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Report No.: SHEM180400259101

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TEST REPORT

Application No.: SHEM1804002591CR
Applicant: Kohler Co.
Address of Applicant: 444 Highland Drive Kohler, WI 53044 United States
Manufacturer: Shanghai Kohler Electronics., Ltd.
Address of Manufacturer: No. 1955, Fengxiang Road, Baoshan Area, Shanghai, PRC Post code: 200444
Factory: Shanghai Kohler Electronics., Ltd.
Address of Factory: No. 1955, Fengxiang Road, Baoshan Area, Shanghai, PRC Post code: 200444
FCC ID: N82-KOHLER031
IC: 4554A- KOHLER031
Equipment Under Test (EUT):
EUT Name: Cleansing Seat
Model No.: K-27142-CR, K-26142-CR ☐
☐ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) : 47 CFR Part 15, Subpart C 15.249
RSS-210 Issue 9 August 2016 (Amendment)
RSS-Gen Issue 5, May 2018
Date of Receipt: 2018-05-10
Date of Test: 2018-05-11 to 2018-05-23
Date of Issue: 2018-05-25

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




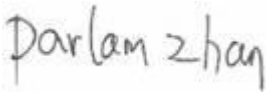
Parlam Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record			
Version	Description	Date	Remark
00	Original	2018-05-25	/

Authorized for issue by:			
			
		<hr/>	
		Eddy Zong / Project Engineer	
			
		<hr/>	
		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
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Restricted Band Around Fundamental Frequency	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass
99% Bandwidth	RSS-210 Issue 9 August 2016 (Amendment)	RSS-Gen Issue 5 Section 6.7	RSS-210 A1.3	Pass

Declaration of EUT Family Grouping:

Note: 1. There are series models mentioned in this report, and they are the identical in electrical and electronic characters. Only the model K-27142-CR was tested since their differences were the model number, trade name and appearance.

2. Model on outer package may be followed by alphanumeric suffixes -0 or -96, 0 means with bright white and 96 means with light white



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4 General Information

4.1 Details of E.U.T.

Power supply:	Toilet: AC 120V 60Hz
Test voltage:	AC 120V, 60Hz
Cable:	AC cable: 110cm
Operation Frequency	2415.5MHz to 2449.5MHz
Modulation Type	MSK
Antenna Type	Integral
Antenna Gain	2.88dBi

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10-8
2	Timeout	2s
3	Duty cycle	0.37%
4	Occupied Bandwidth	3%
5	RF conducted power	0.75dB
6	RF power density	2.84dB
7	Conducted Spurious emissions	0.75dB
8	RF Radiated power	4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
9	Radiated Spurious emission test	4.2dB (Below 30MHz)
		4.4dB (30MHz-1GHz)
		4.6dB (1GHz-18GHz)
		5.2dB (Above 18GHz)
10	Temperature test	1°C
11	Humidity test	3%
12	Supply voltages	1.5%
13	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.

4.5 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). Certificate No. 201034-0.

- **FCC –Designation Number: CN5033**

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

Designation Number: CN5033. Test Firm Registration Number: 479755.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

- **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-3868,C-4336,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
Conducted Emission at AC Power Line					
EMI test receiver	R&S	ESR7	SHEM162-1	2017-12-20	2018-12-19
LISN	Schwarzbeck	NSLK8127	SHEM061-1	2017-12-20	2018-12-19
LISN	EMCO	3816/2	SHEM019-1	2017-12-20	2018-12-19
Pulse limiter	R&S	ESH3-Z2	SHEM029-1	2017-12-20	2018-12-19
CE test Cable	/	CE01	/	2017-12-26	2018-12-25
Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2017-09-26	2018-09-25
Power meter	R&S	NRP	SHEM057-1	2017-12-26	2018-12-25
Power Sensor	R&S	NRP-Z22	SHEM136-1	2017-07-22	2018-07-21
Power Sensor	R&S	NRP-Z91	SHEM057-2	2017-12-26	2018-12-25
Signal Generator	R&S	SMR40	SHEM058-1	2017-07-03	2018-07-02
Signal Generator	Agilent	N5182A	SHEM182-1	2017-09-26	2018-09-25
Communication Tester	R&S	CMW270	SHEM183-1	2017-10-22	2018-10-21
Switcher	Tonscend	JS0806	SHEM184-1	2017-09-26	2018-09-25
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2017-09-26	2018-09-25
AC Power Stabilizer	WOCEN	6100	SHEM045-1	2017-12-26	2018-12-25
DC Power Supply	QJE	QJ30003SII	SHEM046-1	2017-12-26	2018-12-25
Conducted test Cable	/	RF01, RF 02	/	2017-12-26	2018-12-25
Radiated Test					
EMI test receiver	R&S	ESU40	SHEM051-1	2017-12-20	2018-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2017-04-10	2020-04-09
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2017-02-28	2020-02-27
Antenna (25MHz-3GHz)	Schwarzbeck	HL562	SHEM010-1	2017-02-28	2020-02-27
Horn Antenna (1-8GHz)	Schwarzbeck	HF906	SHEM009-1	2017-10-24	2020-10-23
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2017-01-14	2020-01-13
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2017-12-03	2020-12-02
Pre-amplifier (9KHz-2GHz)	CLAVIIO	LNA-0001-412010	SHEM164-1	2017-08-22	2018-08-21
Pre-amplifier (1-18GHz)	CLAVIIO	BDLNA-0118-352810	SHEM050-2	2017-08-22	2018-08-21
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2017-12-20	2018-12-19
Band filter	LORCH	9BRX-875/X150-SR	SHEM156-1	/	/
Band filter	LORCH	13BRX-1950/X500-SR	SHEM083-2	/	/
Band filter	LORCH	5BRX-2400/X200-SR	SHEM155-1	/	/
Band filter	LORCH	5BRX-5500/X1000-SR	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G-100SS	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700-3SS	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
RE test Cable	/	RE01, RE02, RE06	/	2017-12-26	2018-12-25

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

Limit:

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.

