

TEST REPORT

Applicant: Zhejiang Hanshow Technology Co., Ltd.
Address of Applicant: Bld. 33, No. 966 xiuyuan Rd., BeiKeJian Innovation Park,
XiuZhou District, Jiaxing, Zhejiang, China

Equipment Under Test (EUT)

Product Name: electronic shelf label
Model No.: Nebular-350-N, Nebular-350R-N, Nebular-350Y-N, Nebular-350-N@, Nebular-350R-N@, Nebular-350Y-N@
FCC ID: 2AHB5-NEBULAR-350
Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.249
Date of sample receipt: September 14, 2020
Date of Test: September 15-21, 2020
Date of report issued: September 22, 2020
Test Result : PASS *

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

Authorized Signature:



Robinson Lo

Laboratory Manager

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2 Version

Version No.	Date	Description
00	September 22, 2020	Original

Prepared By: Tiger Chen **Date:** September 22, 2020
Project Engineer

Check By: Robinson **Date:** September 22, 2020
Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	N/A
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Remarks:

1. Test according to ANSI C63.10: 2013.
2. Pass: The EUT complies with the essential requirements in the standard.
3. N/A: Not applicable

4.1 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:	electronic shelf label
Model No.:	Nebular-350-N, Nebular-350R-N, Nebular-350Y-N, Nebular-350-N@, Nebular-350R-N@, Nebular-350Y-N@
Test Model No:	Nebular-350R-N
Remark:All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are color and model name for commercial purpose.	
S/N:	088206535022429576
Hardware Version:	HS_EL5102_1M_62_04
Software Version:	V1.0
Test sample(s) ID:	GTS202009000138-1
Sample(s) Status	Engineered sample
Operation Frequency:	2402MHz~2480MHz
Channel separation:	0.5MHz
Modulation type:	GFSK
Antenna Type:	Integral Antenna
Antenna gain:	-0.26dBi(declare by applicant)
Power supply:	Battery: DC 3V, 1030mAh

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
The lowest channel	2402MHz
The middle channel	2441MHz
The Highest channel	2480MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
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Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	93.31	94.78	94.23

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**

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. Registration 381383.

- **IC —Registration No.: 9079A**

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 with Registration No.: 9079A

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

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

5.8 Additional Instructions

Test Software	Special test software prebuilt-in by manufacturer
Power level setup	Default

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 2020	June. 24 2021
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 25 2020	June. 24 2021
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 25 2020	June. 24 2021
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 25 2020	June. 24 2021
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 25 2020	June. 24 2021
9	Coaxial Cable	GTS	N/A	GTS211	June. 25 2020	June. 24 2021
10	Coaxial cable	GTS	N/A	GTS210	June. 25 2020	June. 24 2021
11	Coaxial Cable	GTS	N/A	GTS212	June. 25 2020	June. 24 2021
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 25 2020	June. 24 2021
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 25 2020	June. 24 2021
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 25 2020	June. 24 2021
15	Band filter	Amindeon	82346	GTS219	June. 25 2020	June. 24 2021
16	Power Meter	Anritsu	ML2495A	GTS540	June. 25 2020	June. 24 2021
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 25 2020	June. 24 2021
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 25 2020	June. 24 2021
19	Splitter	Agilent	11636B	GTS237	June. 25 2020	June. 24 2021
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 25 2020	June. 24 2021
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 25 2020	June. 24 2021

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 2020	June. 24 2021
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 25 2020	June. 24 2021
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 25 2020	June. 24 2021
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 25 2020	June. 24 2021
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 25 2020	June. 24 2021
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 25 2020	June. 24 2021
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 25 2020	June. 24 2021

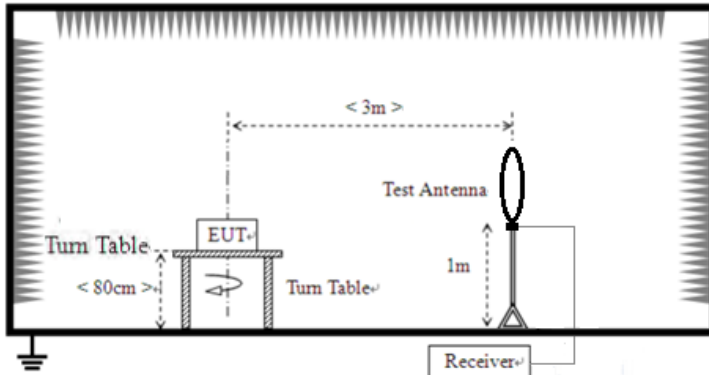
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 25 2020	June. 24 2021
2	Barometer	ChangChun	DYM3	GTS255	June. 25 2020	June. 24 2021

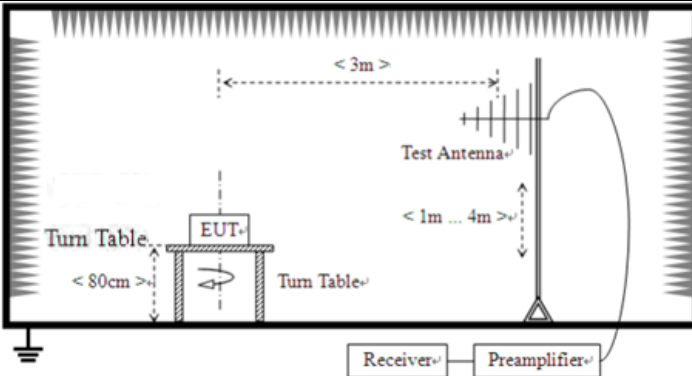
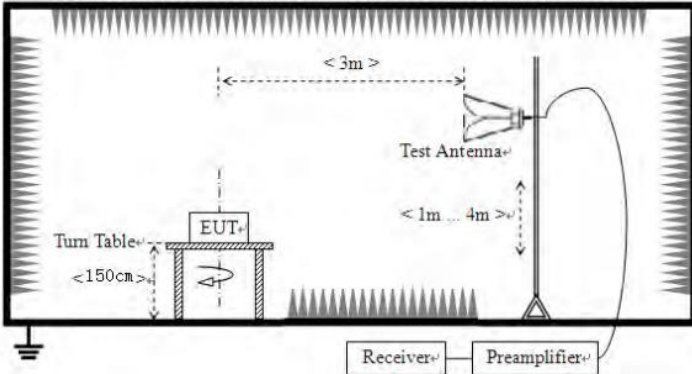
7 Test results and Measurement Data

