

TEST REPORT

Applicant: Dragino Technology Co., Limited.

Address of Applicant: Room 202, BaoChengTai industrial park, No.8 CaiYun, LongCheng Street, LongGang District, Shenzhen 518116, China

Manufacturer/Factory : Dragino Technology Co., Limited.

Address of Manufacturer/Factory : Room 202, BaoChengTai industrial park, No.8 CaiYun LongCheng Street, LongGang District, Shenzhen 518116, China

Equipment Under Test (EUT)

Product Name: LoRaWAN Concentrator

Model No.: PG1302

Trade Mark: Dragino

FCC ID: ZHZPG1302

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: Sep. 24, 2021

Date of Test: Sep. 24- Oct. 13, 2021

Date of report issued: Oct. 13, 2021

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Luo

Laboratory Manager

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2 Version

Version No.	Date	Description
00	Oct. 13, 2021	Original

Prepared By:

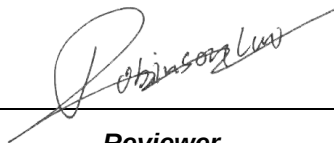


Date:

Oct. 13, 2021

Project Engineer

Check By:



Date:

Oct. 13, 2021

Reviewer

3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
5 GENERAL INFORMATION	5
5.1 GENERAL DESCRIPTION OF EUT	5
5.2 TEST MODE	7
5.3 DESCRIPTION OF SUPPORT UNITS	7
5.4 DEVIATION FROM STANDARDS	7
5.5 ABNORMALITIES FROM STANDARD CONDITIONS	7
5.6 TEST FACILITY	7
5.7 TEST LOCATION	7
6 TEST INSTRUMENTS LIST	8
7 TEST RESULTS AND MEASUREMENT DATA	10
7.1 ANTENNA REQUIREMENT	10
7.2 CONDUCTED EMISSIONS	11
8 TEST ITEMS FOR HYBRID	16
8.1 CONDUCTED PEAK OUTPUT POWER	16
8.2 20dB EMISSION BANDWIDTH	18
8.3 CARRIER FREQUENCIES SEPARATION	20
8.4 HOPPING CHANNEL NUMBER	22
8.5 DWELL TIME	23
8.6 PSEUDORANDOM FREQUENCY HOPPING SEQUENCE	25
8.7 BAND EDGE	26
8.7.1 Conducted Emission Method	26
8.7.2 Radiated Emission Method	28
8.8 SPURIOUS EMISSION	29
8.8.1 Conducted Emission Method	29
8.8.2 Radiated Emission Method	31
9 TEST SETUP PHOTO	44
10 EUT CONSTRUCTIONAL DETAILS	44

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(1)	Pass
20dB Occupied Bandwidth	15.247 (a)(1)	Pass
Carrier Frequencies Separation	15.247 (a)(1)	Pass
Hopping Channel Number	15.247 (a)(1)	Pass
Dwell Time	15.247 (a)(1)	Pass
Pseudorandom Frequency Hopping Sequence	15.247(b)(4)	Pass
Radiated Emission	15.205/15.209	Pass
Band Edge	15.247(d)	Pass

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	LoRaWAN Concentrator
Model No.:	PG1302
Test sample(s) ID:	GTSL202112000228-1
Sample(s) Status:	Engineer sample
Serial No.:	N/A
Hardware Version:	PG1302V1.3
Software Version:	N/A
Operation Frequency:	125KHz: 902.3MHz~914.9MHz
Channel numbers:	64 for FHSS
Channel separation:	200KHz for 125KHz bandwidth
Modulation type:	Lora
Antenna Type:	ANT 1: Fibre-glass epoxy antenna ANT 2: External antenna
Antenna gain:	ANT 1: Omni-directional,Peak Gain 2.69dBi ANT 2: Omni-directional,Peak Gain 3.0 dBi
Power supply:	Input: DC5V

125KHz for FHSS:

Operation Frequency each of channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	902.3	17	905.5	33	908.7	49	911.9
2	902.5	18	905.7	34	908.9	50	912.1
3	902.7	19	905.9	35	909.1	51	912.3
4	902.9	20	906.1	36	909.3	52	912.5
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
13	904.7	29	907.9	45	911.1	61	914.3
14	904.9	30	908.1	46	911.3	62	914.5
15	905.1	31	908.3	47	911.5	63	914.7
16	905.3	32	908.5	48	911.7	64	914.9

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency(125KHz)
The lowest channel	902.30MHz
The middle channel	908.50MHz
The Highest channel	914.90MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: full battery is used	

5.3 Description of Support Units

None.

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: ● FCC—Registration No.: 381383 Designation Number: CN5029 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. ● IC —Registration No.: 9079A CAB identifier: CN0091 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing ● NVLAP (LAB CODE:600179-0) Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).
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5.7 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd. Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 25 2021	June. 24 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 25 2021	June. 24 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 25 2021	June. 24 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 25 2021	June. 24 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 25 2021	June. 24 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 25 2021	June. 24 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 25 2021	June. 24 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 25 2021	June. 24 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 25 2021	June. 24 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 25 2021	June. 24 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 25 2021	June. 24 2022
15	Band filter	Amindeon	82346	GTS219	June. 25 2021	June. 24 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 25 2021	June. 24 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 25 2021	June. 24 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 25 2021	June. 24 2022
19	Splitter	Agilent	11636B	GTS237	June. 25 2021	June. 24 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 25 2021	June. 24 2022
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 17 2021	Oct. 16 2022
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 17 2021	Oct. 16 2022
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 17 2021	Oct. 16 2022
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 25 2021	June. 24 2022

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 24 2021	June. 23 2022
4	ENV216 2-L-V- NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 24 2021	June. 23 2022
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A

6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 24 2021	June. 23 2022
8	Absorbing clamp	Elektronik- Feinmechanik	MDS21	GTS229	June. 24 2021	June. 23 2022
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	June. 24 2021	June. 23 2022
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	July. 09 2021	July. 08 2022

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 25 2021	June. 24 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2021	June. 24 2022
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 25 2021	June. 24 2022
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 25 2021	June. 24 2022
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 25 2021	June. 24 2022
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 25 2021	June. 24 2022
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 25 2021	June. 24 2022
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 25 2021	June. 24 2022

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 25 2021	June. 24 2022
2	Barometer	ChangChun	DYM3	GTS255	June. 25 2021	June. 24 2022

7 Test results and Measurement Data

7.1 Antenna requirement

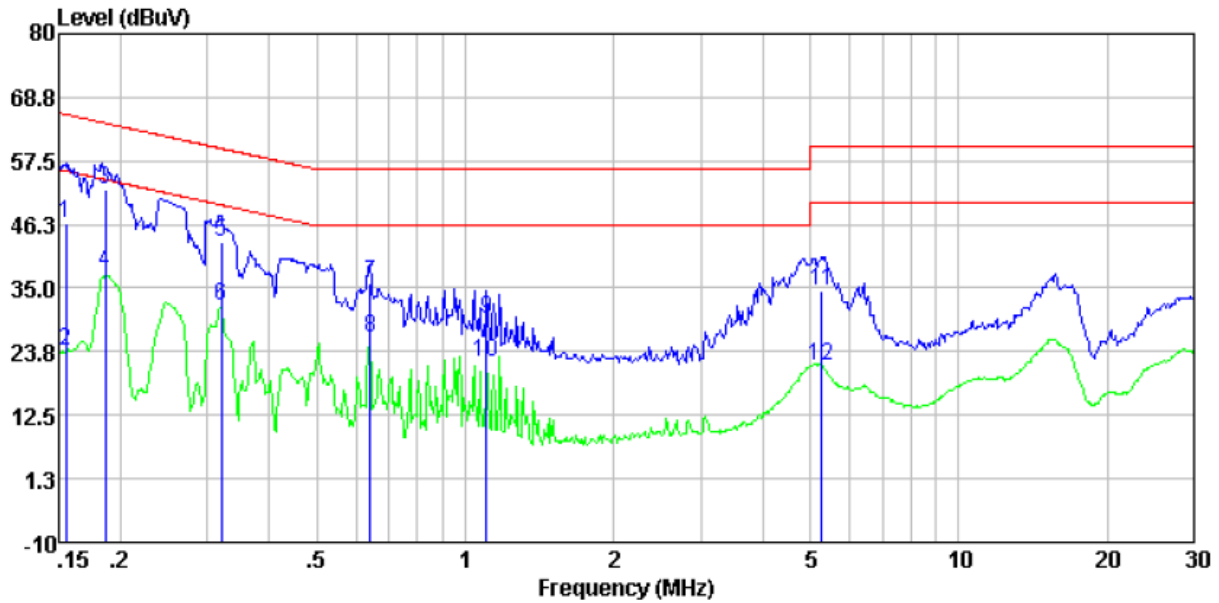
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	
<i>The antenna is Fibre-glass epoxy, the best case gain of the is 3dBi, reference to the appendix II for details.</i>	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207						
Test Method:	ANSI C63.10:2013						
Test Frequency Range:	150KHz to 30MHz						
Class / Severity:	Class B						
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto						
Limit:	Frequency range (MHz)		Limit (dBuV)				
			Quasi-peak		Average		
	0.15-0.5		66 to 56*		56 to 46*		
	0.5-5		56		46		
	5-30		60		50		
* Decreases with the logarithm of the frequency.							
Test setup:	Reference Plane Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m						
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.						
Test Instruments:	Refer to section 6.0 for details						
Test mode:	Refer to section 5.2 for details						
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar	
Test voltage:	AC 120V, 60Hz						
Test results:	PASS						

