RF Test Report

Applicant:	Quectel Wireless Solutions Co., Ltd.
Address:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Product:	Wi-Fi & Bluetooth Module
Model No.:	FLM142D
Brand Name:	QUECTEL
FCC ID:	XMR2024FLM142D
Standards:	FCC CFR47 Part 15C
Report No.:	PD20240175-R3A
Issue Date:	2025/01/17
Test Result:	PASS *

* **Testing performed at Hefei Panwin Technology Co., Ltd. on the above equipment indicates the product meets the requirements of the relevant standards.**

Reviewed By: Jerry Zhang **Approved By:** Alec Yang

Hefei Panwin Technology Co., Ltd.

Floor 1, Zone E, Plant 2#, Mingzhu Industrial Park, No.106 Chuangxin Avenue, High-tech Zone, Hefei City, Anhui Province,China

TEL: +86-0551-63811775

Revision History

Report No.	Version	Description	Issue Date	Note
PD20240175-R3A	1	Initial Report	2025/01/17	Valid

CONTENTS

1 General Information 5
1.1 Notes of the Test Report 5
1.2 Test Facility 5
1.3 Testing Laboratory 5
2 General Description of Equipment under Test 6
2.1 Details of Application 6
2.2 General Information 6
2.3 Application Standards 7
3 Test Condition 8
3.1 Test Configuration 8
3.2 Carrier Frequency and Channel 9
3.3 Equipment List 10
3.4 Support Equipment List 11
3.5 Test Uncertainty 11
4 Test Items Description 12
4.1 Output Power Measurement 12
4.2 6dB and 99% Bandwidth Measurement 14
4.3 Power Spectral Density Measurement 15
4.4 Conducted Band Edges and Spurious Emission Measurement 16
4.5 Radiated Band Edges and Spurious Emission Measurement 17
4.6 AC Conducted Emission Measurement 21
4.7 Antenna Requirements 23
ANNEX A: Test Results of Conducted Test 24
ANNEX B: Test Results of Radiated Test 31
ANNEX C: The EUT Appearance 35
ANNEX D: Test Setup Photograph 36

Test Summary

No.	Test Case	FCC Rules	Verdict
1	Output Power Measurement	15.247(b)	PASS
2	6dB and 99% Bandwidth Measurement	15.247(a)(2)	PASS
3	Power Spectral Density Measurement	15.247(e)	PASS
4	Conducted Band Edges and Spurious Emission Measurement	15.247(d)	PASS
5	Radiated Band Edges and Spurious Emission Measurement	15.247(d)	PASS
6	AC Conducted Emission Measurement	15.207	NA
7	Antenna Requirements	15.203 & 15.247(b)	PASS

Date of Testing: 2024/12/31 to 2025/01/15
Date of Sample Received: 2024/12/30

- We, Hefei Panwin Technology Co., Ltd., would like to declare that the tested sample has been evaluated in accordance with the procedures given in applied standard(s) in **Section 2.3** of this report and shown compliance with the applicable technical standards.
- All indications of PASS/FAIL in this report are based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.

1 General Information

1.1 Notes of the Test Report

This report is invalid without signature of auditor and approver or with any alterations. The report shall not be partially reproduced without written approval of the testing company. Entrusted test results are only responsible for incoming samples. If there is any objection to the testing report, it shall be raised to the testing company within 15 days from the date of receiving the report. In the test results, "NA" means "not applicable", and the test items marked with "Δ" are subcontracted projects.

1.2 Test Facility

A2LA (Certificate Number: 6849.01)

Hefei Panwin Technology Co., Ltd. has been accredited by American Association for Laboratory Accreditation to perform measurement.

FCC (Designation Number: CN1361, Test Firm Registration Number: 473156)

Hefei Panwin Technology Co., Ltd. has been accredited on the US Federal Communications Commission list of test facilities recognized to perform measurements.

1.3 Testing Laboratory

Company Name	Hefei Panwin Technology Co., Ltd.
Address	Floor 1, Zone E, Plant 2#, Mingzhu Industrial Park, No.106 Chuangxin Avenue, High-tech Zone, Hefei City, Anhui Province,China
Telephone	+86-0551-63811775
Post Code	230031

2 General Description of Equipment under Test

2.1 Details of Application

Applicant	Quectel Wireless Solutions Co., Ltd.
Applicant Address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer	Quectel Wireless Solutions Co., Ltd.
Manufacturer Address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

2.2 General Information

Product	Wi-Fi & Bluetooth Module
Model	FLM142D
Hardware Version	R1.0
Software Version	FLM142DAAR02A01M02
Antenna Type	PCB Antenna
Antenna Gain	-1.85dBi
Additional Beamforming Gain	NA
Max. Conducted Power	BLE: 7.30dBm
Operating voltage	Typical 3.3Vdc
Type of Modulation	Bluetooth LE 5.2: GFSK
Operating Frequency Range(s)	Bluetooth LE: 2402 to 2480MHz
Note: The declared of product specification for EUT and/or Antenna presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.	

2.3 Application Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart C §15.247
- FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

3 Test Condition

3.1 Test Configuration

Test mode

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). The worst cases were recorded in this report.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes (Z, X, Y axis), receiver antenna polarization (horizontal and vertical), the worst emission was found in Z position and the worst case was recorded.

