FCC Measurement/Technical Report on

Industrial WLAN Access Point / Client SCALANCE W700 / MSAX MSAX-W1-RJ-E2

FCC ID: LYHMSAXV1 IC: 267AA-MSAXV1

Test Report Reference: MDE_SIEM_2207_FCC_01_rev03

Test Laboratory:
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D-PL-12140-01-02
D-PL-12140-01-03

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1 APPLIED STANDARDS AND TEST SUMMARY

1.1 APPLIED STANDARDS

Type of Authorization
Certification for an Intentional Radiator.

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 2 and 15 (10-1-21 Edition). The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

Part 15, Subpart C – Intentional Radiators

§ 15.201 Equipment authorization requirement

§ 15.207 Conducted limits

§ 15.209 Radiated emission limits; general requirements

§ 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz

Note:
The tests were selected and performed with reference to the FCC Public Notice "Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under Section 15.247 of the FCC Rules, 558074 D01 15.247 Meas Guidance v05r02, 2019-04-02". ANSI C63.10–2013 is applied.

1.2 FCC-IC CORRELATION TABLE

Correlation of measurement requirements for DTS (e.g. WLAN 2.4 GHz, BT LE) equipment from FCC and IC

DTS equipment

Measurement	FCC reference	IC reference
Conducted emissions on AC Mains	§ 15.207	RSS-Gen Issue 5: 8.8
Occupied bandwidth	§ 15.247 (a) (2)	RSS-247 Issue 2: 5.2 (a)
Peak conducted output power	§ 15.247 (b) (3), (4)	RSS-247 Issue 2: 5.4 (d)
Transmitter spurious RF conducted emissions	§ 15.247 (d)	RSS-Gen Issue 5: 6.13 / 8.9/8.10; RSS-247 Issue 2: 5.5
Transmitter spurious radiated emissions	§ 15.247 (d); § 15.209 (a)	RSS-Gen Issue 5: 6.13 / 8.9/8.10; RSS-247 Issue 2: 5.5
Band edge compliance	§ 15.247 (d)	RSS-247 Issue 2: 5.5
Power density	§ 15.247 (e)	RSS-247 Issue 2: 5.2 (b)
Antenna requirement	§ 15.203 / 15.204	RSS-Gen Issue 5: 8.3
Receiver spurious emissions	–	–

1.3 MEASUREMENT SUMMARY

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Conducted Emissions at AC Mains

The measurement was performed according to ANSI C63.10, chapter 6.2 **Final Result**

OP-Mode	Setup	Date	FCC	IC
Operating mode, Connection to AC mains				
worst case, via ancillary/auxiliary equipment	S03_AC_AC02	2022-12-13	Passed	Passed

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Occupied Bandwidth (6 dB)

The measurement was performed according to ANSI C63.10, chapter 11.8.1 **Final Result**

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency				
WLAN ax 20 MHz, high	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 20 MHz, low	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 20 MHz, mid	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 40 MHz, high	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, low	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, mid	S01_AD01	2022-09-16	Passed	Passed
WLAN g 1 Mbit/s, high	S01_AC01	2022-09-15	Passed	Passed
WLAN g 1 Mbit/s, low	S01_AC01	2022-09-15	Passed	Passed
WLAN g 1 Mbit/s, mid	S01_AC01	2022-09-15	Passed	Passed
WLAN g 6 Mbit/s, high	S01_AD01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s, low	S01_AD01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s, mid	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz, high	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz, low	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz, mid	S01_AD01	2022-09-14	Passed	Passed
WLAN n 40 MHz, high	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz, low	S01_AD01	2022-09-15	Passed	Passed
WLAN n 40 MHz, mid	S01_AD01	2022-09-16	Passed	Passed

Occupied Bandwidth (99%)

The measurement was performed according to ANSI C63.10, chapter 6.9.3 **Final Result**

OP-Mode	**Setup**	**Date**	**FCC**	**IC**
Radio Technology, Operating Frequency				
WLAN ax 20 MHz, high	S01_AC01	2022-09-15	N/A	Performed
WLAN ax 20 MHz, low	S01_AC01	2022-09-15	N/A	Performed
WLAN ax 20 MHz, mid	S01_AC01	2022-09-15	N/A	Performed
WLAN ax 40 MHz, high	S01_AD01	2022-09-16	N/A	Performed
WLAN ax 40 MHz, low	S01_AD01	2022-09-16	N/A	Performed
WLAN ax 40 MHz, mid	S01_AD01	2022-09-16	N/A	Performed
WLAN g 1 Mbit/s, high	S01_AC01	2022-09-15	N/A	Performed
WLAN g 1 Mbit/s, low	S01_AC01	2022-09-15	N/A	Performed
WLAN g 1 Mbit/s, mid	S01_AC01	2022-09-15	N/A	Performed
WLAN g 6 Mbit/s, high	S01_AD01	2022-09-14	N/A	Performed
WLAN g 6 Mbit/s, low	S01_AD01	2022-09-14	N/A	Performed
WLAN g 6 Mbit/s, mid	S01_AD01	2022-09-14	N/A	Performed
WLAN n 20 MHz, high	S01_AD01	2022-09-14	N/A	Performed
WLAN n 20 MHz, low	S01_AD01	2022-09-14	N/A	Performed
WLAN n 20 MHz, mid	S01_AD01	2022-09-14	N/A	Performed
WLAN n 40 MHz, high	S01_AD01	2022-09-16	N/A	Performed
WLAN n 40 MHz, low	S01_AD01	2022-09-15	N/A	Performed
WLAN n 40 MHz, mid	S01_AD01	2022-09-16	N/A	Performed

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Peak Power Output

The measurement was performed according to ANSI C63.10, chapter 11.9.1.3 **Final Result**

Output Power for antenna gain up to 6 dBi

OP-Mode Radio Technology, Operating Frequency, Measurement method	Setup	Date	FCC	IC
WLAN ax 20 MHz MIMO, high, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 20 MHz MIMO, low, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 20 MHz MIMO, mid, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 20 MHz, high, conducted	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 20 MHz, low, conducted	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 20 MHz, mid, conducted	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 40 MHz MIMO, high, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz MIMO, low, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz MIMO, mid, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, high, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, low, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, mid, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN g 1 Mbit/s, high, conducted	S01_AC01	2022-09-15	Passed	Passed
WLAN g 1 Mbit/s, low, conducted	S01_AC01	2022-09-15	Passed	Passed
WLAN g 1 Mbit/s, mid, conducted	S01_AC01	2022-09-15	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 1 Mbit/s Diversity, low, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 1 Mbit/s Diversity, mid, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s, high, conducted	S01_AD01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s, low, conducted	S01_AD01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s, mid, conducted	S01_AD01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s Diversity, low, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s Diversity, mid, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN n 20 MHz MIMO, high, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN n 20 MHz MIMO, low, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN n 20 MHz MIMO, mid, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN n 20 MHz, high, conducted	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz, low, conducted	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz, mid, conducted	S01_AD01	2022-09-14	Passed	Passed
WLAN n 40 MHz MIMO, high, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz MIMO, low, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz MIMO, mid, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz, high, conducted	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz, low, conducted	S01_AD01	2022-09-15	Passed	Passed
WLAN n 40 MHz, mid, conducted	S01_AD01	2022-09-16	Passed	Passed

Output Power for antenna gain up to 9 dBi

OP-Mode Radio Technology, Operating Frequency, Measurement method	Setup	Date	FCC	IC
WLAN ax 20 MHz MIMO, high, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN ax 20 MHz MIMO, low, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN ax 20 MHz MIMO, mid, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN ax 20 MHz, high, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN ax 20 MHz, low, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN ax 20 MHz, mid, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN ax 40 MHz MIMO, high, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN ax 40 MHz MIMO, low, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN ax 40 MHz MIMO, mid, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN ax 40 MHz, high, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN ax 40 MHz, low, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN ax 40 MHz, mid, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN g 1 Mbit/s, high, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN g 1 Mbit/s, low, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN g 1 Mbit/s, mid, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 1 Mbit/s Diversity, low, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 1 Mbit/s Diversity, mid, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s, high, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN g 6 Mbit/s, low, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN g 6 Mbit/s, mid, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s Diversity, low, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s Diversity, mid, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN n 20 MHz MIMO, high, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN n 20 MHz MIMO, low, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN n 20 MHz MIMO, mid, conducted	S01_AD02	2022-09-22	Passed	Passed
WLAN n 20 MHz, high, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN n 20 MHz, low, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN n 20 MHz, mid, conducted	S01_AD02	2022-09-21	Passed	Passed
WLAN n 40 MHz MIMO, high, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN n 40 MHz MIMO, low, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN n 40 MHz MIMO, mid, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN n 40 MHz, high, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN n 40 MHz, low, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN n 40 MHz, mid, conducted	S01_AD02	2022-09-23	Passed	Passed

Output Power for antenna gain up to 14 dBi

OP-Mode Radio Technology, Operating Frequency, Measurement method	Setup	Date	FCC	IC
WLAN ax 20 MHz MIMO, high, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN ax 20 MHz MIMO, low, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN ax 20 MHz MIMO, mid, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN ax 20 MHz, high, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN ax 20 MHz, low, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN ax 20 MHz, mid, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN ax 40 MHz MIMO, high, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN ax 40 MHz MIMO, low, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN ax 40 MHz MIMO, mid, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN ax 40 MHz, high, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN ax 40 MHz, low, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN ax 40 MHz, mid, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN g 1 Mbit/s, high, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN g 1 Mbit/s, low, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN g 1 Mbit/s, mid, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 1 Mbit/s Diversity, low, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 1 Mbit/s Diversity, mid, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s, high, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN g 6 Mbit/s, low, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN g 6 Mbit/s, mid, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s Diversity, low, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN g 6 Mbit/s Diversity, mid, conducted	S01_AD02	2022-11-29	Passed	Passed
WLAN n 20 MHz MIMO, high, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN n 20 MHz MIMO, low, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN n 20 MHz MIMO, mid, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN n 20 MHz, high, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN n 20 MHz, low, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN n 20 MHz, mid, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN n 40 MHz MIMO, high, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN n 40 MHz MIMO, low, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN n 40 MHz MIMO, mid, conducted	S01_AD02	2022-09-23	Passed	Passed
WLAN n 40 MHz, high, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN n 40 MHz, low, conducted	S01_AD02	2022-09-27	Passed	Passed
WLAN n 40 MHz, mid, conducted	S01_AD02	2022-09-27	Passed	Passed

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Subpart C §15.247

Spurious RF Conducted Emissions

The measurement was performed according to ANSI C63.10, chapter 11.11

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency				
WLAN ax 20 MHz, high	S01_AD01	2022-09-19	Passed	Passed
WLAN ax 20 MHz, low	S01_AD01	2022-09-19	Passed	Passed
WLAN ax 20 MHz, mid	S01_AD01	2022-09-19	Passed	Passed
WLAN ax 40 MHz, high	S01_AD01	2022-09-19	Passed	Passed
WLAN ax 40 MHz, low	S01_AD01	2022-09-19	Passed	Passed
WLAN ax 40 MHz, mid	S01_AD01	2022-09-19	Passed	Passed
WLAN g 1 Mbit/s, high	S01_AD01	2022-09-19	Passed	Passed
WLAN g 1 Mbit/s, low	S01_AD01	2022-09-19	Passed	Passed
WLAN g 1 Mbit/s, mid	S01_AD01	2022-09-19	Passed	Passed
WLAN g 6 Mbit/s, high	S01_AD01	2022-09-19	Passed	Passed
WLAN g 6 Mbit/s, low	S01_AD01	2022-09-19	Passed	Passed
WLAN g 6 Mbit/s, mid	S01_AD01	2022-09-19	Passed	Passed
WLAN n 20 MHz, high	S01_AD01	2022-09-19	Passed	Passed
WLAN n 20 MHz, low	S01_AD01	2022-09-19	Passed	Passed
WLAN n 20 MHz, mid	S01_AD01	2022-09-19	Passed	Passed
WLAN n 40 MHz, high	S01_AD01	2022-09-19	Passed	Passed
WLAN n 40 MHz, low	S01_AD01	2022-09-19	Passed	Passed
WLAN n 40 MHz, mid	S01_AD01	2022-09-19	Passed	Passed

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Transmitter Spurious Radiated Emissions
The measurement was performed according to ANSI C63.10, chapter 6.4, 6.5, 6.6.5

Final Result

Test with <6 dBi antenna

OP-Mode Radio Technology, Operating Frequency, Measurement range	Setup	Date	FCC	IC
WLAN ax 20 MHz MIMO, high, 1 GHz - 26 GHz Remark: Harmonics measured only	S02_AC01	2022-09-14	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, 1 GHz - 26 GHz	S02_AC01	2022-09-13	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, 30 MHz - 1 GHz	S02_AC02	2022-10-06	Passed	Passed
WLAN g 1 Mbit/s Diversity, low, 1 GHz - 26 GHz	S02_AC01	2022-09-13	Passed	Passed
WLAN g 1 Mbit/s Diversity, low, 30 MHz - 1 GHz	S02_AC02	2022-10-06	Passed	Passed
WLAN g 1 Mbit/s Diversity, mid, 1 GHz - 26 GHz	S02_AC01	2022-09-13	Passed	Passed
WLAN g 1 Mbit/s Diversity, mid, 30 MHz - 1 GHz	S02_AC02	2022-10-06	Passed	Passed
WLAN g 1 Mbit/s Diversity, mid, 9 kHz - 30 MHz	S02_AC02	2022-10-06	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, 1 GHz - 26 GHz	S02_AC01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s Diversity, low, 1 GHz - 26 GHz Remark: measurement range: 1 - 8 GHz	S02_AC01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s Diversity, mid, 1 GHz - 26 GHz	S02_AC01	2022-09-14	Passed	Passed
WLAN n 20 MHz MIMO, high, 1 GHz - 26 GHz Remark: Harmonics measured only	S02_AC01	2022-09-14	Passed	Passed

Test with <9 dBi antenna

OP-Mode Radio Technology, Operating Frequency, Measurement range	Setup	Date	FCC	IC
WLAN ax 20 MHz MIMO, high, 1 GHz - 26 GHz Remark: Harmonics tested only	S03_AC02	2022-09-22	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, 1 GHz - 26 GHz Remark: Harmonics tested only	S03_AC01	2022-09-19	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, 1 GHz - 26 GHz Remark: Harmonics tested only	S03_AC01	2022-09-19	Passed	Passed
WLAN n 20 MHz MIMO, high, 1 GHz - 26 GHz Remark: Harmonics tested only	S03_AC02	2022-09-22	Passed	Passed

Test with <14 dBi antenna

OP-Mode Radio Technology, Operating Frequency, Measurement range	Setup	Date	FCC	IC
WLAN ax 20 MHz MIMO, high, 1 GHz - 26 GHz Remark: Harmonics tested only	S04_AC02	2022-09-23	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, 1 GHz - 26 GHz Remark: Harmonics tested only	S04_AC01	2022-09-23	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, 1 GHz - 26 GHz Remark: Harmonics tested only	S04_AC01	2022-09-23	Passed	Passed
WLAN n 20 MHz MIMO, high, 1 GHz - 26 GHz Remark: Harmonics tested only	S04_AC02	2022-09-23	Passed	Passed

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Subpart C §15.247

Band Edge Compliance Conducted
The measurement was performed according to ANSI C63.10, chapter 11.11 **Final Result**

OP-Mode Radio Technology, Operating Frequency, Band Edge	Setup	Date	FCC	IC
WLAN ax 20 MHz MIMO, high, high	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 20 MHz MIMO, low, low	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 20 MHz, high, high	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 20 MHz, low, low	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 40 MHz MIMO, high, high	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz MIMO, low, low	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, high, high	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, low, low	S01_AD01	2022-09-16	Passed	Passed
WLAN g 1 Mbit/s, high, high	S01_AC01	2022-09-15	Passed	Passed
WLAN g 1 Mbit/s, low, low	S01_AC01	2022-09-15	Passed	Passed
WLAN g 6 Mbit/s, high, high	S01_AD01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s, low, low	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz MIMO, high, high	S01_AD01	2022-09-16	Passed	Passed
WLAN n 20 MHz MIMO, low, low	S01_AD01	2022-09-16	Passed	Passed
WLAN n 20 MHz, high, high	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz, low, low	S01_AD01	2022-09-14	Passed	Passed
WLAN n 40 MHz MIMO, high, high	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz MIMO, low, low	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz, high, high	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz, low, low	S01_AD01	2022-09-15	Passed	Passed

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Band Edge Compliance Radiated
The measurement was performed according to ANSI C63.10, chapter 6.6.5 **Final Result**

Test with <6 dBi antenna

OP-Mode Radio Technology, Operating Frequency, Band Edge	**Setup**	**Date**	**FCC**	**IC**
WLAN ax 20 MHz MIMO, high, high	S02_AC01	2022-09-14	Passed	Passed
WLAN ax 40 MHz MIMO, high, high	S02_AC01	2022-09-14	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, high	S02_AC01	2022-09-13	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, high	S02_AC01	2022-09-14	Passed	Passed
WLAN n 20 MHz MIMO, high, high	S02_AC01	2022-09-14	Passed	Passed
WLAN n 40 MHz MIMO, high, high	S02_AC01	2022-09-14	Passed	Passed

Test with <9 dBi antenna

OP-Mode Radio Technology, Operating Frequency, Band Edge	**Setup**	**Date**	**FCC**	**IC**
WLAN ax 20 MHz MIMO, high, high	S03_AC02	2022-09-22	Passed	Passed
WLAN ax 40 MHz MIMO, high, high	S03_AC02	2022-09-22	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, high	S03_AC01	2022-09-19	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, high	S03_AC01	2022-09-19	Passed	Passed
WLAN n 20 MHz MIMO, high, high	S03_AC02	2022-09-22	Passed	Passed
WLAN n 40 MHz MIMO, high, high	S03_AC02	2022-09-22	Passed	Passed

Test with <14 dBi antenna

OP-Mode Radio Technology, Operating Frequency, Band Edge	**Setup**	**Date**	**FCC**	**IC**
WLAN ax 20 MHz MIMO, high, high	S04_AC02	2022-09-23	Passed	Passed
WLAN ax 40 MHz MIMO, high, high	S04_AC02	2022-09-23	Passed	Passed
WLAN g 1 Mbit/s Diversity, high, high	S04_AC02	2022-09-23	Passed	Passed
WLAN g 6 Mbit/s Diversity, high, high	S04_AC02	2022-09-23	Passed	Passed
WLAN n 20 MHz MIMO, high, high	S04_AC02	2022-09-23	Passed	Passed
WLAN n 40 MHz MIMO, high, high	S04_AC02	2022-09-23	Passed	Passed

47 CFR CHAPTER I FCC PART 15 § 15.247 (e)
Subpart C §15.247

Power Density
The measurement was performed according to ANSI C63.10, chapter 11.10.2

Final Result

OP-Mode Radio Technology, Operating Frequency	Setup	Date	FCC	IC
WLAN ax 20 MHz MIMO, high	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 20 MHz MIMO, low	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 20 MHz MIMO, mid	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 20 MHz, high	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 20 MHz, low	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 20 MHz, mid	S01_AC01	2022-09-15	Passed	Passed
WLAN ax 40 MHz MIMO, high	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz MIMO, low	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz MIMO, mid	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, high	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, low	S01_AD01	2022-09-16	Passed	Passed
WLAN ax 40 MHz, mid	S01_AD01	2022-09-16	Passed	Passed
WLAN g 1 Mbit/s, high	S01_AC01	2022-09-15	Passed	Passed
WLAN g 1 Mbit/s, low	S01_AC01	2022-09-15	Passed	Passed
WLAN g 1 Mbit/s, mid	S01_AC01	2022-09-15	Passed	Passed
WLAN g 6 Mbit/s, high	S01_AD01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s, low	S01_AD01	2022-09-14	Passed	Passed
WLAN g 6 Mbit/s, mid	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz MIMO, high	S01_AD01	2022-09-16	Passed	Passed
WLAN n 20 MHz MIMO, low	S01_AD01	2022-09-16	Passed	Passed
WLAN n 20 MHz MIMO, mid	S01_AD01	2022-09-16	Passed	Passed
WLAN n 20 MHz, high	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz, low	S01_AD01	2022-09-14	Passed	Passed
WLAN n 20 MHz, mid	S01_AD01	2022-09-14	Passed	Passed
WLAN n 40 MHz MIMO, high	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz MIMO, low	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz MIMO, mid	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz, high	S01_AD01	2022-09-16	Passed	Passed
WLAN n 40 MHz, low	S01_AD01	2022-09-15	Passed	Passed
WLAN n 40 MHz, mid	S01_AD01	2022-09-16	Passed	Passed

N/A: Not applicable
N/P: Not performed

2 REVISION HISTORY / SIGNATURES

Report version control			
Version	**Release date**	**Change Description**	**Version validity**
initial	2023-01-24	--	invalid
rev01	2023-03-17	Added cable attenuation of 2m cable and respective combined antenna gain including comments	valid
rev02	2023-03-21	Added clarification in regards to lower band edge to Band Edge test case.	valid
rev03	2023-03-31	Added description of test ranges to test case Transmitter Spurious Radiated Emissions	valid

COMMENT: According to the applicant there exists a second variant of the EUT with type MSAX-W1-RJ-E2-NO without the DI/DO port. Tested for this report is the MSAX-W1-RJ-E2 variant since it is the fully equipped variant and thus assumed worst case.

(responsible for accreditation scope)
Dipl.-Ing. Marco Kullik

(responsible for testing and report)
Dipl.-Ing. Daniel Gall

7 layers GmbH, Borsigstr. 11
40880 Ratingen, Germany
Phone +49 (0)2102 749 0

3 ADMINISTRATIVE DATA

3.1 TESTING LABORATORY

Company Name:	7layers GmbH
Address:	Borsigstr. 11 40880 Ratingen Germany

The test facility is accredited by the following accreditation organisation:

Laboratory accreditation no:	DAkkS D-PL-12140-01-01| -02 | -03
FCC Designation Number:	DE0015
FCC Test Firm Registration:	929146
ISED CAB Identifier	DE0007; ISED#: 3699A
Responsible for accreditation scope:	Dipl.-Ing. Marco Kullik
Report Template Version:	2022-05-25

3.2 PROJECT DATA

Responsible for testing and report:	Dipl.-Ing. Daniel Gall
Employees who performed the tests:	documented internally at 7Layers
Date of Report:	2023-03-31
Testing Period:	2022-09-13 to 2022-12-13

3.3 APPLICANT DATA

Company Name:	SIEMENS AG
Address:	Östliche Rheinbrückenstr. 50 76187 Karlsruhe Germany
Contact Person:	Dr. Malgorzata Janson

3.4 MANUFACTURER DATA

Company Name:	SIEMENS AG
Address:	76181 Karlsruhe Germany
Contact Person:	Mr. Kilian Löser

4 TEST OBJECT DATA

4.1 GENERAL EUT DESCRIPTION

Kind of Device product description	Industrial WLAN Access Point / Client
Product name	SCALANCE W700 / MSAX
Type	MSAX-W1-RJ-E2
Declared EUT data by the supplier	
Voltage Type	DC
Voltage Level	24.0 V
Antenna / Gain	EUT has two permanent 50 Ohm antenna connectors. External antenna(s): For the radiated tests of this test report the EUT was tested with the following antennas: • ANT795-6MN, gain = 5.6 dBi (in the 2.4 GHz ISM Band), including 2m cable: 4.6 dBi • ANT795-6DC, gain = 8.1 dBi (in the 2.4 GHz ISM Band) including 2m cable: 7.1 dBi • ANT792-8DN, gain = 14.8 dBi (in the 2.4 GHz ISM Band) including 2m cable: 13.8 dBi
Tested Modulation Type	WLAN g (1 Mbit): DSSS WLAN g (6 Mbit): OFDM WLAN n (MCS0): OFDM WLAN ax (MCS0): OFDM
Specific product description for the EUT	The MSAX-W1-RJ-E2 device is a wireless LAN access point / client for industrial applications supporting following WLAN modes and frequency bands: • 802.11 ax/ac/a/h/n Mode: 5.15 - 5.35 GHz and 5.47 - 5.85 GHz • 802.11 ax/b/g/n Mode: 2400 - 2483.5 MHz 2 Reverse SMA connectors are available for usage with external antennas. 2x2 MIMO operation is possible in both bands. Simultaneous operation of the device in both frequency bands is supported. Module may be used either as Master or as Client WLAN device. The device supports 10/100/1000 Mbit/s Ethernet on 4 RJ45 ports. Additionally, the device features one digital input and one digital output signalling line, a configuration/licensing plug and a sleep timer. Supply power is 24Vdc. OFDMA for ax mode is not supported in the current firmware.
Number of Transmit Chains	2
Number of Receive Chains	2
Type of TX / RX Chains	symmetrical

Nominal Bandwidth	20 MHz, 40 MHz
EUT ports and connected cables during testing:	• Enclosure • DC port: cable length appr. 1.0m • Digital I/O port: cable length 2.0m (terminated with DIDO box), only for radiated tests • LAN port: cable length (shielded), appr. 3.0m, only for radiated tests • USB C service port: covered by metal plate screwed to housing. 2 Antenna ports, reverse SMA-connector, appr. 1.0 m & antenna
Tested datarates	WLAN g: 1 Mbit (corresponds to IEEE 802.11b mode), 6 Mbit WLAN n: MCS0 WLAN ax: MCS0
Special software used for testing	Test commands in command window interface of EUT with connection by USB C or LAN Port of EUT

4.2 EUT MAIN COMPONENTS

Sample Name	**Sample Code**	**Description**
EUT ac01	DE1039038ac01	
Sample Parameter	**Value**	
Serial No.	VPP7205251	
HW Version	02	
SW Version	V02.00.00	
Comment		

Sample Name	**Sample Code**	**Description**
EUT ac02	DE1039038ac02	
Sample Parameter	**Value**	
Serial No.	VPP7205251	
HW Version	02	
SW Version	V02.00.00	
Comment		

Sample Name	**Sample Code**	**Description**
EUT ad01	DE1039038ad01	
Sample Parameter	**Value**	
Serial No.	VPP7205248	
HW Version	02	
SW Version	V02.00.00	
Comment		

Sample Name	**Sample Code**	**Description**
EUT ad02	DE1039038ad02	
Sample Parameter	**Value**	
Serial No.	VPP7205248	
HW Version	02	
SW Version	V02.00.00	
Comment		

NOTE:The sample name is used to simplify the identification of the EUT in this test report.

4.3 ANCILLARY EQUIPMENT

For the purposes of this test report, ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Ancillary Equipment can influence the test results.

Device	**Details (Manufacturer, Type Model, OUT Code)**	**Description**
-	-	-

4.4 AUXILIARY EQUIPMENT

For the purposes of this test report, auxiliary equipment is defined as equipment which is used temporarily to enable operational and control features especially used for the tests of the EUT which is not used during normal operation or equipment that is used during the tests in combination with the EUT but is not subject of this test report. It is necessary to configure the system in a typical fashion, as a customer would normally use it.
But nevertheless Auxiliary Equipment can influence the test results.

Device	**Details (Manufacturer, Type Model, HW, SW, S/N)**	**Description**
AUX100	Siemens, ANT795-6MN, -, - , -	Omni directional dipole antenna, linear polarisation, gain 5.6 dBi
AUX101	Siemens, ANT795-6MN, -, - , -	Omni directional dipole antenna, linear polarisation, gain 5.6 dBi
AUX102	Siemens, ANT795-6DC, -, - , -	Sector patch antenna, linear polarisation, gain 8.1 dBi
AUX103	Siemens, ANT795-6DC, -, - , -	Sector patch antenna, linear polarisation, gain 8.1 dBi
AUX104	Siemens, ANT792-8DN, -, - , -	Directed patch antenna, linear polarisation, gain 14.8 dBi
AUX105	Siemens, ANT792-8DN, -, - , -	Directed patch antenna, linear polarisation, gain 14.8 dBi
AUX201	Siemens, -, -, - , -	RF-Cable (1m, reverse sma-connector)
AUX202	Siemens, -, -, - , -	RF-Cable (1m, reverse sma-connector)
AUX301	Siemens, -, -, - , -	DI/DO Test box with cable
AUXACDC	PeakTech, 6005D (30 V / 5 A):Laboratory Power Supply 120 V 60 Hz, -, -, 81062045	Laboratory Power Supply 120 V 60 Hz

4.5 EUT SETUPS

This chapter describes the combination of EUTs and equipment used for testing. The rationale for selecting the EUTs, ancillary and auxiliary equipment and interconnecting cables, is to test a representative configuration meeting the requirements of the referenced standards.

Setup	Combination of EUTs	Description and Rationale
S01_AC01	EUT ac01,	Conducted Setup
S02_AC01	EUT ac01, AUX202, AUX100, AUX301, AUX201, AUX101,	Radiated Setup with Omni Directional Dipole Antenna, linear polarisation, gain <6 dBi
S03_AC01	EUT ac01, AUX201, AUX102, AUX301, AUX103, AUX202,	Radiated Setup with Sector Patch Antenna, linear polarisation, gain <9 dBi
S04_AC01	EUT ac01, AUX201, AUX105, AUX104, AUX301, AUX202,	Radiated Setup with Directed Patch Antenna, linear polarisation, gain <14 dBi
S02_AC02	EUT ac02, AUX202, AUX100, AUX301, AUX201, AUX101,	Radiated Setup with Omni Directional Dipole Antenna, linear polarisation, gain <6 dBi
S03_AC02	EUT ac02, AUX201, AUX102, AUX301, AUX103, AUX202,	Radiated Setup with Sector Patch Antenna, linear polarisation, gain <9 dBi
S04_AC02	EUT ac02, AUX201, AUX105, AUX104, AUX301, AUX202,	Radiated Setup with Directed Patch Antenna, linear polarisation, gain <14 dBi
S01_AD01	EUT ad01,	Conducted Setup
S01_AD02	EUT ad02,	Conducted Setup
S03_AC_AC02	EUT ac02, AUX301, AUX103, AUX102, AUX202, AUX201, AUXACDC	AC Conducted Emissions Setup

Note: The given gain represents the gain range that was used for power setting during testing, see next chapter for setting details. The same notation is also used in the respective test cases.

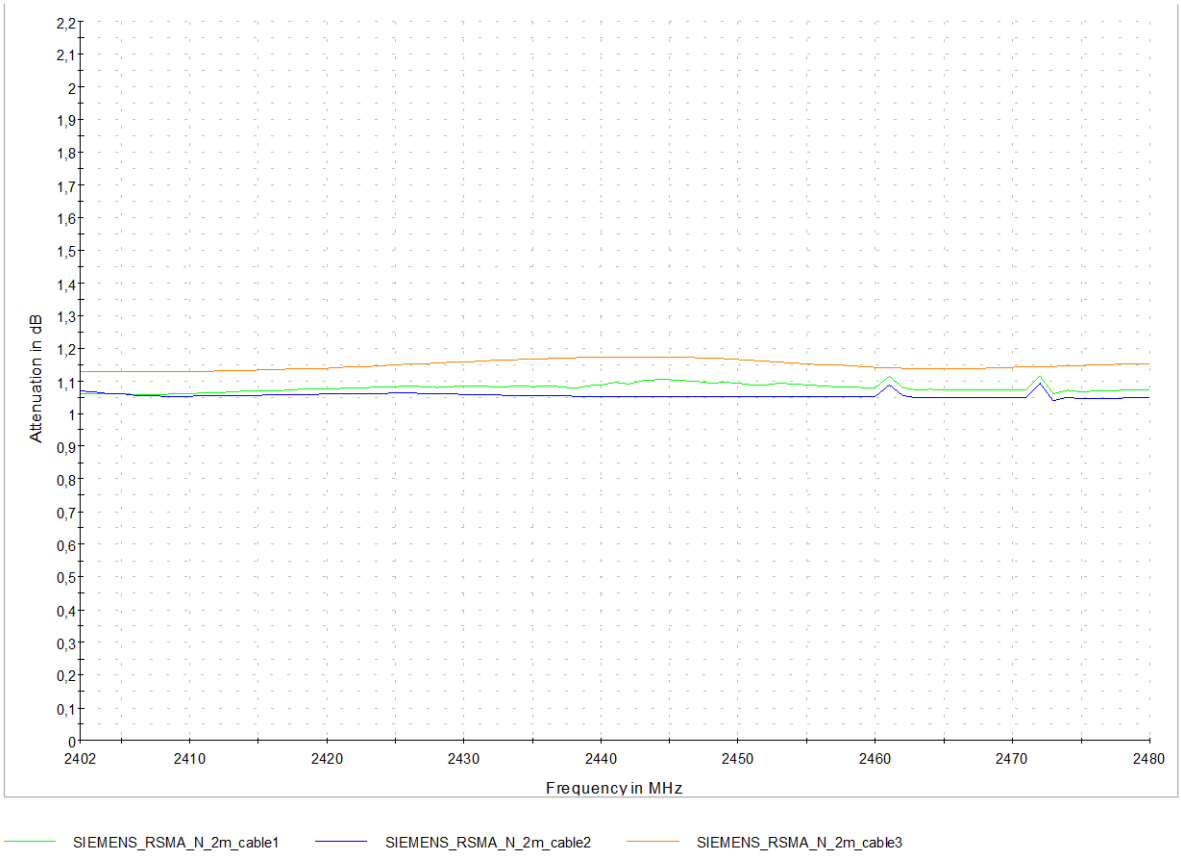
4.6 OPERATING MODES / TEST CHANNELS

This chapter describes the operating modes of the EUTs used for testing.

WLAN **20 MHz Test Channels:**	**2.4 GHz ISM** **2400 - 2483.5 MHz**			**Antenna gain [dBi]**
	low	**mid**	**high**	
Channel:	1	6	11	-
Frequency [MHz]	2412	2437	2462	-
Output Power per Chain SISO [dBm]	17	17	17	≤ 6
	15	15	15	≤ 9
	11	11	11	≤ 14
Output Power per Chain MIMO [dBm]	17	17	17	≤ 6
	15	15	15	≤ 9
	11	11	11	≤ 14

40 MHz Test Channels:	**low**	**mid**	**high**	**Antenna gain [dBi]**
Channel:	3	6	9	-
Frequency [MHz]	2422	2437	2452	-
Output Power per Chain SISO [dBm]	15	15	15	≤ 6
	13	13	13	≤ 9
	10	10	10	≤ 14
Output Power per Chain MIMO [dBm]	15	15	15	≤ 6
	13	13	13	≤ 9
	10	10	10	≤ 14

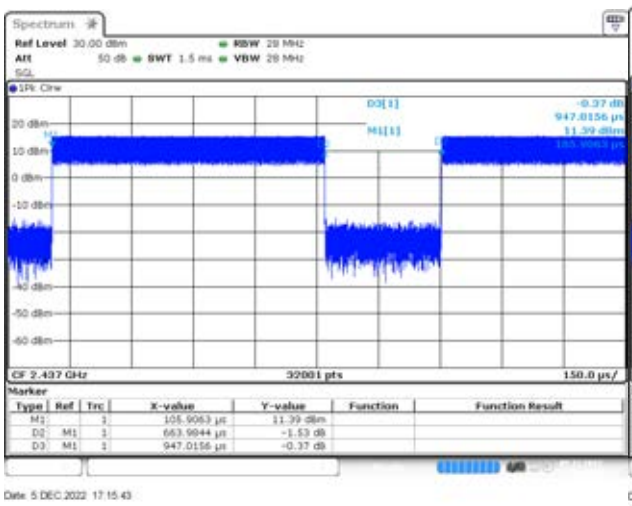
Attenuation of 2m cable (3 cables measured)

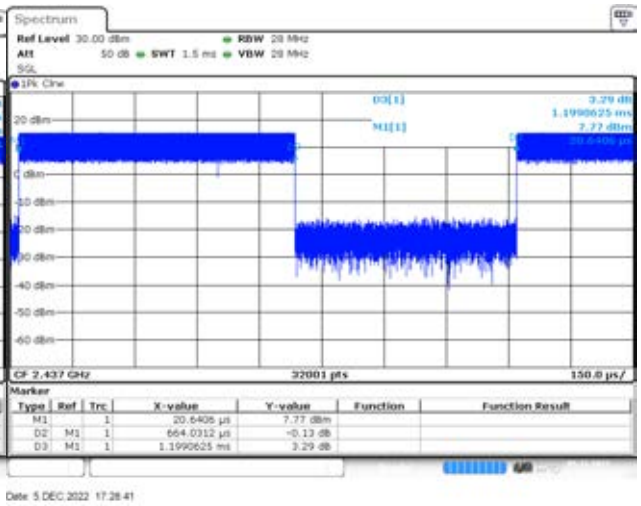


Resulting attenuation assumed for antenna gain calculation: 1 dB.

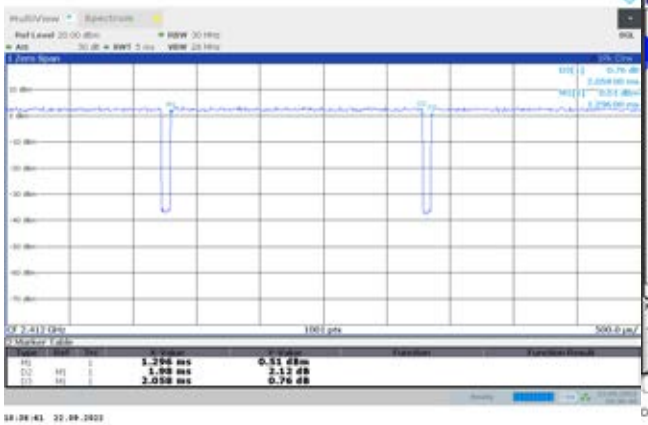
Note: The radiated measurements were performed with cables of 1m length, which is worse case compared to the 2m cable length, which is the minimum length to be used according to the applicant.

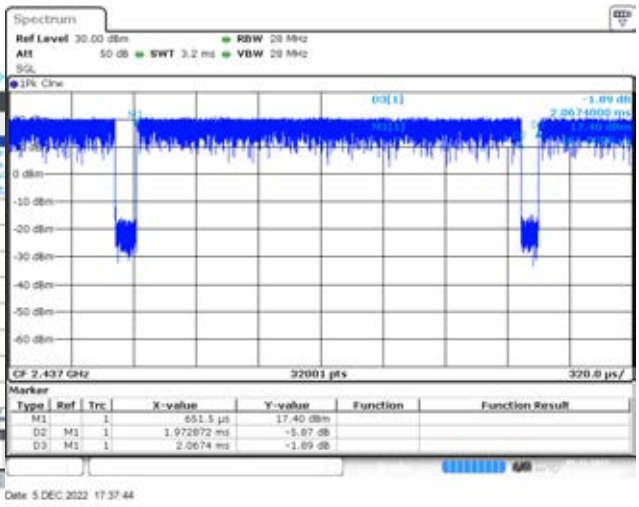
Duty Cycle				
Mode	SISO BW MIMO			
	20 [MHz]	40 [MHz]	20 [MHz]	40 [MHz]
g (1 Mbit)	0.701	-	0.554	-
g (6 Mbit)	0.962	-	0.955	-
n	0.923	0.910	0.948	0.907
ax	0.936	0.925	0.936	0.925





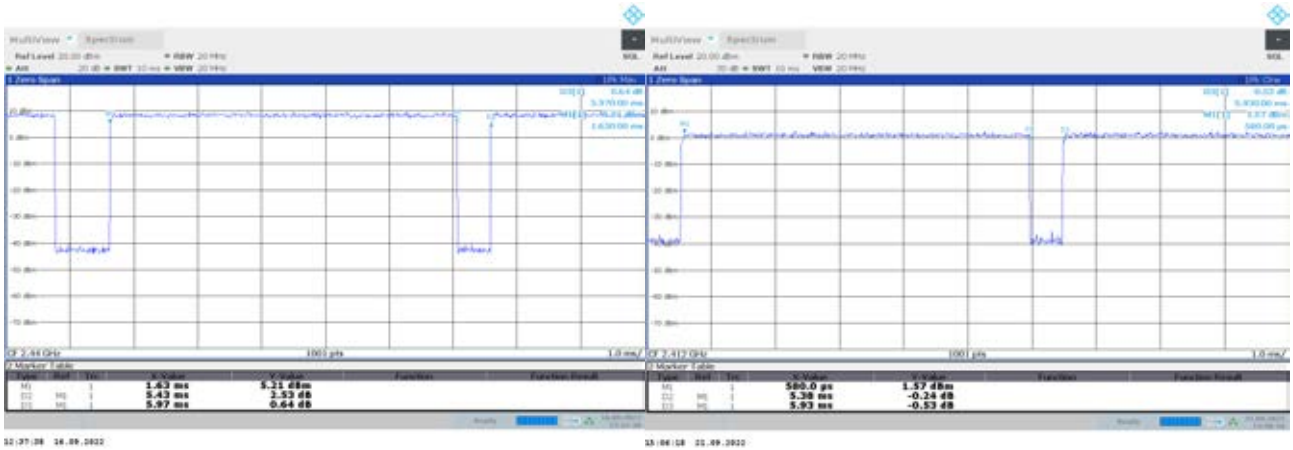
SISO WLAN g 1Mbit/s MIMO



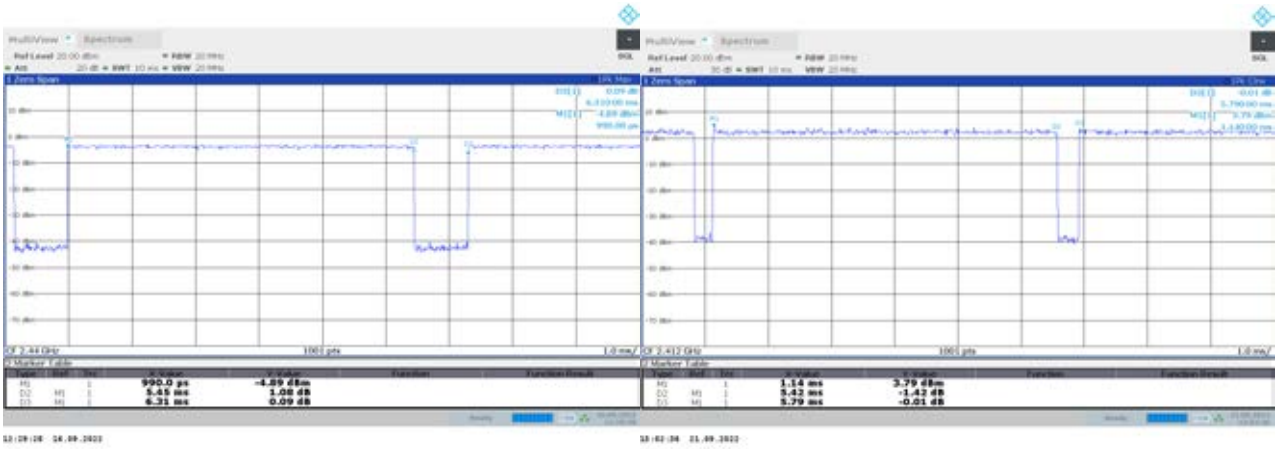


SISO WLAN g 6Mbit/s MIMO

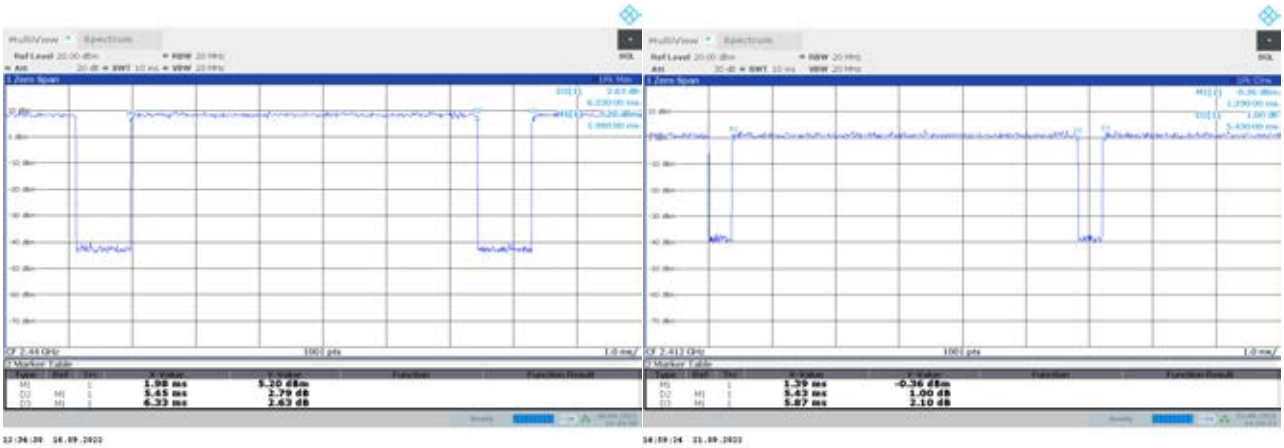
SISO WLAN n 20 MIMO



SISO WLAN n 40 MIMO



SISO WLAN ax 20 MIMO



SISO WLAN ax 40 MIMO

4.7 PRODUCT LABELLING

4.7.1 FCC ID LABEL

Please refer to the documentation of the applicant.

4.7.2 LOCATION OF THE LABEL ON THE EUT

Please refer to the documentation of the applicant.

5 TEST RESULTS

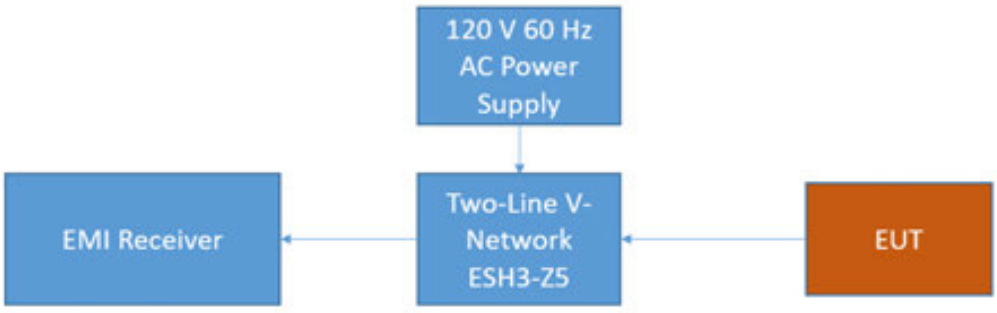
5.1 CONDUCTED EMISSIONS AT AC MAINS

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 6.2

5.1.1 TEST DESCRIPTION

The test set-up was made in accordance to the general provisions of ANSI C 63.10
The Equipment Under Test (EUT) was setup in a shielded room to perform the conducted emissions measurements in a typical installation configuration. The EUT was powered from 50µH || 50 Ohm Line Impedance Stabilization Network (LISN). The LISN's unused connections were terminated with 50 Ohm loads.



