FCC Test Report

Product Name	Wireless Adaptor
Model No.	EXW1-A1
FCC ID	2AJE7SMC-WEX08

Applicant	SMC Corporation
Address	4-2-2, KINUNODAI, TSUKUBAMIRAI-SHI, IBARAKI-KEN 300-2493 JAPAN

Date of Receipt	Apr. 29, 2022
Issued Date	June 20, 2022
Report No.	2240834R-RFUSWL2V01-A
Report Version	V1.0

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
This report must not be used to claim product endorsement by TAF or any agency of the government.
The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

Issued Date: June 20, 2022
Report No.: 2240834R-RFUSWL2V01-A

Product Name	Wireless Adaptor
Applicant	SMC Corporation
Address	4-2-2, KINUNODAI, TSUKUBAMIRAI-SHI, IBARAKI-KEN 300-2493 JAPAN
Manufacturer	SMC Corporation
Model No.	EXW1-A1
FCC ID	2AJE7SMC-WEX08
EUT Rated Voltage	DC 24V
EUT Test Voltage	DC 24V
Trade Name	SMC
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : Genie Chang

(Senior Project Specialist / Genie Chang)

Tested By : Bill Lin

(Senior Engineer / Bill Lin)

Approved By : Alan Chen

(Senior Engineer / Alan Chen)

TABLE OF CONTENTS

Revision History

Report No.	Version	Description	Issued Date
2240834R-RFUSWL2V01-A	V1.0	Initial issue of report.	June 20, 2022

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless Adaptor
Trade Name	SMC
Model No.	EXW1-A1
FCC ID	2AJE7SMC-WEX08
Frequency Range	2403MHz – 2481MHz
Channel Number	79
Type of Modulation	GFSK
Antenna Type	Sleeve Dipole Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	SMC	P5742-106	Sleeve Dipole Antenna	4.37dBi for 2.4 GHz

Note: The antenna of EUT conforms to FCC 15.203.

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 79:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz	Channel 79:	2481 MHz
Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz		

Note:

1. The EUT is a Wireless Adaptor with built-in 2.4G transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
4. These tests were conducted on a sample for the purpose of demonstrating compliance of transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.

Test Mode	Mode 1: Transmit - 250kbps Mode 2: Transmit - 1Mbps

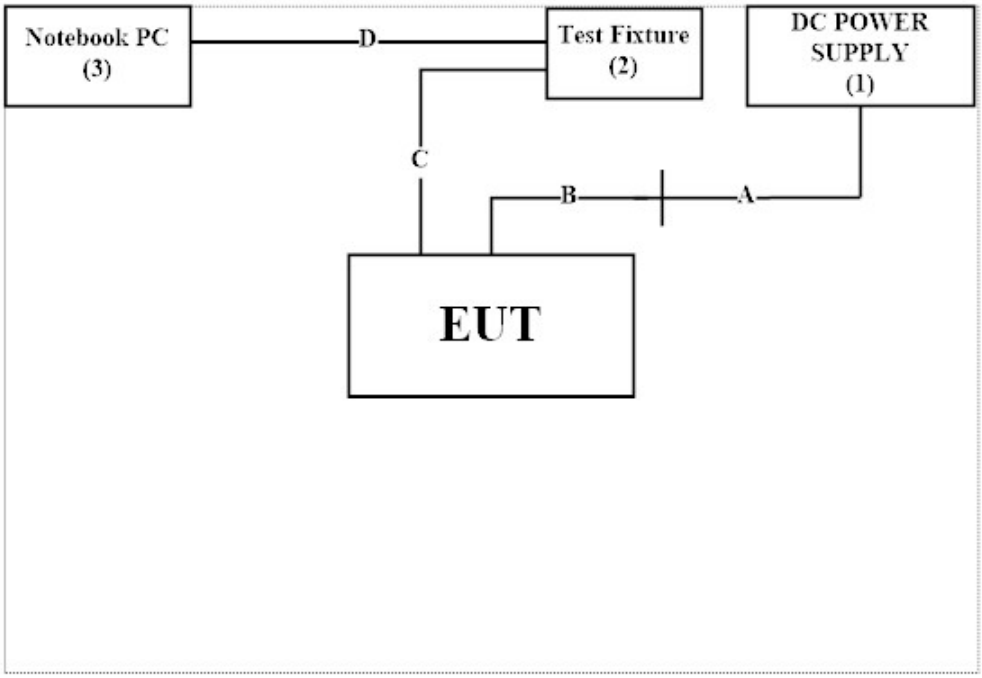
1.2. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Power Adapter	FSP	FSP065-A1BR3	N/A	N/A
2	Test Fixture	SMC Corporation	JIG Board	N/A	N/A
3	DC POWER SUPPLY	KEYSIGHT	E36234A	MY59001234	Non-shielded, 1.8m

Signal Cable Type		Signal cable Description
A	Power Cable	Non-shielded, 1m
B	Power Cable	Non-shielded, 1.5m
C	Signal Cable	Non-shielded, 2.9m
D	USB Cable	Shielded, 1.8m

1.3. Configuration of Tested System



1.4. EUT Exercise Software

1. Setup the EUT as shown in Section 1.3.
2. Execute software “Wireless tool Version 2.0.3” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	24.9 °C
	Humidity (%RH)	10~90 %	59.6 %
Radiated Emission	Temperature (°C)	10~40 °C	24.3°C
	Humidity (%RH)	10~90 %	67 %
Conductive	Temperature (°C)	10~40 °C	22 °C
	Humidity (%RH)	10~90 %	55 %

USA : FCC Registration Number: TW0033

Canada : CAB Identifier Number: TW3023 / Company Number: 26930

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No. 5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan
Performed Location : No. 26, Huaya 1st Rd., Guishan Dist.,Taoyuan City 333411, Taiwan, R.O.C.
Phone number : +886-3-275-7255
Fax number : +866-3-327-8031
Email address : info.tw@dekra.com
Website : http://www.dekra.com.tw

1.6. List of Test Equipment

For Conduction measurements /HY-SR01

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	EMI Test Receiver	R&S	ESR7	101601	2021/06/19	2022/06/18
X	Two-Line V-Network	R&S	ENV216	101306	2022/04/08	2023/04/07
X	Two-Line V-Network	R&S	ENV216	101307	2022/05/04	2023/05/03
X	Coaxial Cable	SUHNER	RG400_BNC	RF001	2021/05/24	2022/05/23

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : E3 210616 dekra V9

For Conducted measurements /HY-SR02

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Spectrum Analyzer	R&S	FSV40	101149	2022/03/25	2023/03/24
X	Power Meter	Anritsu	ML2496A	1548003	2021/12.20	2022/12/19
X	Power Sensor	Anritsu	MA2411B	1531024	2021/12.20	2022/12/19
X	Power Sensor	Anritsu	MA2411B	1531025	2021/12.20	2022/12/19

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : RF Conducted Test Tools R3 V3.0.1.19 .

For Radiated measurements /HY-CB02

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Loop Antenna	AMETEK	HLA6121	49611	2022/03/18	2023/03/17
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-675	2021/08/11	2022/08/10
X	Horn Antenna	ETS-Lindgren	3117	00203799	2021/12/27	2022/12/26
X	Horn Antenna	Com-Power	AH-840	101100	2021/10/04	2022/10/03
X	Pre-Amplifier	SGH	0301-9	20211007-8	2022/02/22	2023/02/21
X	Pre-Amplifier	EMCI	EMC051835SE	980632	2021/09/07	2022/09/06
X	Pre-Amplifier	EMCI	EMC05820SE	980285	2021/07/02	2022/07/01
	Pre-Amplifier	EMCI	EMC184045SE	980369	2022/05/12	2023/05/11
	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314		
	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
X	Filter	MICRO TRONICS	BRM50702	G251	2021/09/16	2022/09/15
	Filter	MICRO TRONICS	BRM50716	G188	2021/09/16	2022/09/15
X	EMI Test Receiver	R&S	ESR	102793	2021/12/15	2022/12/14
X	Spectrum Analyzer	R&S	FSV3044	101114	2022/02/11	2023/02/10
X	Coaxial Cable	SGH	HA800	GD20110223-2	2022/03/17	2023/03/16
	Coaxial Cable	SGH	HA800	GD20110222-4		
	Coaxial Cable	SGH	SGH18	2021005-2		
	Coaxial Cable	SGH	SGH18	202108-5		

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : E3 210616 dekra V9

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

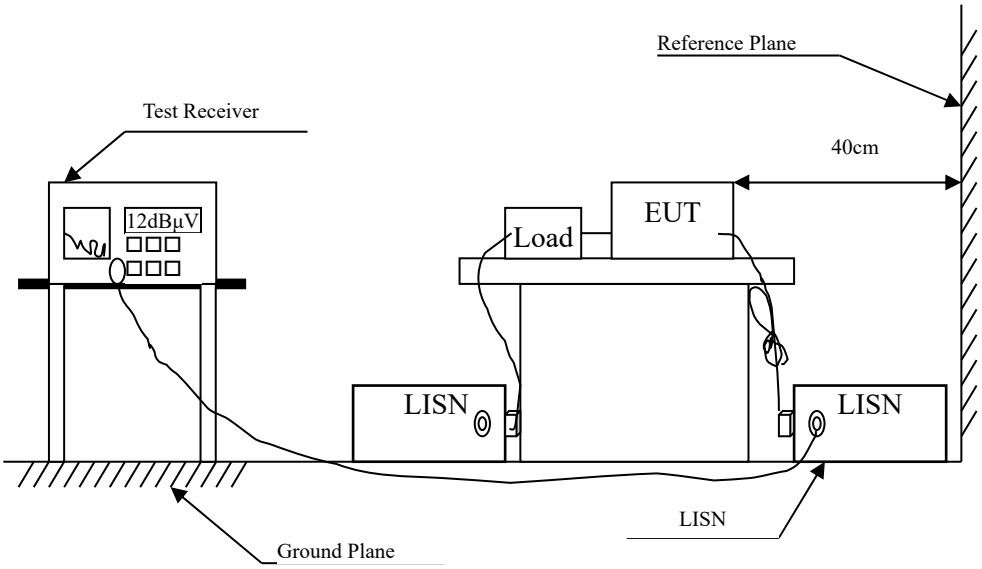
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	±3.42 dB	
Peak Power Output	±0.91 dB	
Radiated Emission	Under 1GHz ±4.06 dB	Above 1GHz ±3.73 dB
RF Antenna Conducted Test	±2.53 dB	
Band Edge	Under 1GHz ±4.06 dB	Above 1GHz ±3.73 dB
Channel Number	N/A	
Channel Separation	±682.83 Hz	
Dwell Time	±2.31 ms	
Occupied Bandwidth	±682.83 Hz	
Duty Cycle	±2.31 ms	

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

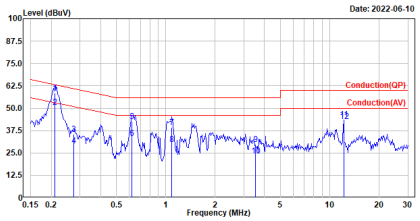
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT setup and the test procedure are according to ANSI C63.4, 2014 to comply with the requirements of FCC 47CFR Subpart C.