Test Mode	Data Rate
Bluetooth LE	1Mbps

3.2 Carrier Frequency and Channel

Frequency Band	Channel	Freq.(MHz)	Channel	Freq.(MHz
2400-2483.5 MHz	0	2402	21	2444
	1	2404	22	2446
	2	2406	23	2448
	3	2408	24	2450
	4	2410	25	2452
	5	2412	26	2454
	6	2414	27	2456
	7	2416	28	2458
	8	2418	29	2460
	9	2420	30	2462
	10	2422	31	2464
	11	2424	32	2466
	12	2426	33	2468
	13	2428	34	2470
	14	2430	35	2472
	15	2432	36	2474
	16	2434	37	2476
	17	2436	38	2478
	18	2438	39	2480
	19	2440	-	-
	20	2442	-	-

3.3 Equipment List

Conducted

Instrument	Manufacturer	Model	Asset No.	Cal. Interval	Cal. Due Date
Spectrum Analyzer	KEYSIGHT	N9020B	PWC0048	1 Year	2025/09/11
RF Control Unit	Tonseced	JS0806-2	PWC0055	/	/
Shielded Chamber	Maorui	MR543	PWC0041	3 Years	2026/08/26
Test Software	Tonseced	JS1120-3 V3.2.22	/	/	/

Radiated

Instrument	Manufacturer	Model	Asset No.	Cal. Interval	Cal. Due Date
EMI Test Receiver	R&S	ESR7	PWB0023	1 Year	2025/09/11
Spectrum Analyzer	R&S	FSV3044	PWB0024	1 Year	2025/09/11
Loop Antenna	R&S	HFH2-Z2E	PWB0026	1 Year	2025/09/13
TRILOG Broadband	Schwarzbeck	VULB9162	PWB0029	1 Year	2025/09/09
Double-Ridged Guide Antenna	ETS-Lindgren	3117	PWB0031	1 Year	2025/09/26
k Type Horn Antenna	Steatite Antennas	QMS-00880	PWB0035	1 Year	2025/09/08
Pre-Amplifier	R&S	SCU40F1	PWB0036	1 Year	2025/09/11
Pre-Amplifier	COM-MW	DLNA8	PWB0094	1 Year	2025/09/11
Pre-Amplifier	R&S	SCU18F	PWB0034	1 Year	2025/09/11
Pre-Amplifier	R&S	OSP220 (OSP-B155G)	PWB0042	1 Year	2025/09/11
Anechoic Chamber	ETS.LINDGREN	Fact 3-2m	PWB0003	3 Years	2026/06/05
Test Software	Tonscend	JS36	/	/	/

3.4 Support Equipment List

Equipment	Manufacturer	Description	Model	Serial Number
Antenna	/	PCB Antenna	/	/
EVB	Quectel	/	Q1-C4796	E1N24L20E000015 E1N24L20E000042 E1N24L20E000063
RF cable	Quectel	2.4G:0.5dB	/	/

3.5 Test Uncertainty

No.	Parameter	Uncertainty
1	DTS Bandwidth	1.9 %
2	Occupied channel bandwidth	1.9 %
3	Duty Cycle	0.11 %
4	Maximum Conducted Output Power	1.18 dB
5	Maximum Power Spectral Density Level	0.98 dB
6	Band-edge Compliance	1.21 dB
7	Unwanted Emissions In Non-restricted Frequency Bands	9kHz-7GHz: 1.21 dB 7GHz-40GHz: 3.31 dB
8	Radiated Band Edges and Spurious Emission	Below 1GHz: 4.88 dB Above 1GHz: 5.06 dB
9	Temperature	3 °C
10	Humidity	1.3 %
11	Supply Voltages	0.006 V

4 Test Items Description

Ambient condition

Shielded Chamber

Temperature [°C]	25.1 to 25.3
Humidity [%RH]	34 to 39
Pressure [kPa]	102.5 to 102.6

Anechoic Chamber

Temperature [°C]	20.7 to 21.9
Humidity [%RH]	29 to 41
Pressure [kPa]	101.0 to 102.9

4.1 Output Power Measurement

4.1.1 Limit of Output Power

Rule Part 15.247 (b) (3) specifies that “For systems using digital modulation in the 902-928 MHz 2400-2483.5 MHz: 1 Watt.”

Average Output Power	≤1W(30dBm)

4.1.2 Measuring Instruments

The section 3.3 of List of Measuring Equipment of this test report is used for test.

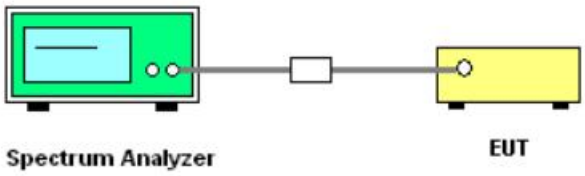
4.1.3 Test Procedures

The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.1.

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

1) Set the RBW ≥DTS bandwidth.
2) Set VBW ≥[3×RBW].
3) Set span ≥[3×RBW].
4) Sweep time = auto couple.
5) Detector = peak.
6) Trace mode = max hold.
7) Allow trace to fully stabilize.
8) Use peak marker function to determine the peak amplitude level.

4.1.4 Test Setup



4.1.5Test Results

See ANNEX A.1.

4.2 6dB and 99% Bandwidth Measurement

4.2.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz

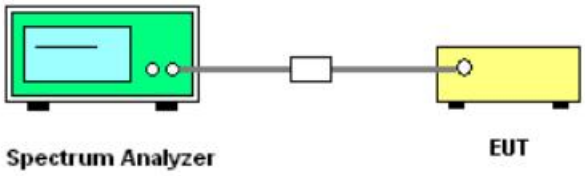
4.2.2 Measuring Instruments

The section 3.3 of List of Measuring Equipment of this test report is used for test.