FCC Conducted Emissions on AC

The measurement procedure consists of two steps. It is implemented into the EMI test software EMC-32 from R&S.

Step 1: Preliminary scan
Intention of this step is, to determine the conducted EMI-profile of the EUT.
EMI receiver settings:
- Detector: Peak – Maxhold & Average
- Frequency range: 150 kHz – 30 MHz
- Frequency steps: 2.5 kHz
- IF–Bandwidth: 9 kHz
- Measuring time / Frequency step: 100 ms (FFT-based)
- Measurement on phase + neutral lines of the power cords

On basis of this preliminary scan the highest amplitudes and the corresponding frequencies relative to the limit are identified. Emissions above the limit and emissions which are in the 10 dB range below the limit are considered.

Step 2: Final measurement
Intention of this step is, to determine the highest emissions with the settings defined in the test specification for the frequencies identified in step 1.
EMI receiver settings:
- Detector: Quasi-Peak & (CISPR) Average
- IF Bandwidth: 9 kHz
- Measuring time: 1 s / frequency

At each frequency determined in step 1, four measurements are performed in the following combinations:
1) Neutral lead - reference ground (PE grounded)
2) Phase lead - reference ground (PE grounded)
3) Neutral lead - reference ground (PE floating)
4) Phase lead - reference ground (PE floating)

The highest value is reported.

5.1.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.207

Frequency (MHz)	QP Limits (dBµV)	AV Limits (dBµV)
0.15 – 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

Used conversion factor: Limit (dBµV) = 20 log (Limit (µV)/1µV).

5.1.3 TEST PROTOCOL

Temperature: 19 °C
Air Pressure: 1004 hPa
Humidity: 32 %

Power line	**PE**	**Frequency [MHz]**	**Measured value QP [dBµV]**	**Measured value AV [dBµV]**	**Limit [dBµV]**	**Margin [dB]**
-	-	-	-	-	-	-

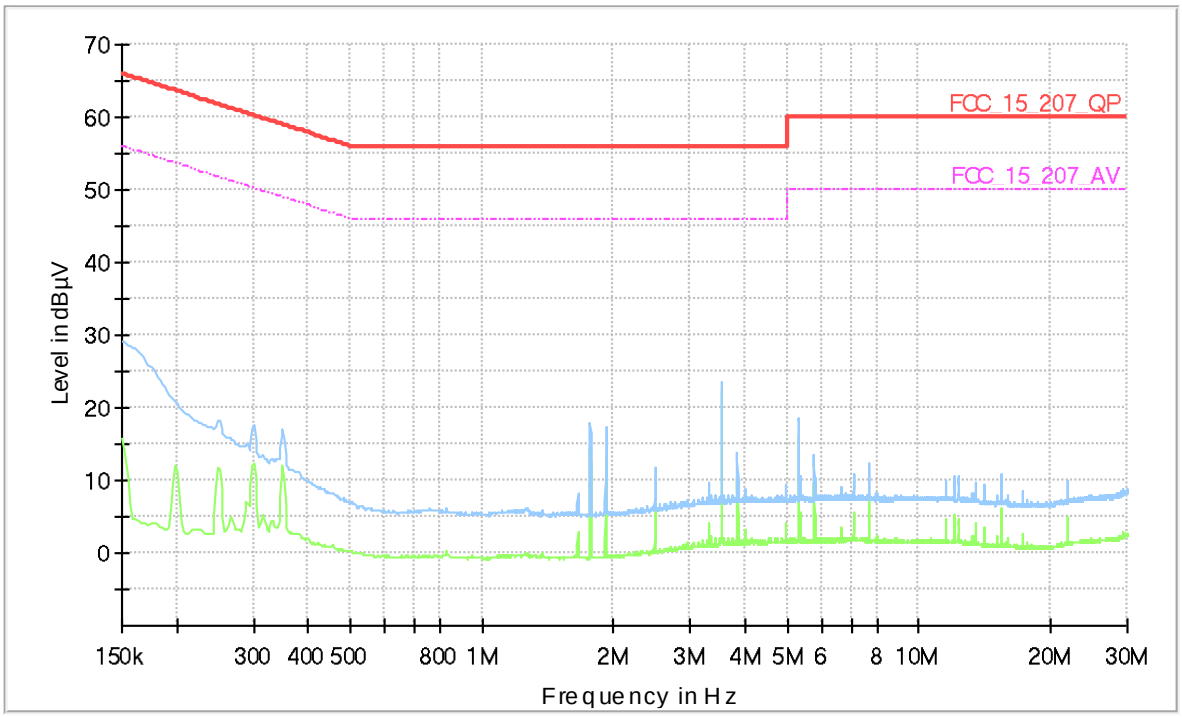
Remark: Please see next sub-clause for the measurement plot.

5.1.4 MEASUREMENT PLOT

Operating mode = worst case, Connection to AC mains = via ancillary/auxiliary equipment (S03_AC_AC02)

Common Information

Test Description:	Conducted Emissions
Test Standard:	FCC §15.207, ANSI C63.10
EUT / Setup Code:	DE1039038ac02
Operating Conditions:	120 V 60 Hz, 24 V DC, WLAN g 1 Mbps Diversity ch. 6 pwr 17
Operator Name:	GAL
Comment:	
Legend:	Trace: blue = QP, green = CISPR AV; Star: red or blue = critical frequency; Rhombus: blue = final QP, green = final CISPR AV
Tested Port / used LISN:	AC mains => 1st LISN ESH3-Z5
Termination of other ports:	N/A



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	PE	Corr. (dB)
---	---	---	---	---	---	---			---

5.1.5 TEST EQUIPMENT USED

- Conducted Emissions FCC

5.2 OCCUPIED BANDWIDTH (6 DB)

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 11.8.1

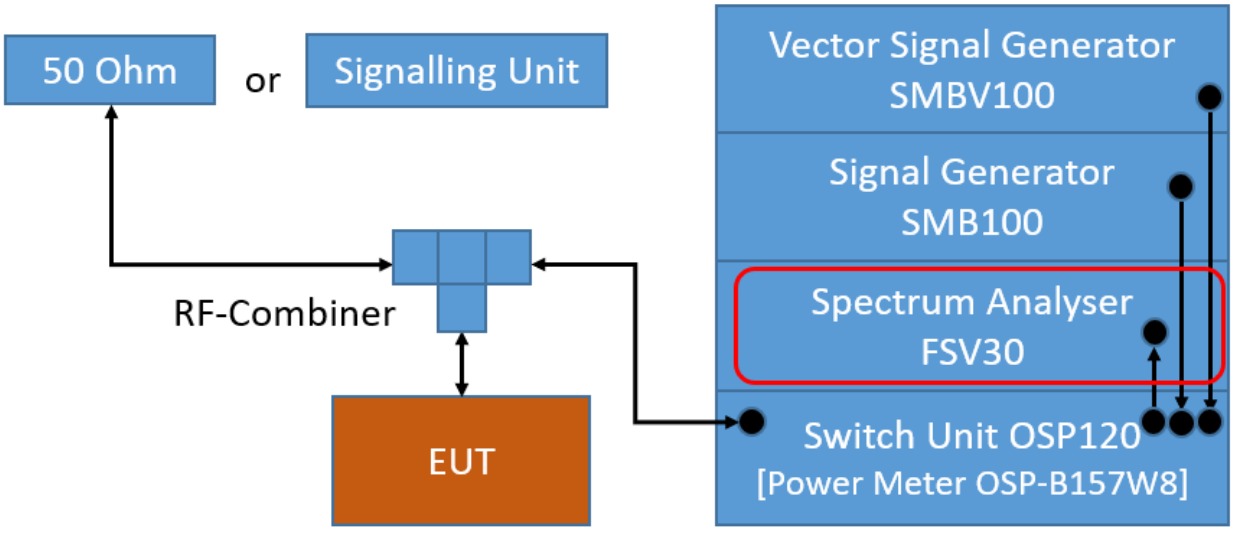
5.2.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up to perform the occupied bandwidth measurements.
The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.
The results recorded were measured with the modulation which produce the worst-case (smallest) emission bandwidth.

The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.

Analyser settings:

- Resolution Bandwidth (RBW): 100 kHz
- Video Bandwidth (VBW): 300 kHz
- Span: Two times nominal bandwidth
- Trace: Maxhold
- Sweeps: Till stable (min. 500, max. 15000)
- Sweeptime: Auto
- Detector: Peak



TS8997; Channel Bandwidth

5.2.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.247 (a) (2)
Systems using digital modulation techniques may operate in the 902-928 MHz and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.2.3 TEST PROTOCOL

Ambient temperature: 23 -25 °C
Air Pressure: 993 - 1017 hPa
Humidity: 37 - 42 %

WLAN g-Mode; 20 MHz; 1 Mbit/s

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	1	2412	8.2	0.5	7.7
	6	2437	8.2	0.5	7.7
	11	2462	8.2	0.5	7.7

WLAN g-Mode; 20 MHz; 6 Mbit/s

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	1	2412	16.1	0.5	15.6
	6	2437	16.1	0.5	15.6
	11	2462	15.9	0.5	15.4

WLAN n-Mode; 20 MHz; MCS0

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	1	2412	17.0	0.5	16.5
	6	2437	17.1	0.5	16.6
	11	2462	16.9	0.5	16.4

WLAN n-Mode; 40 MHz; MCS0

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	3	2422	36.1	0.5	35.6
	6	2437	36.2	0.5	35.7
	9	2452	36.1	0.5	35.6

WLAN ax-Mode; 20 MHz; MCS0

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	1	2412	18.6	0.5	18.1
	6	2437	18.8	0.5	18.3
	11	2462	18.7	0.5	18.2

WLAN ax-Mode; 40 MHz; MCS0

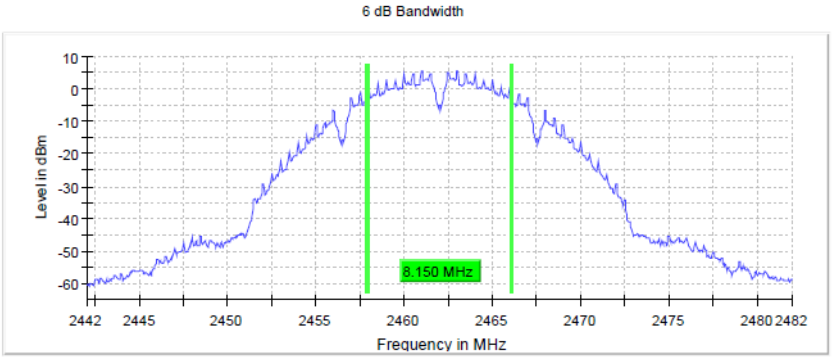
Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	3	2422	37.9	0.5	37.4
	6	2437	38.0	0.5	37.5
	9	2452	38.0	0.5	37.5

Remark: Please see next sub-clause for the measurement plot.

5.2.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN g 1 Mbit/s, Operating Frequency = high (S01_AC01)

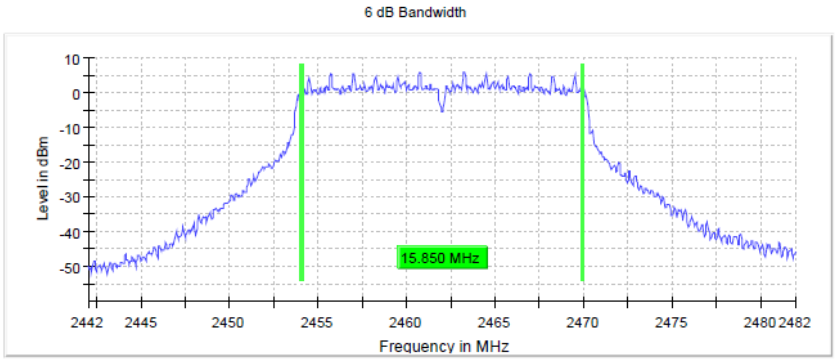
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2462.000000	8.150000	0.500000	---	2457.925000	2466.075000	5.5	PASS



Setting	Instrument Value
Start Frequency	2.44200 GHz
Stop Frequency	2.48200 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweeptime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	32 / max. 150
Stable	5 / 5
Max Stable Difference	0.14 dB

Radio Technology = WLAN g 6 Mbit/s, Operating Frequency = high (S01_AD01)

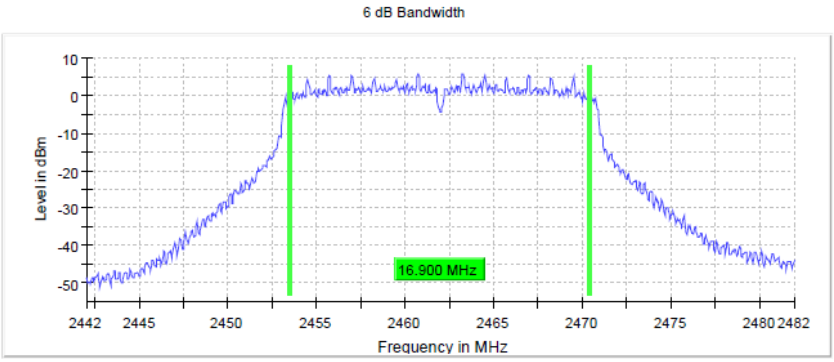
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2462.000000	15.850000	0.500000	---	2454.075000	2469.925000	5.9	PASS



Setting	Instrument Value
Start Frequency	2.44200 GHz
Stop Frequency	2.48200 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweeptime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	62 / max. 150
Stable	5 / 5
Max Stable Difference	0.07 dB

Radio Technology = WLAN n 20 MHz, Operating Frequency = high
(S01_AD01)

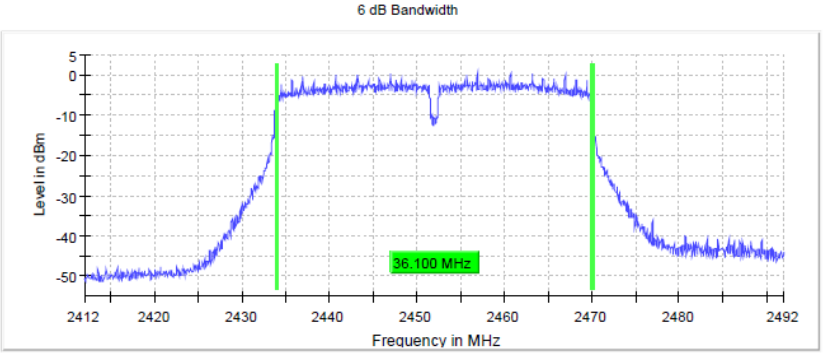
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2462.000000	16.900000	0.500000	---	2453.525000	2470.425000	5.9	PASS



Setting	Instrument Value
Start Frequency	2.44200 GHz
Stop Frequency	2.48200 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweeptime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	90 / max. 150
Stable	5 / 5
Max Stable Difference	0.09 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = high
(S01_AD01)

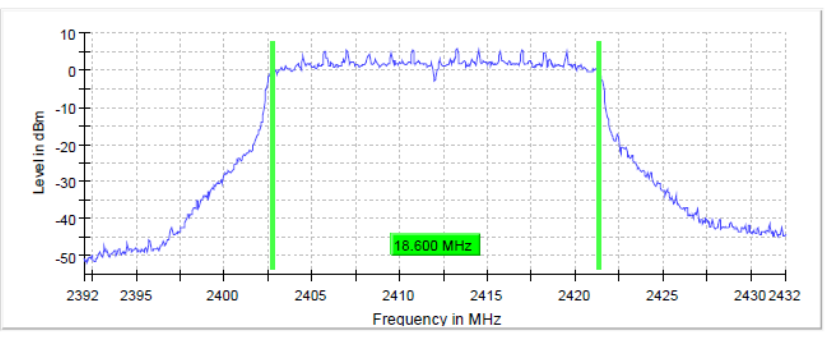
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2452.000000	36.100000	0.500000	---	2434.075000	2470.175000	0.7	PASS



Setting	Instrument Value
Start Frequency	2.41200 GHz
Stop Frequency	2.49200 GHz
Span	80.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1600
Sweeptime	1.600 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	119 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ax 20 MHz, Operating Frequency = low
(S01_AC01)

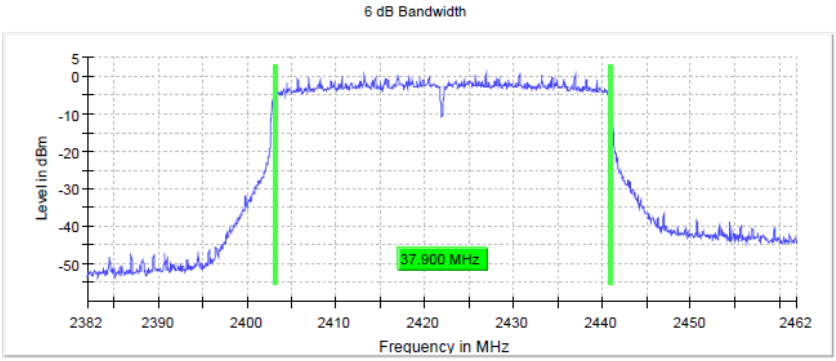
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2412.000000	18.600000	0.500000	---	2402.725000	2421.325000	5.5	PASS



Setting	Instrument Value
Start Frequency	2.39200 GHz
Stop Frequency	2.43200 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweeptime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	119 / max. 150
Stable	5 / 5
Max Stable Difference	0.22 dB

Radio Technology = WLAN ax 40 MHz, Operating Frequency = low
(S01_AD01)

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
2422.000000	37.900000	0.500000	---	2403.125000	2441.025000	0.7	PASS



Setting	Instrument Value
Start Frequency	2.38200 GHz
Stop Frequency	2.46200 GHz
Span	80.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1600
Sweeptime	1.600 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	127 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

5.2.5 TEST EQUIPMENT USED

- R&S TS8997

5.3 OCCUPIED BANDWIDTH (99%)

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 6.9.3

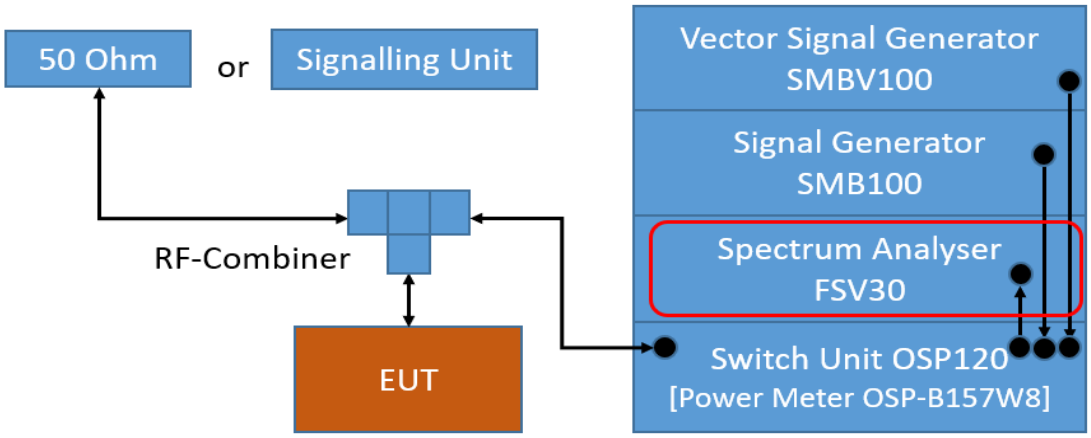
5.3.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up to perform the occupied bandwidth measurements.
The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.

Analyser settings:

- Resolution Bandwidth (RBW): 1 to 5 % of the OBW
- Video Bandwidth (VBW): ≥ 3 times the RBW
- Span: 1.5 to 5 times the OBW
- Trace: Maxhold
- Sweeps: Till stable (min. 500, max. 75000)
- Sweeptime: Auto
- Detector: Peak



TS8997; Channel Bandwidth

5.3.2 TEST REQUIREMENTS / LIMITS

No applicable limit.

5.3.3 TEST PROTOCOL

Ambient temperature: 23 -25 °C
Air Pressure: 993 - 1017 hPa
Humidity: 37 - 42 %

WLAN g-Mode; 20 MHz; 1 Mbit/s

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	1	2412	13.0
	6	2437	13.0
	11	2462	13.0

WLAN g-Mode; 20 MHz; 6 Mbit/s

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	1	2412	16.3
	6	2437	16.4
	11	2462	16.3

WLAN n-Mode; 20 MHz; MCS0

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	1	2412	17.5
	6	2437	17.7
	11	2462	17.6

WLAN n-Mode; 40 MHz; MCS0

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	3	2422	36.3
	6	2437	36.3
	9	2452	36.3

WLAN ax-Mode; 20 MHz; MCS0

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	1	2412	18.9
	6	2437	18.9
	11	2462	18.9

WLAN ax-Mode; 40 MHz; MCS0

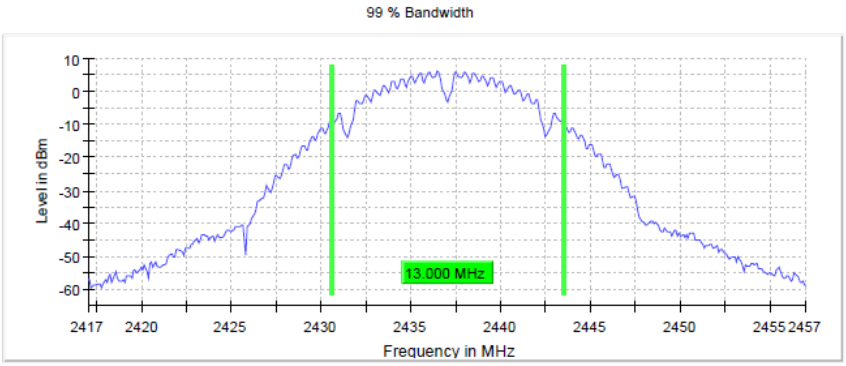
Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	3	2422	37.8
	6	2437	37.8
	9	2452	37.8

Remark: Please see next sub-clause for the measurement plot.

5.3.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN g 1 Mbit/s, Operating Frequency = mid (S01_AC01)

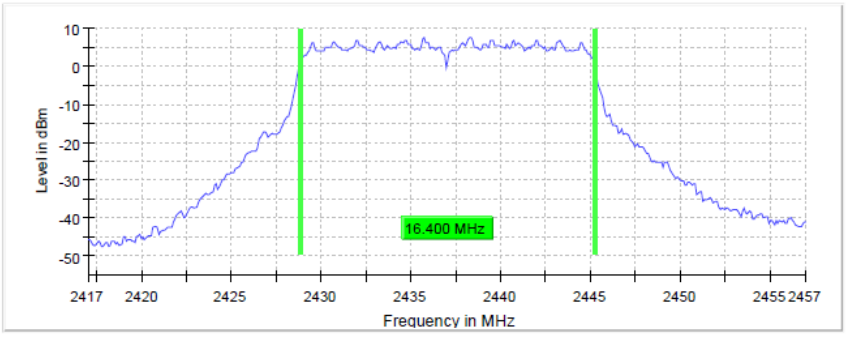
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	13.000000	---	---	2430.550000	2443.550000	PASS



Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	11 / max. 150
Stable	3 / 3
Max Stable Difference	0.13 dB

Radio Technology = WLAN g 6 Mbit/s, Operating Frequency = mid (S01_AD01)

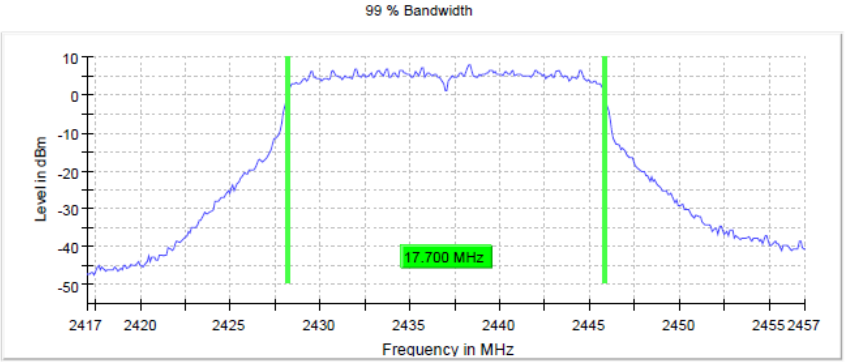
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	16.400000	---	---	2428.850000	2445.250000	PASS



Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	18 / max. 150
Stable	3 / 3
Max Stable Difference	0.18 dB

Radio Technology = WLAN n 20 MHz, Operating Frequency = mid (S01_AD01)

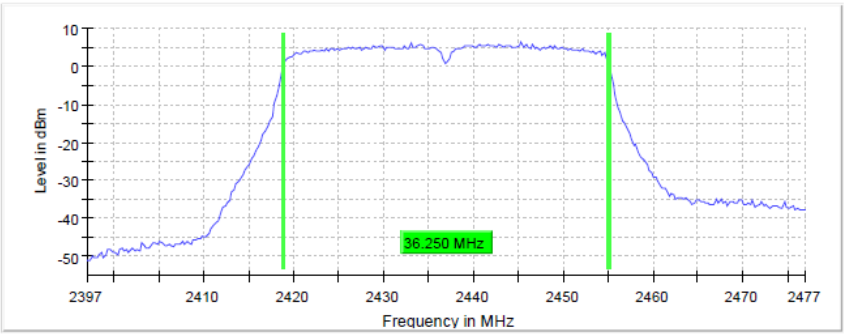
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	17.700000	---	---	2428.150000	2445.850000	PASS



Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	52 / max. 150
Stable	3 / 3
Max Stable Difference	0.00 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = mid (S01_AD01)

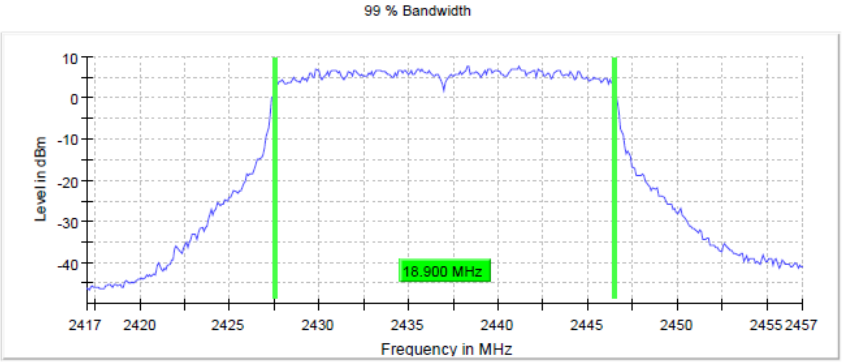
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	36.250000	---	---	2418.875000	2455.125000	PASS



Setting	Instrument Value
Start Frequency	2.39700 GHz
Stop Frequency	2.47700 GHz
Span	80.000 MHz
RBW	500.000 kHz
VBW	2.000 MHz
SweepPoints	320
Sweeptime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	69 / max. 150
Stable	3 / 3
Max Stable Difference	0.28 dB

Radio Technology = WLAN ax 20 MHz, Operating Frequency = mid (S01_AC01)

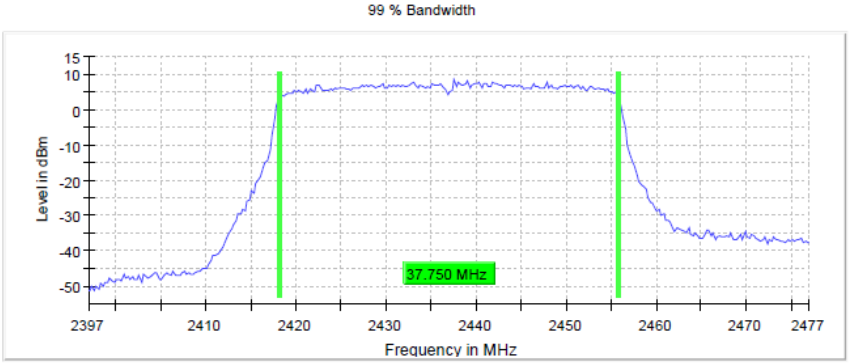
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	18.900000	---	---	2427.550000	2446.450000	PASS



Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	57 / max. 150
Stable	3 / 3
Max Stable Difference	0.12 dB

Radio Technology = WLAN ax 40 MHz, Operating Frequency = mid (S01_AD01)

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	37.750000	---	---	2418.125000	2455.875000	PASS



Setting	Instrument Value
Start Frequency	2.39700 GHz
Stop Frequency	2.47700 GHz
Span	80.000 MHz
RBW	500.000 kHz
VBW	2.000 MHz
SweepPoints	320
Sweeptime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	86 / max. 150
Stable	3 / 3
Max Stable Difference	0.28 dB

5.3.5 TEST EQUIPMENT USED

- R&S TS8997

5.4 PEAK POWER OUTPUT

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 11.9.1.3

5.4.1 TEST DESCRIPTION

DTS EQUIPMENT:
The Equipment Under Test (EUT) was set up to perform the output power measurements. The results recorded were measured with the modulation which produces the worst-case (highest) output power.

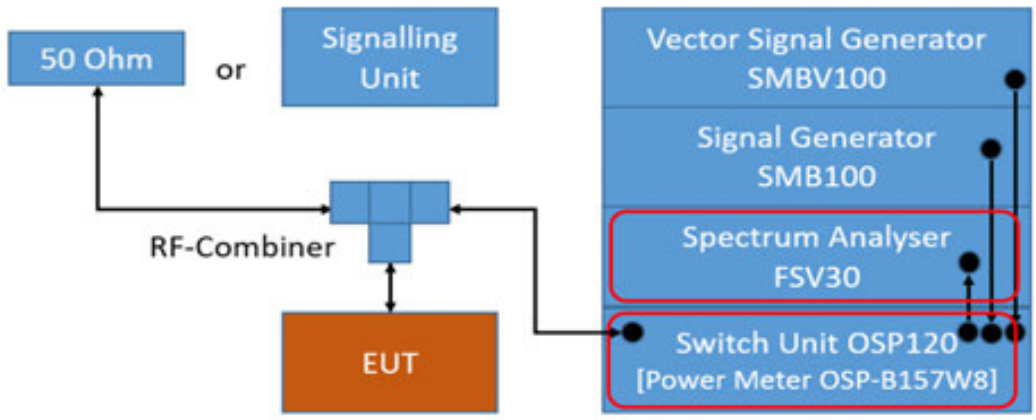
Maximum peak conducted output power (e.g. Bluetooth Low Energy):

The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.
The reference level of the spectrum analyser was set higher than the output power of the EUT.

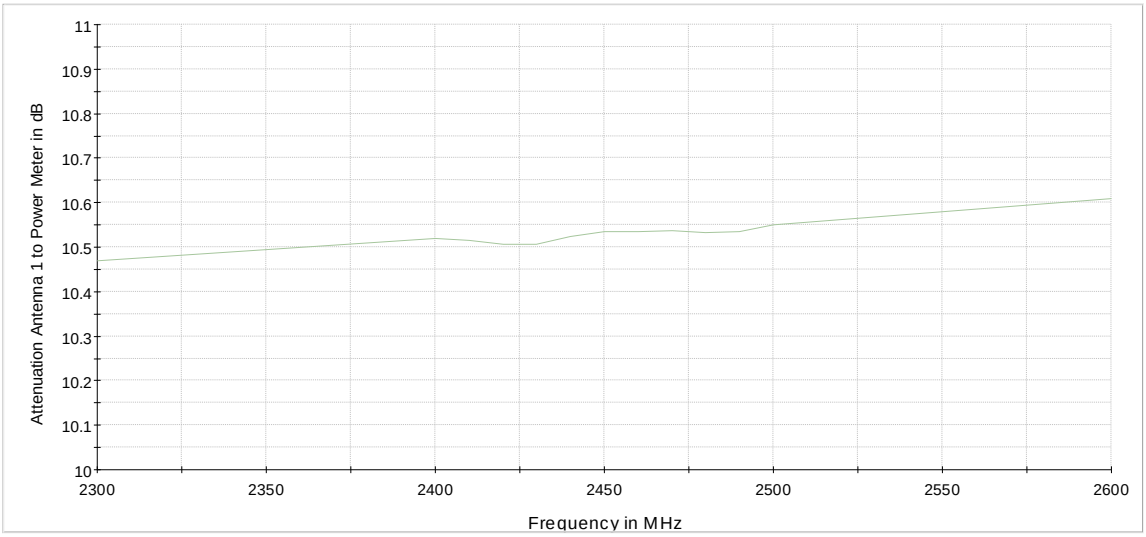
Analyser settings:
- Resolution Bandwidth (RBW): ≥ DTS bandwidth
- Video Bandwidth (VBW): ≥ 3 times RBW or maximum of analyzer
- Span: ≥ 3 times RBW
- Trace: Maxhold
- Sweeps: Till stable (min. 300, max. 15000)
- Sweeptime: Auto
- Detector: Peak

Maximum conducted average output power (e.g. WLAN):

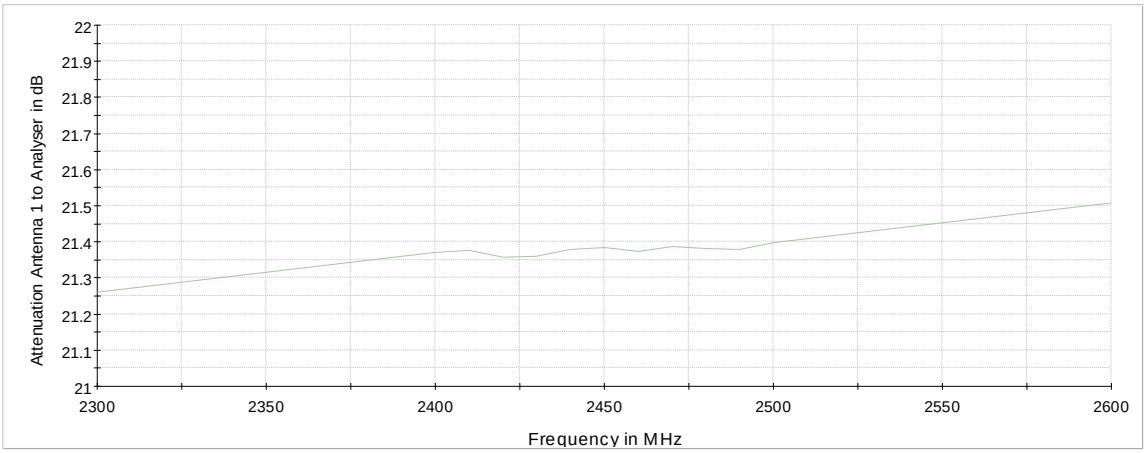
The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.
Measurement is performed using the gated RF average power meter integrated in the OSP 120 module OSP-B157W8 with signal bandwidth >300 MHz.



TS8997; Output Power



Attenuation of the measurement path to Power Meter



Attenuation of the measurement path to Analyser

5.4.2 TEST REQUIREMENTS / LIMITS

DTS devices:
FCC Part 15, Subpart C, §15.247 (b) (3)
For systems using digital modulation techniques in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: 1 watt.

==> Maximum conducted peak output power: 30 dBm (excluding antenna gain, if antennas with directional gains that do not exceed 6 dBi are used).

Frequency Hopping Systems:
FCC Part 15, Subpart C, §15.247 (b) (1)
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

FCC Part 15, Subpart C, §15.247 (b) (2)
For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW)

5.4.3 TEST PROTOCOL

Ambient temperature:	23 -25 °C
Air Pressure:	993 - 1017 hPa
Humidity:	37 - 42 %

Power Setting for antenna gain <6 dBi

WLAN g-Mode; 20 MHz; 1 Mbit/s

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	13.7	30.0	16.3	19.7
	6	2437	13.7	30.0	16.3	19.7
	11	2462	13.7	30.0	16.3	19.7

WLAN g-Mode; 20 MHz; 6 Mbit/s

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	16.2	30.0	13.8	22.2
	6	2437	16.6	30.0	13.4	22.6
	11	2462	16.3	30.0	13.7	22.3

WLAN n-Mode; 20 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	15.9	30.0	14.1	21.9
	6	2437	16.2	30.0	13.8	22.2
	11	2462	15.9	30.0	14.1	21.9

WLAN n-Mode; 40 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	14.7	30.0	15.3	20.7
	6	2437	14.7	30.0	15.3	20.7
	9	2452	14.4	30.0	15.6	20.4

WLAN ax-Mode; 20 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	15.6	30.0	14.4	21.6
	6	2437	16.2	30.0	13.8	22.2
	11	2462	15.8	30.0	14.2	21.8

WLAN ax-Mode; 40 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	14.3	30.0	15.7	20.3
	6	2437	14.3	30.0	15.7	20.3
	9	2452	14.1	30.0	15.9	20.1

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	16.4	30.0	13.6	22.4
	6	2437	16.6	30.0	13.4	22.6
	11	2462	16.8	30.0	13.2	22.8

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	19.5	30.0	10.5	25.5
	6	2437	19.6	30.0	10.4	25.6
	11	2462	19.3	30.0	10.7	25.3

WLAN n-Mode; 20 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	19.1	30.0	10.9	25.1
	6	2437	19.2	30.0	10.8	25.2
	11	2462	19.0	30.0	11.0	25.0

WLAN n-Mode; 40 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	3	2422	17.2	30.0	12.8	23.2
	6	2437	17.7	30.0	12.3	23.7
	9	2452	17.6	30.0	12.4	23.6

WLAN ax-Mode; 20 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	18.9	30.0	11.1	24.9
	6	2437	19.0	30.0	11.0	25.0
	11	2462	18.8	30.0	11.2	24.8

WLAN ax-Mode; 40 MHz; MCS0; MIMO

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	17.3	30.0	12.7	23.3
	6	2437	17.4	30.0	12.6	23.4
	9	2452	17.2	30.0	12.8	23.2

Power Setting for antenna gain <9 dBi

WLAN g-Mode; 20 MHz; 1 Mbit/s

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	11.5	27.0	15.5	20.5
	6	2437	11.5	27.0	15.5	20.5
	11	2462	11.6	27.0	15.4	20.6

WLAN g-Mode; 20 MHz; 6 Mbit/s

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	14.4	27.0	12.6	23.4
	6	2437	14.6	27.0	12.4	23.6
	11	2462	14.4	27.0	12.6	23.4

WLAN n-Mode; 20 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	14.1	27.0	12.9	23.1
	6	2437	14.2	27.0	12.8	23.2
	11	2462	14.1	27.0	12.9	23.1

WLAN n-Mode; 40 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	12.8	27.0	14.2	21.8
	6	2437	13.0	27.0	14.0	22.0
	9	2452	12.8	27.0	14.2	21.8

WLAN ax-Mode; 20 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	13.9	27.0	13.1	22.9
	6	2437	14.0	27.0	13.0	23.0
	11	2462	14.0	27.0	13.0	23.0

WLAN ax-Mode; 40 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	12.3	27.0	14.7	21.3
	6	2437	12.5	27.0	14.5	21.5
	9	2452	12.2	27.0	14.8	21.2

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	14.4	27.0	12.6	23.4
	6	2437	14.6	27.0	12.4	23.6
	11	2462	14.6	27.0	12.4	23.6

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	17.5	27.0	9.5	26.5
	6	2437	17.7	27.0	9.3	26.7
	11	2462	17.6	27.0	9.4	26.6

WLAN n-Mode; 20 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	17.0	27.0	10.0	26.0
	6	2437	17.2	27.0	9.8	26.2
	11	2462	17.1	27.0	9.9	26.1

WLAN n-Mode; 40 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	3	2422	15.6	27.0	11.4	24.6
	6	2437	15.8	27.0	11.2	24.8
	9	2452	15.6	27.0	11.4	24.6

WLAN ax-Mode; 20 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	16.9	27.0	10.1	25.9
	6	2437	17.0	27.0	10.0	26.0
	11	2462	17.0	27.0	10.0	26.0

WLAN ax-Mode; 40 MHz; MCS0; MIMO

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	15.2	27.0	11.8	24.2
	6	2437	15.4	27.0	11.6	24.4
	9	2452	15.2	27.0	11.8	24.2

Power Setting for antenna gain <14 dBi

WLAN g-Mode; 20 MHz; 1 Mbit/s

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	7.5	22.0	14.5	21.5
	6	2437	7.9	22.0	14.1	21.9
	11	2462	7.6	22.0	14.4	21.6

WLAN g-Mode; 20 MHz; 6 Mbit/s

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	10.5	22.0	11.5	24.5
	6	2437	10.7	22.0	11.3	24.7
	11	2462	10.7	22.0	11.3	24.7

WLAN n-Mode; 20 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	10.1	22.0	11.9	24.1
	6	2437	10.4	22.0	11.6	24.4
	11	2462	10.3	22.0	11.7	24.3

WLAN n-Mode; 40 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	9.7	22.0	12.3	23.7
	6	2437	10.0	22.0	12.0	24.0
	9	2452	9.6	22.0	12.4	23.6

WLAN ax-Mode; 20 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	9.9	22.0	12.1	23.9
	6	2437	10.2	22.0	11.8	24.2
	11	2462	10.1	22.0	11.9	24.1

WLAN ax-Mode; 40 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	9.3	22.0	12.7	23.3
	6	2437	9.5	22.0	12.5	23.5
	9	2452	9.3	22.0	12.7	23.3

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	10.3	22.0	11.7	24.3
	6	2437	10.7	22.0	11.3	24.7
	11	2462	10.5	22.0	11.5	24.5

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	13.5	22.0	8.5	27.5
	6	2437	13.7	22.0	8.3	27.7
	11	2462	13.6	22.0	8.4	27.6

WLAN n-Mode; 20 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	12.8	22.0	9.2	26.8
	6	2437	13.2	22.0	8.8	27.2
	11	2462	12.9	22.0	9.1	26.9

WLAN n-Mode; 40 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	3	2422	12.6	22.0	9.4	26.6
	6	2437	12.8	22.0	9.2	26.8
	9	2452	12.6	22.0	9.4	26.6

WLAN ax-Mode; 20 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
2.4 GHz ISM	1	2412	12.9	22.0	9.1	26.9
	6	2437	13.1	22.0	8.9	27.1
	11	2462	13.1	22.0	8.9	27.1

WLAN ax-Mode; 40 MHz; MCS0; MIMO

Band	Ch. No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	12.2	22.0	9.8	26.2
	6	2437	12.5	22.0	9.5	26.5
	9	2452	12.2	22.0	9.8	26.2

Remark: Conducted limits are reduced according to antenna gain bigger than 6 dBi.

5.4.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Power Meter Measurement. No Plots Provided.

5.4.5 TEST EQUIPMENT USED

- R&S TS8997

5.5 SPURIOUS RF CONDUCTED EMISSIONS

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 11.11

5.5.1 TEST DESCRIPTION

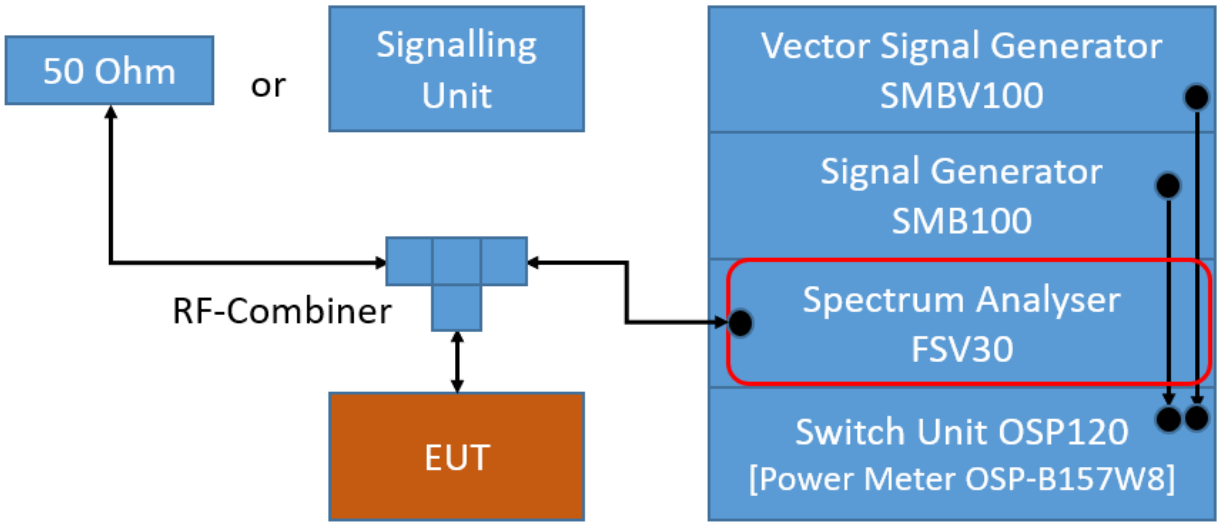
The Equipment Under Test (EUT) was set up to perform the spurious emissions measurements.

The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.

