

## TEST REPORT

**Application No.:** SHCR2302000266AT  
**FCC ID:** 2ACDM-SNG4  
**IC:** 11983A-SNG4  
**Applicant:** Parker Hannifin Corp  
**Address of Applicant:** 8145 Lewis Road, Mpls, MN 55427  
**Manufacturer:** Parker Hannifin Corp  
**Address of Manufacturer:** 8145 Lewis Road, Mpls, MN 55427  
**Factory:** Parker Hannifin Corp  
**Address of Factory:** 8145 Lewis Road, Mpls, MN 55427  
**Equipment Under Test (EUT):**  
**EUT Name:** SensoNEXT  
**Model No.:** QX-008-798  
**Trade Mark:** SensoNODE™  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.249  
RSS-210 Issue10, December 2019  
RSS-Gen Issue 5 April 2018 Amendment 2  
**Date of Receipt:** 2023-02-14  
**Date of Test:** 2023-03-20 to 2023-03-23  
**Date of Issue:** 2023-03-24

<b>Test Result:</b>	<b>Pass*</b>
---------------------	--------------

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

*Parlam Zhan*

Parlam Zhan  
Laboratory Manager



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Revision Record			
Version	Description	Date	Remark
00	Original	2023-03-24	/

Authorized for issue by:			
		Bill Wu	
		Bill Wu/Project Engineer	
		Parlam Zhan	
		Parlam Zhan/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 Section 8.1.3	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-210 Issue 9 Annex 8	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 Issue 9 Annex 2.9 (a)	ANSI C63.10 (2013) Section 6.5&6.6	Pass
Restricted Band Around Fundamental Frequency	47 CFR Part 15, Subpart C 15.249	RSS-Gen Issue 4 Section 4.9 RSS-Gen Issue 4 Section 7.2.2	ANSI C63.10 (2013) Section 6.4&6.5&6.6	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	RSS-Gen Issue 4 Section 4.9 RSS-Gen Issue 4 Section 7.2.2	ANSI C63.10 (2013) Section 6.4&6.5&6.6	Pass
99% Bandwidth	RSS-247 Issue 2, February 2017	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 2.7V to 3.3V
Test Voltage:	DC 3V
Operation Frequency:	902.4MHz to 927.6MHz
Modulation Type:	2GFSK
Number of Channels:	64
Channel Spacing:	400KHz
Antenna Type:	Dipole Antenna
Antenna Gain:	1.5dBi
S/N:	622EC4
Firmware Version:	QX-008-894

### 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 & Decision Rule

No.	Item	Measurement Uncertainty
1	Radio Frequency	$8.4 \times 10^{-8}$
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-6GHz) 5.4dB (6GHz-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.

### 4.4 Test Location

All tests were performed at:

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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 (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.  
Company Number: 8617A

• **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
<b>RF Radiated Test</b>					
EMI test Receiver	R&S	ESU40	SHEM051-1	2022-12-20	2023-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2022-12-20	2023-12-19
Communication Tester	R&S	CMW500	SHEM268-1	2022-07-25	2023-07-24
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2022-12-20	2023-12-19
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2021-09-11	2023-09-10
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2021-05-07	2023-05-06
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2022/8/11	2024-08-10
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2021-09-18	2023-09-17
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2021-09-18	2023-09-17
Pre-Amplifier	HP	8447D	SHEM236-1	2022-08-02	2023-08-01
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2022-12-20	2023-12-19
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2020-05-25	2023-05-24
RE test Cable	/	RE01, RE02, RE06	/	2023-01-07	2024-01-06
Test software	ESE	E3	Version: 6.111221a	/	/



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

#### 6.1.2 Conclusion

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is Dipole Antenna and no consideration of replacement.

Antenna location: Refer to Internal 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

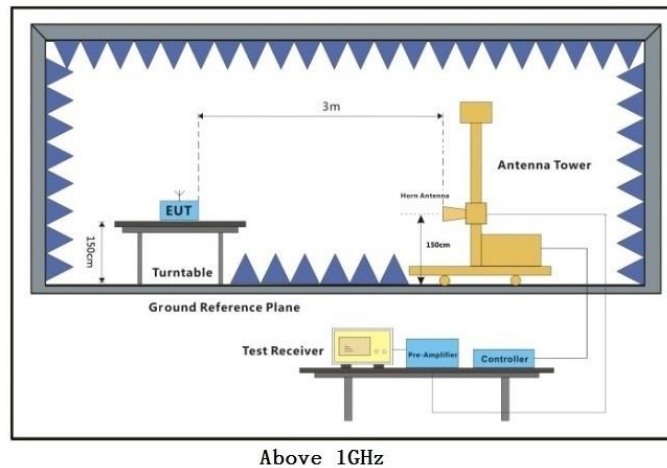
Operating Environment:

Temperature: 15.9 °C Humidity: 60.4 % RH Atmospheric Pressure: 1010 mbar

#### 7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting with modulation mode.

#### 7.1.3 Test Setup Diagram



#### 7.1.4 Measurement Procedure and Data

Frequency (MHz)	Bandwidth (MHz)	Result
902.4	0.24	PASS
915.2	0.25	PASS
927.6	0.25	PASS



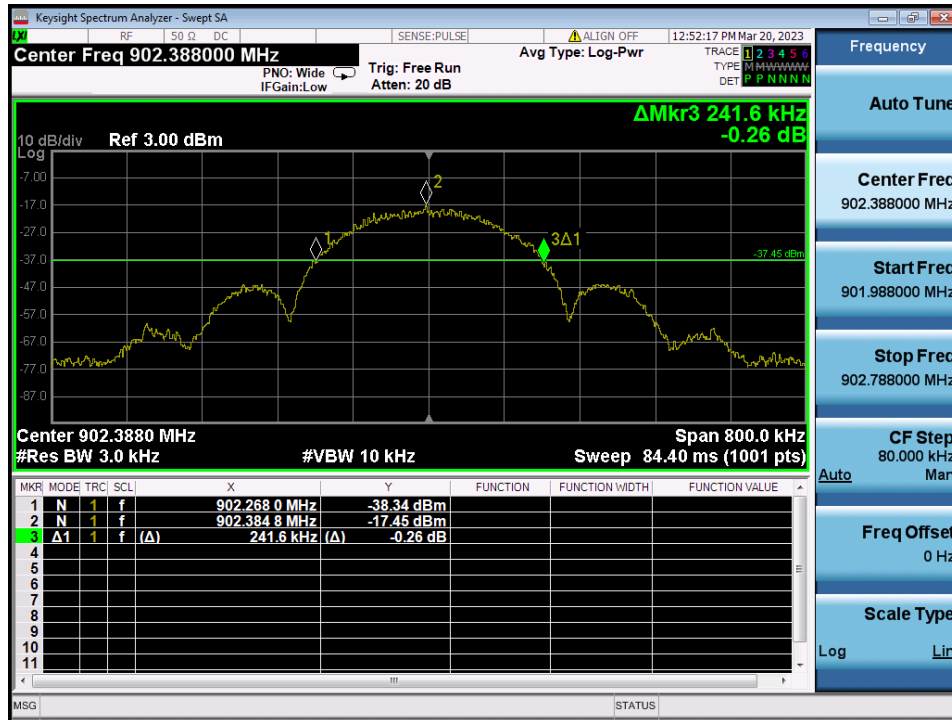
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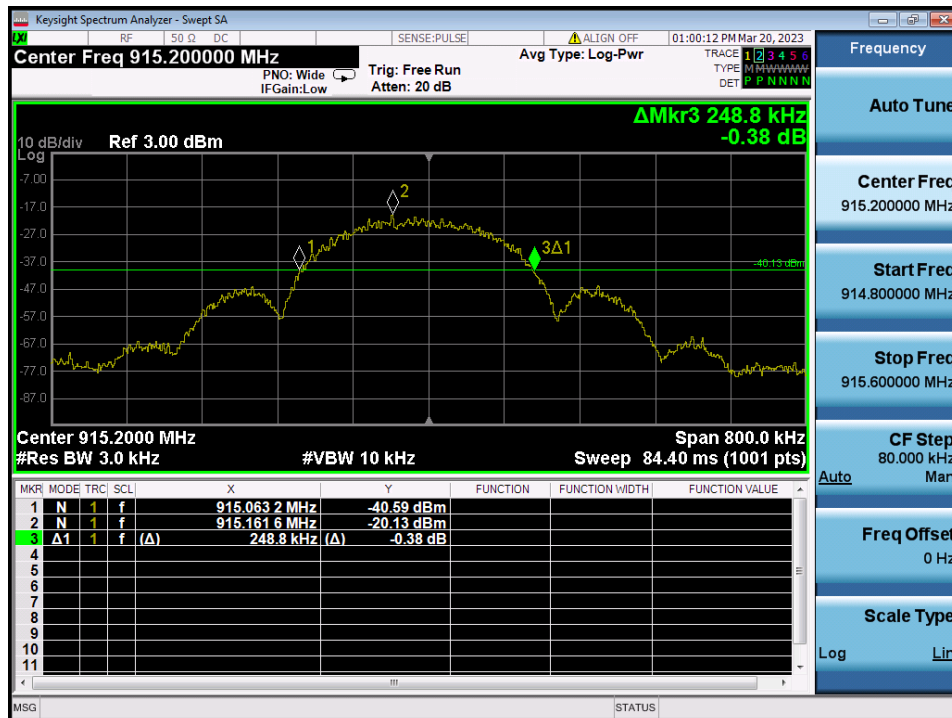
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Channel: 902.4MHz