4.2.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.8 & 6.9.3.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1% to 5% of the 99% OBW and the VBW is set to 3 times of the RBW.
6. Measure and record the results in the test report.

4.2.4 Test Setup



4.2.5 Test Results

See ANNEX A.2.

4.3 Power Spectral Density Measurement

4.3.1 Limit of Power Spectral Density

Rule Part 15.247(e) specifies that" For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2 Measuring Instruments

The section 3.3 of List of Measuring Equipment of this test report is used for test.

4.3.3 Test Procedures

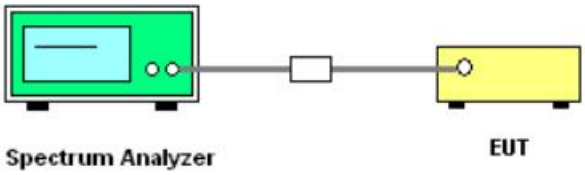
The testing follows ANSI C63.10-2013 clause 11.10.2

The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:

1) Set analyzer center frequency to DTS channel center frequency.
2) Set the span to 1.5 times the DTS bandwidth.
3) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
4) Set the VBW ≥ [3×RBW].
5) Detector = peak.
6) Sweep time = auto couple.
7) Trace mode = max hold.
8) Allow trace to fully stabilize.
9) Use the peak marker function to determine the maximum amplitude level within the RBW.
10)If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

.

4.3.4 Test Setup



4.3.5 Test Result of Power Spectral Density

Please refer to ANNEX A.3.

4.4 Conducted Band Edges and Spurious Emission Measurement

4.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band， In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

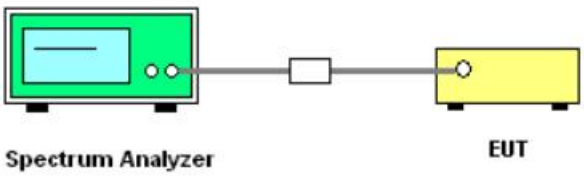
4.4.2 Measuring Instruments

The section 3.3 of List of Measuring Equipment of this test report is used for test

4.4.3 Test Procedure

1. The testing follows ANSI C63.10-2013 clause 11.13.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

4.4.4 Test Setup



4.4.5 Test Result

Please refer to ANNEX A.4.

4.5 Radiated Band Edges and Spurious Emission Measurement

4.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30-88	100	3
88 -216	150	3
216 - 960	200	3
Above 960	500	3

4.5.2 Measuring Instruments

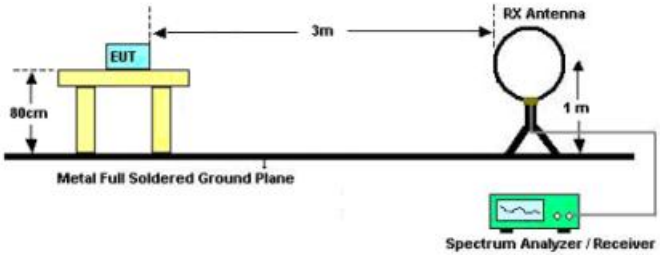
The section 3.3 of List of Measuring Equipment of this test report is used for test.

4.5.3 Test Procedures

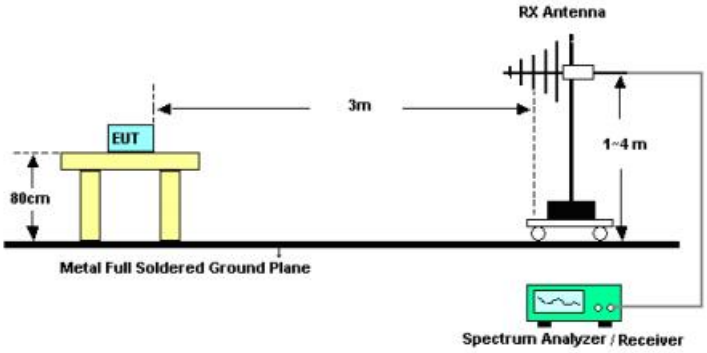
1. The testing follows ANSI C63.10-2013 clause 11.12.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level -Preamp Factor = Level
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured.
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
   (3) Set RBW = 1 MHz, VBW= 3MHz for ≥ 1 GHz for peak measurement
   For average measurement:
   VBW= 10 Hz, when duty cycle is no less than 98 percent.
   VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

4.5.4 Test Setup

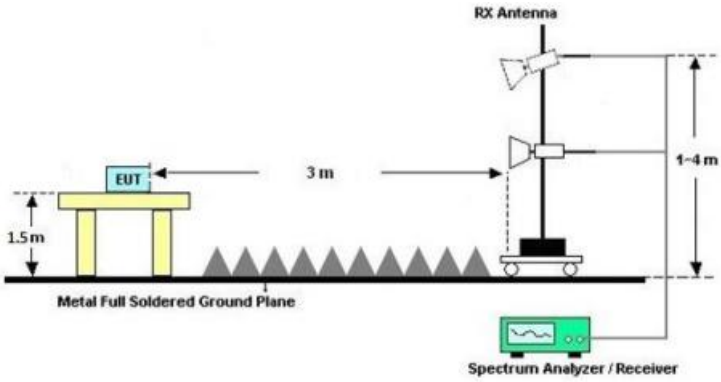
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



4.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

4.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to ANNEX B.1.

