RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART C

Test Standard	**FCC Part 15.247**
Product name	**Wireless Temperature Reader**
Brand Name	**PQSENSE**
Model No.	**PQS-RD-11/4**
Test Result	**Pass**
Statements of Conformity	**Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.**

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.
The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:

Dally Hong
Sr. Engineer

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	November 23, 2021	Initial Issue	ALL	Allison Chen
01	December 2, 2021	See the following Note Rev.(01)	P.1, P.4-5, P.7, P.9-10, P.13-17, P.31, P.34, Annex A	Allison Chen
02	December 20, 2021	See the following Note Rev.(02)	P.14-15, Annex A	Allison Chen
03	January 5, 2022	See the following Note Rev.(03)	P.5	Allison Chen
04	January 7, 2022	See the following Note Rev.(04)	P.5	Allison Chen
05	January 10, 2022	See the following Note Rev.(05)	P.6	Allison Chen

Note:

Rev.(01)

1. Modified model name.
2. Modified modulation type (Pseudorandom FH sequence) in section 1.2, worst mode description in section 3.2, dwell time test data in section 4.7.4, and remove irrelevant description test procedure in section 4.8.2.
3. Add conduction test data and test setup photo.

Rev.(02)

1. Modified worst mode description in section 3.2, conduction test data in section 4.1 and test setup photo.

Rev.(03)

1. Added information about the FHSS characteristics description in section 1.2.

Rev.(04)

1. Modified information about the FHSS characteristics description in section 1.2.

Rev.(05)

1. Modified frequency range in section 1.3.

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	PQSENSE TECHNOLOGY LTD. 8F ,No. 110, Section 2, Keelung Rd, Taipei , 106, Taiwan
Manufacturer	PQSENSE TECHNOLOGY LTD. 8F ,No. 110, Section 2, Keelung Rd, Taipei , 106, Taiwan
Equipment	Wireless Temperature Reader
Model Name	PQS-RD-11/4
Model Discrepancy	N/A
Received Date	June 25, 2021
Date of Test	September 17 ~ December 1, 2021
Power Operation	1. Power from power supply. (AC 85~265V) 2. Power from power supply. (DC 24~48V)

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

1.2 INFORMATION ABOUT THE FHSS CHARACTERISTICS

1.2.1 Pseudorandom Frequency Hopping Sequence

The channel is represented by a pseudo-random hopping sequence hopping through the 50 channels. The hopping sequence is generated by random selecting from predefined RFID channels. The channel is dividing into time slots where each slot corresponds to a hop channel.

1.2.2 Equal Hopping Frequency Use

The channels of the system will be used equally over the long-term period, due to the nature of random selecting principle.

1.2.3 System Receiver Input Bandwidth

Each channel bandwidth is 500kHz.
The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequency in synchronization with the transmitted signals.

1.2.4 Equipment Description

The system receiver get the channel frequency from transmitter when sending out signal, it then adjust the receiving shift frequency accordingly.

1.3 EUT CHANNEL INFORMATION

Frequency Range	902.75MHz - 927.25MHz
Modulation Type	PR_ASK/Miller4.250
Number of channel	50 Channels

Remark:
Refer as ANSI 63.10:2013 clause 5.6.1 Table 4

Number of frequencies to be tested		
Frequency range in which device operates	**Number of frequencies**	**Location in frequency range of operation**
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.4 ANTENNA INFORMATION

Antenna Type	☐ PIFA ☐ PCB ☐ Dipole ☒ UHF RFID Antenna
Antenna Gain	Gain: 4 dBi
Antenna Connector	SMA Male

Remark:
1.The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.

1.5 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

Remark:
1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report

1.6 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan. (R.O.C.)
CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	Jack Chen	-
Radiation	Ray Li	-
RF Conducted	Lance Chen	-

Remark: The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.7 INSTRUMENT CALIBRATION

Conduction (AC power line Conducted Test Site)					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
CABLE	EMCI	CFD300-NL	CERF	06/28/2021	06/27/2022
EMI Test Receiver	R&S	ESCI	100064	07/05/2021	07/04/2022
LISN	SCHAFFNER	NNB 41	03/10013	02/02/2021	02/01/2022
Software	EZ-EMC(CCS-3A1-CE-wugu)				

RF Conducted Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Coaxial Cable	Woken	WC12	CC003	06/28/2021	06/27/2022
Coaxial Cable	Woken	WC12	CC001	06/28/2021	06/27/2022
EXA Signal Analyzer	KEYSIGHT	N9010B	MY59071573	05/25/2021	05/24/2022
Signal Analyzer	R&S	FSV 40	101073	09/07/2021	09/06/2022
Software	Radio Test Software Ver. 21				

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/08/2021	02/07/2022
Bilog Antenna	Sunol Sciences	JB3	A030105	07/19/2021	07/18/2022
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/24/2021	02/23/2022
Coaxial Cable	EMCI	EMC105	190914+327109/4	09/17/2021	09/16/2022
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/06/2021	01/05/2022
Horn Antenna	ETS LINDGREN	3117	55165	07/29/2021	07/28/2022
Horn Antenna	ETS LINDGREN	3116	00026370	12/11/2020	12/10/2021
K Type Cable	Huber+Suhner	SUCOFLEX 102	29406/2	12/09/2020	12/08/2021
K Type Cable	Huber+Suhner	SUCOFLEX 102	22470/2	12/09/2020	12/08/2021
Pre-Amplifier	EMEC	EM330	060609	02/24/2021	02/23/2022
Pre-Amplifier	HP	8449B	3008A00965	12/25/2020	12/24/2021
Pre-Amplifier	MITEQ	AMF-6F-18004000-37-8P	985646	08/31/2021	08/30/2022
Signal Analyzer	R&S	FSV 40	101073	09/15/2021	09/14/2022
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 6.11-20180419c				

Remark: Each piece of equipment is scheduled for calibration once a year.

1.8 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

Support Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
1	DC Power Source	Agilent	E3640A	N/A	N/A
2	NB(J)	TOSHIBA	PT345T-00L002	N/A	PD97260H
3	DC Power Source	GWINSTEK	SPS-3610	N/A	N/A
4	NB(G)	Lenovo	IBM 1951	N/A	CJ6UPA3489WL
5	NB(E)	Lenovo	IBM 7663	N/A	N/A

1.9 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247.

2. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	Pass
15.247(a)(1)	4.2	20 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)(2)	4.3	Output Power Measurement	Pass
15.247(a)(1)	4.4	Frequency Separation	Pass
15.247(a)(1)(i)	4.5	Number of Hopping	Pass
15.247(d)	4.6	Conducted Band Edge	Pass
15.247(d)	4.6	Conducted Spurious Emission	Pass
15.247(a)(1)(iii)	4.7	Time of Occupancy	Pass
15.247(d)	4.8	Radiation Band Edge	Pass
15.247(d)	4.8	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Test Channel Frequencies	902.75MHz, 914.75MHz, 927.25MHz
Channel List	

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	902.75	26	915.25
2	903.25	27	915.75
3	903.75	28	916.25
4	904.25	29	916.75
5	904.75	30	917.25
6	905.25	31	917.75
7	905.75	32	918.25
8	906.25	33	918.75
9	906.75	34	919.25
10	907.25	35	919.75
11	907.75	36	920.25
12	908.25	37	920.75
13	908.75	38	921.25
14	909.25	39	921.75
15	909.75	40	922.25
16	910.25	41	922.75
17	910.75	42	923.25
18	911.25	43	923.75
19	911.75	44	924.25
20	912.25	45	924.75
21	912.75	46	925.25
22	913.25	47	925.75
23	913.75	48	926.25
24	914.25	49	926.75
25	914.75	50	927.25

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	**AC Power line conducted emission for line and neutral**
Power supply Mode	**Mode 1: EUT Power by AC Source (4 Port)**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**

Remark:
1. The worst mode was record in this test report.
2. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

Radiated Emission Measurement Above 1G	
Test Condition	**Radiated Emission Above 1G**
Power supply Mode	**Mode 1: EUT power by DC Power Source (4port)** **Mode 2: EUT power by AC Power Source (4port)**
Worst Mode	**☒ Mode 1 ☐ Mode2**
Worst Position	**☐ Placed in fixed position.** **☒ Placed in fixed position at X-Plane (E2-Plane)** **☐ Placed in fixed position at Y-Plane (E1-Plane)** **☐ Placed in fixed position at Z-Plane (H-Plane)**

Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Power supply Mode	**Mode 2: EUT power by DC Power Source (4port)** **Mode 4: EUT power by AC Power Source (4port)**
Worst Mode	**☒ Mode 1 ☐ Mode2**

Remark:
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report

4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

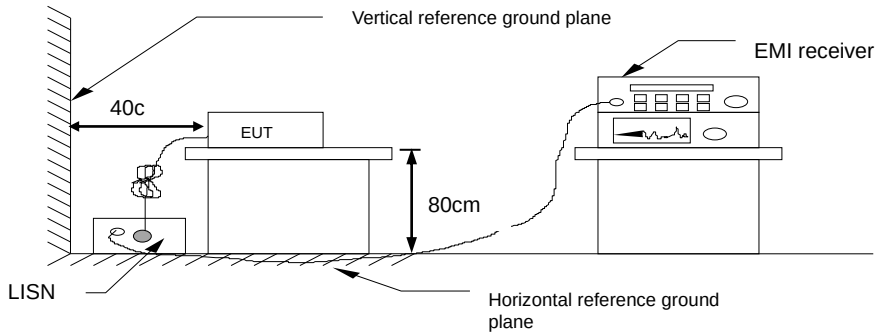
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

