

# **Test Report**

**Report No.:** MTi231204022-01E1

**Date of issue:** 2024-01-17

**Applicant:** Shenzhen Rihuida Electronics Co., Ltd.

**Product:** RC Remote Control

Model(s): RC

FCC ID: 2A8R6-RC

Shenzhen Microtest Co., Ltd.

http://www.mtitest.com



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Test Result Certification					
Applicant:	Shenzhen Rihuida Electronics Co., Ltd.				
Address:	The fourth building&the 02,03 and 04 floors of the third building of Fuzhong Industrial Park, Huaide, Community, Fuyong Street, Bao'an District, Shenzhen, China.				
Manufacturer:	Shenzhen Rihuida Electronics Co., Ltd.				
Address:	The fourth building&the 02,03 and 04 floors of the third building of Fuzhong Industrial Park, Huaide, Community, Fuyong Street, Bao'an District, Shenzhen, China.				
Product description					
Product name:	RC Remote Control				
Trade mark:	N/A				
Model name:	RC				
Series Model(s):	N/A				
Standards:	47 CFR Part 15.249				
Test Method:	ANSI C63.10-2013				
Date of Test					
Date of test:	2023-12-20 to 2024-01-17				
Test result:	Pass				

Test Engineer	:	letter.lan.
		(Letter Lan)
Reviewed By		leon chen
		(Leon Chen)
Approved By		Tom Xue
		(Tom Xue)



# 1 General Description

### 1.1 Description of the EUT

Product name:	RC Remote Control
Model name:	RC
Series Model(s):	N/A
Model difference:	N/A
Electrical rating:	Input: DC 3.3V
Accessories:	N/A
Hardware version:	V1.0
Software version:	VER3.2
Test sample(s) number:	MTi231204022-01S1001
RF specification	
Operating frequency range:	2432 MHz
Channel number:	1
Modulation type:	FSK
Antenna(s) type:	PCB Antenna
Antenna gain:	5.3dBi

#### 1.2 Description of test modes

No.	Emission test modes
Mode1	TX

#### 1.2.1 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2432	1	1	1	1	1	1

# Test Channel List

Operation Band: 2.4G

Bandwidth	Lowest Channel (LCH)	Middle Channel (MCH)	Highest Channel (HCH)
(MHz)	(MHz)	(MHz)	(MHz)
1	2432	2432	2432

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

#### **Test Software: Key**

For power setting, refer to below table.

Mode	2432MHz	1	1
FSK	default	1	1



#### 1.3 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

#### 1.4 Description of support units

Support equipment list							
Description	Manufacturer						
1	1	1	1				
Support cable list							
Description	Length (m)	From	То				
1	1	1	1				

#### 1.5 Measurement uncertainty

Measurement	Uncertainty
Radiated spurious emissions (above 1GHz)	±5.3dB
Radiated spurious emissions (9kHz~30MHz)	±4.3dB
Radiated spurious emissions (30MHz~1GHz)	±4.7dB
Temperature	±1 °C
Humidity	± 5 %
Occupied channel bandwidth	±3 %

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



# 2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Antenna requirement	47 CFR Part 15.249	47 CFR Part 15.203	Pass
2	Occupied Bandwidth	47 CFR Part 15.249	47 CFR 15.215(c)	Init
3	Band edge emissions (Radiated)	47 CFR Part 15.249	47 CFR 15.249(d)	Pass
4	Emissions in frequency bands (below 1GHz)	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)	Pass
5	Emissions in frequency bands (above 1GHz)	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)	Pass



# 3 Test Facilities and accreditations

### 3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093



# 4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due		
	Occupied Bandwidth							
	Band edge emissions (Radiated) Emissions in frequency bands (above 1GHz)							
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25		
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-06-17	2025-06-16		
3	Amplifier	Agilent	8449B	3008A01120	2023-06-26	2024-06-25		
4	Multi-device Controller	TuoPu	TPMDC	1	2023-05-04	2024-05-03		
5	MXA signal analyzer	Agilent	N9020A	MY54440859	2023-06-01	2024-05-31		
	Emissions in frequency bands (below 1GHz)							
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25		
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10		
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2023-06-11	2025-06-10		
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2023-04-25	2024-04-24		
5	Multi-device Controller	TuoPu	TPMDC	1	2023-05-04	2024-05-03		