4.5.7 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHzwhichever is lower)

Please refer to ANNEX B.1.

4.5.8 Duty Cycle

Please refer to ANNEX A.5.

4.6 AC Conducted Emission Measurement

4.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

Decreases with the logarithm of the frequency.

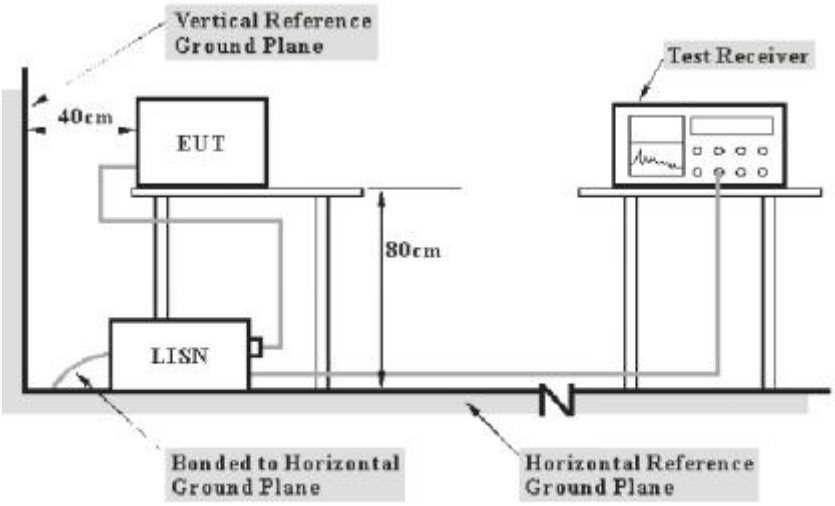
4.6.2 Measuring Instruments

The section 3.3 of List of Measuring Equipment of this test report is used for test.

4.6.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 6.2.
2. The mains terminal disturbance voltage test was conducted in a shielded room.
3. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ωlinear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
4. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
5. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
6. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10-2013 on conducted measurement.

4.6.4 Test Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

4.9.5 Uncertainty Measurement

Where relevant,the following measurement uncertainty levels have been estimated for tests performed on the EUT. The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

CASE	Uncertainty
Continuous Emission (AC port)	2.92 dB

4.9.6 Test Result

Remark: The product is DC powered, this test item is not applicable.

4.7 Antenna Requirements

4.7.1 Standard Applicable

15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 Antenna Anti-Replacement Construction

The antenna is PCB Antenna and no consideration of replacement. The best case gain of the antenna is -1.89dBi.

-------- THE END --------

ANNEX A: Test Results of Conducted Test

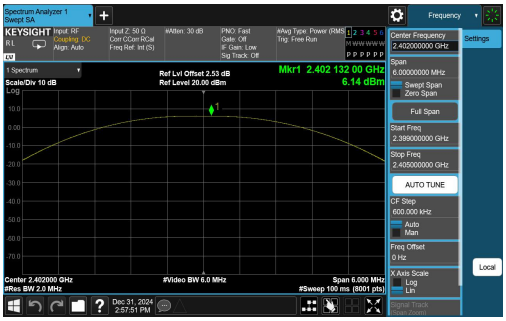
A.1 Conducted Output Power

Test Result Peak

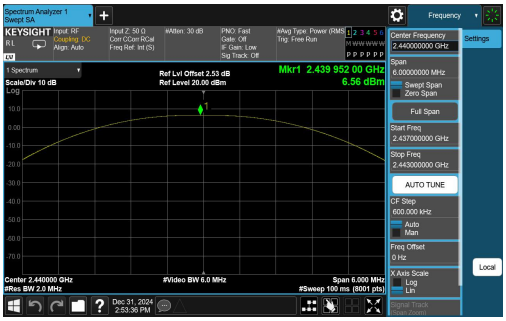
Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
BLE_1M	Ant1	2402	6.14	≤30	4.29	≤36	PASS
BLE_1M	Ant1	2440	6.56	≤30	4.71	≤36	PASS
BLE_1M	Ant1	2480	7.30	≤30	5.45	≤36	PASS

Test Graphs

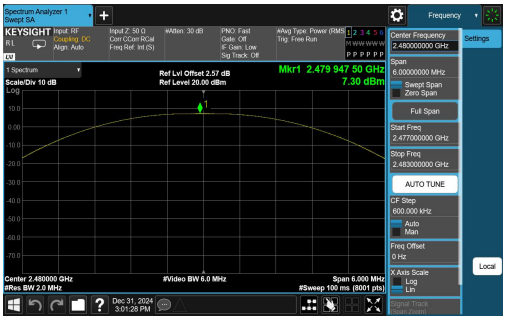
BLE_1M-Ant1-2402-PASS



BLE_1M-Ant1-2440-PASS



BLE_1M-Ant1-2480-PASS



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A.2 6dB and 99% Bandwidth

Test Result 6dB Bandwidth

Test Mode	Antenna	Frequency[MHz]	DTS BW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.724	2401.640	2402.364	0.5	PASS
BLE_1M	Ant1	2440	0.720	2439.644	2440.364	0.5	PASS
BLE_1M	Ant1	2480	0.728	2479.640	2480.368	0.5	PASS

