



Report No.: SZEM190701627602

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# TEST REPORT

**Application No.:** SZEM1907016276CR **Applicant:** KENKO TOKINA CO., LTD.

Address of Applicant: KT Nakano Building, 5-68-10, Nakano, Nakano-ku, Tokyo 164-8616, Japan

Manufacturer: KENKO TOKINA CO., LTD.

Address of Manufacturer: KT Nakano Building, 5-68-10, Nakano, Nakano-ku, Tokyo 164-8616, Japan

Factory: Dongguan Baoyi Electronic Technology Co., LTD

Address of Factory: No255, Jinglang South Road, Dalang town, Dongguan, Guangdong, China

**Equipment Under Test (EUT):** 

EUT Name: Al flash

Model No.: AB600-R(C)

Trade mark: Kenko

FCC ID: 2ASNAAB600R

Standard(s): 47 CFR Part 15, Subpart C 15.249

**Date of Receipt:** 2019-07-12

**Date of Test:** 2019-07-16 to 2019-08-07

**Date of Issue:** 2019-08-15

Test Result: Pass\*

Keny Xu EMC Laboratory Manager



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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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	Revision Record						
Version	Version Chapter Date Modifier Rem						
01		2019-08-15		Original			

Authorized for issue by:		
	Hany Ul	
	Harry Wu /Project Engineer	
	EvicFu	
	Eric Fu /Reviewer	-



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### **Test Summary**

Radio Spectrum Technical Requirement						
Item	Standard	Method	Requirement	Result		
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass		

Radio Spectrum Matter Part							
Item	Standard	Method	Requirement	Result			
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass			
Restricted Band Around Fundamental Frequency	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass			
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass			

#### Remark:

Model No.: AB600-R(C)

This test report (Ref. No.: SZEM190701627602) is only valid with the original test report (Ref. No.: SZEM190101064002).

Compared with the original report, this report changed the model No.. According to the declaration from the applicant, the models in this report and the model in original report was identical in the electrical circuit design, layout, components used, internal wiring and functions, with only difference on adding shaping circuit.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report Field Strength of the Fundamental Signal, Restricted Band Around Fundamental Frequency and Radiated Emissions were fully retested on model AB600-R(C) and shown the data in this report, other test data please refer to the original report SZEM190101064002.



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### **General Information**

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

Power supply:	DC 6V (4 x 1.5V "AA" Batteries)
Operation Frequency:	2411-2471MHz
Modulation Type:	FSK
Number of Channels:	15
Antenna Type:	PCB Antenna
Antenna Gain:	-3.94dBi

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2411.0	2	2419.5	3	2428.0
4	2436.5	5	2445.0	6	2453.5
7	2462.0	8	2411.5	9	2420.0
10	2428.5	11	2437.0	12	2445.5
13	2454.0	14	2462.5	15	2471.0

### 4.2 Description of Support Units

The EUT has been tested as an independent unit.

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	± 7.25 x 10 <sup>-8</sup>
0	DE Dadiated news	± 4.5dB (Below 1GHz)
2	RF Radiated power	± 4.8dB (Above 1GHz)
0	Dedicted Couriers emission test	± 4.5dB (Below 1GHz)
3	Radiated Spurious emission test	± 4.8dB (Above 1GHz)
4	Temperature test	± 1 ℃
5	Humidity test	± 3%
6	Supply voltages	± 1.5%
7	Time	± 3%



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### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

### 4.5 Test Facility

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

#### CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

#### A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

#### VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

#### FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

### Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

#### 4.6 Deviation from Standards

#### **Abnormalities from Standard Conditions** 4.7

None



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## **Equipment List**

Field Strength of the Fundamental Signal (15.249(a))						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM026-01	2019-07-11	2020-07-10	
EXA Spectrum Analyzer	AgilentTechnologies Inc	N9010A	SEM004-12	2019-04-12	2020-04-11	
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12	
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16	
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2018-11-12	2019-11-11	
Pre-amplifier (18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2019-04-01	2020-03-31	
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2019-04-01	2020-03-31	
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2018-09-25	2019-09-24	
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21	

Restricted Band Around Fundamental Frequency							
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date		
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12		
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A		
Coaxial Cable	SGS	N/A	SEM026-01	2019-07-11	2020-07-10		
EXA Spectrum Analyzer	AgilentTechnologies Inc	N9010A	SEM004-12	2019-04-12	2020-04-11		
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12		
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16		
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2018-11-12	2019-11-11		
Pre-amplifier (18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2019-04-01	2020-03-31		