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. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
EUT Antenna:	
<i>The antenna is integral antenna, the best case gain of the antenna is -0.26dBi, reference to the appendix II for details.</i>	

7.2 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	Remark
	9kHz-150kHz	Quasi-peak	200Hz	300Hz	Quasi-peak Value
	150kHz-30MHz	Quasi-peak	9kHz	10kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Peak		1MHz	10Hz	Average Value	
Limit: (Field strength of the fundamental signal)	Frequency		Limit (dBuV/m @3m)		Remark
	2400MHz-2483.5MHz		94.00		Average Value
			114.00		Peak Value
Limit: (Spurious Emissions)	Frequency		Limit (uV/m)		Remark
	0.009MHz-0.490MHz		2400/F(kHz) @300m		Quasi-peak Value
	0.490MHz-1.705MHz		24000/F(kHz) @30m		Quasi-peak Value
	1.705MHz-30.0MHz		30 @30m		Quasi-peak Value
	30MHz-88MHz		100 @3m		Quasi-peak Value
	88MHz-216MHz		150 @3m		Quasi-peak Value
	216MHz-960MHz		200 @3m		Quasi-peak Value
	960MHz-1GHz		500 @3m		Quasi-peak Value
	Above 1GHz		500 @3m		Average Value
5000 @3m			Peak Value		
Limit: (band edge)	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.				
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 1GHz and 1.5 meters for above 1GHz) 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 results:	Pass

Measurement data:

7.2.1 Field Strength of The Fundamental Signal

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
2402.00	88.30	27.41	2.91	30.26	88.36	114.00	-25.64	Vertical
2402.00	94.72	27.41	2.91	30.26	94.78	114.00	-19.22	Horizontal
2441.00	86.32	27.53	2.96	30.14	86.67	114.00	-27.33	Vertical
2441.00	94.96	27.53	2.96	30.14	95.31	114.00	-18.69	Horizontal
2480.00	87.83	27.64	2.99	30.08	88.38	114.00	-25.62	Vertical
2480.00	93.14	27.64	2.99	30.08	93.69	114.00	-20.31	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
2402.00	79.31	27.41	2.91	30.26	79.37	94.00	-14.63	Vertical
2402.00	82.04	27.41	2.91	30.26	82.10	94.00	-11.90	Horizontal
2441.00	77.08	27.53	2.96	30.14	77.43	94.00	-16.57	Vertical
2441.00	83.43	27.53	2.96	30.14	83.78	94.00	-10.22	Horizontal
2480.00	78.64	27.64	2.99	30.08	79.19	94.00	-14.81	Vertical
2480.00	83.11	27.64	2.99	30.08	83.66	94.00	-10.34	Horizontal

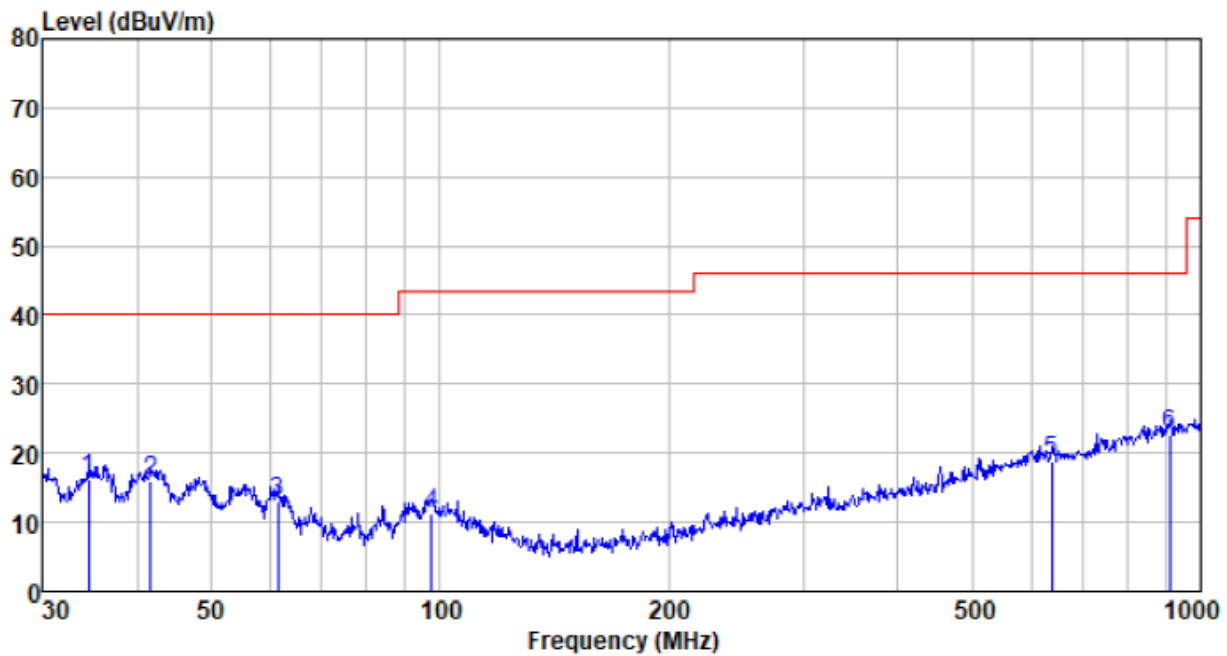
7.2.2 Spurious emissions

■ Below 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o), the test result no need to reported.

