

FCC Measurement/Technical Report on

WLAN and Bluetooth module

JODY-W377

FCC ID: XPYJODYW377

IC: 8595A-JODYW377

JODY-W374

FCC ID: XPYJODYW374

IC: 8595A-JODYW374

Test Report Reference: MDE_UBLOX_2030_FCC_01_rev01

Test Laboratory:

7layers GmbH
Borsigstrasse 11
40880 Ratingen
Germany



Deutsche
Akkreditierungsstelle
D-PL-12140-01-01
D-PL-12140-01-02
D-PL-12140-01-03

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.

7layers GmbH

Borsigstraße 11
40880 Ratingen, Germany
T +49 (0) 2102 749 0
F +49 (0) 2102 749 350

Geschäftsführer/
Managing Directors:
Sebastian Doose
Stefan Kischka
Bernhard Retka

Registergericht/registered:
Düsseldorf HRB 75554
USt-Id.-Nr./VAT-No. DE203159652
Steuer-Nr./TAX-No. 147/5869/0385

a Bureau Veritas
Group Company

www.7layers.com

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1 APPLIED STANDARDS AND TEST SUMMARY

1.1 APPLIED STANDARDS

Type of Authorization

Certification for an Intentional Radiator.

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 2 and 15 (10-1-20 Edition). The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

Part 15, Subpart C – Intentional Radiators

§ 15.201 Equipment authorization requirement

§ 15.207 Conducted limits

§ 15.209 Radiated emission limits; general requirements

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

Note:

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

1.2 FCC-IC CORRELATION TABLE

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

DTS equipment

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

1.3 MEASUREMENT SUMMARY

47 CFR CHAPTER I FCC PART 15 **Subpart C §15.247**

§ 15.207

Conducted Emissions at AC Mains

The measurement was performed according to ANSI C63.10 6.2

Final Result

OP-Mode	Setup	Date	FCC	IC
Operating mode, Connection to AC mains				
worst case, via ancillary/auxiliary equipment	S03_374_BB01	2022-08-09	Passed	Passed
worst case, via ancillary/auxiliary equipment	S03_377_AE01	2022-08-09	Passed	Passed

47 CFR CHAPTER I FCC PART 15 **Subpart C §15.247**

§ 15.247 (a) (2)

Occupied Bandwidth (6 dB)

The measurement was performed according to ANSI C63.10 11.8.1

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency				
Bluetooth LE 1 Mbps, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, high	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 1 Mbps, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, low	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_377_AA01	2022-01-27	Passed	Passed
WLAN ax 20 MHz, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 20 MHz, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 20 MHz, mid	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 40 MHz, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz, low	S01_377_AA01	2022-02-21	Passed	Passed
WLAN ax 40 MHz, mid	S01_377_AA01	2022-02-21	Passed	Passed
WLAN b, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN b, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN b, mid	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, mid	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz, mid	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 40 MHz, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz, low	S01_377_AA01	2022-02-21	Passed	Passed
WLAN n 40 MHz, mid	S01_377_AA01	2022-02-21	Passed	Passed

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Subpart C §15.247
IC RSS-Gen & IC TRC-43; Ch. 6.7 & Ch. 8

Occupied Bandwidth (99%)

The measurement was performed according to ANSI C63.10 6.9.3

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency				
Bluetooth BDR, high	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth BDR, high	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth BDR, low	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth BDR, low	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth BDR, mid	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth BDR, mid	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth EDR 2, high	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth EDR 2, high	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth EDR 2, low	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth EDR 2, low	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth EDR 2, mid	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth EDR 2, mid	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth EDR 3, high	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth EDR 3, high	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth EDR 3, low	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth EDR 3, low	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth EDR 3, mid	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth EDR 3, mid	S01_377_AA01	2022-01-25	N/A	Performed
Bluetooth LE 1 Mbps, high	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth LE 1 Mbps, high	S01_377_AA01	2022-01-27	N/A	Performed
Bluetooth LE 1 Mbps, low	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth LE 1 Mbps, low	S01_377_AA01	2022-01-27	N/A	Performed
Bluetooth LE 1 Mbps, mid	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth LE 1 Mbps, mid	S01_377_AA01	2022-01-27	N/A	Performed
Bluetooth LE 2 Mbps, high	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth LE 2 Mbps, high	S01_377_AA01	2022-01-27	N/A	Performed
Bluetooth LE 2 Mbps, low	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth LE 2 Mbps, low	S01_377_AA01	2022-01-27	N/A	Performed
Bluetooth LE 2 Mbps, mid	S01_374_BA01	2022-07-19	N/A	Performed
Bluetooth LE 2 Mbps, mid	S01_377_AA01	2022-01-27	N/A	Performed
WLAN ax 20 MHz, high	S01_377_AA01	2022-02-18	N/A	Performed
WLAN ax 20 MHz, low	S01_377_AA01	2022-02-18	N/A	Performed
WLAN ax 20 MHz, mid	S01_377_AA01	2022-02-18	N/A	Performed
WLAN ax 40 MHz, high	S01_377_AA01	2022-03-04	N/A	Performed
WLAN ax 40 MHz, low	S01_377_AA01	2022-02-21	N/A	Performed
WLAN ax 40 MHz, mid	S01_377_AA01	2022-02-21	N/A	Performed
WLAN b, high	S01_377_AA01	2022-02-18	N/A	Performed
WLAN b, low	S01_377_AA01	2022-02-18	N/A	Performed
WLAN b, mid	S01_377_AA01	2022-02-18	N/A	Performed
WLAN g, high	S01_377_AA01	2022-02-18	N/A	Performed
WLAN g, low	S01_377_AA01	2022-02-18	N/A	Performed

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Subpart C §15.247
IC RSS-Gen & IC TRC-43; Ch. 6.7 & Ch. 8

Occupied Bandwidth (99%)

The measurement was performed according to ANSI C63.10 6.9.3

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency				
WLAN g, mid	S01_377_AA01	2022-02-18	N/A	Performed
WLAN n 20 MHz, high	S01_377_AA01	2022-02-18	N/A	Performed
WLAN n 20 MHz, low	S01_377_AA01	2022-02-18	N/A	Performed
WLAN n 20 MHz, mid	S01_377_AA01	2022-02-18	N/A	Performed
WLAN n 40 MHz, high	S01_377_AA01	2022-03-04	N/A	Performed
WLAN n 40 MHz, low	S01_377_AA01	2022-02-21	N/A	Performed
WLAN n 40 MHz, mid	S01_377_AA01	2022-02-21	N/A	Performed

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Subpart C §15.247
§ 15.247 (b) (3)

Peak Power Output

The measurement was performed according to ANSI C63.10

11.9.1.1, 11.9.2.3.2

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement method				
Bluetooth BDR, high, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth BDR, high, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth BDR, low, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth BDR, low, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth BDR, mid, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth BDR, mid, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, high, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 2, high, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, low, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 2, low, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, mid, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 2, mid, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, high, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 3, high, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, low, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 3, low, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, mid, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 3, mid, conducted	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth LE 1 Mbps, high, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, high, conducted	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 1 Mbps, low, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, low, conducted	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 1 Mbps, mid, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, mid, conducted	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, high, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, high, conducted	S01_377_AA01	2022-01-27	Passed	Passed

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§ 15.247 (b) (3)
Subpart C §15.247
Peak Power Output

The measurement was performed according to ANSI C63.10

11.9.1.1, 11.9.2.3.2

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement method				
Bluetooth LE 2 Mbps, low, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, low, conducted	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, mid, conducted	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, mid, conducted	S01_377_AA01	2022-01-27	Passed	Passed
WLAN ax 20 MHz MIMO, high, conducted	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 20 MHz MIMO, low, conducted	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 20 MHz MIMO, mid, conducted	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 20 MHz, high, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN ax 20 MHz, high, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 20 MHz, low, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN ax 20 MHz, low, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 20 MHz, mid, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN ax 20 MHz, mid, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 40 MHz MIMO, high, conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz MIMO, low, conducted	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 40 MHz MIMO, mid, conducted	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 40 MHz, high, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN ax 40 MHz, high, conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz, low, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN ax 40 MHz, low, conducted	S01_377_AA01	2022-02-21	Passed	Passed
WLAN ax 40 MHz, mid, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN ax 40 MHz, mid, conducted	S01_377_AA01	2022-02-21	Passed	Passed
WLAN b, high, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN b, high, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN b, low, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN b, low, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN b, mid, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN b, mid, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, high, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN g, high, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, low, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN g, low, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, mid, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN g, mid, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz MIMO, high, conducted	S01_377_AA01	2022-02-22	Passed	Passed
WLAN n 20 MHz MIMO, low, conducted	S01_377_AA01	2022-02-22	Passed	Passed
WLAN n 20 MHz MIMO, mid, conducted	S01_377_AA01	2022-02-22	Passed	Passed
WLAN n 20 MHz, high, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN n 20 MHz, high, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz, low, conducted	S01_374_BA01	2022-07-18	Passed	Passed

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§ 15.247 (b) (3)
Subpart C §15.247

Peak Power Output

The measurement was performed according to ANSI C63.10

11.9.1.1, 11.9.2.3.2

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement method				
WLAN n 20 MHz, low, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz, mid, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN n 20 MHz, mid, conducted	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 40 MHz MIMO, high, conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz MIMO, low, conducted	S01_377_AA01	2022-02-23	Passed	Passed
WLAN n 40 MHz MIMO, mid, conducted	S01_377_AA01	2022-02-23	Passed	Passed
WLAN n 40 MHz, high, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN n 40 MHz, high, conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz, low, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN n 40 MHz, low, conducted	S01_377_AA01	2022-02-21	Passed	Passed
WLAN n 40 MHz, mid, conducted	S01_374_BA01	2022-07-18	Passed	Passed
WLAN n 40 MHz, mid, conducted	S01_377_AA01	2022-02-21	Passed	Passed

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§ 15.247 (d)
Subpart C §15.247

Spurious RF Conducted Emissions

The measurement was performed according to ANSI C63.10 11.11

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency				
Bluetooth BDR, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth BDR, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth BDR, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth BDR, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth BDR, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth BDR, mid	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 2, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 2, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 2, mid	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 3, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 3, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 3, mid	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth LE 1 Mbps, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, high	S01_377_AA01	2022-01-31	Passed	Passed
Bluetooth LE 1 Mbps, low	S01_374_BA01	2022-07-19	Passed	Passed

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Subpart C §15.247
§ 15.247 (d)

Spurious RF Conducted Emissions

The measurement was performed according to ANSI C63.10 11.11

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency				
Bluetooth LE 1 Mbps, low	S01_377_AA01	2022-01-31	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_377_AA01	2022-01-31	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_377_AA01	2022-01-31	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_377_AA01	2022-01-31	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_377_AA01	2022-01-31	Passed	Passed
WLAN ax 20 MHz, high	S01_377_AE01	2022-08-04	Passed	Passed
WLAN ax 20 MHz, low	S01_377_AE01	2022-08-04	Passed	Passed
WLAN ax 20 MHz, mid	S01_377_AE01	2022-08-04	Passed	Passed
WLAN ax 40 MHz, high	S01_377_AA01	2022-02-21	Passed	Passed
WLAN ax 40 MHz, low	S01_377_AA01	2022-02-21	Passed	Passed
WLAN ax 40 MHz, mid	S01_377_AA01	2022-02-21	Passed	Passed
WLAN b, high	S01_377_AE01	2022-08-04	Passed	Passed
WLAN b, low	S01_377_AE01	2022-08-04	Passed	Passed
WLAN b, mid	S01_377_AE01	2022-08-04	Passed	Passed
WLAN g, high	S01_377_AE01	2022-08-04	Passed	Passed
WLAN g, low	S01_377_AE01	2022-08-04	Passed	Passed
WLAN g, mid	S01_377_AE01	2022-08-04	Passed	Passed
WLAN n 20 MHz, high	S01_377_AE01	2022-08-04	Passed	Passed
WLAN n 20 MHz, low	S01_377_AE01	2022-08-04	Passed	Passed
WLAN n 20 MHz, mid	S01_377_AE01	2022-08-04	Passed	Passed
WLAN n 40 MHz, high	S01_377_AA01	2022-02-21	Passed	Passed
WLAN n 40 MHz, low	S01_377_AA01	2022-02-21	Passed	Passed
WLAN n 40 MHz, mid	S01_377_AA01	2022-02-21	Passed	Passed

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Transmitter Spurious Radiated Emissions

The measurement was performed according to ANSI C63.10
6.4, 6.5, 6.6.5

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement range				
Bluetooth BDR, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth BDR, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth BDR, high, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_374_BB01	2022-07-20	Passed	Passed

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Transmitter Spurious Radiated Emissions

The measurement was performed according to ANSI C63.10

6.4, 6.5, 6.6.5

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement range				
Bluetooth BDR, high, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-23	Passed	Passed
Bluetooth BDR, high, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth BDR, high, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth BDR, high, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_374_BA01	2022-07-13	Passed	Passed
Bluetooth BDR, high, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_377_AD01	2022-05-09	Passed	Passed
Bluetooth BDR, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth BDR, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth BDR, low, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_374_BB01	2022-07-19	Passed	Passed
Bluetooth BDR, low, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-22	Passed	Passed
Bluetooth BDR, low, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth BDR, low, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth BDR, low, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_374_BA01	2022-07-13	Passed	Passed
Bluetooth BDR, low, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_377_AD01	2022-05-09	Passed	Passed
Bluetooth BDR, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth BDR, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth BDR, mid, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_374_BB01	2022-07-20	Passed	Passed
Bluetooth BDR, mid, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-23	Passed	Passed
Bluetooth BDR, mid, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth BDR, mid, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth BDR, mid, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_374_BA01	2022-07-13	Passed	Passed
Bluetooth BDR, mid, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_377_AD01	2022-05-09	Passed	Passed
Bluetooth BDR, mid, 9 kHz - 30 MHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth BDR, mid, 9 kHz - 30 MHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed

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Transmitter Spurious Radiated Emissions

The measurement was performed according to ANSI C63.10
6.4, 6.5, 6.6.5

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement range				
Bluetooth BDR, mid, 9 kHz - 30 MHz Remark: Measurement Method: Radiated	S02_374_BB01	2022-07-21	Passed	Passed
Bluetooth BDR, mid, 9 kHz - 30 MHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-14	Passed	Passed
Bluetooth EDR 2, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth EDR 2, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth EDR 2, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth EDR 2, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth EDR 2, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth EDR 2, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth EDR 3, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth EDR 3, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth EDR 3, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth EDR 3, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth EDR 3, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth EDR 3, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth LE 1 Mbps, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth LE 1 Mbps, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-02-04	Passed	Passed
Bluetooth LE 1 Mbps, high, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth LE 1 Mbps, high, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth LE 1 Mbps, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth LE 1 Mbps, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-02-04	Passed	Passed
Bluetooth LE 1 Mbps, low, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth LE 1 Mbps, low, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth LE 1 Mbps, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed

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Transmitter Spurious Radiated Emissions

The measurement was performed according to ANSI C63.10

6.4, 6.5, 6.6.5

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement range				
Bluetooth LE 1 Mbps, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-02-04	Passed	Passed
Bluetooth LE 1 Mbps, mid, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth LE 1 Mbps, mid, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth LE 1 Mbps, mid, 9 kHz - 30 MHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth LE 1 Mbps, mid, 9 kHz - 30 MHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth LE 2 Mbps, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth LE 2 Mbps, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-02-04	Passed	Passed
Bluetooth LE 2 Mbps, high, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth LE 2 Mbps, high, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth LE 2 Mbps, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth LE 2 Mbps, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-02-04	Passed	Passed
Bluetooth LE 2 Mbps, low, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth LE 2 Mbps, low, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth LE 2 Mbps, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth LE 2 Mbps, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-02-04	Passed	Passed
Bluetooth LE 2 Mbps, mid, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth LE 2 Mbps, mid, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth LE 2 Mbps, mid, 9 kHz - 30 MHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
Bluetooth LE 2 Mbps, mid, 9 kHz - 30 MHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
WLAN ax 20 MHz MIMO, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 20 MHz MIMO, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 20 MHz MIMO, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 20 MHz, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed

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Transmitter Spurious Radiated Emissions

The measurement was performed according to ANSI C63.10
6.4, 6.5, 6.6.5

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement range				
WLAN ax 20 MHz, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN ax 20 MHz, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN ax 40 MHz MIMO, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz MIMO, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz MIMO, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN ax 40 MHz, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN ax 40 MHz, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN b, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
WLAN b, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN b, high, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_374_BB01	2022-07-19	Passed	Passed
WLAN b, high, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-17	Passed	Passed
WLAN b, high, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
WLAN b, high, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-14	Passed	Passed
WLAN b, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
WLAN b, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN b, low, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-17	Passed	Passed
WLAN b, low, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
WLAN b, low, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-14	Passed	Passed
WLAN b, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
WLAN b, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN b, mid, 1 GHz - 26 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-17	Passed	Passed
WLAN b, mid, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed

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Transmitter Spurious Radiated Emissions

The measurement was performed according to ANSI C63.10
6.4, 6.5, 6.6.5

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Measurement range				
WLAN b, mid, 30 MHz - 1 GHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
WLAN b, mid, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_374_BA01	2022-07-13	Passed	Passed
WLAN b, mid, 30 MHz - 1 GHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-14	Passed	Passed
WLAN b, mid, 9 kHz - 30 MHz Remark: Measurement Method: Conducted	S01_374_BA01	2022-08-01	Passed	Passed
WLAN b, mid, 9 kHz - 30 MHz Remark: Measurement Method: Conducted	S01_377_AE01	2022-08-04	Passed	Passed
WLAN b, mid, 9 kHz - 30 MHz Remark: Measurement Method: Radiated	S02_374_BB01	2022-07-21	Passed	Passed
WLAN b, mid, 9 kHz - 30 MHz Remark: Measurement Method: Radiated	S02_377_AB01	2022-03-14	Passed	Passed
WLAN g, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN g, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN g, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN n 20 MHz MIMO, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 20 MHz MIMO, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 20 MHz MIMO, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 20 MHz, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN n 20 MHz, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN n 20 MHz, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN n 40 MHz MIMO, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz MIMO, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz MIMO, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz, high, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN n 40 MHz, low, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed
WLAN n 40 MHz, mid, 1 GHz - 26 GHz Remark: Measurement Method: Conducted	S01_377_AA01	2022-03-02	Passed	Passed

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Band Edge Compliance Conducted

The measurement was performed according to ANSI C63.10 11.11

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency, Band Edge				
Bluetooth BDR, high, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth BDR, high, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth BDR, hopping, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth BDR, hopping, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth BDR, low, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth BDR, low, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, high, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 2, high, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, hopping, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, hopping, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 2, low, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 2, low, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, high, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 3, high, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, hopping, high	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, hopping, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth EDR 3, low, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth EDR 3, low, low	S01_377_AA01	2022-01-25	Passed	Passed
Bluetooth LE 1 Mbps, high, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, high, high	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 1 Mbps, low, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, low, low	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, high, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, high, high	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, low, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, low, low	S01_377_AA01	2022-01-27	Passed	Passed
WLAN ax 20 MHz MIMO, high, high	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 20 MHz MIMO, low, low	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 20 MHz, high, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 20 MHz, low, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 40 MHz MIMO, high, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz MIMO, low, low	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 40 MHz, high, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz, low, low	S01_377_AA01	2022-02-21	Passed	Passed
WLAN b, high, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN b, low, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, high, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, low, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz MIMO, high, high	S01_377_AA01	2022-02-22	Passed	Passed
WLAN n 20 MHz MIMO, low, low	S01_377_AA01	2022-02-22	Passed	Passed
WLAN n 20 MHz, high, high	S01_377_AA01	2022-02-18	Passed	Passed

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Band Edge Compliance Conducted

The measurement was performed according to ANSI C63.10 11.11

Final Result

OP-Mode Radio Technology, Operating Frequency, Band Edge	Setup	Date	FCC	IC
WLAN n 20 MHz, low, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 40 MHz MIMO, high, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz MIMO, low, low	S01_377_AA01	2022-02-23	Passed	Passed
WLAN n 40 MHz, high, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz, low, low	S01_377_AA01	2022-02-21	Passed	Passed

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Band Edge Compliance Radiated

The measurement was performed according to ANSI C63.10 6.6.5

Final Result

OP-Mode Radio Technology, Operating Frequency, Band Edge	Setup	Date	FCC	IC
Bluetooth BDR, high, high	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth BDR, high, high	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth BDR, high, high	S02_374_BB01	2022-07-20	Passed	Passed
Bluetooth BDR, high, high	S02_377_AB01	2022-03-23	Passed	Passed
Bluetooth EDR 2, high, high	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth EDR 2, high, high	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth EDR 2, high, high	S02_374_BB01	2022-07-22	Passed	Passed
Bluetooth EDR 3, high, high	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth EDR 3, high, high	S01_377_AE01	2022-08-04	Passed	Passed
Bluetooth EDR 3, high, high	S02_374_BB01	2022-07-22	Passed	Passed
Bluetooth LE 1 Mbps, high, high	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth LE 1 Mbps, high, high	S01_377_AA01	2022-02-04	Passed	Passed
Bluetooth LE 1 Mbps, high, high	S02_377_AD01	2022-04-28	Passed	Passed
Bluetooth LE 2 Mbps, high, high	S01_374_BA01	2022-07-29	Passed	Passed
Bluetooth LE 2 Mbps, high, high	S01_377_AA01	2022-02-04	Passed	Passed
Bluetooth LE 2 Mbps, high, high	S02_374_BB01	2022-07-22	Passed	Passed
WLAN ax 20 MHz MIMO, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN ax 20 MHz, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN ax 40 MHz MIMO, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN ax 40 MHz, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN b, high, high	S01_374_BA01	2022-07-29	Passed	Passed
WLAN b, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN b, high, high	S02_374_BB01	2022-07-19	Passed	Passed
WLAN b, high, high	S02_377_AD01	2022-05-01	Passed	Passed
WLAN g, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN g, high, high	S02_377_AD01	2022-04-28	Passed	Passed
WLAN n 20 MHz MIMO, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN n 20 MHz MIMO, high, high	S02_377_AD01	2022-04-28	Passed	Passed

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Subpart C §15.247
§ 15.247 (d)

Band Edge Compliance Radiated

The measurement was performed according to ANSI C63.10 6.6.5

Final Result

OP-Mode Radio Technology, Operating Frequency, Band Edge	Setup	Date	FCC	IC
WLAN n 20 MHz, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN n 20 MHz, high, high	S02_377_AD01	2022-04-28	Passed	Passed
WLAN n 40 MHz MIMO, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN n 40 MHz MIMO, high, high	S02_377_AD01	2022-04-28	Passed	Passed
WLAN n 40 MHz, high, high	S01_377_AA01	2022-02-04	Passed	Passed
WLAN n 40 MHz, high, high	S02_377_AD01	2022-04-28	Passed	Passed
OFDMA with one active Resource Unit:				
WLAN ax 20 MHz MIMO, high	S01_377_AE01	2022-11-08	Passed	Passed
WLAN ax 20 MHz MIMO, low	S01_377_AE01	2022-11-08	Passed	Passed
WLAN ax 40 MHz MIMO, low	S01_377_AE01	2022-11-18	Passed	Passed
WLAN ax 40 MHz MIMO, high	S01_377_AE01	2022-11-18	Passed	Passed

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Subpart C §15.247
§ 15.247 (e)

Power Density

 The measurement was performed according to ANSI C63.10
 11.10.2, 11.10.7

Final Result

OP-Mode Radio Technology, Operating Frequency	Setup	Date	FCC	IC
Bluetooth LE 1 Mbps, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, high	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 1 Mbps, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, low	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_377_AA01	2022-01-27	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_374_BA01	2022-07-19	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_377_AA01	2022-01-27	Passed	Passed
WLAN ax 20 MHz MIMO, high	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 20 MHz MIMO, low	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 20 MHz MIMO, mid	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 20 MHz, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 20 MHz, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 20 MHz, mid	S01_377_AA01	2022-02-18	Passed	Passed
WLAN ax 40 MHz MIMO, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz MIMO, low	S01_377_AA01	2022-02-22	Passed	Passed
WLAN ax 40 MHz MIMO, mid	S01_377_AA01	2022-02-22	Passed	Passed

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

Power Density

 The measurement was performed according to ANSI C63.10
 11.10.2, 11.10.7

Final Result

OP-Mode	Setup	Date	FCC	IC
Radio Technology, Operating Frequency				
WLAN ax 40 MHz, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN ax 40 MHz, low	S01_377_AA01	2022-02-21	Passed	Passed
WLAN ax 40 MHz, mid	S01_377_AA01	2022-02-21	Passed	Passed
WLAN b, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN b, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN b, mid	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN g, mid	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz MIMO, high	S01_377_AA01	2022-02-22	Passed	Passed
WLAN n 20 MHz MIMO, low	S01_377_AA01	2022-02-22	Passed	Passed
WLAN n 20 MHz MIMO, mid	S01_377_AA01	2022-02-22	Passed	Passed
WLAN n 20 MHz, high	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz, low	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 20 MHz, mid	S01_377_AA01	2022-02-18	Passed	Passed
WLAN n 40 MHz MIMO, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz MIMO, low	S01_377_AA01	2022-02-23	Passed	Passed
WLAN n 40 MHz MIMO, mid	S01_377_AA01	2022-02-23	Passed	Passed
WLAN n 40 MHz, high	S01_377_AA01	2022-03-04	Passed	Passed
WLAN n 40 MHz, low	S01_377_AA01	2022-02-21	Passed	Passed
WLAN n 40 MHz, mid	S01_377_AA01	2022-02-21	Passed	Passed
OFDMA with one active Resource Unit:				
WLAN ax 20 MHz MIMO, high	S01_377_AE01	2022-11-11	Passed	Passed
WLAN ax 20 MHz MIMO, low	S01_377_AE01	2022-11-11	Passed	Passed
WLAN ax 20 MHz MIMO, mid	S01_377_AE01	2022-11-11	Passed	Passed
WLAN ax 40 MHz MIMO, high	S01_377_AE01	2022-11-11	Passed	Passed
WLAN ax 40 MHz MIMO, low	S01_377_AE01	2022-11-11	Passed	Passed
WLAN ax 40 MHz MIMO, mid	S01_377_AE01	2022-11-11	Passed	Passed

N/A: Not applicable

N/P: Not performed

2 REVISION HISTORY / SIGNATURES

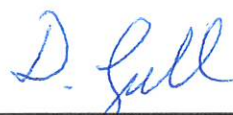
Report version control			
Version	Release date	Change Description	Version validity
initial	2022-08-30	--	invalid
rev01	2022-11-25	Corrected EUT Software Version, added results of OFDMA mode (power density / band edge) with use of single resource unit and related power table	valid

COMMENT: On demand of the applicant BT Classic was tested as DTS device.

According to the applicant the WLAN part of the JODY-W377 is identical to the WLAN part of the JODY-W374. Due to this not all tests have been performed for JODY-W374.



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



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



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

3 ADMINISTRATIVE DATA

3.1 TESTING LABORATORY

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

The test facility is accredited by the following accreditation organisation:

Laboratory accreditation no: DAKKS D-PL-12140-01-01 | -02 | -03
FCC Designation Number: DE0015
FCC Test Firm Registration: 929146
ISED CAB Identifier: DE0007; ISED#: 3699A

Responsible for accreditation scope: Dipl.-Ing. Marco Kullik
Report Template Version: 2021-09-09

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: 2022-11-25
Testing Period: 2022-01-25 to 2022-11-18

3.3 APPLICANT DATA

Company Name: u-blox AG
Address: Zürcherstrasse 68
8800 Thalwil
Switzerland
Contact Person: Filip Kruzela

3.4 MANUFACTURER DATA

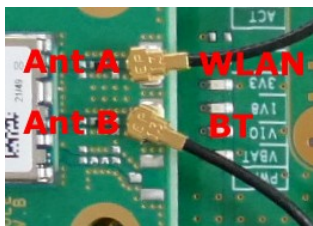
Company Name: please see Applicant Data

Address:

Contact Person:

4 TEST OBJECT DATA

4.1 GENERAL EUT DESCRIPTION

Kind of Device product description	Host-based module with WLAN and Bluetooth technology.
Product name	JODY-W3
Type	JODY-W377-00A JODY W374-00A
Declared EUT data by the supplier	
Voltage Type	DC
Voltage Level	1.8 V + 3.3 V
Antenna / Gain	External / 2 dBi (No antennas were provided for the tests, radiated measurements were performed with 50 Ohm terminations) Remark by laboratory: Naming of antenna ports for the report: W377  W374 
Tested Modulation Type	BT Classic: GFSK (BDR), Pi/4 DQPSK (EDR 2), 8DPSK (EDR 3) BT LE: GFSK WLANb: DSSS WLAng/n/ax: OFDM
Specific product description for the EUT	The EUT is a Bluetooth and WLAN module. In the 2.4 GHz band JODY-W377 supports SISO and MIMO Mode for WLAN, while JODY-W374 supports SISO Mode only. Supported technologies are Bluetooth Classic, Bluetooth Low Energy and WLAN b, g, n, ax 20 and 40 MHz bandwidth.
EUT ports (connected cables during testing):	Enclosure Data DC Antenna The EUT is a module with solder pads for surface mounting, so no cables were connected to the EUT itself.
Tested datarates	BT Classic: 1 (BDR), 2 (EDR 2) and 3 Mbps (EDR 3) BT LE: 1 and 2 Mbps WLAN b: 1 Mbps, g: 6 Mbps, n: MCS 0 SISO / MSC8 MIMO, ax: MSC 0
Special software used for testing	Labtool V2.0.0.85-17.80.200.p204 on computer board provided by applicant.

Used output power

BT Classic: max. power in BT Device Under Test Mode

BT LE: 10 dBm

WLAN:

	2.4-GHz										
Mode	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Ch.9	Ch.10	Ch.11
b	19					21					19
g	14	16	17			18			17	15	13
n20	14	15	16			17			16	14	13
n20-MIMO	13	14				15				13	12
n40	N/A	N/A				13			12	N/A	N/A
n40-MIMO	N/A	N/A				12			11	N/A	N/A
ax20	13	15	15	16		17			16	14	12
ax20-MIMO	12	13	14	15		16			14	13	11
ax40	N/A	N/A			13			12		N/A	N/A
ax40-MIMO	N/A	N/A			12			11		N/A	N/A

OFDMA (SISO and MIMO use the same power setting):

ax 20 MHz: 9 dBm

ax 40 MHz: 6 dBm

4.2 EUT MAIN COMPONENTS

Sample Name	Sample Code	Description
EUT 374 ba01	DE1015152ba01	JODY-W374 Sample
Sample Parameter	Value	
Serial No.	F666009C380BD240500	
HW Version	05	
SW Version	2.0.0.86-17.80.200.p207	
Comment		

Sample Name	Sample Code	Description
EUT 374 bb01	DE1015152bb01	JODY-W374 Sample
Sample Parameter	Value	
Serial No.	F666009C380BD680500	
HW Version	05	
SW Version	2.0.0.86-17.80.200.p207	
Comment		

Sample Name	Sample Code	Description
EUT 377 aa01	DE1015152aa01	JODY-W377 Sample
Sample Parameter	Value	
Serial No.	I316009C380A78C0600	
HW Version	05	
SW Version	2.0.0.86-17.80.200.p207	
Comment		

Sample Name	Sample Code	Description
EUT 377 ab01	DE1015152ab01	JODY-W377 Sample
Sample Parameter	Value	
Serial No.	I316009C380AE380600	
HW Version	05	
SW Version	2.0.0.86-17.80.200.p207	
Comment		

Sample Name	Sample Code	Description
EUT 377 ad01	DE1015152ad01	JODY-W377 Sample
Sample Parameter	Value	
Serial No.	I316009C380A7B00600	
HW Version	05	
SW Version	2.0.0.86-17.80.200.p207	
Comment		

Sample Name	Sample Code	Description
EUT 377 ae01	DE1015152ae01	JODY-W377 Sample
Sample Parameter	Value	
Serial No.	I316009C380A7940600	
HW Version	05	
SW Version	2.0.0.86-17.80.200.p207	
Comment		

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
AUX1	UBLOX, JODY-Carrier Board, REV C, - , 10000001898798018001	Supply and Port connector board
AUX2	UBLOX, JODY-Carrier Board, REV C, - , 10000001898798019001	Supply and Port connector board
AUX21	Toradex, , -, -, ,	Board Computer for setting modes
AUX4	UBLOX, JODY-Carrier Board, REV C, - , 10000001898798014001	Supply and Port connector board
AUX5	UBLOX, JODY-Carrier Board, REV C, - , 10000001898798024001	Supply and Port connector board
AUX6	UBLOX, JODY-Carrier Board, Rev. D, - , 10000002210935012001	Evaluation Board for module providing ports
AUX7	UBLOX, JODY-Carrier Board, REV C, - , 10000001898798022001	Evaluation Board for module providing ports
ACDC1	Agilent, E3631A, -, -, MY40018563	120 V 60 Hz AC laboratory power supply

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
S03_377_AE01	EUT 377 ae01, AUX5, ACDC1	AC Conducted Setup
S01_377_AE01	EUT 377 ae01, AUX5, AUX21	Conducted Setup
S02_374_BB01	EUT 374 bb01, AUX7,	Radiated Setup
S03_374_BB01	EUT 374 bb01, AUX7, ACDC1	AC Conducted Setup
S02_374_BA01	EUT 374 ba01, AUX6,	Radiated Setup
S01_377_AA01	EUT 377 aa01, AUX1, AUX21	Conducted Setup
S01_374_BA01	EUT 374 ba01, AUX21, AUX6	Conducted Setup
S02_377_AD01	EUT 377 ad01, AUX4,	Radiated Setup
S02_377_AB01	EUT 377 ab01, AUX2,	Radiated Setup

4.6 OPERATING MODES / TEST CHANNELS

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

WLAN

20 MHz Test Channels:

Channel:

Frequency [MHz]

2.4 GHz ISM

2400 - 2483.5 MHz

low	mid	high
1	6	11
2412	2437	2462

40 MHz Test Channels:

Channel:

Frequency [MHz]

low	mid	high
3	6	9
2422	2437	2452

BT Test Channels:

Channel:

Frequency [MHz]

2.4 GHz ISM

2400 - 2483.5 MHz

low	mid	high
0	39	78
2402	2441	2480

BT LE Test Channels:

Channel:

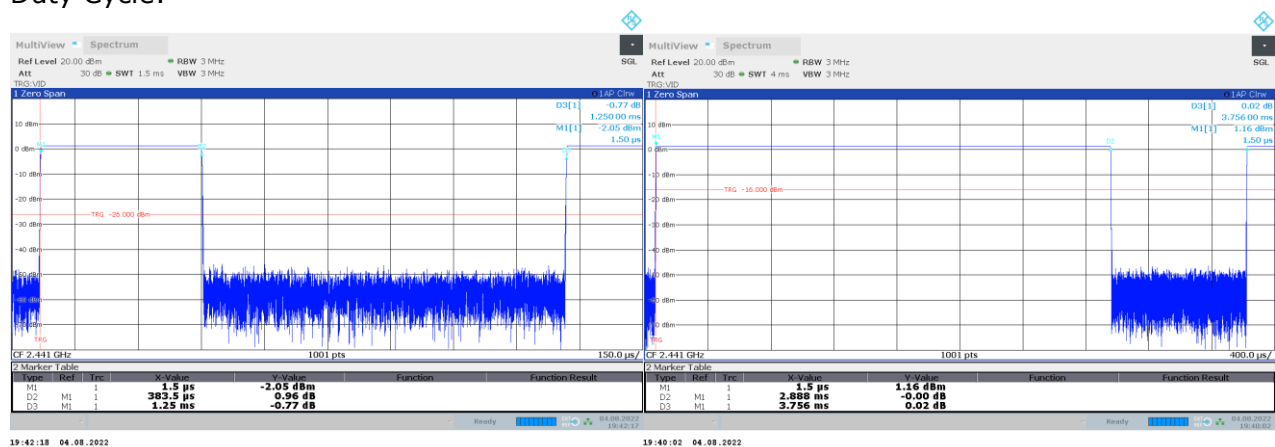
Frequency [MHz]

