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# FCC Test Report

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Report No.: AGC02866150301 FE01

**FCC ID** : 2AEJ9FREEDOM

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION** : GSM/WCDMA Mobile Phone

**BRAND NAME** : /

**MODEL NAME** : Freedom

**CLIENT** : Digit Secure India Private Limited

**DATE OF ISSUE** : Apr.23,2015

**STANDARD(S)** : FCC Part 15 Rules

**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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**Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr.23,2015	Valid	Original Report

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## 1. VERIFICATION OF COMPLIANCE

<b>Applicant</b>	Digit Secure India Private Limited
<b>Address</b>	Plot No-1303&1304,4th Floor,Khanamet,HiTech City,Ayappa Society, Madhapur, Hyderabad, Telangana, India
<b>Manufacturer</b>	SHENZHEN HSEM TECHNOLOGY CO., LTD.
<b>Address</b>	4TH FLOOR, 5 PLANTS, TONGFUYU INDUSTRIAL, TAOYUAN STREET, NANSHAN DISTRICT, SHENZHEN P.R. CHINA
<b>Product Designation</b>	GSM/WCDMA Mobile Phone
<b>Brand Name</b>	/
<b>Test Model</b>	Freedom
<b>Date of test</b>	Apr.18, 2015 to Apr.23, 2015
<b>Deviation</b>	None
<b>Condition of Test Sample</b>	Normal

### WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Prepared By

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Apr.23,2015

Checked By

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Kidd Yang

Apr.23,2015

Authorized By

*Solger Zhang*

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Apr.23,2015

## 2. EUT DESCRIPTION

The EUT is a short range, lower power, Wireless transmitter.

Details of technical specification refer to the description in follows:

Product Designation:	GSM/WCDMA Mobile Phone
Brand Name:	/
Test Model:	Freedom
Hardware Version:	DX01_MB_P2_V01
Software Version:	ALPS.KK1.MP1.V2.11
Operation Frequency:	13.56MHz
Number of Channels:	1 Channel
Antenna Type:	PCB Antenna
Power Supply:	DC 3.7V by battery

NOTE: For more information, please refer to User's Manual.

## 3. DESCRIPTION OF TEST MODES

The EUT has been tested under Normal Operating and standby condition.

#### 4. TEST FACILITY

<b>Site</b>	Compliance Certification Services (Shenzhen) Inc.
<b>Location</b>	No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China
<b>Description</b>	Test Firm Registration Number: 441872

#### TEST EQUIPMENT LIST

<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal. Date</b>	<b>Cal. Due</b>
Power Probe	Anritsu	MA2411B	100309	2014.10.25	2015.10.24
RF attenuator	N/A	RFA20db	68	N/A	N/A
Spectrum Analyzer	Agilent	E4407B	MY50140340	2014.10.25	2015.10.24
Amplifier	EM	EM-30180	060538	2014.12.22	2015.12.21
Horn Antenna	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05
Horn Antenna	R&S	9120D	152265	2014.10.27	2015.10.26
EMI Test Receiver	R&S	102086	102086	2014.10.25	2015.10.24
Biological Antenna	TESEQ	CBL6111D	34678	2014.10.27	2015.10.26
LISN	R&S	ENV216	101242	2014.10.25	2015.10.24
Loop Antenna	ARA	PLA-1030/B	1029	2014.06.08	2015.06.07

Radiated Emission Test Site 966(2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2015	03/01/2016
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2015	03/08/2016
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2015	03/17/2016
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2015	03/17/2016
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	07/10/2014	07/09/2015
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/01/2015	03/01/2016
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/01/2015	03/01/2016
Loop Antenna	COM-POWER	AL-130	121044	09/27/2014	09/26/2015
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2015	02/27/2016
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2015	03/08/2016
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	03/09/2015	03/08/2016
LISN	EMCO	3825/2	8901-1459	03/09/2015	03/08/2016
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	03/04/2015	03/03/2016
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

## 5. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.207	Conducted emission	Compliant
§15.35/15.205/ 15.209/15.225	Radiated Emission	Compliant
§15.225(e)	Frequency Stability	Compliant
§15.215	Occupied Bandwidth	Compliant
§15.203	Antenna Requirment	Compliant

## 6. MEASUREMENT UNCERTAINTY

No.	Item	MU
1	Radio Frequency	$\pm 1 \times 10^{-9}$
2	Temperature	$\pm 0.1^\circ\text{C}$
3	Humidity	$\pm 1.0\%$
4	RF power, conducted	$\pm 0.34\text{dB}$
5	RF power density, conducted	$\pm 2.75\text{dB}$
6	Spurious emissions, conducted	$\pm 3.70\text{dB}$
7	All emissions, radiated	$\pm 3.20\text{dB}$

## 7. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Transmitting

Note:

1. All the test modes can be supply by DC 3.7V, only the result of the worst case was recorded in the report if no any records.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

## **8. ANTENNA REQUIREMENT**

### **8.1. STANDARD APPLICABLE**

For intentional device, according to FCC 47 CFR Section 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.

### **8.2. TEST RESULT**

This product has a Integral antenna, fulfill the requirement of this section.

