RF Test Report

According to

EN 300 328 V2.2.2

DUT Name:	nRF7002 DK
Model No. :	PCA10143
Customer:	Nordic Semiconductor ASA
Address:	Otto Nielsens veg 12, 7052, Norway
Summary	IN COMPLIANCE
Date of Reception:	30.11.2022
Date(s) of Test(s):	13.12.2022 – 30.12.2022

Tested by Test Engineer

Approved by Technical Manager

CONTENTS

1. General Information

Test Engineer(s):	Arto Kuosmanen, Pekka Pulkkinen
Location:	Eurofins Electric & Electronics Finland Oy Yrttipellontie 6 FI-90230 Oulu EMC Laboratory F016-019
Customer:	Nordic Semiconductor ASA Otto Nielsen veg 12, 7004 Trondheim, Norway Mona Hämeenaho tel: +358401823182 e-mail: mona.hameenaho@nordicsemi.no
Climate Conditions:	Temperature: 15 - 35 °C Air pressure: 860 - 1060 hPa Humidity: 30-60 rH% These limits were not exceeded during testing.

2. Test Samples

General description: nRF700x is a wireless companion IC that adds low-power Wi-Fi 6 capabilities to another System on Chip (SoC), Microprocessor Unit (MPU), or Microcontroller (MCU) host. It implements the Physical (PHY) and Medium Access Controller (MAC) layers of the 802.11 protocol stack, while the higher layers of the networking stack run on the host. nRF700x is compatible with IEEE 802.11ax (also known as Wi-Fi 6) and with earlier standards IEEE 802.11a/b/g/n/ac.

Test sample (Conducted):

Sample number	Serial number	Manufacturer	DUT Type	Model	HW version	SW version
3590ER001	1050771090	Nordic Semiconductor ASA	WLAN, Bluetooth evaluation board	PCA10143	0.7.1	v3.0
3590ER005 Adaptivity measurement	1050764883	Nordic Semiconductor ASA	WLAN, Bluetooth evaluation board	PCA10143	0.7.1	Commercial software

Test sample (Radiated):

Sample number	Serial number	Manufacturer	DUT Type	Model	HW version	SW version
3590ER002	105074903	Nordic Semiconductor ASA	WLAN, Bluetooth evaluation board	PCA10143	0.7.1	v3.0

Auxiliary equipment:

Sample number	Serial number	Manufacturer	DUT Type	Model	HW version
G4CER008	G4C-L025	HP	Laptop computer	EliteBook 820	Configuration of the test modes and EUT powering during the tests.

Information	Description	
Modulation:	DSSS, OFDM, OFDMA	
Adaptivity:	Adaptive Equipment without the possibility to switch to an non-adaptive mode.	
Maximum RF output power (e.i.r.p.)	*<20 dBm*	
Operation mode 1: Single Antenna Equipment	Equipment with only one antenna	
- operating frequency range:	*2412-2472 MHz*	
- Nominal Channel Bandwidth:	20 MHz	
Receiver category	1	
Radio technology / type of equipment	802.11bgn20	
Bluetooth Specification	LE 1Mbps PHY	No
	LE 2Mbps PHY	No
	LE Coced PHY S=2 (500 kbit)	No
	LE Coced PHY S=8 (125 kbit)	No
	Stable Modulation Index - Transmitter	No
	Stable Modulation Index - Reer	No
Antenna	Type	Internal (PCB)
	Model	2.45 GHz SMD Antenna, EIA 1206, Detuning resilient, Edge Mount Design. 2450AT18D0100E
	Manufacturer	Johanson Technology
	Gain	-1.5 dBi
Supply voltage	V_{Nom} = 5 VDC	
Type of Power source	USB	
Operating Temperature	TNom = 20°C TMin = 0°C TMax = 70°C	

3. Configuration and Operation Modes

Test modes / description
Continuous modulated carrier at 2412 MHz (ch1), 2442 MHz (ch7) and 2472 MHz (ch13). Following were defined as worst case modes. 802.11b, 1Mbs 802.11g, 9Mbs

802.11n (HT20) MCS0 802.11ax (HE20), MCS0
Continuous reception at 2412 MHz (ch1) and 2472 MHz (ch13)

4. Test equipment

Conducted tests

R&S TS8997 Test System equipment list:

Equipment	Certification-No.	Calibration Date	Next calibration
SMW200A	1035089-D-K-15195-01-00-2022-03	31.03.2022	31.03.2023
SMB100A	1041326-D-K-15195-01-00-2022-03	31.03.2022	31.03.2023
OSP-B157WX+OSP220	300642762-D-K-15195-01-00-2022-03	31.03.2022	31.03.2023
OSP-B157W8plus+OSP150	300639878-D-K-15195-01-00-2022-03	31.03.2022	31.03.2023
ESW	1039208-D-K-15195-01-00-2022-03	31.03.2022	31.03.2023
CMW500	1041276-D-K-15195-01-00-2022-03	31.03.2022	31.03.2023
CMW-Z800A	20-1040958-C	31.03.2022	31.03.2023

Radiated tests

New ID	Manufacturer	Equipment type	Description	Serial	Calibration information	Next calibration
G4C264	Rohde & Schwarz	CMW500	Wideband radio communication tester	126426	23.8.2022	23.8.2023
G4C265	Rohde & Schwarz	ESW26	EMI test receiver	101324	25.8.2022	25.8.2023
G4C273	Frankonia	ALX-4000E	Broadband Antenna, 25MHz-4GHz with 6dB (50-A-MFN-06) att.	00816+1531	11.11.2020	11.11.2023
G4C576	Rohde & Schwarz	HF907	Double-Ridged Waveguide Horn Antenna 800MHz-18GHz	100163	9.8.2022	9.8.2025

5. Uncertainties

Conducted tests

Test Case	Description	Limit	Uncertainties
5.4.2	RF Output Power	±1.5 dB	0,99
5.4.2	Duty Cycle	±5 %	0,02
	Tx Sequence	±5 %	0,02
	Tx Gap	±5 %	0,02
5.4.2	Medium Utilisation	±5 %	0,10
5.4.3	Power Spectral Density	±3 dB	0,99
5.4.4	Accumulated Transmit Time	±5 %	0,01
	Minimum Frequency Occupation Time	±5 %	0,01
5.4.5	Hopping Frequency Separation	-	0,60
5.4.7	Occupied Channel Bandwidth	±5 %	2,08
5.4.8	Out-of-band emissions	±3 dB	0,89
5.4.9	Transmitter unwanted emissions in the spurious domain		
	30 MHz to 1 GHz	±3 dB	0,55
	1 GHz to 12.75GHz	±3 dB	1,76

5.4.10	Receiver Spurious emission		
	30 MHz to 1 GHz	±3 dB	0,55
	1 GHz to 12.75GHz	±3 dB	1,76
5.4.6	Adaptivity	±5 %	0,01
5.4.11	Receiver blocking	n.a.	n.a.

Radiated tests

Uncertainty for Spurious emission	
Frequency [MHz]	**Expanded Uncertainty [dB] (k=2)**
30 – 1000	5,34
1000 – 3000	5,47
over 3000	5,53

6. Summary

Requirement (EN 300 328 v2.2.2)	Result	Remark
4.3.2.2 RF output power	PASS	
4.3.2.3 Power Spectral Density	PASS	
4.3.2.4 Duty Cycle, Tx-sequence, Tx-gap	N/A	For non-adaptive equipment with RF output power >10 dBm EIRP only
4.3.1.4 Accumulated Transmit Time, Frequency Occupation & Hopping	N/A	For FHSS only
4.3.1.4 Frequency Occupation	N/A	For FHSS only
4.3.1.4 Hopping Sequence	N/A	For FHSS only
4.3.1.5 Hopping Frequency Separation	N/A	For FHSS only
4.3.2.5 Medium Utilisation	N/A	For non-adaptive equipment with RF output power >10 dBm EIRP only
4.3.2.6 Adaptivity (Channel access mechanism)	PASS	For non-adaptive equipment with RF output power >10 dBm EIRP only
4.3.2.7 Occupied Channel Bandwidth	PASS	
4.3.2.8 Transmitter unwanted emissions in the out-of-band domain	PASS	
4.3.2.9 Tranmsitter unwanted emissions in the spurious domain (radiated)	PASS	
4.3.2.10 Receiver spurious emissions (radiated)	PASS	
4.3.2.11 Receiver Blocking	PASS	
4.3.2.12 Geo-location capbility	N/A	
Possible test case verdicts: PASS = Tested device meets the requirements FAIL = Tested device does not meet the requirements N/A = Test requirement not applicable for tested device N/T = Test requirement applicable for tested device, but not tested		

7. RF output power

Test requirement: Section 4.3.2.2, RF Output Power
Test method: Section 5.4.2, RF Output Power

Test definition: The RF output power is defined as the mean equivalent isotropic radiated power (e.i.r.p.) of the equipment during a transmission burst.

Limits	
Type	Power limit
Adaptive	≤ 20 dBm
Non-adaptive	≤ value declared by manufacturer ≤ 20 dBm

Summary (used maximum power level command: wifi_radio_test tx_power 20)

Mode / modulation	Frequency (MHz)	Temperature (°C)	Voltage	Max Burst EIRP (dBm)	Limit Max (dBm)	Max Burst RMS (dBm)	Test Verdict
Wi-Fi mode b, 1 Mbps	2412	T_{Nom}	V_{Nom}	16,9	20.0	18,4	PASS
	2412	T_{Min}	V_{Nom}	16,1	20.0	17,6	PASS
	2412	T_{Max}	V_{Nom}	17,9	20.0	19,4	PASS
Wi-Fi mode b, 1 Mbps	2442	T_{Nom}	V_{Nom}	17,1	20.0	18,6	PASS
	2442	T_{Min}	V_{Nom}	17,9	20.0	19,4	PASS
	2442	T_{Max}	V_{Nom}	16,2	20.0	17,7	PASS
Wi-Fi mode b, 1 Mbps	2472	T_{Nom}	V_{Nom}	17,1	20.0	18,6	PASS
	2472	T_{Min}	V_{Nom}	17,4	20.0	18,9	PASS
	2472	T_{Max}	V_{Nom}	16,2	20.0	17,7	PASS
Wi-Fi mode g, 9 Mbps	2412	T_{Nom}	V_{Nom}	17,0	20.0	18,5	PASS
	2412	T_{Min}	V_{Nom}	18,0	20.0	19,5	PASS
	2412	T_{Max}	V_{Nom}	16,2	20.0	17,7	PASS
Wi-Fi mode g, 9 Mbps	2442	T_{Nom}	V_{Nom}	16,9	20.0	18,4	PASS
	2442	T_{Min}	V_{Nom}	18,1	20.0	19,6	PASS
	2442	T_{Max}	V_{Nom}	16,1	20.0	17,6	PASS
Wi-Fi mode g, 9 Mbps	2472	T_{Nom}	V_{Nom}	17,1	20.0	18,6	PASS
	2472	T_{Min}	V_{Nom}	18,1	20.0	19,6	PASS
	2472	T_{Max}	V_{Nom}	16,3	20.0	17,8	PASS
Wi-Fi mode n20, MCS0	2412	T_{Nom}	V_{Nom}	16,3	20.0	17,8	PASS
	2412	T_{Min}	V_{Nom}	17,6	20.0	19,1	PASS
	2412	T_{Max}	V_{Nom}	15,4	20.0	16,9	PASS
Wi-Fi mode n20, MCS0	2442	T_{Nom}	V_{Nom}	16,3	20.0	17,8	PASS
	2442	T_{Min}	V_{Nom}	15,5	20.0	17	PASS
	2442	T_{Max}	V_{Nom}	18,2	20.0	19,7	PASS
Wi-Fi mode n20, MCS0	2472	T_{Nom}	V_{Nom}	16,5	20.0	18	PASS
	2472	T_{Min}	V_{Nom}	18,2	20.0	19,7	PASS
	2472	T_{Max}	V_{Nom}	15,5	20.0	17	PASS
Wi-Fi mode ax20, MCS0	2412	T_{Nom}	V_{Nom}	16,5	20.0	18	PASS
	2412	T_{Min}	V_{Nom}	18,2	20.0	19,7	PASS

	2412	T_{Max}	V_{Nom}	15,7	20.0	17,2	PASS
Wi-Fi mode ax20, MCS0	2442	T_{Nom}	V_{Nom}	16,8	20.0	18,3	PASS
	2442	T_{Min}	V_{Nom}	18,3	20.0	19,8	PASS
	2442	T_{Max}	V_{Nom}	16,0	20.0	17,5	PASS
Wi-Fi mode ax20, MCS0	2472	T_{Nom}	V_{Nom}	16,2	20.0	17,7	PASS
	2472	T_{Min}	V_{Nom}	17,9	20.0	19,4	PASS
	2472	T_{Max}	V_{Nom}	15,4	20.0	16,9	PASS

8. Power Spectral Density

Test requirement: Section 4.3.2.3, Power spectral density
Test method: Section 5.4.3, Power spectral density

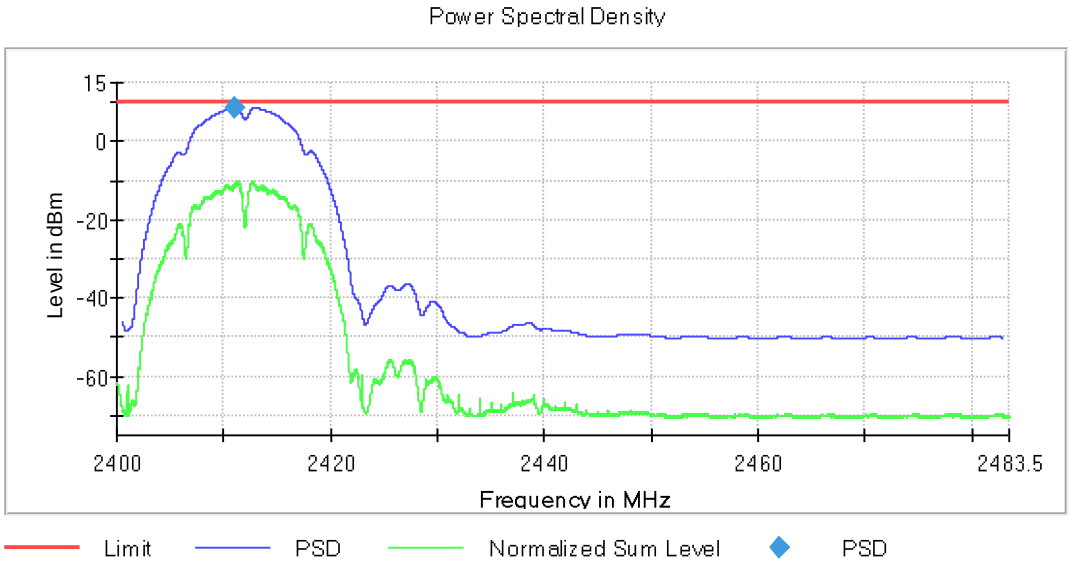
Test definition: The Power Spectral Density is the mean equivalent isotropically radiated power (e.i.r.p.) spectral density in a 1 MHz bandwidth during a transmission burst.

Limits
≤ 10 dBm (10 mW) / 1 MHZ

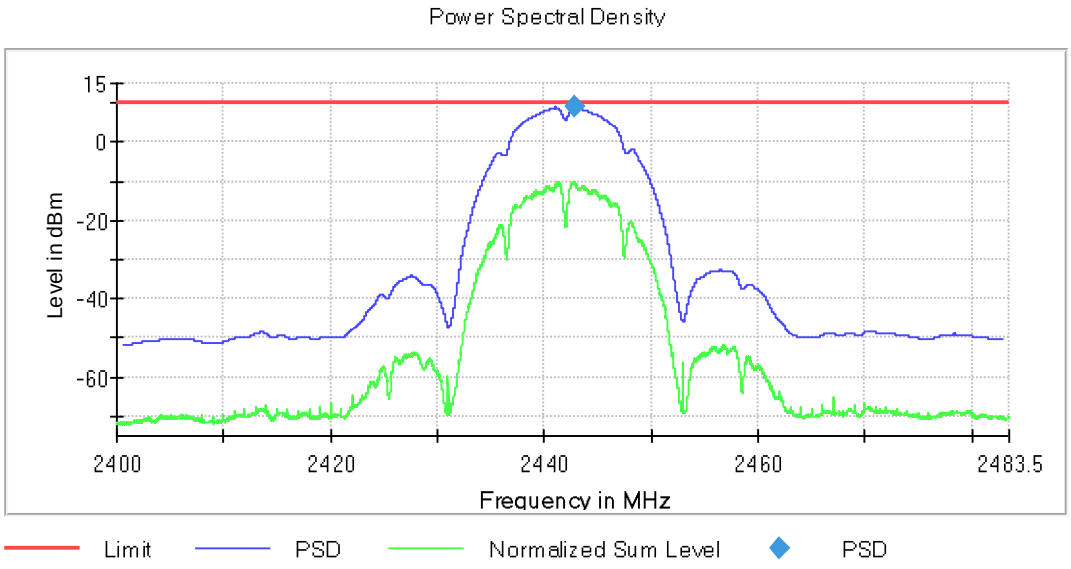
Summary

DUT Mode	DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Test verdict
802.11b, 1 Mbps	2412.000000	2411.073674	8.806	10.0	PASS
802.11b, 1 Mbps	2442.000000	2442.919860	9.038	10.0	PASS
802.11b, 1 Mbps	2472.000000	2471.006496	8.989	10.0	PASS
802.11g, 9 Mbps	2412.000000	2410.583732	5.872	10.0	PASS
802.11g, 9 Mbps	2442.000000	2443.099838	5.791	10.0	PASS
802.11g, 9 Mbps	2472.000000	2470.586547	6.032	10.0	PASS
802.11n20, MCS0	2412.000000	2410.873698	5.530	10.0	PASS
802.11n20, MCS0	2442.000000	2443.079841	5.607	10.0	PASS
802.11n20, MCS0	2472.000000	2470.596545	5.802	10.0	PASS
802.11ax20, MCS0	2412.000000	2410.563735	2.316	10.0	PASS
802.11ax20, MCS0	2442.000000	2443.089840	4.942	10.0	PASS
802.11ax20, MCS0	2472.000000	2470.556550	4.590	10.0	PASS

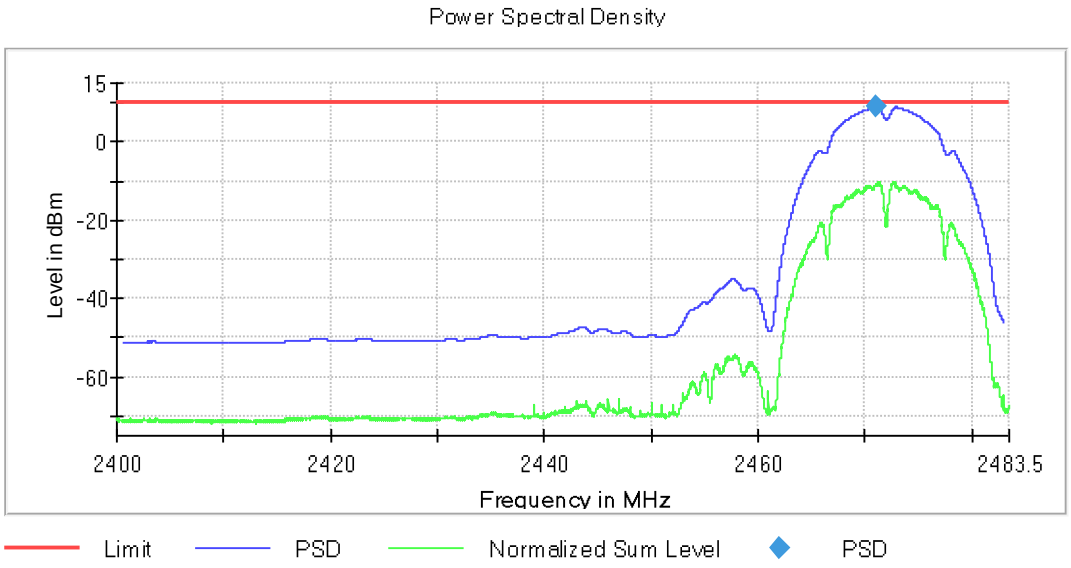
Power Spectral Density (11b, 1 Mbps, 2412 MHz)



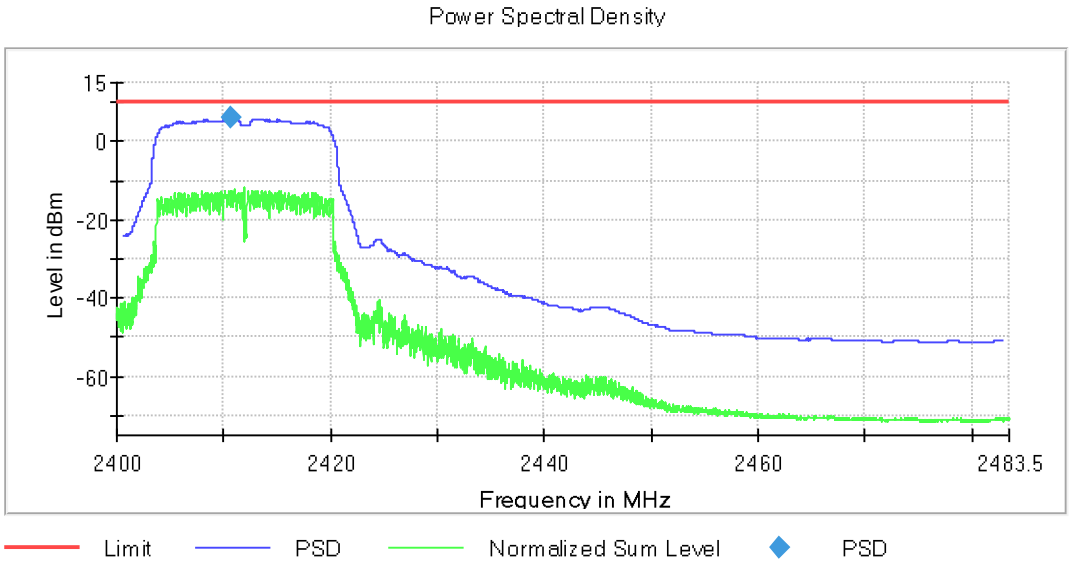
Power Spectral Density (11b, 1 Mbps, 2442 MHz)



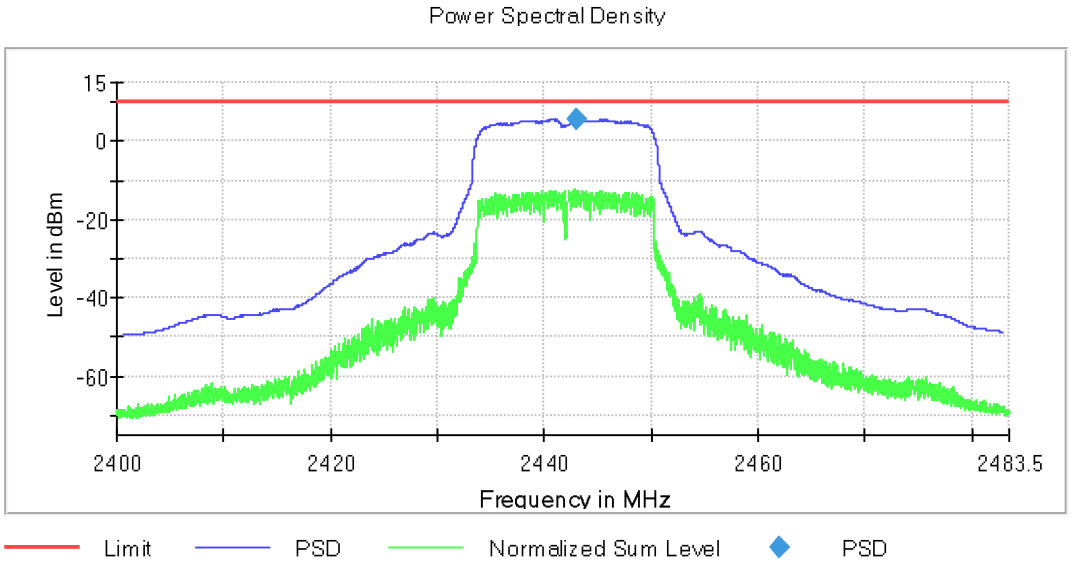
Power Spectral Density (11b, 1 Mbps, 2472 MHz)


Power Spectral Density
15
0
-20
-40
-60
Level in dBm
2400
2420
2440
2460
2483.5
Frequency in MHz
Limit
PSD
Normalized Sum Level
PSD

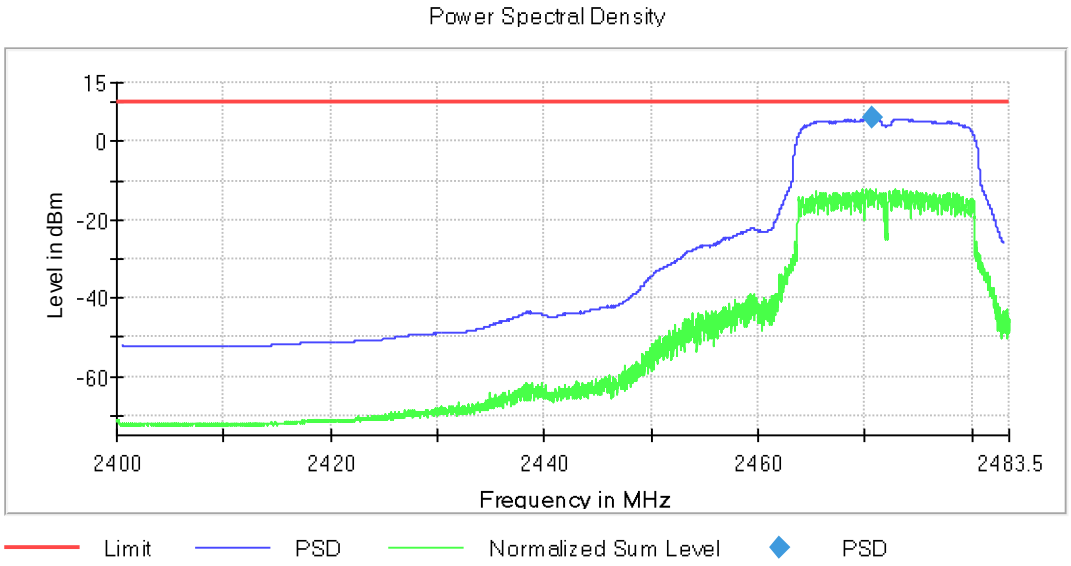
Power Spectral Density (11g, 9 Mbps, 2412 MHz)