2.4 GHz ISM

2400 - 2483.5 MHz

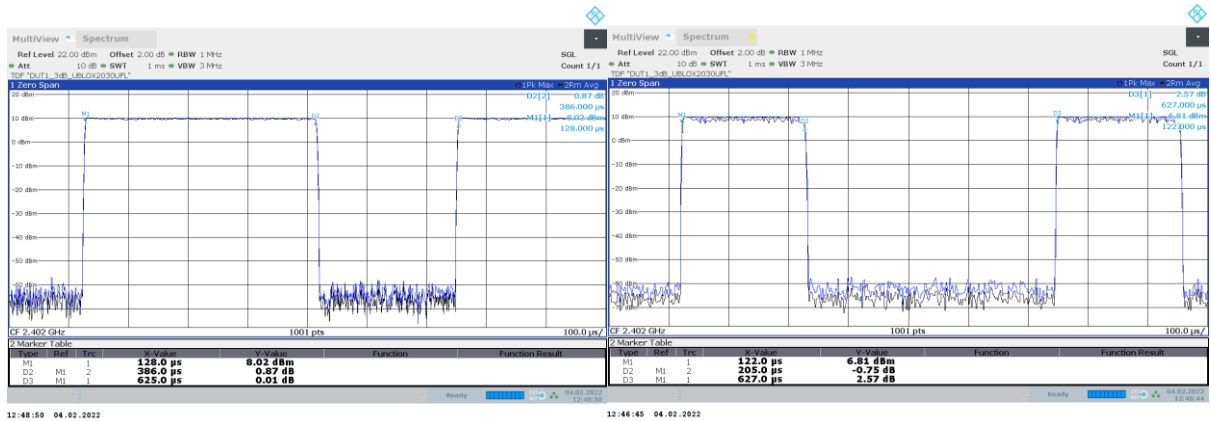
low	mid	high
0	19	39
2402	2440	2480

Duty Cycle:



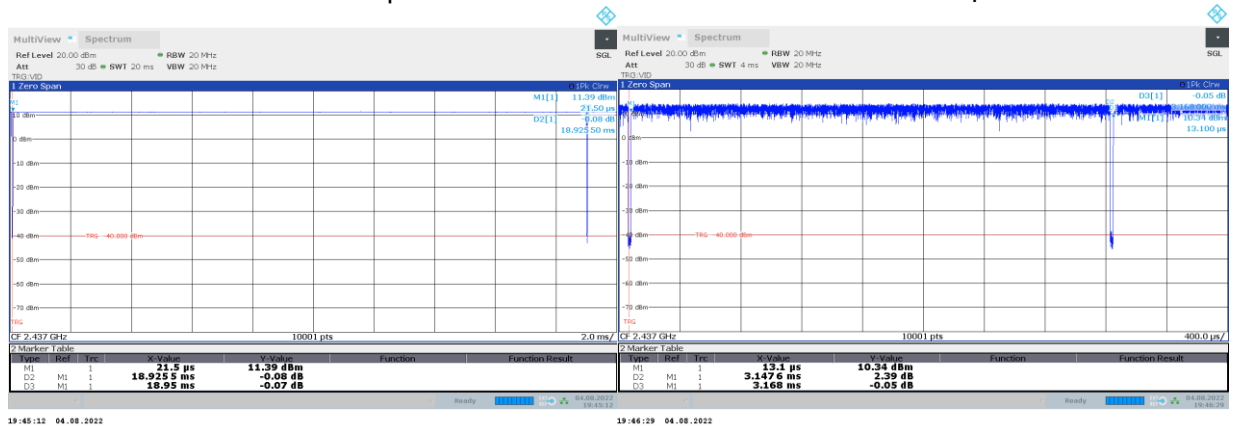
BT Classic x-DH1 packets

BT Classic x-DH5 packets



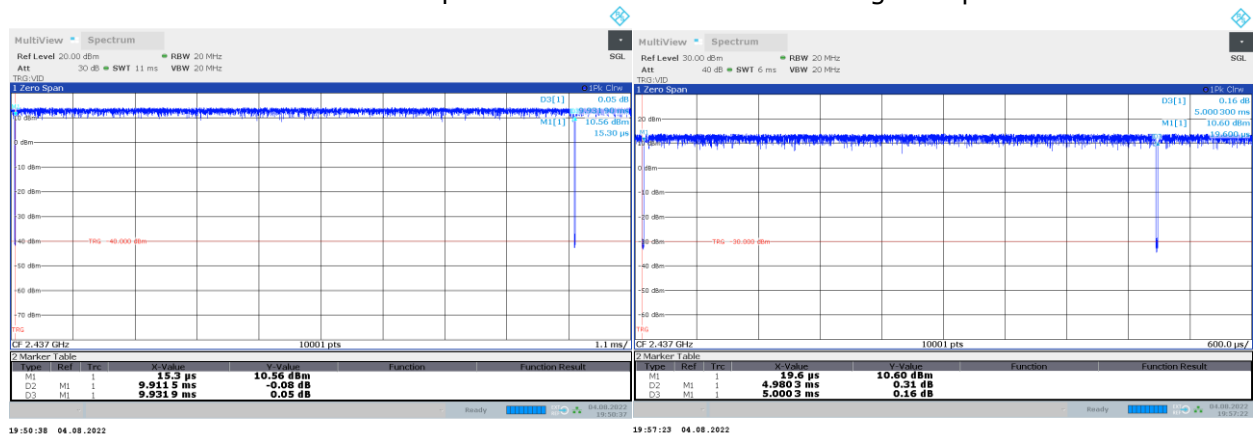
BT LE 1 Mbps

BT LE 2 Mbps



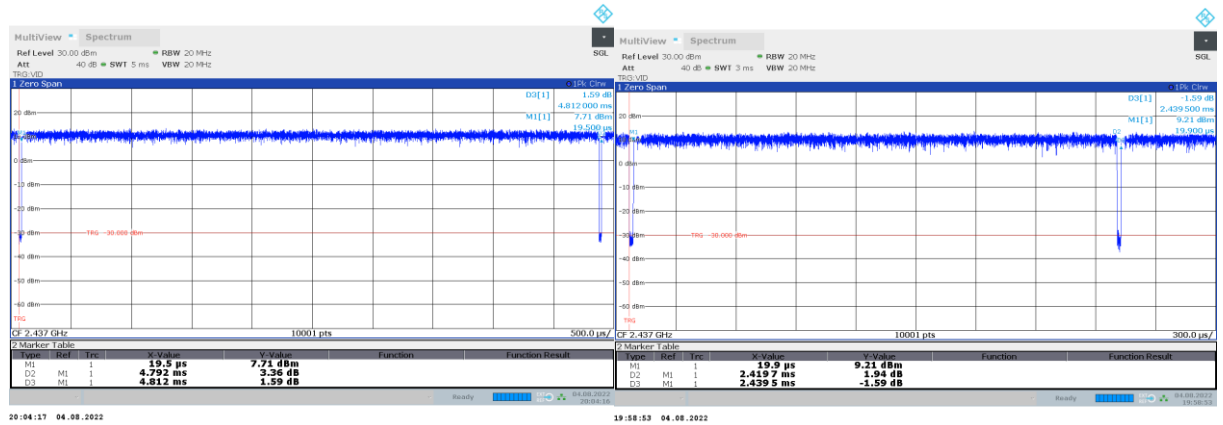
WLAN b 1Mbps

WLAN g 6 Mbps



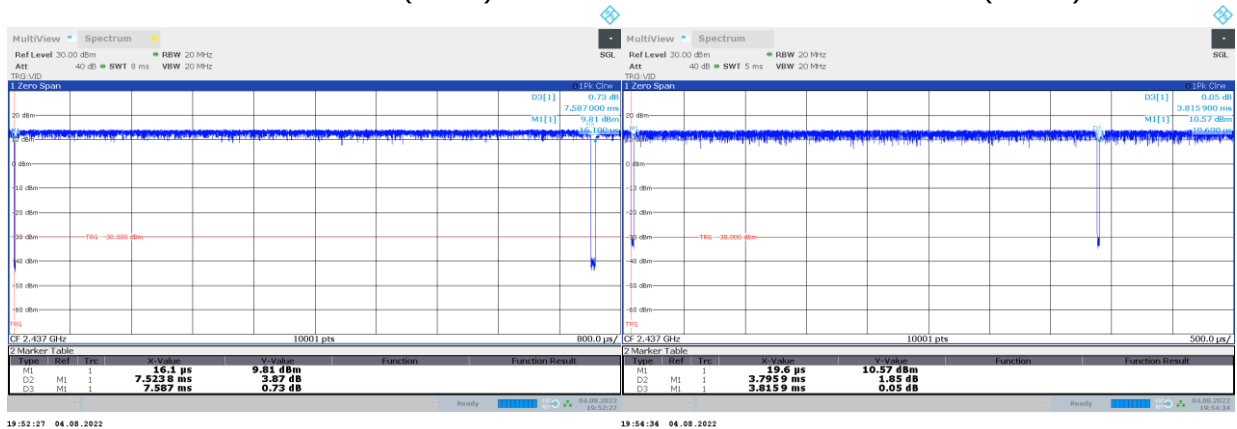
WLAN n20 MCS 0 (SISO)

WLAN n20 MCS 8 (MIMO)



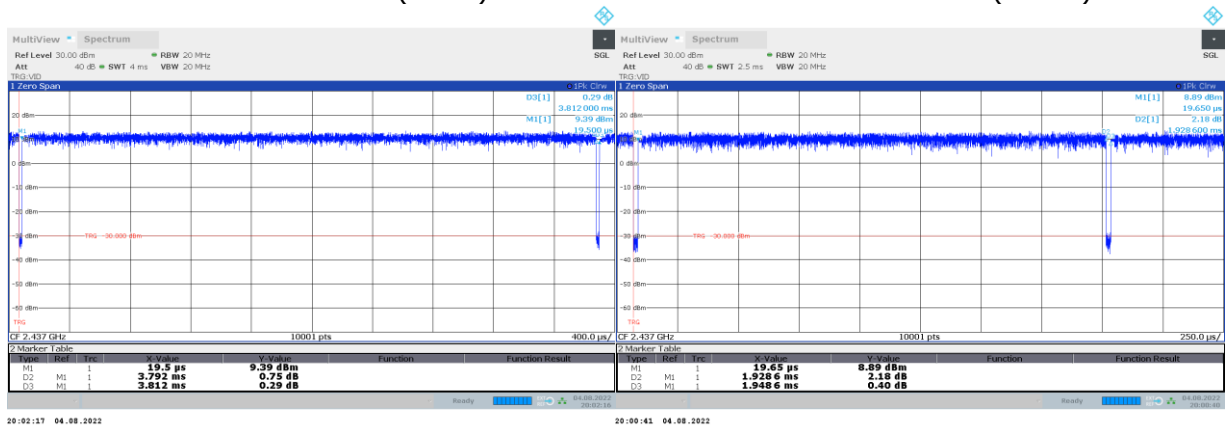
WLAN n40 MCS 0 (SISO)

WLAN n40 MCS 8 (MIMO)



WLAN ax20 MCS 0 (SISO)

WLAN ax20 MCS 0 (MIMO)



WLAN ax40 MCS 0 (SISO)

WLAN ax40 MCS 0 (MIMO)

Mode	Duty Cycle	Resulting Correction AV spurious emissions [dB]
BT Classic (x-DH1)	30.6	10.3
BT Classic (x-DH5)	76.9	2.3
BT LE 1 Mbps	61.8	4.2
BT LE 2 Mbps	32.7	9.7
WLAN b-Mode; 20 MHz; 1 Mbit/s	99.9	0.0
WLAN g-Mode; 20 MHz; 6 Mbit/s	99.4	0.1
WLAN n-Mode; 20 MHz; MCS0	99.8	0.0
WLAN n-Mode; 40 MHz; MCS0	99.6	0.0
WLAN n-Mode; 20 MHz; MCS0; MIMO	99.6	0.0
WLAN n-Mode; 40 MHz; MCS0; MIMO	99.2	0.1
WLAN ax-Mode; 20 MHz; MCS0	99.2	0.1
WLAN ax-Mode; 40 MHz; MCS0	99.5	0.0
WLAN ax-Mode; 20 MHz; MCS0; MIMO	99.5	0.0
WLAN ax-Mode; 40 MHz; MCS0; MIMO	99.0	0.1

4.7 PRODUCT LABELLING

4.7.1 FCC ID LABEL

Please refer to the documentation of the applicant.

4.7.2 LOCATION OF THE LABEL ON THE EUT

Please refer to the documentation of the applicant.

5 TEST RESULTS

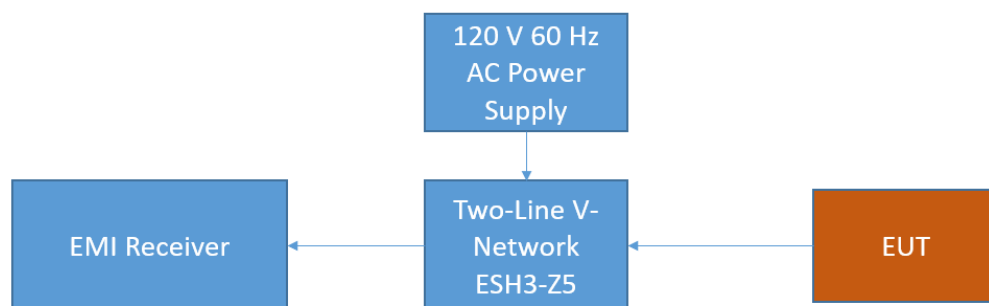
5.1 CONDUCTED EMISSIONS AT AC MAINS

Standard **FCC Part 15 Subpart C**

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

5.1.1 TEST DESCRIPTION

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



FCC Conducted Emissions on AC

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

Step 1: Preliminary scan

Intention of this step is, to determine the conducted EMI-profile of the EUT.

EMI receiver settings:

- Detector: Peak – Maxhold & Average
- Frequency range: 150 kHz – 30 MHz
- Frequency steps: 2.5 kHz
- IF-Bandwidth: 9 kHz
- Measuring time / Frequency step: 100 ms (FFT-based)
- Measurement on phase + neutral lines of the power cords

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

Step 2: Final measurement

Intention of this step is, to determine the highest emissions with the settings defined in the test specification for the frequencies identified in step 1.

EMI receiver settings:

- Detector: Quasi-Peak & (CISPR) Average

- IF Bandwidth: 9 kHz
- Measuring time: 1 s / frequency

At each frequency determined in step 1, four measurements are performed in the following combinations:

- 1) Neutral lead - reference ground (PE grounded)
- 2) Phase lead - reference ground (PE grounded)
- 3) Neutral lead - reference ground (PE floating)
- 4) Phase lead - reference ground (PE floating)

The highest value is reported.

5.1.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.207

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

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

5.1.3 TEST PROTOCOL

Temperature: 30 °C
 Air Pressure: 1018 hPa
 Humidity: 34 %

Power line	PE	Frequency [MHz]	Measured value QP [dBμV]	Measured value AV [dBμV]	Limit [dBμV]	Margin [dB]
N	GND	12.005	46.2	-	60.0	13.8
N	GND	12.005	-	42.4	50.0	7.7
N	FLO	24.009	48.4	-	60.0	11.6
N	FLO	24.009	-	44.6	50.0	5.5
N	GND	12.005	46.2	-	60.0	13.8
N	GND	12.005	-	42.5	50.0	7.5
N	FLO	24.009	46.6	-	60.0	13.5
N	FLO	24.009	-	44.1	50.0	5.9

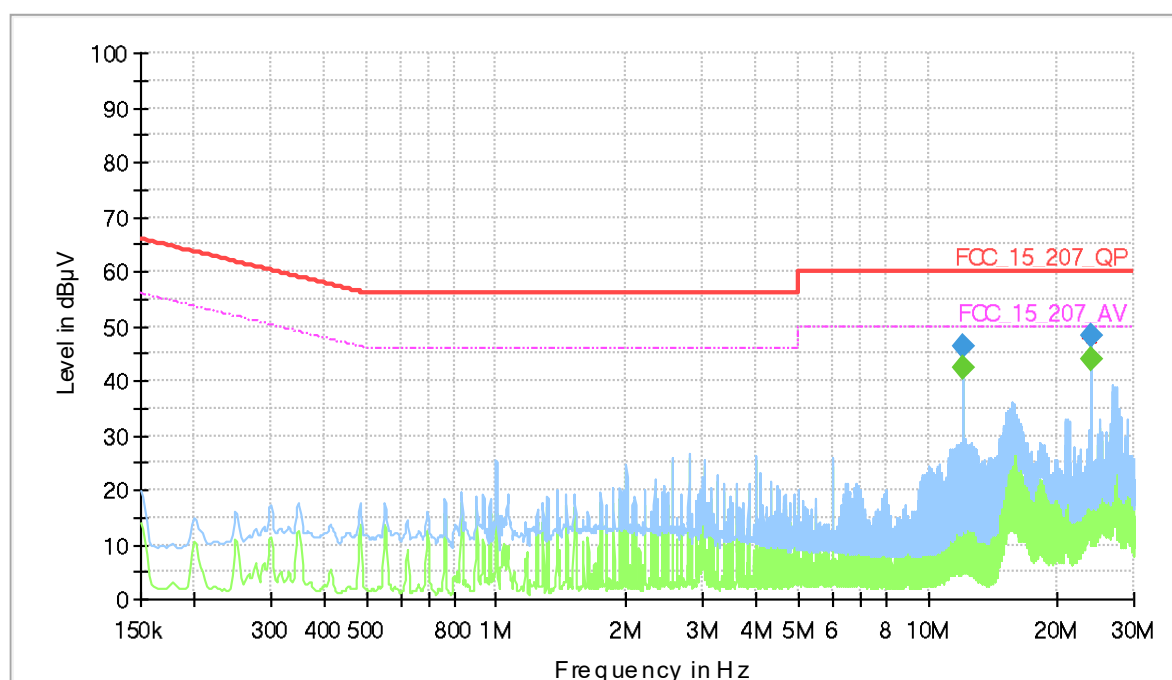
Remark: Please see next sub-clause for the measurement plot.

5.1.4 MEASUREMENT PLOTS

Operating mode = worst case, Connection to AC mains = via ancillary/auxiliary equipment (S03_374_BB01)

Common Information

Test Description:	Conducted Emissions
Test Standard:	FCC §15.207, ANSI C63.10
EUT / Setup Code:	DE1015152bb01
Operating Conditions:	120 V 60 Hz, BT BDR TX on 2441 MHz
Operator Name:	GAL
Comment:	
Legend:	Trace: blue = QP, green = CISPR AV; Star: red or blue = critical frequency; Rhombus: blue = final QP, green = final CISPR AV
Tested Port / used LISN:	AC mains => 1st LISN ESH3-Z5
Termination of other ports:	N/A, AC of AUX => 2nd LISN ESH3-Z5 +50 Ohm

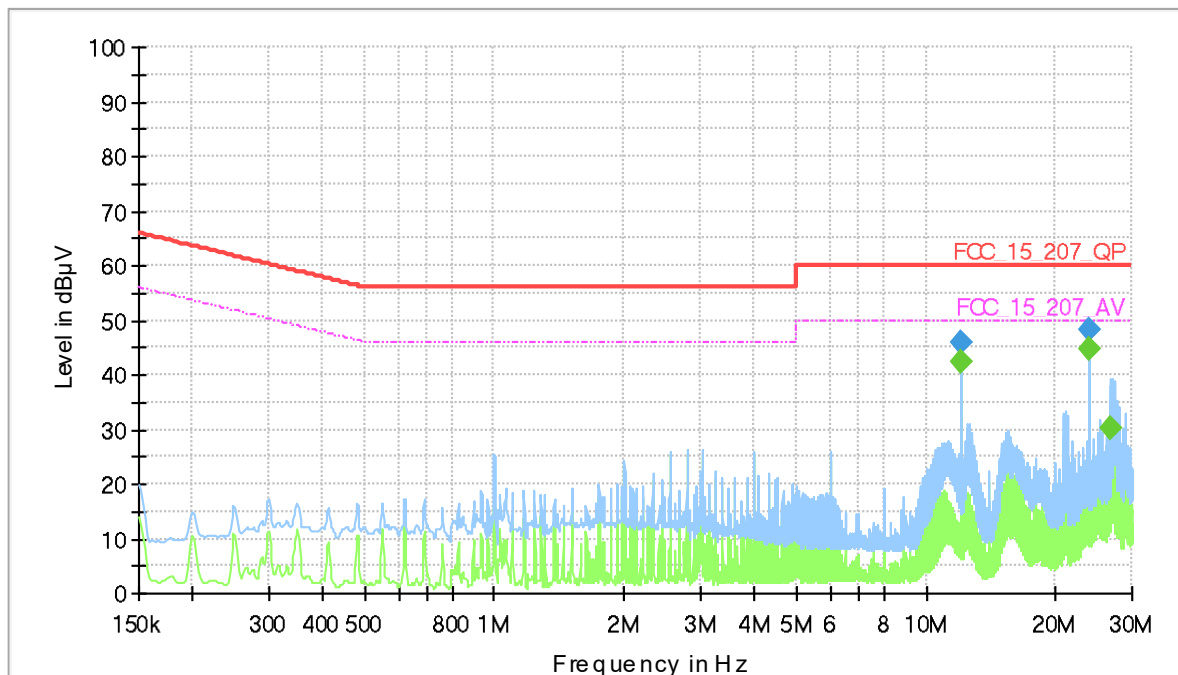


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	PE	Corr. (dB)
12.005250	---	42.47	50.00	7.53	1000.0	9.000	N	GND	10.7
12.005250	46.22	---	60.00	13.78	1000.0	9.000	N	GND	10.7
24.009000	48.40	---	60.00	11.60	1000.0	9.000	N	FLO	11.2
24.009000	---	44.08	50.00	5.92	1000.0	9.000	N	FLO	11.2

Common Information

Test Description: Conducted Emissions
 Test Standard: FCC §15.207, ANSI C63.10
 EUT / Setup Code: DE1015152bb01
 Operating Conditions: 120 V 60 Hz, WLANb 1 Mbps Ch6, WLANa 6 Mbps Ch40
 Operator Name: GAL
 Comment:
 Legend: Trace: blue = QP, green = CISPR AV; Star: red or blue = critical frequency; Rhombus: blue = final QP, green = final CISPR AV
 Tested Port / used LISN: AC mains => 1st LISN ESH3-Z5
 Termination of other ports: N/A, AC of AUX => 2nd LISN ESH3-Z5 +50 Ohm



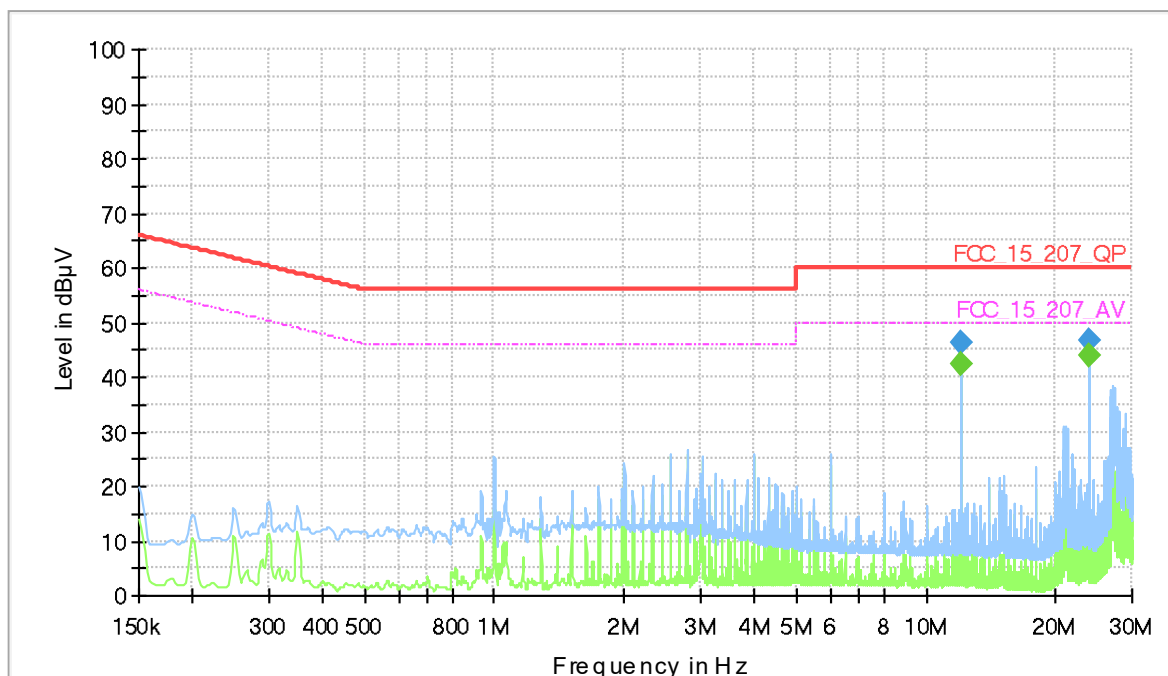
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	PE	Corr. (dB)
12.005250	46.07	---	60.00	13.93	1000.0	9.000	N	GND	10.7
12.005250	---	42.35	50.00	7.65	1000.0	9.000	N	GND	10.7
24.009000	---	44.55	50.00	5.45	1000.0	9.000	N	FLO	11.2
24.009000	48.15	---	60.00	11.85	1000.0	9.000	N	FLO	11.2
26.832750	---	30.33	50.00	19.67	1000.0	9.000	L1	GND	11.2

Operating mode = worst case, Connection to AC mains = via ancillary/auxiliary equipment
 (S03_377_AE01)

Common Information

Test Description:	Conducted Emissions
Test Standard:	FCC §15.207, ANSI C63.10
EUT / Setup Code:	DE1015152ae01
Operating Conditions:	120 V 60 Hz, BT BDR 2441 MHz
Operator Name:	GAL
Comment:	
Legend:	Trace: blue = QP, green = CISPR AV; Star: red or blue = critical frequency; Rhombus: blue = final QP, green = final CISPR AV
Tested Port / used LISN:	AC mains => 1st LISN ESH3-Z5
Termination of other ports:	N/A, AC of AUX => 2nd LISN ESH3-Z5 +50 Ohm

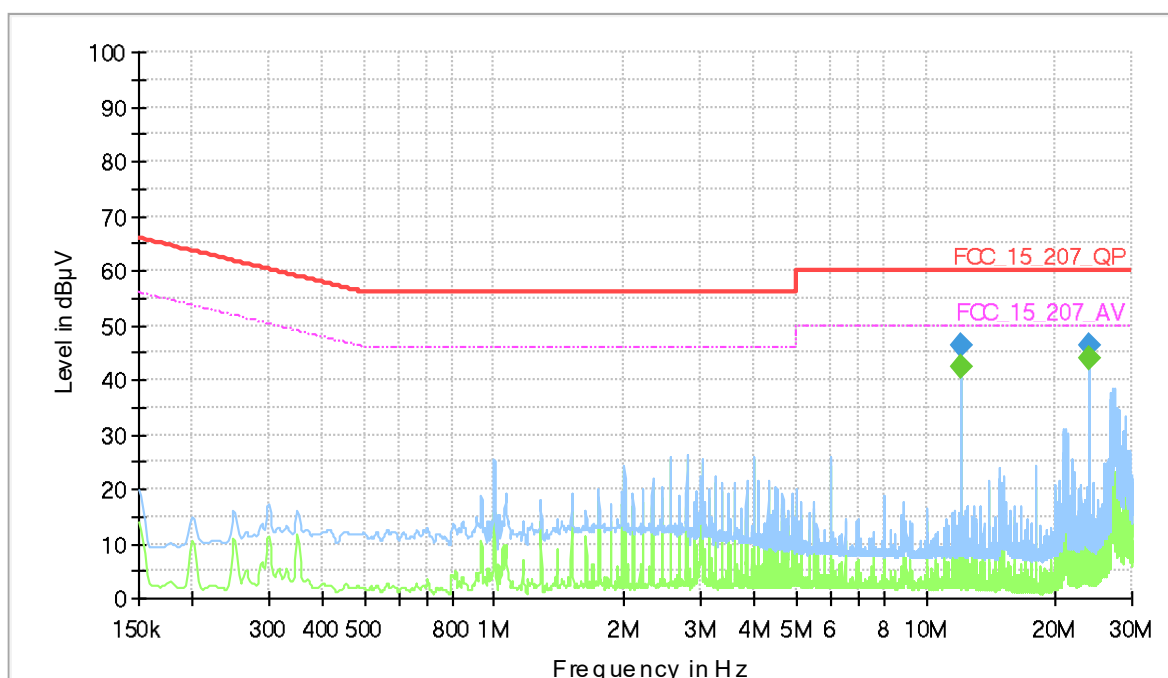


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	PE	Corr. (dB)
12.005250	---	42.47	50.00	7.53	1000.0	9.000	N	GND	10.7
12.005250	46.22	---	60.00	13.78	1000.0	9.000	N	GND	10.7
24.009000	46.55	---	60.00	13.45	1000.0	9.000	N	FLO	11.2
24.009000	---	44.11	50.00	5.89	1000.0	9.000	N	FLO	11.2

Common Information

Test Description:	Conducted Emissions
Test Standard:	FCC §15.207, ANSI C63.10
EUT / Setup Code:	DE1015152ae01
Operating Conditions:	120 V 60 Hz, WLANb 1 Mbps Ch 6, WLANa 6 Mbps Ch 40
Operator Name:	GAL
Comment:	
Legend:	Trace: blue = QP, green = CISPR AV; Star: red or blue = critical frequency; Rhombus: blue = final QP, green = final CISPR AV
Tested Port / used LISN:	AC mains => 1st LISN ESH3-Z5
Termination of other ports:	N/A, AC of AUX => 2nd LISN ESH3-Z5 +50 Ohm



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	PE	Corr. (dB)
12.005250	---	42.46	50.00	7.54	1000.0	9.000	N	GND	10.7
12.005250	46.20	---	60.00	13.80	1000.0	9.000	N	GND	10.7
24.009000	46.26	---	60.00	13.74	1000.0	9.000	N	FLO	11.2
24.009000	---	44.04	50.00	5.96	1000.0	9.000	N	FLO	11.2

5.1.5 TEST EQUIPMENT USED

- Conducted Emissions FCC

5.2 OCCUPIED BANDWIDTH (6 DB)

Standard **FCC Part 15 Subpart C**

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

5.2.1 TEST DESCRIPTION

The Equipment Under Test (EUT) was set up to perform the occupied bandwidth measurements.

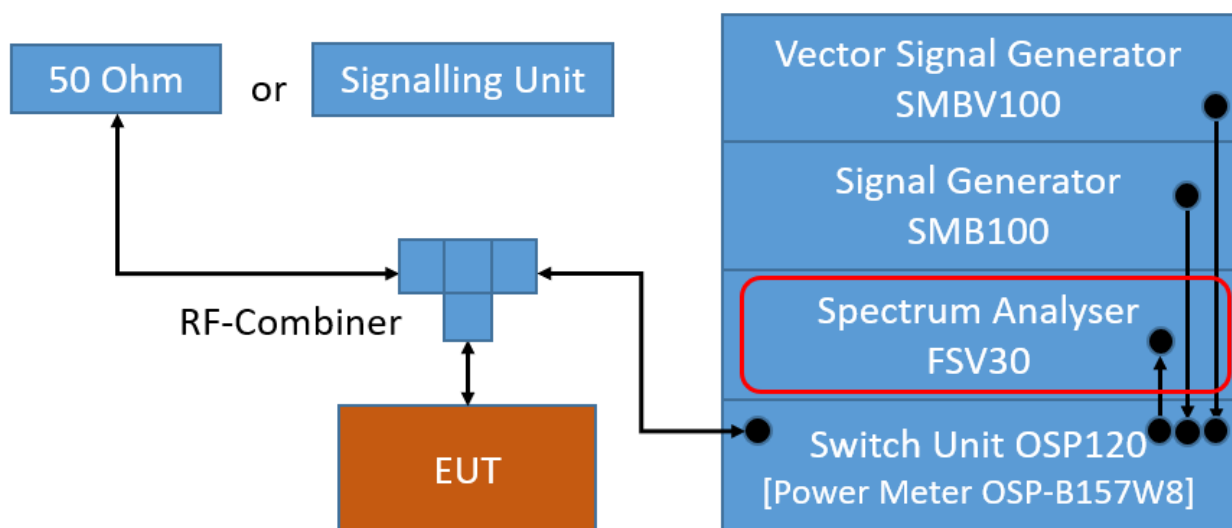
The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

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

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

Analyser settings:

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



TS8997; Channel Bandwidth

5.2.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.247 (a) (2)

Systems using digital modulation techniques may operate in the 902-928 MHz and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.2.3 TEST PROTOCOL

Ambient temperature: 24 -26 °C
 Air Pressure: 1004 - 1026 hPa
 Humidity: 38 -40 %
 BT LE 1 Mbit/s

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	0	2402	0.776	0.5	0.276
374	0	2402	0.792	0.5	0.292
374	19	2440	0.792	0.5	0.292
377	19	2440	0.792	0.5	0.292
377	39	2480	0.776	0.5	0.276
374	39	2480	0.792	0.5	0.292

BT LE 2 Mbit/s

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	0	2402	1.467	0.5	0.967
374	0	2402	1.467	0.5	0.967
374	19	2440	1.467	0.5	0.967
377	19	2440	1.442	0.5	0.942
374	39	2480	1.467	0.5	0.967
377	39	2480	1.493	0.5	0.993

BT GFSK (1-DH5)

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	0	2402	0.535	0.5	0.035
377	39	2441	0.535	0.5	0.035
377	78	2480	0.535	0.5	0.035
374	0	2402	0.535	0.5	0.035
374	39	2441	0.535	0.5	0.035
374	78	2480	0.515	0.5	0.015

BT DQPSK (2-DH5)

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	0	2402	1.109	0.5	0.609
377	39	2441	1.109	0.5	0.609
377	78	2480	1.109	0.5	0.609
374	0	2402	1.109	0.5	0.609
374	39	2441	1.109	0.5	0.609
374	78	2480	1.109	0.5	0.609

BT 8-DPSK (3-DH5)

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	0	2402	1.089	0.5	0.589
377	39	2441	1.050	0.5	0.550
377	78	2480	1.050	0.5	0.550
374	0	2402	1.089	0.5	0.589
374	39	2441	1.050	0.5	0.550
374	78	2480	1.050	0.5	0.550

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

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	1	2412	10.2	0.5	9.7
377	6	2437	10.2	0.5	9.7
377	11	2462	10.2	0.5	9.7

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

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	1	2412	16.5	0.5	16.0
377	6	2437	16.5	0.5	16.0
377	11	2462	16.5	0.5	16.0

WLAN n-Mode; 20 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	1	2412	17.4	0.5	16.9
377	6	2437	17.7	0.5	17.2
377	11	2462	17.4	0.5	16.9

WLAN n-Mode; 40 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	3	2422	35.8	0.5	35.3
377	6	2437	35.8	0.5	35.3
377	9	2452	35.9	0.5	35.4

WLAN ax-Mode; 20 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	1	2412	18.6	0.5	18.1
377	6	2437	18.5	0.5	18.0
377	11	2462	18.6	0.5	18.1

WLAN ax-Mode; 40 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
377	3	2422	37.2	0.5	36.7
377	6	2437	37.4	0.5	36.9
377	9	2452	37.3	0.5	36.8

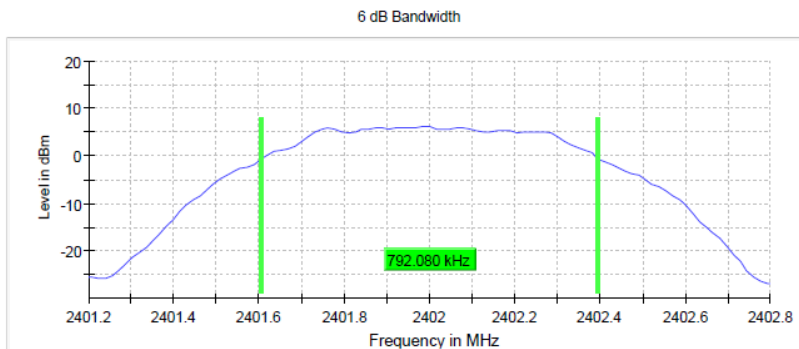
Remark: Please see next sub-clause for the measurement plot.
 WLAN results of antenna A given in table above.