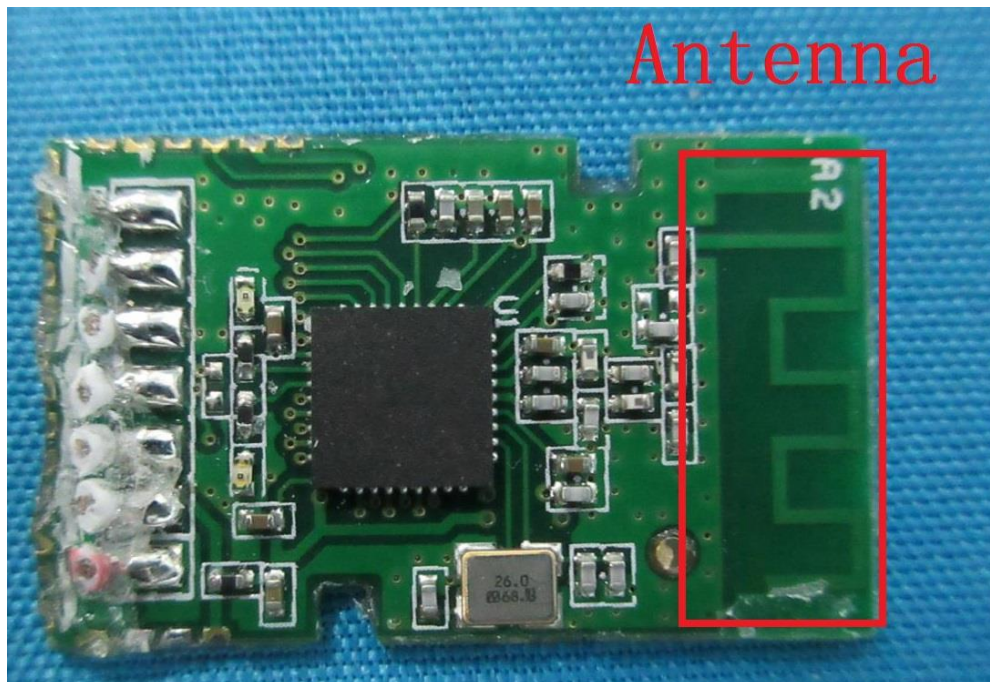
6.1.2 Conclusion

Standard 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 Integral and no consideration of replacement. The best case gain of the antenna is 2.88dBi.



7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

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.

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1001 mbar

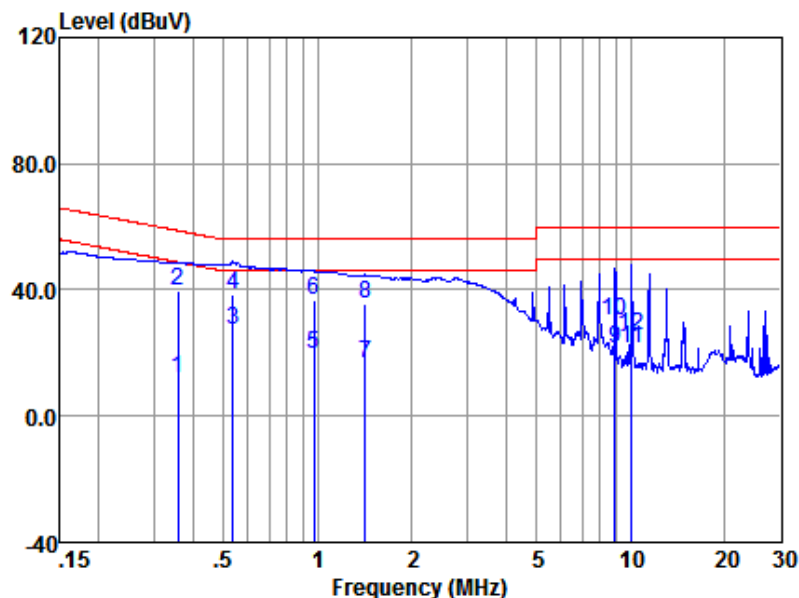
Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.1.2 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) 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 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

