TEST REPORT

Application No.:	KSCR2112000377AT
FCC ID:	2ADTD-CP03029601220
Applicant:	Hangzhou Hikvision Digital Technology Co.,Ltd.
Address of Applicant:	No. 555, Qianmo Road, Binjiang District,Hangzhou
Manufacturer:	Hangzhou Hikvision Digital Technology Co.,Ltd.
Address of Manufacturer:	No. 555, Qianmo Road, Binjiang District,Hangzhou
Factory:	1.Hangzhou Hikvision Technology Co., Ltd. 2.Hangzhou Hikvision Electronics Co.,Ltd. 3.CHONGQING HIKVISION TECHNOLOGY CO.,LTD.
Address of Factory:	1.No.700, Dongliu Road, Binjiang District, Hangzhou Ctiy, Zhejiang, 310052, China 2.No.299, Qiushi Road, Tonglu Economic Development Zone, Tonglu County, Hangzhou, Zhejiang, 310052, China. 3. Building 18, Louyu Area, C area, Jianqiao industrial park, Chongqing.
Equipment Under Test (EUT):	
EUT Name:	AX PRO
Model No.:	DS-PWA96-M2H-WA,DS-PWA96-M2H-WAUHK, DS-PWA96-M2H-WACKV,DS-PWA96-M2H-WAUVS, DS-PWA96-M2H-WAKVO,DS-PWA96-M2H-WAHUN¤
¤	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark:	HIKVISION
Standard(s) :	47 CFR Part 15, Subpart C 15.249
Date of Receipt:	2021-12-23
Date of Test:	2022-01-06 to 2022-01-26
Date of Issue:	2022-01-27
Test Result:	**Pass***

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

Eric Lin
Laboratory 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 writing.

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Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2022-01-27	/

Authorized for issue by:				
		Damon zhou **Damon Zhou / Project Engineer**		
		Eric Lin **Eric Lin / Reviewer**		

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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

Declaration of EUT Family Grouping:

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model DS-PWA96-M2H-WA was tested since their differences were the model number and appearance.

3 Contents

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4 General Information

4.1 Details of E.U.T.

Power supply: AC 100~240V 50/60Hz
Test voltage: AC 120V/60Hz
Antenna Gain: Ant1: 3.30dBi (Provided by manufacturer)
Ant2: -0.39dBi (Provided by manufacturer)
Antenna Type: Ant1: PCB Antenna
Ant2: PCB Antenna
Modulation Type: FSK
Operation Frequency: 920MHz
Channel Number: 1

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	Lenovo	N/A	N/A

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Occupied Bandwidth	3%
4	Conducted Spurious Emissions	0.75dB
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-18GHz)
		5.4dB (Above 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.

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4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

4.5 Test Facility

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

• CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 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.

• A2LA (Certificate No. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC (Designation Number: CN1172)

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

• ISED (CAB identifier: CN0072)

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

• VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600,C-11707, T-11499, G-10216 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Item	Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals (150kHz-30MHz)						
1	EMI Test Receive	R&S	ESCI	100781	02/01/2021	01/31/2022
2	LISN	R&S	ENV216	101604	10/12/2021	10/11/2022
3	LISN	Schwarzbeck	NNLK 8129	8129-143	10/12/2021	10/11/2022
4	Pulse Limiter	R&S	ESH3-Z2	100609	02/01/2021	01/31/2022
5	CE test Cable	Thermax	/	14	10/16/2021	10/15/2022
6	Test Software	Farad	EZ-EMC	CCS-03A1	N.C.R	N.C.R
RF Conducted Test						
1	Spectrum Analyzer	Agilent	E4446A	MY44020154	04/16/2021	04/15/2022
2	Spectrum Analyzer	Keysight	N9020A	MY55370209	10/11/2021	10/10/2022
3	Spectrum Analyzer	Keysight	N9010A	MY56480443	02/01/2021	01/31/2022
4	Signal Generator	Agilent	N5182A	MY50142015	08/27/2021	08/26/2022
5	Radio Communication Test Station	Anritsu	MT8000A	6262012849	N/A	N/A
6	Radio Communication Analyzer	Anritsu	MT8821C	6201692222	N/A	N/A
7	Universal Radio Communication Tester	R&S	CMW500	159275	10/12/2021	10/11/2022
8	Universal Radio Communication Tester	R&S	CMW500	167239	04/16/2021	04/15/2022
9	Power Meter	Anritsu	ML2495A	1445010	04/15/2021	04/14/2022
10	Switcher	CCSRF	FY562	KUS2001M001-3	10/12/2021	10/11/2022
11	AC Power Source	EXTECH	6605	1570106	N.C.R	N.C.R
12	DC Power Supply	Aglient	E3632A	MY50340053	N.C.R	N.C.R
13	6dB Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R	N.C.R
14	Power Divider	AISI	IOWOPE2068	PE2068	N.C.R	N.C.R
15	Filter	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
16	Conducted test cable	/	RF01-RF04	/	04/15/2021	04/14/2022
17	Software	BST	TST-PASS	N/A	N/A	N/A
18	Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	04/15/2021	04/14/2022
19	Thermometer	Anymetre	TH603	CCS007	10/14/2021	10/13/2022
RF Radiated Test						
1	Spectrum Analyzer	R&S	FSV40	101493	10/11/2021	10/10/2022
2	Signal Generator	Agilent	E8257C	MY43321570	10/18/2021	10/17/2022
3	Loop Antenna	Schwarzbeck	HXYZ9170	9170-108	02/22/2021	02/21/2022
4	Bilog Antenna	TESEQ	CBL 6112D	35403	06/21/2021	06/20/2023
5	Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/13/2021	04/12/2023
6	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	267	10/26/2020	10/25/2022
7	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	00143290	02/22/2021	02/21/2023
8	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	BBHA9170171	02/22/2021	02/21/2022
9	Pre-Amplifier(30MHz~18GHz)	LNA	/	/	04/15/2021	04/14/2022
10	Amplifier(18~40GHz)	COM-POWER	PAM-840A	461332	10/18/2021	10/17/2022
11	Low Pass Filter	MICRO-TRONICS	VLFX-950	RV142900829	N.C.R	N.C.R
12	High Pass Filter	Mini-Circuits	VHF-1200	15542	N.C.R	N.C.R
13	Filter (5450MHz～5770 MHz)	MICRO-TRONICS	BRC50704-01	2	N.C.R	N.C.R
14	Filter (5690 MHz～5930 MHz)	MICRO-TRONICS	BRC50705-01	4	N.C.R	N.C.R

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15	Filter (5150 MHz～5350 MHz）	MICRO-TRONICS	BRC50703-01	2	N.C.R	N.C.R
16	Filter (885 MHz～915 MHz）	MICRO-TRONICS	BRM14698	1	N.C.R	N.C.R
17	Filter (815 MHz～860 MHz）	MICRO-TRONICS	BRM14697	1	N.C.R	N.C.R
18	Filter (1745 MHz～1910 MHz)	MICRO-TRONICS	BRM14700	1	N.C.R	N.C.R
19	Filter (1922 MHz～1977 MHz)	MICRO-TRONICS	BRM50715	1	N.C.R	N.C.R
20	Filter (2550 MHz)	MICRO-TRONICS	HPM13362	5	N.C.R	N.C.R
21	Filter (1532 MHz～1845 MHz)	MICRO-TRONICS	BRM50713	1	N.C.R	N.C.R
22	Filter (2.4GHz)	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
23	RE test cable	/	RE01-RE04	/	04/15/2021	04/14/2022
24	Software	Faratronic	EZ_EMC-v 3A1	N/A	N/A	N/A

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 1 and antenna 2 is PCB antenna, and all no consideration of replacement. The best case gain of the antenna 1 is 3.30dBi. and antenna 2 is -0.39dBi.

Antenna location: Refer to Appendix (internal photo)

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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 of Emission (MHz)	Conducted Limit (dBμV)	
	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.		

