

# FCC RADIO TEST REPORT

## FCC ID: 2ACHW-GT78VN

**Product :** Rugged Android Tablet

**Trade Mark :** ARBOR

**Model Name :** GT78-VN

GT78-VNAG, GT78V-VNB, GT78-VNC,

GT78V-VND, GT78V-VN\*, P78P-E,

**Family Model :** GT78-VNxxxxxxxx (x=0-9, a-z, A-Z and  
"-")

**Report No. :** S21091802204007

### Prepared for

ARBOR Technology Corp.

10F., No.700, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan

### Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street  
Bao'an District, Shenzhen 518126 P.R. China

Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090

Website: <http://www.ntek.org.cn>

## TEST RESULT CERTIFICATION

**Applicant's name** ..... : ARBOR Technology Corp.

Address ..... : 10F., No.700, Zhongzheng Rd., Zhonghe Dist., New Taipei City  
235, Taiwan

**Manufacturer's Name** ..... : ARBOR Technology Corp.

Address ..... : 10F., No.700, Zhongzheng Rd., Zhonghe Dist., New Taipei City  
235, Taiwan

### Product description

Product name ..... : Rugged Android Tablet

Model and/or type reference : GT78-VN

Family Model:  
GT78-VNAG, GT78V-VNB, GT78-VNC, GT78V-VND,  
GT78V-VN\*, P78P-E, GT78-VNxxxxxxxx (x=0-9, a-z, A-Z and  
"-")

**Standards** ..... : FCC Part15.225

Test procedure ..... ANSI C63.10-2013

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

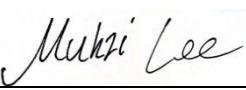
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**Date of Test** ..... :

Date (s) of performance of tests ..... : Nov 05 . 2021 ~ Dec 07. 2021

Date of Issue ..... : Dec 07. 2021

Test Result ..... : **Pass**

Testing Engineer : 

(Mukzi Lee)

Authorized Signatory : 

(Alex Li)

## Table of Contents

## Page

<b>1 . SUMMARY OF TEST RESULTS</b>	<b>4</b>
<b>1.1 TEST FACILITY</b>	<b>5</b>
<b>1.2 MEASUREMENT UNCERTAINTY</b>	<b>5</b>
<b>2 . GENERAL INFORMATION</b>	<b>6</b>
<b>2.1 GENERAL DESCRIPTION OF EUT</b>	<b>6</b>
<b>2.2 DESCRIPTION OF TEST MODES</b>	<b>7</b>
<b>2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED</b>	<b>8</b>
<b>2.4 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)</b>	<b>9</b>
<b>2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS</b>	<b>10</b>
<b>3 . ANTENNA REQUIREMENT</b>	<b>11</b>
<b>3.1 STANDARD REQUIREMENT</b>	<b>11</b>
<b>3.2 EUT ANTENNA</b>	<b>11</b>
<b>4 . EMC EMISSION TEST</b>	<b>12</b>
<b>4.1 CONDUCTED EMISSION MEASUREMENT</b>	<b>12</b>
<b>4.1.1 POWER LINE CONDUCTED EMISSION LIMITS</b>	<b>12</b>
<b>4.1.2 TEST CONFIGURATION</b>	<b>12</b>
<b>4.1.3 TEST PROCEDURE</b>	<b>12</b>
<b>4.1.4 TEST RESULT</b>	<b>13</b>
<b>4.2 RADIATED EMISSION MEASUREMENT</b>	<b>15</b>
<b>4.2.1 RADIATED EMISSION LIMITS</b>	<b>15</b>
<b>4.2.2 TEST PROCEDURE</b>	<b>16</b>
<b>4.2.3 DEVIATION FROM TEST STANDARD</b>	<b>16</b>
<b>4.2.4 TEST SETUP</b>	<b>17</b>
<b>4.2.5 TEST RESULTS (BELOW 30MHZ)</b>	<b>18</b>
<b>4.2.6 TEST RESULTS (BETWEEN 30 – 1000 MHZ)</b>	<b>22</b>
<b>5 . BANDWIDTH TEST</b>	<b>24</b>
<b>5.1 TEST PROCEDURE</b>	<b>24</b>
<b>5.2 DEVIATION FROM STANDARD</b>	<b>24</b>
<b>5.3 TEST SETUP</b>	<b>24</b>
<b>5.4 TEST RESULTS</b>	<b>25</b>
<b>6. FREQUENCY TOLERANCE</b>	<b>26</b>

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.225)			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	Pass	
15.205(a) 15.209 15.225(abcd)	Radiated Spurious Emission	Pass	
15.225 15.215(c)	20dB Bandwidth	Pass	
15.225(e)	Frequency Tolerance	Pass	
15.203	Antenna Requirement	Pass	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.

## 1.1 TEST FACILITY

All measurement facilities used to collect the measurement data are located at 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R. China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

### Site Description

CNAS-Lab.	: The Certificate Registration Number is L5516.
IC-Registration	The Certificate Registration Number is 9270A. CAB identifier:CN0074
FCC- Accredited	Test Firm Registration Number: 463705. Designation Number: CN1184
A2LA-Lab.	The Certificate Registration Number is 4298.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).
Name of Firm	: Shenzhen NTEK Testing Technology Co., Ltd.
Site Location	: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R. China.

