TEST REPORT

Applicant:	HANSHOW TECHNOLOGY CO.,LTD.
Address of Applicant:	Building 1 (IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No. 1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang, China
Manufacturer/ Factory:	HANSHOW TECHNOLOGY CO.,LTD.
Address of Manufacturer/ Factory:	Building 1 (IF podium building and 4F) and Building 5 (7F) in Jiaxing Photovolta High-tech Park, No. 1288 Kanghe Rd., Xiuzhou District, Jiaxing, Zhejiang, China
Equipment Under Test (EUT)	
Product Name:	electronic shelf label
Model No.:	Nebular-350F-N, Nebular-350R-N, Nebular-350Y-N
FCC ID:	2AYMH-NEBULAR-350B
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249
Date of sample receipt:	April 06, 2022
Date of Test:	April 06-24, 2022
Date of report issued:	April 24, 2022
Test Result :	PASS *

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

Authorized Signature:

Robinson Luo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	April 24, 2022	Original

Prepared By: Tiger Chen ***Date:*** *April 24, 2022*

Project Engineer

Check By: Robinson Liu ***Date:*** *April 24, 2022*

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.*

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-350F-N, Nebular-350R-N, Nebular-350Y-N
Test Model No.:	Nebular-350F-N
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance color and model name for commercial purpose.	
S/N:	088206535022429576
Test sample(s) ID:	GTS202204000050-1
Sample(s) Status	Engineered sample
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	157
Channel separation:	0.5MHz
Modulation type:	GFSK
Antenna Type:	Integral Antenna
Antenna gain:	0dBi(declare by applicant)
Power supply:	DC 3V by battery

Operation Frequency each of channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2402.0	41	2422.0	81	2442.0	121	2462.0
2	2402.5	42	2422.5	82	2442.5	122	2462.5
3	2403.0	43	2423.0	83	2443.0	123	2463.0
4	2403.5	44	2423.5	84	2443.5	124	2463.5
5	2404.0	45	2424.0	85	2444.0	125	2464.0
6	2404.5	46	2424.5	86	2444.5	126	2464.5
7	2405.0	47	2425.0	87	2445.0	127	2465.0
8	2405.5	48	2425.5	88	2445.5	128	2465.5
9	2406.0	49	2426.0	89	2446.0	129	2466.0
10	2406.5	50	2426.5	90	2446.5	130	2466.5
11	2407.0	51	2427.0	91	2447.0	131	2467.0
12	2407.5	52	2427.5	92	2447.5	132	2467.5
13	2408.0	53	2428.0	93	2448.0	133	2468.0
14	2408.5	54	2428.5	94	2448.5	134	2468.5
15	2409.0	55	2429.0	95	2449.0	135	2469.0
16	2409.5	56	2429.5	96	2449.5	136	2469.5
17	2410.0	57	2430.0	97	2450.0	137	2470.0
18	2410.5	58	2430.5	98	2450.5	138	2470.5
19	2411.0	59	2431.0	99	2451.0	139	2471.0
20	2411.5	60	2431.5	100	2451.5	140	2471.5
21	2412.0	61	2432.0	101	2452.0	141	2472.0
22	2412.5	62	2432.5	102	2452.5	142	2472.5
23	2413.0	63	2433.0	103	2453.0	143	2473.0
24	2413.5	64	2433.5	104	2453.5	144	2473.5
25	2414.0	65	2434.0	105	2454.0	145	2474.0
26	2414.5	66	2434.5	106	2454.5	146	2474.5
27	2415.0	67	2435.0	107	2455.0	147	2475.0
28	2415.5	68	2435.5	108	2455.5	148	2475.5
29	2416.0	69	2436.0	109	2456.0	149	2476.0
30	2416.5	70	2436.5	110	2456.5	150	2476.5
31	2417.0	71	2437.0	111	2457.0	151	2477.0
32	2417.5	72	2437.5	112	2457.5	152	2477.5
33	2418.0	73	2438.0	113	2458.0	153	2478.0
34	2418.5	74	2438.5	114	2458.5	154	2478.5
35	2419.0	75	2439.0	115	2459.0	155	2479.0
36	2419.5	76	2439.5	116	2459.5	156	2479.5
37	2420.0	77	2440.0	117	2460.0	157	2480.0
38	2420.5	78	2440.5	118	2460.5		
39	2421.0	79	2441.0	119	2461.0		
40	2421.5	80	2441.5	120	2461.5		

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.

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)	92.89	93.31	93.14

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).

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	Continuously transmitter provided 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. 24 2021	June. 23 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 24 2021	June. 23 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 24 2021	June. 23 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 24 2021	June. 23 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 24 2021	June. 23 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 24 2021	June. 23 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 24 2021	June. 23 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 24 2021	June. 23 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 24 2021	June. 23 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 24 2021	June. 23 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 24 2021	June. 23 2022
15	Band filter	Amindeon	82346	GTS219	June. 24 2021	June. 23 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 24 2021	June. 23 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 24 2021	June. 23 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 24 2021	June. 23 2022
19	Splitter	Agilent	11636B	GTS237	June. 24 2021	June. 23 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 24 2021	June. 23 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. 24 2021	June. 23 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. 24 2021	June. 23 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 24 2021	June. 23 2022
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 24 2021	June. 23 2022
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 24 2021	June. 23 2022
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 24 2021	June. 23 2022
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 24 2021	June. 23 2022
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 24 2021	June. 23 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. 24 2021	June. 23 2022
2	Barometer	ChangChun	DYM3	GTS255	June. 24 2021	June. 23 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. **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:	
The antenna is integral antenna, the best case gain of the antenna is 0dBi, reference to the appendix II for details.	

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)

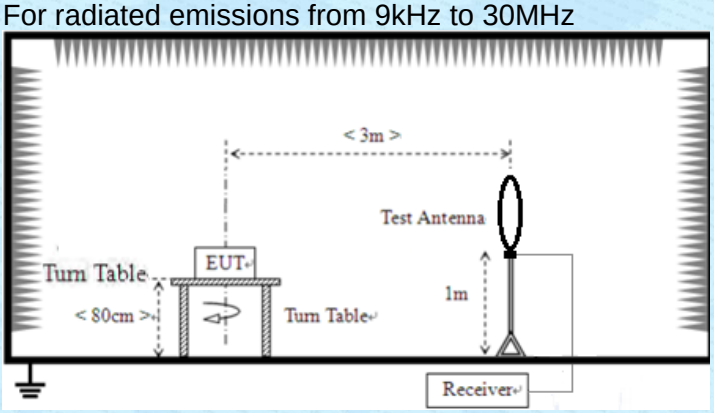
Frequency	Limit (uV/m)	Remark
0.009MHz-0.490MHz	2400/F(kHz) @300m	Quasi-peak Value
0.490MHz-1.705MHz	24000/F(kHz) @30m	Quasi-peak Value
1.705MHz-30.0MHz	30 @30m	Quasi-peak Value
30MHz-88MHz	100 @3m	Quasi-peak Value
88MHz-216MHz	150 @3m	Quasi-peak Value
216MHz-960MHz	200 @3m	Quasi-peak Value
960MHz-1GHz	500 @3m	Quasi-peak Value
Above 1GHz	500 @3m	Average Value
	5000 @3m	Peak Value