2.4. Test Result of Conducted Emission

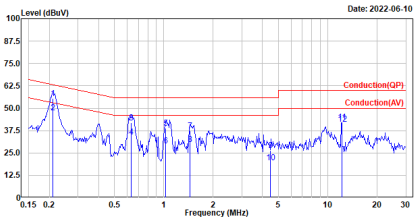
Site :HY-SR01
Condition :Line
Mode :250kps_2442MHz_TX
test by :Pounder



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.210	58.45	63.20	-4.75	48.77	9.68	QP
2	0.210	50.63	53.20	-2.57	40.95	9.68	Average
3	0.275	35.36	60.97	-25.61	25.68	9.68	QP
4	0.275	29.18	50.97	-21.79	19.50	9.68	Average
5	0.621	42.54	56.00	-13.46	32.85	9.69	QP
6	0.621	33.32	46.00	-12.68	23.63	9.69	Average
7	1.092	39.29	56.00	-16.71	29.56	9.73	QP
8	1.092	29.97	46.00	-16.03	20.24	9.73	Average
9	3.523	29.95	56.00	-26.05	19.61	10.34	QP
10	3.523	23.41	46.00	-22.59	13.07	10.34	Average
11	12.199	43.70	60.00	-16.30	32.91	10.79	QP
12	12.199	42.45	50.00	-7.55	31.66	10.79	Average

Note:
1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

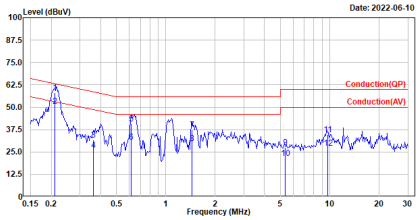
Site :HY-SR01
Condition :Neutral
Mode :250kps_2442MHz_TX
test by :Pounder



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.211	55.30	63.17	-7.87	45.64	9.66	QP
2	0.211	47.61	53.17	-5.56	37.95	9.66	Average
3	0.633	41.86	56.00	-14.14	32.18	9.68	QP
4	0.633	33.78	46.00	-12.22	24.10	9.68	Average
5	1.027	38.79	56.00	-17.21	29.09	9.70	QP
6	1.027	29.09	46.00	-16.91	19.39	9.70	Average
7	1.450	37.40	56.00	-18.60	27.65	9.75	QP
8	1.450	29.72	46.00	-16.28	19.97	9.75	Average
9	4.450	26.48	56.00	-29.52	15.84	10.64	QP
10	4.450	19.67	46.00	-26.33	9.03	10.64	Average
11	12.198	42.35	60.00	-17.65	31.54	10.81	QP
12	12.198	41.18	50.00	-8.82	30.37	10.81	Average

Note:
1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

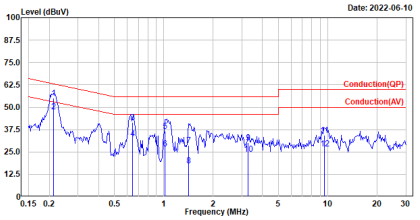
Site :HY-SR01
Condition :Line
Mode :1M_2442MHz_TX
test by :Pounder



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.211	58.28	63.17	-4.89	48.60	9.68	QP
2	0.211	50.71	53.17	-2.46	41.03	9.68	Average
3	0.361	31.82	58.70	-26.88	22.14	9.68	QP
4	0.361	26.06	48.70	-22.64	16.38	9.68	Average
5	0.613	40.73	56.00	-15.27	31.04	9.69	QP
6	0.613	30.46	46.00	-15.54	20.77	9.69	Average
7	1.449	37.50	56.00	-18.50	27.73	9.77	QP
8	1.449	29.68	46.00	-16.32	19.91	9.77	Average
9	5.345	27.52	60.00	-32.48	16.68	10.84	QP
10	5.345	21.38	50.00	-28.62	10.54	10.84	Average
11	9.693	34.62	60.00	-25.38	23.82	10.80	QP
12	9.693	27.18	50.00	-22.82	16.38	10.80	Average

Note:
1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

Site :HY-SR01
Condition :Neutral
Mode :1M_2442MHz_TX
test by :Pounder

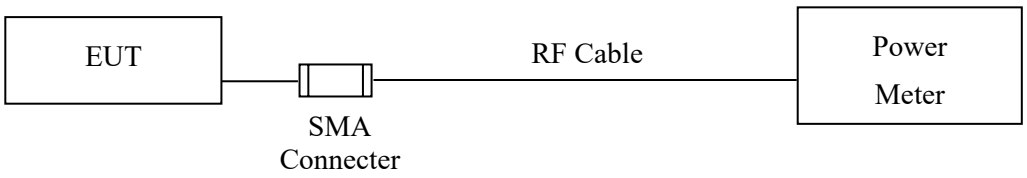


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.213	54.93	63.09	-8.16	45.27	9.66	QP
2	0.213	47.59	53.09	-5.50	37.93	9.66	Average
3	0.642	41.46	56.00	-14.54	31.78	9.68	QP
4	0.642	32.54	46.00	-13.46	22.86	9.68	Average
5	1.017	36.56	56.00	-19.44	26.86	9.70	QP
6	1.017	26.65	46.00	-19.35	16.95	9.70	Average
7	1.415	28.76	56.00	-27.24	19.01	9.75	QP
8	1.415	17.29	46.00	-28.71	7.54	9.75	Average
9	3.264	30.00	56.00	-26.00	19.77	10.23	QP
10	3.264	23.64	46.00	-22.36	13.41	10.23	Average
11	9.533	34.42	60.00	-25.58	23.62	10.80	QP
12	9.533	26.66	50.00	-23.34	15.86	10.80	Average

Note:
1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

3. Peak Power Output

3.1. Test Setup



3.2. Limit

The maximum peak power shall be less 1Watt,for all other frequency hopping systems in the 2400-2483.5MHz band: 0.125 watts.

3.3. Test Procedure

Tested according to FHSS test procedure of KDB 558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

3.4. Test Result of Peak Power Output

Product : Wireless Adaptor
Test Item : Peak Power Output
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2022/05/23

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
01	2403	12.80	125mWatt= 20.96 dBm	Pass
40	2442	12.93	125mWatt= 20.96 dBm	Pass
79	2481	-0.05	125mWatt= 20.96 dBm	Pass

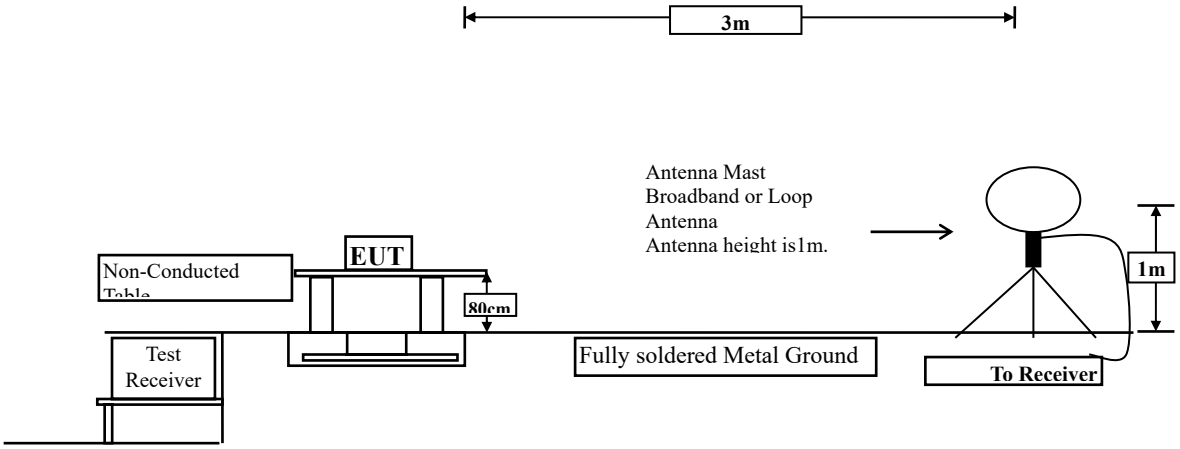
Product : Wireless Adaptor
Test Item : Peak Power Output
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2022/05/23

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
01	2403	12.81	125mWatt= 20.96 dBm	Pass
40	2442	12.92	125mWatt= 20.96 dBm	Pass
79	2481	-0.07	125mWatt= 20.96 dBm	Pass

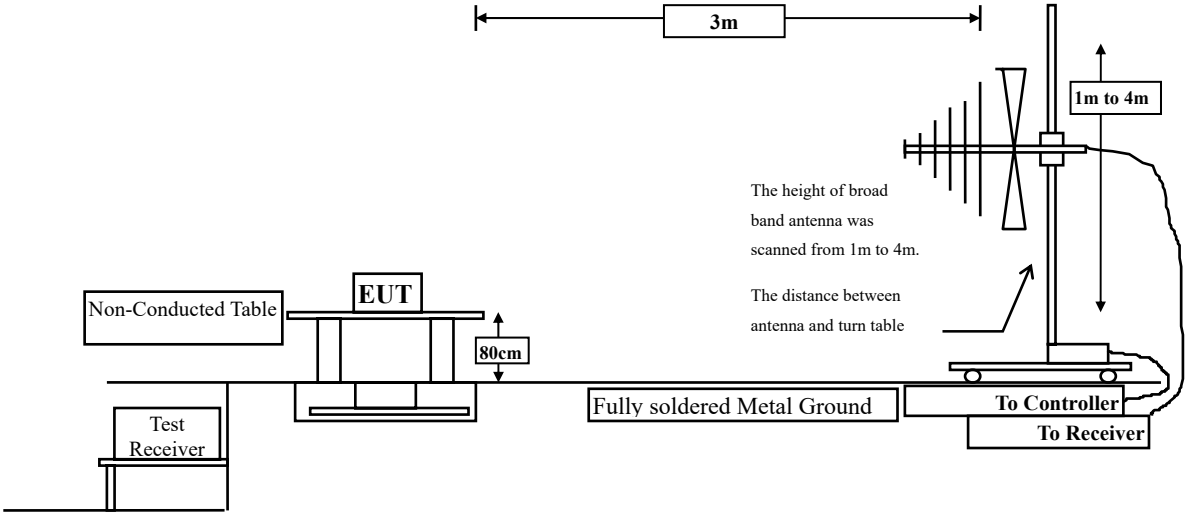
4. Radiated Emission

4.1. Test Setup

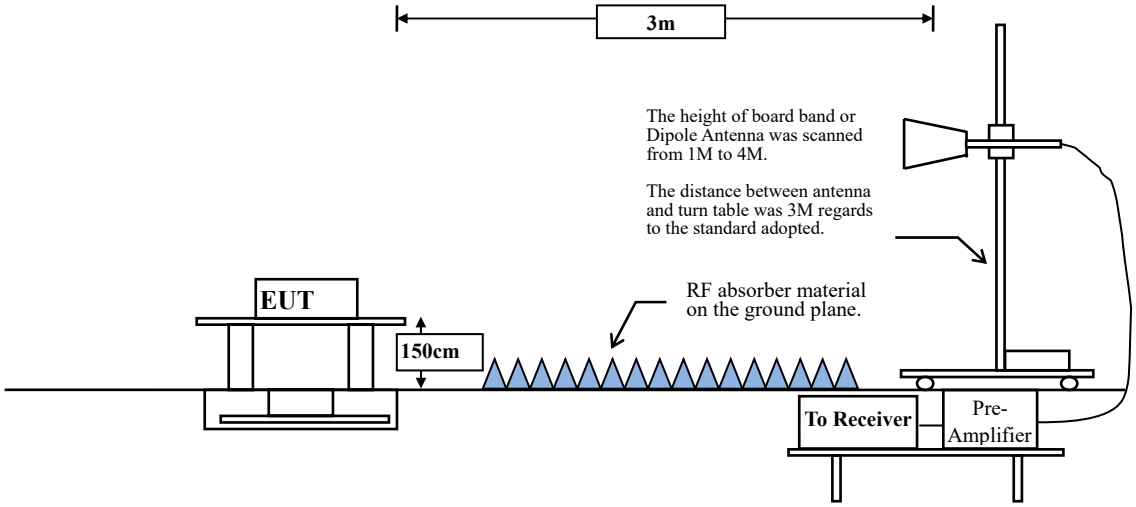
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

➢ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

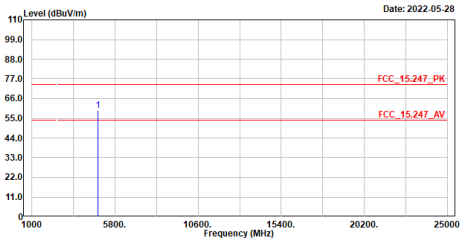
The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Test Result of Radiated Emission

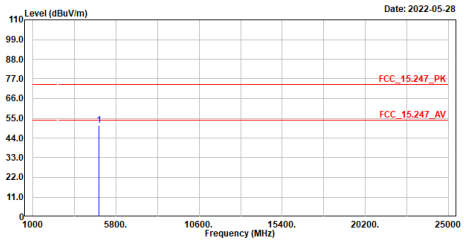
Site :HY-CB02
Condition :3m ,HORIZONTAL
Mode :TX_250kps_2403MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4806.000	59.16	74.00	-14.84	72.30	-13.14	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

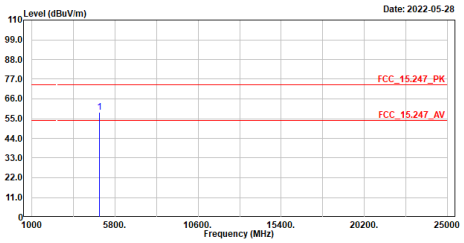
Site :HY-CB02
Condition :3m ,VERTICAL
Mode :TX_250kps_2403MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4806.000	51.25	74.00	-22.75	64.39	-13.14	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

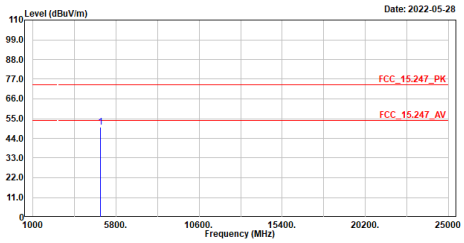
Site :HY-CB02
Condition :3m ,HORIZONTAL
Mode :TX_250kps_2442MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4884.000	58.42	74.00	-15.58	71.47	-13.05	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