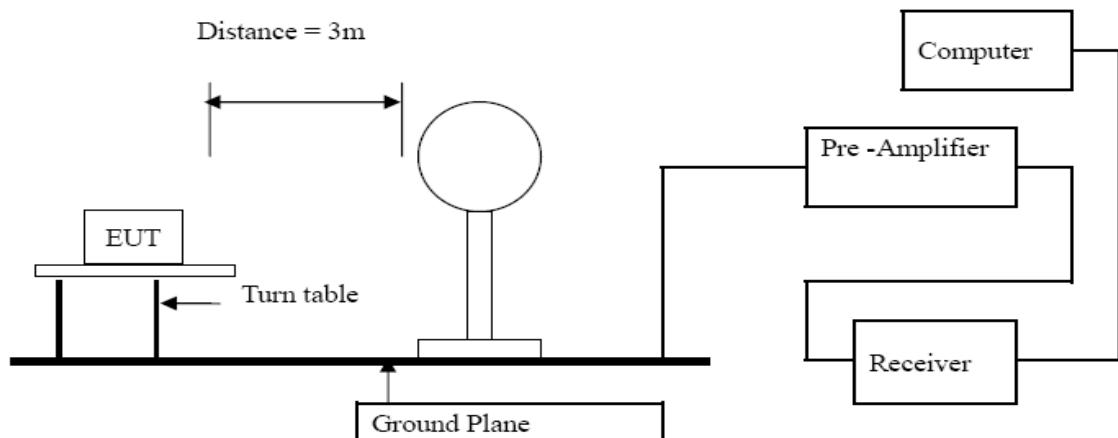
## 9. RADIATED EMISSION

### 9.1 MEASUREMENT PROCEDURE

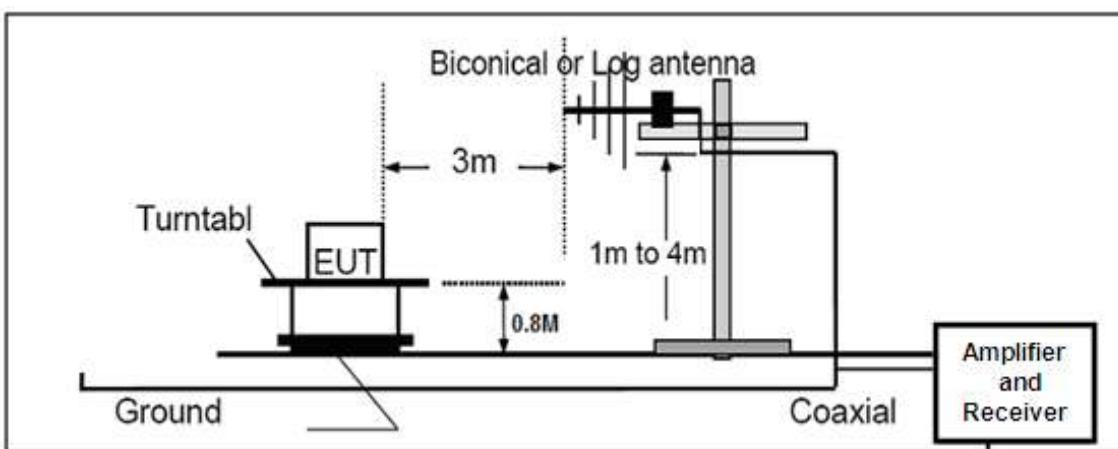
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. The frequency spectrum from 9kHz to 5GHz was investigated. All readings from 9kHz to 30MHz are quasi-peak values with a resolution bandwidth of 10 kHz, measured with loop antenna. All readings from 30MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz, measured with Bi-log antenna. All readings are above 1 GHz are peak values with a resolution bandwidth of 1 MHz, measured with horn antenna.

## 9.2 TEST SETUP

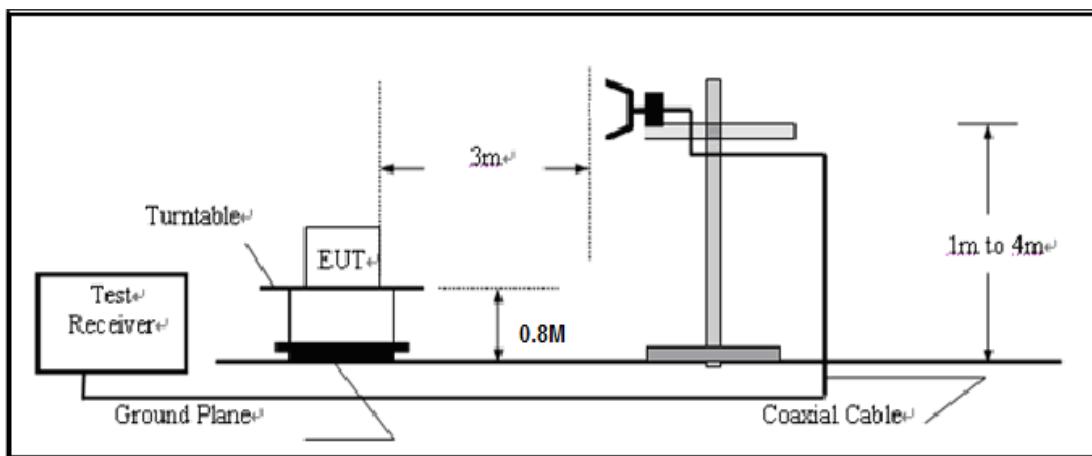
### RADIATED EMISSION TEST SETUP BELOW 30MHz



### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



### 9.3 LIMITS AND MEASUREMENT RESULT

According to 15.225,

- (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.

Frequencies (MHz)	Field Strength at 30m (micorvolts/meter)	Field Strength at 30m (dBuV/m)	Field Strength at 3m (dBuV/m)
13.553~13.567	15.848	84	124
13.410~13.553	334	50.5	90.5
13.567~13.710			
13.110~13.410	106	40.5	80.5
13.710~14.010			

According to 15.35, on any frequency or frequencies below or equal to 1000 MHz, the limits Shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test.

According to 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.

Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field Strength at 30m (micorvolts/meter)
0.009-0.490	3	20log 2400/F (kHz) + 80
0.490-1.705	3	20log 24000/F (kHz) + 40
1.705-30	3	20log 30 + 40
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

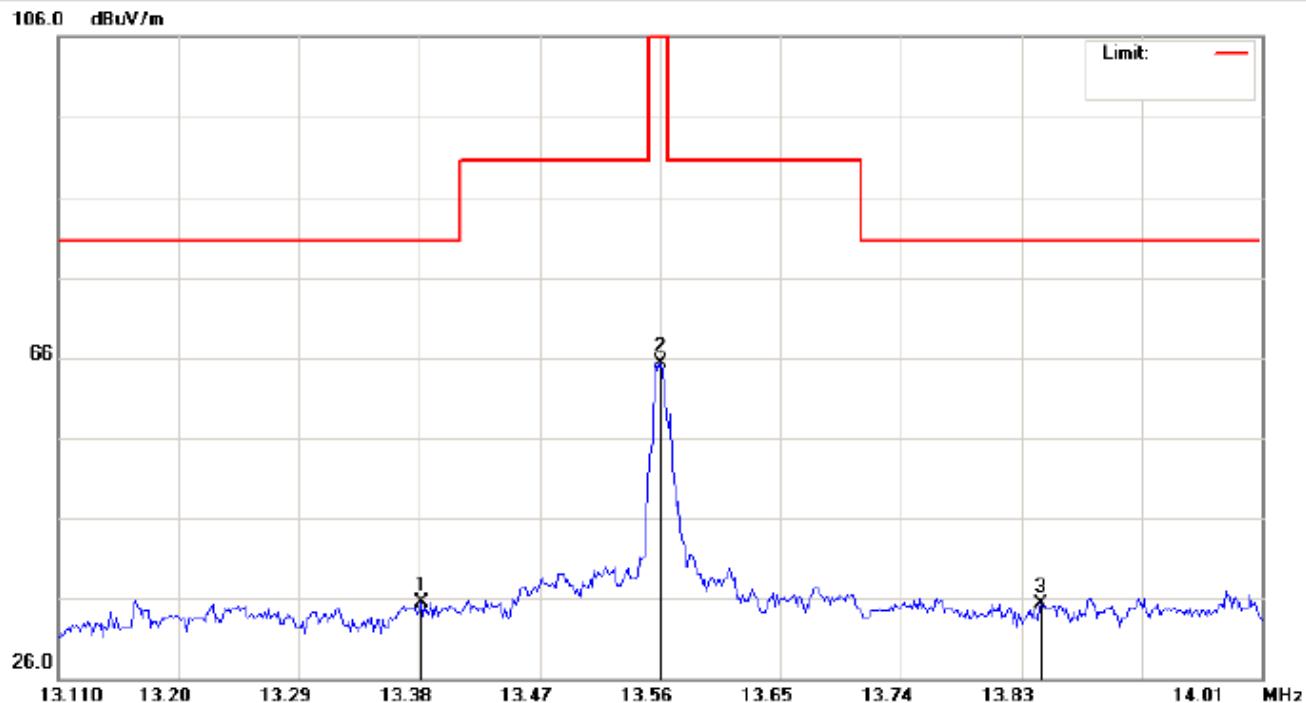
- 1) RF Voltage (dBuV) = 20 log RF Voltage (uV)
- 2) In the Above Table, the tighter limit applies at the band edges.
- 3) Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4) The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
- 5) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula  $Ld1 = Ld2 * (d2/d1)$

## 9.4 TEST RESULT

### RADIATED EMISSION BELOW 30MHZ

#### RADIATED EMISSION TEST- (13.110MHZ-14.010MHZ) –HORIZONTAL

Job No.:	20150422	Probe :	Horizontal
Standard:	FCC Part225 (13.11M-14.010MHz)	Tested Distance:	3m
Test item:	Radiation Test	Power Source:	DC 3V
Temp.(C)/Hum.(%RH):	24 (C) / 52 %RH	Date:	2015-4-22 Time: 18:17:23
Company:		EUT:	
Model:	Freedom	Test By :	JIMMY
Test Mode:	Transmitting		