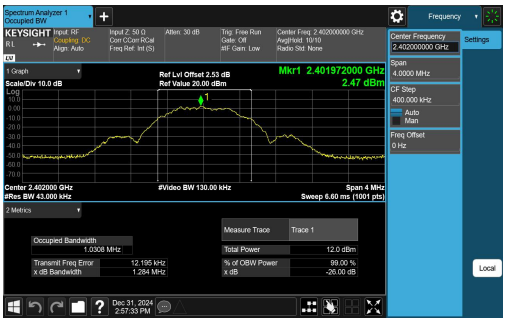
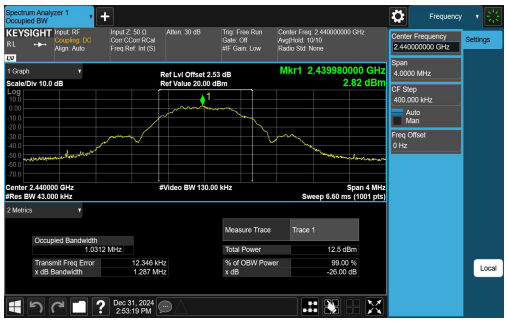
Test Result 99% Bandwidth

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0308	2401.4968	2402.5276	---	---
BLE_1M	Ant1	2440	1.0312	2439.4968	2440.5280	---	---
BLE_1M	Ant1	2480	1.0313	2479.4972	2480.5285	---	---

Test Graphs_6dB Bandwidth

BLE_1M-Ant1-2402-PASS	BLE_1M-Ant1-2440-PASS
BLE_1M-Ant1-2480-PASS	/
	/

Test Graphs_99% Bandwidth

BLE_1M-Ant1-2402	BLE_1M-Ant1-2440
	
BLE_1M-Ant1-2480	**/**
	/

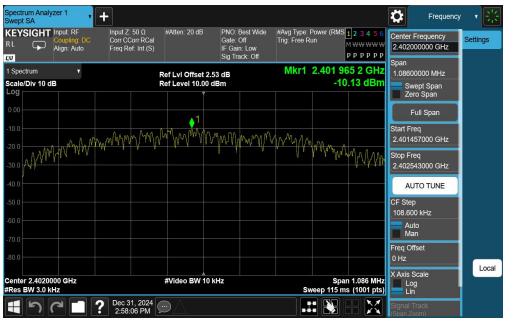
A.3 Power Spectral Density

Test Result

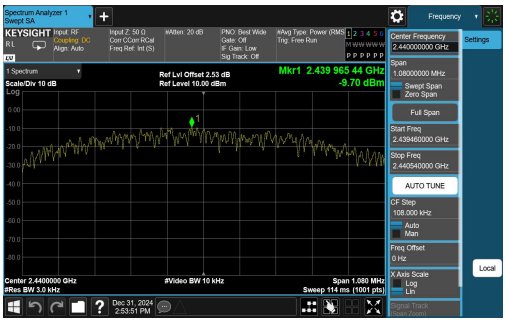
Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-10.13	≤8.00	PASS
BLE_1M	Ant1	2440	-9.70	≤8.00	PASS
BLE_1M	Ant1	2480	-8.98	≤8.00	PASS

Test Graphs

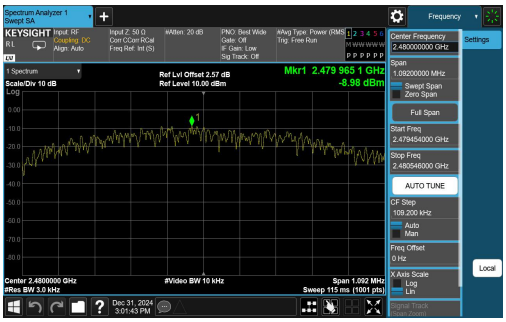
BLE_1M-Ant1-2402-PASS



BLE_1M-Ant1-2440-PASS



BLE_1M-Ant1-2480-PASS



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A.4 Conducted Band Edges and Spurious Emission

Test Result

Band Edges

Test Mode	Antenna	Ch Name	Frequency[MHz]	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	4.98	-43.87	≤-15.02	PASS
BLE_1M	Ant1	High	2480	6.12	-46.78	≤-13.88	PASS

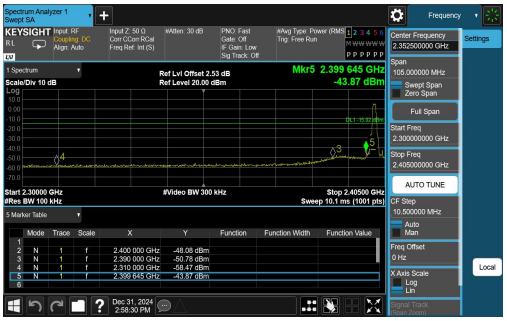
Spurious Emission

Test Mode	Antenna	Frequency[MHz]	Freq Range[MHz]	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	30~1000	4.98	-69.44	≤-15.02	PASS
BLE_1M	Ant1	2402	1000~26500	4.98	-52.13	≤-15.02	PASS
BLE_1M	Ant1	2440	30~1000	5.43	-68.37	≤-14.57	PASS
BLE_1M	Ant1	2440	1000~26500	5.43	-51.31	≤-14.57	PASS
BLE_1M	Ant1	2480	30~1000	6.12	-67.57	≤-13.88	PASS
BLE_1M	Ant1	2480	1000~26500	6.12	-48.84	≤-13.88	PASS

