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## **TEST REPORT**

Application No.: Applicant: Address of Applicant: Manufacturer: Address of Manufacturer:	CHINA		
Equipment Under Test (EU EUT Name:			
Model No.:	REMOTE CONTROL CAR SERIES UJ99-T180, UJ99-T181, UJ99-T182, UJ99-T183, UJ99-T184, UJ99-T185, UJ99-T186, UJ99-T187, UJ99-T188, UJ99-T189, UJ99-D160, UJ99-D161, UJ99-D162, UJ99-D163, UJ99-D164, UJ99-D165, UJ99-D166, UJ99-D167, UJ99-D168, UJ99-D169, UJ99-D240, UJ99-D241, UJ99-D243, UJ99-D244, UJ99-D245, UJ99-D246, UJ99-D247, UJ99-D248, UJ99-D249, UJ99-L160, UJ99-L161, UJ99-L162, UJ99-L163, UJ99-L164, UJ99-L165, UJ99-L166, UJ99-L167, UJ99-L168, UJ99-L169, UJ99-L180, UJ99-L181, UJ99-L182, UJ99-L183, UJ99-L184, UJ99-L185, UJ99-L186, UJ99-L187, UJ99-L188, UJ99-L189, UJ99-L240, UJ99-L241, UJ99-L242, UJ99-L243, UJ99-L244, UJ99-L245, UJ99-L246, UJ99-L247, UJ99-L248, UJ99-L243, UJ99-L244, UJ99-L245, UJ99-29, UJ99-30, UJ99-11, UJ99-14, UJ99-17, UJ99-27, UJ99- 2810B, UJ99-2811B, UJ99-2812B, UJ99-2815B, UJ99-1813B, UJ99-1815B		
÷.	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.		
FCC ID:	2AGCM851399000		
Standard(s) :	47 CFR Part 15, Subpart C 15.249		
Date of Receipt:	2021-07-05		
Date of Test:	2021-07-07 to 2021-07-14		
Date of Issue:	2021-07-16		
Test Result:	Pass*		

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

Keny. Ku

Keny Xu EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-07-16		Original

Authorized for issue by:		
	Gebin Sun	
	Gebin Sun/Project Engineer	
	Eric Fu	
	Eric Fu/Reviewer	



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### 2 Test Summary

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

Radio Spectrum Matter Part					
Item	Standard	Method	Requirement	Result	
20dB Bandwidth		ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass	
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15,	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass	
Restricted Band Around Fundamental Frequency	Subpart C 15.249	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass	
Radiated Emissions		ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass	

### **Declaration of EUT Family Grouping:**

Model No.: UJ99-T180, UJ99-T181, UJ99-T182, UJ99-T183, UJ99-T184, UJ99-T185, UJ99-T186, UJ99-T187, UJ99-T188, UJ99-T189, UJ99-D160, UJ99-D161, UJ99-D162, UJ99-D163, UJ99-D164, UJ99-D165, UJ99-D166, UJ99-D167, UJ99-D168, UJ99-D169, UJ99-D240, UJ99-D241, UJ99-D243, UJ99-D244, UJ99-D245, UJ99-D246, UJ99-D247, UJ99-D248, UJ99-D249, UJ99-L160, UJ99-L161, UJ99-L162, UJ99-L163, UJ99-L164, UJ99-L165, UJ99-L166, UJ99-L167, UJ99-L168, UJ99-L169, UJ99-L180, UJ99-L181, UJ99-L182, UJ99-L183, UJ99-L184, UJ99-L185, UJ99-L186, UJ99-L187, UJ99-L188, UJ99-L189, UJ99-L240, UJ99-L241, UJ99-L242, UJ99-L243, UJ99-L244, UJ99-L245, UJ99-L246, UJ99-L247, UJ99-L248, UJ99-L249, UJ99-, UJ99-2, UJ99-6, UJ99-29, UJ99-30, UJ99-11, UJ99-14, UJ99-17, UJ99-27, UJ99-2810B, UJ99-2811B, UJ99-2812B, UJ99-2815B, UJ99-1813B, UJ99-1815B

Only the model UJ99-T181 was tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used and internal wiring and functions were identical for the above models, with only difference on color, appearance and package.



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#### 4 **General Information**

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

Power supply:	3V DC(1.5V x 2 "AA" Size Batteries) for TX
Operation Frequency:	2415MHz to 2470MHz
Modulation Type:	GFSK
Number of Channels:	3
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	1dBi

Channel list

Channel	Frequency (MHz)	
1	2415	
2	2440	
3	2470	

### 4.2 Description of Support Units

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

The EUT has been tested as an independent unit.

