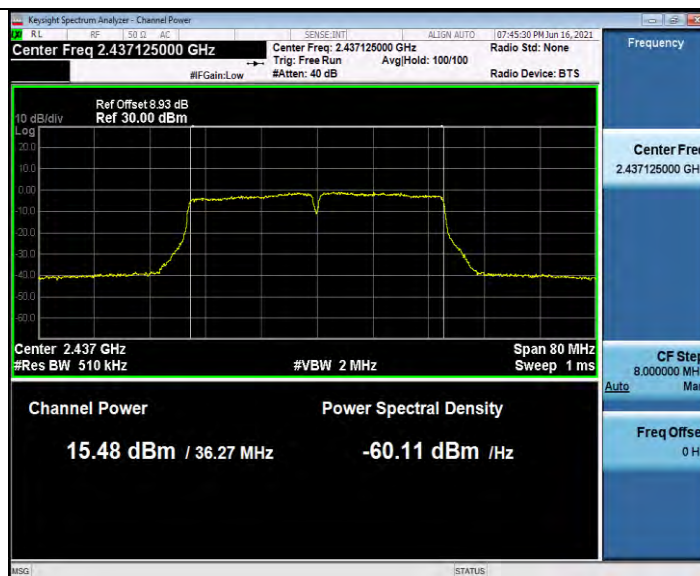




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Test Report No.: RFBGDJ-W7L-P21060011-3



11N40SISO_Ant1_2437



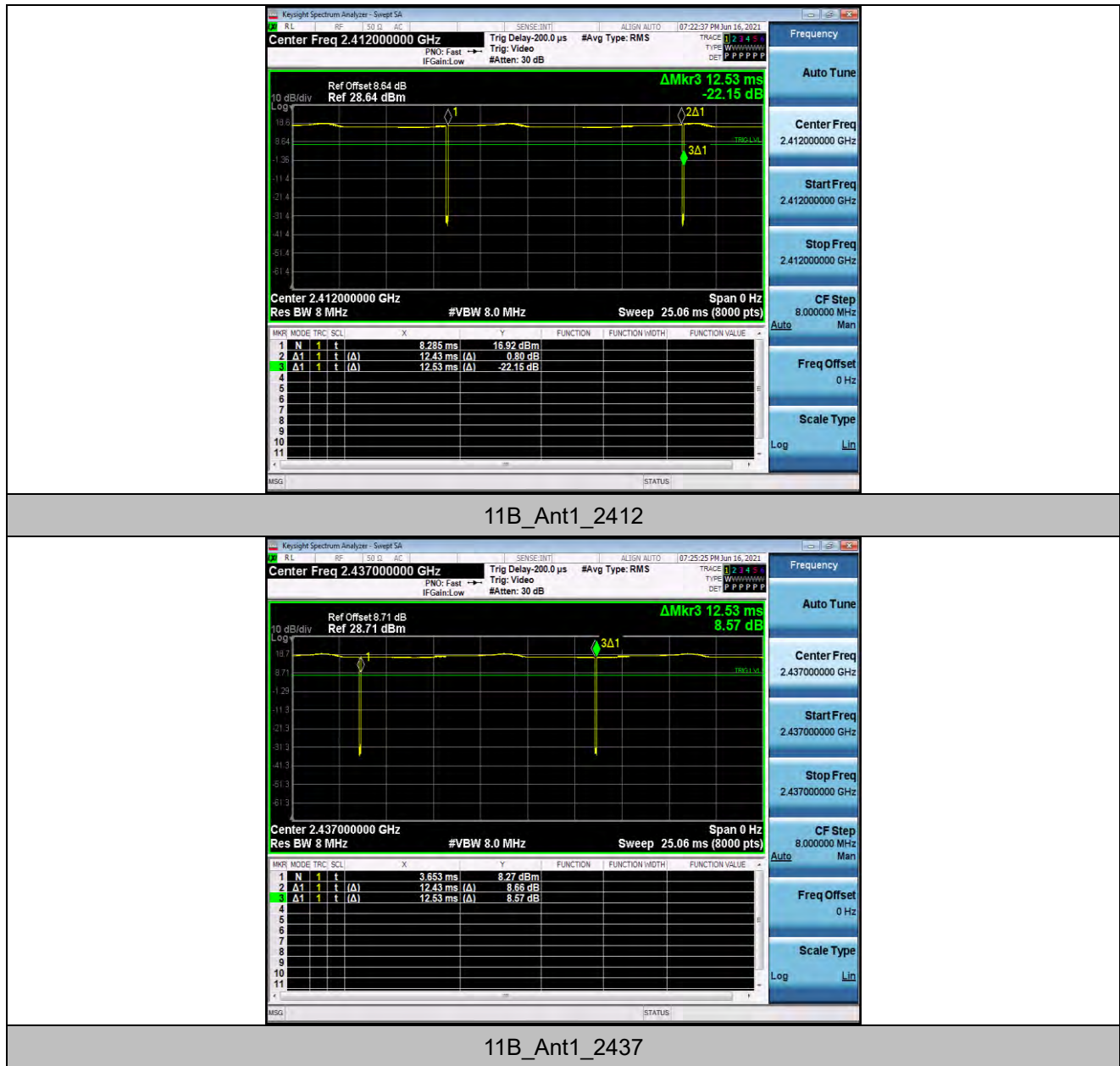
11N40SISO_Ant1_2452

Appendix D: Duty Cycle

Test Result

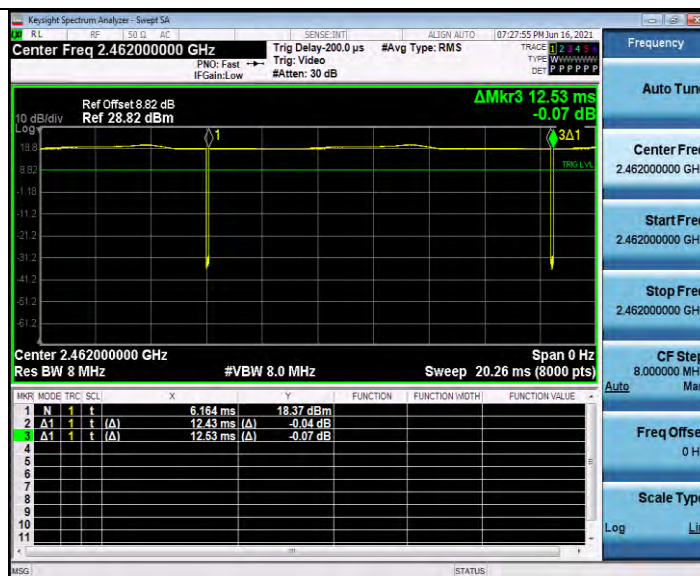
TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant1	2412	12.43	12.53	99.20
		2437	12.43	12.53	99.20
		2462	12.43	12.53	99.20
11G	Ant1	2412	2.06	2.10	98.10
		2437	2.06	2.10	98.10
		2462	2.06	2.10	98.10
11N20SISO	Ant1	2412	1.92	1.96	97.96
		2437	1.92	1.96	97.96
		2462	1.92	1.96	97.96
11N40SISO	Ant1	2422	0.95	1.00	95.00
		2437	0.95	1.00	95.00
		2452	0.95	1.00	95.00

Test Graphs

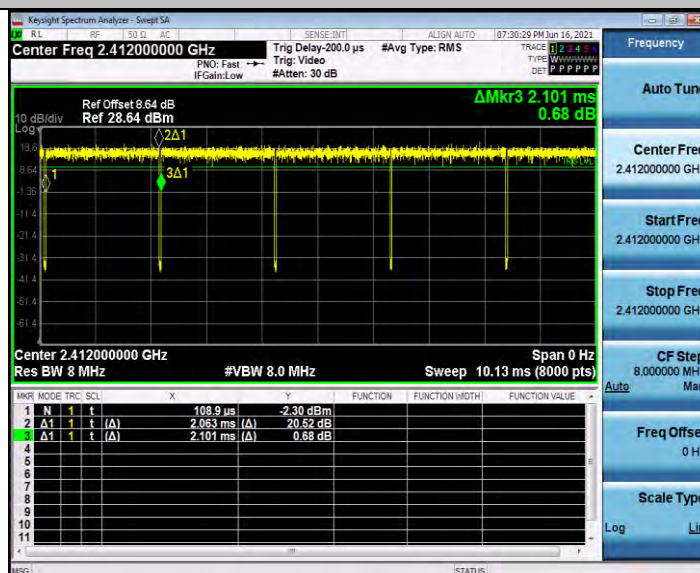




Test Report No.: RFBGDJ-W7L-P21060011-3



11B Ant1 2462

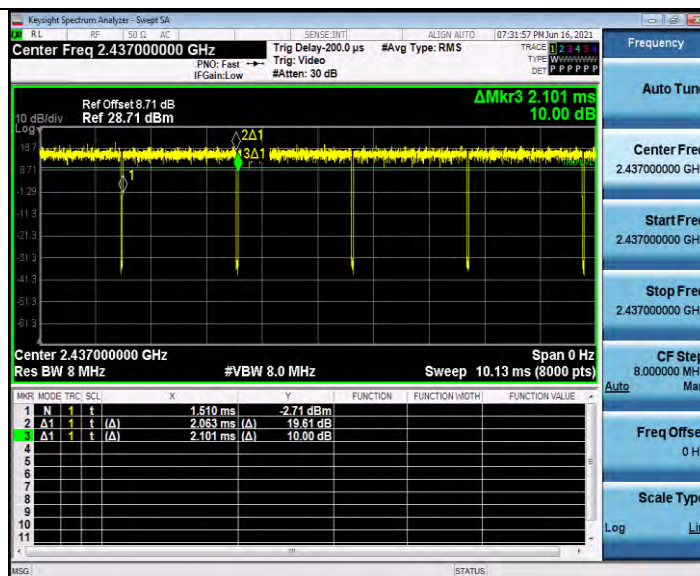


11G_Ant1_2412

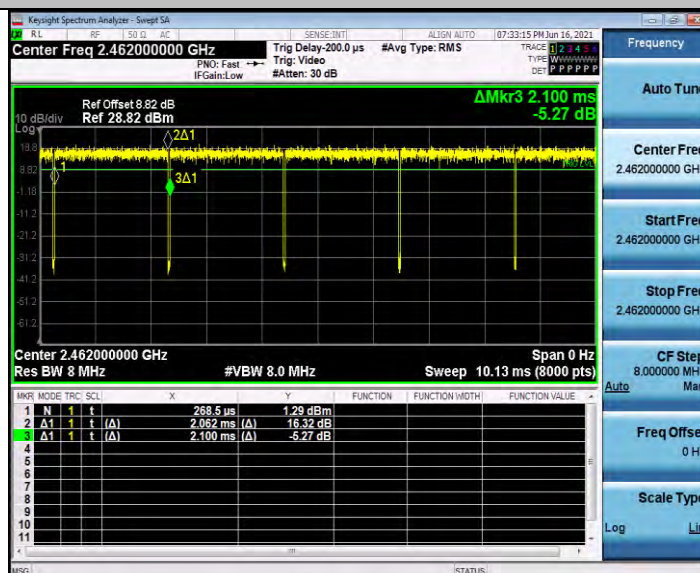


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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11G_Ant1_2437

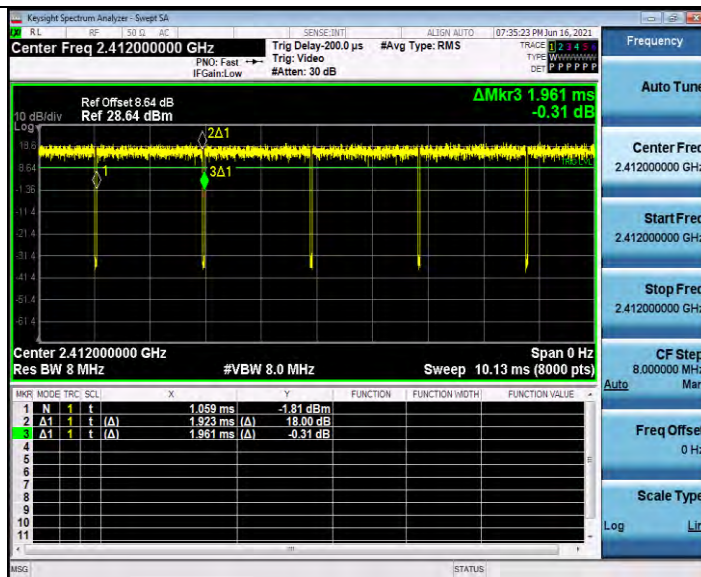


11G_Ant1_2462

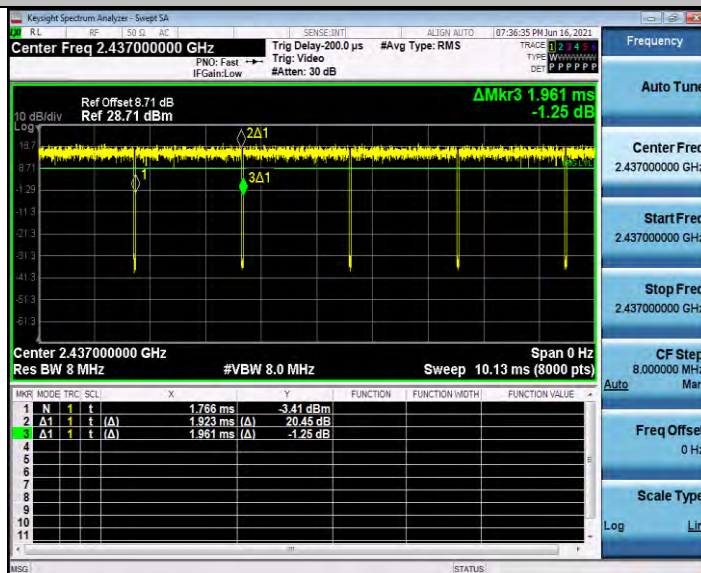


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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2412