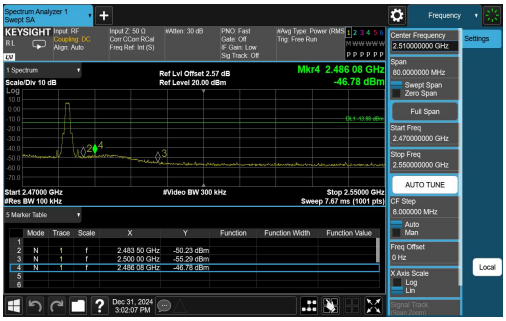
Test Graphs

Band Edges

BLE_1M-Ant1-2402-PASS

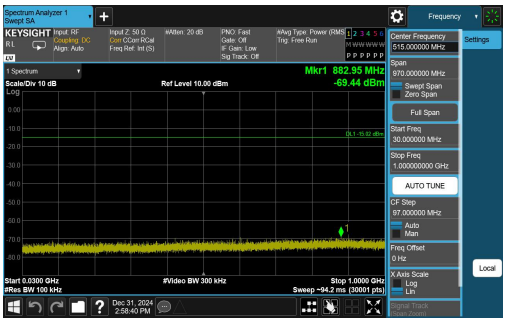


BLE_1M-Ant1-2480-PASS

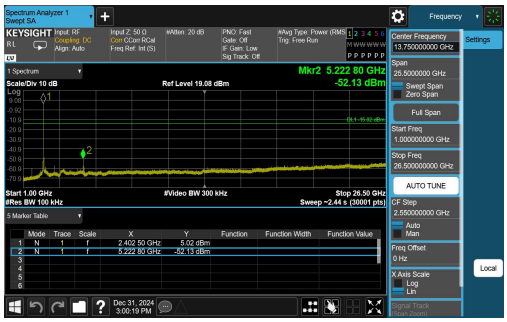


Spurious Emission

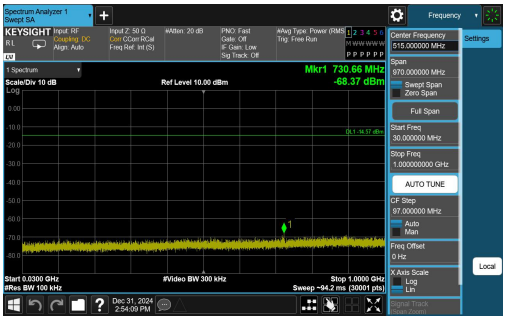
BLE_1M-Ant1-2402-30~1000-PASS



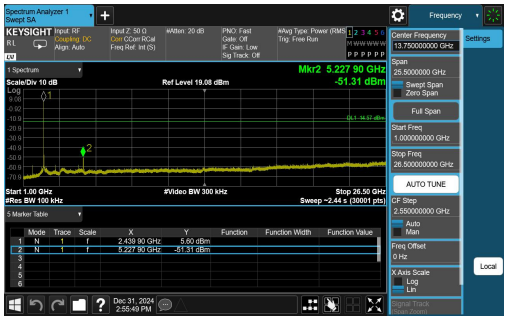
BLE_1M-Ant1-2402-1000~26500-PASS



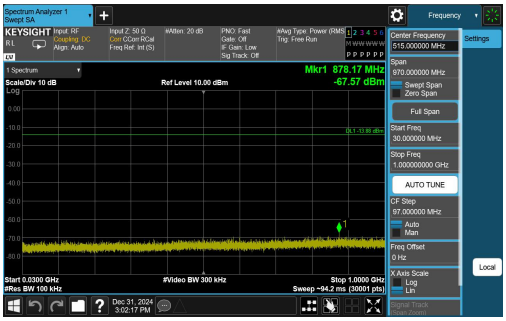
BLE_1M-Ant1-2440-30~1000-PASS



BLE_1M-Ant1-2440-1000~26500-PASS



BLE_1M-Ant1-2480-30~1000-PASS



BLE_1M-Ant1-2480-1000~26500-PASS

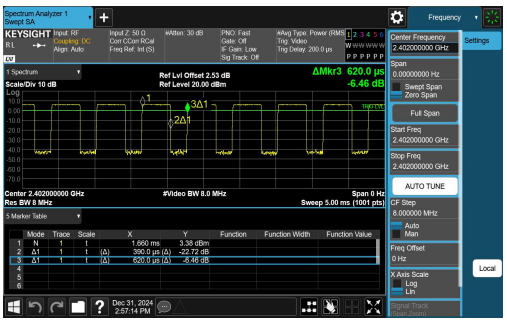
A.5 Duty Cycle

Test Result

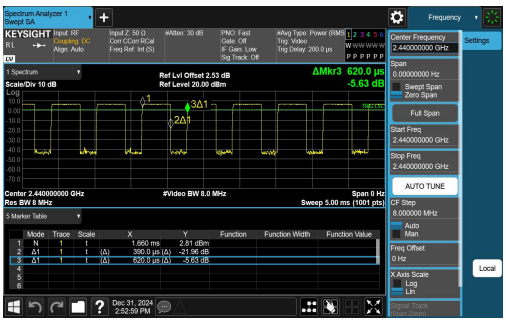
Test Mode	Antenna	Frequency[MHz]	ON Time[ms]	Period[ms]	Duty Cycle[%]	Duty Cycle Factor[dB]
BLE_1M	Ant1	2402	0.39	0.62	62.90	2.01
BLE_1M	Ant1	2440	0.39	0.62	62.90	2.01
BLE_1M	Ant1	2480	0.39	0.63	61.90	2.08

