R F – T E S T R E P O R T

- FCC Part 15.247, RSS-247 -

Type / Model Name	:	GTC600C (3 601 K83 510)
Product Description	:	Thermal Camera
Applicant	:	Robert Bosch Power Tools GmbH
Address	:	Max-Lang-Straße 40-46
		70771 Leinfelden-Echterdingen, GERMANY
Manufacturer	:	Robert Bosch Tool Corp.
Address	:	1800 W. Central Rd.
		Mount Prospect, Illinois, 60056, USA

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

Test Report No. : 80166757-03 Rev_1	26. October 2023 Date of issue

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

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (May 2023)

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 (May 2023)

Part 15, Subpart C, Section 15.203	Antenna requirement
Part 15, Subpart C, Section 15.204	External radio frequency power amplifiers and antenna modifications
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 v05	Guidance for compliance measurements on DTS; FHSS and hybrid system devices operating under Section 15.247 of the FCC rules, April 2, 2019.

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 Photo documentation

For detailed photos of the respective test setup refer to ATTACHMENT B.
For detailed photos of the EUT refer to ATTACHMENT C.

2.4 General remarks

FCC ID: TXTGTC600C
IC ID: 909H-GTC600C

2.5 Equipment type

WLAN - AP

2.6 Short description of the equipment under test (EUT)

The EUT is a thermal imaging camera that integrates contactless temperature measurement with WLAN functionality, suitable for both indoor and outdoor use. This device is specifically designed for thermal inspections, including assessing thermal insulation, locating thermal bridges, and detecting overheated electrical components. In addition, it incorporates WLAN connectivity for seamless data transfer and remote monitoring.

Tested samples:	Radiated Test Sample	Conducted Test Sample
Serial number:	Sample C1-4	Sample C1-3
Firmware version:	GTC600C_Ratio_V0_6_0_R4808_AE9_NO_EEPROM_NO_BOOT_WIFI_ISOLATED.hex	

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

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 WLAN Standard 802.11b, g, n HT20,:

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

2.9 Transmit operating modes

The EUT use DSSS or OFDM modulation and may operate under operating mode 2 and provide following data rates with auto-fall-back:

- 802.11b mode 11, 5.5, 2, 1 Mbps (Mbps = *megabits per second)*
- 802.11g mode 54, 48, 36, 24, 18, 12, 9, 6 Mbps
- 802.11n, HT20, MCS 0 - 7

2.10 Antenna

Customer provided following data regarding internal antenna:

Number	Characteristic	Part number	Frequency range (MHz)	Peak Gain (dBi)
1	Omni	AH316M245001	2400 - 2500	+1.9

2.11 Power supply system utilised

Power supply voltage, V_{nom} : 12 V (Battery: BAT414, 2 Ah)

2.12 Peripheral devices and interface cables

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

- Debug Adapter Model : TI EMUBOOST
- USB cable Model : 1 m
- Laptop Model : CSA 02-01/01-16-002

2.13 Determination of worst-case conditions for final measurement

Preliminary tests in all three orthogonal axes are performed to find the worst case mode from all possible combinations between available modulations and data rates. the settings of the EUT are changed to locate at which position and at what setting of the EUT the maximum of the emissions is genarated.

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

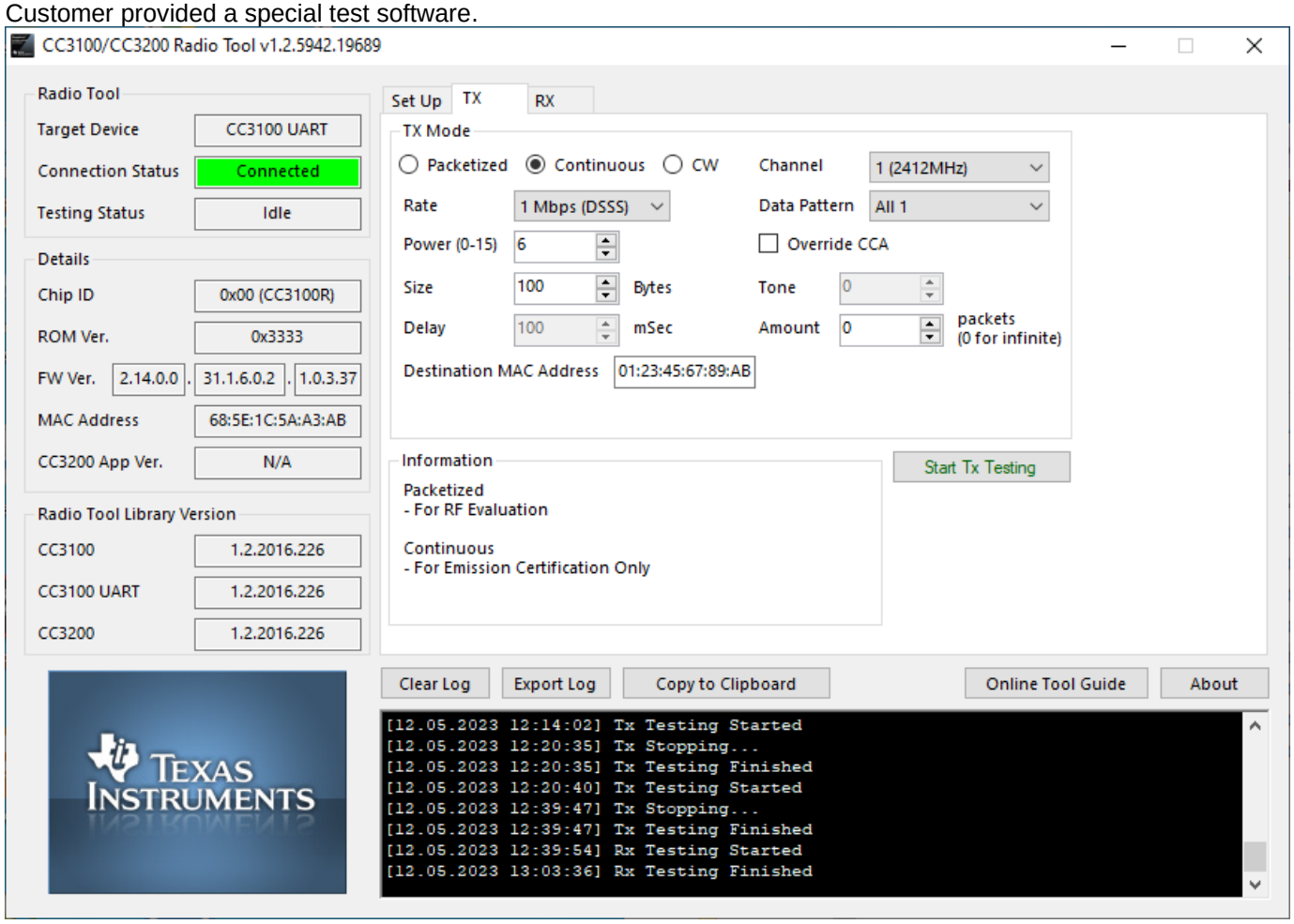
WLAN	Available channel	Tested channels	Power setting	Modulation	Data rate
802.11b	1 to 11	1, 6, 11	P6	DSSS	1 Mbps
802.11g	1 to 11	1, 6, 11	P6	OFDM	6 Mbps
802.11n HT20	1 to 11	1, 6, 11	P6	OFDM	MCS0

2.13.1 Test jig

No test jig is used.

2.13.2 Test software

Customer provided a special test software.



3 TEST RESULT SUMMARY

FCC Rule Part	RSS Rule Part	Description	Result
15.207(a)	RSS-Gen, 8.8	AC power line conducted emissions	NA
15.247(a)(2)	RSS-247, 5.2(a)	-6 dB EBW	passed
15.247(b)(3)	RSS-247, 5.4(d)	Maximum peak conducted output power	passed
15.247(d)	RSS-247, 5.5	Unwanted emission, radiated	passed
15.247(d)	RSS-Gen, 8.10	Emissions in restricted bands	passed
15.247(e)	RSS-247, 5.2(b)	PSD	passed
15.203	-	Antenna requirement	passed
	RSS-Gen, 6.6	99 % Bandwidth	passed

The mentioned 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
80166757-03	0	06 July 2023	Initial test report
80166757-03	1	12 October 2023	Added 802.11g Mode conducted measurements

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 : 10 May 2023

Testing concluded on : 12 June 2023

Checked by:

Klaus Gegenfurtner
2023.10.27 07:49:25
+02'00'

Klaus Gegenfurtner
Teamleader Radio

Tested by:

Lukas Scheuermann
2023.10.26 17:11:41
+02'00'

Lukas Scheuermann
Radio Team

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 power line conducted emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
EBW and OBW	2400 MHz to 3000 MHz	95%	± 2.5 x 10^{-7}
Maximum peak conducted output power	2400 MHz to 3000 MHz	95%	± 0.62 dB
Power spectral density	2400 MHz to 3000 MHz	95%	± 0.62 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB
Conducted Spurious Emissions	10000 MHz to 40000 MHz	95%	± 3.47 dB
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
Field strength of the fundamental	100 kHz to 100 MHz	95%	± 3.53 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".

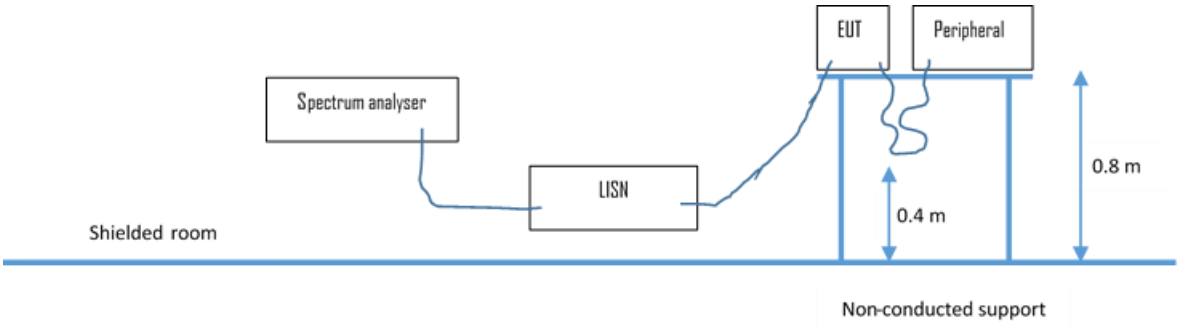
4.5.2.1 Justification

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:

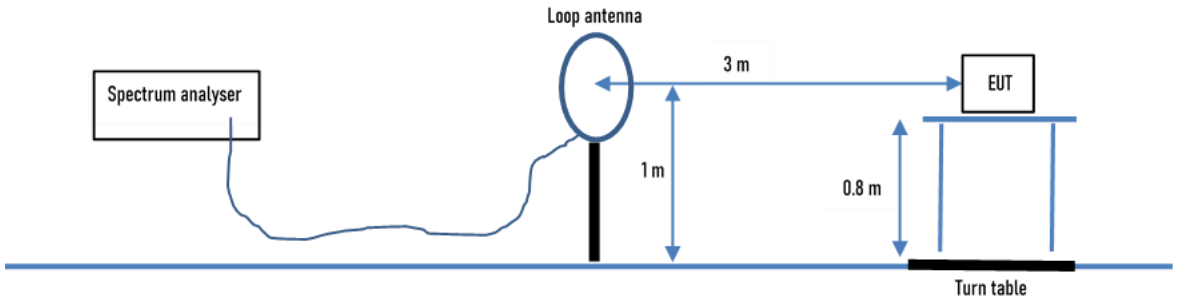
dBµV = 20(log µV)
µV = Inverse log(dBµV/20)

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):

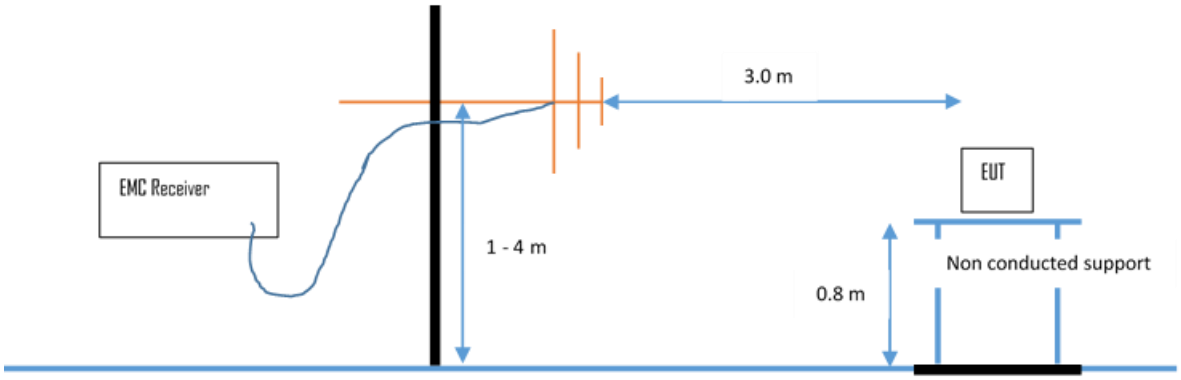
Test setup according ANSI C63.10



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 center 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 center 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.