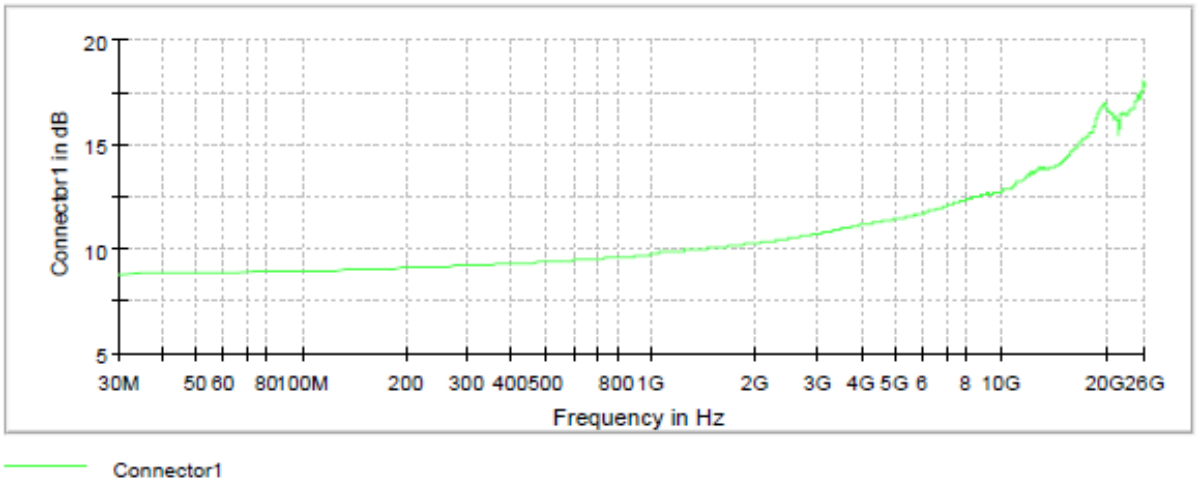
Analyser settings:

- Frequency range: 30 – 26000 MHz
- Resolution Bandwidth (RBW): 100 kHz
- Video Bandwidth (VBW): 300 kHz
- Trace: Maxhold
- Sweeps: Till Stable (max. 120)
- Sweep Time: Auto
- Detector: Peak

The reference value for the measurement of the spurious RF conducted emissions is determined during the test "band edge compliance conducted". This value is used to calculate the 20 dBc or 30 dBc limit.



TS8997; Spurious RF Conducted Emissions



Attenuation of the measurement part

5.5.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.247 (c)
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.5.3 TEST PROTOCOL

Ambient temperature: 23 -25 °C
Air Pressure: 993 - 1017 hPa
Humidity: 37 - 42 %

WLAN g-Mode; 20 MHz; 1 Mbit/s

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2395.0	-49.8	PEAK	100	3.6	-26.4	23.4
6	2437	7315.7	-53.4	PEAK	100	3.9	-26.1	27.3
11	2462	7385.7	-53.4	PEAK	100	4.0	-26.0	27.4

WLAN g-Mode; 20 MHz; 6 Mbit/s

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2395.0	-33.6	PEAK	100	5.4	-24.6	9.0
6	2437	7305.7	-54.4	PEAK	100	6.0	-24.0	30.4
11	2462	25705.2	-43.5	PEAK	100	4.8	-25.2	18.3

WLAN n-Mode; 20 MHz; MCS0

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2395.0	-29.3	PEAK	100	4.8	-25.2	4.1
6	2437	7305.7	-54.6	PEAK	100	6.2	-23.8	30.8
11	2462	25565.2	-43.7	PEAK	100	4.6	-25.4	18.3

WLAN n-Mode; 40 MHz; MCS0

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
3	2422	2395.0	-36.8	PEAK	100	0.3	-29.7	7.1
6	2437	2488.5	-48.5	PEAK	100	-1.5	-31.5	17.0
9	2452	2488.5	-39.4	PEAK	100	-1.0	-31.0	8.4

WLAN ax-Mode; 20 MHz; MCS0

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2395.0	-31.6	PEAK	100	3.3	-26.7	4.9
6	2437	7315.7	-51.9	PEAK	100	4.0	-26.0	25.9
11	2462	25355.4	-43.1	PEAK	100	1.6	-28.4	14.7

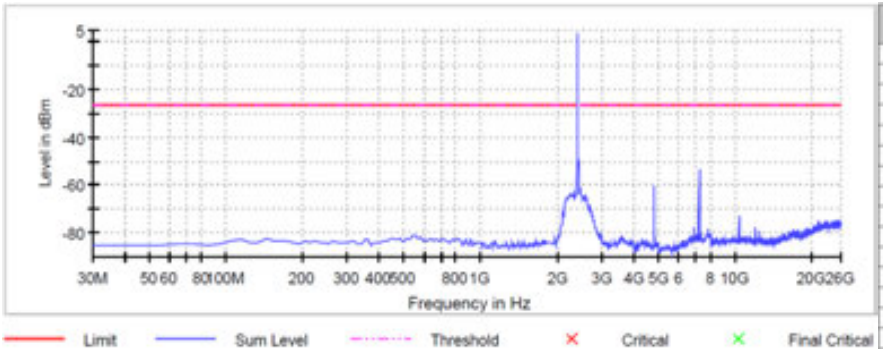
WLAN ax-Mode; 40 MHz; MCS0

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
3	2422	2395.0	-54.2	PEAK	100	2.9	-27.1	27.1
6	2437	7345.7	-54.9	PEAK	100	2.8	-27.2	27.7
9	2452	25695.2	-43.9	PEAK	100	2.2	-27.8	16.1

Remark: Please see next sub-clause for the measurement plot.

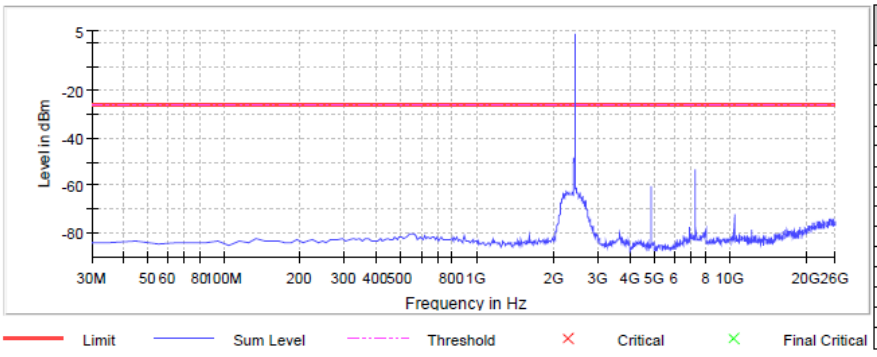
5.5.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN g 1 Mbit/s, Operating Frequency = low (S01_AD01)



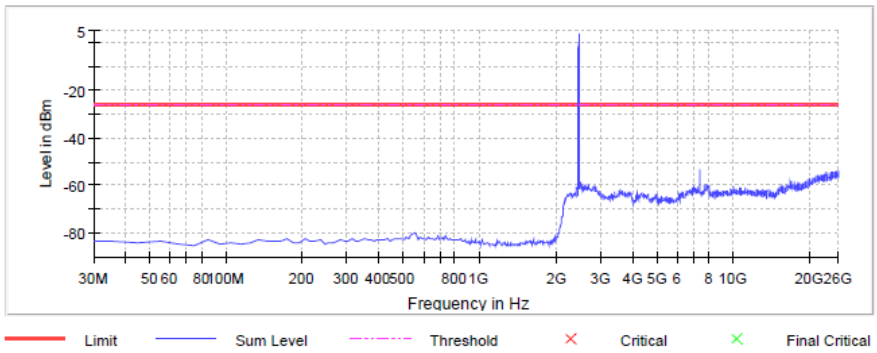
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-49.8	23.4	-26.4
7235.771887	-53.2	26.8	-26.4
4827.154590	-60.5	34.1	-26.4
2385.063025	-61.6	35.2	-26.4
2355.189076	-63.5	37.1	-26.4
2235.693277	-63.7	37.3	-26.4
2488.497131	-63.7	37.3	-26.4
2245.651261	-63.8	37.4	-26.4
2375.105042	-63.8	37.4	-26.4
2275.525210	-64.0	37.7	-26.4
2295.441176	-64.2	37.8	-26.4
2578.445495	-64.2	37.8	-26.4
2345.231092	-64.2	37.8	-26.4
2365.147059	-64.2	37.8	-26.4
2315.357143	-64.3	37.9	-26.4

Radio Technology = WLAN g 1 Mbit/s, Operating Frequency = mid (S01_AD01)



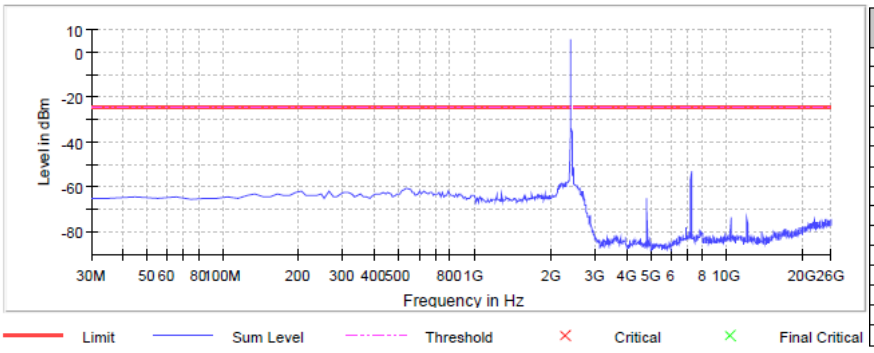
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7315.725988	-53.4	27.3	-26.1
7305.731725	-53.9	27.8	-26.1
4877.125903	-60.5	34.5	-26.1
2255.609244	-62.5	36.4	-26.1
2375.105042	-62.5	36.4	-26.1
2305.399160	-62.6	36.5	-26.1
2498.491394	-63.1	37.0	-26.1
2275.525210	-63.1	37.0	-26.1
2315.357143	-63.2	37.1	-26.1
2488.497131	-63.2	37.2	-26.1
2245.651261	-63.3	37.2	-26.1
2215.777311	-63.5	37.4	-26.1
2385.063025	-63.5	37.4	-26.1
2265.567227	-63.5	37.4	-26.1
2395.021008	-63.5	37.5	-26.1

Radio Technology = WLAN g 1 Mbit/s, Operating Frequency = high (S01_AD01)



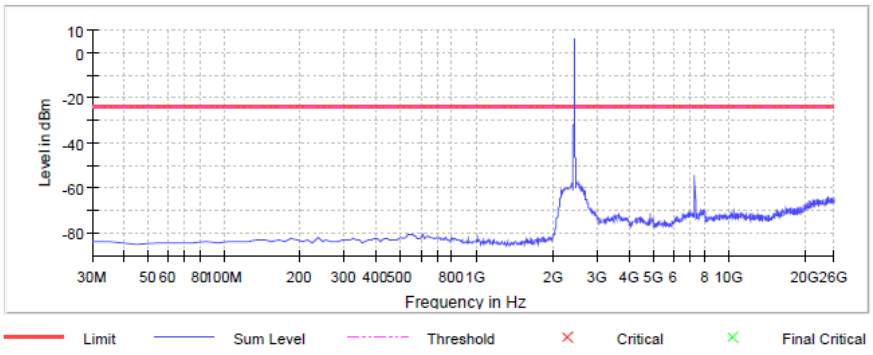
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7385.685827	-53.4	27.4	-26.0
26000.000000	-53.9	27.9	-26.0
25995.002869	-53.9	27.9	-26.0
25585.238100	-54.0	28.0	-26.0
25265.421696	-54.4	28.4	-26.0
24615.794624	-54.5	28.5	-26.0
24295.978219	-54.5	28.5	-26.0
25685.180727	-54.6	28.6	-26.0
24236.012643	-54.6	28.6	-26.0
23426.477369	-54.6	28.7	-26.0
24795.691351	-54.7	28.7	-26.0
25625.215151	-54.7	28.7	-26.0
24455.886422	-54.8	28.8	-26.0
24735.725776	-54.9	28.9	-26.0
24925.616766	-54.9	29.0	-26.0

Radio Technology = WLAN g 6 Mbit/s, Operating Frequency = low
(S01_AD01)



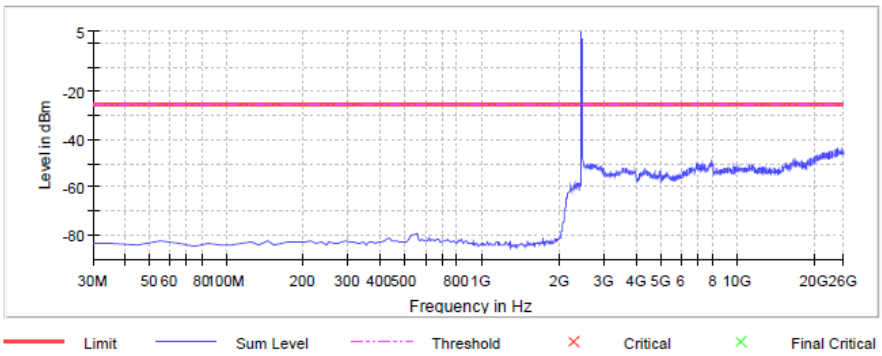
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-33.6	9.0	-24.6
7235.771887	-53.0	28.4	-24.6
7245.766150	-56.0	31.4	-24.6
2385.063025	-56.3	31.7	-24.6
7225.777624	-56.7	32.1	-24.6
2365.147059	-57.0	32.4	-24.6
2375.105042	-57.5	32.9	-24.6
2325.315126	-57.9	33.3	-24.6
2215.777311	-57.9	33.3	-24.6
2335.273109	-58.0	33.4	-24.6
2355.189076	-58.0	33.4	-24.6
2345.231092	-58.4	33.8	-24.6
2265.567227	-58.5	33.9	-24.6
2195.861345	-58.5	33.9	-24.6
2295.441176	-58.6	34.0	-24.6

Radio Technology = WLAN g 6 Mbit/s, Operating Frequency = mid
(S01_AD01)



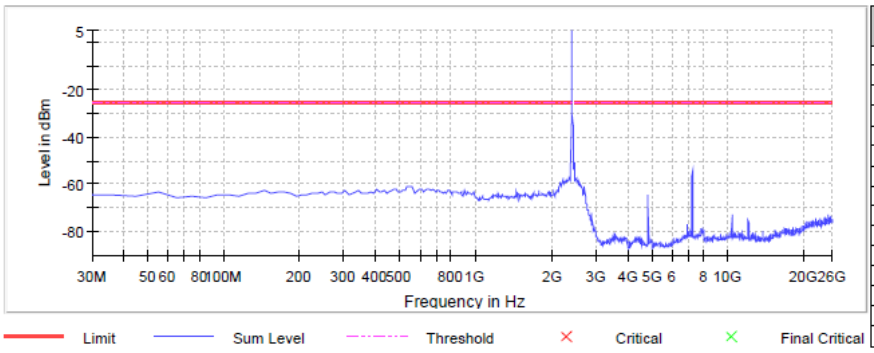
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7305.731725	-54.4	30.3	-24.0
7315.725988	-54.8	30.7	-24.0
7325.720251	-57.1	33.1	-24.0
2498.491394	-57.3	33.2	-24.0
7295.737463	-57.6	33.6	-24.0
2395.021008	-57.7	33.7	-24.0
2518.479919	-57.8	33.8	-24.0
2538.468445	-58.0	34.0	-24.0
2385.063025	-58.2	34.1	-24.0
2508.485657	-58.3	34.3	-24.0
2488.497131	-58.5	34.5	-24.0
2365.147059	-58.8	34.8	-24.0
2568.451232	-59.1	35.1	-24.0
2528.474182	-59.1	35.1	-24.0
2375.105042	-59.1	35.1	-24.0

Radio Technology = WLAN g 6 Mbit/s, Operating Frequency = high
(S01_AD01)



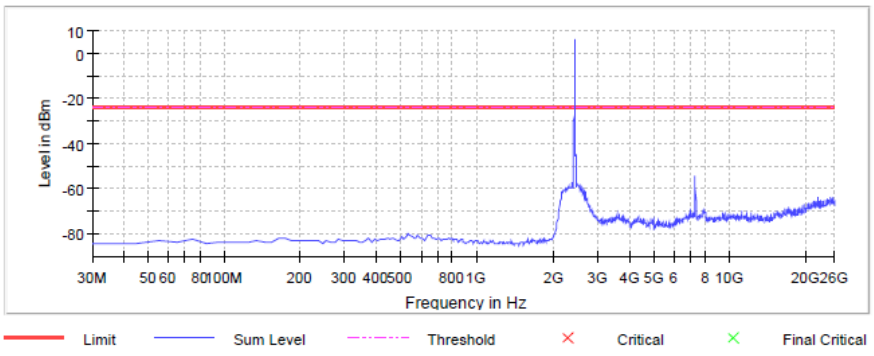
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
25705.169252	-43.5	18.2	-25.2
25725.157777	-43.7	18.5	-25.2
24555.829048	-44.0	18.7	-25.2
25695.174989	-44.0	18.8	-25.2
25595.232363	-44.1	18.9	-25.2
24395.920846	-44.1	18.9	-25.2
25645.203676	-44.2	19.0	-25.2
24365.938058	-44.3	19.0	-25.2
24795.691351	-44.5	19.3	-25.2
24865.651190	-44.6	19.3	-25.2
25685.180727	-44.6	19.3	-25.2
23886.213451	-44.6	19.3	-25.2
23496.437208	-44.6	19.4	-25.2
25905.054505	-44.6	19.4	-25.2
25165.479069	-44.7	19.4	-25.2

Radio Technology = WLAN n 20 MHz, Operating Frequency = low
(S01_AD01)



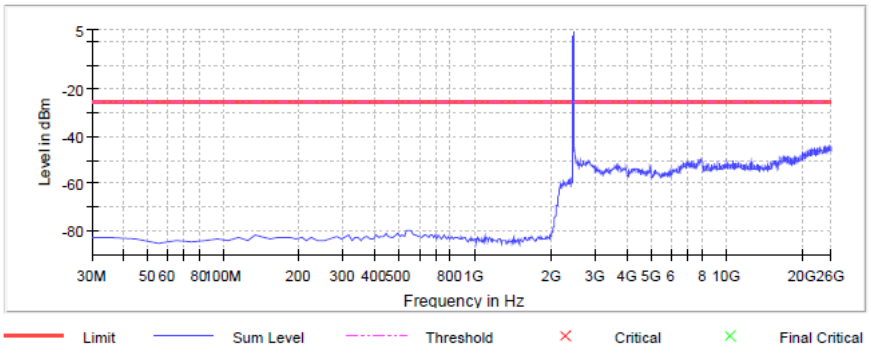
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-29.3	4.1	-25.2
7235.771887	-53.7	28.5	-25.2
2385.063025	-53.9	28.6	-25.2
7245.766150	-54.3	29.0	-25.2
2345.231092	-56.6	31.4	-25.2
7225.777624	-56.9	31.7	-25.2
2498.491394	-57.2	31.9	-25.2
2355.189076	-57.4	32.2	-25.2
2375.105042	-57.8	32.6	-25.2
2335.273109	-58.0	32.8	-25.2
2528.474182	-58.2	33.0	-25.2
2205.819328	-58.2	33.0	-25.2
2365.147059	-58.4	33.2	-25.2
2325.315126	-58.6	33.4	-25.2
2225.735294	-58.7	33.5	-25.2

Radio Technology = WLAN n 20 MHz, Operating Frequency = mid
(S01_AD01)



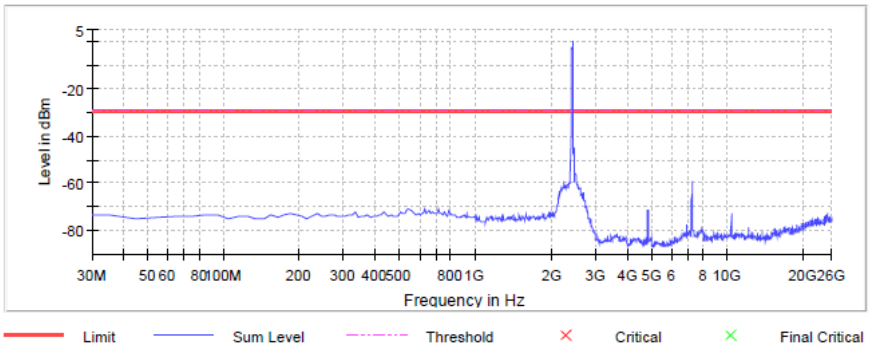
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7305.731725	-54.6	30.8	-23.8
7315.725988	-54.6	30.8	-23.8
2385.063025	-57.6	33.7	-23.8
2488.497131	-57.6	33.8	-23.8
2395.021008	-57.7	33.9	-23.8
2538.468445	-58.2	34.3	-23.8
7295.737463	-58.4	34.6	-23.8
2498.491394	-58.6	34.8	-23.8
2295.441176	-58.7	34.8	-23.8
2508.485657	-58.7	34.9	-23.8
2518.479919	-58.8	34.9	-23.8
2375.105042	-58.8	34.9	-23.8
2355.189076	-59.3	35.4	-23.8
7325.720251	-59.3	35.4	-23.8
2325.315126	-59.3	35.5	-23.8

Radio Technology = WLAN n 20 MHz, Operating Frequency = high
(S01_AD01)



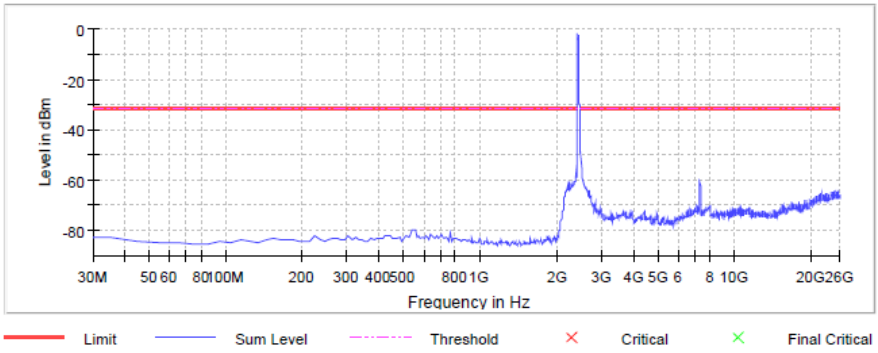
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
25565.249575	-43.7	18.3	-25.4
25265.421696	-44.0	18.6	-25.4
2488.497131	-44.1	18.7	-25.4
24415.909371	-44.1	18.7	-25.4
24445.892159	-44.2	18.8	-25.4
25685.180727	-44.2	18.8	-25.4
25245.433170	-44.4	19.0	-25.4
25075.530705	-44.4	19.0	-25.4
24505.857735	-44.4	19.0	-25.4
25205.456120	-44.5	19.1	-25.4
24605.800361	-44.5	19.1	-25.4
24385.926583	-44.5	19.1	-25.4
23456.460157	-44.5	19.1	-25.4
25415.335635	-44.5	19.1	-25.4
25975.014343	-44.5	19.1	-25.4

Radio Technology = WLAN n 40 MHz, Operating Frequency = low
(S01_AD01)



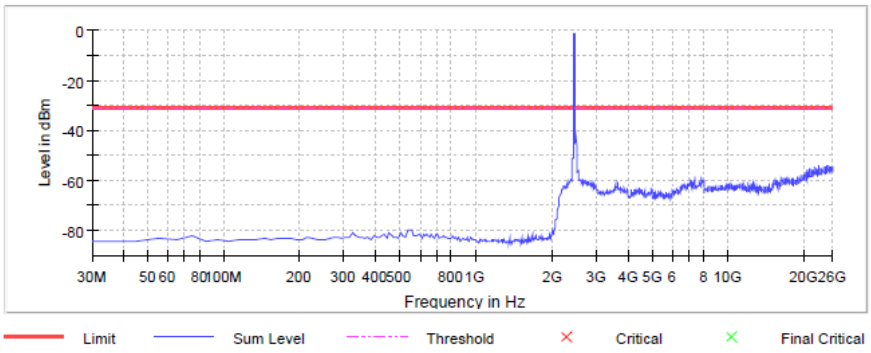
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-36.8	7.0	-29.7
2488.497131	-55.8	26.0	-29.7
2498.491394	-56.6	26.8	-29.7
2385.063025	-57.5	27.7	-29.7
2508.485657	-58.9	29.1	-29.7
7275.748938	-59.0	29.3	-29.7
2365.147059	-59.1	29.4	-29.7
7265.754675	-59.1	29.4	-29.7
7255.760412	-59.2	29.5	-29.7
2518.479919	-59.8	30.1	-29.7
2375.105042	-60.1	30.3	-29.7
7295.737463	-60.1	30.4	-29.7
2255.609244	-60.4	30.7	-29.7
2335.273109	-60.5	30.8	-29.7
2538.468445	-60.6	30.8	-29.7

Radio Technology = WLAN n 40 MHz, Operating Frequency = mid
(S01_AD01)



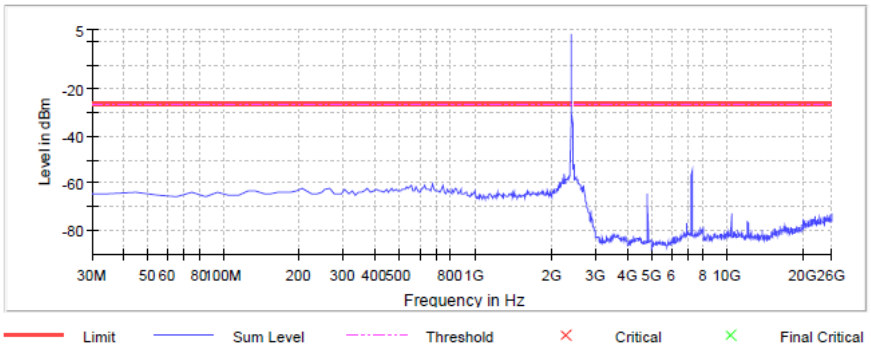
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2488.497131	-48.5	17.0	-31.5
2395.021008	-52.7	21.2	-31.5
2498.491394	-55.8	24.3	-31.5
2508.485657	-55.8	24.3	-31.5
2385.063025	-58.8	27.3	-31.5
2518.479919	-59.2	27.7	-31.5
2375.105042	-60.3	28.8	-31.5
7305.731725	-60.3	28.8	-31.5
2355.189076	-60.5	29.0	-31.5
2365.147059	-60.6	29.1	-31.5
7295.737463	-60.7	29.2	-31.5
2315.357143	-60.8	29.3	-31.5
2548.462707	-60.9	29.4	-31.5
2245.651261	-61.0	29.5	-31.5
7325.720251	-61.0	29.5	-31.5

Radio Technology = WLAN n 40 MHz, Operating Frequency = high
(S01_AD01)



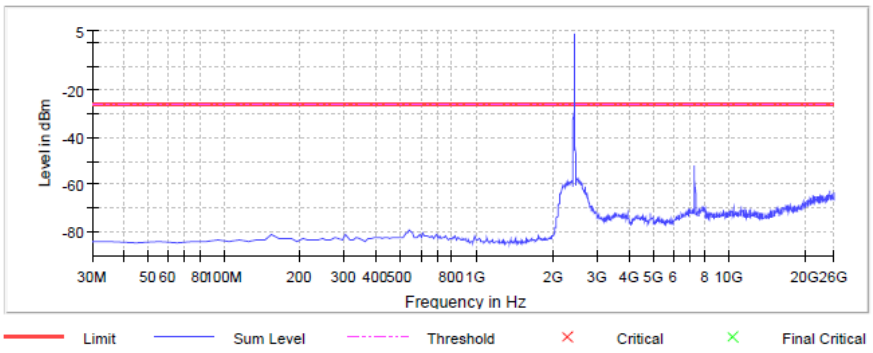
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2488.497131	-39.4	8.4	-31.0
2498.491394	-46.5	15.5	-31.0
22936.758500	-54.0	23.0	-31.0
24925.616766	-54.2	23.2	-31.0
24675.760200	-54.3	23.3	-31.0
24415.909371	-54.3	23.3	-31.0
25695.174989	-54.3	23.3	-31.0
24275.989694	-54.3	23.3	-31.0
24735.725776	-54.4	23.3	-31.0
24785.697089	-54.4	23.3	-31.0
2508.485657	-54.4	23.4	-31.0
25235.438908	-54.4	23.4	-31.0
25955.025818	-54.4	23.4	-31.0
25315.393009	-54.4	23.4	-31.0
24955.599554	-54.4	23.4	-31.0

Radio Technology = WLAN ax 20 MHz, Operating Frequency = low
(S01_AD01)



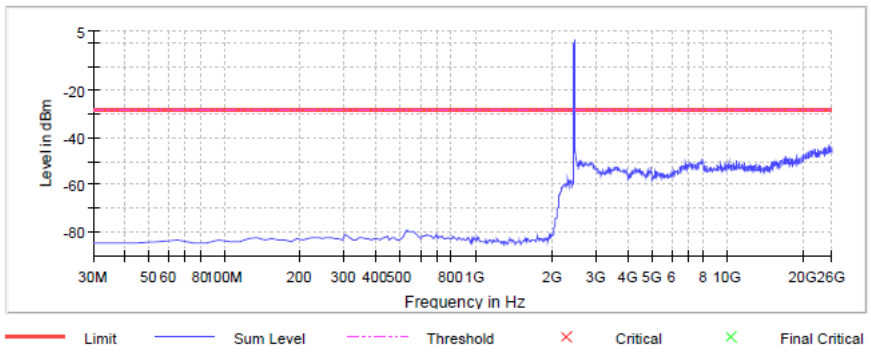
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-31.6	4.9	-26.7
2385.063025	-53.6	26.9	-26.7
7235.771887	-54.6	27.9	-26.7
7245.766150	-54.6	28.0	-26.7
2255.609244	-56.4	29.7	-26.7
2375.105042	-56.6	29.9	-26.7
2365.147059	-56.7	30.0	-26.7
7225.777624	-56.8	30.2	-26.7
2498.491394	-57.4	30.8	-26.7
2335.273109	-57.6	30.9	-26.7
2305.399160	-58.3	31.6	-26.7
2508.485657	-58.3	31.7	-26.7
2295.441176	-58.3	31.7	-26.7
2355.189076	-58.4	31.7	-26.7
2548.462707	-58.5	31.9	-26.7

Radio Technology = WLAN ax 20 MHz, Operating Frequency = mid
(S01_AD01)



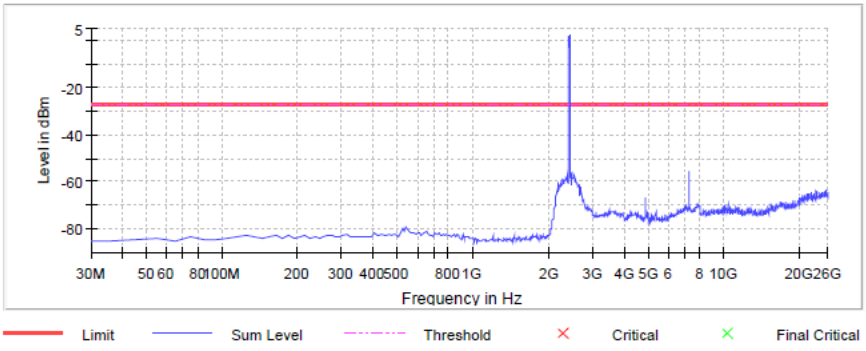
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7315.725988	-51.9	25.9	-26.0
7305.731725	-54.8	28.8	-26.0
7295.737463	-55.8	29.8	-26.0
2498.491394	-57.1	31.1	-26.0
2518.479919	-57.9	31.9	-26.0
2488.497131	-57.9	31.9	-26.0
2395.021008	-58.1	32.1	-26.0
2385.063025	-58.3	32.3	-26.0
2558.456970	-58.3	32.3	-26.0
7325.720251	-58.6	32.6	-26.0
2375.105042	-58.6	32.6	-26.0
2365.147059	-58.9	32.9	-26.0
2355.189076	-59.0	33.0	-26.0
2508.485657	-59.0	33.0	-26.0
2305.399160	-59.0	33.0	-26.0

Radio Technology = WLAN ax 20 MHz, Operating Frequency = high
(S01_AD01)



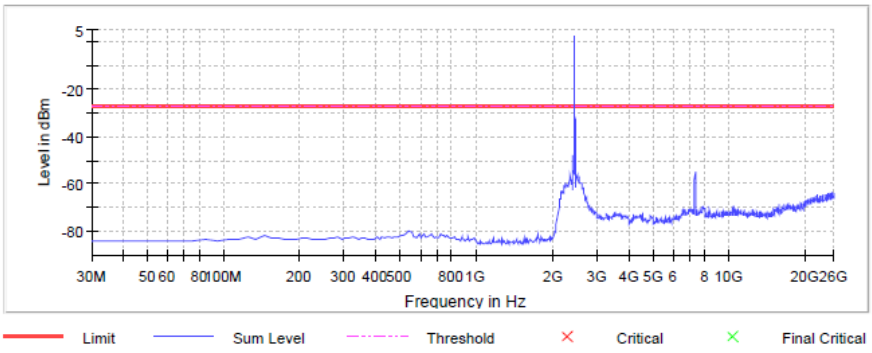
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
25355.370059	-43.1	14.6	-28.4
25185.467595	-43.9	15.5	-28.4
25685.180727	-43.9	15.5	-28.4
25225.444645	-44.0	15.6	-28.4
25455.312686	-44.1	15.7	-28.4
25875.071717	-44.2	15.7	-28.4
24385.926583	-44.2	15.7	-28.4
25605.226626	-44.2	15.8	-28.4
25565.249575	-44.2	15.8	-28.4
24885.639715	-44.3	15.9	-28.4
25695.174989	-44.4	15.9	-28.4
25555.255312	-44.4	15.9	-28.4
26000.000000	-44.4	16.0	-28.4
25745.146303	-44.4	16.0	-28.4
25995.002869	-44.4	16.0	-28.4

Radio Technology = WLAN ax 40 MHz, Operating Frequency = low
(S01_AD01)



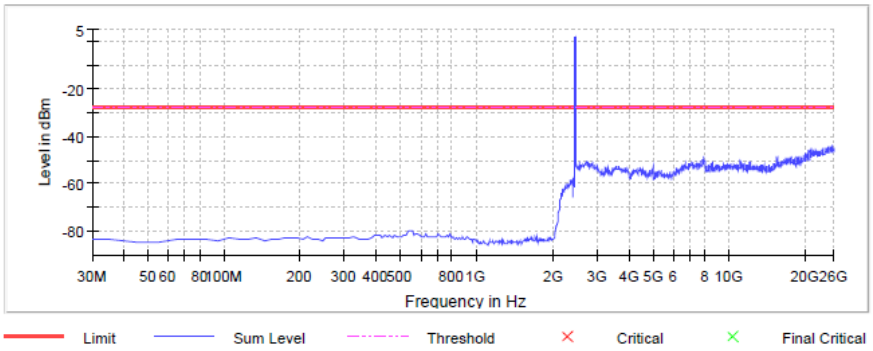
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-54.2	27.1	-27.1
7295.737463	-55.7	28.6	-27.1
2518.479919	-56.9	29.8	-27.1
7305.731725	-57.6	30.4	-27.1
2385.063025	-57.9	30.7	-27.1
2355.189076	-58.4	31.3	-27.1
2528.474182	-58.5	31.3	-27.1
7285.743200	-58.5	31.4	-27.1
2558.456970	-58.6	31.4	-27.1
2498.491394	-58.7	31.5	-27.1
2488.497131	-58.7	31.6	-27.1
2345.231092	-58.8	31.7	-27.1
2508.485657	-59.0	31.8	-27.1
2285.483193	-59.0	31.9	-27.1
2538.468445	-59.2	32.0	-27.1

Radio Technology = WLAN ax 40 MHz, Operating Frequency = mid
(S01_AD01)



Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7345.708776	-54.9	27.7	-27.2
7335.714513	-55.1	27.9	-27.2
2355.189076	-56.1	28.9	-27.2
2498.491394	-56.4	29.2	-27.2
2548.462707	-56.8	29.6	-27.2
2335.273109	-57.7	30.5	-27.2
2488.497131	-58.0	30.8	-27.2
7325.720251	-58.2	31.0	-27.2
2518.479919	-58.3	31.1	-27.2
2385.063025	-58.3	31.1	-27.2
2395.021008	-58.4	31.2	-27.2
2538.468445	-58.5	31.3	-27.2
2508.485657	-58.7	31.5	-27.2
2345.231092	-58.8	31.6	-27.2
2528.474182	-58.9	31.7	-27.2

Radio Technology = WLAN ax 40 MHz, Operating Frequency = high
(S01_AD01)



Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
25695.174989	-43.9	16.1	-27.8
25715.163515	-43.9	16.1	-27.8
25285.410221	-44.1	16.3	-27.8
25305.398746	-44.3	16.5	-27.8
25645.203676	-44.3	16.6	-27.8
24705.742988	-44.6	16.8	-27.8
25055.542180	-44.6	16.8	-27.8
24495.863472	-44.7	16.9	-27.8
25615.220888	-44.7	16.9	-27.8
25885.065980	-44.7	17.0	-27.8
24166.052805	-44.8	17.0	-27.8
25035.553655	-44.8	17.1	-27.8
24825.674139	-44.8	17.1	-27.8
25215.450382	-44.9	17.1	-27.8
23686.328198	-44.9	17.1	-27.8

5.5.5 TEST EQUIPMENT USED

- R&S TS8997

5.6 TRANSMITTER SPURIOUS RADIATED EMISSIONS

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 6.4, 6.5, 6.6.5

5.6.1 TEST DESCRIPTION

The test set-up was made in accordance to the general provisions of ANSI C63.10 in a typical installation configuration. The measurements were performed according the following sub-chapters of ANSI C63.10:

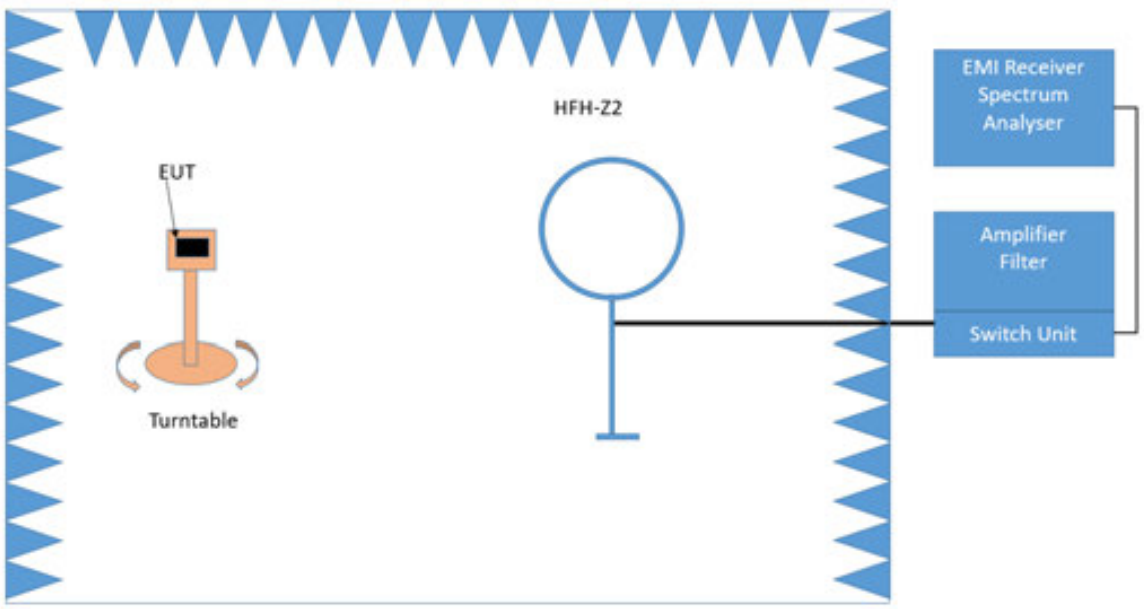
- < 30 MHz: Chapter 6.4
- 30 MHz – 1 GHz: Chapter 6.5
- > 1 GHZ: Chapter 6.6 (procedure according 6.6.5 used)

The measurement procedure is implemented into the EMI test software EMC32 from R&S. Exploratory tests are performed at 3 orthogonal axes to determine the worst-case orientation of a body-worn or handheld EUT. The final test on all kind of EUTs is also performed at 3 axes. A pre-check is performed while the EUT is powered.

Below 1 GHz:

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The influence of the EUT support table that is used between 30–1000 MHz was evaluated.

1. Measurement up to 30 MHz



Test Setup; Spurious Emission Radiated (SAC), 9 kHz – 30 MHz

The Loop antenna HFH2-Z2 is used.

Step 1: pre measurement

- Anechoic chamber
- Antenna distance: 3 m
- Antenna height: 1 m
- Detector: Peak-Maxhold
- Frequency range: 0.009 - 0.15 MHz and 0.15 – 30 MHz
- Frequency steps: 0.05 kHz and 2.25 kHz
- IF–Bandwidth: 0.2 kHz and 9 kHz
- Measuring time / Frequency step: 100 ms (FFT-based)

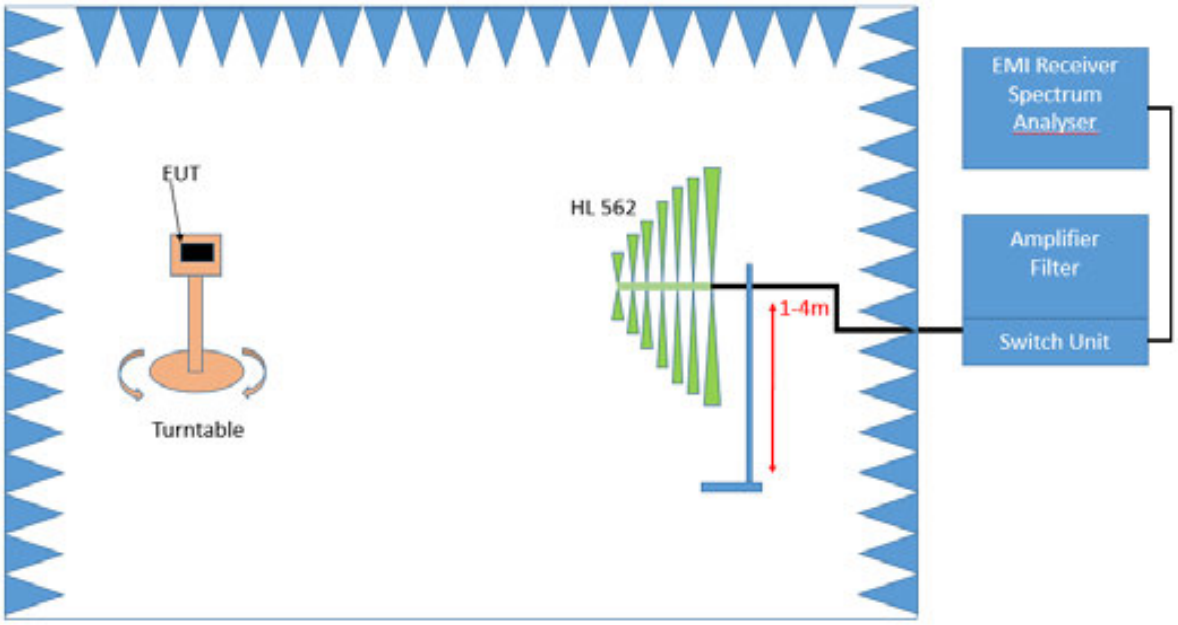
Intention of this step is, to determine the radiated EMI-profile of the EUT. Afterwards the relevant emissions for the final measurement are identified.

Step 2: final measurement

For the relevant emissions determined in step 1, an additional measurement with the following settings will be performed. Intention of this step is to find the maximum emission level.

- Detector: Quasi-Peak (9 kHz – 150 kHz, Peak / Average 150 kHz- 30 MHz)
- Frequency range: 0.009 – 30 MHz
- Frequency steps: measurement at frequencies detected in step 1
- IF–Bandwidth: 0.2 - 10 kHz
- Measuring time / Frequency step: 1 s

2. Measurement above 30 MHz and up to 1 GHz



Test Setup; Spurious Emission Radiated (SAC), 30 MHz- 1GHz

Step 1: Preliminary scan

This is a preliminary test to identify the highest amplitudes relative to the limit.

Settings for step 1:

- Antenna distance: 3 m
- Detector: Peak-Maxhold / Quasipeak (FFT-based)
- Frequency range: 30 – 1000 MHz
- Frequency steps: 30 kHz
- IF–Bandwidth: 120 kHz
- Measuring time / Frequency step: 100 ms
- Turntable angle range: –180° to 90°

- Turntable step size: 90°
- Height variation range: 1 – 4 m
- Height variation step size: 1.5 m
- Polarisation: Horizontal + Vertical

Intention of this step is, to determine the radiated EMI-profile of the EUT. Afterwards the relevant emissions for the final measurement are identified.

Step 2: Adjustment measurement

In this step the accuracy of the turntable azimuth and antenna height will be improved. This is necessary to find out the maximum value of every frequency.

For each frequency, which was determined the turntable azimuth and antenna height will be adjusted. The turntable azimuth will slowly vary by 360°. During this action, the value of emission is continuously measured. The turntable azimuth at the highest emission will be recorded and adjusted. In this position, the antenna height will also slowly vary between 1 – 4 meter. During this action, the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.

- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100 ms
- Turntable angle range: 360 °
- Height variation range:1 – 4 m
- Antenna Polarisation: max. value determined in step 1

Step 3: Final measurement with QP detector

With the settings determined in step 2, the final measurement will be performed:

EMI receiver settings for step 3:

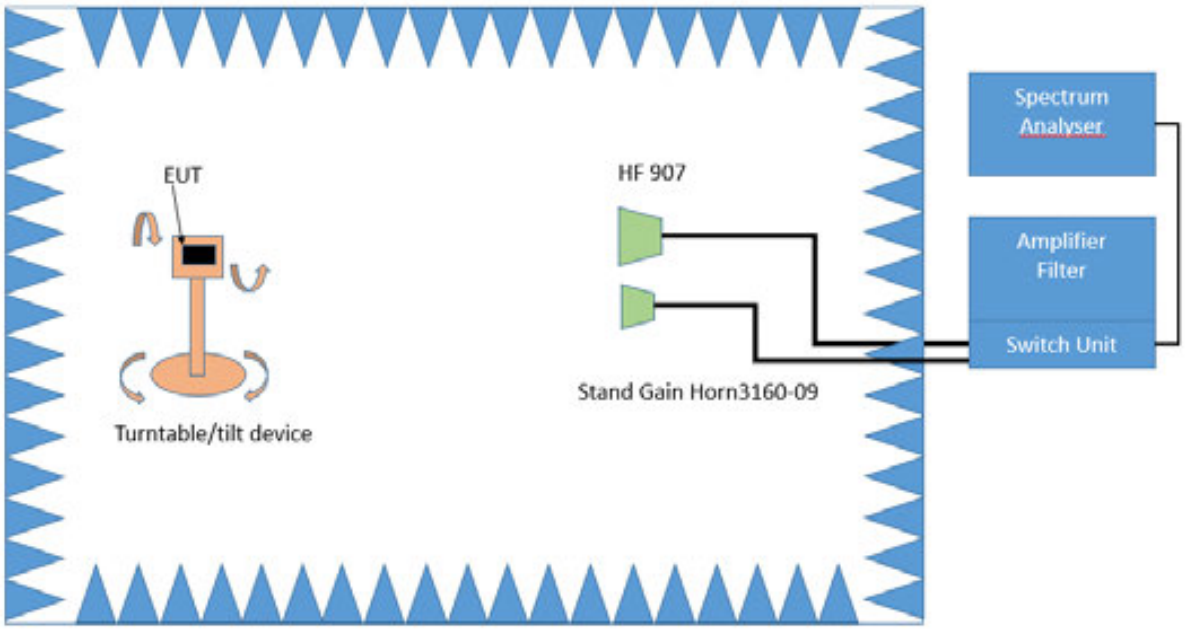
- Detector: Quasi-Peak (< 1 GHz)
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 1 s

After the measurement a plot will be generated which contains a diagram with the results of the preliminary scan and a chart with the frequencies and values of the results of the final measurement.

