



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR251200324401

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TEST REPORT

Application No.: SHCR2512003244HS
FCC ID: WN2KL-VJN30
Applicant: Suzhou Cleva Electric Appliance Co., Ltd.
Address of Applicant: No. 8, Ting Rong Street, Suzhou Industrial Park, Suzhou, Jiangsu, 215122, China
Manufacturer: Suzhou Cleva Electric Appliance Co., Ltd.
Address of Manufacturer: No. 8, Ting Rong Street, Suzhou Industrial Park, Suzhou, Jiangsu, 215122, China
Factory: 1, Skybest Electric Appliance (Suzhou) Co., Ltd.
2, Suzhou Cleva Precision Machinery & Technology Co., Ltd.
Address of Factory: 1, No. 18, Huahong Street, Suzhou Industrial Park, Suzhou, Jiangsu, China.
2, No. 8, Ting Rong Street, Suzhou Industrial District, Suzhou, Jiangsu, 215122, China
Equipment Under Test (EUT):
EUT Name: Remote controller
Model No.: VJN30
Standard(s) : 47 CFR Part 15, Subpart C 15.249
Date of Receipt: 2025-12-08
Date of Test: 2025-12-10 to 2025-12-25
Date of Issue: 2025-12-26

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Member of the SGS Group (SGS SA)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

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Revision Record			
Version	Description	Date	Remark
00	Original	2025-12-26	/

Authorized for issue by:				
Tested By		Bill Wu		
		Bill Wu/Project Engineer		
Approved By		Parlam Zhan		
		Parlam Zhan / Reviewer		

2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2020) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Restricted Band Around Fundamental Frequency		ANSI C63.10 (2020) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass
Radiated Emissions Below 1GHz		ANSI C63.10 (2020) Section 6.4&6.5	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass
Radiated Emissions Above 1GHz		ANSI C63.10 (2020) Section 6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass
20dB Bandwidth		ANSI C63.10 (2020) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.7V 130mAh Rechargeable battery
Test voltage:	DC 3.7V
Operation Frequency:	2402MHz-2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2
Antenna Type:	PCB Antenna
Antenna Gain:	4.09 dBi (Provided by manufacturer)

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	LENOVO	L460	-
Serial port adapter plate	-	Test Plate 3	-

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty cycle	0.4%
4	Occupied Bandwidth	3%
5	RF Radiated power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
6	Radiated Spurious emission test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
7	Temperature test	1°C
8	Humidity test	3%
9	Supply voltages	1.5%
10	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).
3. Sample source: sent by customer.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

- **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.
Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Radiated Test					
Spectrum Analyzer	Keysight	N9010A	SHEM181-2	2025/04/30	2026/04/29
Communication Tester	R&S	CMW500	SHEM268-1	2025/04/30	2026/04/29
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2025/12/17	2026/12/16
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2025/08/31	2027/08/30
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2025/04/12	2027/04/11
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2024/08/05	2026/08/04
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2025/08/31	2027/08/30
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2025/08/31	2027/08/30
Pre-Amplifier	HP	8447D	SHEM236-1	2025/12/17	2026/12/16
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2025/12/17	2026/12/16
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2023/05/06	2026/05/05
RE test Cable	/	PT18-NMNM-10M	SHEM217-2	2025/07/30	2026/07/29
Test software	ESE	E3	Version: 6.111221a	/	/

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

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.

EUT Antenna:

The antenna is PCB antenna and no consideration of replacement.

Antenna location: Refer to Internal photos

7 Radio Spectrum Matter Test Results

7.1 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)

Test Method: ANSI C63.10 (2020) Section 6.5&6.6

Measurement Distance: 3m

Limit:

Fundamental frequency(MHz)	Field strength of fundamental(millivolts/meter)	Field strength of harmonics(microvolts/meter)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

Remark: The frequencies above 1000MHz are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

For fundamental frequency in "902-928MHz", the field strength of fundamental is based on Quasi-Peak.

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

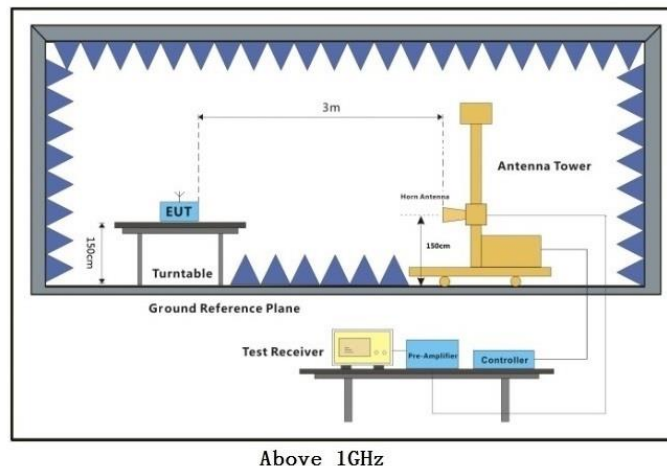
Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_ Keep the EUT in transmitting with modulation mode.

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Please Refer to Appendix for Details

7.2 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209

Test Method: ANSI C63.10 (2020) Section 6.10.5

Measurement Distance: 3m

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
Above 1GHz	74.0	Peak Value

Emission 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.

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

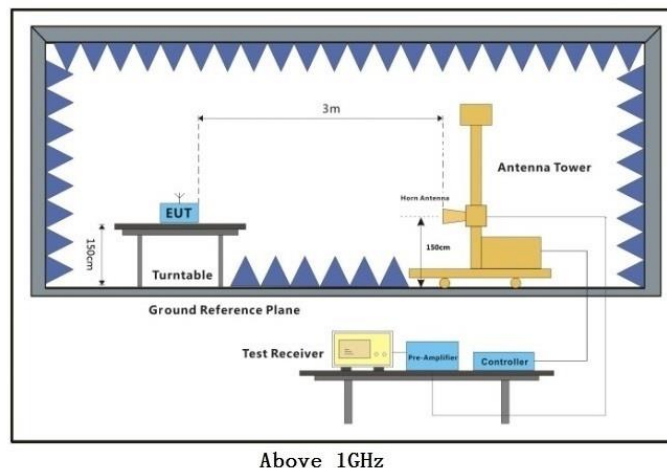
Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