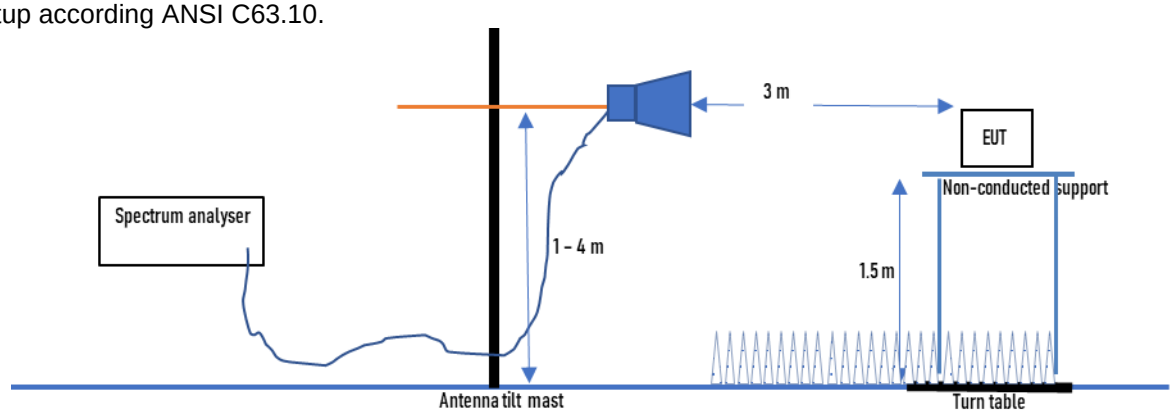
The resolution bandwidth setting:
30 MHz – 1000 MHz: RBW: 120 kHz

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

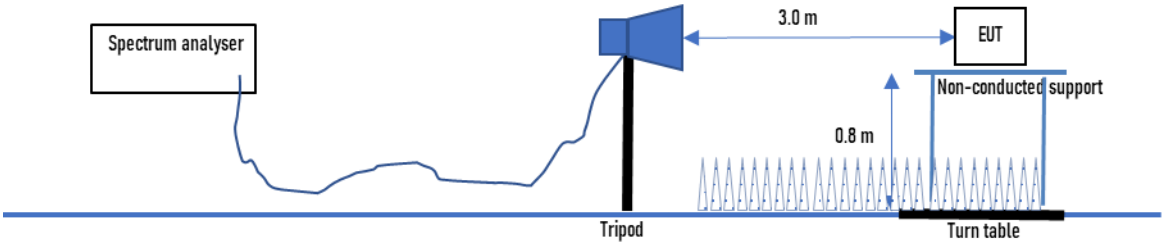
4.5.3.2.3 Anechoic chamber 1 (1000 MHz – 18000 MHz)

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 center, 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 center, 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 are adopted.

5 TEST CONDITIONS AND RESULTS

5.1 EBW 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 Applicable standard

According to FCC Part 15, Section 15.247(a)(2):
Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 – 2483.5 MHz and 5725 – 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.1.3 Description of Measurement

The bandwidth was 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. An alternative is to use the bandwidth measurement of the analyser.

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

5.1.4 Test result

FCC §15.247 (a)(2) | RSS-247 5.2 (a)				
Modulation	Channel	Frequency	DTS-BW	min. Limit
		MHz	MHz	MHz
802.11b, 1 Mbps	CH1	2412	9.102	0.5
	CH6	2437	9.100	0.5
	CH11	2462	9.098	0.5
802.11g, 1 Mbps	CH1	2412	15.103	0.5
	CH11	2462	15.103	0.5
802.11n, HT20, MCS0	CH1	2412	15.109	0.5
	CH6	2437	15.106	0.5
	CH11	2462	15.105	0.5

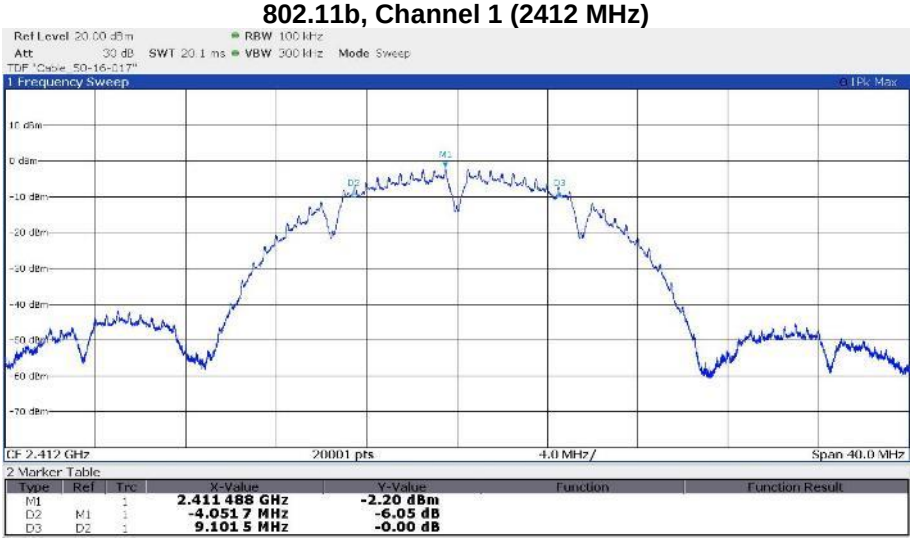
RSS-Gen 6.7			
Modulation	**Channel**	**Frequency**	**OBW99**
		MHz	MHz
802.11b, 1 Mbps	CH1	2412	14.143
	CH6	2437	14.123
	CH11	2462	14.122
802.11g, 1 Mbps	CH1	2412	16.341
	CH11	2462	16.369
802.11n, HT20, MCS0	CH1	2412	17.481
	CH6	2437	17.505
	CH11	2462	17.449

The requirements are **FULFILLED.**

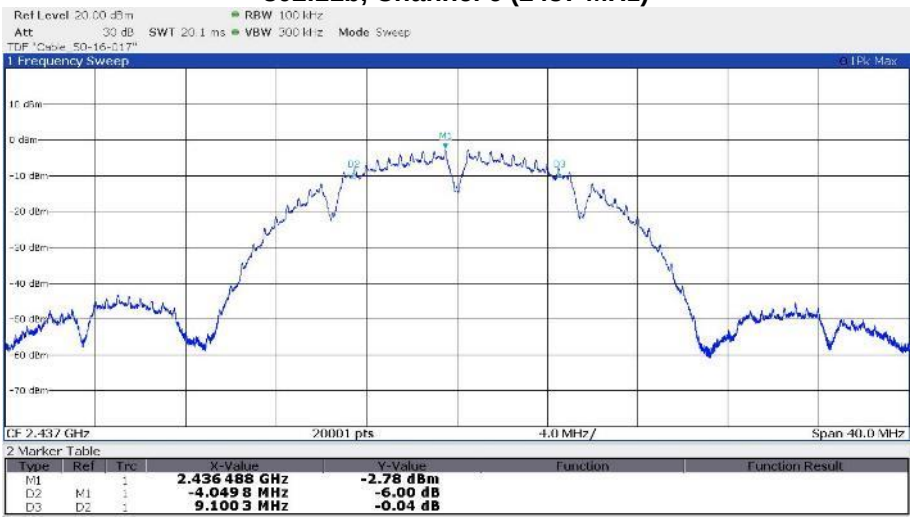
Remarks: For detailed test results please refer to following test protocols. The RSS Gen defines no limit for the occupied bandwidth!

5.1.5 Test protocols EBW

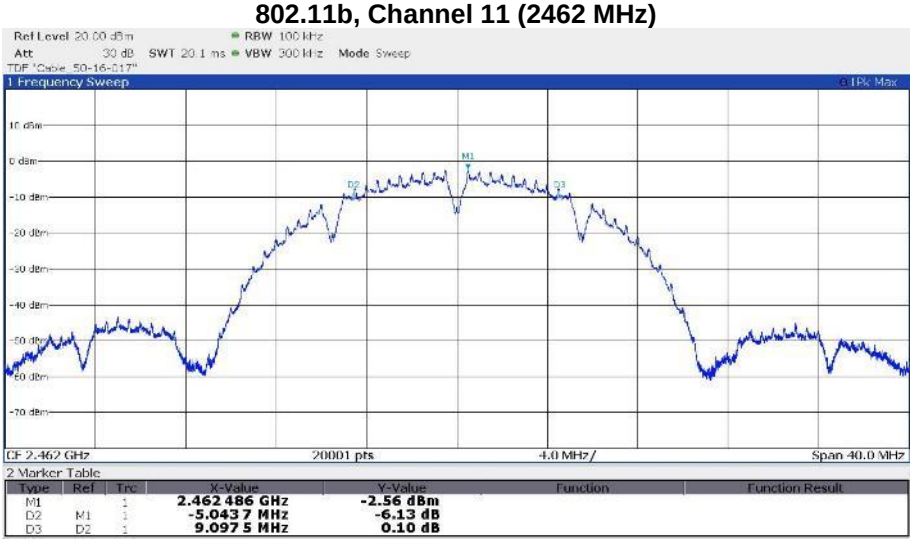
802.11b, Channel 1 (2412 MHz)



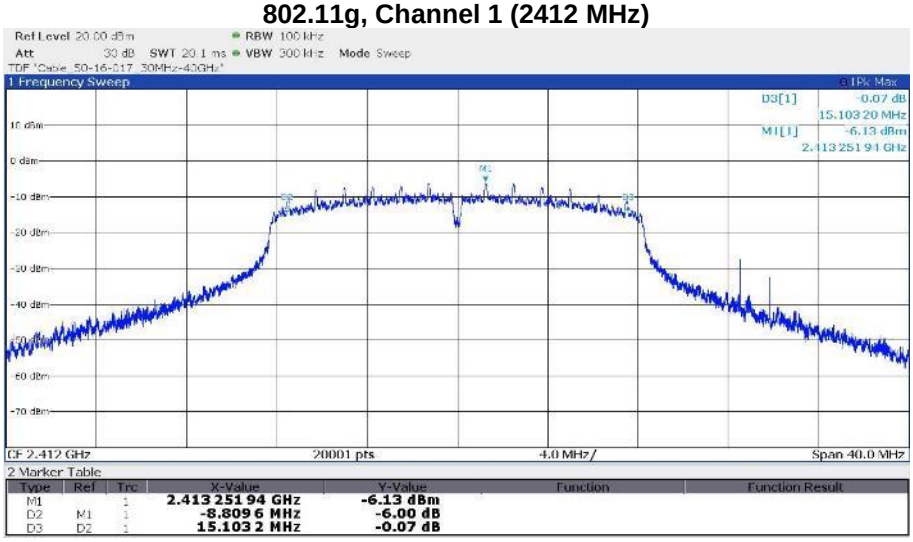
802.11b, Channel 6 (2437 MHz)



