

FCC Test Report

FCC ID: 2AUVRTVE1021G

Product: Tablet PC
Trade Mark: N/A
Model Number: TVE1021G
Family Model: N/A
Report No.: S19091601902005

Prepared for

LPG SYSTEMS SAS
LPG SYSTEMS SAS Technoparc de la Plaine 30 Rue du Dc Henri Abel
CS 90035 26902 Valence Cedex 09 - FRANCE

Prepared by

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TEST RESULT CERTIFICATION**Applicant's name**: LPG SYSTEMS SASAddress: LPG SYSTEMS SAS Technoparc de la Plaine 30 Rue du Dc Henri
Abel CS 90035 26902 Valence Cedex 09 - FRANCE**Manufacturer's Name**: LPG SYSTEMS SASAddress: LPG SYSTEMS SAS Technoparc de la Plaine 30 Rue du Dc Henri
Abel CS 90035 26902 Valence Cedex 09 - FRANCE**Product description**

Product name.....: Tablet PC

Model and/or type reference ..: TVE1021G

Family Model.....: N/A

Standards.....: FCC Part15B

ANSI C63.4:2014

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. 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: 24 Sep. 2019 ~ 21 Oct, 2019

Date of Issue: 21 Oct, 2019

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

Testing Engineer : _____

Jerry Xie

(Jerry Xie)

Technical Manager : _____

Jason Chen

(Jason Chen)

Authorized Signatory : _____

Sam. Chen

(Sam Chen)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B ANSI C63.4: 2014	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd

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

FCC Registration Number:463705; IC Registration Number:9270A-1

CNAS Registration Number:L5516

1.2 MEASUREMENT UNCERTAINTY

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

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.2	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~12.4GHz	5.0	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Tablet PC		
Trade Mark	N/A		
Model Name	TVE1021G		
Family Model	N/A		
Model Difference	N/A		
Product Description	The EUT is a Tablet PC.		
	Connecting I/O port:	Micro USB, Earphone	
	Operation Frequency:	2.568GHz	
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Power Source	DC 12V from Adapter.		
Adapter	N/A		
HW Version	PCBA,M/B,TVE1021G_M-V1.1.2-32G-S-(RK3399+8223)2GDDR		
SW Version	update_nougat_rk3399_TVE1020G_debug_20190909.095500_debug.zip		

2.1.1 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.

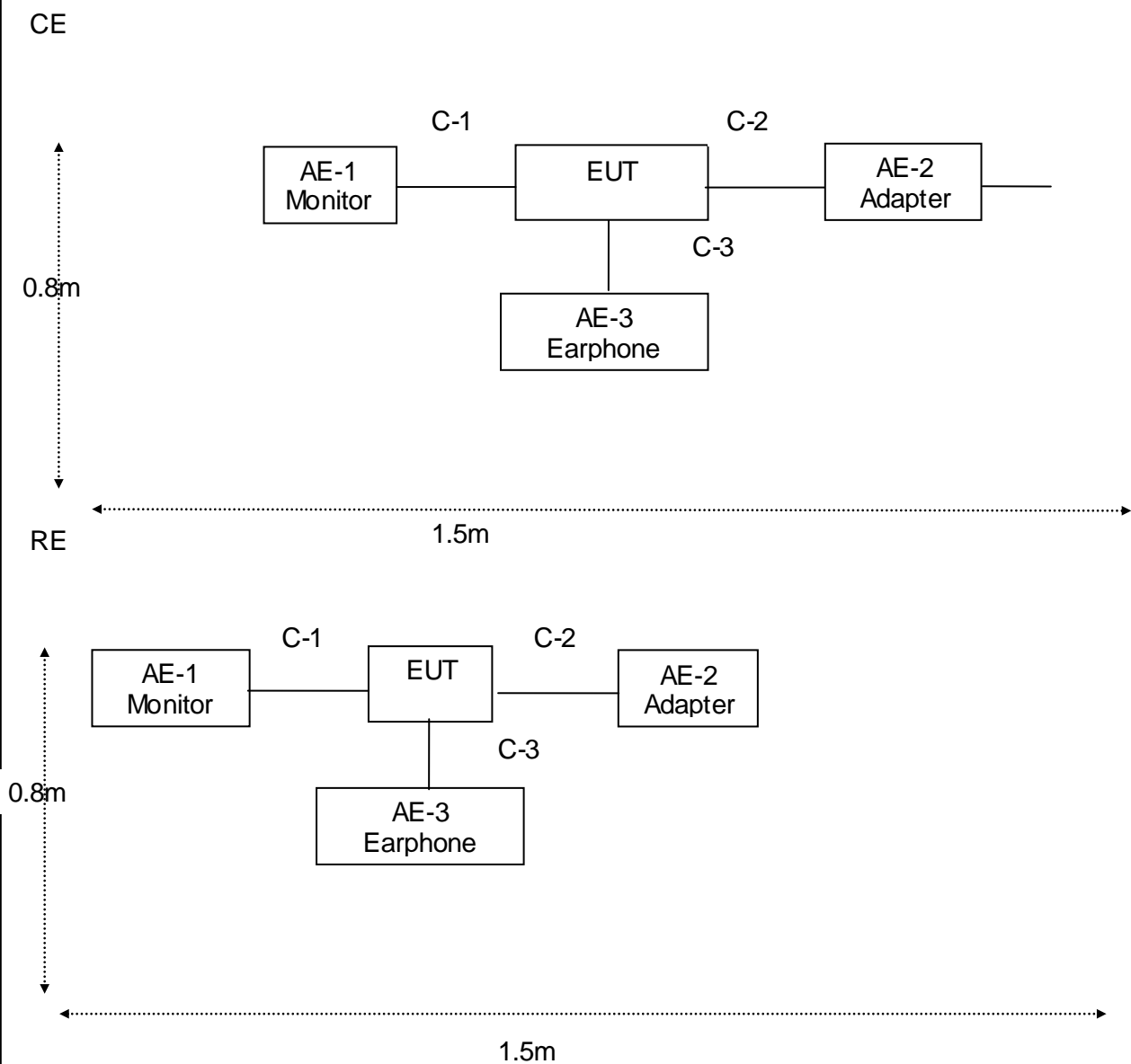
Pretest Mode	Description
Mode 1	U Disk Data Transmission
Mode 2	TF card Playing
Mode 3	REC
Mode 4	FM