7.2.3 Test Setup Diagram

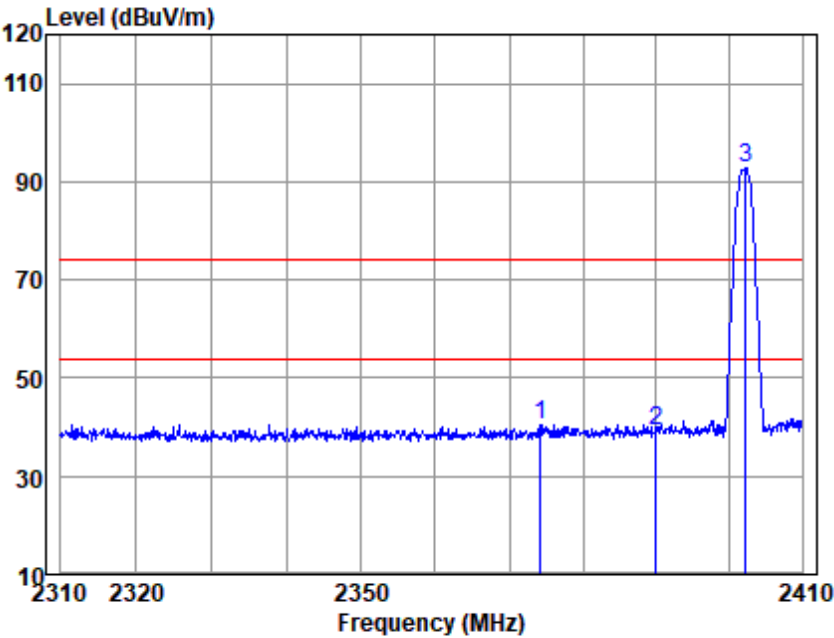


7.2.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low

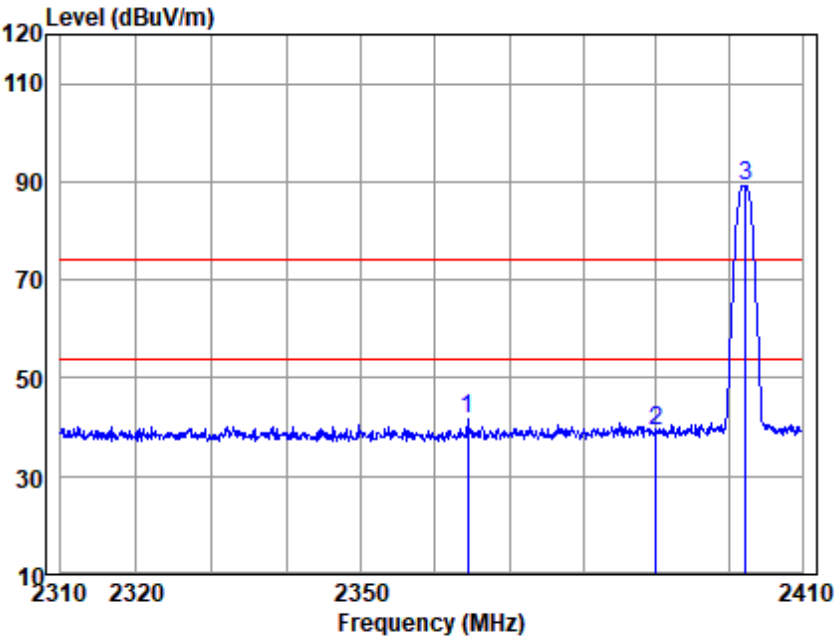


Antenna Polarity :HORIZONTAL
EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2374.215	43.65	28.71	3.32	35.17	40.51	74.00	-33.49	Peak
2390.000	42.47	28.80	3.33	35.18	39.42	74.00	-34.58	Peak
2402.250	95.66	28.85	3.34	35.19	92.66	74.00	18.66	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low

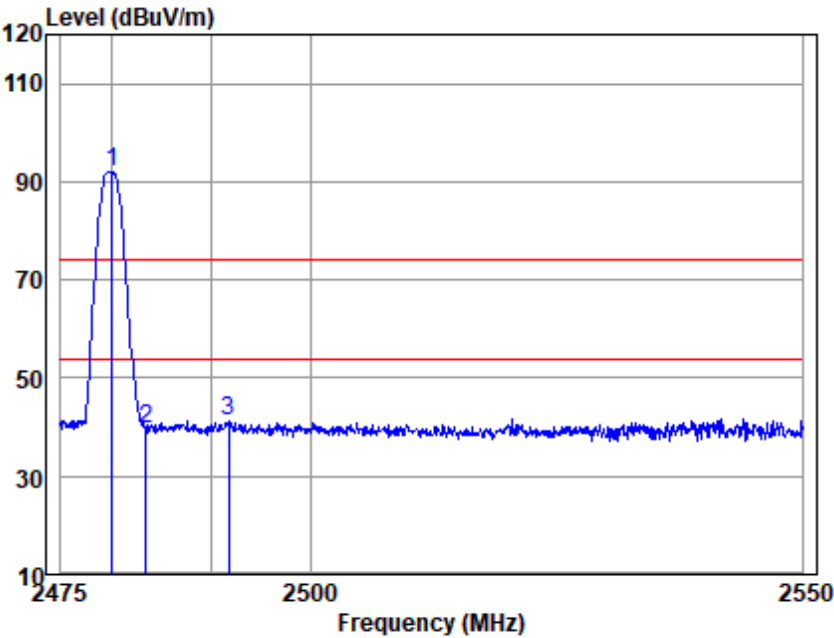


Antenna Polarity :VERTICAL
EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2364.375	44.65	28.68	3.31	35.16	41.48	74.00	-32.52	Peak
2390.000	42.38	28.80	3.33	35.18	39.33	74.00	-34.67	Peak
2402.250	92.13	28.85	3.34	35.19	89.13	74.00	15.13	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High

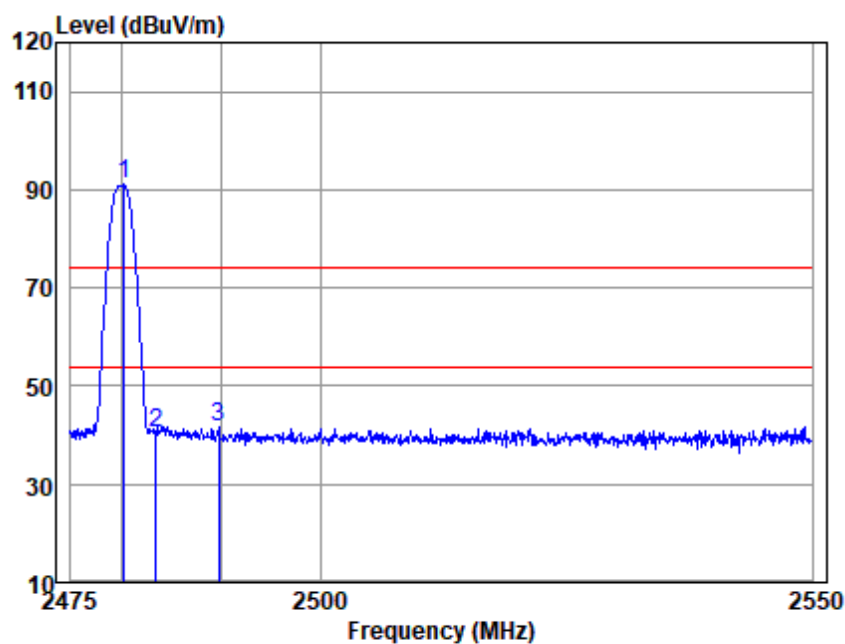


Antenna Polarity :HORIZONTAL
EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2480.104	94.80	29.08	3.40	35.25	92.03	74.00	18.03	Peak
2483.500	42.25	29.09	3.41	35.26	39.49	74.00	-34.51	Peak
2491.829	43.95	29.10	3.41	35.26	41.20	74.00	-32.80	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL

EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
2480.325	93.77	29.08	3.40	35.25	91.00	74.00	17.00	Peak
2483.500	43.07	29.09	3.41	35.26	40.31	74.00	-33.69	Peak
2489.822	44.58	29.10	3.41	35.26	41.83	74.00	-32.17	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

7.3 Radiated Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

Test Method: ANSI C63.10 (2020) Section 6.4&6.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
960-1000	500	3

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C

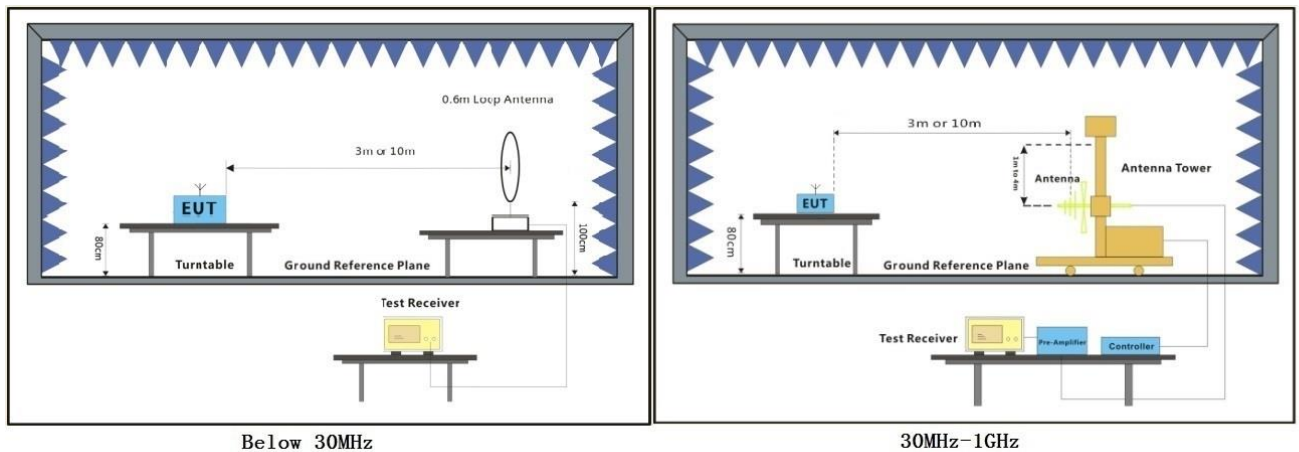
Humidity: 52.6 % RH

Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

7.3.3 Test Setup Diagram



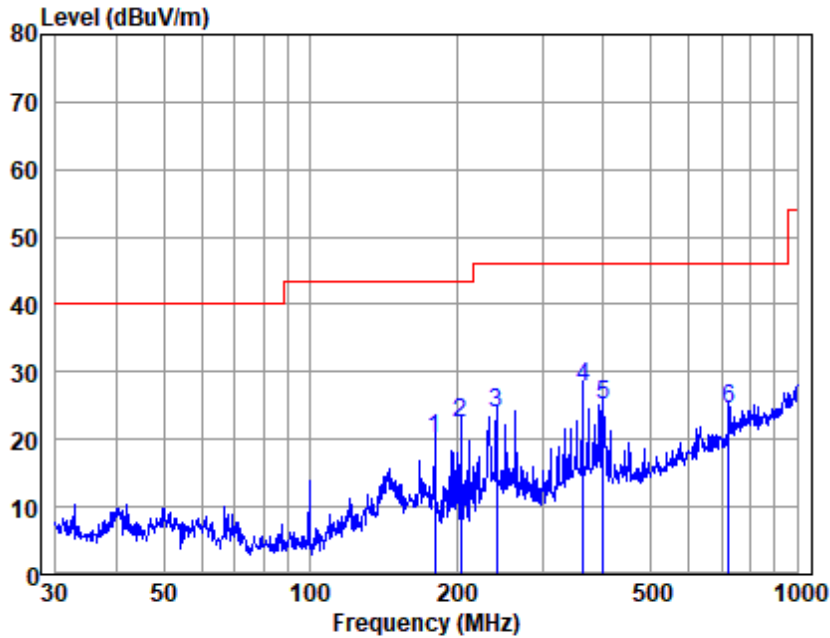
7.3.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Test Mode: 00; Polarity: Horizontal; Channel:Low

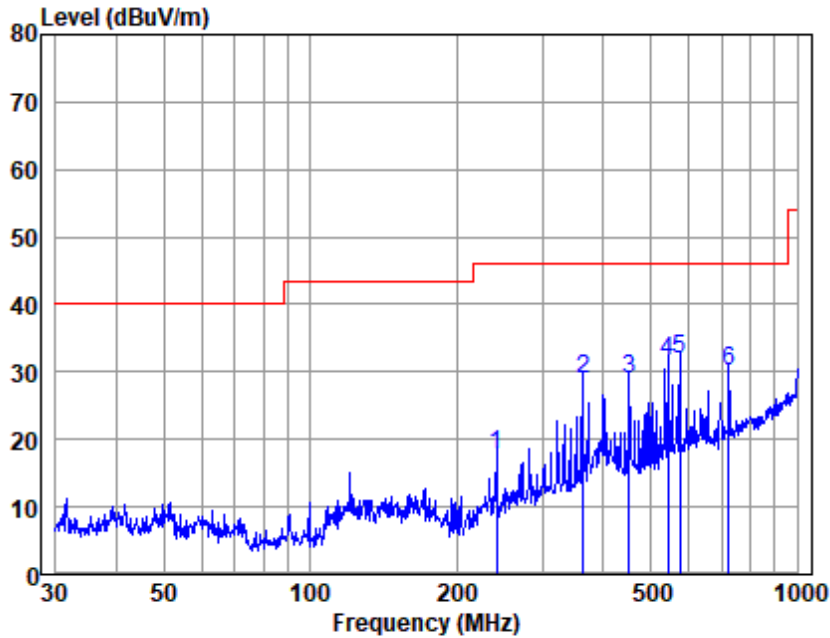


Antenna Polarity :HORIZONTAL
EUT/Project :3244HS
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	180.017	38.96	11.10	2.76	32.87	19.95	43.50	-23.55	QP
2	204.238	43.32	9.10	2.94	32.81	22.55	43.50	-20.95	QP
3	241.676	42.83	10.60	3.24	32.88	23.79	46.00	-22.21	QP
4	362.985	42.65	13.82	4.01	32.73	27.75	46.00	-18.25	QP
5	399.030	38.80	14.90	4.20	32.80	25.10	46.00	-20.90	QP
6	724.261	29.87	21.20	5.82	32.45	24.44	46.00	-21.56	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Channel:Low

