



## Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR230900155301

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# TEST REPORT

**Application No.:** KSCR2309001553AU  
**FCC ID:** 2A7HDARS131  
**Applicant:** Nanjing Chuhang Technology Co., Ltd.  
**Address of Applicant:** 12F, Building A, No.9, Yunzheng Street, Nanjing, P.R. China  
**Manufacturer:** Nanjing Chuhang Technology Co., Ltd.  
**Address of Manufacturer:** 12F, Building A, No.9, Yunzheng Street, Nanjing, P.R. China  
**Factory:** Anqing Chuhang Electronic Technology Co.,Ltd.  
**Address of Factory:** 1st Floor,Building 1,New Energy Vehicle Industrial Park,Economic and Technological Development Zone,Anqing,P.R.China

**Equipment Under Test (EUT):**  
**EUT Name:** Millimeter Wave Radar  
**Model No.:** ARS1.31  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.255  
**Date of Receipt:** 2023-09-05  
**Date of Test:** 2023-09-13 to 2023-09-21  
**Date of Issue:** 2023-09-22

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

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



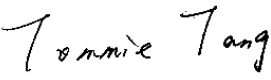

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Revision Record			
Version	Description	Date	Remark
00	Original	2023-09-22	/

Authorized for issue by:			
Tested By			
		<hr/> <b>Tommie_Tang/Project Engineer</b>	
Approved By			
		<hr/> <b>Terry Hou /Reviewer</b>	



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## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.255	N/A	47 CFR Part 15, Subpart C 15.203	Pass

N/A: Not applicable

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Transmitter power and power spectral density	47 CFR Part 15, Subpart C 15.255	ANSI C63.10, Sections 9.4, 9.5	47 CFR Part 15, Subpart C 15.255(c)(2), (d)(1)	PASS
Occupied bandwidth	47 CFR Part 15, Subpart C 15.255	ANSI C63.10 (2013) Section 9.3	47 CFR Part 15, Subpart C 15.215(c), 15.255(c2)	PASS
Radiated spurious emissions below 40 GHz	47 CFR Part 15, Subpart C 15.255	ANSI C63.10 (2013) Section 9.13	47 CFR Part 15, Subpart C 15.255(d)(2)	PASS
Radiated emissions outside assigned band and above 40 GHz up to 200 GHz	47 CFR Part 15, Subpart C 15.255	ANSI C63.10 (2013) Section 9.9, 9.12	47 CFR Part 15, Subpart C 15.255(d)(3)	PASS
Frequency stability	47 CFR Part 15, Subpart C 15.255	ANSI C63.10 (2013) Section 9.4	47 CFR Part 15, Subpart C 15.255(f)	PASS

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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	DC 9-16V
Frequency:	59.3GHz-64.0GHz
Modulation Type:	FMCW
Antenna Type:	Integrated Patch Antenna
Antenna Gain:	6.1dBi (Provided by the manufacturer)

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
CAN-bus Professional tools	/	CANa1yst-II	319000279C6
DC Power Supply	Agilent	E3632A	/
Notebook	ThinkPad	L14	/

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$8.4 \times 10^{-8}$
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
6	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-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.

#### **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. internal working 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 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	Inventory No	Cal Date	Cal. Due Date
1	Spectrum Analyzer	R&S	FSV40	KUS1806E003	08/24/2023	08/23/2024
2	PXA Spectrum Analyzer	KEYSIGHT	N9030B	KSEM021-1	02/03/2023	02/02/2024
3	Signal Generator	Agilent	E8257C	KS301066	08/24/2023	08/23/2024
4	Loop Antenna	COM-POWER	AL-130R	KUS1806E001	03/18/2023	03/17/2025
5	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E005	06/29/2023	06/28/2025
6	Bilog Antenna	SCHWARZBECK	VULB9160	CZ301016	04/13/2021	04/12/2024
7	Amplifier(30MHz~18GHz)	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-1	01/17/2023	01/16/2024
8	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	KS301186	04/07/2023	04/06/2025
9	Amplifier(18~40GHz)	COM-POWER	PAM-840A	KUS1710E001	01/17/2023*	01/16/2024**
10	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	CZ301058	02/26/2023*	02/25/2024**
11	Horn-antenna(40-60GHz)	ERAVANT	SAZ-2410-19-S1	KSEM003-1	02/02/2021*	02/01/2031**
12	Horn-antenna(50-75GHz)	ERAVANT	SAZ-2410-15-S1	KSEM003-2	02/02/2021*	02/01/2031**
13	Horn-antenna(75-110GHz)	ERAVANT	SAZ-2410-10-S1	KSEM003-3	02/02/2021*	02/01/2031**
14	Horn-antenna(110-170GHz)	ERAVANT	SAZ-2410-06-S1	KSEM003-4	02/02/2021*	02/01/2031**
15	Horn-antenna(140-220GHz)	ERAVANT	SAZ-2410-05-S1	KSEM003-5	02/02/2021*	02/01/2031**
16	Horn-antenna(220-325GHz)	ERAVANT	SAR-2309-03-S2	KSEM003-6	02/02/2021*	02/01/2031**
17	Extended waveguide(40-60GHz)	ERAVANT	SWG-19025-FB	KSEM004-1	02/02/2021*	02/01/2031**
18	Extended waveguide(50-75GHz)	ERAVANT	SWG-15025-FB	KSEM004-2	02/02/2021*	02/01/2031**
19	Extended waveguide(75-110GHz)	ERAVANT	SWG-10025-FB	KSEM004-3	02/02/2021*	02/01/2031**
20	Extended waveguide(110-170GHz)	ERAVANT	SWG-06025-FB	KSEM004-4	02/02/2021*	02/01/2031**
21	Extended waveguide(140-220GHz)	ERAVANT	SWG-05025-FB	KSEM004-5	02/02/2021*	02/01/2031**
22	Extended waveguide(220-325GHz)	ERAVANT	SWG-03025-FB	KSEM004-6	02/02/2021*	02/01/2031**
23	Harmonic mixer(40-60GHz)	ERAVANT	STH-19SF-S1	KSEM005-2	10/01/2020*	09/30/2030**
24	Harmonic Mixer(50-75GHz)	VDI	SAX WR15	KSEM007-1	08/23/2023*	08/23/2033**
25	Harmonic Mixer(60-90GHz)	VDI	SAX WR12	KSEM007-2	08/23/2023*	08/23/2033**
26	Harmonic mixer(90-140GHz)	VDI	SAX WR8.0	KSEM007-3	08/23/2023*	08/23/2033**
27	Harmonic mixer(140-220GHz)	VDI	SAX WR5.1	KSEM007-4	08/23/2023*	08/23/2033**
28	Harmonic mixer(220-325GHz)	ERAVANT	HM 220-325	KSEM005-4	04/20/2021*	04/19/2031**
29	RE Test Cable	ERAVANT MICROWAVE	/	CZ301097	11/12/2022	11/11/2023
30	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-4	03/22/2023	03/21/2024
31	Software	Faratronic	EZ_EMG-v 3A1	/	N/A	N/A
32	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.

## **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.



## 7 Radio Spectrum Matter Test Results

### 7.1 Occupied bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215(c), 15.255(c2)

Test Method: ANSI C63.10, Section 9.3

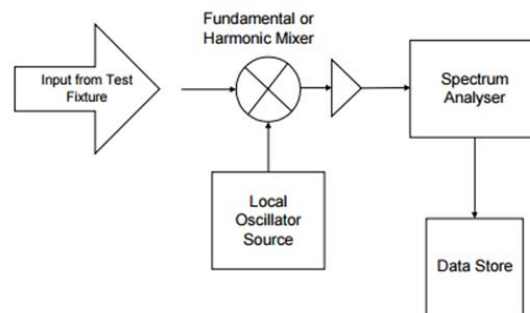
#### 7.1.1 E.U.T. Operation

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=3\*RBW and Detector=Peak, or a minimum of 1 MHz if this is not possible due to a large OBW.
- 3) Measure and record the result of 20dB and 99% bandwidth

Please Refer to Appendix for Details

### 7.2 Transmitter power and power spectral density

Test Requirement	47 CFR Part 15, Subpart C 15.255(c)(2), (d)(1)
Test Method:	ANSI C63.10, Sections 9.4, 9.5
Limit:	The peak EIRP shall not exceed 14 dBm, and the sum of continuous transmitter off-times of at least two milliseconds shall equal at least 25.5 milliseconds within any contiguous interval of 33 milliseconds.

