

# Radio Test Report

Report No.:STS2405098W01

Issued for

Shanghai Huace Navigation Technology Ltd.

577 Songying Road, Qingpu District, 201706 Shanghai, China

Product Name: Multi-point Deformation Monitoring System

Brand Name:



Model Name: PS-2000

Series Model(s) N/A

FCC ID: SY4-A02052

Test Standards: FCC Part 90

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.



## TEST REPORT

**Applicant's Name**.....: Shanghai Huace Navigation Technology Ltd.  
Address.....: 577 Songying Road, Qingpu District, 201706 Shanghai, China  
**Manufacturer's Name**.....: Shanghai Huace Navigation Technology Ltd.  
Address.....: 577 Songying Road, Qingpu District, 201706 Shanghai, China

### Product Description

Product Name .....: Multi-point Deformation Monitoring System

Brand Name .....



Model Name.....: PS-2000

Series Model .....: N/A

**Test Standards**.....: FCC Part 90

Test Procedure .....: ANSI C63.26-2015

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test.....:

Date of receipt of test item.....: 23 May 2024

Date of performance of tests ..: 23 May 2024 ~ 29 Sept. 2024

Date of Issue.....: 29 Sept. 2024

Test Result .....: Pass

Testing Engineer : *Chris Chen*

*Chris Chen*

(Chris Chen)

Technical Manager : *Tony Liu*

*Tony Liu*

(Tony Liu)



Authorized Signatory : *Bovey Yang*

*Bovey Yang*

(Bovey Yang)



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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	29 Sept. 2024	STS2405098W01	ALL	Initial Issue



## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Emission			
Standard	Item	Result	Remarks
FCC Part 90.205	Maximum Transmitter Power	PASS	
FCC Part 90.209	Occupied Bandwidth	PASS	
FCC Part 90.210	Emission Mask	PASS	
FCC Part 90.210	Transmitter Radiated Spurious Emission	PASS	
FCC Part 90.210	Spurious Emission on Antenna Port	PASS	
FCC Part 90.213	Frequency Stability Test	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.



## 1.1 TEST FACILITY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.755\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.874\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 3.80\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.18\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 4.90\text{dB}$
6	All emissions, radiated 6G-18GHz	$\pm 5.24\text{dB}$
7	All emissions, radiated 18G-40GHz	$\pm 5.42\text{dB}$
8	All emissions, radiated >40GHz	$\pm 5.86\text{dB}$

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Multi-point Deformation Monitoring System
Brand Name:	<b>CHCNAV</b>
Model Name:	PS-2000
Series Model:	N/A
Model Difference description:	N/A
Operation Band:	17.11-17.3 GHz
Channel List:	Please refer to the Note 3.
Maximum Transmitter Power:	6.221dBm
Modulation type:	FMCW
Raing:	Input: 22-25VDC 10A

#### Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	<b>CHCNAV</b>	PS-2000	microstrip antenna	N/A	12dBi	Antenna

The EUT antenna is External Antenna. No antenna other than that furnished by the responsible party shall be used with the device.

3

Channel List					
Channel	Frequency (GHz)	Channel	Frequency (GHz)	Channel	Frequency (GHz)
01	17.11	02	17.2	03	17.3

#### Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test,please see the above listed frequency for testing.

## 2.2 EUT OPERATION MODE

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

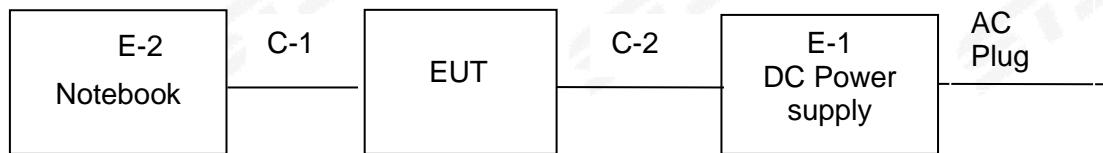
## 2.3 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

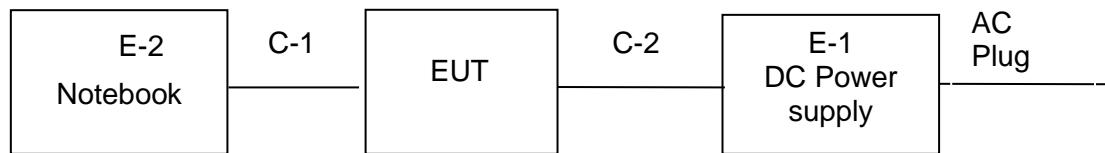
Test Mode	Modulation Type	Frenquency
Mode1	FMCW	Channel 01 (17.11GHz)
Mode2	FMCW	Channel 02 (17.2GHz)
Mode3	FMCW	Channel 03 (17.3GHz)

## 2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Emission Test



**2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS**

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

**Necessary accessories**

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

**Support units**

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-1	Power supply	HONGSHENGFENG	DPS-305AF	N/A	N/A
E-2	Notebook	LENOVO	E470	N/A	N/A
C-1	USB Cable	N/A	N/A	150cm	N/A

**Note:**

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



## 2.6 TEST EQUIPMENT

RF Radiation Test Equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2024.02.23	2025.02.22
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2024.02.23	2025.02.22
Pre-Amplifier(1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2024.09.25	2025.09.24
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2024.02.23	2025.02.22
Pre-Amplifier(40G-60GHz)	Dechen	QQ-LNA-4060-3305C	AEAU01	2024.09.01	2025.08.31
Pre-Amplifier(50G-75GHz)	Dechen	QQ-LNA-5075-3825T	AEMAY01	2024.09.01	2025.08.31
Pre-Amplifier(75G-110GHz)	Dechen	QQ-LNA-75110-4204E	AEAU04	2024.09.01	2025.08.31
Active loop Antenna(9KHz-30MHz)	ZHINAN	ZN30900C	16035	2023.02.28	2025.02.27
Bilog Antenna(30-1000MHz)	TESEQ	CBL6111D	34678	2024.09.30	2025.09.29
Horn Antenna(1G-18GHz)	SCHWARZBECK	BBHA 9120D	02014	2024.09.24	2025.09.23
Horn Antenna(18G-40GHz)	A-INFOMW	LB-180400-KF	J211020657	2024.10.10	2025.10.09
Horn Antenna(40G-60GHz)	A-INFO	LB-19-20-C-2.4F	2020036000051	2024.09.01	2025.08.31
Horn Antenna(60G-90GHz)	A-INFO	LB-12-20-A	2020026000061	2024.09.01	2025.08.31
Mixer(40-60GHz)	AT-Microwave	AT-SAX8-4060	N/A	2024.08.12	2025.08.11
Mixer(60-90GHz)	Keysight	M1971E	N/A	2024.08.16	2025.08.15
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2024.09.26	2025.09.25
Signal Analyzer	Agilent	N9020A	MY51510623	2024.02.23	2025.02.22
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	SC100_1	60531	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC power supply	HONGSHENGFENG	DPS-305AF	17064939	2024.09.26	2025.09.25
Test SW	EZ-EMC		Ver.STSLAB-03A1 RE		
Conduction Test equipment					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2024.09.25	2025.09.24
Limtter	CYBERTEK	EM5010	N/A	2024.09.25	2025.09.24
LISN	R&S	ENV216	101242	2024.09.25	2025.09.24
LISN	EMCO	3810/2NM	23625	2024.09.25	2025.09.24
Temperature & Humidity	SW-108	SuWei	N/A	2024.02.23	2025.02.22
Test SW	EZ-EMC		Ver.STSLAB-03A1 CE		
RF Connected Test					
Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY51510623	2024.02.23	2025.02.22
Signal Analyzer	R&S	FSV 40-N	101823	2024.09.26	2025.09.25
Mixer(40-60GHz)	AT-Microwave	AT-SAX8-4060	N/A	2024.08.12	2025.08.11
Mixer(60-90GHz)	Keysight	M1971E	N/A	2024.08.16	2025.08.15
Switch control box	MW	MW100-RFCB	N/A	N/A	N/A
Temperature & Humidity	SW-108	SuWei	N/A	2024.02.23	2025.02.22
Test SW	LzRf.exe		Ver.STSRF001		

### 3. MAXIMUM TRANSMITTER POWER

#### 3.1 Limit

Applicants for licenses must request and use no more power than the actual power necessary for satisfactory operation. Except where otherwise specifically provided for, the maximum power that will be authorized to applicants whose license applications for new stations are filed after August 18, 1995 is as follows:

All other frequency bands. Requested transmitter power will be considered and authorized on a case by case basis.

#### 3.2 Measurement Procedure

- a. The EUT was connected to the spectrum analyzer through sufficient attenuation.
- b. Set SPA Center Frequency=fundamental frequency, RBW=1MHz,VBW=3MHz,span=5MHz.
- c Set SPA Max hold. Mark peak.

#### 3.3 Test Setup



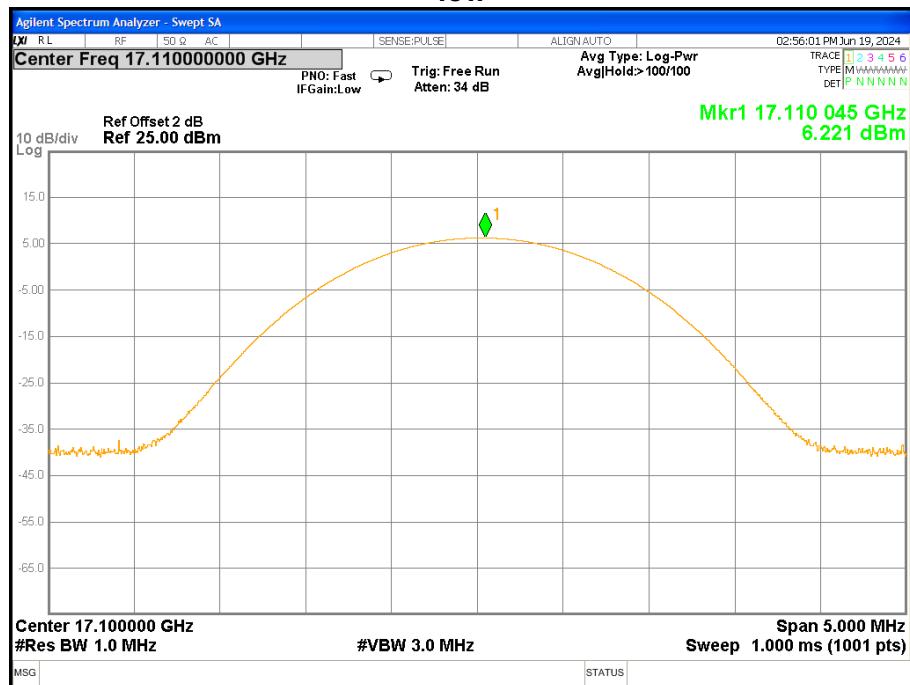
#### 3.4 Test Result

Frequency (GHz)	Conducted output power (dBm)	EIRP
17.11	6.221	18.221
17.2	5.855	17.855
17.3	6.130	18.130
17.1-17.3(chrip)	6.217	18.217

