FCC Measurement/Technical Report on

WLAN and Bluetooth Module MAYA-W166

FCC ID: XPYMAYAW166
IC: 8595A-MAYAW166

Test Report Reference: MDE_UBLOX_2110_FCC_03

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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.

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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

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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_166_AE01	2022-06-22	Passed	Passed

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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 BDR, high	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth BDR, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth BDR, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, high	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, high	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth LE 1 Mbps, high	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 1 Mbps, low	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_166_AB01	2022-06-29	Passed	Passed
WLAN b, high	S01_166_AB01	2022-06-27	Passed	Passed
WLAN b, low	S01_166_AB01	2022-06-27	Passed	Passed
WLAN b, mid	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, high	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, low	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, mid	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, high	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, low	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, mid	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, high	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, low	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, mid	S01_166_AB01	2022-06-27	Passed	Passed

Occupied Bandwidth (99%)
The measurement was performed according to ANSI C63.10 6.9.3 **Final Result**

OP-Mode Radio Technology, Operating Frequency	**Setup**	**Date**	**FCC**	**IC**
Bluetooth BDR, high	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth BDR, low	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth BDR, mid	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth EDR 2, high	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth EDR 2, low	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth EDR 2, mid	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth EDR 3, high	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth EDR 3, low	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth EDR 3, mid	S01_166_AB01	2022-07-07	Performed	Performed
Bluetooth LE 1 Mbps, high	S01_166_AB01	2022-06-29	Performed	Performed
Bluetooth LE 1 Mbps, low	S01_166_AB01	2022-06-29	Performed	Performed
Bluetooth LE 1 Mbps, mid	S01_166_AB01	2022-06-29	Performed	Performed
Bluetooth LE 2 Mbps, high	S01_166_AB01	2022-06-29	Performed	Performed
Bluetooth LE 2 Mbps, low	S01_166_AB01	2022-06-29	Performed	Performed
Bluetooth LE 2 Mbps, mid	S01_166_AB01	2022-06-29	Performed	Performed
WLAN b, high	S01_166_AB01	2022-06-27	Performed	Performed
WLAN b, low	S01_166_AB01	2022-06-27	Performed	Performed
WLAN b, mid	S01_166_AB01	2022-06-27	Performed	Performed
WLAN g, high	S01_166_AB01	2022-06-27	Performed	Performed
WLAN g, low	S01_166_AB01	2022-06-27	Performed	Performed
WLAN g, mid	S01_166_AB01	2022-06-27	Performed	Performed
WLAN n 20 MHz, high	S01_166_AB01	2022-06-27	Performed	Performed
WLAN n 20 MHz, low	S01_166_AB01	2022-06-27	Performed	Performed
WLAN n 20 MHz, mid	S01_166_AB01	2022-06-27	Performed	Performed
WLAN n 40 MHz, high	S01_166_AB01	2022-06-27	Performed	Performed
WLAN n 40 MHz, low	S01_166_AB01	2022-06-27	Performed	Performed
WLAN n 40 MHz, mid	S01_166_AB01	2022-06-27	Performed	Performed

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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 Radio Technology, Operating Frequency, Measurement method	Setup	Date	FCC	IC
Bluetooth BDR, high, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth BDR, low, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth BDR, mid, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, high, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, low, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, mid, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, high, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, low, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, mid, conducted	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth LE 1 Mbps, high, conducted	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 1 Mbps, low, conducted	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 1 Mbps, mid, conducted	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, high, conducted	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, low, conducted	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, mid, conducted	S01_166_AB01	2022-06-29	Passed	Passed
WLAN b, high, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN b, low, conducted	S01_166_AB01	2022-06-29	Passed	Passed
WLAN b, mid, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, high, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, low, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, mid, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, high, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, low, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, mid, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, high, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, low, conducted	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, mid, conducted	S01_166_AB01	2022-06-27	Passed	Passed

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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_166_AB01	2022-07-07	Passed	Passed
Bluetooth BDR, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth BDR, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, high	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, high	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth LE 1 Mbps, high	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 1 Mbps, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_166_AB01	2022-06-29	Passed	Passed
WLAN b, high	S01_166_AB01	2022-07-01	Passed	Passed
WLAN b, low	S01_166_AB01	2022-07-01	Passed	Passed
WLAN b, mid	S01_166_AB01	2022-07-01	Passed	Passed
WLAN g, high	S01_166_AB01	2022-07-01	Passed	Passed
WLAN g, low	S01_166_AB01	2022-07-01	Passed	Passed
WLAN g, mid	S01_166_AB01	2022-07-01	Passed	Passed
WLAN n 20 MHz, high	S01_166_AB01	2022-07-01	Passed	Passed
WLAN n 20 MHz, low	S01_166_AB01	2022-07-01	Passed	Passed
WLAN n 20 MHz, mid	S01_166_AB01	2022-07-01	Passed	Passed
WLAN n 40 MHz, high	S01_166_AB01	2022-07-01	Passed	Passed
WLAN n 40 MHz, low	S01_166_AB01	2022-07-01	Passed	Passed
WLAN n 40 MHz, mid	S01_166_AB01	2022-07-01	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 Radio Technology, Operating Frequency, Measurement range	Setup	Date	FCC	IC
Bluetooth BDR, high, 1 GHz - 26 GHz Remark: At final output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth BDR, high, 1 GHz - 26 GHz Remark: At final output power	S02_166_AB01	2022-07-15	Passed	Passed
Bluetooth BDR, high, 1 GHz - 26 GHz Remark: At final output power	S02_166_AE01	2022-07-04	Passed	Passed
Bluetooth BDR, high, 30 MHz - 1 GHz Remark: At final output power	S02_166_AB01	2022-07-21	Passed	Passed
Bluetooth BDR, high, 30 MHz - 1 GHz Remark: At initial output power	S02_166_AE01	2022-06-23	Passed	Passed
Bluetooth BDR, high, 30 MHz - 1 GHz Remark: At final output power	S01_166_AB01	2022-07-29	Passed	Passed
Bluetooth BDR, high, 9 kHz - 30 MHz Remark: At final output power	S02_166_AB01	2022-07-21	Passed	Passed
Bluetooth BDR, low, 1 GHz - 26 GHz Remark: At initial output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth BDR, low, 1 GHz - 26 GHz Remark: At initial output power	S02_166_AE01	2022-06-28	Passed	Passed
Bluetooth BDR, low, 30 MHz - 1 GHz Remark: At initial output power	S02_166_AE01	2022-06-23	Passed	Passed
Bluetooth BDR, low, 30 MHz - 1 GHz Remark: At final output power	S01_166_AB01	2022-07-29	Passed	Passed
Bluetooth BDR, mid, 1 GHz - 26 GHz Remark: At final output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth BDR, mid, 1 GHz - 26 GHz Remark: At initial output power	S02_166_AE01	2022-06-28	Passed	Passed
Bluetooth BDR, mid, 30 MHz - 1 GHz Remark: At initial output power	S02_166_AE01	2022-06-23	Passed	Passed
Bluetooth BDR, mid, 30 MHz - 1 GHz Remark: At initial output power	S01_166_AB01	2022-07-29	Passed	Passed
Bluetooth BDR, mid, 9 kHz - 30 MHz Remark: At initial output power	S02_166_AE01	2022-06-23	Passed	Passed
Bluetooth BDR, mid, 9 kHz - 30 MHz Remark: At final output power	S01_166_AB01	2022-07-29	Passed	Passed
Bluetooth EDR 2, high, 1 GHz - 26 GHz Remark: At final output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth EDR 2, low, 1 GHz - 26 GHz Remark: At final output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth EDR 2, mid, 1 GHz - 26 GHz Remark: At final output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth EDR 3, high, 1 GHz - 26 GHz Remark: At final output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth EDR 3, low, 1 GHz - 26 GHz Remark: At final output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth EDR 3, mid, 1 GHz - 26 GHz Remark: At final output power	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth LE 1 Mbps, high, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	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 Radio Technology, Operating Frequency, Measurement range	Setup	Date	FCC	IC
Bluetooth LE 1 Mbps, low, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth LE 1 Mbps, mid, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth LE 2 Mbps, high, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth LE 2 Mbps, low, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
Bluetooth LE 2 Mbps, mid, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN b, high, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN b, high, 1 GHz - 26 GHz	S02_166_AB01	2022-06-25	Passed	Passed
WLAN b, high, 1 GHz - 26 GHz	S02_166_AF01	2022-06-25	Passed	Passed
WLAN b, high, 30 MHz - 1 GHz	S02_166_AB01	2022-07-21	Passed	Passed
WLAN b, high, 30 MHz - 1 GHz	S02_166_AE01	2022-06-23	Passed	Passed
WLAN b, high, 30 MHz - 1 GHz	S01_166_AB01	2022-07-29	Passed	Passed
WLAN b, low, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN b, low, 1 GHz - 26 GHz	S02_166_AF01	2022-06-25	Passed	Passed
WLAN b, low, 30 MHz - 1 GHz	S02_166_AE01	2022-06-23	Passed	Passed
WLAN b, low, 30 MHz - 1 GHz	S01_166_AB01	2022-07-29	Passed	Passed
WLAN b, mid, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN b, mid, 1 GHz - 26 GHz	S02_166_AF01	2022-06-25	Passed	Passed
WLAN b, mid, 30 MHz - 1 GHz	S02_166_AE01	2022-06-23	Passed	Passed
WLAN b, mid, 30 MHz - 1 GHz	S01_166_AB01	2022-07-29	Passed	Passed
WLAN b, mid, 9 kHz - 30 MHz	S02_166_AB01	2022-07-21	Passed	Passed
WLAN b, mid, 9 kHz - 30 MHz	S02_166_AE01	2022-06-23	Passed	Passed
WLAN b, mid, 9 kHz - 30 MHz	S01_166_AB01	2022-07-29	Passed	Passed
WLAN g, high, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN g, low, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN g, mid, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN n 20 MHz, high, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN n 20 MHz, low, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN n 20 MHz, mid, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN n 40 MHz, high, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	Passed	Passed
WLAN n 40 MHz, low, 1 GHz - 26 GHz	S01_166_AB01	2022-06-28	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**
Bluetooth BDR, high, high	S01_166_AB01	2022-06-22	Passed	Passed
Bluetooth BDR, low, low	S01_166_AB01	2022-06-22	Passed	Passed
Bluetooth EDR 2, high, high	S01_166_AB01	2022-06-22	Passed	Passed
Bluetooth EDR 2, low, low	S01_166_AB01	2022-06-22	Passed	Passed
Bluetooth EDR 3, high, high	S01_166_AB01	2022-06-22	Passed	Passed
Bluetooth EDR 3, low, low	S01_166_AB01	2022-06-22	Passed	Passed
Bluetooth LE 1 Mbps, high, high	S01_166_AB01	2022-07-29	Passed	Passed
Bluetooth LE 1 Mbps, low, low	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, high, high	S01_166_AB01	2022-07-29	Passed	Passed
Bluetooth LE 2 Mbps, low, low	S01_166_AB01	2022-07-29	Passed	Passed
WLAN b, high, high	S01_166_AB01	2022-07-07	Passed	Passed
WLAN b, low, low	S01_166_AB01	2022-07-07	Passed	Passed
WLAN g, high, high	S01_166_AB01	2022-07-07	Passed	Passed
WLAN g, low, low	S01_166_AB01	2022-07-07	Passed	Passed
WLAN n 20 MHz, high, high	S01_166_AB01	2022-07-07	Passed	Passed
WLAN n 20 MHz, low, low	S01_166_AB01	2022-07-07	Passed	Passed
WLAN n 40 MHz, high, high	S01_166_AB01	2022-07-07	Passed	Passed
WLAN n 40 MHz, low, low	S01_166_AB01	2022-07-07	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_166_AB01	2022-07-28	Passed	Passed
Bluetooth BDR, high, high	S02_166_AB01	2022-07-15	Passed	Passed
Bluetooth BDR, high, high	S02_166_AE01	2022-06-28	Passed	Passed
Bluetooth EDR 2, high, high	S01_166_AB01	2022-07-28	Passed	Passed
Bluetooth EDR 2, high, high	S02_166_AE01	2022-06-28	Passed	Passed
Bluetooth EDR 3, high, high	S01_166_AB01	2022-07-28	Passed	Passed
Bluetooth EDR 3, high, high	S02_166_AE01	2022-06-28	Passed	Passed
Bluetooth LE 1 Mbps, high, high	S01_166_AB01	2022-07-28	Passed	Passed
Bluetooth LE 2 Mbps, high, high	S01_166_AB01	2022-07-28	Passed	Passed
Bluetooth LE 2 Mbps, high, high	S02_166_AE01	2022-06-29	Passed	Passed
WLAN b, high, high	S01_166_AB01	2022-07-28	Passed	Passed
WLAN b, high, high	S02_166_AB01	2022-07-13	Passed	Passed
WLAN b, high, high	S02_166_AE01	2022-06-27	Passed	Passed
WLAN g, high, high	S01_166_AB01	2022-07-28	Passed	Passed
WLAN g, high, high	S02_166_AG01	2022-06-28	Passed	Passed
WLAN n 20 MHz, high, high	S01_166_AB01	2022-07-28	Passed	Passed
WLAN n 20 MHz, high, high	S02_166_AG01	2022-06-28	Passed	Passed
WLAN n 40 MHz, high, high	S01_166_AB01	2022-07-28	Passed	Passed
WLAN n 40 MHz, high, high	S02_166_AG01	2022-06-28	Passed	Passed

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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				
Bluetooth BDR, high	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth BDR, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth BDR, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, high	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 2, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, high	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, low	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth EDR 3, mid	S01_166_AB01	2022-07-07	Passed	Passed
Bluetooth LE 1 Mbps, high	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 1 Mbps, low	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 1 Mbps, mid	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, high	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, low	S01_166_AB01	2022-06-29	Passed	Passed
Bluetooth LE 2 Mbps, mid	S01_166_AB01	2022-06-29	Passed	Passed
WLAN b, high	S01_166_AB01	2022-06-27	Passed	Passed
WLAN b, low	S01_166_AB01	2022-06-27	Passed	Passed
WLAN b, mid	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, high	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, low	S01_166_AB01	2022-06-27	Passed	Passed
WLAN g, mid	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, high	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, low	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 20 MHz, mid	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, high	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, low	S01_166_AB01	2022-06-27	Passed	Passed
WLAN n 40 MHz, mid	S01_166_AB01	2022-06-27	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	2022-08-08	--	valid
--	--	--	--

COMMENT: -

(responsible for accreditation scope)
Dipl.-Ing. Daniel Gall

(responsible for testing and report)
B.Sc. Jens Dörwald

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. Daniel Gall
Report Template Version:	2021-09-09

3.2 PROJECT DATA

Responsible for testing and report:	B.Sc. Jens Dörwald
Employees who performed the tests:	documented internally at 7Layers
Date of Report:	2022-08-08
Testing Period:	2022-06-22 to 2022-07-29

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	MAYA-W166
Type	MAYA-W166-00B-00 MAYA-W166-01B-00
Declared EUT data by the supplier	
Voltage Type	DC
Voltage Level	1.8 V + 3.3 V
Antenna / Gain	MAYA-W166-00B-00: Integral / -3.4 dBi MAYA-W166-01B-00: External / 2 dBi (No antennas were provided for the tests, radiated measurements were performed with 50 Ohm terminations)
Tested Modulation Type	BT Classic: GFSK (BDR), Pi/4 DQPSK (EDR 2), 8DPSK (EDR 3) BT LE: GFSK WLANb: DSSS WLANg/n: OFDM
Specific product description for the EUT	The EUT is a Bluetooth and WLAN module. In the 2.4 GHz band it supports SISO Mode only. Supported technologies are Bluetooth Classic, Bluetooth Low Energy and WLAN b, g, n 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
Special software used for testing	Scripts were provided by the applicant on a laptop that control a board computer, which sets the test modes of the EUT.

Used output power	BT Classic: 8 dBm BT LE: max. power in Direct Test Mode set by applicant's script 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	18	18									18
g	16	18	18							17	16
n20	15	16	16							16	15
n40	N/A	N/A	14		15	16	15			N/A	N/A

Note by the laboratory: Testing for Bluetooth Classic started at max power of power control level of test mode and was reduced later on to the final power of 8 dBm. Some radiated spurious emissions tests were not repeated with final power since the original power was worst case.

4.2 EUT MAIN COMPONENTS

Sample Name	**Sample Code**	**Description**
MAYA W166 AB01	DE1015159ab01	MAYA-W166-01B-00
Sample Parameter	**Value**	
Serial No.	AK36C1DEB90E4A80400	
HW Version	04	
SW Version	W16.92.21.p22-16.92.21.p22-MXM5X16298_V0	
Comment	Antenna Pin Sample	

Sample Name	**Sample Code**	**Description**
MAYA W166 AE01	DE1015159ae01	MAYA-W166-00B-00
Sample Parameter	**Value**	
Serial No.	M406C1DEB90B93C0400	
HW Version	04	
SW Version	W16.92.21.p22-16.92.21.p22-MXM5X16298_V0	
Comment	Integral antenna sample	

Sample Name	**Sample Code**	**Description**
MAYA W166 AF01	DE1015159af01	MAYA-W166-00B-00
Sample Parameter	**Value**	
Serial No.	M406C1DEB90B8B00400	
HW Version	04	
SW Version	W16.92.21.p22-16.92.21.p22-MXM5X16298_V0	
Comment	Integral antenna sample	

Sample Name	**Sample Code**	**Description**
MAYA W166 AG01	DE1015159ag01	MAYA-W166-00B-00
Sample Parameter	**Value**	
Serial No.	M406C1DEB90B8A40400	
HW Version	04	
SW Version	W16.92.21.p22-16.92.21.p22-MXM5X16298_V0	
Comment	Integral antenna sample	

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**
AUX10	UBLOX, MAYA-W1 EVK, Rev. A, - , 10000002636490002003	Evaluation Board for module providing ports
AUX20	Toradex, Ixora, V1.2A, -, 10824714	Board Computer connected to Evaluation board for setting modes
AUX21	Toradex, Ixora, V1.2A, -, 10824739	Board Computer connected to Evaluation board for setting modes
AUX22	DELL, Latitude E7250, -, -, 43283371358	Laptop computer with prepared scripts controlling AUX10
AUX23	DELL, Latitude E7270, 2016, -, 14393036990	Laptop computer with prepared scripts controlling AUX11
AUX6	UBLOX, MAYA-W1 EVK, Rev. A, - , 10000002386976004001	Evaluation Board for module providing ports
AUX8	UBLOX, MAYA-W1 EVK, Rev. A, - , 10000002636490002004	Evaluation Board for module providing ports
AUX9	UBLOX, MAYA-W1 EVK, Rev. A, - , 10000002636490001002	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
S02_166_AE01	MAYA W166 AE01, AUX9,	Radiated Setup
S03_166_AE01	MAYA W166 AE01, AUX9, ACDC1	AC Conducted Setup
S01_166_AB01	MAYA W166 AB01, AUX6, AUX10 + AUX12 or AUX 11 + AUX 13	Conducted Setup
S02_166_AG01	MAYA W166 AG01, AUX10,	Radiated Setup
S02_166_AB01	MAYA W166 AB01, AUX6,	Radiated Setup
S02_166_AF01	MAYA W166 AF01, AUX8,	Radiated Setup

4.6 OPERATING MODES / TEST CHANNELS

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

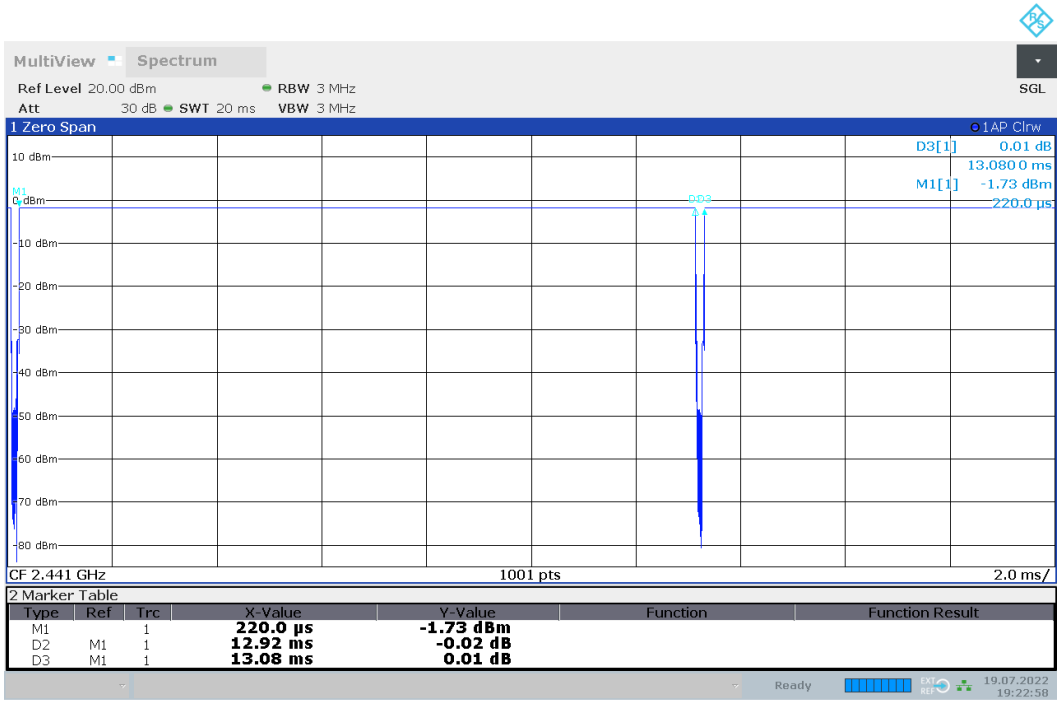
WLAN	**2.4 GHz ISM 2400 - 2483.5 MHz**		
20 MHz Test Channels:	**low**	**mid**	**high**
Channel:	1	6	11
Frequency [MHz]	2412	2437	2462

40 MHz Test Channels:	**low**	**mid**	**high**
Channel:	3	6	9
Frequency [MHz]	2422	2437	2452

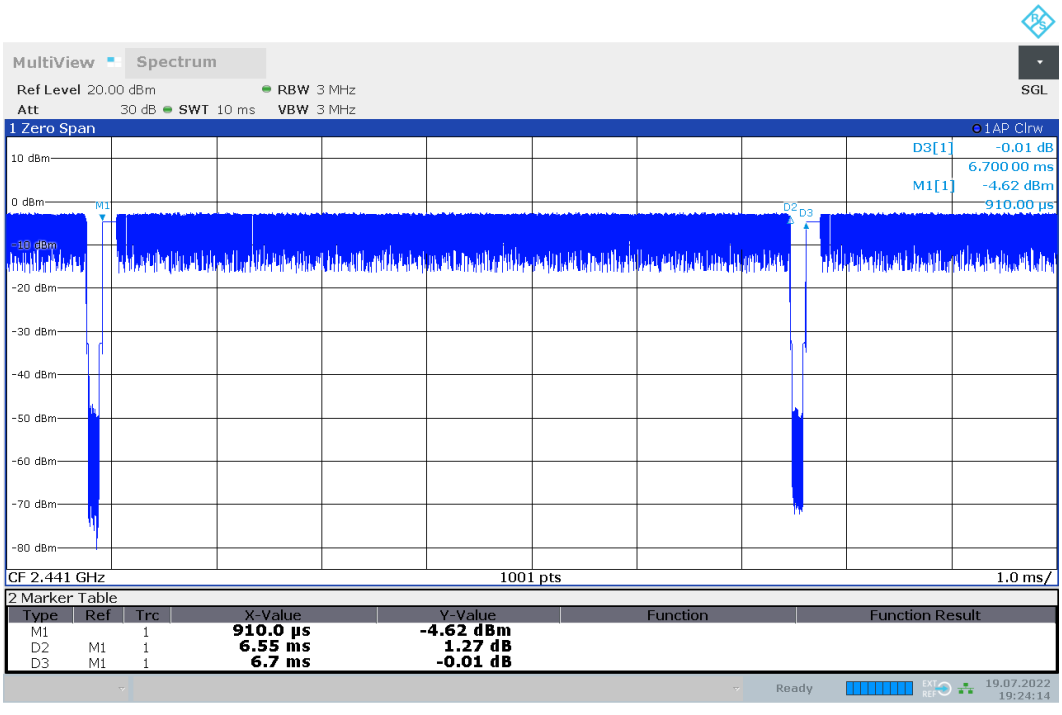
	2.4 GHz ISM 2400 - 2483.5 MHz		
BT Test Channels:	**low**	**mid**	**high**
Channel:	0	39	78
Frequency [MHz]	2402	2441	2480

	2.4 GHz ISM 2400 - 2483.5 MHz		
BT LE Test Channels:	**low**	**mid**	**high**
Channel:	0	19	39
Frequency [MHz]	2402	2440	2480

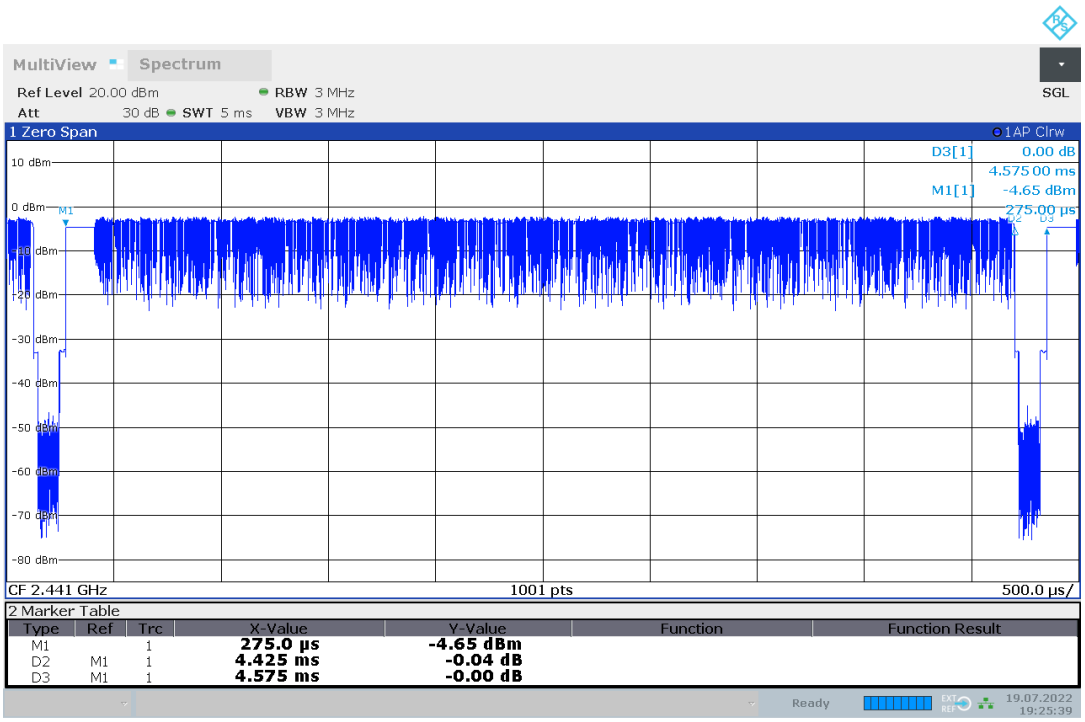
Duty Cycle:



BT GFSK (98.8 %)



BT Classic Pi/4 DQPSK (97.8 %)

