

FCC Part 15B TEST REPORT

Product Name : GPS Locator

Model Name : GV500

Prepared for:

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Report Number : UL12620150824FCC058-1
Date of Report : 09-22-2015
Date of Test : 08-24-2015~09-22-2015

Notes :

The test results only relate to these samples which have been tested.
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Unilab is only responsible for the complete report with the reported stamp of Unilab.

Applicant: Queclink Wireless Solutions Co.,Ltd
Room 501, Building 9,No.99 Tianzhou Road,Shanghai,China

Manufacturer: Queclink Wireless Solutions Co.,Ltd
Room 501, Building 9,No.99 Tianzhou Road,Shanghai,China

Product Name: GPS Locator

Brand Name: Queclink

Model Name: GV500

FCC ID: YQD--GV500

EUT Voltage: Extreme Low:8V, Nominal:12V/24V, Extreme High:32V

Date of Receipt: 08-24-2015

Test Standard: FCC CFR Title 47 Part 15 Subpart B

Test Result: Pass

Date of Test 08-24-2015-09-22-2015

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(Senior Engineer: Forest Cao)

Approved by : Eva Wang
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1. TECHNICAL SUMMARY

1.1 SUMMARY OF STANDARDS AND TEST RESULTS

The EUT have been tested according to the applicable standards as referenced below:

| Test Item | FCC | Result |
|-----------------------|------------|--------|
| Conducted disturbance | FCC 15.107 | P* |
| Radiated disturbance | FCC 15.109 | P |

Note: P means pass, F means failure, N/A means not applicable

1.2 TEST UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Test item | Value (dB) |
|-----------------------|------------|
| Conducted disturbance | 3.4 |
| Radiated disturbance | 4.2 |

1.3 TEST EQUIPMENT LIST

| Equipment | Manufacturer | Model | Serial No. | Due Date | Cal interval |
|----------------------------------|----------------|------------|------------|------------|--------------|
| Receiver | Agilent | N9038A | MY51210142 | 11/11/2015 | 1 year |
| LISN | R&S | NNBM 8126F | 1035 | 08/21/2016 | 1 year |
| 3m Chamber & Accessory Equipment | ETS-LINDGREN | FACT-3 | CT-0000336 | 11/26/2017 | 3 years |
| Biconilog Antenna | SCHWARZBECK | VULB 9160 | 3316 | 09/19/2016 | 2 years |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 942 | 09/19/2016 | 2 years |
| Microwave Preamplifier | EM Electronics | EM30180 | 3008A02425 | 02/18/2016 | 1 year |

1.4 SUPPORT EQUIPMENT AND CABLE

| Equipment | Manufacturer | Model | Serial No. | Due Date |
|-----------|--------------|------------|------------------------------|----------|
| PC | DELL | VOSTRO 260 | 7JXLB3X | / |
| Displayer | DELL | E1910Hc | CN-0CD1MT-64180-OC7-06TS | / |
| Mouse | DELL | MS111-P | CN-0MF3JY-71581-2C7-05GB | / |
| Keyboard | DELL | KB212-B | CN-0Y88XT-65890-22L-01MG-A01 | / |

1.5 CABLE OF TEST

| No. | Cable Type | Quantity | Provider | Length(m) | Specification | Note |
|-----|------------|----------|----------|-----------|---------------|------|
| 1 | AC Cable | 2 | Unilab | 1.5 | Unshielded | None |
| 2 | USB cable | 1 | Queclink | 1.0 | Unshielded | None |
| 3 | VGA Cable | 1 | Unilab | 1.5 | Unshielded | None |

1.6 TEST MODE AND DESCRIPTION

| | |
|-------------|--|
| Test mode | Data exchange with USB cable, |
| Description | The EUT connect to PC with a USB cable, then the command was sent through the hyperterminal to achieve data exchange between PC and EUT. |

1.7 TEST FACILITY

All test facilities used to collect the test data are located at No. 1350, Lianxi Rd. Pudong New District, Shanghai, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4: 2009, CISPR 16-1-1 and other equivalent standards. The laboratory is compliance with the requirements of the ISO/IEC/EN17025.