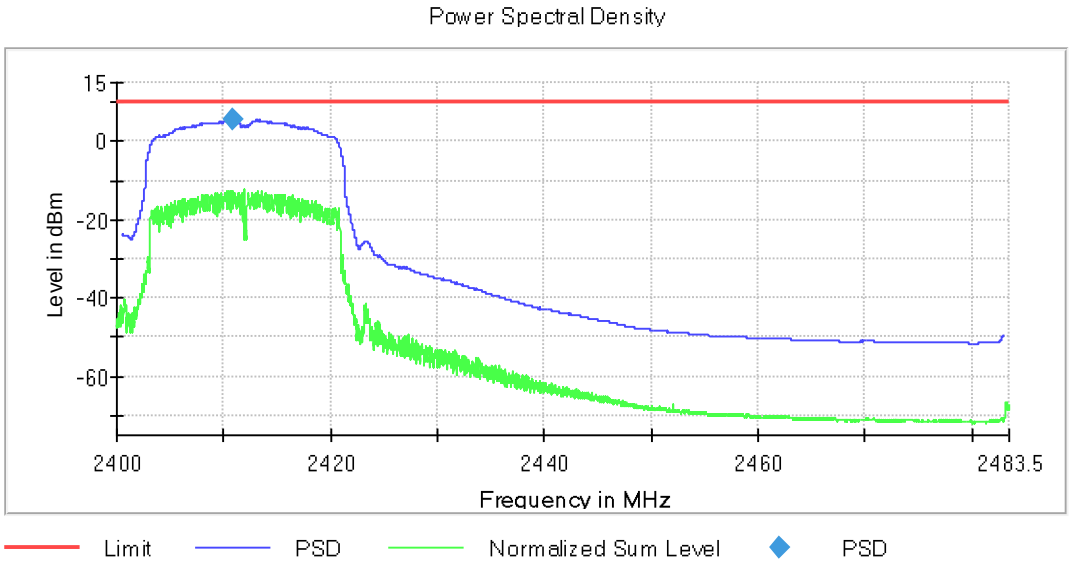
Power Spectral Density (11g, 9 Mbps, 2442 MHz)



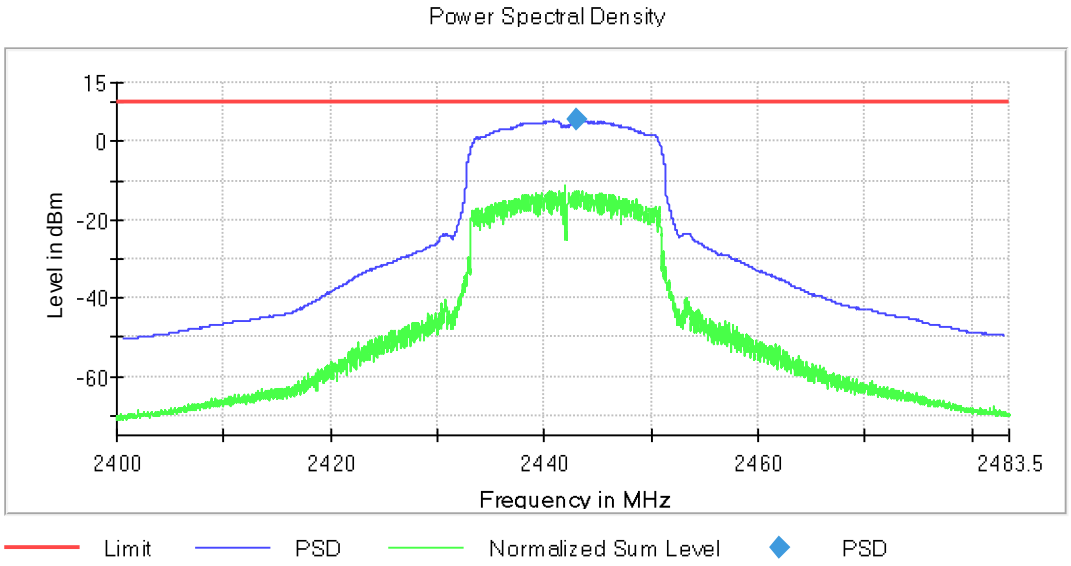
Power Spectral Density (11g, 9 Mbps, 2472 MHz)



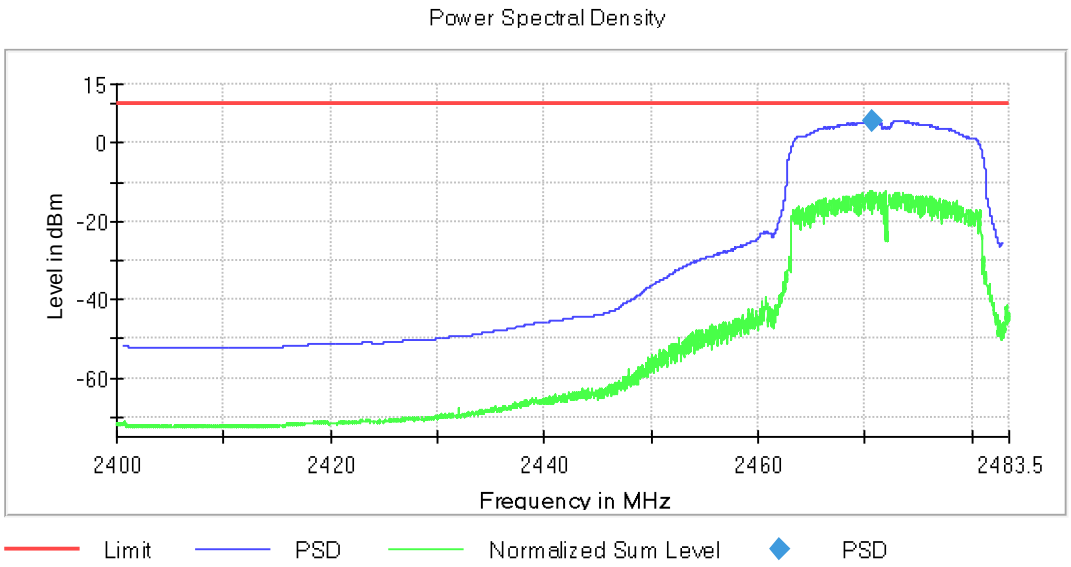
Power Spectral Density (11n20, MCS0, 2412 MHz)



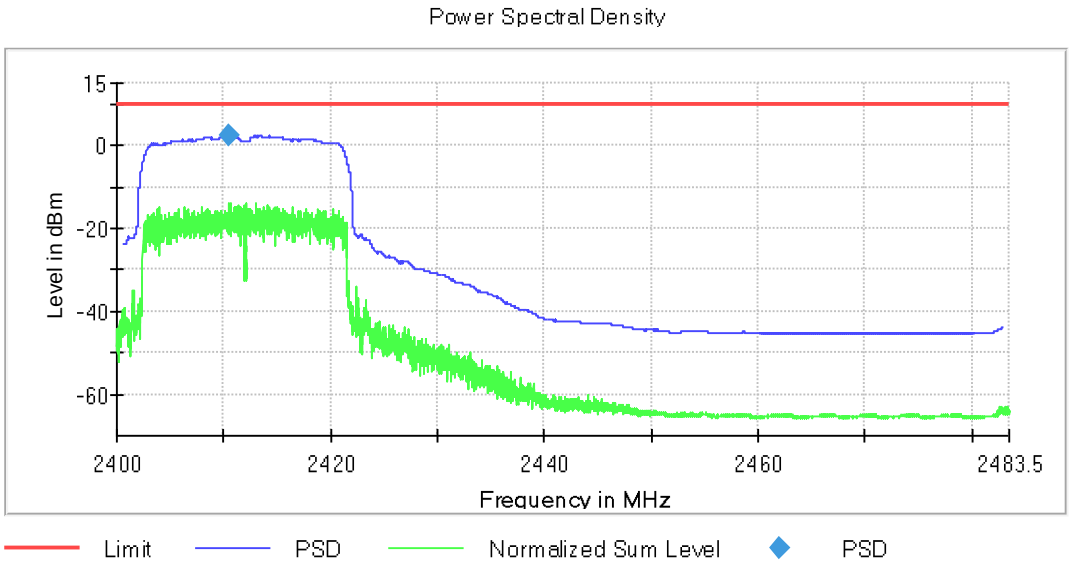
Power Spectral Density (11n20, MCS0, 2442 MHz)



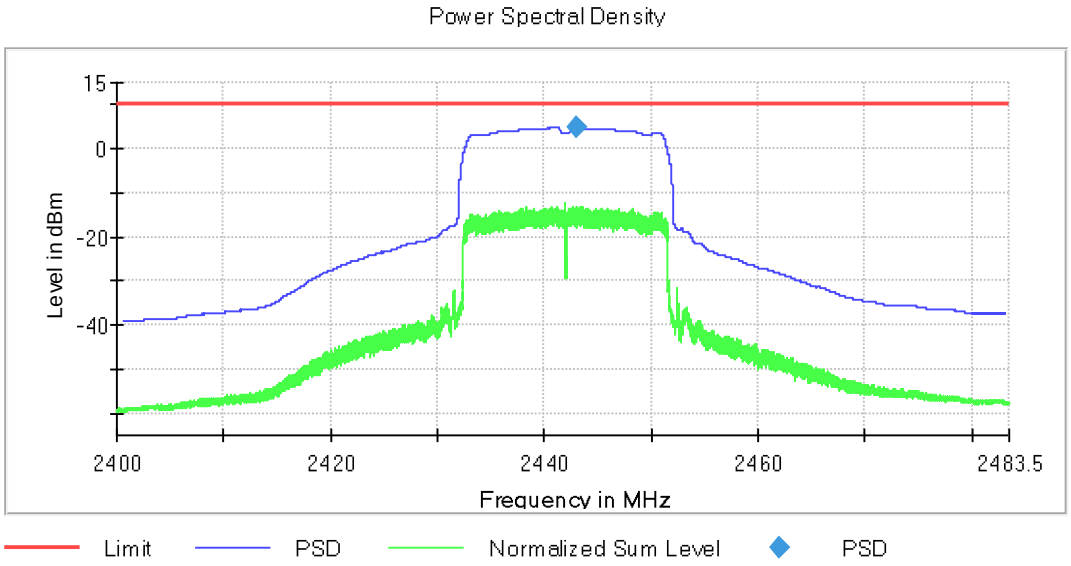
Power Spectral Density (11n20, MCS0, 2472 MHz)



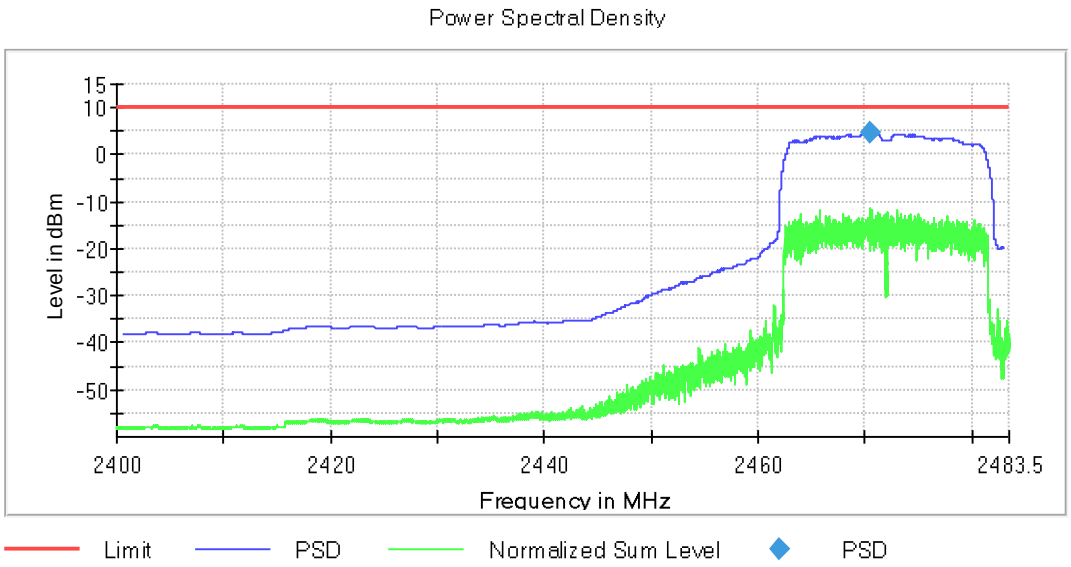
Power Spectral Density (11ax20, MCS0, 2412 MHz)


Power Spectral Density
15
0
-20
-40
-60
Level in dBm
2400
2420
2440
2460
2483.5
Frequency in MHz
Limit
PSD
Normalized Sum Level
PSD

Power Spectral Density (11ax20, MCS0, 2442 MHz)



Power Spectral Density (11ax20, MCS0, 2472 MHz)



9. Occupied Channel Bandwidth

Test requirement: Section 4.3.2.7, Occupied bandwidth
Test method: Section 5.4.7, Occupied bandwidth

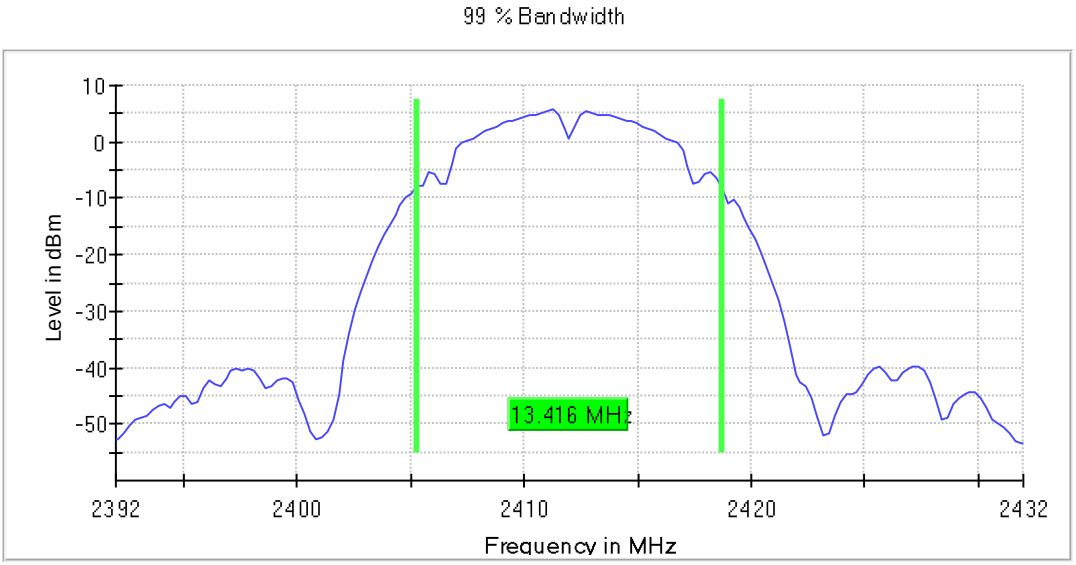
Test definition: The Occupied Channel Bandwidth is the bandwidth that contains 99 % of the power of the signal.

Limits	
Condition	Bandwidth (MHz)
Non-adaptive FHSS, power > 10 dBm EIRP	≤ value declared by manufacturer ≤ 5
Non-adaptive non-FHSS, power > 10 dBm EIRP	< 20
Occupied channel bandwidth shall fall completely within in the band	

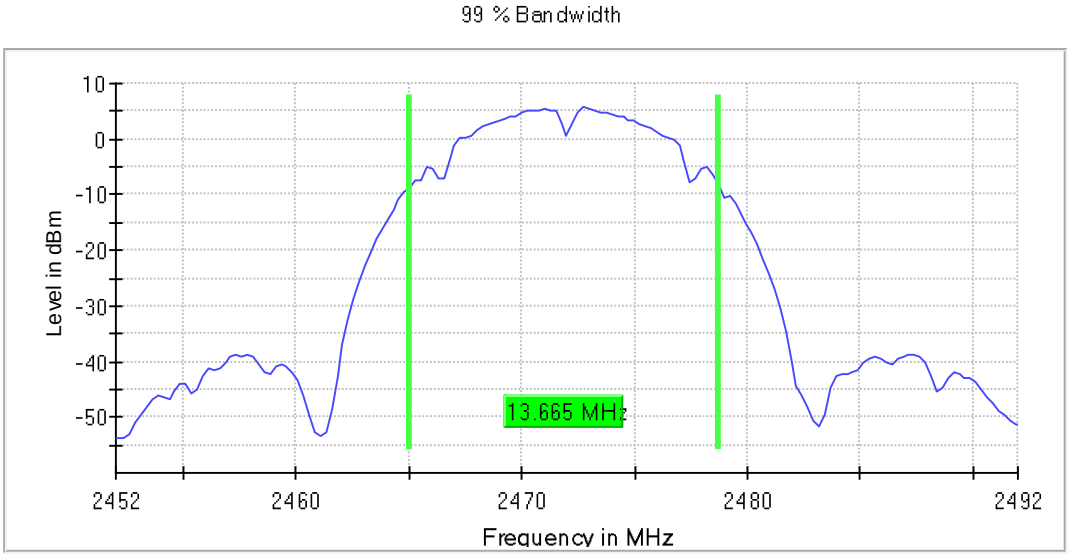
Summary

Test mode	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Limit Min BE L (MHz)	Band Edge Right (MHz)	Limit Max BE R (MHz)	Test verdict
802.11b, 1 Mbps	2412.000000	13.416150	2405.291925	2400.000000	2418.708075	2483.500000	PASS
802.11b, 1 Mbps	2472.000000	13.664597	2465.043478	2400.000000	2478.708075	2483.500000	PASS
802.11g, 9 Mbps	2412.000000	16.645963	2403.552795	2400.000000	2420.198758	2483.500000	PASS
802.11g, 9 Mbps	2472.000000	16.894410	2463.552795	2400.000000	2480.447205	2483.500000	PASS
802.11n20, MCS0	2412.000000	17.639751	2403.055901	2400.000000	2420.695652	2483.500000	PASS
802.11n20, MCS0	2472.000000	17.639751	2463.055901	2400.000000	2480.695652	2483.500000	PASS
802.11ax20, MCS0	2412.000000	18.881988	2402.559006	2400.000000	2421.440994	2483.500000	PASS
802.11ax20, MCS0	2472.000000	18.881988	2462.559006	2400.000000	2481.440994	2483.500000	PASS

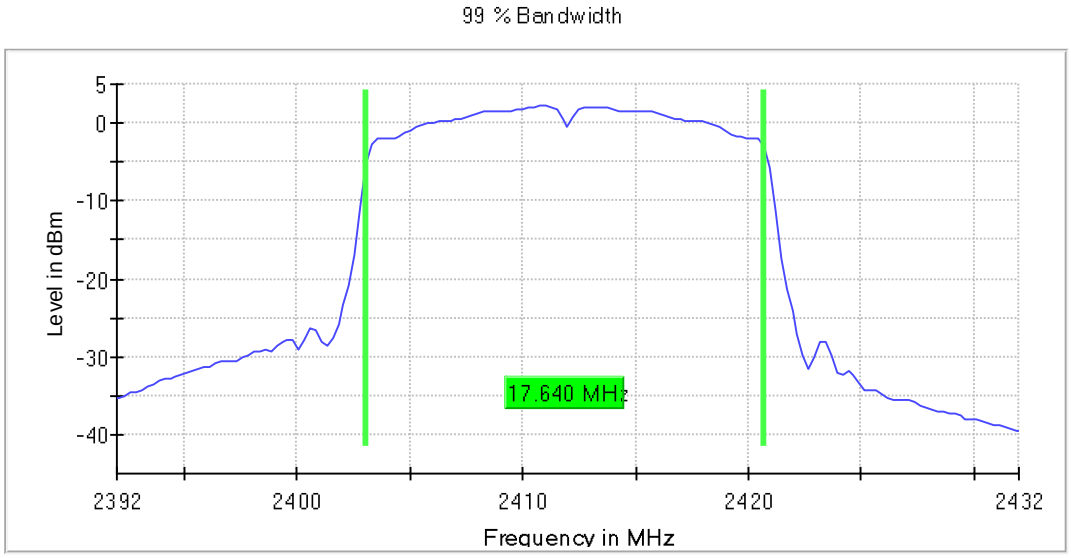
99 % Bandwidth, 802.11b, 2402 MHz



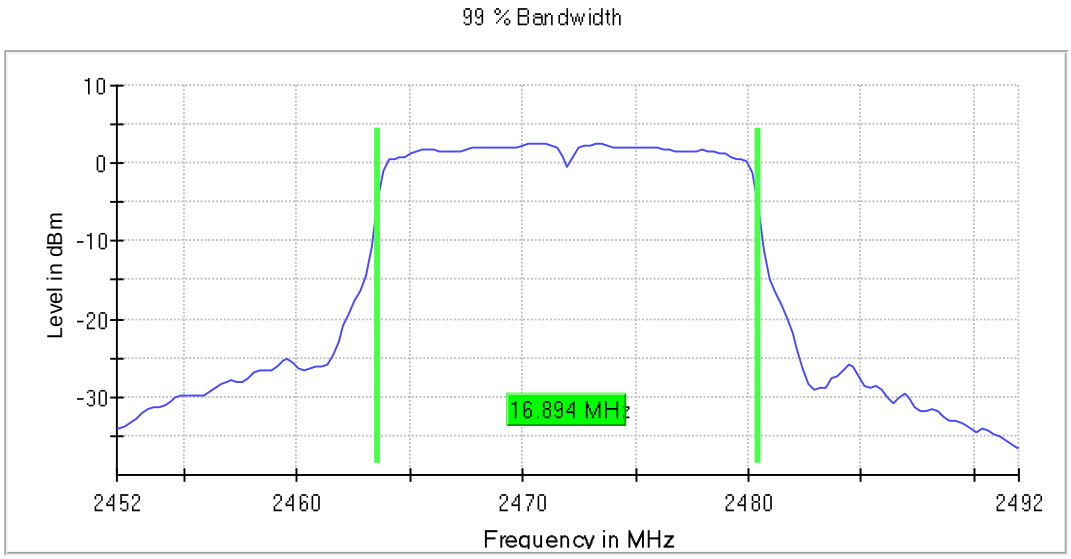
99 % Bandwidth, 802.11b, 2472 MHz



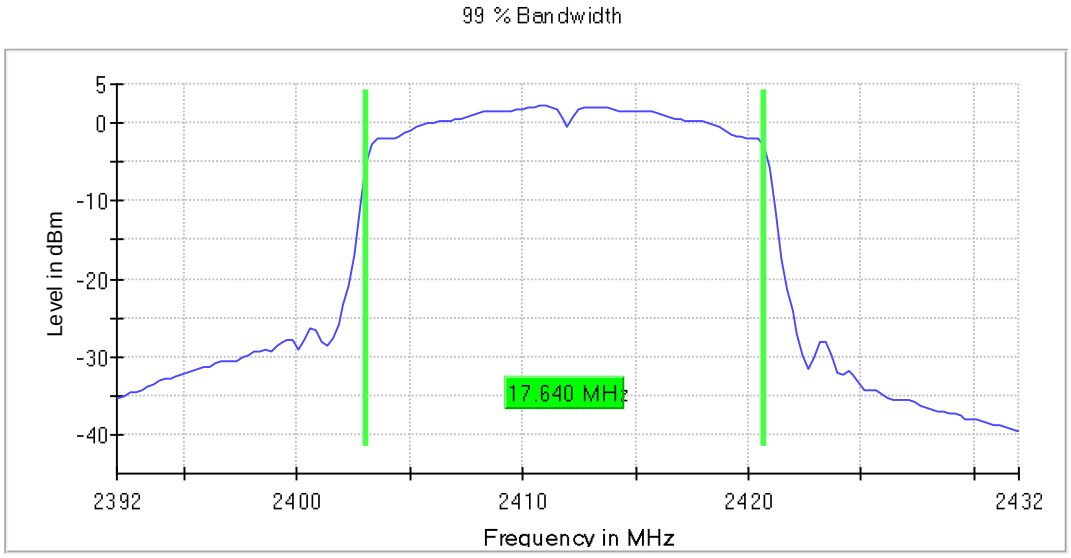
99 % Bandwidth, 802.11g, 2412 MHz



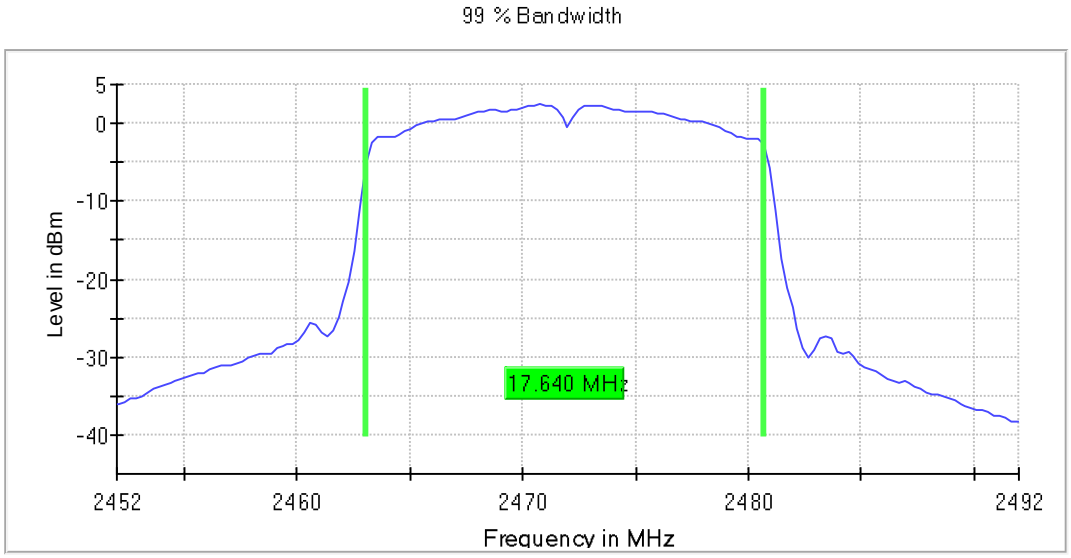
99 % Bandwidth, 802.11g, 2472 MHz



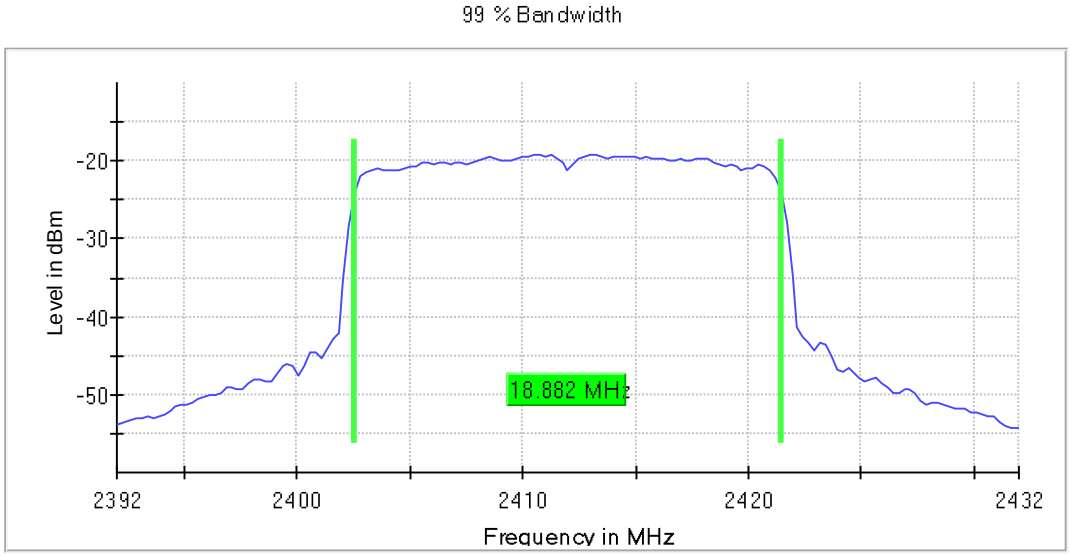
99 % Bandwidth, 802.11n20, 2412 MHz



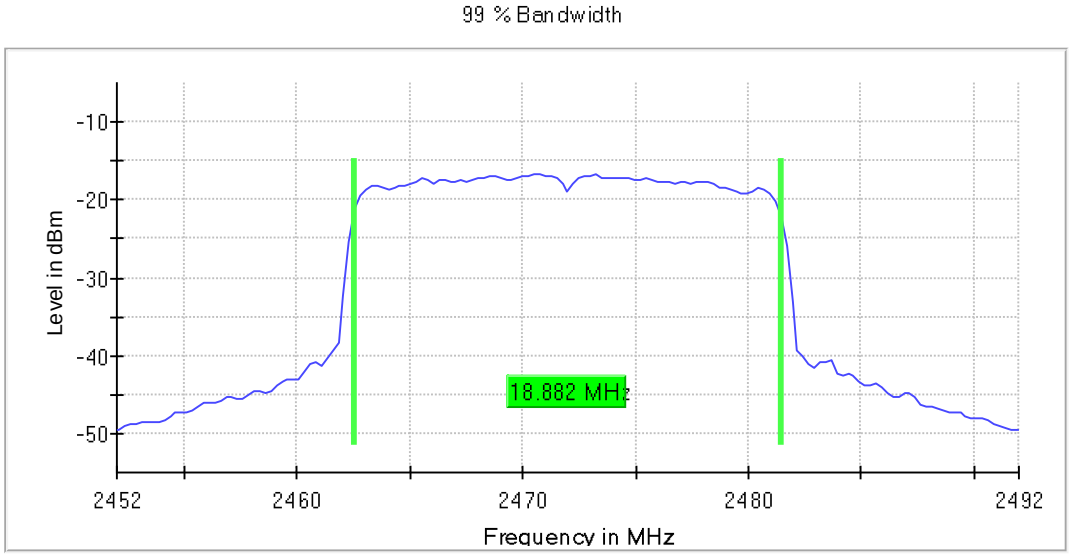
99 % Bandwidth, 802.11n20, 2472 MHz



99 % Bandwidth, 802.11ax20, 2412 MHz



99 % Bandwidth, 802.11ax20, 2472 MHz


99 % Bandwidth
-10
-20
-30
-40
-50
Level in dBm
18.882 MHz
2452
2460
2470
2480
2492
Frequency in MHz

10. Adaptivity (adaptive equipment using modulations other than FHSS)

Test requirement: Section 4.3.2.6, Adaptivity (non-FHSS), 4.3.2.6.3 Adaptive non-FHSS using LBT
Test method: Section 5.4.6.2.1.4 Non-FHSS equipment using LBT

Test definition: Adaptive non-FHSS using LBT is a mechanism by which non-FHSS adaptive equipment avoids transmissions in a channel in the presence of an interfering signal in that channel. This mechanism shall operate as intended in the presence of an unwanted signal on frequencies other than those of the operating band.

