TEST REPORT

CTK Co., Ltd.
(Ho-dong), 113, Yejik-ro, Cheoin-gu,
Yongin-si, Gyeonggi-do, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.: CTK-2024-00179

1. Applicant

◦ Name : Haier US Appliance Solutions, Inc.

◦ Address : Appliance Park AP5-2N-65, Louisville, Kentucky, KY 40225, United States

◦ Date of Receipt : 2024-01-04

2. Manufacturer

◦ Name : Haier US Appliance Solutions, Inc.

◦ Address : Appliance Park AP5-2N-65, Louisville, Kentucky, KY 40225, United States

3. Use of Report : For FCC Conformance / ISED Conformance

4. Test Sample / Model: Wi-Fi/Bluetooth Combo ACM(Appliance Connect Module) / WCATC002

5. Date of Test : 2024-01-09 to 2024-01-16

6. Test Standard(method) used : FCC 47 CFR part 15 subpart C 15.247
ISED RSS-247 & RSS-Gen

7. Testing Environment: Temp.: (22 ± 1) ℃, Humidity: (32 ± 3) % R.H.

8. Test Results : Compliance

9. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

(Address : (Unhak-Dong) 5, Dongbu-ro 221beon-gil, Cheoin-gu, Yong-in-si, Gyeonggi-do, Korea)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This report cannot be reproduced or copied without the written consent of CTK.

Approval	Tested by Ji-Hye, Kim: (Signature)	Technical Manager Won-Jae, Hwang: (Signature)

Remark. This report is not related to KOLAS accreditation and relevant regulation.

2024-01-17

CTK Co., Ltd.

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REPORT REVISION HISTORY

Date	Revision	Page No
2024-01-17	Issued (CTK-2024-00179)	all

CONTENTS

1. General Product Description

1.1 Applicant Information

Company	Haier US Appliance Solutions, Inc.
Contact Point	Appliance Park AP5-2N-65, Louisville, Kentucky, KY 40225, United States
Contact Person	Name : Park, Hansung E-mail : hansung.park@geappliances.com Tel : +82-31-8094-6732 Fax : +82-31-8094-6888

1.2 Product Information

FCC ID	ZKJ-WCATC002
ISED	10229A-WCATC002
Product Description	Wi-Fi/Bluetooth Combo ACM(Appliance Connect Module)
Model name	WCATC002
Variant Model name	-
Operating Frequency	2 412 MHz – 2 462 MHz
RF Output Power	802.11b : 16.37 dBm (43.35 mW) 802.11g : 11.65 dBm (14.62 mW) 802.11n_HT20 : 11.68 dBm (14.72 mW)
Antenna Specification	Antenna type : Chip Antenna Peak Gain : 2.6 dBi
Number of channels	11 (802.11b/g/n_HT20)
Type of Modulation	802.11b : DSSS 802.11g/n : OFDM
Data Rate	802.11b : 11 / 5.5 / 2 / 1 Mbps 802.11g : 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps 802.11n: up to 72.2 Mbps
Power Source	DC 5 V, DC 13.6 V
Hardware Rev	v2.09
Software Rev	V0.3.15.113
RF Power setting in Test SW	802.11b : 90 802.11g : 84 802.11n_HT20 : 84

1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Note Computer	HP	15-bs563TU	CND7253R6N
AC/DC Adapter	HP	HSTNN-CA40	-

1.4 Model Differences

Not applicable

2. Accreditations

2.1 Laboratory Accreditations and Listings

Country	Agency	Registration Number
USA	FCC	805871
CANADA	ISED	CN : 8737A CAB ID : KR0025
KOREA	NRRA	KR0025

2.2 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

3. Test Specifications

3.1 Standards

FCC Part Section(s)	Requirement(s)	Status (Note 1)	Test Condition
15.247(a)	6 dB Bandwidth	C	Conducted
15.247(b)	Maximum Output Power	C	
15.247(d)	Conducted Spurious emission	C	
15.247(d)	Unwanted Emission(Conducted)	C	
15.247(e)	Transmitter Power Spectral Density	C	
15.209	Radiated Emissions	C	Radiated
15.207	AC Conducted Emissions	C	Line Conducted
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable			
Note 2: The data in this test report are traceable to the national or international standards.			
Note 3: The sample was tested according to the following specification: FCC Part 15.247			
Note 4: The tests were performed according to the method of measurements prescribed in KDB No.558074, ANSI C63.10-2013			

ISED Part Section(s)	Requirement(s)	Status (Note 1)	Test Condition
RSS-247 5.2(a)	6 dB Bandwidth	C	Conducted
RSS-247 5.4(d)	Maximum Output Power	C	
RSS-247 5.5	Conducted Spurious emission	C	
RSS-247 5.5	Unwanted Emission(Conducted)	C	
RSS-247 5.2(b)	Transmitter Power Spectral Density	C	
RSS-Gen 6.13	Radiated Emissions	C	Radiated
RSS-Gen 8.8	AC Conducted Emissions	C	Line Conducted
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable			
Note 2: The data in this test report are traceable to the national or international standards.			
Note 3: The sample was tested according to the following specification: RSS-247, RSS-GEN			
Note 4: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013			

3.2 Mode of operation during the test

The EUT is operated in a manner representative of the typical of the equipments.
During at testing, system components were manipulated within the confines of typical usage to maximize each emission. All modulation modes were tests.
The results are only attached worst cases.

Test Frequency

802.11b/g/n_HT20

Lowest channel	Middle channel	Highest channel
2 412 MHz	2 437 MHz	2 462 MHz

Test mode

Test mode	Modulation	Data rate	Duty Cycle	Duty Cycle Factor
802.11b	DSSS	1 Mbps	99.3 %	0.00 dB
802.11g	OFDM	6 Mbps	94.4 %	0.25 dB
802.11n_HT20	OFDM	MCS 0	94.0 %	0.27 dB

3.3 Device Modifications

The following modifications were necessary for compliance:

Not applicable

3.4 Maximum Measurement Uncertainty

The value of the measurement uncertainty for the measurement of each parameter.
Coverage factor k = 2, Confidence levels of 95 %

Description	Uncertainty
Conducted RF Output Power	1.5 dB (C.L.: Approx. 95 %, k = 2)
Power Spectral Density	1.5 dB (C.L.: Approx. 95 %, k = 2)
Occupied Bandwidth	0.1 MHz (C.L.: Approx. 95 %, k = 2)
Unwanted Emission(conducted)	3.0 dB (C.L.: Approx. 95 %, k = 2)
Radiated Emissions (f ≤ 1 GHz)	3.88 dB (C.L.: Approx. 95 %, k = 2)
Radiated Emissions (f > 1 GHz)	4.50 dB (C.L.: Approx. 95 %, k = 2)
Line Conducted Emission	2.08 dB (C.L.: Approx. 95 %, k = 2)

3.5 Test Software

Conducted Test	Ics Pro Ver. 6.0.3
Radiated Test	EP5RE Ver. 6.0.10, ES10 Ver. 2022.04.000
Line Conducted Test	EMC32 Ver. 10.50.00

4. Technical Characteristic Test

4.1 6dB Bandwidth

Test Procedures

KDB 558074 - Section 8.2
ANSI C63.10-2013 - Section 11.8.2
RSS-Gen – Section 6.7

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.

Test Procedures

ANSI C63.10-2013 - Section 6.9
RSS-Gen – Section 6.7

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.
Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

Test Settings :

Center frequency = the highest, middle and the lowest channels

a) RBW = 100 kHz
b) VBW ≥ 3 x RBW
c) Detector = peak
d) Trace mode = Max hold
e) Sweep = auto couple
f) Allow trace to fully stabilize
g) 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.

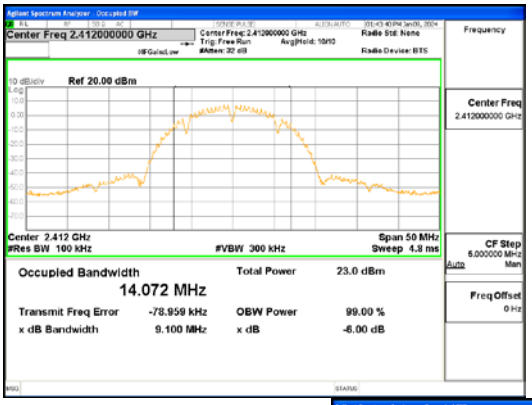
Minimum Standard :

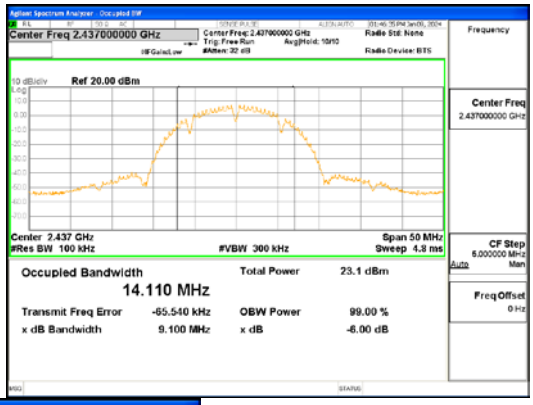
6 dB Bandwidth > 500kHz

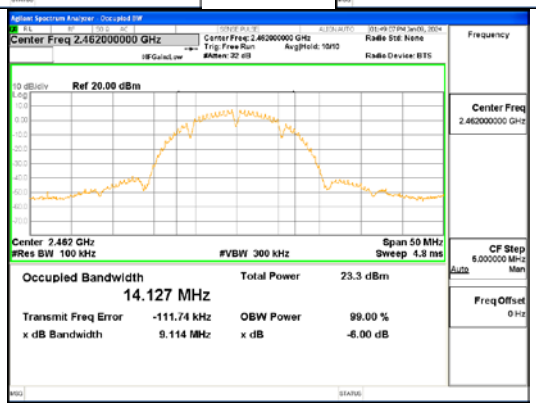
Test Data :

Mode	6 dB Bandwidth and 99 % Bandwidth (MHz)					
	802.11b		802.11g		802.11n_HT20	
Frequency	6 dB	99 %	6 dB	99 %	6 dB	99 %
2 412 MHz	9.10	14.07	16.37	16.49	17.55	17.68
2 437 MHz	9.10	14.11	16.37	16.50	17.36	17.67
2 462 MHz	9.11	14.13	16.39	16.51	17.60	17.69

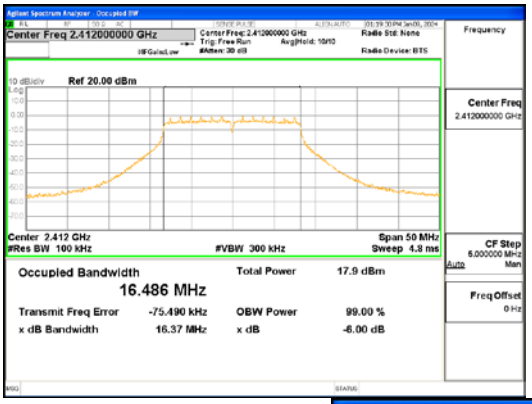
See next pages for actual measured spectrum plots.