Above 1 GHz:

The Equipment Under Test (EUT) was set up on a non-conductive support (tilt device) at 1.5 m height in the fully-anechoic chamber.
All steps were performed with one height (1.5 m) of the receiving antenna only.

3. Measurement above 1 GHz



Test Setup; Spurious Emission Radiated (FAC), 1 GHz-26.5 GHz

Step 1:
The EUT is turned during the preliminary measurement across the elevation axis, with a step size of 90 °.
The turn table step size (azimuth angle) for the preliminary measurement is 45 °.
Spectrum analyser settings:
- Detector: Peak, Average
- RBW = 1 MHz
- VBW = 3 MHz

Step 2:
The turn table azimuth will slowly vary by ± 22.5°.
The elevation angle will slowly vary by ± 45°
Spectrum analyser settings:
- Detector: Peak

Step 3:
Spectrum analyser settings for step 3:
- Detector: Peak / CISPR Average
- Measured frequencies: in step 1 determined frequencies
- RBW = 1 MHz
- VBW = 3 MHz
- Measuring time: 1 s

Measurements are only performed inside of the restricted bands according 47 CFR Part 15.205 using the following sweep ranges:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	
12.51975-12.52025	240-285	3345.8-3358	
12.57675-12.57725	322-335.4	3600-4400	
13.36-13.41			

The blue traces inside of the measurement plots give the peak detector results inside of the restricted bands and the green traces give the average detector results inside of the restricted bands.
The measured traces include the lower and upper edges of the restricted bands closest to the band of operation, the lower and upper band edges. For transmitters inside of the 2.4 GHz band, results of the upper band edge, which is directly adjacent to a restricted band, are given in chapter “BAND EDGE COMPLIANCE RADIATED”, since special measurement methods are allowed within 2 MHz of the band edge.
Results of the lower band edge are shown inside of this chapter, since the normal method for emissions in restricted frequency bands is used.

5.6.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.247 (d)
... In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

FCC Part 15, Subpart C, §15.209, Radiated Emission Limits

Frequency in MHz	Limit (µV/m)	Measurement distance (m)	Limits (dBµV/m)
0.009 – 0.49	2400/F(kHz)@300m	3	(48.5 – 13.8)@300m
0.49 – 1.705	24000/F(kHz)@30m	3	(33.8 – 23.0)@30m
1.705 – 30	30@30m	3	29.5@30m

The measured values are corrected with an inverse linear distance extrapolation factor (40 dB/decade) according FCC 15.31 (2).

Frequency in MHz	Limit (µV/m)	Measurement distance (m)	Limits (dBµV/m)
30 – 88	100@3m	3	40.0@3m
88 – 216	150@3m	3	43.5@3m
216 – 960	200@3m	3	46.0@3m
960 - 26000	500@3m	3	54.0@3m
26000 - 40000	500@3m	1	54.0@3m

The measured values above 26 GHz are corrected with an inverse linear distance extrapolation factor (20 dB/decade).

§15.35(b) ..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit....

Used conversion factor: Limit (dBµV/m) = 20 log (Limit (µV/m)/1µV/m)

5.6.3 TEST PROTOCOL

Ambient temperature: 25–26 °C
Air Pressure: 998–1003 hPa
Humidity: 47–50 %

Test with <6 dBi antenna

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity
Applied duty cycle correction (AV): 5.1 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
1	2412	1070.6	61.8	PEAK	1000	74.0	12.2	RB
1	2412	1070.6	38.7	AV	1000	54.0	15.3	RB
1	2412	1071.0	63.6	PEAK	1000	74.0	10.4	RB
1	2412	1071.0	41.4	AV	1000	54.0	12.6	RB
6	2437	1070.8	60.5	PEAK	1000	74.0	13.5	RB
6	2437	1070.8	38.7	AV	1000	54.0	15.3	RB
6	2437	7312.1	52.3	PEAK	1000	74.0	21.7	RB
6	2437	7312.4	43.3	AV	1000	54.0	10.7	RB
11	2462	1091.3	55.5	PEAK	1000	74.0	18.5	RB
11	2462	1091.3	32.5	AV	1000	54.0	21.5	RB
11	2462	1070.8	63.5	PEAK	1000	74.0	10.5	RB
11	2462	1070.8	41.3	AV	1000	54.0	12.7	RB

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity
Applied duty cycle correction (AV): 0.4 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
1	2412	1071.3	65.3	PEAK	1000	74.0	8.7	RB
1	2412	1071.3	40.6	AV	1000	54.0	13.4	RB
6	2437	1070.8	62.1	PEAK	1000	74.0	11.9	RB
6	2437	1070.8	36.6	AV	1000	54.0	17.4	RB
6	2437	7312.0	61.6	PEAK	1000	74.0	12.4	RB
6	2437	7312.0	46.4	AV	1000	54.0	7.6	RB
11	2462	1071.3	64.4	PEAK	1000	74.0	9.6	RB
11	2462	1071.3	40.2	AV	1000	54.0	13.8	RB

WLAN n-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.5 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	7384.5	35.9	AV	1000	54.0	18.1	RB

WLAN ax-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.6 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	7383.7	59.1	PEAK	1000	74.0	14.9	RB
11	2462	7383.2	37.3	AV	1000	54.0	16.7	RB

Test with <9 dBi antenna

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity
Applied duty cycle correction (AV): 5.1 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	- - -	- - -	- - -	- - -	- - -	- - -	RB

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity
Applied duty cycle correction (AV): 0.4 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	- - -	- - -	- - -	- - -	- - -	- - -	RB

WLAN n-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.5 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	- - -	- - -	- - -	- - -	- - -	- - -	RB

WLAN ax-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.6 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	- - -	- - -	- - -	- - -	- - -	- - -	RB

Test with <14 dBi antenna

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity
Applied duty cycle correction (AV): 5.1 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	- - -	- - -	- - -	- - -	- - -	- - -	RB

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity
Applied duty cycle correction (AV): 0.4 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	- - -	- - -	- - -	- - -	- - -	- - -	RB

WLAN n-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.5 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	- - -	- - -	- - -	- - -	- - -	- - -	RB

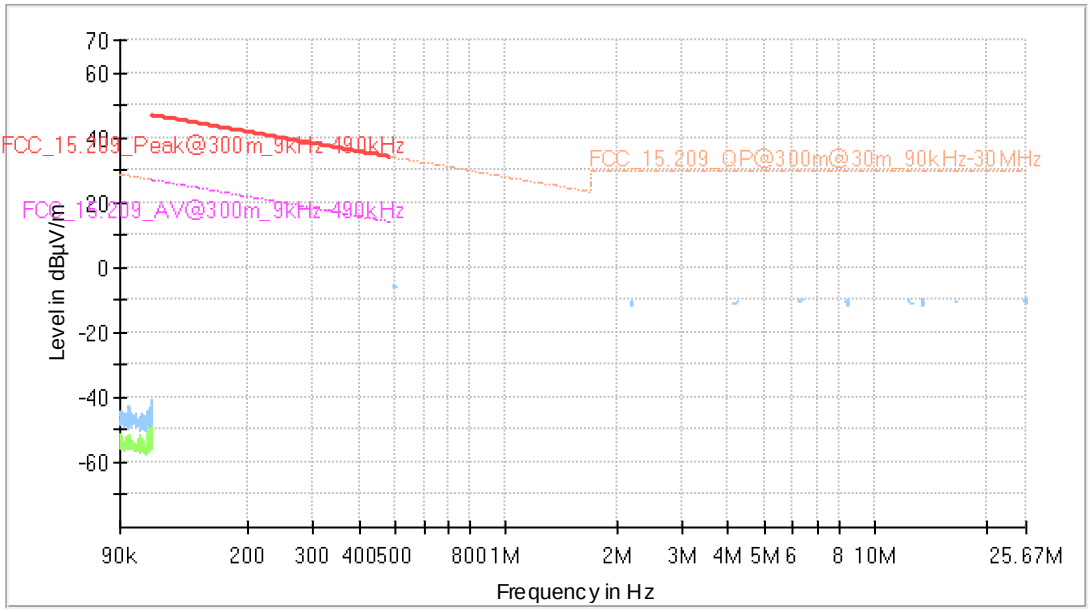
WLAN ax-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.6 dB

Ch. No	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
11	2462	7387.5	58.2	PEAK	1000	74.0	15.8	RB
11	2462	7388.3	36.4	AV	1000	54.0	17.6	RB

Remark: WLAN ax MIMO Mode with 14 dBi antenna tested with 12 dBm setting and not repeated at final power setting of 11 dBm since 12 dBm is worse case.
Please see next sub-clause for the measurement plot.

5.6.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

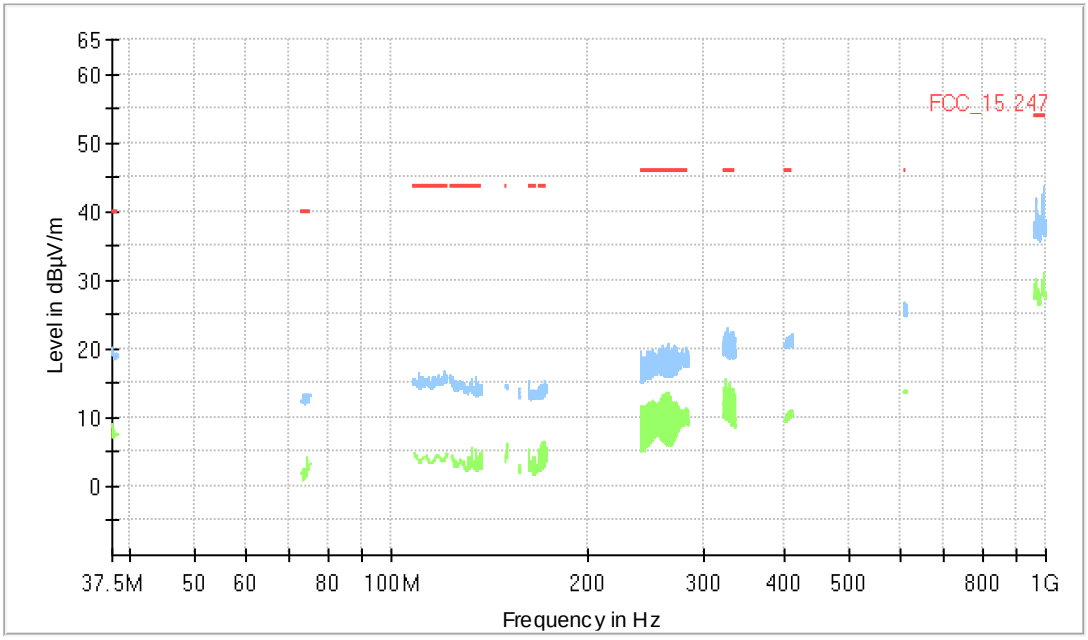
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = mid, Measurement range = 9 kHz - 30 MHz
(S02_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---	---	---	---	---

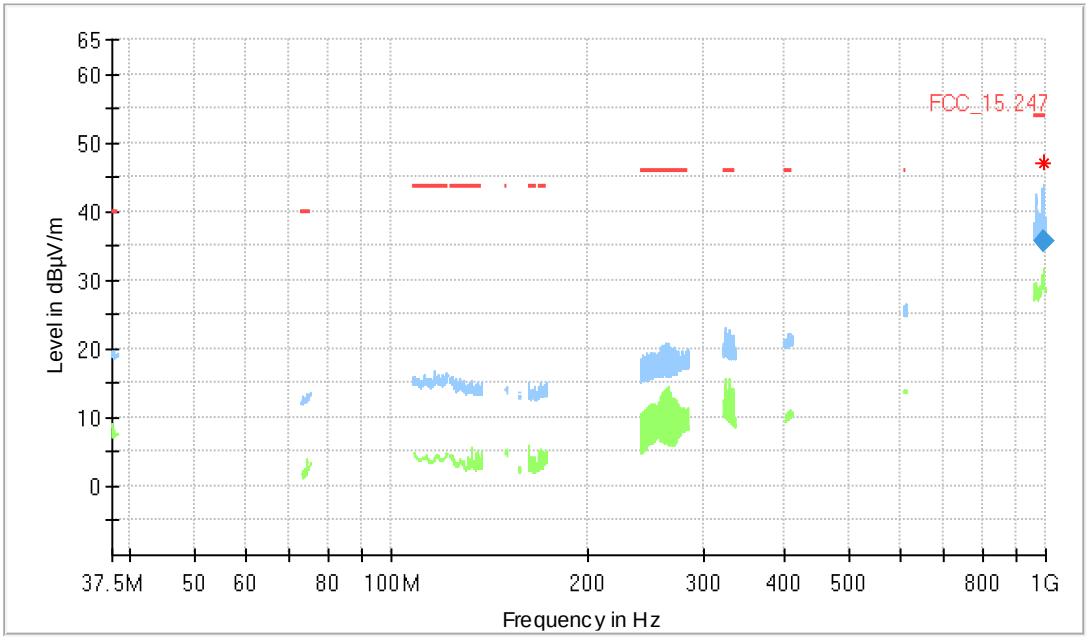
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = low, Measurement range = 30 MHz - 1 GHz
(S02_AC02)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---	---		---	---

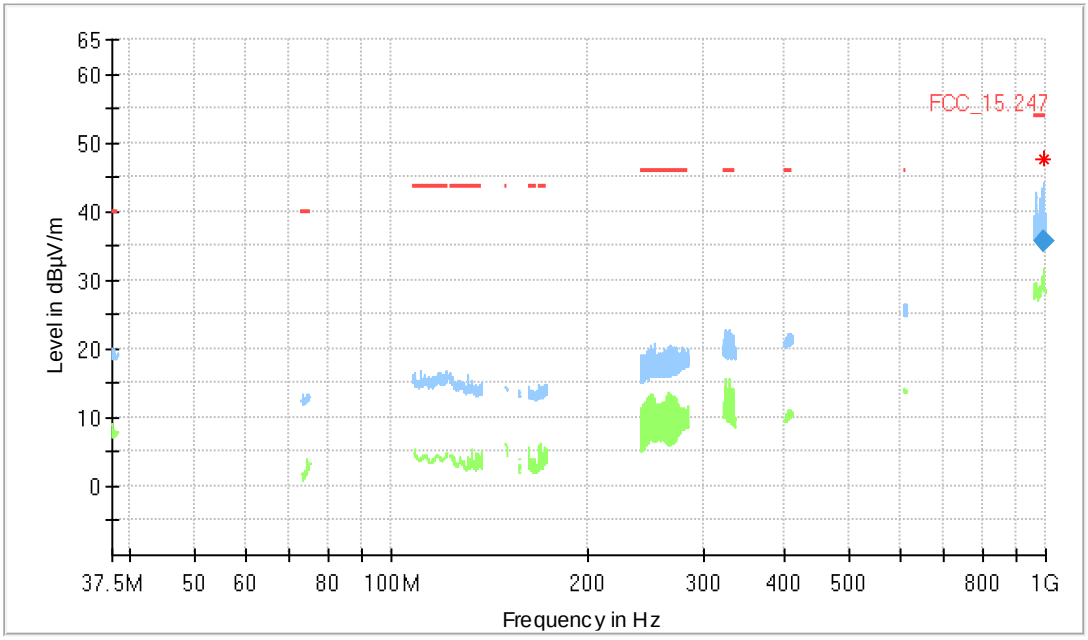
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = mid, Measurement range = 30 MHz - 1 GHz
(S02_AC02)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
990.150000	35.57	54.00	18.43	1000.0	120.000	124.0	V	282.0	26.6

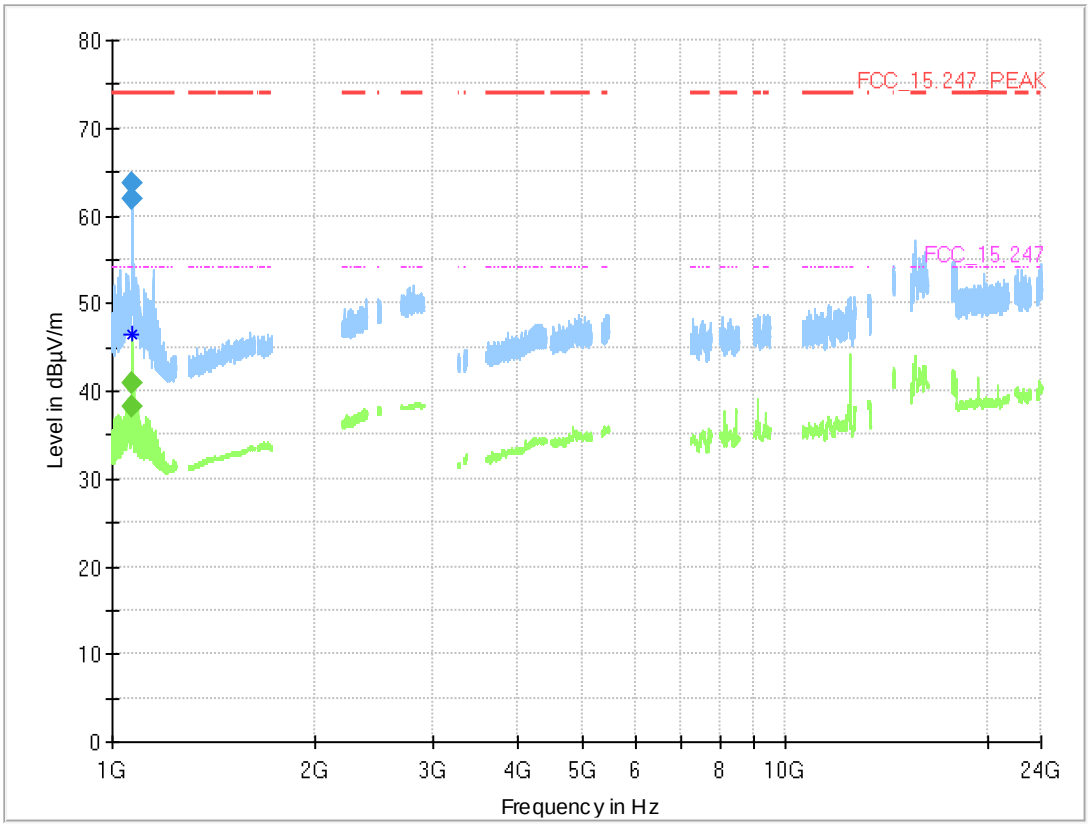
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high, Measurement range = 30 MHz - 1 GHz
(S02_AC02)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
990.120000	35.56	54.00	18.44	1000.0	120.000	122.0	V	276.0	26.6

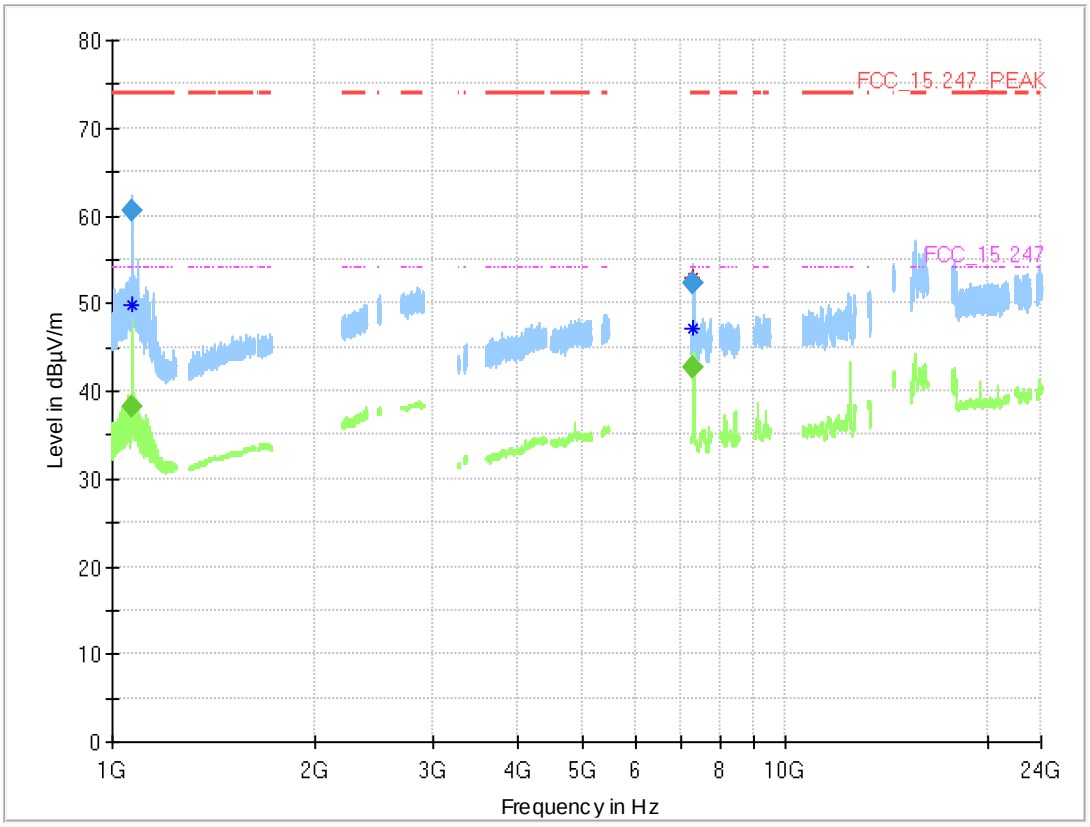
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = low, Measurement range = 1 GHz - 26 GHz
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
1070.560	---	38.2	54.00	15.77	1000.0	1000.000	150.0	V	21.0	105.0	-1.4
1070.560	61.8	---	74.00	12.18	1000.0	1000.000	150.0	V	21.0	105.0	-1.4
1071.040	---	40.9	54.00	13.05	1000.0	1000.000	150.0	H	-91.0	3.0	-1.4
1071.040	63.6	---	74.00	10.39	1000.0	1000.000	150.0	H	-91.0	3.0	-1.4

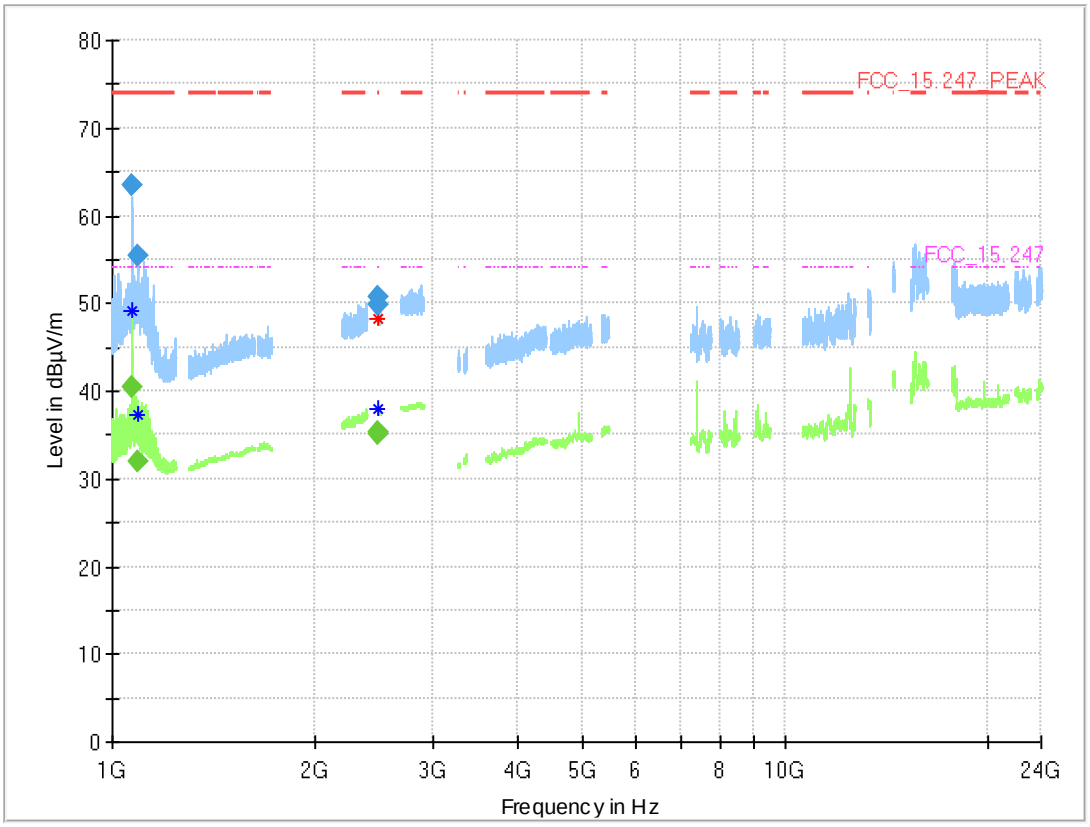
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = mid, Measurement range = 1 GHz - 26 GHz
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
1070.800	---	38.2	54.00	15.78	1000.0	1000.000	150.0	V	-56.0	-8.0	-1.4
1070.800	60.5	---	74.00	13.46	1000.0	1000.000	150.0	V	-56.0	-8.0	-1.4
7312.125	---	42.8	54.00	11.21	1000.0	1000.000	150.0	H	85.0	91.0	-13.0
7312.125	52.3	---	74.00	21.67	1000.0	1000.000	150.0	H	85.0	91.0	-13.0
7312.375	---	42.8	54.00	11.23	1000.0	1000.000	150.0	H	86.0	91.0	-13.0
7312.375	52.4	---	74.00	21.64	1000.0	1000.000	150.0	H	86.0	91.0	-13.0

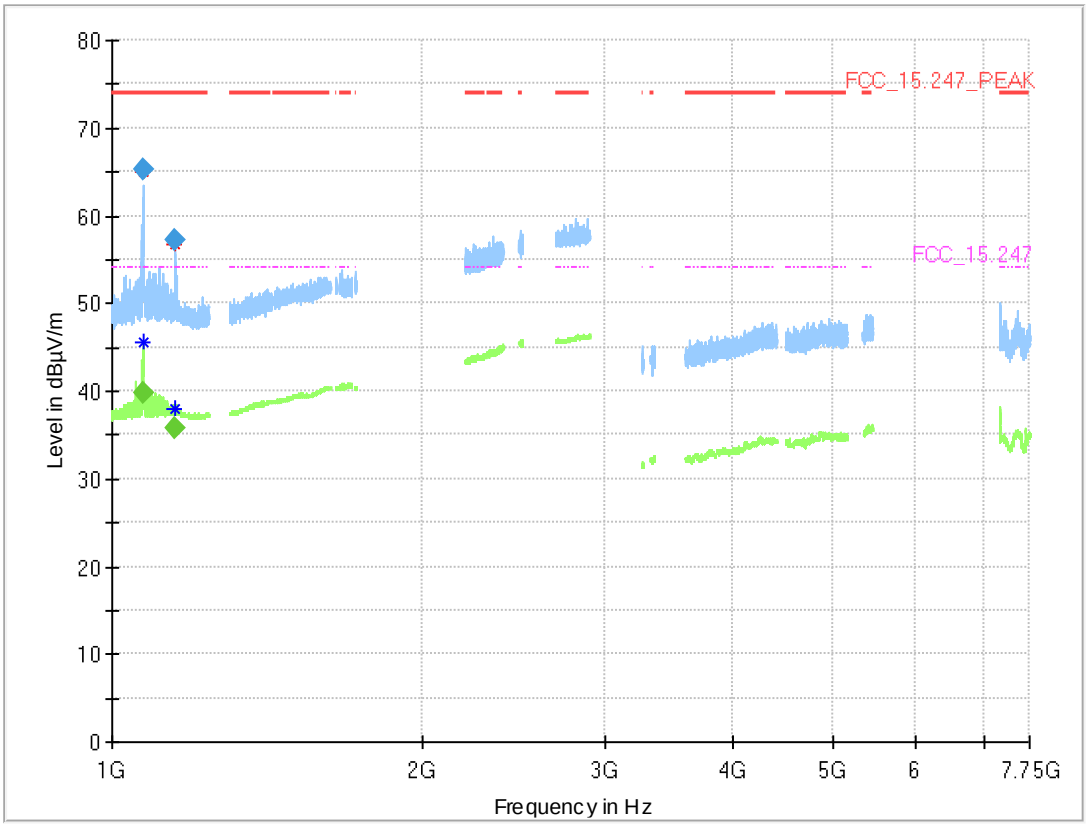
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
1070.800	---	40.6	54.00	13.45	1000.0	1000.000	150.0	H	-86.0	-6.0	-1.4
1070.800	63.5	---	74.00	10.50	1000.0	1000.000	150.0	H	-86.0	-6.0	-1.4
1091.320	---	32.0	54.00	21.95	1000.0	1000.000	150.0	H	32.0	1.0	-1.4
1091.320	55.5	---	74.00	18.49	1000.0	1000.000	150.0	H	32.0	1.0	-1.4
2484.573	---	35.1	54.00	18.89	1000.0	1000.000	150.0	V	-178.0	-4.0	5.3
2484.573	50.7	---	74.00	23.35	1000.0	1000.000	150.0	V	-178.0	-4.0	5.3
2485.398	---	35.3	54.00	18.68	1000.0	1000.000	150.0	V	-145.0	-15.0	5.3
2485.398	49.9	---	74.00	24.14	1000.0	1000.000	150.0	V	-145.0	-15.0	5.3

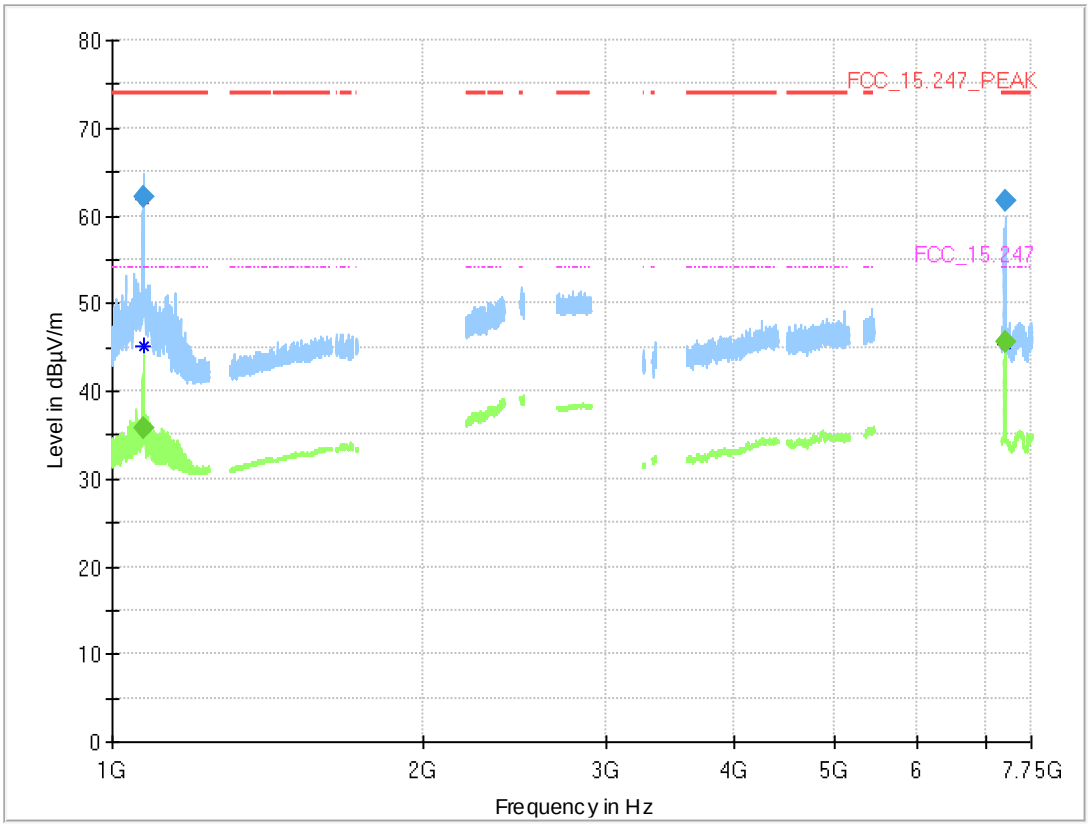
Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = low, Measurement range = 1 GHz - 26 GHz
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
1071.280	---	39.8	54.00	14.15	1000.0	1000.000	150.0	V	-146.0	77.0	38.2
1071.280	65.3	---	74.00	8.70	1000.0	1000.000	150.0	V	-146.0	77.0	38.2
1150.960	---	35.9	54.00	18.14	1000.0	1000.000	150.0	H	-146.0	-22.0	38.6
1150.960	57.3	---	74.00	16.68	1000.0	1000.000	150.0	H	-146.0	-22.0	38.6

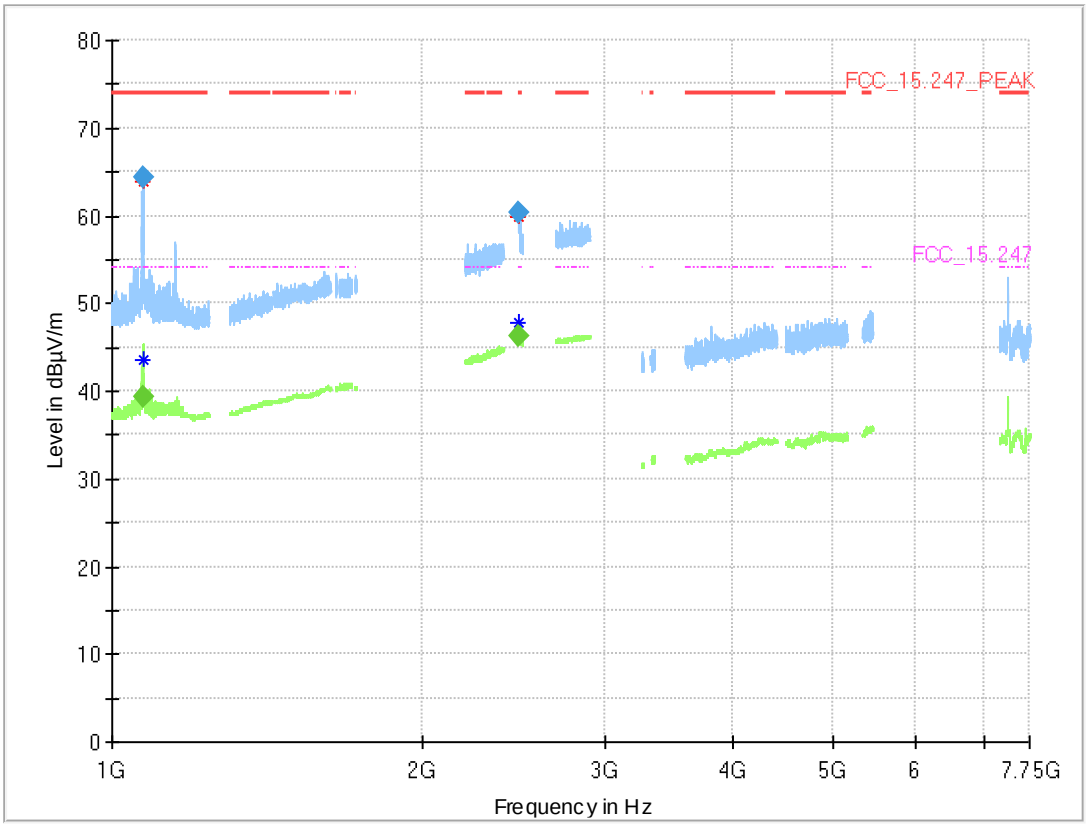
Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = mid, Measurement range = 1 GHz - 26 GHz
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
1070.800	---	35.8	54.00	18.21	1000.0	1000.000	150.0	H	20.0	7.0	-1.4
1070.800	62.1	---	74.00	11.92	1000.0	1000.000	150.0	H	20.0	7.0	-1.4
7312.000	---	45.6	54.00	8.38	1000.0	1000.000	150.0	H	-56.0	90.0	-13.0
7312.000	61.6	---	74.00	12.38	1000.0	1000.000	150.0	H	-56.0	90.0	-13.0

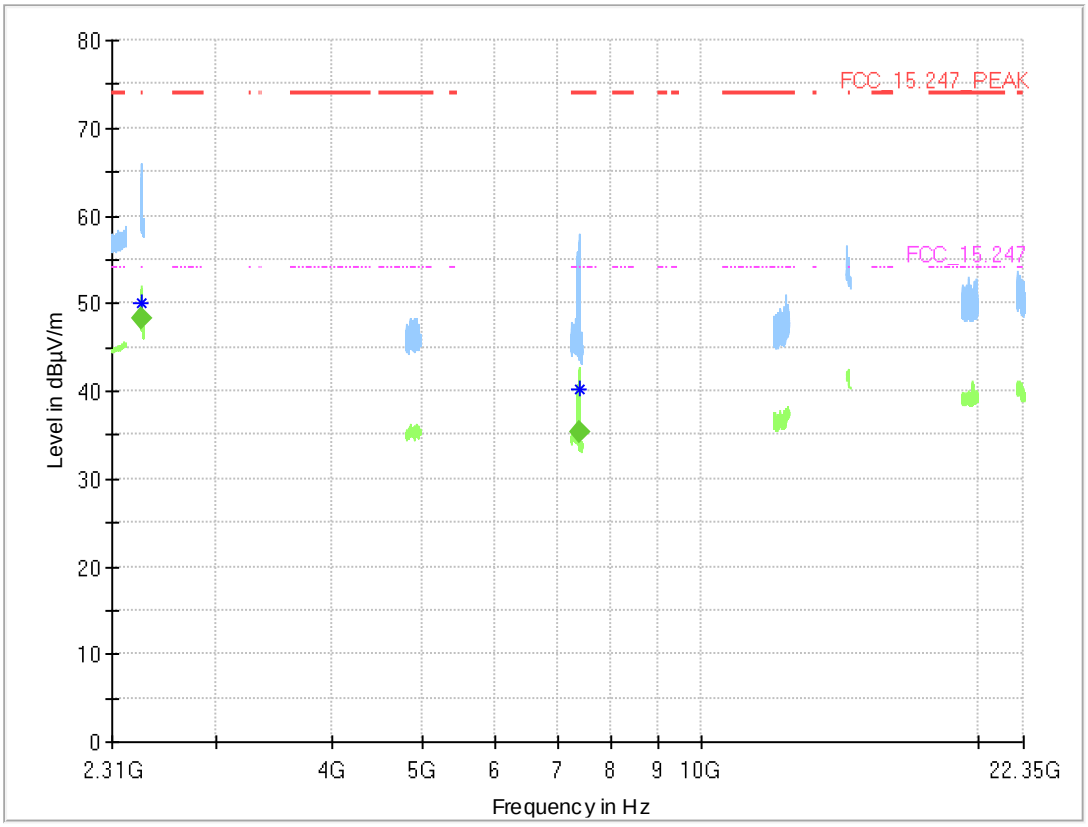
Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
1071.280	---	39.4	54.00	14.59	1000.0	1000.000	150.0	V	-194.0	-5.0	38.2
1071.280	64.4	---	74.00	9.61	1000.0	1000.000	150.0	V	-194.0	-5.0	38.2
2483.830	---	46.2	54.00	7.83	1000.0	1000.000	150.0	H	-60.0	110.0	45.0
2483.830	60.4	---	74.00	13.56	1000.0	1000.000	150.0	H	-60.0	110.0	45.0

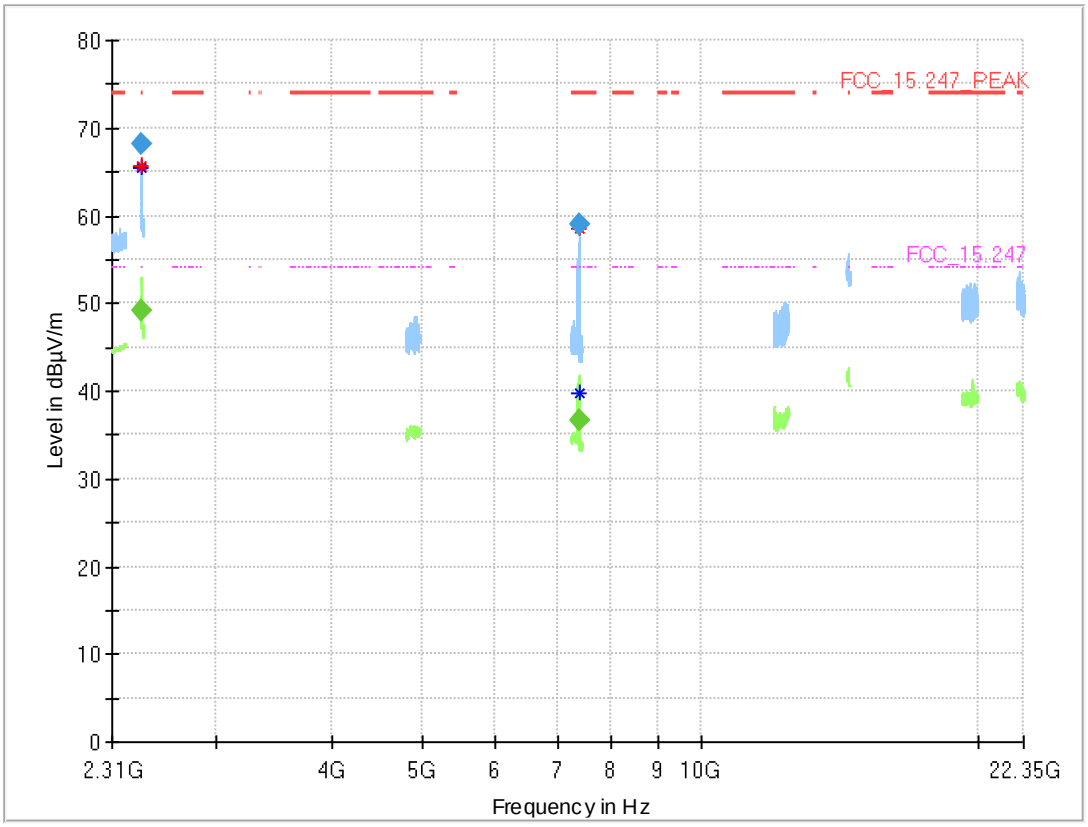
Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	48.2	54.00	5.80	1000.0	1000.000	150.0	H	61.0	87.0	45.0
7384.485	---	35.4	54.00	18.63	1000.0	1000.000	150.0	H	-60.0	95.0	-14.2

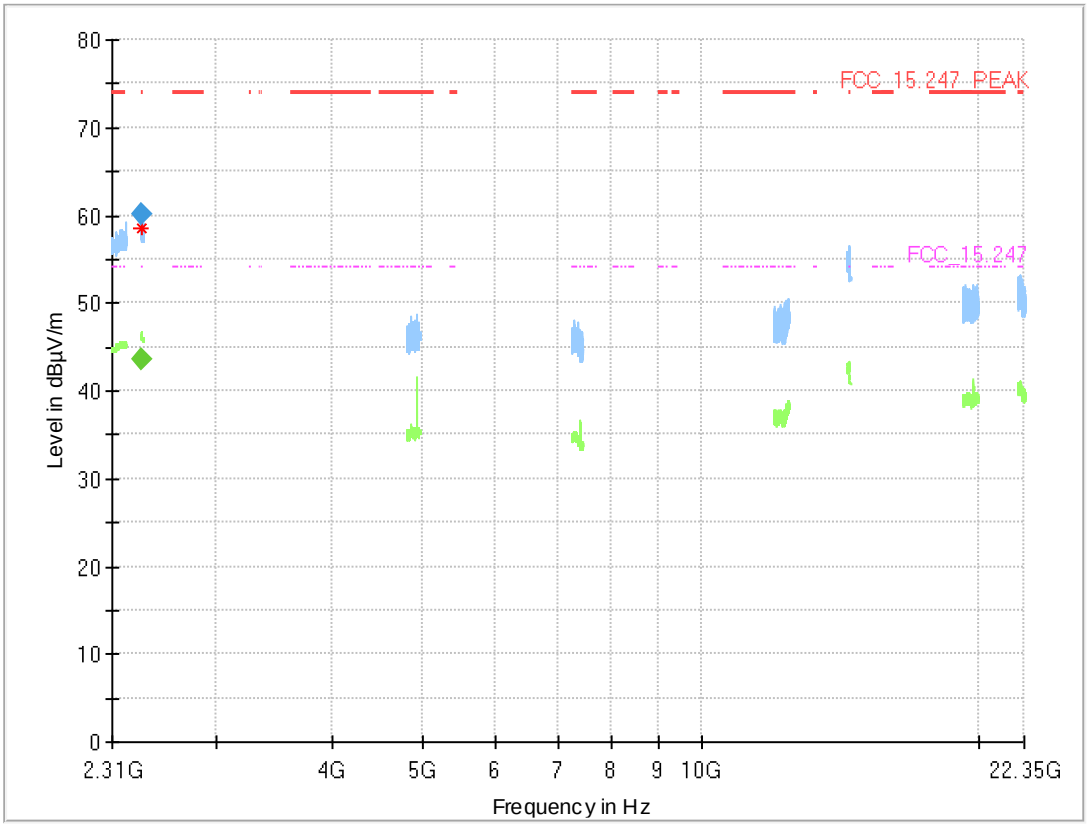
Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	68.2	---	74.00	5.75	1000.0	1000.000	150.0	H	63.0	92.0	45.0
2483.583	---	49.1	54.00	4.89	1000.0	1000.000	150.0	H	63.0	87.0	45.0
7383.734	59.1	---	74.00	14.90	1000.0	1000.000	150.0	H	-52.0	89.0	-14.2
7384.185	---	36.7	54.00	17.33	1000.0	1000.000	150.0	H	-59.0	86.0	-14.2

