

Report No.: SZEM201201274202 Page: 1 of 29

## **TEST REPORT**

Application No.:	SZEM2012012742CR
Applicant:	Genrui Biotech Inc.
Address of Applicant:	4-10F, Building 3, Geya Technology Park, Guangming District, 518106, Shenzhen, China
Manufacturer:	Genrui Biotech Inc.
Address of Manufacturer:	4-10F, Building 3, Geya Technology Park, Guangming District, 518106, Shenzhen, China
Factory:	Genrui Biotech Inc.
Address of Factory:	4-10F, Building 3, Geya Technology Park, Guangming District, 518106, Shenzhen, China
Equipment Under Test (EUT	):
EUT Name:	Quantitative Immunoassay Analyzer
Model No.:	FA50, VF10 🔺
*	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:	Genrui
	GENRUI
FCC ID:	2AZC7FA5001
Standard(s) :	47 CFR Part 15, Subpart C 15.225
Date of Receipt:	2020-12-10
Date of Test:	2020-12-11 to 2021-01-04
Date of Issue:	2021-01-05
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 Remai						
01		2021-01-05		Original		

Authorized for issue by:		
	Damon Su	
	Damon Su/Project Engineer	-
	Evic Fu	
	Eric Fu/Reviewer	-



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## 2 Test Summary

Radio Spectrum Technical Requirement						
ltem	Item Standard Method Requirement Re					
Antenna Requirement	47 CFR Part 15, Subpart C 15.225	N/A	47 CFR Part 15, Subpart C 15.203	Pass		

Radio Spectrum Matter Part						
Item	Standard	Method	Requirement	Result		
20dB Bandwidth	47 CFR Part 15, Subpart C 15.225 15.225	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass		
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.225 15.225	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass		
Emission Mask	47 CFR Part 15, Subpart C 15.225 15.225	ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.225(a)&(b)&(C )	Pass		
Frequency tolerance	47 CFR Part 15, Subpart C 15.225 15.225	ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart C 15.225(e)	Pass		
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart C 15.225 15.225	ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.225(d) & 15.209	Pass		
Radiated Emissions (9kHz-30MHz)	47 CFR Part 15, Subpart C 15.225 15.225	ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.225(d) & 15.209	Pass		

#### Remark:

Model No.: FA50, VF10

Only the model FA50 was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on appearance color.



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### 4 General Information

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

Power supply:	Input: AC 100-240V, 50/60Hz	
Test voltage:	AC 120V	
Cable(s):	AC Cable,1.8m, Unshielded	
Modulation Type: ASK		
Operation Frequency:	13.56MHz	
Antenna Type: Loop Antenna		

#### 4.2 Description of Support Units

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

#### 4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty	
20dB Bandwidth	± 3%	
Conducted Emissions at Mains Terminals (150kHz-30MHz)	± 3.0dB	
Emission Mask	± 4.5dB (Below 1GHz)	
Frequency tolerance	± 3%	
Radiated Emissions (30MHz-1GHz)	$\pm$ 4.5dB (Below 1GHz)	
Radiated Emissions (9kHz-30MHz)	± 4.5dB (Below 1GHz)	
Pomark:		

Remark:

The  $U_{lab}$  (lab Uncertainty) is less than  $U_{cispr}$  (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

Tel: +86 755 2601 2053 Fax: +86 755 2

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

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

#### • FCC – Designation Number: CN1178

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

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

#### Innovation, Science and Economic Development Canada

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

CAB identifier: CN0006.