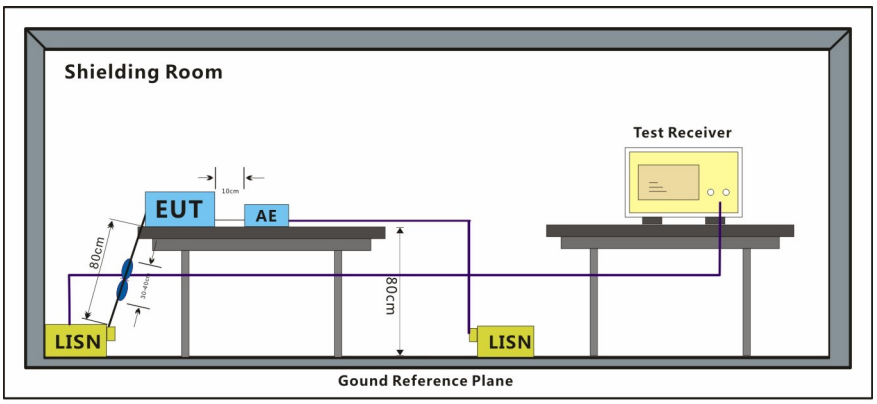
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

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

7.1.2 Test Setup Diagram



7.1.3 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.

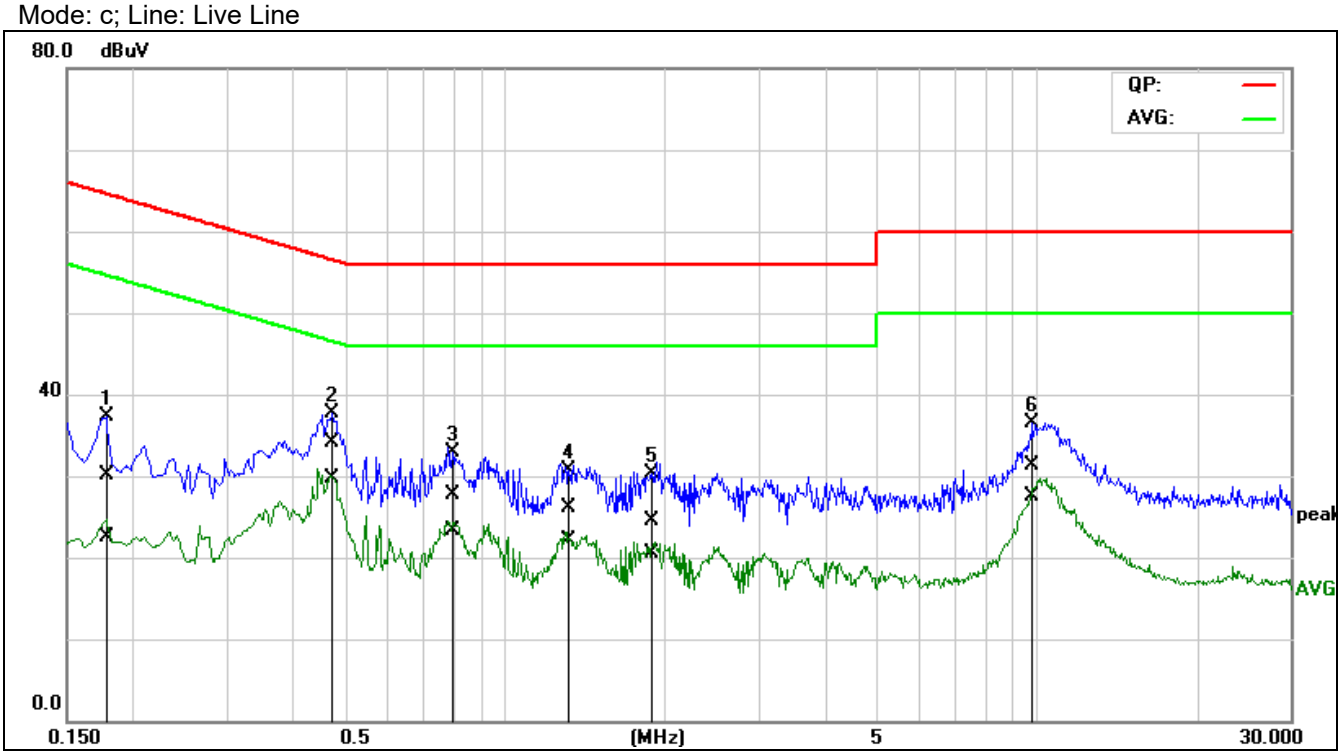
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

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: c; Line: Live Line



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1768	10.39	2.82	19.75	30.14	22.57	64.63	54.63	-34.49	-32.06	Pass
2*	0.4736	14.36	9.88	19.79	34.15	29.67	56.45	46.45	-22.30	-16.78	Pass
3	0.7884	8.02	3.59	19.71	27.73	23.30	56.00	46.00	-28.27	-22.70	Pass
4	1.3115	6.44	2.42	19.70	26.14	22.12	56.00	46.00	-29.86	-23.88	Pass
5	1.8629	4.70	0.77	19.72	24.42	20.49	56.00	46.00	-31.58	-25.51	Pass
6	9.8032	11.41	7.46	19.95	31.36	27.41	60.00	50.00	-28.64	-22.59	Pass

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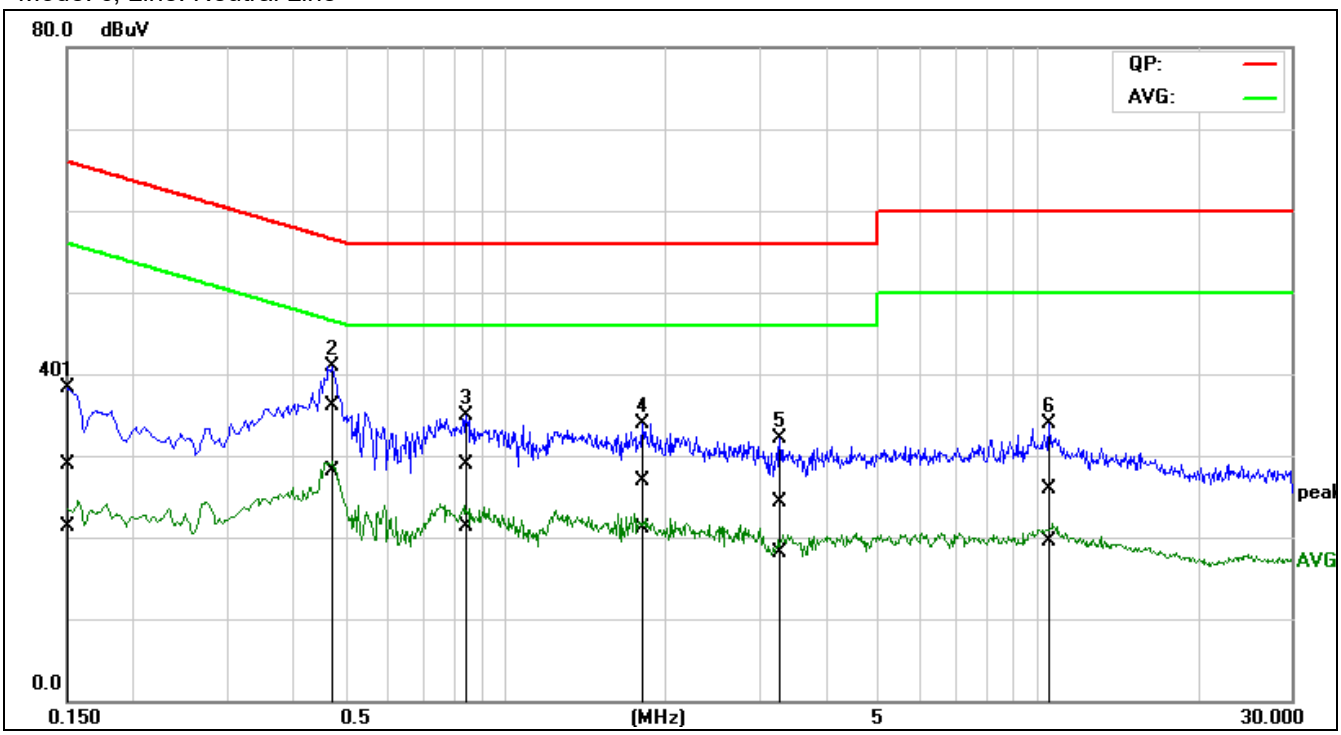
Mode: c; Line: Neutral Line