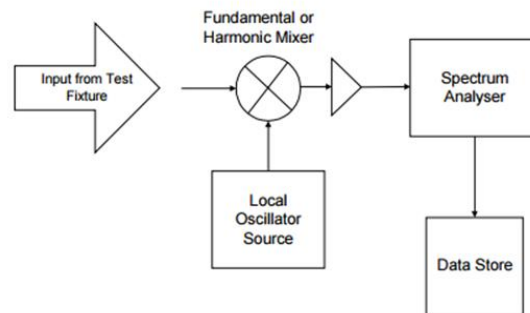
#### 7.2.1 E.U.T. Operation

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=1MHz , VBW=3\*RBW , Detector=Peak/Average, Trace: Mask Hold, Peak Search
- 3) The EUT was turned from 0 degrees to 360 degrees to find the maximum reading.

Please Refer to Appendix for Details

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### 7.3 Out of band radiated emissions below 40 GHz

Test Requirement: 47 CFR Part 15, Subpart C 15.255(d)(2)  
 Test Method: ANSI C63.10, Section 9.13  
 Limit:

#### Below 30MHz

Frequency	Field Strength ( $\mu\text{V/m}$ )	Measurement Distance (metres)
9 - 490 kHz	2,400/F (kHz)	300
490 - 1,705 kHz	24,000/F (kHz)	30
1.705-30 MHz	30	30

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.

#### Above 30MHz

Frequency (MHz)	Field Strength ( $\mu\text{V/m}$ )	Measurement Distance (metres)
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

Frequency (MHz)	Field strength at 3 m, dB(uV/m)*		
	Within restricted bands		
	Peak	Quasi Peak	Average
0.009 - 0.090	148.5 - 128.5	NA	128.5 - 108.5**
0.090 - 0.110	NA	108.5 - 106.8**	NA
0.110 - 0.490	126.8 - 113.8	NA	106.8 - 93.8**
0.490 - 1.705	NA	73.8 - 63.0**	NA
1.705 - 30.0*		69.5	
30 - 88		40.0	
88 - 216		43.5	
216 - 960		46.0	
960-40000		54.0	

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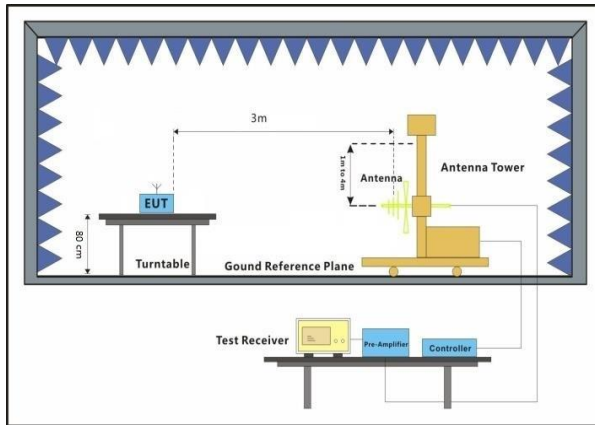
### 7.3.1 E.U.T. Operation

Operating Environment:

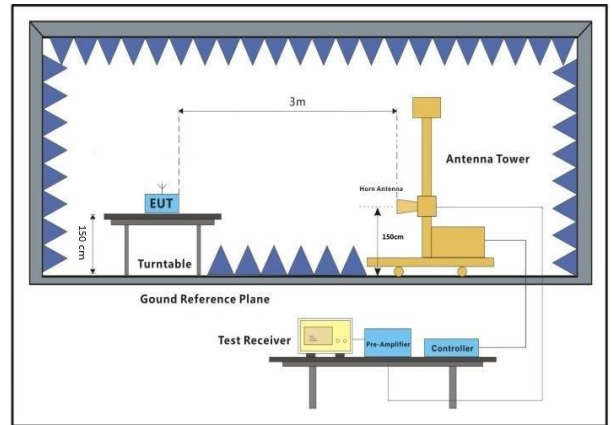
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

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

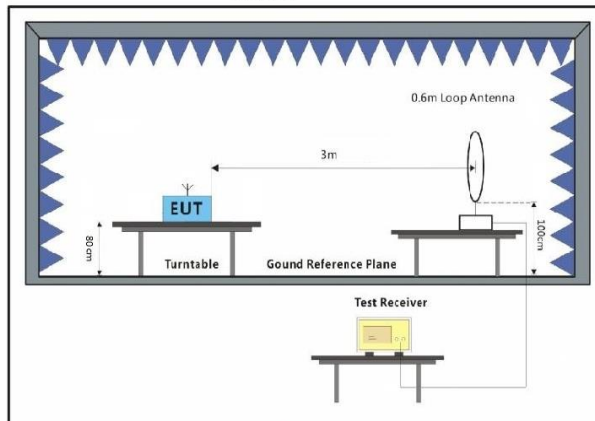
### 7.3.2 Test Setup Diagram



30MHz-1GHz



1GHz-40GHz



Below 30MHz

**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 1-40GHz, 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 antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the same height (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. 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.
- h. 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.

Remark 3: Scan from 9kHz to 30MHz, the disturbance 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.

Please Refer to Appendix for Details

### 7.4 Out of band radiated emissions above 40 GHz

Test Requirement: 47 CFR Part 15, Subpart C 15.255(d)(3)  
 Test Method: ANSI C63.10, Section 9.9, 9.12  
 Limit:

#### Above 40GHz

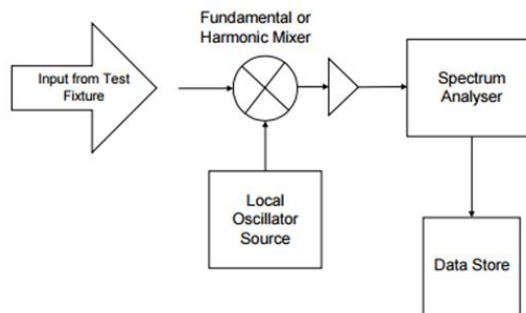
Frequency (GHz)	Power density at 3 m distance (pW/cm <sup>2</sup> )	Distance (m)	Field strength (dBuV/m)*, peak	Field strength (dBuV/m)*, average
40 - 200	90	3.0	105.31	85.31

\* - Field strength was calculated per equation (26) of ANSI C63.10-2013 section 9 as follows:  $E = \sqrt{PD \times 377}$ , where PD is the power density at the distance specified by the limit in W/m<sup>2</sup>, E- field strength in V/m.

#### 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



Above 40GHz

**7.4.3 Measurement Procedure and Data**

- a. For above 40GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation
- b. The 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.
- c. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the same height (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.
- d. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- e. 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.
- f. 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.
- g. Repeat above procedures until all frequencies measured was complete.

Remark 1:  $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$

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.

Please Refer to Appendix for Details

### 7.5 Frequency stability

Test Requirement: 47 CFR Part 15, Subpart C 15. 255(f)  
 Test Method: ANSI C63.10, Section 9.14  
 Limit:

Frequency (GHz)	Limit
57 - 64	The signal must be contained within assigned frequency band

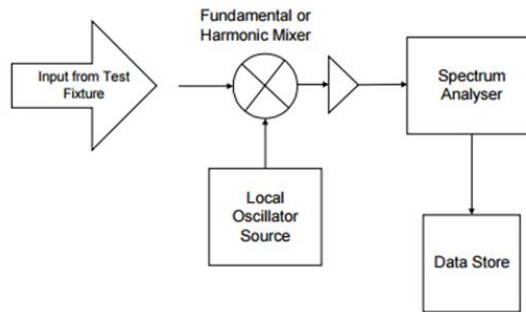
#### 7.5.1 E.U.T. Operation

Operating Environment:

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

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

#### 7.5.2 Test Setup Diagram





### **7.5.3 Measurement Procedure and Data**

1. Temperature conditions:

- a) The RF output port of the EUT was connected to Frequency Meter;
- b) Set the working Frequency in the middle channel;
- c) record the 20°C and nominal voltage frequency value as reference point;
- d) vary the temperature from -20°C to 50°C with step 10°C
- e) when reach a temperature point, keep the temperature balance at least 1 hour to make the product working in this status;
- f) read the frequency at the relative temperature.

2. Voltage conditions:

- a) record the 20°C and nominal voltage frequency value as reference point;
- b) vary the voltage from -15% nominal voltage to +15% voltage;  
read the frequency at the relative voltage.