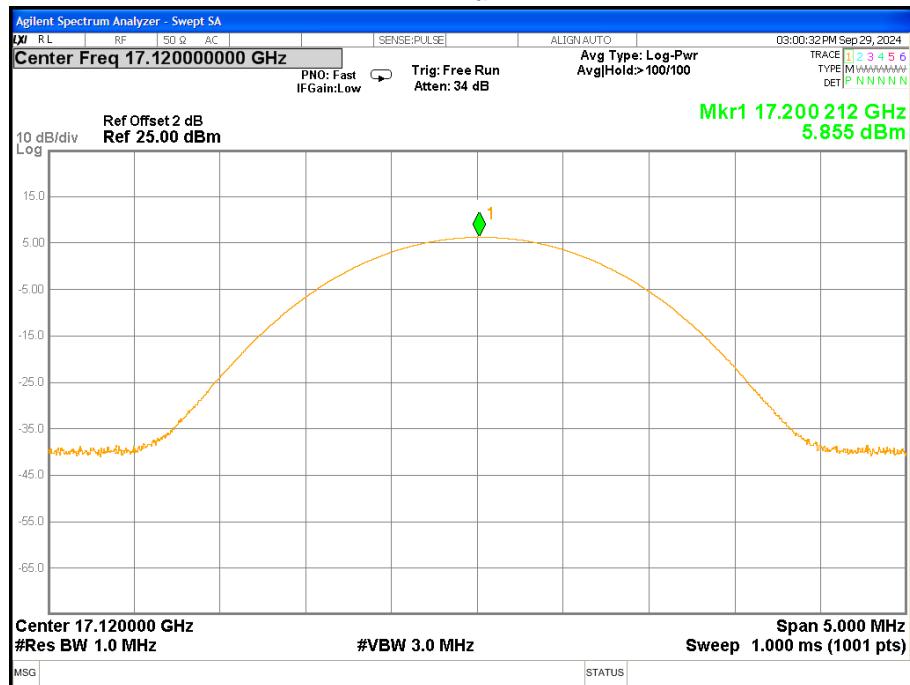
**Note:(EIRP) values are calculated, based on the conducted peak output power values plus an antenna gain of 12 dBi.**



low

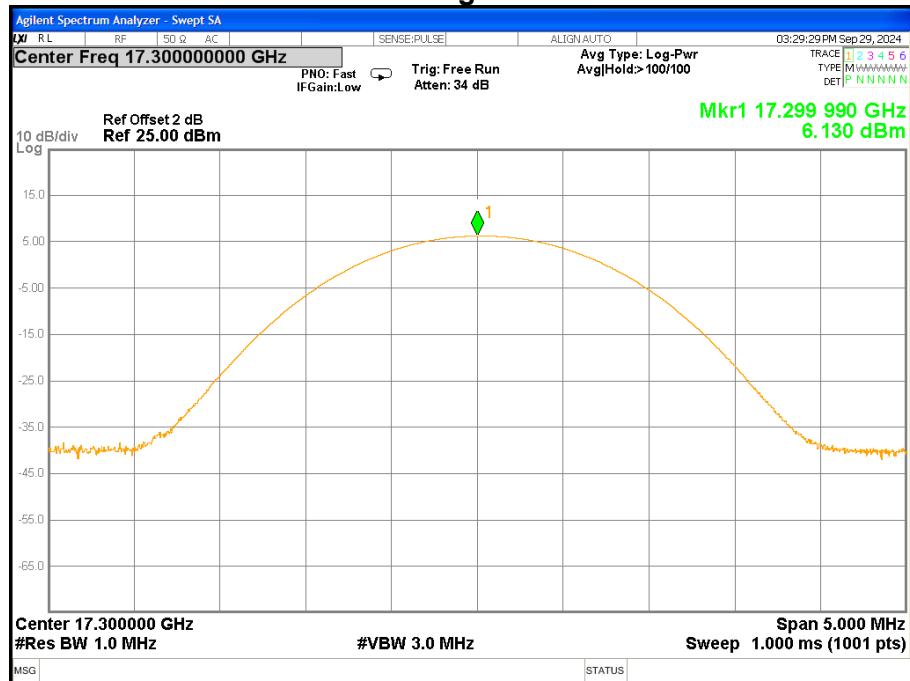


mid

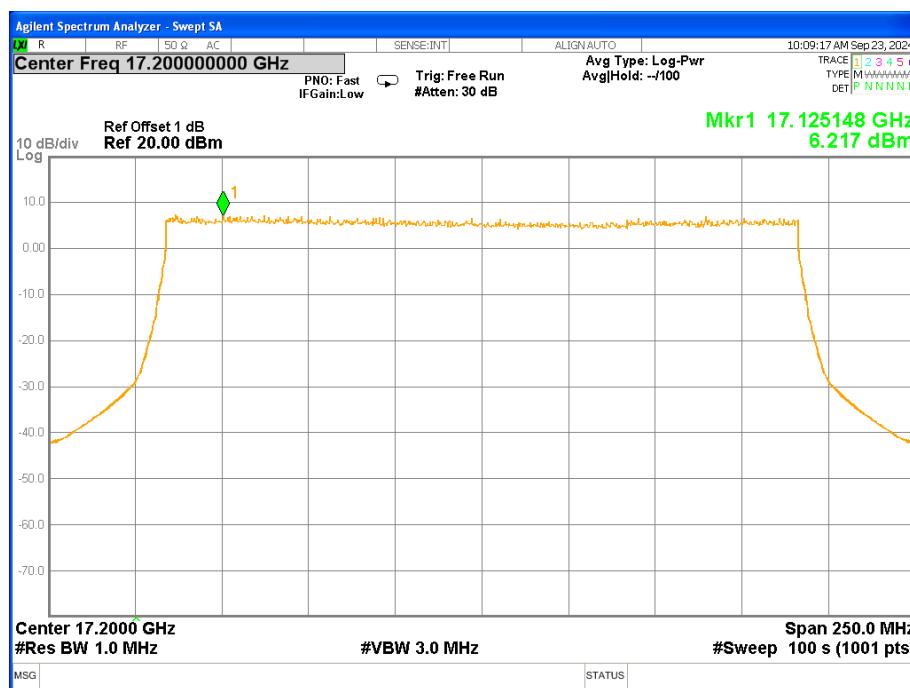




high



seep



## 4. OCCUPIED BANDWIDTH

### 4.1 Limit

(a) Each authorization issued to a station licensed under this part will show an emission designator representing the class of emission authorized. The designator will be prefixed by a specified necessary bandwidth. This number does not necessarily indicate the bandwidth occupied by the emission at any instant. In those cases where § 2.202 of this chapter does not provide a formula for the computation of necessary bandwidth, the occupied bandwidth, as defined in part 2 of this chapter, may be used in lieu of the necessary bandwidth.

(b) The maximum authorized single channel bandwidth of emission corresponding to the type of emission specified in § 90.207 is as follows:

(1) For A1A or A1B emissions, the maximum authorized bandwidth is 0.25 kHz. The maximum authorized bandwidth for type A3E emission is 8 kHz.

(2) For operations below 25 MHz utilizing J3E emission, the bandwidth occupied by the emission shall not exceed 3000 Hz. The assigned frequency will be specified in the authorization. The authorized carrier frequency will be 1400 Hz lower in frequency than the assigned frequency. Only upper sideband emission may be used. In the case of regularly available double sideband radiotelephone channels, an assigned frequency for J3E emissions is available either 1600 Hz below or 1400 Hz above the double sideband radiotelephone assigned frequency.

(3) For all other types of emissions, the maximum authorized bandwidth shall not be more than that normally authorized for voice operations.

(4) Where a frequency is assigned exclusively to a single licensee, more than a single emission may be used within the authorized bandwidth. In such cases, the frequency stability requirements of § 90.213 must be met for each emission.

(5) Unless specified elsewhere, channel spacings and bandwidths that will be authorized in the following frequency bands are given in the following table.

TABLE 1 TO §90.209(b)(5)—STANDARD CHANNEL SPACING/BANDWIDTH

Frequency band (MHz)	Channel spacing (kHz)	Authorized bandwidth (kHz)
Below 25 <sup>2</sup>		
25-50	20	20
72-76	20	20
150-174	17.5	1 <sup>3</sup> 20/11.25/6
216-220 <sup>5</sup>	6.25	20/11.25/6
220-222	5	4
406-512 <sup>2</sup>	16.25	13 <sup>6</sup> 20/11.25/6
806-809/851-854	12.5	20
809-817/854-862	12.5	6 <sup>20/11.25</sup>
817-824/862-869	25	6 <sup>20</sup>
896-901/935-940	12.5	13.6
902-928 <sup>4</sup>		
929-930	25	20
1427-1432 <sup>5</sup>	12.5	12.5
2450-2483.5 <sup>2</sup>		
Above 2500 <sup>2</sup>		

### 4.2 Measurement Procedure

- The EUT was connected to the spectrum analyzer through sufficient attenuation.
- Set SPA Center Frequency=fundamental frequency, RBW=100KHz, VBW=300KHz
- Set SPA Max hold. Mark peak, Set 99% Occupied Bandwidth.

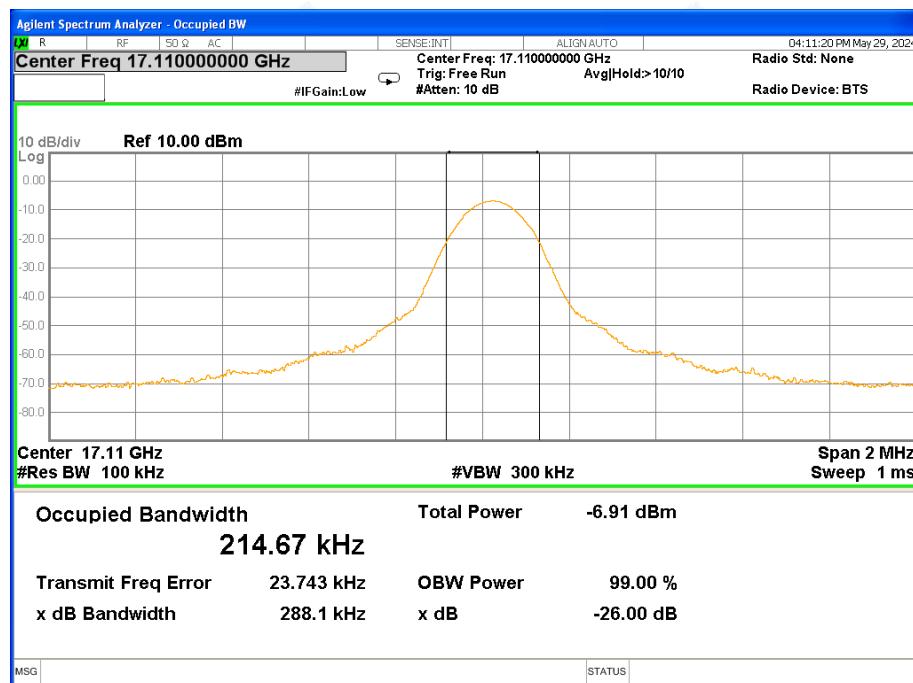
### 4.3 Test Setup



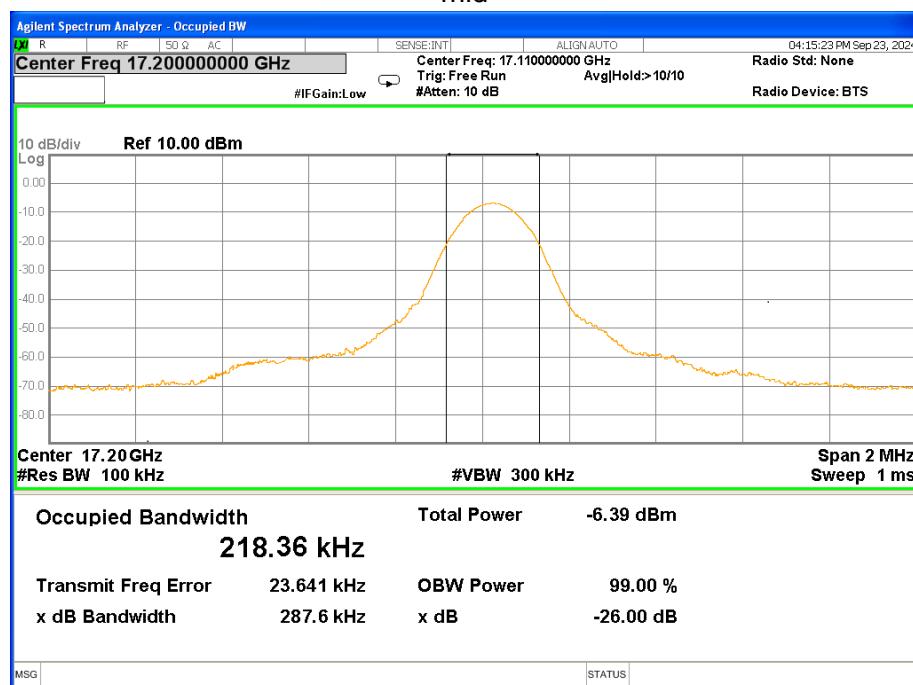
#### 4.4 TEST RESULT

Frequency	Bandwidth
17.11 GHz	214.67 KHz
17.2 GHz	218.36 KHz
17.3 GHz	213.39 KHz
17.1GHz -17.3 GHz (sweep)	181.8 MHz