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$  , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$  , providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Rugged Android Tablet								
Trade Mark	ARBOR								
Model Name	GT78-VN								
Family Model	GT78-VNAG, GT78V-VNB, GT78-VNC, GT78V-VND, GT78V-VN*, P78P-E, GT78-VNxxxxxxxx (x=0-9, a-z, A-Z and "-")								
Model Difference	Only the memory size, appearance color and customer LOGO are different between all series models and the main inspection model								
Product Description	<p>The EUT is a Rugged Android Tablet</p> <table border="1"><tr><td>Operation Frequency:</td><td>13.56MHz</td></tr><tr><td>Modulation Type:</td><td>ASK</td></tr><tr><td>Number Of Channel</td><td>1CH.</td></tr><tr><td>Antenna Designation:</td><td>Induction coil</td></tr></table>	Operation Frequency:	13.56MHz	Modulation Type:	ASK	Number Of Channel	1CH.	Antenna Designation:	Induction coil
Operation Frequency:	13.56MHz								
Modulation Type:	ASK								
Number Of Channel	1CH.								
Antenna Designation:	Induction coil								
Adapter	<p>Model: HJ-0502000W2-US</p> <p>Input: AC 100-240V~50/60Hz 0.3A</p> <p>Output: DC 5V---2000mA</p>								
Battery	DC 3.8V, 6200mAh, 23.56Wh								
Power supply	DC 3.8V from battery or DC 5V from Adapter.								
HW Version	GT78VN_MB_R0.2								
SW Version	N/A								

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

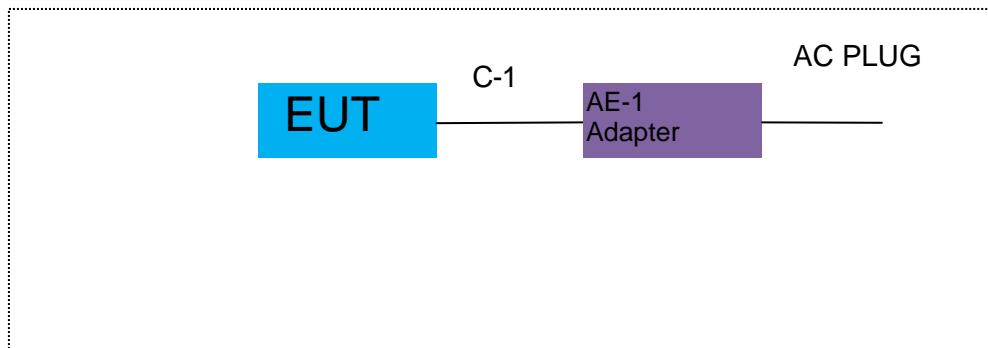
Pretest Mode	Description
Mode 1	TX-13.56MHz

For Conducted Emission	
Final Test Mode	Description
Mode 1	TX-13.56MHz

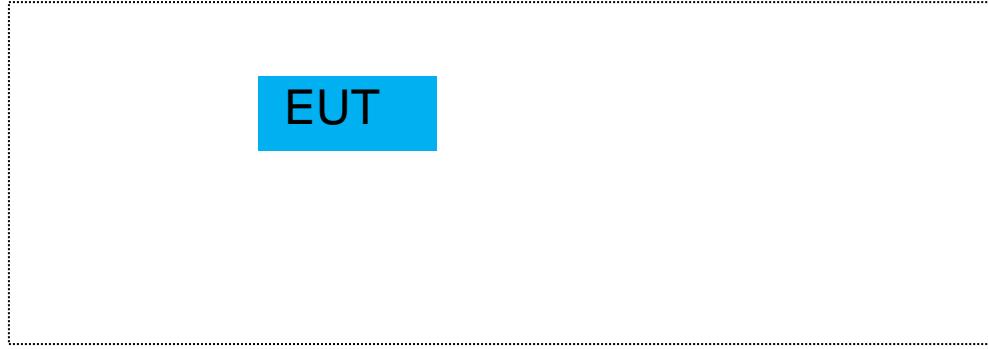
For Radiated Emission	
Final Test Mode	Description
Mode 1	TX-13.56MHz

### 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

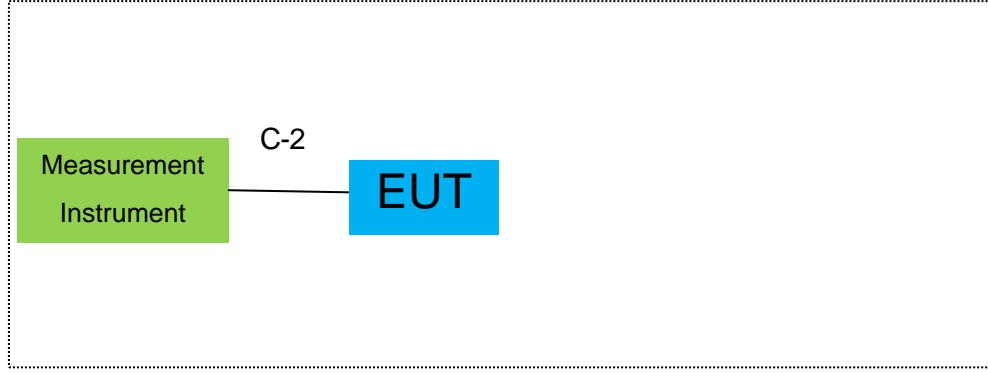
For AC Conducted Emission Mode



For Radiated Test Cases



For Conducted Test Cases



Note:1.The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

2.EUT built-in battery-powered, the battery is fully-charged.

## 2.4 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

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.