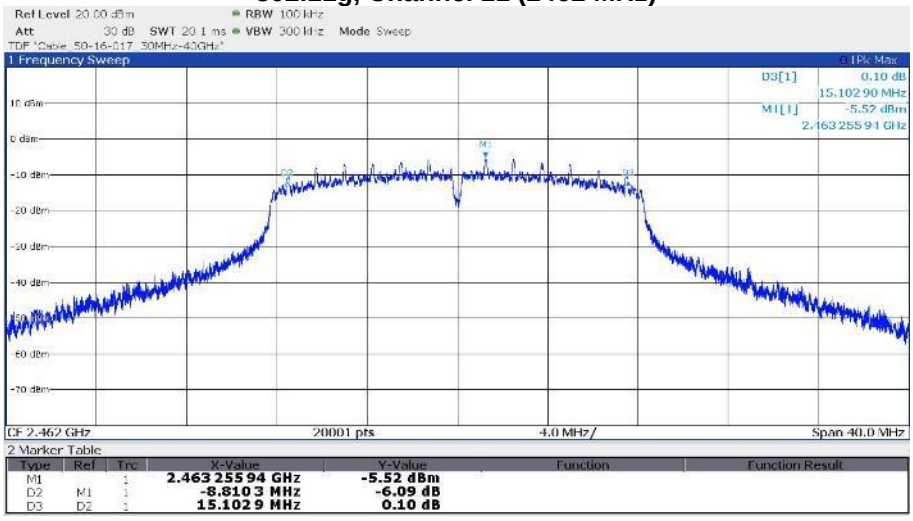
802.11b, Channel 11 (2462 MHz)



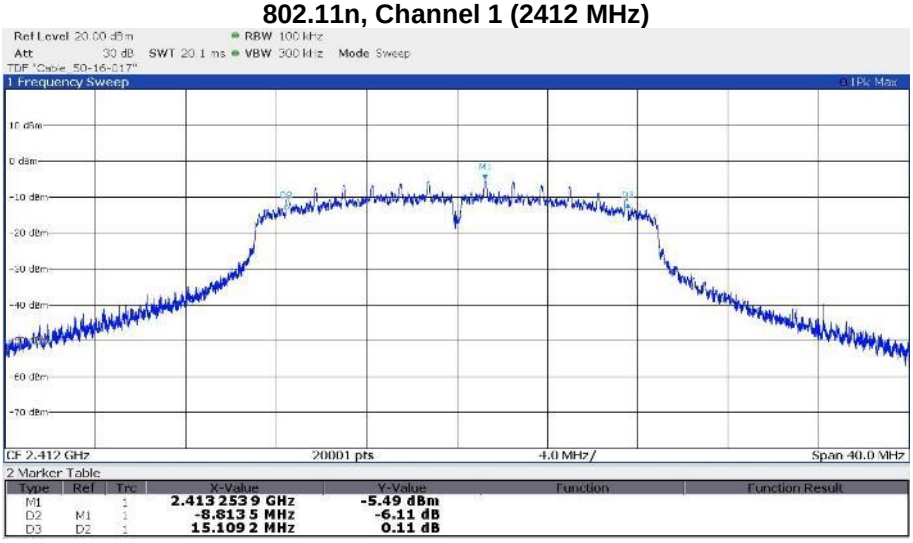
802.11g, Channel 1 (2412 MHz)



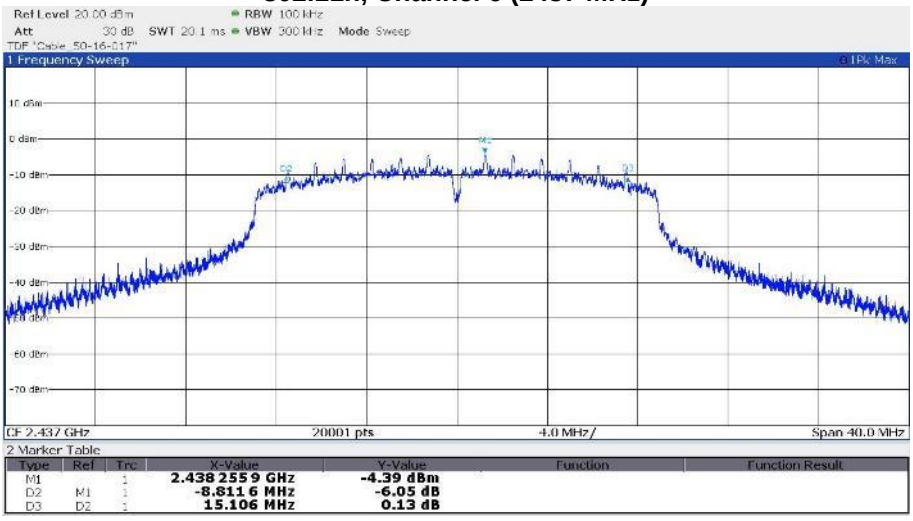
802.11g, Channel 11 (2462 MHz)



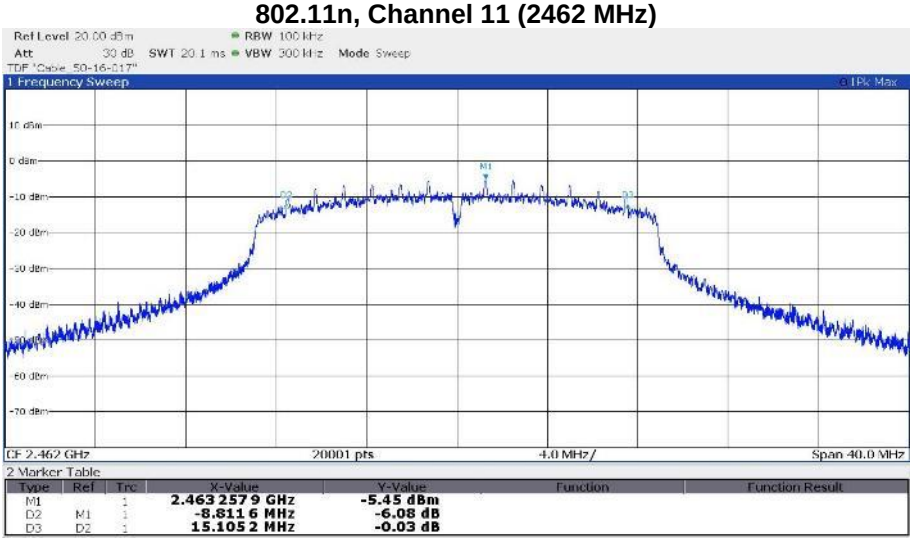
802.11n, Channel 1 (2412 MHz)



802.11n, Channel 6 (2437 MHz)

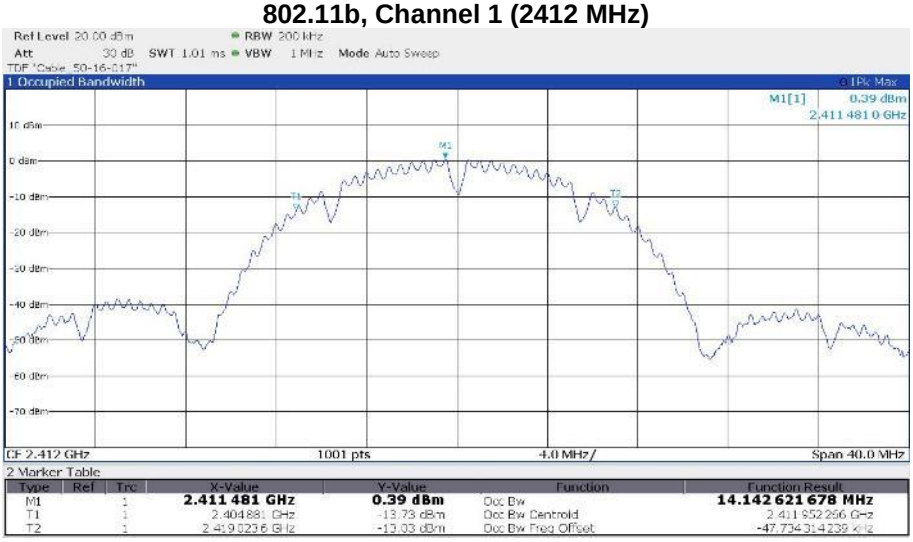


802.11n, Channel 11 (2462 MHz)



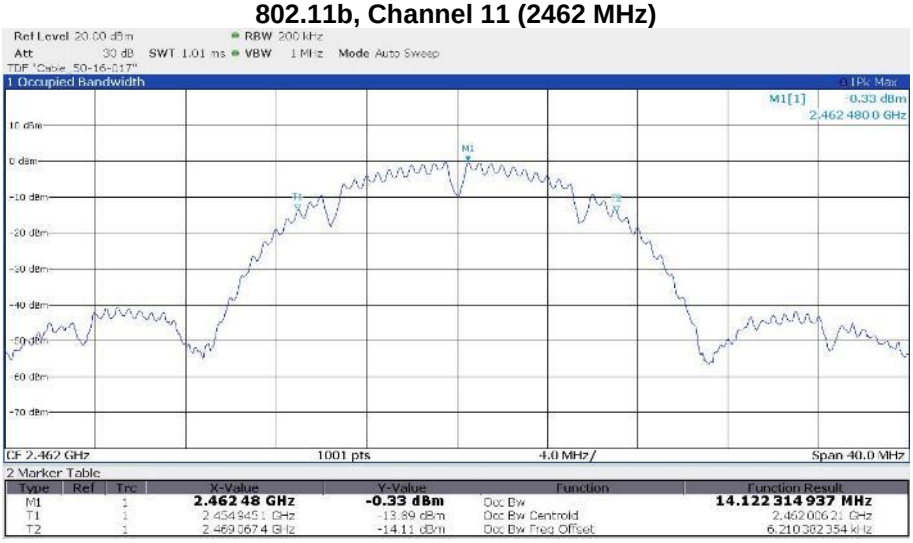
5.1.6 Test protocols OBW

802.11b, Channel 1 (2412 MHz)

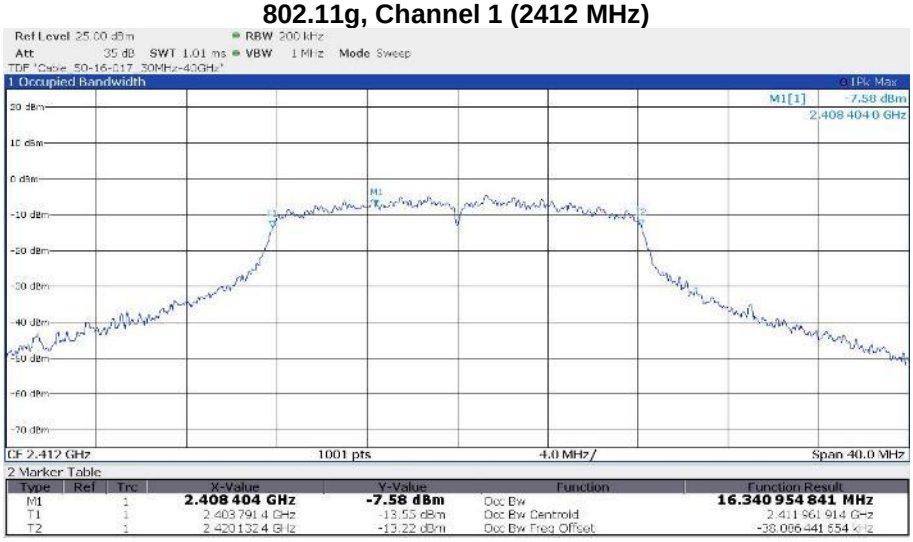


802.11b, Channel 6 (2437 MHz)

802.11b, Channel 11 (2462 MHz)

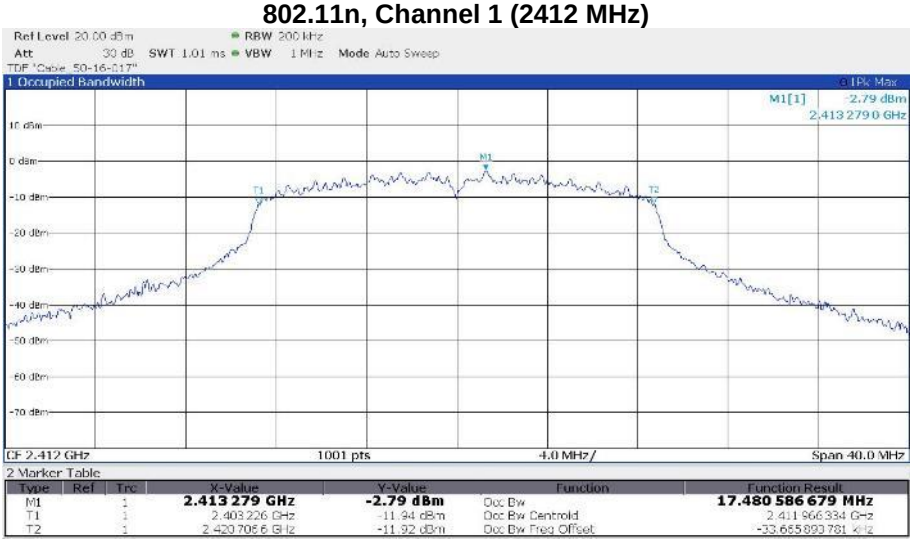


802.11g, Channel 1 (2412 MHz)