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Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2019-04-01	2020-03-31
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2018-09-25	2019-09-24
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21

Radiated Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2019-07-11	2020-07-10
EXA Spectrum Analyzer	AgilentTechnologies Inc	N9010A	SEM004-12	2019-04-12	2020-04-11
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2018-11-12	2019-11-11
Pre-amplifier (18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2019-04-01	2020-03-31
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2019-04-01	2020-03-31
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2018-09-25	2019-09-24
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	ilent Technologies N9038A SEM		2018-09-25	2019-09-24
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2019-04-01	2020-03-31
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2018-07-12	2019-07-11



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General used equipment									
Equipment	Manufacturer	Model No	Model No Inventory No		Cal Due Date				
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2018-09-27	2019-09-26				
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2018-09-27	2019-09-26				
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2018-09-27	2019-09-26				
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2019-04-04	2020-04-03				



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#### **Radio Spectrum Technical Requirement** 6

### 6.1 Antenna Requirement

### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 Limit:

#### 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 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 integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -3.94dBi.

Antenna location: Refer to Internal photos



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#### **Radio Spectrum Matter Test Results** 7

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

47 CFR Part 15, Subpart C 15.249(a) Test Requirement Test Method: ANSI C63.10 (2013) Section 6.5&6.6

Measurement Distance: 3m

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.



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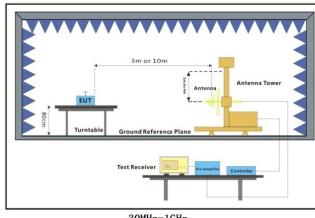
### 7.1.1 E.U.T. Operation

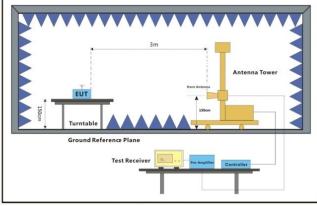
Operating Environment:

Temperature: 23.9 °C Humidity: 54.8 % RH Atmospheric Pressure: 1005 mbar

a:TX mode\_Keep the EUT in transmitting mode Test mode

#### 7.1.2 Test Setup Diagram





30MHz-1GHz

Above 1GHz

#### 7.1.3 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 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



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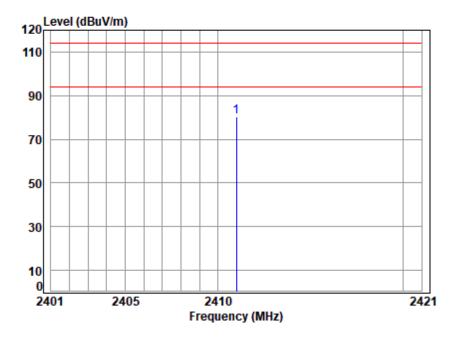
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Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 16276CR\16280CR

Mode : 2411 Field strength

> Ant Preamp Limit Cable Read 0ver

Loss Factor Factor Level Level Line Limit Remark Freq

MHz dB dB/m dB dBuV dBuV/m dBuV/m dB

2411.000 5.50 28.55 41.18 87.66 80.53 114.00 -33.47 peak



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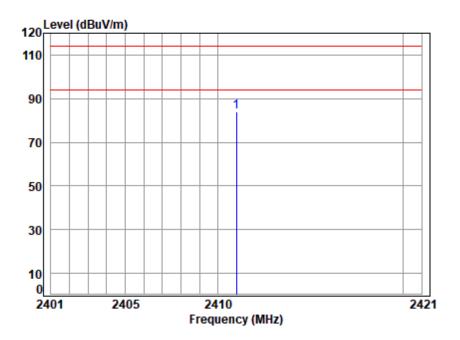
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Mode:a; Polarization: Vertical; Modulation: GFSK; ; Channel: Low