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1500	9.22	1.53	19.76	28.98	21.29	66.00	56.00	-37.02	-34.71	Pass
2*	0.4721	16.39	8.24	19.80	36.19	28.04	56.48	46.48	-20.29	-18.44	Pass
3	0.8432	9.24	1.68	19.71	28.95	21.39	56.00	46.00	-27.05	-24.61	Pass
4	1.8041	7.13	1.36	19.71	26.84	21.07	56.00	46.00	-29.16	-24.93	Pass
5	3.2968	4.60	-1.72	19.75	24.35	18.03	56.00	46.00	-31.65	-27.97	Pass
6	10.5964	6.02	-0.40	19.96	25.98	19.56	60.00	50.00	-34.02	-30.44	Pass

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7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215

Test Method: ANSI C63.10 (2013) Section 6.9

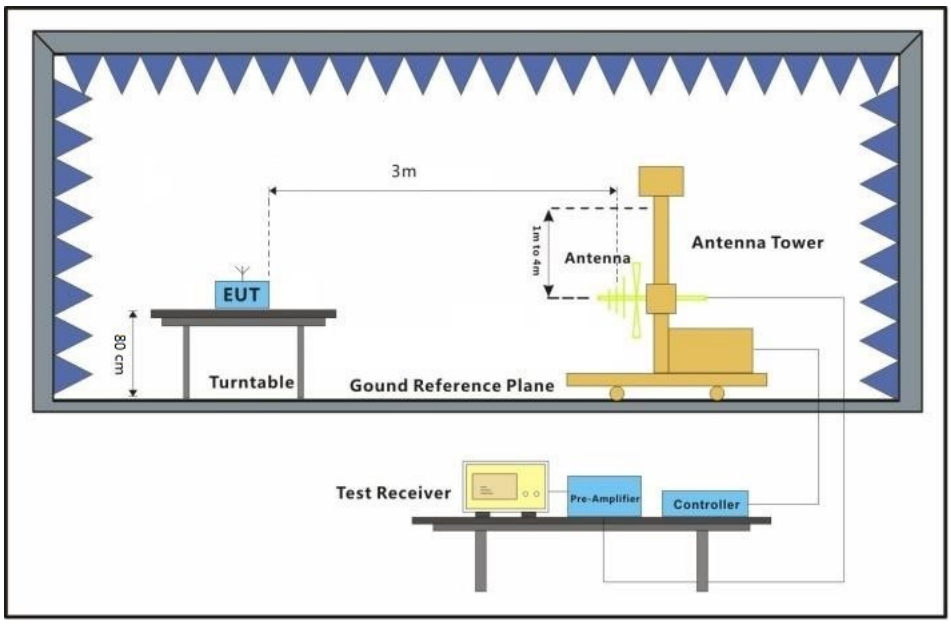
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 49 % RH Atmospheric Pressure: 1008 mbar

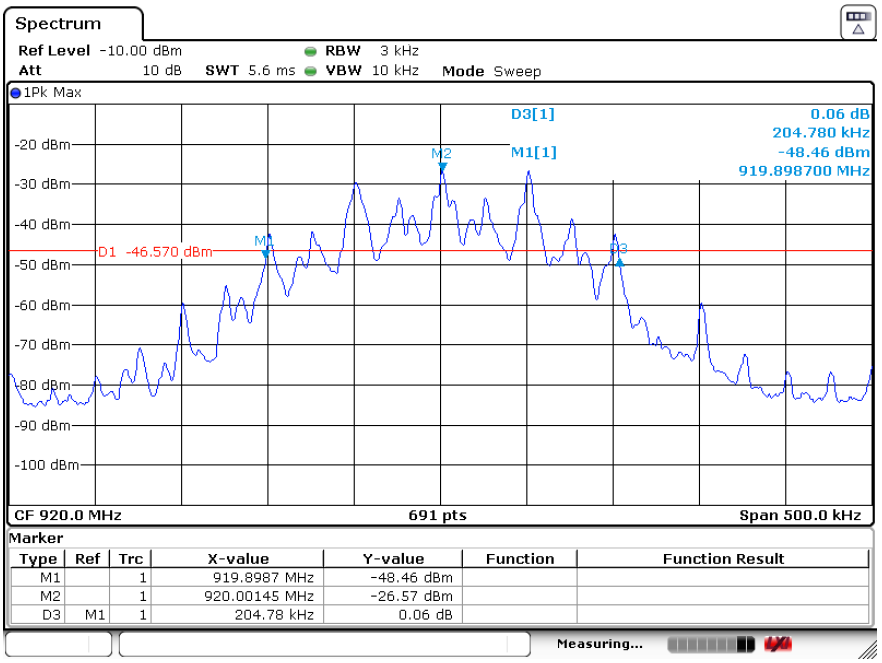
Test mode c: TX mode_Keep the EUT in transmitting with modulation mode.

7.2.2 Test Setup Diagram

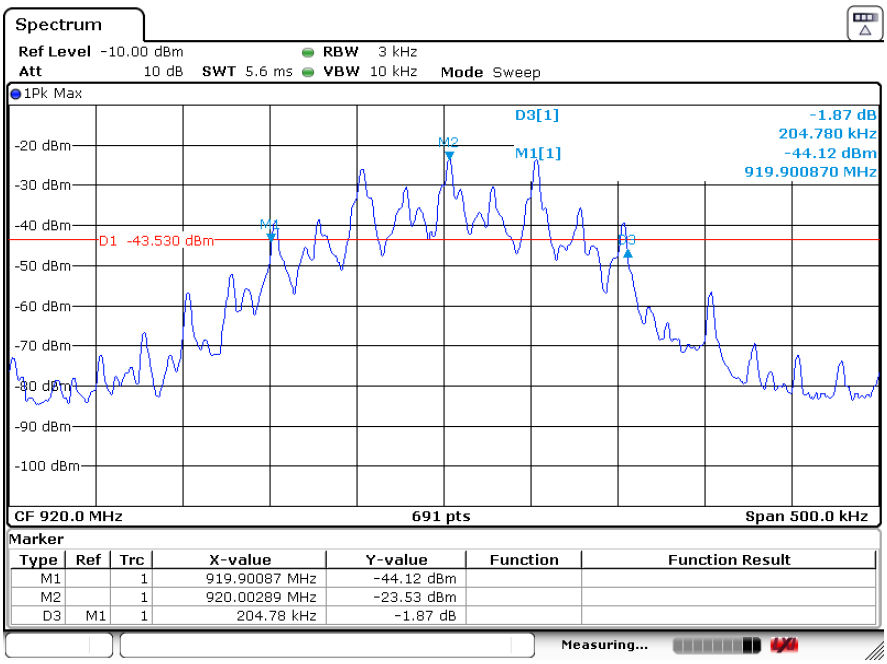


7.2.3 Measurement Procedure and Data

Mode: c, Ant Port: 1



Mode: c, Ant Port: 2



Mode	Frequency (MHz)	20dB Bandwidth (MHz)		Test Result
		Ant 1	Ant 2	
FSK	920	0.205	0.205	Pass

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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:

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.		

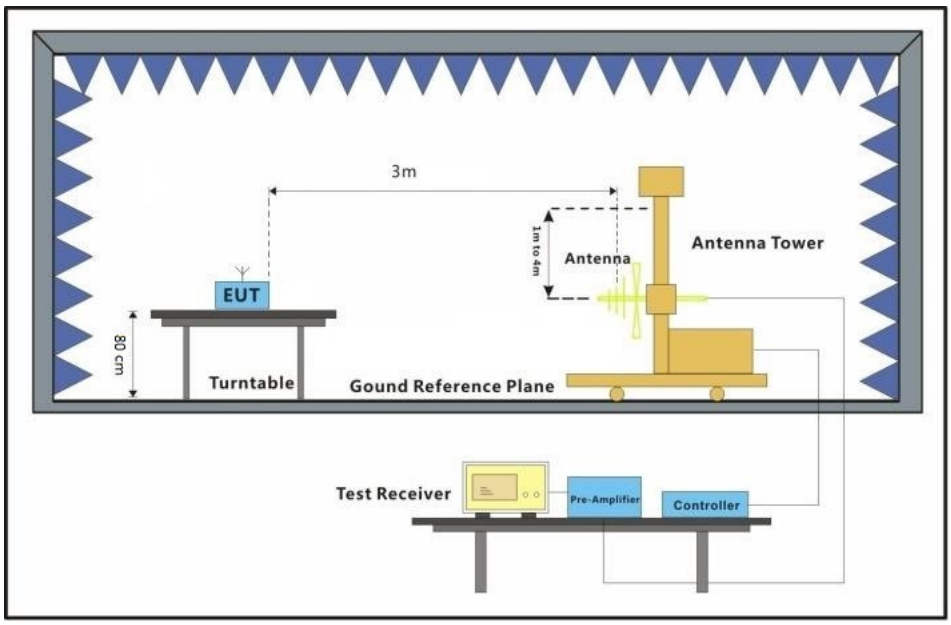
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 49 % RH Atmospheric Pressure: 1008 mbar

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

7.3.2 Test Setup Diagram



7.3.3 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

Measurement Data

Peak value:

Frequency (MHz)	Read Level (dBuV)		Factor (dB/m)	Level (dBuV/m)		Limit Line (dBuV/m)	Over Limit (dB)		Detector	Polarization
	Ant 1	Ant 2		Ant 1	Ant 2		Ant 1	Ant 2		
920	52.53	53.78	28.92	81.45	82.70	94.00	-12.55	-11.30	Peak	Horizontal
	51.66	53.90	28.92	80.58	82.82	94.00	-13.42	-11.18	Peak	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) The peak value of the Fundamental Frequency is below the average limit value, so we haven't read the AV value.