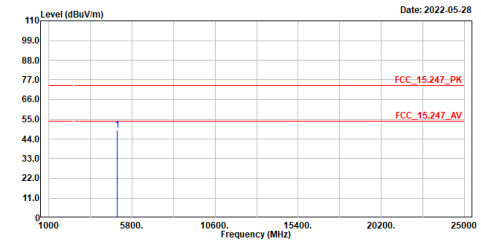
Site :HY-CB02
Condition :3m ,VERTICAL
Mode :TX_250kps_2442MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4884.000	50.35	74.00	-23.65	63.40	-13.05	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

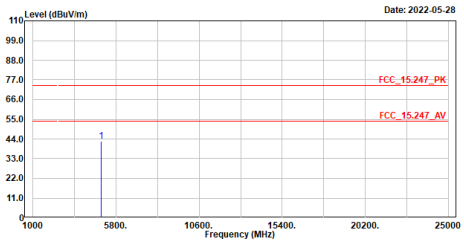
Site :HY-CB02
Condition :3m ,HORIZONTAL
Mode :TX_250kps_2481MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4962.000	49.10	74.00	-24.90	62.01	-12.91	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

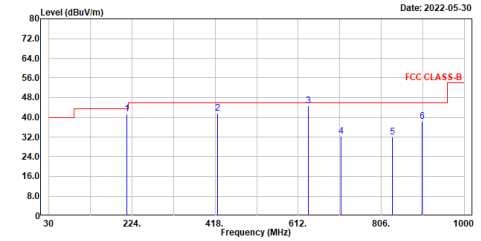
Site :HY-CB02
Condition :3m ,VERTICAL
Mode :TX_250kps_2481MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4962.000	42.86	74.00	-31.14	55.77	-12.91	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

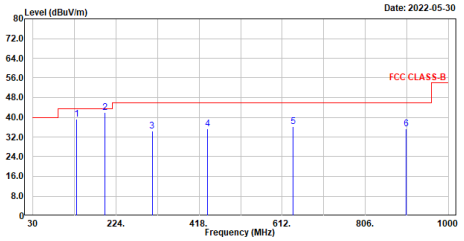
Site :HY-CB02
Condition :3m ,HORIZONTAL
Mode :TX_250kps_2442MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	212.360	41.42	43.50	-2.08	68.43	-27.01	QP
2	423.820	41.69	46.00	-4.31	62.27	-20.58	QP
3	635.280	44.54	46.00	-1.46	60.29	-15.75	QP
4	712.880	32.42	46.00	-13.58	47.18	-14.76	QP
5	832.190	32.05	46.00	-13.95	45.24	-13.19	QP
6	901.060	38.36	46.00	-7.64	50.64	-12.28	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

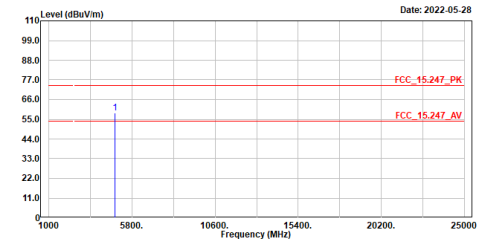
Site :HY-CB02
Condition :3m ,VERTICAL
Mode :TX_250kps_2442MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	131.850	39.23	43.50	-4.27	64.46	-25.23	QP
2	198.780	42.08	43.50	-1.42	69.28	-27.20	QP
3	308.390	34.47	46.00	-11.53	57.94	-23.47	QP
4	437.400	35.47	46.00	-10.53	55.36	-19.89	QP
5	638.190	36.27	46.00	-9.73	51.96	-15.69	QP
6	901.060	35.37	46.00	-10.63	47.65	-12.28	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

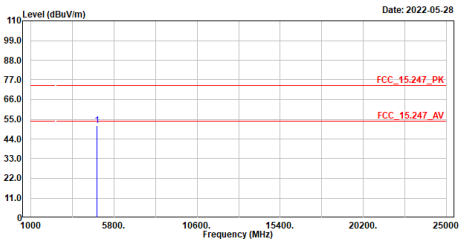
Site :HY-CB02
Condition :3m ,HORIZONTAL
Mode :TX_1M_2403MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4806.000	58.72	74.00	-15.28	71.86	-13.14	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

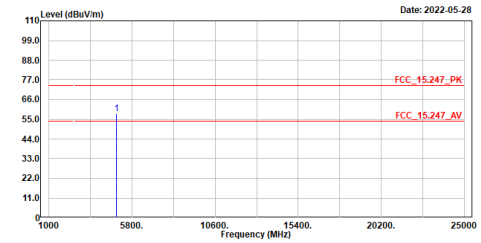
Site :HY-CB02
Condition :3m ,VERTICAL
Mode :TX_1M_2403MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4806.000	51.61	74.00	-22.39	64.75	-13.14	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

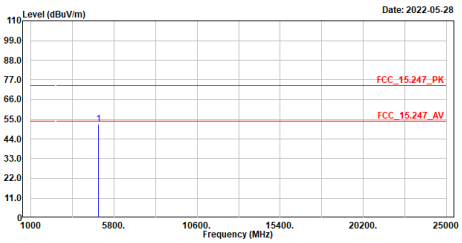
Site :HY-CB02
Condition :3m ,HORIZONTAL
Mode :TX_1M_2442MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4884.000	58.31	74.00	-15.69	71.36	-13.05	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

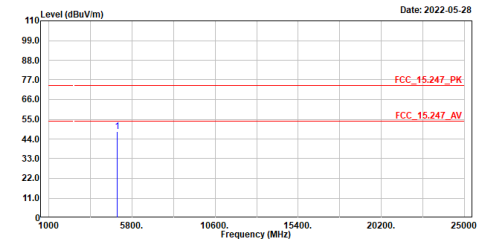
Site :HY-CB02
Condition :3m ,VERTICAL
Mode :TX_1M_2442MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4884.000	52.16	74.00	-21.84	65.21	-13.05	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

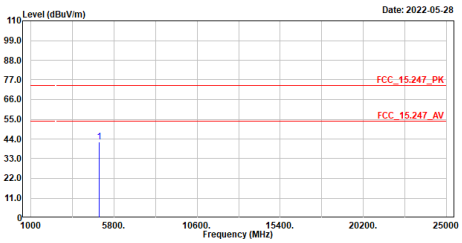
Site :HY-CB02
Condition :3m ,HORIZONTAL
Mode :TX_1M_2481MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4962.000	48.02	74.00	-25.98	60.93	-12.91	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

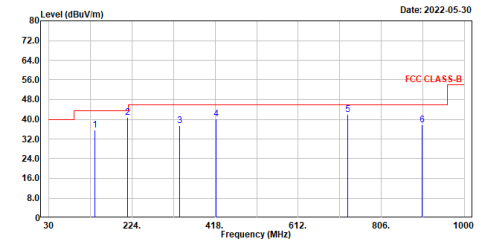
Site :HY-CB02
Condition :3m ,VERTICAL
Mode :TX_1M_2481MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4962.000	42.28	74.00	-31.72	55.19	-12.91	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

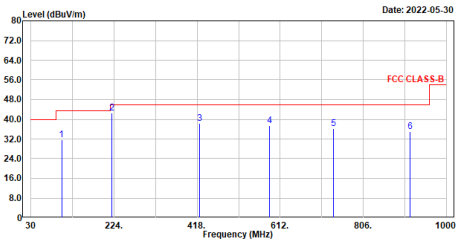
Site :HY-CB02
Condition :3m ,HORIZONTAL
Mode :TX_1M_2442MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	136.700	35.59	43.50	-7.91	60.58	-24.99	QP
2	213.330	40.89	43.50	-2.61	67.88	-26.99	QP
3	334.580	37.47	46.00	-8.53	60.09	-22.62	QP
4	419.940	40.15	46.00	-5.85	60.89	-20.74	QP
5	728.400	41.93	46.00	-4.07	56.40	-14.47	QP
6	901.060	37.72	46.00	-8.28	50.00	-12.28	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Site :HY-CB02
Condition :3m ,VERTICAL
Mode :TX_1M_2442MHz
TEST BY :Lance Chiang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	101.780	31.62	43.50	-11.88	60.32	-28.70	QP
2	218.180	42.65	46.00	-3.35	69.59	-26.94	QP
3	423.820	38.30	46.00	-7.70	58.88	-20.58	QP
4	587.750	37.31	46.00	-8.69	53.89	-16.58	QP
5	736.160	36.34	46.00	-9.66	50.46	-14.12	QP
6	915.610	34.99	46.00	-11.01	46.98	-11.99	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

2403MHz-250k

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal **Average Detector:**					
4806	59.16	-32.396	26.764	-27.236	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

2442MHz-250k

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal **Average Detector:**					
4884	58.42	-32.396	26.024	-27.976	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

2403MHz-1M

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal **Average Detector:**					
4806	58.72	-33.556	25.164	-28.836	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

2442MHz-1M

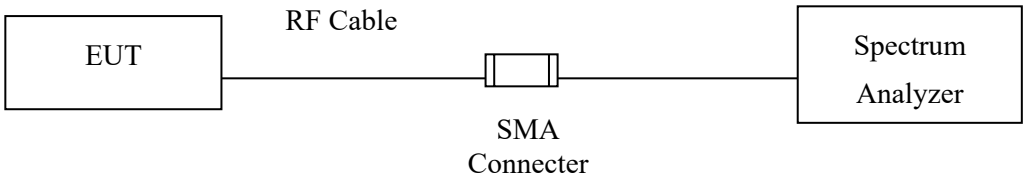
Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal **Average Detector:**					
4884	58.31	-33.556	24.754	-29.246	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

5. RF Antenna Conducted Test

5.1. Test Setup



5.2. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

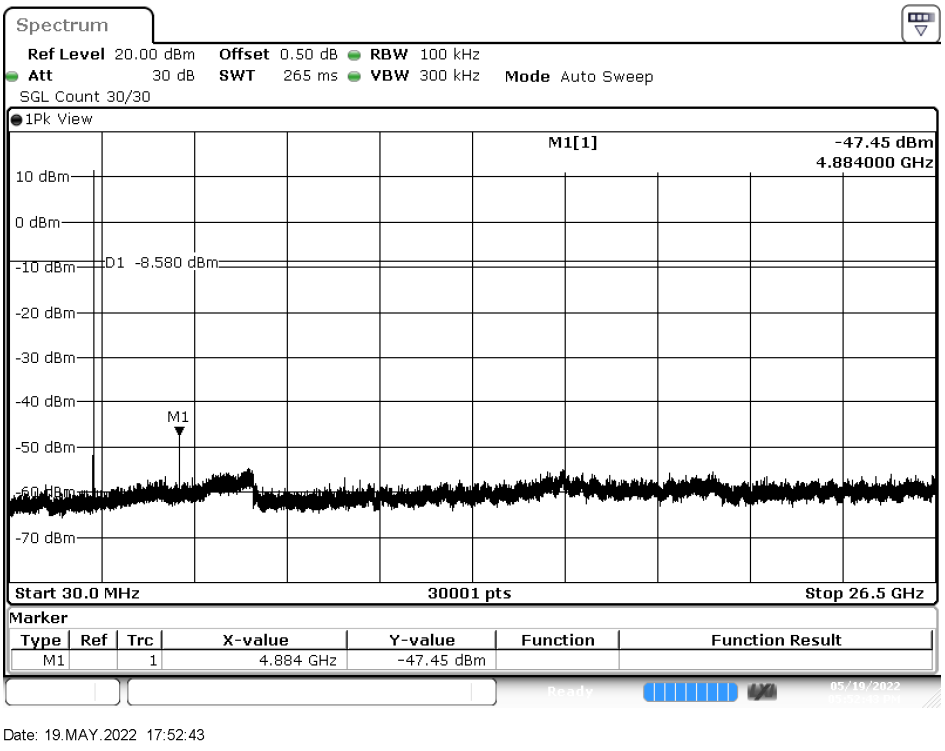
5.3. Test Procedure

Tested according to FHSS test procedure of KDB558074 section 9 b) for compliance to FCC 47CFR 15.247 requirements.

