

FCC Measurement/Technical Report on

Daimler RSE

FCC ID: WUQ-DAIRSE

Test Report Reference: MDE_PANAS_1704_FCC03

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Note:

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

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1 APPLIED STANDARDS AND TEST SUMMARY

1.1 APPLIED STANDARDS

Type of Authorization

Certification for an Intentional Radiator (Digital Device / Spread Spectrum).

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 2 (10-1-18 Edition) and 15 (10-1-18 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

Part 15, Subpart E – Unlicensed National Information Infrastructure Devices

§ 15.403 Definitions

§ 15.407 General technical requirements

Note:

The tests were selected and performed with reference to the FCC Public Notice "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, 789033 D02 General U-NII Test Procedures New Rules v02r01, 2017-12-14".

ANSI C63.10-2013 is applied.

FCC ET Docket No. 13-49, FIRST REPORT AND ORDER, April 1, 2014 ("new rules") is applied.

Summary Test Results:

The EUT complied with all performed tests as listed in chapter 1.3 Measurement Summary / Signatures.

1.2 FCC-IC CORRELATION TABLE

**Correlation of measurement requirements for
UNII / LE-LAN (e.g. WLAN 5 GHz) equipment
from
FCC and IC**

UNII equipment

Measurement	FCC reference	IC reference
Conducted emissions on AC Mains	§ 15.207	RSS-Gen Issue 5: 8.8
Occupied bandwidth	§ 15.403 (i) (26 dB) /	RSS-247 Issue 2: 6.2.1.1, 6.2.2.1, 6.2.3.1 (99%)
	§ 15.407 (e) (6 dB)	RSS-247 Issue 2: 6.2.4.1 (6 dB)
Maximum conducted output power	§ 15.407 (a) (1),(2),(3),(4)	RSS-247 Issue 2: 6.2.1.1, 6.2.2.1, 6.2.3.1, 6.2.4.1
Maximum power spectral density	§ 15.407 (a) (1),(2),(3),(5)	RSS-247 Issue 2: 6.2.1.1, 6.2.2.1, 6.2.3.1, 6.2.4.1
Transmitter undesirable emissions; General Field Strength Limits, Restricted Bands	§ 15.407 (b) § 15.209 (a)	RSS-Gen Issue 5: 6.13/8.9/8.10; RSS-247 Issue 2: 3.3/6.2 6.2.1.2, 6.2.2.2, 6.2.3.2, 6.2.4.2
Frequency stability	§ 15.407 (g)	RSS-Gen Issue 5: 6.11/8.11
Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS)	§ 15.407 (h)	RSS-247 Issue 2: 6.2.2.1, 6.2.3.1, 6.3
Antenna requirement	§ 15.203 / 15.204	RSS-Gen Issue 5: 8.3
Receiver spurious emissions	-	-

1.3 MEASUREMENT SUMMARY / SIGNATURES

Android Core 0

47 CFR CHAPTER I FCC PART 15 Subpart E §15.407

FCC §15.31, §15.403 (i)

26 dB Bandwidth

The measurement was performed according to ANSI C63.10

Final Result

OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, high, U-NII-1	S01_AR04	Performed
WLAN a, high, U-NII-3	S01_AR04	Performed
WLAN a, low, U-NII-1	S01_AR04	Performed
WLAN a, low, U-NII-3	S01_AR04	Performed
WLAN a, mid, U-NII-1	S01_AR04	Performed
WLAN a, mid, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN n 40 MHz, low, U-NII-1	S01_AR04	Performed
WLAN n 40 MHz, low, U-NII-3	S01_AR04	Performed

47 CFR CHAPTER I FCC PART 15 Subpart E §15.407

FCC §15.31, §15.407 (e)

6 dB Bandwidth

The measurement was performed according to ANSI C63.10

Final Result

OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, high, U-NII-3	S01_AR04	Passed
WLAN a, low, U-NII-3	S01_AR04	Passed
WLAN a, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
FCC §15.31, §15.407 (e)

6 dB Bandwidth

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN ac 20 MHz, low, U-NII-3

Setup
FCC

Passed

WLAN ac 20 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN ac 40 MHz, high, U-NII-3

S01_AR04

Passed

WLAN ac 40 MHz, low, U-NII-3

S01_AR04

Passed

WLAN ac 80 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, high, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, low, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN n 40 MHz, high, U-NII-3

S01_AR04

Passed

WLAN n 40 MHz, low, U-NII-3

S01_AR04

Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.31, IC RSS 247 Ch.
6.2.x**

99 % Bandwidth

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN a, high, U-NII-1

S01_AR04

Performed

WLAN a, high, U-NII-3

S01_AR04

Performed

WLAN a, low, U-NII-1

S01_AR04

Performed

WLAN a, low, U-NII-3

S01_AR04

Performed

WLAN a, mid, U-NII-1

S01_AR04

Performed

WLAN a, mid, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, high, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, high, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, low, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, low, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN ac 40 MHz, high, U-NII-1

S01_AR04

Performed

WLAN ac 40 MHz, high, U-NII-3

S01_AR04

Performed

WLAN ac 40 MHz, low, U-NII-1

S01_AR04

Performed

WLAN ac 40 MHz, low, U-NII-3

S01_AR04

Performed

WLAN ac 80 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN ac 80 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, high, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, high, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, low, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, low, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN n 40 MHz, high, U-NII-1

S01_AR04

Performed

WLAN n 40 MHz, high, U-NII-3

S01_AR04

Performed

47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407
FCC §15.31, §15.407 (a)(1)

Maximum Conducted Output Power
The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN n 20 MHz MIMO, low, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz MIMO, low, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz MIMO, mid, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz MIMO, mid, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, high, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, low, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, mid, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz MIMO, high, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz MIMO, high, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz MIMO, low, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz MIMO, low, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz, high, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz, low, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz, low, U-NII-3	S01_AR04	Passed

47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407
FCC §15.31, §15.407 (a)(1),(5)

Peak Power Spectral Density

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, high, U-NII-1	S01_AR04	Passed
WLAN a, high, U-NII-3	S01_AR04	Passed
WLAN a, low, U-NII-1	S01_AR04	Passed
WLAN a, low, U-NII-3	S01_AR04	Passed
WLAN a, mid, U-NII-1	S01_AR04	Passed
WLAN a, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz MIMO, high, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz MIMO, high, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz MIMO, low, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz MIMO, low, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz MIMO, mid, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz MIMO, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, mid, U-NII-1	S01_AR04	Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.31, §15.407 (a)
(1),(5)**

Peak Power Spectral Density

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN ac 20 MHz, mid, U-NII-3

S01_AR04 Passed

WLAN ac 40 MHz MIMO, high, U-NII-1

S01_AR04 Passed

WLAN ac 40 MHz MIMO, high, U-NII-3

S01_AR04 Passed

WLAN ac 40 MHz MIMO, low, U-NII-1

S01_AR04 Passed

WLAN ac 40 MHz MIMO, low, U-NII-3

S01_AR04 Passed

WLAN ac 40 MHz, high, U-NII-1

S01_AR04 Passed

WLAN ac 40 MHz, high, U-NII-3

S01_AR04 Passed

WLAN ac 40 MHz, low, U-NII-1

S01_AR04 Passed

WLAN ac 40 MHz, low, U-NII-3

S01_AR04 Passed

WLAN ac 80 MHz MIMO, mid, U-NII-1

S01_AR04 Passed

WLAN ac 80 MHz MIMO, mid, U-NII-3

S01_AR04 Passed

WLAN ac 80 MHz, mid, U-NII-1

S01_AR04 Passed

WLAN ac 80 MHz, mid, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz MIMO, high, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz MIMO, high, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz MIMO, low, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz MIMO, low, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz MIMO, mid, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz MIMO, mid, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz, high, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz, high, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz, low, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz, low, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz, mid, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04 Passed

WLAN n 40 MHz MIMO, high, U-NII-1

S01_AR04 Passed

WLAN n 40 MHz MIMO, high, U-NII-3

S01_AR04 Passed

WLAN n 40 MHz MIMO, low, U-NII-1

S01_AR04 Passed

WLAN n 40 MHz MIMO, low, U-NII-3

S01_AR04 Passed

WLAN n 40 MHz, high, U-NII-1

S01_AR04 Passed

WLAN n 40 MHz, high, U-NII-3

S01_AR04 Passed

WLAN n 40 MHz, low, U-NII-1

S01_AR04 Passed

WLAN n 40 MHz, low, U-NII-3

S01_AR04 Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.407 (b),
(1),(2),(3),(4); FCC §15.205,
§15.209, §15.407 (b) (5),(6)**

Undesirable Emissions; General Field Strength Limits

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Measurement range, Subband

	Setup	FCC
WLAN a, high, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN a, low, 1GHz - 26GHz, U-NII-1	S01_AG01	Passed
WLAN a, low, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN a, low, 9kHz - 30MHz, U-NII-1	S01_AG01	Passed
WLAN a, mid, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN a, mid, 30MHz - 1GHz, U-NII-1	S01_AG01	Passed
WLAN ac 40 MHz, high, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN ac 40 MHz, high, 1GHz - 26GHz, U-NII-3	S01_AD01	Passed
WLAN ac 40 MHz, low, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN ac 40 MHz, low, 1GHz - 26GHz, U-NII-3	S01_AD01	Passed
WLAN n 20 MHz, high, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN n 20 MHz, low, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN n 20 MHz, mid, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN n 40 MHz, high, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN n 40 MHz, high, 1GHz - 26GHz, U-NII-3	S01_AD01	Passed
WLAN n 40 MHz, low, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN n 40 MHz, low, 1GHz - 26GHz, U-NII-3	S01_AD01	Passed
WLAN n 40 MHz, low, 30MHz - 1GHz, U-NII-1	S01_AG01	Passed
WLAN n 40 MHz, low, 9kHz - 30MHz, U-NII-1	S01_AG01	Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.407 (b),
(1),(2),(3),(4)**

Band Edge

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, low, U-NII-1	S01_AG01	Passed
WLAN ac 20 MHz, low, U-NII-1	S01_AS04	Passed
WLAN ac 20 MHz MIMO, low, U-NII-1	S01_AS04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AL01	Passed
WLAN ac 40 MHz, high, U-NII-3	S01_AD01	Passed
WLAN ac 40 MHz, low, U-NII-1	S01_AL01	Passed
WLAN ac 40 MHz, low, U-NII-3	S01_AD01	Passed
WLAN ac 80 MHz MIMO, mid, U-NII-1	S01_AD01	Passed
WLAN ac 80 MHz MIMO, mid, U-NII-3	S01_AD01	Passed
WLAN ac 80 MHz, mid, U-NII-1	S01_AD01	Passed
WLAN ac 80 MHz, mid, U-NII-3	S01_AD01	Passed
WLAN n 20 MHz, low, U-NII-1	S01_AS04	Passed
WLAN n 20 MHz, high, U-NII-3	S01_AG01	Passed
WLAN n 20 MHz, low, U-NII-3	S01_AG01	Passed

47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407
**FCC §15.407 (b),
(1),(2),(3),(4)**

Band Edge

The measurement was performed according to ANSI C63.10

Final Result**OP-Mode**

Radio Technology, Operating Frequency, Subband

WLAN n 40 MHz, high, U-NII-3

Setup**FCC**

Passed

WLAN n 40 MHz, low, U-NII-1

S01_AD01

Passed

WLAN n 40 MHz, low, U-NII-3

S01_AD01

Passed

Android Core 1

47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407
FCC §15.31, §15.403 (i)

26 dB Bandwidth

The measurement was performed according to ANSI C63.10

Final Result**OP-Mode**

Radio Technology, Operating Frequency, Subband

WLAN a, high, U-NII-1

Setup**FCC**

Performed

WLAN a, high, U-NII-3

S01_AR04

Performed

WLAN a, low, U-NII-1

S01_AR04

Performed

WLAN a, low, U-NII-3

S01_AR04

Performed

WLAN a, mid, U-NII-1

S01_AR04

Performed

WLAN a, mid, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, high, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, high, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, low, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, low, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN ac 40 MHz, high, U-NII-1

S01_AR04

Performed

WLAN ac 40 MHz, high, U-NII-3

S01_AR04

Performed

WLAN ac 40 MHz, low, U-NII-1

S01_AR04

Performed

WLAN ac 40 MHz, low, U-NII-3

S01_AR04

Performed

WLAN ac 80 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN ac 80 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, high, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, high, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, low, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, low, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN n 40 MHz, high, U-NII-1

S01_AR04

Performed

WLAN n 40 MHz, high, U-NII-3

S01_AR04

Performed

WLAN n 40 MHz, low, U-NII-1

S01_AR04

Performed

WLAN n 40 MHz, low, U-NII-3

S01_AR04

Performed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
FCC §15.31, §15.407 (e)

6 dB Bandwidth

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

Setup
FCC

WLAN a, high, U-NII-3	S01_AR04	Passed
WLAN a, low, U-NII-3	S01_AR04	Passed
WLAN a, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Passed
WLAN ac 40 MHz, high, U-NII-3	S01_AR04	Passed
WLAN ac 40 MHz, low, U-NII-3	S01_AR04	Passed
WLAN ac 80 MHz, mid, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz, low, U-NII-3	S01_AR04	Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
FCC §15.31, IC RSS 247 Ch. 6.2.x

99 % Bandwidth

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

Setup
FCC

WLAN a, high, U-NII-1	S01_AR04	Performed
WLAN a, high, U-NII-3	S01_AR04	Performed
WLAN a, low, U-NII-1	S01_AR04	Performed
WLAN a, low, U-NII-3	S01_AR04	Performed
WLAN a, mid, U-NII-1	S01_AR04	Performed
WLAN a, mid, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Performed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.31, IC RSS 247 Ch.
6.2.x**

99 % Bandwidth

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN n 20 MHz, low, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, low, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN n 40 MHz, high, U-NII-1

S01_AR04

Performed

WLAN n 40 MHz, high, U-NII-3

S01_AR04

Performed

WLAN n 40 MHz, low, U-NII-1

S01_AR04

Performed

WLAN n 40 MHz, low, U-NII-3

S01_AR04

Performed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
FCC §15.31, §15.407 (a)(1)

Maximum Conducted Output Power

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN a, high, U-NII-1

S01_AR04

Passed

WLAN a, high, U-NII-3

S01_AR04

Passed

WLAN a, low, U-NII-1

S01_AR04

Passed

WLAN a, low, U-NII-3

S01_AR04

Passed

WLAN a, mid, U-NII-1

S01_AR04

Passed

WLAN a, mid, U-NII-3

S01_AR04

Passed

WLAN ac 20 MHz, high, U-NII-1

S01_AR04

Passed

WLAN ac 20 MHz, high, U-NII-3

S01_AR04

Passed

WLAN ac 20 MHz, low, U-NII-1

S01_AR04

Passed

WLAN ac 20 MHz, low, U-NII-3

S01_AR04

Passed

WLAN ac 20 MHz, mid, U-NII-1

S01_AR04

Passed

WLAN ac 20 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN ac 40 MHz, high, U-NII-1

S01_AR04

Passed

WLAN ac 40 MHz, high, U-NII-3

S01_AR04

Passed

WLAN ac 40 MHz, low, U-NII-1

S01_AR04

Passed

WLAN ac 40 MHz, low, U-NII-3

S01_AR04

Passed

WLAN ac 80 MHz, mid, U-NII-1

S01_AR04

Passed

WLAN ac 80 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, high, U-NII-1

S01_AR04

Passed

WLAN n 20 MHz, high, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, low, U-NII-1

S01_AR04

Passed

WLAN n 20 MHz, low, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, mid, U-NII-1

S01_AR04

Passed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN n 40 MHz, high, U-NII-1

S01_AR04

Passed

WLAN n 40 MHz, high, U-NII-3

S01_AR04

Passed

WLAN n 40 MHz, low, U-NII-1

S01_AR04

Passed

WLAN n 40 MHz, low, U-NII-3

S01_AR04

Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
FCC §15.31, §15.407 (a)(1)

Maximum Conducted Output Power

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband
WLAN n 40 MHz, low, U-NII-3

Setup
FCC

S01_AR04

Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.31, §15.407 (a)
(1),(5)**

Peak Power Spectral Density

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN a, high, U-NII-1
WLAN a, high, U-NII-3
WLAN a, low, U-NII-1
WLAN a, low, U-NII-3
WLAN a, mid, U-NII-1
WLAN a, mid, U-NII-3
WLAN ac 20 MHz, high, U-NII-1
WLAN ac 20 MHz, high, U-NII-3
WLAN ac 20 MHz, low, U-NII-1
WLAN ac 20 MHz, low, U-NII-3
WLAN ac 20 MHz, mid, U-NII-1
WLAN ac 20 MHz, mid, U-NII-3
WLAN ac 40 MHz, high, U-NII-1
WLAN ac 40 MHz, high, U-NII-3
WLAN ac 40 MHz, low, U-NII-1
WLAN ac 40 MHz, low, U-NII-3
WLAN ac 80 MHz, mid, U-NII-1
WLAN ac 80 MHz, mid, U-NII-3
WLAN n 20 MHz, high, U-NII-1
WLAN n 20 MHz, high, U-NII-3
WLAN n 20 MHz, low, U-NII-1
WLAN n 20 MHz, low, U-NII-3
WLAN n 20 MHz, mid, U-NII-1
WLAN n 40 MHz, high, U-NII-1
WLAN n 40 MHz, high, U-NII-3
WLAN n 40 MHz, low, U-NII-1
WLAN n 40 MHz, low, U-NII-3

Setup
FCC

S01_AR04

Passed

47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407
**FCC §15.407 (b),
(1),(2),(3),(4); FCC §15.205,
§15.209, §15.407 (b) (5),(6)**

Undesirable Emissions; General Field Strength Limits

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Measurement range,
Subband

Setup
FCC

WLAN a, high, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN a, low, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN a, mid, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN a, mid, 26GHz - 40GHz, U-NII-3	S01_AG01	Passed
WLAN a, mid, 9kHz - 30MHz, U-NII-1	S01_AD01	Passed
WLAN n 20 MHz, high, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN n 20 MHz, low, 1GHz - 26GHz, U-NII-1	S01_AG01	Passed
WLAN n 20 MHz, mid, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed

47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407
**FCC §15.407 (b),
(1),(2),(3),(4)**

Band Edge

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

Setup
FCC

WLAN a, high, U-NII-3	S01_AG01	Passed
WLAN a, low, U-NII-3	S01_AG01	Passed
WLAN ac 20 MHz, low, U-NII-1	S01_AL01	Passed
WLAN ac 20 MHz, low, U-NII-3	S01_AL01	Passed
WLAN n 20 MHz, low, U-NII-1	S01_AG01	Passed

Linux Core 0
**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**

26 dB Bandwidth

The measurement was performed according to ANSI C63.10

FCC §15.31, §15.403 (i)
Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, high, U-NII-1	S01_AR04	Performed
WLAN a, high, U-NII-3	S01_AR04	Performed
WLAN a, low, U-NII-1	S01_AR04	Performed
WLAN a, low, U-NII-3	S01_AR04	Performed
WLAN a, mid, U-NII-1	S01_AR04	Performed
WLAN a, mid, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN n 40 MHz, low, U-NII-1	S01_AR04	Performed
WLAN n 40 MHz, low, U-NII-3	S01_AR04	Performed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**

6 dB Bandwidth

The measurement was performed according to ANSI C63.10

FCC §15.31, §15.407 (e)
Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, high, U-NII-3	S01_AR04	Passed
WLAN a, low, U-NII-3	S01_AR04	Passed
WLAN a, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
FCC §15.31, §15.407 (e)

6 dB Bandwidth

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN ac 20 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN ac 40 MHz, high, U-NII-3

S01_AR04

Passed

WLAN ac 40 MHz, low, U-NII-3

S01_AR04

Passed

WLAN ac 80 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, high, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, low, U-NII-3

S01_AR04

Passed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04

Passed

WLAN n 40 MHz, high, U-NII-3

S01_AR04

Passed

WLAN n 40 MHz, low, U-NII-3

S01_AR04

Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
FCC §15.31, IC RSS 247 Ch. 6.2.x

99 % Bandwidth

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN a, high, U-NII-1

S01_AR04

Performed

WLAN a, high, U-NII-3

S01_AR04

Performed

WLAN a, low, U-NII-1

S01_AR04

Performed

WLAN a, low, U-NII-3

S01_AR04

Performed

WLAN a, mid, U-NII-1

S01_AR04

Performed

WLAN a, mid, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, high, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, high, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, low, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, low, U-NII-3

S01_AR04

Performed

WLAN ac 20 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN ac 20 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN ac 40 MHz, high, U-NII-1

S01_AR04

Performed

WLAN ac 40 MHz, high, U-NII-3

S01_AR04

Performed

WLAN ac 40 MHz, low, U-NII-1

S01_AR04

Performed

WLAN ac 40 MHz, low, U-NII-3

S01_AR04

Performed

WLAN ac 80 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN ac 80 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, high, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, high, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, low, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, low, U-NII-3

S01_AR04

Performed

WLAN n 20 MHz, mid, U-NII-1

S01_AR04

Performed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04

Performed

WLAN n 40 MHz, high, U-NII-1

S01_AR04

Performed

WLAN n 40 MHz, high, U-NII-3

S01_AR04

Performed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**

99 % Bandwidth

The measurement was performed according to ANSI C63.10

FCC §15.31, IC RSS 247 Ch. 6.2.x
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN n 40 MHz, low, U-NII-1

WLAN n 40 MHz, low, U-NII-3

Final Result
Setup
FCC

S01_AR04

Performed

S01_AR04

Performed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**

Maximum Conducted Output Power

The measurement was performed according to ANSI C63.10

FCC §15.31, §15.407 (a)(1)
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN a, high, U-NII-1

WLAN a, high, U-NII-3

WLAN a, low, U-NII-1

WLAN a, low, U-NII-3

WLAN a, mid, U-NII-1

WLAN a, mid, U-NII-3

WLAN ac 20 MHz MIMO, high, U-NII-1

WLAN ac 20 MHz MIMO, high, U-NII-3

WLAN ac 20 MHz MIMO, low, U-NII-1

WLAN ac 20 MHz MIMO, low, U-NII-3

WLAN ac 20 MHz MIMO, mid, U-NII-1

WLAN ac 20 MHz MIMO, mid, U-NII-3

WLAN ac 20 MHz, high, U-NII-1

WLAN ac 20 MHz, high, U-NII-3

WLAN ac 20 MHz, low, U-NII-1

WLAN ac 20 MHz, low, U-NII-3

WLAN ac 20 MHz, mid, U-NII-1

WLAN ac 20 MHz, mid, U-NII-3

WLAN ac 40 MHz MIMO, high, U-NII-1

WLAN ac 40 MHz MIMO, high, U-NII-3

WLAN ac 40 MHz MIMO, low, U-NII-1

WLAN ac 40 MHz MIMO, low, U-NII-3

WLAN ac 40 MHz, high, U-NII-1

WLAN ac 40 MHz, high, U-NII-3

WLAN ac 40 MHz, low, U-NII-1

WLAN ac 40 MHz, low, U-NII-3

WLAN ac 80 MHz MIMO, mid, U-NII-1

WLAN ac 80 MHz MIMO, mid, U-NII-3

WLAN ac 80 MHz, mid, U-NII-1

WLAN ac 80 MHz, mid, U-NII-3

WLAN n 20 MHz MIMO, high, U-NII-1

WLAN n 20 MHz MIMO, high, U-NII-3

WLAN n 20 MHz MIMO, low, U-NII-1

Final Result
Setup
FCC

S01_AR04

Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
FCC §15.31, §15.407 (a)(1)

Maximum Conducted Output Power

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN n 20 MHz MIMO, low, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz MIMO, mid, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz MIMO, mid, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, high, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, low, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, mid, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz MIMO, high, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz MIMO, high, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz MIMO, low, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz MIMO, low, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz, high, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz, low, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz, low, U-NII-3	S01_AR04	Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.31, §15.407 (a)
(1),(5)**

Peak Power Spectral Density

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, high, U-NII-1	S01_AR04	Passed
WLAN a, high, U-NII-3	S01_AR04	Passed
WLAN a, low, U-NII-1	S01_AR04	Passed
WLAN a, low, U-NII-3	S01_AR04	Passed
WLAN a, mid, U-NII-1	S01_AR04	Passed
WLAN a, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz MIMO, high, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz MIMO, high, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz MIMO, low, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz MIMO, low, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz MIMO, mid, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz MIMO, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, mid, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.31, §15.407 (a)
(1),(5)**

Peak Power Spectral Density

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband

WLAN ac 40 MHz MIMO, high, U-NII-1

S01_AR04 Passed

WLAN ac 40 MHz MIMO, high, U-NII-3

S01_AR04 Passed

WLAN ac 40 MHz MIMO, low, U-NII-1

S01_AR04 Passed

WLAN ac 40 MHz MIMO, low, U-NII-3

S01_AR04 Passed

WLAN ac 40 MHz, high, U-NII-1

S01_AR04 Passed

WLAN ac 40 MHz, high, U-NII-3

S01_AR04 Passed

WLAN ac 40 MHz, low, U-NII-1

S01_AR04 Passed

WLAN ac 40 MHz, low, U-NII-3

S01_AR04 Passed

WLAN ac 80 MHz MIMO, mid, U-NII-1

S01_AR04 Passed

WLAN ac 80 MHz MIMO, mid, U-NII-3

S01_AR04 Passed

WLAN ac 80 MHz, mid, U-NII-1

S01_AR04 Passed

WLAN ac 80 MHz, mid, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz MIMO, high, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz MIMO, high, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz MIMO, low, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz MIMO, low, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz MIMO, mid, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz MIMO, mid, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz, high, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz, high, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz, low, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz, low, U-NII-3

S01_AR04 Passed

WLAN n 20 MHz, mid, U-NII-1

S01_AR04 Passed

WLAN n 20 MHz, mid, U-NII-3

S01_AR04 Passed

WLAN n 40 MHz MIMO, high, U-NII-1

S01_AR04 Passed

WLAN n 40 MHz MIMO, high, U-NII-3

S01_AR04 Passed

WLAN n 40 MHz MIMO, low, U-NII-1

S01_AR04 Passed

WLAN n 40 MHz MIMO, low, U-NII-3

S01_AR04 Passed

WLAN n 40 MHz, high, U-NII-1

S01_AR04 Passed

WLAN n 40 MHz, high, U-NII-3

S01_AR04 Passed

WLAN n 40 MHz, low, U-NII-1

S01_AR04 Passed

WLAN n 40 MHz, low, U-NII-3

S01_AR04 Passed

**47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407**
**FCC §15.407 (b),
(1),(2),(3),(4); FCC §15.205,
§15.209, §15.407 (b) (5),(6)**

Undesirable Emissions; General Field Strength Limits

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

 Radio Technology, Operating Frequency, Measurement range,
Subband

WLAN a, high, 1GHz - 26GHz, U-NII-3

Setup
FCC

S01_AG01 Passed

47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407
**FCC §15.407 (b),
(1),(2),(3),(4); FCC §15.205,
§15.209, §15.407 (b) (5),(6)**

Undesirable Emissions; General Field Strength Limits

The measurement was performed according to ANSI C63.10

Final Result**OP-Mode**

Radio Technology, Operating Frequency, Measurement range, Subband

	Setup	FCC
WLAN a, low, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN a, low, 26GHz - 40GHz, U-NII-3	S01_AL01	Passed
WLAN a, low, 9kHz - 30MHz, U-NII-1	S01_AG01	Passed
WLAN a, mid, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN n 20 MHz, high, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN n 20 MHz, low, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN n 20 MHz, mid, 1GHz - 26GHz, U-NII-1	S01_AG01	Passed

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**FCC §15.407 (b),
(1),(2),(3),(4)**

Band Edge

The measurement was performed according to ANSI C63.10

Final Result**OP-Mode**

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, high, U-NII-3	S01_AG01	Passed
WLAN a, low, U-NII-3	S01_AG01	Passed
WLAN ac 20 MHz, low, U-NII-1	S01_AL01	Passed
WLAN ac 20 MHz MIMO, low, U-NII-1	S01_AS04	Passed
WLAN ac 20 MHz, low, U-NII-3	S01_AL01	Passed
WLAN ac 80 MHz MIMO, mid, U-NII-1	S01_AD01	Passed
WLAN ac 80 MHz MIMO, mid, U-NII-3	S01_AD01	Passed
WLAN n 20 MHz, low, U-NII-1	S01_AD01	Passed
WLAN n 20 MHz MIMO, low, U-NII-1	S01_AS04	Passed

Linux Core 1
**47 CFR CHAPTER I FCC PART 15 Subpart E
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26 dB Bandwidth

The measurement was performed according to ANSI C63.10

FCC §15.31, §15.403 (i)

OP-Mode	Setup	FCC
Radio Technology, Operating Frequency, Subband		
WLAN a, high, U-NII-1	S01_AR04	Performed
WLAN a, high, U-NII-3	S01_AR04	Performed
WLAN a, low, U-NII-1	S01_AR04	Performed
WLAN a, low, U-NII-3	S01_AR04	Performed
WLAN a, mid, U-NII-1	S01_AR04	Performed
WLAN a, mid, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN n 40 MHz, low, U-NII-1	S01_AR04	Performed
WLAN n 40 MHz, low, U-NII-3	S01_AR04	Performed

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6 dB Bandwidth

The measurement was performed according to ANSI C63.10

FCC §15.31, §15.407 (e)

OP-Mode	Setup	FCC
Radio Technology, Operating Frequency, Subband		
WLAN a, high, U-NII-3	S01_AR04	Passed
WLAN a, low, U-NII-3	S01_AR04	Passed
WLAN a, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Passed

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6 dB Bandwidth

The measurement was performed according to ANSI C63.10

FCC §15.31, §15.407 (e)

The measurement was performed according to ANSI C63.10			Final Result
OP-Mode	Setup	FCC	
Radio Technology, Operating Frequency, Subband			
WLAN ac 40 MHz, high, U-NII-3	S01_AR04	Passed	
WLAN ac 40 MHz, low, U-NII-3	S01_AR04	Passed	
WLAN ac 80 MHz, mid, U-NII-3	S01_AR04	Passed	
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Passed	
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Passed	
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Passed	
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Passed	
WLAN n 40 MHz, low, U-NII-3	S01_AR04	Passed	

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99 % Bandwidth

The measurement was performed according to ANSI C63.10

FCC §15.31, IC RSS 247 Ch.
6.2.x

Final Result		
OP-Mode	Setup	FCC
Radio Technology, Operating Frequency, Subband		
WLAN a, high, U-NII-1	S01_AR04	Performed
WLAN a, high, U-NII-3	S01_AR04	Performed
WLAN a, low, U-NII-1	S01_AR04	Performed
WLAN a, low, U-NII-3	S01_AR04	Performed
WLAN a, mid, U-NII-1	S01_AR04	Performed
WLAN a, mid, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-1	S01_AR04	Performed
WLAN ac 40 MHz, low, U-NII-3	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN ac 80 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, low, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Performed
WLAN n 20 MHz, mid, U-NII-1	S01_AR04	Performed
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Performed
WLAN n 40 MHz, high, U-NII-1	S01_AR04	Performed
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Performed
WLAN n 40 MHz, low, U-NII-1	S01_AR04	Performed

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**FCC §15.31, IC RSS 247 Ch.
6.2.x**

99 % Bandwidth

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband
WLAN n 40 MHz, low, U-NII-3

Setup
FCC

S01_AR04

Performed

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§15.407**
FCC §15.31, §15.407 (a)(1)