IC#: 4620C.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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#### **Equipment List** 5

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	Zhao Xin	KXN-6020D	SEM011-08	2020-09-23	2021-09-22	
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2020-09-23	2021-09-22	
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09	

Conducted Emissions at Mains Terminals (150kHz-30MHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2019-06-13	2022-06-12	
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2020-03-24	2021-03-23	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM024-01	2020-07-10	2021-07-09	
LISN	Rohde&Schwarz	ENV216	SEM007-01	2020-09-23	2021-09-22	

Emission Mask					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2018-03-31	2021-03-30
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2020-11-02	2021-11-01
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2019-08-08	2022-08-07
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2020-04-09	2021-04-08
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2020-08-14	2023-08-13
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2020-07-10	2021-07-09

Frequency tolerance					
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	Zhao Xin	KXN-6020D	SEM011-08	2020-09-23	2021-09-22
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2020-09-23	2021-09-22
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09



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Radiated Emissions (30MHz-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	2019-11-03	2020-11-02	
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	2020-04-01	2021-03-31	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09	

Radiated Emissions (9kHz-30MHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2018-03-31	2021-03-30	
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2020-11-02	2021-11-01	
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2019-08-08	2022-08-07	
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2020-04-09	2021-04-08	
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2020-08-14	2023-08-13	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM029-01	2020-07-10	2021-07-09	

General used equipment						
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	2020-04-07	2021-04-06	



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### 6 Radio Spectrum Matter Test Results

#### 6.1 20dB Bandwidth

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

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

Operating Environment:

Temperature: 25.7 °C

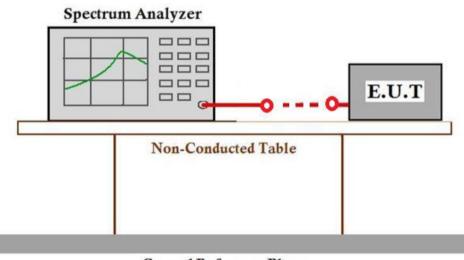
Humidity: 41.0 % RH

Atmospheric Pressure: 1010 mbar

#### 6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode with modulation

#### 6.1.3 Test Setup Diagram



**Ground Reference Plane** 

#### 6.1.4 Measurement Procedure and Data



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× \*RBW 10 Hz Marker 1 [T1 ] VBW 30 Hz -13.21 dBm 13.560127981 MHz 0 dBm \* Att 10 dB SWT 1 s Ref 0 ndB [T1] 20 .00 dB 6 250000000 Hz TR INT A [T1 nd -3 3.22 dBr 1 PK VIEW 3.56011 000 MH2 .36 dBr 3.56014 250 MH -30 3DB -60 -100 13.56012856 MHz 60 Hz Center 6 Hz/ Span



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#### 6.2 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement	
Test Method:	

47 CFR Part 15, Subpart C 15.207 ANSI C63.10 (2013) Section 6.2

Limit:

	Limit (d	BuV)
Frequency range (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

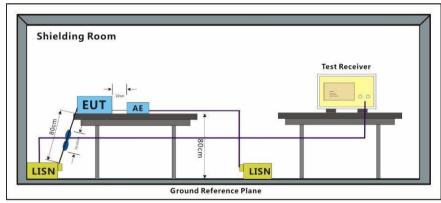
#### 6.2.1 E.U.T. Operation

Operating Enviro	nment:					
Temperature:	23.1 °C	Humidity:	50.2 % RH	Atmospheric Pressure:	1010	mbar

#### 6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode with modulation

#### 6.2.3 Test Setup Diagram





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#### 6.2.4 Measurement Procedure and Data

1) The mains terminal disturbance voltage test was conducted in a shielded room.

2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50 $\mu$ H + 50hm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor



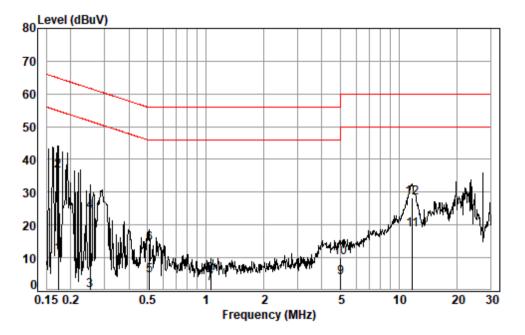
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Test Mode: 00; Line: Live line



