

FCC Test Report

For

Industrial Remote Control

Model Number : Alpha604AJ, Alpha604BJ

FCC ID : LZ6-ALPHA604XJ

Date of Receipt : May 16, 2022

Date of Report : June 10, 2022

Prepared for

Fomotech International Corp.

2F-1, 286-3, Hsin Ya Road, Chien Chen District, Kaohsiung City 806, Taiwan, R.O.C.

Prepared by



Central Research Technology Co.

11, Lane 41, Fushuen St., Jungshan Chiu, Taipei 104, Taiwan



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Verification of Compliance

Equipment under Test : Industrial Remote Control
Model No. : Alpha604AJ, Alpha604BJ
FCC ID : LZ6-ALPHA604XJ
Manufacturer : Fomotech International Corp.
Applicant : Fomotech International Corp.
Address : 2F-1, 286-3, Hsin Ya Road, Chien Chen District, Kaohsiung City
806, Taiwan, R.O.C.
Applicable Standards : 47 CFR part 15, Subpart C
ANSI 63.10:2013
RSS-247 Issue 2
RSS-Gen Issue 5
Date of Testing : May 23 ~ 26, 2022
Deviation : The method, configuration and arrangement of the tests are following the requirement of customer and the applicable standards cited above.
Condition of Test Sample : Mass Production



We, **Central Research Technology Co.**, hereby certify that one sample of the designated product was tested in our facility during the period mentioned above. The test records, data evaluation and Equipment Under Test (EUT) configurations shown in the present report are true and accurate representation of the measurements of the sample's RF characteristics under the conditions herein specified.

The test results show that the EUT as described in the present report is in compliance with the requirements set forth in the standards mentioned above and apply to the tested sample identified in the present report only. The test report shall not be reproduced, except in its entirety, without the written approval of Central Research Technology Co.

PREPARED BY : Cathy Chen , **DATE** : June 10, 2022
(Cathy Chen/ Technical Manager)
APPROVED BY : Sam Chien , **DATE** : June 10, 2022
(Sam Chien /General Manager)

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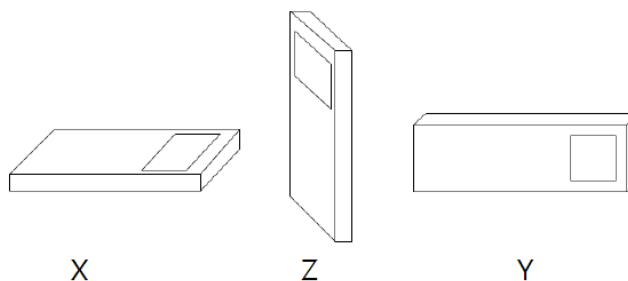
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1 General Description

1.1 General Description of EUT

Equipment under Test : Industrial Remote Control
Model No. : Alpha604AJ, Alpha604BJ
Power in : 3Vdc (Transmitter)
Test Voltage : 3Vdc by battery (Transmitter) ,
Manufacturer : Fomotech International Corp.
Channel Numbers : 50
Frequency Range : 902~928MHz
Modular Function : GFSK
Antenna Spec : Antenna Gain : 0dBi

Since the transmitter is considered a portable unit, it was pre-tested on the positioned in each of 3 axis. It was found that the X axis was the worst. It was taken as the representative condition for testing and its data are recorded in the present document.



Channel List:

Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel
903.0	1	911.5	18	920.0	35
903.5	2	912.0	19	920.5	36
904.0	3	912.5	20	921.0	37
904.5	4	913.0	21	921.5	38
905.0	5	913.5	22	922.0	39
905.5	6	914.0	23	922.5	40
906.0	7	914.5	24	923.0	41
906.5	8	915.0	25	923.5	42
907.0	9	915.5	26	924.0	43
907.5	10	916.0	27	924.5	44
908.0	11	916.5	28	925.0	45
908.5	12	917.0	29	925.5	46
909.0	13	917.5	30	926.0	47
909.5	14	918.0	31	926.5	48
910.0	15	918.5	32	927.0	49
910.5	16	919.0	33	927.5	50
911.0	17	919.5	34		

1.2 Test Mode

Test item	Test frequency
Conducted power test	903 MHz, 915 MHz, 927.5 MHz
Radiated emission below 1 GHz	903 MHz
Radiated emission above 1 GHz	903 MHz, 915 MHz, 927.5 MHz

EUT Test step:

1. Adjust test channel.
2. Turn on the power.
3. EUT transmit signal.

1.3 Applied standards

(1) 20 dB Bandwidth

According to FCC 15.247(a)(1)(i), the maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

(2) Hopping number and Time of occupancy

According to FCC 15.247(a)(1)(i), for frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

(3) Hopping separation

According to FCC 15.247(a)(1), 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. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

(4) Maximun Peak Output Power

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

(5) 100 kHz bandwidth outside of band

According to FCC 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 a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph FCC 15.247(b)(3), the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in FCC 15.209(a) and RSS-Gen are not required. Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must also comply with the radiated emission limits specified in FCC 15.209(a).

(6) Radiated emission measurements

For intentional device, according to FCC 15.209, the general requirement of field strength of radiated emissions from intentional radiator at a distance of 3 meters shall not exceed the below table.

Frequency (MHz)	Measurement Distance (m)	Field Strength (uV/m)	Field Strength (dBuV/m)
0.009-0.490	300	2400/F(kHz)	
0.490-1.705	30	24000/F(kHz)	
1.705-30.0	3	30	29.5
30 – 88	3	100	40.0
88 – 216	3	150	43.5
216 – 960	3	200	46.0
above 1610	3	500	54.0

Note1 : At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

Note 2: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade)

(7) Restricted Band

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	Above 38.6
13.36 - 13.41			

1.4 Test result

Test Item	FCC/RSS standard section	Report section	Test result
20 dB bandwidth	FCC 15.247(a)(1)(i)	2	PASS
Hopping number and Time of occupancy	FCC 15.247(a)(1)(i)	3	PASS
Hopping separation	FCC 15.247(a)(1)	4	PASS
Maximun Peak Output Power	FCC 15.247(b)	5	PASS
100 kHz bandwidth outside of band	FCC 15.247(d)	6	PASS
Radiated emission measurements	FCC 15.209	7	PASS

According to ANSI C63.10, determining compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

1.5 The Support Units

No.	Unit	Trade Name	Model No.	Power Code	Supported by lab.
N/A	-				

No.	Cable	Length	Core	Supported by lab.
N/A	-			

1.6 Layout of Setup

TX

1.7 Test Instruments

Conducted Power Test

Test Site and Equipment	Manufacturer	Model No. /Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Alayzer	R&S	FSV40/ 101609	2021/10/18	2022/10/18
RFcable	JMCA	MWX/ C0150~C0153, C0161~C0163	2021/6/5	2022/6/5
Test software	R&S	EMC32/ V11.10.00	NCR	NCR
Test room	N/A	TR13	NCR	NCR

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Radiated Emission Test (Below 1GHz)

Test Site and Equipment	Manufacturer	Model No. /Serial No.	Last Calibration Date	Calibration Due Date
EMI Receiver	R&S	ESCS30/ 836858/020	2021/11/3	2022/11/3
Spectrum Alayzer	Agilent	E4407B/ MY45106795	2021/6/23	2022/6/23
Antenna	EMCO	6502/ 00020558	2021/9/16	2022/9/16
Antenna	SCHWARZBECK & Mini-Circuits	VULB 9168 & FAT- NM5NF5T10G2W5/ VULB 9168-612 & 004	2022/5/18	2023/5/18
Pre-amplifer	Mini-circuit	ZKL-1R5+/ 004	2022/1/5	2022/7/5
RF cable	JYEBAO	0214/ C0080-4 + C0080-1 + C0080- 2+RSU(CRC- 011/11)+C0080-3	2022/1/5	2022/7/5
Test software	Audix	e3/ V6.110303a2	NCR	NCR
Semi-anechoic chamber	ETS. LINDGREN	TR11/ 906-A	2022/3/5	2023/3/5

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the semi-anechoic chamber listed above is the date of NSA measurement.

Radiated Emission Test (Above 1 GHz)

Test Site and Equipment	Manufacturer	Model No. /Serial No.	Last Calibration Date	Calibration Due Date
Antenna	EMCO	3117/ 0082847	2021/11/9	2022/11/9
Antenna	Com-Power	AH-840/ 101098	2021/12/16	2022/12/16
Pre-amplifier	MITEQ	TTA1800-30-HG- N-M/ 1904295	2022/4/26	2023/4/26
RFcable	Suhner	Sucoflex 106P / C0091	2021/10/4	2022/10/4
RFcable	JMCA	MWX241/B/ C0103~C0104	2022/4/7	2023/4/7
MXA singal analyzer	KeySight	N9020A/ MY54420147	2021/7/5	2022/7/5
Test software	Audix	e3/ V9 20150907c	NCR	NCR
Semi-anechoic chamber	ETS. LINDGREN	TR1/ 17627-B	2022/1/22	2023/1/22

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the chamber TR1 listed above is the date of site VSWR measurement.

1.8 Test Capability

Test Facility

The test facility used for evaluating the conformance of the EUT with each standard in the present report meets what required in CISPR16 series and ANSI C63.4:2014 amended as per ANSI 63.4a:2017.

Test Room	Type of Test Room	Descriptions
TR1	10m semi-anechoic chamber	For the radiated emission measurement (below 1GHz)
TR1	3m fully-anechoic chamber	For the radiated emission measurement (above 1GHz)
TR11	3m semi-anechoic chamber	For the radiated emission measurement (below 1GHz)
TR13	Test Site	For the RF conducted emission measurement.
TR5	Shielding Room	For the conducted emission measurement.
TR20	Shielding Room	

Test Laboratory Competence Information

Central Research Technology Co. has been accredited / filed / authorized by the agencies listed in the following table.

Certificate	Nation	Agency	Code	Mark
Accreditation Certificate	USA	NVLAP	200575-0	ISO/IEC 17025
	USA	FCC	TW1104, TW0019	ISO/IEC 17025
	R.O.C. (Taiwan)	TAF	0905	ISO/IEC 17025
	R.O.C. (Taiwan)	BSMI	SL2-IN-E-0033, SL2-IS-E-0033, SL2-R1/R2-E-0033, SL2-A1-E-0033, SL2-L1-E-0033	ISO/IEC 17025
	Canada	ISED	TW0905	ISO/IEC 17025
Site Filing Document	Japan	VCCI	R-11527,C-11609,T-11441, G-10010,C-20010, G-10614, T-20009	Test facility list & NSA Data
Authorization Certificate	Germany	TUV	UA 50235497	ISO/IEC 17025

The copy of each certificate can be downloaded from our web site: www.crc-lab.com

1.9 Measurement Uncertainty

The assessed measurement uncertainty with a suitable coverage factor K to ensure 95% confidence level for the normal distribution are shown as below, the values are less than U_{CISPR} in table 1 of CISPR 16-4-2.

Test Item	Measurement Uncertainty	
Radiated Emission: (9kHz~30MHz)	Horizontal 3.92dB ; Vertical 3.92dB	
Radiated Emission: (30MHz~1000MHz)	Horizontal 4.20dB ; Vertical 6.12dB	
Radiated Emission: (1GHz~6GHz)	Horizontal 4.72dB ; Vertical 4.62dB	
Radiated Emission: (6GHz~18GHz)	Horizontal 4.78dB ; Vertical 4.78dB	
Radiated Emission: (18GHz~40GHz)	Horizontal 5.10dB ; Vertical 5.12dB	
Line Conducted Emission	NSLK-8128-RC	2.92 dB
	ENV 4200	2.90 dB
	ESH2-Z5	3.08 dB

2 20dB Bandwidth

Result: Pass

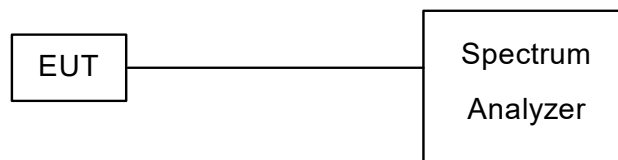
2.1 Applied standard

The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

2.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. A software provided by client enabled the EUT to transmit data at middle channel frequencies individually.
- c. Test procedures follow ANSI C63.10 Section 6.9.
- d. Measure the 20dB bandwidth and compare with the required limit.