### 4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
20dB Bandwidth	± 3%
Field Strength of the Fundamental Signal (15.249(a))	± 4.5dB (Below 1GHz);± 4.8dB (Above 1GHz)
Restricted Band Around Fundamental Frequency	± 4.5dB (Below 1GHz);± 4.8dB (Above 1GHz)
Radiated Emissions	± 4.5dB (Below 1GHz);± 4.8dB (Above 1GHz)
Temperature test	± 1°C
Humidity test	± 3%
Supply voltages	± 1.5%
Time	± 3%

#### Remark:

The Ulab (lab Uncertainty) is less than Ucispr (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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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:

### 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 (Member No. 1937)

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. Shenzhen EMC laboratory 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

None

### 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

20dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	SAEMC	MSR733	SEM001-09	2019-06-13	2022-06-12
DC Power Supply	Rohde & Schwarz	NGSM 32/10	SEM011-04	2021-03-23	2022-03-22
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2021-03-24	2022-03-23
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09
COaxial Cable	565	N/A	3E10031-02	2021-07-09	2022-07-08
Attenuator	Huber+Suhner	6620_SMA-50- 1	SEM021-09	2021-04-08	2022-04-07

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	2021-03-26	2024-03-25					
EXA Signal Analyzer	Agilent Technologies Inc	N9010A	SEM004-12	2021-02-01	2022-01-31					
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2021-04-14	2024-04-13					
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2020-09-23	2021-09-22					
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A					
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09					
COaxial Cable	363	IN/A	3E10031-02	2021-07-09	2022-07-08					



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Restricted Band Around Fundamental Frequency											
Equipment	Equipment Manufacturer Model No Inventory No Cal Date Cal Due										
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2021-03-26	2024-03-25						
EXA Signal Analyzer	Agilent Technologies Inc	N9010A	SEM004-12	2021-02-01	2022-01-31						
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2021-04-14	2024-04-13						
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2020-09-23	2021-09-22						
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A						
Copyiel Coble	505	N1/A	SEM021 02	2020-07-10	2021-07-09						
Coaxial Cable	SGS	N/A	SEM031-02	2021-07-09	2022-07-08						

Radiated Emissions Below 1GHz										
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date					
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18					
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2020-11-02	2021-11-01					
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-02	2019-05-24	2022-05-23					
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2021-03-24	2022-03-23					
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A					
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09					
Coaxial Cable	363	IN/A	3EIVI031-02	2021-07-09	2022-07-08					



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Radiated Emissions Above 1GHz										
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date					
3m Semi-Anechoic Chamber	AUDIX	N/A SEM001-02		2021-03-26	2024-03-25					
EXA Signal Analyzer	Agilent Technologies Inc	N9010A	SEM004-12	2021-02-01	2022-01-31					
Horn Antenna	Rohde&Schwarz	HF907	IF907 SEM003-07		2024-04-13					
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2020-09-23	2021-09-22					
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A					
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09					
Coaxial Cable	363	IN/A	3EIVI031-02	2021-07-09	2022-07-08					

General used equipmen	t				
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2020-09-15	2021-09-14
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2020-09-15	2021-09-14
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2021-03-30	2022-03-29



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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

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.

### 6.1.2 Conclusion

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1dBi.

Antenna location: Refer to Internal photos



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

#### 20dB Bandwidth 7.1

Test Requirement	47 CFR Part 15, Subpart C 15.215
Test Method:	ANSI C63.10 (2013) Section 6.9
Limit:	N/A

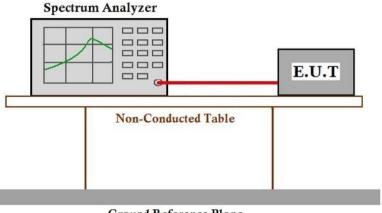
### 7.1.1 E.U.T. Operation

Operating Enviror	nment:					
Temperature:	21.1 °C	Humidity:	47.7 % 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



Ground Reference Plane

### 7.1.4 Measurement Procedure and Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	2.301	Pass
Middle	2.229	Pass
Highest	2.243	Pass



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Spect	rum	Re	ceiver	×						
Ref Le	vel ·	-10.00 dBr	n	R	BW 100 kHz					
Att		10 d	B SWT 1	9 µs 🥯 ۷	BW 300 kHz	Mode Aut	to FFT In	put 1 AC		
⊖1Pk Vi	ew									
						[	01[1]		:	-0.21 dB 2.3010 MHz
-20 dBm						M2 N	41[1]			46.70 dBm
-30 dBm	-+					$\mu_{m}$	X		2.41	41750 GHz
-40 dBm							$\mathbf{N}$			
-40 080		01 -46.120	dBro		M1		01			
-50 dBm	γ <del>-</del>	-10.120			+					
-60 dBm	∩ -				<u> </u>					
-70 dBm		0	5	$\sim$						0
	2	n	$\mathcal{V}$						h	$\sim$
-80 dBm	1									
-90 d8m	ı									
-100 dB										
100 00										
CF 2.4	15 GI	Hz			691	l pts			Span	10.0 MHz
Marker										
Туре	Ref	Trc	X-valu		Y-value		ction	Fun	ction Result	
M1		1	****	175 GHz	-46.70 d					
D1 M2	M1	1		301 MHz 174 GHz	-0.21 -26.12 d					
	į	J				Me	asuring		. 🦇	14.07.2021 18:30:52

