

# EMC Test Report

Report No.: CTA231220002E04

Issued for

Shanghai UniOne Science&Technology CO., Ltd.  
Building 4, No.651 Wanfang Road, Pujiang Town, Minhang  
District, Shanghai, China.

Product Name: Rugged Windows Tablet

Brand Name: N/A

Model Name: GTW6101

Series Model(s): N/A

Test Standards: FCC 47 CFR Part 15: Subpart B

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen CTA Test Services Co., Ltd.



**TEST REPORT**

**Applicant's Name** ..... : Shanghai UniOne Science&Technology CO., Ltd.  
**Address** ..... : Building 4, No.651 Wanfang Road, Pujiang Town, Minhang District,  
Shanghai, China.

**Manufacturer's Name** ..... : Shanghai UniOne Science&Technology CO., Ltd.  
**Address** ..... : Building 4, No.651 Wanfang Road, Pujiang Town, Minhang District,  
Shanghai, China.

**Product Description** .....

**Product Name** ..... : Rugged Windows Tablet

**Brand Name** ..... : N/A

**Model Name** ..... : GTW6101

**Series Model(s)** ..... : N/A

**Test Standards** ..... : FCC 47 CFR Part 15: Subpart B

**Test Procedure** ..... : ANSI C63.4-2014

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

**Date of Receipt of Test Item** ..... : 07 Sept. 2023

**Date of Performance of Tests** ..... : 07 Sept. 2023 ~ 25 Dec. 2023

**Date of Issue** ..... : 25 Dec. 2023

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

**Testing Engineer** :

*Zoey Cao*

(Zoey Cao)

**Technical Manager** :

*Amy Wen*

(Amy Wen)

**Authorized Signatory** :

*Eric Wang*

(Eric Wang)

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**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	25 Dec. 2023	CTA231220002E04	ALL	Initial Issue

## 1. SUMMARY OF THE TEST RESULTS

Test procedures according to the technical standards:

EMISSION			
Standard	Item	Result	Remarks
FCC 47 CFR Part 15: Subpart B	Conducted Emission	N/A	Meet Class B limit
	Radiated Emission	PASS	Meet Class B limit

NOTE:

(1) N/A=Not Applicable.

## 1.1 TEST FACTORY

Shenzhen CTA Testing Technology Co., Ltd.

ROOM 106, BUILDING 1, YIBAOLAI INDUSTRIAL PARK, QIAOTOU COMMUNITY, FUHAI STREET, BAO'AN DISTRICT, SHENZHEN, CHINA

FCC TEST FIRM REGISTRATION NUMBER: 517856

IC TEST FIRM REGISTRATION NUMBER: 27890

A2LA CERTIFICATE NO.: 6534.01

IC CAB ID: CN0127

## 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 %.

Test	Range	Measurement Uncertainty
Radiated Emission	30~1000MHz	4.06 dB
Radiated Emission	1~18GHz	5.14 dB
Radiated Emission	18-40GHz	5.38 dB
Conducted Disturbance	0.15~30MHz	2.14 dB

## 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Rugged Windows Tablet	
Brand Name	N/A	
Model Name	GTW6101	
Series Model(s)	N/A	
Model Difference	N/A	
Product Description	<p>The EUT is a Rugged Windows Tablet</p> <p>ITE equipment having a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control of data and/or telecommunication messages and which may be equipped with one or more ports typically for information transfer.</p>	
Frequency Bands	Bluetooth	2402~2480 MHz
	2.4G WLAN	802.11b/g/n/ax(20MHz): 2412~2472MHz 802.11n/ax(40MHz):2422~2462MHz
	5G WLAN	802.11a/n/ac (20MHz): 5180~5240MHz 802.11n/ac (40MHz):5190~5230MHz 802.11ac (80MHz):5210MHz
	5.8G WLAN	802.11a/n/ac(20MHz): 5745~5825MHz 802.11n /ac(40MHz):5755~5795MHz 802.11ac(80MHz):5775MHz
	GPS	1575.42MHz
	GLONASS	1602MHz
	GALILEO	1575.42 MHz
	BDS	1561.098MHz
Modulation Mode	Bluetooth	BT BR(1Mbps): GFSK BT EDR(2Mbps): $\pi/4$ -DQPSK BT EDR(3Mbps): 8DPSK
	BLE	GFSK
	2.4G WLAN	802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM):BPSK,QPSK,16-QAM,64-QAM
	5G/5.8G WLAN	802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM 802.11ax(OFDM, OFDMA): BPSK,QPSK,16-QAM,64-QAM,256-QAM, 1024QAM