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

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low
(S01_374_BA01)

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
2402.000000	0.792080	0.500000	---	2401.603960	2402.396040	6.2	PASS

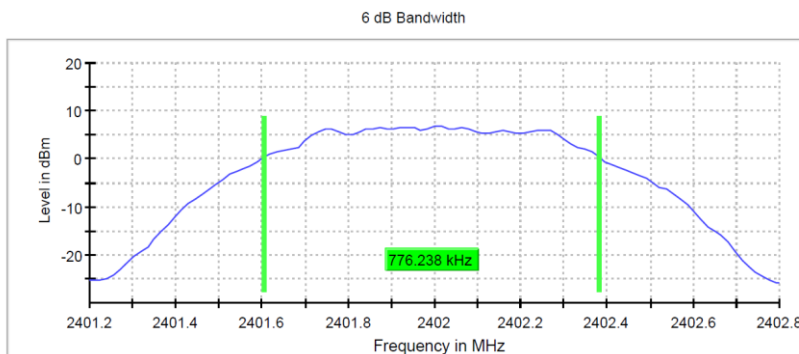


Setting	Instrument Value
Start Frequency	2.40120 GHz
Stop Frequency	2.40280 GHz
Span	1.600 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
SweepTime	41.920 μ s
Reference Level	-10.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	11 / max. 150
Stable	5 / 5
Max Stable Difference	0.06 dB

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low
(S01_377_AA01)

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
2402.000000	0.776238	0.500000	---	2401.603960	2402.380198	6.8	PASS

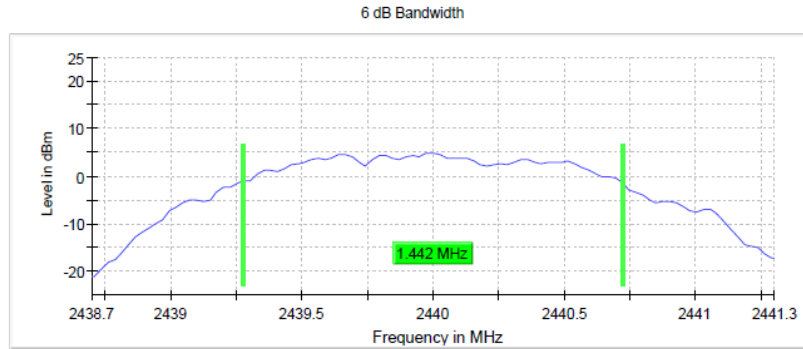


Setting	Instrument Value
Start Frequency	2.40120 GHz
Stop Frequency	2.40280 GHz
Span	1.600 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
SweepTime	41.920 μ s
Reference Level	-10.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	11 / max. 150
Stable	5 / 5
Max Stable Difference	0.12 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = mid
(S01_377_AA01)

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
2440.000000	1.441584	0.500000	---	2439.279208	2440.720792	4.9	PASS

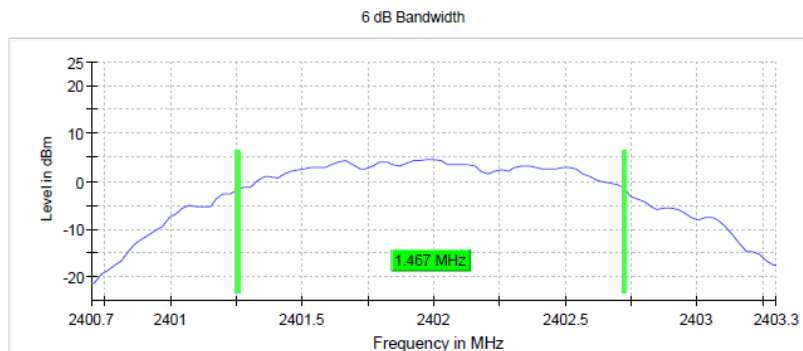


Setting	Instrument Value
Start Frequency	2.43870 GHz
Stop Frequency	2.44130 GHz
Span	2.600 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
Sweeptime	41.890 μ s
Reference Level	-10.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	10 / max. 150
Stable	5 / 5
Max Stable Difference	0.40 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low
(S01_374_BA01)

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
2402.000000	1.467327	0.500000	---	2401.253465	2402.720792	4.6	PASS

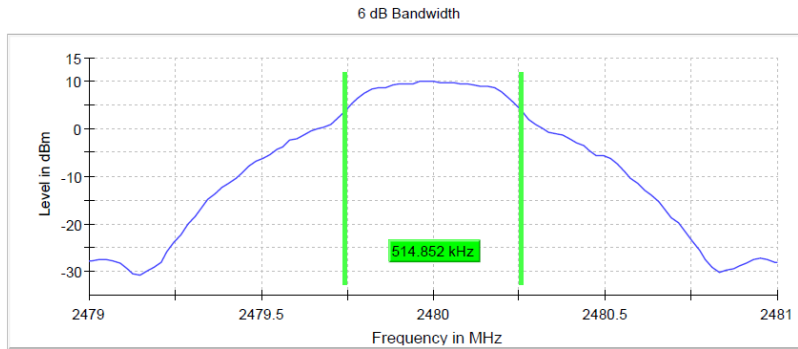


Setting	Instrument Value
Start Frequency	2.40070 GHz
Stop Frequency	2.40330 GHz
Span	2.600 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
Sweeptime	41.890 μ s
Reference Level	-10.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	16 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = Bluetooth BDR, Operating Frequency = high
(S01_374_BA01)

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
2480.000000	0.514852	0.500000	---	2479.742574	2480.257426	10.1	PASS

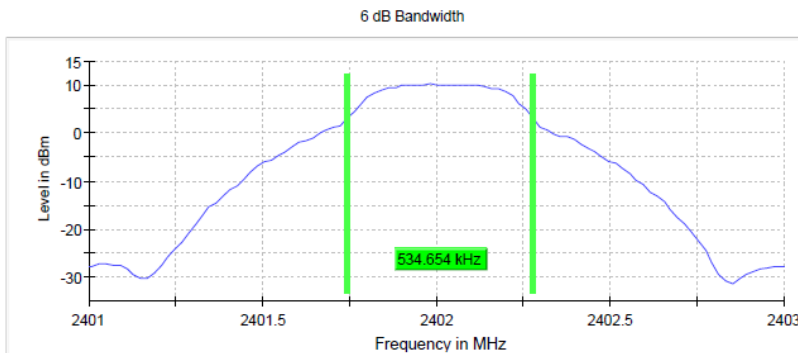


Setting	Instrument Value
Start Frequency	2.47900 GHz
Stop Frequency	2.48100 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
SweepTime	41.830 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	9 / max. 150
Stable	5 / 5
Max Stable Difference	0.38 dB

Radio Technology = Bluetooth BDR, Operating Frequency = low
(S01_377_AA01)

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
2402.000000	0.534654	0.500000	---	2401.742574	2402.277228	10.2	PASS

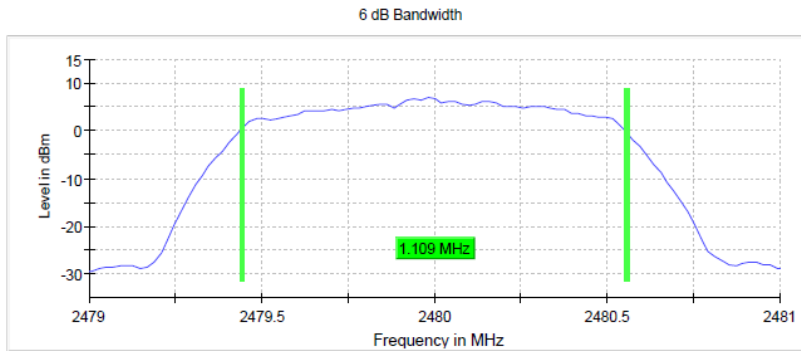


Setting	Instrument Value
Start Frequency	2.40100 GHz
Stop Frequency	2.40300 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
SweepTime	41.830 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	10 / max. 150
Stable	5 / 5
Max Stable Difference	0.03 dB

Radio Technology = Bluetooth EDR2, Operating Frequency = high
(S01_374_BA01)

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
2480.000000	1.108910	0.500000	---	2479.445545	2480.554455	6.9	PASS

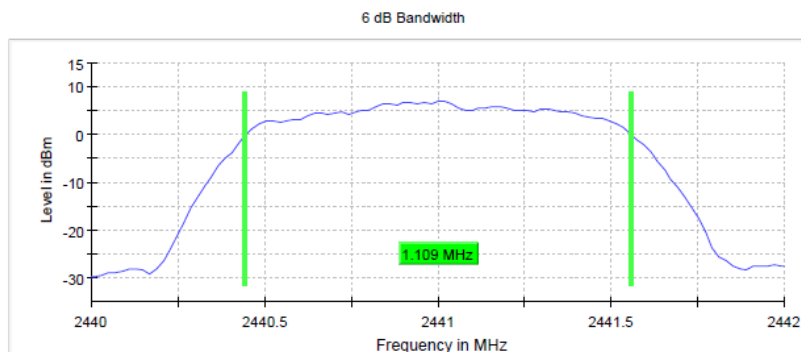


Setting	Instrument Value
Start Frequency	2.47900 GHz
Stop Frequency	2.48100 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
SweepTime	41.830 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	21 / max. 150
Stable	5 / 5
Max Stable Difference	0.06 dB

Radio Technology = Bluetooth EDR2, Operating Frequency = mid
(S01_377_AA01)

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
2441.000000	1.108910	0.500000	---	2440.445545	2441.554455	7.0	PASS

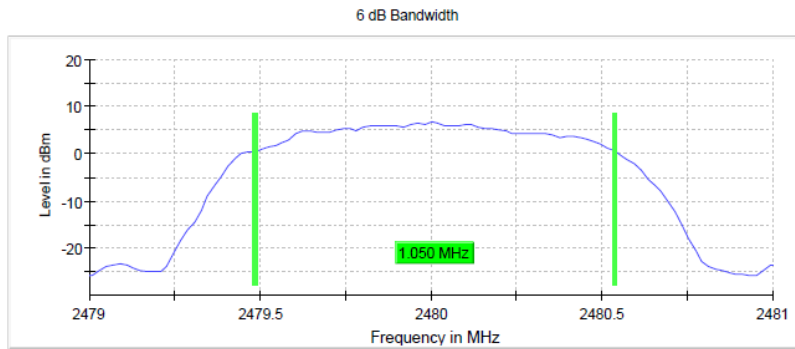


Setting	Instrument Value
Start Frequency	2.44000 GHz
Stop Frequency	2.44200 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
SweepTime	41.830 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	18 / max. 150
Stable	5 / 5
Max Stable Difference	0.19 dB

Radio Technology = Bluetooth EDR3, Operating Frequency = high
(S01_374_BA01)

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
2480.000000	1.049504	0.500000	---	2479.485149	2480.534653	6.6	PASS

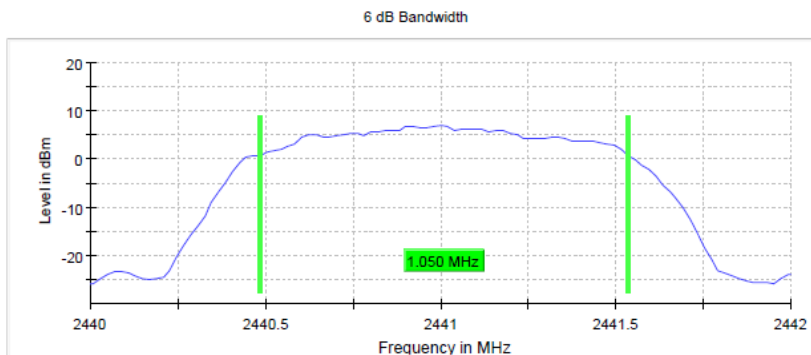


Setting	Instrument Value
Start Frequency	2.47900 GHz
Stop Frequency	2.48100 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
SweepTime	41.830 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	19 / max. 150
Stable	5 / 5
Max Stable Difference	0.04 dB

Radio Technology = Bluetooth EDR3, Operating Frequency = mid
(S01_377_AA01)

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
2441.000000	1.049504	0.500000	---	2440.485149	2441.534653	7.0	PASS

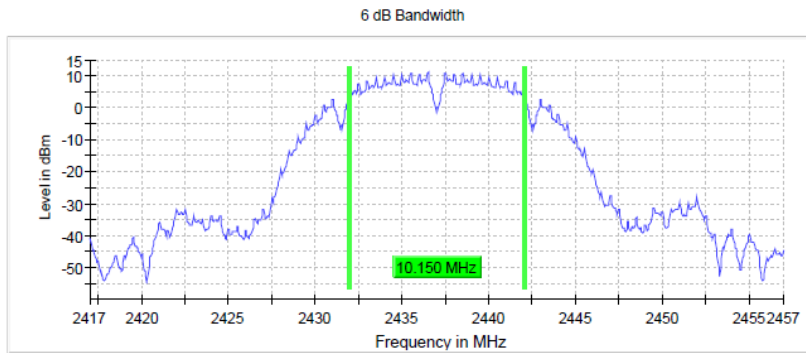


Setting	Instrument Value
Start Frequency	2.44000 GHz
Stop Frequency	2.44200 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
SweepTime	41.830 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	17 / max. 150
Stable	5 / 5
Max Stable Difference	0.00 dB

Radio Technology = WLAN b, Operating Frequency = mid
(S01_377_AA01)

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
2437.000000	10.150000	0.500000	---	2431.925000	2442.075000	11.1	PASS

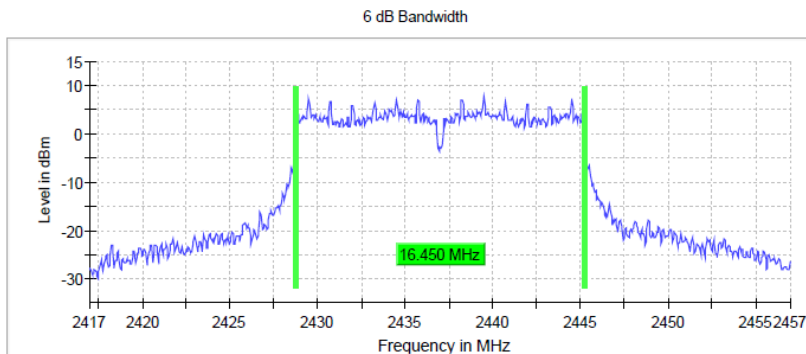


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
SweepTime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	24 / max. 150
Stable	5 / 5
Max Stable Difference	0.16 dB

Radio Technology = WLAN g, Operating Frequency = mid
(S01_377_AA01)

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
2437.000000	16.450000	0.500000	---	2428.775000	2445.225000	7.8	PASS

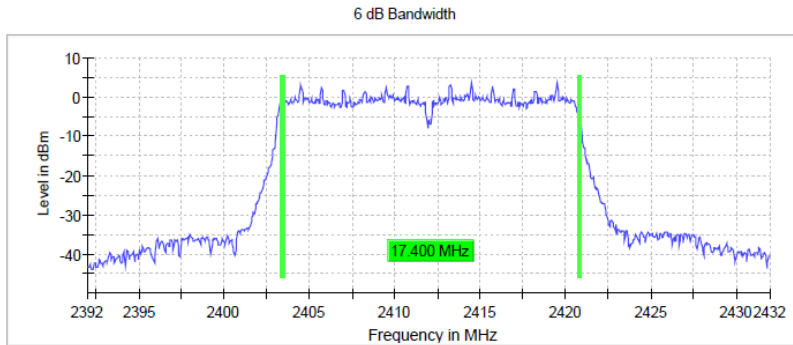


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
SweepTime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	32 / max. 150
Stable	5 / 5
Max Stable Difference	0.09 dB

Radio Technology = WLAN n 20 MHz, Operating Frequency = low
(S01_377_AA01)

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
2412.000000	17.400000	0.500000	---	2403.425000	2420.825000	3.8	PASS

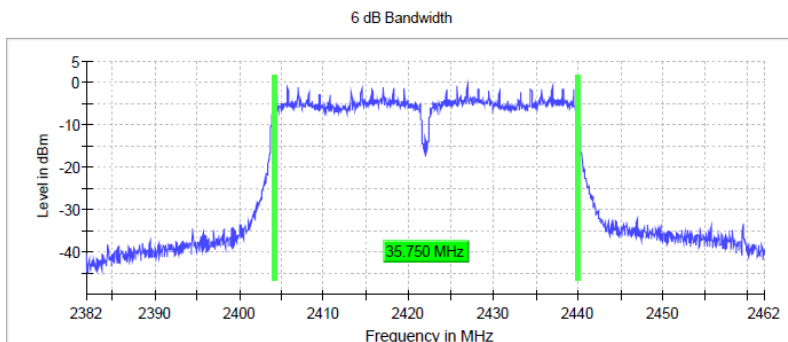


Setting	Instrument Value
Start Frequency	2.39200 GHz
Stop Frequency	2.43200 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
SweepTime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	61 / max. 150
Stable	5 / 5
Max Stable Difference	0.21 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = low
(S01_377_AA01)

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
2422.000000	35.750000	0.500000	---	2404.175000	2439.925000	-0.4	PASS

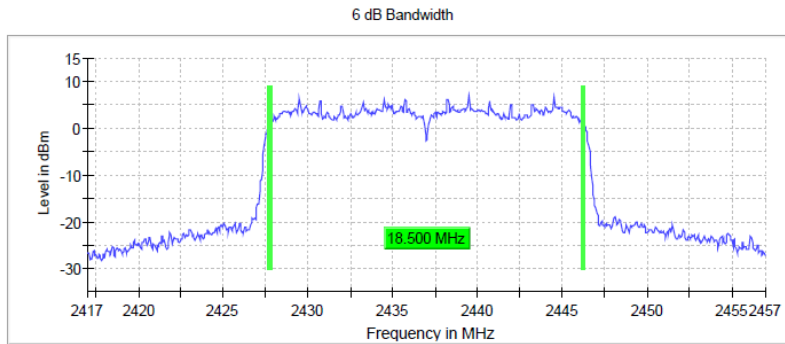


Setting	Instrument Value
Start Frequency	2.38200 GHz
Stop Frequency	2.46200 GHz
Span	80.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1600
SweepTime	1.600 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	98 / max. 150
Stable	5 / 5
Max Stable Difference	0.16 dB

Radio Technology = WLAN ax 20 MHz, Operating Frequency = mid
(S01_377_AA01)

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
2437.000000	18.500000	0.500000	---	2427.775000	2446.275000	6.9	PASS

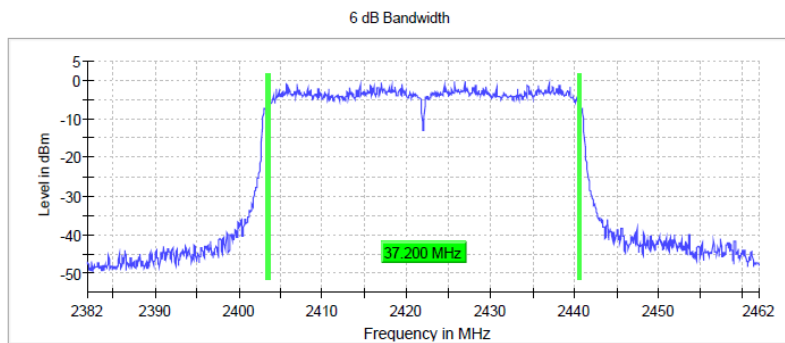


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
SweepTime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	86 / max. 150
Stable	5 / 5
Max Stable Difference	0.35 dB

Radio Technology = WLAN ax 40 MHz, Operating Frequency = low
(S01_377_AA01)

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
2422.000000	37.200000	0.500000	---	2403.475000	2440.675000	-0.4	PASS



Setting	Instrument Value
Start Frequency	2.38200 GHz
Stop Frequency	2.46200 GHz
Span	80.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1600
SweepTime	1.600 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	130 / max. 150
Stable	5 / 5
Max Stable Difference	0.01 dB

5.2.5 TEST EQUIPMENT USED

- R&S TS8997

5.3 OCCUPIED BANDWIDTH (99%)

Standard **FCC Part 15 Subpart C**

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

5.3.1 TEST DESCRIPTION

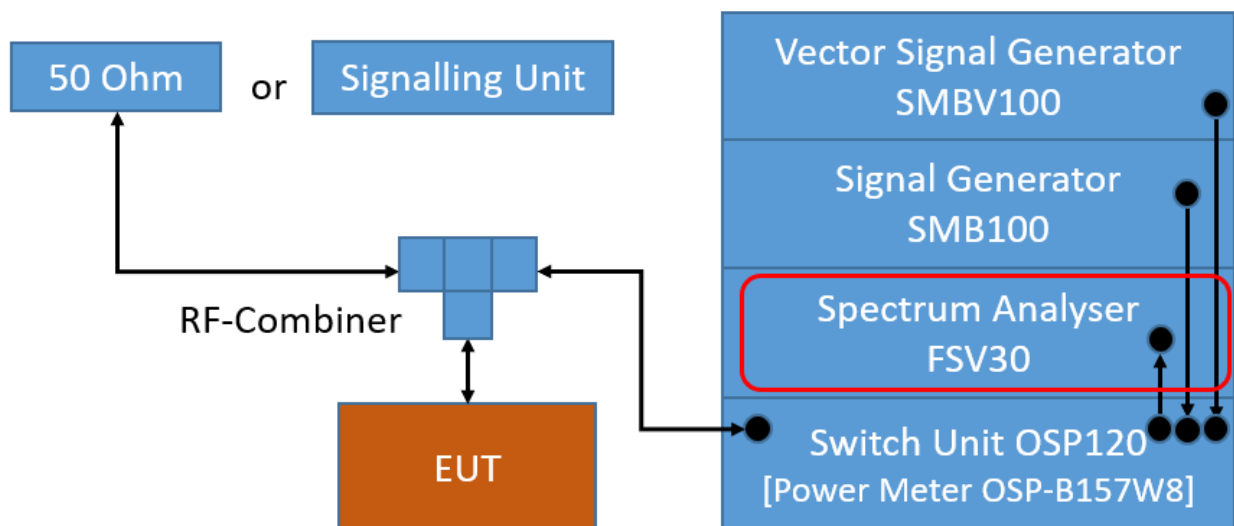
The Equipment Under Test (EUT) was set up to perform the occupied bandwidth measurements.

The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

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

Analyser settings:

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



TS8997; Channel Bandwidth

5.3.2 TEST REQUIREMENTS / LIMITS

No applicable limit.

5.3.3 TEST PROTOCOL

Ambient temperature: 24 -26 °C
 Air Pressure: 1004 - 1026 hPa
 Humidity: 38 -40 %
 BT GFSK (1-DH1)

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
374	0	2402	0.840
377	0	2402	0.870
374	39	2441	0.845
377	39	2441	0.870
374	78	2480	0.845
377	78	2480	0.870

BT DQPSK (2-DH5)

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
374	0	2402	1.140
377	0	2402	1.165
374	39	2441	1.145
377	39	2441	1.170
377	78	2480	1.170
374	78	2480	1.150

BT 8-DPSK (3-DH1)

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
374	0	2402	1.160
377	0	2402	1.180
377	39	2441	1.180
374	39	2441	1.115
377	78	2480	1.180
374	78	2480	1.160

BT LE 1 Mbit/s

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
374	0	2402	1.030
377	0	2402	1.030
374	19	2440	1.030
377	19	2440	1.040
374	39	2480	1.030
377	39	2480	1.040

BT LE 2 Mbit/s

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
374	0	2402	2.040
377	0	2402	2.040
377	19	2440	2.040
374	19	2440	2.040
374	39	2480	2.040
377	39	2480	2.040

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

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
377	1	2412	13.4
377	6	2437	13.8
377	11	2462	13.5

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

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
377	1	2412	16.6
377	6	2437	16.8
377	11	2462	16.6

WLAN n-Mode; 20 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
377	1	2412	17.6
377	6	2437	17.7
377	11	2462	17.7

WLAN n-Mode; 40 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
377	3	2422	36.3
377	6	2437	36.3
377	9	2452	36.3

WLAN ax-Mode; 20 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
377	1	2412	18.8
377	6	2437	18.9
377	11	2462	18.8

WLAN ax-Mode; 40 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
377	3	2422	37.8
377	6	2437	37.8
377	9	2452	37.8

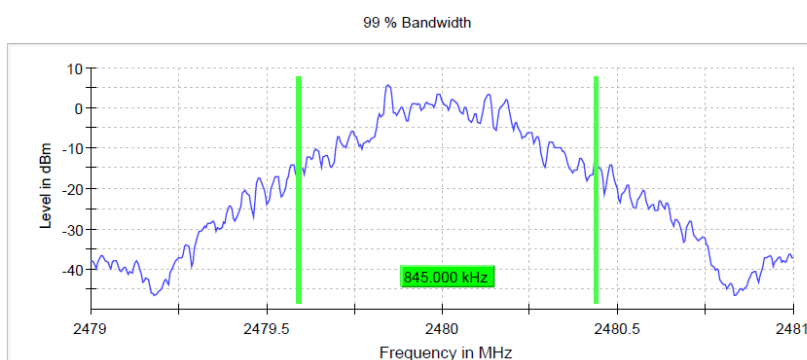
Remark: Please see next sub-clause for the measurement plot.
WLAN results of antenna A given in table above.

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

Radio Technology = Bluetooth BDR, Operating Frequency = high
(S01_374_BA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2480.000000	0.845000	---	---	2479.592500	2480.437500	PASS

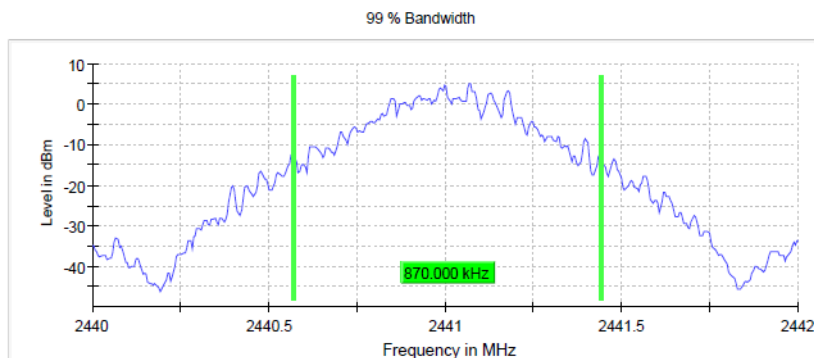


Setting	Instrument Value
Start Frequency	2.47900 GHz
Stop Frequency	2.48100 GHz
Span	2.000 MHz
RBW	10.000 kHz
VBW	30.000 kHz
SweepPoints	400
SweepTime	419.000 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	500
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	4 / max 150
Stable	3 / 3
Max Stable Difference	0.09 dB

Radio Technology = Bluetooth BDR, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2441.000000	0.870000	---	---	2440.572500	2441.442500	PASS

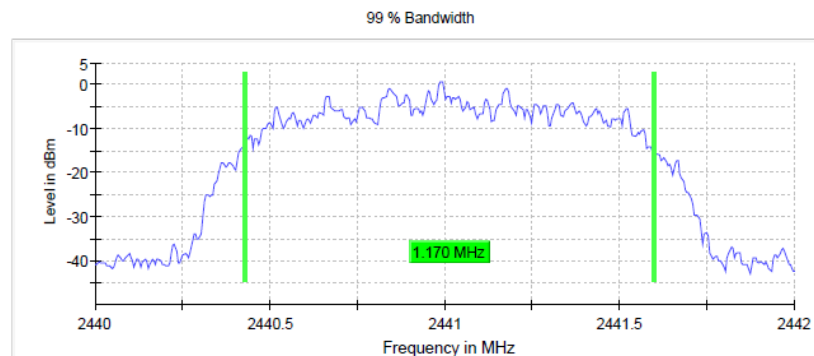


Setting	Instrument Value
Start Frequency	2.44000 GHz
Stop Frequency	2.44200 GHz
Span	2.000 MHz
RBW	10.000 kHz
VBW	30.000 kHz
SweepPoints	400
SweepTime	419.000 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	500
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	5 / max. 150
Stable	3 / 3
Max Stable Difference	0.24 dB

Radio Technology = Bluetooth EDR 2, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2441.000000	1.170000	---	---	2440.427500	2441.597500	PASS

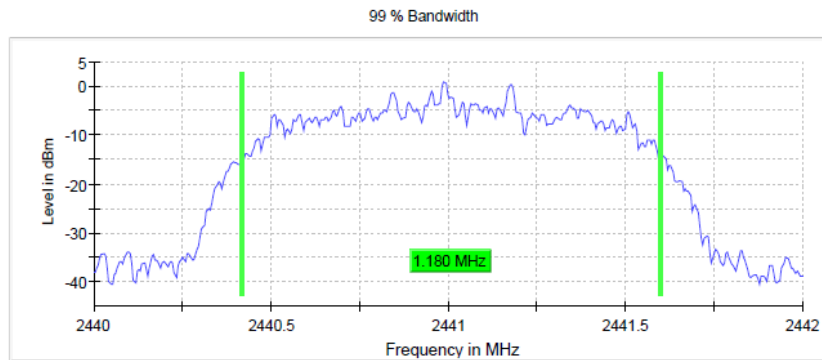


Setting	Instrument Value
Start Frequency	2.44000 GHz
Stop Frequency	2.44200 GHz
Span	2.000 MHz
RBW	10.000 kHz
VBW	30.000 kHz
SweepPoints	400
SweepTime	419.000 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	500
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	6 / max. 150
Stable	3 / 3
Max Stable Difference	0.19 dB

Radio Technology = Bluetooth EDR 3, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2441.000000	1.180000	---	---	2440.417500	2441.597500	PASS

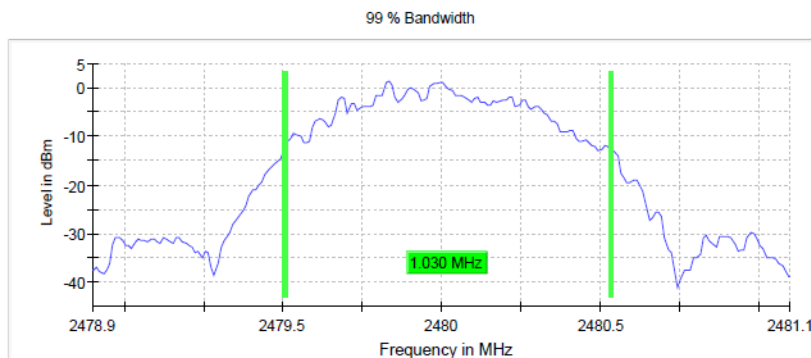


Setting	Instrument Value
Start Frequency	2.44000 GHz
Stop Frequency	2.44200 GHz
Span	2.000 MHz
RBW	10.000 kHz
VBW	30.000 kHz
SweepPoints	400
SweepTime	419.000 μ s
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	500
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	9 / max. 150
Stable	3 / 3
Max Stable Difference	0.11 dB

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = high
(S01_374_BA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2480.000000	1.030000	---	---	2479.505000	2480.535000	PASS

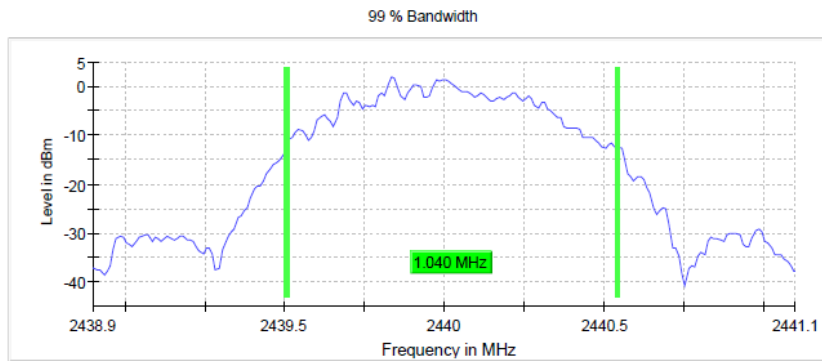


Setting	Instrument Value
Start Frequency	2.47890 GHz
Stop Frequency	2.48110 GHz
Span	2.200 MHz
RBW	20.000 kHz
VBW	100.000 kHz
SweepPoints	220
SweepTime	210.000 μ s
Reference Level	-10.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	7 / max. 150
Stable	3 / 3
Max Stable Difference	0.08 dB

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2440.000000	1.040000	---	---	2439.505000	2440.545000	PASS

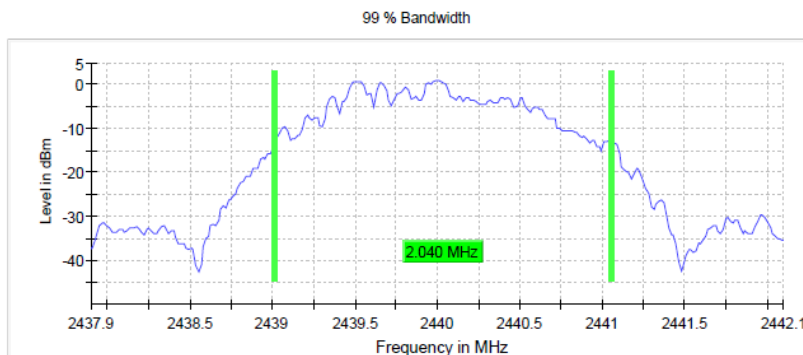


Setting	Instrument Value
Start Frequency	2.43890 GHz
Stop Frequency	2.44110 GHz
Span	2.200 MHz
RBW	20.000 kHz
VBW	100.000 kHz
SweepPoints	220
SweepTime	210.000 μ s
Reference Level	-10.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	8 / max. 150
Stable	3 / 3
Max Stable Difference	0.08 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2440.000000	2.040000	---	---	2439.017500	2441.057500	PASS