Limit: (band edge)

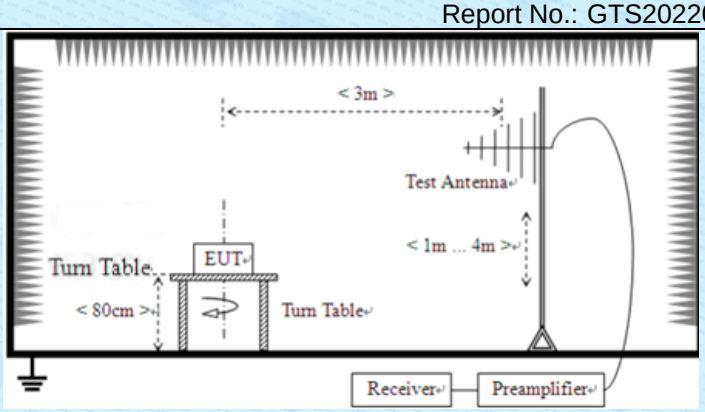
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Test setup:

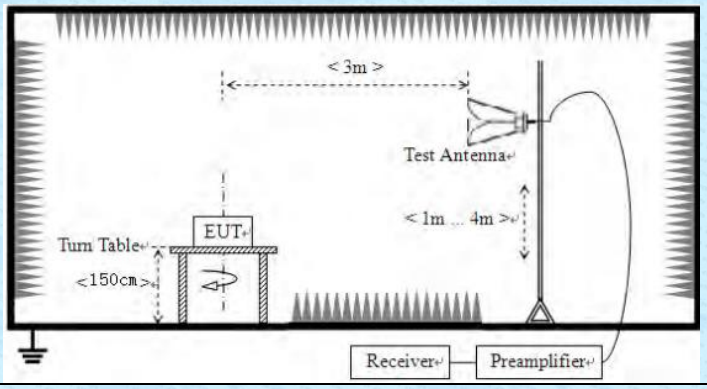
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz



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 voltage:	DC 3V
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)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2402.00	98.68	27.41	2.91	38.86	90.14	114.00	-23.86	Horizontal
2402.00	101.39	27.41	2.91	38.86	92.85	114.00	-21.15	Vertical
2441.00	98.52	27.53	2.96	38.96	90.05	114.00	-23.95	Horizontal
2441.00	100.44	27.53	2.96	38.96	91.97	114.00	-22.03	Vertical
2480.00	98.31	27.64	2.99	39.05	89.89	114.00	-24.11	Horizontal
2480.00	101.73	27.64	2.99	39.05	93.31	114.00	-20.69	Vertical

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
2402.00	88.74	27.41	2.91	38.86	80.20	94.00	-13.80	Horizontal
2402.00	91.08	27.41	2.91	38.86	82.54	94.00	-11.46	Vertical
2441.00	89.21	27.53	2.96	38.96	80.74	94.00	-13.26	Horizontal
2441.00	90.68	27.53	2.96	38.96	82.21	94.00	-11.79	Vertical
2480.00	89.35	27.64	2.99	39.05	80.93	94.00	-13.07	Horizontal
2480.00	91.41	27.64	2.99	39.05	82.99	94.00	-11.01	Vertical

