

# FCC REPORT

**Applicant:** Shenzhen Zhonganxie Technology Co., Ltd.

**Address of Applicant:** A3 Building, Zhongtai, Shilong, Dezheng No.2 Road, Baoan, Shenzhen, China

## Equipment Under Test (EUT)

**Product Name:** Handheld Metal Detector

**Model No.:** MD-300, MD-3003B1, GP-3003B1, TX-1001B, GC-1001, ARSENAL-100180, ARSENAL-1165180, ZHONGANXIE-83448859, ZHONGANXIE-83448689, ZHONGANXIE-25332807, ZHONGANXIE-82879177, ZHONGANXIE-82876007, MD-5006, MD-3010II

**FCC ID:** 2AE0U-MD300

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C:2014

**Date of sample receipt:** April 27, 2015

**Date of Test:** April 27-30, 2015

**Date of report issued:** May 04, 2015

**Test Result :** Pass \*

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

Authorized Signature:



Robinson Lo  
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

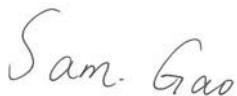
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## 2 Version

Version No.	Date	Description
00	May 04, 2015	Original

Prepared by:



Date:

May 04, 2015

Project Engineer

Reviewed by:



Date:

May 04, 2015

Reviewer

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## 4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.209	Pass
Spurious emissions	15.209	Pass
20dB Bandwidth	15.215	Pass

Pass: The EUT comply with the essential requirements in the standard.

### 4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

## 5 General Information

### 5.1 Client Information

Applicant:	Shenzhen Zhonganxie Technology Co., Ltd.
Address of Applicant:	A3 Building, Zhongtai, Shilong, Dezheng No.2 Road, Baoan, Shenzhen, China
Manufacturer:	Shenzhen Zhonganxie Technology Co., Ltd.
Address of Manufacturer:	A3 Building, Zhongtai, Shilong, Dezheng No.2 Road, Baoan, Shenzhen, China

### 5.2 General Description of EUT

Product Name:	Handheld Metal Detector
Model No.:	MD-300, MD-3003B1, GP-3003B1, TX-1001B, GC-1001, ARSENAL-100180, ARSENAL-1165180, ZHONGANXIE-83448859, ZHONGANXIE-83448689, ZHONGANXIE-25332807, ZHONGANXIE-82879177, ZHONGANXIE-82876007, MD-5006, MD-3010II
Operation Frequency:	33KHz
Antenna Type:	Integral antenna
Antenna gain:	0dBi (declare by Applicant)
Power Supply:	AC/DC Adapter: Model: SP-888 Input: AC 100-240V, 0.3A, 50/60Hz Output:DC 12V, 1A Or DC 9.0V Extra Heavy Duty

### 5.3 Test mode and Test voltage

<b>Test mode:</b>	
Transmitting mode	Keep the EUT in transmitting mode.

### 5.4 Description of Support Units

None.
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### 5.5 Deviation from Standards

None.
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### 5.6 Abnormalities from Standard Conditions

None.
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## 5.7 Test Facility

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

- **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. to ISO/IEC 17025 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.

- **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

- **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

## 5.8 Test Location

Tests were performed at:

Global United Technology Services Co., Ltd.

Address: Room 301-309, 3th Floor, Block A, Huafeng Jinyuan Business Building,  
No. 300 Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen 518102

Tel: 0755-27798480 Fax: 0755-27798960

## 6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	Mar. 27 2015	Mar. 26 2016
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	Jun. 29 2014	Jun. 28 2015
4	Loop Antenna	ZHINAN	ZN30900A	GTS534	Feb. 22 2015	Feb. 21 2016
5	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	Jun. 29 2014	Jun. 28 2015
6	RF Amplifier	HP	8347A	GTS204	Jun. 29 2014	Jun. 28 2015
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial cable	GTS	N/A	GTS210	Jul. 06 2014	Jul. 05 2015
9	Coaxial Cable	GTS	N/A	GTS211	Jul. 06 2014	Jul. 05 2015
10	Thermo meter	KTJ	TA328	GTS256	Jul. 01 2014	Jun. 30 2015

