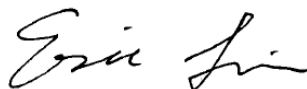


TEST REPORT

Application No.: KSEM2306001338AT (SHCR2305000966HS)
FCC ID: N82-KOHLER053
IC: 4554A-KOHLER053
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, 200444, PRC
Factory: Shanghai Kohler Electronics., Ltd
Address of Factory: No.1955, Fengxiang Road, Baoshan Area, Shanghai, 200444, PRC
Equipment Under Test (EUT):
EUT Name: 24GHz Radar
Model No.: 1521835
Trade Mark: KOHLER
Standard(s) : 47 CFR Part 15, Subpart C 15.249
 RSS-210 Issue10, December 2019
 RSS-Gen Issue 5 Amendment 2 (February 2021)
Date of Receipt: 2023-05-16
Date of Test: 2023-05-17 to 2023-06-12
Date of Issue: 2023-06-16

Test Result:	Pass*
---------------------	--------------

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



Eric Lin
Laboratory Manager


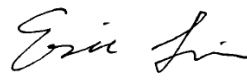


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Revision Record			
Version	Description	Date	Remark
00	Original	2023-06-16	/

Authorized for issue by:			
			
		<hr/>	
		Eric Liu/Project Engineer	
			
		<hr/>	
		Eric Lin/Reviewer	



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2 Test Summary

Radio Spectrum Technical Requirement				
Item	FCC Requirement	IC Requirement	Method	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	RSS-Gen Clause 6.8	N/A	Pass

Radio Spectrum Matter Part				
Item	FCC Requirement	IC Requirement	Method	Result
20dB Bandwidth	47 CFR Part 15, Subpart C 15.249	RSS-Gen Section 6.7	ANSI C63.10 (2013) Section 6.9	Pass
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	RSS-210 Issue10 Annex B B.10	ANSI C63.10 (2013) Section 6.5&6.6	Pass
Restricted Band Around Fundamental Frequency	47 CFR Part 15, Subpart C 15.249	RSS-210 Issue10 Annex B B.10& RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.4&6.5&6.6	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	RSS-210 Issue10 Annex B B.10& RSS-Gen Section 8.9	ANSI C63.10 (2013) Section 6.4&6.5&6.6	Pass
99% Bandwidth	-	RSS-Gen Section 6.7	ANSI C63.10 Section 6.9.3	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 5V
Test voltage:	DC 5V
Operation Frequency Range:	24.00GHz to 24.25GHz
Modulation:	FMCW
Antenna type:	PCB Antenna
S/N:	0000
Firmware Version:	5.0.12

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
The EUT has been tested as an independent unit.			

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 ⁻⁸
2	Occupied Bandwidth	3%
3	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
4	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
5	Temperature Test	1°C
6	Humidity Test	3%
7	Supply Voltages	1.5%
8	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.

Note:

1.SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).

2.SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

4.5 Test Facility

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

- **A2LA**

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

- **FCC**

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

- **ISED**

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**

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
RF Radiated Test						
1	Spectrum Analyzer	R&S	FSV40	101493	10/11/2022	10/10/2023
2	Signal Generator	Agilent	E8257C	MY43321570	10/18/2022	10/17/2023
3	Loop Antenna	Schwarzbeck	HXYZ9170	9170-108	02/21/2022 02/21/2023	02/20/2023 02/20/2024
4	Bilog Antenna	TESEQ	CBL 6112D	35403	06/21/2022	06/20/2024
5	Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/13/2022	04/12/2024
6	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	267	02/26/2023*	02/25/2024**
7	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	00143290	02/02/2021*	02/01/2031**
8	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	BBHA9170171	02/02/2021*	02/01/2031**
9	Horn-antenna(40-60GHz)	REBES	SAZ-2410-19-S1	06299-01	02/02/2021*	02/01/2031**
10	Horn-antenna(50-75GHz)	REBES	SAZ-2410-15-S1	01731-01	02/02/2021*	02/01/2031**
11	Horn-antenna(75-110GHz)	REBES	SAZ-2410-10-S1	01773-09	02/02/2021*	02/01/2031**
12	Horn-antenna(110-170GHz)	REBES	SAZ-2410-06-S1	01776-05	02/02/2021*	02/01/2031**
13	Horn-antenna(140-220GHz)	REBES	SAZ-2410-05-S1	01759-04	02/02/2021*	02/01/2031**
14	Horn-antenna(220-325GHz)	REBES	SAR-2309-03-S2	06300-01	02/02/2021*	02/01/2031**
15	Extended waveguide(40-60GHz)	REBES	SWG-19025-FB	06303-01	02/02/2021*	02/01/2031**
16	Extended waveguide(50-75GHz)	REBES	SWG-15025-FB	01525-09	02/02/2021*	02/01/2031**
17	Extended waveguide(75-110GHz)	REBES	SWG-10025-FB	01509-01	02/02/2021*	02/01/2031**
18	Extended waveguide(110-170GHz)	REBES	SWG-06025-FB	06302-01	02/02/2021*	02/01/2031**
19	Extended waveguide(140-220GHz)	REBES	SWG-05025-FB	06304-01	10/01/2020*	09/30/2030**
20	Extended waveguide(220-325GHz)	REBES	SWG-03025-FB	06301-01	02/21/2017*	02/20/2027**
21	Harmonic mixer(110-170GHz)	REBES	STH-06SF-S1	06110-01	12/08/2016*	12/07/2026**
22	Harmonic mixer(40-60GHz)	REBES	STH-19SF-S1	06937-01	08/31/2020*	08/30/2030**
23	Waveguide Harmonic Mixer(50-75GHz)	KEYSIGHT	M1970V	MY51390966	05/19/2020*	05/18/2030**
24	Waveguide Harmonic Mixer(50-75GHz) cable	Silverline	SLU18-SMSM-01.00M	99612	04/20/2021*	04/19/2031**
25	Waveguide Harmonic Mixer(75-110GHz)	KEYSIGHT	M1970W	MY51430883	02/02/2021*	02/01/2031**
26	Waveguide Harmonic Mixer(75-110GHz) cable	Silverline	SLU18-SMSM-01.00M	94202	02/02/2021*	02/01/2031
27	Pre-Amplifier(30MHz~18GHz)	LNA	/	/	01/17/2023	01/16/2024
28	Amplifier(18~40GHz)	COM-POWER	PAM-840A	461332	01/17/2023*	01/16/2024**
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	/	04/14/2023	04/13/2024
32	PXA Spectrum Analyzer	KEYSIGHT	N9010A	MY56480443	01/31/2023	01/30/2024
33	Vector Signal Generator	R&S	SMW200A	110074	10/12/2022	10/12/2023
34	Software	Farad	EZ-EMC	CCS-03A1	N/A	N/A
35	Software	ESE	E3_V 6.111221a	/	N/A	N/A

*Calibration date provided by the equipment manufacturer.

**Calibration every ten years. During this period, there will be daily check files for the equipment and the requirements for operators will be clearly defined through SOP.



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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 PCB antenna and no consideration of replacement.

Antenna location: Refer to EUT Photos.