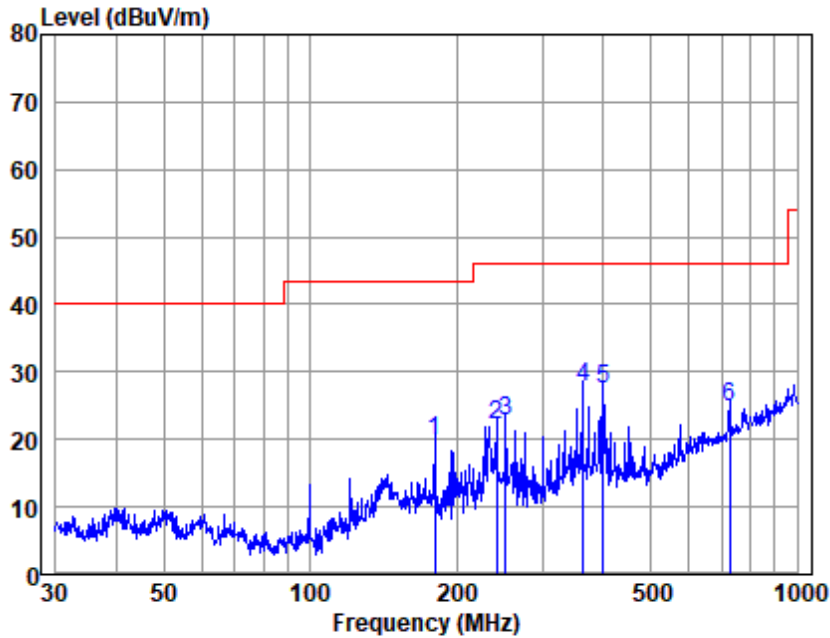


Antenna Polarity :VERTICAL
EUT/Project :3244HS
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	241.676	36.83	10.60	3.24	32.88	17.79	46.00	-28.21	QP
2	362.985	43.87	13.82	4.01	32.73	28.97	46.00	-17.03	QP
3	452.720	40.91	16.04	4.55	32.71	28.79	46.00	-17.21	QP
4	543.274	41.61	17.70	5.02	32.71	31.62	46.00	-14.38	QP
5	574.626	40.86	18.56	5.18	32.75	31.85	46.00	-14.15	QP
6	724.261	35.61	21.20	5.82	32.45	30.18	46.00	-15.82	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Channel:middle

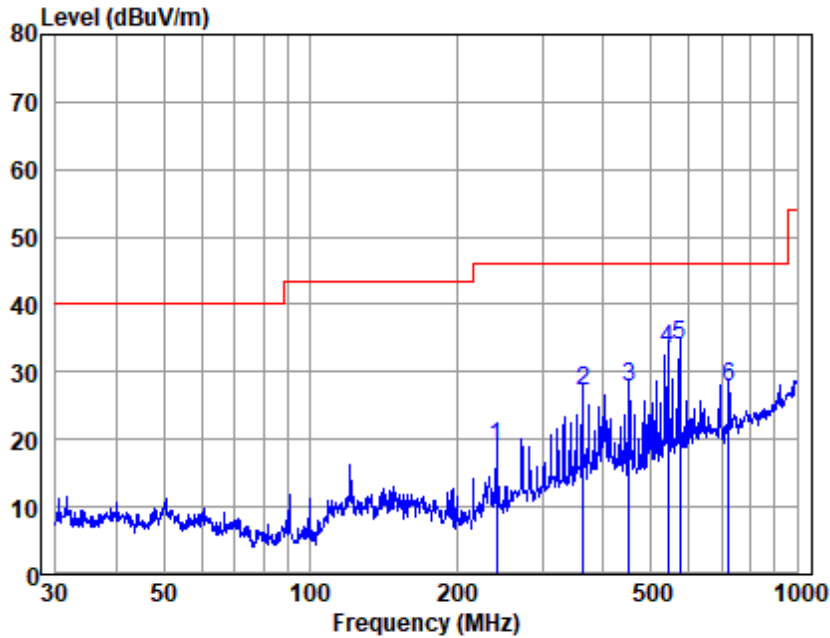


Antenna Polarity :HORIZONTAL
EUT/Project :3244HS
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	180.017	38.84	11.10	2.76	32.87	19.83	43.50	-23.67	QP
2	241.676	41.18	10.60	3.24	32.88	22.14	46.00	-23.86	QP
3	252.063	41.33	10.86	3.30	32.90	22.59	46.00	-23.41	QP
4	362.985	42.62	13.82	4.01	32.73	27.72	46.00	-18.28	QP
5	400.432	40.98	15.00	4.20	32.80	27.38	46.00	-18.62	QP
6	726.805	30.20	21.13	5.87	32.43	24.77	46.00	-21.23	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Channel:middle

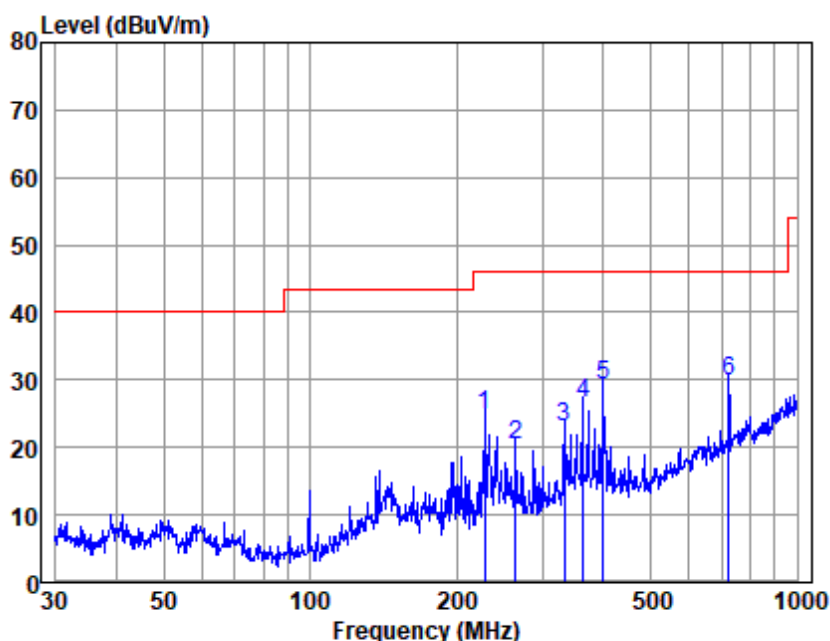


Antenna Polarity :VERTICAL
EUT/Project :3244HS
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	241.676	38.01	10.60	3.24	32.88	18.97	46.00	-27.03	QP
2	362.985	42.05	13.82	4.01	32.73	27.15	46.00	-18.85	QP
3	452.720	39.94	16.04	4.55	32.71	27.82	46.00	-18.18	QP
4	543.274	43.47	17.70	5.02	32.71	33.48	46.00	-12.52	QP
5	574.626	42.88	18.56	5.18	32.75	33.87	46.00	-12.13	QP
6	724.261	33.27	21.20	5.82	32.45	27.84	46.00	-18.16	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Channel: High