Please Refer to Appendix for Details



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### **8 Test Setup Photo**

Refer to Appendix - Test Setup Photo for KSCR2309001553AU

### **9 EUT Constructional Details (EUT Photos)**

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2309001553AU

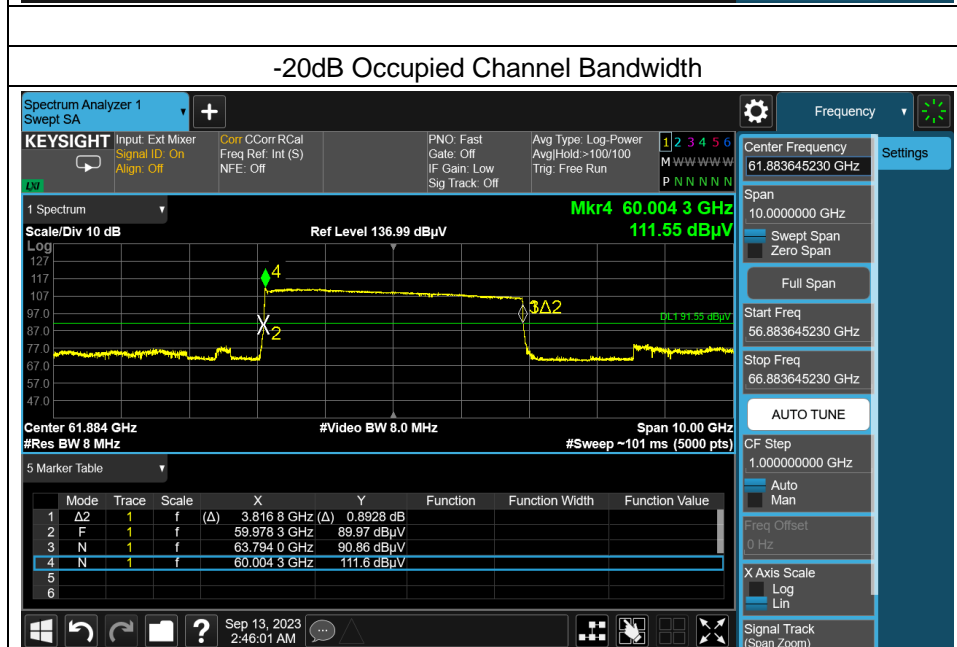
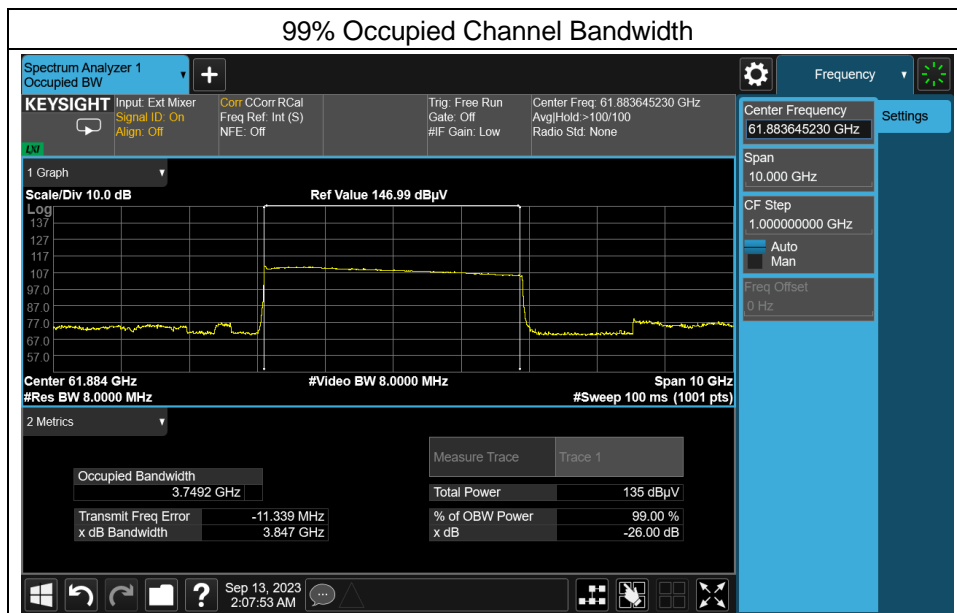
### 10 Appendix

#### 10.1 Occupied bandwidth

Centre Frequency (GHz)	-20dB OCW (MHz)	99% OCW (MHz)	F <sub>L</sub> (GHz)	Limit (GHz)	F <sub>H</sub> (GHz)	Limit (GHz)	Result
61.884	3816.8	3749.2	59.978	57	63.794	64	Pass

Remark:

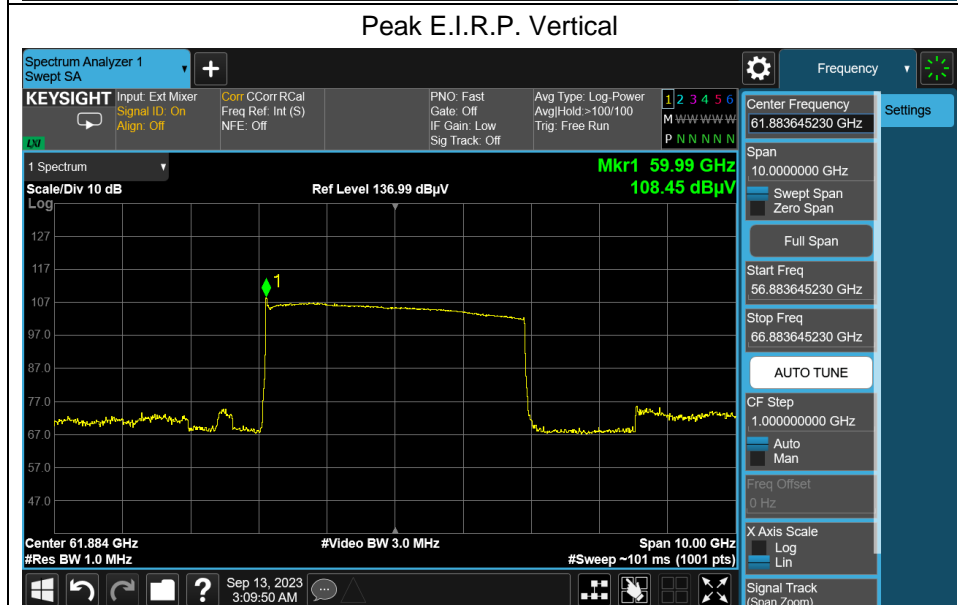
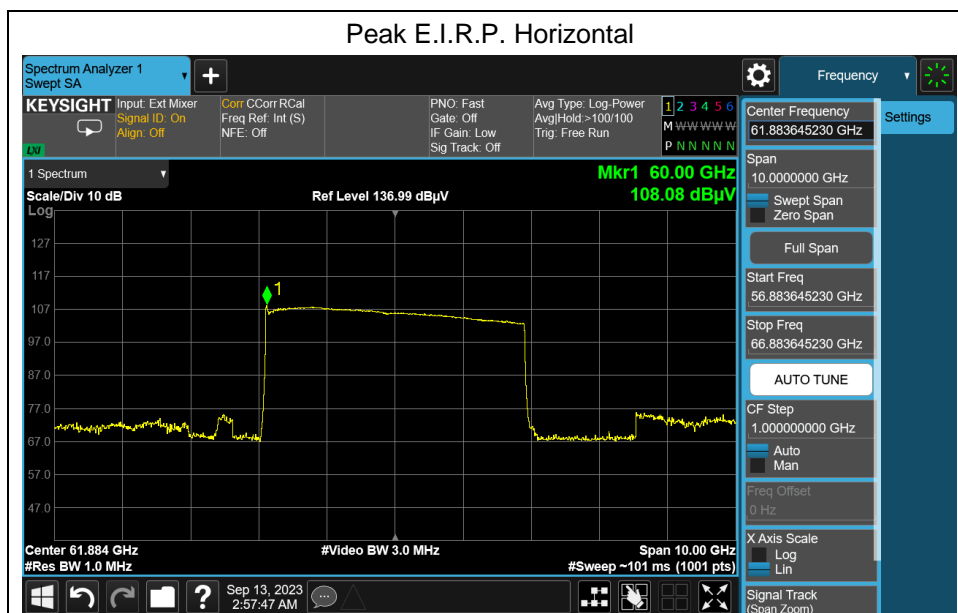
F<sub>L</sub>: Frequency Low Band Edge, F<sub>H</sub>: Frequency High Band Edge