Adaptivity and Unwanted Signal Limit
☒ Only for adaptive systems and RF Output Power> 10dBm
☐ Non-LBT based Detect and Avoid: • minimum remain unavailable= 1sec; • minimum Idle Period time = 100us; • maximum Channel Occupancy Time (COT) = 40ms • detection threshold level = -70 dBm/MHz + 10 x log10(100mW / Pout)(Pout in mW e.i.r.p);
☐ LBT based Detect and Avoid (Frame Based Equipment): • minimum Clear Channel Assessment (CCA)time = 18us; • COT =1 ms to 10 ms • Idle Period= 5% of COT • detection threshold level = -70 dBm/MHz + 10 x log10(100mW / Pout) (Pout in mW e.i.r.p);
☒ LBT based Detect and Avoid (Load Based Equipment referred to in the first paragraph of clause 4.3.2.6.3.2.3 (IEEE 802.11™ [i.3] or IEEE 802.15.4™ [i.4] equipment) or other types of Load Based Equipment not using any of the mechanism referenced in above): • minimum Clear Channel Assessment (CCA)time = 18us; • COT = 13 ms • Idle period = 18 us • detection threshold level = -70 dBm/MHz + 10 x log10(100mW / Pout) (Pout in mW e.i.r.p);
☒ Short Control Signaling Transmissions: • Short Control Signaling Transmissions shall have a maximum duty cycle of 10 % within an observation period of 50 ms • Note: Adaptive equipment may or may not have Short Control Signalling Transmissions

Unwanted Signal Parameters			
Equipment Type	Wanted Signal Mean Power from Companion Device	Unwanted signal frequency (MHz)	Unwanted CW signal power (dBm)
non-FHSS using LBT - Chapter 4.3.2.6.3.2.2 Frame Based Equipment, table 10 - Chapter 4.3.2.6.3.2.3 Load Based Equipment, table 11	sufficient to maintain the link(see note 3)	2395 or 2488,5 (see note 1)	-35 (see note 2)
non-FHSS using DAA - Chapter 4.3.2.6.2.2, table 9	-30 dBm(see note 2)		
Note 1: The highest frequency shall be used for testing operating channels within the range 2 400 MHz to 2 442MHz, while the lowest frequency shall be used for testing operating channels within the range 2 442 MHz to 2 483,5 MHz.			

Note 2: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density in front of the UUT antenna

Note 3: A typical conducted value which can be used in most cases is -50 dBm/MHz

Normal Operation, DUT signal measurement without interferer, test step 2

Test mode	Frequency (MHz)	Monitoring Length (ms)	COT Max (ms)	COT Max Limit (ms)	COT Max Start (ms)	COT Min (ms)	Number of COTs	CCA Time Min (ms)	CCA Time Max (ms)	CCA Time (Idle Time) Limit Min (ms)	Result
802.11b, 1 Mbps	2412	10000.000	9.231	13.000	1360.919	0.284	4048	0.030	4.556	0.018	PASS
802.11b, 1 Mbps	2472	10000.000	9.232	13.000	7723.173	0.002	4334	0.019	3.190	0.018	PASS
802.11g, 9 Mbps	2412	10000.000	1.945	13.000	5824.860	0.044	7337	0.019	10.116	0.018	PASS
802.11g, 9 Mbps	2472	10000.000	1.482	13.000	3163.794	0.002	7422	0.019	3.262	0.018	PASS
802.11n20, MCS0	2412	10000.000	1.483	13.000	6849.848	0.044	9885	0.019	4.595	0.018	PASS
802.11n20, MCS0	2472	10000.000	9.231	13.000	283.330	0.044	9412	0.019	4.258	0.018	PASS
802.11ax20, MCS0	2412	10000.000	3.740	13.000	838.940	0.068	4306	0.019	6.152	0.018	PASS
802.11ax20, MCS0	2472	10000.000	3.740	13.000	3202.665	0.068	4102	0.019	4.460	0.018	PASS

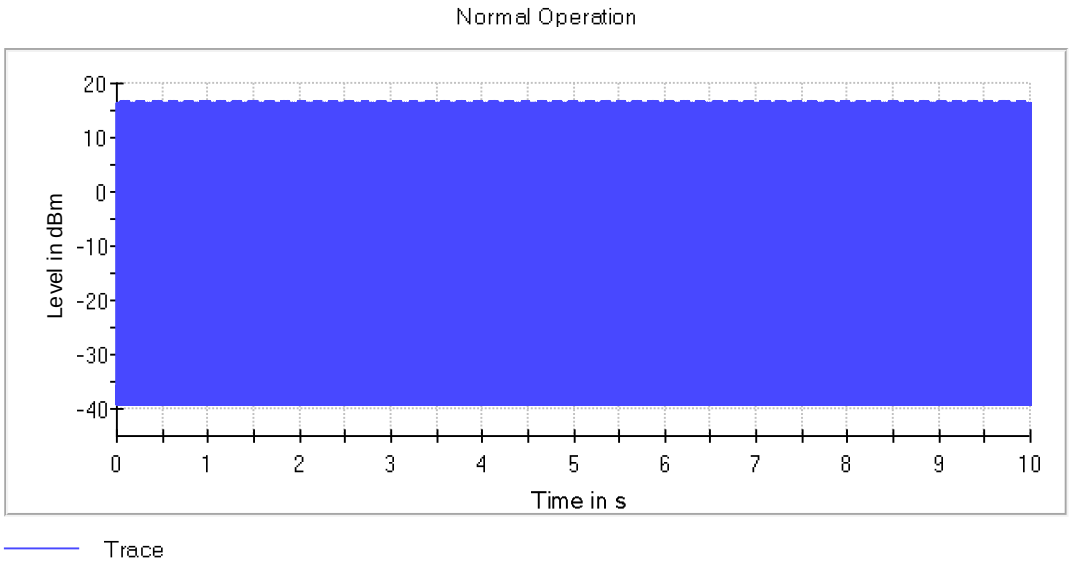
Reaction on Interference signal and unwanted signal, test steps 4 (verification of reaction to the interference signal) and 5 (adding the unwanted signal)

Test mode	Frequency (MHz)	Test step	Number of COTs	Detection Threshold Level (per MHz at DUT)	Unwanted signal level (dBm)	DC in max DC Evaluation Window (%)	Limit Max (%)	Result
802.11b, 1 Mbps	2412	4 and 5	0	-69.750	-36.50	0.000	10.000	PASS
802.11b, 1 Mbps	2472	4 and 5	0	-69.750	-36.50	0.000	10.000	PASS
802.11g, 9 Mbps	2412	4 and 5	0	-69.750	-36.50	0.000	10.000	PASS
802.11g, 9 Mbps	2472	4 and 5	0	-69.750	-36.50	0.000	10.000	PASS
802.11n20, MCS0	2412	4 and 5	0	-69.750	-36.50	0.000	10.000	PASS
802.11n20, MCS0	2472	4 and 5	0	-69.750	-36.50	0.000	10.000	PASS
802.11ax20, MCS0	2412	4 and 5	0	-69.750	-36.50	0.000	10.000	PASS

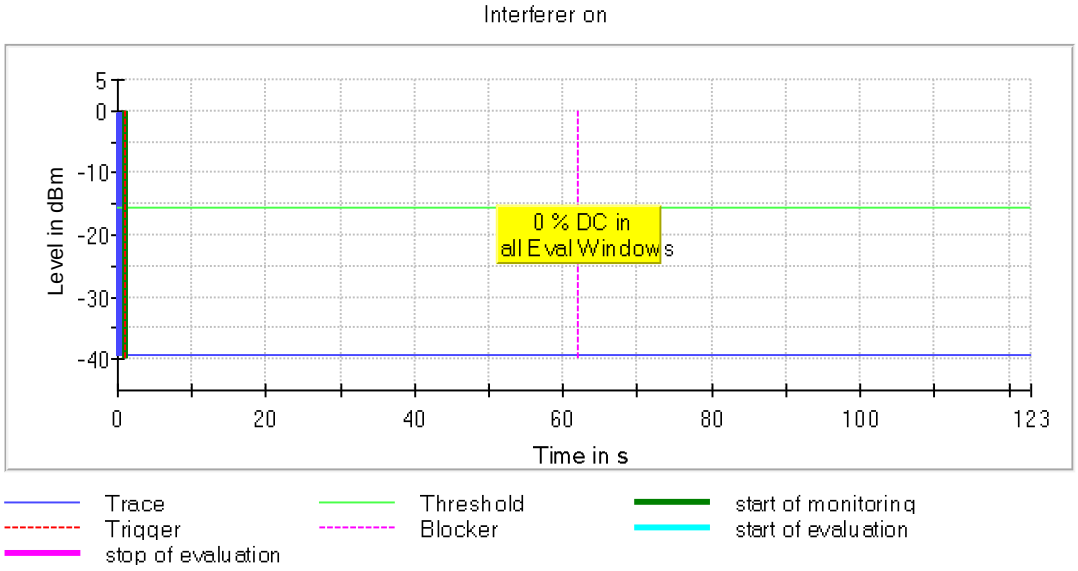
802.11ax20, MCS0	2472	4 and 5	0	-69.750	-36.50	0.000	10.000	PASS