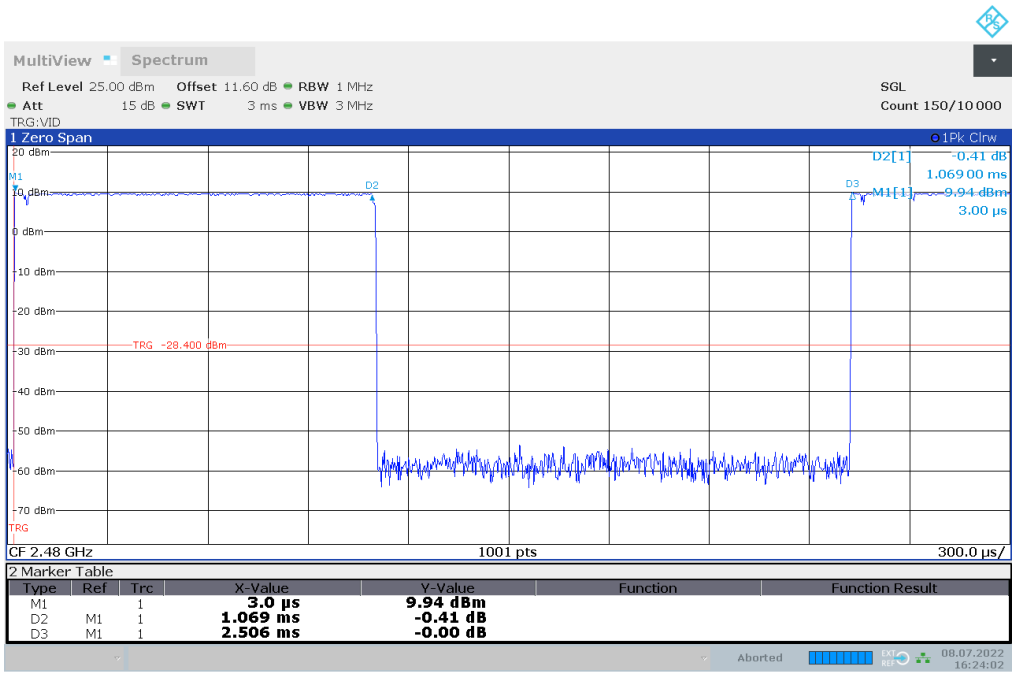


19:25:40 19.07.2022

BT Classic 8DPSK (96.7 %)

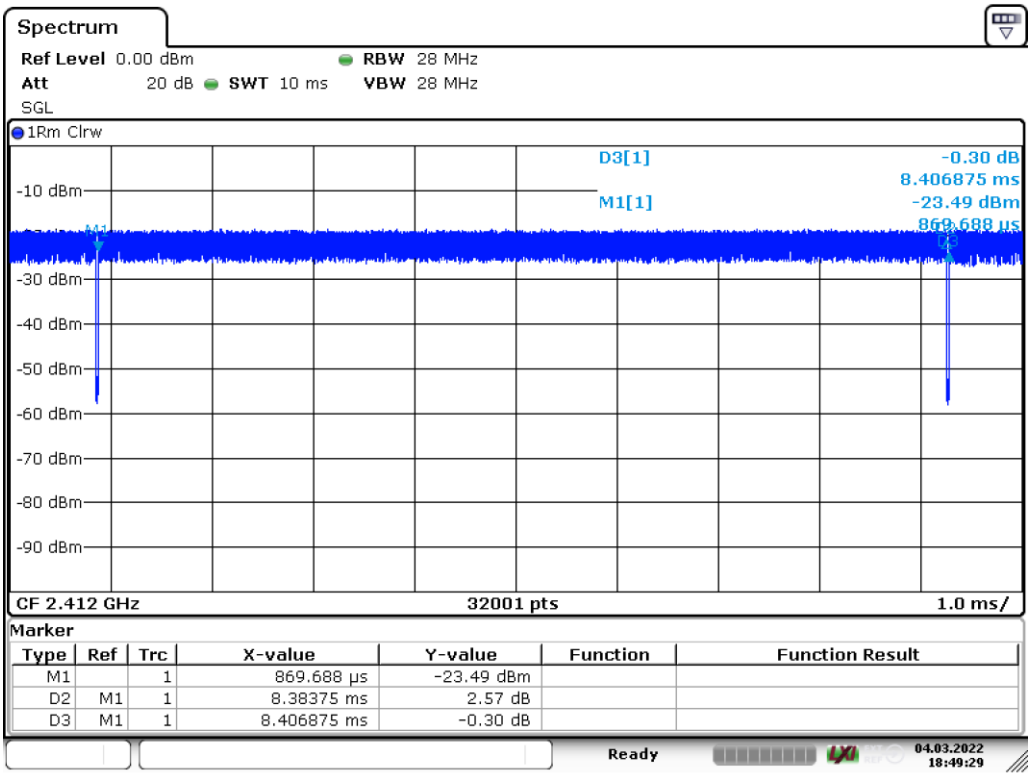
16:22:57 08.07.2022

BT LE 1 Mbps (85 %)



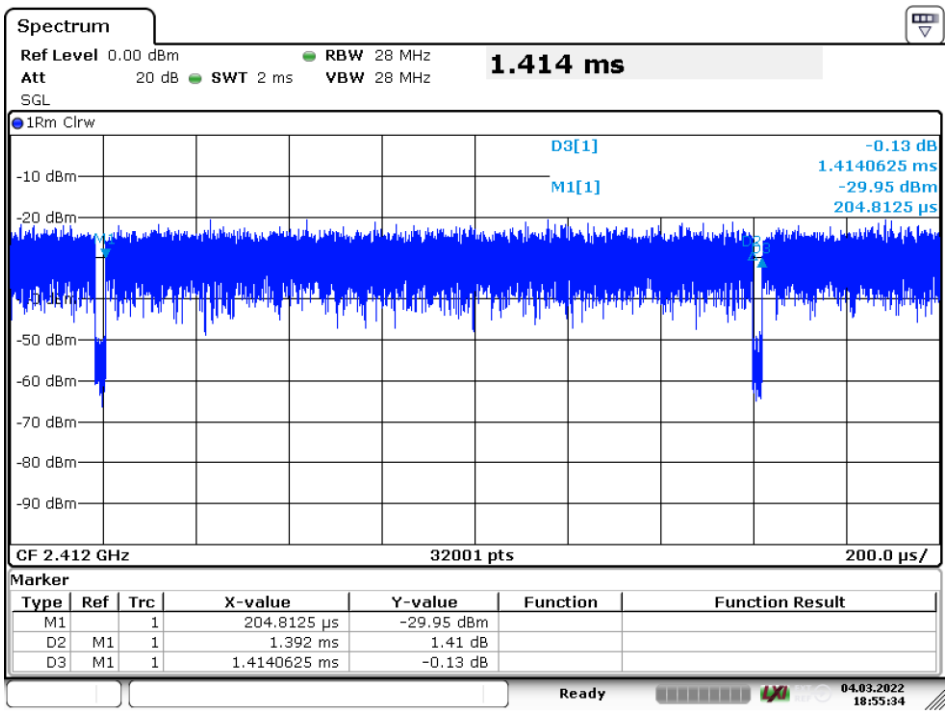
16:24:02 08.07.2022

BT LE 2 Mbps (42.7 %)



Date: 4.MAR.2022 18:49:29

WLAN b (99.7 %)



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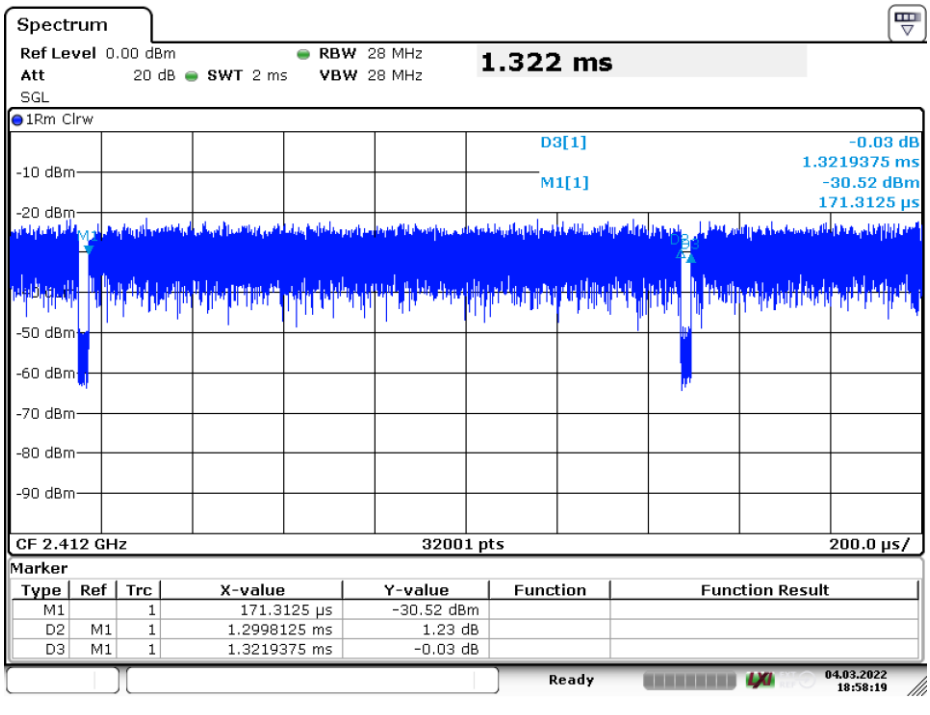
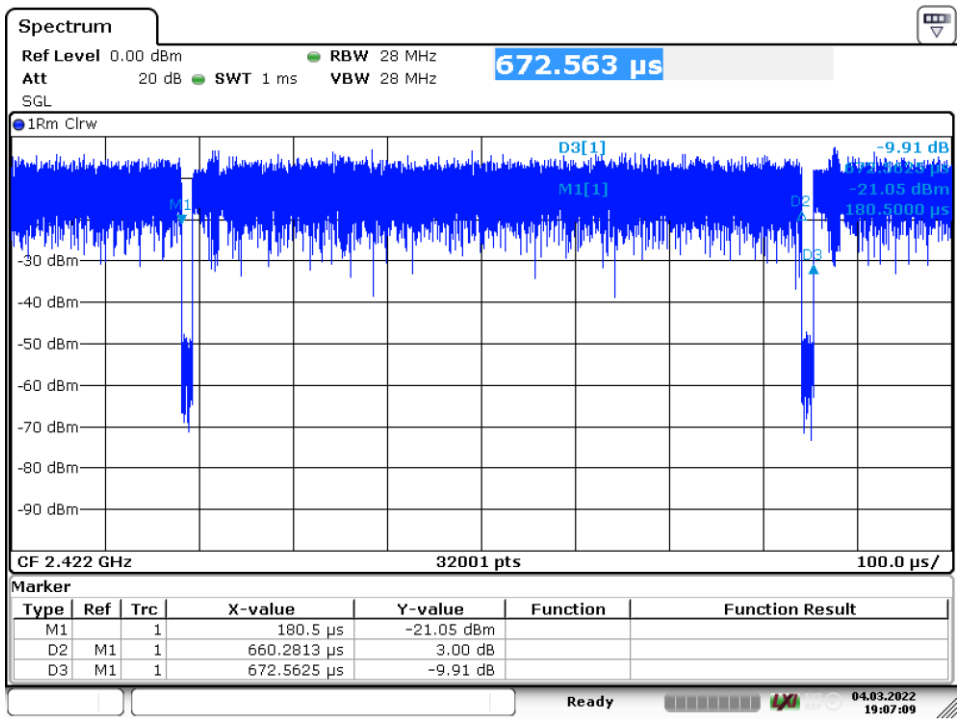
WLAN g (98.4 %)



Date: 4.MAR.2022 18:58:20

WLAN n 20 MHz (98.3 %)



WLAN n 40 MHz (98.3 %)

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

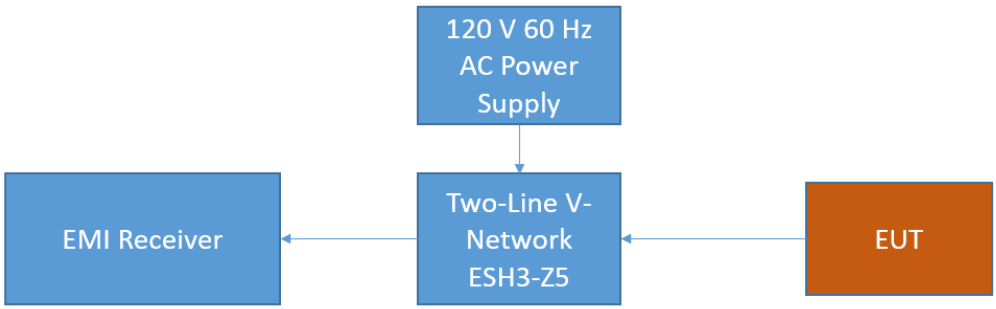
5.1 CONDUCTED EMISSIONS AT AC MAINS

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 50µH || 50 Ohm Line Impedance Stabilization Network (LISN). The LISN's unused connections were terminated with 50 Ohm loads.



FCC Conducted Emissions on AC

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

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

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

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

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

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

The highest value is reported.

5.1.2 TEST REQUIREMENTS / LIMITS

FCC Part 15, Subpart C, §15.207

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

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

5.1.3 TEST PROTOCOL

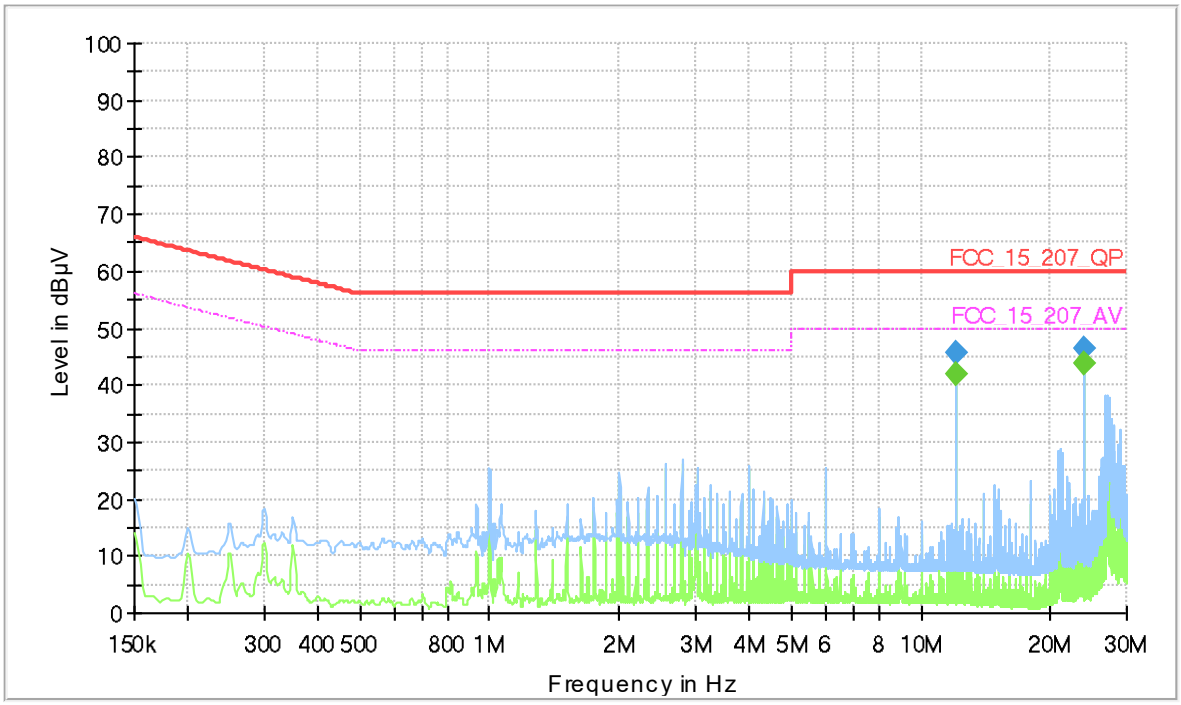
Temperature: 28 °C
Air Pressure: 1008 hPa
Humidity: 40 %

Power line	**PE**	**Frequency [MHz]**	**Measured value QP [dBµV]**	**Measured value AV [dBµV]**	**Limit [dBµV]**	**Margin [dB]**
N	GND	12.005	45.7	-	60.0	14.3
N	GND	12.005	-	42.0	50.0	8.0
N	FLO	24.009	46.5	-	60.0	13.5
N	FLO	24.009	-	43.7	50.0	6.3

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

5.1.4 MEASUREMENT PLOT

Operating mode = worst case, Connection to AC mains = via ancillary/auxiliary equipment (S03_166_AE01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	PE	Corr. (dB)
12.005250	---	41.97	50.00	8.03	1000.0	9.000	N	GND	10.7
12.005250	45.68	---	60.00	14.32	1000.0	9.000	N	GND	10.7
24.009000	46.46	---	60.00	13.54	1000.0	9.000	N	FLO	11.2
24.009000	---	43.73	50.00	6.27	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

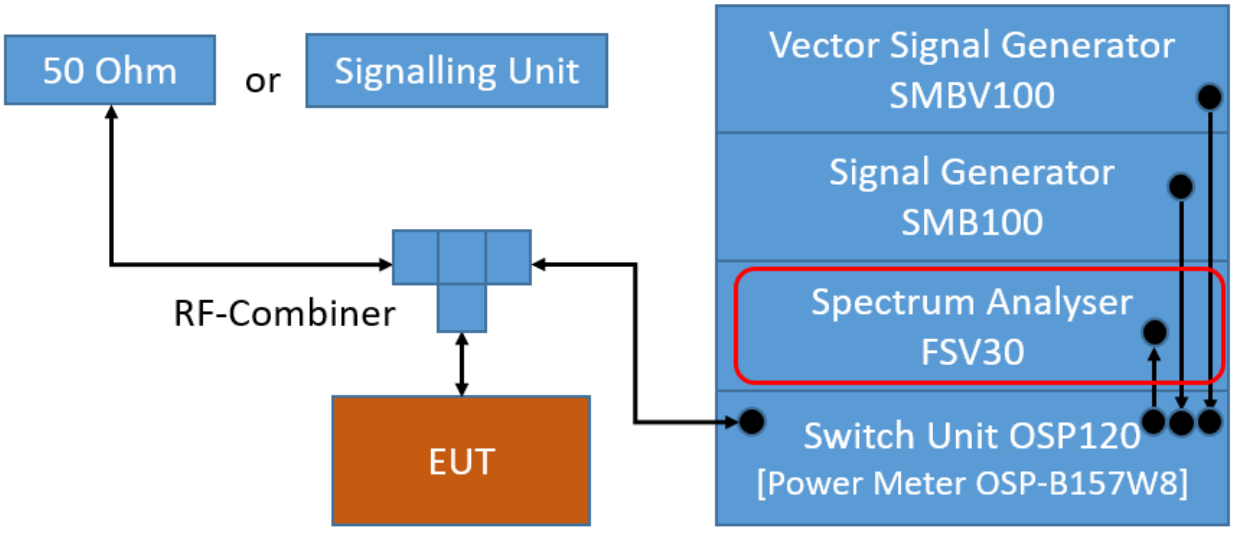
5.2.1 TEST DESCRIPTION

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)
- Sweeptime: Auto
- Detector: Peak



TS8997; Channel Bandwidth

5.2.2 TEST REQUIREMENTS / LIMITS

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

5.2.3 TEST PROTOCOL

Ambient temperature: 23 °C
Air Pressure: 1006 hPa
Humidity: 53 %

BT Classic GFSK

Band / Mode	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	0	2402	0.535	0.5	0.035
	39	2441	0.535	0.5	0.035
	78	2480	0.535	0.5	0.035

BT Classic Pi/4 DQPSK

Band / Mode	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	0	2402	1.109	0.5	0.609
	39	2441	1.109	0.5	0.609
	78	2480	1.109	0.5	0.609

BT Classic 8DPSK

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	0	2402	1.109	0.5	0.609
	39	2441	1.089	0.5	0.589
	78	2480	1.089	0.5	0.589

BT LE 1 Mbit/s

Band / Mode	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	0	2402	0.760	0.5	0.260
	19	2440	0.760	0.5	0.260
	39	2480	0.770	0.5	0.270

BT LE 2 Mbit/s

Band / Mode	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	0	2402	1.440	0.5	0.940
	19	2440	1.410	0.5	0.910
	39	2480	1.410	0.5	0.910

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

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	1	2412	9.2	0.5	8.7
	6	2437	9.2	0.5	8.7
	11	2462	9.2	0.5	8.7

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

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	1	2412	16.4	0.5	15.9
	6	2437	16.4	0.5	15.9
	11	2462	16.4	0.5	15.9

WLAN n-Mode; 20 MHz; MCS0

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	1	2412	17.7	0.5	17.2
	6	2437	17.7	0.5	17.2
	11	2462	17.7	0.5	17.2

WLAN n-Mode; 40 MHz; MCS0

Band	Channel No.	Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]	Margin to Limit [MHz]
2.4 GHz ISM	3	2422	35.9	0.5	35.4
	6	2437	35.8	0.5	35.3
	9	2452	35.9	0.5	35.4

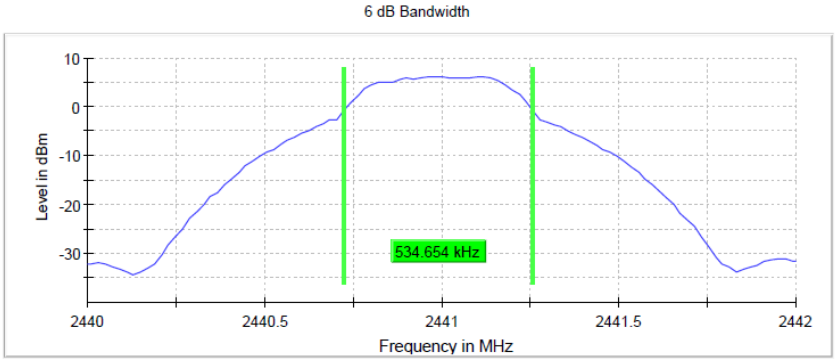
Remark: Please see next sub-clause for the measurement plot.

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

Radio Technology = BT Classic GFSK, Operating Frequency = mid (S01_166_AB01)

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	0.534654	0.500000	---	2440.722772	2441.257426	6.1	PASS

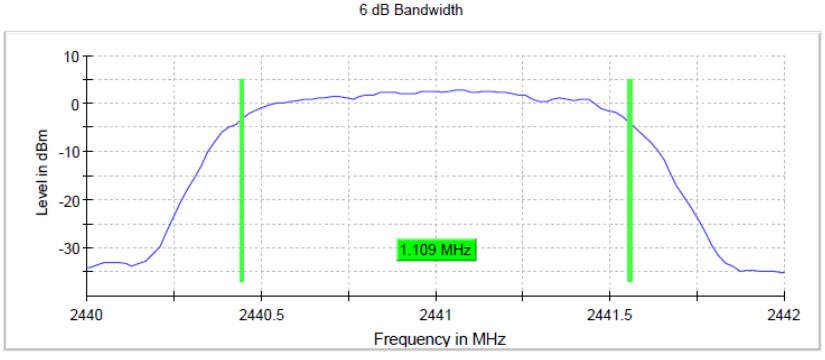


Setting	Instrument Value
Start Frequency	2.44000 GHz
Stop Frequency	2.44200 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
Sweeptime	41.830 µs
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	11 / max. 150
Stable	5 / 5
Max Stable Difference	0.21 dB

Radio Technology = BT Classic Pi/4 DQPSK, Operating Frequency = mid (S01_166_AB01)

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	2.9	PASS

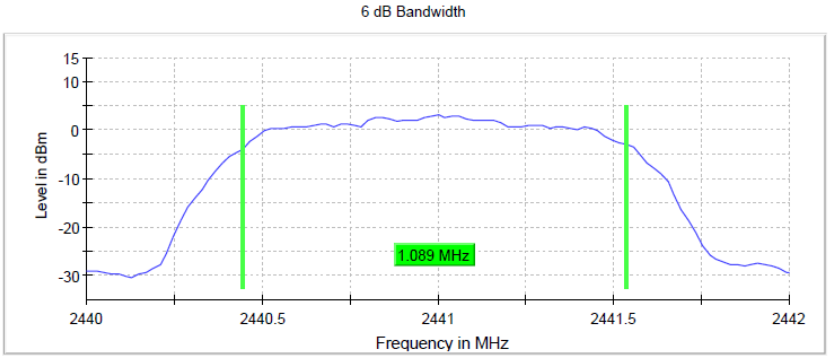


Setting	Instrument Value
Start Frequency	2.44000 GHz
Stop Frequency	2.44200 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
Sweeptime	41.830 µs
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	14 / max. 150
Stable	5 / 5
Max Stable Difference	0.40 dB

Radio Technology = BT Classic 8DPSK, Operating Frequency = mid
(S01_166_AB01)

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	1.089108	0.500000	---	2440.445545	2441.534653	3.1	PASS

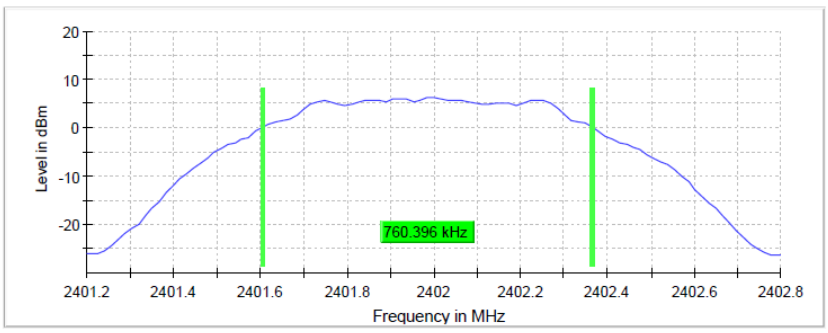


Setting	Instrument Value
Start Frequency	2.44000 GHz
Stop Frequency	2.44200 GHz
Span	2.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
Sweeptime	41.830 µs
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	15 / max. 150
Stable	5 / 5
Max Stable Difference	0.06 dB

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low
(S01_166_AB01)

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	0.760396	0.500000	---	2401.603960	2402.364356	6.3	PASS

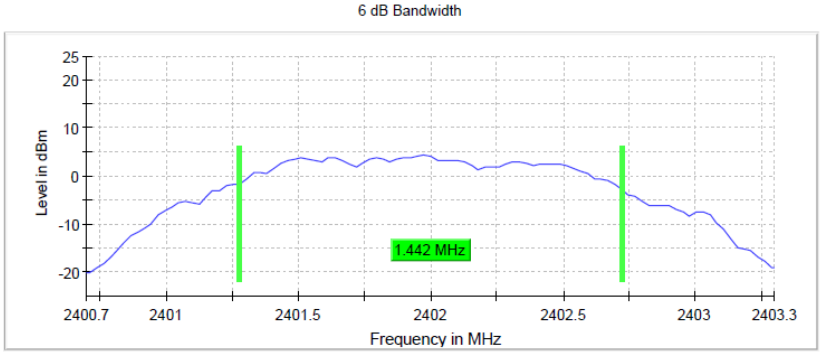


Setting	Instrument Value
Start Frequency	2.40120 GHz
Stop Frequency	2.40280 GHz
Span	1.600 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
Sweeptime	41.920 µs
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	10 / max. 150
Stable	5 / 5
Max Stable Difference	0.08 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low
(S01_166_AB01)

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	1.441584	0.500000	---	2401.279208	2402.720792	4.3	PASS