## 10.2 Transmitter power and power spectral density

Frequency (GHz)	Distance (m)	Polarity	dBuV/m @ 3m	E.I.R.P. Power (dBm)	E.I.R.P. Limit (dBm)	Remark	Duty Cycle	Duty Cycle Limit	Result
61.884	3	Horizontal	108.08	12.88	14	peak	7.5%	≤22.7%	Pass
		Vertical	108.45	13.25	14	peak			Pass

Remark:  $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] - 20 \log(d[\text{meters}]) + 104.77$ , where E = field strength and d = distance at which field strength limit is specified in the rules

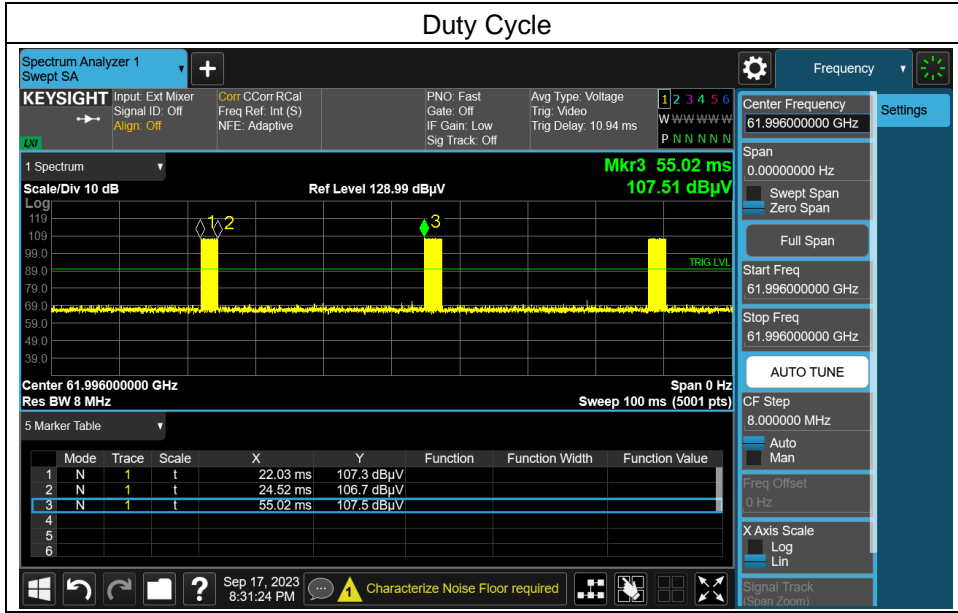


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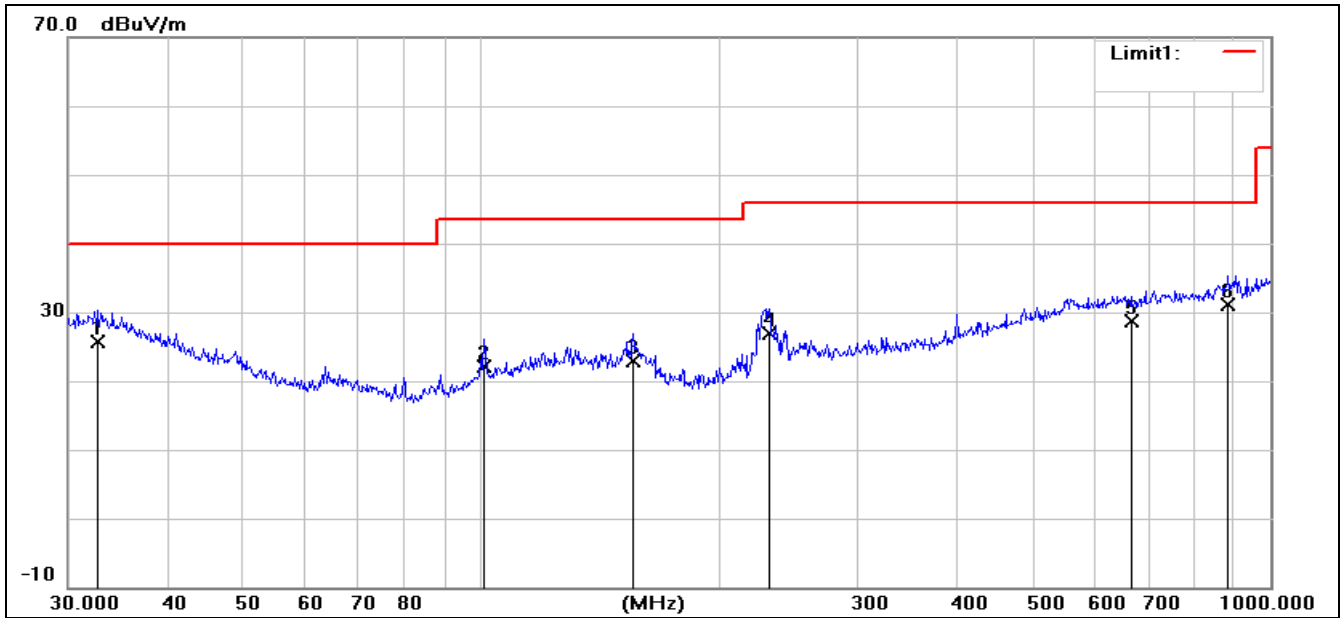
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### 10.3 Out of band radiated emissions below 40 GHz

#### Radiation Spurious Emission

30MHz-1GHz Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	32.7486	0.53	25.11	25.64	40.00	-14.36	100	345	QP
2	100.9340	4.85	17.28	22.13	43.50	-21.37	200	261	QP
3	155.9101	5.20	17.64	22.84	43.50	-20.66	100	273	QP
4	231.7179	9.26	17.71	26.97	46.00	-19.03	100	68	QP
5	665.8035	1.41	27.28	28.69	46.00	-17.31	100	341	QP
6	884.5029	1.65	29.40	31.05	46.00	-14.95	100	38	QP

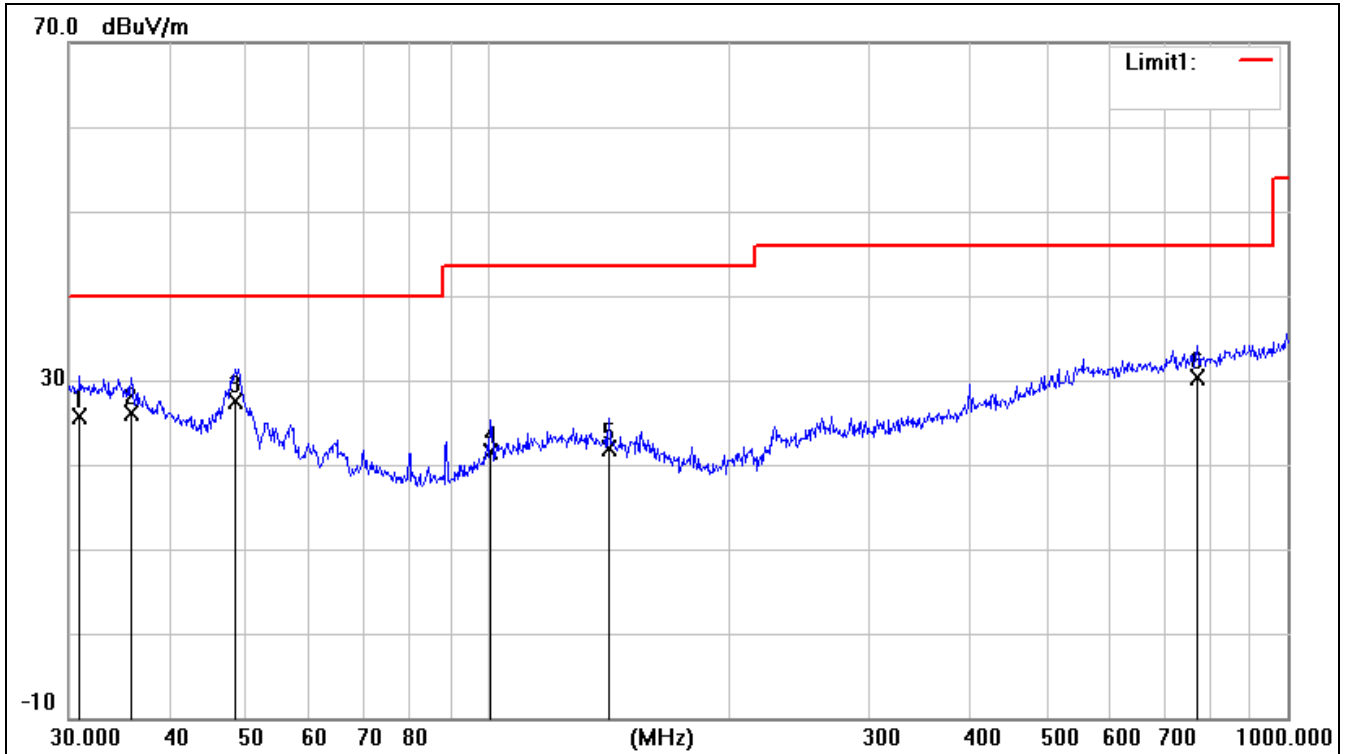
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30MHz-1GHz Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.9619	0.46	25.20	25.66	40.00	-14.34	100	276	QP
2	35.8747	1.95	24.18	26.13	40.00	-13.87	100	304	QP
3	48.3318	9.11	18.41	27.52	40.00	-12.48	100	239	QP
4	100.9340	4.20	17.28	21.48	43.50	-22.02	146	360	QP
5	141.8262	3.52	18.40	21.92	43.50	-21.58	200	270	QP
6	771.4486	2.02	28.23	30.25	46.00	-15.75	200	7	QP