802.11b, low channel

Tests steps 2

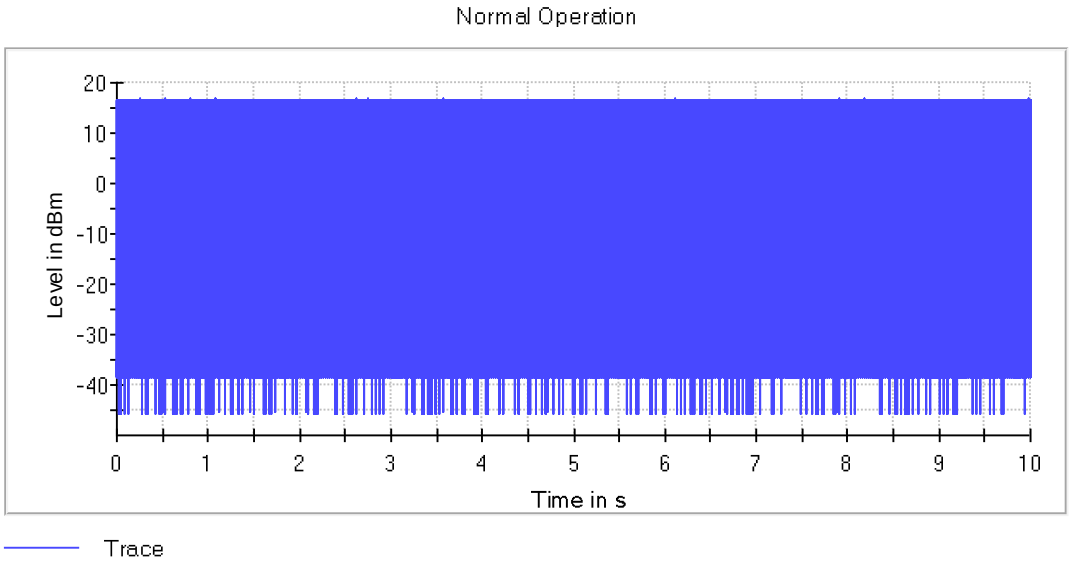


Test steps 4-5

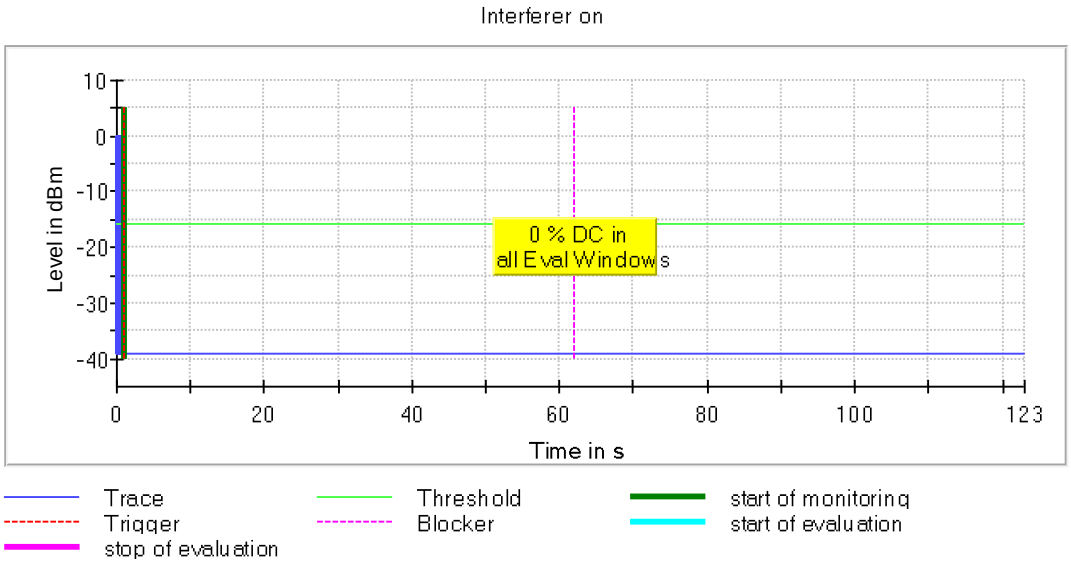


802.11b, high channel

Tests step 2

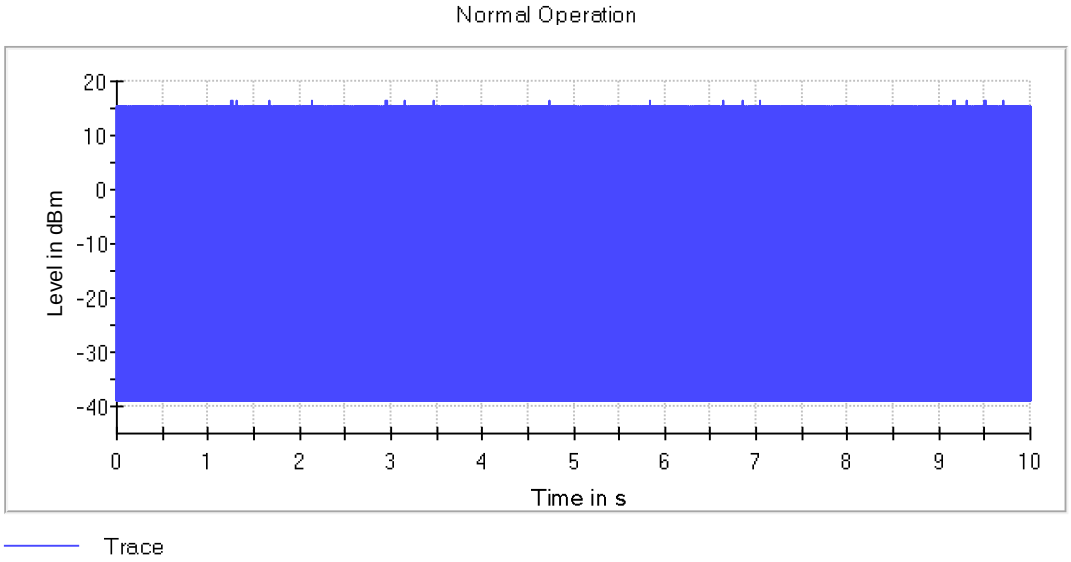


Test steps 4-5

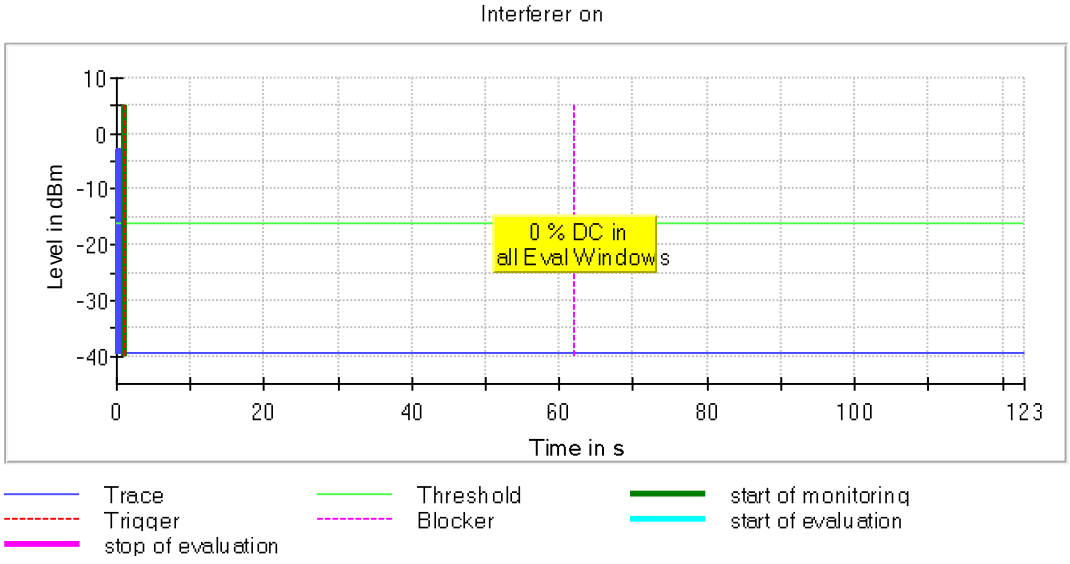


802.11g, low channel

Tests step 2

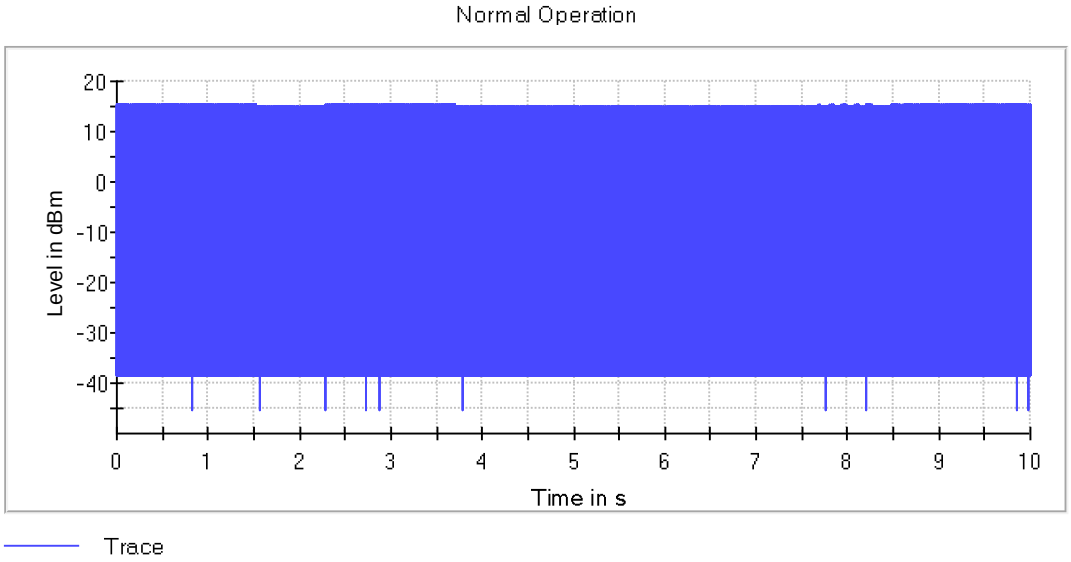


Tests steps 4 and 5

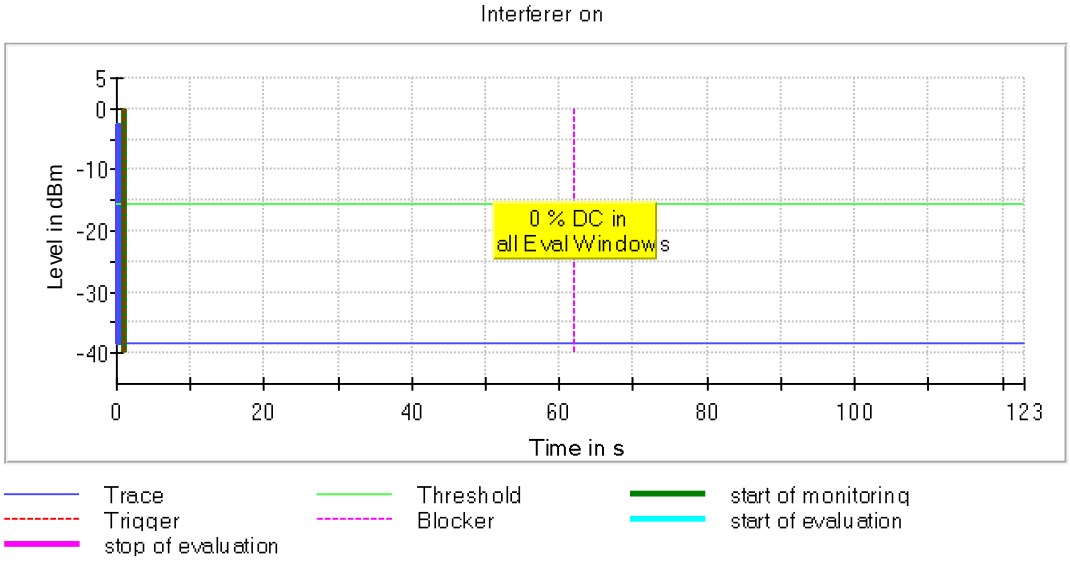


802.11g, high channel

Tests step 2

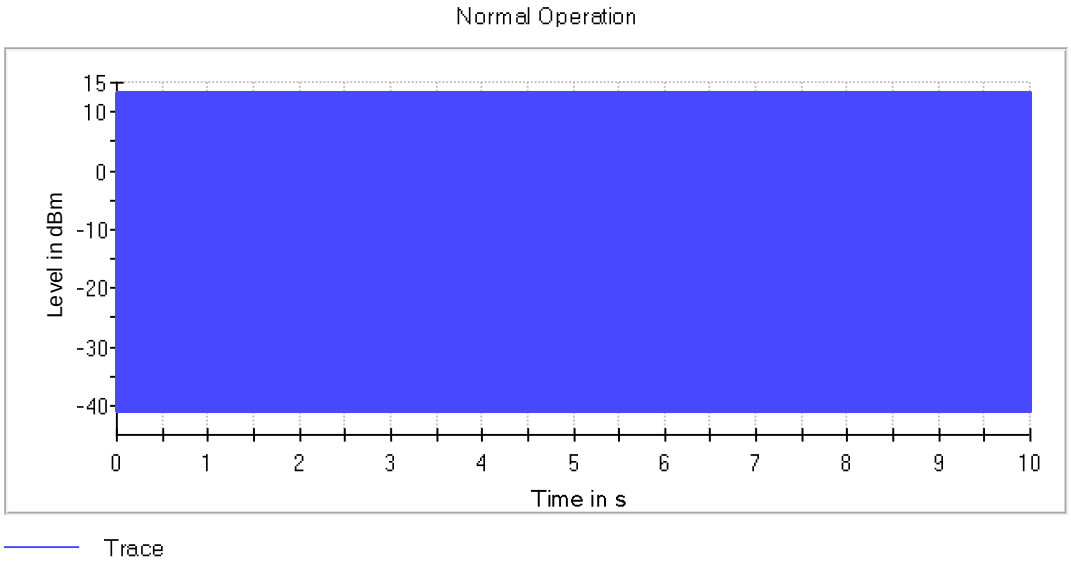


Tests steps 4 and 5

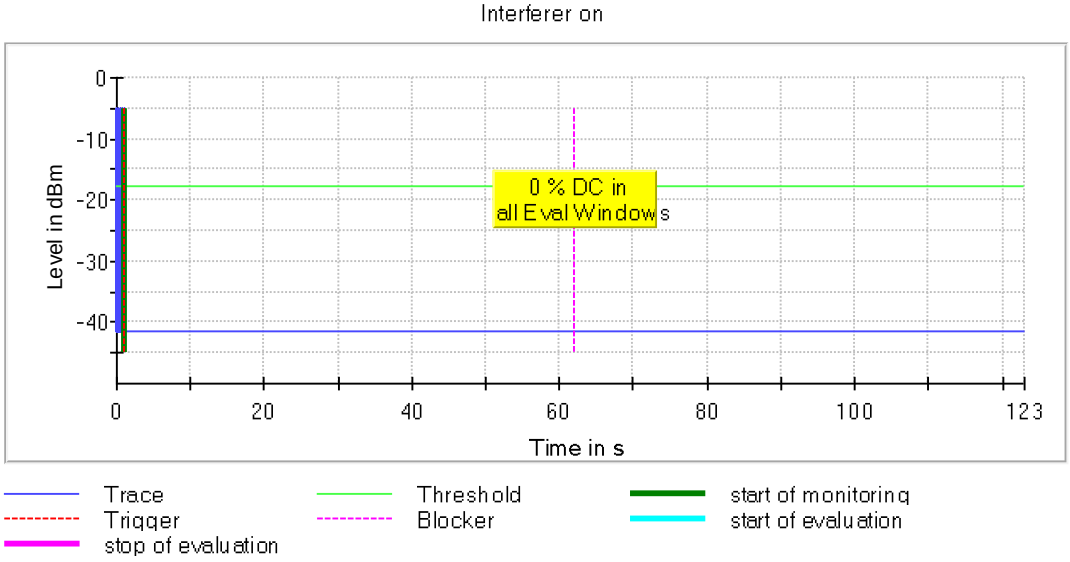


802.11n, low channel

Test step 2

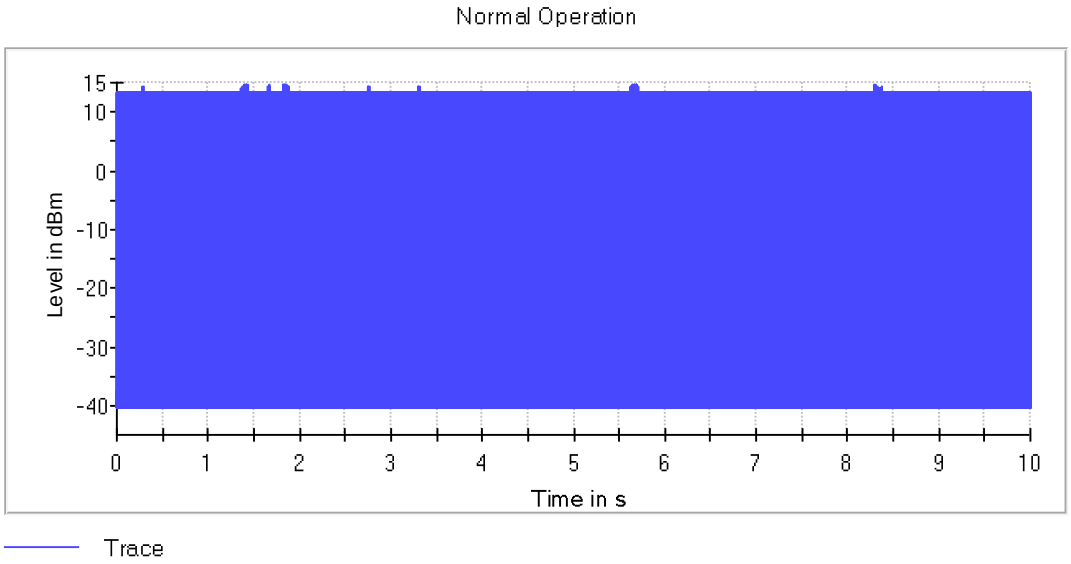


Test steps 4 and 5

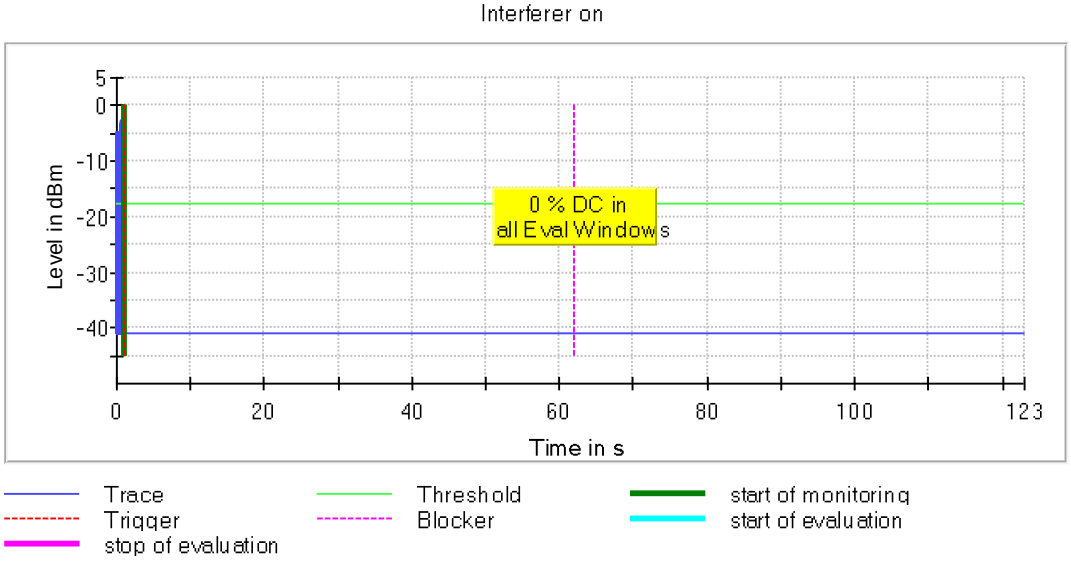


802.11n, high channel

Test step 2

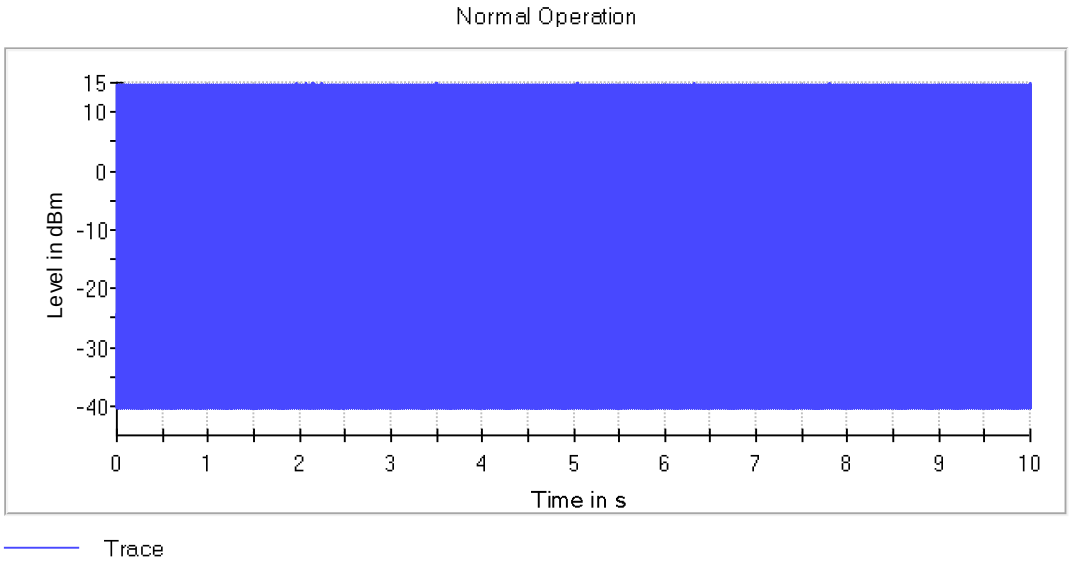


Test step 4 and 5

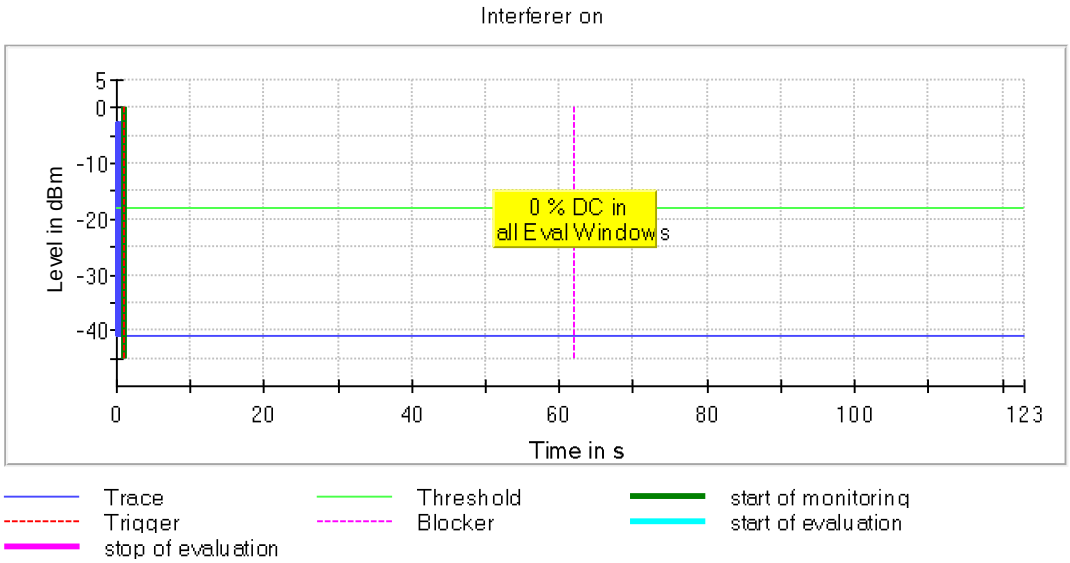


802.11ax, low channel

Test step 2

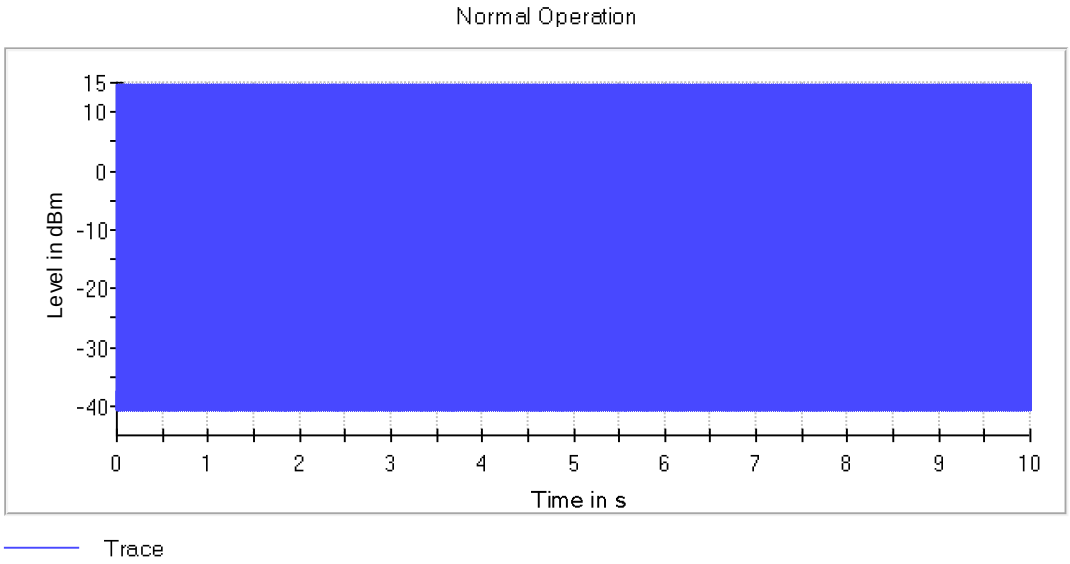


Test step 4 and 5

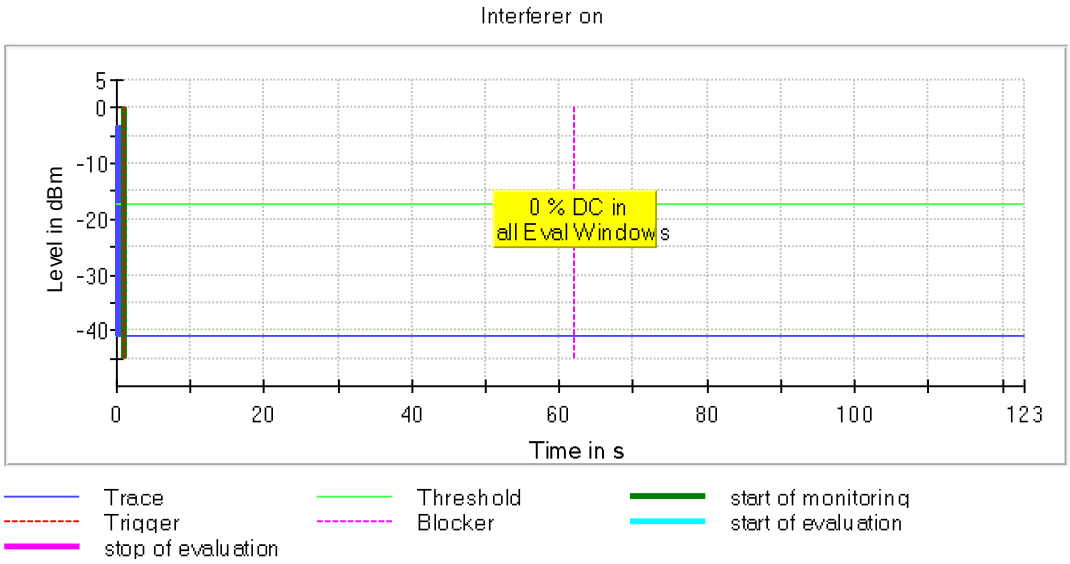


802.11ax, high channel

Test step 2



Test step 4 and 5

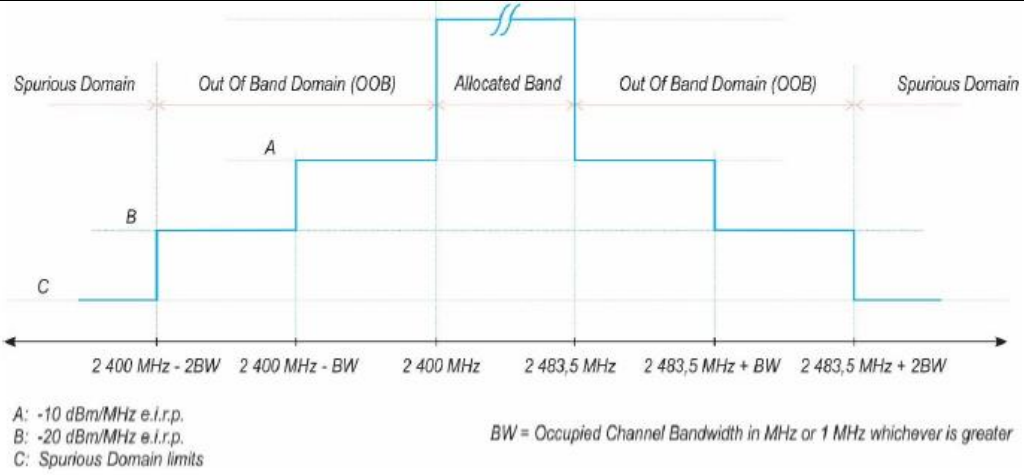


11. Transmitter unwanted emissions in the out-of-band domain

Test requirement: Section 4.3.2.8, Transmitter unwanted emissions in the out-of-band domain
Test method: Section 5.4.8, Transmitter unwanted emissions in the out-of-band domain

Test definition: Transmitter unwanted emissions in the out-of-band domain are emissions when the equipment is in Transmit mode, on frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions.

Limits
The transmitter unwanted emissions in the out-of-band domainbut outside the allocated band, shall not exceed the values provided by the mask



Summary

DUT Mode	DUT Frequency (MHz)	FAIL	PASS	Result
802.11b, 1 Mbps	2412.000000	0	56	PASS
802.11b, 1 Mbps	2472.000000	0	56	PASS
802.11g, 9 Mbps	2412.000000	0	68	PASS
802.11g, 9 Mbps	2472.000000	0	68	PASS
802.11n20, MCS0	2412.000000	0	72	PASS
802.11n20, MCS0	2472.000000	0	72	PASS
802.11ax20, MCS0	2412.000000	0	76	PASS
802.11ax20, MCS0	2472.000000	0	80	PASS

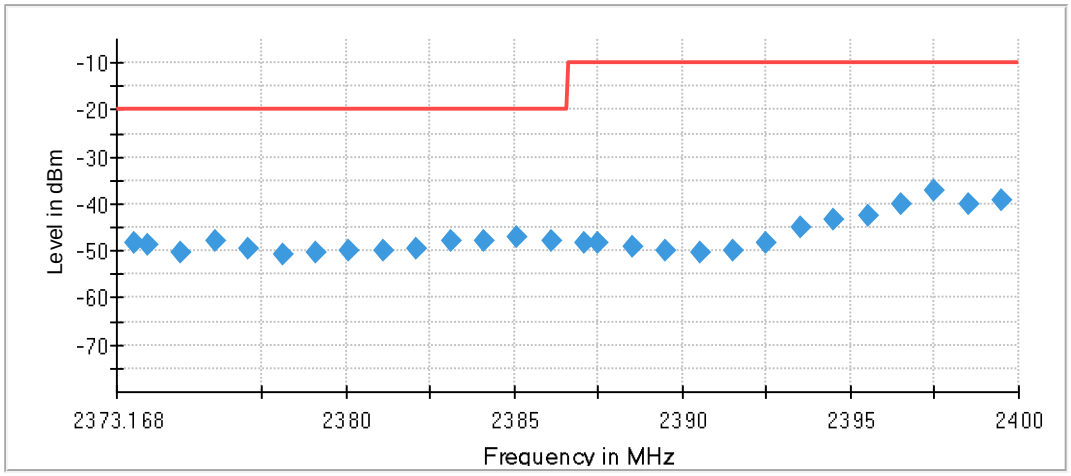
Measurements, 802.11b, 2402 MHz

Frequency (MHz)	level (dBm)	Limit (dBm)	Result
2373.667700	-48.2	-20.0	PASS
2374.083850	-48.5	-20.0	PASS
2375.083850	-50.2	-20.0	PASS
2376.083850	-48.0	-20.0	PASS
2377.083850	-49.6	-20.0	PASS

2378.083850	-50.9	-20.0	PASS
2379.083850	-50.3	-20.0	PASS
2380.083850	-50.1	-20.0	PASS
2381.083850	-50.1	-20.0	PASS
2382.083850	-49.3	-20.0	PASS
2383.083850	-47.7	-20.0	PASS
2384.083850	-48.0	-20.0	PASS
2385.083850	-47.2	-20.0	PASS
2386.083850	-47.8	-20.0	PASS
2387.083850	-48.4	-10.0	PASS
2387.500000	-48.2	-10.0	PASS
2388.500000	-48.9	-10.0	PASS
2389.500000	-49.9	-10.0	PASS
2390.500000	-50.5	-10.0	PASS
2391.500000	-50.0	-10.0	PASS
2392.500000	-48.2	-10.0	PASS
2393.500000	-44.9	-10.0	PASS
2394.500000	-43.4	-10.0	PASS
2395.500000	-42.5	-10.0	PASS
2396.500000	-40.0	-10.0	PASS
2397.500000	-37.3	-10.0	PASS
2398.500000	-40.0	-10.0	PASS
2399.500000	-39.1	-10.0	PASS
2484.000000	-48.7	-10.0	PASS
2485.000000	-49.1	-10.0	PASS
2486.000000	-49.1	-10.0	PASS
2487.000000	-48.1	-10.0	PASS
2488.000000	-49.9	-10.0	PASS
2489.000000	-48.5	-10.0	PASS
2490.000000	-49.2	-10.0	PASS
2491.000000	-48.0	-10.0	PASS
2492.000000	-49.0	-10.0	PASS
2493.000000	-46.6	-10.0	PASS
2494.000000	-46.7	-10.0	PASS
2495.000000	-47.0	-10.0	PASS
2496.000000	-47.8	-10.0	PASS
2496.416150	-48.1	-10.0	PASS
2497.416150	-49.9	-20.0	PASS
2498.416150	-50.0	-20.0	PASS
2499.416150	-50.2	-20.0	PASS
2500.416150	-49.8	-20.0	PASS
2501.416150	-50.0	-20.0	PASS
2502.416150	-50.3	-20.0	PASS
2503.416150	-47.3	-20.0	PASS
2504.416150	-49.5	-20.0	PASS

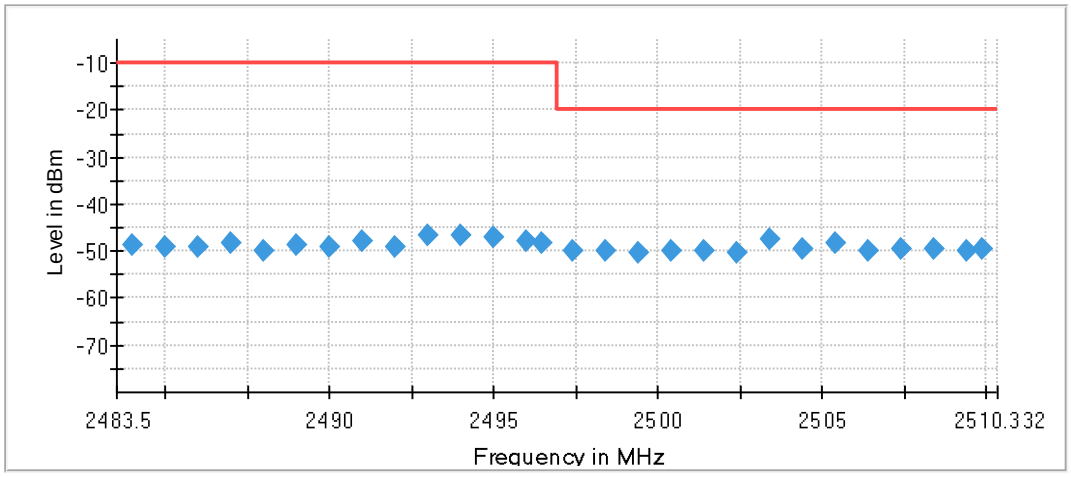
2505.416150	-48.2	-20.0	PASS
2506.416150	-49.7	-20.0	PASS
2507.416150	-49.7	-20.0	PASS
2508.416150	-49.4	-20.0	PASS
2509.416150	-50.1	-20.0	PASS
2509.832300	-49.5	-20.0	PASS

Out of band low



Level Limit

Out of band high



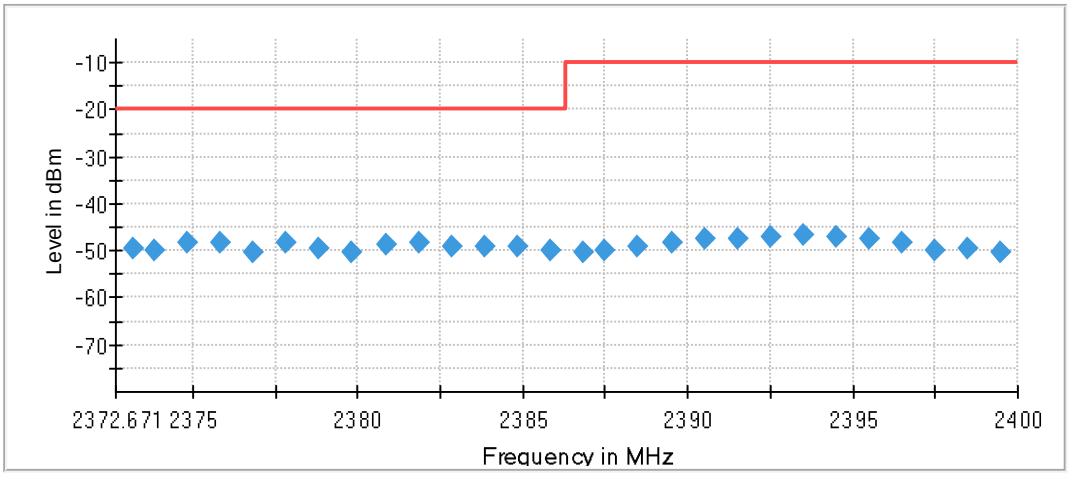
Level Limit

Measurements, 80.11b, 2472 MHz

Frequency (MHz)	level (dBm)	Limit (dBm)	Result
2373.170806	-49.5	-20.0	PASS
2373.835403	-49.8	-20.0	PASS
2374.835403	-48.2	-20.0	PASS
2375.835403	-48.3	-20.0	PASS
2376.835403	-50.3	-20.0	PASS
2377.835403	-48.3	-20.0	PASS
2378.835403	-49.7	-20.0	PASS
2379.835403	-50.4	-20.0	PASS
2380.835403	-48.7	-20.0	PASS
2381.835403	-48.1	-20.0	PASS
2382.835403	-49.1	-20.0	PASS
2383.835403	-49.1	-20.0	PASS
2384.835403	-49.0	-20.0	PASS
2385.835403	-50.1	-20.0	PASS
2386.835403	-50.4	-10.0	PASS
2387.500000	-49.9	-10.0	PASS
2388.500000	-49.1	-10.0	PASS
2389.500000	-48.5	-10.0	PASS
2390.500000	-47.6	-10.0	PASS
2391.500000	-47.6	-10.0	PASS
2392.500000	-47.2	-10.0	PASS
2393.500000	-46.7	-10.0	PASS
2394.500000	-46.9	-10.0	PASS
2395.500000	-47.5	-10.0	PASS
2396.500000	-48.4	-10.0	PASS
2397.500000	-50.1	-10.0	PASS
2398.500000	-49.3	-10.0	PASS
2399.500000	-50.5	-10.0	PASS
2484.000000	-40.3	-10.0	PASS
2485.000000	-38.1	-10.0	PASS
2486.000000	-37.0	-10.0	PASS
2487.000000	-36.2	-10.0	PASS
2488.000000	-38.1	-10.0	PASS
2489.000000	-40.1	-10.0	PASS
2490.000000	-39.8	-10.0	PASS
2491.000000	-45.2	-10.0	PASS
2492.000000	-48.9	-10.0	PASS
2493.000000	-50.8	-10.0	PASS
2494.000000	-49.0	-10.0	PASS
2495.000000	-50.0	-10.0	PASS
2496.000000	-48.8	-10.0	PASS
2496.664597	-49.0	-10.0	PASS

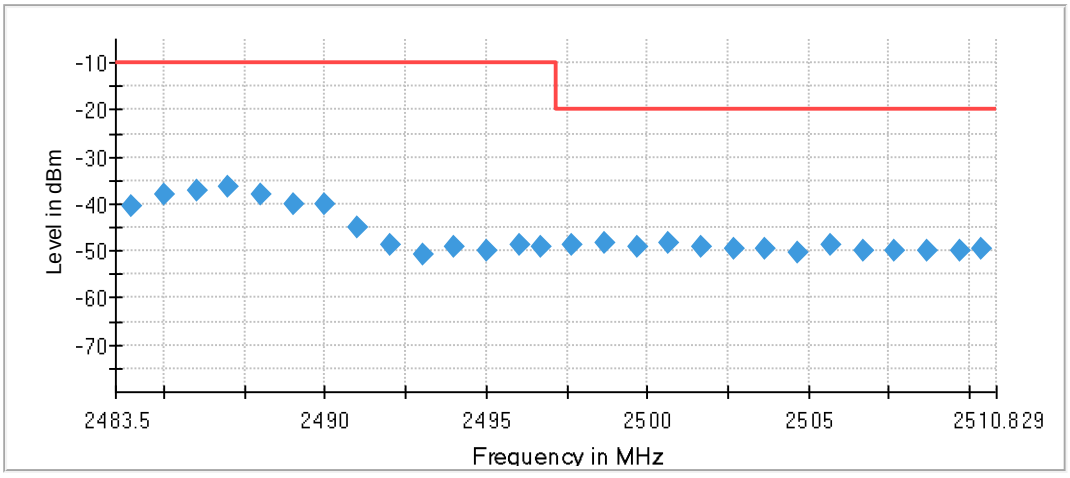
2497.664597	-48.6	-20.0	PASS
2498.664597	-48.1	-20.0	PASS
2499.664597	-49.0	-20.0	PASS
2500.664597	-48.2	-20.0	PASS
2501.664597	-48.9	-20.0	PASS
2502.664597	-49.5	-20.0	PASS
2503.664597	-49.4	-20.0	PASS
2504.664597	-50.4	-20.0	PASS
2505.664597	-48.7	-20.0	PASS
2506.664597	-49.8	-20.0	PASS
2507.664597	-49.9	-20.0	PASS
2508.664597	-50.0	-20.0	PASS
2509.664597	-49.7	-20.0	PASS
2510.329194	-49.6	-20.0	PASS