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	Sep. 06 2014	Sep. 05 2015
2	EMI Test Receiver	R&S	ESCS30	GTS223	Jun. 29 2014	Jun. 28 2015
3	Pulse Limiter	R&S	ESH3-Z2	GTS224	Jun. 29 2014	Jun. 28 2015
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	Jun. 29 2014	Jun. 28 2015
5	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	Jun. 29 2014	Jun. 28 2015
6	Coaxial Cable	GTS	N/A	GTS227	Jul. 06 2014	Jul. 05 2015
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Thermo meter	KTJ	TA328	GTS233	Jul. 01 2014	Jun. 30 2015

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	Barometer	ChangChun	DYM3	GTS257	Jul. 27 2014	Jul. 26 2015

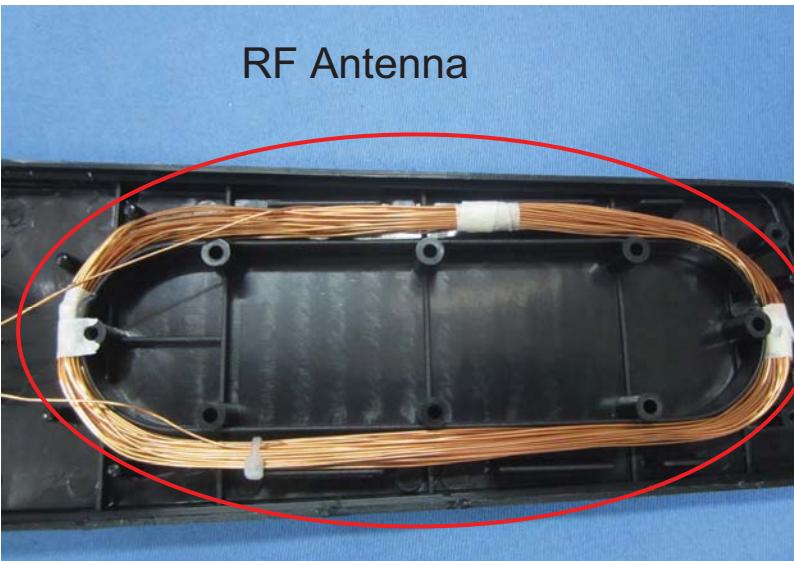
## 7 Test Results and Measurement Data

### 7.1 Antenna requirement

<b>Standard requirement:</b>	FCC Part15 C Section 15.203
<b>15.203 requirement:</b>	
<p>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.</p>	
<b>E.U.T Antenna:</b>	