For Conducted Test	
Final Test Mode	Description
Mode 1	U Disk Data Transmission
Mode 2	TF card Playing
Mode 3	REC
Mode 4	FM

For Radiated Test	
Final Test Mode	Description
Mode 1	U Disk Data Transmission
Mode 2	TF card Playing
Mode 3	REC
Mode 4	FM

Note: Final Test Mode: Through Pre-scan, find the mode 1 is the worst case.
Only the worst case mode is recorded in the report.

2.2 DESCRIPTION OF TEST SETUP



2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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	Brand	Model/Type No.	Series No.	Note
AE-1	Monitor	SHARP	N/A	N/A	Peripherals
AE-2	Adapter	N/A	N/A	N/A	Peripherals
AE-3	Earphone	N/A	N/A	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	HDMI Cable	YES	YES	1.0m	
C-2	Power Cable	NO	NO	1.2m	
C-3	Earphone Cable	NO	NO	1.2m	

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.
- (3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

2.4 MEASUREMENT INSTRUMENTS LIST

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2019.05.13	2020.05.12	1 year
2	Test Receiver	R&S	ESPI	101318	2019.05.13	2020.05.12	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2019.04.15	2020.04.14	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2019.05.13	2020.05.12	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2019.05.13	2020.05.12	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2019.04.15	2020.04.14	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2019.05.13	2020.05.12	1 year
8	Amplifier	EMC	EMC051835SE	980246	2019.08.06	2020.08.05	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2019.05.13	2020.05.12	1 year
10	Power Meter	DARE	RPR3006W	15100041S NO84	2019.08.06	2020.08.05	1 year
11	Power Sensor	R&S	URTVE1021G-Z4	0395.1619.05	2019.05.13	2020.05.12	1 year
12	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2017.04.21	2020.04.20	3 year
13	High Test Cable(1G-40 GHz)	N/A	R-03	N/A	2017.04.21	2020.04.20	3 year
14	High Test Cable(1G-40 GHz)	N/A	R-04	N/A	2017.04.21	2020.04.20	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	2019.05.13	2020.05.12	1 year
2	LISN	R&S	ENV216	101313	2019.04.15	2020.04.14	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2019.05.13	2020.05.12	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2019.05.13	2020.05.12	1 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2017.04.21	2020.04.20	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2017.04.21	2020.04.20	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2017.04.21	2020.04.20	3 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable which is scheduled for calibration every 3 years.