Antenna Polarity : HORIZONTAL

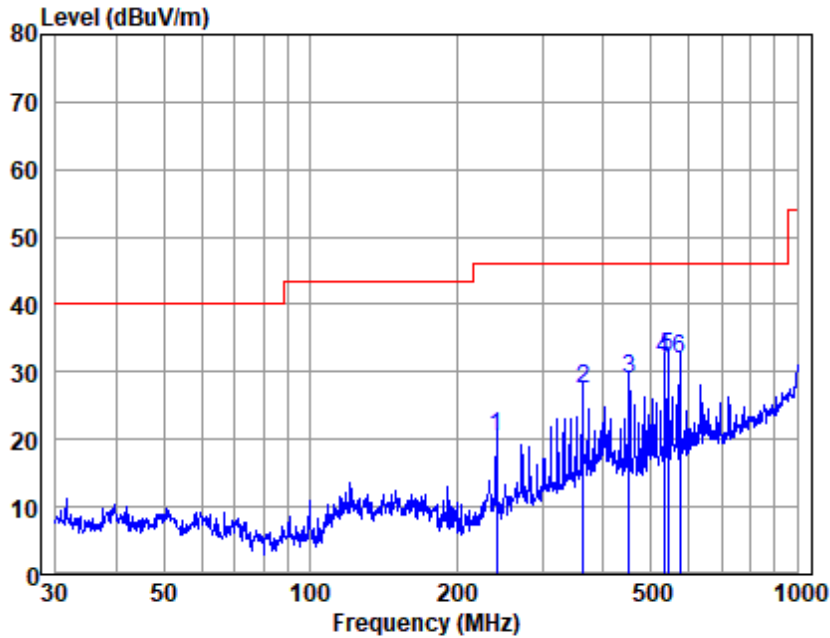
EUT/Project : 3244HS

Test mode : 00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	228.490	44.49	10.06	3.14	32.86	24.83	46.00	-21.17	QP
2	263.819	38.63	11.36	3.38	32.90	20.47	46.00	-25.53	QP
3	332.519	38.56	13.30	3.82	32.77	22.91	46.00	-23.09	QP
4	362.985	41.36	13.82	4.01	32.73	26.46	46.00	-19.54	QP
5	400.432	42.68	15.00	4.20	32.80	29.08	46.00	-16.92	QP
6	724.261	35.37	21.20	5.82	32.45	29.94	46.00	-16.06	QP

Note: Emission Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

Test Mode: 00; Polarity: Vertical; Channel: High



Antenna Polarity : VERTICAL
EUT/Project : 3244HS
Test mode : 00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	241.676	39.52	10.60	3.24	32.88	20.48	46.00	-25.52	QP
2	362.985	42.47	13.82	4.01	32.73	27.57	46.00	-18.43	QP
3	452.720	41.00	16.04	4.55	32.71	28.88	46.00	-17.12	QP
4	533.832	42.21	17.37	4.99	32.73	31.84	46.00	-14.16	QP
5	543.274	42.22	17.70	5.02	32.71	32.23	46.00	-13.77	QP
6	574.626	40.91	18.56	5.18	32.75	31.90	46.00	-14.10	QP

Note: Emission Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

7.4 Radiated Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

Test Method: ANSI C63.10 (2020) Section 6.6

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

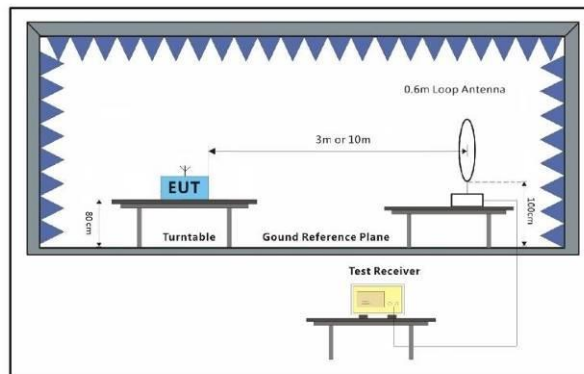
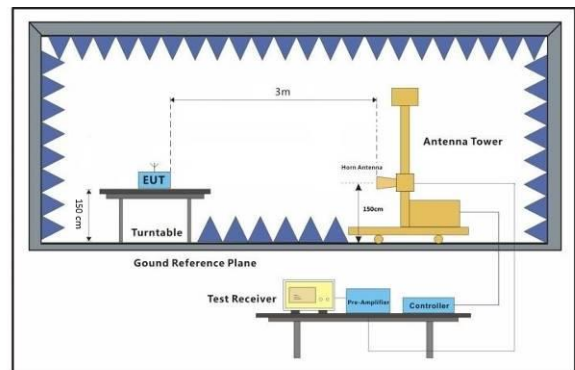
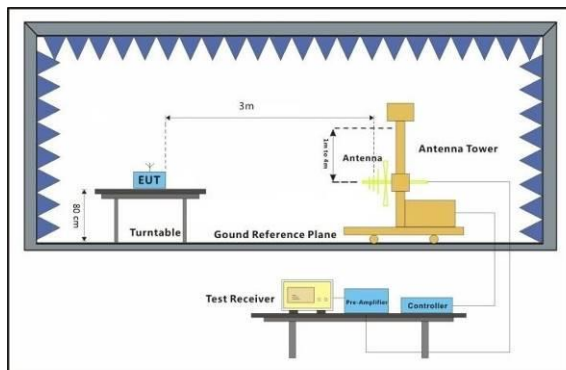
Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