7.2.2 Spurious emissions

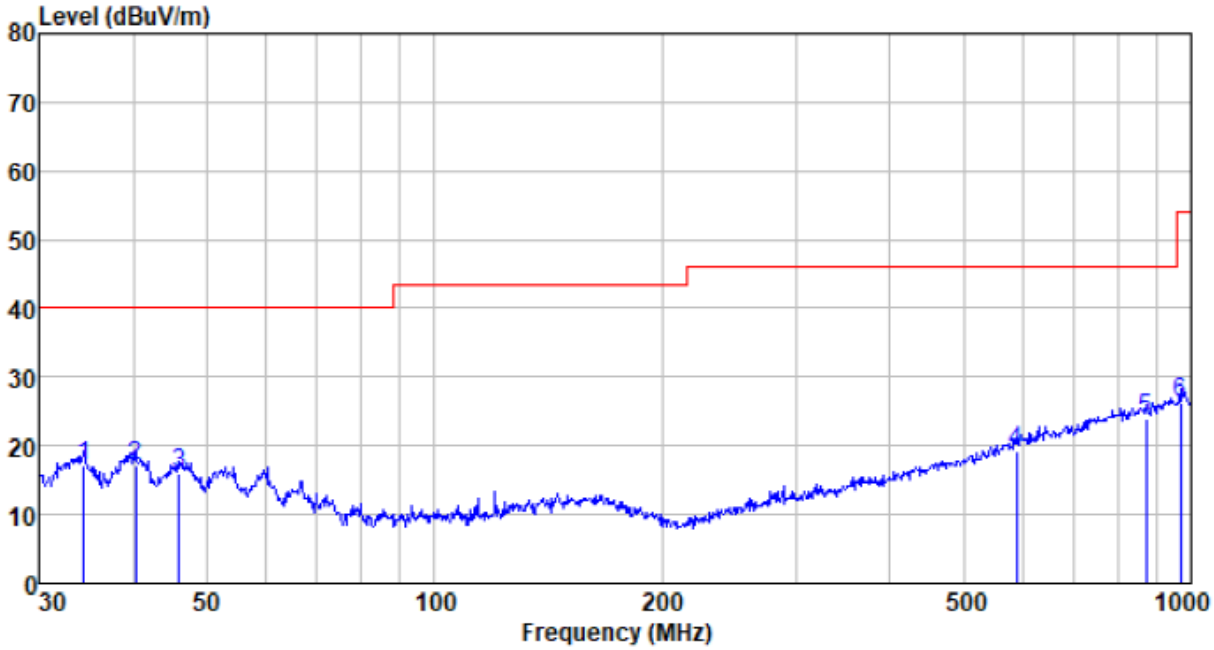
■ **Below 30MHz**

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**

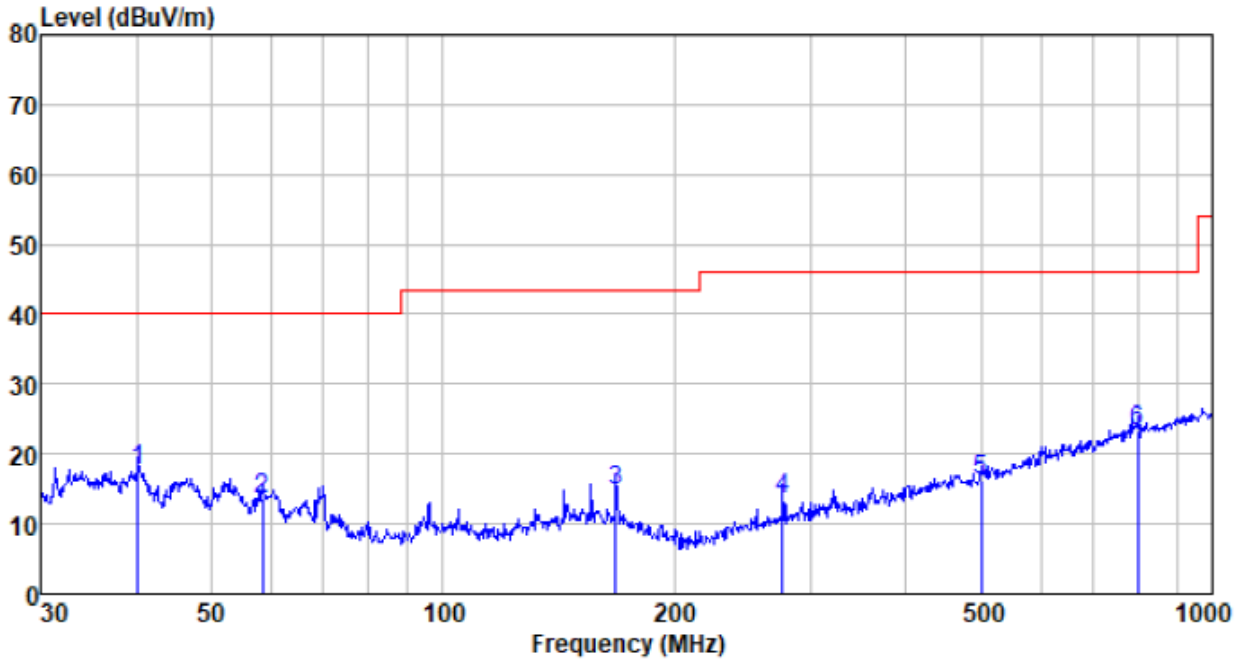
Only worst condition(2402MHz) report

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
34.396	39.40	12.46	0.60	35.32	17.14	40.00	-22.86	QP
40.276	38.83	13.24	0.66	35.68	17.05	40.00	-22.95	QP
46.016	38.09	12.98	0.73	35.99	15.81	40.00	-24.19	QP
586.844	34.22	18.91	3.67	37.54	19.26	46.00	-26.74	QP
872.183	34.12	22.75	4.74	37.61	24.00	46.00	-22.00	QP
968.934	34.71	23.99	5.11	37.54	26.27	54.00	-27.73	QP

Vertical:

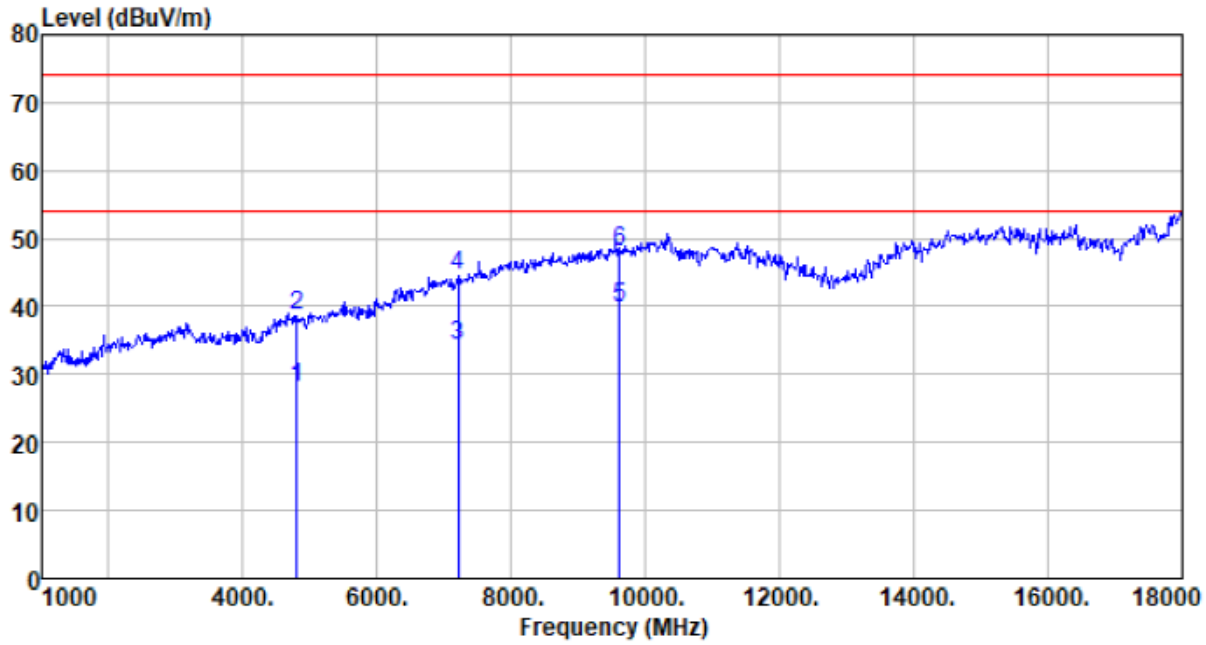


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
40.135	39.35	13.25	0.66	35.67	17.59	40.00	-22.41	QP
58.203	36.78	12.40	0.84	36.30	13.72	40.00	-26.28	QP
167.824	37.74	12.52	1.67	37.18	14.75	43.50	-28.75	QP
276.124	36.95	11.72	2.25	37.40	13.52	46.00	-32.48	QP
501.179	33.86	16.65	3.31	37.51	16.31	46.00	-29.69	QP
798.980	34.25	22.23	4.45	37.62	23.31	46.00	-22.69	QP