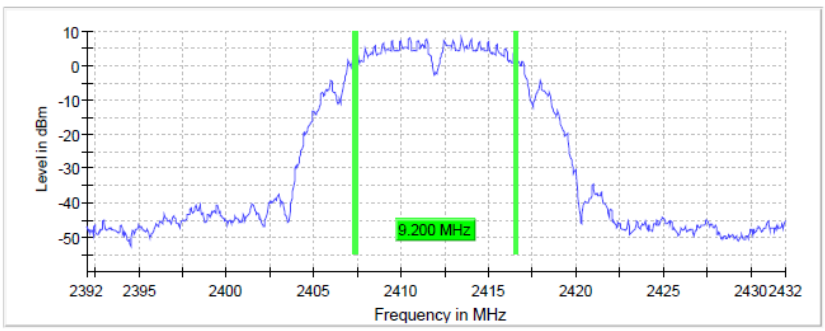


Setting	Instrument Value
Start Frequency	2.40070 GHz
Stop Frequency	2.40330 GHz
Span	2.600 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	101
Sweeptime	41.890 µs
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	11 / max. 150
Stable	5 / 5
Max Stable Difference	0.16 dB

Radio Technology = WLAN b, Operating Frequency = low
(S01_166_AB01)

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	9.200000	0.500000	---	2407.375000	2416.575000	8.0	PASS

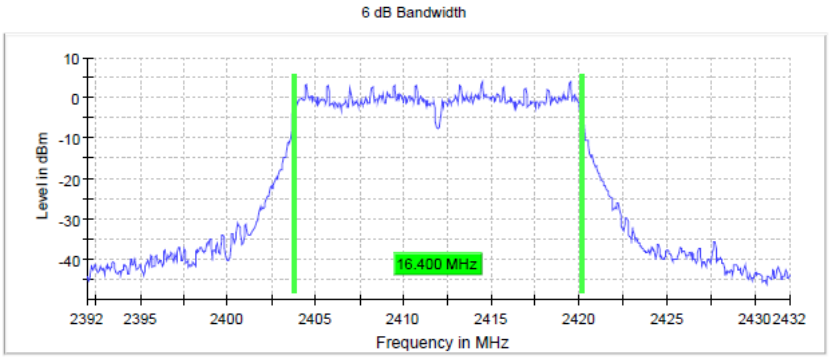


Setting	Instrument Value
Start Frequency	2.39200 GHz
Stop Frequency	2.43200 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweeptime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	18 / max. 150
Stable	5 / 5
Max Stable Difference	0.35 dB

Radio Technology = WLAN g, Operating Frequency = low
(S01_166_AB01)

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	16.400000	0.500000	--	2403.775000	2420.175000	4.0	PASS

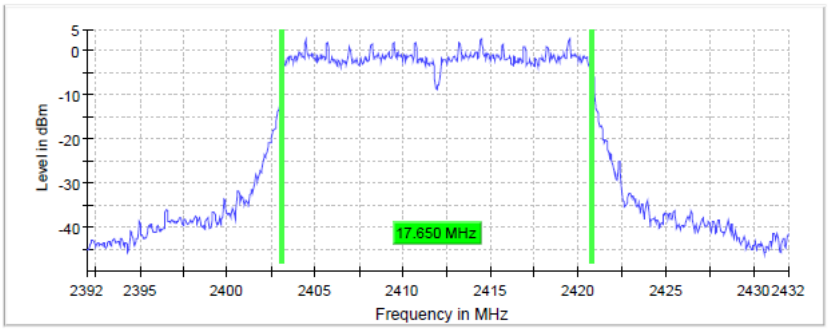


Setting	Instrument Value
Start Frequency	2.39200 GHz
Stop Frequency	2.43200 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweeptime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	40 / max. 150
Stable	5 / 5
Max Stable Difference	0.34 dB

Radio Technology = WLAN n 20 MHz, Operating Frequency = low
(S01_166_AB01)

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	17.650000	0.500000	--	2403.125000	2420.775000	2.9	PASS

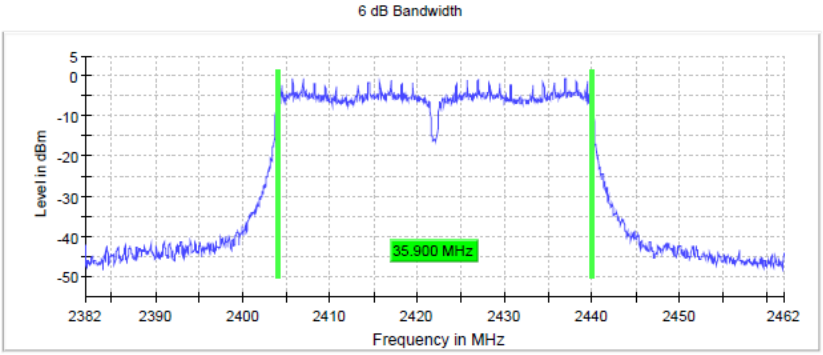


Setting	Instrument Value
Start Frequency	2.39200 GHz
Stop Frequency	2.43200 GHz
Span	40.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	800
Sweeptime	1.040 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	41 / max. 150
Stable	5 / 5
Max Stable Difference	0.43 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = low
(S01_166_AB01)

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	35.900000	0.500000	---	2404.025000	2439.925000	-0.6	PASS



Setting	Instrument Value
Start Frequency	2.38200 GHz
Stop Frequency	2.46200 GHz
Span	80.000 MHz
RBW	100.000 kHz
VBW	300.000 kHz
SweepPoints	1600
Sweeptime	1.600 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	62 / max. 150
Stable	5 / 5
Max Stable Difference	0.27 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

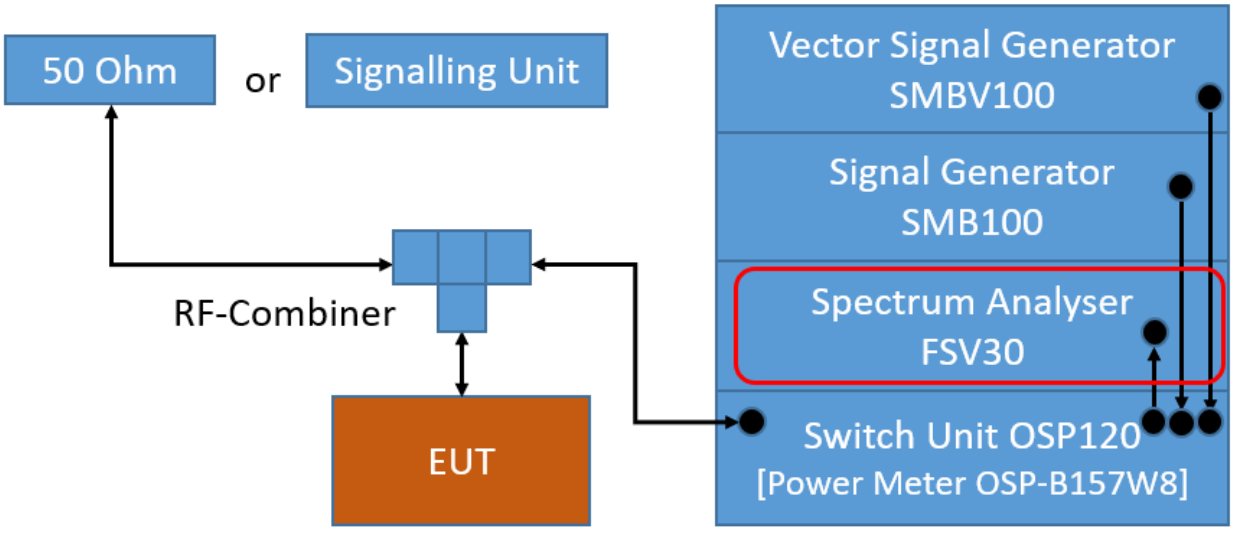
5.3.1 TEST DESCRIPTION

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)
- Sweeptime: Auto
- Detector: Peak



TS8997; Channel Bandwidth

5.3.2 TEST REQUIREMENTS / LIMITS

No applicable limit:

5.3.3 TEST PROTOCOL

Ambient temperature: 23 °C
Air Pressure: 1006 hPa
Humidity: 53 %

BT GFSK

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	0	2402	0.860
	39	2441	0.850
	78	2480	0.850

BT π/4 DQPSK

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	0	2402	1.117
	39	2441	1.117
	78	2480	1.117

BT 8-DPSK

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	0	2402	1.175
	39	2441	1.175
	78	2480	1.175

BT LE 1 Mbit/s

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	0	2402	1.030
	19	2440	1.020
	39	2480	1.030

BT LE 2 Mbit/s

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	0	2402	2.025
	19	2440	2.025
	39	2480	2.025

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

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	1	2412	12.0
	6	2437	12.0
	11	2462	12.0

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

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	1	2412	16.6
	6	2437	16.7
	11	2462	16.6

WLAN n-Mode; 20 MHz; MCS0

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

WLAN n-Mode; 40 MHz; MCS0

Band	Channel No.	Frequency [MHz]	99 % Bandwidth [MHz]
2.4 GHz ISM	3	2422	36.3
	6	2437	36.5
	9	2452	36.5

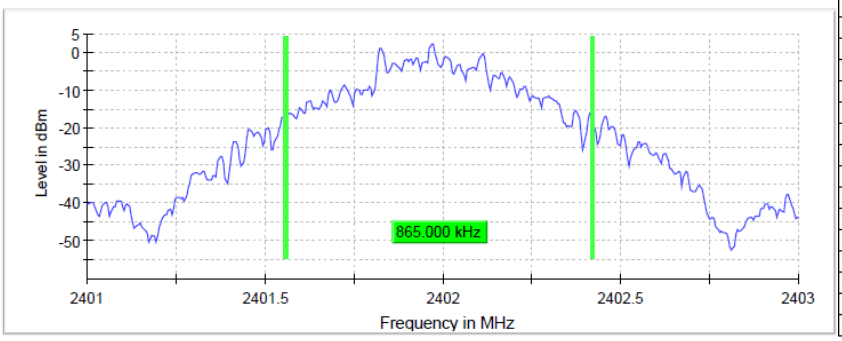
Remark: Please see next sub-clause for the measurement plot.

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

Radio Technology = Bluetooth BDR, Operating Frequency = low
(S01_166_AB01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2402.000000	0.865000	---	---	2401.557500	2402.422500	PASS

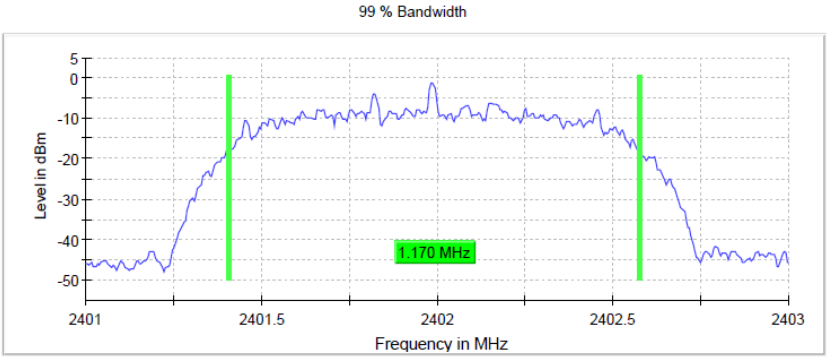


Setting	Instrument Value
Start Frequency	2.40100 GHz
Stop Frequency	2.40300 GHz
Span	2.000 MHz
RBW	10.000 kHz
VBW	30.000 kHz
SweepPoints	400
Sweeptime	419.000 µs
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	500
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	5 / max. 150
Stable	3 / 3
Max Stable Difference	0.07 dB

Radio Technology = Bluetooth EDR 2, Operating Frequency = low
(S01_166_AB01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2402.000000	1.170000	---	---	2401.407500	2402.577500	PASS

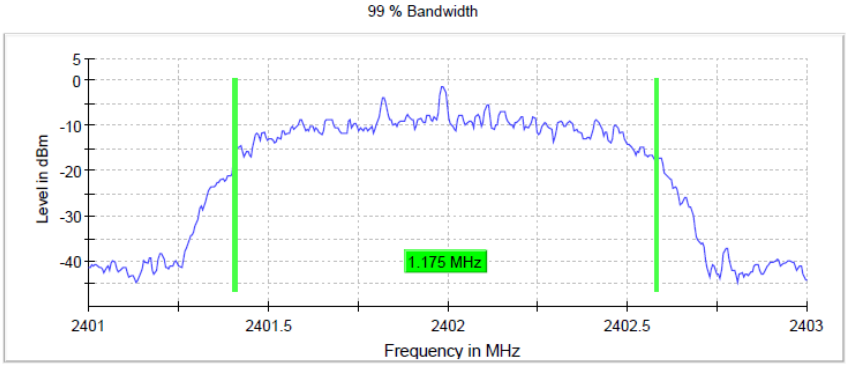


Setting	Instrument Value
Start Frequency	2.40100 GHz
Stop Frequency	2.40300 GHz
Span	2.000 MHz
RBW	10.000 kHz
VBW	30.000 kHz
SweepPoints	400
Sweeptime	419.000 µs
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	500
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	6 / max. 150
Stable	3 / 3
Max Stable Difference	0.08 dB

Radio Technology = Bluetooth EDR 3, Operating Frequency = low
(S01_166_AB01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2402.000000	1.175000	---	---	2401.407500	2402.582500	PASS

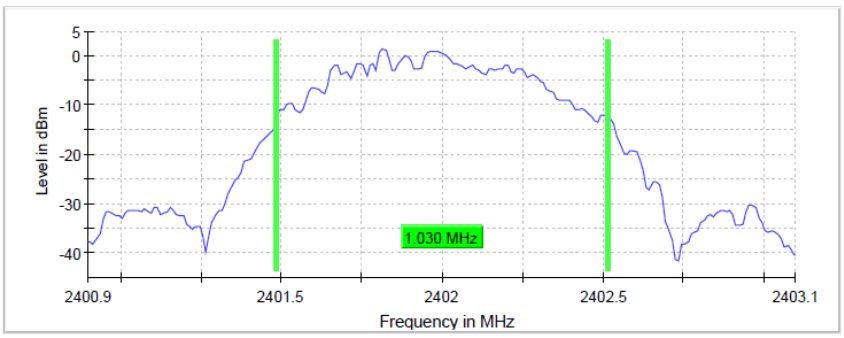


Setting	Instrument Value
Start Frequency	2.40100 GHz
Stop Frequency	2.40300 GHz
Span	2.000 MHz
RBW	10.000 kHz
VBW	30.000 kHz
SweepPoints	400
Sweeptime	419.000 µs
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	500
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	6 / max. 150
Stable	3 / 3
Max Stable Difference	0.07 dB

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low
(S01_166_AB01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2402.000000	1.030000	---	---	2401.485000	2402.515000	PASS

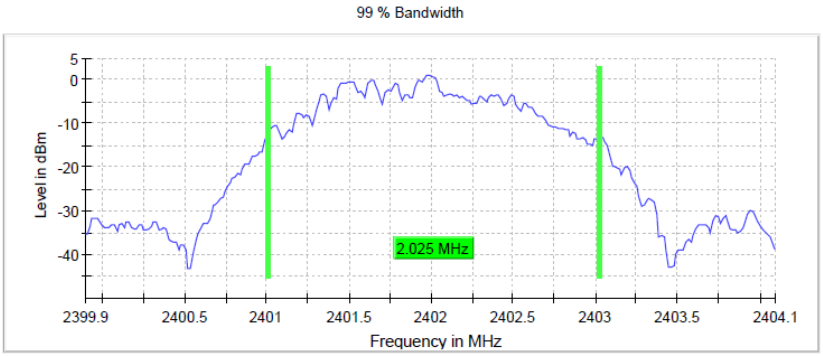


Setting	Instrument Value
Start Frequency	2.40090 GHz
Stop Frequency	2.40310 GHz
Span	2.200 MHz
RBW	20.000 kHz
VBW	100.000 kHz
SweepPoints	220
Sweeptime	210.000 µs
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	7 / max. 150
Stable	3 / 3
Max Stable Difference	0.10 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low
(S01_166_AB01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2402.000000	2.025000	---	---	2401.002500	2403.027500	PASS

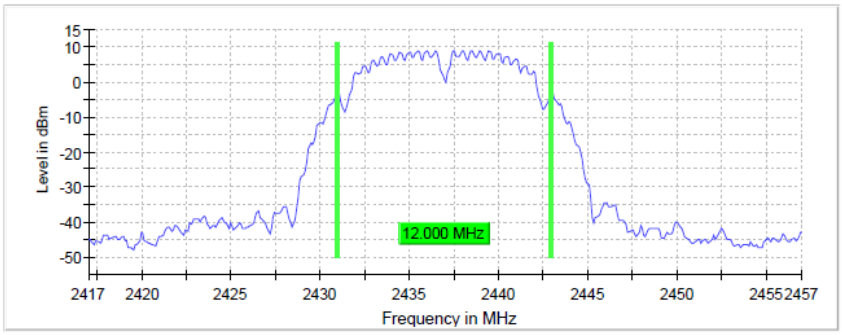


Setting	Instrument Value
Start Frequency	2.39990 GHz
Stop Frequency	2.40410 GHz
Span	4.200 MHz
RBW	30.000 kHz
VBW	100.000 kHz
SweepPoints	280
Sweeptime	140.000 µs
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	10 / max. 150
Stable	3 / 3
Max Stable Difference	0.05 dB

Radio Technology = WLAN b, Operating Frequency = mid
(S01_166_AB01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	12.000000	---	---	2430.950000	2442.950000	PASS

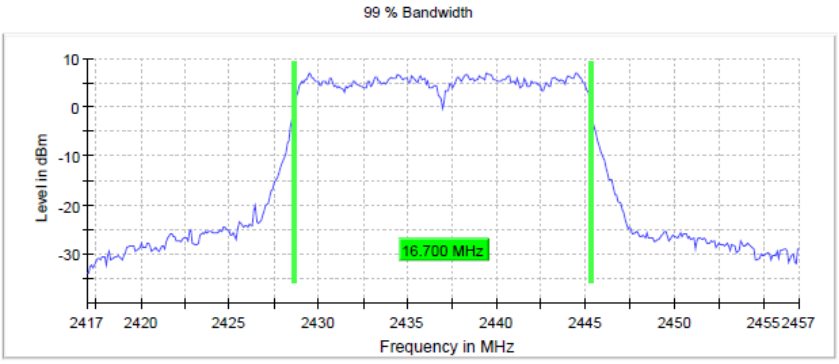


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	1.000 ms
Reference Level	0.000 dBm
Attenuation	10.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	16 / max. 150
Stable	3 / 3
Max Stable Difference	0.20 dB

Radio Technology = WLAN g, Operating Frequency = mid
(S01_166_AB01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	16.700000	---	---	2428.650000	2445.350000	PASS

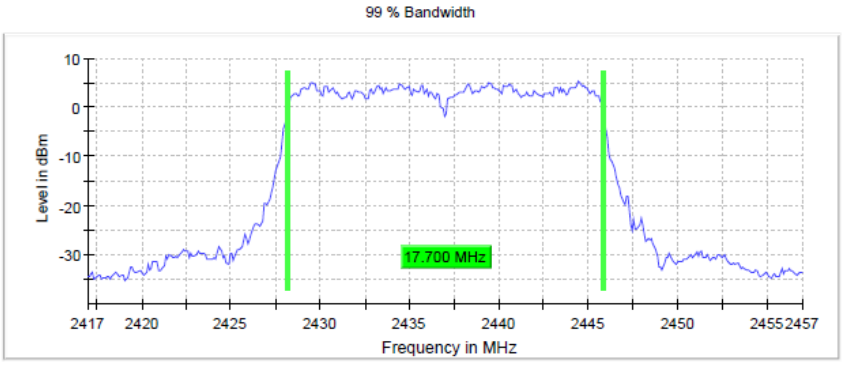


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	35 / max. 150
Stable	3 / 3
Max Stable Difference	0.25 dB

Radio Technology = WLAN n 20 MHz, Operating Frequency = mid
(S01_166_AB01)

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

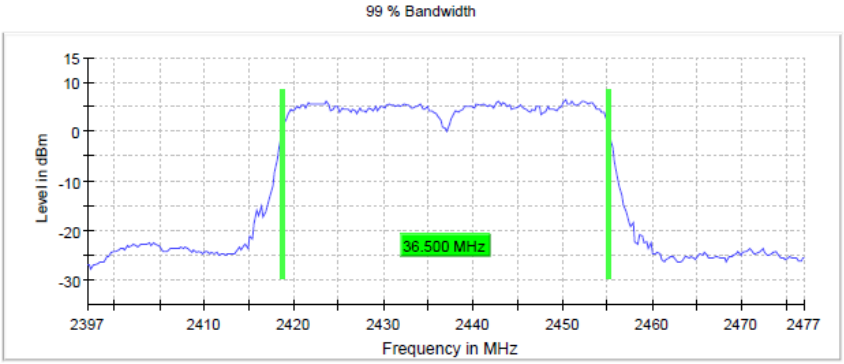


Setting	Instrument Value
Start Frequency	2.41700 GHz
Stop Frequency	2.45700 GHz
Span	40.000 MHz
RBW	200.000 kHz
VBW	1.000 MHz
SweepPoints	400
Sweeptime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	51 / max. 150
Stable	3 / 3
Max Stable Difference	0.29 dB

Radio Technology = WLAN n 40 MHz, Operating Frequency = mid
(S01_166_AB01)

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437.000000	36.500000	---	---	2418.625000	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	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	65 / max. 150
Stable	3 / 3
Max Stable Difference	0.22 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.

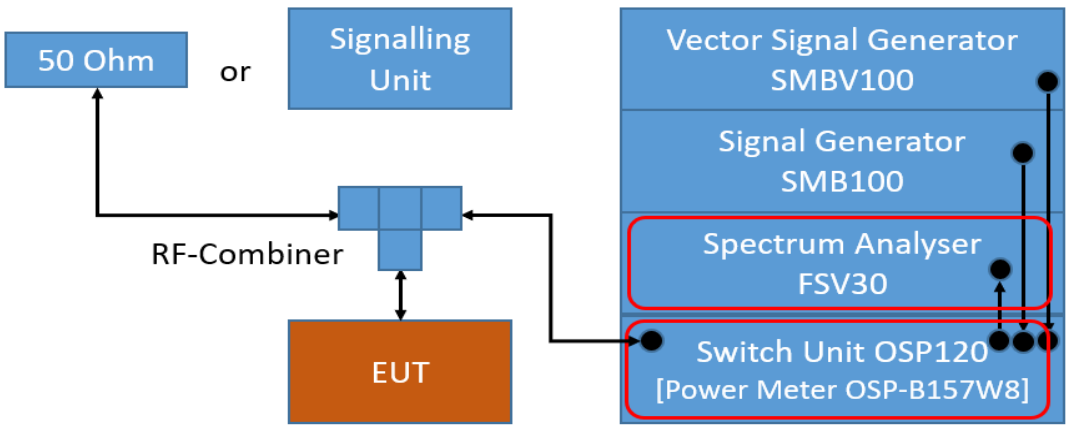
Maximum peak conducted output power (e.g. Bluetooth Low Energy):

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.

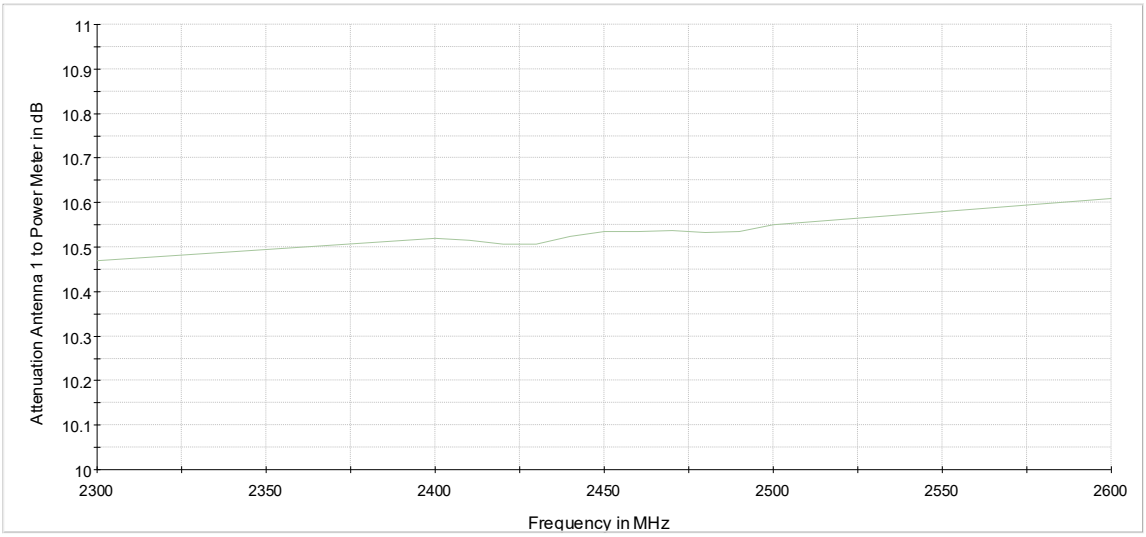
Analyser settings:
- Resolution Bandwidth (RBW): ≥ DTS bandwidth
- Video Bandwidth (VBW): ≥ 3 times RBW or maximum of analyzer
- Span: ≥ 3 times RBW
- Trace: Maxhold
- Sweeps: Till stable (min. 300, max. 15000)
- Sweeptime: Auto
- Detector: Peak

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

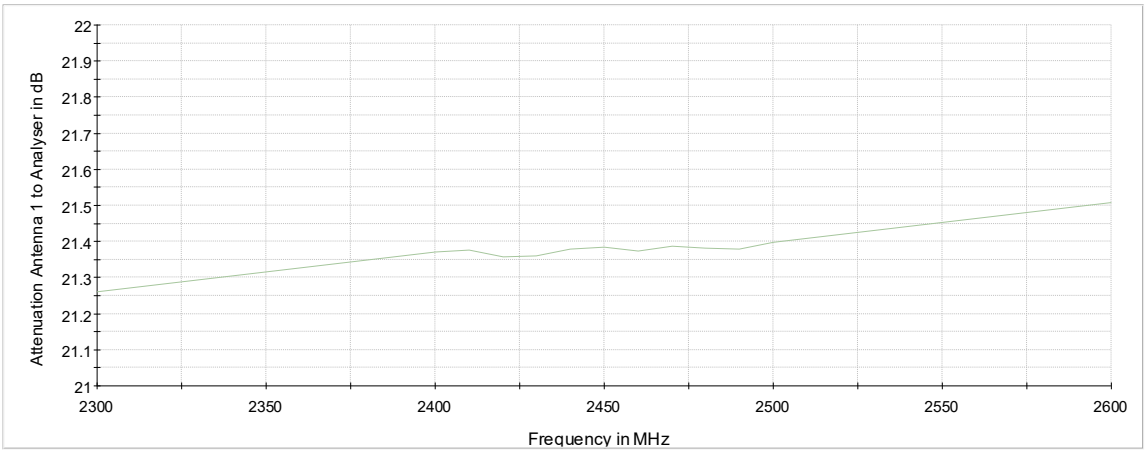
The EUT was connected to the test system as described in the block diagram below. The complete attenuation of the measurement path is known and considered.
Measurement is performed using the gated RF average power meter integrated in the OSP 120 module OSP-B157W8 with signal bandwidth >300 MHz.