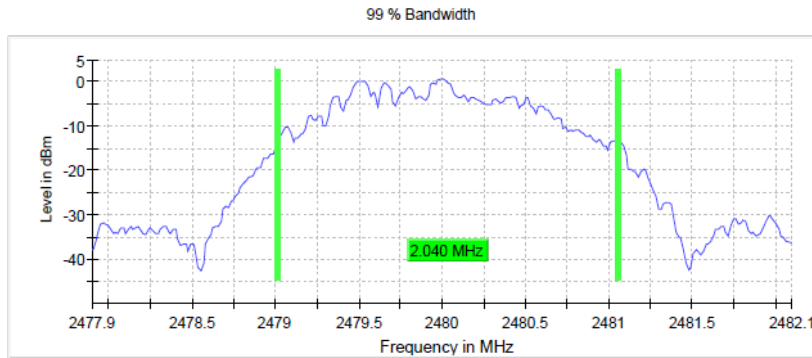


Setting	Instrument Value
Start Frequency	2.43790 GHz
Stop Frequency	2.44210 GHz
Span	4.200 MHz
RBW	30.000 kHz
VBW	100.000 kHz
SweepPoints	280
SweepTime	140.000 μ s
Reference Level	-10.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	9 / max. 150
Stable	3 / 3
Max Stable Difference	0.10 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = high
(S01_374_BA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2480.000000	2.040000	---	---	2479.017500	2481.057500	PASS

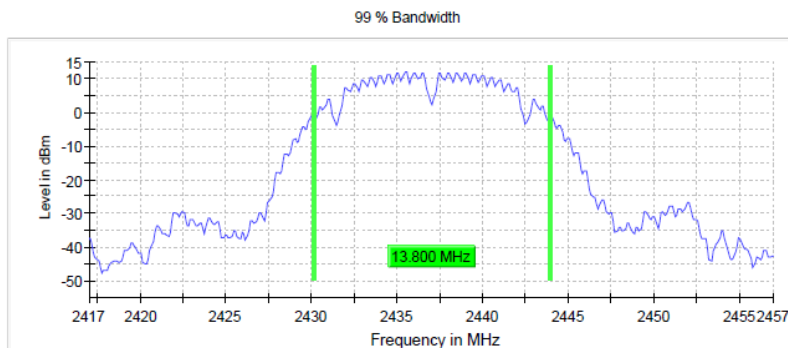


Setting	Instrument Value
Start Frequency	2.47790 GHz
Stop Frequency	2.48210 GHz
Span	4.200 MHz
RBW	30.000 kHz
VBW	100.000 kHz
SweepPoints	280
SweepTime	140.000 μ s
Reference Level	-10.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	8 / max. 150
Stable	3 / 3
Max Stable Difference	0.09 dB

Radio Technology = WLAN b, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	13.800000	---	---	2430.150000	2443.950000	PASS

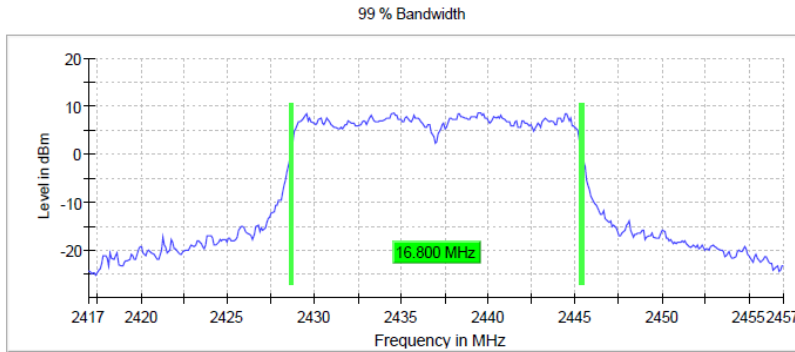


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
SweepTime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	6 / max. 150
Stable	3 / 3
Max Stable Difference	0.12 dB

Radio Technology = WLAN g, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	16.800000	---	---	2428.650000	2445.450000	PASS

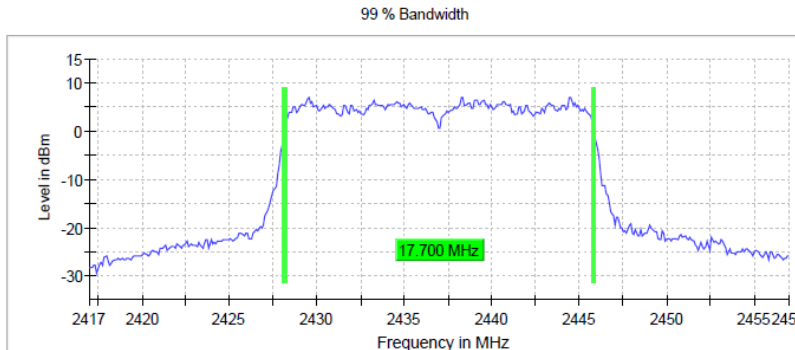


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	38 / max. 150
Stable	3 / 3
Max Stable Difference	0.20 dB

Radio Technology = WLAN n 20 MHz, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

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

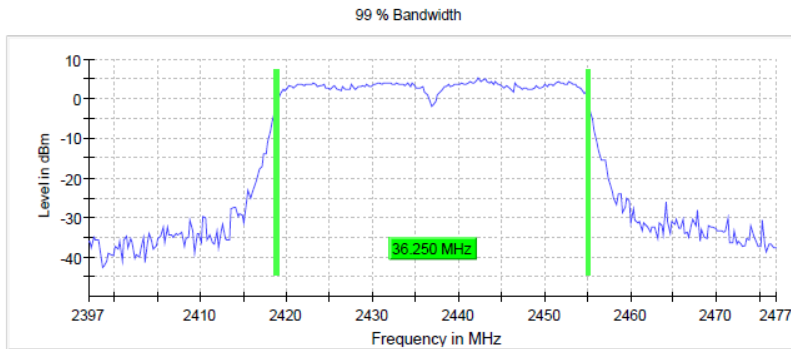


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	48 / max. 150
Stable	3 / 3
Max Stable Difference	0.08 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

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

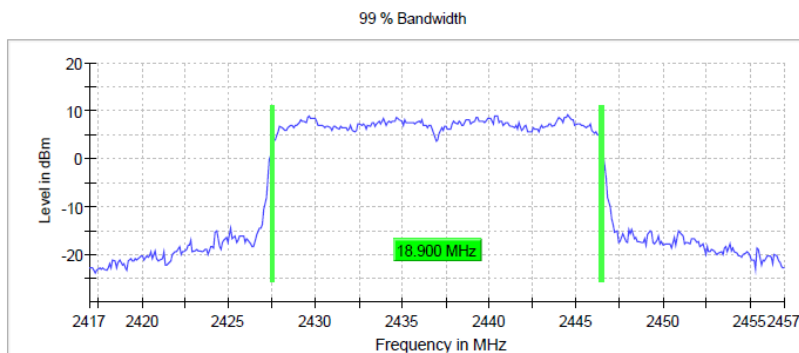


Setting	Instrument Value
Start Frequency	2.39700 GHz
Stop Frequency	2.47700 GHz
Span	80.000 MHz
RBW	500.000 kHz
VBW	2.000 MHz
SweepPoints	320
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	50 / max. 150
Stable	3 / 3
Max Stable Difference	0.17 dB

Radio Technology = WLAN ax 20 MHz, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

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



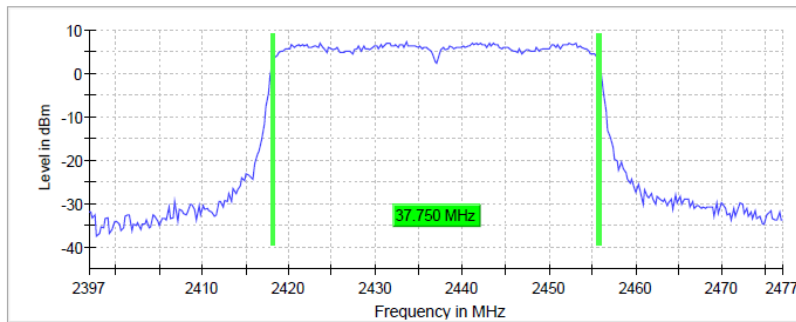
Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	67 / max. 150
Stable	3 / 3
Max Stable Difference	0.27 dB

Radio Technology = WLAN ax 40 MHz, Operating Frequency = mid
(S01_377_AA01)

99 % Bandwidth

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

99 % Bandwidth



Setting	Instrument Value
Start Frequency	2.39700 GHz
Stop Frequency	2.47700 GHz
Span	80.000 MHz
RBW	500.000 kHz
VBW	2.000 MHz
SweepPoints	320
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	124 / max. 150
Stable	3 / 3
Max Stable Difference	0.26 dB

5.3.5 TEST EQUIPMENT USED

- R&S TS8997

5.4 PEAK POWER OUTPUT

Standard **FCC Part 15 Subpart C**

The test was performed according to:

ANSI C63.10 11.9.1.1, 11.9.2.3.2

5.4.1 TEST DESCRIPTION

DTS EQUIPMENT:

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

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

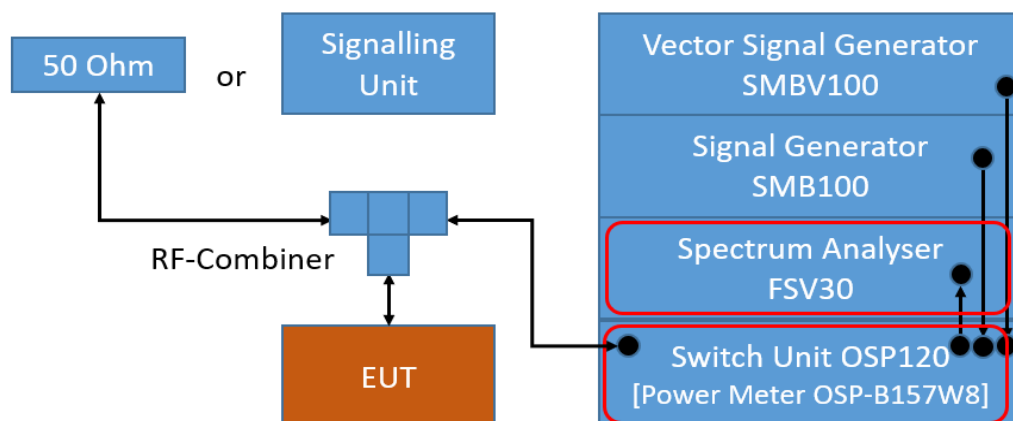
The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered. The reference level of the spectrum analyser was set higher than the output power of the EUT.

Analyser settings:

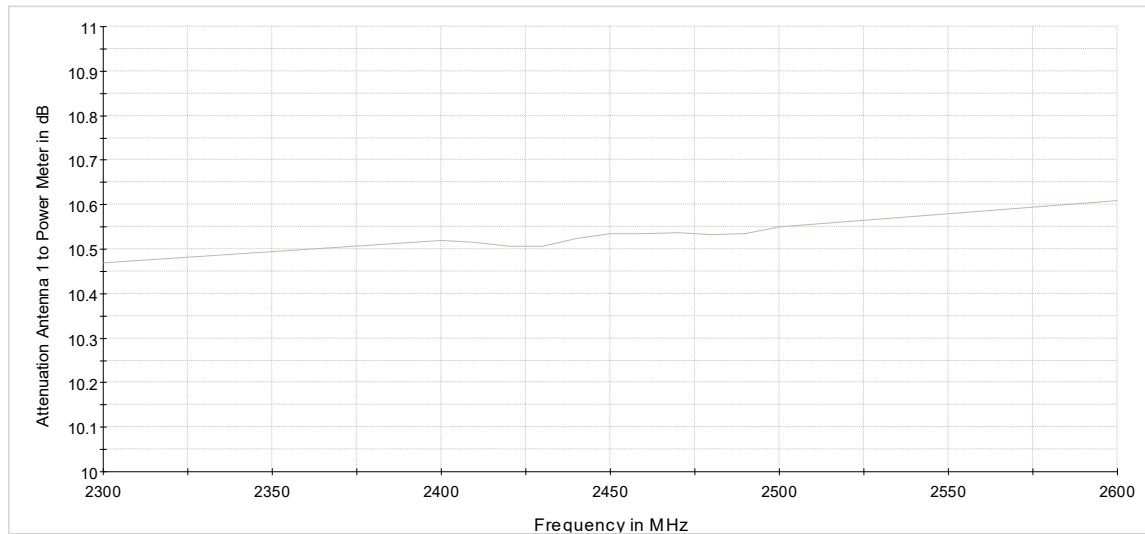
- Resolution Bandwidth (RBW): $\geq$ DTS bandwidth
- Video Bandwidth (VBW): $\geq$ 3 times RBW or maximum of analyzer
- Span: $\geq$ 3 times RBW
- Trace: Maxhold
- Sweeps: Till stable (min. 300, max. 15000)
- Sweep time: Auto
- Detector: Peak

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

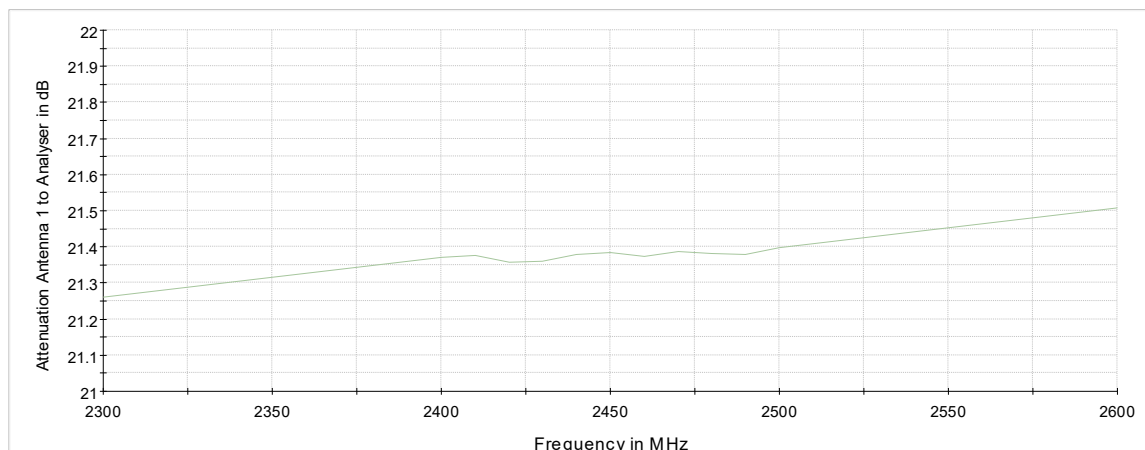
The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered. Measurement is performed using the gated RF average power meter integrated in the OSP 120 module OSP-B157W8 with signal bandwidth >300 MHz.



TS8997; Output Power



Attenuation of the measurement path to Power Meter



Attenuation of the measurement path to Analyser

5.4.2 TEST REQUIREMENTS / LIMITS

DTS devices:

FCC Part 15, Subpart C, §15.247 (b) (3)

For systems using digital modulation techniques in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: 1 watt.

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

Frequency Hopping Systems:

FCC Part 15, Subpart C, §15.247 (b) (1)

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

FCC Part 15, Subpart C, §15.247 (b) (2)

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

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

5.4.3 TEST PROTOCOL

Ambient temperature: 24 -26 °C
Air Pressure: 1004 - 1026 hPa
Humidity: 38 -40 %
BT GFSK (1-DH1)

Variant	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
374	0	2402	11.1	21.0	9.9	13.1
377	0	2402	11.2	21.0	9.8	13.2
377	39	2441	11.2	21.0	9.8	13.2
374	39	2441	11.0	21.0	10.0	13.0
377	78	2480	11.2	21.0	9.8	13.2
374	78	2480	10.9	21.0	10.1	12.9

BT π/4 DQPSK (2-DH1)

Variant	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
374	0	2402	10.3	21.0	10.7	12.3
377	0	2402	10.5	21.0	10.5	12.5
377	39	2441	10.5	21.0	10.5	12.5
374	39	2441	10.3	21.0	10.7	12.3
377	78	2480	10.4	21.0	10.6	12.4
374	78	2480	10.1	21.0	10.9	12.1

BT 8-DPSK (3-DH1)

Variant	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
377	0	2402	10.8	21.0	10.2	12.8
374	0	2402	10.5	21.0	10.5	12.5
374	39	2441	11.0	21.0	10.0	13.0
377	39	2441	10.8	21.0	10.2	12.8
374	78	2480	10.3	21.0	10.7	12.3
377	78	2480	10.7	21.0	10.3	12.7

BT LE 1 Mbit/s

Variant	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
374	0	2402	8.0	30.0	22.0	10.0
377	0	2402	8.4	30.0	21.6	10.4
374	19	2440	8.0	30.0	22.0	10.0
377	19	2440	8.4	30.0	21.6	10.4
374	39	2480	7.9	30.0	22.1	9.9
377	39	2480	8.4	30.0	21.6	10.4

BT LE 2 Mbit/s

Variant	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
374	0	2402	8.0	30.0	22.0	10.0
377	0	2402	8.4	30.0	21.6	10.4
374	19	2440	8.0	30.0	22.0	10.0
377	19	2440	8.4	30.0	21.6	10.4
377	39	2480	8.3	30.0	21.7	10.3
374	39	2480	7.9	30.0	22.1	9.9

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

Variant	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
377	1	2412	18.9	30.0	11.1	20.9
374	1	2412	18.6	30.0	11.4	20.6
374	6	2437	21.3	30.0	8.7	23.3
377	6	2437	20.7	30.0	9.3	22.7
377	11	2462	19.2	30.0	10.8	21.2
374	11	2462	19.6	30.0	10.4	21.6

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

Variant	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
374	1	2412	14.9	30.0	15.1	16.9
377	1	2412	14.5	30.0	15.5	16.5
377	6	2437	18.6	30.0	11.4	20.6
374	6	2437	18.9	30.0	11.1	20.9
377	11	2462	13.8	30.0	16.2	15.8
374	11	2462	14.1	30.0	15.9	16.1

WLAN n-Mode; 20 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
374	1	2412	14.8	30.0	15.2	16.8
377	1	2412	14.5	30.0	15.5	16.5
377	6	2437	16.8	30.0	13.2	18.8
374	6	2437	17.5	30.0	12.5	19.5
374	11	2462	13.1	30.0	16.9	15.1
377	11	2462	13.8	30.0	16.2	15.8

WLAN n-Mode; 40 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
377	3	2422	13.2	30.0	16.8	15.2
374	3	2422	13.8	30.0	16.2	15.8
374	6	2437	13.9	30.0	16.1	15.9
377	6	2437	13.7	30.0	16.3	15.7
377	9	2452	12.9	30.0	17.1	14.9
374	9	2452	12.6	30.0	17.4	14.6

WLAN ax-Mode; 20 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
374	1	2412	13.9	30.0	16.1	15.9
377	1	2412	13.6	30.0	16.4	15.6
377	6	2437	17.9	30.0	12.1	18.9
374	6	2437	18.5	30.0	11.5	20.5
374	11	2462	13.1	30.0	16.9	15.1
377	11	2462	13.0	30.0	17.0	15.0

WLAN ax-Mode; 40 MHz; MCS0

Variant	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
377	3	2422	13.9	30.0	16.1	15.9
374	3	2422	14.1	30.0	15.9	16.1
374	6	2437	14.2	30.0	15.8	16.2
377	6	2437	14.0	30.0	16.0	16.0
374	9	2452	13.3	30.0	16.7	15.3
377	9	2452	13.3	30.0	16.7	15.3

WLAN n-Mode; 20 MHz; MCS0; MIMO

Variant	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
377	1	2412	16.6	30.0	13.4	18.6
377	6	2437	18.9	30.0	11.1	20.9
377	11	2462	15.8	30.0	14.2	17.8

WLAN n-Mode; 40 MHz; MCS0; MIMO

Variant	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
377	3	2422	15.5	30.0	14.5	17.5
377	6	2437	15.5	30.0	14.5	17.5
377	9	2452	14.7	30.0	15.3	16.7

WLAN ax-Mode; 20 MHz; MCS0; MIMO

Variant	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
377	1	2412	15.8	30.0	14.2	17.8
377	6	2437	20.0	30.0	10.0	22.0
377	11	2462	15.0	30.0	15.0	17.0

WLAN ax-Mode; 40 MHz; MCS0; MIMO

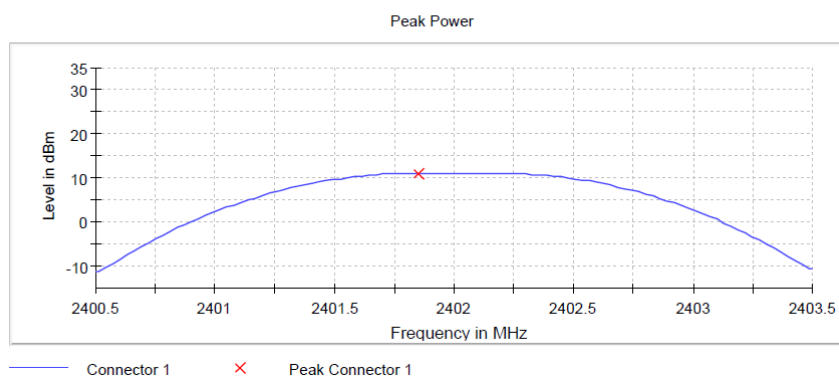
Variant	Ch. No.	Freq. [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	EIRP [dBm]
377	3	2422	15.8	30.0	14.2	17.8
377	6	2437	15.9	30.0	14.1	17.9
377	9	2452	14.9	30.0	15.1	16.9

Remark: Please see next sub-clause for the measurement plot.
No plots are given for WLAN (Power Meter measurement).
WLAN SISO results of antenna A given in table above.

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

Radio Technology = Bluetooth BDR, Operating Frequency = low, Measurement method = conducted
(S01_374_BA01)

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	11.1	21.0	PASS

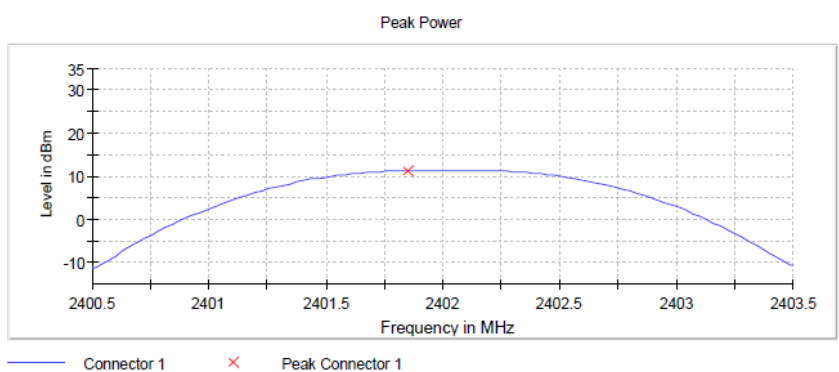


Setting	Instrument Value
Start Frequency	2.40050 GHz
Stop Frequency	2.40350 GHz
Span	3.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
SweepTime	4.210 μ s
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.02 dB

Radio Technology = Bluetooth BDR, Operating Frequency = low, Measurement method = conducted
(S01_377_AA01)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	11.2	21.0	PASS

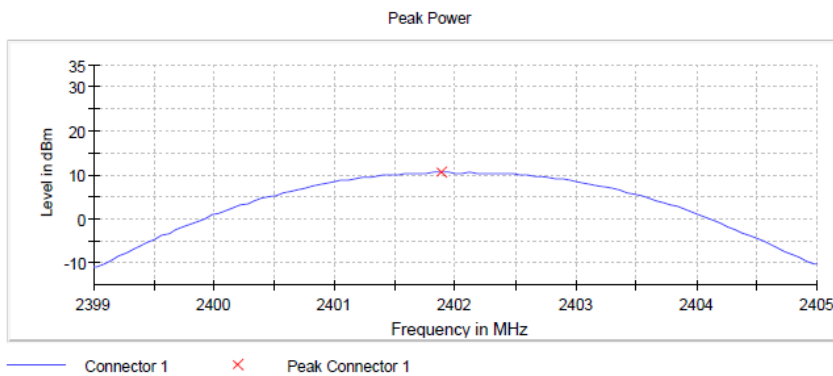


Setting	Instrument Value
Start Frequency	2.40050 GHz
Stop Frequency	2.40350 GHz
Span	3.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	101
SweepTime	4.210 μ s
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	FFT
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.01 dB

Radio Technology = Bluetooth EDR 2, Operating Frequency = low, Measurement method = conducted
(S01_377_AA01)

Result

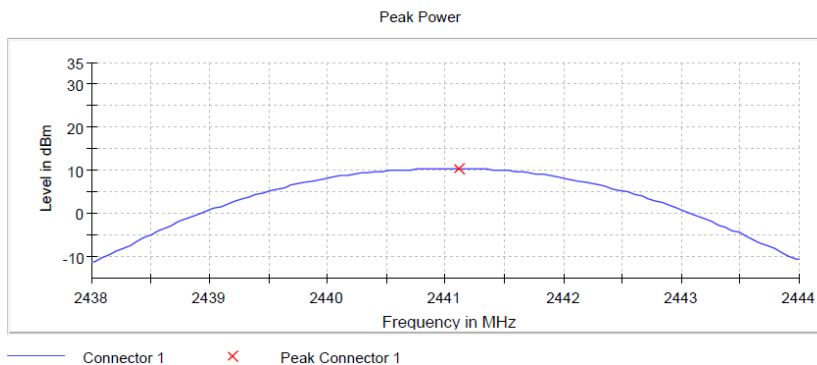
DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	10.5	21.0	PASS



Setting	Instrument Value
Start Frequency	2.39900 GHz
Stop Frequency	2.40500 GHz
Span	6.000 MHz
RBW	2.000 MHz
VBW	10.000 MHz
SweepPoints	101
SweepTime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.04 dB

Radio Technology = Bluetooth EDR 2, Operating Frequency = mid, Measurement method = conducted
(S01_374_BA01)

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2441.000000	10.3	21.0	PASS

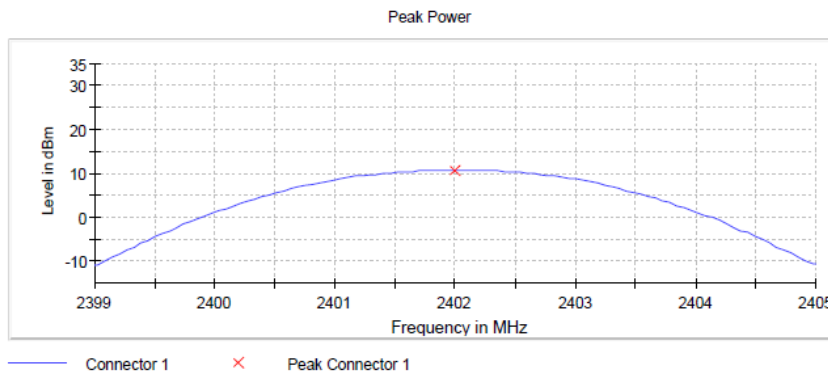


Setting	Instrument Value
Start Frequency	2.43800 GHz
Stop Frequency	2.44400 GHz
Span	6.000 MHz
RBW	2.000 MHz
VBW	10.000 MHz
SweepPoints	101
SweepTime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.15 dB

Radio Technology = Bluetooth EDR 3, Operating Frequency = low, Measurement method = conducted
(S01_377_AA01)

Result

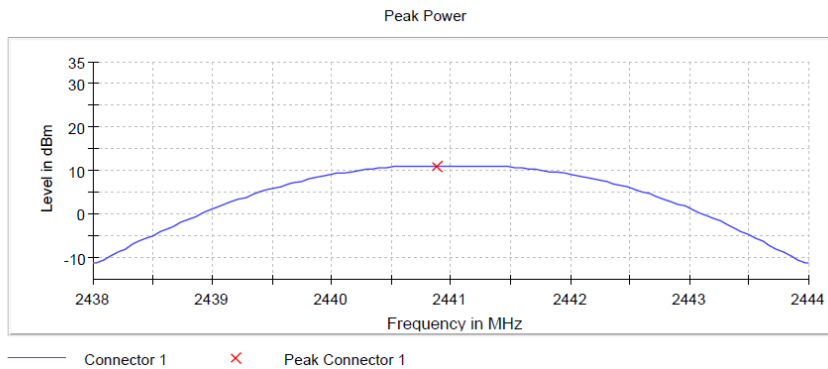
DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	10.8	21.0	PASS



Setting	Instrument Value
Start Frequency	2.39900 GHz
Stop Frequency	2.40500 GHz
Span	6.000 MHz
RBW	2.000 MHz
VBW	10.000 MHz
SweepPoints	101
SweepTime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.12 dB

Radio Technology = Bluetooth EDR 3, Operating Frequency = mid, Measurement method = conducted
(S01_374_BA01)

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2441.000000	11.0	21.0	PASS

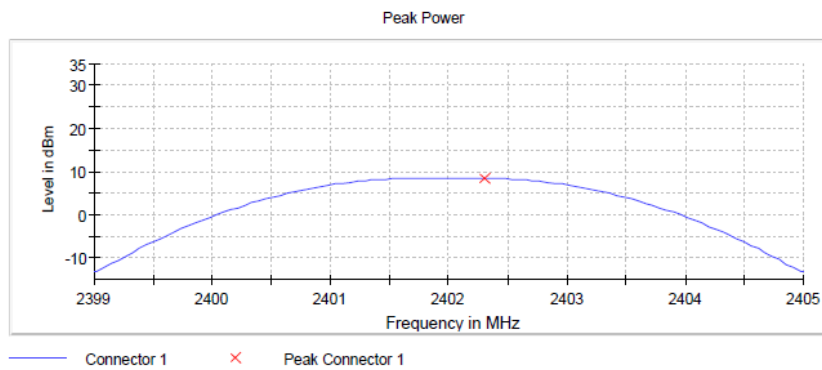


Setting	Instrument Value
Start Frequency	2.43800 GHz
Stop Frequency	2.44400 GHz
Span	6.000 MHz
RBW	2.000 MHz
VBW	10.000 MHz
SweepPoints	101
SweepTime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.03 dB

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low, Measurement method =
conducted
(S01_377_AA01)

Result

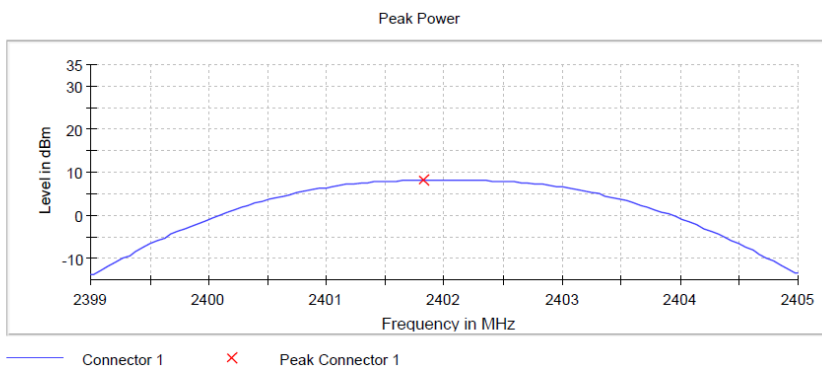
DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	8.4	30.0	PASS



Setting	Instrument Value
Start Frequency	2.39900 GHz
Stop Frequency	2.40500 GHz
Span	6.000 MHz
RBW	2.000 MHz
VBW	10.000 MHz
SweepPoints	101
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.02 dB

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low, Measurement method =
conducted
(S01_374_BA01)

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	8.0	30.0	PASS

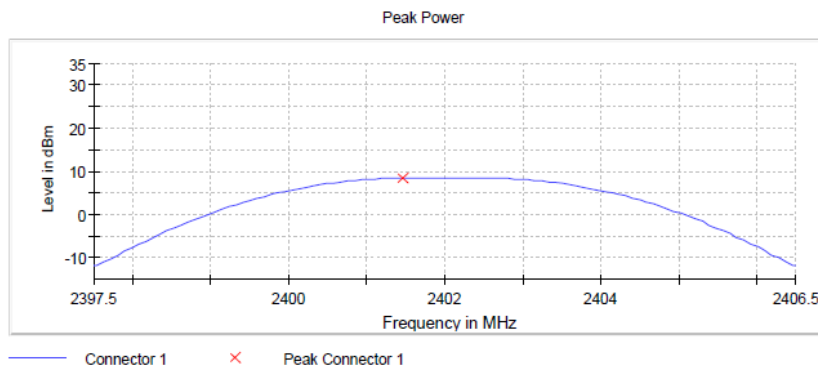


Setting	Instrument Value
Start Frequency	2.39900 GHz
Stop Frequency	2.40500 GHz
Span	6.000 MHz
RBW	2.000 MHz
VBW	10.000 MHz
SweepPoints	101
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamplifier	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.01 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low, Measurement method = conducted
(S01_377_AA01)

Result

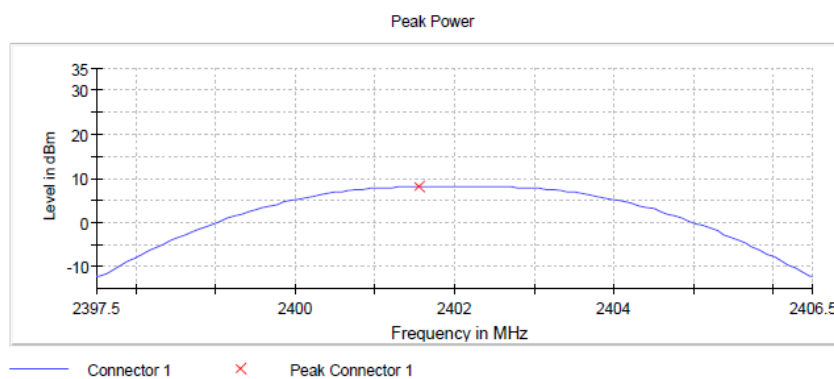
DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	8.4	30.0	PASS



Setting	Instrument Value
Start Frequency	2.39750 GHz
Stop Frequency	2.40650 GHz
Span	9.000 MHz
RBW	3.000 MHz
VBW	10.000 MHz
SweepPoints	101
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.04 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low, Measurement method = conducted
(S01_374_BA01)

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	8.0	30.0	PASS



Setting	Instrument Value
Start Frequency	2.39750 GHz
Stop Frequency	2.40650 GHz
Span	9.000 MHz
RBW	3.000 MHz
VBW	10.000 MHz
SweepPoints	101
SweepTime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
SweepType	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.03 dB

5.4.5 TEST EQUIPMENT USED

- R&S TS8997

5.5 SPURIOUS RF CONDUCTED EMISSIONS

Standard **FCC Part 15 Subpart C**

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

5.5.1 TEST DESCRIPTION

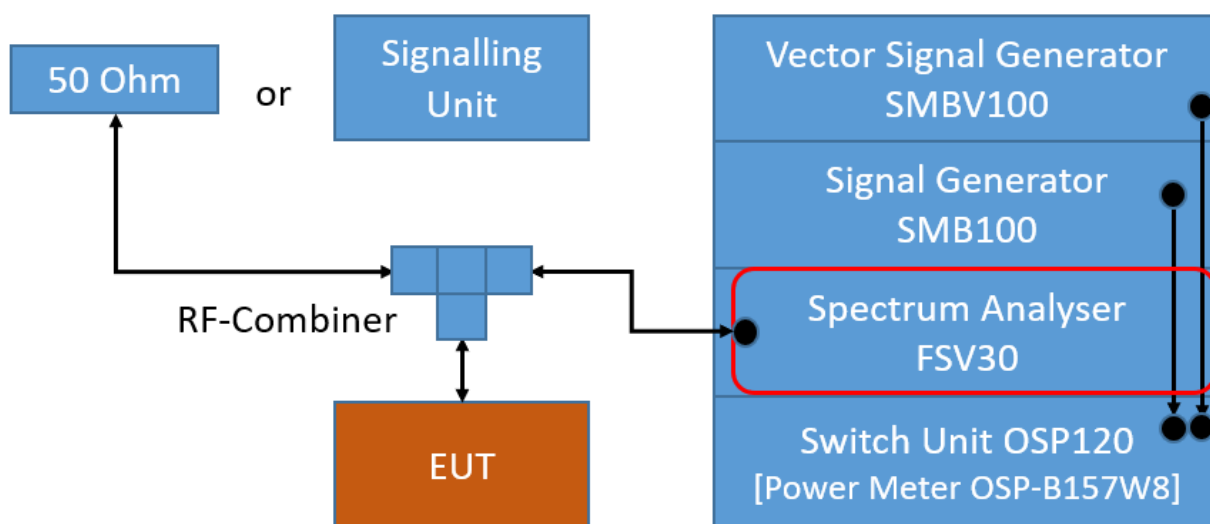
The Equipment Under Test (EUT) was set up to perform the spurious emissions measurements.