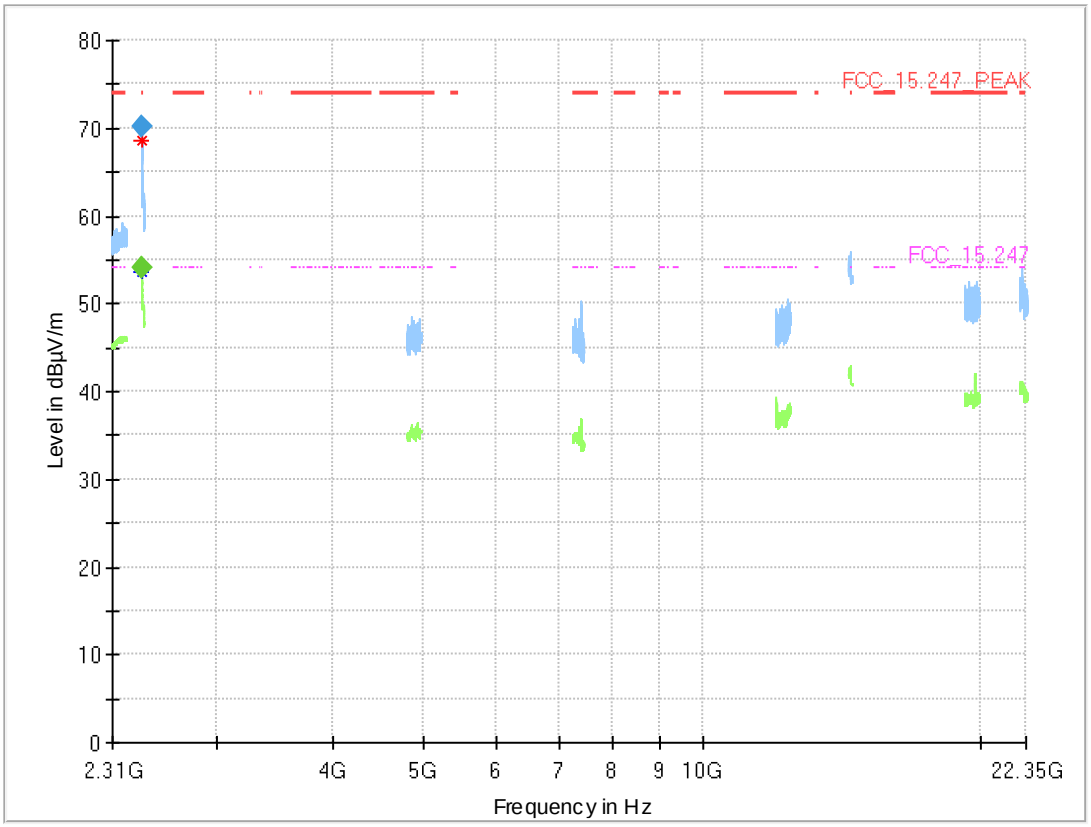
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S03_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2484.243	---	43.7	54.00	10.35	1000.0	1000.000	150.0	V	-4.0	84.0	45.0
2484.243	60.1	---	74.00	13.93	1000.0	1000.000	150.0	V	11.0	89.0	45.0

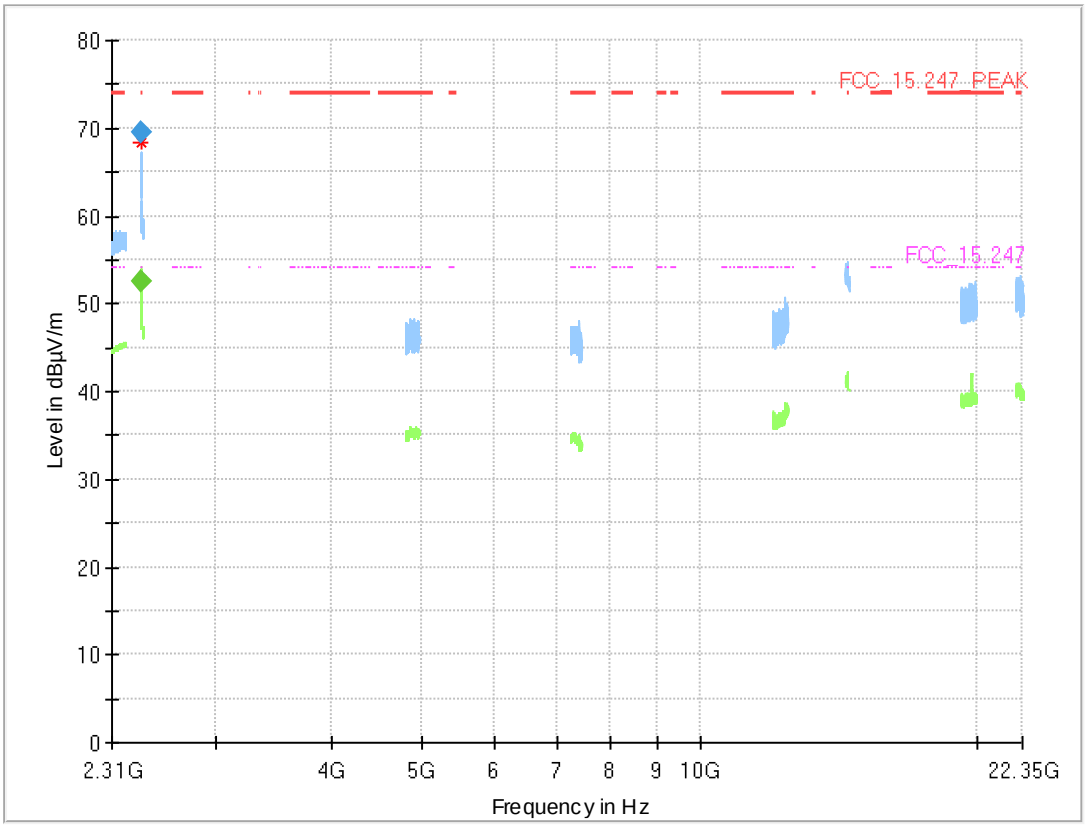
Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S03_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	53.6	54.00	0.4	1000.0	1000.000	150.0	H	-1.0	78.0	45.0
2484.655	70.2	---	74.00	3.75	1000.0	1000.000	150.0	H	1.0	78.0	45.0

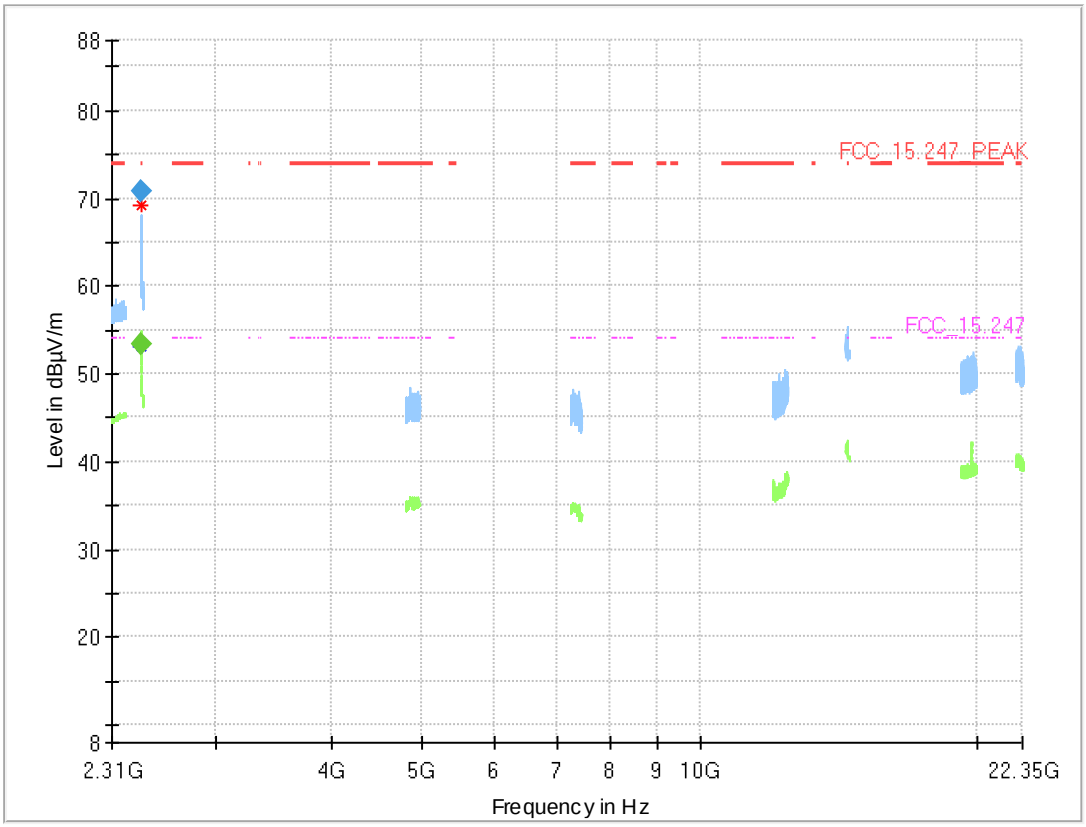
Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S03_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.748	---	52.5	54.00	1.45	1000.0	1000.000	150.0	V	11.0	90.0	45.0
2483.830	69.5	---	74.00	4.50	1000.0	1000.000	150.0	V	11.0	105.0	45.0

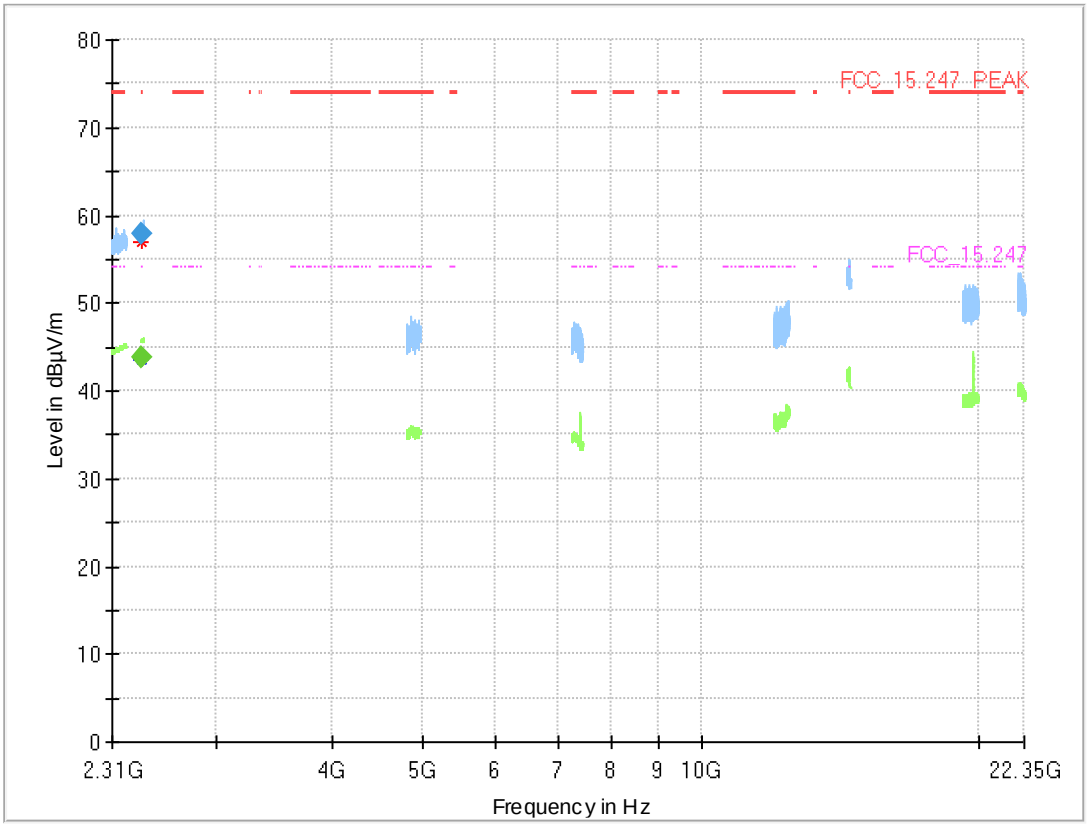
Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S03_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.665	---	53.3	54.00	0.74	1000.0	1000.000	150.0	V	4.0	92.0	45.0
2484.078	70.9	---	74.00	3.14	1000.0	1000.000	150.0	V	11.0	92.0	45.0

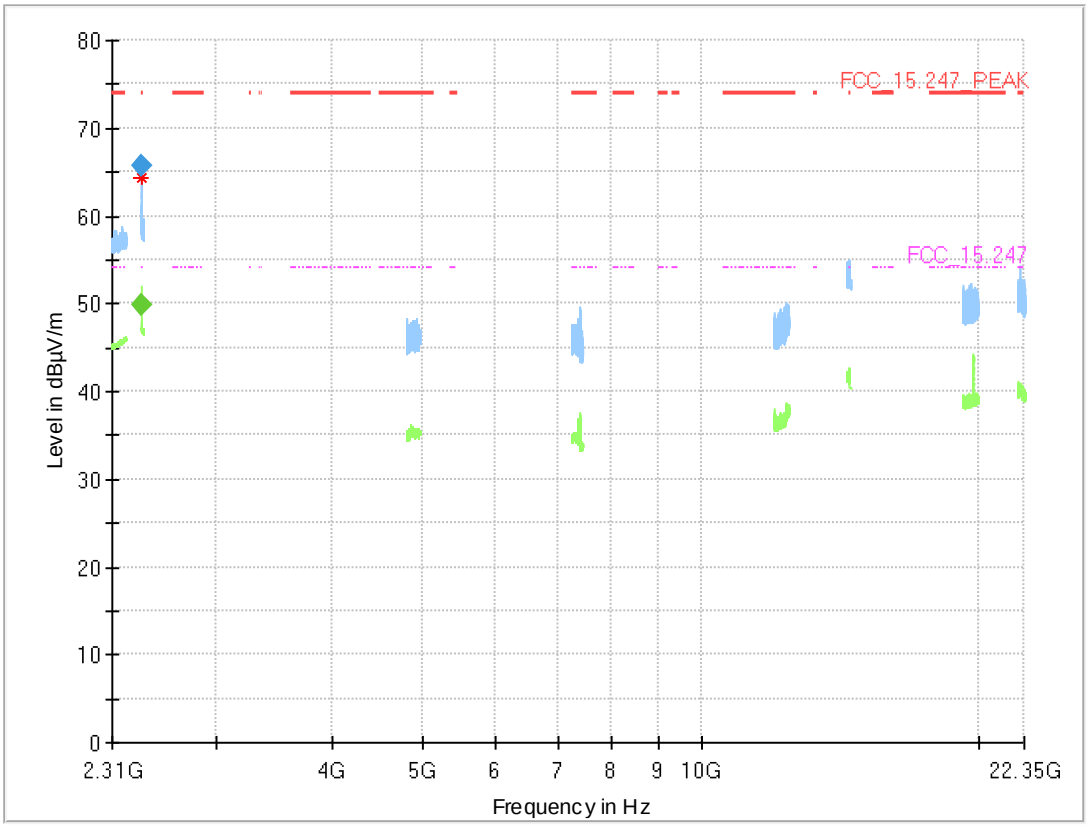
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S04_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.913	---	43.7	54.00	10.31	1000.0	1000.000	150.0	H	1.0	86.0	45.0
2483.913	57.9	---	74.00	16.13	1000.0	1000.000	150.0	H	-124.0	93.0	45.0

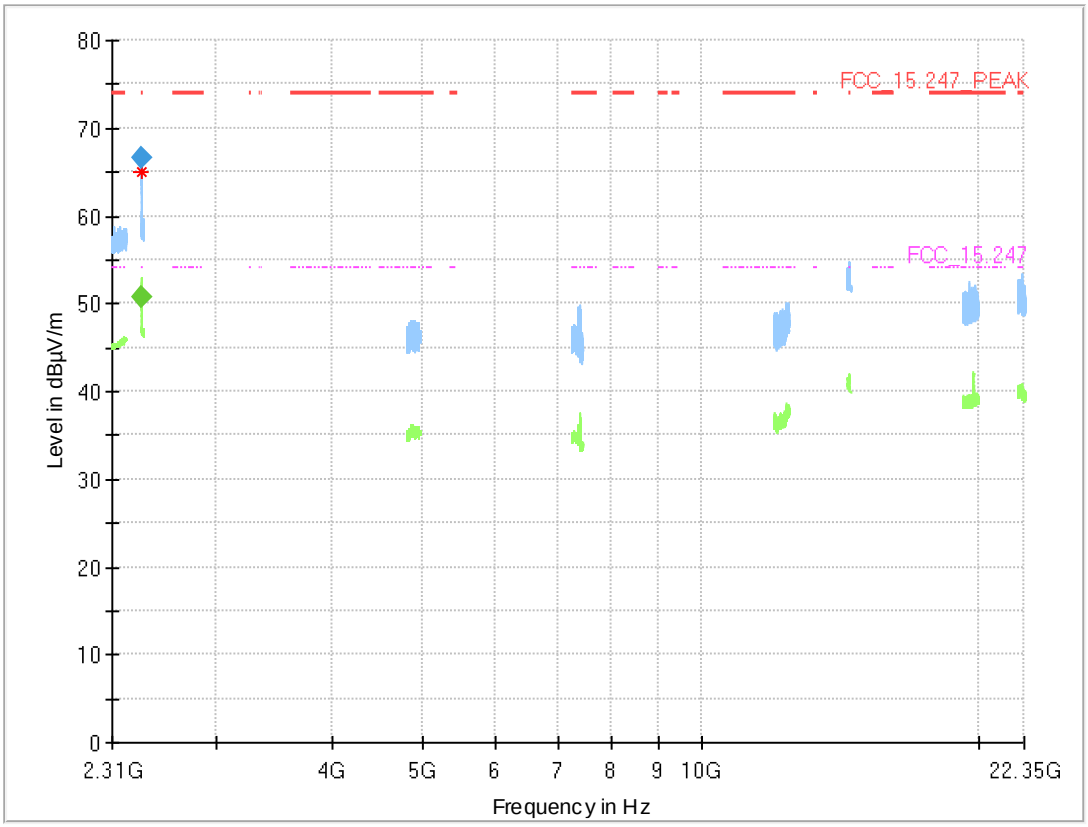
Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S04_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	49.8	54.00	4.22	1000.0	1000.000	150.0	H	4.0	86.0	45.0
2483.500	65.8	---	74.00	8.20	1000.0	1000.000	150.0	H	-4.0	79.0	45.0

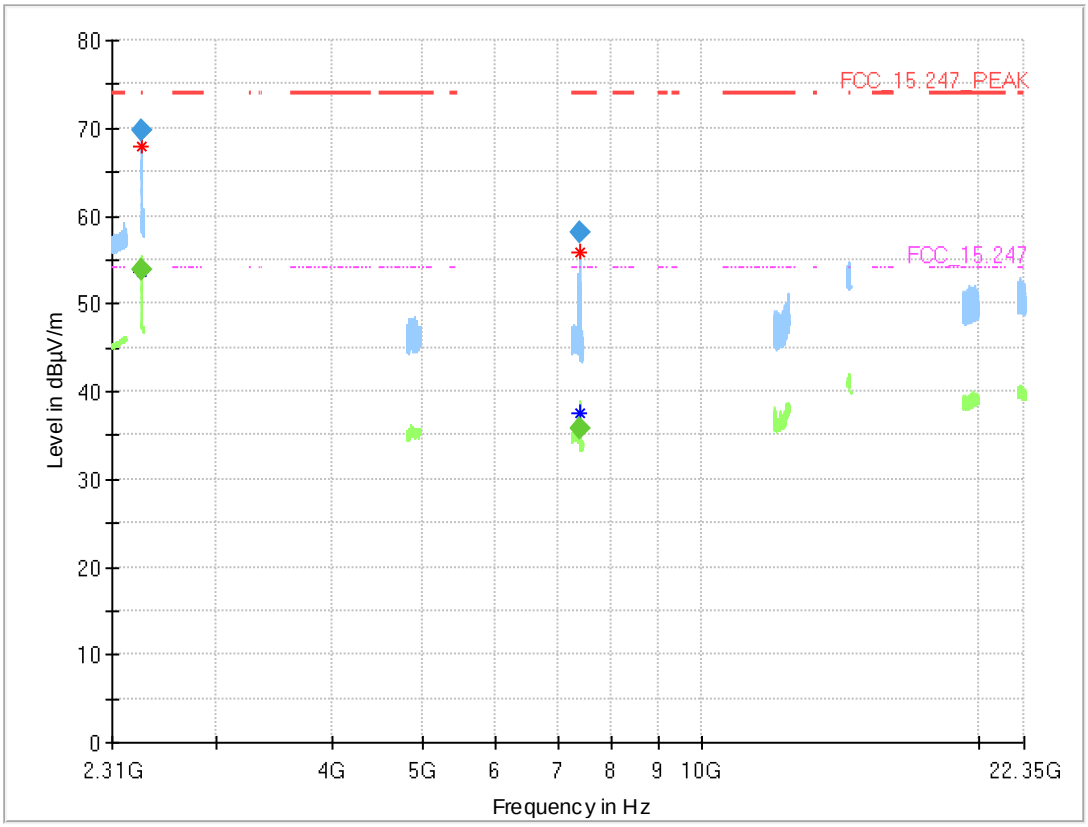
Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S04_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.748	---	50.6	54.00	3.36	1000.0	1000.000	150.0	H	2.0	86.0	45.0
2483.748	66.6	---	74.00	7.43	1000.0	1000.000	150.0	H	1.0	75.0	45.0

Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S04_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
7387.493	58.2	---	74.00	15.85	1000.0	1000.000	150.0	V	32.0	78.0	-14.1
7388.295	---	35.8	54.00	18.18	1000.0	1000.000	150.0	H	-11.0	84.0	-14.1

5.6.5 TEST EQUIPMENT USED

- Radiated Emissions FAR 2.4 GHz FCC
- Radiated Emissions SAC H-Field
- Radiated Emissions SAC up to 1 GHz

5.7 BAND EDGE COMPLIANCE CONDUCTED

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 11.11

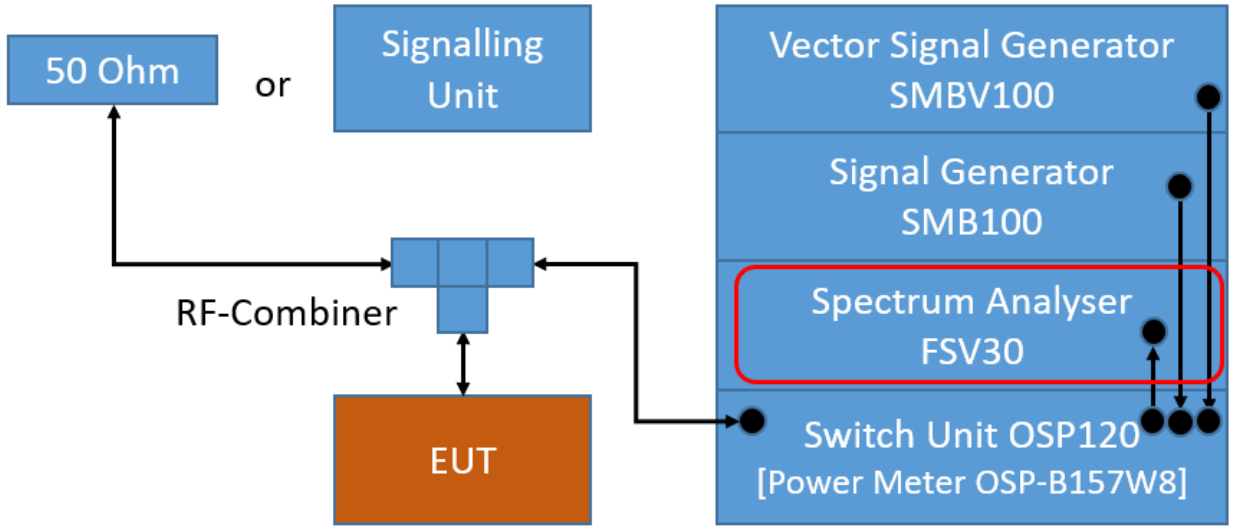
5.7.1 TEST DESCRIPTION

For the conducted measurement, the Equipment Under Test (EUT) is placed in a shielded room. The reference power was measured in the test case "Spurious RF Conducted Emissions".

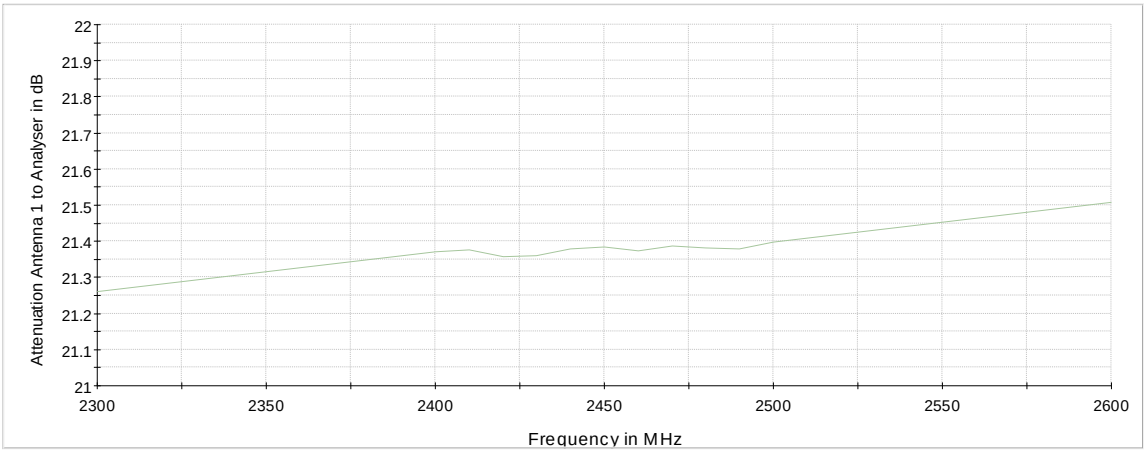
The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.

Analyser settings:

- Lower Band Edge:
  Measured range: 2310.0 MHz to 2483.5 MHz
  Upper Band Edge
  Measured range: 2400.0 MHz to 2500 MHz
- Detector: Peak
- Resolution Bandwidth (RBW): 100 kHz
- Video Bandwidth (VBW): 300 kHz
- Sweeptime: Auto
- Sweeps: Till stable (min. 300, max. 15000)
- Trace: Maxhold



TS8997; Band Edge Conducted



Attenuation of the measurement path

5.7.2 TEST REQUIREMENTS / LIMITS

FCC Part 15.247 (d)
"In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. ...
If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c))."

For the conducted measurement the RF power at the band edge shall be "at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power..."

5.7.3 TEST PROTOCOL

Ambient temperature: 23 -25 °C
Air Pressure: 993 - 1017 hPa
Humidity: 37 - 42 %

WLAN g-Mode; 20 MHz; 1 Mbit/s

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2400.0	-45.2	PEAK	100	5.7	-24.3	20.9
11	2462	2483.5	-57.1	PEAK	100	5.3	-24.7	32.4

WLAN g-Mode; 20 MHz; 6 Mbit/s

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2400.0	-30.8	PEAK	100	5.9	-24.1	6.7
11	2462	2483.5	-45.6	PEAK	100	5.8	-24.2	21.4

WLAN n-Mode; 20 MHz; MCS0

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2400.0	-27.0	PEAK	100	5.8	-24.2	2.8
11	2462	2483.5	-44.0	PEAK	100	5.8	-24.2	19.8

WLAN n-Mode; 40 MHz; MCS0

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
3	2422	2400.0	-32.0	PEAK	100	0.9	-29.1	2.9
9	2452	2483.5	-40.5	PEAK	100	0.6	-29.4	11.1

WLAN ax-Mode; 20 MHz; MCS0

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2400.0	-27.8	PEAK	100	5.6	-24.4	3.4
11	2462	2483.5	-43.4	PEAK	100	5.5	-24.5	18.9

WLAN ax-Mode; 40 MHz; MCS0

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
3	2422	2400.0	-33.3	PEAK	100	0.7	-29.3	4.0
9	2452	2483.5	-39.4	PEAK	100	0.5	-29.5	9.9

WLAN b-Mode; 20 MHz; 1 Mbit/s; Diversity

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2400.0	-41.5	PEAK	100	7.9	-22.1	19.4
11	2462	2483.5	-43.6	PEAK	100	8.7	-21.3	22.3

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
3	2422	2400.0	-27.1	PEAK	100	9.2	-20.8	6.3
9	2452	2483.5	-36.9	PEAK	100	9.2	-20.8	16.1

WLAN n-Mode; 20 MHz; MCS0; MIMO

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2400.0	-25.6	PEAK	100	9.0	-21.0	4.6
11	2462	2483.5	-40.9	PEAK	100	8.1	-21.9	19.0

WLAN n-Mode; 40 MHz; MCS0; MIMO

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
3	2422	2400.0	-28.9	PEAK	100	3.9	-26.1	2.8
9	2452	2483.5	-37.7	PEAK	100	3.9	-26.1	11.6

WLAN ax-Mode; 20 MHz; MCS0; MIMO

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2400.0	-24.3	PEAK	100	9.0	-21.0	3.3
11	2462	2483.5	-40.5	PEAK	100	8.9	-21.1	19.4

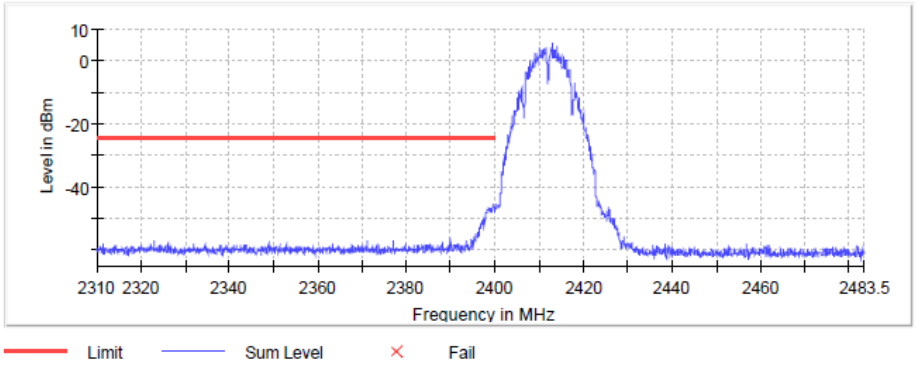
WLAN ax-Mode; 40 MHz; MCS0; MIMO

Channel No.	Channel Center Frequency [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
3	2422	2400.0	-30.1	PEAK	100	3.7	-26.3	3.8
9	2452	2483.5	-38.5	PEAK	100	3.7	-26.3	12.2

Remark: Please see next sub-clause for the measurement plot.

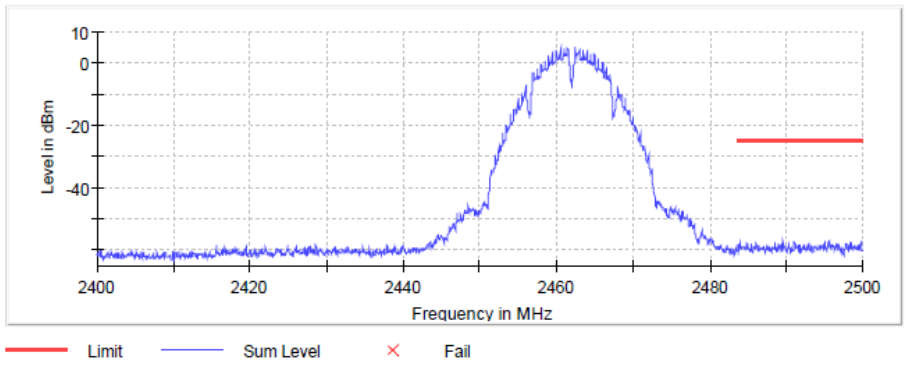
5.7.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN g 1 Mbit/s, Operating Frequency = low, Band Edge = low (S01_AC01)



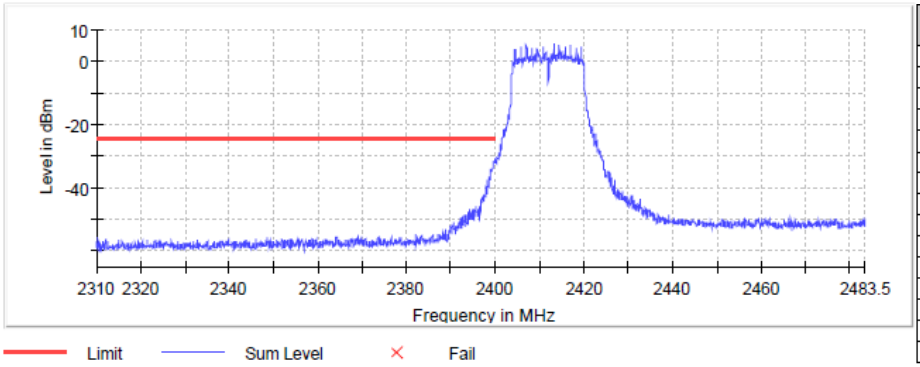
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.525000	-45.2	20.9
2399.475000	-45.6	21.2
2399.575000	-45.8	21.5
2399.725000	-46.0	21.7
2399.675000	-46.1	21.8
2399.775000	-46.2	21.8
2399.875000	-46.2	21.9
2399.625000	-46.2	21.9
2399.925000	-46.3	21.9
2399.825000	-46.3	21.9
2399.975000	-46.3	22.0
2399.275000	-46.6	22.2
2399.175000	-46.6	22.3
2398.675000	-46.6	22.3
2398.725000	-46.7	22.4

Radio Technology = WLAN g 1 Mbit/s, Operating Frequency = high, Band Edge = high (S01_AC01)



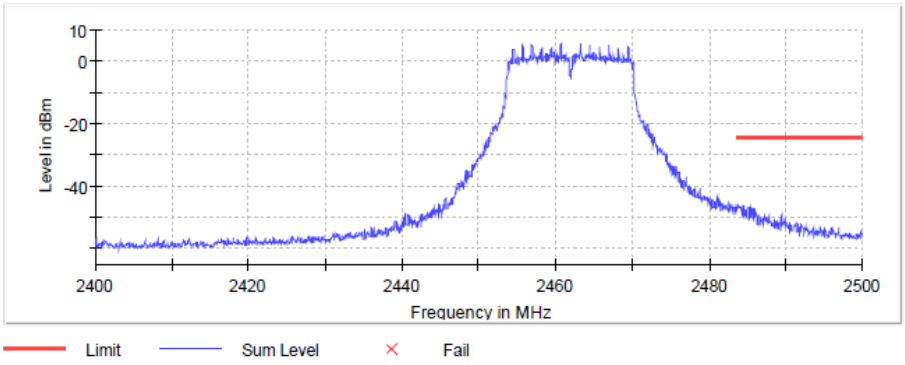
Frequency (MHz)	Level (dBm)	Margin (dB)
2495.625000	-57.1	32.4
2489.625000	-57.2	32.4
2499.775000	-57.3	32.6
2499.725000	-57.4	32.7
2495.575000	-57.5	32.7
2494.975000	-57.5	32.8
2491.025000	-57.5	32.8
2484.775000	-57.6	32.9
2488.525000	-57.6	32.9
2498.525000	-57.7	33.0
2498.575000	-57.7	33.0
2495.025000	-57.7	33.0
2491.075000	-57.7	33.0
2495.675000	-57.8	33.0
2489.575000	-57.8	33.0

Radio Technology = WLAN g 6 Mbit/s, Operating Frequency = low, Band Edge = low (S01_AD01)



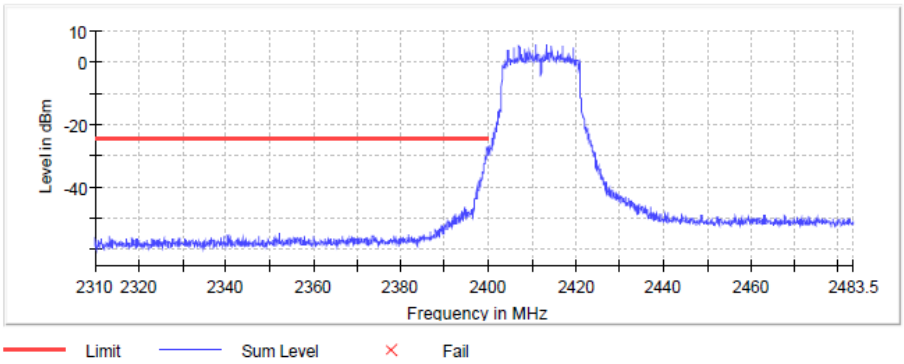
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.975000	-30.8	6.7
2399.875000	-31.4	7.3
2399.775000	-31.6	7.5
2399.825000	-31.7	7.6
2399.925000	-31.9	7.8
2399.725000	-32.1	8.0
2399.625000	-32.7	8.6
2399.675000	-32.7	8.6
2399.575000	-33.0	8.9
2399.525000	-33.4	9.3
2399.475000	-33.4	9.3
2398.875000	-33.9	9.8
2399.075000	-34.0	9.9
2399.225000	-34.0	9.9
2399.125000	-34.0	9.9

Radio Technology = WLAN g 6 Mbit/s, Operating Frequency = high, Band Edge = high (S01_AD01)



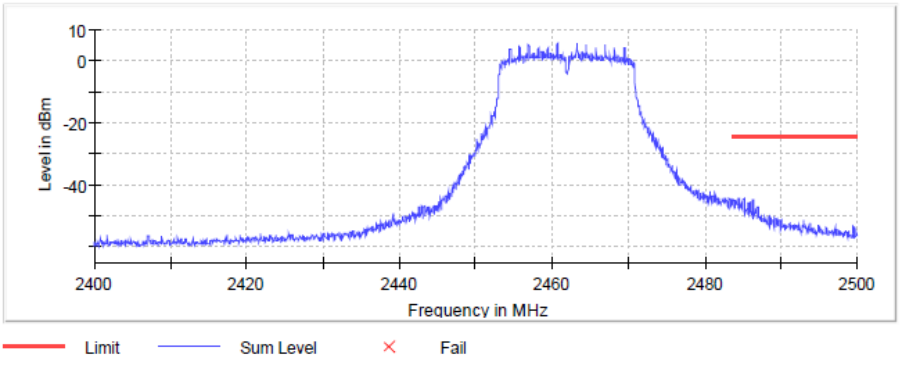
Frequency (MHz)	Level (dBm)	Margin (dB)
2483.525000	-45.6	21.4
2484.025000	-46.0	21.8
2484.475000	-46.1	21.9
2483.575000	-46.2	22.0
2483.875000	-46.2	22.0
2484.525000	-46.2	22.0
2483.975000	-46.4	22.2
2483.725000	-46.5	22.3
2483.625000	-46.7	22.5
2484.125000	-46.7	22.5
2483.925000	-46.8	22.6
2484.075000	-46.8	22.6
2485.125000	-46.9	22.7
2483.825000	-47.0	22.8
2485.775000	-47.1	22.9

Radio Technology = WLAN n 20 MHz, Operating Frequency = low, Band Edge = low (S01_AD01)



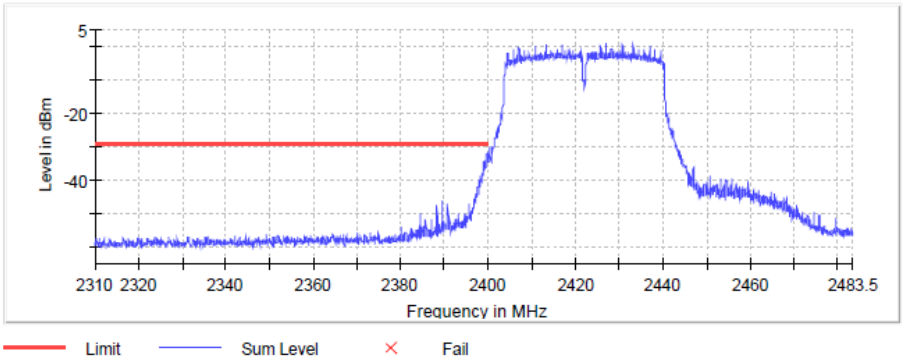
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.725000	-27.0	2.8
2399.775000	-27.4	3.2
2399.875000	-27.8	3.7
2399.825000	-28.2	4.0
2399.675000	-28.7	4.5
2399.975000	-29.2	5.0
2399.925000	-29.2	5.0
2399.475000	-29.7	5.5
2399.525000	-29.8	5.7
2399.425000	-30.4	6.2
2399.575000	-30.6	6.4
2399.625000	-31.1	6.9
2399.175000	-31.7	7.6
2399.375000	-32.0	7.8
2399.225000	-32.0	7.8

Radio Technology = WLAN n 20 MHz, Operating Frequency = high, Band Edge = high (S01_AD01)



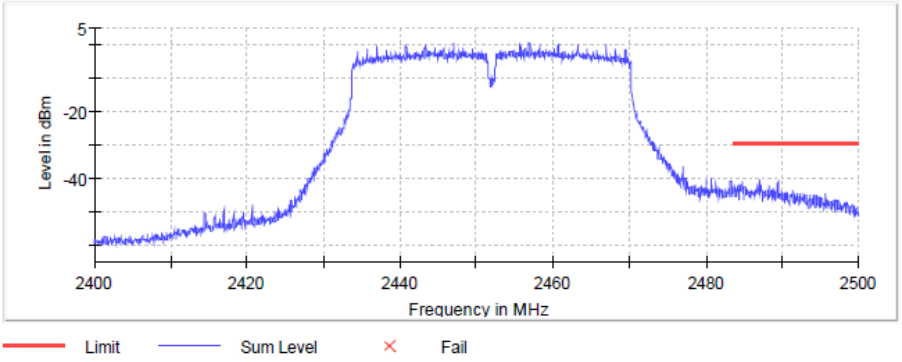
Frequency (MHz)	Level (dBm)	Margin (dB)
2485.125000	-44.1	19.9
2484.525000	-44.4	20.1
2484.475000	-44.4	20.1
2485.175000	-44.4	20.2
2483.625000	-44.6	20.4
2483.575000	-44.6	20.4
2483.975000	-44.7	20.5
2483.675000	-44.8	20.6
2486.375000	-44.8	20.6
2485.075000	-44.9	20.7
2483.525000	-45.0	20.8
2486.325000	-45.0	20.8
2483.875000	-45.1	20.8
2484.125000	-45.4	21.1
2486.025000	-45.4	21.1

Radio Technology = WLAN n 40 MHz, Operating Frequency = low, Band Edge = low (S01_AD01)



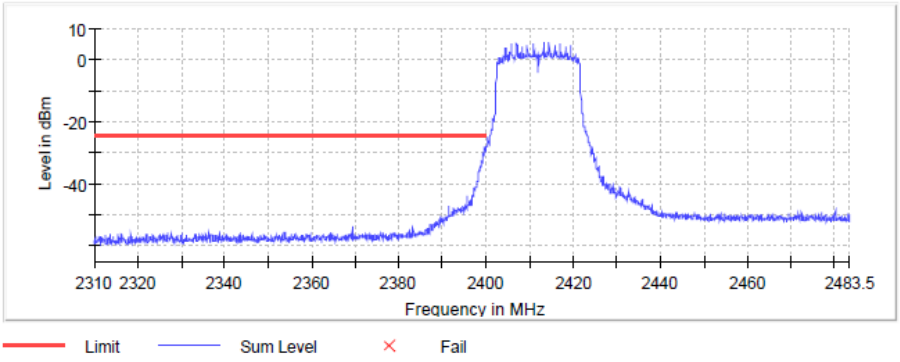
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.775000	-32.1	3.0
2399.825000	-32.4	3.3
2399.725000	-32.9	3.8
2399.875000	-33.4	4.3
2399.975000	-33.5	4.4
2399.475000	-34.3	5.2
2399.425000	-34.4	5.3
2398.875000	-34.6	5.5
2398.825000	-34.9	5.8
2399.925000	-35.0	5.9
2399.525000	-35.1	6.0
2399.375000	-35.5	6.4
2399.575000	-35.8	6.7
2399.675000	-35.9	6.8
2398.925000	-36.1	7.0

Radio Technology = WLAN n 40 MHz, Operating Frequency = high, Band Edge = high (S01_AD01)



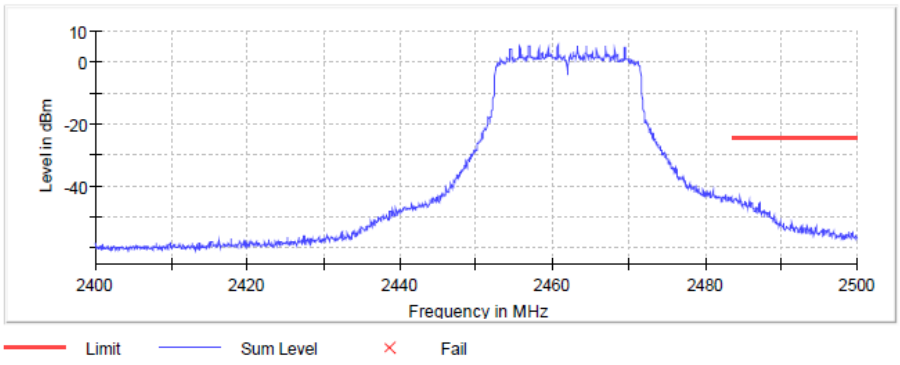
Frequency (MHz)	Level (dBm)	Margin (dB)
2487.025000	-40.5	11.0
2486.975000	-40.5	11.1
2489.475000	-41.0	11.6
2484.825000	-41.1	11.7
2484.775000	-41.2	11.7
2484.725000	-41.6	12.2
2489.425000	-42.0	12.5
2488.275000	-42.2	12.7
2484.475000	-42.2	12.7
2489.525000	-42.2	12.8
2484.425000	-42.3	12.8
2484.675000	-42.3	12.8
2484.175000	-42.4	13.0
2485.125000	-42.5	13.1
2485.075000	-42.5	13.1