Channel: 915.2MHz

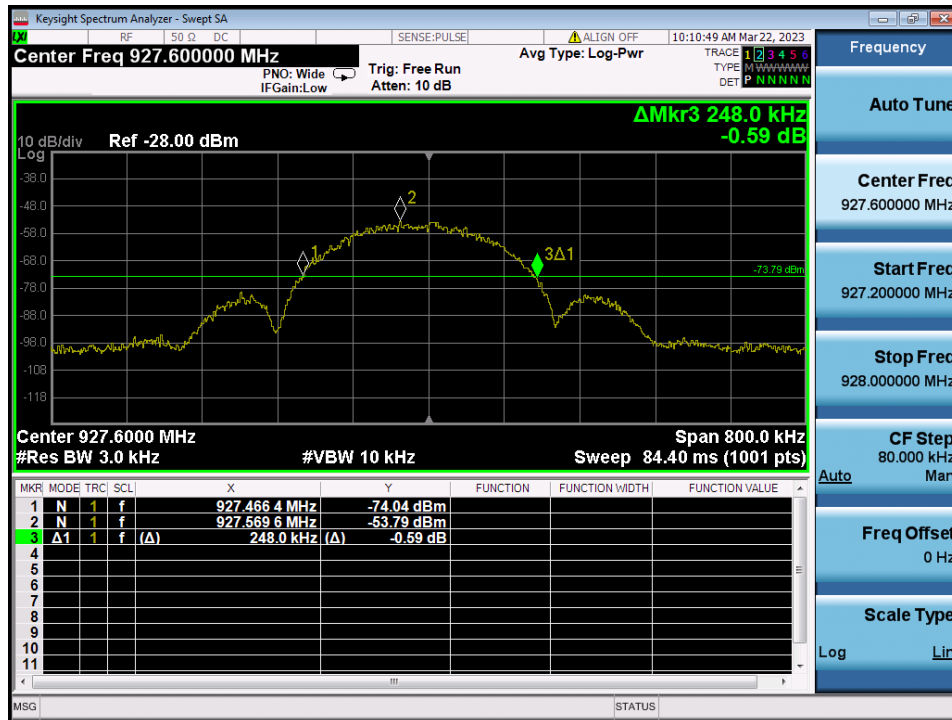


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Channel: 927.6MHz



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## 7.2 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)

Test Method: ANSI C63.10 (2013) Section 6.5&6.6

Limit:

Fundamental frequency(MHz)	Field strength of fundamental(millivolts/meter)	Field strength of harmonics(microvolts/meter)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

Remark: The frequencies above 1000MHz are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

For fundamental frequency in "902-928MHz", the field strength of fundamental is based on Quasi-Peak.

### 7.2.1 E.U.T. Operation

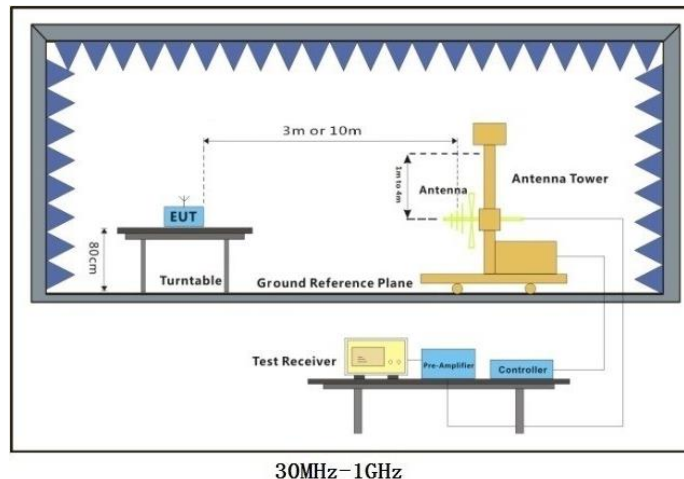
Operating Environment:

Temperature: 15.8 °C Humidity: 60.3 % RH Atmospheric Pressure: 1010 mbar

### 7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting with modulation mode.

### 7.2.3 Test Setup Diagram



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## 7.2.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
  - b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
  - c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
  - d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
  - e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
  - f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
  - g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
  - h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
  - i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
  - j. Repeat above procedures until all frequencies measured was complete.
- Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
902.3	102.99	1.81	104.80	114	-9.20	Peak	Horizontal
	89.99	1.81	91.80	94	-2.20	Average	Horizontal
	98.47	1.81	100.28	114	-13.72	Peak	Vertical
	85.47	1.81	87.28	94	-6.72	Average	Vertical

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
915.2	102.34	2.04	104.38	114	-9.62	Peak	Horizontal
	89.34	2.04	91.38	94	-2.62	Average	Horizontal
	98.70	2.04	100.74	114	-13.26	Peak	Vertical
	85.70	2.04	87.74	94	-6.26	Average	Vertical



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Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
927.6	101.56	2.23	103.79	114	-10.21	Peak	Horizontal
	88.56	2.23	90.79	94	-3.21	Average	Horizontal
	97.39	2.23	99.62	114	-14.38	Peak	Vertical
	84.39	2.23	86.62	94	-7.38	Average	Vertical

Remark:

- 1) The basic equation with a sample calculation is as follows: Level = Read Level + Factor.

**(The Factor is calculated by adding the Antenna Factor, Cable Loss and Preamp Factor)**

If the Peak value below the Average Limit, the Average test doesn't perform for this submission.



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### 7.3 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209

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

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
Above 1GHz	74.0	Peak Value

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 15.8 °C Humidity: 60.3 % RH Atmospheric Pressure: 1010 mbar

#### 7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting with modulation mode.



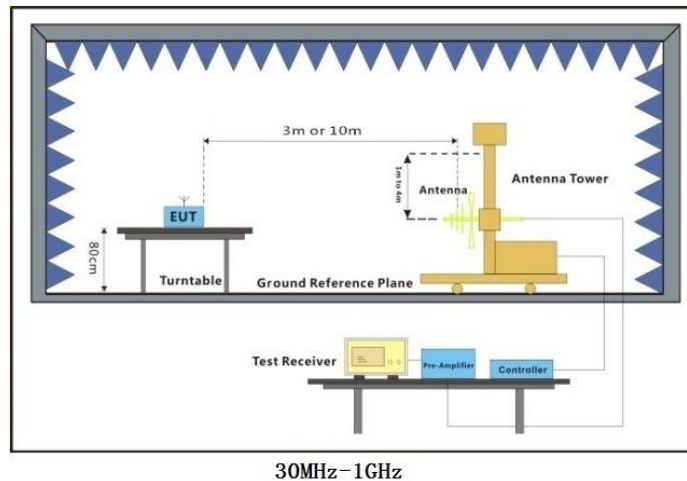
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### 7.3.3 Test Setup Diagram



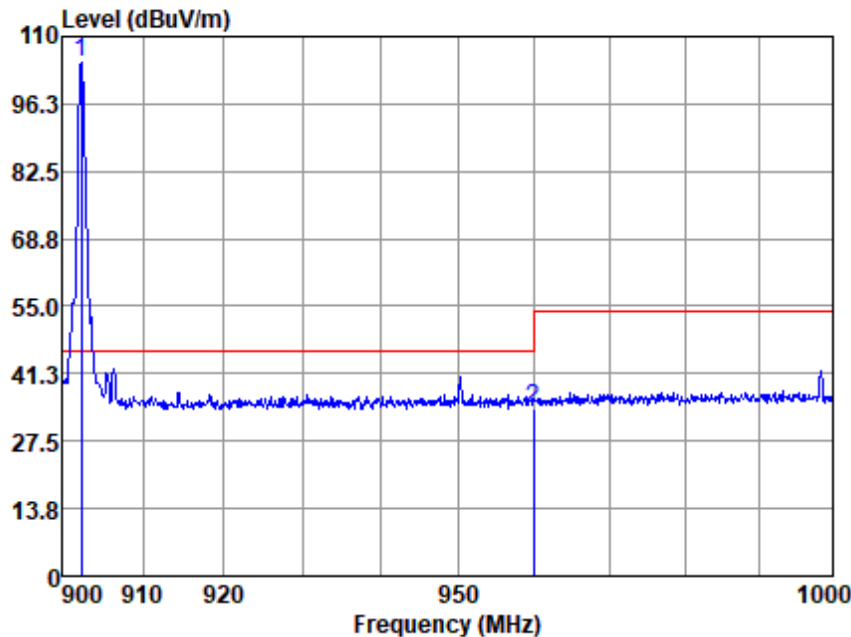
### 7.3.4 Measurement Procedure and Data