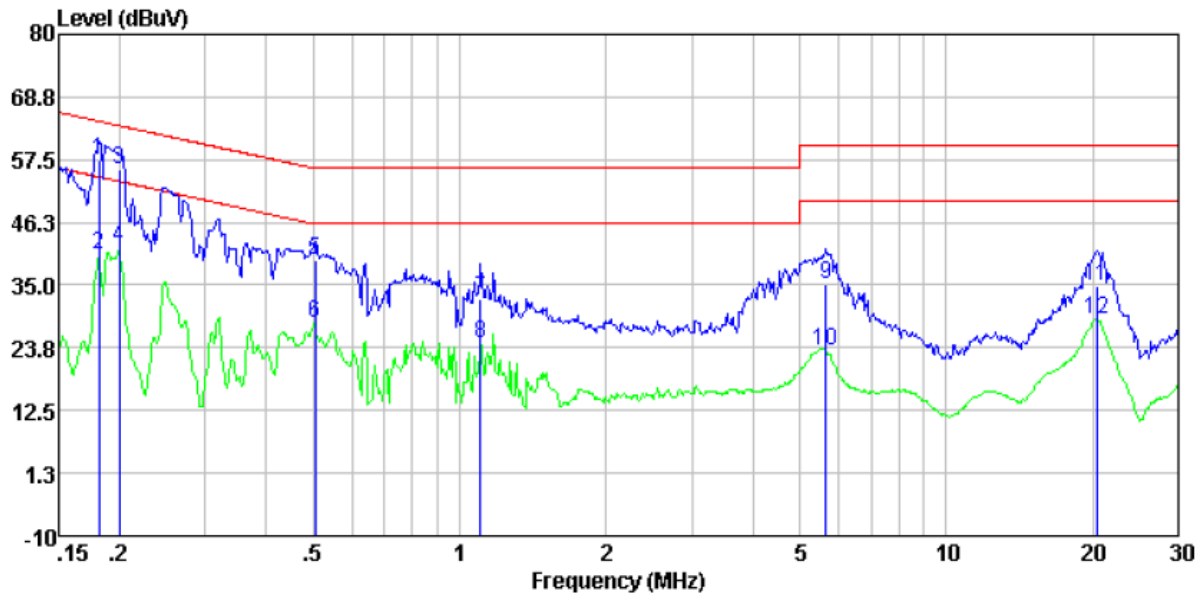
Test mode:	Transmitting mode	Phase Polarity:	Line
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Ant 1:



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.155	36.06	10.40	0.01	46.47	65.74	-19.27	QP
2	0.155	13.41	10.40	0.01	23.82	55.74	-31.92	Average
3	0.186	42.13	10.40	0.01	52.54	64.20	-11.66	QP
4	0.186	27.49	10.40	0.01	37.90	54.20	-16.30	Average
5	0.320	32.58	10.39	0.01	42.98	59.71	-16.73	QP
6	0.320	21.39	10.39	0.01	31.79	49.71	-17.92	Average
7	0.641	25.58	10.27	0.02	35.87	56.00	-20.13	QP
8	0.641	16.00	10.27	0.02	26.29	46.00	-19.71	Average
9	1.106	19.35	10.20	0.03	29.58	56.00	-26.42	QP
10	1.106	11.51	10.20	0.03	21.74	46.00	-24.26	Average
11	5.277	24.26	10.20	0.07	34.53	60.00	-25.47	QP
12	5.277	11.07	10.20	0.07	21.34	50.00	-28.66	Average

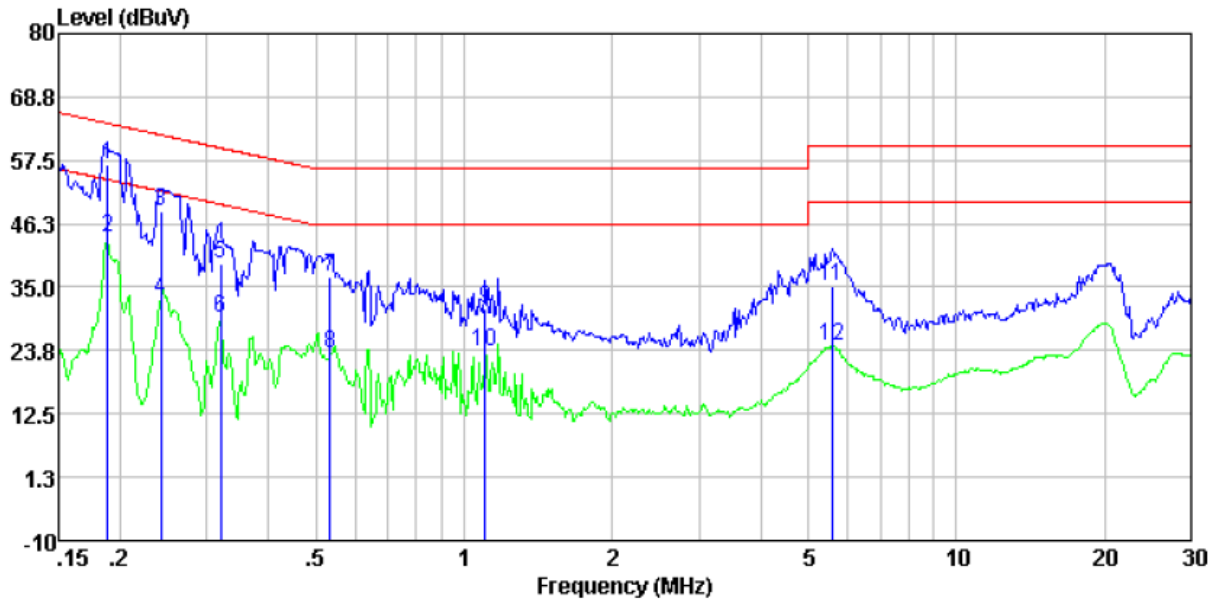
Test mode:	Transmitting mode	Phase Polarity:	Neutral
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	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.182	47.05	10.40	0.01	57.46	64.42	-6.96	QP
2	0.182	30.04	10.40	0.01	40.45	54.42	-13.97	Average
3	0.200	45.31	10.40	0.01	55.72	63.62	-7.90	QP
4	0.200	31.53	10.40	0.01	41.94	53.62	-11.68	Average
5	0.505	29.19	10.31	0.01	39.51	56.00	-16.49	QP
6	0.505	18.03	10.31	0.01	28.35	46.00	-17.65	Average
7	1.106	22.17	10.20	0.03	32.40	56.00	-23.60	QP
8	1.106	14.31	10.20	0.03	24.54	46.00	-21.46	Average
9	5.653	25.03	10.20	0.07	35.30	60.00	-24.70	QP
10	5.653	13.05	10.20	0.07	23.32	50.00	-26.68	Average
11	20.377	24.48	10.30	0.19	34.97	60.00	-25.03	QP
12	20.377	18.28	10.30	0.19	28.77	50.00	-21.23	Average

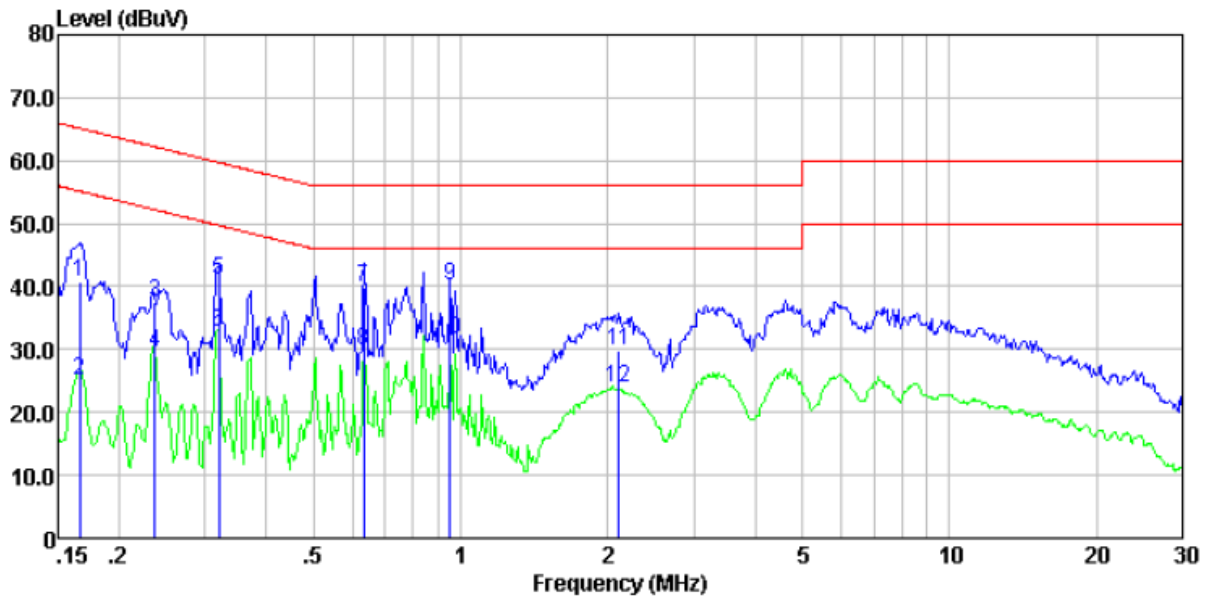
Test mode:	Transmitting mode	Phase Polarity:	Line
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Ant 2:



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.188	46.21	10.40	0.01	56.62	64.11	-7.49	QP
2	0.188	33.48	10.40	0.01	43.89	54.11	-10.22	Average
3	0.242	38.08	10.40	0.01	48.49	62.04	-13.55	QP
4	0.242	22.46	10.40	0.01	32.87	52.04	-19.17	Average
5	0.320	28.90	10.39	0.01	39.30	59.71	-20.41	QP
6	0.320	19.17	10.39	0.01	29.57	49.71	-20.14	Average
7	0.535	26.65	10.30	0.01	36.96	56.00	-19.04	QP
8	0.535	12.76	10.30	0.01	23.07	46.00	-22.93	Average
9	1.106	21.06	10.20	0.03	31.29	56.00	-24.71	QP
10	1.106	13.32	10.20	0.03	23.55	46.00	-22.45	Average
11	5.594	24.90	10.20	0.07	35.17	60.00	-24.83	QP
12	5.594	14.11	10.20	0.07	24.38	50.00	-25.62	Average

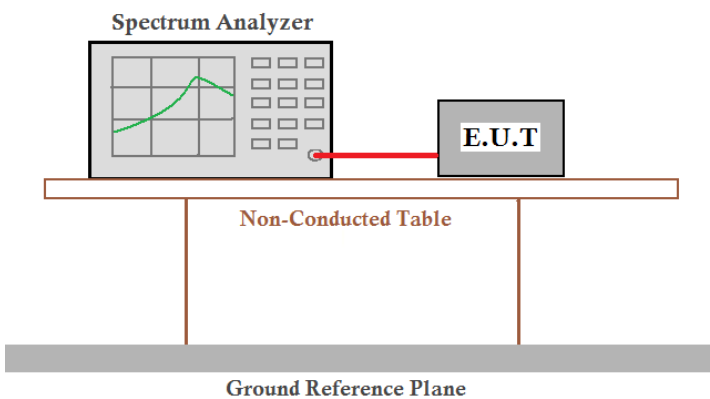
Test mode:	Transmitting mode	Phase Polarity:	Neutral
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	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.166	20.43	20.40	0.01	40.84	65.16	-24.32	QP
2	0.166	4.78	20.40	0.01	25.19	55.16	-29.97	Average
3	0.237	17.07	20.40	0.01	37.48	62.22	-24.74	QP
4	0.237	9.13	20.40	0.01	29.54	52.22	-22.68	Average
5	0.320	20.78	20.39	0.01	41.18	59.71	-18.53	QP
6	0.320	12.25	20.39	0.01	32.65	49.71	-17.06	Average
7	0.634	19.59	20.28	0.02	39.89	56.00	-16.11	QP
8	0.634	9.49	20.28	0.02	29.79	46.00	-16.21	Average
9	0.953	19.93	20.21	0.03	40.17	56.00	-15.83	QP
10	0.953	11.21	20.21	0.03	31.45	46.00	-14.55	Average
11	2.110	9.48	20.20	0.05	29.73	56.00	-26.27	QP
12	2.110	3.53	20.20	0.05	23.78	46.00	-22.22	Average

8 Test Items for Hybrid

8.1 Conducted Peak Output Power

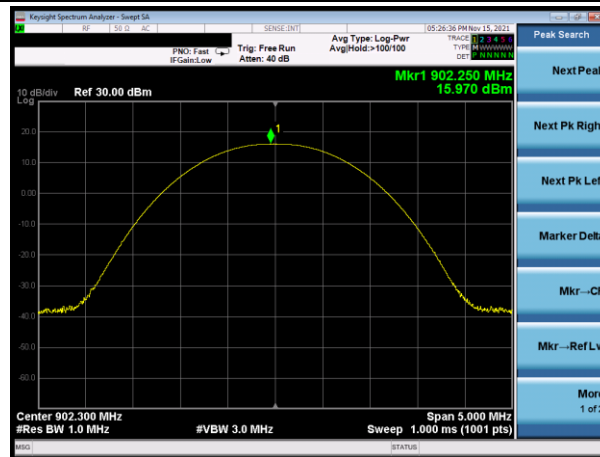
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013
Limit:	30dBm
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

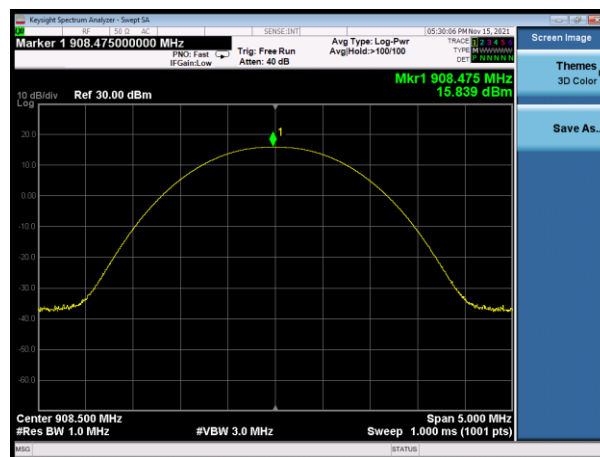
Mode	Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
125KHz Bandwidth	Lowest	15.970	30.00	Pass
	Middle	15.839		
	Highest	15.849		

Test plot as follows:

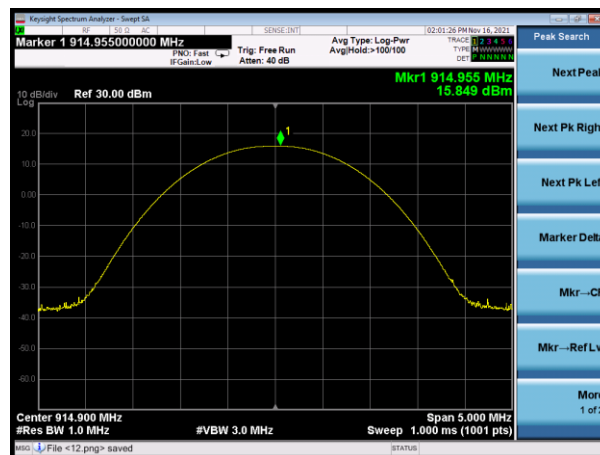
Test mode:	125KHz Bandwidth
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Lowest channel

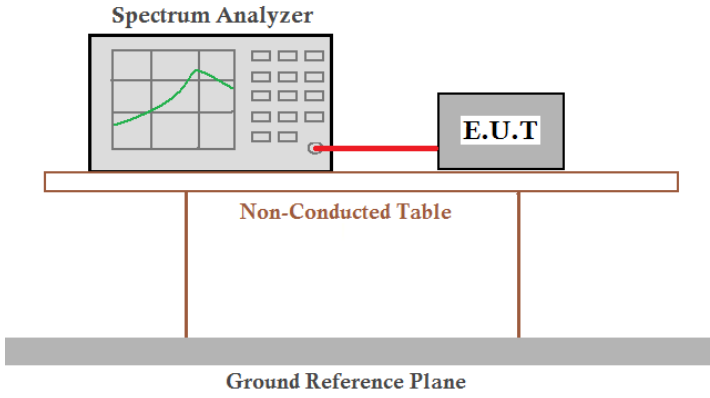


Middle channel



Highest channel

8.2 20dB Emission Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Limit:	Less than 500KHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Mode	Test channel	20dB Emission Bandwidth (KHz)	Result
125KHz Bandwidth	Lowest	135.0	Pass
	Middle	134.9	
	Highest	134.5	

Test plot as follows:

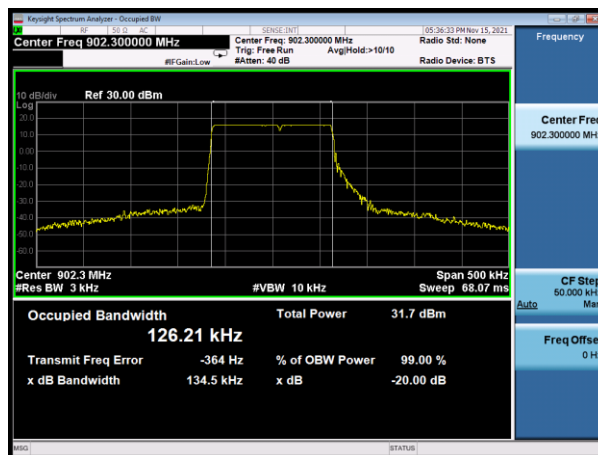
Test mode:	125KHz Bandwidth
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Lowest channel