low

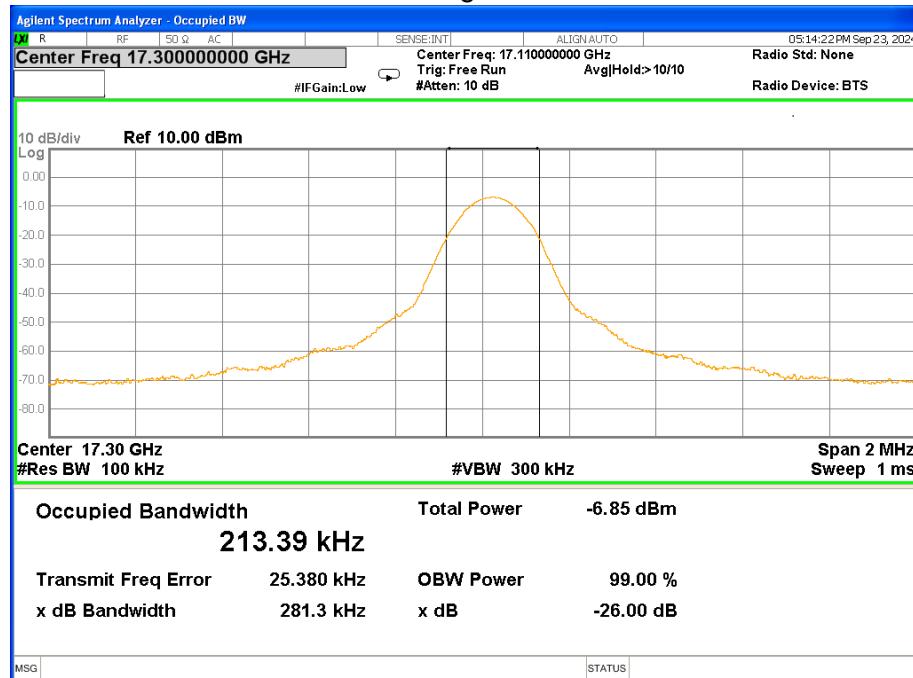


mid

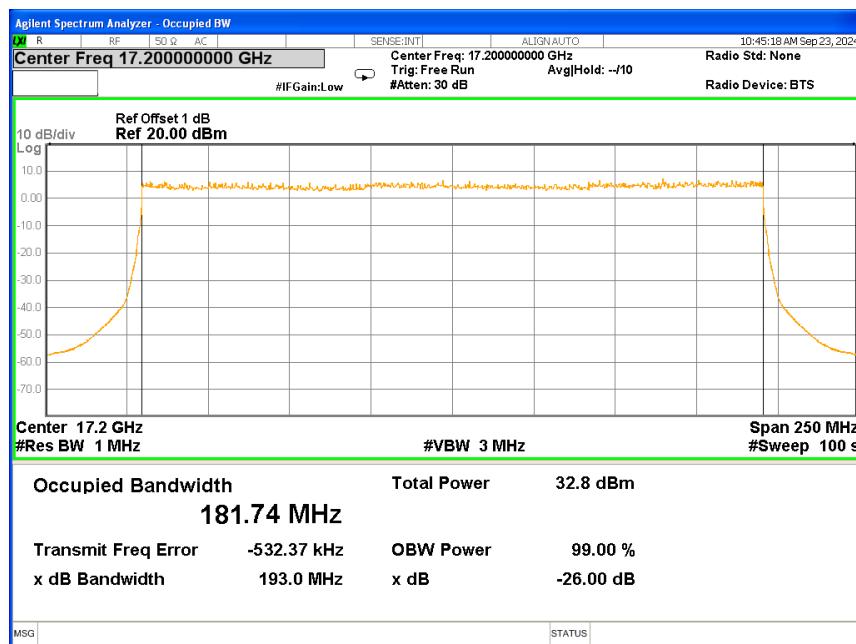




high



sweep



## 5. EMISSION MASK

### 5.1 Limit

Except as indicated elsewhere in this part, transmitters used in the radio services governed by this part must comply with the emission masks outlined in this section. Unless otherwise stated, per paragraphs (d)(4), (e)(4), and (o) of this section, measurements of emission power can be expressed in either peak or average values provided that emission powers are expressed with the same parameters used to specify the unmodulated transmitter carrier power. For transmitters that do not produce a full power unmodulated carrier, reference to the unmodulated transmitter carrier power refers to the total power contained in the channel bandwidth. Unless indicated elsewhere in this part, the table in this section specifies the emission masks for equipment operating under this part.

(b) Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log (P)$  dB.

(c) Emission Mask C. For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:

(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz, but not more than 10 kHz: At least  $83 \log (fd/5)$  dB;

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least  $29 \log (fd/11)$  dB or 50 dB, whichever is the lesser attenuation;

(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log (P)$  dB.

(4) In the 1427-1432 MHz band, licensees are encouraged to take all reasonable steps to ensure that unwanted emissions power does not exceed the following levels in the 1400-1427 MHz band:

(i) For stations of point-to-point systems in the fixed service: -45 dBW/27 MHz.

(ii) For stations in the mobile service: -60 dBW/27 MHz.

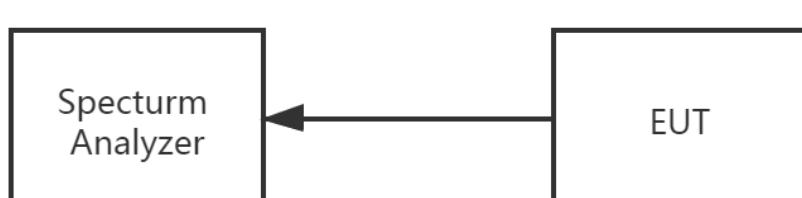
### 5.2 Measurement Procedure

a. The EUT was connected to the spectrum analyzer through sufficient attenuation.

b. Set SPA Center Frequency=fundamental frequency, RBW=100KHz,VBW=100KHz..

c. Set SPA Max hold. Mark peak.