7.4.3 Test Setup Diagram



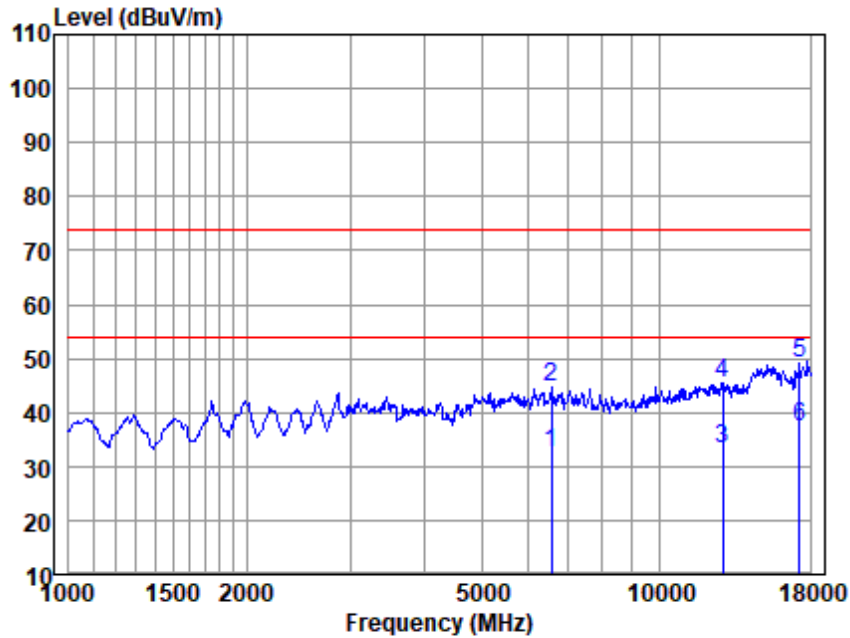
7.4.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$
2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



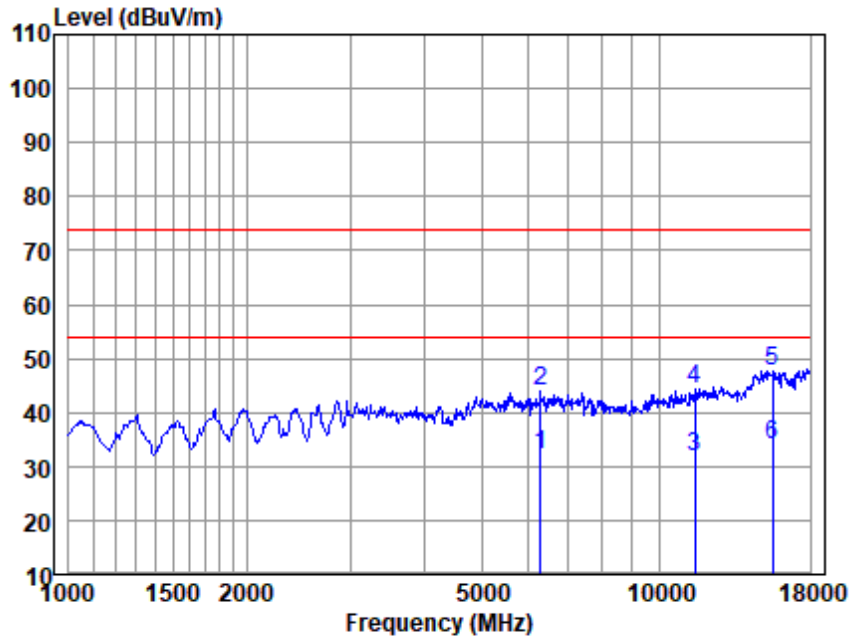
Antenna Polarity :HORIZONTAL

EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
6564.209	27.69	35.47	6.74	37.27	32.63	54.00	-21.37	Average
6564.209	39.61	35.47	6.74	37.27	44.55	74.00	-29.45	Peak
12798.240	23.23	39.02	10.54	39.53	33.26	54.00	-20.74	Average
12798.240	35.57	39.02	10.54	39.53	45.60	74.00	-28.40	Peak
17286.170	34.10	42.05	13.44	40.32	49.27	74.00	-24.73	Peak
17286.170	22.32	42.05	13.44	40.32	37.49	54.00	-16.51	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



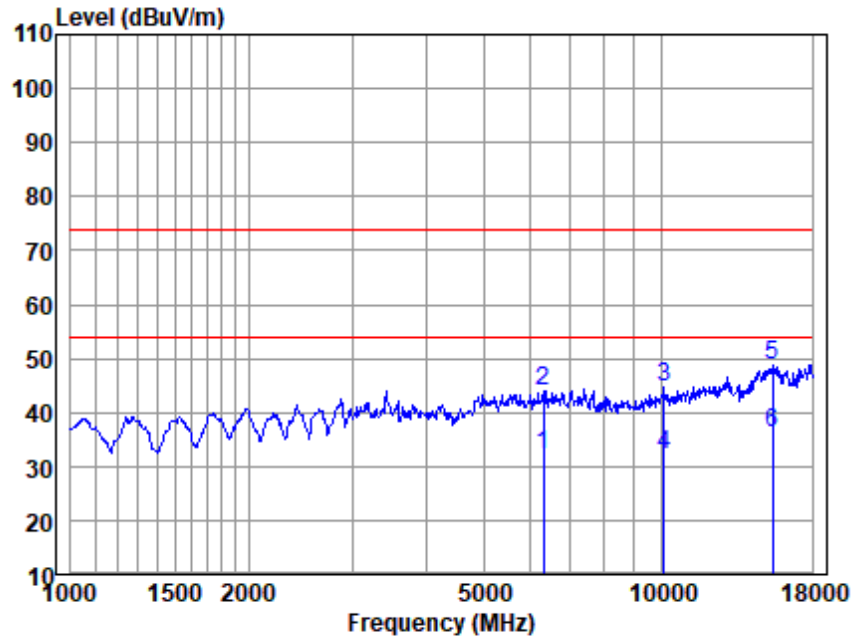
Antenna Polarity :VERTICAL

EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
6285.695	26.83	35.53	6.46	36.65	32.17	54.00	-21.83	Average
6285.695	38.72	35.53	6.46	36.65	44.06	74.00	-29.94	Peak
11467.000	21.77	38.28	9.52	37.68	31.89	54.00	-22.11	Average
11467.000	34.23	38.28	9.52	37.68	44.35	74.00	-29.65	Peak
15577.900	32.89	43.29	12.37	40.81	47.74	74.00	-26.26	Peak
15577.900	19.31	43.29	12.37	40.81	34.16	54.00	-19.84	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:middle



