

# Test Report

Product Name	Wireless Remote Control
Model No.	884242
FCC ID	X96884242

Applicant	Comeup Industries Inc.
Address	No.139, Jieyukeng Rd., Ruifang Dist., New Taipei City 22453, Taiwan

Date of Receipt	Aug. 26, 2022
Issued Date	Dec. 30, 2022
Report No.	2280835R-RFUSOTHV05-A
Report Version	V1.0



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



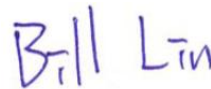
Product Name	Wireless Remote Control
Applicant	Comeup Industries Inc.
Address	No.139, Jieyukeng Rd., Ruifang Dist., New Taipei City 22453, Taiwan
Manufacturer	Comeup Industries Inc.
Model No.	884242
FCC ID	X96884242
EUT Rated Voltage	DC 24 V (by battery)
EUT Test Voltage	DC 24 V (by battery)
Trade Name	COMEUP
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



( Senior Project Specialist / Joanne Lin )

Tested By :



( Senior Engineer / Bill Lin )

Approved By :



( Senior Engineer / Alan Chen )

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**Revision History**

Report No.	Version	Description	Issued Date
2280835R-RFUSOTHV05-A	V1.0	Initial issue of report.	Dec. 30, 2022

## 1. General Information

### 1.1. EUT Description

Product Name	Wireless Remote Control
Trade Name	COMEUP
Model No.	884242
FCC ID	X96884242
Frequency Range	2402-2480 MHz
Channel Number	79 CH
Type of Modulation	GFSK
Antenna Type	PCB
Channel Control	Auto
Antenna Gain	Refer to the Antenna List

#### Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	SHIN WUU TECHNIQUE CORP.	SW-032T-S	PCB	2.8 dBi for 2400 MHz

Note: The antenna of EUT is conforming to FCC 15.203.

## Center Frequency of Each Channel:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
02	2402	03	2403	04	2404	05	2405
06	2406	07	2407	08	2408	09	2409
10	2410	11	2411	12	2412	13	2413
14	2414	15	2415	16	2416	17	2417
18	2418	19	2419	20	2420	21	2421
22	2422	23	2423	24	2424	25	2425
26	2426	27	2427	28	2428	29	2429
30	2430	31	2431	32	2432	33	2433
34	2434	35	2435	36	2436	37	2437
38	2438	39	2439	40	2440	41	2441
42	2442	43	2443	44	2444	45	2445
46	2446	47	2447	48	2448	49	2449
50	2450	51	2451	52	2452	53	2453
54	2454	55	2455	56	2456	57	2457
58	2458	59	2459	60	2460	61	2461
62	2462	63	2463	64	2464	65	2465
66	2466	67	2467	68	2468	69	2469
70	2470	71	2471	72	2472	73	2473
74	2474	75	2475	76	2476	77	2477
78	2478	79	2479	80	2480		

## Note:

1. The EUT is a Wireless Remote Control with built-in 2.4G wireless transceiver.
2. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
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
	Mode 2	Normal mode

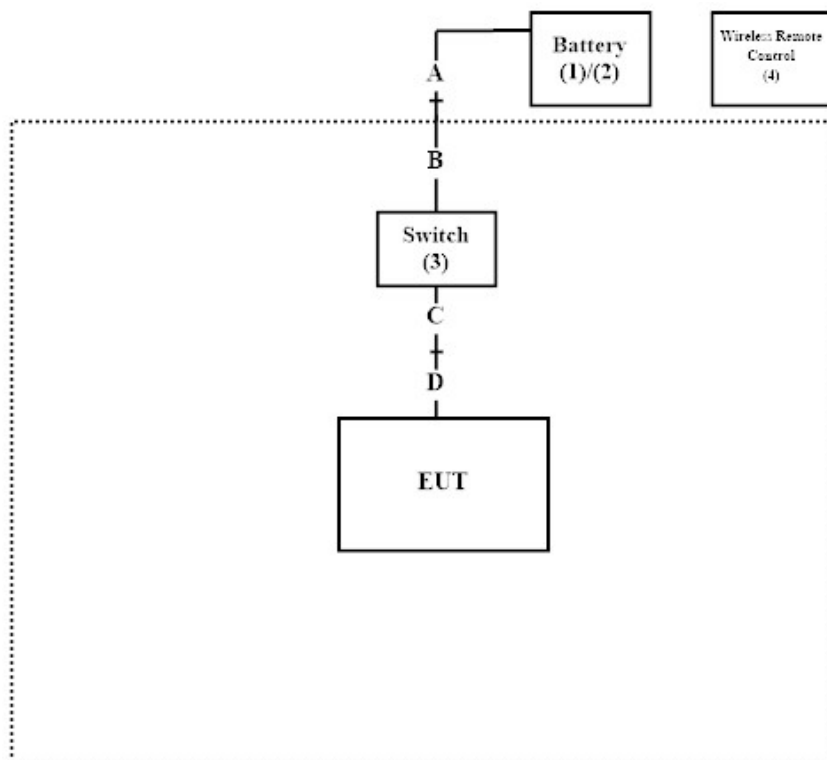
### 1.2. Tested System Details

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 Battery	YUASA	55B24L-CMF II	N/A	N/A
2 Battery	YUASA	55D23L-SMF	N/A	N/A
3 Switch	COMEUP	DES-4024	N/A	N/A
4 Wireless Remote Control	COMEUP	883822	N/A	N/A

Signal Cable Type	Signal cable Description
A Power Cable	Non-shielded, 2m
B Power Cable	Non-shielded, 0.2m
C Signal Cable	Non-shielded, 0.24m
D Signal Cable	Non-shielded, 0.1m

### 1.3. Configuration of Tested System



### 1.4. EUT Exercise Software

1. Setup the EUT as shown in Section 1.3.
2. The Wireless Remote Control uses in controlling EUT to transmit continuous.
3. Configure the test mode and test channel.
4. Verify that the EUT works properly.



## 1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Radiated Emission	Temperature (°C)	10~40 °C	24.5 °C
	Humidity (%RH)	10~90 %	62.3 %
Conductive	Temperature (°C)	10~40 °C	27.8 °C
	Humidity (%RH)	10~90 %	59.0 %

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 : +886-3-327-8031

Email Address : [info.tw@dekra.com](mailto:info.tw@dekra.com)Website : <http://www.dekra.com.tw>

## 1.6. List of Test Equipment

**For Conducted Measurements / HY-SR02**

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Spectrum Analyzer	R&S	FSV30	103466	2021/12/27	2022/12/26
V	Peak Power Analyzer	KEYSIGHT	8990B	MY51000539	2022/05/27	2023/05/26
V	Power Sensor	KEYSIGHT	N1923A	MY59240002	2022/05/19	2023/05/18
V	Power Sensor	KEYSIGHT	N1923A	MY59240003	2022/05/19	2023/05/18

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software version: RF Conducted Test Tools R3 V3.0.1.14.

**For Radiated Measurements / HY-CB03**

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Loop Antenna	AMETEK	HLA6121	49611	2022/03/18	2023/03/17
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-675	2021/08/11	2023/08/10
V	Horn Antenna	RF SPIN	DRH18-E	210508A18ES	2022/06/08	2023/06/07
V	Horn Antenna	Com-Power	AH-840	101100	2021/10/04	2023/10/03
V	Pre-Amplifier	SGH	SGH0301-9	20211007-10	2022/02/22	2023/02/21
V	Pre-Amplifier	SGH	PRAMP118	20200701	2022/07/28	2023/07/27
V	Pre-Amplifier	EMCI	EMC05820SE	980310	2022/07/28	2023/07/27
V	Pre-Amplifier	EMCI	EMC184045SE	980369	2022/05/12	2023/05/11
	Coaxial Cable	EMCI	EMC102-KM-K M-600	1160314		
	Coaxial Cable	EMCI	EMC102-KM-K M-7000	170242		
V	Filter	MICRO TRONICS	BRM50702	G269	2022/07/31	2023/07/30
	Filter	MICRO TRONICS	BRM50716	G196	2022/07/27	2023/07/26
V	EMI Test Receiver	R&S	ESR	102793	2021/12/15	2022/12/14
V	Spectrum Analyzer	R&S	FSV3044	101114	2022/02/11	2023/02/10
V	Coaxial Cable	SGH	SGH18	2021005-1	2022/03/18	2023/03/17
	Coaxial Cable	SGH	SGH18	202108-4		
	Coaxial Cable	SGH	SGH18	GD20110223-1		
	Coaxial Cable	SGH	HA800	GD20110222-3		

Note:

1. Bi-Log Antenna and Horn Antenna(AH-840) is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with “V” 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.