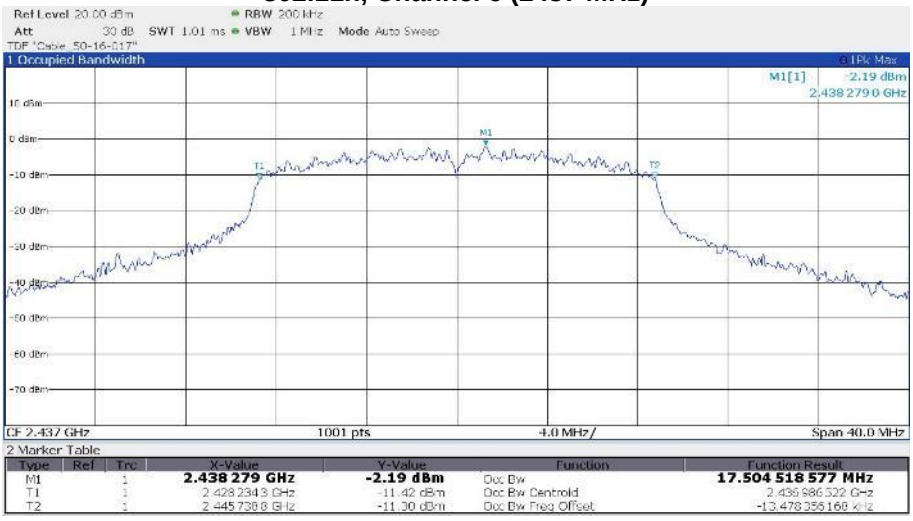


802.11g, Channel 11 (2462 MHz)

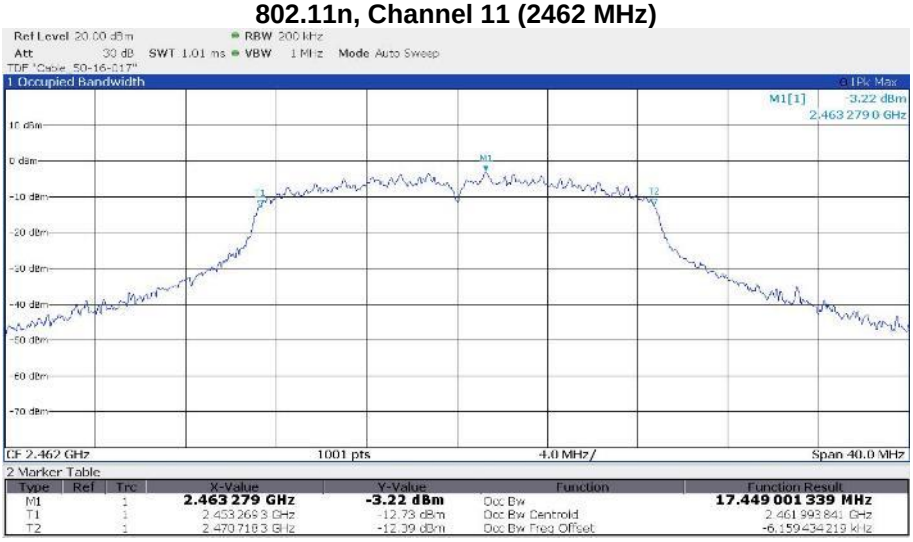
802.11n, Channel 1 (2412 MHz)



802.11n, Channel 6 (2437 MHz)



802.11n, Channel 11 (2462 MHz)



5.2 Maximum peak conducted output power

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

5.2.1 Description of the test location

Test location: Shielded Room S6

5.2.2 Applicable standard

According to FCC Part 15, Section 15.247(b)(3):
For systems using digital modulation in the 2400 – 2483.5 MHz the maximum peak output power of the transmitter shall not exceed 1 Watt. The limit is based on transmitting antennas of directional gain that do not exceed 6 dBi.

5.2.3 Description of Measurement

The maximum peak conducted output power is measured using a spectrum analyser following the procedure set out in ANSI C63.10, item 11.9.1.1. The EUT is set in TX continuous mode while measuring.

5.2.4 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
802.11b, 1 Mbps	CH1	2412	9.8	30.0	-20.2
	CH6	2437	9.4	30.0	-20.6
	CH11	2462	9.5	30.0	-20.5
802.11g, 1 Mbps	CH1	2412	12.4	30.0	-17.6
	CH11	2462	12.7	30.0	-17.4
802.11n, HT20, MCS0	CH1	2412	13.1	30.0	-17.0
	CH6	2437	12.8	30.0	-17.2
	CH11	2462	12.9	30.0	-17.1

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
802.11b, 1 Mbps	CH1	2412	106.49	11.3	36	-24.7
	CH6	2437	105.87	10.7	36	-25.3
	CH11	2462	105.10	9.9	36	-26.1
802.11n, HT20, MCS0	CH1	2412	109.84	14.6	36	-21.4
	CH6	2437	109.61	14.4	36	-21.6
	CH11	2462	108.91	13.7	36	-22.3

Peak Power Limit according to FCC Part 15, Section 15.247(b)(3):

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

The requirements are **FULFILLED.**

Remarks: None.

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 Applicable standard

According to FCC Part 15, Section 15.247(e):
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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.3.3 Description of Measurement

The measurement is performed using the procedure set out in ANSI C63.10, item 11.10.21. 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,

5.3.4 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
802.11b, 1 Mbps	CH1	2412	-17.5	8.0	-25.5
	CH6	2437	-17.9	8.0	-25.9
	CH11	2462	-17.1	8.0	-25.1
802.11g, 1 Mbps	CH1	2412	-21.0	8.0	-29.0
	CH11	2462	-20.4	8.0	-28.4
802.11n, HT20, MCS0	CH1	2412	-20.5	8.0	-28.5
	CH6	2437	-19.3	8.0	-27.3
	CH11	2462	-19.5	8.0	-27.5

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

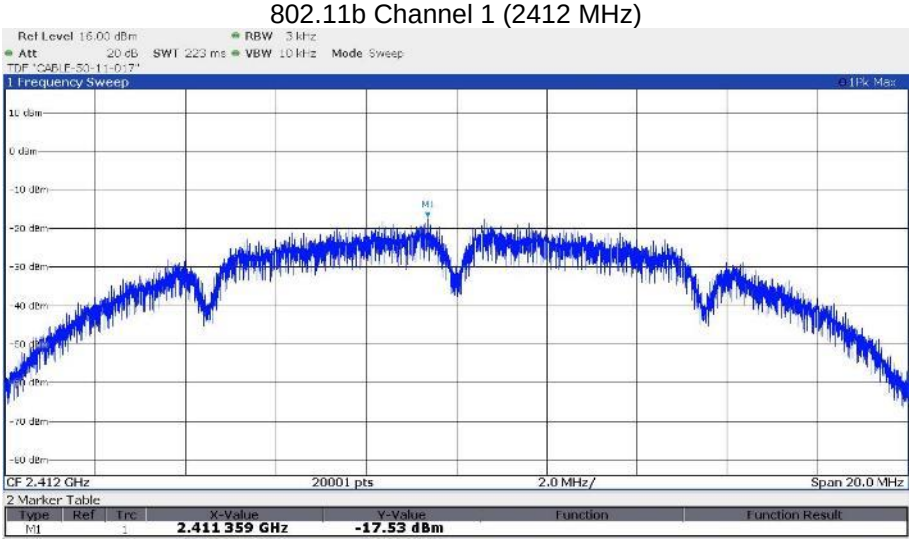
Frequency (MHz)	Power spectral density limit (dBm/3 kHz)
2400 - 2483.5	8

The requirements are **FULFILLED.**

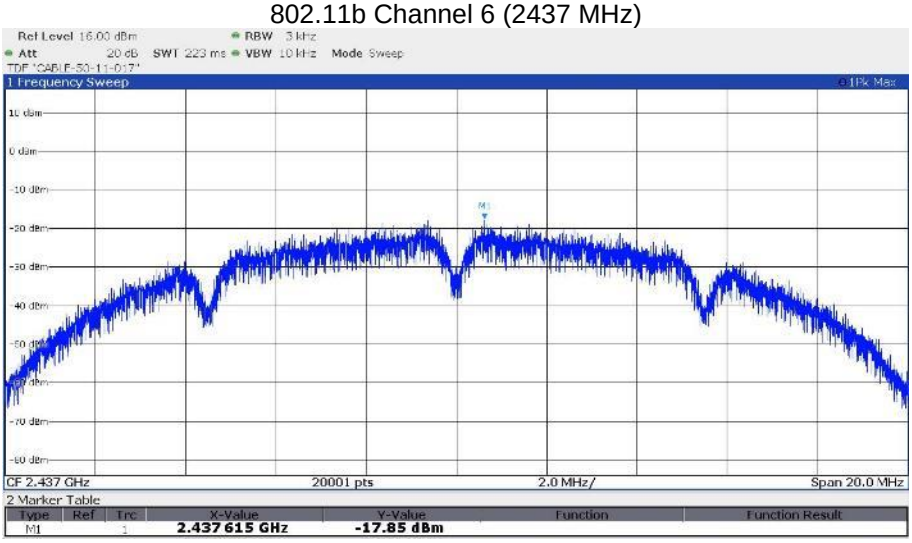
Remarks: For detailed test results please refer to following test protocols.

5.3.5 Power spectral density plots

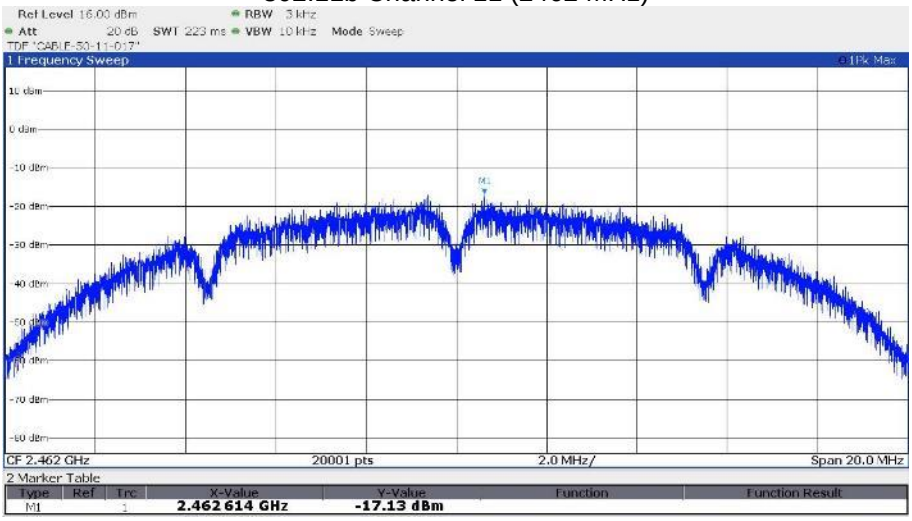
802.11b Channel 1 (2412 MHz)



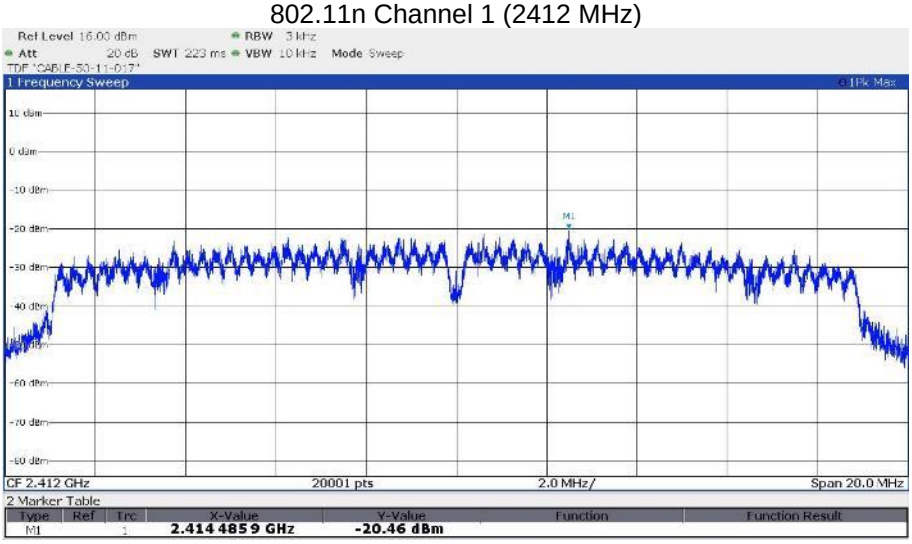
802.11b Channel 6 (2437 MHz)



