

# Test Report

**Report No.:** MTi240527008-04E2

**Date of issue:** 2024-07-16

**Applicant:** Shenzhen Xinzi Union Technology Co., Ltd.

**Product name:** Label Tag

**Model(s):** Label Tag - C1

**FCC ID:** 2BEPA-LABELTAGC1

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.cn>

The test report is only used for customer scientific research, teaching, internal quality control and other purposes, and is for internal reference only.



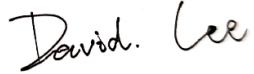
## Instructions

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2. The test results in this test report are only responsible for the samples submitted
3. This test report is invalid without the seal and signature of the laboratory.
4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.
5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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<b>Test Result Certification</b>	
<b>Applicant:</b>	Shenzhen Xinzi Union Technology Co., Ltd.
Address:	4F Building D2 Hengli Industrial park, No.168 Xiakeng 1 Road, Longgang District, Shenzhen, Guangdong province
<b>Manufacturer:</b>	Shenzhen Xinzi Union Technology Co., Ltd.
Address:	4F Building D2 Hengli Industrial park, No.168 Xiakeng 1 Road, Longgang District, Shenzhen, Guangdong province
<b>Factory:</b>	Shenzhen Xinzi Union Technology Co., Ltd.
Address:	4F Building D2 Hengli Industrial park, No.168 Xiakeng 1 Road, Longgang District, Shenzhen, Guangdong province
<b>Product description</b>	
Product name:	Label Tag
Trademark:	KINGZI
Model name:	Label Tag - C1
Series Model(s):	N/A
Standards:	47 CFR Part 15.225
Test Method:	ANSI C63.10-2013
<b>Date of Test</b>	
Date of test:	2024-06-14 to 2024-06-28
Test result:	Pass

<b>Test Engineer</b>	:	
		(Yanice.Xie)
<b>Reviewed By</b>	:	
		(David Lee)
<b>Approved By</b>	:	
		(Leon Chen)

## 1 General Description

### 1.1 Description of the EUT

Product name:	Label Tag
Model name:	Label Tag - C1
Series Model(s):	N/A
Model difference:	N/A
Electrical rating:	Input: Wireless :DC 4.2V, Wired: DC 5V Battery: DC 3.7V 100mAh 0.37Wh
Accessories:	Cable: USB-A charging cable (0.6m)*1
Hardware version:	V6d
Software version:	V1.7.0
Test sample(s) number:	MTi240527008-04S1001
<b>RF specification</b>	
Operating frequency range:	13.56MHz
Antenna(s) type:	Coil
Modulation type:	ASK

### 1.2 Description of test modes

No.	Emission test modes
Mode1	NFC(13.56MHz)

### 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

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

<b>Support equipment list</b>			
Description	Model	Serial No.	Manufacturer
Mobile phone	Phone 13	/	Apple
<b>Support cable list</b>			
Description	Length (m)	From	To
/	/	/	/

### 1.5 Measurement uncertainty

Measurement	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	±3.1dB
Occupied channel bandwidth	±3 %
Time	±1 %
Radiated spurious emissions (9kHz~30MHz)	±4.3dB
Radiated spurious emissions (30MHz~1GHz)	±4.7dB
Temperature	±1 °C
Humidity	± 5 %

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	Requirement	Result
1	Antenna requirement	47 CFR 15.203	Pass
2	Conducted Emission at AC power line	47 CFR 15.207(a)	N/A
3	20dB Bandwidth	47 CFR 15.215(c)	Pass
4	Frequency Tolerance	47 CFR 15.225(e)	Pass
5	Field Strength of The Fundamental Signal	47 CFR 15.225(a)	Pass
6	Emission Mask	47 CFR 15.225(b), 15.225(c)	Pass
7	Emissions in frequency bands (below 30MHz)	47 CFR 15.225(d)	Pass
8	Emissions in frequency bands (30M-1GHz)	47 CFR 15.225(d)	Pass