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

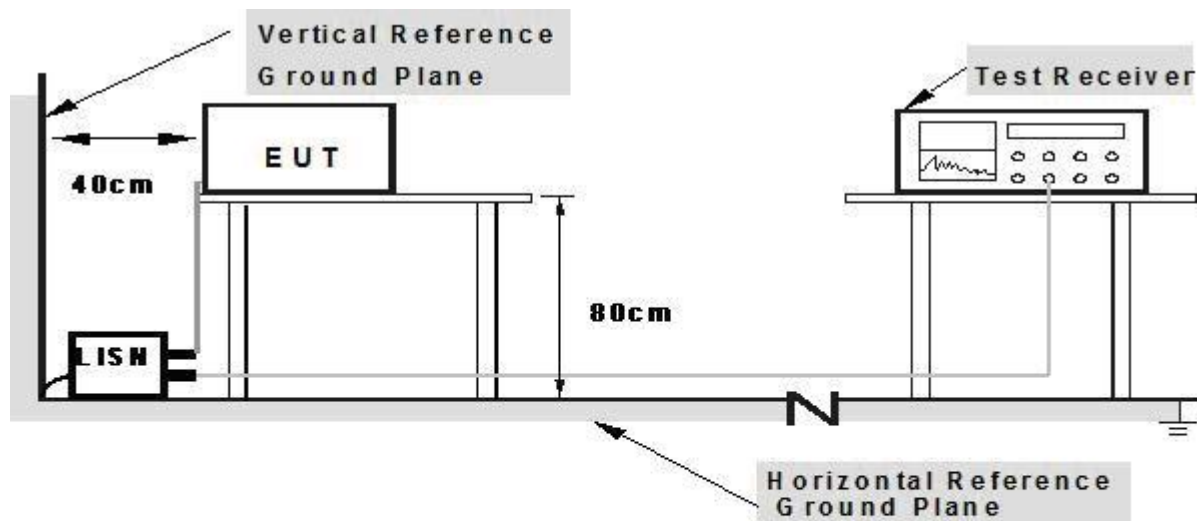
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected 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.
- 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 40 cm long.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

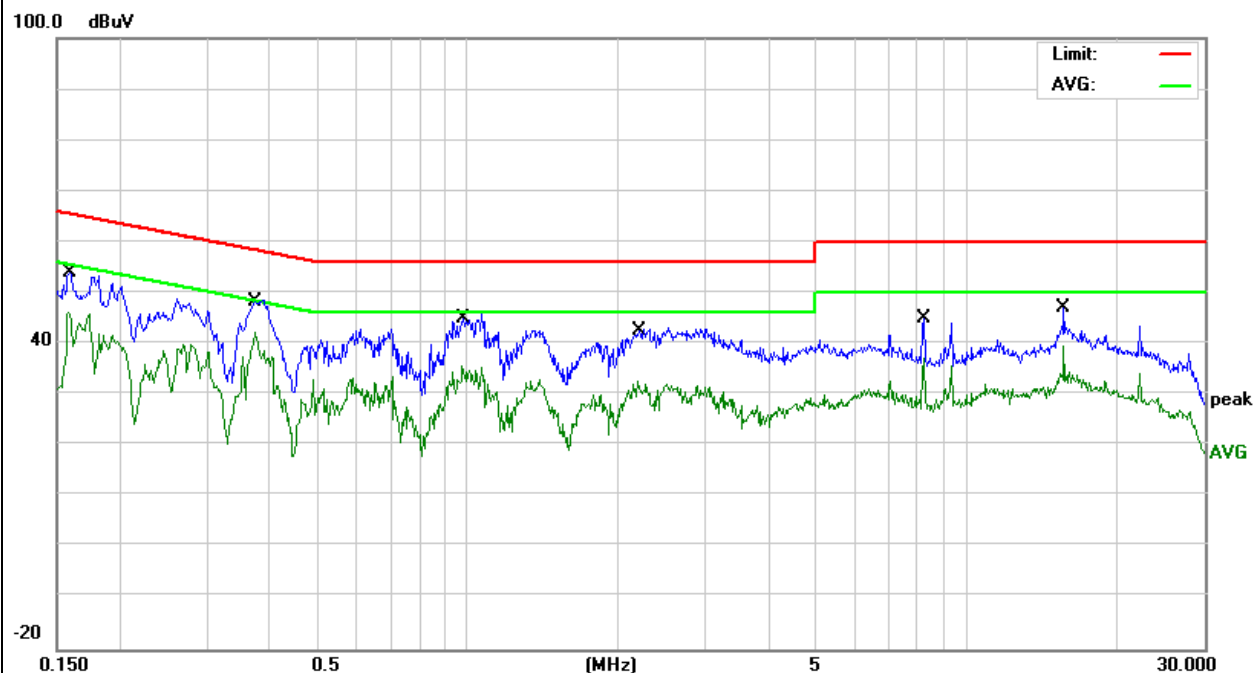
3.1.5 TEST RESULTS

EUT:	Tablet PC	Model Name. :	TVE1021G
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2019-10-10
Test Mode:	Mode 1	Phase :	L
Test Voltage:	DC 5V from PC (AC120V/60Hz)		