5.4. Test Result of RF Antenna Conducted Test

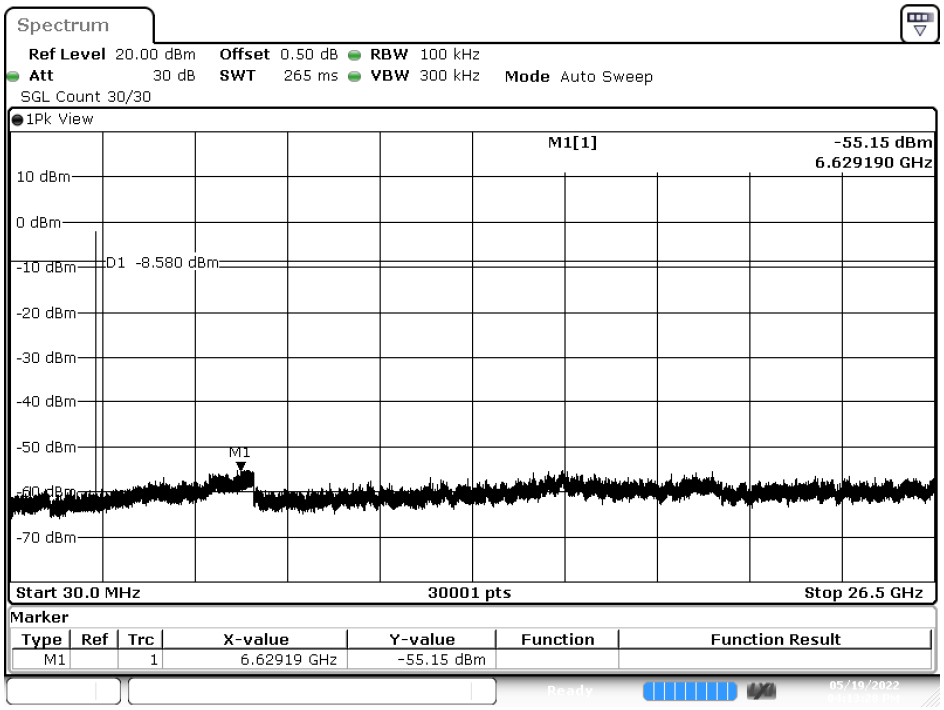
Product : Wireless Adaptor
Test Item : RF Antenna Conducted Test
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2022/05/19

Figure Channel 40:



Product : Wireless Adaptor
Test Item : RF Antenna Conducted Test
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2022/05/19

Figure Channel 79:

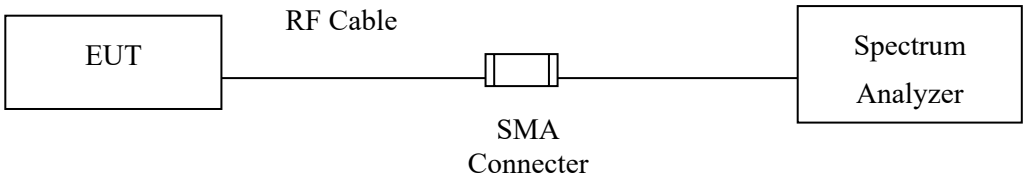


Date: 19.MAY.2022 16:13:28

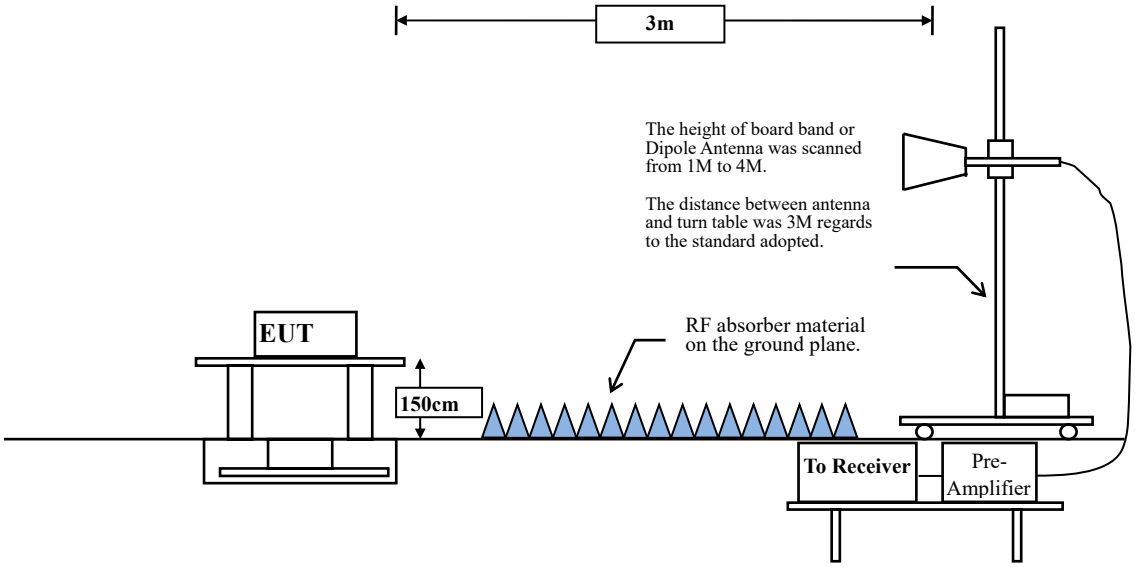
6. Band Edge

6.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



6.2. Limit

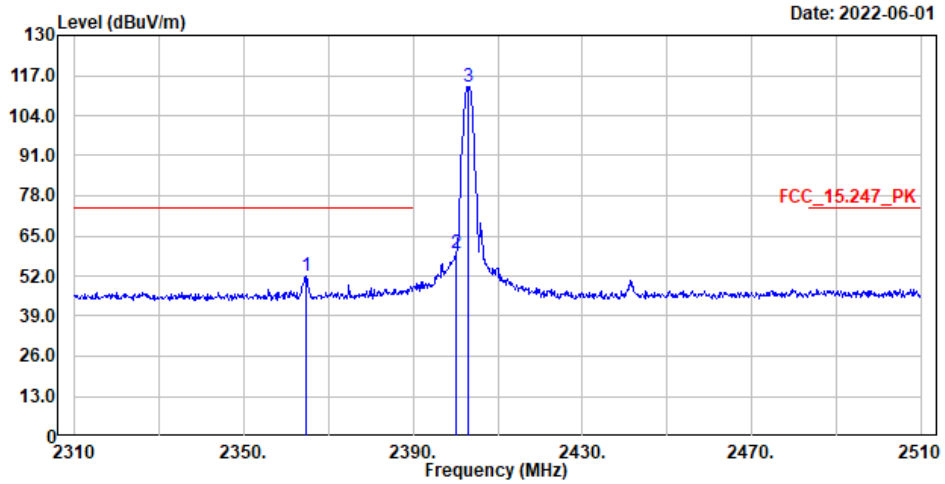
According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. 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)).

6.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.
The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

6.4. Test Result of Band Edge

```
Site       :HY-CB02
Condition  :3m    ,Horizontal
Mode       :TX_250kps_2403MHz
TEST BY    :Lance Chiang
```



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2364.600	51.76	74.00	-22.24	40.00	11.76	Peak
2	2400.000	59.40	------	------	47.47	11.93	Peak
3	2403.000	113.16	------	------	101.24	11.92	Peak

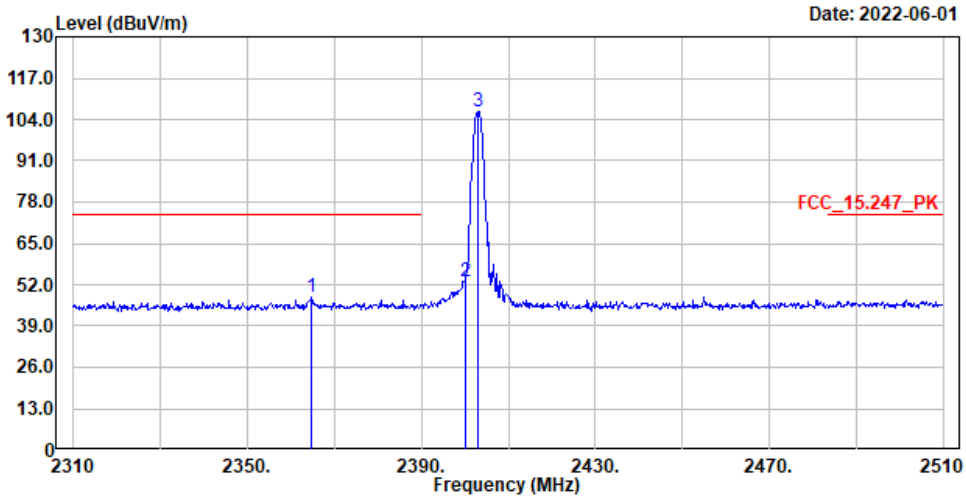
```
Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
```

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal **Average Detector:**					
2364.6	51.76	-32.396	19.364	-34.636	54.000
2400	59.4	-32.396	27.004	--	--
2403	113.16	-32.396	80.764	--	--

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

```
Site      :HY-CB02
Condition :3m    ,Vertical
Mode      :TX_250kps_2403MHz
TEST BY   :Lance Chiang
```



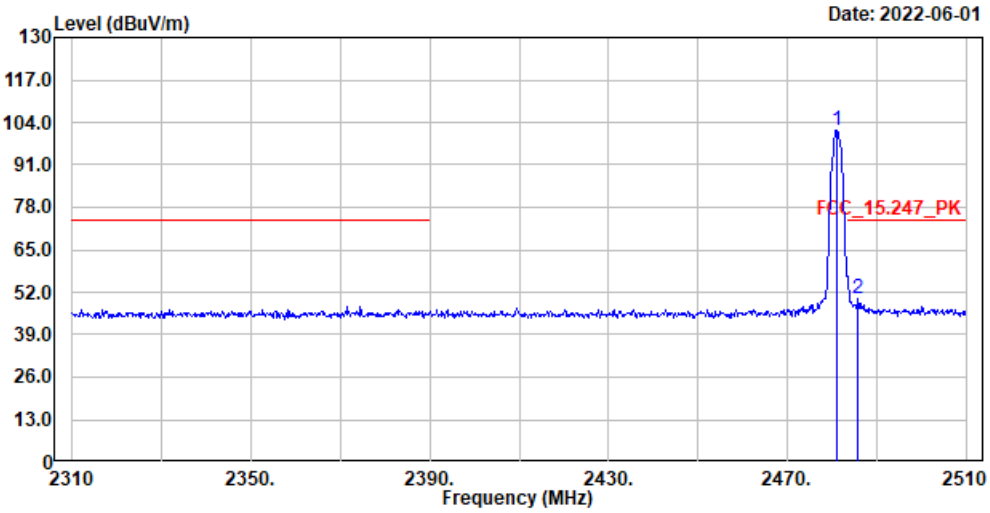
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2364.800	48.24	74.00	-25.76	36.48	11.76	Peak
2	2400.000	53.12	------	------	41.19	11.93	Peak
3	2403.000	106.27	------	------	94.35	11.92	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Vertical **Average Detector:**					
2364.8	48.24	-32.396	15.844	-38.156	54.000
2400	53.12	-32.396	20.724	--	--
2403	106.27	-32.396	73.874	--	--

Note:
1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

```
Site      :HY-CB02
Condition :3m    ,Horizontal
Mode      :TX_250kps_2481MHz
TEST BY   :Lance Chiang
```



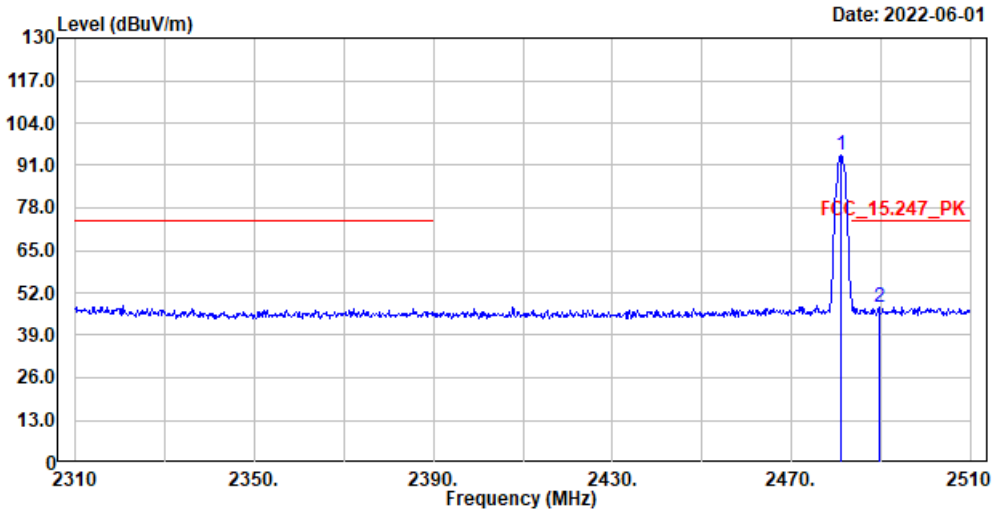
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2481.000	101.54	------	------	89.62	11.92	Peak
2	2485.800	49.94	74.00	-24.06	37.99	11.95	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal **Average Detector:**					
2481	101.54	-32.396	69.144	--	--
2485.8	49.94	-32.396	17.544	-36.456	54.000

Note:
1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

Site :HY-CB02
Condition :3m ,Vertical
Mode :TX_250kps_2481MHz
TEST BY :Lance Chiang