TS8997; Output Power



Attenuation of the measurement path to Power Meter



Attenuation of the measurement path to Analyser

5.4.2 TEST REQUIREMENTS / LIMITS

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

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

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

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

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

5.4.3 TEST PROTOCOL

Ambient temperature: 23 °C
Air Pressure: 1006 hPa
Humidity: 53 %

BT GFSK (1-DH1)

Band	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	0	2402	7.9	30.0	22.1	9.9
	39	2441	6.6	30.0	23.4	8.6
	78	2480	6.6	30.0	23.4	8.6

BT π/4 DQPSK (2-DH1)

Band	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	0	2402	6.1	30.0	23.9	8.1
	39	2441	6.0	30.0	24.0	8.0
	78	2480	5.8	30.0	24.2	7.8

BT 8-DPSK (3-DH1)

Band	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	0	2402	6.4	30.0	23.6	8.4
	39	2441	6.2	30.0	23.8	8.2
	78	2480	6.5	30.0	23.5	8.5

BT LE 1 Mbit/s

Band	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	0	2402	7.8	30.0	22.2	9.8
	19	2440	7.6	30.0	22.4	9.6
	39	2480	7.6	30.0	22.4	9.6

BT LE 2 Mbit/s

Band	Channel No.	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	0	2402	7.8	30.0	22.2	9.8
	19	2440	7.8	30.0	22.2	9.8
	39	2480	7.6	30.0	22.4	9.6

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

Band	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	17.5	30.0	12.5	19.5
	6	2437	17.5	30.0	12.5	19.5
	11	2462	17.6	30.0	12.4	19.6

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

Band	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	15.2	30.0	14.8	17.2
	6	2437	17.3	30.0	12.7	19.3
	11	2462	15.4	30.0	14.6	17.4

WLAN n-Mode; 20 MHz; MCS0

Band	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	1	2412	14.4	30.0	15.6	16.4
	6	2437	15.5	30.0	14.5	17.5
	11	2462	14.6	30.0	15.4	16.6

WLAN n-Mode; 40 MHz; MCS0

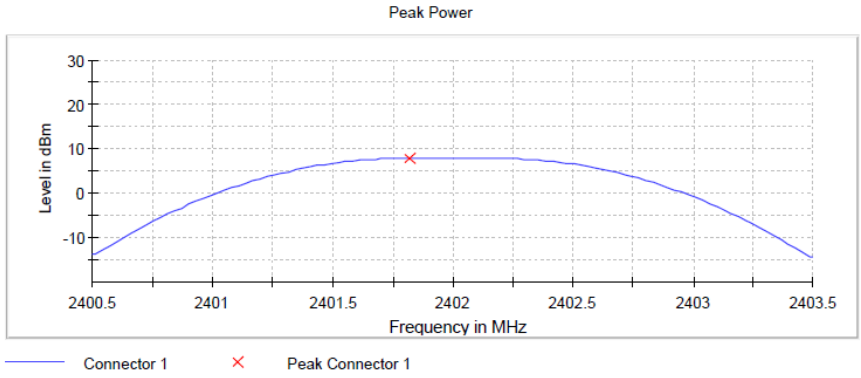
Band	Channel No.	Frequency [MHz]	Maximum Average Power [dBm]	Limit [dBm]	Margin to Limit [dB]	E.I.R.P [dBm]
2.4 GHz ISM	3	2422	13.3	30.0	16.7	15.3
	6	2437	15.3	30.0	14.7	17.3
	9	2452	14.5	30.0	15.5	16.5

Remark: Please see next sub-clause for the measurement plot.
No plots are provided for WLAN since a power meter was used for measurement.

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

Radio Technology = Bluetooth BDR, Operating Frequency = low, Measurement method = conducted
(S01_166_AB01)

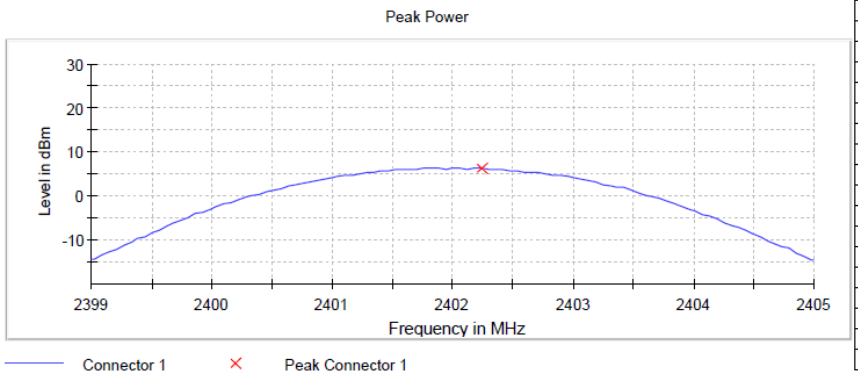
DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	7.9	21.0	PASS



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 µs
Reference Level	20.000 dBm
Attenuation	30.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.00 dB

Radio Technology = Bluetooth EDR 2, Operating Frequency = low, Measurement method = conducted
(S01_166_AB01)

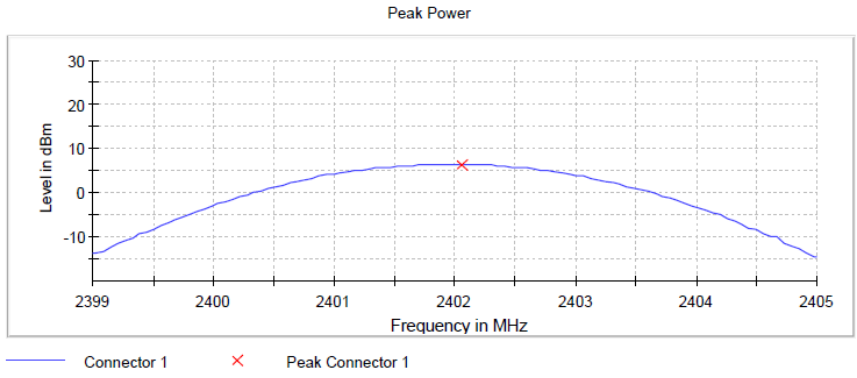
DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	6.1	21.0	PASS



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	20.000 dBm
Attenuation	30.000 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	0.15 dB

Radio Technology = Bluetooth EDR 3, Operating Frequency = low, Measurement method = conducted
(S01_166_AB01)

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	6.4	21.0	PASS

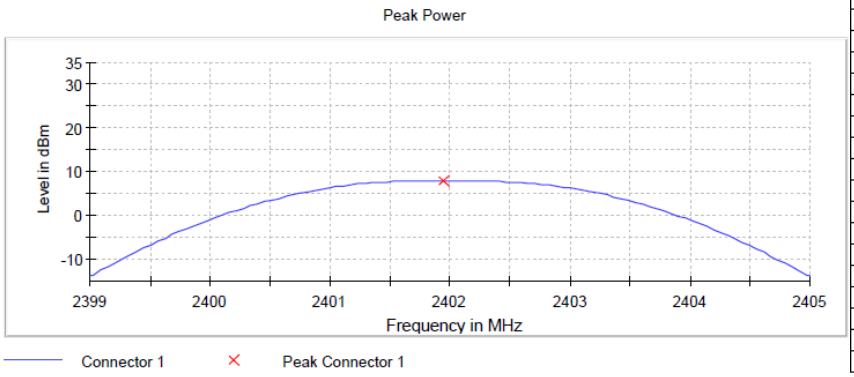


Setting	Instrument Value
Start Frequency	2.39900 GHz
Stop Frequency	2.40500 GHz
Span	6.000 MHz
RBW	2.000 MHz
VBW	10.000 MHz
SweepPoints	101
Sweeptime	1.000 ms
Reference Level	20.000 dBm
Attenuation	30.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.12 dB

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low, Measurement method = conducted
(S01_166_AB01)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	7.8	30.0	PASS

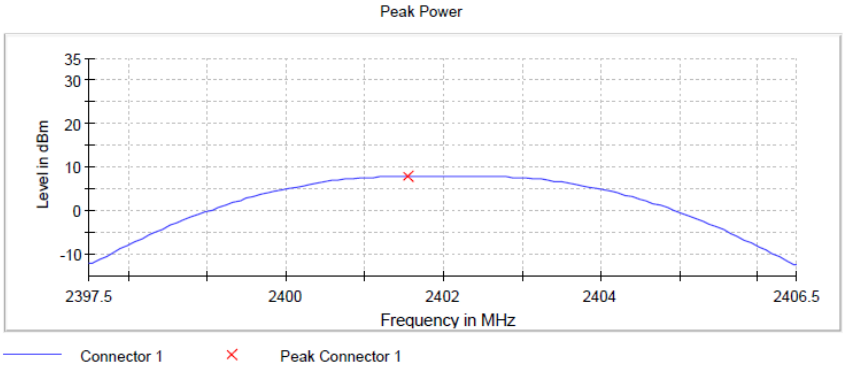


Setting	Instrument Value
Start Frequency	2.39900 GHz
Stop Frequency	2.40500 GHz
Span	6.000 MHz
RBW	2.000 MHz
VBW	10.000 MHz
SweepPoints	101
Sweeptime	1.000 ms
Reference Level	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.02 dB

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low, Measurement method = conducted
(S01_166_AB01)

Result

DUT Frequency (MHz)	Peak Power (dBm)	Limit Max (dBm)	Result
2402.000000	7.8	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	10.000 dBm
Attenuation	20.000 dB
Detector	MaxPeak
SweepCount	100
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	Sweep
Preamp	off
Stablemode	Trace
Stablevalue	0.50 dB
Run	4 / max. 150
Stable	3 / 3
Max Stable Difference	0.02 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

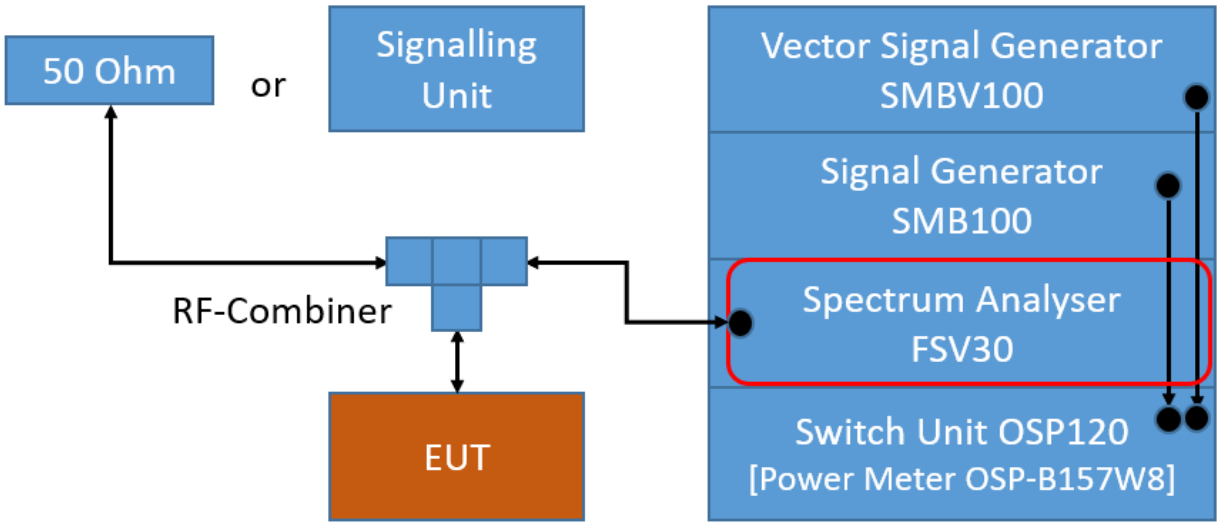
The Equipment Under Test (EUT) was set up to perform the spurious emissions measurements.

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.

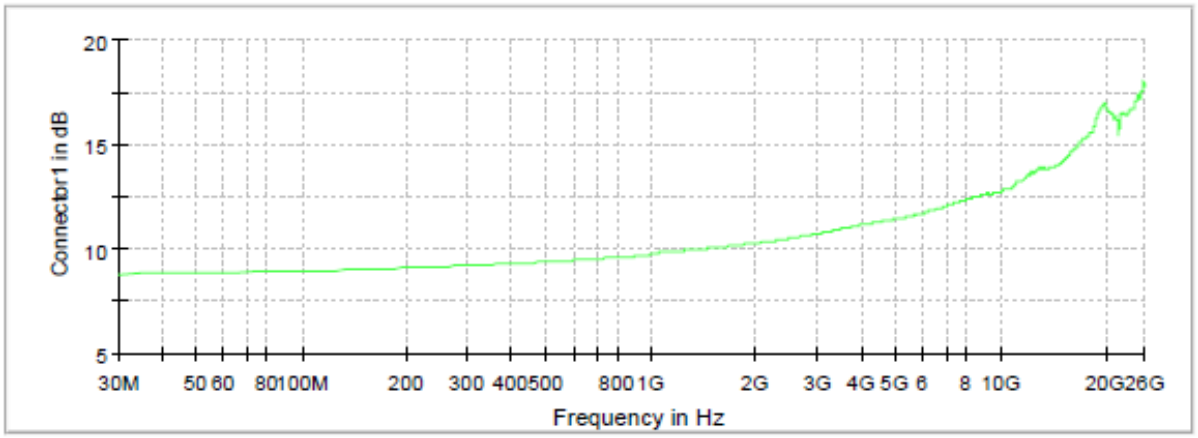
Analyser settings:

- 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: 23 °C
Air Pressure: 1006 hPa
Humidity: 53 %

BT GFSK

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
0	2402	2395.0	-53.7	PEAK	100	6.7	-13.3	40.4
39	2441	841.6	-44.7	PEAK	100	6.4	-13.6	31.1
78	2480	2488.5	-55.9	PEAK	100	6.4	-13.6	42.3

BT π/4 DQPSK

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
0	2402	2395.0	-48.6	PEAK	100	4.7	-15.3	33.3
39	2441	7325.7	-62.2	PEAK	100	2.4	-17.6	44.6
78	2480	2884.5	-56.2	PEAK	100	4.3	-15.7	40.5

BT 8-DPSK

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
0	2402	2395.0	-46.8	PEAK	100	4.1	-15.9	30.9
39	2441	7325.7	-59.4	PEAK	100	3.0	-17.0	42.4
78	2480	2488.5	-55.8	PEAK	100	2.0	-18.0	37.8

BT LE 1 Mbit/s

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
0	2402	881.4	-40.6	PEAK	100	5.6	-14.4	26.2
19	2440	891.4	-56.0	PEAK	100	6.3	-13.7	42.3
39	2480	881.4	-43.1	PEAK	100	6.7	-13.3	29.8

BT LE 2 Mbit/s

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
0	2402	2395.0	-27.0	PEAK	100	4.3	-15.7	11.3
19	2440	881.4	-44.5	PEAK	100	6.9	-13.1	31.4
39	2480	881.4	-44.3	PEAK	100	6.7	-13.3	31.0

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

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2395.0	-38.7	PEAK	100	8.0	-22.0	16.7
6	2437	1628.3	-45.0	PEAK	100	8.0	-22.0	23.0
11	2462	25855.1	-39.1	PEAK	100	8.0	-22.0	17.1

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

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2395.0	-38.1	PEAK	100	3.9	-26.1	12.0
6	2437	3248.1	-44.2	PEAK	100	5.9	-24.1	20.1
11	2462	24915.6	-39.9	PEAK	100	4.1	-25.9	14.0

WLAN n-Mode; 20 MHz; MCS0

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
1	2412	2395.0	-36.8	PEAK	100	2.8	-27.2	9.6
6	2437	2688.4	-47.8	PEAK	100	4.0	-26.0	21.8
11	2462	24865.7	-40.3	PEAK	100	3.1	-26.9	13.4

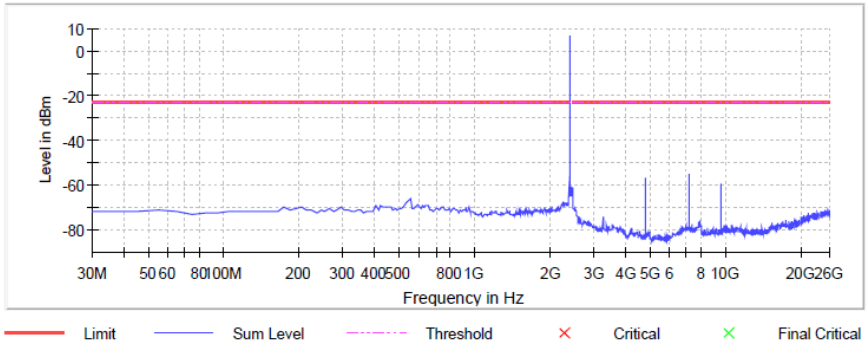
WLAN n-Mode; 40 MHz; MCS0

Channel No	Channel Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Ref. Level [dBm]	Limit [dBm]	Margin to Limit [dB]
3	2422	2395.0	-39.7	PEAK	100	0.3	-29.7	10.0
6	2437	2488.5	-44.2	PEAK	100	0.1	-29.9	14.3
9	2452	2488.5	-36.5	PEAK	100	1.1	-28.9	7.6

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

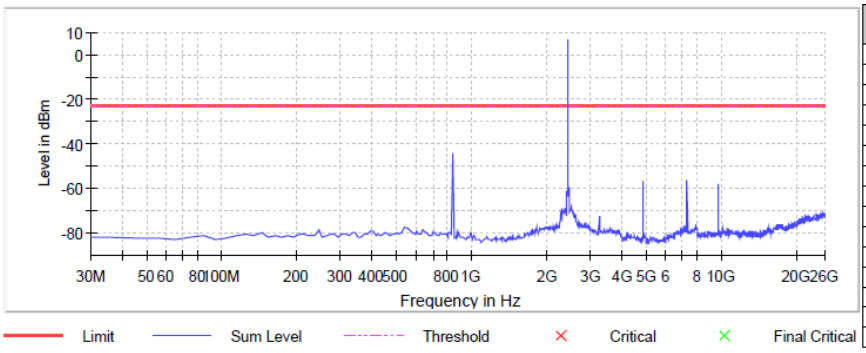
5.5.4 MEASUREMENT PLOT (EXAMPLE PLOT, SHOWING WORST CASE, IF APPLICABLE)

Radio Technology = Bluetooth BDR, Operating Frequency = low
(S01_166_AB01)



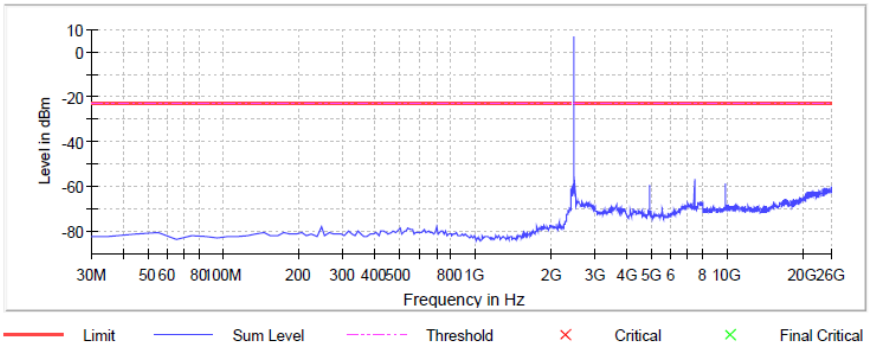
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-53.7	30.4	-23.3
7205.789099	-55.2	31.9	-23.3
4807.166065	-56.8	33.5	-23.3
9604.412133	-59.2	35.9	-23.3
2375.105042	-65.1	41.8	-23.3
2385.063025	-65.5	42.2	-23.3
552.794118	-66.1	42.8	-23.3
542.836134	-67.4	44.1	-23.3
532.878151	-68.0	44.7	-23.3
2235.693277	-68.0	44.7	-23.3
2345.231092	-68.1	44.8	-23.3
2335.273109	-68.1	44.8	-23.3
2315.357143	-68.1	44.8	-23.3
2325.315126	-68.2	44.9	-23.3
2285.483193	-68.3	45.0	-23.3

Radio Technology = Bluetooth BDR, Operating Frequency = mid
(S01_166_AB01)



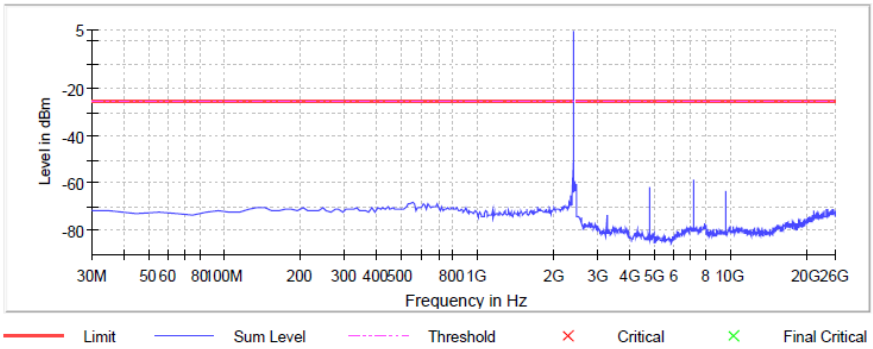
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
841.575630	-44.7	21.3	-23.4
7325.720251	-56.1	32.7	-23.4
4877.125903	-57.2	33.8	-23.4
9764.320336	-58.0	34.6	-23.4
4887.120166	-59.1	35.7	-23.4
2498.491394	-68.6	45.2	-23.4
2385.063025	-68.8	45.4	-23.4
2518.479919	-68.9	45.5	-23.4
2325.315126	-69.7	46.3	-23.4
2365.147059	-69.9	46.5	-23.4
2538.468445	-70.0	46.6	-23.4
2508.485657	-70.0	46.6	-23.4
2355.189076	-70.0	46.6	-23.4
2345.231092	-70.4	47.0	-23.4
2488.497131	-70.5	47.1	-23.4

Radio Technology = Bluetooth BDR, Operating Frequency = high
(S01_166_AB01)



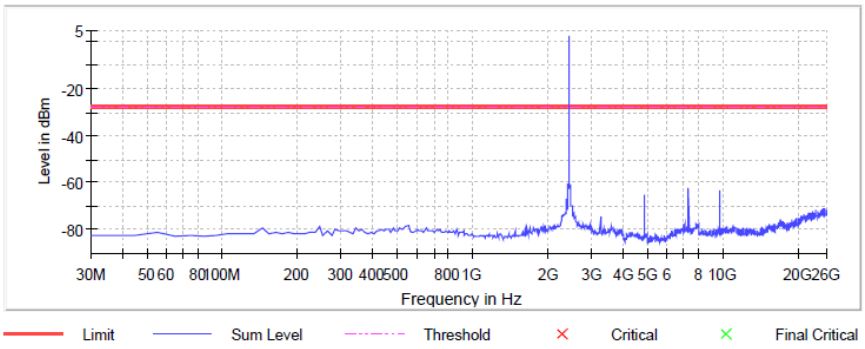
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2488.497131	-55.9	32.5	-23.4
7435.657140	-57.1	33.7	-23.4
9924.228538	-58.6	35.2	-23.4
4957.080004	-59.6	36.2	-23.4
25845.088929	-60.2	36.8	-23.4
24945.605291	-60.8	37.4	-23.4
25645.203676	-60.9	37.5	-23.4
24325.961007	-60.9	37.5	-23.4
25505.283999	-61.0	37.6	-23.4
25605.226626	-61.0	37.6	-23.4
25085.524968	-61.0	37.6	-23.4
24715.737250	-61.0	37.6	-23.4
24725.731513	-61.0	37.6	-23.4
23996.150340	-61.1	37.7	-23.4
25365.364322	-61.2	37.8	-23.4

Radio Technology = Bluetooth EDR 2, Operating Frequency = low
(S01_166_AB01)



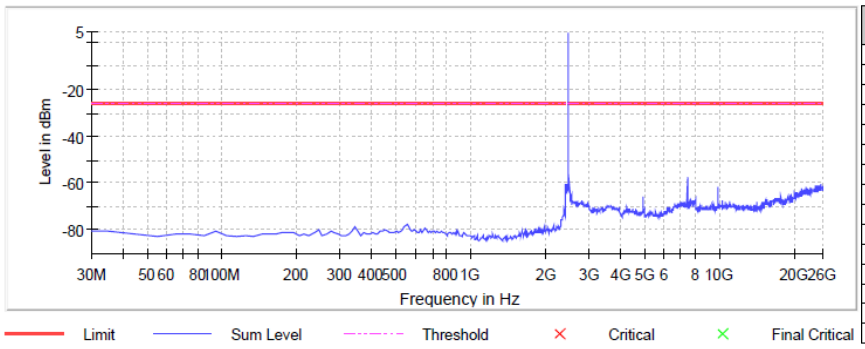
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-48.6	23.2	-25.3
7205.789099	-58.5	33.2	-25.3
4807.166065	-61.4	36.1	-25.3
9604.412133	-63.2	37.9	-25.3
2385.063025	-63.7	38.4	-25.3
2355.189076	-65.3	40.0	-25.3
2375.105042	-67.5	42.1	-25.3
2325.315126	-68.2	42.9	-25.3
552.794118	-68.3	42.9	-25.3
2345.231092	-68.5	43.2	-25.3
692.205882	-68.6	43.2	-25.3
542.836134	-68.7	43.4	-25.3
532.878151	-68.7	43.4	-25.3
612.542017	-68.8	43.4	-25.3
642.415966	-68.9	43.5	-25.3

Radio Technology = Bluetooth EDR 2, Operating Frequency = mid
(S01_166_AB01)



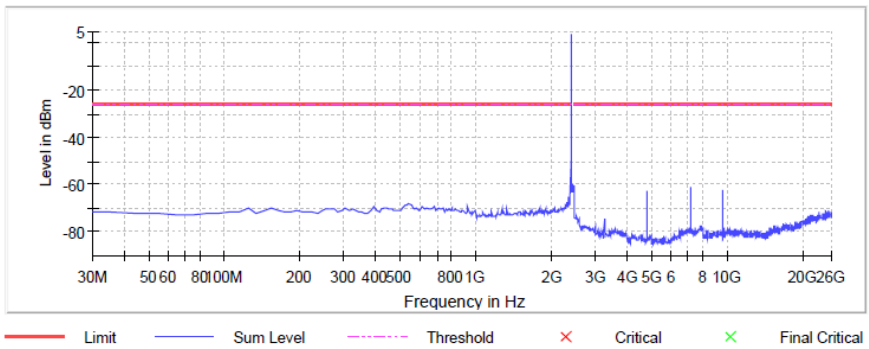
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7325.720251	-62.2	34.6	-27.6
9764.320336	-63.4	35.9	-27.6
4877.125903	-65.0	37.4	-27.6
4887.120166	-65.1	37.5	-27.6
2385.063025	-66.7	39.1	-27.6
2498.491394	-69.6	42.0	-27.6
2488.497131	-70.0	42.4	-27.6
25625.215151	-71.1	43.5	-27.6
25375.358585	-71.3	43.7	-27.6
2395.021008	-71.5	43.9	-27.6
23556.402784	-71.5	44.0	-27.6
25155.484807	-71.6	44.0	-27.6
25095.519231	-71.6	44.0	-27.6
24775.702826	-71.6	44.1	-27.6
25875.071717	-71.7	44.1	-27.6

Radio Technology = Bluetooth EDR 2, Operating Frequency = high
(S01_166_AB01)