*The antenna is Integral antenna, the best case gain of the antenna is 0.0dBi*

**RF Antenna**

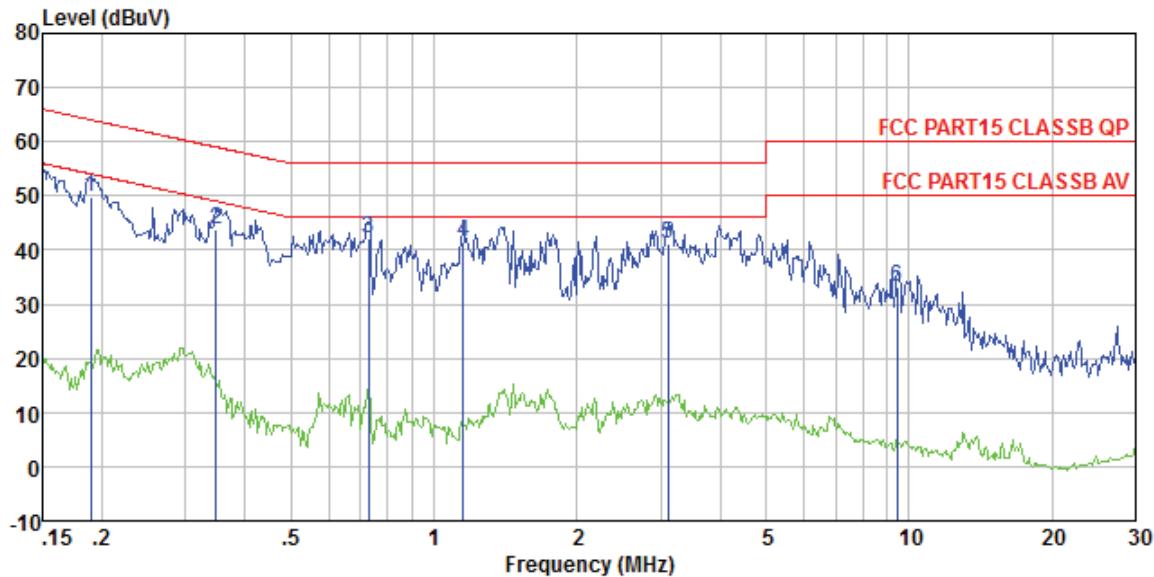


## 7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207																
Test Method:	ANSI C63.4:2014																
Test Frequency Range:	150kHz to 30MHz																
Class / Severity:	Class B																
Receiver setup:	RBW=9kHz, VBW=30kHz																
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dB<math>\mu</math>V)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>0.5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>			Frequency range (MHz)	Limit (dB $\mu$ V)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	0.5-30	60	50
Frequency range (MHz)	Limit (dB $\mu$ V)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
0.5-30	60	50															
Test setup:	<p><b>Reference Plane</b></p> <p><i>Remark:</i>  <i>E.U.T: Equipment Under Test</i>  <i>LISN: Line Impedance Stabilization Network</i>  <i>Test table height=0.8m</i></p>																
Test procedure	<ol style="list-style-type: none"> <li>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). They provide a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.</li> </ol>																
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar											
Test Instruments:	Refer to section 6 for details																
Test mode:	Refer to section 5.3 for details																
Test results:	Pass																

### Measurement Data

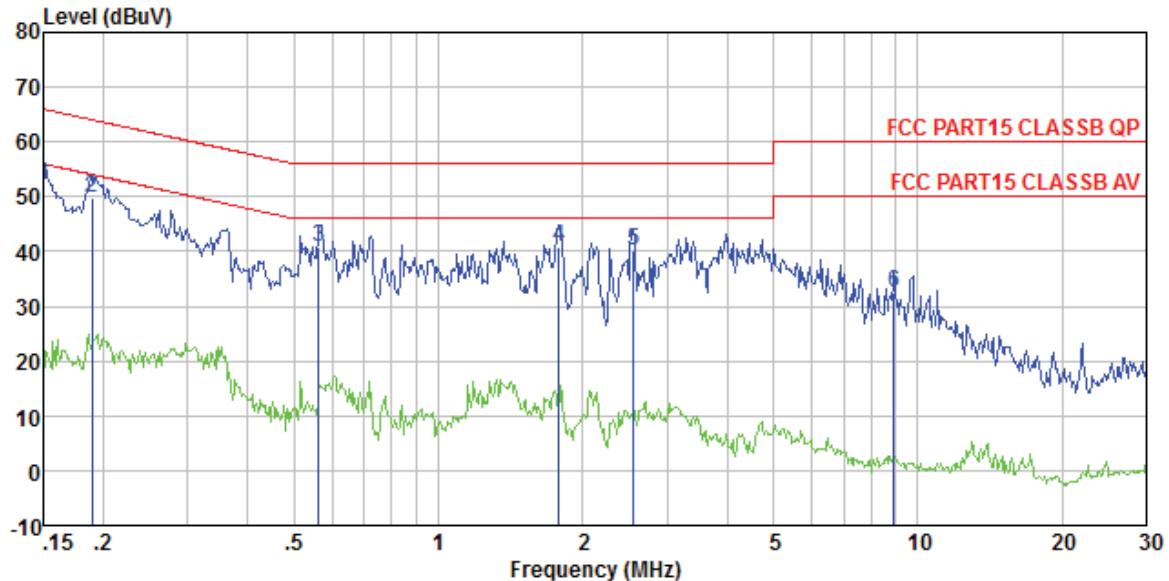
Line



Site : Shielded room  
 Condition : FCC PART15 CLASSB QP LISN-2013 LINE  
 Job No. : 0557  
 Test mode : Transmitter mode  
 Test Engineer: Qing