Date: 14.JUL.2021 18:30:52



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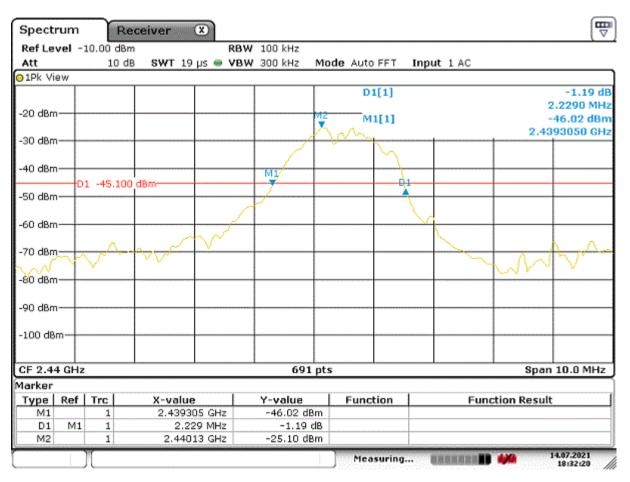
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Spect	rum	Re	ceiver	×									₽
Ref Lev	vel -	-10.00 dBn	1		RBW	100 kHz							
Att		10 d8	SWT	19 µs 👄 '	vøw	300 kHz	Mode .	Auto P	FT	Inpu	ut 1 AC		
⊖1Pk Vie	ew												
								D1[	1]			2	-0.28 dB 2.2430 MHz
-20 dBm							M2 X ,	M1[	1]				45.71 dBm 93340 GHz
-30 dBm						~ ~	FW	and a				2.10	
-40 dBm						MI			$\rightarrow$				
		01 -44.920	d8m						<u>0</u> 1				
-50 dBm	+					/							
-60 dBm	-+			1-1-7	4					~	<u></u>		
-70 dBm		$\sim \sqrt{2}$	0000	46									har
-80 dBm	4	~											V
-90 dBm	-+												
-100 dB	m+												
CF 2.47	7 GH	z		I		691	pts				I	Span	10.0 MHz
Marker													
Type	Ref	Trc	X-va	lue		Y-value	F	unctio	on		Fund	tion Result	
M1		1	2.46	9334 GHz		-45.71 di							
D1	_M1			2.243 MHz		-0.28							
M2		1	2.47	0145 GHz		-24.92 di	Bm						
	l	)[]						Measu	uring	-			14.07.2021 18:34:35

Date: 14.JUL 2021 18:34:35



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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
Measurement Distance:	3m

Limit:

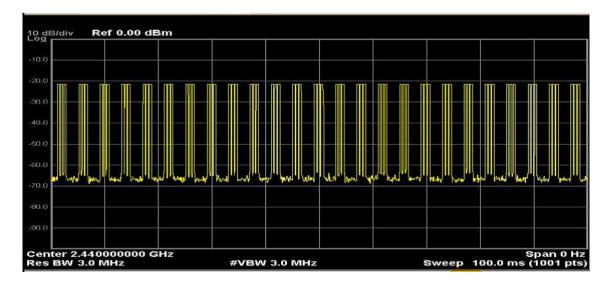
Fundamental frequency(MHz)	Field strength of fundamental(millivolts/meter)	Field strength of harmonics(microvolts/meter)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

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.

Average value:

Calculate Formula:	Average value=Peak value + PDCF			
	PDCF=20 log(Duty cycle)			
	Duty cycle= T on time / T period			
	Ton time =0.99ms			
Test data:	T period =4ms			
Test data.	Duty cycle=24.75%			
	PDCF value= -12.13dB			





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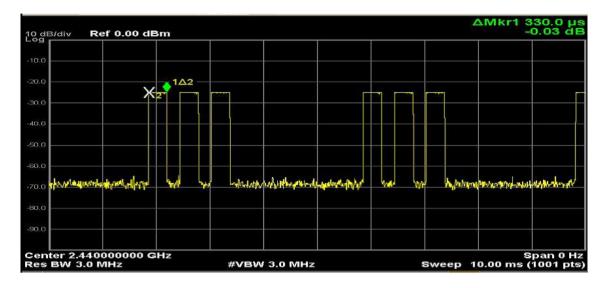
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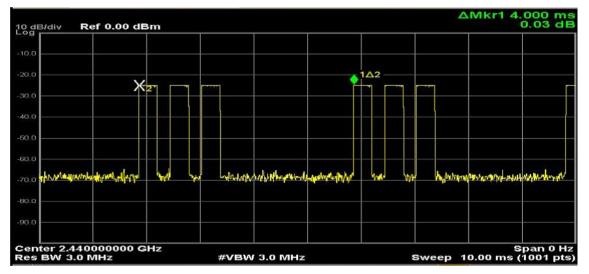


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### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature:	26.1 °C	Humidity:	54.8 % 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.