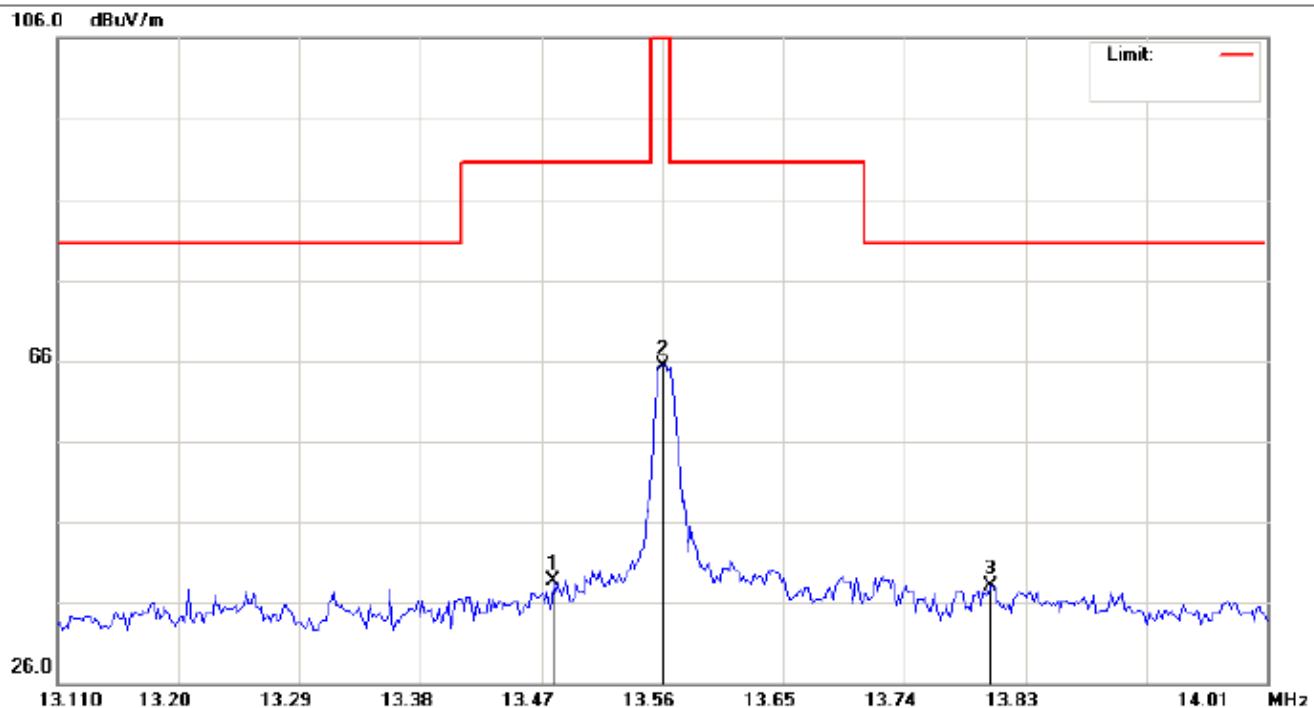


No.	Freq.	Reading	Factor	Measurement	Limit	Over
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	13.3815	35.56	9.51	45.07	80.50	-35.43
2	13.5600	65.24	9.71	74.95	124.00	-49.05
3	13.8450	35.37	9.62	44.99	90.50	-45.51

**RESULT: PASS**

## RADIATED EMISSION TEST- (13.110MHZ-14.010MHZ) –VERTICAL

Job No.:	20150422	Probe :	Vertical
Standard:	FCC Part225 (13.11M-14.010MHz)	Tested Distance:	3m
Test item:	Radiation Test	Power Source:	DC 3V
Temp.(C)/Hum.(%RH):	24 (C) / 52 %RH	Date:	2015-4-22 Time: 18:14:45
Company:		EUT:	
Model:	Freedom	Test By :	JIMMY
Test Mode:	Transmitting		

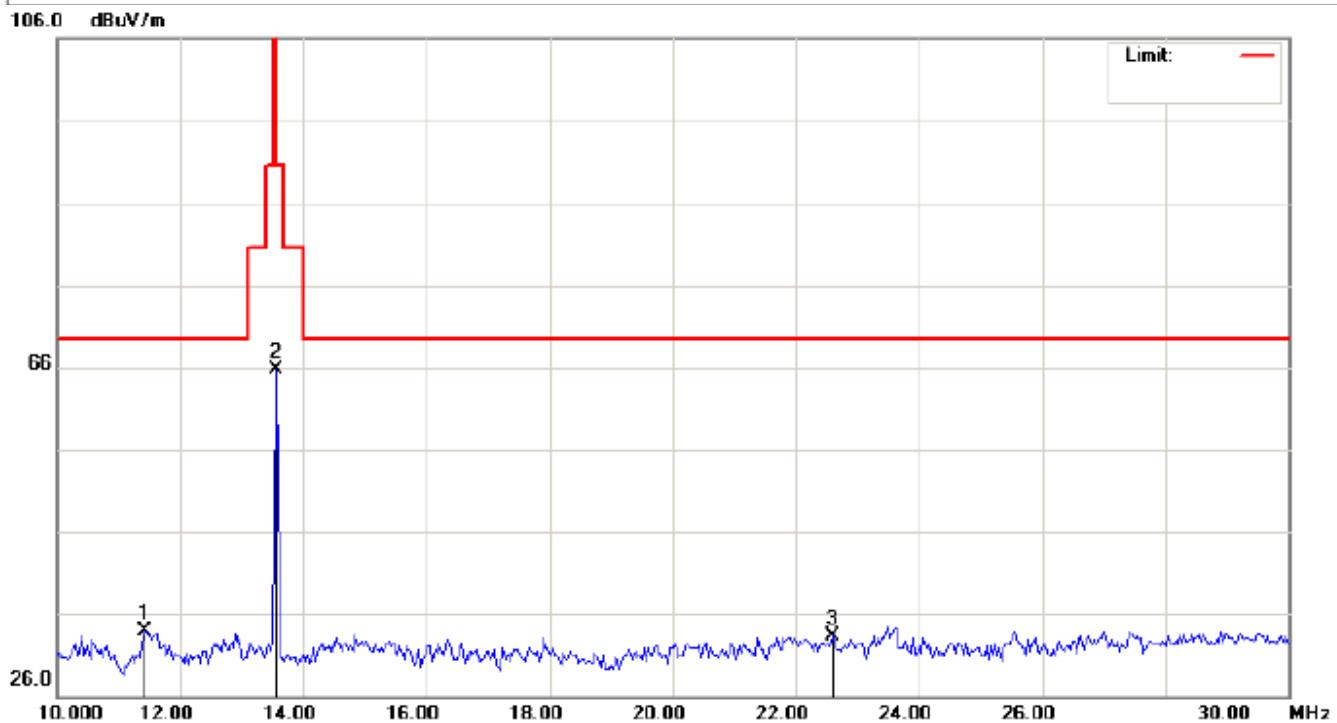


No.	Freq.	Reading	Factor	Measurement	Limit	Over
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	13.4786	38.77	9.68	48.45	80.50	-32.05
2	13.5600	65.26	9.71	74.97	124.00	-49.03
3	13.8045	38.09	9.67	47.76	80.50	-32.74