2.3 Test configuration



2.4 Test Data

Test Mode : Continuous Transmitting
Ambient Temperature : 25°C

Tester : Wayne
Relative Humidity : 67%

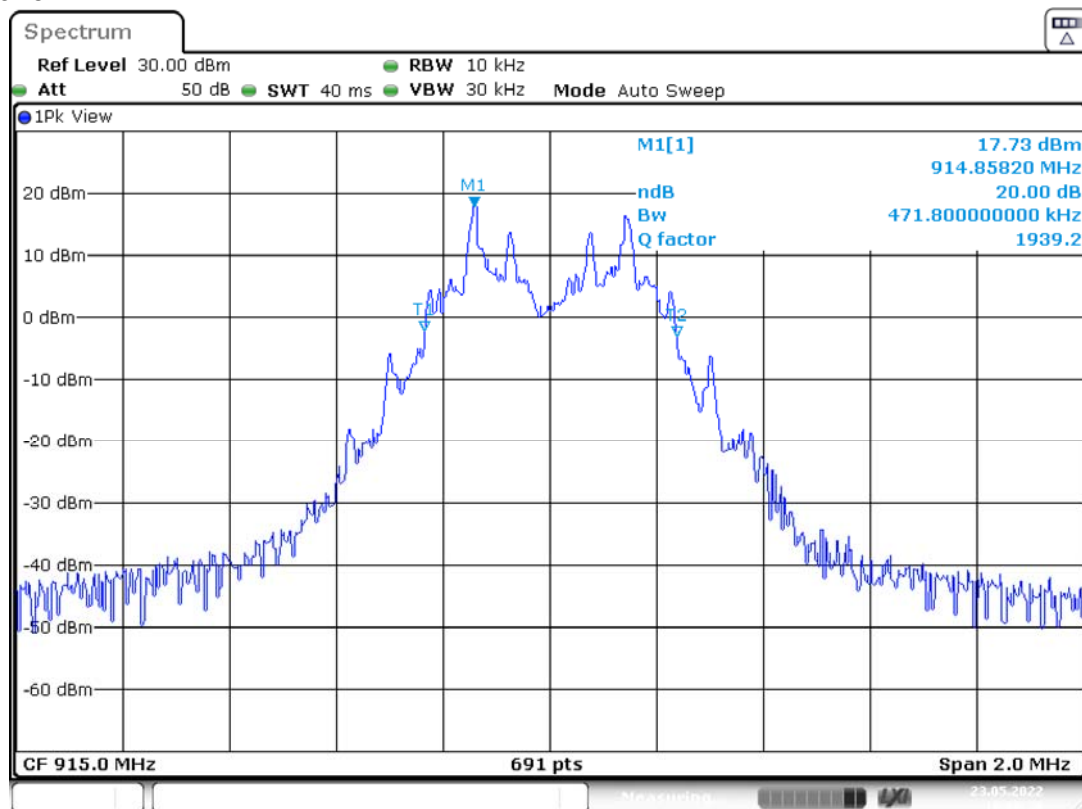
Operating Frequency (MHz)	20 dB Bandwidth (kHz)	Limit (kHz)
903	469	500
915	472	500
927.5	469	500

903 MHz



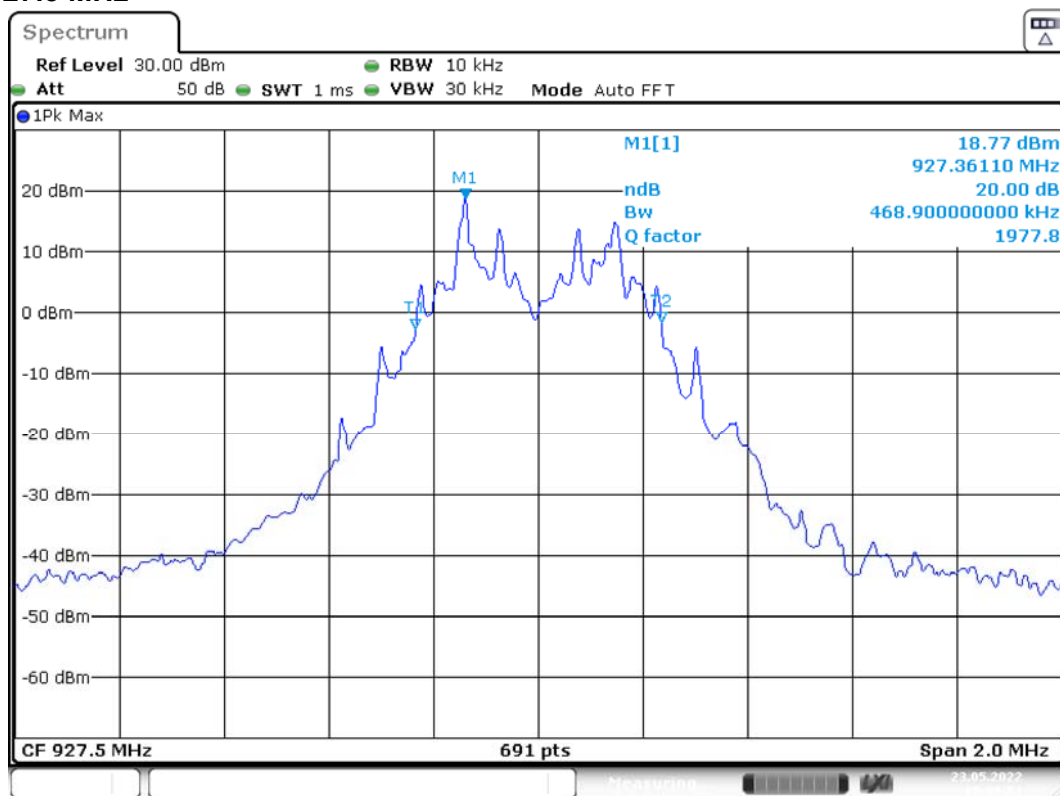
Date: 23.MAY.2022 10:41:30

915 MHz



Date: 23.MAY.2022 10:06:30

927.5 MHz



Date: 23.MAY.2022 10:23:51

3 Hopping Channel and Time of Occupancy

Result: Pass

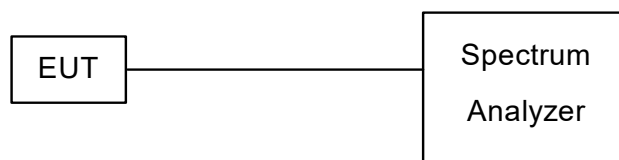
3.1 Applied standard

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

3.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. Test procedures follow ANSI 63.10 section 7.8.3.
- c. Measurement the hopping channel and Time of occupancy and compare with the required limit.

3.3 Test configuration



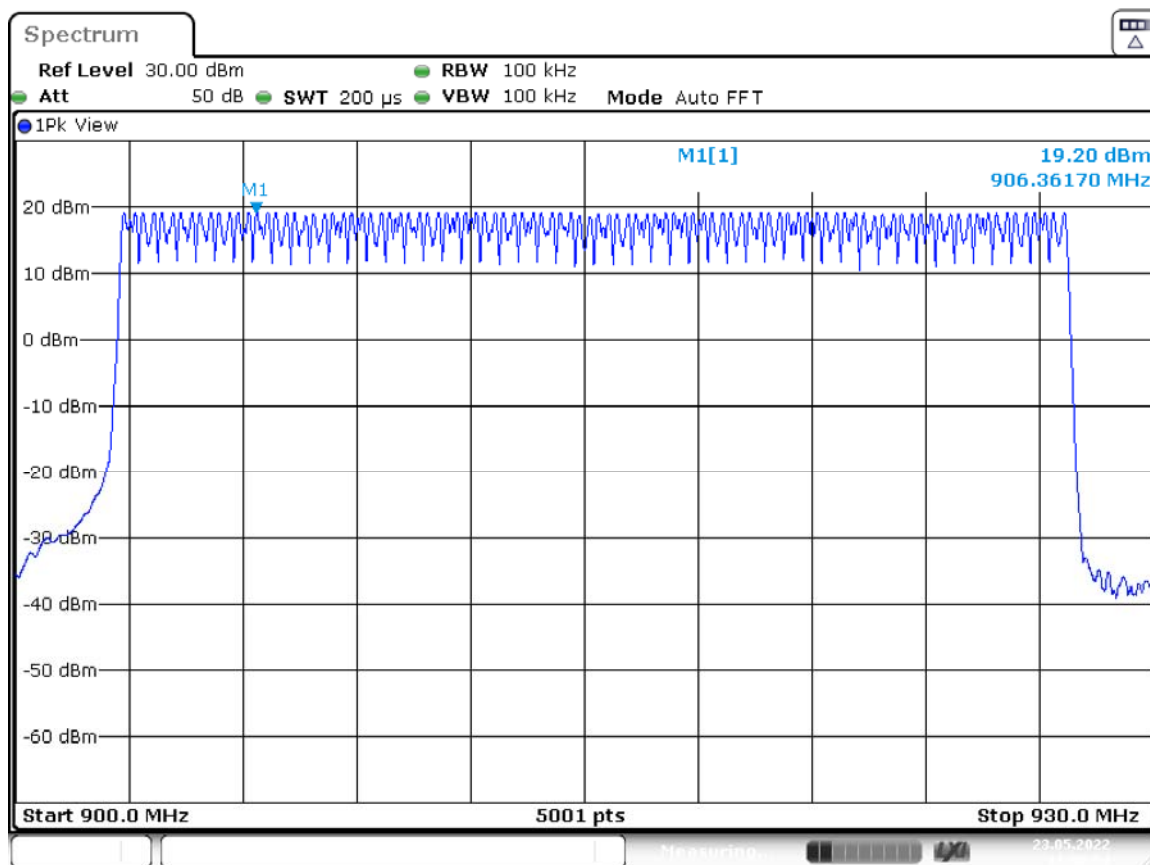
3.4 Test Data

Hopping Channel

Test Mode : Hopping
Ambient Temperature : 25°C

Tester : Wayne
Relative Humidity : 67%

Hopping number is 50 which is greater than limit 25.