Item	Equipment	Model/Type No.	Series No.	Note
AE-1	Adapter	HJ-0502000W2-US	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable	YES	NO	1.0m	
C-2	RF Cable	YES	NO	0.1m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation& Conducted Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2021.04.27	2022.04.26	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2021.04.27	2022.04.26	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2021.04.27	2022.04.26	1 year
4	Test Receiver	R&S	ESPI7	101318	2021.04.27	2022.04.26	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2021.03.29	2022.03.28	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2021.03.29	2022.03.28	1 year
8	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	055	2020.11.19 2021.11.07	2021.11.18 2022.11.06	1 year
9	LF Cable	N/A	R-03	N/A	2020.05.11	2023.05.10	3 year
10	PSG Analog Signal Generator	Agilent	E8257D	MY51110112	2021.07.13	2022.07.12	1 year
11	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2020.05.11	2023.05.10	3 year
12	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2020.05.11	2023.05.10	3 year

### AC Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2021.04.27	2022.04.26	1 year
2	LISN	R&S	ENV216	101313	2021.04.27	2022.04.26	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2021.04.27	2022.04.26	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2020.05.11	2023.05.10	3 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2020.05.11	2023.05.10	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2020.05.11	2023.05.10	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2020.05.11	2023.05.10	3 year

#### Note:

1. We will use the temporary antenna connector (soldered on the PCB board) When conducted test  
And this temporary antenna connector is listed within the instrument list
2. Each piece of equipment is scheduled for calibration once a year except the Test Cable& Aux Equipment which is scheduled for calibration every 3 years.

### 3. ANTENNA REQUIREMENT

#### 3.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

#### 3.2 EUT ANTENNA

The EUT antenna is permanent attached antenna. It comply with the standard requirement.

## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

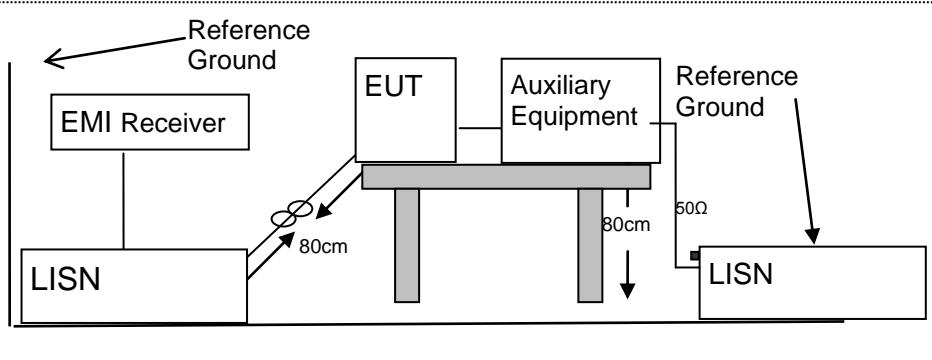
Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56*	56-46*
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. \*Decreases with the logarithm of the frequency

2. The lower limit shall apply at the transition frequencies

3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

#### 4.1.2 TEST CONFIGURATION



#### 4.1.3 TEST PROCEDURE

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
9. For the actual test configuration, please refer to the related Item –EUT Test Photos.

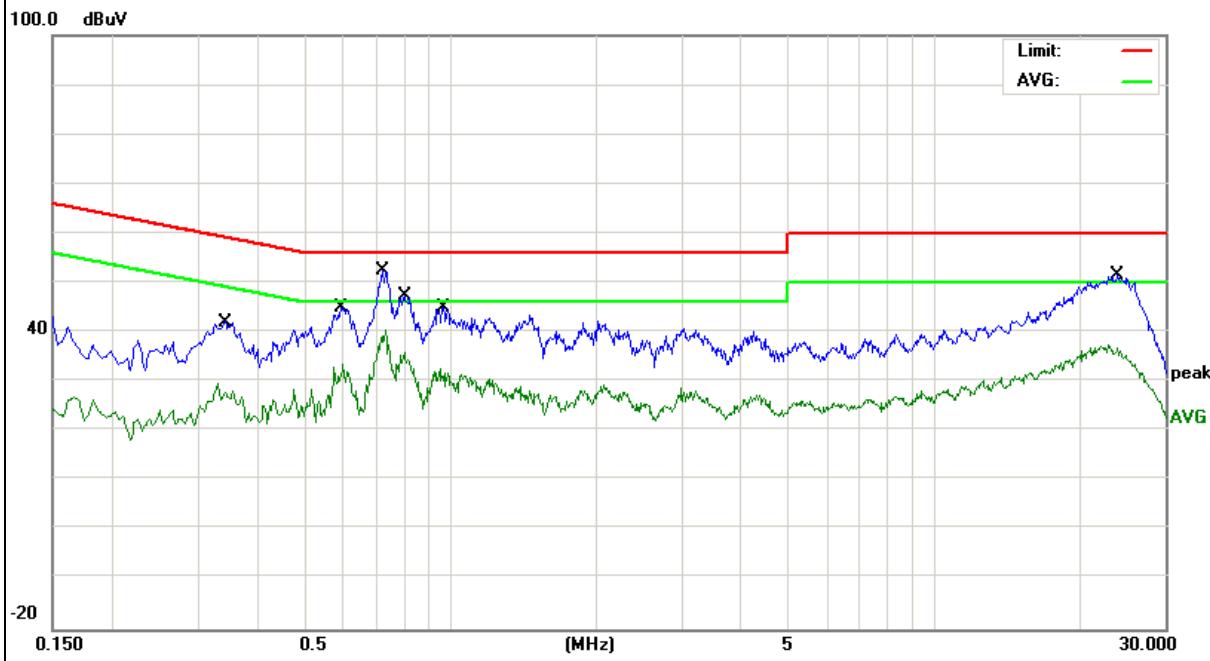
#### 4.1.4 TEST RESULT

EUT :	Rugged Android Tablet	Model Name :	GT78-VN
Temperature :	22 °C	Relative Humidity :	57%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Mode 1