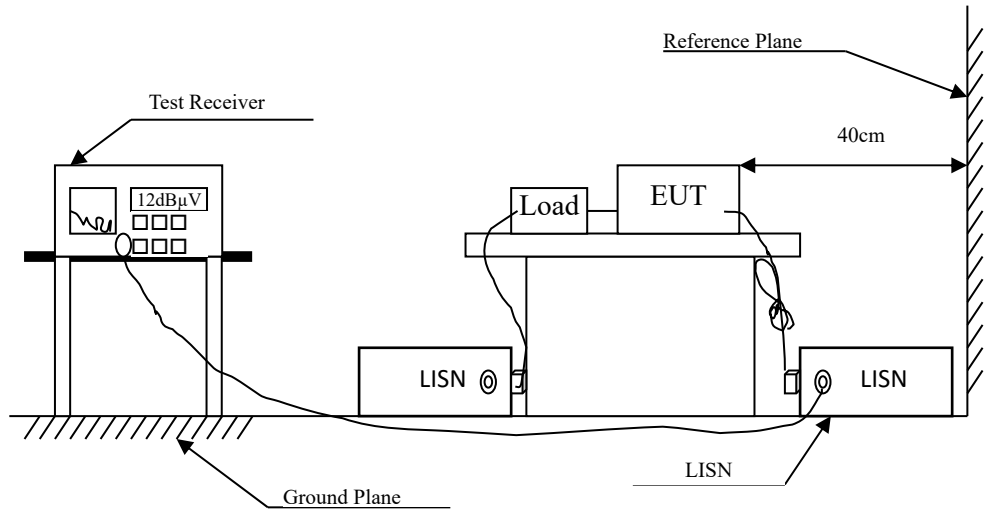
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%.

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	$\pm 3.42$ dB	
Peak Power Output	$\pm 0.89$ dB	
Radiated Emission	Under 1GHz $\pm 4.05$ dB	Above 1GHz $\pm 3.73$ dB
RF Antenna Conducted Test	$\pm 2.06$ dB	
Band Edge	Under 1GHz $\pm 4.05$ dB	Above 1GHz $\pm 3.73$ dB
6dB Bandwidth	$\pm 1544.74$ Hz	
Power Density	$\pm 2.06$ dB	
Duty Cycle	$\pm 2.31$ 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 investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

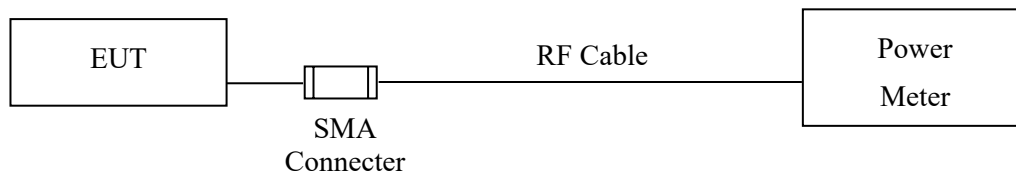
The EUT was setup to ANSI C63.4, 2014; tested to DTS test procedure of FCC KDB-558074 for compliance to FCC 47CFR Subpart C requirements.

#### 2.4. Test Result of Conducted Emission

Owing to the EUT use battery supply voltage, this test item is not performed.

### 3. Peak Power Output

#### 3.1. Test Setup



#### 3.2. Limit

The maximum peak power shall be less 1 Watt.

#### 3.3. Test Procedure

The EUT was tested according to C63.10:2013 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using C63.10:2013 Section 11.9.1.3 PKPM1 Peak power meter method.

### 3.4. Test Result of Peak Power Output

Product : Wireless Remote Control  
Test Item : Peak Power Output  
Test Mode : Transmit  
Test Date : 2022/11/02

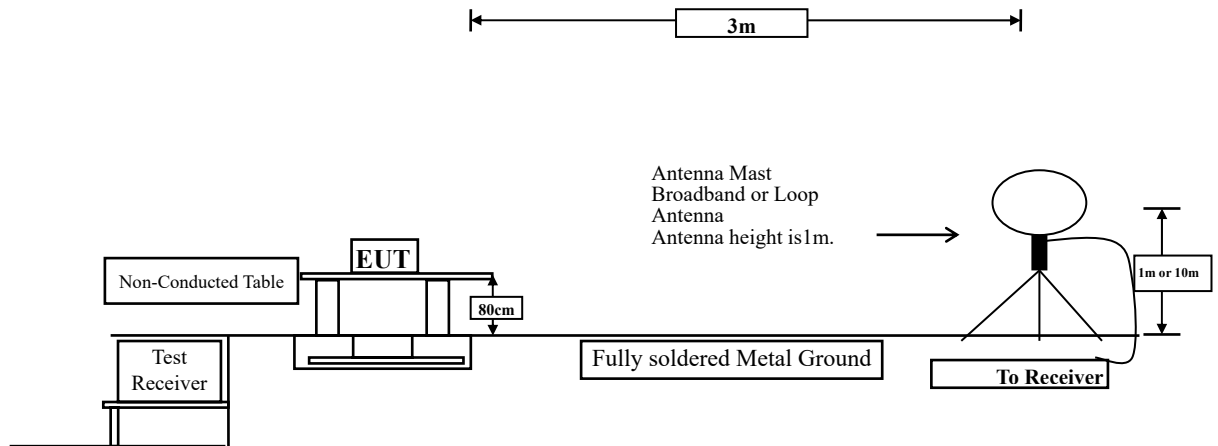
Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
02	2402	-0.78	1 Watt= 30 dBm	Pass
41	2441	0.64	1 Watt= 30 dBm	Pass
80	2480	-0.49	1 Watt= 30 dBm	Pass



