

TEST REPORT

Application No.: KSCR2112000369AT
FCC ID: 2ADTD-D0512040
Applicant: Hangzhou Hikvision Digital Technology Co.,Ltd.
Address of Applicant: No. 555, Qianmo Road, Binjiang District, Hangzhou 310052, China
Manufacturer: Hangzhou Hikvision Digital Technology Co.,Ltd.
Address of Manufacturer: No. 555, Qianmo Road, Binjiang District, Hangzhou 310052, China
Factory: 1.Hangzhou Hikvision Electronics Co., Ltd.
 2.Hangzhou Hikvision Technology Co., Ltd.
 3.CHONGQING HIKVISION TECHNOLOGY CO.,LTD.
Address of Factory: 1.No.299,Qiushi Road,Tonglu Economic Development Zone,Tonglu County, Hangzhou,Zhejiang
 2.No.700 Dongliu Road, Binjiang District, Hangzhou 310052, China
 3.No. 118, Haikang Road, Area C, Jianqiao Industrial Park, Dadukou District, Chongqing, 401325,China
Equipment Under Test (EUT):
EUT Name: Wired Dual-Tech Ceiling Detector
Model No.: DS-PDCL12DT-EG2,DS-PDCL12DT-EG2UHK,DS-PDCL12DT-EG2CKV, DS-PDCL12DT-EG2UVS,DS-PDCL12DT-EG2KVO,DS-PDCL12DT-EG2HUN[□]
[□] 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: 2021-12-15
Date of Test: 2022-03-10 to 2022-03-15
Date of Issue: 2022-03-15

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

Eric Lin
Laboratory Manager

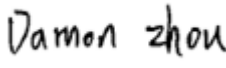


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Revision Record			
Version	Description	Date	Remark
00	Original	2022-03-15	/

Authorized for issue by:			
		 <hr/> Damon Zhou / Project Engineer	
		 <hr/> 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

N/A: Not applicable

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 Emission 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
Filed strength of fundamental	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Radiation Spurious Emission	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.10	47 CFR Part 15, Subpart C 15.205 & 15.209	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-PDCL12DT-EG2 was tested since their differences are model number and appearance.



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3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY.....	3
3 CONTENTS.....	4
4 GENERAL INFORMATION	5
4.1 DETAILS OF E.U.T.	5
4.2 DESCRIPTION OF SUPPORT UNITS.....	5
4.3 MEASUREMENT UNCERTAINTY	6
4.4 TEST LOCATION	7
4.5 TEST FACILITY	7
4.6 DEVIATION FROM STANDARDS	7
4.7 ABNORMALITIES FROM STANDARD CONDITIONS.....	7
5 EQUIPMENT LIST	8
6 RADIO SPECTRUM TECHNICAL REQUIREMENT	9
6.1 ANTENNA REQUIREMENT.....	9
7 RADIO SPECTRUM MATTER TEST RESULTS	10
7.1 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ).....	10
7.2 20DB BANDWIDTH.....	14
7.3 FILED STRENGTH OF FUNDAMENTAL AND RADIATION SPURIOUS EMISSION	16
7.4 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS.....	35
8 TEST SETUP PHOTOGRAPHS.....	42
9 EUT CONSTRUCTIONAL DETAILS.....	42



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 12V
Test voltage:	AC120V/60Hz
Number of Channels:	1
Frequency:	24GHz-24.25GHz
Center frequency:	24.125GHz
Modulation Technique:	FMCW
Antenna Type:	Integrated Patch Antenna
Output Power:	Peak: 91.08dBuV/m @1m AV: 76.84dBuV/m @1m

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	HONOTO	ADS-12AM-12 12012EPCU	/



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4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Timeout	2s
2	Duty Cycle	0.37%
3	Occupied Bandwidth	3%
4	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
5	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
6	Temperature Test	1°C
7	Humidity Test	3%
8	Supply Voltages	1.5%
9	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 (ISED) Canada as an accredited testing laboratory.

CAB Identifier: CN0072.

- **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



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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	02/01/2022	01/31/2023
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	02/01/2022	01/31/2023
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 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	02/22/2022	02/21/2023
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	02/22/2022	02/21/2023
9	Horn-antenna(40-60GHz)	REBES	SAZ-2410-19-S1	06299-01	N/A	N/A
10	Horn-antenna(50-75GHz)	REBES	SAZ-2410-15-S1	01731-01	N/A	N/A
11	Horn-antenna(75-110GHz)	REBES	SAZ-2410-10-S1	01773-09	N/A	N/A
12	Horn-antenna(110-170GHz)	REBES	SAZ-2410-06-S1	01776-05	N/A	N/A
13	Horn-antenna(140-220GHz)	REBES	SAZ-2410-05-S1	01759-04	N/A	N/A
14	Horn-antenna(220-325GHz)	REBES	SAR-2309-03-S2	06300-01	N/A	N/A
15	Extended waveguide(40-60GHz)	REBES	SWG-19025-FB	06303-01	N/A	N/A
16	Extended waveguide(50-75GHz)	REBES	SWG-15025-FB	01525-09	N/A	N/A
17	Extended waveguide(75-110GHz)	REBES	SWG-10025-FB	01509-01	N/A	N/A
18	Extended waveguide(110-170GHz)	REBES	SWG-06025-FB	06302-01	N/A	N/A
19	Extended waveguide(140-220GHz)	REBES	SWG-05025-FB	06304-01	N/A	N/A
20	Extended waveguide(220-325GHz)	REBES	SWG-03025-FB	06301-01	N/A	N/A
21	Harmonic mixer(110-170GHz)	REBES	STH-06SF-S1	06110-01	N/A	N/A
22	Harmonic mixer(40-60GHz)	REBES	STH-19SF-S1	06937-01	N/A	N/A
23	Waveguide Harmonic Mixer(50-75GHz)	KEYSIGHT	M1970V	MY51390966	N/A	N/A
24	Waveguide Harmonic Mixer(50-75GHz) cable	Silverline	SLU18-SMSM-01.00M	99612	N/A	N/A
25	Waveguide Harmonic Mixer(75-110GHz)	KEYSIGHT	M1970W	MY51430883	N/A	N/A
26	Waveguide Harmonic Mixer(75-110GHz) cable	Silverline	SLU18-SMSM-01.00M	94202	N/A	N/A
27	Pre-Amplifier(30MHz~18GHz)	LNA	/	/	04/15/2021	04/14/2022
28	Amplifier(18~40GHz)	COM-POWER	PAM-840A	461332	10/18/2021	10/17/2022
29	Low Pass Filter	MICRO-TRONICS	VLFX-950	RV142900829	N.C.R	N.C.R
30	High Pass Filter	Mini-Circuits	VHF-1200	15542	N.C.R	N.C.R
31	RE test cable	/	RE01-RE04	/	04/15/2021	04/14/2022
32	PXA Spectrum Analyzer	KEYSIGHT	N9010A	MY56480443	02/01/2022	01/31/2023
33	Vector Signal Generator	R&S	SMW200A	110074	10/12/2021	10/12/2022
34	Software	Farad	EZ-EMC	CCS-03A1	N/A	N/A



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

FCC 47 CFR Part 15C Section 15.203

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 an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an 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 Integrated Patch Antenna and no consideration of replacement.

Antenna location: Refer to EUT Photos.



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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.

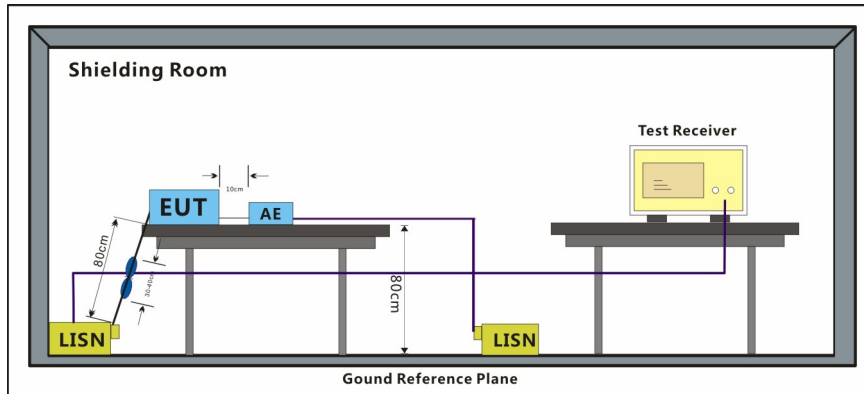
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test Mode: a: TX mode _ Keep the EUT in continuously transmitting mode.

7.1.2 Test Setup Diagram



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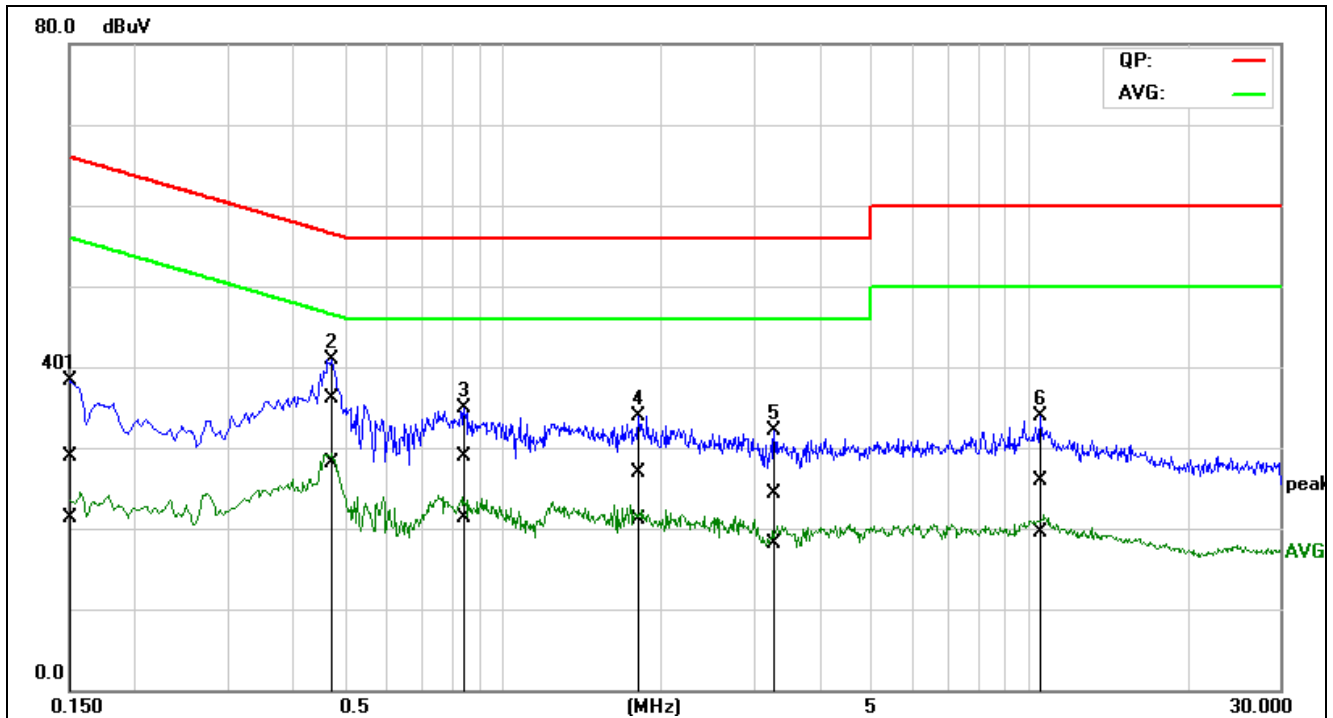
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7.1.3 Measurement Procedure and Data