	Read Freq	Level MHz	LISN Level dBuV	Cable Factor	Limit dB	Over Line dB	Over Limit dB	Remark
		MHz	dBuV		dB	dBuV	dB	
1	0.189	49.35	49.62	0.14	0.13	64.06	-14.44	QP
2	0.348	43.57	43.78	0.11	0.10	59.00	-15.22	QP
3	0.727	41.97	42.24	0.14	0.13	56.00	-13.76	QP
4	1.153	41.09	41.35	0.13	0.13	56.00	-14.65	QP
5	3.107	40.72	41.03	0.16	0.15	56.00	-14.97	QP
6	9.451	32.63	33.11	0.29	0.19	60.00	-26.89	QP

Neutral

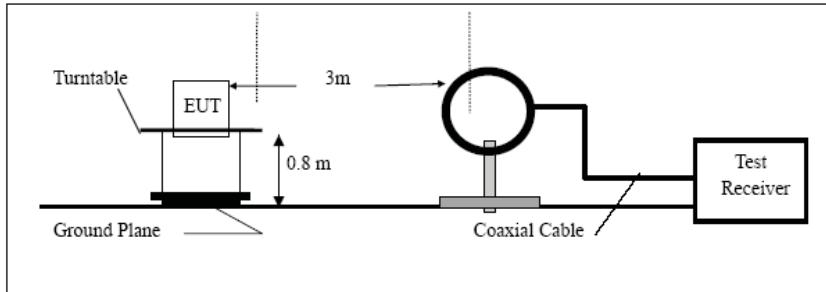
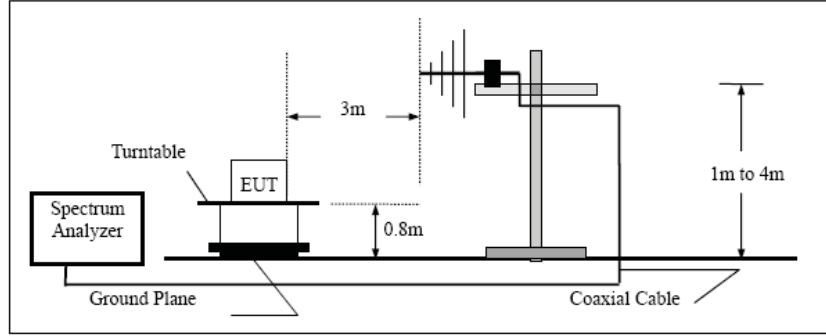


Site : Shielded room  
 Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL  
 Job No. : 0557  
 Test mode : Transmitter mode  
 Test Engineer: Qing

Freq	Read		LISM Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV					
1	0.150	51.95	52.14	0.07	0.12	66.00	-13.86 QP
2	0.189	49.62	49.82	0.07	0.13	64.06	-14.24 QP
3	0.564	40.70	40.89	0.07	0.12	56.00	-15.11 QP
4	1.781	40.52	40.75	0.09	0.14	56.00	-15.25 QP
5	2.554	40.02	40.27	0.10	0.15	56.00	-15.73 QP
6	8.916	32.08	32.48	0.21	0.19	60.00	-27.52 QP

## 7.3 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209						
Test Method:	ANSI C63.4:2014						
Test Frequency Range:	9kHz to 1GHz						
Test site:	Measurement Distance: 3m						
Receiver setup:	Frequency	Detector	RBW	VBW	Value		
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak		
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak		
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak		
	Above 1GHz	Peak	1MHz	3MHz	Peak		
	Above 1GHz	Peak	1MHz	10Hz	Average		
Limit: (Spurious Emissions)	Frequency	Limit (uV/m)	Value	Measurement Distance			
	0.009MHz-0.490MHz	2400/F(KHz)	QP *	300m			
	0.490MHz-1.705MHz	24000/F(KHz)	QP	300m			
	1.705MHz-30MHz	30	QP	30m			
	30MHz-88MHz	100	QP	3m			
	88MHz-216MHz	150	QP				
	216MHz-960MHz	200	QP				
	960MHz-1GHz	500	QP				
	Above 1GHz	500	Average				
	Above 1GHz	5000	Peak				
*: 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. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions.							
Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3. 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>4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> </ol>						