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7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215

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

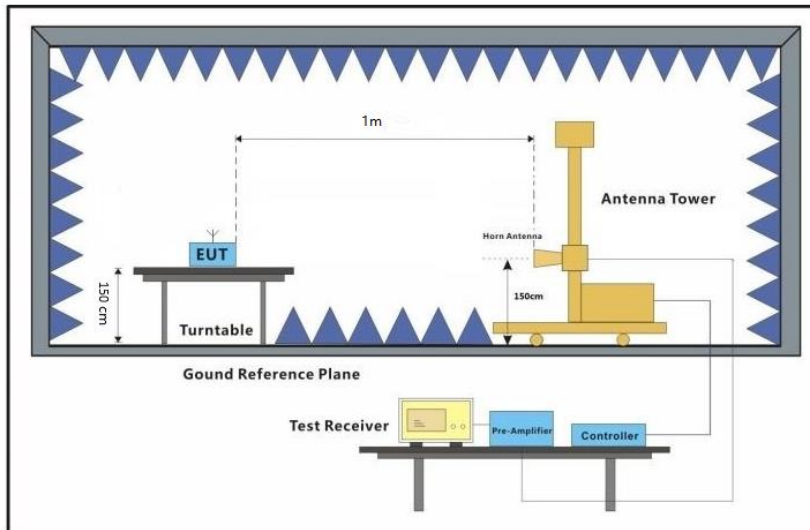
7.1.1 E.U.T. Operation

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



7.1.3 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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Low Frequency (GHz)	Limit (GHz)	High Frequency (GHz)	Limit (GHz)	20db Bandwidth(MHz)	Result
24.0067	24.00	24.2323	24.25	225.6	Pass

Remark:

Center Frequency(GHz)= (High Frequency(GHz)+ Low Frequency(GHz))/2=24.1195 (GHz)

20db Bandwidth(MHz)= (High Frequency(GHz)- Low Frequency(GHz))*1000=225.6 (MHz)



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7.2 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	
	Peak	AVG
18-40GHz	83.5dBuV/m@1m	63.5dBuV/m@1m
Above 40GHz	100.00dBuV/m @0.15m	80.00dBuV/m @0.15m

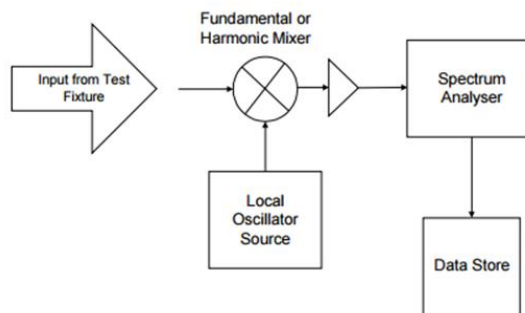
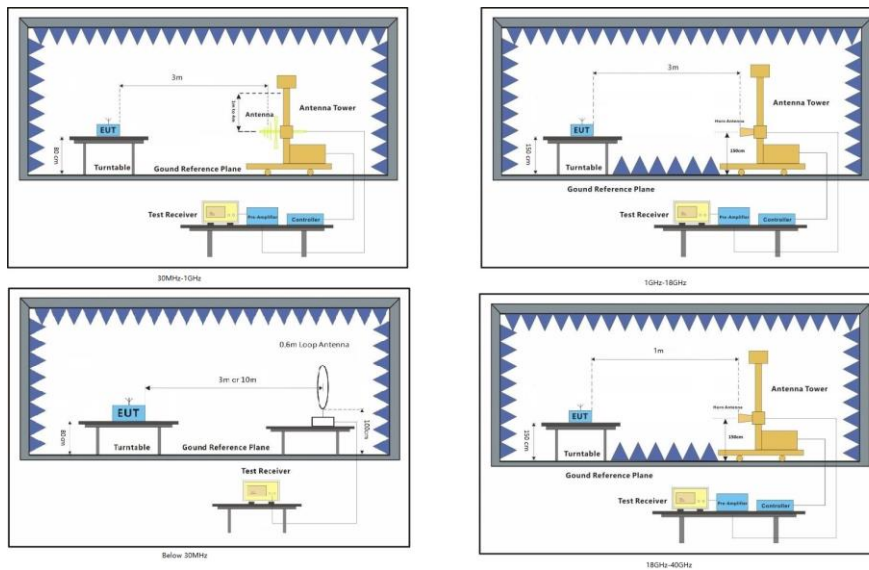
7.2.1 E.U.T. Operation

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



Above 40GHz



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Report No.: KSEM230600133801

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7.2.3 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.

Filed Strength of Fundamental

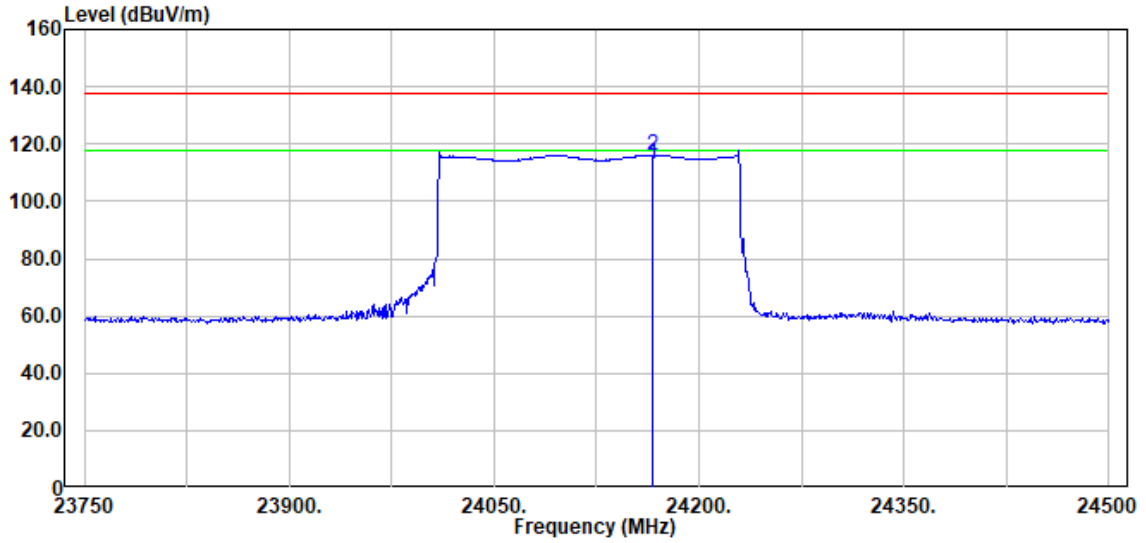
Frequency (GHz)	Polarity	dBuV/m@1m	dBuV/m@3m	Limit dBuV/m@3m	Result	Remark
24.1195	Horizontal	115.92	106.38	127.95	Pass	Peak
24.1195	Horizontal	112.78	103.24	107.95	Pass	AVG
24.1195	Vertical	102.13	92.59	127.95	Pass	Peak
24.1195	Vertical	98.53	88.99	107.95	Pass	AVG



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Horizontal



Site : Shielding Room

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

	Read	Cable	Ant	Preamp	Limit	Over		
Freq	Level	Loss	Factor	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	24166.250	107.65	5.84	39.29	40.00	112.78	117.50	-4.72 Average
2	24166.250	110.79	5.84	39.29	40.00	115.92	137.50	-21.58 Peak



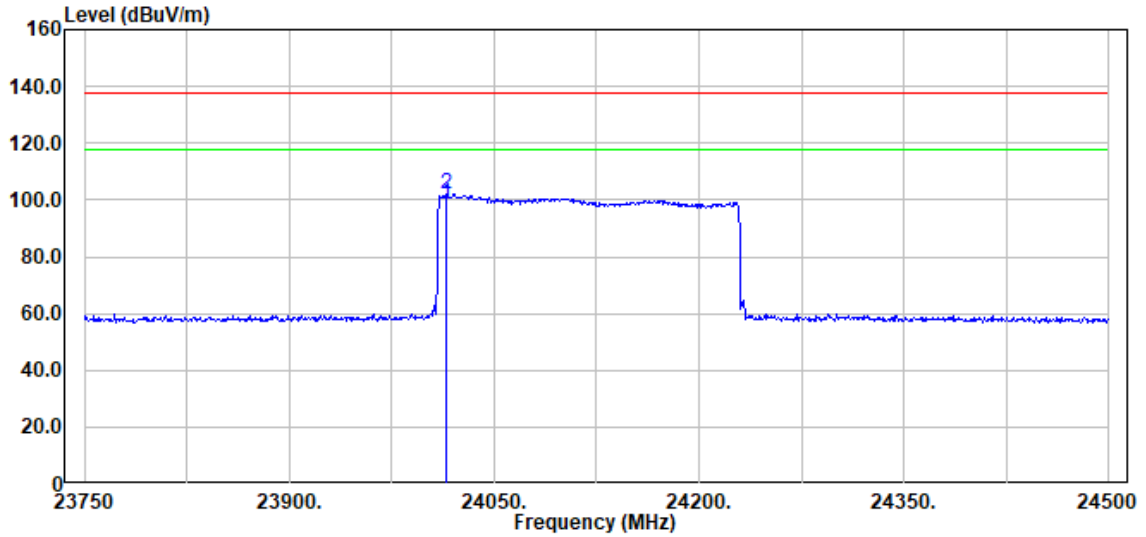
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Vertical