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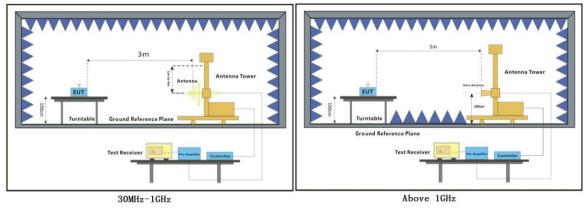


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### 7.2.3 Test Setup Diagram



### 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



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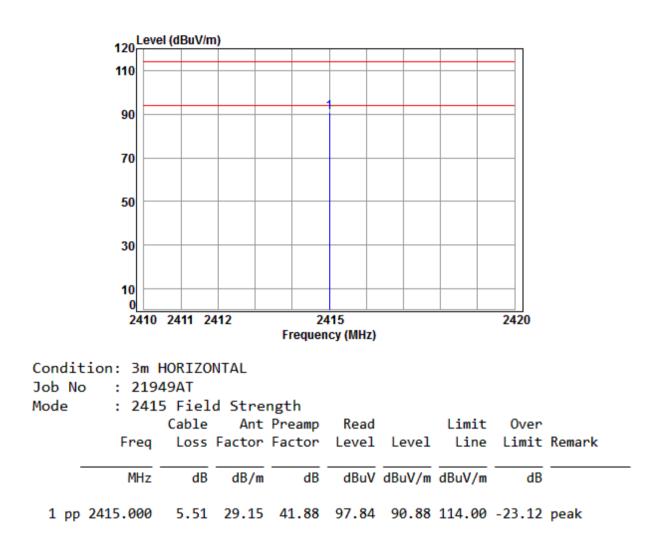
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low





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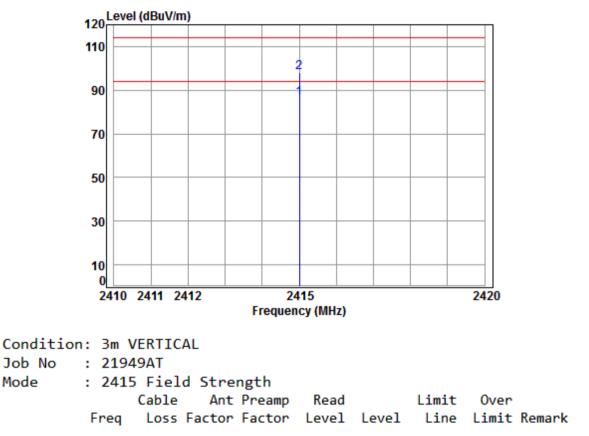
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 2415.000 2 pk 2415.000								-



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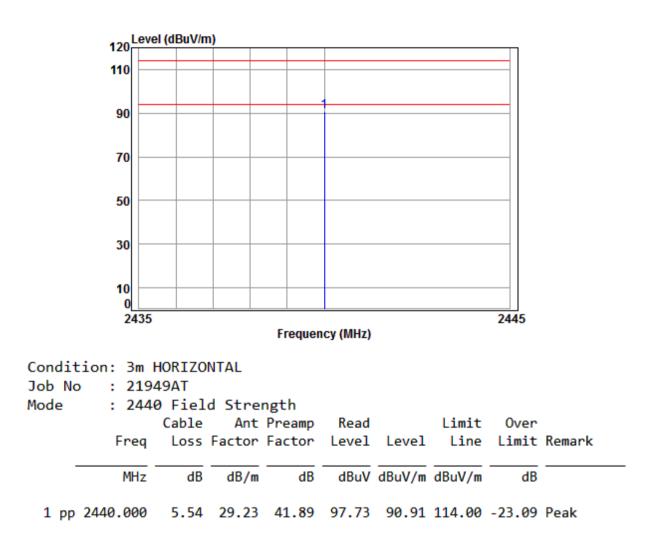
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:middle





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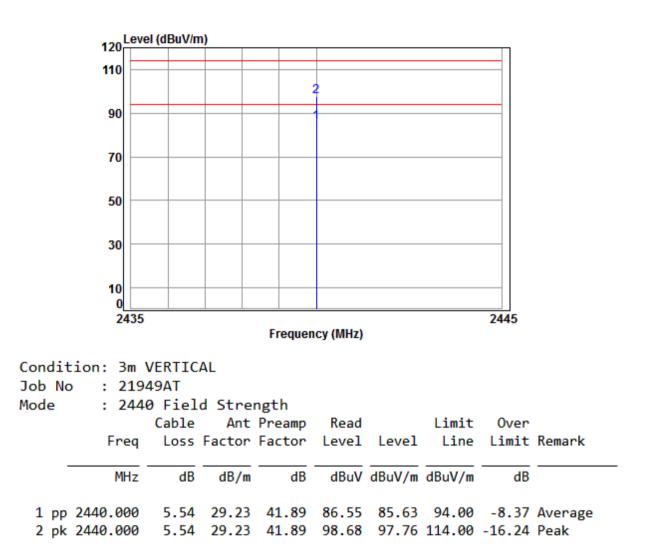
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:middle





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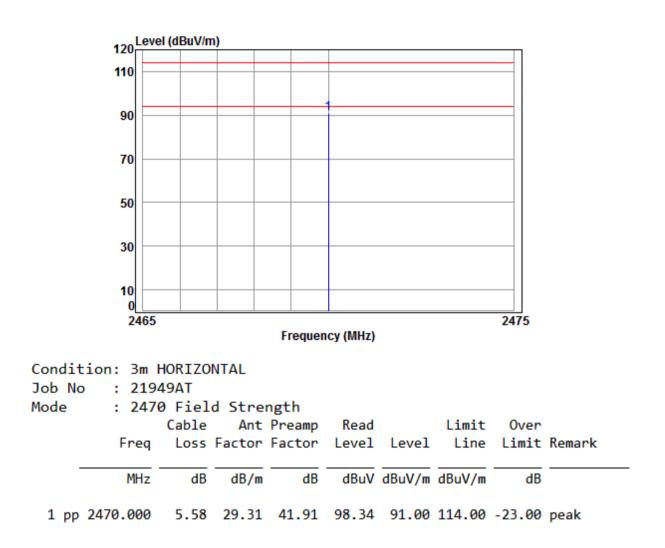
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High