# 5 Evaluation Results (Evaluation)

## 5.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, 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 shall be considered sufficient to comply with the provisions of this section.
Description of the antenna of EUT:	The antenna of the EUT is permanently attached.
Conclusion:	The EUT complies with the requirement of FCC PART 15.203.

# 6 Radio Spectrum Matter Test Results (RF)

# 6.1 Occupied Bandwidth

Test Requirement:	47 CFR 15.215(c)
	Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
	ANSI C63.10-2013, section 6.9.2
Procedure:	a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Steps a) through c) might require iteration to adjust within the specified tolerances. e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "-xx dB down" requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value. f) Set detection mode to peak and trace mode to max hold. g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value). h) Determine the "-xx dB down amplitude" using [(reference value) - xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument. i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j). j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "-xx dB do



marker is below this "-xx dB down amplitude" value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "-xx dB down amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

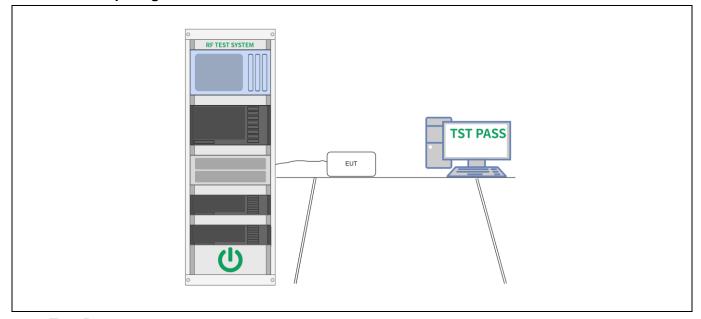
Report No.: MTi231204022-01E1

k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

#### 6.1.1 E.U.T. Operation:

Operating Environment:						
Temperature:	25 °C		Humidity:	45 %	Atmospheric Pressure:	101kPa
Pre test mode:		Mode	e1			
Final test mode: Mod		Mode	e1			

#### 6.1.2 Test Setup Diagram:



#### 6.1.3 Test Data:

Please Refer to Appendix for Details.



### 6.2 Band edge emissions (Radiated)

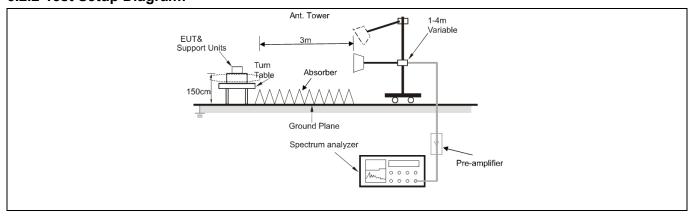
Test Requirement:	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.				
Test Limit:	harmonics, shall be atten	de of the specified frequency ba uated by at least 50 dB below t neral radiated emission limits in	the level of the		
	Frequency (MHz)	Field strength (microvolts/meter)	Measuremen t 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		
	Above 960	500	3		
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.				
Test Method:	ANSI C63.10-2013 section	n 6.6.4			
Procedure:	ANSI C63.10-2013 section	n 6.6.4			

#### 6.2.1 E.U.T. Operation:

Operating Environn	nent:				
Temperature: 24	°C	Humidity:	54 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mod	e1			
Final test mode:	Mod	e1			
Note:					
The amplitude of sr	urious em	issions which	ch are attenuat	ed more than 20 dB belov	v the limits are not