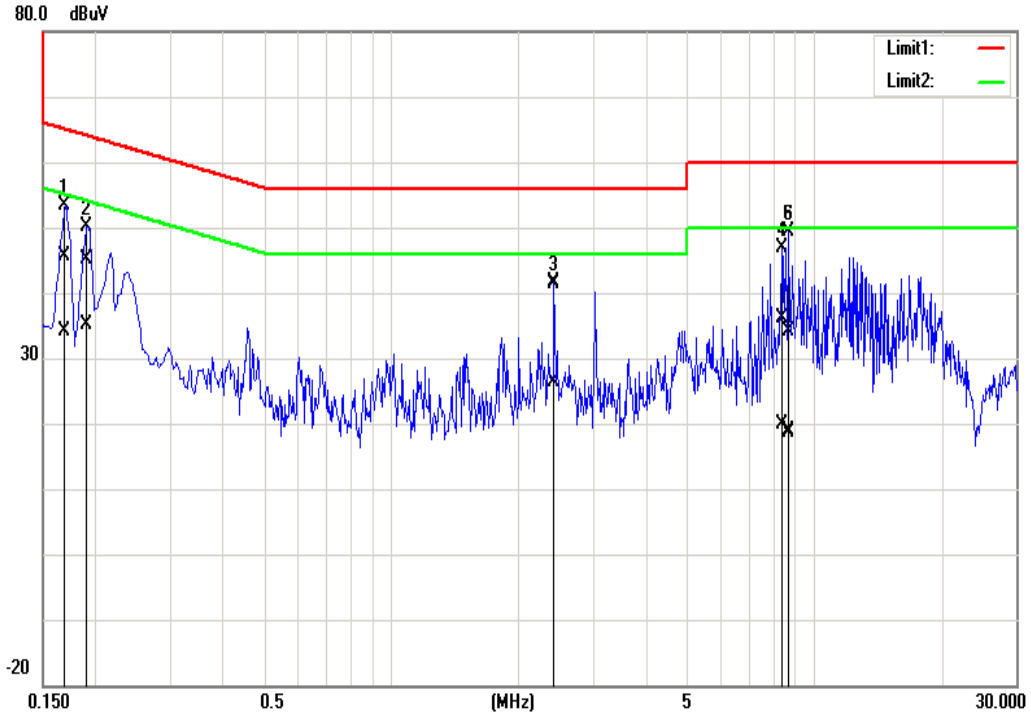


4.1.4 Test Result

PASS

Test Data

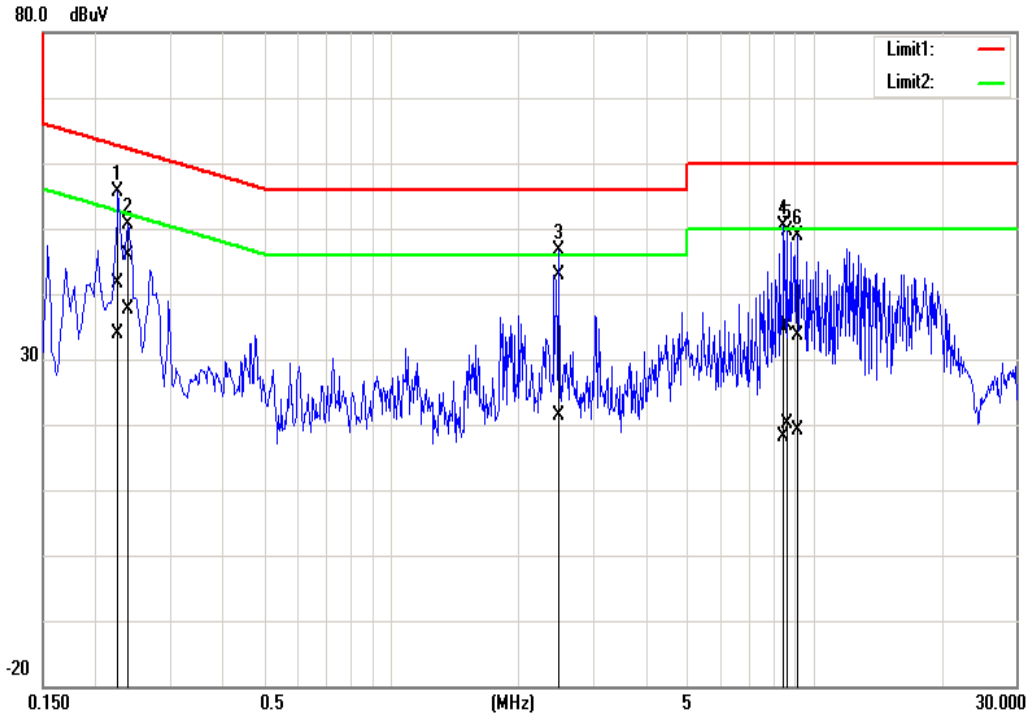
Test Mode:	Mode 1	Temp/Hum	20.4(℃)/ 49%RH
Phase:	Line	Test Date	December 1, 2021
Configuration	4 Port	Test Engineer	Jack Chen



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1700	35.32	23.96	10.29	45.61	34.25	64.96	54.96	-19.35	-20.71	Pass
0.1900	34.73	24.85	10.29	45.02	35.14	64.04	54.04	-19.02	-18.90	Pass
2.4340	31.06	16.16	10.34	41.40	26.50	56.00	46.00	-14.60	-19.50	Pass
8.3900	25.61	9.48	10.44	36.05	19.92	60.00	50.00	-23.95	-30.08	Pass
8.5500	23.57	8.12	10.44	34.01	18.56	60.00	50.00	-25.99	-31.44	Pass
8.7100	23.61	8.33	10.44	34.05	18.77	60.00	50.00	-25.95	-31.23	Pass

Note: Correction factor = LISN loss + Cable loss.

Test Mode:	Mode 1	Temp/Hum	20.4(℃)/ 49%RH
Phase:	Neutral	Test Date	December 1, 2021
Configuration	4 Port	Test Engineer	Jack Chen



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.2260	31.27	23.61	10.29	41.56	33.90	62.60	52.60	-21.04	-18.70	Pass
0.2380	35.54	27.37	10.29	45.83	37.66	62.17	52.17	-16.34	-14.51	Pass
2.4900	32.61	11.01	10.34	42.95	21.35	56.00	46.00	-13.05	-24.65	Pass
8.4580	24.16	7.75	10.44	34.60	18.19	60.00	50.00	-25.40	-31.81	Pass
8.6180	24.60	9.65	10.44	35.04	20.09	60.00	50.00	-24.96	-29.91	Pass
9.1220	23.14	8.75	10.45	33.59	19.20	60.00	50.00	-26.41	-30.80	Pass

Note: Correction factor = LISN loss + Cable loss.

4.2 20dB BANDWIDTH

4.2.1 Test Limit

According to §15.247(a) (1),

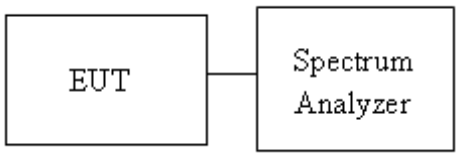
20 dB Bandwidth：For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.9.2, ANSI 63.10:2013 clause 6.9.3

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 1% ~5%, VBW >=3xRBW and Detector = Peak, to measurement 20 dB Bandwidth and 99% Bandwidth.
4. Measure and record the result of 20 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup



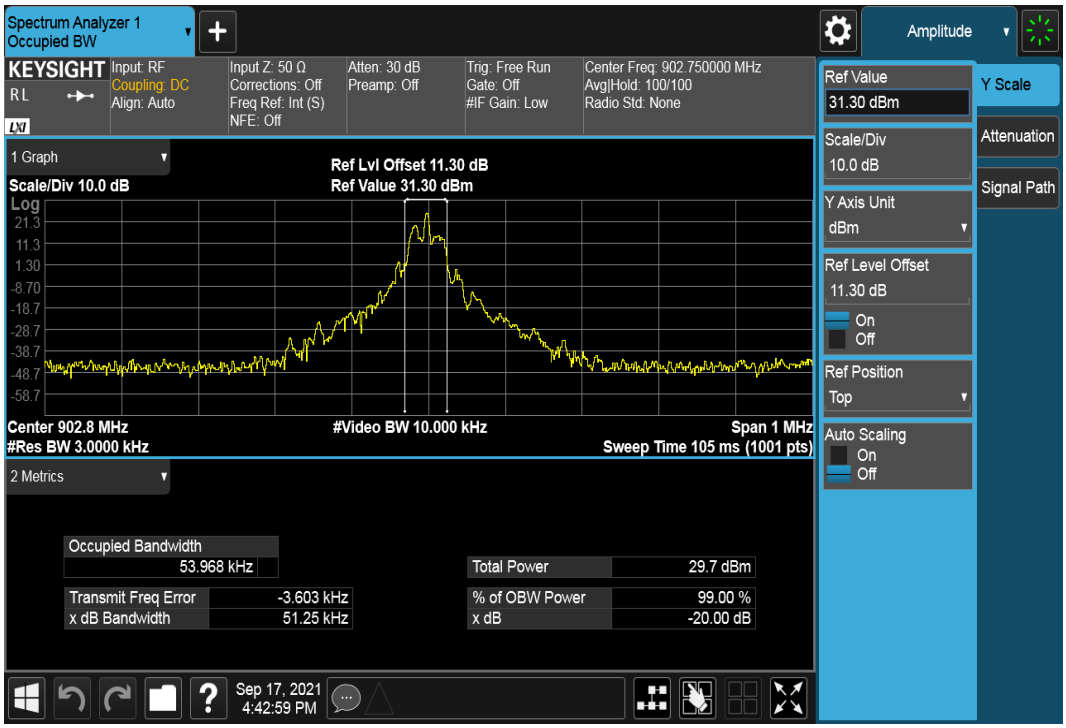
4.2.4 Test Result

Temperature:	24.9℃	**Test Date:**	September 17, 2021
Humidity:	58% RH	**Test by:**	Lance Chen

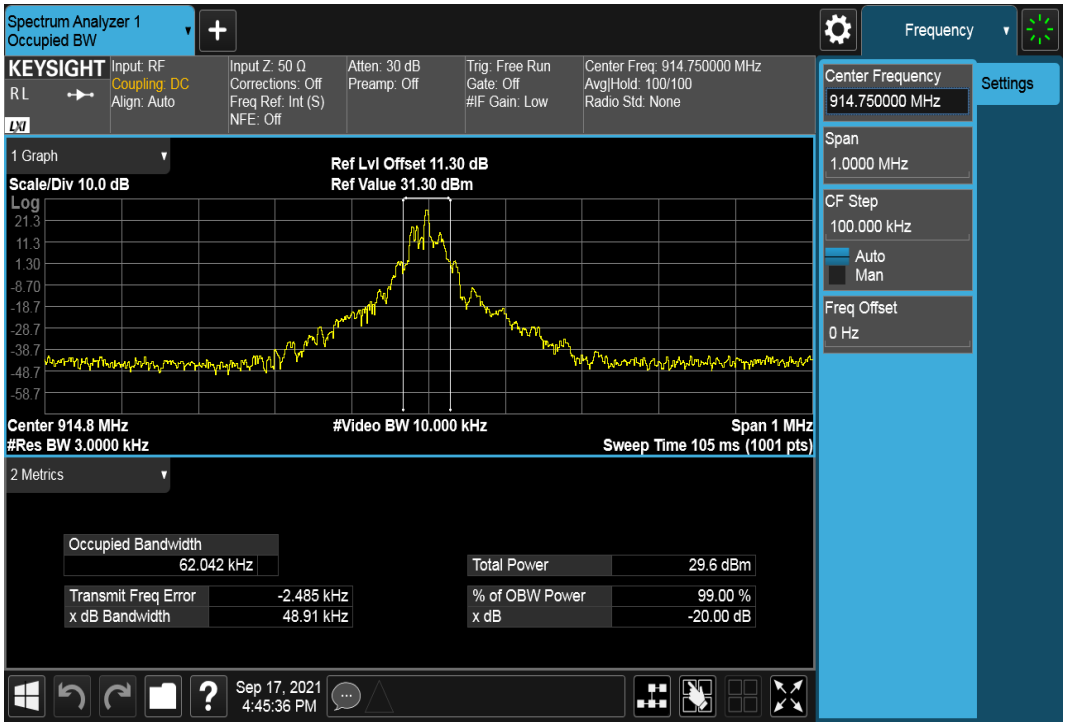
Channel	Frequency (MHz)	OBW (99%) (KHz)	20dB BW (KHz)
Low	902.75	53.968	51.25
Mid	914.75	62.042	48.91
High	927.25	50.837	51.11