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1580	43.38	9.75	53.13	65.56	-12.43	QP
0.1580	36.30	9.75	46.05	55.56	-9.51	AVG
0.3738	38.48	9.74	48.22	58.41	-10.19	QP
0.3738	32.54	9.74	42.28	48.41	-6.13	AVG
0.9778	34.20	9.74	43.94	56.00	-12.06	QP
0.9778	25.92	9.74	35.66	46.00	-10.34	AVG
2.1899	31.95	9.78	41.73	56.00	-14.27	QP
2.1899	22.76	9.78	32.54	46.00	-13.46	AVG
8.2217	35.04	9.94	44.98	60.00	-15.02	QP
8.2217	27.14	9.94	37.08	50.00	-12.92	AVG
15.6897	36.87	10.11	46.98	60.00	-13.02	QP
15.6897	29.42	10.11	39.53	50.00	-10.47	AVG

Remark:

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

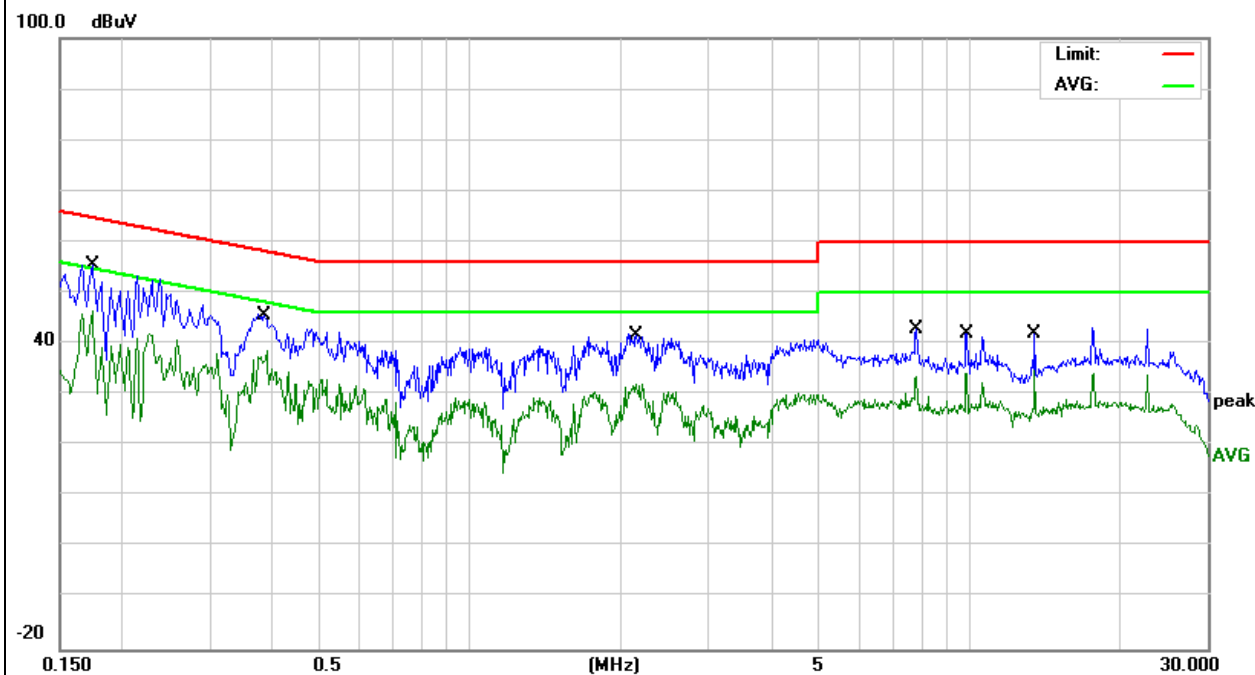


EUT:	Tablet PC	Model Name. :	TVE1021G
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2019-10-10
Test Mode:	Mode 1	Phase :	N
Test Voltage:	DC 5V from PC (AC120V/60Hz)		

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1737	45.79	9.73	55.52	64.78	-9.26	QP
0.1737	36.67	9.73	46.40	54.78	-8.38	AVG
0.3899	35.02	9.75	44.77	58.06	-13.29	QP
0.3899	28.93	9.75	38.68	48.06	-9.38	AVG
2.1459	31.99	9.80	41.79	56.00	-14.21	QP
2.1459	22.20	9.80	32.00	46.00	-14.00	AVG
7.8459	32.96	9.99	42.95	60.00	-17.05	QP
7.8459	23.60	9.99	33.59	50.00	-16.41	AVG
9.9059	31.91	10.05	41.96	60.00	-18.04	QP
9.9059	24.07	10.05	34.12	50.00	-15.88	AVG
13.4817	31.76	10.07	41.83	60.00	-18.17	QP
13.4817	24.54	10.07	34.61	50.00	-15.39	AVG