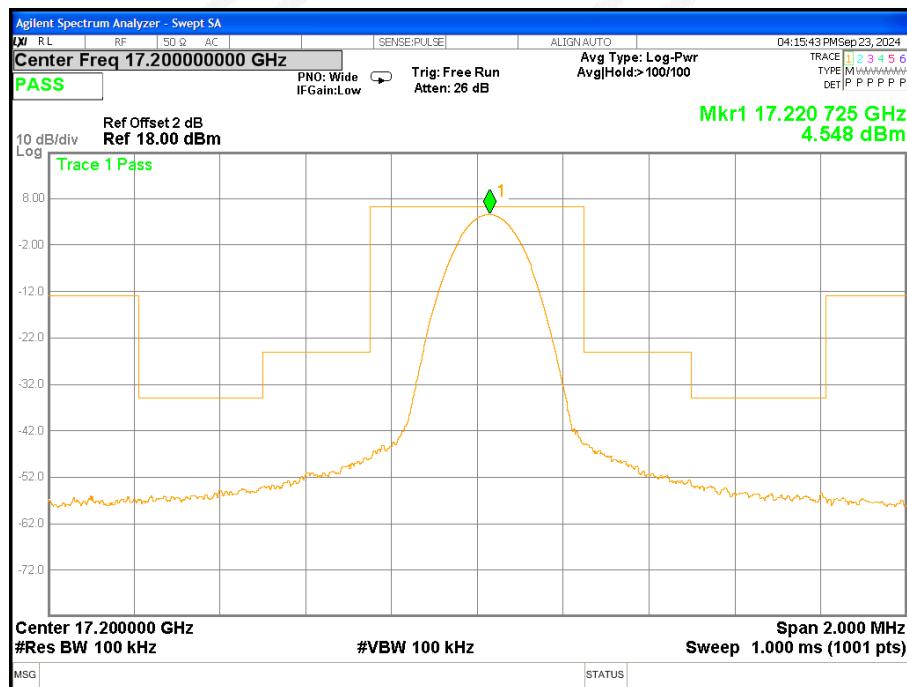
### 5.3 Test Setup



## 5.4 Test Result

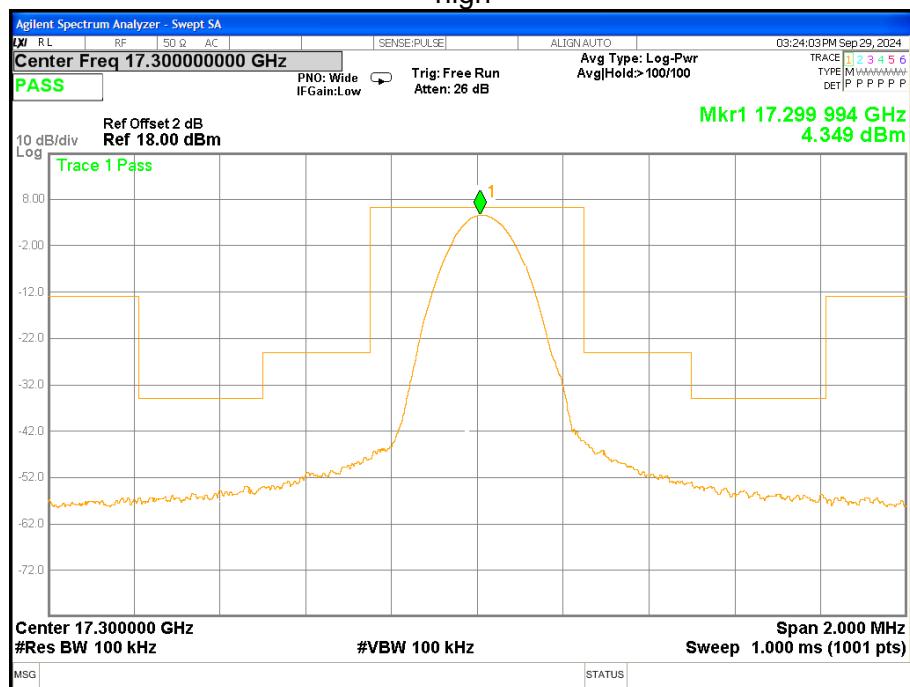


mid

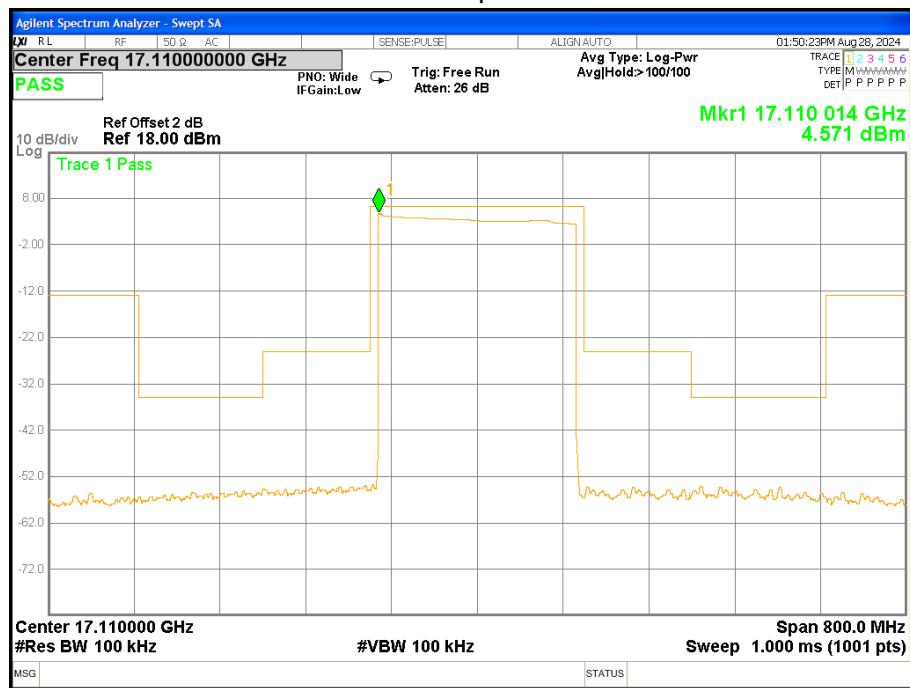




high



seep





## 6. TRANSMITTER RADIATED SPURIOUS EMISSION

### 6.1 Limit

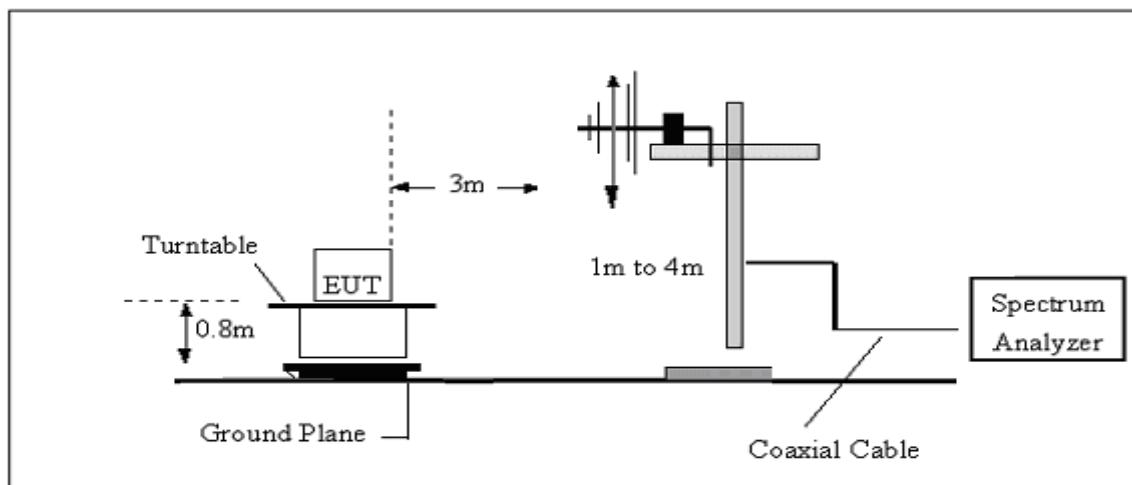
On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log (P)$  dB.

### 6.2 Measurement Procedure

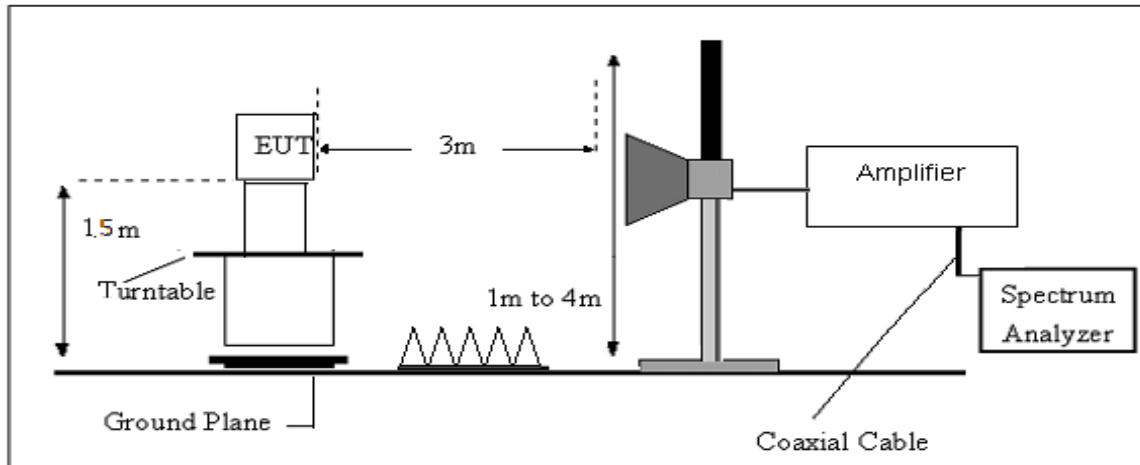
- a. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. for emission measurements. The height of receiving antenna is 1.50 m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in six channels were measured with peak detector.
- b. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- c. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100KHz, VBW=300KHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).
- d. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- e. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (P<sub>cl</sub>) ,the Substitution Antenna Gain (G<sub>a</sub>) and the Amplifier Gain (P<sub>Ag</sub>) should be recorded after test. The measurement results are obtained as described below:  
Amplifier for substituation test; The measurement results are amend as described below:  
$$\text{Power(EIRP)} = P_{\text{Mea}} - P_{\text{cl}} + G_a$$
- f. Radiation testing at frequencies greater than 40GHz, Test Antenna is 1.5m away from the EUT. Test Antenna height is varied from 1m to 2.5m above the ground and the Turn Table is actuated to turn from 0° to 360° to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of reject filter. The LNA can be used to increase the dynamic range for the measurement receiver.

### 6.3 Test Setup

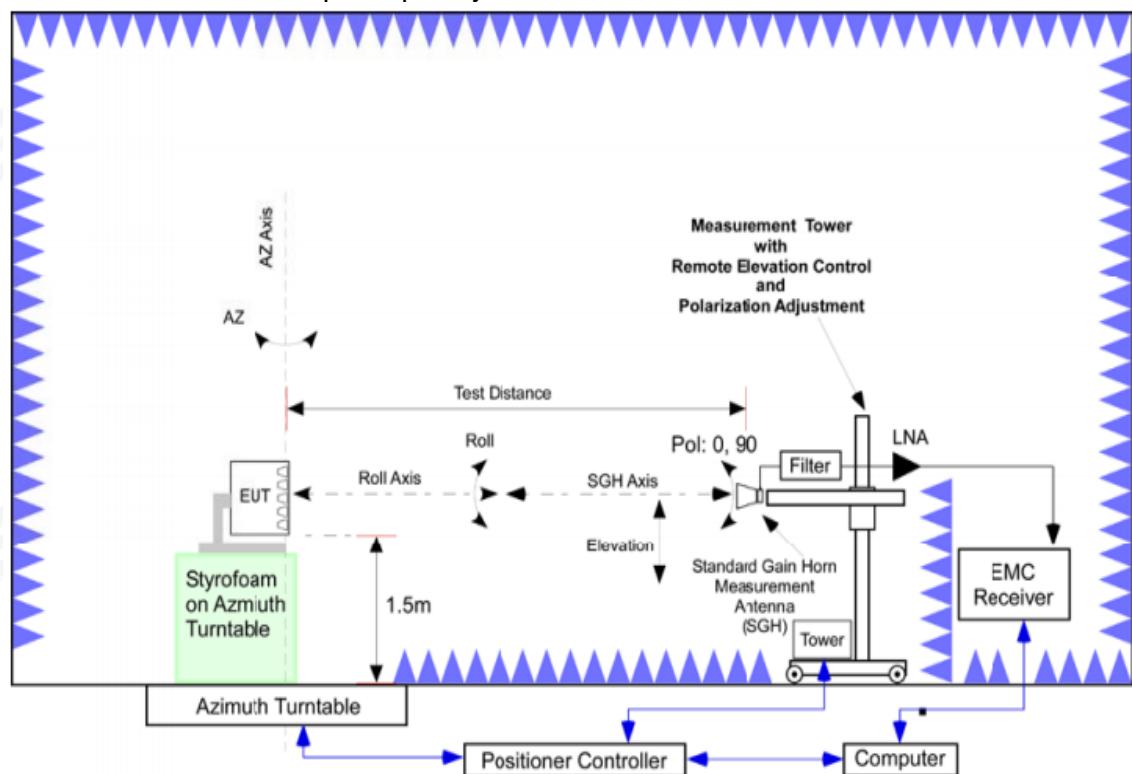
#### (A) Radiated Emission Test-Up Frequency 30MHz~1GHz