Site : Shielding Room

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

	Read	Cable	Ant	Preamp	Limit	Over		
Freq	Level	Loss	Factor	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1 24014.750	93.12	6.17	39.24	40.00	98.53	117.50	-18.97	Average
2 24014.750	96.72	6.17	39.24	40.00	102.13	137.50	-35.37	Peak

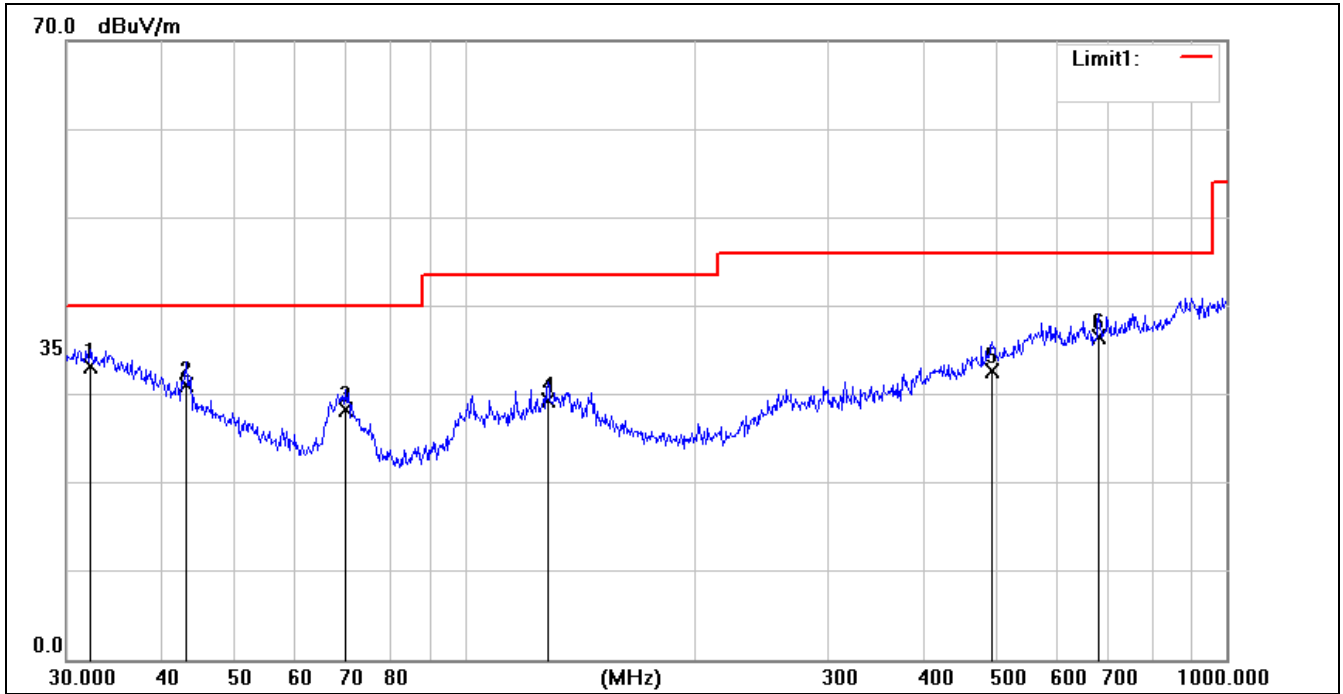


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Radiation Spurious Emission 30MHz-1GHz Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	32.2924	7.93	25.18	33.11	40.00	-6.89	QP
2	43.0504	10.40	20.66	31.06	40.00	-8.94	QP
3	69.6004	12.58	15.69	28.27	40.00	-11.73	QP
4	128.5630	9.90	19.46	29.36	43.50	-14.14	QP
5	492.4685	7.00	25.64	32.64	46.00	-13.36	QP
6	679.9600	34.06	2.43	36.49	46.00	-9.51	QP

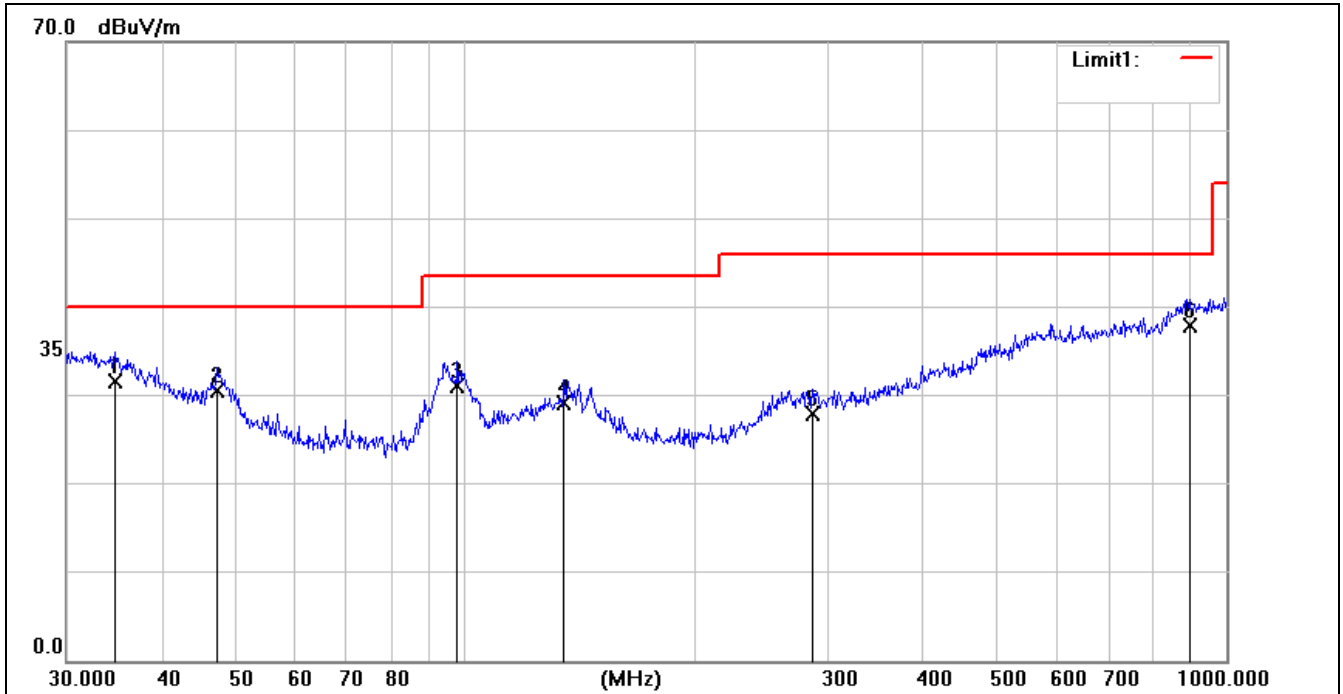


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30MHz-1GHz Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	34.7602	6.94	24.73	31.67	40.00	-8.33	QP
2	47.3255	11.67	18.82	30.49	40.00	-9.51	QP
3	97.7983	14.36	16.69	31.05	43.50	-12.45	QP
4	135.0320	10.00	19.13	29.13	43.50	-14.37	QP
5	285.9778	7.42	20.41	27.83	46.00	-18.17	QP
6	893.8567	35.46	2.45	37.91	46.00	-8.09	QP