Out of band low



Level Limit

Out of band high



Level Limit

Measurements, 80.11g, 2412 MHz

Frequency (MHz)	level (dBm)	Limit (dBm)	Result
2360.500000	-48.6	-20.0	PASS
2361.500000	-46.5	-20.0	PASS
2362.500000	-47.5	-20.0	PASS
2363.500000	-48.9	-20.0	PASS
2364.500000	-48.6	-20.0	PASS
2365.500000	-50.0	-20.0	PASS
2366.500000	-50.1	-20.0	PASS
2367.500000	-49.3	-20.0	PASS
2368.500000	-49.0	-20.0	PASS
2369.500000	-49.5	-20.0	PASS
2370.500000	-48.9	-20.0	PASS
2371.500000	-48.6	-20.0	PASS
2372.500000	-48.3	-20.0	PASS
2373.500000	-49.0	-20.0	PASS
2374.500000	-48.6	-20.0	PASS
2375.500000	-49.9	-20.0	PASS
2376.500000	-47.6	-20.0	PASS
2377.500000	-48.0	-20.0	PASS
2378.500000	-49.2	-20.0	PASS
2379.500000	-50.1	-20.0	PASS
2380.500000	-48.2	-10.0	PASS
2381.500000	-49.4	-10.0	PASS
2382.500000	-49.1	-10.0	PASS
2383.500000	-49.5	-10.0	PASS
2384.500000	-48.9	-10.0	PASS
2385.500000	-46.9	-10.0	PASS
2386.500000	-47.4	-10.0	PASS
2387.500000	-49.0	-10.0	PASS
2388.500000	-48.2	-10.0	PASS
2389.500000	-49.9	-10.0	PASS
2390.500000	-49.7	-10.0	PASS
2391.500000	-48.5	-10.0	PASS
2392.500000	-49.1	-10.0	PASS
2393.500000	-48.7	-10.0	PASS
2394.500000	-46.5	-10.0	PASS
2395.500000	-47.8	-10.0	PASS
2396.500000	-48.3	-10.0	PASS
2397.500000	-47.6	-10.0	PASS
2398.500000	-49.4	-10.0	PASS
2399.500000	-46.3	-10.0	PASS

2484.000000	-35.9	-10.0	PASS
2485.000000	-37.0	-10.0	PASS
2486.000000	-38.1	-10.0	PASS
2487.000000	-37.8	-10.0	PASS
2488.000000	-39.7	-10.0	PASS
2489.000000	-38.8	-10.0	PASS
2490.000000	-39.5	-10.0	PASS
2491.000000	-40.4	-10.0	PASS
2492.000000	-41.5	-10.0	PASS
2493.000000	-41.3	-10.0	PASS
2494.000000	-42.0	-10.0	PASS
2495.000000	-43.2	-10.0	PASS
2496.000000	-42.8	-10.0	PASS
2497.000000	-44.6	-10.0	PASS
2498.000000	-44.5	-10.0	PASS
2499.000000	-44.9	-10.0	PASS
2500.000000	-45.4	-10.0	PASS
2501.000000	-45.5	-10.0	PASS
2502.000000	-44.2	-10.0	PASS
2503.000000	-46.5	-10.0	PASS
2504.000000	-45.0	-20.0	PASS
2505.000000	-44.9	-20.0	PASS
2506.000000	-46.2	-20.0	PASS
2507.000000	-46.6	-20.0	PASS
2508.000000	-45.1	-20.0	PASS
2509.000000	-48.2	-20.0	PASS
2510.000000	-46.2	-20.0	PASS
2511.000000	-47.5	-20.0	PASS
2512.000000	-47.9	-20.0	PASS
2513.000000	-49.8	-20.0	PASS
2514.000000	-47.3	-20.0	PASS
2515.000000	-47.1	-20.0	PASS

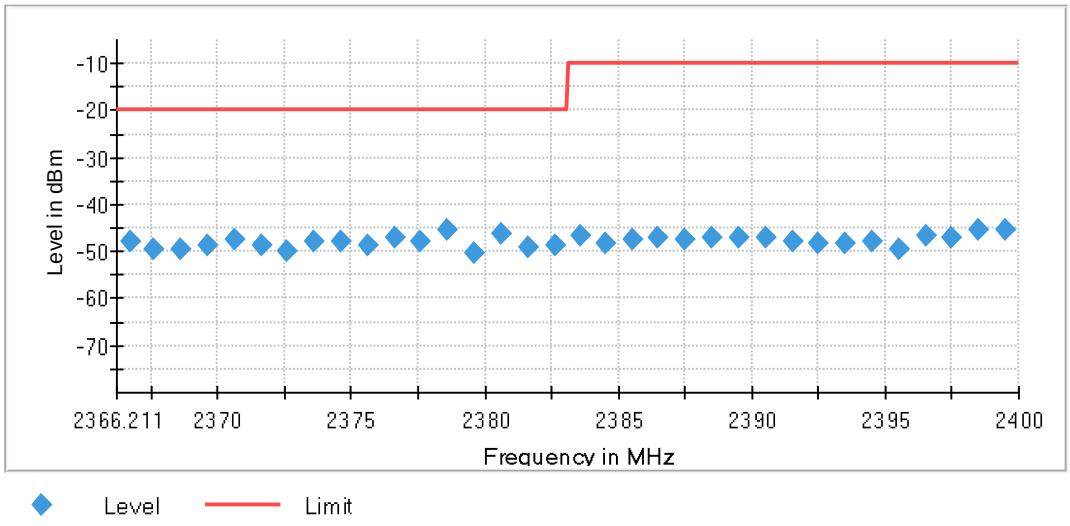
Measurements, 80.11g, 2472 MHz

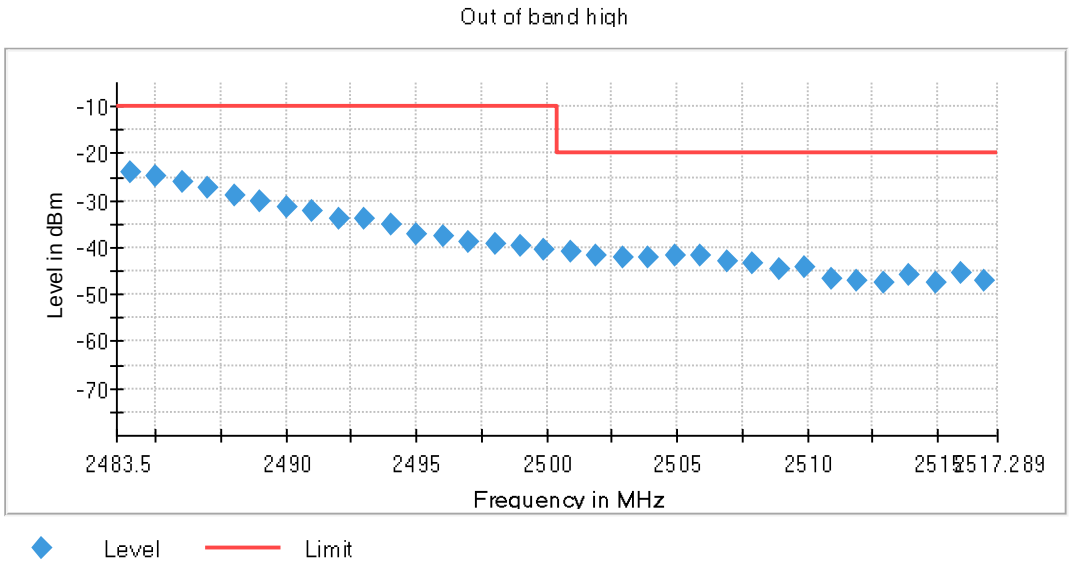
Frequency (MHz)	level (dBm)	Limit (dBm)	Result
2366.711180	-48.0	-20.0	PASS
2367.605590	-49.7	-20.0	PASS
2368.605590	-49.7	-20.0	PASS
2369.605590	-48.7	-20.0	PASS
2370.605590	-47.6	-20.0	PASS
2371.605590	-48.5	-20.0	PASS
2372.605590	-49.9	-20.0	PASS

2373.605590	-47.9	-20.0	PASS
2374.605590	-47.8	-20.0	PASS
2375.605590	-48.8	-20.0	PASS
2376.605590	-47.1	-20.0	PASS
2377.605590	-48.0	-20.0	PASS
2378.605590	-45.4	-20.0	PASS
2379.605590	-50.5	-20.0	PASS
2380.605590	-46.2	-20.0	PASS
2381.605590	-49.3	-20.0	PASS
2382.605590	-48.7	-20.0	PASS
2383.605590	-46.6	-10.0	PASS
2384.500000	-48.1	-10.0	PASS
2385.500000	-47.4	-10.0	PASS
2386.500000	-47.2	-10.0	PASS
2387.500000	-47.5	-10.0	PASS
2388.500000	-47.2	-10.0	PASS
2389.500000	-47.1	-10.0	PASS
2390.500000	-47.2	-10.0	PASS
2391.500000	-48.0	-10.0	PASS
2392.500000	-48.2	-10.0	PASS
2393.500000	-48.3	-10.0	PASS
2394.500000	-47.7	-10.0	PASS
2395.500000	-49.5	-10.0	PASS
2396.500000	-46.7	-10.0	PASS
2397.500000	-47.2	-10.0	PASS
2398.500000	-45.3	-10.0	PASS
2399.500000	-45.5	-10.0	PASS
2484.000000	-23.9	-10.0	PASS
2485.000000	-24.6	-10.0	PASS
2486.000000	-26.1	-10.0	PASS
2487.000000	-27.2	-10.0	PASS
2488.000000	-28.9	-10.0	PASS
2489.000000	-30.1	-10.0	PASS
2490.000000	-31.3	-10.0	PASS
2491.000000	-32.0	-10.0	PASS
2492.000000	-34.0	-10.0	PASS
2493.000000	-33.7	-10.0	PASS
2494.000000	-35.2	-10.0	PASS
2495.000000	-37.0	-10.0	PASS
2496.000000	-37.6	-10.0	PASS
2497.000000	-38.9	-10.0	PASS
2498.000000	-39.4	-10.0	PASS
2499.000000	-39.8	-10.0	PASS
2499.894410	-40.5	-10.0	PASS
2500.894410	-41.0	-20.0	PASS

2501.894410	-41.7	-20.0	PASS
2502.894410	-42.1	-20.0	PASS
2503.894410	-42.2	-20.0	PASS
2504.894410	-41.5	-20.0	PASS
2505.894410	-41.6	-20.0	PASS
2506.894410	-42.7	-20.0	PASS
2507.894410	-43.5	-20.0	PASS
2508.894410	-44.7	-20.0	PASS
2509.894410	-44.2	-20.0	PASS
2510.894410	-46.6	-20.0	PASS
2511.894410	-47.0	-20.0	PASS
2512.894410	-47.3	-20.0	PASS
2513.894410	-45.7	-20.0	PASS
2514.894410	-47.3	-20.0	PASS
2515.894410	-45.2	-20.0	PASS
2516.788820	-47.1	-20.0	PASS

Out of band low





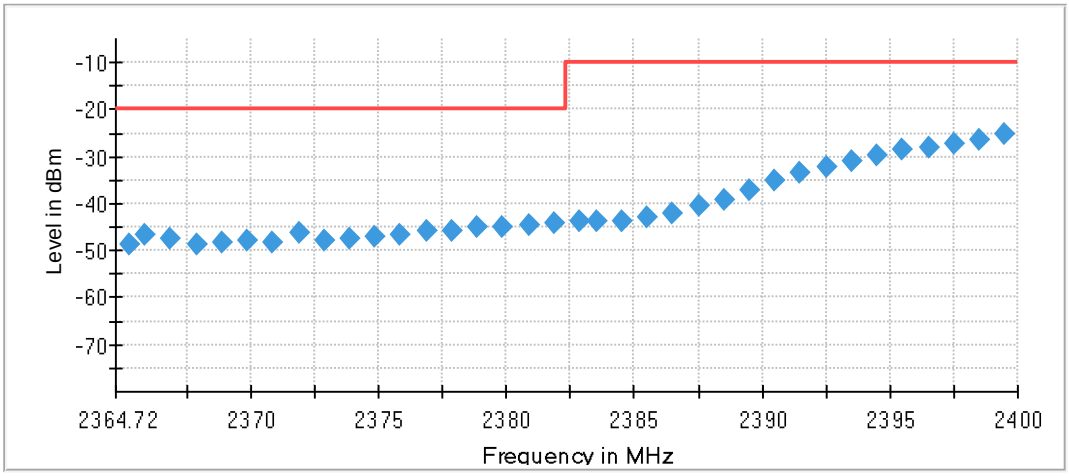
Measurements, 80.11n HT20, 2412 MHz

Frequency (MHz)	level (dBm)	Limit (dBm)	Result
2365.220498	-48.7	-20.0	PASS
2365.860249	-46.8	-20.0	PASS
2366.860249	-47.3	-20.0	PASS
2367.860249	-48.6	-20.0	PASS
2368.860249	-48.4	-20.0	PASS
2369.860249	-47.7	-20.0	PASS
2370.860249	-48.3	-20.0	PASS
2371.860249	-46.0	-20.0	PASS
2372.860249	-47.8	-20.0	PASS
2373.860249	-47.4	-20.0	PASS
2374.860249	-47.2	-20.0	PASS
2375.860249	-46.6	-20.0	PASS
2376.860249	-45.9	-20.0	PASS
2377.860249	-45.6	-20.0	PASS
2378.860249	-45.0	-20.0	PASS
2379.860249	-45.0	-20.0	PASS
2380.860249	-44.5	-20.0	PASS
2381.860249	-44.4	-20.0	PASS
2382.860249	-43.9	-10.0	PASS
2383.500000	-43.6	-10.0	PASS
2384.500000	-43.6	-10.0	PASS
2385.500000	-43.0	-10.0	PASS
2386.500000	-42.0	-10.0	PASS
2387.500000	-40.5	-10.0	PASS
2388.500000	-39.1	-10.0	PASS

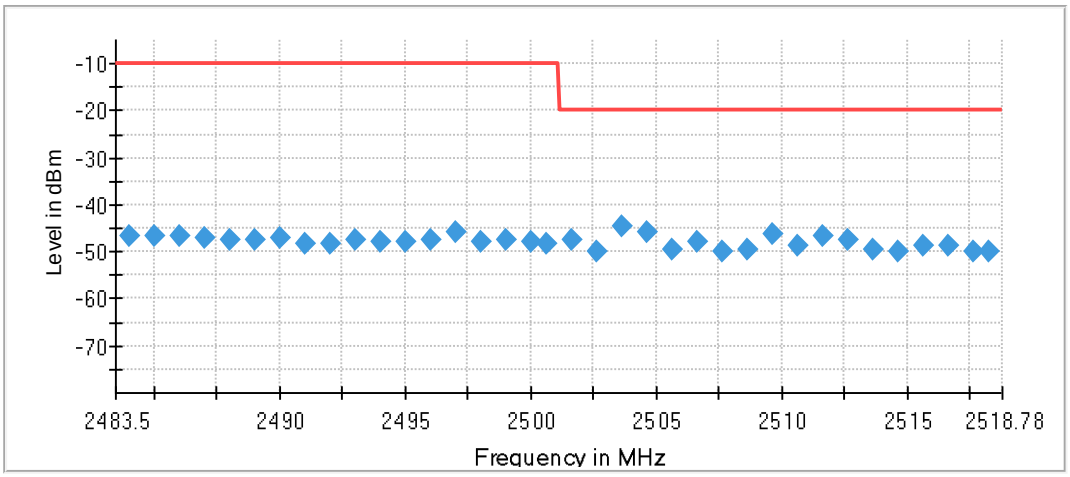
2389.500000	-37.1	-10.0	PASS
2390.500000	-35.2	-10.0	PASS
2391.500000	-33.6	-10.0	PASS
2392.500000	-32.1	-10.0	PASS
2393.500000	-30.9	-10.0	PASS
2394.500000	-29.9	-10.0	PASS
2395.500000	-28.6	-10.0	PASS
2396.500000	-27.9	-10.0	PASS
2397.500000	-27.3	-10.0	PASS
2398.500000	-26.5	-10.0	PASS
2399.500000	-25.1	-10.0	PASS
2484.000000	-46.4	-10.0	PASS
2485.000000	-46.6	-10.0	PASS
2486.000000	-46.8	-10.0	PASS
2487.000000	-47.0	-10.0	PASS
2488.000000	-47.5	-10.0	PASS
2489.000000	-47.6	-10.0	PASS
2490.000000	-47.2	-10.0	PASS
2491.000000	-48.2	-10.0	PASS
2492.000000	-48.2	-10.0	PASS
2493.000000	-47.4	-10.0	PASS
2494.000000	-48.0	-10.0	PASS
2495.000000	-47.7	-10.0	PASS
2496.000000	-47.6	-10.0	PASS
2497.000000	-45.6	-10.0	PASS
2498.000000	-48.0	-10.0	PASS
2499.000000	-47.6	-10.0	PASS
2500.000000	-47.8	-10.0	PASS
2500.639751	-48.2	-10.0	PASS
2501.639751	-47.3	-20.0	PASS
2502.639751	-49.8	-20.0	PASS
2503.639751	-44.7	-20.0	PASS
2504.639751	-45.7	-20.0	PASS
2505.639751	-49.4	-20.0	PASS
2506.639751	-47.8	-20.0	PASS
2507.639751	-49.7	-20.0	PASS
2508.639751	-49.6	-20.0	PASS
2509.639751	-46.4	-20.0	PASS
2510.639751	-48.8	-20.0	PASS
2511.639751	-46.6	-20.0	PASS
2512.639751	-47.4	-20.0	PASS
2513.639751	-49.6	-20.0	PASS
2514.639751	-50.0	-20.0	PASS
2515.639751	-48.7	-20.0	PASS

2516.639751	-48.7	-20.0	PASS
2517.639751	-49.8	-20.0	PASS
2518.279502	-50.0	-20.0	PASS

Out of band low



Out of band high



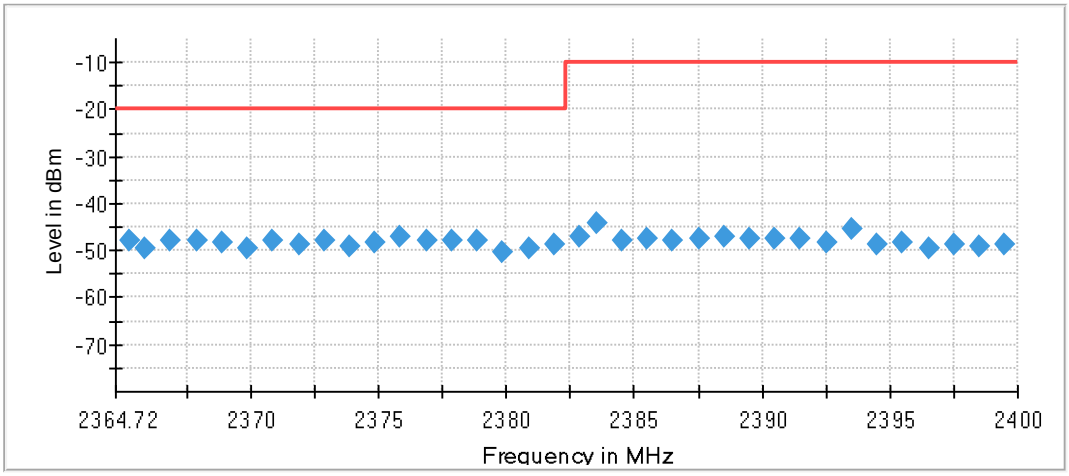
Measurements, 80.11n HT20, 2472 MHz

Frequency (MHz)	level (dBm)	Limit (dBm)	Result
2365.220498	-47.9	-20.0	PASS
2365.860249	-49.6	-20.0	PASS
2366.860249	-47.7	-20.0	PASS
2367.860249	-47.7	-20.0	PASS
2368.860249	-48.3	-20.0	PASS
2369.860249	-49.7	-20.0	PASS
2370.860249	-48.0	-20.0	PASS
2371.860249	-48.8	-20.0	PASS
2372.860249	-47.9	-20.0	PASS
2373.860249	-49.2	-20.0	PASS

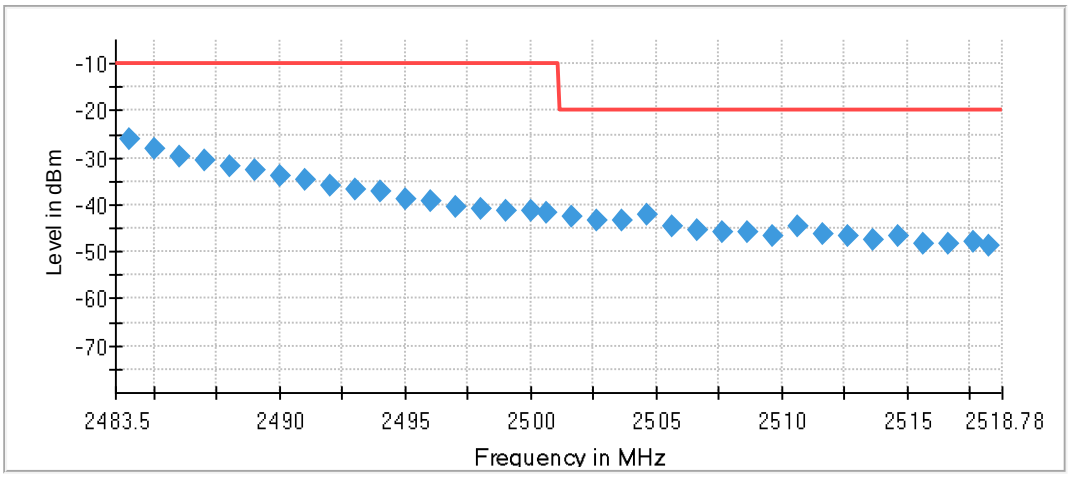
2374.860249	-48.5	-20.0	PASS
2375.860249	-47.2	-20.0	PASS
2376.860249	-47.9	-20.0	PASS
2377.860249	-47.8	-20.0	PASS
2378.860249	-48.0	-20.0	PASS
2379.860249	-50.1	-20.0	PASS
2380.860249	-49.6	-20.0	PASS
2381.860249	-48.6	-20.0	PASS
2382.860249	-46.9	-10.0	PASS
2383.500000	-44.0	-10.0	PASS
2384.500000	-48.0	-10.0	PASS
2385.500000	-47.5	-10.0	PASS
2386.500000	-48.0	-10.0	PASS
2387.500000	-47.4	-10.0	PASS
2388.500000	-47.2	-10.0	PASS
2389.500000	-47.2	-10.0	PASS
2390.500000	-47.3	-10.0	PASS
2391.500000	-47.6	-10.0	PASS
2392.500000	-48.3	-10.0	PASS
2393.500000	-45.4	-10.0	PASS
2394.500000	-48.6	-10.0	PASS
2395.500000	-48.3	-10.0	PASS
2396.500000	-49.6	-10.0	PASS
2397.500000	-48.6	-10.0	PASS
2398.500000	-48.9	-10.0	PASS
2399.500000	-48.5	-10.0	PASS
2484.000000	-26.1	-10.0	PASS
2485.000000	-28.1	-10.0	PASS
2486.000000	-29.6	-10.0	PASS
2487.000000	-30.5	-10.0	PASS
2488.000000	-31.7	-10.0	PASS
2489.000000	-32.7	-10.0	PASS
2490.000000	-33.8	-10.0	PASS
2491.000000	-34.8	-10.0	PASS
2492.000000	-35.7	-10.0	PASS
2493.000000	-36.7	-10.0	PASS
2494.000000	-37.3	-10.0	PASS
2495.000000	-38.6	-10.0	PASS
2496.000000	-39.2	-10.0	PASS
2497.000000	-40.2	-10.0	PASS
2498.000000	-40.7	-10.0	PASS
2499.000000	-41.3	-10.0	PASS
2500.000000	-41.5	-10.0	PASS
2500.639751	-41.7	-10.0	PASS
2501.639751	-42.6	-20.0	PASS

2502.639751	-43.2	-20.0	PASS
2503.639751	-43.3	-20.0	PASS
2504.639751	-42.3	-20.0	PASS
2505.639751	-44.7	-20.0	PASS
2506.639751	-45.5	-20.0	PASS
2507.639751	-45.9	-20.0	PASS
2508.639751	-45.6	-20.0	PASS
2509.639751	-46.6	-20.0	PASS
2510.639751	-44.5	-20.0	PASS
2511.639751	-46.4	-20.0	PASS
2512.639751	-46.5	-20.0	PASS
2513.639751	-47.4	-20.0	PASS
2514.639751	-46.8	-20.0	PASS
2515.639751	-48.3	-20.0	PASS
2516.639751	-48.2	-20.0	PASS
2517.639751	-47.7	-20.0	PASS
2518.279502	-48.9	-20.0	PASS