Test Data

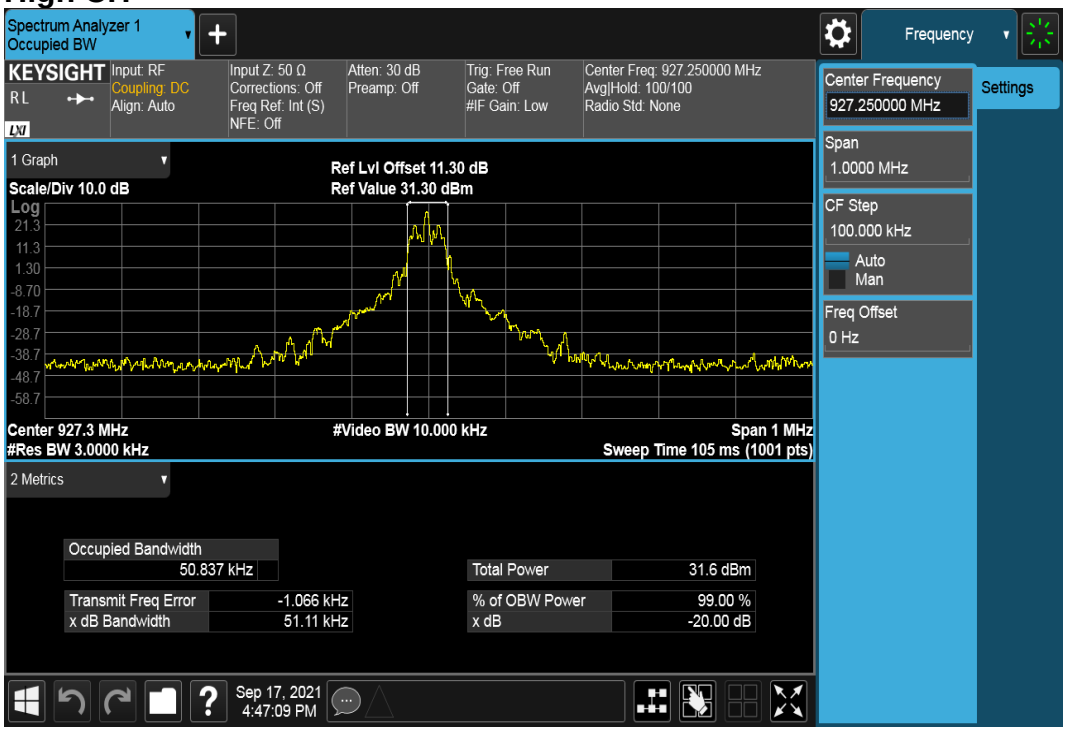
Low CH



Mid CH



High CH



4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b)(2)

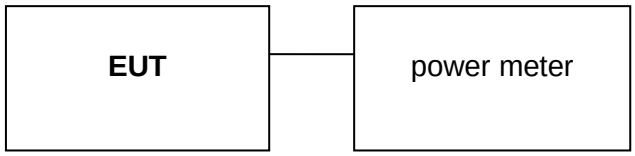
Peak output power：

For frequency hopping systems operating in the 902~928 MHz band: 1 watt.

4.3.2 Test Procedure

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power. in the test report.

4.3.3 Test Setup



4.3.4 Test Result

Temperature:	24.9℃	**Test Date:**	September 17, 2021
Humidity:	58% RH	**Test by:**	Lance Chen

Channel	Frequency (MHz)	Setting	Peak Power (dBm)	AVG Power (dBm)	Output Power Limit (dBm)	Result
Low	902.75	27	27.82	27.16	30	Pass
Middle	914.75	27	28.89	28.21	30	Pass
High	927.25	27	29.62	28.95	30	Pass

4.4 FREQUENCY SEPARATION

4.4.1 Test Limit

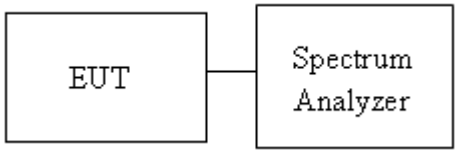
According to §15.247(a)(1)

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.

4.4.2 Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. EUT RF output port connected to the SA by RF cable.
3. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Sweep = auto.
   Max hold, mark 2 peaks of hopping channel and record channel separation.

4.4.3 Test Setup



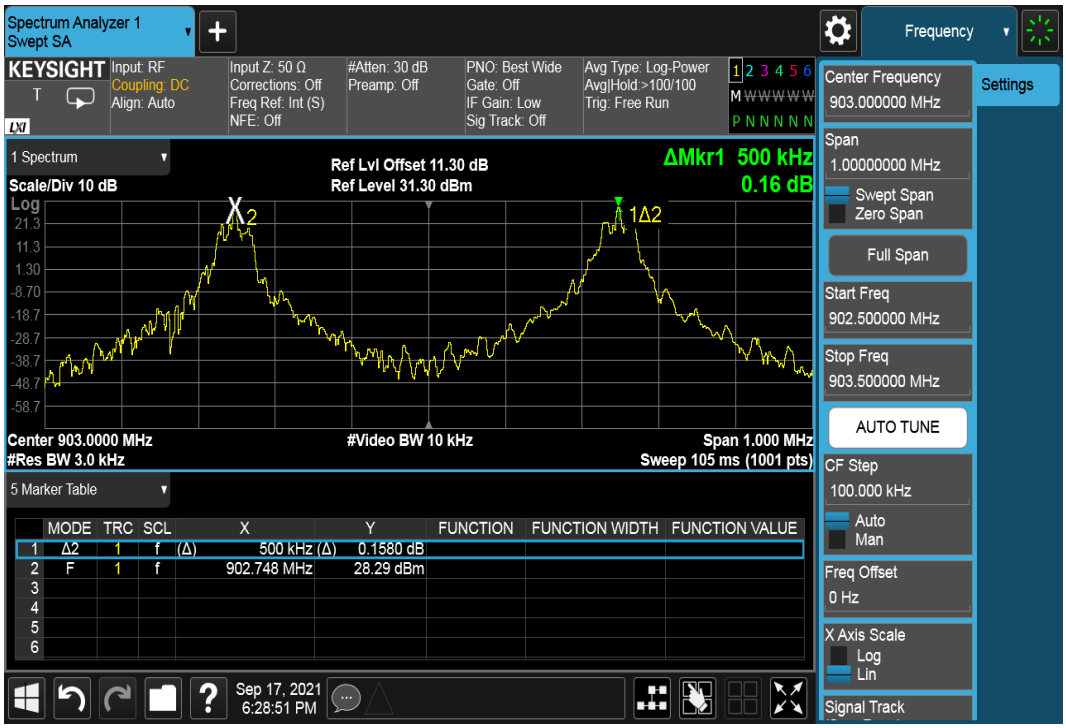
4.4.4 Test Result

Temperature:	24.9℃	**Test Date:**	September 17, 2021
Humidity:	58% RH	**Test by:**	Lance Chen

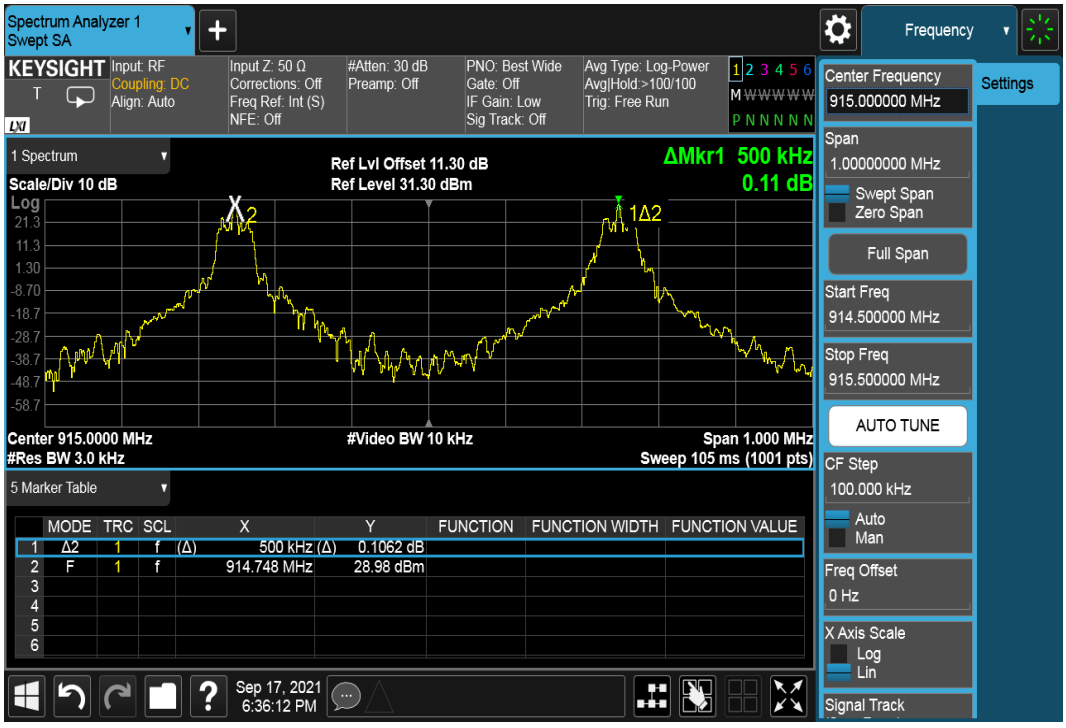
Frequency Separation				
Channel	**Frequency (MHz)**	**Channel Separation (kHz)**	**Channel Separation Limit (kHz)**	**Result**
Low	902.75	500	51.25	PASS
Middle	914.75	500	48.91	PASS
High	927.25	499	51.11	PASS

Test Data

Low CH



Mid CH



High CH

4.5 NUMBER OF HOPPING

4.5.1 Test Limit

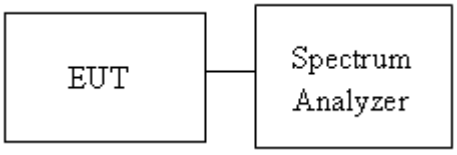
According to 15.247(a)(1)(i),

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.

4.5.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 7.8.3
1. Place the EUT on the table and set it in transmitting mode.
2. EUT RF output port connected to the SA by RF cable.
3. 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>= RBW.
4. Max hold, view and count how many channel in the band.

4.5.3 Test Setup

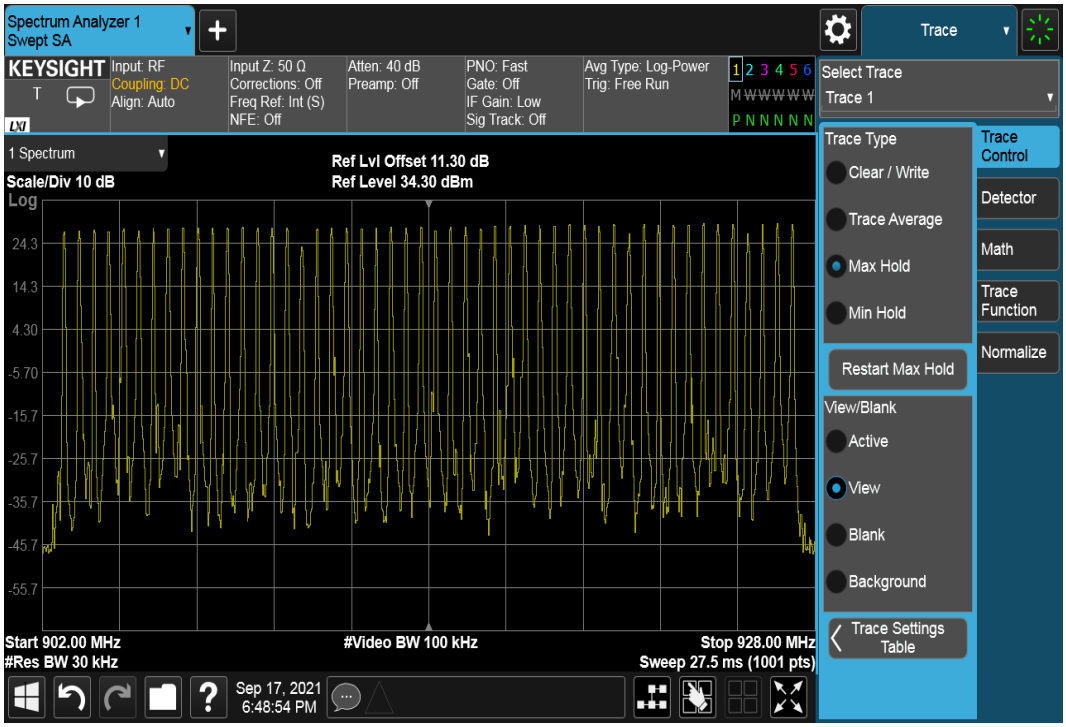


4.5.4 Test Result

Temperature:	24.9℃	**Test Date:**	September 17, 2021
Humidity:	58% RH	**Test by:**	Lance Chen

Number of Hopping			
Frequency (MHz)	**Hopping Channel Number**	**Hopping Channel Number Limits**	**Result**
Hopping	50	50	Pass

Test Data



4.6 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

According to §15.247(d)

Limit	-20 dBc

.