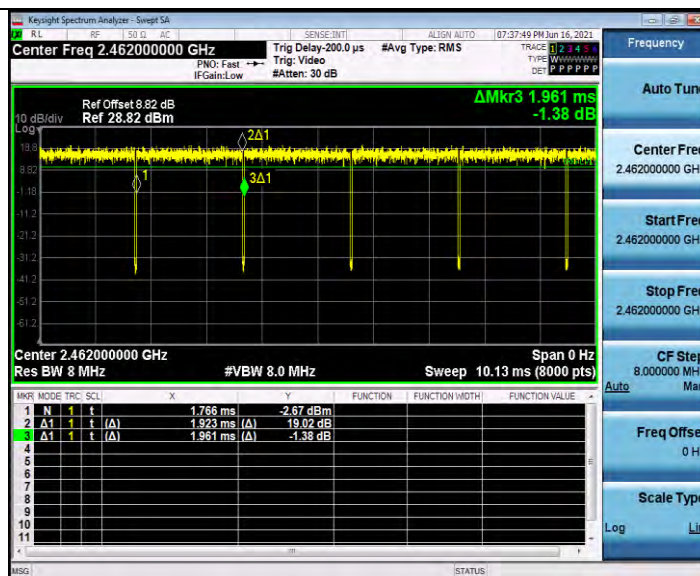


11N20SISO_Ant1_2437

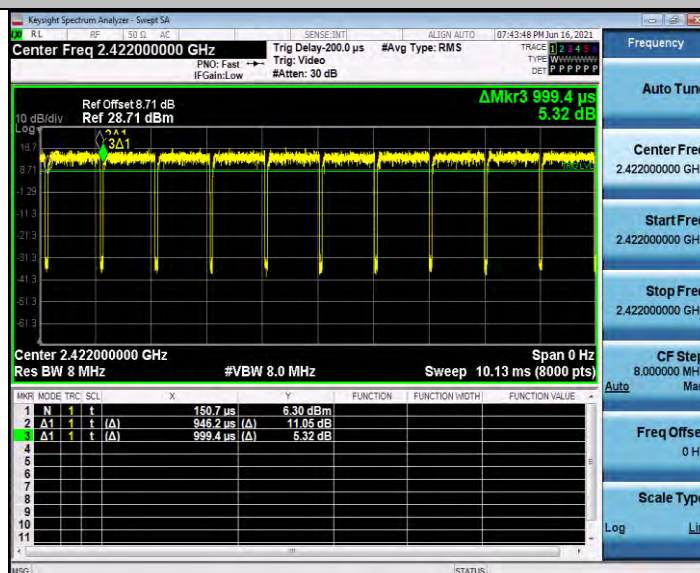


BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2462

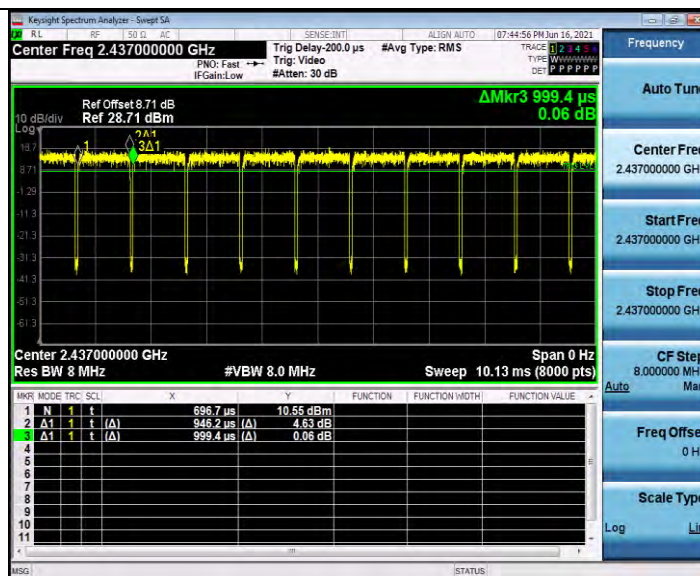


11N40SISO_Ant1_2422

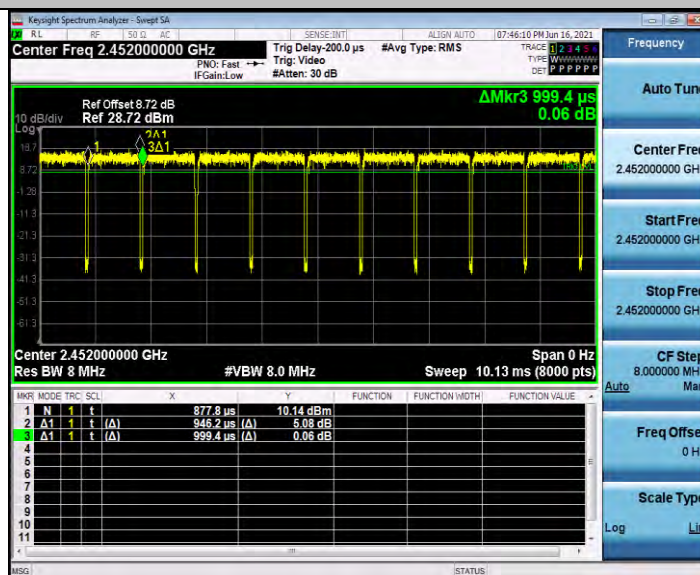


BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N40SISO_Ant1_2437



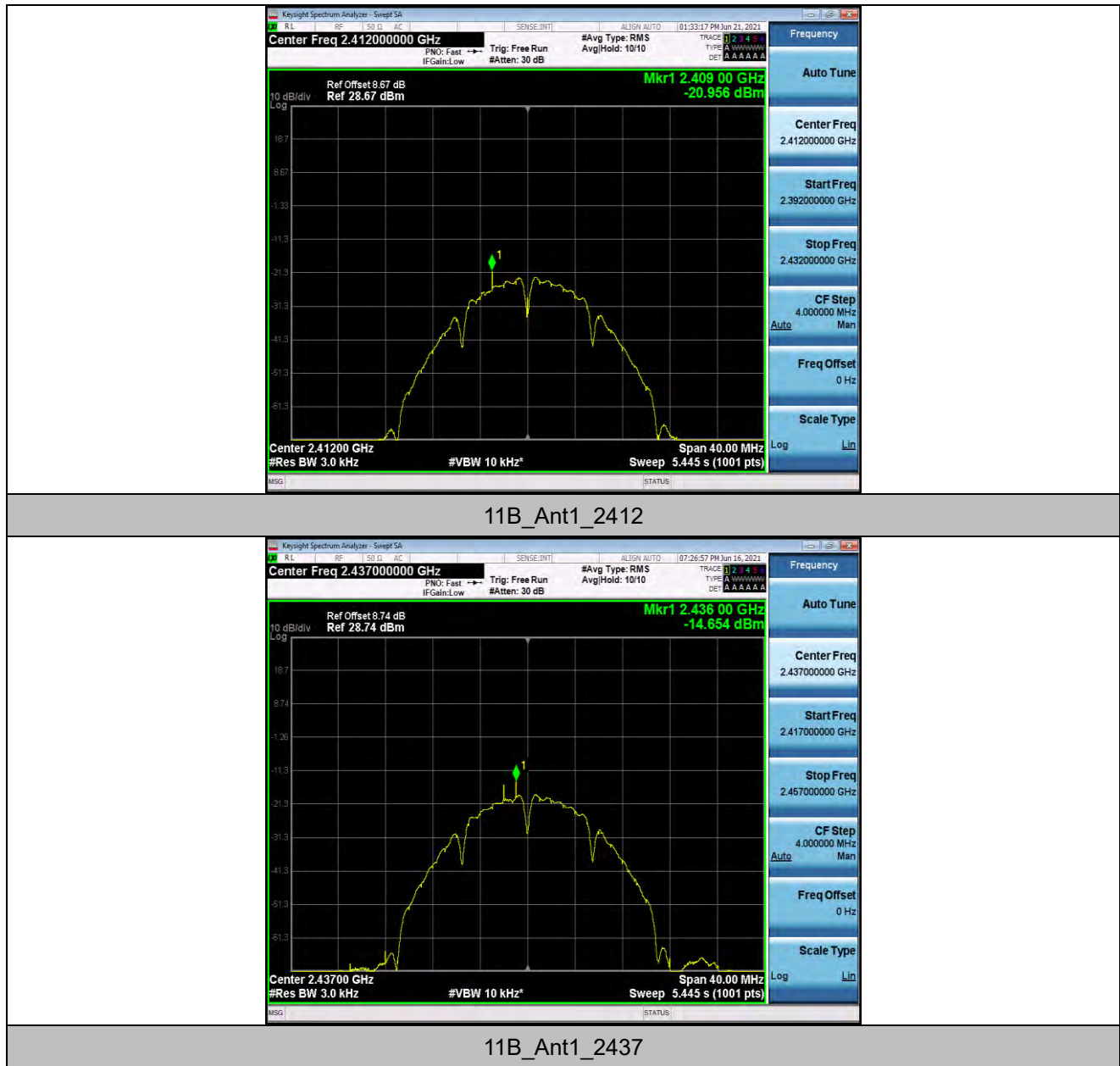
11N40SISO_Ant1_2452

Appendix E: Maximum power spectral density

Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-20.96	<=8	PASS
		2437	-14.65	<=8	PASS
		2462	-17.02	<=8	PASS
11G	Ant1	2412	-20.61	<=8	PASS
		2437	-19.98	<=8	PASS
		2462	-19.97	<=8	PASS
11N20SISO	Ant1	2412	-20.24	<=8	PASS
		2437	-20.53	<=8	PASS
		2462	-20.31	<=8	PASS
11N40SISO	Ant1	2422	-22.21	<=8	PASS
		2437	-22.13	<=8	PASS
		2452	-22.48	<=8	PASS

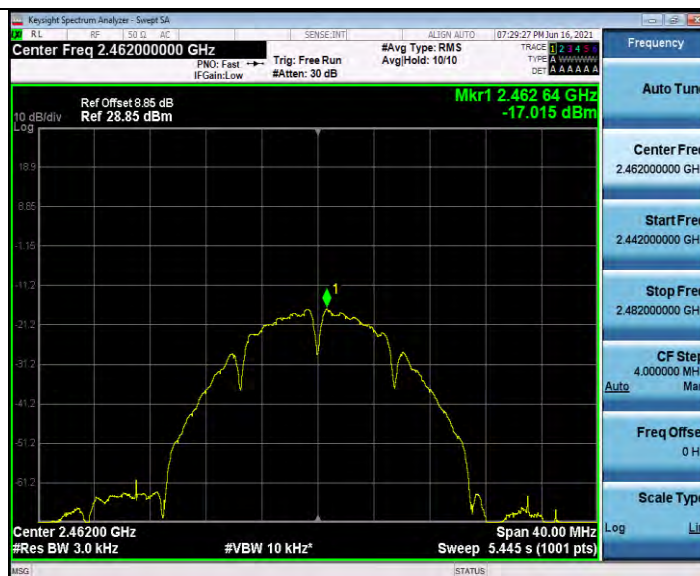
Test Graphs



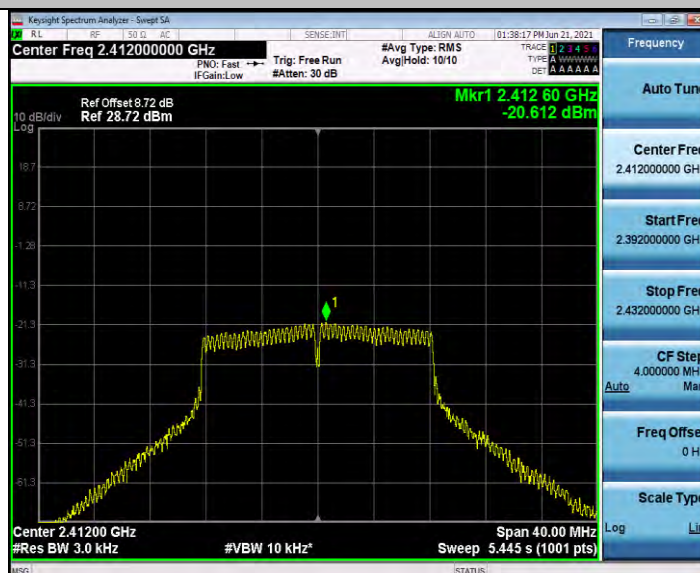


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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11B_Ant1_2462