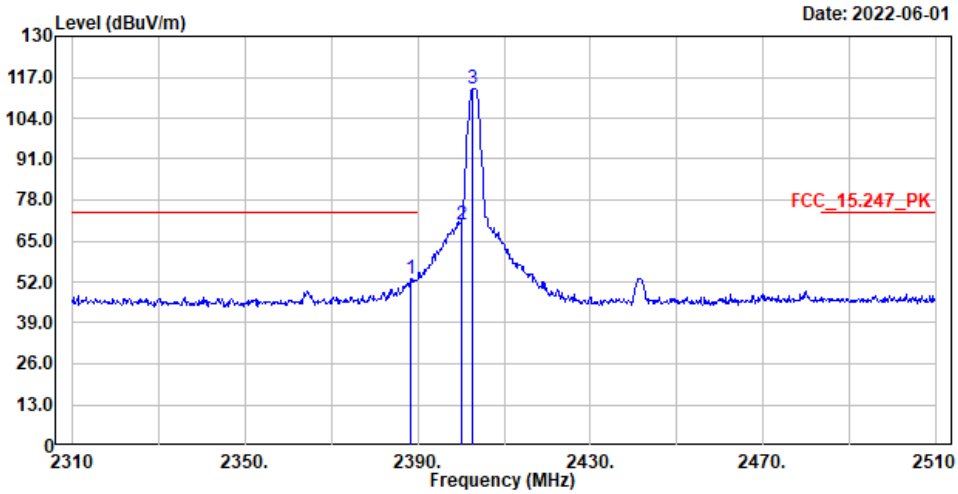
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2481.000	93.94	------	------	82.02	11.92	Peak
2	2489.600	47.68	74.00	-26.32	35.71	11.97	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Vertical **Average Detector:**					
2481	93.94	-32.396	61.544	--	--
2489.6	47.68	-32.396	15.284	-38.716	54.000

Note:
1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

```
Site       :HY-CB02
Condition  :3m    ,Horizontal
Mode       :TX_1M_2403MHz
TEST BY    :Lance Chiang
```



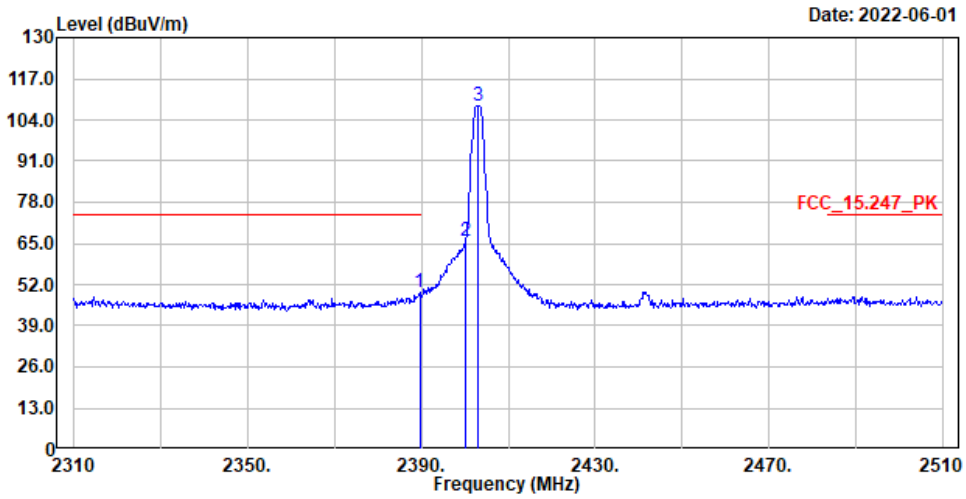
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2388.400	53.16	74.00	-20.84	41.30	11.86	Peak
2	2400.000	70.25	------	------	58.32	11.93	Peak
3	2402.800	113.28	------	------	101.36	11.92	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal **Average Detector:**					
2388.4	53.16	-33.556	19.604	-34.396	54.000
2400	70.25	-33.556	36.694	--	--
2403.2	113.28	-33.556	79.724	--	--

Note:
1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

```
Site       :HY-CB02
Condition  :3m    ,Vertical
Mode       :TX_1M_2403MHz
TEST BY    :Lance Chiang
```



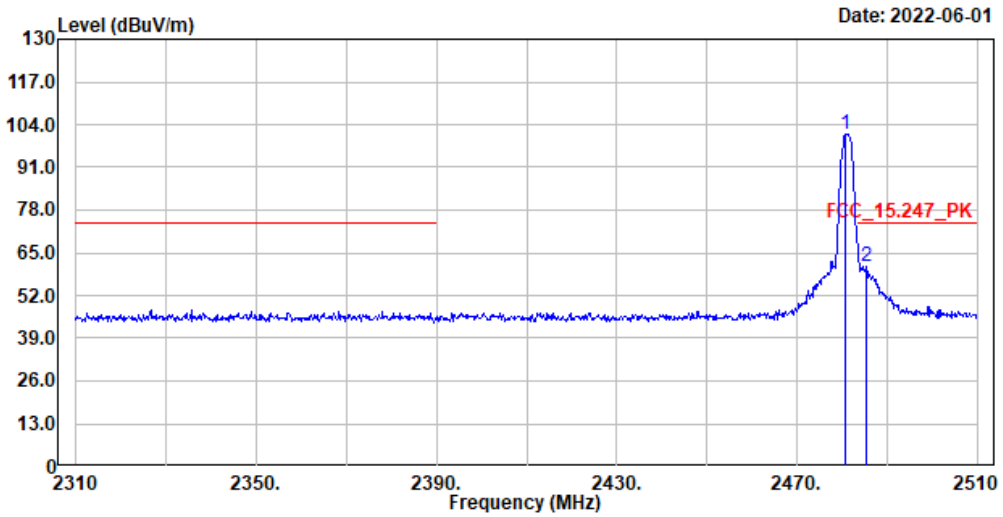
No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2389.600	49.41	74.00	-24.59	37.54	11.87	Peak
2	2400.000	65.82	------	------	53.89	11.93	Peak
3	2403.000	108.40	------	------	96.48	11.92	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Vertical **Average Detector:**					
2389.6	49.41	-33.556	15.854	-38.146	54.000
2400	65.82	-33.556	32.264	--	--
2403	108.4	-33.556	74.844	--	--

Note:
1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

```
Site       :HY-CB02
Condition  :3m    ,Horizontal
Mode       :TX_1M_2481MHz
TEST BY    :Lance Chiang
```



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2480.800	101.19	------	------	89.27	11.92	Peak
2	2485.400	60.90	74.00	-13.10	48.95	11.95	Peak

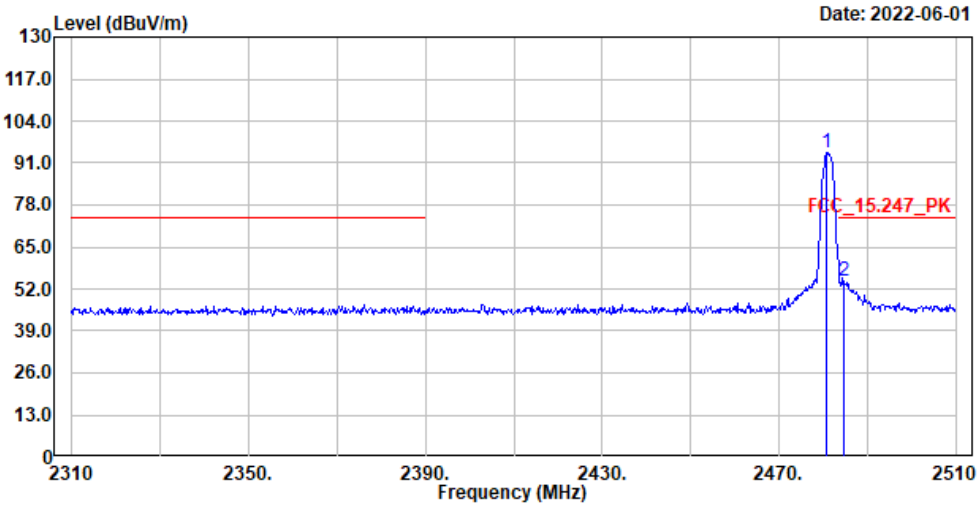
```
Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
```

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal **Average Detector:**					
2480.8	101.19	-33.556	67.634	--	--
2485.4	60.9	-33.556	27.344	-26.656	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

```
Site       :HY-CB02
Condition  :3m    ,Vertical
Mode       :TX_1M_2481MHz
TEST BY    :Lance Chiang
```



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2480.800	93.99	------	------	82.07	11.92	Peak
2	2484.800	54.60	74.00	-19.40	42.65	11.95	Peak

```
Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
```

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Vertical **Average Detector:**					
2480.8	93.99	-33.556	60.434	--	--
2484.8	54.6	-33.556	21.044	-32.956	54.000

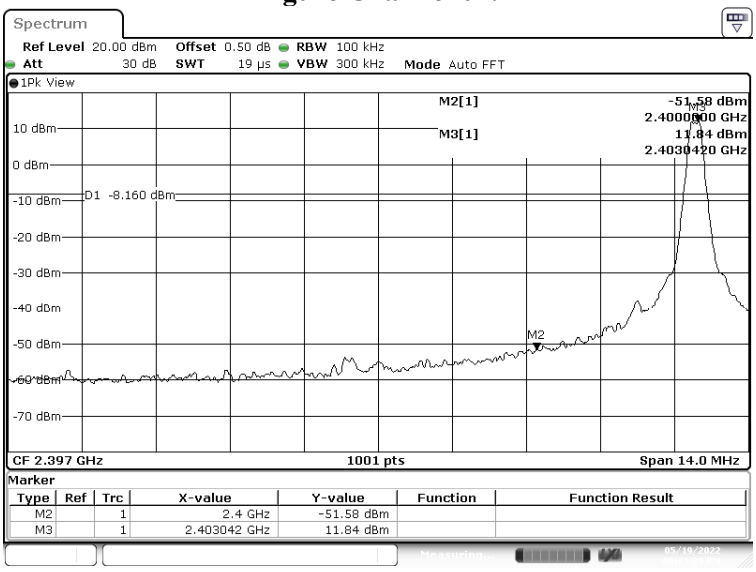
Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor.
2. The Duty Cycle is refer to section 11.

Product : Wireless Adaptor
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 250kbps(Hopping off)
Test Date : 2022/05/19

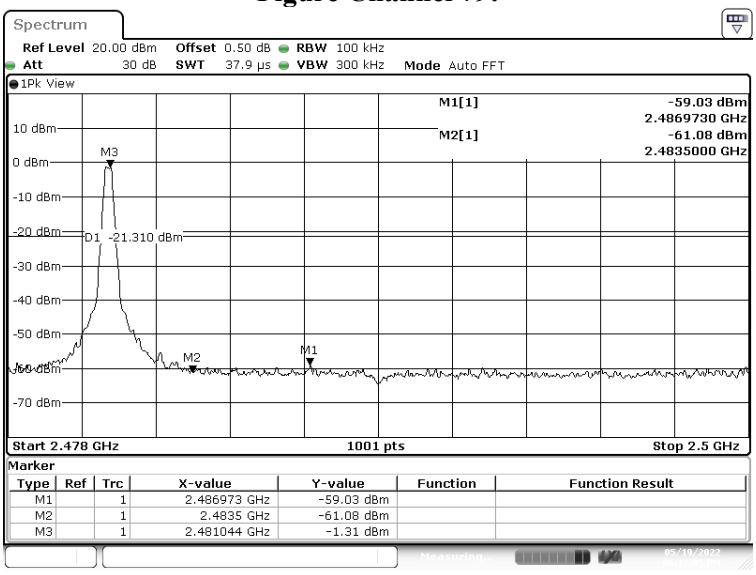
Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 01:



Date: 19.MAY.2022 18:21:29

Figure Channel 79:

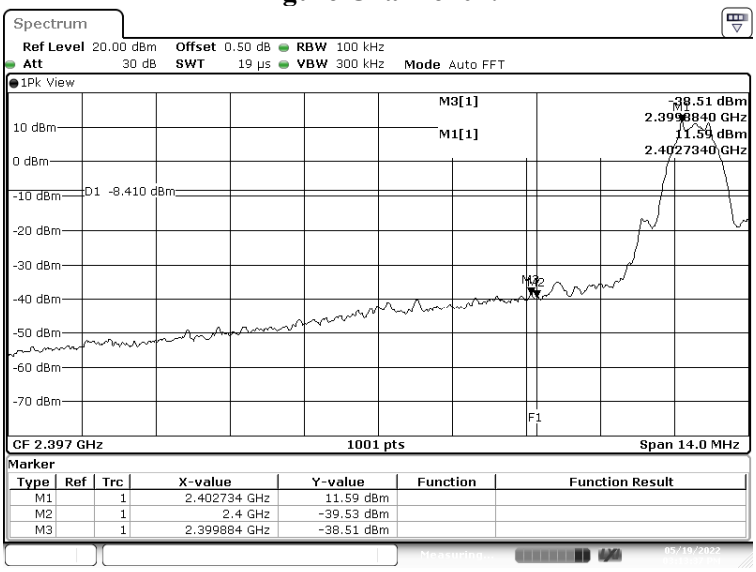


Date: 19.MAY.2022 18:17:05

Product : Wireless Adaptor
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (Hopping off)
Test Date : 2022/05/19