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.		

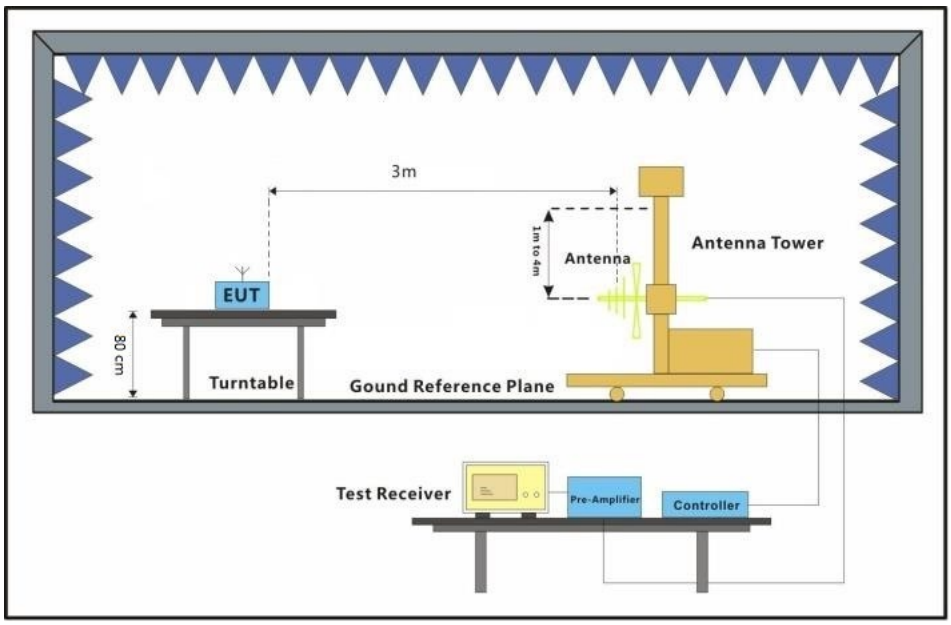
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 49 % RH Atmospheric Pressure: 1008 mbar

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

7.4.2 Test Setup Diagram



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7.4.3 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.

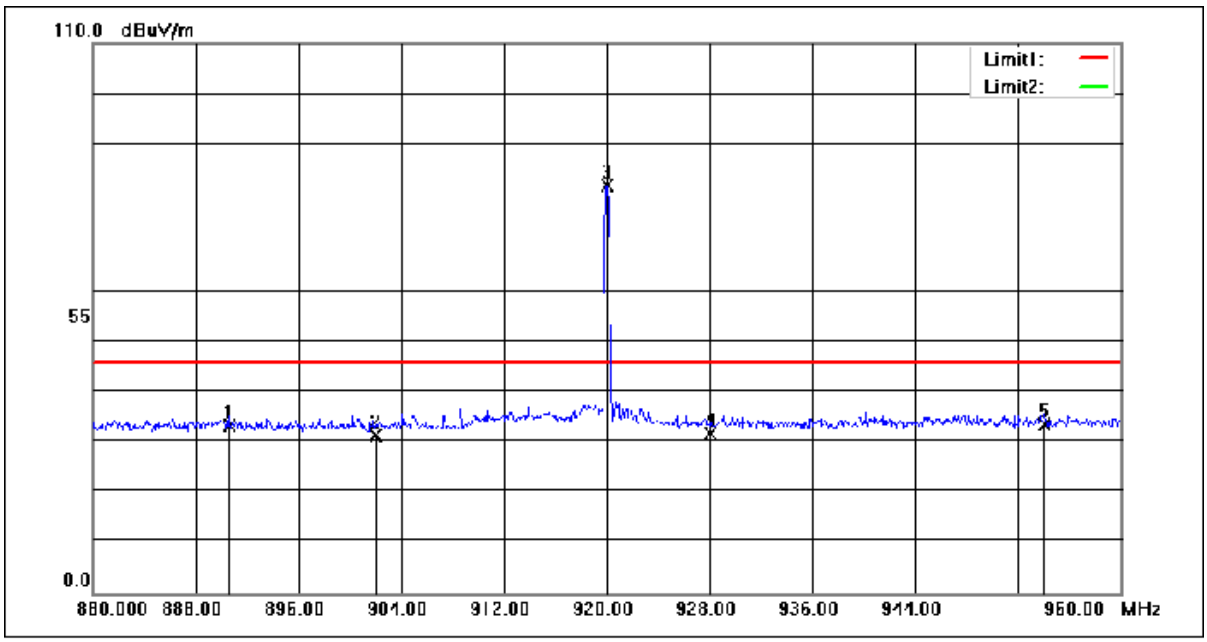
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

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

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

For ANT1 of 920MHz:

Mode: c; Polarization: Horizontal; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	890.5600	4.92	28.56	33.48	46.00	-12.52	QP
2	902.0000	2.77	28.70	31.47	46.00	-14.53	QP
3	920.0800	52.53	28.92	81.45	46.00	35.45	peak
4	928.0000	2.70	29.02	31.72	46.00	-14.28	QP
5	954.0800	4.50	29.29	33.79	46.00	-12.21	QP

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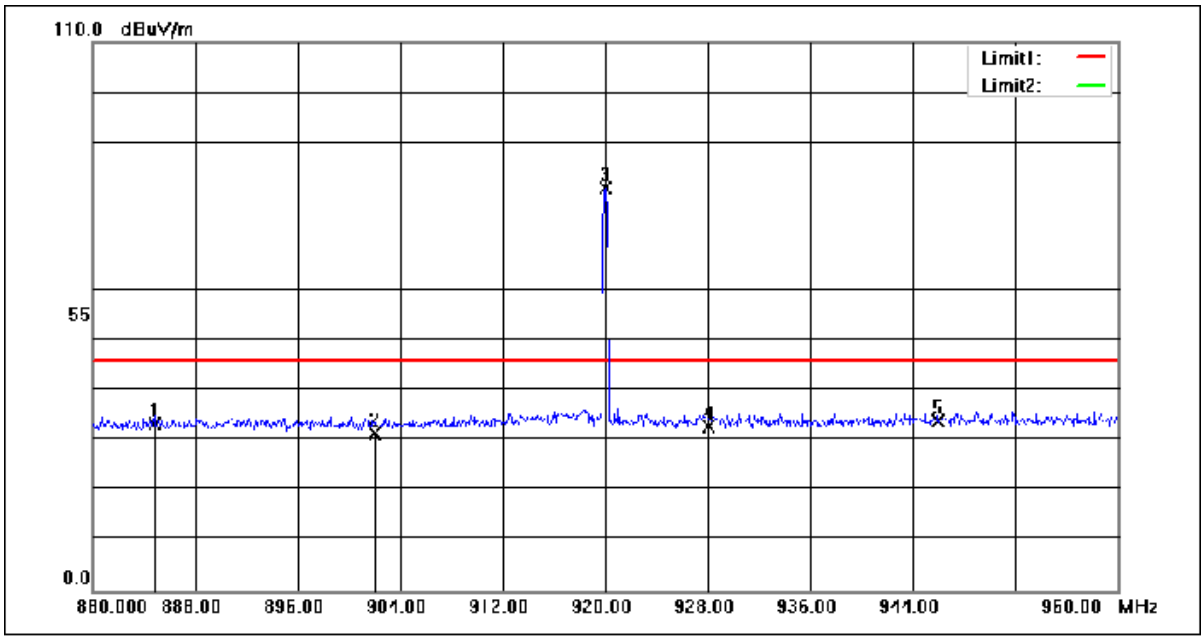
Mode: c; Polarization: Vertical; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	884.8000	4.99	28.49	33.48	46.00	-12.52	QP
2	902.0000	2.78	28.70	31.48	46.00	-14.52	QP
3	920.0000	51.66	28.92	80.58	46.00	34.58	peak
4	928.0000	3.82	29.02	32.84	46.00	-13.16	QP
5	945.9200	4.72	29.25	33.97	46.00	-12.03	QP