■ Above 1GHz

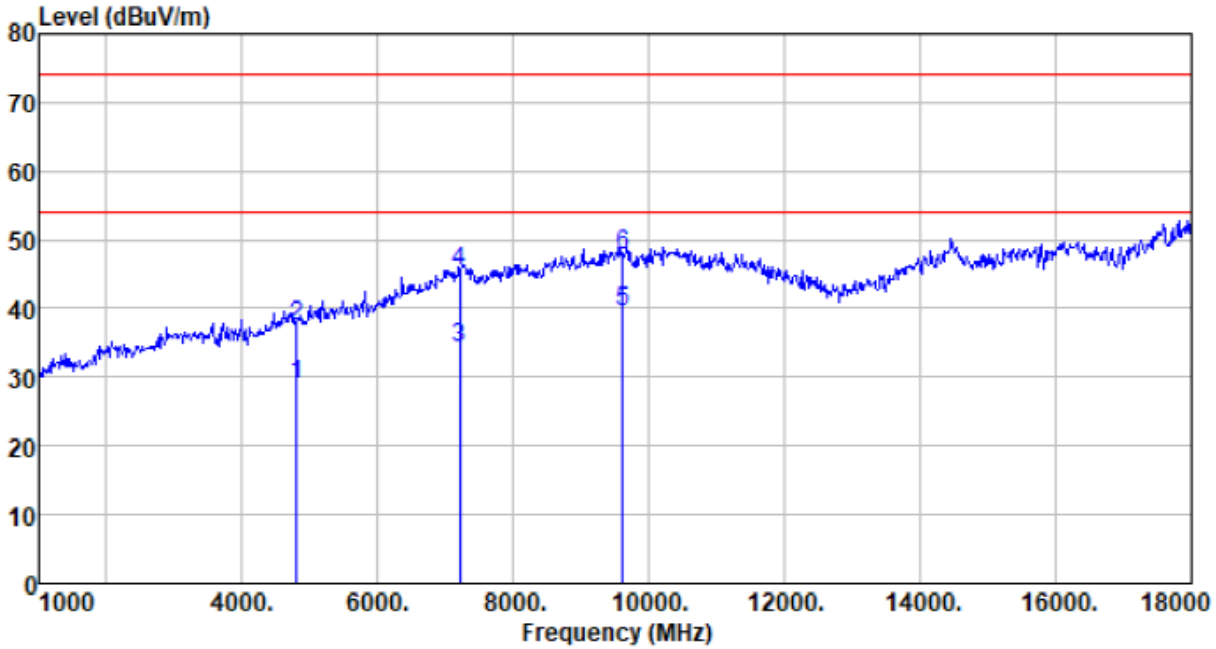
Test channel:	Lowest

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	30.06	31.20	4.61	37.70	28.17	54.00	-25.83	Average
4804.000	40.71	31.20	4.61	37.70	38.82	74.00	-35.18	Peak
7206.000	29.36	36.16	6.48	37.82	34.18	54.00	-19.82	Average
7206.000	39.84	36.16	6.48	37.82	44.66	74.00	-29.34	Peak
9608.000	31.74	37.93	7.97	37.92	39.72	54.00	-14.28	Average
9608.000	40.08	37.93	7.97	37.92	48.06	74.00	-25.94	Peak

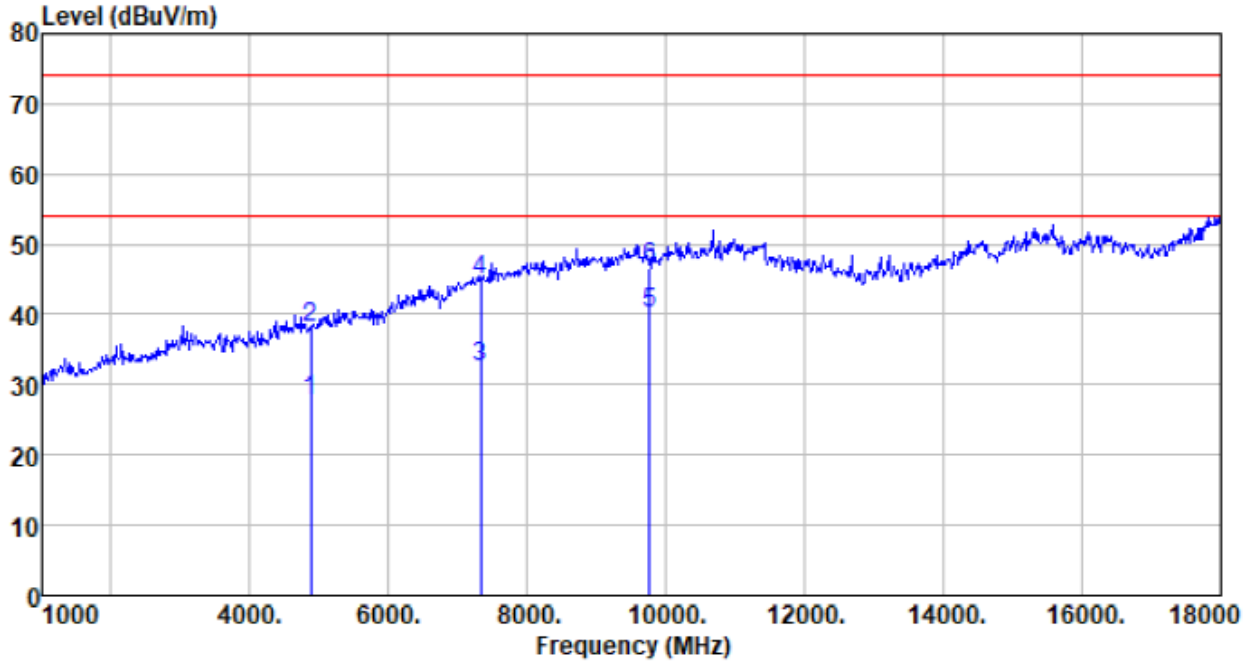
Vertical:



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	30.89	31.20	4.61	37.70	29.00	54.00	-25.00	Average
4804.000	39.29	31.20	4.61	37.70	37.40	74.00	-36.60	Peak
7206.000	29.56	36.16	6.48	37.82	34.38	54.00	-19.62	Average
7206.000	40.76	36.16	6.48	37.82	45.58	74.00	-28.42	Peak
9608.000	31.61	37.93	7.97	37.92	39.59	54.00	-14.41	Average
9608.000	39.86	37.93	7.97	37.92	47.84	74.00	-26.16	Peak