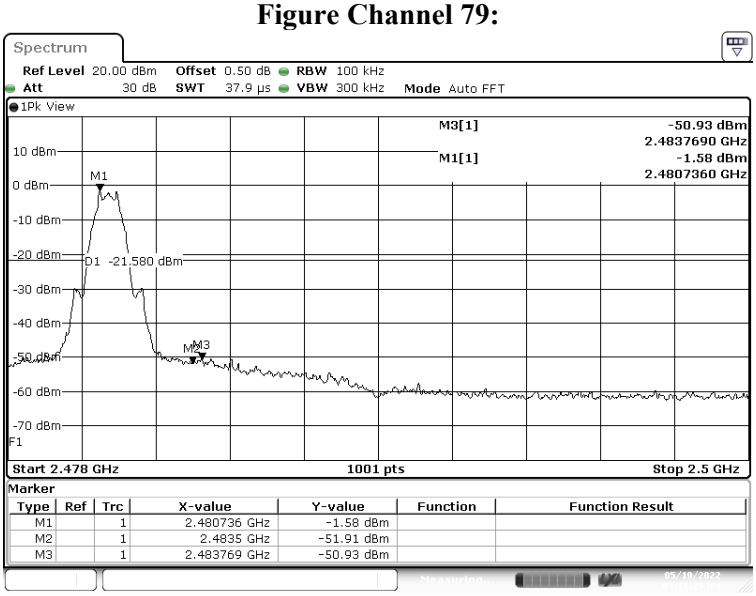
Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 01:



Date: 19.MAY.2022 15:13:37

Figure Channel 79:

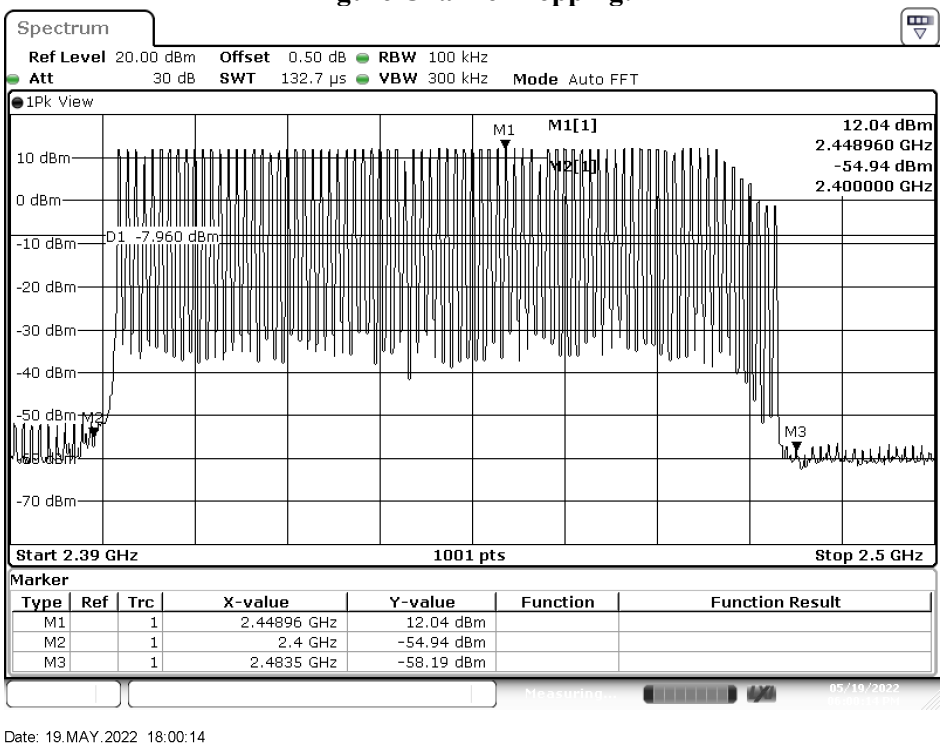


Date: 19.MAY.2022 15:16:29

Product : Wireless Adaptor
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 250kbps(Hopping on)
Test Date : 2022/05/19

Measurement Level Δ (dB)	Result
> 20	PASS

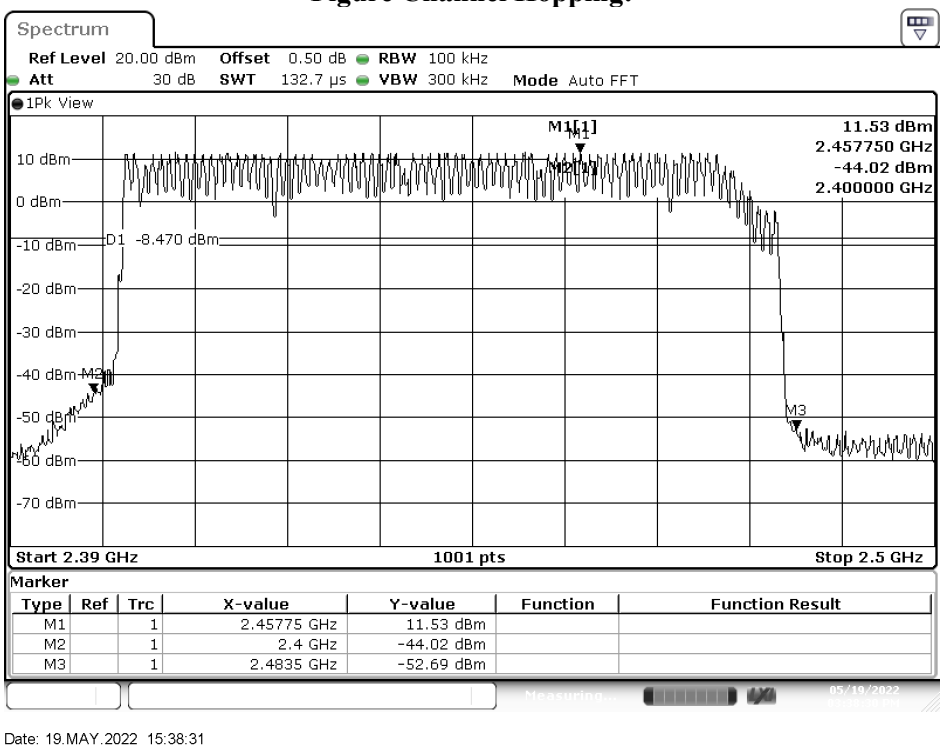
Figure Channel Hopping:



Product : Wireless Adaptor
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (Hopping on)
Test Date : 2022/05/19

Measurement Level Δ (dB)	Result
> 20	PASS

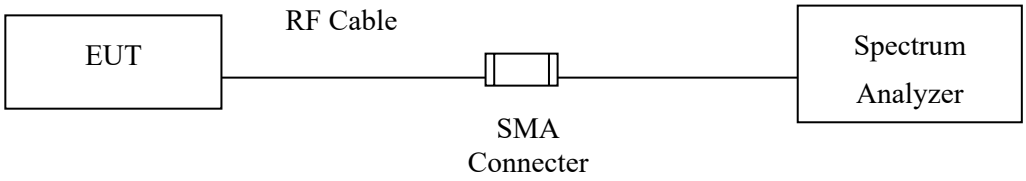
Figure Channel Hopping:



Date: 19.MAY.2022 15:38:31

7. Channel Number

7.1. Test Setup



7.2. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

7.3. Test Procedure

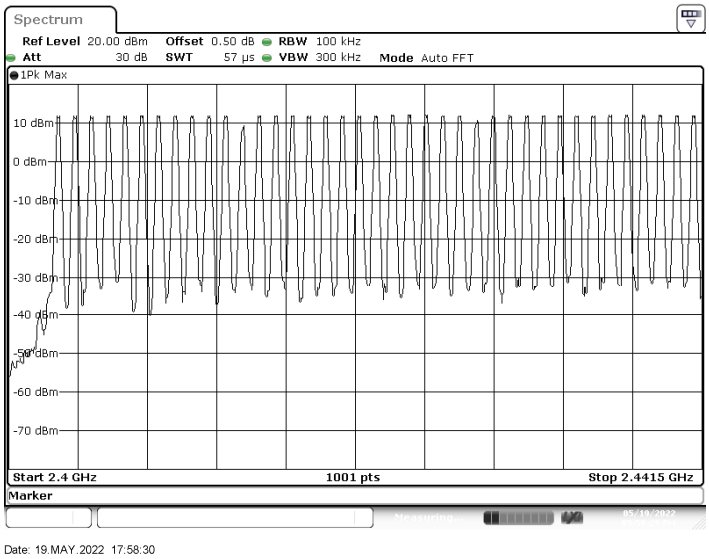
Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

7.4. Test Result of Channel Number

Product : Wireless Adaptor
Test Item : Channel Number
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2022/05/19

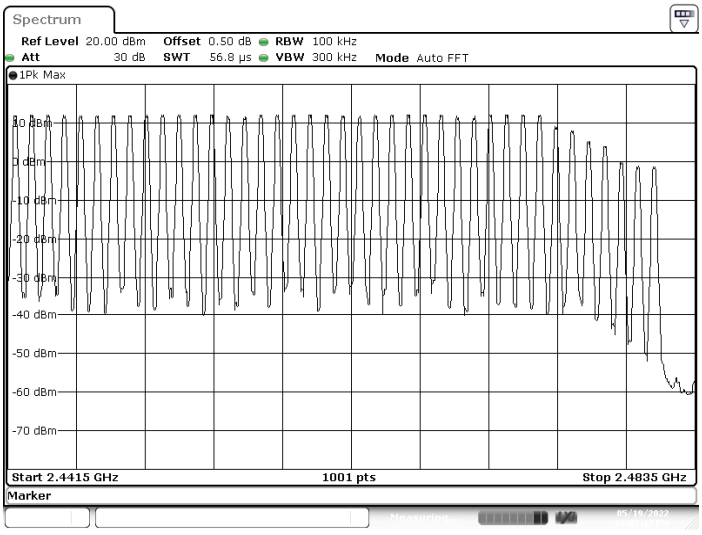
Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2403 ~ 2481	79	>75	Pass

2403MHz



Date: 19.MAY.2022 17:58:30

2481MHz

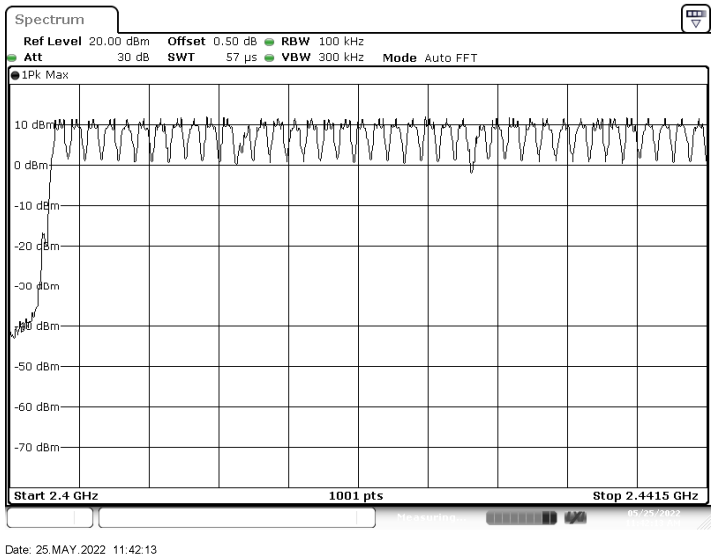


Date: 19.MAY.2022 18:02:17

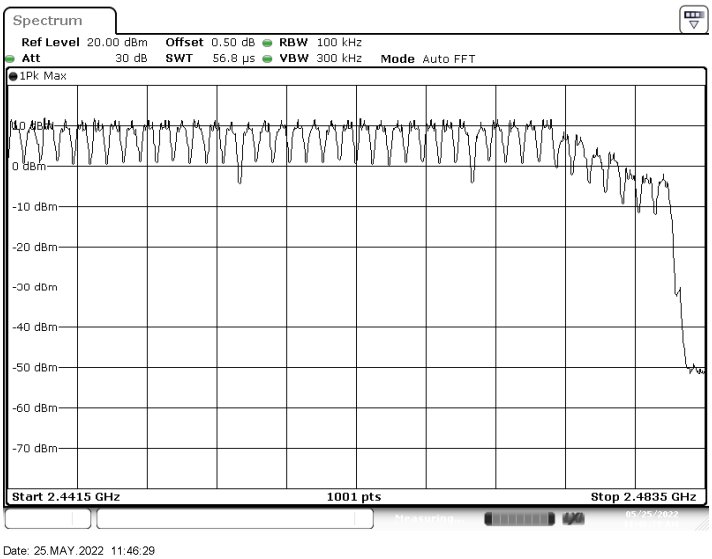
Product : Wireless Adaptor
Test Item : Channel Number
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2022/05/19