#### 6.2.2 Test Setup Diagram:

reported



Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com



#### 6.2.3 Test Data:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2310.000	52.10	-12.83	39.27	74.00	-34.73	peak
2		2310.000	42.45	-12.83	29.62	54.00	-24.38	AVG
3		2390.000	51.95	-12.42	39.53	74.00	-34.47	peak
4		2390.000	41.39	-12.42	28.97	54.00	-25.03	AVG
5		2400.000	53.39	-12.37	41.02	74.00	-32.98	peak
6		2400.000	47.89	-12.37	35.52	54.00	-18.48	AVG
7		2432.000	91.96	-12.52	79.44	114.00	-34.56	peak
8	*	2432.000	91.42	-12.52	78.90	94.00	-15.10	AVG



Mode1 / Polarization: Vertical / CH: L Reading Correct Measure-Limit Over No. Mk. Freq. Level Factor ment MHz dBuV dB dBuV/m dBuV/m dB Detector 1 2310.000 51.95 -12.8339.12 -34.8874.00 peak 2310.000 2 42.38 -12.8329.55 54.00 -24.45AVG 3 2390.000 51.09 -12.4238.67 74.00 -35.33 peak 4 2390.000 41.44 -12.4229.02 54.00 -24.98AVG 5 2400.000 50.52 -12.3738.15 74.00 -35.85 peak 2400.000 41.38 -12.3729.01 54.00 -24.99 AVG 6 7 2432.000 76.58 -12.5264.06 114.00 -49.94peak 8 2432.000 75.93 -12.5263.41 94.00 -30.59 AVG

Note: 2432 is the main dominant frequency.



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2432.000	91.59	-12.52	79.07	114.00	-34.93	peak
2	*	2432.000	91.16	-12.52	78.64	94.00	-15.36	AVG
3		2483.500	51.88	-12.44	39.44	74.00	-34.56	peak
4		2483.500	41.47	-12.44	29.03	54.00	-24.97	AVG
5		2500.000	51.42	-12.35	39.07	74.00	-34.93	peak
6		2500.000	41.98	-12.35	29.63	54.00	-24.37	AVG



Mode1 / Polarization: Vertical / CH: H Reading Correct Measure-Limit Over No. Mk. Freq. Level Factor ment MHz dBuV dB dBuV/m dBuV/m dΒ Detector -12.522432.000 76.45 63.93 -50.07 1 114.00 peak 2 2432.000 75.60 -12.5263.08 -30.92 AVG 94.00 3 2483.500 50.86 -12.4438.42 74.00 -35.58 peak 4 2483.500 41.54 -12.4429.10 54.00 -24.90 AVG 5 2500.000 51.75 -12.3539.40 74.00 -34.60 peak 2500.000 42.03 -12.3529.68 54.00 -24.32 AVG 6

Note: 2432 is the main dominant frequency.



### 6.3 Emissions in frequency bands (below 1GHz)

6.3 Emissions in fro	equency bands (below 10	GHz)						
Test Requirement:	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)							
Test Limit:	emissions from intention	Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:						
	Fundamental frequency	Field strength of fundamental	Field strength of harmonics					
	000,000,001	(millivolts/meter)	(microvolts/meter)					
	902-928 MHz	50	500					
	2400-2483.5 MHz	50	500					
	5725-5875 MHz	50	500					
	24.0-24.25 GHz	250	2500					
	is the lesser attenuation  Frequency (MHz)		n limits in § 15.209, whichever  Measuremen					
	r requestoy (Wir 12)	(microvolts/meter)	t 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 ** 150 **	3					
	88-216 216-960	200 **	3					
	Above 960	500	3					
		n paragraph (g), fundam						
	intentional radiators op frequency bands 54-72 However, operation wit sections of this part, e. In the emission table a	erating under this section of the condition of the condit	on shall not be located in the 216 MHz or 470-806 MHz. Indoor sis permitted under other 1. Indoor sis permitted under other 2. Indoor sis permitted under other 3. Indoor sis permitted under other 3.					
	The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.							
	limits in paragraphs (a) However, the peak field maximum permitted av any condition of moduli (b)of this section, the p	and (b)of this section ard strength of any emission erage limits specified at	oove by more than 20 dB under operation under paragraph not exceed 2500					
Test Method:	ANSI C63.10-2013 sec	tion 6.5						
Procedure:	ANSI C63.10-2013 sec	ction 6.5						
	i							