	GPS	BPSK
	GLONASS	FDMA
	GALILEO	CBOC
	BDS	QPSK
Rating	Input :DC20V, 3.25A	
Battery	Rated Voltage:7.6V Charge Limit Voltage:8.7V Capacity: 4500mAh	
Hardware Version Number	E7251LG3_MAIN_V3.0	
Software Version Number	R.MB.01.81.0x	

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

## 2.2 DESCRIPTION OF THE 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 possibly 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	Charging + Audio + Video + SD Card+USB+Earphone
Mode 2	Adapter + BT+ 2.4G WIFI
Mode 3	Adapter + BT+ 5G WIFI

For Radiated Test	
Final Test Mode	Description
Mode 1	Charging + Audio + Video + SD Card+USB+Earphone

### Note:

1. For radiated emission test, test mode 1 was the worst case and only this mode was presented in this report.
2. We have be tested for all avaiable U.S. voltage and frequencies (For 120V, 50/60Hz) for which the device is capable of operation.



### 2.3 DESCRIPTION OF THE TEST SETUP

The EUT has been tested with associated equipment below and the test setup please refer to appendix 1 - test setup.

#### Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
	Adapter	BANG	DSA-45PDH	N/A	N/A
	DC Cable	N/A	N/A	200cm	NO

#### Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
	SD Card	Sandisk	840XKT-FB	N/A	N/A
	U-disk	Sandisk	CZ73	N/A	N/A

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (2) “YES” is means “with core”; “NO” is means “without core”.

## 2.4 EQUIPMENTS LIST FOR ALL TEST ITEMS

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.

## Radiated Emission

Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2023/10/17	2024/10/16
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	CTA-306	2023/08/02	2024/08/01
3	Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2023/10/13	2024/10/12
4	Universal Radio Communication	CMW500	R&S	CTA-302	2023/08/02	2024/08/01
5	Band-reject filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-DZA66	CTA-410	2023/08/02	2024/08/01
6	Band-reject filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-DZA64	CTA-411	2023/08/02	2024/08/01
7	Band-reject filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-DZA63	CTA-411	2023/08/02	2024/08/01
8	High-pass filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-GTA10	CTA-412	2023/08/02	2024/08/01
9	High-pass filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-GTA18	CTA-402	2023/08/02	2024/08/01

## Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	EMI Test Receiver	R&S	ESPI	CTA-307	2023/08/02	2024/08/01
2	Artificial Mains	R&S	ENV-216	CTA-308	2023/08/02	2024/08/01
3	Artificial Mains	R&S	ENV-216	CTA-314	2023/08/02	2024/08/01
4	ISN	Schwarzbeck	NTFM8158	CTA-407	2023/08/02	2024/08/01
5	ISN	Schwarzbeck	CAT58158	CTA-408	2023/08/02	2024/08/01
6	ISN	Schwarzbeck	CAT38158	CTA-409	2023/08/02	2024/08/01
7	Universal Radio Communication	R&S	CMW500	CTA-302	2023/08/02	2024/08/01

Test Equipment	Manufacturer	Model No.	Version number	Calibration Date	Calibration Due Date
EMI Test Software	Tonscend	TS®JS32-RE	5.0.0.2	N/A	N/A
EMI Test Software	Tonscend	TS®JS32-CE	5.0.0.1	N/A	N/A

## 3. EMC EMISSION TEST

## 3.1 CONDUCTED EMISSION MEASUREMENT

## 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

FREQUENCY (MHz)	<input type="checkbox"/> Class A (dB $\mu$ V)		<input checked="" type="checkbox"/> Class B (dB $\mu$ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.5 ~ 5	73.00	60.00	56.00	46.00
5 ~ 30	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