RESULT: PASS

## RADIATED EMISSION TEST- (10MHZ-30MHZ) -HORIZONTAL

Job No.:	20150422	Probe :	Horizontal
Standard:	FCC Part225 (10M-30MHz)	Tested Distance:	3m
Test item:	Radiation Test	Power Source:	DC 3V
Temp.(C)/Hum.(%RH):	24 (C) / 52 %RH	Date:	2015-4-22 Time: 18:21:23
Company:		EUT:	
Model:	Freedom	Test By :	JIMMY
Test Mode:	Transmitting		

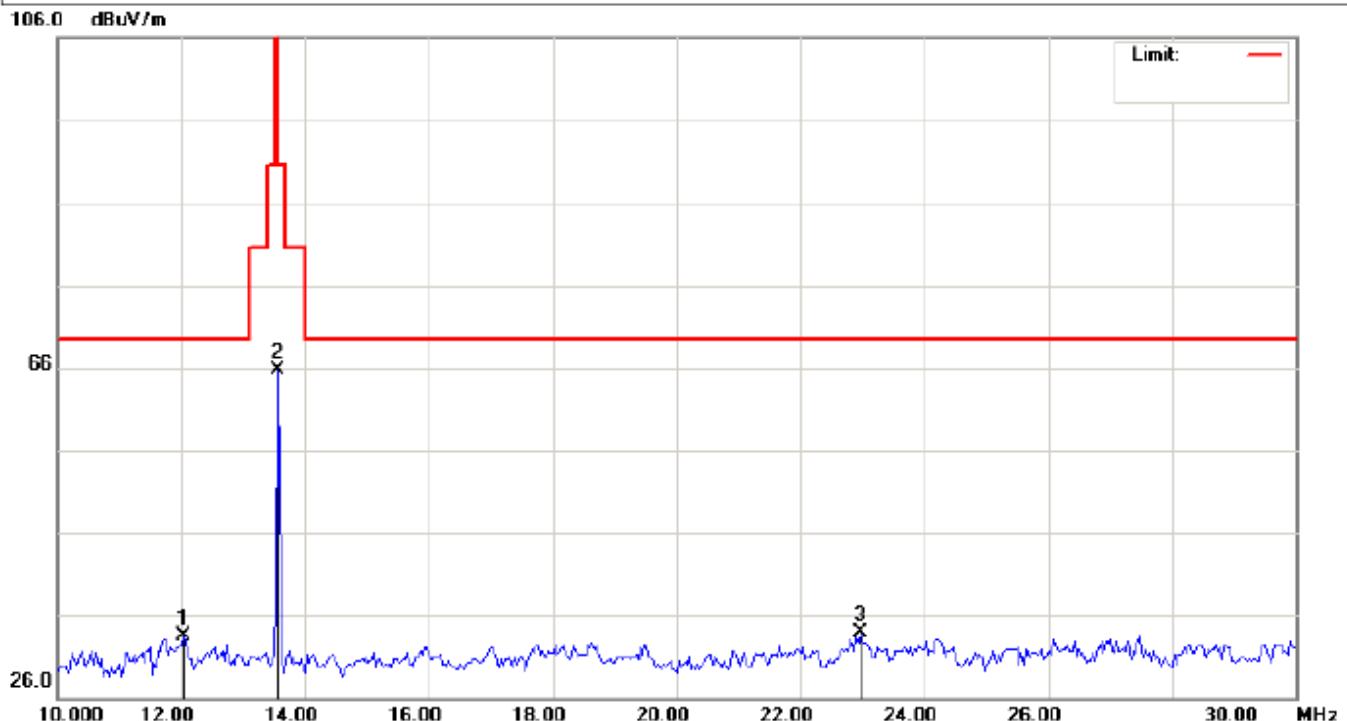


No.	Freq.	Reading	Factor	Measurement	Limit	Over
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	11.4330	34.00	9.62	43.62	69.54	-25.92
2	13.5600	65.73	9.71	75.44	124.00	-48.56
3	22.6000	33.39	9.65	43.04	69.54	-26.50

**RESULT: PASS**

## RADIATED EMISSION TEST- (10MHZ-30MHZ) -VERTICAL

Job No.:	20150422	Probe :	Vertical
Standard:	FCC Part225 (10M-30MHz)	Tested Distance:	3m
Test item:	Radiation Test	Power Source:	DC 3V
Temp.(C)/Hum.(%RH):	24 (C) / 52 %RH	Date:	2015-4-22 Time: 18:19:45
Company:		EUT:	
Model:	Freedom	Test By :	JIMMY
Test Mode:	Transmitting		



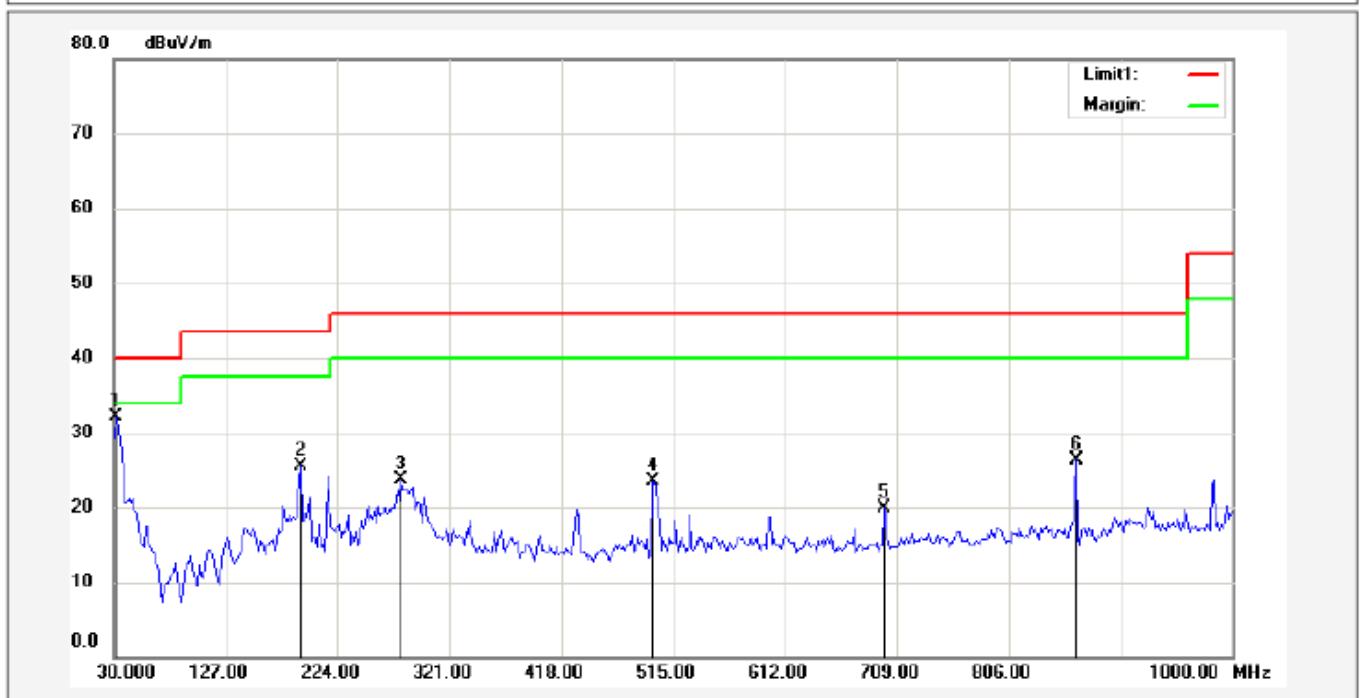
No.	Freq.	Reading	Factor	Measurement	Limit	Over
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	12.0333	33.47	9.62	43.09	69.54	-26.45
2	13.5600	65.71	9.71	75.42	124	-48.58
3	22.9664	33.90	9.65	43.55	69.54	-25.99