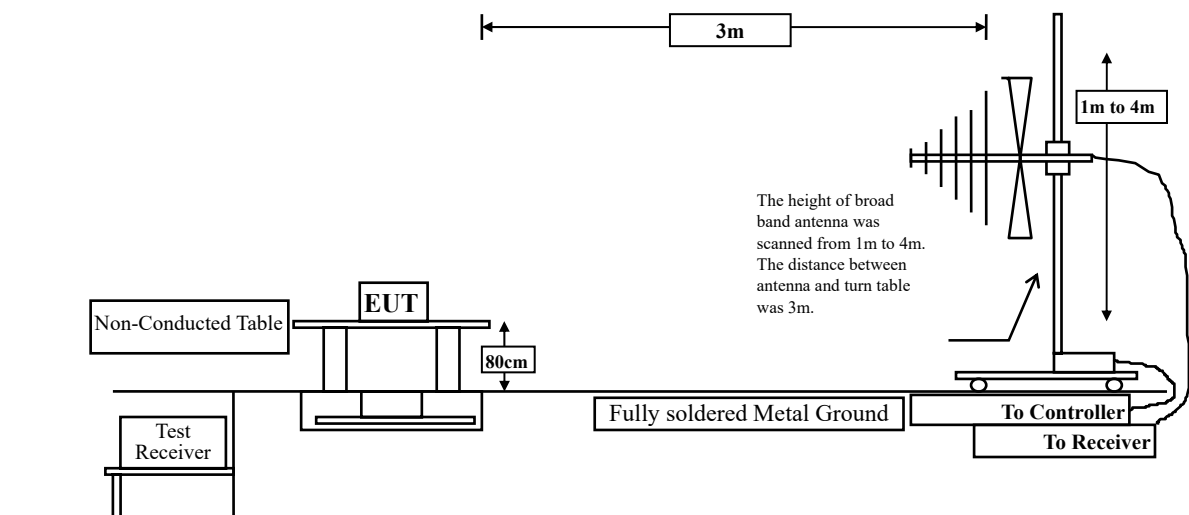
## 4. Radiated Emission

### 4.1. Test Setup

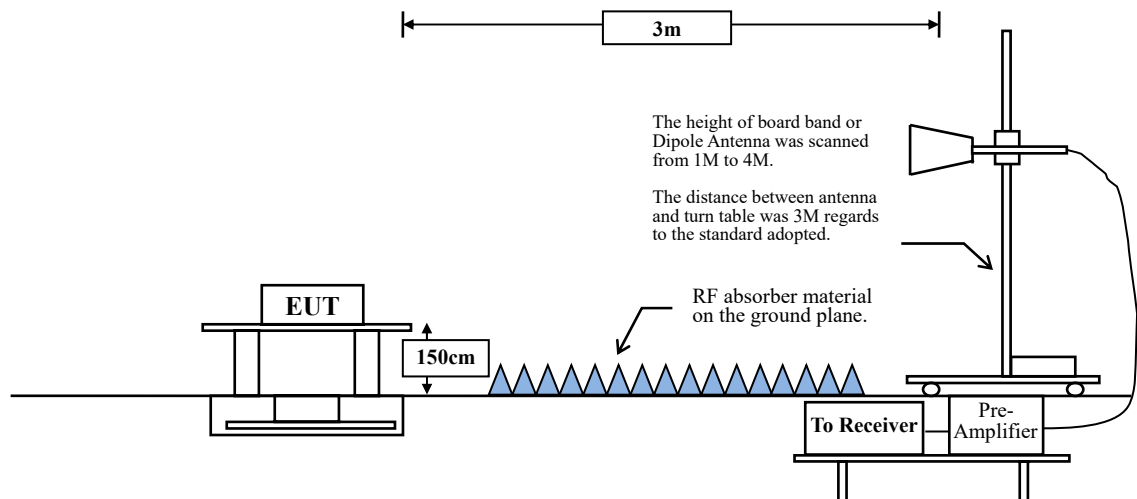
#### Radiated Emission Under 30 MHz



#### Radiated Emission Below 1 GHz



#### Radiated Emission Above 1 GHz



#### 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 (dBμV) = 20 log RF Voltage (μV)
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 according to C63.10:2013 Section 11.12.1 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1 GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1 GHz, 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 30 MHz setting on the field strength meter is 9 kHz and 30 MHz~1 GHz is 120 kHz and above 1 GHz is 1 MHz.

Radiated emission measurements below 30 MHz are made using Loop Antenna and 30 MHz~1 GHz are made using broadband Bilog antenna and above 1 GHz 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 from 9 kHz - 10th Harmonic of fundamental was investigated.

**RBW and VBW Parameter setting:**

According to C63.10 Section 11.12.2.4 Peak measurement procedure.

RBW = as specified in Table 1.

$VBW \geq 3 \times RBW$ .

**Table 1 - RBW as a function of frequency**

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to C63.10 Section 11.12.2.5 Average measurement procedure.

RBW = 1 MHz.

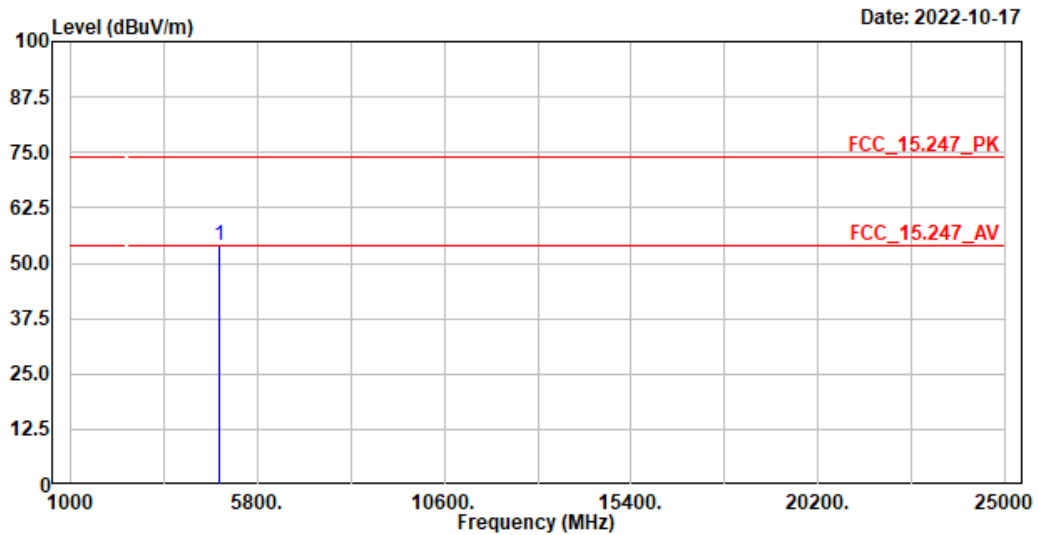
VBW = 10 Hz, when duty cycle  $\geq 98 \%$

$VBW \geq 1/T$ , when duty cycle  $< 98 \%$

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

## 4.4. Test Result of Radiated Emission

Site :HY-CB03  
 Condition :3m ,HORIZONTAL  
 Mode :TX\_Wireless\_2402MHz  
 Test BY :Jing Chang

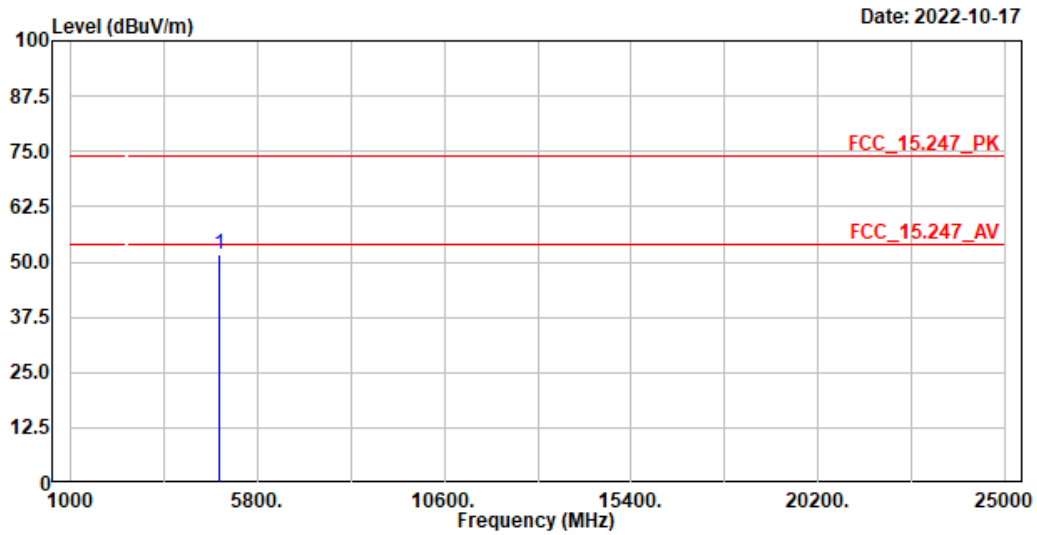


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4804.000	53.80	74.00	-20.20	68.44	-14.64	Peak

## Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Site :HY-CB03  
 Condition :3m ,VERTICAL  
 Mode :TX\_Wireless\_2402MHz  
 Test BY :Jing Chang