Site : chamber Condition: 3m VERTICAL

: 16276CR\16280CR Job No

Mode : 2411 Field strength

> Ant Preamp Limit Cable Read 0ver

Loss Factor Factor Level Level Line Limit Remark Freq

MHz dB dB/m dB dBuV dBuV/m dBuV/m dB

2411.000 5.50 28.55 41.18 90.87 83.74 114.00 -30.26 peak



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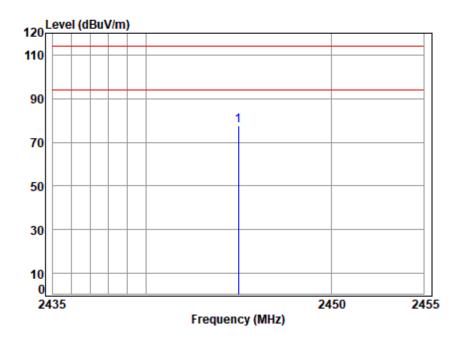
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Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:middle



Site : chamber

Condition: 3m HORIZONTAL : 16276CR\16280CR Job No

Mode : 2445 Field strength

> Ant Preamp Limit Cable Read 0ver

Loss Factor Factor Level Level Line Limit Remark Freq

MHz dB dB/m dB dBuV dBuV/m dBuV/m dB

2445.000 5.55 28.61 41.20 84.77 77.73 114.00 -36.27 peak



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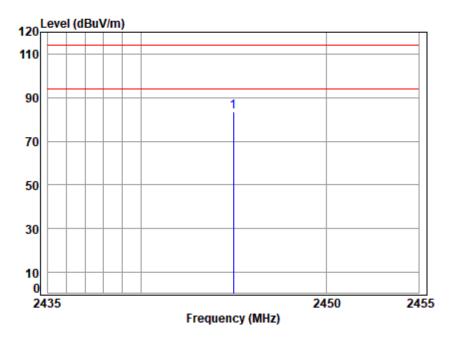
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Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:middle



Site : chamber Condition: 3m VERTICAL

: 16276CR\16280CR Job No

Mode : 2445 Field strength

> Ant Preamp Limit Cable Read 0ver

Loss Factor Factor Level Level Line Limit Remark Freq

MHz dB dB/m dB dBuV dBuV/m dBuV/m dB

2445.000 5.55 28.61 41.20 90.33 83.29 114.00 -30.71 peak



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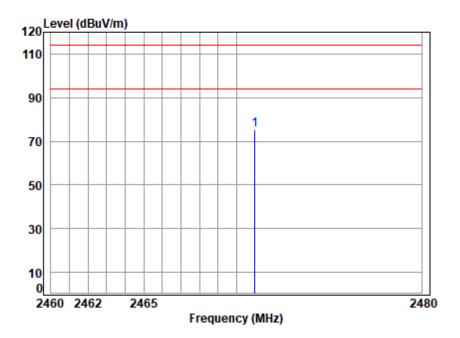
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Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 16276CR\16280CR

Mode : 2471 Field strength

> Ant Preamp Cable Read Limit 0ver

Loss Factor Factor Level Level Line Limit Remark Freq

MHz dB dB/m dB dBuV dBuV/m dBuV/m dB

2471.000 5.58 28.65 41.21 82.12 75.14 114.00 -38.86 peak



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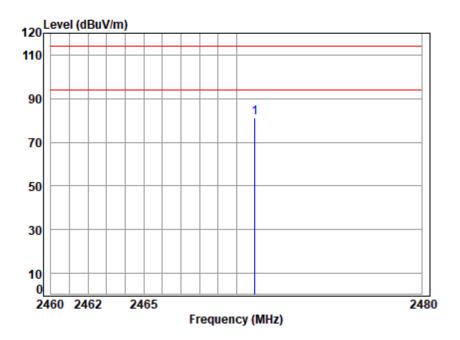
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Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:High



Site : chamber Condition: 3m VERTICAL

: 16276CR\16280CR Job No

Mode : 2471 Field strength

> Ant Preamp Limit Cable Read 0ver

Loss Factor Factor Level Level Line Limit Remark Freq

MHz dB dB/m dB dBuV dBuV/m dBuV/m dB

2471.000 5.58 28.65 41.21 88.39 81.41 114.00 -32.59 peak



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### 7.2 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 6.4&6.5&6.6

Measurement Distance: 3m

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.