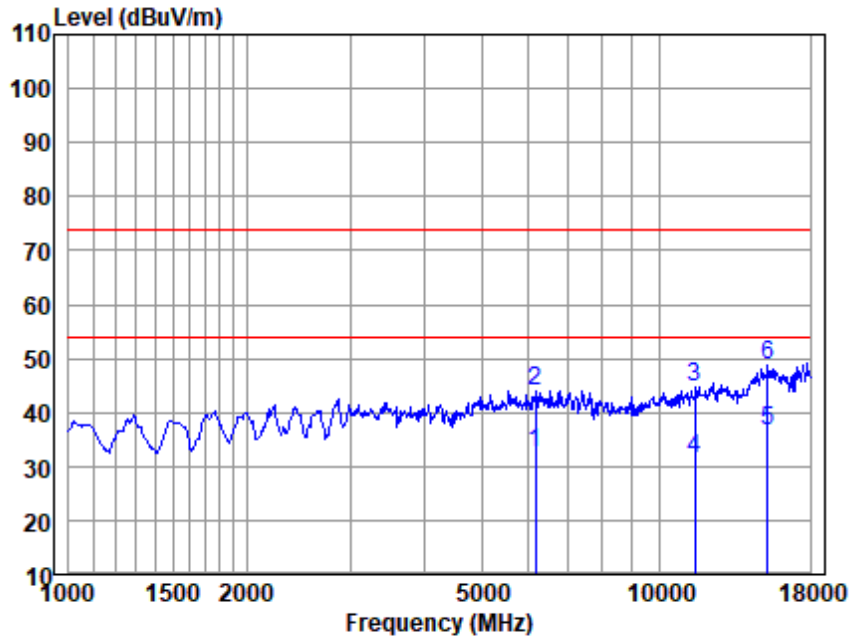
Antenna Polarity :HORIZONTAL

EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
6322.136	27.71	35.53	6.50	37.60	32.14	54.00	-21.86	Average
6322.136	39.67	35.53	6.50	37.60	44.10	74.00	-29.90	Peak
10097.600	35.45	37.77	8.95	37.41	44.76	74.00	-29.24	Peak
10097.600	22.84	37.77	8.95	37.41	32.15	54.00	-21.85	Average
15443.410	34.58	43.68	12.29	41.82	48.73	74.00	-25.27	Peak
15443.410	22.00	43.68	12.29	41.82	36.15	54.00	-17.85	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:middle



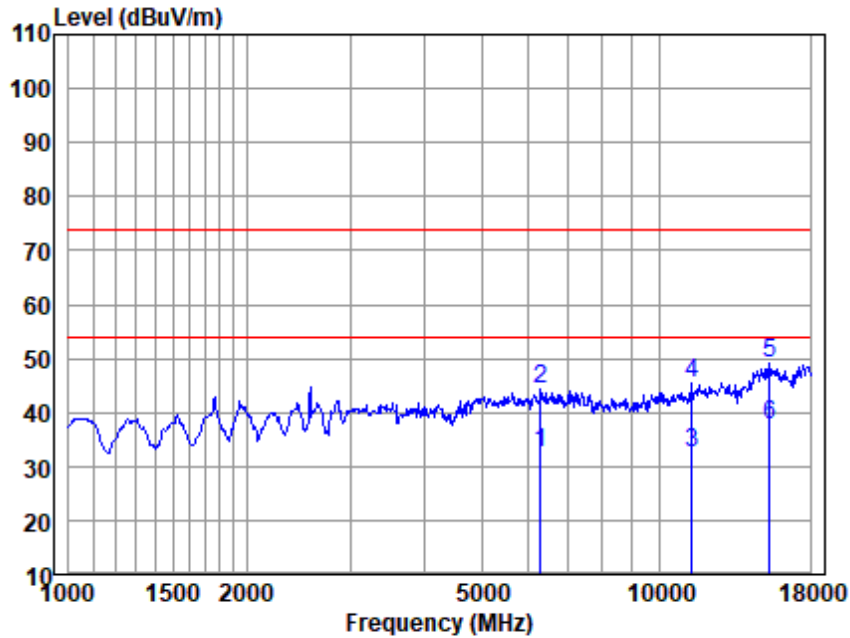
Antenna Polarity :VERTICAL

EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
6159.797	27.63	35.42	6.34	36.83	32.56	54.00	-21.44	Average
6159.797	39.12	35.42	6.34	36.83	44.05	74.00	-29.95	Peak
11500.200	34.80	38.30	9.55	37.80	44.85	74.00	-29.15	Peak
11500.200	21.24	38.30	9.55	37.80	31.29	54.00	-22.71	Average
15265.880	22.90	43.33	12.18	41.83	36.58	54.00	-17.42	Average
15265.880	34.93	43.33	12.18	41.83	48.61	74.00	-25.39	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



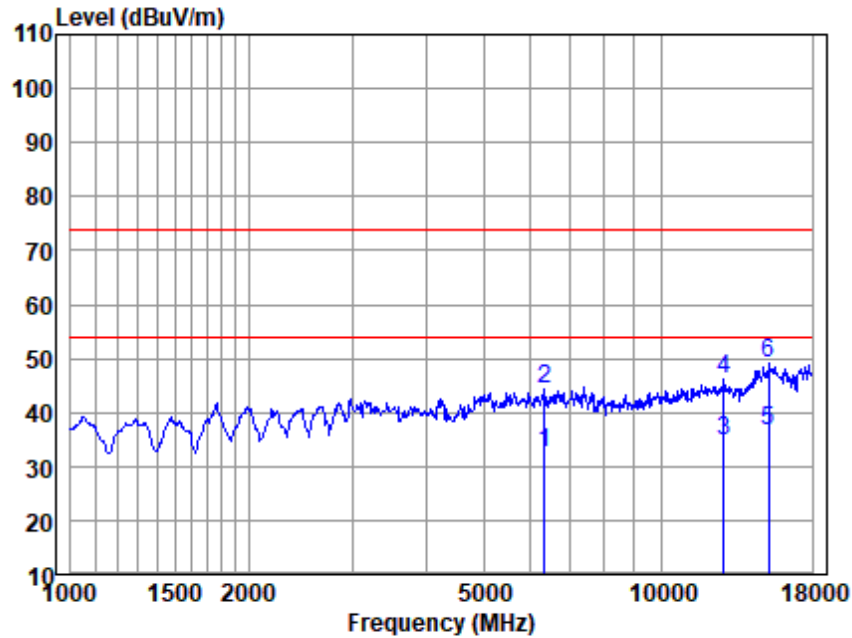
Antenna Polarity :HORIZONTAL

EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
6285.695	27.20	35.53	6.46	36.65	32.54	54.00	-21.46	Average
6285.695	38.95	35.53	6.46	36.65	44.29	74.00	-29.71	Peak
11335.190	22.91	38.29	9.43	38.17	32.46	54.00	-21.54	Average
11335.190	35.70	38.29	9.43	38.17	45.25	74.00	-28.75	Peak
15354.390	35.01	43.59	12.24	41.83	49.01	74.00	-24.99	Peak
15354.390	23.59	43.59	12.24	41.83	37.59	54.00	-16.41	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL

EUT/Project :3244HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
6340.436	28.10	35.51	6.52	37.58	32.55	54.00	-21.45	Average
6340.436	39.81	35.51	6.52	37.58	44.26	74.00	-29.74	Peak
12761.300	24.70	39.01	10.52	39.54	34.69	54.00	-19.31	Average
12761.300	36.24	39.01	10.52	39.54	46.23	74.00	-27.77	Peak
15177.890	23.12	43.14	12.13	41.84	36.55	54.00	-17.45	Average
15177.890	35.55	43.14	12.13	41.84	48.98	74.00	-25.02	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