Remark:

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

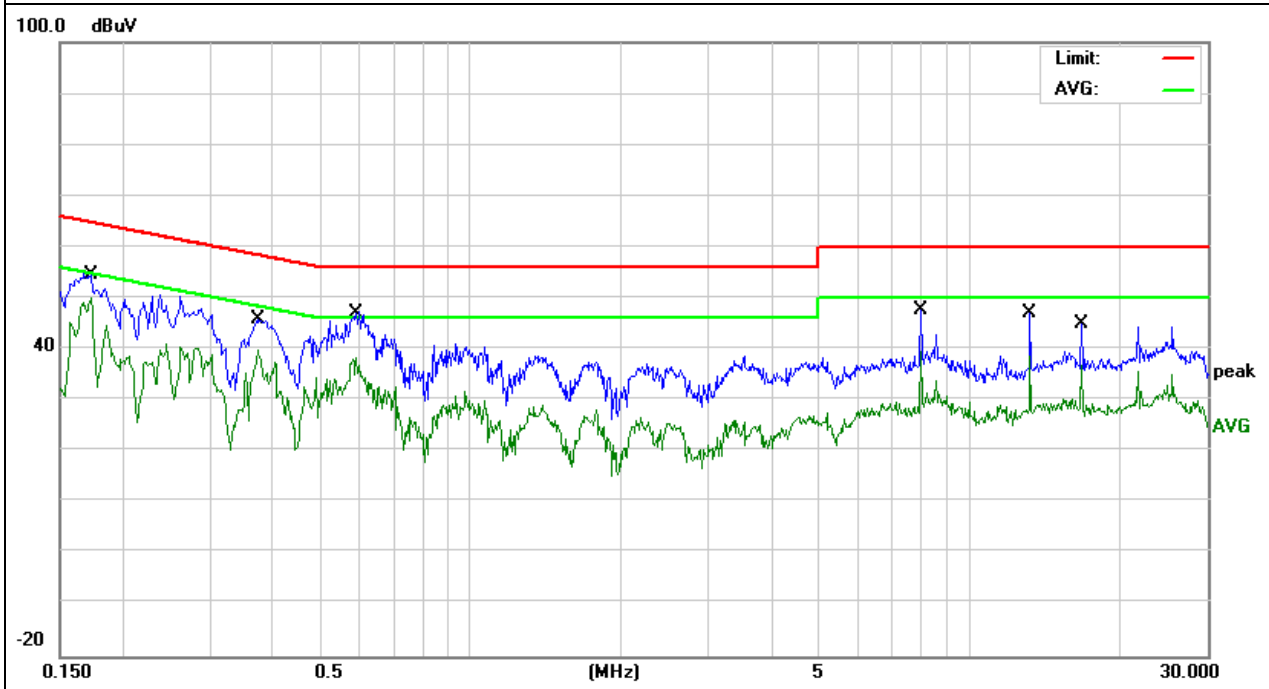


EUT:	Tablet PC	Model Name. :	TVE1021 G
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2019-10-10
Test Mode:	Mode 1	Phase :	L
Test Voltage:	DC 5V from PC (AC240V/60Hz)		

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1728	44.80	9.76	54.56	64.82	-10.26	QP
0.1728	40.34	9.76	50.10	54.82	-4.72	AVG
0.3738	35.98	9.74	45.72	58.41	-12.69	QP
0.3738	30.04	9.74	39.78	48.41	-8.63	AVG
0.5897	37.22	9.74	46.96	56.00	-9.04	QP
0.5897	28.54	9.74	38.28	46.00	-7.72	AVG
8.0059	37.81	9.93	47.74	60.00	-12.26	QP
8.0059	29.63	9.93	39.56	50.00	-10.44	AVG
13.2659	36.96	10.07	47.03	60.00	-12.97	QP
13.2659	28.56	10.07	38.63	50.00	-11.37	AVG
16.8139	34.89	10.15	45.04	60.00	-14.96	QP
16.8139	26.81	10.15	36.96	50.00	-13.04	AVG

Remark:

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

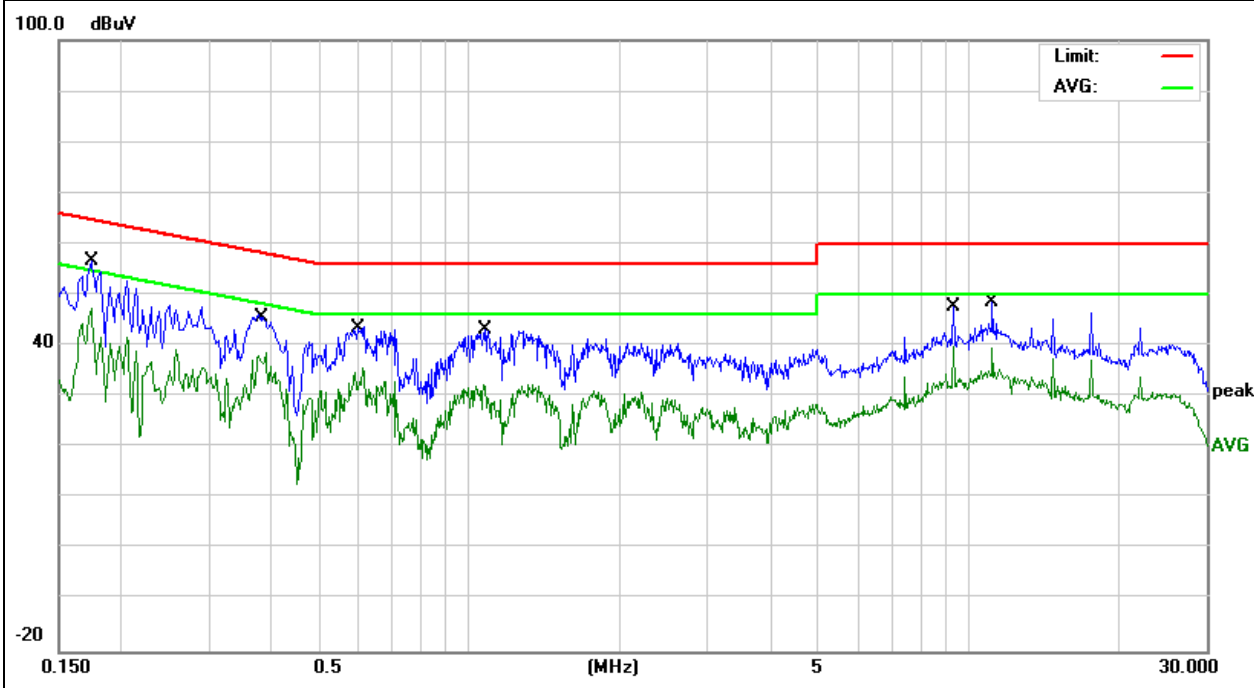


EUT:	Tablet PC	Model Name. :	TVE1021G
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date:	2019-10-10
Test Mode:	Mode 1	Phase :	N
Test Voltage:	DC 5V from PC (AC240V/60Hz)		

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1737	46.79	9.73	56.52	64.78	-8.26	QP
0.1737	37.67	9.73	47.40	54.78	-7.38	AVG
0.3899	35.02	9.75	44.77	58.06	-13.29	QP
0.3899	28.93	9.75	38.68	48.06	-9.38	AVG
0.6097	32.30	9.75	42.05	56.00	-13.95	QP
0.6097	25.98	9.75	35.73	46.00	-10.27	AVG
1.0660	32.31	9.75	42.06	56.00	-13.94	QP
1.0660	22.65	9.75	32.40	46.00	-13.60	AVG
9.3258	37.75	10.03	47.78	60.00	-12.22	QP
9.3258	29.69	10.03	39.72	50.00	-10.28	AVG
11.1699	38.54	10.05	48.59	60.00	-11.41	QP
11.1699	29.43	10.05	39.48	50.00	-10.52	AVG

Remark:

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



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

Test Arrangement for Radiated Emissions up to 1 GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. 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 is a broadband antenna, and its 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency below 1GHz.

Test Arrangement for Radiated Emissions above 1 GHz.

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited chamber room. 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 height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