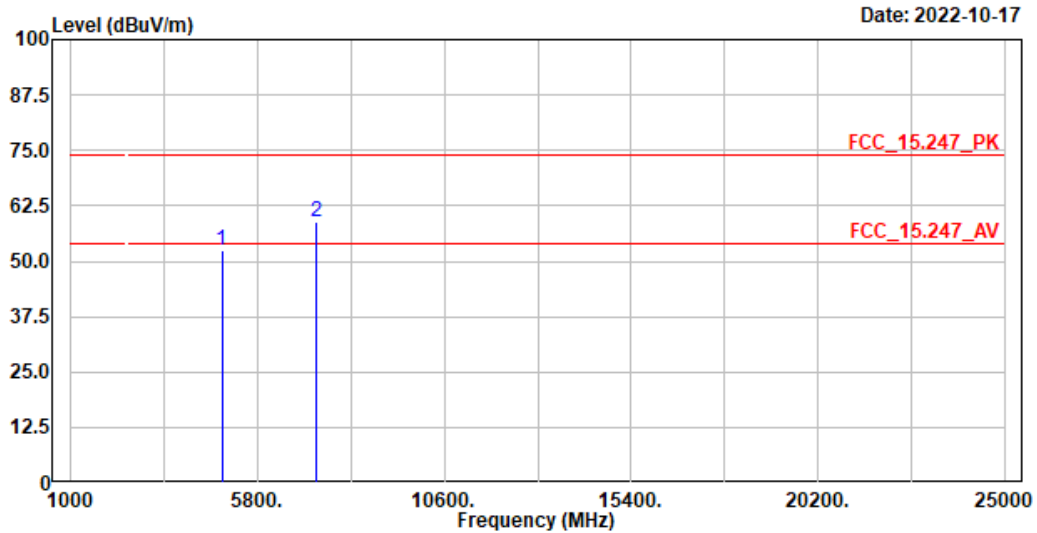


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4804.000	51.81	74.00	-22.19	66.45	-14.64	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Site :HY-CB03  
 Condition :3m ,HORIZONTAL  
 Mode :TX\_Wireless\_2441MHz  
 Test BY :Jing Chang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4882.000	52.34	74.00	-21.66	66.68	-14.34	Peak
2	7323.000	58.94	74.00	-15.06	65.83	-6.89	Peak

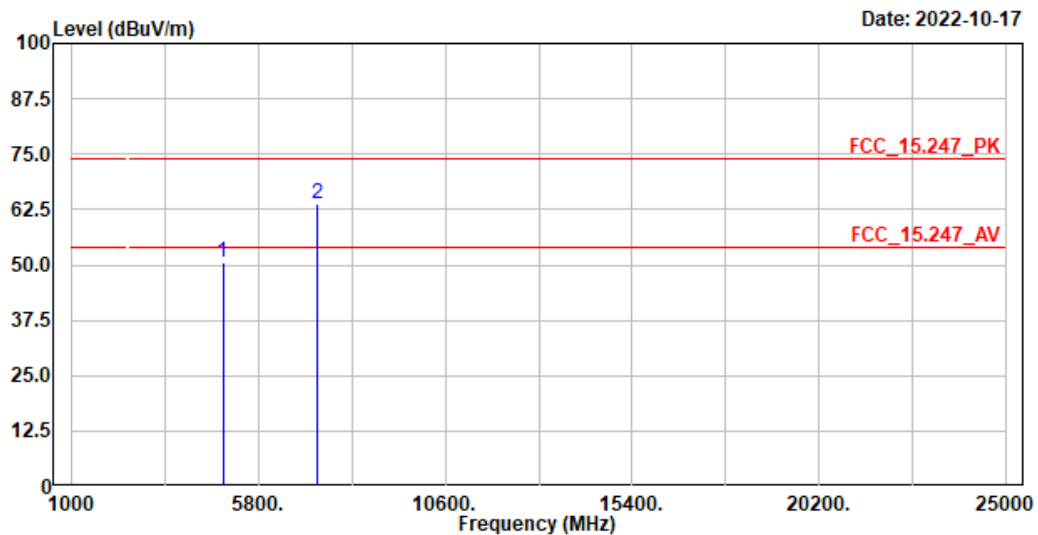
**Note:**

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

**Horizontal-Average Detector:**

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)
7323	58.94	-31.835	27.105	-26.895	54.000

Site :HY-CB03  
 Condition :3m ,VERTICAL  
 Mode :TX\_Wireless\_2441MHz  
 Test BY :Jing Chang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4882.000	50.57	74.00	-23.43	64.91	-14.34	Peak
2	7323.000	63.88	74.00	-10.12	70.77	-6.89	Peak

**Note:**

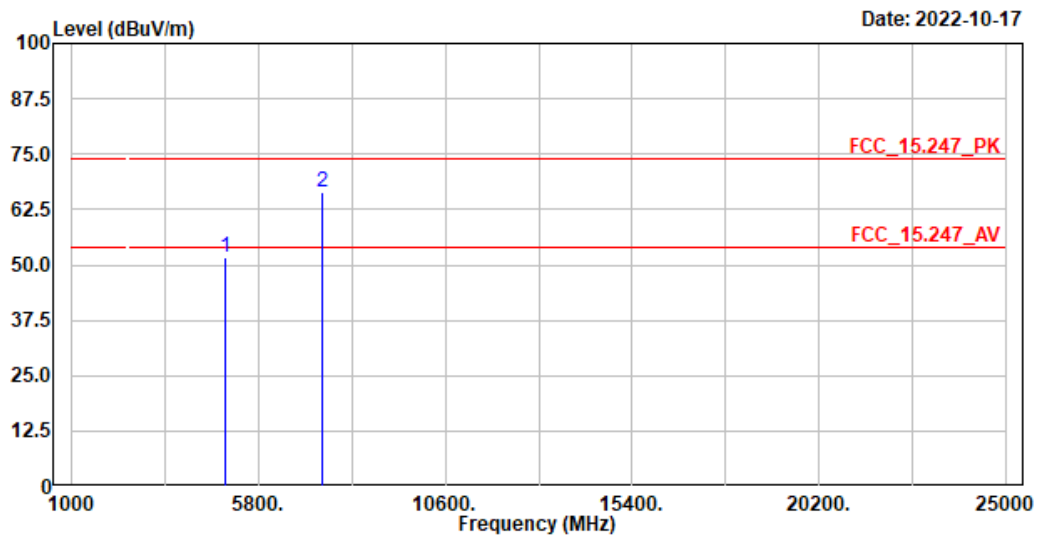
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

**Vertical-Average Detector:**

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)
7323	63.88	-31.835	32.045	-21.955	54.000



Site :HY-CB03  
 Condition :3m ,HORIZONTAL  
 Mode :TX\_Wireless\_2480MHz  
 Test BY :Jing Chang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4960.000	51.76	74.00	-22.24	65.72	-13.96	Peak
2	7440.000	66.47	74.00	-7.53	73.43	-6.96	Peak

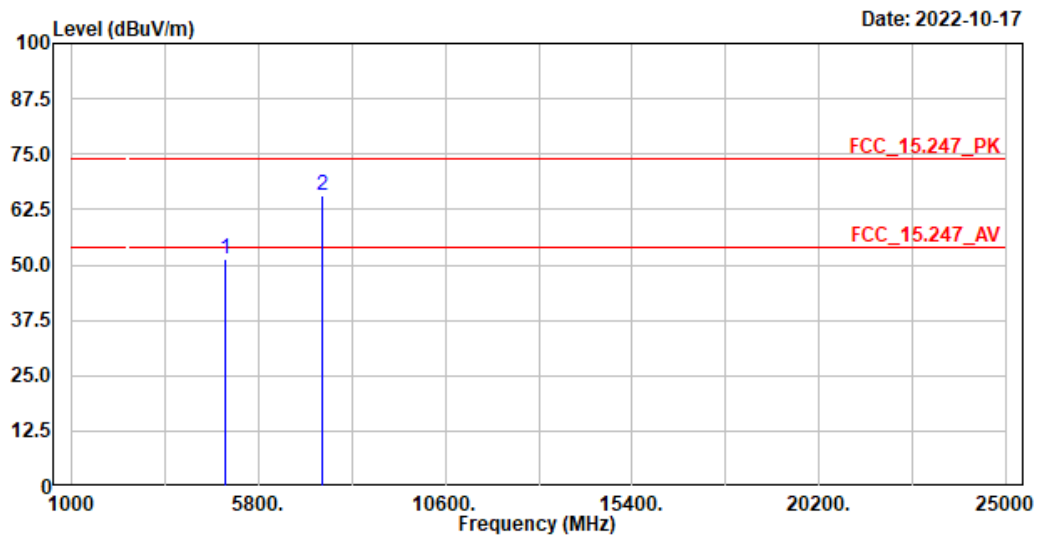
**Note:**

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

**Horizontal-Average Detector:**

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)
7440	66.47	-31.835	34.635	-19.365	54.000

Site :HY-CB03  
 Condition :3m ,VERTICAL  
 Mode :TX\_Wireless\_2480MHz  
 Test BY :Jing Chang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4960.000	51.47	74.00	-22.53	65.43	-13.96	Peak
2	7440.000	65.64	74.00	-8.36	72.60	-6.96	Peak