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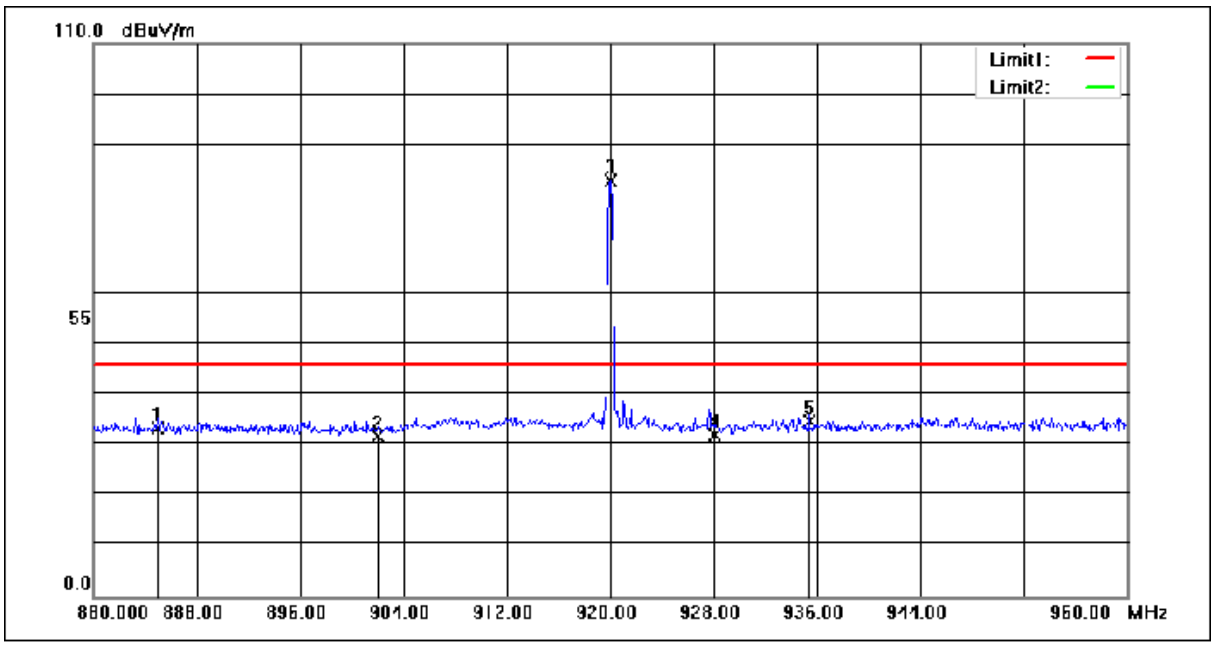
For ANT2 of 920MHz:

Mode: c; Polarization: Horizontal; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	884.9600	4.79	28.49	33.28	46.00	-12.72	QP
2	902.0000	3.02	28.70	31.72	46.00	-14.28	QP
3	920.0800	53.78	28.92	82.70	46.00	36.70	peak
4	928.0000	3.05	29.02	32.07	46.00	-13.93	QP
5	935.3600	5.54	29.12	34.66	46.00	-11.34	QP

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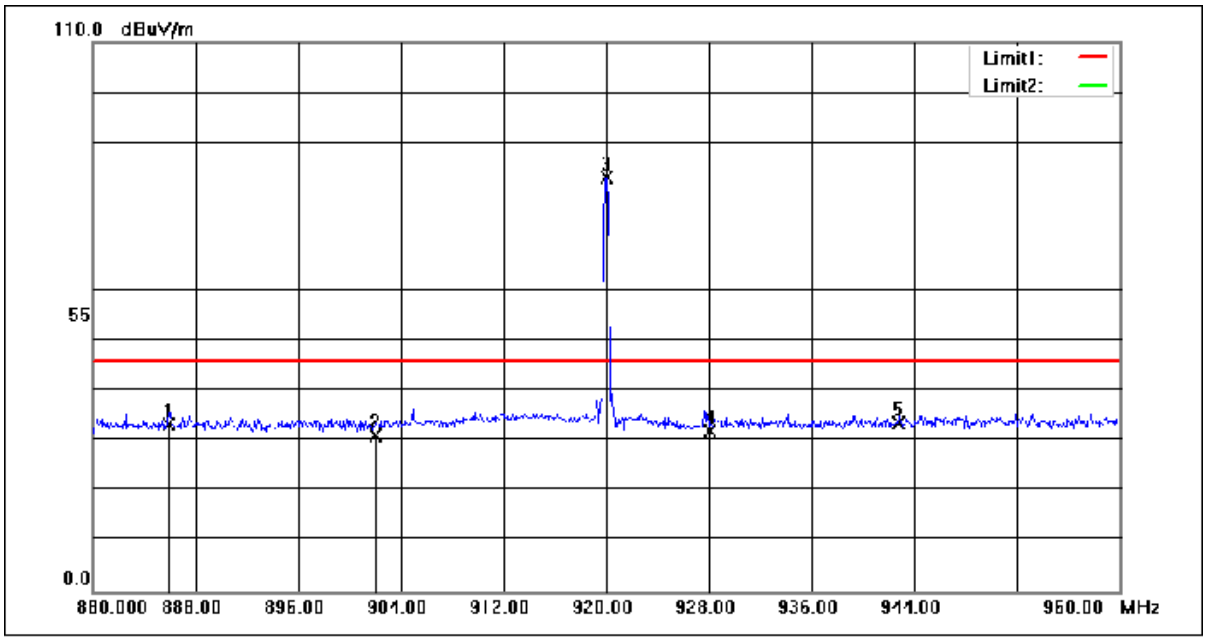
Mode: c; Polarization: Vertical; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	885.9200	4.98	28.50	33.48	46.00	-12.52	QP
2	902.0000	2.52	28.70	31.22	46.00	-14.78	QP
3	920.0000	53.90	28.92	82.82	46.00	36.82	peak
4	928.0000	2.96	29.02	31.98	46.00	-14.02	QP
5	942.8000	4.41	29.21	33.62	46.00	-12.38	QP

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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

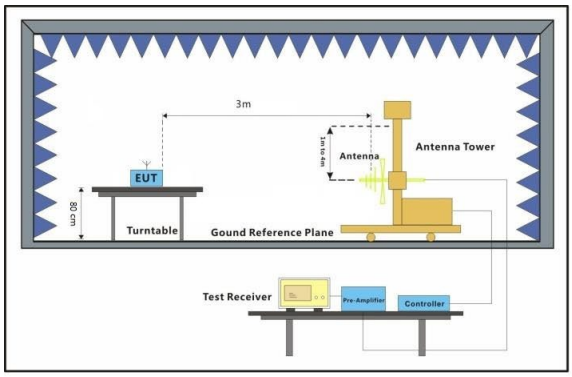
7.5.1 E.U.T. Operation

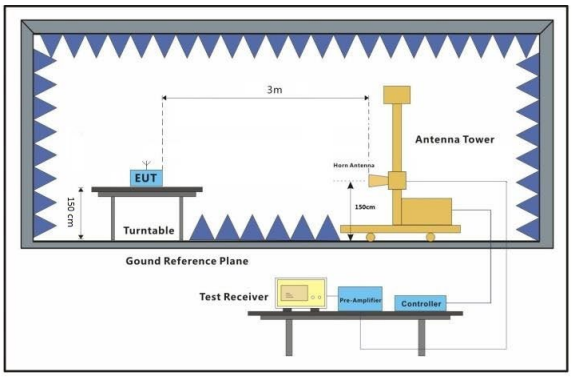
Operating Environment:

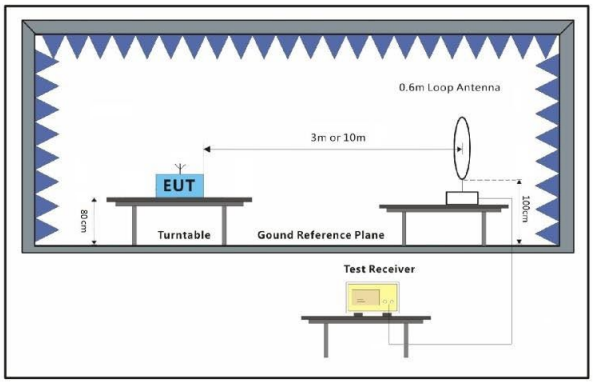
Temperature: 25 °C Humidity: 49 % RH Atmospheric Pressure: 1008 mbar

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

7.5.2 Test Setup Diagram







7.5.3 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:

1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

3) Scan from 9kHz to 10GHz, 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.