**Notes:**

1. N/A means not applicable.

2. Since the EUT power by DC supply, therefore AC power line conducted emissions test is not required.

### 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
Conducted Emission at AC power line						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2024-03-20	2025-03-19
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2024-03-21	2025-03-20
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2024-03-20	2025-03-19
20dB Bandwidth Frequency Tolerance						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2024-03-20	2025-03-19
2	ESG Series Analog Signal Generator	Agilent	E4421B	GB40051240	2024-03-21	2025-03-20
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2024-03-21	2025-03-20
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2024-03-21	2025-03-20
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2024-03-21	2025-03-20
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2024-03-21	2025-03-20
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2024-03-21	2025-03-20
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2024-03-20	2025-03-19
9	DC Power Supply	Agilent	E3632A	MY40027695	2024-03-21	2025-03-20
Emissions in frequency bands (below 30MHz) Field Strength of The Fundamental Signal Emission Mask						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-20	2025-03-19
2	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2024-03-23	2025-03-22
3	Amplifier	Hewlett-Packard	8447F	3113A06184	2024-03-20	2025-03-19
Emissions in frequency bands (30M-1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2024-03-20	2025-03-19
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1338	2023-06-11	2025-06-10
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2024-03-23	2025-03-22
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2024-03-20	2025-03-19

## 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.
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#### 5.1.1 Conclusion:

The antenna of the EUT is permanently attached.  
The EUT complies with the requirement of FCC PART 15.203.

## 6 Radio Spectrum Matter Test Results (RF)

### 6.1 20dB Bandwidth

Test Requirement:	47 CFR 15.215(c)
Test Limit:	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.
Test Method:	ANSI C63.10-2013, section 6.9.2
Procedure:	<p>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.</p> <p>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.</p> <p>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 <math>[10 \log (\text{OBW}/\text{RBW})]</math> below the reference level. Specific guidance is given in 4.1.5.2.</p> <p>d) Steps a) through c) might require iteration to adjust within the specified tolerances.</p> <p>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.</p> <p>f) Set detection mode to peak and trace mode to max hold.</p> <p>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).</p> <p>h) Determine the “-xx dB down amplitude” using <math>[(\text{reference value}) - \text{xx}]</math>. Alternatively, this calculation may be made by using the marker-delta function of the instrument.</p> <p>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).</p> <p>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</p>



the “ $f_{xx}$  dB down amplitude” determined in step h). If a 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 “ $f_{xx}$  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.

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:

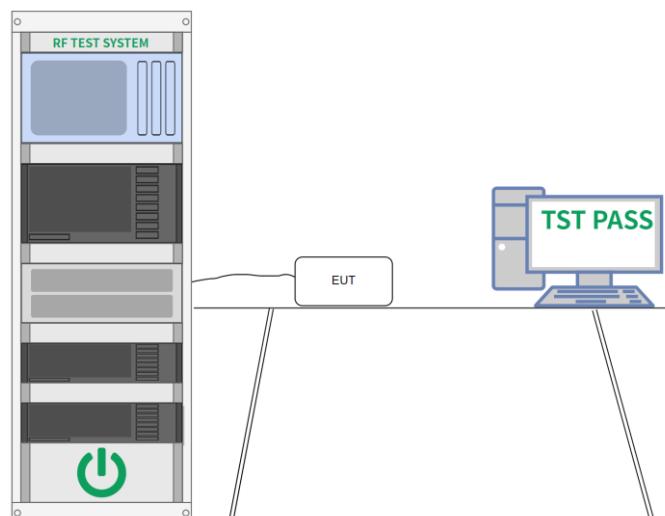
Operating Environment:

Temperature:	24 °C	Humidity:	54 %	Atmospheric Pressure:	101 kPa
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Pre test mode:	Mode1
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Final test mode:	Mode1
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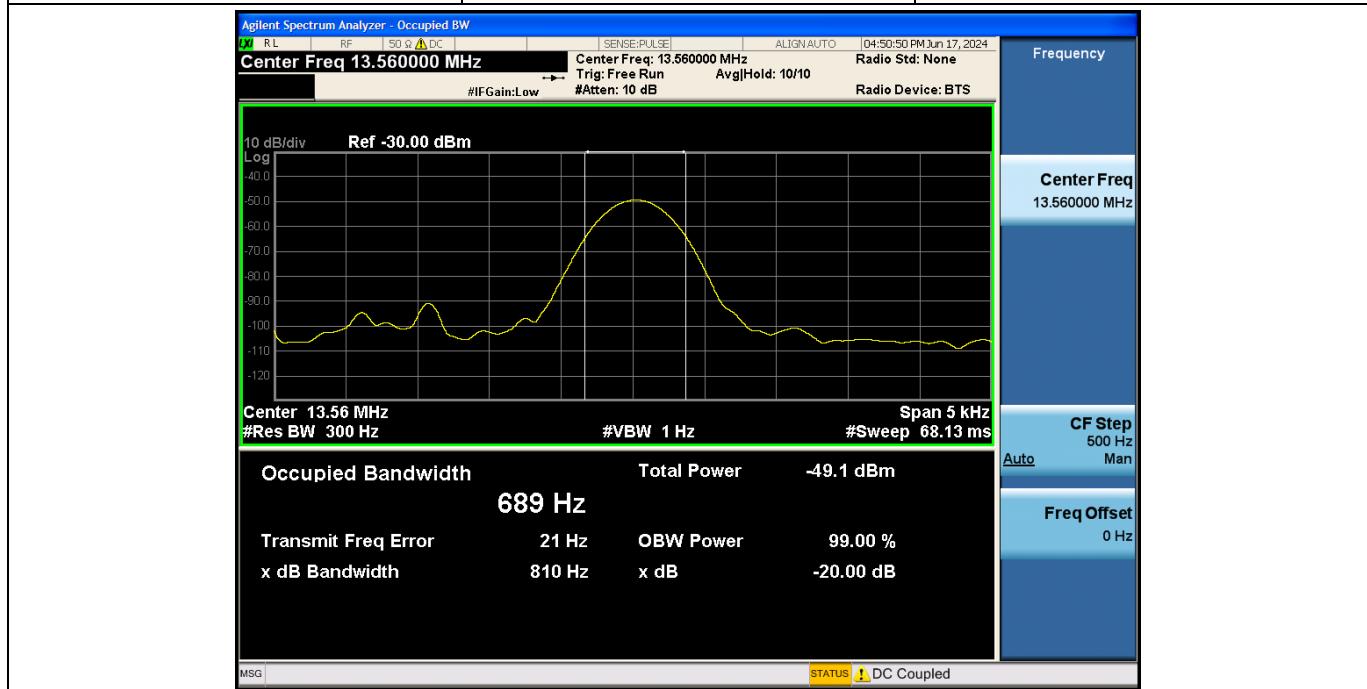
#### 6.1.2 Test Setup Diagram:



### 6.1.3 Test Data:

**Note:** Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measurement bandwidth will always follow the RBW. The RBW is set to 300 Hz to perform the occupied bandwidth test.

Frequency MHz	20 dB occupied bandwidth Hz	99% occupied bandwidth Hz
13.56	810	689



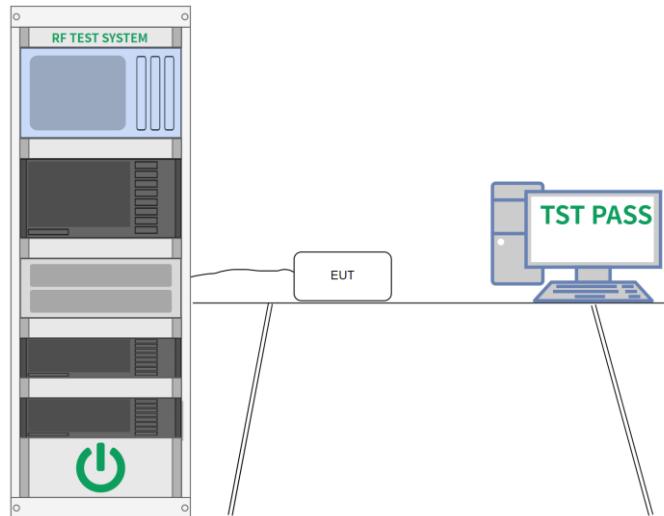
## 6.2 Frequency Tolerance

Test Requirement:	47 CFR 15.225(e)
Test Limit:	The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.
Test Method:	ANSI C63.10-2013, Section 6.8
Procedure:	Refer to ANSI C63.10-2013, Section 6.8