RESULT: PASS

## RADIATED EMISSION BELOW 1GHZ

## RADIATED EMISSION TEST- (30MHZ-1GHZ) - HORIZONTAL

Job No.:	20150422	Probe :	Horizontal
Standard:	FCC Part15 Class B (30-1000MHz)	Tested Distance:	3m
Test item:	Radiation Test	Power Source:	DC 3V
Temp.(C)/Hum.(%RH):	24 (C) / 52 %RH	Date:	2015-4-22 Time: 18:06:43
Company:		EUT:	
Model:	Freedom	Test By :	JIMMY
Test Mode:	Transmitting		

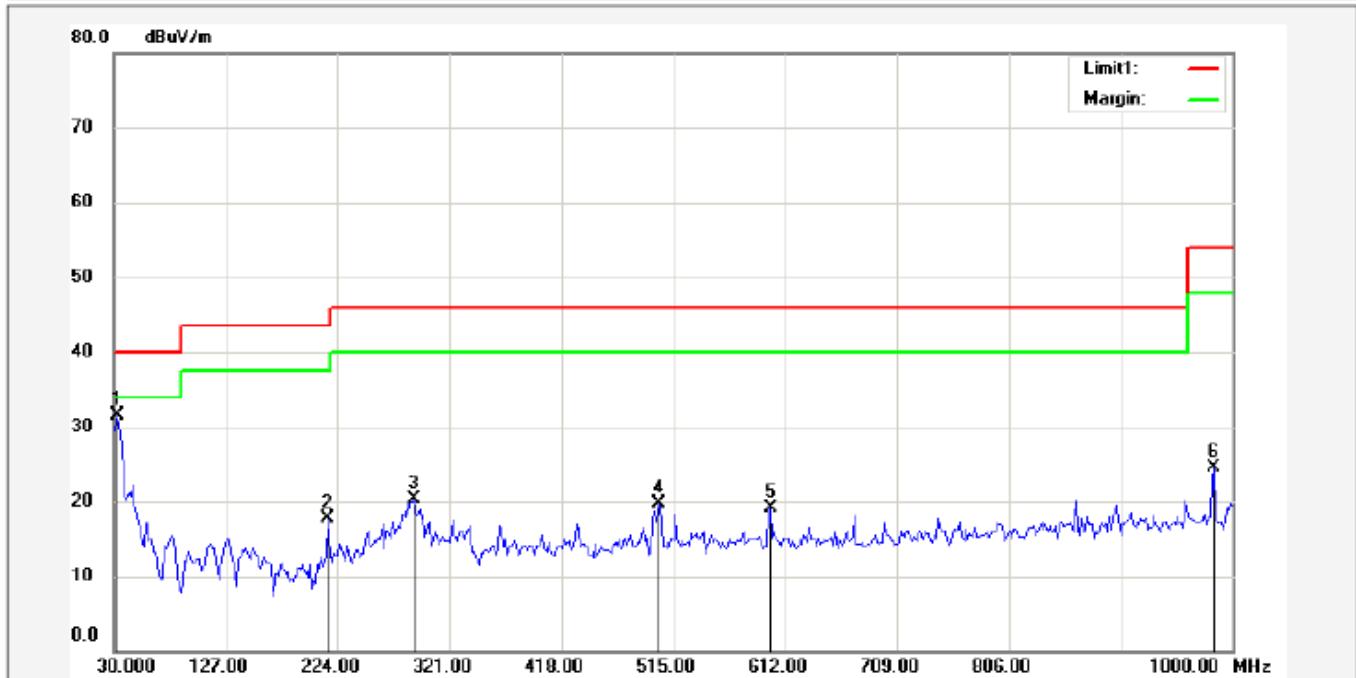


No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	31.6167	44.78	-12.61	32.17	40.00	-7.83	---	---	peak
2	191.6667	48.33	-22.84	25.49	43.50	-18.01	---	---	peak
3	278.9667	44.11	-20.40	23.71	46.00	-22.29	---	---	peak
4	497.2167	37.87	-14.36	23.51	46.00	-22.49	---	---	peak
5	697.6833	31.91	-12.00	19.91	46.00	-26.09	---	---	peak
6	864.2000	36.70	-10.49	26.21	46.00	-19.79	---	---	peak

RESULT: PASS

## RADIATED EMISSION TEST- (30MHZ-1GHZ) -VERTICAL

Job No.:	20150422	Probe :	Vertical
Standard:	FCC Part15 Class B (30-1000MHz)	Tested Distance:	3m
Test item:	Radiation Test	Power Source:	DC 3V
Temp.(C)/Hum.(%RH):	24 (C) / 52 %RH	Date:	2015-4-22 Time: 18:04:41
Company:		EUT:	
Model:	Freedom	Test By :	JIMMY
Test Mode:	Transmitting		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	33.2333	45.13	-13.64	31.49	40.00	-8.51	---	---	peak
2	215.9167	38.62	-20.82	17.80	43.50	-25.70	---	---	peak
3	290.2833	40.70	-20.44	20.26	46.00	-25.74	---	---	peak
4	502.0667	33.98	-14.34	19.64	46.00	-26.36	---	---	peak
5	599.0667	32.02	-12.89	19.13	46.00	-26.87	---	---	peak
6	983.8333	33.82	-9.24	24.58	54.00	-29.42	---	---	peak

**RESULT: PASS**

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Result-Limit.  
 2. The "Factor" value can be calculated automatically by software of measurement system.

## 10. FCC LINE CONDUCTED EMISSION TEST

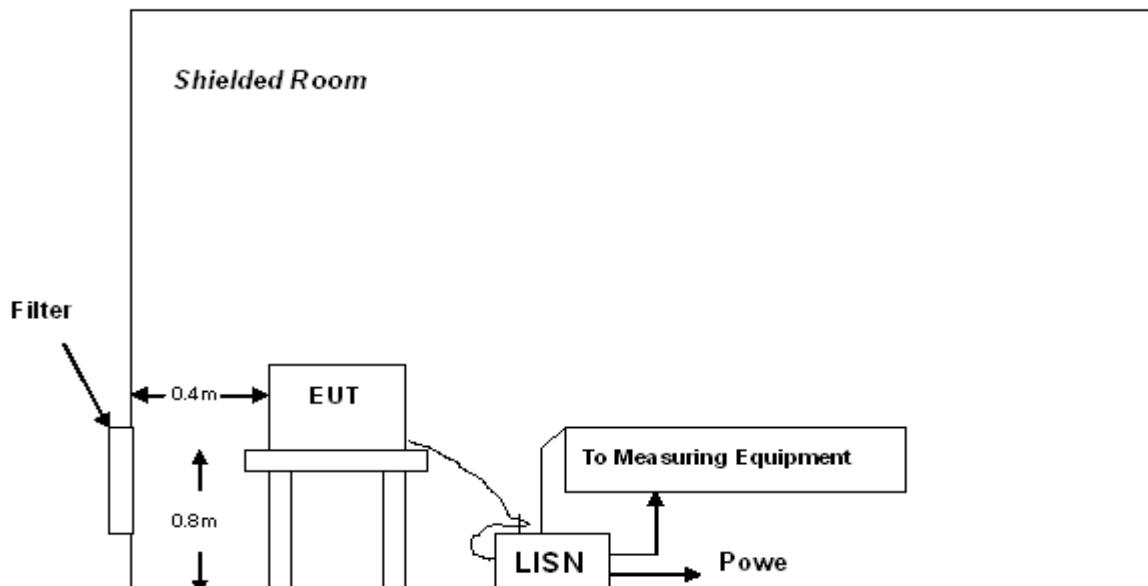
### 10.1 LIMITS

Frequency	Maximum RF Line Voltage	
	Q.P. ( dBuV)	Average ( dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