Maximum Conducted Output Power

The measurement was performed according to ANSI C63.10

Final Result
OP-Mode

Radio Technology, Operating Frequency, Subband
WLAN a, high, U-NII-1
WLAN a, high, U-NII-3
WLAN a, low, U-NII-1
WLAN a, low, U-NII-3
WLAN a, mid, U-NII-1
WLAN a, mid, U-NII-3
WLAN ac 20 MHz, high, U-NII-1
WLAN ac 20 MHz, high, U-NII-3
WLAN ac 20 MHz, low, U-NII-1
WLAN ac 20 MHz, low, U-NII-3
WLAN ac 20 MHz, mid, U-NII-1
WLAN ac 20 MHz, mid, U-NII-3
WLAN ac 40 MHz, high, U-NII-1
WLAN ac 40 MHz, high, U-NII-3
WLAN ac 40 MHz, low, U-NII-1
WLAN ac 40 MHz, low, U-NII-3
WLAN ac 80 MHz, mid, U-NII-1
WLAN ac 80 MHz, mid, U-NII-3
WLAN n 20 MHz, high, U-NII-1
WLAN n 20 MHz, high, U-NII-3
WLAN n 20 MHz, low, U-NII-1
WLAN n 20 MHz, low, U-NII-3
WLAN n 20 MHz, mid, U-NII-1
WLAN n 40 MHz, high, U-NII-1
WLAN n 40 MHz, high, U-NII-3
WLAN n 40 MHz, low, U-NII-1
WLAN n 40 MHz, low, U-NII-3

Setup
FCC

S01_AR04

Passed

S01_AR04
</

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**FCC §15.31, §15.407 (a)
(1),(5)**

Peak Power Spectral Density

The measurement was performed according to ANSI C63.10

Final Result

OP-Mode	Setup	FCC
Radio Technology, Operating Frequency, Subband		
WLAN a, high, U-NII-1	S01_AR04	Passed
WLAN a, high, U-NII-3	S01_AR04	Passed
WLAN a, low, U-NII-1	S01_AR04	Passed
WLAN a, low, U-NII-3	S01_AR04	Passed
WLAN a, mid, U-NII-1	S01_AR04	Passed
WLAN a, mid, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN ac 20 MHz, mid, U-NII-1	S01_AR04	Passed
WLAN ac 20 MHz, mid, U-NII-3	S01_AR04	Passed
WLAN ac 40 MHz, high, U-NII-1	S01_AR04	Passed
WLAN ac 40 MHz, high, U-NII-3	S01_AR04	Passed
WLAN ac 40 MHz, low, U-NII-1	S01_AR04	Passed
WLAN ac 40 MHz, low, U-NII-3	S01_AR04	Passed
WLAN ac 80 MHz, mid, U-NII-1	S01_AR04	Passed
WLAN ac 80 MHz, mid, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, high, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, high, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, low, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, low, U-NII-3	S01_AR04	Passed
WLAN n 20 MHz, mid, U-NII-1	S01_AR04	Passed
WLAN n 20 MHz, mid, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz, high, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz, high, U-NII-3	S01_AR04	Passed
WLAN n 40 MHz, low, U-NII-1	S01_AR04	Passed
WLAN n 40 MHz, low, U-NII-3	S01_AR04	Passed

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**FCC §15.407 (b),
(1),(2),(3),(4); FCC §15.205,
§15.209, §15.407 (b) (5),(6)**

Undesirable Emissions: General Field Strength Limits

The measurement was performed according to ANSI C63.10

Final Result

OP-Mode	Setup	FCC
Radio Technology, Operating Frequency, Measurement range, Subband		
WLAN a, high, 1GHz - 26GHz, U-NII-1	S01_AG01	Passed
WLAN a, low, 1GHz - 26GHz, U-NII-1	S01_AG01	Passed
WLAN a, mid, 1GHz - 26GHz, U-NII-1	S01_AG01	Passed
WLAN a, mid, 30MHz - 1GHz, U-NII-3	S01_AG01	Passed
WLAN a, mid, 9kHz - 30MHz, U-NII-3	S01_AD01	Passed

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§15.407
**FCC §15.407 (b),
(1),(2),(3),(4); FCC §15.205,
§15.209, §15.407 (b) (5),(6)**

Undesirable Emissions; General Field Strength Limits

The measurement was performed according to ANSI C63.10

Final Result**OP-Mode**

Radio Technology, Operating Frequency, Measurement range, Subband

	Setup	FCC
WLAN ac 40 MHz, high, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN ac 40 MHz, high, 1GHz - 26GHz, U-NII-3	S01_AD01	Passed
WLAN ac 40 MHz, low, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN ac 40 MHz, low, 1GHz - 26GHz, U-NII-3	S01_AD01	Passed
WLAN n 20 MHz, high, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN n 20 MHz, low, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN n 20 MHz, mid, 1GHz - 26GHz, U-NII-3	S01_AG01	Passed
WLAN n 40 MHz, high, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN n 40 MHz, high, 1GHz - 26GHz, U-NII-3	S01_AD01	Passed
WLAN n 40 MHz, high, 26GHz - 40GHz, U-NII-3	S01_AL01	Passed
WLAN n 40 MHz, low, 1GHz - 26GHz, U-NII-1	S01_AD01	Passed
WLAN n 40 MHz, low, 1GHz - 26GHz, U-NII-3	S01_AD01	Passed

47 CFR CHAPTER I FCC PART 15 Subpart E
§15.407
**FCC §15.407 (b),
(1),(2),(3),(4)**

Band Edge

The measurement was performed according to ANSI C63.10

Final Result**OP-Mode**

Radio Technology, Operating Frequency, Subband

	Setup	FCC
WLAN a, low, U-NII-1	S01_AG01	Passed
WLAN ac 20 MHz, low, U-NII-1	S01_AS04	Passed
WLAN ac 20 MHz, high, U-NII-3	S01_AL01	Passed
WLAN ac 40 MHz, high, U-NII-3	S01_AD01	Passed
WLAN ac 40 MHz, low, U-NII-1	S01_AD01	Passed
WLAN ac 40 MHz, low, U-NII-3	S01_AD01	Passed
WLAN ac 80 MHz, mid, U-NII-1	S01_AD01	Passed
WLAN ac 80 MHz, mid, U-NII-3	S01_AD01	Passed
WLAN n 20 MHz, low, U-NII-1	S01_AS04	Passed
WLAN n 20 MHz, high, U-NII-3	S01_AG01	Passed
WLAN n 40 MHz, high, U-NII-3	S01_AD01	Passed
WLAN n 40 MHz, low, U-NII-1	S01_AD01	Passed
WLAN n 40 MHz, low, U-NII-3	S01_AD01	Passed

N/A: Not applicable

N/P: Not performed

2 REVISION HISTORY

Report version control			
Version	Release date	Change Description	Version validity
initial	2019-08-23	--	valid
--	--	--	--

COMMENT: -



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



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

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-12140-01-00

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: 2019-02-12

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: 2019-08-23

Testing Period: 2019-02-03 to 2019-06-29

3.3 APPLICANT DATA

Company Name: Panasonic Automotive Systems Europe GmbH

Address: Robert-Bosch Str 27-29
63225 Langen
Germany

Contact Person: Mr. Mario Müller

3.4 MANUFACTURER DATA

Company Name: please see Applicant Data

4 TEST OBJECT DATA

4.1 GENERAL EUT DESCRIPTION

Kind of Device product description	Rear Seat Entertainment The EUT is a rear seat entertainment system, it is using Bluetooth and WLAN radio technology in the 2.4 GHz and 5 GHz ISM band. RSE Uses two chips to Handle WLAN: Chip0 - STA mode /BT and is controlled by Android and CHIP 1 - STA mode controlled by Linux	
Product name	Daimler RSE	
Type	BR167	
Declared EUT data by the supplier		
Voltage Type	DC (vehicular battery)	
Voltage Level	13.5 V	
Tested Modulation Type	OFDM:BPSK	
General product description	The EUT is a rear seat entertainment system, it is using Bluetooth and WLAN radio technology in the 2.4 GHz and 5 GHz ISM band. RSE Uses two chips to Handle WLAN: Chip0 - STA mode /BT and is controlled by Android and CHIP 1 - STA mode controlled by Linux	
Specific product description	WLAN mode a, n20/40 and ac20/40/80 MHz are supported in the 5 GHz band by the device. Since DFS is not supported, only the Sub-bands 1 and 3 are supported.	
Ports of the device	<ul style="list-style-type: none"> - Cable Harness incl. DC - HDMI - USB - Audio jack 	
Antenna Gain	Antenna 1 (Android 1)	UNII SB1 Gain [dBi]: 5,89 UNII SB3 Gain [dBi]: 4,07
	Antenna 2 (Android 0)	UNII SB1 Gain [dBi]: 4,79 UNII SB3 Gain [dBi]: 2,19
	Antenna 3 (Linux 1)	UNII SB1 Gain [dBi]: 6,91 UNII SB3 Gain [dBi]: 5,70
	Antenna 4 (Linux 0)	UNII SB1 Gain [dBi]: 5,16 UNII SB3 Gain [dBi]: 4,02
Tested Datarates	WLAN a: 6 Mbps WLAN n/ac: MCS0	
Special software used for testing	Integrated software controlled by touchscreen	

The main components of the EUT are listed and described in chapter 3.2 EUT Main components.

4.2 EUT MAIN COMPONENTS

Sample Name	Sample Code	Description
EUT D	DE1238002ad01	Radiated Sample
Sample Parameter		Value
Serial No.	PA1703J0000559	
HW Version	CR-FPM8X0AE*	
SW Version	2019-07	
Comment	-	
Integral Antenna		

Sample Name	Sample Code	Description
EUT G	DE1238002ag01	Radiated Sample
Sample Parameter		Value
Serial No.	PA1703J0000364	
HW Version	CR-FPM8X0AE*	
SW Version	2019-07	
Comment		
Integral Antenna		

Sample Name	Sample Code	Description
EUT L	DE1238002al01	Radiated Sample
Sample Parameter		Value
Serial No.	PA1703J0000549	
HW Version	CR-FPM8X0AE*	
SW Version	2019-07	
Comment	-	
Integral Antenna		

Sample Name	Sample Code	Description
EUT M	DE1238002am01	Conducted Sample
Sample Parameter		Value
Serial No.	PA1703J0000760	
HW Version	CR-FPM8X0AE*	
SW Version	2019-07	
Comment	-	
Integral Antenna	Replaced by temporary antenna connector	

Sample Name	Sample Code	Description
EUT AR	DE1238002ar04	Conducted Sample
Sample Parameter		Value
Serial No.	PA1703J0001456	
HW Version	CR-FPM8X0AE*	
SW Version	2019-07	
Comment	-	
Integral Antenna	Replaced by temporary antenna connector	

Sample Name	Sample Code	Description
EUT AS	DE1238002as04	Conducted Sample
Sample Parameter	Value	
Serial No.	PA1703J0001468	
HW Version	CR-FPM8X0AE*	
SW Version	2019-07	
Comment	-	
Integral Antenna	Replaced by temporary antenna connector	

NOTE: The short description 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
-	-	-

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_AR04	EUT AR,	Setup for conducted measurement
S01_AD01	EUT D,	Setup for radiated measurement
S01_AG01	EUT G,	Setup for radiated measurement
S01_AL01	EUT L,	Setup for radiated measurement
S01_AM01	EUT M,	Setup for conducted measurement
S01_AS04	EUT AS,	Setup for conducted measurement

4.6 OPERATING MODES

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

4.6.1 TEST CHANNELS

U-NII-Subband 1 5150 - 5250 MHz			U-NII-Subband 3 5725 - 5850 MHz			Nom. BW
low	mid	high	low	mid	high	20 MHz
36	44	48	149	157	165	Ch.-No.
5180	5220	5240	5745	5785	5825	MHz

low	mid	high	low	mid	high	40 MHz
38	-	46	151	-	159	Ch.-No.
5190	-	5230	5755	-	5795	MHz
low	mid	high	low	mid	high	80 MHz
42	-		-	155	-	Ch.-No.
5210	-		-	5775	-	MHz

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 26 DB BANDWIDTH

Standard **FCC Part 15 Subpart E**

The test was performed according to:

ANSI C63.10

5.1.1 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 (widest) emission bandwidth.

The EUT was connected to spectrum analyzer via a short coax cable with a known loss.

Analyzer settings:

- Please see measurement plots

5.1.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart E, §15.403 (i)

There exist no applicable limits for the U-NII subbands 1, 2A and 2C. The test was performed to determine the limits for the "Maximum Conducted Output Power" test case. Therefore no result was applied.

5.1.3 TEST PROTOCOL

Android Core 0

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	Subband	26 dB Bandwidth [MHz]
WLAN a	low	U-NII-1	21.6
WLAN a	mid	U-NII-1	21.5
WLAN a	high	U-NII-1	21.5
WLAN a	low	U-NII-3	21.4
WLAN a	mid	U-NII-3	21.5
WLAN a	high	U-NII-3	21.5
WLAN n 20 MHz	low	U-NII-1	22.0
WLAN n 20 MHz	mid	U-NII-1	22.1
WLAN n 20 MHz	high	U-NII-1	21.9
WLAN n 20 MHz	low	U-NII-3	22.0
WLAN n 20 MHz	mid	U-NII-3	22.0
WLAN n 20 MHz	high	U-NII-3	22.0
WLAN n 40 MHz	low	U-NII-1	40.7
WLAN n 40 MHz	high	U-NII-1	40.4
WLAN n 40 MHz	low	U-NII-3	40.2
WLAN n 40 MHz	high	U-NII-3	40.4
WLAN ac 20 MHz	low	U-NII-1	22.1
WLAN ac 20 MHz	mid	U-NII-1	22.0
WLAN ac 20 MHz	high	U-NII-1	22.1
WLAN ac 20 MHz	low	U-NII-3	22.0
WLAN ac 20 MHz	mid	U-NII-3	21.9
WLAN ac 20 MHz	high	U-NII-3	22.0
WLAN ac 40 MHz	low	U-NII-1	40.7
WLAN ac 40 MHz	high	U-NII-1	40.4
WLAN ac 40 MHz	low	U-NII-3	40.4
WLAN ac 40 MHz	high	U-NII-3	40.1
WLAN ac 80 MHz	mid	U-NII-1	84.0
WLAN ac 80 MHz	mid	U-NII-3	83.0

Android Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	Subband	26 dB Bandwidth [MHz]
WLAN a	low	U-NII-1	21.7
WLAN a	mid	U-NII-1	21.5
WLAN a	high	U-NII-1	21.5
WLAN a	low	U-NII-3	21.6
WLAN a	mid	U-NII-3	21.6
WLAN a	high	U-NII-3	21.6
WLAN n 20 MHz	low	U-NII-1	22.1
WLAN n 20 MHz	mid	U-NII-1	21.9
WLAN n 20 MHz	high	U-NII-1	22.0
WLAN n 20 MHz	low	U-NII-3	22.1
WLAN n 20 MHz	mid	U-NII-3	22.0
WLAN n 20 MHz	high	U-NII-3	22.1
WLAN n 40 MHz	low	U-NII-1	40.4
WLAN n 40 MHz	high	U-NII-1	40.5
WLAN n 40 MHz	low	U-NII-3	40.2
WLAN n 40 MHz	high	U-NII-3	40.1
WLAN ac 20 MHz	low	U-NII-1	21.9
WLAN ac 20 MHz	mid	U-NII-1	22.0
WLAN ac 20 MHz	high	U-NII-1	21.9
WLAN ac 20 MHz	low	U-NII-3	22.0
WLAN ac 20 MHz	mid	U-NII-3	21.9
WLAN ac 20 MHz	high	U-NII-3	22.0

WLAN ac 40 MHz	low	U-NII-1	40.4
WLAN ac 40 MHz	high	U-NII-1	40.4
WLAN ac 40 MHz	low	U-NII-3	40.4
WLAN ac 40 MHz	high	U-NII-3	40.5
WLAN ac 80 MHz	mid	U-NII-1	83.5
WLAN ac 80 MHz	mid	U-NII-3	82.5

Linux Core 0

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	Subband	26 dB Bandwidth [MHz]
WLAN a	low	U-NII-1	21.6
WLAN a	mid	U-NII-1	21.5
WLAN a	high	U-NII-1	21.4
WLAN a	low	U-NII-3	21.5
WLAN a	mid	U-NII-3	21.5
WLAN a	high	U-NII-3	21.6
WLAN n 20 MHz	low	U-NII-1	21.8
WLAN n 20 MHz	mid	U-NII-1	21.9
WLAN n 20 MHz	high	U-NII-1	22.0
WLAN n 20 MHz	low	U-NII-3	22.1
WLAN n 20 MHz	mid	U-NII-3	22.0
WLAN n 20 MHz	high	U-NII-3	21.9
WLAN n 40 MHz	low	U-NII-1	40.4
WLAN n 40 MHz	high	U-NII-1	40.1
WLAN n 40 MHz	low	U-NII-3	40.2
WLAN n 40 MHz	high	U-NII-3	40.4
WLAN ac 20 MHz	low	U-NII-1	22.0
WLAN ac 20 MHz	mid	U-NII-1	21.9
WLAN ac 20 MHz	high	U-NII-1	21.9
WLAN ac 20 MHz	low	U-NII-3	22.0
WLAN ac 20 MHz	mid	U-NII-3	22.0
WLAN ac 20 MHz	high	U-NII-3	21.8
WLAN ac 40 MHz	low	U-NII-1	40.5
WLAN ac 40 MHz	high	U-NII-1	40.1
WLAN ac 40 MHz	low	U-NII-3	40.4
WLAN ac 40 MHz	high	U-NII-3	40.2
WLAN ac 80 MHz	mid	U-NII-1	83.5
WLAN ac 80 MHz	mid	U-NII-3	83.5

Linux Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	Subband	26 dB Bandwidth [MHz]
WLAN a	low	U-NII-1	21.5
WLAN a	mid	U-NII-1	21.5
WLAN a	high	U-NII-1	21.5
WLAN a	low	U-NII-3	21.6
WLAN a	mid	U-NII-3	21.6
WLAN a	high	U-NII-3	21.6
WLAN n 20 MHz	low	U-NII-1	21.9
WLAN n 20 MHz	mid	U-NII-1	22.0
WLAN n 20 MHz	high	U-NII-1	21.9
WLAN n 20 MHz	low	U-NII-3	22.0
WLAN n 20 MHz	mid	U-NII-3	21.9
WLAN n 20 MHz	high	U-NII-3	22.1
WLAN n 40 MHz	low	U-NII-1	40.2
WLAN n 40 MHz	high	U-NII-1	40.4
WLAN n 40 MHz	low	U-NII-3	40.1
WLAN n 40 MHz	high	U-NII-3	40.2
WLAN ac 20 MHz	low	U-NII-1	21.9
WLAN ac 20 MHz	mid	U-NII-1	21.9
WLAN ac 20 MHz	high	U-NII-1	21.9
WLAN ac 20 MHz	low	U-NII-3	21.9
WLAN ac 20 MHz	mid	U-NII-3	21.9
WLAN ac 20 MHz	high	U-NII-3	21.8
WLAN ac 40 MHz	low	U-NII-1	40.4
WLAN ac 40 MHz	high	U-NII-1	40.2
WLAN ac 40 MHz	low	U-NII-3	40.1
WLAN ac 40 MHz	high	U-NII-3	40.4
WLAN ac 80 MHz	mid	U-NII-1	83.5
WLAN ac 80 MHz	mid	U-NII-3	83.5

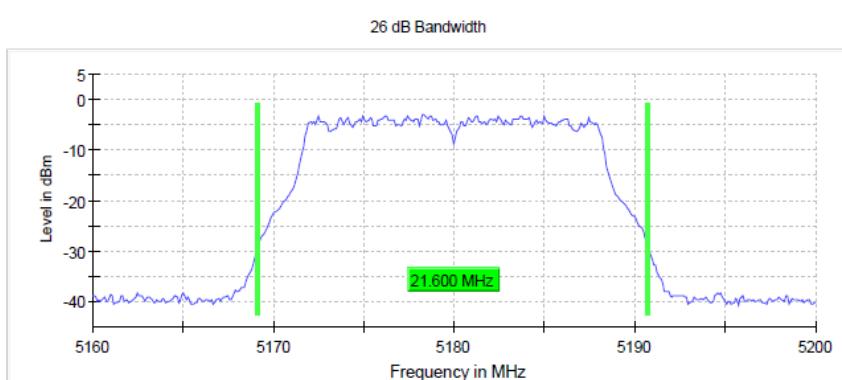
Remark: Please see next sub-clause for the measurement plot.

5.1.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

Android Core 0

Radio Technology = WLAN a, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)

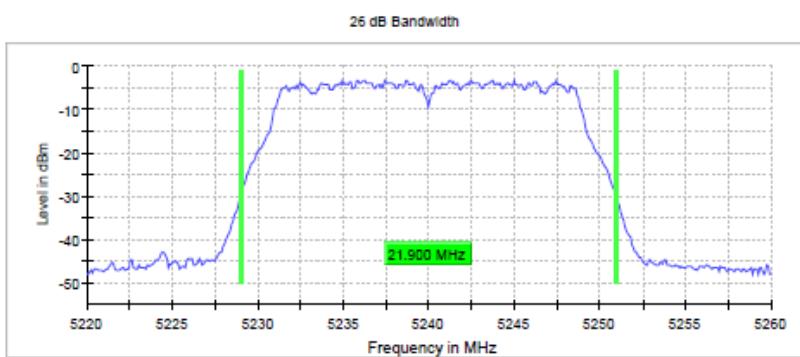
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5180.000000	21.600000	--	--	5169.150000	5190.750000	-2.9	PASS



Setting	Instrument Value
Start Frequency	5.16000 GHz
Stop Frequency	5.20000 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweptime	28.477 μs
Reference Level	0.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	31 / max_150
Stable	5 / 5
Max Stable Difference	0.27 dB

Radio Technology = WLAN n 20 MHz, Operating Frequency = high, Subband = U-NII-1
(S01_AR04)

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5240.000000	21.900000	--	--	5229.050000	5250.950000	-3.2	PASS



Setting	Instrument Value
Start Frequency	5.22000 GHz
Stop Frequency	5.26000 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweptime	28.477 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	42 / max_150
Stable	5 / 5
Max Stable Difference	0.13 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = low, Subband = U-NII-3
(S01_AR04)

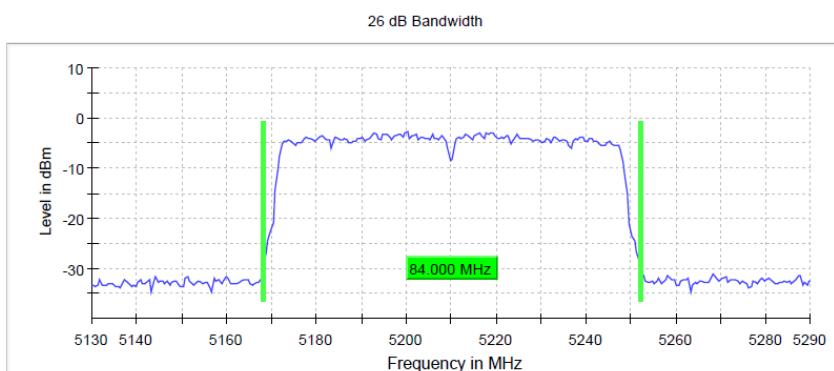


Setting	Instrument Value
Start Frequency	5.71500 GHz
Stop Frequency	5.79500 GHz
Span	80.000 MHz
RBW	300.000 kHz
VBW	1.000 MHz
SweepPoints	533
Sweptime	31.621 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	103 / max_150
Stable	5 / 5
Max Stable Difference	0.22 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-3
(S01_AR04)

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5210.000000	84.000000	--	--	5168.250000	5252.250000	-2.7	PASS



Measurement

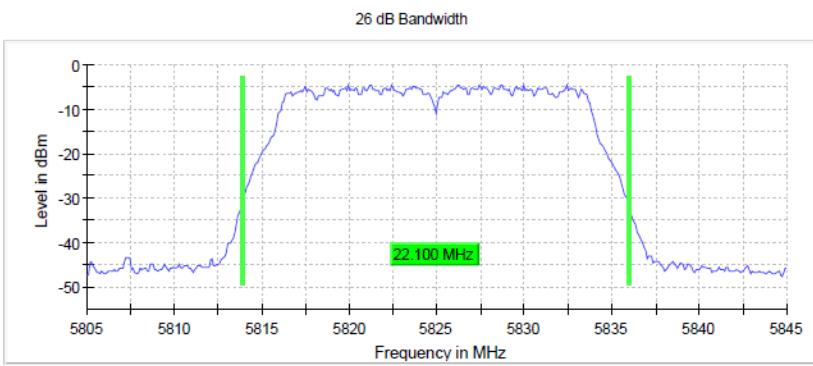
Setting	Instrument Value
Start Frequency	5.13000 GHz
Stop Frequency	5.29000 GHz
Span	160.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	320
Sweeptime	22.875 µs
Reference Level	0.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	94 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Android Core 1

Radio Technology = WLAN n 20 MHz, Operating Frequency = high, Subband = U-NII-3
(S01_AR04)

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5825.000000	22.100000	--	--	5813.850000	5835.950000	-4.5	PASS



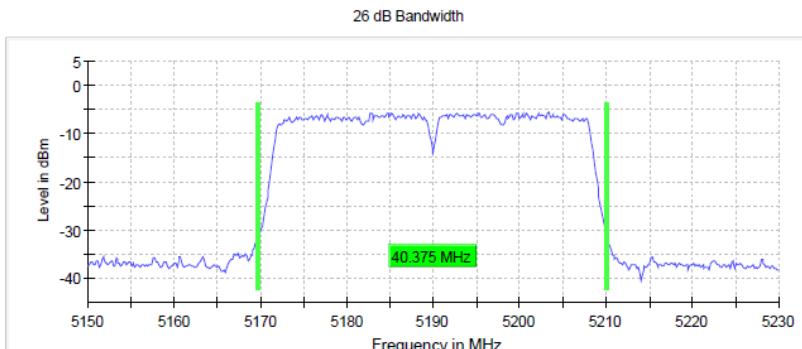
Measurement

Setting	Instrument Value
Start Frequency	5.80500 GHz
Stop Frequency	5.84500 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	28.477 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	90 / max. 150
Stable	5 / 5
Max Stable Difference	0.06 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5190.000000	40.375234	--	--	5169.737336	5210.112570	-5.6	PASS



Measurement

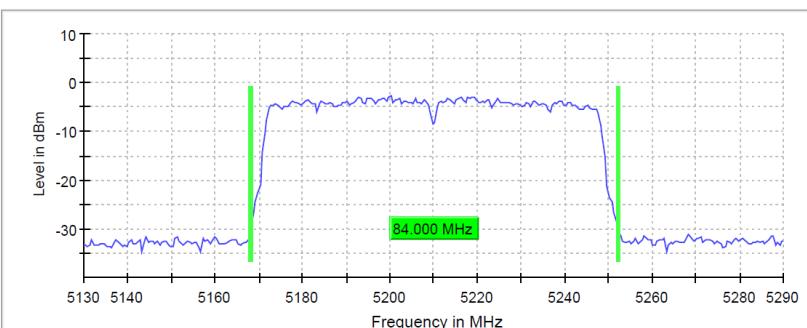
Setting	Instrument Value
Start Frequency	5.15000 GHz
Stop Frequency	5.23000 GHz
Span	80.000 MHz
RBW	300.000 kHz
VBW	1.000 MHz
SweepPoints	533
Sweeptime	31.621 µs
Reference Level	0.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	88 / max. 150
Stable	5 / 5
Max Stable Difference	0.24 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1
(S01_AR04)

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5210.000000	84.000000	---	---	5168.250000	5252.250000	-2.7	PASS

26 dB Bandwidth



Measurement

Setting	Instrument Value
Start Frequency	5.13000 GHz
Stop Frequency	5.29000 GHz
Span	160.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	320
Sweptime	22.875 µs
Reference Level	0.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	101 / max. 150
Stable	5 / 5
Max Stable Difference	0.24 dB

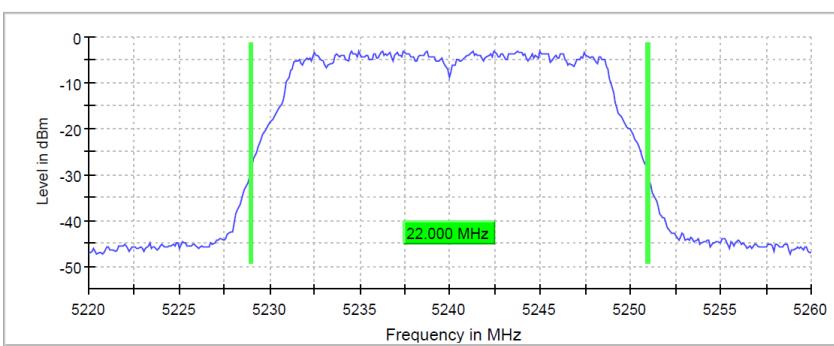
Linux Core 0

Radio Technology = WLAN n 20 MHz, Operating Frequency = high, Subband = U-NII-1
(S01_AR04)

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5240.000000	22.000000	---	---	5228.950000	5250.950000	-3.1	PASS

26 dB Bandwidth



Measurement

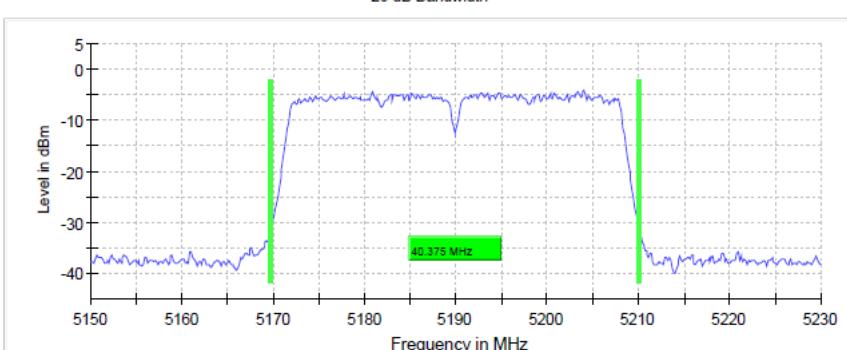
Setting	Instrument Value
Start Frequency	5.22000 GHz
Stop Frequency	5.26000 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweptime	28.477 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	100 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5190.000000	40.375234	---	---	5169.737336	5210.112570	-4.2	PASS

26 dB Bandwidth



Measurement

Setting	Instrument Value
Start Frequency	5.15000 GHz
Stop Frequency	5.23000 GHz
Span	80.000 MHz
RBW	300.000 kHz
VBW	1.000 MHz
SweepPoints	533
Sweptime	31.621 µs
Reference Level	0.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	95 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1
(S01_AR04)

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5210.000000	83.500000	--	--	5168.250000	5251.750000	-3.4	PASS

26 dB Bandwidth



Measurement

Setting	Instrument Value
Start Frequency	5.13000 GHz
Stop Frequency	5.29000 GHz
Span	160.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	320
Sweptime	22.875 μs
Reference Level	0.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	79 / max. 150
Stable	5 / 5
Max Stable Difference	0.28 dB

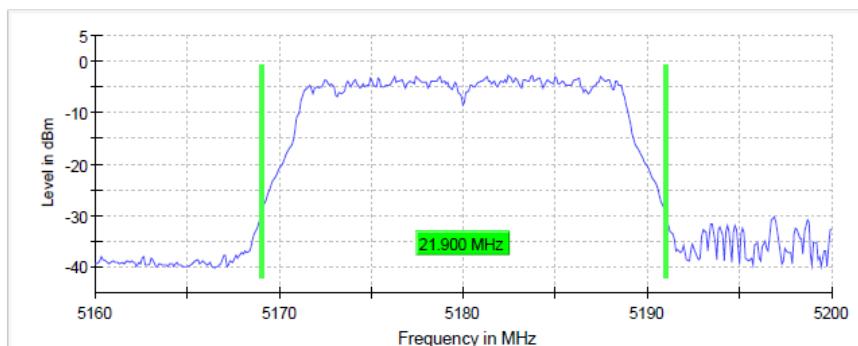
Linux Core 1

Radio Technology = WLAN n 20 MHz, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)

26 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5180.000000	21.900000	--	--	5169.050000	5190.950000	-2.8	PASS

26 dB Bandwidth



Measurement

Setting	Instrument Value
Start Frequency	5.16000 GHz
Stop Frequency	5.20000 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweptime	28.477 μs
Reference Level	0.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	79 / max. 150
Stable	5 / 5
Max Stable Difference	0.22 dB

5.1.5 TEST EQUIPMENT USED

- R&S TS8997

5.2 6 DB BANDWIDTH

Standard **FCC Part 15 Subpart E**

The test was performed according to:

ANSI C63.10

5.2.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was setup in a shielded room 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 spectrum analyzer via a short coax cable with a known loss.