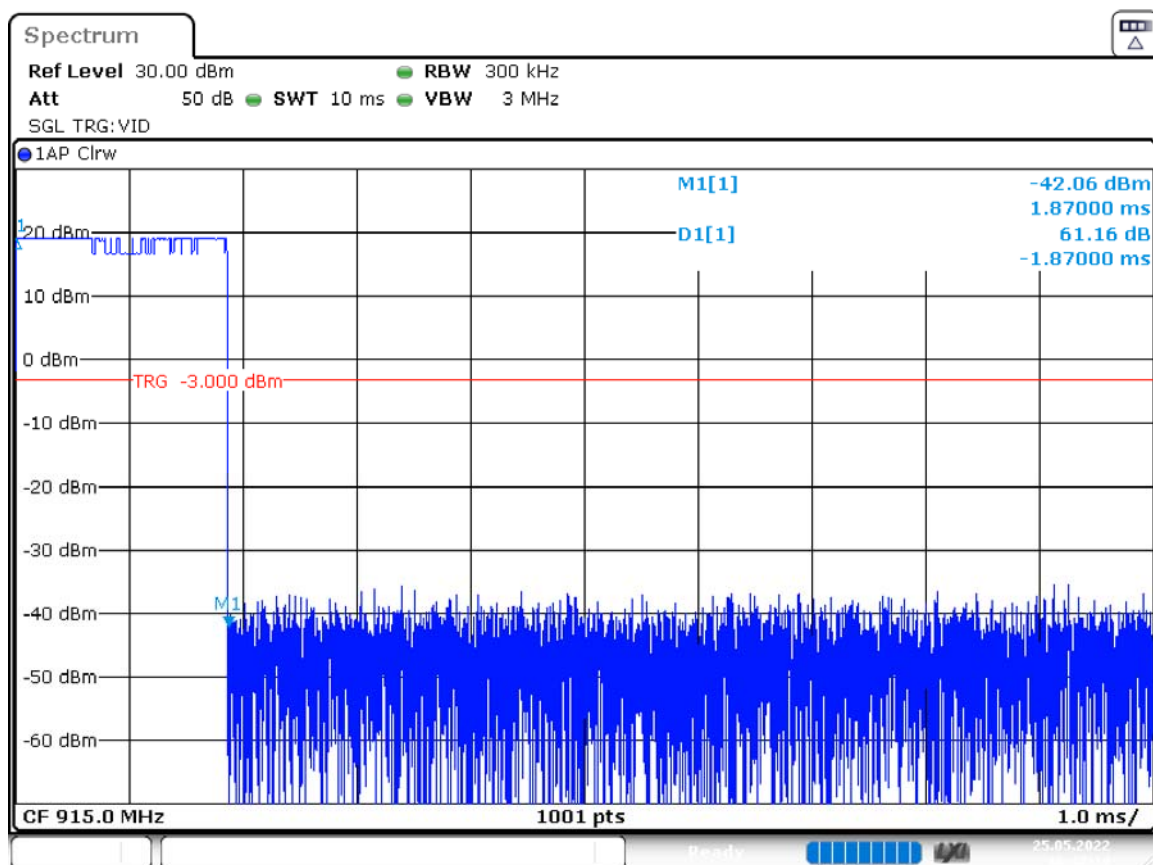
Date: 23.MAY.2022 11:00:54

Time of Occupancy

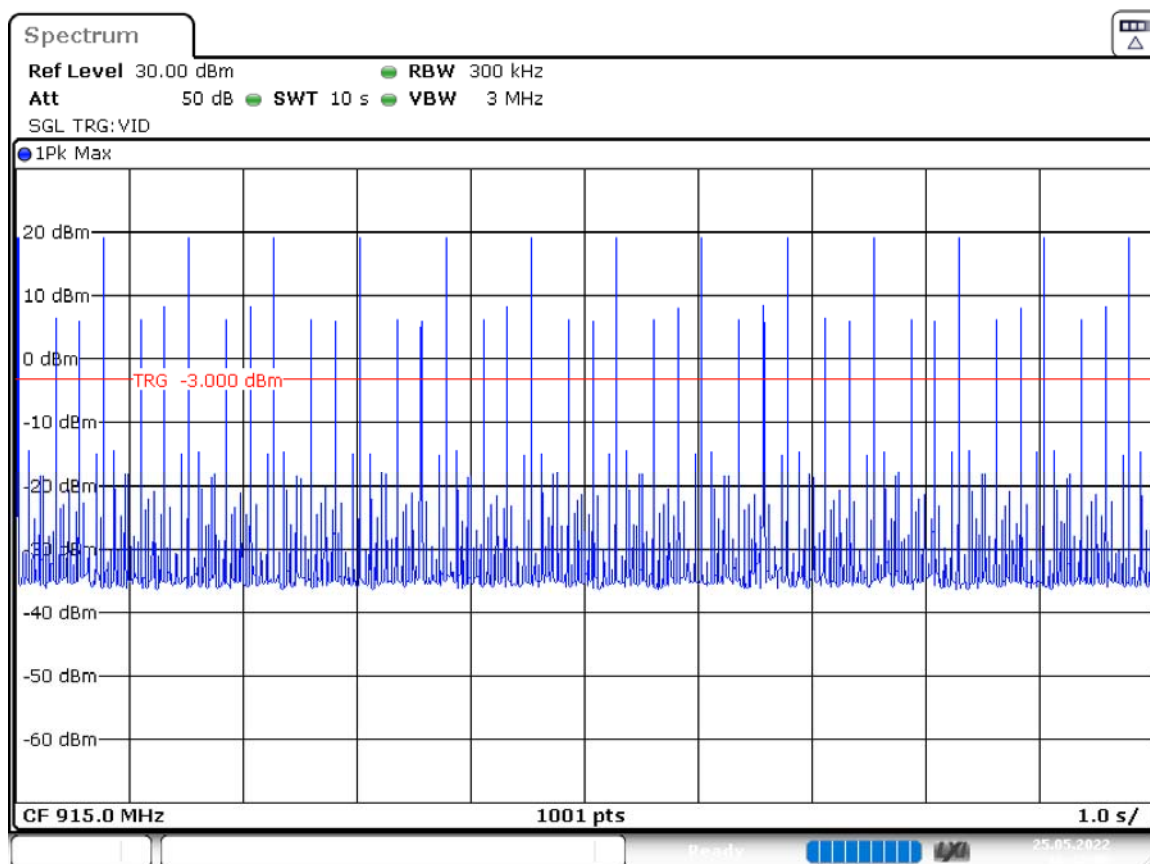
Test Mode : Hopping
Ambient Temperature : 25°C

Tester : Wayne
Relative Humidity : 67%

Operating Frequency (MHz)	Occupancy of hop (ms)	Number of hops @ 10s	Time of occupancy @10 s (ms)	Limit (s)
915	1.87	40	74.8	0.4



Date: 23.MAY.2022 10:48:21



Date: 23.MAY.2022 10:49:22

4 Hopping Separation

Result: Pass

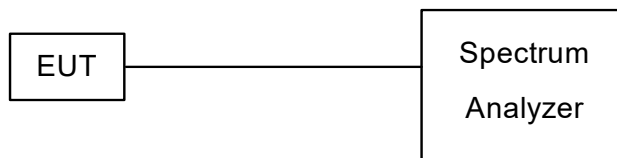
4.1 Applied standard

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.

4.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. Test procedures follow ANSI 63.10 section 7.8.2
- c. Measure the hopping separation and compare with the required limit.

4.3 Test configuration



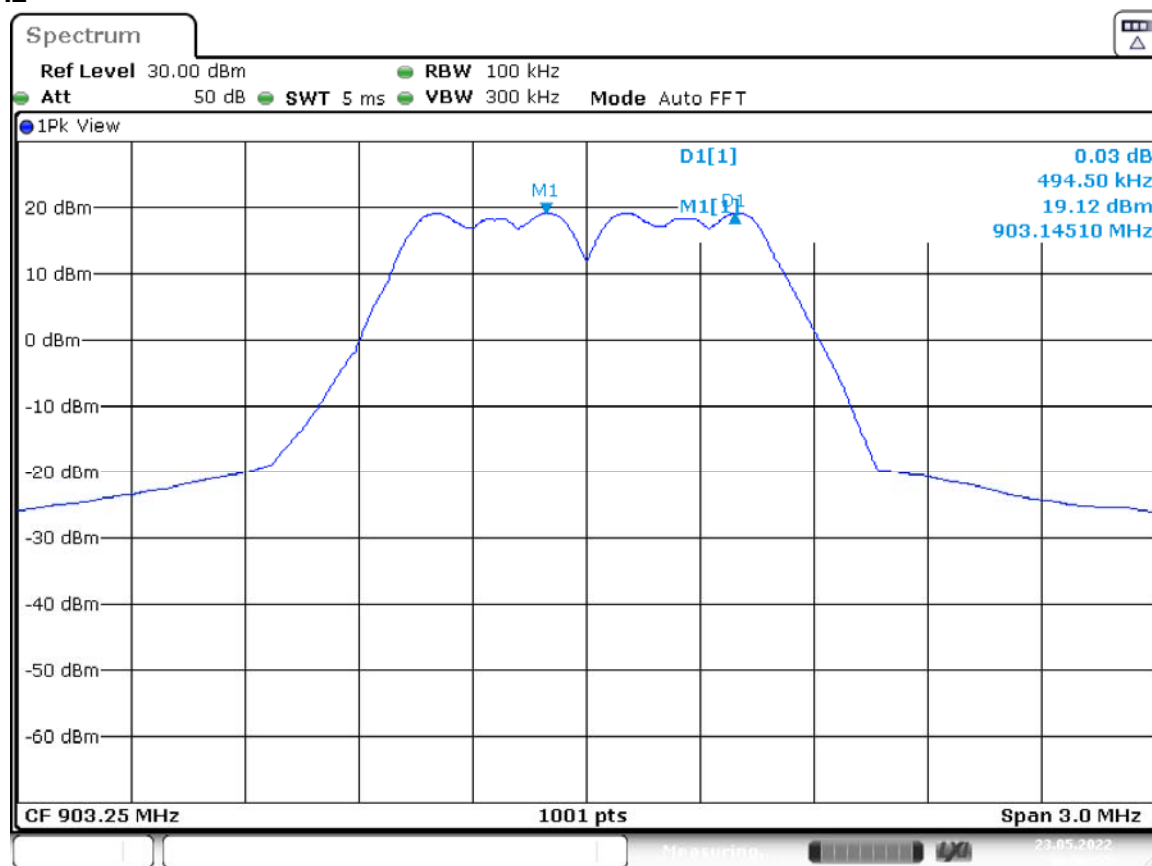
4.4 Test Data

Test Mode : Continuous transmitter
Ambient Temperature : 25°C

Tester : Wayne
Relative Humidity : 67%

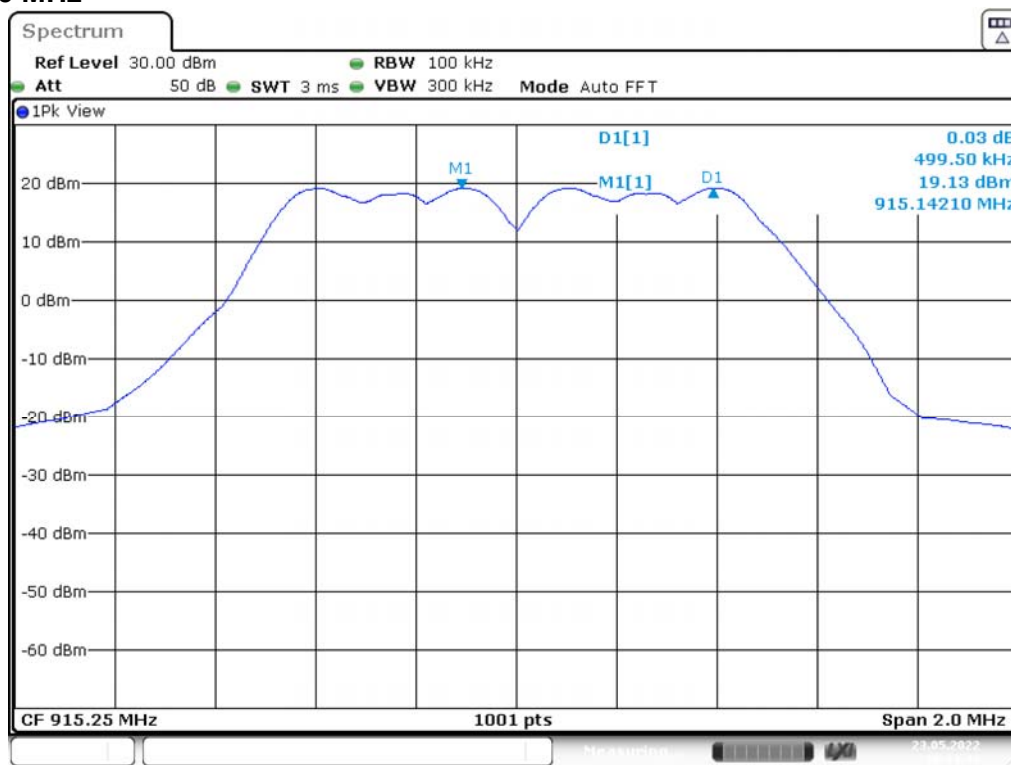
Operating Frequency (MHz)	Hopping separation (kHz)	Limit (kHz)
903	494.5	472
915	499.5	472
927.5	500.5	472

903 MHz

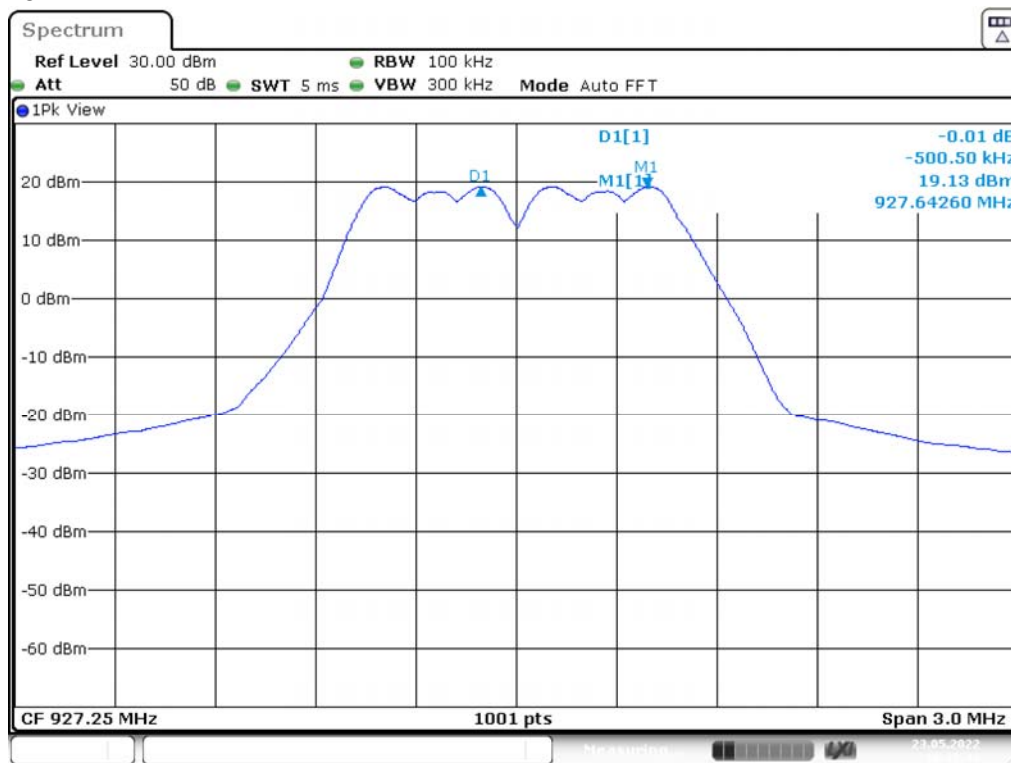


Date: 23.MAY.2022 09:56:56

915 MHz



927.5 MHz



5 Output power

Result: Pass

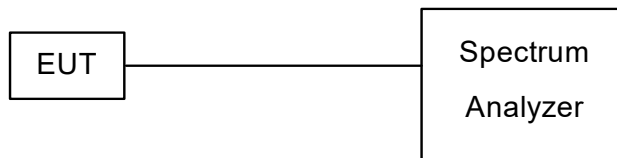
5.1 Applied standard

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels.