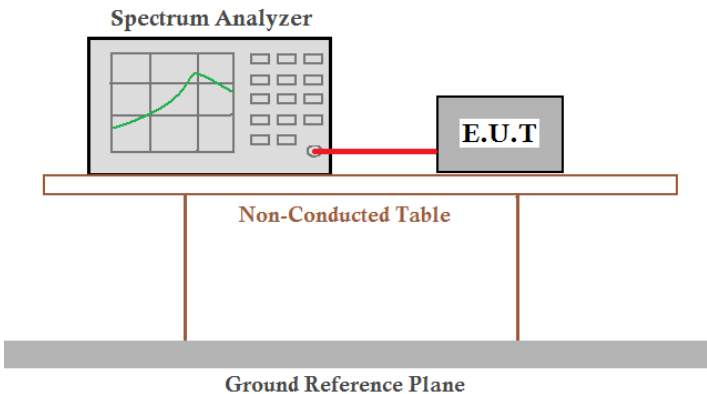


Middle channel



Highest channel

8.3 Carrier Frequencies Separation

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, detector=Peak
Limit:	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Mode	Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
125KHz Bandwidth	Lowest	200.40	500KHz	Pass
	Middle	200.40		Pass
	Highest	201.00		Pass

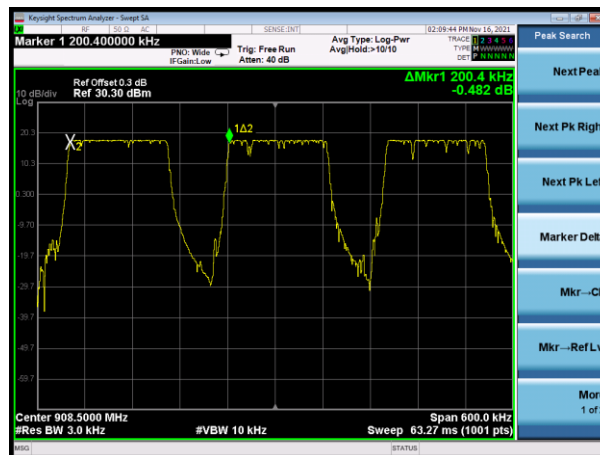
Test plot as follows:

Modulation mode:

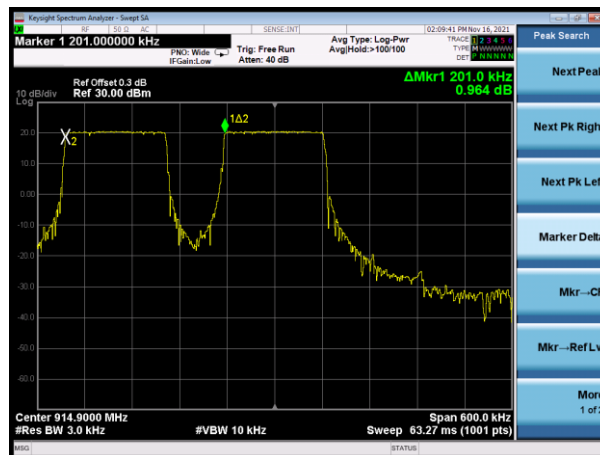
125KHz Bandwidth



Lowest channel

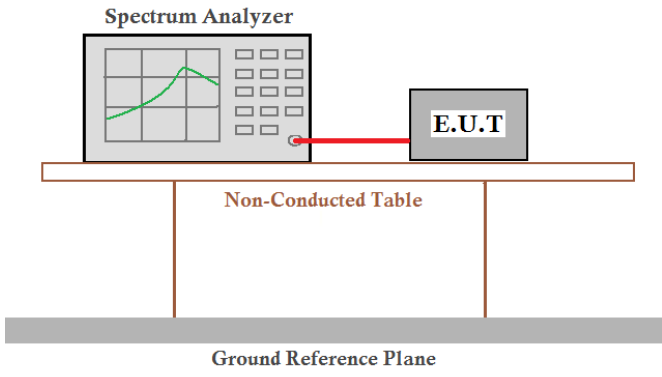


Middle channel



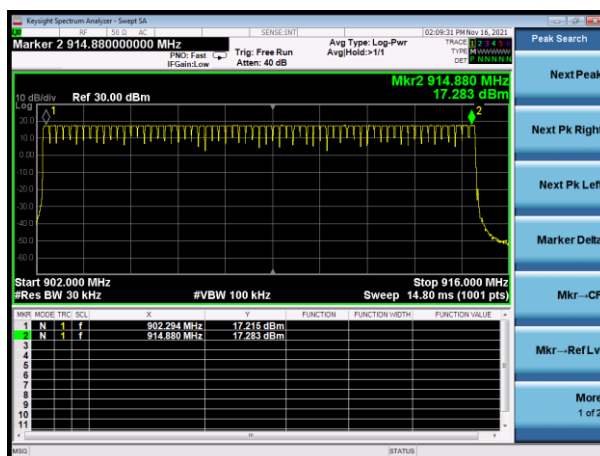
Highest channel

8.4 Hopping Channel Number

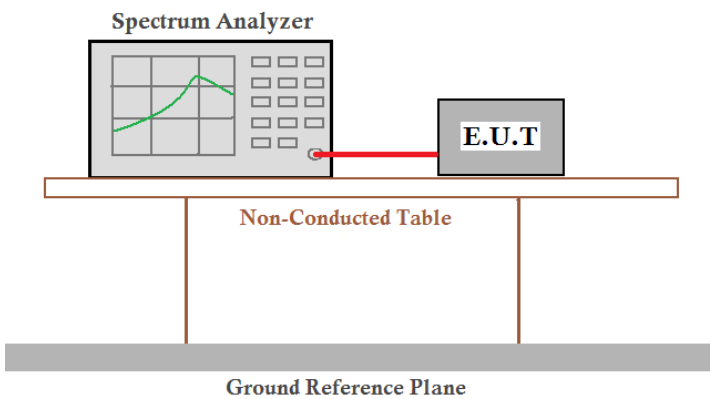
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies. If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data:

Mode	Hopping channel numbers	Limit	Result
125KHz Bandwidth	64	50	Pass



8.5 Dwell Time

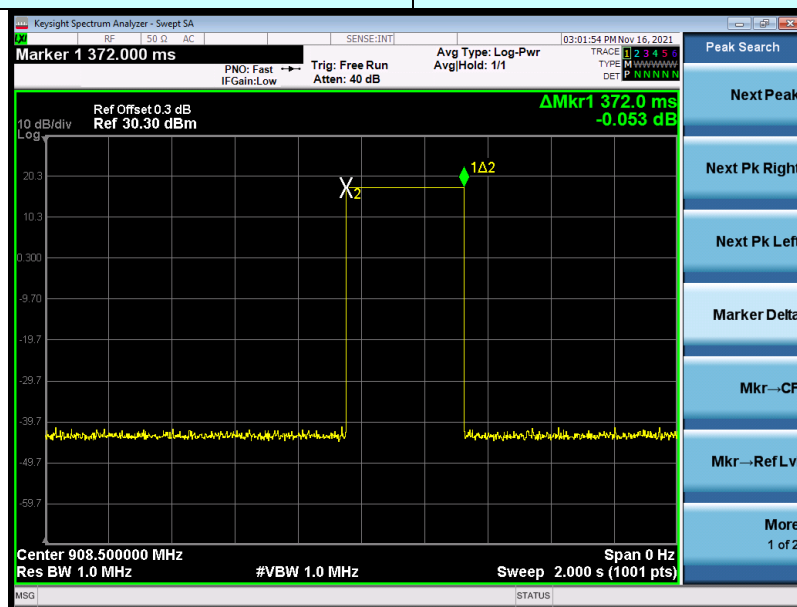
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=10kHz, VBW=30KHz, Span=0Hz, Detector=Peak
Limit:	0.4 Second
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

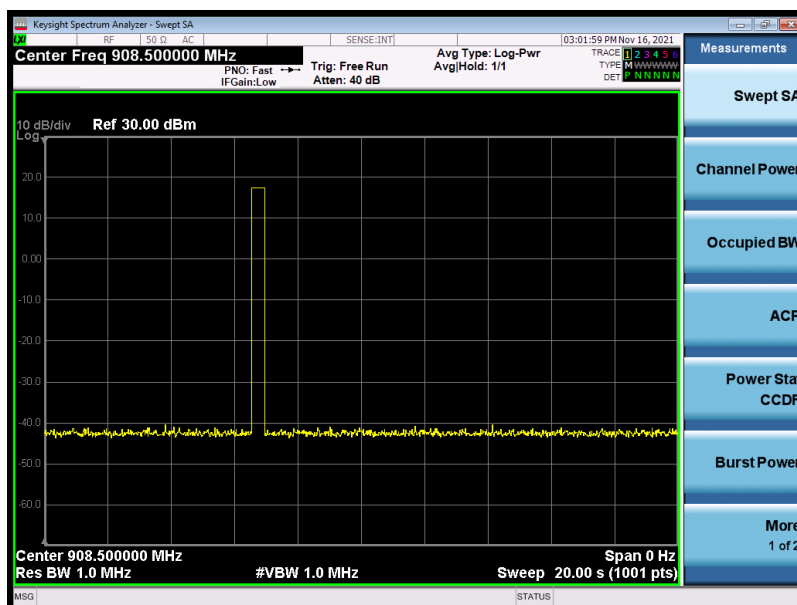
Mode	Ton(ms)	Dwell time(ms)	Limit(ms)	Result
125KHz Bandwidth	372.00	372.00	400	Pass

Test plot as follows:

Test Mode:	125KHz Bandwidth
------------	------------------



Ton



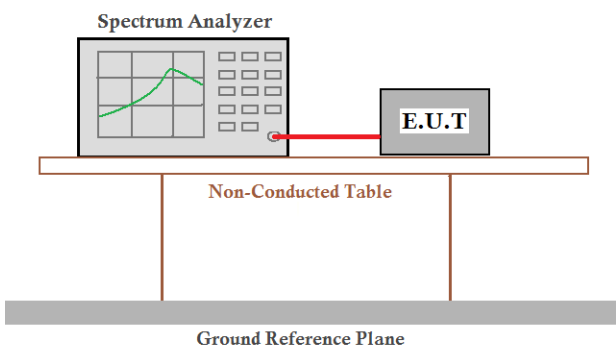
Tperiod

8.6 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)/g/h requirement:
a(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals. (g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section. (h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.	
EUT Pseudorandom Frequency Hopping Sequence	
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones. • Number of shift register stages: 9 • Length of pseudo-random sequence: $2^9 - 1 = 511$ bits • Longest sequence of zeros: 8 (non-inverted signal) Linear Feedback Shift Register for Generation of the PRBS sequence An example of Pseudorandom Frequency Hopping Sequence as follow: Each frequency used equally on the average by each transmitter. The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals. it permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted.	