Test Graphs

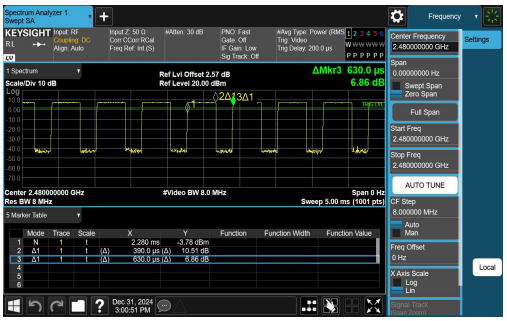
NTNV-BLE_1M-Ant1-2402



NTNV-BLE_1M-Ant1-2440



NTNV-BLE_1M-Ant1-2480



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ANNEX B: Test Results of Radiated Test

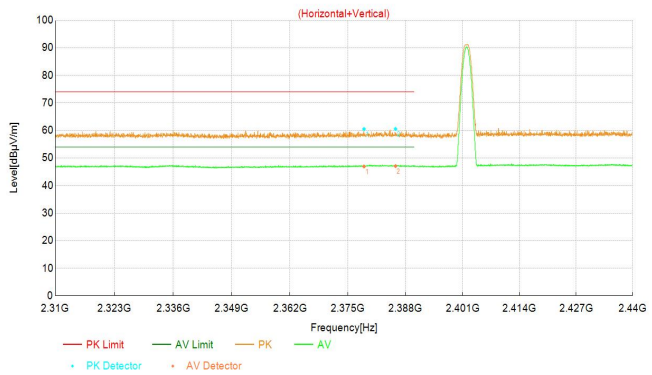
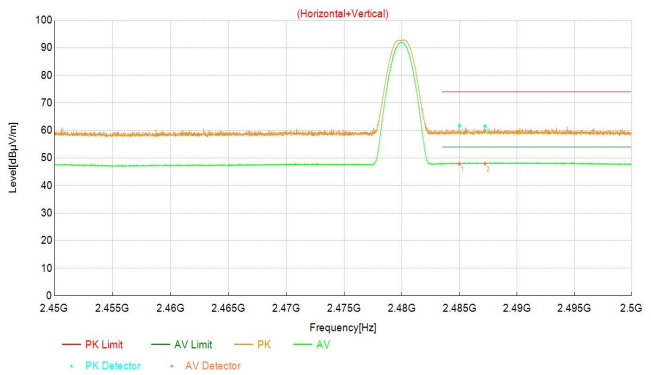
B.1 Radiated Band Edges and Spurious Emission

Test Result_Band Edges

Note:Both vertical and horizontal polarities have been evaluated, and the test data only shows the worst-case. Level=Reading+Factor; Margin=Limit-Level; V=Vertical , H=Horizontal.

Data List								
Test Mode	Frequency [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Pol.	Det
BLE_1M_2402	2378.66847	48.41	60.54	12.13	74.00	13.46	H	PK
	2378.66847	34.81	46.94	12.13	54.00	7.06	H	AV
	2385.79525	48.39	60.56	12.17	74.00	13.44	H	PK
	2385.79525	34.91	47.08	12.17	54.00	6.92	H	AV
BLE_1M_2480	2484.99478	48.97	61.75	12.78	74.00	12.25	H	PK
	2484.99478	35.15	47.93	12.78	54.00	6.07	H	AV
	2487.22775	48.77	61.56	12.79	74.00	12.44	H	PK
	2487.22775	35.19	47.98	12.79	54.00	6.02	H	AV

Test Graphs_Band Edges

BLE_1M_2402	BLE_1M_2480
	

Test Result_Spurious Emission

Note1: Test result Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier the Emissions in the frequency band 9kHz-30MHz and 18GHz-26.5GHz are more than 20dB below the limit are not reported.

Note2: Both vertical and horizontal polarities have been evaluated, and the test data only shows the worst-case. Level=Reading+Factor; Margin=Limit-Level; V=Vertical , H=Horizontal.