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

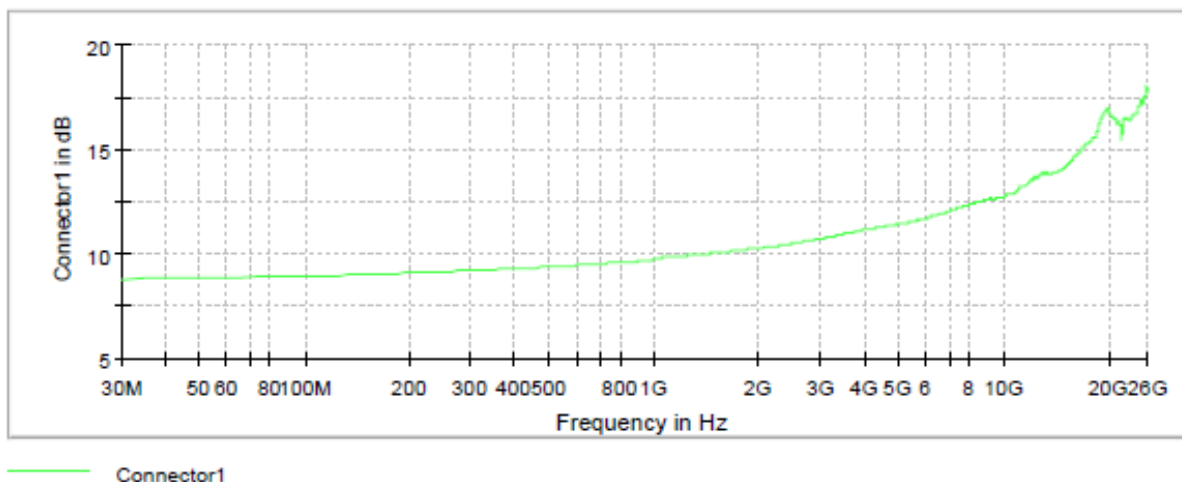
Analyser settings:

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

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



TS8997; Spurious RF Conducted Emissions



Attenuation of the measurement part

5.5.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.247 (c)

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

5.5.3 TEST PROTOCOL

Ambient temperature: 24 -26 °C
 Air Pressure: 1004 - 1026 hPa
 Humidity: 38 -40 %
 BT GFSK (1-DH1)

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2402	4807.2	-47.8	PEAK	100	7.9	-12.1	35.7
374	2402	2395.0	-51.5	PEAK	100	10.1	-9.9	41.6
377	2441	4887.1	-49.9	PEAK	100	7.8	-12.2	37.7
374	2441	2385.1	-53.4	PEAK	100	9.7	-10.3	43.1
377	2480	4957.1	-53.0	PEAK	100	7.9	-12.1	40.9
374	2480	25945.0	-52.6	PEAK	100	9.9	-10.1	42.5

BT n/4 DQPSK (2-DH1)

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2402	4807.2	-54.4	PEAK	100	5.0	-15.0	39.4
374	2402	2395.0	-50.0	PEAK	100	6.8	-13.2	36.8
377	2441	4877.1	-54.9	PEAK	100	2.8	-17.2	37.7
374	2441	64.9	-53.8	PEAK	100	6.8	-13.2	40.6
374	2480	25975.0	-52.0	PEAK	100	7.5	-12.5	39.5
377	2480	4957.1	-56.0	PEAK	100	5.0	-15.0	41.0

BT 8-DPSK (3-DH1)

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2402	4807.2	-51.9	PEAK	100	5.2	-14.8	37.1
374	2402	2395.0	-52.0	PEAK	100	3.8	-16.2	35.8
374	2441	64.9	-52.6	PEAK	100	7.9	-12.1	40.5
377	2441	4887.1	-56.7	PEAK	100	3.3	-16.7	40.0
374	2480	2448.5	-51.2	PEAK	100	7.3	-12.7	38.5
377	2480	2488.5	-53.6	PEAK	100	3.5	-16.5	37.1

Ambient temperature: 25 °C
 Air Pressure: 1026 hPa
 Humidity: 33 %
 BT LE 1 Mbit/s

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2402	4807.2	-49.1	PEAK	100	6.9	-13.1	36.0
374	2402	2395.0	-50.1	PEAK	100	6.0	-14.0	36.1
377	2440	4877.1	-51.0	PEAK	100	7.8	-12.2	38.8
374	2440	64.9	-55.3	PEAK	100	6.6	-13.4	41.9
377	2480	2488.5	-49.2	PEAK	100	7.7	-12.3	36.9
374	2480	2488.5	-51.3	PEAK	100	7.1	-12.9	38.4

BT LE 2 Mbit/s

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2402	2395.0	-29.2	PEAK	100	7.5	-12.5	16.7
374	2402	2395.0	-30.3	PEAK	100	7.5	-12.5	17.8
374	2440	64.9	-50.3	PEAK	100	6.8	-13.2	37.1
377	2440	4877.1	-54.2	PEAK	100	6.5	-13.5	40.7
374	2480	64.9	-50.2	PEAK	100	5.6	-14.4	35.8
377	2480	2488.5	-50.6	PEAK	100	7.5	-12.5	38.1

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

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2412	2395.0	-40.9	PEAK	100	10.9	-19.1	21.8
377	2437	2395.0	-50.8	PEAK	100	12.1	-17.9	32.9
377	2462	25645.2	-32.1	PEAK	100	10.5	-19.5	12.6

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

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2412	2395.0	-42.9	PEAK	100	2.6	-27.4	15.5
377	2437	2395.0	-43.2	PEAK	100	7.8	-22.2	21.0
377	2462	25625.2	-52.4	PEAK	100	4.9	-25.1	27.3

WLAN n-Mode; 20 MHz; MCS0

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2412	2395.0	-37.7	PEAK	100	5.7	-24.3	13.4
377	2437	2395.0	-45.4	PEAK	100	5.3	-24.7	20.7
377	2462	25645.2	-42.0	PEAK	100	1.2	-28.8	13.2

WLAN n-Mode; 40 MHz; MCS0

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2422	2395.0	-35.7	PEAK	100	-1.0	-31.0	4.7
377	2437	104.7	-50.2	PEAK	100	-1.8	-31.8	18.4
377	2452	25725.2	-42.5	PEAK	100	-2.3	-32.3	10.2

WLAN ax-Mode; 20 MHz; MCS0

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2412	2395.0	-44.2	PEAK	100	2.0	-28.0	16.2
377	2437	2395.0	-41.1	PEAK	100	5.8	-24.2	16.9
377	2462	25685.2	-41.9	PEAK	100	0.9	-29.1	12.8

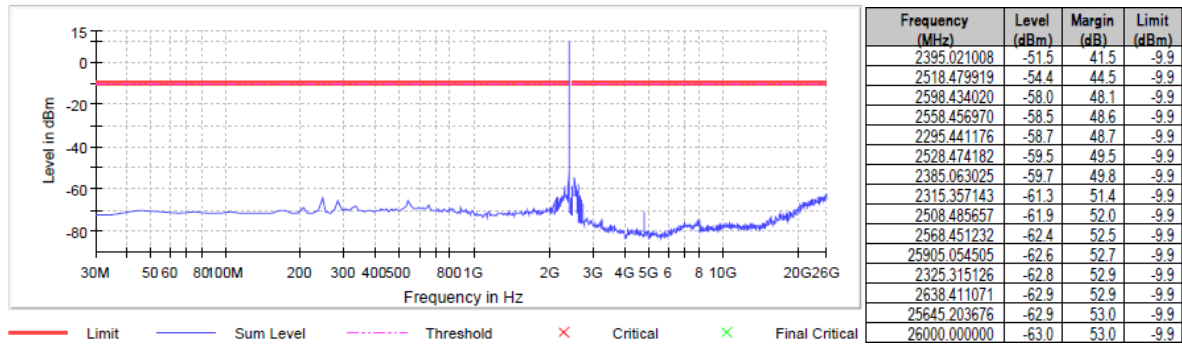
WLAN ax-Mode; 40 MHz; MCS0

Variant	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
377	2422	2385.1	-47.5	PEAK	100	-0.4	-30.4	17.1
377	2437	2385.1	-47.9	PEAK	100	-0.7	-30.7	17.2
377	2452	25675.2	-42.2	PEAK	100	-3.5	-33.5	8.7

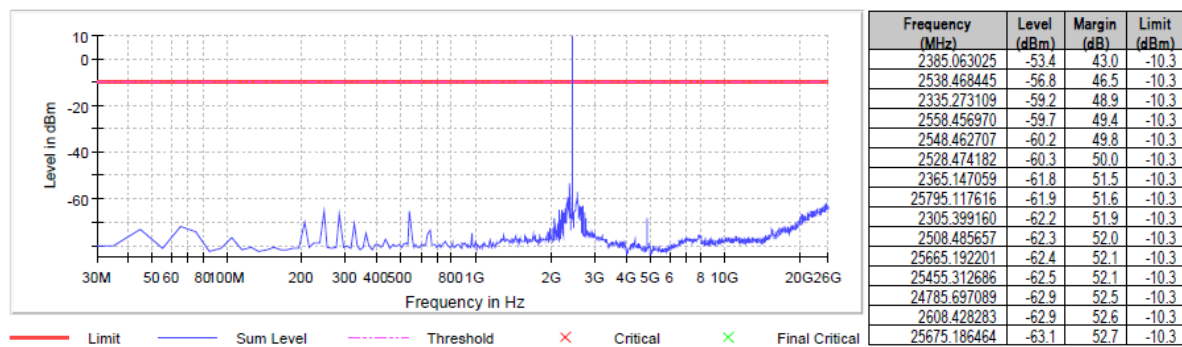
Remark: Please see next sub-clause for the measurement plot.
WLAN results of antenna A given in table above.

5.5.4 MEASUREMENT PLOT

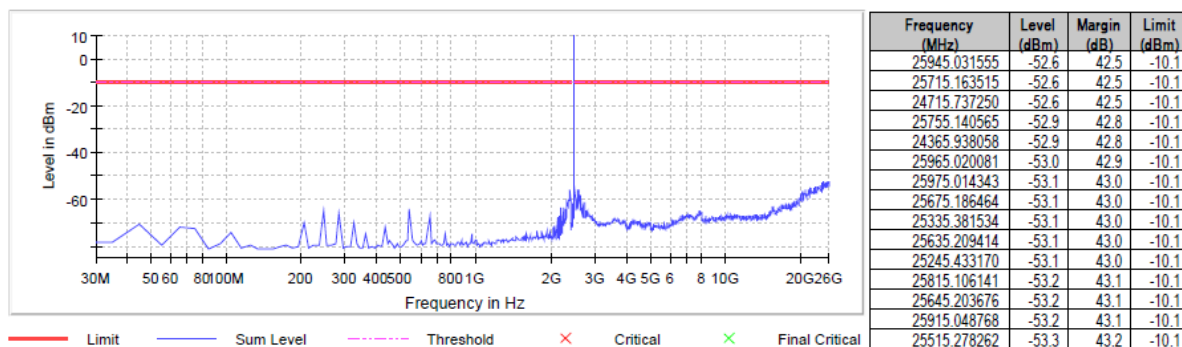
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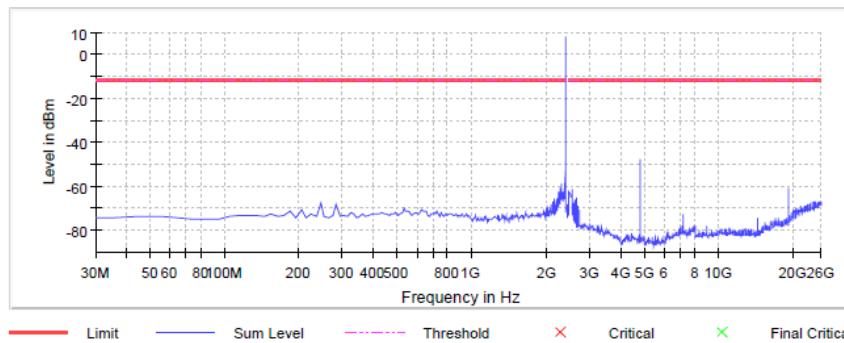
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Radio Technology = Bluetooth BDR, Operating Frequency = high
(S01_374_BA01)

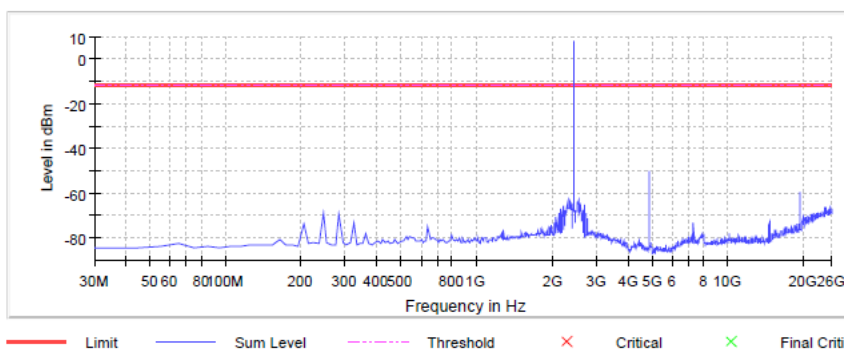


Radio Technology = Bluetooth BDR, Operating Frequency = low (S01_377_AA01)



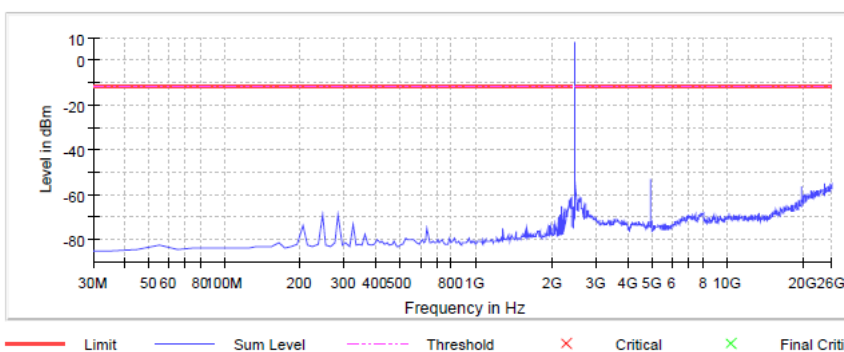
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
4807.166065	-47.8	35.7	-12.1
2395.021008	-50.7	38.7	-12.1
2315.357143	-58.7	46.6	-12.1
19218.892796	-60.7	48.6	-12.1
2275.525210	-60.7	48.6	-12.1
2548.462707	-61.5	49.4	-12.1
2295.441176	-61.5	49.5	-12.1
2305.399160	-61.7	49.6	-12.1
2255.609244	-62.4	50.3	-12.1
2385.063025	-62.5	50.4	-12.1
2335.273109	-62.5	50.4	-12.1
2488.497131	-62.5	50.5	-12.1
2235.693277	-63.5	51.4	-12.1
2498.491394	-64.0	52.0	-12.1
2528.474182	-64.4	52.3	-12.1

Radio Technology = Bluetooth BDR, Operating Frequency = mid (S01_377_AA01)



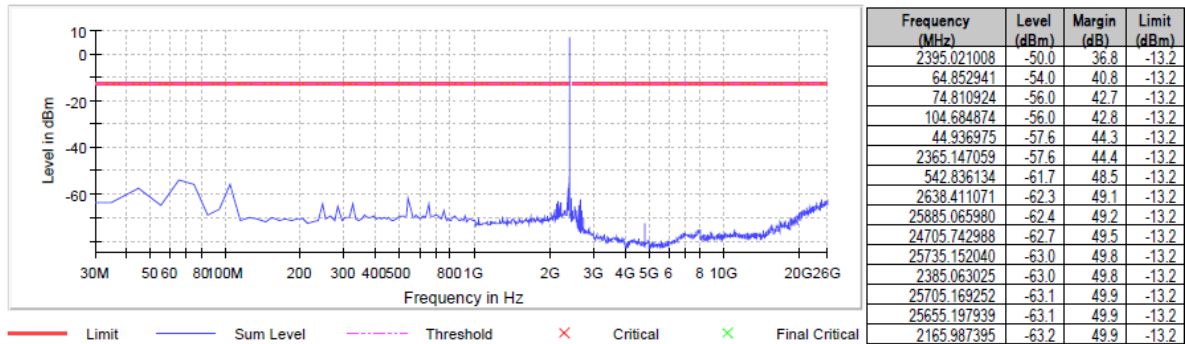
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
4887.120166	-49.9	37.8	-12.2
4877.125903	-50.8	38.6	-12.2
19528.714938	-59.3	47.1	-12.2
2355.189076	-63.2	51.0	-12.2
2528.474182	-63.2	51.0	-12.2
2295.441176	-63.7	51.5	-12.2
2315.357143	-63.8	51.6	-12.2
2345.231092	-63.8	51.6	-12.2
2508.485657	-64.0	51.9	-12.2
2365.147059	-64.3	52.2	-12.2
2588.439758	-64.6	52.4	-12.2
2538.468445	-64.6	52.5	-12.2
2395.021008	-64.8	52.7	-12.2
2678.388122	-65.1	52.9	-12.2
2518.479919	-65.3	53.1	-12.2

Radio Technology = Bluetooth BDR, Operating Frequency = high (S01_377_AA01)

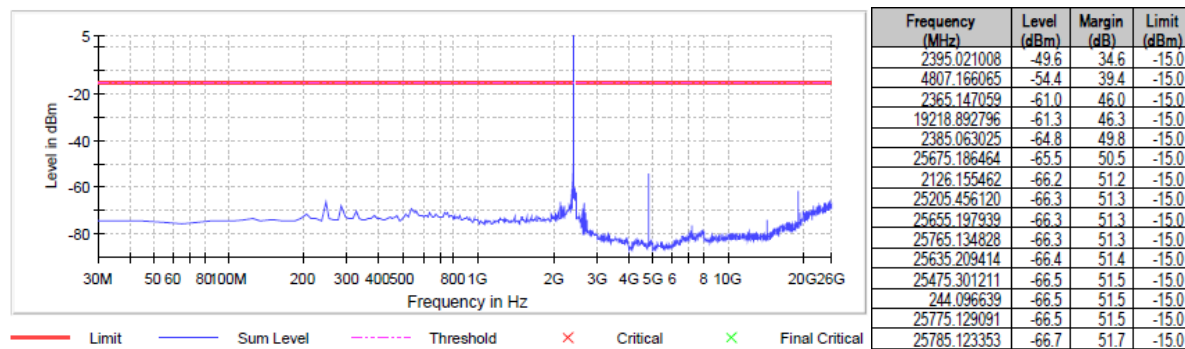


Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
4957.080004	-53.0	40.9	-12.1
2488.497131	-53.7	41.7	-12.1
25605.226626	-54.9	42.9	-12.1
24365.938058	-55.0	42.9	-12.1
26000.000000	-55.7	43.7	-12.1
25995.002869	-55.8	43.7	-12.1
25675.186464	-55.8	43.7	-12.1
25825.100404	-55.8	43.7	-12.1
25745.146303	-55.9	43.8	-12.1
24855.656927	-56.0	43.9	-12.1
25945.031555	-56.1	44.0	-12.1
25615.220888	-56.1	44.1	-12.1
25695.174989	-56.1	44.1	-12.1
25575.243838	-56.2	44.1	-12.1
25775.129091	-56.2	44.1	-12.1

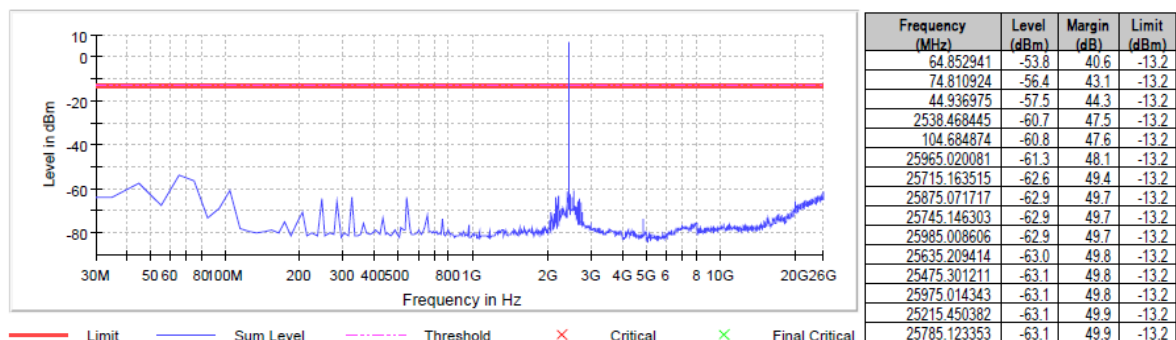
Radio Technology = Bluetooth EDR 2, Operating Frequency = low
(S01_374_BA01)



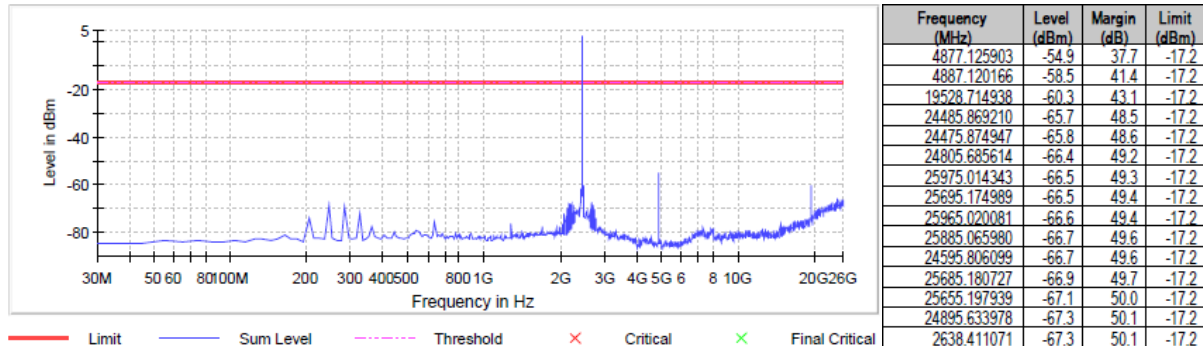
Radio Technology = Bluetooth EDR 2, Operating Frequency = low
(S01_377_AA01)



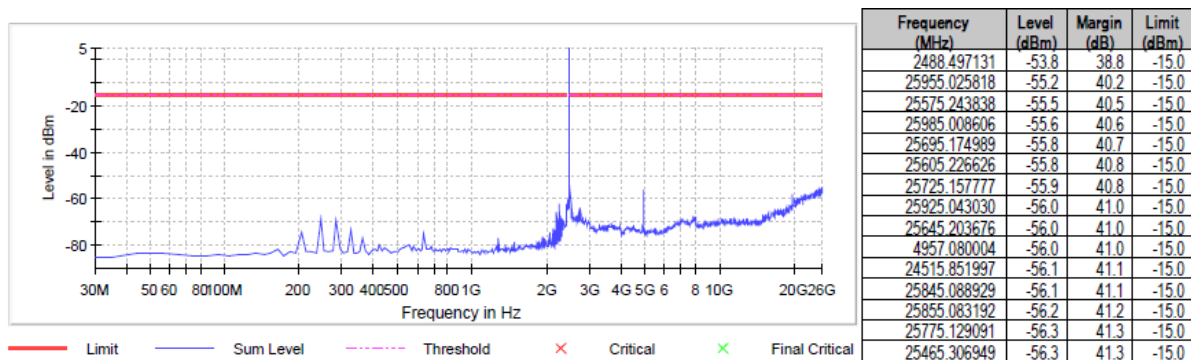
Radio Technology = Bluetooth EDR 2, Operating Frequency = mid
(S01_374_BA01)



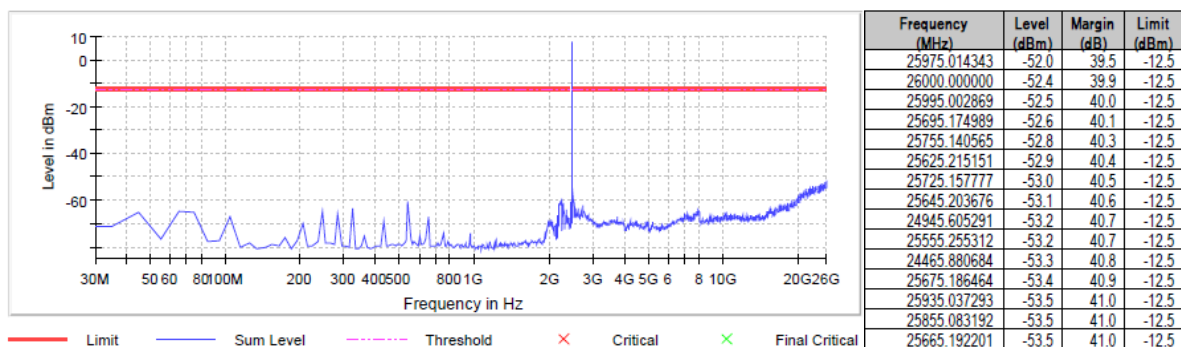
Radio Technology = Bluetooth EDR 2, Operating Frequency = mid
(S01_377_AA01)



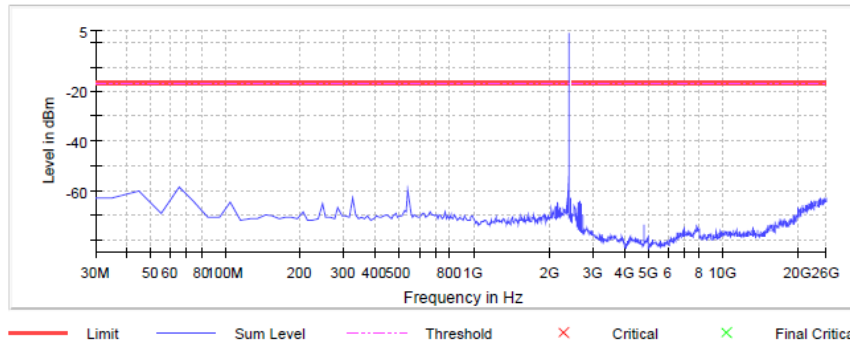
Radio Technology = Bluetooth EDR 2, Operating Frequency = high
(S01_377_AA01)



Radio Technology = Bluetooth EDR 2, Operating Frequency = high
(S01_374_BA01)

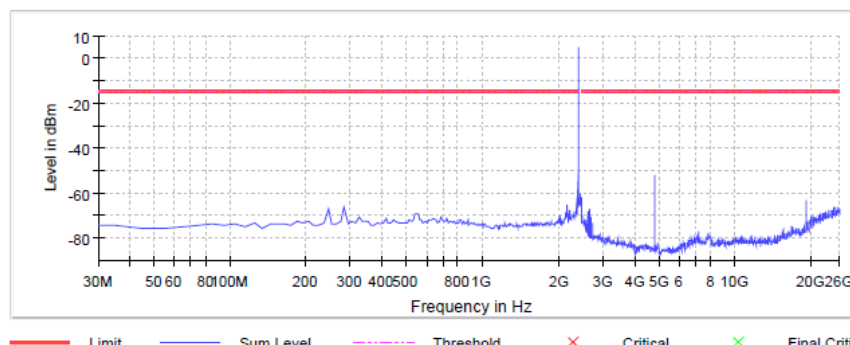


Radio Technology = Bluetooth EDR 3, Operating Frequency = low
(S01_374_BA01)



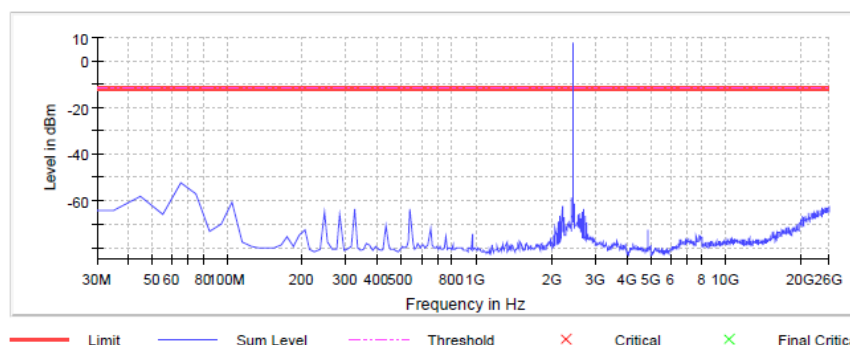
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-52.0	35.8	-16.2
64.852941	-58.5	42.3	-16.2
542.836134	-59.4	43.3	-16.2
44.936975	-60.5	44.3	-16.2
2365.147059	-62.6	46.4	-16.2
25915.048768	-62.8	46.7	-16.2
25985.008606	-62.8	46.7	-16.2
26000.000000	-62.9	46.8	-16.2
25975.014343	-62.9	46.8	-16.2
25995.002869	-63.0	46.8	-16.2
25785.123353	-63.0	46.8	-16.2
25735.152040	-63.0	46.9	-16.2
24485.869210	-63.1	46.9	-16.2
25565.249575	-63.1	46.9	-16.2
323.760504	-63.1	46.9	-16.2

Radio Technology = Bluetooth EDR 3, Operating Frequency = low
(S01_377_AA01)



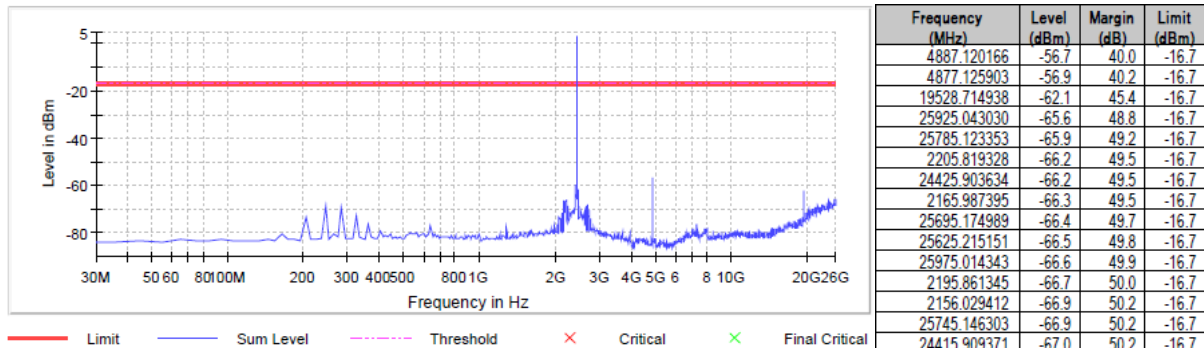
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-47.6	32.8	-14.8
4807.166065	-51.9	37.1	-14.8
2365.147059	-61.7	46.9	-14.8
19218.892796	-63.4	48.6	-14.8
2385.063025	-64.3	49.5	-14.8
2165.987395	-64.9	50.1	-14.8
24505.857735	-66.2	51.4	-14.8
283.928571	-66.2	51.4	-14.8
25715.163515	-66.4	51.6	-14.8
25005.570867	-66.5	51.7	-14.8
25565.249575	-66.5	51.8	-14.8
25665.192201	-66.7	51.9	-14.8
25905.054505	-66.7	51.9	-14.8
25835.094666	-66.7	51.9	-14.8
25555.255312	-66.8	52.0	-14.8

Radio Technology = Bluetooth EDR 3, Operating Frequency = mid
(S01_374_BA01)

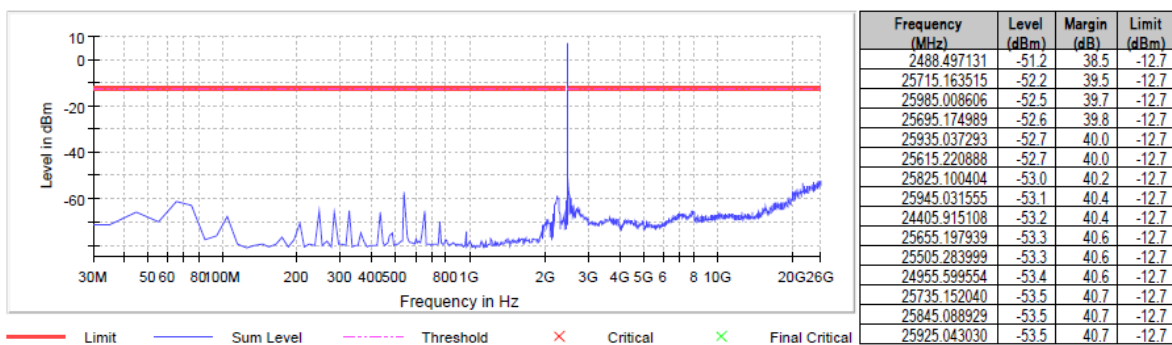


Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
64.852941	-52.6	40.5	-12.1
74.810924	-56.9	44.8	-12.1
44.936975	-58.4	46.3	-12.1
104.684874	-60.7	48.6	-12.1
2205.819328	-62.4	50.3	-12.1
25955.025818	-62.7	50.6	-12.1
25645.203676	-63.0	50.9	-12.1
25975.014343	-63.0	51.0	-12.1
25665.192201	-63.1	51.0	-12.1
25985.008606	-63.1	51.0	-12.1
25925.043030	-63.1	51.0	-12.1
25705.169252	-63.1	51.0	-12.1
24795.691351	-63.2	51.1	-12.1
25415.335635	-63.2	51.1	-12.1
25725.157777	-63.3	51.2	-12.1