Mode:a; Line:Live Line

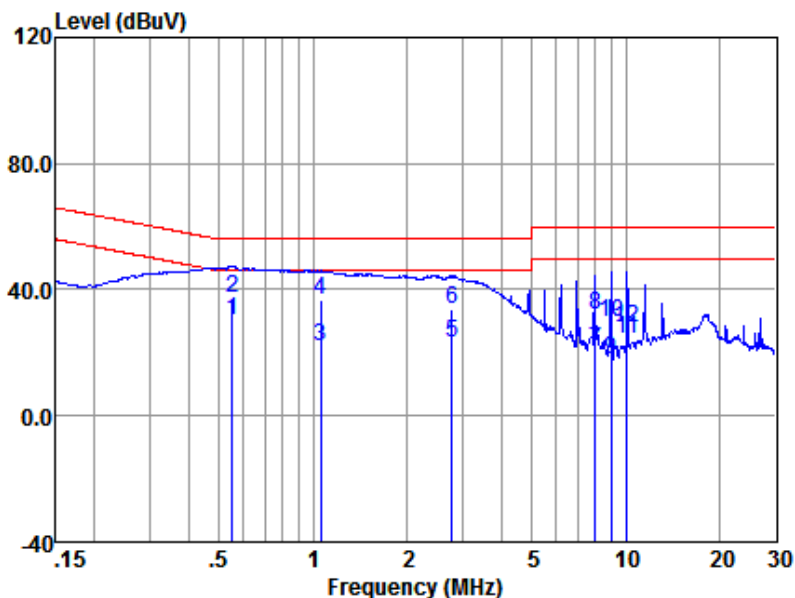


LISN : LINE
 EUT/Project No : 2591CR
 Test Mode : a

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.36	2.00	0.11	9.81	11.92	48.78	-36.86	Average
2	0.36	29.94	0.11	9.81	39.86	58.78	-18.92	QP
3	0.53	17.09	0.11	9.82	27.02	46.00	-18.98	Average
4	0.53	28.88	0.11	9.82	38.81	56.00	-17.19	QP
5	0.97	9.69	0.11	9.84	19.64	46.00	-26.36	Average
6	0.97	26.85	0.11	9.84	36.80	56.00	-19.20	QP
7	1.42	6.55	0.11	9.84	16.50	46.00	-29.50	Average
8	1.42	25.56	0.11	9.84	35.51	56.00	-20.49	QP
9	8.92	11.56	0.10	9.87	21.53	50.00	-28.47	Average
10	8.92	20.47	0.10	9.87	30.44	60.00	-29.56	QP
11	10.07	11.72	0.10	9.87	21.69	50.00	-28.31	Average
12	10.07	15.69	0.10	9.87	25.66	60.00	-34.34	QP

Notes: Emission Level = Read Level + LISN Factor + Cable loss

Mode:a; Line:Neutral Line



LISN : NEUTRAL
 EUT/Project No : 2591CR
 Test Mode : a

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.55	20.56	0.11	9.82	30.49	46.00	-15.51	Average
2	0.55	27.53	0.11	9.82	37.46	56.00	-18.54	QP
3	1.05	11.90	0.11	9.84	21.85	46.00	-24.15	Average
4	1.05	26.55	0.11	9.84	36.50	56.00	-19.50	QP
5	2.78	13.21	0.13	9.85	23.19	46.00	-22.81	Average
6	2.78	23.90	0.13	9.85	33.88	56.00	-22.12	QP
7	7.98	10.90	0.13	9.86	20.89	50.00	-29.11	Average
8	7.98	22.04	0.13	9.86	32.03	60.00	-27.97	QP
9	8.96	8.12	0.13	9.87	18.12	50.00	-31.88	Average
10	8.96	19.83	0.13	9.87	29.83	60.00	-30.17	QP
11	10.13	14.34	0.13	9.87	24.34	50.00	-25.66	Average
12	10.13	18.16	0.13	9.87	28.16	60.00	-31.84	QP

Notes: Emission Level = Read Level + LISN Factor + Cable loss



7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215
Test Method: ANSI C63.10 (2013) Section 6.9
Limit: N/A

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

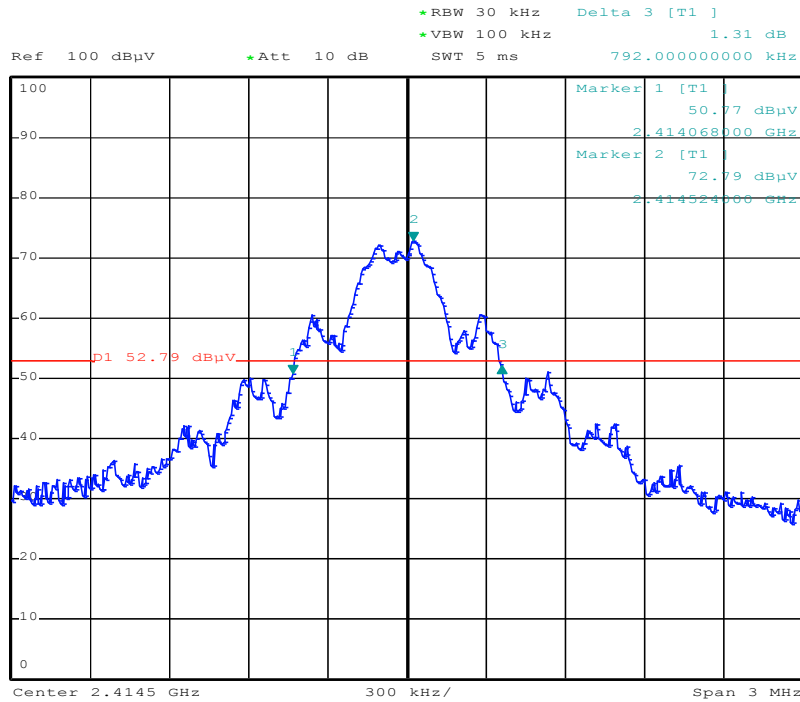
Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.2.2 Measurement Procedure and Data