Analyzer settings:

- See measurement plots

5.2.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart E, §15.407 (e)

Within the 5.725-5.850 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

5.2.3 TEST PROTOCOL

Android Core 0

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	6 dB Bandwidth [MHz]	Limit [MHz]	Margin [MHz]	Min. 6 dB Frequency [MHz]	Max. 6 dB Frequency [MHz]
WLAN a	low	16.5	0.5	15.95	5736.78	5753.23
WLAN a	mid	16.5	0.5	15.95	5776.78	5793.23
WLAN a	high	16.5	0.5	15.95	5816.78	5833.23
WLAN n 20 MHz	low	17.6	0.5	17.15	5736.18	5753.83
WLAN n 20 MHz	mid	17.6	0.5	17.15	5776.18	5793.83
WLAN n 20 MHz	high	17.6	0.5	17.15	5816.18	5833.83
WLAN n 40 MHz	low	36.5	0.5	36.05	5736.73	5773.28
WLAN n 40 MHz	high	36.5	0.5	36.05	5776.73	5813.28
WLAN ac 20 MHz	low	17.6	0.5	17.15	5736.18	5753.83
WLAN ac 20 MHz	mid	17.6	0.5	17.15	5776.18	5793.83
WLAN ac 20 MHz	high	17.6	0.5	17.15	5816.18	5833.83
WLAN ac 40 MHz	low	36.5	0.5	36.05	5736.73	5773.28
WLAN ac 40 MHz	high	36.5	0.5	36.05	5776.73	5813.28
WLAN ac 80 MHz	mid	76.5	0.5	75.95	5736.78	5813.23

Android Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	6 dB Bandwidth [MHz]	Limit [MHz]	Margin [MHz]	Min. 6 dB Frequency [MHz]	Max. 6 dB Frequency [MHz]
WLAN a	low	16.5	0.5	15.95	5736.78	5753.23
WLAN a	mid	16.5	0.5	15.95	5776.78	5793.23
WLAN a	high	16.5	0.5	15.95	5816.78	5833.23
WLAN n 20 MHz	low	16.5	0.5	15.95	5736.78	5753.23
WLAN n 20 MHz	mid	16.5	0.5	15.95	5776.78	5793.23
WLAN n 20 MHz	high	16.5	0.5	15.95	5816.78	5833.23
WLAN n 40 MHz	low	36.5	0.5	36.05	5736.73	5773.28
WLAN n 40 MHz	high	36.5	0.5	36.05	5776.73	5813.28
WLAN ac 20 MHz	low	17.6	0.5	17.15	5736.18	5753.83
WLAN ac 20 MHz	mid	17.6	0.5	17.15	5776.18	5793.83
WLAN ac 20 MHz	high	17.6	0.5	17.15	5816.18	5833.83
WLAN ac 40 MHz	low	36.5	0.5	36.05	5736.73	5773.28
WLAN ac 40 MHz	high	36.5	0.5	36.05	5776.73	5813.28
WLAN ac 80 MHz	mid	76.5	0.5	76.05	5736.73	5813.28

Linux Core 0

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	6 dB Bandwidth [MHz]	Limit [MHz]	Margin [MHz]	Min. 6 dB Frequency [MHz]	Max. 6 dB Frequency [MHz]
WLAN a	low	16.40	0.5	15.90	5736.78	5753.18
WLAN a	mid	16.40	0.5	15.90	5776.78	5793.18
WLAN a	high	16.40	0.5	15.90	5816.78	5833.18
WLAN n 20 MHz	low	17.70	0.5	17.20	5736.13	5753.83
WLAN n 20 MHz	mid	17.70	0.5	17.20	5776.13	5793.83
WLAN n 20 MHz	high	17.70	0.5	17.20	5816.13	5833.83
WLAN n 40 MHz	low	36.40	0.5	35.90	5736.78	5773.18
WLAN n 40 MHz	high	36.40	0.5	35.90	5776.78	5813.18
WLAN ac 20 MHz	low	17.70	0.5	17.20	5736.13	5753.83
WLAN ac 20 MHz	mid	17.70	0.5	17.20	5776.13	5793.83
WLAN ac 20 MHz	high	17.70	0.5	17.20	5816.13	5833.83
WLAN ac 40 MHz	low	36.40	0.5	35.90	5736.78	5773.18
WLAN ac 40 MHz	high	36.40	0.5	35.90	5776.78	5813.18
WLAN ac 80 MHz	mid	76.05	0.5	75.55	5736.73	5812.78

Linux Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	6 dB Bandwidth [MHz]	Limit [MHz]	Margin [MHz]	Min. 6 dB Frequency [MHz]	Max. 6 dB Frequency [MHz]
WLAN a	low	16.40	0.5	15.90	5736.78	5753.18
WLAN a	mid	16.40	0.5	15.90	5776.78	5793.18
WLAN a	high	16.40	0.5	15.90	5816.78	5833.18
WLAN n 20 MHz	low	17.70	0.5	17.20	5736.13	5753.83
WLAN n 20 MHz	mid	17.70	0.5	17.20	5776.13	5793.83
WLAN n 20 MHz	high	17.70	0.5	17.20	5816.13	5833.83
WLAN n 40 MHz	low	36.40	0.5	35.90	5736.78	5773.18
WLAN n 40 MHz	high	36.40	0.5	35.90	5776.78	5813.18
WLAN ac 20 MHz	low	17.70	0.5	17.20	5736.13	5753.83
WLAN ac 20 MHz	mid	17.70	0.5	17.20	5776.13	5793.83
WLAN ac 20 MHz	high	17.70	0.5	17.20	5816.13	5833.83
WLAN ac 40 MHz	low	36.40	0.5	35.90	5736.78	5773.18
WLAN ac 40 MHz	high	36.40	0.5	35.90	5776.78	5813.18
WLAN ac 80 MHz	mid	76.15	0.5	75.65	5737.03	5813.18

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

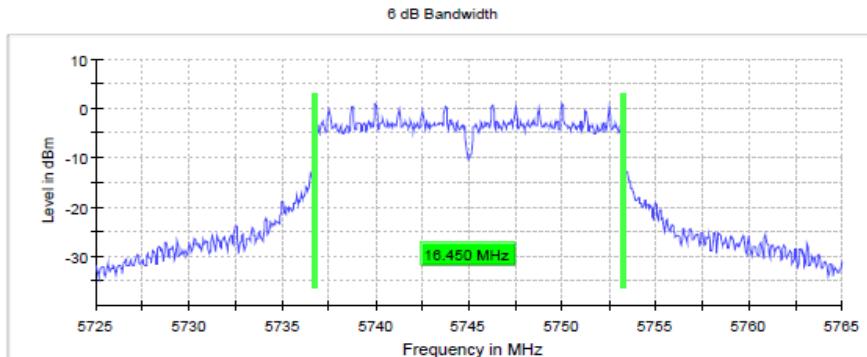
5.2.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

Android Core 0

Radio Technology = WLAN a, Operating Frequency = low, Subband = U-NII-3
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5745.000000	16.450000	0.500000	--	5736.775000	5753.225000	0.8	PASS



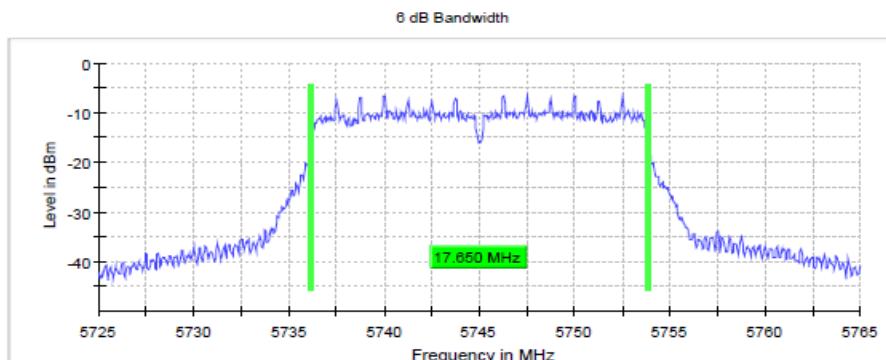
Setting	Instrument Value
Start Frequency	5.72500 GHz
Stop Frequency	5.76500 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweptime	56.836 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	41 / max_150
Stable	5 / 5
Max Stable Difference	0.21 dB

Android Core 1

Radio Technology = WLAN ac 20 MHZ, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5745.000000	17.650000	0.500000	--	5736.175000	5753.825000	-6.6	PASS



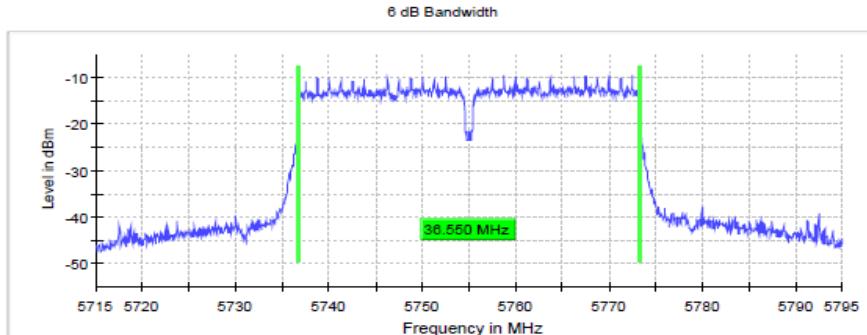
Measurement

Setting	Instrument Value
Start Frequency	5.72500 GHz
Stop Frequency	5.76500 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweptime	56.836 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	43 / max_150
Stable	5 / 5
Max Stable Difference	0.11 dB

Radio Technology = WLAN n 40 MHZ, Operating Frequency = low, Subband = U-NII-I
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5755.000000	36.550000	0.500000	--	5736.725000	5773.275000	-9.4	PASS



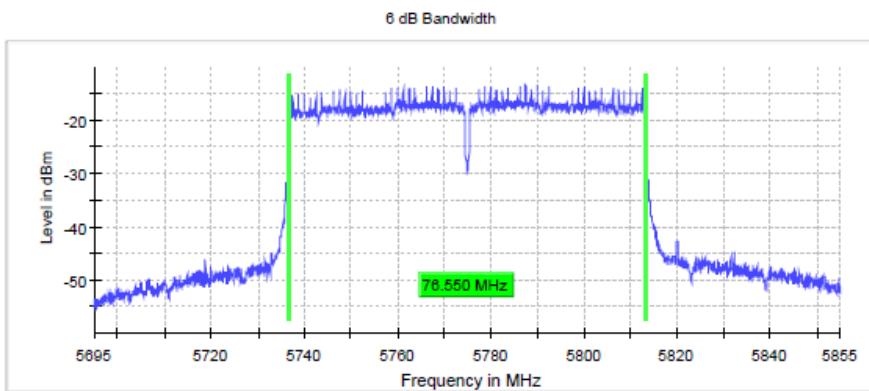
Measurement

Setting	Instrument Value
Start Frequency	5.71500 GHz
Stop Frequency	5.79500 GHz
Span	80.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1600
Sweptime	94.727 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	101 / max_150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHZ, Operating Frequency = mid, Subband = U-NII-I
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5775.000000	76.550000	0.500000	--	5736.725000	5813.275000	-13.3	PASS



Measurement

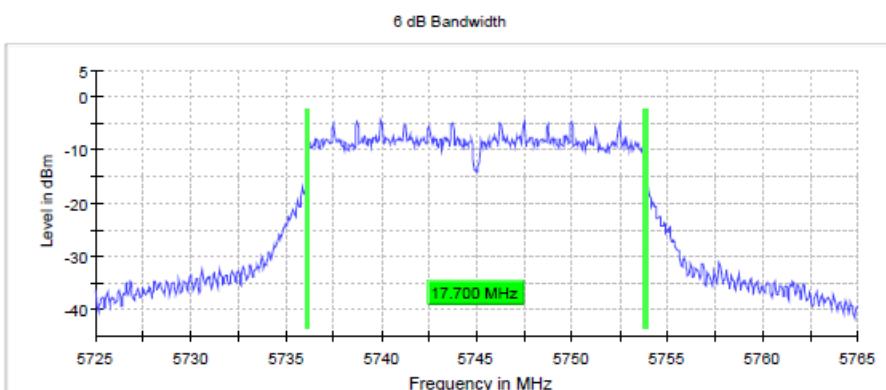
Setting	Instrument Value
Start Frequency	5.69500 GHz
Stop Frequency	5.85500 GHz
Span	160.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	3200
Sweptime	189.453 us
Reference Level	-20.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	120 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Linux Core 0

Radio Technology = WLAN n 20 MHZ, Operating Frequency = low, Subband = U-NII-3
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5745.000000	17.700000	0.500000	--	5736.125000	5753.825000	-4.4	PASS



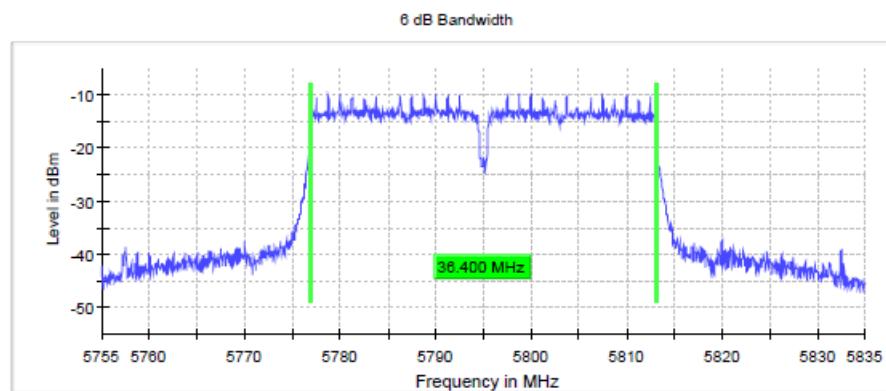
Measurement

Setting	Instrument Value
Start Frequency	5.72500 GHz
Stop Frequency	5.76500 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweptime	56.836 us
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	70 / max. 150
Stable	5 / 5
Max Stable Difference	0.24 dB

Radio Technology = WLAN n 40 MHZ, Operating Frequency = low, Subband = U-NII-I
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5795.000000	36.400000	0.500000	--	5776.775000	5813.175000	-9.7	PASS



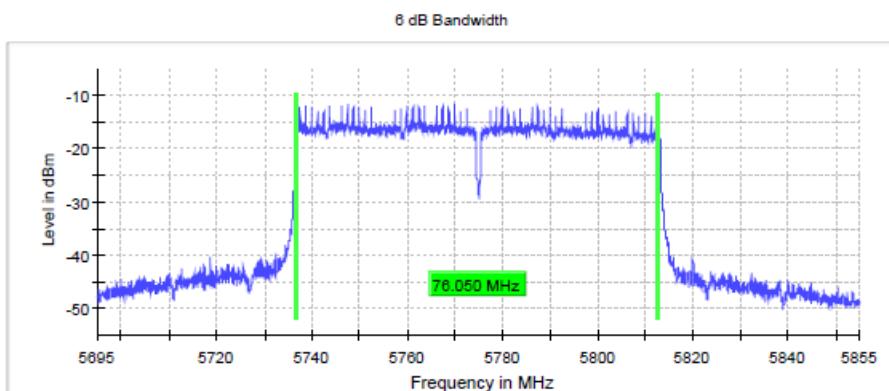
Measurement

Setting	Instrument Value
Start Frequency	5.75500 GHz
Stop Frequency	5.83500 GHz
Span	80.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1600
Sweptime	94.727 us
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	87 / max. 150
Stable	5 / 5
Max Stable Difference	0.21 dB

Radio Technology = WLAN ac 80 MHZ, Operating Frequency = mid, Subband = U-NII-I
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5775.000000	76.050000	0.500000	--	5736.725000	5812.775000	-11.7	PASS



Measurement

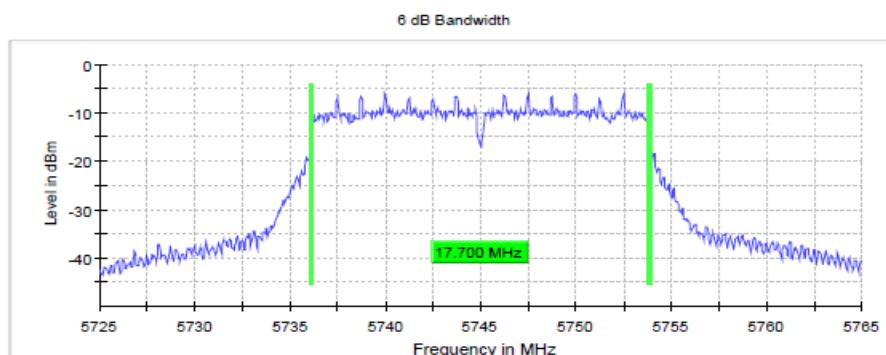
Setting	Instrument Value
Start Frequency	5.69500 GHz
Stop Frequency	5.85500 GHz
Span	160.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	3200
Sweptime	189.453 us
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	94 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Linux Core 1

Radio Technology = WLAN n 20 MHZ, Operating Frequency = low, Subband = U-NII-3
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5745.000000	17.700000	0.500000	--	5736.125000	5753.825000	-6.1	PASS



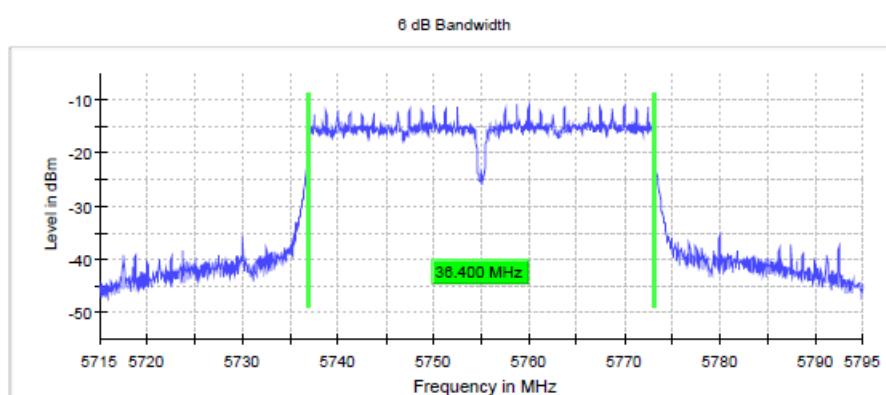
Measurement

Setting	Instrument Value
Start Frequency	5.72500 GHz
Stop Frequency	5.76500 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweptime	56.836 us
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	78 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN n 40 MHZ, Operating Frequency = low, Subband = U-NII-3
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5755.000000	36.400000	0.500000	--	5736.775000	5773.175000	-10.7	PASS



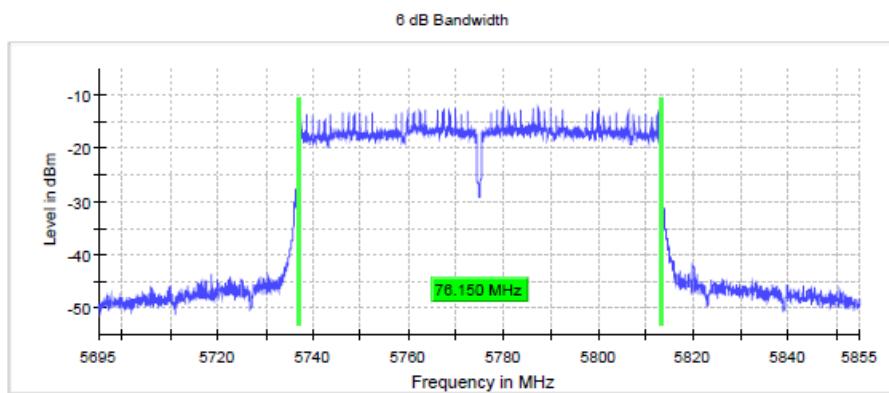
Measurement

Setting	Instrument Value
Start Frequency	5.71500 GHz
Stop Frequency	5.79500 GHz
Span	80.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1600
Sweptime	94.727 us
Reference Level	-20.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	84 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHZ, Operating Frequency = mid, Subband = U-NII-I
(S01_AR04)

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBm)	Result
5775.000000	76.150000	0.500000	---	5737.025000	5813.175000	-12.4	PASS



Measurement

Setting	Instrument Value
Start Frequency	5.69500 GHz
Stop Frequency	5.85500 GHz
Span	160.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	3200
Sweptime	189.453 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	87 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

5.2.5 TEST EQUIPMENT USED

- R&S TS8997

5.3 99 % BANDWIDTH

Standard **FCC Part 15 Subpart E**

The test was performed according to:

ANSI C63.10

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 results recorded were measured with the modulation which produce the worst-case (widest) emission bandwidth.

The EUT was connected to spectrum analyzer via a short coax cable with a known loss.

Analyzer settings:

- Please see measurement plots

5.3.2 TEST REQUIREMENTS / LIMITS

No applicable limit:

5.3.3 TEST PROTOCOL

Android Core 0

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	Subband	99% Bandwidth [MHz]
WLAN a	low	U-NII-1	16.8
WLAN a	mid	U-NII-1	16.8
WLAN a	high	U-NII-1	16.8
WLAN a	low	U-NII-3	16.8
WLAN a	mid	U-NII-3	16.8
WLAN a	high	U-NII-3	16.8
WLAN n 20 MHz	low	U-NII-1	18.0
WLAN n 20 MHz	mid	U-NII-1	17.9
WLAN n 20 MHz	high	U-NII-1	18.0
WLAN n 20 MHz	low	U-NII-3	18.0
WLAN n 20 MHz	mid	U-NII-3	18.0
WLAN n 20 MHz	high	U-NII-3	18.0
WLAN n 40 MHz	low	U-NII-1	36.8
WLAN n 40 MHz	high	U-NII-1	36.5
WLAN n 40 MHz	low	U-NII-3	36.8
WLAN n 40 MHz	high	U-NII-3	36.8
WLAN ac 20 MHz	low	U-NII-1	18.0
WLAN ac 20 MHz	mid	U-NII-1	18.0
WLAN ac 20 MHz	high	U-NII-1	18.0
WLAN ac 20 MHz	low	U-NII-3	18.0
WLAN ac 20 MHz	mid	U-NII-3	18.1
WLAN ac 20 MHz	high	U-NII-3	18.0
WLAN ac 40 MHz	low	U-NII-1	36.8
WLAN ac 40 MHz	high	U-NII-1	36.5
WLAN ac 40 MHz	low	U-NII-3	36.8
WLAN ac 40 MHz	high	U-NII-3	36.8
WLAN ac 80 MHz	mid	U-NII-1	76.0
WLAN ac 80 MHz	mid	U-NII-3	76.5

Android Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	Subband	99% Bandwidth [MHz]
WLAN a	low	U-NII-1	16.8
WLAN a	mid	U-NII-1	16.7
WLAN a	high	U-NII-1	16.8
WLAN a	low	U-NII-3	16.8
WLAN a	mid	U-NII-3	16.8
WLAN a	high	U-NII-3	16.8
WLAN n 20 MHz	low	U-NII-1	17.9
WLAN n 20 MHz	mid	U-NII-1	17.9
WLAN n 20 MHz	high	U-NII-1	18.0
WLAN n 20 MHz	low	U-NII-3	18.1
WLAN n 20 MHz	mid	U-NII-3	18.0
WLAN n 20 MHz	high	U-NII-3	18.0
WLAN n 40 MHz	low	U-NII-1	36.8
WLAN n 40 MHz	high	U-NII-1	36.8
WLAN n 40 MHz	low	U-NII-3	36.8
WLAN n 40 MHz	high	U-NII-3	36.8
WLAN ac 20 MHz	low	U-NII-1	18.0
WLAN ac 20 MHz	mid	U-NII-1	18.1
WLAN ac 20 MHz	high	U-NII-1	18.0
WLAN ac 20 MHz	low	U-NII-3	18.0
WLAN ac 20 MHz	mid	U-NII-3	17.9

WLAN ac 20 MHz	high	U-NII-3	18.0
WLAN ac 40 MHz	low	U-NII-1	36.8
WLAN ac 40 MHz	high	U-NII-1	36.8
WLAN ac 40 MHz	low	U-NII-3	36.8
WLAN ac 40 MHz	high	U-NII-3	36.5
WLAN ac 80 MHz	mid	U-NII-1	76.5
WLAN ac 80 MHz	mid	U-NII-3	76.5

Linux Core 0

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	Subband	99% Bandwidth [MHz]
WLAN a	low	U-NII-1	16.8
WLAN a	mid	U-NII-1	16.8
WLAN a	high	U-NII-1	16.8
WLAN a	low	U-NII-3	16.8
WLAN a	mid	U-NII-3	16.8
WLAN a	high	U-NII-3	16.8
WLAN n 20 MHz	low	U-NII-1	18.0
WLAN n 20 MHz	mid	U-NII-1	18.0
WLAN n 20 MHz	high	U-NII-1	18.0
WLAN n 20 MHz	low	U-NII-3	18.0
WLAN n 20 MHz	mid	U-NII-3	18.0
WLAN n 20 MHz	high	U-NII-3	18.0
WLAN n 40 MHz	low	U-NII-1	36.8
WLAN n 40 MHz	high	U-NII-1	36.8
WLAN n 40 MHz	low	U-NII-3	36.8
WLAN n 40 MHz	high	U-NII-3	36.8
WLAN ac 20 MHz	low	U-NII-1	18.0
WLAN ac 20 MHz	mid	U-NII-1	18.0
WLAN ac 20 MHz	high	U-NII-1	17.9
WLAN ac 20 MHz	low	U-NII-3	18.0
WLAN ac 20 MHz	mid	U-NII-3	18.0
WLAN ac 20 MHz	high	U-NII-3	18.0
WLAN ac 40 MHz	low	U-NII-1	36.5
WLAN ac 40 MHz	high	U-NII-1	36.8
WLAN ac 40 MHz	low	U-NII-3	36.8
WLAN ac 40 MHz	high	U-NII-3	36.8
WLAN ac 80 MHz	mid	U-NII-1	76.5
WLAN ac 80 MHz	mid	U-NII-3	76.0

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

Linux Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

Radio Technology	Operating Frequency	Subband	99% Bandwidth [MHz]
WLAN a	low	U-NII-1	16.7
WLAN a	mid	U-NII-1	16.8
WLAN a	high	U-NII-1	16.8
WLAN a	low	U-NII-3	16.8
WLAN a	mid	U-NII-3	16.8
WLAN a	high	U-NII-3	16.8
WLAN n 20 MHz	low	U-NII-1	18.0
WLAN n 20 MHz	mid	U-NII-1	18.0
WLAN n 20 MHz	high	U-NII-1	18.0
WLAN n 20 MHz	low	U-NII-3	18.0
WLAN n 20 MHz	mid	U-NII-3	18.0
WLAN n 20 MHz	high	U-NII-3	18.0
WLAN n 40 MHz	low	U-NII-1	36.8
WLAN n 40 MHz	high	U-NII-1	36.8
WLAN n 40 MHz	low	U-NII-3	36.8
WLAN n 40 MHz	high	U-NII-3	36.8
WLAN ac 20 MHz	low	U-NII-1	18.0
WLAN ac 20 MHz	mid	U-NII-1	18.0
WLAN ac 20 MHz	high	U-NII-1	17.9
WLAN ac 20 MHz	low	U-NII-3	18.0
WLAN ac 20 MHz	mid	U-NII-3	17.9
WLAN ac 20 MHz	high	U-NII-3	18.0
WLAN ac 40 MHz	low	U-NII-1	36.8
WLAN ac 40 MHz	high	U-NII-1	36.8
WLAN ac 40 MHz	low	U-NII-3	37.0
WLAN ac 40 MHz	high	U-NII-3	36.5
WLAN ac 80 MHz	mid	U-NII-1	76.0
WLAN ac 80 MHz	mid	U-NII-3	76.5

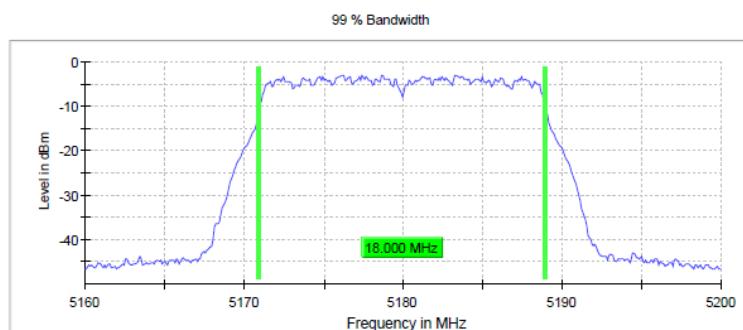
5.3.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

Android Core 0

Radio Technology = WLAN n 20 MHz, Operating Frequency = high, Subband = U-NII-1 (S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5180.000000	18.000000	—	—	5170.950000	5188.950000	PASS

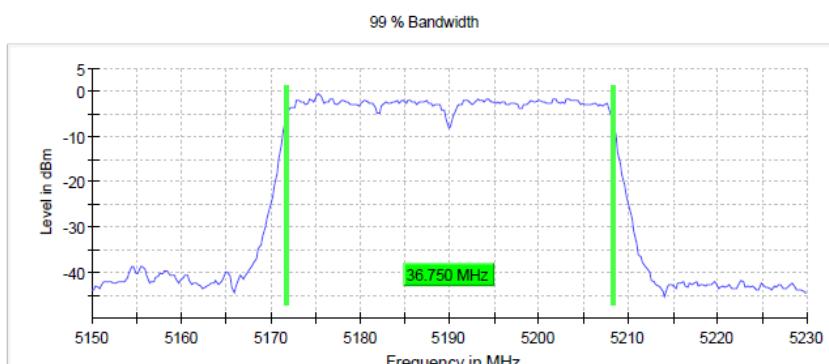


Setting	Instrument Value
Start Frequency	5.16000 GHz
Stop Frequency	5.20000 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	28.477 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	72 / max. 150
Stable	5 / 5
Max Stable Difference	0.14 dB

Radio Technology = WLAN ac 40 MHz, Operating Frequency = low, Subband = U-NII-1 (S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5190.000000	36.750000	—	—	5171.625000	5208.375000	PASS



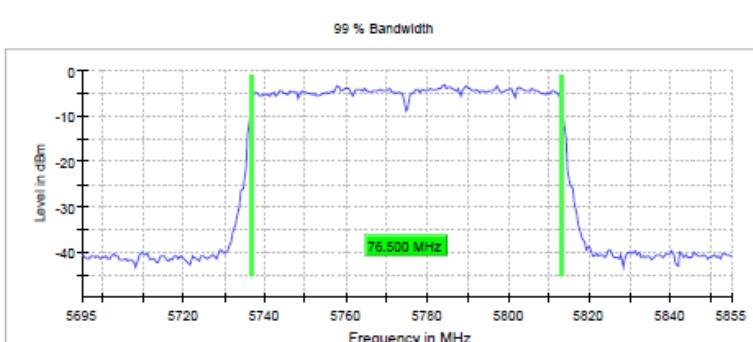
Measurement

Setting	Instrument Value
Start Frequency	5.15000 GHz
Stop Frequency	5.23000 GHz
Span	80.000 MHz
RBW	500.000 kHz
VBW	2.000 MHz
SweepPoints	320
Sweeptime	18.906 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	79 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1 (S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5775.000000	76.500000	—	—	5736.750000	5813.250000	PASS