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

Operating Environment:			
Temperature:	24 °C	Humidity:	54 %
Pre test mode:	Mode1		
Final test mode:	Mode1		

### 6.2.2 Test Setup Diagram:



**6.2.3 Test Data:**

Power Supply (VDC)	Temperature (°C)	Measured Frequency (MHz)	Frequency Deviation	Limit
3.7	-20	13.56043	0.0032%	+/-0.01%
	-10	13.56034	0.0025%	
	0	13.56029	0.0021%	
	10	13.56031	0.0023%	
	20	13.56023	0.0017%	
	30	13.56022	0.0016%	
	40	13.56025	0.0018%	
	50	13.56022	0.0016%	
3.145	20	13.56030	0.0022%	
4.255	20	13.56023	0.0017%	

**Note:** All of the listed pre-test mode were tested, only the data of the worst mode is recorded in the report

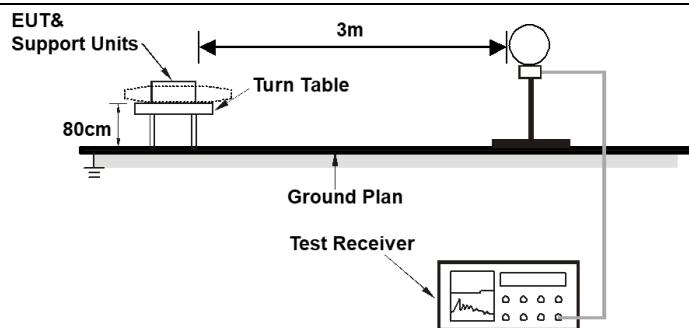
### 6.3 Emission Mask

Test Requirement:	47 CFR 15.225(b), 15.225(c)
Test Limit:	(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters. (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
Test Method:	ANSI C63.10-2013, Section 6.4
Procedure:	Refer to ANSI C63.10-2013, Section 6.4

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

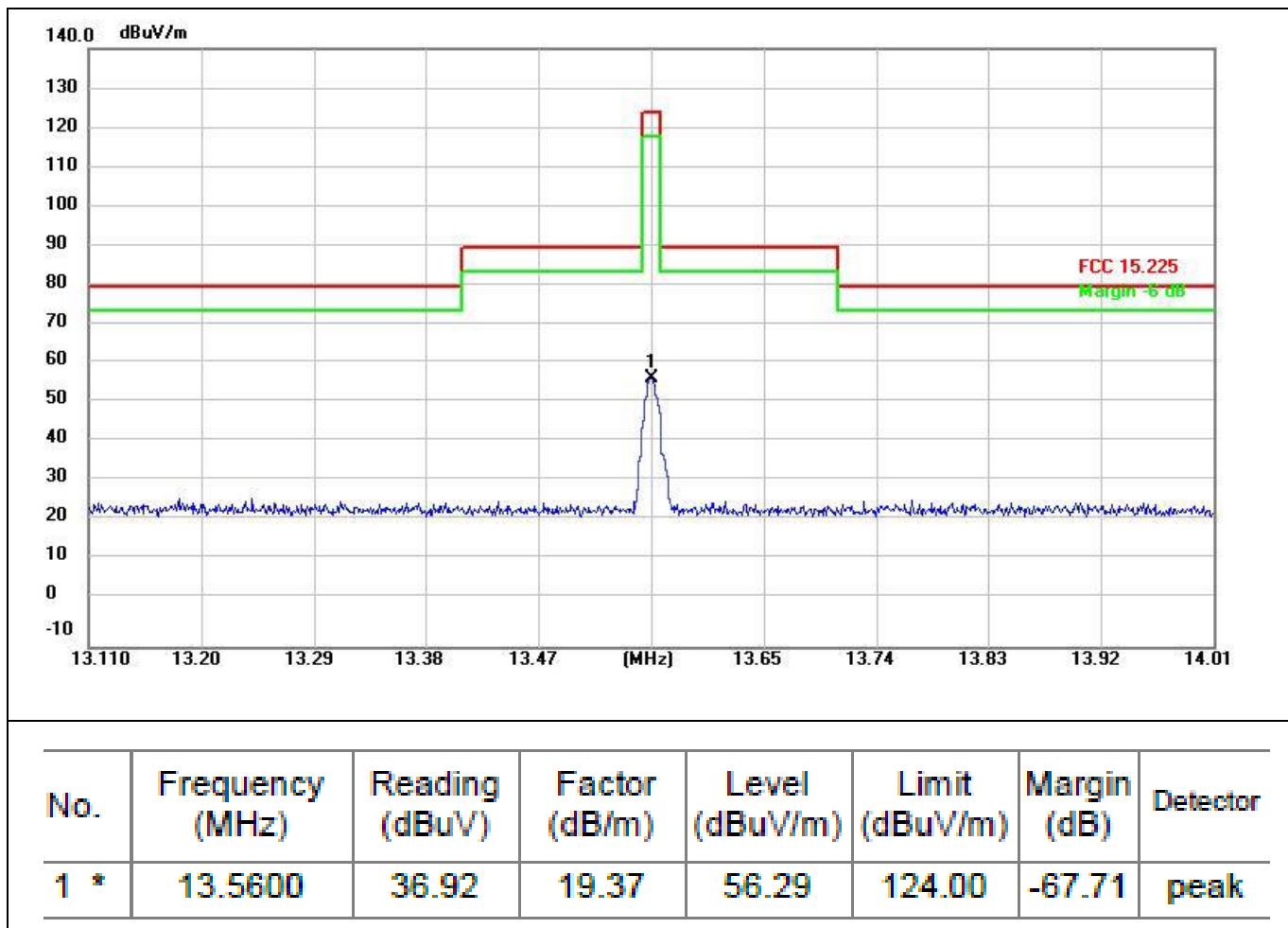
Operating Environment:			
Temperature:	23.2 °C	Humidity:	51.8 %
Pre test mode:	Mode1		
Final test mode:	Mode1		