Radio Technology = WLAN ax 20 MHz, Operating Frequency = low, Band Edge = low (S01_AC01)



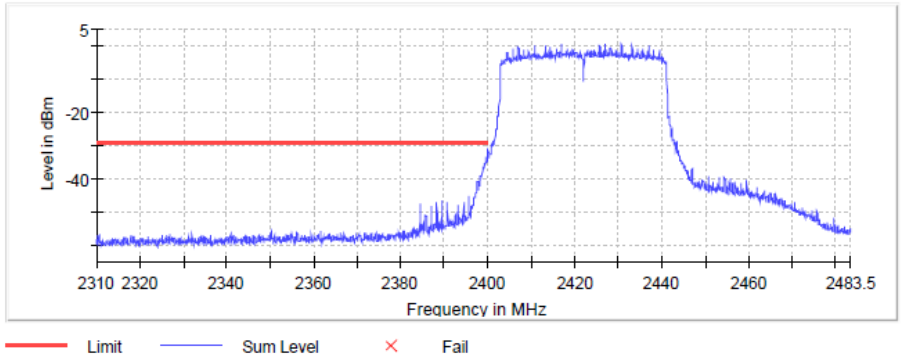
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.725000	-27.8	3.4
2399.775000	-28.6	4.2
2399.675000	-28.8	4.4
2399.575000	-28.9	4.5
2399.925000	-28.9	4.5
2399.875000	-29.0	4.6
2399.975000	-29.1	4.7
2399.625000	-29.2	4.8
2399.825000	-29.2	4.9
2399.375000	-29.9	5.5
2399.525000	-30.0	5.6
2399.325000	-30.2	5.8
2399.475000	-30.6	6.2
2399.425000	-30.7	6.3
2399.275000	-31.5	7.1

Radio Technology = WLAN ax 20 MHz, Operating Frequency = high, Band Edge = high (S01_AC01)



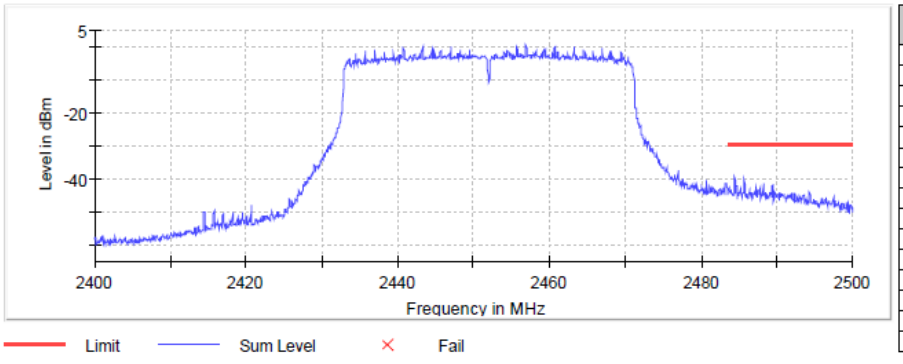
Frequency (MHz)	Level (dBm)	Margin (dB)
2484.675000	-43.4	18.9
2483.975000	-43.7	19.3
2484.025000	-43.8	19.4
2484.625000	-44.0	19.6
2484.575000	-44.1	19.7
2483.875000	-44.2	19.8
2484.075000	-44.3	19.9
2484.275000	-44.4	20.0
2484.125000	-44.5	20.0
2484.175000	-44.5	20.0
2483.925000	-44.6	20.1
2484.825000	-44.8	20.3
2483.675000	-44.8	20.3
2483.525000	-44.8	20.3
2485.775000	-44.8	20.4

Radio Technology = WLAN ax 40 MHz, Operating Frequency = low, Band Edge = low (S01_AD01)



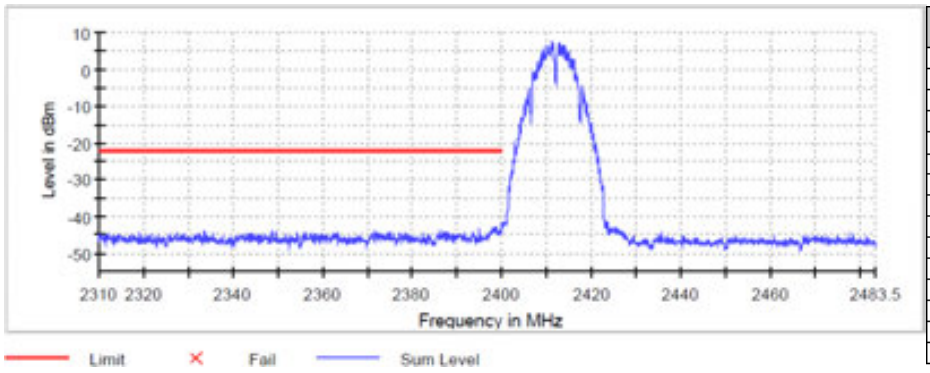
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.525000	-33.3	4.0
2399.575000	-33.4	4.1
2399.925000	-33.4	4.1
2399.875000	-33.4	4.1
2399.975000	-34.2	4.8
2399.475000	-34.7	5.4
2399.825000	-35.0	5.7
2399.725000	-35.2	5.9
2399.625000	-35.2	5.9
2399.675000	-35.3	6.0
2399.275000	-35.4	6.1
2399.775000	-35.4	6.1
2399.225000	-35.5	6.2
2399.325000	-35.7	6.4
2399.375000	-36.0	6.7

Radio Technology = WLAN ax 40 MHz, Operating Frequency = high, Band Edge = high (S01_AD01)



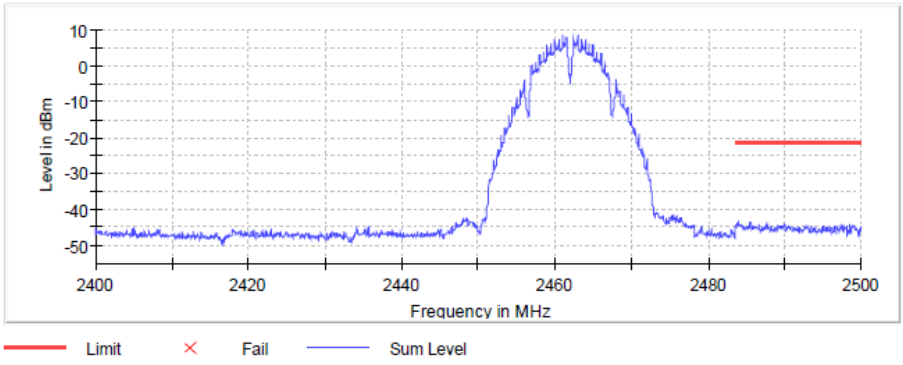
Frequency (MHz)	Level (dBm)	Margin (dB)
2484.475000	-39.4	9.8
2485.725000	-40.2	10.7
2484.525000	-40.5	10.9
2488.225000	-41.2	11.7
2485.675000	-41.2	11.7
2488.275000	-41.3	11.8
2484.425000	-41.3	11.8
2485.775000	-41.9	12.3
2489.475000	-42.0	12.5
2489.425000	-42.2	12.7
2484.675000	-42.3	12.8
2484.725000	-42.4	12.9
2487.325000	-42.5	12.9
2487.275000	-42.5	13.0
2487.825000	-42.6	13.0

Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = low, Band Edge = low
(S01_AC01)



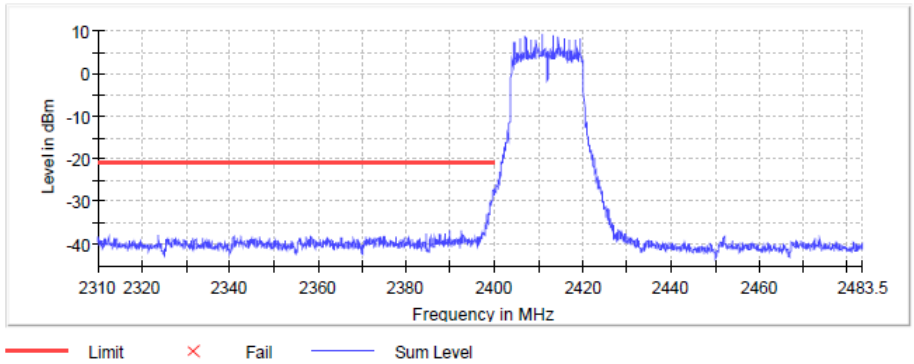
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.975000	-41.5	19.4
2399.925000	-41.6	19.4
2398.525000	-42.8	20.6
2399.875000	-42.9	20.7
2398.875000	-43.0	20.8
2394.925000	-43.1	20.9
2398.375000	-43.2	21.0
2397.975000	-43.2	21.0
2398.475000	-43.3	21.1
2398.825000	-43.3	21.1
2398.025000	-43.4	21.2
2398.275000	-43.4	21.2
2398.075000	-43.5	21.3
2398.425000	-43.5	21.3
2398.575000	-43.5	21.3

Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high, Band Edge = high
(S01_AC01)



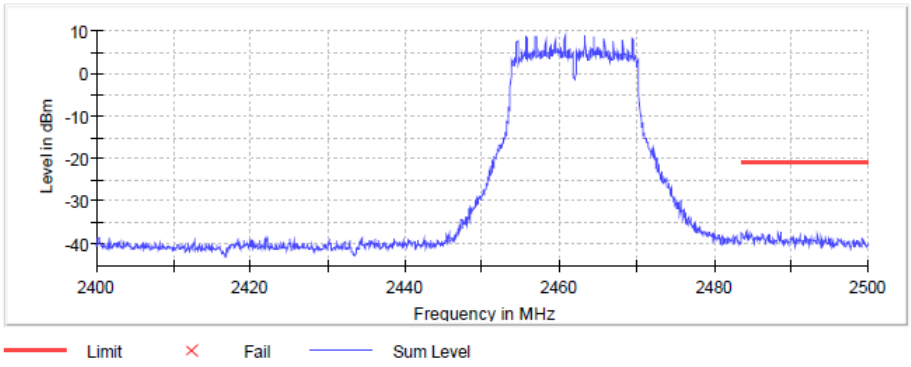
Frequency (MHz)	Level (dBm)	Margin (dB)
2485.475000	-43.6	22.3
2483.925000	-43.7	22.3
2485.525000	-43.7	22.3
2483.975000	-43.8	22.4
2487.625000	-43.8	22.5
2483.725000	-43.9	22.5
2487.675000	-43.9	22.5
2490.025000	-44.0	22.6
2484.425000	-44.0	22.6
2489.925000	-44.0	22.6
2489.975000	-44.0	22.6
2484.075000	-44.1	22.7
2498.575000	-44.1	22.8
2486.675000	-44.2	22.8
2485.575000	-44.2	22.9

Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = low, Band Edge = low
(S01_AD01)



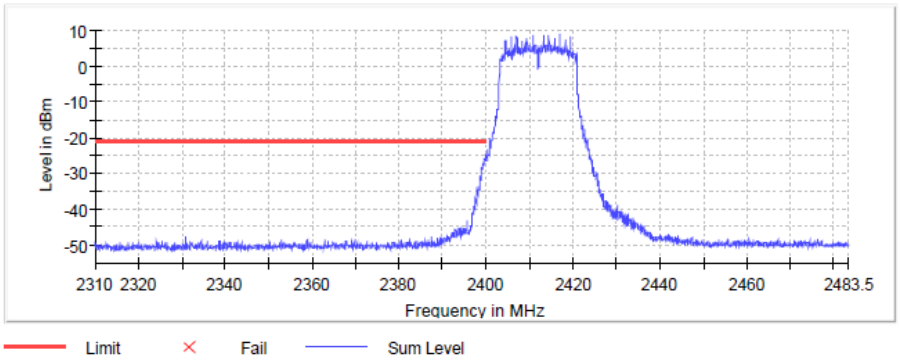
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.825000	-27.1	6.3
2399.875000	-27.3	6.5
2399.775000	-27.3	6.5
2399.975000	-27.4	6.6
2399.725000	-28.0	7.2
2399.625000	-28.1	7.2
2399.575000	-28.2	7.4
2399.925000	-28.5	7.6
2399.675000	-29.0	8.2
2399.525000	-29.4	8.6
2399.475000	-29.5	8.7
2399.175000	-29.9	9.1
2399.225000	-29.9	9.1
2399.125000	-30.1	9.3
2399.425000	-30.2	9.4

Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = high, Band Edge = high
(S01_AD01)



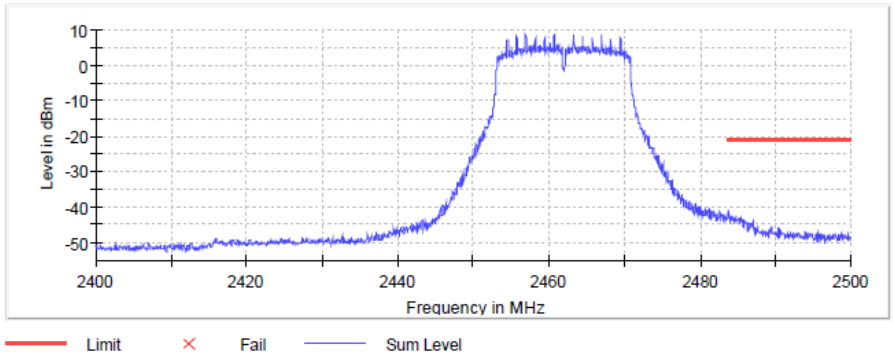
Frequency (MHz)	Level (dBm)	Margin (dB)
2488.675000	-36.9	16.1
2488.725000	-37.0	16.2
2484.475000	-37.1	16.2
2484.375000	-37.2	16.4
2484.875000	-37.3	16.4
2484.425000	-37.4	16.5
2483.675000	-37.4	16.5
2486.225000	-37.4	16.5
2484.825000	-37.4	16.5
2488.325000	-37.4	16.5
2484.125000	-37.5	16.6
2488.375000	-37.5	16.7
2487.125000	-37.6	16.7
2486.375000	-37.7	16.8
2483.625000	-37.7	16.8

Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = low, Band Edge = low
(S01_AD01)



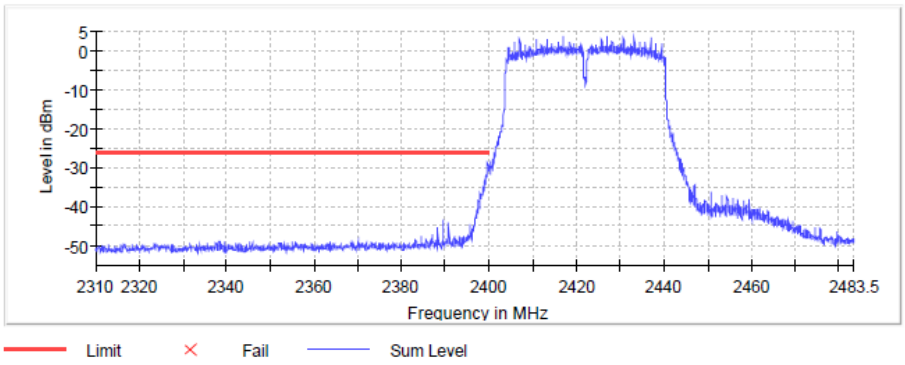
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.975000	-25.6	4.6
2399.725000	-25.7	4.8
2399.825000	-25.8	4.8
2399.875000	-26.1	5.1
2399.775000	-26.1	5.1
2399.675000	-26.4	5.4
2399.475000	-26.6	5.6
2399.925000	-26.7	5.7
2399.525000	-26.9	5.9
2399.425000	-27.5	6.5
2399.625000	-27.7	6.7
2399.575000	-27.9	6.9
2399.175000	-28.1	7.1
2399.225000	-28.2	7.2
2398.875000	-28.3	7.3

Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = high, Band Edge = high
(S01_AD01)



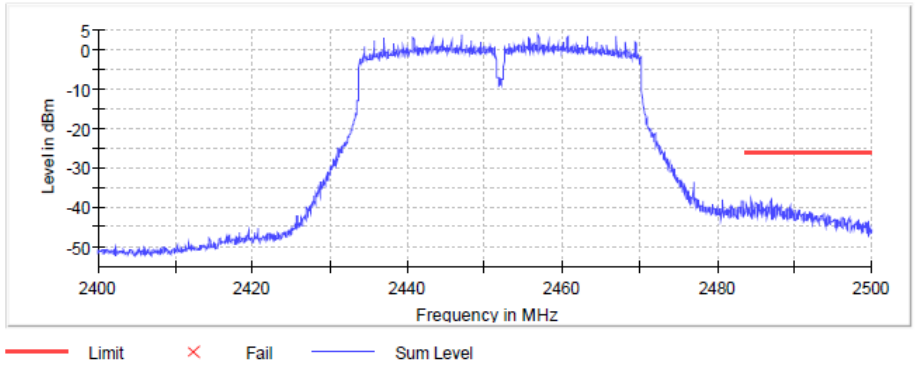
Frequency (MHz)	Level (dBm)	Margin (dB)
2483.825000	-40.9	19.8
2483.875000	-41.2	20.1
2483.525000	-41.9	20.8
2483.775000	-42.2	21.1
2484.775000	-42.3	21.2
2483.575000	-42.3	21.3
2483.625000	-42.5	21.4
2484.225000	-42.6	21.5
2484.475000	-42.9	21.8
2484.825000	-43.0	21.9
2484.525000	-43.1	22.0
2483.925000	-43.1	22.0
2484.575000	-43.1	22.1
2484.125000	-43.2	22.1
2485.475000	-43.2	22.2

Radio Technology = WLAN n 40 MHz MIMO, Operating Frequency = low, Band Edge = low (S01_AD01)



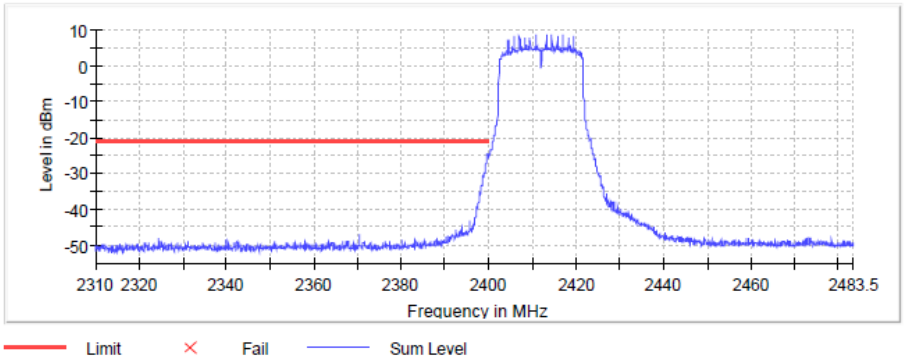
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.775000	-28.9	2.8
2399.725000	-29.0	3.0
2399.825000	-29.5	3.4
2399.875000	-30.5	4.4
2399.975000	-30.7	4.6
2399.925000	-31.1	5.1
2399.675000	-31.2	5.1
2399.525000	-31.3	5.3
2399.475000	-31.5	5.4
2399.425000	-32.0	5.9
2399.575000	-32.1	6.1
2399.625000	-32.5	6.4
2399.175000	-32.6	6.5
2399.125000	-32.6	6.6
2399.225000	-33.1	7.0

Radio Technology = WLAN n 40 MHz MIMO, Operating Frequency = high, Band Edge = high (S01_AD01)



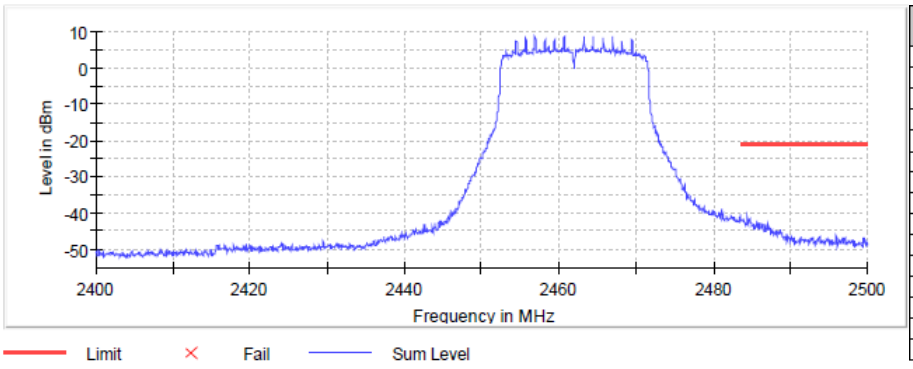
Frequency (MHz)	Level (dBm)	Margin (dB)
2484.475000	-37.7	11.6
2486.975000	-38.2	12.1
2484.425000	-38.6	12.5
2485.725000	-38.6	12.5
2486.925000	-38.8	12.7
2485.075000	-38.9	12.8
2485.775000	-39.0	12.9
2485.375000	-39.2	13.1
2484.525000	-39.3	13.1
2485.125000	-39.4	13.3
2483.875000	-39.4	13.3
2487.625000	-39.4	13.3
2484.575000	-39.6	13.5
2486.375000	-39.6	13.5
2488.225000	-39.6	13.5

Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = low, Band Edge = low (S01_AD01)



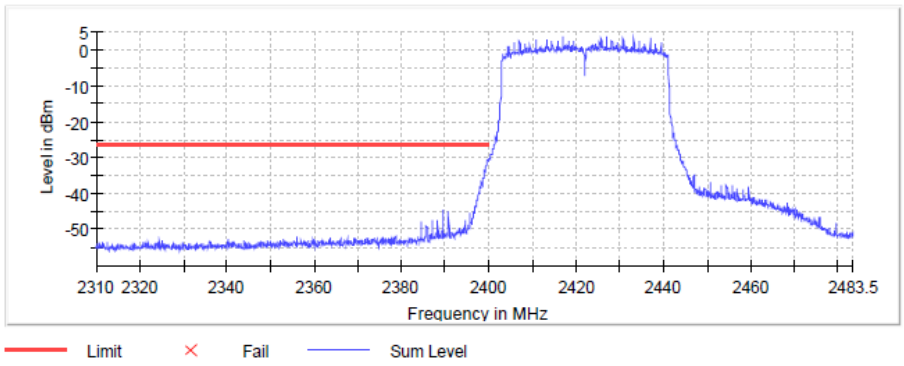
Frequency (MHz)	Level (dBm)	Margin (dB)
2399.975000	-24.3	3.3
2399.775000	-24.5	3.4
2399.825000	-24.7	3.7
2399.925000	-24.7	3.7
2399.875000	-24.9	3.8
2399.725000	-24.9	3.9
2399.525000	-26.1	5.1
2399.675000	-26.2	5.2
2399.575000	-26.5	5.4
2399.625000	-26.6	5.6
2399.475000	-27.2	6.1
2399.425000	-27.3	6.2
2399.375000	-27.9	6.8
2399.325000	-28.8	7.8
2399.225000	-29.0	7.9

Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = high, Band Edge = high (S01_AD01)



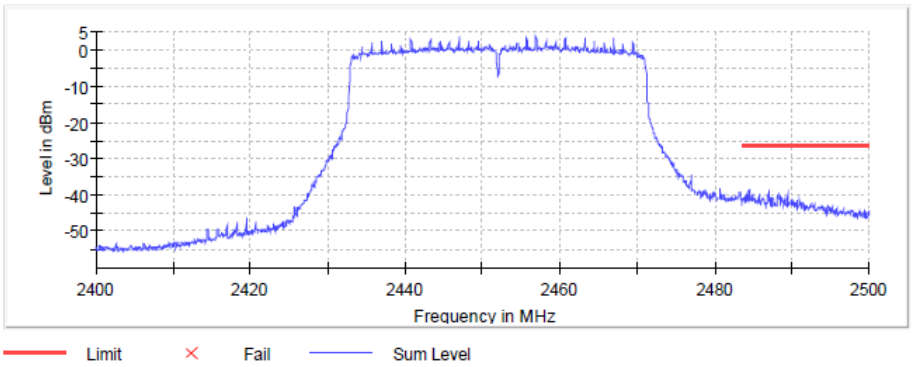
Frequency (MHz)	Level (dBm)	Margin (dB)
2483.575000	-40.5	19.4
2484.475000	-40.8	19.8
2483.625000	-40.9	19.9
2483.525000	-41.2	20.1
2484.425000	-41.3	20.2
2484.575000	-41.4	20.4
2483.775000	-41.6	20.5
2484.775000	-41.8	20.7
2484.725000	-41.8	20.7
2484.625000	-41.9	20.9
2483.675000	-41.9	20.9
2483.725000	-41.9	20.9
2483.825000	-42.0	20.9
2484.075000	-42.1	21.0
2485.575000	-42.1	21.1

Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = low, Band Edge = low (S01_AD01)



Frequency (MHz)	Level (dBm)	Margin (dB)
2399.875000	-30.1	3.8
2399.975000	-30.5	4.2
2399.825000	-30.5	4.2
2399.925000	-30.6	4.2
2399.725000	-30.6	4.3
2399.775000	-30.8	4.5
2399.675000	-31.1	4.8
2399.625000	-31.4	5.1
2399.575000	-31.6	5.2
2399.525000	-31.6	5.3
2399.475000	-31.9	5.6
2399.225000	-32.2	5.9
2399.275000	-32.3	6.0
2399.425000	-32.5	6.2
2399.325000	-33.0	6.7

Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = high, Band Edge = high (S01_AD01)



Frequency (MHz)	Level (dBm)	Margin (dB)
2484.525000	-38.5	12.2
2484.475000	-38.7	12.4
2486.975000	-39.1	12.8
2488.275000	-39.5	13.2
2485.825000	-39.5	13.2
2489.525000	-39.6	13.4
2489.475000	-39.7	13.4
2488.225000	-39.7	13.4
2484.975000	-39.9	13.6
2487.025000	-40.0	13.7
2484.225000	-40.1	13.8
2488.525000	-40.1	13.9
2484.575000	-40.1	13.9
2484.825000	-40.2	13.9
2485.775000	-40.2	13.9

5.7.5 TEST EQUIPMENT USED

- R&S TS8997

5.8 BAND EDGE COMPLIANCE RADIATED

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 6.6.5

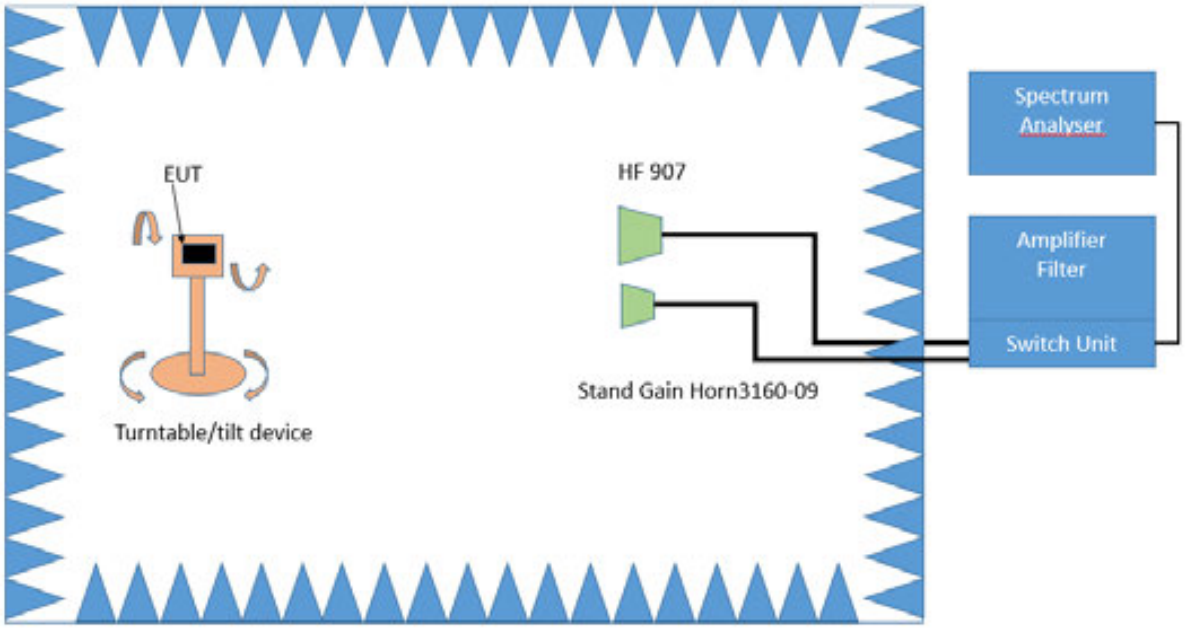
5.8.1 TEST DESCRIPTION

The test set-up was made in accordance to the general provisions of ANSI C63.10 in a typical installation configuration. The measurements were performed according the following sub-chapter of ANSI C63.10:

- Chapter 6.10.5

The Equipment Under Test (EUT) was set up on a non-conductive support (tilt device) at 1.5 m height in the fully-anechoic chamber.
All steps were performed with one height (1.5 m) of the receiving antenna only (procedure according ANSI C63.10, chapter 6.6.5.

3. Measurement above 1 GHz



Test Setup; Spurious Emission Radiated (FAC), 1 GHz-26.5 GHz

Step 1:
The EUT is turned during the preliminary measurement across the elevation axis, with a step size of 90 °.
The turn table step size (azimuth angle) for the preliminary measurement is 45 °.
Spectrum analyser settings:
- Detector: Peak, Average
- RBW = 1 MHz
- VBW = 3 MHz

Step 2:
The turn table azimuth will slowly vary by ± 22.5°.
The elevation angle will slowly vary by ± 45°

Spectrum analyser settings:
- Detector: Peak

Step 3:
Spectrum analyser settings for step 3:
- Detector: Peak / CISPR Average
- Measured frequencies: in step 1 determined frequencies
- RBW = 1 MHz
- VBW = 3 MHz
- Measuring time: 1 s

5.8.2 TEST REQUIREMENTS / LIMITS

For band edges connected to a restricted band, the limits are specified in Section 15.209(a)

FCC Part 15, Subpart C, §15.209, Radiated Emission Limits

Frequency in MHz	Limit (µV/m)	Measurement distance (m)	Limits (dBµV/m)
0.009 – 0.49	2400/F(kHz)@300m	3	(48.5 – 13.8)@300m
0.49 – 1.705	24000/F(kHz)@30m	3	(33.8 – 23.0)@30m
1.705 – 30	30@30m	3	29.5@30m

The measured values are corrected with an inverse linear distance extrapolation factor (40 dB/decade) according FCC 15.31 (2).

Frequency in MHz	Limit (µV/m)	Measurement distance (m)	Limits (dBµV/m)
30 – 88	100@3m	3	40.0@3m
88 – 216	150@3m	3	43.5@3m
216 – 960	200@3m	3	46.0@3m
960 - 26000	500@3m	3	54.0@3m
26000 - 40000	500@3m	1	54.0@3m

The measured values above 26 GHz are corrected with an inverse linear distance extrapolation factor (20 dB/decade).

§15.35(b) ..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit....

Used conversion factor: Limit (dBµV/m) = 20 log (Limit (µV/m)/1µV/m)

5.8.3 TEST PROTOCOL

Ambient temperature: 22–25 °C
Air Pressure: 998–1017 hPa
Humidity: 37–50 %

Test with <6 dBi antenna

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity
Applied duty cycle correction (AV): 5.1 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	50.7	PEAK	1000	74.0	23.3
11	2462	2483.5	35.8	AV	1000	54.0	18.2

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity
Applied duty cycle correction (AV): 0.4 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	60.4	PEAK	1000	74.0	13.6
9	2452	2483.5	46.7	AV	1000	54.0	7.3

WLAN n-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.5 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	65.9	PEAK	1000	74.0	8.1
11	2462	2483.5	48.7	AV	1000	54.0	5.3

WLAN n-Mode; 40 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.8 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	63.9	PEAK	1000	74.0	10.1
9	2452	2483.5	49.5	AV	1000	54.0	4.5

WLAN ax-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.6 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	68.2	PEAK	1000	74.0	5.8
11	2462	2483.5	49.7	AV	1000	54.0	4.3

WLAN ax-Mode; 40 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.7 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	67.5	PEAK	1000	74.0	6.5
9	2452	2483.5	51.5	AV	1000	54.0	2.5

Test with <9 dBi antenna

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity
Applied duty cycle correction (AV): 5.1 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	60.1	PEAK	1000	74.0	13.9
11	2462	2483.5	48.8	AV	1000	54.0	5.2

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity
Applied duty cycle correction (AV): 0.4 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	70.2	PEAK	1000	74.0	3.8
9	2452	2483.5	54.0	AV	1000	54.0	0.0

WLAN n-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.5 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	69.5	PEAK	1000	74.0	4.5
11	2462	2483.5	53.0	AV	1000	54.0	1.0

WLAN n-Mode; 40 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.8 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	69.1	PEAK	1000	74.0	4.9
9	2452	2483.5	53.0	AV	1000	54.0	1.0

WLAN ax-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.6 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	70.9	PEAK	1000	74.0	3.1
11	2462	2483.5	53.9	AV	1000	54.0	0.1

WLAN ax-Mode; 40 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.7 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	68.6	PEAK	1000	74.0	5.4
9	2452	2483.5	52.7	AV	1000	54.0	1.3

Test with <14 dBi antenna

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity
Applied duty cycle correction (AV): 5.1 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	57.9	PEAK	1000	74.0	16.1
11	2462	2483.5	48.8	AV	1000	54.0	5.2

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity
Applied duty cycle correction (AV): 0.4 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	65.8	PEAK	1000	74.0	8.2
9	2452	2483.5	50.2	AV	1000	54.0	3.8

WLAN n-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.5 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	66.6	PEAK	1000	74.0	7.4
11	2462	2483.5	51.1	AV	1000	54.0	2.9

WLAN n-Mode; 40 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.8 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	69.9	PEAK	1000	74.0	4.1
9	2452	2483.5	53.8	AV	1000	54.0	0.2

WLAN ax-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.6 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
11	2462	2483.5	67.7	PEAK	1000	74.0	6.3
11	2462	2483.5	52.4	AV	1000	54.0	1.6

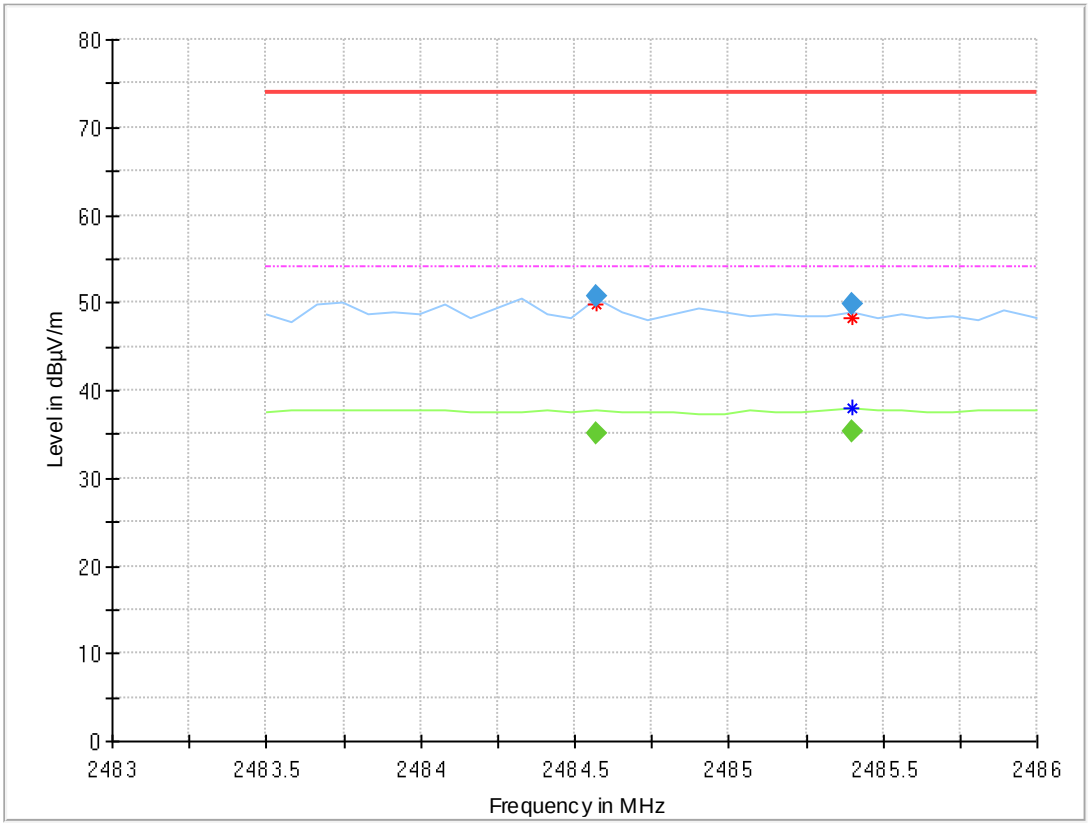
WLAN ax-Mode; 40 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.7 dB

Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]
9	2452	2483.5	69.6	PEAK	1000	74.0	4.4
9	2452	2483.5	53.9	AV	1000	54.0	0.1

Remark: WLAN g mode 1 and 6 Mbit Diversity with 9 dBi antenna were tested with 17 dBm power setting and not repeated at final power of 15 dBm 17 dBm is worse case.
For the "lower band edge" (nearest, lower restricted band to the 2.4 GHz ISM band) the measurement values are reported in section 5.6 "TRANSMITTER SPURIOUS RADIATED EMISSIONS" in case that the margin to the compliance limit is less than 20 dB.
Please see next sub-clause for the measurement plot.

5.8.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

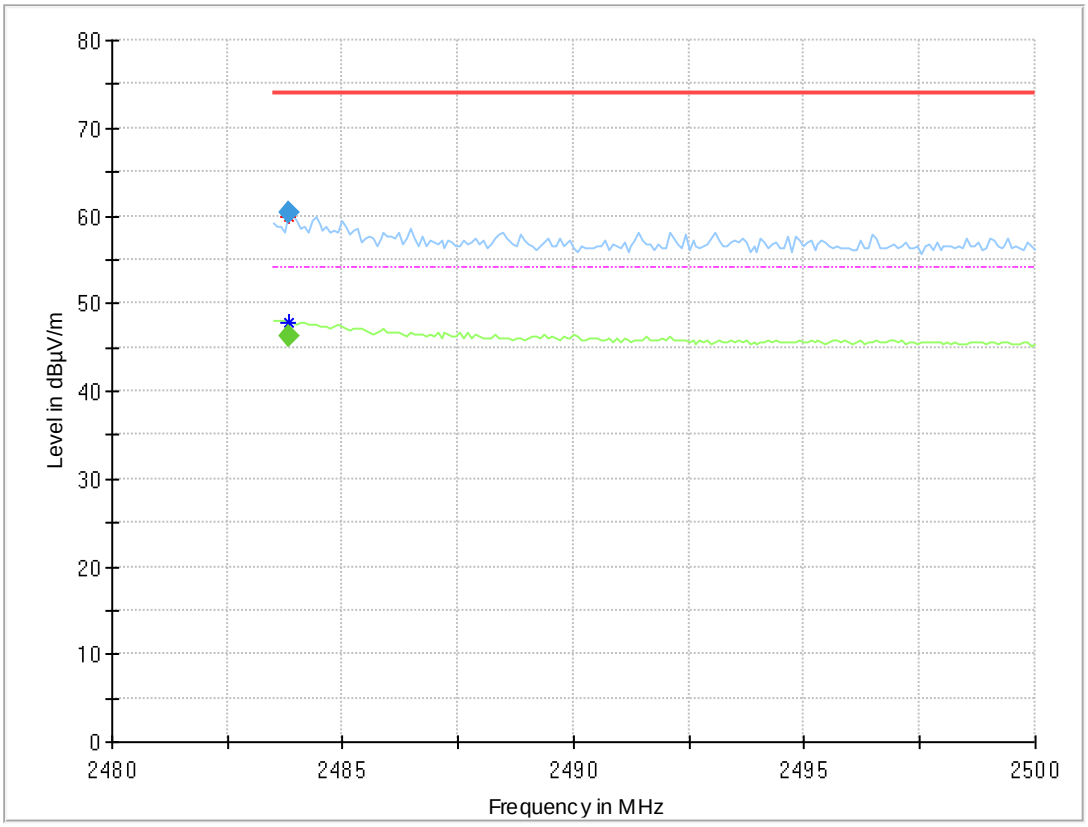
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high, Band Edge = high
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2484.573	---	35.1	54.00	18.89	1000.0	1000.000	150.0	V	-178.0	-4.0	5.3
2484.573	50.7	---	74.00	23.35	1000.0	1000.000	150.0	V	-178.0	-4.0	5.3
2485.398	---	35.3	54.00	18.68	1000.0	1000.000	150.0	V	-145.0	-15.0	5.3
2485.398	49.9	---	74.00	24.14	1000.0	1000.000	150.0	V	-145.0	-15.0	5.3

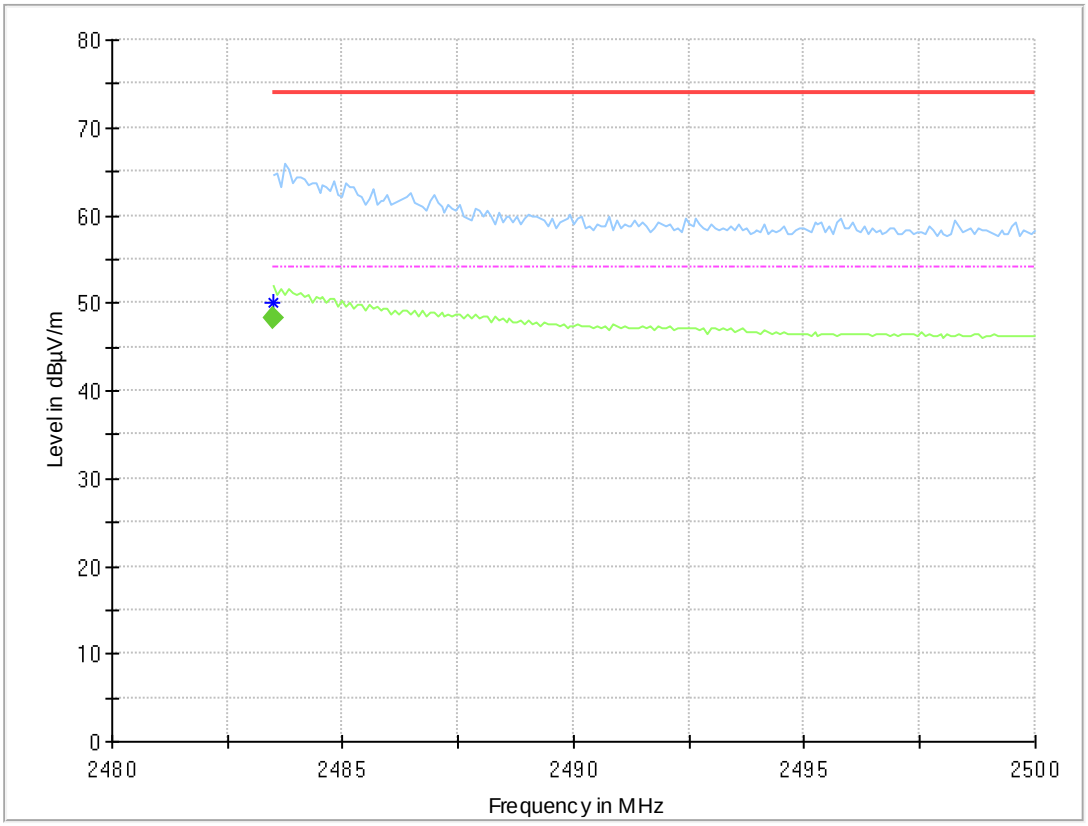
Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = high, Band Edge = high
(S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.830	---	46.2	54.00	7.83	1000.0	1000.000	150.0	H	-60.0	110.0	45.0
2483.830	60.4	---	74.00	13.56	1000.0	1000.000	150.0	H	-60.0	110.0	45.0

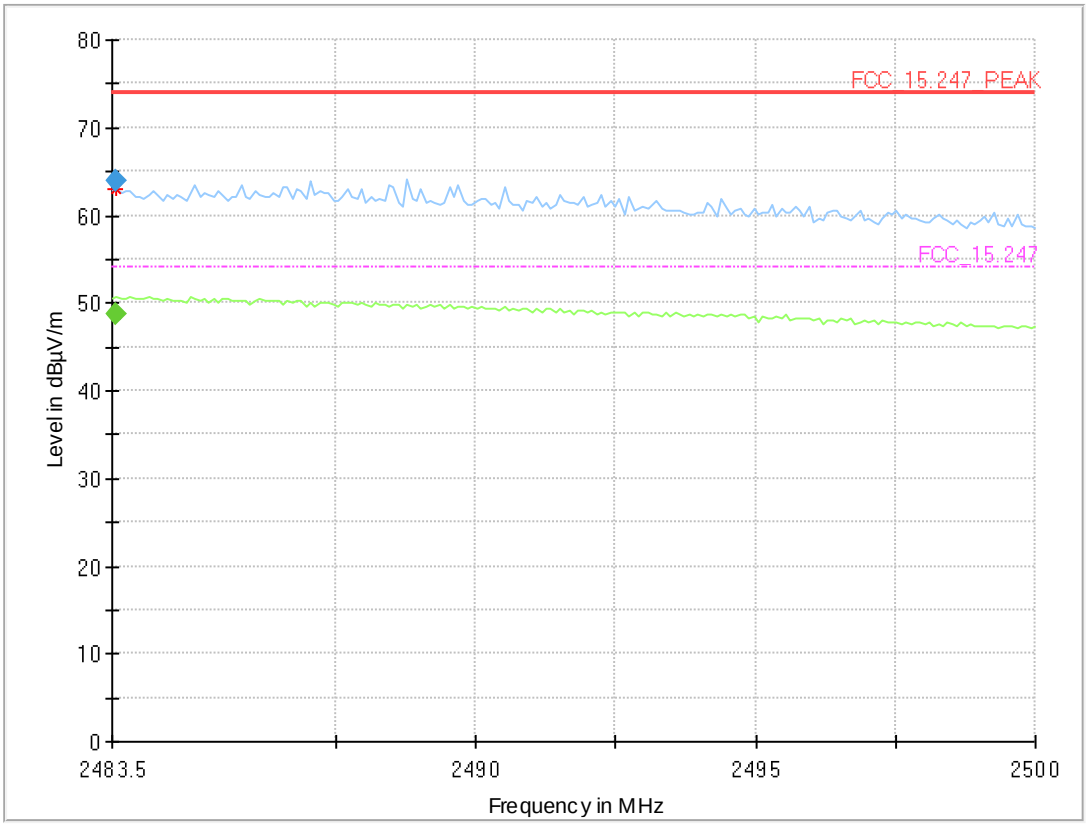
Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = high, Band Edge = high (S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	48.2	54.00	5.80	1000.0	1000.000	150.0	H	61.0	87.0	45.0
7384.485	---	35.4	54.00	18.63	1000.0	1000.000	150.0	H	-60.0	95.0	-14.2