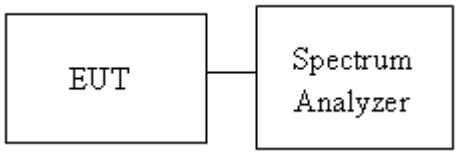
4.6.2 Test Procedure

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.

2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.

3. The Band Edge at 922MHz and 928MHz are investigated with normal hopping mode.

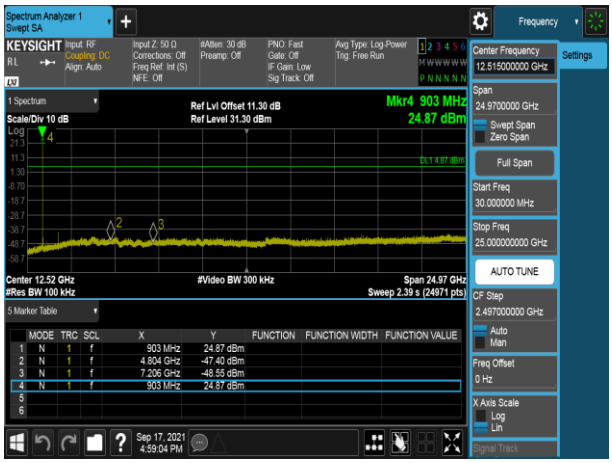
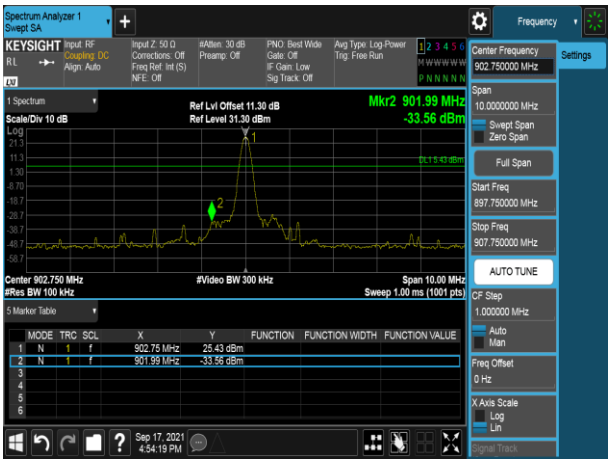
4.6.3 Test Setup



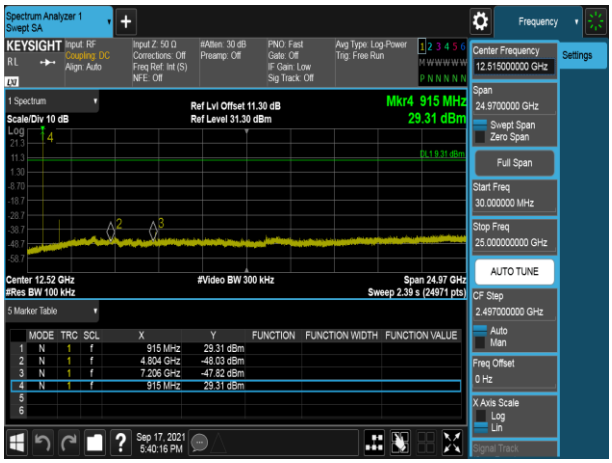
4.6.4 Test Result

Temperature:	24.9℃	**Test Date:**	September 17, 2021
Humidity:	58% RH	**Test by:**	Lance Chen

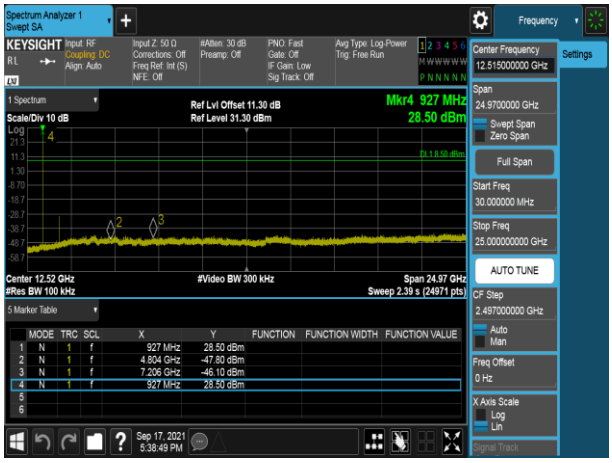
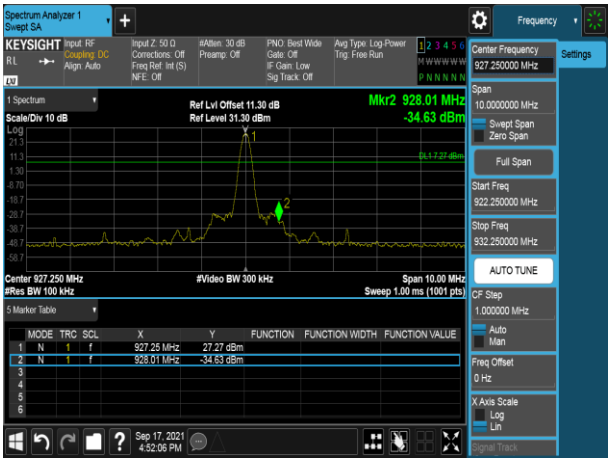
Test Data
Low CH

Spurious Emission 30MHz-12.5GHz	Band Edge
	
Hopping Bandedge	
	

Mid CH

Spurious Emission 30MHz-12.5GHz


High CH

Spurious Emission 30MHz-12.5GHz	Band Edge
	
Hopping Bandedge	
	

4.7 TIME OF OCCUPANCY (DWELL TIME)

4.7.1 Test Limit

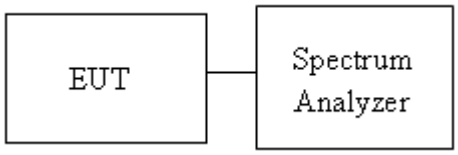
According to §15.247(a)(1)(iii)

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

4.7.2 Test Procedure

1. EUT RF output port connected to the SA by RF cable.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
   VBW > RBW

4.7.3 Test Setup

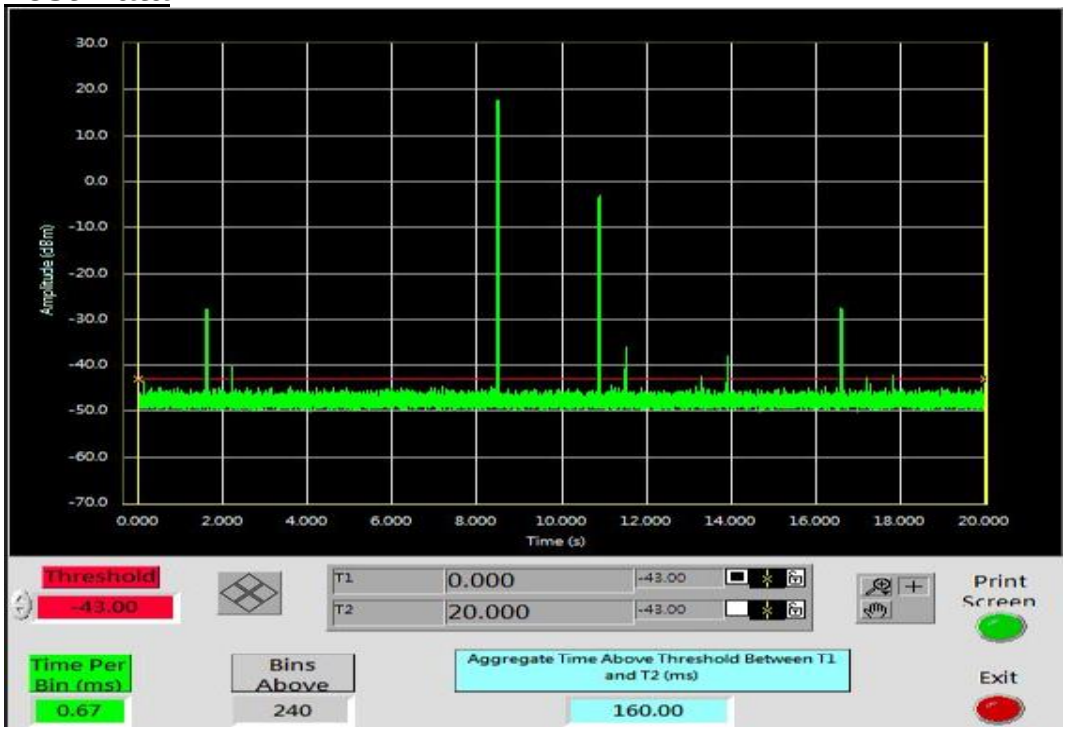


4.7.4 Test Result

Temperature:	24.9℃	**Test Date:**	September 17, 2021
Humidity:	58% RH	**Test by:**	Lance Chen

Time of Occupancy (Dwell Time)					
Mode	**Frequency (MHz)**	**Number of Pulse**	**Dwell Time (ms)**	**Dwell Time Limits (s)**	**Result**
Hopping	902.8	240	160	0.4	Pass

Test Data



4.8 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.8.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205,

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Remark:
Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

4.8.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4mabove the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 30MHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

4. The SA setting following：

(1) Below 1G：RBW = 100kHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2) Above 1G：

(2.1) For Peak measurement：RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2.2) For Average measurement：RBW = 1MHz, VBW

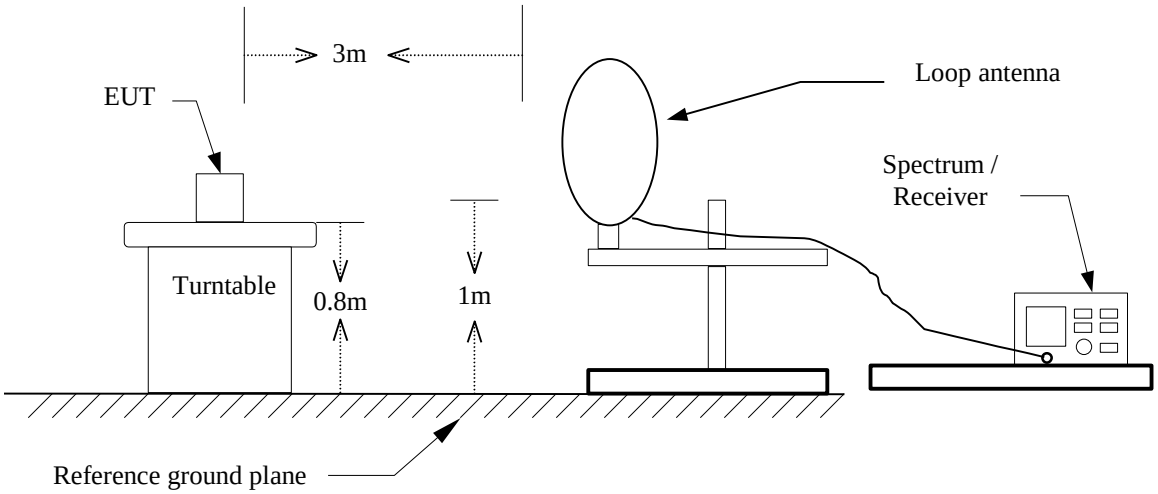
˙If Duty Cycle ≥ 98%, VBW=10Hz.