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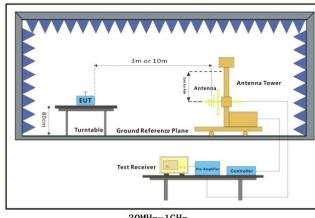
#### 7.2.1 E.U.T. Operation

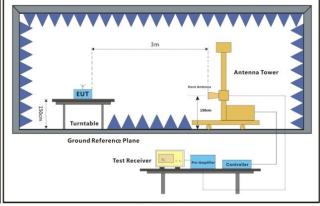
Operating Environment:

Temperature: 23.6 °C 56.5 % RH Atmospheric Pressure: 1005 mbar Humidity:

a:TX mode\_Keep the EUT in transmitting mode Test mode

#### 7.2.2 Test Setup Diagram





30MHz-1GHz

Above 1GHz

#### 7.2.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For 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



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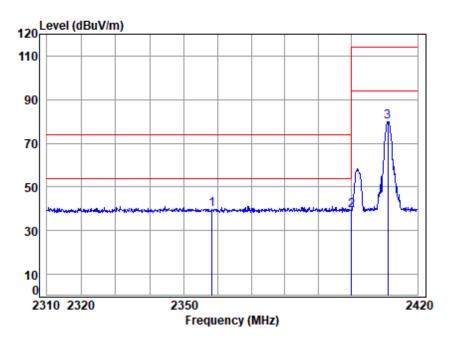
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Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 16276CR\16280CR Mode : 2411 Band edge

	Freq			Preamp Factor					
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2358.428	5.43	28.46	41.16	46.95	39.68	74.00	-34.32	Peak
2	2400.000	5.49	28.54	41.18	46.45	39.30	74.00	-34.70	Peak
3	2411.000	5.50	28.55	41.18	86.98	79.85	114.00	-34.15	Peak



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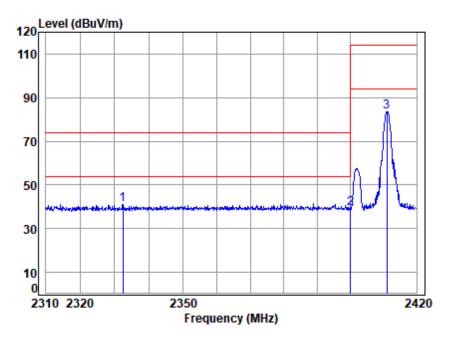
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Mode:a; Polarization: Vertical; Modulation: GFSK; ; Channel: Low



Site : chamber Condition: 3m VERTICAL

Job No : 16276CR\16280CR Mode : 2411 Band edge

Jue	. 24.	rr Dall	u euge							
		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2332.460	5.40	28.42	41.15	48.52	41.19	74.00	-32.81	Peak	
2	2400.000	5.49	28.54	41.18	46.41	39.26	74.00	-34.74	Peak	
3	2411.000	5.50	28.55	41.18	90.44	83.31	114.00	-30.69	Peak	



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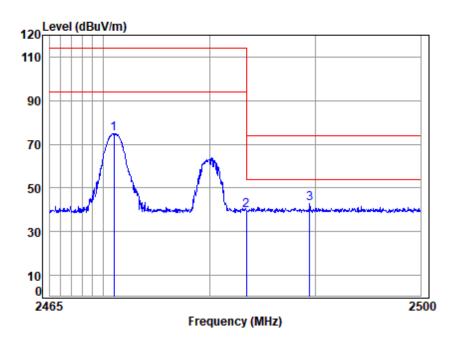
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Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 16276CR\16280CR Mode : 2471 Band edge

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2471.000	5.58	28.65	41.21	81.60	74.62	114.00	-39.38	Peak
2	2483.500	5.60	28.67	41.21	46.79	39.85	74.00	-34.15	Peak
3	2489.483	5.61	28.68	41.21	49.64	42.72	74.00	-31.28	Peak



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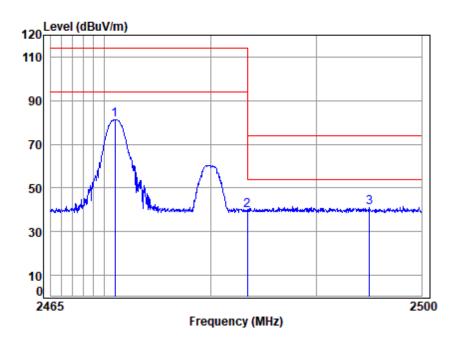
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Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:High



Site : chamber Condition: 3m VERTICAL

: 16276CR\16280CR Job No Mode : 2471 Band edge

ue	. 24	/ L Dall	u euge						
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2471.000	5.58	28.65	41.21	88.23	81.25	114.00	-32.75	Peak
2	2483.500	5.60	28.67	41.21	46.57	39.63	74.00	-34.37	Peak
3	2495.035	5.61	28.69	41.22	48.20	41.28	74.00	-32.72	Peak