#### (B) Radiated Emission Test-Up Frequency 1GHz~18GHz

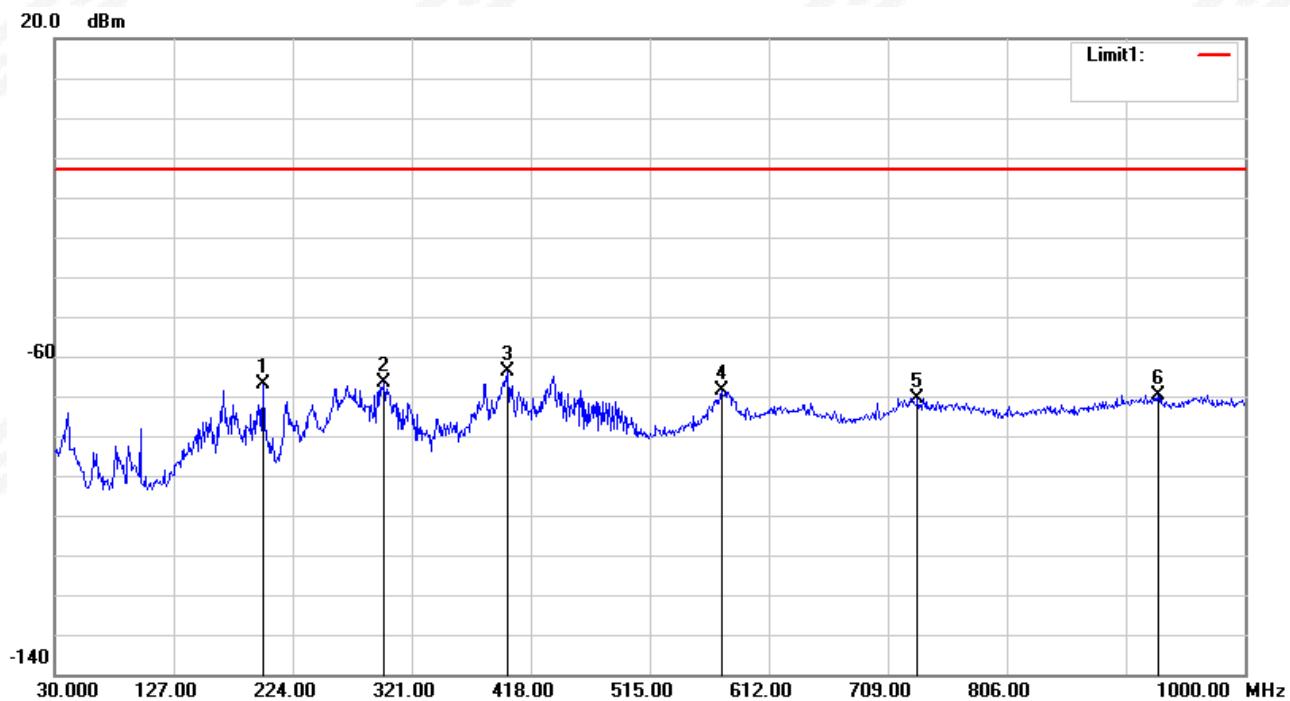


#### (C) Radiated Emission Test-Up Frequency 18GHz~200GHz



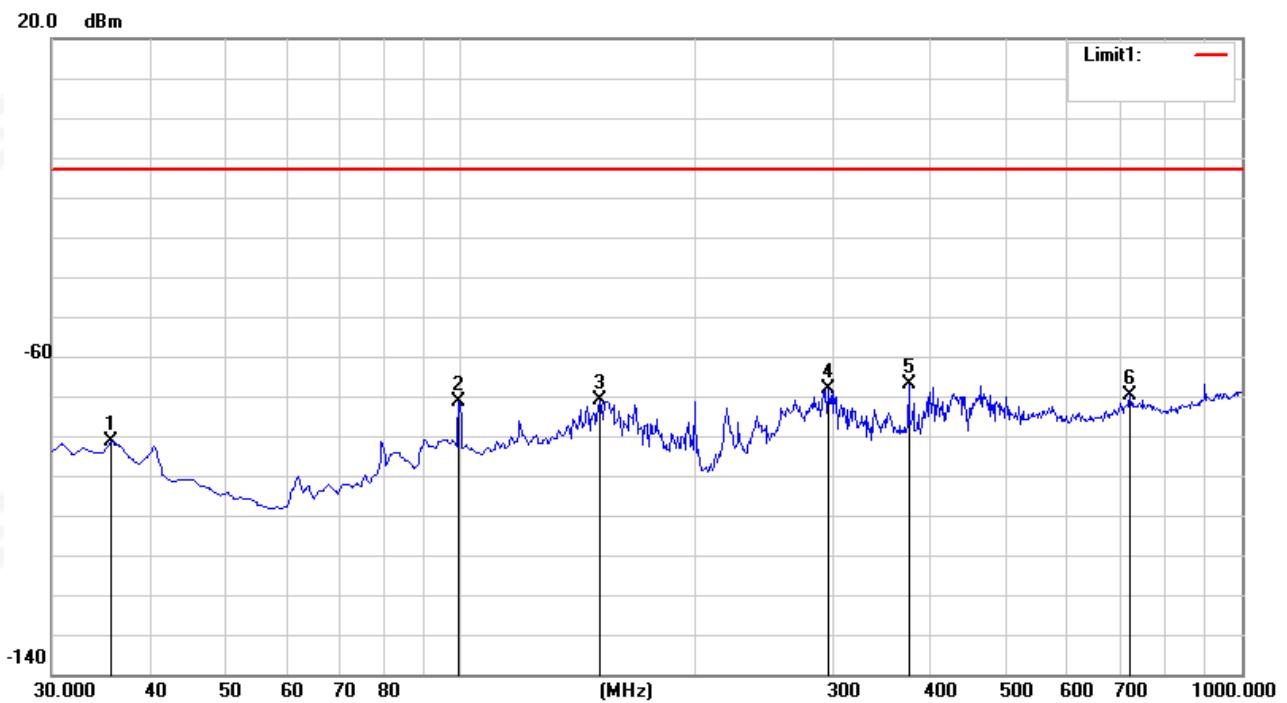
## 6.4 Test Result

Mode1 30-1000MHz-H



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	199.7500	-54.52	-12.55	-67.07	-13.00	-54.07	peak
2	298.6900	-58.55	-8.19	-66.74	-13.00	-53.74	peak
3	399.5700	-63.91	-0.06	-63.97	-13.00	-50.97	peak
4	573.2000	-73.18	4.67	-68.51	-13.00	-55.51	peak
5	733.2500	-76.31	5.72	-70.59	-13.00	-57.59	peak
6	929.1900	-78.00	8.32	-69.68	-13.00	-56.68	peak

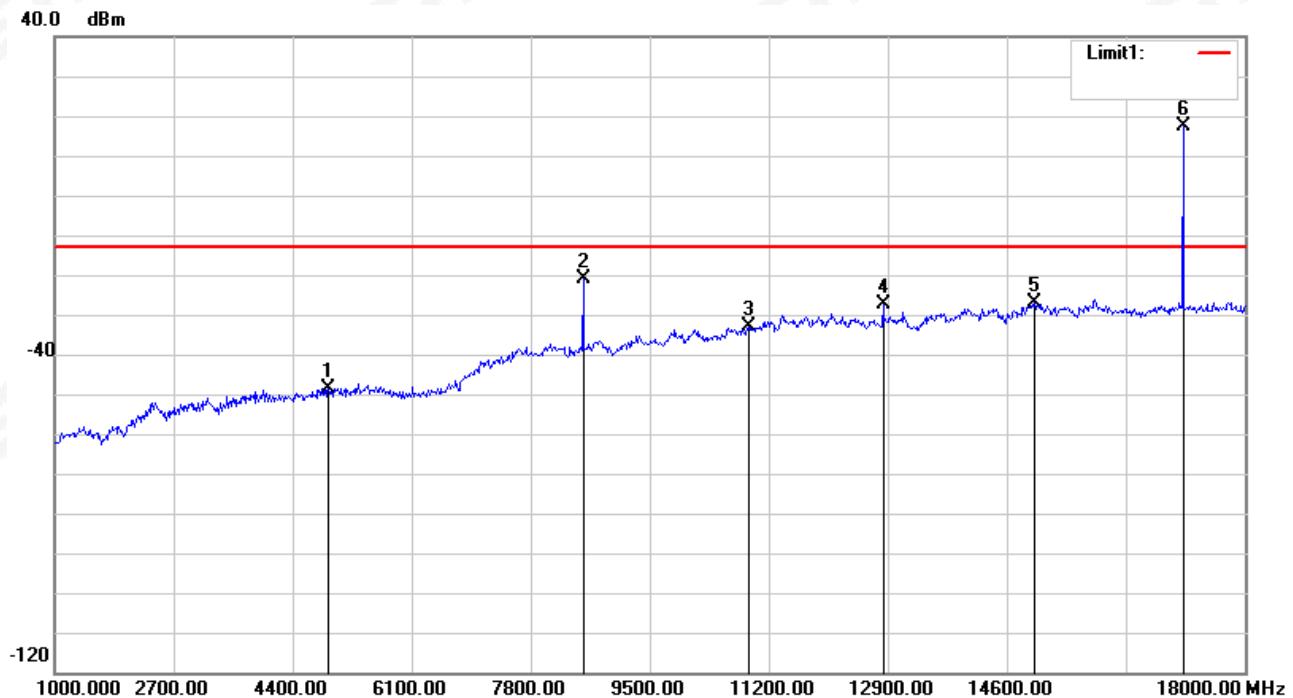
## Mode1 30-1000MHz V



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	35.8200	-70.99	-10.22	-81.21	-13.00	-68.21	peak
2	99.8400	-65.83	-5.64	-71.47	-13.00	-58.47	peak
3	151.2500	-66.96	-4.11	-71.07	-13.00	-58.07	peak
4	295.7800	-63.31	-5.01	-68.32	-13.00	-55.32	peak
5	375.3200	-64.00	-3.07	-67.07	-13.00	-54.07	peak
6	720.6400	-76.81	7.03	-69.78	-13.00	-56.78	peak

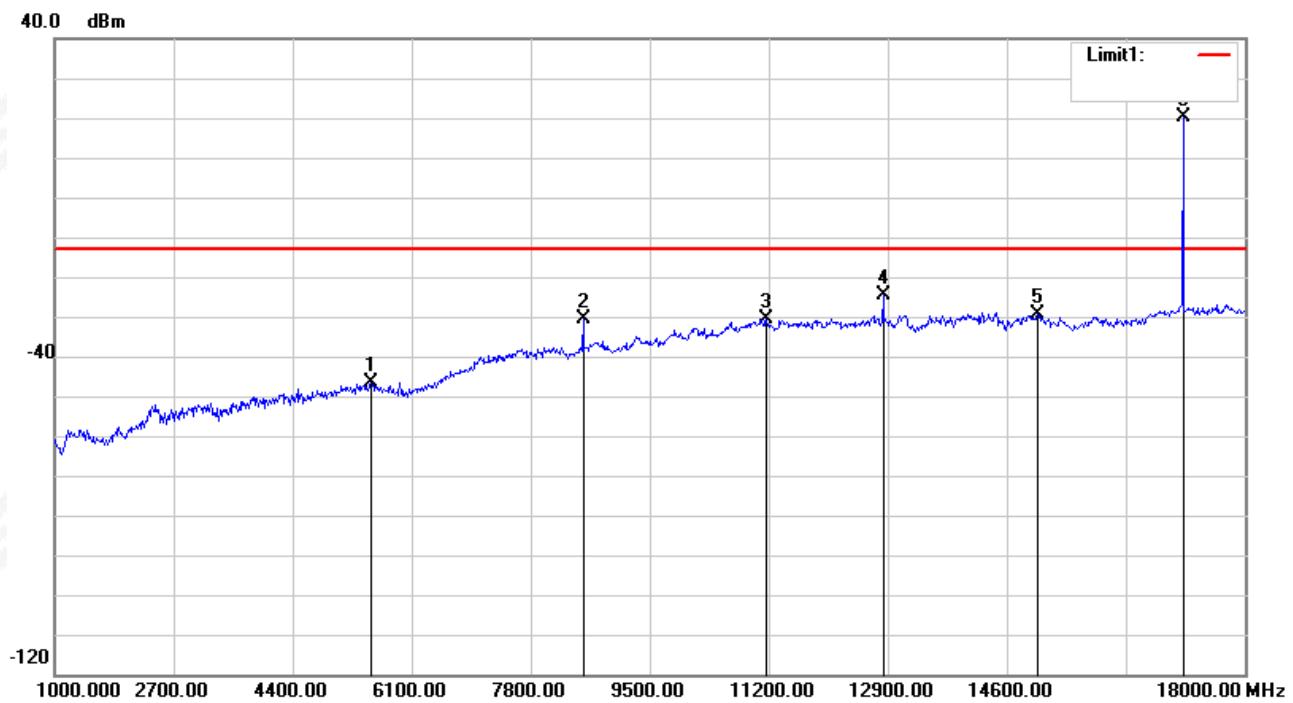
Above 1G

## Mode1 1-18 GHz -H



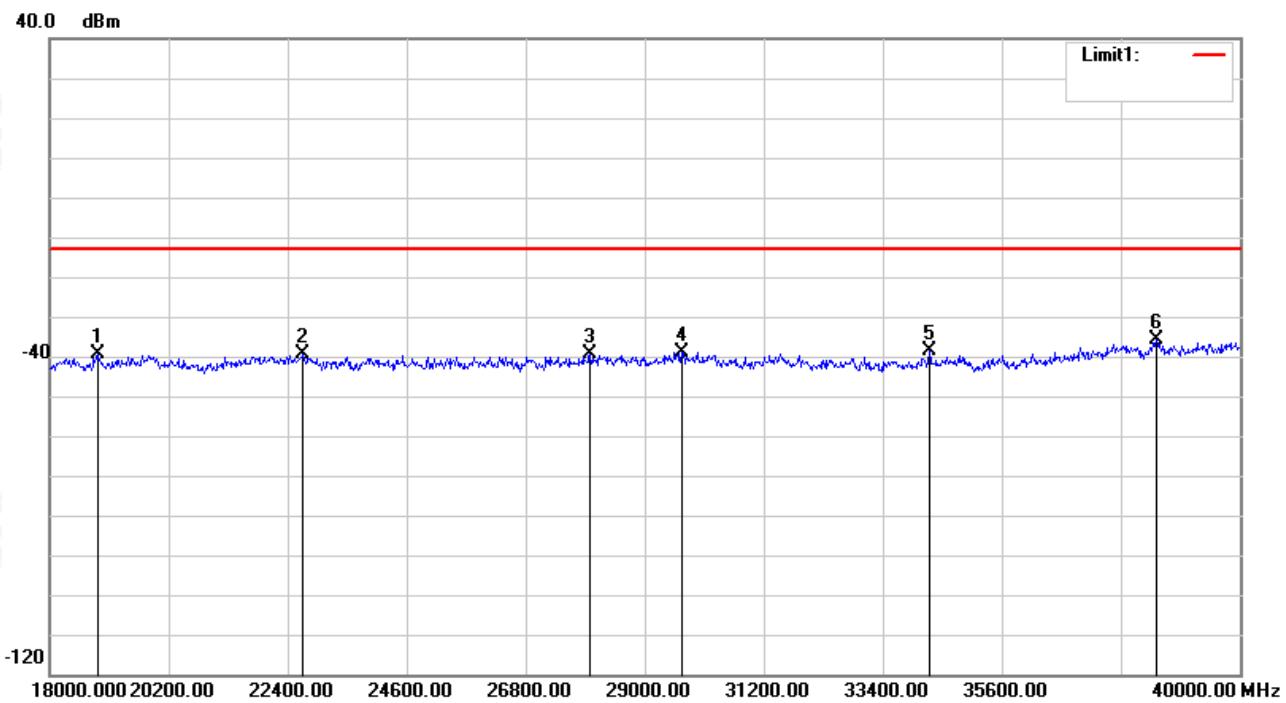
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	4910.000	-56.83	8.39	-48.44	-13.00	-35.44	peak
2	8548.000	-38.57	17.46	-21.11	-13.00	-8.11	peak
3	10911.000	-55.06	22.19	-32.87	-13.00	-19.87	peak
4	12832.000	-52.32	25.05	-27.27	-13.00	-14.27	peak
5	14991.000	-54.60	27.57	-27.03	-13.00	-14.03	peak
6	17116.000	-10.28	27.72	17.44	-	-	fundamental frequency