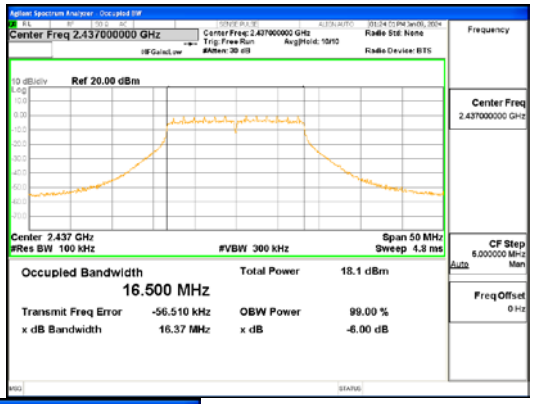


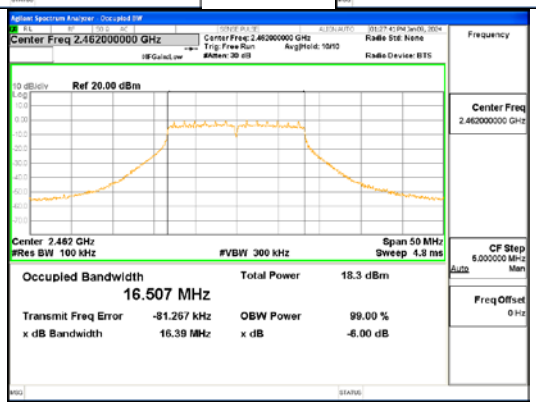




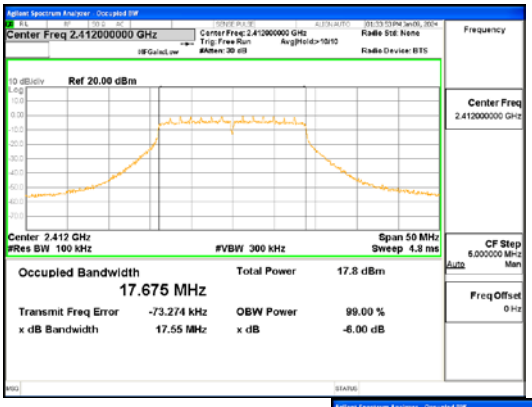
802.11b

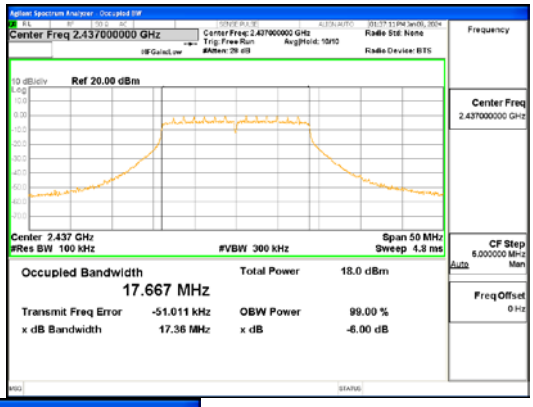


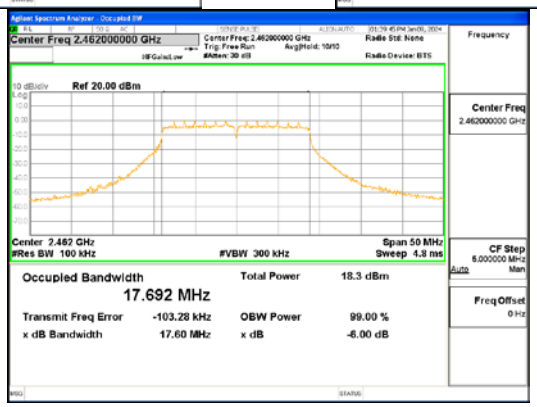




802.11g


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.412000000 GHz
Center Freq: 2.412000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 20.00 dBm
Center Freq
2.412000000 GHz
Center 2.412 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 50 MHz
Sweep 4.8 ms
CF Step
6.000000 MHz
Auto
Man
Occupied Bandwidth
17.675 MHz
Total Power 17.8 dBm
Transmit Freq Error -73.274 kHz
OBW Power 99.00 %
x dB Bandwidth 17.55 MHz
x dB -6.00 dB
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.437000000 GHz
Center Freq: 2.437000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 20.00 dBm
Center Freq
2.437000000 GHz
Center 2.437 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 50 MHz
Sweep 4.8 ms
CF Step
6.000000 MHz
Auto
Man
Occupied Bandwidth
17.667 MHz
Total Power 18.0 dBm
Transmit Freq Error -51.011 kHz
OBW Power 99.00 %
x dB Bandwidth 17.36 MHz
x dB -6.00 dB
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 20.00 dBm
Center Freq
2.462000000 GHz
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 50 MHz
Sweep 4.8 ms
CF Step
6.000000 MHz
Auto
Man
Occupied Bandwidth
17.692 MHz
Total Power 18.3 dBm
Transmit Freq Error -103.28 kHz
OBW Power 99.00 %
x dB Bandwidth 17.60 MHz
x dB -6.00 dB
Freq Offset
0 Hz

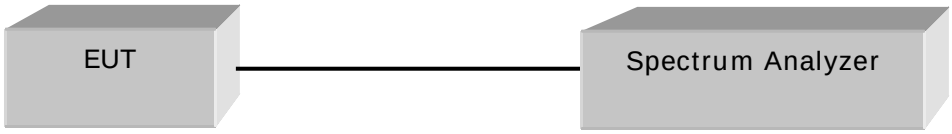
802.11n_HT20

4.2 OUTPUT POWER

Test Procedures

KDB 558074 - Section 8.3.2.2 (Average Power)
ANSI C63.10-2013 - Section 11.9.2.2

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



Test Settings:

Center frequency = the highest, middle and the lowest channels

a) span ≥ 1.5 x OBW
b) RBW = 1 MHz
c) VBW ≥ 3 x RBW
d) Sweep time = auto
e) Detector = RMS
f) average at least 100
g) Duty cycle factor = 10log(1/x)

Test mode	Duty Cycle Factor (dB)
802.11b	0.00
802.11g	0.25
802.11n_HT20	0.27

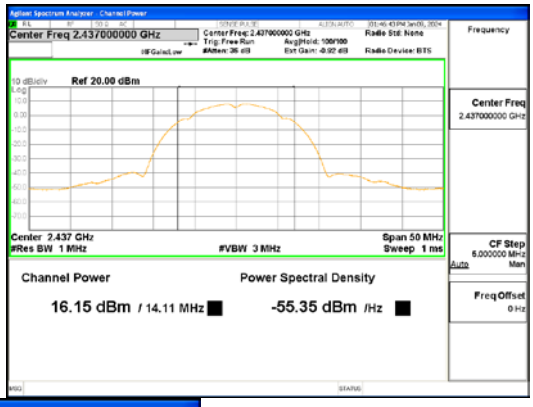
Limit

Operating Mode	Mode	ANT Gain (dBi)	Limit (dBm)
SISO	802.11b/g/n_HT20	2.6	30

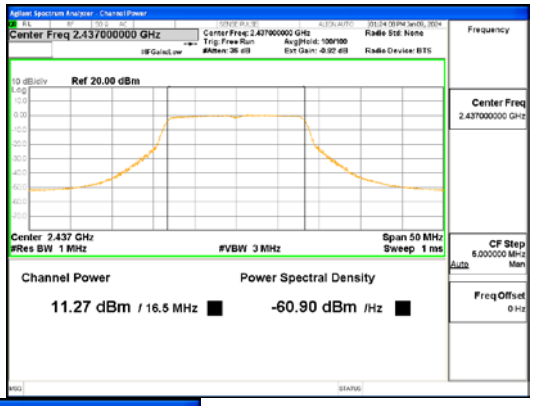
Test Data :

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	Duty cycle Factor (dB)	Result Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11b	2 412	16.20	0.00	16.20	30.00	13.80
	2 437	16.15	0.00	16.15	30.00	13.85
	2 462	16.37	0.00	16.37	30.00	13.63
802.11g	2 412	11.01	0.25	11.26	30.00	18.74
	2 437	11.27	0.25	11.52	30.00	18.48
	2 462	11.40	0.25	11.65	30.00	18.35
802.11n _HT20	2 412	11.02	0.27	11.29	30.00	18.71
	2 437	11.13	0.27	11.40	30.00	18.60
	2 462	11.41	0.27	11.68	30.00	18.32

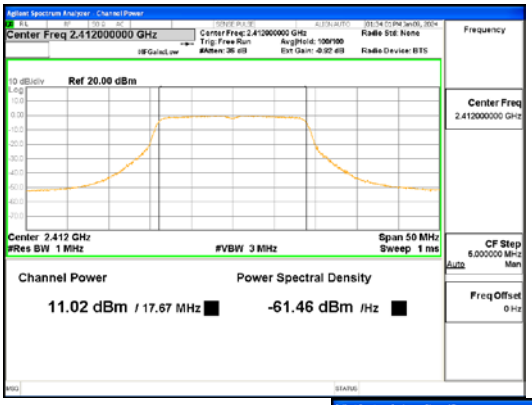
See next pages for actual measured spectrum plots.

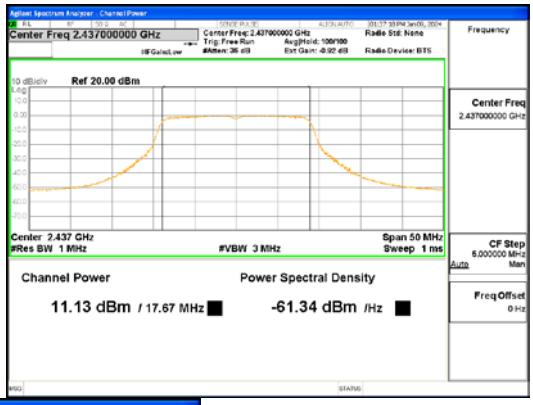


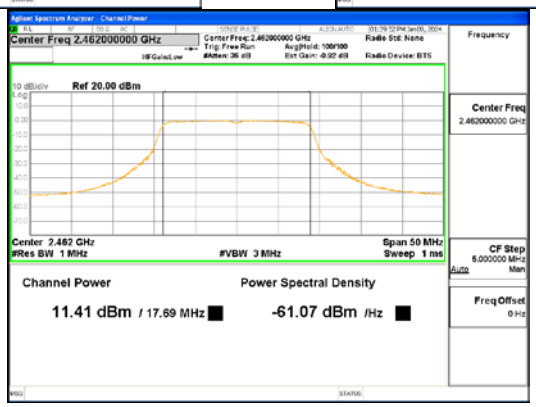
802.11b



802.11g


Center Freq 2.412000000 GHz
Ref 20.00 dBm
Center 2.412 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 50 MHz
Sweep 1 ms
Channel Power
11.02 dBm / 17.67 MHz
Power Spectral Density
-61.46 dBm /Hz


Center Freq 2.437000000 GHz
Ref 20.00 dBm
Center 2.437 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 50 MHz
Sweep 1 ms
Channel Power
11.13 dBm / 17.67 MHz
Power Spectral Density
-61.34 dBm /Hz


Center Freq 2.462000000 GHz
Ref 20.00 dBm
Center 2.462 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 50 MHz
Sweep 1 ms
Channel Power
11.41 dBm / 17.69 MHz
Power Spectral Density
-61.07 dBm /Hz

802.11n_HT20

4.3 Transmitter Power Spectral Density

Test Procedures

KDB 558074 - Section 8.4
ANSI C63.10-2013 - Section 11.10.2

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance.