Measurement

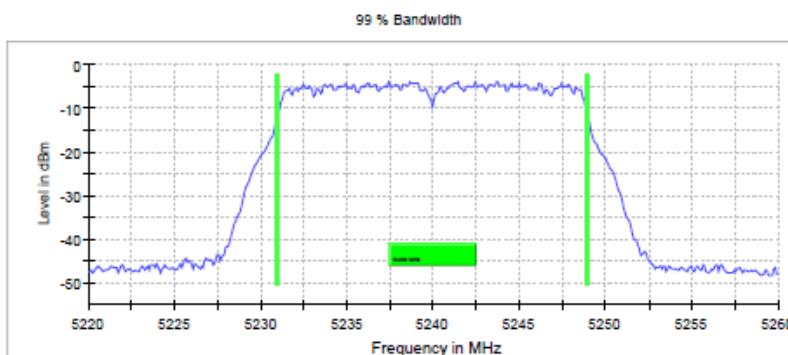
Setting	Instrument Value
Start Frequency	5.69500 GHz
Stop Frequency	5.85500 GHz
Span	160.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	320
Sweeptime	22.875 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	78 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Android Core 1

Radio Technology = WLAN ac 20 MHz, Operating Frequency = high, Subband = U-NII-1
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5240.000000	18.000000	—	—	5230.950000	5248.950000	PASS



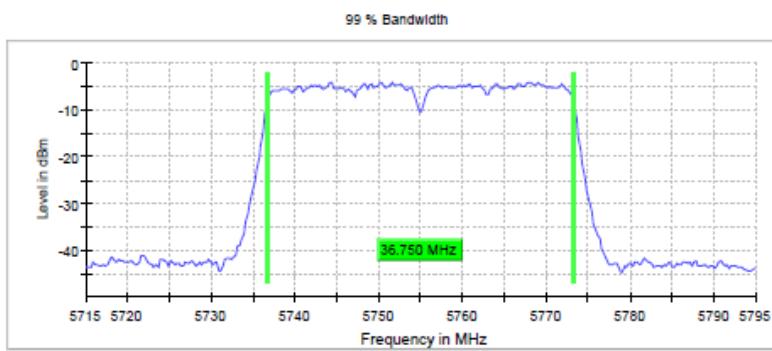
Measurement

Setting	Instrument Value
Start Frequency	5.22000 GHz
Stop Frequency	5.26000 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweptime	28.477 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	39 / max. 150
Stable	5 / 5
Max Stable Difference	0.08 dB

Radio Technology = WLAN ac 40 MHz, Operating Frequency = low, Subband = U-NII-3
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5755.000000	36.750000	—	—	5736.625000	5773.375000	PASS



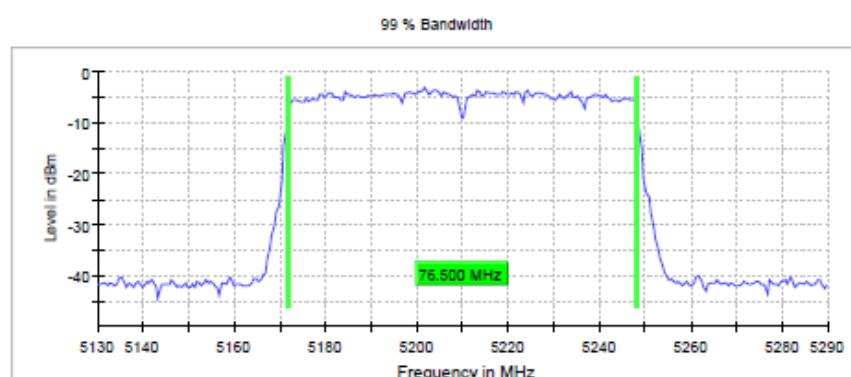
Measurement

Setting	Instrument Value
Start Frequency	5.71500 GHz
Stop Frequency	5.79500 GHz
Span	80.000 MHz
RBW	500.000 kHz
VBW	2.000 MHz
SweepPoints	320
Sweptime	18.906 µs
Reference Level	-20.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	73 / max. 150
Stable	5 / 5
Max Stable Difference	0.14 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5210.000000	76.500000	—	—	5171.750000	5248.250000	PASS



Measurement

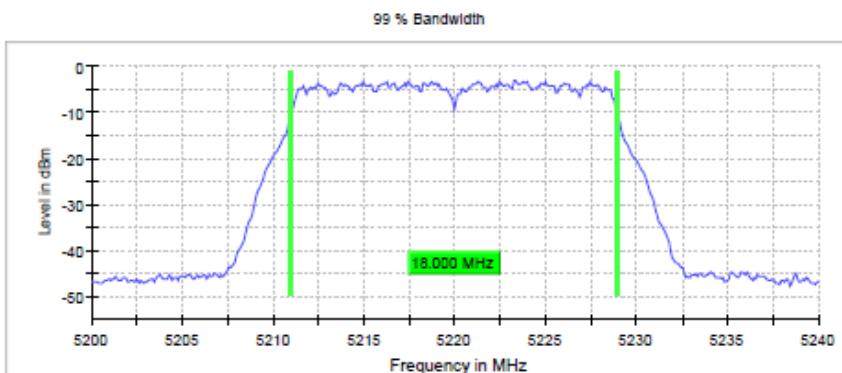
Setting	Instrument Value
Start Frequency	5.13000 GHz
Stop Frequency	5.29000 GHz
Span	160.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	320
Sweptime	22.875 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	94 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Linux Core 0

Radio Technology = WLAN n 20 MHz, Operating Frequency = mid, Subband = U-NII-1
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5220.000000	18.000000	--	--	5210.950000	5228.950000	PASS



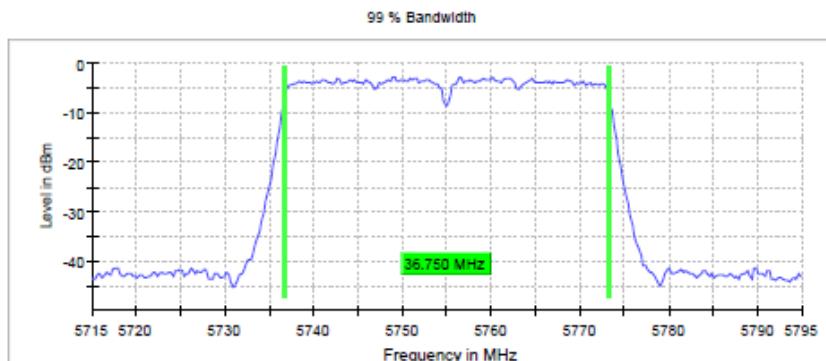
Measurement

Setting	Instrument Value
Start Frequency	5.20000 GHz
Stop Frequency	5.24000 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweptime	28.477 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	60 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 40 MHz, Operating Frequency = low, Subband = U-NII-3
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5755.000000	36.750000	--	--	5736.625000	5773.375000	PASS



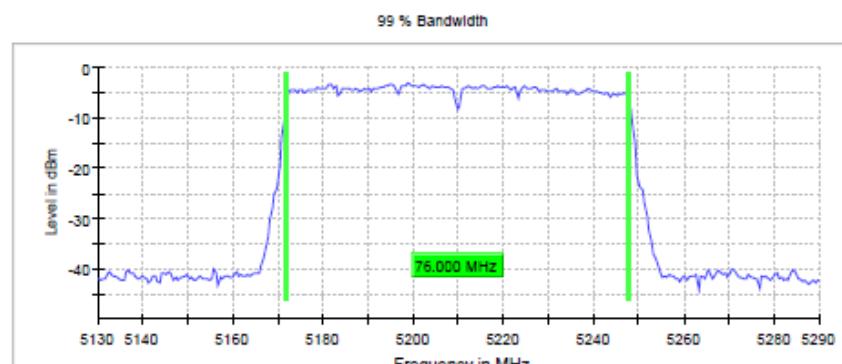
Measurement

Setting	Instrument Value
Start Frequency	5.71500 GHz
Stop Frequency	5.79500 GHz
Span	80.000 MHz
RBW	500.000 kHz
VBW	2.000 MHz
SweepPoints	320
Sweptime	18.906 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	43 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5210.000000	76.000000	--	--	5171.750000	5247.750000	PASS



Measurement

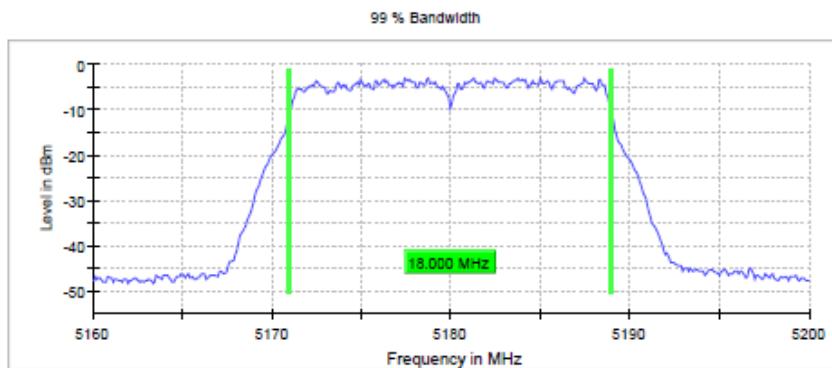
Setting	Instrument Value
Start Frequency	5.13000 GHz
Stop Frequency	5.29000 GHz
Span	160.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	320
Sweptime	22.875 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	74 / max. 150
Stable	5 / 5
Max Stable Difference	0.08 dB

Linux Core 1

Radio Technology = WLAN n 20 MHz, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5180.000000	18.000000	--	--	5170.950000	5188.950000	PASS



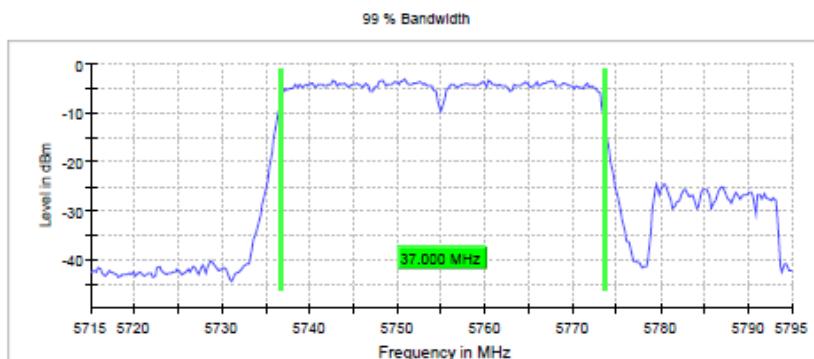
Measurement

Setting	Instrument Value
Start Frequency	5.16000 GHz
Stop Frequency	5.20000 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweptime	28.477 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	58 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 40 MHz, Operating Frequency = low, Subband = U-NII-3
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5755.000000	37.000000	--	--	5736.625000	5773.625000	PASS



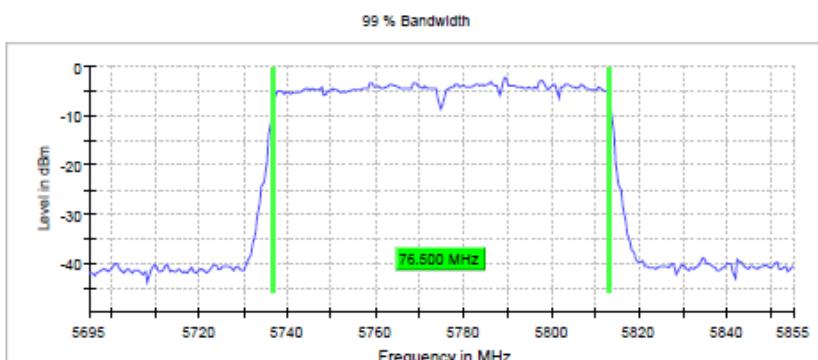
Measurement

Setting	Instrument Value
Start Frequency	5.71500 GHz
Stop Frequency	5.79500 GHz
Span	80.000 MHz
RBW	500.000 kHz
VBW	2.000 MHz
SweepPoints	320
Sweptime	18.906 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	97 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-3
(S01_AR04)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
5775.000000	76.500000	--	--	5736.750000	5813.250000	PASS



Measurement

Setting	Instrument Value
Start Frequency	5.69500 GHz
Stop Frequency	5.65500 GHz
Span	160.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	320
Sweptime	22.875 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	63 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

5.3.5 TEST EQUIPMENT USED

- R&S TS8997

5.4 MAXIMUM CONDUCTED OUTPUT POWER

Standard **FCC Part 15 Subpart E**

The test was performed according to:

ANSI C63.10

5.4.1 TEST DESCRIPTION

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.

The EUT was connected to a gated RF average power meter

Analyzer settings:

- See measurement plots

5.4.2 TEST REQUIREMENTS / LIMITS

A) FCC

For systems using digital modulation techniques in the 5.15 – 5.25 GHz bands:

§15.407 (a) (1)

Limit: 50 mW (17 dBm) or $4 \text{ dBm} + 10 \log(26 \text{ dB bandwidth/MHz})$ whatever is the lesser.

FCC ET Docket No. 13-49, FIRST REPORT AND ORDER, April 1, 2014 ("new rules"):

§15.407 (a) (1) (i): Outdoor access point:

Limit: 1 W (30 dBm) provided the maximum antenna gain does not exceed 6 dBi.

The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

§15.407 (a) (1) (ii): Indoor access point:

Limit: 1 W (30 dBm) provided the maximum antenna gain does not exceed 6 dBi.

§15.407 (a) (1) (iv): Mobile and portable client devices:

Limit: 250 mW (24 dBm) provided the maximum antenna gain does not exceed 6 dBi.

For systems using digital modulation techniques in the 5.25 – 5.35 GHz and 5.47 – 5.725 GHz bands:

§15.407 (a) (2)

Limit: 250 mW (24 dBm) or $11 \text{ dBm} + 10 \log(26 \text{ dB bandwidth/MHz})$ whatever is the lesser.

For systems using digital modulation techniques in the 5.725 – 5.850 GHz bands:

§15.407 (a) (3)

Limit: 1 W (30 dBm) or $17 \text{ dBm} + 10 \log(26 \text{ dB bandwidth/MHz})$ whatever is the lesser.

FCC ET Docket No. 13-49, FIRST REPORT AND ORDER, April 1, 2014 ("new rules"):

§15.407 (a) (3):

Limit: 1 W (30 dBm).

§15.407 (a) (4):

The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

B) IC

Different frequency bands and limits apply, as compared to the FCC requirements.

RSS-247, 6.2.1 (1), Band 5150-5250 MHz, indoor operation only:

Limit (e.i.r.p.): 200 mW (23 dBm) or $10 + 10 \log_{10} B$ [dBm], whichever power is less.
B is the 99% emission bandwidth in MHz.

RSS-247, 6.2.2 (1), Band 5250-5350 MHz:

Limits:

Maximum conducted Power: 250 mW (24 dBm) or $11 + 10 \log_{10} B$ [dBm], whichever power is less.

e.i.r.p.: 1.0 W (30 dBm) or $17 + 10 \log_{10} B$ [dBm], whichever power is less.

Note: For EUTs operating at a higher e.i.r.p. than 200 mW (23 dBm), compliance with the e.i.r.p. elevation mask is required.

RSS-247, 6.2.3 (1), Bands 5470-5600 MHz and 5650-5725 MHz:

Limits:

Maximum conducted Power: 250 mW (24 dBm) or $11 + 10 \log_{10} B$ [dBm], whichever power is less.

e.i.r.p.: 1.0 W (30 dBm) or $17 + 10 \log_{10} B$ [dBm], whichever power is less.

RSS-247, 6.2.4 (1), Band 5725-5825 MHz:

Limits:

Maximum conducted Power: 1W (30 dBm) or $17 + 10 \log_{10} B$ [dBm], whichever power is less.

e.i.r.p.: 4.0 W (36 dBm) or $23 + 10 \log_{10} B$ [dBm], whichever power is less.

All frequency bands: B is the 99% emission bandwidth in MHz.

5.4.3 TEST PROTOCOL

Android Core 0

Ambient temperature:

23 °C

Air Pressure:

1010 hPa

Humidity:

47 %

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

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	7.3	12.1	24.0	16.7
	44	5220	7.2	12.0	24.0	16.8
	48	5240	7.2	12.0	24.0	16.8
3	149	5745	6.7	8.9	30.0	23.3
	157	5785	7.2	9.4	30.0	22.8
	165	5825	7.4	9.6	30.0	22.6

WLAN n-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	7.4	12.2	24.0	16.6
	44	5220	7.1	11.8	24.0	16.9
	48	5240	7.3	12.1	24.0	16.7
3	149	5745	6.8	9.0	30.0	23.2
	157	5785	7.2	9.4	30.0	22.8
	165	5825	7.4	9.6	30.0	22.6

WLAN n-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.7	11.5	24.0	17.3
	46	5230	6.6	11.4	24.0	17.4
	3	151	5755	6.3	8.5	30.0
3	159	5795	6.4	8.6	30.0	23.6

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	7.5	12.2	24.0	16.5
	44	5220	7.1	11.9	24.0	16.9
	48	5240	7.0	11.8	24.0	17.0
3	149	5745	6.8	9.0	30.0	23.2
	157	5785	7.1	9.3	30.0	22.9
	165	5825	7.2	9.4	30.0	22.8

WLAN ac-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.9	11.7	24.0	17.1
	46	5230	6.6	11.4	24.0	17.4
	3	151	5755	6.0	8.2	30.0
3	159	5795	6.3	8.5	30.0	23.7

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	42	5210	5.5	10.3	24.0	18.5
3	155	5775	5.0	7.2	30.0	25.0

Android MIMO

Ambient temperature: 23 °C
Air Pressure: 1010 hPa
Humidity: 47 %

WLAN n-Mode; 20 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	6.2	11.0	24.0	17.8
	44	5220	6.4	11.2	24.0	17.6
	48	5240	6.2	11.0	24.0	17.8
3	149	5745	4.6	6.8	30.0	25.4
	157	5785	5.1	7.3	30.0	24.9
	165	5825	4.9	7.1	30.0	25.1

WLAN n-Mode; 40 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.5	11.3	24.0	17.5
	46	5230	6.3	11.1	24.0	17.7
	151	5755	5.2	7.4	30.0	24.8
	159	5795	5.4	7.6	30.0	24.6

WLAN ac-Mode; 20 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	6.4	11.2	24.0	17.6
	44	5220	6.5	11.3	24.0	17.5
	48	5240	6.1	10.9	24.0	17.9
	149	5745	5.0	7.2	30.0	25.0
	157	5785	5.1	7.3	30.0	24.9
	165	5825	4.9	7.0	30.0	25.1

WLAN ac-Mode; 40 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.7	11.5	24.0	17.3
	46	5230	6.4	11.2	24.0	17.6
	151	5755	5.1	7.3	30.0	24.9
	159	5795	5.7	7.8	30.0	24.3

WLAN ac-Mode; 80 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	42	5210	6.1	10.9	24.0	17.9
	155	5775	5.3	7.5	30.0	24.7

Android Core 1

Ambient temperature:

25 °C

Air Pressure:

1010 hPa

Humidity:

30 %

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

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	6.5	12.4	24.0	17.5
	44	5220	6.7	12.6	24.0	17.3
	48	5240	6.7	12.6	24.0	17.3
3	149	5745	5.5	9.6	30.0	24.5
	157	5785	4.4	8.5	30.0	25.6
	165	5825	5.7	9.8	30.0	24.3

WLAN n-Mode; 20 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	6.7	12.6	24.0	17.3
	44	5220	6.6	12.5	24.0	17.4
	48	5240	6.7	12.6	24.0	17.3
3	149	5745	5.1	9.2	30.0	24.9
	157	5785	5.7	9.8	30.0	24.3
	165	5825	5.8	9.9	30.0	24.2

WLAN n-Mode; 40 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.2	12.1	24.0	17.8
	46	5230	6.1	12.0	24.0	17.9
3	151	5755	4.7	8.8	30.0	25.3
	159	5795	5.0	9.1	30.0	25.0

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	6.8	12.7	24.0	17.2
	44	5220	6.7	12.6	24.0	17.3
	48	5240	6.7	12.6	24.0	17.3
3	149	5745	4.8	8.9	30.0	25.2
	157	5785	5.4	9.5	30.0	24.6
	165	5825	5.4	9.5	30.0	24.6

WLAN ac-Mode; 40 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.2	12.1	24.0	17.8
	46	5230	6.2	12.1	24.0	17.8
3	151	5755	4.6	8.7	30.0	25.4
	159	5795	5.1	9.1	30.0	24.9

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	42	5210	4.8	10.7	24.0	19.2
3	155	5775	3.6	7.7	30.0	26.4

Linux Core 0

Ambient temperature: 23 °C
Air Pressure: 1010 hPa
Humidity: 47 %
WLAN a-Mode; 20 MHz; 6 Mbit/s

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	7.7	12.9	24.0	16.3
	44	5220	7.7	12.9	24.0	16.3
	48	5240	7.6	12.7	24.0	16.4
3	149	5745	4.3	8.3	30.0	25.7
	157	5785	4.6	8.6	30.0	25.4
	165	5825	4.9	8.9	30.0	25.1

WLAN n-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	7.8	12.9	24.0	16.2
	44	5220	7.5	12.6	24.0	16.5
	48	5240	7.6	12.7	24.0	16.4
3	149	5745	4.1	8.2	30.0	25.9
	157	5785	4.4	8.4	30.0	25.6
	165	5825	4.9	9.0	30.0	25.1

WLAN n-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	7.3	12.5	24.0	16.7
	46	5230	7.0	12.1	24.0	17.0
	3	151	5755	3.5	7.5	30.0
3	159	5795	3.6	7.7	30.0	26.4

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	5.4	10.6	24.0	18.6
	44	5220	5.3	10.5	24.0	18.7
	48	5240	5.4	10.5	24.0	18.6
3	149	5745	7.3	11.4	30.0	22.7
	157	5785	7.5	11.5	30.0	22.5
	165	5825	7.7	11.7	30.0	22.3

WLAN ac-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	5.0	10.1	24.0	19.0
	46	5230	4.7	9.9	24.0	19.3
	3	151	5755	6.2	10.2	30.0
3	159	5795	6.6	10.6	30.0	23.8

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	42	5210	3.0	8.1	24.0	21.0
3	155	5775	4.9	8.9	30.0	25.1

Linux Core MIMO

Ambient temperature: 23 °C
Air Pressure: 1010 hPa
Humidity: 47 %
WLAN n-Mode; 20 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	6.1	11.2	24.0	17.9
	44	5220	5.8	10.9	24.0	18.2
	48	5240	5.9	11.1	24.0	18.1
3	149	5745	5.7	9.8	30.0	24.3
	157	5785	5.4	9.4	30.0	24.6
	165	5825	5.6	9.6	30.0	24.4

WLAN n-Mode; 40 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.1	11.2	24.0	17.9
	46	5230	5.7	10.9	24.0	18.3
3	151	5755	5.5	9.5	30.0	24.5
	159	5795	5.8	9.8	30.0	24.2

WLAN ac-Mode; 20 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	6.1	11.3	24.0	17.9
	44	5220	5.8	11.0	24.0	18.2
	48	5240	6.0	11.2	24.0	18.0
3	149	5745	5.5	9.6	30.0	24.5
	157	5785	5.7	9.7	30.0	24.3
	165	5825	5.6	9.6	30.0	24.4

WLAN ac-Mode; 40 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	5.9	11.1	24.0	18.1
	46	5230	5.8	11.0	24.0	18.2
3	151	5755	5.5	9.5	30.0	24.5
	159	5795	5.8	9.8	30.0	24.2

WLAN ac-Mode; 80 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	42	5210	5.6	10.8	24.0	18.4
3	155	5775	5.6	9.7	30.0	24.4

Linux Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %
WLAN a-Mode; 20 MHz; 6 Mbit/s

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	7.4	14.4	24.0	16.6
	44	5220	7.3	14.2	24.0	16.7
	48	5240	7.4	14.3	24.0	16.6
3	149	5745	7.2	12.9	30.0	22.8
	157	5785	7.6	13.3	30.0	22.4
	165	5825	7.6	13.3	30.0	22.4

WLAN n-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	7.5	14.4	24.0	16.5
	44	5220	7.2	14.1	24.0	16.8
	48	5240	7.1	14.0	24.0	16.9
3	149	5745	7.1	12.8	30.0	22.9
	157	5785	7.9	13.6	30.0	22.1
	165	5825	7.5	13.2	30.0	22.5

WLAN n-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.7	13.6	24.0	17.3
	46	5230	6.5	13.4	24.0	17.5
3	151	5755	6.1	11.8	30.0	23.9
	159	5795	6.7	12.4	30.0	23.3

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	36	5180	7.2	14.1	24.0	16.8
	44	5220	7.2	14.1	24.0	16.8
	48	5240	7.0	13.9	24.0	17.0
3	149	5745	6.8	12.5	30.0	23.2
	157	5785	7.4	13.1	30.0	22.6
	165	5825	7.6	13.3	30.0	22.4

WLAN ac-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	38	5190	6.8	13.7	24.0	17.2
	46	5230	6.5	13.4	24.0	17.5
3	151	5755	5.4	11.1	30.0	24.6
	159	5795	6.1	11.8	30.0	24.0

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Freq. [MHz]	Cond. Power [dBm]	EIRP [dBm]	FCC Cond. Limit [dBm]	Margin [dB]
1	42	5210	5.6	12.6	24.0	18.4
3	155	5775	4.6	10.3	30.0	25.4

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

5.4.4 TEST EQUIPMENT USED

- R&S TS8997

5.5 PEAK POWER SPECTRAL DENSITY

Standard **FCC Part 15 Subpart E**

The test was performed according to:

ANSI C63.10

5.5.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up in a shielded room to perform the Maximum Power Spectral Density measurements.

The results recorded were measured with the modulation which produces the worst-case (highest) output power.

The EUT was connected to the spectrum analyzer via a short coax cable with a known loss.

Analyzer settings:

- Resolution Bandwidth (RBW): 1 MHz
- Video Bandwidth (VBW): 3 MHz
- Trace: Average, RMS power averaging mode
- Sweeps: 100
- Sweeptime: 5 ms
- Detector: RMS
- Trigger: gated mode

Note:

The analyser settings are according FCC Public Note "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, 789033 D02", method **SA-1**.

5.5.2 TEST REQUIREMENTS / LIMITS

A) FCC

FCC Part 15, Subpart E, §15.407 (a) (1)

For systems using digital modulation techniques in the 5.15 – 5.25 GHz bands:

(i) and (ii), outdoor and indoor access points: Limit: 17 dBm/MHz.
(iv), mobile and portable client devices: Limit: 11 dBm/MHz.

FCC Part 15, Subpart E, §15.407 (a) (2)

For systems using digital modulation techniques in the 5.25 – 5.35 GHz and 5.47 – 5.725 GHz bands:

Limit: 11 dBm/MHz.

FCC Part 15, Subpart E, §15.407 (a) (3)

For systems using digital modulation techniques in the 5.725 – 5.850 GHz bands:
Limit: 30 dBm/500 kHz.

Note: The limit will be also fulfilled when measuring at any bandwidth greater than 500 kHz.

This applies to signals where the maximum conducted output power was measured at a bandwidth exceeding 500 kHz and which fulfil that limit of 30 dBm.

B) IC

Different frequency bands and limits apply, as compared to the FCC requirements.

RSS-247, 6.2.1 (1), Band 5150-5250 MHz, indoor operation only:
Limit (e.i.r.p.): 10 dBm/MHz.

RSS-247, 6.2.2 (1), Band 5250-5350 MHz:
Limit: 11 dBm/MHz.

RSS-247, 6.2.3 (1), Bands 5470-5600 MHz and 5650-5725 MHz:
Limit: 11 dBm/MHz.

RSS-247, 6.2.4 (1), Band 5725-5850 MHz:
Limit: 30 dBm/500 kHz.