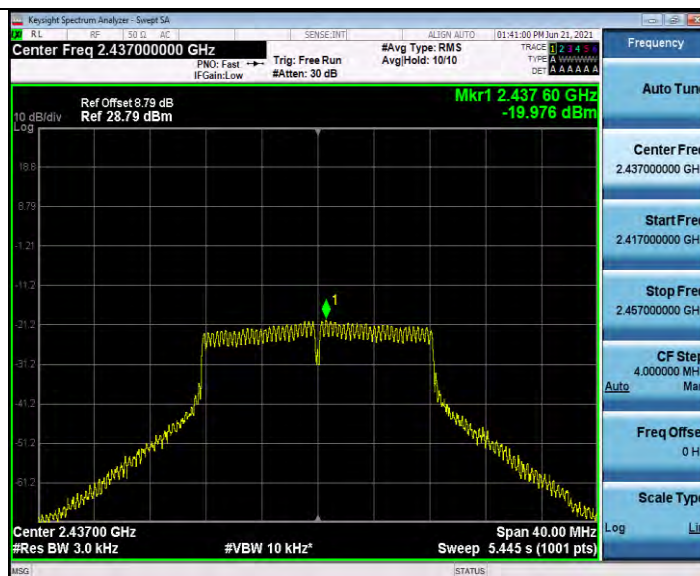


11G_Ant1_2412

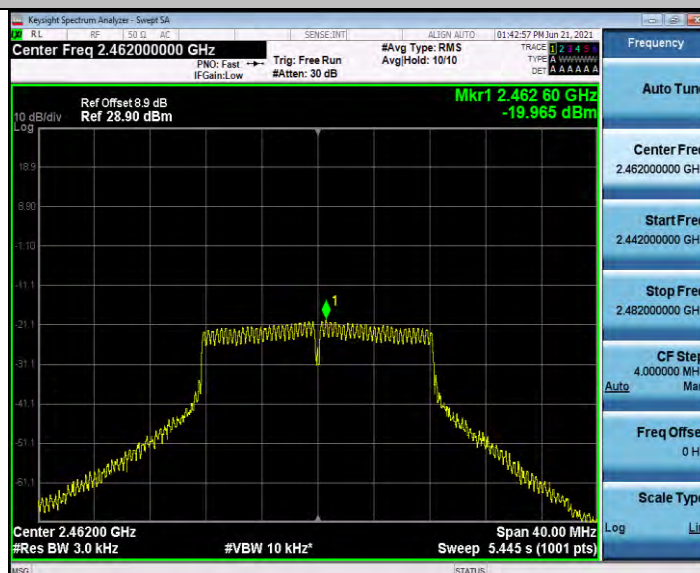


BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11G_Ant1_2437

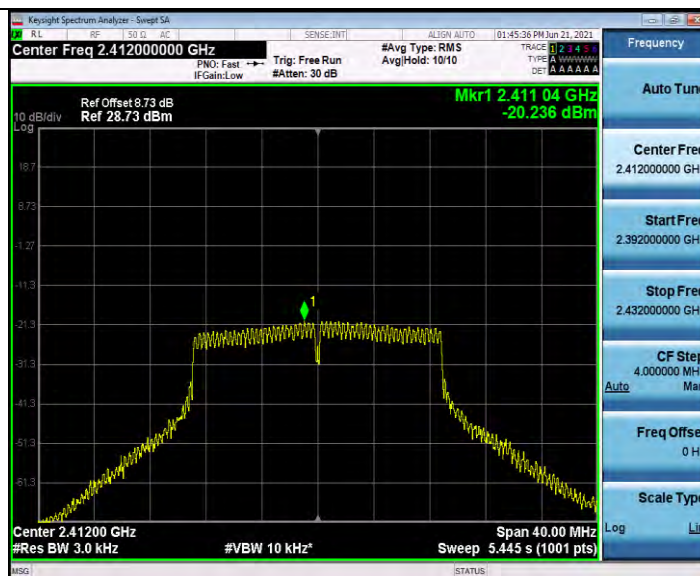


11G_Ant1_2462

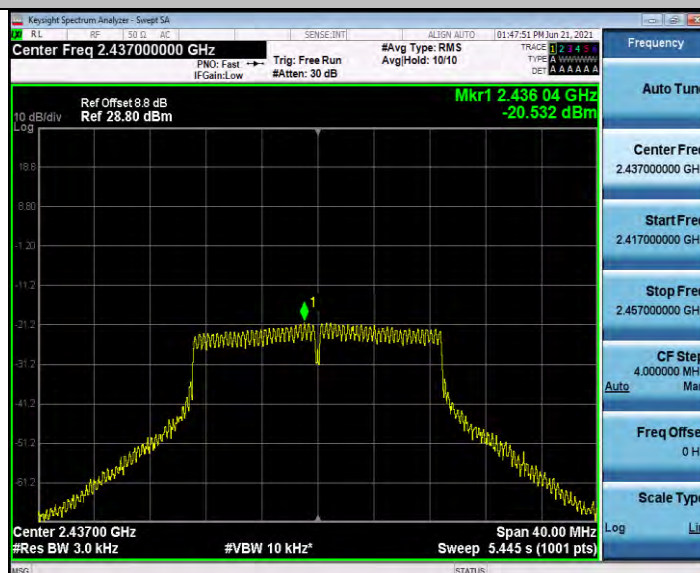


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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2412

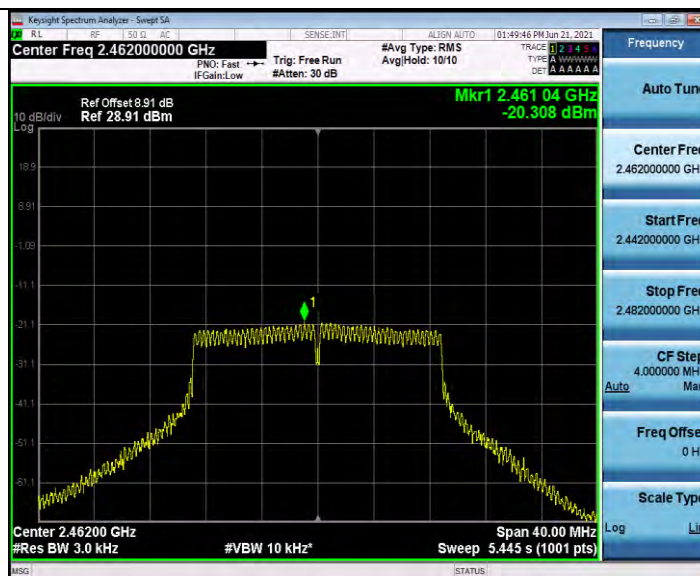


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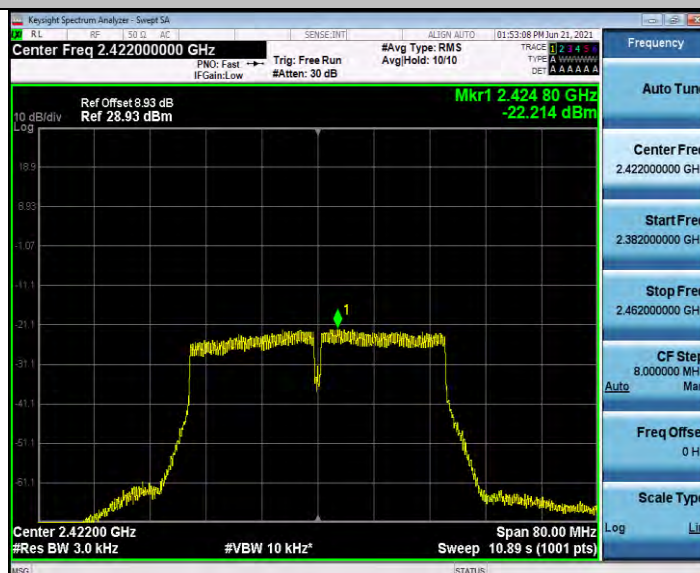


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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2462

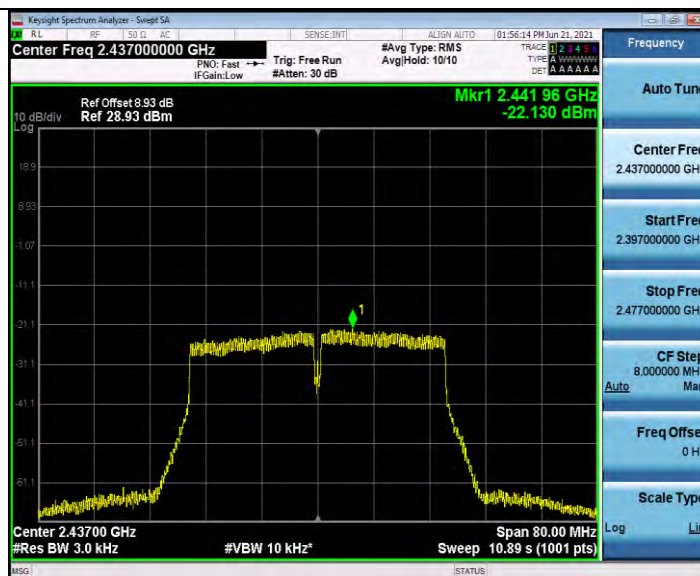


11N40SISO_Ant1_2422

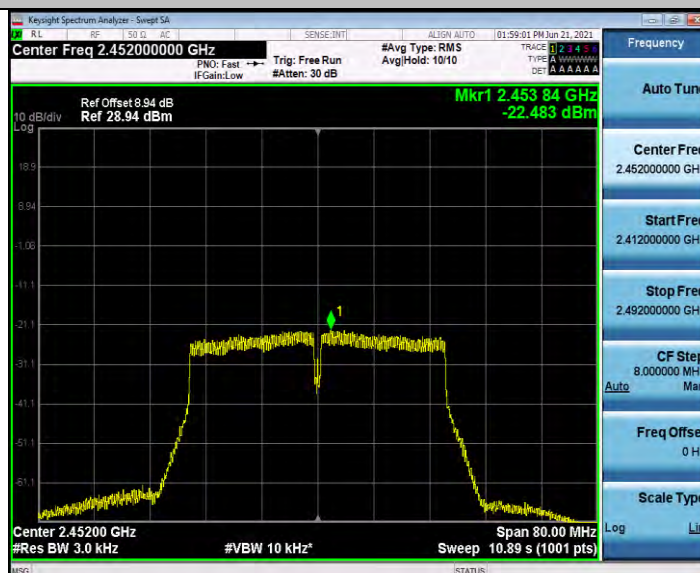


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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452

Appendix F: Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	1.27	-46.54	<=-28.73	PASS
		High	2462	1.18	-46.17	<=-28.82	PASS
11G	Ant1	Low	2412	4.16	-28.27	<=-25.84	PASS
		High	2462	4.59	-45.81	<=-25.41	PASS
11N20SISO	Ant1	Low	2412	4.43	-25.71	<=-25.57	PASS
		High	2462	4.53	-45.66	<=-25.47	PASS
11N40SISO	Ant1	Low	2422	2.36	-33.17	<=-27.64	PASS
		High	2452	1.98	-42.57	<=-28.02	PASS

Test Graphs



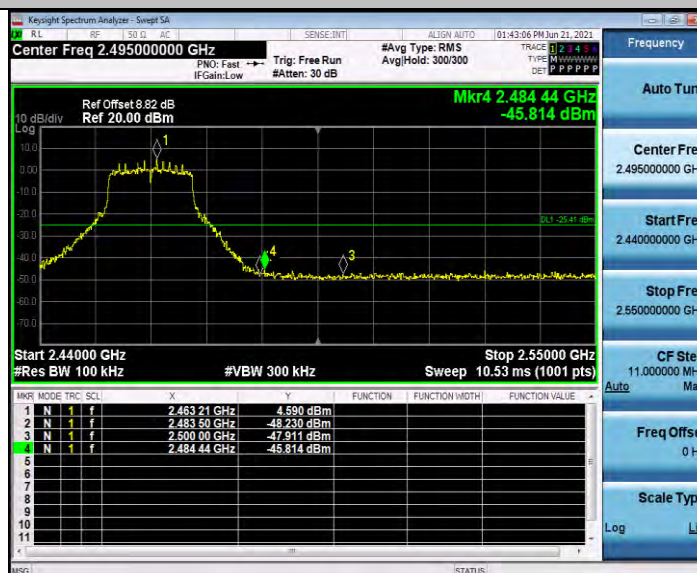


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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11G_Ant1_Low_2412



11G_Ant1_High_2462

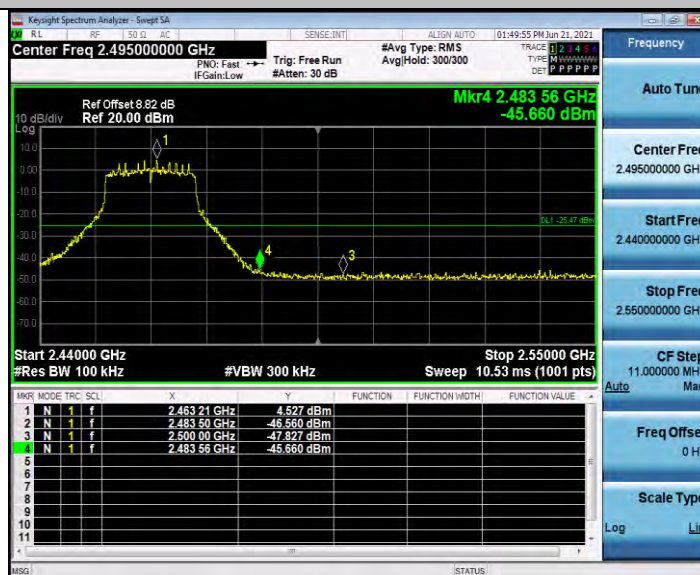


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Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_Low_2412



11N20SISO_Ant1_High_2462



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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452