Frequency (MHz)	Reading Level (dB $\mu$ V)	Correct Factor (dB)	Measure-ment (dB $\mu$ V)	Limits (dB $\mu$ V)	Margin (dB)	Remark
0.3420	32.47	9.63	42.10	59.15	-17.05	QP
0.3420	18.26	9.63	27.89	49.15	-21.26	AVG
0.5939	35.22	9.69	44.91	56.00	-11.09	QP
0.5939	23.97	9.69	33.66	46.00	-12.34	AVG
0.7219	42.64	9.74	52.38	56.00	-3.62	QP
0.7219	29.45	9.74	39.19	46.00	-6.81	AVG
0.8020	37.68	9.74	47.42	56.00	-8.58	QP
0.8020	26.12	9.74	35.86	46.00	-10.14	AVG
0.9659	35.27	9.75	45.02	56.00	-10.98	QP
0.9659	22.03	9.75	31.78	46.00	-14.22	AVG
23.9020	41.54	9.86	51.40	60.00	-8.60	QP
23.9020	26.87	9.86	36.73	50.00	-13.27	AVG

##### Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

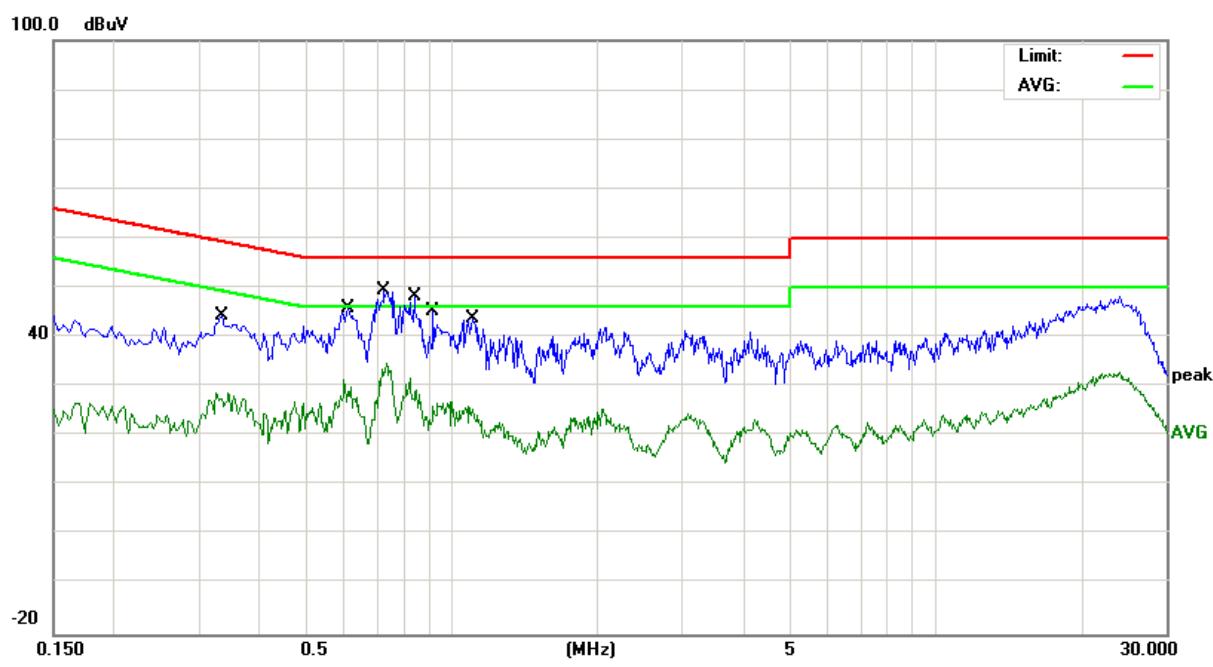


EUT :	Rugged Android Tablet	Model Name :	GT78-VN
Temperature :	22 °C	Relative Humidity :	57%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V)	(dB $\mu$ V)	(dB)	
0.3339	34.71	9.67	44.38	59.35	-14.97	QP
0.3339	16.33	9.67	26.00	49.35	-23.35	AVG
0.6097	36.11	9.68	45.79	56.00	-10.21	QP
0.6097	19.11	9.68	28.79	46.00	-17.21	AVG
0.7258	39.68	9.65	49.33	56.00	-6.67	QP
0.7258	22.76	9.65	32.41	46.00	-13.59	AVG
0.8378	17.99	9.69	27.68	46.00	-18.32	AVG
0.8378	38.61	9.69	48.30	56.00	-7.70	QP
0.9140	35.57	9.72	45.29	56.00	-10.71	QP
0.9140	15.07	9.72	24.79	46.00	-21.21	AVG
1.1019	33.99	9.74	43.73	56.00	-12.27	QP
1.1019	15.78	9.74	25.52	46.00	-20.48	AVG

## Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 Radiated Emission Limits ( FCC 15.209 )

Frequencies (MHz)	Field Strength (micorvolts/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

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).
- (3) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

### LIMITS OF RADIATED EMISSION MEASUREMENT ( FCC 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, equal to 124dBuV/m at 3 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, equal to 90.5dBuV/m at 3 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, equal to 80.5dBuV/m at 3 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.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

#### 4.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz And above 1GHz,
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