8.7 Band Edge

8.7.1 Conducted Emission Method

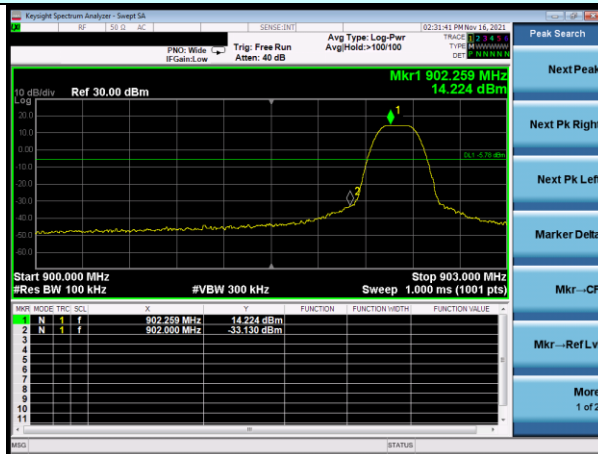
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by 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.
Test setup:	 The diagram illustrates the test setup for conducted emission measurement. A Spectrum Analyzer is connected via a red cable to an E.U.T (Equipment Under Test). Both are placed on a Non-Conducted Table, which is supported by two vertical legs. Below the table is a Ground Reference Plane, represented by a thick grey bar.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test plot as follows:

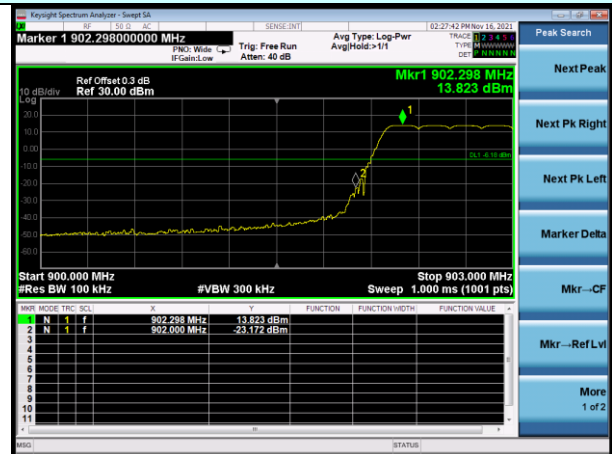
125KHz Bandwidth:

Test channel:

Lowest channel



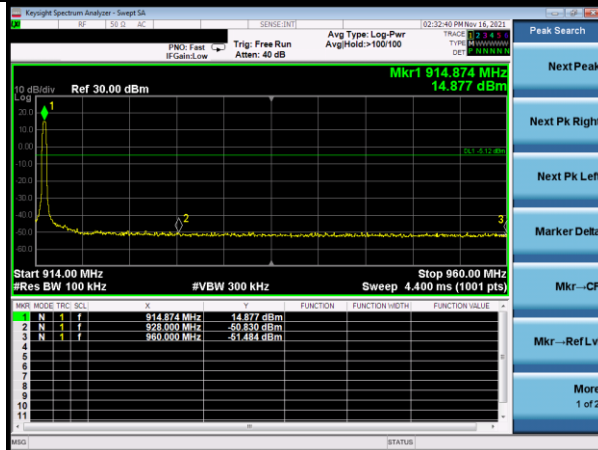
No-hopping mode



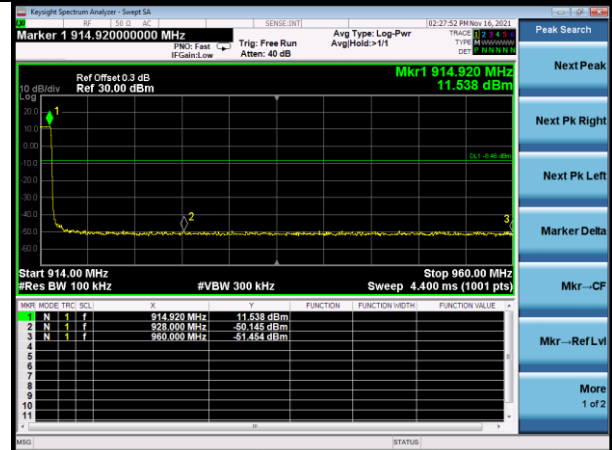
Hopping mode

Test channel:

Highest channel



No-hopping mode



Hopping mode

8.7.2 Radiated Emission Method

Band Edge test data:

Ant 1:

Test channel:	Lowest channel
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QP value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
902.00	37.30	22.30	4.87	37.60	26.87	46.00	-19.13	Horizontal
902.00	39.37	22.41	4.96	37.57	29.17	46.00	-16.83	Vertical

Test channel:	Highest channel
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QP value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
928.00	37.14	22.30	4.87	37.60	26.71	46.00	-19.29	Horizontal
928.00	36.83	22.41	4.96	37.57	26.63	46.00	-19.37	Vertical

Ant 2:

Test channel:	Lowest channel
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QP value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
902.00	36.89	22.3	4.87	37.6	26.46	46.00	-19.54	Horizontal
902.00	38.74	22.41	4.96	37.57	28.54	46.00	-17.46	Vertical

Test channel:	Highest channel
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QP value:

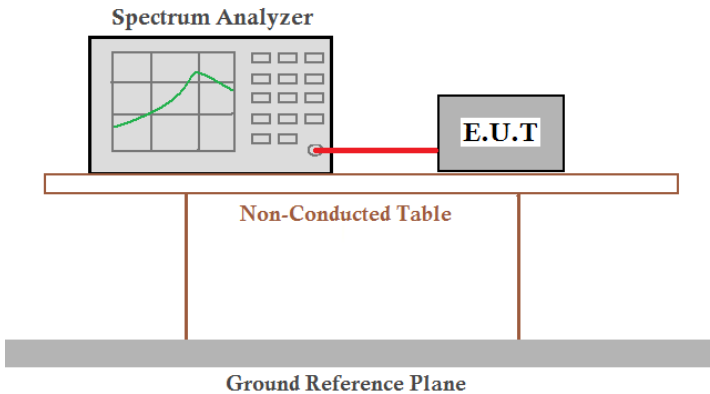
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
928.00	36.75	22.3	4.87	37.6	26.32	46.00	-19.68	Horizontal
928.00	36.12	22.41	4.96	37.57	25.92	46.00	-20.08	Vertical

Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.

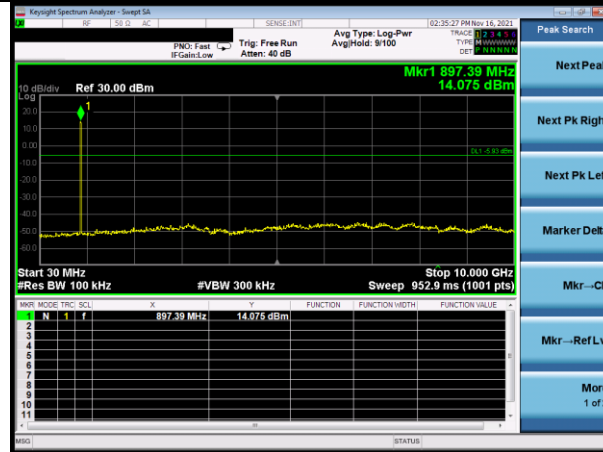
8.8 Spurious Emission

8.8.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test setup:	 The diagram illustrates the test setup for conducted emission measurement. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table, which is supported by two vertical legs. Below the table is a Ground Reference Plane, represented by a thick grey bar.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