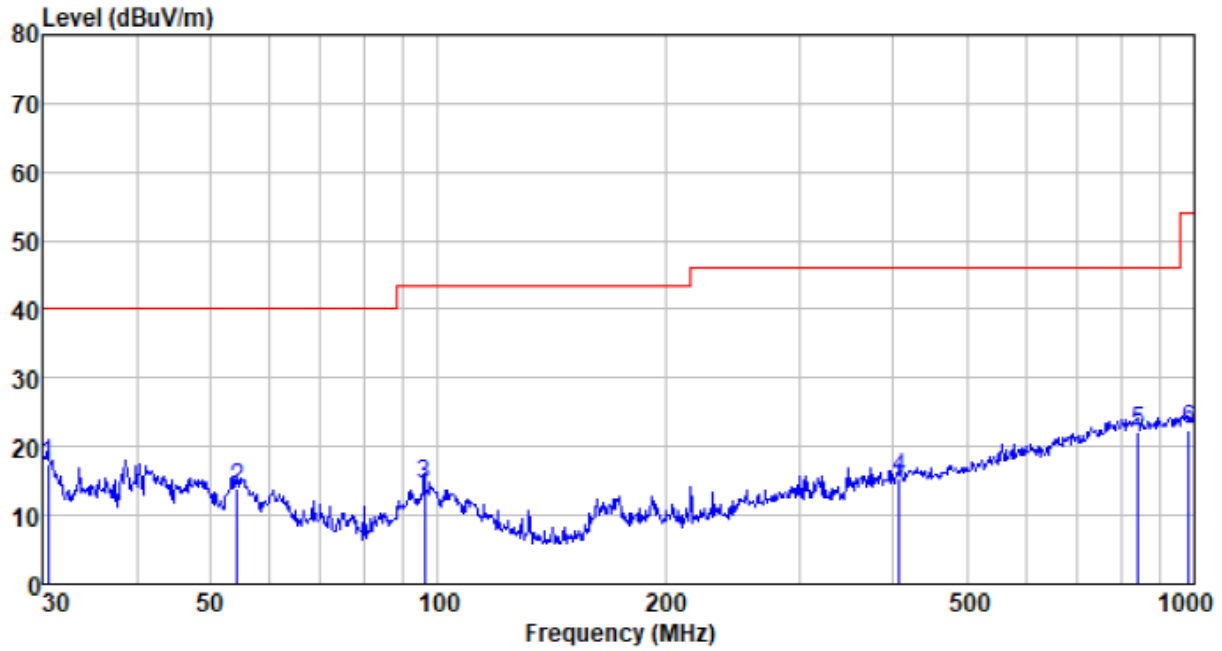
■ Below 1GHz

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
34.517	39.69	11.29	0.60	35.32	16.26	40.00	-23.74	QP
41.713	38.84	12.22	0.68	35.76	15.98	40.00	-24.02	QP
61.132	37.73	10.84	0.87	36.34	13.10	40.00	-26.90	QP
97.456	34.86	11.86	1.17	36.70	11.19	43.50	-32.31	QP
636.134	33.13	19.54	3.86	37.57	18.96	46.00	-27.04	QP
909.667	33.06	22.34	4.88	37.59	22.69	46.00	-23.31	QP

Vertical:

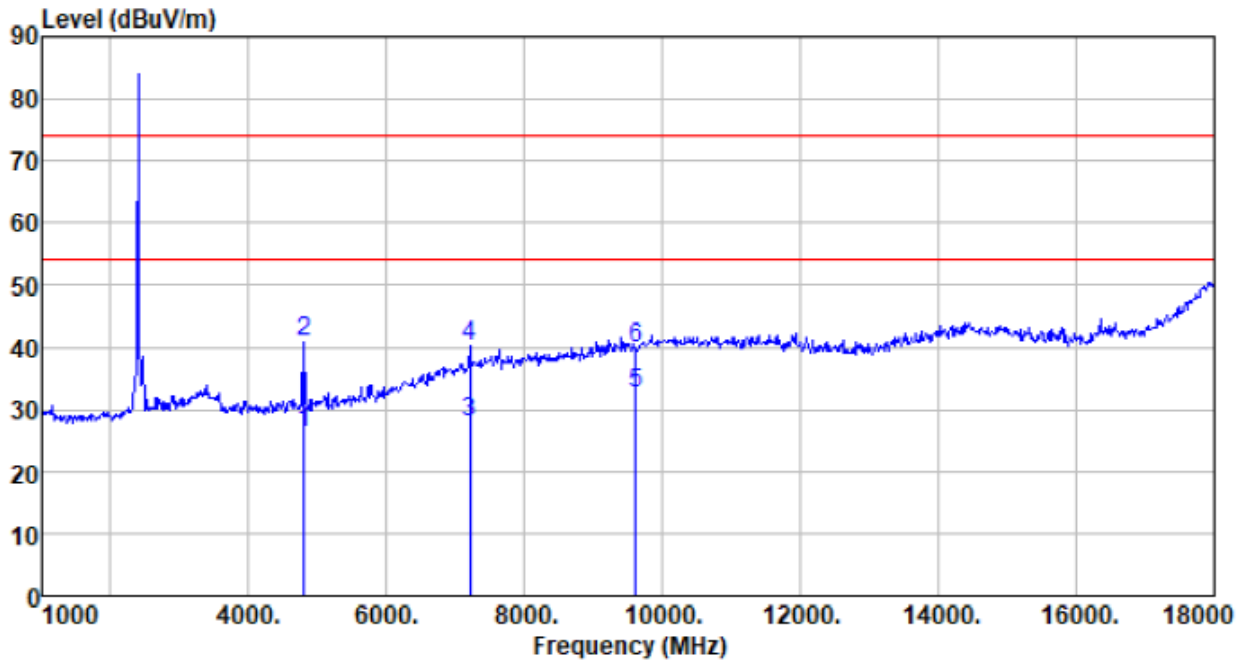


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
30.531	40.70	11.21	0.56	35.04	17.43	40.00	-22.57	QP
54.261	37.33	11.85	0.81	36.24	13.75	40.00	-26.25	QP
96.099	38.20	11.65	1.16	36.69	14.32	43.50	-29.18	QP
407.515	34.51	15.50	2.89	37.52	15.38	46.00	-30.62	QP
842.130	33.43	21.78	4.63	37.61	22.23	46.00	-23.77	QP
982.620	32.26	22.65	5.16	37.52	22.55	54.00	-31.45	QP