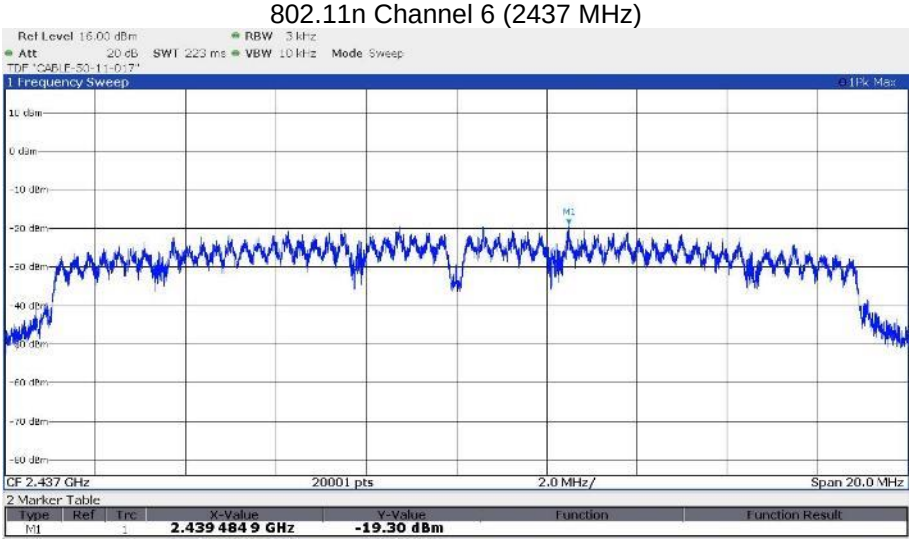
802.11b Channel 11 (2462 MHz)



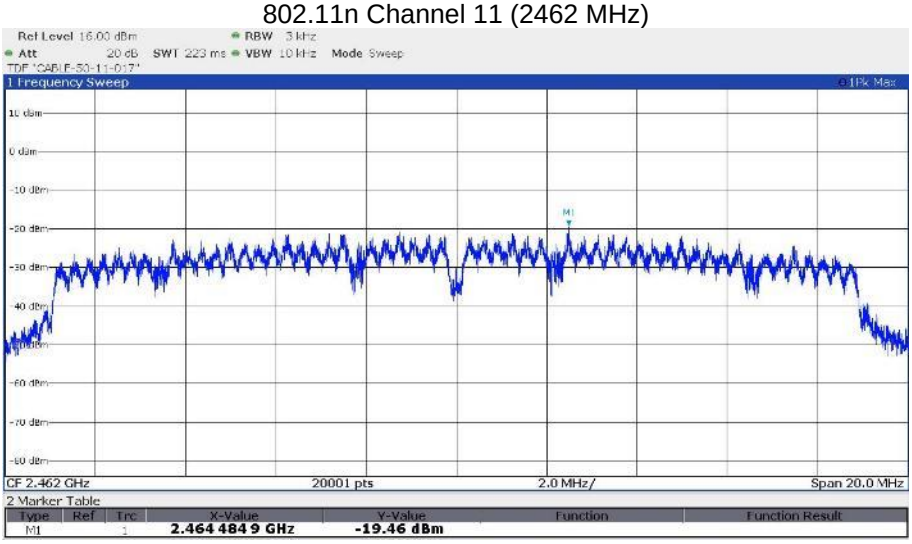
802.11n Channel 1 (2412 MHz)



802.11n Channel 6 (2437 MHz)



802.11n Channel 11 (2462 MHz)



5.5 Unwanted emissions, radiated

For test instruments and accessories used see section 6 Part **SER1, SER 2, SER 3**.

5.5.1 Description of the test location

Test location: OATS 1
Test location: Anechoic chamber 1

Test distance: 3 m

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).

5.5.2 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.

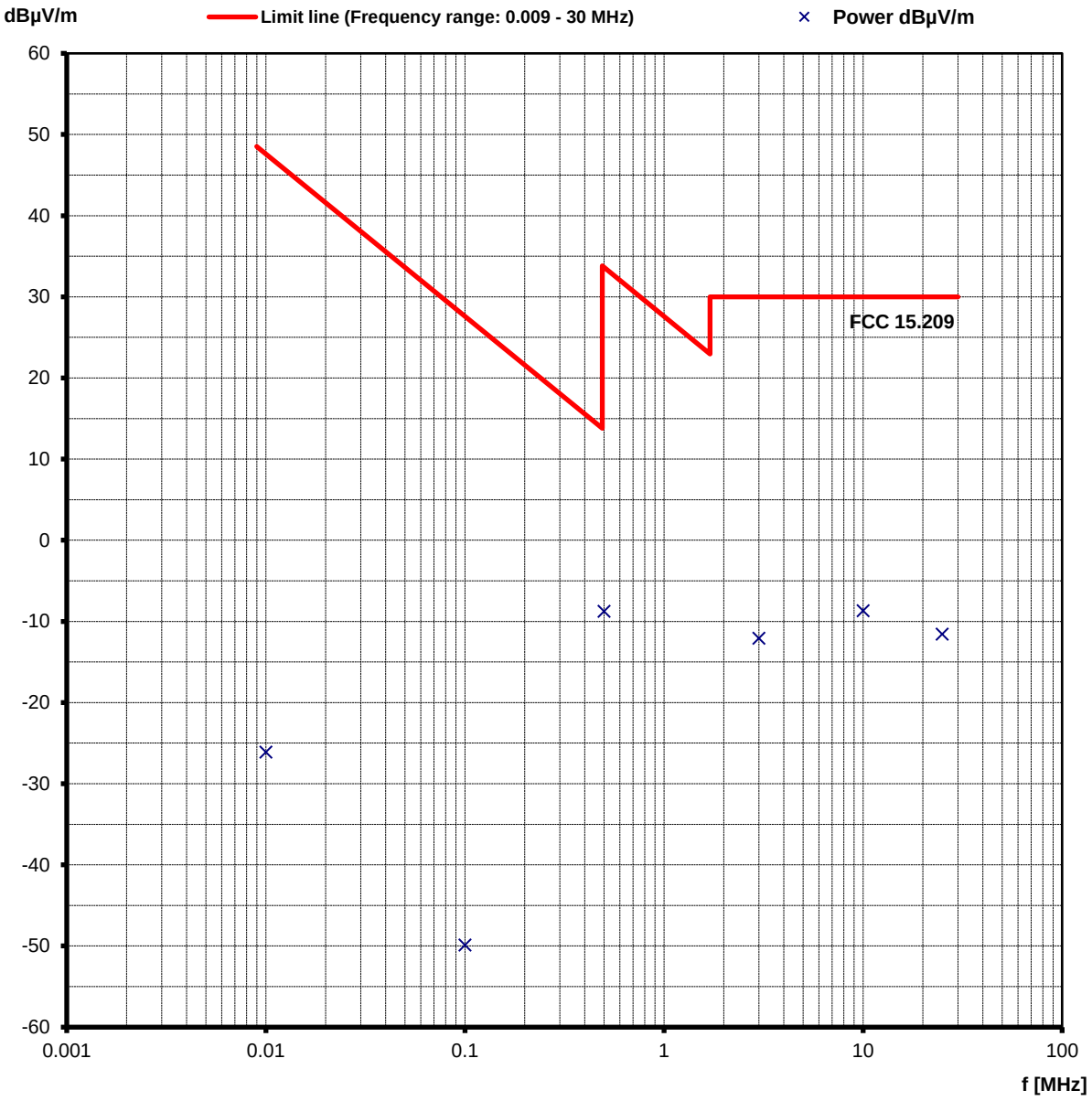
Spectrum analyser settings:
9 kHz – 150 kHz RBW: 200 Hz
150 kHz - 30 MHz RBW: 9 kHz
30 MHz – 1000 MHz: RBW: 120 kHz
1000 MHz – 25 GHz: RBW: 1 MHz, VBW: 3 MHz, Sweep: Auto, Detector function: Peak

5.5.1 Test result

5.5.1.1 Frequency Range 9 kHz – 30 MHz

Note: No emissions from the EUT could be identified. Data shows noise from the measurement site.

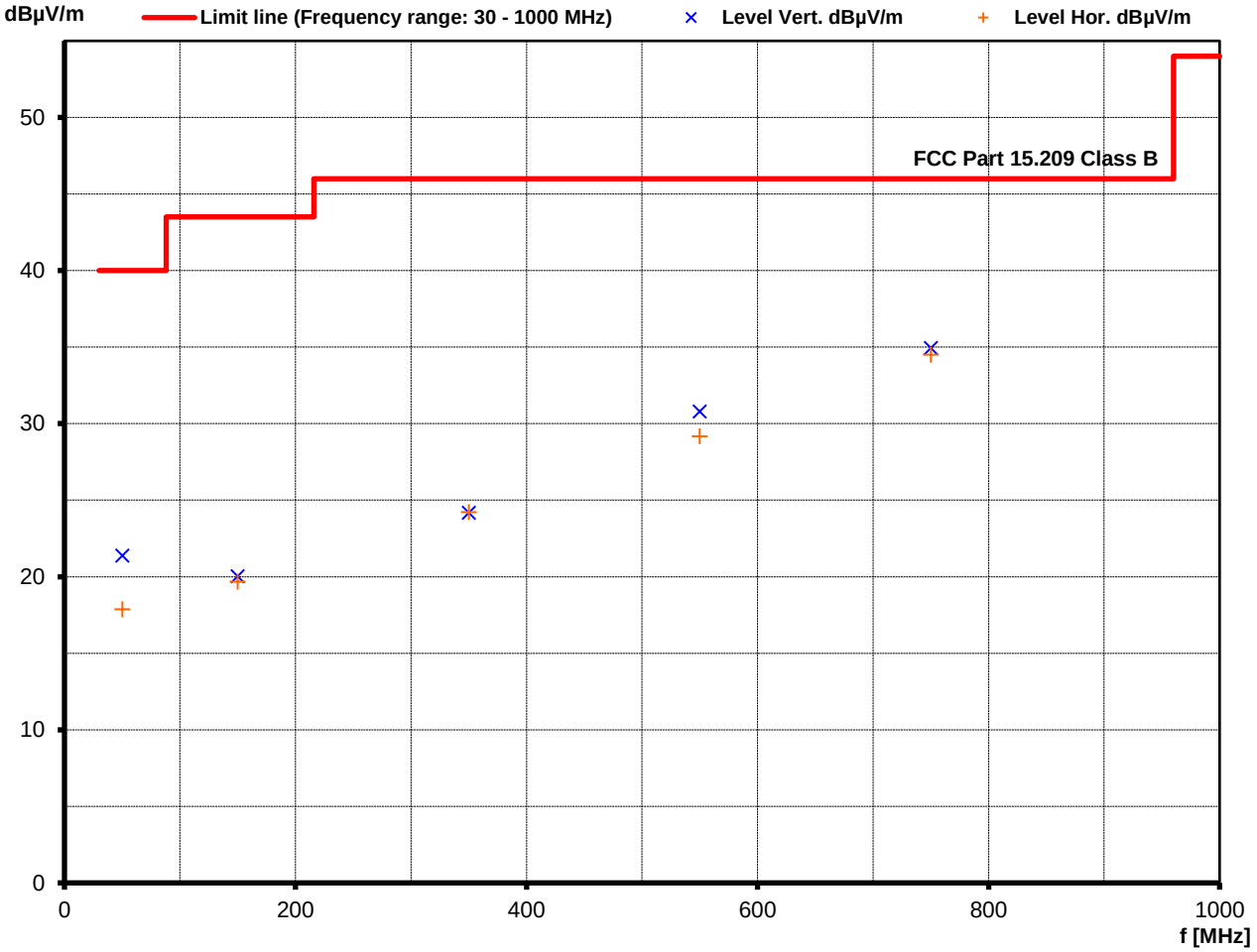
Frequency (MHz)	Reading (dBµV)	Correction * (dB)	Field strength (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
0.010	33.3	-59.4	-26.1	47.6	-73.7
0.100	11.8	18.3	-49.9	27.6	-77.5
0.500	14.1	17.1	-8.8	33.6	-42.4
3.000	10.0	17.9	-12.1	30.0	-42.1
10.000	14.9	16.4	-8.7	30.0	-38.7
25.000	10.2	18.3	-11.6	30.0	-41.6



5.5.1.1 Frequency Range 30 MHz – 1 GHz

Note: No emissions from the EUT could be identified. Data shows noise from the measurement site.