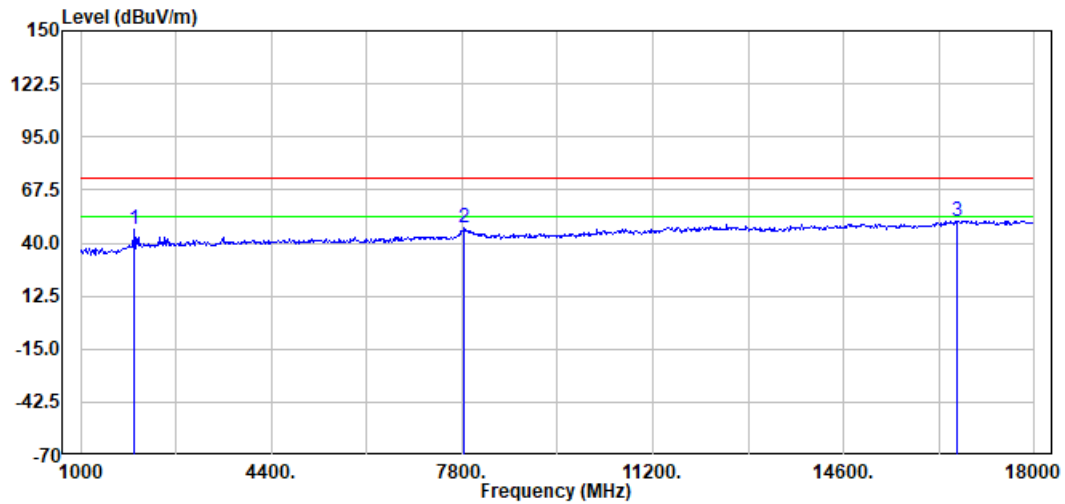
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1-18GHz Horizontal



Antenna Polarity :Horizontal

No.	Freq (MHz)	Read level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	1952.00	63.44	31.23	3.38	47.42	74.00	-26.58	Peak
2	7834.00	47.68	35.48	10.68	47.55	74.00	-26.45	Peak
3	16623.00	43.91	41.19	10.29	51.54	74.00	-22.46	Peak

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



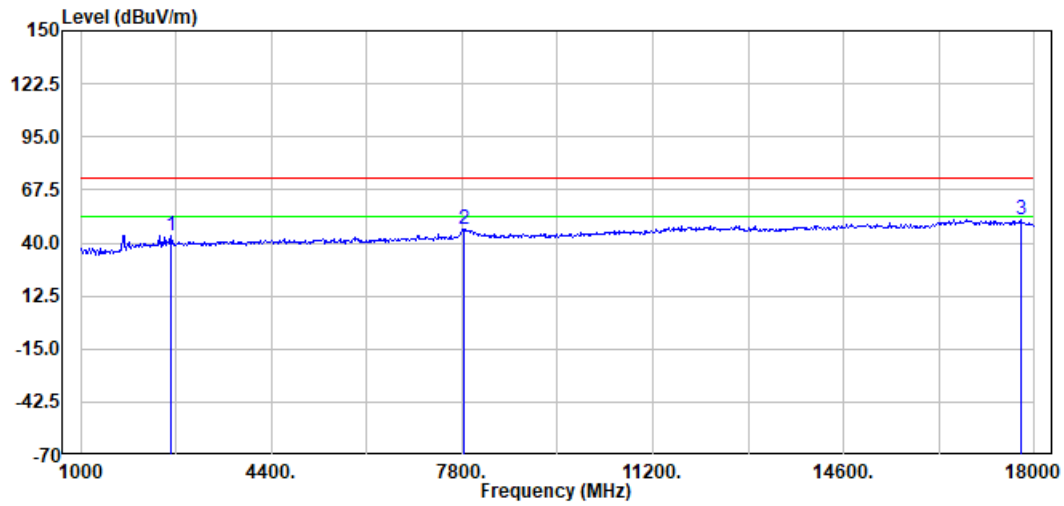
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1-18GHz Vertical



Antenna Polarity :Vertical

No.	Freq (MHz)	Read level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	2598.00	57.78	32.19	3.90	44.08	74.00	-29.92	Peak
2	7834.00	47.21	35.48	10.68	47.08	74.00	-26.92	Peak
3	17762.00	43.73	40.85	10.66	51.79	74.00	-22.21	Peak

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



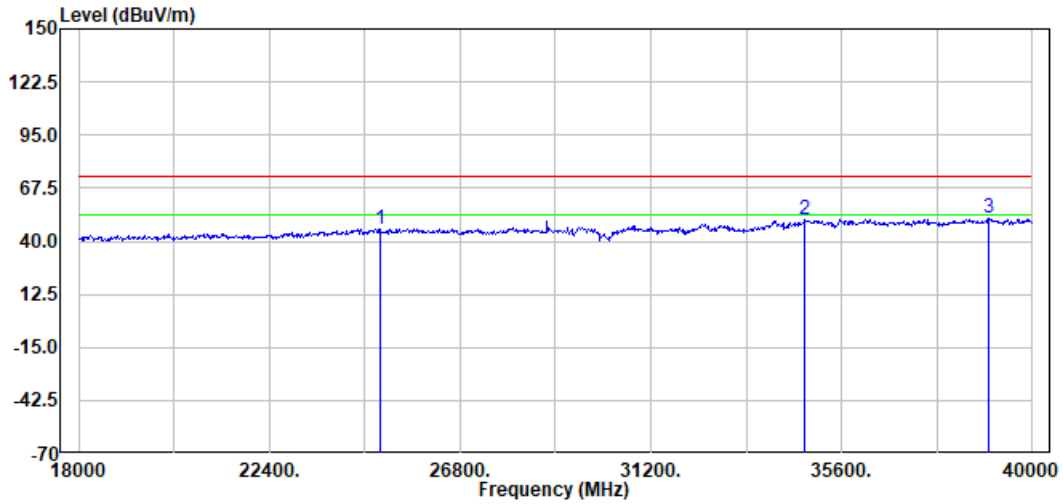
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18-40GHz Horizontal



Antenna Polarity :Horizontal

No.	Freq (MHz)	Read level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	24952.00	595.86	-500.00	5.41	46.62	74.00	-27.38	Peak
2	34764.00	595.24	-500.00	8.61	51.43	74.00	-22.57	Peak
3	38988.00	594.81	-500.00	9.38	51.93	74.00	-22.07	Peak

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

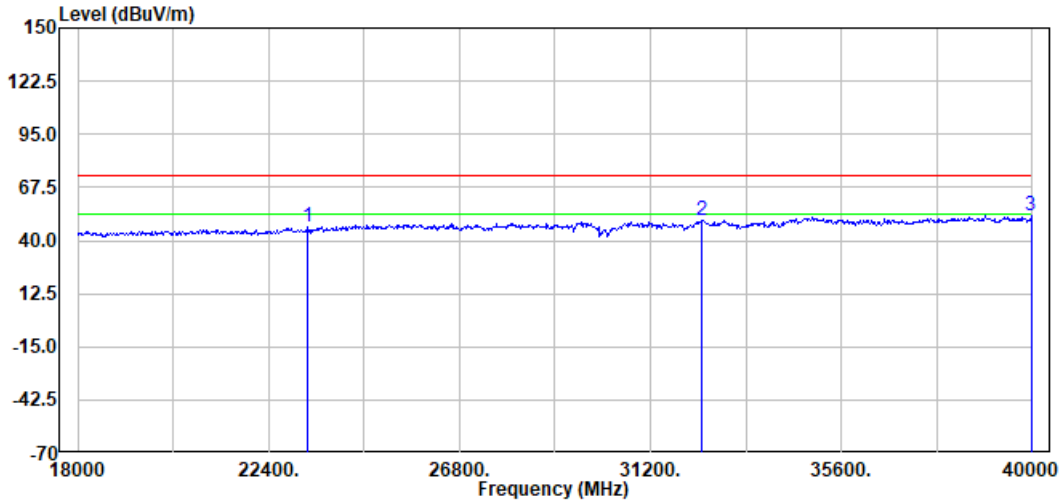
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18-40GHz Vertical