5.5.3 TEST PROTOCOL

Android Core 0

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

WLAN a-Mode; 20 MHz; 6 Mbit/s ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.2	11.0	15.2
	44	5220	-4.2	11.0	15.2
	48	5240	-4.5	11.0	15.5
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
	3	5745	-7.5	30.0	37.5
	157	5785	-7.1	30.0	37.1
	165	5825	-7.1	30.0	37.1

WLAN n-Mode; 20 MHz; MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.5	11.0	15.5
	44	5220	-4.9	11.0	15.9
	48	5240	-4.7	11.0	15.7
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
	3	5745	-7.9	30.0	37.9
	157	5785	-7.6	30.0	37.6
	165	5825	7.5	30.0	22.5

WLAN n-Mode; 40 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-4.7	11.0	15.7
	46	5230	-4.8	11.0	15.8
	48	5240	-4.7	11.0	15.7
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
	3	5755	-7.3	30.0	37.3
	159	5795	-6.9	30.0	36.9

WLAN ac-Mode; 20 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.7	11.0	15.7
	44	5220	-5.1	11.0	16.1
	48	5240	-5.1	11.0	16.1
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
	3	5745	-8.2	30.0	38.2
	157	5785	-7.8	30.0	37.8
	165	5825	-7.8	30.0	37.8

WLAN ac-Mode; 40 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-3.6	11.0	14.6
	46	5230	-3.4	11.0	14.4
	48	5240	-3.4	11.0	14.4
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
	3	5755	-7.5	30.0	37.5
	159	5795	-6.7	30.0	36.7

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	42	5210	-7.5	11.0	18.5
	46	5230	-7.5	11.0	18.5
	48	5240	-7.5	11.0	18.5
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
	3	5755	-10.0	30.0	40.0
	159	5795	-10.0	30.0	40.0

Android Core MIMO

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

WLAN n-Mode; 20 MHz; MCS0 ; MISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-5.6	11.0	16.6
	44	5220	-5.6	11.0	16.6
	48	5240	-5.8	11.0	16.8
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-10.5	30.0	40.5
	157	5785	-10.1	30.0	40.1
	165	5825	-10.3	30.0	40.3

WLAN n-Mode; 40 MHz;MCS0 ; MISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-4.8	11.0	15.8
	46	5230	-5.3	11.0	16.3
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-8.3	30.0	38.3
	159	5795	-8.3	30.0	38.3

WLAN ac-Mode; 20 MHz;MCS0 ; MISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	5180	-1.3	-5.2	11.0	16.2
	5220	-1.3	-5.3	11.0	16.3
	5240	-1.6	-5.8	11.0	16.8
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	5745	-4.6	-10.3	30.0	40.3
	5785	-4.6	-10.1	30.0	40.1
	5825	-4.5	-10.0	30.0	40.0

WLAN ac-Mode; 40 MHz;MCS0 ; MISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-4.4	11.0	15.4
	46	5230	-4.9	11.0	15.9
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-8.0	30.0	38.0
	159	5795	-7.8	30.0	37.8

WLAN ac-Mode; 80 MHz; MCS0; MISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	42	5210	-7.2	11.0	18.2
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	155	5775	-10.6	30.0	40.6

Android Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

WLAN a-Mode; 20 MHz; 6 Mbit/s ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.8	11.0	15.8
	44	5220	-4.8	11.0	15.8
	48	5240	-4.9	11.0	15.9
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-9.1	30.0	39.1
	157	5785	-9.2	30.0	39.2
	165	5825	-9.2	30.0	39.2

WLAN n-Mode; 20 MHz; MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-5.2	11.0	16.2
	44	5220	-5.3	11.0	16.3
	48	5240	-5.2	11.0	16.2
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-9.7	30.0	39.7
	157	5785	-9.5	30.0	39.5
	165	5825	-9.1	30.0	39.1

WLAN n-Mode; 40 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-5.4	11.0	16.4
	46	5230	-4.7	11.0	15.7
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-8.6	30.0	38.6
	159	5795	-8.1	30.0	38.1

WLAN ac-Mode; 20 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-5.4	11.0	16.4
	44	5220	-5.5	11.0	16.5
	48	5240	-5.4	17.0	22.4
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-10.4	30.0	40.4
	157	5785	-9.9	30.0	39.9
	165	5825	-9.9	30.0	39.9

WLAN ac-Mode; 40 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-3.6	11.0	14.6
	46	5230	-5.3	11.0	16.3
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-8.3	30.0	38.3
	159	5795	-8.3	30.0	38.3

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	42	5210	-8.5	11.0	19.5
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	155	5775	-12.8	30.0	42.8

Linux Core 0

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

WLAN a-Mode; 20 MHz; 6 Mbit/s ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.1	11.0	15.1
	44	5220	-4.3	11.0	15.3
	48	5240	-4.2	11.0	15.2
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-10.3	30.0	40.3
	157	5785	10.0	30.0	20.0
	165	5825	-9.6	30.0	39.6

WLAN n-Mode; 20 MHz; MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.5	11.0	15.5
	44	5220	-4.9	11.0	15.9
	48	5240	-4.8	11.0	15.8
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-10.9	30.0	40.9
	157	5785	-10.6	30.0	40.6
	165	5825	-10.1	30.0	40.1

WLAN n-Mode; 40 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-3.9	11.0	14.9
	46	5230	-3.4	11.0	14.4
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-9.6	30.0	39.6
	159	5795	-9.4	30.0	39.4

WLAN ac-Mode; 20 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-6.6	11.0	17.6
	44	5220	-6.7	11.0	17.7
	48	5240	-6.7	11.0	17.7
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-7.7	30.0	37.7
	157	5785	-7.5	30.0	37.5
	165	5825	-7.4	30.0	37.4

WLAN ac-Mode; 40 MHz;MCS0 ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-5.3	11.0	16.3
	46	5230	-6.7	11.0	17.7
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-6.5	30.0	36.5
	159	5795	-5.7	30.0	35.7

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	42	5210	-9.4	11.0	20.4
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	155	5775	-10.1	30.0	40.1

Linux Core MIMO

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

WLAN n-Mode; 20 MHz; MCS0 ; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-6.1	11.0	17.1
	44	5220	-6.3	11.0	17.3
	48	5240	-6.4	11.0	17.4
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-9.5	30.0	39.5
	157	5785	-9.7	30.0	39.7
	165	5825	-9.6	30.0	39.6

WLAN n-Mode; 40 MHz;MCS0 ; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-3.9	11.0	14.9
	46	5230	-4.7	11.0	15.7
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-7.8	30.0	37.8
	159	5795	-7.5	30.0	37.5

WLAN ac-Mode; 20 MHz;MCS0 ; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-6.0	11.0	17.0
	44	5220	-6.2	11.0	17.2
	48	5240	-6.2	11.0	17.2
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-9.7	30.0	39.7
	157	5785	-9.5	30.0	39.5
	165	5825	-9.5	30.0	39.5

WLAN ac-Mode; 40 MHz; MCS0 ; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-4.8	11.0	15.8
	46	5230	-4.8	11.0	15.8
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-7.8	30.0	37.8
	159	5795	-7.7	30.0	37.7

WLAN ac-Mode; 80 MHz; MCS0; MIMO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	42	5210	-5.9	11.0	16.9
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	155	5775	-10.1	30.0	40.1

Linux Core 1

Ambient temperature: 25 °C
Air Pressure: 1010 hPa
Humidity: 30 %

WLAN a-Mode; 20 MHz; 6 Mbit/s ; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.1	11.0	15.1
	44	5220	-4.5	11.0	15.5
	48	5240	-4.6	11.0	15.6
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-7.5	30.0	37.5
	157	5785	-7.3	30.0	37.3
	165	5825	-7.4	30.0	37.4

WLAN n-Mode; 20 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.8	11.0	15.8
	44	5220	-5.1	11.0	16.1
	48	5240	-5.2	11.0	16.2
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-8.2	30.0	38.2
	157	5785	-7.7	30.0	37.7
	165	5825	-8.0	30.0	38.0

WLAN n-Mode; 40 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-4.3	11.0	15.3
	46	5230	-5.0	11.0	16.0
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-7.2	30.0	37.2
	159	5795	-6.7	30.0	36.7

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	36	5180	-4.7	11.0	15.7
	44	5220	-5.1	11.0	16.1
	48	5240	-5.2	11.0	16.2
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	149	5745	-8.2	30.0	38.2
	157	5785	-8.0	30.0	38.0
	165	5825	-7.5	30.0	37.5

WLAN ac-Mode; 40 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	38	5190	-4.5	11.0	15.5
	46	5230	-4.5	11.0	15.5
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	151	5755	-7.3	30.0	37.3
	159	5795	-7.0	30.0	37.0

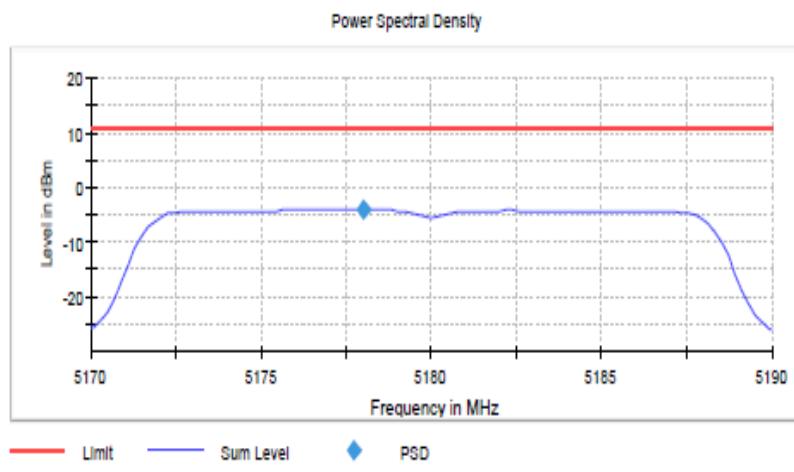
WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ MHz]	FCC Limit [dBm/MHz]	Margin [dB]
1	42	5210	-6.9	11.0	17.9
U-NII- Subband	Ch. No.	Freq. [MHz]	MPSD [dBm/ 500 kHz]	FCC Limit [dBm/500 kHz]	Margin [dB]
3	155	5775	-10.4	30.0	40.4

5.5.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

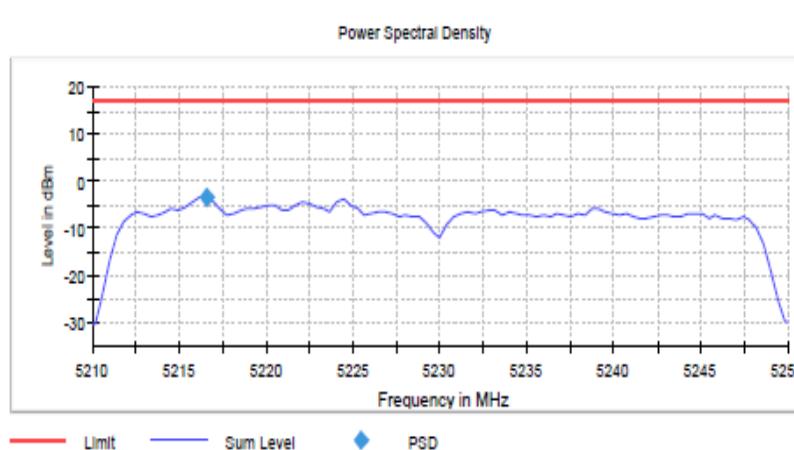
Android Core 0

Radio Technology = WLAN a 20 MHz, Operating Frequency = low, Subband = U-NII-1 (S01_AR04)



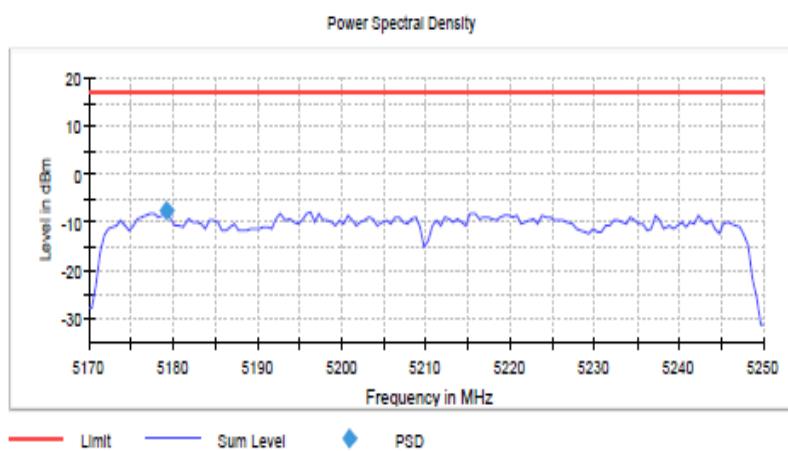
Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.19000 GHz
Span	20.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
Sweptime	505.000 ms
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	119
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stakemode	Trace
Stablevalue	0.30 dB
Run	4 / max. 15
Stable	3 / 3
Max Stable Difference	0.04 dB

Radio Technology = WLAN ac 40 MHz , Operating Frequency = high, Subband = U-NII-1 (S01_AR04)



Setting	Instrument Value
Start Frequency	5.21000 GHz
Stop Frequency	5.25000 GHz
Span	40.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
Sweptime	11.000 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	0
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stakemode	Trace
Stablevalue	0.30 dB
Run	15 / max. 15
Stable	2 / 3
Max Stable Difference	0.00 dB

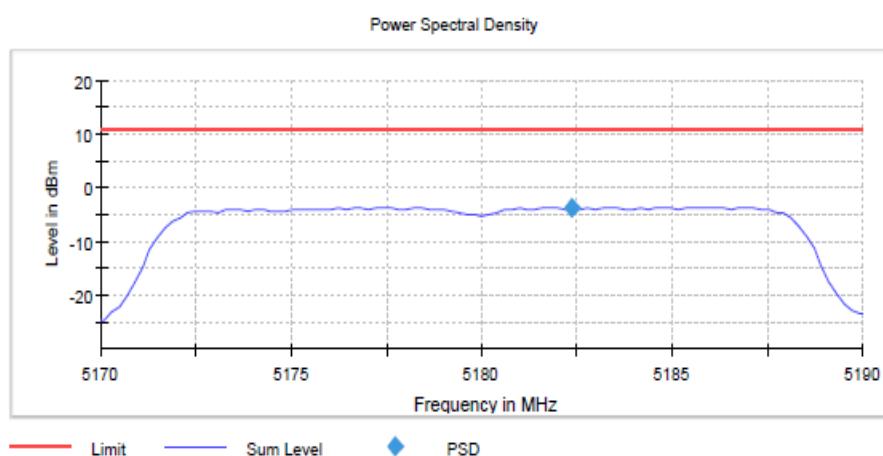
Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1
(S01_AH02)



Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.25000 GHz
Span	80.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	160
Sweptime	16.000 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	0
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	12 / max. 15
Stable	3 / 3
Max Stable Difference	0.00 dB

Android Core 1

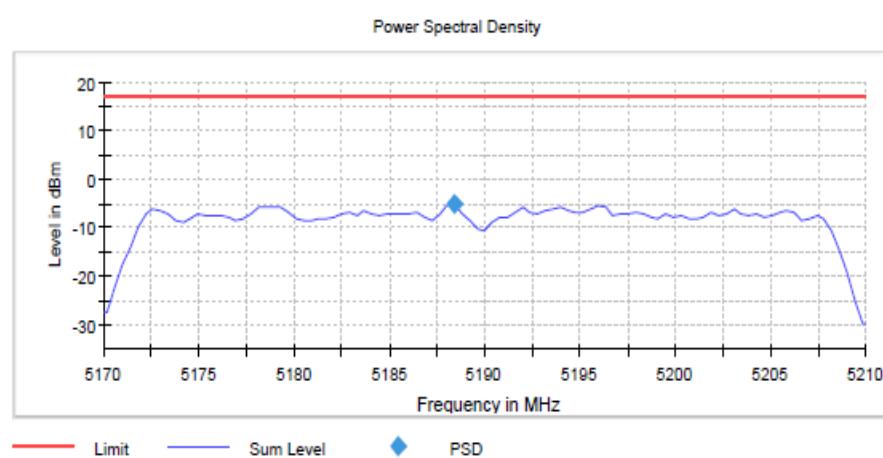
Radio Technology = WLAN a-mode , Operating Frequency = low, Subband = U-NII-1
(S01_AR04)



Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.19000 GHz
Span	20.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
Sweptime	505.000 ms
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	119
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	14 / max. 15
Stable	3 / 3
Max Stable Difference	0.21 dB

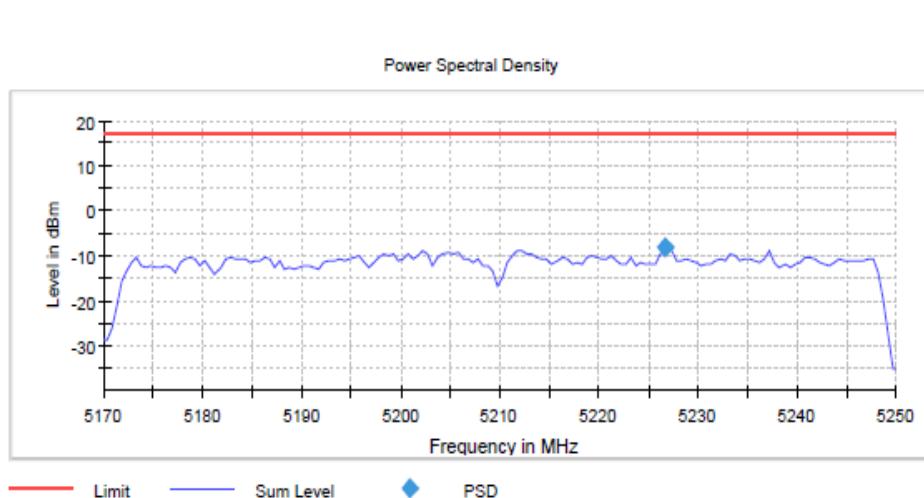
Radio Technology = WLAN ac 40 MHz, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)



Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.21000 GHz
Span	40.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
Sweptime	11.000 μs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	0
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	15 / max. 15
Stable	3 / 3
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1
(S01_AR04)

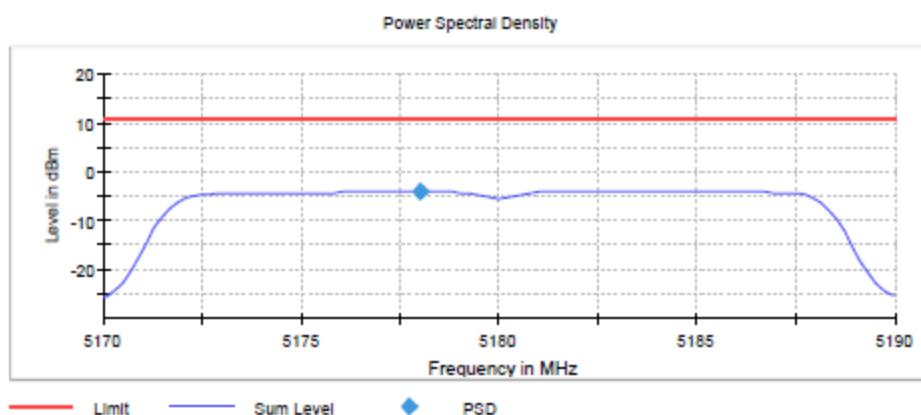


Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.25000 GHz
Span	80.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	160
Sweeptime	16.000 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	0
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	14 / max. 15
Stable	3 / 3
Max Stable Difference	0.00 dB

Linux Core 0

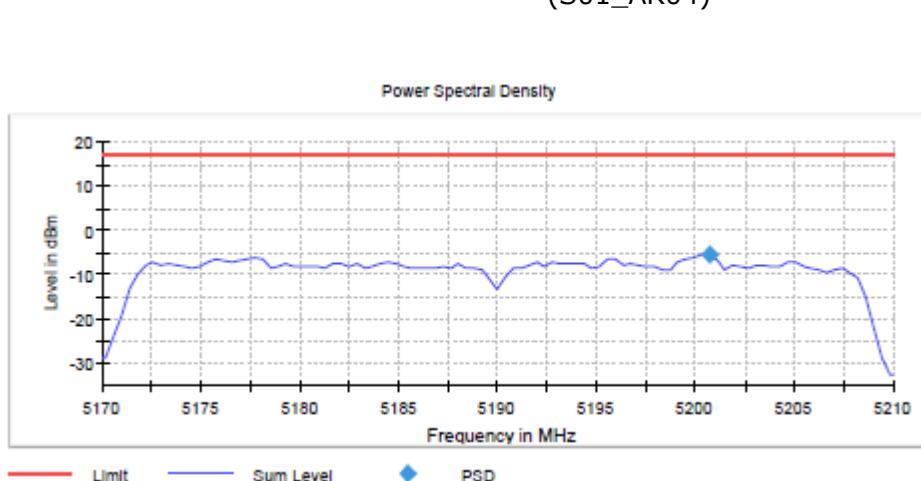
Radio Technology = WLAN a mode, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)



Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.19000 GHz
Span	20.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
Sweeptime	505.000 ms
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	119
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	4 / max. 15
Stable	3 / 3
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 40 MHz, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)

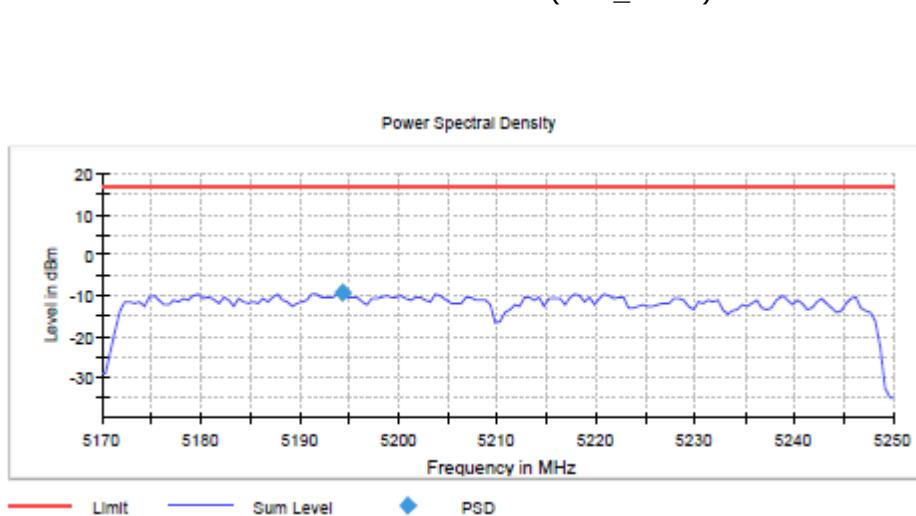


Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.21000 GHz
Span	40.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
Sweeptime	11.000 µs
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	0
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	14 / max. 15
Stable	3 / 3
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1

(S01_AR04)

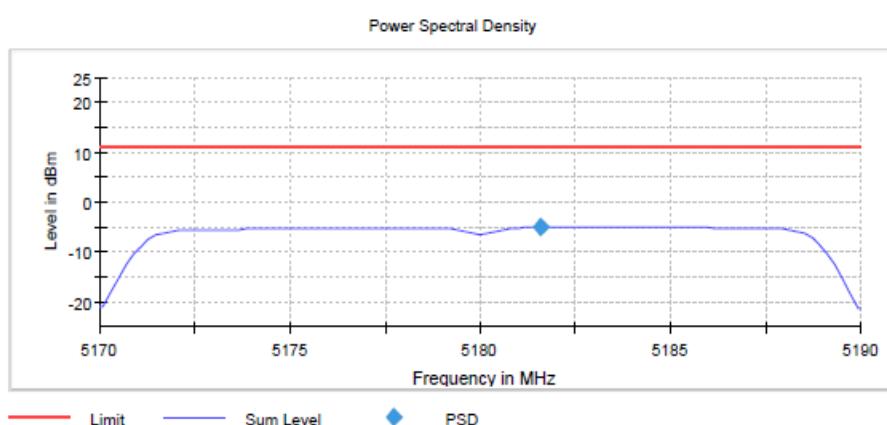


Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.25000 GHz
Span	80.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	160
Sweptime	16.000 μ s
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	0
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	15 / max. 15
Stable	2 / 3
Max Stable Difference	0.00 dB

Linux Core 1

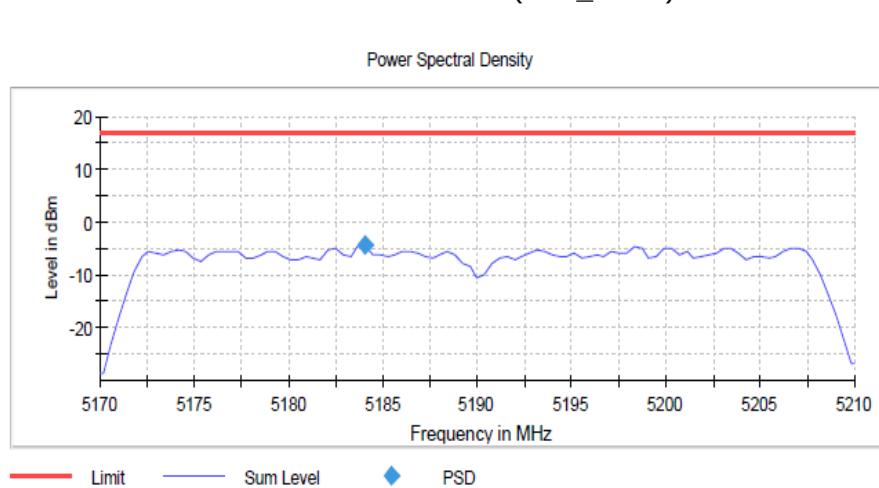
Radio Technology = WLAN n-mode 20 MHz, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)



Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.19000 GHz
Span	20.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
Sweptime	505.000 ms
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	119
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	4 / max. 15
Stable	3 / 3
Max Stable Difference	0.05 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = low, Subband = U-NII-1
(S01_AR04)

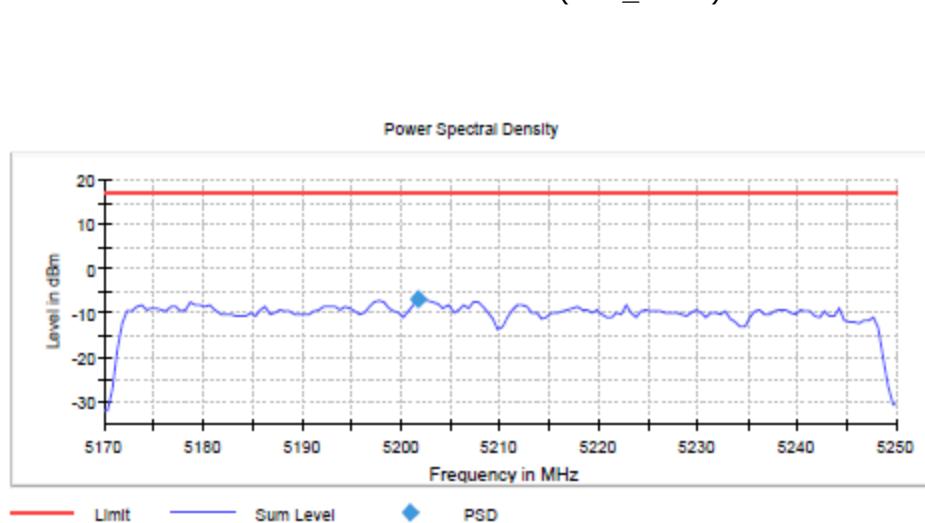


Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.21000 GHz
Span	40.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
Sweptime	11.000 μ s
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	0
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	15 / max. 15
Stable	1 / 3
Max Stable Difference	0.00 dB

Radio Technology = WLAN ac 80 MHz, Operating Frequency = mid, Subband = U-NII-1

(S01_AR04)



Measurement

Setting	Instrument Value
Start Frequency	5.17000 GHz
Stop Frequency	5.25000 GHz
Span	80.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	160
Sweptime	16.000 μ s
Reference Level	-10.000 dBm
Attenuation	10.000 dB
Detector	RMS
SweepCount	0
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	15 / max. 15
Stable	1 / 3
Max Stable Difference	0.00 dB

5.5.5 TEST EQUIPMENT USED

- R&S TS8997

5.6 UNDESIRABLE EMISSIONS; GENERAL FIELD STRENGTH LIMITS

Standard **FCC Part 15 Subpart E**

The test was performed according to:

ANSI C63.10

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 Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m² in the semi-anechoic chamber. The influence of the EUT support table that is used between 30–1000 MHz was evaluated.

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 from a DC power source.

1. Measurement up to 30 MHz

The Loop antenna HFH2-Z2 is used.

Step 1: pre measurement

- Anechoic chamber
- Antenna distance: 3 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.

- Open area test side
- Antenna distance: according to the Standard
- Detector: Quasi-Peak
- 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

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 – 3 m
- Height variation step size: 2 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 ± 45° around this value. 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 by ± 100 cm around the antenna height determined. 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: ± 45 ° around the determined value
- Height variation range: ± 100 cm around the determined value
- Antenna Polarisation: max. value determined in step 1

Step 3: Final measurement with QP detector

With the settings determined in step 3, the final measurement will be performed:

EMI receiver settings for step 4:

- 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.

3. Measurement above 1 GHz

The following modifications apply to the measurement procedure for the frequency range above 1 GHz:

Step 1:

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.

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 °.

Above 26 GHz the measurement distance is reduced to 1 m.

Step 2:

Due to the fact, that in this frequency range the test is performed in a fully anechoic room, the height scan of the receiving antenna instep 2 is omitted. Instead of this, a maximum search with a step size ± 45° for the elevation axis is performed.

The turn table azimuth will slowly vary by ± 22.5°.

The elevation angle will slowly vary by ± 45°

EMI receiver settings (for all steps):

- Detector: Peak, Average
- IF Bandwidth = 1 MHz

Step 3:

Spectrum analyser settings for step 3:

- Detector: Peak / Average
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 1 MHz
- Measuring time: 1 s

5.6.2 TEST REQUIREMENTS / LIMITS

A) FCC

FCC Part 15 Subpart E, §15.407 (b)(1)

For transmitters operating in the 5150–5250 MHz band:

Limit: -27 dBm/MHz EIRP outside of the band 5150–5350 MHz.

FCC Part 15 Subpart E, §15.407 (b)(2)

For transmitters operating in the 5250–5350 MHz band:

Limit: -27 dBm/MHz EIRP outside of the band 5150–5350 MHz.

FCC Part 15 Subpart E, §15.407 (b)(3)

For transmitters operating in the 5470–5725 MHz band:

Limit: -27 dBm/MHz EIRP outside of the band 5470–5725 MHz.

FCC Part 15 Subpart E, §15.407 (b)(4)(i)

All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

B) IC

Different frequency bands and limits apply, as compared to the FCC requirements.

RSS-247, 6.2.1.1, Emissions outside the band 5150–5250 MHz, indoor operation only:

Limit: -27 dBm/MHz EIRP outside of the band 5150–5250 MHz.

RSS-247, 6.2.2.2, Emissions outside the band 5250–5350 MHz:

Limit: -27 dBm/MHz EIRP outside of the band 5250–5350 MHz.

RSS-247, 6.2.3.2, Emissions outside the bands 5470–5600 MHz and 5650–5725 MHz:

Limit: -27 dBm/MHz EIRP outside of the band 5470–5725 MHz.

Note: No operation is permitted for the frequency range 5600–5650 MHz.

RSS-247, 6.2.4.2, Emissions outside the band 5725–5825 MHz:

- a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

C) FCC & IC

FCC Part 15 Subpart E, §15.405

The provisions of §§ 15.203 and 15.205 are included.

§15.407 (b)(6)

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.

§15.407 (b)(7)

The provisions of §15.205 apply to intentional radiators operating under this section

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

Frequency in MHz	Limit (μ V/m)	Measurement distance (m)	Limits (dB μ V/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 (μ V/m)	Measurement distance (m)	Limits (dB μ V/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 (dB μ V/m) = 20 log (Limit (μ V/m)/1 μ V/m)
- Limit (dB μ V/m) = EIRP [dBm] – 20 log (d [m]) + 104.8

Limit types (in result tables on next page):

RB – Emissions falls into a “Restricted Band” according FCC §§15.205 and 15.209 *)

UE – “Undesirable Emission Limit” according FCC §15.407

BE-RB – Band Edge Limit basing on “Restricted Band Limits”

BE-UE – Band Edge Limit basing on “Undesirable Emission Limit”

*) Below 1 GHz the limits of §15.209 are applied for all frequencies.