■ Above 1GHz

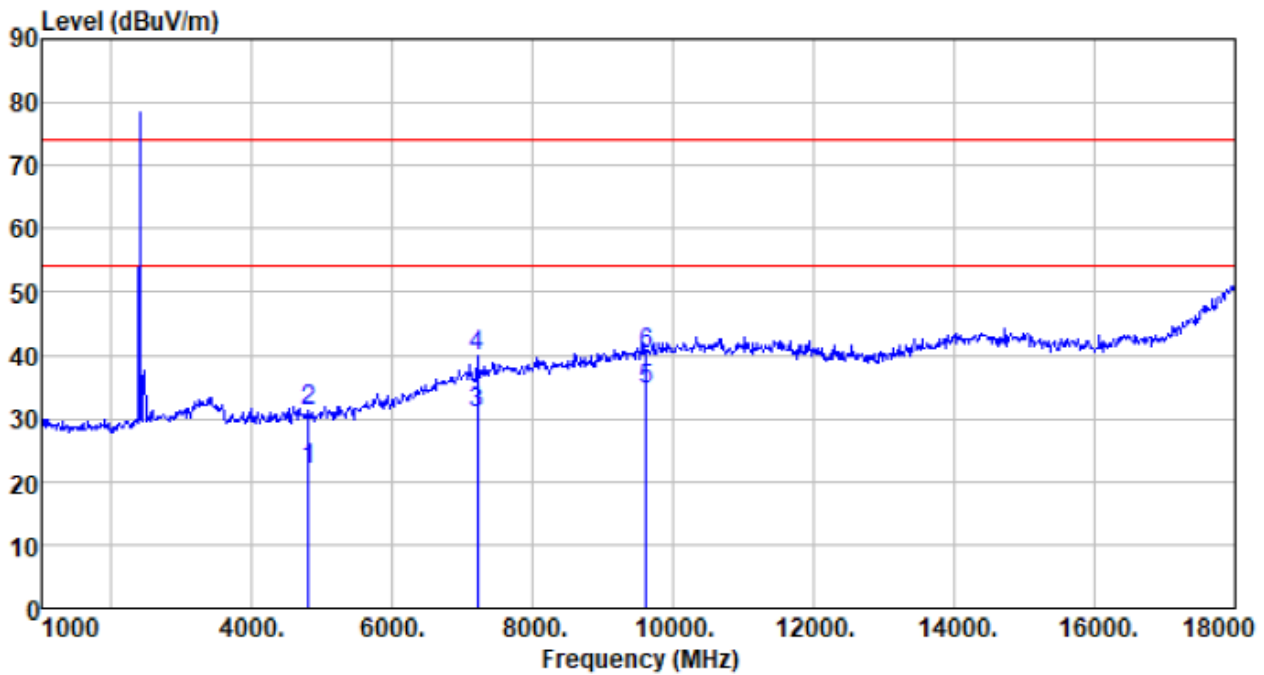
Test channel:	Lowest channel
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Horizontal:



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
4804.000	28.13	31.20	4.61	37.73	26.21	54.00	-27.79	Average
4804.000	42.81	31.20	4.61	37.73	40.89	74.00	-33.11	Peak
7206.000	21.01	36.16	6.48	35.63	28.02	54.00	-25.98	Average
7206.000	33.30	36.16	6.48	35.63	40.31	74.00	-33.69	Peak
9608.000	21.69	37.93	7.97	34.94	32.65	54.00	-21.35	Average
9608.000	28.80	37.93	7.97	34.94	39.76	74.00	-34.24	Peak

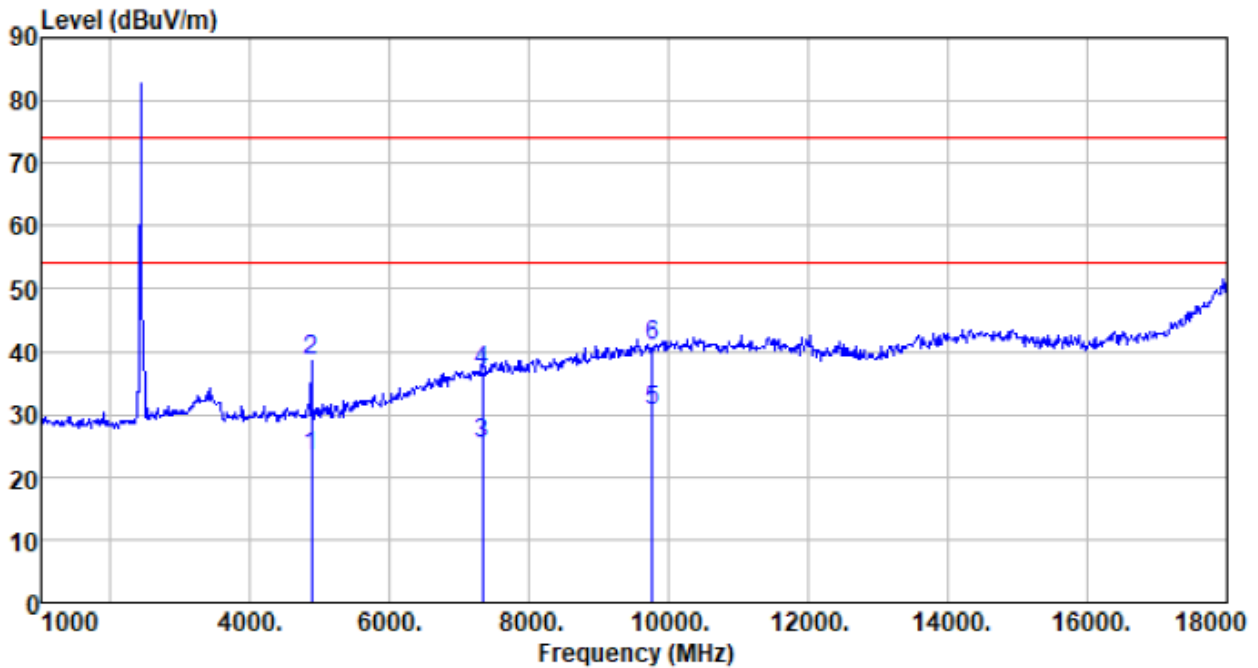
Vertical:



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
4804.000	23.87	31.20	4.61	37.73	21.95	54.00	-32.05	Average
4804.000	33.19	31.20	4.61	37.73	31.27	74.00	-42.73	Peak
7206.000	23.86	36.16	6.48	35.63	30.87	54.00	-23.13	Average
7206.000	33.00	36.16	6.48	35.63	40.01	74.00	-33.99	Peak
9608.000	23.45	37.93	7.97	34.94	34.41	54.00	-19.59	Average
9608.000	29.22	37.93	7.97	34.94	40.18	74.00	-33.82	Peak