Test Settings:

Center frequency = the highest, middle and the lowest channels

a) RBW : 3 kHz ≤ RBW ≤ 100 kHz
b) VBW ≥ 3 x RBW
c) span ≥ 1.5 x DTS bandwidth
d) Sweep time = auto couple
e) Detector = peak
f) Trace mode= max hold
g) Allow trace to fully stabilize
h) Use the peak marker function to determine the maximum amplitude level within the RBW.

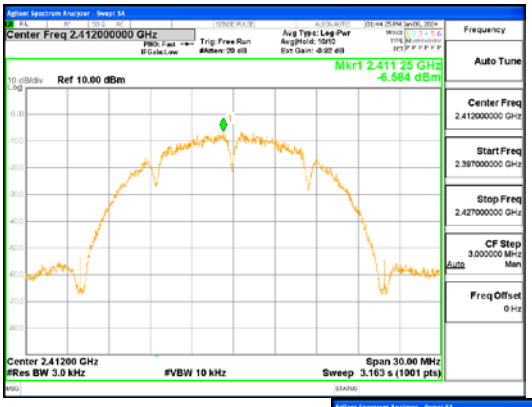
Limit

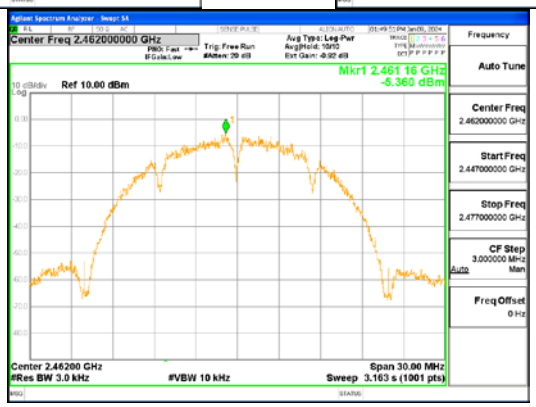
Operating Mode	Mode	ANT Gain (dBi)	Limit (dBm)
SISO	802.11b/g/n_HT20	2.6	8

Test Data

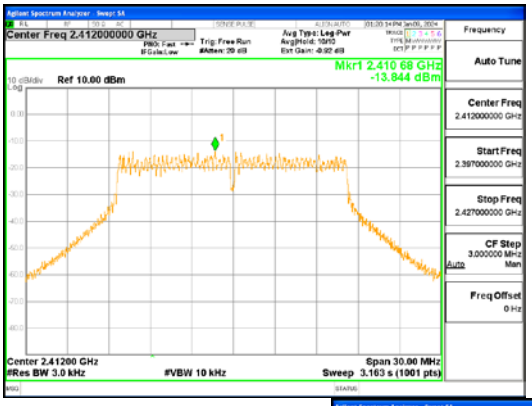
Test Mode	Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Margin(dB)
802.11b	2 412	-6.58	8.00	14.58
	2 437	-5.60	8.00	13.60
	2 462	-5.36	8.00	13.36
802.11g	2 412	-13.84	8.00	21.84
	2 437	-12.98	8.00	20.98
	2 462	-13.14	8.00	21.14
802.11n_HT20	2 412	-14.44	8.00	22.44
	2 437	-13.82	8.00	21.82
	2 462	-13.45	8.00	21.45

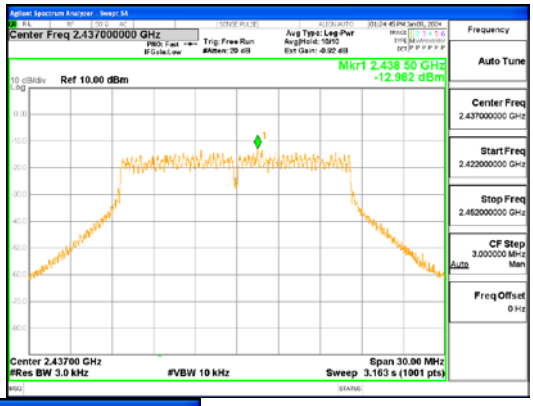
See next pages for actual measured spectrum plots.

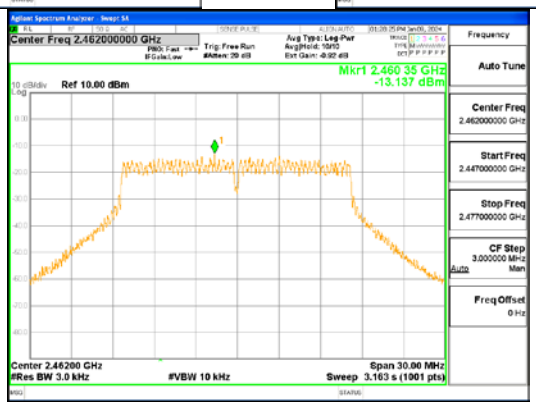




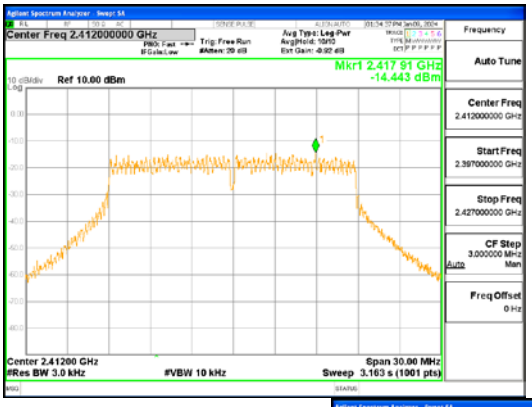
802.11b

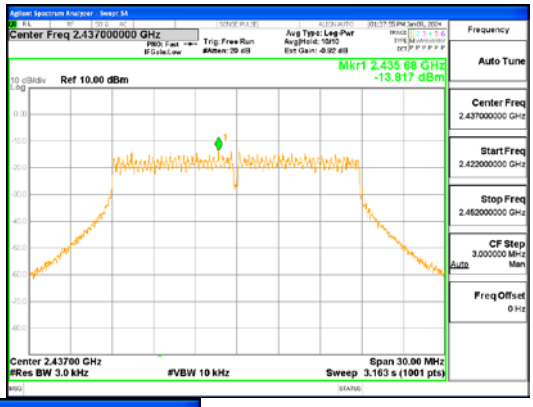


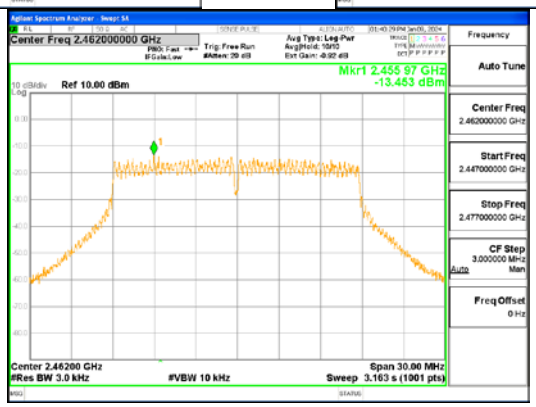




802.11g


Center Freq 2.412000000 GHz
Mkr1 2.417 91 GHz
-14.443 dBm
Ref 10.00 dBm
Center 2.41200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 30.00 MHz
Sweep 3.163 s (1001 pts)


Center Freq 2.437000000 GHz
Mkr1 2.435 68 GHz
-13.817 dBm
Ref 10.00 dBm
Center 2.43700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 30.00 MHz
Sweep 3.163 s (1001 pts)


Center Freq 2.462000000 GHz
Mkr1 2.455 97 GHz
-13.453 dBm
Ref 10.00 dBm
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 30.00 MHz
Sweep 3.163 s (1001 pts)

802.11n_HT20

4.4 Conducted Spurious emission

Test Procedures

KDB 558074 - Section 8.5
ANSI C63.10-2013 - Section 11.11.3
RSS-Gen - Section 6.13

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.
After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

Test Settings:

Center frequency = the highest, middle and the lowest channels

a) RBW = 100 kHz
b) VBW ≥ 3 x RBW
c) Detector = peak
d) Sweep time = auto couple
e) Trace mode= max hold
f) Allow trace to fully stabilize
g) Use the peak marker function to determine the maximum amplitude level.

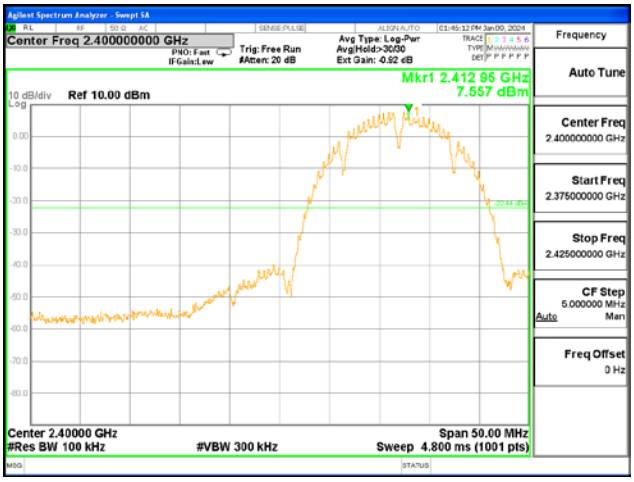
Limit :

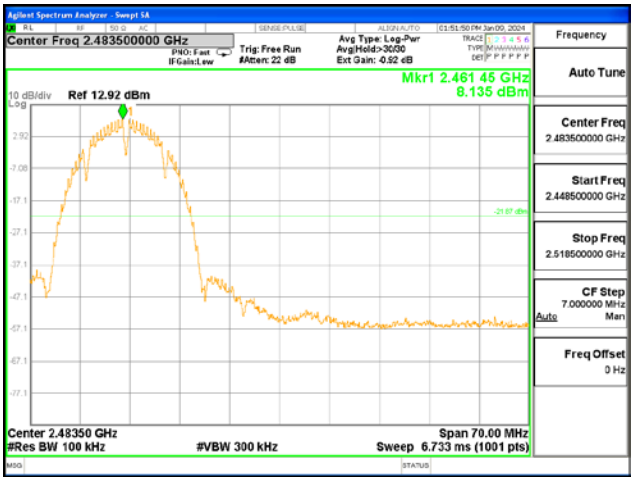
Emission level < 30 dBc

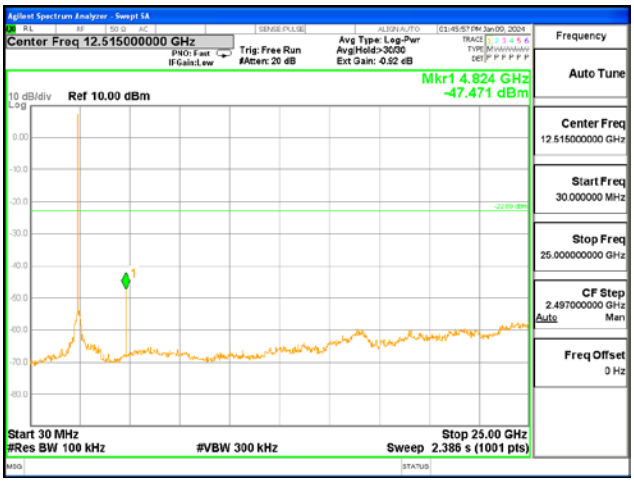
Test Data: Complies

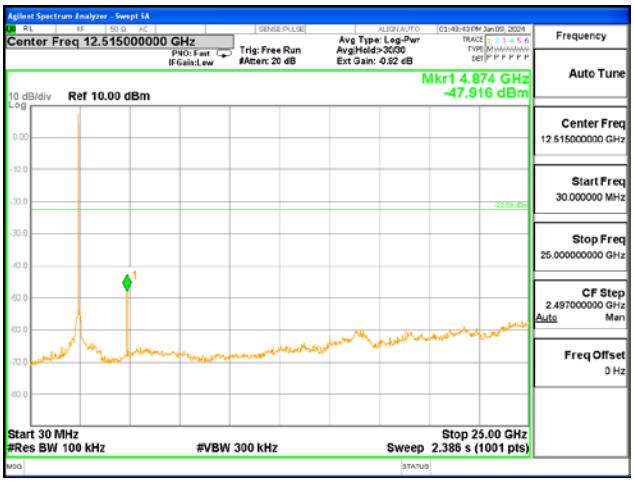
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 30dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