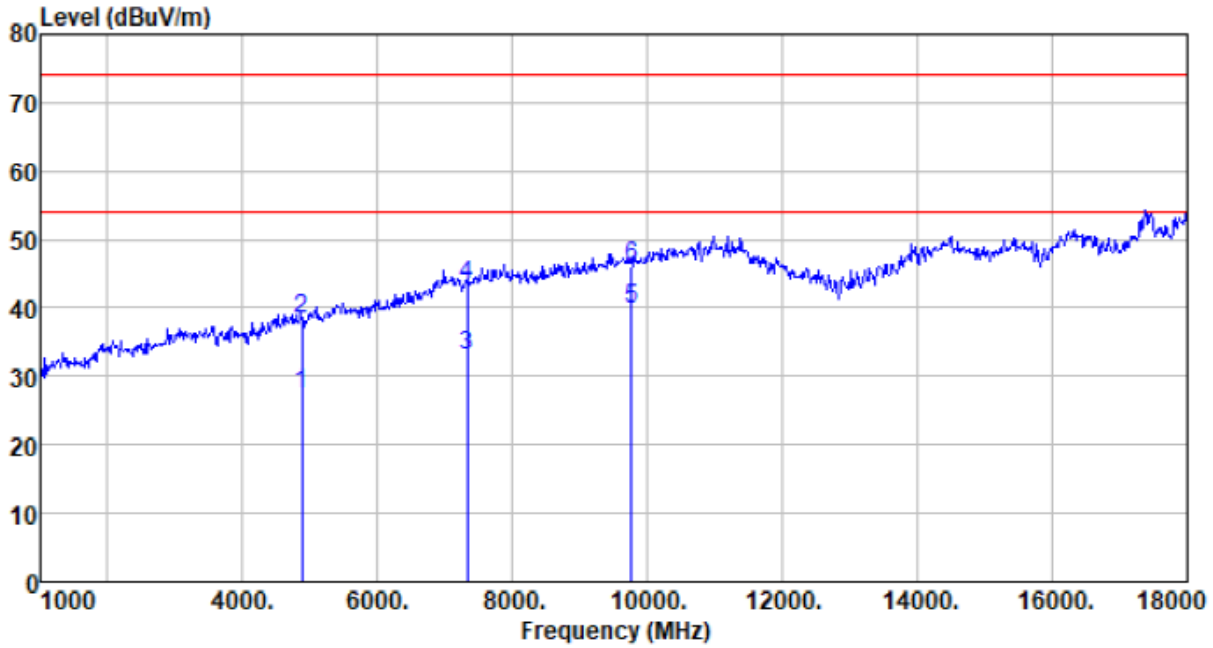
Test channel:	Middle

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	29.25	31.33	4.69	37.62	27.65	54.00	-26.35	Average
4882.000	39.82	31.33	4.69	37.62	38.22	74.00	-35.78	Peak
7323.000	27.17	36.43	6.63	37.77	32.46	54.00	-21.54	Average
7323.000	39.67	36.43	6.63	37.77	44.96	74.00	-29.04	Peak
9764.000	32.02	38.10	8.03	37.95	40.20	54.00	-13.80	Average
9764.000	38.50	38.10	8.03	37.95	46.68	74.00	-27.32	Peak

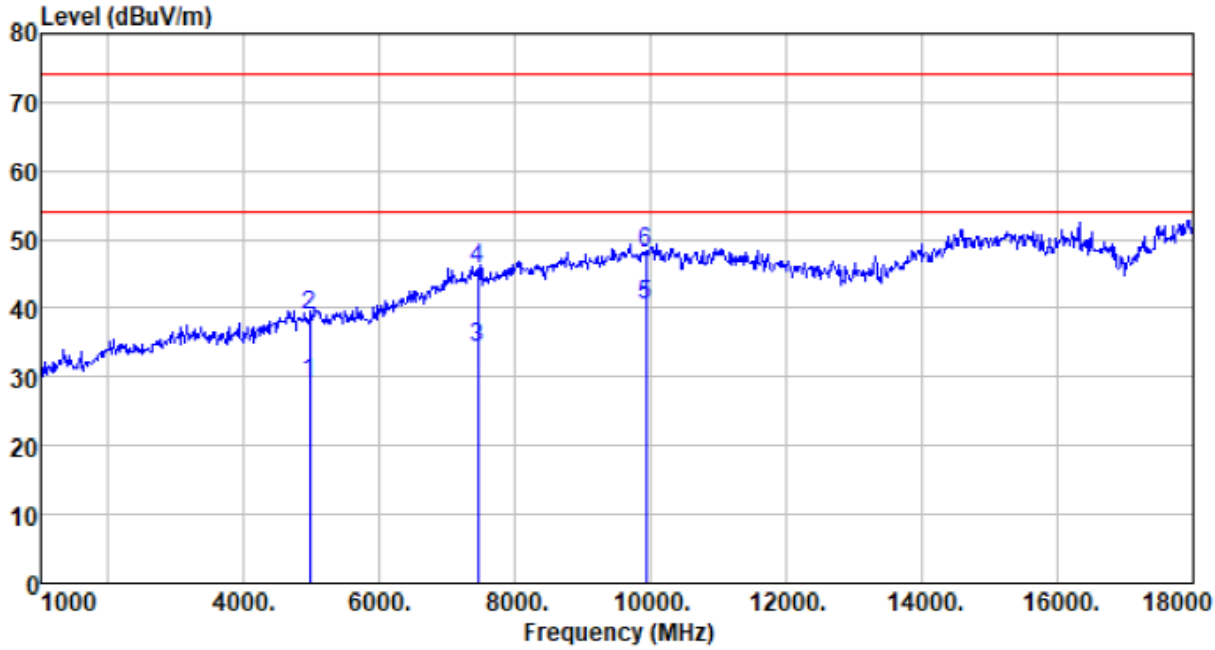
Vertical:



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	29.03	31.33	4.69	37.62	27.43	54.00	-26.57	Average
4882.000	39.90	31.33	4.69	37.62	38.30	74.00	-35.70	Peak
7323.000	27.75	36.43	6.63	37.77	33.04	54.00	-20.96	Average
7323.000	37.97	36.43	6.63	37.77	43.26	74.00	-30.74	Peak
9764.000	31.76	38.10	8.03	37.95	39.94	54.00	-14.06	Average
9764.000	37.78	38.10	8.03	37.95	45.96	74.00	-28.04	Peak