- 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 the interface cables must be changed according to ANSI C63.10 on conducted measurement.



Mode: a; Line: Live Line



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
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

Remark:

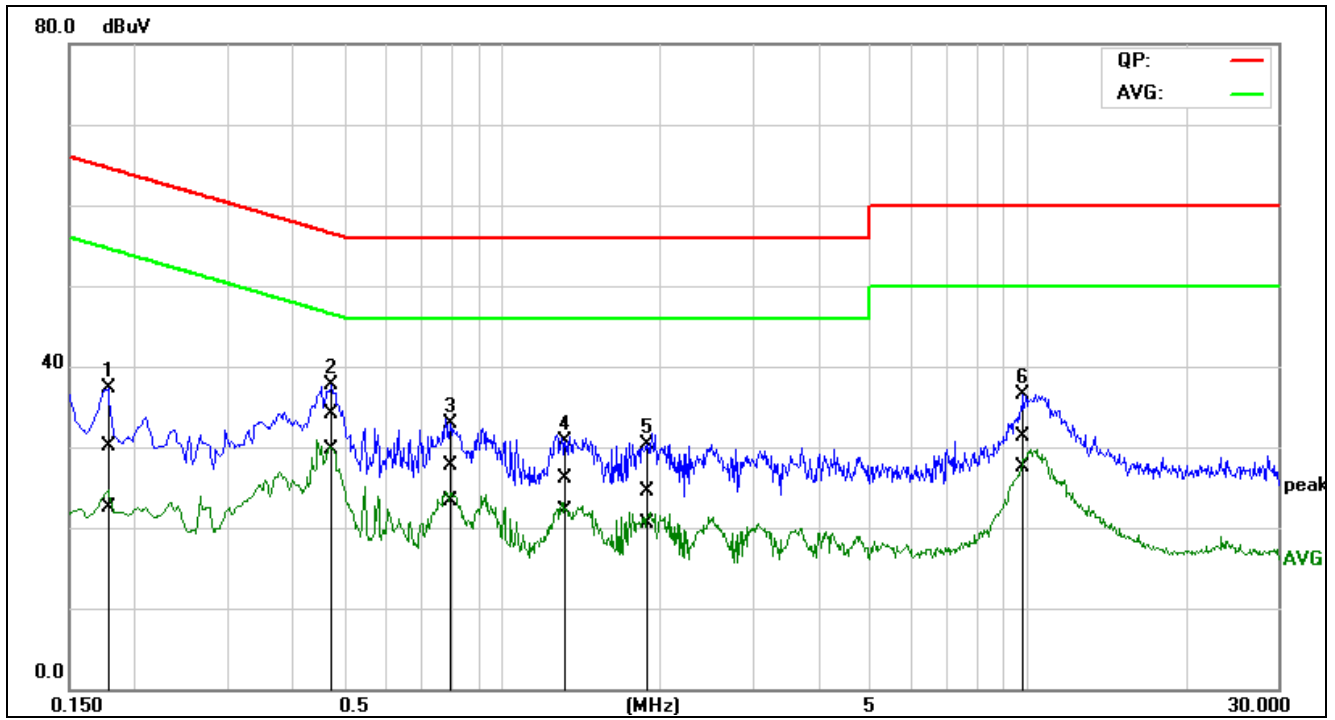
- 1.Result (dBuV) = Reading(dBuV) + Correction Factor (dB)
- 2.Correction Factor (dB)=LISN Factor (dB)+Cable Loss (dB)



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Mode: a; Line: Neutral Line



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
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

Remark:

- 1.Result (dBuV) = Reading(dBuV) + Correction Factor (dB)
- 2.Correction Factor (dB)=LISN Factor (dB)+Cable Loss (dB)



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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

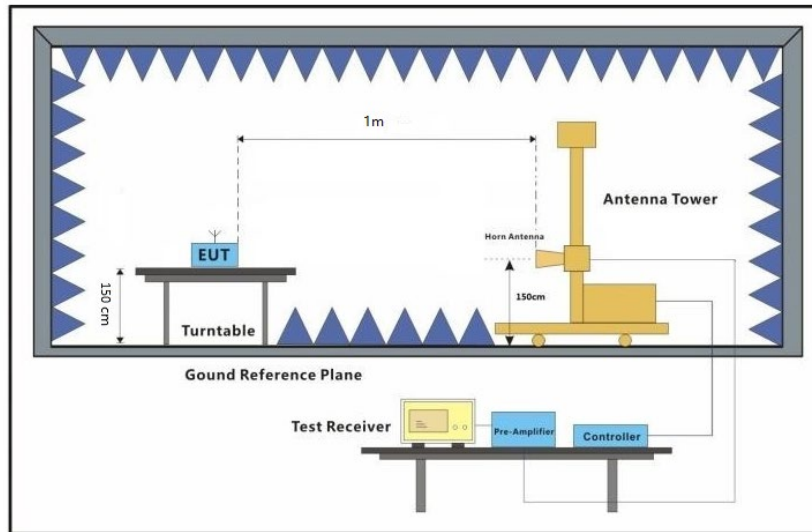
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test Mode: a: TX mode _ Keep the EUT in continuously transmitting mode.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

- 1) Place the EUT on the table and set it in the transmitting mode
- 2) SA set RBW=1%~5% OBW, VBW=RBW and Detector=Peak
- 3) Measure and record the result of 20dB bandwidth



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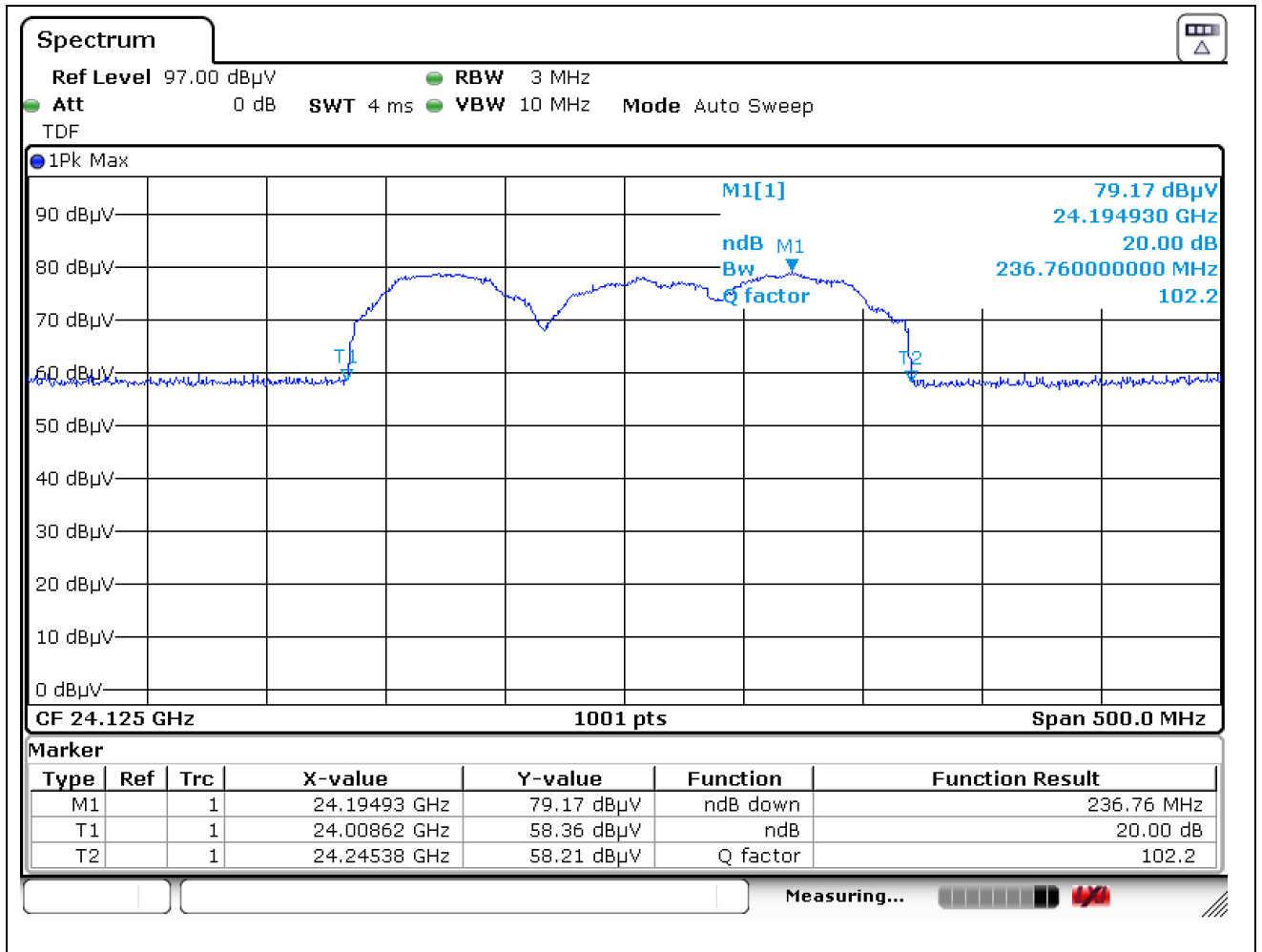
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Low Frequency (GHz)	Limit (GHz)	High Frequency (GHz)	Limit (GHz)	20db Bandwidth (MHz)	Result
24.125	24.00	24.24538	24.25	236.76	Pass



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7.3 Filed Strength of Fundamental and Radiation Spurious Emission

Test Requirement: 47 CFR Part 15, Subpart C 15.249(a)
Test Method: ANSI C63.10 (2013) Section 6.6
Limit:

FCC according to §15.249(a).