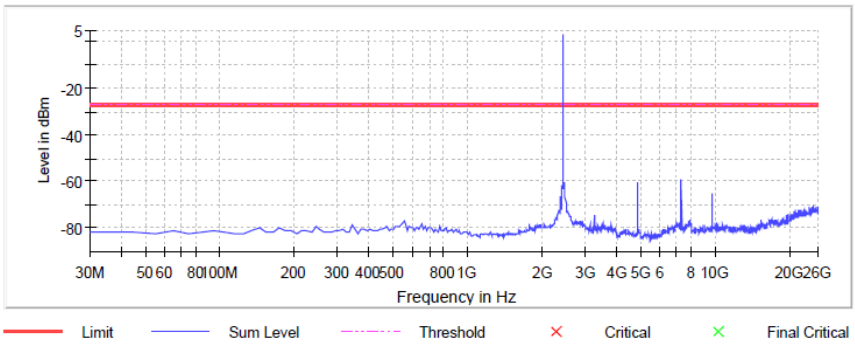
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2488.497131	-56.2	30.5	-25.7
7435.657140	-57.2	31.5	-25.7
25705.169252	-60.6	34.8	-25.7
25725.157777	-60.7	35.0	-25.7
24555.829048	-60.9	35.2	-25.7
25645.203676	-60.9	35.2	-25.7
24995.576604	-61.0	35.3	-25.7
25035.553655	-61.0	35.3	-25.7
24945.605291	-61.0	35.3	-25.7
25555.255312	-61.1	35.4	-25.7
24355.943795	-61.1	35.4	-25.7
25235.438908	-61.2	35.4	-25.7
24815.679877	-61.2	35.5	-25.7
24955.599554	-61.2	35.5	-25.7
25655.197939	-61.2	35.5	-25.7

Radio Technology = Bluetooth EDR 3, Operating Frequency = low
(S01_166_AB01)



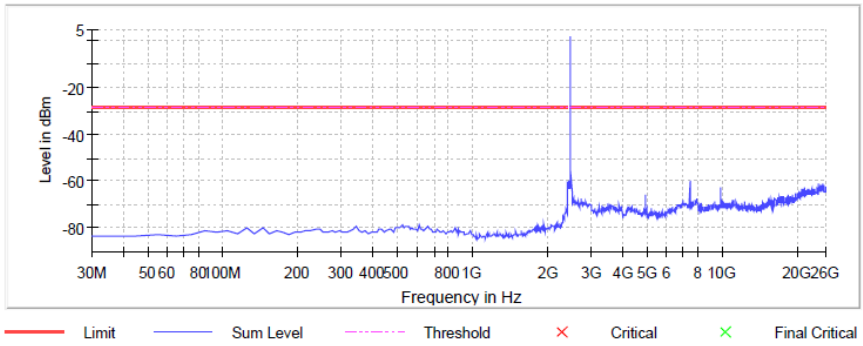
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-46.8	20.9	-25.9
7205.789099	-61.0	35.1	-25.9
9604.412133	-62.3	36.4	-25.9
4807.166065	-62.9	37.0	-25.9
2385.063025	-63.6	37.7	-25.9
2355.189076	-64.8	38.9	-25.9
2375.105042	-66.9	41.0	-25.9
2305.399160	-67.6	41.7	-25.9
542.836134	-68.1	42.1	-25.9
522.920168	-68.5	42.6	-25.9
552.794118	-68.6	42.7	-25.9
532.878151	-68.6	42.7	-25.9
2285.483193	-68.7	42.7	-25.9
2365.147059	-68.7	42.8	-25.9
2345.231092	-68.8	42.9	-25.9

Radio Technology = Bluetooth EDR 3, Operating Frequency = mid
(S01_166_AB01)



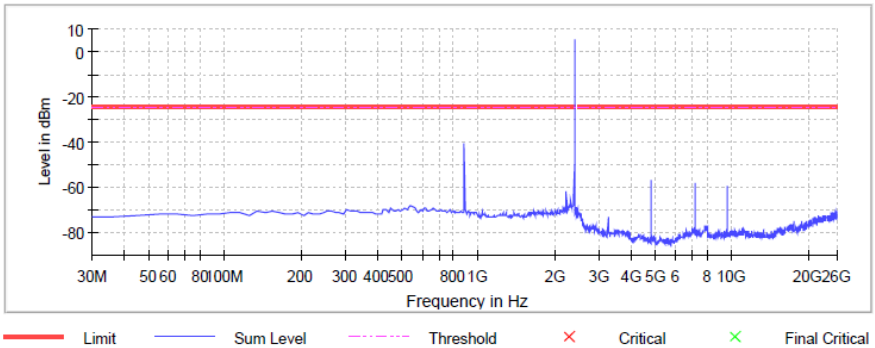
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7325.720251	-59.4	32.4	-27.0
4887.120166	-60.6	33.6	-27.0
4877.125903	-61.0	34.0	-27.0
9764.320336	-65.3	38.3	-27.0
2385.063025	-66.5	39.5	-27.0
2488.497131	-66.8	39.8	-27.0
2498.491394	-69.3	42.3	-27.0
24995.576604	-70.7	43.7	-27.0
25525.272524	-70.7	43.7	-27.0
25885.065980	-70.9	43.9	-27.0
25655.197939	-71.0	44.0	-27.0
25965.020081	-71.0	44.0	-27.0
24445.892159	-71.0	44.0	-27.0
25545.261050	-71.1	44.1	-27.0
23896.207714	-71.3	44.3	-27.0

Radio Technology = Bluetooth EDR 3, Operating Frequency = high
(S01_166_AB01)



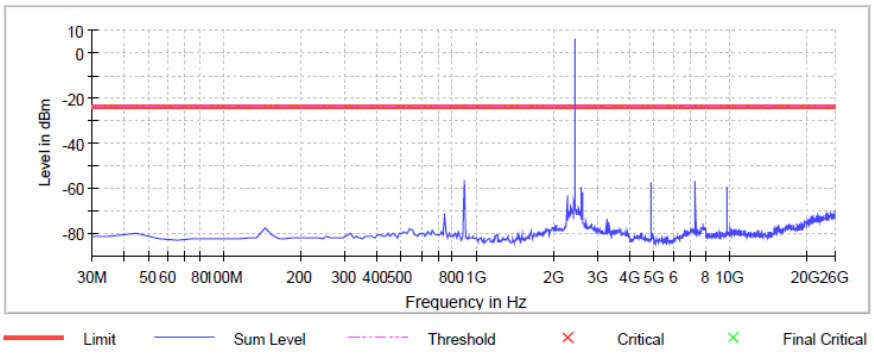
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2488.497131	-55.8	27.8	-28.0
7435.657140	-59.6	31.6	-28.0
24325.961007	-60.8	32.9	-28.0
25135.496281	-61.2	33.2	-28.0
25675.186464	-61.2	33.3	-28.0
25665.192201	-61.3	33.4	-28.0
25565.249575	-61.4	33.4	-28.0
25305.398746	-61.4	33.4	-28.0
24805.685614	-61.5	33.5	-28.0
25175.473332	-61.6	33.6	-28.0
25685.180727	-61.7	33.7	-28.0
25355.370059	-61.7	33.8	-28.0
25745.146303	-61.8	33.8	-28.0
25165.479069	-61.9	33.9	-28.0
25765.134828	-61.9	33.9	-28.0

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = low
(S01_166_AB01)



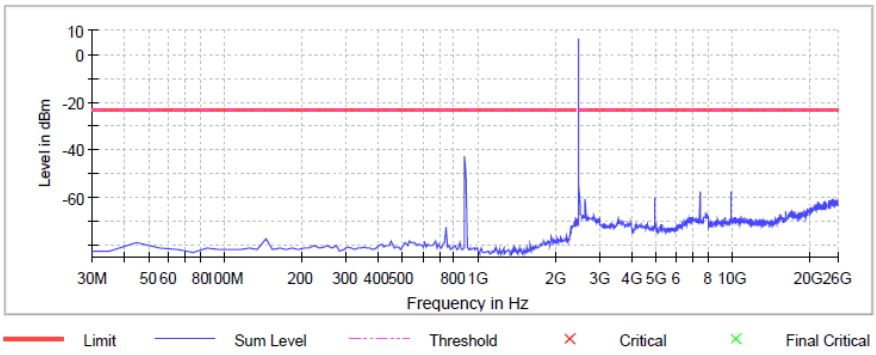
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
881.407563	-40.6	16.1	-24.4
2395.021008	-48.6	24.2	-24.4
4807.166065	-57.0	32.5	-24.4
7205.789099	-58.3	33.8	-24.4
9604.412133	-59.6	35.2	-24.4
2225.735294	-61.7	37.3	-24.4
2385.063025	-65.2	40.8	-24.4
2325.315126	-65.4	40.9	-24.4
2375.105042	-67.3	42.8	-24.4
2365.147059	-67.9	43.4	-24.4
542.836134	-68.1	43.7	-24.4
2345.231092	-68.2	43.7	-24.4
2315.357143	-68.5	44.1	-24.4
2355.189076	-68.5	44.1	-24.4
2335.273109	-68.6	44.1	-24.4

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = mid
(S01_166_AB01)



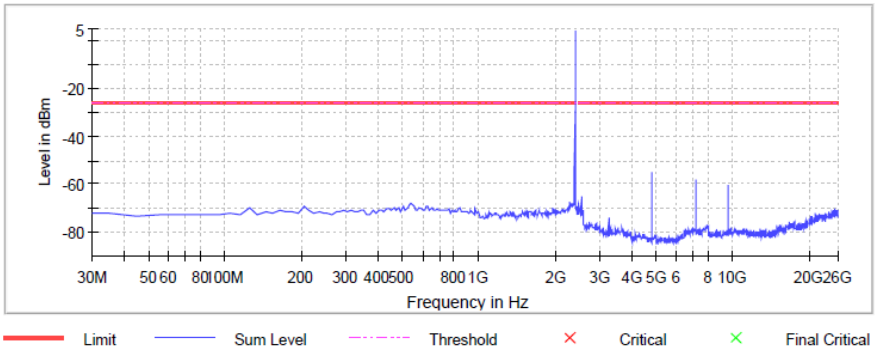
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
891.365546	-56.0	32.3	-23.7
7315.725988	-56.7	33.0	-23.7
4877.125903	-57.7	34.1	-23.7
2578.445495	-59.5	35.9	-23.7
9764.320336	-59.6	35.9	-23.7
9754.326073	-59.6	35.9	-23.7
2618.422546	-61.9	38.2	-23.7
7325.720251	-62.1	38.5	-23.7
2265.567227	-62.9	39.3	-23.7
2355.189076	-68.4	44.7	-23.7
2518.479919	-68.9	45.3	-23.7
2345.231092	-69.4	45.8	-23.7
2385.063025	-69.9	46.2	-23.7
25965.020081	-70.1	46.4	-23.7
2365.147059	-70.1	46.5	-23.7

Radio Technology = Bluetooth LE 1 Mbps, Operating Frequency = high
(S01_166_AB01)



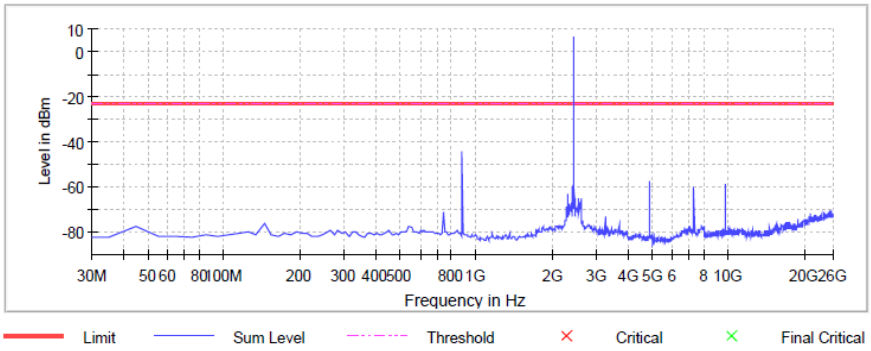
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
881.407563	-43.1	19.8	-23.3
891.365546	-50.1	26.8	-23.3
2488.497131	-54.0	30.7	-23.3
7435.657140	-57.4	34.1	-23.3
9914.234275	-57.5	34.2	-23.3
9924.228538	-58.4	35.0	-23.3
4957.080004	-60.2	36.9	-23.3
24815.679877	-60.5	37.2	-23.3
2628.416808	-60.5	37.2	-23.3
7445.651402	-60.7	37.4	-23.3
25725.157777	-60.7	37.4	-23.3
24445.892159	-60.7	37.4	-23.3
24455.886422	-61.0	37.7	-23.3
25425.329898	-61.1	37.8	-23.3
24785.697089	-61.2	37.9	-23.3

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = low
(S01_166_AB01)



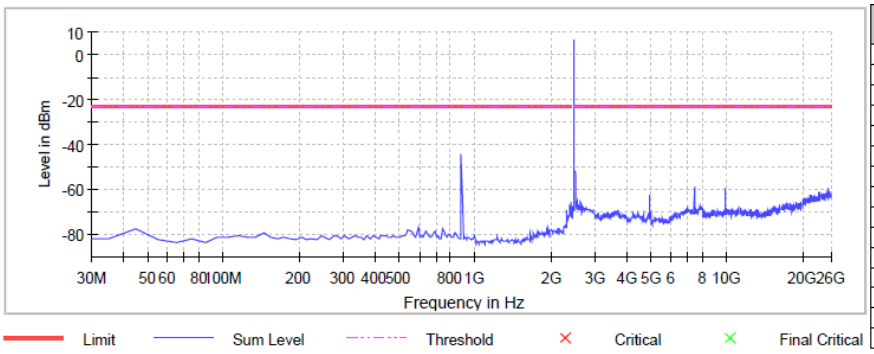
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-27.0	1.2	-25.7
4807.166065	-55.1	29.3	-25.7
2385.063025	-56.1	30.3	-25.7
7205.789099	-57.9	32.2	-25.7
9604.412133	-60.5	34.7	-25.7
9614.406396	-61.3	35.6	-25.7
2528.474182	-65.1	39.4	-25.7
2275.525210	-67.6	41.8	-25.7
2375.105042	-67.6	41.9	-25.7
542.836134	-67.9	42.1	-25.7
2315.357143	-68.0	42.2	-25.7
2345.231092	-68.2	42.5	-25.7
2305.399160	-68.3	42.5	-25.7
2295.441176	-68.4	42.7	-25.7
532.878151	-68.6	42.9	-25.7

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = mid
(S01_166_AB01)



Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
881.407563	-44.5	21.4	-23.1
4877.125903	-57.3	34.1	-23.1
9754.326073	-58.6	35.4	-23.1
7325.720251	-60.3	37.1	-23.1
7315.725988	-60.5	37.4	-23.1
9764.320336	-61.4	38.3	-23.1
2305.399160	-63.4	40.3	-23.1
2538.468445	-64.7	41.6	-23.1
2598.434020	-64.8	41.7	-23.1
2578.445495	-66.7	43.6	-23.1
2528.474182	-67.2	44.0	-23.1
2345.231092	-67.6	44.4	-23.1
2608.428283	-68.1	45.0	-23.1
2488.497131	-68.6	45.5	-23.1
2568.451232	-68.7	45.6	-23.1

Radio Technology = Bluetooth LE 2 Mbps, Operating Frequency = high
(S01_166_AB01)



Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
881.407563	-44.3	21.0	-23.3
2488.497131	-51.3	28.0	-23.3
2498.491394	-53.3	30.0	-23.3
7445.651402	-58.9	35.6	-23.3
25265.421696	-59.3	36.0	-23.3
7435.657140	-59.4	36.1	-23.3
9914.234275	-59.6	36.3	-23.3
25665.192201	-60.3	37.1	-23.3
25585.238100	-60.5	37.2	-23.3
891.365546	-60.6	37.3	-23.3
23216.597854	-61.2	38.0	-23.3
24985.582342	-61.3	38.0	-23.3
23676.333935	-61.3	38.1	-23.3
25015.565130	-61.3	38.1	-23.3
24955.599554	-61.4	38.1	-23.3

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 integral antenna or 50 Ohm termination at antenna port

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:

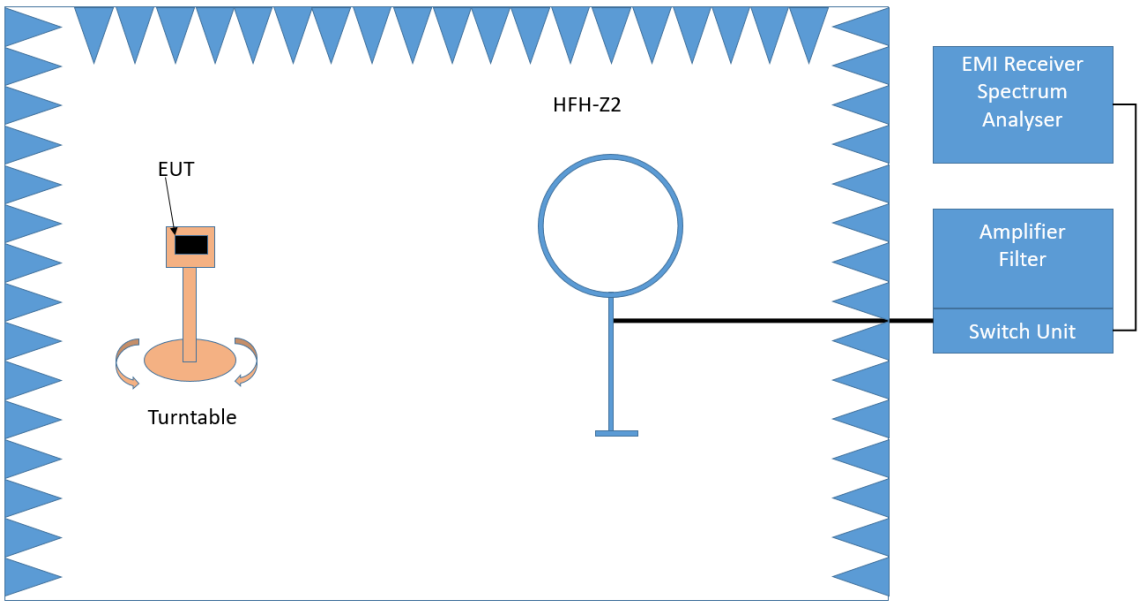
- < 30 MHz: Chapter 6.4
- 30 MHz – 1 GHz: Chapter 6.5
- > 1 GHZ: Chapter 6.6 (procedure according 6.6.5 used)

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)

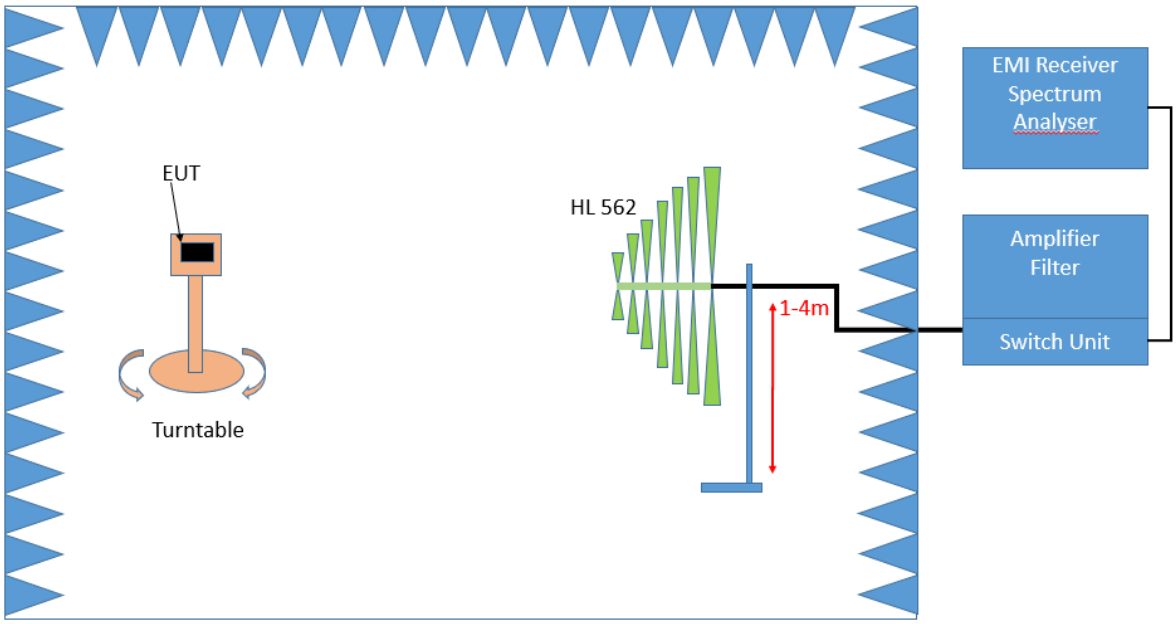
Intention of this step is, to determine the radiated EMI-profile of the EUT. Afterwards the relevant emissions for the final measurement are identified.

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 ± 45° around this value. During this action, the value of emission is continuously measured. The turntable azimuth at the highest emission will be recorded and adjusted. In this position, the antenna height will also slowly vary by ± 100 cm around the antenna height determined. During this action, the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.

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

Step 3: Final measurement with QP detector

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

EMI receiver settings for step 3:

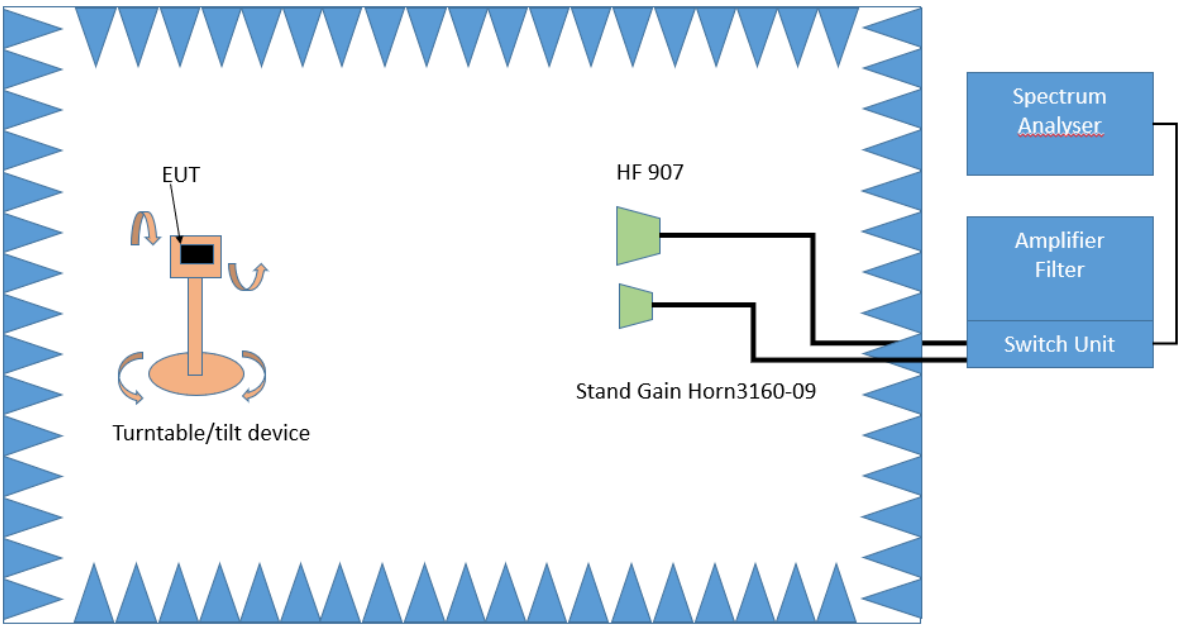
- Detector: Quasi-Peak (< 1 GHz)
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 1 s

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

Above 1 GHz:

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

3. Measurement above 1 GHz



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

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

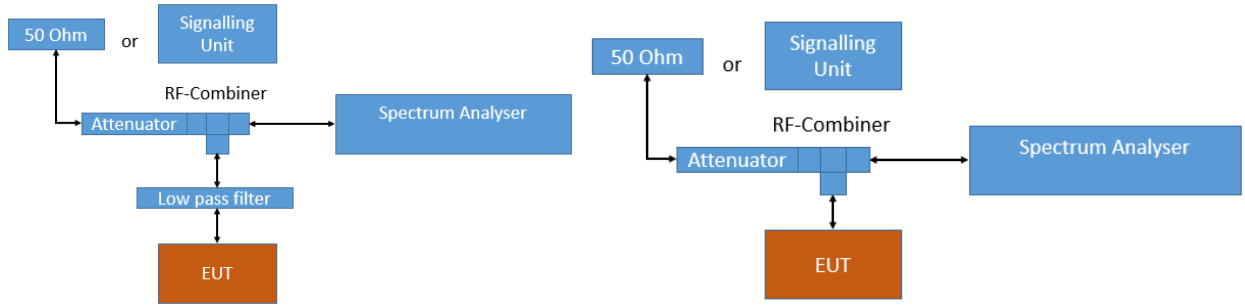
Step 2:
The turn table azimuth will slowly vary by ± 22.5°.
The elevation angle will slowly vary by ± 45°
Spectrum analyser settings:
- Detector: Peak

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

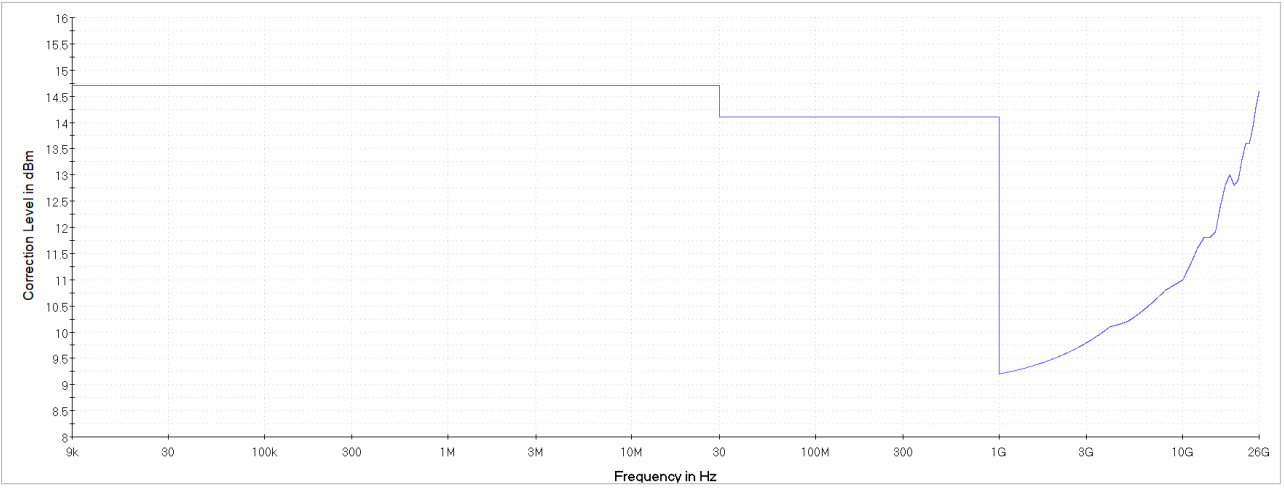
Conducted Measurements at antenna ports

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.