**\*\*Note:** 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

### 10.2 TEST SETUP



A: Powered through filter

### 10.3 PRELIMINARY PROCEDURE

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) All support equipments received AC120V/60Hz power from a LISN, if any.
- 5) The EUT received power by adapter which received power by a LISN.
- 6) The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

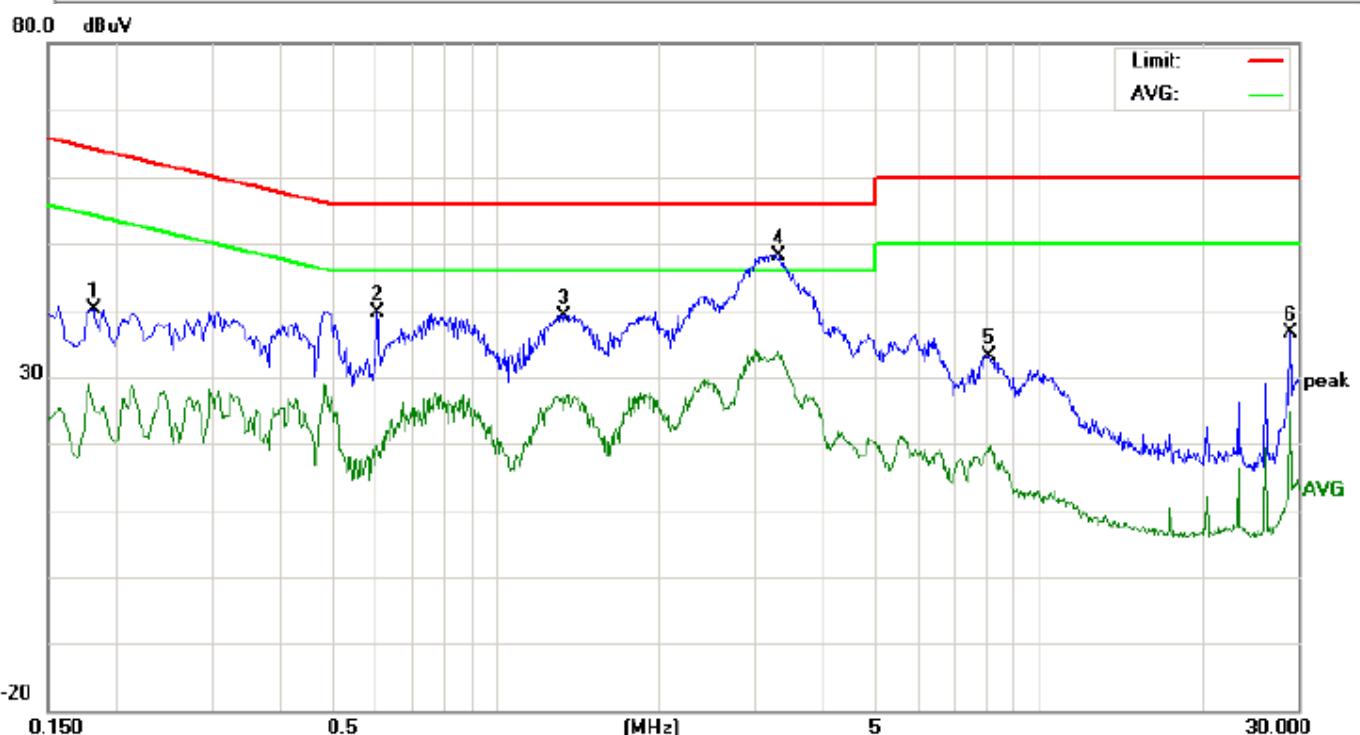
### 10.4 FINAL TEST PROCEDURE

- 10) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 11) 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 12) 3) The test data of the worst case condition(s) was reported on the Summary Data page.

## 10.5 TEST RESULT OF POWER LINE

### Line Conducted Emission Test Line 1-L

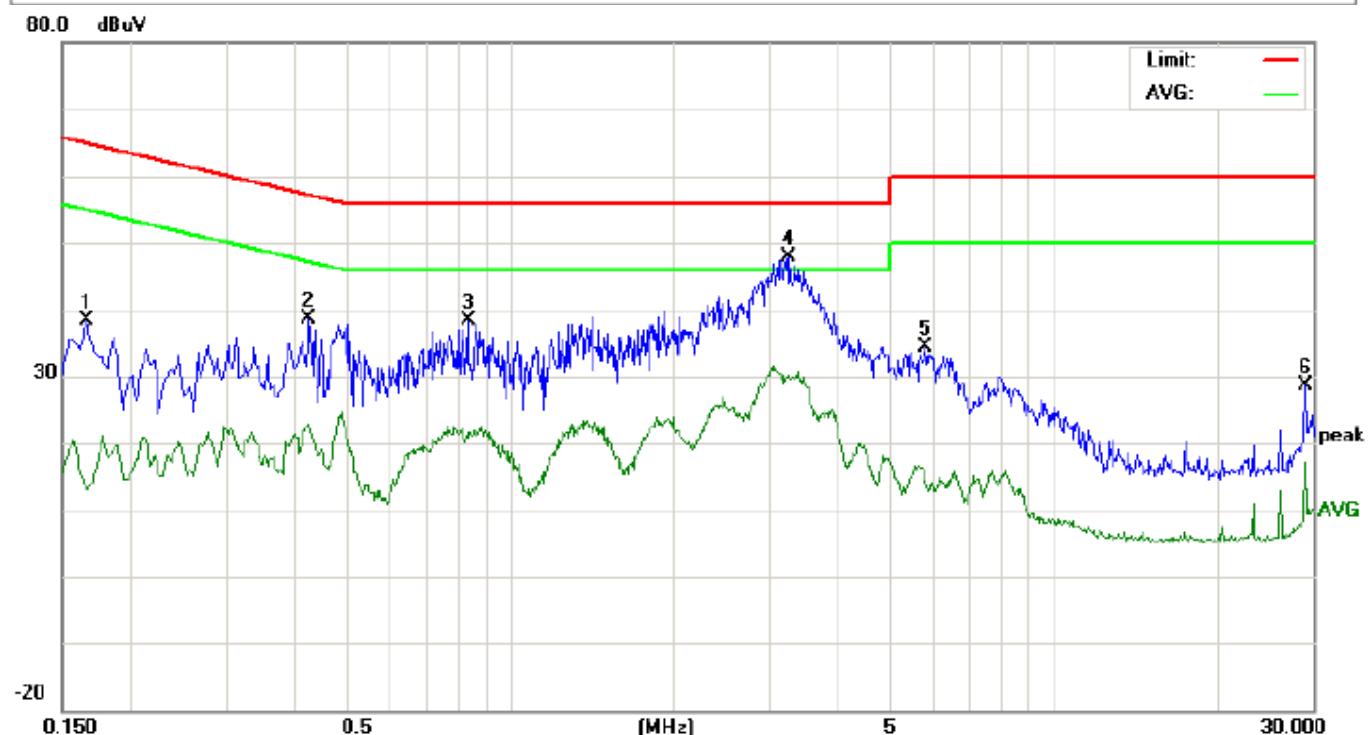
Job No.:	20150422	Date:	2015-4-22
Company:		Time:	18:56:50
Standard:	FCC Class B Conduction(QP)	Temp.(C)/Hum.(%):	26(C) / 60 %
Test item:	Conduction Test	EUT:	
Line :	L1	Test Voltage	AC 120V/60Hz
Model:	Freedom	Test By :	
Description: Transmitting			