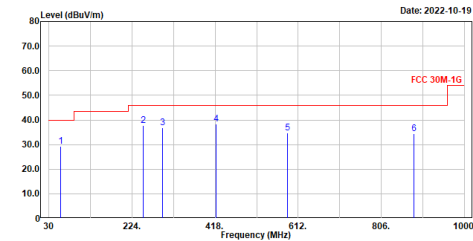
**Note:**

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

**Vertical-Average Detector:**

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)
7440	65.64	-31.835	33.805	-20.195	54.000

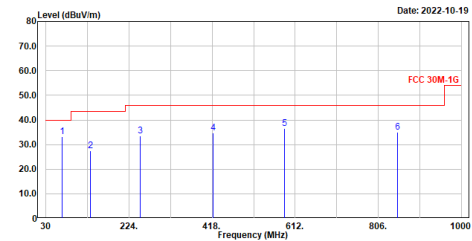
Site :HY-CB03  
Condition :3m ,HORIZONTAL  
Mode :TX\_Wireless\_2441MHz  
Test BY :Jing Chang



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	57.160	29.16	40.00	-10.84	53.92	-24.76	QP
2	250.190	37.75	46.00	-8.25	63.35	-25.60	QP
3	294.810	36.96	46.00	-9.04	60.93	-23.97	QP
4	419.940	38.21	46.00	-7.79	59.07	-20.86	QP
5	587.750	34.59	46.00	-11.41	51.30	-16.71	QP
6	802.630	34.35	46.00	-11.65	47.19	-12.84	QP

Note:  
1. Level = Read Level + Factor  
2. Factor = Antenna Factor + Cable Loss - Preamp Factor  
3. Over Limit = Level - Limit Line  
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :HY-CB03  
Condition :3m ,VERTICAL  
Mode :TX\_Wireless\_2441MHz  
Test BY :Jing Chang

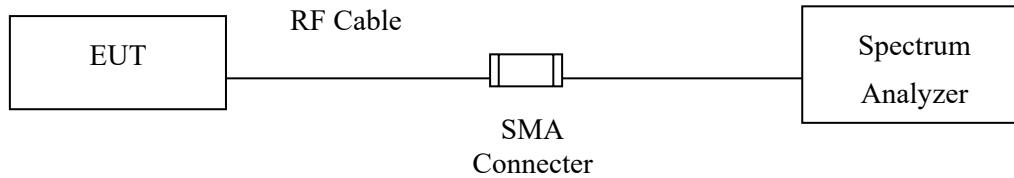


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	67.830	33.30	40.00	-6.70	59.42	-26.12	QP
2	133.790	27.50	43.50	-16.00	52.75	-25.25	QP
3	250.190	33.50	46.00	-12.50	59.10	-25.60	QP
4	419.940	34.85	46.00	-11.15	55.71	-20.86	QP
5	587.750	36.60	46.00	-9.40	53.31	-16.71	QP
6	850.620	34.90	46.00	-11.10	48.01	-13.11	QP

Note:  
1. Level = Read Level + Factor  
2. Factor = Antenna Factor + Cable Loss - Preamp Factor  
3. Over Limit = Level - Limit Line  
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

## 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

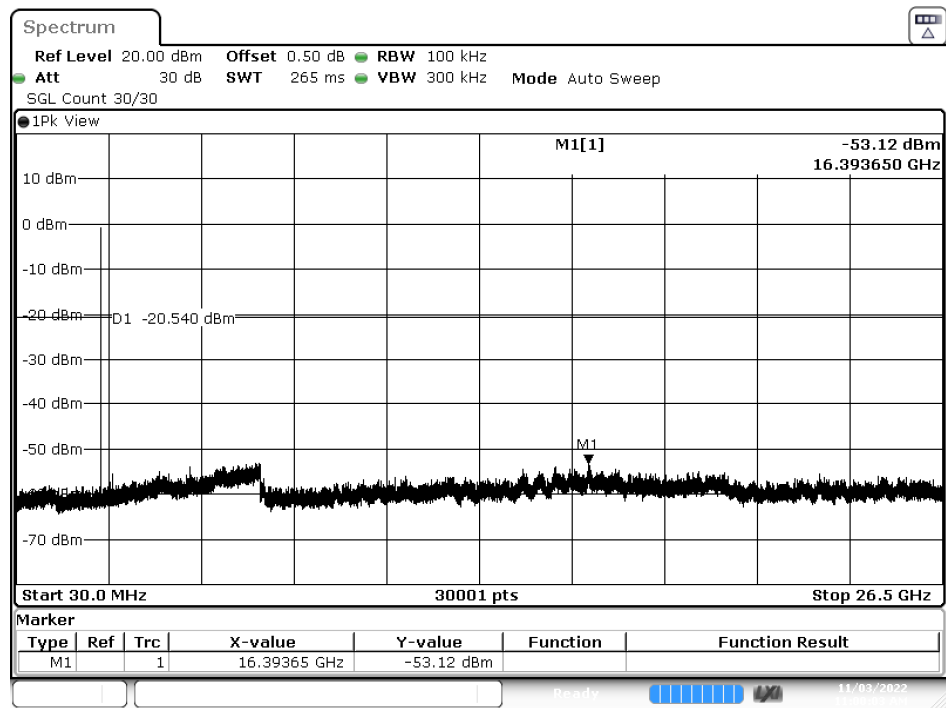
The EUT was tested according to C63.10:2013 Section 11.11 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

5.4. Test Result of RF Antenna Conducted Test

Product : Wireless Remote Control  
Test Item : RF Antenna Conducted Test  
Test Mode : Transmit  
Test Date : 2022/11/03

Figure Channel 41:

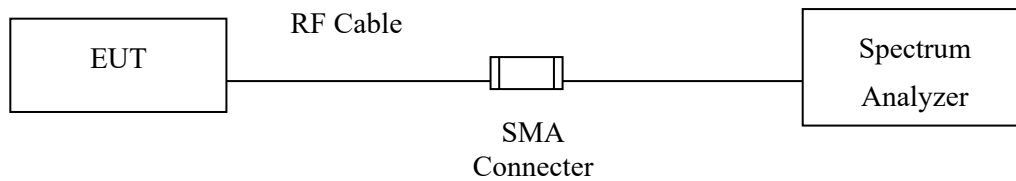


Date: 3.NOV.2022 11:00:04

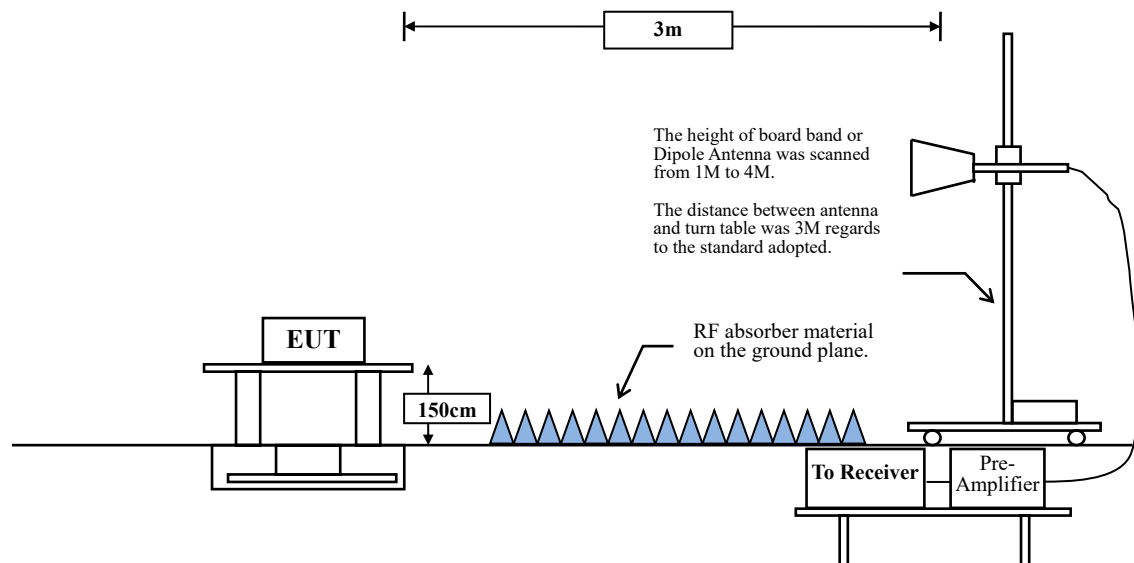
## 6. Band Edge

### 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 was setup according to ANSI C63.10, 2013 and tested according to C63.10:2013 Section 11.12.1 for compliance to FCC 47CFR 15.247 requirements.