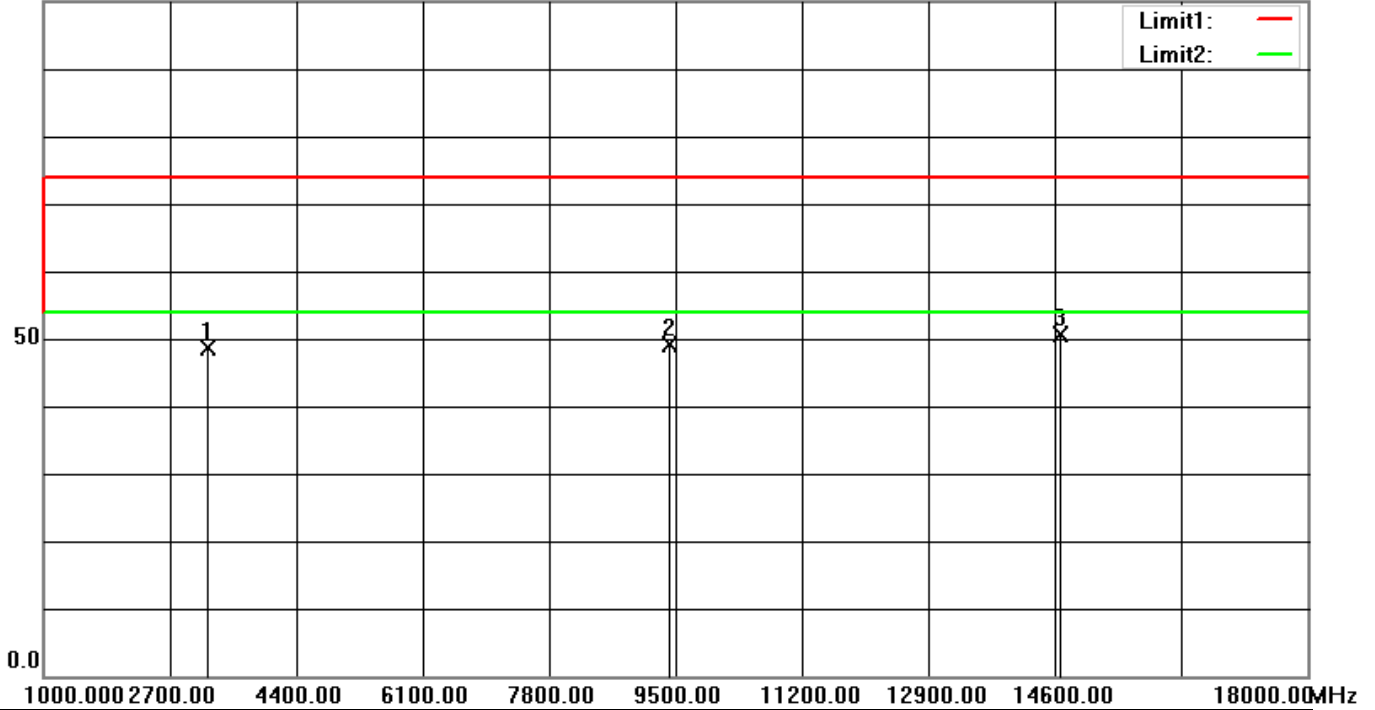
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1-18GHz Horizontal

100.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3219.000	64.14	-15.61	48.53	74.00	-25.47	peak
2	9431.000	49.69	-0.60	49.09	74.00	-24.91	peak
3	14673.000	44.19	6.48	50.67	74.00	-23.33	peak



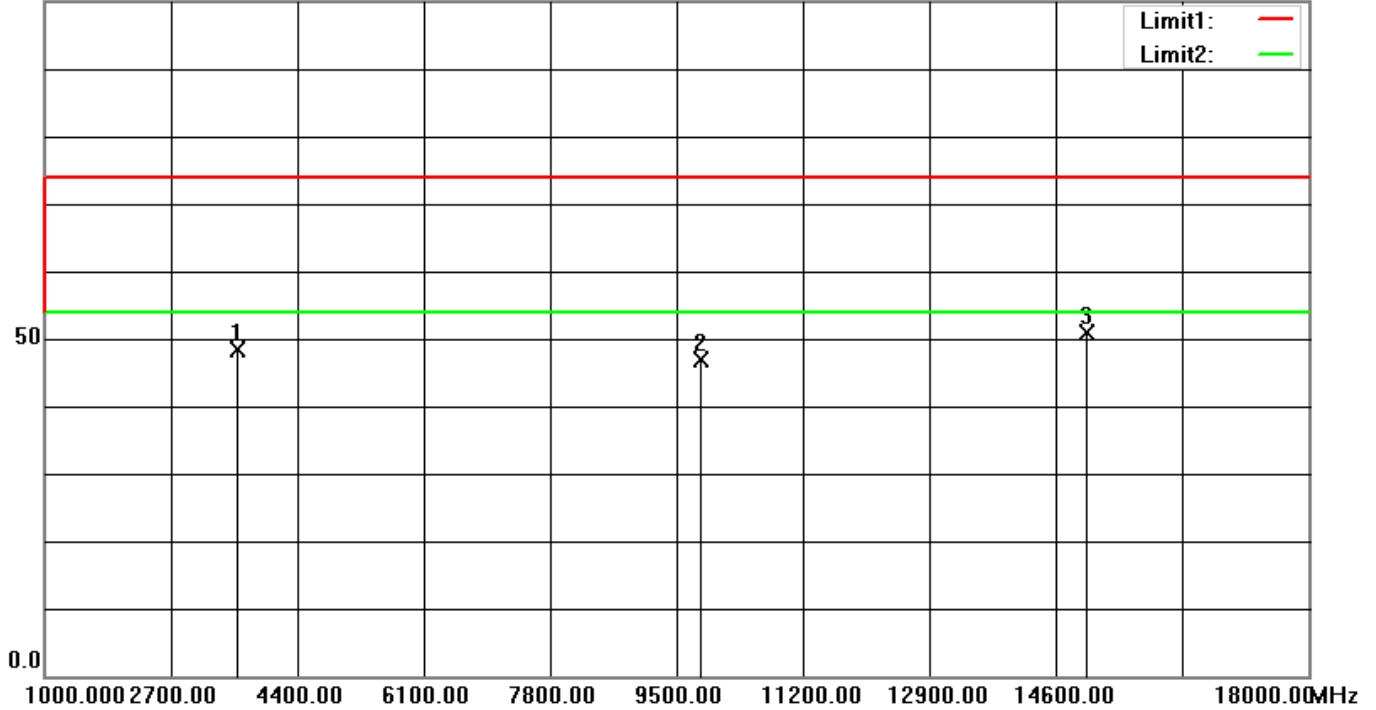
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1-18GHz Vertical

100.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3591.000	62.82	-14.51	48.31	74.00	-25.69	peak
2	9837.000	46.88	-0.01	46.87	74.00	-27.13	peak
3	15013.000	44.88	6.05	50.93	74.00	-23.07	peak



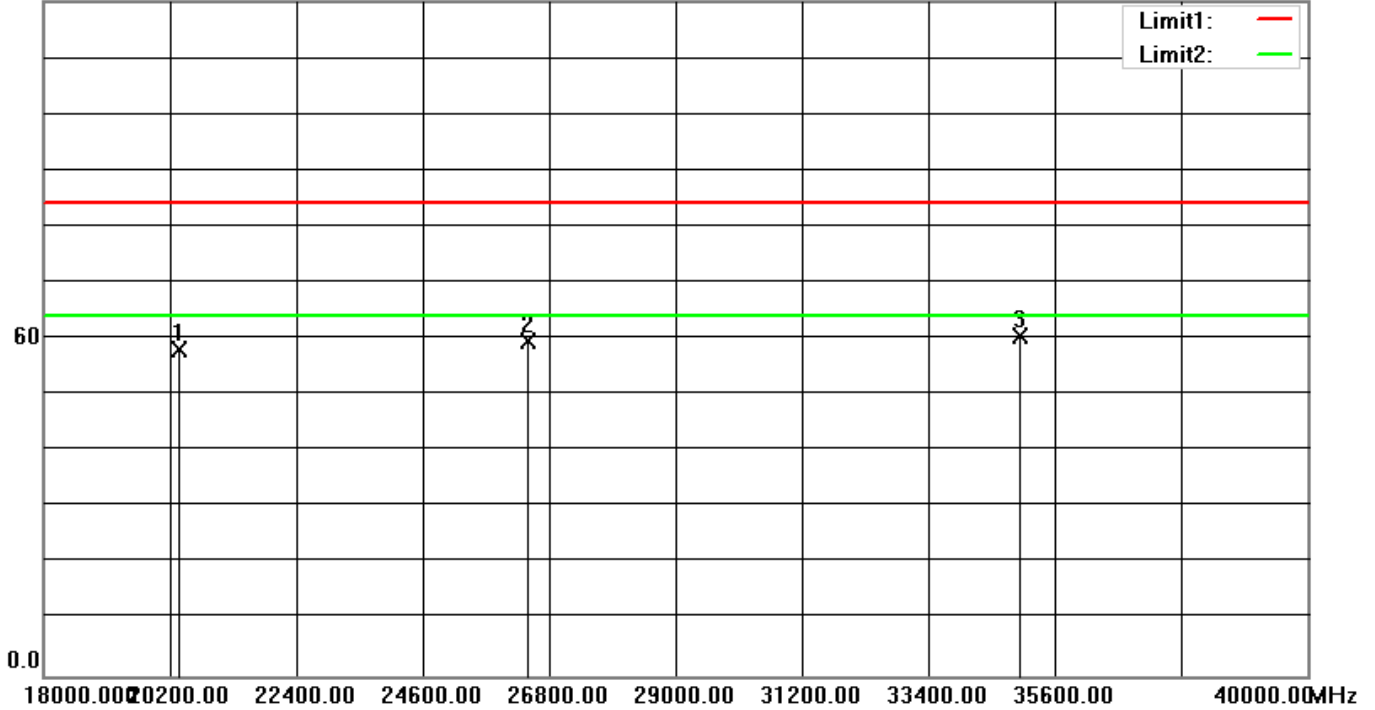
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18-40GHz Horizontal
120.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	20358.000	45.22	12.90	58.12	84.00	-25.88	peak
2	26436.000	43.85	15.79	59.64	84.00	-24.36	peak
3	35012.000	42.75	17.62	60.37	84.00	-23.63	peak