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		dB	Peak	QP	AVG	QP	AVG	QP	AVG	
1	0.1819	30.01		15.01	10.20	40.21		25.21	64.39	54.39	-24.18	-29.18	P	
2	0.6060	29.23		9.41	10.31	39.54		19.72	56.00	46.00	-16.46	-26.28	P	
3	1.3340	28.87		14.78	10.38	39.25		25.16	56.00	46.00	-16.75	-20.84	P	
4	3.3300	37.72		22.76	10.52	48.24		33.28	56.00	46.00	-7.76	-12.72	P	
5	8.1380	22.79		8.85	10.35	33.14		19.20	60.00	50.00	-26.86	-30.80	P	
6	29.1260	26.46		14.65	10.12	36.58		24.77	60.00	50.00	-23.42	-25.23	P	

## Line Conducted Emission Test Line 1-N

Job No.:	20150422	Date:	2015-4-22
Company:		Time:	18:53:38
Standard:	FCC Class B Conduction(QP)	Temp.(C)/Hum.(%):	26(C) / 60 %
Test item:	Conduction Test	EUT:	
Line :	N	Test Voltage	AC 120V/60Hz
Model:	Freedom	Test By :	
Description: Transmitting			



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	Avg		Peak	QP	Avg	QP	Avg	QP	Avg		
1	0.1660	28.28		2.92	10.18	38.46		13.10	65.15	55.15	-26.69	-42.05	P	
2	0.4260	28.32		12.45	10.35	38.67		22.80	57.33	47.33	-18.66	-24.53	P	
3	0.8380	28.17		10.45	10.33	38.50		20.78	56.00	46.00	-17.50	-25.22	P	
4	3.2620	37.33		19.57	10.53	47.86		30.10	56.00	46.00	-8.14	-15.90	P	
5	5.8060	24.14		4.11	10.27	34.41		14.38	60.00	50.00	-25.59	-35.62	P	
6	29.1180	18.62		7.13	10.12	28.74		17.25	60.00	50.00	-31.26	-32.75	P	

## 11. Occupied Bandwidth

### 11.1 LIMITS

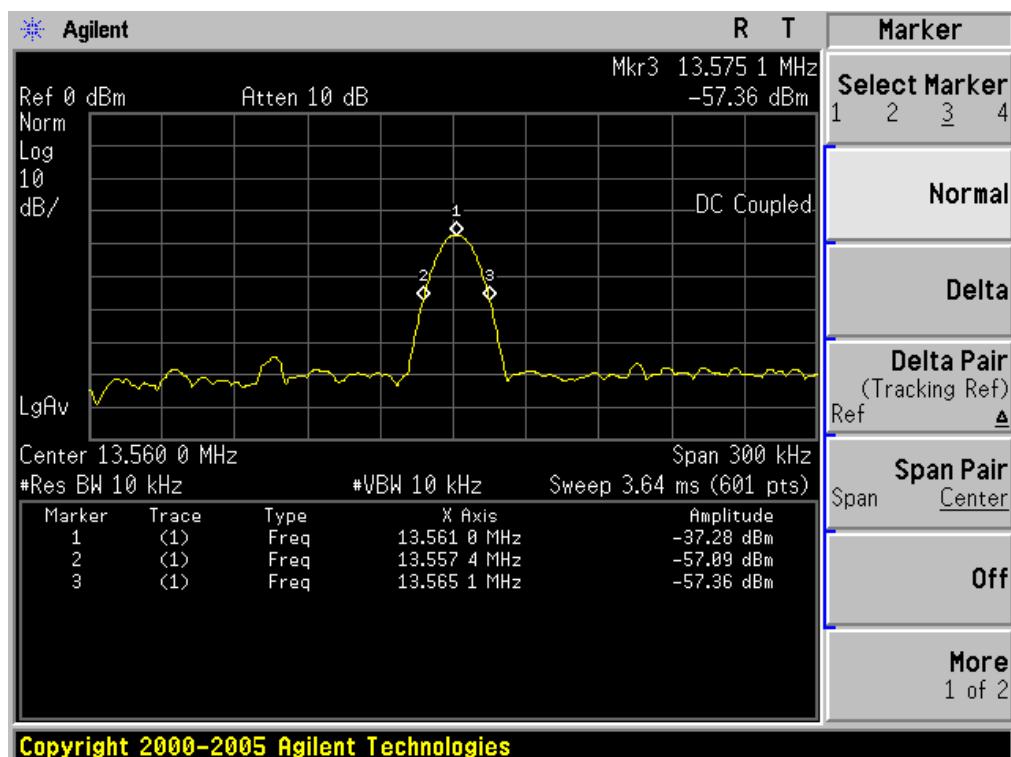
According to 15.215(c), Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be 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.

### 11.2 Test specification:

Environmental conditions: Temperature 23° CHumidity: 50% Atmospheric pressure: 960mbar

### 11.3 TEST RESULT

Frequency MHz	20dB Bandwidth (kHz)	Frequency range (MHz) $f_L > 13.553\text{MHz}$	Frequency range (MHz) $f_H < 13.567\text{MHz}$	Conclusion
13.56	7.7	13.5574	13.5651	PASS



## 12. Frequency Stability Measurement

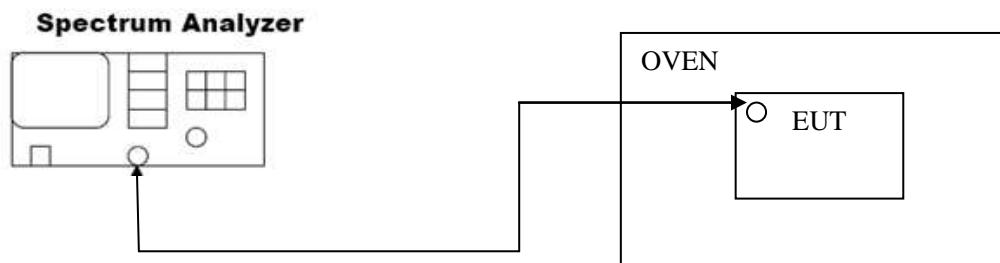
### 12.1 Limit

According to 15.225(e), 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.

### 12.2 Test Method and test Procedure:

- 1) The transmitter output (antenna port) was connected to the spectrum analyzer.
- 2) EUT have transmitted absence of modulation signal and fixed channelize.
- 3) Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
- 4) Set RBW = 1 kHz, VBW = 1 kHz with peak detector and max hold settings.
- 5) The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
- 6) Extreme temperature rule is -20°C~50°C.