(1) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

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

* Field strength limits are specified at a distance of 3 meters.

Fundamental Limit Conversion			
Average (mV/m) at 3M	Average (dBuV/m) at 3M	Average (dBuV/m) at 1M	Peak (dBuV/m) at 1M
250	107.9588	117.50	137.50

* (Limit = 107.9588 + 20LOG(3/1) = 117.50 dBuV/m)

Harmonic Limit Conversion			
Average (uV/m) at 3M	Average (dBuV/m) at 3M	Average (dBuV/m) at 1M	Peak (dBuV/m) at 1M
2500	67.9588	77.50	97.50

*(Limit=67.9588+20LOG(3/1)=77.50 dBuV/m)

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

Below 30MHz

Frequency	Field Strength (µA/m)	Magnetic field strength (H-Field) (µA/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)



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Frequency	Field Strength microvolts/m at specific distance	
	Transmitters	Receivers
18-40GHz	63.5dBuV/m@1m	63.5dBuV/m@1m
Above 40GHz	80.00dBuV/m @0.15m	80.00dBuV/m @0.15m



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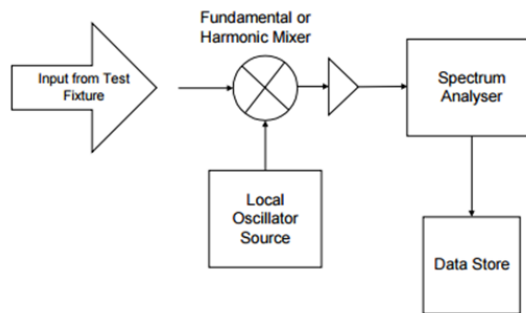
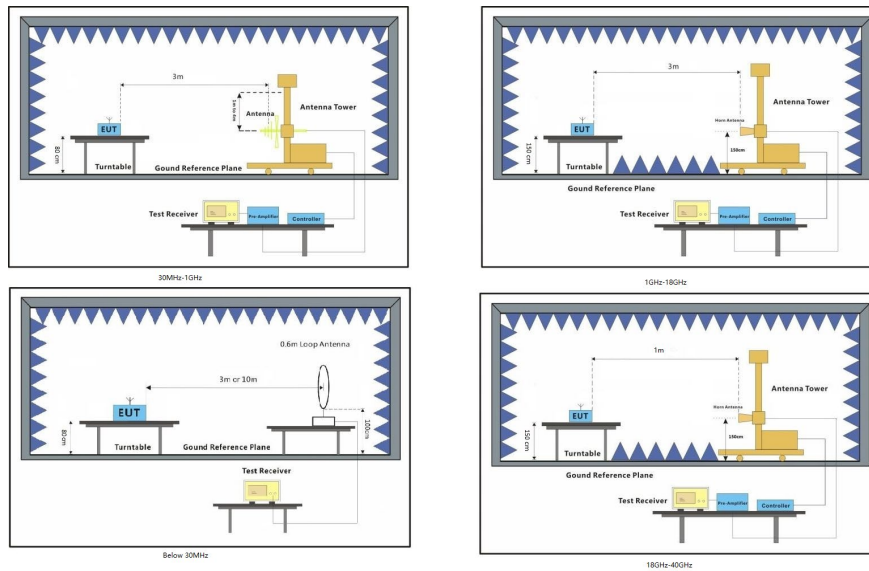
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7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar
Test Mode: a: TX mode _ Keep the EUT in continuously transmitting mode.

7.3.2 Test Setup Diagram



Above 40GHz



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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 1-18GHz, 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. For 18-40GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 1 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 40GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 0.15 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation
- 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.
- 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: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: 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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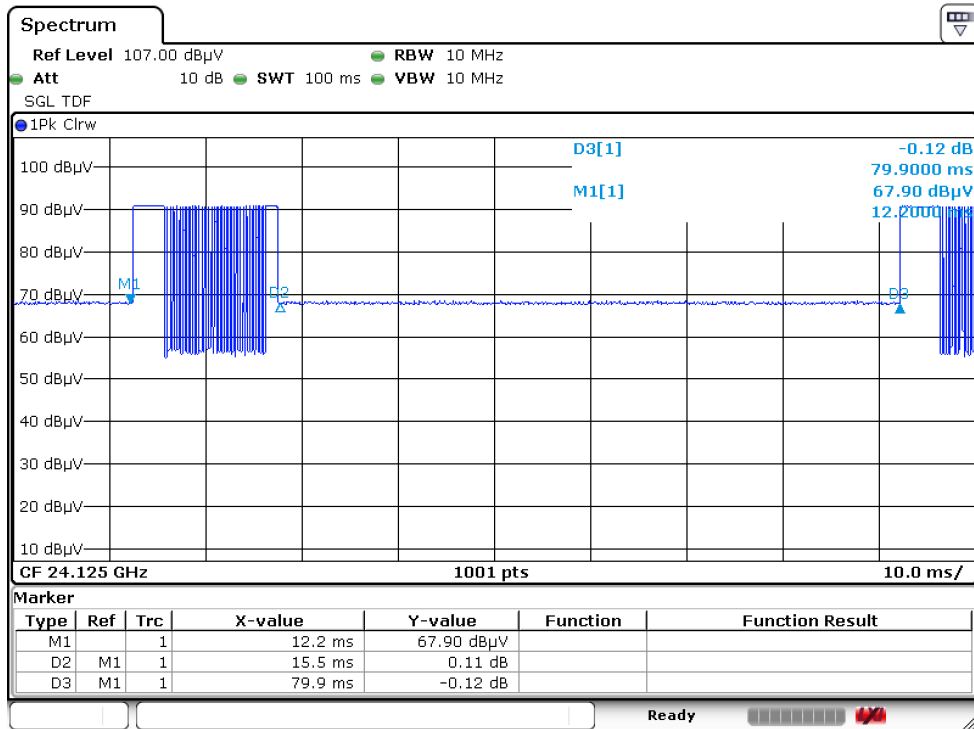
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Filed Strength of Fundamental

Duty cycle:

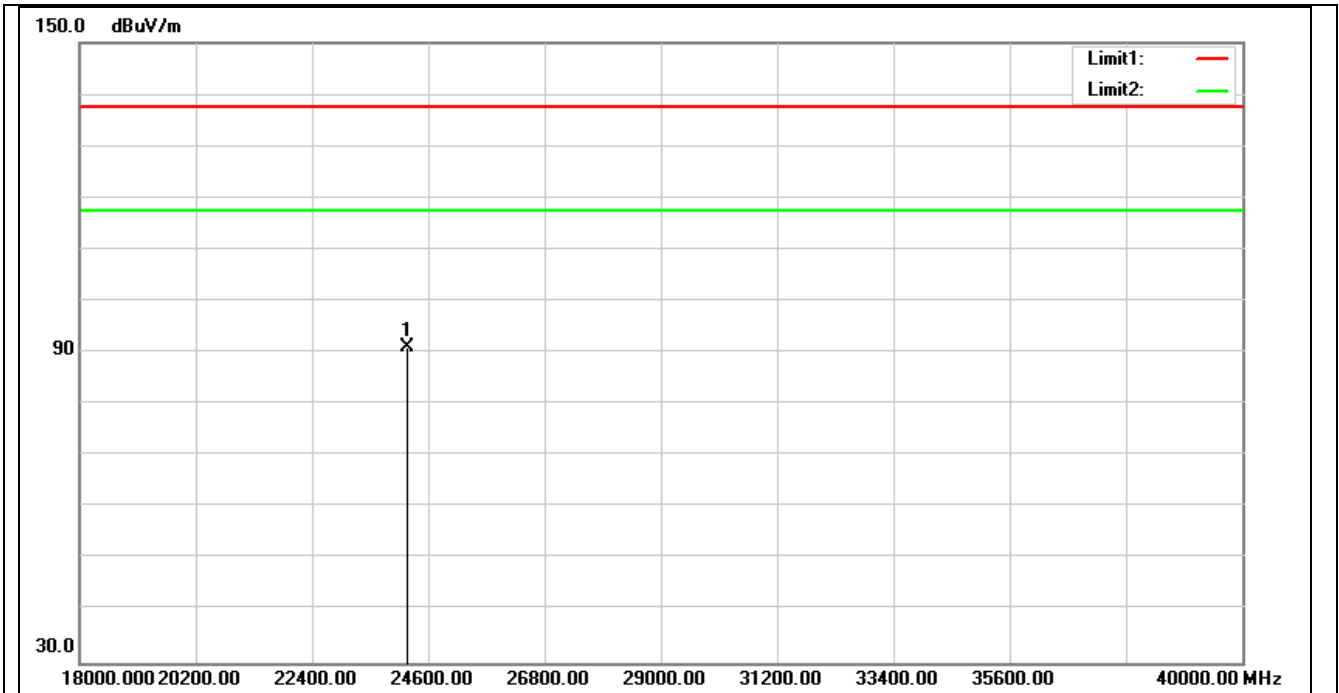


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Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	24196.400	78.52	12.56	91.08	137.50	-46.42	peak

Frequency (GHz)	Distance(m)	Polarity	dBuV/m	Limit	Result	Remark
24.125	1	Vertical	91.08	137.50	Pass	peak
24.125	1	Vertical	76.84	117.50	Pass	average

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)
- 3.If the Peak value below the AV Limit, the AV test doesn't perform for this submission.