## Mode1 1-18 GHz -V



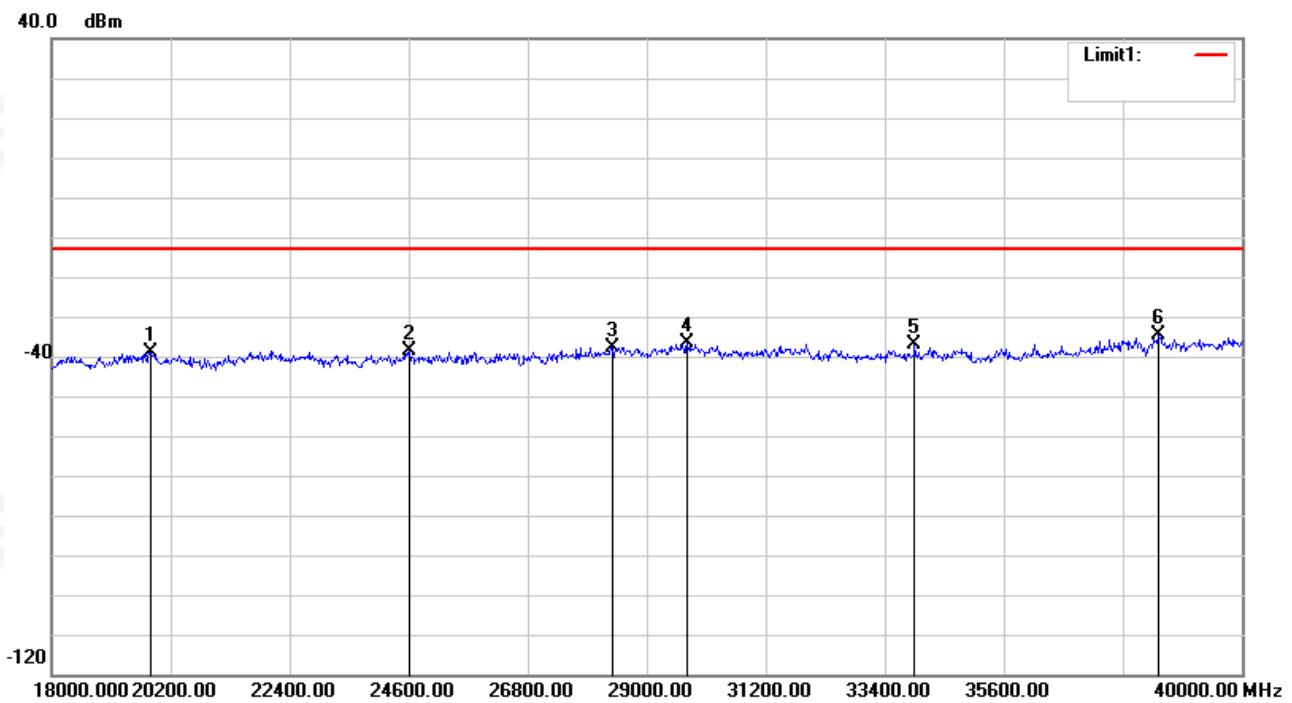
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	5522.000	-56.71	10.18	-46.53	-13.00	-33.53	peak
2	8548.000	-47.83	17.40	-30.43	-13.00	-17.43	peak
3	11166.000	-54.62	23.98	-30.64	-13.00	-17.64	peak
4	12832.000	-49.84	25.25	-24.59	-13.00	-11.59	peak
5	15042.000	-54.70	25.31	-29.39	-13.00	-16.39	peak
6	17116.000	-7.51	27.74	20.23	-	-	fundamental frequency

## Mode1 18-40 GHz -H



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	18880.000	-67.66	28.17	-39.49	-13.00	-26.49	peak
2	22686.000	-68.04	28.52	-39.52	-13.00	-26.52	peak
3	27988.000	-68.55	29.00	-39.55	-13.00	-26.55	peak
4	29682.000	-67.79	28.87	-38.92	-13.00	-25.92	peak
5	34258.000	-66.38	27.70	-38.68	-13.00	-25.68	peak
6	38460.000	-63.81	28.00	-35.81	-13.00	-22.81	peak

## Mode1 18-40GHz -V



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	19826.000	-67.06	28.26	-38.80	-13.00	-25.80	peak
2	24622.000	-67.43	28.69	-38.74	-13.00	-25.74	peak
3	28362.000	-66.77	28.97	-37.80	-13.00	-24.80	peak
4	29748.000	-65.39	28.87	-36.52	-13.00	-23.52	peak
5	33950.000	-64.66	27.66	-37.00	-13.00	-24.00	peak
6	38460.000	-62.78	28.00	-34.78	-13.00	-21.78	peak

**Remark: EUT at a 1.5 meter test distance from the receive antenna for test**

40 GHz -90GHz

Frequency (MHz)	Reading (dBm)	Coret Factor (dBm)	Result (dBm)	Limit (dBm)	Margin (dB)	Detector	Comment
42762.93	-65.34	17.21	-48.13	-13.00	-35.13	Peak	Horizontal
42773.29	-65.47	17.41	-48.06	-13.00	-35.06	Peak	Vertical
51313.64	-66.74	23.75	-42.99	-13.00	-29.99	Peak	Horizontal
51324.57	-65.37	23.95	-41.42	-13.00	-28.42	Peak	Vertical
68436.00	-66.26	29.21	-37.05	-13.00	-24.05	Peak	Horizontal
68421.86	-66.32	28.46	-37.86	-13.00	-24.86	Peak	Vertical
85542.87	-66.01	26.00	-40.01	-13.00	-27.01	Peak	Horizontal
85541.86	-66.24	25.60	-40.64	-13.00	-27.64	Peak	Vertical

## 7. SPURIOUS EMISSION ON ANTENNA PORT

### 7.1 Limit

On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least  $43 + 10 \log (P)$  dB.

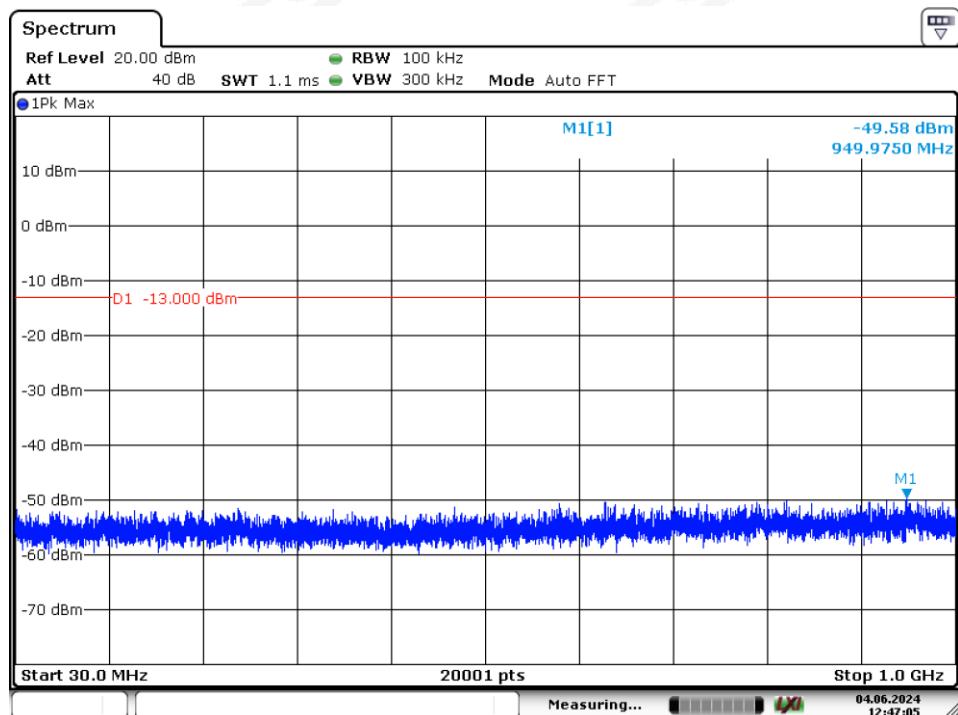
### 7.2 Measurement Procedure

- a. The EUT was connected to the spectrum analyzer through sufficient attenuation.
- b. Sufficient scans were taken to show any out of band emission up to 5th. Harmonic for the lower and the highest frequency range.  
Set RBW 100kHz, VBW 300 kHz in the frequency band 30MHz to 1GHz,while set RBW=1MHz.
- c. VBW=3MHz from the 1GHz to 5th Harmonic.