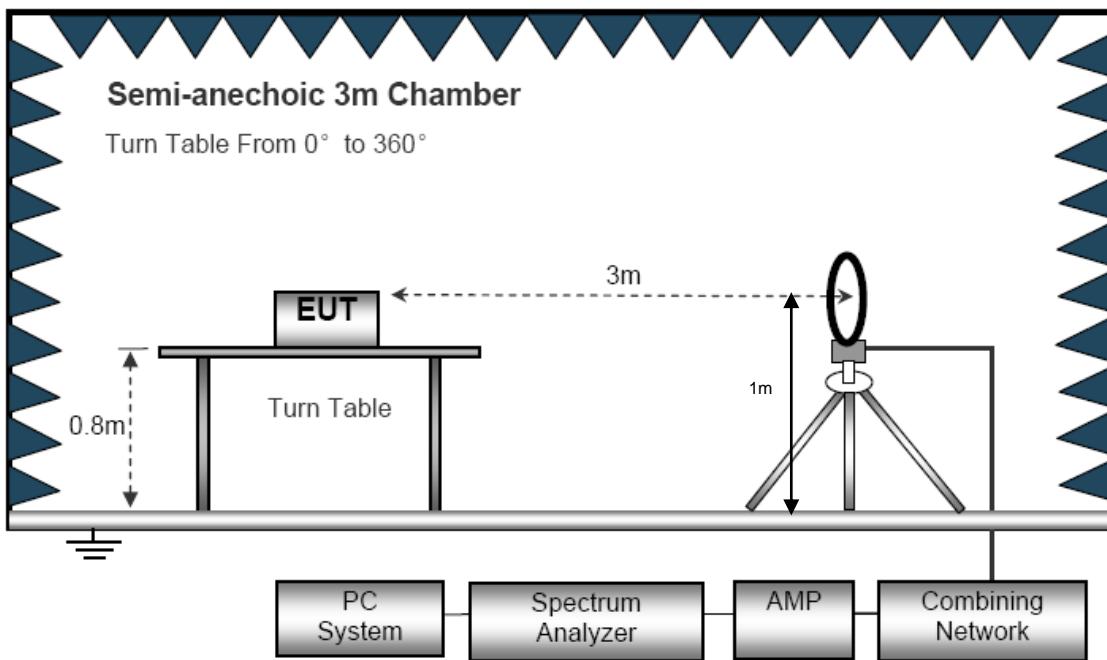
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

#### 4.2.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.4 TEST SETUP

##### (A) Radiated Emission Test-Up Frequency Below 30MHz



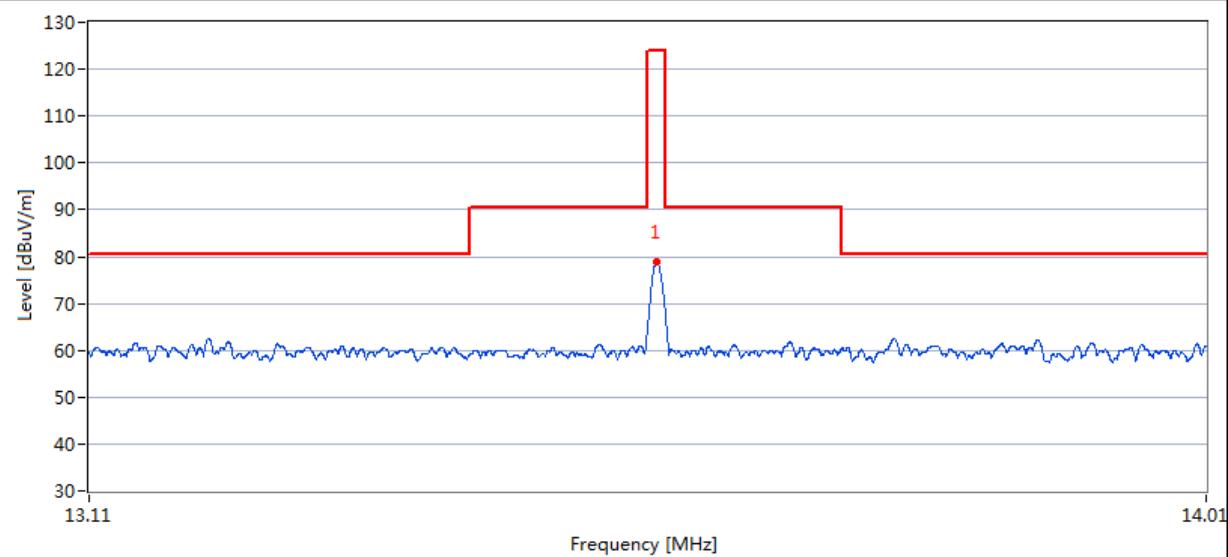
##### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



#### 4.2.5 TEST RESULTS (BELOW 30MHz)

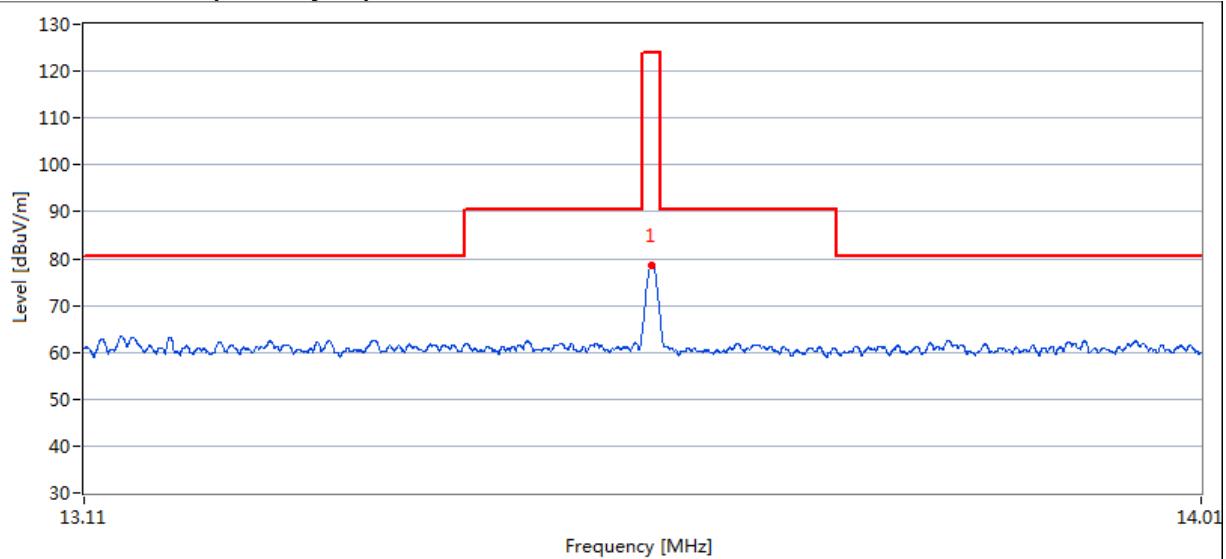
EUT :	Rugged Android Tablet	Model Name. :	GT78-VN
Temperature :	20 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Voltage :	DC 3.8V
Test Mode :	TX-13.56MHz		

