

TEST REPORT
On behalf of

Mettler Toledo (Changzhou) Measurement Technology Co., Ltd

Product Name: RF Module

Model No.: MT-UHF-RFID01

FCC ID: 2ALAI24MT107

Prepared For: Mettler Toledo (Changzhou) Measurement Technology Co., Ltd
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Date of Test : 2024.08.16-09.25
Date of Report : 2024.09.26

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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TEST REPORT

Applicant : Mettler Toledo (Changzhou) Measurement Technology Co., Ltd
EUT Description : RF Module
(A) Model No. : Refer to Sec.2.1
(B) Power Supply : DC 5V or 24V
(C) Test Voltage : DC 5V (from notebook)

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C
AND ANSI C63.10-2013*

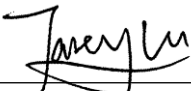
The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: Refer to Sec2.1), which was tested is technically compliance with the FCC limits.

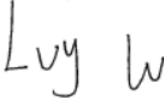
This report applies to above tested Sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

Date of Test : 2024.08.16-09.25 Date of Report : 2024.09.26

Producer :


JAREY LU / Deputy Assistant Manager

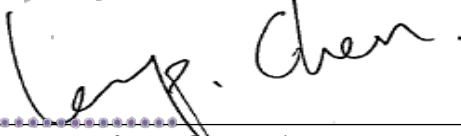
Review :


LVY LV / Deputy Assistant Manager

 For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory :

.....
Authorized Signature(s)


KAMP CHEN / Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The result is determined according to the decision rules of customer selection in the ASC-403 application service form.

1. According to IEC GUIDE 115 Procedure 2 and ILAC-G8, the uncertainties value is not used in determining the PASS/FAIL results.

2. If the required specification or standard already contains the decision rules, it will be carried out in accordance with the regulations or standard documents or the requirements of the competent units. If the required specification or standard does not contain a decision rule, the same paragraph 1.

3. If your company has a required decision rule, it will be implemented in accordance with the requirements and ISO/IEC Guide 98-4 specifications.

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
EMISSION			
Conducted Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	N/A	15.207
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.209(a) 15.205(a)(c)
20 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(a)(1)
Carrier Frequency Separation Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(a)(1)
Number of Hopping Frequencies Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(a)(1)(i)
Dwell Time Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(a)(1)(i)
Maximum Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(b)(2)
Band Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)
Emission Limitations Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.247(d)
Antenna Requirement	FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013	Pass	15.203
N/A is an abbreviation for Not Applicable.			

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : RF Module

Type of EUT : ☒ Production ☐ Pre-product ☐ Pro-type

Model Number : MT-UHF-RFID01

Radio Tech. : RFID

Chanel Freq. : 902-928MHz, Total 50 channels.

Modulation : ASK

Antenna Port : Transmit Type: 1T1X;
Connector: IPEX

Note : The EUT shipped with one of Antennas provided as below:

No.	Model	Antenna Type	Connector	Peak Gain(dBi)
1.	868/915 MHz Flexible Antenna	Flex	IPEX	-26.3
2.	ARRKP5062-S915B	Dielectric Ceramics	MMCX-JW	3

Note1: When EUT shipped with Antenna #2, one additional IPEX-to-MMCX-JW cable shipped.

Note2: As the Gain showed as above, we select Antenna #2 for the full test and Antenna#1 for differential test in current report.

Applicant : Mettler Toledo (Changzhou) Measurement Technology Co., Ltd
No.111 Taihu West Road Changzhou City,
Jiangsu Province, China.

Manufacturer : Same as Applicant.

2.2 EUT Specifications Assessed in Current Report

Mode	Modulation
RFID	ASK

Channel List			
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
01	902.75	26	915.25
02	903.25	27	915.75
03	903.75	28	916.25
...	...	...	...
...	...	...	...
...	...	...	...
23	913.75	48	926.25
24	914.25	49	926.75
25	914.75	50	927.25
01	902.75	26	915.25
02	903.25	27	915.75

2.3 Test Information

The test software “ UniversalReaderAssistant.exe” was used to control EUT work in TX mode, Power Setting and select test channel.

Mode	Power Setting	Test Channel		Frequency (MHz)
RFID	24	Low:	01	902.75
	24	Middle:	26	915.25
	24	High:	50	927.25
	24	Hopping:	--	--

2.4 Sample Description

Test Item	HVIN	Sample Number	Date of receipted
Radiated Emission	MT-UHF-RFID01	E20240607439-02/02	2024.06.07
Conducted RF Test	MT-UHF-RFID01	E20240607439-02/02	2024.06.07

2.5 Supported equipment

Brand : Acer
Product Name: : Notebook PC
Model Name : TravelMate P238 series
Model Number : N15W8

2.6 Description of Test Facility

Name of Firm : Audix Technology (Shanghai) Co., Ltd.
Site Location : 3F, Building 34, No. 680 Guiping Rd.,
Caohejing, Hi-Tech Park,
Shanghai 200233, China
Accredited by NVLAP, Lab Code : 200371-0
FCC Designation Number : CN5027
Test Firm Registration Number : 954668

3 RADIATED EMISSION TEST

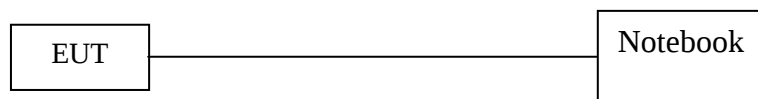
3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

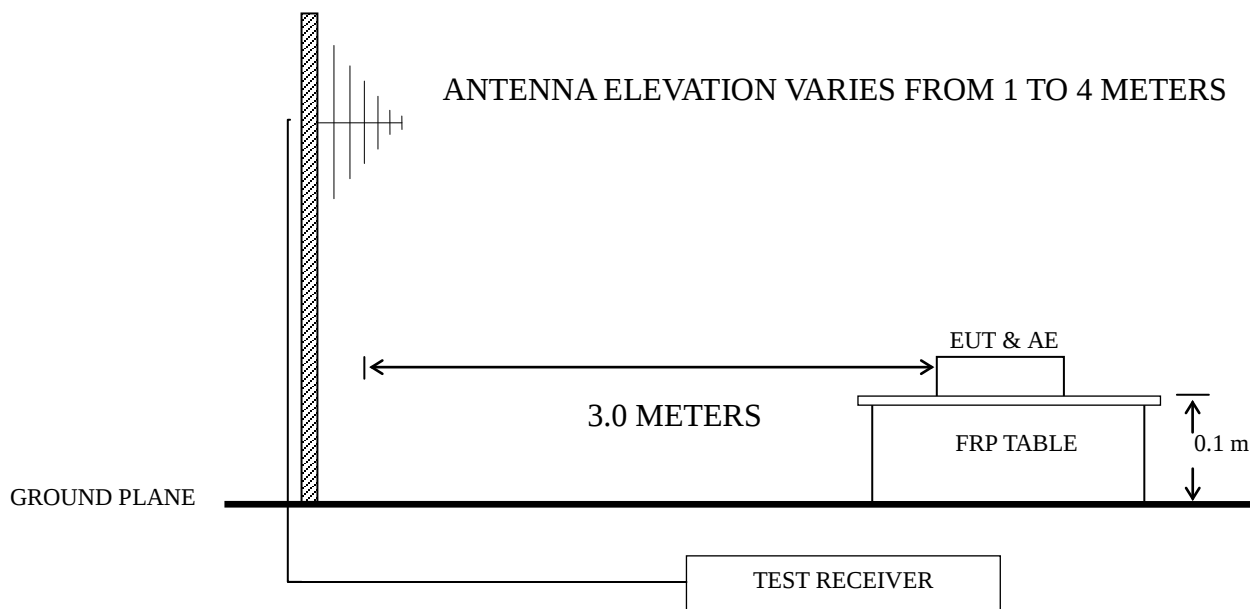
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Preamplifier	Agilent	8447D	2944A10548	2024.02.22	1 Year
2.	Preamplifier	HP	8449B	3008A00864	2024.02.22	1 Year
3.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2024.08.09	1 Year
4.	Test Receiver	R&S	ESCI	101303	2024.02.22	1 Year
5.	Bilog Antenna+6dB Attenuator	Schwarz beck	VULB 9168+EMCI-N-6-06	707+AT-N0637	2024.07.31	1 Year
6.	Horn Antenna	EMCO	3115	96074878	2024.07.25	1 Year
7.	Coaxial Switch	Anritsu	MP59B	6200655086	2024.02.22	1 Year
8.	High Pass Filter	Agilent	84300-80038	006	2023.12.13	1 Year
9.	Coaxial Cable	SCHAFFNER	RG 212U-MIL C 17+N1K50-E W0630-N1K50-15m-1	RE-10m-001/ RE-15m-002	2024.02.22	1 Year
10.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2024.08.09	1 Year
11.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022830	2024.08.09	1 Year
12.	Software	Audix	e3	210616	--	--

3.2 Block Diagram of Test Setup

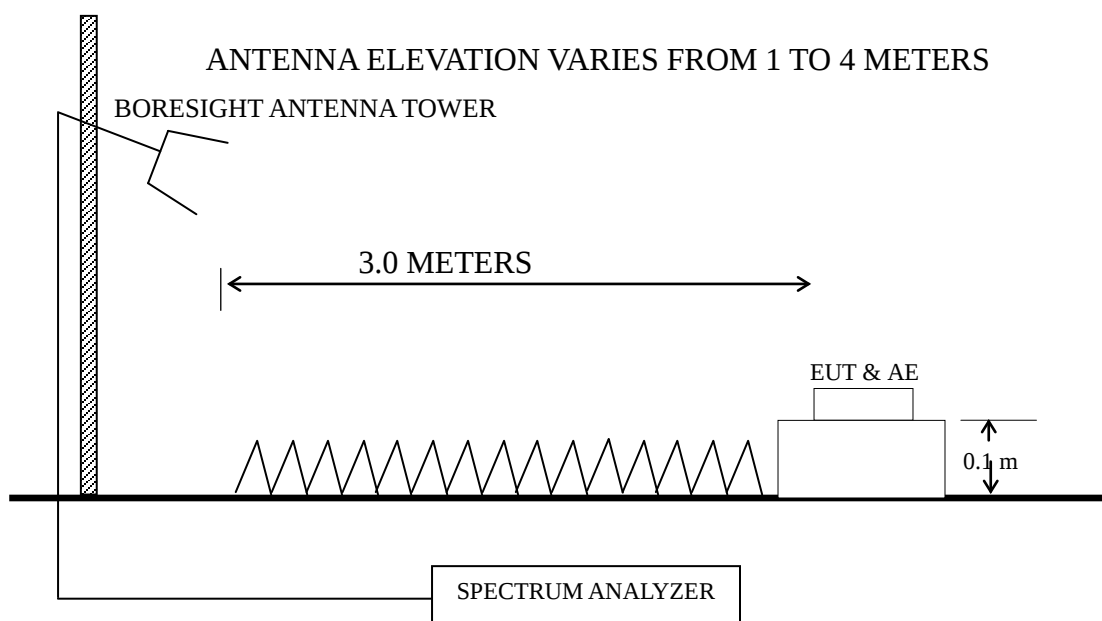
3.2.1 EUT & Peripherals



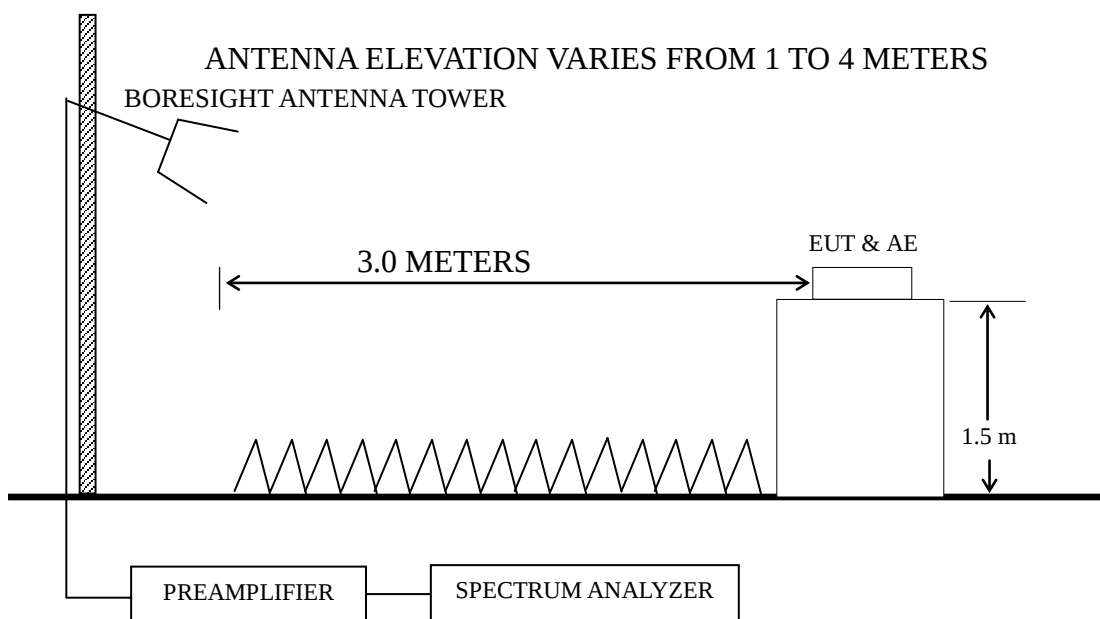
3.2.2 Below 1GHz



3.2.3 Above 1GHz (1 to 4GHz)



3.2.4 Above 1GHz (4 to 10GHz)



3.3 Radiated Emission Limit (§15.209)

Frequency (MHz)	Distance (m)	Field strength limits ($\mu\text{V/m}$)	
		($\mu\text{V/m}$)	$\text{dB}(\mu\text{V/m})$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level $\text{dB}(\mu\text{V/m}) = 20 \log \text{Emission Level}(\mu\text{V/m})$

NOTE 2 - The tighter limit applies at the band edges.

NOTE 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.

NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.

NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

3.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.4.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn the EUT on.

3.5.3 Connect the EUT and Notebook PC through one USB-to Type-C cable.

3.5.4 Use the software as section 2.3 to select the test mode, and then test.

3.5.5 Repeat step 3.5.3 and 3.5.4, until the test of all modes finished.

3.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a 0.1m high insulating support on a turntable. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.10: 2013 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of Agilent N9010A was set at 1MHz for above 1GHz.

The frequency range from 30 MHz to 10 GHz (Up to 10th harmonics from fundamental frequency) was checked.

All the test results are listed in Sec.3.7.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Frequency range: below 1GHz (Worst case emission)

(Shipped With ANT#2):

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	RFID	01	902.75 MHz	P15-16
2.			26	915.25 MHz	P17-18
3.			50	927.25 MHz	P19-20
4.			Hopping	--	P21-22

(Shipped With ANT#1):

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	RFID	01	902.75 MHz	P23-24
2.			26	915.25 MHz	P25-26
3.			50	927.25 MHz	P27-28
4.			Hopping	--	P29-30

Frequency range: 1GHz to 4GHz

(Shipped With ANT#2):

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	RFID	01	902.75 MHz	P31-32
2.			26	915.25 MHz	P33-34
3.			50	927.25 MHz	P35-36
4.			Hopping	--	P37-38

(Shipped With ANT#1):

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	RFID	01	902.75 MHz	P39-40
2.			26	915.25 MHz	P41-42
3.			50	927.25 MHz	P43-44
4.			Hopping	--	P45-46

Frequency range: 4GHz to 10GHz
(Shipped With ANT#2):

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	RFID	01	902.75 MHz	P48-49
2.			26	915.25 MHz	P50-51
3.			50	927.25 MHz	P52-53
4.			Hopping	--	P54-55

(Shipped With ANT#1):

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	RFID	01	902.75 MHz	P56-57
2.			26	915.25 MHz	P58-59
3.			50	927.25 MHz	P60-61
4.			Hopping	--	P62-63

Band-Edge and Restricted bands:
(Shipped With ANT#2):

No.	Operation	Mode	Channel	Frequency	Data Page
1.	Transmitting	RFID	01	902.75 MHz	P64-65
2.			50	927.25 MHz	P66-67

NOTE 1 – The equation of Emission Level and Margin showed as below:

a). For 30MHz – 1GHz & 1GHz – 4GHz:

Emission Level = Read Level + Antenna Factor + Cable Loss

Margin = Limits - Emission Level.

b). For 4GHz – 10GHz:

Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin = Limits - Emission Level.

NOTE 2 – “QP” means “Quasi-Peak” values.

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The emission levels which not reported are too low against the official limit.

NOTE 5 – The emission levels recorded below is data of EUT configured in Lying direction, for this direction was the maximum emission direction during the test. The data of Side & Standing direction are too low against the official limit to be reported.

NOTE 6 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

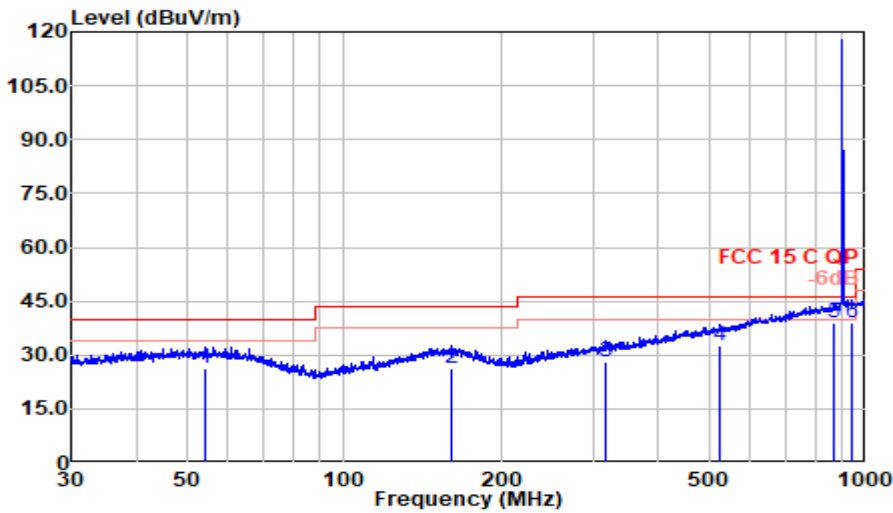
NOTE 7 – The frequency range 608-614MHz & 960-1240MHz were tested for Restricted bands.