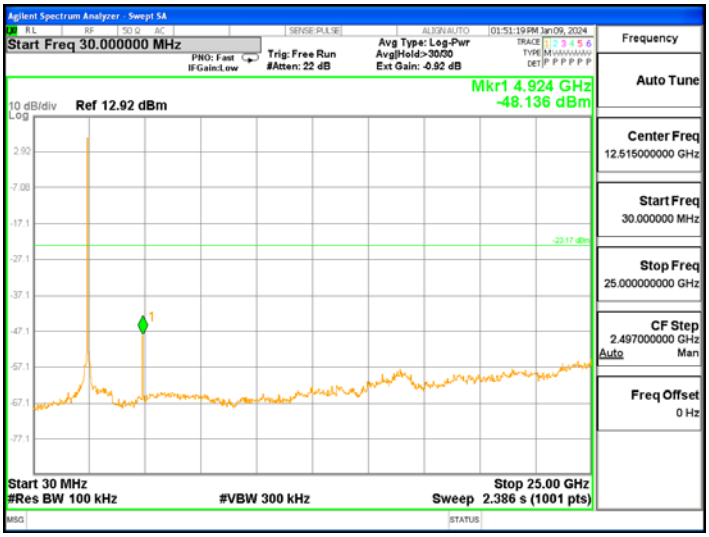
See next pages for actual measured spectrum plots.


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.400000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 2.412 95 GHz
7.557 dBm
10 dB/div
Ref 10.00 dBm
Log
Center 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 50.00 MHz
Sweep 4.800 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.375000000 GHz
Stop Freq
2.425000000 GHz
CF Step
5.000000 MHz
Auto
Man
Freq Offset
0 Hz

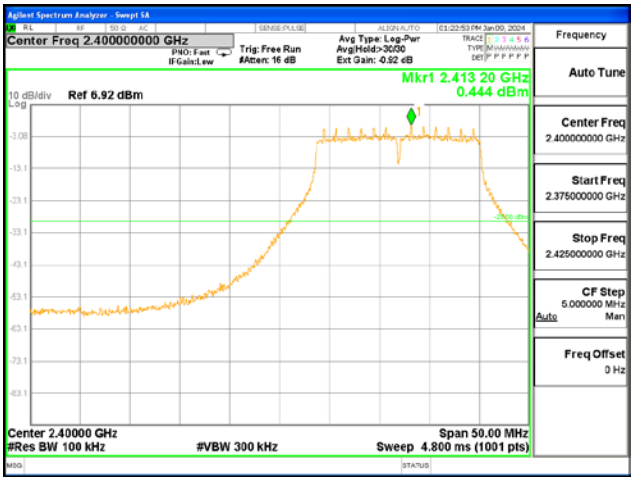

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.483500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 22 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 2.461 45 GHz
8.135 dBm
10 dB/div
Ref 12.92 dBm
Log
Center 2.48350 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 70.00 MHz
Sweep 6.733 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.448500000 GHz
Stop Freq
2.518500000 GHz
CF Step
7.000000 MHz
Auto
Man
Freq Offset
0 Hz

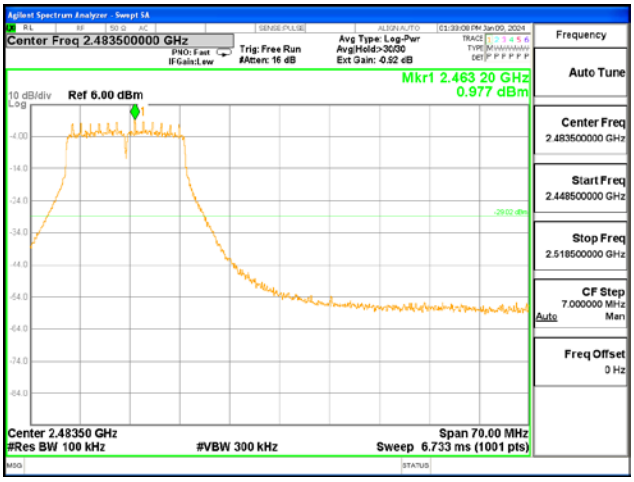

Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 4.824 GHz
-47.471 dBm
10 dB/div
Ref 10.00 dBm
Log
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

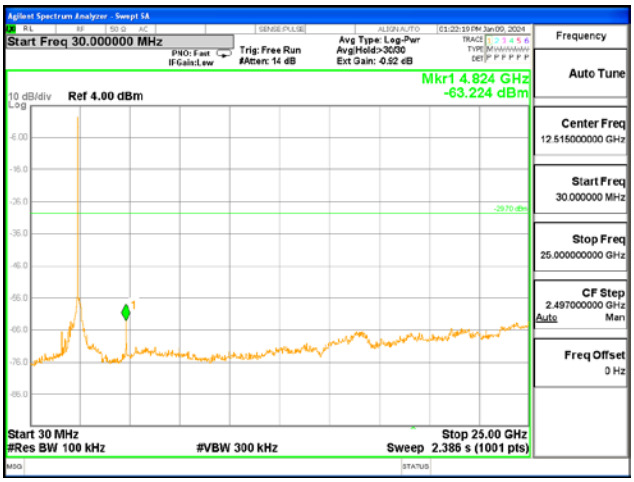

Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 4.874 GHz
-47.916 dBm
10 dB/div
Ref 10.00 dBm
Log
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

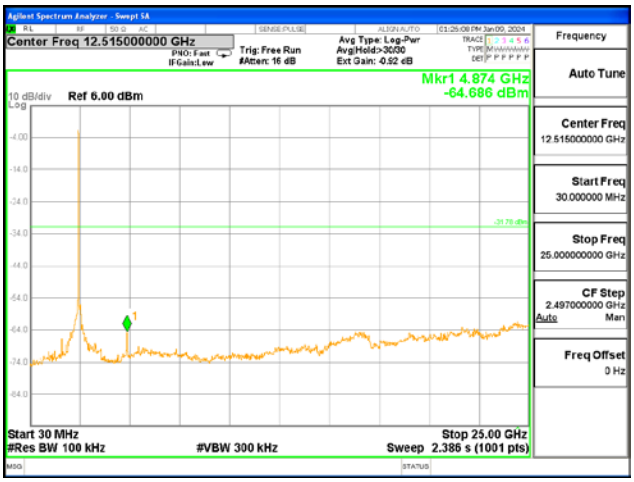

Agilent Spectrum Analyzer - Swept SA
Start Freq 30.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 22 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.92 dB
Mkr1 4.924 GHz
-48.136 dBm
10 dB/div
Ref 12.92 dBm
Log
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

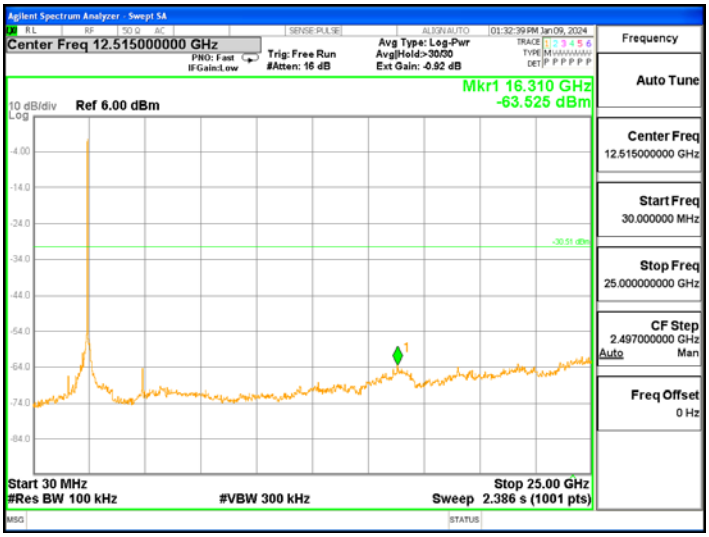
802.11b


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.400000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 2.413 20 GHz
0.444 dBm
10 dB/div
Ref 6.92 dBm
Center 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 50.00 MHz
Sweep 4.800 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.375000000 GHz
Stop Freq
2.425000000 GHz
CF Step
5.000000 MHz
Auto
Man
Freq Offset
0 Hz

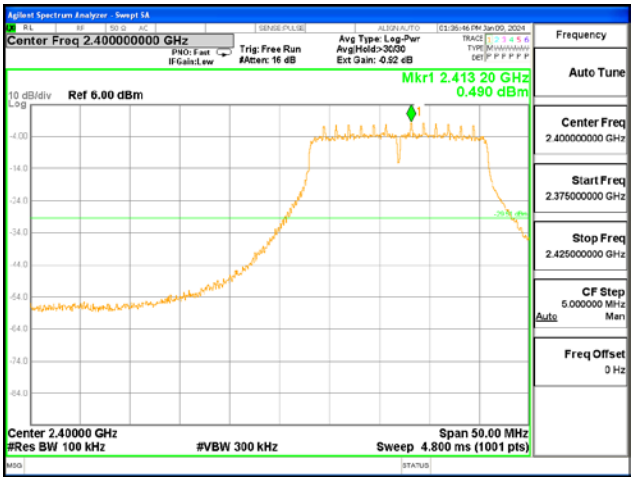

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.483500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 2.463 20 GHz
0.977 dBm
10 dB/div
Ref 6.00 dBm
Center 2.48350 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 70.00 MHz
Sweep 6.733 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.448500000 GHz
Stop Freq
2.518500000 GHz
CF Step
7.000000 MHz
Auto
Man
Freq Offset
0 Hz

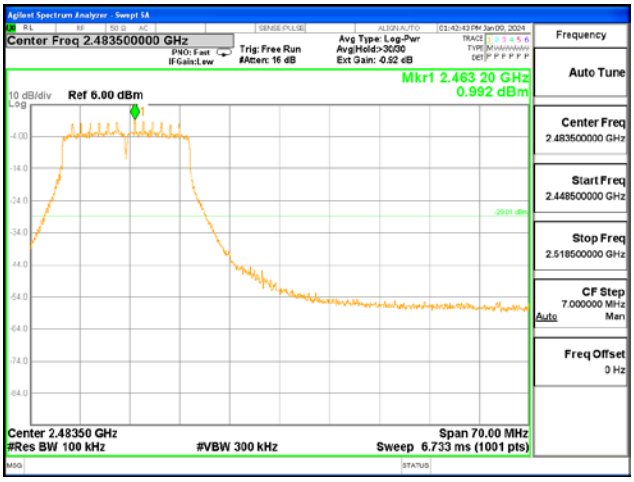

Agilent Spectrum Analyzer - Swept SA
Start Freq 30.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 14 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 4.824 GHz
-63.224 dBm
10 dB/div
Ref 4.00 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