Average level=Peak level-Duty Cycle Factor

Duty Cycle Factor= 20log(Duty Cycle)=14.24dB



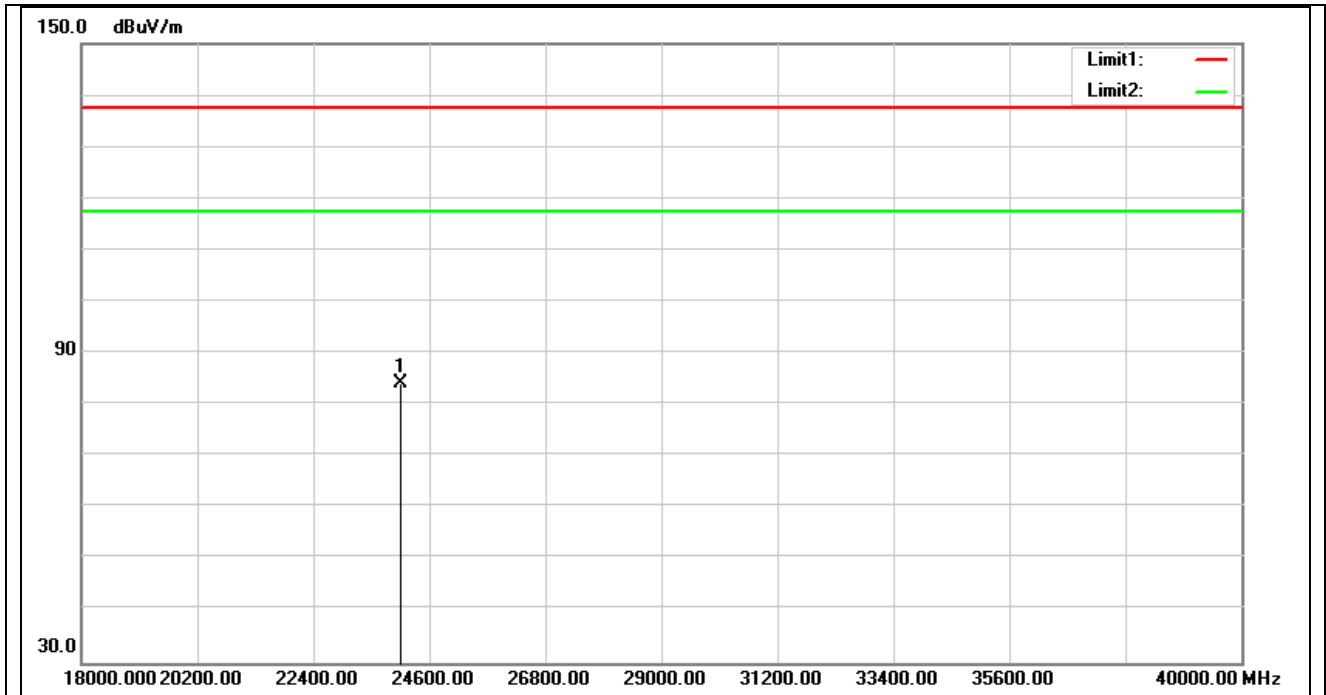
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Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	24066.200	71.52	12.64	84.16	137.50	-53.34	peak

Frequency (GHz)	Distance(m)	Polarity	dBuV/m	Limit	Result	Remark
24.125	1	Horizontal	84.16	137.50	Pass	peak
24.125	1	Horizontal	69.92	117.50	Pass	average

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
 - 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)
 - 3.If the Peak value below the AV Limit, the AV test doesn't perform for this submission.
- Average level=Peak level-Duty Cycle Factor
Duty Cycle Factor= 20log(Duty Cycle)=14.24dB

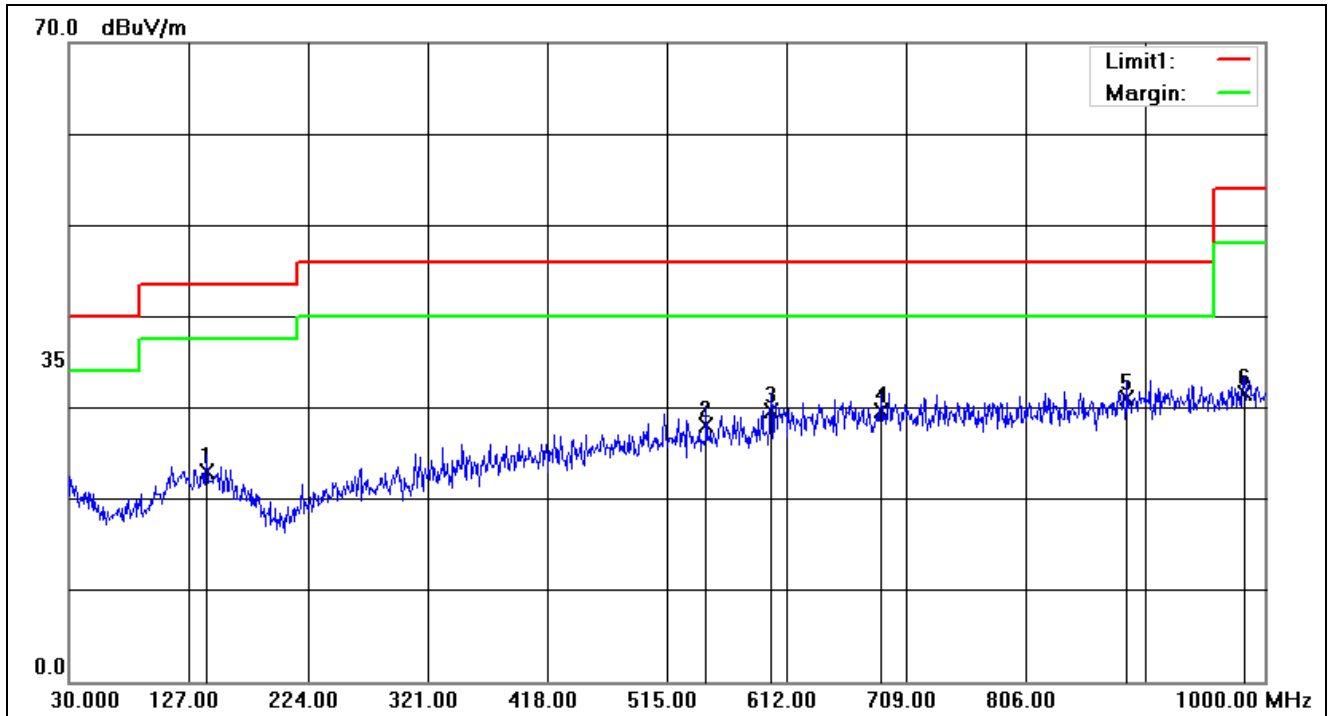


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Radiation Spurious Emission
30MHz-1GHz Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	141.5500	3.14	19.86	23.00	43.50	-20.50	QP
2	547.0100	2.37	25.79	28.16	46.00	-17.84	QP
3	599.3900	3.13	26.50	29.63	46.00	-16.37	QP
4	688.6300	2.22	27.41	29.63	46.00	-16.37	QP
5	888.4500	2.53	28.53	31.06	46.00	-14.94	QP
6	983.5100	2.35	29.23	31.58	54.00	-22.42	QP

Remark:

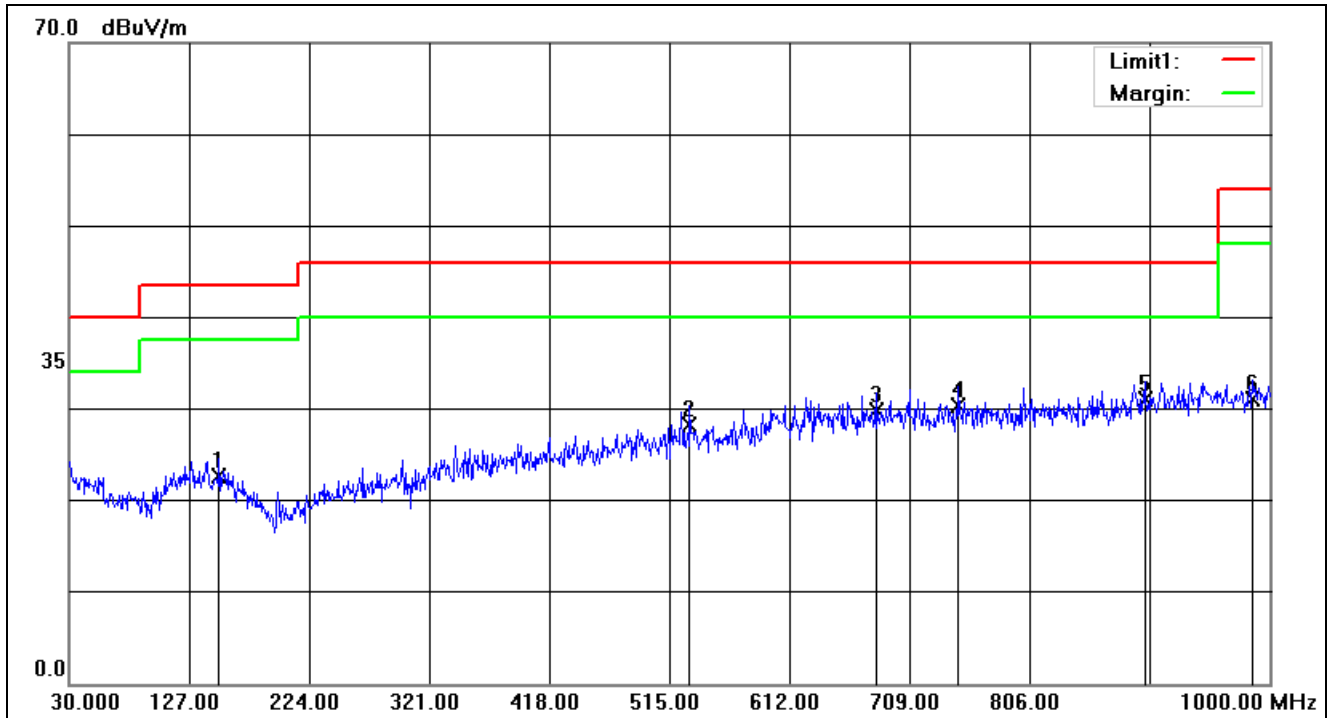
- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



