6	-/-	V1.01.03	-/-	-/-
Line impedance stabilisation network (LISN)	Rohde & Schwarz	ESH2-Z5	10139	879675/028	2019 – Jan.	3 years
Shielded room	Siemens	(6,2 x 4,7 x 3,3) m (I x w x h) DC – 10 GHz	10113	1	-/-	-/-

All measurements were made with measuring instruments, including any accessories that may affect test results, calibrated according to the requests of ISO/IEC 17025 according to which the test site is accredited from DAkkS. Measurement of conducted mains emissions was made with instruments conforming to American National Standard Specification, ANSI C63.4-2014.

#### Test equipment to support EUT functions:

Kind of equipment	Manufacturer	Туре	Ident no.
Laptop	DELL	Inspiron	11488
AC-Adaptor [Laptop/EUT]	DELL	DA130PE1-00	Part of 11488
Test Adaptor Board	Vestel (Client)	17TEST02	Client
Software	Provided by Vestel (Client)	MT7662U QA Tool	-/-

# 9. Test Setups

# Block diagram Conducted Mains emissions



Groundplane



# **Block diagram Radiated emissions**



tested frequency range 9 kHz - 30 MHz



Semi anechoic chamber with absorber and ferrite tiles

Test receiver



tested frequency range 30 MHz - 1000 MHz



tested frequency range > 1000 MHz

Block diagram Band Edge emisions



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# Block diagram for conducted measurements





## **10. Measurement uncertainty**

according to CISPR 16-4-2 Edition 2.0 2011-06

Measurement	calculated uncertainty U _{lab}	Specified CISPR uncertainty according CISPR 16-4-2 Edition 2.0 2011-06, table 1 U _{CISPR}
Conducted disturbance at mains		
port using AMN	3.6 dB	3.8 dB
9 kHz – 150 kHz		
Conducted disturbance at mains		
port using AMN	3.2 dB	3.4 dB
150 kHz – 30 MHz		
Magn. fieldstrength	3.4 dB	-/-
9kHz - 30MHz	3:4 dB	-7-
Radiated disturbance (electric field		
strength in the SAC)	4.7 dB	6.3 dB
30 MHz to 1 000 MHz		
Radiated disturbance (electric field		
strength in the SAC)	4.1 dB	-/-
1 GHz to 26.5 GHz		
Radiated disturbance (electric field		
strength in the SAC)	3.1 dB	-/-
26.5 GHz to 40 GHz		

Measurement	calculated uncertainty U _{lab}	Maximum measurement uncertainty
Channel Bandwidth	±1.17 %	±5 %
RF output power, conducted	±1.36 dB	±1.5 dB
Power Spectral Density, conducted	±1.99 dB	±3 dB
Unwanted Emissions, conducted	±1.71 dB	±3 dB
All emissions, radiated	±4.8 dB	±6 dB
Temperature	±0.72 °C	±3 °C
	±0.76 % (DC up to 40V)	
Supply voltages		±3 %
	±1.74 % (AC 50Hz up to 400V)	
Time	±0.012 %	±5 %

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurements uncertainty was calculated in accordance with CISPR 16-4-2 Edition 2.0 2011-06.

The measurement uncertainty was given with a confidence of 95 % (k = 2).

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# 11. Photos setup

Refer to "0030-fcc-ised-photos test setup.pdf" file

# 12. Conclusions

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the relevant §15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the relevant RSS-247 issue 02 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network

Following specific modifications and/or special attributes are necessary to pass the above mentioned requirements:

none

This test report replaces the test report no. 20/01-0030 dated 10.04.2020.

21.10.2020 Erstellt am/prepared on M. Beindl, Laboratory Engineer (Name/name / Stellung/position)

(Unterschrift/signature)

21.10.2020 Freigabe am/released on A. Tropmann, Head of Laboratory (Name/name / Stellung/position)

(Unterschrift/signature)



# 13. Photos of tested sample

Refer to "0030-fcc-ised-ext-photos.pdf" file

# End of test report