Shielding	Room
Line	
12742CR	
00	
	Line 12742CR

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1722	0.03	9.71	1.28	11.02			Average
2	0.1722	0.03	9.71	26.64	36.38		-28.48	-
3 4	0.2521 0.2521	0.05 0.05	9.74 9.74	-9.69 14.28	0.10 24.07			Average
5		0.05					-37.62	-
6	0.5128 0.5128		9.77 9.77	-5.23	4.61 14.38		-41.59	Average
		0.07		4.54				•
7	1.0597	0.10	9.78	-7.89	1.99			Average
8	1.0597	0.10	9.78	-4.99	4.89	56.00	-51.11	QP
9	5.0046	0.16	9.93	-6.27	3.82	50.00	-46.18	Average
10	5.0046	0.16	9.93	0.09	10.18	60.00	-49.82	QP
11	11.7446	0.16	10.32	8.10	18.58	50.00	-31.42	Average
12	11.7446	0.16	10.32	17.86	28.34		-31.66	



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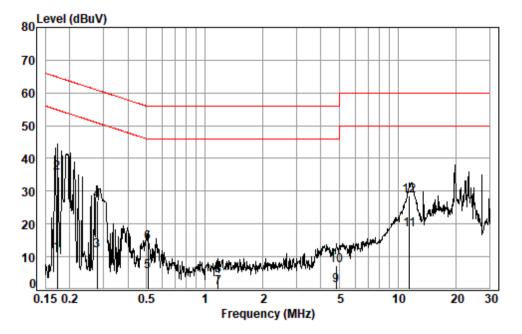
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Test Mode: 00; Line: Neutral Line



Site :	Shielding	Room
Condition:	Neutral	
Job No. :	12742CR	
Test mode:	00	

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1731	0.03	9.71	1.26	11.00	54.81	-43.81	Average
2	0.1731	0.03	9.71	25.78	35.52	64.81	-29.29	QP
3	0.2773	0.05	9.74	2.07	11.86	50.90	-39.04	Average
4	0.2773	0.05	9.74	17.14	26.93	60.90	-33.97	QP
5	0.5101	0.07	9.76	-4.26	5.57	46.00	-40.43	Average
6	0.5101	0.07	9.76	4.34	14.17	56.00	-41.83	QP
7	1.1781	0.11	9.79	-9.36	0.54	46.00	-45.46	Average
8	1.1781	0.11	9.79	-5.79	4.11	56.00	-51.89	QP
9	4.7969	0.16	9.92	-8.87	1.21	46.00	-44.79	Average
10	4.7969	0.16	9.92	-2.74	7.34	56.00	-48.66	QP
11	11.4983	0.16	10.32	7.68	18.16	50.00	-31.84	Average
12	11.4983	0.16	10.32	18.05	28.53	60.00	-31.47	QP



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#### 6.3 Emission Mask

Test Requirement47 CFR Part 15, Subpart C 15.225(a)&(b)&(C )Test Method:ANSI C63.10 (2013) Section 6.4Measurement Distance:10m

Limit:

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

- (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.

(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.

#### **Below 30MHz**

The test was performed at a 10m test site.

The factor calculated by the following equation:

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

where

$FS_{\text{limit}}$	is the calculation of field strength at the limit distance, expressed in $dB\mu V/m$
$FS_{max}$	is the measured field strength, expressed in dBµV/m
$d_{\text{measure}}$	is the distance of the measurement point from the EUT
$d_{ m limit}$	is the reference distance or the distance of the $\lambda/2\pi$ point

The limit at 10m test distance is below:

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 103.08 dBuV/m at 10 meters.

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

Operating Environment:

Temperature: 23.5 °C

Humidity: 45 % RH

Atmospheric Pressure: 1010 mbar

#### 6.3.2 Test Mode Description

#### Pre-scan / Mode Description

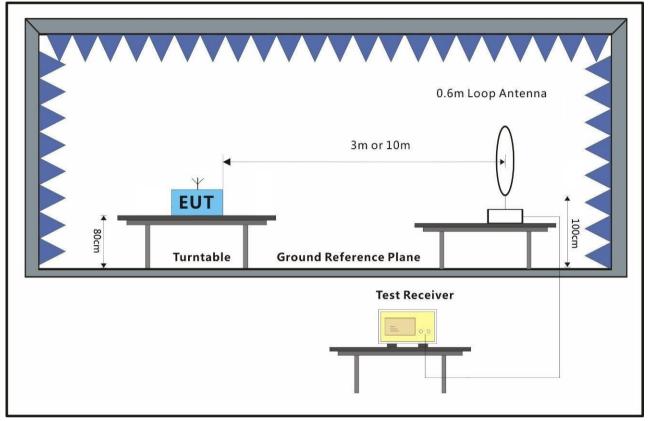




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Final test	Code	
Final test	00	TX mode with modulation

#### 6.3.3 Test Setup Diagram



#### 6.3.4 Measurement Procedure and Data

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

Frequenc y (MHz)	Cable loss (dB)	ANT Factor (dB)	Preamp Factor (dB)	Read Level @ 3m (dBuV)	Level @ 3m (dBuV/m)	Level @ 30m (dBuV/m)	Limit @ 30m (dBuV/m)	Margin (dB)
13.56	0.62	8.88	32.5	79.02	56.02	16.02	84.00	-67.98



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#### 6.4 Frequency tolerance

Test Requirement	47 CFR Part 15, Subpart C 15.225(e)
Test Method:	ANSI C63.10 (2013) Section 6.8

Limit:

±0.01

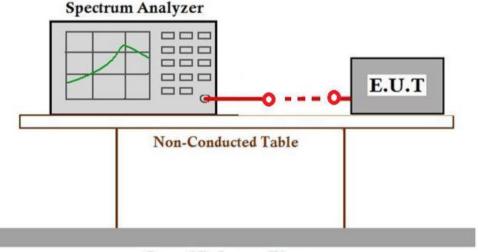
#### 6.4.1 E.U.T. Operation

Operating Enviror	nment:					
Temperature:	25.7 °C	Humidity:	40.9 % RH	Atmospheric Pressure:	1010	mbar

#### 6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode with modulation

#### 6.4.3 Test Setup Diagram



**Ground Reference Plane** 

#### 6.4.4 Measurement Procedure and Data

The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.





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Declared Frequency (MHz)			13.56MHz						
Temperature (°C)	Voltage(VAC)		leasurement equency(MHz)	Frequency Tolerance (%)	Limit (%)	Result			
50			13.560187	0.0014		Pass			
40	120		13.560152	0.0011	±0.01	Pass			
30			13.560141	0.0010		Pass			
20			13.560127	0.0009		Pass			
10			13.560132	0.0010		Pass			
0			13.560144	0.0011		Pass			
-10			13.560167	0.0012		Pass			
-20			13.560175	0.0013		Pass			
20	108		13.560128	0.0009		Pass			
20	100		13.560133	0.0010		Pass			



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#### 6.5 Radiated Emissions (30MHz-1GHz)

Test Requirement	47 CFR Part 15, Subpart C 15.225(d) & 15.209
Test Method:	ANSI C63.10 (2013) Section 6.5
Measurement Distance:	3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.

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

Operating Environ	ment:						
Temperature:	23.5 °C	Humidity:	46	% RH	Atmospheric Pressure:	1010	mbar

#### 6.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode with modulation



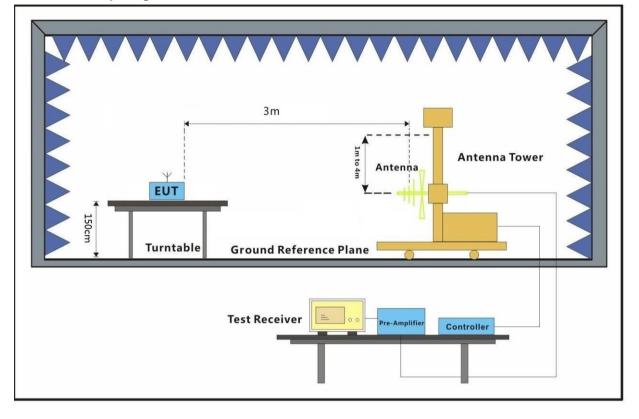
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6.5.3 Test Setup Diagram