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30MHz-1GHz Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	151.2500	2.55	20.04	22.59	43.50	-20.91	QP
2	531.4900	2.72	25.61	28.33	46.00	-17.67	QP
3	681.8400	2.47	27.36	29.83	46.00	-16.17	QP
4	748.7700	2.92	27.48	30.40	46.00	-15.60	QP
5	899.1200	2.34	28.66	31.00	46.00	-15.00	QP
6	986.4200	1.92	29.23	31.15	54.00	-22.85	QP

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)

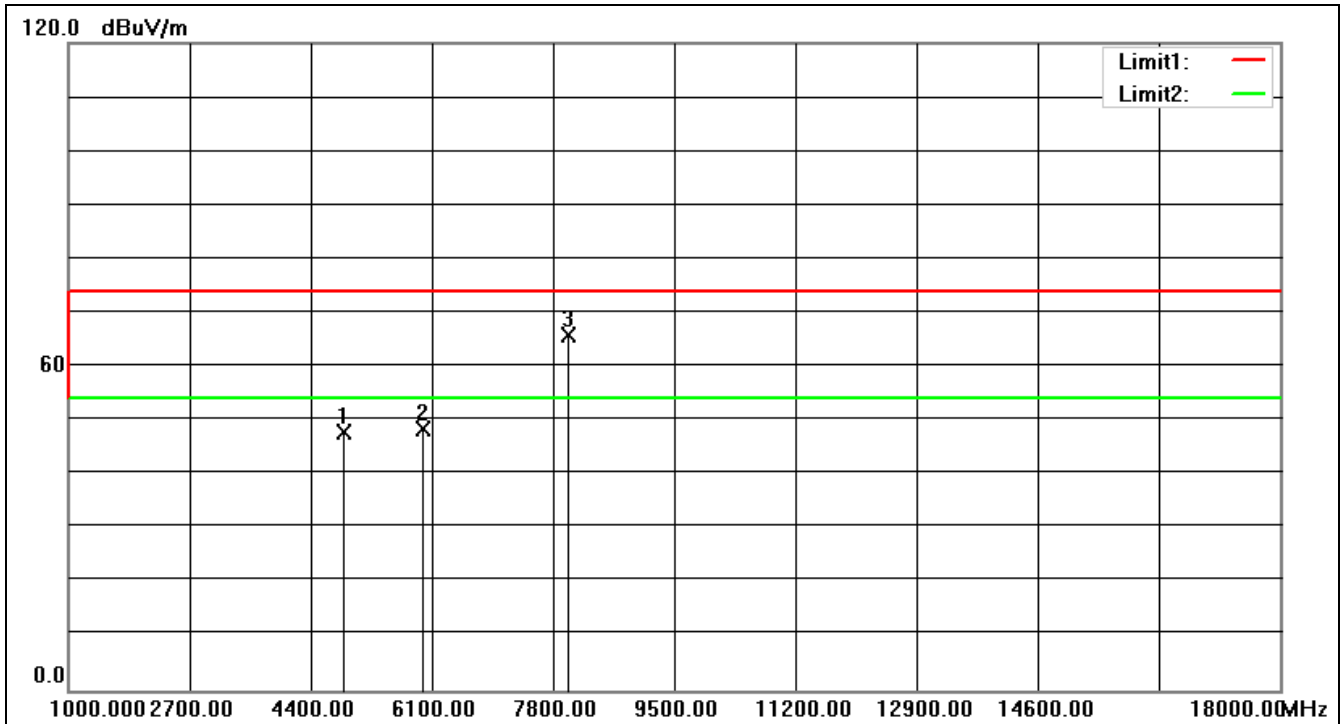


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1-18GHz Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4859.000	57.23	-9.50	47.73	74.00	-26.27	peak
2	5964.000	55.52	-7.04	48.48	74.00	-25.52	peak
3	8004.000	66.91	-1.19	65.72	74.00	-8.28	peak

Frequency (GHz)	Distance (m)	Polarity	dBuV/m	Limit	Result	Remark
8.004	3	Vertical	65.72	74.00	Pass	peak
8.004	3	Vertical	51.48	54.00	Pass	AVG

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)

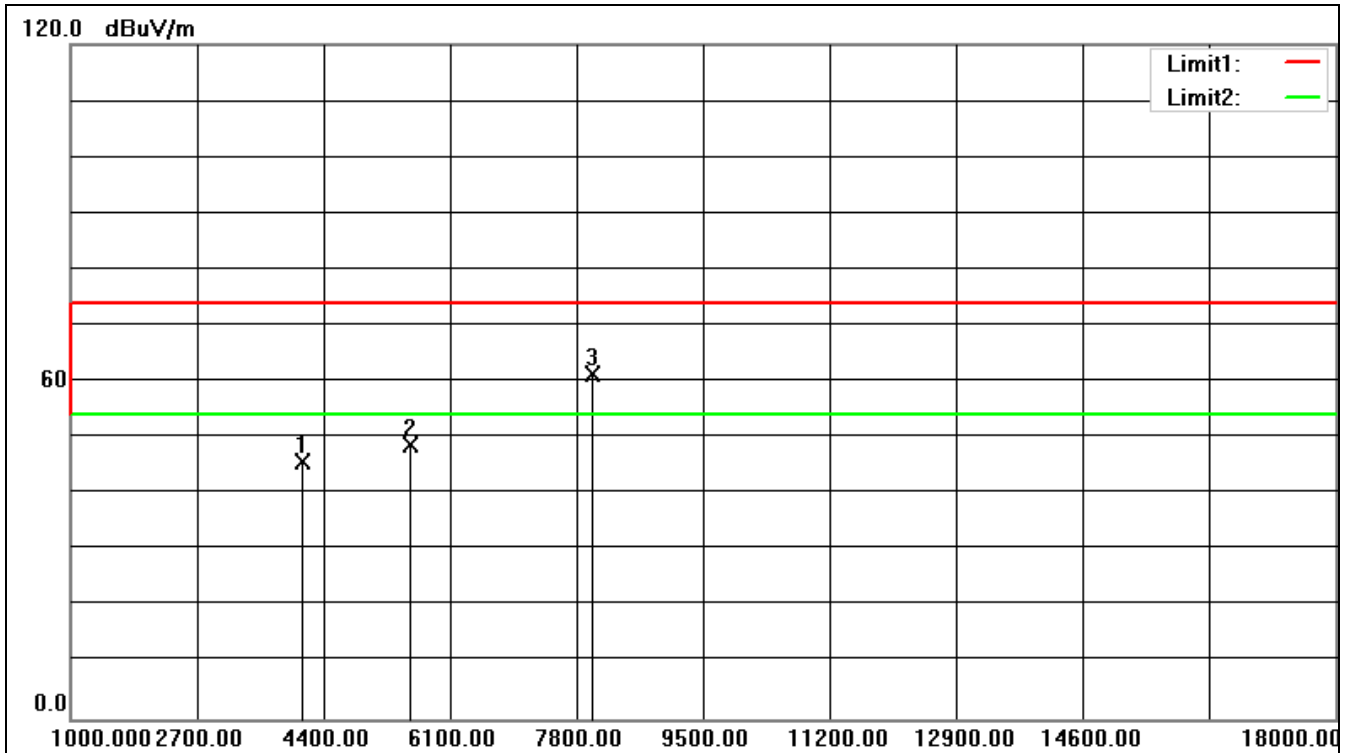


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1-18GHz Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4111.000	57.36	-11.62	45.74	74.00	-28.26	peak
2	5573.000	56.64	-7.77	48.87	74.00	-25.13	peak
3	8004.000	62.56	-1.19	61.37	74.00	-12.63	peak

Frequency (GHz)	Distance (m)	Polarity	dBuV/m	Limit	Result	Remark
8.004	3	Horizontal	61.37	74.00	Pass	peak
8.004	3	Horizontal	47.13	54.00	Pass	AVG

Remark:

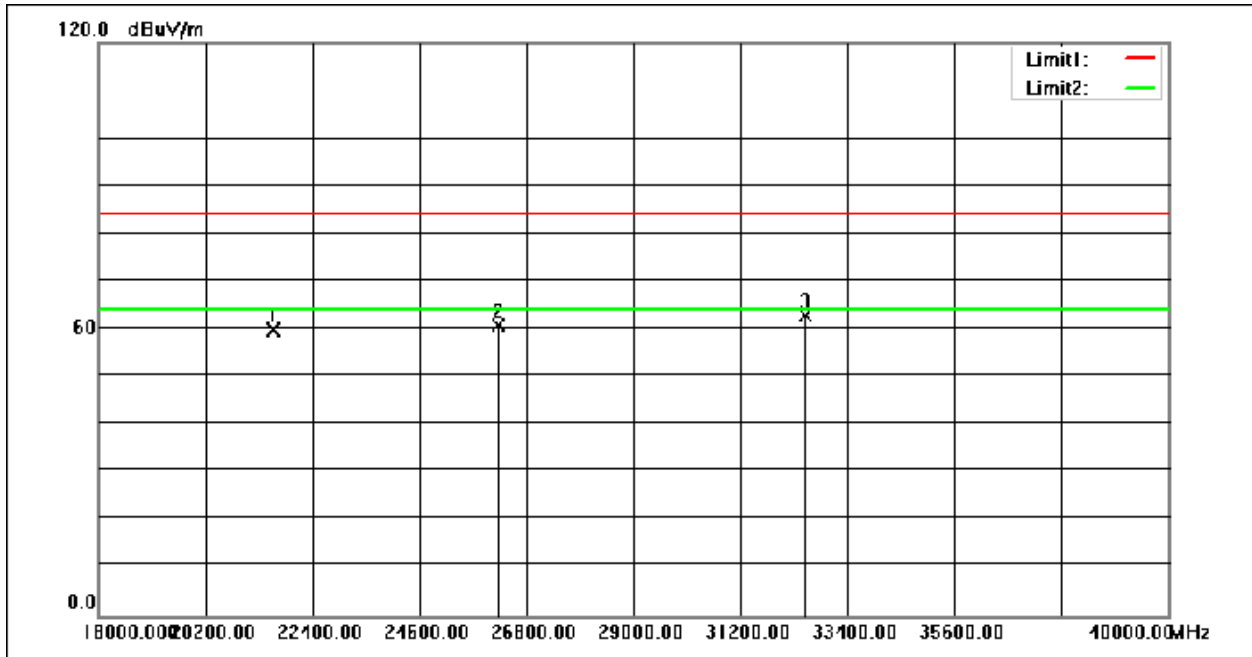
- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