Measurement <1GHz Measurement >1GHz



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

5.6.3 TEST PROTOCOL

Ambient temperature: 24-30 °C
Air Pressure: 990–1020 hPa
Humidity: 30–40 %
BT GFSK
Applied duty cycle correction (AV): 0.1 dB

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Radiated Integral Antenna	2402	4804.0	55.3	PEAK	1000	74.0	18.7	RB
Radiated Integral Antenna	2402	4804.0	49.1	AV	1000	54.0	4.9	RB
Radiated Integral Antenna	2441	4882.4	58.1	PEAK	1000	74.0	15.9	RB
Radiated Integral Antenna	2441	4882.2	51.8	AV	1000	54.0	2.2	RB
Radiated Integral Antenna	2441	7322.3	60.1	PEAK	1000	74.0	13.9	RB
Radiated Integral Antenna	2441	7322.3	50.2	AV	1000	54.0	3.8	RB
Radiated Integral Antenna	2480	4960.0	56.2	PEAK	1000	74.0	17.8	RB
Radiated Integral Antenna	2480	4960.0	52.4	AV	1000	54.0	1.6	RB
Radiated 50 Ohm Termination	2480	4960.9	52.2	PEAK	1000	74.0	21.8	RB
Radiated 50 Ohm Termination	2480	4960.9	45.7	AV	1000	54.0	8.3	RB
Radiated 50 Ohm Termination	2480	7439.5	50.1	PEAK	1000	74.0	23.9	RB
Radiated 50 Ohm Termination	2480	7439.5	41.0	AV	1000	54.0	13.0	RB
Conducted	2402	4804.3	46.7	PEAK	1000	74.0	27.3	RB
Conducted	2402	4804.0	41.5	AV	1000	54.0	12.5	RB
Conducted	2441	4881.8	46.8	PEAK	1000	74.0	27.2	RB
Conducted	2441	4881.0	39.9	AV	1000	54.0	14.1	RB
Conducted	2480	4960.1	45.9	PEAK	1000	74.0	28.1	RB
Conducted	2480	4960.0	38.0	AV	1000	54.0	16.0	RB
Conducted	2480	7439.8	49.5	PEAK	1000	74.0	24.5	RB
Conducted	2480	7440.1	41.0	AV	1000	54.0	13.0	RB

BT π/4 DQPSK
Applied duty cycle correction (AV): 0.2 dB

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Conducted	2402	4804.3	45.4	PEAK	1000	74.0	28.6	RB
Conducted	2402	4804.0	37.5	AV	1000	54.0	16.5	RB
Conducted	2441	4882.3	44.4	PEAK	1000	74.0	29.6	RB
Conducted	2441	4882.0	36.3	AV	1000	54.0	17.7	RB
Conducted	2441	7321.8	48.4	PEAK	1000	74.0	25.6	RB
Conducted	2441	7323.1	40.4	AV	1000	54.0	13.6	RB
Conducted	2480	4959.8	44.8	PEAK	1000	74.0	29.2	RB
Conducted	2480	4960.3	36.5	AV	1000	54.0	17.5	RB
Conducted	2480	7439.3	48.6	PEAK	1000	74.0	25.4	RB
Conducted	2480	7440.2	39.8	AV	1000	54.0	14.2	RB

BT 8-DPSK
Applied duty cycle correction (AV): 0.3 dB

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Conducted	2402	4803.6	45.2	PEAK	1000	74.0	28.8	RB
Conducted	2402	4803.7	37.5	AV	1000	54.0	16.5	RB
Conducted	2441	4882.1	45.3	PEAK	1000	74.0	28.7	RB
Conducted	2441	4882.0	36.7	AV	1000	54.0	17.3	RB
Conducted	2441	7322.8	48.2	PEAK	1000	74.0	25.8	RB
Conducted	2441	7323.1	40.9	AV	1000	54.0	13.1	RB
Conducted	2480	4958.3	45.1	PEAK	1000	74.0	28.9	RB
Conducted	2480	4960.2	36.5	AV	1000	54.0	17.5	RB
Conducted	2480	7349.3	50.8	PEAK	1000	74.0	23.2	RB
Conducted	2480	7440.3	39.8	AV	1000	54.0	14.2	RB

BT LE 1 Mbit/s
Applied duty cycle correction (AV): 1.4 dB

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Conducted	2402	4804.8	47.8	PEAK	1000	74.0	26.2	RB
Conducted	2402	4803.8	41.6	AV	1000	54.0	12.4	RB
Conducted	2440	4880.3	46.3	PEAK	1000	74.0	27.7	RB
Conducted	2440	4880.1	40.2	AV	1000	54.0	13.8	RB
Conducted	2440	7319.6	49.3	PEAK	1000	74.0	24.7	RB
Conducted	2440	7320.3	42.2	AV	1000	54.0	11.8	RB
Conducted	2480	4959.8	46.3	PEAK	1000	74.0	27.7	RB
Conducted	2480	4960.3	38.3	AV	1000	54.0	15.7	RB
Conducted	2480	7440.3	49.1	PEAK	1000	74.0	24.9	RB
Conducted	2480	7440.1	41.2	AV	1000	54.0	12.8	RB

BT LE 2 Mbit/s
Applied duty cycle correction (AV): 7.4 dB

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Conducted	2402	4803.3	47.1	PEAK	1000	74.0	26.9	RB
Conducted	2402	4804.8	44.1	AV	1000	54.0	9.9	RB
Conducted	2440	4878.8	46.4	PEAK	1000	74.0	27.6	RB
Conducted	2440	4879.1	43.5	AV	1000	54.0	10.5	RB
Conducted	2440	7318.6	48.4	PEAK	1000	74.0	25.6	RB
Conducted	2440	7318.5	46.6	AV	1000	54.0	7.4	RB
Conducted	2480	4960.6	45.5	PEAK	1000	74.0	28.5	RB
Conducted	2480	4960.9	43.1	AV	1000	54.0	10.9	RB
Conducted	2480	7438.3	48.5	PEAK	1000	74.0	25.5	RB
Conducted	2480	7438.5	45.9	AV	1000	54.0	8.1	RB

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

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Radiated Integral Antenna	2412	12061.6	55.3	PEAK	1000	74.0	18.7	RB
Radiated Integral Antenna	2412	12061.6	47.9	PEAK	1000	74.0	26.1	RB
Radiated Integral Antenna	2412	19295.7	54.2	PEAK	1000	74.0	19.8	RB
Radiated Integral Antenna	2412	19295.7	47.2	AV	1000	54.0	6.8	RB
Conducted	2412	2711.4	56.4	PEAK	1000	74.0	17.6	RB
Conducted	2412	2712.1	47.5	AV	1000	54.0	6.5	RB
Conducted	2412	3618.9	58.8	PEAK	1000	74.0	15.2	RB
Conducted	2412	3617.7	53.4	AV	1000	54.0	0.6	RB
Radiated Integral Antenna	2437	7312.8	54.1	PEAK	1000	74.0	19.9	RB
Radiated Integral Antenna	2437	7312.8	48.0	AV	1000	54.0	6.0	RB
Radiated Integral Antenna	2437	12185.4	56.8	PEAK	1000	74.0	17.2	RB
Radiated Integral Antenna	2437	12185.4	49.6	AV	1000	54.0	4.4	RB
Conducted	2437	1608.1	56.2	PEAK	1000	74.0	17.8	RB
Conducted	2437	1608.0	53.5	AV	1000	54.0	0.5	RB
Conducted	2437	2712.3	57.0	PEAK	1000	74.0	17.0	RB
Conducted	2437	2712.3	46.8	AV	1000	54.0	7.2	RB
Conducted	2437	3618.1	58.9	PEAK	1000	74.0	15.1	RB
Conducted	2437	3618.1	53.4	AV	1000	54.0	0.6	RB
Radiated Integral Antenna	2462	7384.5	54.9	PEAK	1000	74.0	19.1	RB
Radiated Integral Antenna	2462	7384.5	48.4	AV	1000	54.0	5.6	RB
Radiated Integral Antenna	2462	12309.3	57.9	PEAK	1000	74.0	16.1	RB
Radiated Integral Antenna	2462	12309.3	51.3	AV	1000	54.0	2.7	RB
Radiated 50 Ohm Termination	2462	7385.0	55.1	PEAK	1000	74.0	18.9	RB
Radiated 50 Ohm Termination	2462	7385.0	48.6	AV	1000	54.0	5.4	RB
Radiated 50 Ohm Termination	2462	12310.6	53.8	PEAK	1000	74.0	20.2	RB
Radiated 50 Ohm Termination	2462	12310.6	46.0	AV	1000	54.0	8.0	RB
Conducted	2462	2228.9	56.4	PEAK	1000	74.0	17.6	RB
Conducted	2462	2228.8	44.0	AV	1000	54.0	10.0	RB
Conducted	2462	2729.9	55.8	PEAK	1000	74.0	18.2	RB
Conducted	2462	2729.9	44.7	AV	1000	54.0	9.3	RB
Conducted	2462	3692.9	57.2	PEAK	1000	74.0	16.8	RB
Conducted	2462	3693.1	51.5	AV	1000	54.0	2.5	RB

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

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Conducted	2412	1608.1	52.0	PEAK	1000	74.0	22.0	RB
Conducted	2412	1607.8	44.0	AV	1000	54.0	10.0	RB
Conducted	2412	2719.9	56.1	PEAK	1000	74.0	17.9	RB
Conducted	2412	2720.6	44.0	AV	1000	54.0	10.0	RB
Conducted	2412	3620.4	57.5	PEAK	1000	74.0	16.5	RB
Conducted	2412	3620.1	48.0	AV	1000	54.0	6.0	RB
Conducted	2437	1625.1	53.8	PEAK	1000	74.0	20.2	RB
Conducted	2437	1624.8	46.4	AV	1000	54.0	7.6	RB
Conducted	2437	2712.4	56.7	PEAK	1000	74.0	17.3	RB
Conducted	2437	2712.1	45.2	AV	1000	54.0	8.8	RB
Conducted	2437	3648.1	59.1	PEAK	1000	74.0	14.9	RB
Conducted	2437	3648.4	49.2	AV	1000	54.0	4.8	RB
Conducted	2462	2234.1	56.7	PEAK	1000	74.0	17.3	RB
Conducted	2462	2234.0	43.1	AV	1000	54.0	10.9	RB
Conducted	2462	2726.6	57.9	PEAK	1000	74.0	16.1	RB
Conducted	2462	2726.1	44.8	AV	1000	54.0	9.2	RB
Conducted	2462	3694.6	55.2	PEAK	1000	74.0	18.8	RB
Conducted	2462	3695.4	46.1	AV	1000	54.0	7.9	RB

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

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Conducted	2412	1607.9	51.0	PEAK	1000	74.0	23.1	RB
Conducted	2412	1608.0	44.1	AV	1000	54.0	9.9	RB
Conducted	2412	2720.1	55.6	PEAK	1000	74.0	18.4	RB
Conducted	2412	2720.1	43.2	AV	1000	54.0	10.8	RB
Conducted	2412	3614.9	56.4	PEAK	1000	74.0	17.6	RB
Conducted	2412	3615.4	47.0	AV	1000	54.0	7.0	RB
Conducted	2437	2203.1	55.5	PEAK	1000	74.0	18.5	RB
Conducted	2437	2203.3	43.0	AV	1000	54.0	11.0	RB
Conducted	2437	2693.9	57.8	PEAK	1000	74.0	16.2	RB
Conducted	2437	2693.6	44.8	AV	1000	54.0	9.2	RB
Conducted	2437	3659.4	57.4	PEAK	1000	74.0	16.6	RB
Conducted	2437	3659.4	46.7	AV	1000	54.0	7.3	RB
Conducted	2462	2211.4	55.4	PEAK	1000	74.0	18.6	RB
Conducted	2462	2211.5	43.0	AV	1000	54.0	11.0	RB
Conducted	2462	2713.1	55.6	PEAK	1000	74.0	18.4	RB
Conducted	2462	2713.6	44.4	AV	1000	54.0	9.6	RB
Conducted	2462	3685.9	54.7	PEAK	1000	74.0	19.3	RB
Conducted	2462	3685.6	45.8	AV	1000	54.0	8.2	RB

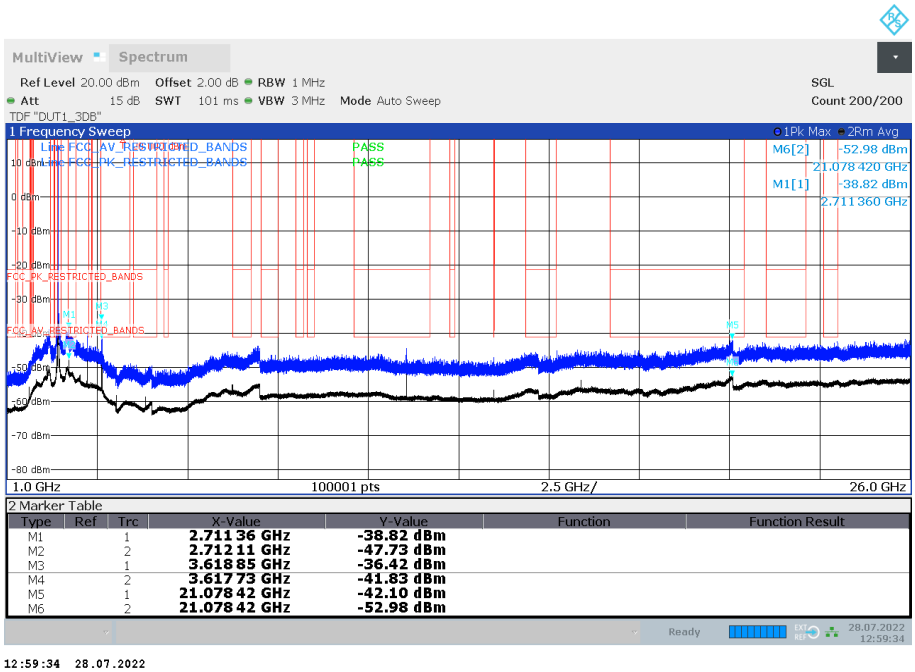
WLAN n-Mode; 40 MHz; MCS0
Applied duty cycle correction (AV): 0.2 dB

Measurement Method	Ch. Center Freq. [MHz]	Spurious Freq. [MHz]	Spurious Level [dBµV/m]	Detec-tor	RBW [kHz]	Limit [dBµV/m]	Margin to Limit [dB]	Limit Type
Conducted	2422	1614.9	51.2	PEAK	1000	74.0	22.9	RB
Conducted	2422	1614.5	41.6	AV	1000	54.0	12.4	RB
Conducted	2422	2710.1	53.8	PEAK	1000	74.0	20.2	RB
Conducted	2422	2708.6	43.1	AV	1000	54.0	10.9	RB
Conducted	2422	3618.1	53.7	PEAK	1000	74.0	20.3	RB
Conducted	2422	3617.1	44.4	AV	1000	54.0	9.6	RB
Conducted	2452	2204.6	54.4	PEAK	1000	74.0	19.6	RB
Conducted	2452	2707.6	43.2	AV	1000	54.0	10.8	RB
Conducted	2452	2707.6	54.5	PEAK	1000	74.0	19.5	RB
Conducted	2452	3269.1	44.0	AV	1000	54.0	10.0	RB
Conducted	2452	3269.4	53.9	PEAK	1000	74.0	20.1	RB
Conducted	2452	3269.4	48.1	AV	1000	54.0	5.9	RB

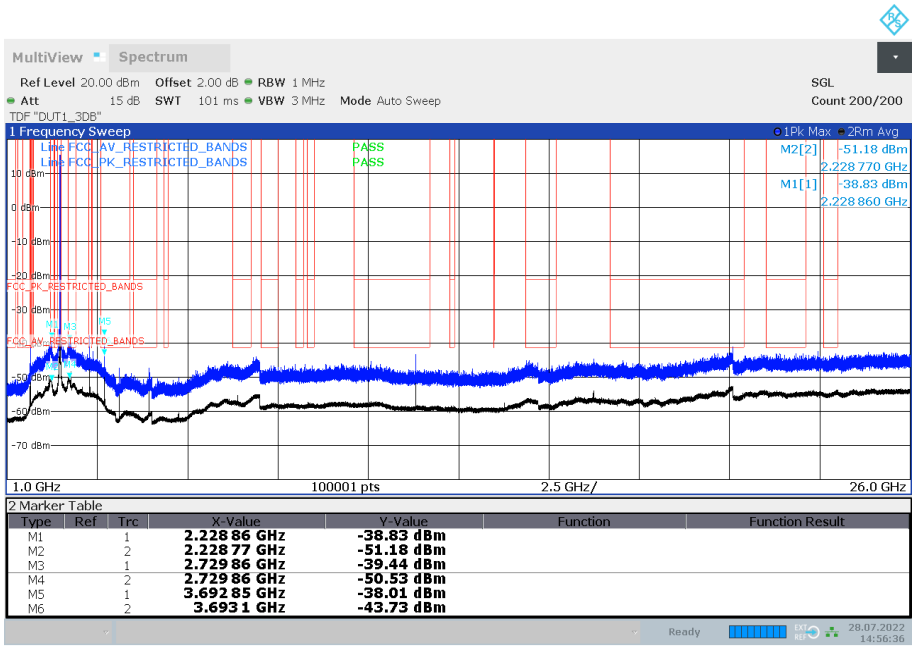
Remark: Please see next sub-clause for the measurement plot.

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

Radio Technology = WLAN b, Operating Frequency = low, Measurement range = 1 GHz - 26 GHz
(S01_166_AB01)



Radio Technology = WLAN b, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S01_166_AB01)



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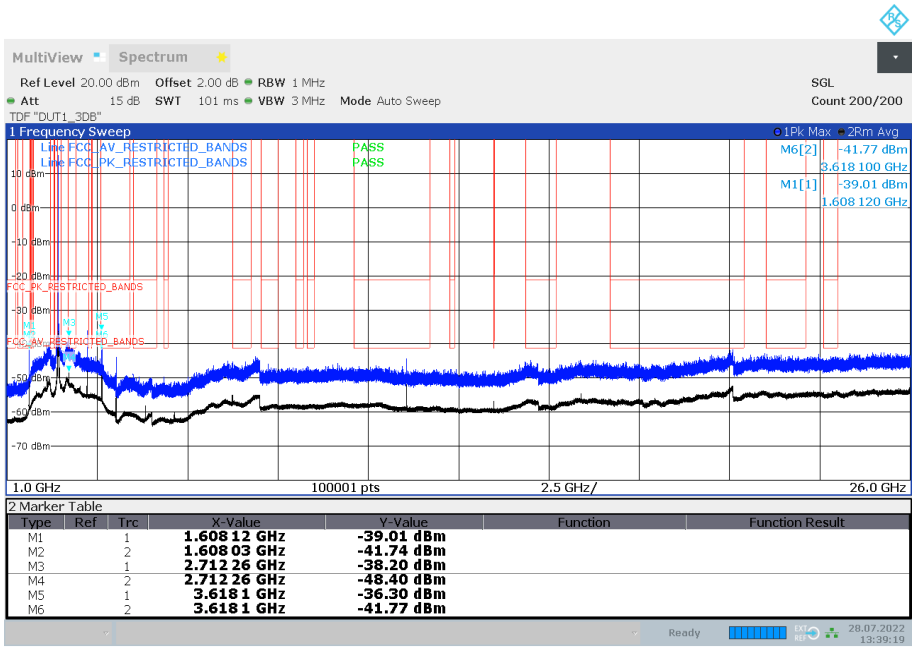
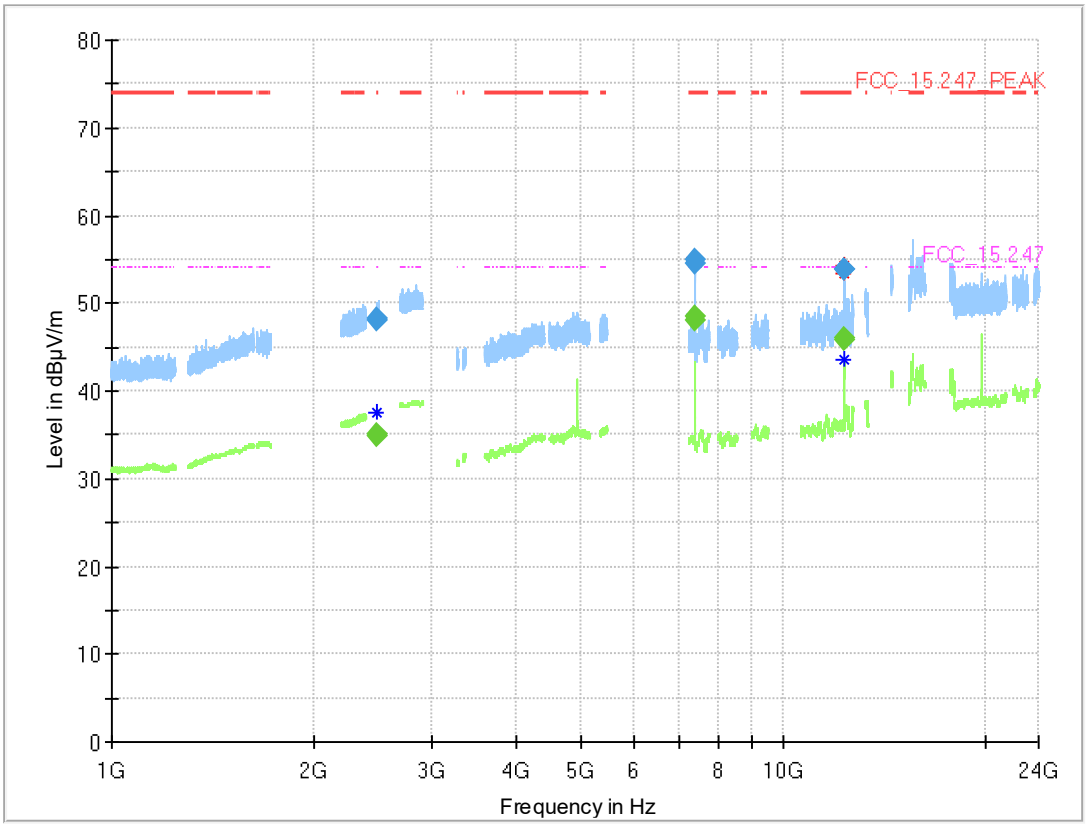
Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 1 GHz - 26 GHz
(S01_166_AB01)



13:39:20 28.07.2022

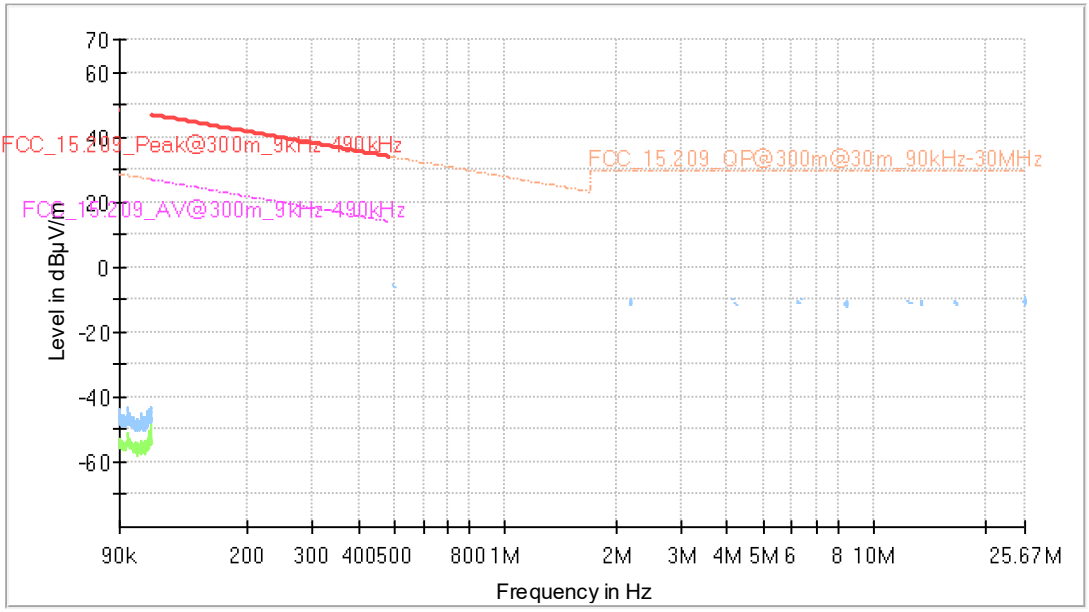
Radio Technology = WLAN b, Operating Frequency = high, Measurement range = 1 GHz - 26 GHz
(S02_166_AB01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2483.500	48.1	---	74.00	25.93	1000.0	1000.000	150.0	H	64.0	105.0	5.3
2483.500	---	35.0	54.00	18.96	1000.0	1000.000	150.0	H	64.0	105.0	5.3
2483.995	48.2	---	74.00	25.78	1000.0	1000.000	150.0	V	-66.0	91.0	5.3
2483.995	---	35.0	54.00	19.04	1000.0	1000.000	150.0	V	-66.0	91.0	5.3
7384.375	54.5	---	74.00	19.55	1000.0	1000.000	150.0	H	62.0	94.0	-14.2
7384.375	---	48.1	54.00	5.91	1000.0	1000.000	150.0	H	62.0	94.0	-14.2
7385.000	55.1	---	74.00	18.92	1000.0	1000.000	150.0	H	65.0	105.0	-14.2
7385.000	---	48.6	54.00	5.40	1000.0	1000.000	150.0	H	65.0	105.0	-14.2
12310.555	---	45.7	54.00	8.29	1000.0	1000.000	150.0	H	-31.0	75.0	-7.0
12310.555	53.8	---	74.00	20.22	1000.0	1000.000	150.0	H	-31.0	75.0	-7.0
12310.660	---	46.0	54.00	8.04	1000.0	1000.000	150.0	V	-180.0	8.0	-7.0
12310.660	53.7	---	74.00	20.25	1000.0	1000.000	150.0	V	-180.0	8.0	-7.0