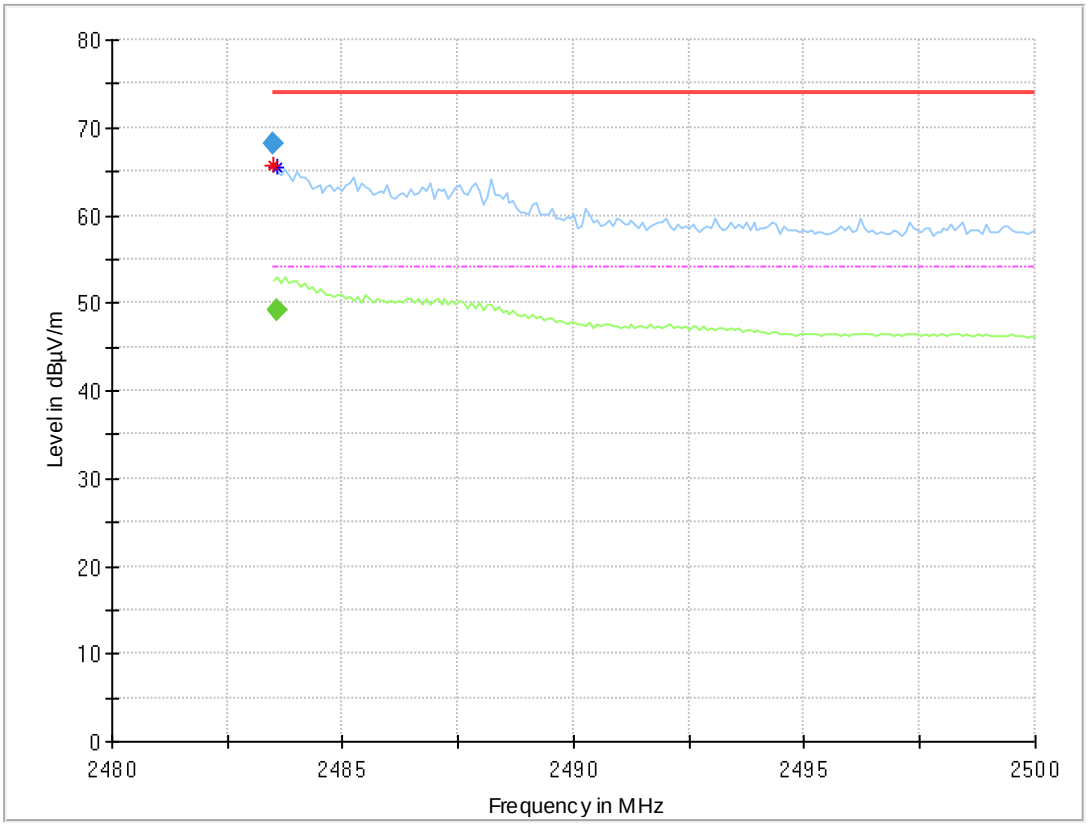
Radio Technology = WLAN n 40 MHz MIMO, Operating Frequency = high, Band Edge = high (S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.583	63.9	---	74.00	10.15	1000.0	1000.000	150.0	V	150.0	-10.0	45.0
2483.583	---	48.7	54.00	5.26	1000.0	1000.000	150.0	V	149.0	-15.0	45.0

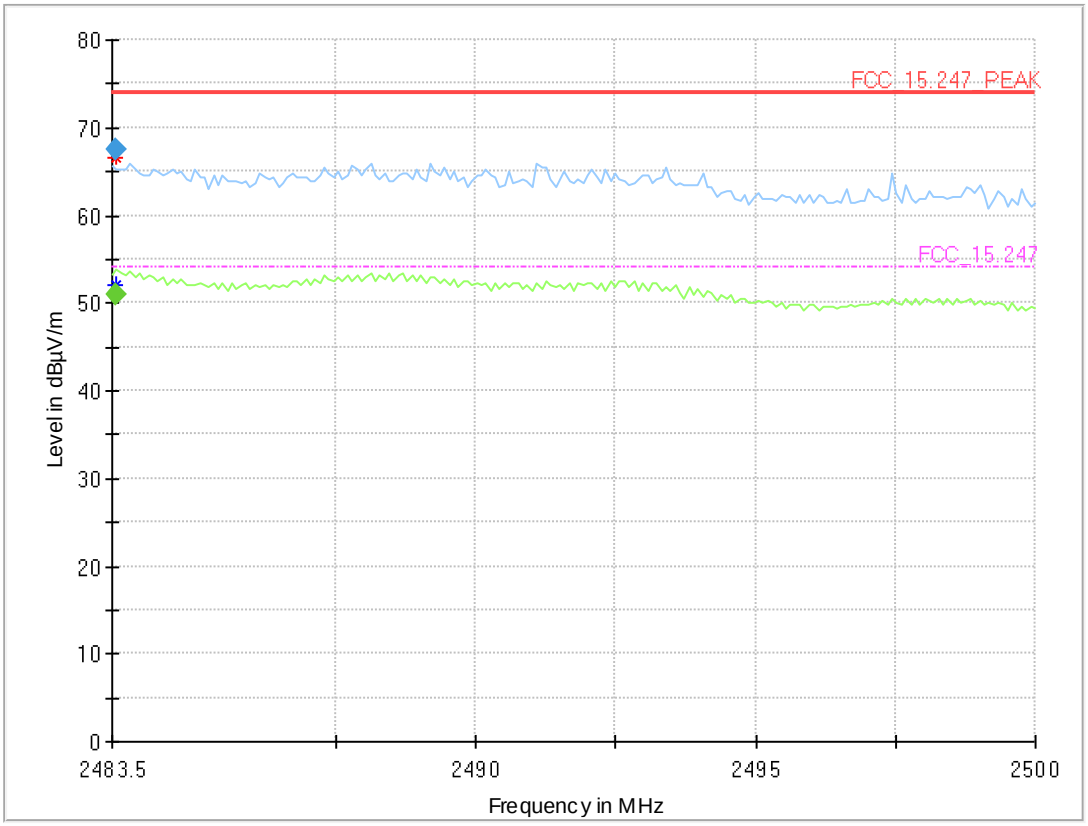
Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = high, Band Edge = high (S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	68.2	---	74.00	5.75	1000.0	1000.000	150.0	H	63.0	92.0	45.0
2483.583	---	49.1	54.00	4.89	1000.0	1000.000	150.0	H	63.0	87.0	45.0

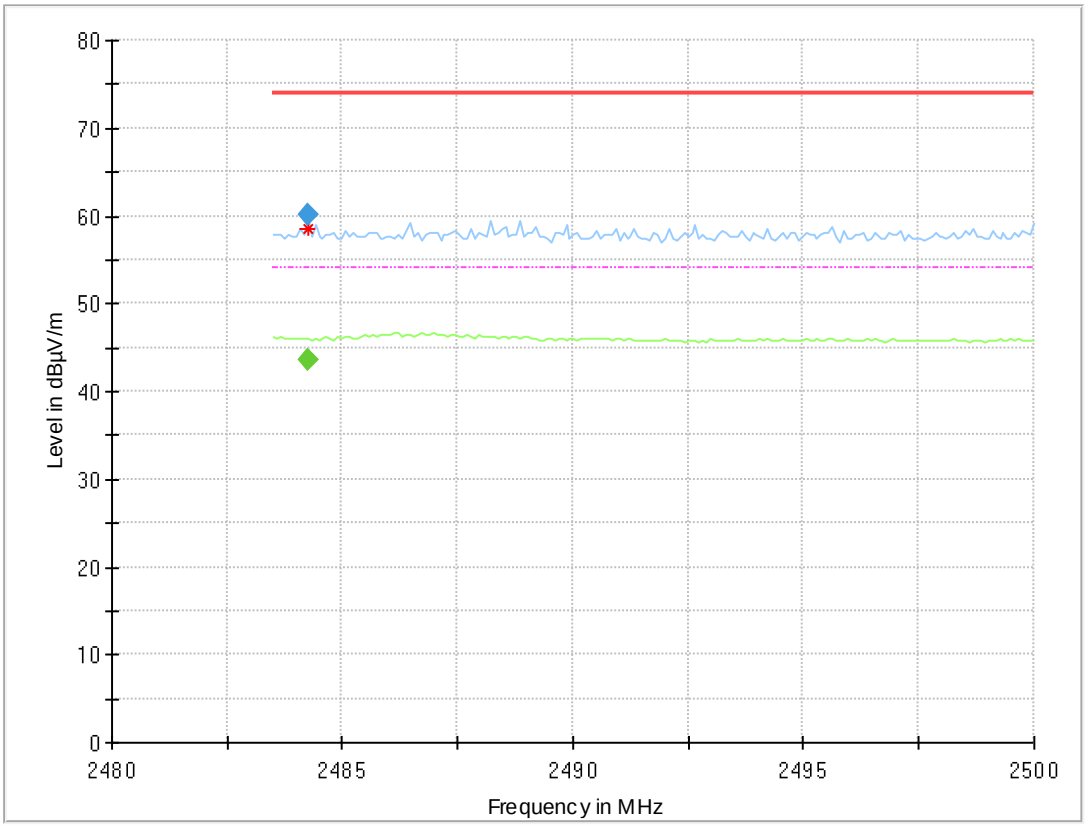
Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = high, Band Edge = high (S02_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.583	---	50.8	54.00	3.16	1000.0	1000.000	150.0	H	62.0	88.0	45.0
2483.583	67.5	---	74.00	6.55	1000.0	1000.000	150.0	H	60.0	90.0	45.0

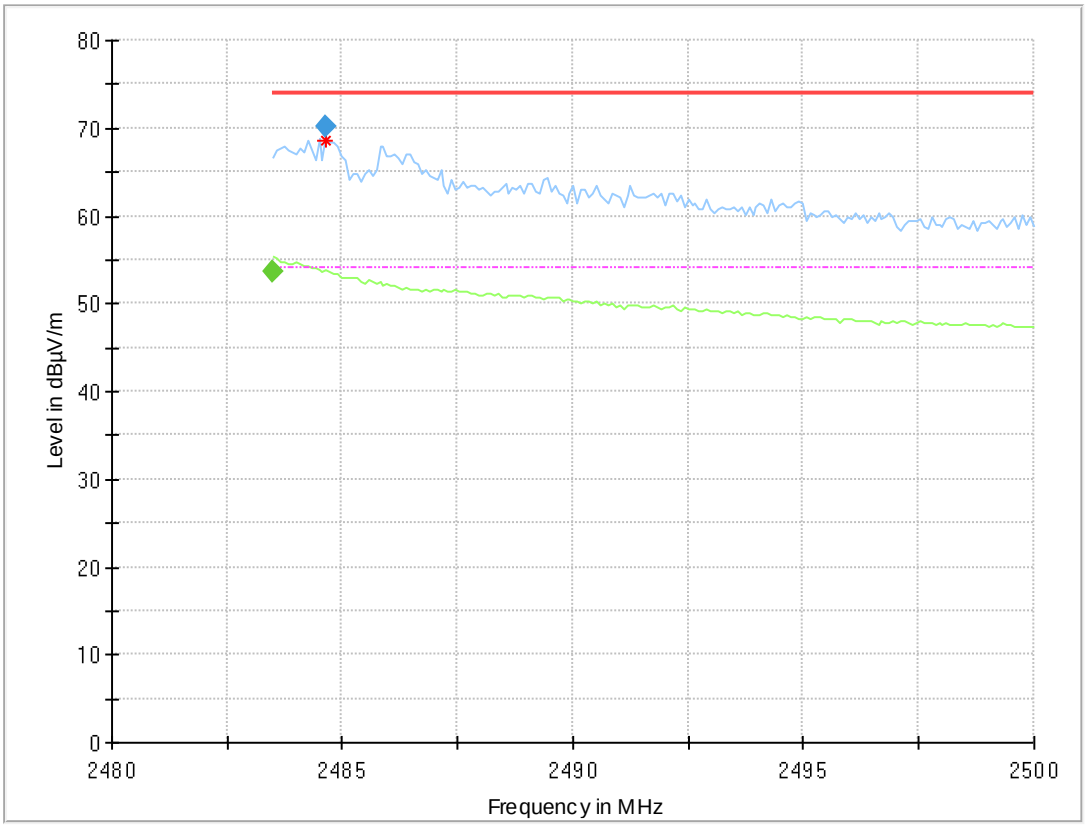
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high, Band Edge = high
(S03_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2484.243	---	43.7	54.00	10.35	1000.0	1000.000	150.0	V	-4.0	84.0	45.0
2484.243	60.1	---	74.00	13.93	1000.0	1000.000	150.0	V	11.0	89.0	45.0

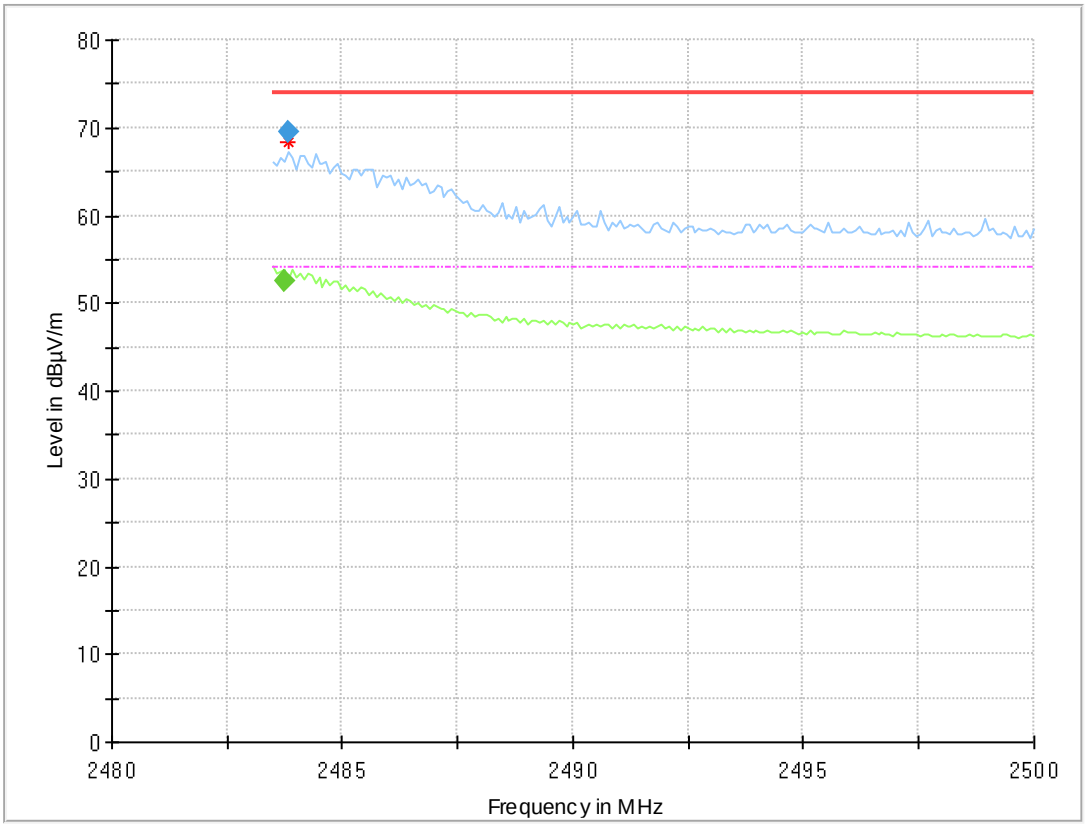
Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = high, Band Edge = high
(S03_AC01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	53.6	54.00	0.42	1000.0	1000.000	150.0	H	-1.0	78.0	45.0
2484.655	70.2	---	74.00	3.75	1000.0	1000.000	150.0	H	1.0	78.0	45.0

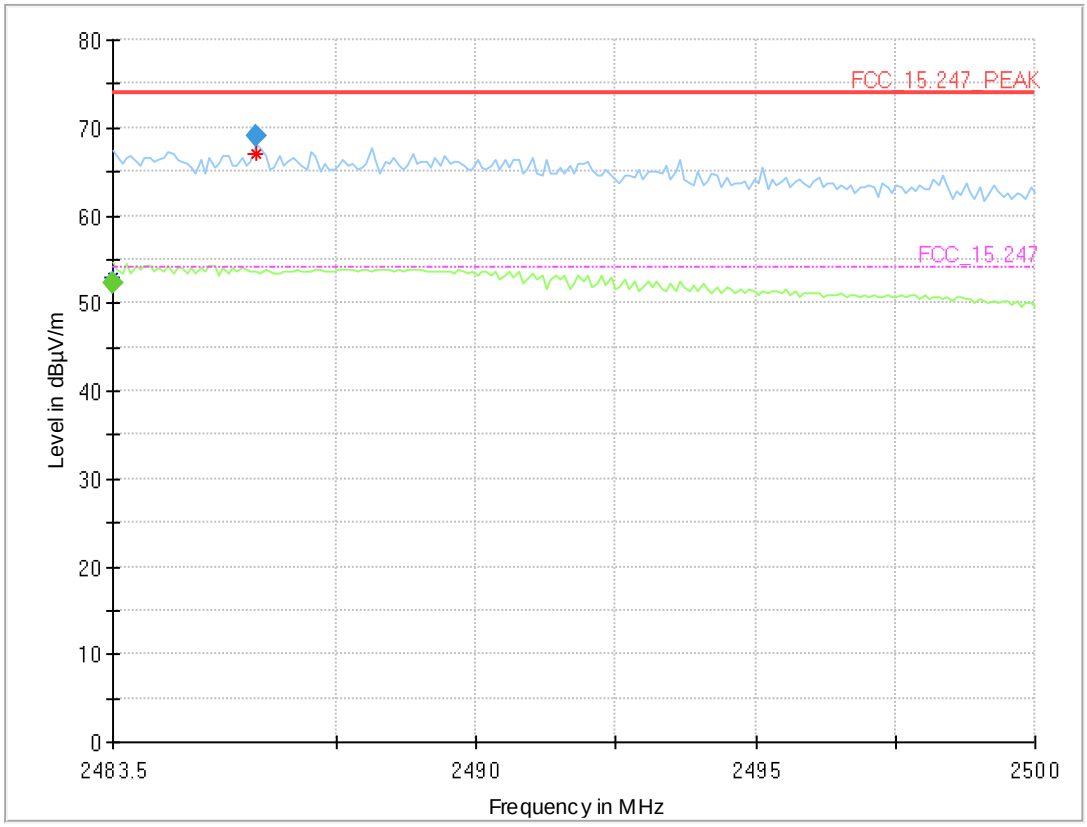
Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = high, Band Edge = high (S03_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.748	---	52.5	54.00	1.45	1000.0	1000.000	150.0	V	11.0	90.0	45.0
2483.830	69.5	---	74.00	4.50	1000.0	1000.000	150.0	V	11.0	105.0	45.0

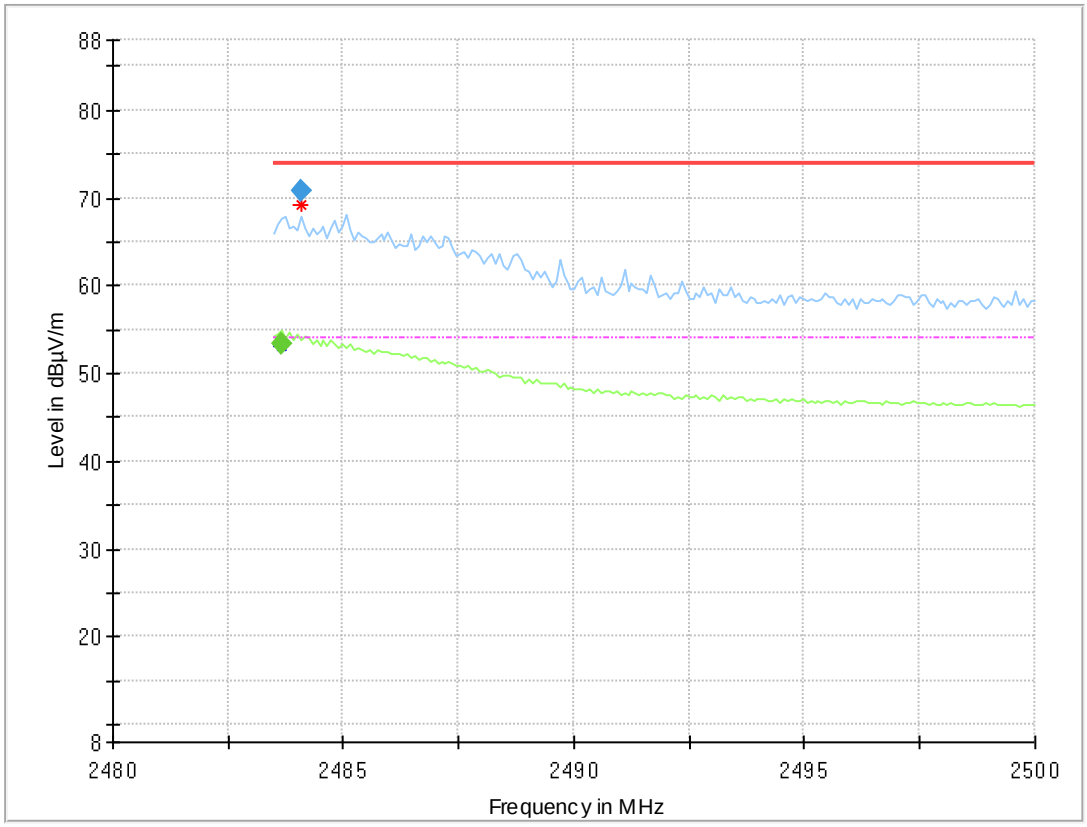
Radio Technology = WLAN n 40 MHz MIMO, Operating Frequency = high, Band Edge = high (S03_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	52.2	54.00	1.75	1000.0	1000.000	150.0	V	8.0	87.0	45.0
2486.058	69.1	---	74.00	4.89	1000.0	1000.000	150.0	H	9.0	102.0	45.0

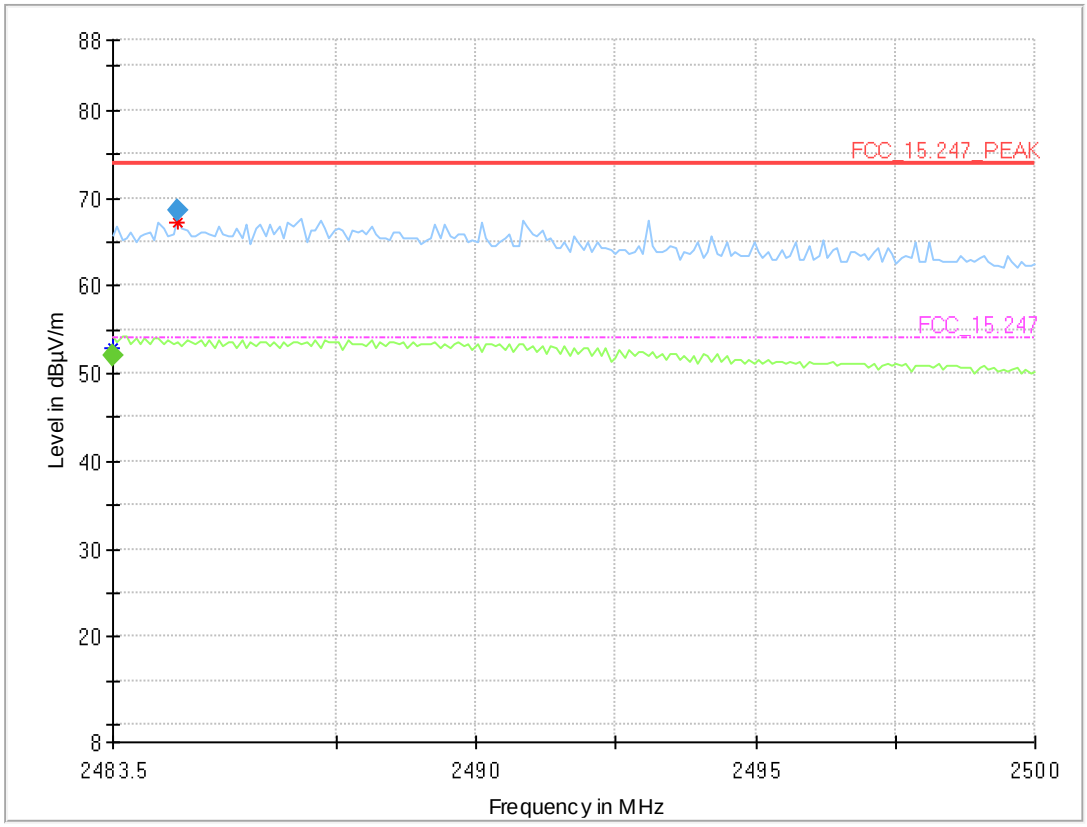
Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = high, Band Edge = high (S03_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.665	---	53.3	54.00	0.74	1000.0	1000.000	150.0	V	4.0	92.0	45.0
2484.078	70.9	---	74.00	3.14	1000.0	1000.000	150.0	V	11.0	92.0	45.0

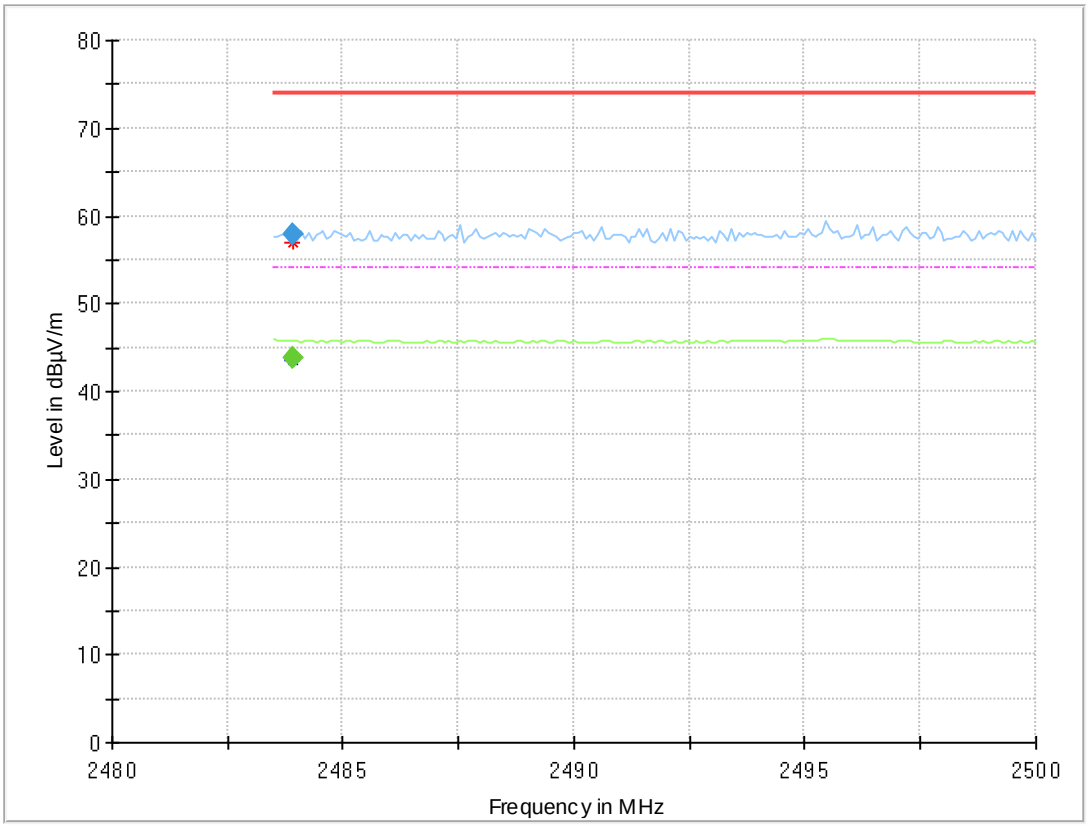
Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = high, Band Edge = high (S03_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	52.0	54.00	1.98	1000.0	1000.000	150.0	V	11.0	87.0	45.0
2484.655	68.6	---	74.00	5.42	1000.0	1000.000	150.0	V	11.0	88.0	45.0

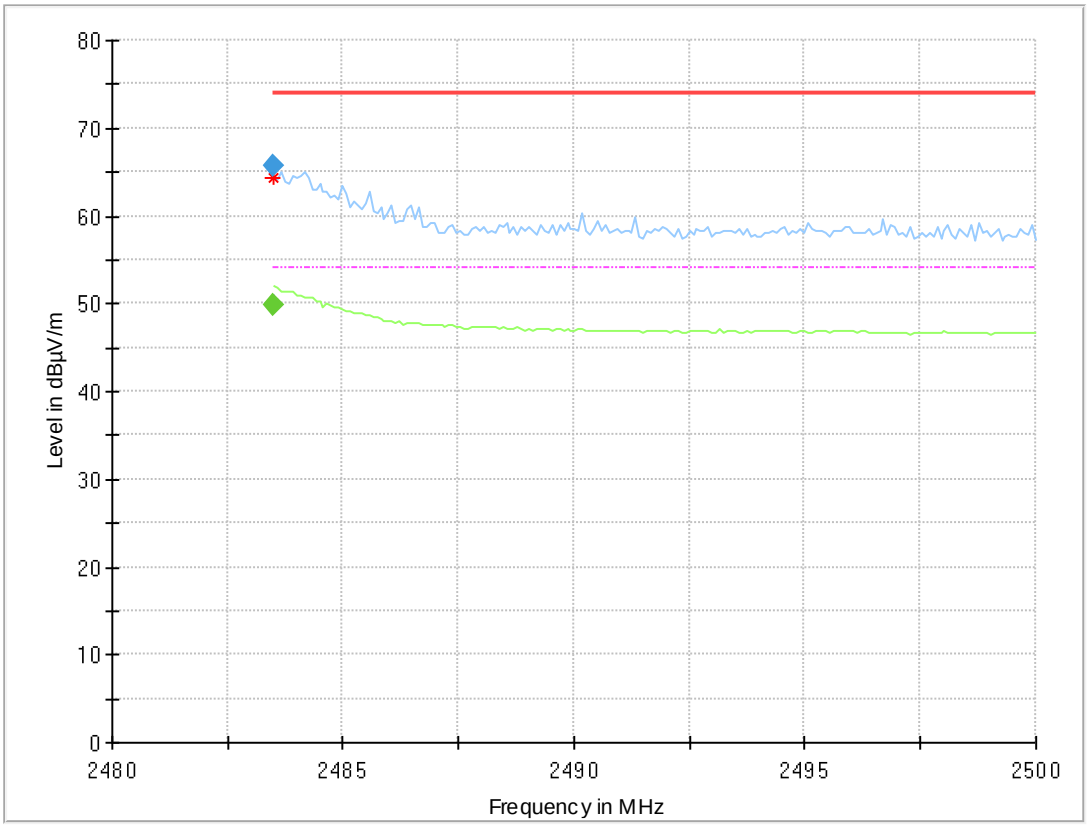
Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high, Band Edge = high
(S04_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.913	---	43.7	54.00	10.31	1000.0	1000.000	150.0	H	1.0	86.0	45.0
2483.913	57.9	---	74.00	16.13	1000.0	1000.000	150.0	H	-124.0	93.0	45.0

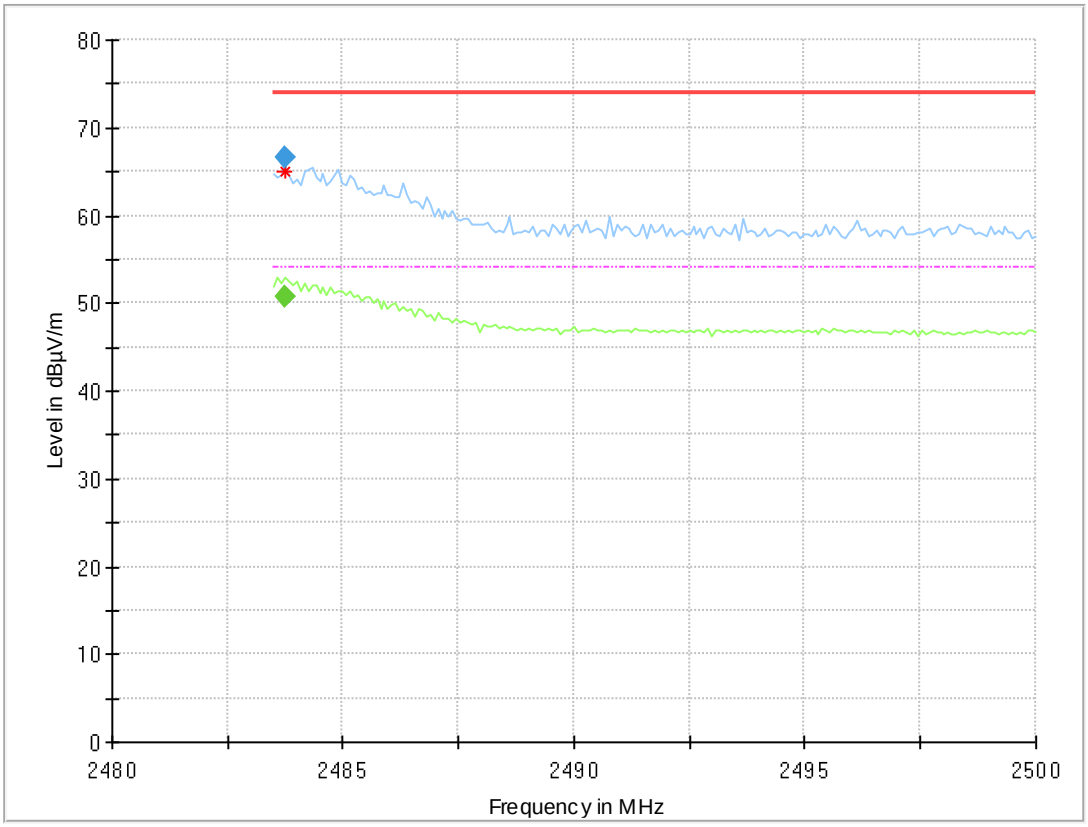
Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = high, Band Edge = high
(S04_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	49.8	54.00	4.22	1000.0	1000.000	150.0	H	4.0	86.0	45.0
2483.500	65.8	---	74.00	8.20	1000.0	1000.000	150.0	H	-4.0	79.0	45.0

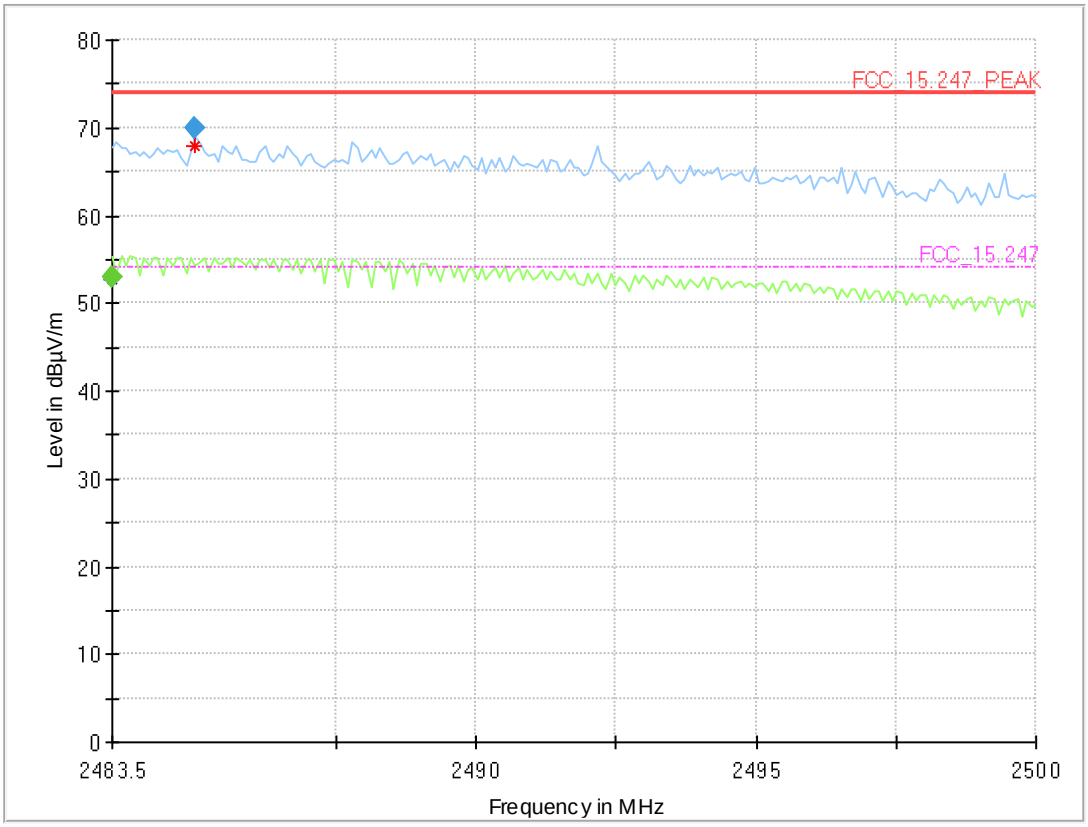
Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = high, Band Edge = high (S04_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.748	---	50.6	54.00	3.36	1000.0	1000.000	150.0	H	2.0	86.0	45.0
2483.748	66.6	---	74.00	7.43	1000.0	1000.000	150.0	H	1.0	75.0	45.0

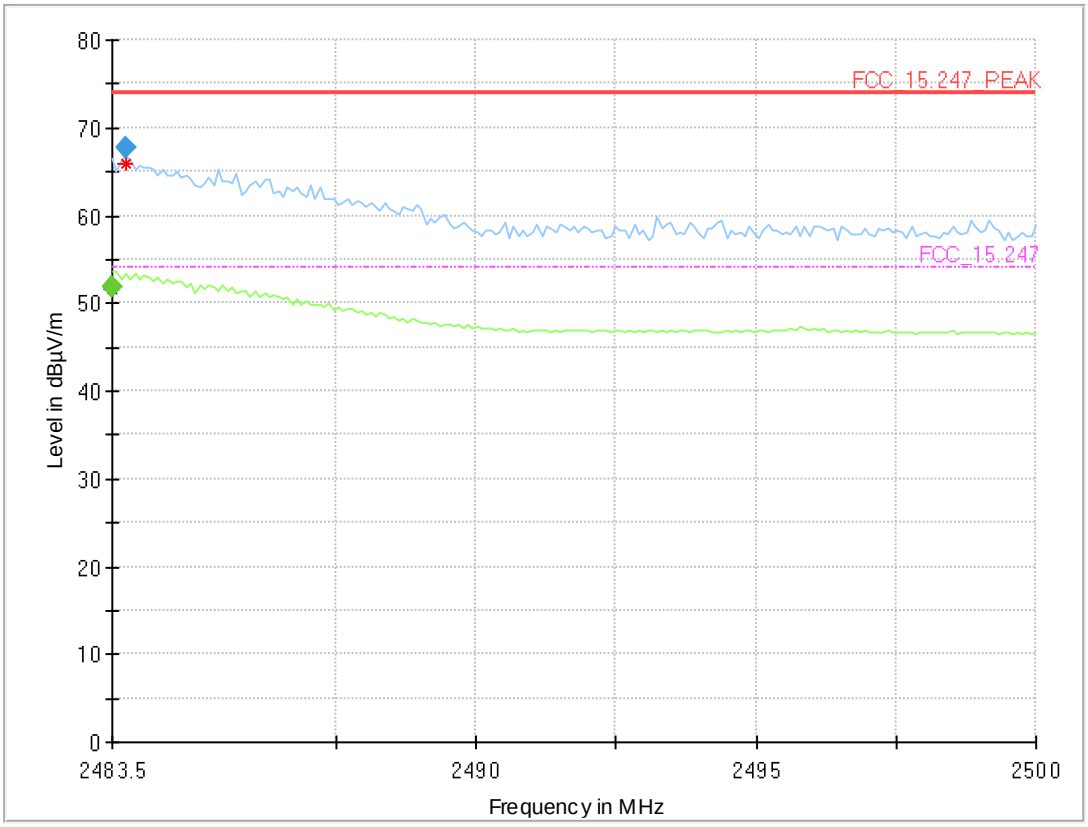
Radio Technology = WLAN n 40 MHz MIMO, Operating Frequency = high, Band Edge = high (S04_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	53.0	54.00	0.96	1000.0	1000.000	150.0	H	0.0	83.0	45.0
2484.985	69.9	---	74.00	4.06	1000.0	1000.000	150.0	H	3.0	92.0	45.0

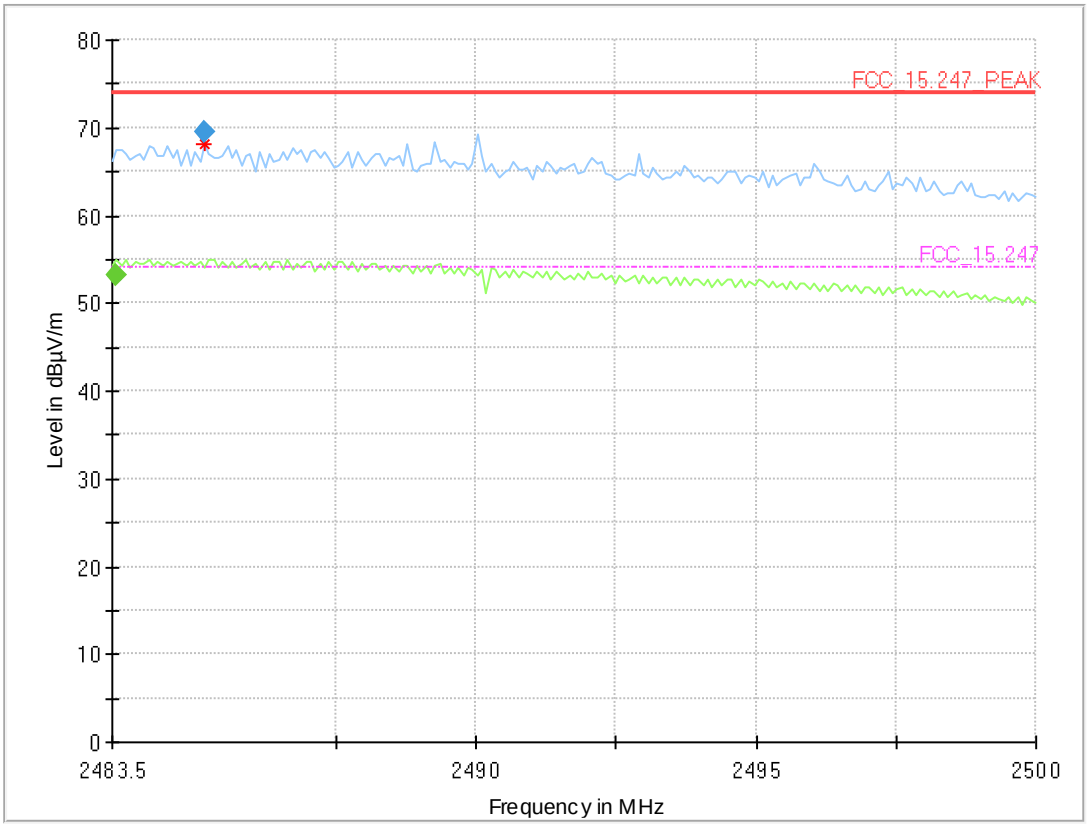
Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = high, Band Edge = high (S04_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	---	51.8	54.00	2.24	1000.0	1000.000	150.0	H	4.0	88.0	45.0
2483.748	67.7	---	74.00	6.29	1000.0	1000.000	150.0	V	30.0	97.0	45.0

Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = high, Band Edge = high (S04_AC02)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.583	---	53.2	54.00	0.79	1000.0	1000.000	150.0	H	6.0	79.0	45.0
2485.150	69.6	---	74.00	4.44	1000.0	1000.000	150.0	V	35.0	98.0	45.0

5.8.5 TEST EQUIPMENT USED

- Radiated Emissions FAR 2.4 GHz FCC

5.9 POWER DENSITY

Standard **FCC Part 15 Subpart C**

The test was performed according to:
ANSI C63.10, chapter 11.10.2

5.9.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up in a shielded room to perform the Power Density measurements.
The results recorded were measured with the modulation which produces the worst-case (highest) power density.

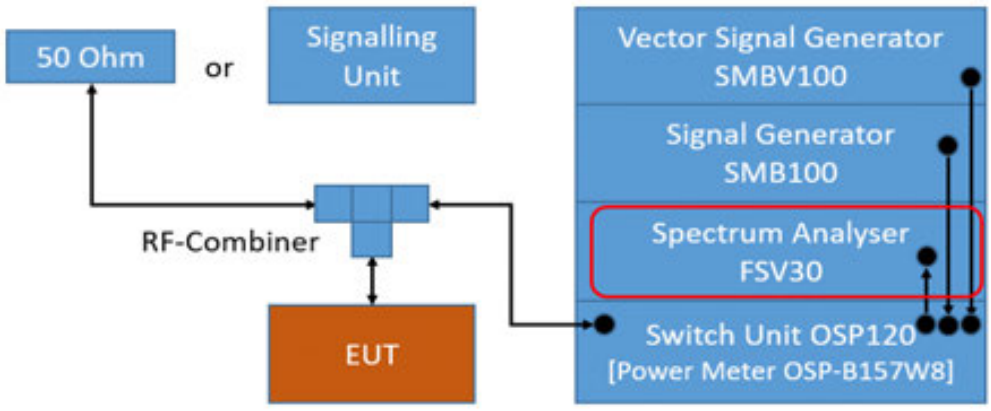
The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.