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18-40GHz Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	21586.000	46.98	12.73	59.71	84.00	-24.29	peak
2	26228.000	45.24	15.59	60.83	84.00	-23.17	peak
3	32520.000	46.50	16.31	62.81	84.00	-21.19	peak

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



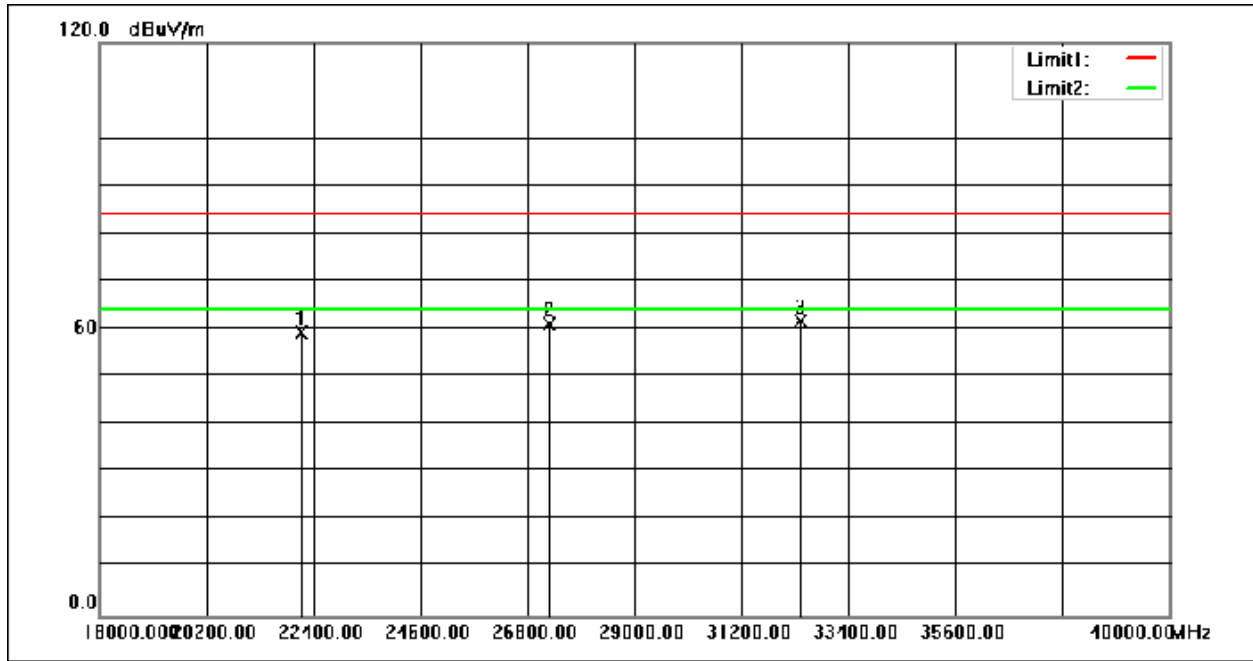
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18-40GHz Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	22136.000	46.26	12.91	59.17	84.00	-24.83	peak
2	27262.000	45.64	15.47	61.11	84.00	-22.89	peak
3	32410.000	45.74	15.96	61.70	84.00	-22.30	peak

Remark:

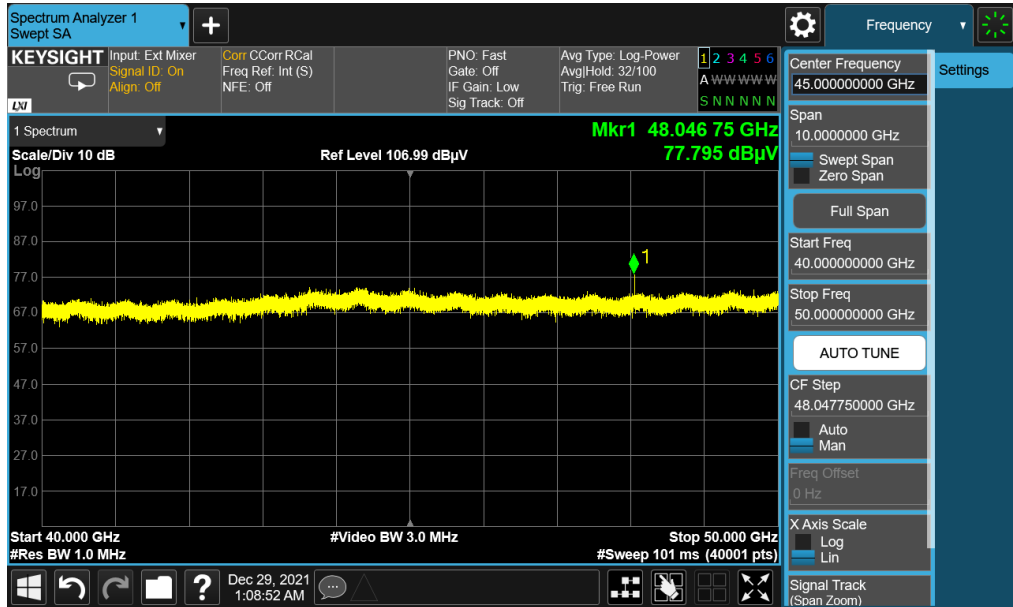
- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



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40-50GHz Vertical



Frequency (GHz)	Distance (M)	Peak Value (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
48.04675	0.15	77.795	80.00	V	PASS

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



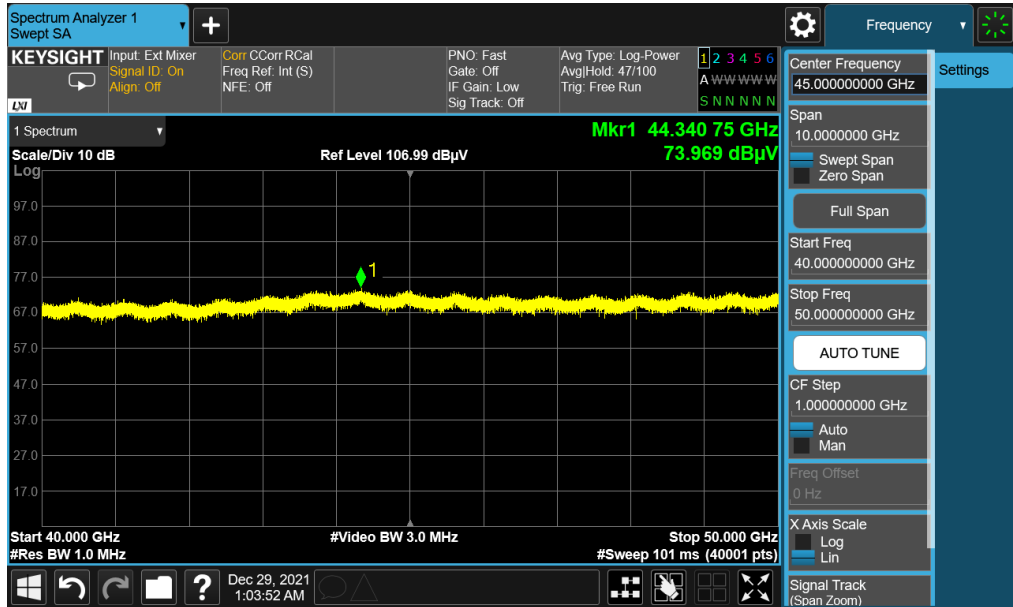
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40-50GHz Horizontal



Frequency (GHz)	Distance (M)	Peak Value (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
44.34075	0.15	73.969	80.00	H	PASS

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)

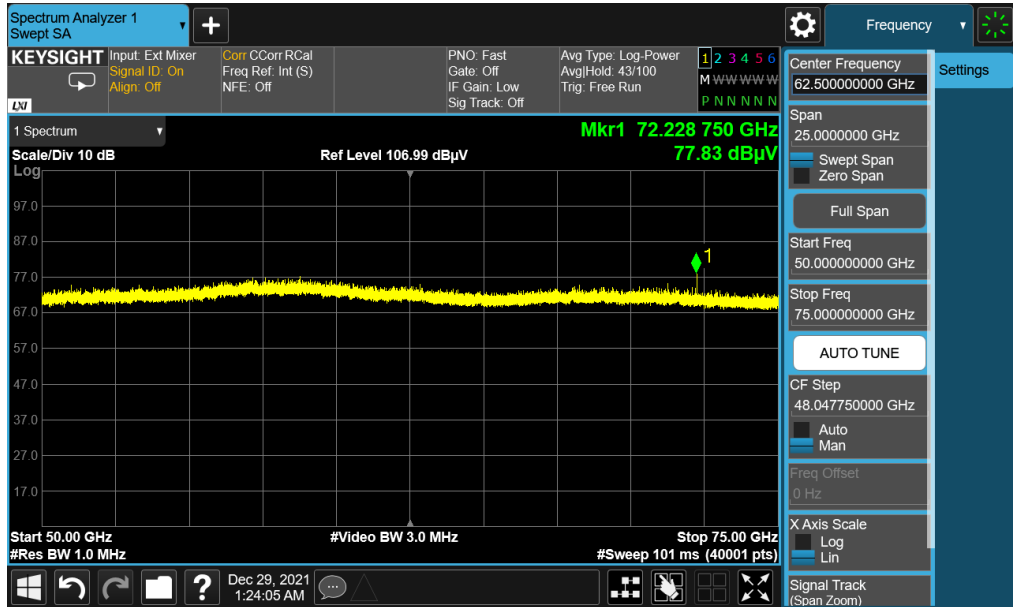


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50-75GHz Vertical



Frequency (GHz)	Distance (M)	Peak Value (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
72.228750	0.15	77.93	80.00	V	PASS