5.6.3 TEST PROTOCOL

Android Core 0

Ambient temperature: 23–26 °C
Air Pressure: 1002–1014 hPa
Humidity: 32–43 %
WLAN a-Mode; 20 MHz; 6 Mbit/s

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type
36	5180	-	-	-	-	-	>6	-
44	5220	81.6	25.0	QP	120	40.0	15.0	UE
44	5220	131.8	24.3	QP	120	43.5	19.2	UE
44	5220	271.2	32.1	QP	120	46.0	13.9	UE
44	5220	337.8	35.6	QP	120	46.0	10.4	UE

WLAN n-Mode; 20 MHz; MCS0

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type
149	5745	-	-	-	-	-	>6	-
157	5785	-	-	-	-	-	>6	-
165	5825	-	-	-	-	-	>6	-

WLAN n-Mode; 40 MHz; MCS0; SISO

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type
38	5190	67.7	20.3	QP	120	40.0	19.7	RB
38	5190	271.3	27.4	QP	120	46.0	18.6	RB
38	5190	280.4	10.8	QP	120	46.0	35.2	RB
38	5190	337.8	35.3	QP	120	46.0	10.7	RB
38	5190	743.0	22.5	QP	120	46.0	23.5	RB
46	5230	-	-	-	-	-	>6	-
151	5755	-	-	-	-	-	>6	-
159	5795	-	-	-	-	-	>6	-

WLAN ac-Mode; 40 MHz; MCS0; SISO

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type
38	5190	2459.5	48.7	PEAK	1000	68.2	19.5	RB
46	5230	-	-	-	-	-	>6	-
151	5755	-	-	-	-	-	>6	-
159	5795	-	-	-	-	-	>6	-

Android Core 1

Ambient temperature: 23–26 °C
Air Pressure: 1002–1014 hPa
Humidity: 32–43 %
WLAN a-mode; 20 MHz; 6 Mbit/s

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type
44	5220	-	-	-	-	-	>6	-
149	5745	1717.7	45.1	PEAK	1000	68.2	23.1	UE
149	5745	1718.0	45.5	PEAK	1000	68.2	22.7	UE
149	5745	1720.2	32.4	AV	1000	54.0	21.6	RB
149	5745	1720.2	45.7	PEAK	1000	74.0	28.3	RB
149	5745	17854.2	54.2	PEAK	1000	74.0	19.8	RB
149	5745	22092.1	54.3	PEAK	1000	74.0	19.7	RB
157	5785	-	-	-	-	-	>6	-
165	5825	-	-	-	-	-	>6	-

WLAN n-Mode; 20 MHz; MCS0; SISO

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type
36	5180	-	-	-	-	-	>6	-
44	5220	5139.0	56.7	PEAK	1000	68.2	11.5	UE
44	5220	5138.5	43.7	AV	1000	68.2	24.5	UE
48	5240	5149.4	67.9	PEAK	1000	68.2	0.3	UE
48	5240	5148.2	49.6	AV	1000	68.2	18.6	UE

Linux Core 0

Ambient temperature: 23–26 °C
Air Pressure: 1002–1014 hPa
Humidity: 32–43 %
WLAN a-Mode; 20 MHz; 6 Mbit/s

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type
149	5745	-	-	-	-	-	>6	-
157	5785	1717.7	45.1	PEAK	1000	68.2	23.1	UE
157	5785	1718.0	45.5	PEAK	1000	68.2	22.7	UE
157	5785	1720.2	32.4	AV	1000	54.0	21.6	RB
157	5785	1720.2	45.7	PEAK	1000	74.0	28.3	RB
157	5785	17854.2	54.2	PEAK	1000	74.0	19.8	RB
157	5785	22092.1	54.3	PEAK	1000	74.0	19.7	RB
165	5825	-	-	-	-	-	>6	-

WLAN n-Mode; 20 MHz; MCS0; SISO

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type
36	5180	5149.4	67.9	PEAK	1000	68.2	0.3	UE
36	5180	5148.2	49.6	AV	1000	68.2	18.6	UE
48	5240	5139.0	56.7	PEAK	1000	68.2	11.5	UE
48	5240	5138.5	43.7	AV	1000	68.2	24.5	UE

Linux Core 1

Ambient temperature: 23–26 °C
Air Pressure: 1002–1014 hPa
Humidity: 32-43 %
WLAN a-Mode; 20 MHz; MCS0

Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type
157	5785	81.6	25.0	QP	1000	40.0	15.0	UE
157	5785	131.7	24.3	QP	1000	43.5	19.2	UE
157	5785	271.1	32.1	QP	1000	46.0	13.9	UE
157	5785	35.6	35.6	QP	1000	46.0	10.4	UE

WLAN ac-Mode; 40 MHz; MCS0; SISO

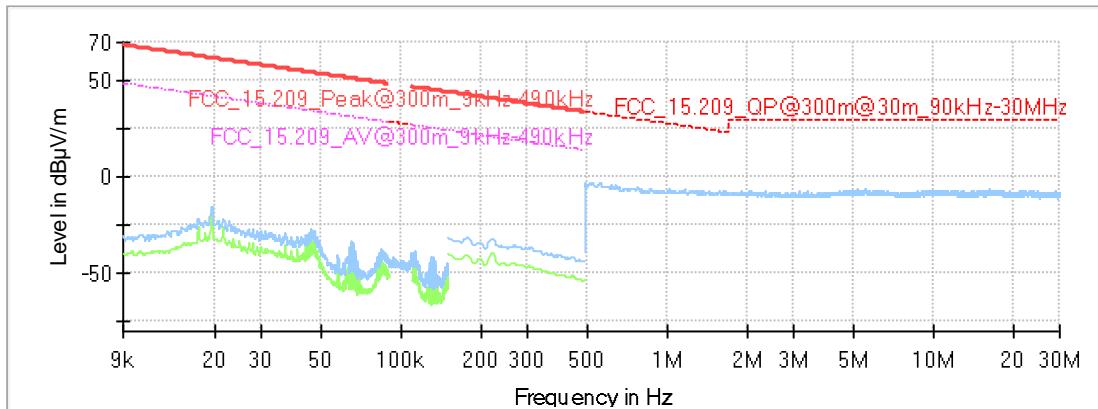
Ch. No.	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type
38	5190	2450.0	48.5	PEAK	1000	68.2	19.7	RB

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

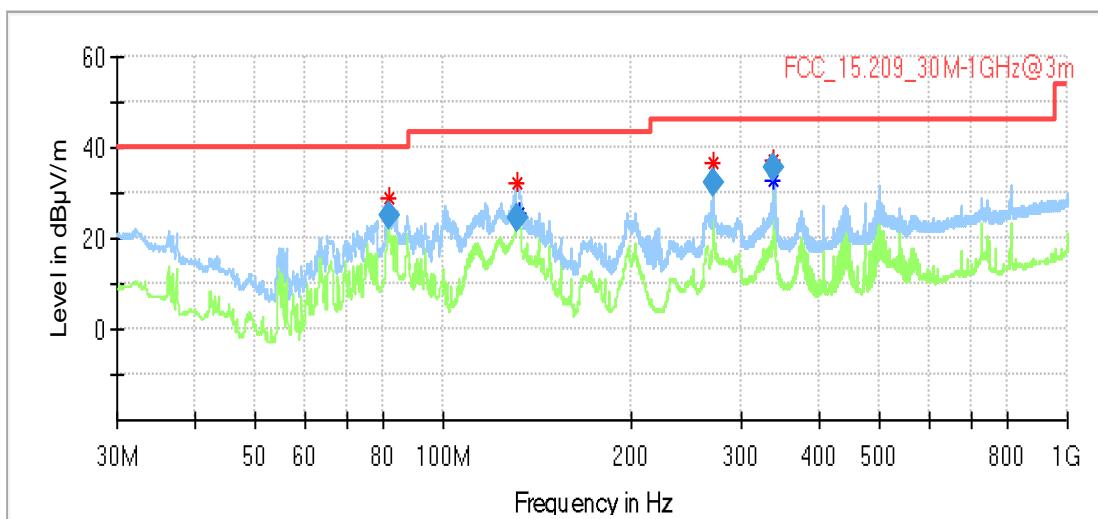
5.6.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

Android Core 0

9 kHz – 30 MHz, WLAN a 6Mbps, Ch. 44



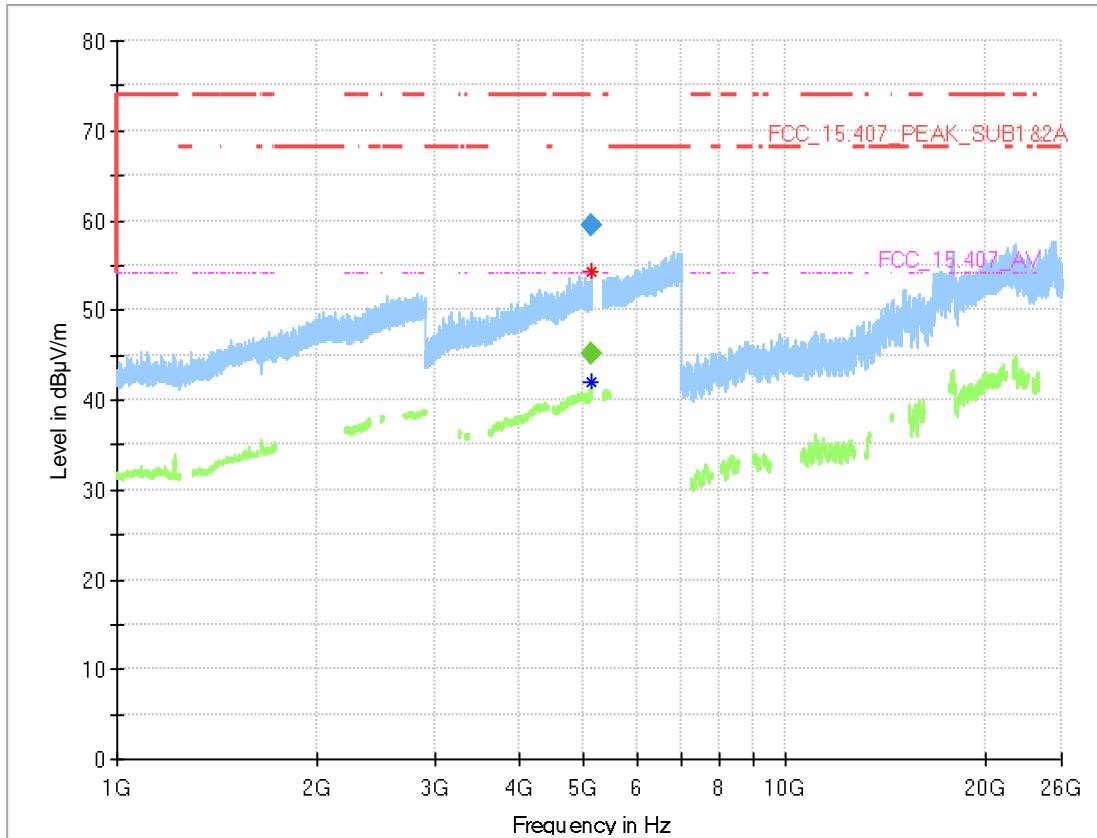
30 MHz – 1 GHz, WLAN a 6Mbps, Ch. 44



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)	Comment
81.600000	25.04	40.00	14.96	1000.0	120.000	115.0	V	-198.0	10.2	
131.760000	24.35	43.50	19.15	1000.0	120.000	113.0	V	-91.0	10.4	
271.170000	32.11	46.00	13.89	1000.0	120.000	111.0	H	-55.0	12.1	
337.800000	35.64	46.00	10.36	1000.0	120.000	100.0	H	113.0	14.6	

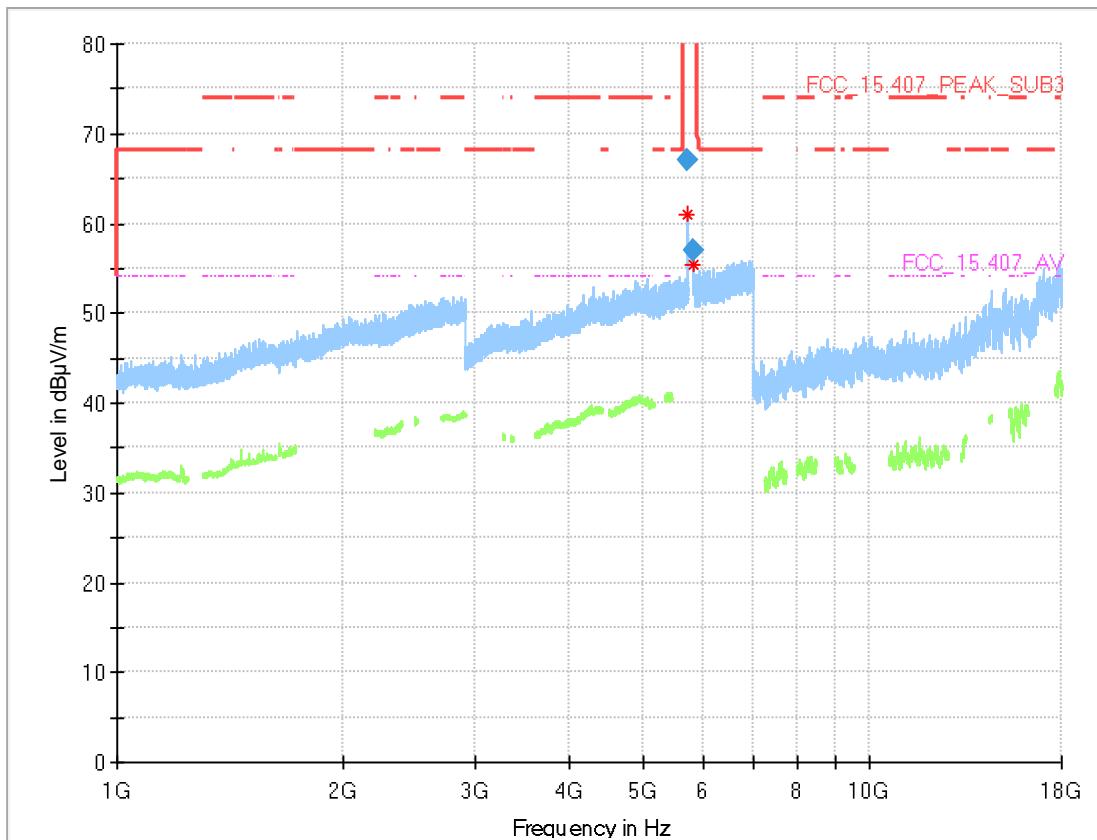
1 GHz – 26 GHz, WLAN a 6Mbps, Ch. 36



Final_Result

Frequency (MHz)	MaxPeak (dB μ V/m)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5149.025	59.4	--	74.00	14.58	1000.0	1000.000	150.0	V	83.0	-3.0
5149.838	--	45.1	54.00	8.86	1000.0	1000.000	150.0	V	85.0	-4.0

1 GHz – 18 GHz, WLAN n-mode 20MHz MCS0, Ch. 149

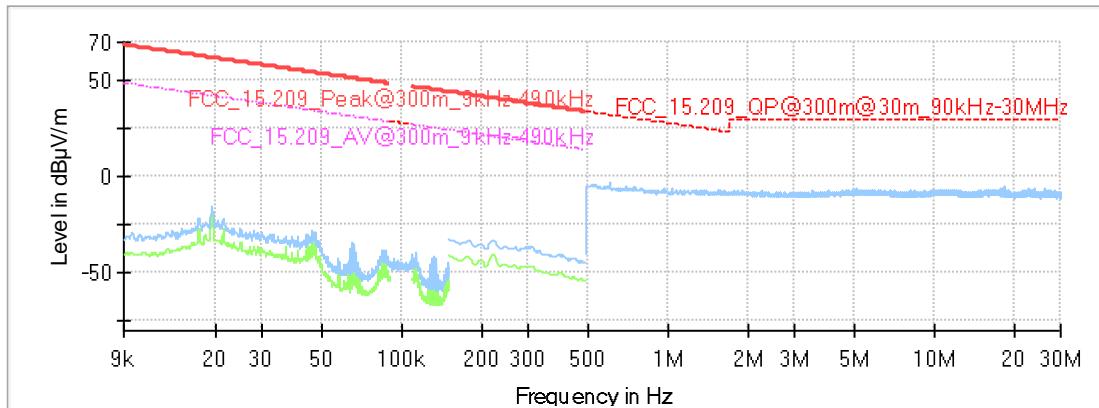


Final_Result

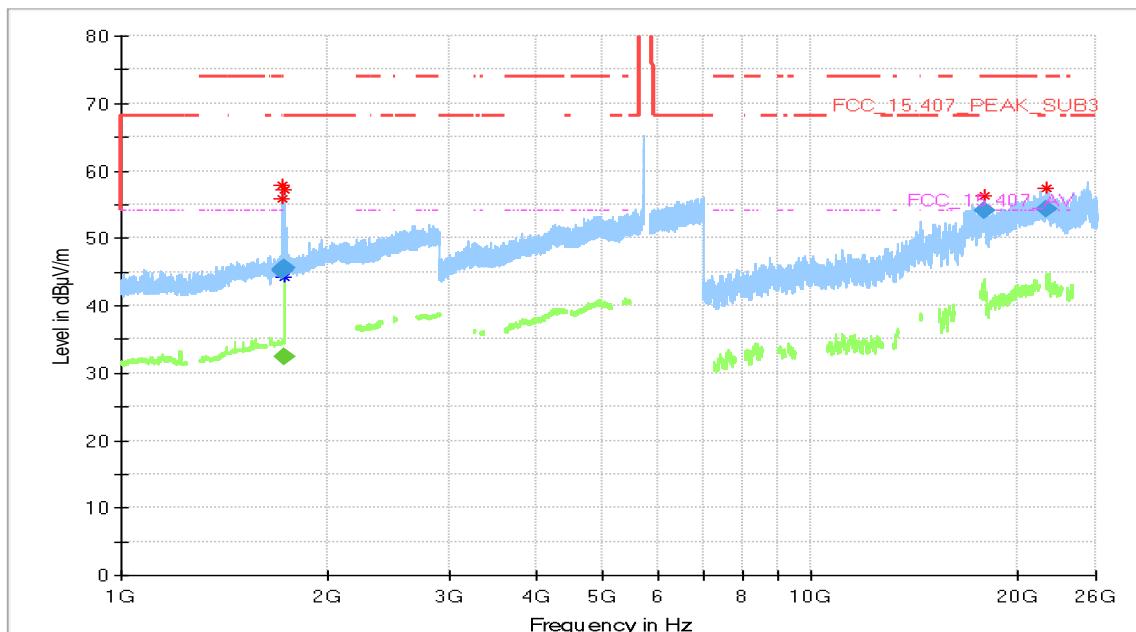
Frequency (MHz)	MaxPeak (dB μ V/m)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5724.300	67.0	---	120.60	53.63	1000.0	1000.000	150.0	V	11.0	-2.0
5850.700	57.1	---	120.60	63.54	1000.0	1000.000	150.0	V	-191.0	104.0

Android Core 1

9 kHz – 30 MHz, WLAN a-mode 6Mbps, Ch. 157



1 GHz – 26 GHz, WLAN a-mode 6Mbps, Ch. 149

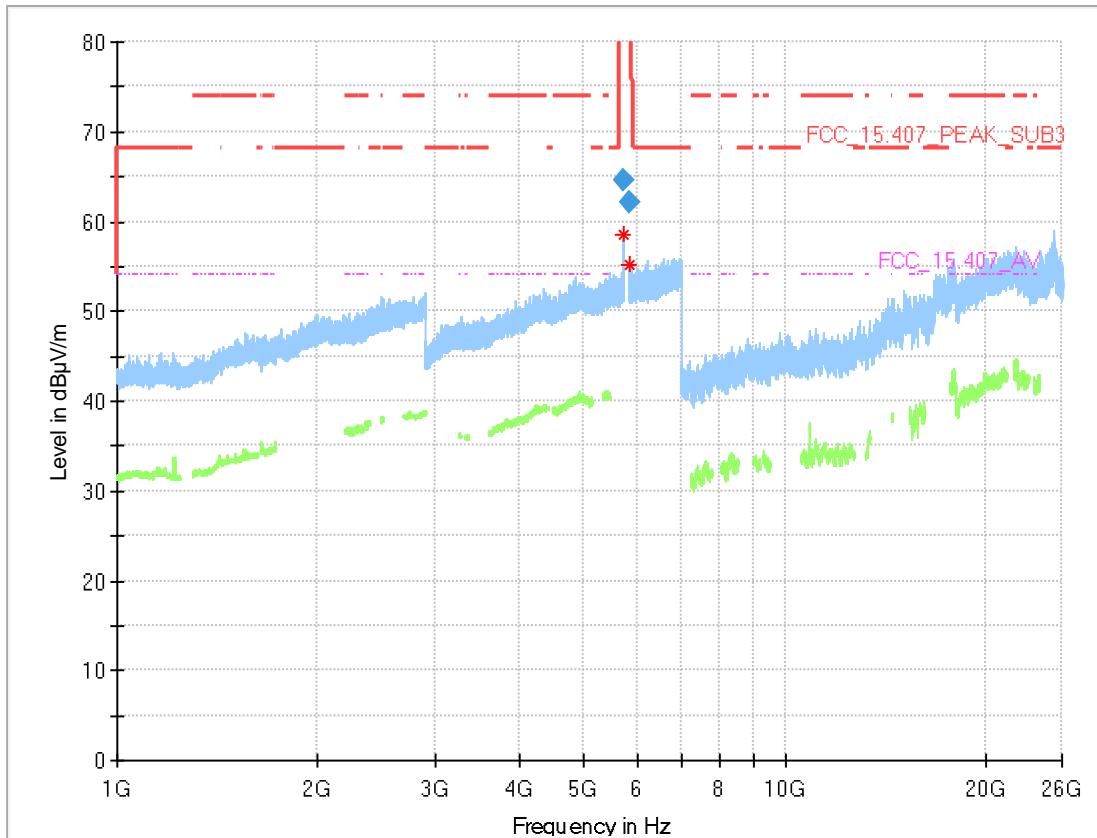

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
1717.744	57.9	---	68.20	10.29	---	---	150.0	V	-85.0	78.0
1718.008	55.9	---	68.20	12.32	---	---	150.0	V	-1.0	89.0
1720.194	57.2	---	74.00	16.80	---	---	150.0	V	7.0	15.0
1720.194	---	44.3	54.00	9.72	---	---	150.0	V	-6.0	15.0
17854.200	56.4	---	74.00	17.64	---	---	150.0	V	-173.0	82.0
22092.140	57.5	---	74.00	16.55	---	---	150.0	V	-51.0	2.0

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)
1717.744	45.1	---	68.20	23.14	1000.0	1000.000	150.0	V	-85.0	78.0
1718.008	45.5	---	68.20	22.74	1000.0	1000.000	150.0	V	-1.0	89.0
1720.194	--	32.4	54.00	21.64	1000.0	1000.000	150.0	V	-6.0	15.0
1720.194	45.7	---	74.00	28.32	1000.0	1000.000	150.0	V	7.0	15.0
17854.200	54.2	---	74.00	19.82	1000.0	1000.000	150.0	V	-173.0	82.0

1 GHz – 26 GHz, WLAN a-mode 6Mbps, Ch. 165



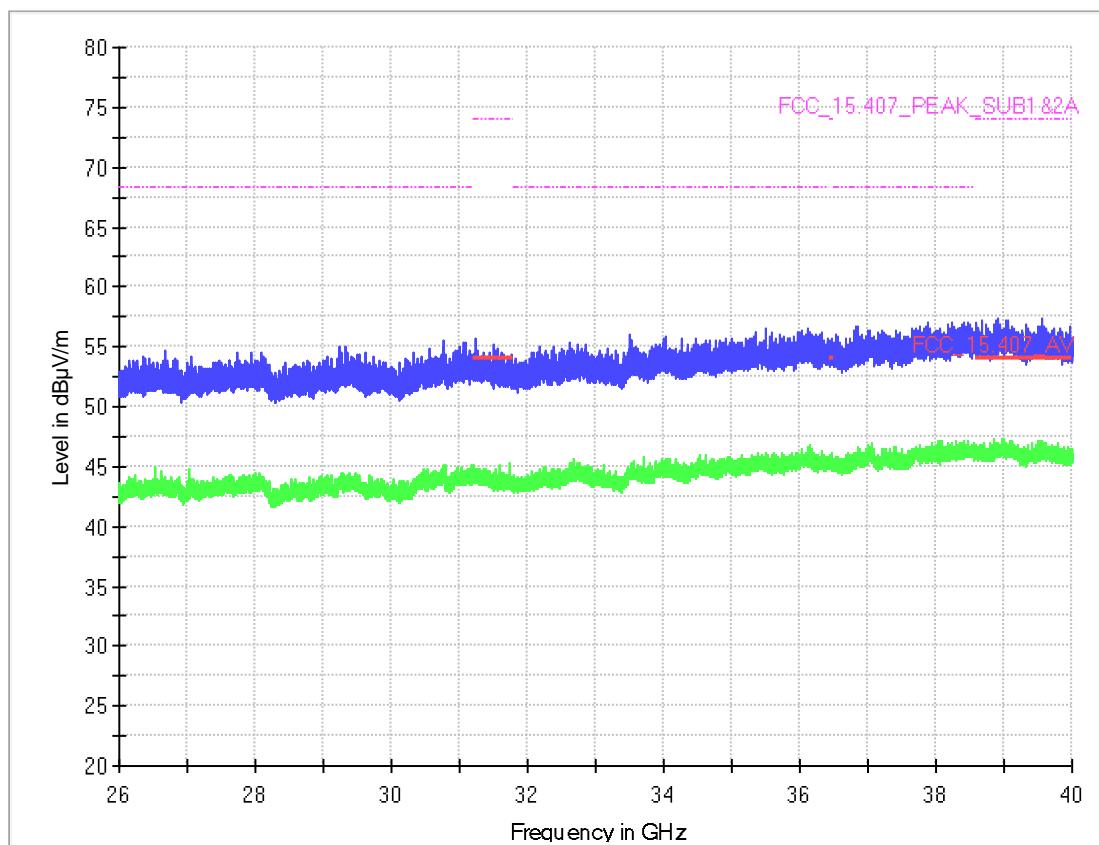
Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5724.200	58.6	---	120.38	61.79	---	---	150.0	H	-190.0	92.0
5850.300	55.2	---	121.52	66.30	---	---	150.0	V	-132.0	86.0

Final_Result

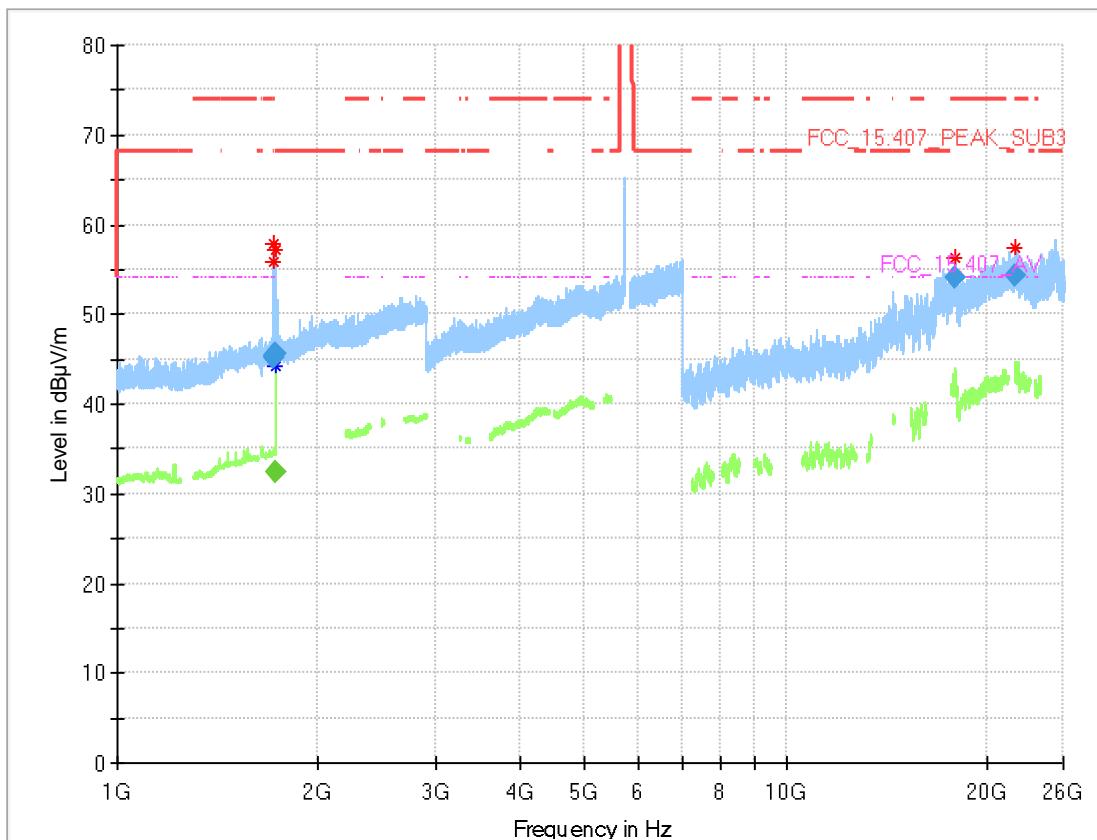
Frequency (MHz)	MaxPeak (dB μ V/m)	CAverage (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5724.200	64.6	---	120.38	55.73	1000.0	1000.000	150.0	H	-190.0	92.0
5850.300	62.2	---	121.52	59.30	1000.0	1000.000	150.0	V	-132.0	86.0

26 GHz – 40 GHz, WLAN n-mode 20MHz MCS0, Ch. 157



Linux Core 0

1 GHz – 26 GHz, WLAN a-mode MCS0, Ch. 157



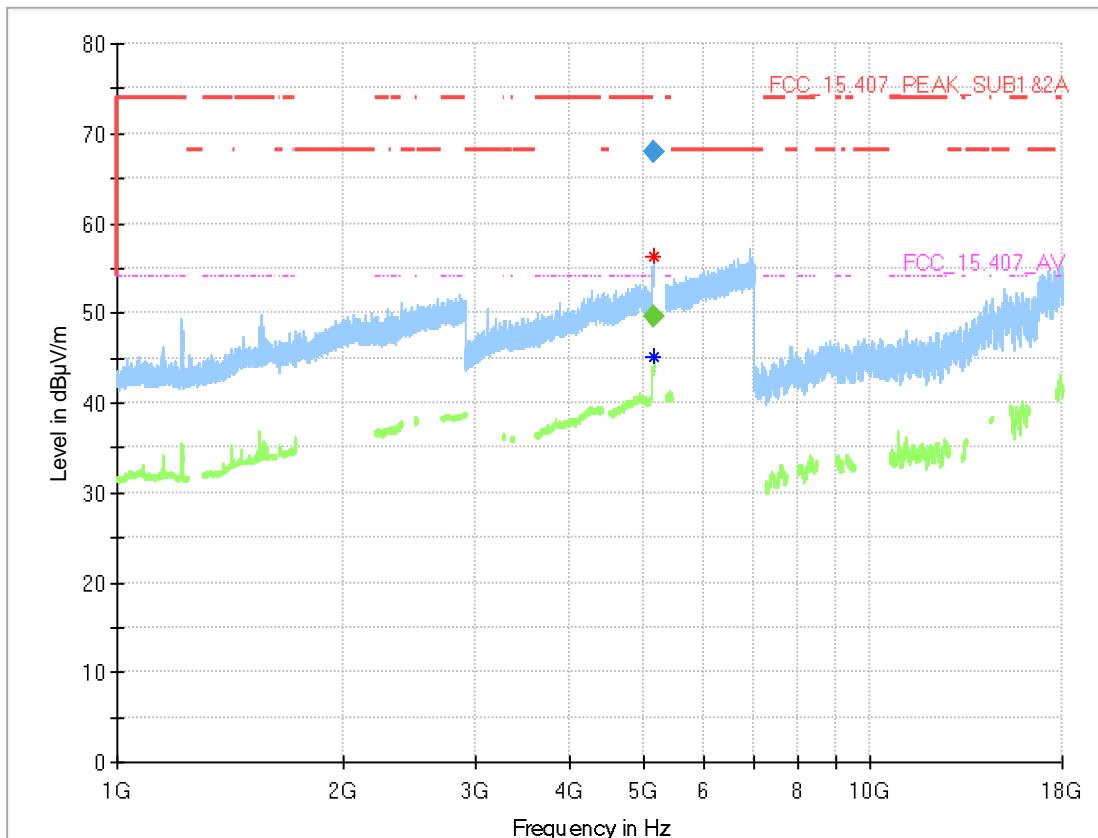
Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
1717.744	57.9	---	68.20	10.29	---	---	150.0	V	-85.0	78.0
1718.008	55.9	---	68.20	12.32	---	---	150.0	V	-1.0	89.0
1720.194	57.2	---	74.00	16.80	---	---	150.0	V	7.0	15.0
1720.194	---	44.3	54.00	9.72	---	---	150.0	V	-6.0	15.0
17854.200	56.4	---	74.00	17.64	---	---	150.0	V	-173.0	82.0
22092.140	57.5	---	74.00	16.55	---	---	150.0	V	-51.0	2.0

Final_Result

Frequency (MHz)	MaxPeak (dB μ V/m)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
1717.744	45.1	---	68.20	23.14	1000.0	1000.000	150.0	V	-85.0	78.0
1718.008	45.5	---	68.20	22.74	1000.0	1000.000	150.0	V	-1.0	89.0
1720.194	--	32.4	54.00	21.64	1000.0	1000.000	150.0	V	-6.0	15.0
1720.194	45.7	---	74.00	28.32	1000.0	1000.000	150.0	V	7.0	15.0
17854.200	54.2	---	74.00	19.82	1000.0	1000.000	150.0	V	-173.0	82.0
22092.140	54.3	---	74.00	19.71	1000.0	1000.000	150.0	V	-51.0	2.0

1 GHz – 18 GHz, WLAN n-mode 20MHz MCS0, Ch. 36

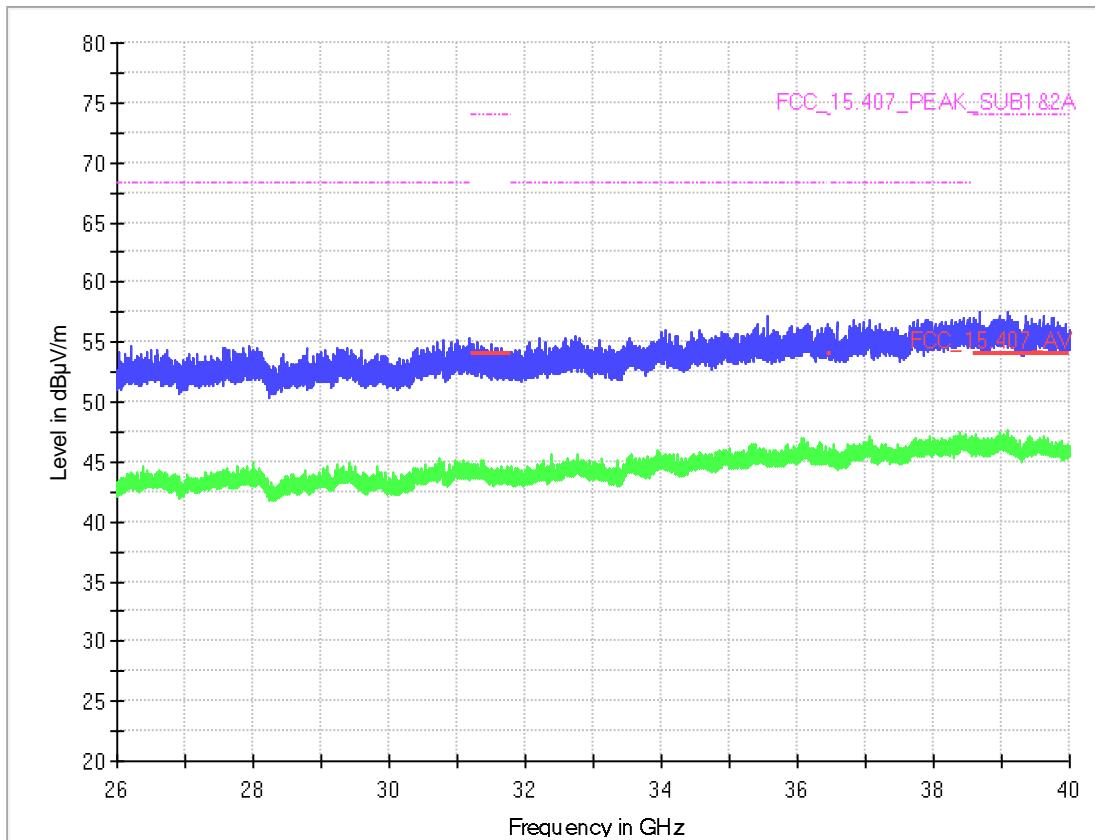

Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5148.213	--	45.0	54.00	8.96	---	---	150.0	V	142.0	2.0
5149.350	56.3	---	74.00	17.73	---	---	150.0	V	143.0	8.0