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  - For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
  - The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
  - 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.
  - 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.
  - The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
  - 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.
  - Test the EUT in the lowest channel, the middle channel, the Highest channel.
  - 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.
  - Repeat above procedures until all frequencies measured was complete.
- Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor





Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Antenna Polarity :HORIZONTAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	902.279	102.99	23.94	5.34	27.47	104.80	46.00	58.80	Peak
2	960.000	31.68	23.85	5.54	26.78	34.29	46.00	-11.71	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



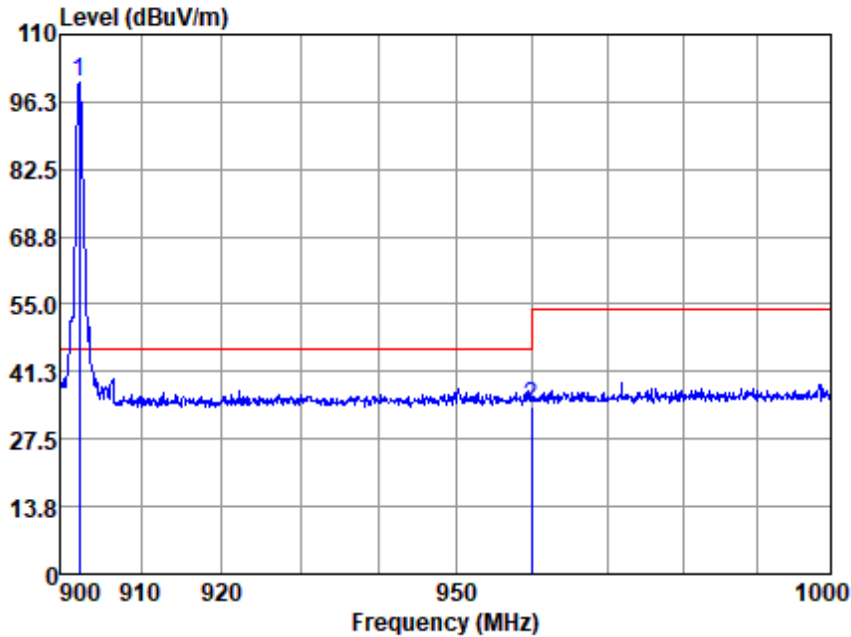
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



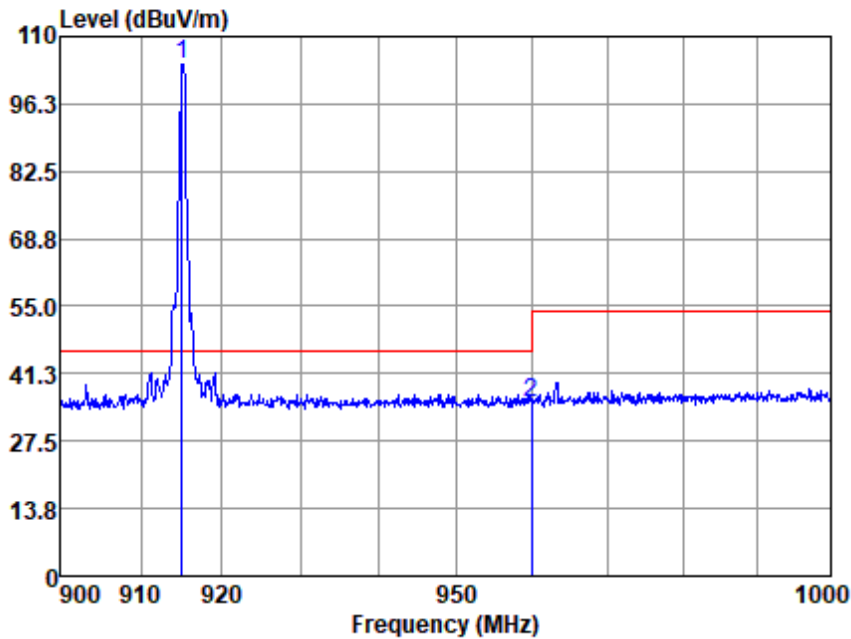
Antenna Polarity :VERTICAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	902.279	98.47	23.94	5.34	27.47	100.28	46.00	54.28	Peak
2	960.000	31.32	23.85	5.54	26.78	33.93	46.00	-12.07	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Antenna Polarity :HORIZONTAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	915.108	102.34	23.96	5.39	27.31	104.38	46.00	58.38	Peak
2	960.000	32.83	23.85	5.54	26.78	35.44	46.00	-10.56	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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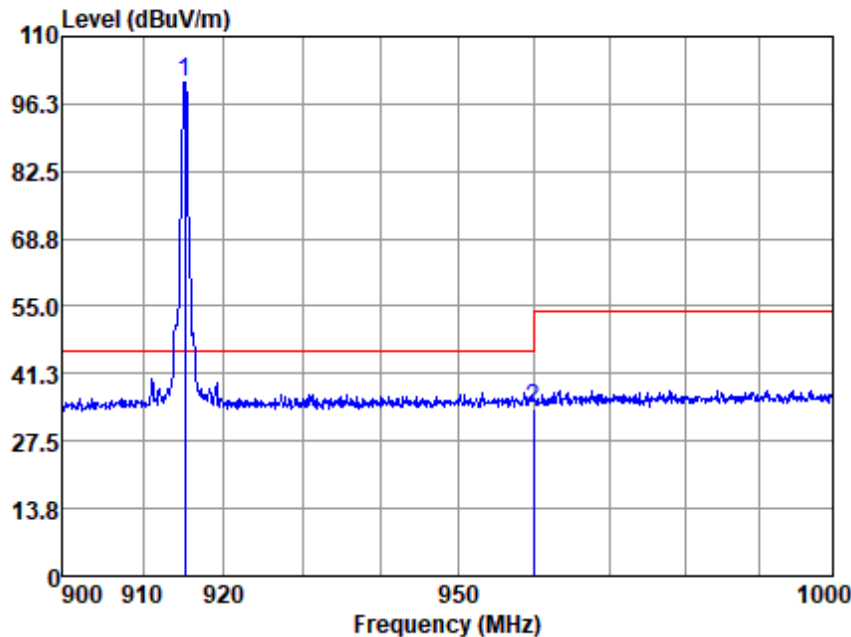
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:middle



Antenna Polarity :VERTICAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	915.204	98.70	23.96	5.39	27.31	100.74	46.00	54.74	Peak
2	960.000	31.32	23.85	5.54	26.78	33.93	46.00	-12.07	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



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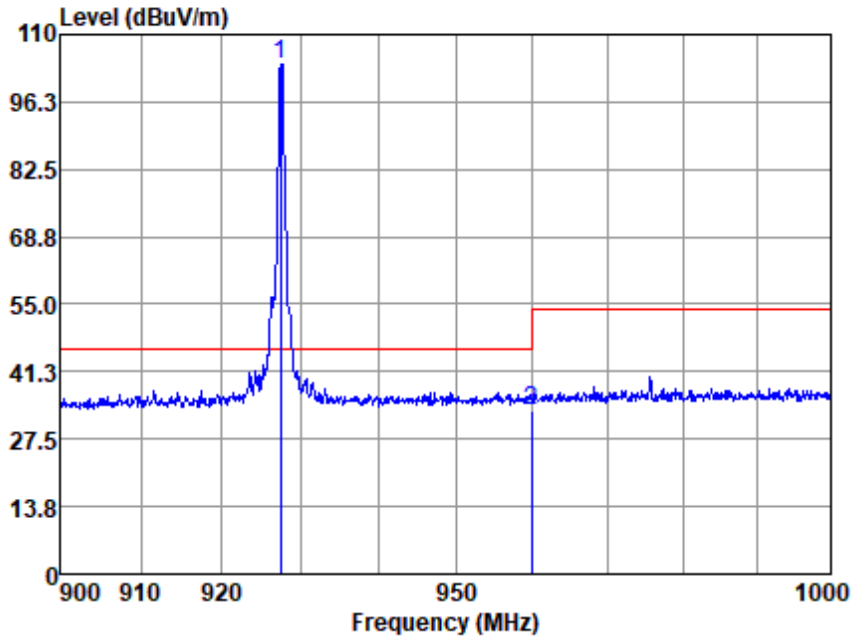
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