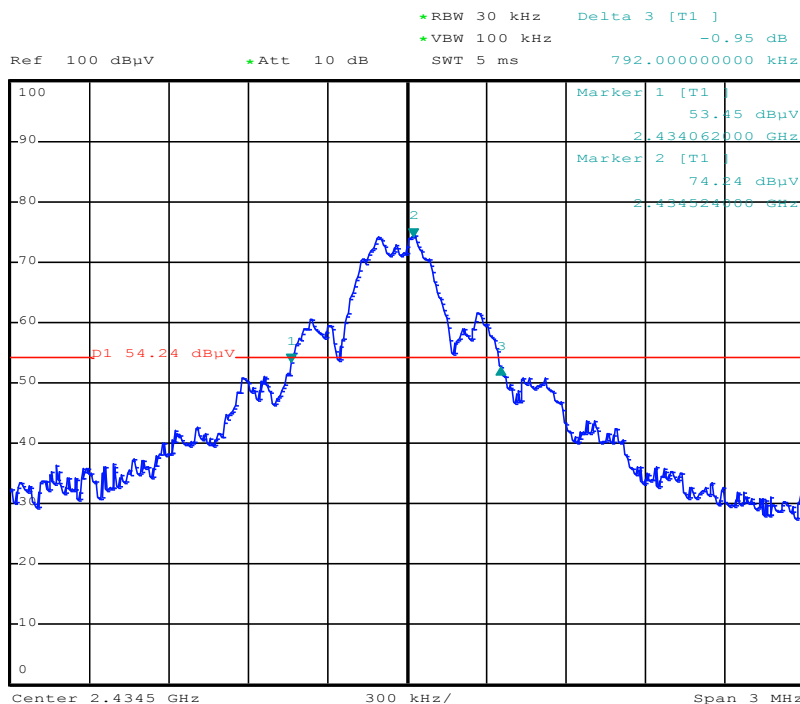
CH	Frequency (MHz)	Bandwidth (kHz)	Result
Low	2414.5	792	PASS
Mid	2434.5	792	PASS
High	2449.5	786	PASS

Test plot as follows:

Channel: Lowest

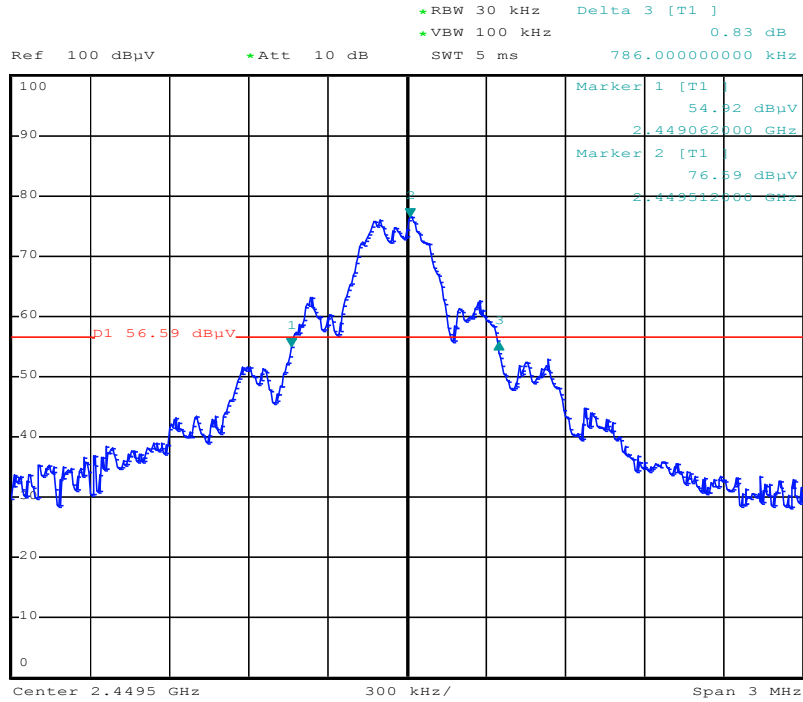


Channel: Middle





Channel: Highest





7.3 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 (2013) Section 6.5&6.6

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.3.2 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



Peak value:

Channel	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
Lowest	92.53	-3.93	88.6	94	-5.4	Horizontal
	82.19	-3.94	78.25	94	-15.75	Vertical
Middle	87.94	-3.96	83.98	94	-10.02	Horizontal
	78.8	-3.96	74.84	94	-19.16	Vertical
Highest	86.9	-3.97	82.93	94	-11.07	Horizontal
	74.64	-3.97	70.67	94	-23.33	Vertical

Remark:

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



7.4 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 (2013) Section 6.4&6.5&6.6

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.



7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.4.2 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.

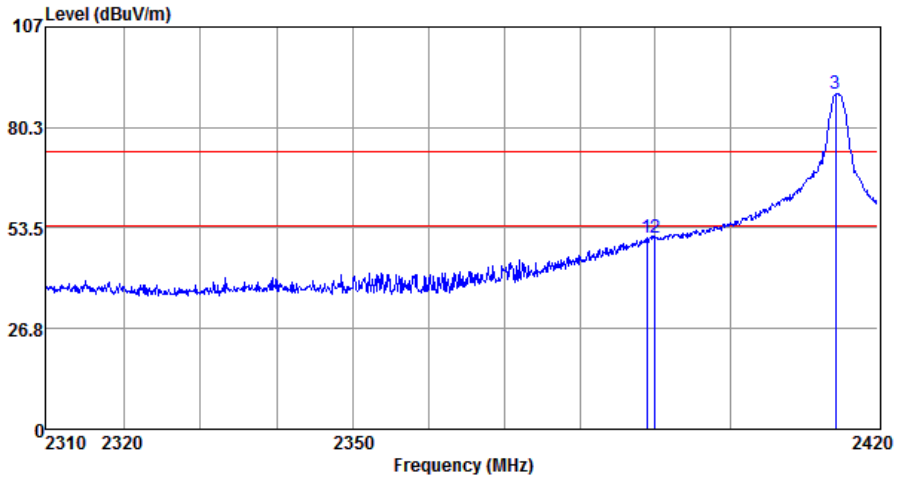
j. Repeat above procedures until all frequencies measured was complete.