5.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. Test procedures follow ANSI 63.10 section 7.8.5.
- c. Measure the output power and compare with the required limit.

5.3 Test configuration



5.4 Test Data

Test Mode : Continuous transmitter
Ambient Temperature : 25°C

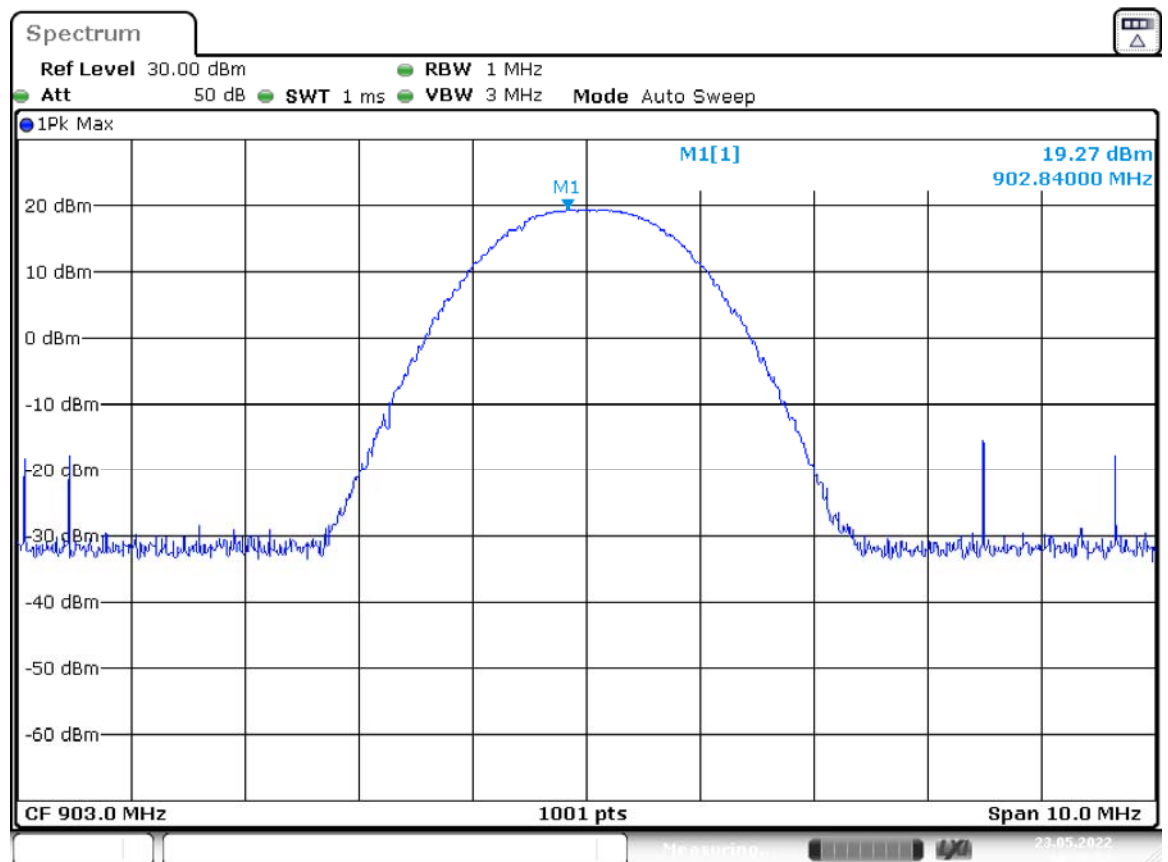
Tester : Wayne
Relative Humidity : 67%

Operating Frequency (MHz)	Peak output power (dBm)			EIRP (dBm)		
	Test data		Limit (W)	Test data		Limit (W)
	(dBm)	(W)		(dBm)	(W)	
903	19.27	0.084	1	19.27	0.084	4
915	19.21	0.083	1	19.21	0.083	4
927.5	19.23	0.084	1	19.23	0.084	4

Note:

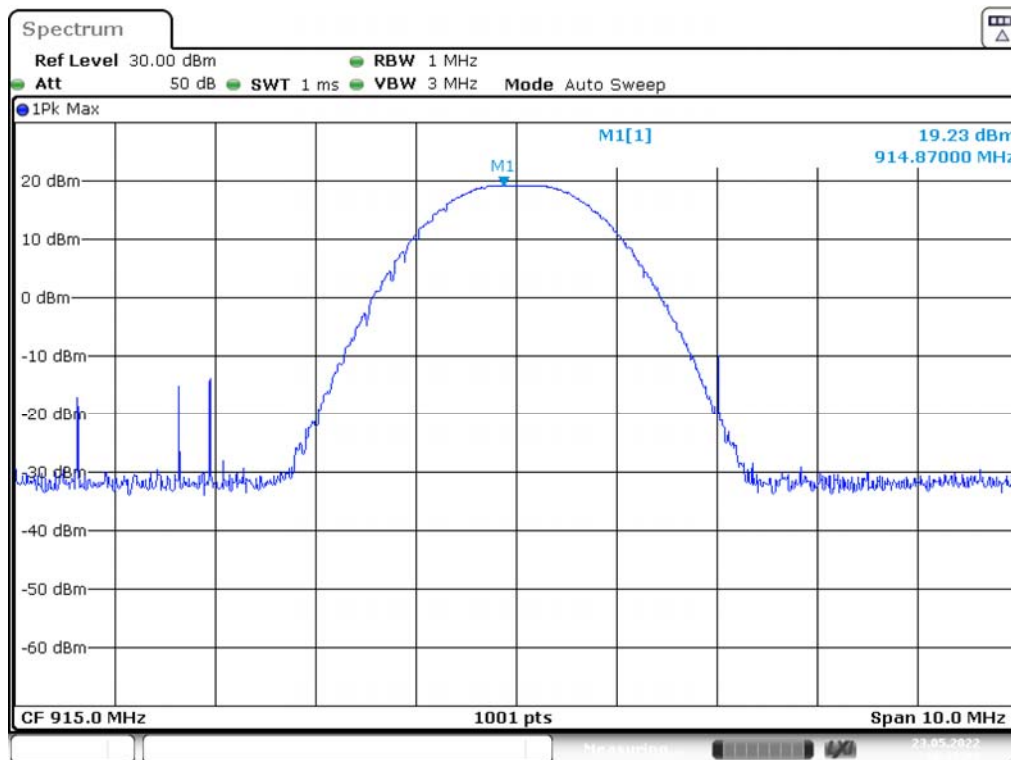
1. EIRP = peak output power+ antenna gain

903 MHz

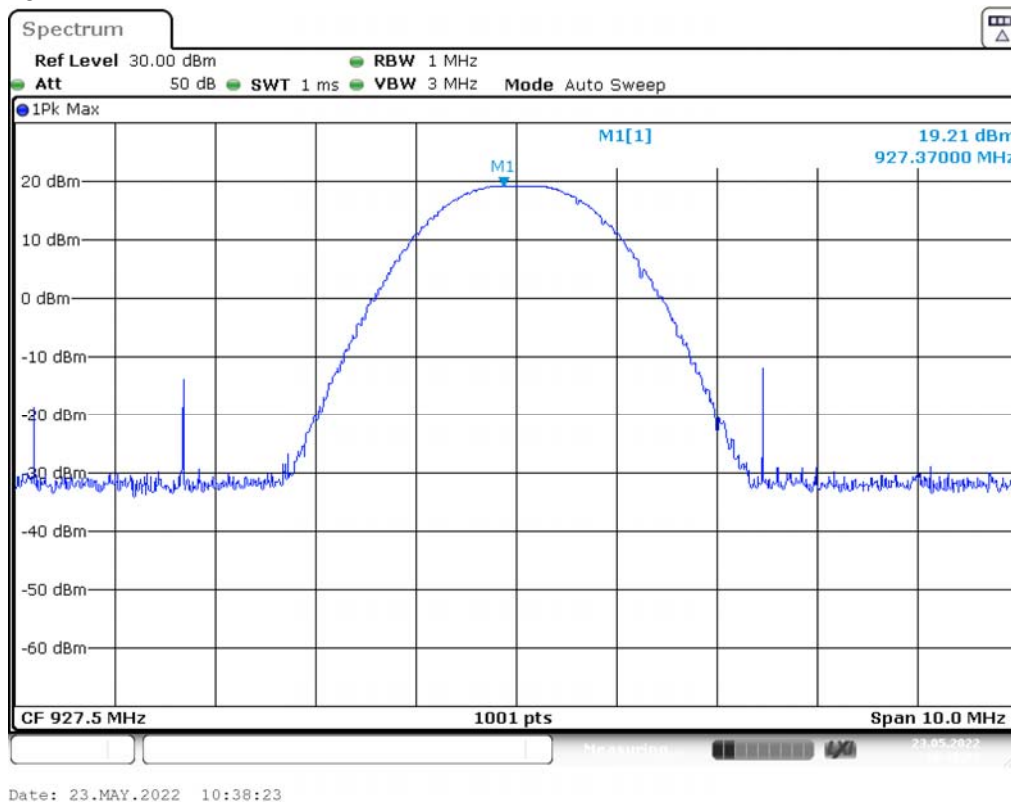


Date: 23.MAY.2022 10:39:53

915 MHz



927.5 MHz



6 RF Antenna Conducted spurious

Result: Pass

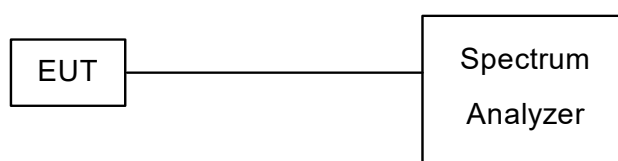
6.1 Applied standard

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 a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph FCC 15.247(b)(3), the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in FCC 15.209(a) is not required.

6.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. The software provided by client enabled the EUT to transmit data at low and high channel frequencies individually.
- c. Test procedures follow ANSI 63.10 section 7.8.6.
- d. Measurement the conducted spurious and compare with the required limit.