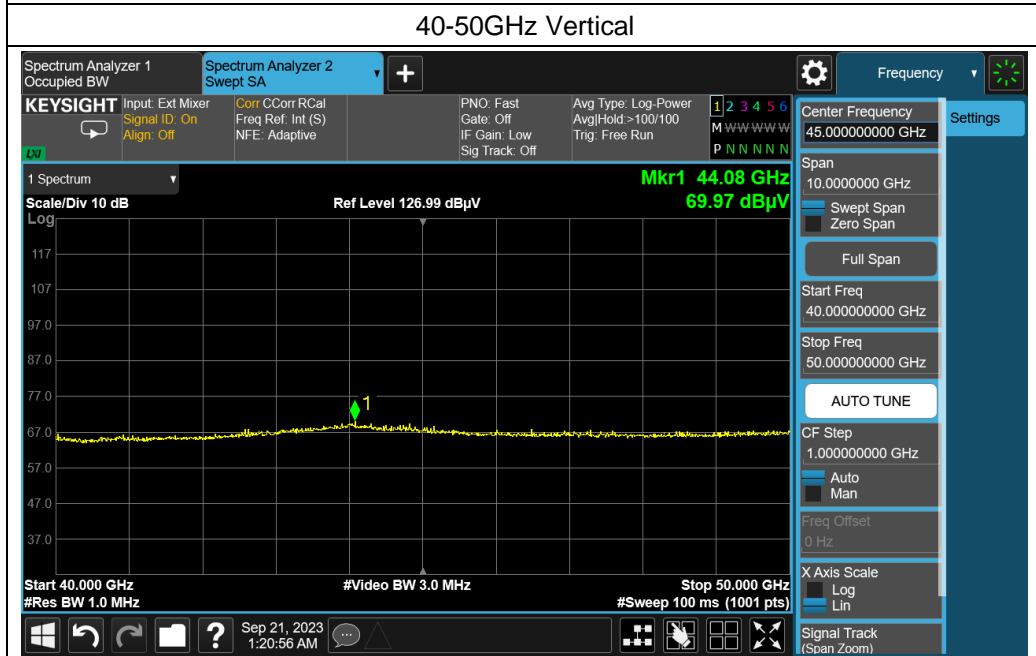
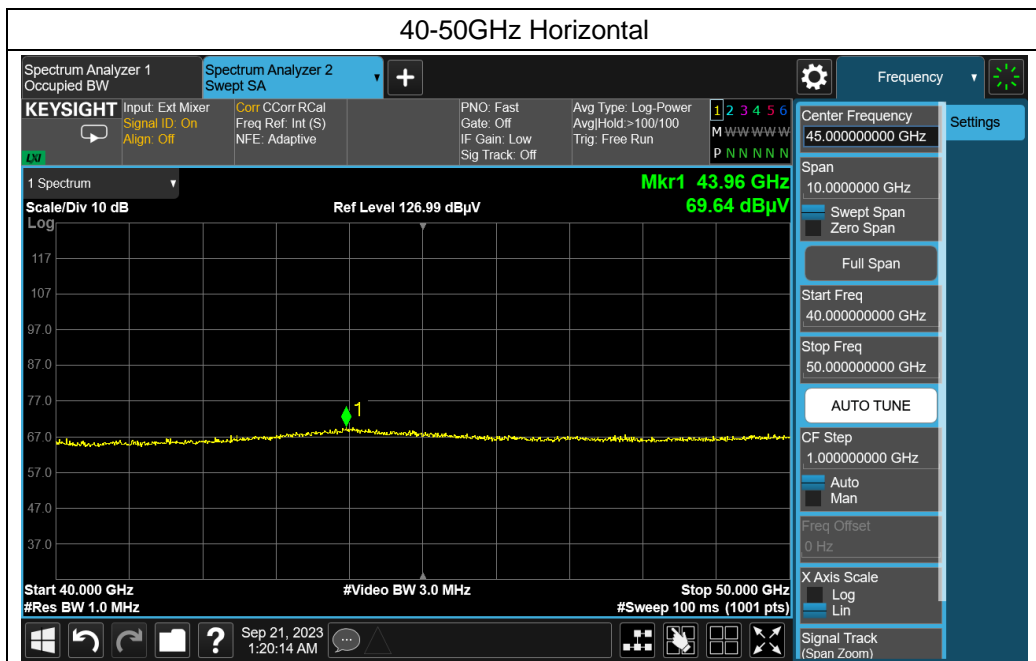
Antenna Polarity :Vertical

No.	Freq (MHz)	Read level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	23302.00	58.66	39.00	4.90	46.85	74.00	-27.15	Peak
2	32366.00	57.58	40.63	7.35	50.76	74.00	-23.24	Peak
3	39978.00	50.29	43.81	10.68	52.66	74.00	-21.34	Peak

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

### 10.4 Out of band radiated emissions above 40 GHz

Frequency (GHz)	Distance (M)	PK Value (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
44.08	3	69.97	105.31	85.31	V	PASS
43.96	3	69.64	105.31	85.31	H	PASS





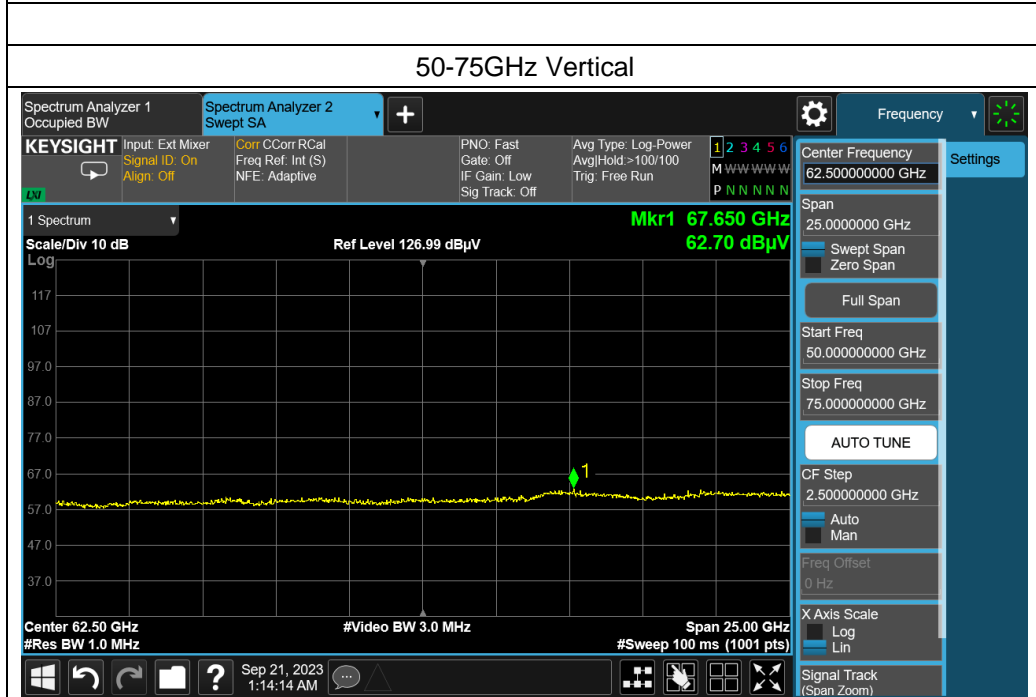
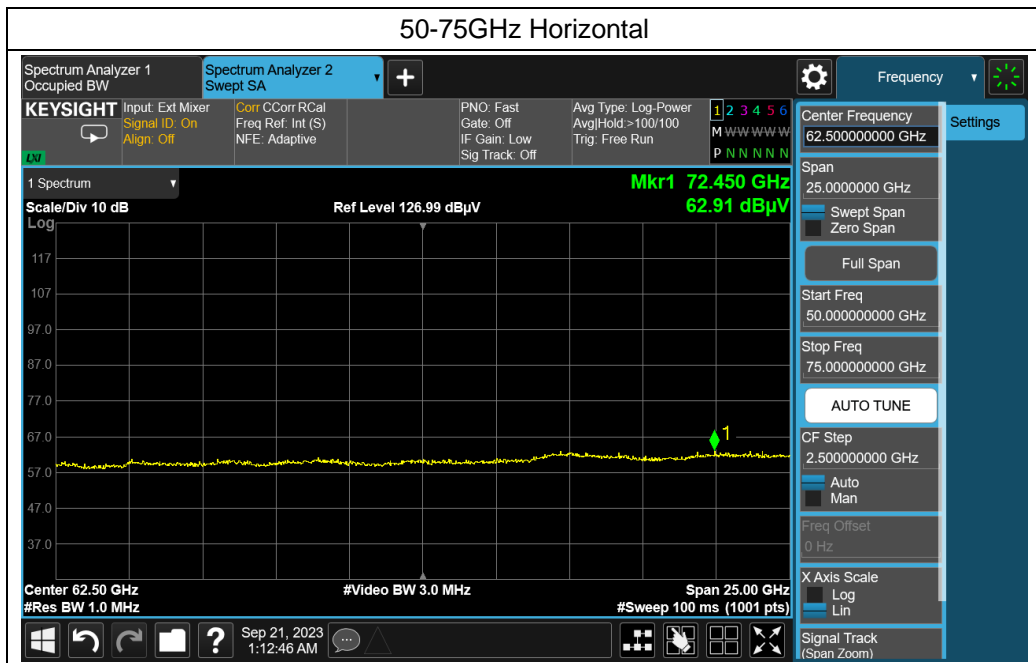
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Frequency (GHz)	Distance (M)	PK Value (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
67.65	3	62.70	105.31	85.31	V	PASS
72.45	3	62.91	105.31	85.31	H	PASS