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



Channel: lowest

Horizontal:



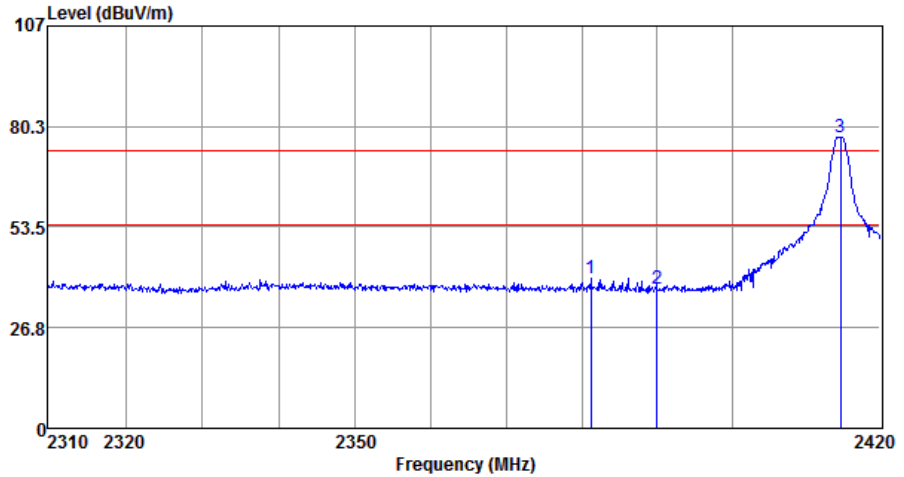
Antenna Polarity :HORIZONTAL

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 2388.91	55.68	26.03	6.47	37.36	50.82	74.00	-23.18	Peak
2 2390.00	55.67	26.03	6.47	37.36	50.81	74.00	-23.19	Peak
3 2414.27	93.90	26.08	6.50	37.36	89.12	74.00	15.12	Peak

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



Vertical:



Antenna Polarity :VERTICAL

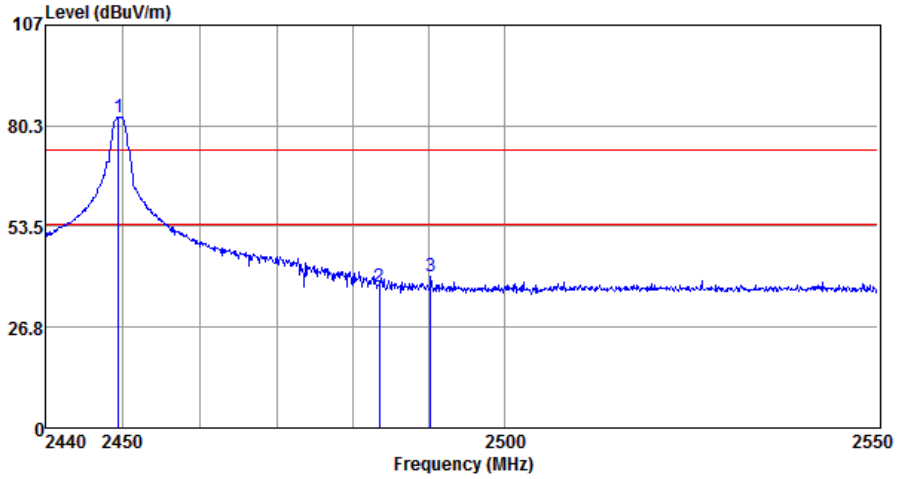
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Freq	Read	Antenna	Cable	Preamp	Emission	Limit	Over		
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 2381.14	44.62	26.02	6.45	37.36	39.73	74.00	-34.27	Peak	
2 2390.00	42.13	26.03	6.47	37.36	37.27	74.00	-36.73	Peak	
3 2414.60	82.31	26.08	6.50	37.36	77.53	74.00	3.53	Peak	

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



Channel: Highest

Horizontal:



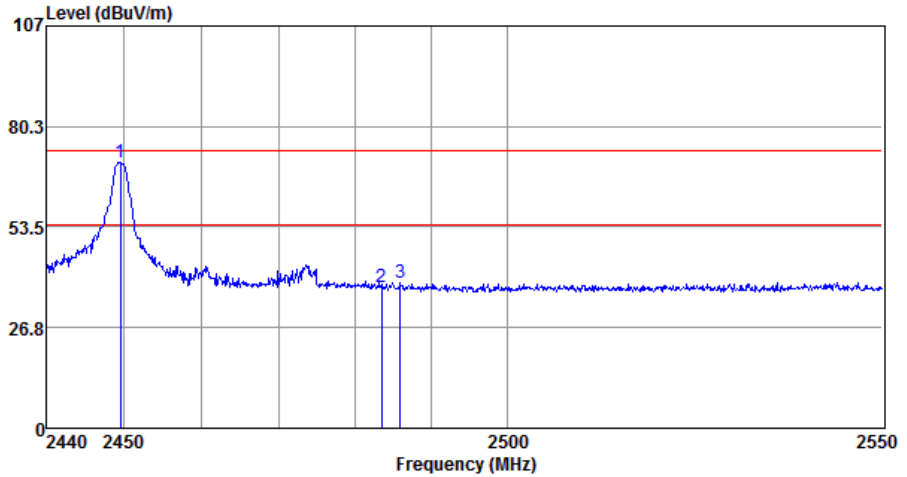
Antenna Polarity :HORIZONTAL

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 2449.38	87.07	26.13	6.68	37.43	82.45	74.00	8.45	Peak
2 2483.50	42.20	26.18	6.80	37.51	37.67	74.00	-36.33	Peak
3 2490.22	44.92	26.19	6.80	37.52	40.39	74.00	-33.61	Peak

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



Vertical:



Antenna Polarity :VERTICAL

-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Freq	Read	Antenna	Cable	Preamp	Emission	Limit	Over		
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB		
1 2449.49	75.20	26.13	6.68	37.43	70.58	74.00	-3.42	Peak	
2 2483.50	41.98	26.18	6.80	37.51	37.45	74.00	-36.55	Peak	
3 2485.94	43.33	26.18	6.80	37.51	38.80	74.00	-35.20	Peak	