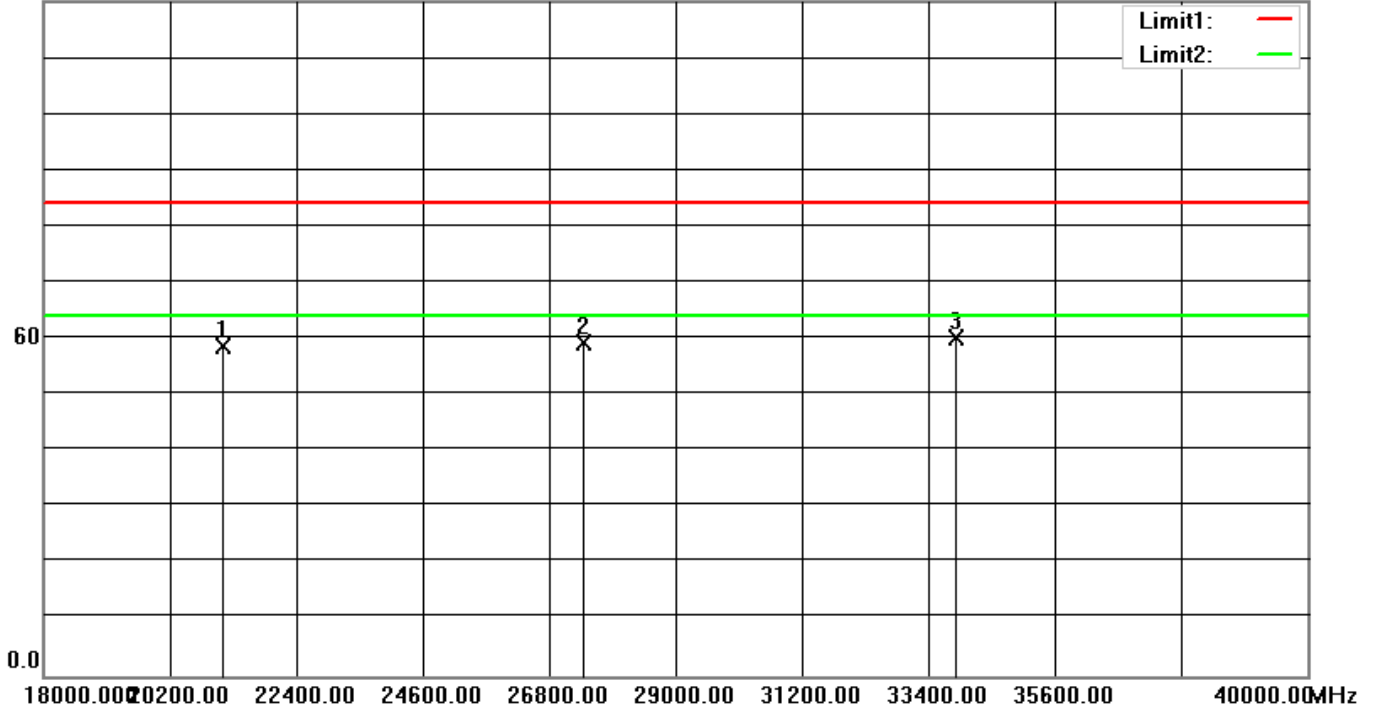
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18-40GHz Vertical
120.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	21138.000	46.16	12.45	58.61	84.00	-25.39	peak
2	27406.000	44.36	15.01	59.37	84.00	-24.63	peak
3	33872.000	41.05	19.24	60.29	84.00	-23.71	peak



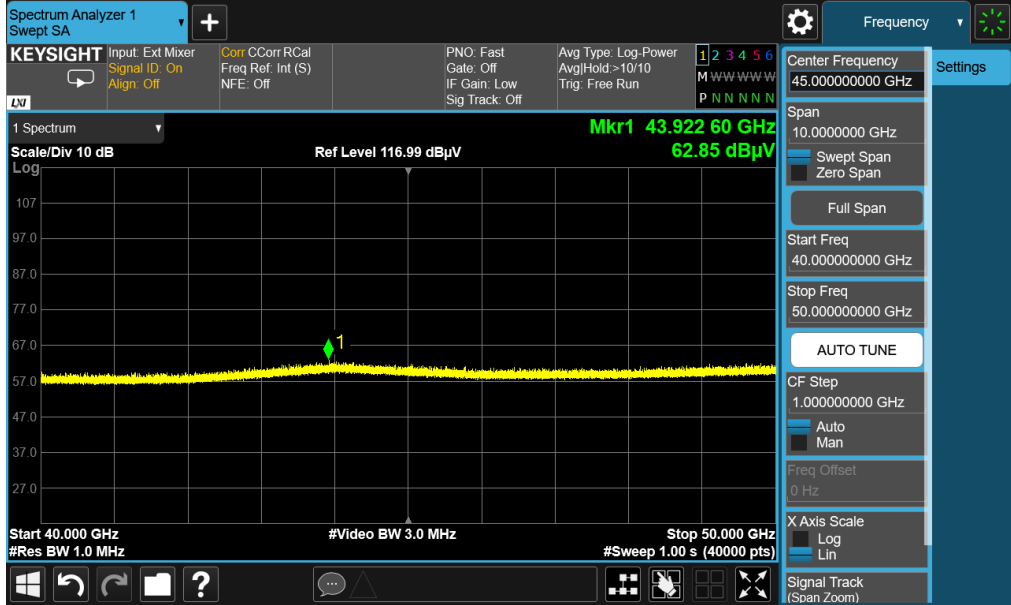
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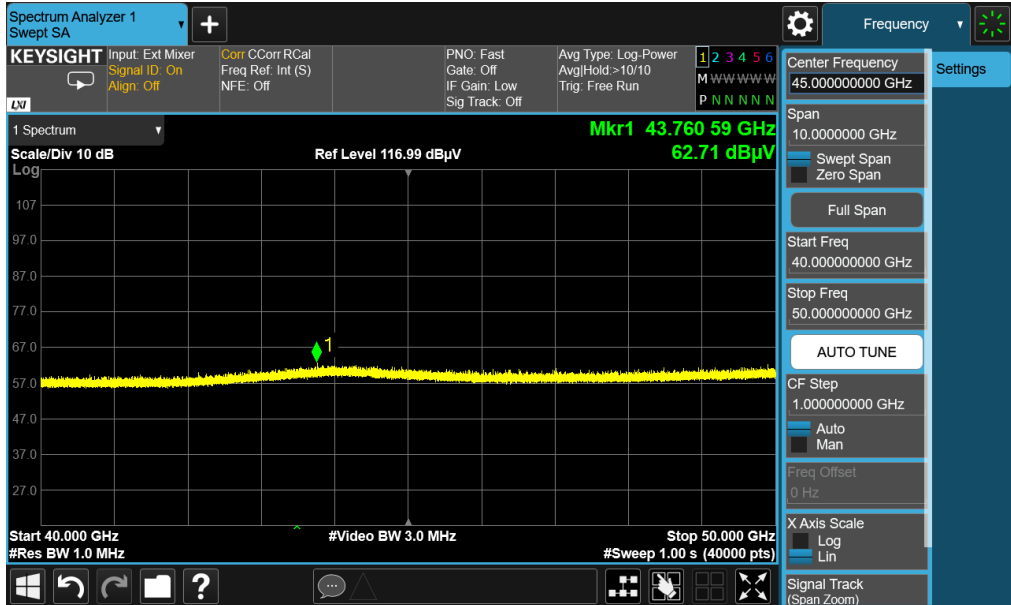
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40-50GHz Vertical