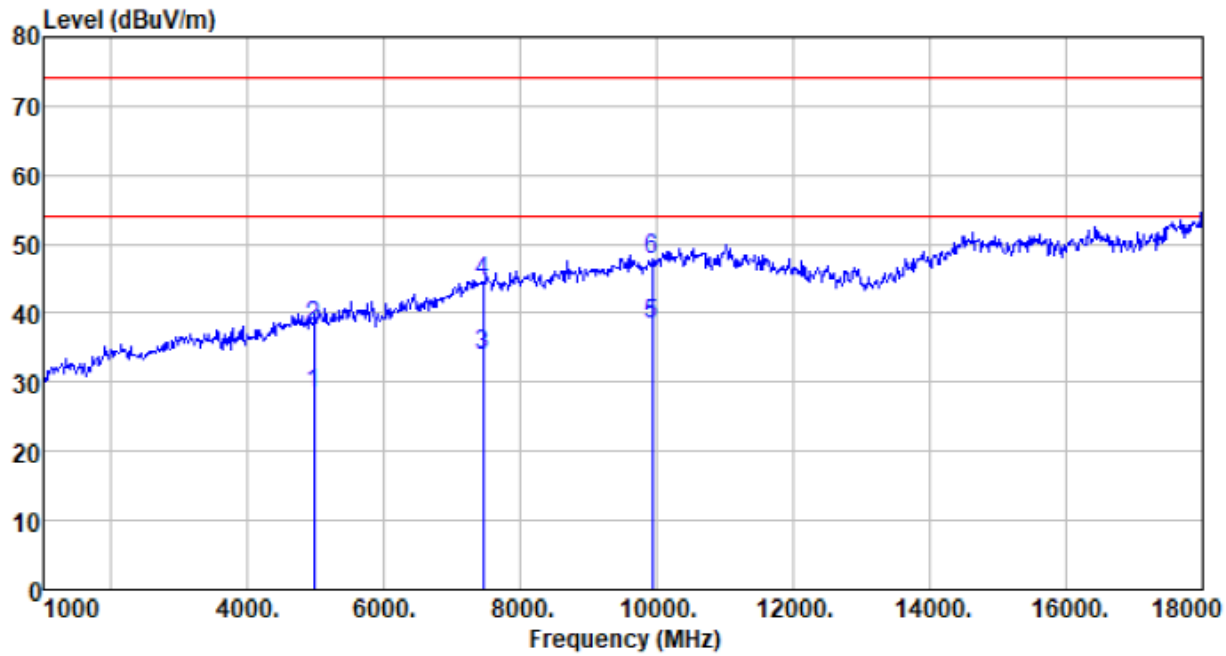
Test channel:	Highest

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	30.48	31.44	4.79	37.54	29.17	54.00	-24.83	Average
4960.000	40.24	31.44	4.79	37.54	38.93	74.00	-35.07	Peak
7440.000	28.63	36.66	6.77	37.72	34.34	54.00	-19.66	Average
7440.000	39.96	36.66	6.77	37.72	45.67	74.00	-28.33	Peak
9920.000	31.91	38.30	8.09	37.98	40.32	54.00	-13.68	Average
9920.000	39.69	38.30	8.09	37.98	48.10	74.00	-25.90	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	29.62	31.44	4.79	37.54	28.31	54.00	-25.69	Average
4960.000	39.36	31.44	4.79	37.54	38.05	74.00	-35.95	Peak
7440.000	28.13	36.66	6.77	37.72	33.84	54.00	-20.16	Average
7440.000	38.89	36.66	6.77	37.72	44.60	74.00	-29.40	Peak
9920.000	30.03	38.30	8.09	37.98	38.44	54.00	-15.56	Average
9920.000	39.34	38.30	8.09	37.98	47.75	74.00	-26.25	Peak

Remarks:

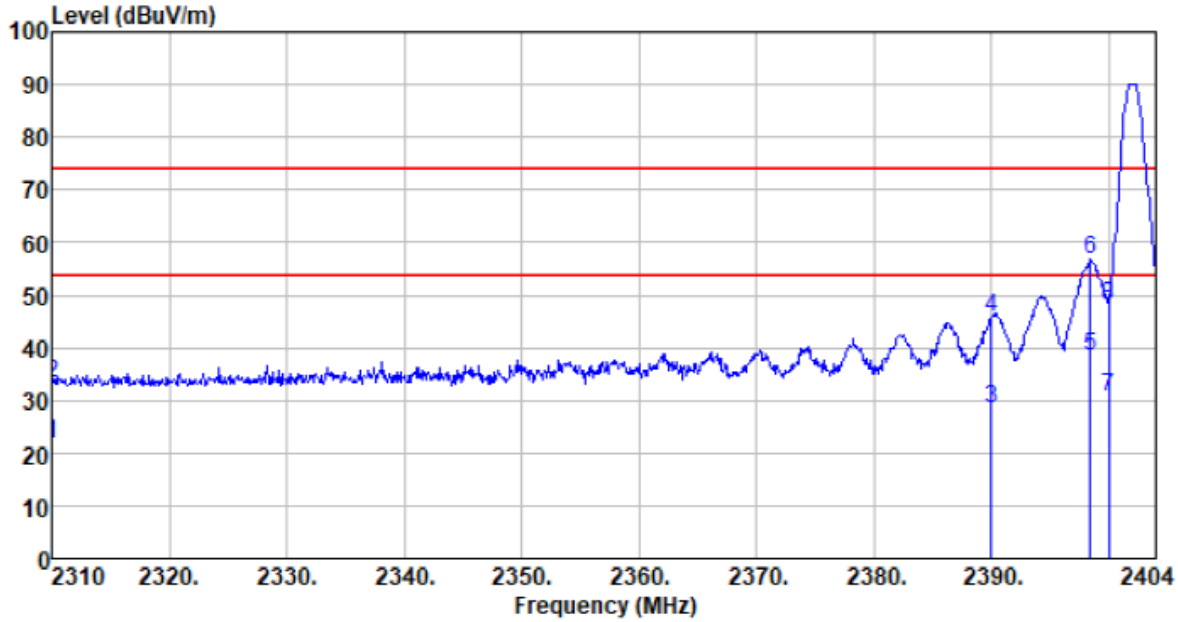
1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