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



7.5 Radiated Emissions

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

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar

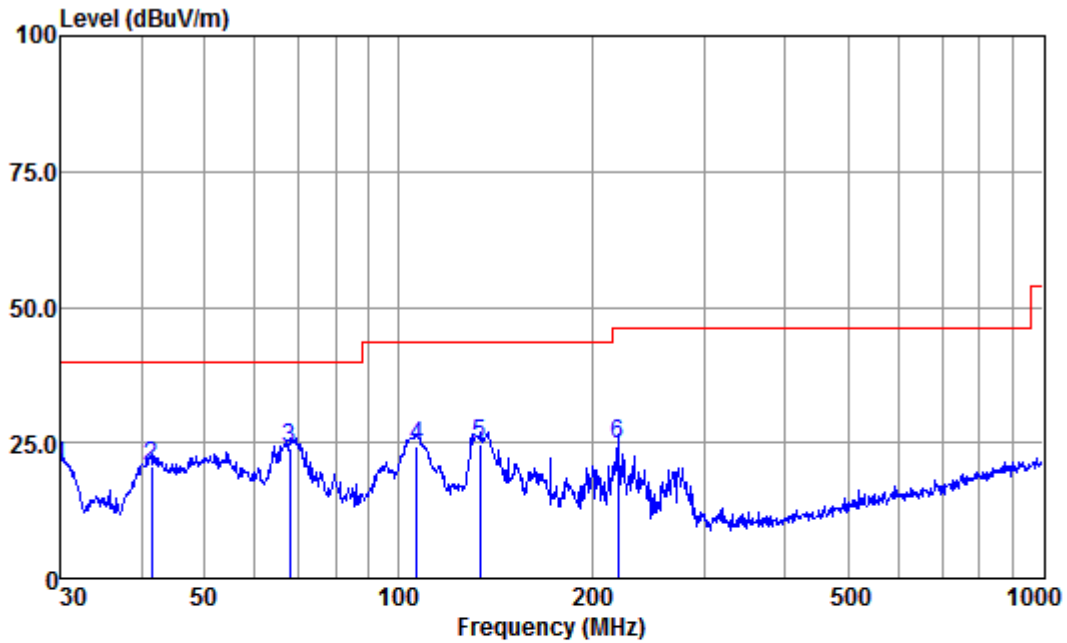
Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.5.2 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

30MHz-1GHz:

Mode:a; Polarization:Horizontal

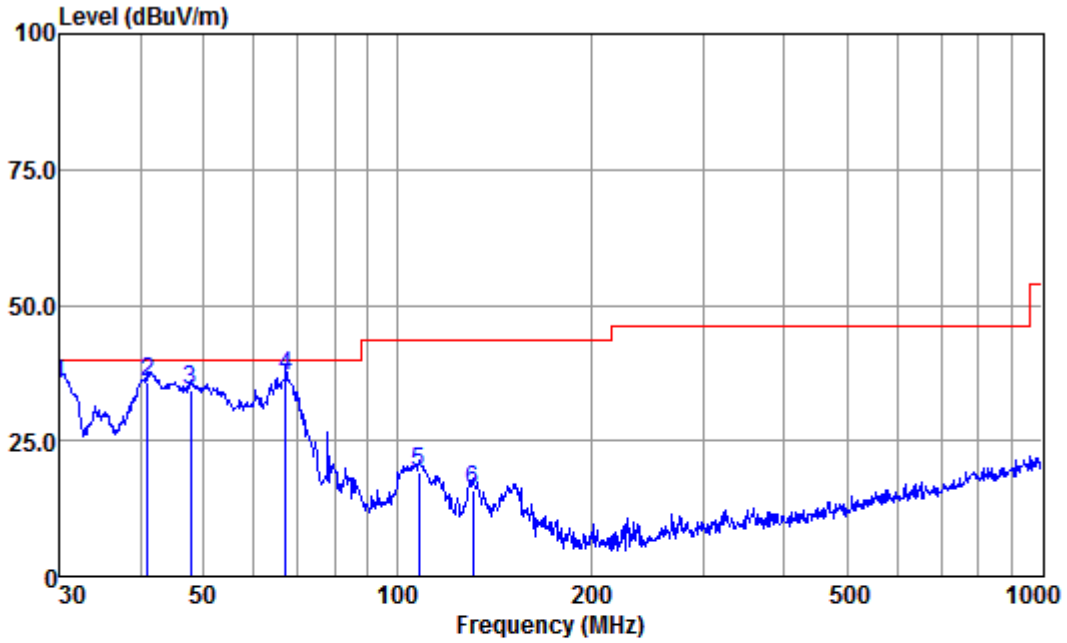


Antenna Polarity :HORIZONTAL

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	30.00	47.75	15.30	0.18	42.60	20.63	40.00	-19.37 QP
2	41.42	47.84	15.41	0.23	42.63	20.85	40.00	-19.15 QP
3	67.91	54.62	11.65	0.33	42.66	23.94	40.00	-16.06 QP
4	107.13	57.05	9.57	0.49	42.70	24.41	43.50	-19.09 QP
5	134.09	54.75	12.16	0.59	42.64	24.86	43.50	-18.64 QP
6	219.84	56.23	10.28	0.72	42.49	24.74	46.00	-21.26 QP