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#### 7.3 Radiated Emissions

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&6.6

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3



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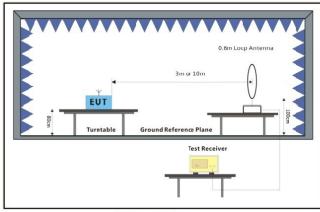
### 7.3.1 E.U.T. Operation

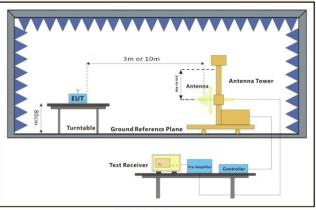
Operating Environment:

Temperature: 23.9 °C Humidity: 55.4 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode\_Keep the EUT in transmitting mode

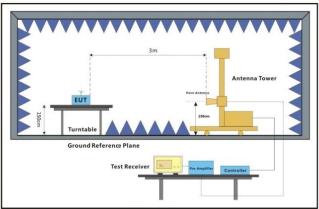
### 7.3.2 Test Setup Diagram





Below 30MHz

30MHz-1GHz



Above 1GHz

#### 7.3.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



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### Average value:

	Average value=Peak value + PDCF
Calculate Formula:	PDCF=20 log(Duty cycle)
	Duty cycle= T on time / T period
	Ton time =0.3053ms
Test data:	T period =4.401ms
	PDCF value= -23.18dB

#### Duty cycle test plots:





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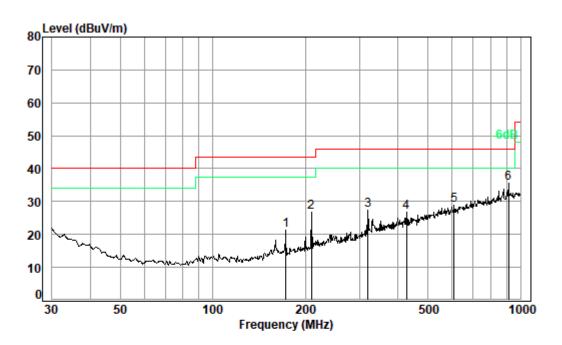
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30MHz~1GHz

QP value:

Mode: a; Polarization: Horizontal



Condition: 3m HORIZONTAL

Job No. : 16276CR

Test mode: a

		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	172.60	1.36	15.76	27.27	31.33	21.18	43.50	-22.32
2	209.31	1.46	16.83	27.14	35.56	26.71	43.50	-16.79
3	319.94	1.97	20.23	27.01	32.06	27.25	46.00	-18.75
4	426.52	2.31	23.03	27.54	28.88	26.68	46.00	-19.32
5	607.79	2.72	26.71	28.15	27.57	28.85	46.00	-17.15
6 pp	916.07	3.62	29.88	27.23	29.37	35.64	46.00	-10.36



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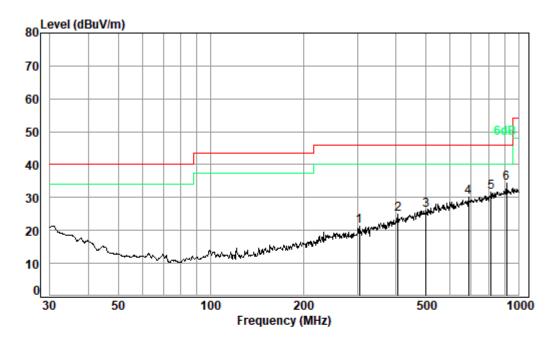
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Mode: a; Polarization: Vertical



Condition: 3m VERTICAL Job No. : 16276CR

Test mode: a

	Freq			Preamp Factor			Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	304.61	1.91	19.75	26.92	26.58	21.32	46.00	-24.68
2	406.09	2.23	22.55	27.45	27.64	24.97	46.00	-21.03
3	501.18	2.60	24.63	27.84	26.81	26.20	46.00	-19.80
4	689.56	2.88	27.77	27.95	27.35	30.05	46.00	-15.95
5	815.97	3.27	28.72	27.65	27.19	31.53	46.00	-14.47
6 pp	916.07	3.62	29.88	27.23	28.18	34.45	46.00	-11.55