Antenna Polarity :HORIZONTAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	927.533	101.56	23.89	5.43	27.09	103.79	46.00	57.79	Peak
2	960.000	30.48	23.85	5.54	26.78	33.09	46.00	-12.91	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



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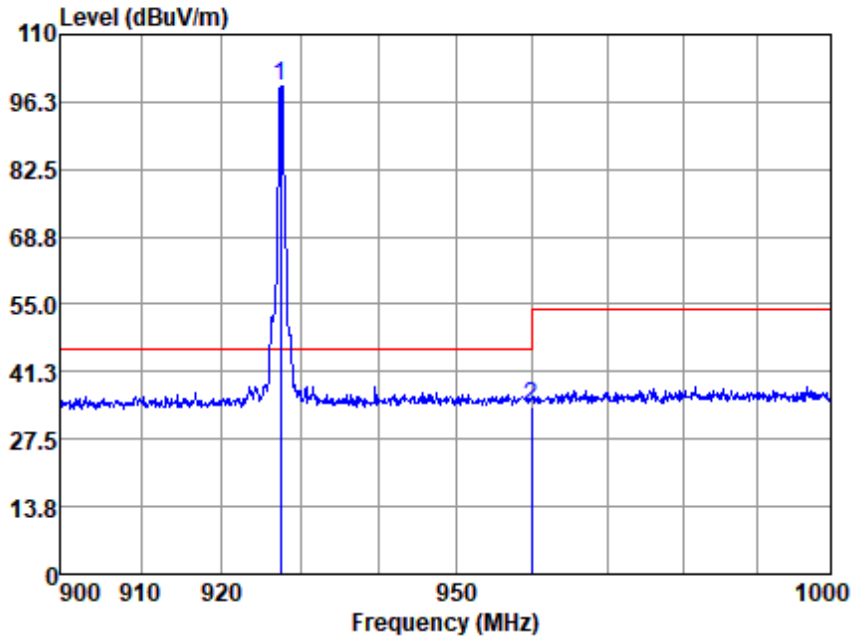
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	927.533	97.39	23.89	5.43	27.09	99.62	46.00	53.62	Peak
2	960.000	31.53	23.85	5.54	26.78	34.14	46.00	-11.86	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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### 7.4 Radiated Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

Test Method: ANSI C63.10 (2013) Section 6.4&6.5

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
960-1000	500	3

#### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 15.8 °C

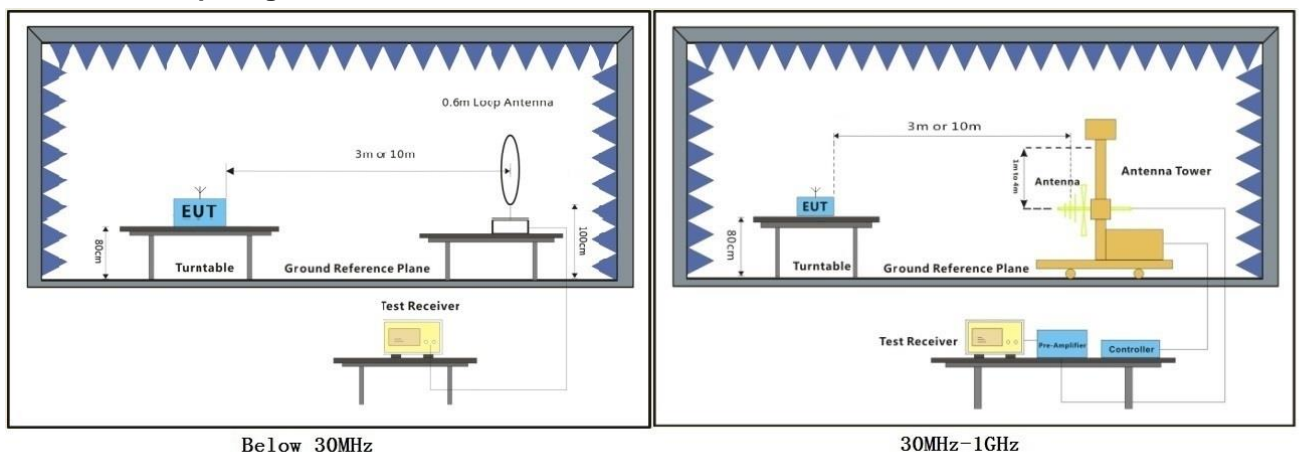
Humidity: 60.3 % RH

Atmospheric Pressure: 1010 mbar

#### 7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting with modulation mode.

#### 7.4.3 Test Setup Diagram



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#### 7.4.4 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 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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 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.
- 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 quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



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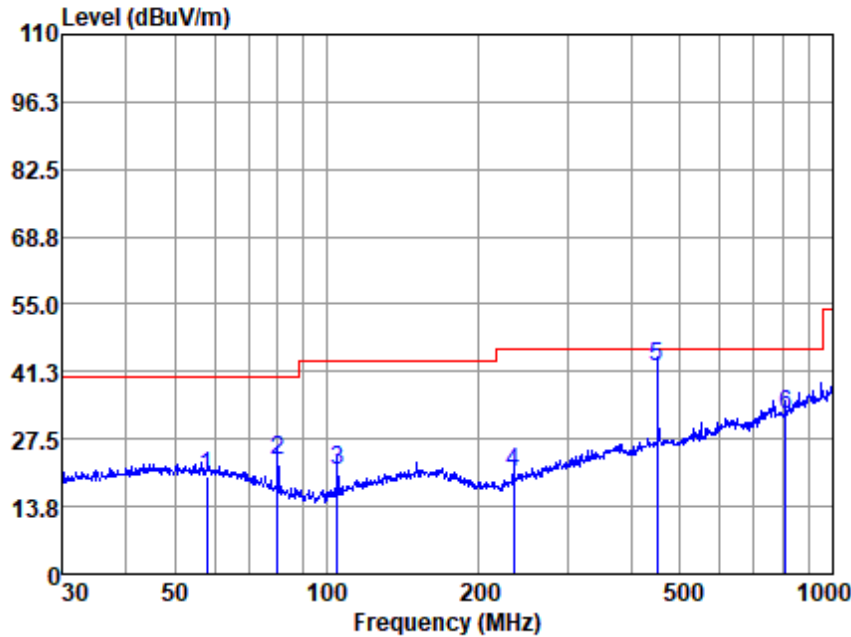
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Antenna Polarity :HORIZONTAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	57.999	31.35	13.44	1.26	26.20	19.85	40.00	-20.15	QP
2	79.800	38.29	9.42	1.57	26.10	23.18	40.00	-16.82	QP
3	104.903	36.69	9.64	1.77	27.10	21.00	43.50	-22.50	QP
4	234.168	33.93	10.99	2.65	26.86	20.71	46.00	-25.29	QP
5	451.135	47.94	17.10	3.66	26.53	42.17	46.00	-3.83	QP
6	807.429	33.06	22.26	4.91	27.78	32.45	46.00	-13.55	QP

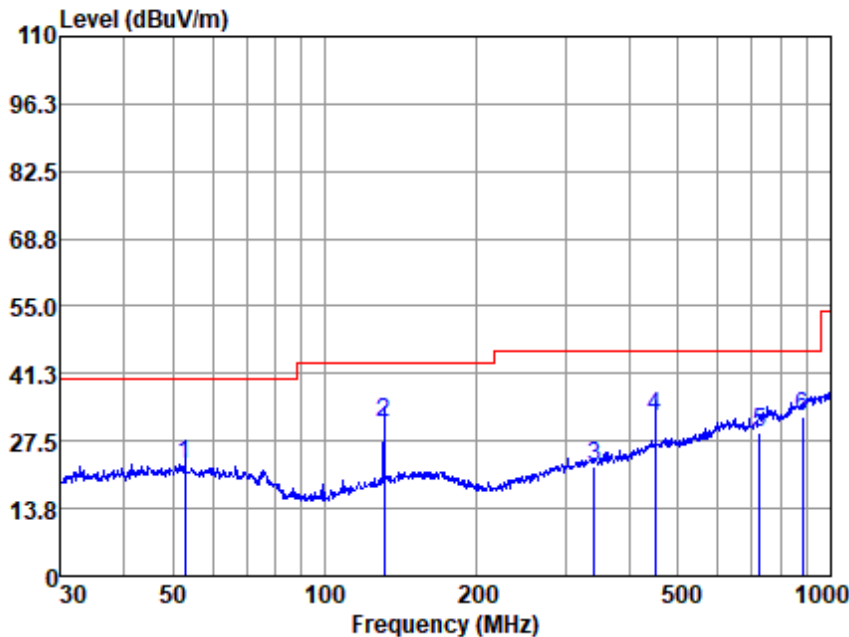
Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