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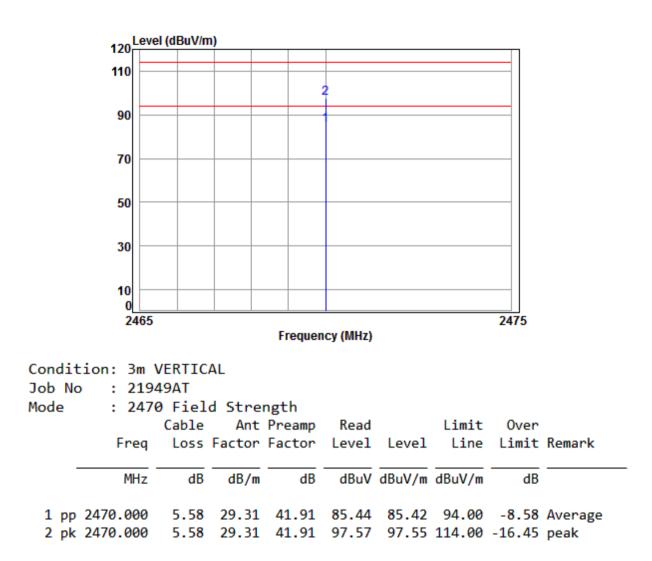
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

2) 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. So, only the above measurement data were shown in the report



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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
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.

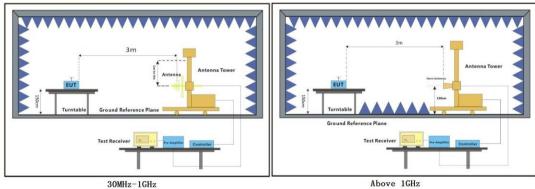
### 7.3.1 E.U.T. Operation

Operating Enviro	nment:					
Temperature:	25.3 °C	Humidity:	51.5 % RH	Atmospheric Pressure:	1010	mbar

### 7.3.2 Test Mode Description

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

### 7.3.3 Test Setup Diagram





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#### 7.3.4 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



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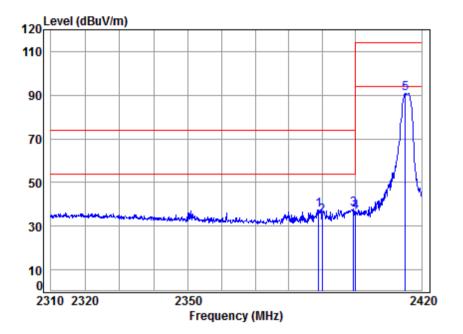
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



### Condition: 3m HORIZONTAL

Job No	: 219	49AT							
Mode	: 241	5 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	2389.016	5.47	29.07	41.87	44.29	37.54	74.00	-36.46	peak
2	2390.000	5.47	29.08	41.87	41.29	34.52	74.00	-39.48	peak
3	2399.486	5.49	29.11	41.88	45.04	38.02	74.00	-35.98	peak
4	2400.000	5.49	29.11	41.88	43.72	36.68	74.00	-37.32	peak
5 pp	2415.000	5.51	29.15	41.88	97.84	90.88	114.00	-23.12	peak



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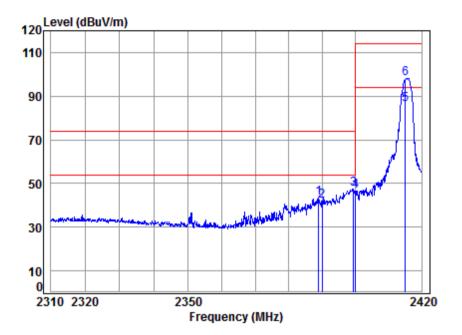
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



Condition: 3m \	<b>VERTICAL</b>
-----------------	-----------------

Mode	: 241	5 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	2389.016	5.47	29.07	41.87	46.14	43.22	74.00	-30.78	peak
2	2390.000	5.47	29.08	41.87	44.54	41.83	74.00	-32.17	peak
3	2399.486	5.49	29.11	41.88	48.32	47.57	74.00	-26.43	peak
4	2400.000	5.49	29.11	41.88	47.19	46.54	74.00	-27.46	peak
5 pp	2415.000	5.51	29.15	41.88	86.80	86.05	94.00	-7.95	Average
6 pk	2415.000	5.51	29.15	41.88	98.93	98.18	114.00	-15.82	peak