Appendix G: Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.88	3.88	---	PASS
			30~1000	3.88	-57.09	<=-26.12	PASS
			1000~26500	3.88	-37.69	<=-26.12	PASS
		2437	Reference	4.95	4.95	---	PASS
			30~1000	4.95	-56.83	<=-25.05	PASS
			1000~26500	4.95	-37.26	<=-25.05	PASS
		2462	Reference	6.63	6.63	---	PASS
			30~1000	6.63	-56.29	<=-23.37	PASS
			1000~26500	6.63	-37.29	<=-23.37	PASS
11G	Ant1	2412	Reference	4.85	4.85	---	PASS
			30~1000	4.85	-56.59	<=-25.15	PASS
			1000~26500	4.85	-37.89	<=-25.15	PASS
		2437	Reference	4.91	4.91	---	PASS
			30~1000	4.91	-56.78	<=-25.09	PASS
			1000~26500	4.91	-37.03	<=-25.09	PASS
		2462	Reference	4.51	4.51	---	PASS
			30~1000	4.51	-56.01	<=-25.49	PASS
			1000~26500	4.51	-37.51	<=-25.49	PASS
11N20SISO	Ant1	2412	Reference	4.39	4.39	---	PASS
			30~1000	4.39	-56.45	<=-25.61	PASS
			1000~26500	4.39	-37.87	<=-25.61	PASS
		2437	Reference	5.33	5.33	---	PASS
			30~1000	5.33	-56.76	<=-24.67	PASS
			1000~26500	5.33	-37.55	<=-24.67	PASS
		2462	Reference	5.35	5.35	---	PASS
			30~1000	5.35	-56.78	<=-24.65	PASS
			1000~26500	5.35	-36.99	<=-24.65	PASS
11N40SISO	Ant1	2422	Reference	3.06	3.06	---	PASS
			30~1000	3.06	-56.88	<=-26.94	PASS
			1000~26500	3.06	-37.45	<=-26.94	PASS

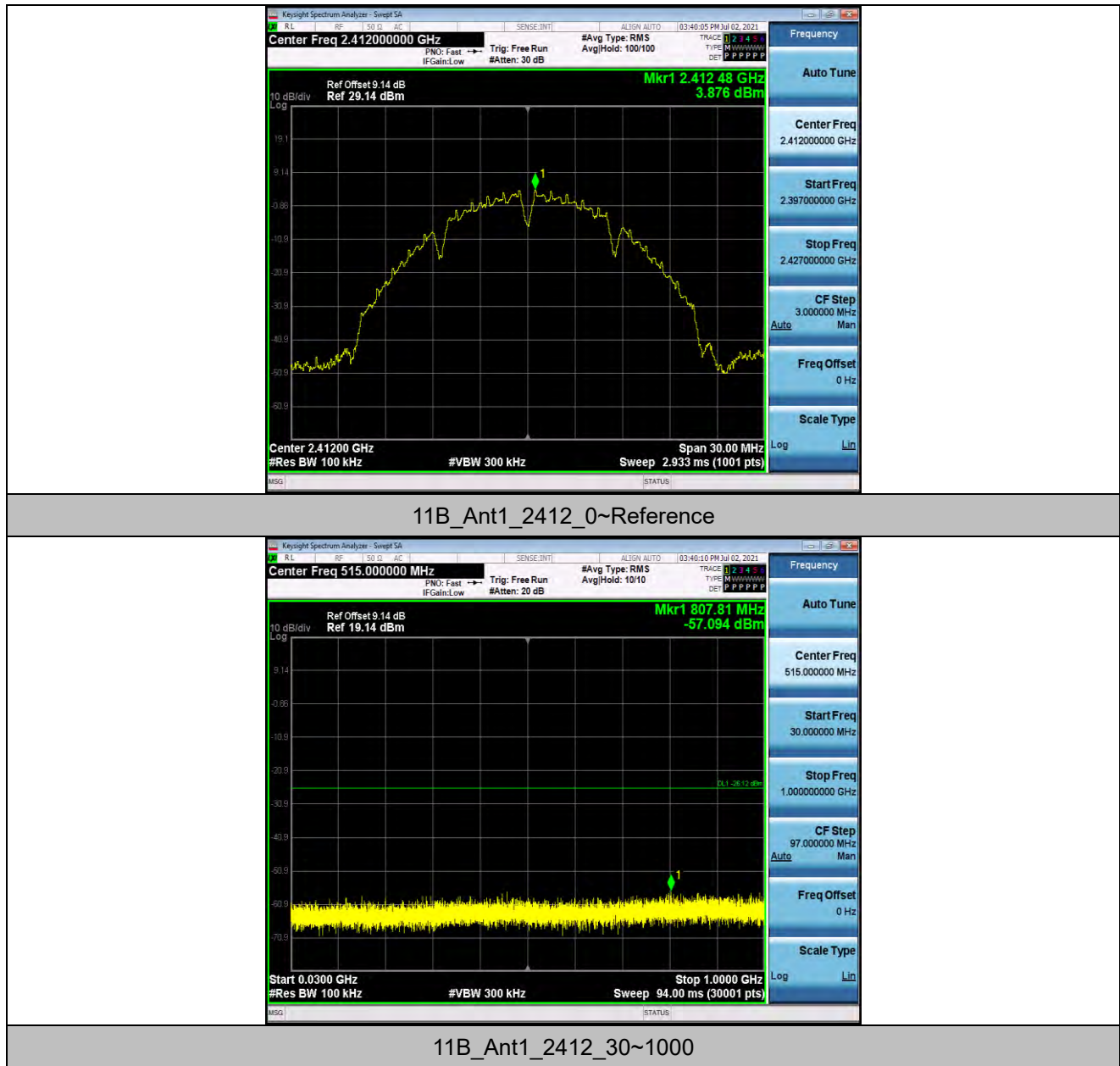


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Test Report No.: RFBGDJ-W7L-P21060011-3

		2437	Reference	3.03	3.03	---	PASS
			30~1000	3.03	-56.63	≤ -26.97	PASS
			1000~26500	3.03	-37	≤ -26.97	PASS
		2452	Reference	2.55	2.55	---	PASS
			30~1000	2.55	-57.02	≤ -27.45	PASS
			1000~26500	2.55	-36.78	≤ -27.45	PASS

Test Graphs





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Test Report No.: RFBGDJ-W7L-P21060011-3



11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference



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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11B_Ant1_2437_30~1000



11B_Ant1_2437_1000~26500

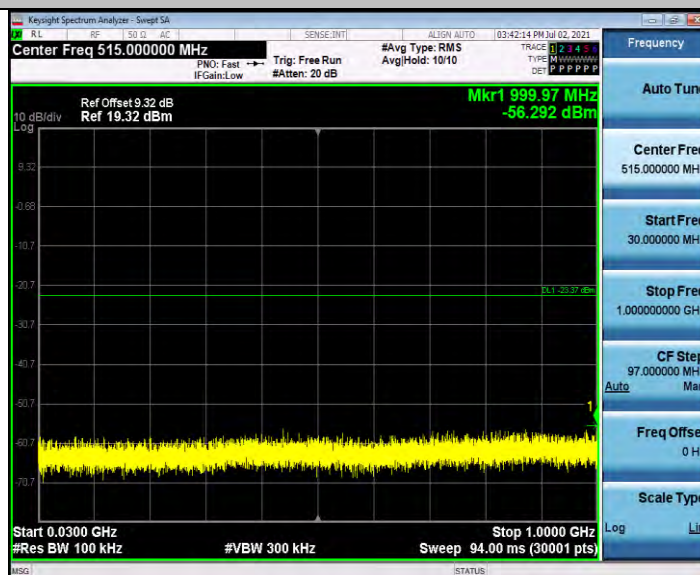


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Test Report No.: RFBGDJ-W7L-P21060011-3



11B_Ant1_2462_0~Reference



11B_Ant1_2462_30~1000



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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11B_Ant1_2462_1000~26500



11G_Ant1_2412_0~Reference



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11G_Ant1_2412_30~1000



11G_Ant1_2412_1000~26500

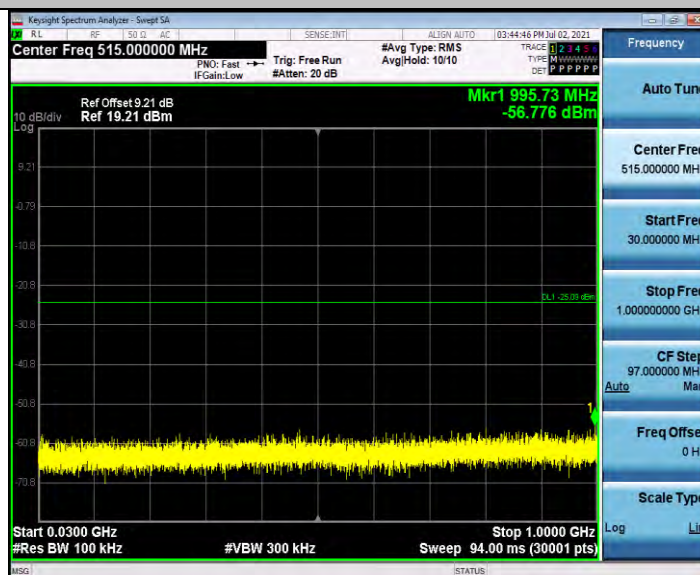


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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11G_Ant1_2437_1000~26500

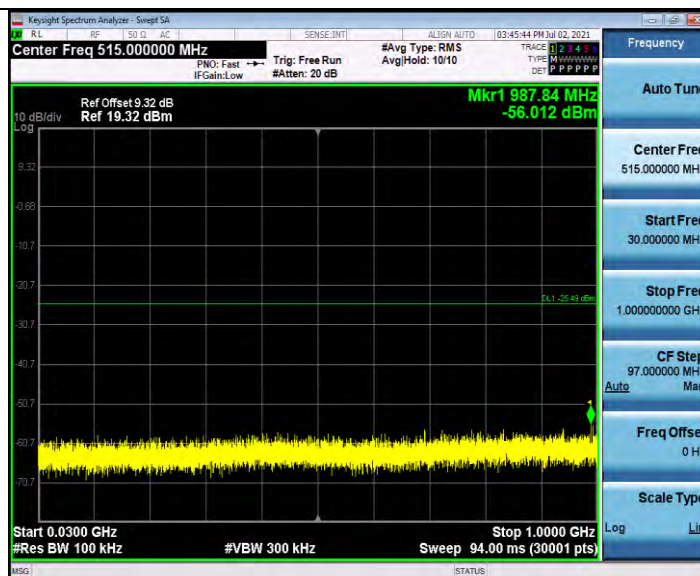


11G_Ant1_2462_0~Reference



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11G_Ant1_2462_30~1000



11G_Ant1_2462_1000~26500



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2412_0~Reference



11N20SISO_Ant1_2412_30~1000



BUREAU
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Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2412_1000~26500



11N20SISO_Ant1_2437_0~Reference



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VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500

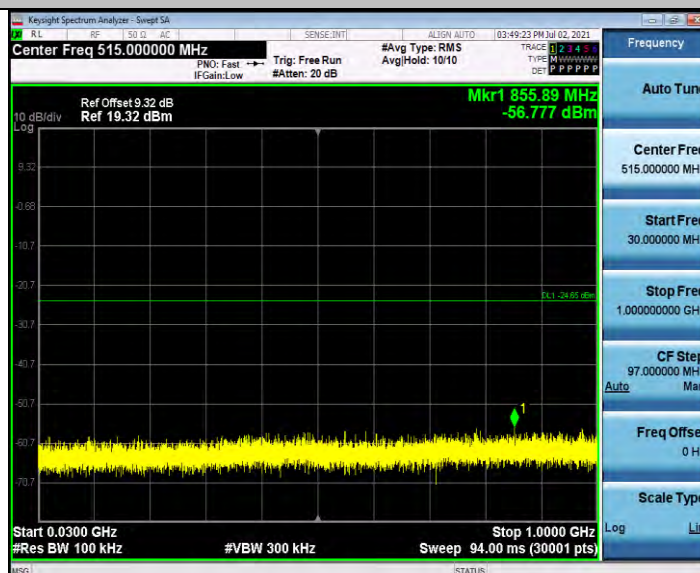


BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2462_0~Reference



11N20SISO_Ant1_2462_30~1000



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N20SISO_Ant1_2462_1000~26500



11N40SISO_Ant1_2422_0~Reference



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N40SISO_Ant1_2422_30~1000



11N40SISO_Ant1_2422_1000~26500

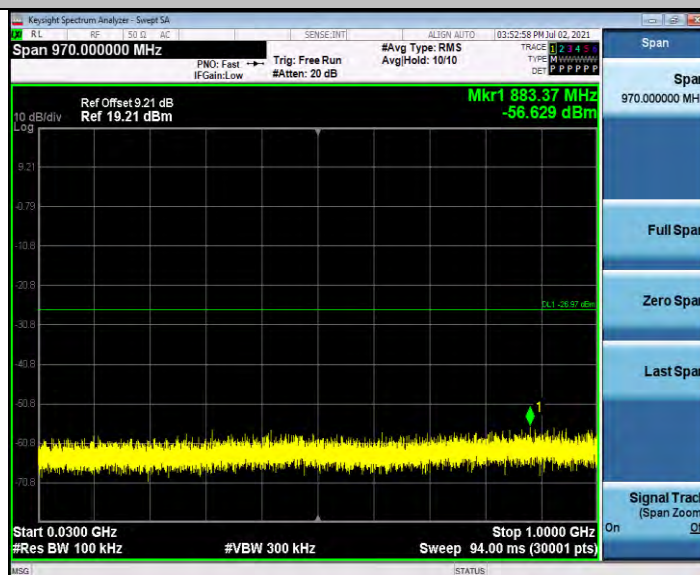


BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N40SISO_Ant1_2437_0~Reference