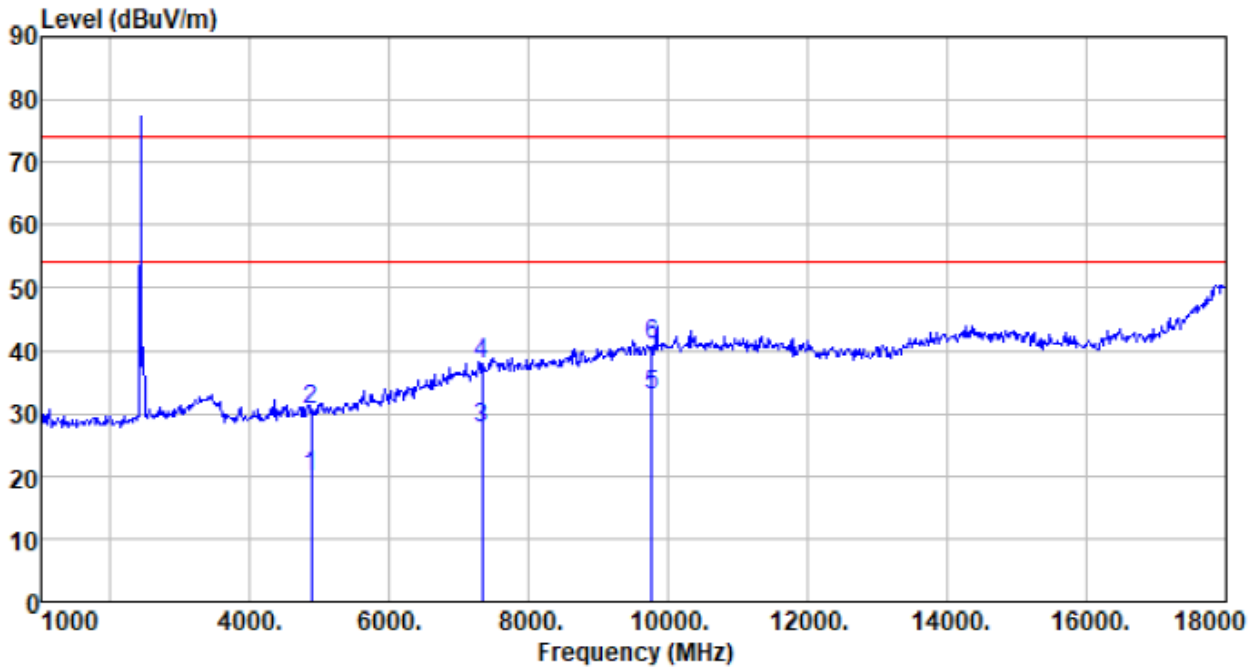
Test channel:	Middle
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Horizontal:



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
4882.000	25.04	31.33	4.69	37.76	23.30	54.00	-30.70	Average
4882.000	40.10	31.33	4.69	37.76	38.36	74.00	-35.64	Peak
7323.000	17.91	36.43	6.63	35.60	25.37	54.00	-28.63	Average
7323.000	29.48	36.43	6.63	35.60	36.94	74.00	-37.06	Peak
9764.000	19.37	38.10	8.03	35.03	30.47	54.00	-23.53	Average
9764.000	29.62	38.10	8.03	35.03	40.72	74.00	-33.28	Peak

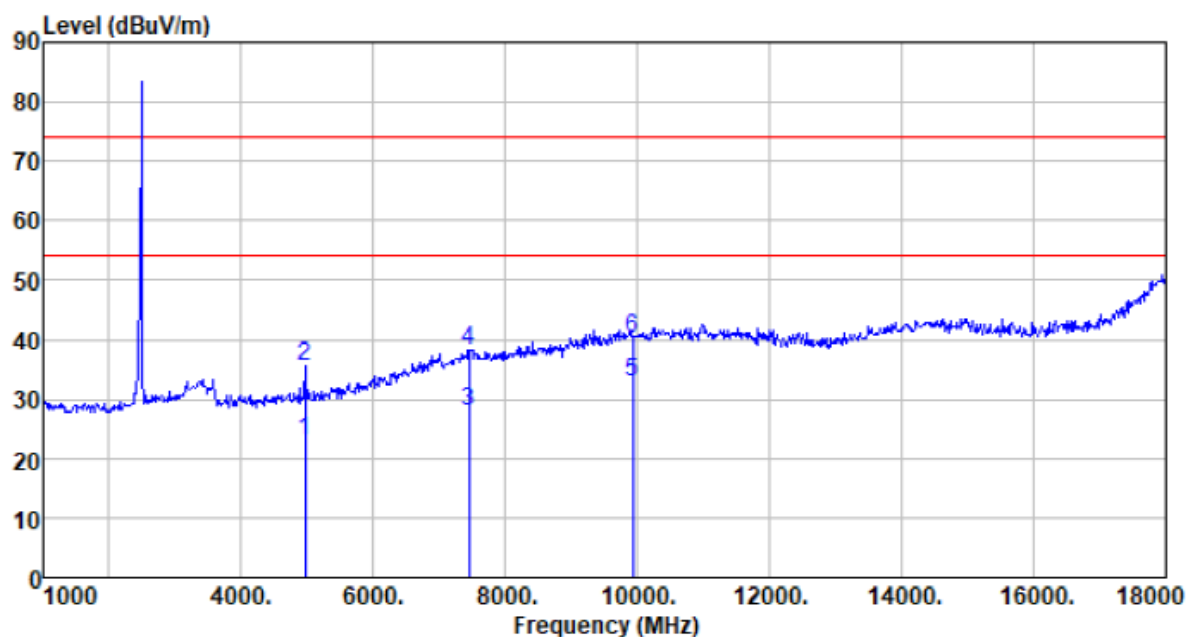
Vertical:



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
4882.000	21.56	31.33	4.69	37.76	19.82	54.00	-34.18	Average
4882.000	32.36	31.33	4.69	37.76	30.62	74.00	-43.38	Peak
7323.000	20.16	36.43	6.63	35.60	27.62	54.00	-26.38	Average
7323.000	30.39	36.43	6.63	35.60	37.85	74.00	-36.15	Peak
9764.000	21.69	38.10	8.03	35.03	32.79	54.00	-21.21	Average
9764.000	29.64	38.10	8.03	35.03	40.74	74.00	-33.26	Peak