Final_Result

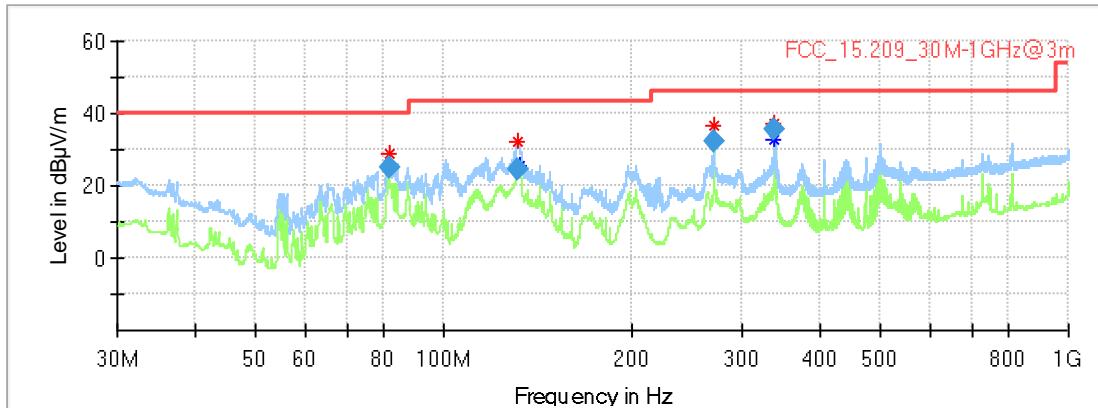
Frequency (MHz)	MaxPeak (dB μ V/m)	CAverage (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5148.213	--	49.6	54.00	4.43	1000.0	1000.000	150.0	V	142.0	2.0
5149.350	67.9	---	74.00	6.12	1000.0	1000.000	150.0	V	143.0	8.0

26 GHz – 40 GHz, WLAN a-mode MCS0, Ch. 44



Linux Core 1

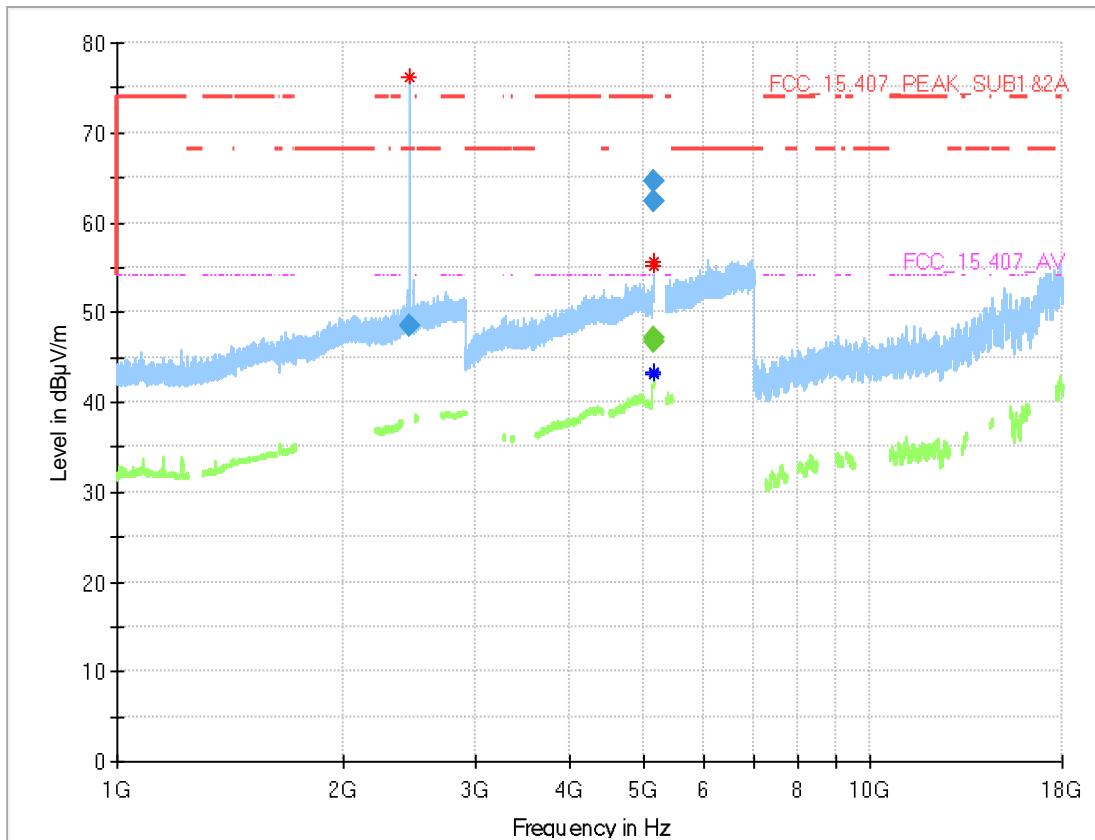
30 MHz – 1 GHz, WLAN a-mode 6mbps, Ch. 157


Final Result

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
81.600000	25.04	40.00	14.96	1000.0	120.000	115.0	V	-198.0	10.2	
131.760000	24.35	43.50	19.15	1000.0	120.000	113.0	V	-91.0	10.4	
271.170000	32.11	46.00	13.89	1000.0	120.000	111.0	H	-55.0	12.1	
337.800000	35.64	46.00	10.36	1000.0	120.000	100.0	H	113.0	14.6	

30 MHz – 1 GHz, WLAN a-mode 6mbps, Ch. 157

1 GHz – 18 GHz, WLAN ac-mode 40 MHz, Ch. 38


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
2450.214	76.3	---	68.20	-8.05	---	---	150.0	H	143.0	0.0
5148.538	--	43.0	54.00	10.97	---	---	150.0	V	-92.0	-12.0
5148.538	55.6	---	74.00	18.38	---	---	150.0	V	-92.0	-15.0
5149.838	--	43.3	54.00	10.72	---	---	150.0	V	-92.0	-12.0
5149.838	55.2	---	74.00	18.76	---	---	150.0	V	-91.0	15.0

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)
2450.214	48.5	---	68.20	19.71	1000.0	1000.000	150.0	H	143.0	0.0
5148.538	--	46.8	54.00	7.24	1000.0	1000.000	150.0	V	-92.0	-12.0
5148.538	62.4	---	74.00	11.60	1000.0	1000.000	150.0	V	-92.0	-15.0
5149.838	--	47.2	54.00	6.79	1000.0	1000.000	150.0	V	-92.0	-12.0
5149.838	64.5	---	74.00	9.50	1000.0	1000.000	150.0	V	-91.0	15.0

5.6.5 TEST EQUIPMENT USED

- Radiated Emissions

5.7 BAND EDGE

Standard **FCC Part 15 Subpart E**

The test was performed according to:

ANSI C63.10

5.7.1 TEST DESCRIPTION

Please see test description for the test case "Spurious Radiated Emissions"

5.7.2 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 (μ V/m)	Measurement distance (m)	Limits ($\text{dB}\mu\text{V}/\text{m}$)
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 (μ V/m)	Measurement distance (m)	Limits ($\text{dB}\mu\text{V}/\text{m}$)
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 ($\text{dB}\mu\text{V}/\text{m}$) = 20 log (Limit (μ V/m)/1 μ V/m)

5.7.3 TEST PROTOCOL

Android Core 0

Ambient temperature: 23–26 °C
Air Pressure: 1007–1013 hPa
Humidity: 30 – 37 %
WLAN a-Mode; 20 MHz; 6 Mbit/s

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	59.4	PEAK	1000	74.0	14.6	BE-RB	FCC&IC
	36	5180	5150.0	45.1	AV	1000	54.0	8.9	BE-RB	FCC&IC

WLAN n-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	56.5	PEAK	1000	74.0	17.5	BE-RB	FCC&IC
	36	5180	5150.0	44.4	AV	1000	54.0	9.6	BE-RB	FCC&IC
3	149	5745	5725.0	67.0	PEAK	1000	120.6	53.6	BE-UE	FCC&IC
	165	5825	5850.0	59.8	PEAK	1000	120.6	60.8	BE-UE	FCC&IC

WLAN n-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	38	5190	5150.0	63.1	PEAK	1000	74.0	10.9	BE-RB	FCC&IC
	38	5190	5150.0	46.7	AV	1000	54.0	7.3	BE-RB	FCC&IC
3	151	5755	5725.0	67.0	PEAK	1000	121.7	54.7	BE-UE	FCC&IC
	159	5795	5850.0	57.4	PEAK	1000	120.6	63.2	BE-UE	FCC&IC

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	57.3	PEAK	1000	74.0	16.7	BE-RB	FCC&IC
	36	5180	5150.0	44.9	AV	1000	54.0	9.1	BE-RB	FCC&IC
3	165	5825	5850.0	71.5	PEAK	1000	120.6	49.1	BE-UE	FCC&IC

WLAN ac-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	38	5190	5150.0	63.1	PEAK	1000	74.0	10.9	BE-RB	FCC&IC
	38	5190	5150.0	46.7	AV	1000	54.0	7.3	BE-RB	FCC&IC
3	151	5755	5725.0	66.2	PEAK	1000	120.6	54.4	BE-UE	FCC&IC
	159	5795	5850.0	56.9	PEAK	1000	120.6	63.7	BE-UE	FCC&IC

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	42	5210	5150.0	61.1	PEAK	1000	74.0	12.9	BE-RB	FCC&IC
	42	5210	5150.0	46.0	AV	1000	54.0	8.0	BE-RB	FCC&IC
3	155	5775	5725.0	63.0	PEAK	1000	120.6	57.6	BE-UE	FCC&IC
	155	5775	5850.0	59.4	PEAK	1000	120.6	61.2	BE-UE	FCC&IC

WLAN ac-Mode; 20 MHz; MCS0; MIMO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	56.7	PEAK	1000	74.0	17.3	BE-RB	FCC&IC
	36	5180	5150.0	45.0	AV	1000	54.0	9.0	BE-RB	FCC&IC

WLAN ac-Mode; 80 MHz; MCS8; MIMO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type	FCC /IC?
1	42	5210	5150.0	64.0	PEAK	1000	74.0	10.0	BE-RB	FCC&IC
	42	5210	5150.0	48.2	AV	1000	54.0	5.8	BE-RB	FCC&IC
3	155	5775	5725.0	65.1	PEAK	1000	118.1	53.0	BE-UE	FCC&IC
	155	5775	5850.0	63.4	PEAK	1000	119.7	56.3	BE-UE	FCC&IC

Android Core 1

Ambient temperature:

23–26 °C

Air Pressure:

1007-1013 hPa

Humidity:

30-37 %

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

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type	FCC /IC?
3	149	5745	5725.0	72.3	PEAK	1000	120.6	48.3	BE-UE	FCC&IC
	165	5825	5850.0	62.2	PEAK	1000	120.6	58.4	BE-UE	FCC&IC

WLAN n-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	61.9	PEAK	1000	74.0	12.1	BE-RB	FCC&IC
	36	5180	5150.0	46.9	AV	1000	54.0	7.1	BE-RB	FCC&IC

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBµV/m]	Detector	RBW [kHz]	Limit [dBµV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	67.7	PEAK	1000	74.0	6.3	BE-RB	FCC&IC
	36	5180	5150.0	48.7	AV	1000	54.0	5.3	BE-RB	FCC&IC
3	149	5745	5725.0	80.4	PEAK	1000	120.6	40.2	BE-UE	FCC&IC

Linux Core 0

Ambient temperature: 23–26 °C
Air Pressure: 1007-1013 hPa
Humidity: 30-37 %
WLAN a-Mode; 20 MHz; 6 Mbit/s SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
3	149	5745	5725.0	64.6	PEAK	1000	120.6	56.0	BE-UE	FCC&IC
	165	5825	5850.0	58.6	PEAK	1000	120.6	62.0	BE-UE	FCC&IC

WLAN n-Mode; 20 MHz MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	67.9	PEAK	1000	74.0	6.1	BE-RB	FCC&IC
	36	5180	5150.0	49.6	AV	1000	54.0	4.4	BE-RB	FCC&IC

WLAN n-Mode; 20 MHz MCS0; MIMO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	57.7	PEAK	1000	74.0	10.2	BE-RB	FCC&IC
	36	5180	5150.0	43.9	AV	1000	54.0	16.3	BE-RB	FCC&IC

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	59.6	PEAK	1000	74.0	14.4	BE-RB	FCC&IC
	36	5180	5150.0	44.4	AV	1000	54.0	9.6	BE-RB	FCC&IC
3	149	5745	5725.0	78.8	PEAK	1000	120.6	41.8	BE-UE	FCC&IC

WLAN ac-Mode; 20 MHz; MCS0; MIMO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	56.5	PEAK	1000	74.0	17.5	BE-RB	FCC&IC
	36	5180	5150.0	43.7	AV	1000	54.0	10.3	BE-RB	FCC&IC

WLAN ac-Mode; 80 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	42	5210	5150.0	65.0	PEAK	1000	74.0	9.0	BE-RB	FCC&IC
	42	5210	5150.0	48.7	AV	1000	54.0	5.3	BE-RB	FCC&IC
3	155	5775	5725.0	65.0	PEAK	1000	120.6	55.6	BE-UE	FCC&IC
	155	5775	5850.0	60.3	PEAK	1000	120.6	60.3	BE-UE	FCC&IC

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

Linux Core 1

Ambient temperature: 23-26 °C
Air Pressure: 1007-1013 hPa
Humidity: 30-37 %
WLAN a-Mode; 20 MHz; 6 Mbit/s

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	61.7	PEAK	1000	74.0	12.3	BE-RB	FCC&IC
	36	5180	5150.0	46.5	AV	1000	54.0	7.5	BE-RB	FCC&IC

WLAN n-Mode; 20 MHz; 6 Mbit/s ; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	57.3	PEAK	1000	74.0	16.7	BE-RB	FCC&IC
	36	5180	5150.0	44.5	AV	1000	54.0	9.5	BE-RB	FCC&IC
	3	165	5825	5850.0	57.1	PEAK	1000	120.6	63.5	BE-UE

WLAN n-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?	
1	38	5190	5150.0	62.5	PEAK	1000	74.0	11.5	BE-RB	FCC&IC	
	38	5190	5150.0	44.1	AV	1000	54.0	9.9	BE-RB	FCC&IC	
	3	151	5755	5725.0	64.3	PEAK	1000	120.6	56.3	BE-UE	FCC&IC
	159	5795	5850.0	57.4	PEAK	1000	120.6	63.2	BE-UE	FCC&IC	

WLAN ac-Mode; 20 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?
1	36	5180	5150.0	58.1	PEAK	1000	74.0	15.9	BE-RB	FCC&IC
	36	5180	5150.0	44.6	AV	1000	54.0	9.4	BE-RB	FCC&IC
	3	165	5825	5850.0	70.2	PEAK	1000	120.6	50.4	BE-UE

WLAN ac-Mode; 40 MHz; MCS0; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?	
1	38	5190	5150.0	64.5	PEAK	1000	74.0	9.5	BE-RB	FCC&IC	
	38	5190	5150.0	47.2	AV	1000	54.0	6.8	BE-RB	FCC&IC	
	3	151	5755	5725.0	64.8	PEAK	1000	120.6	55.8	BE-UE	FCC&IC
	159	5795	5850.0	57.6	PEAK	1000	120.6	63.0	BE-UE	FCC&IC	

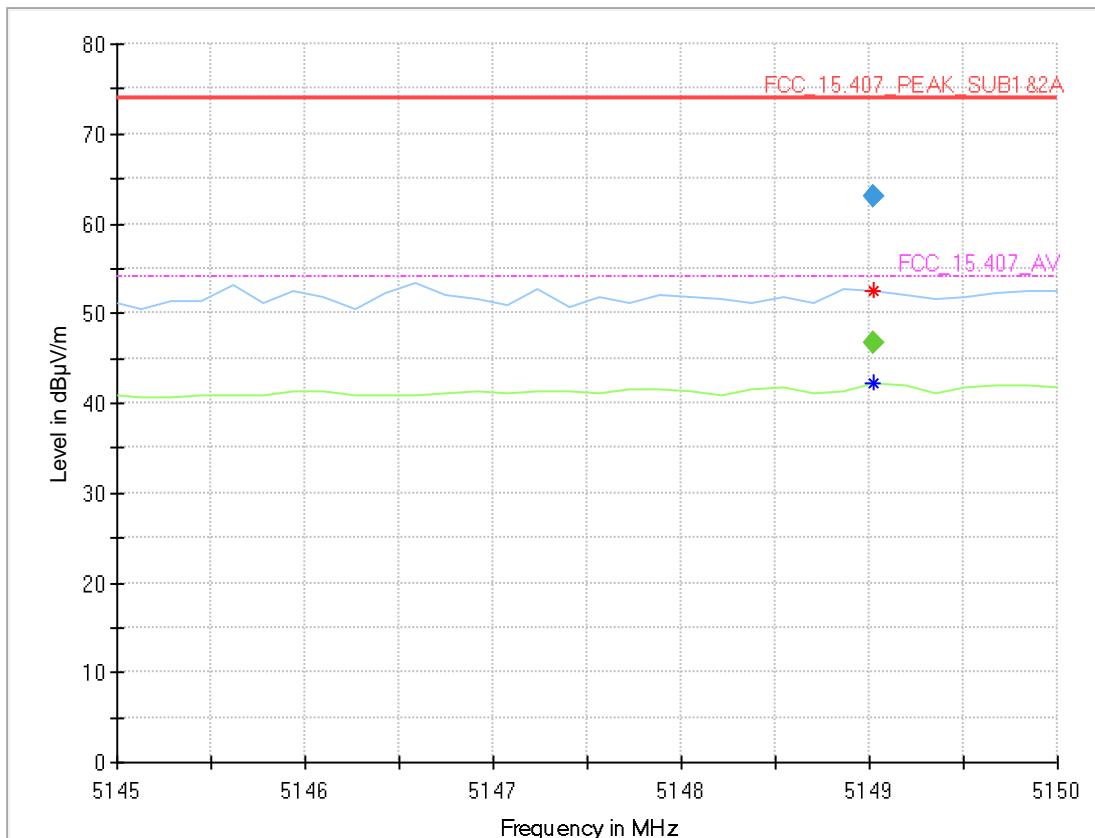
WLAN ac-Mode; 80 MHz; MCS8; SISO

U-NII-Subband	Ch. No.	Ch. Center Freq. [MHz]	Band Edge Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin [dB]	Limit Type	FCC /IC?	
1	42	5210	5150.0	58.1	PEAK	1000	74.0	15.9	BE-RB	FCC&IC	
	42	5210	5150.0	43.7	AV	1000	54.0	10.3	BE-RB	FCC&IC	
	3	155	5775	5725.0	60.0	PEAK	1000	120.6	60.6	BE-UE	FCC&IC
	155	5775	5850.0	60.0	PEAK	1000	120.6	60.6	BE-UE	FCC&IC	

5.7.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

Android Core 0

WLAN n 40 MHz, Ch. 38 SISO



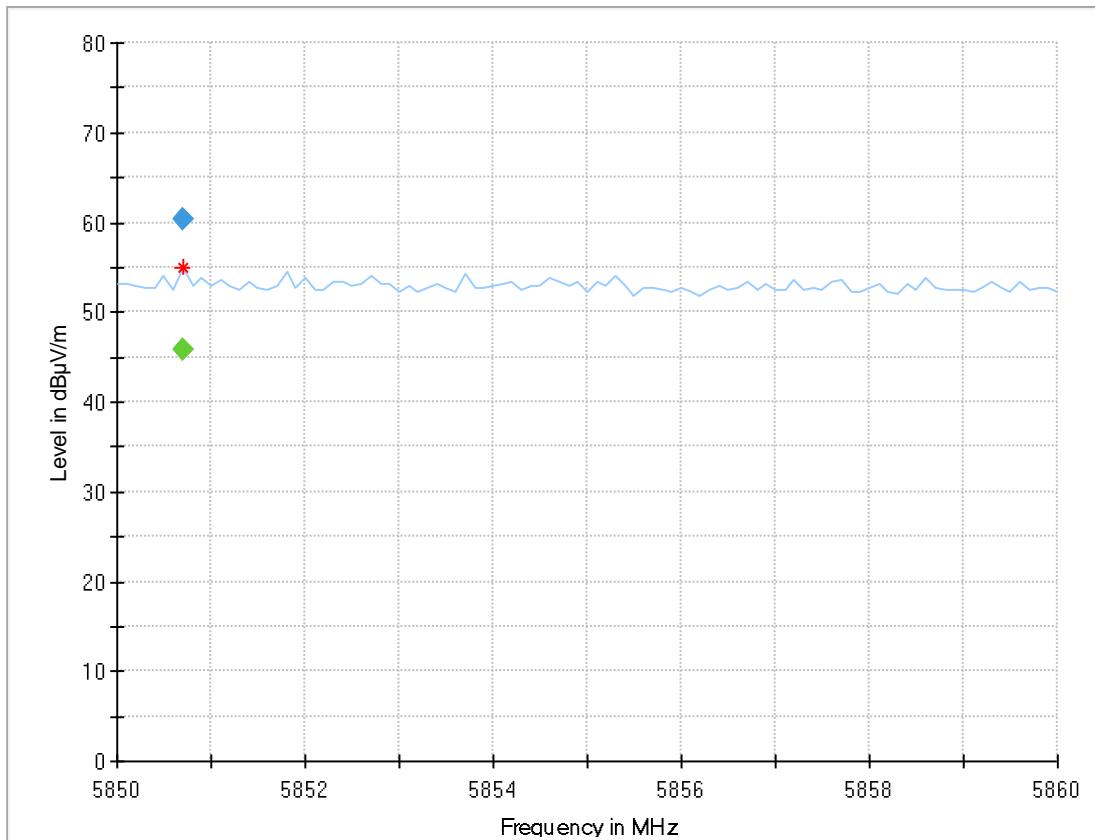
Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5149.025	--	42.2	54.00	11.82	---	---	150.0	V	-124.0	95.0
5149.025	52.6	---	74.00	21.44	---	---	150.0	V	-124.0	98.0

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)
5149.025	63.1	---	74.00	10.91	1000.0	1000.000	150.0	V	-124.0	98.0
5149.025	--	46.7	54.00	7.27	1000.0	1000.000	150.0	V	-124.0	95.0

WLAN ac-mode 80 MHz MCS8, Ch. 155 MIMO


Critical_Freqs

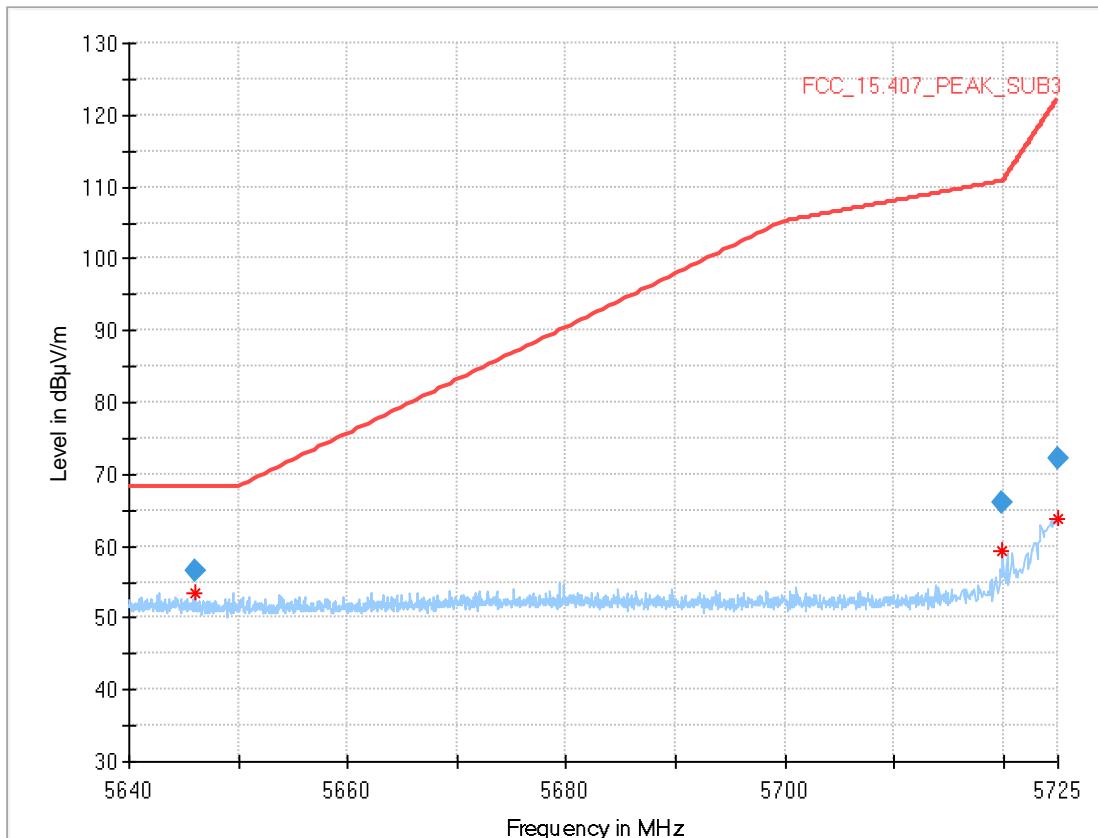
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5850.700	54.9	---	120.60	65.68	---	---	150.0	H	43.0	1.0

Final_Result

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5850.700	---	45.7	---	---	1000.0	1000.000	150.0	H	43.0	1.0
5850.700	60.3	---	120.60	60.30	1000.0	1000.000	150.0	H	43.0	1.0

Android Core 1

WLAN a-mode 6 Mbps, Ch. 149

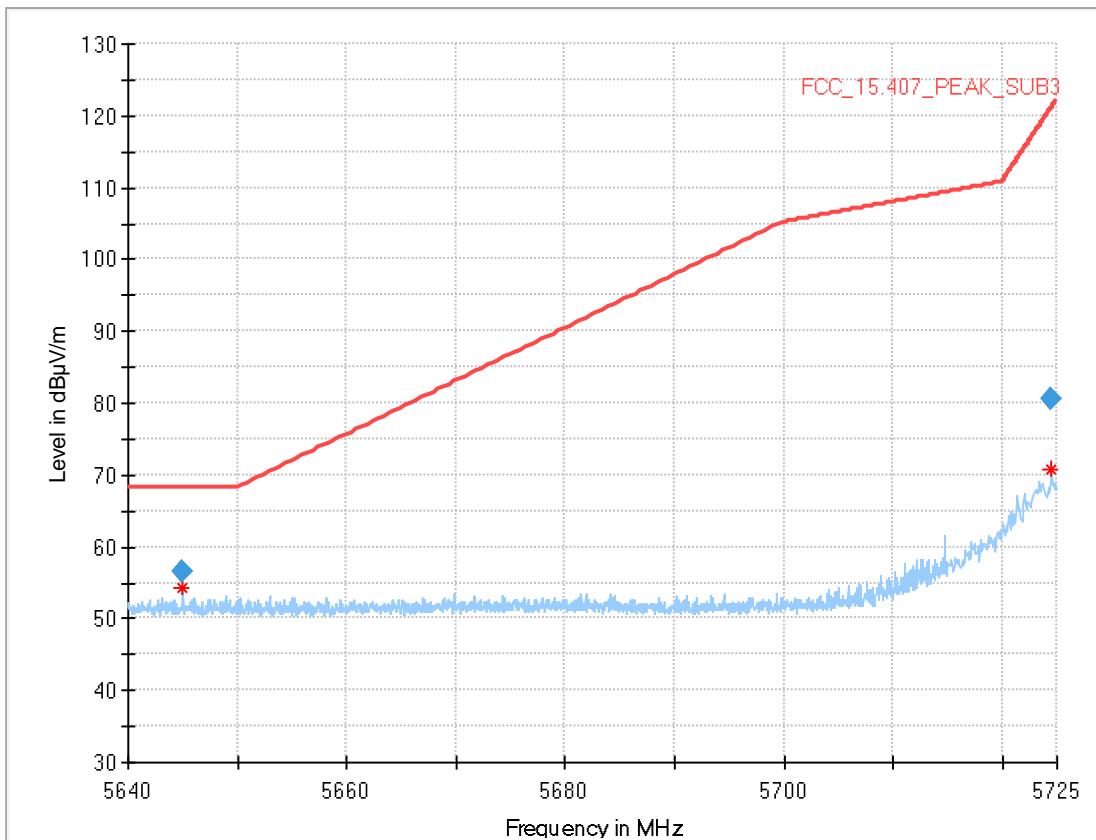

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5646.075	53.5	---	68.20	14.70	---	---	150.0	V	-129.0	96.0
5719.900	59.4	---	110.77	51.37	---	---	150.0	V	-128.0	85.0
5725.000	63.9	---	122.20	58.34	---	---	150.0	V	-134.0	83.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5646.075	56.5	---	68.20	11.74	1000.0	1000.000	150.0	V	-129.0	96.0
5719.900	66.1	---	110.77	44.71	1000.0	1000.000	150.0	V	-128.0	85.0
5725.000	72.3	---	122.20	49.92	1000.0	1000.000	150.0	V	-134.0	83.0