40-50GHz Horizontal



Frequency (GHz)	Distance (m)	Peak Value (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
43.92260	0.15	62.85	80.00	V	PASS
43.76059	0.15	62.71	80.00	H	PASS



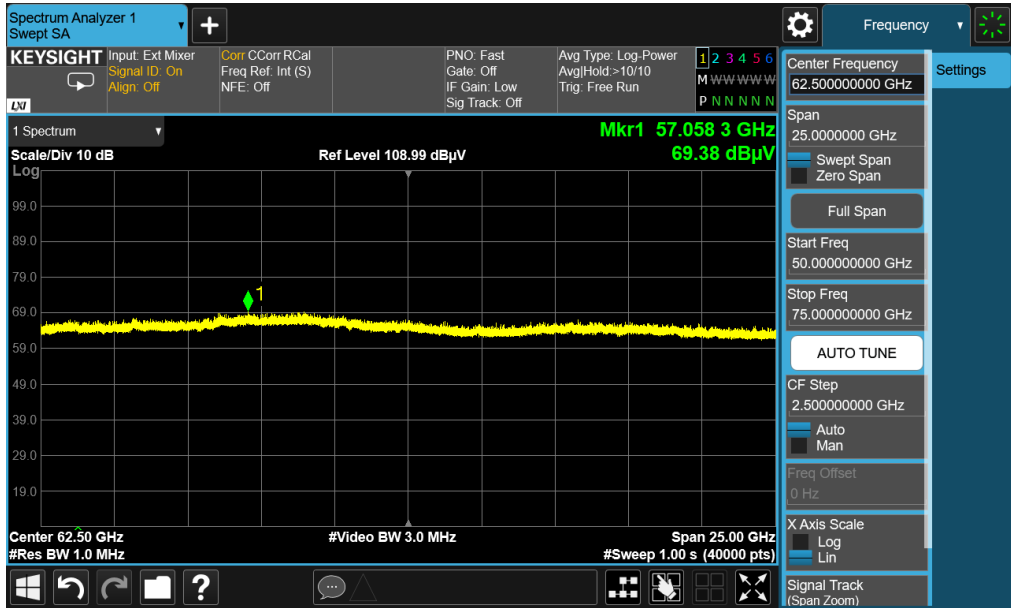
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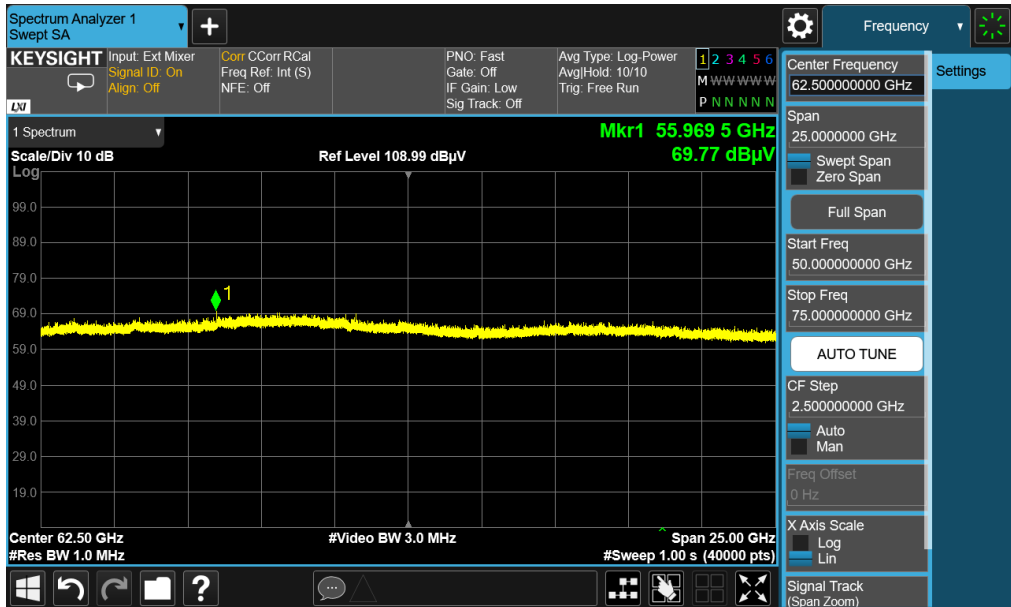
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50-75GHz Vertical



50-75GHz Horizontal



Frequency (GHz)	Distance (M)	Peak Value (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
57.0583	0.15	69.38	80.00	H	PASS
55.9695	0.15	69.77	80.00	V	PASS



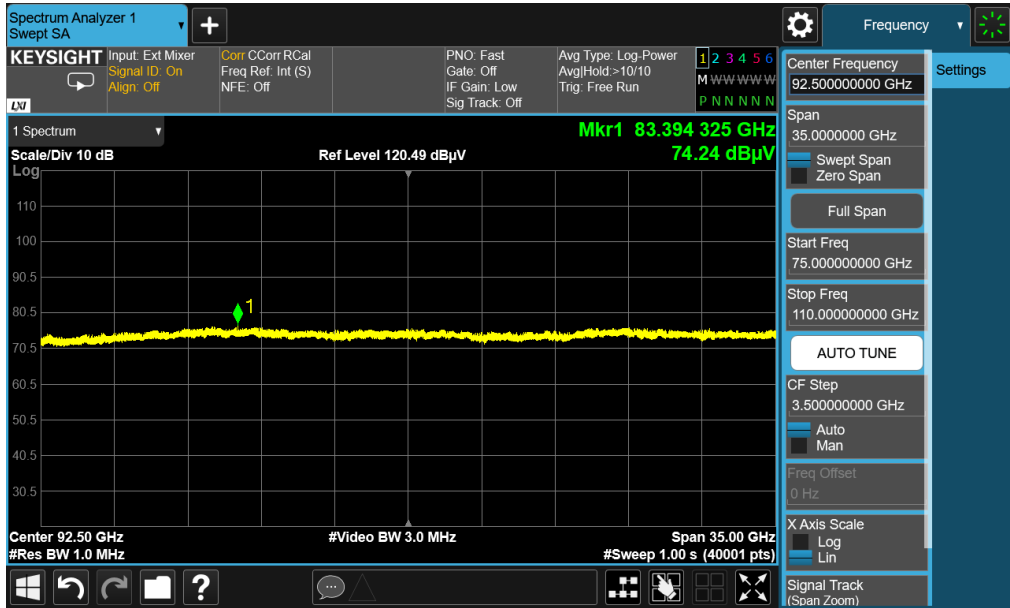
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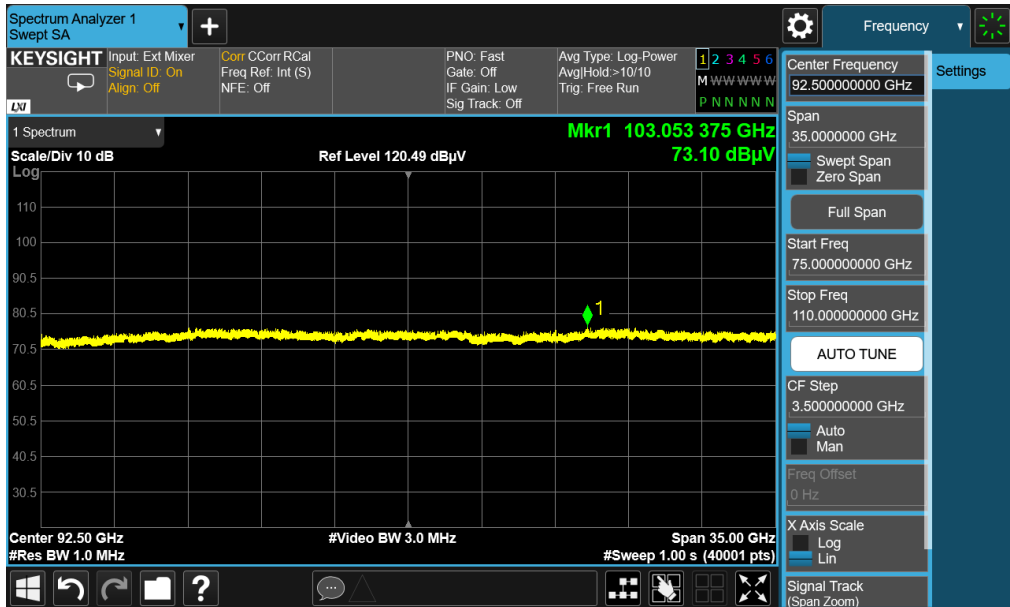
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75-110GHz Vertical