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 from 1 meter to 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.

**RBW and VBW Parameter setting:**

According to C63.10 Section 11.12.2.4 Peak measurement procedure.

RBW = as specified in Table 1.

$VBW \geq 3 \times RBW$ .

**Table 1 - RBW as a function of frequency**

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to C63.10 Section 11.12.2.5 Average measurement procedure.

RBW = 1 MHz.

VBW = 10 Hz, when duty cycle  $\geq 98 \%$

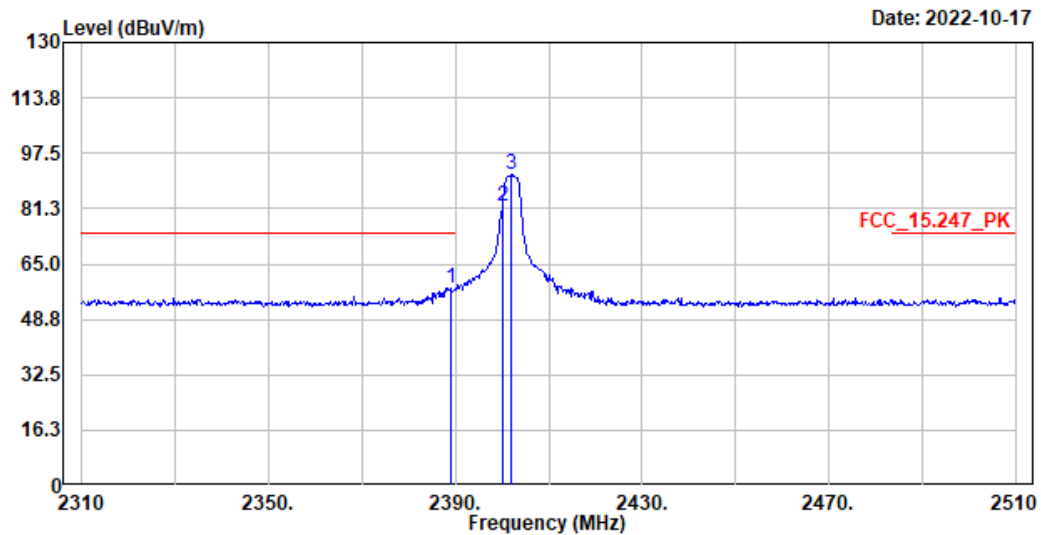
$VBW \geq 1/T$ , when duty cycle  $< 98 \%$

(T refers to 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.)



## 6.4. Test Result of Band Edge

Site :HY-CB03  
 Condition :3m ,Horizontal  
 Mode :TX\_Wireless\_2402MHz  
 Test BY :Jing Chang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2389.000	58.00	74.00	-16.00	51.46	6.54	Peak
2	2400.000	81.98	-----	-----	75.45	6.53	Peak
3	2402.000	91.07	-----	-----	84.54	6.53	Peak

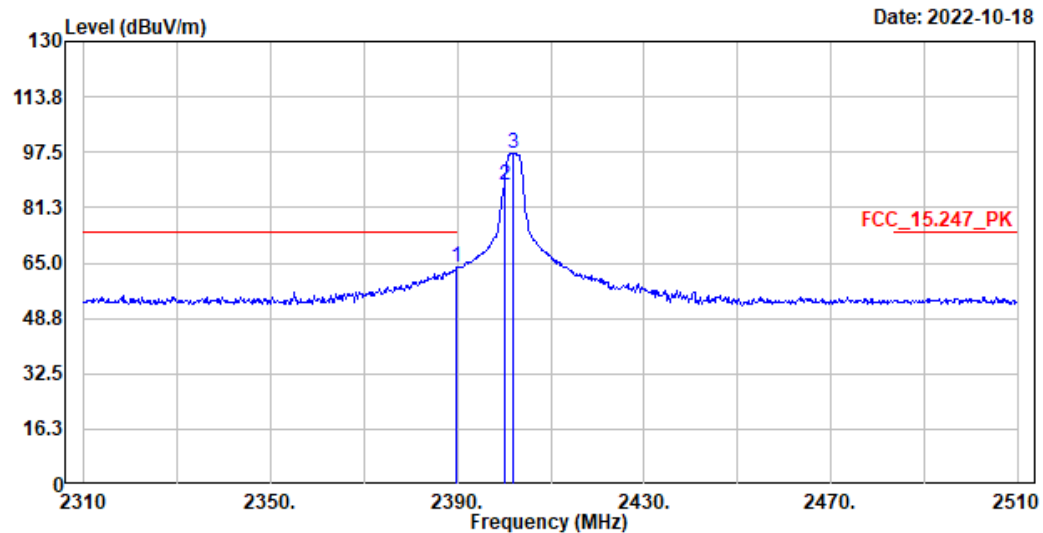
## Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

## Horizontal-Average Detector:

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)
2389	58.00	-31.835	26.165	-27.835	54.000
2400	81.98	-31.835	50.145	--	--
2402	91.07	-31.835	59.235	--	--

Site :HY-CB03  
 Condition :3m ,Vertical  
 Mode :TX\_Wireless\_2402MHz  
 Test BY :Jing Chang



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level		
			dBuV/m	dB	dBuV	dB	
1	2389.800	63.69	74.00	-10.31	57.15	6.54	Peak
2	2400.000	88.05	-----	-----	81.52	6.53	Peak
3	2402.000	97.05	-----	-----	90.52	6.53	Peak

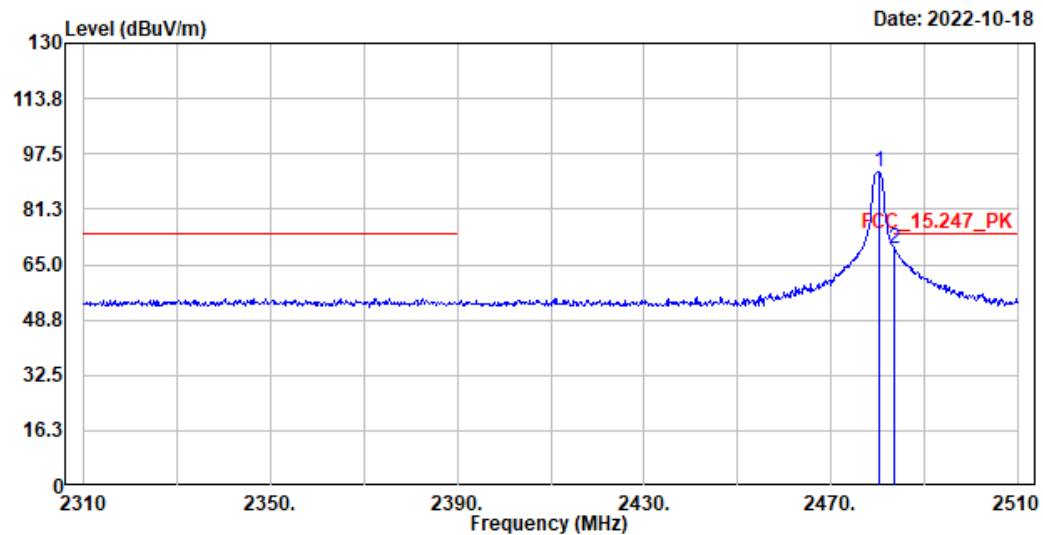
Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

**Vertical-Average Detector:**

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)
2389.8	63.69	-31.835	31.855	-22.145	54.000
2400	88.05	-31.835	56.215	--	--
2402	97.05	-31.835	65.215	--	--

Site :HY-CB03  
 Condition :3m ,Horizontal  
 Mode :TX\_Wireless\_2480MHz  
 Test BY :Jing Chang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2480.200	92.10	-----	-----	85.57	6.53	Peak
2	2483.600	69.71	74.00	-4.29	63.17	6.54	Peak