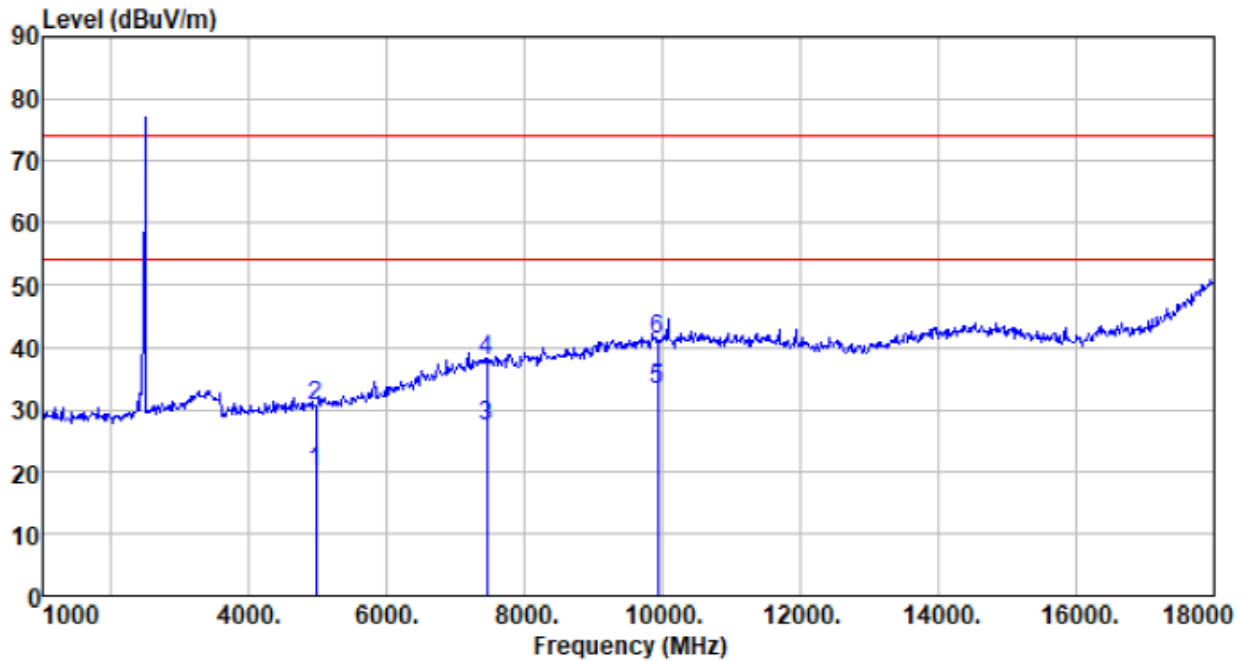
Test channel:	Highest
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Horizontal:



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
4960.000	24.50	31.44	4.79	37.78	22.95	54.00	-31.05	Average
4960.000	37.21	31.44	4.79	37.78	35.66	74.00	-38.34	Peak
7440.000	20.18	36.66	6.77	35.56	28.05	54.00	-25.95	Average
7440.000	30.39	36.66	6.77	35.56	38.26	74.00	-35.74	Peak
9920.000	21.67	38.30	8.09	35.14	32.92	54.00	-21.08	Average
9920.000	29.03	38.30	8.09	35.14	40.28	74.00	-33.72	Peak

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
4960.000	21.41	31.44	4.79	37.78	19.86	54.00	-34.14	Average
4960.000	32.08	31.44	4.79	37.78	30.53	74.00	-43.47	Peak
7440.000	19.25	36.66	6.77	35.56	27.12	54.00	-26.88	Average
7440.000	30.01	36.66	6.77	35.56	37.88	74.00	-36.12	Peak
9920.000	22.10	38.30	8.09	35.14	33.35	54.00	-20.65	Average
9920.000	29.90	38.30	8.09	35.14	41.15	74.00	-32.85	Peak

Remarks:

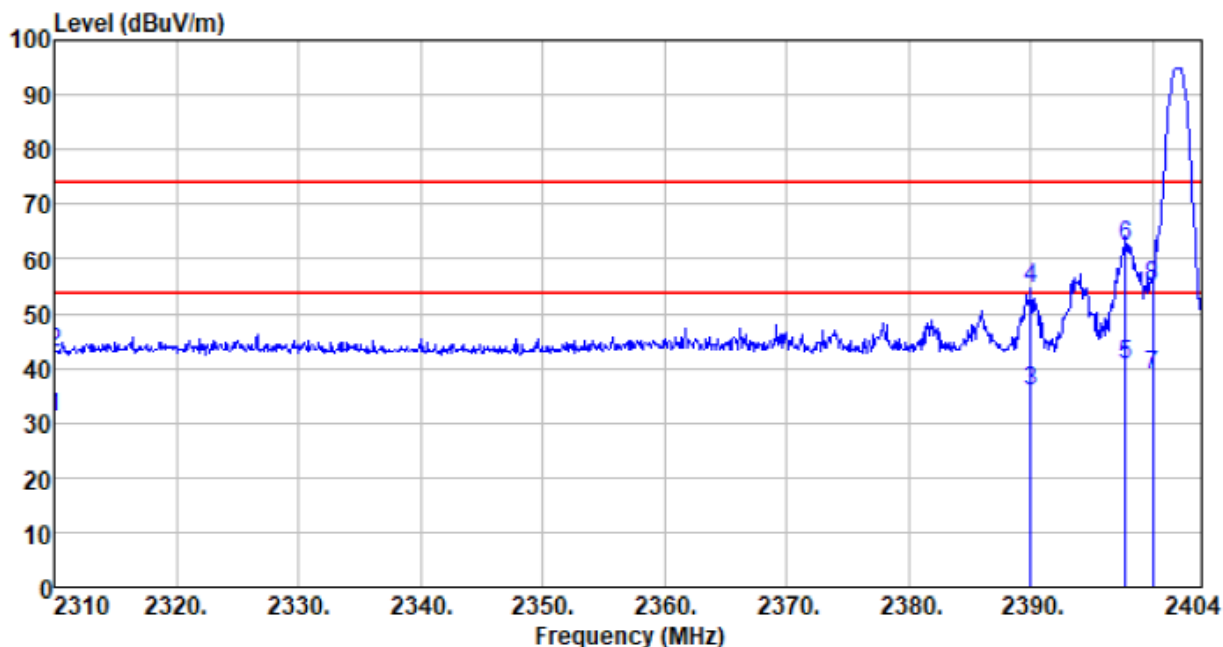
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

7.2.3 Bandedge emissions

All of the restriction bands were tested, and only the data of worst case was exhibited.