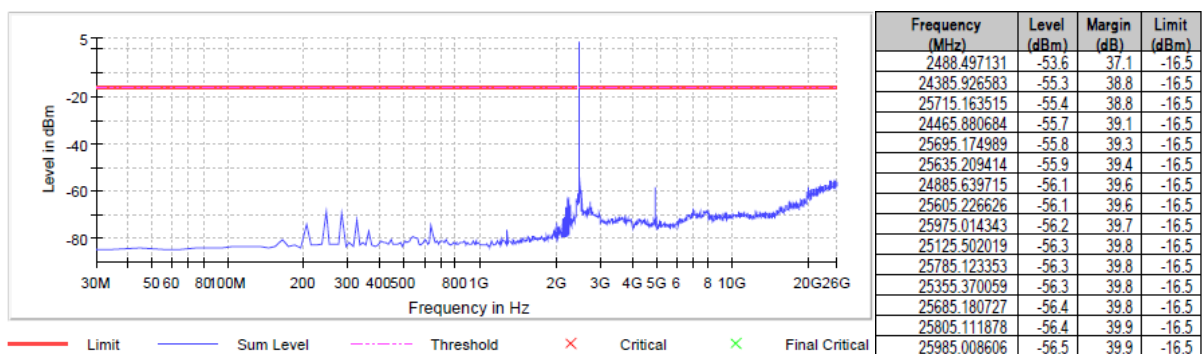
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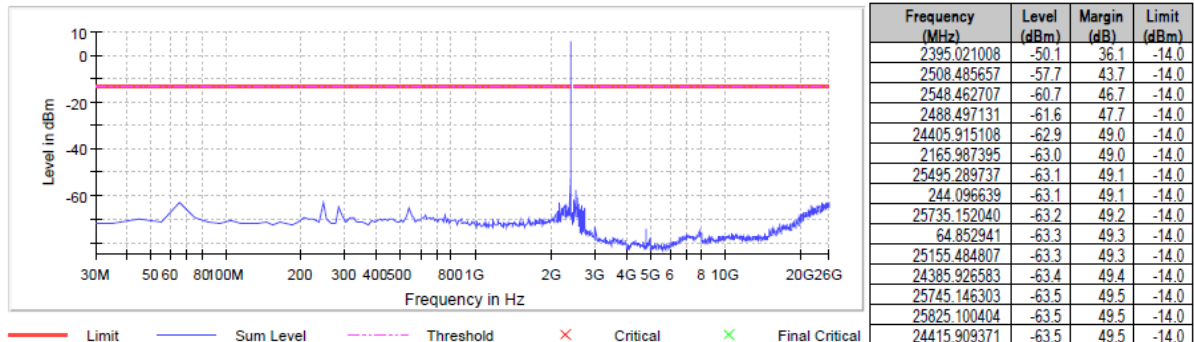
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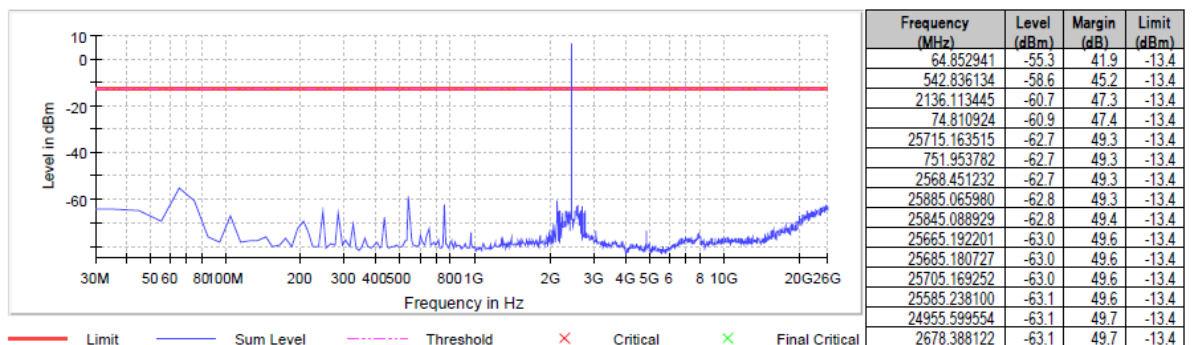
Radio Technology = Bluetooth EDR 3, Operating Frequency = high
(S01_377_AA01)



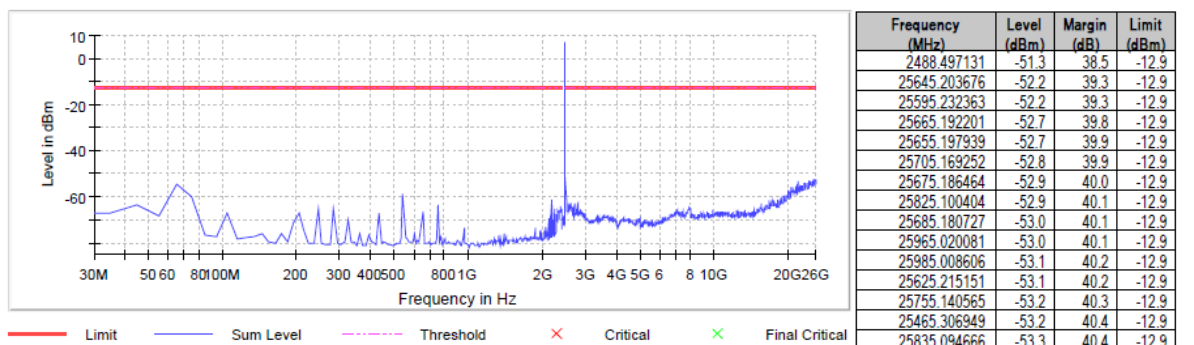
Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low
(S01_374_BA01)



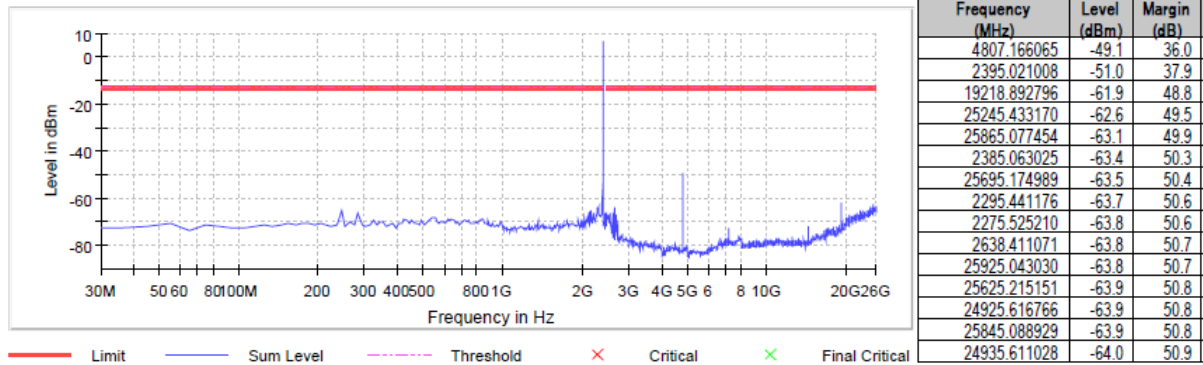
Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = mid
(S01_374_BA01)



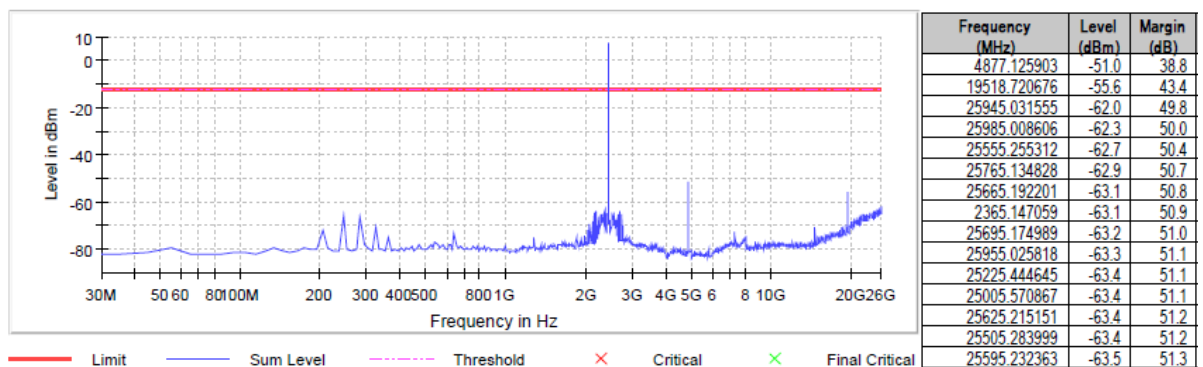
Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = high
(S01_374_BA01)



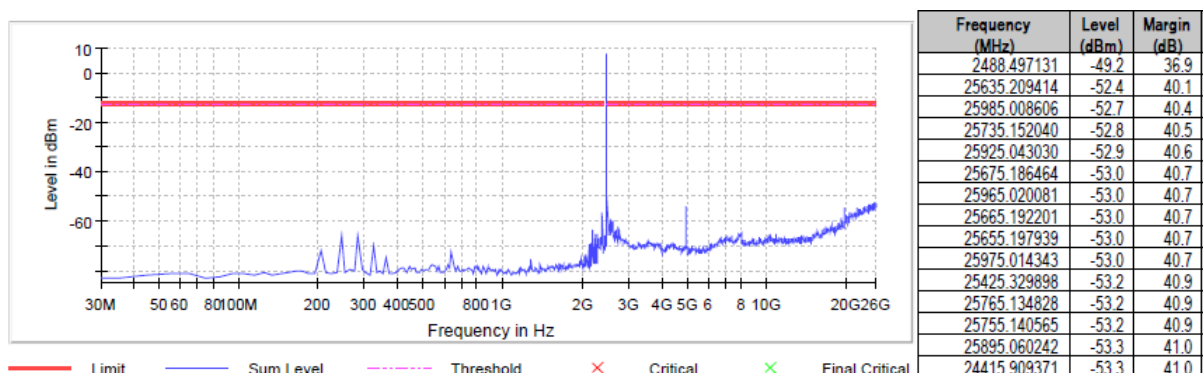
Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low
(S01_377_AA01)



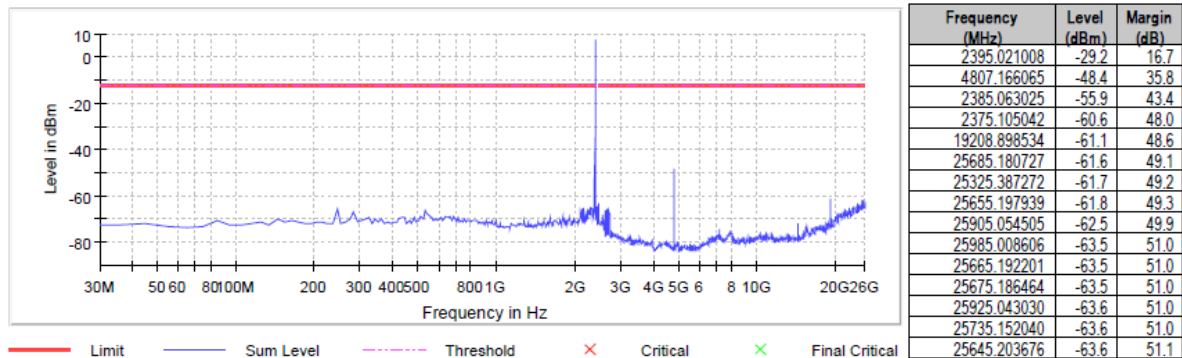
Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = mid
(S01_377_AA01)



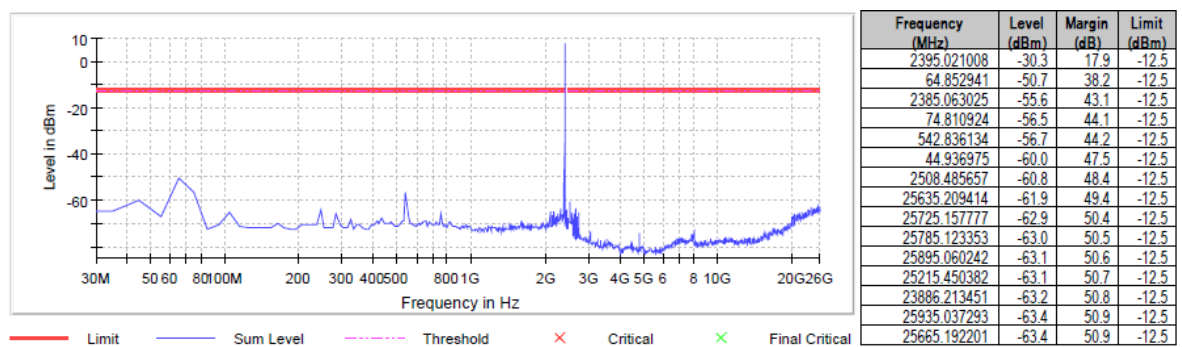
Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = high
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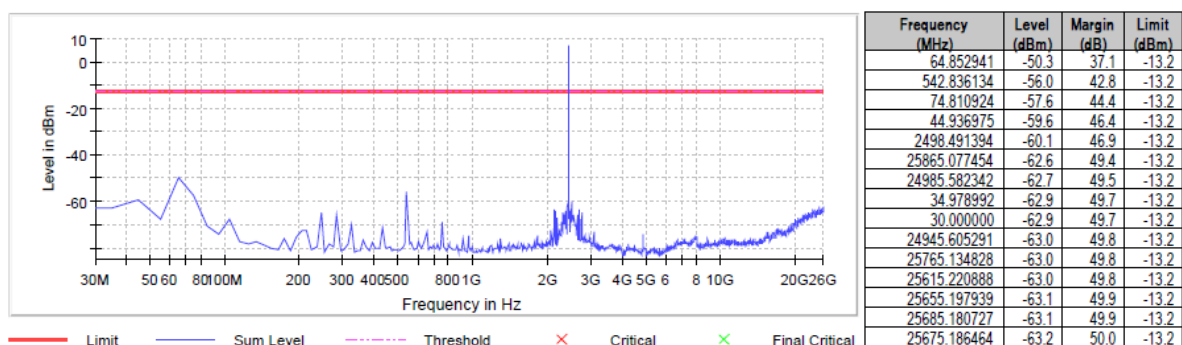
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low
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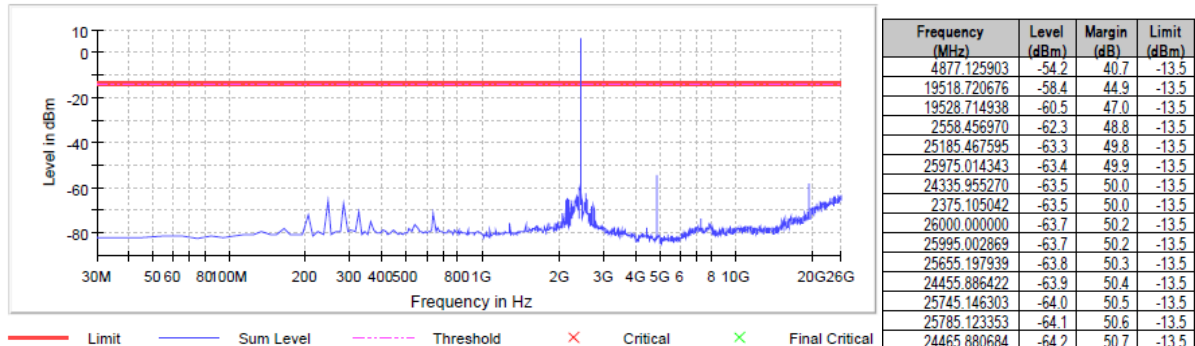
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low
(S01_374_BA01)



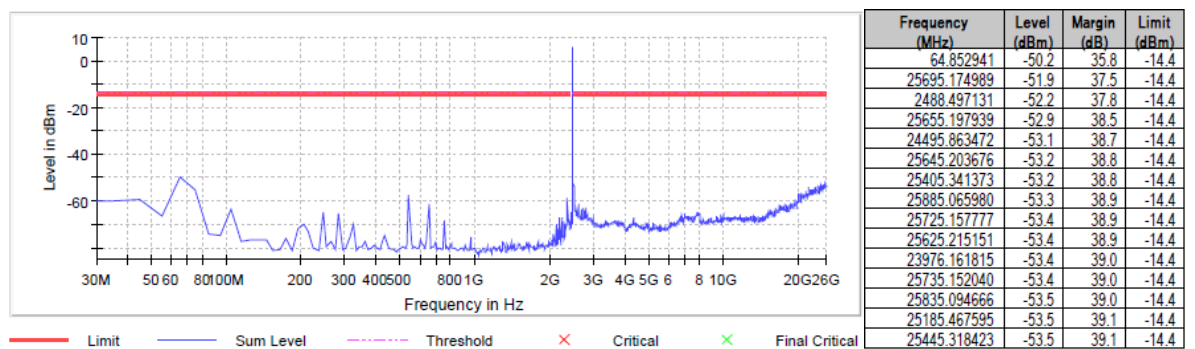
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = mid
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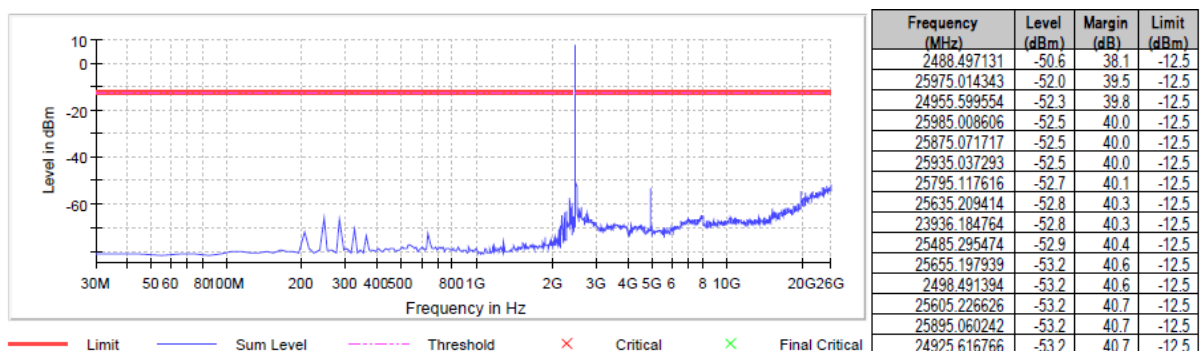
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = mid
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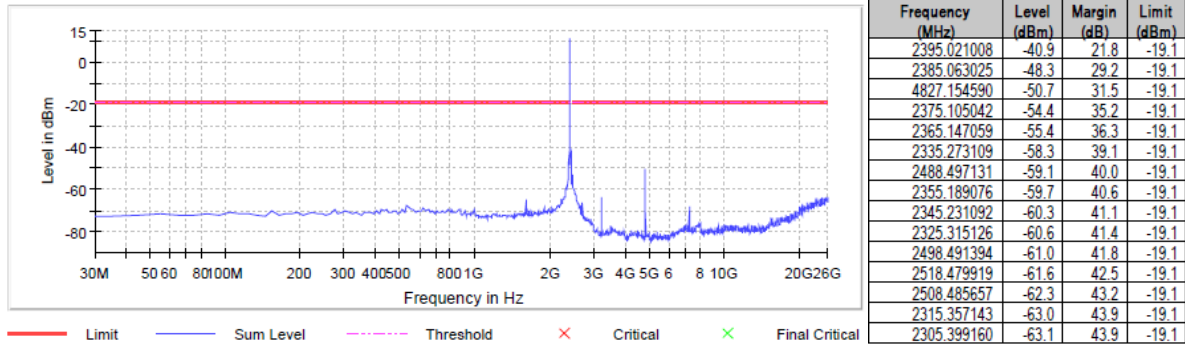
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(S01_374_BA01)



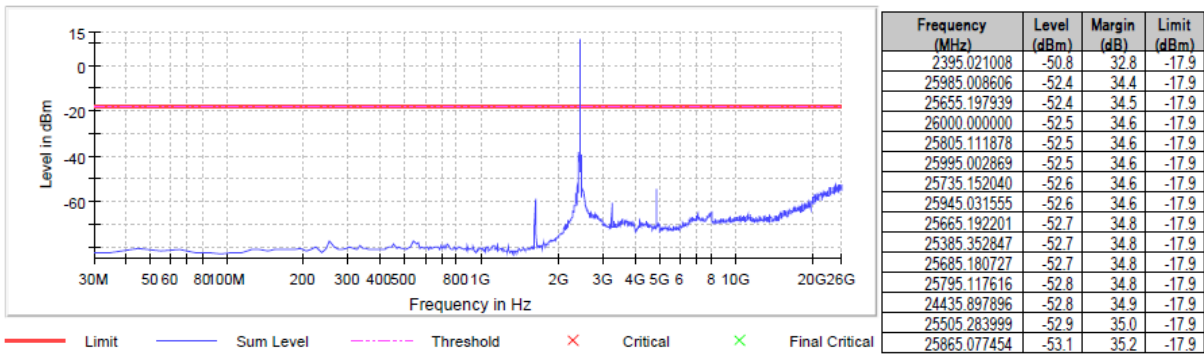
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = high
(S01_377_AA01)



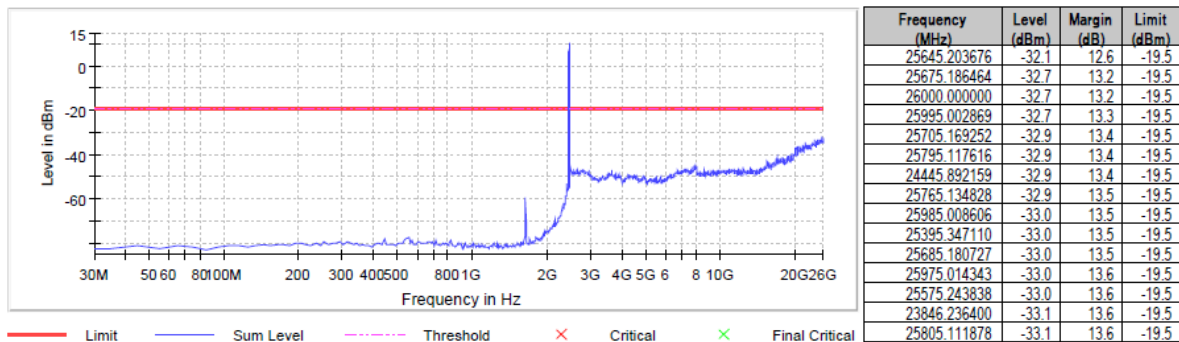
Radio Technology = WLAN b, Operating Frequency = low
(S01_377_AE01)



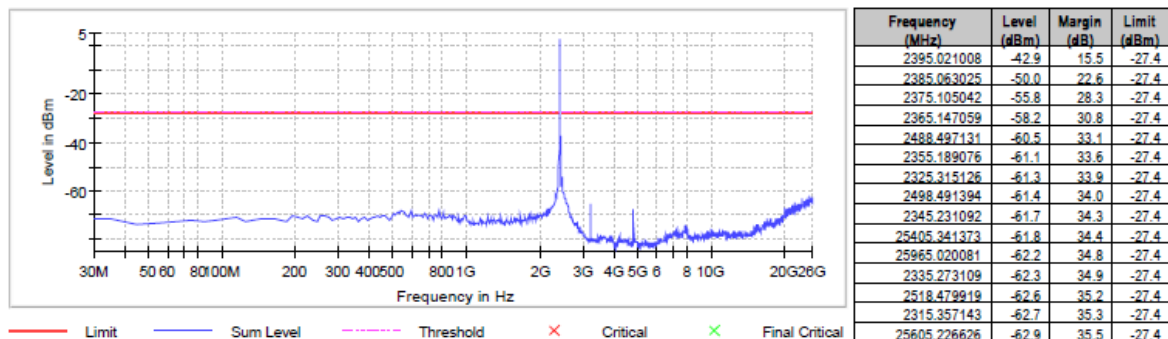
Radio Technology = WLAN b, Operating Frequency = mid
(S01_377_AE01)



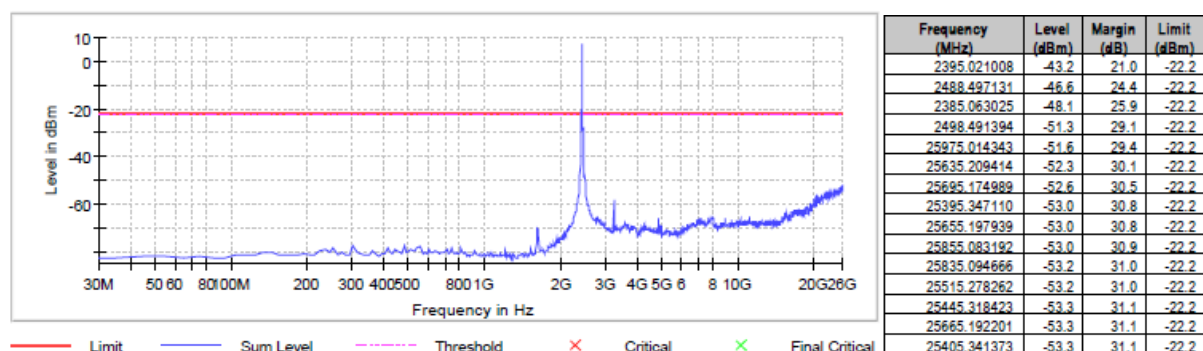
Radio Technology = WLAN b, Operating Frequency = high
(S01_377_AE01)



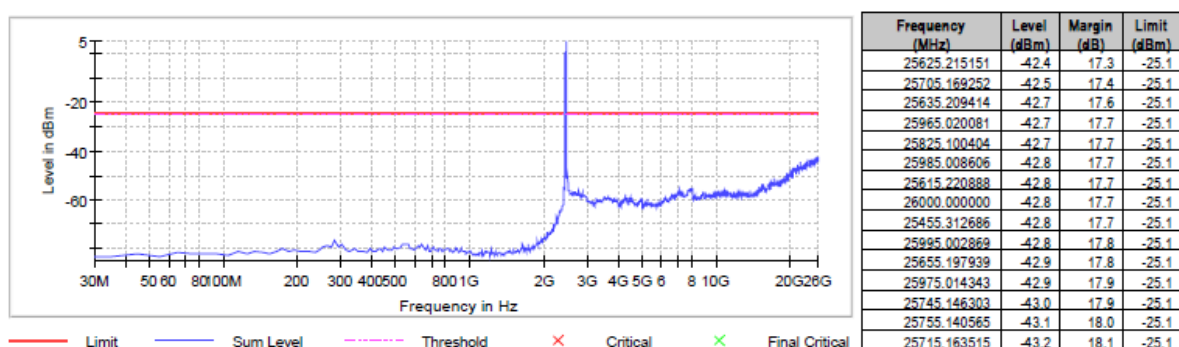
Radio Technology = WLAN g, Operating Frequency = low
(S01_377_AE01)



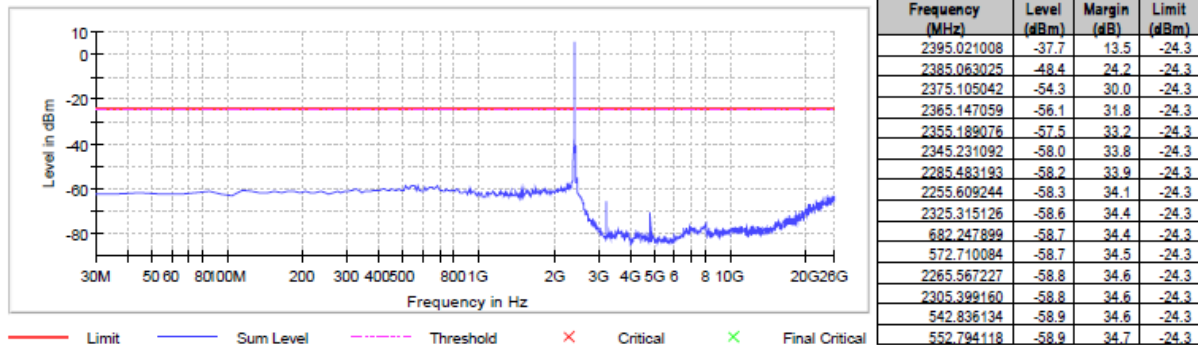
Radio Technology = WLAN g, Operating Frequency = mid
(S01_377_AE01)



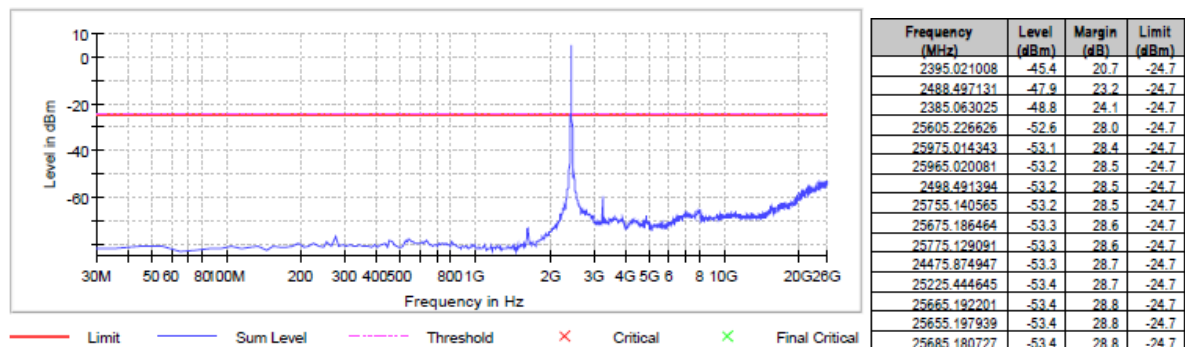
Radio Technology = WLAN g, Operating Frequency = high
(S01_377_AE01)



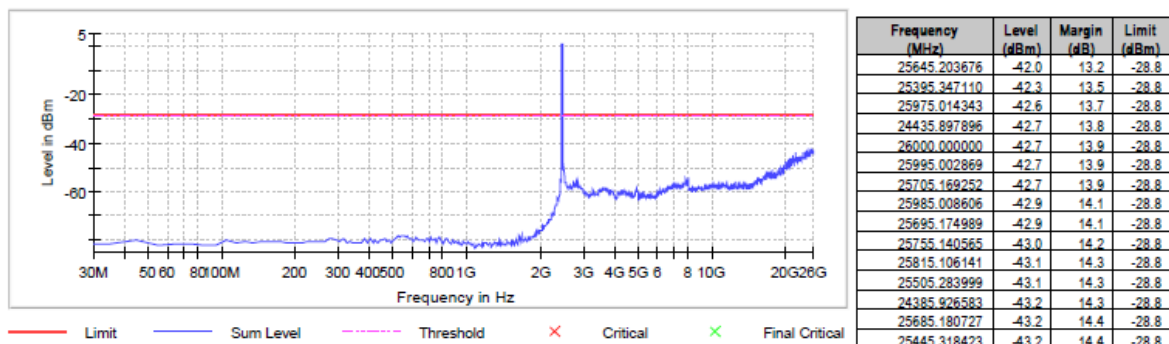
Radio Technology = WLAN n 20 MHz, Operating Frequency = low
(S01_377_AE01)



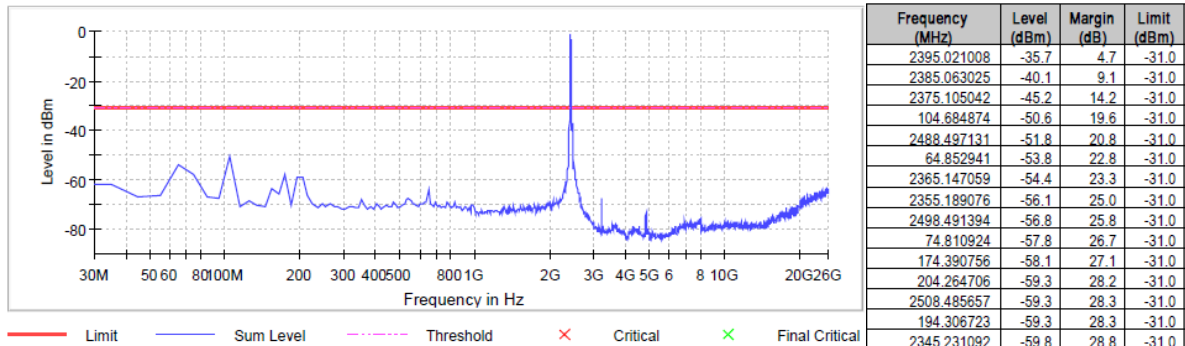
Radio Technology = WLAN n 20 MHz, Operating Frequency = mid
(S01_377_AE01)



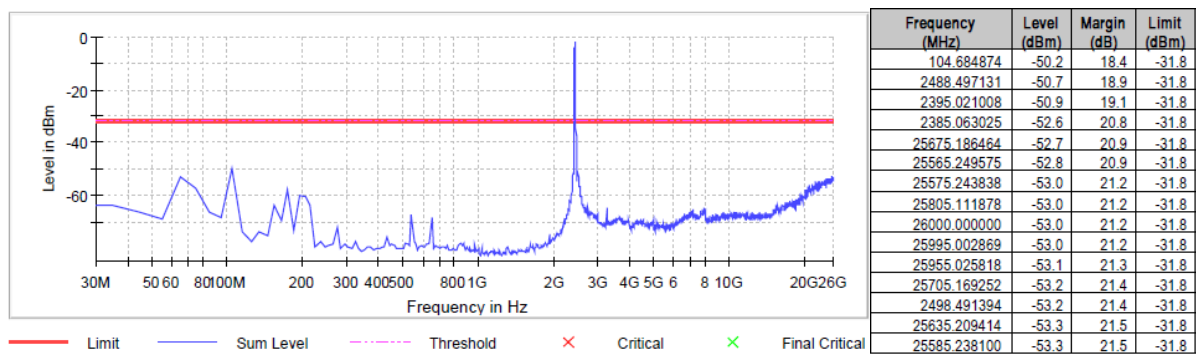
Radio Technology = WLAN n 20 MHz, Operating Frequency = high
(S01_377_AE01)



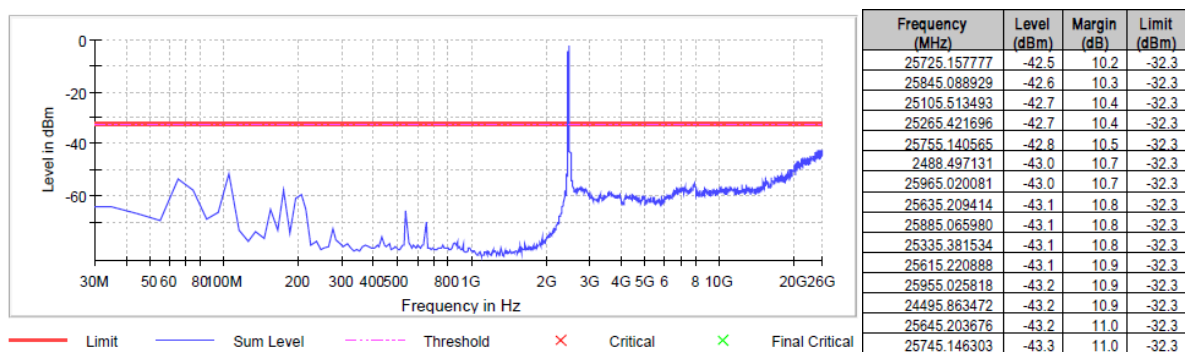
Radio Technology = WLAN n 40 MHz, Operating Frequency = low
(S01_377_AA01)



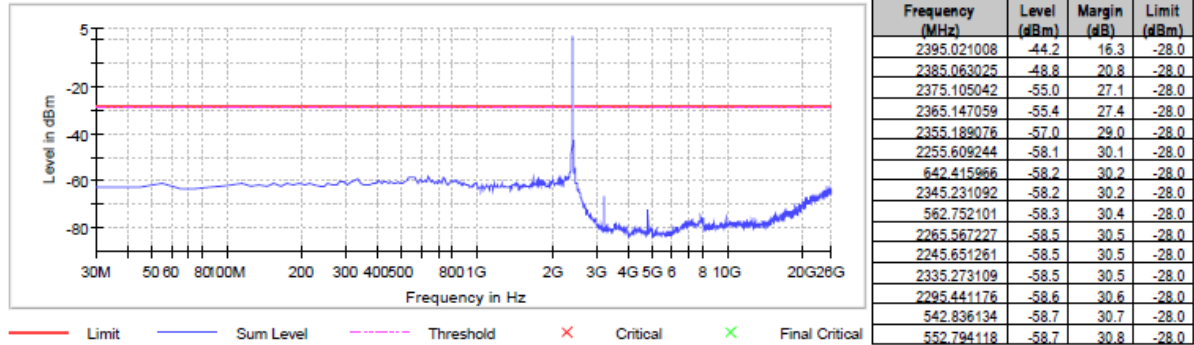
Radio Technology = WLAN n 40 MHz, Operating Frequency = mid
(S01_377_AA01)