˙If Duty Cycle <98%, VBW=1/T.

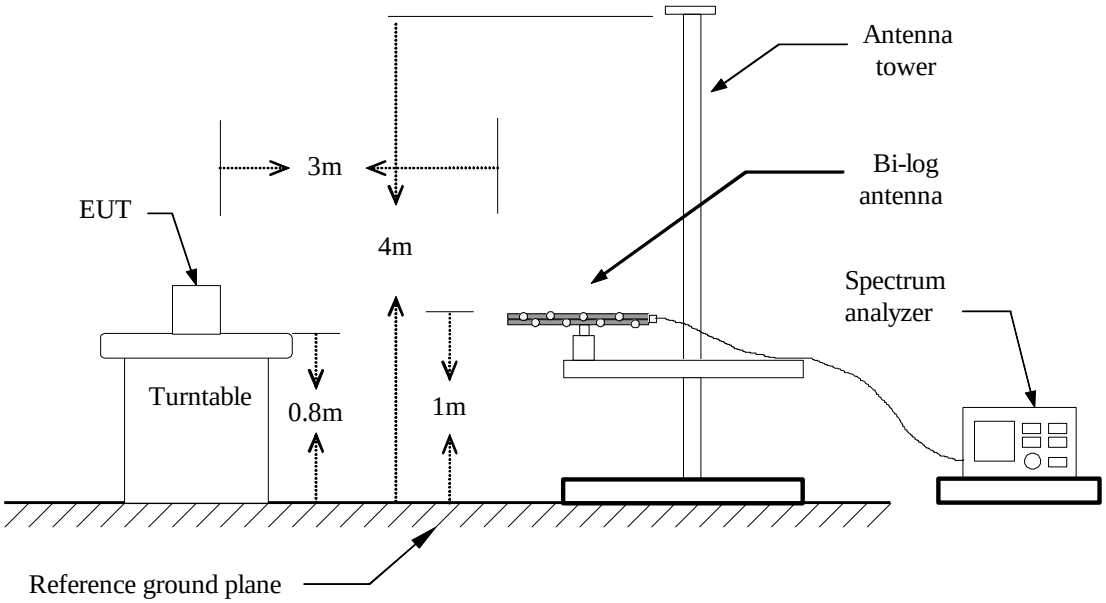
Note: No emission found between lowest internal used/generated frequency to 30MHz (9KHz~30MHz)

4.8.3 Test Setup

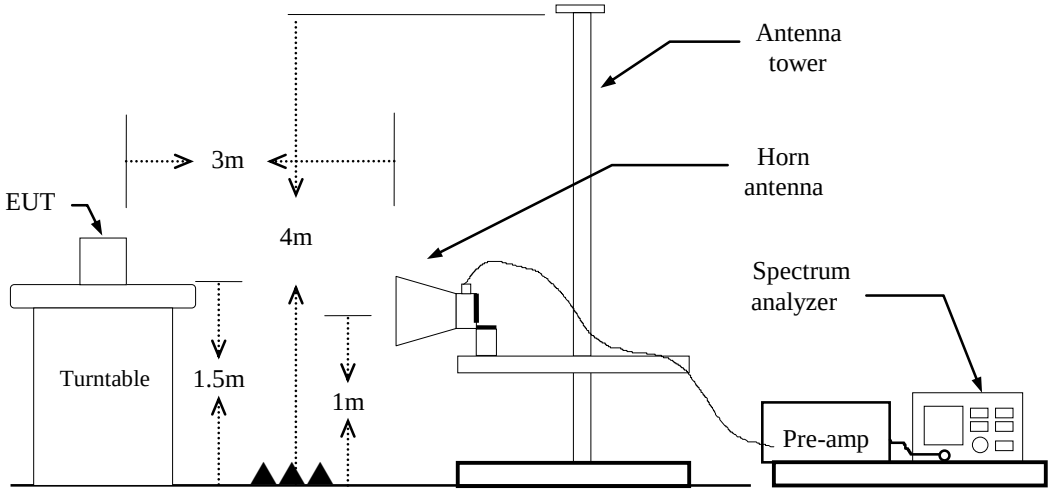
9kHz ~ 30MHz



30MHz ~ 1GHz



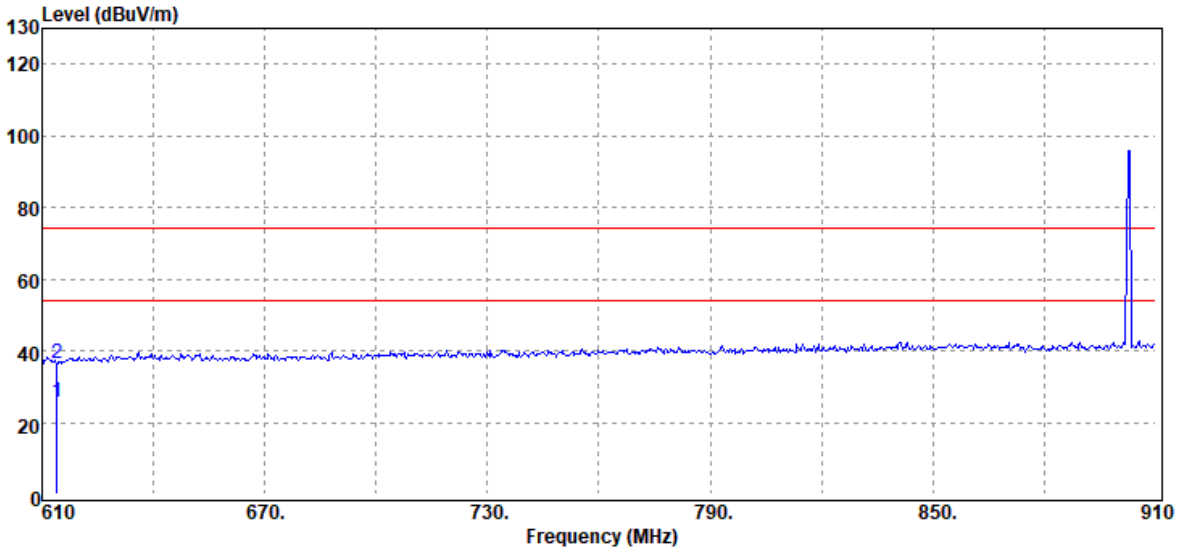
Above 1 GHz



4.8.4 Test Result

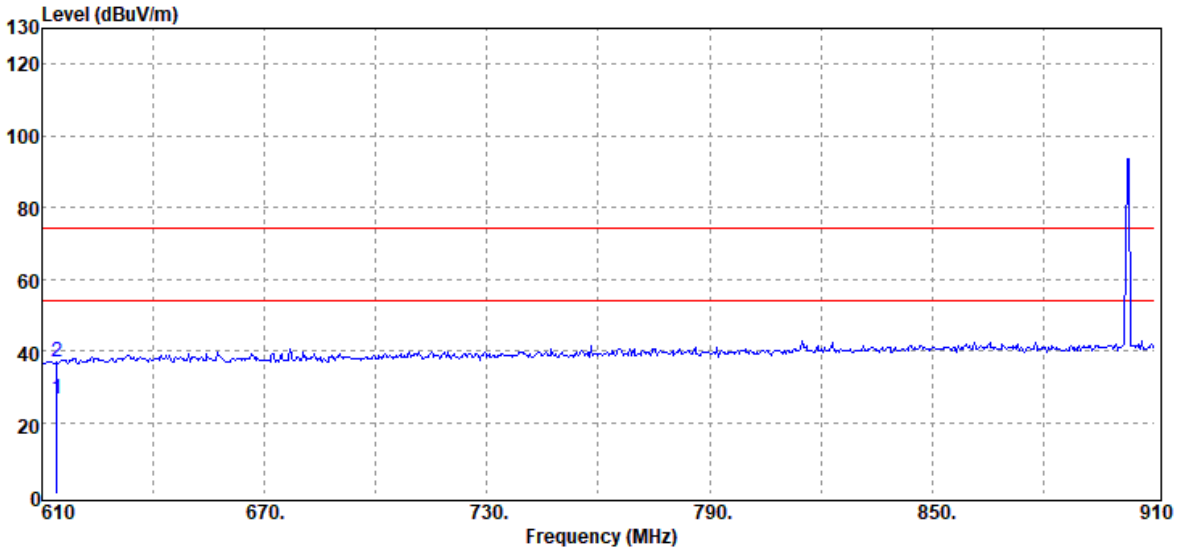
Band Edge Test Data

Test Mode:	Low CH 902.75 MHz	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Band Edge	Test Date	September 24, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	QP / Peak		



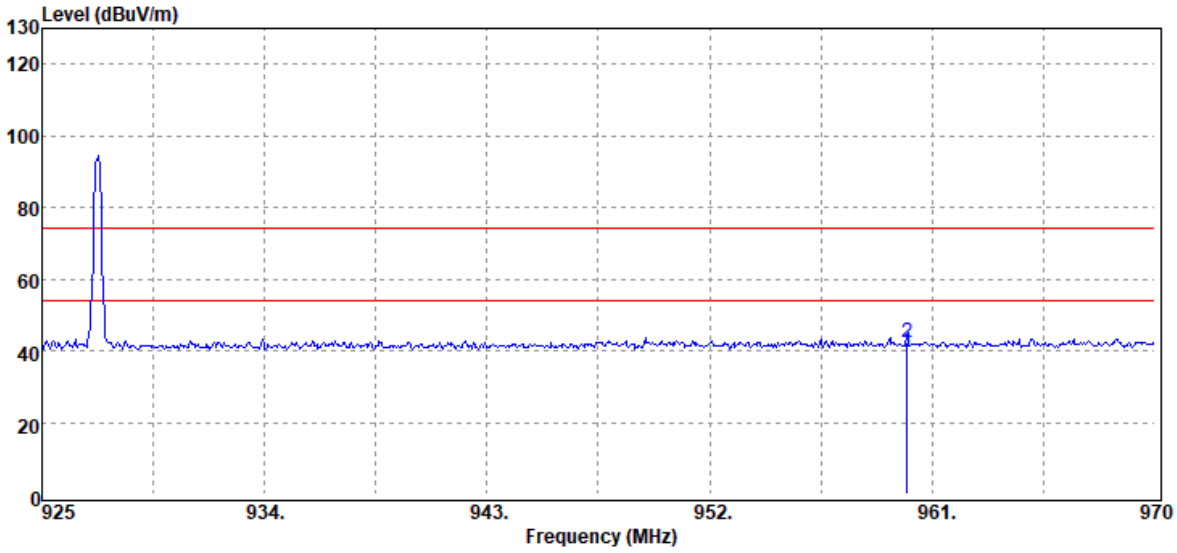
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
614.00	QP	27.30	-1.59	25.71	54.00	-28.29
614.00	Peak	38.05	-1.59	36.46	74.00	-37.54