Radiated emission < 1GHz

Test Date:	2024.08.20, 2024.09.25	Temp./Hum.:	22°C/51%RH	Test By:	Jarey
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Mode: TX 902.75MHz

With ANT#2

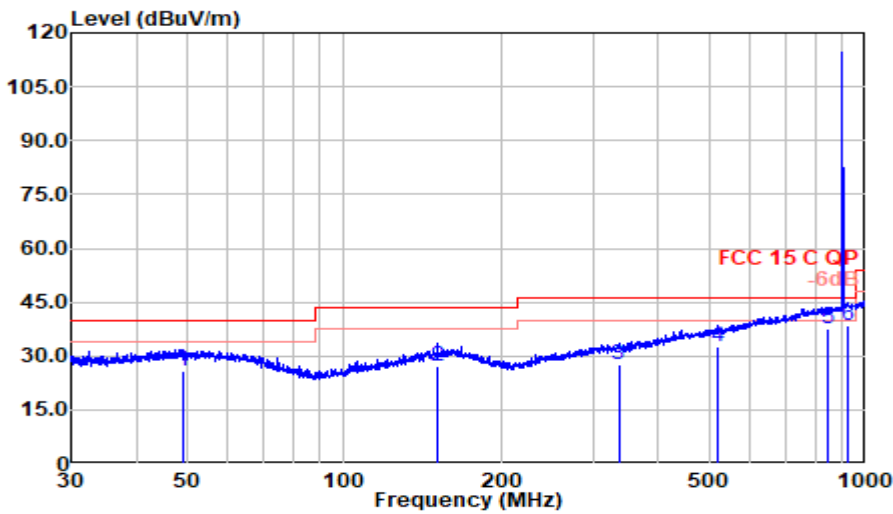


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
54.356	6.02	19.40	0.80	26.23	40.00	13.77	QP
160.627	5.90	19.10	1.40	26.40	43.50	17.10	QP
317.701	6.13	19.81	1.96	27.89	46.00	18.11	QP
524.554	6.28	23.79	2.55	32.62	46.00	13.38	QP
870.655	6.94	28.51	3.36	38.81	46.00	7.19	QP
938.833	6.40	29.40	3.35	39.15	46.00	6.85	QP

Mode: TX 902.75MHz

With ANT#2

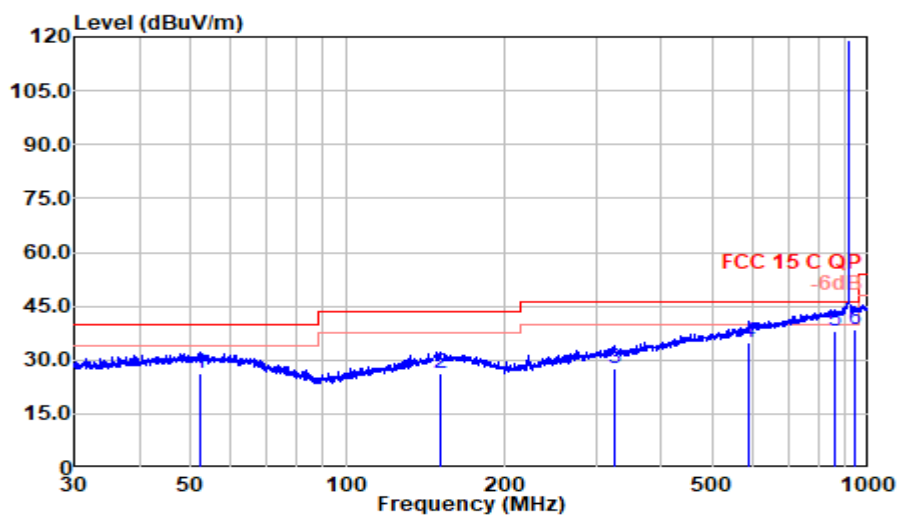


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
49.014	5.38	19.50	0.76	25.64	40.00	14.36	QP
151.332	6.74	19.20	1.35	27.28	43.50	16.22	QP
336.035	5.53	20.18	1.98	27.69	46.00	18.31	QP
519.065	6.18	23.70	2.54	32.42	46.00	13.58	QP
848.056	5.92	28.40	3.30	37.62	46.00	8.38	QP
925.756	5.99	29.30	3.38	38.66	46.00	7.34	QP

Mode: TX 915.25MHz

With ANT#2

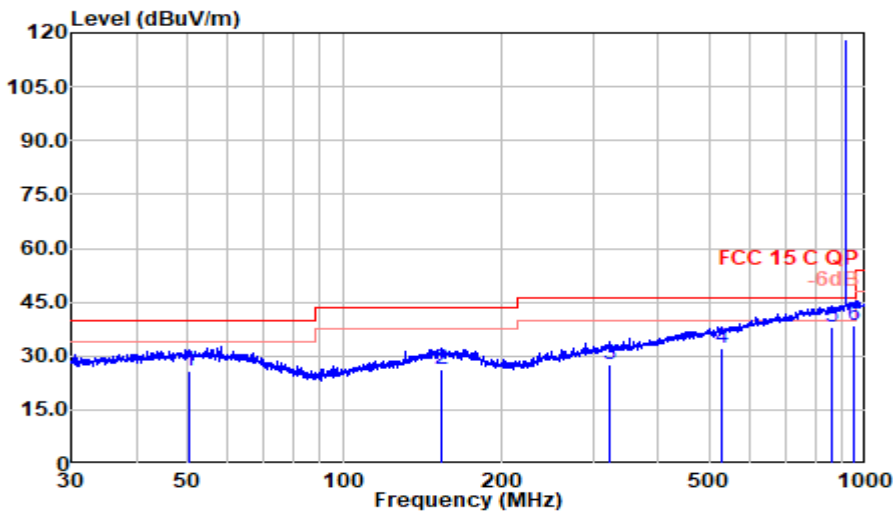


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
52.483	6.06	19.50	0.79	26.35	40.00	13.65	QP
150.802	5.66	19.18	1.34	26.19	43.50	17.31	QP
326.167	5.72	20.10	1.97	27.79	46.00	18.21	QP
588.905	7.18	24.96	2.78	34.91	46.00	11.09	QP
863.056	6.37	28.40	3.34	38.11	46.00	7.89	QP
937.188	5.59	29.40	3.36	38.35	46.00	7.65	QP

Mode: TX 915.25MHz

With ANT#2

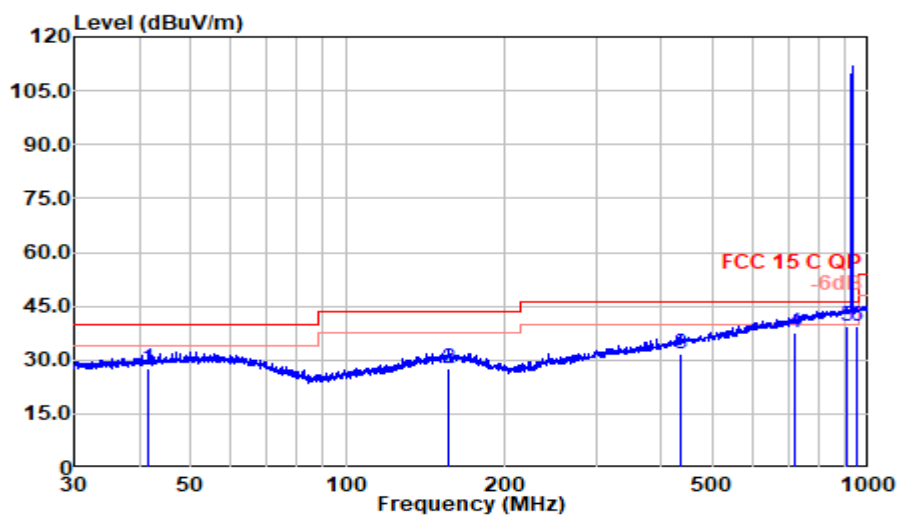


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
50.497	5.33	19.50	0.77	25.60	40.00	14.40	QP
154.279	5.64	19.27	1.36	26.28	43.50	17.22	QP
323.888	5.82	20.06	1.96	27.84	46.00	18.16	QP
527.321	5.66	23.80	2.56	32.01	46.00	13.99	QP
861.544	6.17	28.40	3.34	37.91	46.00	8.09	QP
952.094	5.92	29.40	3.34	38.65	46.00	7.35	QP

Mode: TX 927.75MHz

With ANT#2

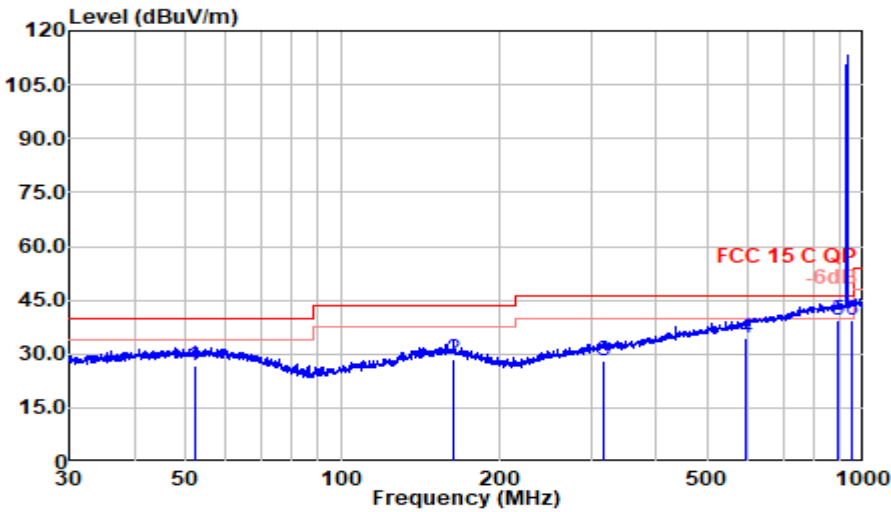


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
41.567	7.73	19.16	0.70	27.59	40.00	12.41	QP
155.910	6.83	19.20	1.37	27.41	43.50	16.09	QP
435.590	6.94	22.51	2.30	31.75	46.00	14.25	QP
719.200	7.62	26.98	2.95	37.55	46.00	8.45	QP
906.482	7.02	28.83	3.42	39.27	46.00	6.73	QP
945.440	6.85	29.40	3.34	39.58	46.00	6.42	QP

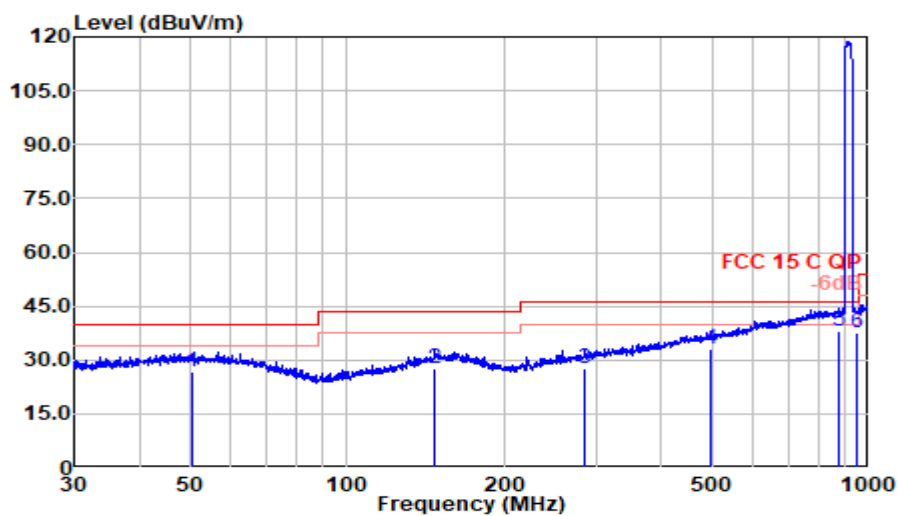
Mode: TX 927.75MHz

With ANT#2



Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
52.116	6.44	19.50	0.79	26.72	40.00	13.28	QP
164.042	7.96	19.00	1.42	28.37	43.50	15.13	QP
318.259	6.45	19.83	1.96	28.24	46.00	17.76	QP
592.011	6.36	25.04	2.79	34.20	46.00	11.80	QP
892.291	7.31	28.65	3.41	39.37	46.00	6.63	QP
948.761	6.61	29.40	3.33	39.34	46.00	6.66	QP

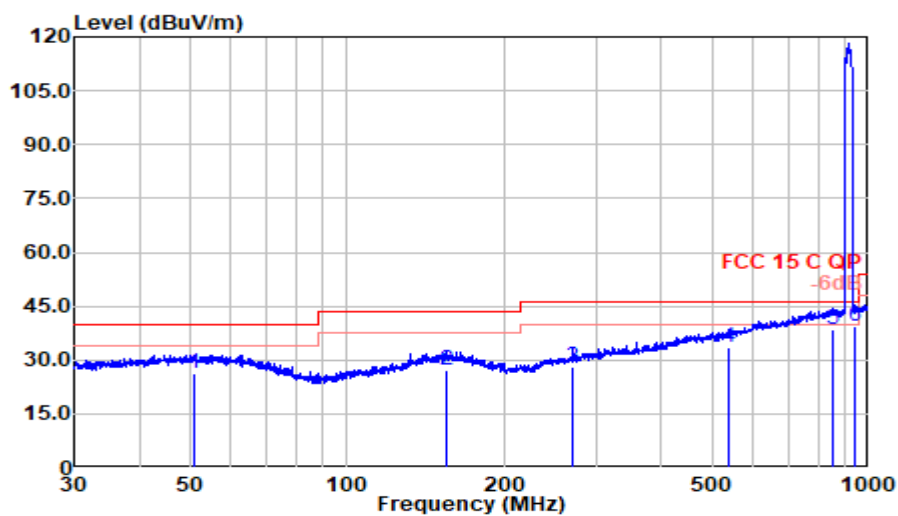
Mode: TX Hopping(902-928)
With ANT#2


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
50.321	6.65	19.50	0.77	26.92	40.00	13.08	QP
147.662	7.08	19.10	1.33	27.51	43.50	15.99	QP
284.977	6.93	18.80	1.89	27.62	46.00	18.38	QP
497.677	7.17	23.40	2.49	33.06	46.00	12.94	QP
878.322	6.18	28.60	3.38	38.16	46.00	7.84	QP
945.440	4.85	29.40	3.34	37.59	46.00	8.41	QP

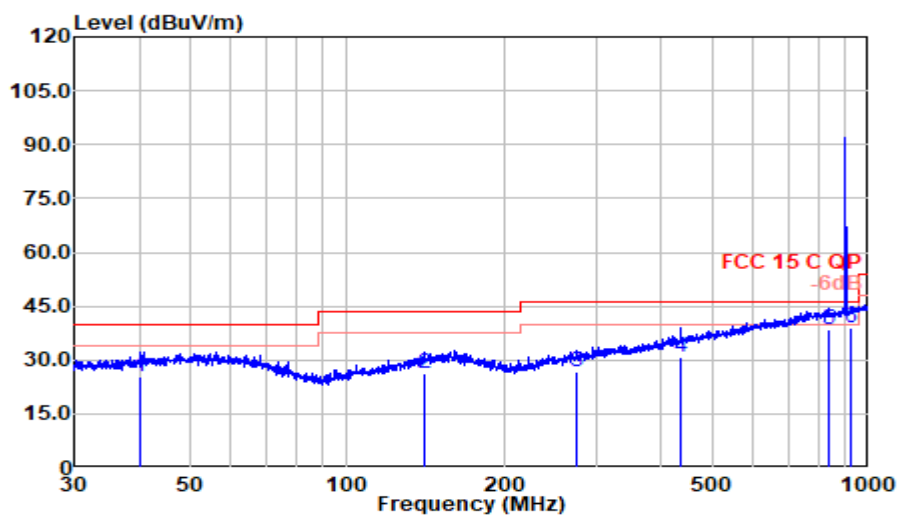
Mode: TX Hopping(902-928)

With ANT#2



Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
50.942	6.03	19.50	0.78	26.31	40.00	13.69	QP
154.549	6.46	19.24	1.37	27.07	43.50	16.43	QP
271.325	7.84	18.35	1.82	28.02	46.00	17.98	QP
537.589	6.79	23.95	2.58	33.32	46.00	12.68	QP
854.025	6.83	28.40	3.32	38.55	46.00	7.45	QP
943.784	6.71	29.40	3.34	39.45	46.00	6.55	QP

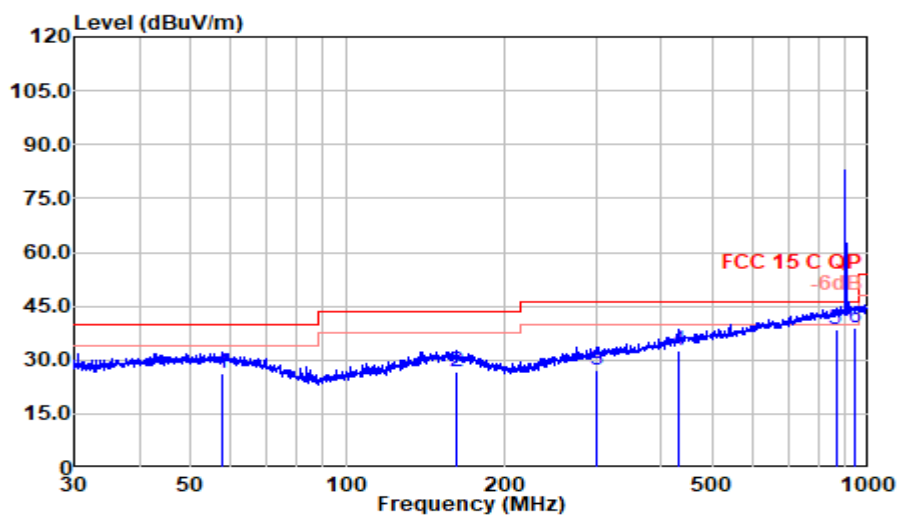
Mode: TX 902.75MHz
With ANT#1


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
40.135	5.54	18.93	0.75	25.21	40.00	14.79	QP
141.082	6.10	18.71	1.39	26.19	43.50	17.31	QP
275.157	6.19	18.51	1.96	26.66	46.00	19.34	QP
435.590	5.76	22.51	2.45	30.72	46.00	15.28	QP
834.779	6.86	28.20	3.37	38.43	46.00	7.57	QP
927.381	5.90	29.30	3.60	38.80	46.00	7.20	QP

Mode: TX 902.75MHz

With ANT#1

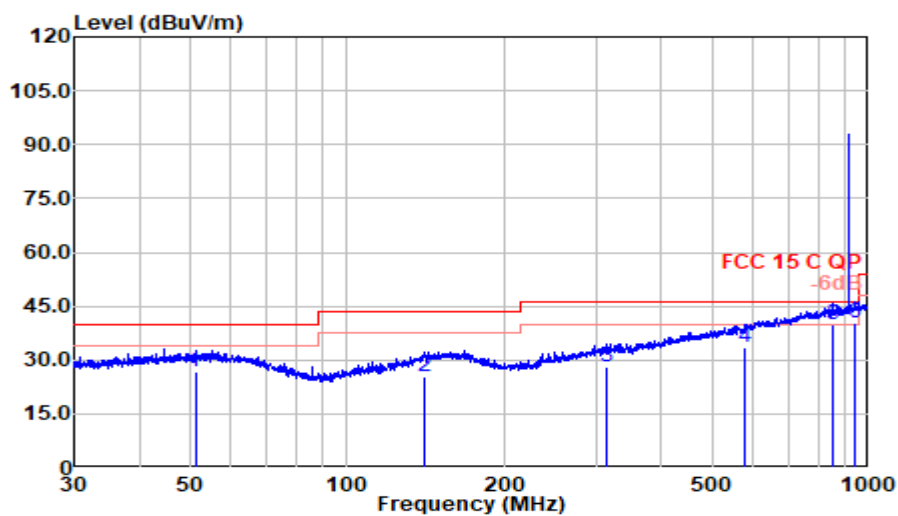


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
57.594	5.93	19.24	0.88	26.05	40.00	13.95	QP
162.611	6.14	19.10	1.48	26.72	43.50	16.78	QP
299.841	6.21	19.10	2.07	27.38	46.00	18.62	QP
431.788	7.61	22.37	2.44	32.42	46.00	13.58	QP
864.571	6.63	28.40	3.46	38.49	46.00	7.51	QP
942.131	5.79	29.40	3.61	38.81	46.00	7.19	QP

Mode: TX 915.25MHz

With ANT#1

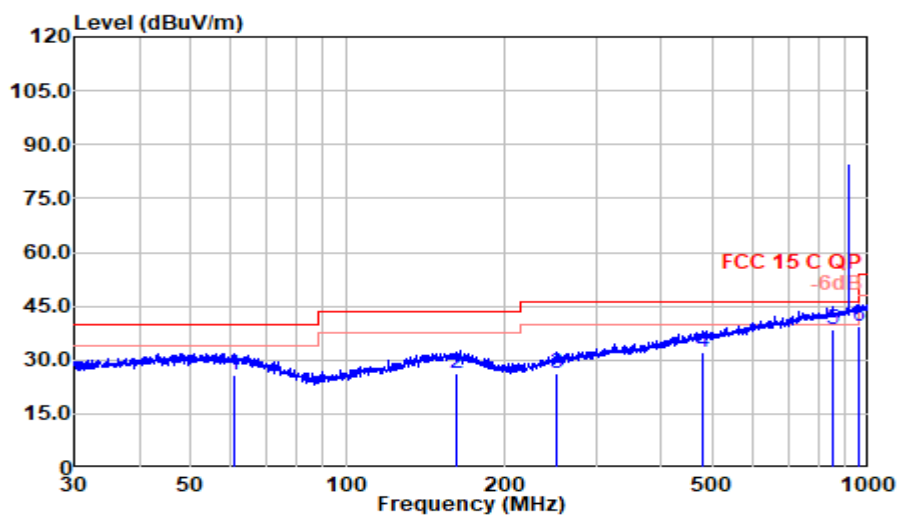


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
51.211	6.31	19.50	0.84	26.65	40.00	13.35	QP
140.342	5.25	18.70	1.38	25.34	43.50	18.16	QP
314.377	6.45	19.68	2.11	28.24	46.00	17.76	QP
577.656	6.15	24.61	2.90	33.66	46.00	12.34	QP
854.025	7.82	28.40	3.43	39.65	46.00	6.35	QP
940.480	7.20	29.40	3.61	40.21	46.00	5.79	QP