Data List

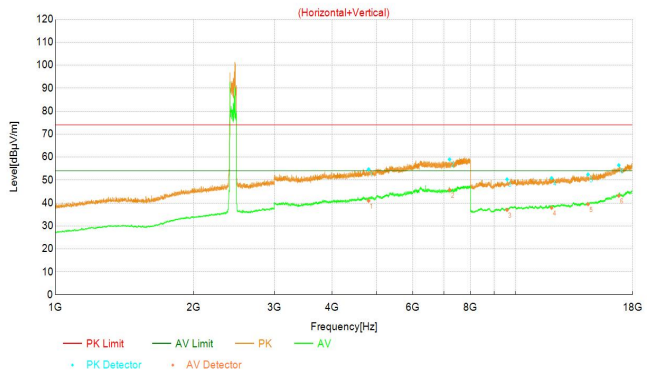
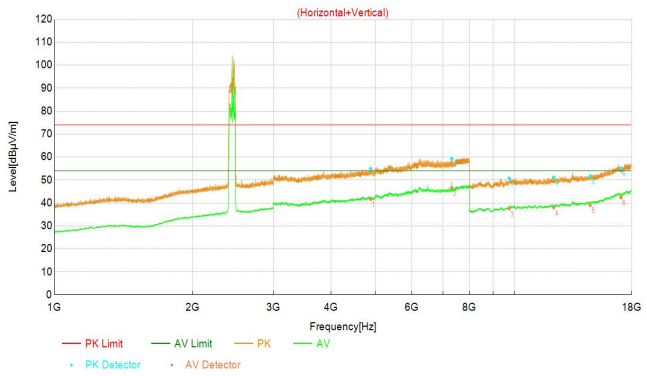
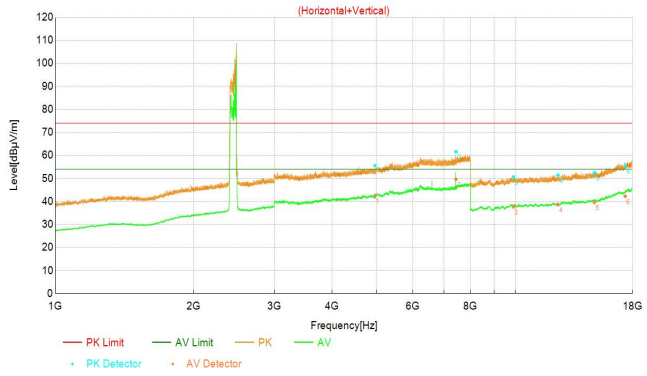
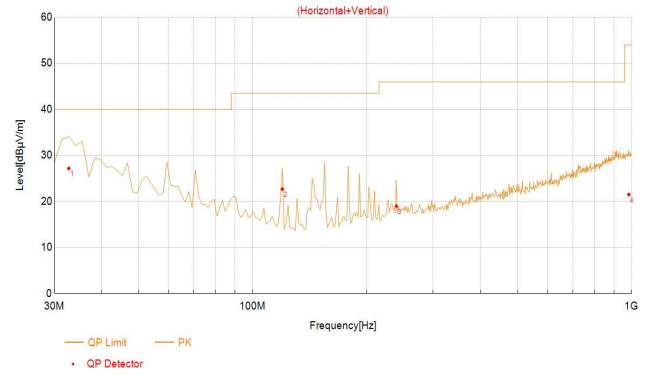
Test Mode	Frequency [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Pol.	Det
BLE_1M_2402	4804.038	36.91	54.68	17.77	74.00	19.32	V	PK
	4804.038	23.18	40.95	17.77	54.00	13.05	V	AV
	7205.6475	45.31	58.99	13.68	74.00	15.01	H	PK
	7205.6475	32.02	45.70	13.68	54.00	8.30	H	AV
	9608.0925	35.57	50.28	14.71	74.00	23.72	V	PK
	9608.0925	22.26	36.97	14.71	54.00	17.03	V	AV
	12010.0925	35.03	50.86	15.83	74.00	23.14	H	PK
	12010.0925	22.04	37.87	15.83	54.00	16.13	H	AV
	14411.9425	34.06	52.41	18.35	74.00	21.59	H	PK
	14411.9425	21.12	39.47	18.35	54.00	14.53	H	AV
	16814.1275	33.22	56.45	23.23	74.00	17.55	H	PK
	16814.1275	19.88	43.11	23.23	54.00	10.89	H	AV
BLE_1M_2440	4879.6414	37.60	55.03	17.43	74.00	18.97	V	PK
	4879.6414	24.17	41.60	17.43	54.00	12.40	V	AV
	7320.3625	44.88	59.30	14.42	74.00	14.70	V	PK
	7320.3625	32.23	46.65	14.42	54.00	7.35	V	AV
	9759.6725	35.78	50.78	15.00	74.00	23.22	V	PK
	9759.6725	22.56	37.56	15.00	54.00	16.44	V	AV
	12199.7575	35.66	51.19	15.53	74.00	22.81	V	PK
	12199.7575	22.48	38.01	15.53	54.00	15.99	V	AV
	14639.6675	33.23	51.68	18.45	74.00	22.32	H	PK
	14639.6675	20.66	39.11	18.45	54.00	14.89	H	AV
	17079.5975	30.66	55.18	24.52	74.00	18.82	V	PK

	17079.5975	17.88	42.40	24.52	54.00	11.60	V	AV
BLE_1M_2480	4959.7752	37.68	55.58	17.90	74.00	18.42	V	PK
	4959.7752	24.60	42.50	17.90	54.00	11.50	V	AV
	7440.1325	47.18	61.62	14.44	74.00	12.38	V	PK
	7440.1325	35.22	49.66	14.44	54.00	4.34	V	AV
	9919.8875	35.63	50.67	15.04	74.00	23.33	H	PK
	9919.8875	22.65	37.69	15.04	54.00	16.31	H	AV
	12399.8875	35.01	51.48	16.47	74.00	22.52	V	PK
	12399.8875	22.14	38.61	16.47	54.00	15.39	V	AV
	14879.8775	33.95	52.47	18.52	74.00	21.53	V	PK
	14879.8775	21.08	39.60	18.52	54.00	14.40	V	AV
	17360.2425	30.77	55.59	24.82	74.00	18.41	H	PK
	17360.2425	17.44	42.26	24.82	54.00	11.74	H	AV

Data List

Test Mode	Frequency [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Pol.	Det
BLE_1M_2480	32.807294	45.42	27.19	-18.23	40.00	12.81	V	QP
	120.018515	41.87	22.70	-19.17	43.50	20.80	V	QP
	239.961268	33.29	18.99	-14.30	46.00	27.01	V	QP
	984.553732	23.81	21.51	-2.30	54.00	32.49	V	QP

Test Graphs_Spurious Emission

BLE_1M_2402	BLE_1M_2440
	
BLE_1M_2480	**BLE_1M_2480**
	

ANNEX C: The EUT Appearance

The EUT Appearance (internal and external photographs) are submitted separately.

ANNEX D: Test Setup Photograph

The Test Setup Photographs are submitted separately.