#### 6.5.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-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, quasi-peak or average method as specified and then reported in a data sheet. g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

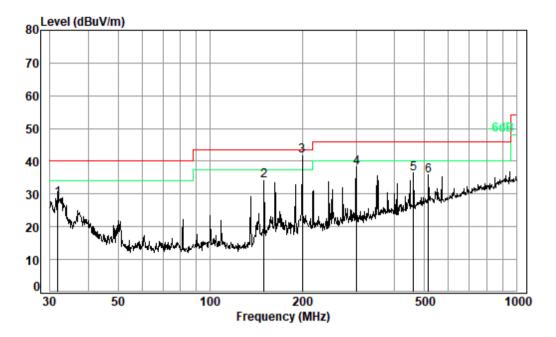


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Test Mode: 00; Polarity: Horizontal



Condition: 3m HORIZONTAL Job No. : 12742CR Test Mode: 00

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 2 3 pp 4 5 6	31.84 150.01 199.99 300.37 460.73 515.44	1.16 1.20 2.00 2.43	14.70 15.80 19.11 22.95	27.14 26.87 27.65	45.41 51.87 43.75 38.51	33.93 41.73 37.99 36.24	43.50 43.50 46.00 46.00	-9.57 -1.77 -8.01 -9.76	QP



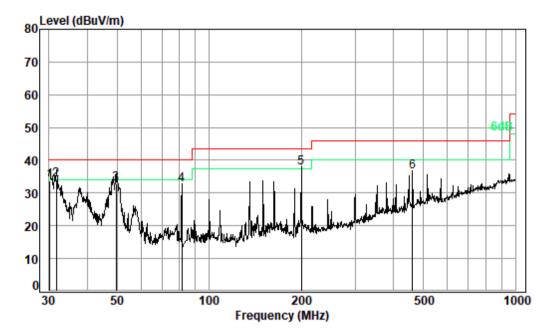
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Test Mode: 00; Polarity: Vertical



Condition: 3m VERTICAL Job No. : 12742CR Test Mode: 00

	Freq	Cable Loss					Limit Line		Remark
-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.21	0.60	22.84	27.73	38.01	33.72	40.00	-6.28	
2 pp	31.73	0.62	21.70	27.73	39.53	34.12	40.00	-5.88	
3	49.71	0.70	14.17	27.68	45.74	32.93	40.00	-7.07	
4	81.50	1.22	12.05	27.63	46.79	32.43	40.00	-7.57	
5	199.99	1.20	15.80	27.14	47.71	37.57	43.50	-5.93	
6	460.73	2.43	22.95	27.65	38.80	36.53	46.00	-9.47	



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#### 6.6 Radiated Emissions (9kHz-30MHz)

Test Requirement	47 CF
Test Method:	ANSI
Measurement Distance:	3m
Limit:	

R Part 15, Subpart C 15.225(d) & 15.209 C63.10 (2013) Section 6.4

Linnt.						
Frequency(MHz)	Field strength		Detector	Measurement Distance		
	(microvolts/meter)	(dBuV/m)		(meters)		
0.009-0.490	2400/F(kHz)	2400/F(kHz) 300				
0.490-1.705	24000/F(kHz)	-	-	30		
1.705-30	30	-	-	30		
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.						

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than  $\lambda/2\pi$  and the limit distance is greater than  $\lambda/2\pi$ , the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the  $\lambda/2\pi$  distance, and at a 20 dB/decade of distance rate beyond  $\lambda/2\pi$ . This shall be accomplished using Equation (2):

$$FS_{(10m)} = FS_{(30/300m)} + 40log\{d_{(near field)}/d_{(10m)}\} + 20log\{d_{(30/300m)}/d_{(near field)}\}$$

(2)

If the single point measured is at a distance greater than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20log\{d_{(30/300m)}/d_{(10m)}\}$$

(3)

If both the single point and the limit distance are equal to or closer to the EUT than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40log\{d_{(30/300m)}/d_{(10m)}\}$$

(4)

Remark:

$$d_{\text{near field}} = 47.77 / f_{\text{MHz}}$$

where f<sub>MHz</sub> is the frequency of the emission being measured in MHz.