Out of band low



Out of band high



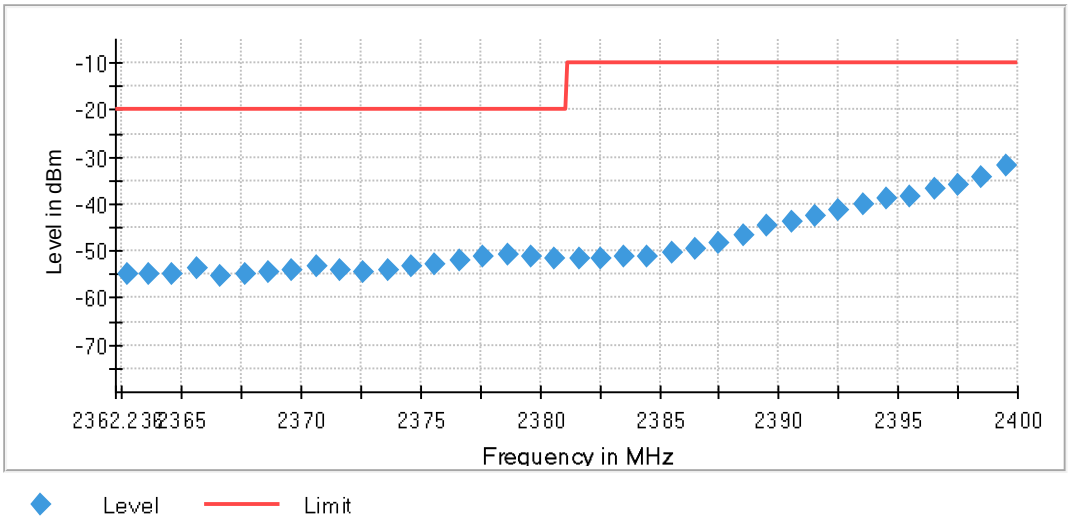
Measurements, 80.11ax HT20, 2412 MHz

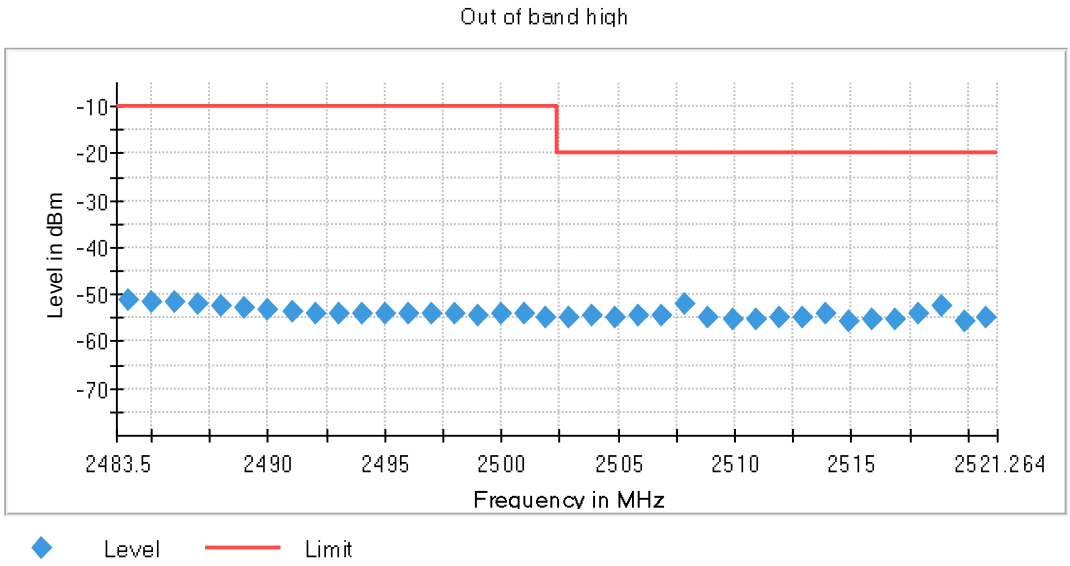
Frequency (MHz)	level (dBm)	Limit (dBm)	Result
2362.736024	-54.9	-20.0	PASS
2363.618012	-54.7	-20.0	PASS
2364.618012	-54.9	-20.0	PASS
2365.618012	-53.6	-20.0	PASS
2366.618012	-55.3	-20.0	PASS
2367.618012	-54.9	-20.0	PASS
2368.618012	-54.6	-20.0	PASS
2369.618012	-54.2	-20.0	PASS
2370.618012	-53.2	-20.0	PASS
2371.618012	-54.2	-20.0	PASS
2372.618012	-54.5	-20.0	PASS

2373.618012	-54.1	-20.0	PASS
2374.618012	-53.4	-20.0	PASS
2375.618012	-52.6	-20.0	PASS
2376.618012	-51.8	-20.0	PASS
2377.618012	-51.2	-20.0	PASS
2378.618012	-50.6	-20.0	PASS
2379.618012	-51.0	-20.0	PASS
2380.618012	-51.4	-20.0	PASS
2381.618012	-51.6	-10.0	PASS
2382.500000	-51.7	-10.0	PASS
2383.500000	-51.3	-10.0	PASS
2384.500000	-51.0	-10.0	PASS
2385.500000	-50.4	-10.0	PASS
2386.500000	-49.4	-10.0	PASS
2387.500000	-48.1	-10.0	PASS
2388.500000	-46.7	-10.0	PASS
2389.500000	-44.7	-10.0	PASS
2390.500000	-43.6	-10.0	PASS
2391.500000	-42.6	-10.0	PASS
2392.500000	-41.3	-10.0	PASS
2393.500000	-40.0	-10.0	PASS
2394.500000	-38.8	-10.0	PASS
2395.500000	-38.2	-10.0	PASS
2396.500000	-36.6	-10.0	PASS
2397.500000	-35.8	-10.0	PASS
2398.500000	-34.1	-10.0	PASS
2399.500000	-31.6	-10.0	PASS
2484.000000	-51.0	-10.0	PASS
2485.000000	-51.5	-10.0	PASS
2486.000000	-51.4	-10.0	PASS
2487.000000	-52.2	-10.0	PASS
2488.000000	-52.3	-10.0	PASS
2489.000000	-52.8	-10.0	PASS
2490.000000	-53.1	-10.0	PASS
2491.000000	-53.4	-10.0	PASS
2492.000000	-53.9	-10.0	PASS
2493.000000	-53.9	-10.0	PASS
2494.000000	-54.0	-10.0	PASS
2495.000000	-54.0	-10.0	PASS
2496.000000	-54.2	-10.0	PASS
2497.000000	-53.9	-10.0	PASS
2498.000000	-53.9	-10.0	PASS
2499.000000	-54.3	-10.0	PASS
2500.000000	-53.9	-10.0	PASS
2501.000000	-54.1	-10.0	PASS

2501.881988	-55.0	-10.0	PASS
2502.881988	-54.8	-20.0	PASS
2503.881988	-54.3	-20.0	PASS
2504.881988	-54.8	-20.0	PASS
2505.881988	-54.4	-20.0	PASS
2506.881988	-54.5	-20.0	PASS
2507.881988	-52.1	-20.0	PASS
2508.881988	-54.9	-20.0	PASS
2509.881988	-55.4	-20.0	PASS
2510.881988	-55.1	-20.0	PASS
2511.881988	-54.8	-20.0	PASS
2512.881988	-54.9	-20.0	PASS
2513.881988	-54.0	-20.0	PASS
2514.881988	-55.6	-20.0	PASS
2515.881988	-55.3	-20.0	PASS
2516.881988	-55.3	-20.0	PASS
2517.881988	-53.9	-20.0	PASS
2518.881988	-52.4	-20.0	PASS
2519.881988	-55.8	-20.0	PASS
2520.763976	-54.9	-20.0	PASS

Out of band low





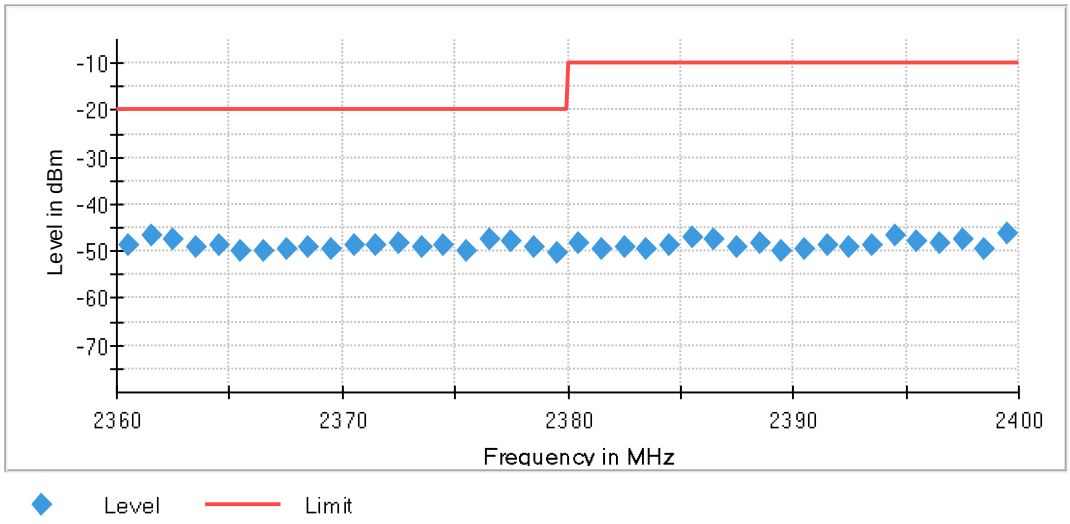
Measurements, 80.11ax HT20, 2472 MHz

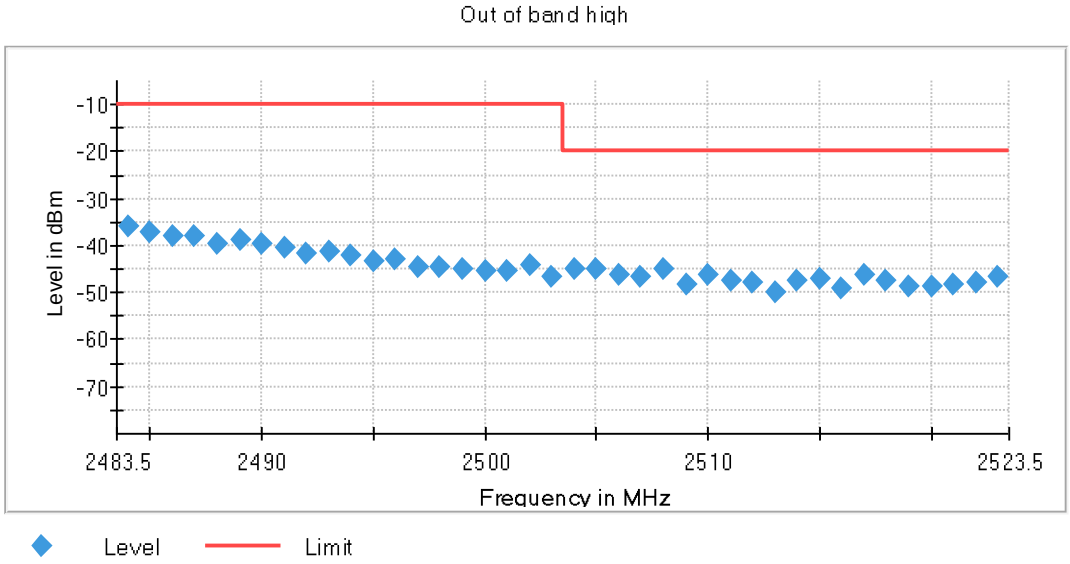
Frequency (MHz)	level (dBm)	Limit (dBm)	Result
2360.500000	-48.6	-20.0	PASS
2361.500000	-46.5	-20.0	PASS
2362.500000	-47.5	-20.0	PASS
2363.500000	-48.9	-20.0	PASS
2364.500000	-48.6	-20.0	PASS
2365.500000	-50.0	-20.0	PASS
2366.500000	-50.1	-20.0	PASS
2367.500000	-49.3	-20.0	PASS
2368.500000	-49.0	-20.0	PASS
2369.500000	-49.5	-20.0	PASS
2370.500000	-48.9	-20.0	PASS
2371.500000	-48.6	-20.0	PASS
2372.500000	-48.3	-20.0	PASS
2373.500000	-49.0	-20.0	PASS
2374.500000	-48.6	-20.0	PASS
2375.500000	-49.9	-20.0	PASS
2376.500000	-47.6	-20.0	PASS
2377.500000	-48.0	-20.0	PASS
2378.500000	-49.2	-20.0	PASS
2379.500000	-50.1	-20.0	PASS
2380.500000	-48.2	-10.0	PASS
2381.500000	-49.4	-10.0	PASS
2382.500000	-49.1	-10.0	PASS
2383.500000	-49.5	-10.0	PASS
2384.500000	-48.9	-10.0	PASS
2385.500000	-46.9	-10.0	PASS

2386.500000	-47.4	-10.0	PASS
2387.500000	-49.0	-10.0	PASS
2388.500000	-48.2	-10.0	PASS
2389.500000	-49.9	-10.0	PASS
2390.500000	-49.7	-10.0	PASS
2391.500000	-48.5	-10.0	PASS
2392.500000	-49.1	-10.0	PASS
2393.500000	-48.7	-10.0	PASS
2394.500000	-46.5	-10.0	PASS
2395.500000	-47.8	-10.0	PASS
2396.500000	-48.3	-10.0	PASS
2397.500000	-47.6	-10.0	PASS
2398.500000	-49.4	-10.0	PASS
2399.500000	-46.3	-10.0	PASS
2484.000000	-35.9	-10.0	PASS
2485.000000	-37.0	-10.0	PASS
2486.000000	-38.1	-10.0	PASS
2487.000000	-37.8	-10.0	PASS
2488.000000	-39.7	-10.0	PASS
2489.000000	-38.8	-10.0	PASS
2490.000000	-39.5	-10.0	PASS
2491.000000	-40.4	-10.0	PASS
2492.000000	-41.5	-10.0	PASS
2493.000000	-41.3	-10.0	PASS
2494.000000	-42.0	-10.0	PASS
2495.000000	-43.2	-10.0	PASS
2496.000000	-42.8	-10.0	PASS
2497.000000	-44.6	-10.0	PASS
2498.000000	-44.5	-10.0	PASS
2499.000000	-44.9	-10.0	PASS
2500.000000	-45.4	-10.0	PASS
2501.000000	-45.5	-10.0	PASS
2502.000000	-44.2	-10.0	PASS
2503.000000	-46.5	-10.0	PASS
2504.000000	-45.0	-20.0	PASS
2505.000000	-44.9	-20.0	PASS
2506.000000	-46.2	-20.0	PASS
2507.000000	-46.6	-20.0	PASS
2508.000000	-45.1	-20.0	PASS
2509.000000	-48.2	-20.0	PASS
2510.000000	-46.2	-20.0	PASS
2511.000000	-47.5	-20.0	PASS
2512.000000	-47.9	-20.0	PASS
2513.000000	-49.8	-20.0	PASS

2514.000000	-47.3	-20.0	PASS
2515.000000	-47.1	-20.0	PASS
2516.000000	-49.0	-20.0	PASS
2517.000000	-46.2	-20.0	PASS
2518.000000	-47.4	-20.0	PASS
2519.000000	-48.5	-20.0	PASS
2520.000000	-48.6	-20.0	PASS
2521.000000	-48.4	-20.0	PASS
2522.000000	-47.7	-20.0	PASS
2523.000000	-46.7	-20.0	PASS

Out of band low





12. Transmitter unwanted emissions in the spurious domain

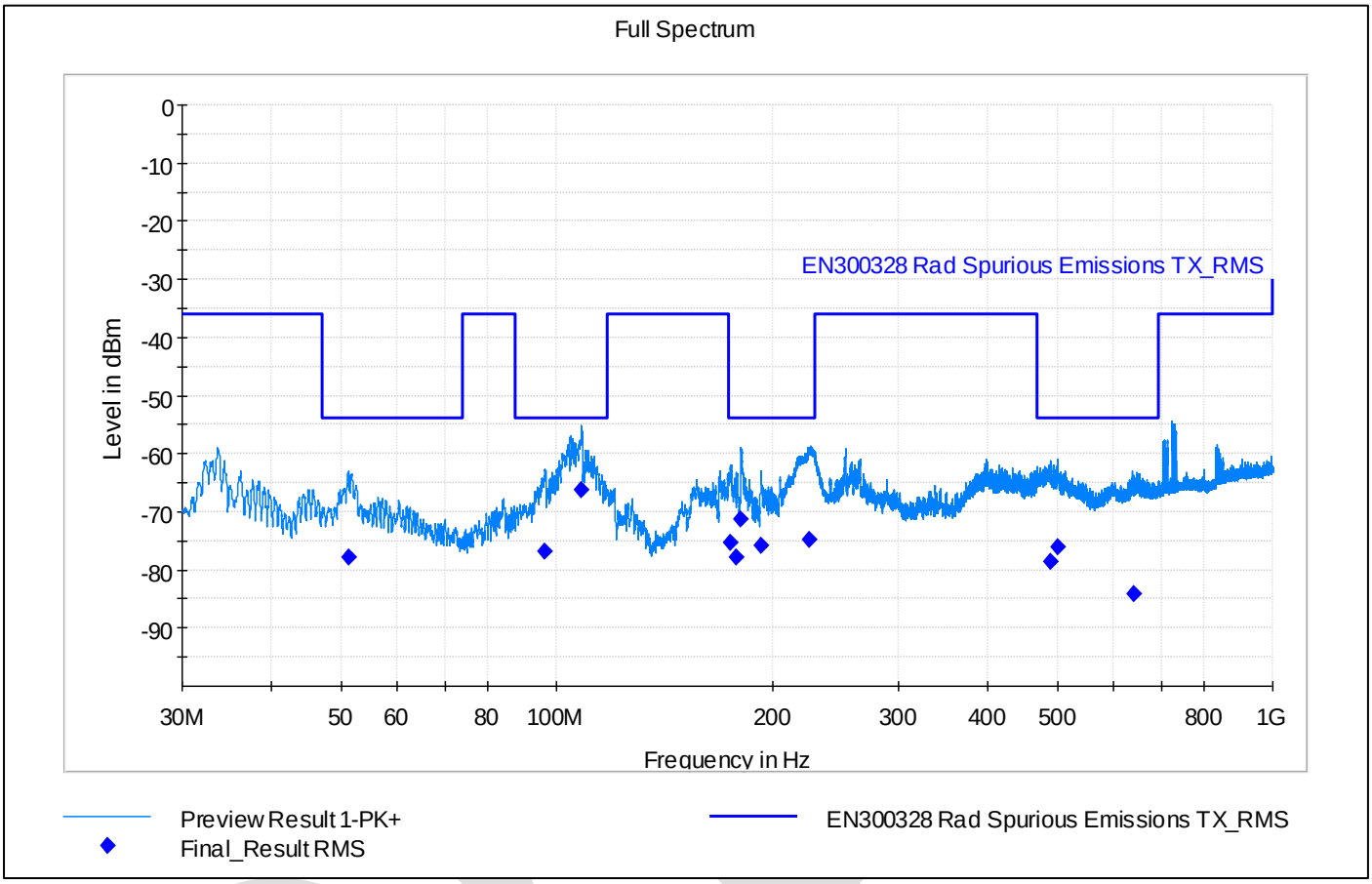
Test requirement 4.3.2.9 Transmitter unwanted emissions in the spurious domain
Test method: 5.4.9.2.2 (radiated) Transmitter unwanted emissions in the spurious domain

Test definition: transmitter unwanted emissions in the spurious domain are emissions outside the allocated band and outside the Out-of-band Domain when the equipment is in Transmit mode.

Limits:		
Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

Operation mode(s)	Configuration	Test Verdict
802.11b	1 Mbps, ch01 (2412 MHz)	PASS
802.11b	1 Mbps, ch13 (2472 MHz)	PASS

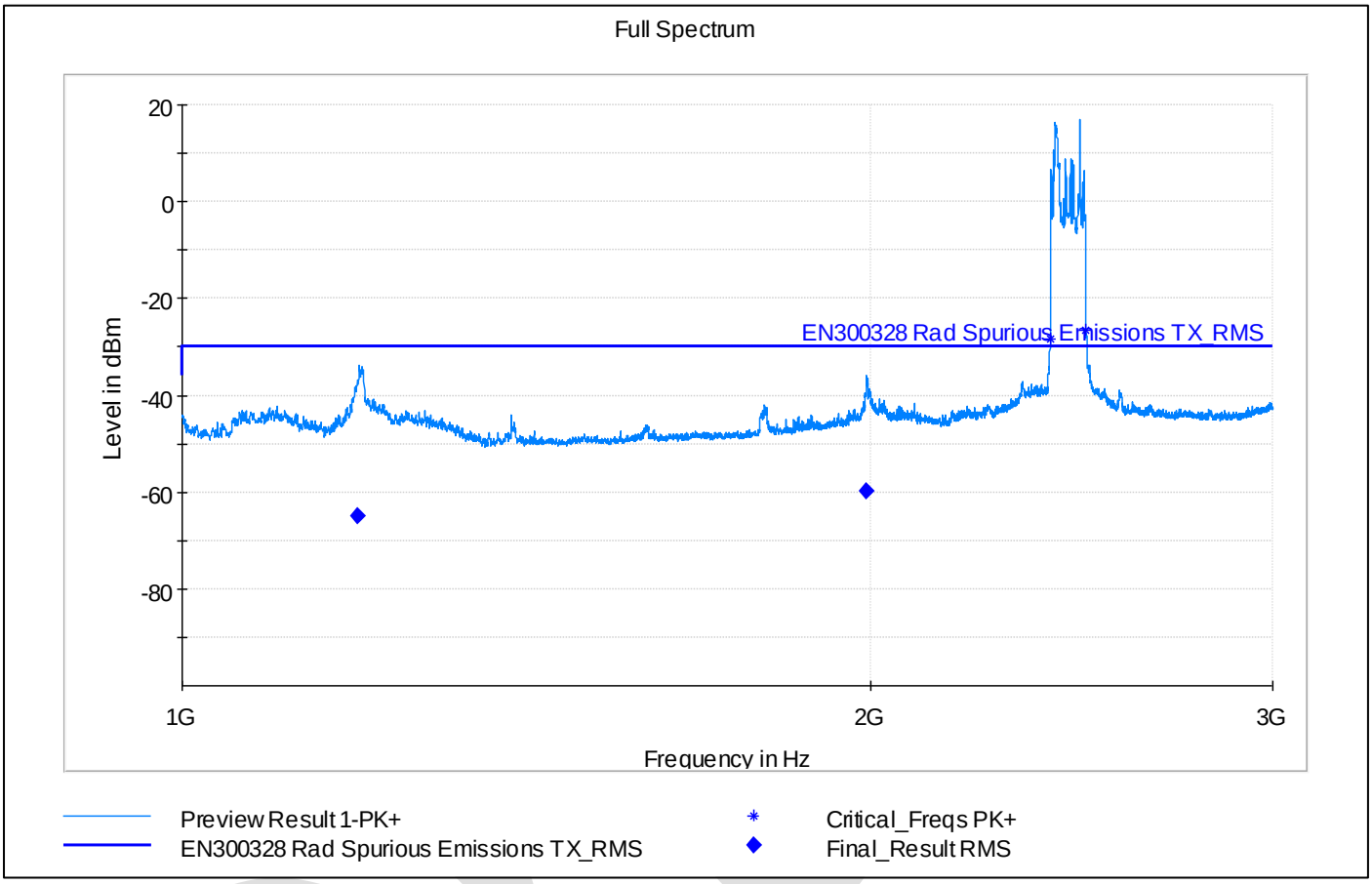
Test data: 802.11b, channel low, 30 – 1000 MHz



Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
51.275000	-77.90	-54.00	23.90	100.0	100.000	170.0	V	230.0	90.0	-76.4	PASS
96.425000	-76.72	-54.00	22.72	100.0	100.000	170.0	V	202.0	0.0	-75.4	PASS
108.325000	-66.17	-54.00	12.17	100.0	100.000	170.0	V	186.0	90.0	-78.3	PASS
174.950000	-75.26	-54.00	21.26	100.0	100.000	170.0	V	216.0	90.0	-79.7	PASS
178.375000	-77.73	-54.00	23.73	100.0	100.000	170.0	H	-7.0	0.0	-79.3	PASS
180.975000	-71.19	-54.00	17.19	100.0	100.000	170.0	H	192.0	0.0	-78.9	PASS
192.975000	-75.77	-54.00	21.77	100.0	100.000	170.0	H	167.0	0.0	-77.0	PASS
225.525000	-74.85	-54.00	20.85	100.0	100.000	170.0	V	261.0	90.0	-77.1	PASS
488.400000	-78.52	-54.00	24.52	100.0	100.000	170.0	H	221.0	90.0	-72.6	PASS
501.000000	-76.05	-54.00	22.05	100.0	100.000	170.0	H	232.0	90.0	-72.2	PASS
639.600000	-84.20	-54.00	30.20	100.0	100.000	170.0	V	323.0	90.0	-69.8	PASS

Test data: 802.11b, channel low, 1.0 – 3.0 GHz



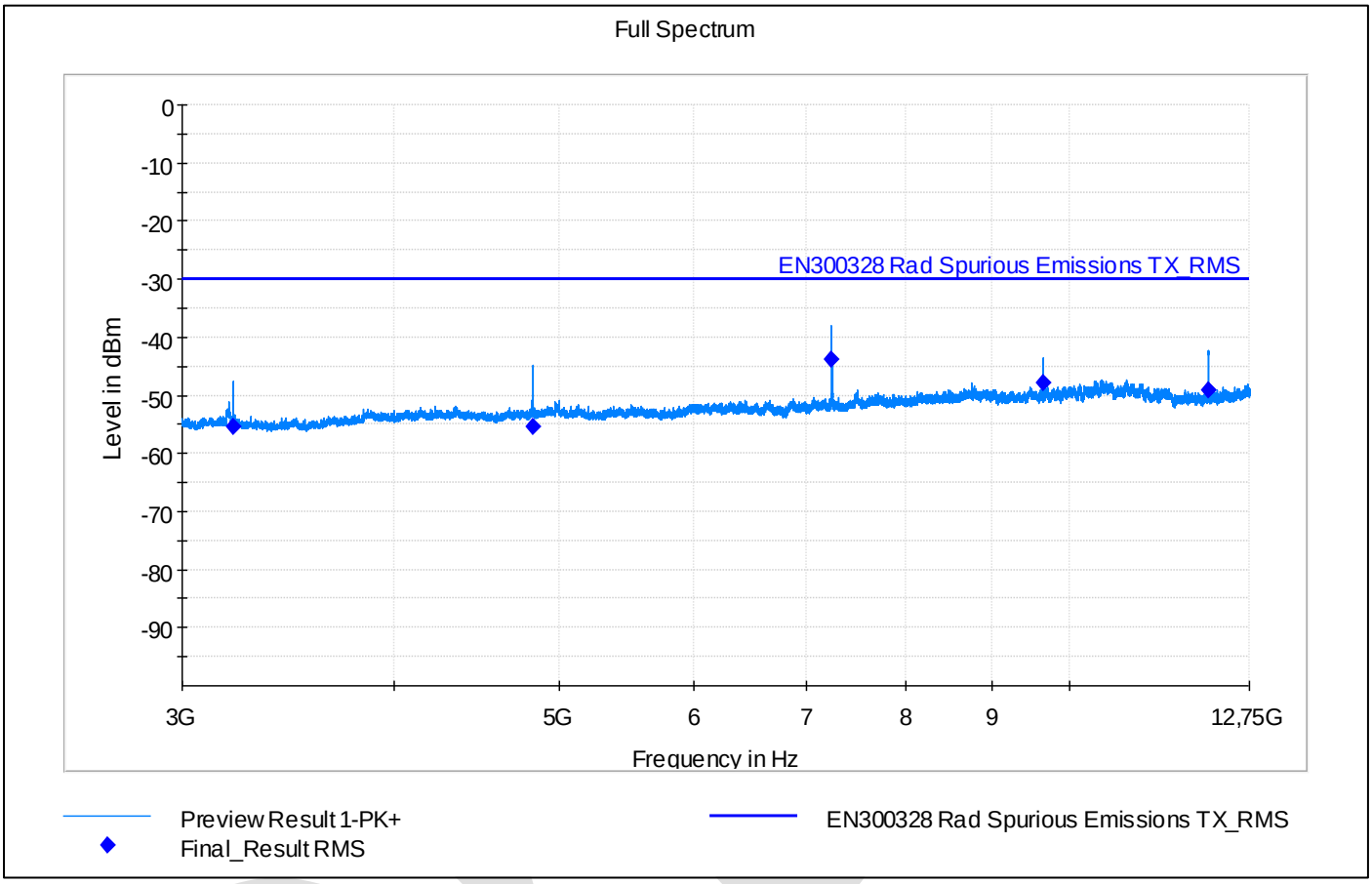
Note: Frequency range 2400 MHz to 2483,750 MHz is excluded from spurious domain measurements and ignored. See table below.