6.3 Test configuration



6.4 Test Data

Bandedge

Test Mode : Continuous transmitter

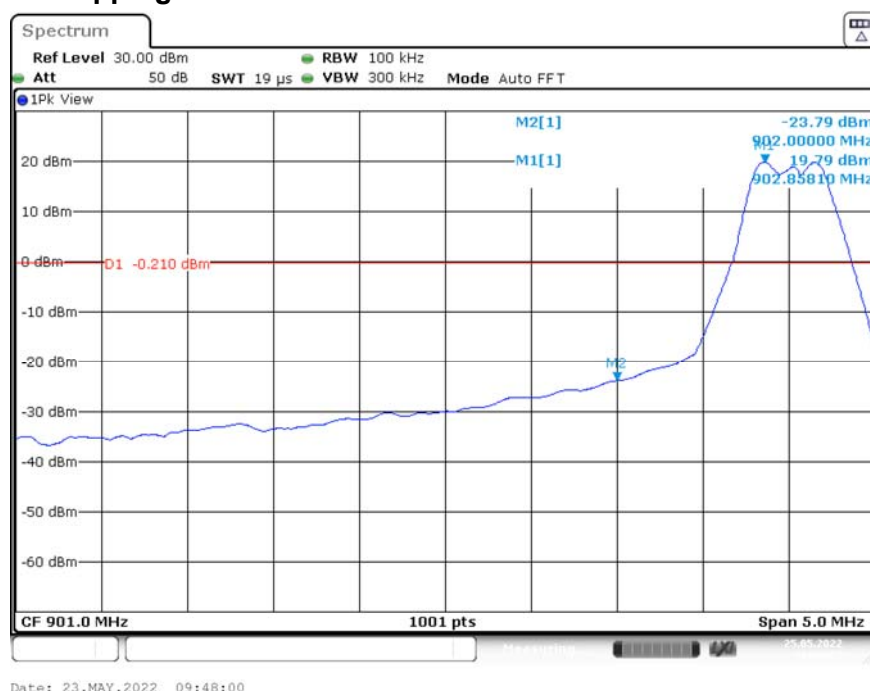
Tester : Wayne

Ambient Temperature : 25°C

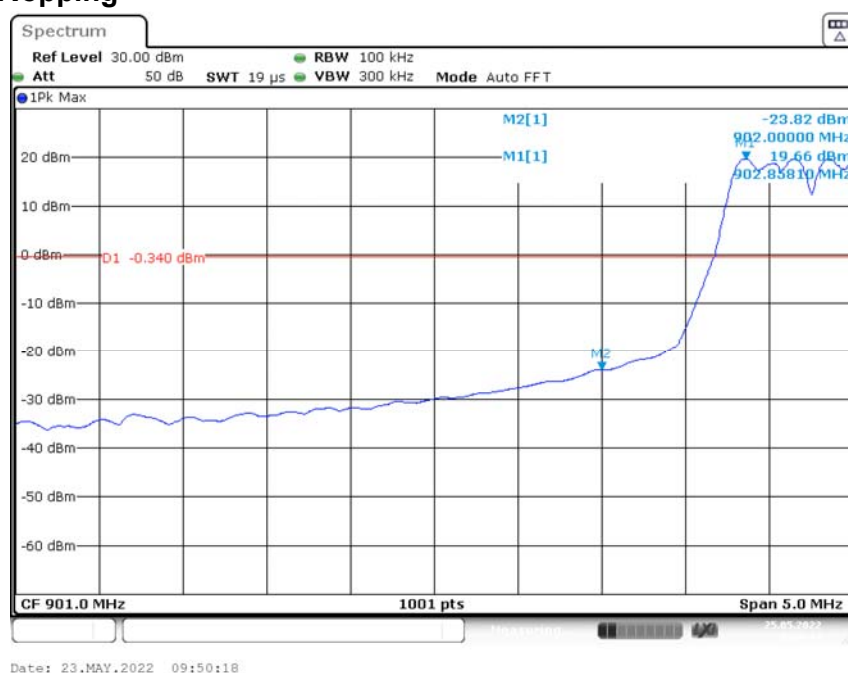
Relative Humidity : 67%

903 MHz

Non-hopping

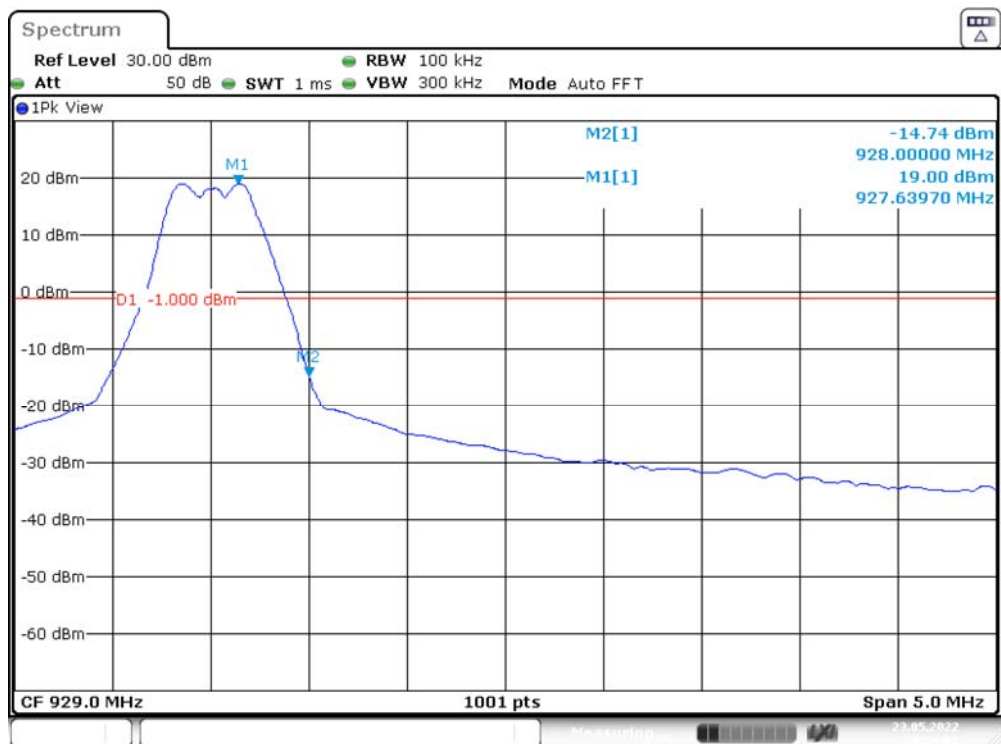


Hopping

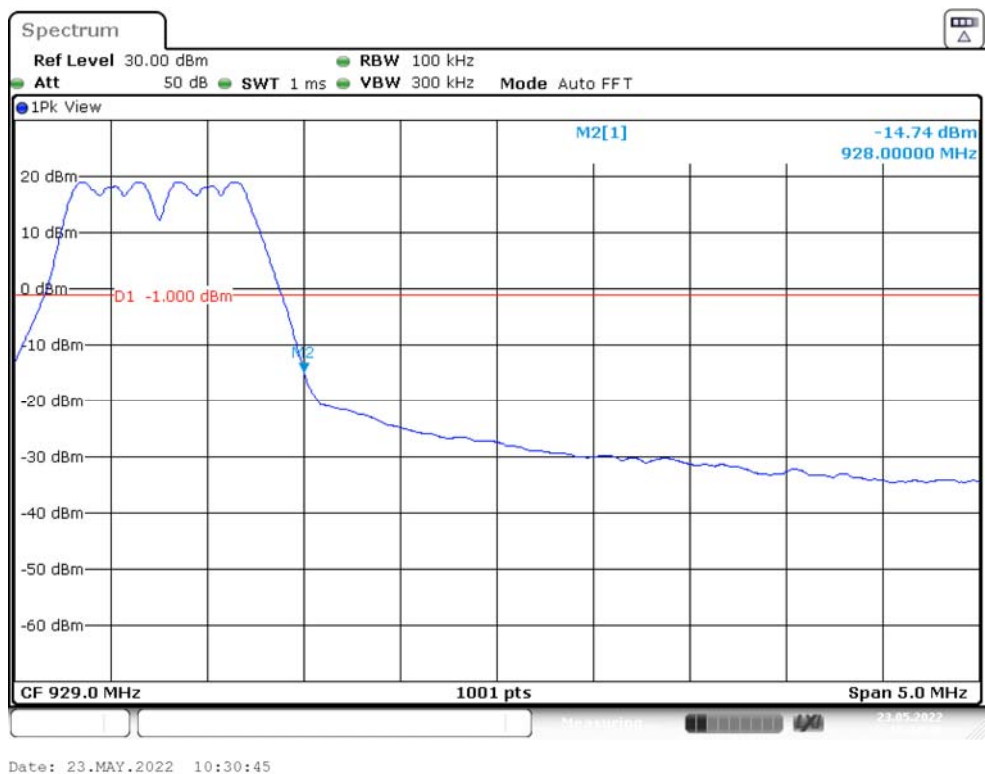


927 MHz

Non-hopping



Hopping



Out of band emission

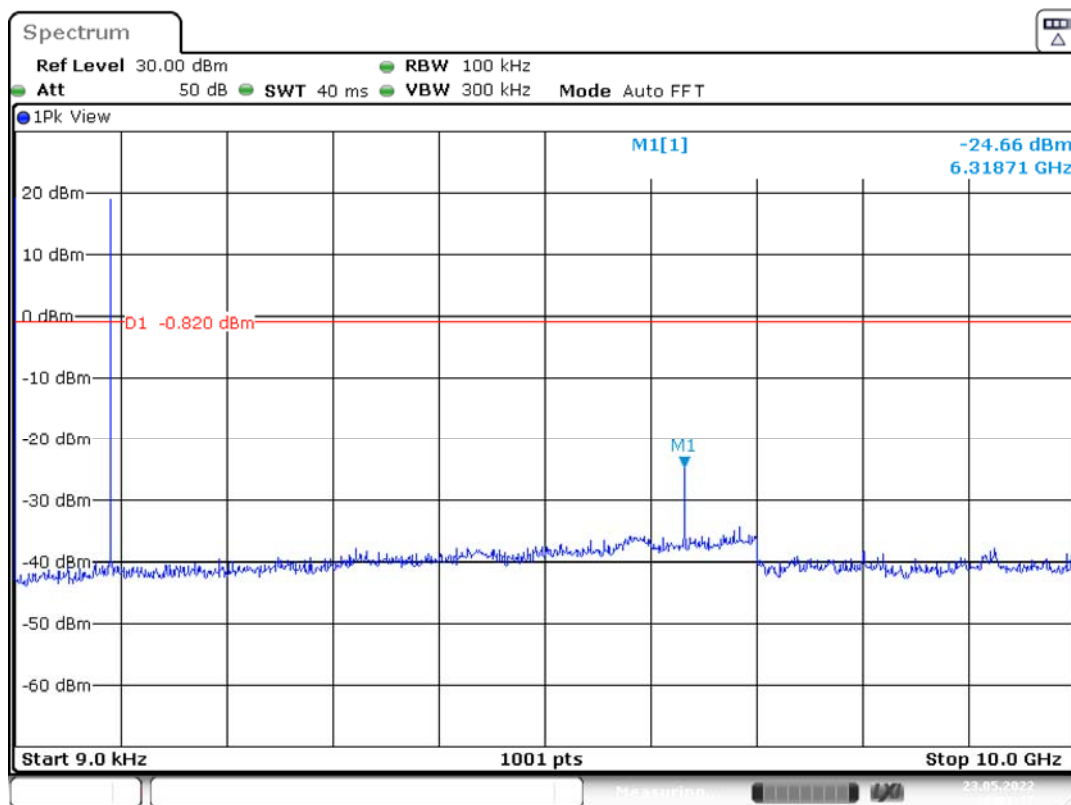
Test Mode : Continuous transmitter

Tester : Wayne

Ambient Temperature : 25°C

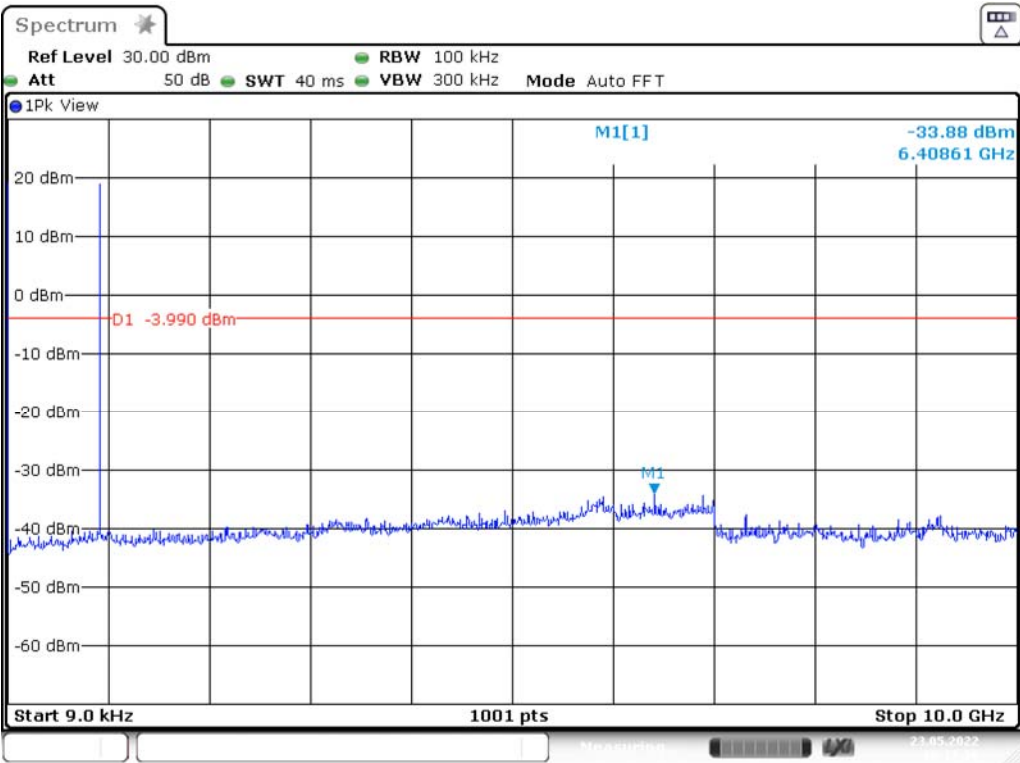
Relative Humidity : 67%

903 MHz

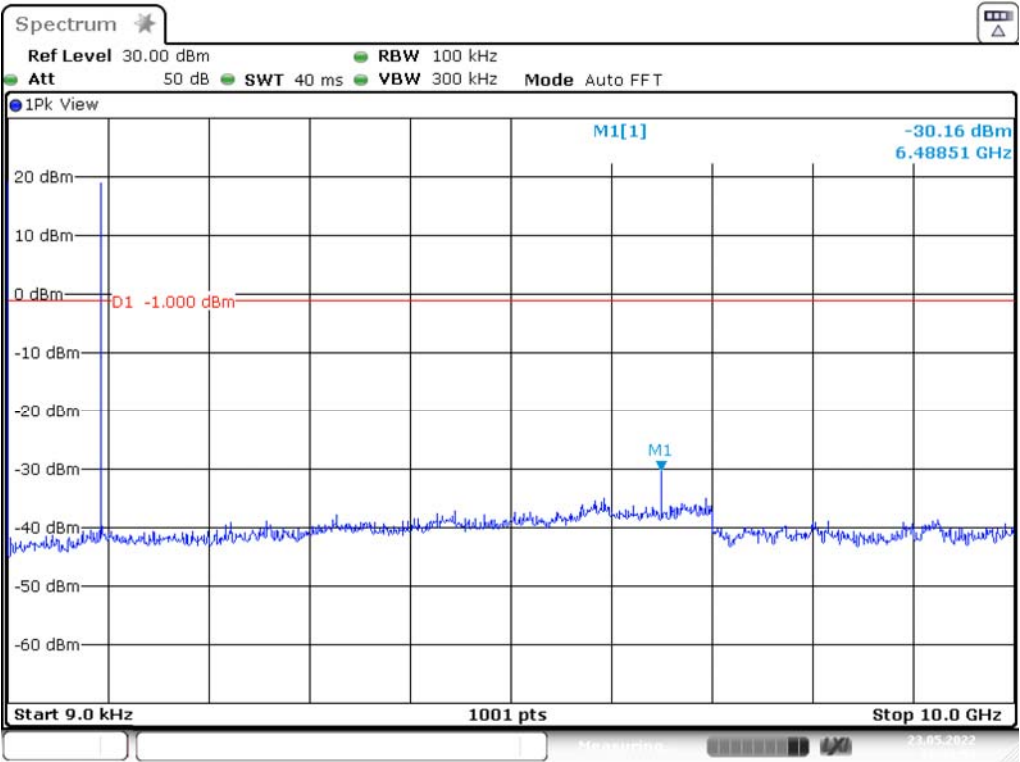


Date: 23.MAY.2022 10:01:17

915 MHz



927.5 MHz



7 Radiated Emission

Result: Pass

7.1 Applied standard

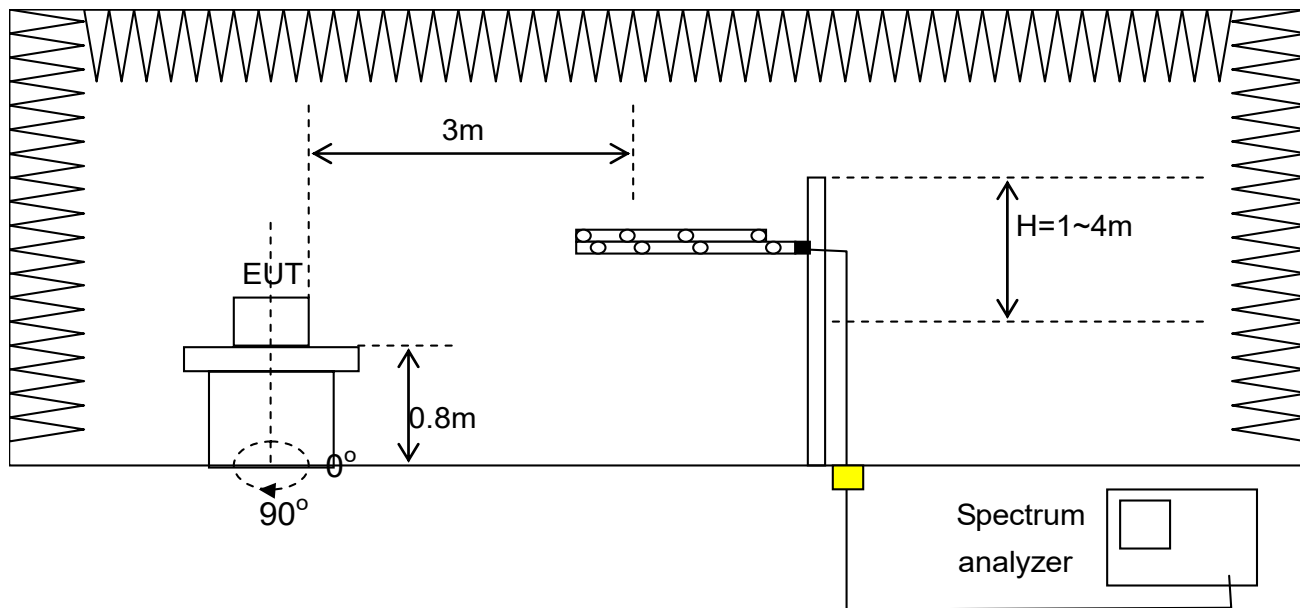
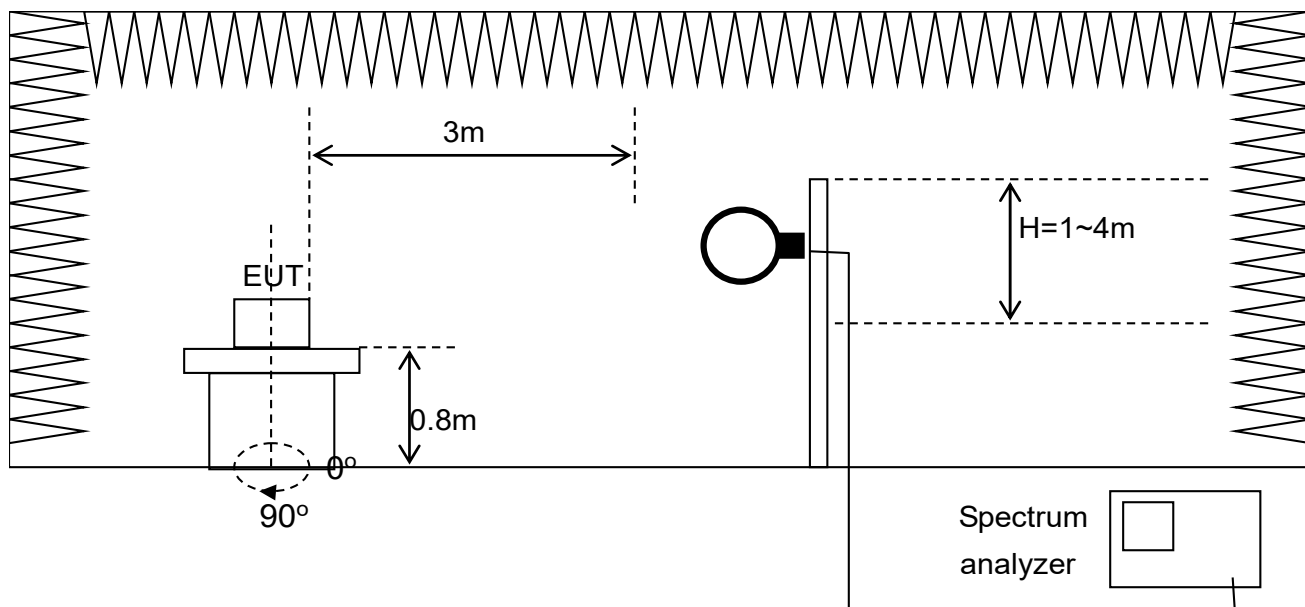
Fall in the restricted bands, must also comply with the radiated emission limits specified in FCC 15.209(a).

7.2 Measurement Procedure

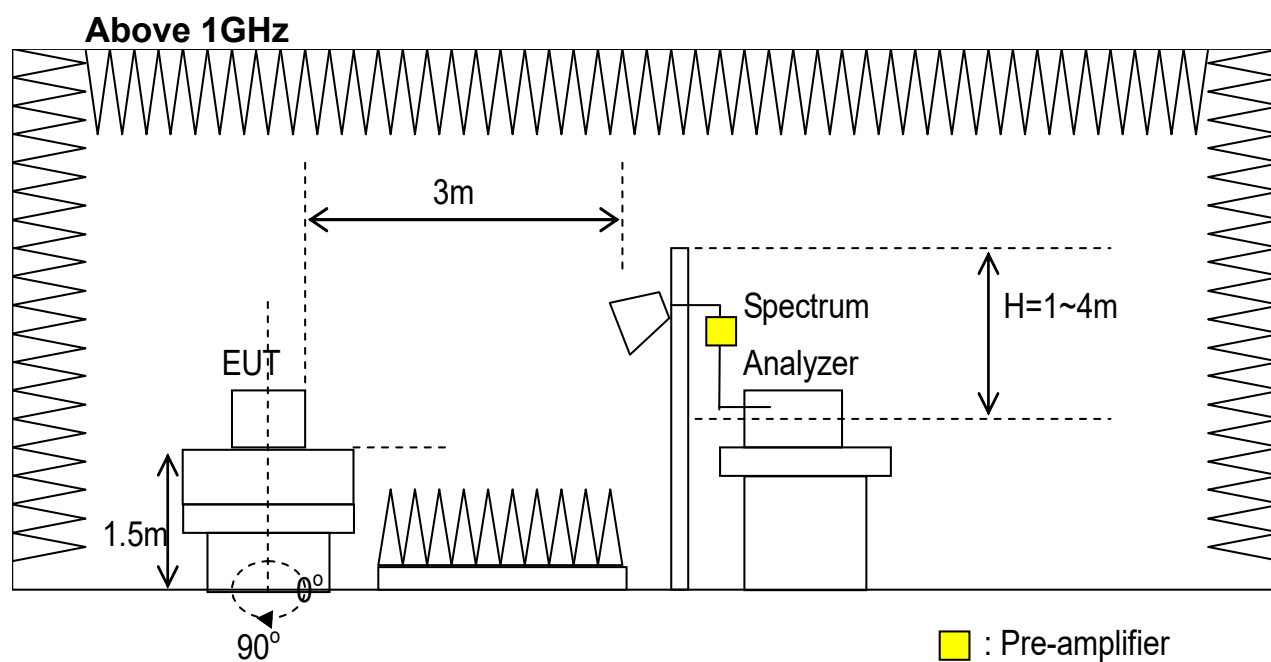
- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. A software provided by client enabled the EUT to transmit and receive data at operating frequency.(if necessary)
- c. If the EUT is tabletop equipment, it should be placed on a wooden table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it should be placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.
- d. The EUT is set 3m away from the interference receiving antenna.
- e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.
- f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine at least six frequencies associated with higher emission levels and record them.
- g. Then measure each frequency found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.
- h. For measurement of frequency below 1000MHz, set the receiver detector to be Quasi-Peak per CISPR 16-1 to find out the maximum level occurred.
- i. For measurement of frequency above 1000MHz, set the spectrum detector to be Peak or Average to find out the maximum level occurred, if any.
- j. Record frequency, azimuth angle of the turntable, height, and polarization of the receiving antenna and compare the maximum level with the required limit.
- k. Change the receiving antenna to another polarization to measure radiated emission by following step e. to j. again.
- l. If the peak emission level below 1000MHz measured from step f. is 4dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate Q.P. value will be measured and presented.
- m. If the peak emission level above 1000MHz measured from step f. is 20dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate A.V. value will be measured and presented.