Mode: TX 915.25MHz

With ANT#1

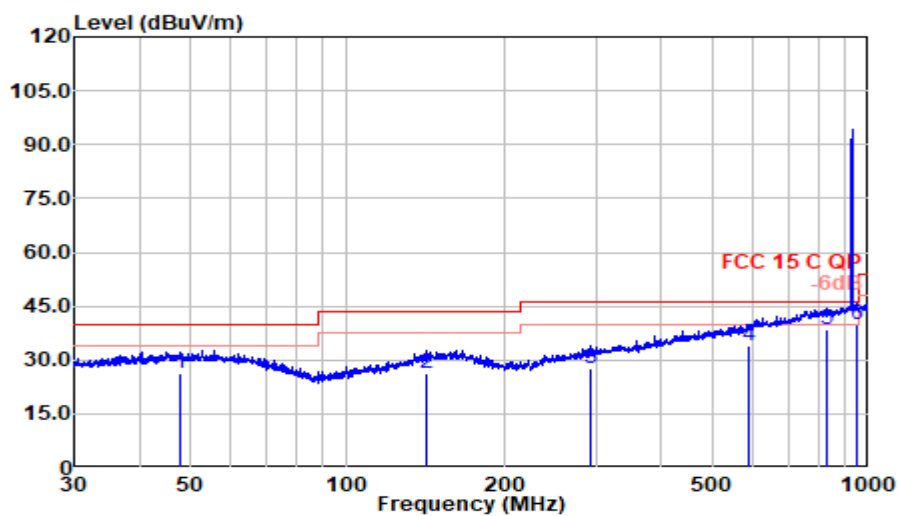


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
60.918	6.02	18.91	0.91	25.84	40.00	14.16	QP
162.611	5.61	19.10	1.48	26.19	43.50	17.31	QP
252.948	6.59	17.70	1.87	26.16	46.00	19.84	QP
481.371	6.23	23.13	2.59	31.95	46.00	14.05	QP
851.035	6.81	28.40	3.42	38.63	46.00	7.37	QP
958.794	6.13	29.40	3.64	39.17	46.00	6.83	QP

Mode: TX 927.25MHz

With ANT#1

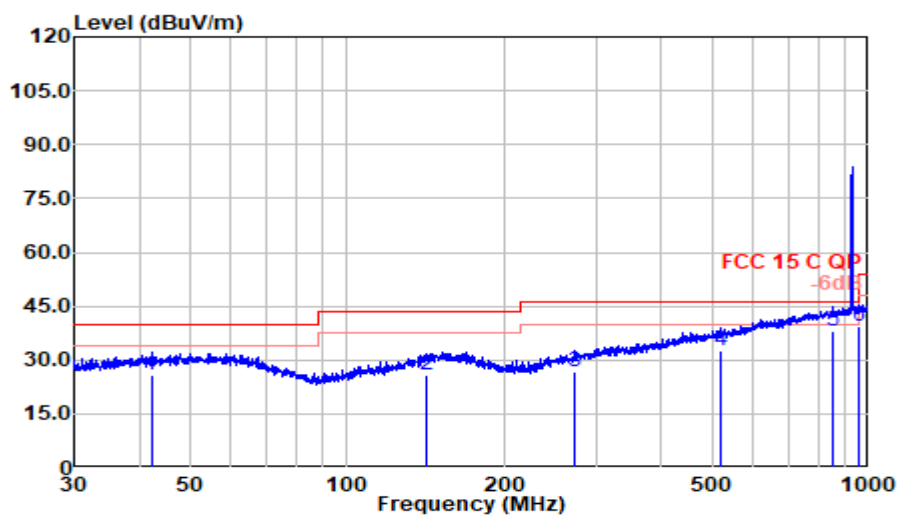


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
47.826	5.94	19.52	0.81	26.27	40.00	13.73	QP
142.574	6.19	18.86	1.39	26.44	43.50	17.06	QP
292.058	6.76	18.94	2.04	27.74	46.00	18.26	QP
588.905	6.18	24.96	2.93	34.07	46.00	11.93	QP
828.946	6.62	28.30	3.35	38.27	46.00	7.73	QP
950.426	6.71	29.40	3.63	39.74	46.00	6.26	QP

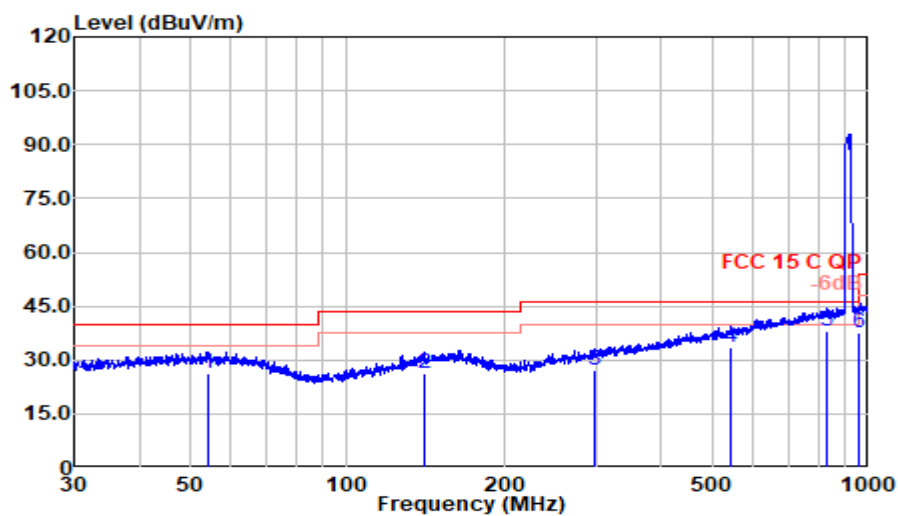
Mode: TX 927.25MHz

With ANT#1



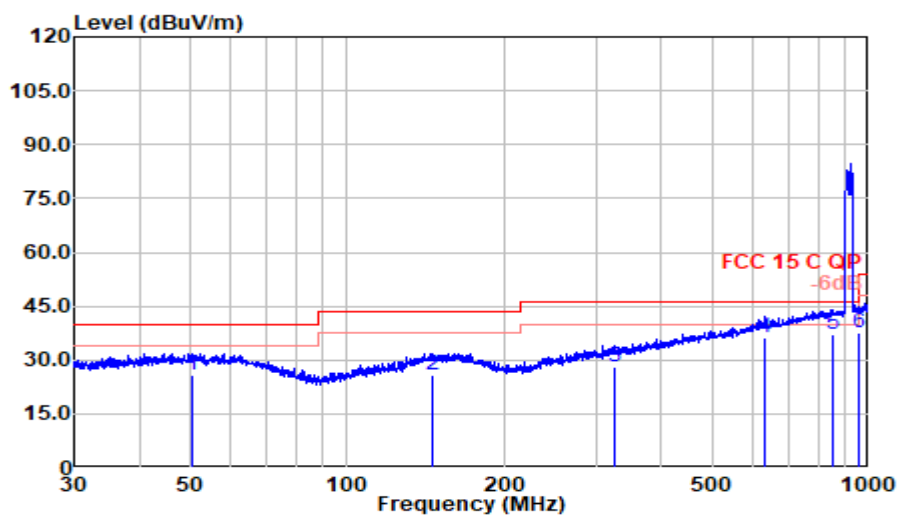
Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
42.154	6.03	19.20	0.77	26.00	40.00	14.00	QP
142.075	5.68	18.81	1.39	25.88	43.50	17.62	QP
272.755	6.22	18.41	1.95	26.58	46.00	19.42	QP
518.156	6.39	23.70	2.71	32.80	46.00	13.20	QP
855.523	6.04	28.40	3.43	37.87	46.00	8.13	QP
953.765	6.26	29.40	3.63	39.29	46.00	6.71	QP

Mode: Hopping(902-928)
With ANT#1


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
54.071	5.97	19.40	0.86	26.23	40.00	13.77	QP
140.588	6.11	18.70	1.38	26.19	43.50	17.31	QP
297.746	6.12	19.06	2.06	27.23	46.00	18.77	QP
542.323	6.79	24.05	2.79	33.62	46.00	12.38	QP
831.857	6.62	28.26	3.36	38.24	46.00	7.76	QP
953.765	4.75	29.40	3.63	37.78	46.00	8.22	QP

Mode: Hopping(902-928)
With ANT#1


Polarization at Vertical

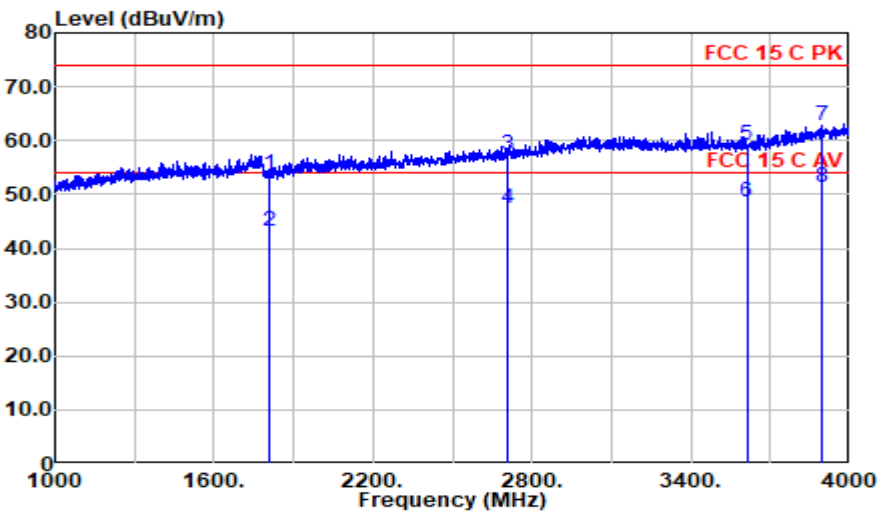
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
50.675	5.45	19.50	0.83	25.78	40.00	14.22	QP
145.351	5.35	19.00	1.41	25.75	43.50	17.75	QP
324.456	5.72	20.08	2.14	27.93	46.00	18.07	QP
630.582	7.13	25.90	3.00	36.03	46.00	9.97	QP
852.529	5.12	28.40	3.42	36.94	46.00	9.06	QP
953.765	4.58	29.40	3.63	37.61	46.00	8.39	QP

Radiated Emission 1GHz to 4GHz

Test Date:	2024.08.20, 2024.09.25	Temp./Hum.:	22°C/51%RH	Test By:	Jarey
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Mode: TX 902.75MHz

With ANT#2

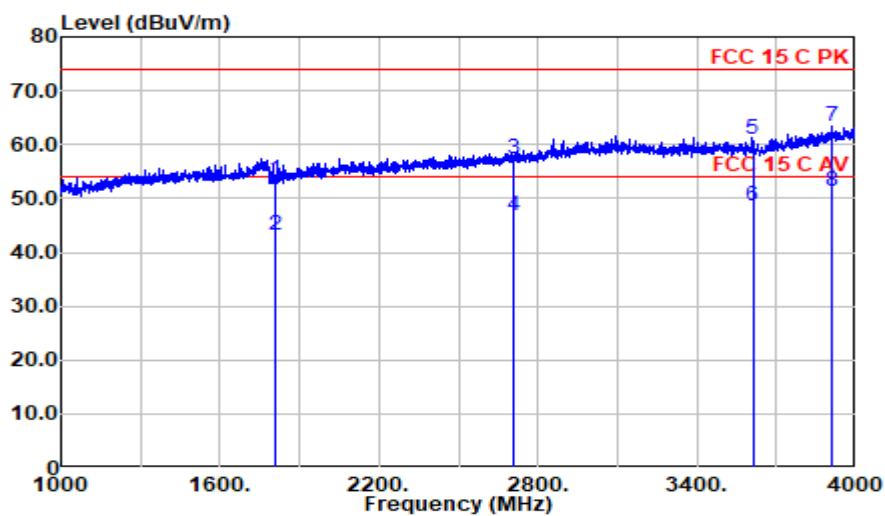


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1805.500	26.23	26.54	0.83	53.61	74.00	20.39	Peak
1805.500	15.88	26.54	0.83	43.26	54.00	10.74	Average
2708.250	27.18	29.18	1.02	57.38	74.00	16.62	Peak
2708.250	17.10	29.18	1.02	47.30	54.00	6.70	Average
3611.000	26.55	31.52	1.19	59.26	74.00	14.74	Peak
3611.000	15.78	31.52	1.19	48.49	54.00	5.51	Average
3894.650	28.83	32.68	1.24	62.75	74.00	11.25	Peak
3894.650	17.37	32.68	1.24	51.29	54.00	2.71	Average

Mode: TX 902.75MHz

With ANT#2

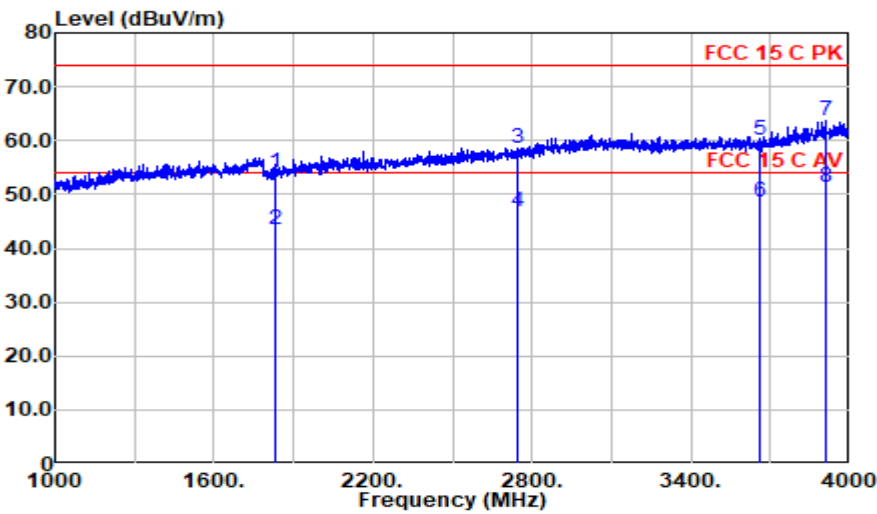


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1805.500	26.20	26.54	0.83	53.58	74.00	20.42	Peak
1805.500	15.69	26.54	0.83	43.07	54.00	10.93	Average
2708.250	27.23	29.18	1.02	57.43	74.00	16.57	Peak
2708.250	16.73	29.18	1.02	46.93	54.00	7.07	Average
3611.000	28.20	31.52	1.19	60.91	74.00	13.09	Peak
3611.000	15.97	31.52	1.19	48.68	54.00	5.32	Average
3908.450	29.40	32.72	1.24	63.36	74.00	10.64	Peak
3908.450	17.45	32.72	1.24	51.41	54.00	2.59	Average

Mode: TX 915.25MHz

With ANT#2

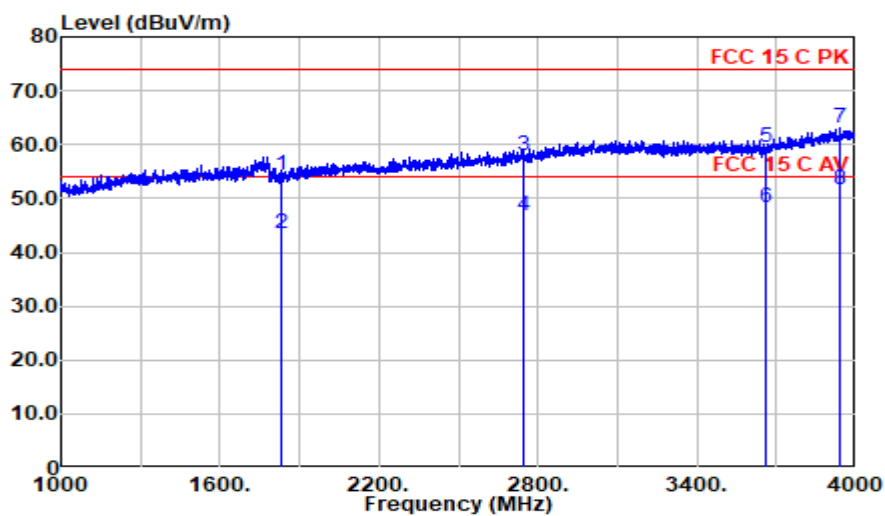


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1830.500	26.33	26.75	0.84	53.92	74.00	20.08	Peak
1830.500	15.92	26.75	0.84	43.50	54.00	10.50	Average
2745.750	28.29	29.11	1.02	58.42	74.00	15.58	Peak
2745.750	16.71	29.11	1.02	46.84	54.00	7.16	Average
3661.000	27.19	31.67	1.20	60.06	74.00	13.94	Peak
3661.000	15.67	31.67	1.20	48.54	54.00	5.46	Average
3911.900	29.61	32.72	1.24	63.58	74.00	10.42	Peak
3911.900	17.38	32.72	1.24	51.35	54.00	2.65	Average

Mode: TX 915.25MHz

With ANT#2

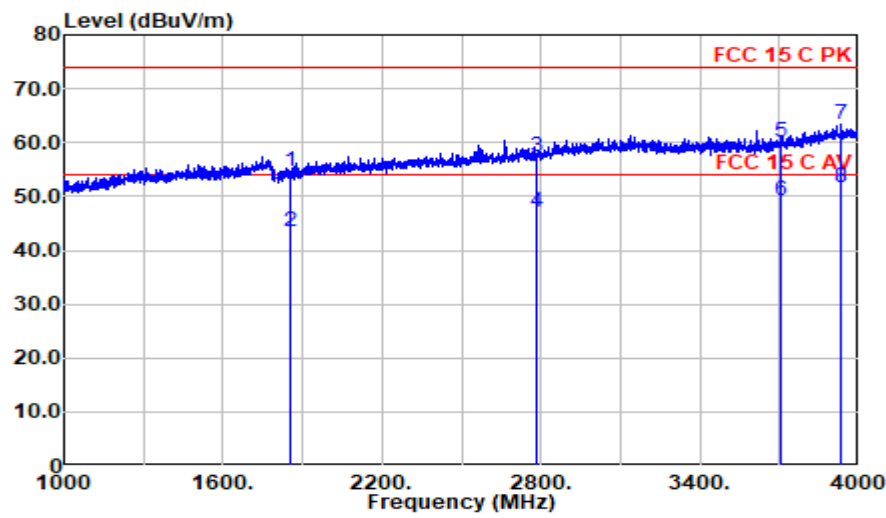


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1830.500	26.63	26.75	0.84	54.22	74.00	19.78	Peak
1830.500	15.74	26.75	0.84	43.32	54.00	10.68	Average
2745.750	27.71	29.11	1.02	57.84	74.00	16.16	Peak
2745.750	16.75	29.11	1.02	46.88	54.00	7.12	Average
3661.000	26.53	31.67	1.20	59.40	74.00	14.60	Peak
3661.000	15.52	31.67	1.20	48.39	54.00	5.61	Average
3940.650	29.19	32.78	1.25	63.22	74.00	10.78	Peak
3940.650	17.47	32.78	1.25	51.50	54.00	2.50	Average