Maximum Peak Power Spectral Density (e.g. Bluetooth low energy):

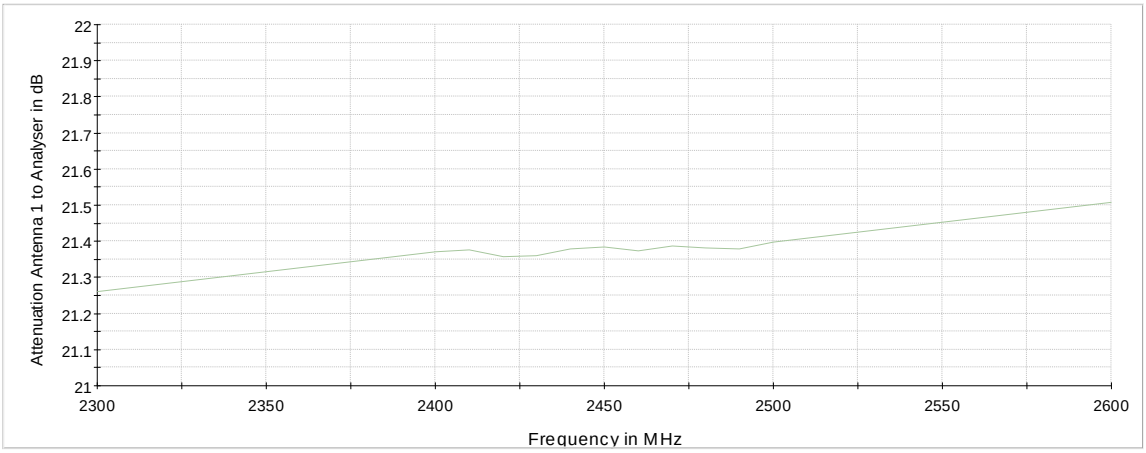
Analyser settings:
- Resolution Bandwidth (RBW): 100 kHz, 10 kHz or 3 kHz
- Video Bandwidth (VBW): ≥ 3 times RBW
- Trace: Maxhold
- Sweeps: Till stable (min. 200, max. 15000)
- Sweeptime: Auto
- Detector: Peak

Maximum Average Power Spectral Density (e.g. WLAN):

Analyser settings:
- Resolution Bandwidth (RBW): 100 kHz, 10 kHz or 3 kHz
- Video Bandwidth (VBW): ≥ 3 times RBW
- Sweep Points: ≥ 2 times span / RBW
- Trace: Maxhold
- Sweeps: Till stable (max. 150)
- Sweeptime: ≤ Number of Sweep Points x minimum transmission duration
- Detector: RMS



TS8997; Power Spectral Density



Attenuation of the measurement path

5.9.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.247 (e)

For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
…
The same method of determining the conducted output power shall be used to determine the power spectral density.

FCC Part 15, Subpart C, §15.247 (f)

(f) For the purposes of this section, hybrid systems are those that employ a combination of both frequency hopping and digital modulation techniques.
…
The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

5.9.3 TEST PROTOCOL

Ambient temperature: 23 -25 °C
Air Pressure: 993 - 1017 hPa
Humidity: 37 - 42 %

WLAN g-Mode; 20 MHz; 1 Mbit/s

Band	Ch. No.	Freq. [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/ 3kHz]	Margin to Limit [dB]
2.4 GHz ISM	1	2412	-4.0	100.0	8.0	12.0
	6	2437	-3.8	100.0	8.0	11.8
	11	2462	-3.7	100.0	8.0	11.7

WLAN g-Mode; 20 MHz; 6 Mbit/s

Band	Ch. No.	Freq. [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/ 3kHz]	Margin to Limit [dB]
2.4 GHz ISM	1	2412	-4.0	100.0	8.0	12.0
	6	2437	-3.6	100.0	8.0	11.6
	11	2462	-3.8	100.0	8.0	11.8

WLAN n-Mode; 20 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/3kHz]	Margin to Limit [dB]
2.4 GHz ISM	1	2412	-4.3	100.0	8.0	12.3
	6	2437	-3.8	100.0	8.0	11.8
	11	2462	-4.2	100.0	8.0	12.2

WLAN n-Mode; 40 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/3kHz]	Margin to Limit [dB]
2.4 GHz ISM	3	2422	-8.2	100.0	8.0	16.2
	6	2437	-8.3	100.0	8.0	16.3
	9	2452	-8.4	100.0	8.0	16.4

WLAN ax-Mode; 20 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/3kHz]	Margin to Limit [dB]
2.4 GHz ISM	1	2412	-5.8	100.0	8.0	13.8
	6	2437	-5.4	100.0	8.0	13.4
	11	2462	-5.7	100.0	8.0	13.7

WLAN ax-Mode; 40 MHz; MCS0

Band	Ch. No.	Frequency [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/3kHz]	Margin to Limit [dB]
2.4 GHz ISM	3	2422	-10.5	100.0	8.0	18.5
	6	2437	-10.0	100.0	8.0	18.0
	9	2452	-10.2	100.0	8.0	18.2

WLAN g-Mode; 20 MHz; 1 Mbit/s; Diversity

Band	Ch. No.	Freq. [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/ 3kHz]	Margin to Limit [dB]
2.4 GHz ISM	1	2412	-0.9	100	8.0	8.9
	6	2437	-1.0	100	8.0	9.0
	11	2462	-0.8	100	8.0	8.8

WLAN g-Mode; 20 MHz; 6 Mbit/s; Diversity

Band	Ch. No.	Frequency [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/3kHz]	Margin to Limit [dB]
2.4 GHz ISM	1	2412	-0.3	100	8.0	8.3
	6	2437	-0.2	100	8.0	8.2
	11	2462	-0.5	100	8.0	8.5

WLAN n-Mode; 20 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/ 3kHz]	Margin to Limit [dB]
2.4 GHz ISM	1	2412	-1.1	100	8.0	9.1
	6	2437	-0.9	100	8.0	8.9
	11	2462	-1.0	100	8.0	9.0

WLAN n-Mode; 40 MHz; MCS0; MIMO

Band	Ch. No.	Freq. [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/3kHz]	Margin to Limit [dB]
2.4 GHz ISM	3	2422	-5.3	100	8.0	13.3
	6	2437	-5.2	100	8.0	13.2
	9	2452	-5.3	100	8.0	13.3

WLAN ax-Mode; 20 MHz; MCS0; MIMO

Band	Ch. No.	Frequency [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/3kHz]	Margin to Limit [dB]
2.4 GHz ISM	1	2412	-2.7	100	8.0	10.7
	6	2437	-2.5	100	8.0	10.5
	11	2462	-2.6	100	8.0	10.6

WLAN ax-Mode; 40 MHz; MCS0; MIMO

Band	Ch. No.	Frequency [MHz]	Power Density [dBm / RBW]	RBW [kHz]	Limit [dBm/3kHz]	Margin to Limit [dB]
2.4 GHz ISM	3	2422	-7.1	100	8.0	15.1
	6	2437	-7.0	100	8.0	15.0
	9	2452	-7.1	100	8.0	15.1

Remark: Please see next sub-clause for the measurement plot.

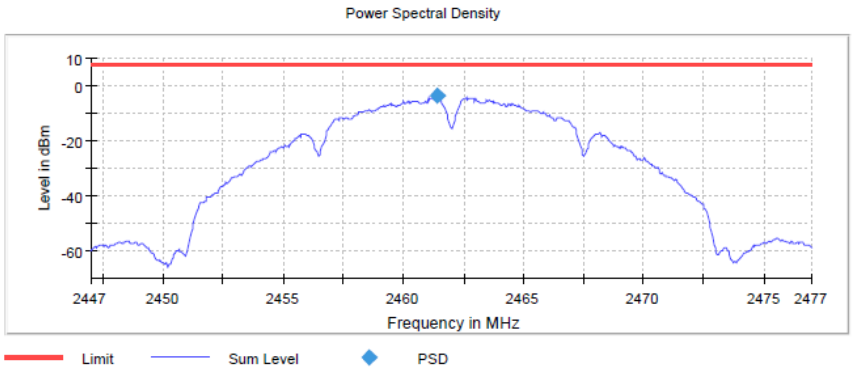
5.9.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN g 1 Mbit/s, Operating Frequency = high (S01_AC01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2461.425000	-3.724	8.0	PASS

Ports

Port	State
1	used



Setting	Instrument Value
Start Frequency	2.44700 GHz
Stop Frequency	2.47700 GHz
Span	30.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	600
Sweeptime	600.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	15 / max. 150
Stable	3 / 3
Max Stable Difference	0.38 dB

Radio Technology = WLAN g 1 Mbit/s Diversity, Operating Frequency = high (S01_AD02)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2462.625000	-0.766	8.0	PASS

Ports

Port	State
1	used
2	used

Setting	Instrument Value
Start Frequency	2.44700 GHz
Stop Frequency	2.47700 GHz
Span	30.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	600
Sweeptime	600.000 ms
Reference Level	0.000 dBm
Attenuation	20.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	20 / max. 150
Stable	3 / 3
Max Stable Difference	0.44 dB

Radio Technology = WLAN n 20 MHz MIMO, Operating Frequency = mid (S01_AD01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2437.625000	-0.944	8.0	PASS

Ports

Port	State
1	used
2	used

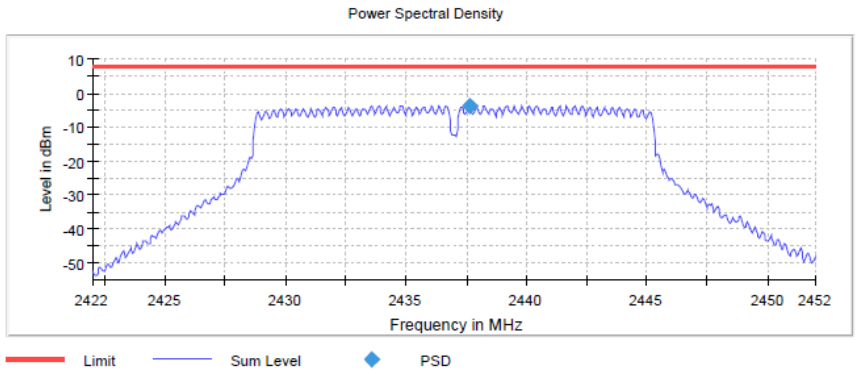
Setting	Instrument Value
Start Frequency	2.42200 GHz
Stop Frequency	2.45200 GHz
Span	30.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	600
Sweeptime	600.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	14 / max. 150
Stable	3 / 3
Max Stable Difference	0.40 dB

Radio Technology = WLAN g 6 Mbit/s, Operating Frequency = mid (S01_AD01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2437.625000	-3.628	8.0	PASS

Ports

Port	State
1	used



Setting	Instrument Value
Start Frequency	2.42200 GHz
Stop Frequency	2.45200 GHz
Span	30.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	600
Sweeptime	600.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	9 / max. 150
Stable	3 / 3
Max Stable Difference	0.49 dB

Radio Technology = WLAN g 6 Mbit/s Diversity, Operating Frequency = high (S01_AD02)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2434.825000	-0.246	8.0	PASS

Ports

Port	State
1	used
2	used

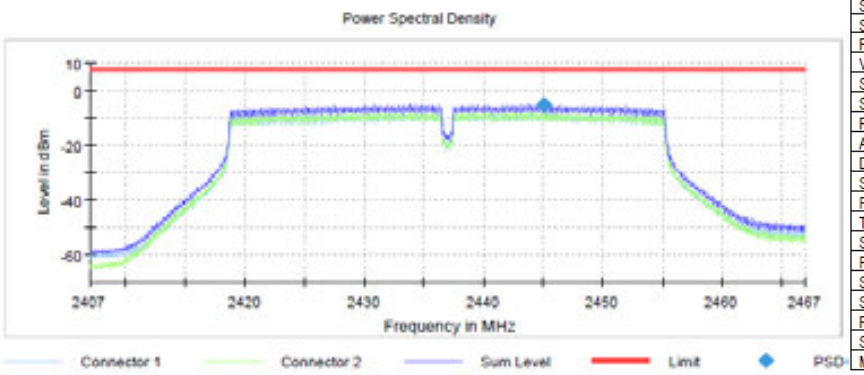
Setting	Instrument Value
Start Frequency	2.42200 GHz
Stop Frequency	2.45200 GHz
Span	30.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	600
Sweeptime	600.000 ms
Reference Level	10.000 dBm
Attenuation	30.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	10 / max. 150
Stable	3 / 3
Max Stable Difference	0.27 dB

Radio Technology = WLAN n 40 MHz MIMO, Operating Frequency = mid (S01_AD01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2445.125000	-5.185	8.0	PASS

Ports

Port	State
1	used
2	used



Setting	Instrument Value
Start Frequency	2.40700 GHz
Stop Frequency	2.46700 GHz
Span	60.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1200
Sweeptime	1.200 s
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	20 / max. 150
Stable	3 / 3
Max Stable Difference	0.39 dB

Radio Technology = WLAN ax 20 MHz MIMO, Operating Frequency = mid (S01_AD01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2435.725000	-2.458	8.0	PASS

Ports

Port	State
1	used
2	used

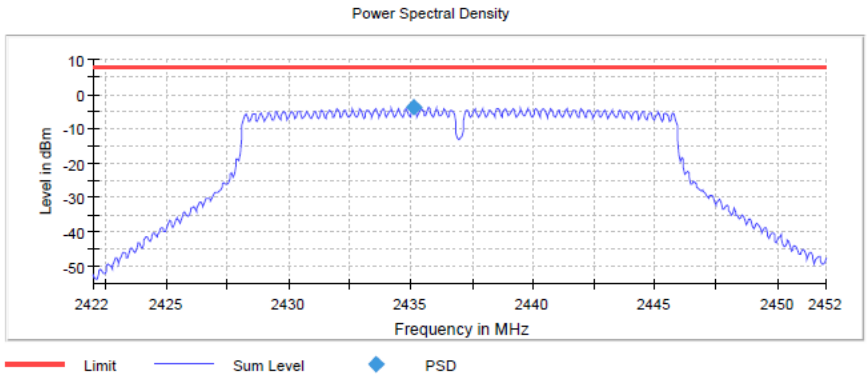
Setting	Instrument Value
Start Frequency	2.42200 GHz
Stop Frequency	2.45200 GHz
Span	30.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	600
Sweeptime	600.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	10 / max. 150
Stable	3 / 3
Max Stable Difference	0.49 dB

Radio Technology = WLAN n 20 MHz, Operating Frequency = mid (S01_AD01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2435.125000	-3.837	8.0	PASS

Ports

Port	State
1	used



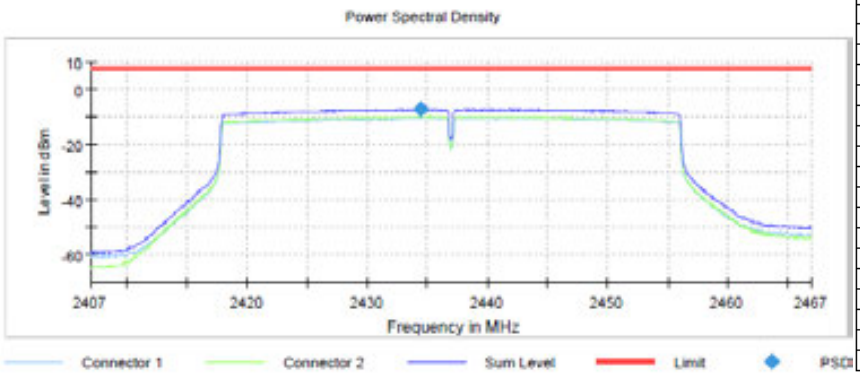
Setting	Instrument Value
Start Frequency	2.42200 GHz
Stop Frequency	2.45200 GHz
Span	30.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	600
Sweeptime	600.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	23 / max. 150
Stable	3 / 3
Max Stable Difference	0.49 dB

Radio Technology = WLAN ax 40 MHz MIMO, Operating Frequency = mid (S01_AD01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2434.525000	-7.000	8.0	PASS

Ports

Port	State
1	used
2	used



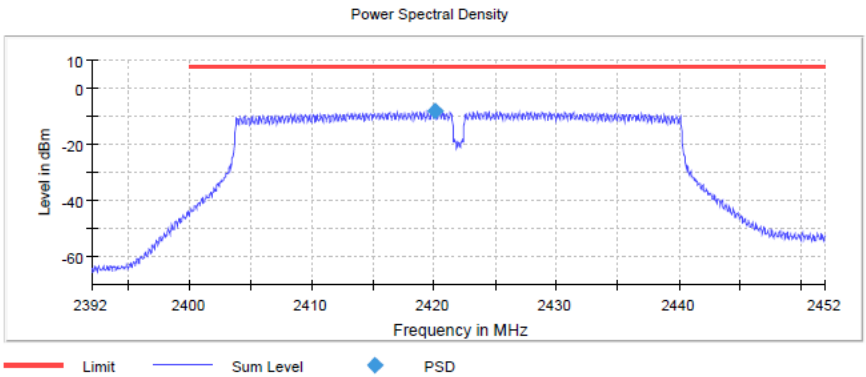
Setting	Instrument Value
Start Frequency	2.40700 GHz
Stop Frequency	2.46700 GHz
Span	60.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1200
Sweeptime	1.200 s
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	10 / max. 150
Stable	3 / 3
Max Stable Difference	0.42 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = low (S01_AD01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2422.000000	2420.125000	-8.232	8.0	PASS

Ports

Port	State
1	used



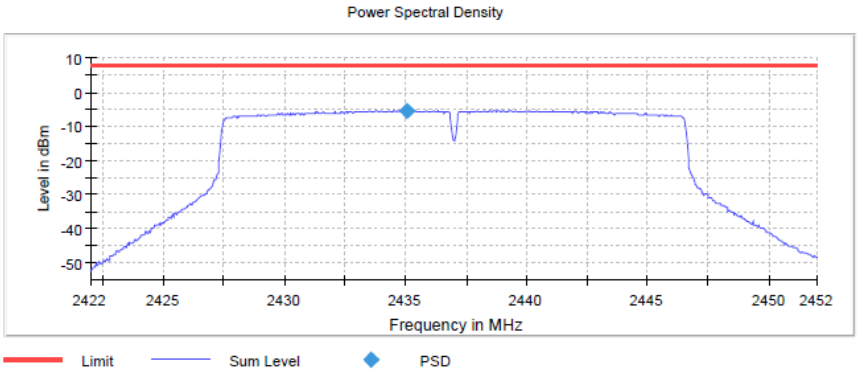
Setting	Instrument Value
Start Frequency	2.39200 GHz
Stop Frequency	2.45200 GHz
Span	60.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1200
Sweeptime	1.200 s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	15 / max. 150
Stable	3 / 3
Max Stable Difference	0.47 dB

Radio Technology = WLAN ax 20 MHz, Operating Frequency = mid (S01_AC01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2435.075000	-5.402	8.0	PASS

Ports

Port	State
1	used



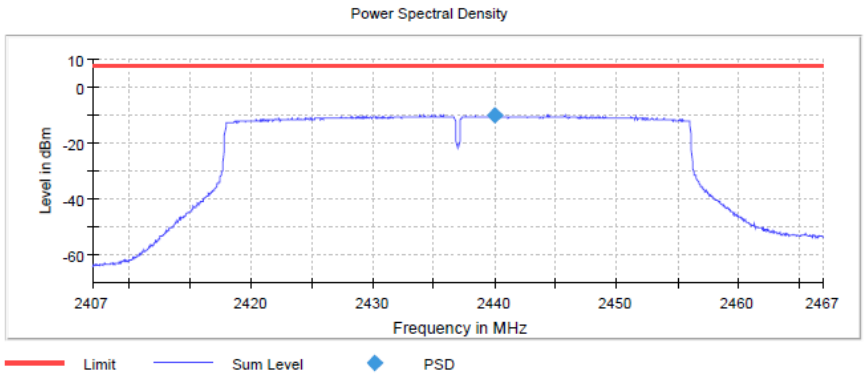
Setting	Instrument Value
Start Frequency	2.42200 GHz
Stop Frequency	2.45200 GHz
Span	30.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	600
Sweeptime	600.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	17 / max. 150
Stable	3 / 3
Max Stable Difference	0.28 dB

Radio Technology = WLAN ax 40 MHz, Operating Frequency = mid (S01_AD01)

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2439.975000	-10.026	8.0	PASS

Ports

Port	State
1	used



Setting	Instrument Value
Start Frequency	2.40700 GHz
Stop Frequency	2.46700 GHz
Span	60.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1200
Sweeptime	1.200 s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	1
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	16 / max. 150
Stable	3 / 3
Max Stable Difference	0.28 dB

5.9.5 TEST EQUIPMENT USED

- R&S TS8997

6 TEST EQUIPMENT

6.1 TEST EQUIPMENT HARDWARE

1 Conducted Emissions FCC
Conducted Emissions AC Mains for FCC standards

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
1.1	Opus10 TPR (8253.00)	T/P Logger 13	Lufft Mess- und Regeltechnik GmbH	13936	2021-10	2023-10
1.2	Fluke 177	Digital Multimeter 03 (Multimeter)	Fluke Europe B.V.	86670383	2022-06	2024-06
1.3	Chroma 6404	AC Source	Chroma ATE INC.	64040001304		
1.4	Shielded Room 02	Shielded Room 4m x 3m	Frankonia Germany EMC Solution GmbH	-		
1.5	ESH3-Z5	Two-Line V-Network (EUT)	Rohde & Schwarz GmbH & Co. KG	829996/002	2021-08	2023-08
1.6	ESR 7	EMI Receiver / Spectrum Analyzer	Rohde & Schwarz	101424	2021-01	2023-01
1.7	Opus10 THI (8152.00)	T/H Logger 02	Lufft Mess- und Regeltechnik GmbH	7489	2021-10	2023-10

2 R&S TS8997
2.4 and 5 GHz Bands Conducted Test Lab

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
2.1	MFS	Rubidium Frequency Normal	Datum GmbH	002	2021-11	2022-11
2.2	Opus10 TPR (8253.00)	T/P Logger 13	Lufft Mess- und Regeltechnik GmbH	13936	2021-10	2023-10
2.3	EX520	Digital Multimeter 12	Extech Instruments Corp	05157876	2022-06	2024-06
2.4	NGSM 32/10	Power Supply	Rohde & Schwarz GmbH & Co. KG	3456	2022-01	2024-01
2.5	FSW43	Signal analyser	Rohde & Schwarz GmbH & Co. KG	102013	2021-06	2023-06
2.6	Opus10 THI (8152.00)	T/H Logger 14	Lufft Mess- und Regeltechnik GmbH	13993	2021-08	2023-08
2.7	OSP120	Contains Power Meter and Switching Unit OSP-B157W8 PLUS	Rohde & Schwarz	101158	2021-08	2024-08

3 Radiated Emissions FAR 2.4 GHz FCC
Radiated emission tests for 2.4 GHz ISM devices in a fully anechoic room

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
3.1	Opus10 TPR (8253.00)	T/P Logger 13	Lufft Mess- und Regeltechnik GmbH	13936	2021-10	2023-10
3.2	AMF-7D00101800-30-10P-R	Broadband Amplifier 100 MHz - 18 GHz	Miteq			
3.3	Anechoic Chamber 03	FAR, 8.80m x 4.60m x 4.05m (l x w x h)	Albatross Projects	P26971-647-001-PRB	2021-04	2023-04
3.4	Fluke 177	Digital Multimeter 03 (Multimeter)	Fluke Europe B.V.	86670383	2022-06	2024-06
3.5	JS4-18002600-32-5P	Broadband Amplifier 18 GHz - 26 GHz	Miteq	849785		
3.6	FSW 43	Spectrum Analyzer	Rohde & Schwarz GmbH & Co. KG	103779	2021-06	2023-06
3.7	EP 1200/B, NA/B1	AC Source, Amplifier with integrated variable Oscillator	Spitzenberger & Spies GmbH & Co. KG	B6278		
3.8	3160-09	Standard Gain / Pyramidal Horn Antenna 26.5 GHz	EMCO Elektronic GmbH	00083069		
3.9	WHKX 7.0/18G-8SS	High Pass Filter	Wainwright Instruments GmbH	09		
3.10	TT 1.5 WI	Turn Table	Maturo GmbH	-		
3.11	5HC3500/18000-1.2-KK	High Pass Filter	Trilithic	200035008		
3.12	Opus 20 THI (8120.00)	ThermoHygro Datalogger	Lufft Mess- und Regeltechnik GmbH	115.0318.0802.033	2020-10	2022-10
3.13	TD1.5-10kg	EUT Tilt Device (Rohacell)	Maturo GmbH	TD1.5-10kg/024/3790709		
3.14	PAS 2.5 - 10 kg	Antenna Mast	Maturo GmbH	-		
3.15	AFS42-00101800-25-S-42	Broadband Amplifier 25 MHz - 18 GHz	Miteq	2035324		
3.16	HF 907	Double-ridged horn	Rohde & Schwarz	102444	2021-09	2024-09

4 Radiated Emissions SAC H-Field
Radiated emission tests in the H-Field in a semi anechoic room

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
4.1	N5000/NP	Filter for EUT, 2 Lines, 250 V, 16 A	ETS-LINDGREN	241515		
4.2	Opus10 TPR (8253.00)	T/P Logger 13	Lufft Mess- und Regeltechnik GmbH	13936	2021-10	2023-10

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
4.3	ESW44	EMI Receiver / Spectrum Analyzer	Rohde & Schwarz GmbH & Co. KG	101603	2022-01	2024-01
4.4	Anechoic Chamber 01	SAC/FAR, 10.58 m x 6.38 m x 6.00 m	Frankonia	none		
4.5	Opus10 THI (8152.00)	T/H Logger 10	Lufft Mess- und Regeltechnik GmbH	12488	2021-08	2023-08
4.6	EP 1200/B, NA/B1	AC Source, Amplifier with integrated variable Oscillator	Spitzenberger & Spies GmbH & Co. KG	B6278		
4.7	DS 420S	Turn Table 2 m diameter	HD GmbH	420/573/99		
4.8	HFH2-Z2	Loop Antenna + 3 Axis Tripod	Rohde & Schwarz GmbH & Co. KG	829324/006	2021-01	2024-01

5 Radiated Emissions SAC up to 1 GHz
Radiated emission tests up to 1 GHz in a semi anechoic room

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
5.1	N5000/NP	Filter for EUT, 2 Lines, 250 V, 16 A	ETS-LINDGREN	241515		
5.2	Opus10 TPR (8253.00)	T/P Logger 13	Lufft Mess- und Regeltechnik GmbH	13936	2021-10	2023-10
5.3	ESW44	EMI Receiver / Spectrum Analyzer	Rohde & Schwarz GmbH & Co. KG	101603	2022-01	2024-01
5.4	Anechoic Chamber 01	SAC/FAR, 10.58 m x 6.38 m x 6.00 m	Frankonia	none		
5.5	HL 562 ULTRALOG	Biconical-log-per antenna (30 MHz - 3 GHz) with HL 562E biconicals	Rohde & Schwarz GmbH & Co. KG	830547/003	2021-09	2024-09
5.6	Opus10 THI (8152.00)	T/H Logger 10	Lufft Mess- und Regeltechnik GmbH	12488	2021-08	2023-08
5.7	EP 1200/B, NA/B1	AC Source, Amplifier with integrated variable Oscillator	Spitzenberger & Spies GmbH & Co. KG	B6278		
5.8	DS 420S	Turn Table 2 m diameter	HD GmbH	420/573/99		
5.9	AM 4.0	Antenna Mast 4 m	Maturo GmbH	AM4.0/180/1192 0513		

The calibration interval is the time interval between “Last Calibration” and “Calibration Due”

6.2 TEST EQUIPMENT SOFTWARE

Semi-Anechoic Chamber:	
Software	Version
EMC32 Measurement Software	10.60.10
INNCO Mast Controller	1.02.62
MATURO Mast Controller	12.19
MATURO Turn-Table Controller	30.10
Fully-Anechoic Chamber:	
Software	Version
EMC32 Measurement Software	10.60.10
MATURO Turn-Unit Controlller	11.10
MATURO Mast Controller	12.10
MATURO Turntable Controller	12.11
Conducted AC Emissions:	
Software	Version
EMC32 Measurement Software	10.60.20

7 ANTENNA FACTORS, CABLE LOSS AND SAMPLE CALCULATIONS

This chapter contains the antenna factors with their corresponding path loss of the used measurement path for all antennas as well as the insertion loss of the LISN.

7.1 LISN R&S ESH3-Z5 (150 KHZ – 30 MHZ)

Frequency		Corr.	LISN insertion loss ESH3-Z5	cable loss (incl. 10 dB atten-uator)
MHz		dB	dB	dB
0.15		10.1	0.1	10.0
5		10.3	0.1	10.2
7		10.5	0.2	10.3
10		10.5	0.2	10.3
12		10.7	0.3	10.4
14		10.7	0.3	10.4
16		10.8	0.4	10.4
18		10.9	0.4	10.5
20		10.9	0.4	10.5
22		11.1	0.5	10.6
24		11.1	0.5	10.6
26		11.2	0.5	10.7
28		11.2	0.5	10.7
30		11.3	0.5	10.8

Sample calculation

U_{LISN} (dB µV) = U (dB µV) + Corr. (dB)
U = Receiver reading
LISN Insertion loss = Voltage Division Factor of LISN
Corr. = sum of single correction factors of used LISN, cables, switch units (if used)
Linear interpolation will be used for frequencies in between the values in the table.

7.2 ANTENNA R&S HFH2-Z2 (9 KHZ – 30 MHZ)

Frequency	AF HFH-Z2)	Corr.	cable loss 1 (inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit)	cable loss 4 (to receiver)	distance corr. (-40 dB/ decade)	d_{Limit} (meas. distance (limit)	d_{used} (meas. distance (used)
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB	m	m
0.009	20.50	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.01	20.45	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.015	20.37	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.02	20.36	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.025	20.38	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.03	20.32	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.05	20.35	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.08	20.30	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.1	20.20	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.2	20.17	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.3	20.14	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.49	20.12	-79.6	0.1	0.1	0.1	0.1	-80	300	3
0.490001	20.12	-39.6	0.1	0.1	0.1	0.1	-40	30	3
0.5	20.11	-39.6	0.1	0.1	0.1	0.1	-40	30	3
0.8	20.10	-39.6	0.1	0.1	0.1	0.1	-40	30	3
1	20.09	-39.6	0.1	0.1	0.1	0.1	-40	30	3
2	20.08	-39.6	0.1	0.1	0.1	0.1	-40	30	3
3	20.06	-39.6	0.1	0.1	0.1	0.1	-40	30	3
4	20.05	-39.5	0.2	0.1	0.1	0.1	-40	30	3
5	20.05	-39.5	0.2	0.1	0.1	0.1	-40	30	3
6	20.02	-39.5	0.2	0.1	0.1	0.1	-40	30	3
8	19.95	-39.5	0.2	0.1	0.1	0.1	-40	30	3
10	19.83	-39.4	0.2	0.1	0.2	0.1	-40	30	3
12	19.71	-39.4	0.2	0.1	0.2	0.1	-40	30	3
14	19.54	-39.4	0.2	0.1	0.2	0.1	-40	30	3
16	19.53	-39.3	0.3	0.1	0.2	0.1	-40	30	3
18	19.50	-39.3	0.3	0.1	0.2	0.1	-40	30	3
20	19.57	-39.3	0.3	0.1	0.2	0.1	-40	30	3
22	19.61	-39.3	0.3	0.1	0.2	0.1	-40	30	3
24	19.61	-39.3	0.3	0.1	0.2	0.1	-40	30	3
26	19.54	-39.3	0.3	0.1	0.2	0.1	-40	30	3
28	19.46	-39.2	0.3	0.1	0.3	0.1	-40	30	3
30	19.73	-39.1	0.4	0.1	0.3	0.1	-40	30	3

Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
distance correction = -40 * LOG (d_{Limit}/ d_{used})
Linear interpolation will be used for frequencies in between the values in the table.
Table shows an extract of values

7.3 ANTENNA R&S HL562 (30 MHZ – 1 GHZ)

(d_{Limit} = 3 m)

Frequency	AF R&S HL562	Corr.	cable loss 1 (inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit)	cable loss 4 (to receiver)	distance corr. (-20 dB/ decade)	d_{Limit} (meas. distance (limit)	d_{used} (meas. distance (used)
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB	m	m
30	18.6	0.6	0.29	0.04	0.23	0.02	0.0	3	3
50	6.0	0.9	0.39	0.09	0.32	0.08	0.0	3	3
100	9.7	1.2	0.56	0.14	0.47	0.08	0.0	3	3
150	7.9	1.6	0.73	0.20	0.59	0.12	0.0	3	3
200	7.6	1.9	0.84	0.21	0.70	0.11	0.0	3	3
250	9.5	2.1	0.98	0.24	0.80	0.13	0.0	3	3
300	11.0	2.3	1.04	0.26	0.89	0.15	0.0	3	3
350	12.4	2.6	1.18	0.31	0.96	0.13	0.0	3	3
400	13.6	2.9	1.28	0.35	1.03	0.19	0.0	3	3
450	14.7	3.1	1.39	0.38	1.11	0.22	0.0	3	3
500	15.6	3.2	1.44	0.39	1.20	0.19	0.0	3	3
550	16.3	3.5	1.55	0.46	1.24	0.23	0.0	3	3
600	17.2	3.5	1.59	0.43	1.29	0.23	0.0	3	3
650	18.1	3.6	1.67	0.34	1.35	0.22	0.0	3	3
700	18.5	3.6	1.67	0.42	1.41	0.15	0.0	3	3
750	19.1	4.1	1.87	0.54	1.46	0.25	0.0	3	3
800	19.6	4.1	1.90	0.46	1.51	0.25	0.0	3	3
850	20.1	4.4	1.99	0.60	1.56	0.27	0.0	3	3
900	20.8	4.7	2.14	0.60	1.63	0.29	0.0	3	3
950	21.1	4.8	2.22	0.60	1.66	0.33	0.0	3	3
1000	21.6	4.9	2.23	0.61	1.71	0.30	0.0	3	3

(d_{Limit} = 10 m)

30	18.6	-9.9	0.29	0.04	0.23	0.02	-10.5	10	3
50	6.0	-9.6	0.39	0.09	0.32	0.08	-10.5	10	3
100	9.7	-9.2	0.56	0.14	0.47	0.08	-10.5	10	3
150	7.9	-8.8	0.73	0.20	0.59	0.12	-10.5	10	3
200	7.6	-8.6	0.84	0.21	0.70	0.11	-10.5	10	3
250	9.5	-8.3	0.98	0.24	0.80	0.13	-10.5	10	3
300	11.0	-8.1	1.04	0.26	0.89	0.15	-10.5	10	3
350	12.4	-7.9	1.18	0.31	0.96	0.13	-10.5	10	3
400	13.6	-7.6	1.28	0.35	1.03	0.19	-10.5	10	3
450	14.7	-7.4	1.39	0.38	1.11	0.22	-10.5	10	3
500	15.6	-7.2	1.44	0.39	1.20	0.19	-10.5	10	3
550	16.3	-7.0	1.55	0.46	1.24	0.23	-10.5	10	3
600	17.2	-6.9	1.59	0.43	1.29	0.23	-10.5	10	3
650	18.1	-6.9	1.67	0.34	1.35	0.22	-10.5	10	3
700	18.5	-6.8	1.67	0.42	1.41	0.15	-10.5	10	3
750	19.1	-6.3	1.87	0.54	1.46	0.25	-10.5	10	3
800	19.6	-6.3	1.90	0.46	1.51	0.25	-10.5	10	3
850	20.1	-6.0	1.99	0.60	1.56	0.27	-10.5	10	3
900	20.8	-5.8	2.14	0.60	1.63	0.29	-10.5	10	3
950	21.1	-5.6	2.22	0.60	1.66	0.33	-10.5	10	3
1000	21.6	-5.6	2.23	0.61	1.71	0.30	-10.5	10	3

Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
distance correction = -20 * LOG (d_{Limit}/ d_{used})
Linear interpolation will be used for frequencies in between the values in the table.
Tables show an extract of values.

7.4 ANTENNA R&S HF907 (1 GHZ – 18 GHZ)

Frequency	AF R&S HF907	Corr.	cable loss 1 (relay + cable inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit, atten-uator & pre-amp)	cable loss 4 (to receiver)		
MHz	dB (1/m)	dB	dB	dB	dB	dB		
1000	24.4	-19.4	0.99	0.31	-21.51	0.79		
2000	28.5	-17.4	1.44	0.44	-20.63	1.38		
3000	31.0	-16.1	1.87	0.53	-19.85	1.33		
4000	33.1	-14.7	2.41	0.67	-19.13	1.31		
5000	34.4	-13.7	2.78	0.86	-18.71	1.40		
6000	34.7	-12.7	2.74	0.90	-17.83	1.47		
7000	35.6	-11.0	2.82	0.86	-16.19	1.46		

Frequency	AF R&S HF907	Corr.	cable loss 1 (relay inside chamber)	cable loss 2 (inside chamber)	cable loss 3 (outside chamber)	cable loss 4 (switch unit, atten-uator & pre-amp)	cable loss 5 (to receiver)	used for FCC 15.247
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB	
3000	31.0	-23.4	0.47	1.87	0.53	-27.58	1.33	
4000	33.1	-23.3	0.56	2.41	0.67	-28.23	1.31	
5000	34.4	-21.7	0.61	2.78	0.86	-27.35	1.40	
6000	34.7	-21.2	0.58	2.74	0.90	-26.89	1.47	
7000	35.6	-19.8	0.66	2.82	0.86	-25.58	1.46	

Frequency	AF R&S HF907	Corr.	cable loss 1 (relay inside chamber)	cable loss 2 (High Pass)	cable loss 3 (pre-amp)	cable loss 4 (inside chamber)	cable loss 5 (outside chamber)	cable loss 6 (to receiver)
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB	dB
7000	35.6	-57.3	0.56	1.28	-62.72	2.66	0.94	1.46
8000	36.3	-56.3	0.69	0.71	-61.49	2.84	1.00	1.53
9000	37.1	-55.3	0.68	0.65	-60.80	3.06	1.09	1.60
10000	37.5	-56.2	0.70	0.54	-61.91	3.28	1.20	1.67
11000	37.5	-55.3	0.80	0.61	-61.40	3.43	1.27	1.70
12000	37.6	-53.7	0.84	0.42	-59.70	3.53	1.26	1.73
13000	38.2	-53.5	0.83	0.44	-59.81	3.75	1.32	1.83
14000	39.9	-56.3	0.91	0.53	-63.03	3.91	1.40	1.77
15000	40.9	-54.1	0.98	0.54	-61.05	4.02	1.44	1.83
16000	41.3	-54.1	1.23	0.49	-61.51	4.17	1.51	1.85
17000	42.8	-54.4	1.36	0.76	-62.36	4.34	1.53	2.00
18000	44.2	-54.7	1.70	0.53	-62.88	4.41	1.55	1.91

Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
Linear interpolation will be used for frequencies in between the values in the table.
Tables show an extract of values.

7.5 ANTENNA EMCO 3160-09 (18 GHZ – 26.5 GHZ)

Frequency	AF EMCO 3160-09	Corr.	cable loss 1 (inside chamber)	cable loss 2 (pre-amp)	cable loss 3 (inside chamber)	cable loss 4 (switch unit)	cable loss 5 (to receiver)
MHz	dB (1/m)	dB	dB	dB	dB	dB	dB
18000	40.2	-23.5	0.72	-35.85	6.20	2.81	2.65
18500	40.2	-23.2	0.69	-35.71	6.46	2.76	2.59
19000	40.2	-22.0	0.76	-35.44	6.69	3.15	2.79
19500	40.3	-21.3	0.74	-35.07	7.04	3.11	2.91
20000	40.3	-20.3	0.72	-34.49	7.30	3.07	3.05
20500	40.3	-19.9	0.78	-34.46	7.48	3.12	3.15
21000	40.3	-19.1	0.87	-34.07	7.61	3.20	3.33
21500	40.3	-19.1	0.90	-33.96	7.47	3.28	3.19
22000	40.3	-18.7	0.89	-33.57	7.34	3.35	3.28
22500	40.4	-19.0	0.87	-33.66	7.06	3.75	2.94
23000	40.4	-19.5	0.88	-33.75	6.92	3.77	2.70
23500	40.4	-19.3	0.90	-33.35	6.99	3.52	2.66
24000	40.4	-19.8	0.88	-33.99	6.88	3.88	2.58
24500	40.4	-19.5	0.91	-33.89	7.01	3.93	2.51
25000	40.4	-19.3	0.88	-33.00	6.72	3.96	2.14
25500	40.5	-20.4	0.89	-34.07	6.90	3.66	2.22
26000	40.5	-21.3	0.86	-35.11	7.02	3.69	2.28
26500	40.5	-21.1	0.90	-35.20	7.15	3.91	2.36

Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
Linear interpolation will be used for frequencies in between the values in the table.
Table shows an extract of values.

7.6 ANTENNA EMCO 3160-10 (26.5 GHZ – 40 GHZ)

Frequency	AF EMCO 3160-10	Corr.	cable loss 1 (inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit)	cable loss 4 (to receiver)	distance corr. (-20 dB/ decade)	d_{Limit} (meas. distance (limit)	d_{used} (meas. distance (used)
GHz	dB (1/m)	dB	dB	dB	dB	dB	dB	m	m
26.5	43.4	-11.2	4.4				-9.5	3	1.0
27.0	43.4	-11.2	4.4				-9.5	3	1.0
28.0	43.4	-11.1	4.5				-9.5	3	1.0
29.0	43.5	-11.0	4.6				-9.5	3	1.0
30.0	43.5	-10.9	4.7				-9.5	3	1.0
31.0	43.5	-10.8	4.7				-9.5	3	1.0
32.0	43.5	-10.7	4.8				-9.5	3	1.0
33.0	43.6	-10.7	4.9				-9.5	3	1.0
34.0	43.6	-10.6	5.0				-9.5	3	1.0
35.0	43.6	-10.5	5.1				-9.5	3	1.0
36.0	43.6	-10.4	5.1				-9.5	3	1.0
37.0	43.7	-10.3	5.2				-9.5	3	1.0
38.0	43.7	-10.2	5.3				-9.5	3	1.0
39.0	43.7	-10.2	5.4				-9.5	3	1.0
40.0	43.8	-10.1	5.5				-9.5	3	1.0

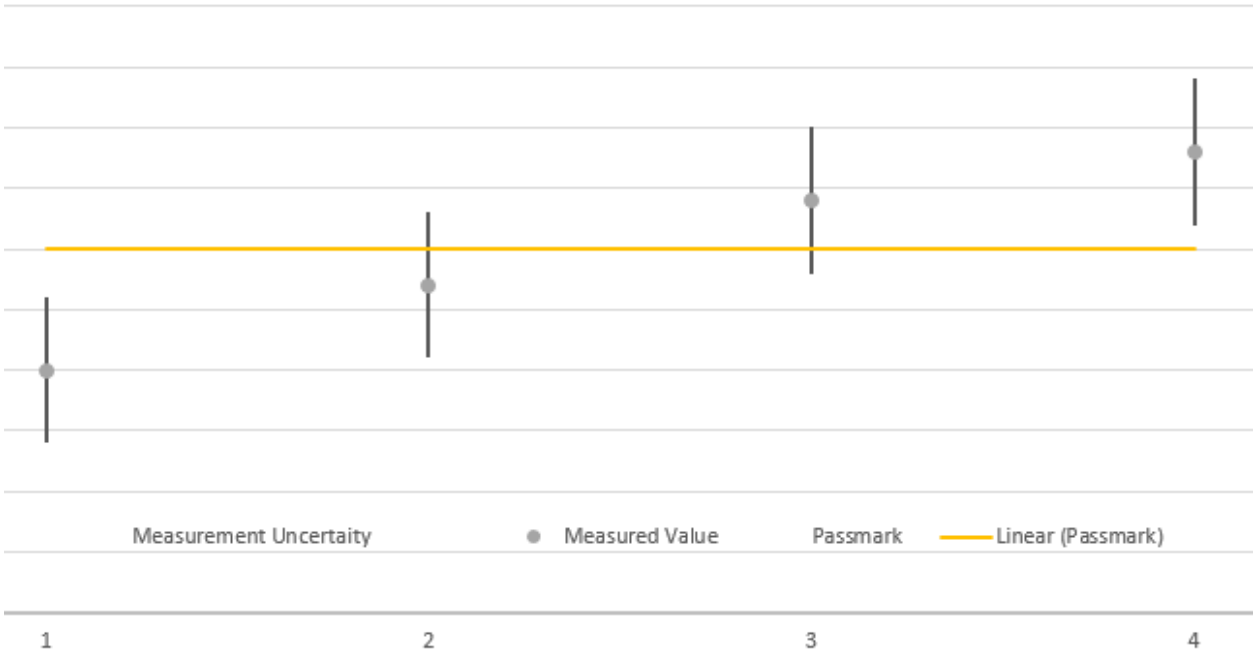
Sample calculation

E (dB µV/m) = U (dB µV) + AF (dB 1/m) + Corr. (dB)
U = Receiver reading
AF = Antenna factor
Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
Linear interpolation will be used for frequencies in between the values in the table.
distance correction = -20 * LOG (d_{Limit}/ d_{used})
Linear interpolation will be used for frequencies in between the values in the table.
Table shows an extract of values.

8 MEASUREMENT UNCERTAINTIES

Test Case	Parameter	Uncertainty
AC Power Line	Power	± 3.4 dB
Field Strength of spurious radiation	Power	± 5.5 dB
6 dB / 26 dB / 99% Bandwidth	Power Frequency	± 2.9 dB ± 11.2 kHz
Conducted Output Power	Power	± 2.2 dB
Band Edge Compliance	Power Frequency	± 2.2 dB ± 11.2 kHz
Frequency Stability	Frequency	± 25 Hz
Power Spectral Density	Power	± 2.2 dB

The measurement uncertainties for all parameters are calculated with an expansion factor (coverage factor) k = 1.96. This means, that the true value is in the corresponding interval with a probability of 95 %.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so called shared risk principle.

9 PHOTO REPORT

Please see separate photo report.