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

Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL

	Read 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	30.00	62.62	15.30	0.18	42.60	35.50	40.00	-4.50	QP
2	40.99	62.49	15.68	0.23	42.62	35.78	40.00	-4.22	QP
3	47.83	64.84	11.76	0.25	42.64	34.21	40.00	-5.79	QP
4	67.20	67.42	11.73	0.33	42.66	36.82	40.00	-3.18	QP
5	108.27	51.95	9.58	0.49	42.70	19.32	43.50	-24.18	QP
6	131.30	45.43	12.59	0.58	42.65	15.95	43.50	-27.55	QP

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



Above 1GHz:

Channel: lowest

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4829	39.79	6.45	46.24	54	-7.76	peak	Horizontal
2	7243.5	37.19	10.79	47.98	54	-6.02	peak	Horizontal
3	9658	34.94	14.35	49.29	54	-4.71	peak	Horizontal
4	4829	42.57	6.45	49.02	54	-4.98	peak	Vertical
5	7243.5	37.07	10.79	47.86	54	-6.14	peak	Vertical
6	9658	35.25	14.35	49.6	54	-4.4	peak	Vertical

Channel: Middle

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4869	39.68	6.86	46.54	54	-7.46	peak	Horizontal
2	7303.5	39.35	11.06	50.41	54	-3.59	peak	Horizontal
3	9738	32.65	14.36	47.01	54	-6.99	peak	Horizontal
4	4869	43.24	6.86	50.1	54	-3.9	peak	Vertical
5	7303.5	39.5	11.06	50.56	54	-3.44	peak	Vertical
6	9738	36.58	14.36	50.94	54	-3.06	peak	Vertical

Channel: Highest

Mark	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	4899	39.21	7.19	46.4	54	-7.6	peak	Horizontal
2	7348.5	35.8	11.25	47.05	54	-6.95	peak	Horizontal
3	9798	34.69	14.37	49.06	54	-4.94	peak	Horizontal
4	4899	38.52	7.19	45.71	54	-8.29	peak	Vertical
5	7348.5	35.23	11.25	46.48	54	-7.52	peak	Vertical
6	9798	31.99	14.37	46.36	54	-7.64	peak	Vertical

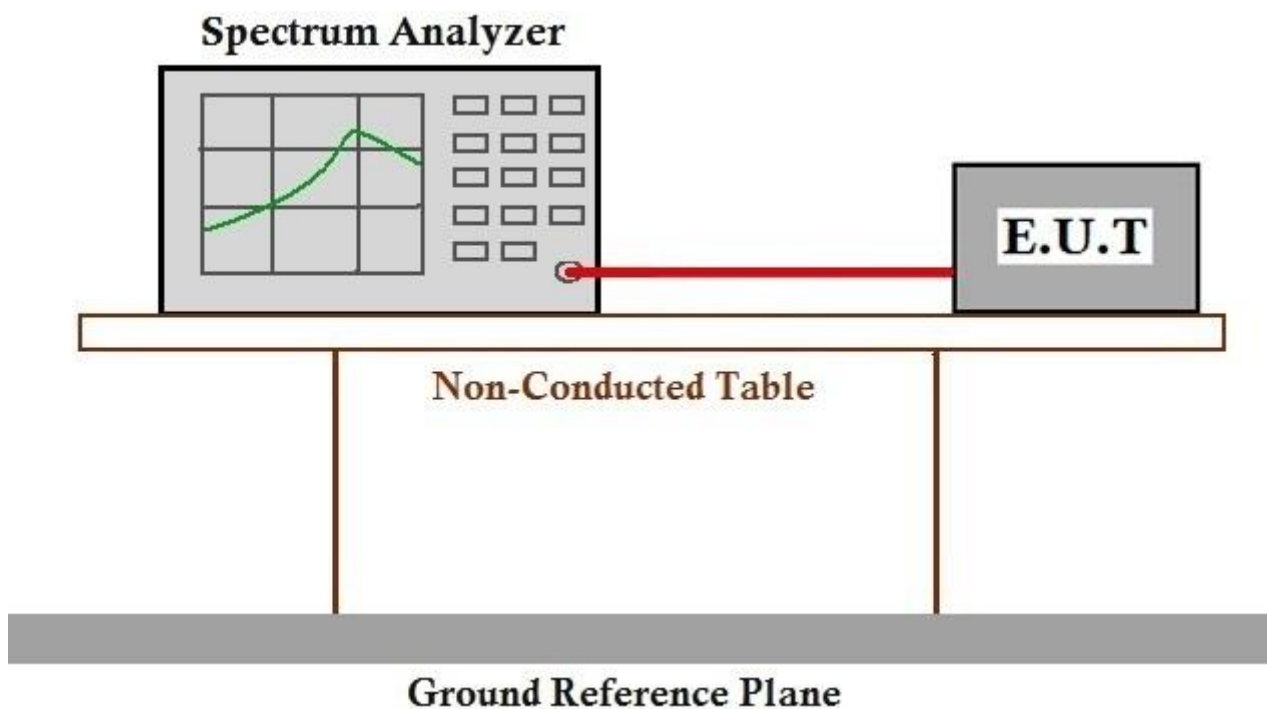
7.6 99% Bandwidth

Test Requirement RSS-210 A1.3
 Test Method: RSS-Gen Issue 5 Section 6.7

7.6.1 E.U.T. Operation

Operating Environment:
 Temperature: 21 °C Humidity: 45 % RH Atmospheric Pressure: 1010 mbar
 Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.6.2 Test Setup Diagram