7.2.3 Bandedge emissions

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

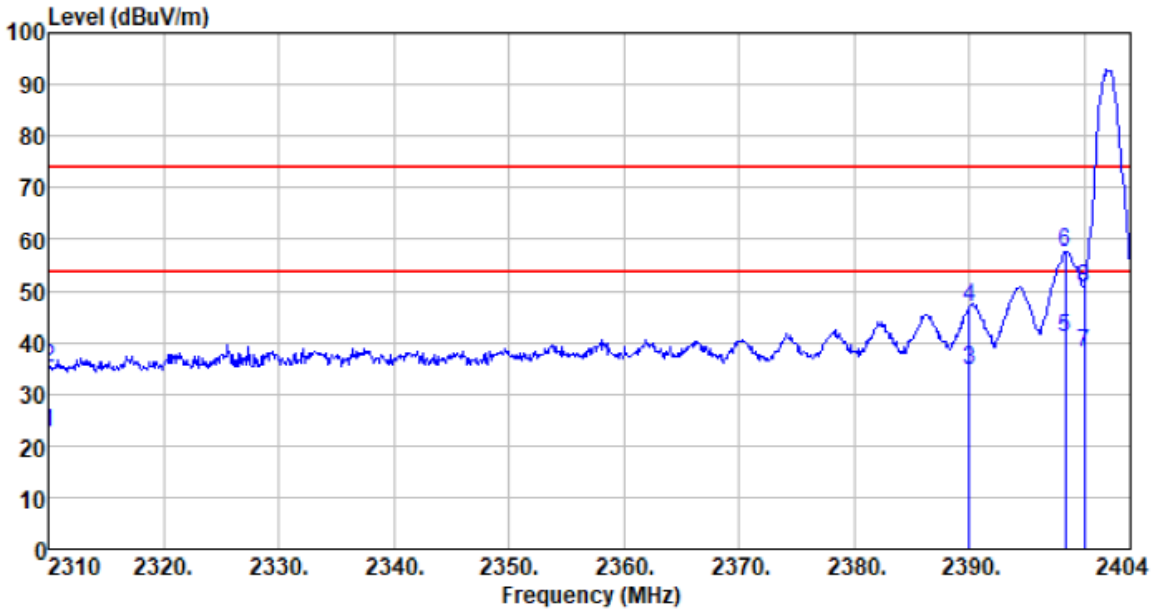
Test channel:	Lowest

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	30.59	27.14	2.81	38.64	21.90	54.00	-32.10	Average
2310.000	41.85	27.14	2.81	38.64	33.16	74.00	-40.84	Peak
2390.000	36.80	27.37	2.91	38.84	28.24	54.00	-25.76	Average
2390.000	54.48	27.37	2.91	38.84	45.92	74.00	-28.08	Peak
2398.454	46.81	27.41	2.91	38.86	38.27	54.00	-15.73	Average
2398.454	65.38	27.41	2.91	38.86	56.84	74.00	-17.16	Peak
2400.000	39.11	27.41	2.91	38.86	30.57	54.00	-23.43	Average
2400.000	56.66	27.41	2.91	38.86	48.12	74.00	-25.88	Peak

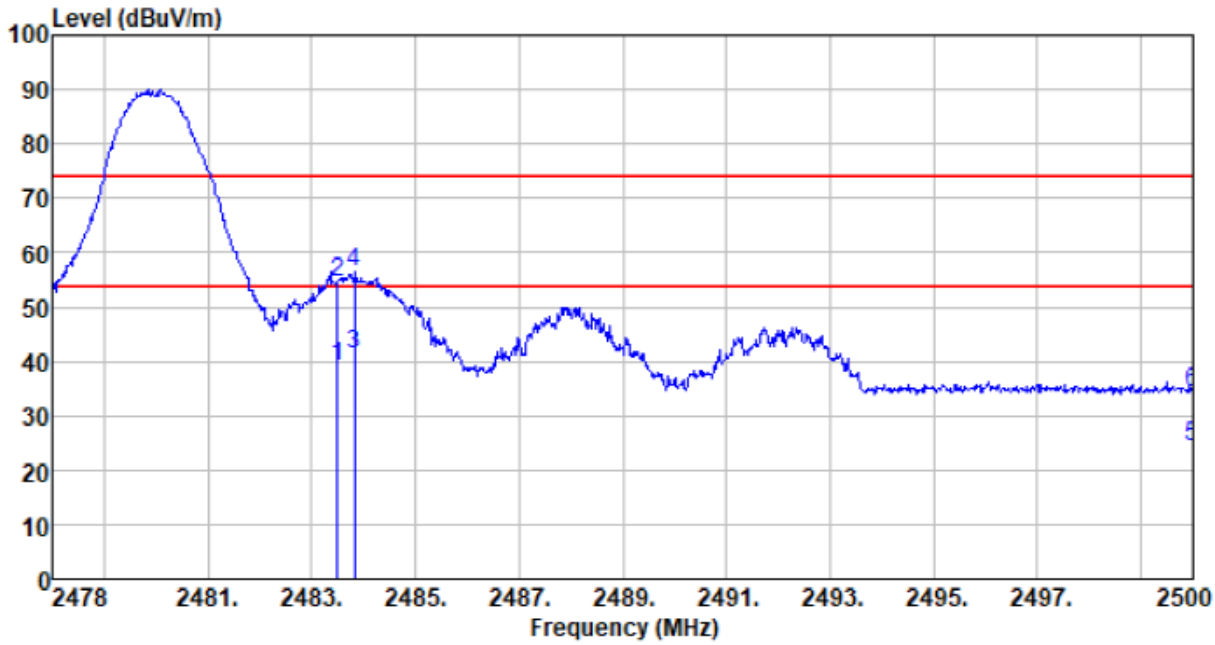
Vertical:



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	31.18	27.14	2.81	38.64	22.49	54.00	-31.51	Average
2310.000	43.91	27.14	2.81	38.64	35.22	74.00	-38.78	Peak
2390.000	43.12	27.37	2.91	38.84	34.56	54.00	-19.44	Average
2390.000	55.51	27.37	2.91	38.84	46.95	74.00	-27.05	Peak
2398.360	49.60	27.41	2.91	38.86	41.06	54.00	-12.94	Average
2398.360	66.26	27.41	2.91	38.86	57.72	74.00	-16.28	Peak
2400.000	46.55	27.41	2.91	38.86	38.01	54.00	-15.99	Average
2400.000	59.25	27.41	2.91	38.86	50.71	74.00	-23.29	Peak