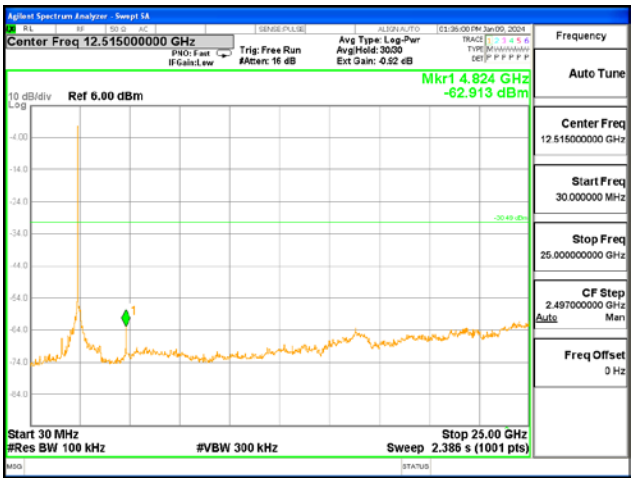

Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 4.874 GHz
-64.686 dBm
10 dB/div
Ref 6.00 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

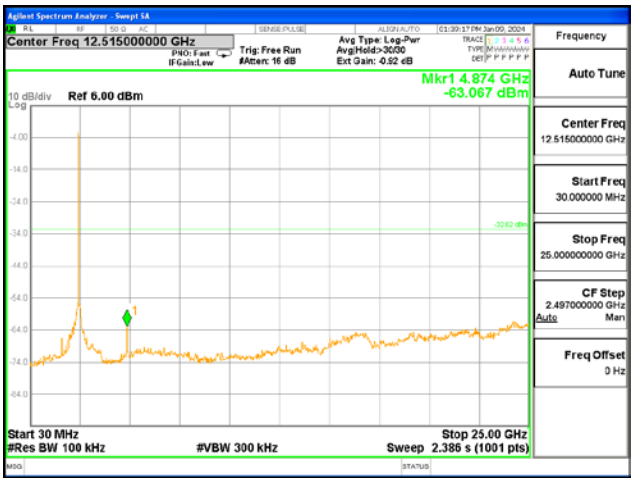

Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 16.310 GHz
-63.525 dBm
10 dB/div
Ref 6.00 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

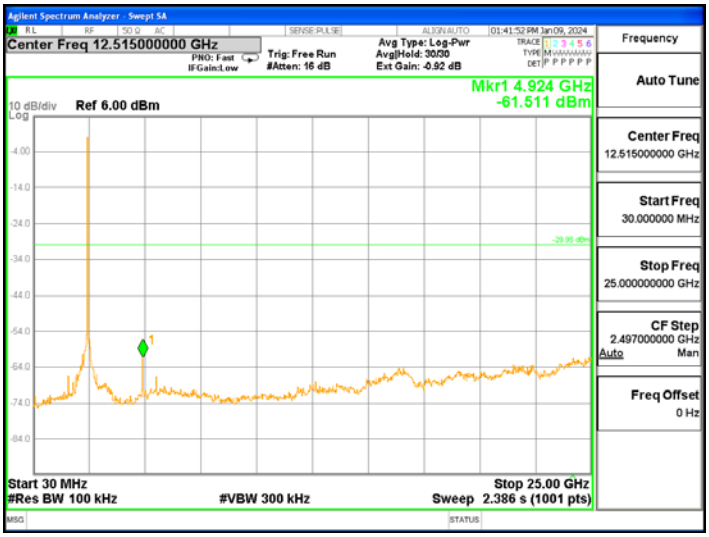
802.11g


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.400000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 2.413 20 GHz
0.490 dBm
10 dB/div
Ref 6.00 dBm
Center 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 50.00 MHz
Sweep 4.800 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.375000000 GHz
Stop Freq
2.425000000 GHz
CF Step
5.000000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.483500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold:>30/30
Ext Gain: -0.52 dB
Mkr1 2.463 20 GHz
0.992 dBm
10 dB/div
Ref 6.00 dBm
Center 2.48350 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 70.00 MHz
Sweep 6.733 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.448500000 GHz
Stop Freq
2.518500000 GHz
CF Step
7.000000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold: 30/30
Ext Gain: -0.52 dB
Mkr1 4.824 GHz
-62.913 dBm
10 dB/div
Ref 6.00 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold: 30/30
Ext Gain: -0.52 dB
Mkr1 4.874 GHz
-63.067 dBm
10 dB/div
Ref 6.00 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 16 dB
Avg Type: Log-Pwr
Avg|Hold: 30/30
Ext Gain: -0.52 dB
Mkr1 4.924 GHz
-61.511 dBm
10 dB/div
Ref 6.00 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

802.11n_HT20

4.5 Radiated Emission

Test Location

☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)
☒ 3 m SAC (test distance : 3 m)

Test Procedures

KDB 558074 - Section 8.5, 8.6
ANSI C63.10-2013 - Section 11.11, 11.12
RSS-Gen - Section 6.13

1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
2) In the frequency rage above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

Test Settings:

Frequency Range = 9 kHz ~ 1 GHz

a) RBW = 100 kHz for f < 1 GHz, 9 kHz for f < 30 MHz

b) VBW ≥ RBW

c) Detector = CISPR Quasi-peak

d) Sweep time = auto couple

- Peak

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10^{th} harmonic)

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

c) Detector = Peak

d) Sweep time = auto

e) Trace mode = max hold

- Average (duty cycle ≥ 98%)

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10^{th} harmonic)

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

c) Detector = RMS

d) Sweep time = auto

e) Averaging type = power (i.e., RMS)

f) Trace mode = average (at least 100 traces)

- Average (duty cycle < 98%, duty cycle variations are less than ±2%)

Frequency Range = 1 GHz ~ 25 GHz (2.4 GHz 10th harmonic)

a) RBW = 1 MHz

b) VBW ≥ 3 x RBW

c) Detector = RMS

d) Sweep time = auto

e) Averaging type = power (i.e., RMS)

f) Trace mode = average (at least 100 traces)

A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 % duty cycle.
If power averaging (RMS) mode, then the applicable correction factor is 10 log(1/x), where x is the duty cycle.

Test mode	Duty Cycle Factor
802.11b	0.00 dB
802.11g	0.25 dB
802.11n_HT20	0.27 dB

Limit :

FCC Part 15 § 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	MHz	GHz
0.09-0.11	8.37626-8.38675	73-74.6	399.9-410	2690-2900	10.6-12.7
[1]0.495-0.505	8.41425-8.41475	74.8-75.2	608-614	3260-3267	13.25-13.4
2.1735-2.1905	12.29-12.293	108-121.94	960-1240	3332-3339	14.47-14.5
4.125-4.128	12.51975-12.52025	123-138	1300-1427	3345.8-3358	15.35-16.2
4.17725-4.17775	12.57675-12.57725	149.9-150.05	1435-1626.5	3600-4400	17.7-21.4
4.20725-4.20775	13.36-13.41	156.52475-156.52525	1645.5-1646.5	4500-5150	22.01-23.12
6.215-6.218	16.42-16.423	156.7-156.9	1660-1710	5350-5460	23.6-24
6.26775-6.26825	16.69475-16.69525	162.0125-167.17	1718.8-1722.2	7250-7750	31.2-31.8
6.31175-6.31225	16.80425-16.80475	167.72-173.2	2200-2300	8025-8500	36.43-36.5
8.291-8.294	25.5-25.67	240-285	2310-2390	9000-9200	[2]Above 38.6
8.362-8.366	37.5-38.25	322-335.4	2483.5-2500	9300-9500	

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

FCC Part 15 § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m	Deasurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	-	30
30-88	100**	40	3
88-216	150**	43.5	3
216-960	200**	46	3
Above 960	500	54	3

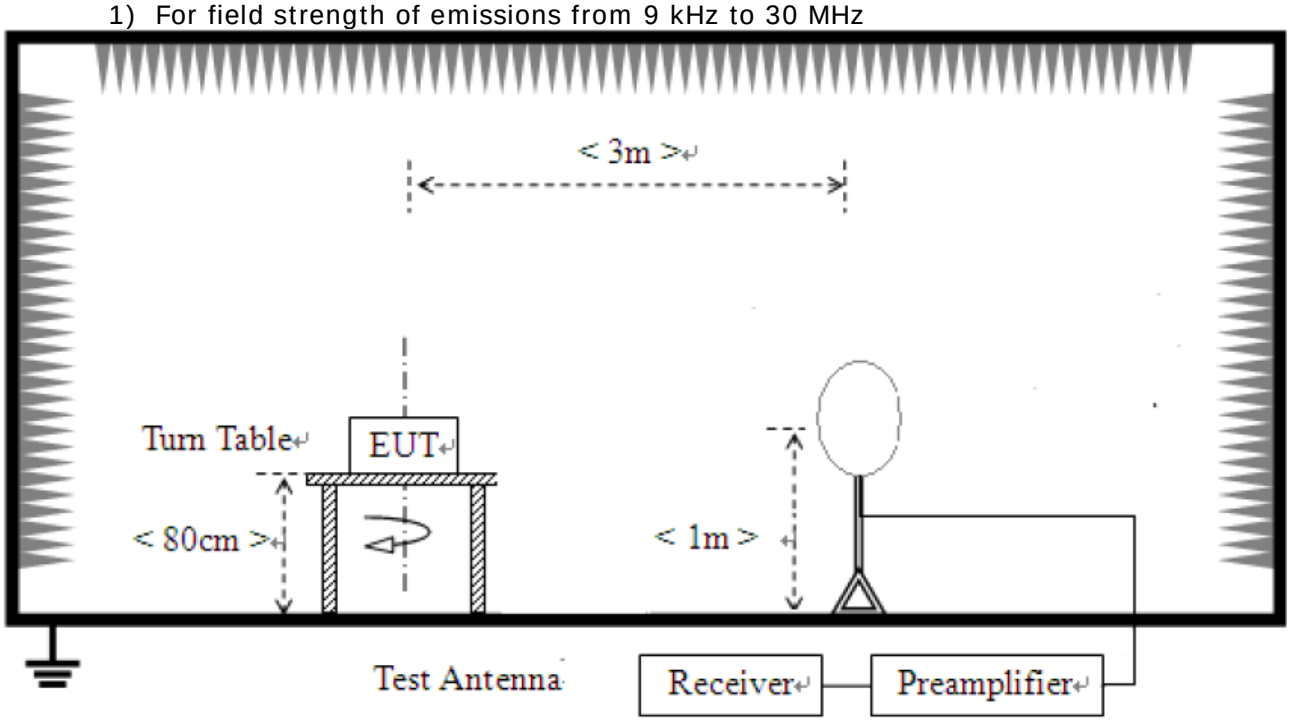
** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :

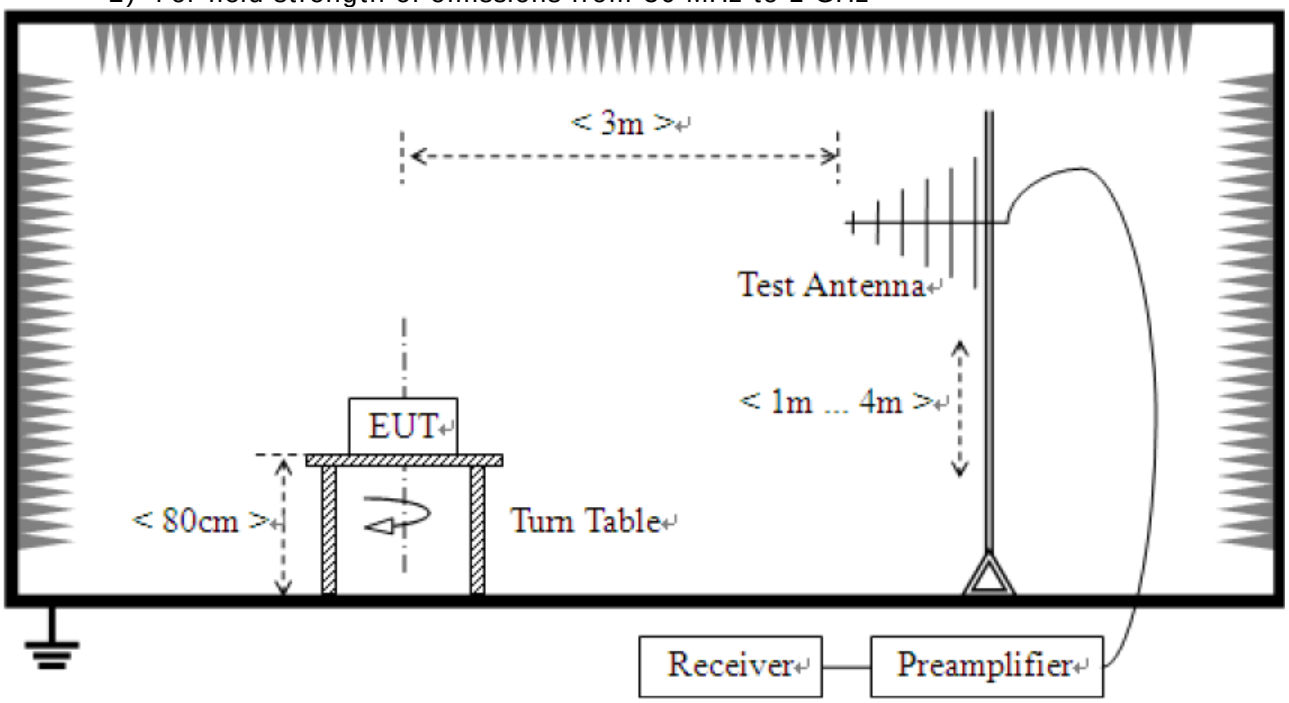
1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

Test Setup:

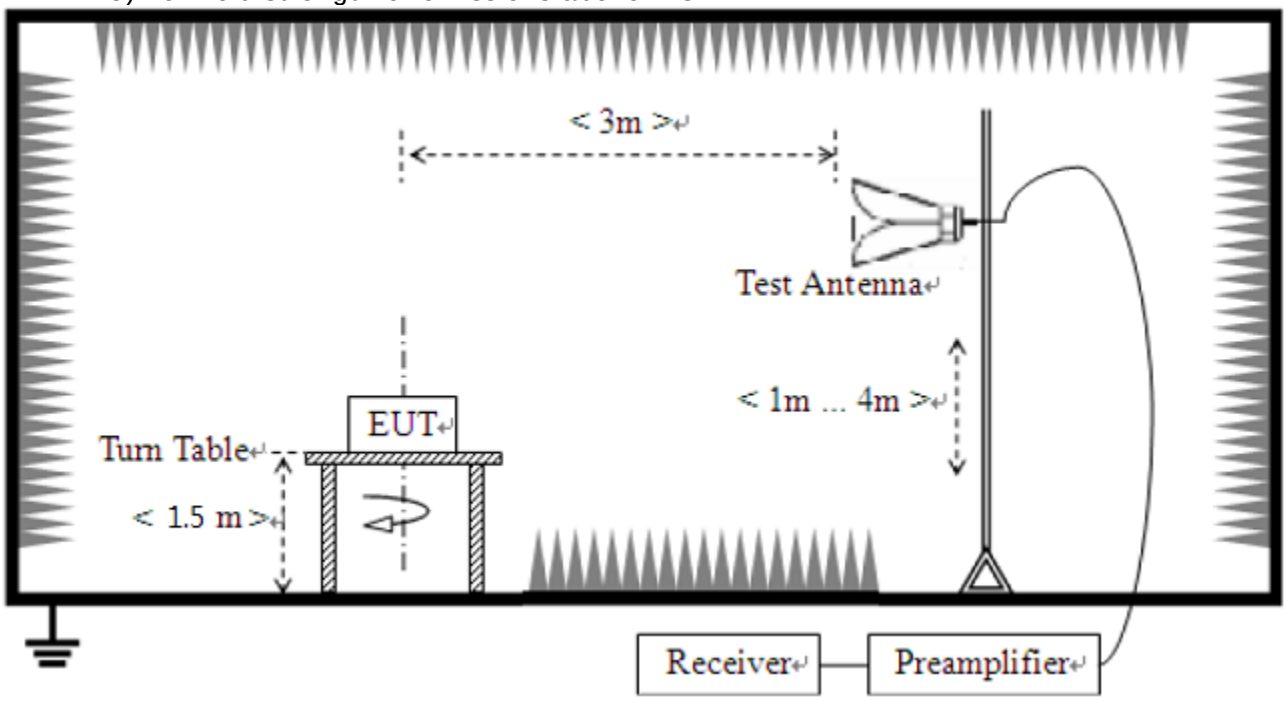
1) For field strength of emissions from 9 kHz to 30 MHz



2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz



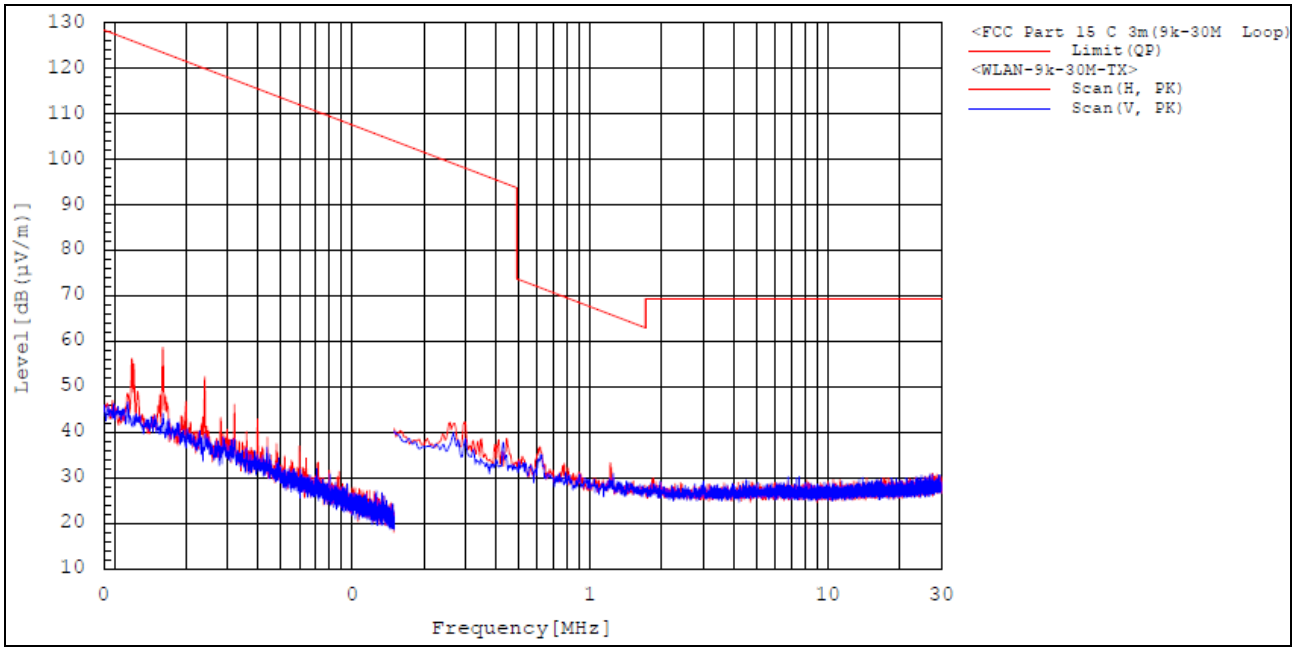
Test results

1) 9 kHz to 30 MHz

Test mode : Transmitter (Worst Case)

The requirements are:
☒ Complies

Test Data



Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]
The emissions 9 kHz to 30 MHz were 20 dB lower than the limit.						

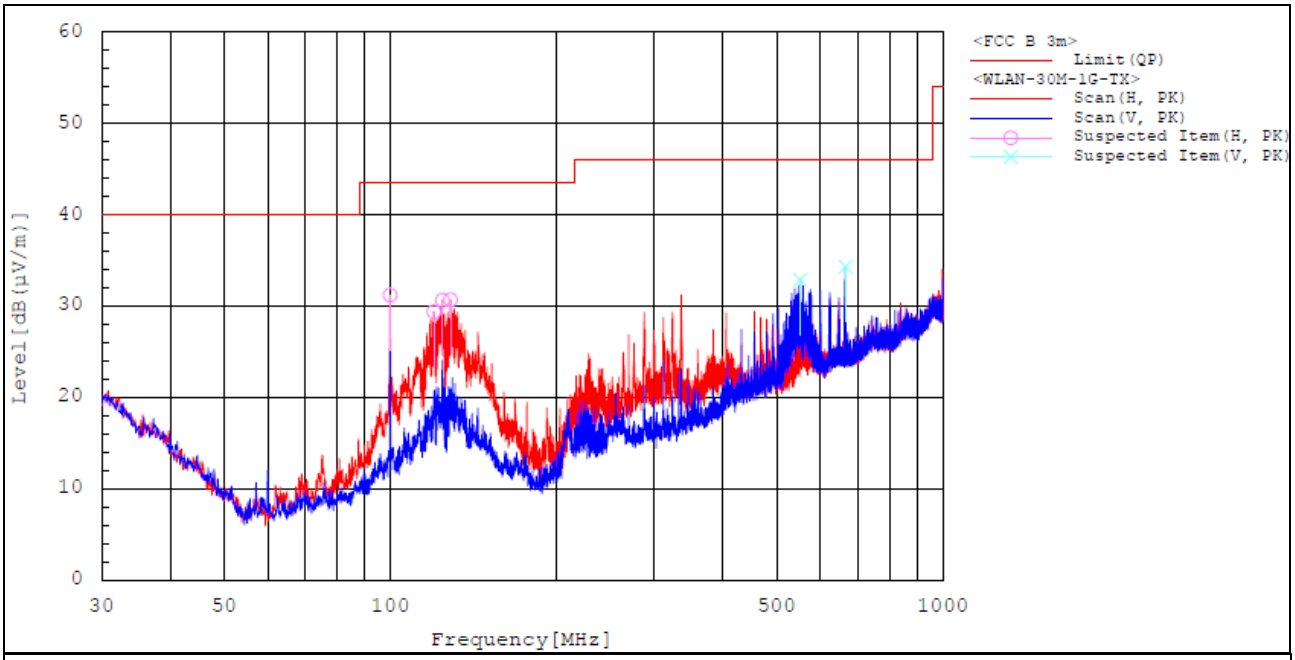
Remark :
1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(Y axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator
4. This data is the Peak(PK) value