##### Measurement Plot (Polarity: X):

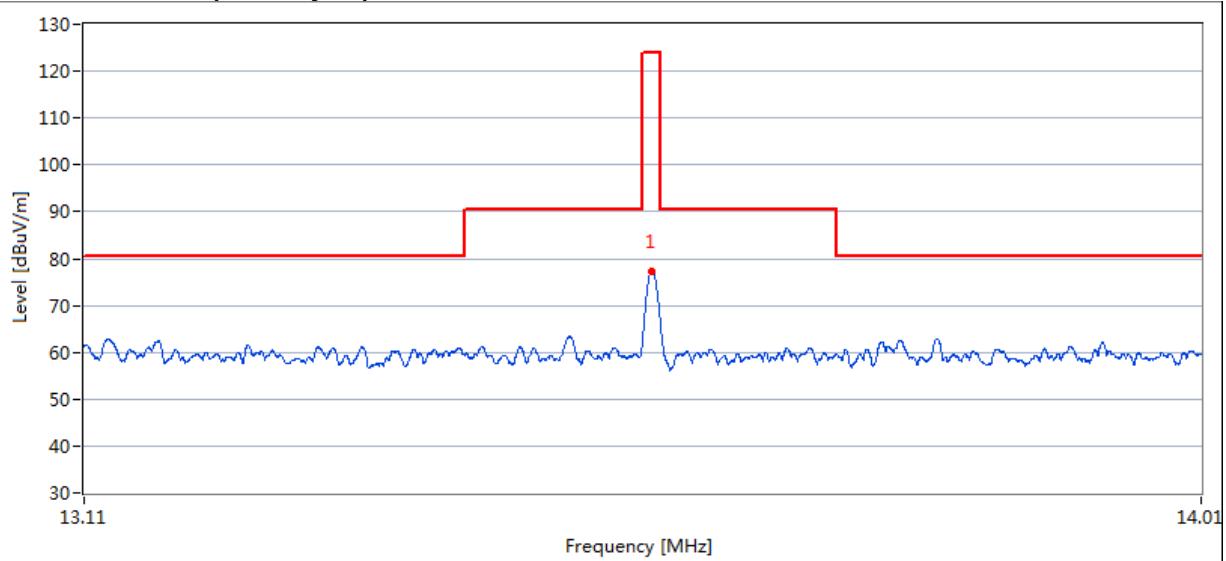


##### Measurement Result:

Frequency MHz	Pre-scan Level MaxPeak dBuV/m	Final Test Level MaxPeak dBuV/m	Limit MaxPeak dBuV/m	Margin dB
13.559	78.5	78.2	124.0	45.8

**Measurement Plot (Polarity: Y):****Measurement Result:**

Frequency MHz	Pre-scan Level MaxPeak dBuV/m	Final Test Level MaxPeak dBuV/m	Limit MaxPeak dBuV/m	Margin dB
13.560	78.5	77.3	124.0	46.7

**Measurement Plot (Polarity: Z):****Measurement Result:**

Frequency MHz	Pre-scan Level MaxPeak dBuV/m	Final Test Level MaxPeak dBuV/m	Limit MaxPeak dBuV/m	Margin dB
13.560	77.1	76.5	124.0	47.5

Spurious emissions at 9KHz~13.110MHz &amp; 14.010MHz~30MHz

Frequency (MHz)	Ant.Pol. dB $\mu$ V @3m	Emission Level (dB $\mu$ V/m)	Limits dB $\mu$ V/m @3m	Margin (dB)	Detector
		@3m			
0.144	X	45.86	104.437	-58.58	Avg
0.158	X	46.22	103.631	-57.41	Avg
0.258	X	45.58	99.372	-53.79	Avg
0.462	X	46.23	114.311	-68.08	Avg
10.527	X	45.55	69.54	-23.99	QP
12.632	X	43.25	69.54	-26.29	QP

## Note:

Below 30MHz, Pre-test the X, Y, Z axis to find X axis is worst case, so only record X axis test data.

X: Field strength which this device generates since the position of the charging coil and loop antenna differ by 0 degrees.

Y: Field strength which this device generates since the position of the charging coil and loop antenna differ by 90 degrees.

Z: Field strength which this device generates since the position of the charging coil and loop antenna differ by 180 degrees