4) 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.

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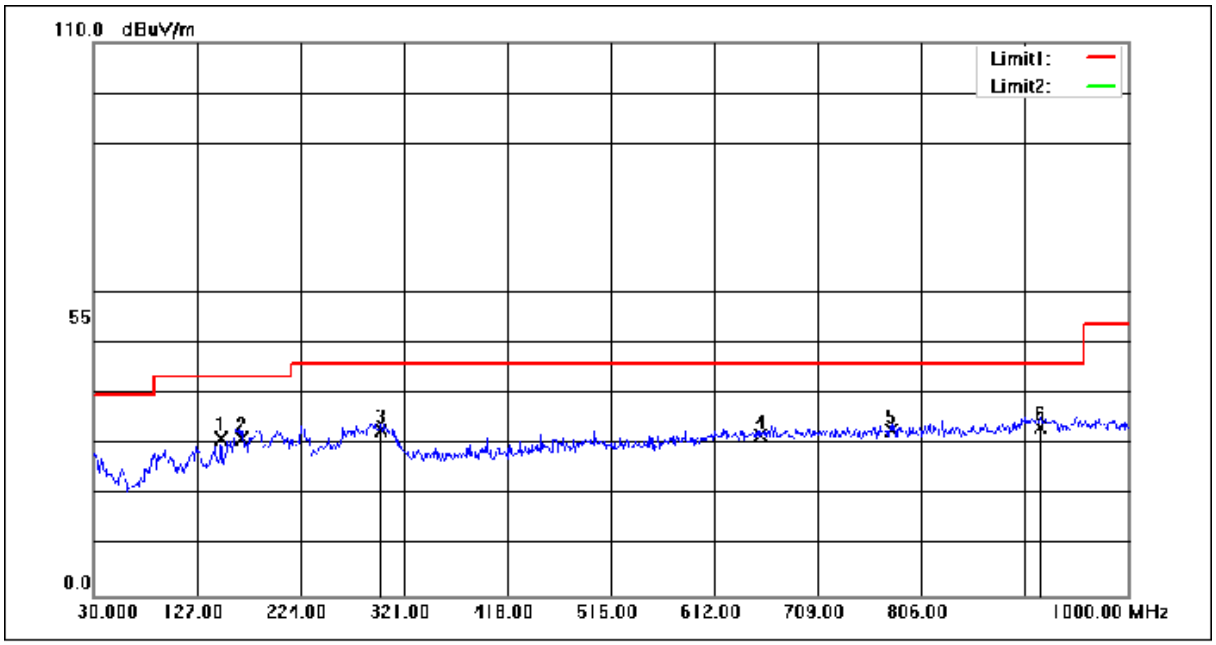
For ANT1

920MHz: Below 1GHz:

Mode: c; Polarization: Horizontal; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	149.3100	11.08	20.12	31.20	43.50	-12.30	QP
2	168.7100	12.56	18.68	31.24	43.50	-12.26	QP
3	299.6600	12.34	20.61	32.95	46.00	-13.05	QP
4	654.6800	4.59	27.15	31.74	46.00	-14.26	QP
5	777.8700	5.09	27.68	32.77	46.00	-13.23	QP
6	917.5500	4.65	28.89	33.54	46.00	-12.46	QP

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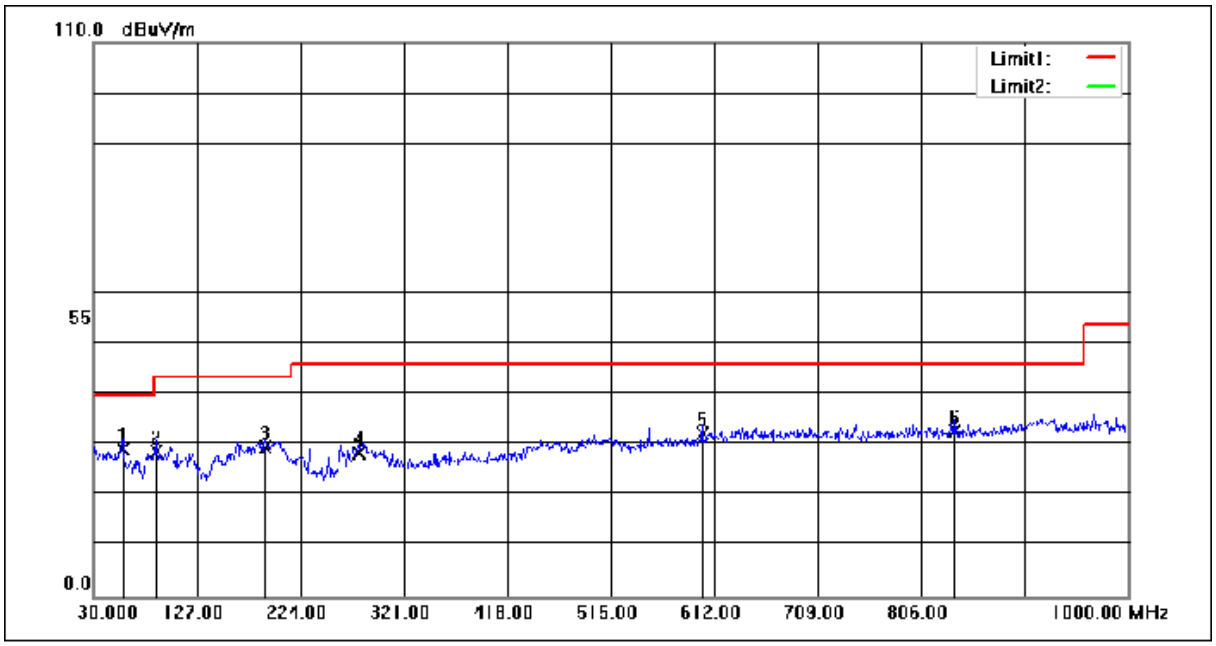
Mode: c; Polarization: Vertical; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	57.1600	16.45	12.89	29.34	40.00	-10.66	QP
2	88.2000	12.25	16.42	28.67	43.50	-14.83	QP
3	191.0200	12.73	16.95	29.68	43.50	-13.82	QP
4	279.2900	8.40	20.08	28.48	46.00	-17.52	QP
5	600.3600	5.67	26.51	32.18	46.00	-13.82	QP
6	838.0100	4.86	28.02	32.88	46.00	-13.12	QP