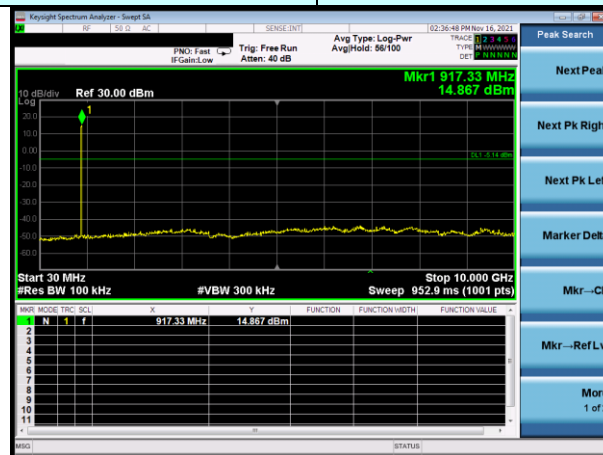
125KHz Bandwidth:

Test channel:	Lowest channel
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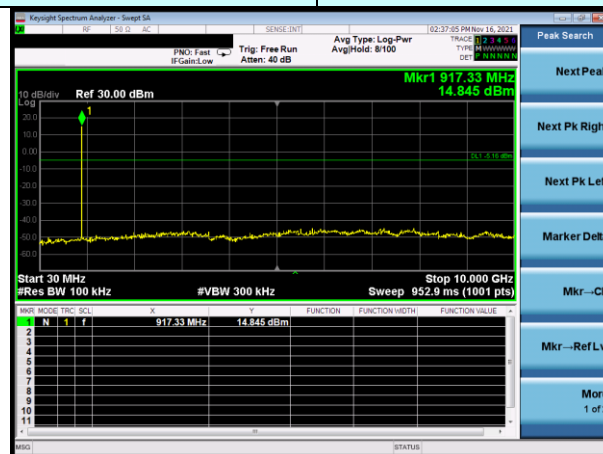
30MHz~10GHz

Test channel:	Middle channel
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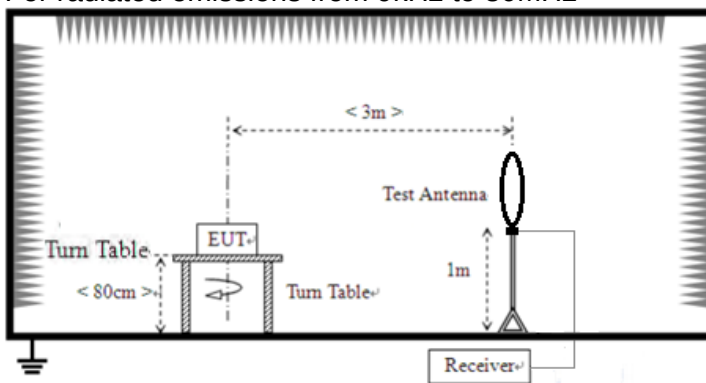
30MHz~10GHz

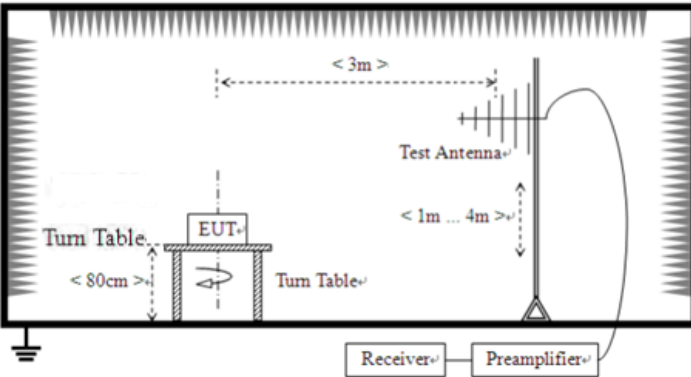
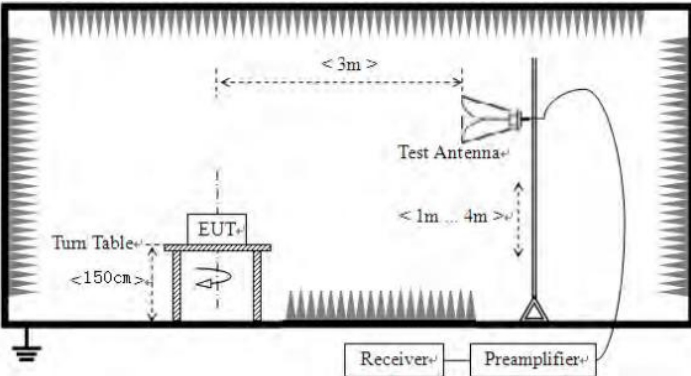
Test channel:	Highest channel
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30MHz~10GHz

8.8.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	30m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
		5000	Peak		
Test setup:	For radiated emissions from 9kHz to 30MHz				
					

	For radiated emissions from 30MHz to 1GHz  For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details

Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Measurement data:*Remarks:*

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

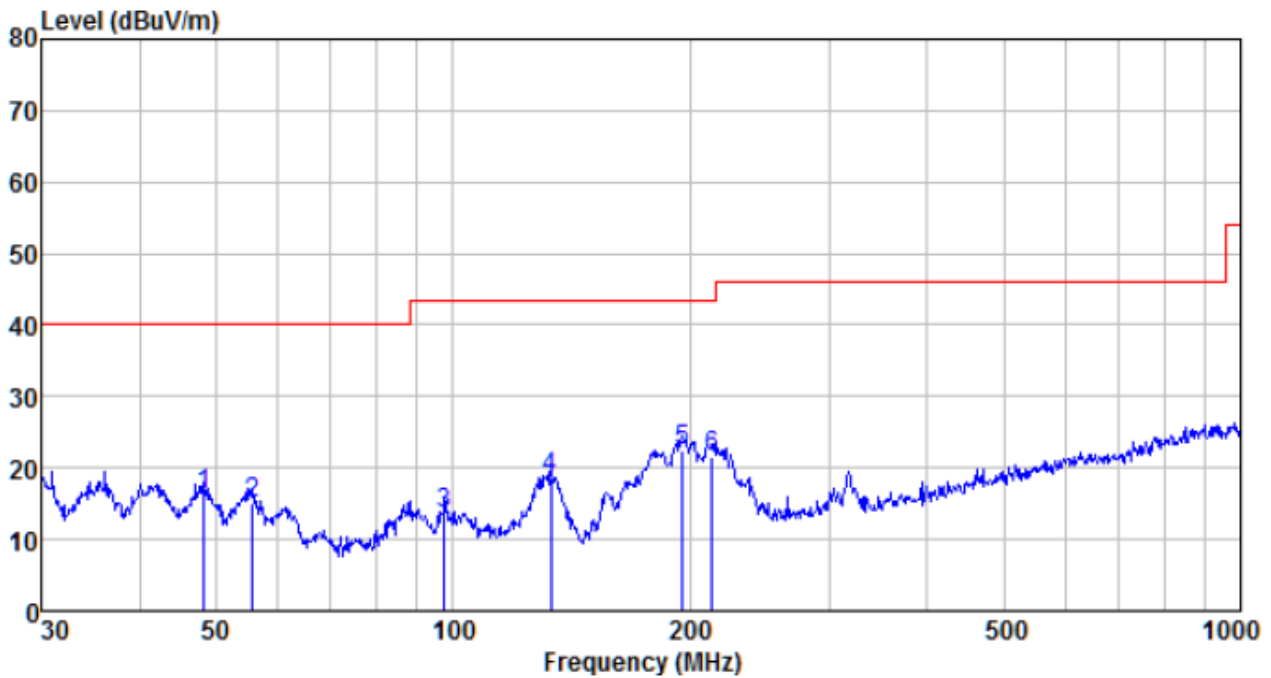
■ 9kHz~30MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

■ Below 1GHz

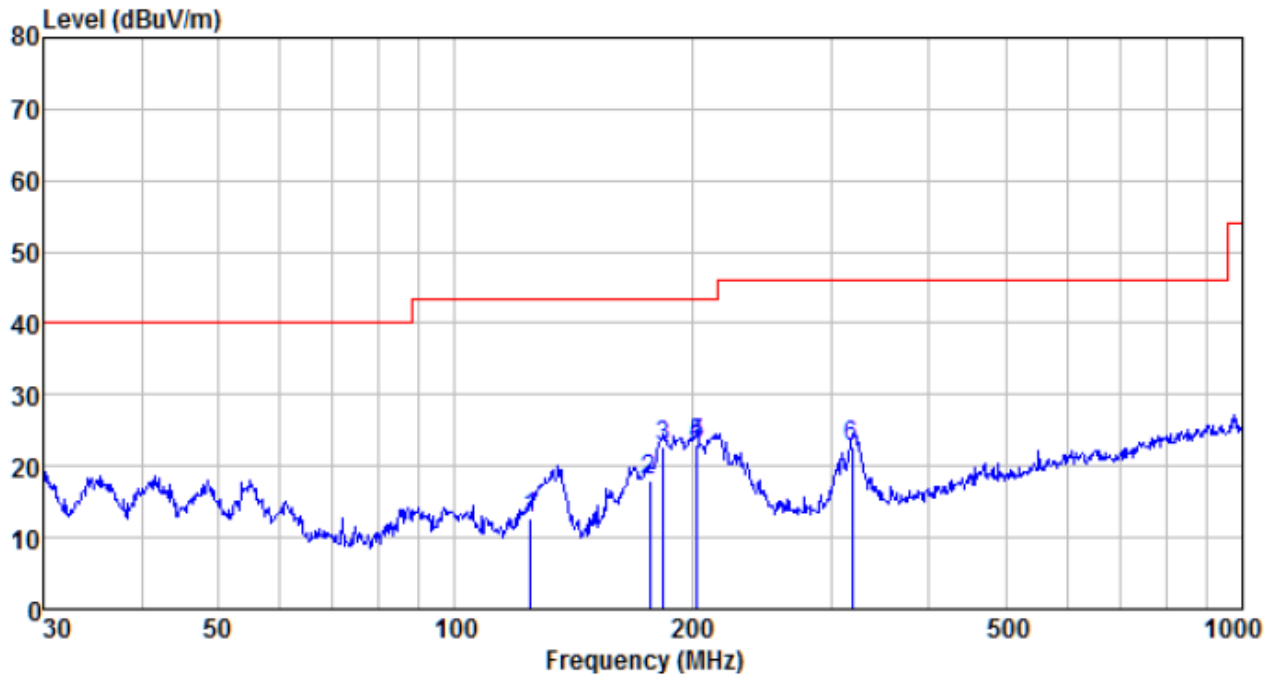
Ant 1:

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
48.332	39.17	12.29	0.75	36.10	16.11	40.00	-23.89	QP
55.609	38.70	11.73	0.82	36.26	14.99	40.00	-25.01	QP
97.456	37.37	11.86	1.17	36.70	13.70	43.50	-29.80	QP
133.151	46.17	7.92	1.46	36.97	18.58	43.50	-24.92	QP
195.822	47.88	10.17	1.82	37.31	22.56	43.50	-20.94	QP
213.015	45.94	10.91	1.92	37.34	21.43	43.50	-22.07	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
124.569	39.44	8.89	1.40	36.91	12.82	43.50	-30.68	QP
176.888	44.74	8.77	1.72	37.22	18.01	43.50	-25.49	QP
183.844	48.77	9.32	1.76	37.26	22.59	43.50	-20.91	QP
202.810	47.96	10.51	1.86	37.33	23.00	43.50	-20.50	QP
202.810	47.96	10.51	1.86	37.33	23.00	43.50	-20.50	QP
318.817	43.65	13.96	2.46	37.44	22.63	46.00	-23.37	QP

■ Above 1GHz

Test channel:	Lowest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1804.60	40.77	25.35	4.67	34.04	36.75	74.00	-37.25	Vertical
2706.90	34.60	28.26	5.43	33.25	35.04	74.00	-38.96	Vertical
3609.20	33.22	29.18	7.11	37.34	32.17	74.00	-41.83	Vertical
4511.50	*					74.00		Vertical
5413.80	*					74.00		Vertical
6316.10	*					74.00		Vertical
1804.60	39.40	25.35	4.67	34.04	35.38	74.00	-38.62	Horizontal
2706.90	34.49	28.26	5.43	33.25	34.93	74.00	-39.07	Horizontal
3609.20	32.50	29.18	7.11	37.34	31.45	74.00	-42.55	Horizontal
4511.50	*					74.00		Horizontal
5413.80	*					74.00		Horizontal
6316.10	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1804.60	29.85	25.35	4.67	34.04	25.83	54.00	-28.17	Vertical
2706.90	23.47	28.26	5.43	33.25	23.91	54.00	-30.09	Vertical
3609.20	23.57	29.18	7.11	37.34	22.52	54.00	-31.48	Vertical
4511.50	*					54.00		Vertical
5413.80	*					54.00		Vertical
6316.10	*					54.00		Vertical
1804.60	28.93	25.35	4.67	34.04	24.91	54.00	-29.09	Horizontal
2706.90	23.07	28.26	5.43	33.25	23.51	54.00	-30.49	Horizontal
3609.20	22.25	29.18	7.11	37.34	21.20	54.00	-32.80	Horizontal
4511.50	*					54.00		Horizontal
5413.80	*					54.00		Horizontal
6316.10	*					54.00		Horizontal

Test channel:	Middle channel
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Peak value:

Frequency (MHz)	Read Level (dBUV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	polarization
1817.00	39.81	25.43	4.89	34.12	36.01	74.00	-37.99	Vertical
2725.50	34.66	28.34	5.68	33.57	35.11	74.00	-38.89	Vertical
3634.00	34.24	29.42	7.29	37.66	33.29	74.00	-40.71	Vertical
4542.50	*					74.00		Vertical
5451.00	*					74.00		Vertical
6359.50	*					74.00		Vertical
1817.00	40.25	25.43	4.89	34.12	36.45	74.00	-37.55	Horizontal
2725.50	33.45	28.34	5.68	33.57	33.90	74.00	-40.10	Horizontal
3634.00	33.82	29.42	7.29	37.66	32.87	74.00	-41.13	Horizontal
4542.50	*					74.00		Horizontal
5451.00	*					74.00		Horizontal
6359.50	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBUV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	polarization
1817.00	30.66	25.43	4.89	34.12	26.86	54.00	-27.14	Vertical
2725.50	22.98	28.34	5.68	33.57	23.43	54.00	-30.57	Vertical
3634.00	23.49	29.42	7.29	37.66	22.54	54.00	-31.46	Vertical
4542.50	*					54.00		Vertical
5451.00	*					54.00		Vertical
6359.50	*					54.00		Vertical
1817.00	30.36	25.43	4.89	34.12	26.56	54.00	-27.44	Horizontal
2725.50	22.54	28.34	5.68	33.57	22.99	54.00	-31.01	Horizontal
3634.00	23.54	29.42	7.29	37.66	22.59	54.00	-31.41	Horizontal
4542.50	*					54.00		Horizontal
5451.00	*					54.00		Horizontal
6359.50	*					54.00		Horizontal

Test channel:	Highest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1829.80	45.38	25.64	4.75	34.67	41.10	74.00	-32.90	Vertical
2744.70	35.36	28.46	5.87	33.83	35.86	74.00	-38.14	Vertical
3659.60	37.55	29.75	7.59	37.76	37.13	74.00	-36.87	Vertical
4574.50	*					74.00		Vertical
5489.40	*					74.00		Vertical
6404.30	*					74.00		Vertical
1829.80	44.64	25.64	4.75	34.67	40.36	74.00	-33.64	Horizontal
2744.70	34.41	28.46	5.87	33.83	34.91	74.00	-39.09	Horizontal
3659.60	33.42	29.75	7.59	37.76	33.00	74.00	-41.00	Horizontal
4574.50	*					74.00		Horizontal
5489.40	*					74.00		Horizontal
6404.30	*					74.00		Horizontal

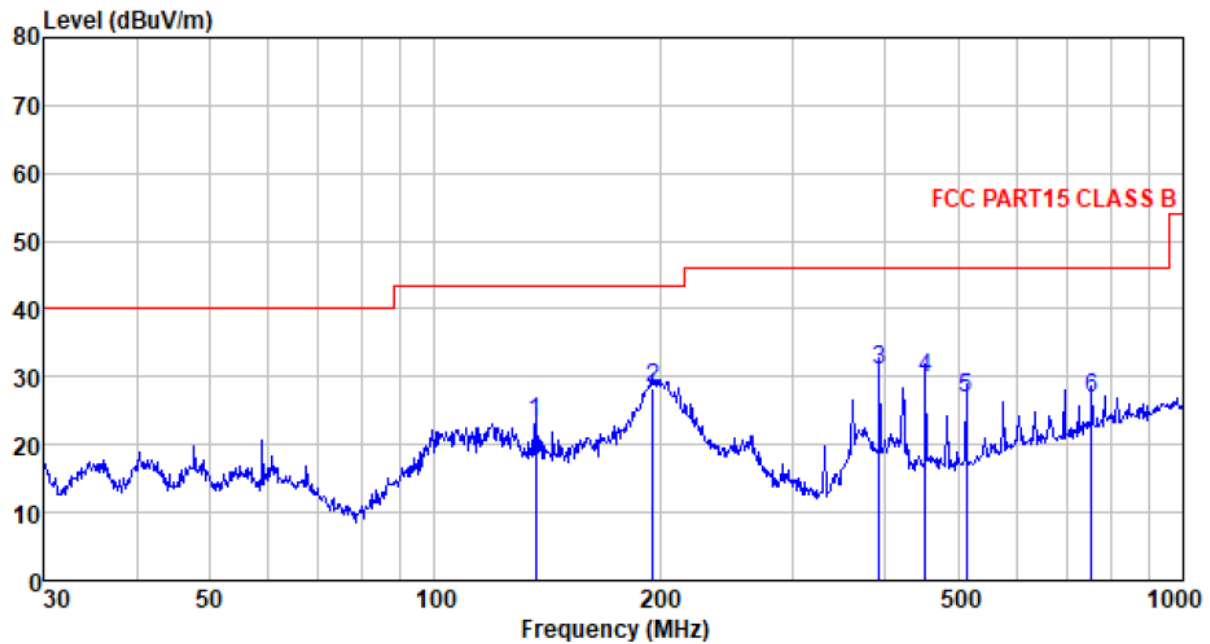
Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1829.80	36.29	25.64	4.75	34.67	32.01	54.00	-21.99	Vertical
2744.70	25.28	28.46	5.87	33.83	25.78	54.00	-28.22	Vertical
3659.60	26.05	29.75	7.59	37.76	25.63	54.00	-28.37	Vertical
4574.50	*					54.00		Vertical
5489.40	*					54.00		Vertical
6404.30	*					54.00		Vertical
1829.80	35.00	25.64	4.75	34.67	30.72	54.00	-23.28	Horizontal
2744.70	23.79	28.46	5.87	33.83	24.29	54.00	-29.71	Horizontal
3659.60	22.68	29.75	7.59	37.76	22.26	54.00	-31.74	Horizontal
4574.50	*					54.00		Horizontal
5489.40	*					54.00		Horizontal
6404.30	*					54.00		Horizontal