Mode: TX 927.25MHz

With ANT#2

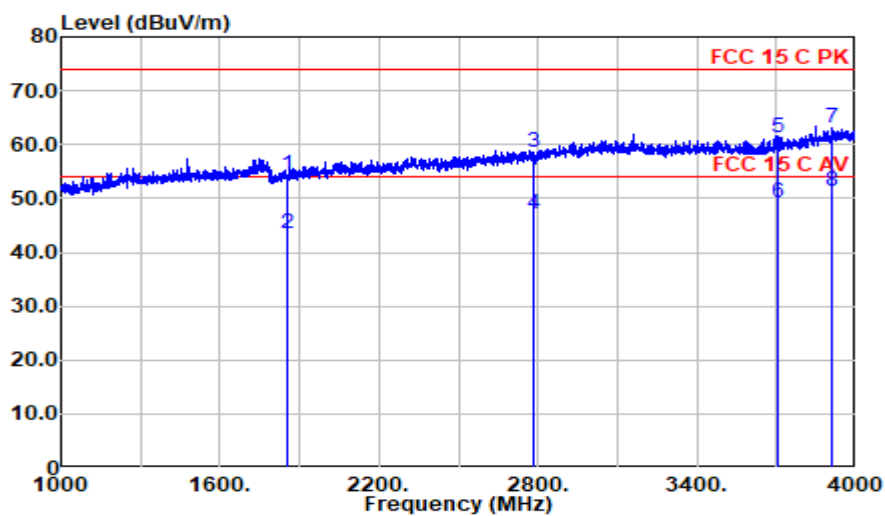


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1854.500	27.00	26.94	0.84	54.78	74.00	19.22	Peak
1854.500	15.68	26.94	0.84	43.46	54.00	10.54	Average
2781.750	27.36	29.10	1.03	57.49	74.00	16.51	Peak
2781.750	16.86	29.10	1.03	46.99	54.00	7.01	Average
3709.000	26.88	31.95	1.21	60.04	74.00	13.96	Peak
3709.000	16.00	31.95	1.21	49.16	54.00	4.84	Average
3931.450	29.48	32.76	1.25	63.49	74.00	10.51	Peak
3931.450	17.50	32.76	1.25	51.51	54.00	2.49	Average

Mode: TX 927.25MHz

With ANT#2

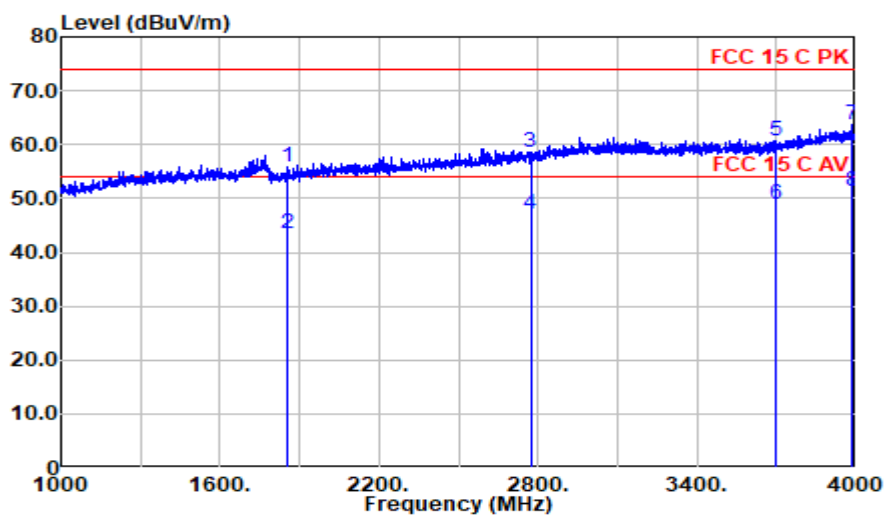


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1854.500	26.43	26.94	0.84	54.21	74.00	19.79	Peak
1854.500	15.68	26.94	0.84	43.46	54.00	10.54	Average
2781.750	28.57	29.10	1.03	58.70	74.00	15.30	Peak
2781.750	16.87	29.10	1.03	47.00	54.00	7.00	Average
3709.000	28.03	31.95	1.21	61.19	74.00	12.81	Peak
3709.000	16.14	31.95	1.21	49.30	54.00	4.70	Average
3907.300	29.18	32.71	1.24	63.14	74.00	10.86	Peak
3907.300	17.47	32.71	1.24	51.43	54.00	2.57	Average

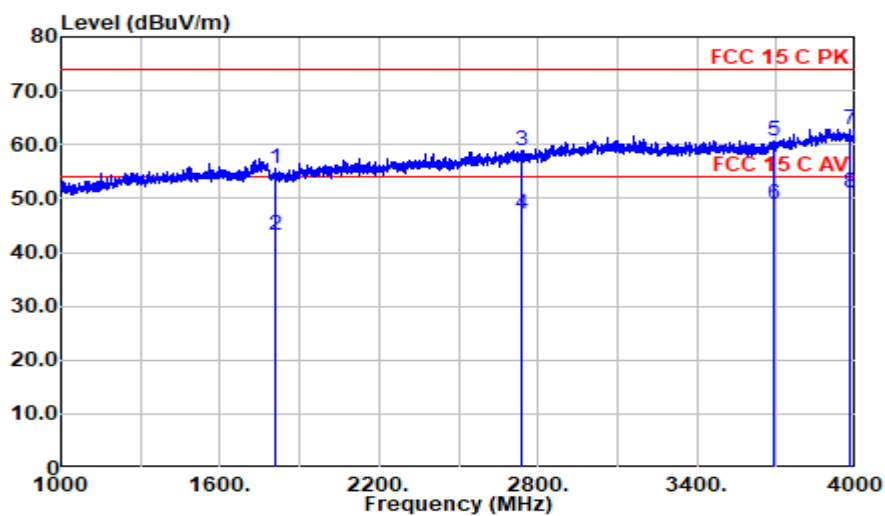
Mode: Hopping(902-928)

With ANT#2



Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1852.250	28.00	26.92	0.84	55.76	74.00	18.24	Peak
1852.250	15.78	26.92	0.84	43.54	54.00	10.46	Average
2772.250	28.56	29.10	1.03	58.68	74.00	15.32	Peak
2772.250	16.84	29.10	1.03	46.97	54.00	7.03	Average
3698.000	27.57	31.89	1.21	60.66	74.00	13.34	Peak
3698.000	15.88	31.89	1.21	48.97	54.00	5.03	Average
3985.500	29.70	32.73	1.26	63.69	74.00	10.31	Peak
3985.500	17.19	32.73	1.26	51.18	54.00	2.82	Average

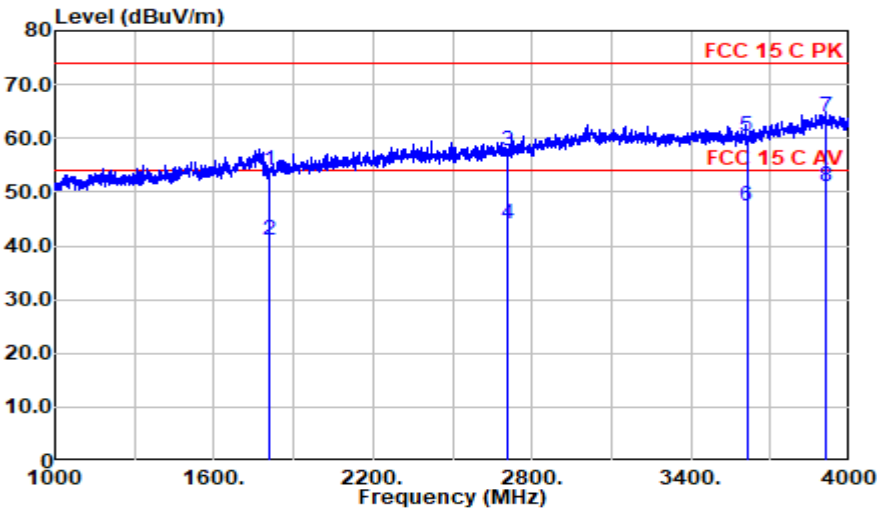
Mode: Hopping(902-928)
With ANT#2


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1810.850	27.99	26.59	0.84	55.41	74.00	18.59	Peak
1810.850	15.81	26.59	0.84	43.23	54.00	10.77	Average
2741.200	28.76	29.12	1.02	58.90	74.00	15.10	Peak
2741.200	16.86	29.12	1.02	47.00	54.00	7.00	Average
3692.250	27.66	31.85	1.21	60.72	74.00	13.28	Peak
3692.250	15.92	31.85	1.21	48.98	54.00	5.02	Average
3977.450	28.93	32.74	1.26	62.93	74.00	11.07	Peak
3977.450	17.09	32.74	1.26	51.09	54.00	2.91	Average

Mode: TX 902.75MHz

With ANT#1

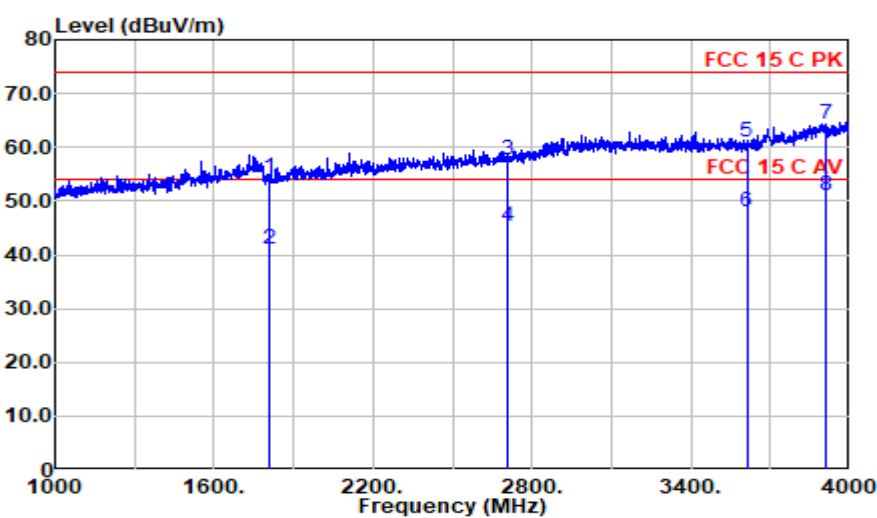


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1805.500	22.60	26.83	4.66	54.09	74.00	19.91	Peak
1805.500	9.56	26.83	4.66	41.05	54.00	12.95	Average
2708.250	23.10	29.17	5.50	57.76	74.00	16.24	Peak
2708.250	9.41	29.17	5.50	44.08	54.00	9.92	Average
3611.000	22.68	31.47	6.29	60.44	74.00	13.56	Peak
3611.000	9.57	31.47	6.29	47.32	54.00	6.68	Average
3913.000	24.53	32.85	6.55	63.94	74.00	10.06	Peak
3913.000	11.75	32.85	6.55	51.15	54.00	2.85	Average

Mode: TX 902.75MHz

With ANT#1

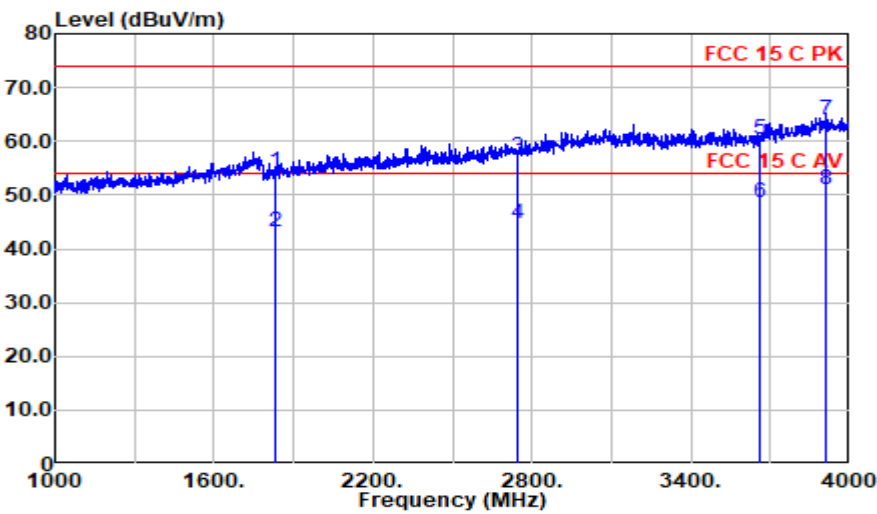


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1805.500	22.89	26.83	4.66	54.38	74.00	19.62	Peak
1805.500	9.49	26.83	4.66	40.98	54.00	13.02	Average
2708.250	23.10	29.17	5.50	57.77	74.00	16.23	Peak
2708.250	10.51	29.17	5.50	45.18	54.00	8.82	Average
3611.000	23.09	31.47	6.29	60.84	74.00	13.16	Peak
3611.000	10.21	31.47	6.29	47.96	54.00	6.04	Average
3907.000	24.90	32.87	6.55	64.32	74.00	9.68	Peak
3907.000	11.59	32.87	6.55	51.01	54.00	2.99	Average

Mode: TX 915.25MHz

With ANT#1

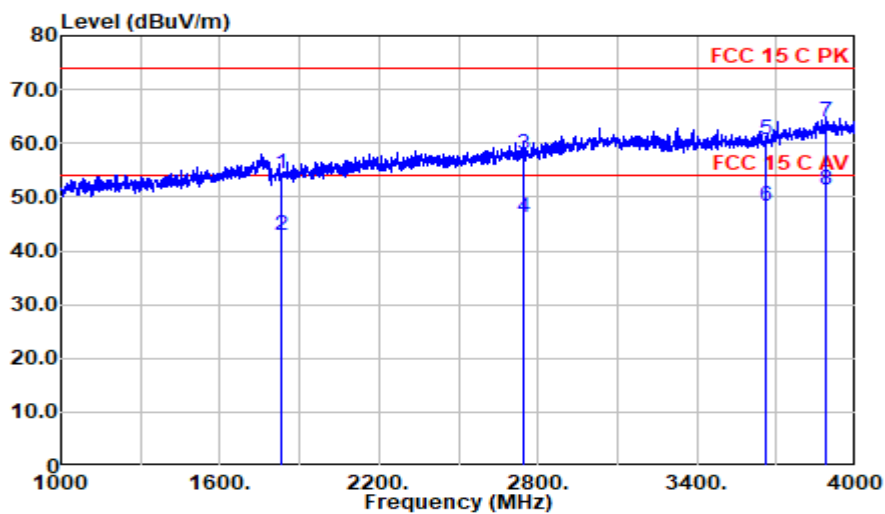


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1830.500	22.71	26.98	4.69	54.38	74.00	19.62	Peak
1830.500	11.43	26.98	4.69	43.10	54.00	10.90	Average
2745.750	22.46	29.02	5.53	57.00	74.00	17.00	Peak
2745.750	10.25	29.02	5.53	44.79	54.00	9.21	Average
3661.000	22.36	31.79	6.33	60.48	74.00	13.52	Peak
3661.000	10.44	31.79	6.33	48.56	54.00	5.44	Average
3908.500	24.71	32.87	6.55	64.13	74.00	9.87	Peak
3908.500	11.47	32.87	6.55	50.89	54.00	3.11	Average

Mode: TX 915.25MHz

With ANT#1

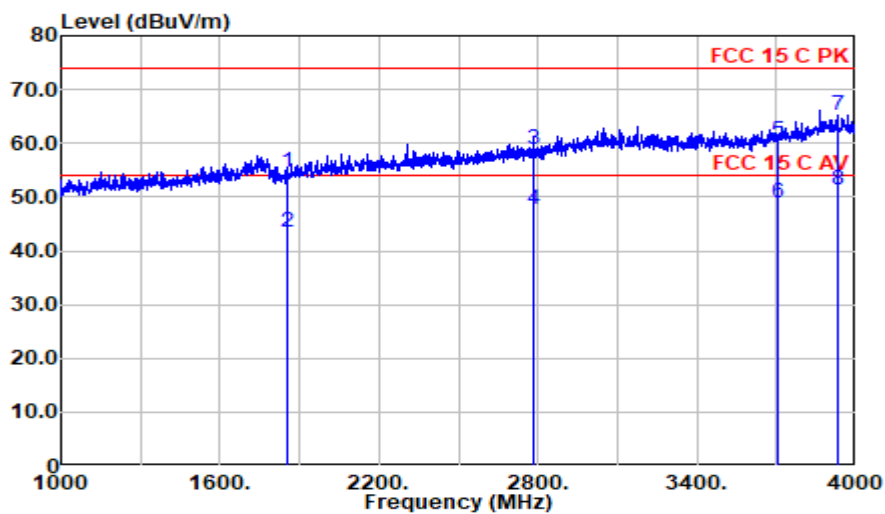


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1830.500	22.58	26.98	4.69	54.25	74.00	19.75	Peak
1830.500	11.26	26.98	4.69	42.93	54.00	11.07	Average
2745.750	23.36	29.02	5.53	57.91	74.00	16.09	Peak
2745.750	11.54	29.02	5.53	46.08	54.00	7.92	Average
3661.000	22.53	31.79	6.33	60.65	74.00	13.35	Peak
3661.000	10.25	31.79	6.33	48.37	54.00	5.63	Average
3889.000	24.62	32.86	6.53	64.01	74.00	9.99	Peak
3889.000	11.96	32.86	6.53	51.35	54.00	2.65	Average

Mode: TX 927.25MHz

With ANT#1

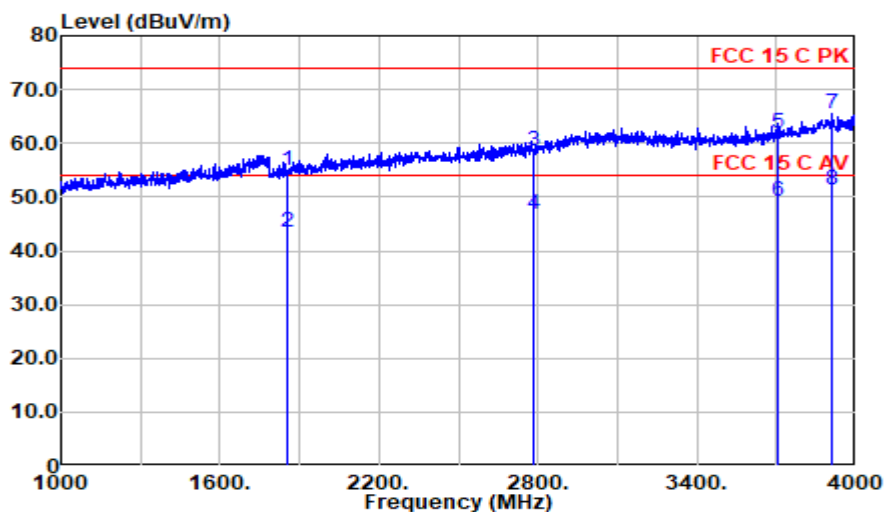


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1854.500	22.64	27.15	4.72	54.50	74.00	19.50	Peak
1854.500	11.46	27.15	4.72	43.32	54.00	10.68	Average
2781.750	24.34	29.00	5.56	58.90	74.00	15.10	Peak
2781.750	13.23	29.00	5.56	47.80	54.00	6.20	Average
3709.000	21.71	32.15	6.37	60.24	74.00	13.76	Peak
3709.000	10.47	32.15	6.37	49.00	54.00	5.00	Average
3929.500	25.78	32.78	6.57	65.13	74.00	8.87	Peak
3929.500	11.98	32.78	6.57	51.33	54.00	2.67	Average