### 7.3 Test Setup

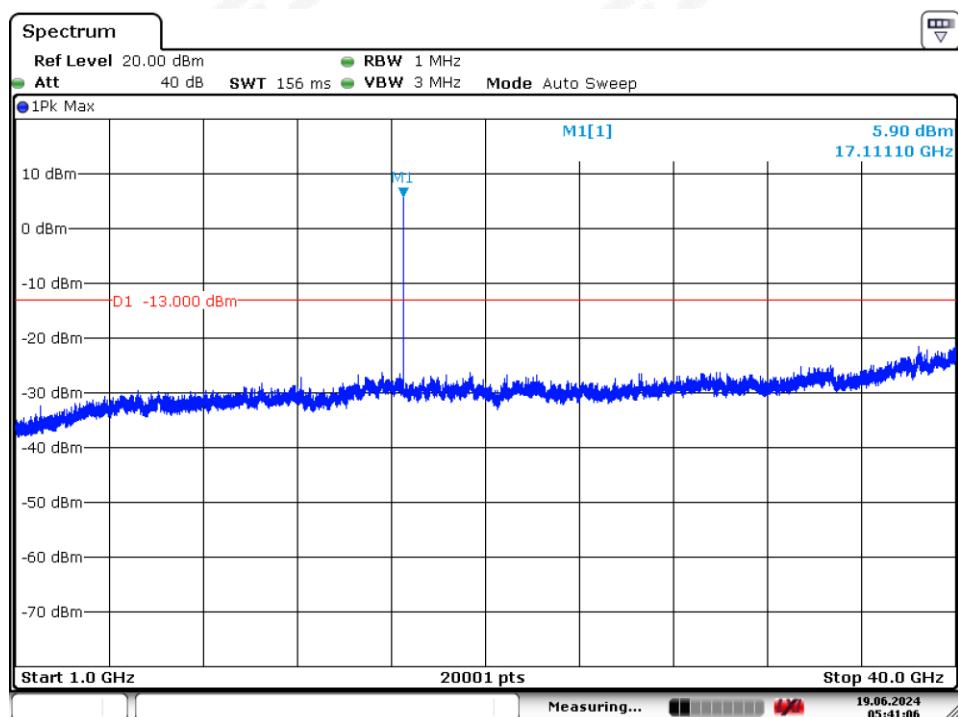


## 7.4 Test Result

Low frequency  
Mode1 30MHz-1GHz

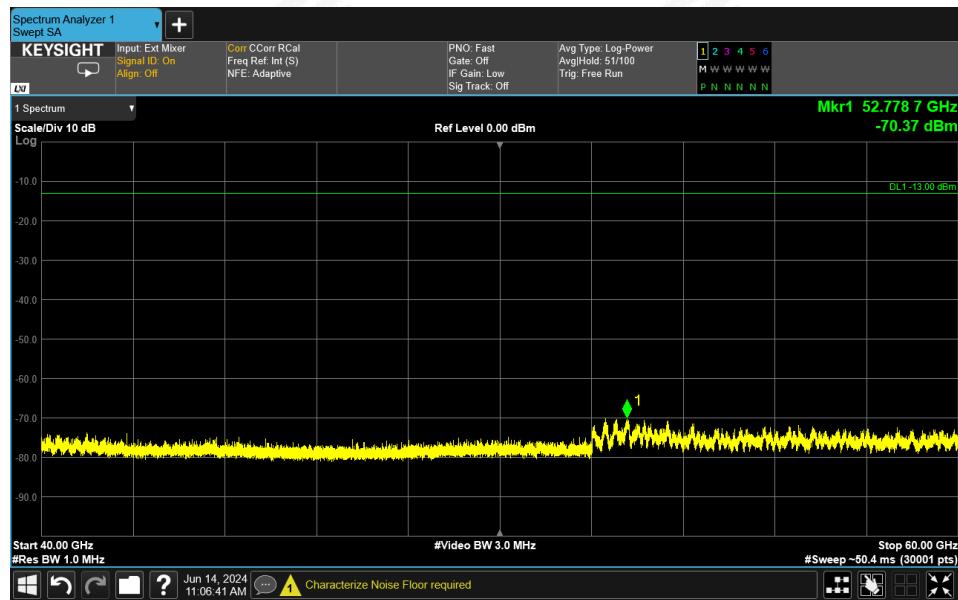
Date: 4.JUN.2024 12:47:05

## Mode1 1GHz-40GHz

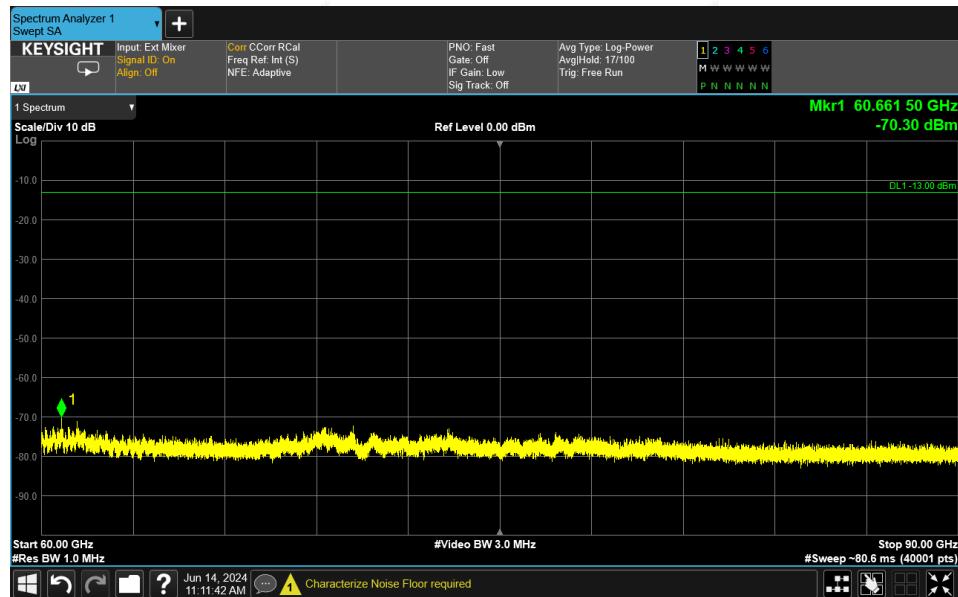


Date: 19.JUN.2024 05:41:06

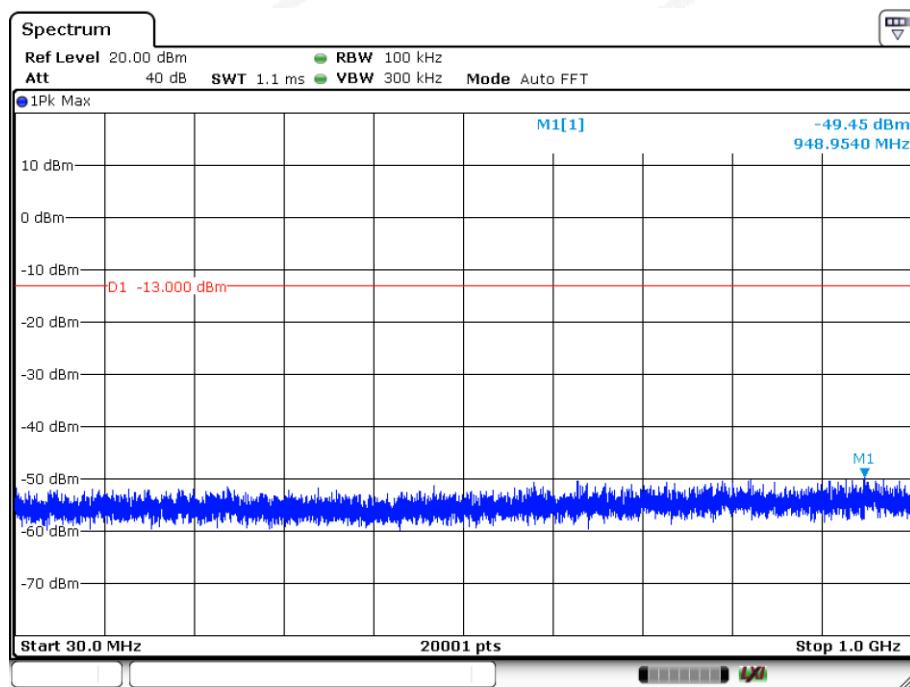
## Mode1 40GHz-60GHz



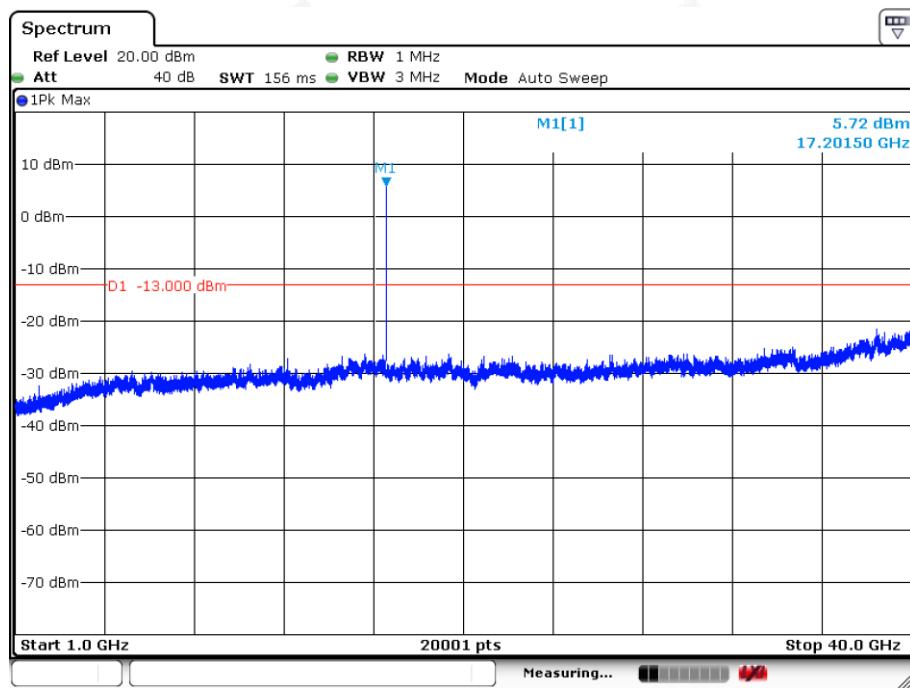
## Mode1 60GHz-90GHz



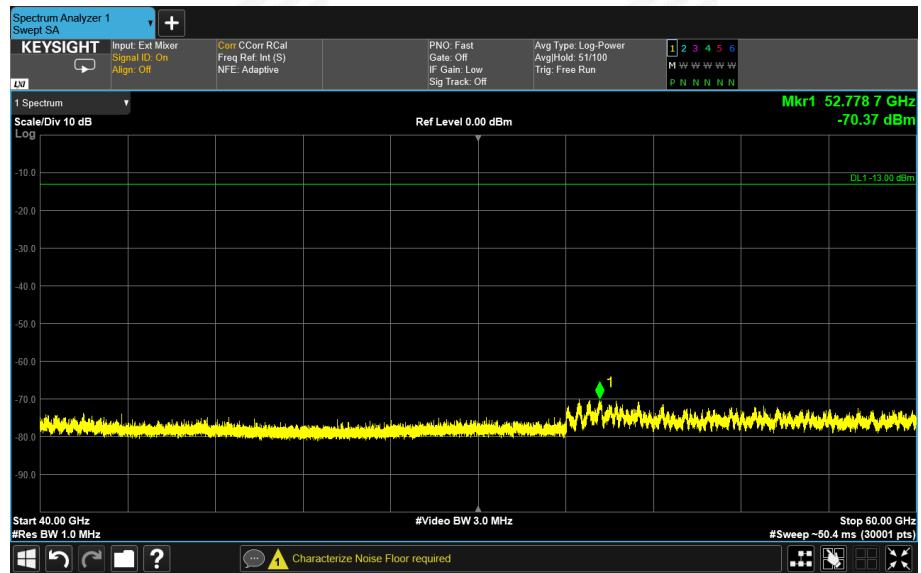
Mid frequency  
Mode1 30MHz-1GHz



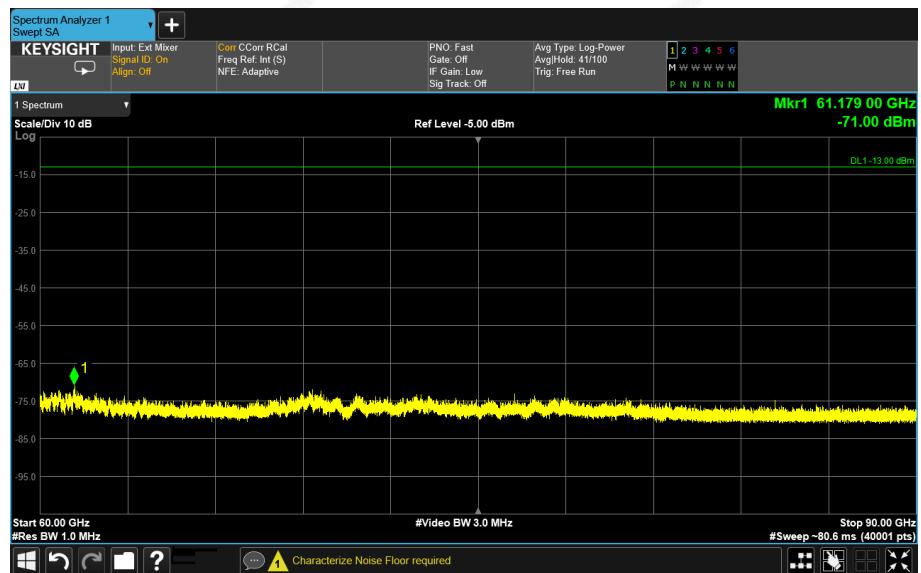
Mode1 1GHz-40GHz



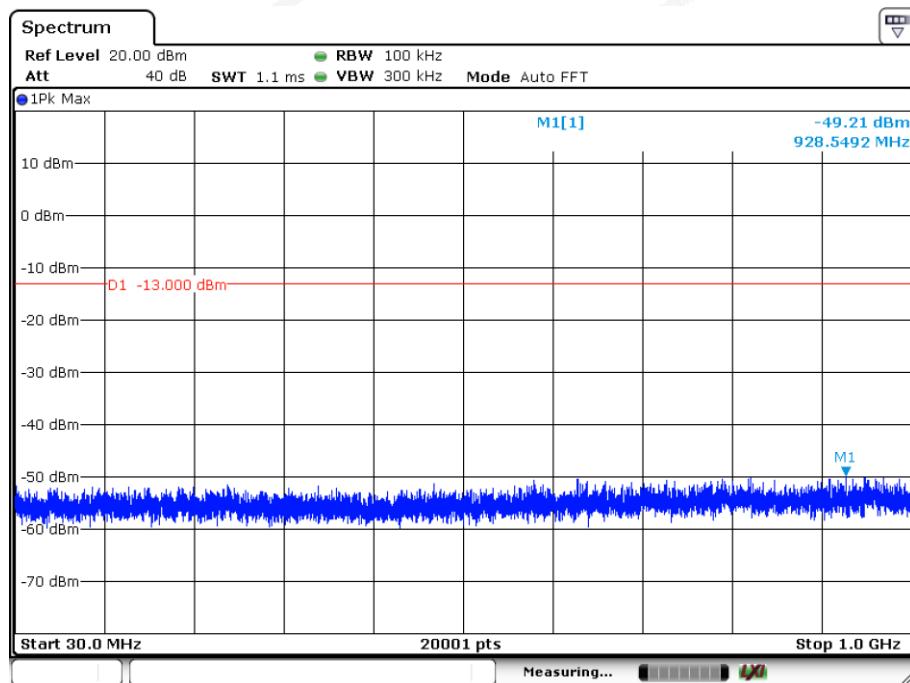
## Mode1 40GHz-60GHz



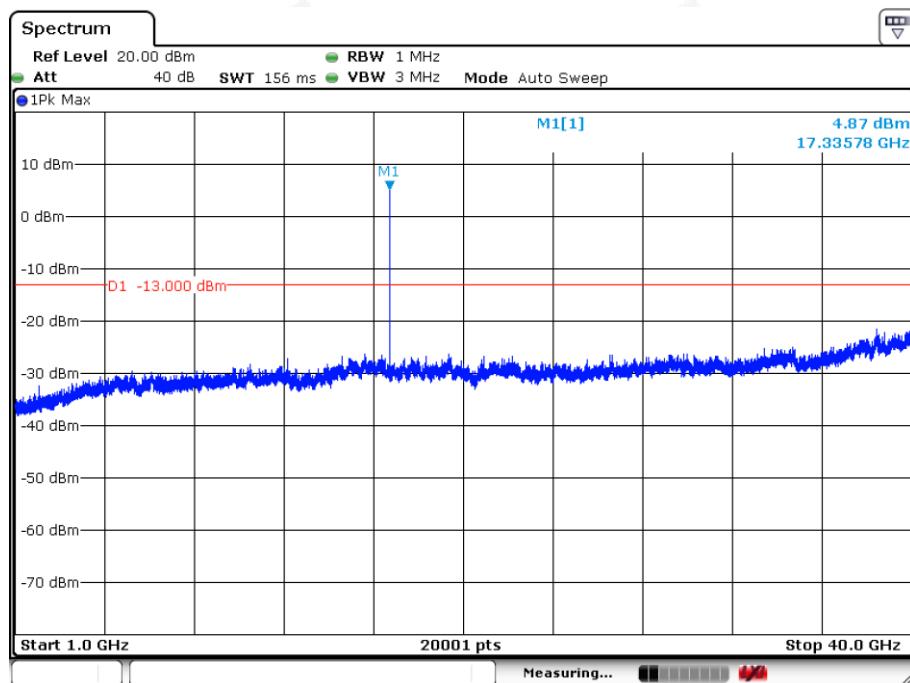
## Mode1 60GHz-90GHz



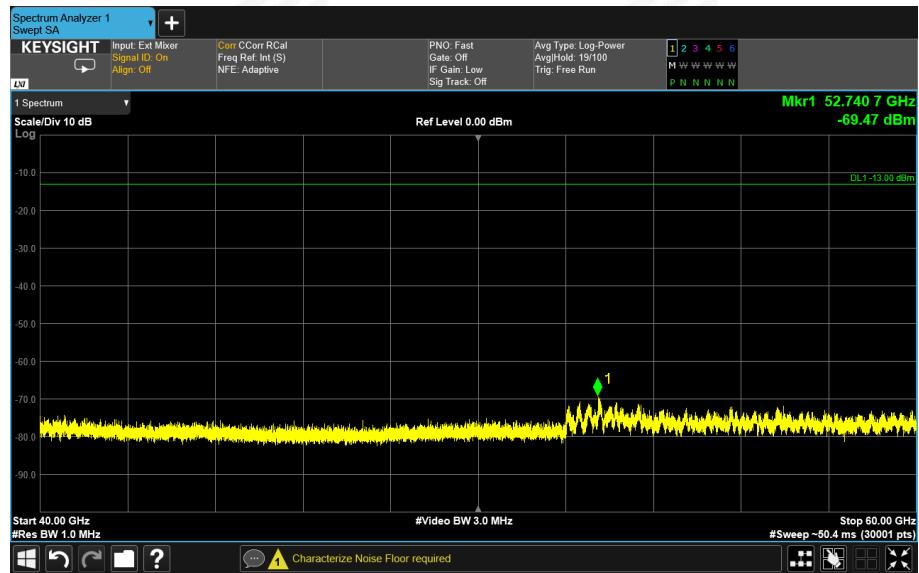
### High frequency Mode1 30MHz-1GHz



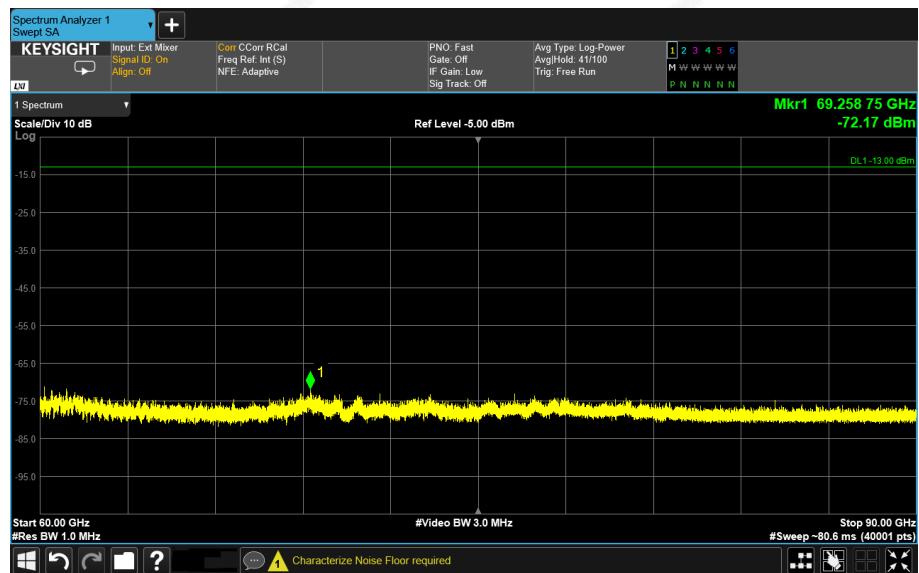
### Mode1 1GHz-40GHz



## Mode1 40GHz-60GHz



## Mode1 60GHz-90GHz



## 8. FREQUENCY STABILITY

### 8.1 Provisions Applicable

1) According to FCC Part 2 Section 2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from -30°C to +50°C centigrade.

2) According to FCC Part 2 Section 2.1055 (a) (2), for battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacturer.

3) Vary primary supply voltage from 85 to 115 percent of the nominal value.

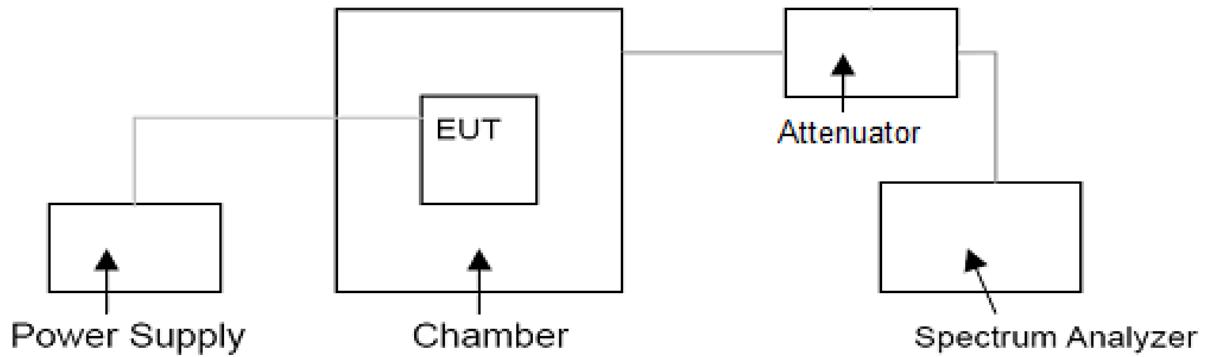
4)

Frequency range (MHz)	Fixed and base stations	Mobile stations	
		Over 2 watts output power	2 watts or less output power
Below 25	1 2 3 100	100	200
25-50	20	20	50
72-76	5		50