	<ol style="list-style-type: none"> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>6. 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.</li> <li>7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.</li> </ol>
Test setup:	<p>Below 30MHz</p>  <p>30MHz ~ 1000MHz</p> 
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

**Measurement data:**
**Note: Limit dBuV/m @3m = Limit dBuV/m @300m + 80**
**Limit dBuV/m @3m = Limit dBuV/m @30m + 40**
**Below 30MHz**

Frequency (kHz)	Read Level (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit @3m (dBuV/m)	Over Limit (dB)	ANT. Polarization	Detector
33	75.45	19.83	0.08	0.00	95.36	137.23	-41.87	Vertical	Peak
33	72.24	19.83	0.08	0.00	92.15	117.23	-25.08	Vertical	Ave.
33	69.04	19.83	0.08	0.00	88.95	137.23	-48.28	Horizontal	Peak
33	65.37	19.83	0.08	0.00	85.28	117.23	-31.95	Horizontal	Ave.

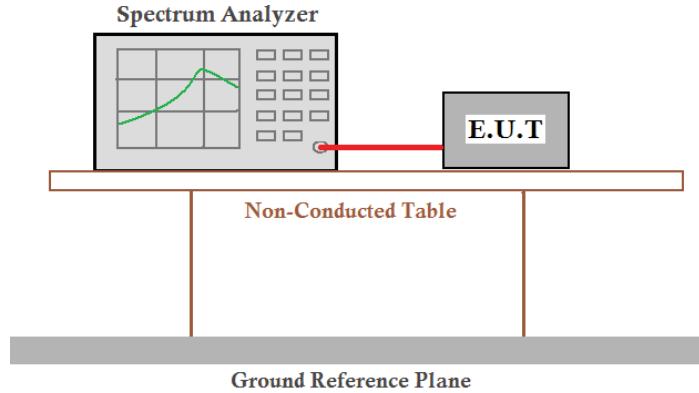
**Remark:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. From 9kHz to 330KHz , except fundamental , all other emission are very lower than the limit and not show in test report.

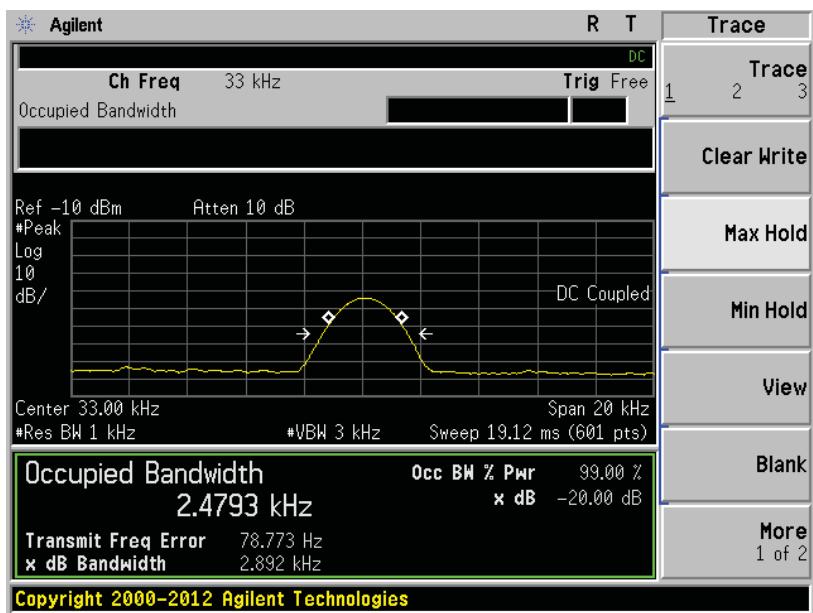
**30MHz ~ 1000MHz**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
50.06	42.34	15.25	0.77	30.00	28.36	40.00	-11.64	Vertical
94.10	45.50	14.67	1.14	29.73	31.58	43.50	-11.92	Vertical
128.11	46.04	11.22	1.42	29.52	29.16	43.50	-14.34	Vertical
198.59	46.89	12.57	1.83	29.20	32.09	43.50	-11.41	Vertical
281.01	48.88	14.70	2.27	29.88	35.97	46.00	-10.03	Vertical
869.13	43.00	22.78	4.74	29.13	41.39	46.00	-4.61	Vertical
67.91	39.01	11.47	0.92	29.87	21.53	40.00	-18.47	Horizontal
144.84	50.95	10.23	1.53	29.43	33.28	43.50	-10.22	Horizontal
189.07	46.62	12.48	1.78	29.24	31.64	43.50	-11.86	Horizontal
329.04	46.37	15.73	2.52	29.83	34.79	46.00	-11.21	Horizontal
432.55	32.95	17.53	3.01	29.43	24.06	46.00	-21.94	Horizontal
776.88	38.56	21.77	4.37	29.20	35.50	46.00	-10.50	Horizontal