Mode: TX 927.25MHz

With ANT#1

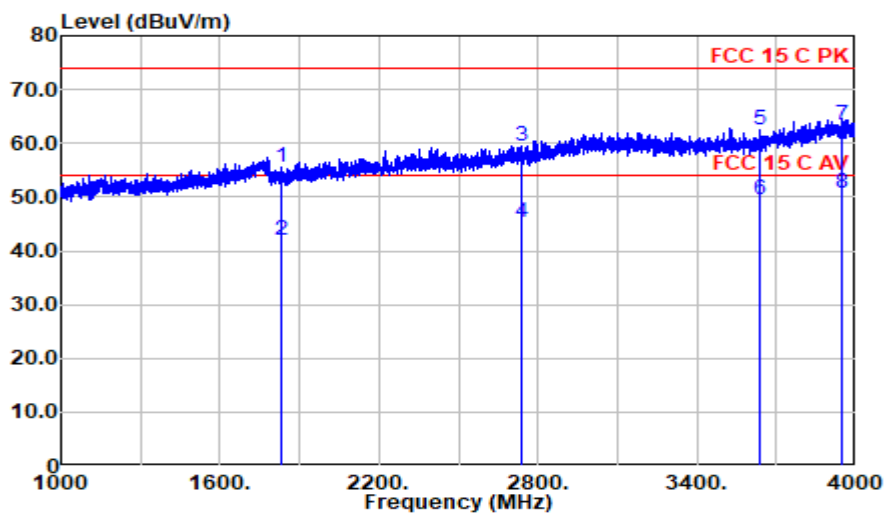


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1854.500	23.16	27.15	4.72	55.02	74.00	18.98	Peak
1854.500	11.52	27.15	4.72	43.38	54.00	10.62	Average
2781.750	24.11	29.00	5.56	58.68	74.00	15.32	Peak
2781.750	12.31	29.00	5.56	46.87	54.00	7.13	Average
3709.000	23.32	32.15	6.37	61.85	74.00	12.15	Peak
3709.000	10.53	32.15	6.37	49.06	54.00	4.94	Average
3911.500	26.00	32.85	6.55	65.40	74.00	8.60	Peak
3911.500	11.85	32.85	6.55	51.26	54.00	2.74	Average

Mode: TX Hopping(902-928)

With ANT#1

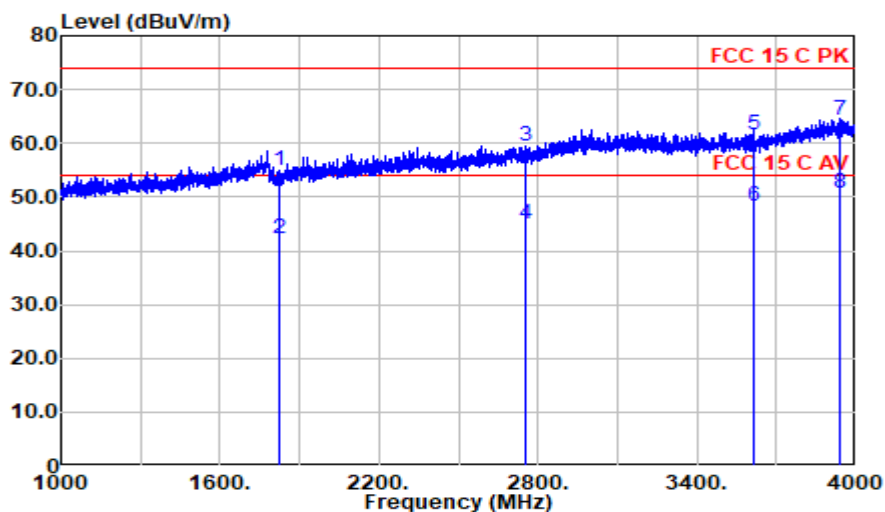


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1834.750	23.82	27.01	4.69	55.52	74.00	18.48	Peak
1834.750	10.38	27.01	4.69	42.08	54.00	11.92	Average
2736.250	24.95	29.05	5.52	59.53	74.00	14.47	Peak
2736.250	10.59	29.05	5.52	45.17	54.00	8.83	Average
3636.250	24.44	31.62	6.31	62.37	74.00	11.63	Peak
3636.250	11.53	31.62	6.31	49.46	54.00	4.54	Average
3945.250	24.24	32.72	6.58	63.54	74.00	10.46	Peak
3945.250	11.52	32.72	6.58	50.82	54.00	3.18	Average

Mode: TX Hopping(902-928)

With ANT#1



Polarization at Vertical

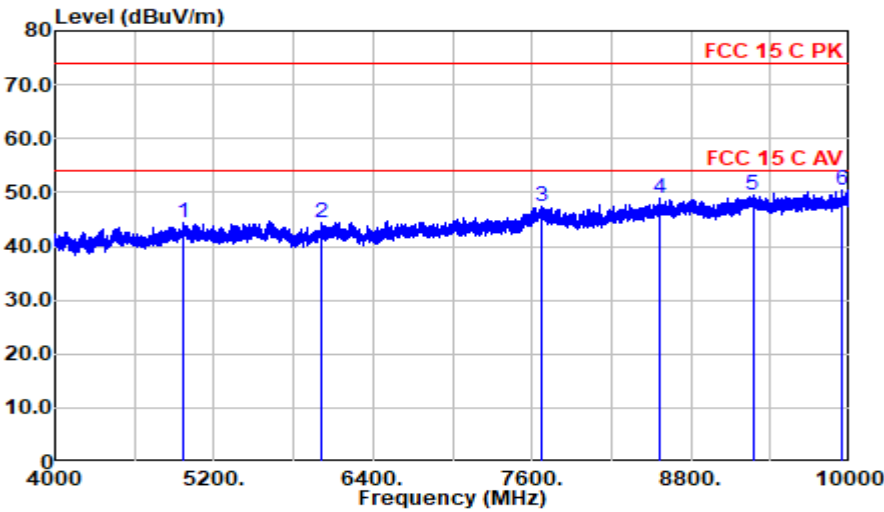
Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
1825.000	23.30	26.95	4.68	54.94	74.00	19.06	Peak
1825.000	10.53	26.95	4.68	42.16	54.00	11.84	Average
2749.750	24.99	29.00	5.53	59.52	74.00	14.48	Peak
2749.750	10.50	29.00	5.53	45.03	54.00	8.97	Average
3616.750	23.71	31.50	6.29	61.50	74.00	12.50	Peak
3616.750	10.57	31.50	6.29	48.36	54.00	5.64	Average
3936.250	24.88	32.75	6.57	64.21	74.00	9.79	Peak
3936.250	11.54	32.75	6.57	50.87	54.00	3.13	Average

Radiated Emission 4GHz to 10GHz

Test Date:	2024.08.20, 2024.09.25	Temp./Hum.:	22°C/51%RH	Test By:	Jarey
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Mode: TX 902.75MHz

With ANT#2

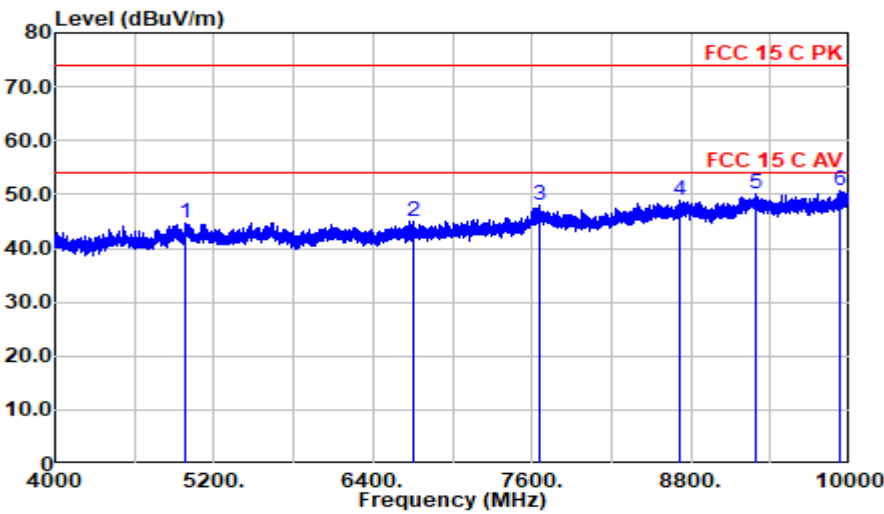


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4962.250	38.69	33.25	7.77	35.32	44.40	74.00	29.60	Peak
6007.750	36.98	34.23	8.43	35.30	44.33	74.00	29.67	Peak
7667.500	36.19	36.80	9.97	35.57	47.39	74.00	26.61	Peak
8571.250	35.81	38.16	10.50	35.60	48.87	74.00	25.13	Peak
9267.250	35.97	38.17	10.86	35.52	49.48	74.00	24.52	Peak
9945.250	35.90	38.40	11.41	35.32	50.40	74.00	23.60	Peak

Mode: TX 902.75MHz

With ANT#2

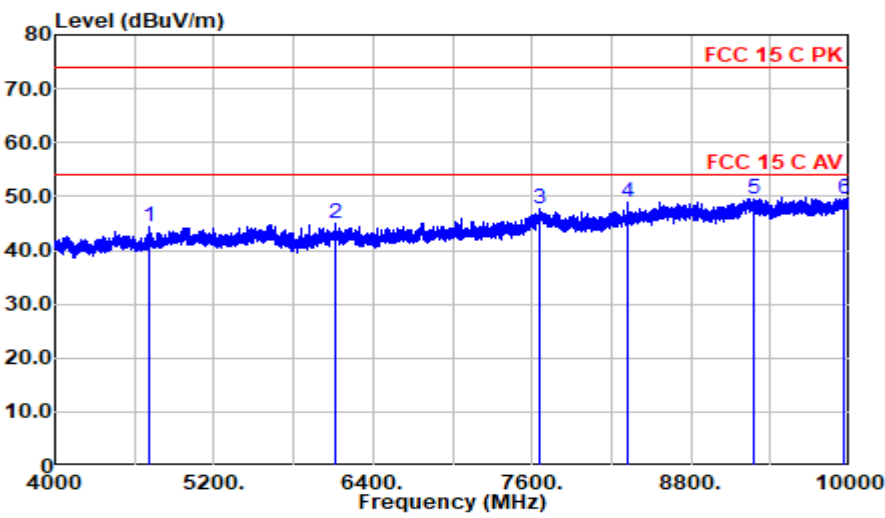


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4985.500	38.91	33.34	7.80	35.31	44.74	74.00	29.26	Peak
6703.750	36.48	35.03	9.02	35.44	45.08	74.00	28.92	Peak
7658.500	36.86	36.80	9.96	35.57	48.05	74.00	25.95	Peak
8718.250	35.92	37.90	10.54	35.60	48.76	74.00	25.24	Peak
9287.500	36.76	38.12	10.87	35.51	50.25	74.00	23.75	Peak
9928.750	36.20	38.40	11.39	35.32	50.67	74.00	23.33	Peak

Mode: TX 915.25MHz

With ANT#2

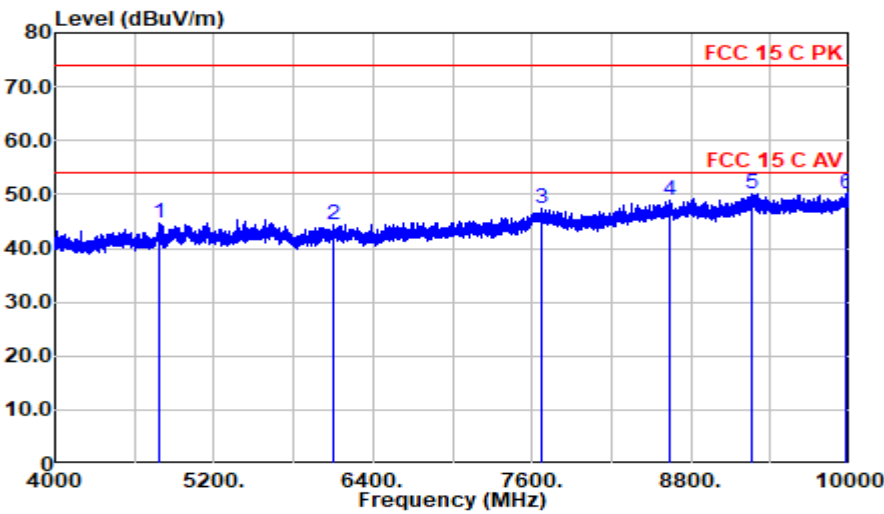


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4710.250	39.82	32.46	7.53	35.46	44.35	74.00	29.65	Peak
6112.750	37.37	34.47	8.52	35.32	45.04	74.00	28.96	Peak
7660.000	36.51	36.80	9.97	35.57	47.71	74.00	26.29	Peak
8325.250	36.15	38.00	10.42	35.60	48.96	74.00	25.04	Peak
9279.250	36.09	38.14	10.87	35.51	49.58	74.00	24.42	Peak
9955.750	35.14	38.39	11.42	35.31	49.63	74.00	24.37	Peak

Mode: TX 915.25MHz

With ANT#2

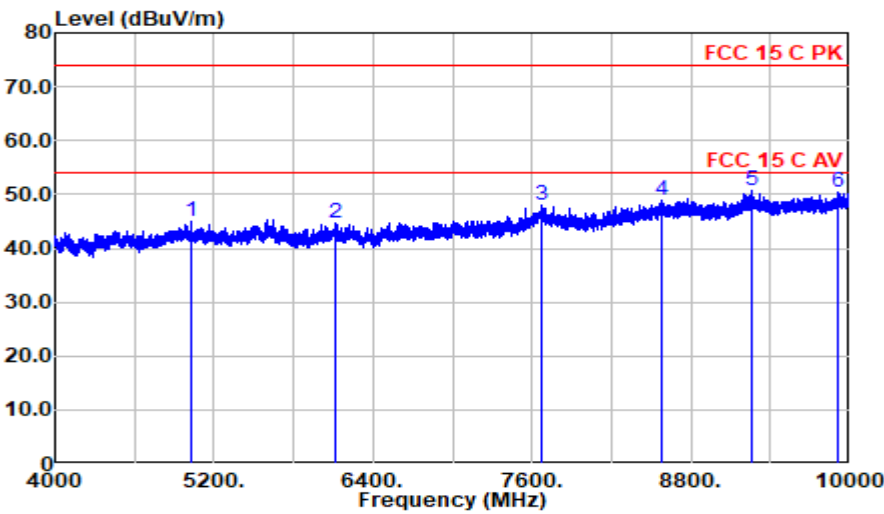


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4785.250	39.53	32.84	7.60	35.42	44.55	74.00	29.45	Peak
6097.750	36.82	34.50	8.51	35.32	44.50	74.00	29.50	Peak
7676.500	36.05	36.80	9.98	35.57	47.27	74.00	26.73	Peak
8647.000	35.92	38.10	10.52	35.60	48.94	74.00	25.06	Peak
9253.750	36.70	38.19	10.85	35.52	50.22	74.00	23.78	Peak
9975.250	35.79	38.35	11.43	35.31	50.26	74.00	23.74	Peak

Mode: TX 927.25MHz

With ANT#2

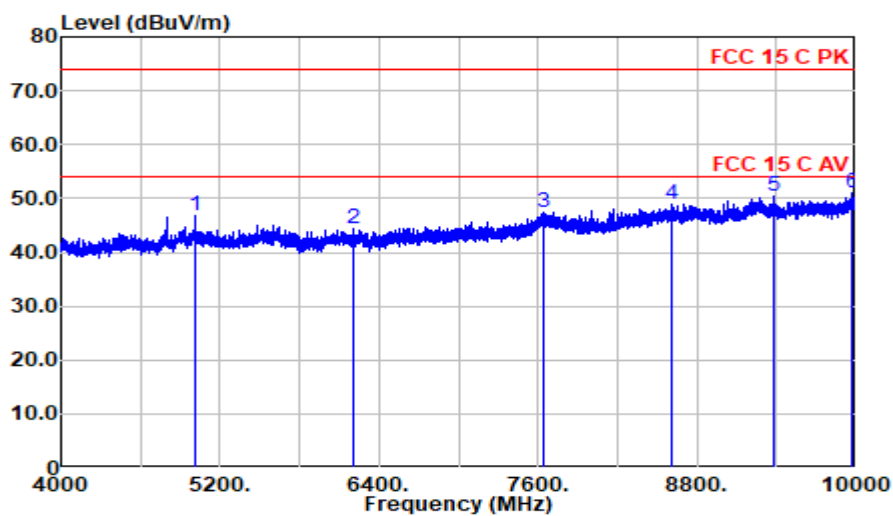


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
5024.500	38.90	33.45	7.83	35.30	44.88	74.00	29.12	Peak
6109.750	36.92	34.48	8.52	35.32	44.59	74.00	29.41	Peak
7671.250	36.72	36.80	9.98	35.57	47.93	74.00	26.07	Peak
8574.250	35.95	38.15	10.50	35.60	49.00	74.00	25.00	Peak
9256.000	37.28	38.19	10.85	35.52	50.80	74.00	23.20	Peak
9916.750	36.05	38.40	11.38	35.32	50.51	74.00	23.49	Peak

Mode: TX 927.25MHz

With ANT#2

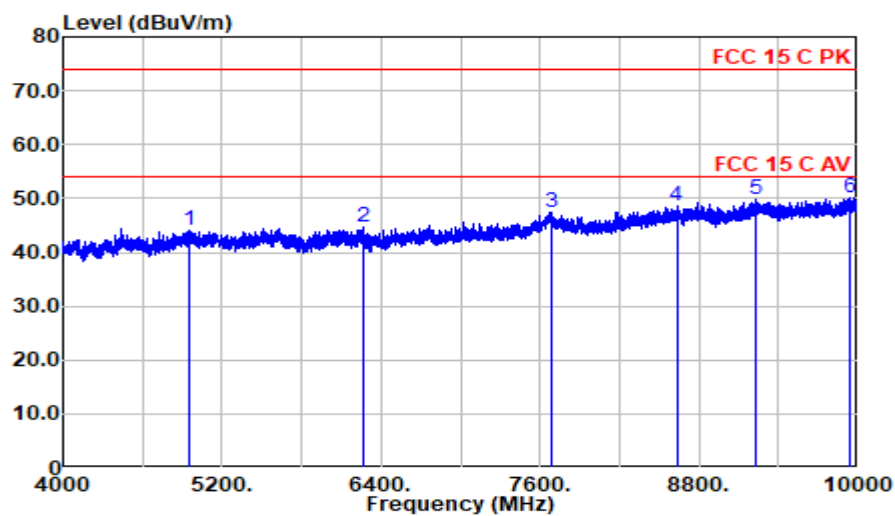


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
5010.250	40.71	33.42	7.82	35.30	46.64	74.00	27.36	Peak
6211.750	36.49	34.62	8.61	35.35	44.38	74.00	29.62	Peak
7648.750	36.18	36.80	9.95	35.57	47.37	74.00	26.63	Peak
8616.250	35.86	38.10	10.51	35.60	48.88	74.00	25.12	Peak
9376.750	36.74	38.11	10.95	35.48	50.31	74.00	23.69	Peak
9964.750	36.39	38.37	11.42	35.31	50.87	74.00	23.13	Peak

Mode: TX Hopping(902-928)

With ANT#2

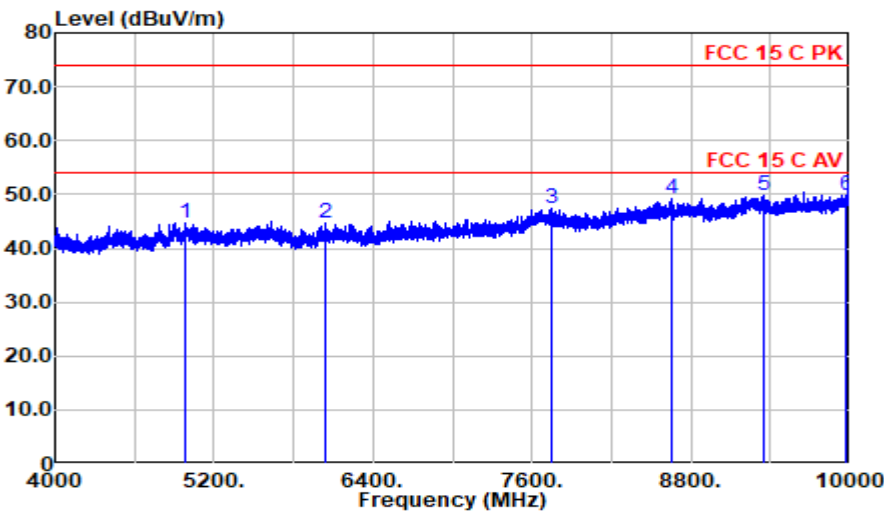


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4949.500	38.43	33.20	7.76	35.33	44.06	74.00	29.94	Peak
6272.500	36.64	34.70	8.66	35.36	44.65	74.00	29.35	Peak
7687.000	36.25	36.80	9.99	35.57	47.47	74.00	26.53	Peak
8632.750	35.55	38.10	10.52	35.60	48.57	74.00	25.43	Peak
9232.000	36.29	38.24	10.83	35.53	49.83	74.00	24.17	Peak
9946.750	35.56	38.40	11.41	35.32	50.06	74.00	23.94	Peak