Test Mode:	Low CH 902.75 MHz	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Band Edge	Test Date	September 24, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	QP / Peak		



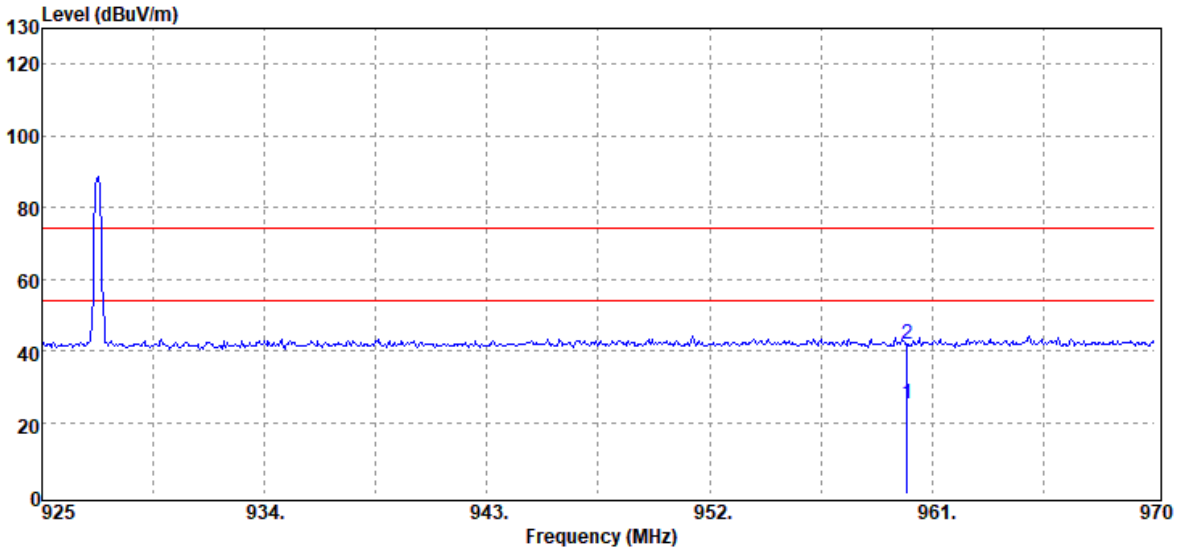
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
614.00	QP	27.91	-1.59	26.32	54.00	-27.68
614.00	Peak	38.39	-1.59	36.80	74.00	-37.20

Test Mode:	High CH 927.25 MHz	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Band Edge	Test Date	September 24, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	QP / Peak		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
960.00	QP	35.70	3.83	39.53	54.00	-14.47
960.00	Peak	38.36	3.83	42.19	74.00	-31.81

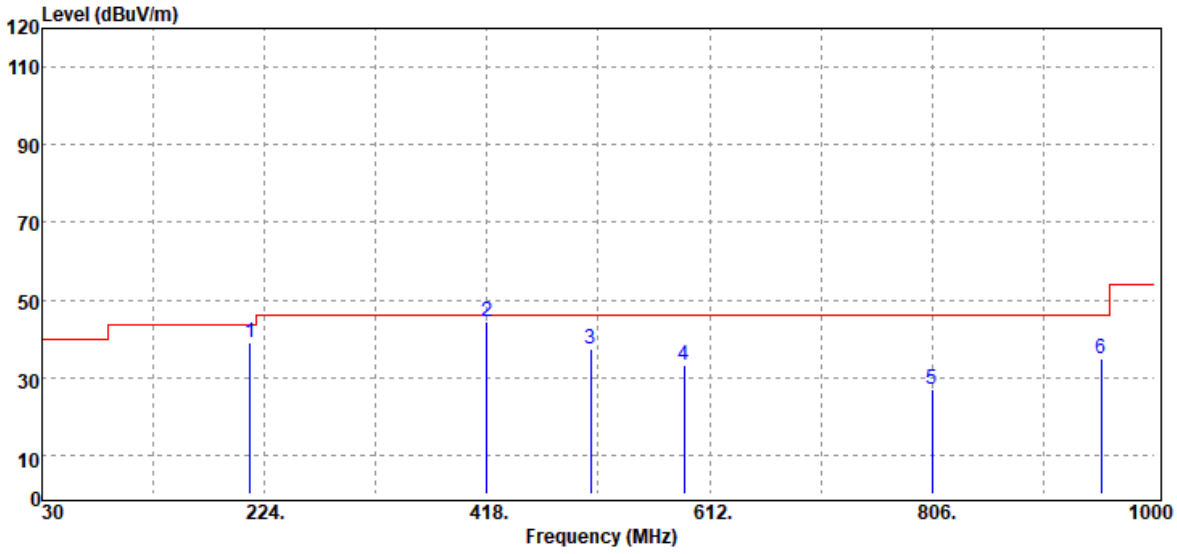
Test Mode:	High CH 927.25 MHz	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Band Edge	Test Date	September 24, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	QP / Peak		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB
960.00	QP	21.37	3.83	25.20	54.00	-28.80
960.00	Peak	37.84	3.83	41.67	74.00	-32.33

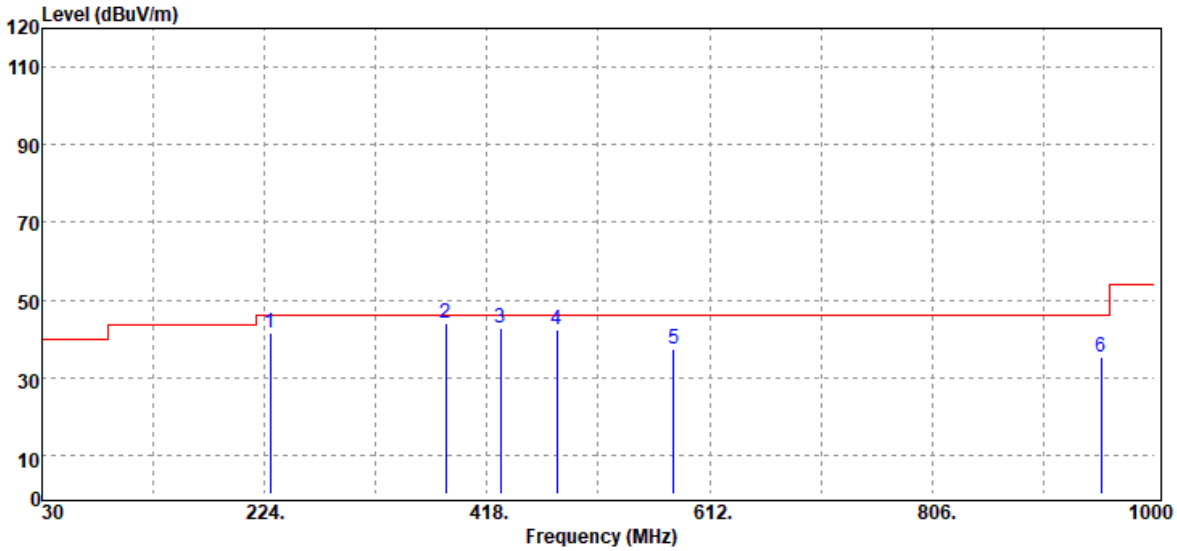
Below 1G Test Data

Test Mode:	CH Low	Temp/Hum	23.1(℃)/ 57%RH
Test Item	30MHz-1GHz	Test Date	September 23, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



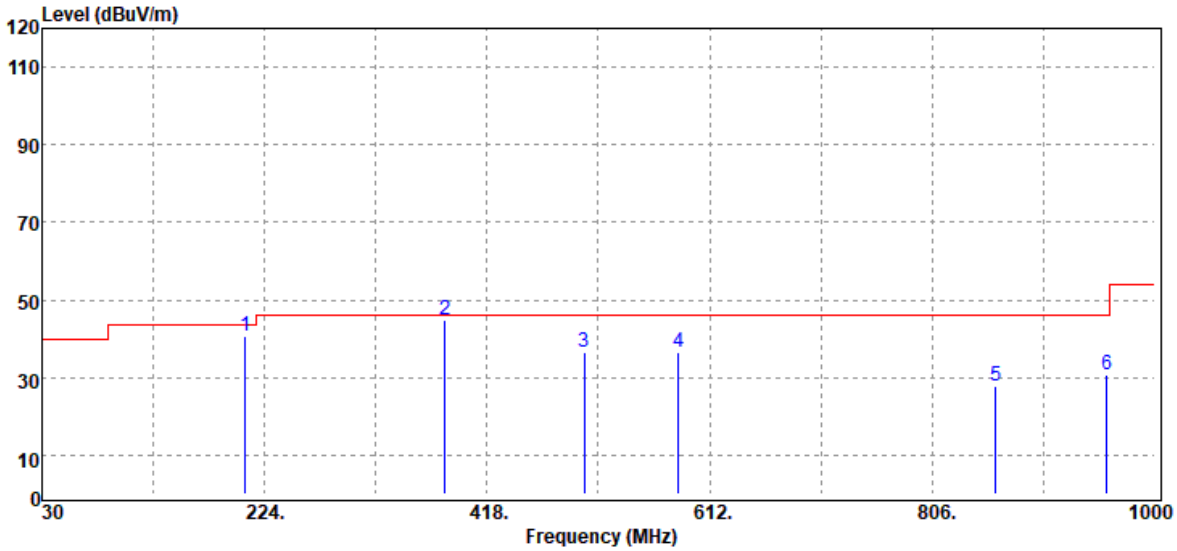
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
211.39	Peak	51.03	-11.99	39.04	43.50	-4.46
418.00	Peak	49.66	-5.31	44.35	46.00	-1.65
508.21	Peak	40.88	-3.39	37.49	46.00	-8.51
589.69	Peak	35.38	-2.28	33.10	46.00	-12.90
806.00	Peak	25.20	1.70	26.90	46.00	-19.10
953.44	Peak	31.28	3.77	35.05	46.00	-10.95

Test Mode:	CH Low	Temp/Hum	23.1(℃)/ 57%RH
Test Item	30MHz-1GHz	Test Date	September 23, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