11N40SISO_Ant1_2437_30~1000



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N40SISO_Ant1_2437_1000~26500

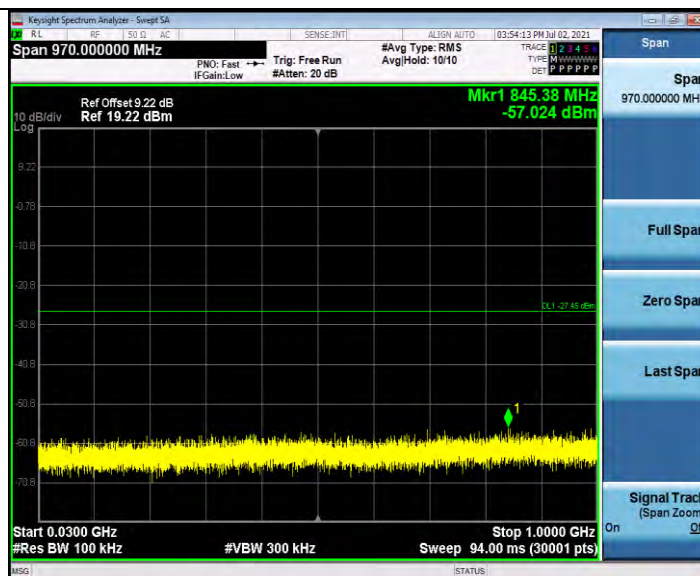


11N40SISO_Ant1_2452_0~Reference



BUREAU
VERITAS

Test Report No.: RFBGDJ-W7L-P21060011-3



11N40SISO_Ant1_2452_30~1000



11N40SISO_Ant1_2452_1000~26500

RADIO TEST REPORT

(FCC Part 15 Subpart C / IC RSS-247)

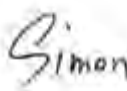
Applicant:	Honeywell International Inc Honeywell Safety and Productivity Solutions
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States

Manufacturer:	Honeywell International Inc Honeywell Safety and Productivity Solutions
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States
Product:	Mobile Computer
Brand Name:	Honeywell
Model Name:	CT45-L0N
FCC ID:	HD5-CT45L0N
Date of tests:	2021-06-11 to 2021-07-01

The tests have been carried out according to the requirements of the following standard:

☒ **Part 15 Subpart C §15. 247 / IC RSS-247 issue 2**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
 Date: Jul. 02, 2021	 Date: Jul. 02, 2021

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2021.07.02	Valid	Original Report

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Summary of Test RESULT

FCC Rule	IC Rule	Description	Limit	Result	Remark
15.247(a)(2)	RSS-247 5.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
-	RSS-Gen 6.7	99% Bandwidth	-	Pass	-
15.247(b)(3)	RSS-247 5.4(d)	Peak Output Power	$\leq 30\text{dBm}$	Pass	-
15.247(e)	RSS-247 5.2(b)	Power Spectral Density	$\leq 8\text{dBm/3kHz}$	Pass	-
15.247(d)	RSS-247 5.5	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass	-
15.247(d)	RSS-247 5.5	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d) RSS-247 5.5 & RSS-Gen Table 5 , Table 6	Pass	Under limit 10.16 dB at 4880 MHz
15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a) RSS-GEN 8.8 Table 4	Pass	Under limit 17.16 dB at 0.497 MHz
15.203 & 15.247(b)	RSS-GEN 6.8	Antenna Requirement	15.203 & 15.247(b) RSS-GEN 6.8	Pass	-

1. General Description

1.1 Applicant

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bailes Road, Fort Mill, SC 29707 United States

1.2 Manufacturer

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bailes Road, Fort Mill, SC 29707 United States

1.3 General Description Of EUT

Product	Mobile Computer
Model No.	CT45-L0N
Additional No.	N/A
Difference Description	N/A
Power Supply	3.85Vdc for EUT
Modulation Technology	BLE
Modulation Type	GFSK
Operating Frequency	2402MHz~2480MHz
Number Of Channel	40
Max. Output Power	6.56 dBm (0.0045 W)
Max. e.i.r.p.	7.96 dBm (0.0063W)
Antenna Type	LDS type Antenna with 1.4dBi gain
HW Version	V1.0
SW Version	OS.11.001
I/O Ports	Refer to user's manual

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ ANSI C63.10-2013
- ♦ KDB 558074 D01 15.247 Meas Guidance v05r02
- ♦ IC RSS-247 Issue 2
- ♦ IC RSS-Gen Issue 5

Remark:

1. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B&ICES-003, recorded in a separate test report.

2. Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

The transmitter has a maximum peak conducted output power as follows:

Test Mode	Channel	Frequency	Bluetooth RF Output Power
BLE_125K	Ch00	2402MHz	4.66
	Ch19	2440MHz	5.33
	Ch39	2480MHz	6.52
BLE_1M	Ch00	2402MHz	4.69
	Ch19	2440MHz	5.32
	Ch39	2480MHz	6.54
BLE_2M	Ch00	2402MHz	4.72
	Ch19	2440MHz	5.37
	Ch39	2480MHz	6.56
BLE_500K	Ch00	2402MHz	4.68
	Ch19	2440MHz	5.33
	Ch39	2480MHz	6.54

- Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.
- The data rate was set in 2Mbps for all the test items due to the highest RF output power

2.2 Test Mode

2.2.1 Antenna Port Conducted Measurement

Summary table of Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth 5.1 – LE GFSK 2Mbps
Conducted Test Cases	Mode 1: CH00_2402 MHz Mode 2: CH19_2440 MHz Mode 3: CH39_2480 MHz



2.2.2 Radiated Emission Test (Below 1GHz)

Radiated Test Cases	Bluetooth 5.1 – LE GFSK 2Mbps
	Mode 1: CH00_2402 MHz

Note : 1. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type. Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

2. Following channel(s) was (were) selected for the final test as listed above

2.2.3 Radiated Emission Test (Above 1GHz)

Radiated Test Cases	Bluetooth 5.1 – LE GFSK 2Mbps
	Mode 1: CH00_2402 MHz Mode 2: CH19_2440 MHz Mode 3: CH39_2480 MHz

Note : 1. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

2. Following channel(s) was (were) selected for the final test as listed above

3. For frequency above 18GHz, the measured value is much lower than the limit, therefore, it is not reflected in the report.

2.2.4 Power Line Conducted Emission Test:

AC Conducted Emission	Mode 1 : BT Linking + Earphone + Adapter
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2.3 Support Equipment

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	NETGARE	R7800	PY315100319	N/A	unshielded AC I/P cable1.2 m
2.	Notebook	Lenovo	E470C	FCC DoC	N/A	shielded cable DC O/P 1.8 m unshielded AC I/P cable1.2 m
3.	Earphone	Honeywell	PTE-300N	FCC sDoC	N/A	N/A
4.	Adapter	Honeywell	ADS-12B-06	FCC sDoC	N/A	N/A

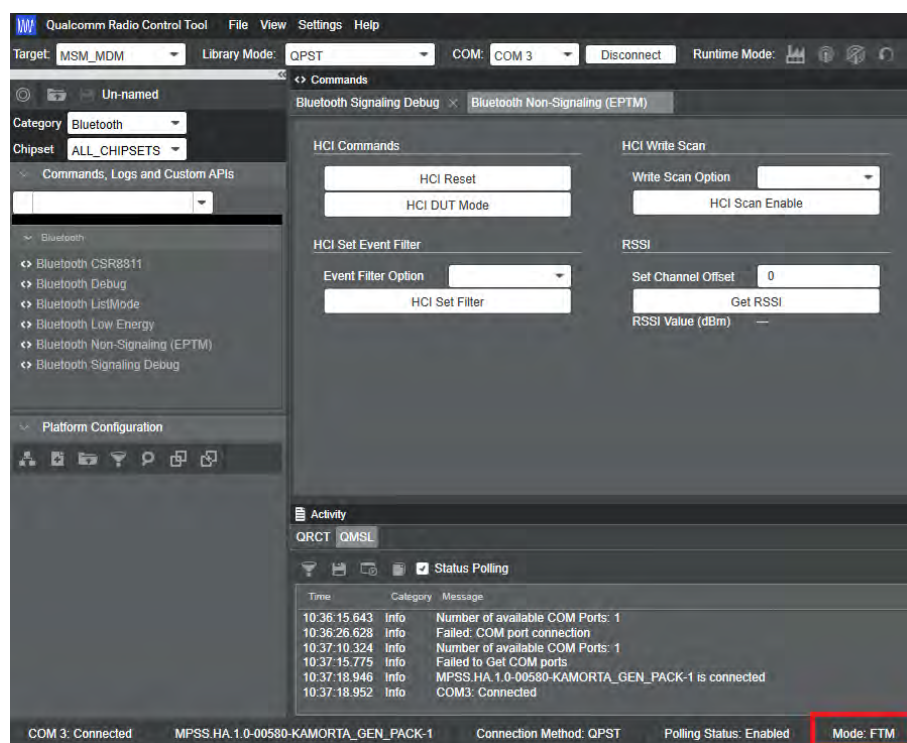


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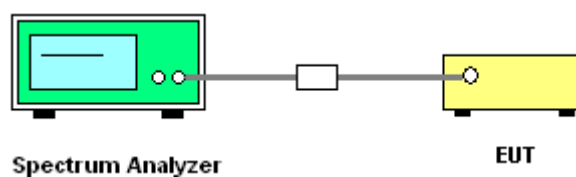
2.4 Test Setup

EUT was set in the Hidden menu mode to enable BT communications.

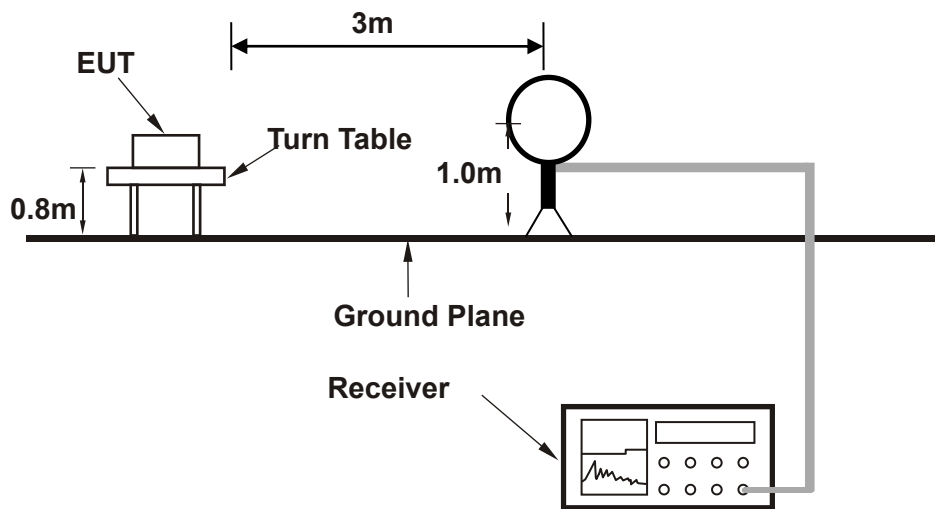
The following picture is a screenshot of the test software



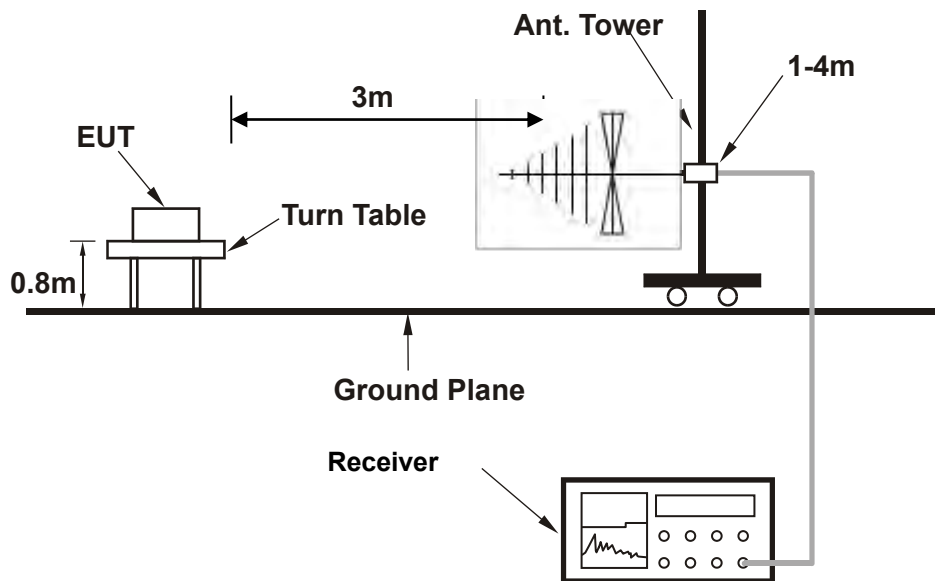
Setup diagram for Conducted Test



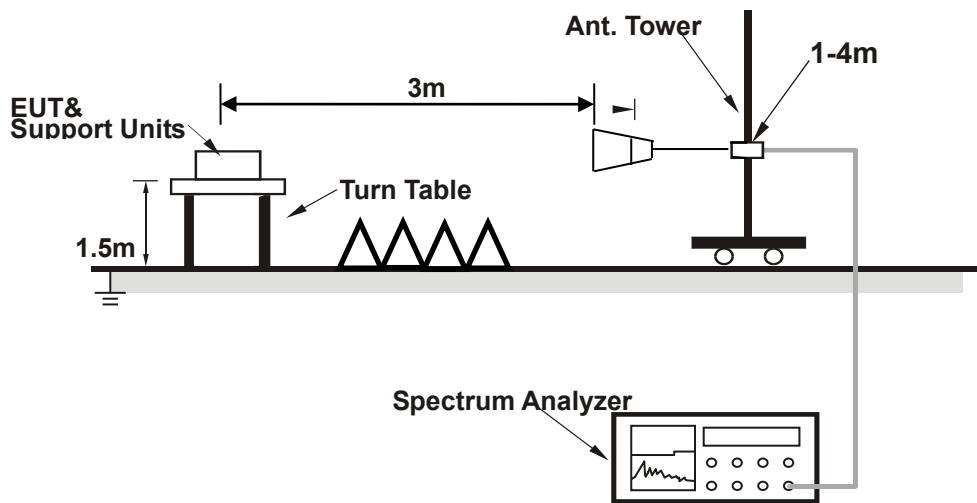
Setup diagram for Radiation(9KHz~30MHz) Test