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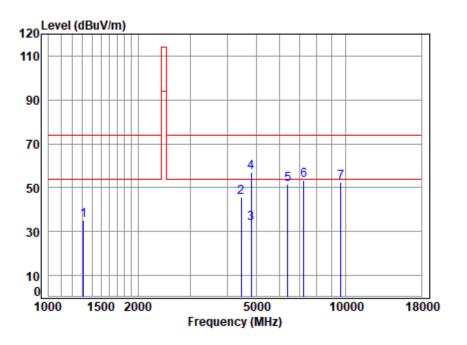


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Above 1GHz

Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Site : chamber

Condition: 3m HORIZONTAL Job No : 16276CR\16280CR Mode : 2411 TX RSE

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1308.399	4.83	25.06	40.57	45.97	35.29	74.00	-38.71	peak
2	4456.315	7.51	33.53	43.26	47.79	45.57	74.00	-28.43	peak
3	4820.000	7.91	33.99	43.63	35.45	33.72	54.00	-20.28	Average
4	4820.000	7.91	33.99	43.63	58.63	56.90	74.00	-17.10	peak
5	6395.654	11.34	35.50	42.49	47.32	51.67	74.00	-22.33	peak
6	7230.000	10.07	36.09	41.84	48.92	53.24	74.00	-20.76	peak
7	9640.000	10.76	37.69	38.38	42.44	52.51	74.00	-21.49	peak



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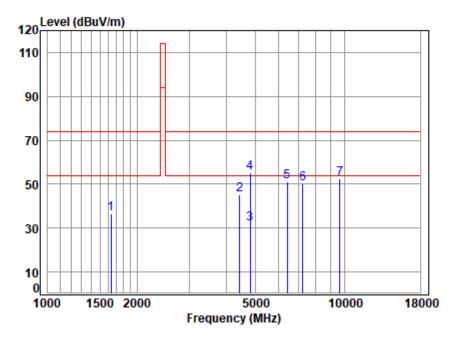
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Mode:a; Polarization: Vertical; Modulation: GFSK; ; Channel: Low



Site : chamber Condition: 3m VERTICAL Job No : 16276CR\16280CR

Mode : 2411 TX RSE

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1634.543	5.31	26.40	40.79	45.67	36.59	74.00	-37.41	peak
2	4443.453	7.50	33.50	43.25	47.50	45.25	74.00	-28.75	peak
3	4820.000	7.91	33.99	43.63	33.56	31.83	54.00	-22.17	Average
4	4820.000	7.91	33.99	43.63	56.74	55.01	74.00	-18.99	peak
5	6414.167	11.38	35.52	42.48	46.90	51.32	74.00	-22.68	peak
6	7230.000	10.07	36.09	41.84	45.74	50.06	74.00	-23.94	peak
7	9640.000	10.76	37.69	38.38	42.41	52.48	74.00	-21.52	peak



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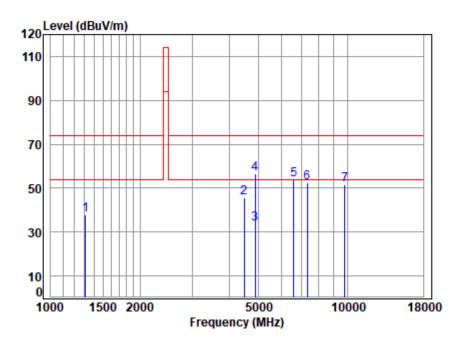
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Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:middle



Site : chamber

Condition: 3m HORIZONTAL : 16276CR\16280CR Mode : 2445 TX RSE

> Cable Ant Preamp Read Limit 0ver Freq Loss Factor Factor Level Level Line Limit Remark MHz dB dB/m dΒ dBuV dBuV/m dBuV/m dB 37.80 74.00 -36.20 peak 1308.399 4.83 25.06 40.57 48.48 4482.150 7.54 33.57 43.29 48.03 45.85 74.00 -28.15 peak 7.98 4890.000 34.07 43.70 35.23 33.58 54.00 -20.42 Average 4890.000 7.98 34.07 43.70 58.41 56.76 74.00 -17.24 peak 6583.209 11.30 35.65 42.34 49.13 53.74 74.00 -20.26 peak 7335.000 10.04 36.17 41.76 48.16 52.61 74.00 -21.39 peak