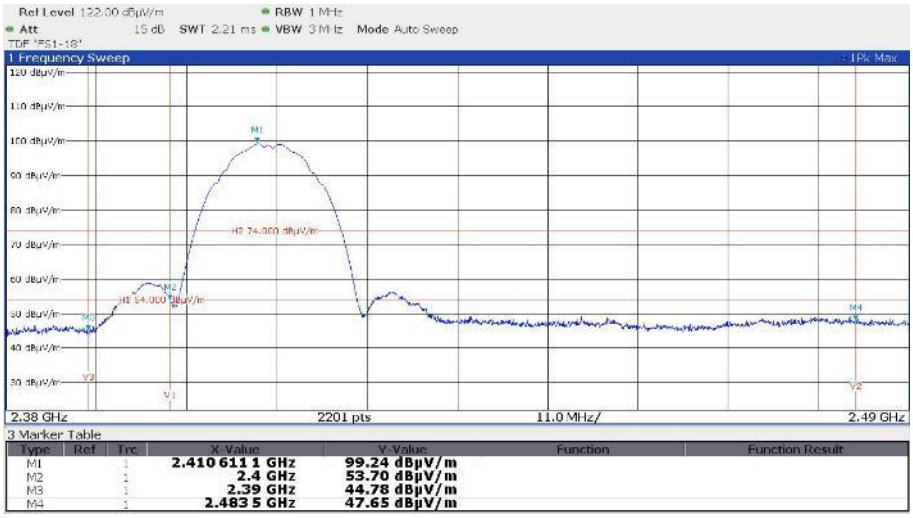
Frequency (MHz)	Reading Vert. (dBµV)	Reading Hor. (dBµV)	Correct. Vert. (dB)	Correct. Hor. (dB)	Level Vert. (dBµV/m)	Level Hor. (dBµV/m)	Limit (dBµV/m)	Dlimit (dB)
50.00	6.2	3.7	15.2	14.2	21.4	17.9	40.0	-18.6
150.00	6.1	4.9	13.9	14.8	20.0	19.7	43.5	-23.5
350.00	5.8	6.2	18.4	18.0	24.2	24.2	46.0	-21.8
550.00	6.8	5.4	24.0	23.8	30.8	29.2	46.0	-15.2
750.00	6.7	6.8	28.3	27.7	35.0	34.5	46.0	-11.0

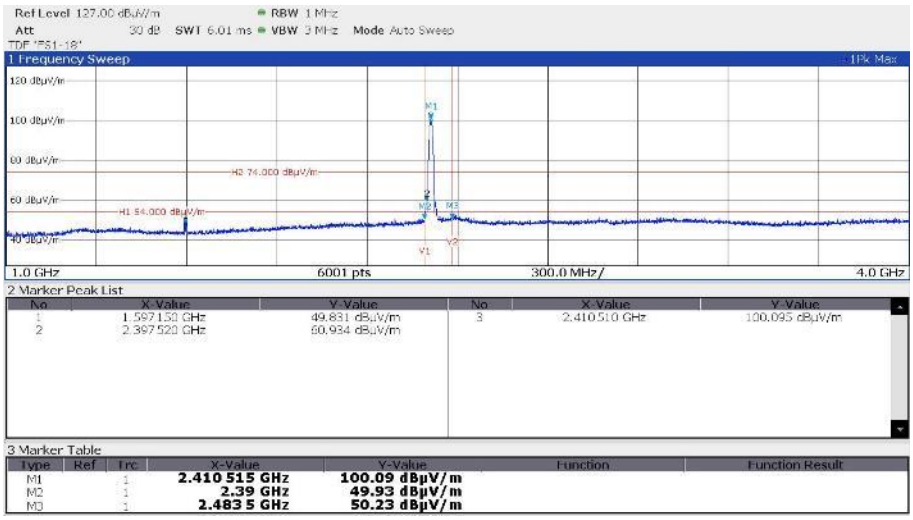


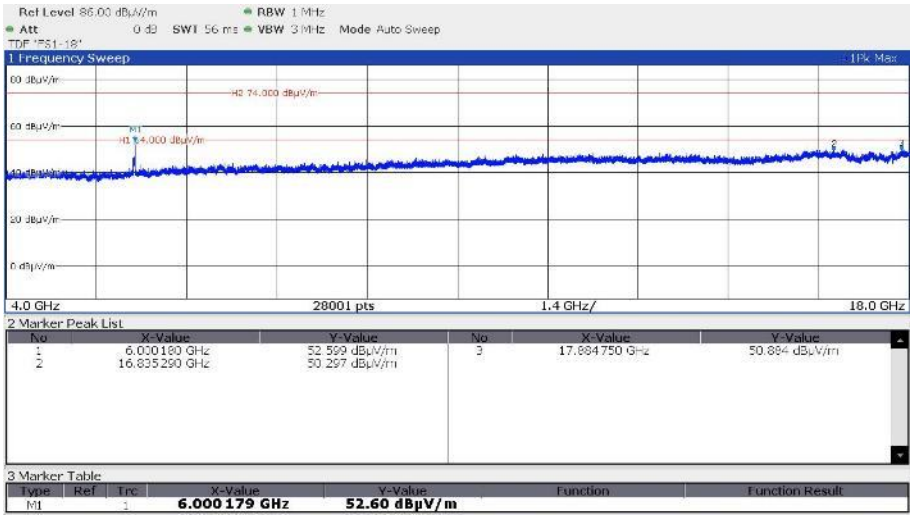
5.5.1.1 Frequency Range 1 GHz – 25 GHz

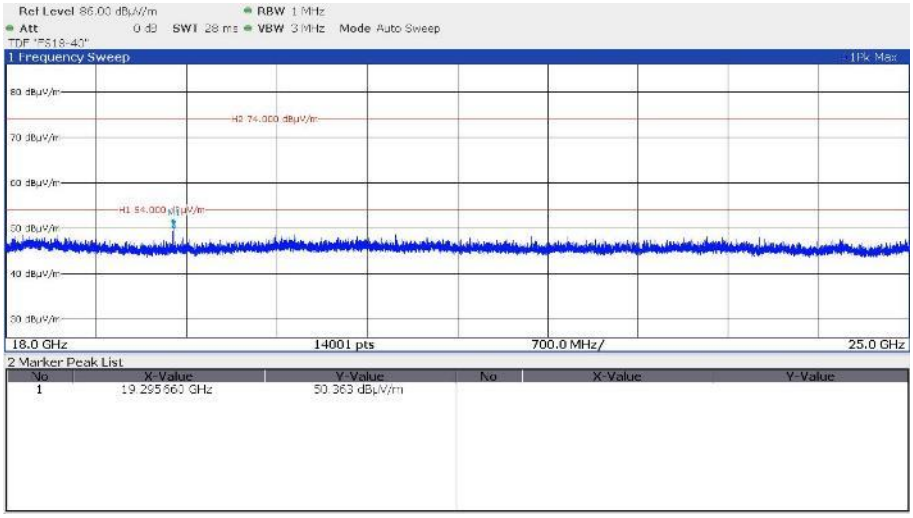
Note: Only worst case plots are listed with vertical antenna polarization.