#### 6.3.2 Test Setup Diagram:





### 6.3.3 Test Data:





#### 6.4 Emissions in frequency bands (below 30MHz)

Test Requirement:	47 CFR 15.225(d)		
Test Limit:	Refer to 47 CFR Part 15.225(d), The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.		
	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	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 9–90 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 modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

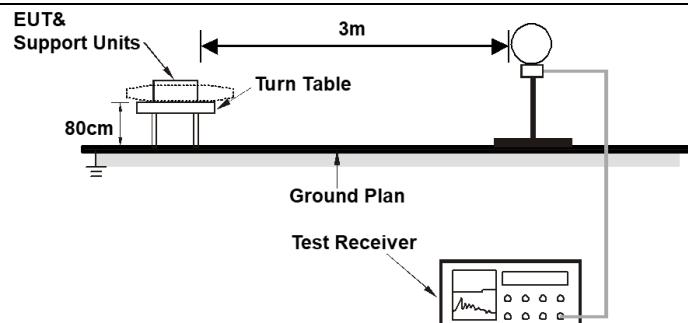
Test Method: ANSI C63.10-2013, Section 6.4

Procedure: Refer to ANSI C63.10-2013 section 6.4

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

Operating Environment:			
Temperature:	22.5 °C	Humidity:	43 %
Pre test mode:			Mode1
Final test mode:			Mode1