Antenna Polarity :VERTICAL  
EUT/Project :0266AT  
Test mode :01

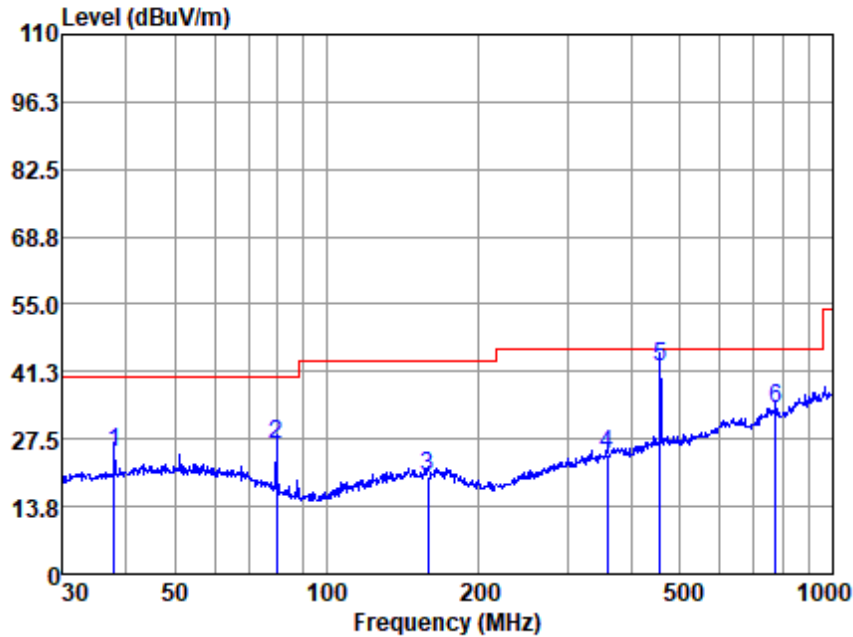
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	52.945	33.82	13.76	1.24	26.20	22.62	40.00	-17.38	QP
2	130.837	44.33	12.15	2.00	27.10	31.38	43.50	-12.12	QP
3	340.782	31.08	14.45	3.21	26.60	22.14	46.00	-23.86	QP
4	451.135	38.35	17.10	3.66	26.53	32.58	46.00	-13.42	QP
5	724.261	30.58	21.63	4.82	27.65	29.38	46.00	-16.62	QP
6	881.407	30.86	23.55	5.25	27.33	32.33	46.00	-13.67	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor





Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Antenna Polarity :HORIZONTAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	37.945	36.57	13.16	1.11	26.20	24.64	40.00	-15.36	QP
2	79.521	41.33	9.49	1.58	26.10	26.30	40.00	-13.70	QP
3	158.668	31.39	13.27	2.18	27.05	19.79	43.50	-23.71	QP
4	359.186	32.91	14.74	3.25	26.69	24.21	46.00	-21.79	QP
5	457.507	47.80	17.17	3.76	26.66	42.07	46.00	-3.93	QP
6	774.158	33.76	22.42	4.86	27.55	33.49	46.00	-12.51	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



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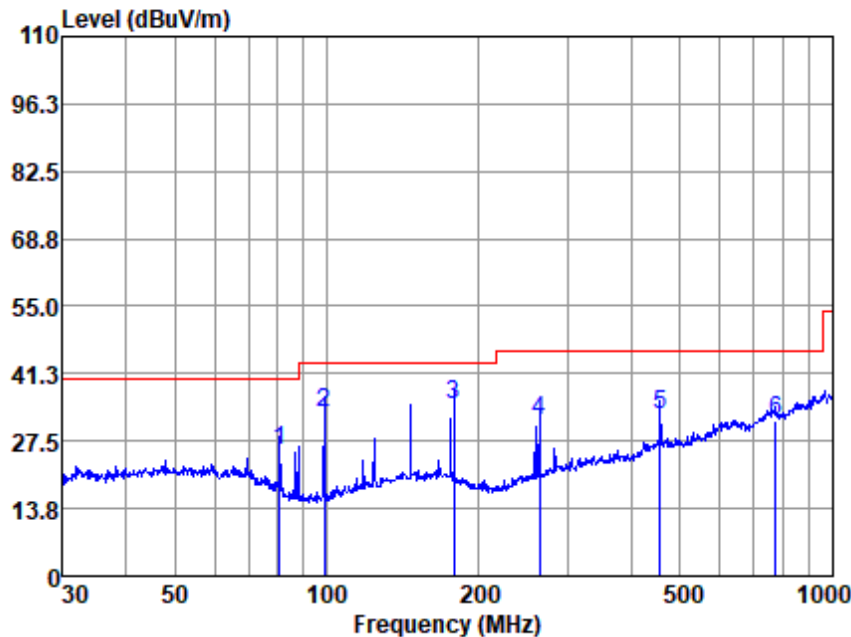
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Test Mode: 01; Polarity: Vertical; Modulation: GFSK; Channel: middle



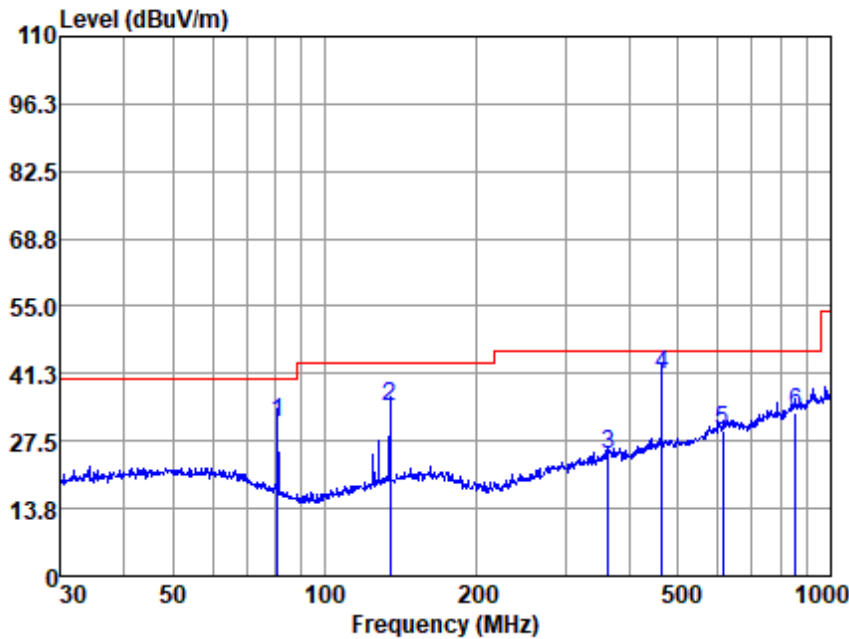
Antenna Polarity : VERTICAL  
EUT/Project : 0266AT  
Test mode : 01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	80.644	40.74	9.20	1.57	26.10	25.41	40.00	-14.59	QP
2	98.833	49.87	8.79	1.72	27.03	33.35	43.50	-10.15	QP
3	178.758	47.13	12.06	2.34	26.82	34.71	43.50	-8.79	QP
4	263.819	43.50	12.27	2.82	26.84	31.75	46.00	-14.25	QP
5	457.507	38.55	17.17	3.76	26.66	32.82	46.00	-13.18	QP
6	771.449	31.69	22.42	4.86	27.50	31.47	46.00	-14.53	QP

Note: Emission Level = Read Level + Antenna Factor + Cable loss - Preamplifier Factor



Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



Antenna Polarity :HORIZONTAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	80.644	46.58	9.20	1.57	26.10	31.25	40.00	-8.75	QP
2	134.559	47.19	12.36	2.01	27.10	34.46	43.50	-9.04	QP
3	364.260	33.13	14.93	3.26	26.76	24.56	46.00	-21.44	QP
4	463.970	46.63	17.27	3.85	26.82	40.93	46.00	-5.07	QP
5	612.064	32.00	20.55	4.41	27.20	29.76	46.00	-16.24	QP
6	854.025	31.57	23.52	5.09	27.02	33.16	46.00	-12.84	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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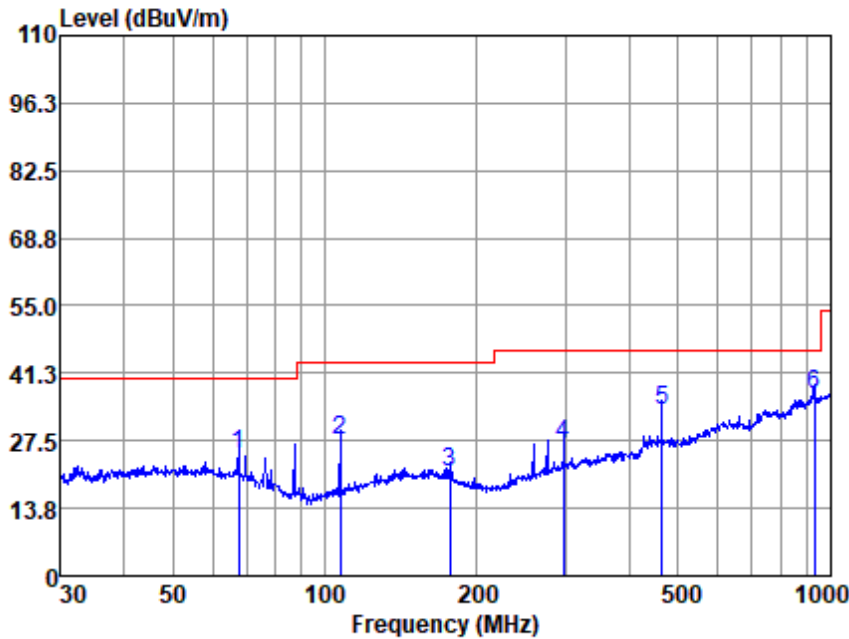
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL  
EUT/Project :0266AT  
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	67.438	37.43	12.19	1.40	26.12	24.90	40.00	-15.10	QP
2	107.134	43.06	9.96	1.79	27.10	27.71	43.50	-15.79	QP
3	176.888	33.32	12.27	2.32	26.84	21.07	43.50	-22.43	QP
4	297.224	36.91	13.40	2.97	26.61	26.67	46.00	-19.33	QP
5	463.970	39.36	17.27	3.85	26.82	33.66	46.00	-12.34	QP
6	932.272	34.50	23.87	5.43	27.03	36.77	46.00	-9.23	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor



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### 7.5 Radiated Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

Test Method: ANSI C63.10 (2013) Section 6.6

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

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

Operating Environment:

Temperature: 15.9 °C

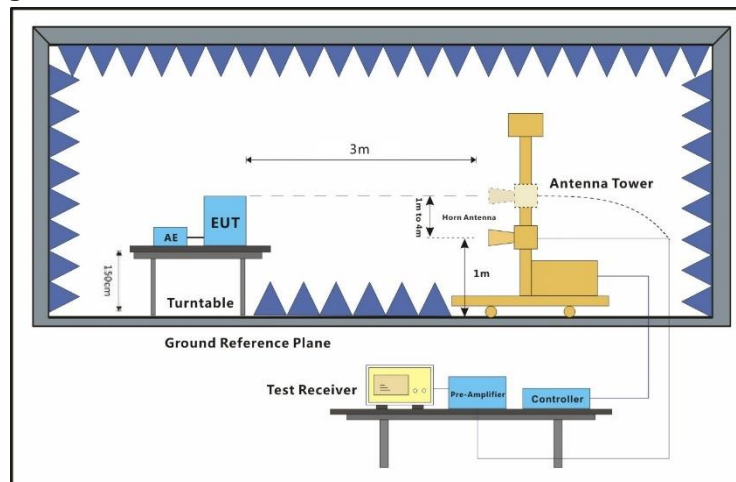
Humidity: 60.2 % RH

Atmospheric Pressure: 1010 mbar

#### 7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting with modulation mode.

#### 7.5.3 Test Setup Diagram



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#### 7.5.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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 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.
- 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 or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 18GHz to 40GHz, the disturbance above 18GHz 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.
3. As shown in this section, 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.
4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



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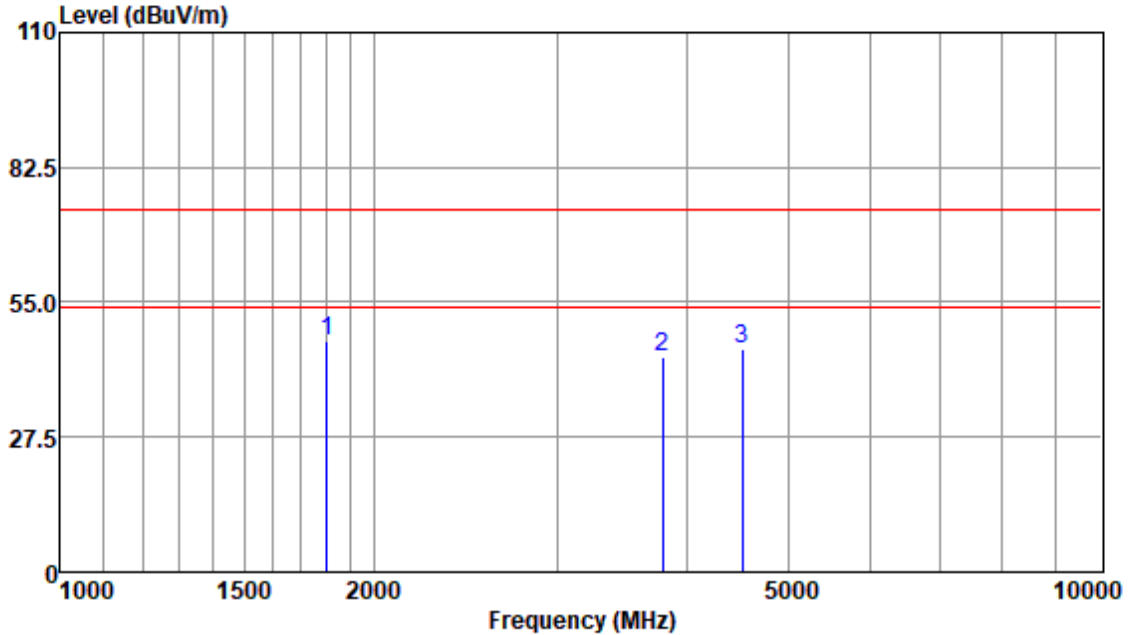
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Antenna Polarity :HORIZONTAL

EUT/Project :0266AT

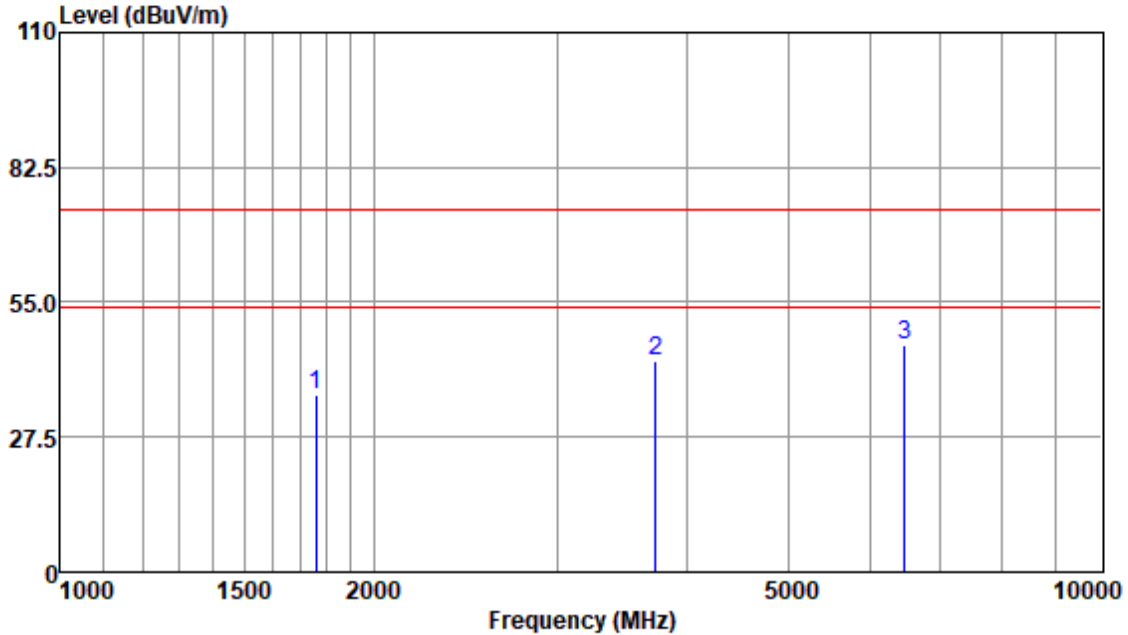
Test Mode :01

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 1803.02	51.62	27.26	3.12	34.79	47.21	74.00	-26.79	Peak
2 3784.43	42.88	32.90	4.30	36.21	43.87	74.00	-30.13	Peak
3 4508.17	44.93	32.46	4.62	36.70	45.31	74.00	-28.69	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