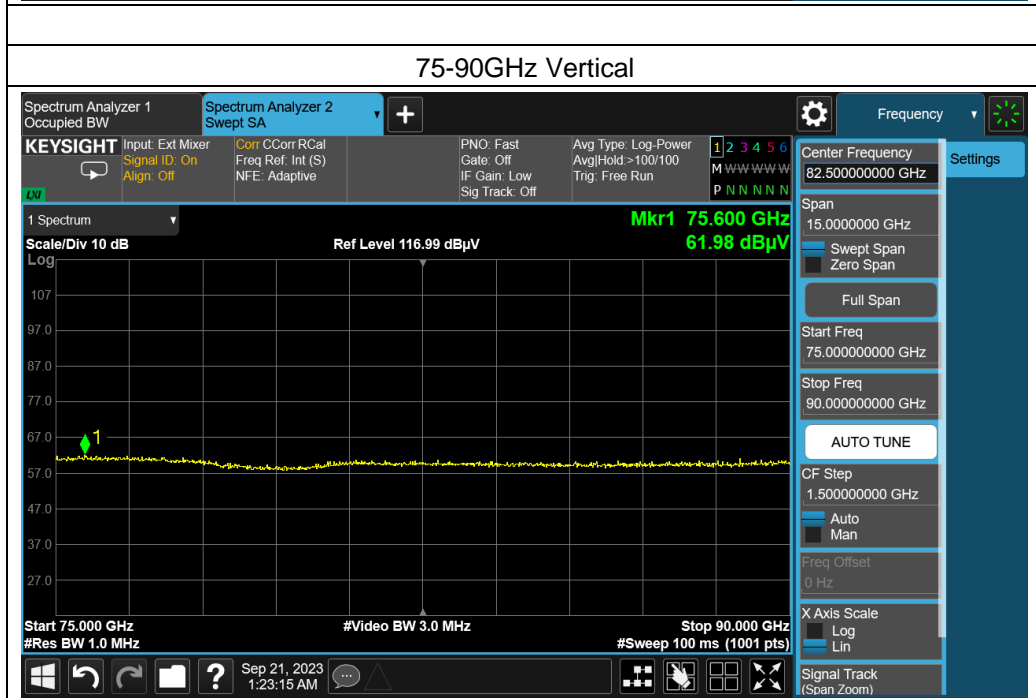
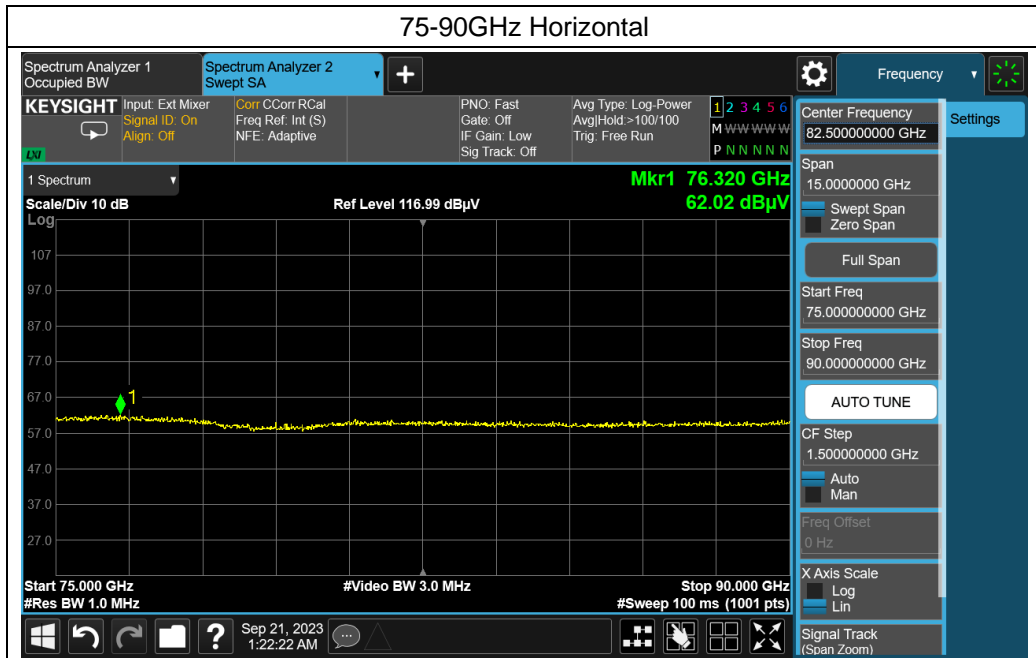
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Frequency (GHz)	Distance (M)	PK Value (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
75.60	3	61.98	105.31	85.31	V	PASS
76.32	3	62.02	105.31	85.31	H	PASS