7.5 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215

Test Method: ANSI C63.10 (2020) Section 6.9

Measurement Distance: 3m

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

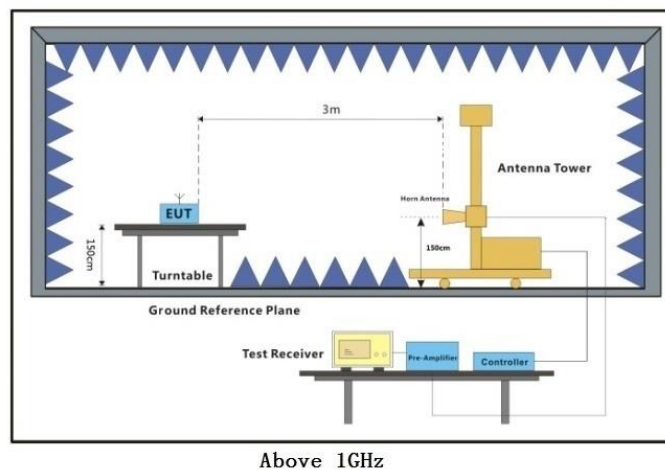
Humidity: 50 % RH

Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SHCR2512003244HS

9 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photographs of EUT Constructional Details for SHCR2512003244HS

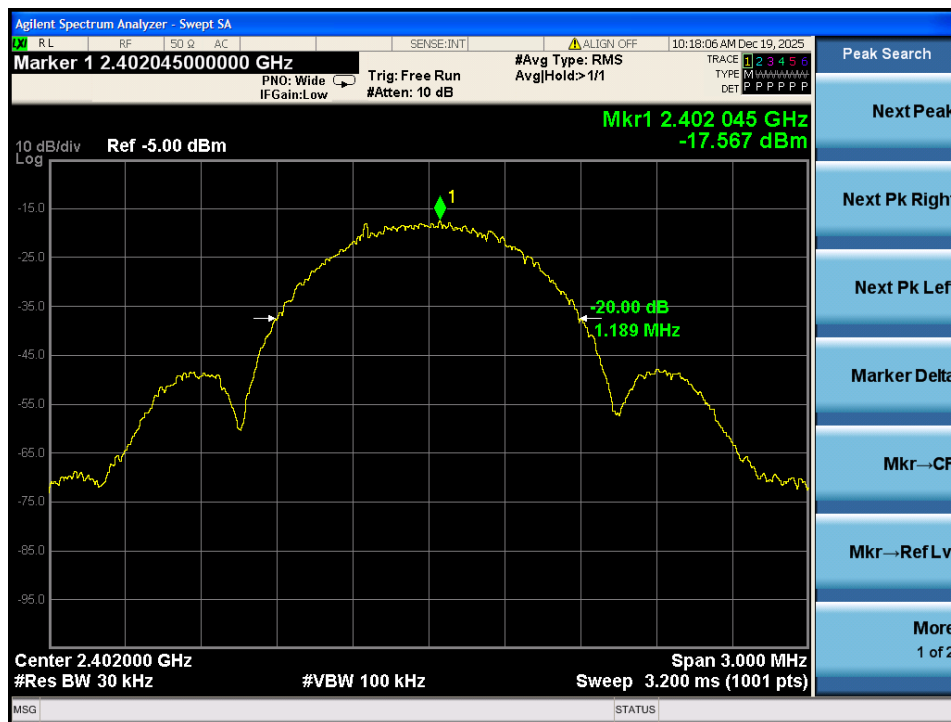
10 Appendix

1. 20dB Bandwidth

Frequency (MHz)	Bandwidth (MHz)	Result
2402	1.189	PASS
2440	1.206	PASS
2480	1.216	PASS

Test plot as follows:

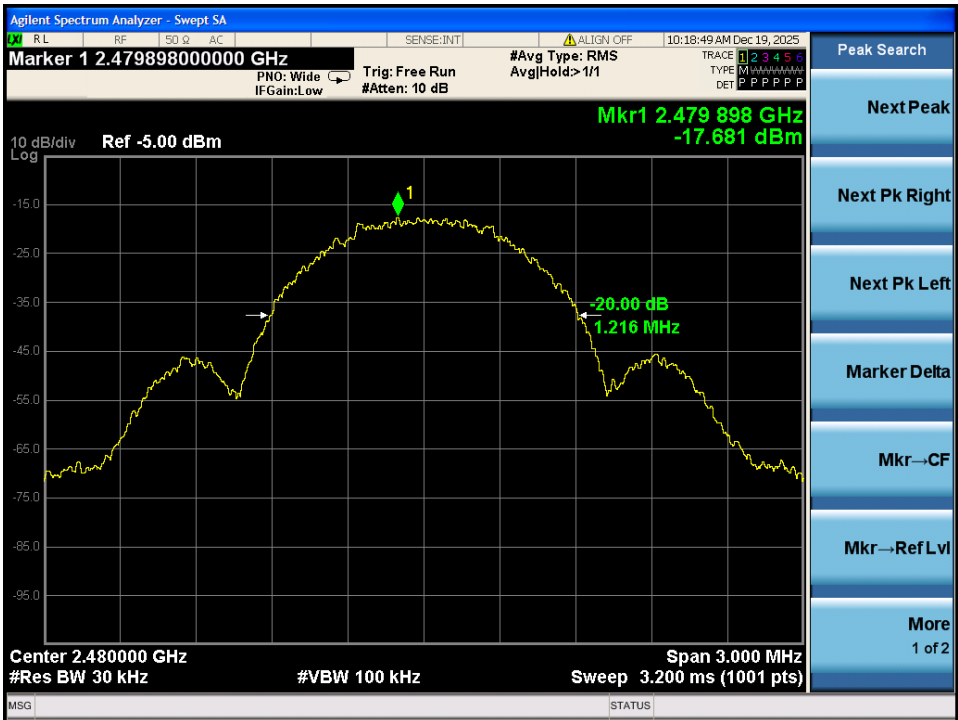
Channel: 2402MHz



Channel: 2440MHz



Channel: 2480MHz



2. Field Strength of the Fundamental

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
2402	95.66	-3.00	92.66	94	-1.34	Peak	Horizontal
	92.13	-3.00	89.13	94	-4.87	Peak	Vertical

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
2440	94.87	-2.86	92.01	94	-1.99	Peak	Horizontal
	91.21	-2.86	88.35	94	-5.65	Peak	Vertical

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
2480	94.80	-2.77	92.03	94	-1.97	Peak	Horizontal
	93.77	-2.77	91.00	94	-3.00	Peak	Vertical

Remark:

- The basic equation with a sample calculation is as follows: $\text{Level} = \text{Read Level} + \text{Factor}$.
(The Factor is calculated by adding the Antenna Factor, Cable Loss and Preamp Factor)
If the Peak value below the Average Limit, the Average test doesn't perform for this submission.

- End of the Report -