WLAN ac-mode20 MHz 6 Mbps, Ch. 149


Critical_Freqs

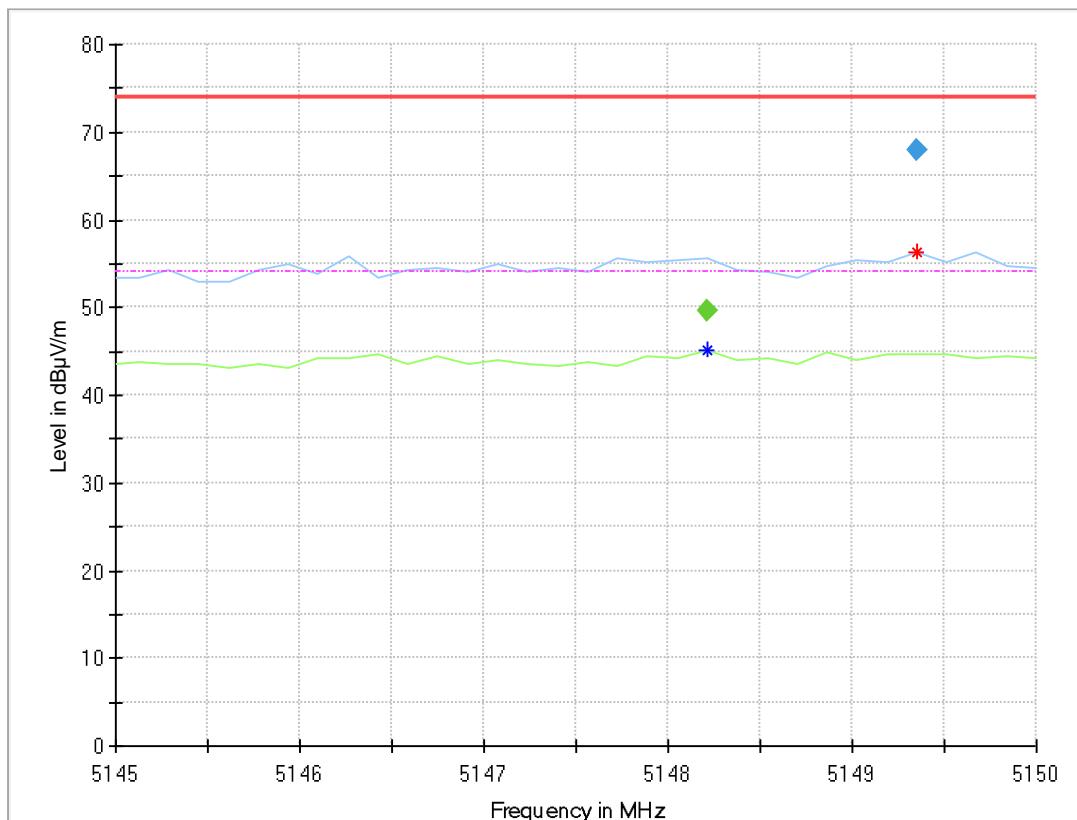
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5645.025	54.2	---	68.20	14.00	---	---	150.0	V	-179.0	-2.0
5724.500	70.7	---	121.06	50.41	---	---	150.0	V	-169.0	105.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5645.025	56.6	---	68.20	11.62	1000.0	1000.000	150.0	V	-179.0	-2.0
5724.500	80.4	---	121.06	40.61	1000.0	1000.000	150.0	V	-169.0	105.0

Linux Core 0

WLAN n 20 MHz, Ch. 36 SISO

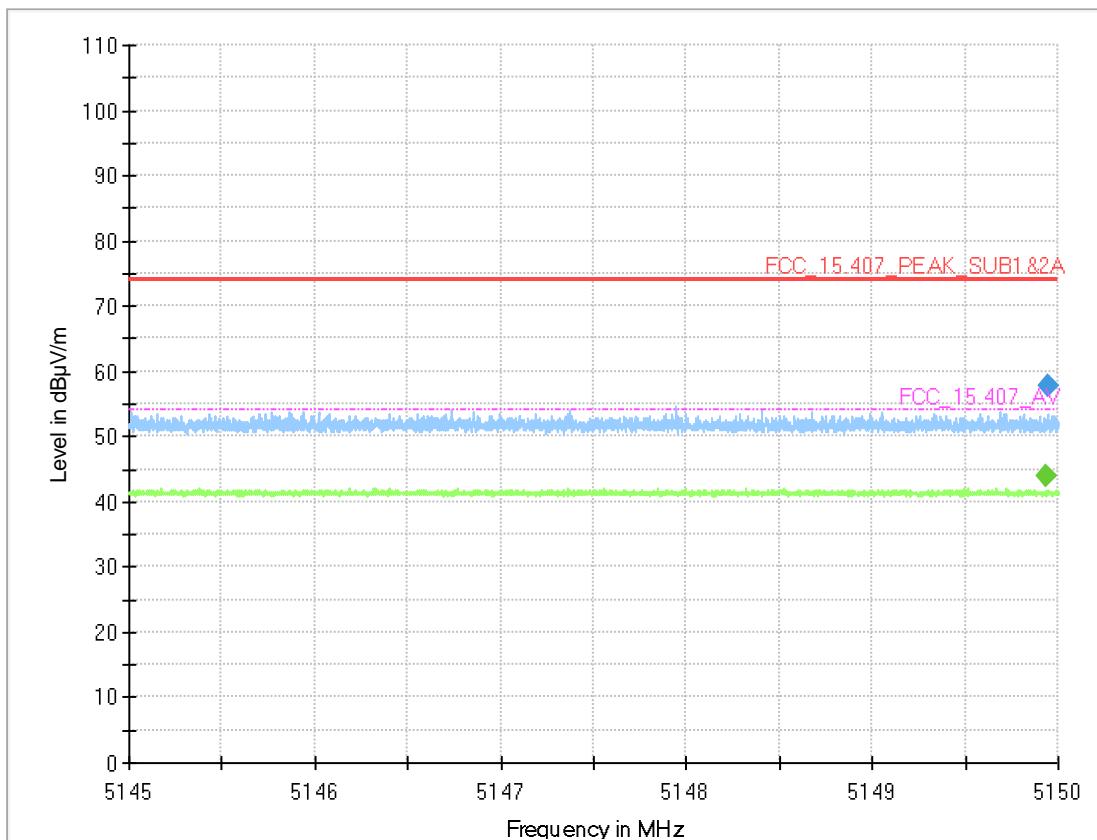

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5148.213	---	45.0	54.00	8.96	---	---	150.0	V	142.0	2.0
5149.350	56.3	---	74.00	17.73	---	---	150.0	V	143.0	8.0

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)
5148.213	---	49.6	54.00	4.43	1000.0	1000.000	150.0	V	142.0	2.0
5149.350	67.9	---	74.00	6.12	1000.0	1000.000	150.0	V	143.0	8.0

WLAN n 20 MHz, Ch. 36 MIMO

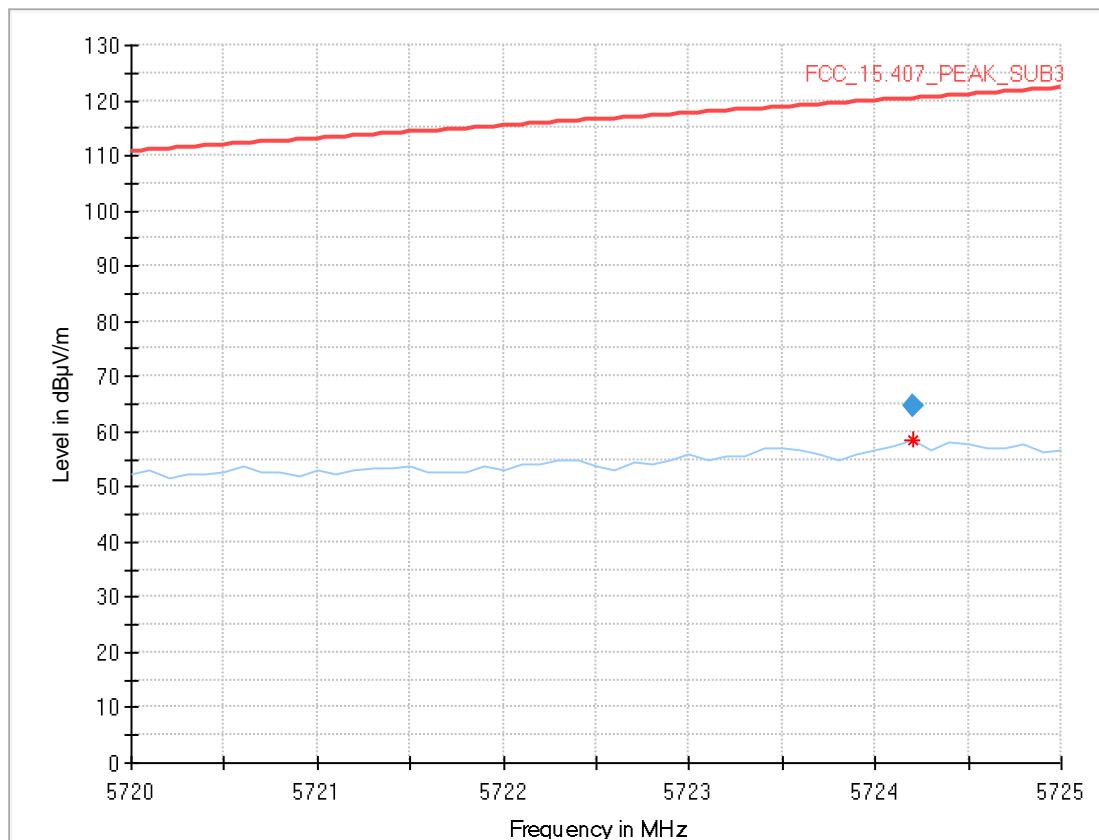

Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	MARGIN	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Elevation
5149.936	--	43.9	54.00	12.37	---	---	150.0	V	-93.0	-4.0
5149.941	58.2	---	74.00	20.39	---	---	150.0	H	146.0	105.0

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin	Meas. Time (ms)	Bandwidth	Height	Pol	Azimuth	Elevation
5149.936	--	43.8	54.00	10.16	1000.0	1000.000	150.0	V	-93.0	-4.0
5149.941	57.7	---	74.00	16.26	1000.0	1000.000	150.0	H	146.0	105.0

WLAN a-mode, Ch. 149 SISO


Critical_Freqs

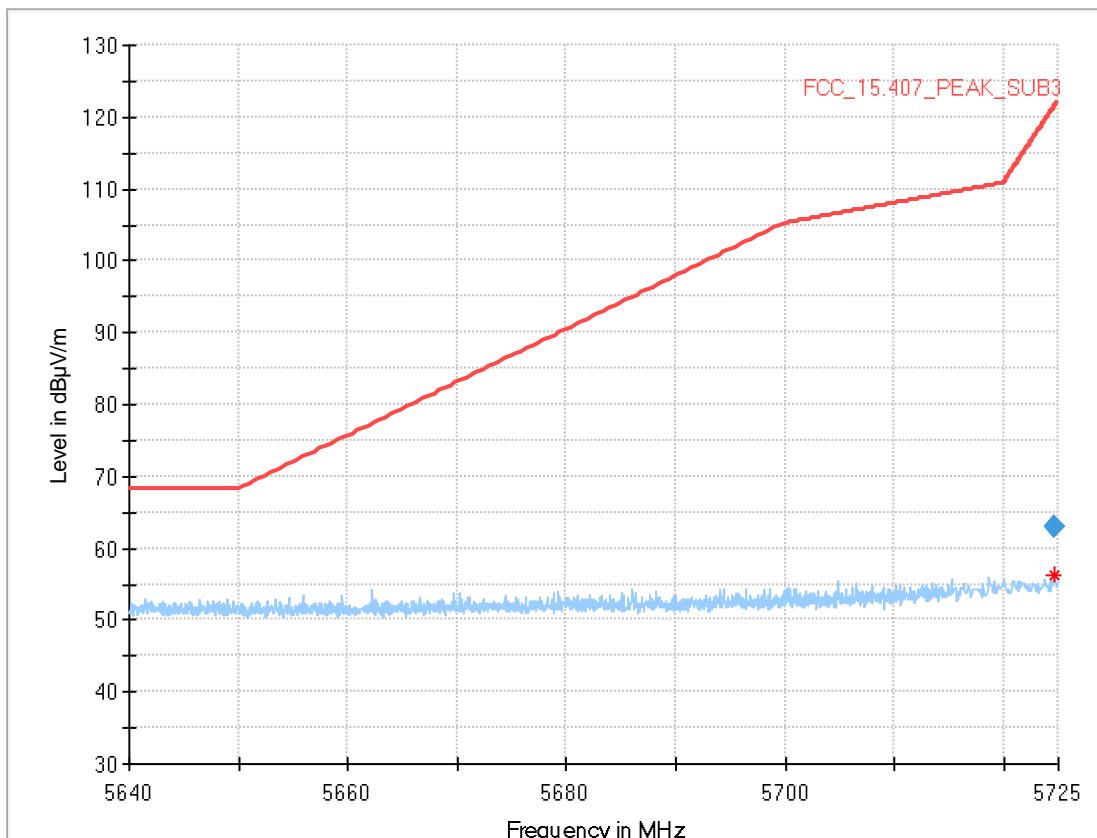
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5724.200	58.6	---	120.38	61.79	---	---	150.0	H	-190.0	92.0
5850.300	55.2	---	121.52	66.30	---	---	150.0	V	-132.0	86.0

Final Result

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5724.200	64.6	---	120.38	55.73	1000.0	1000.000	150.0	H	-190.0	92.0
5850.300	62.2	---	121.52	59.30	1000.0	1000.000	150.0	V	-132.0	86.0

Linux Core 1

WLAN ac-mode 80 MHz, Ch. 155 SISO


Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5724.600	56.4	---	121.29	64.93	---	---	150.0	V	-176.0	87.0

Final_Result

Frequency (MHz)	MaxPeak (dB μ V/m)	CAverage (dB μ V/m)	Limit (dB μ V/m)	MARGIN (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)
5724.600	63.0	---	121.29	58.26	1000.0	1000.000	150.0	V	-176.0	87.0

5.7.5 TEST EQUIPMENT USED

- Radiated Emissions

6 TEST EQUIPMENT

- 1 R&S TS8997
EN300328/301893 Test Lab

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
1.1	SMB100A	Signal Generator 9 kHz - 6 GHz	Rohde & Schwarz	107695	2017-07	2020-07
1.2	MFS	Rubidium Frequency Standard	Datum-Beverly	5489/001	2018-07	2019-07
1.3	1515 / 93459	Broadband Power Divider SMA (Aux)	Weinschel Associates	LN673		
1.4	FSV30	Signal Analyzer 10 Hz - 30 GHz	Rohde & Schwarz	103005	2018-04	2020-04
1.5	Fluke 177	Digital Multimeter 03 (Multimeter)	Fluke Europe B.V.	86670383	2018-04	2020-04
1.6	VHF-3100+	High Pass Filter		-		
1.7	VT 4002	Temperature Chamber	Vötsch	58566002150010	2018-04	2020-04
1.8	A8455-4	4 Way Power Divider (SMA)		-		
1.9	Opus10 THI (8152.00)	ThermoHygro Datalogger 03 (Environ)	Lufft Mess- und Regeltechnik GmbH	7482	2017-04 2019-05	2019-04 2021-05
1.10	SMBV100A	Vector Signal Generator 9 kHz - 6 GHz	Rohde & Schwarz	259291	2016-10	2019-10
1.11	OSP120	Switching Unit with integrated power meter	Rohde & Schwarz	101158	2018-05	2021-05

- 2 Radiated Emissions
Lab to perform radiated emission tests

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
2.1	NRV-Z1	Sensor Head A	Rohde & Schwarz GmbH & Co. KG	827753/005	2018-07	2019-07
2.2	MFS	Rubidium Frequency Normal MFS	Datum GmbH	002	2018-10	2020-10
2.3	Opus10 TPR (8253.00)	ThermoAirpres sure Datalogger 13 (Environ)	Lufft Mess- und Regeltechnik GmbH	13936	2017-04 2019-05	2019-04 2021-05
2.4	ESW44	EMI Test Receiver	Rohde & Schwarz GmbH & Co. KG	101603	2018-05	2019-11
2.5	Anechoic Chamber	10.58 x 6.38 x 6.00 m ³	Frankonia	none	2018-06	2020-06
2.6	FS-Z60	Harmonic Mixer 40 - 60 GHz	Rohde & Schwarz Messgerätebau GmbH	100178	2016-12	2019-12

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
2.7	FS-Z220	Harmonic Mixer 140 - 220 GHz	Rohde & Schwarz Messgerätebau GmbH	101005	2017-03	2020-03
2.8	SGH-05	Standard Gain / Pyramidal Horn Antenna (140 - 220 GHz)	RPG-Radiometer Physics GmbH	075		
2.9	HL 562	Ultralog new biconicals	Rohde & Schwarz	830547/003	2018-07	2021-07
2.10	5HC2700/12750 -1.5-KK	High Pass Filter	Trilithic	9942012		
2.11	ASP 1.2/1.8-10 kg	Antenna Mast	Maturo GmbH	-		
2.12	Fully Anechoic Room	8.80m x 4.60m x 4.05m (l x w x h)	Albatross Projects	P26971-647-001-PRB	2018-06	2020-06
2.13	Fluke 177	Digital Multimeter 03 (Multimeter)	Fluke Europe B.V.	86670383	2018-04	2020-04
2.14	NRVD	Power Meter	Rohde & Schwarz GmbH & Co. KG	828110/016	2018-07	2019-07
2.15	HF 906	Double-ridged horn	Rohde & Schwarz	357357/002	2018-09	2021-09
2.16	JS4-18002600-32-5P	Broadband Amplifier 18 GHz - 26 GHz	Miteq	849785		
2.17	FSW 43	Spectrum Analyzer	Rohde & Schwarz	103779	2019-02	2021-02
2.18	3160-09	Standard Gain / Pyramidal Horn Antenna 26.5 GHz	EMCO Elektronik GmbH	00083069		
2.19	SGH-19	Standard Gain / Pyramidal Horn Antenna (40 - 60 GHz)	RPG-Radiometer Physics GmbH	093		
2.20	WHKX 7.0/18G-8SS	High Pass Filter	Wainwright	09		
2.21	4HC1600/12750 -1.5-KK	High Pass Filter	Trilithic	9942011		
2.22	Chroma 6404	AC Power Source	Chroma ATE INC.	64040001304		
2.23	JS4-00102600-42-5A	Broadband Amplifier 30 MHz - 26 GHz	Miteq	619368		
2.24	TT 1.5 WI	Turn Table	Maturo GmbH	-		
2.25	HL 562 Ultralog	Log.-per. Antenna	Rohde & Schwarz	100609	2016-04 2019-05	2019-04 2022-05
2.26	HF 906	Double-ridged horn	Rohde & Schwarz	357357/001	2018-03	2021-03
2.27	FS-Z325	Harmonic Mixer 220 - 325 GHz	Rohde & Schwarz Messgerätebau GmbH	101006	2017-03	2020-03

Ref.No.	Device Name	Description	Manufacturer	Serial Number	Last Calibration	Calibration Due
2.28	3160-10	Standard Gain / Pyramidal Horn Antenna 40 GHz	EMCO Elektronic GmbH	00086675		
2.29	SGH-08	Standard Gain / Pyramidal Horn Antenna (90 - 140 GHz)	RPG-Radiometer Physics GmbH	064		
2.30	SGH-12	Standard Gain / Pyramidal HornAntenna (60 - 90 GHz)	RPG-Radiometer Physics GmbH	326		
2.31	5HC3500/18000 -1.2-KK	High Pass Filter	Trilithic	200035008		
2.32	FS-Z140	Harmonic Mixer 90 -140 GHz	Rohde & Schwarz Messgerätebau GmbH	101007	2017-02	2020-02
2.33	HFH2-Z2	Loop Antenna	Rohde & Schwarz	829324/006	2018-01	2021-01
2.34	Opus10 THI (8152.00)	ThermoHygro Datalogger 12 (Environ)	Lufft Mess- und Regeltechnik GmbH	12482	2017-03 2019-04	2019-04 2021-05
2.35	ESR 7	EMI Receiver / Spectrum Analyzer	Rohde & Schwarz	101424	2019-01	2020-01
2.36	JS4-00101800-35-5P	Broadband Amplifier 30 MHz - 18 GHz	Miteq	896037		
2.37	AS 620 P	Antenna mast	HD GmbH	620/37		
2.38	Tilt device Maturo (Rohacell)	Antrieb TD1.5-10kg	Maturo GmbH	TD1.5-10kg/024/3790709		
2.39	SGH-03	Standard Gain / Pyramidal Horn Antenna (220 - 325 GHz)	RPG-Radiometer Physics GmbH	060		
2.40	FS-Z90	Harmonic Mixer 60 - 90 GHz	Rohde & Schwarz Messgerätebau GmbH	101686	2017-03	2020-03
2.41	ESIB 26	Spectrum Analyzer	Rohde & Schwarz	830482/004	2018-01	2020-01
2.42	PAS 2.5 - 10 kg	Antenna Mast	Maturo GmbH	-		
2.43	AFS42-00101800-25-S-42	Broadband Amplifier 25 MHz - 18 GHz	Miteq	2035324		
2.44	AM 4.0	Antenna mast	Maturo GmbH	AM4.0/180/11920513		
2.45	HF 907	Double-ridged horn	Rohde & Schwarz	102444	2018-07	2021-07

The calibration interval is the time interval between "Last Calibration" and "Calibration Due"

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 attenuator)
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

$$U_{\text{LISN}} (\text{dB } \mu\text{V}) = U (\text{dB } \mu\text{V}) + \text{Corr. (dB)}$$

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 MHz	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))
			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

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + AF \text{ (dB } 1/\text{m)} + \text{Corr. (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
distance correction = $-40 * \log(d_{\text{limit}}/d_{\text{used}})$

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)

($d_{\text{Limit}} = 3 \text{ m}$)

Frequency	AF R&S HL562	Corr.
MHz	dB (1/m)	dB
30	18.6	0.6
50	6.0	0.9
100	9.7	1.2
150	7.9	1.6
200	7.6	1.9
250	9.5	2.1
300	11.0	2.3
350	12.4	2.6
400	13.6	2.9
450	14.7	3.1
500	15.6	3.2
550	16.3	3.5
600	17.2	3.5
650	18.1	3.6
700	18.5	3.6
750	19.1	4.1
800	19.6	4.1
850	20.1	4.4
900	20.8	4.7
950	21.1	4.8
1000	21.6	4.9

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)
dB	dB	dB	dB	dB	m	m
0.29	0.04	0.23	0.02	0.0	3	3
0.39	0.09	0.32	0.08	0.0	3	3
0.56	0.14	0.47	0.08	0.0	3	3
0.73	0.20	0.59	0.12	0.0	3	3
0.84	0.21	0.70	0.11	0.0	3	3
0.98	0.24	0.80	0.13	0.0	3	3
1.04	0.26	0.89	0.15	0.0	3	3
1.18	0.31	0.96	0.13	0.0	3	3
1.28	0.35	1.03	0.19	0.0	3	3
1.39	0.38	1.11	0.22	0.0	3	3
1.44	0.39	1.20	0.19	0.0	3	3
1.55	0.46	1.24	0.23	0.0	3	3
1.59	0.43	1.29	0.23	0.0	3	3
1.67	0.34	1.35	0.22	0.0	3	3
1.67	0.42	1.41	0.15	0.0	3	3
1.87	0.54	1.46	0.25	0.0	3	3
1.90	0.46	1.51	0.25	0.0	3	3
1.99	0.60	1.56	0.27	0.0	3	3
2.14	0.60	1.63	0.29	0.0	3	3
2.22	0.60	1.66	0.33	0.0	3	3
2.23	0.61	1.71	0.30	0.0	3	3

($d_{\text{Limit}} = 10 \text{ m}$)

30	18.6	-9.9
50	6.0	-9.6
100	9.7	-9.2
150	7.9	-8.8
200	7.6	-8.6
250	9.5	-8.3
300	11.0	-8.1
350	12.4	-7.9
400	13.6	-7.6
450	14.7	-7.4
500	15.6	-7.2
550	16.3	-7.0
600	17.2	-6.9
650	18.1	-6.9
700	18.5	-6.8
750	19.1	-6.3
800	19.6	-6.3
850	20.1	-6.0
900	20.8	-5.8
950	21.1	-5.6
1000	21.6	-5.6

0.29	0.04	0.23	0.02	-10.5	10	3
0.39	0.09	0.32	0.08	-10.5	10	3
0.56	0.14	0.47	0.08	-10.5	10	3
0.73	0.20	0.59	0.12	-10.5	10	3
0.84	0.21	0.70	0.11	-10.5	10	3
0.98	0.24	0.80	0.13	-10.5	10	3
1.04	0.26	0.89	0.15	-10.5	10	3
1.18	0.31	0.96	0.13	-10.5	10	3
1.28	0.35	1.03	0.19	-10.5	10	3
1.39	0.38	1.11	0.22	-10.5	10	3
1.44	0.39	1.20	0.19	-10.5	10	3
1.55	0.46	1.24	0.23	-10.5	10	3
1.59	0.43	1.29	0.23	-10.5	10	3
1.67	0.34	1.35	0.22	-10.5	10	3
1.67	0.42	1.41	0.15	-10.5	10	3
1.87	0.54	1.46	0.25	-10.5	10	3
1.90	0.46	1.51	0.25	-10.5	10	3
1.99	0.60	1.56	0.27	-10.5	10	3
2.14	0.60	1.63	0.29	-10.5	10	3
2.22	0.60	1.66	0.33	-10.5	10	3
2.23	0.61	1.71	0.30	-10.5	10	3

Sample calculation

$$E (\text{dB } \mu\text{V}/\text{m}) = U (\text{dB } \mu\text{V}) + AF (\text{dB } 1/\text{m}) + \text{Corr. (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)
distance correction = $-20 * \log(d_{\text{Limit}}/d_{\text{used}})$

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.
MHz	dB (1/m)	dB
1000	24.4	-19.4
2000	28.5	-17.4
3000	31.0	-16.1
4000	33.1	-14.7
5000	34.4	-13.7
6000	34.7	-12.7
7000	35.6	-11.0

cable loss 1 (relay + cable inside chamber)	cable loss 2 (outside chamber)	cable loss 3 (switch unit, attenuator & pre-amp)	cable loss 4 (to receiver)		
dB	dB	dB	dB		
0.99	0.31	-21.51	0.79		
1.44	0.44	-20.63	1.38		
1.87	0.53	-19.85	1.33		
2.41	0.67	-19.13	1.31		
2.78	0.86	-18.71	1.40		
2.74	0.90	-17.83	1.47		
2.82	0.86	-16.19	1.46		

Frequency	AF R&S HF907	Corr.
MHz	dB (1/m)	dB
3000	31.0	-23.4
4000	33.1	-23.3
5000	34.4	-21.7
6000	34.7	-21.2
7000	35.6	-19.8

cable loss 1 (relay inside chamber)	cable loss 2 (inside chamber)	cable loss 3 (outside chamber)	cable loss 4 (switch unit, attenuator & pre-amp)	cable loss 5 (to receiver)	used for FCC 15.247
dB	dB	dB	dB	dB	
0.47	1.87	0.53	-27.58	1.33	
0.56	2.41	0.67	-28.23	1.31	
0.61	2.78	0.86	-27.35	1.40	
0.58	2.74	0.90	-26.89	1.47	
0.66	2.82	0.86	-25.58	1.46	

Frequency	AF R&S HF907	Corr.
MHz	dB (1/m)	dB
7000	35.6	-57.3
8000	36.3	-56.3
9000	37.1	-55.3
10000	37.5	-56.2
11000	37.5	-55.3
12000	37.6	-53.7
13000	38.2	-53.5
14000	39.9	-56.3
15000	40.9	-54.1
16000	41.3	-54.1
17000	42.8	-54.4
18000	44.2	-54.7

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)
dB	dB	dB	dB	dB	dB
0.56	1.28	-62.72	2.66	0.94	1.46
0.69	0.71	-61.49	2.84	1.00	1.53
0.68	0.65	-60.80	3.06	1.09	1.60
0.70	0.54	-61.91	3.28	1.20	1.67
0.80	0.61	-61.40	3.43	1.27	1.70
0.84	0.42	-59.70	3.53	1.26	1.73
0.83	0.44	-59.81	3.75	1.32	1.83
0.91	0.53	-63.03	3.91	1.40	1.77
0.98	0.54	-61.05	4.02	1.44	1.83
1.23	0.49	-61.51	4.17	1.51	1.85
1.36	0.76	-62.36	4.34	1.53	2.00
1.70	0.53	-62.88	4.41	1.55	1.91

Sample calculation

$$E (\text{dB } \mu\text{V}/\text{m}) = U (\text{dB } \mu\text{V}) + \text{AF} (\text{dB } 1/\text{m}) + \text{Corr.} (\text{dB})$$

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	cable	cable	cable	cable
			loss 1 (inside chamber)	loss 2 (pre- amp)	loss 3 (inside chamber)	loss 4 (switch unit)	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

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + AF \text{ (dB } 1/\text{m)} + \text{Corr. (dB)}$$

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))
			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

$$E (\text{dB } \mu\text{V/m}) = U (\text{dB } \mu\text{V}) + AF (\text{dB } 1/\text{m}) + Corr. (\text{dB})$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

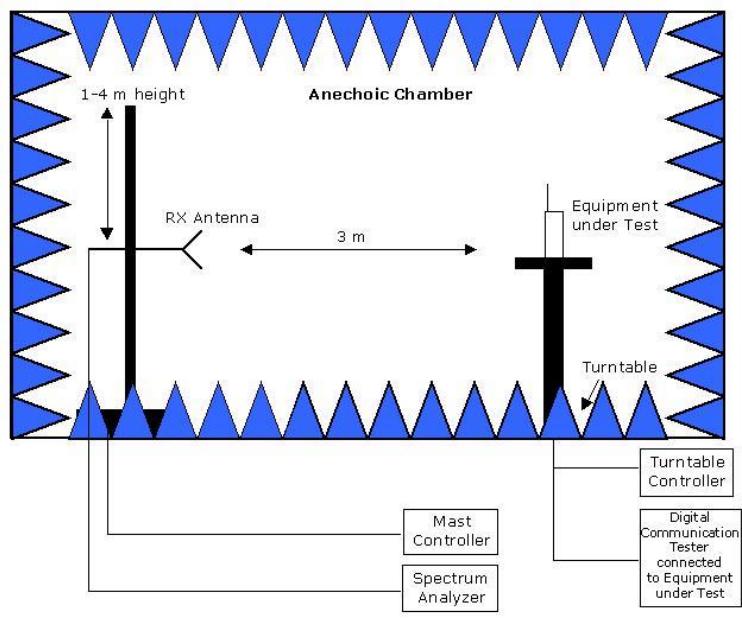
Linear interpolation will be used for frequencies in between the values in the table.

distance correction = $-20 * \log(d_{\text{limit}} / d_{\text{used}})$

Linear interpolation will be used for frequencies in between the values in the table.

Table shows an extract of values.

8 SETUP DRAWINGS



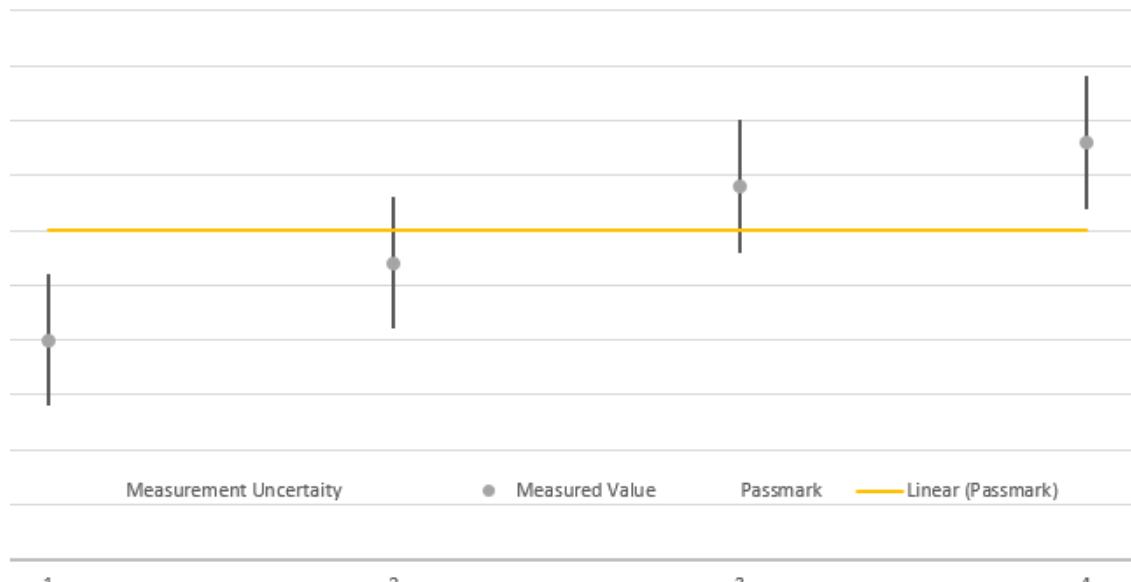
Remark: Depending on the frequency range suitable antenna types, attenuators or preamplifiers are used.

Drawing 1: Setup in the Anechoic chamber. For measurements below 1 GHz the ground was replaced by a conducting groundplane.

9 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.



10 PHOTO REPORT

Please see separate photo report.