Radio Technology = Bluetooth BDR, Operating Frequency = mid, Measurement range = 9 kHz - 30 MHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Azimuth (deg)	Corr. (dB/m)
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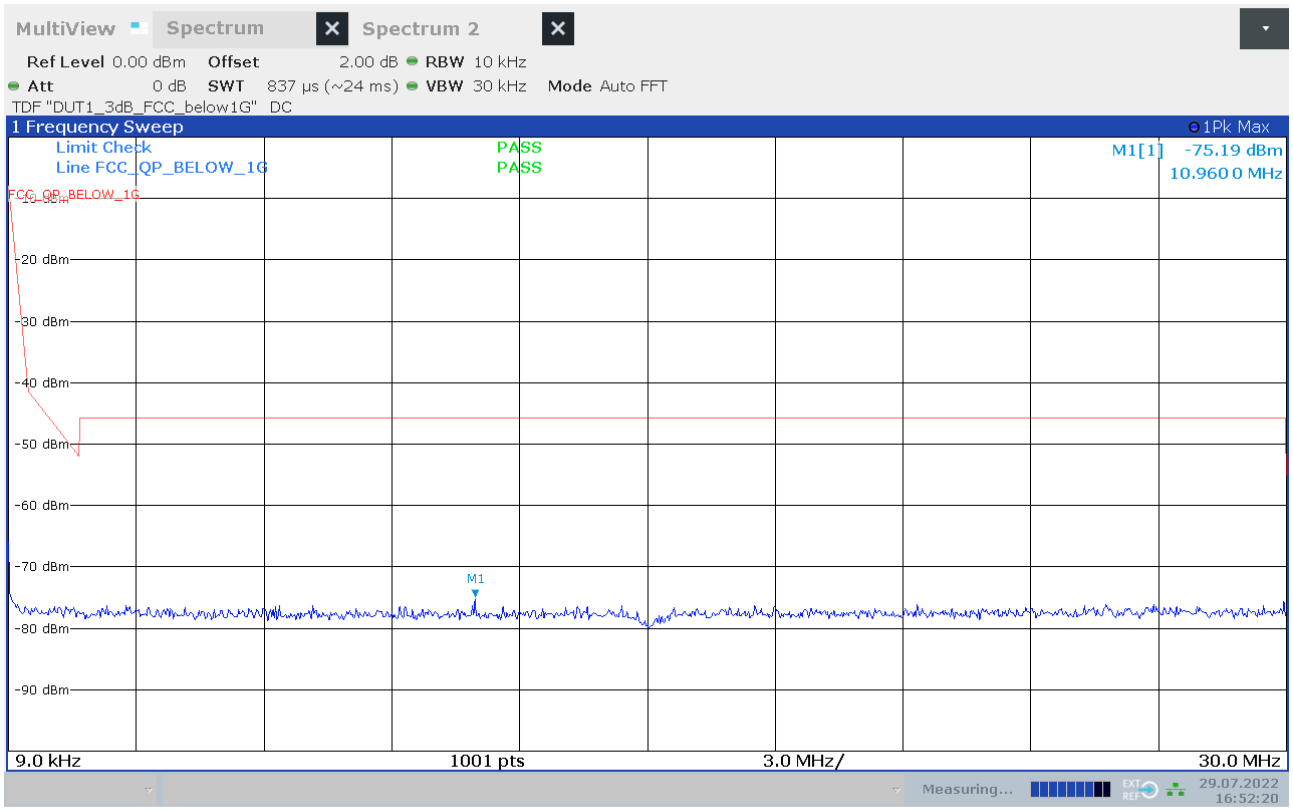
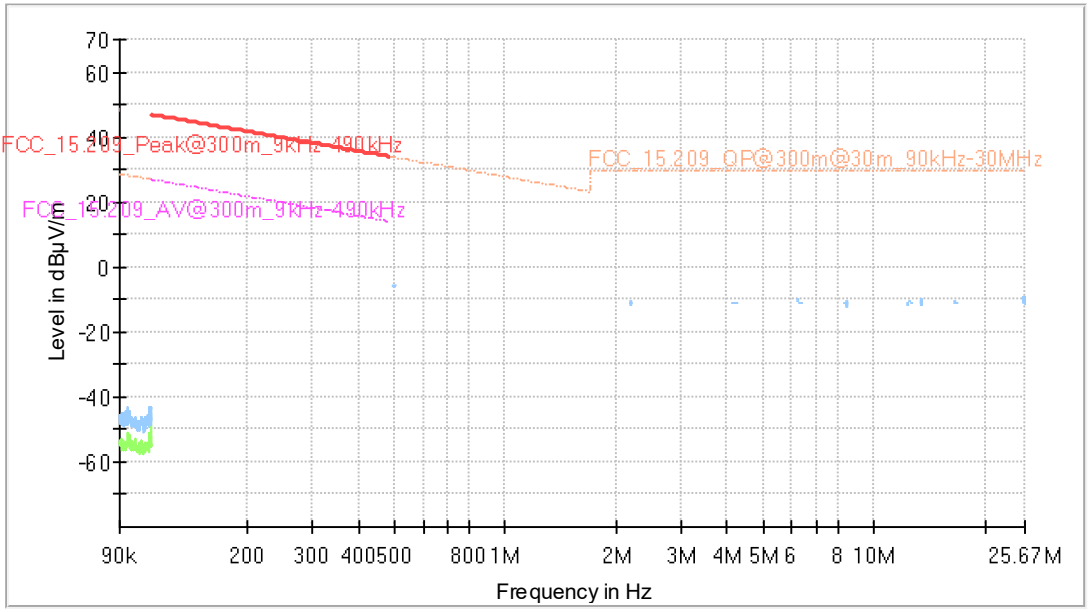
Radio Technology = Bluetooth BDR, Operating Frequency = mid, Measurement range = 9 kHz - 30 MHz
(S01_166_AB01)



16:52:20 29.07.2022

Radio Technology = Bluetooth BDR, Operating Frequency = high, Measurement range = 9 kHz - 30 MHz
(S02_166_AB01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Azimuth (deg)	Corr. (dB/m)
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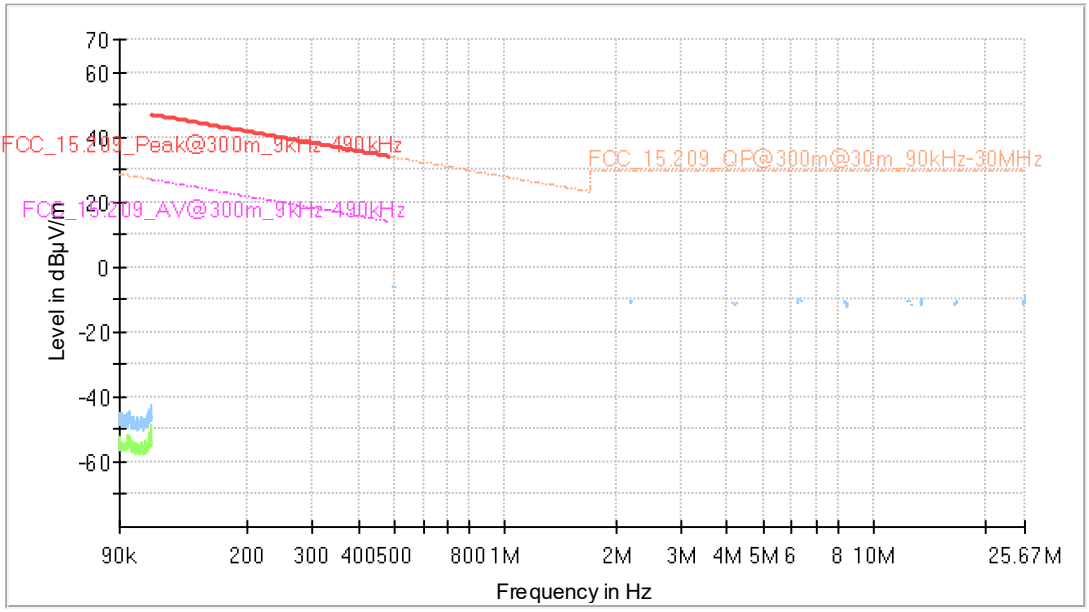
Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 9 kHz - 30 MHz
(S02_166_AB01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Azimuth (deg)	Corr. (dB/m)
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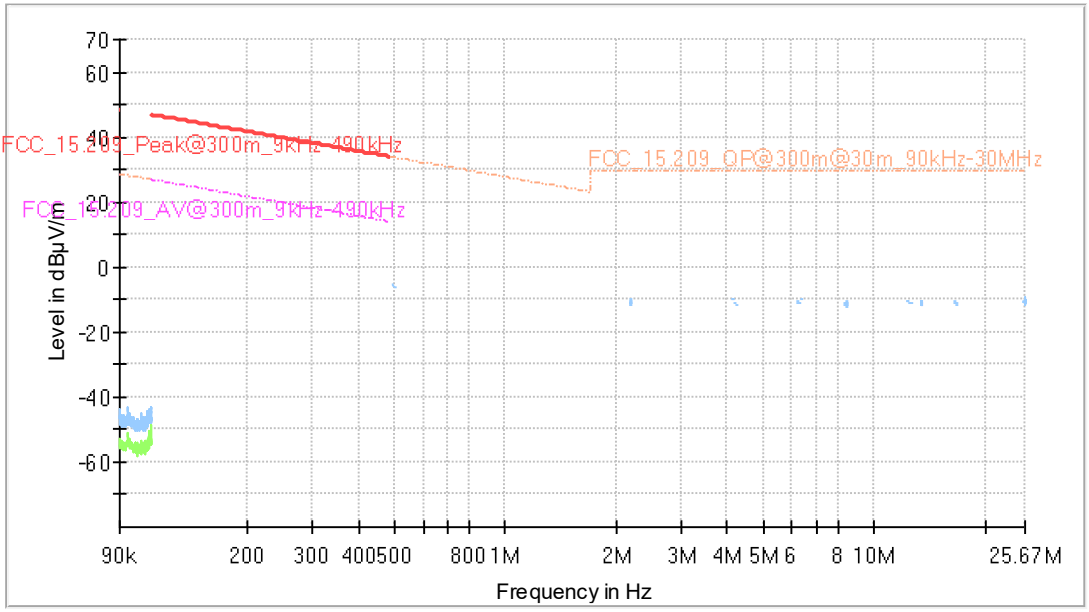
Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 9 kHz - 30 MHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Azimuth (deg)	Corr. (dB/m)
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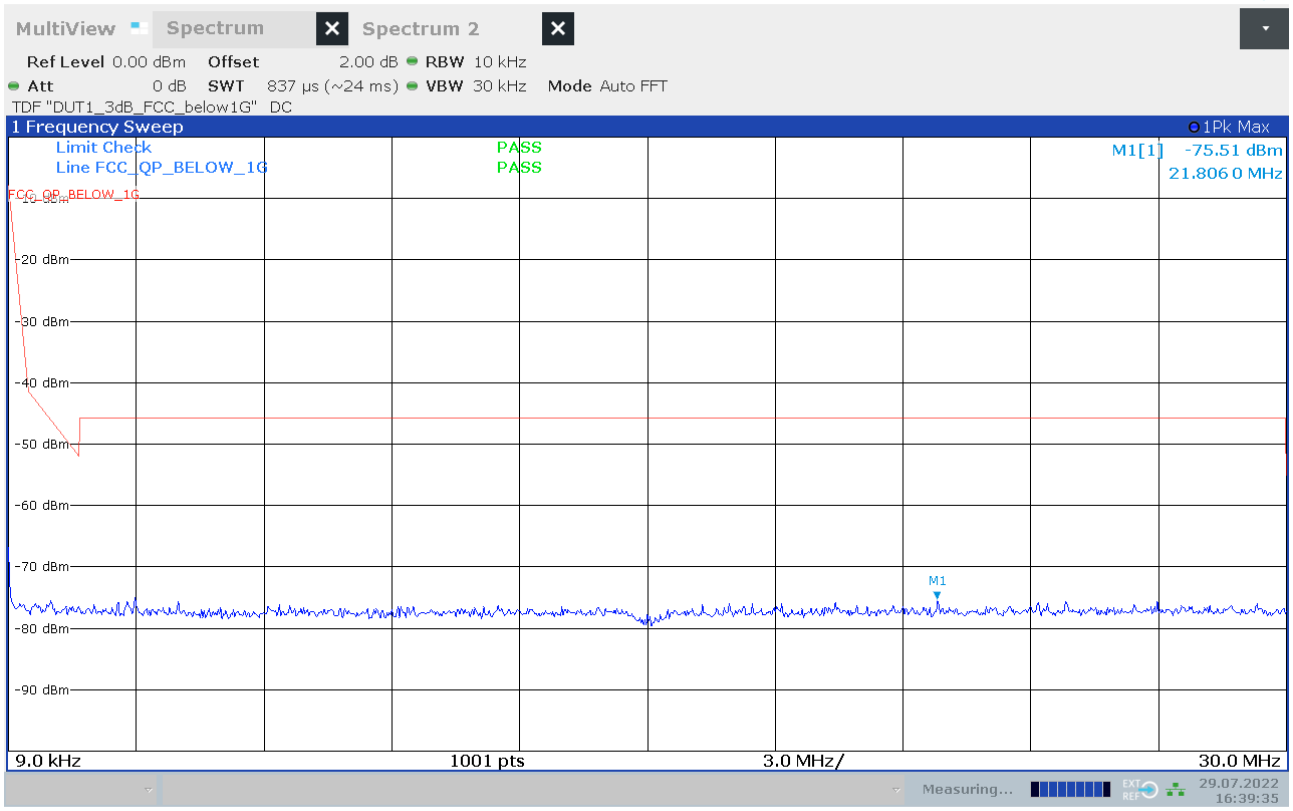
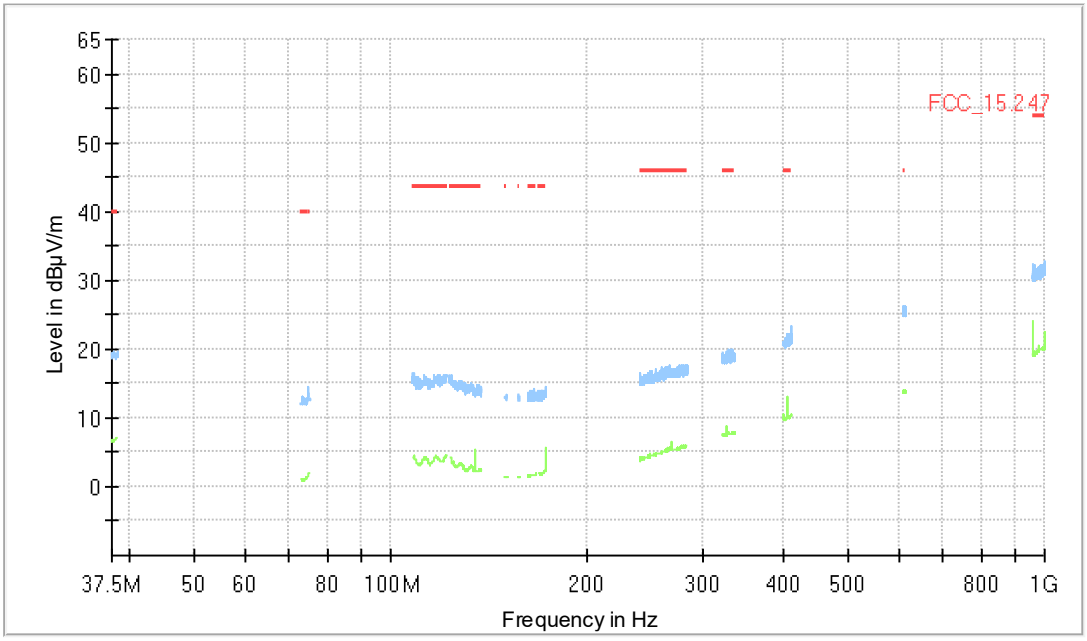
Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 9 kHz - 30 MHz
(S01_166_AB01)



16:39:35 29.07.2022

Radio Technology = Bluetooth BDR, Operating Frequency = mid, Measurement range = 30 MHz - 1 GHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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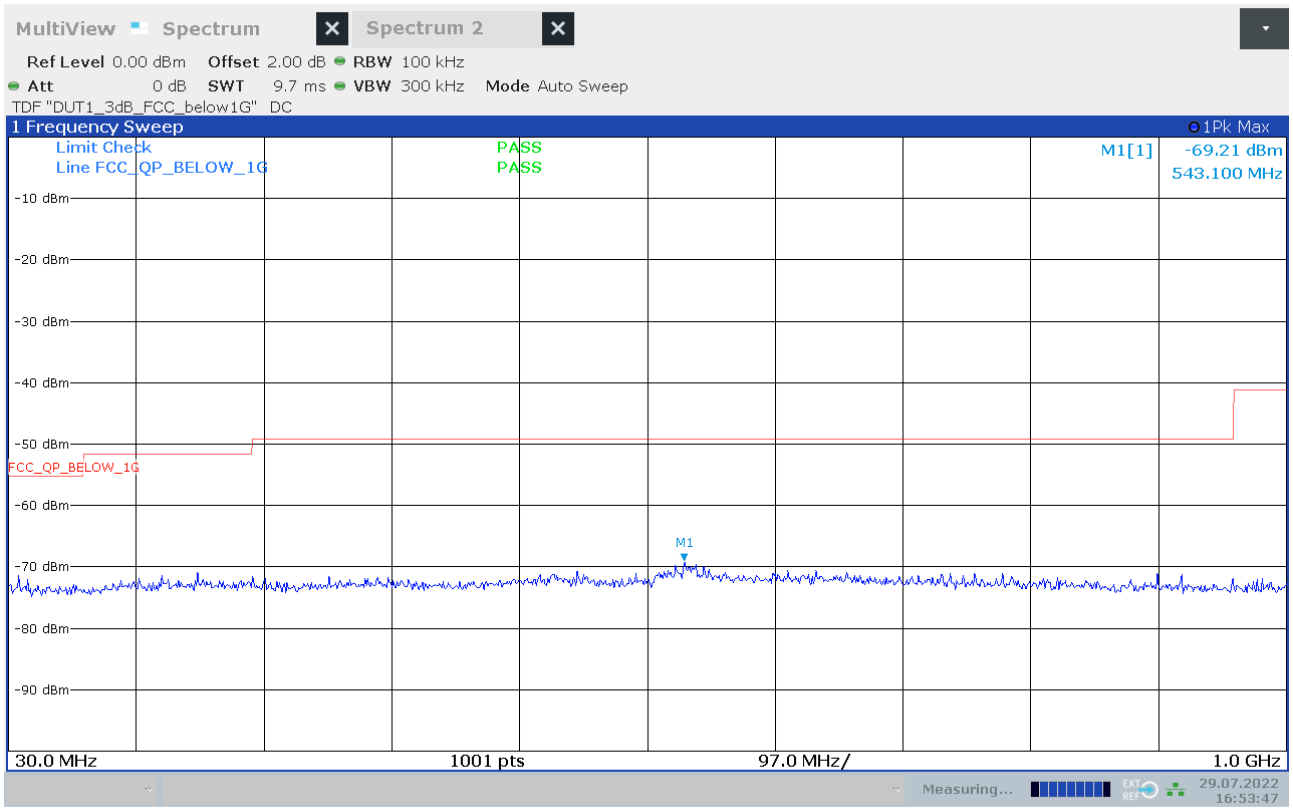
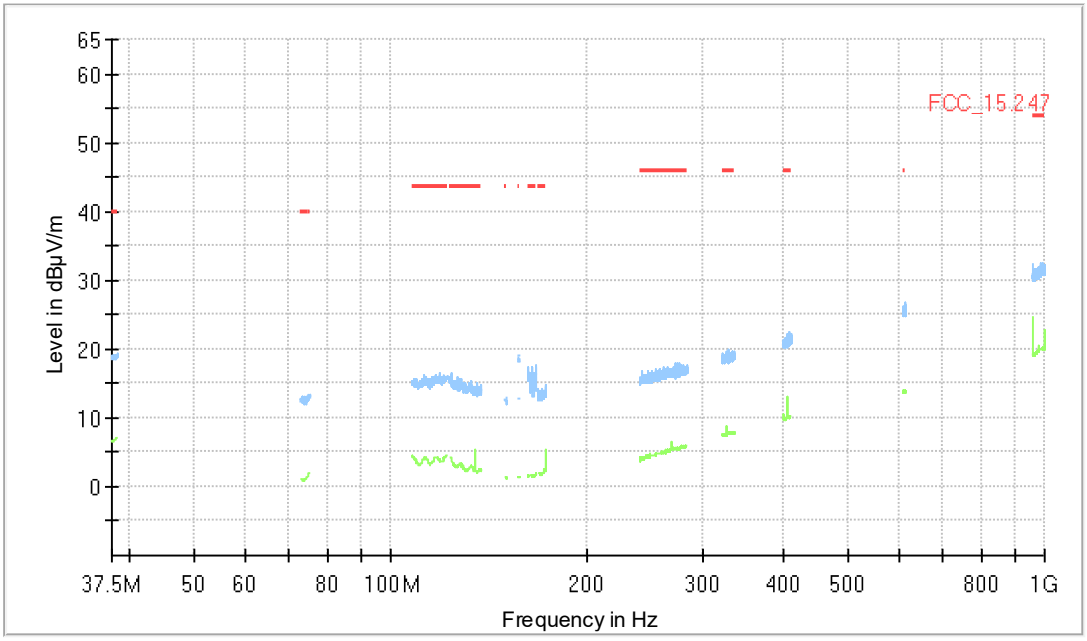
Radio Technology = Bluetooth BDR, Operating Frequency = mid, Measurement range = 30 MHz - 1 GHz
(S01_166_AB01)



16:53:47 29.07.2022

Radio Technology = Bluetooth BDR, Operating Frequency = low, Measurement range = 30 MHz - 1 GHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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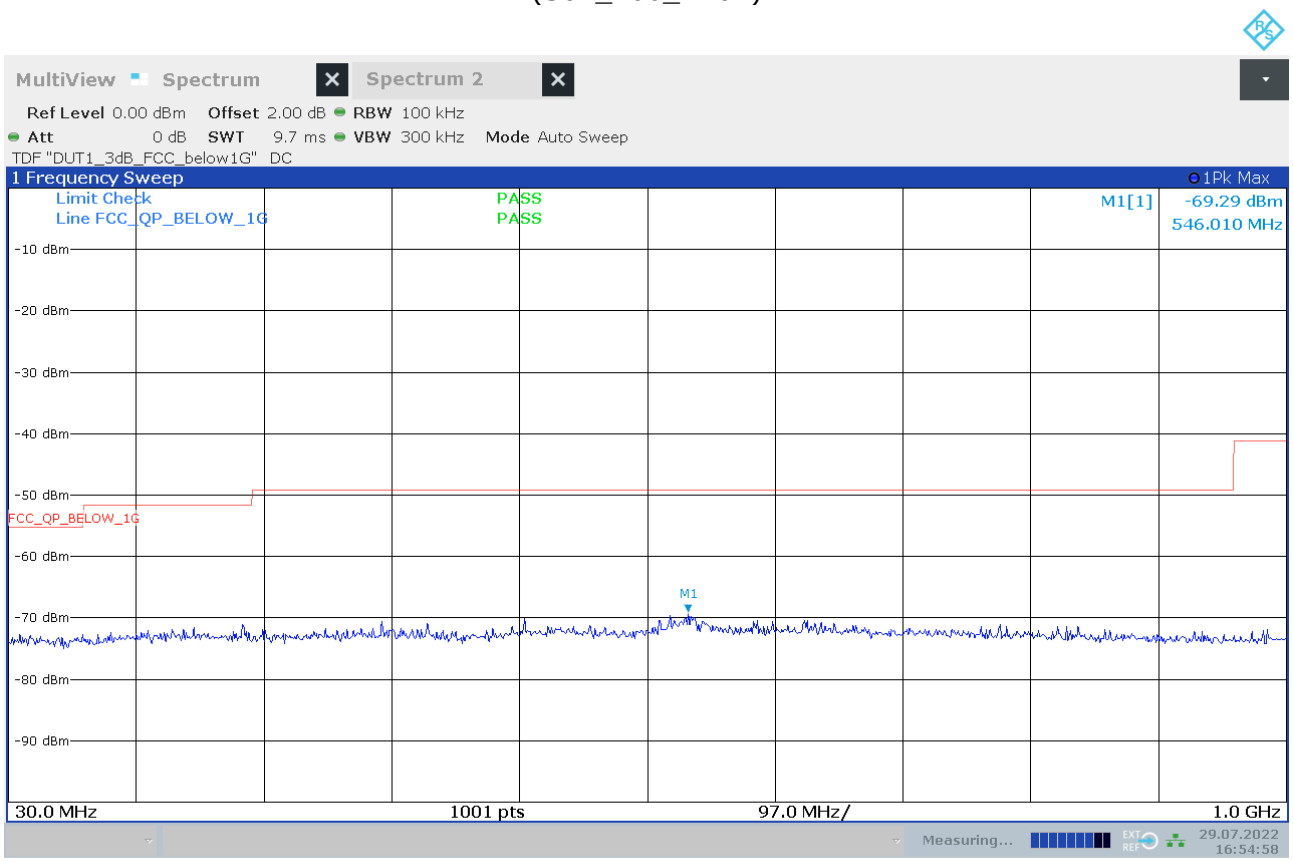
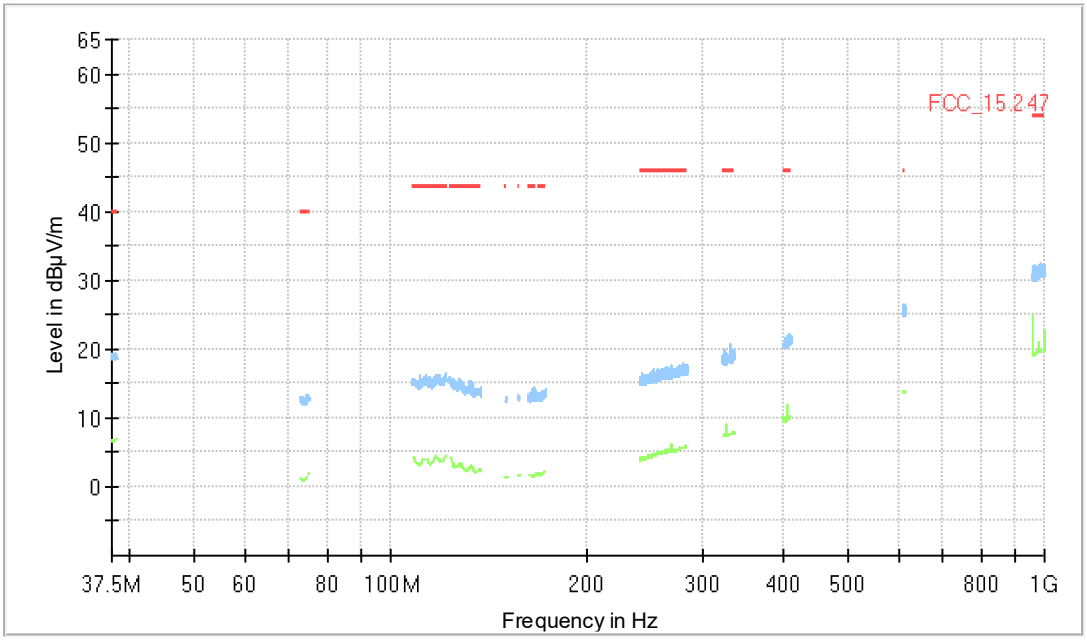
Radio Technology = Bluetooth BDR, Operating Frequency = low, Measurement range = 30 MHz - 1 GHz
(S01_166_AB01)