Antenna Polarity :VERTICAL  
EUT/Project :0266AT  
Test Mode :01

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 1757.92	40.96	27.01	3.09	34.78	36.28	74.00	-37.72	Peak
2 3723.92	42.14	32.79	4.22	36.18	42.97	74.00	-31.03	Peak
3 6456.54	40.84	35.44	6.21	36.42	46.07	74.00	-27.93	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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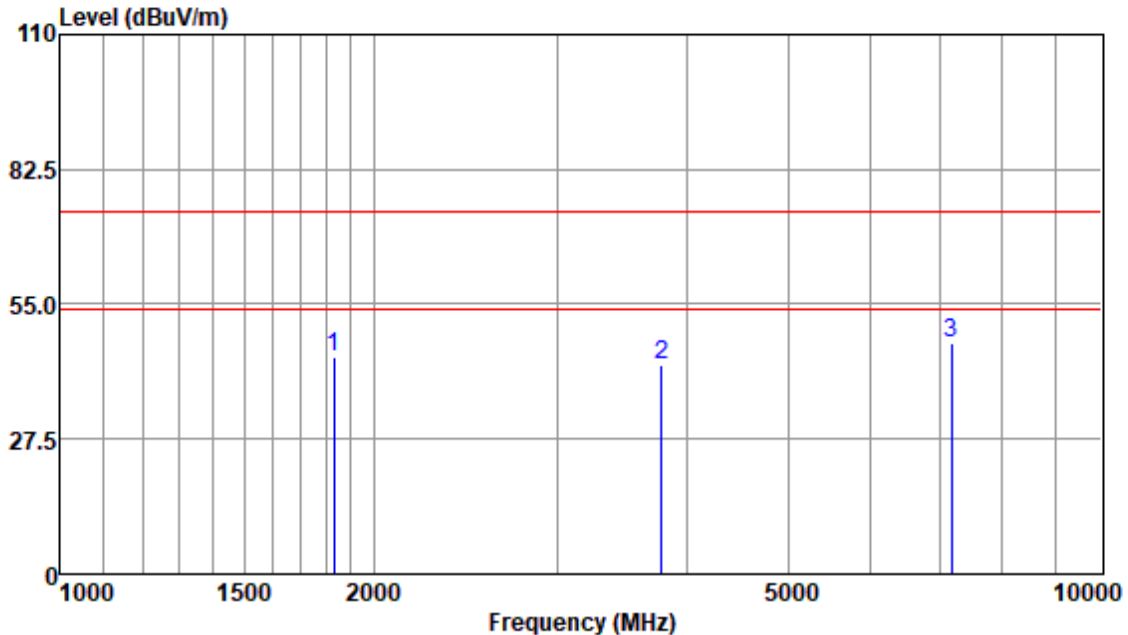
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Antenna Polarity :HORIZONTAL  
EUT/Project :0266AT  
Test Mode :01

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 1828.10	48.71	27.39	3.12	34.79	44.43	74.00	-29.57	Peak
2 3775.72	41.84	32.90	4.27	36.21	42.80	74.00	-31.20	Peak
3 7161.43	39.65	36.20	6.69	35.57	46.97	74.00	-27.03	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



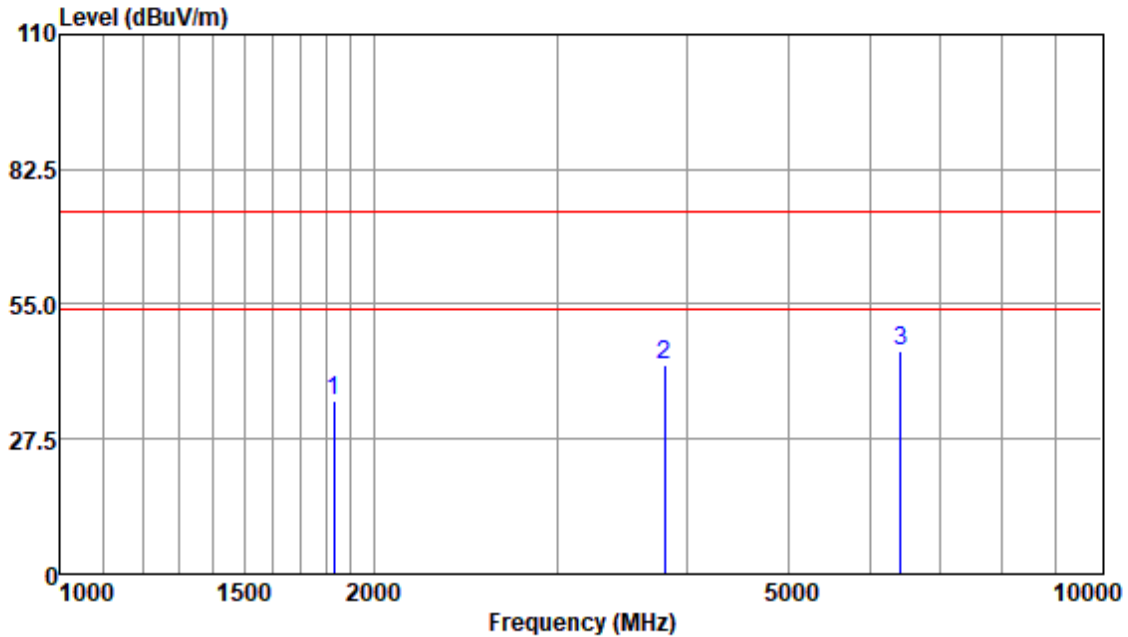
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:middle



Antenna Polarity :VERTICAL  
EUT/Project :0266AT  
Test Mode :01

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1 1828.10	39.60	27.39	3.12	34.79	35.32	74.00	-38.68	Peak
2 3801.89	41.68	32.91	4.33	36.22	42.70	74.00	-31.30	Peak
3 6397.35	40.50	35.48	6.18	36.50	45.66	74.00	-28.34	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



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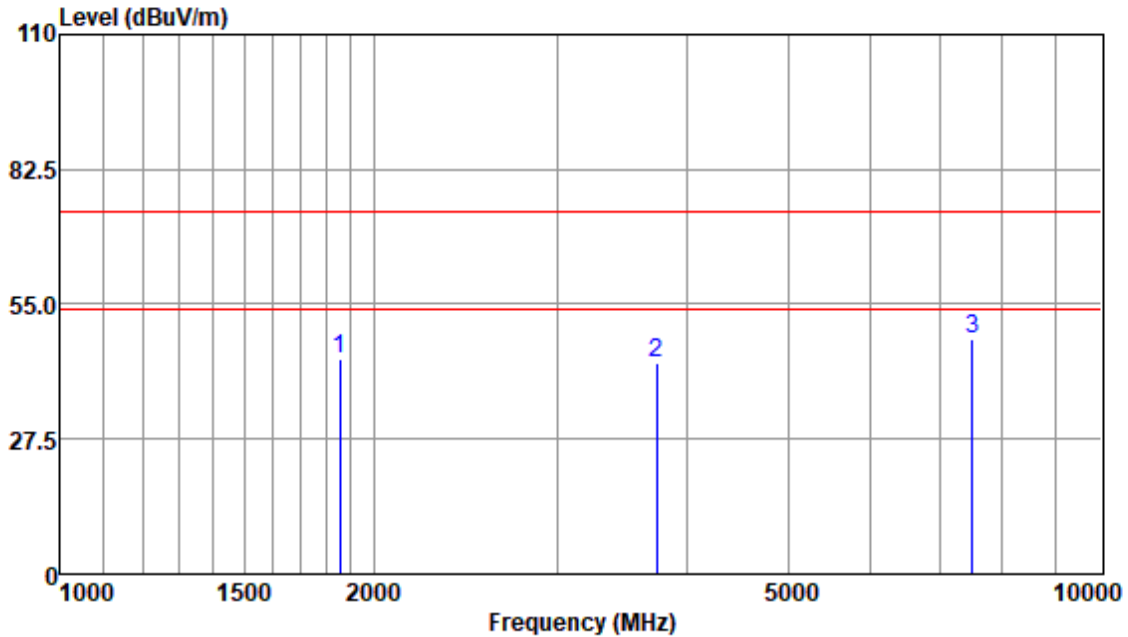
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