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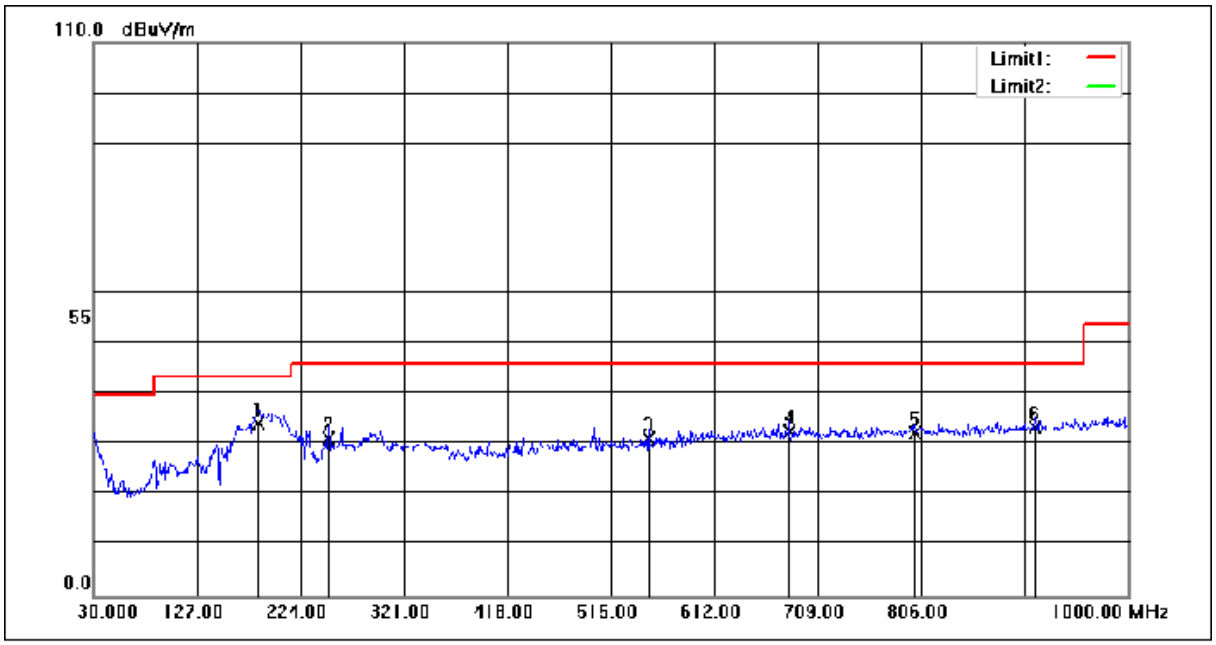
For ANT2

920MHz: Below 1GHz:

Mode: c; Polarization: Horizontal; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	184.2300	16.74	17.48	34.22	43.50	-9.28	QP
2	250.1900	11.95	19.32	31.27	46.00	-14.73	QP
3	549.9200	5.25	25.83	31.08	46.00	-14.92	QP
4	681.8400	5.12	27.36	32.48	46.00	-13.52	QP
5	800.1800	4.35	27.83	32.18	46.00	-13.82	QP
6	912.7000	4.66	28.83	33.49	46.00	-12.51	QP

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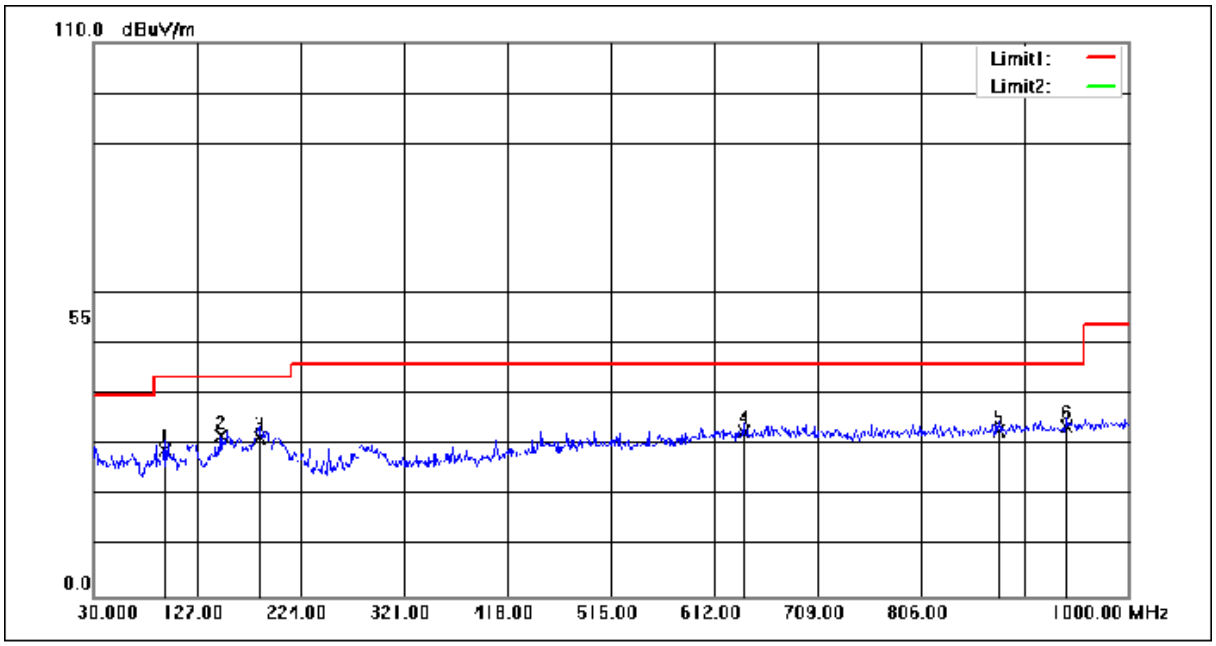
Mode: c; Polarization: Vertical; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	95.9600	11.21	17.74	28.95	43.50	-14.55	QP
2	149.3100	11.77	20.12	31.89	43.50	-11.61	QP
3	185.2000	14.08	17.40	31.48	43.50	-12.02	QP
4	639.1600	5.73	26.98	32.71	46.00	-13.29	QP
5	878.7500	4.52	28.42	32.94	46.00	-13.06	QP
6	942.7700	4.43	29.21	33.64	46.00	-12.36	QP

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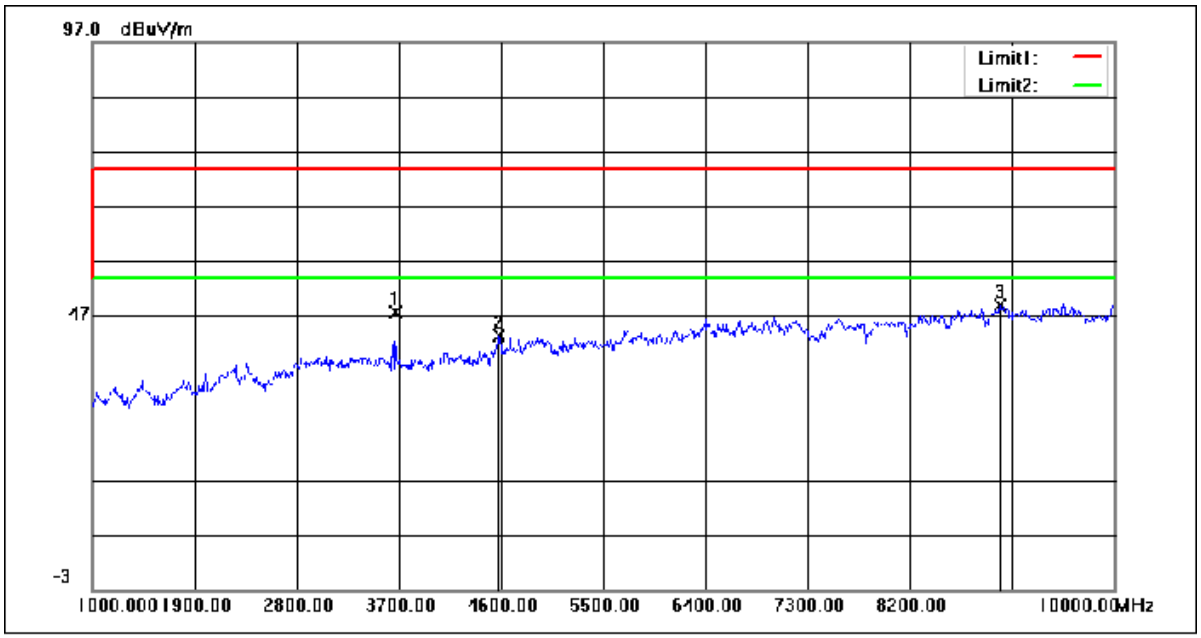
For ANT1

920MHz: Above 1GHz:

Mode: c; Polarization: Horizontal; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3664.000	62.28	-14.66	47.62	74.00	-26.38	peak
2	4582.000	55.79	-12.29	43.50	74.00	-30.50	peak
3	8992.000	51.03	-2.26	48.77	74.00	-25.23	peak