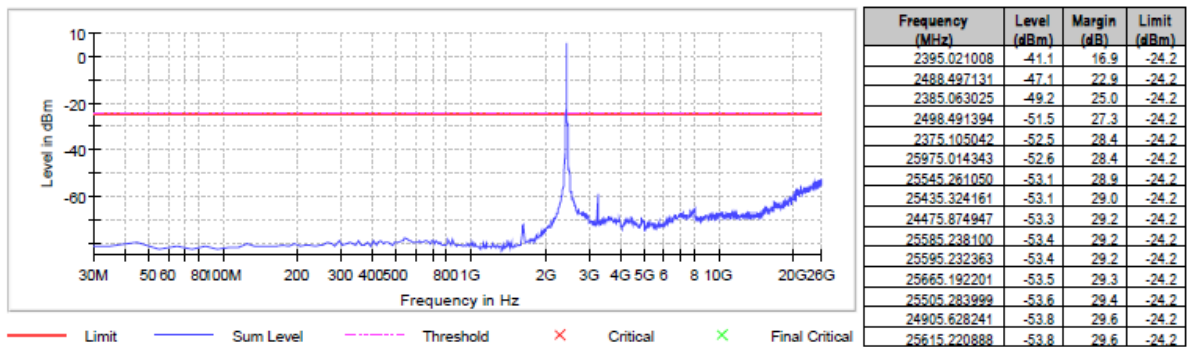
Radio Technology = WLAN n 40 MHz, Operating Frequency = high
(S01_377_AA01)



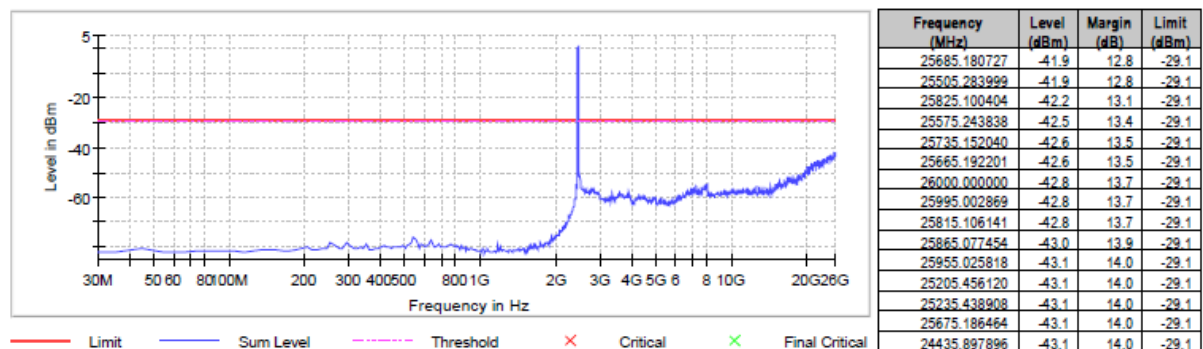
Radio Technology = WLAN ax 20 MHz, Operating Frequency = low
(S01_377_AE01)



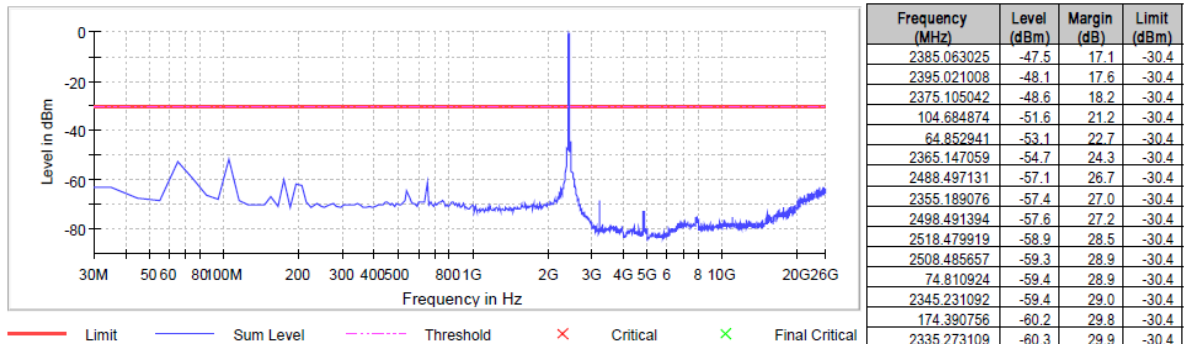
Radio Technology = WLAN ax 20 MHz, Operating Frequency = mid
(S01_377_AE01)



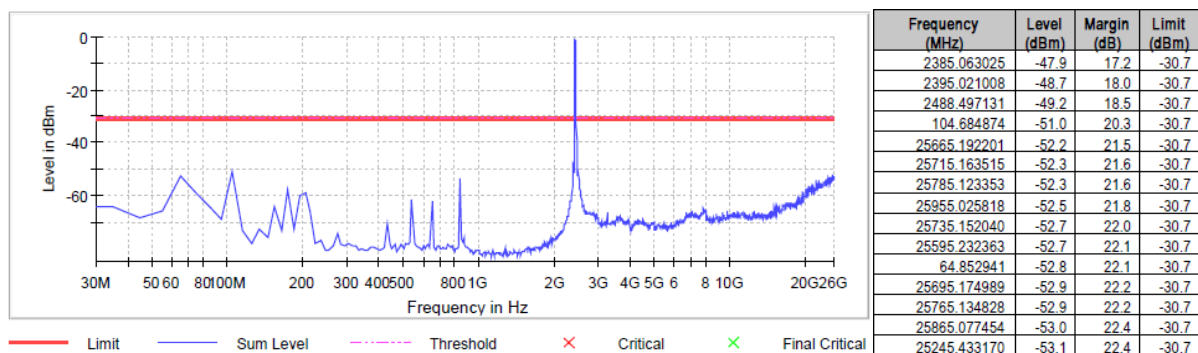
Radio Technology = WLAN ax 20 MHz, Operating Frequency = high
(S01_377_AE01)



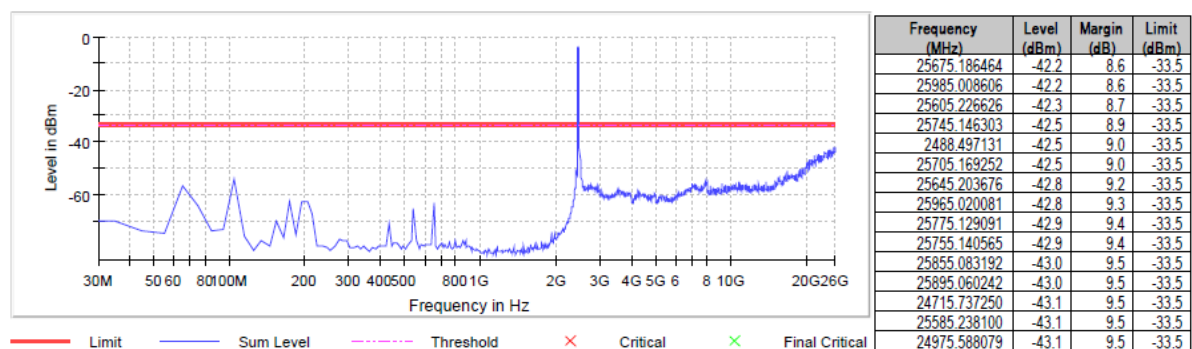
Radio Technology = WLAN ax 40 MHz, Operating Frequency = low
(S01_377_AA01)



Radio Technology = WLAN ax 40 MHz, Operating Frequency = mid
(S01_377_AA01)



Radio Technology = WLAN ax 40 MHz, Operating Frequency = high
(S01_377_AA01)



5.5.5 TEST EQUIPMENT USED

- R&S TS8997

5.6 TRANSMITTER SPURIOUS RADIATED EMISSIONS

Standard **FCC Part 15 Subpart C**

The test was performed according to:
 ANSI C63.10

5.6.1 TEST DESCRIPTION

Radiated Measurement with 50 Ohm termination at antenna ports

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

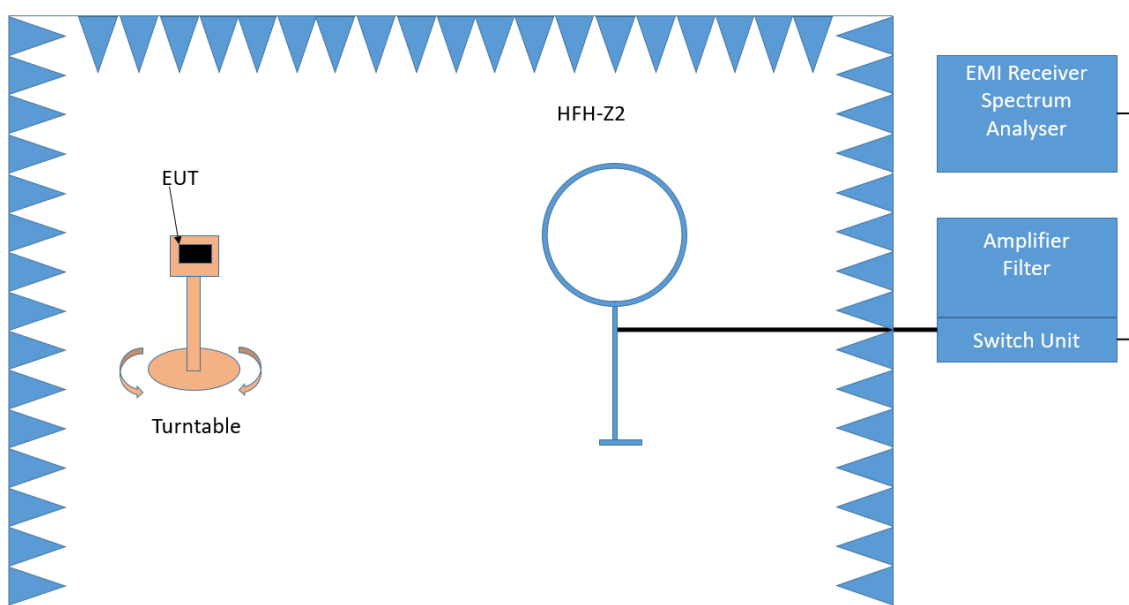
- < 30 MHz: Chapter 6.4
- 30 MHz – 1 GHz: Chapter 6.5
- > 1 GHz: Chapter 6.6 (procedure according 6.6.5 used)

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

Below 1 GHz:

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

1. Measurement up to 30 MHz



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

The Loop antenna HFH2-Z2 is used.

Step 1: pre measurement

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

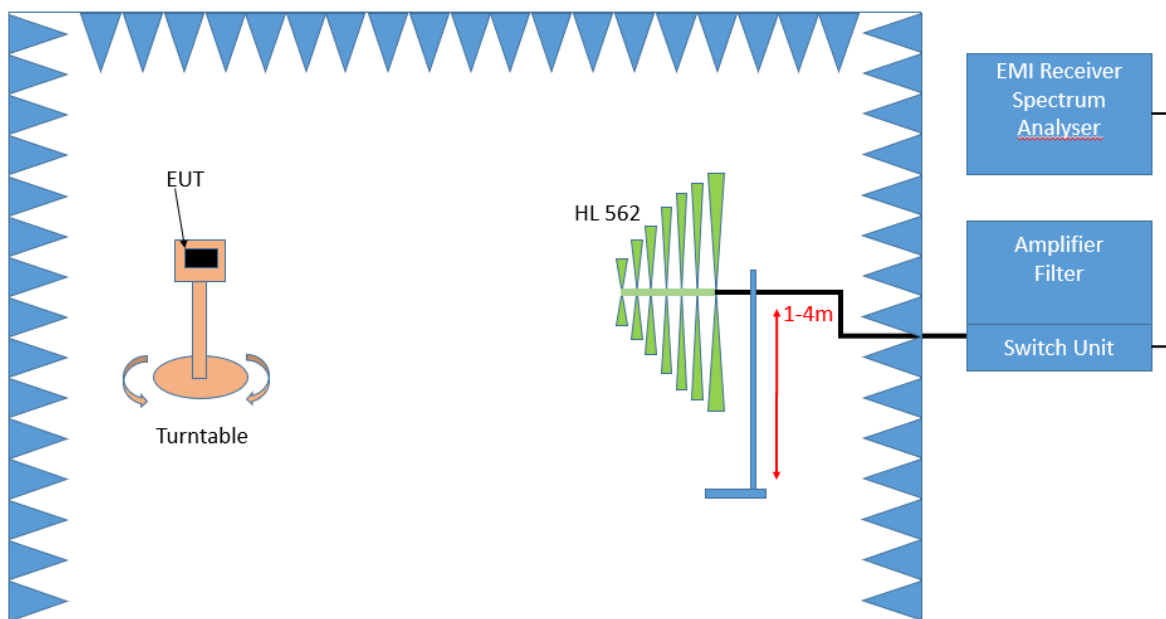
Intention of this step is, to determine the radiated EMI-profile of the EUT. Afterwards the relevant emissions for the final measurement are identified.

Step 2: final measurement

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

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

2. Measurement above 30 MHz and up to 1 GHz



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

Step 1: Preliminary scan

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

Settings for step 1:

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

- Turntable angle range: -180° to 90°
- Turntable step size: 90°
- Height variation range: 1 – 4 m
- Height variation step size: 1.5 m
- Polarisation: Horizontal + Vertical

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

Step 2: Adjustment measurement

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

For each frequency, which was determined the turntable azimuth and antenna height will be adjusted. The turntable azimuth will slowly vary by $\pm 45^{\circ}$ 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: 360°
- Height variation range: 1 – 4 m
- Antenna Polarisation: max. value determined in step 1

Step 3: Final measurement with QP detector

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

EMI receiver settings for step 3:

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

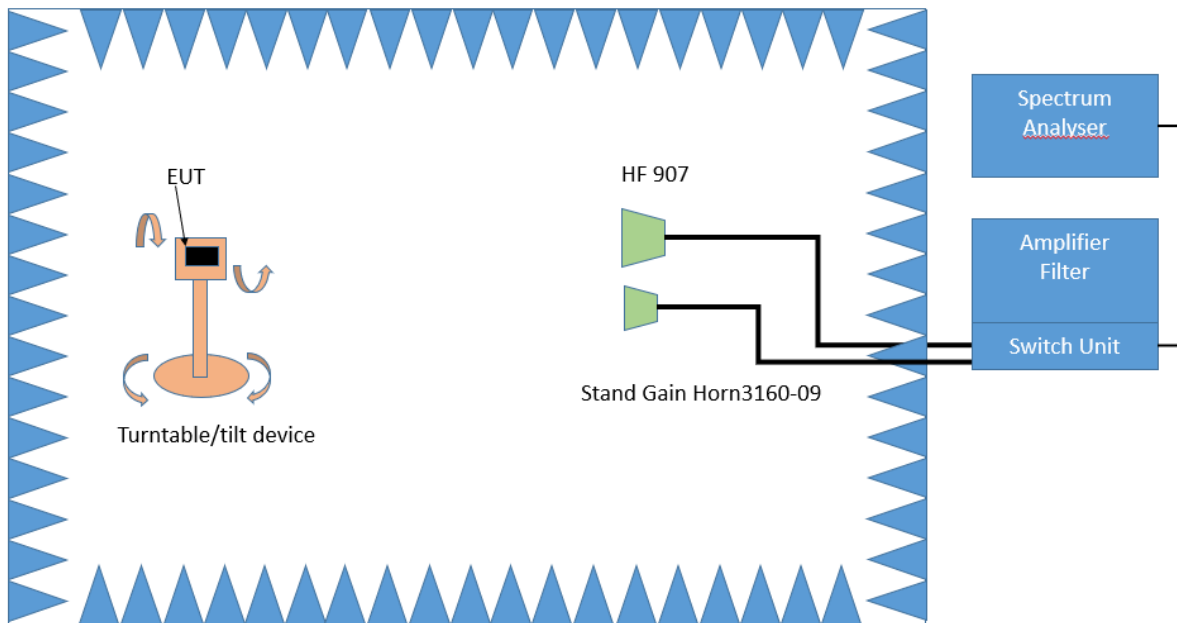
After the measurement a plot will be generated which contains a diagram with the results of the preliminary scan and a chart with the frequencies and values of the results of the final measurement.

Above 1 GHz:

The Equipment Under Test (EUT) was set up on a non-conductive support (tilt device) at 1.5 m height in the fully-anechoic chamber.

All steps were performed with one height (1.5 m) of the receiving antenna only.

3. Measurement above 1 GHz



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

Step 1:

The EUT is turned during the preliminary measurement across the elevation axis, with a step size of 90 °.

The turn table step size (azimuth angle) for the preliminary measurement is 45 °.

Spectrum analyser settings:

- Detector: Peak, Average
- RBW = 1 MHz
- VBW = 3 MHz

Step 2:

The turn table azimuth will slowly vary by $\pm 22.5^\circ$.

The elevation angle will slowly vary by $\pm 45^\circ$

Spectrum analyser settings:

- Detector: Peak

Step 3:

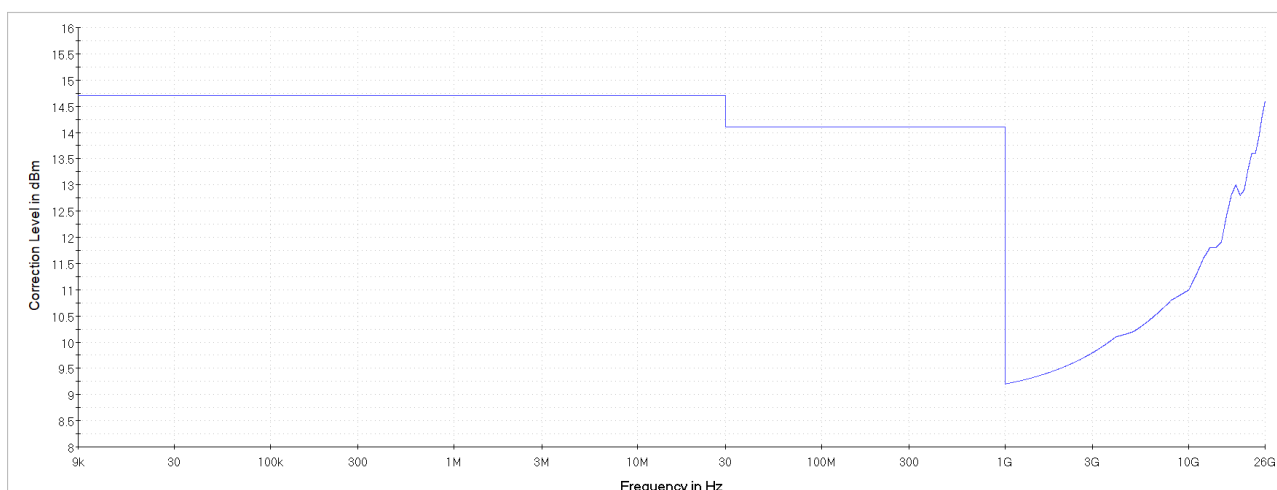
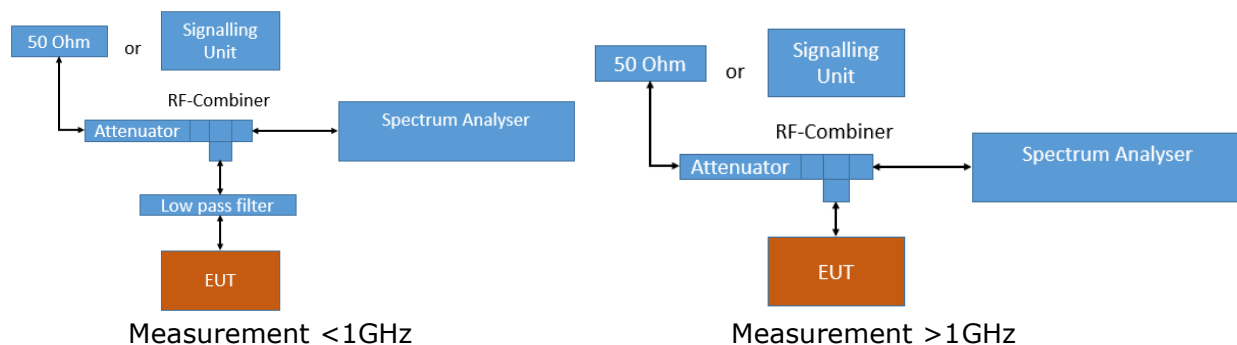
Spectrum analyser settings for step 3:

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

Conducted Measurements at antenna ports

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

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



Analyser settings:

- Frequency range: 0.009 – 30 MHz
 - Resolution Bandwidth (RBW): 10 kHz
 - Video Bandwidth (VBW): 30 kHz
 - Trace: Maxhold
 - Sweeps: till stable
 - Sweep Time: coupled
 - Detector: Peak
-
- Frequency range: 30 – 1000 MHz
 - Resolution Bandwidth (RBW): 100 kHz
 - Video Bandwidth (VBW): 300 kHz
 - Trace: Maxhold
 - Sweeps: till stable
 - Sweep Time: coupled
 - Detector: Peak

- Frequency range: 1000 – 26000 MHz
- Resolution Bandwidth (RBW): 1000 kHz
- Video Bandwidth (VBW): 3000 kHz
- Trace: Maxhold, Average Power
- Sweeps: 500
- Sweep Time: coupled
- Detector: Peak, RMS

For the conducted emissions in restricted bands the Value is measured in dBm and then converted to dBμV/m as given in KDB 558074:

1. Measure the conducted output power in dBm.
2. Add the maximum antenna gain in dBi. (Included in measurement result by offset)
3. Add the appropriate ground reflection factor (included in measurement result by transducer factor)
 - 6 dB for frequencies ≤ 30 MHz;
 - 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive; and
 - 0 dB for frequencies > 1000 MHz).
4. Convert the resultant EIRP level to an equivalent electric field strength level using the following relationship:
 - $E = \text{EIRP} - 20 \log D + 104.8$
 - Where E is the electric field strength in dBμV/m,
 - EIRP is the equivalent isotropically radiated power in dBm
 - D is the specified measurement distance in m

Value [dBμV/m] = Measured value [dBm] (including gain and ground reflection factor) – 20 log D + 104.8

5.6.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.247 (d)

... In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

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

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

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

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

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

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

Used conversion factor: $\text{Limit (dB}\mu\text{V/m)} = 20 \log (\text{Limit } (\mu\text{V/m})/1\mu\text{V/m})$

5.6.3 TEST PROTOCOL

Ambient temperature: 24 -30 °C
 Air Pressure: 990 - 1020 hPa
 Humidity: 30 -40 %
 BT GFSK (1-DH1)
 Applied duty cycle correction (AV): 10.3 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
374 / Radiated	2402	-	-	-	-	-	-	RB
374 / Radiated	2441	-	-	-	-	-	-	RB
374 / Radiated	2480	-	-	-	-	-	-	RB
377 / Radiated	2402	12009.6	53.5	PEAK	1000	74.0	20.5	RB
377 / Radiated	2402	12009.6	46.6	AV	1000	54.0	7.4	RB
374 / Conducted	2402	-	-	-	-	-	-	RB
374 / Conducted	2441	-	-	-	-	-	-	RB
377 / Radiated	2441	7322.8	52.2	PEAK	1000	74.0	21.8	RB
377 / Radiated	2441	7322.9	46.7	AV	1000	54.0	7.3	RB
377 / Radiated	2441	12204.3	54.9	PEAK	1000	74.0	19.1	RB
377 / Radiated	2441	12205.1	47.9	AV	1000	54.0	6.1	RB
374 / Conducted	2480	-	-	-	-	-	-	RB
377 / Radiated	2480	7439.9	50.2	PEAK	1000	74.0	23.8	RB
377 / Radiated	2480	7439.9	43.7	AV	1000	54.0	10.3	RB
377 / Radiated	2480	12399.7	50.1	PEAK	1000	74.0	23.9	RB
377 / Radiated	2480	12399.7	44.5	AV	1000	54.0	9.5	RB
377 / Conducted	2402	4803.8	52.4	PEAK	1000	74.0	21.6	RB
377 / Conducted	2402	4804.1	51.4	AV	1000	54.0	2.6	RB
377 / Conducted	2441	4881.8	49.8	PEAK	1000	74.0	24.2	RB
377 / Conducted	2441	4882.1	48.8	AV	1000	54.0	5.2	RB
377 / Conducted	2480	2320.0	51.8	PEAK	1000	74.0	22.2	RB
377 / Conducted	2480	2320.1	38.1	AV	1000	54.0	15.9	RB
377 / Conducted	2480	4960.3	48.3	PEAK	1000	74.0	25.7	RB
377 / Conducted	2480	4960.1	46.1	AV	1000	54.0	7.9	RB

BT n/4 DQPSK (2-DH1)
 Applied duty cycle correction (AV): 2.3 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
374 / Conducted	2402	-	-	-	-	-	-	RB
374 / Conducted	2441	-	-	-	-	-	-	RB
374 / Conducted	2480	-	-	-	-	-	-	RB
377 / Conducted	2402	4804.3	50.5	PEAK	1000	74.0	23.5	RB
377 / Conducted	2402	4804.1	47.6	AV	1000	54.0	6.4	RB
377 / Conducted	2441	4881.8	48.7	PEAK	1000	74.0	25.3	RB
377 / Conducted	2441	4882.1	44.7	AV	1000	54.0	9.3	RB
377 / Conducted	2480	2220.5	55.7	PEAK	1000	74.0	18.3	RB
377 / Conducted	2480	2220.6	34.9	AV	1000	54.0	19.1	RB
377 / Conducted	2480	4959.8	45.9	PEAK	1000	74.0	28.1	RB
377 / Conducted	2480	4960.1	41.8	AV	1000	54.0	12.2	RB

BT 8-DPSK (3-DH1)

Applied duty cycle correction (AV): 2.3 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
374 / Conducted	2402	-	-	-	-	-	-	RB
374 / Conducted	2441	-	-	-	-	-	-	RB
374 / Conducted	2480	-	-	-	-	-	-	RB
377 / Conducted	2402	4803.8	50.9	PEAK	1000	74.0	23.1	RB
377 / Conducted	2402	4804.1	47.6	AV	1000	54.0	6.4	RB
377 / Conducted	2441	4882.1	48.2	PEAK	1000	74.0	25.8	RB
377 / Conducted	2441	4881.8	44.3	AV	1000	54.0	9.7	RB
377 / Conducted	2480	2222.0	55.9	PEAK	1000	74.0	18.1	RB
377 / Conducted	2480	2222.1	35.3	AV	1000	54.0	18.7	RB
377 / Conducted	2480	4960.3	46.4	PEAK	1000	74.0	27.6	RB
377 / Conducted	2480	4960.1	42.1	AV	1000	54.0	11.9	RB

BT LE 1 Mbit/s

Applied duty cycle correction (AV): 4.2 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
374 / Conducted	2402	-	-	-	-	-	-	RB
374 / Conducted	2440	-	-	-	-	-	-	RB
374 / Conducted	2480	-	-	-	-	-	-	RB
377 / Conducted	2402	4804.5	49.7	PEAK	1000	74.0	24.3	RB
377 / Conducted	2402	4804.0	48.1	AV	1000	54.0	5.9	RB
377 / Conducted	2440	4880.5	47.8	PEAK	1000	74.0	26.2	RB
377 / Conducted	2440	4880.0	45.7	AV	1000	54.0	8.3	RB
377 / Conducted	2480	4960.5	46.1	PEAK	1000	74.0	27.9	RB
377 / Conducted	2480	4960.0	42.7	AV	1000	54.0	11.3	RB

BT LE 2 Mbit/s

Applied duty cycle correction (AV): 9.7 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
374 / Conducted	2402	-	-	-	-	-	-	RB
374 / Conducted	2440	-	-	-	-	-	-	RB
374 / Conducted	2480	-	-	-	-	-	-	RB
377 / Conducted	2402	4803.0	49.4	PEAK	1000	74.0	24.6	RB
377 / Conducted	2402	4803.3	49.3	AV	1000	54.0	4.7	RB
377 / Conducted	2440	4879.0	46.5	PEAK	1000	74.0	27.5	RB
377 / Conducted	2440	4879.3	46.8	AV	1000	54.0	7.2	RB
377 / Conducted	2480	4958.8	45.1	PEAK	1000	74.0	28.9	RB
377 / Conducted	2480	4959.0	44.4	AV	1000	54.0	9.6	RB

WLAN b-Mode; 20 MHz; 1 Mbit/s
Applied duty cycle correction (AV): 0 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
374 / Radiated	2462	19696.1	56.6	PEAK	1000	74.0	17.4	RB
374 / Radiated	2462	19696.1	50.7	AV	1000	54.0	3.3	RB
374 / Conducted	2437	4873.8	57.0	PEAK	1000	74.0	17.0	RB
374 / Conducted	2437	4874.2	51.2	AV	1000	54.0	2.8	RB
374 / Conducted	2462	4920.0	51.6	PEAK	1000	74.0	22.4	RB
374 / Conducted	2462	4924.1	48.6	AV	1000	54.0	5.4	RB
377 / Radiated	2412	19296.1	55.7	PEAK	1000	74.0	18.3	RB
377 / Radiated	2412	19296.1	50.4	AV	1000	54.0	3.6	RB
377 / Radiated	2437	19496.0	56.2	PEAK	1000	74.0	17.8	RB
377 / Radiated	2437	19496.0	51.2	AV	1000	54.0	2.8	RB
377 / Radiated	2462	19695.9	56.3	PEAK	1000	74.0	17.7	RB
377 / Radiated	2462	19696.1	50.7	AV	1000	54.0	3.3	RB

WLAN g-Mode; 20 MHz; 6 Mbit/s
Applied duty cycle correction (AV): 0.1 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2412	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2462	-	-	-	-	-	-	RB

WLAN n-Mode; 20 MHz; MCS0
Applied duty cycle correction (AV): 0 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2412	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2462	-	-	-	-	-	-	RB

WLAN n-Mode; 40 MHz; MCS0
Applied duty cycle correction (AV): 0 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2422	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2452	-	-	-	-	-	-	RB

WLAN ax-Mode; 20 MHz; MCS0
Applied duty cycle correction (AV): 0.1 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2412	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2462	-	-	-	-	-	-	RB

WLAN ax-Mode; 40 MHz; MCS0
Applied duty cycle correction (AV): 0 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2422	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2452	-	-	-	-	-	-	RB

WLAN n-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2412	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2462	-	-	-	-	-	-	RB

WLAN n-Mode; 40 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.1 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2422	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2452	-	-	-	-	-	-	RB

WLAN ax-Mode; 20 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2412	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2462	-	-	-	-	-	-	RB

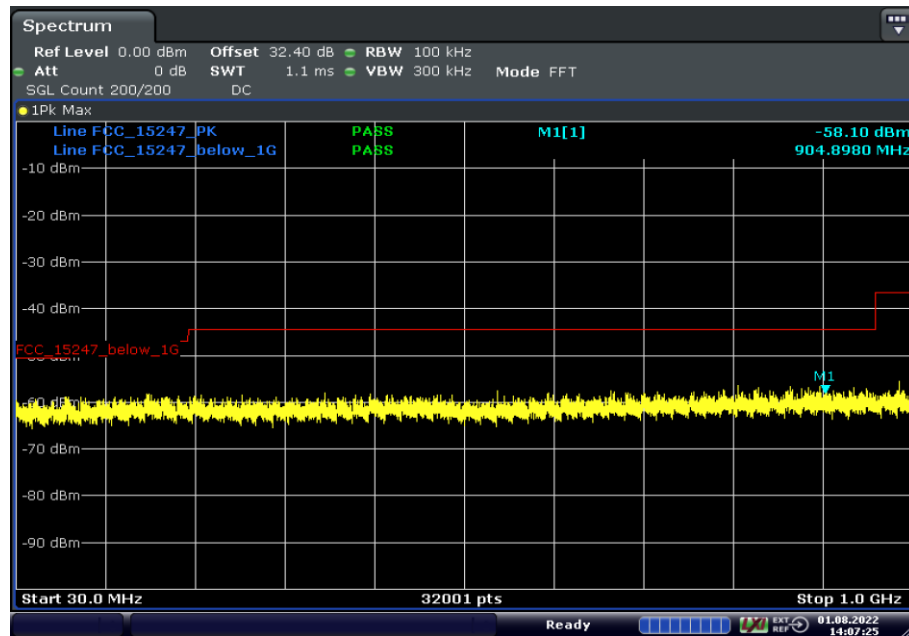
WLAN ax-Mode; 40 MHz; MCS0; MIMO
Applied duty cycle correction (AV): 0.1 dB

Variant / Test Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBμV/m]	Detector	RBW [kHz]	Limit [dBμV/m]	Margin to Limit [dB]	Limit Type
377 / Conducted	2422	-	-	-	-	-	-	RB
377 / Conducted	2437	-	-	-	-	-	-	RB
377 / Conducted	2452	-	-	-	-	-	-	RB

Remark: Please see next sub-clause for the measurement plot.
See plots for tested antennas of each range for WLAN SISO mode.