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)

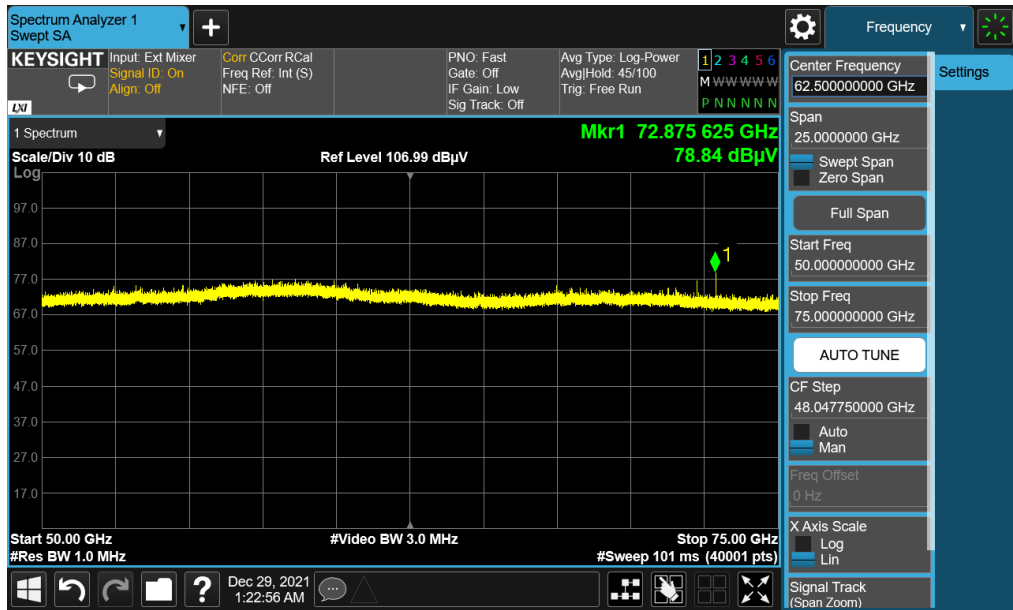


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50-75GHz Horizontal



Frequency (GHz)	Distance (M)	Peak Value (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
72.875625	0.15	78.84	80.00	H	PASS

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)

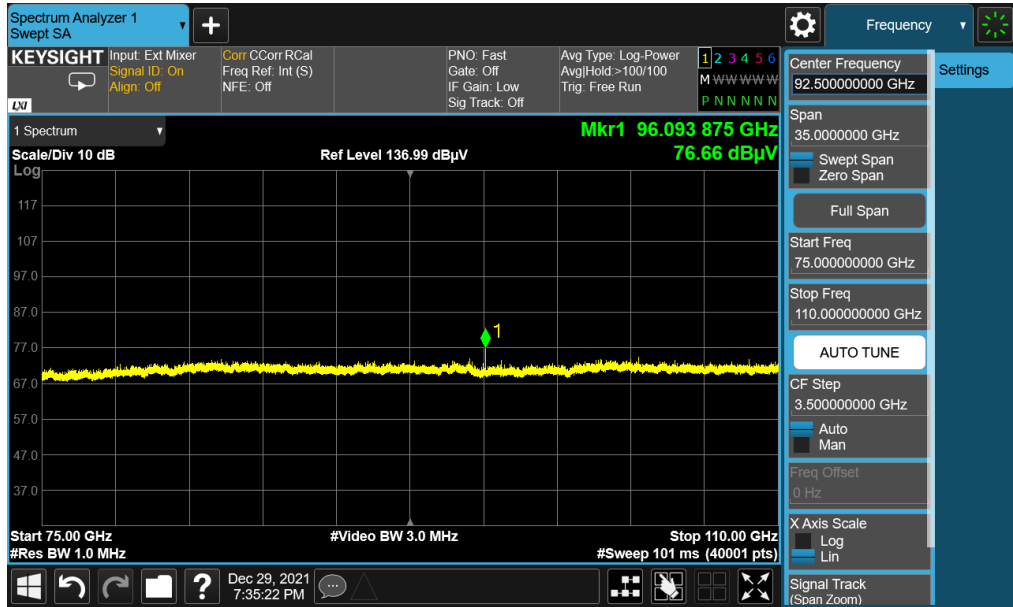


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75-110GHz Vertical



Frequency (GHz)	Distance (M)	Peak Value (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
96.093875	0.15	76.66	80.00	V	PASS

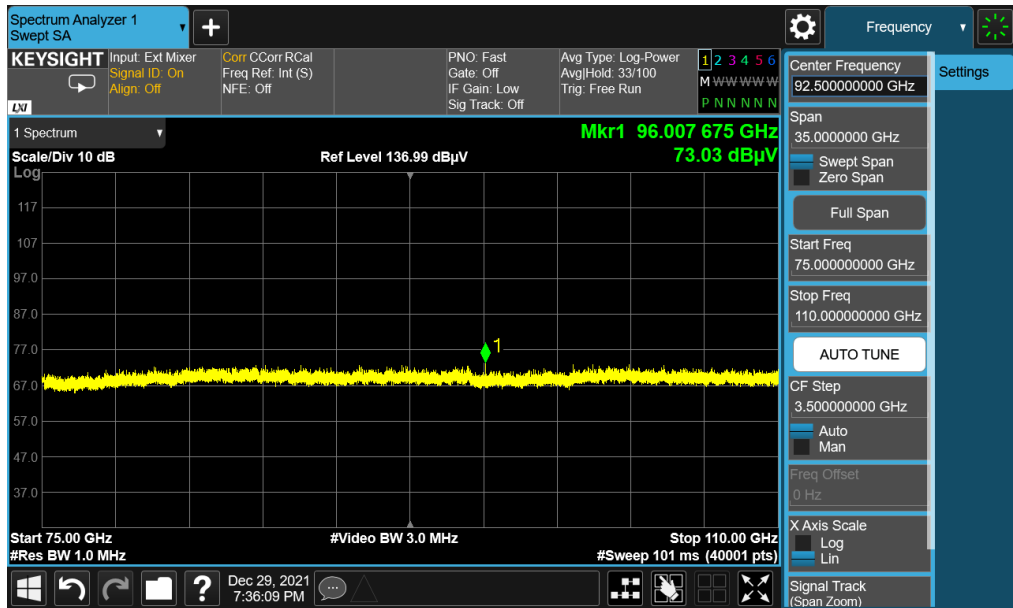
Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



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75-110GHz Horizontal



Frequency (GHz)	Distance (M)	Peak Value (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
96.007675	0.15	73.03	80.00	H	PASS

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



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7.4 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

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
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.

Remark: For measurement distance 1m, the field strength doesn't exceed 80.00 dBuV/m



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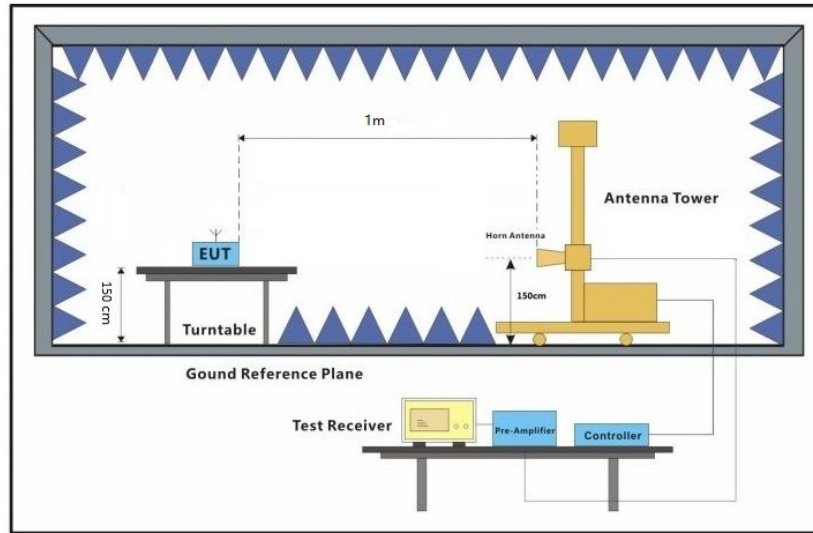
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test Mode: a: TX mode _ Keep the EUT in continuously transmitting mode.

7.4.2 Test Setup Diagram



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7.4.3 Measurement Procedure and Data

- 1) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 1 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2) 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.
- 3) 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.
- 4) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 5) 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.
- 6) 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.
- 7) Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: 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.