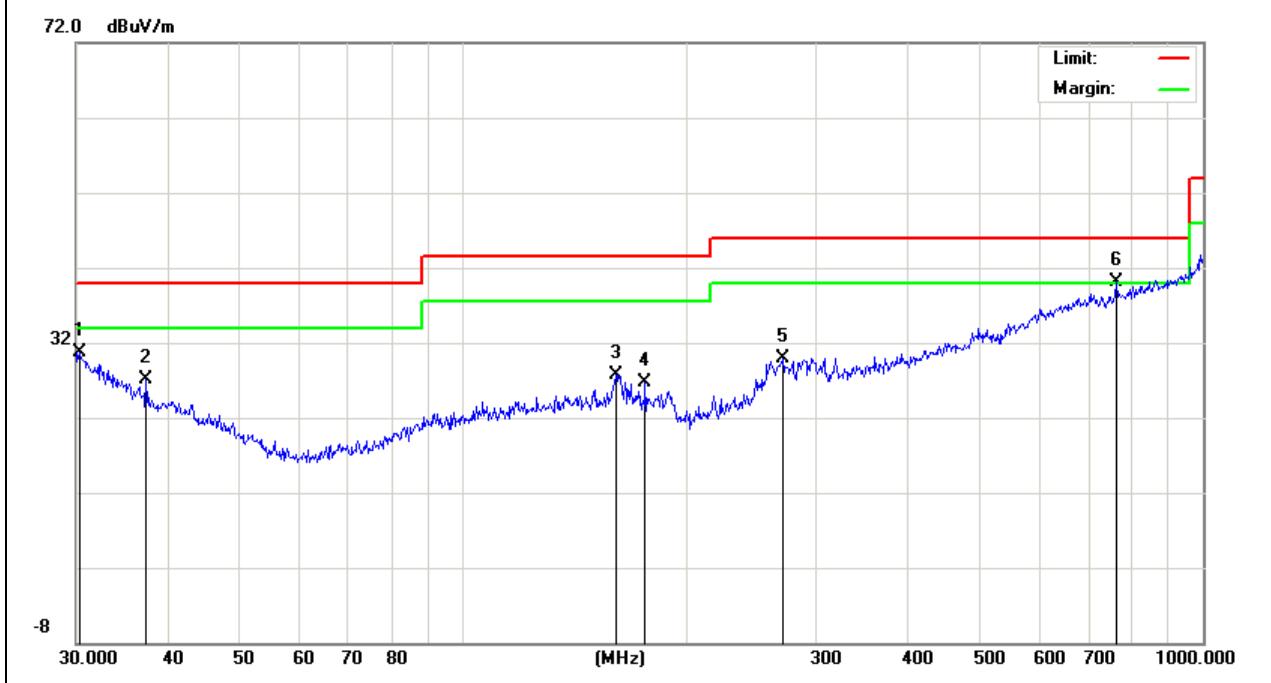
#### 4.2.6 TEST RESULTS (BETWEEN 30 – 1000 MHZ)

EUT :	Rugged Android Tablet	Model Name :	GT78-VN
Temperature :	22 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Voltage :	DC 3.8V
Test Mode :	TX	Polarization :	Horizontal

Freq. (MHz)	Reading (dB $\mu$ V/m)	Factor (dB)	Measurement (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over (dB)	Detector
30.317	5.8	24.88	30.68	40	-9.32	QP
37.2854	7.35	19.68	27.03	40	-12.97	QP
160.9088	9.27	18.49	27.76	43.5	-15.74	QP
176.2684	9.47	17.16	26.63	43.5	-16.87	QP
270.3747	8.22	21.75	29.97	46	-16.03	QP
763.3757	8.15	31.91	40.06	46	-5.94	QP

Remark:

Factor = Antenna Factor + Cable Loss.

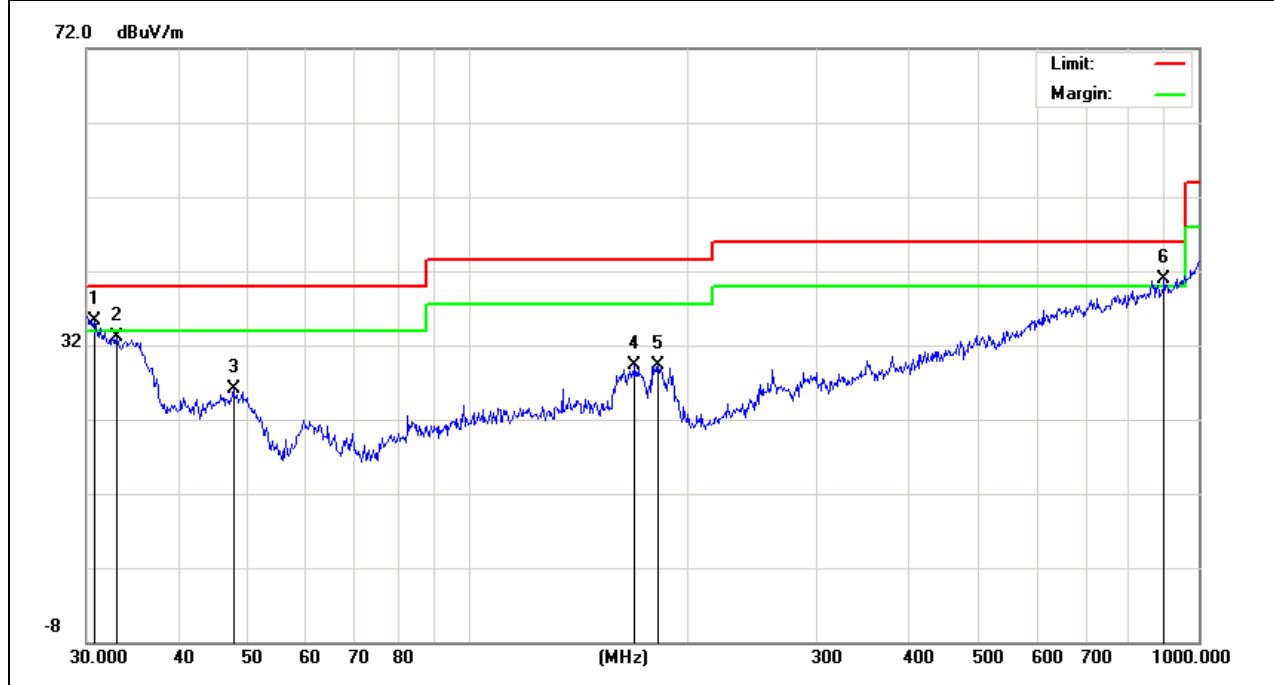


EUT :	Rugged Android Tablet	Model Name :	GT78-VN
Temperature :	25°C	Relative Humidity :	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.8V
Test Mode :	TX	Polarization :	Vertical

Freq. (MHz)	Reading (dB $\mu$ V/m)	Factor (dB)	Measurement (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over (dB)	Detector
						QP
30.7454	10.81	24.43	35.24	40	-4.76	QP
32.9791	10.65	22.54	33.19	40	-6.81	QP
47.6584	10.1	15.98	26.08	40	-13.92	QP
169.0054	12	17.26	29.26	43.5	-14.24	QP
181.9199	12.52	16.86	29.38	43.5	-14.12	QP
896.9963	7.16	33.74	40.9	46	-5.1	QP

Remark:

Factor = Antenna Factor + Cable Loss.