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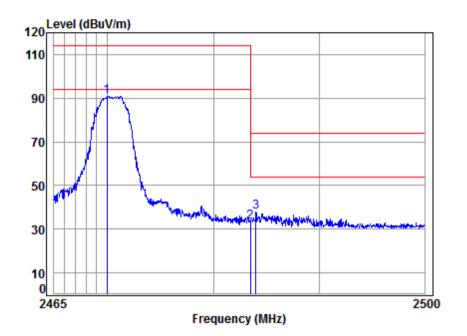
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



Condition:	3m HORIZONTAL
	2404047

Job No	) : 219	49A I							
Mode	: 247	0 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 pp	2470.000	5.58	29.31	41.91	98.34	91.00	114.00	-23.00	peak
2	2483.500	5.60	29.35	41.91	40.74	33.24	74.00	-40.76	peak
3	2484.014	5.60	29.35	41.91	45.30	37.80	74.00	-36.20	peak



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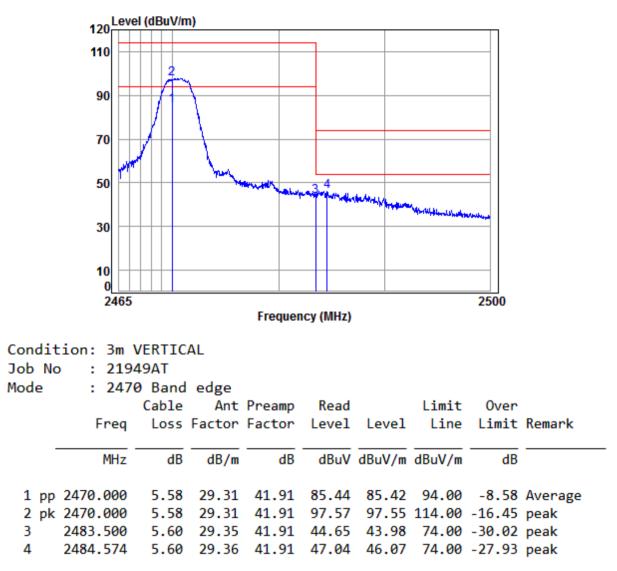
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Remark:

 The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) 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. So, only the above measurement data were shown in the report



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### 7.4 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

### 7.4.1 E.U.T. Operation

Operating Enviro	onment:					
Temperature:	24.6 °C	Humidity:	50.8 % 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.



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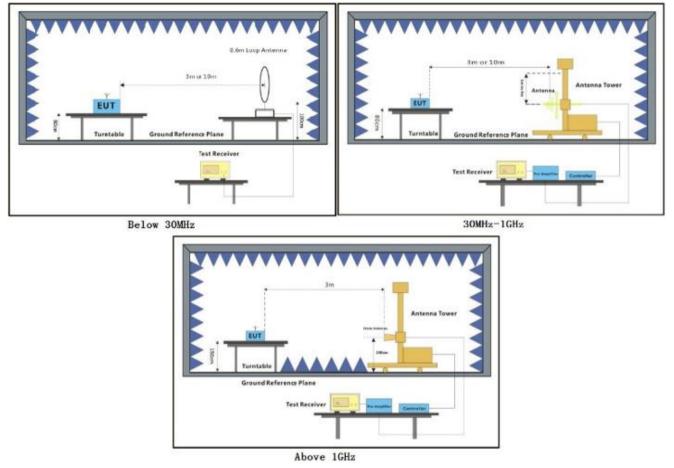
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7.4.3 Test Setup Diagram







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### 7.4.4 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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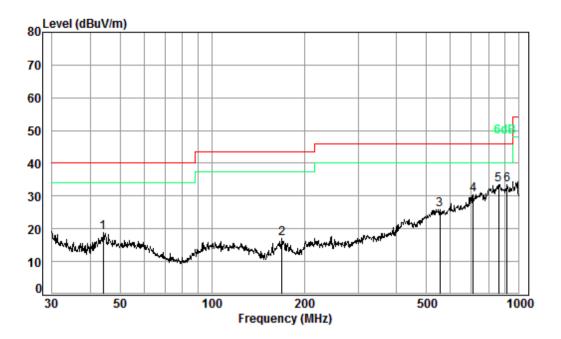


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**Below 1GHz** 

Test Mode: 01; Polarity: Horizontal



Condition: 3m HORIZONTAL Job No. : 21949AT Test mode: 01

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
3 4 5 pp	44.12 169.01 554.83 711.67 863.06 919.29	1.35 2.66 2.94 3.46	15.69 25.74 27.97 29.34	27.78 27.53 27.20	25.45 23.90 24.54 23.02	17.08 25.93 30.43 33.60	43.50 46.00 46.00 46.00	-26.42 -20.07 -15.57 -12.40	QP QP QP QP



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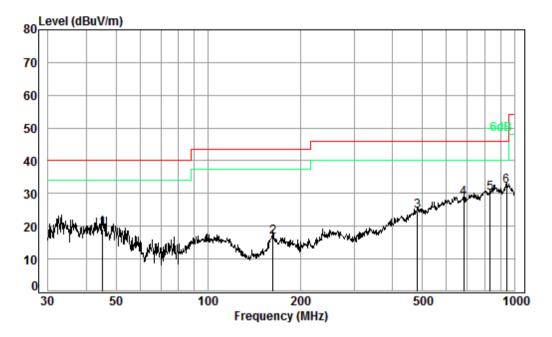
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Test Mode: 01; Polarity: Vertical