7.3 Test configuration

Below 1GHz



■ : Pre-amplifier



7.4 Test Data

Radiated Emission Measurement below 1000MHz

Test Mode : Continuous Transmitting

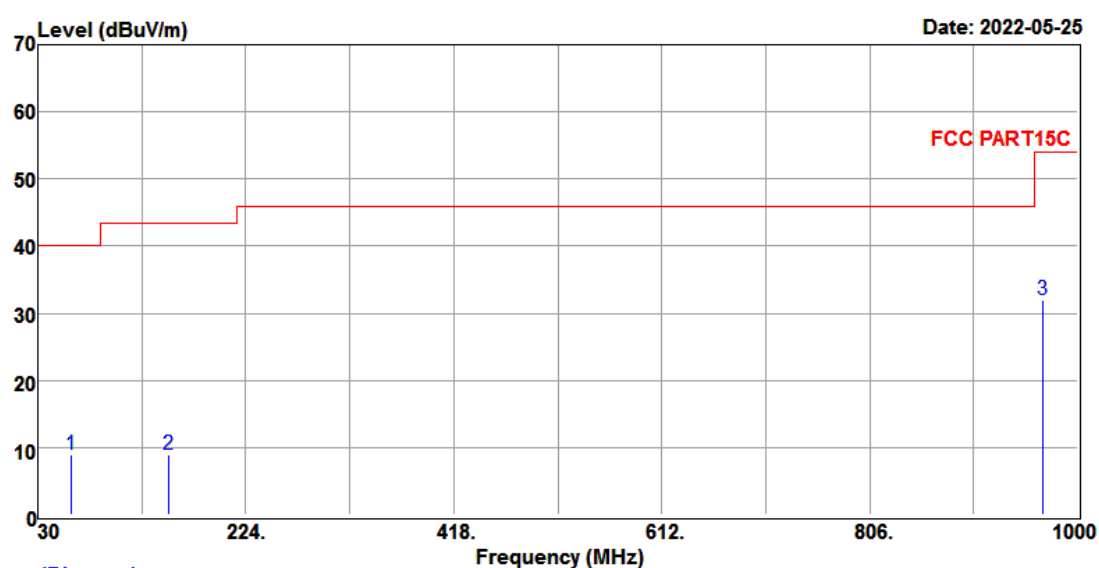
Test Range : 30 MHz ~1 GHz

Polarization : Horizontal

Tester : Volvo

Ambient Temperature : 23°C

Relative Humidity : 51%



Trace: (Discrete)

Site : TR11 9*6*6 chamber
 Condition : FCC PART15C 3m VULB_9168-612 HORIZONTAL
 Power : Battery
 Operator : Volvo T23 H51 P1017

	Freq	Level	Read	Limit	Over	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	61.525	8.85	30.54	-21.69	40.00	-31.15	214	360	HORIZONTAL QP
2	152.560	8.97	29.35	-20.38	43.50	-34.53	100	0	HORIZONTAL QP
3	966.860	32.08	40.06	-7.98	54.00	-21.92	100	334	HORIZONTAL QP

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. QK. is abbreviation of Quasi-Peak
5. The amplitude of spurious emission below 30 MHz which are attenuated by more than 20 dB below the permissible value has no need to be reprinted.

Test Mode : Continuous Transmitting

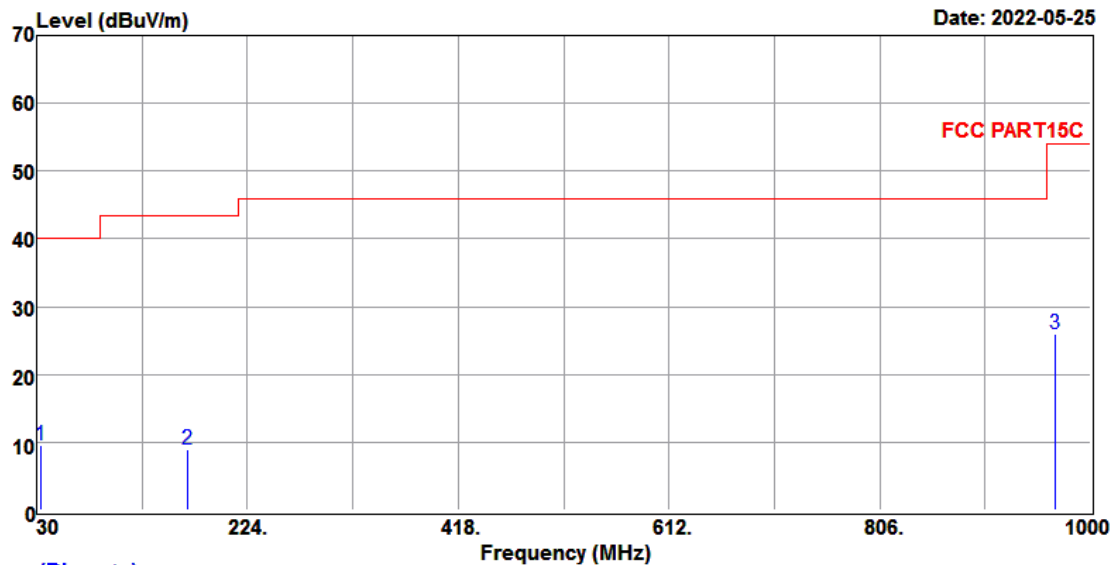
Test Range : 30 MHz ~1GHz

Polarization : Vertical

Tester : Volvo

Ambient Temperature : 23°C

Relative Humidity : 51%



Trace: (Discrete)

Site : TR11 9*6*6 chamber
 Condition : FCC PART15C 3m VULB_9168-612 VERTICAL
 Power : Battery
 Operator : Volvo T23 H51 P1017

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	33.613	9.55	32.11	-22.56	40.00	-30.45	100	360	VERTICAL	QP
2	168.775	8.86	29.72	-20.86	43.50	-34.64	100	264	VERTICAL	QP
3	967.160	26.00	33.98	-7.98	54.00	-28.00	100	51	VERTICAL	QP

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. QK. is abbreviation of Quasi-Peak
5. The amplitude of spurious emission below 30 MHz which are attenuated by more than 20 dB below the permissible value has no need to be reprinted.

Radiated Emission Measurement above 1000MHz

Test Mode : Continuous Transmitting, 903 MHz

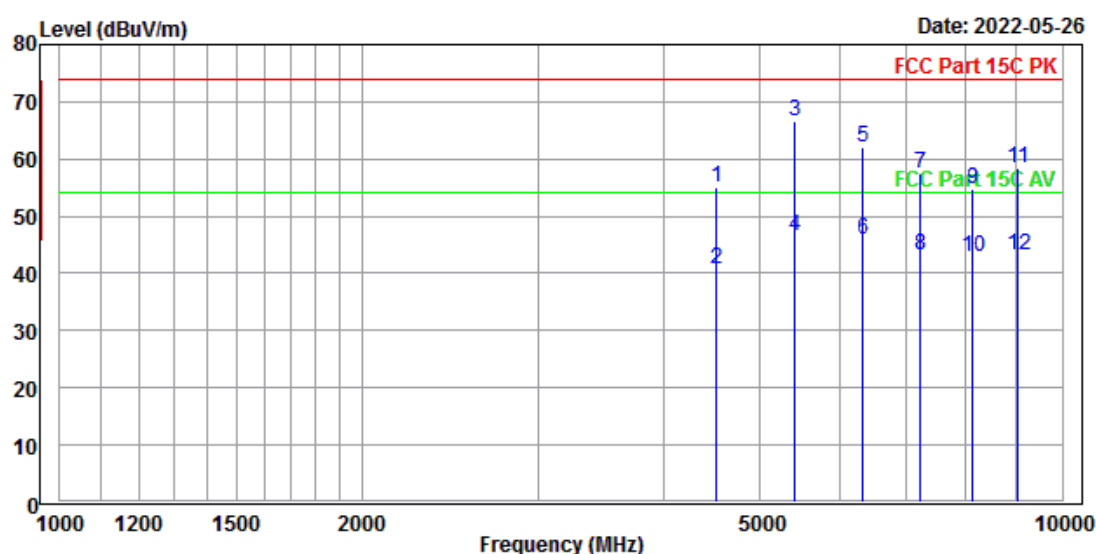
Test Range : 1 GHz ~ 10GHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 22°C

Relative Humidity : 64%



Condition : FCC Part 15C PK 3m EMCO_3117_82847 HORIZONTAL

POWER : BATTERY

OPERATOR : JEFFRY T:22 H:64 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4514.286	55.14	69.57	-14.43	74.00	-18.86	387	106	HORIZONTAL Peak
2	4514.835	40.84	55.27	-14.43	54.00	-13.16	383	110	HORIZONTAL Average
3	5417.676	66.60	81.01	-14.41	74.00	-7.40	347	242	HORIZONTAL Peak
4	5417.858	46.59	61.00	-14.41	54.00	-7.41	342	245	HORIZONTAL Average
5	6322.069	61.99	74.82	-12.83	74.00	-12.01	382	255	HORIZONTAL Peak
6	6322.211	45.81	58.64	-12.83	54.00	-8.19	386	258	HORIZONTAL Average
7	7224.414	57.53	69.02	-11.49	74.00	-16.47	382	42	HORIZONTAL Peak
8	7224.894	43.14	54.63	-11.49	54.00	-10.86	387	50	HORIZONTAL Average
9	8125.652	54.84	65.55	-10.71	74.00	-19.16	386	360	HORIZONTAL Peak
10	8125.854	42.86	53.57	-10.71	54.00	-11.14	382	355	HORIZONTAL Average
11	9028.229	58.29	68.23	-9.94	74.00	-15.71	390	77	HORIZONTAL Peak
12	9028.357	43.31	53.25	-9.94	54.00	-10.69	392	80	HORIZONTAL Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 903 MHz

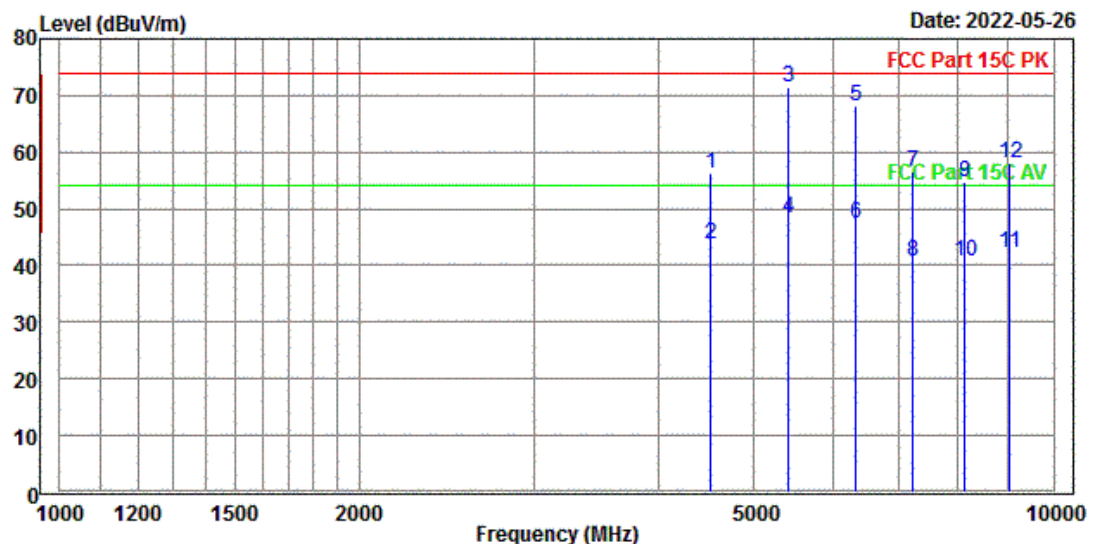
Test Range : 1 GHz ~ 10 GHz

Polarization : Vertical

Tester : Jeffry

Ambient Temperature : 22°C

Relative Humidity : 64%



Condition : FCC Part 15C PK 3m EMCO_3117_82847 VERTICAL

POWER : BATTERY

OPERATOR : JEFFRY T:22 H:64 P:1012

	Freq	Level	Read Level	Limit Factor	Over Line	Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4514.444	56.41	70.84	-14.43	74.00	-17.59	344	189	VERTICAL	Peak
2	4514.955	43.78	58.21	-14.43	54.00	-10.22	347	184	VERTICAL	Average
3	5417.781	70.58	84.99	-14.41	74.00	-3.42	326	137	VERTICAL	Peak
4	5417.919	48.46	62.87	-14.41	54.00	-5.54	323	135	VERTICAL	Average
5	6322.223	68.02	80.85	-12.83	74.00	-5.98	382	56	VERTICAL	Peak
6	6322.263	47.44	60.27	-12.83	54.00	-6.56	386	60	VERTICAL	Average
7	7223.542	56.54	68.03	-11.49	74.00	-17.46	393	76	VERTICAL	Peak
8	7223.851	40.87	52.36	-11.49	54.00	-13.13	397	80	VERTICAL	Average
9	8126.337	54.78	65.49	-10.71	74.00	-19.22	354	68	VERTICAL	Peak
10	8126.853	40.64	51.35	-10.71	54.00	-13.36	356	70	VERTICAL	Average
11	9028.687	42.41	52.35	-9.94	54.00	-11.59	396	184	VERTICAL	Average
12	9028.845	58.02	67.96	-9.94	74.00	-15.98	400	189	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 915 MHz