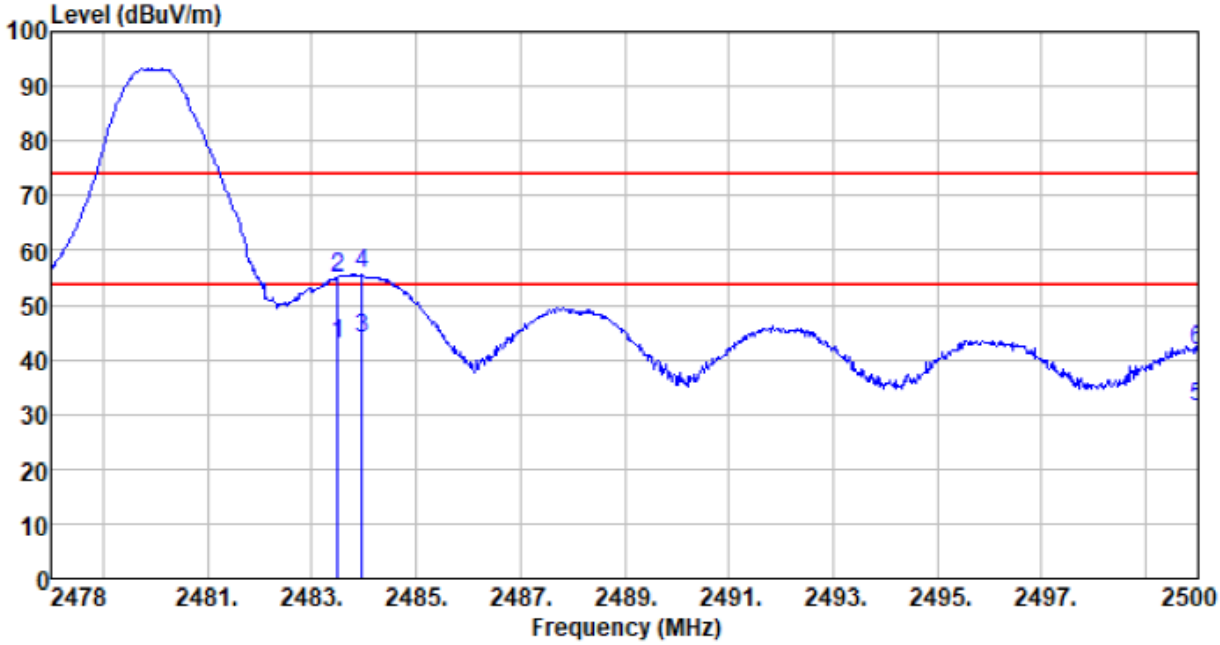
Test channel:	Highest

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	47.51	27.66	2.99	39.06	39.10	54.00	-14.90	Average
2483.500	62.95	27.66	2.99	39.06	54.54	74.00	-19.46	Peak
2483.830	49.63	27.66	2.99	39.06	41.22	54.00	-12.78	Average
2483.830	64.76	27.66	2.99	39.06	56.35	74.00	-17.65	Peak
2500.000	32.76	27.70	3.01	39.10	24.37	54.00	-29.63	Average
2500.000	42.78	27.70	3.01	39.10	34.39	74.00	-39.61	Peak

Vertical:

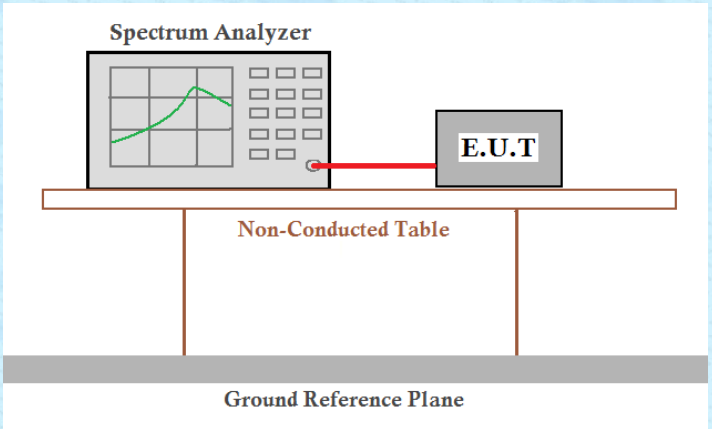


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2483.500	51.36	27.66	2.99	39.06	42.95	54.00	-11.05	Average
2483.500	63.44	27.66	2.99	39.06	55.03	74.00	-18.97	Peak
2483.962	52.46	27.66	2.99	39.06	44.05	54.00	-9.95	Average
2483.962	64.05	27.66	2.99	39.06	55.64	74.00	-18.36	Peak
2500.000	39.71	27.70	3.01	39.10	31.32	54.00	-22.68	Average
2500.000	50.07	27.70	3.01	39.10	41.68	74.00	-32.32	Peak

Remark:

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

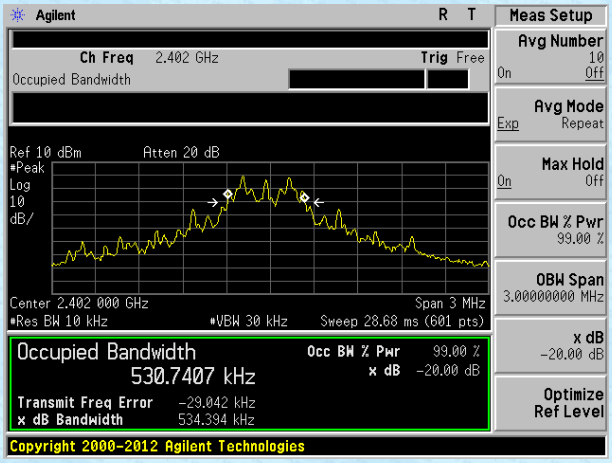
7.3 20dB Occupy Bandwidth

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:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

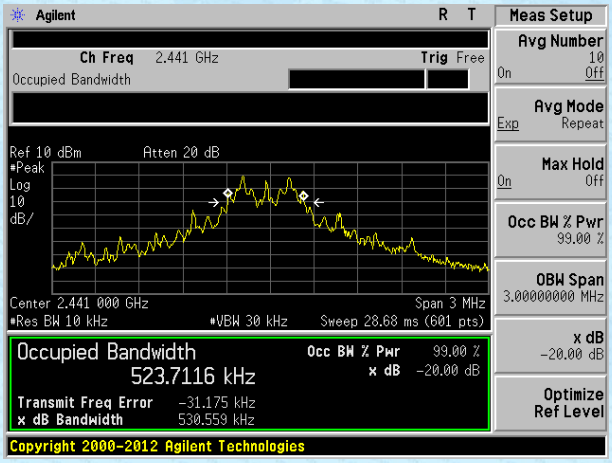
Measurement Data

Test channel	20dB bandwidth(MHz)	Result
Lowest	0.534	Pass
Middle	0.531	Pass
Highest	0.533	Pass

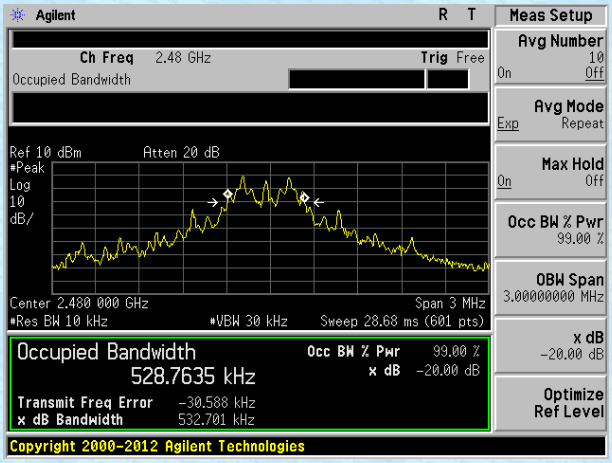
Test plot as follows:



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------