#### 6.3.1 E.U.T. Operation:

Operating Envi	ronment:				
Temperature:	24 °C	Humidity:	54 %	Atmospheric Pressure:	101 kPa



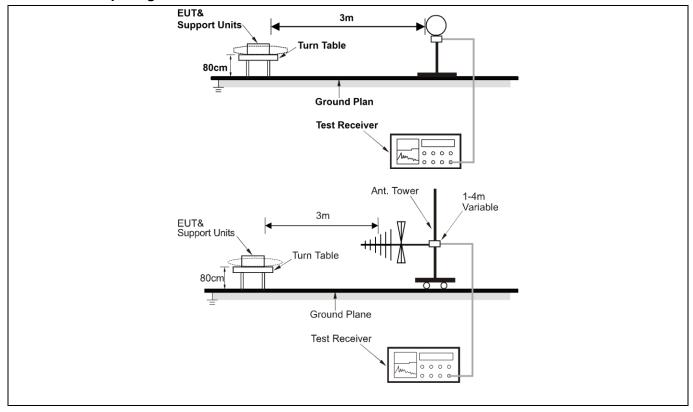
Pre test mode:	Mode1
Final test mode:	Mode1

Note:

The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

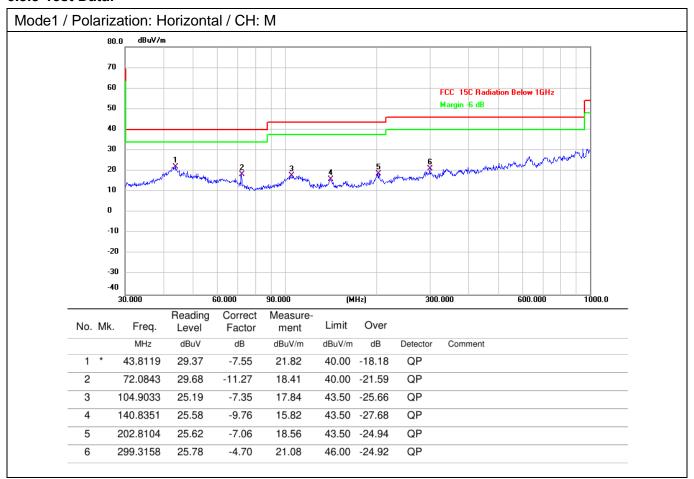
All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.

#### 6.3.2 Test Setup Diagram:

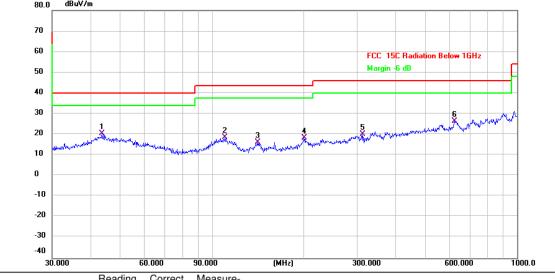




#### 6.3.3 Test Data:



Report No.: MTi231204022-01E1 Mode1 / Polarization: Vertical / CH: M 80.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	43.6584	28.16	-7.56	20.60	40.00	-19.40	QP	
2		110.1816	25.85	-7.32	18.53	43.50	-24.97	QP	
3		140.8351	26.02	-9.76	16.26	43.50	-27.24	QP	
4		200.6881	24.54	-6.32	18.22	43.50	-25.28	QP	
5		311.0867	26.00	-5.85	20.15	46.00	-25.85	QP	
6		625.0780	26.54	-0.04	26.50	46.00	-19.50	QP	