9780.000 10.83 37.77 38.15 41.01 51.46 74.00 -22.54 peak



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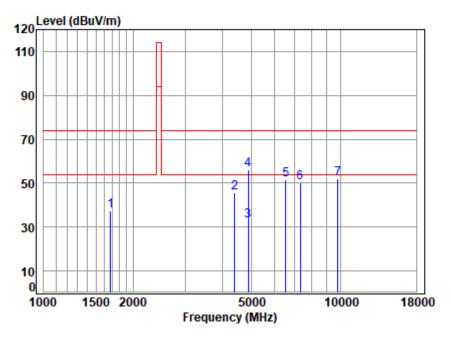
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Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:middle



Site : chamber Condition: 3m VERTICAL Job No : 16276CR\16280CR

Mode : 2445 TX RSE

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
_	4677 604		06.50			27.50	74.00	26.40	
1	1677.621	5.25	26.58	40.82	46.5/	37.58	/4.00	-36.42	peak
2	4405.090	7.46	33.44	43.20	47.73	45.43	74.00	-28.57	peak
3	4890.000	7.98	34.07	43.70	34.48	32.83	54.00	-21.17	Average
4	4890.000	7.98	34.07	43.70	57.66	56.01	74.00	-17.99	peak
5	6545.263	11.41	35.63	42.37	46.97	51.64	74.00	-22.36	peak
6	7335.000	10.04	36.17	41.76	45.91	50.36	74.00	-23.64	peak
7	9780.000	10.83	37.77	38.15	41.65	52.10	74.00	-21.90	peak



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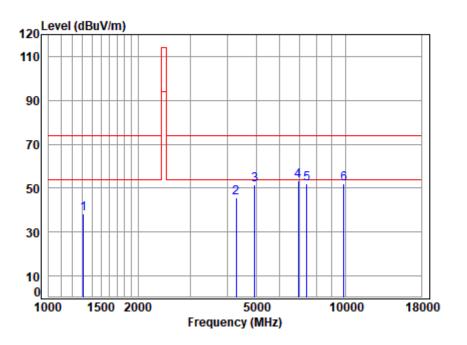
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Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



Site : chamber

Condition: 3m HORIZONTAL Job No : 16276CR\16280CR

Mode : 2471 TX RSE

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1308.399	4.83	25.06	40.57	49.06	38.38	74.00	-35.62	peak
2	4279.589	7.31	33.22	43.07	48.31	45.77	74.00	-28.23	peak
3	4940.000	8.03	34.13	43.74	53.29	51.71	74.00	-22.29	peak
4	6934.778	10.31	35.86	42.06	49.31	53.42	74.00	-20.58	peak
5	7410.000	10.02	36.23	41.71	47.46	52.00	74.00	-22.00	peak
6	9880.000	10.88	37.83	37.99	41.49	52.21	74.00	-21.79	peak



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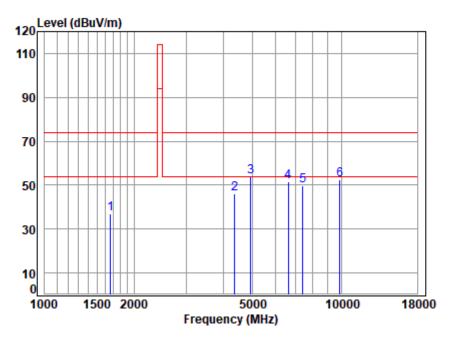
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Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:High



: chamber Site Condition: 3m VERTICAL : 16276CR\16280CR

: 2471 TX RSE Mode

loue	. 24	/ T I/	NJL						
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1667.951	5.27	26.54	40.81	45.92	36.92	74.00	-37.08	peak
2	4367.058	7.41	33.37	43.16	48.48	46.10	74.00	-27.90	peak
3	4940.000	8.03	34.13	43.74	55.39	53.81	74.00	-20.19	peak
4	6621.375	11.19	35.67	42.31	47.09	51.64	74.00	-22.36	peak
5	7410.000	10.02	36.23	41.71	45.05	49.59	74.00	-24.41	peak
6	9880.000	10.88	37.83	37.99	41.90	52.62	74.00	-21.38	peak



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#### **Photographs** 8

### 8.1 Test Setup

Refer to Setup Photos

### 8.2 EUT Constructional Details (EUT Photos)

Refer to EUT external and internal photos

- End of the Report -



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