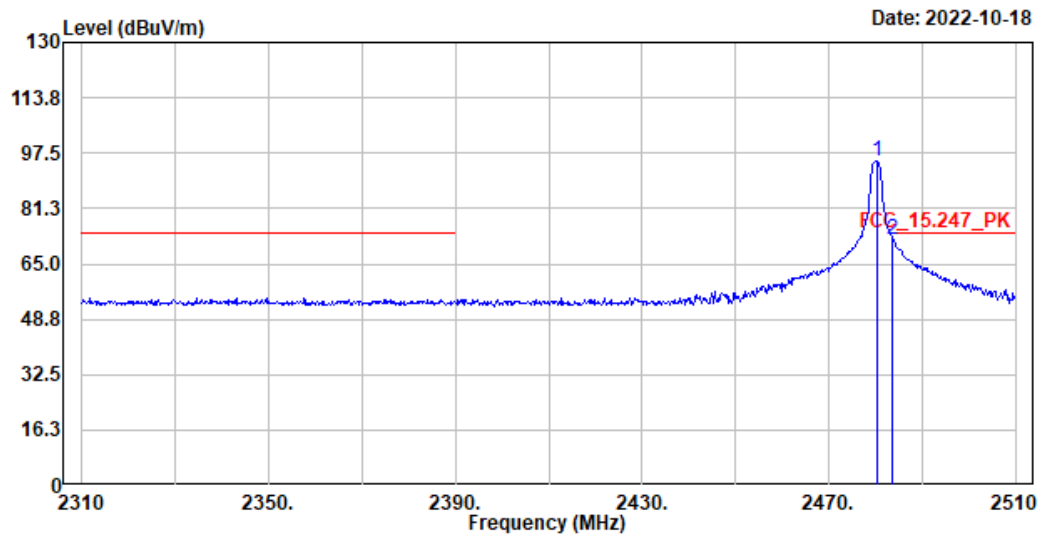
Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

#### Horizontal-Average Detector:

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)
2480.2	92.10	-31.835	60.265	--	--
2483.6	69.71	-31.835	37.875	-16.125	54.000

Site :HY-CB03  
 Condition :3m ,Vertical  
 Mode :TX\_Wireless\_2480MHz  
 Test BY :Jing Chang



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2480.200	94.99	-----	-----	88.46	6.53	Peak
2	2483.600	72.35	74.00	-1.65	65.81	6.54	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

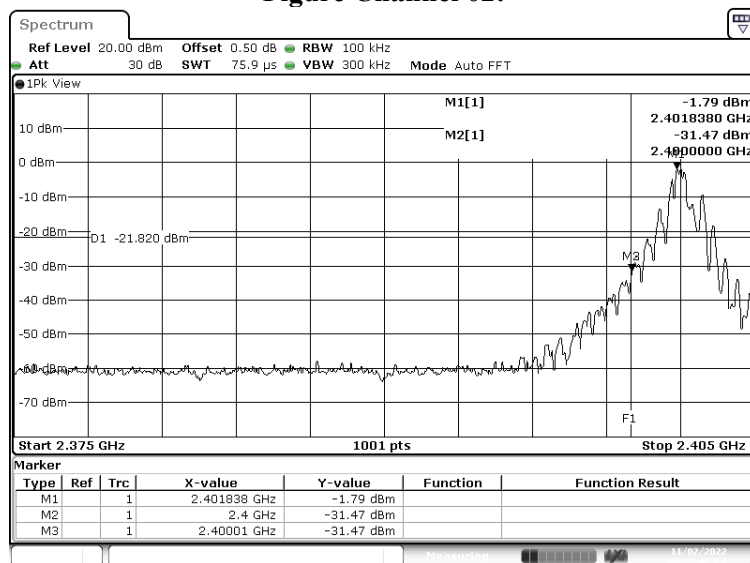
**Vertical-Average Detector:**

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement Level (dBμV/m)	Margin (dB)	Limit (dBμV/m)
2480.2	94.99	-31.835	63.155	--	--
2483.6	72.35	-31.835	40.515	-13.485	54.000

Product : Wireless Remote Control  
 Test Item : Band Edge  
 Test Mode : Transmit  
 Test Date : 2022/11/02

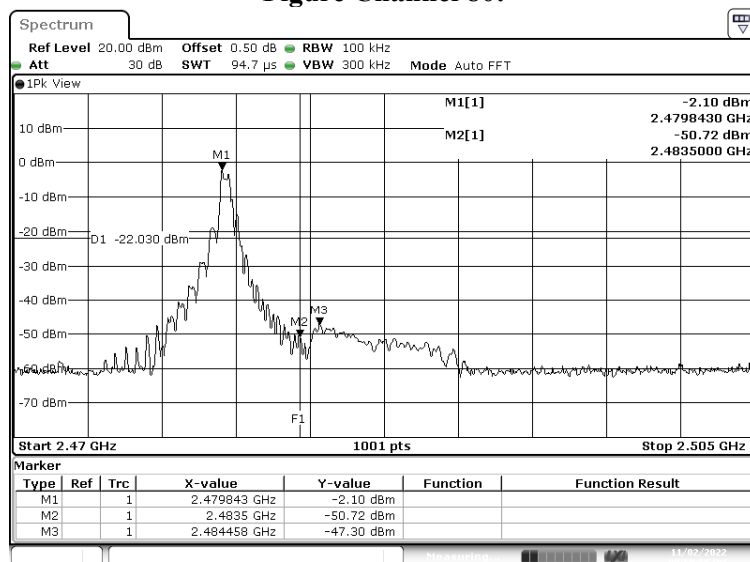
Measurement Level $\Delta$ (dB)	Result
> 20	PASS

Figure Channel 02:



Date: 2.NOV.2022 18:25:48

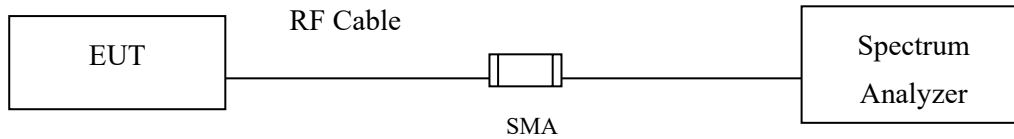
Figure Channel 80:



Date: 2.NOV.2022 21:58:55

## 7. 6dB Bandwidth

### 7.1. Test Setup



### 7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

### 7.3. Test Procedure

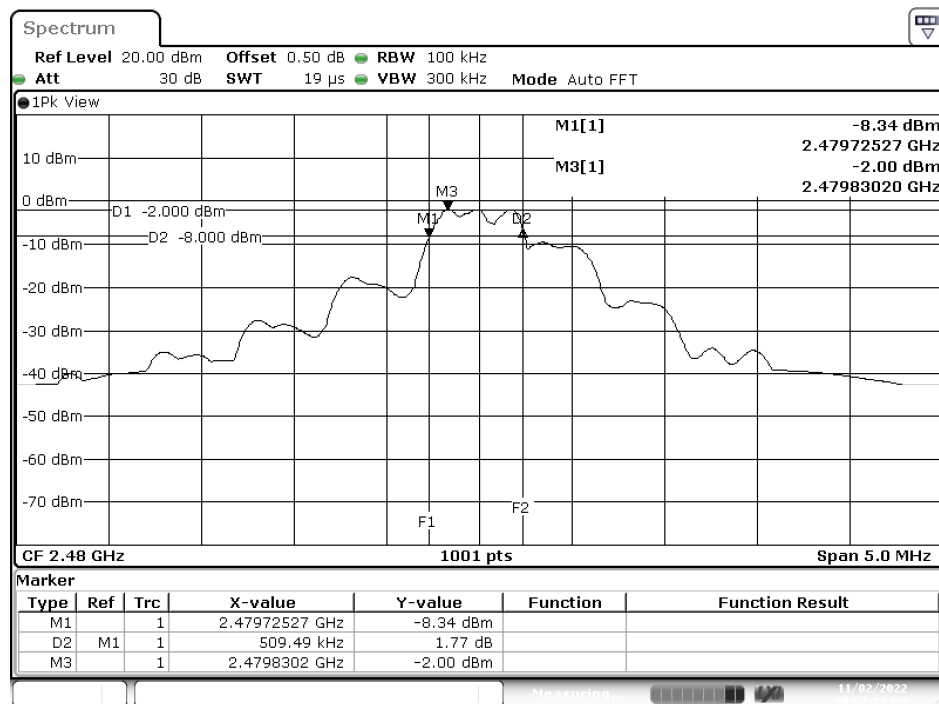
The EUT was setup according to ANSI C63.4, 2014; tested according to ANSI C63.10 Section 11.8 for compliance to FCC 47CFR 15.247 requirements.