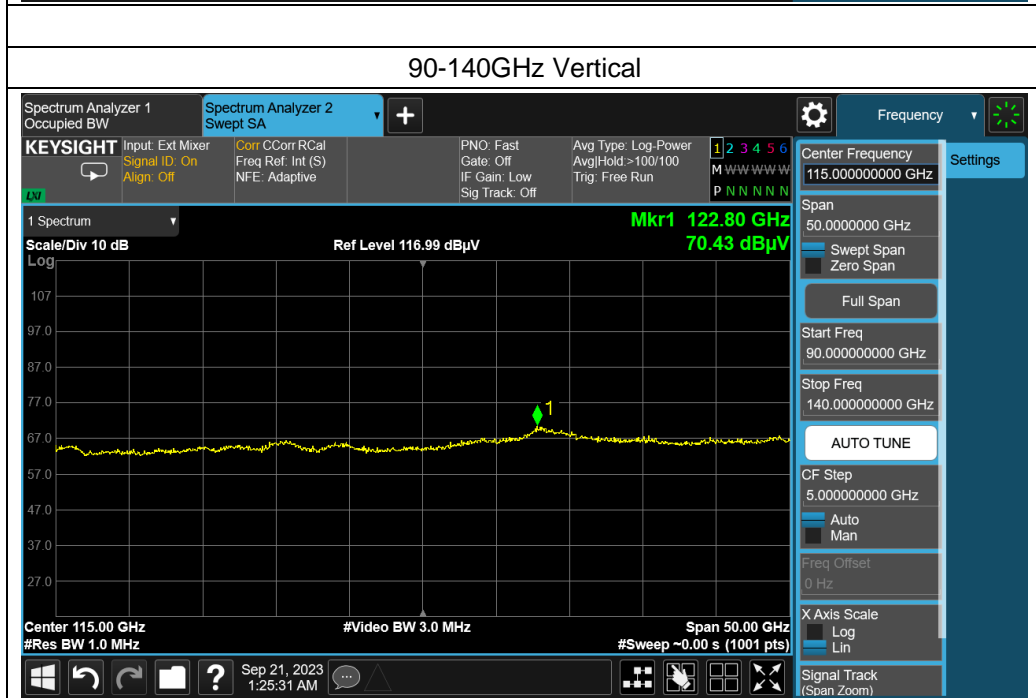
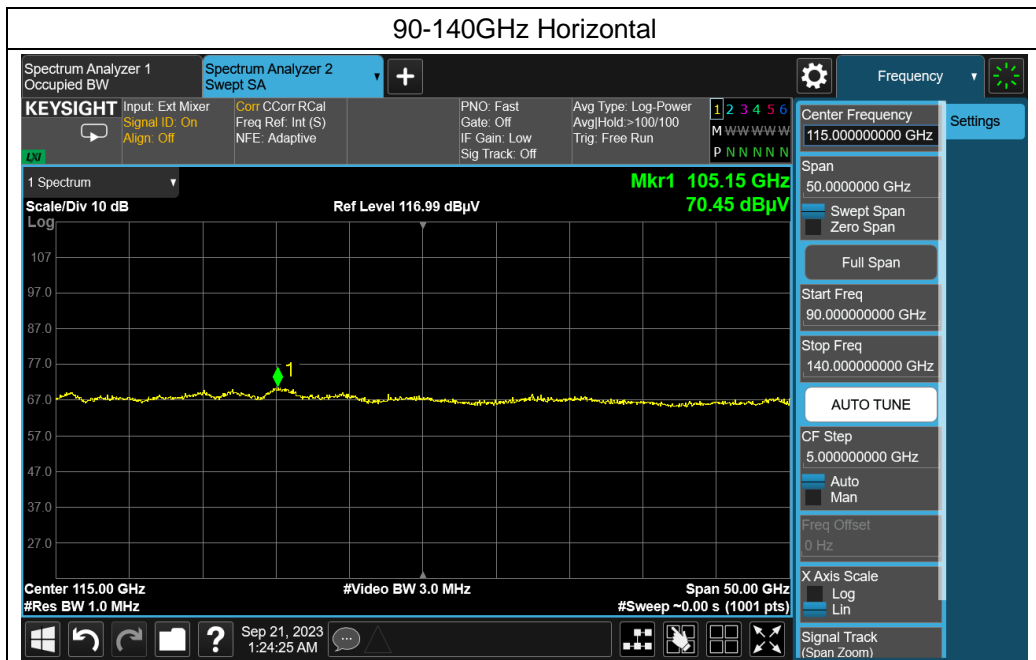
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Frequency (GHz)	Distance (M)	PK Value (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
122.80	3	70.43	105.31	85.31	V	PASS
105.15	3	70.45	105.31	85.31	H	PASS





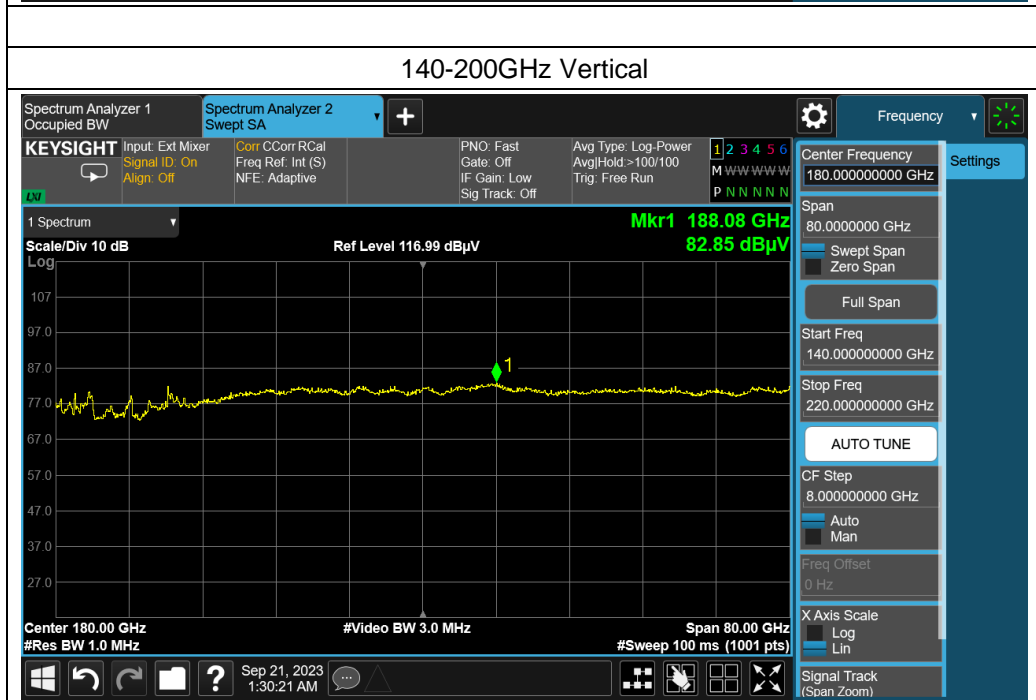
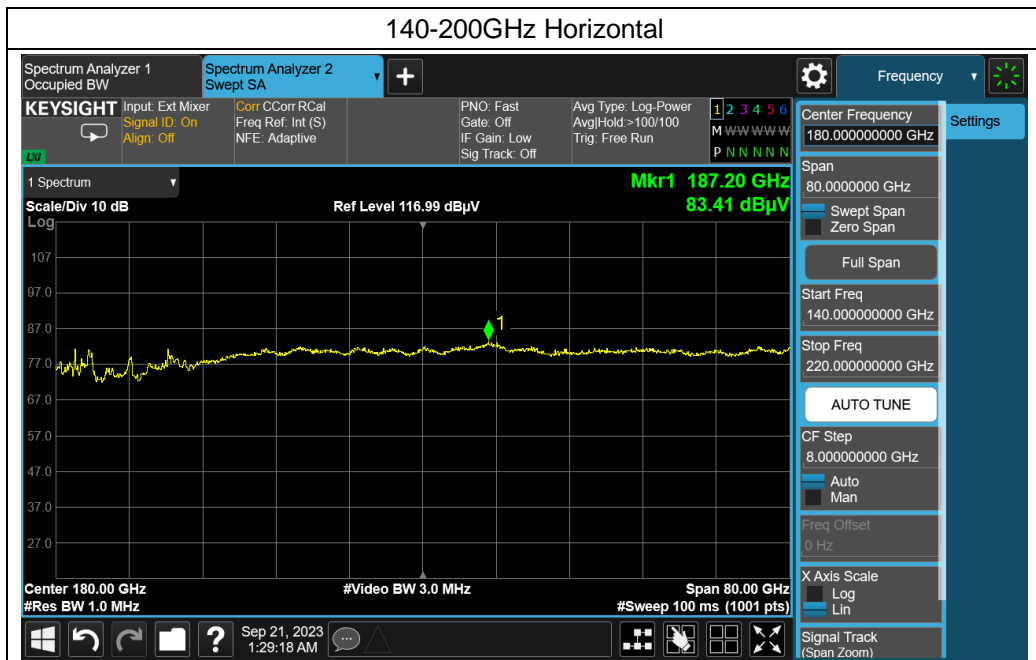
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Frequency (GHz)	Distance (M)	PK Value (dBuV/m)	PK Limit (dBuV/m)	AV Limit (dBuV/m)	Polarization	Result
188.08	3	82.85	105.31	85.31	V	PASS
187.20	3	83.41	105.31	85.31	H	PASS





**10.5 Frequency stability**

Frequency Stability vs temperature:

Test for 57GHz to 64GHz (Channel=61.884GHz)

Frequency (GHz)	Temperature (°C)	Voltage (V DC)	F <sub>L</sub> (GHz)	Limit (GHz)	F <sub>H</sub> (GHz)	Limit (GHz)	Result
57-64	50	12.00	59.975	57	63.794	64	Pass
	40	12.00	59.973	57	63.795	64	Pass
	30	12.00	59.975	57	63.793	64	Pass
	20	12.00	59.972	57	63.791	64	Pass
	10	12.00	59.977	57	63.794	64	Pass
	0	12.00	59.976	57	63.796	64	Pass
	-10	12.00	59.978	57	63.797	64	Pass
	-20	12.00	59.974	57	63.793	64	Pass
	20	7.65	59.972	57	63.792	64	Pass
	20	12.00	59.975	57	63.795	64	Pass
	20	18.40	59.977	57	63.791	64	Pass

Remark: F<sub>L</sub>: Frequency Low Band Edge, F<sub>H</sub>: Frequency High Band Edge