2) 30 MHz to 1 GHz

Test mode : Transmitter (Worst Case)

The requirements are:
☒ Complies

Test Data



Spectrum Selection

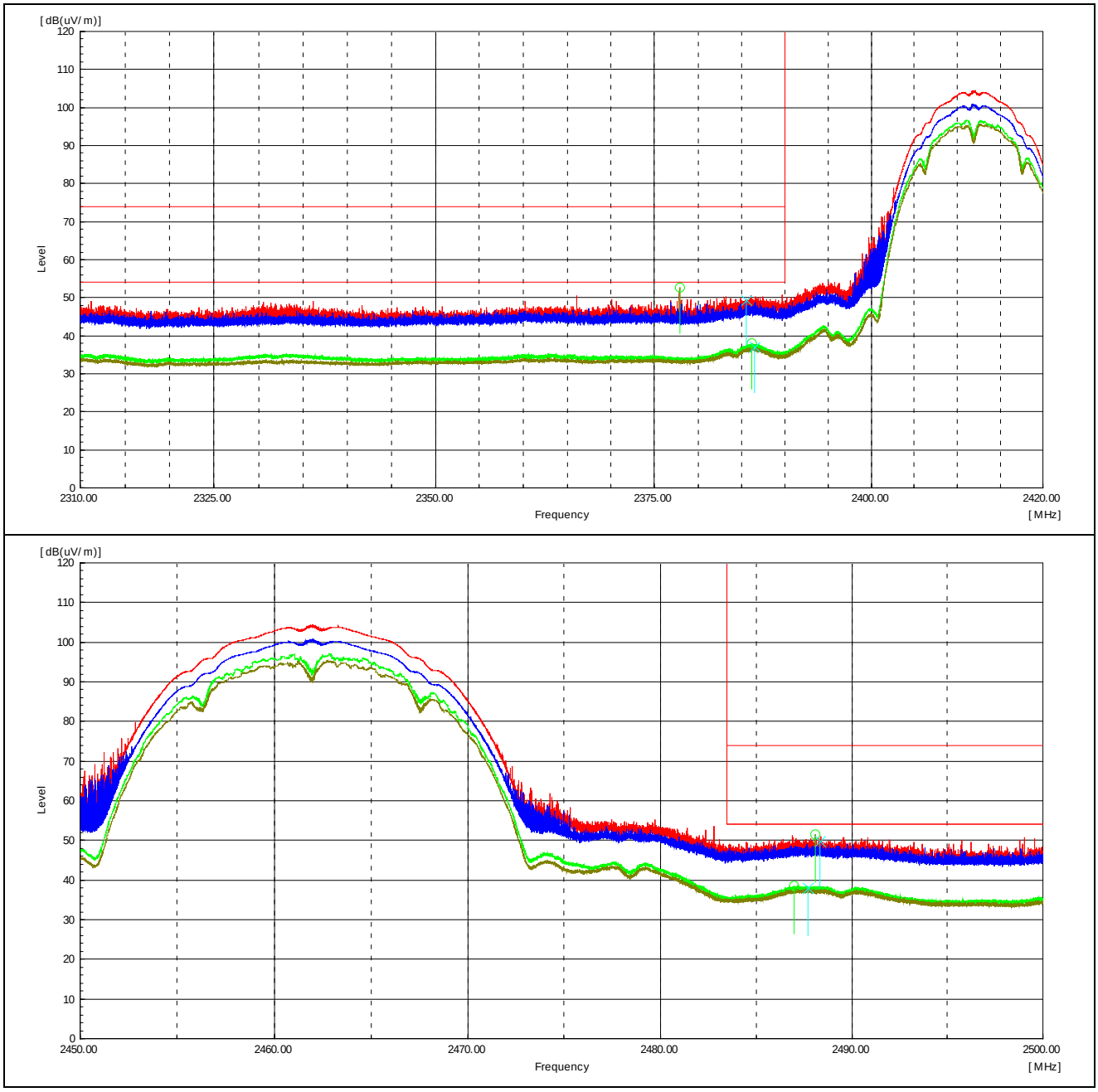
No.	Frequency [MHz]	Pol	Reading PK [dB(µV)]	c.f [dB(1/m)]	Result PK [dB(µV/m)]	Limit QP [dB(µV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
1	99.840	H	46.2	-15.0	31.2	43.5	12.3	300.2	359.7
2	119.822	H	42.6	-13.2	29.4	43.5	14.1	200.0	357.5
3	124.187	H	43.7	-13.1	30.6	43.5	12.9	200.0	357.5
4	128.455	H	43.7	-13.0	30.7	43.5	12.8	300.2	348.5
5	552.054	V	35.7	-2.8	32.9	46.0	13.1	99.9	199.7
6	666.514	V	35.5	-1.2	34.3	46.0	11.7	99.9	357.9

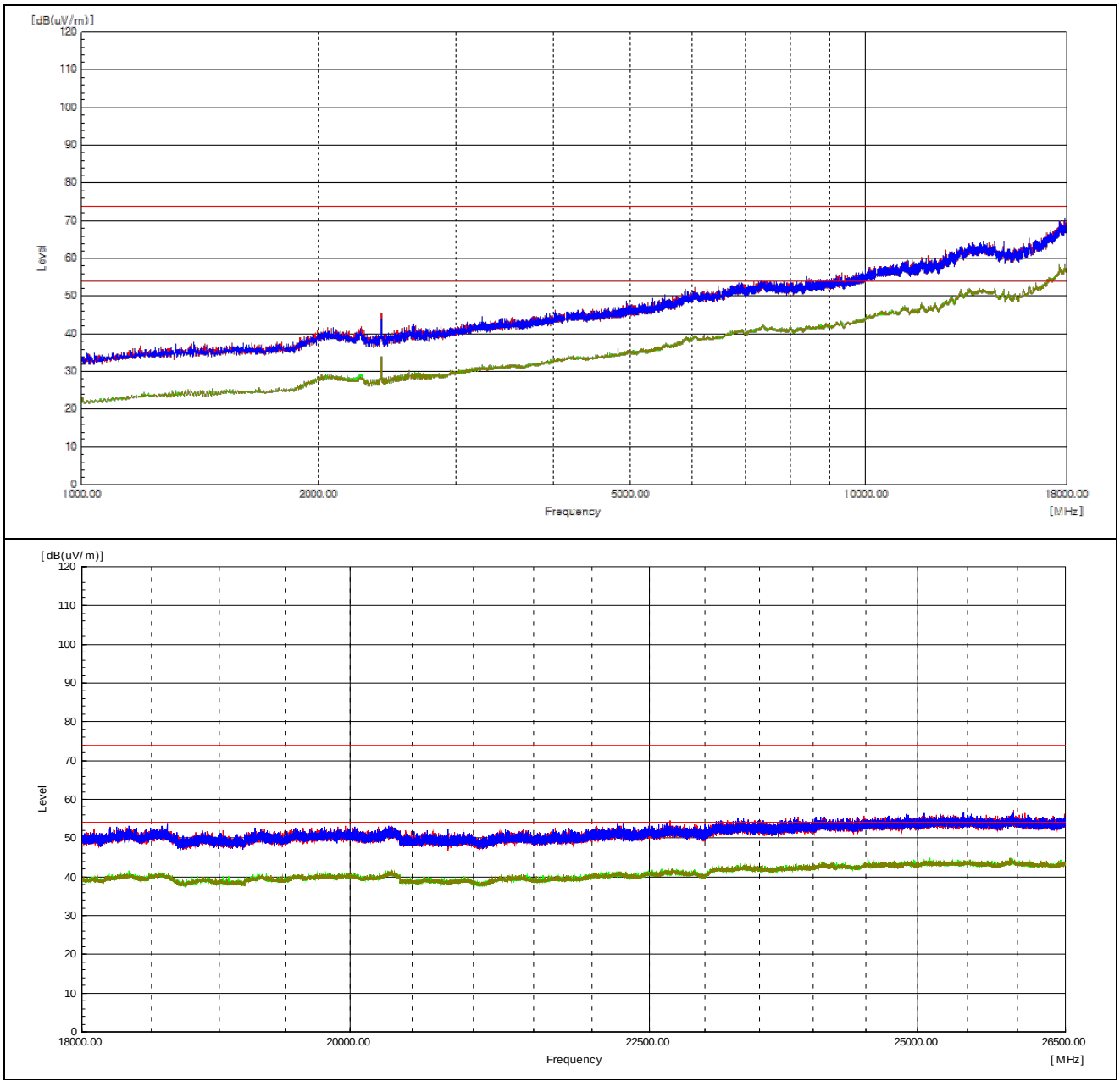
Remark :
1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(Y axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain
4. This data is the Peak(PK) value

3) above 1 GHz

The requirements are:
☒ Complies

Test Data




[dB(uV/m)]
120
110
100
90
80
70
60
50
40
30
20
10
0
Level
1000.00
2000.00
5000.00
10000.00
18000.00
Frequency
[MHz]
[dB(uV/m)]
120
110
100
90
80
70
60
50
40
30
20
10
0
Level
18000.00
20000.00
22500.00
25000.00
26500.00
Frequency
[MHz]

Test mode : Transmitter, 802.11b

Lowest channel (2 412 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
2 377.87	H	58.6	-5.9	-----	52.7	-----	74.0	-----	21.3	-----	Peak
2 386.15	H	43.9	-5.8	0.0	-----	38.1	-----	54.0	-----	15.9	Average
2 385.51	V	55.1	-5.8	-----	49.3	-----	74.0	-----	24.7	-----	Peak
2 386.48	V	42.8	-5.8	0.0	-----	37.0	-----	54.0	-----	17.0	Average
4 824.19	H	45.7	2.3	-----	48.0	-----	74.0	-----	26.0	-----	Peak
4 823.87	H	33.5	2.3	0.0	-----	35.8	-----	54.0	-----	18.2	Average
4 824.10	V	45.6	2.3	-----	47.9	-----	74.0	-----	26.1	-----	Peak
4 823.77	V	34.7	2.3	0.0	-----	37.0	-----	54.0	-----	17.0	Average

Middle channel (2 437 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
4 873.94	H	45.7	2.4	-----	48.1	-----	74.0	-----	25.9	-----	Peak
4 873.77	H	34.2	2.4	0.0	-----	36.6	-----	54.0	-----	17.4	Average
4 873.76	V	47.0	2.4	-----	49.4	-----	74.0	-----	24.6	-----	Peak
4 873.67	V	33.8	2.4	0.0	-----	36.2	-----	54.0	-----	17.8	Average

Highest channel (2 462 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
2 488.08	H	56.7	-5.2	-----	51.5	-----	74.0	-----	22.5	-----	Peak
2 487.00	H	43.8	-5.2	0.0	-----	38.6	-----	54.0	-----	15.4	Average
2 488.31	V	55.0	-5.2	-----	49.8	-----	74.0	-----	24.2	-----	Peak
2 487.71	V	43.1	-5.2	0.0	-----	37.9	-----	54.0	-----	16.1	Average
4 924.06	H	45.9	2.6	-----	48.5	-----	74.0	-----	25.5	-----	Peak
4 923.81	H	34.8	2.6	0.0	-----	37.4	-----	54.0	-----	16.6	Average
4 924.45	V	45.3	2.6	-----	47.9	-----	74.0	-----	26.1	-----	Peak
4 923.84	V	33.1	2.6	0.0	-----	35.7	-----	54.0	-----	18.3	Average

Remarks

1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(Y axis) and the worst case was recorded.
2. Peak Result = Reading + c.f(Correction factor)
   Average Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : Transmitter, 802.11g

Lowest channel (2 412 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
The emissions above 1 GHz were 20 dB lower than the limit.											