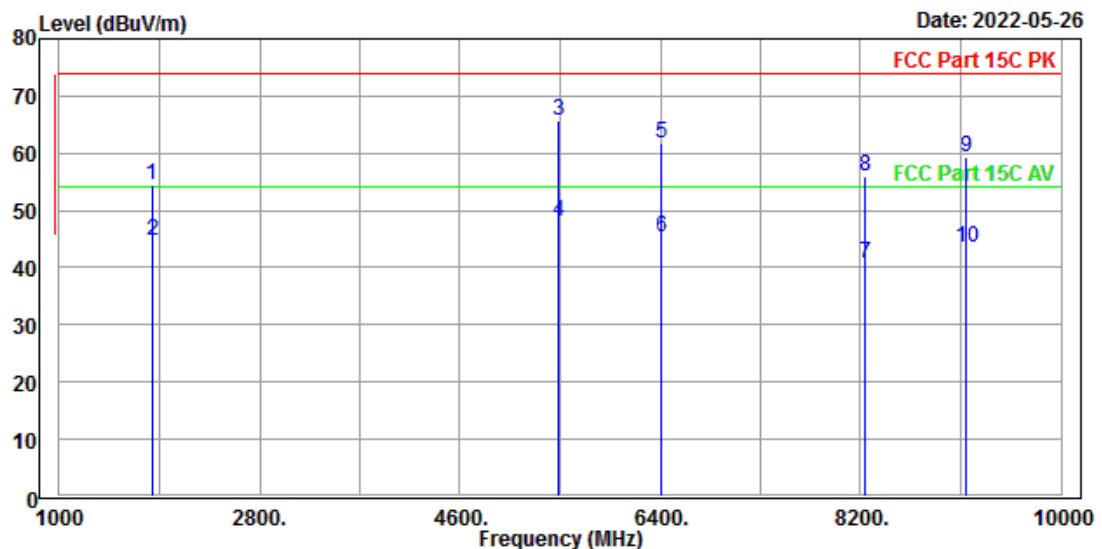
Test Range : 1 GHz ~ 10 GHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 22°C

Relative Humidity : 64%



Condition : FCC Part 15C PK 3m EMCO_3117_82847 HORIZONTAL

POWER : BATTERY

OPERATOR : JEFFRY T:22 H:64 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	1830.016	54.52	71.98	-17.46	74.00	-19.48	321	285	HORIZONTAL Peak
2	1830.941	44.81	62.25	-17.44	54.00	-9.19	326	287	HORIZONTAL Average
3	5491.117	65.75	80.19	-14.44	74.00	-8.25	341	57	HORIZONTAL Peak
4	5491.780	47.93	62.37	-14.44	54.00	-6.07	344	60	HORIZONTAL Average
5	6406.163	61.87	74.45	-12.58	74.00	-12.13	351	54	HORIZONTAL Peak
6	6406.270	45.29	57.87	-12.58	54.00	-8.71	357	60	HORIZONTAL Average
7	8233.577	40.75	51.47	-10.72	54.00	-13.25	391	266	HORIZONTAL Average
8	8233.667	55.85	66.57	-10.72	74.00	-18.15	395	263	HORIZONTAL Peak
9	9148.715	59.29	69.24	-9.95	74.00	-14.71	381	255	HORIZONTAL Peak
10	9148.803	43.43	53.38	-9.95	54.00	-10.57	384	258	HORIZONTAL Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 915 MHz

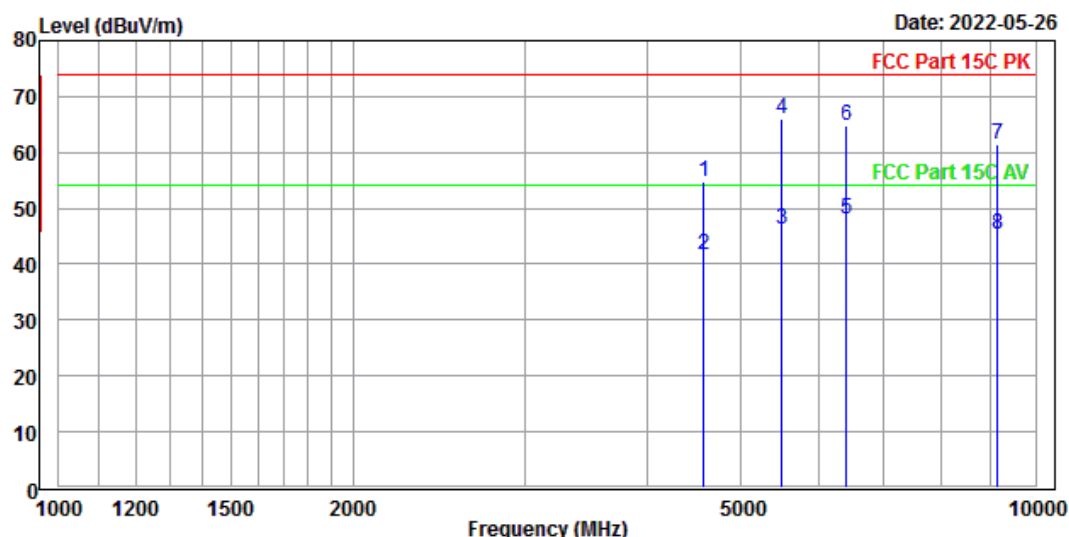
Test Range : 1 GHz ~ 10 GHz

Polarization : Vertical

Tester : Jeffry

Ambient Temperature : 22°C

Relative Humidity : 64%



Condition : FCC Part 15C PK 3m EMCO_3117_82847 VERTICAL

POWER : BATTERY

OPERATOR : JEFFRY T:22 H:64 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4575.823	54.85	69.12	-14.27	74.00	-19.15	400	360	VERTICAL Peak
2	4575.843	41.59	55.86	-14.27	54.00	-12.41	396	357	VERTICAL Average
3	5490.828	46.19	60.63	-14.44	54.00	-7.81	398	100	VERTICAL Average
4	5490.949	65.87	80.31	-14.44	74.00	-8.13	394	98	VERTICAL Peak
5	6403.414	48.05	60.64	-12.59	54.00	-5.95	397	304	VERTICAL Average
6	6403.918	64.86	77.45	-12.59	74.00	-9.14	400	301	VERTICAL Peak
7	9148.431	61.52	71.47	-9.95	74.00	-12.48	373	198	VERTICAL Peak
8	9148.656	45.30	55.25	-9.95	54.00	-8.70	370	200	VERTICAL Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 927.5 MHz

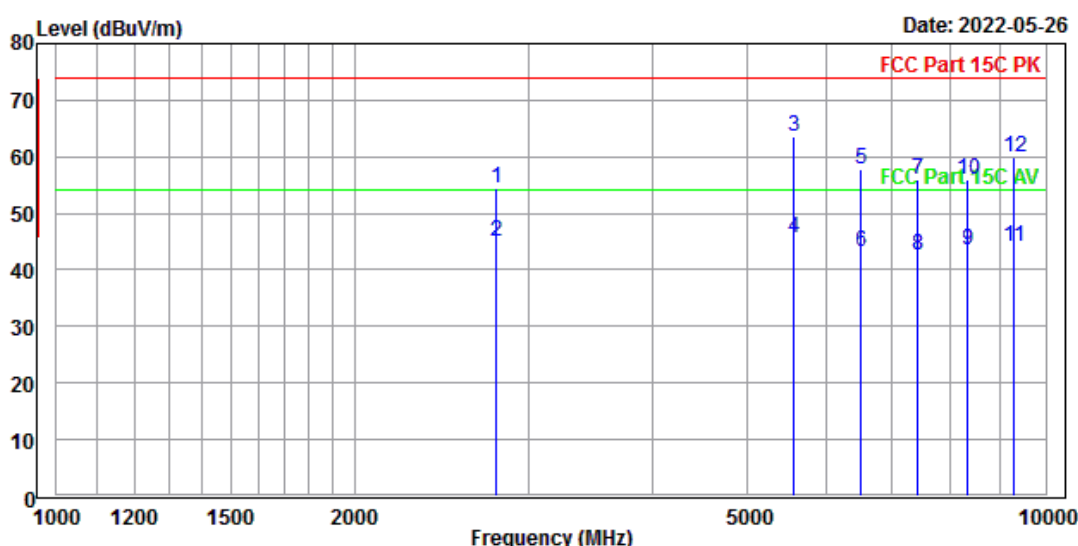
Test Range : 1 GHz ~ 10 GHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 22°C

Relative Humidity : 64%



Condition : FCC Part 15C PK 3m EMCO_3117_82847 HORIZONTAL

POWER : BATTERY

OPERATOR : JEFFRY T:22 H:64 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	2783.061	54.52	69.84	-15.32	74.00	-19.48	210	162	HORIZONTAL Peak
2	2783.379	44.94	60.26	-15.32	54.00	-9.06	213	166	HORIZONTAL Average
3	5566.026	63.54	77.99	-14.45	74.00	-10.46	375	0	HORIZONTAL Peak
4	5566.482	45.69	60.13	-14.44	54.00	-8.31	371	3	HORIZONTAL Average
5	6491.376	57.65	70.41	-12.76	74.00	-16.35	334	47	HORIZONTAL Peak
6	6491.493	43.11	55.87	-12.76	54.00	-10.89	337	50	HORIZONTAL Average
7	7421.033	56.02	67.34	-11.32	74.00	-17.98	365	229	HORIZONTAL Peak
8	7421.037	42.62	53.94	-11.32	54.00	-11.38	366	232	HORIZONTAL Average
9	8346.299	43.39	53.96	-10.57	54.00	-10.61	372	253	HORIZONTAL Average
10	8346.358	56.08	66.65	-10.57	74.00	-17.92	377	258	HORIZONTAL Peak
11	9273.338	44.17	54.12	-9.95	54.00	-9.83	393	259	HORIZONTAL Average
12	9273.640	59.86	69.81	-9.95	74.00	-14.14	390	257	HORIZONTAL Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 927.5 MHz

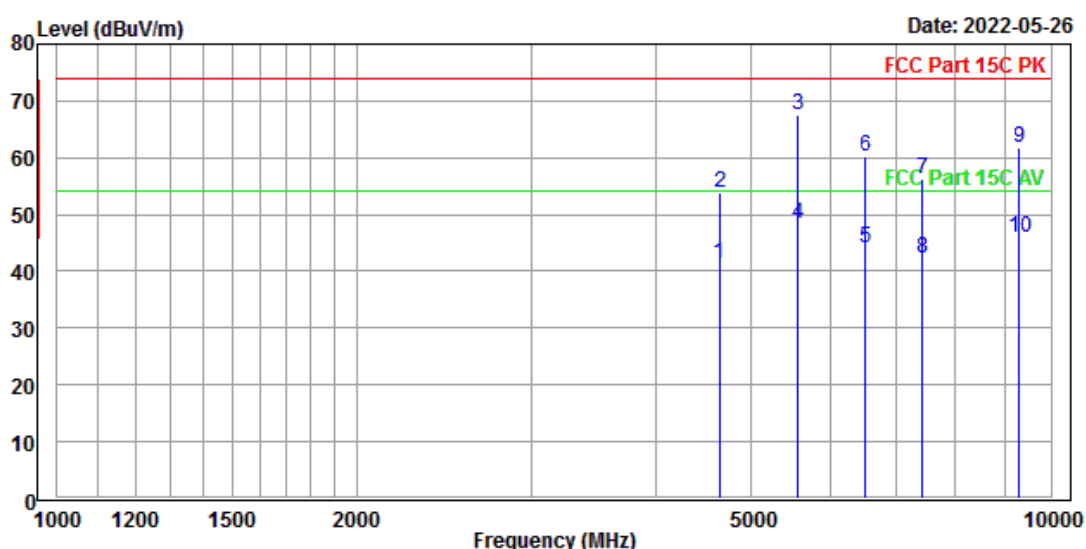
Test Range : 1 GHz ~ 10 GHz

Polarization : Vertical

Tester : Jeffry

Ambient Temperature : 22°C

Relative Humidity : 64%



Condition : FCC Part 15C PK 3m EMCO_3117_82847 VERTICAL

POWER : BATTERY

OPERATOR : JEFFRY T:22 H:64 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4636.164	41.45	55.76	-14.31	54.00	-12.55	390	358	VERTICAL Average
2	4636.728	53.89	68.20	-14.31	74.00	-20.11	392	360	VERTICAL Peak
3	5564.217	67.55	82.00	-14.45	74.00	-6.45	322	251	VERTICAL Peak
4	5564.495	48.40	62.85	-14.45	54.00	-5.60	327	256	VERTICAL Average
5	6491.491	44.08	56.84	-12.76	54.00	-9.92	372	276	VERTICAL Average
6	6491.583	60.31	73.07	-12.76	74.00	-13.69	377	271	VERTICAL Peak
7	7418.601	56.28	67.61	-11.33	74.00	-17.72	389	251	VERTICAL Peak
8	7418.854	42.31	53.63	-11.32	54.00	-11.69	384	256	VERTICAL Average
9	9273.446	61.81	71.76	-9.95	74.00	-12.19	380	257	VERTICAL Peak
10	9273.683	45.90	55.85	-9.95	54.00	-8.10	376	259	VERTICAL Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line