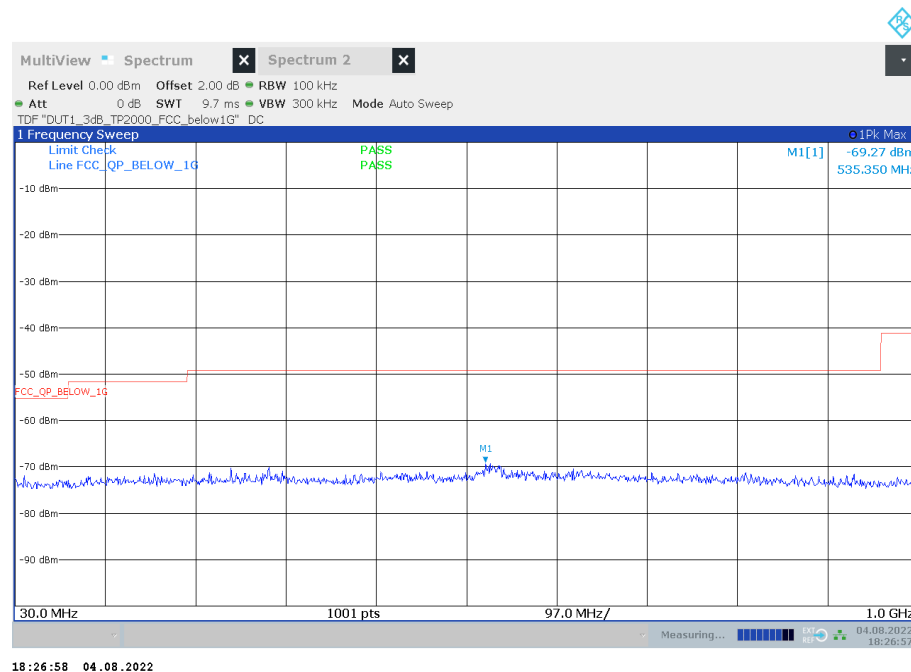
5.6.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 30 MHz - 1 GHz
 (S01_374_BA01)



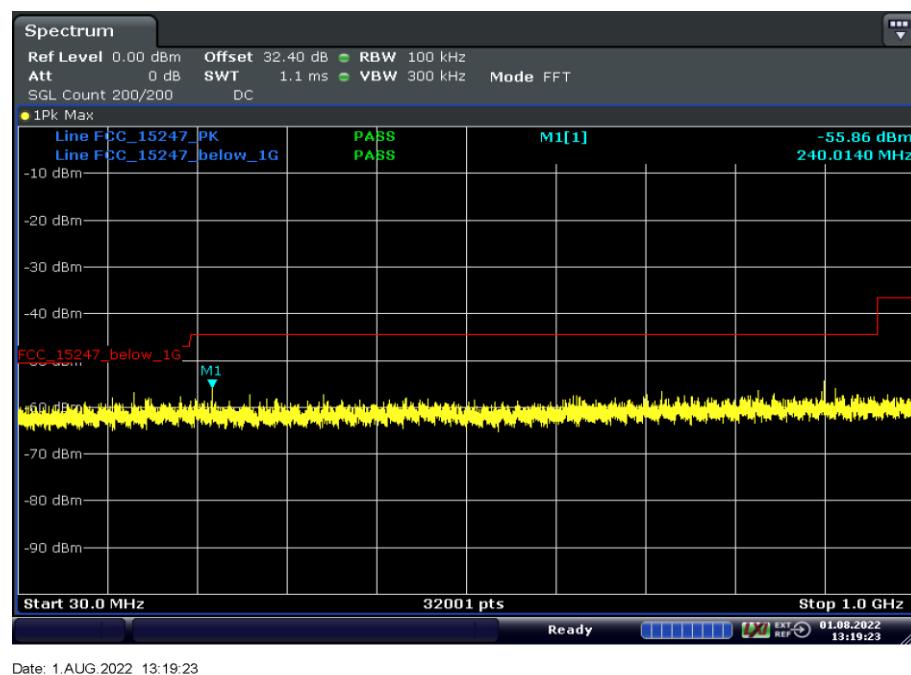
Date: 1.AUG.2022 14:07:25

Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 30 MHz - 1 GHz
(S01_377_AE01)

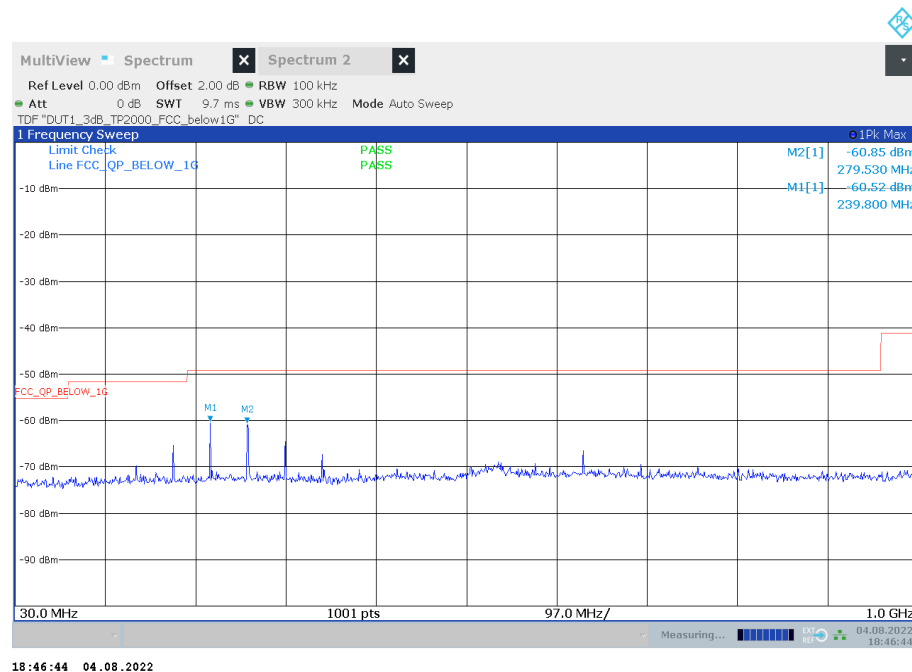


Antenna A

Radio Technology = Bluetooth BDR, Operating Frequency = low, Measurement range = 30 MHz - 1 GHz
(S01_374_BA01)



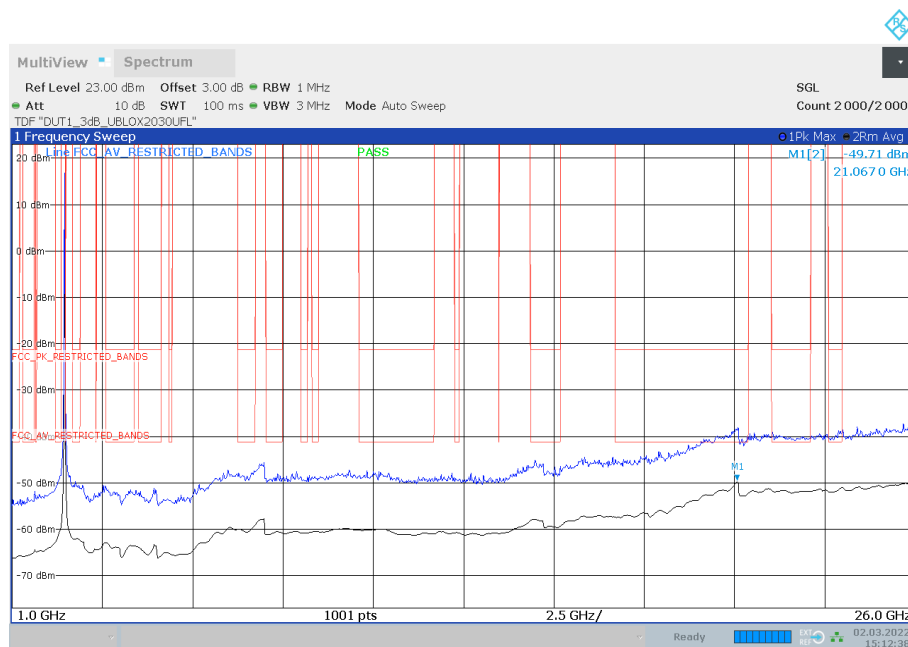
Radio Technology = Bluetooth BDR, Operating Frequency = low, Measurement range = 30 MHz
- 1 GHz
(S01_377_AE01)



Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = high, Measurement range =
30 MHz - 1 GHz
(S01_377_AE01)

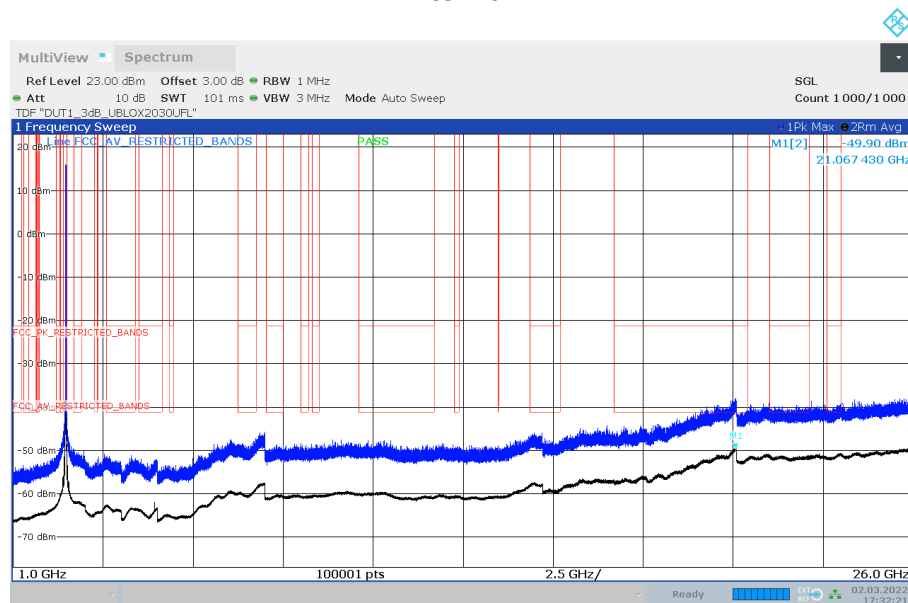


Radio Technology = WLAN b, Operating Frequency = high, Measurement range = 1 GHz - 26
GHz
(S01_377_AA01)



15:12:39 02.03.2022

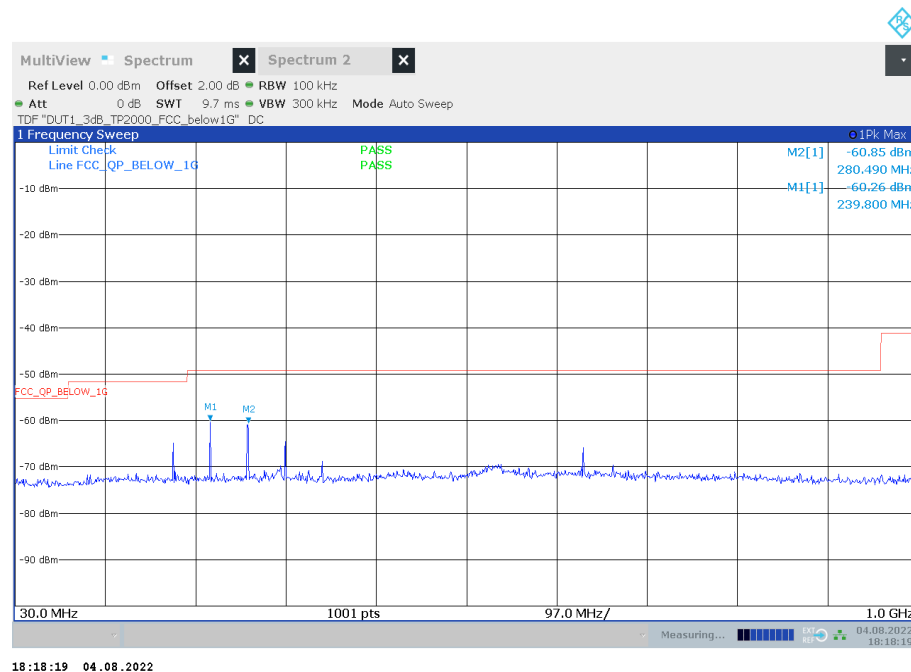
Antenna A



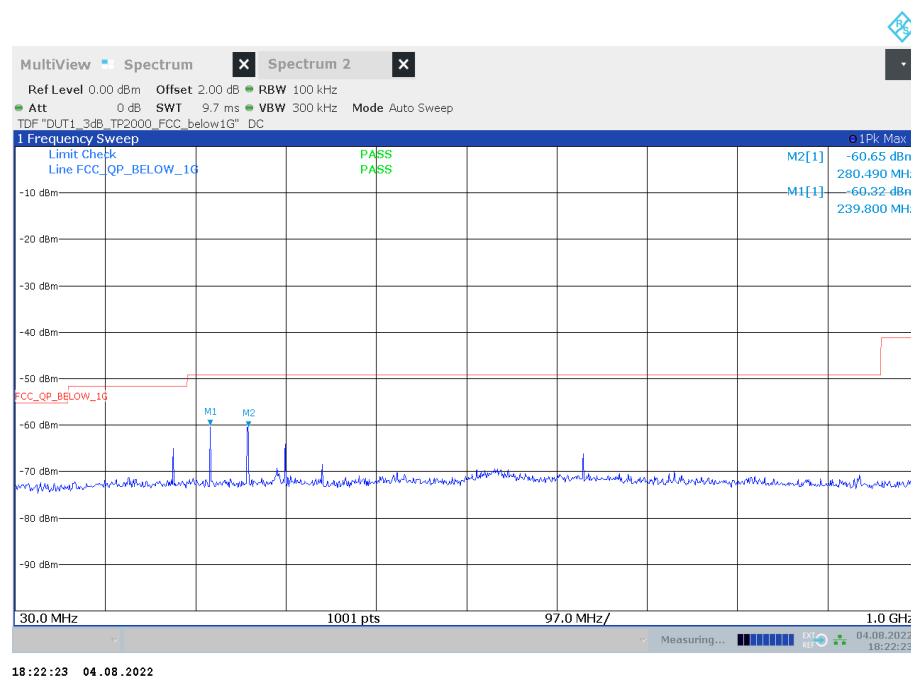
17:32:22 02.03.2022

Antenna B

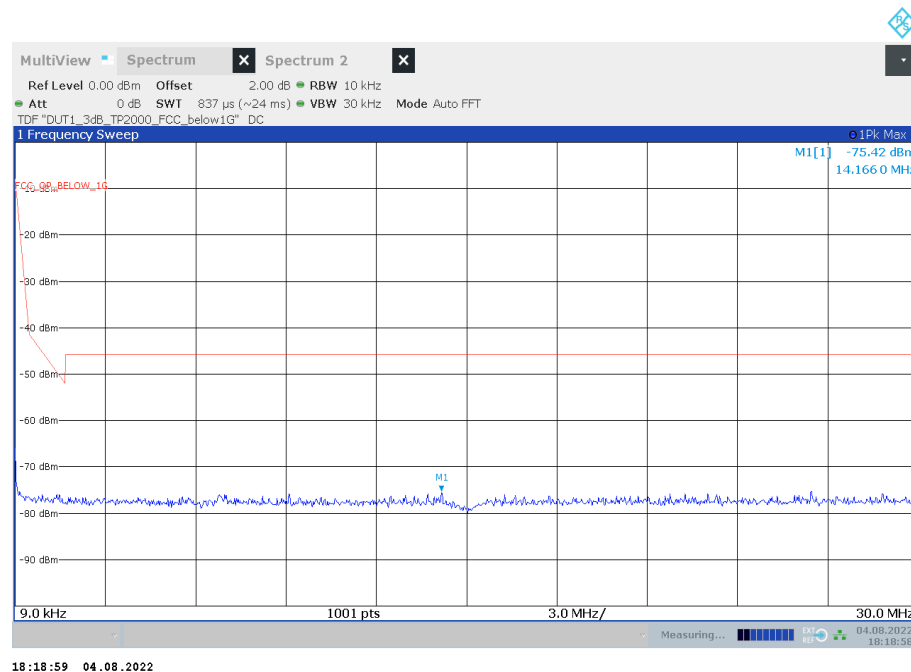
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = mid, Measurement range =
30 MHz - 1 GHz
(S01_377_AE01)



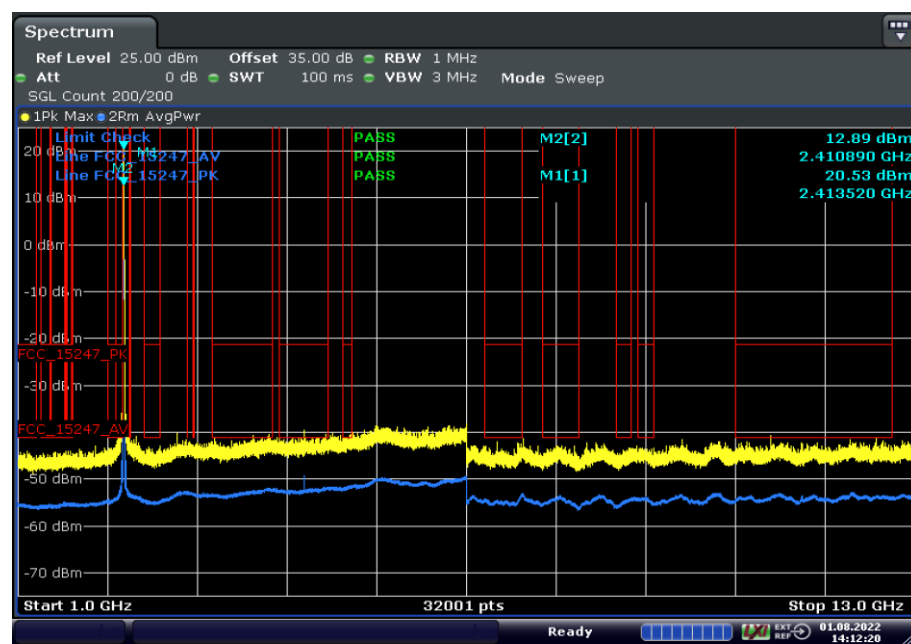
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = high, Measurement range =
30 MHz - 1 GHz
(S01_377_AE01)



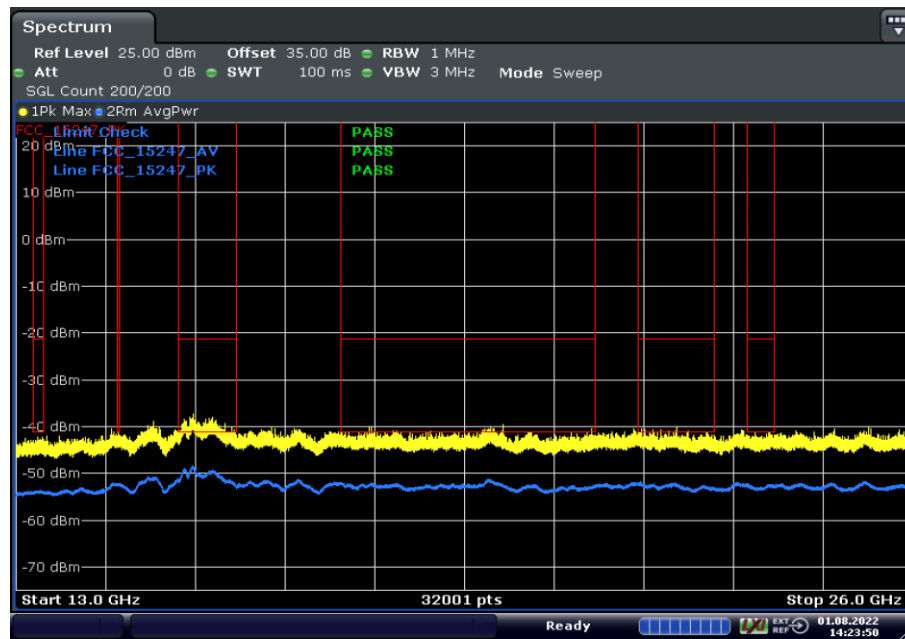
Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = mid, Measurement range =
9 kHz - 30 MHz
(S01_377_AE01)



Radio Technology = WLAN b, Operating Frequency = low, Measurement range = 1 GHz - 26
GHz
(S01_374_BA01)

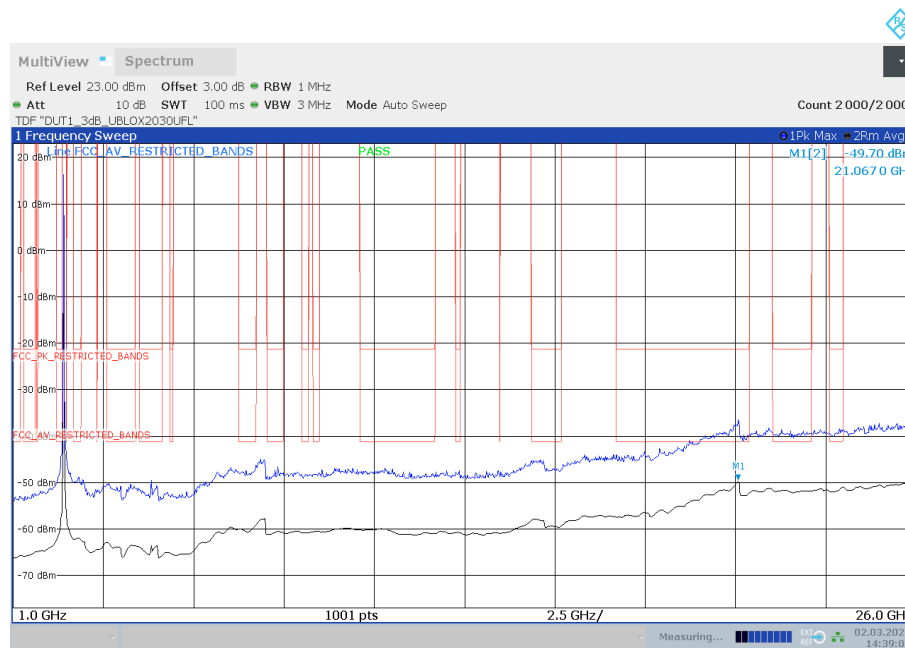


Date: 1.AUG.2022 14:12:20



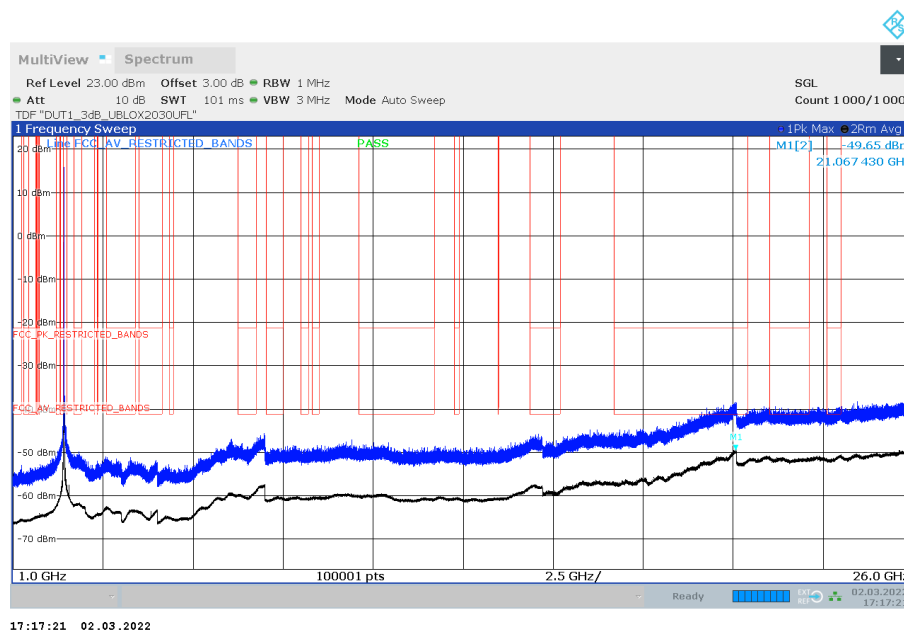
Date: 1.AUG.2022 14:23:51

Radio Technology = WLAN b, Operating Frequency = low, Measurement range = 1 GHz - 26 GHz
(S01_377_AA01)



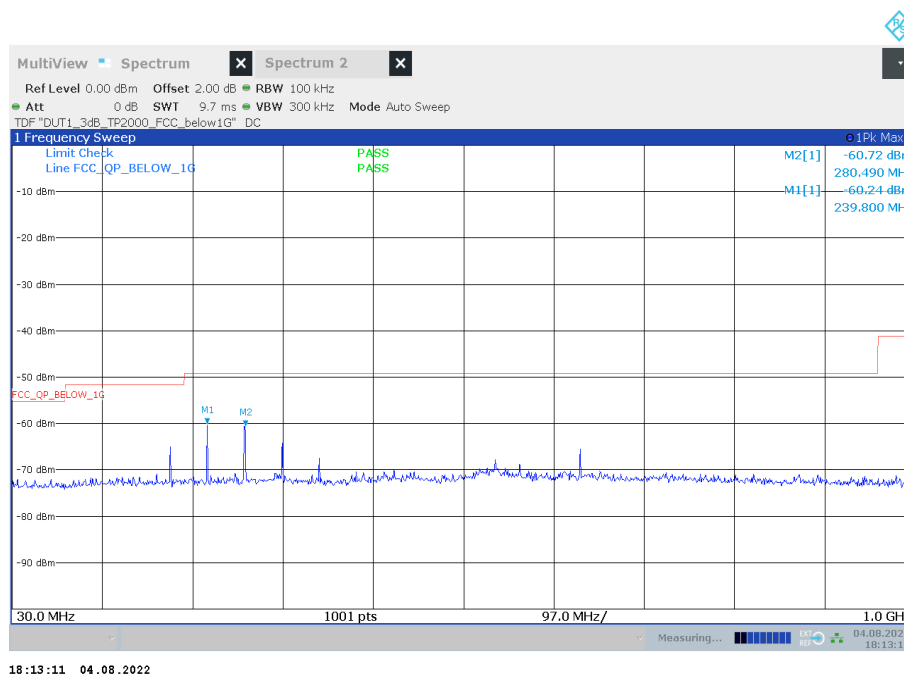
14:39:03 02.03.2022

Antenna A

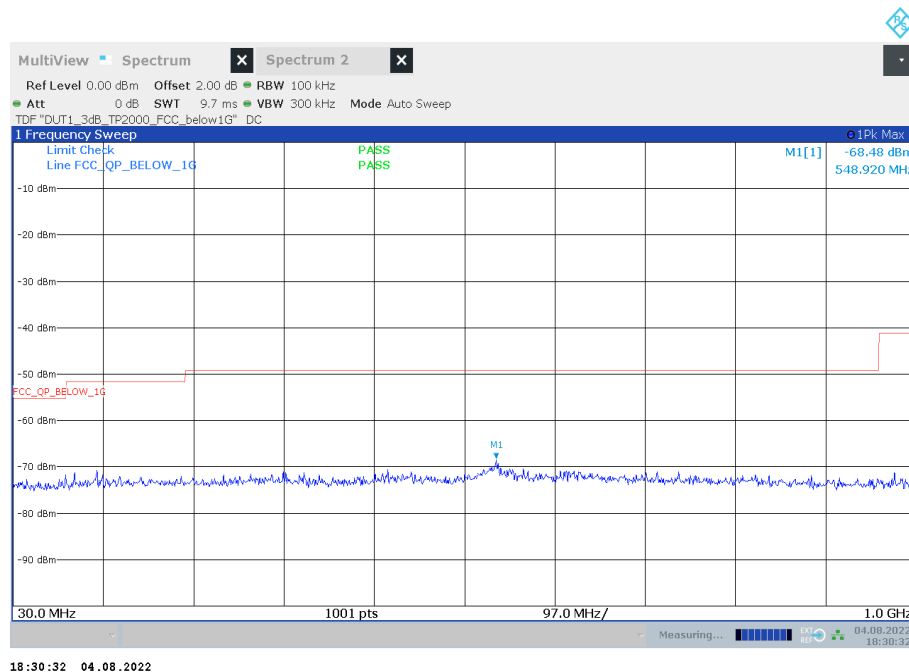


Antenna B

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low, Measurement range =
30 MHz - 1 GHz
(S01_377_AE01)

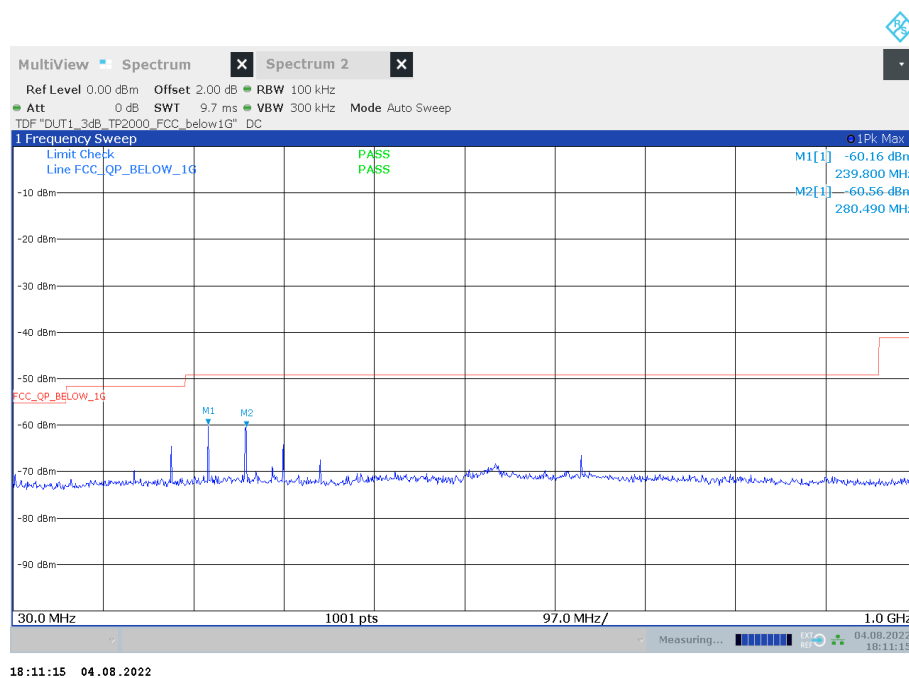


Radio Technology = WLAN b, Operating Frequency = high, Measurement range = 30 MHz - 1
GHz
(S01_377_AE01)

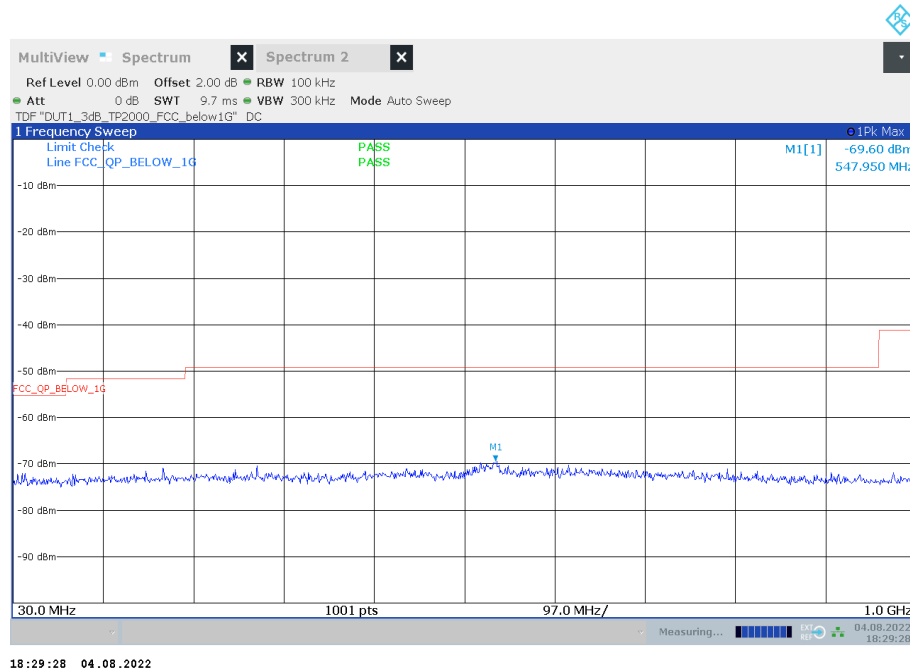


Antenna A

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low, Measurement range =
30 MHz - 1 GHz
(S01_377_AE01)

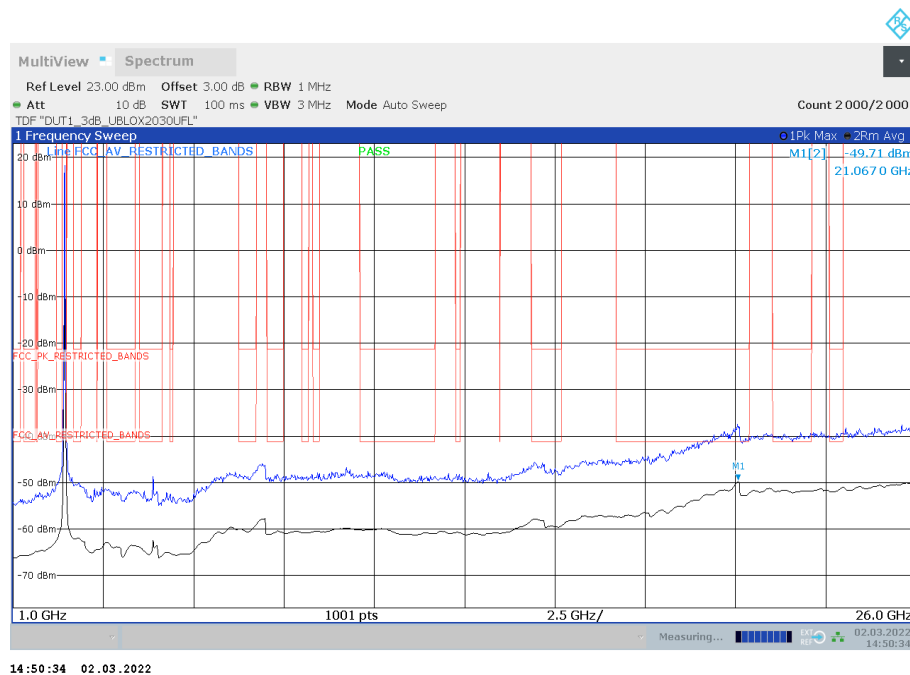


Radio Technology = WLAN b, Operating Frequency = low, Measurement range = 30 MHz - 1
GHz
(S01_377_AE01)

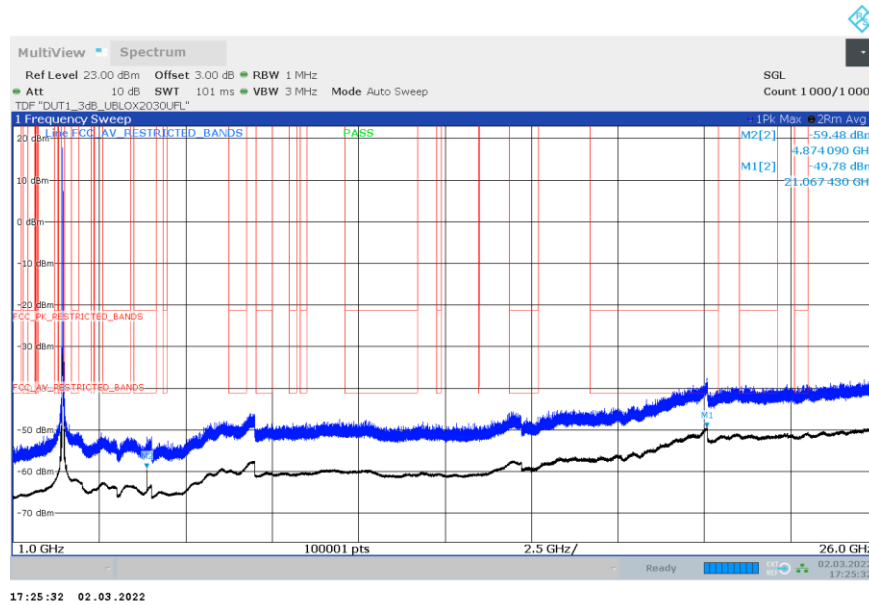


Antenna A

Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 1 GHz - 26
GHz
(S01_377_AA01)

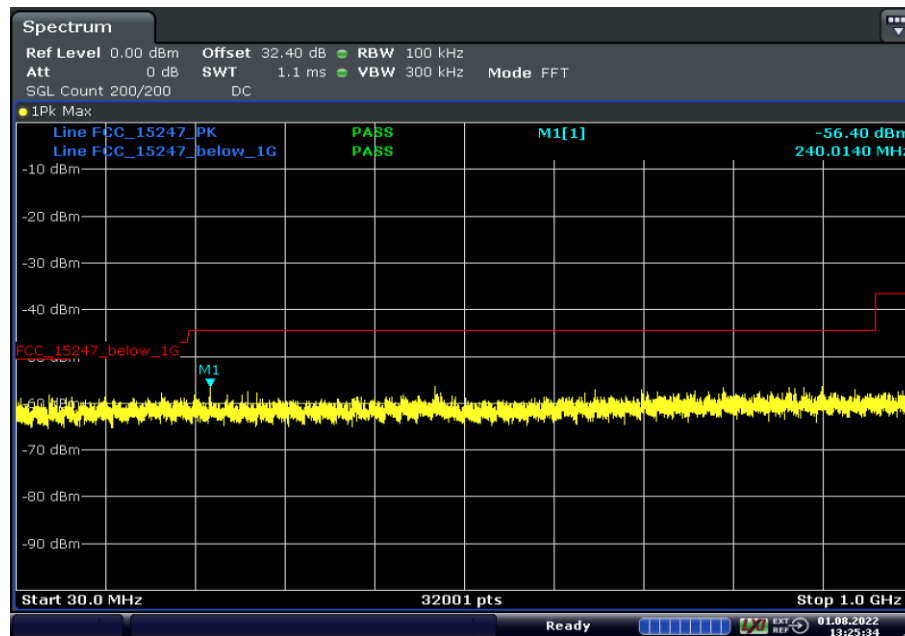


Antenna A



Antenna B

Radio Technology = Bluetooth BDR, Operating Frequency = mid, Measurement range = 30 MHz - 1 GHz
(S01_374_BA01)



Date: 1.AUG.2022 13:25:34