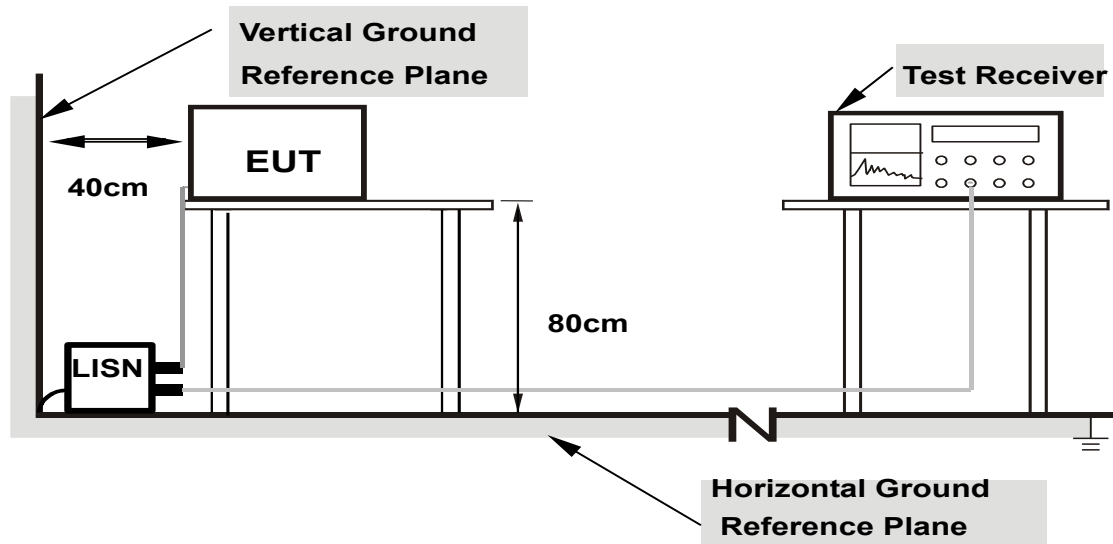
Setup diagram for Radiation(Below 1G) Test



Setup diagram for Radiation (Above1G) Test



Setup diagram for AC Conducted Emission Test



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

2.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 5 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 5 + 10 = 15 \text{ (dB)}\end{aligned}$$

For all radiated test items:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Over Limit (dB μ V/m) = Level(dB μ V/m) - Limit Level (dB μ V/m)

3. Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

FCC §15.247 (a) (2)

IC RSS-247 5.2(a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

3.1.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
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 30kHz and set the Video bandwidth (VBW) = 100kHz.

3.1.3 Test Result of 6dB Bandwidth

Refer to Appendix A of this test report.

3.1.4 Test Result of 99% Bandwidth

Refer to Appendix B of this test report.

3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

FCC §15.247 (b)(3)

For systems using digital modulation in the 2400-2483.5 MHz bands: 30dBm.

IC RSS-247 A5.4(d)

For DTSs employing digital modulation techniques operating in the bands 902-928MHz and 2400-2483.5MHz, the maximum peak conducted output power shall not exceed 1 W.

The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e)

3.2.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to spectrum analyzer.
3. Set to the maximum power setting and enable the EUT transmit continuously
4. Set the $RBW \geq DTS \text{ Bandwidth}$, $VBW \geq 3 * RBW$, $Span \geq 1.5 * DTS \text{ Bandwidth}$, Detector=Peak, Sweep time=auto couple, Trace mode=max holde.
5. Allow trace to fully stabilize, Use peak marker function to determine the peak amplitude level.
6. Measure the conducted output power

3.2.3 Test Result of Peak Output Power

Refer to Appendix C of this test report.

3.3 Power Spectral Density Measurement

3.3.1 Limits of Power Spectral Density

FCC§15.247(e)

IC RSS-247 5.2(b)

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

3.3.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
4. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
5. Measure and record the results in the test report.
6. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.3 Test Result of Power Spectral Density

Refer to Appendix D of this test report.

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

FCC §15.247 (d)

IC RSS-247 5.5

Maximum conducted (average) output power was used to determine compliance, then the peak power 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 (i.e., 20 dBc).

3.4.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. 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 per 15.247(d).
4. Measure and record the results in the test report.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.3 Test Result of Conducted Band Edges

Refer to Appendix E of this test report.

3.4.4 Test Result of Conducted Spurious Emission

Refer to Appendix F of this test report.

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

FCC §15.247 (d)

IC RSS-247 5.5

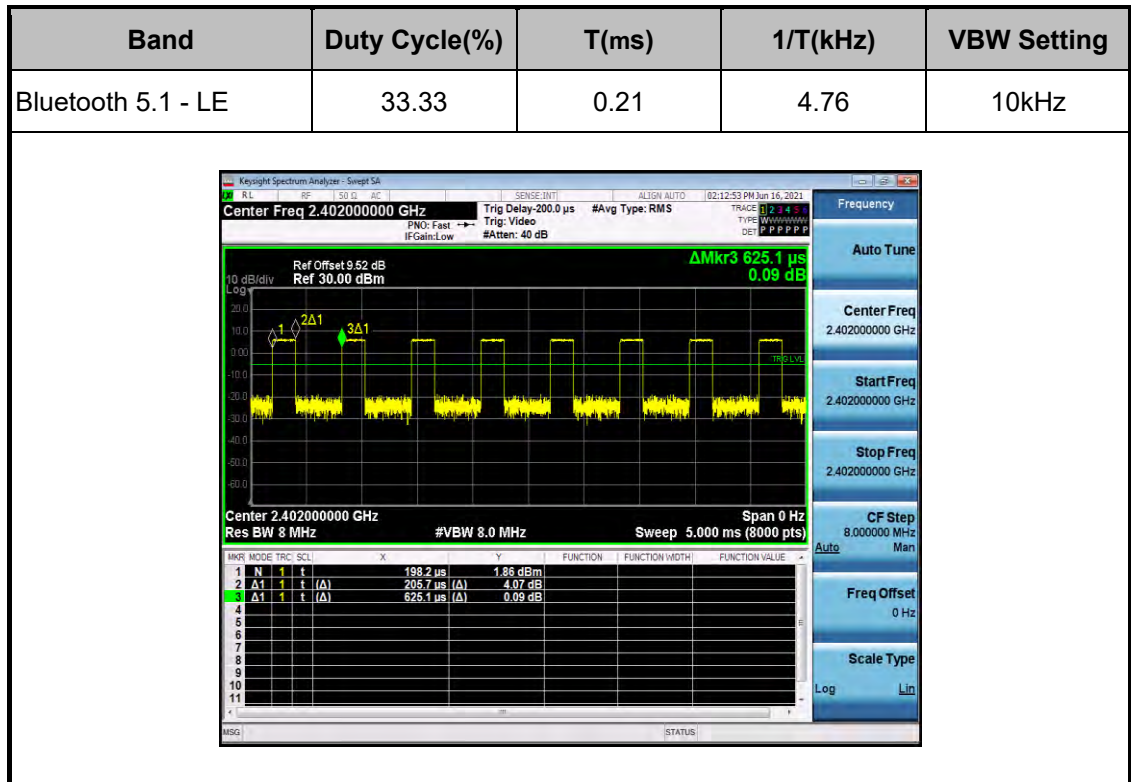
In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as 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

3.5.2 Test Procedures

1. 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.
2. The measurement distance is 3 meter.
3. For each suspected emission, 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 to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. 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, RBW=1MHz for $f > 1$ GHz ; VBW RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement:
 VBW = 10 Hz, when duty cycle is no less than 98 percent.
 VBW $\geq 1/T$, 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.



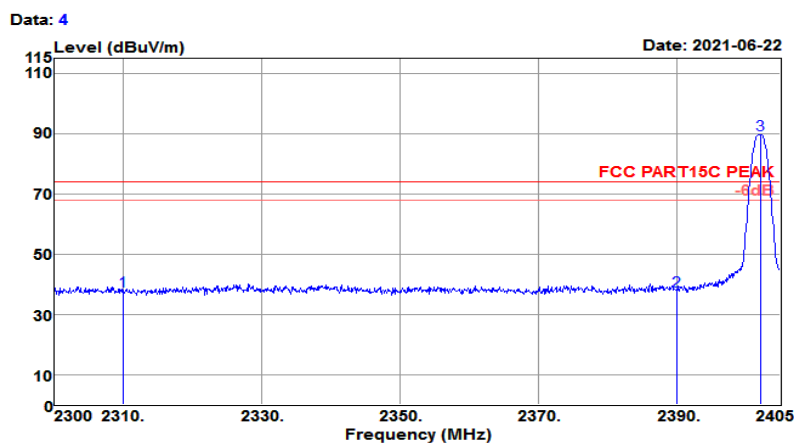
3.5.3 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.4 Test Result of Radiated Spurious at Band Edges

Test Mode :	BLE CH00 (2402 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.405GHz	Polarization :	Horizontal

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : HORIZONTAL
Test Mode : Ble CH00(2402MHz)	Power rating: DC 3.85W

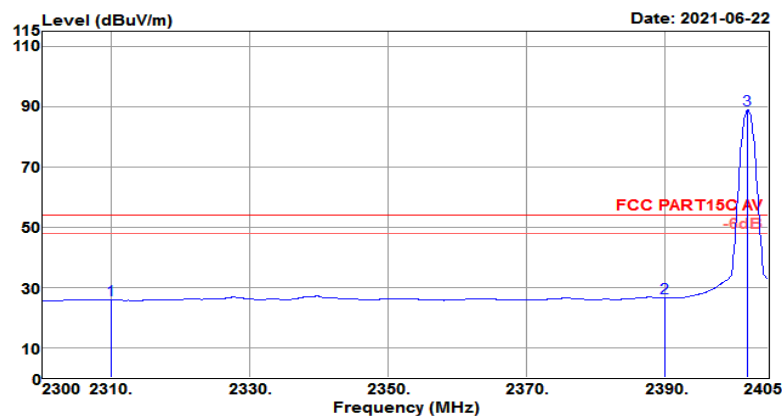


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	41.96	27.38	4.08	35.68	37.74	74.00	-36.26	Peak
2390.000	41.89	27.56	4.16	35.88	37.73	74.00	-36.27	Peak
2402.270	93.66	27.58	4.17	35.91	89.50	74.00	15.50	Peak

Test Mode :	BLE CH00 (2402 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.405GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: Ble CH00(2402MHz)	Power rating:	DC 3.85V

Data: 5

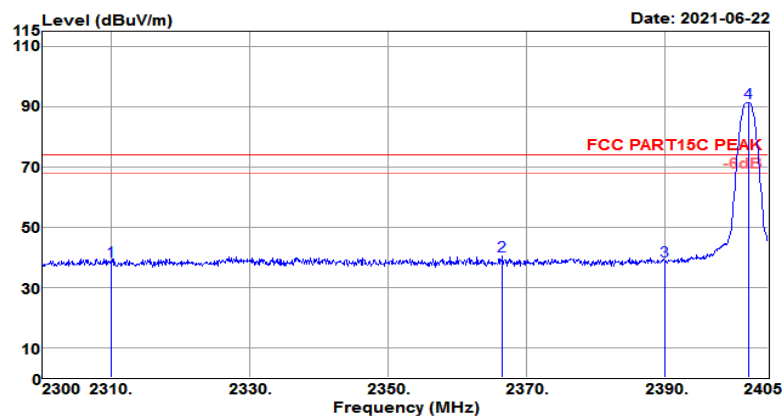


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	30.11	27.38	4.08	35.68	25.89	54.00	-28.11	Average
2390.000	30.57	27.56	4.16	35.88	26.41	54.00	-27.59	Average
2402.060	93.16	27.58	4.17	35.91	89.00	54.00	35.00	Average

Test Mode :	BLE CH00 (2402 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.405GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : Ble CH00(2402MHz)	Power rating: DC 3.85V