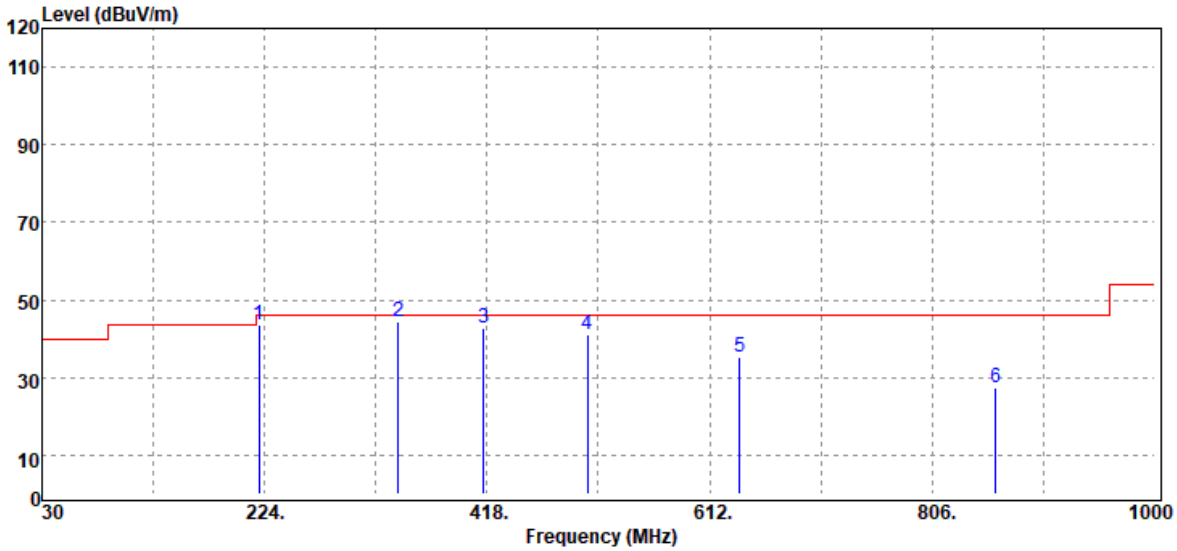
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
228.85	Peak	52.87	-11.41	41.46	46.00	-4.54
382.11	Peak	50.53	-6.64	43.89	46.00	-2.11
429.64	Peak	47.82	-5.03	42.79	46.00	-3.21
479.11	Peak	45.85	-3.39	42.46	46.00	-3.54
580.96	Peak	39.70	-2.19	37.51	46.00	-8.49
953.44	Peak	31.62	3.77	35.39	46.00	-10.61

Test Mode:	CH Mid	Temp/Hum	23.1(℃)/ 57%RH
Test Item	30MHz-1GHz	Test Date	September 23, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



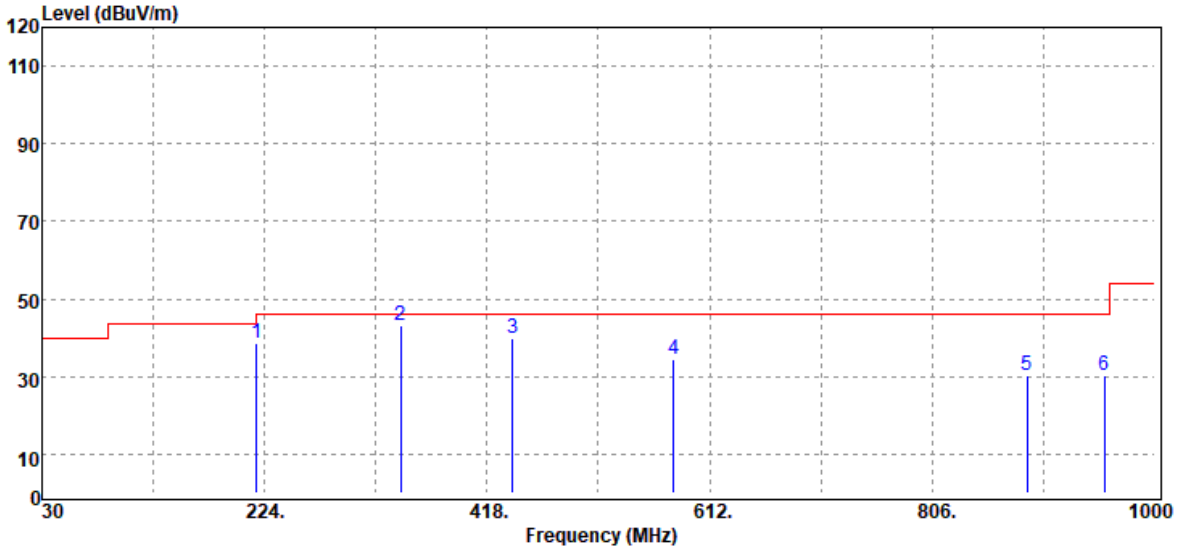
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
207.51	Peak	52.36	-11.85	40.51	43.50	-2.99
381.14	Peak	51.37	-6.68	44.69	46.00	-1.31
502.39	Peak	39.92	-3.38	36.54	46.00	-9.46
584.84	Peak	38.80	-2.26	36.54	46.00	-9.46
861.29	Peak	25.50	2.49	27.99	46.00	-18.01
958.29	Peak	26.87	3.82	30.69	46.00	-15.31

Test Mode:	CH Mid	Temp/Hum	23.1(℃)/ 57%RH
Test Item	30MHz-1GHz	Test Date	September 23, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



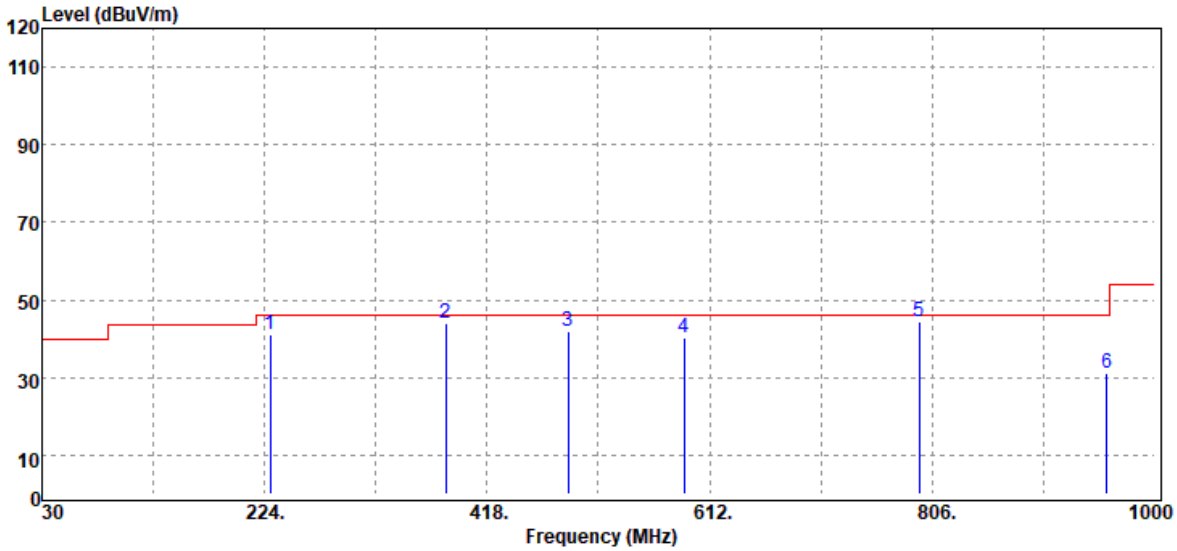
Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
219.15	Peak	55.43	-11.85	43.58	46.00	-2.42
340.40	Peak	52.56	-7.96	44.60	46.00	-1.40
415.09	Peak	48.12	-5.38	42.74	46.00	-3.26
505.30	Peak	44.53	-3.36	41.17	46.00	-4.83
638.19	Peak	36.01	-0.63	35.38	46.00	-10.62
861.29	Peak	24.78	2.49	27.27	46.00	-18.73

Test Mode:	CH High	Temp/Hum	23.1(℃)/ 57%RH
Test Item	30MHz-1GHz	Test Date	September 23, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
217.21	Peak	50.70	-11.89	38.81	46.00	-7.19
342.34	Peak	50.98	-7.89	43.09	46.00	-2.91
440.31	Peak	44.54	-4.73	39.81	46.00	-6.19
580.96	Peak	36.75	-2.19	34.56	46.00	-11.44
888.45	Peak	27.90	2.60	30.50	46.00	-15.50
956.35	Peak	26.69	3.81	30.50	46.00	-15.50

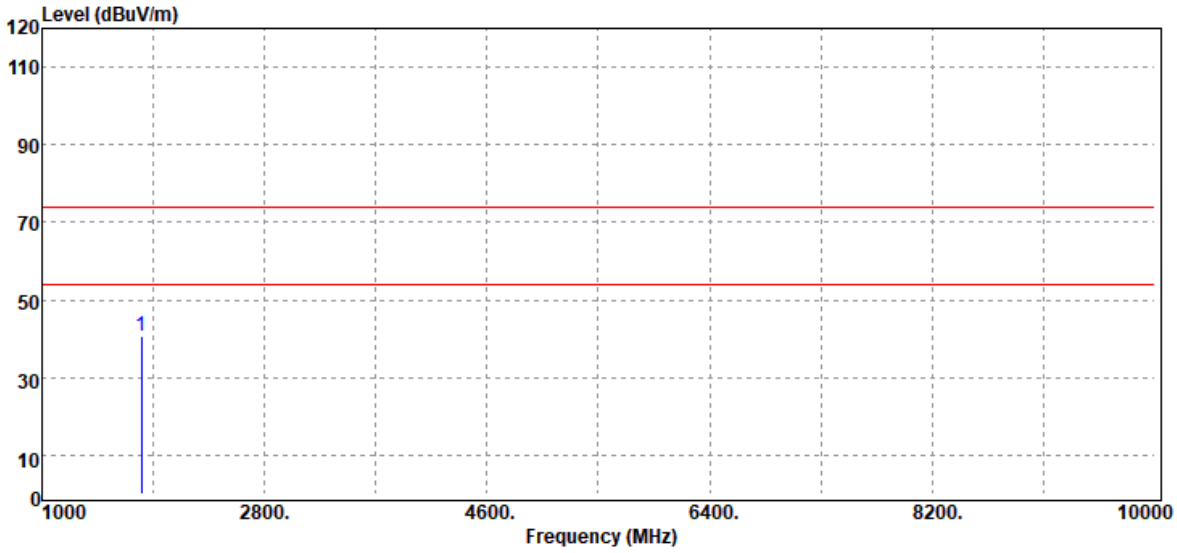
Test Mode:	CH High	Temp/Hum	23.1(℃)/ 57%RH
Test Item	30MHz-1GHz	Test Date	September 23, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
228.85	Peak	52.52	-11.41	41.11	46.00	-4.89
382.11	Peak	50.86	-6.64	44.22	46.00	-1.78
488.81	Peak	45.40	-3.45	41.95	46.00	-4.05
589.69	Peak	42.46	-2.28	40.18	46.00	-5.82
794.36	Peak	42.77	1.46	44.23	46.00	-1.77
958.29	Peak	27.37	3.82	31.19	46.00	-14.81

Above 1G Test Data

Test Mode:	Low CH	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Harmonic	Test Date	September 24, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		