Remarks:

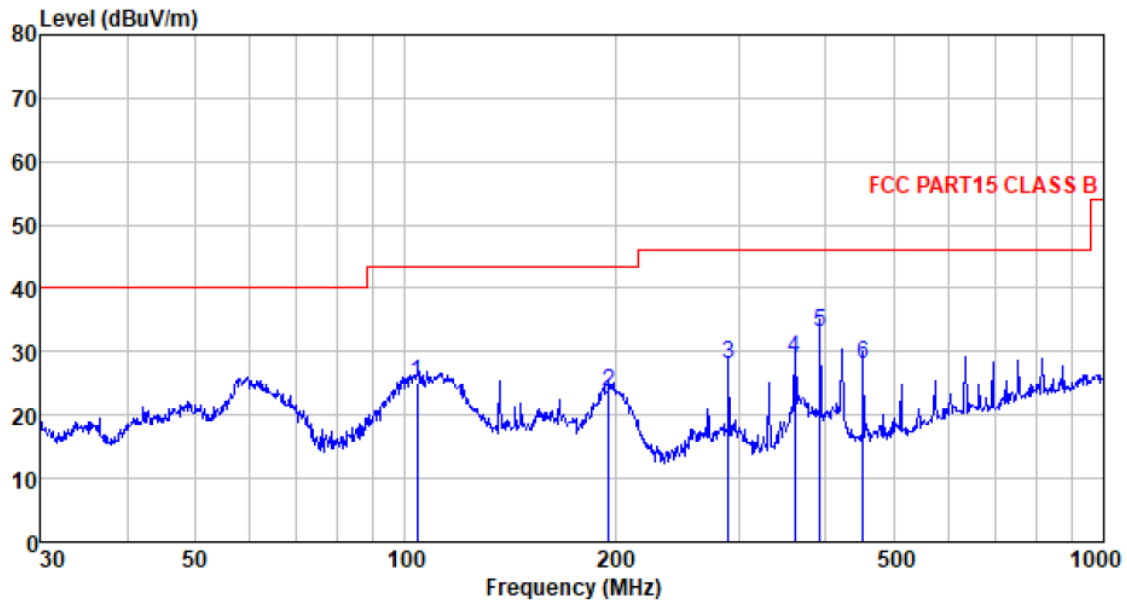
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. The test data shows only the worst case 125KHz bandwidth mode.

Ant 2:
Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
136.460	46.97	11.88	1.48	36.99	23.34	43.50	-20.16	QP
195.822	54.42	9.48	1.82	37.31	28.41	43.50	-15.09	QP
392.095	51.02	14.54	2.82	37.51	30.87	46.00	-15.13	QP
452.720	48.33	16.04	3.10	37.51	29.96	46.00	-16.04	QP
513.633	44.16	16.94	3.36	37.51	26.95	46.00	-19.05	QP
755.387	38.43	21.62	4.29	37.62	26.72	46.00	-19.28	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
104.170	51.21	9.47	1.23	36.76	25.15	43.50	-18.35	QP
195.822	49.52	9.48	1.82	37.31	23.51	43.50	-19.99	QP
290.017	51.03	12.12	2.31	37.41	28.05	46.00	-17.95	QP
361.714	49.74	13.85	2.68	37.49	28.78	46.00	-17.22	QP
392.095	53.19	14.54	2.82	37.51	33.04	46.00	-12.96	QP
452.720	46.53	16.04	3.10	37.51	28.16	46.00	-17.84	QP

■ Above 1GHz

Test channel:	Lowest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1804.60	39.23	25.35	4.67	34.04	35.21	74.00	-38.79	Vertical
2706.90	34.46	28.26	5.43	33.25	34.9	74.00	-39.1	Vertical
3609.20	31.45	29.18	7.11	37.34	30.4	74.00	-43.6	Vertical
4511.50	*					74.00		Vertical
5413.80	*					74.00		Vertical
6316.10	*					74.00		Vertical
1804.60	38.95	25.35	4.67	34.04	34.93	74.00	-39.07	Horizontal
2706.90	35.73	28.26	5.43	33.25	36.17	74.00	-37.83	Horizontal
3609.20	33.21	29.18	7.11	37.34	32.16	74.00	-41.84	Horizontal
4511.50	*					74.00		Horizontal
5413.80	*					74.00		Horizontal
6316.10	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1804.60	28.21	25.35	4.67	34.04	24.19	54.00	-29.81	Vertical
2706.90	22.15	28.26	5.43	33.25	22.59	54.00	-31.41	Vertical
3609.20	23.21	29.18	7.11	37.34	22.16	54.00	-31.84	Vertical
4511.50	*					54.00		Vertical
5413.80	*					54.00		Vertical
6316.10	*					54.00		Vertical
1804.60	29.02	25.35	4.67	34.04	25.00	54.00	-29.00	Horizontal
2706.90	24.15	28.26	5.43	33.25	24.59	54.00	-29.41	Horizontal
3609.20	22.01	29.18	7.11	37.34	20.96	54.00	-33.04	Horizontal
4511.50	*					54.00		Horizontal
5413.80	*					54.00		Horizontal
6316.10	*					54.00		Horizontal

Test channel:	Middle channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1817.00	38.23	25.43	4.89	34.12	34.43	74.00	-37.99	Vertical
2725.50	35.21	28.34	5.68	33.57	35.66	74.00	-38.89	Vertical
3634.00	34.01	29.42	7.29	37.66	33.06	74.00	-40.71	Vertical
4542.50	*					74.00		Vertical
5451.00	*					74.00		Vertical
6359.50	*					74.00		Vertical
1817.00	39.21	25.43	4.89	34.12	35.41	74.00	-38.59	Horizontal
2725.50	33.13	28.34	5.68	33.57	33.58	74.00	-40.42	Horizontal
3634.00	32.89	29.42	7.29	37.66	31.94	74.00	-42.06	Horizontal
4542.50	*					74.00		Horizontal
5451.00	*					74.00		Horizontal
6359.50	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1817.00	29.14	25.43	4.89	34.12	25.34	54.00	-28.66	Vertical
2725.50	22.24	28.34	5.68	33.57	22.69	54.00	-31.31	Vertical
3634.00	23.01	29.42	7.29	37.66	22.06	54.00	-31.94	Vertical
4542.50	*					54.00		Vertical
5451.00	*					54.00		Vertical
6359.50	*					54.00		Vertical
1817.00	30.23	25.43	4.89	34.12	26.43	54.00	-27.57	Horizontal
2725.50	22.23	28.34	5.68	33.57	22.68	54.00	-31.32	Horizontal
3634.00	23.21	29.42	7.29	37.66	22.26	54.00	-31.74	Horizontal
4542.50	*					54.00		Horizontal
5451.00	*					54.00		Horizontal
6359.50	*					54.00		Horizontal

Test channel:	Highest channel
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1829.80	44.89	25.64	4.75	34.67	40.61	74.00	-33.39	Vertical
2744.70	34.87	28.46	5.87	33.83	35.37	74.00	-38.63	Vertical
3659.60	37.21	29.75	7.59	37.76	36.79	74.00	-37.21	Vertical
4574.50	*					74.00		Vertical
5489.40	*					74.00		Vertical
6404.30	*					74.00		Vertical
1829.80	43.98	25.64	4.75	34.67	39.7	74.00	-34.3	Horizontal
2744.70	34.63	28.46	5.87	33.83	35.13	74.00	-38.87	Horizontal
3659.60	33.21	29.75	7.59	37.76	32.79	74.00	-41.21	Horizontal
4574.50	*					74.00		Horizontal
5489.40	*					74.00		Horizontal
6404.30	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1829.80	35.32	25.64	4.75	34.67	31.04	54.00	-22.96	Vertical
2744.70	25.43	28.46	5.87	33.83	25.93	54.00	-28.07	Vertical
3659.60	26.15	29.75	7.59	37.76	25.73	54.00	-28.27	Vertical
4574.50	*					54.00		Vertical
5489.40	*					54.00		Vertical
6404.30	*					54.00		Vertical
1829.80	35.23	25.64	4.75	34.67	30.95	54.00	-23.05	Horizontal
2744.70	23.53	28.46	5.87	33.83	24.03	54.00	-29.97	Horizontal
3659.60	22.27	29.75	7.59	37.76	21.85	54.00	21.85	Horizontal
4574.50	*					54.00		Horizontal
5489.40	*					54.00		Horizontal
6404.30	*					54.00		Horizontal

Remarks:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- “*”, means this data is too weak instrument of signal is unable to test.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- The test data shows only the worst case 125KHz bandwidth mode.

9 Test Setup Photo

Reference to the **appendix I** for details.

10 EUT Constructional Details

Reference to the **appendix II** for details.

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