#### Condition: 3m VERTICAL Job No. : 21949AT Test mode: 01

	Enor			Preamp					Romank
	Freq	LOSS	Factor	Factor	Level	rever	LTHE	LIMIC	Nelliar K
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	45.22	0.72	15.69	27.61	25.99	19.09	40.00	-20.91	QP
2	162.61	1.34	15.55	27.52	26.16	16.73	43.50	-26.77	QP
3	482.22	2.53	24.24	27.86	23.18	24.55	46.00	-21.45	QP
4	682.35	2.87	27.68	27.58	23.56	28.56	46.00	-17.44	QP
5	833.32	3.34	28.95	27.30	22.64	30.24	46.00	-15.76	QP
6 pp	942.13	3.64	30.02	26.94	23.14	32.16	46.00	-13.84	QP



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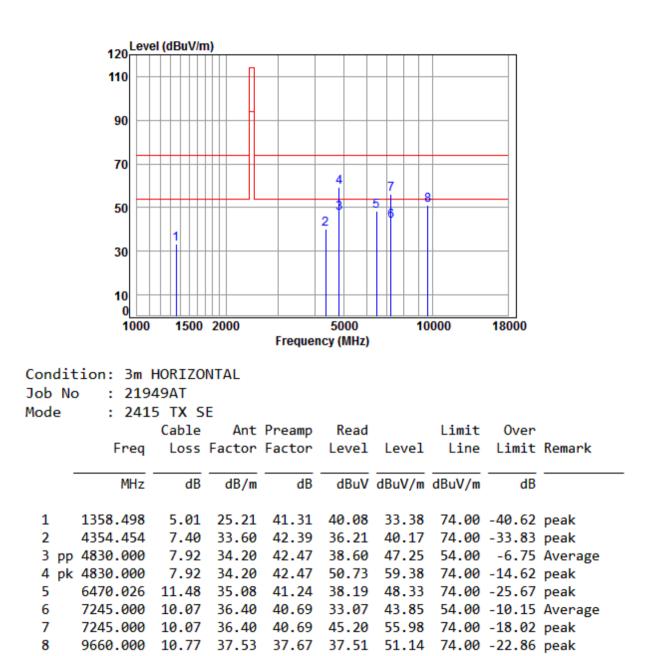
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### Above 1GHz

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





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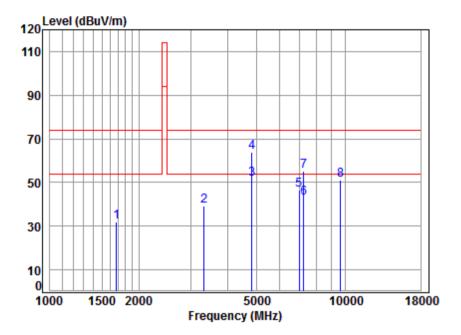
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



Condition:	3m VERTICAL
Job No :	21949AT

TX SF

JOD NO		21949
Mode	:	2415

loue	. 241								
		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	1677.621	5.25	26.58	41.52	40.77	32.08	74.00	-41.92	peak
2	3328.077	6.30	31.91	42.18	40.55	39.24	74.00	-34.76	peak
3 pp	4830.000	7.92	34.20	42.47	42.92	51.57	54.00	-2.43	Average
4 pk	4830.000	7.92	34.20	42.47	55.05	63.70	74.00	-10.30	peak
5	6974.982	10.20	36.43	40.87	36.72	46.72	74.00	-27.28	peak
6	7245.000	10.07	36.40	40.69	32.34	43.12	54.00	-10.88	Average
7	7245.000	10.07	36.40	40.69	44.47	55.25	74.00	-18.75	peak
8	9660.000	10.77	37.53	37.67	37.50	51.13	74.00	-22.87	peak



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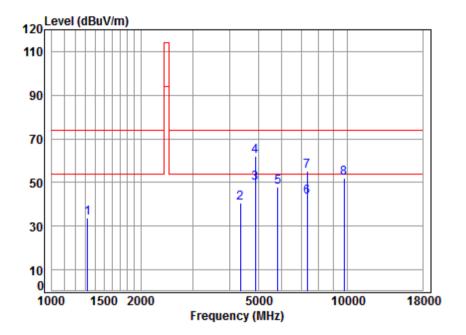
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:middle



Condition:	3m HORIZONTAL
Job No :	21949AT

Job No	Job No : 21949AT										
Mode	: 244	0 TX S	E								
		Cable	Ant	Preamp	Read		Limit	0ver			
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark		
	MHz	dB	dB/m	dB		dBuV/m		dB			
	11112	ub	00/11	ub	ubuv	ubuv/m	ubuv/m	ub			
1	1319.794	4.87	25.04	41.28	39.87	33.64	74.00	-40.36	peak		
2	4354.454	7.40	33.60	42.39	36.66	40.62	74.00	-33.38	peak		
3 pp	4880.000	7.97	34.29	42.48	39.93	49.71	54.00	-4.29	Average		
4 pk	4880.000	7.97	34.29	42.48	52.06	61.84	74.00	-12.16	peak		
5	5830.640	10.00	34.60	41.75	38.00	47.75	74.00	-26.25	peak		
6	7320.000	10.05	36.37	40.63	32.40	43.19	54.00	-10.81	Average		
7	7320.000	10.05	36.37	40.63	44.53	55.32	74.00	-18.68	peak		
8	9760.000	10.82	37.55	37.53	38.20	52.04	74.00	-21.96	peak		