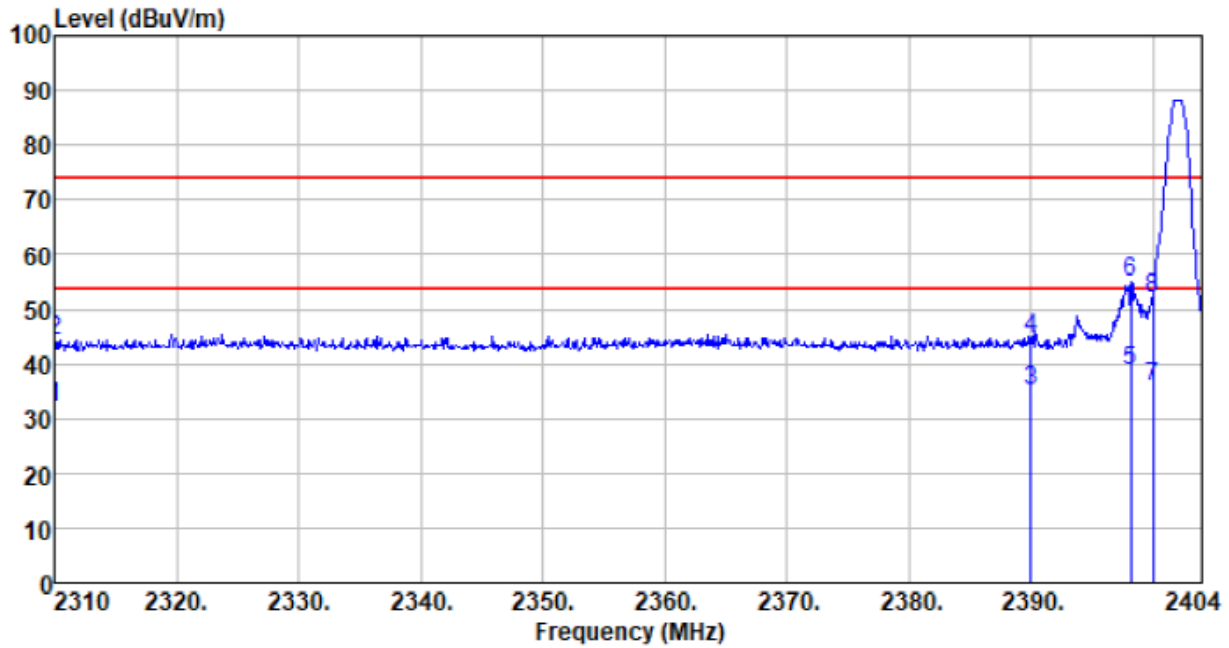
Test channel:	Lowest channel
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Horizontal:



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
2310.000	31.49	27.14	2.81	30.43	31.01	54.00	-22.99	Average
2310.000	43.29	27.14	2.81	30.43	42.81	74.00	-31.19	Peak
2390.000	35.82	27.37	2.91	30.24	35.86	54.00	-18.14	Average
2390.000	54.57	27.37	2.91	30.24	54.61	74.00	-19.39	Peak
2397.796	40.41	27.41	2.91	30.26	40.47	54.00	-13.53	Average
2397.796	62.15	27.41	2.91	30.26	62.21	74.00	-11.79	Peak
2400.000	38.77	27.41	2.91	30.26	38.83	54.00	-15.17	Average
2400.000	54.87	27.41	2.91	30.26	54.93	74.00	-19.07	Peak

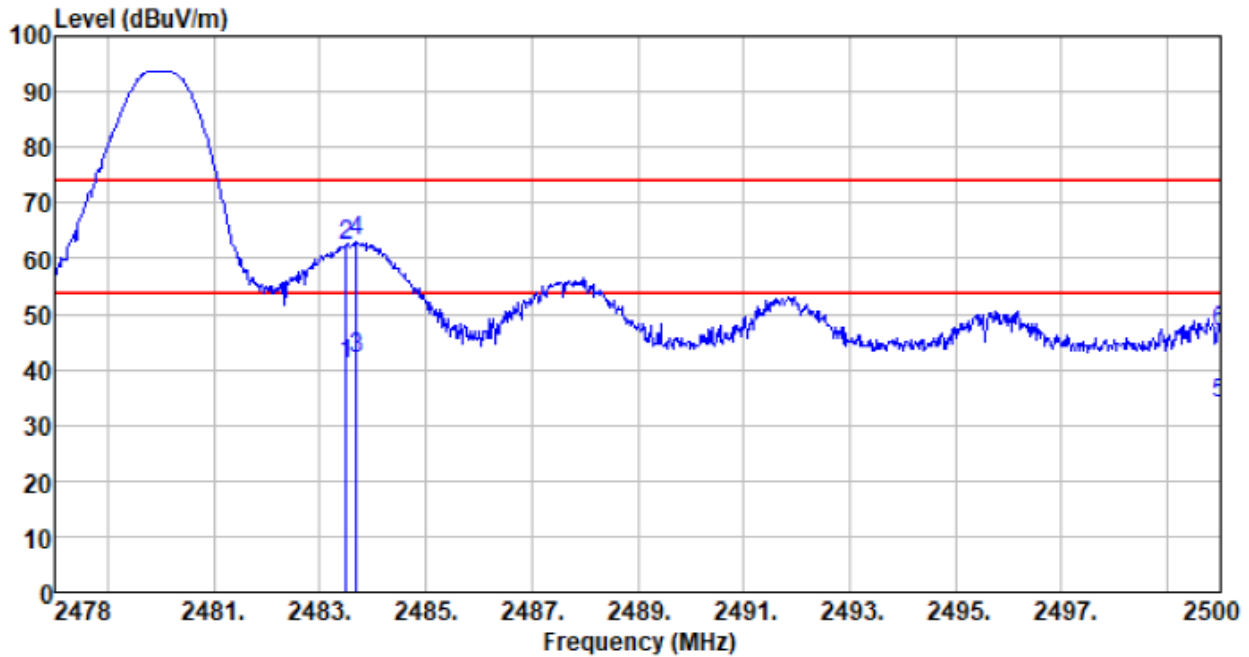
Vertical:



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
2310.000	32.47	27.14	2.81	30.43	31.99	54.00	-22.01	Average
2310.000	44.67	27.14	2.81	30.43	44.19	74.00	-29.81	Peak
2390.000	35.19	27.37	2.91	30.24	35.23	54.00	-18.77	Average
2390.000	44.43	27.37	2.91	30.24	44.47	74.00	-29.53	Peak
2398.172	38.57	27.41	2.91	30.26	38.63	54.00	-15.37	Average
2398.172	54.80	27.41	2.91	30.26	54.86	74.00	-19.14	Peak
2400.000	35.77	27.41	2.91	30.26	35.83	54.00	-18.17	Average
2400.000	51.93	27.41	2.91	30.26	51.99	74.00	-22.01	Peak

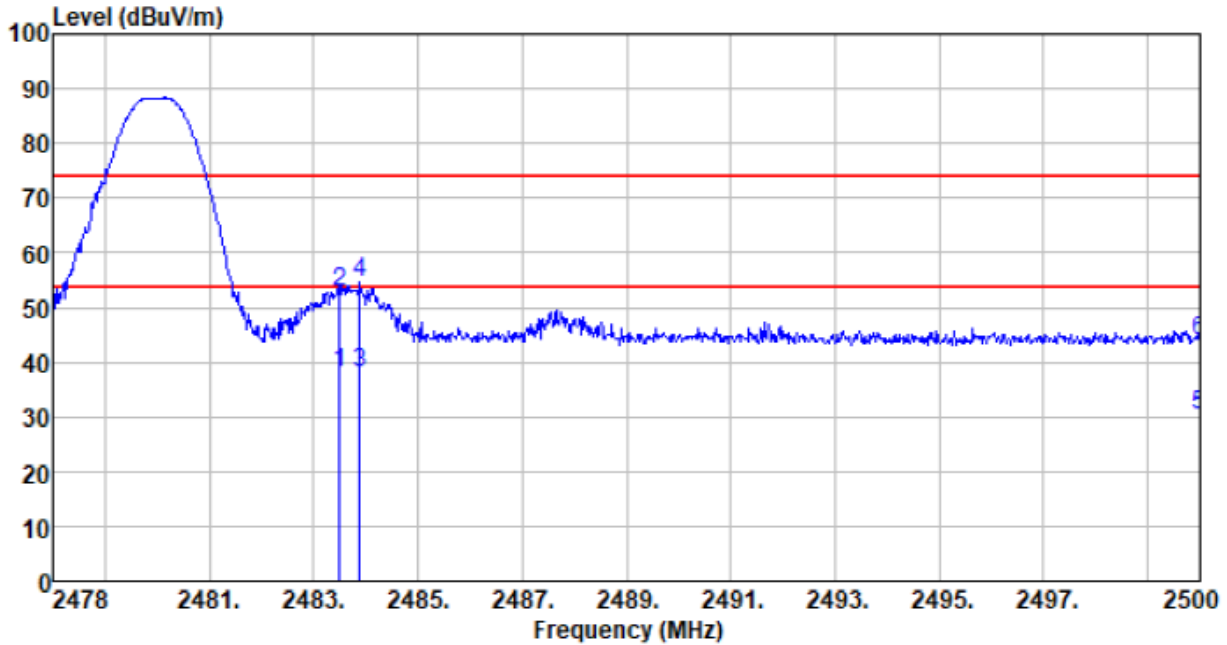
Test channel:	Highest channel
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Horizontal:



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
2483.500	40.47	27.66	2.99	30.12	41.00	54.00	-13.00	Average
2483.500	61.76	27.66	2.99	30.12	62.29	74.00	-11.71	Peak
2483.698	41.65	27.66	2.99	30.12	42.18	54.00	-11.82	Average
2483.698	62.41	27.66	2.99	30.12	62.94	74.00	-11.06	Peak
2500.000	33.37	27.70	3.01	30.13	33.95	54.00	-20.05	Average
2500.000	46.40	27.70	3.01	30.13	46.98	74.00	-27.02	Peak

Vertical:

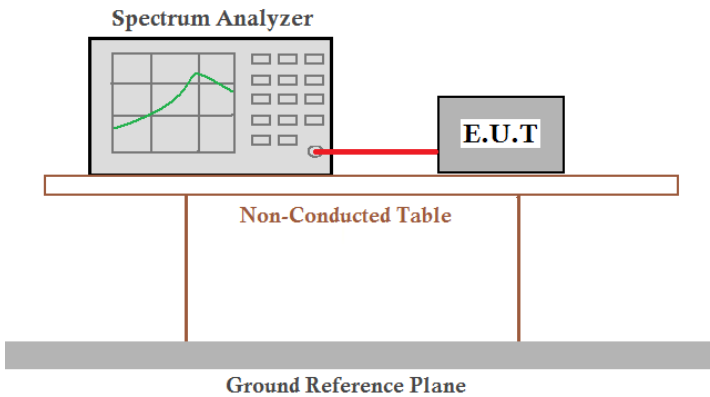


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2483.500	37.30	27.66	2.99	30.12	37.83	54.00	-16.17	Average
2483.500	52.18	27.66	2.99	30.12	52.71	74.00	-21.29	Peak
2483.896	37.40	27.66	2.99	30.12	37.93	54.00	-16.07	Average
2483.896	54.04	27.66	2.99	30.12	54.57	74.00	-19.43	Peak
2500.000	29.66	27.70	3.01	30.13	30.24	54.00	-23.76	Average
2500.000	43.36	27.70	3.01	30.13	43.94	74.00	-30.06	Peak

Remark:

Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

7.3 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 2400MHz~2483.5MHz
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

Test channel	20dB bandwidth(MHz)	Result
Lowest	0.592	Pass
Middle	0.600	Pass
Highest	0.601	Pass

Test plot as follows:



Lowest channel



Middle channel



Highest channel

8 Test Setup Photo

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

9 EUT Constructional Details

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

-----End-----