Data: 1

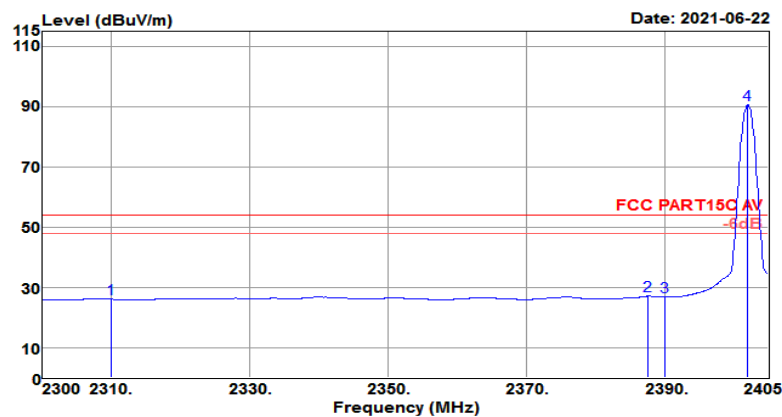


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	42.90	27.38	4.08	35.68	38.68	74.00	-35.32	Peak
2366.570	44.59	27.51	4.14	35.82	40.42	74.00	-33.58	Peak
2390.000	42.94	27.56	4.16	35.88	38.78	74.00	-35.22	Peak
2402.270	95.43	27.58	4.17	35.91	91.27	74.00	17.27	Peak

Test Mode :	BLE CH00 (2402 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.405GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : Ble CH00(2402MHz)	Power rating: DC 3.85V

Data: 2

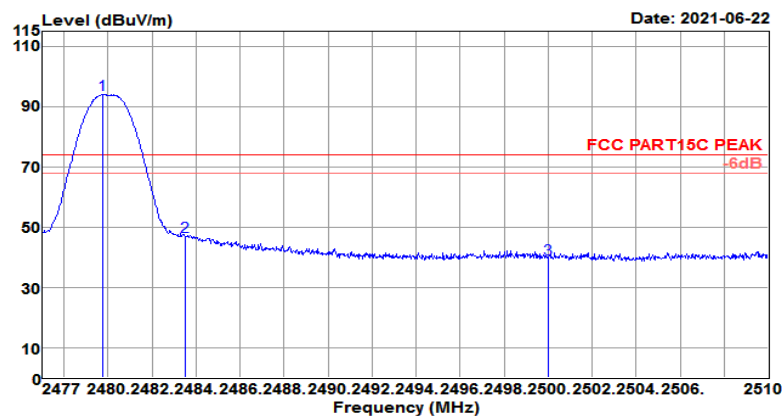


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2309.975	30.25	27.38	4.08	35.67	26.04	54.00	-27.96	Average
2387.675	31.22	27.55	4.16	35.87	27.06	54.00	-26.94	Average
2390.000	30.92	27.56	4.16	35.88	26.76	54.00	-27.24	Average
2402.060	94.90	27.58	4.17	35.91	90.74	54.00	36.74	Average

Test Mode :	BLE CH39 (2480 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.477GHz~2.51GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: Ble CH39(2480MHz)	Power rating:	DC 3.85V

Data: 12

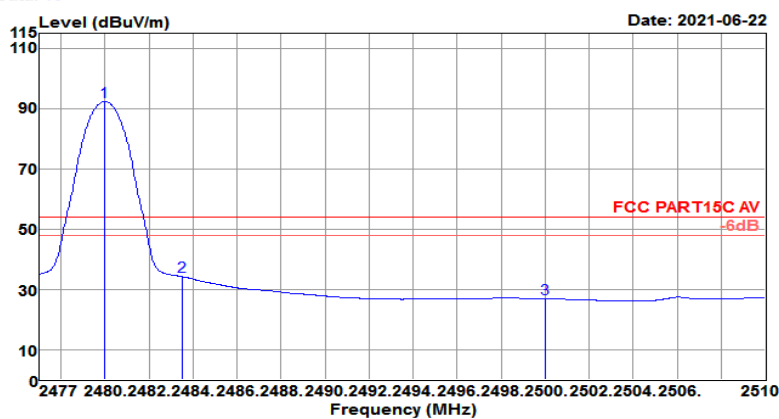


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2479.739	98.01	27.76	4.19	36.10	93.86	74.00	19.86	Peak
2483.500	51.01	27.76	4.19	36.11	46.85	74.00	-27.15	Peak
2500.000	43.61	27.80	4.19	36.15	39.45	74.00	-34.55	Peak

Test Mode :	BLE CH39 (2480 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.477GHz~2.51GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: Ble CH39(2480MHz)	Power rating:	DC 3.85V

Data: 13

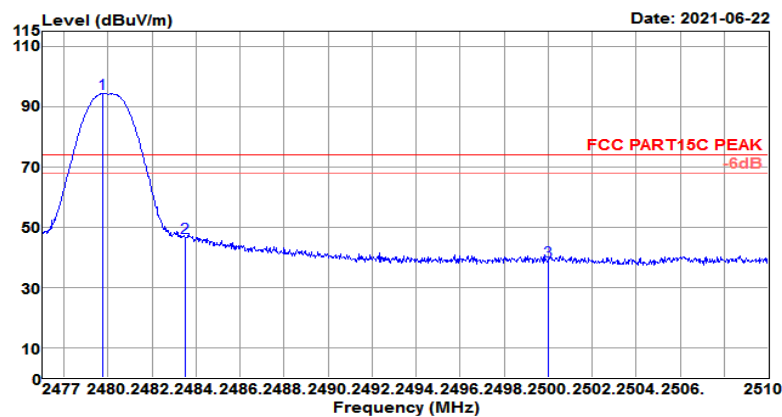


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2480.003	96.48	27.76	4.19	36.10	92.33	54.00	38.33	Average
2483.500	38.32	27.76	4.19	36.11	34.16	54.00	-19.84	Average
2500.000	30.92	27.80	4.19	36.15	26.76	54.00	-27.24	Average

Test Mode :	BLE CH39 (2480 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.477GHz~2.51GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : Ble CH39(2480MHz)	Power rating: DC 3.85V

Data: 9

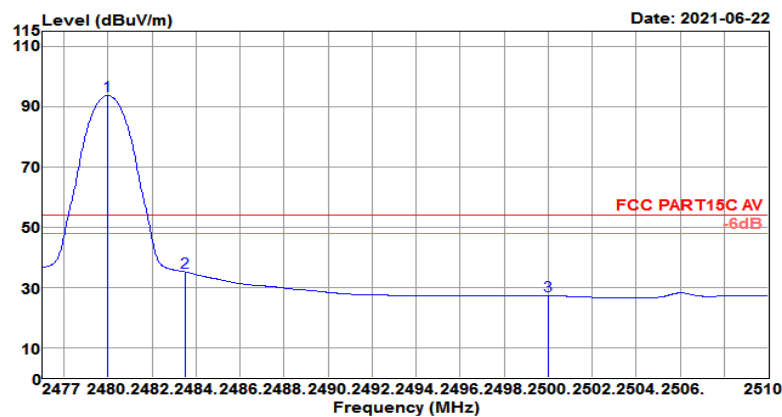


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2479.772	98.41	27.76	4.19	36.10	94.26	74.00	20.26	Peak
2483.500	50.71	27.76	4.19	36.11	46.55	74.00	-27.45	Peak
2500.000	42.76	27.80	4.19	36.15	38.60	74.00	-35.40	Peak

Test Mode :	BLE CH39 (2480 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.477GHz~2.51GHz	Polarization :	Vertical

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: Ble CH39(2480MHz)	Power rating:	DC 3.85V

Data: 10

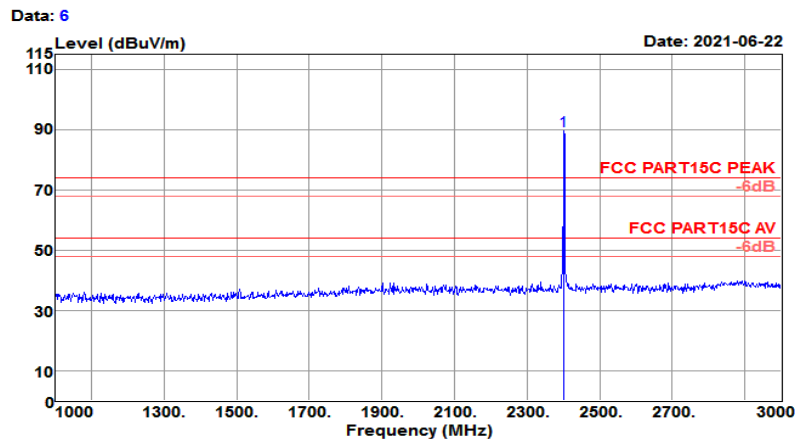


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2480.003	97.81	27.76	4.19	36.10	93.66	54.00	39.66	Average
2483.500	39.26	27.76	4.19	36.11	35.10	54.00	-18.90	Average
2500.000	31.25	27.80	4.19	36.15	27.09	54.00	-26.91	Average

3.5.5 Test Result of Radiated Spurious Emission (1GHz ~ 10th Harmonic)

Test Mode :	BLE CH00 (2402 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: Ble CH00(2402MHz)	Power rating	: DC 3.85W

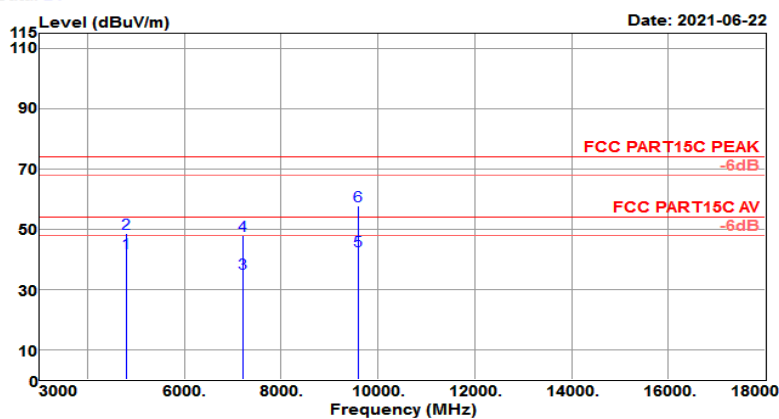


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2402.000	93.57	27.58	4.17	35.91	89.41	74.00	15.41	Peak

Test Mode :	BLE CH00 (2402 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : HORIZONTAL
Test Mode : Ble CH00(2402MHz)	Power rating: DC 3.85V

Data: 24

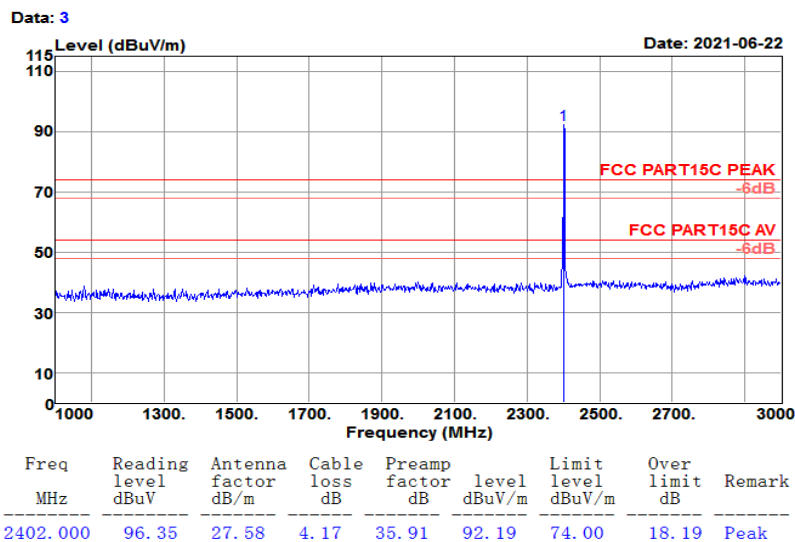


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4804.000	38.84	30.93	6.44	34.12	42.09	54.00	-11.91	Average
4804.000	45.38	30.93	6.44	34.12	48.63	74.00	-25.37	Peak
7206.000	25.59	35.39	8.61	34.39	35.20	54.00	-18.80	Average
7206.000	38.26	35.39	8.61	34.39	47.87	74.00	-26.13	Peak
9608.000	26.84	38.39	11.69	34.14	42.78	54.00	-11.22	Average
9608.000	41.82	38.39	11.69	34.14	57.76	74.00	-16.24	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	BLE CH00 (2402 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

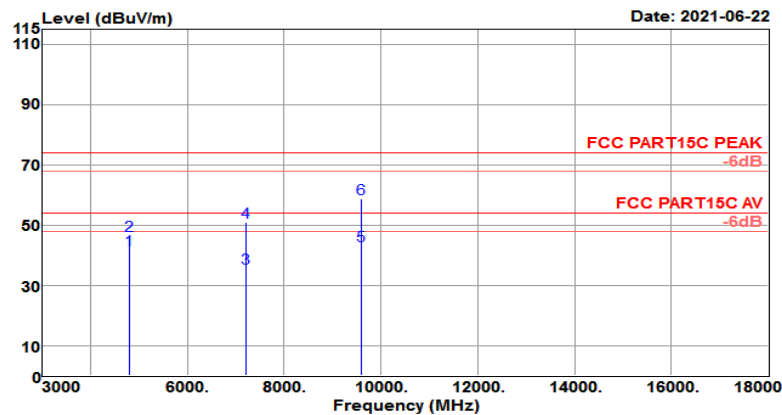
Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: Ble CH00(2402MHz)	Power rating:	DC 3.85V



Test Mode :	BLE CH00 (2402 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : Ble CH00(2402MHz)	Power rating: DC 3.85V