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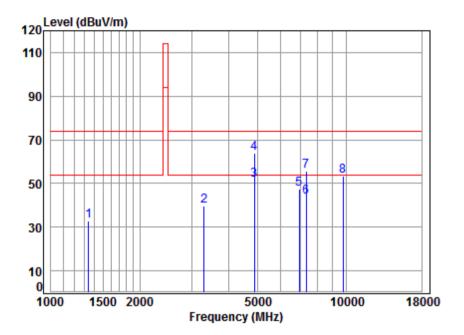
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:middle



Cond	dition:	Зm	VERTICAL
Joh	No .	210	TAON

Job No	: 21949AT	
Mode	: 2440 TX SE	

	Freq	Cable Loss		Preamp Factor			Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1339.006	4.94	25.13	41.29	41.10	32.89	74.00	-41.11	peak
2	3308.894	6.29	31.87	42.18	41.27	39.67	74.00	-34.33	peak
3 рр	4880.000	7.97	34.29	42.48	41.81	51.59	54.00	-2.41	Average
4 pk	4880.000	7.97	34.29	42.48	53.94	63.72	74.00	-10.28	peak
5	6934.778	10.31	36.32	40.90	37.60	47.43	74.00	-26.57	peak
6	7320.000	10.05	36.37	40.63	32.86	43.65	54.00	-10.35	Average
7	7320.000	10.05	36.37	40.63	44.99	55.78	74.00	-18.22	peak
8	9760.000	10.82	37.55	37.53	39.50	53.34	74.00	-20.66	peak



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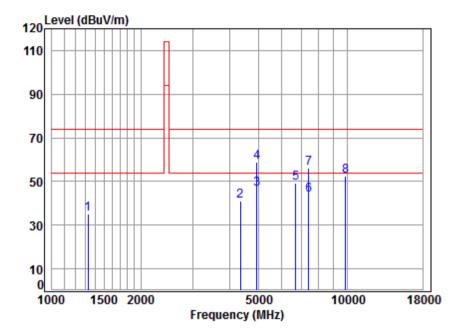
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Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



Condition:	3m HORIZONTAL
Joh No ·	21949AT

JOD NO . 21949A1									
Mode : 2470 TX SE									
		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	1323.614	4.88	25.06	41.28	41.54	35.29	74.00	-38.71	peak
2	4354.454	7.40	33.60	42.39	36.94	40.90	74.00	-33.10	peak
3 pp	4940.000	8.03	34.40	42.49	42.24	46.70	54.00	-7.30	Average
4 pk	4940.000	8.03	34.40	42.49	54.37	58.83	74.00	-15.17	peak
5	6698.373	10.97	35.67	41.07	38.85	49.30	74.00	-24.70	peak
6	7410.000	10.02	36.33	40.57	33.13	43.91	54.00	-10.09	Average
7	7410.000	10.02	36.33	40.57	45.26	56.04	74.00	-17.96	peak
8	9880.000	10.88	37.58	37.36	38.56	52.66	74.00	-21.34	peak



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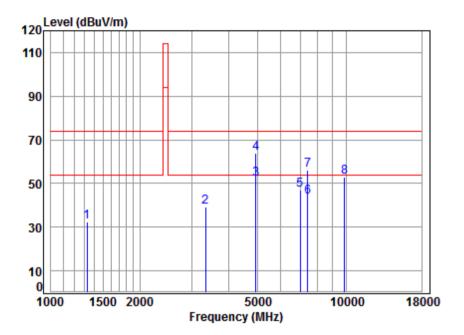
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Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Cond	ditio	on:	Зm	VERTICAL
Job	No	:	219	949AT

300	NO		212
Mode	2	:	247

lode	: 247	0 TX S	E						
		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	1323.614	4.88	25.06	41.28	40.20	32.51	74.00	-41.49	peak
2	3347.371	6.32	31.94	42.19	40.52	39.28	74.00	-34.72	peak
3 pp	4940.000	8.03	34.40	42.49	41.87	51.81	54.00	-2.19	Average
4 pk	4940.000	8.03	34.40	42.49	54.00	63.94	74.00	-10.06	peak
5	6995.172	10.14	36.49	40.86	36.76	46.84	74.00	-27.16	peak
6	7410.000	10.02	36.33	40.57	33.02	43.80	54.00	-10.20	Average
7	7410.000	10.02	36.33	40.57	45.15	55.93	74.00	-18.07	peak
8	9880.000	10.88	37.58	37.36	38.67	52.77	74.00	-21.23	peak



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### 8 Test Setup Photo

Refer to Setup Photos for SZCR2107021949AT

## 9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2107021949AT

- End of the Report -



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