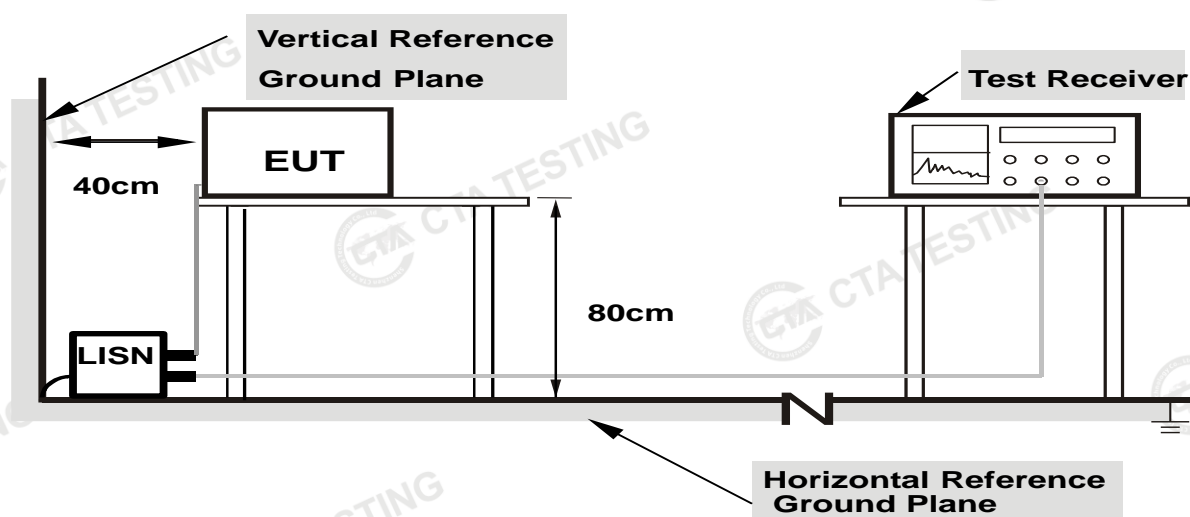
### 3.1.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 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**

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

## 3.1.6 TEST RESULTS

Temperature:	--°C	Relative Humidity:	--%
Phase:	L/N	Test Mode:	N/A
Test Voltage:	N/A	Test Date:	N/A

NOTE: N/A

### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS

Below 1 GHz

Measurement Method and Applied Limits:

ANSI C63.4:

Frequency (MHz)	<input type="checkbox"/> Class A		<input checked="" type="checkbox"/> Class B
	Field strength (dBuV/m) ( at 10m)	Field strength (dBuV/m) (at 3m)	Field strength (dBuV/m) (at 3m)
30 ~ 88	39	49.5	40
88 ~ 216	43.5	54	43.5
216 ~ 960	46.4	56.9	46
Above 960	49.5	60	54

Above 1 GHz

Measurement Method and Applied Limits:

ANSI C63.4:

Frequency (MHz)	<input type="checkbox"/> Class A				<input checked="" type="checkbox"/> Class B	
	(dBuV/m) (at 3m)		(dBuV/m) (at 10m)		(dBuV/m) (at 3m)	
	Peak	Average	Peak	Average	Peak	Average
Above 1000	80	60	69.5	49.5	74	54

#### Frequency Range of Radiated Disturbance Measurement

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 ~ 108	1000
108 ~ 500	2000
500 ~ 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Note:

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

### 3.2.2 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. EUT as the center to the edge of the auxiliary device, the distance from the maximum edge to the center of the antenna is 3 meter.
- c. The height of antenna is varied from 1 meter to 4 meter 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 meter and the rotatable table was turned from 0 degrees to 360 degree to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.
- f. 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