16:54:58 29.07.2022

Radio Technology = WLAN b, Operating Frequency = high, Measurement range = 30 MHz - 1 GHz
(S02_166_AB01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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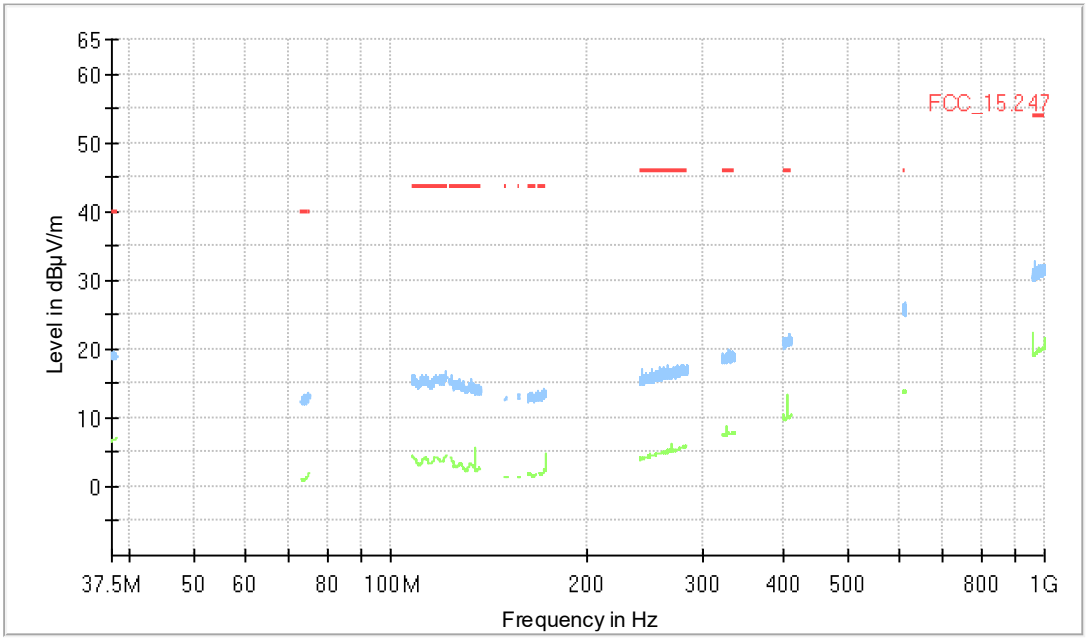
Radio Technology = WLAN b, Operating Frequency = high, Measurement range = 30 MHz - 1 GHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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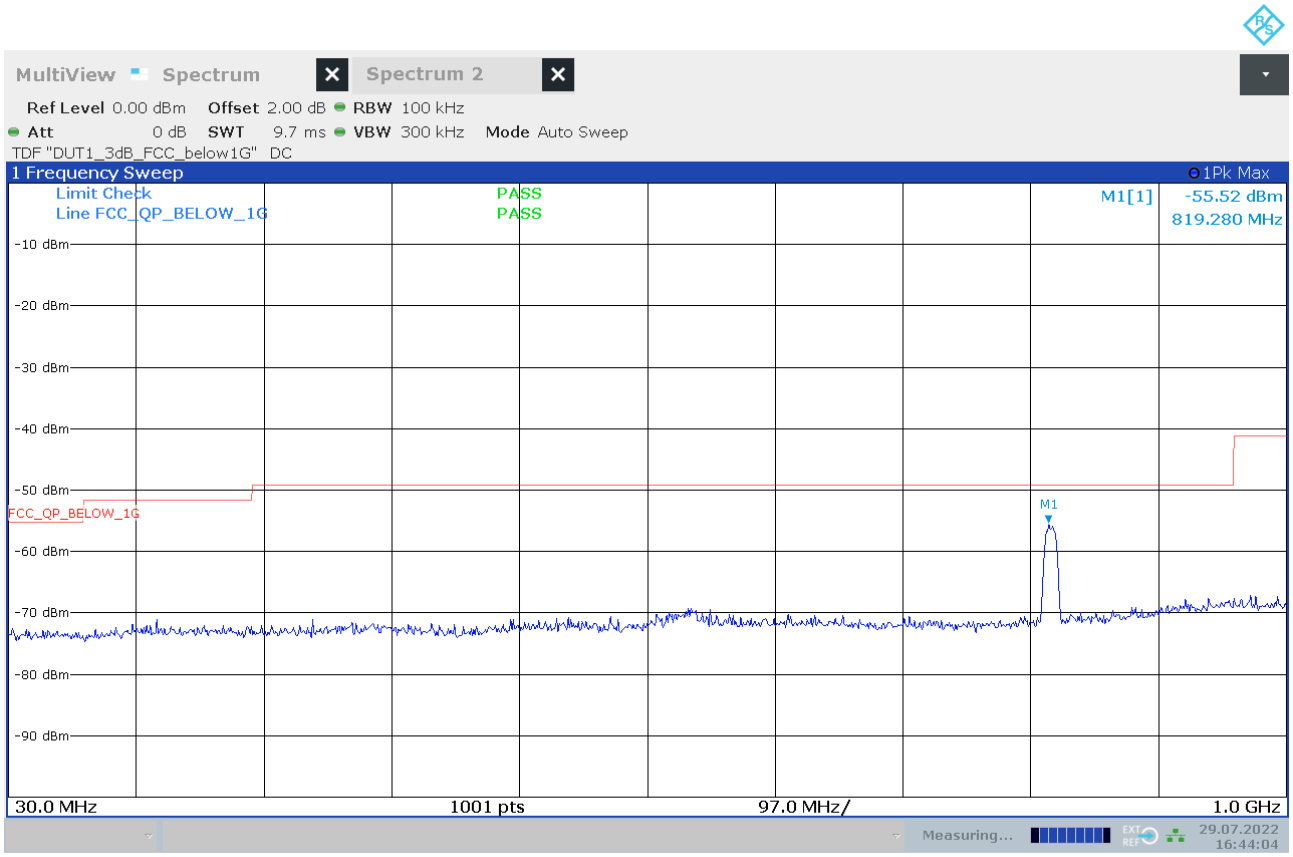
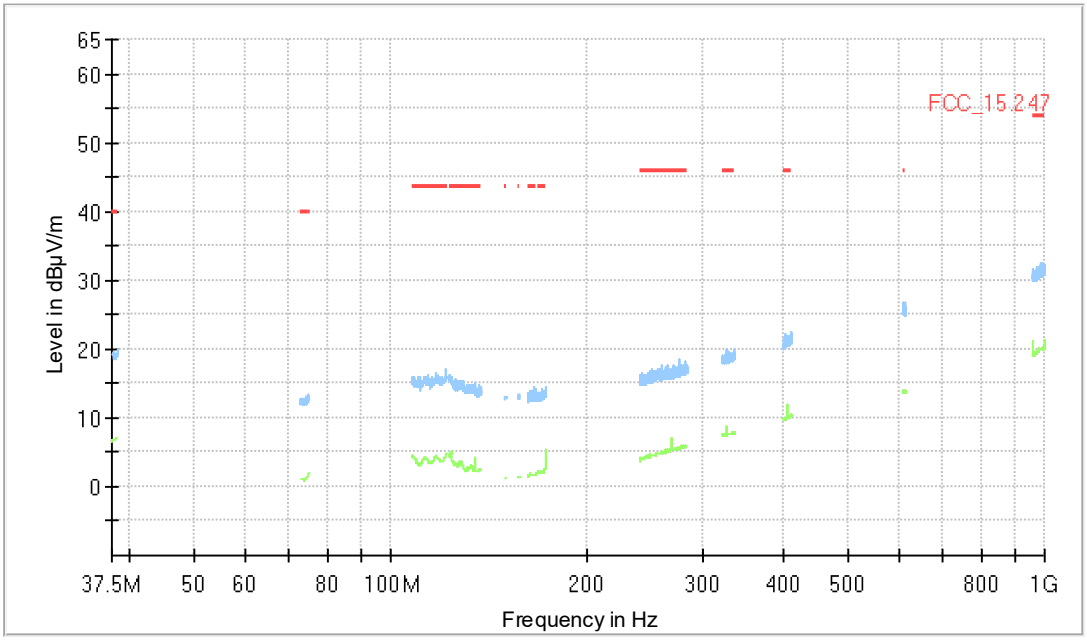
Radio Technology = WLAN b, Operating Frequency = high, Measurement range = 30 MHz - 1 GHz
(S01_166_AB01)



16:44:04 29.07.2022

Radio Technology = WLAN b, Operating Frequency = low, Measurement range = 30 MHz - 1 GHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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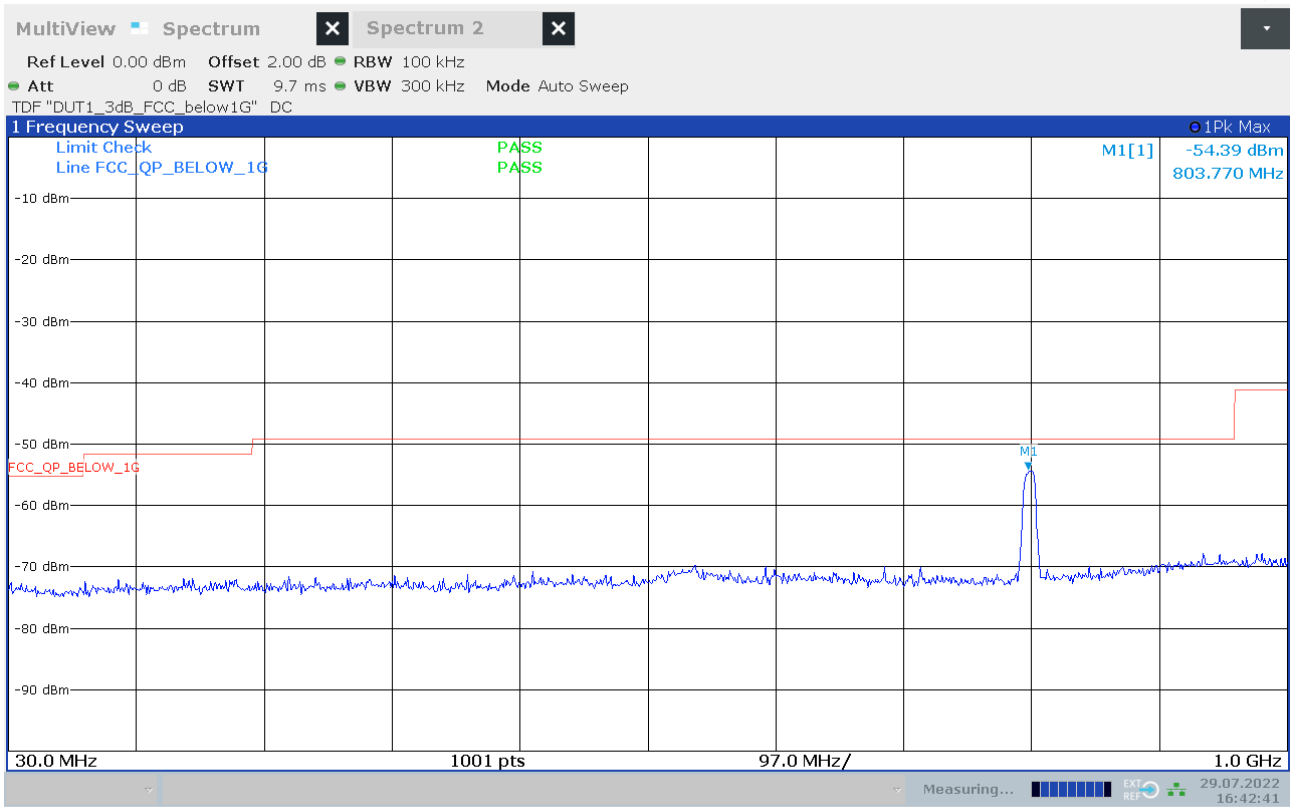
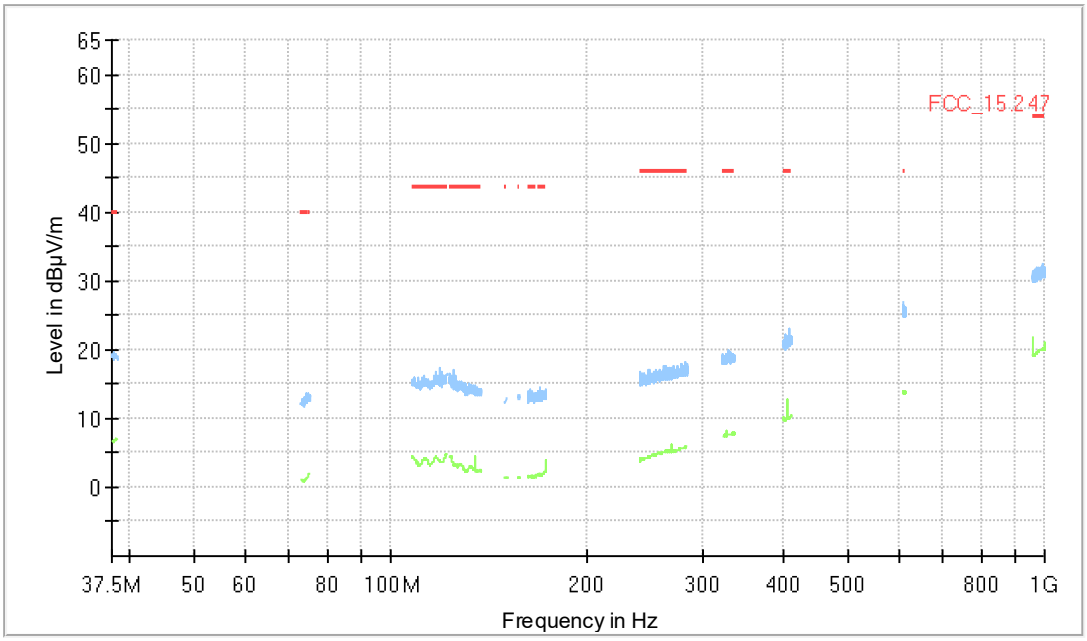
Radio Technology = WLAN b, Operating Frequency = low, Measurement range = 30 MHz - 1 GHz
(S01_166_AB01)



16:42:41 29.07.2022

Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 30 MHz - 1 GHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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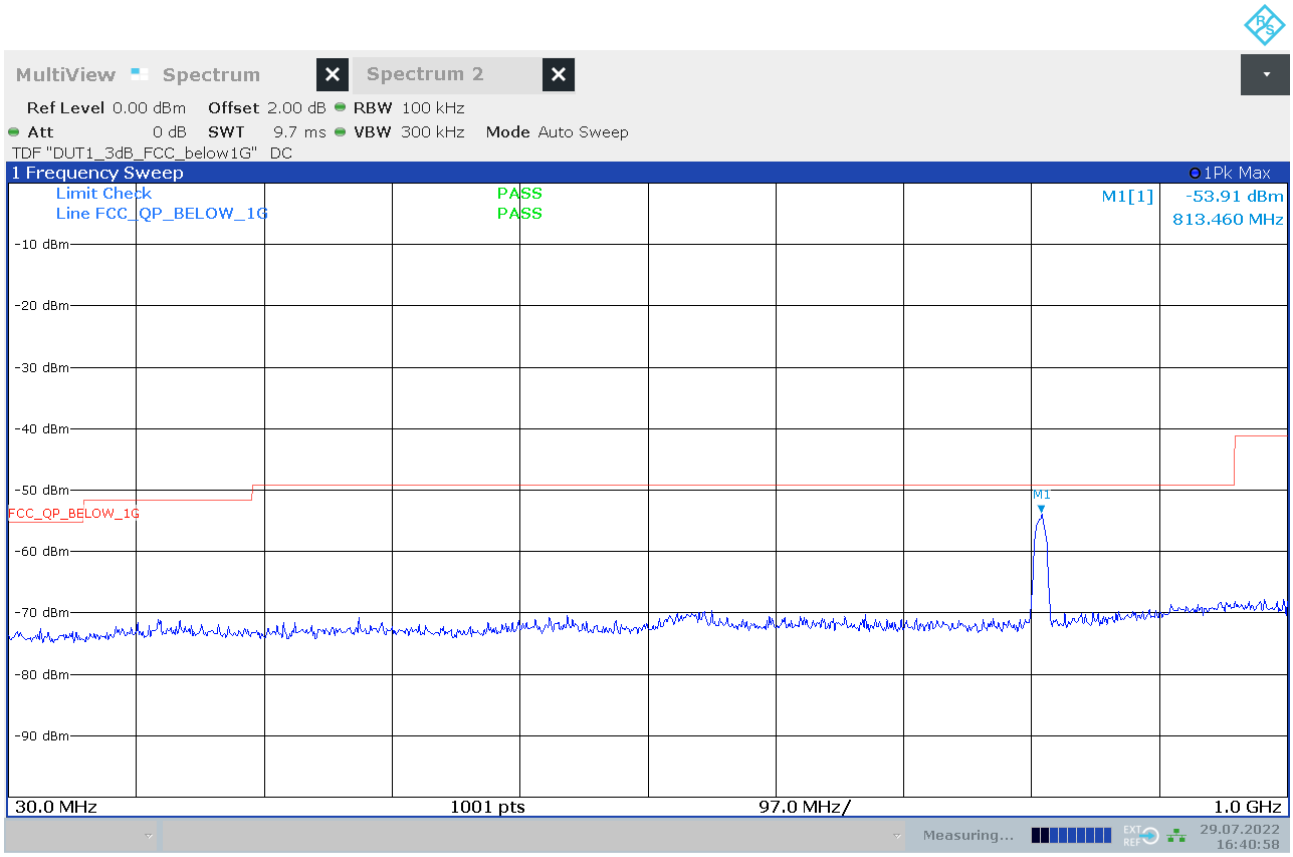
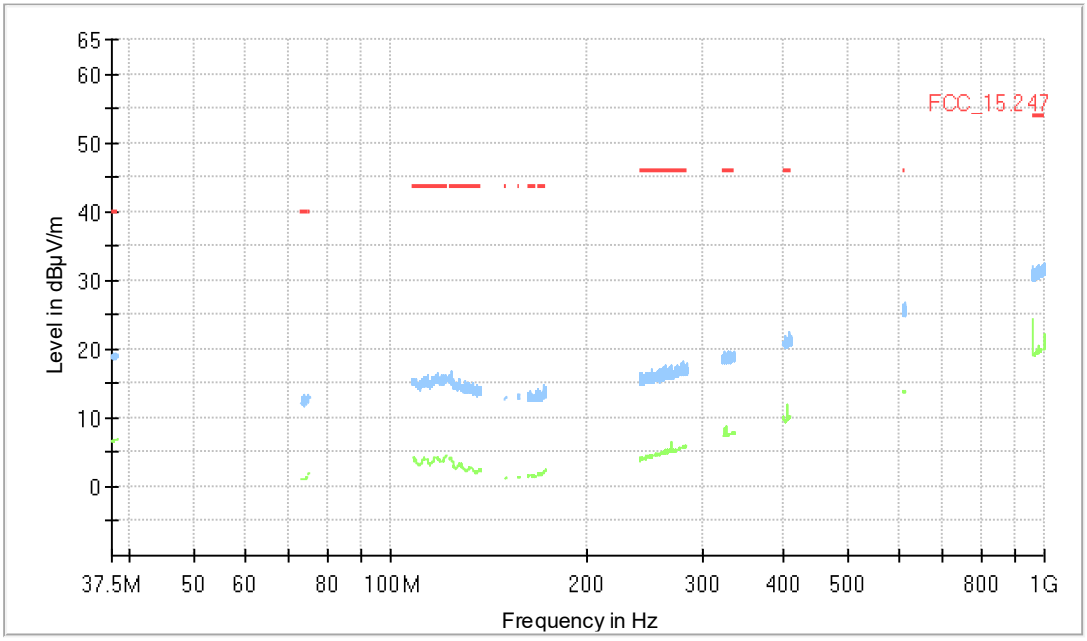
Radio Technology = WLAN b, Operating Frequency = mid, Measurement range = 30 MHz - 1 GHz
(S01_166_AB01)



16:40:58 29.07.2022

Radio Technology = Bluetooth BDR, Operating Frequency = high, Measurement range = 30 MHz - 1 GHz
(S02_166_AB01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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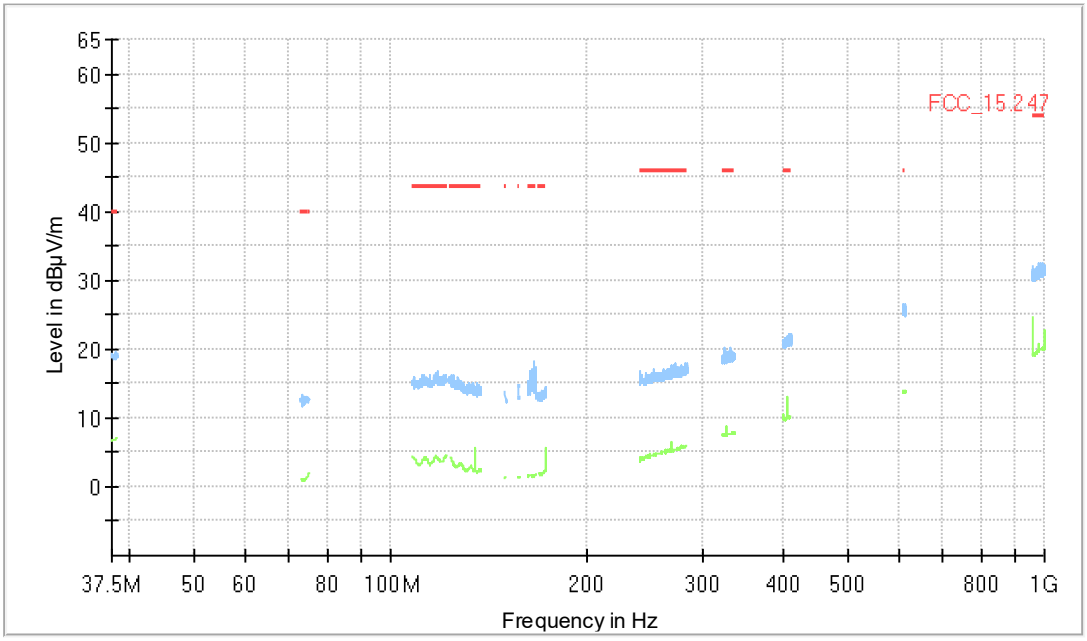
Radio Technology = Bluetooth BDR, Operating Frequency = high, Measurement range = 30 MHz - 1 GHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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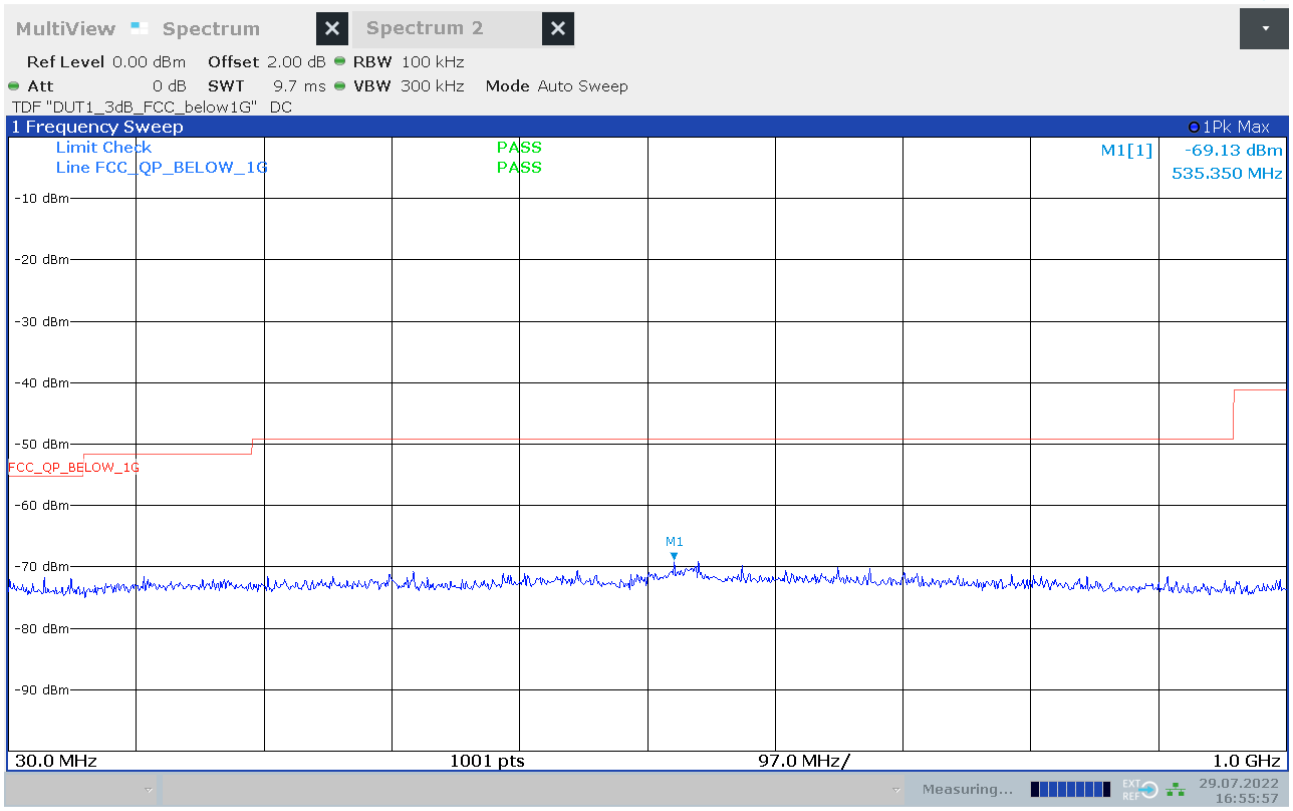
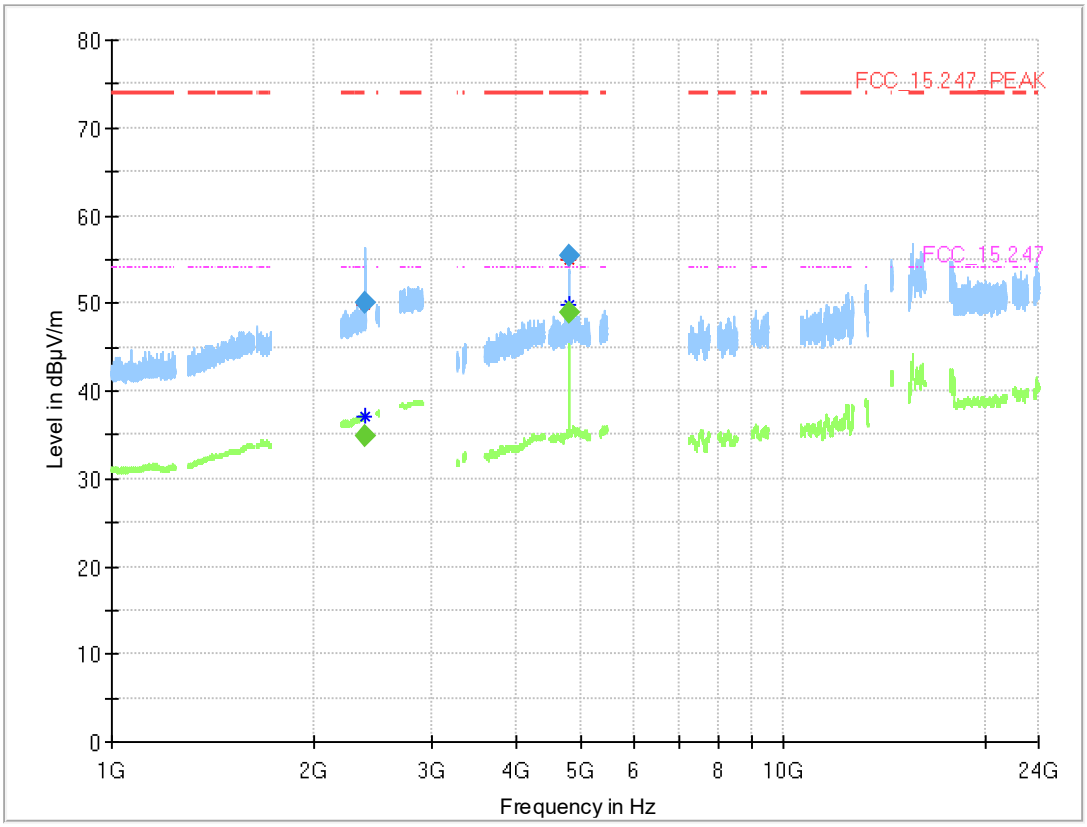
Radio Technology = Bluetooth BDR, Operating Frequency = high, Measurement range = 30 MHz - 1 GHz
(S01_166_AB01)



16:55:57 29.07.2022

Radio Technology = Bluetooth BDR, Operating Frequency = low, Measurement range = 1 GHz - 26 GHz
(S02_166_AE01)



Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2389.600	---	34.8	54.00	19.20	1000.0	1000.000	150.0	H	96.0	75.0	4.9
2389.600	50.0	---	74.00	24.04	1000.0	1000.000	150.0	H	96.0	75.0	4.9
4804.038	---	49.0	54.00	5.02	1000.0	1000.000	150.0	H	-128.0	15.0	4.8
4804.038	55.3	---	74.00	18.68	1000.0	1000.000	150.0	H	-128.0	15.0	4.8