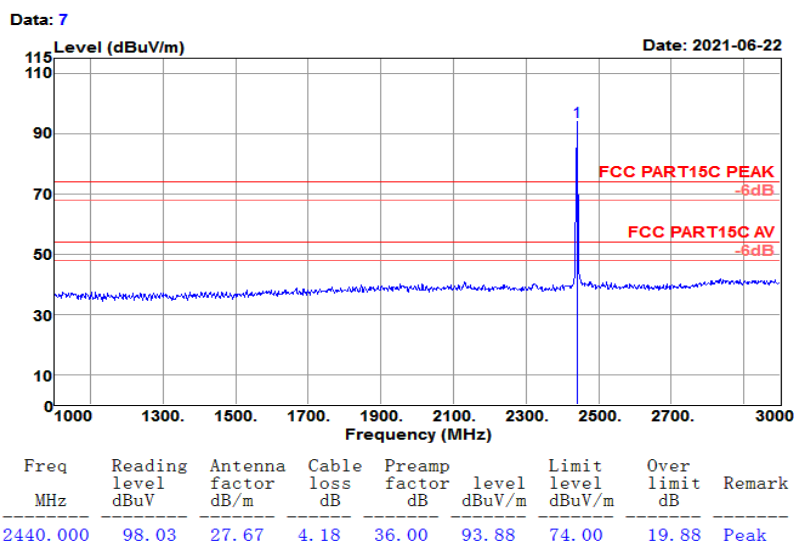
Data: 26



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4804.000	38.59	30.93	6.44	34.12	41.84	54.00	-12.16	Average
4804.000	43.38	30.93	6.44	34.12	46.63	74.00	-27.37	Peak
7206.000	26.19	35.39	8.61	34.39	35.80	54.00	-18.20	Average
7206.000	41.29	35.39	8.61	34.39	50.90	74.00	-23.10	Peak
9608.000	27.18	38.39	11.69	34.14	43.12	54.00	-10.88	Average
9608.000	42.73	38.39	11.69	34.14	58.67	74.00	-15.33	Peak

Test Mode :	BLE CH19 (2440 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

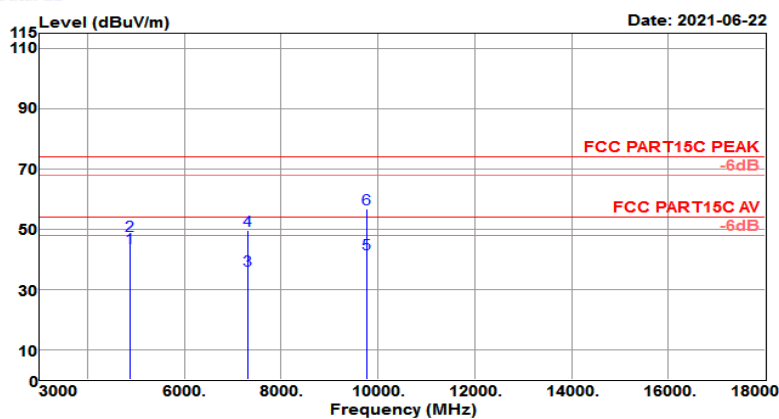
Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: Ble CH19(2440MHz)	Power rating:	DC 3.85V



Test Mode :	BLE CH19 (2440 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : HORIZONTAL
Test Mode : Ble CH19(2440MHz)	Power rating: DC 3.85V

Data: 22

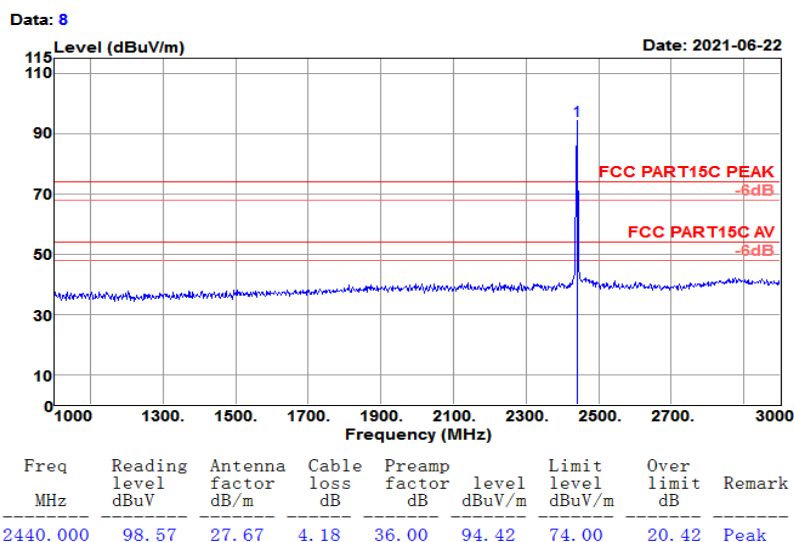


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4880.000	39.83	31.03	7.01	34.03	43.84	54.00	-10.16	Average
4880.000	43.95	31.03	7.01	34.03	47.96	74.00	-26.04	Peak
7320.000	26.18	35.67	8.97	34.49	36.33	54.00	-17.67	Average
7320.000	39.48	35.67	8.97	34.49	49.63	74.00	-24.37	Peak
9760.000	26.14	38.51	11.16	34.20	41.61	54.00	-12.39	Average
9760.000	41.27	38.51	11.16	34.20	56.74	74.00	-17.26	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	BLE CH19 (2440 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

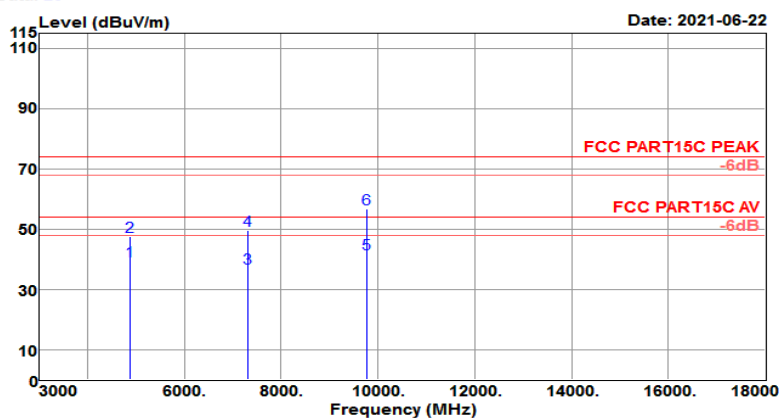
Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: Ble CH19(2440MHz)	Power rating:	DC 3.85V



Test Mode :	BLE CH19 (2440 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : Ble CH19(2440MHz)	Power rating: DC 3.85V

Data: 20



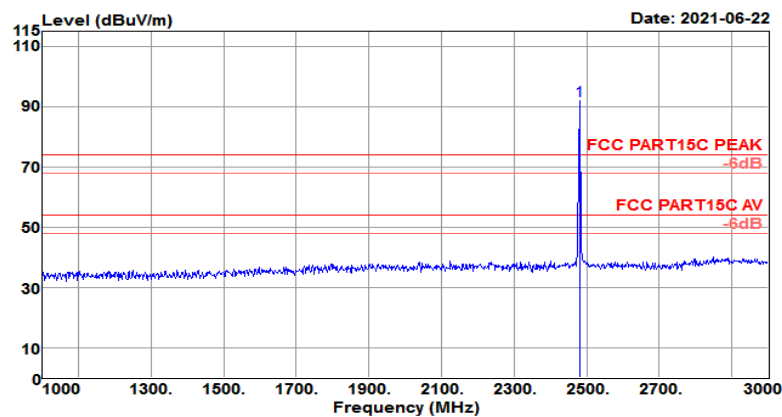
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4880.000	35.28	31.03	7.01	34.03	39.29	54.00	-14.71	Average
4880.000	43.59	31.03	7.01	34.03	47.60	74.00	-26.40	Peak
7320.000	26.82	35.67	8.97	34.49	36.97	54.00	-17.03	Average
7320.000	39.43	35.67	8.97	34.49	49.58	74.00	-24.42	Peak
9760.000	26.38	38.51	11.16	34.20	41.85	54.00	-12.15	Average
9760.000	41.27	38.51	11.16	34.20	56.74	74.00	-17.26	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	BLE CH39 (2480 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: Ble CH39(2480MHz)	Power rating:	DC 3.85V

Data: 14

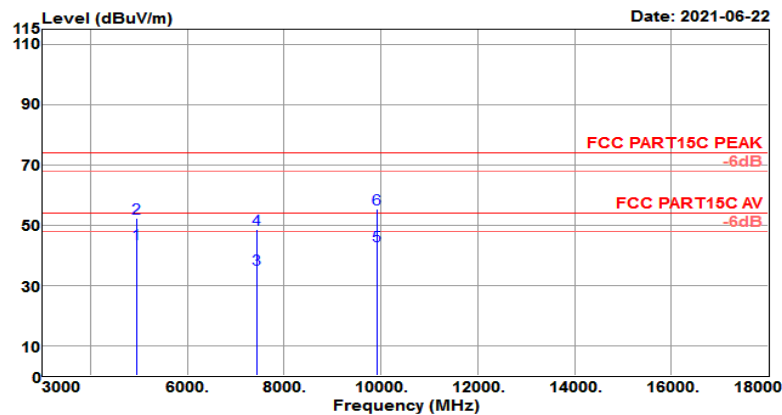


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2480.000	96.01	27.76	4.19	36.10	91.86	74.00	17.86	Peak

Test Mode :	BLE CH39 (2480 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : HORIZONTAL
Test Mode : Ble CH39(2480MHz)	Power rating: DC 3.85V

Data: 16

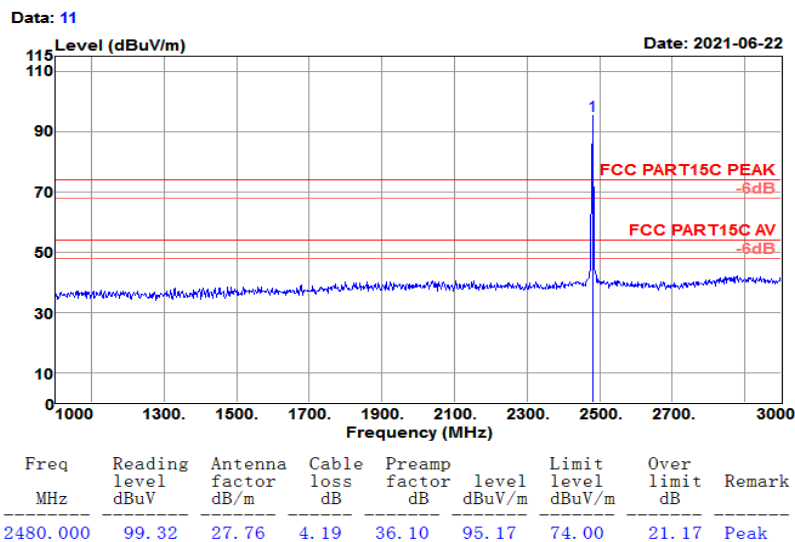


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4960.000	38.85	31.14	7.62	33.94	43.67	54.00	-10.33	Average
4960.000	47.38	31.14	7.62	33.94	52.20	74.00	-21.80	Peak
7440.000	24.87	35.96	9.03	34.60	35.26	54.00	-18.74	Average
7440.000	38.19	35.96	9.03	34.60	48.58	74.00	-25.42	Peak
9920.000	26.38	38.64	12.18	34.27	42.93	54.00	-11.07	Average
9920.000	38.82	38.64	12.18	34.27	55.37	74.00	-18.63	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	BLE CH39 (2480 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

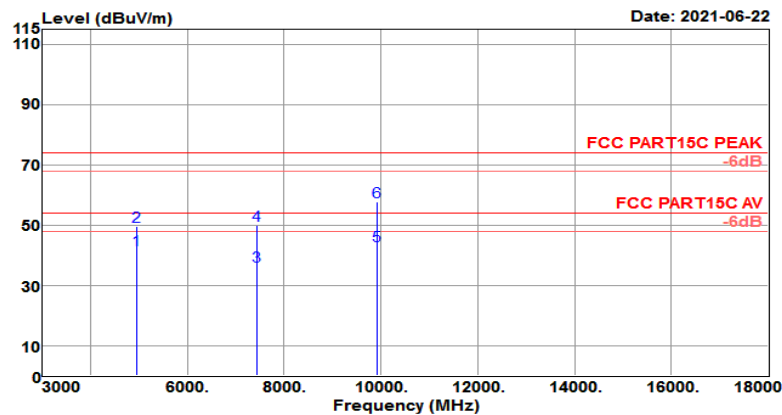
Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : Ble CH39(2480MHz)	Power rating: DC 3.85V



Test Mode :	BLE CH39 (2480 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Test Site : 3m Chamber	Temp/Humi : 25℃/64%
Tested by : Jack	Pol/Phase : VERTICAL
Test Mode : Ble CH39(2480MHz)	Power rating: DC 3.85V

Data: 18



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4960.000	36.92	31.14	7.62	33.94	41.74	54.00	-12.26	Average
4960.000	44.82	31.14	7.62	33.94	49.64	74.00	-24.36	Peak
7440.000	25.82	35.96	9.03	34.60	36.21	54.00	-17.79	Average
7440.000	39.43	35.96	9.03	34.60	49.82	74.00	-24.18	Peak
9920.000	26.38	38.64	12.18	34.27	42.93	54.00	-11.07	Average
9920.000	41.28	38.64	12.18	34.27	57.83	74.00	-16.17	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.