## 5. BANDWIDTH TEST

### 5.1 TEST PROCEDURE

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
2. 20dB Bandwidth the resolution bandwidth of 1 kHz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

### 5.2 DEVIATION FROM STANDARD

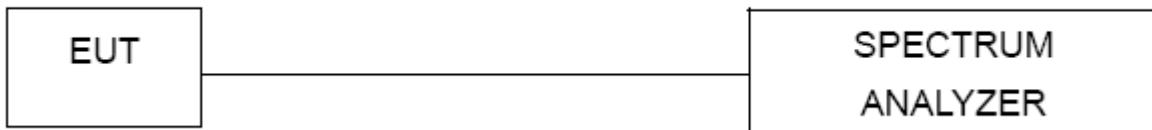
15.215

(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

FCC Part15.225

Operation within the band 13.110 – 14.010MHz

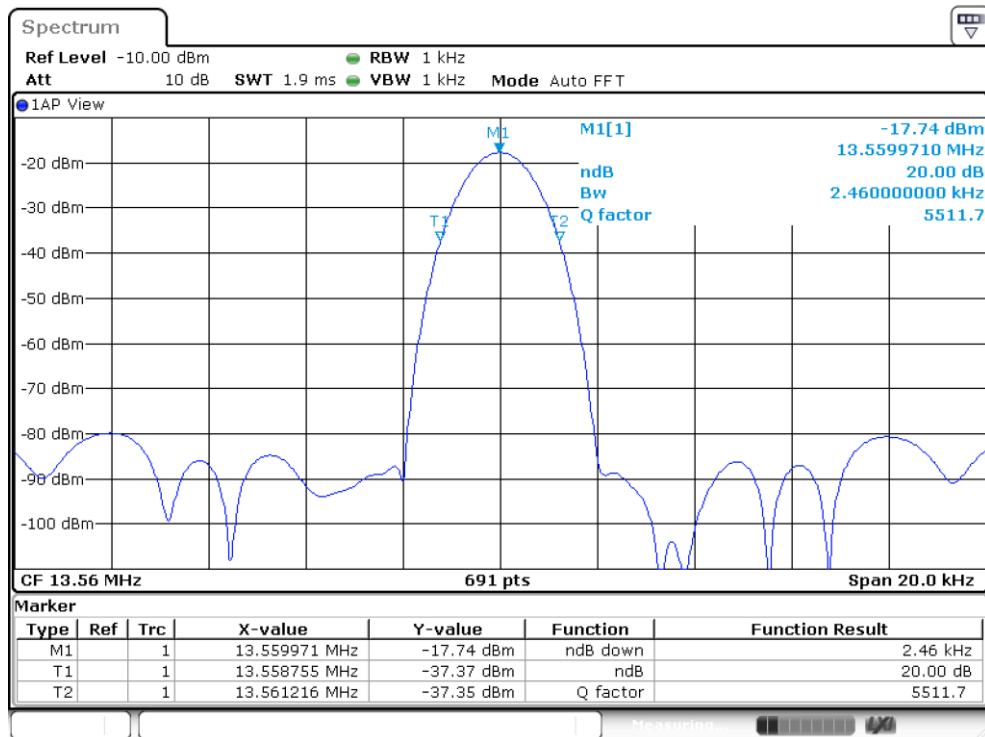
### 5.3 TEST SETUP



## 5.4 TEST RESULTS

EUT :	Rugged Android Tablet	Model Name :	GT78-VN
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1020 hPa	Test Power :	DC 3.8V
Test Mode :	TX		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (kHz)
CH01	13.56	2.46



## 6. FREQUENCY TOLERANCE

### 6.1 Requirement:

Test Requirement: FCC Part15.225

Test Method: ANSI C63.4:2014

Requirement: The frequency tolerance of the carrier signal shall be maintained within +/- 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.

### 6.2 Test Procedure

- 1.The EUT was placed on a turn table which is 0.8m above ground plane.
- 2.Set EUT as normal operation
- 3.Set SPA Center Frequency = fundamental frequency, RBW, VBW= 10kHz, Span =100kHz.
- 4.Set SPA Max hold. Mark peak.

**Test Result**

Power Supply	Temperature (°C)	Measured Frequency (MHz)	Frequency Error (MHz)	Result (ppm)	Part 15.225 Limit
DC 4.2V	-20	13.56032	0.0003197	23.58	+/- 0.01%(100ppm)
	20	13.55973	-0.0002657	-19.60	+/- 0.01%(100ppm)
	50	13.56019	0.000189	13.94	+/- 0.01%(100ppm)
DC 3.8V	-20	13.56022	0.0002157	15.90	+/- 0.01%(100ppm)
	20	13.56057	0.0005657	41.72	+/- 0.01%(100ppm)
	50	13.55926	-0.0007424	-54.75	+/- 0.01%(100ppm)
DC 3.4V	-20	13.56088	0.0008772	64.69	+/- 0.01%(100ppm)
	20	13.56028	0.0002807	20.70	+/- 0.01%(100ppm)
	50	13.56046	0.0004571	33.71	+/- 0.01%(100ppm)

**END OF REPORT**