5.5.1.1.1 802.11b, DSSS, 1 Mbps, CH1

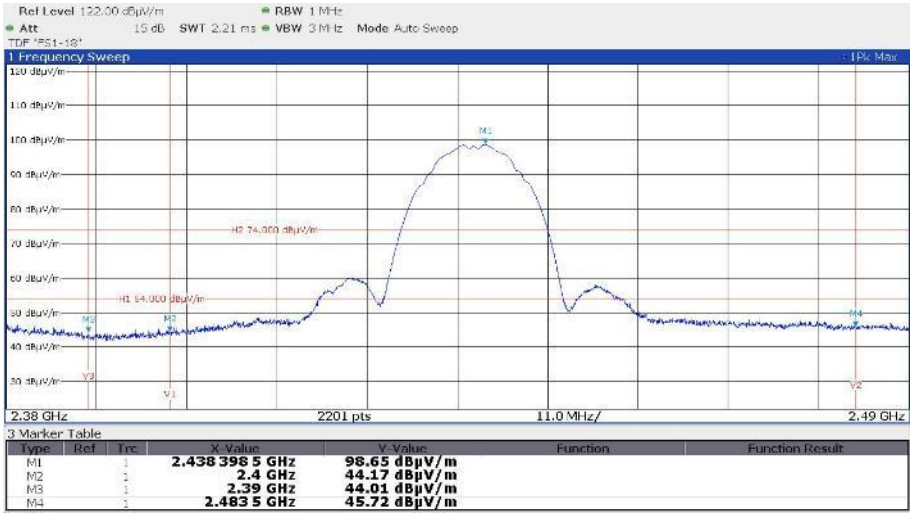


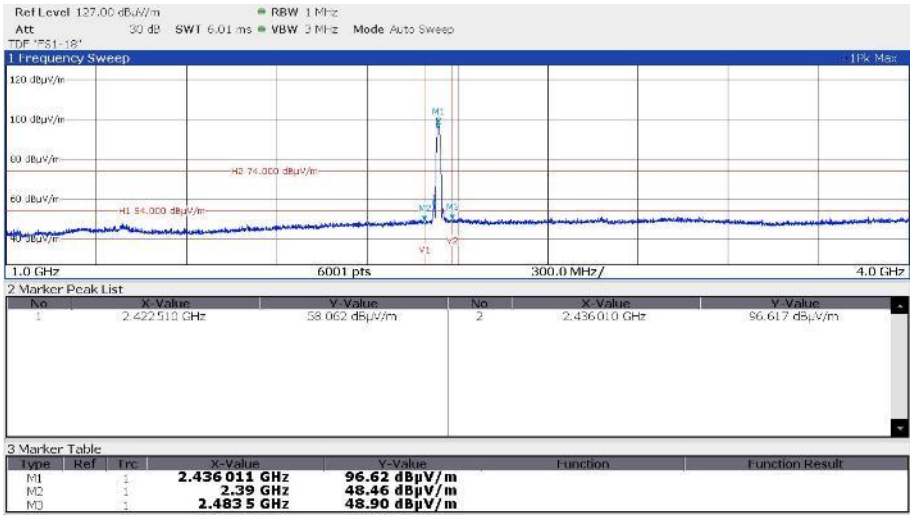


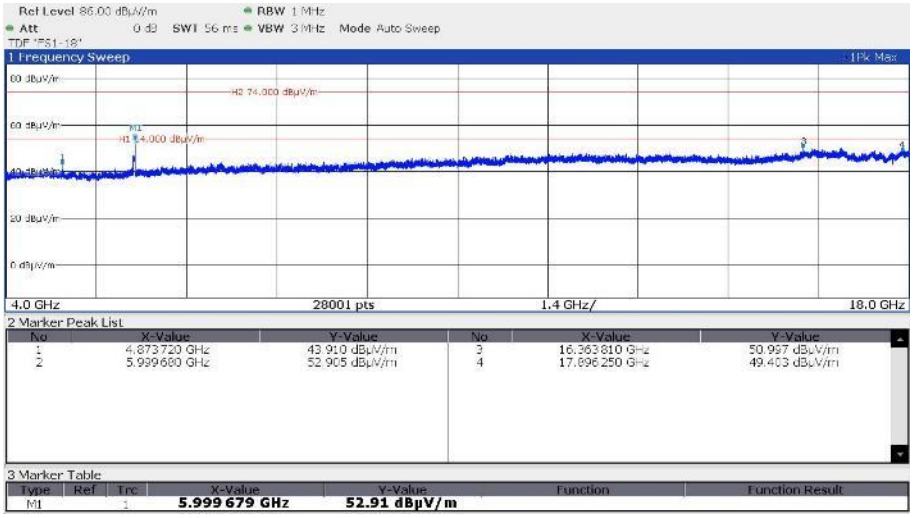


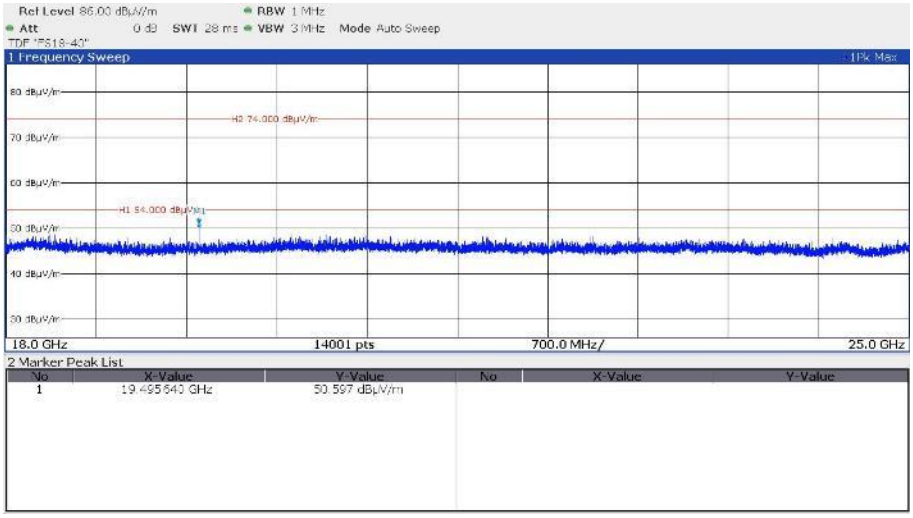


5.5.1.1.2 802.11b, DSSS, 1 Mbps, CH6

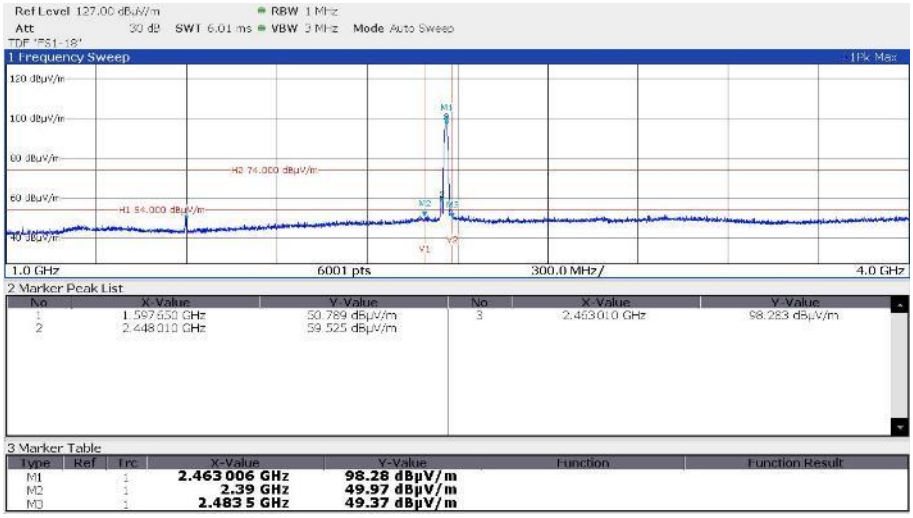


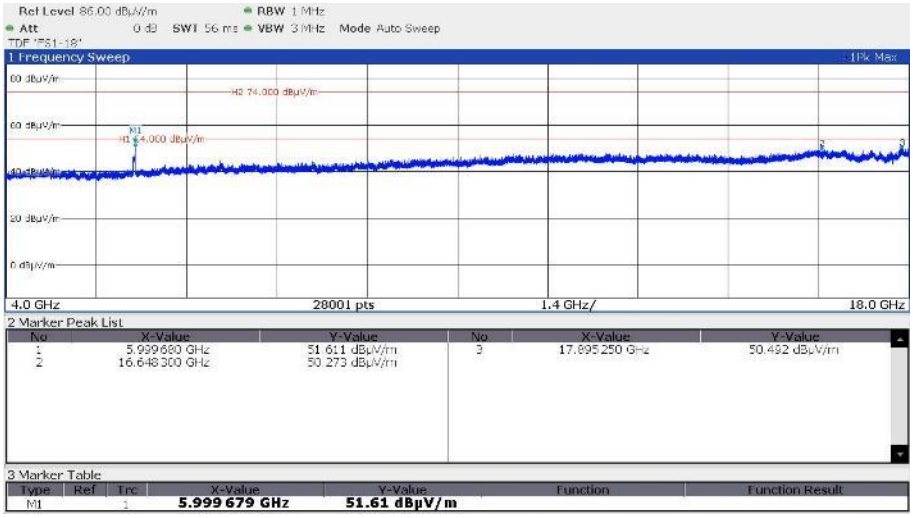


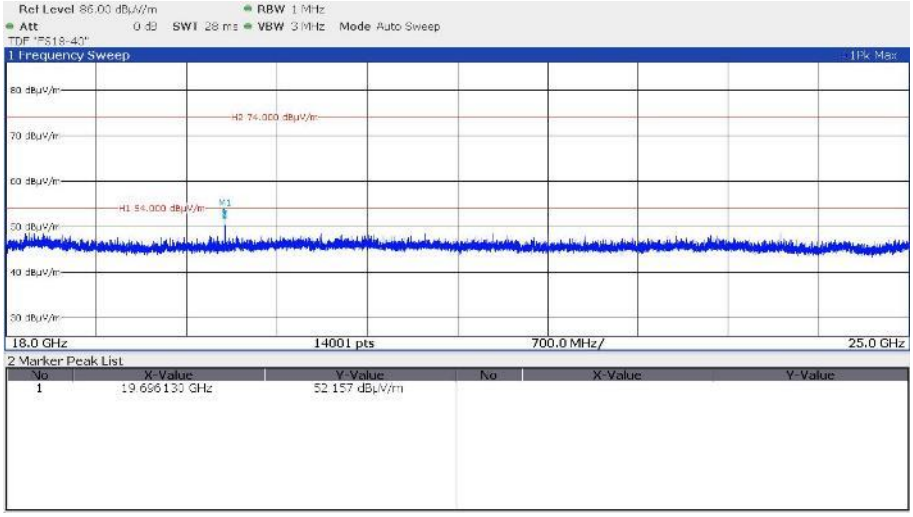




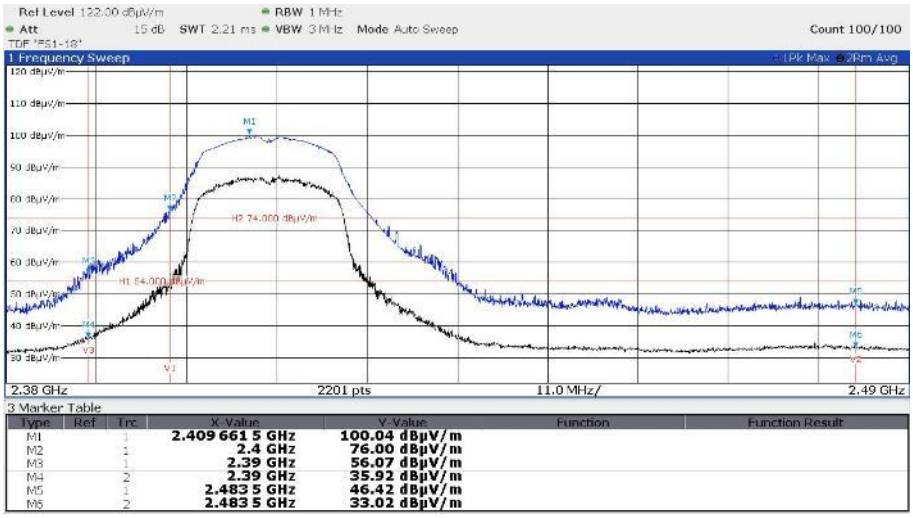
5.5.1.1.3 802.11b, DSSS, 1 Mbps, CH11

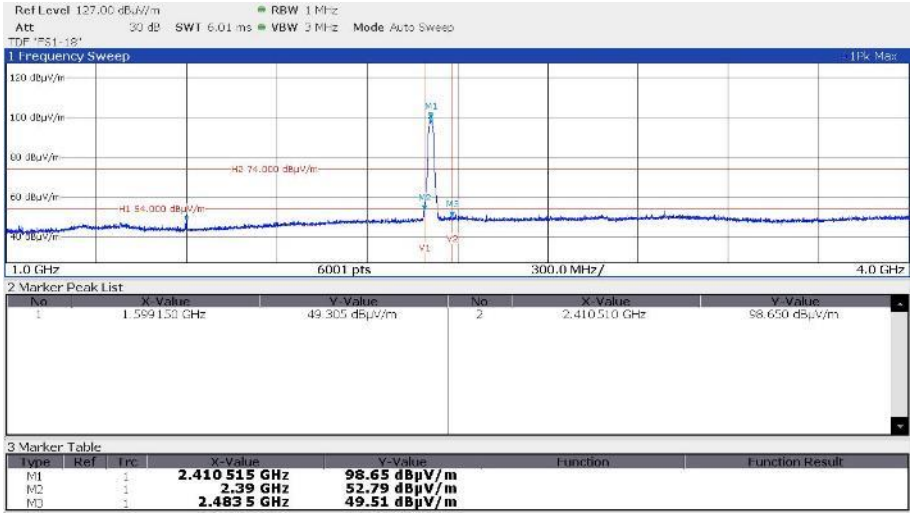


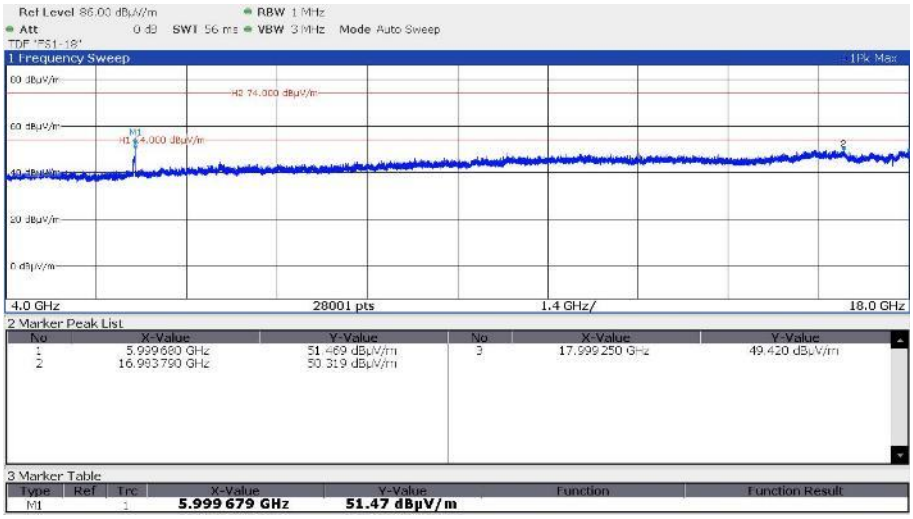


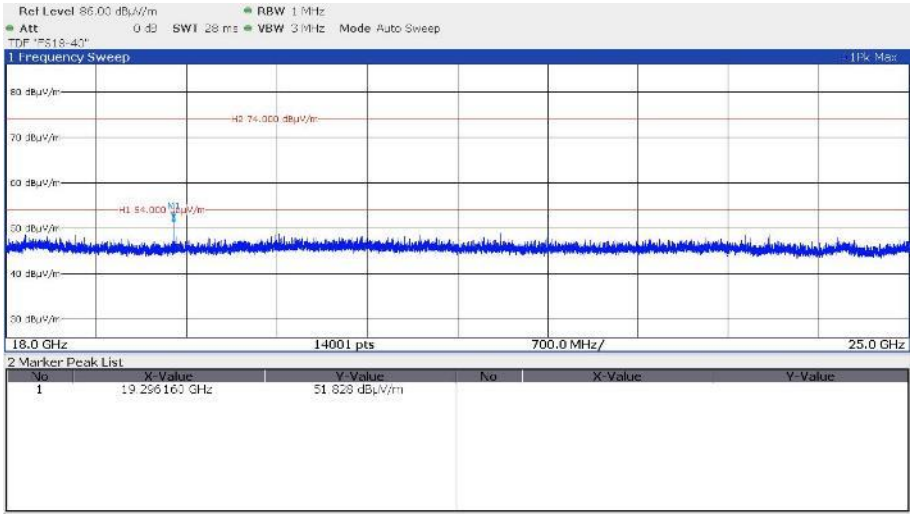


5.5.1.1.4 802.11n, MCS 0, CH1

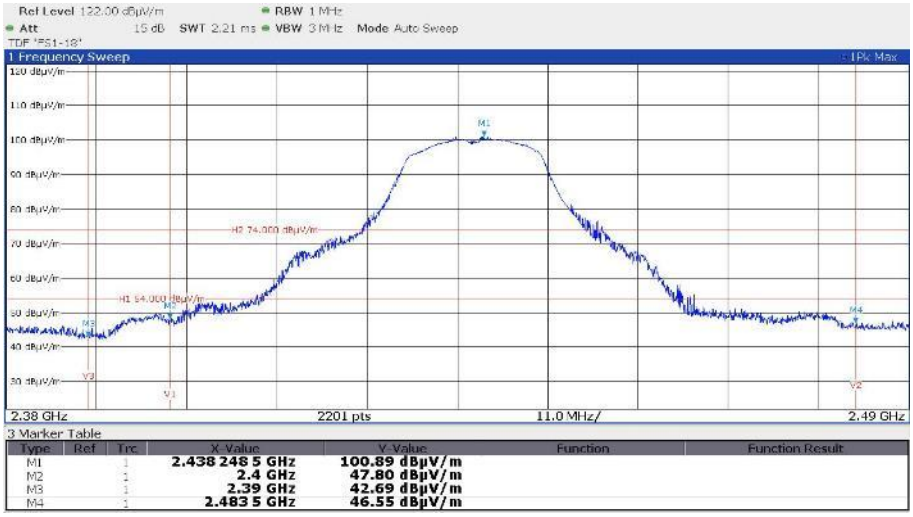


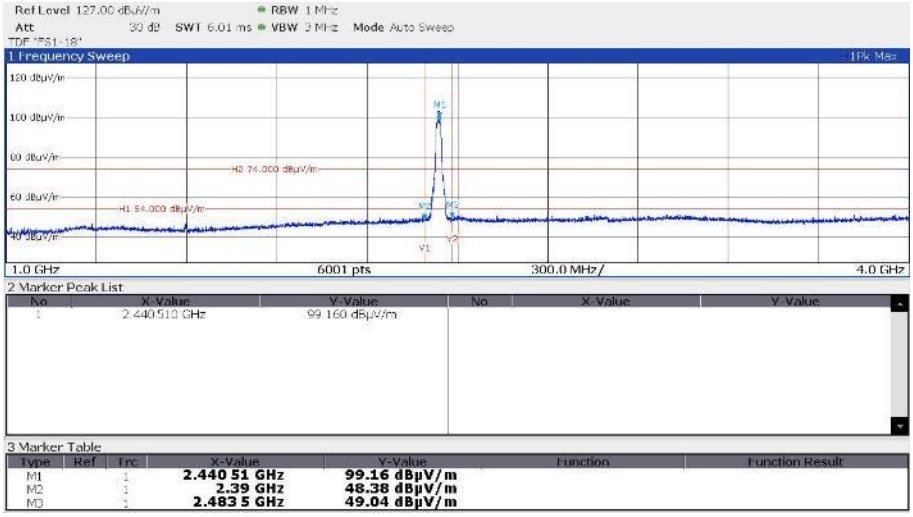


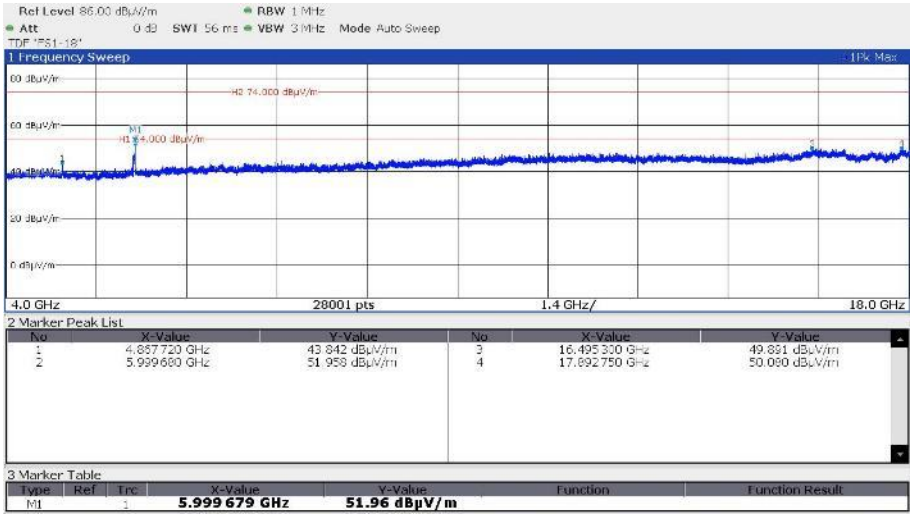


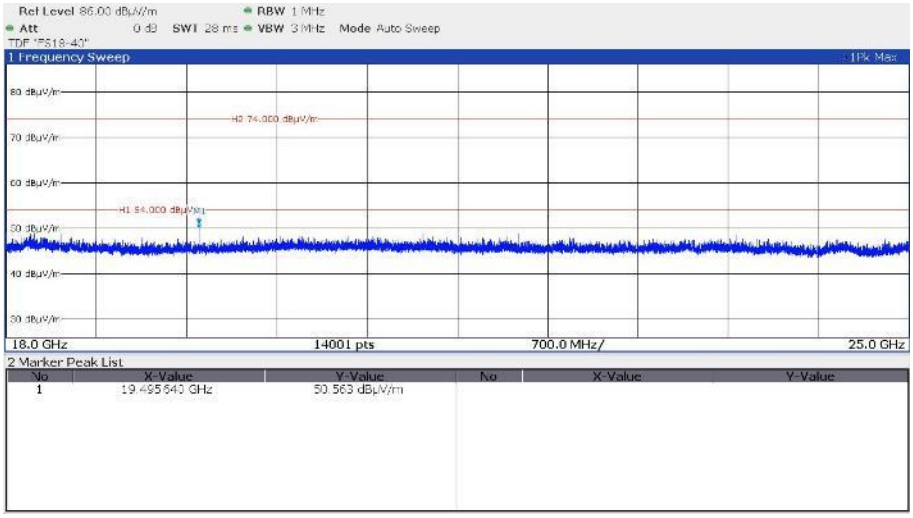


5.5.1.1.5 802.11n, MCS 0, CH6

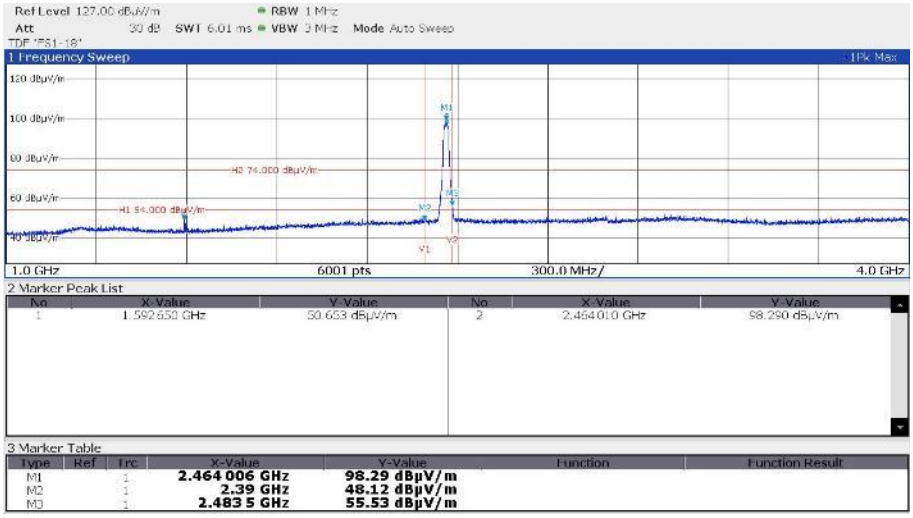


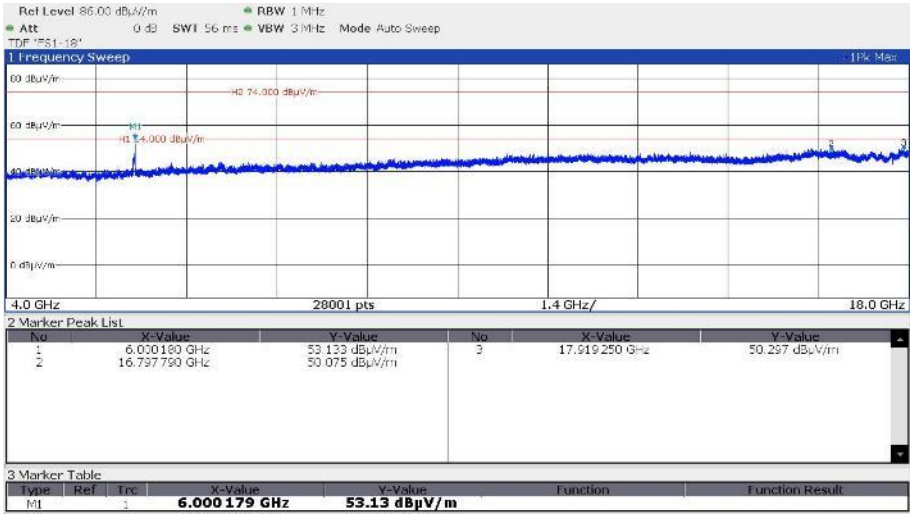


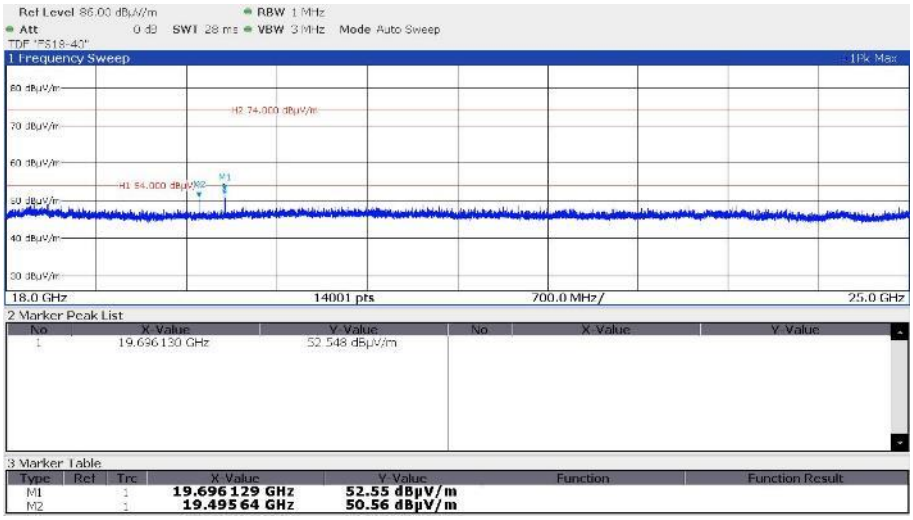




5.5.1.1.6 802.11n, MCS 0, CH11







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

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.