### 1GHz)

6.4	Emissions in fre	equency bands (above 10	GHz)					
	Requirement:	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)						
Test	: Limit:	Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:						
		Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)				
		902-928 MHz	50	500				
		2400-2483.5 MHz	50	500				
		5725-5875 MHz	50	500				
		24.0-24.25 GHz	250	2500				
		24.0-24.23 GHZ	200	2300				
		fundamental or to the gis the lesser attenuation	general radiated emissio n.	IB below the level of the in limits in § 15.209, whichever				
		Frequency (MHz)	Field strength (microvolts/meter)	Measuremen t 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				
		Above 960	500 n paragraph (g), fundan	3				
		intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a)and (b)of this section 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 modul (b)of this section, the p millivolts/meter at 3 me	ation. For point-to-point eak field strength shall reters along the antenna	operation under paragraph not exceed 2500				
	Method:	ANSI C63.10-2013 sec	ction 6.6					
Pro	cedure:	ANSI C63.10-2013 sec	ction 6.6					

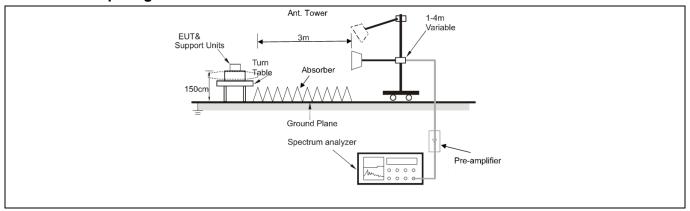
### 6.4.1 E.U.T. Operation:

Operating Environment:							
Temperature:	24 °C	Humidity:	54 %	Atmospheric Pressure:	101 kPa		



Pre test mode:	Mode1								
Final test mode:	Mode1								
Note: Test frequency ar	Note: Test frequency are from 1GHz to 25GHz, the amplitude of spurious emissions which are								

### 6.4.2 Test Setup Diagram:





#### 6.4.3 Test Data:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4864.000	51.40	-7.45	43.95	74.00	-30.05	peak
2		4864.000	44.66	-7.45	37.21	54.00	-16.79	AVG
3		7296.000	47.36	0.62	47.98	74.00	-26.02	peak
4		7296.000	40.73	0.62	41.35	54.00	-12.65	AVG
5		9728.000	47.72	2.67	50.39	74.00	-23.61	peak
6	*	9728.000	41.69	2.67	44.36	54.00	-9.64	AVG



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4864.000	55.64	-7.45	48.19	74.00	-25.81	peak
2		4864.000	49.80	-7.45	42.35	54.00	-11.65	AVG
3		7296.000	47.16	0.62	47.78	74.00	-26.22	peak
4		7296.000	40.74	0.62	41.36	54.00	-12.64	AVG
5		9728.000	47.96	2.67	50.63	74.00	-23.37	peak
6	*	9728.000	41.84	2.67	44.51	54.00	-9.49	AVG



# Photographs of the test setup

Refer to Appendix - Test Setup Photos



# Photographs of the EUT

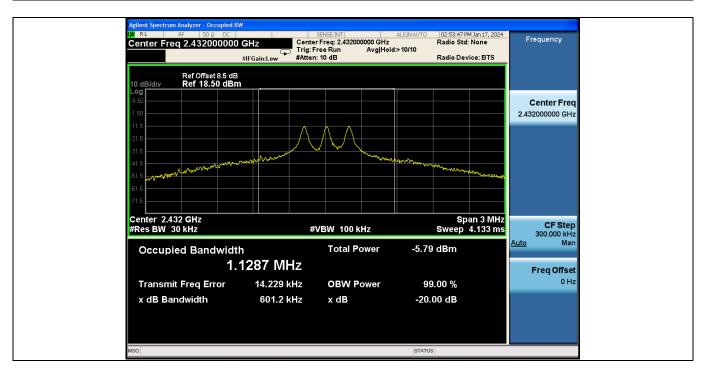
Refer to Appendix - EUT Photos



# Appendix A: 6.1 Occupied Bandwidth

#### Test Result

Test Mode	Antenna	Frequency [MHz]	20db EBW [MHz]
1	Ant1	2432	0.6012



----End of Report----