1.8 TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

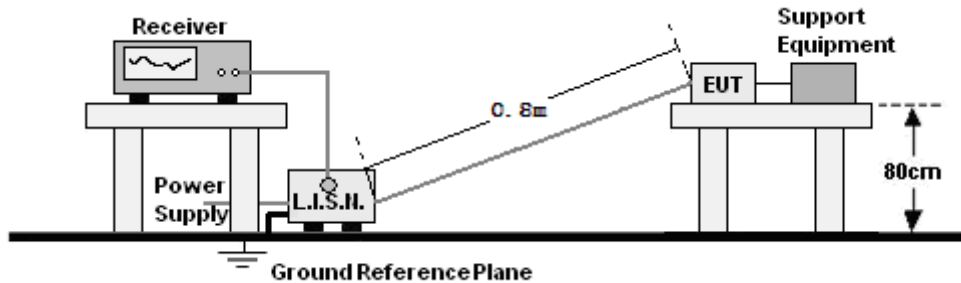
Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. All the tests were carried out with the EUT in normal operation. Which was shown in this test report is the worst test mode.

2. CONDUCTED DISTURBANCE

2.1 TEST SETUP

For mains port:



2.2 LIMITS

Limits for Class B digital devices

| Frequency range (MHz) | Limits dB(μV) | |
|-----------------------|---------------|----------|
| | Quasi-peak | Average |
| 0,15 to 0,50 | 66 to 56 | 56 to 46 |
| 0,50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

NOTE: 1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

2.3 TEST PROCEDURE

For mains port:

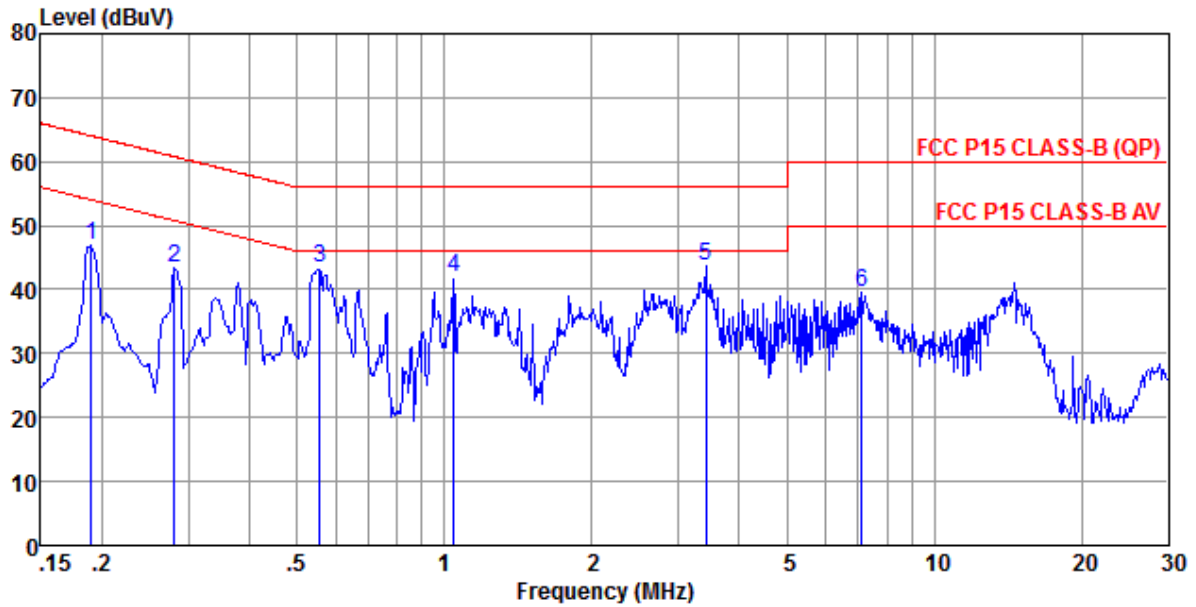
- The EUT and support equipment were placed on a nonconductive table 0.8m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane. The EUT connected to the main through Line Impedance Stability Network (L.I.S.N) to provide a 50 Ω/50uH coupling impedance for the measuring equipment. The support equipment is also connected to the main power through a LISN that provides a 50 Ω/50uH coupling impedance with 50 Ω terminations. Both sides of AC line (Line & Neutral) were checked to find out the maximum conducted emission.
- The RBW of the receiver was set at 9 kHz. The frequency range from 150 kHz to 30 MHz was checked. Run the receiver's pre-scan to record the maximum disturbance generated from EUT in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