## 7.4 20dB Occupy Bandwidth

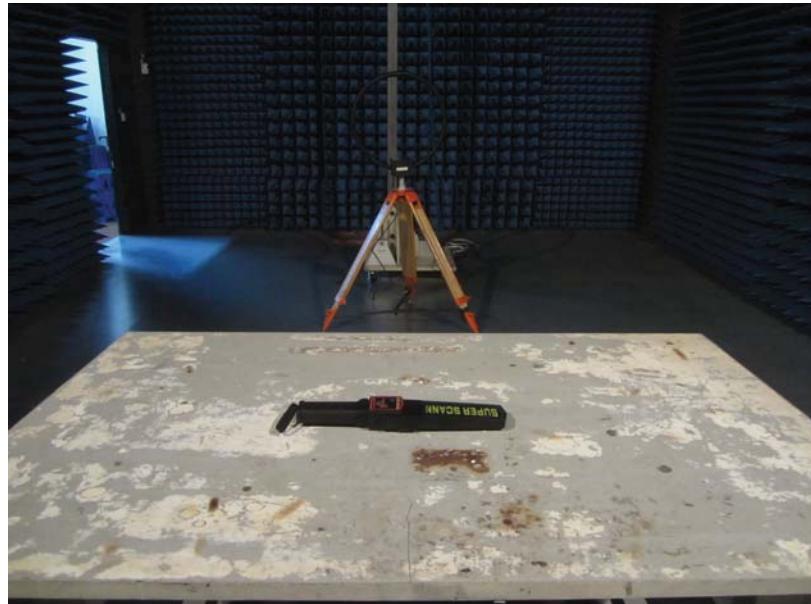
Test Requirement:	FCC Part15 C Section 15.215
Test Method:	ANSI C63.4:2014
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