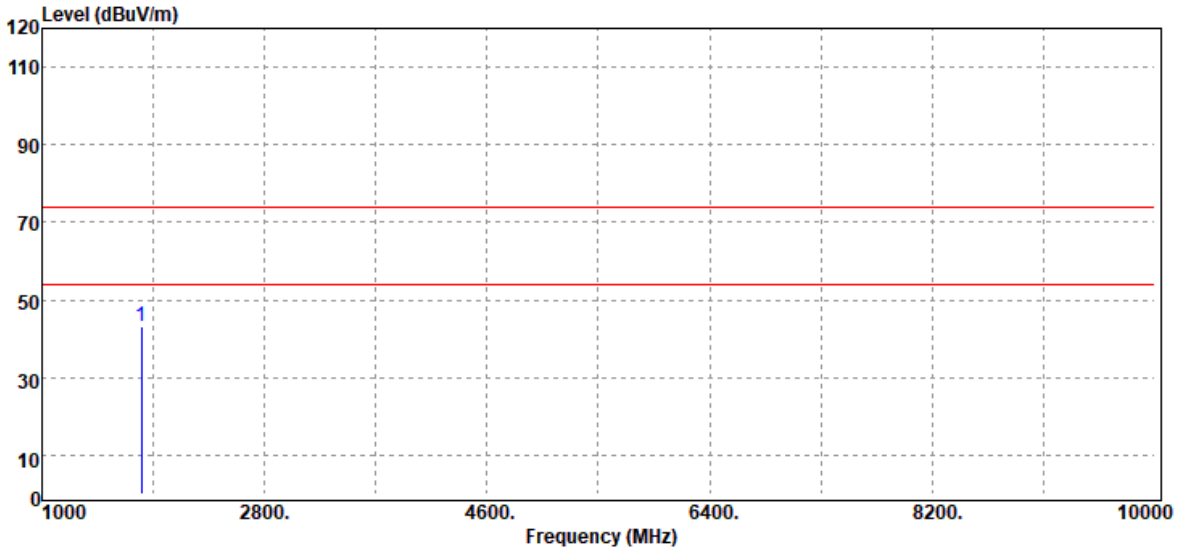


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
1805.50	Peak	44.82	-4.30	40.52	74.00	-33.48
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit

Test Mode:	Low CH	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Harmonic	Test Date	September 24, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		

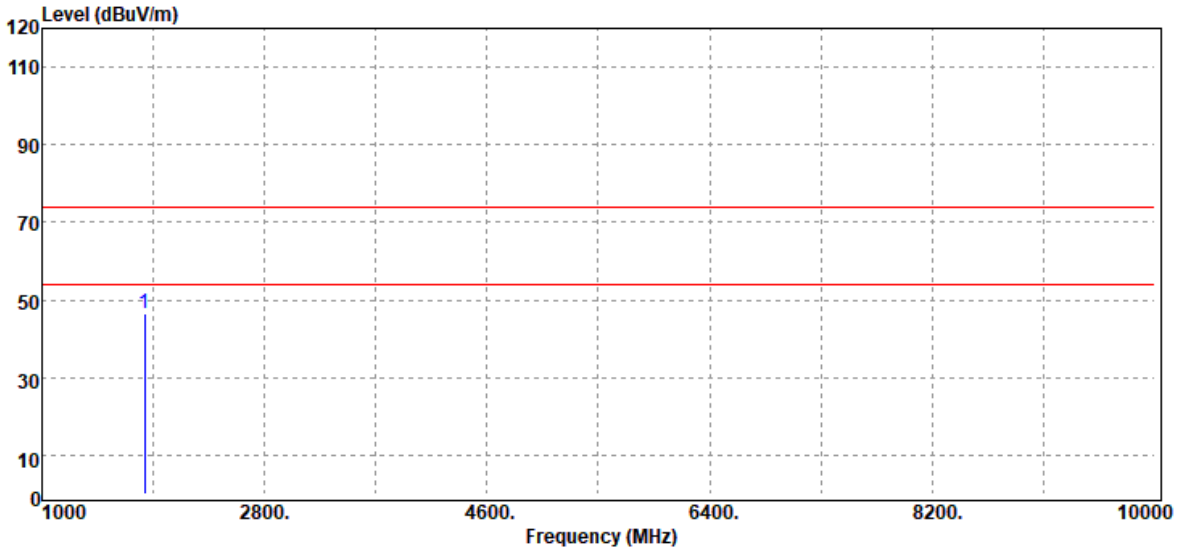


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
1805.50	Peak	47.53	-4.30	43.23	74.00	-30.77
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit

Test Mode:	Mid CH	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Harmonic	Test Date	September 24, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		

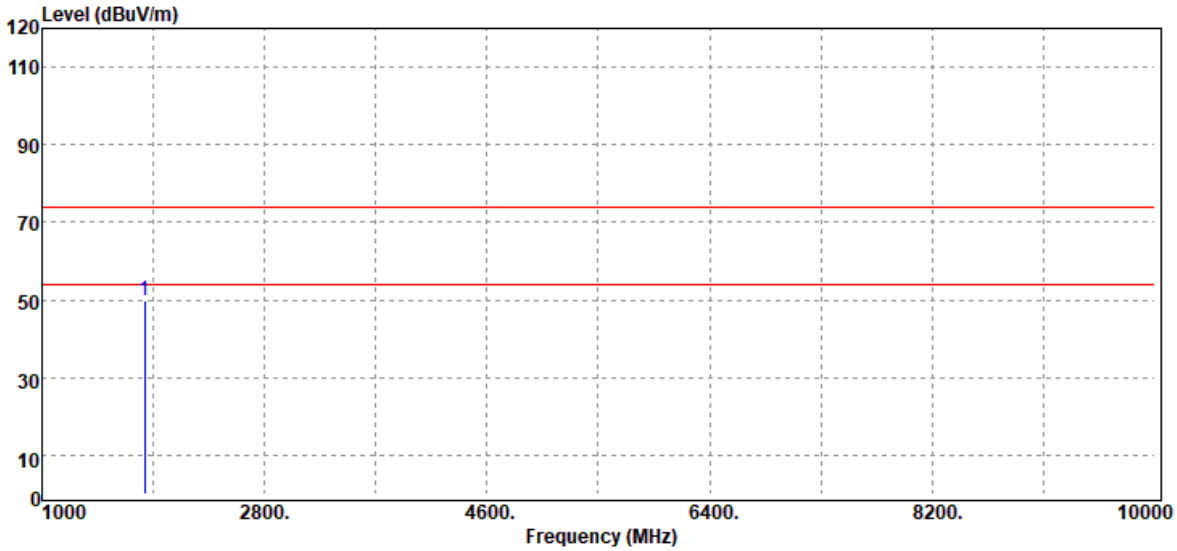


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
1829.50	Peak	50.51	-3.99	46.52	74.00	-27.48
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit

Test Mode:	Mid CH	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Harmonic	Test Date	September 24, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		

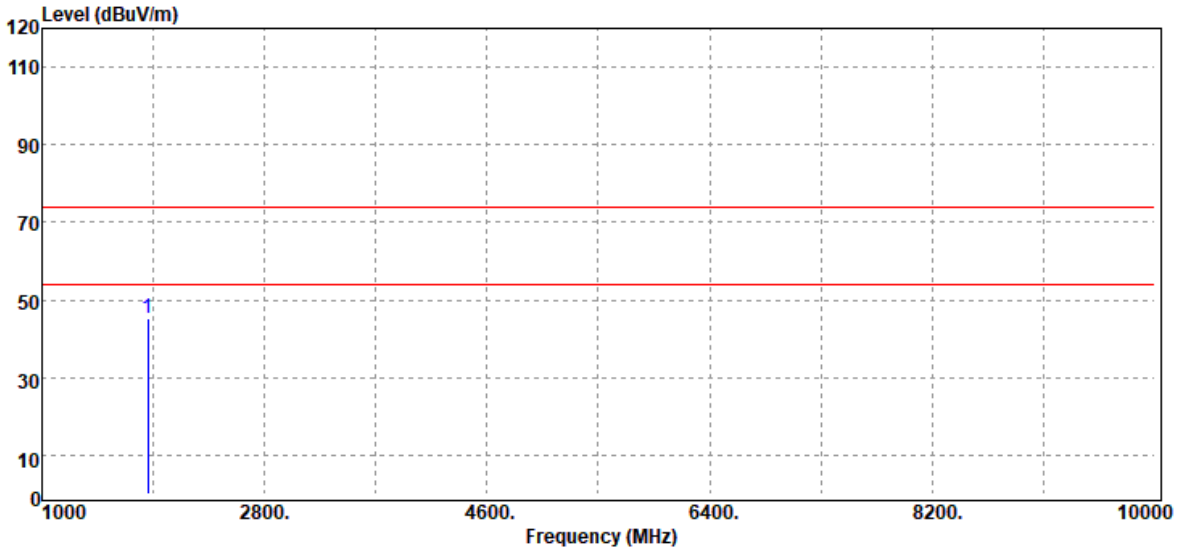


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
1829.50	Peak	53.78	-3.99	49.79	74.00	-24.21
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit

Test Mode:	High CH	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Harmonic	Test Date	September 24, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		

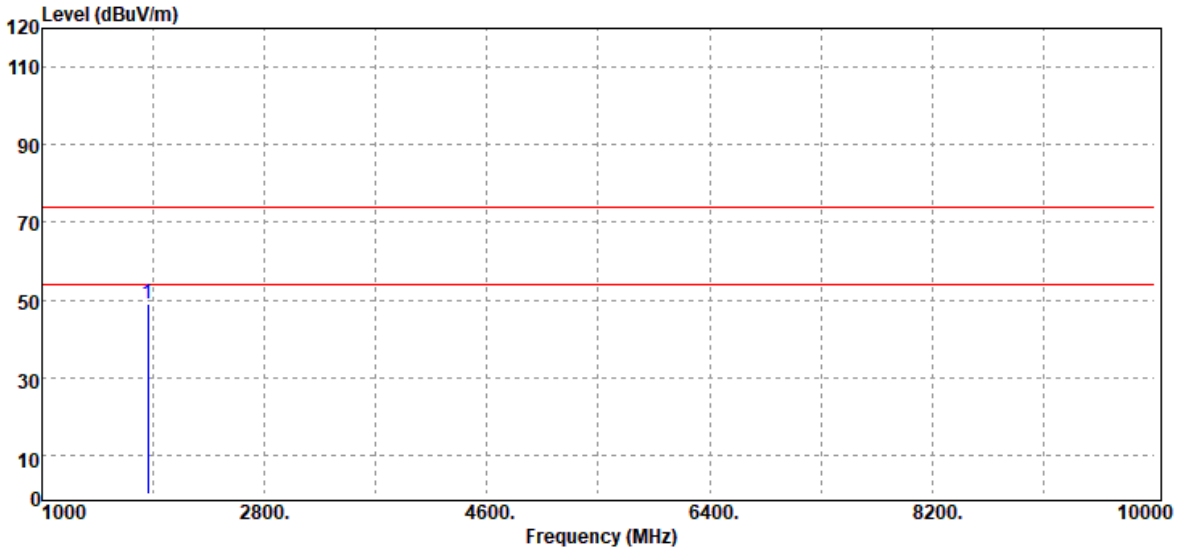


Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
1854.50	Peak	49.13	-3.82	45.31	74.00	-28.69
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit

Test Mode:	High CH	Temp/Hum	24.1(℃)/ 48%RH
Test Item	Harmonic	Test Date	September 24, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



Freq. (MHz)	Detector Mode (PK/QP/AV)	Spectrum Reading Level (dBµV)	Factor (dB)	Actual FS (dBµV/m)	Limit @3m (dBµV/m)	Margin (dB)
1854.50	Peak	52.98	-3.82	49.16	74.00	-24.84
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit

- End of Test Report -