75-110GHz Horizontal



Frequency (GHz)	Distance (M)	Peak Value (dBuv/m)	AV Limit (dBuv/m)	Polarization	Result
83.394325	0.15	74.24	80.00	H	PASS
103.053375	0.15	73.10	80.00	V	PASS



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7.3 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 filed strength doesn't exceed 80.00 dBuV/m



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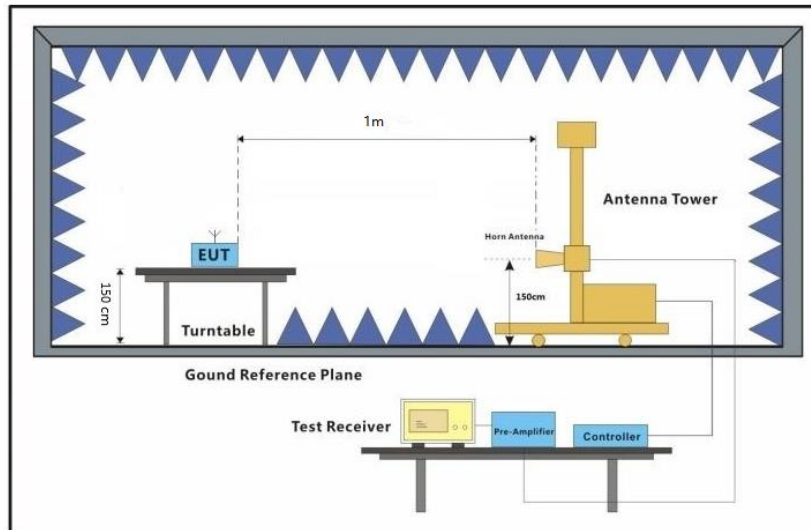
7.3.1 E.U.T. Operation

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



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7.3.3 Measurement Procedure and Data

- 1) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 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.

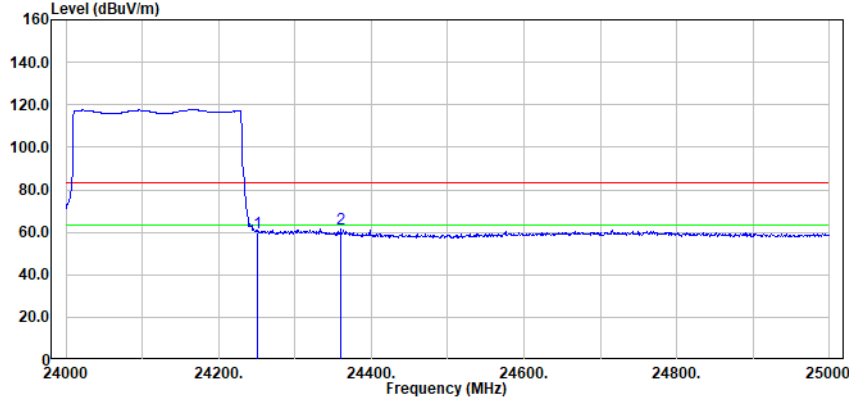


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Polarization:Horizontal; Modulation: FMCW;



Site : Shielding Room

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

	Read	Cable	Ant	Preamp	Limit	Over	
Freq	Level	Loss	Factor	Factor	Level	Line	Limit Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB
1 24250.000	54.74	5.64	39.33	40.00	59.71	83.50	-23.79 Peak
2 24360.000	56.66	5.42	39.37	40.00	61.45	83.50	-22.05 Peak

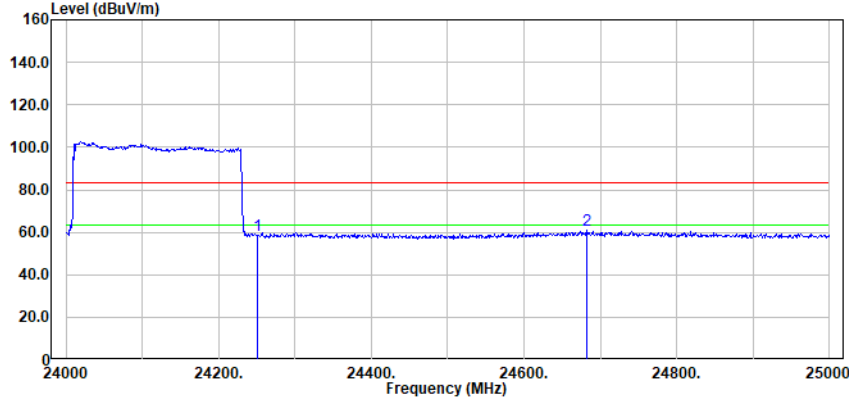


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Polarization: Vertical; Modulation: FMCW;



Site : Shielding Room

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

Freq	Read Level	Cable Loss	Ant Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1 24250.000	53.66	5.64	39.33	40.00	58.63	83.50	-24.87	Peak
2 24683.000	56.50	4.88	39.50	40.00	60.88	83.50	-22.62	Peak



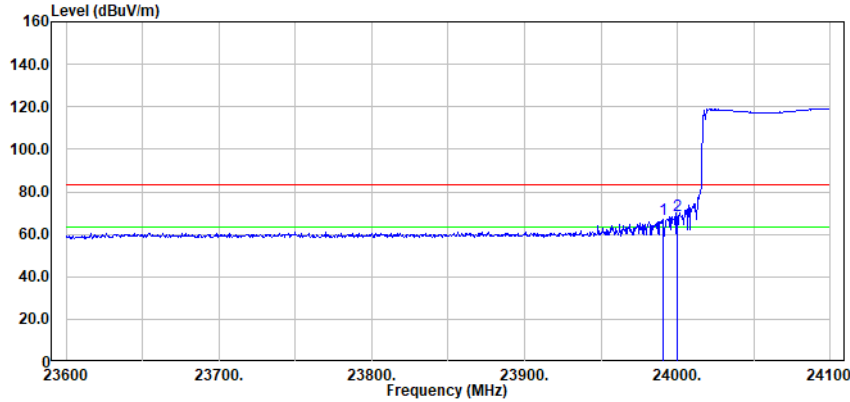
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Polarization:Horizontal; Modulation: FMCW;



Site : Shielding Room

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

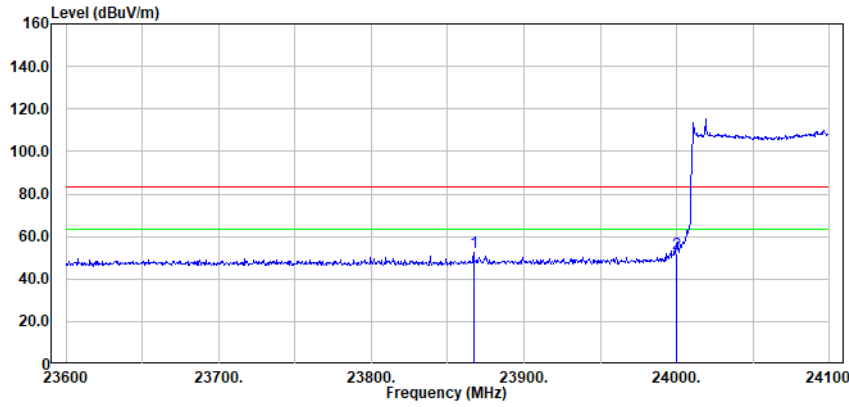
Freq	Read Level	Cable Loss	Ant Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1 23991.000	61.57	6.18	39.23	40.00	66.98	83.50	-16.52	Peak
2 24000.000	63.30	6.19	39.23	40.00	68.72	83.50	-14.78	Peak