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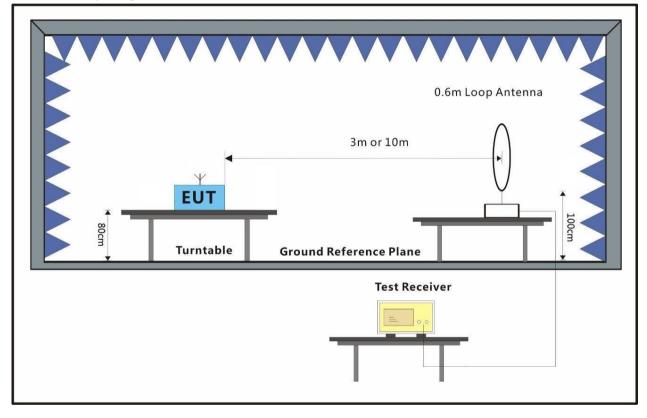
#### 6.6.1 E.U.T. Operation

<b>Operating Environ</b>	ment:						
Temperature:	23.5 °C	Humidity:	45	% RH	Atmospheric Pressure:	1010	mbar

#### 6.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode with modulation

#### 6.6.3 Test Setup Diagram



#### 6.6.4 Measurement Procedure and Data

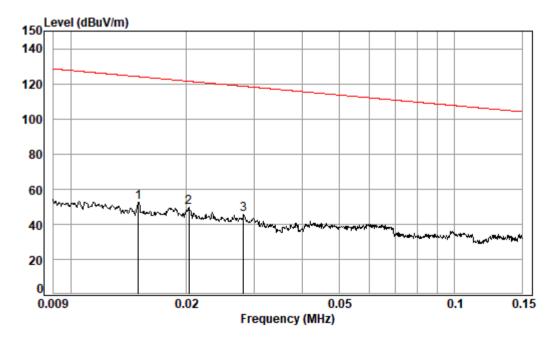
For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated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





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9K-150K



Condition: 3m Job No. : 12742CR Test Mode: 00

		Ant	Preamp	Cable	Read		Limit	0ver	
	Freq	Factor	Factor	Loss	Level	Level	Line	Limit	Remark
_									
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	0.015	16.00	31.73	0.01	68.20	52.48	124.08	-71.60	Average
2	0.020	14.12	31.92	0.01	67.35	49.56	121.44	-71.88	Average
3	0.028	12.88	32.13	0.01	64.63	45.39	118.58	-73.19	Average

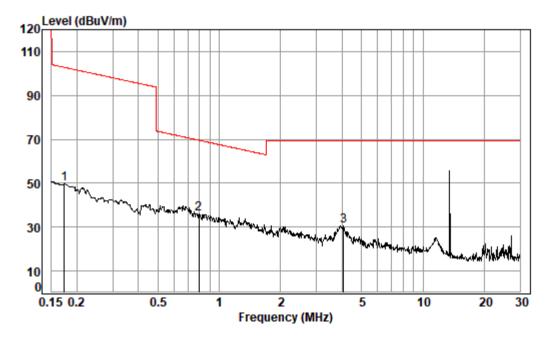


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Condition: 3m Job No. : 12742CR Test Mode: 00

	Freq		Preamp Factor						Remark
-	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1 av 2 pp 3	0.796	10.83		0.63	57.08	36.04	69.56	-33.52	•



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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

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

where

$FS_{\text{limit}}$	is the calculation of field strength at the limit distance, expressed in $dB\mu V/m$
$FS_{max}$	is the measured field strength, expressed in dBµV/m
$d_{\text{measure}}$	is the distance of the measurement point from the EUT
$d_{\text{limit}}$	is the reference distance or the distance of the $\lambda/2\pi$ point



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### 7 Test Setup Photo

Please refer to setup photos.

## 8 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

End of the Report -



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