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.

All supplied antennas meet the requirements of part 15.203 and 15.204.

Remarks: None.

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	04/05/2024	04/05/2023		
	minibend KR-16	02-02/50-16-017				
SER 1	FMZB 1516	01-02/24-01-018	15/12/2023	15/12/2022		
	ESCI	02-02/03-05-004	16/09/2023	16/09/2022		
SER 2	ESVS 30	02-02/03-05-006	27/07/2023	27/07/2022		
	VULB 9168	02-02/24-05-005	20/04/2024	20/04/2023	03/07/2023	03/07/2022
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
	KK-SD_7/8-2X21N-33,0M	02-02/50-15-028				
	50F-003 N 3 dB	02-02/50-21-010				
SER 3	FSW43	02-02/11-15-001	04/05/2024	04/05/2023		
	AMF-6D-01002000-22-10P	02-02/17-15-004				
	LNA-40-18004000-33-5P	02-02/17-20-002				
	3117	02-02/24-05-009	23/06/2023	23/06/2022		
	BBHA 9170	02-02/24-05-013	21/03/2026	21/03/2023	21/03/2024	21/03/2023
	WHK 3.0/18G-10EF	02-02/50-05-180				
	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				
	KMS116-GL140SE-KMS116-	02-02/50-20-026				
	BAT-EMC 2022.0.23.0	02-02/68-13-001				