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2403 ~ 2481	79	>75	Pass

2403MHz

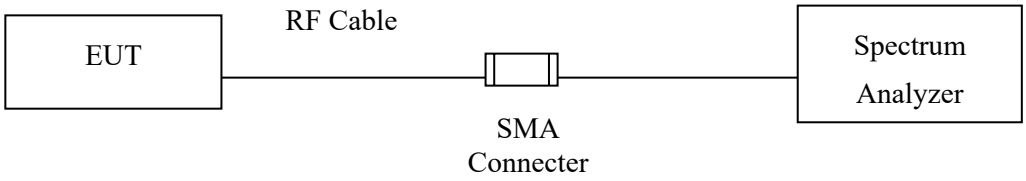


2481MHz



8. Channel Separation

8.1. Test Setup



8.2. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

8.3. Test Procedure

Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

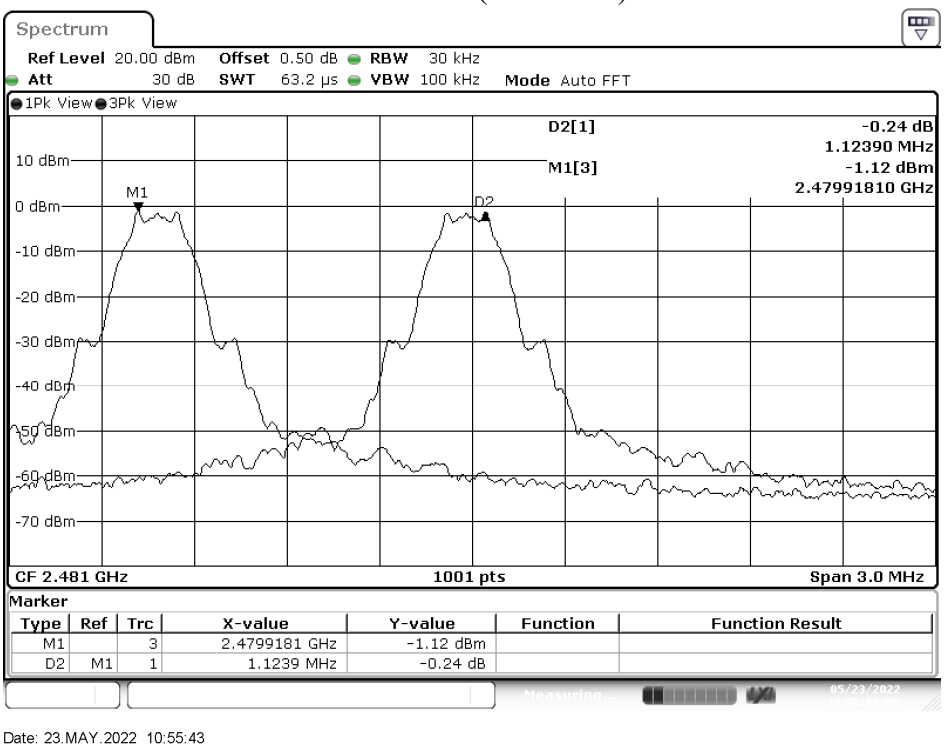
8.4. Test Result of Channel Separation

Product : Wireless Adaptor
Test Item : Channel Separation
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2022/05/23

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
01	2403	1001	>25 kHz	209.3	Pass
40	2442	875	>25 kHz	209.3	Pass
79	2481	1123	>25 kHz	211.3	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

Channel 79 (2481MHz)



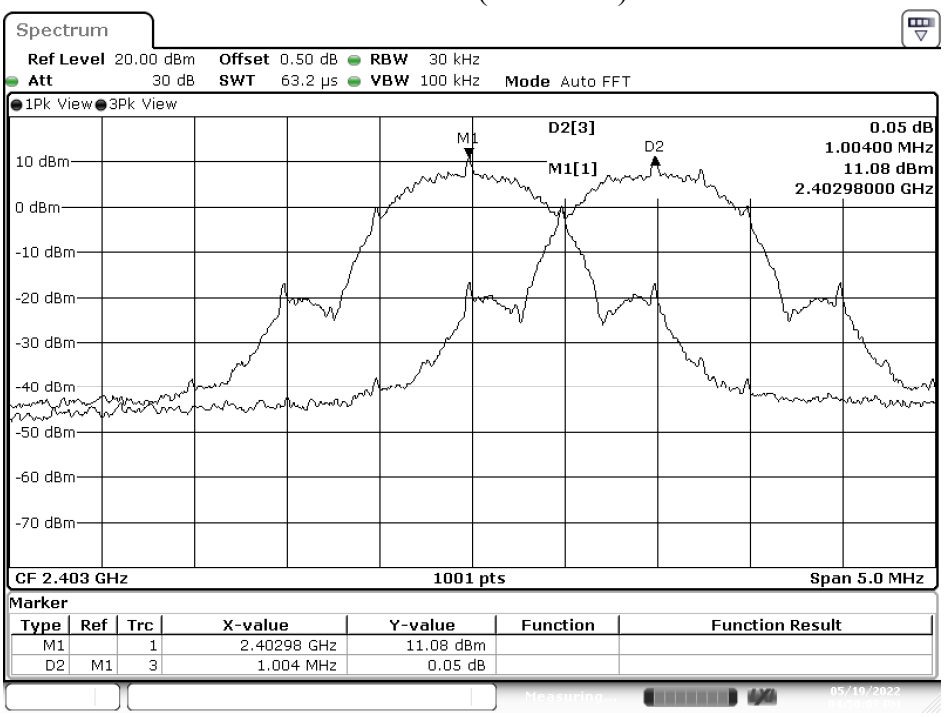
Date: 23.MAY.2022 10:55:43

Product : Wireless Adaptor
Test Item : Channel Separation
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2022/05/23

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
01	2403	1004	>25 kHz	780.7	Pass
40	2442	999	>25 kHz	770.7	Pass
79	2481	998	>25 kHz	774.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

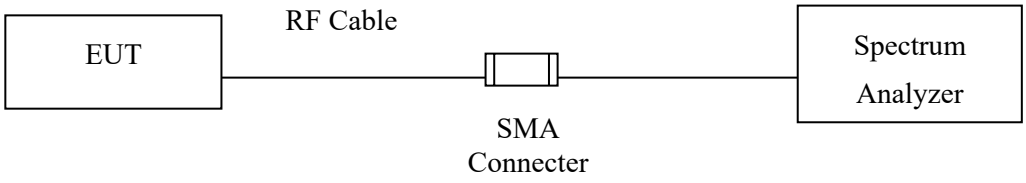
Channel 01 (2403MHz)



Date: 19.MAY.2022 16:50:03

9. Dwell Time

9.1. Test Setup



9.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3. Test Procedure

Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

9.4. Test Result of Dwell Time

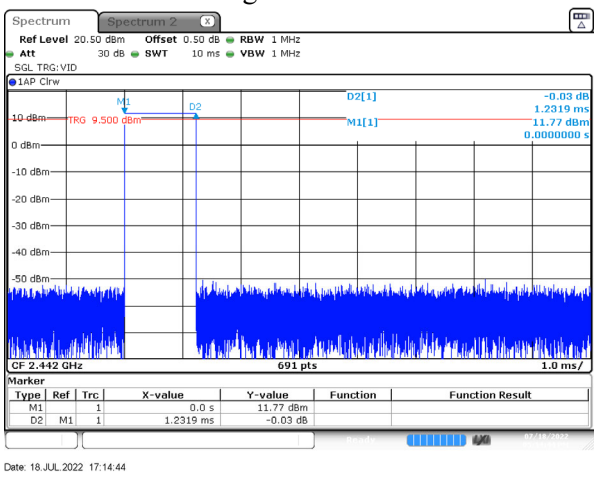
Product : Wireless Adaptor
Test Item : Dwell Time
Test Mode : Mode 1: Transmit - 250kbps (Channel 01,40,79)
Test Date : 2022/05/23

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (ms)	Limit (ms)	Result
2403	1.231	80	31600	98.480	400	Pass
2442	1.231	80	31600	98.480	400	Pass
2481	1.231	80	31600	98.480	400	Pass

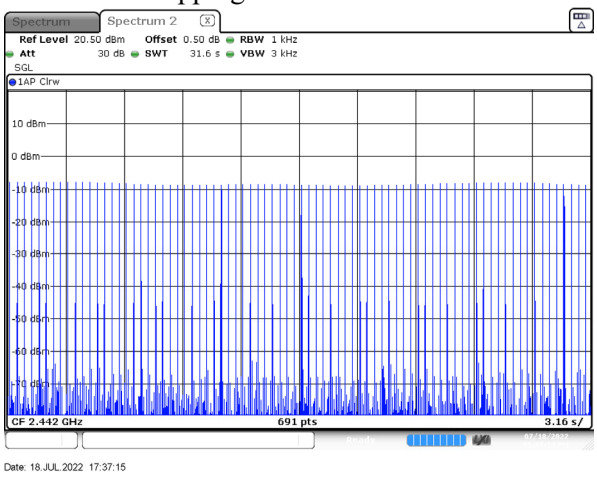
Dwell time = Time slot length (ms)*Hopping of Number

Hopping of Number is S.A software calculated value.

CH 40 Time slot length



CH 40 Hopping of Number



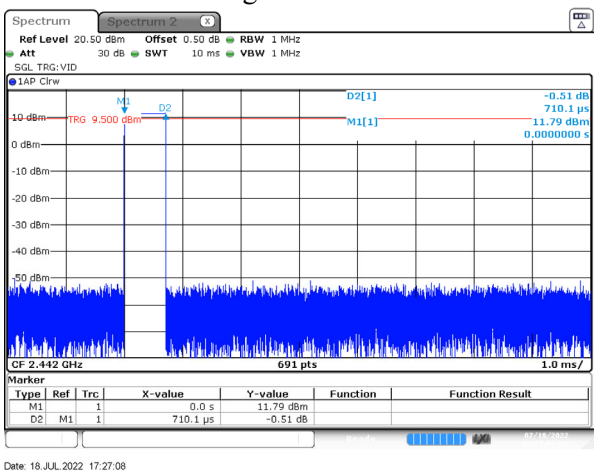
Product : Wireless Adaptor
Test Item : Dwell Time
Test Mode : Mode 2: Transmit - 1Mbps (Channel 01,40,79)
Test Date : 2022/05/23

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (ms)	Limit (ms)	Result
2403	0.710	201	31600	142.710	400	Pass
2442	0.710	202	31600	143.420	400	Pass
2481	0.695	201	31600	139.695	400	Pass

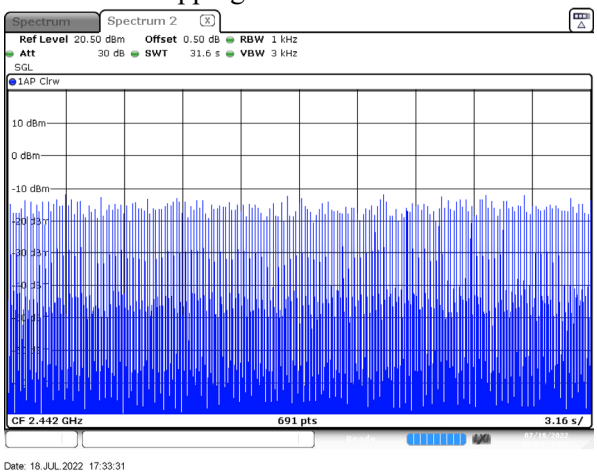
Dwell time = Time slot length (ms)*Hopping of Number

Hopping of Number is S.A software calculated value.