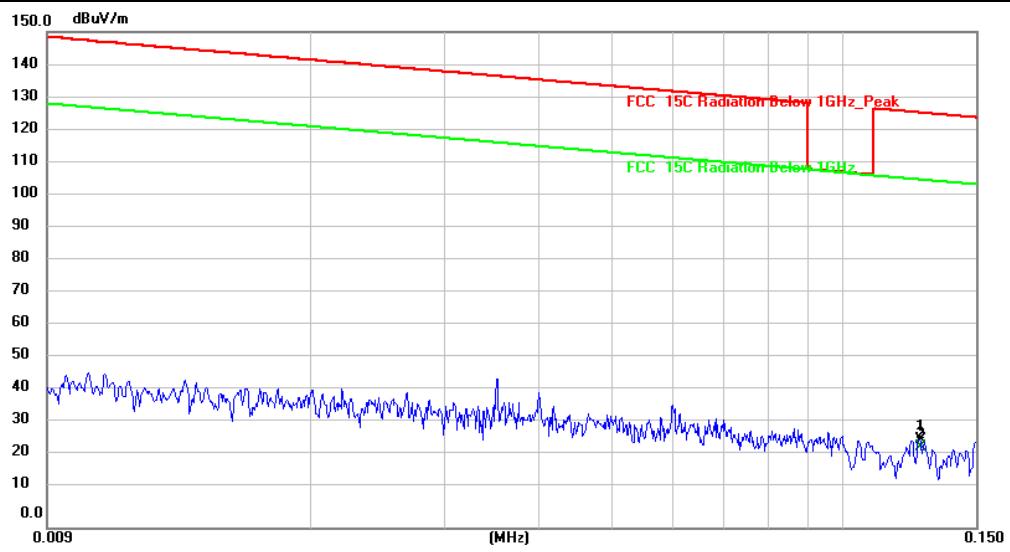
##### 6.4.2 Test Setup Diagram:





#### 6.4.3 Test Data:

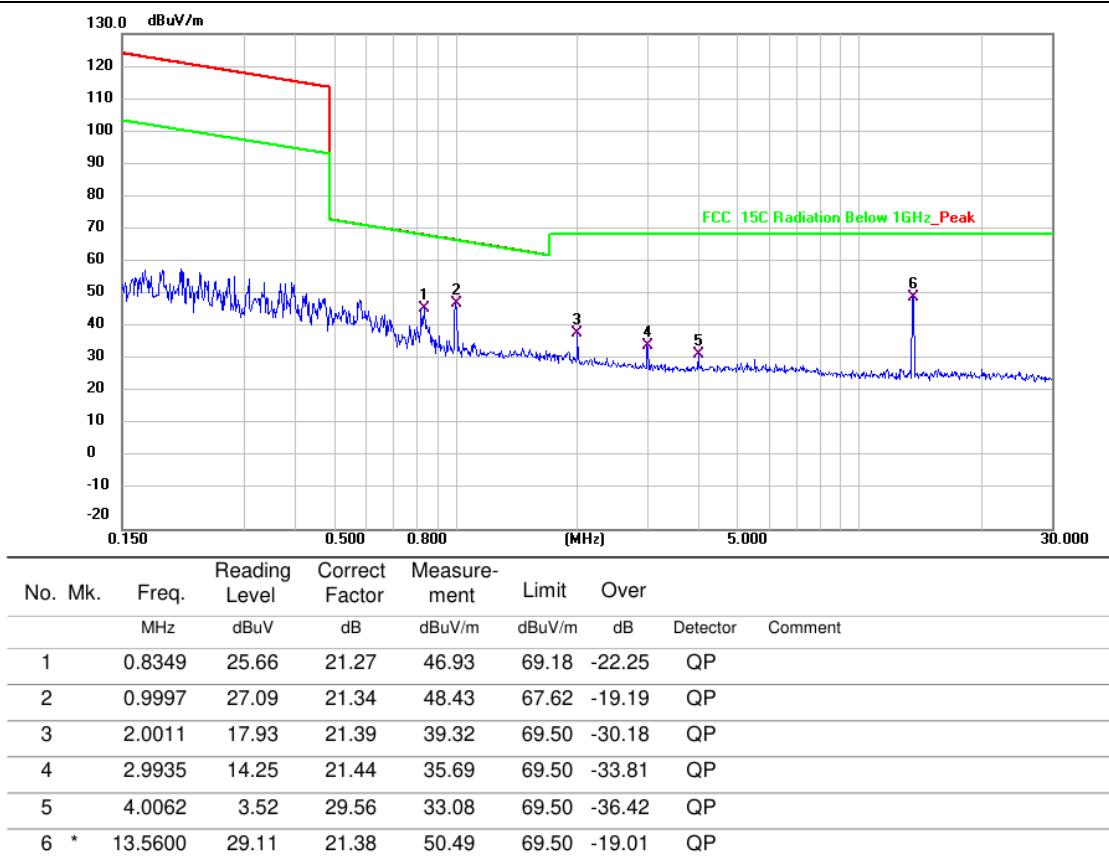
##### Mode1 / Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector Comment
1		0.1263	6.79	20.19	26.98	125.60	-98.62	peak
2	*	0.1263	4.37	20.19	24.56	105.60	-81.04	AVG