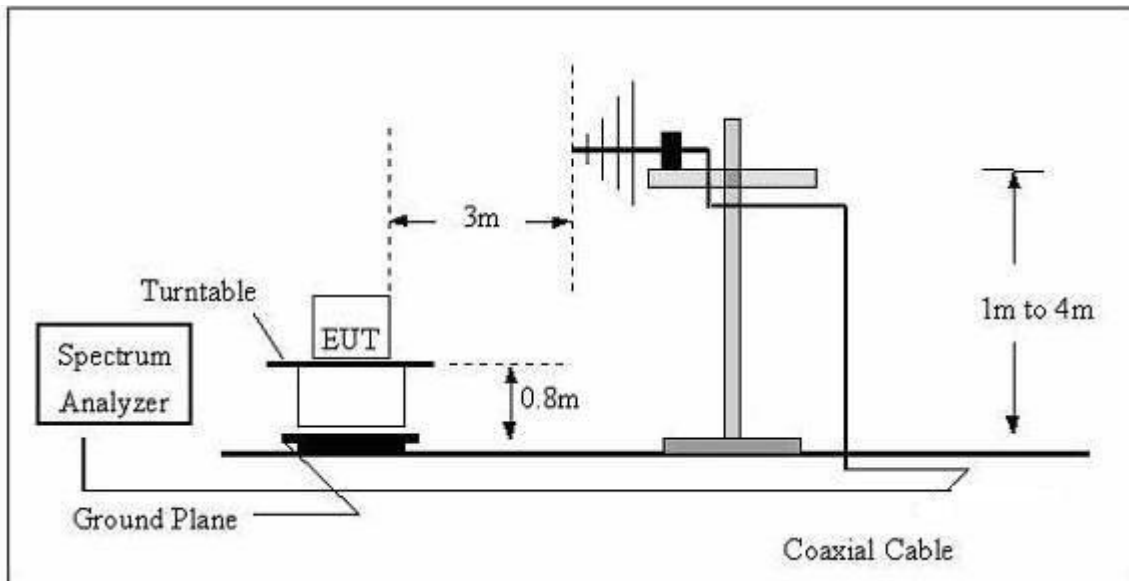
Note: For the hand-held device, the EUT should be measured for all 3 axes and only the worst case is recorded in the report

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

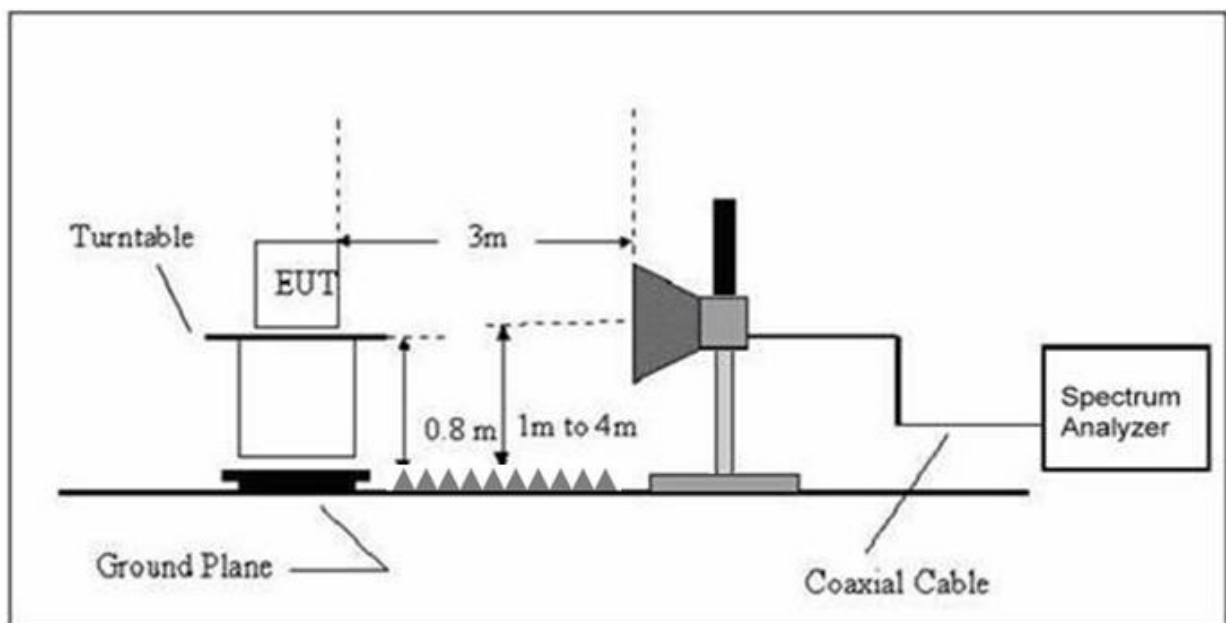
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Avg	1 MHz	10 Hz

3.2.3 TEST SETUP

For Radiated Emission 30~1000MHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz



3.2.4 TEST RESULTS

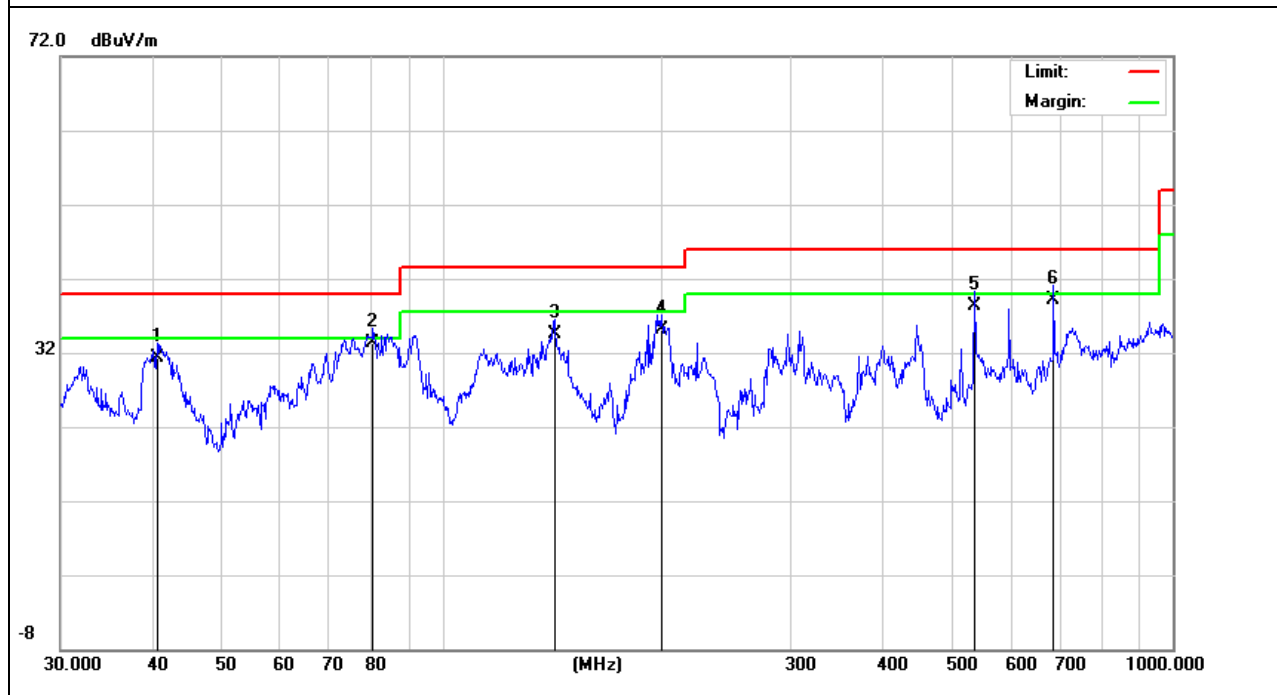
TEST RESULTS (30~1000 MHz)

EUT:	Tablet PC	Model Name:	TVE1021G
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Test Date :	2019-10-10
Test Mode :	Mode 1	Polarization :	Horizontal
Test Power :	DC 5V from PC (AC120V/60Hz)		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	40.7014	17.80	13.52	31.32	40.00	-8.68	QP
H	80.3619	25.18	8.13	33.31	40.00	-6.69	QP
H	142.3240	22.14	12.27	34.41	43.50	-9.09	QP
H	199.2855	26.56	8.55	35.11	43.50	-8.39	QP
H	535.7073	17.35	20.99	38.34	46.00	-7.66	QP
H	687.1507	16.49	22.64	39.13	46.00	-6.87	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



EUT:	Tablet PC	Model Name :	TVE1021G
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Test Date :	2019-10-10
Test Mode :	Mode 1	Polarization :	Vertical
Test Power :	DC 5V from PC (AC120V/60Hz)		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	53.5052	22.35	7.25	29.60	40.00	-10.40	QP
V	119.0180	23.22	12.33	35.55	43.50	-7.95	QP
V	212.2692	27.45	9.69	37.14	43.50	-6.36	QP
V	309.9977	19.92	14.84	34.76	46.00	-11.24	QP
V	411.8240	23.68	18.26	41.94	46.00	-4.06	QP
V	640.6109	16.66	22.35	39.01	46.00	-6.99	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



3.2.5 TEST RESULTS(1000~26500MHz)

EUT:	Tablet PC	Model Name :	TVE1021G
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Test Date :	2019-10-10
Test Mode :	Mode 1		
Test Power :	DC 5V from PC (AC120V/60Hz)		

All the modulation modes have been tested, and the worst result was report as below:

Polar (H/V)	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Remark
V	2790	41.91	-2.8	39.19	74	-34.81	peak
V	7034.5	-7.43	50.57	43.16	74	-30.84	peak
V	10612	-7.68	56.44	49.26	74	-24.74	peak
V	13244	-9.16	60.82	51.16	74	-22.84	peak
H	2935	41.13	-2.45	38.67	74	-35.33	peak
H	5576.5	33.44	7.45	40.89	74	-33.11	peak
H	10562.5	-7.44	56.38	48.94	74	-25.06	peak
H	13367.5	-9.15	60.91	51.26	74	-22.74	peak

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

Note: Only the worst results data points are reported in the report.