Middle channel (2 437 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
The emissions above 1 GHz were 20 dB lower than the limit.											

Highest channel (2 462 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
The emissions above 1 GHz were 20 dB lower than the limit.											

Remarks

1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(Y axis) and the worst case was recorded.
2. Peak Result = Reading + c.f(Correction factor)
   Average Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

Test mode : Transmitter, 802.11n_HT20

Lowest channel (2 412 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
The emissions above 1 GHz were 20 dB lower than the limit.											

Middle channel (2 437 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
The emissions above 1 GHz were 20 dB lower than the limit.											

Highest channel (2 462 MHz)

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor [dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
The emissions above 1 GHz were 20 dB lower than the limit.											

Remarks

1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(Y axis) and the worst case was recorded.
2. Peak Result = Reading + c.f(Correction factor)
   Average Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss - Amp Gain

4.6 AC Conducted Emissions

Frequency Range of Measurement
150 kHz to 30 MHz

Instrument Settings
IF Band Width: 9 kHz

Test Procedures

ANSI C63.10-2013 - Section 6.2
RSS-Gen - Section 8.8

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.
Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit
- **15.207(a)**

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average**
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* The level decreases linearly with the logarithm of the frequency.
** A linear average detector is required.

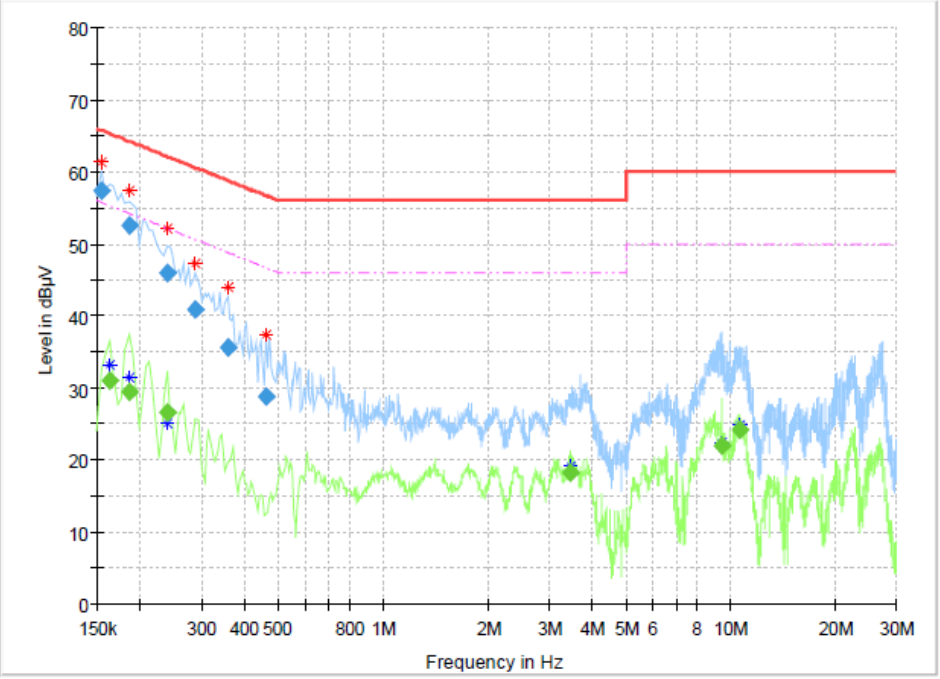
Test Results

The requirements are:
☒ Complies

Test Data

[LINE]

Full Spectrum

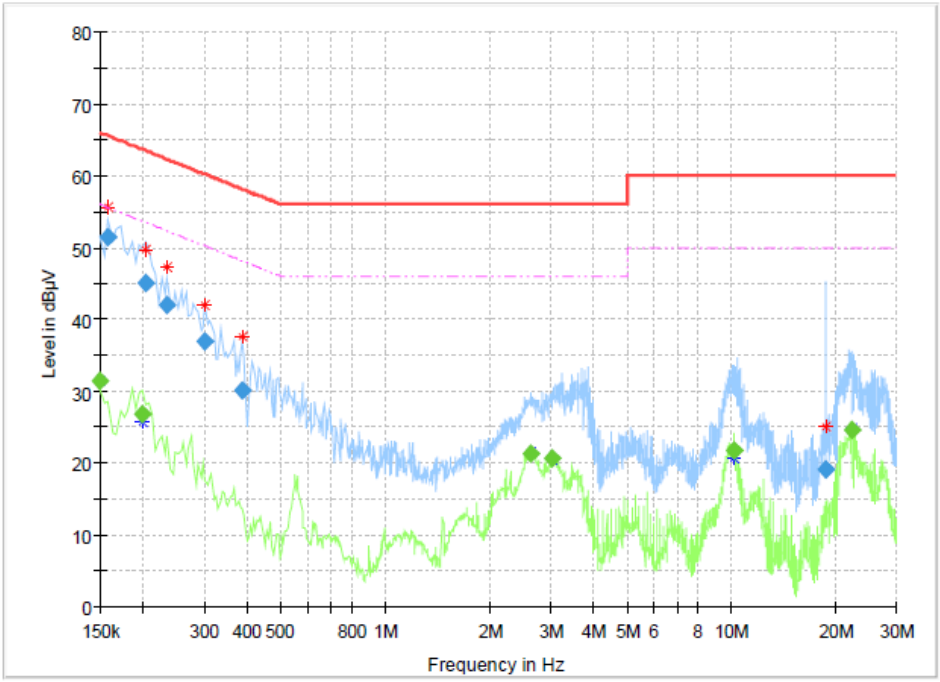


Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.154500	57.31	---	65.75	8.45	15000.0	9.000	L1	ON	9.8
0.163500	---	30.91	55.28	24.38	15000.0	9.000	L1	ON	9.9
0.186000	---	29.35	54.21	24.86	15000.0	9.000	L1	ON	9.9
0.186000	52.47	---	64.21	11.75	15000.0	9.000	L1	ON	9.9
0.240000	---	26.51	52.10	25.59	15000.0	9.000	L1	ON	9.7
0.240000	45.98	---	62.10	16.12	15000.0	9.000	L1	ON	9.7
0.289500	40.78	---	60.54	19.76	15000.0	9.000	L1	ON	9.7
0.357000	35.67	---	58.80	23.13	15000.0	9.000	L1	ON	9.8
0.460500	28.85	---	56.68	27.84	15000.0	9.000	L1	ON	9.8
3.453000	---	18.27	46.00	27.73	15000.0	9.000	L1	ON	9.6
9.451500	---	21.98	50.00	28.02	15000.0	9.000	L1	ON	9.8
10.648500	---	24.14	50.00	25.86	15000.0	9.000	L1	ON	9.8

[NEUTRAL]

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.150000	---	31.52	56.00	24.48	15000.0	9.000	N	ON	9.7
0.159000	51.44	---	65.52	14.07	15000.0	9.000	N	ON	9.8
0.199500	---	26.77	53.63	26.87	15000.0	9.000	N	ON	9.8
0.204000	45.09	---	63.45	18.36	15000.0	9.000	N	ON	9.8
0.235500	41.87	---	62.25	20.38	15000.0	9.000	N	ON	9.7
0.303000	36.82	---	60.16	23.34	15000.0	9.000	N	ON	9.7
0.388500	30.06	---	58.10	28.03	15000.0	9.000	N	ON	9.8
2.652000	---	21.35	46.00	24.65	15000.0	9.000	N	ON	9.7
3.052500	---	20.69	46.00	25.31	15000.0	9.000	N	ON	9.7
10.225500	---	21.82	50.00	28.18	15000.0	9.000	N	ON	9.9
18.771000	19.21	---	60.00	40.79	15000.0	9.000	N	ON	10.0
22.321500	---	24.70	50.00	25.30	15000.0	9.000	N	ON	10.0

APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date
1	Signal Analyzer	Agilent	N9020A	MY49101016	2023-09-25	2024-09-25
2	Signal Generator	Rohde & Schwarz	SMB100A	175528	2023-03-22	2024-03-22
3	EMI TEST RECEIVER	Rohde & Schwarz	ESW44	102039	2023-05-03	2024-05-03
4	BILOG ANTENNA	TESEQ	CBL6111D	60654	2023-08-21	2025-08-21
5	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-125	2022-04-15	2024-04-15
6	6dB Attenuator	PASTERNACK	PE7AP006-06	L20210504000023	2023-08-04	2024-08-04
7	AMPLIFIER	SONOMA INSTRUMENT	310N	411011	2023-08-04	2024-08-04
8	Signal Analyzer	Rohde & Schwarz	FSV30	100925	2023-12-05	2024-12-05
9	PRE AMPLIFIER	HP	8449B	3008A00620	2023-04-21	2024-04-21
10	Double Ridged Guide Antenna	ETS-Lindgren	3115	00078895	2023-04-13	2024-04-13
11	HORN ANTENNA	SCHWARZBECK	BBHA9170	1153	2023-10-19	2024-10-19
12	LOW NOISE AMPLIFIER	TESTEK	TK-PA1840H	210124-L	2023-10-23	2024-10-23
13	Band Reject Filter	Micro Tronics	BRM50702	G233	2023-12-04	2024-12-04
14	EMI Test Receiver	Rohde & Schwarz	ESR3	102826	2023-05-03	2024-05-03
15	LISN	Rohde & Schwarz	ENV216	102698	2023-05-03	2024-05-03

	Cable	Manufacturer	Model No.	Serial No.	Check Date
1	RF Cable (Conducted)	Junkosha Inc.	MWX221	1512S151	2024-01-09
2	RF Cable (Line Conducted)	Canare Corporation	L-5D2W	N/A	2023-03-06
3	RF Cable (9 kHz - 1 GHz Radiated)	HUBER+SUHNER	SUCOFLEX 104	MY27558/4	2023-03-06
4	RF Cable (9 kHz - 1 GHz Radiated)	HUBER+SUHNER	L-5D2W	N/A	2023-03-06
5	RF Cable (1 GHz - 18 GHz Radiated)	Junkosha Inc.	MWX221	2008S246	2023-06-28
6	RF Cable (1 GHz - 18 GHz Radiated)	Junkosha Inc.	MWX221	J0970749	2023-06-28
7	RF Cable (1 GHz - 18 GHz Radiated)	Sensorview Co., LTD	13A26	TPC2204060007	2023-06-28
8	RF Cable (18 GHz – 26.5 GHz Radiated)	HUBER+SUHNER	SUCOFLEX 102	MY2372/2	2023-06-28
9	RF Cable (18 GHz – 26.5 GHz Radiated)	HUBER+SUHNER	SUCOFLEX 102	MY2371/2	2023-06-28
10	RF Cable (18 GHz – 26.5 GHz Radiated)	Sensorview Co., LTD	9A40	TP210713-001	2023-06-28

-END-