Mode1 / Polarization: Vertical





## 6.5 Emissions in frequency bands (30M-1GHz)

Test Requirement:	47 CFR 15.225(d)				
Test Limit:	Refer to 47 CFR Part 15.225(d), The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.				
		Frequency (MHz)	Field strength (microvolts/meter)		
		0.009-0.490	2400/F(kHz)		
		0.490-1.705	24000/F(kHz)		
		1.705-30.0	30		
		30-88	100 **		
		88-216	150 **		
		216-960	200 **		
		Above 960	500		
		Measurement distance (meters)			
		300			
		30			
		30			
		3			
		3			
		3			
		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 9–90 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 modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.					
Test Method:	ANSI C63.10-2013, Section 6.5				
Procedure:	<ol style="list-style-type: none"><li>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>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.</li><li>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.</li><li>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.</li><li>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</li><li>h. The radiation measurements are performed in X, Y, Z axis positioning for</li></ol>				

Transmitting mode, and found the X axis positioning which it is the worst case.

i. Repeat above procedures until all frequencies measured was complete.

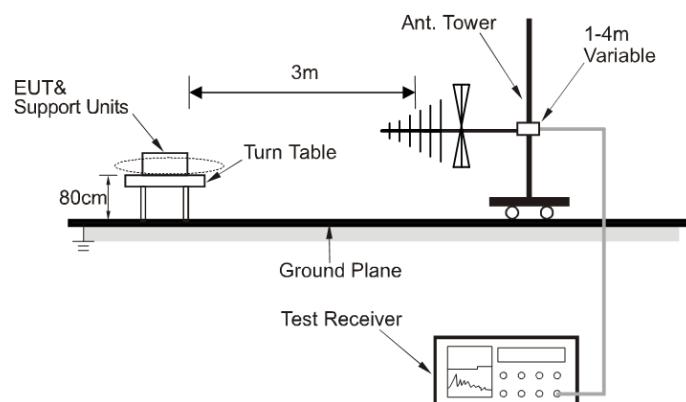
Remark:

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

#### 6.5.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.5 °C	Humidity:	43 %
Pre test mode:	Mode1		
Final test mode:	Mode1		

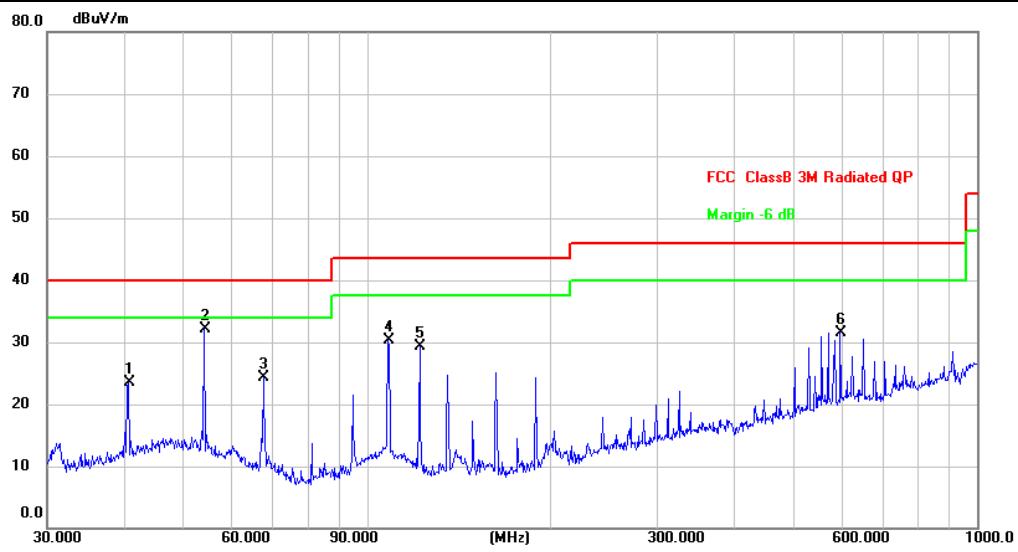
#### 6.5.2 Test Setup Diagram:





### 6.5.3 Test Data:

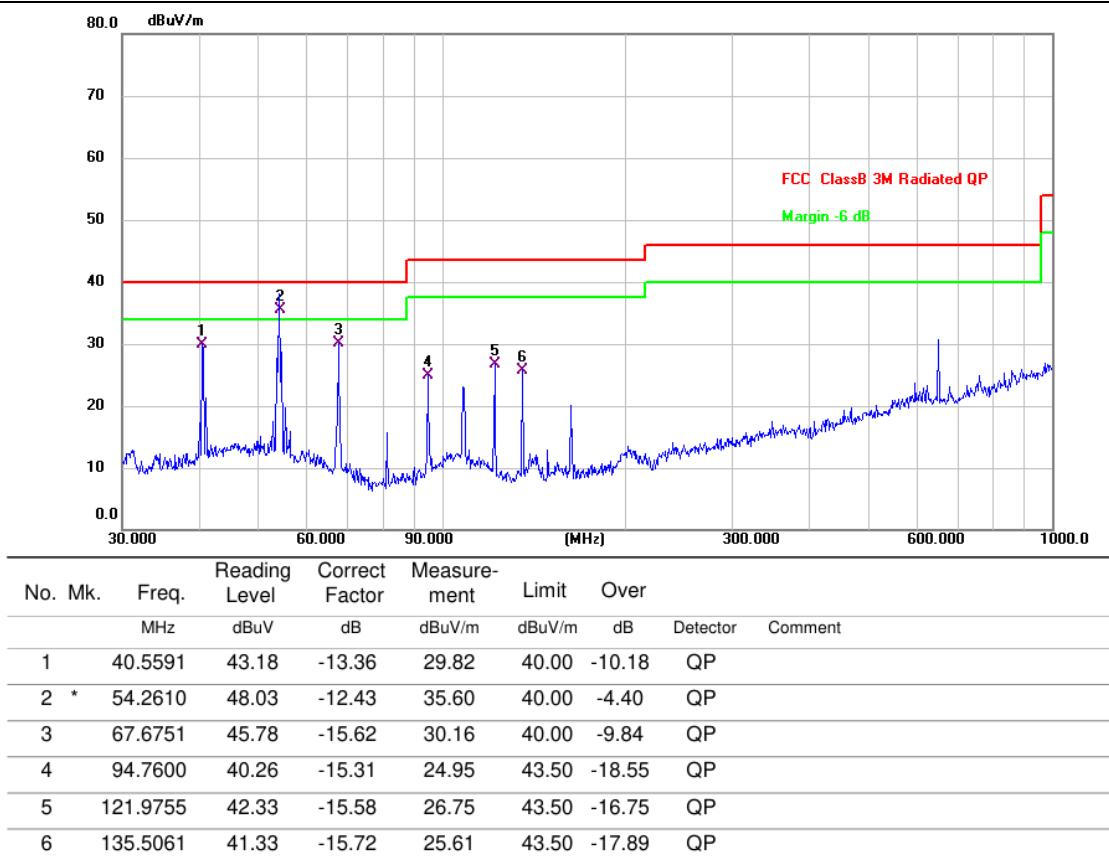
Mode1 / Polarization: Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	40.7016	36.87	-13.30	23.57	40.00	-16.43		peak	
2 *	54.2609	44.45	-12.43	32.02	40.00	-7.98		peak	
3	67.6751	39.98	-15.62	24.36	40.00	-15.64		peak	
4	108.2666	42.89	-12.68	30.21	43.50	-13.29		peak	
5	121.9755	44.91	-15.58	29.33	43.50	-14.17		peak	
6	597.2234	36.34	-4.74	31.60	46.00	-14.40		peak	



Mode1 / Polarization: Vertical



## Photographs of the test setup

Refer to Appendix - Test Setup Photos

## Photographs of the EUT

Refer to Appendix - EUT Photos

----End of Report----