### Measurement Data



## 8 Test Setup Photo

Radiated Emission



Conducted Emission

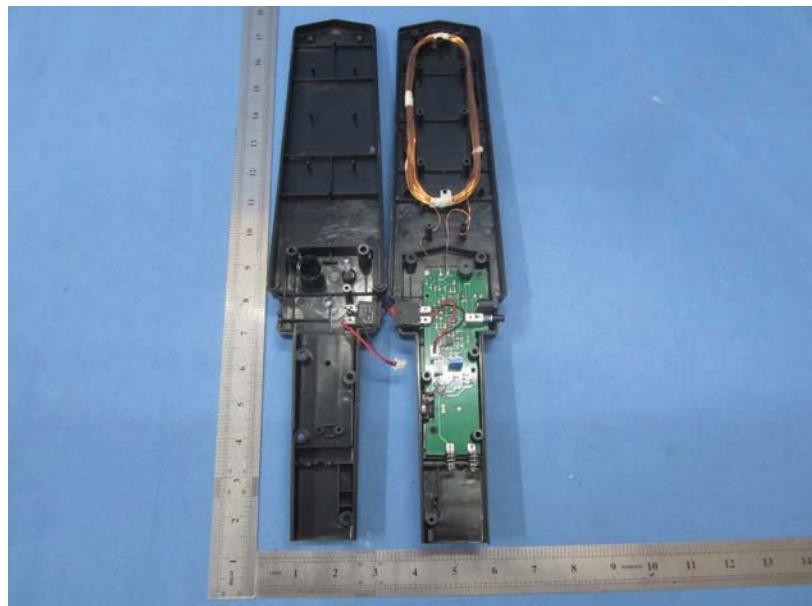


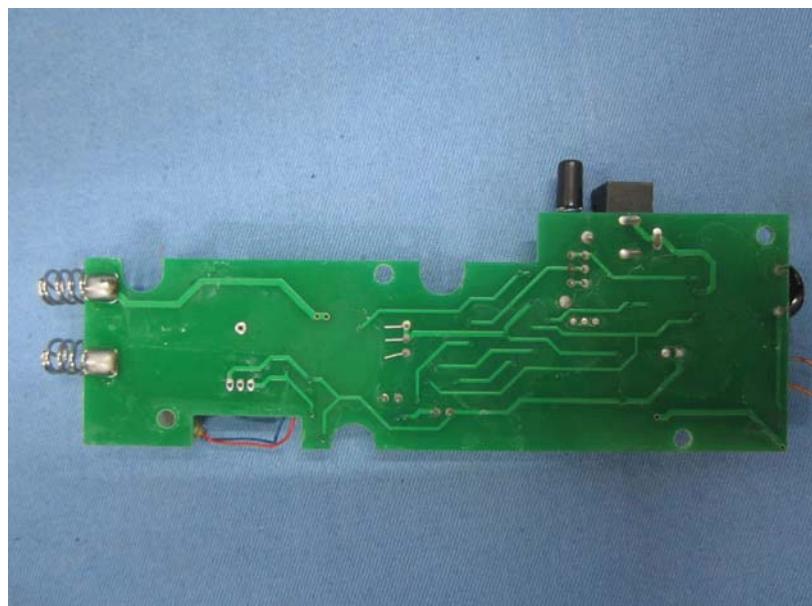
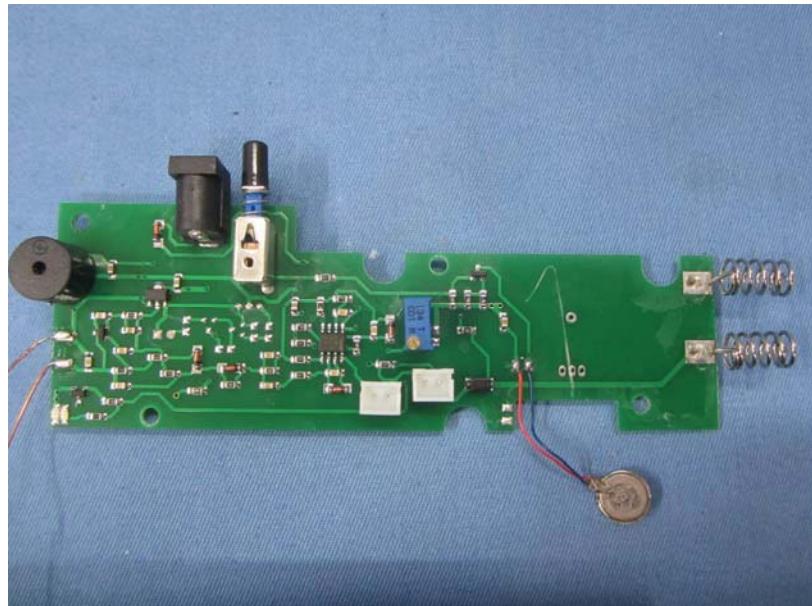
## 9 EUT Constructional Details













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