## 7.4. Test Result of 6dB Bandwidth

Product : Wireless Remote Control  
 Test Item : 6dB Bandwidth Data  
 Test Mode : Transmit  
 Test Date : 2022/11/03

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
02	2402	669	>500	Pass
41	2441	614	>500	Pass
80	2480	509	>500	Pass

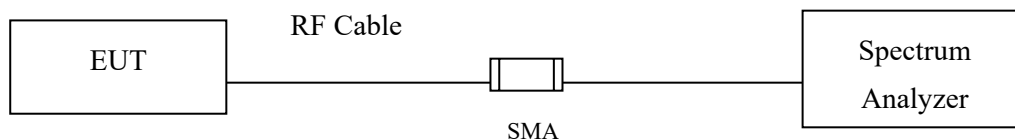
Figure Channel 80:



Date: 2.NOV.2022 21:57:54

## 8. Power Density

### 8.1. Test Setup



### 8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3 kHz bandwidth.

### 8.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

The maximum power spectral density using C63.10 Section 11.10.2 Method PKPSD (peak PSD)

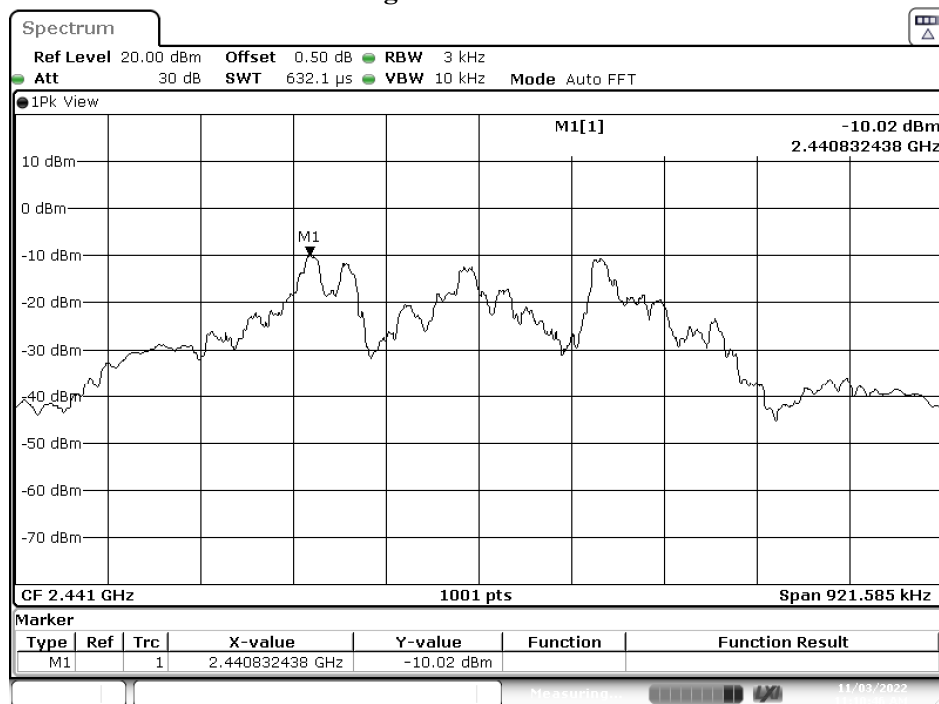


## 8.4. Test Result of Power Density

Product : Wireless Remote Control  
 Test Item : Power Density Data  
 Test Mode : Transmit  
 Test Date : 2022/11/02

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
02	2402	-10.84	$\leq 8\text{dBm}$	Pass
41	2441	-10.02	$\leq 8\text{dBm}$	Pass
80	2480	-11.27	$\leq 8\text{dBm}$	Pass

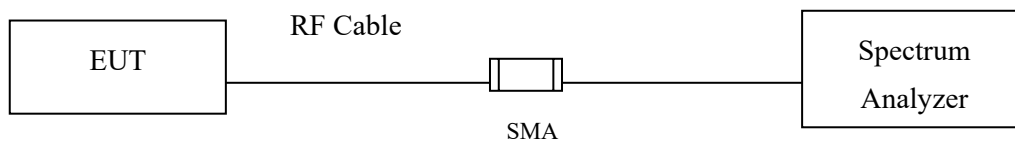
Figure Channel 41:



Date: 3.NOV.2022 11:10:46

## 9. Duty Cycle

### 9.1. Test Setup

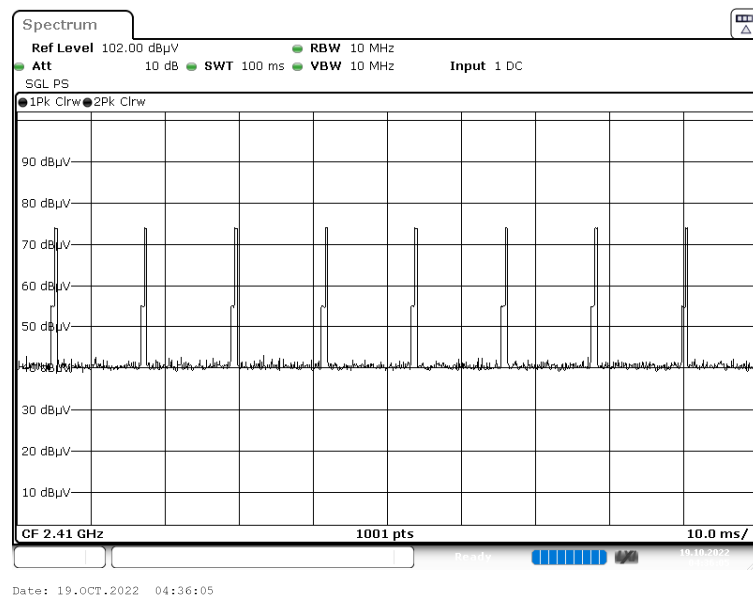
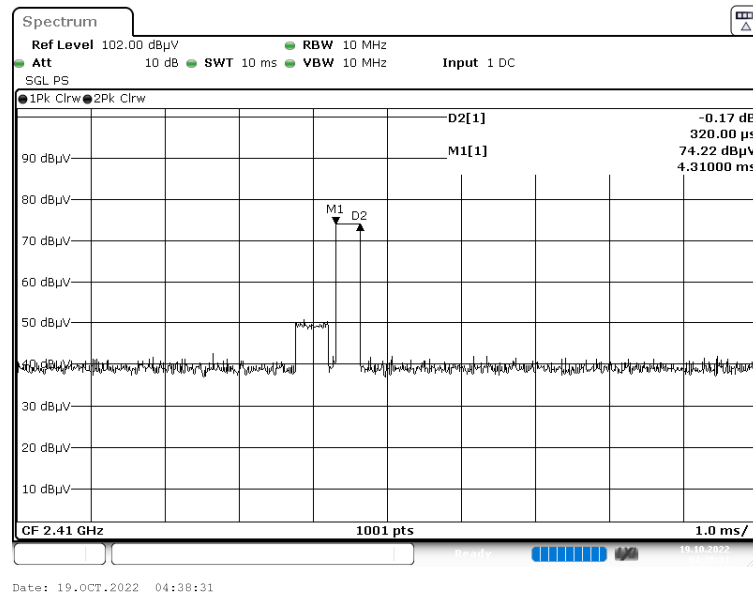


### 9.2. Test Procedure

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

## 9.3. Test Result of Duty Cycle

Product : Wireless Remote Control  
 Test Item : Duty Cycle  
 Test Mode : Normal mode



Time on of 100ms = 2.560msec

Duty Cycle = 2.56ms / 100ms = 0.0256

Duty Cycle correction factor = 20 LOG 0.0256 = -31.835 dB

Duty Cycle correction factor	-31.835 dB
------------------------------	------------

## **10. EMI Reduction Method During Compliance Testing**

No modification was made during testing.