Mode: TX Hopping(902-928)

With ANT#2

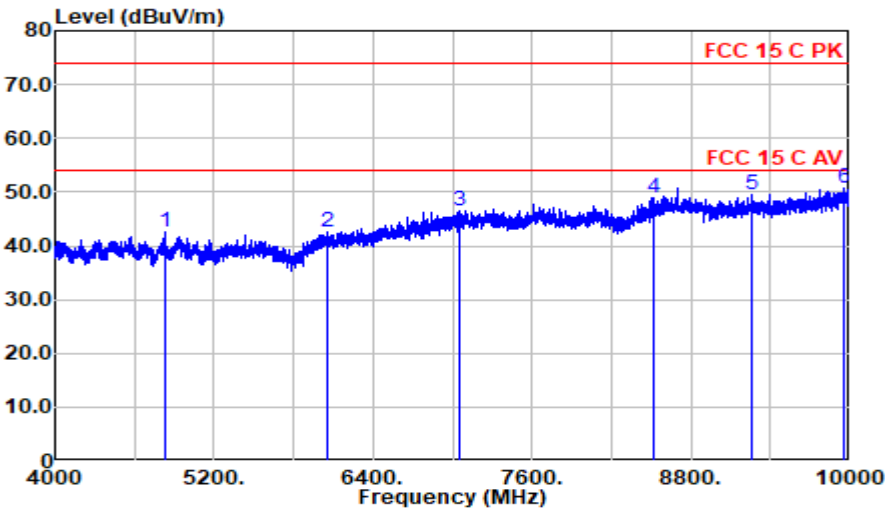


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4989.250	38.96	33.36	7.80	35.31	44.81	74.00	29.19	Peak
6038.500	37.07	34.35	8.45	35.31	44.57	74.00	29.43	Peak
7748.500	36.15	36.90	10.06	35.58	47.53	74.00	26.47	Peak
8660.500	36.10	38.06	10.53	35.60	49.08	74.00	24.92	Peak
9346.750	36.46	38.01	10.92	35.49	49.90	74.00	24.10	Peak
9973.750	35.48	38.35	11.43	35.31	49.96	74.00	24.04	Peak

Mode: TX 902.75MHz

With ANT#1

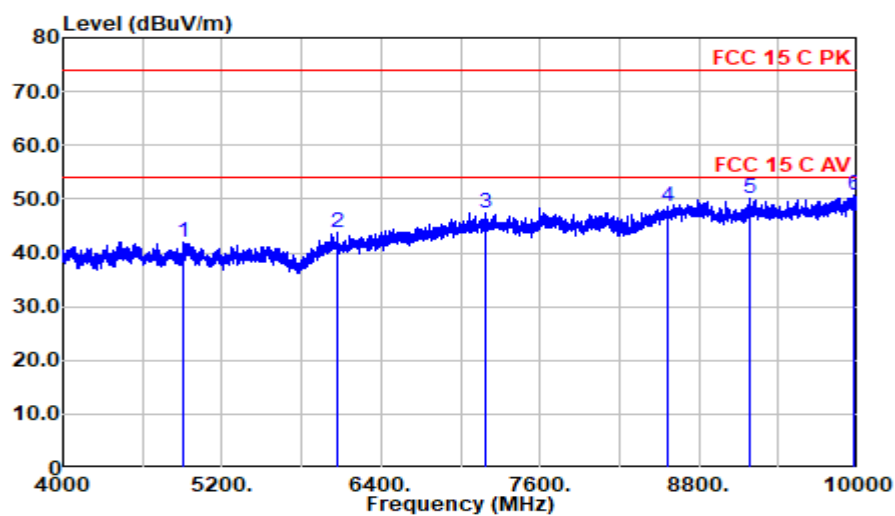


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4831.000	37.21	33.24	7.50	35.39	42.56	74.00	31.44	Peak
6052.000	35.29	34.39	8.33	35.31	42.70	74.00	31.30	Peak
7049.500	37.20	35.60	9.18	35.51	46.48	74.00	27.52	Peak
8525.500	35.63	38.40	10.36	35.60	48.78	74.00	25.22	Peak
9263.500	36.25	38.17	10.73	35.52	49.63	74.00	24.37	Peak
9949.000	36.21	38.49	11.29	35.31	50.67	74.00	23.33	Peak

Mode: TX 902.75MHz

With ANT#1

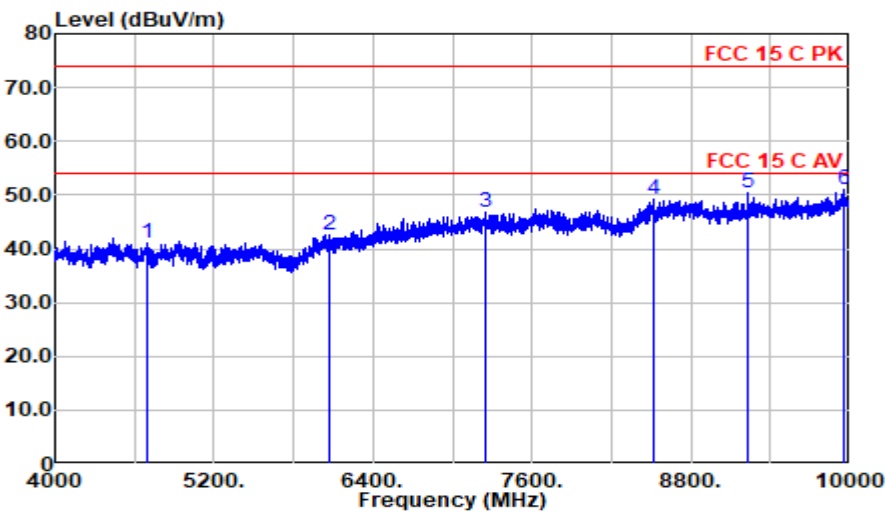


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4910.500	36.26	33.34	7.59	35.35	41.84	74.00	32.16	Peak
6076.000	36.32	34.30	8.35	35.32	43.65	74.00	30.35	Peak
7195.000	37.45	36.18	9.34	35.52	47.45	74.00	26.55	Peak
8567.500	35.48	38.40	10.37	35.60	48.66	74.00	25.34	Peak
9187.000	36.78	38.25	10.66	35.54	50.16	74.00	23.84	Peak
9976.000	36.20	38.50	11.31	35.31	50.71	74.00	23.29	Peak

Mode: TX 915.25MHz

With ANT#1

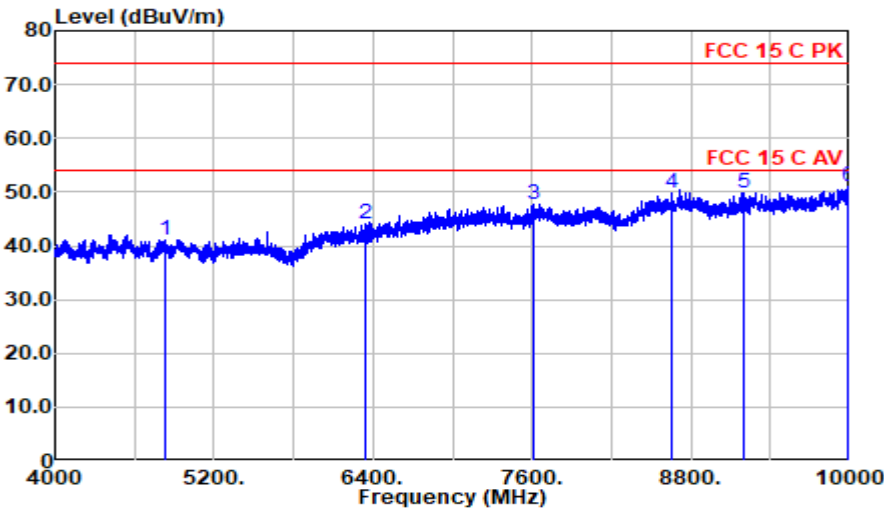


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4702.000	36.52	32.50	7.37	35.47	40.92	74.00	33.08	Peak
6077.500	35.22	34.29	8.36	35.32	42.54	74.00	31.46	Peak
7253.500	36.21	36.62	9.40	35.53	46.70	74.00	27.30	Peak
8521.000	36.00	38.40	10.36	35.60	49.16	74.00	24.84	Peak
9224.500	36.90	38.20	10.69	35.53	50.27	74.00	23.73	Peak
9952.000	36.44	38.50	11.29	35.31	50.92	74.00	23.08	Peak

Mode: TX 915.25MHz

With ANT#1

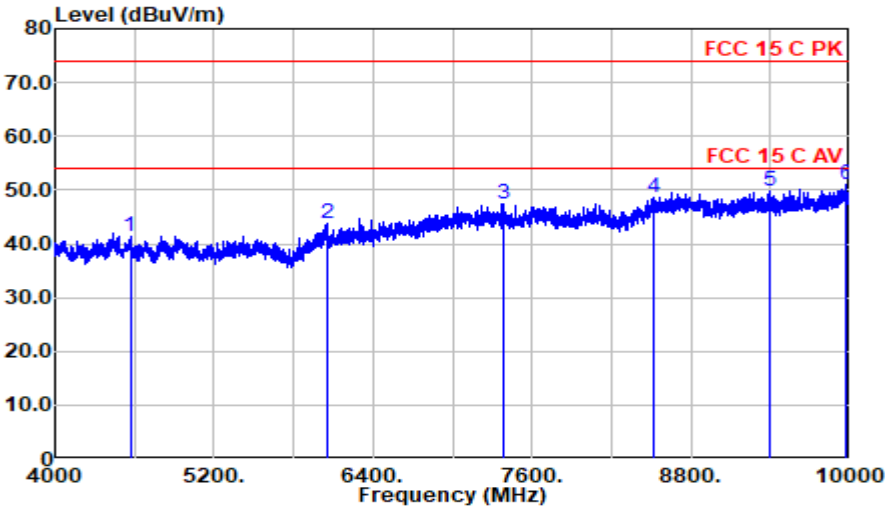


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4825.000	35.84	33.25	7.50	35.40	41.19	74.00	32.81	Peak
6341.500	36.32	34.60	8.58	35.37	44.13	74.00	29.87	Peak
7619.500	36.57	37.00	9.79	35.56	47.80	74.00	26.20	Peak
8654.500	36.71	38.42	10.40	35.60	49.93	74.00	24.07	Peak
9202.000	36.62	38.20	10.68	35.54	49.96	74.00	24.04	Peak
9991.000	36.54	38.50	11.32	35.30	51.06	74.00	22.94	Peak

Mode: TX 927.75MHz

With ANT#1

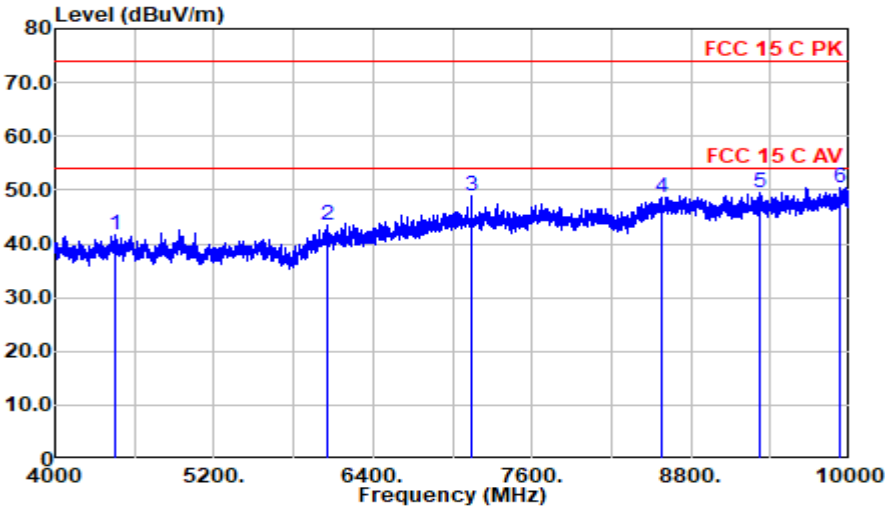


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4567.000	37.27	32.47	7.23	35.54	41.42	74.00	32.58	Peak
6052.000	36.49	34.39	8.33	35.31	43.90	74.00	30.10	Peak
7388.500	36.47	36.98	9.54	35.54	47.44	74.00	26.56	Peak
8512.000	35.47	38.40	10.35	35.60	48.63	74.00	25.37	Peak
9397.000	36.17	38.38	10.84	35.48	49.91	74.00	24.09	Peak
9970.000	36.42	38.50	11.31	35.31	50.92	74.00	23.08	Peak

Mode: TX 927.75MHz

With ANT#1

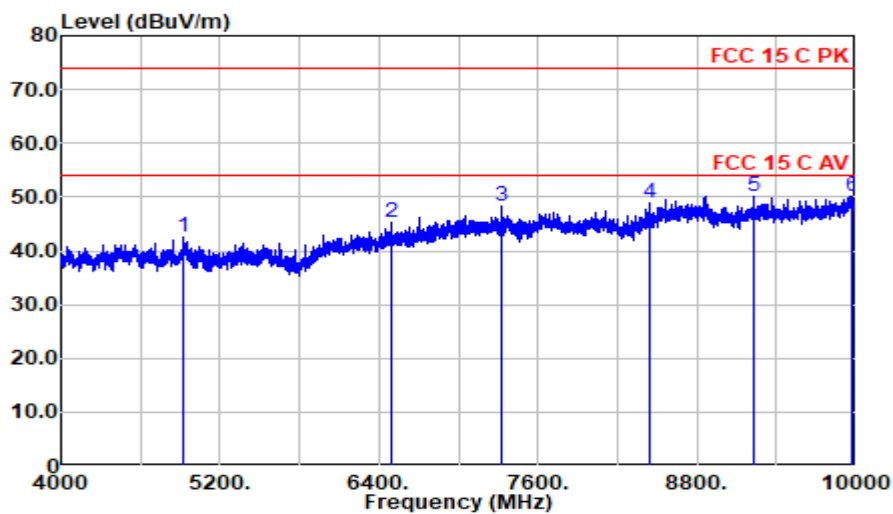


Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4450.000	37.63	32.50	7.10	35.61	41.62	74.00	32.38	Peak
6059.500	35.97	34.36	8.34	35.31	43.36	74.00	30.64	Peak
7144.000	39.08	35.99	9.28	35.52	48.84	74.00	25.16	Peak
8584.000	35.35	38.40	10.38	35.60	48.53	74.00	25.47	Peak
9326.500	36.18	38.10	10.78	35.50	49.56	74.00	24.44	Peak
9926.500	36.03	38.31	11.27	35.32	50.29	74.00	23.71	Peak

Mode: TX Hopping(902-928)

With ANT#1

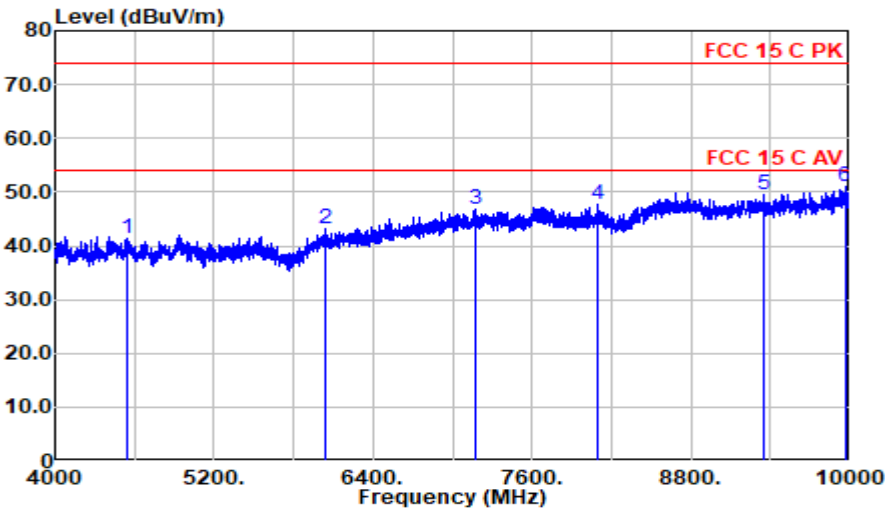


Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4928.500	36.77	33.41	7.60	35.34	42.45	74.00	31.55	Peak
6497.500	37.42	34.60	8.71	35.40	45.32	74.00	28.68	Peak
7327.000	37.37	36.90	9.48	35.53	48.21	74.00	25.79	Peak
8440.000	35.82	38.22	10.33	35.60	48.77	74.00	25.23	Peak
9233.500	36.88	38.20	10.70	35.53	50.25	74.00	23.75	Peak
9973.000	35.54	38.50	11.31	35.31	50.04	74.00	23.96	Peak

Mode: TX Hopping(902-928)

With ANT#1



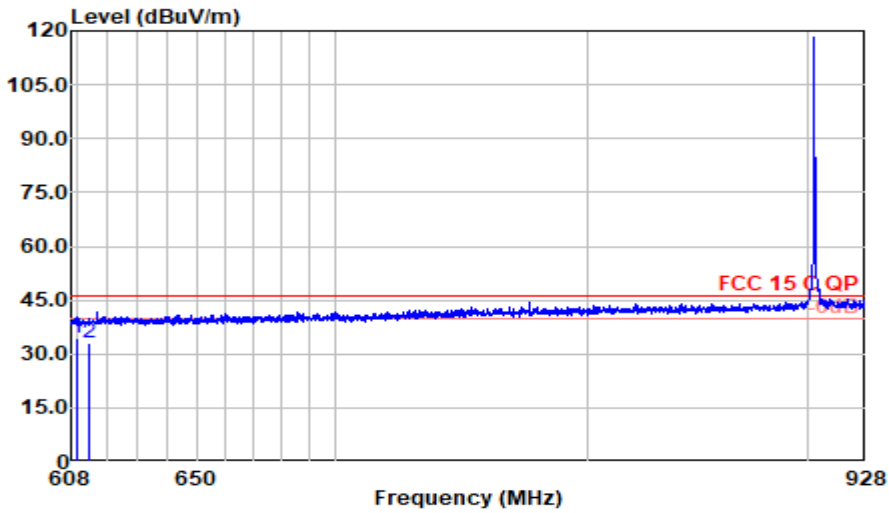
Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
4538.500	37.33	32.52	7.20	35.56	41.49	74.00	32.51	Peak
6043.000	35.78	34.37	8.33	35.31	43.17	74.00	30.83	Peak
7168.000	36.95	36.07	9.31	35.52	46.81	74.00	27.19	Peak
8101.000	35.59	37.60	10.22	35.60	47.81	74.00	26.19	Peak
9352.000	36.00	38.11	10.80	35.49	49.42	74.00	24.58	Peak
9962.500	36.58	38.50	11.30	35.31	51.07	74.00	22.93	Peak

Band-Edge and Restricted bands:

Test Date:	2024.08.20	Temp./Hum.:	22°C/51%RH	Test By:	Jarey
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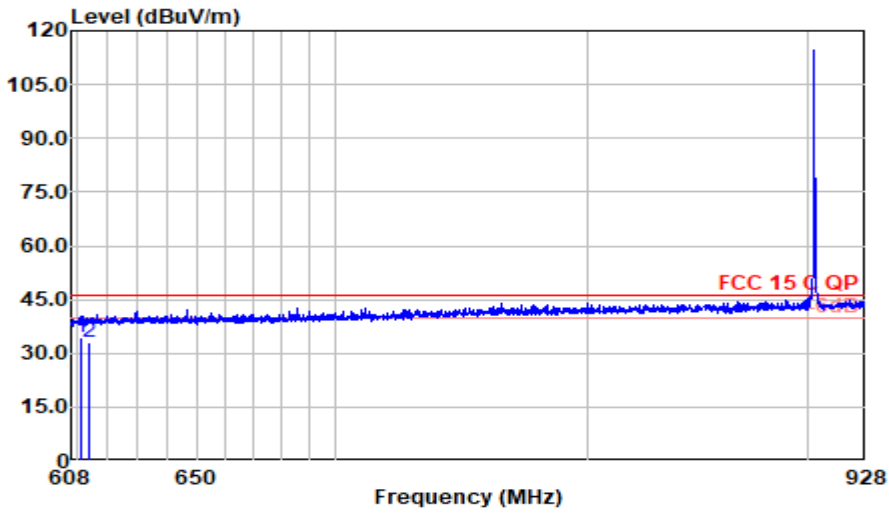
Mode: TX 902.75MHz



Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
609.673	5.79	25.59	2.84	34.22	46.00	11.78	QP
614.000	4.59	25.76	2.84	33.19	46.00	12.81	QP

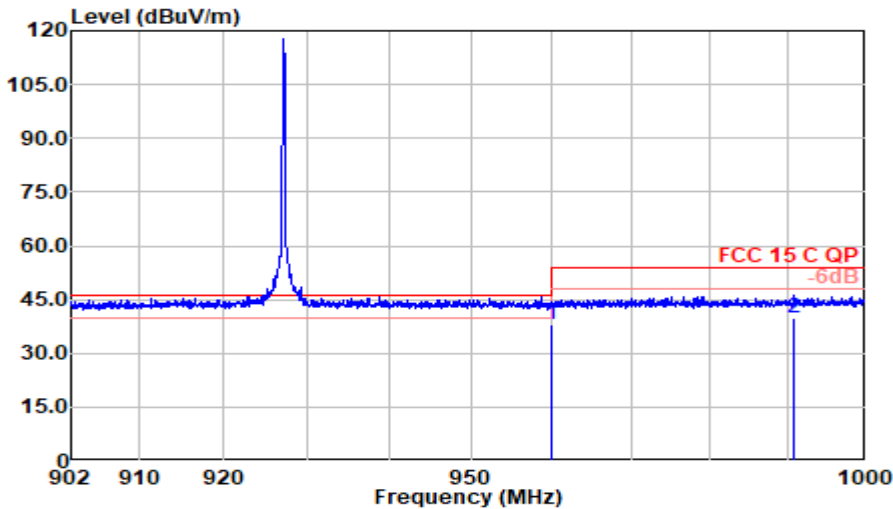
Mode: TX 902.75MHz



Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
611.222	5.90	25.65	2.84	34.38	46.00	11.62	QP
614.000	4.45	25.76	2.84	33.05	46.00	12.95	QP

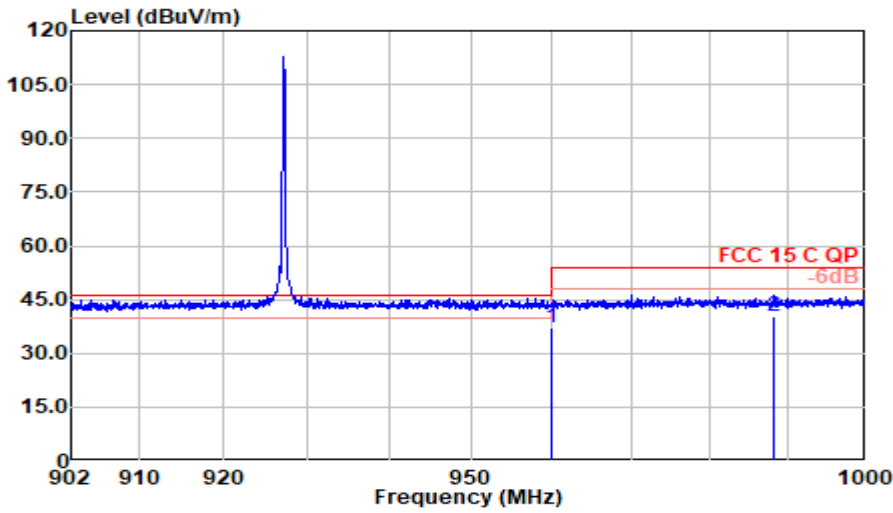
Mode: TX 927.75MHz



Polarization at Horizontal

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
960.000	5.19	29.40	3.36	37.95	46.00	8.05	QP
990.641	6.93	29.60	3.47	40.00	54.00	14.00	QP

Mode: TX 927.75MHz



Polarization at Vertical

Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
960.000	4.37	29.40	3.36	37.13	46.00	8.87	QP
988.093	7.25	29.60	3.46	40.31	54.00	13.69	QP

4 20DB BANDWIDTH MEASUREMENT

4.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2024.08.09	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2024.08.09	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2024.08.09	1 Year

4.2 Block Diagram of Test Setup



4.3 Specification Limits (§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.

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

4.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

4.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of 20 dB bandwidth was measure by spectrum analyzer with settings: Span = between 2.0 times and 5.0 times of the OBW, RBW = 1% to 5% of the OBW, VBW $\geq 3 \times$ RBW, Detector = Peak, Trace = Max Hold.

Use the “x dB” bandwidth function of the instrument, set it as “-20 dB” to measure and report the 20dB bandwidth.

The test procedure is defined in ANSI C63.10-2013 (the 6.9.2 Measurement Procedure “ Occupied bandwidth—relative measurement procedure” was used).

4.6 Test Results

PASSED.

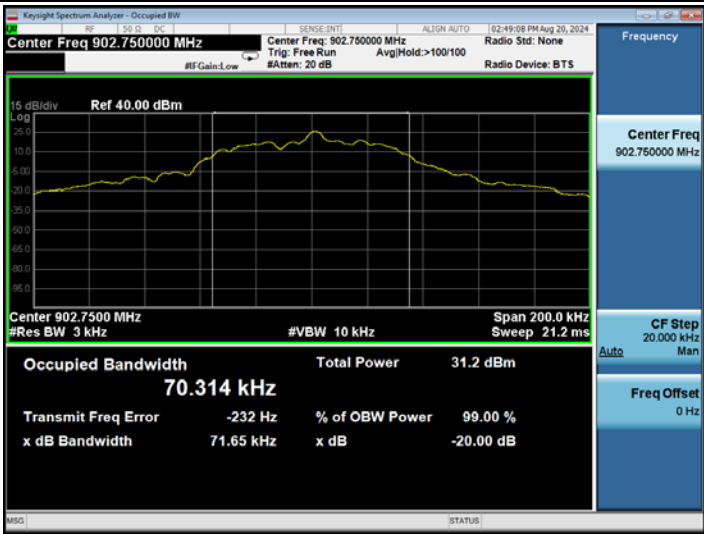
All the test results are attached in next pages.

(Test Date: 2024.08.20 Temperature: 23°C Humidity: 51 %)

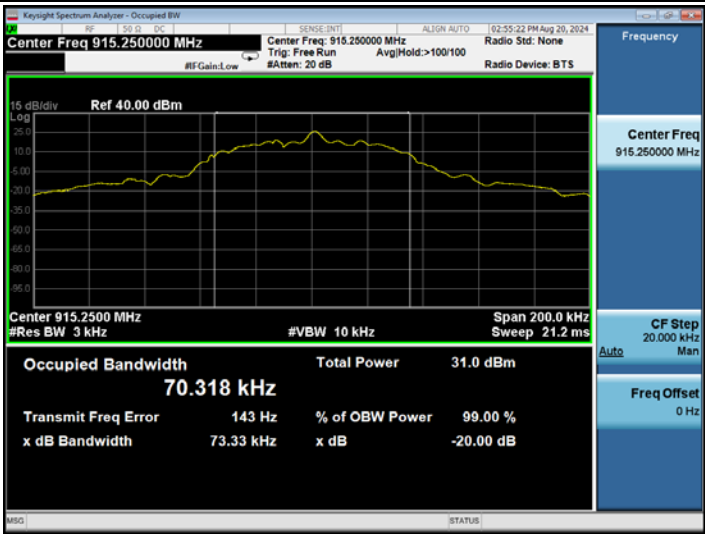
Mode	Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	Limit (kHz)
RFID	01	902.75	71.65	500
	26	915.25	73.33	500
	50	927.25	71.58	500

RFID

CH01 (902.75MHz)



CH25 (915.25MHz)



CH50 (927.25MHz)



5 CARRIER FREQUENCY SEPARATION

MEASUREMENT

5.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2024.08.09	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2024.08.09	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2024.08.09	1 Year

5.2 Block Diagram of Test Setup

The Same as Section. 4.2

5.3 Specification Limits (§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.

5.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to have its hopping function enabled.

5.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = wide enough to capture the peaks of two adjacent channels
- RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- VBW $\geq$ RBW
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

The test procedure is defined in ANSI C63.10-2013 (the 7.8.2 Measurement Procedure “Carrier frequency separation” was used).

5.6 Test Results

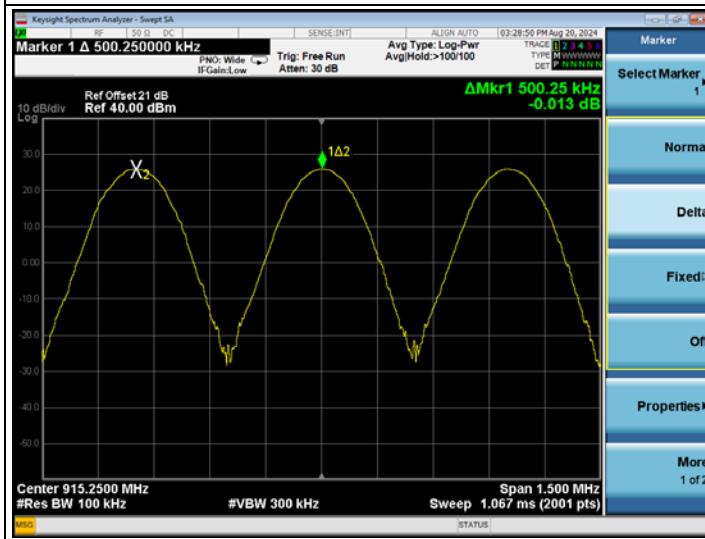
PASSED.

All the test results are attached in next pages.

(Test Date: 2024.08.20 Temperature: 23℃ Humidity: 51 %)

Mode	Channel	Separation (kHz)	Limit (kHz)
RFID	Hopping	500.25	73.33

RFID-Hopping



6 NUMBER OF HOPPING FREQUENCIES

MEASUREMENT

6.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2024.08.09	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2024.08.09	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2024.08.09	1 Year

6.2 Block Diagram of Test Setup

The Same as Section. 4.2

6.3 Specification Limits (§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. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

6.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to have its hopping function enabled.

6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = the frequency band of operation.
- RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- VBW $\geq$ RBW
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize. It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies.

The test procedure is defined in ANSI C63.10-2013 (the 7.8.3 Measurement Procedure “Number of Hopping Frequencies” was used).

6.6 Test Results

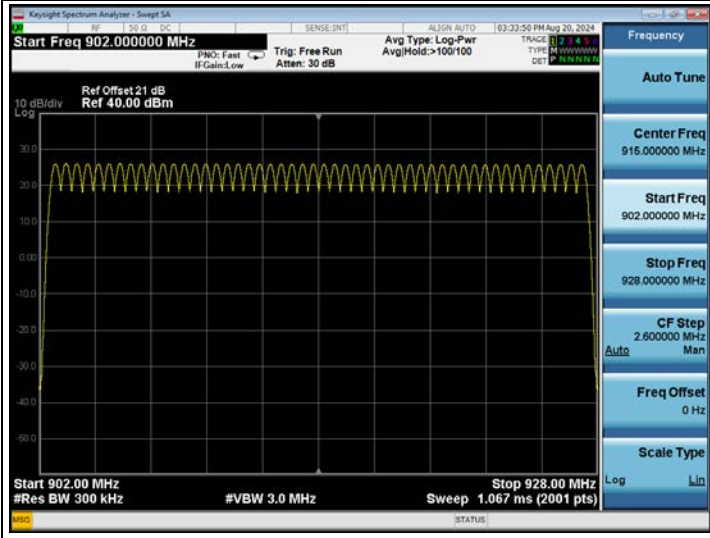
PASSED.

All the test results are attached in next pages.

(Test Date: 2024.08.20 Temperature: 23°C Humidity: 51 %)

Mode	Channel	Number of Hopping Frequencies
RFID	Hopping	50

RFID-Hopping



7 DWELL TIME MEASUREMENT

7.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2024.08.09	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2024.08.09	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2024.08.09	1 Year

7.2 Block Diagram of Test Setup

The Same as Section. 4.2

7.3 Specification Limits (§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. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

7.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to have its hopping function enabled.

7.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = zero span, centered on a hopping channel.
- RBW shall be $\leq$ channel spacing and where possible RBW should be set $\gg 1 / T$, where T is the expected dwell time per channel.
- Sweep: As necessary to capture the entire dwell time per hopping channel.
- Detector function: Peak.
- Trace: Max hold.

Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.

Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be

equal to, or less than, the period specified in the requirements.

Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

$$\begin{aligned} & \text{(Number of hops in the period specified in the requirements)} = \\ & \text{(number of hops on spectrum analyzer)} \times \text{(period specified in the requirements} \\ & \text{ / analyzer sweep time)} \end{aligned}$$

The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation.

The test procedure is defined in ANSI C63.10-2013 (the 7.8.4 Measurement Procedure “Time of occupancy (dwell time)” was used).

7.6 Test Results

PASSED.

All the test results are attached in next pages.

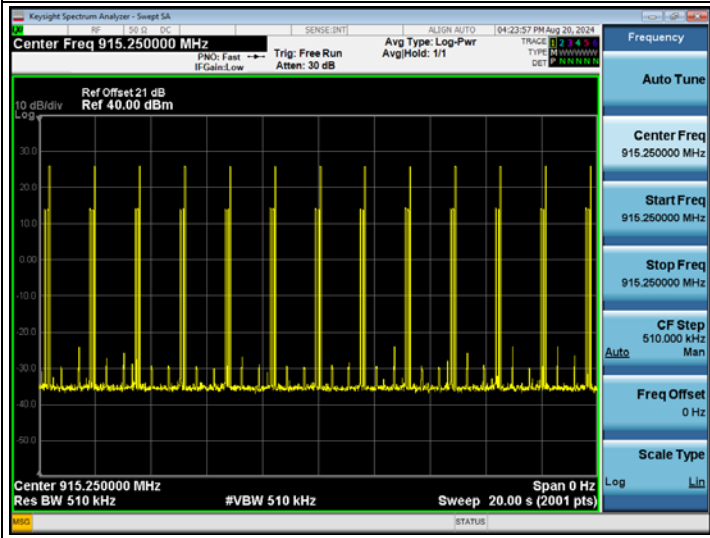
(Test Date: 2024.08.20 Temperature: 23°C Humidity: 51 %)

Mode	Number of Hops on SA	SA Sweep time (s)	Period specified in the requirements (s)	Number of Hops in period specified in the requirements
RFID	13	20	20	13

Mode	Number of Hops in period specified in the requirements	Transmit time per hop (ms)	Dwell Time (ms)	Limit (ms)
RFID	13	28.2	366.6	400

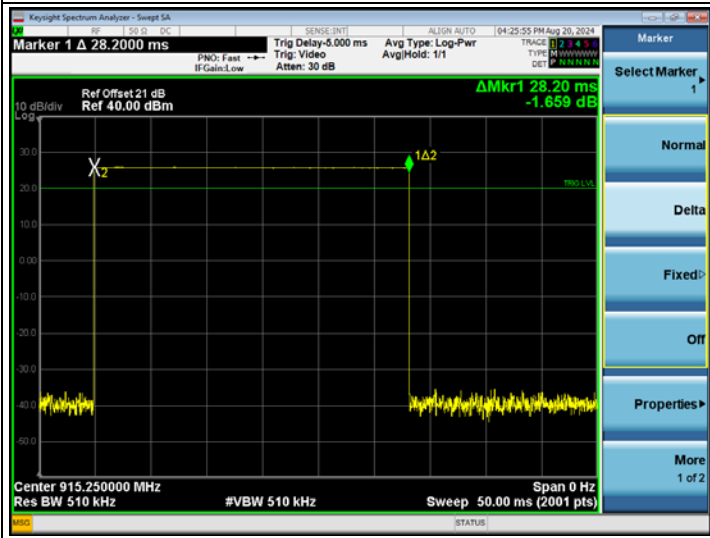
Number of Hops on SA

RFID-Hopping



Transmit time per hop

RFID-Hopping



8 TRANSMITTER OUTPUT POWER

8.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2024.08.09	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2024.08.09	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2024.08.09	1 Year

8.2 Block Diagram of Test Setup

Same as section 4.2.

8.3 Specification Limits (§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.

8.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

8.5 Test Procedure

This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

a) Use the following spectrum analyzer settings:

- 1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 2) RBW > 20 dB bandwidth of the emission being measured.
- 3) VBW ≥ RBW.
- 4) Sweep: Auto.
- 5) Detector function: Peak.
- 6) Trace: Max hold.

b) Allow trace to stabilize.

c) Use the marker-to-peak function to set the marker to the peak of the emission.

d) The indicated level is the peak output power, after any corrections for external attenuators and cables.

The test procedure is defined in ANSI C63.10-2013 (7.8.5 Measurement Procedure “ Output power test procedure for frequency-hopping spread-spectrum (FHSS) devices” was used).

8.6 Test Results

PASSED.

All the test results are listed below.

(Test Date: 2024.08.20 Temperature: 23℃ Humidity: 51 %)

Mode	Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
RFID	01	902.75	25.948	30
	26	915.25	25.767	30
	50	927.25	25.642	30

RFID

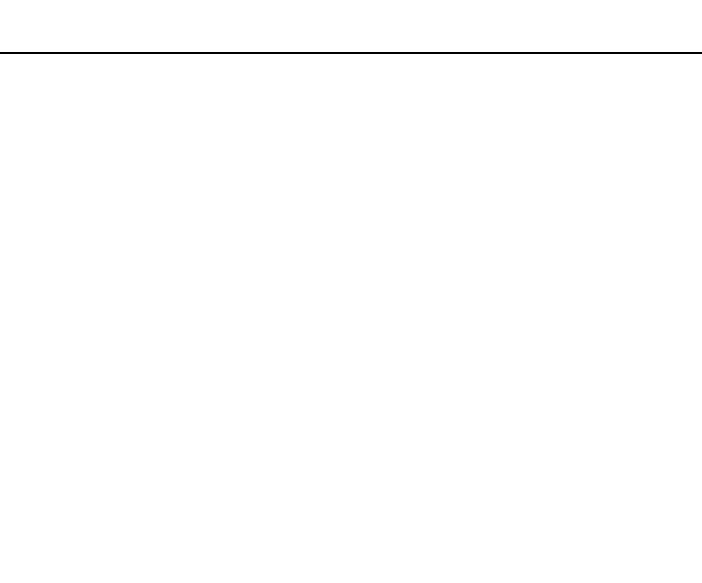
CH01 (902.75MHz)



CH25 (915.25MHz)



CH50 (927.25MHz)



9 BAND EDGE MEASUREMENT

9.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2024.08.09	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2024.08.09	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2024.08.09	1 Year

9.2 Block Diagram of Test Setup

The Same as Section. 4.2

9.3 Specification Limits (§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 (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)). (※ This test result attaching to §3.7).

9.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one and have its hopping function enabled.

9.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

a) Set the EUT to the lowest frequency channel (for the hopping on test, the hopping sequence shall include the lowest frequency channel).

b) Set the EUT to operate at maximum output power and 100% duty cycle, or equivalent “normal mode of operation” as specified in 6.10.3 of ANSI C63.10.

c) Perform the test as follows:

1) Span: wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation.

2) Attenuation: Auto

- 3) Sweep time: Coupled.
- 4) Resolution bandwidth: 100kHz.
- 5) Video bandwidth: 300kHz.
- 6) Detector: peak
- 7) Trace: max hold.
- d) Allow the trace to stabilize. For the test with the hopping function turned ON, this can take several minutes to achieve a reasonable probability of intercepting any emissions due to oscillator overshoot.
- e) Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, and then use the marker-to-peak function to move the marker to the peak of the in-band emission.
- f) Repeat step b) through step e) for every applicable modulation.
- k) Set the EUT to the highest frequency channel (for the hopping on test, the hopping sequence shall include the highest frequency channel and repeat step b) through step f).