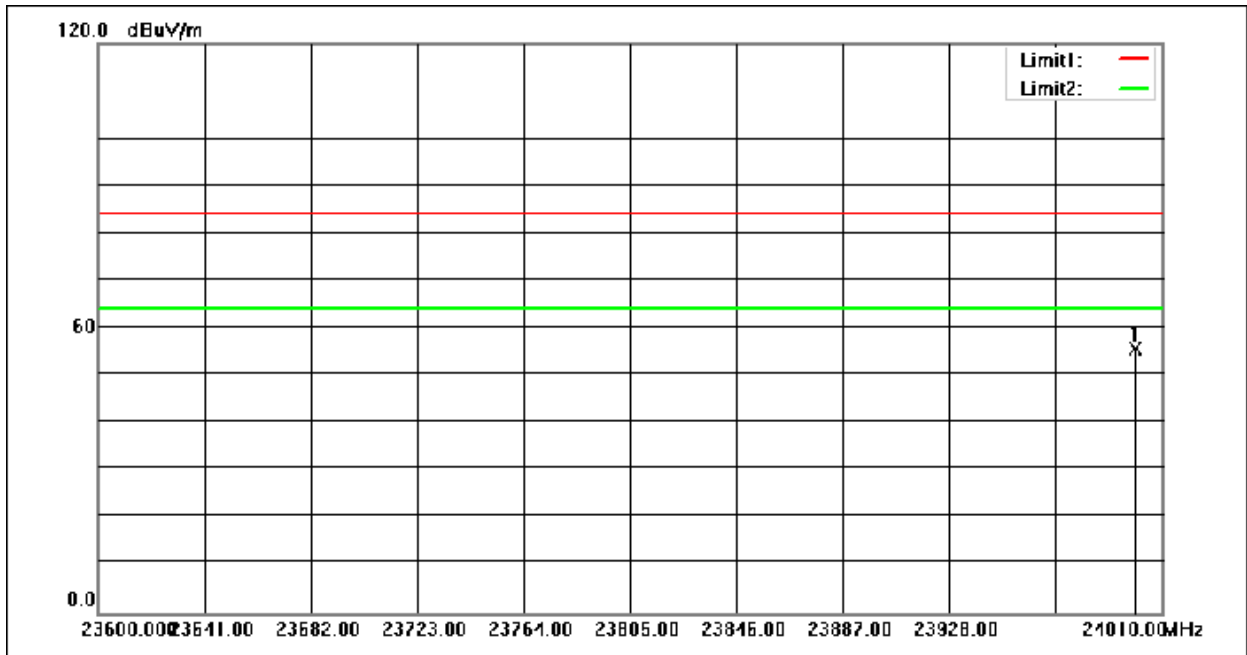


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Polarization:Vertical; Modulation: FMCW;



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	24000.000	43.00	12.68	55.68	84.00	-28.32	peak

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



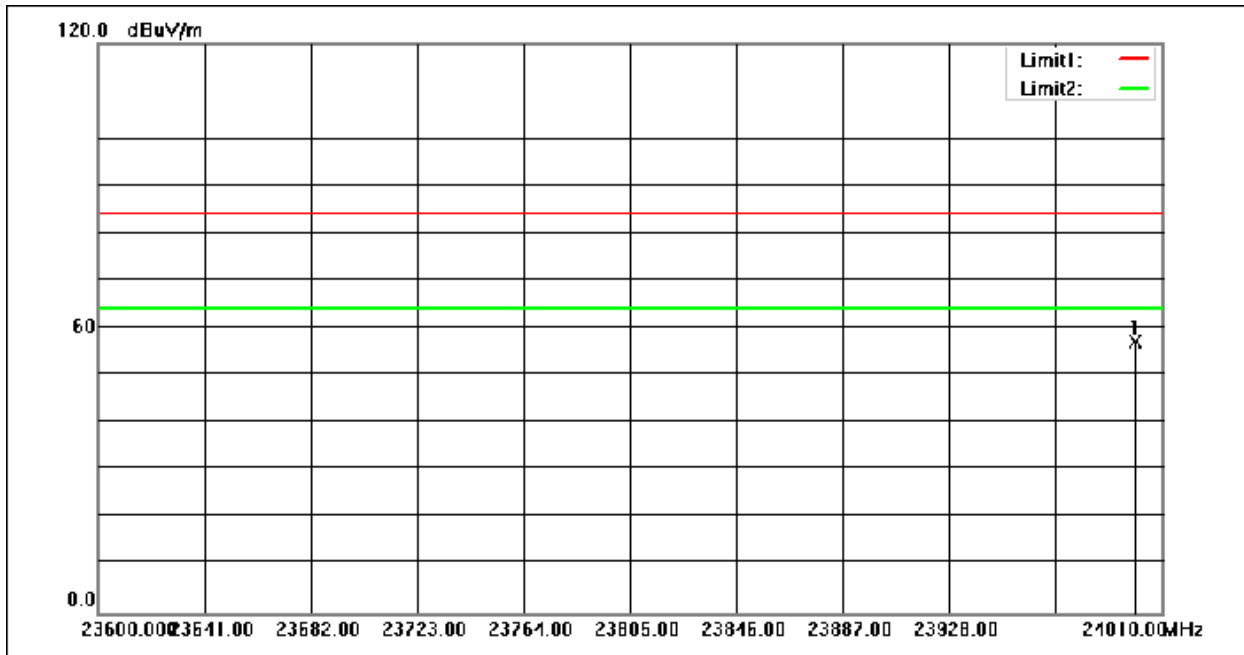
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Polarization:Horizontal; Modulation: FMCW;



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	24000.000	44.49	12.68	57.17	84.00	-26.83	peak

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



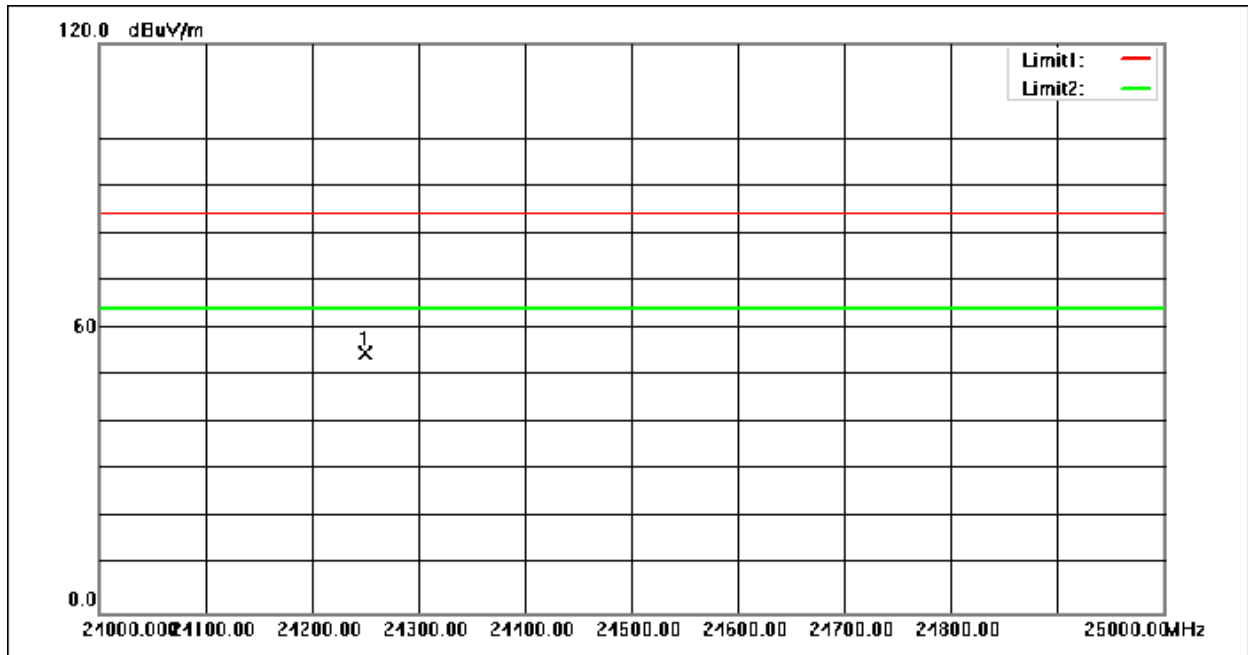
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Polarization:Horizontal; Modulation: FMCW;



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	24250.000	42.37	12.52	54.89	84.00	-29.11	peak

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)

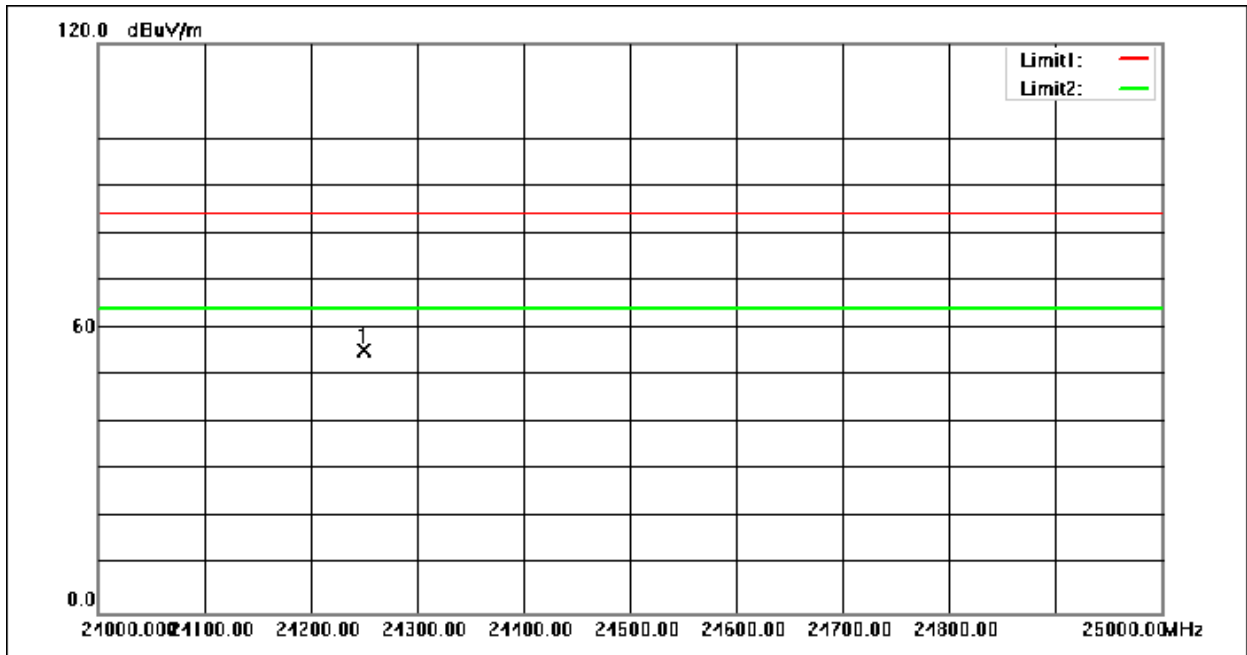


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Polarization:Vertical; Modulation: FMCW;



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	24250.000	42.68	12.52	55.20	84.00	-28.80	peak

Remark:

- 1.Result (dBuV/m) = Reading(dBuV/m) + Correction Factor (dB/m)
- 2.Correction Factor (dB/m)=Antenna Factor (dB/m)+Cable Loss (dB)- Amplifier (dB)



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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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