CH 40 Time slot length

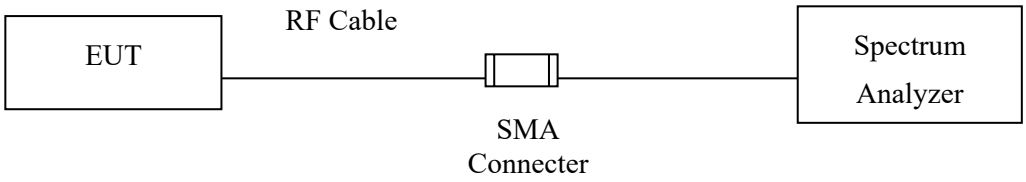


CH 40 Hopping of Number



10. Occupied Bandwidth

10.1. Test Setup



10.2. Limits

N/A

10.3. Test Procedure

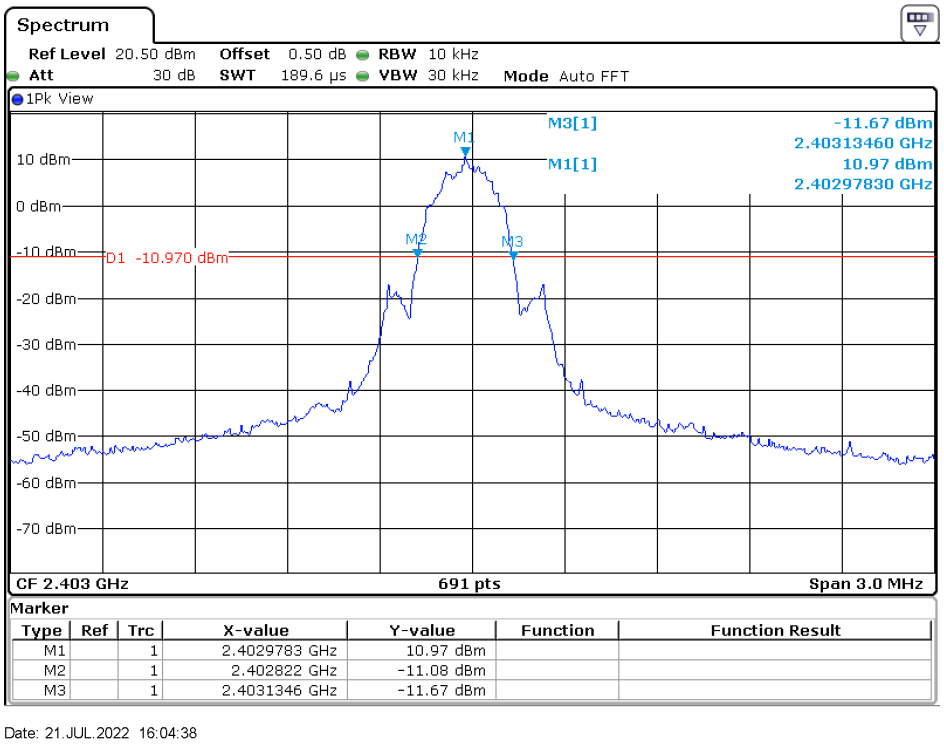
Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

10.4. Test Result of Occupied Bandwidth

Product : Wireless Adaptor
Test Item : Occupied Bandwidth Data
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2022/05/19

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2403	312	--	NA
40	2442	308	--	NA
79	2481	303	--	NA

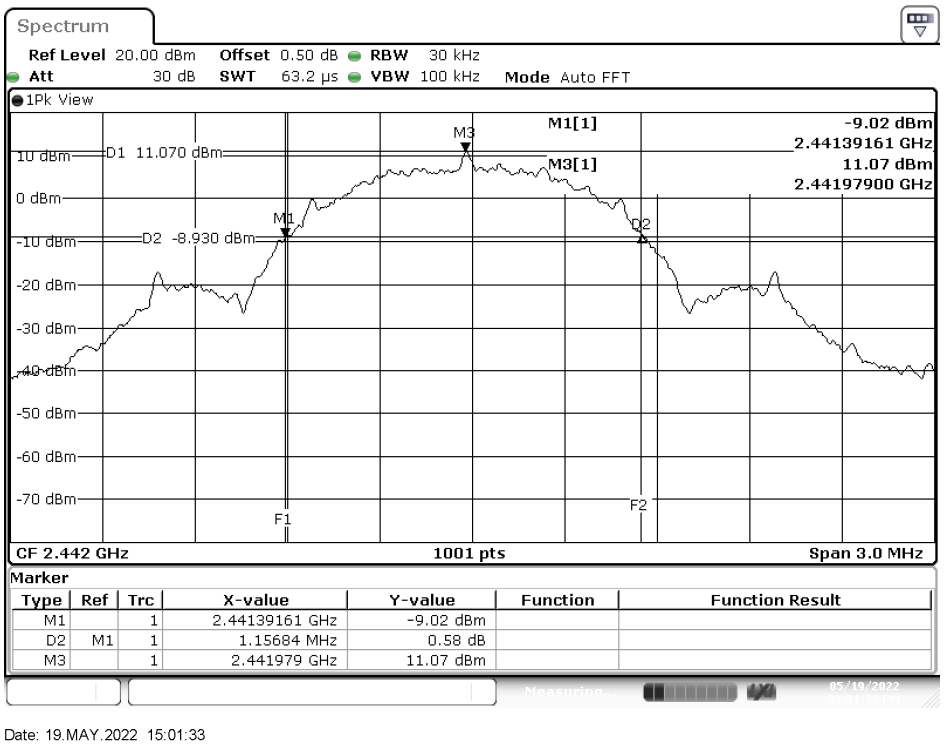
Figure Channel 01:



Product : Wireless Adaptor
Test Item : Occupied Bandwidth Data
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2022/05/19

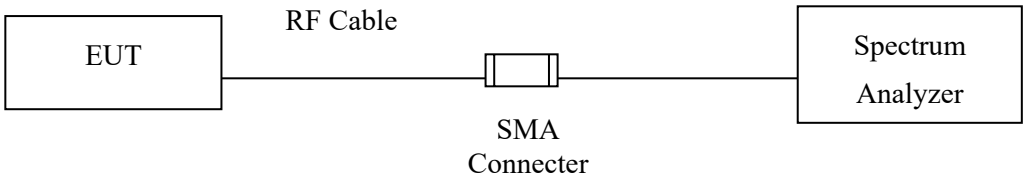
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2403	1171	--	NA
40	2442	1156	--	NA
79	2481	1161	--	NA

Figure Channel 40:



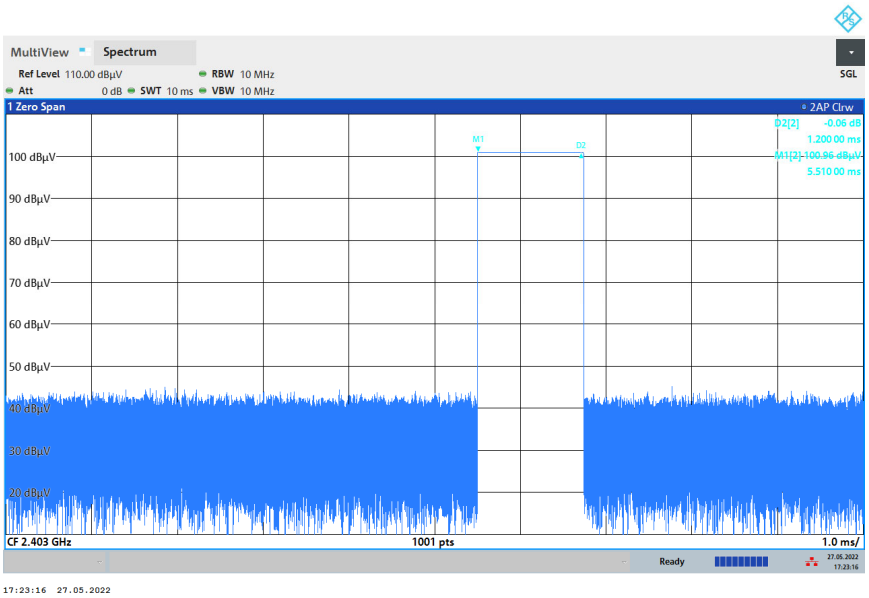
11. Duty Cycle

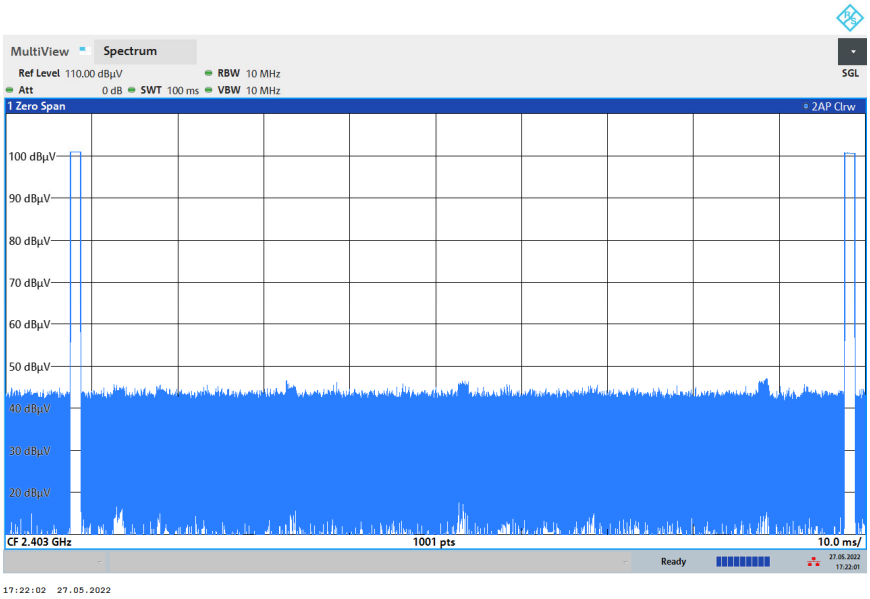
11.1. Test Setup



11.2. Test Result of Duty Cycle

Product : Wireless Adaptor
Test Item : Duty Cycle Data
Test Mode : Mode 1: Transmit - 250kbps





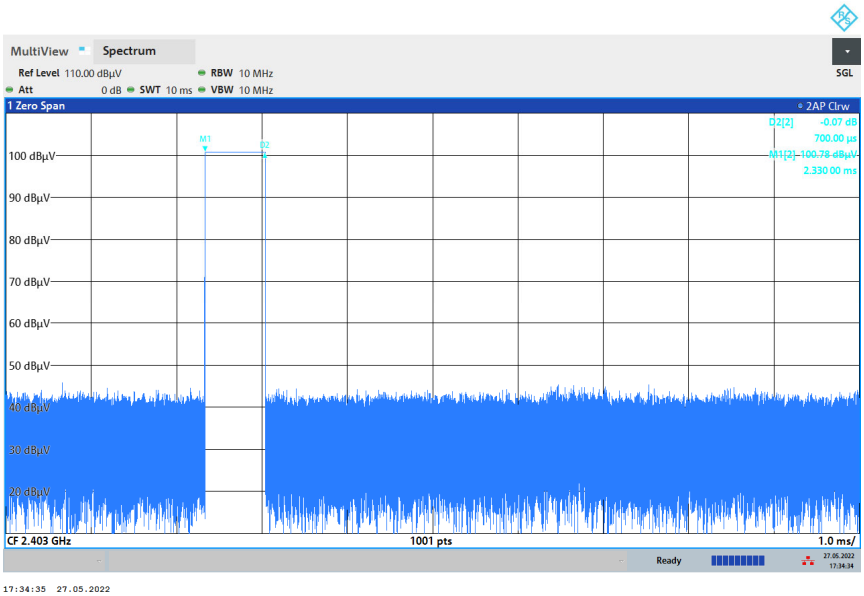
Time on of 100ms= 1.20ms*2= 2.40ms

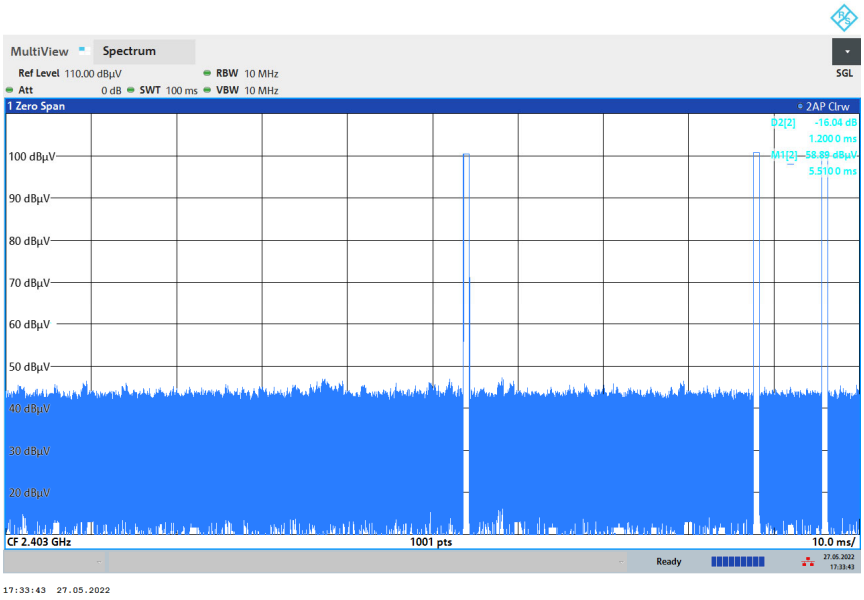
Duty Cycle=2.4ms / 100ms= 0.024

Duty Cycle correction factor= 20 LOG 0.024= -32.396 dB

Duty Cycle correction factor	**-32.396**	**dB**

Product : Wireless Adaptor
Test Item : Duty Cycle Data
Test Mode : Mode 2: Transmit - 1Mbps





Time on of 100ms= 0.7ms*3= 2.10ms

Duty Cycle=2.10ms / 100ms= 0.021

Duty Cycle correction factor= 20 LOG 0.021= -33.556 dB

Duty Cycle correction factor	**-33.556**	**dB**

12. EMI Reduction Method During Compliance Testing

No modification was made during testing.