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Site : Shielding Room

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

	Read	Cable	Ant	Preamp	Limit	Over	
Freq	Level	Loss	Factor	Factor	Level	Line	Limit Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB
1 23867.000	47.32	5.97	39.19	40.00	52.48	63.50	-11.02 Average
2 24000.000	46.70	6.20	39.23	40.00	52.13	63.50	-11.37 Average



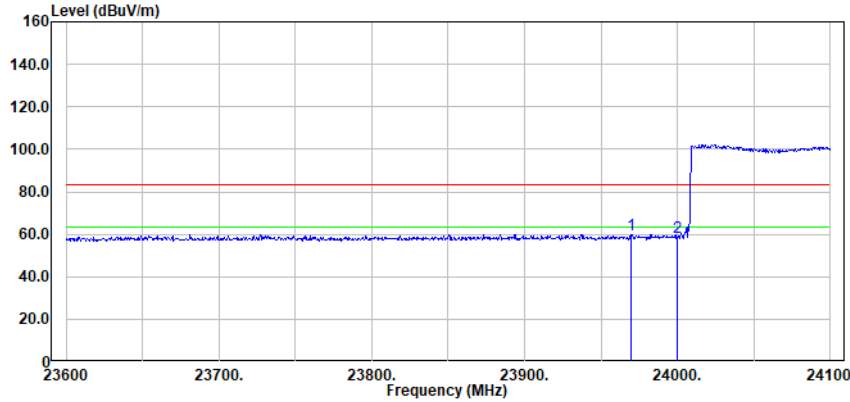
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Polarization: Vertical; Modulation: FMCW;



Site : Shielding Room

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

Freq	Read Level	Cable Loss	Ant Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1 23970.000	54.61	6.15	39.22	40.00	59.98	83.50	-23.52	Peak
2 24000.000	53.42	6.19	39.23	40.00	58.84	83.50	-24.66	Peak



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7.4 99% Bandwidth

Test Requirement RSS-Gen Section 6.7
 Test Method: RSS-Gen Section 6.7

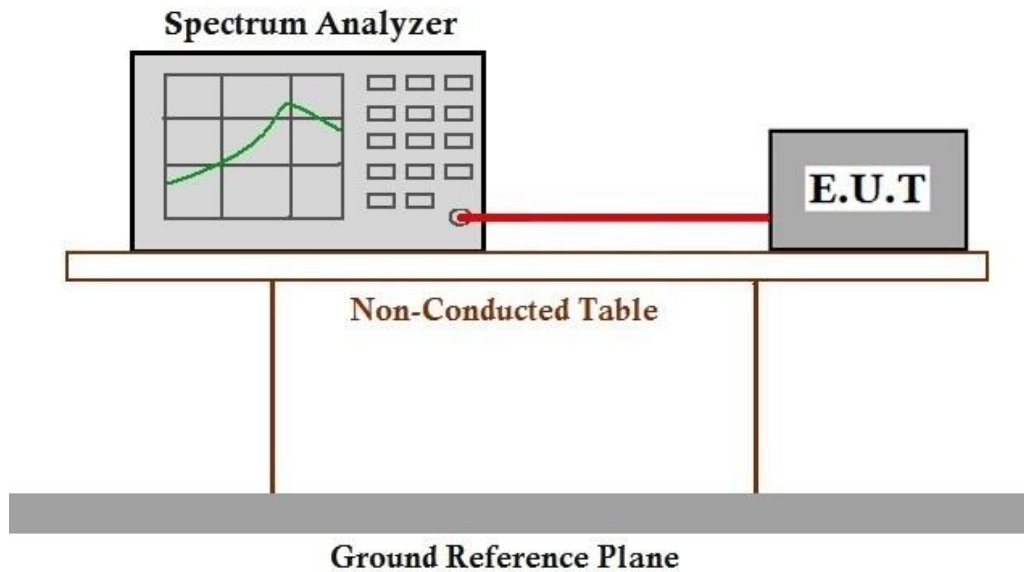
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

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

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

1. Place the EUT on the table and set it in Engineering mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 1 % to 5 % of the OBW, VBW= approximately 3* RBW, Span=between 1.5 to 5 times the OBW, Sweep=auto, Detector function = peak, Trace = max hold.
4. Allow the trace to stabilize, Mark the peak frequency and using the 99% OBW function measure the bandwidth.
5. Repeat above procedures until all frequency measured was complete.

Frequency (GHz)	Bandwidth (MHz)	Result
24.12	221.89	PASS

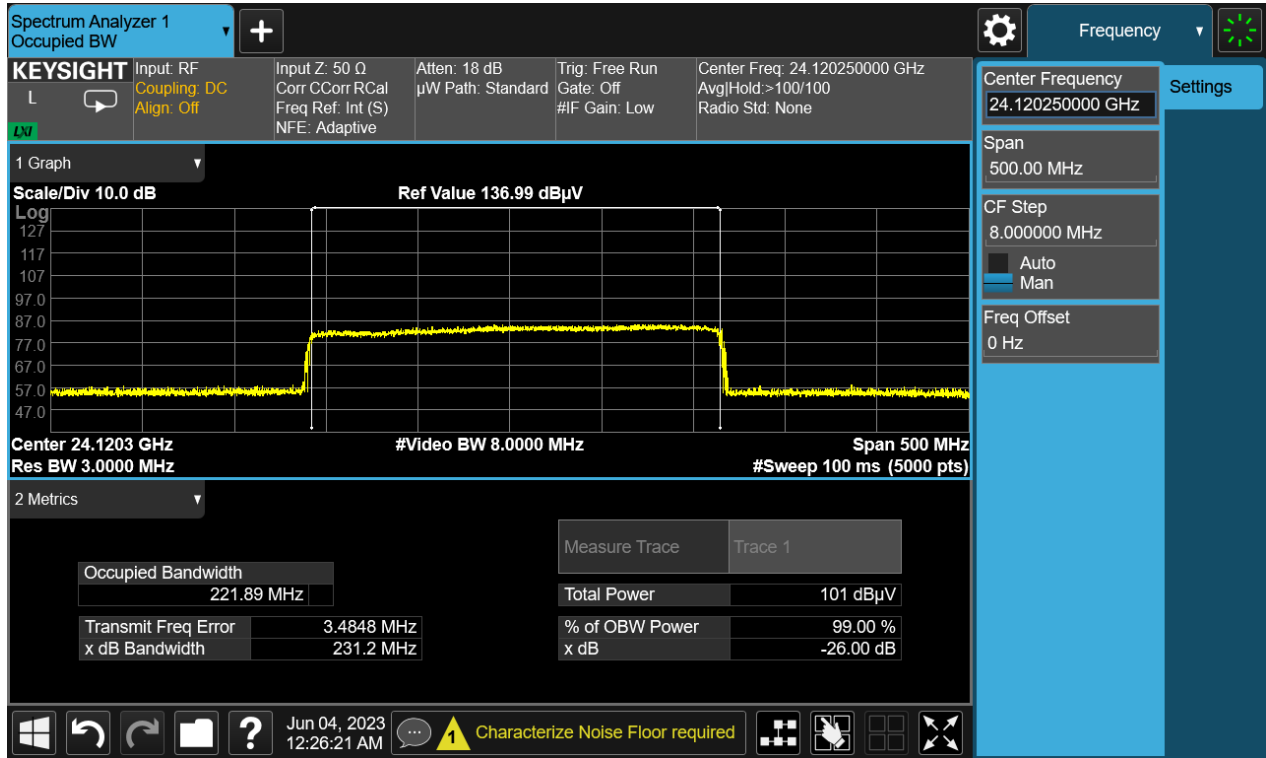


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Test plot as follows:



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSEM2306001338HS

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for KSEM2306001338HS

- End of the Report -



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