150-174	5 11 5	65	4650
216-220	1.0		1.0
220-222 <sup>12</sup>	0.1	1.5	1.5
421-512	7 11 14 2.5	85	85
806-809	14 1.0	1.5	1.5
809-824	14 1.5	2.5	2.5
851-854	1.0	1.5	1.5
854-869	1.5	2.5	2.5
896-901	14 0.1	1.5	1.5
902-928	2.5	2.5	2.5
902-928 <sup>13</sup>	2.5	2.5	2.5
929-930	1.5		
935-940	0.1	1.5	1.5
1427-1435	9 300	300	300
Above 2450 <sup>10</sup>			

### 8.2 Measurement Procedure

- The EUT was connected to the spectrum analyzer through sufficient attenuation.
- The EUT was set in the climate chamber and connected to an external DC power supply
- After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded.
- For Frequency stability Vs. Voltage the EUT was connected to a DC power supply and the voltage was adjusted in the required ranges. The result was recorded.

### 8.3 Test Setup



#### 8.4 Test Result

Operation Mode	Temperature (°C)	Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	Frequency Deviation (ppm)	Limits	Result
Mode 1	25	Normal Voltage	17110.0000	17109.9986	-0.08	2.5ppm	PASS
	-20		17110.0000	17109.9974	-0.15		
	-10		17110.0000	17109.9975	-0.15		
	0		17110.0000	17109.9981	-0.11		
	10		17110.0000	17109.9971	-0.17		
	20		17110.0000	17109.9972	-0.16		
	30		17110.0000	17109.9987	-0.08		
	40		17110.0000	17109.9976	-0.14		
	50		17110.0000	17109.9985	-0.09		
	20	Maximum Voltage	17110.0000	17109.9972	-0.16		
	20	BEP	17110.0000	17109.9978	-0.13		



## 9. PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

\*\*\*\*\*END OF THE REPORT\*\*\*\*\*