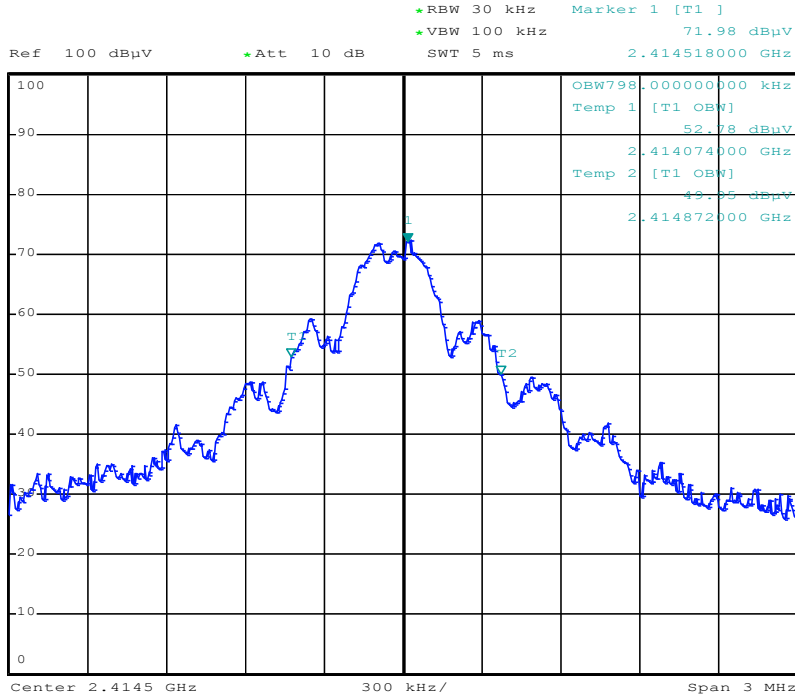
7.6.3 Measurement Procedure and Data

CH	Frequency (MHz)	Bandwidth (MHz)
Low	2414.5	0.798
Mid	2434.5	0.780
High	2449.5	0.750

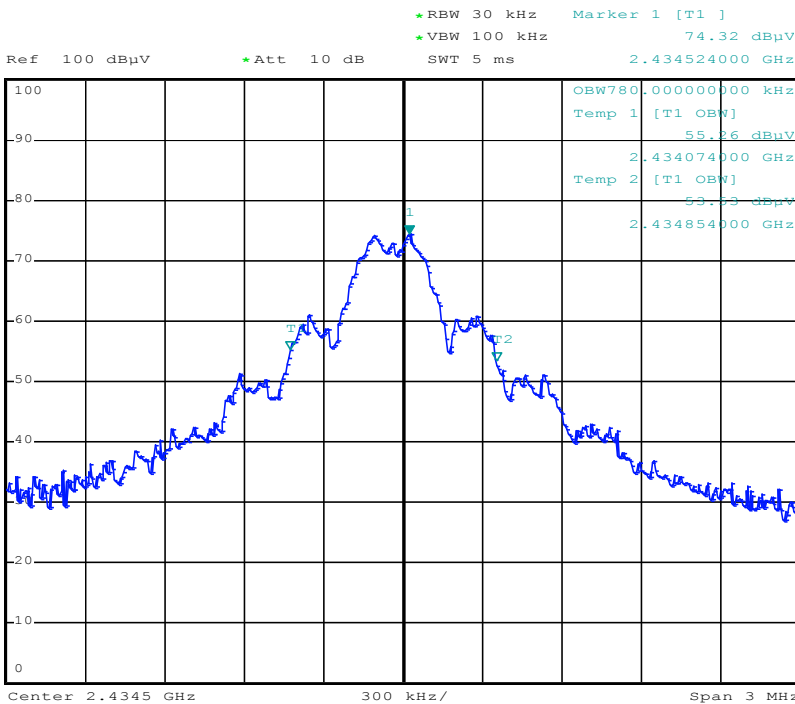


Test plot as follows:

Channel:	lowest
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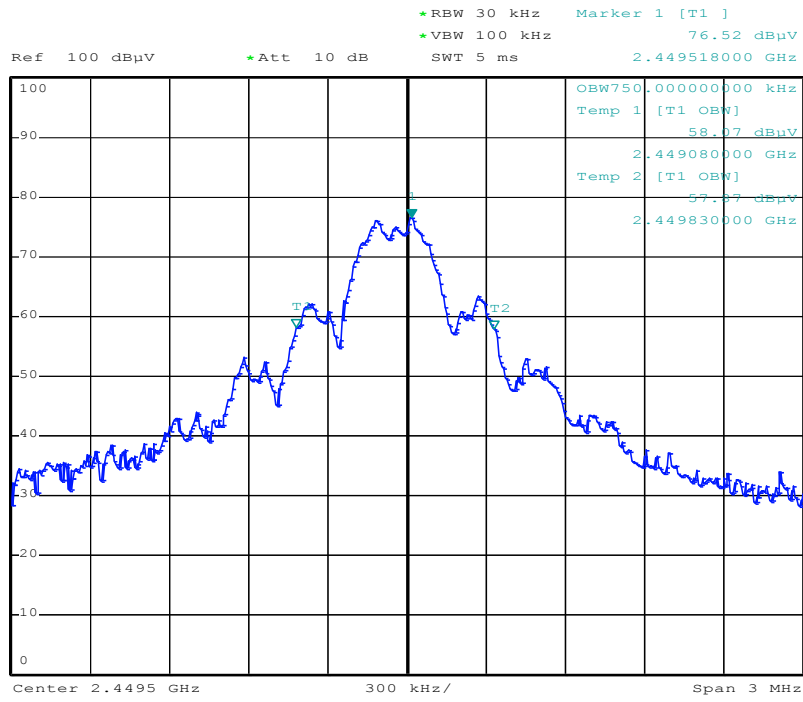


Channel:	Middle
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Channel:	Highest
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8 Test Setup Photographs

Refer to the < Test Setup photos-FCC>.

9 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

- End of the Report -