Band-edge measurements shall be tested both on single channels, and with the EUT hopping.

The test procedure is defined in ANSI C63.10-2013 (7.8.6 “ Band-edge measurements for RF conducted emissions”, 6.10.4 Measurement Procedure “ Authorized-band band-edge measurements (relative method)” was used).

9.6 Test Results

PASSED.

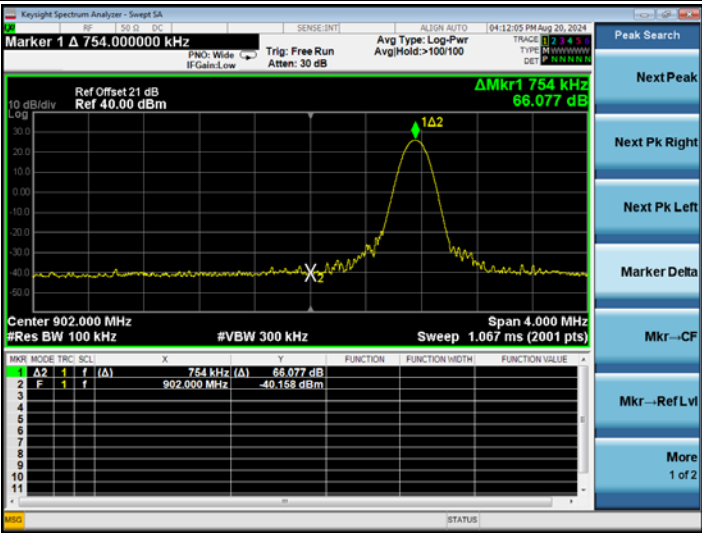
All the test results are attached in next pages.

(Test Date: 2024.08.20 Temperature: 23°C Humidity: 51 %)

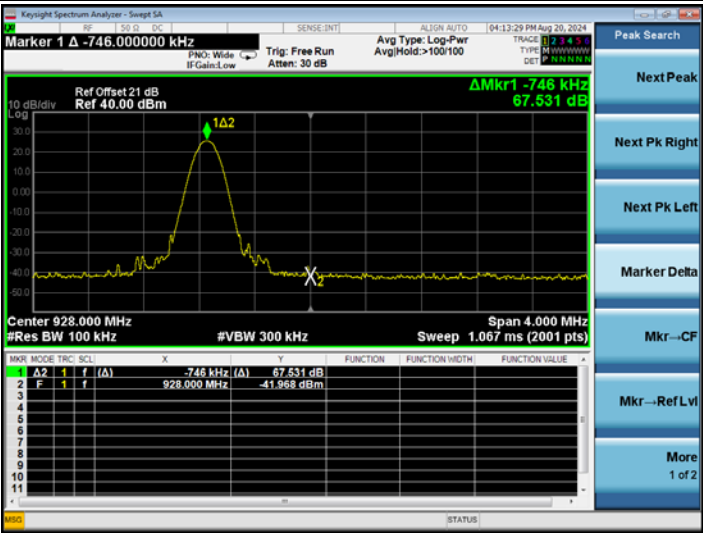
Mode	Location	Channel	Frequency (MHz)	Delta Marker (dB)	Limit (dB)
RFID	Lower Edge	01	902.75	66.077	20
	Upper Edge	50	927.25	67.531	20
RFID	Lower Edge	Hopping	--	67.733	20
	Upper Edge	Hopping	--	68.675	20

RFID

CH01 (902.75MHz)

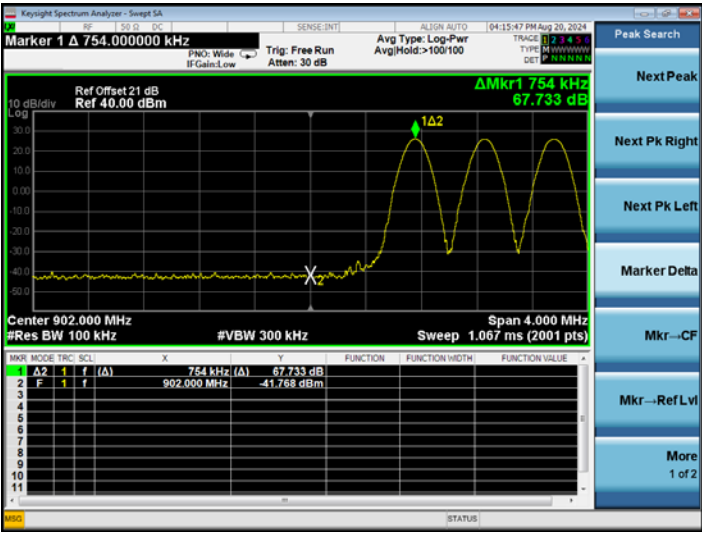


CH50 (927.25MHz)

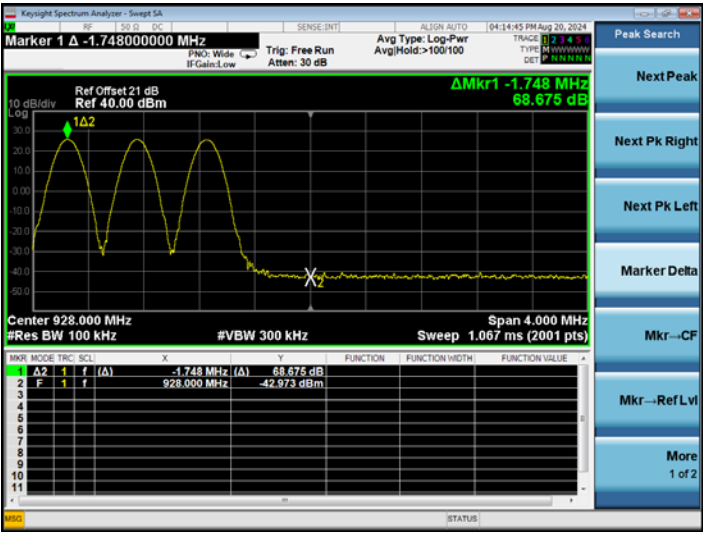


RFID

Hopping



Hopping



10 UNWANTED EMISSIONS MEASUREMENT

10.1 Test Equipment

The following test equipment was used during the emission limitations test :

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	2024.08.09	1 Year
2.	RF Cable	Mini-Circuits	FLC-3FT-SM SM+	22022838	2024.08.09	1 Year
3.	20 dB Attenuator	Mini-Circuits	BW-S20W2+	001	2024.08.09	1 Year

10.2 Block Diagram of Test Setup

Same as Section. 4.2.

10.3 Specification Limits (§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 (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see§15.205(c)). (※ This test result attaching to §4.7).

10.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

10.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:

Connect the primary antenna port through an attenuator to the spectrum analyzer input; in the results, account for all losses between the unlicensed wireless device output and the spectrum analyzer. The instrument shall span 30 MHz to 10 times the operating frequency in GHz, with a resolution bandwidth of 100 kHz, video bandwidth of 300 kHz, and a coupled sweep time with a peak detector. The band 30 MHz to the highest frequency may be split into smaller spans, as long as the entire spectrum is covered.

The test procedure is defined in ANSI C63.10-2013 (7.8.8 “ Conducted spurious emissions test methodology” was used).

10.6 Test Results

PASSED.

The test data was attached in the next pages.

(Test Date: 2024.08.20 Temperature: 23℃ Humidity: 51 %)

Mode	Channel	Frequency (MHz)	Data Page
RFID	01	902.75	P89
	26	915.25	P90
	50	927.25	P91

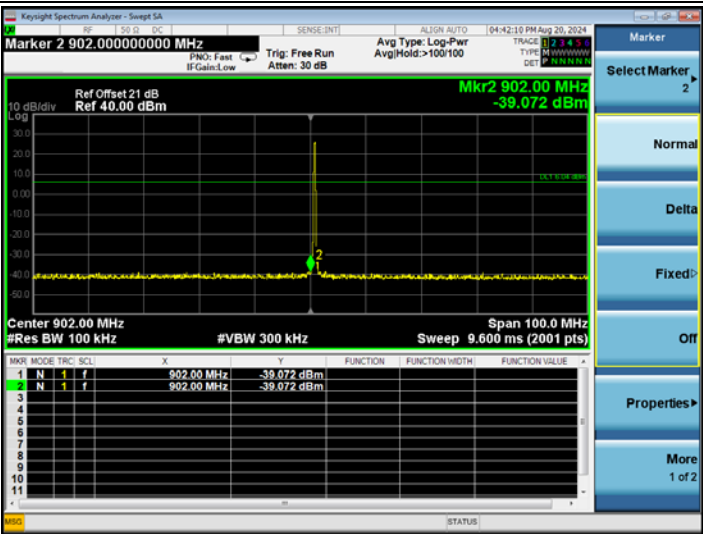
RFID

CH01 (902.75MHz)

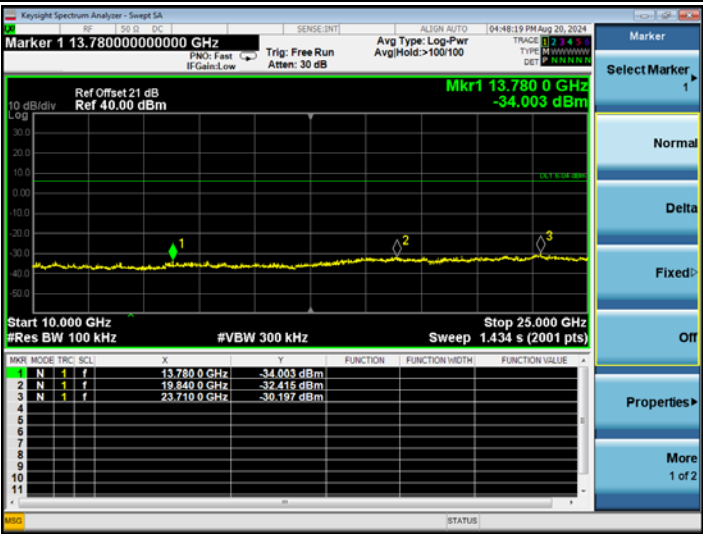
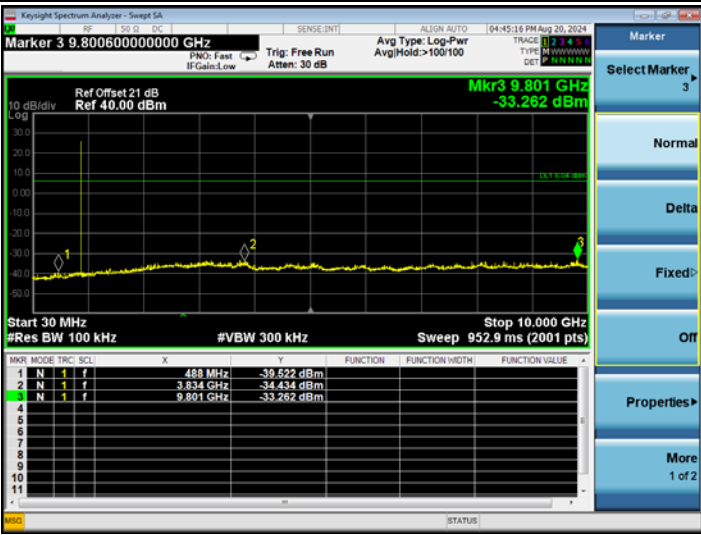
Reference Level



Edge



Emission Level



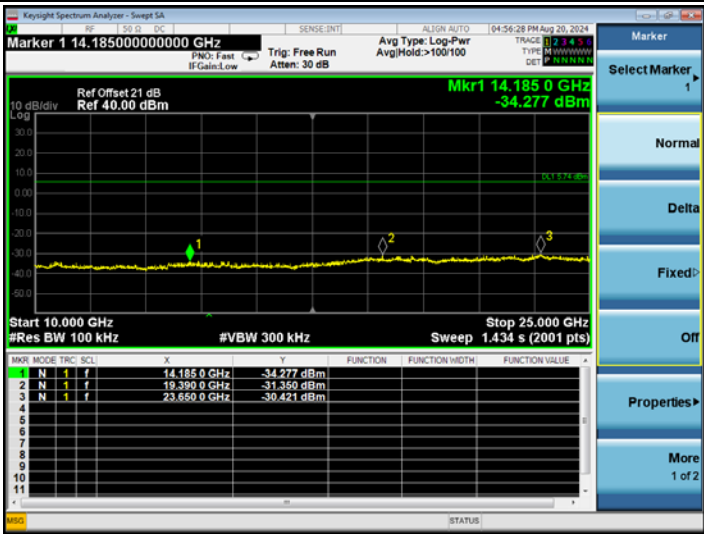
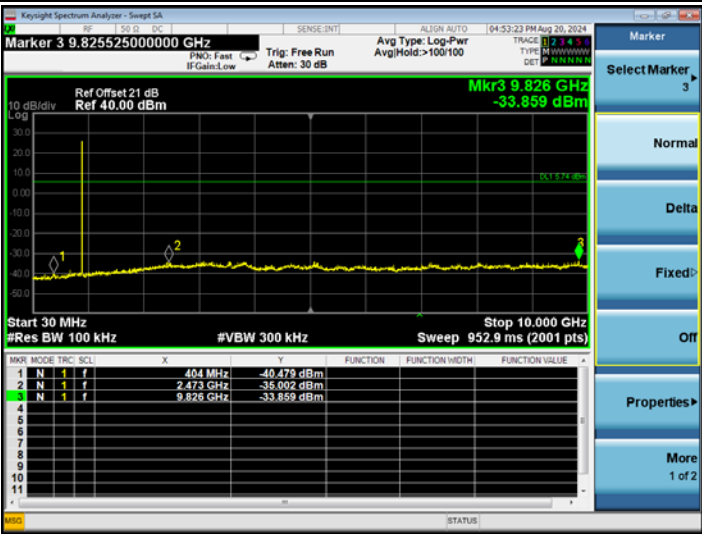
RFID

CH25 (915.25MHz)

Reference Level



Emission Level



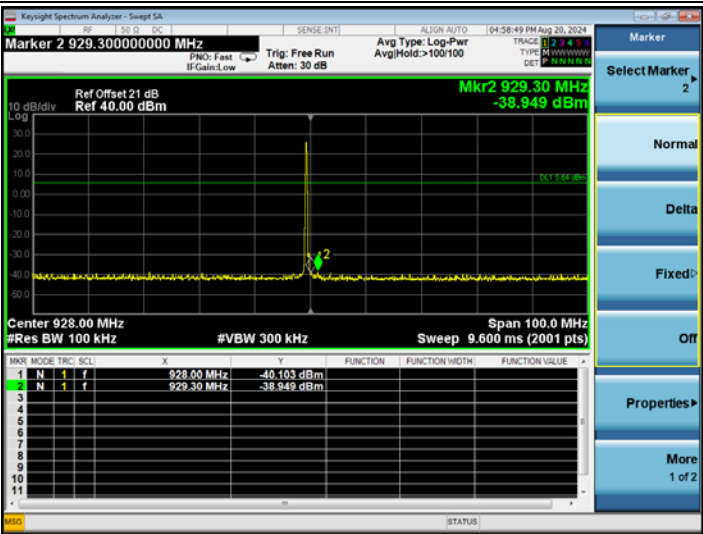
RFID

CH50 (927.25MHz)

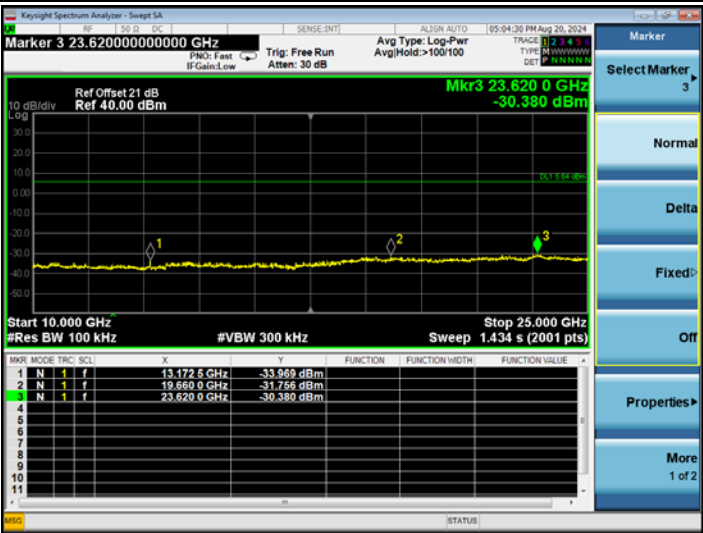
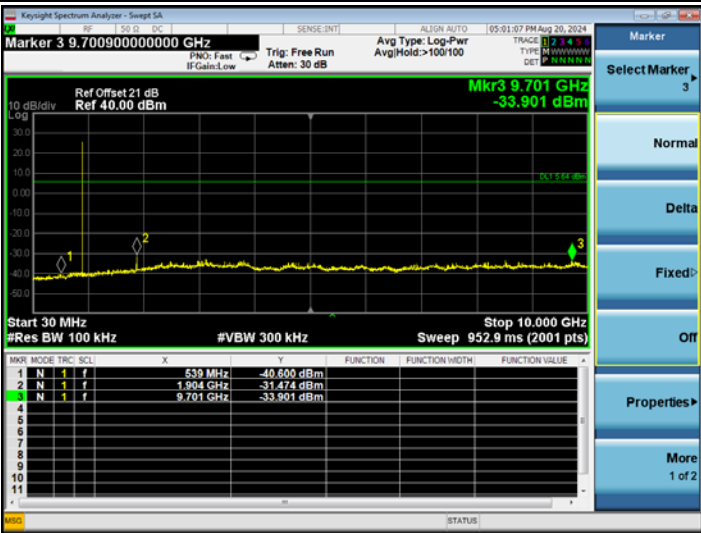
Reference Level



Edge



Emission Level



11 ANTENNA REQUIREMENT

11.1 Specification Limits (§15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

11.2 Result

According to KDB 353028 D1, the following describes the three ways that can be used to demonstrate compliance to Section 15.203:

- a) Antenna permanently attached.
- b) Unique (non-standard) antenna connector.
- c) Professional installation.

For this product, the antenna is:

- ☐ Antenna permanently attached
- ☒ Unique (non-standard) antenna connector
- ☐ Professional installation
- ☐ not meet any of ways list above

that

- ☒ compliant
- ☐ not compliant

with the requirement of Section 15.203.

12 DEVIATION TO TEST SPECIFICATIONS

None.

13 MEASUREMENT UNCERTAINTY LIST

The measurement uncertainty was estimated for test on the EUT according to CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage of K=2.

The uncertainties value is not used in determining the PASS/FAIL results.

Test Items/Facilities	Frequency/Equipment/Unit	Uncertainty
Conducted Emission No.1 Shielded Room	9kHz~150kHz	±3.1 dB
	150kHz~30MHz	±2.6 dB
Conducted Emission No.3 Shielded Room	9kHz~150kHz	±3.1 dB
	150kHz~30MHz	±2.6 dB
Radiated Emission	30MHz~200MHz, Horizontal	±3.8 dB
	30MHz~200MHz, Vertical	±4.1 dB
	200MHz~1000MHz, Horizontal	±3.6 dB
	200MHz~1000MHz, Vertical	±5.1 dB
	1GHz~6GHz	±5.3 dB
	6GHz~18GHz	±5.3 dB
	18GHz~40GHz	±3.5 dB
Output Power Test	50MHz~18GHz	0.77 dB
Power Density Test	9kHz~6GHz	1.08 dB
RF Frequency Test	9kHz~40GHz	6×10^{-4}
Bandwidth Test	9kHz~6GHz	1.5×10^{-3}
RF Radiated Power Test	30MHz~1000MHz	3.06 dB
Conducted Output Power Test	50MHz~18GHz	0.83 dB
AC Voltage(<10kHz) Test	120V~230V	0.04 %
DC Power Test	0V~30V	0.4 %
Temperature	-40°C~+100°C	0.52 °C
Humidity	30%~95%	2.6 %