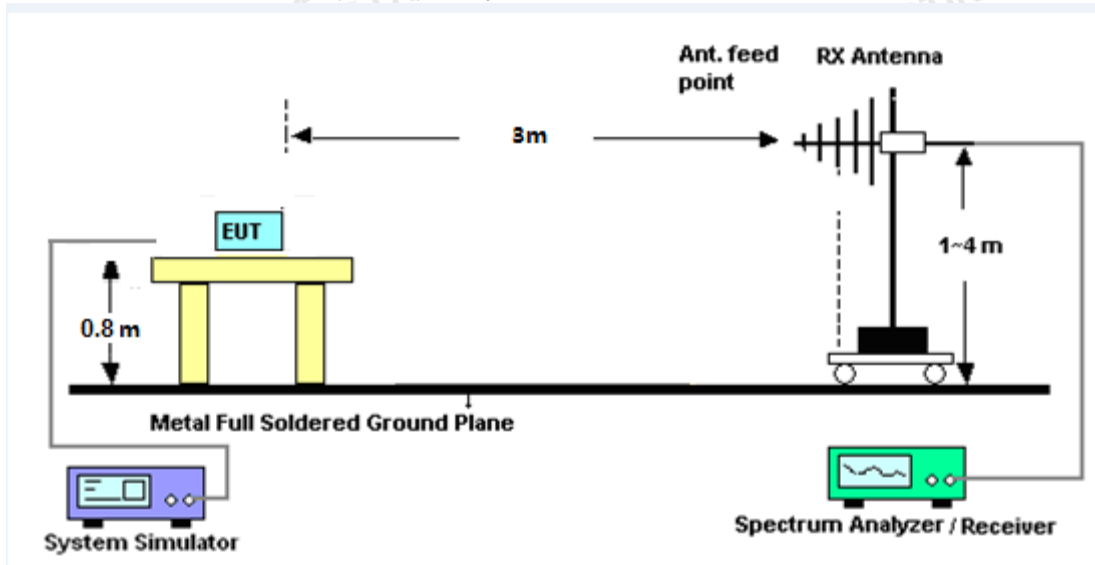
### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation

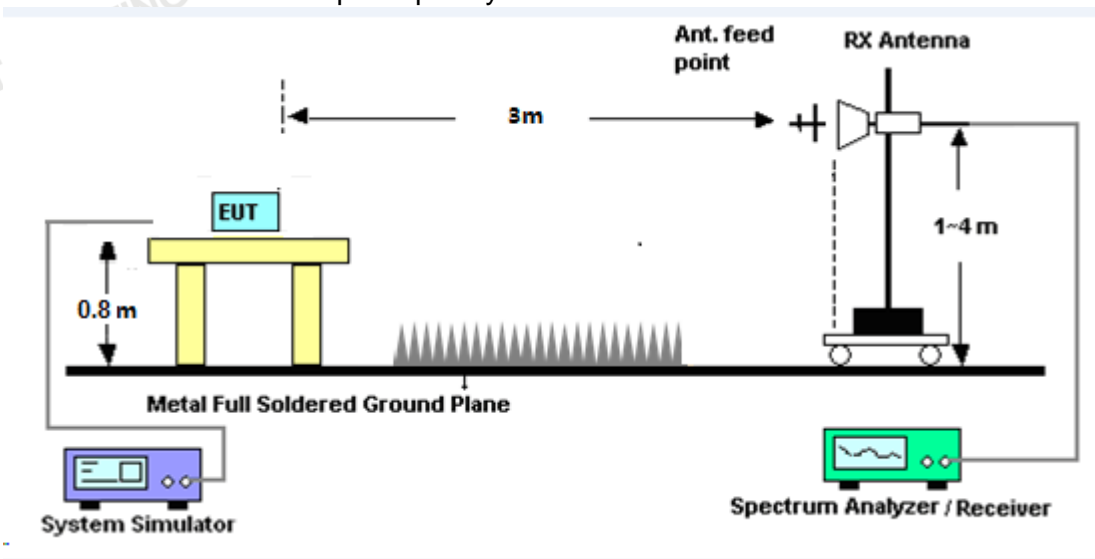


### 3.2.4 TEST SETUP

#### (A) Radiated Emission Test-Up Frequency Below 1 GHz



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



### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 described unless otherwise a special operating condition is specified in the following during the testing.