Frequency (MHz)	Comment
2400	2.4 GHz ISM Band reject filter, low edge, IGNORED
2483.750	2.4 GHz ISM Band reject filter, high edge, IGNORED

Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
1194.000000	-64.86	-30.00	34.86	100.0	1000.000	170.0	V	282.0	0.0	-90.0	PASS
1991.500000	-59.86	-30.00	29.86	100.0	1000.000	170.0	V	286.0	0.0	-84.4	PASS

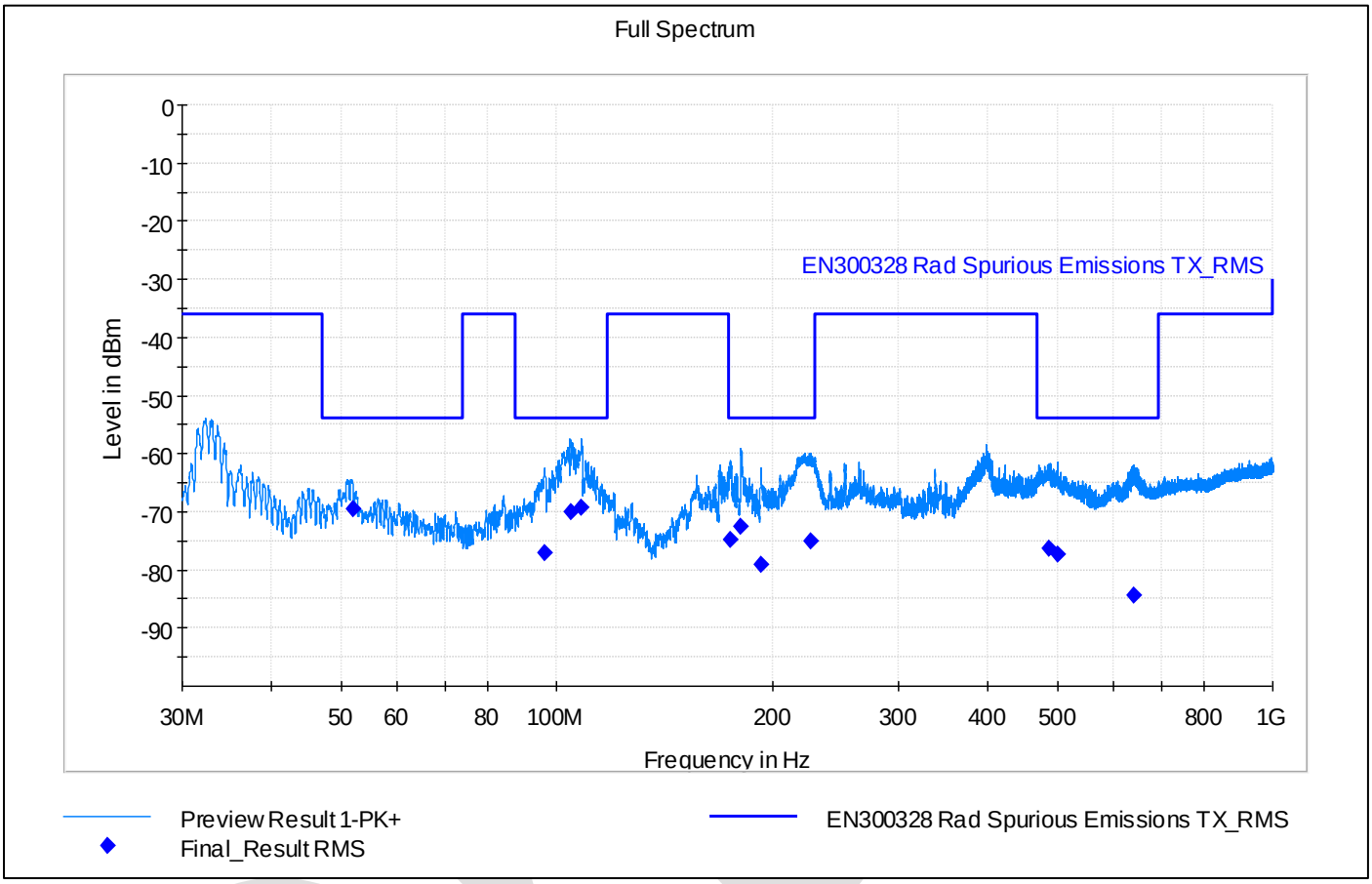
Test data: 802.11b, channel low, 3.0 – 12.75 GHz



Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
3216.000000	-55.47	-30.00	25.47	100.0	1000.000	170.0	H	271.0	0.0	-93.0	PASS
4823.750000	-55.43	-30.00	25.43	100.0	1000.000	170.0	H	219.0	90.0	-89.5	PASS
7235.000000	-43.92	-30.00	13.92	100.0	1000.000	170.0	H	202.0	0.0	-86.0	PASS
9647.750000	-47.82	-30.00	17.82	100.0	1000.000	170.0	H	200.0	0.0	-83.1	PASS
12059.250000	-49.22	-30.00	19.22	100.0	1000.000	170.0	H	198.0	0.0	-80.9	PASS

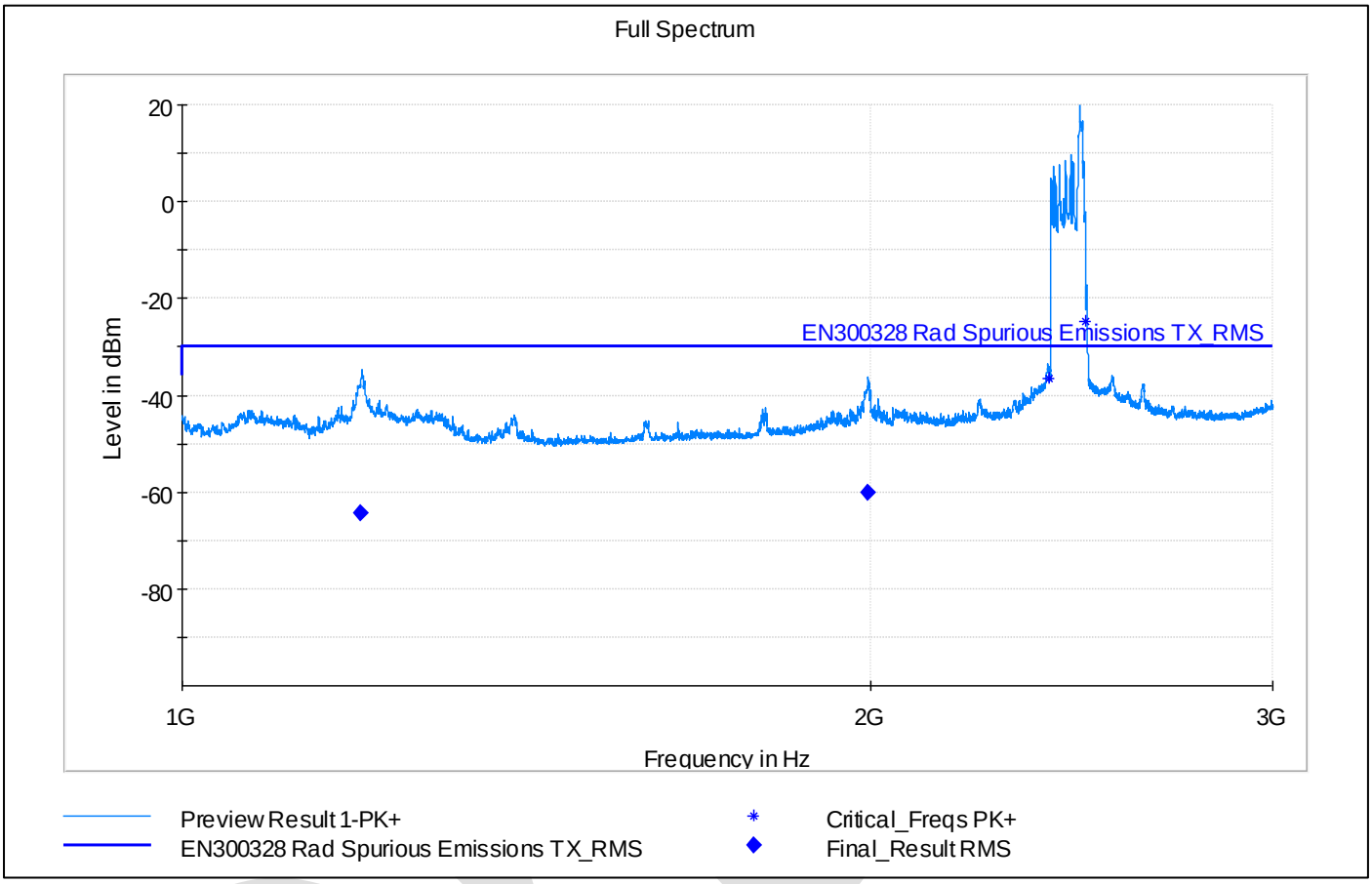
Test data: 802.11b, channel high, 30 – 1000 MHz



Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
51.900000	-69.64	-54.00	15.64	100.0	100.000	170.0	V	236.0	90.0	-76.4	PASS
96.075000	-77.14	-54.00	23.14	100.0	100.000	170.0	V	181.0	0.0	-75.5	PASS
104.550000	-70.12	-54.00	16.12	100.0	100.000	170.0	V	173.0	0.0	-76.4	PASS
108.350000	-69.21	-54.00	15.21	100.0	100.000	170.0	V	183.0	90.0	-78.3	PASS
175.200000	-74.93	-54.00	20.93	100.0	100.000	170.0	V	208.0	90.0	-79.7	PASS
181.100000	-72.57	-54.00	18.57	100.0	100.000	170.0	H	-13.0	0.0	-78.8	PASS
193.000000	-79.08	-54.00	25.08	100.0	100.000	170.0	H	202.0	90.0	-77.0	PASS
226.225000	-74.96	-54.00	20.96	100.0	100.000	170.0	V	279.0	0.0	-77.0	PASS
487.775000	-76.23	-54.00	22.23	100.0	100.000	170.0	V	202.0	0.0	-72.4	PASS
500.300000	-77.45	-54.00	23.45	100.0	100.000	170.0	H	247.0	90.0	-72.2	PASS
641.175000	-84.41	-54.00	30.41	100.0	100.000	170.0	V	305.0	0.0	-69.7	PASS

Test data: 802.11b, channel high, 1.0 – 3.0 GHz



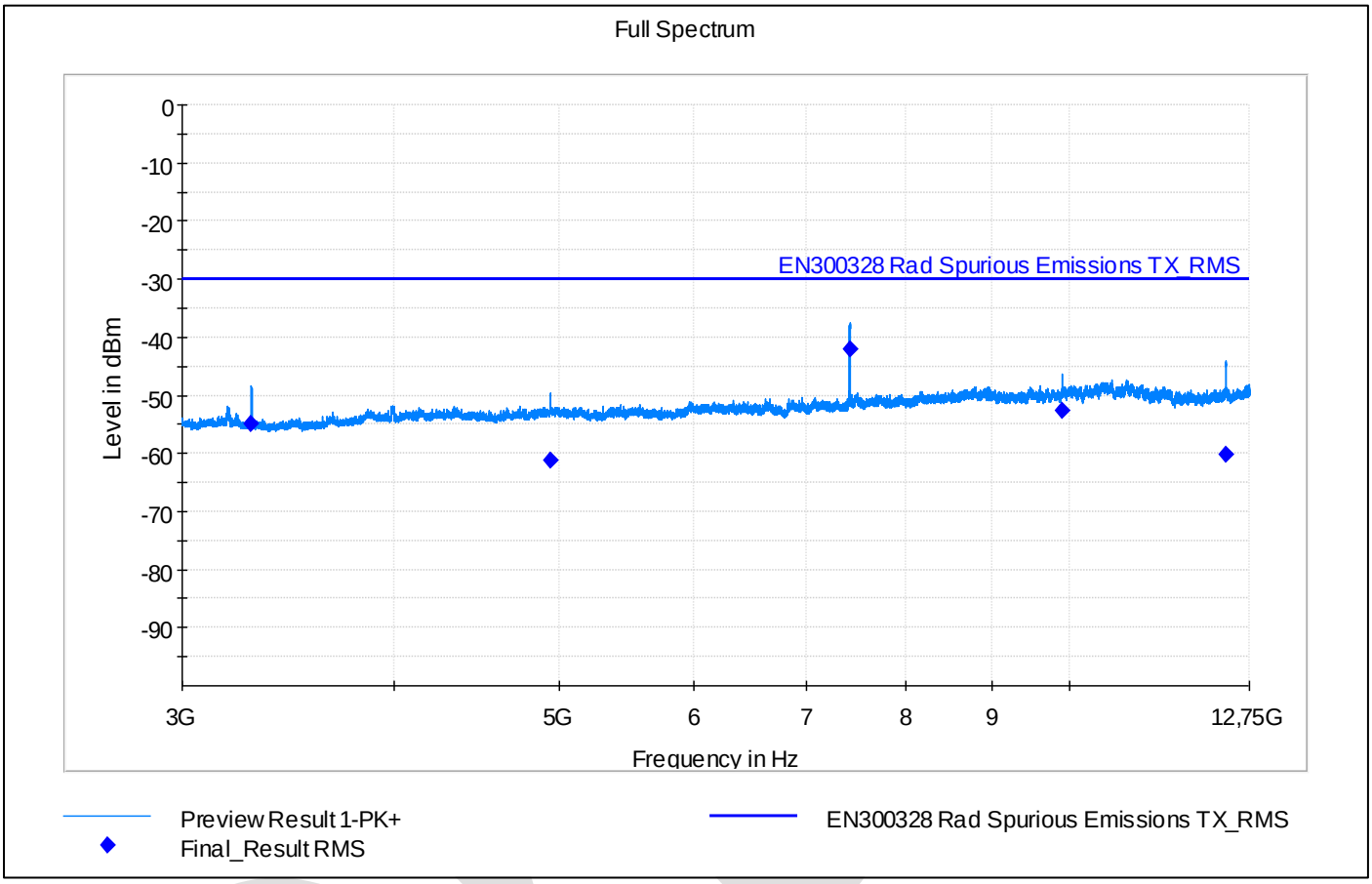
Note: Frequency range 2400 MHz to 2481,500 MHz is excluded from spurious domain measurements and ignored. See table below.

Frequency (MHz)	Comment
2400	2.4 GHz ISM Band reject filter, low edge, IGNORED
2481.500	2.4 GHz ISM Band reject filter, high edge, IGNORED

Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
1197.500000	-64.39	-30.00	34.39	100.0	1000.000	170.0	H	165.0	0.0	-90.5	PASS
1995.500000	-59.96	-30.00	29.96	100.0	1000.000	170.0	V	285.0	0.0	-84.4	PASS

Test data: 802.11b, channel high, 3.0 – 12.75 GHz



Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
3296.000000	-55.02	-30.00	25.02	100.0	1000.000	170.0	H	215.0	0.0	-92.9	PASS
4944.000000	-61.19	-30.00	31.19	100.0	1000.000	170.0	H	292.0	0.0	-89.4	PASS
7415.000000	-42.01	-30.00	12.01	100.0	1000.000	170.0	H	198.0	0.0	-85.5	PASS
9887.750000	-52.69	-30.00	22.69	100.0	1000.000	170.0	H	194.0	0.0	-82.5	PASS
12359.250000	-60.12	-30.00	30.12	100.0	1000.000	170.0	H	163.0	90.0	-80.9	PASS

13. Receiver spurious emissions

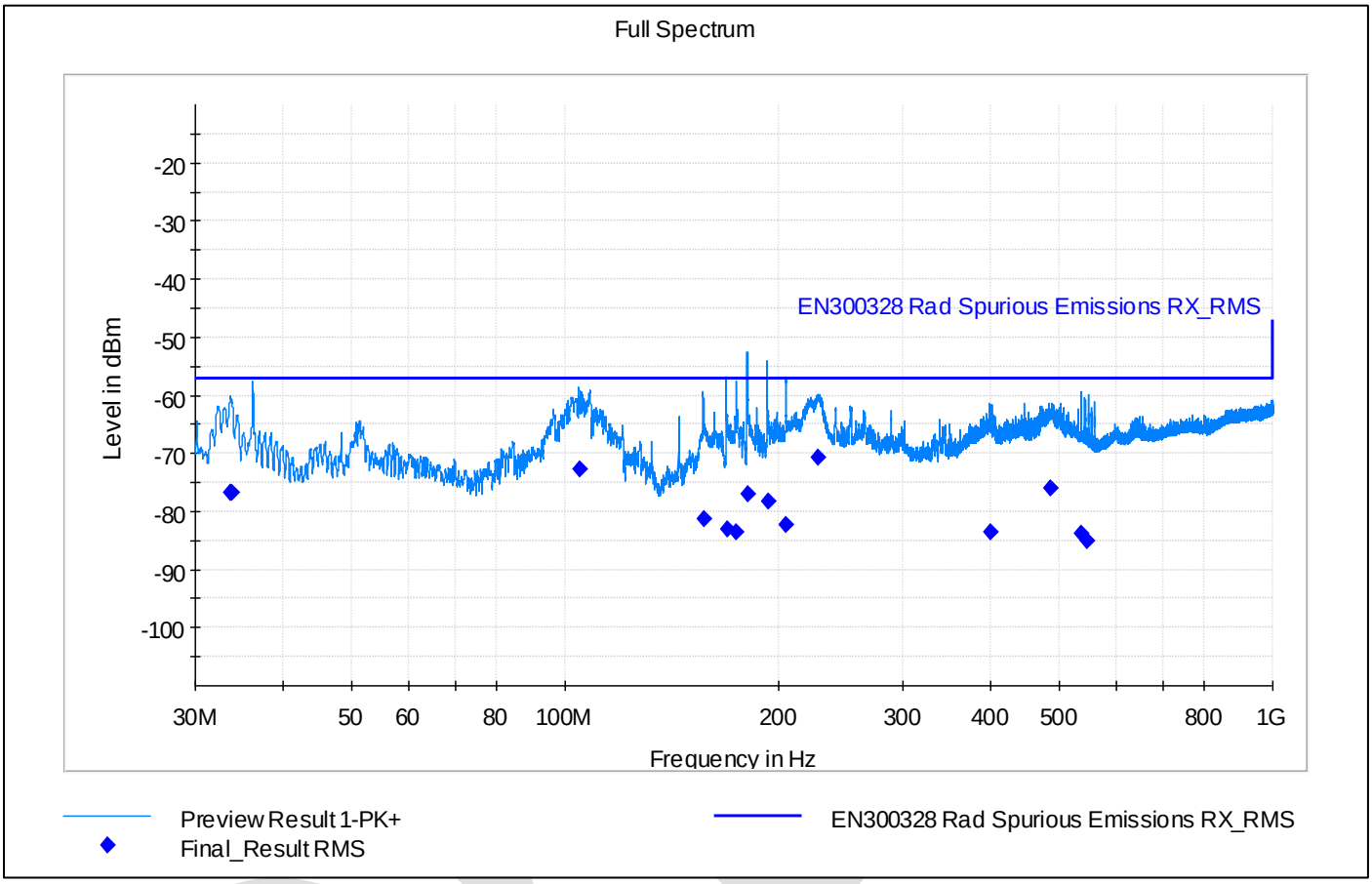
Test requirement 4.3.2.10 Receiver spurious emissions
Test method: 5.4.10.2.2 (radiated) Receiver spurious emissions

Test definition: Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

Limits:		
Frequency range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12.75 GHz	-47 dBm	1 MHz

Operation mode(s)	Configuration	Test Verdict
802.11b	ch01 (2412 MHz)	PASS
802.11b	ch13 (2472 MHz)	PASS

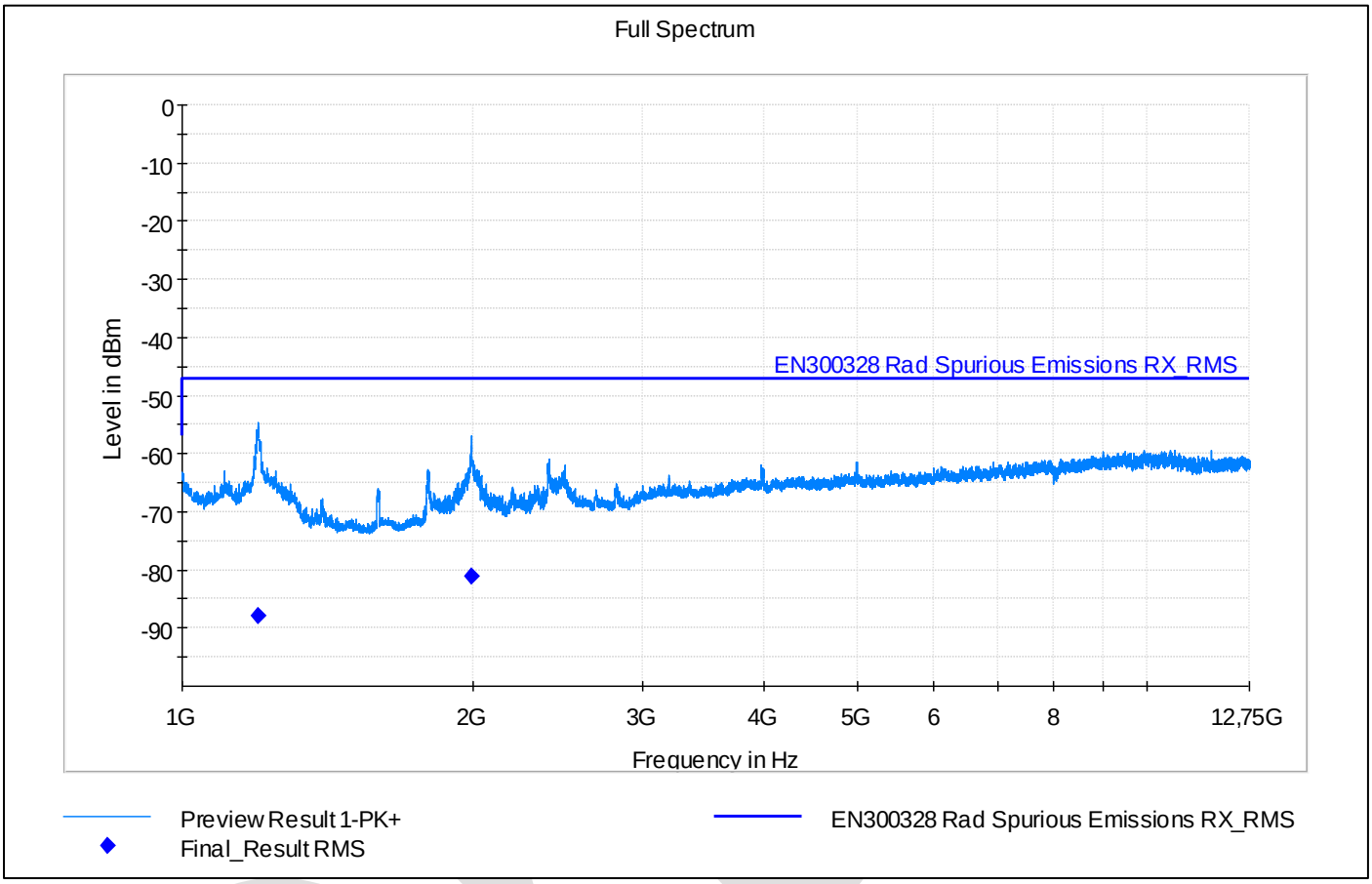
Test data: 802.11b, channel low, 30 – 1000 MHz



Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
33.650000	-76.63	-57.00	19.63	100.0	100.000	170.0	V	292.0	0.0	-81.6	PASS
33.725000	-76.78	-57.00	19.78	100.0	100.000	170.0	V	296.0	0.0	-81.6	PASS
104.650000	-72.80	-57.00	15.80	100.0	100.000	170.0	V	173.0	0.0	-76.4	PASS
157.025000	-81.37	-57.00	24.37	100.0	100.000	170.0	H	193.0	0.0	-80.0	PASS
169.175000	-83.08	-57.00	26.08	100.0	100.000	170.0	H	337.0	0.0	-79.9	PASS
174.750000	-83.53	-57.00	26.53	100.0	100.000	170.0	H	337.0	0.0	-79.4	PASS
181.075000	-77.02	-57.00	20.02	100.0	100.000	170.0	H	332.0	0.0	-78.8	PASS
193.250000	-78.28	-57.00	21.28	100.0	100.000	170.0	H	333.0	0.0	-77.0	PASS
205.075000	-82.17	-57.00	25.17	100.0	100.000	170.0	H	325.0	0.0	-76.9	PASS
227.900000	-70.59	-57.00	13.59	100.0	100.000	170.0	V	292.0	90.0	-76.9	PASS
399.075000	-83.60	-57.00	26.60	100.0	100.000	170.0	V	198.0	90.0	-74.4	PASS
484.600000	-75.90	-57.00	18.90	100.0	100.000	170.0	V	182.0	0.0	-72.4	PASS
535.100000	-83.91	-57.00	26.91	100.0	100.000	170.0	H	112.0	0.0	-70.6	PASS
546.300000	-84.96	-57.00	27.96	100.0	100.000	170.0	H	112.0	0.0	-70.7	PASS

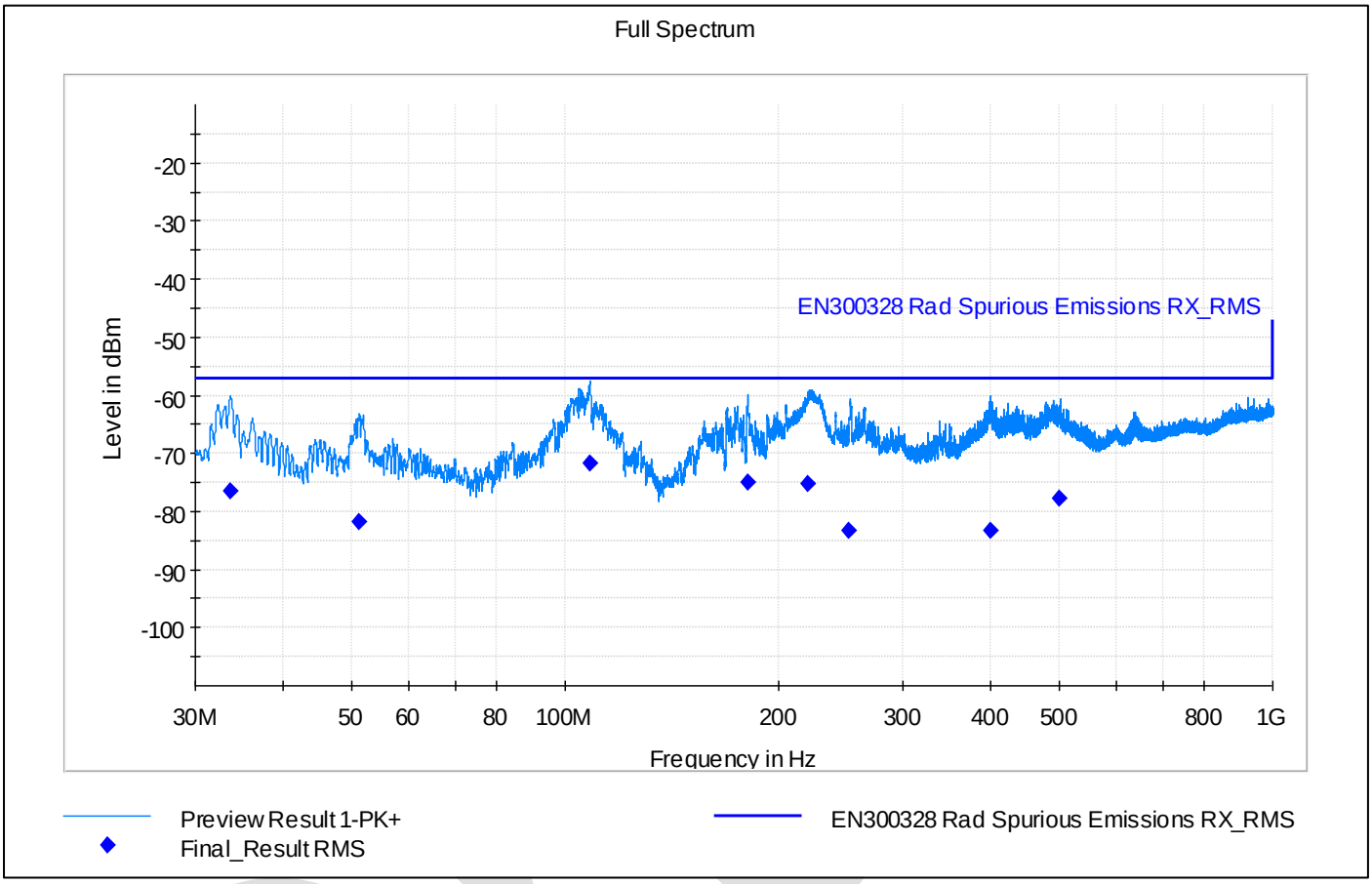
Test data: 802.11b, channel low, 1.0 – 12.75 GHz



Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
1197.500000	-87.97	-47.00	40.97	100.0	1000.000	170.0	H	170.0	90.0	-115.5	PASS
1996.250000	-81.05	-47.00	34.05	100.0	1000.000	170.0	V	259.0	0.0	-110.2	PASS

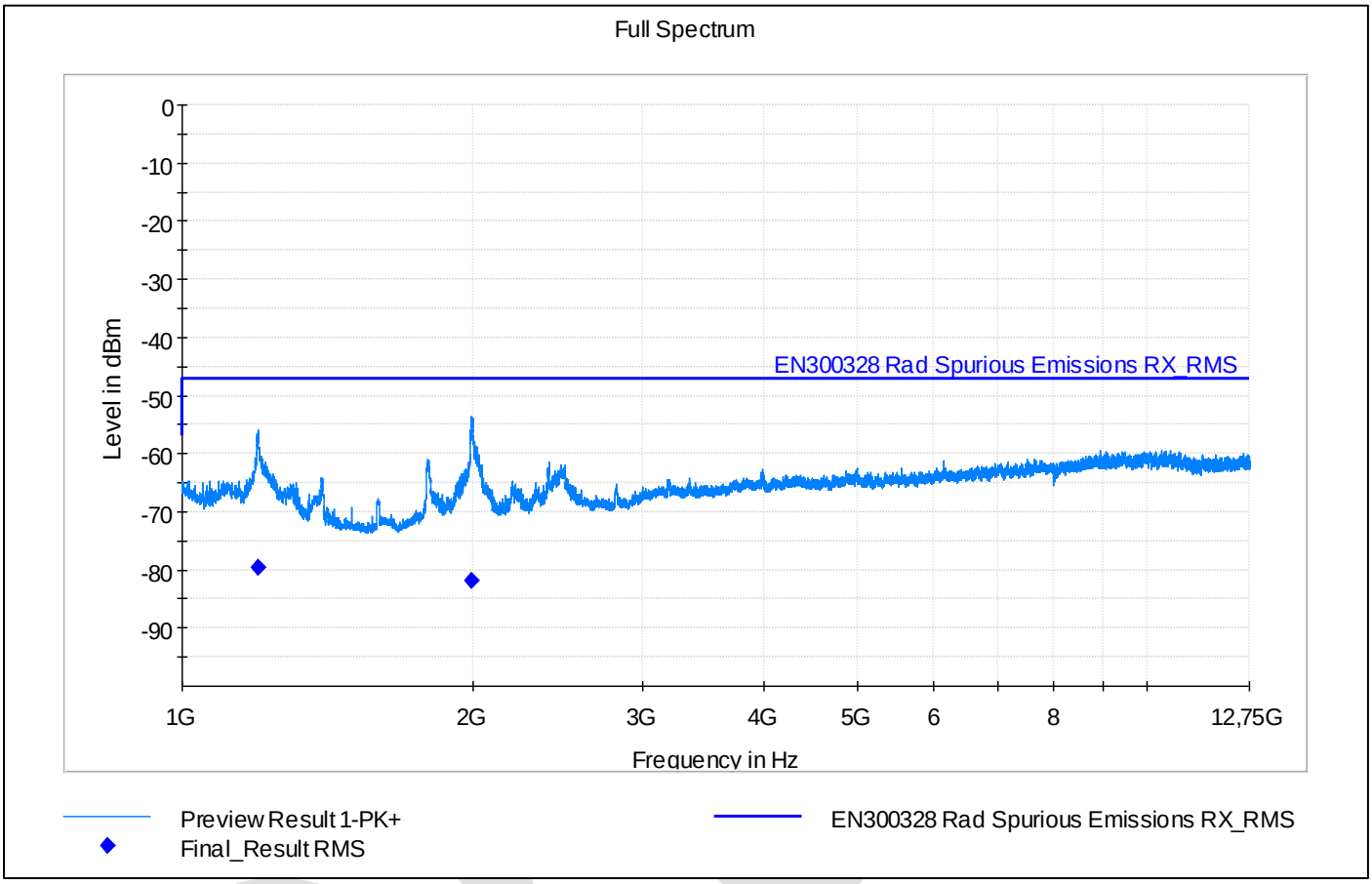
Test data: 802.11b, channel high, 30 – 1000 MHz



Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
33.675000	-76.58	-57.00	19.58	100.0	100.000	170.0	V	217.0	0.0	-81.6	PASS
51.025000	-81.71	-57.00	24.71	100.0	100.000	170.0	V	227.0	90.0	-76.4	PASS
108.250000	-71.64	-57.00	14.64	100.0	100.000	170.0	V	178.0	90.0	-78.3	PASS
180.950000	-74.98	-57.00	17.98	100.0	100.000	170.0	V	229.0	90.0	-79.9	PASS
220.200000	-75.29	-57.00	18.29	100.0	100.000	170.0	V	42.0	90.0	-77.4	PASS
252.025000	-83.24	-57.00	26.24	100.0	100.000	170.0	H	297.0	0.0	-75.0	PASS
398.925000	-83.40	-57.00	26.40	100.0	100.000	170.0	V	220.0	90.0	-74.4	PASS
499.750000	-77.83	-57.00	20.83	100.0	100.000	170.0	H	242.0	90.0	-72.2	PASS

Test data: 802.11b, channel high, 1.0 – 12.75 GHz



Final results

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB)	Comment
1199.500000	-79.58	-47.00	32.58	100.0	1000.000	170.0	V	285.0	90.0	-115.8	PASS
1995.000000	-81.76	-47.00	34.76	100.0	1000.000	170.0	V	255.0	0.0	-110.2	PASS

14. Receiver Blocking

Test requirement: Section 4.3.2.11, Receiver blocking
Test method: Section 5.4.11, Receiver blocking

Test definition: Receiver blocking is a measure of the ability of the equipment to receive a wanted signal on its operating channel without exceeding a given degradation in the presence of an unwanted signal (blocking signal) on frequencies other than those of the operating band.

Limits – Receiver Blocking parameters for receiver category 1

Performance criteria PER ≤ 10%

Table 14: Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × $\log_{10}$(OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × $\log_{10}$(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

NOTE 1: OCBW is in Hz.
NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.
NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 20 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.
NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Summary

Test mode	DUT Frequency (MHz)	Receiver Category	Test verdict
802.11b, 1 Mbps	2412.000000	1	PASS
802.11b, 1 Mbps	2472.000000	1	PASS

DUT Monitoring CH1 2412MHz

Antenna Gain -1.5 dBm

Wanted Signal level to DUT -67.72 dBm

#	Blocking Frequency (MHz)	Blocking Frequency Level (dBm)	Name	PER Value %	Limit Min	PER Limit Max %	Result
1	2 300	-35.5	Channel 1	0.000	---	10.000	PASS
2	2 330	-35.5	Channel 1	0.000	---	10.000	PASS

3	2 360	-35.5	Channel 1	0.000	---	10.000	PASS
4	2 524	-35.5	Channel 1	0.000	---	10.000	PASS
5	2 584	-35.5	Channel 1	0.000	---	10.000	PASS
6	2 674	-35.5	Channel 1	0.000	---	10.000	PASS

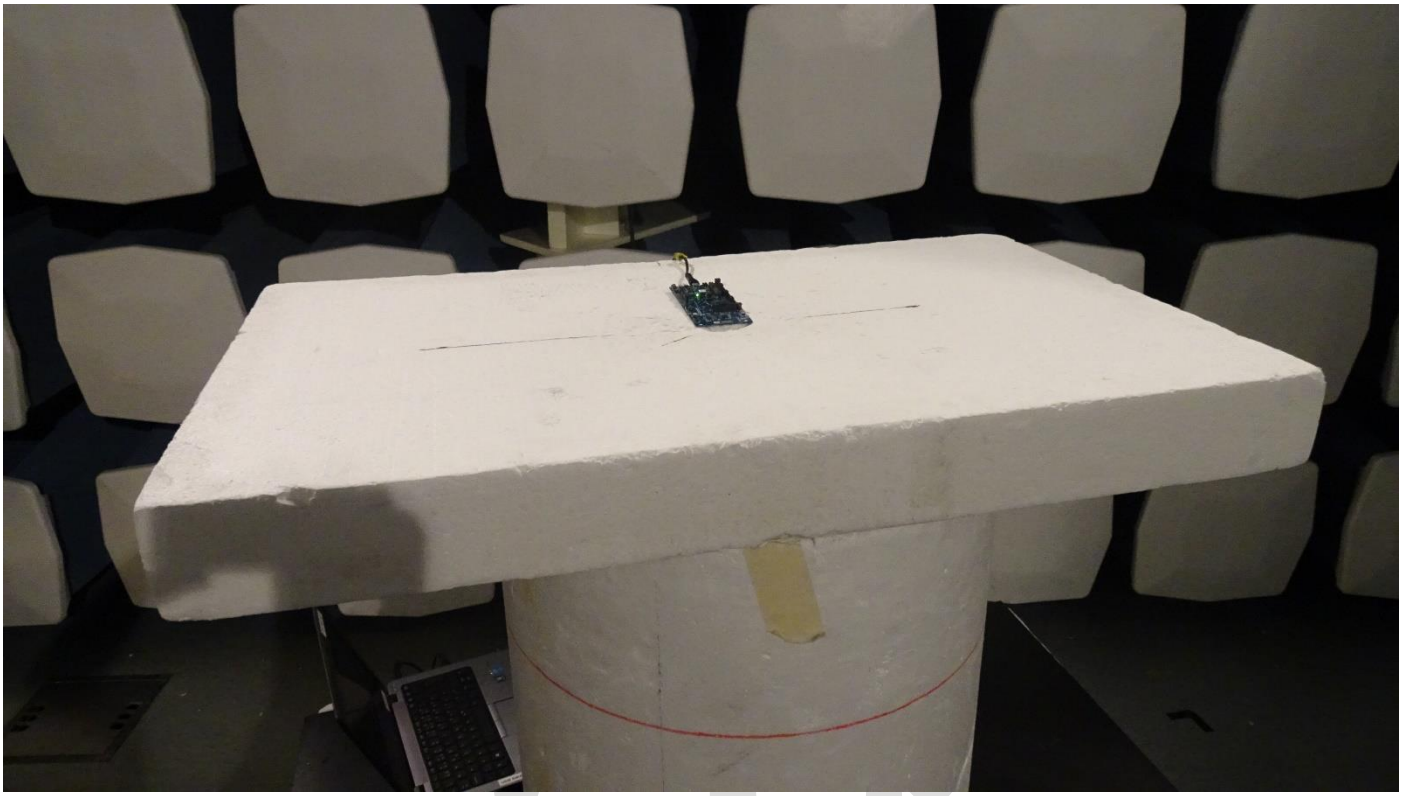
DUT Monitoring CH13 2472MHz

Antenna Gain -1.5 dBm

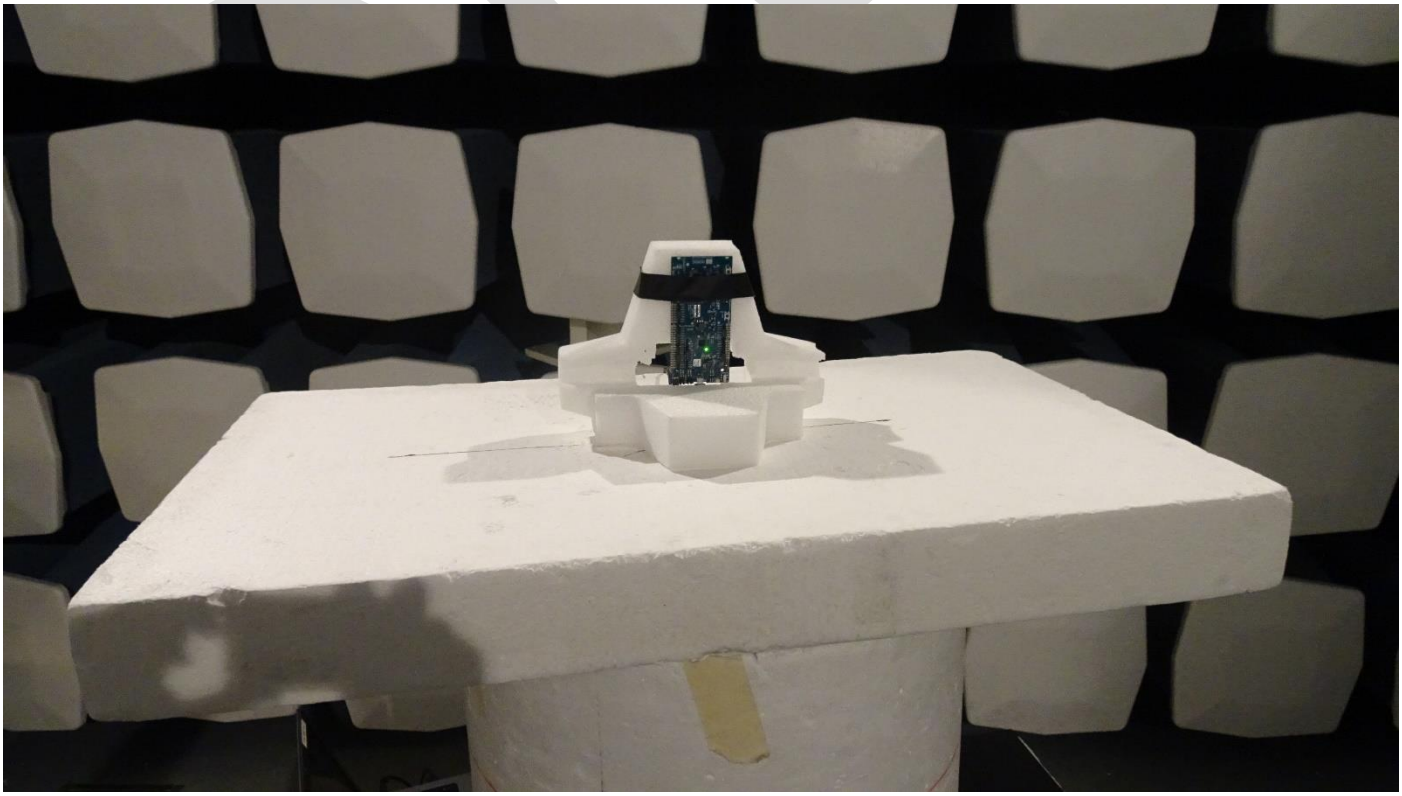
Wanted Signal level to DUT -67.64 dBm

#	Blocking Frequency (MHz)	Blocking Frequency Level (dBm)	Name	PER Value %	Limit Min	PER Limit Max %	Result
1	2 300	-35.5	Channel 13	0.000	---	10.000	PASS
2	2 330	-35.5	Channel 13	0.000	---	10.000	PASS
3	2 360	-35.5	Channel 13	0.000	---	10.000	PASS
4	2 524	-35.5	Channel 13	0.000	---	10.000	PASS
5	2 584	-35.5	Channel 13	0.000	---	10.000	PASS
6	2 674	-35.5	Channel 13	0.000	---	10.000	PASS

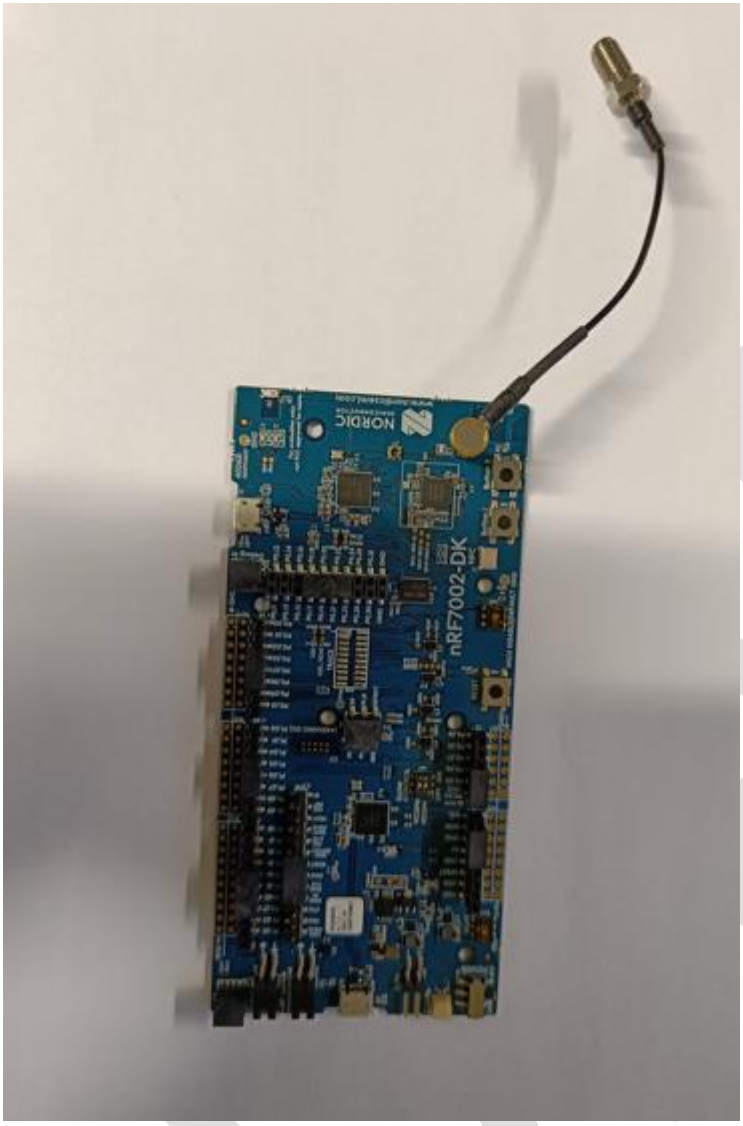
15. Photographs



Picture 1 Radiated Spurious Emissions, RX and TX, EUT elevation 0-deg



Picture 2 Radiated Spurious Emissions, RX and TX, EUT elevation 90-deg



Picture 3 Conducted RF DUT

APPENDIX A, APPLICATION FORM FOR TESTING

Information as required by ETSI EN 300 328 V2.2.2, clause 5.4.1

In accordance with ETSI EN 300 328, clause 5.4.1, the following information is provided by the manufacturer.

a) The type of wideband data transmission equipment:

☐ FHSS

☒ non-FHSS

b) In case of FHSS:

- In case of non-Adaptive FHSS equipment:

  The number of Hopping Frequencies: ……..

- In case of Adaptive FHSS equipment:

  The maximum number of Hopping Frequencies: ……..

  The minimum number of Hopping Frequencies: ……..

- The (average) dwell time: ……..

c) Adaptive/non-adaptive equipment:

☐ non-adaptive Equipment

☒ adaptive Equipment without the possibility to switch to a non-adaptive

☐ mode adaptive Equipment which can also operate in a non-adaptive mode

d) In case of adaptive equipment:

The maximum Channel Occupancy Time implemented by the equipment: ..... ms

☐ The equipment has implemented an LBT mechanism

- In case of non-FHSS equipment:

  ☐ The equipment is Frame Based

  ☒ The equipment is Load Based equipment

  ☐ The equipment can switch dynamically between Frame Based and Load Based

  ☐ equipment The CCA time implemented by the equipment: µs

☐ The equipment has implemented a DAA mechanism

☐ The equipment can operate in more than one adaptive mode

e) In case of non-adaptive Equipment:

The maximum RF Output Power (e.i.r.p.): 17.5 dBm

The maximum (corresponding) Duty Cycle: 96%

Equipment with dynamic behaviour, that behaviour is described here. (e.g. the different combinations of duty cycle and

corresponding power levels to be declared):

Back-to-back maximum length 1 Mbps packets.....

.....

.....

f) The worst case operational mode for each of the following tests:

- RF Output Power

  DSSS/CCK TX.

- Power Spectral Density

  DSSS/CCK TX

- Duty cycle, Tx-Sequence, Tx-gap

  DSSS/CCK TX

- Accumulated Transmit time, Frequency Occupation & Hopping Sequence (only for FHSS equipment)

  N/A

- Hopping Frequency Separation (only for FHSS equipment)

  N/A

- Medium Utilization

  DSSS/CCK TX

- Adaptivity & Receiver Blocking

  N/A

- Nominal Channel Bandwidth

  OFDM TX

- Transmitter unwanted emissions in the OOB domain

  OFDMTX

- Transmitter unwanted emissions in the spurious domain

  DSSS/CCK TX

- Receiver spurious emissions

  RX

g) The different transmit operating modes (tick all that apply):

☒ Operating mode 1: Single Antenna Equipment

☒ Equipment with only one antenna

☐ Equipment with two diversity antennas but only one antenna active at any moment in time

☐ Smart Antenna Systems with two or more antennas, but operating in a (legacy) mode where only one antenna is used (e.g. IEEE 802.11™ legacy mode in smart antenna systems)

☐ Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming

☐ Single spatial stream/Standard throughput/(e.g. IEEE 802.11™ legacy mode)

☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1

☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2

NOTE 1: Add more lines if more channel bandwidths are supported.

☐ Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming

☐ Single spatial stream/Standard throughput (e.g. IEEE 802.11™ legacy mode)

☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1

☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2

NOTE 2: Add more lines if more channel bandwidths are supported.

h) In case of Smart Antenna Systems:

- The number of Receive chains: .....
- The number of Transmit chains: .....

☐ symmetrical power distribution

☐ asymmetrical power distribution

In case of beam forming, the maximum (additional) beam forming gain: ..... dB

NOTE: The additional beam forming gain does not include the basic gain of a single antenna.

i) Operating Frequency Range(s) of the equipment:

- Operating Frequency Range 1: 2401 MHz to 2495 MHz
- Operating Frequency Range 2: ..... MHz to..... MHz

NOTE: Add more lines if more Frequency Ranges are supported.

j) Nominal Channel Bandwidth(s):

- Nominal Channel Bandwidth 1: 22 MHz

- Nominal Channel Bandwidth 2:..... MHz

NOTE: Add more lines if more channel bandwidths are supported.

k) Type of Equipment (stand-alone, combined, plug-in radio device, etc.):

☒ Stand-alone

☐ Combined Equipment

☐ Plug-in radio device

☐ Other .....

l) The normal and the extreme operating conditions that apply to the equipment:

Normal operating conditions (if applicable):

Operating temperature: 0 - +40 °C

Other (please specify if applicable): ……

Extreme operating conditions:

Operating temperature range: Minimum: 0 °C Maximum +70°C

Other (please specify if applicable): Minimum: …… °C Maximum… °C

Details provided are for the: ☒ stand-alone equipment
☐ combined
☐ equipment test jig

m) The intended combination(s) of the radio equipment power settings and one or more antenna assemblies and their corresponding e.i.r.p. levels:

- Antenna Type:

☒ Integral Antenna (information to be provided in case of conducted measurements)

Antenna Gain: -1.5 dBi

If applicable, additional beamforming gain (excluding basic antenna gain): .....dB

☐ Temporary RF connector provided

☐ No temporary RF connector provided

☐ Dedicated Antennas (equipment with antenna connector)

☐ Single power level with corresponding antenna(s)

☐ Multiple power settings and corresponding antenna(s)

Number of different Power Levels: .....

Power Level 1: ..... dBm

Power Level 2: ..... dBm

Power Level 3: ..... dBm

NOTE 1: Add more lines in case the equipment has more power levels.

NOTE 2: These power levels are conducted power levels (at antenna connector).

- For each of the Power Levels, provide the intended antenna assemblies, their corresponding gains (G) and the resulting e.i.r.p. levels also taking into account the beamforming gain (Y) if applicable

Power Level 1:..... dBm

Number of antenna assemblies provided for this power level: .....

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

NOTE 3: Add more rows in case more antenna assemblies are supported for this power level.

Power Level 2:..... dBm

Number of antenna assemblies provided for this power level: .....

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

NOTE 4: Add more rows in case more antenna assemblies are supported for this power level.

Power Level 3:..... dBm

Number of antenna assemblies provided for this power level: .....

Assembly #	Gain (dBi)	e.i.r.p. (dBm)	Part number or model name
1			
2			
3			
4			

NOTE 5: Add more rows in case more antenna assemblies are supported for this power level.

n) The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined equipment or test jig in case of plug-in devices:

Details provided are for the: ☒ stand-alone equipment
☐ combined equipment
☐ test jig

Supply Voltage ☐ AC main State AC voltage V
☒ DC State DC voltage 5V

In case of DC, indicate the type of power source

☐ Internal Power Supply

☒ External Power Supply or AC/DC adapter

☐ Battery

☐ Other:

o) Describe the test modes available which can facilitate testing:

Wi-Fi Radio Test shell application…….

…….

p) The equipment type (e.g. Bluetooth®, IEEE 802.11™, IEEE 802.15.4™, proprietary, etc.):

IEEE802.11™

q) If applicable, the statistical analysis referred to in clause 5.4.1 q)

(to be provided as separate attachment)

r) If applicable, the statistical analysis referred to in clause 5.4.1 r)

(to be provided as separate attachment)

s) Geo-location capability supported by the equipment:

☐ Yes

☐ The geographical location determined by the equipment as defined in clause 4.3.1.13.2 or clause 4.3.2.12.2 is not accessible to the user

☒ No

Configuration for testing (see clause 5.3.2.3 of ETSI EN 300 328 V2.2.2)

From all combinations of conducted power settings and intended antenna assembly(ies) specified in clause 5.4.1 m), specify the combination resulting in the highest e.i.r.p. for the radio equipment.

Unless otherwise specified in ETSI EN 300 328, this power setting is to be used for testing against the requirements of ETSI EN 300 328. In case there is more than one such conducted power setting resulting in the same (highest) e.i.r.p. level, the highest power setting is to be used for testing. See also ETSI EN 300 328, clause 5.3.2.3.

Highest overall e.i.r.p. value:	17.5	dBm	
Corresponding Antenna assembly gain:	-1.5	dBi	Antenna Assembly #: .....
Corresponding conducted power setting: (also the power level to be used for testing)	19	dBm	Listed as Power Setting #: .....