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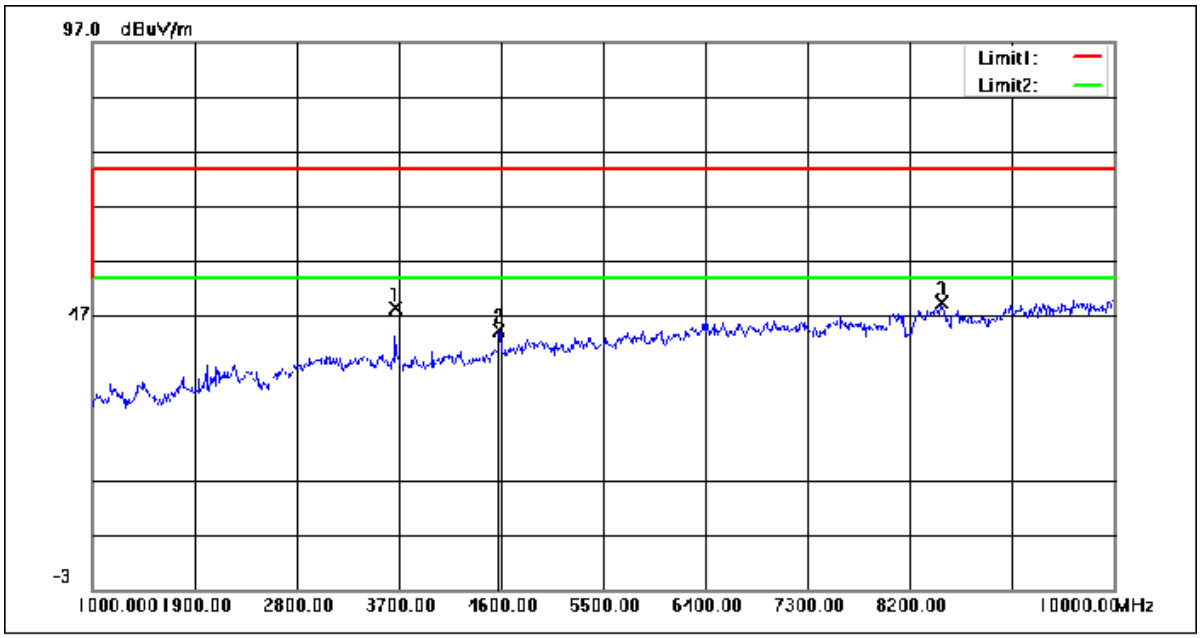
Mode: c; Polarization: Vertical; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3664.000	63.01	-14.66	48.35	74.00	-25.65	peak
2	4582.000	56.62	-12.29	44.33	74.00	-29.67	peak
3	8479.000	52.93	-3.56	49.37	74.00	-24.63	peak

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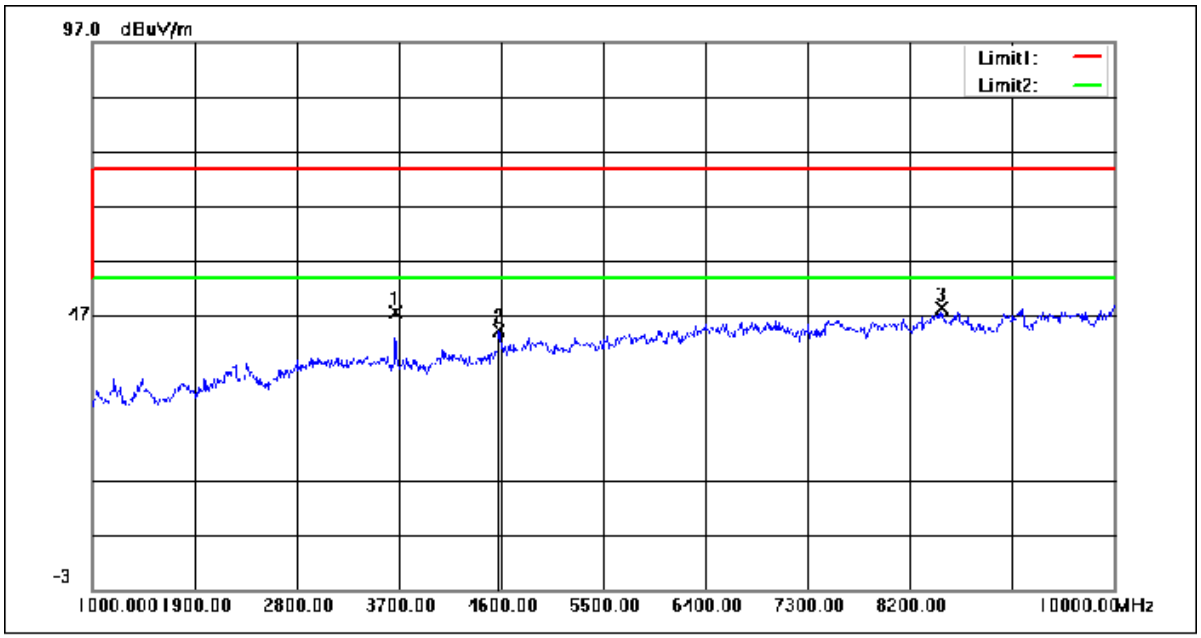
For ANT2

920MHz: Above 1GHz:

Mode: c; Polarization: Horizontal; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3664.000	62.26	-14.66	47.60	74.00	-26.40	peak
2	4582.000	56.65	-12.29	44.36	74.00	-29.64	peak
3	8479.000	51.94	-3.56	48.38	74.00	-25.62	peak

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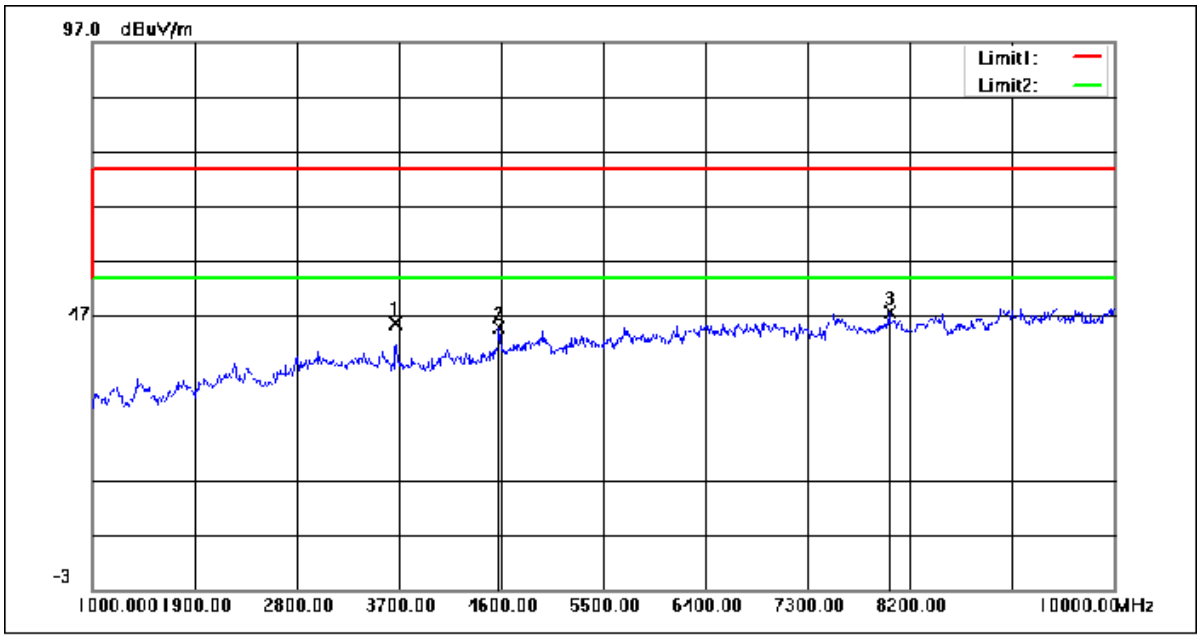
Mode: c; Polarization: Vertical; Modulation: FSK; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3664.000	60.33	-14.66	45.67	74.00	-28.33	peak
2	4582.000	57.14	-12.29	44.85	74.00	-29.15	peak
3	8020.000	51.27	-3.76	47.51	74.00	-26.49	peak

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8 Test Setup Photographs

Refer to the < Test Setup photos>.

9 EUT Constructional Details

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

- End of the Report -

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