### 12.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



### 12.4 Test specification:

Environmental conditions: Temperature 23° CHumidity: 50% Atmospheric pressure: 960mbar

## 12.5 TEST RESULT

PASS

Operating frequency: 13.56MHz

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit(MHz)	Conclusion
3.7	13.5606	0.0009	0.001356	PASS
3.4	13.5609			
4.2	13.5603			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit(MHz)	Conclusion
- 20°C	13.56014	0.00016	0.001356	PASS
-10°C	13.56011			
0°C	13.56008			
10°C	13.56006			
20°C	13.56007			
30°C	13.56005			
40°C	13.56009			
50°C	13.56016			

## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP



## APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT



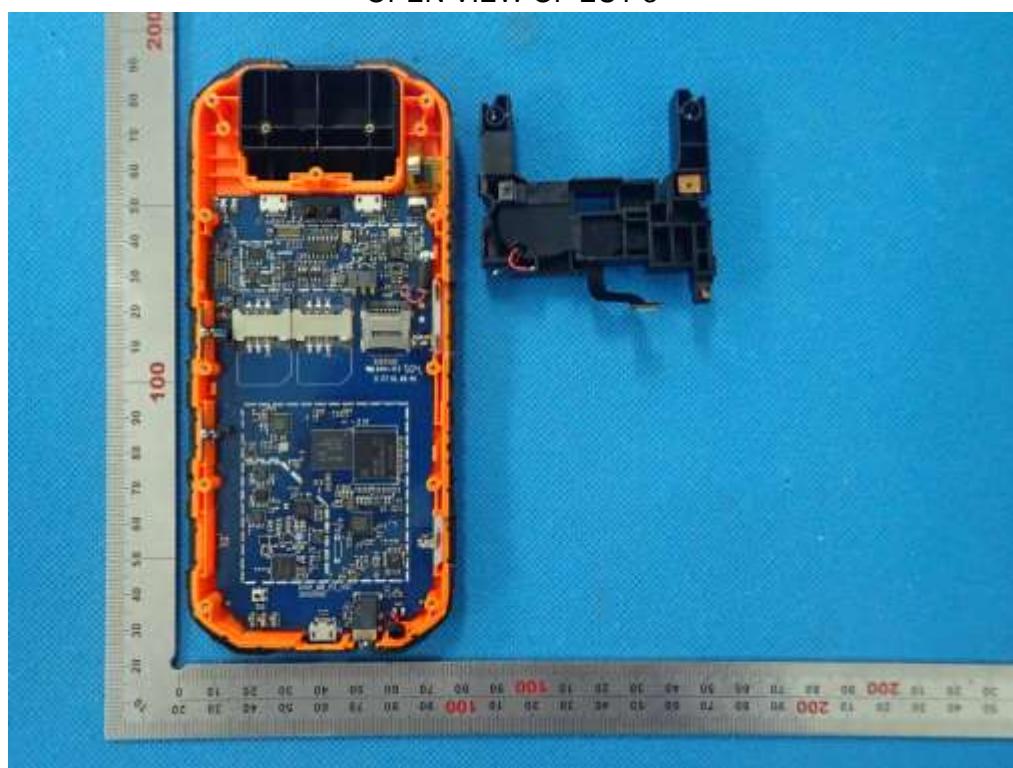
OPEN VIEW OF EUT-1



OPEN VIEW OF EUT-2



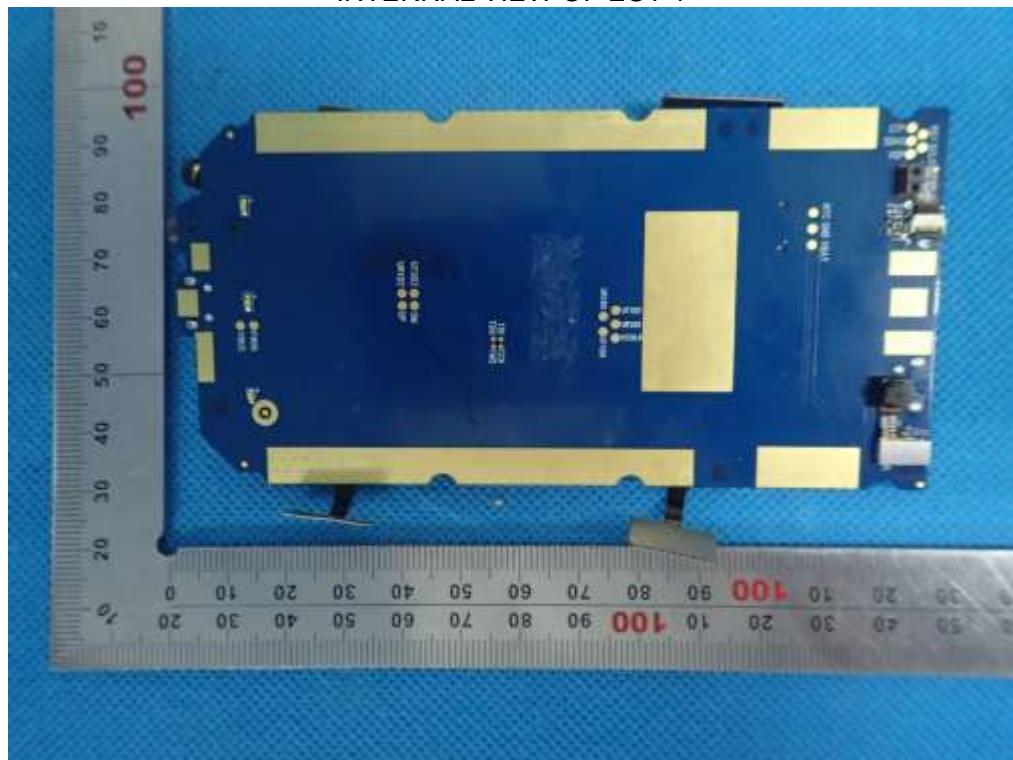
OPEN VIEW OF EUT-3



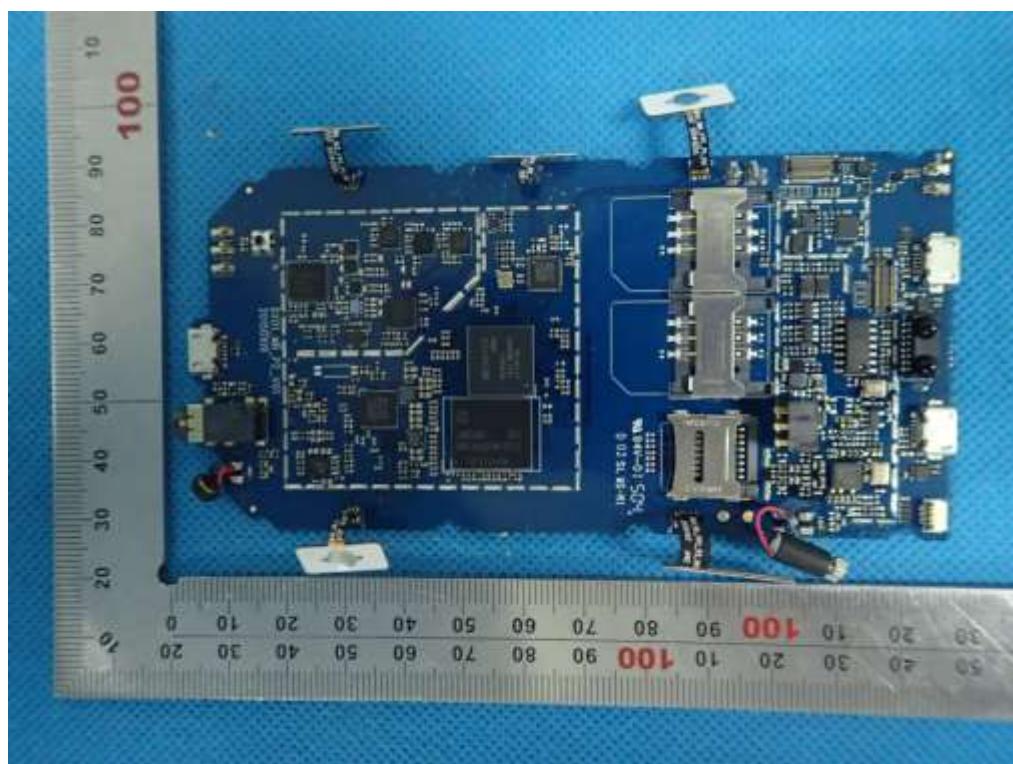
OPEN VIEW OF EUT-4



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----