## 3.2.6 TEST RESULTS

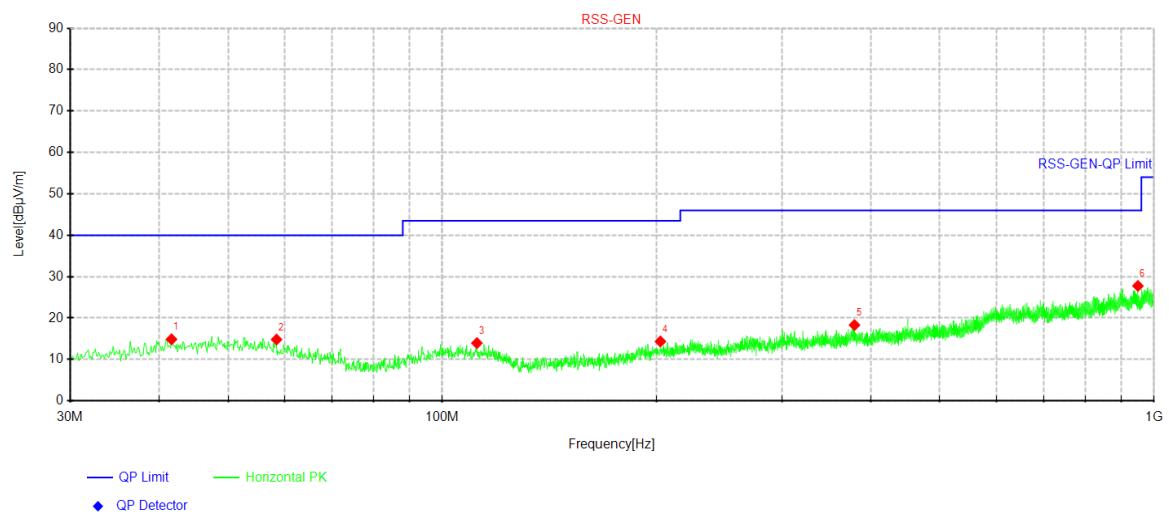
30MHz - 1000MHz

Temperature:	25.3℃	Relative Humidity:	43%
Phase:	Horizontal	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz	Test Date:	2023.09.11

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	41.64	26.94	14.87	-12.07	40.00	25.13	100	124	Horizontal
2	58.4938	27.65	14.82	-12.83	40.00	25.18	100	360	Horizontal
3	111.843	27.78	13.96	-13.82	43.50	29.54	100	272	Horizontal
4	202.538	27.60	14.35	-13.25	43.50	29.15	100	101	Horizontal
5	379.442	29.00	18.31	-10.69	46.00	27.69	100	193	Horizontal
6	949.196	29.67	27.77	-1.90	46.00	18.23	100	284	Horizontal

Remark:

1. All readings are Quasi-Peak
2. Margin = Result (Result = Reading + Factor)–Limit
3. Factor= Cable Loss +Antenna Factor–Amplifier Gain



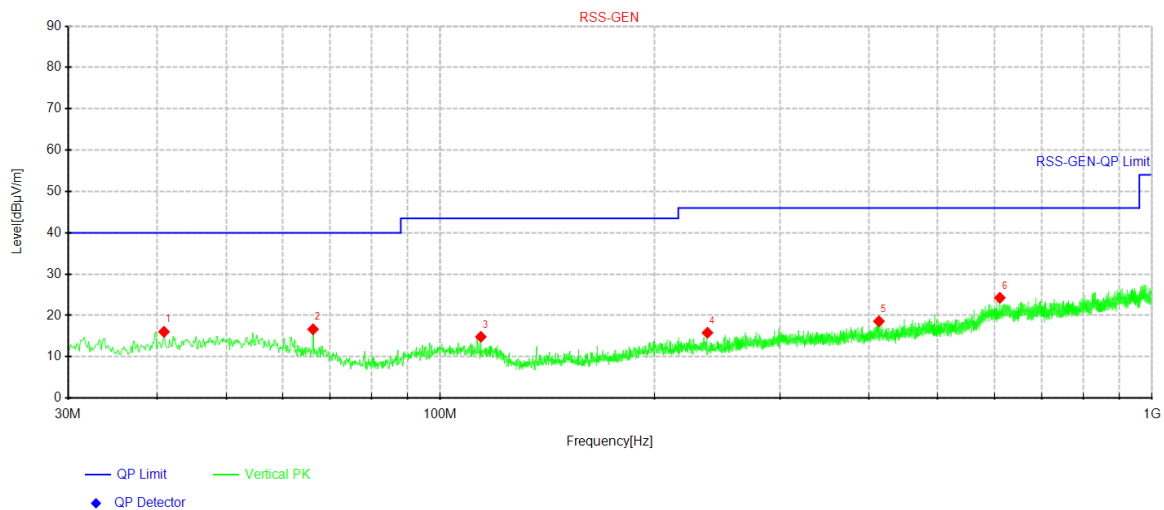
Temperature:	25.3℃	Relative Humidity:	43%
Phase:	Vertical	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz	Test Date:	2023.09.11

Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.9125	28.20	16.05	-12.15	40.00	23.95	100	115	Vertical
2	66.2538	31.10	16.66	-14.44	40.00	23.34	100	22	Vertical
3	114.026	28.80	14.84	-13.96	43.50	28.66	100	0	Vertical
4	237.337	28.71	15.82	-12.89	46.00	30.18	100	136	Vertical
5	413.271	28.95	18.60	-10.35	46.00	27.40	100	282	Vertical
6	611.151	29.55	24.27	-5.28	46.00	21.73	100	8	Vertical

Remark:

1. All readings are Quasi-Peak
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor = Cable Loss + Antenna Factor – Amplifier Gain



(1 GHz - 18GHz)

Temperature:	25.3°C	Relative Humidity:	43%
Phase:	Horizontal	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz	Test Date:	2023.09.11

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	3839.000	40.24	3.94	44.18	74.00	-29.82	Peak
2	3839.000	32.58	3.94	36.52	54.00	-17.48	AVG
3	6907.500	36.51	10.57	47.08	74.00	-26.92	Peak
4	6907.500	28.43	10.57	39.00	54.00	-15.00	AVG
5	9500.000	32.84	13.78	46.62	74.00	-27.38	Peak
6	9500.000	24.37	13.78	38.15	54.00	-15.85	AVG
7	12900.000	34.90	15.37	50.27	74.00	-23.73	Peak
8	12900.000	24.81	15.37	40.18	54.00	-13.82	AVG
9	15016.500	33.28	17.80	51.08	74.00	-22.92	Peak
10	15016.500	24.50	17.80	42.30	54.00	-11.70	AVG
11	17787.500	30.64	24.24	54.88	74.00	-19.12	Peak
12	17787.500	21.24	24.24	45.48	54.00	-8.52	AVG

Remark:

1. All readings are Peak and Average values
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor = Cable Loss + Antenna Factor - Amplifier Gain

Temperature:	25.3°C	Relative Humidity:	43%
Phase:	Vertical	Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz	Test Date:	2023.09.11

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2768.000	42.15	1.05	43.20	74.00	-30.80	Peak
2	2768.000	33.32	1.05	34.37	54.00	-19.63	AVG
3	7205.000	35.09	11.27	46.36	74.00	-27.64	Peak
4	7205.000	25.71	11.27	36.98	54.00	-17.02	AVG
5	9797.500	34.89	13.57	48.46	74.00	-25.54	Peak
6	9797.500	25.48	13.57	39.05	54.00	-14.95	AVG
7	12279.500	34.44	15.20	49.64	74.00	-24.36	Peak
8	12279.500	24.49	15.20	39.69	54.00	-14.31	AVG
9	14778.500	33.11	17.99	51.10	74.00	-22.90	Peak
10	14778.500	23.11	17.99	41.10	54.00	-12.90	AVG
11	17753.500	30.72	23.68	54.40	74.00	-19.60	Peak
12	17753.500	22.21	23.68	45.89	54.00	-8.11	AVG

## Remark:

1. All readings are Peak and Average values
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor = Cable Loss + Antenna Factor – Amplifier Gain

## Notes:

1. Measuring frequencies from 1 GHz to 18GHz.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak and average detector mode of the emission shown in Actual FS column.
3. The frequency emission of 18-25GHz is at least 20dB lower than the limit, and the frequency emission mainly comes from environmental noise.

\*\*\*\*\*END OF THE REPORT\*\*\*\*\*