Antenna Polarity :HORIZONTAL

EUT/Project :0266AT

Test Mode :01

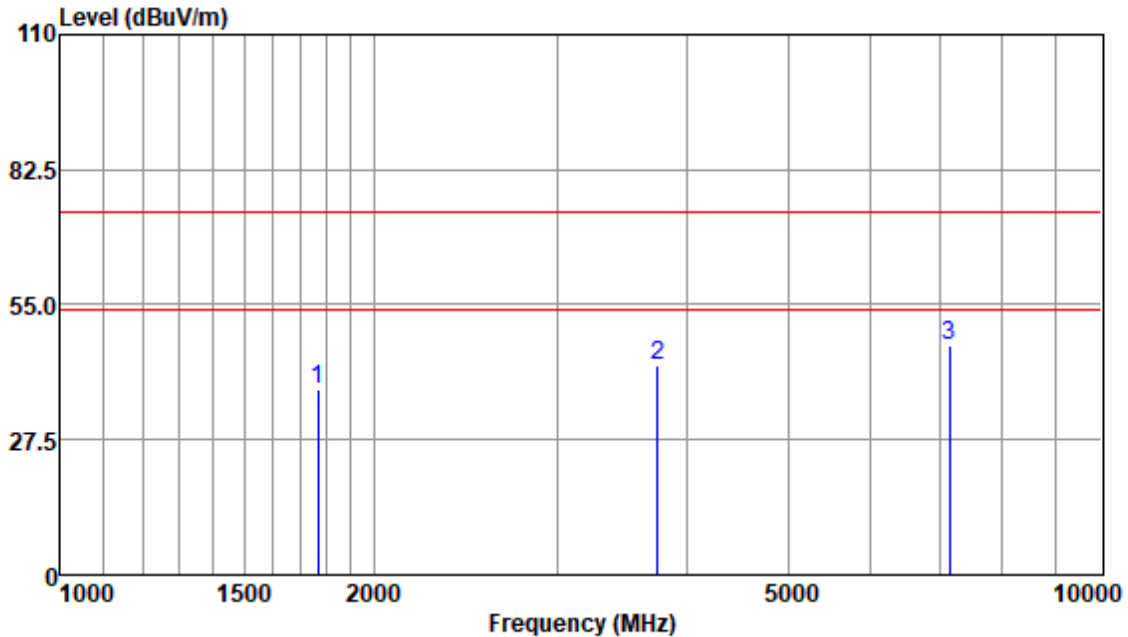
	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 1853.53	47.96	27.50	3.11	34.80	43.77	74.00	-30.23	Peak
2 3732.50	42.22	32.83	4.23	36.19	43.09	74.00	-30.91	Peak
3 7498.94	40.33	36.22	6.71	35.28	47.98	74.00	-26.02	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor





Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Antenna Polarity :VERTICAL

EUT/Project :0266AT

Test Mode :01

	Read	Antenna	Cable	Preamp	Emission	Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 1766.04	42.32	27.08	3.09	34.78	37.71	74.00	-36.29	Peak
2 3741.11	41.57	32.83	4.23	36.19	42.44	74.00	-31.56	Peak
3 7128.53	39.44	36.17	6.70	35.58	46.73	74.00	-27.27	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



### 7.6 99% Bandwidth

Test Requirement RSS-Gen Section 6.7  
Test Method: ANSI C63.10 Section 6.9.3

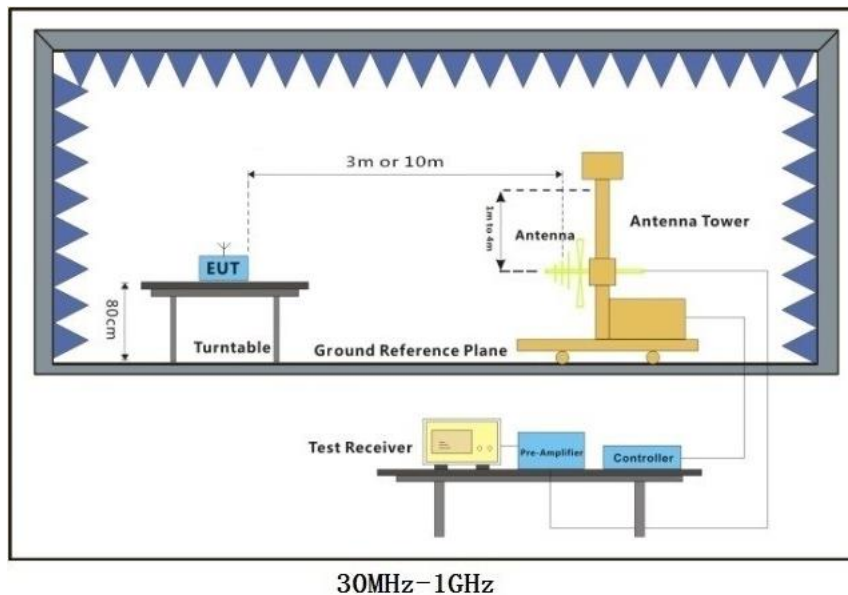
#### 7.6.1 E.U.T. Operation

Operating Environment:  
Temperature: 15.9 °C Humidity: 59.7 % RH Atmospheric Pressure: 1010 mbar

#### 7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in transmitting with modulation mode.

#### 7.6.3 Test Setup Diagram

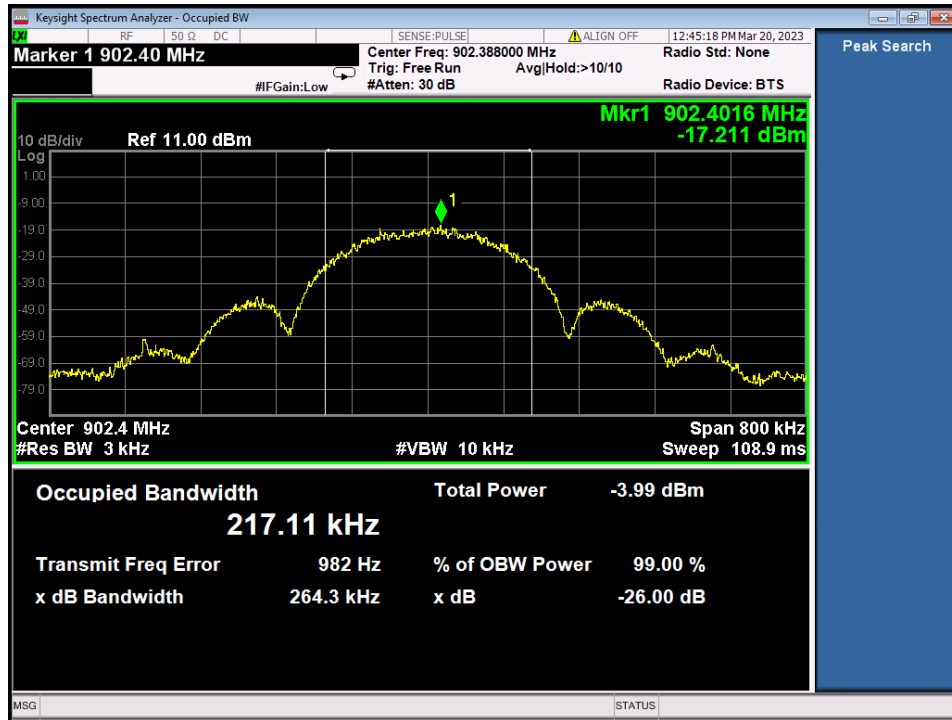


#### 7.6.4 Measurement Procedure and Data

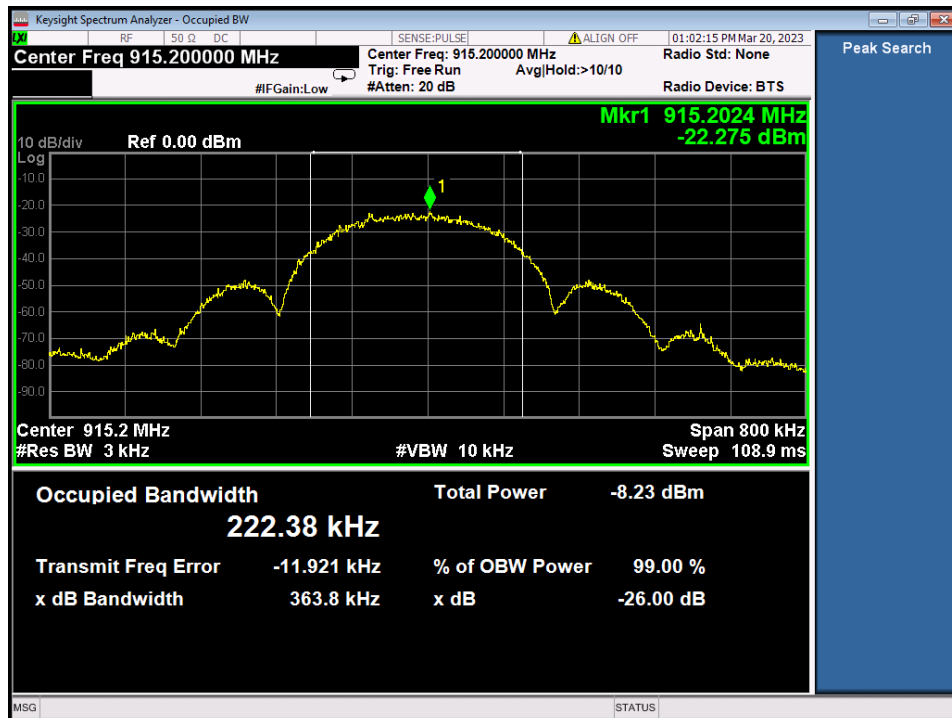
Frequency (MHz)	99% Bandwidth (MHz)	Limit(MHz)	Result
902.4	0.217	--	PASS
915.2	0.222	--	PASS
927.6	0.218	--	PASS



Channel: 902.3MHz



Channel: 915.2MHz



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Channel: 927.6MHz



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## 8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SHCR2302000266AT

## 9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for SHCR2302000266AT

**-- End of the Report --**



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