2.4 TEST RESULT

For mains port:

Test mode: Data exchange by USB cable

LISN: Positive

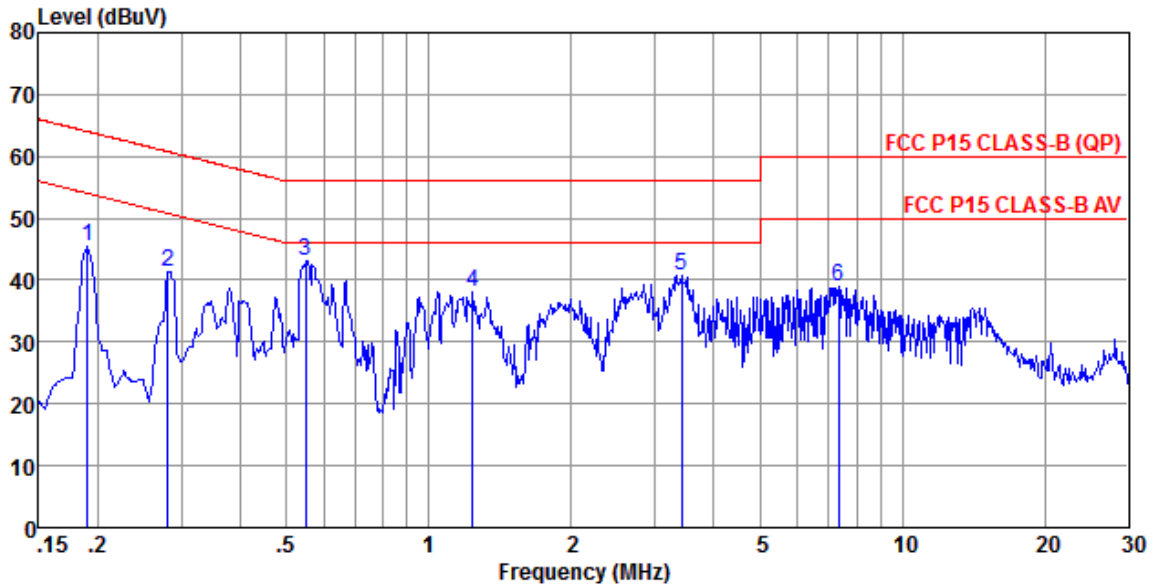


Site : chamber
 Condition : FCC P15 CLASS-B (QP) ENV216(L)-20120730 LINE
 EUT :
 Model Name :
 Temp/Humi : 24 °C / 53 %
 Power Rating: DC 3.7V
 Mode : USB Data Exchange
 Memo :

| | Read Freq | LISN Level | Cable Factor | Preamp Loss | Level | Limit Line | Over Limit | Remark |
|------|-----------|------------|--------------|-------------|-------|------------|------------|--------|
| | MHz | dBuV | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.19 | 36.33 | 10.47 | 0.23 | 47.03 | 64.02 | -16.99 | Peak |
| 2 | 0.28 | 32.78 | 10.48 | 0.19 | 43.45 | 60.81 | -17.36 | Peak |
| 3 | 0.56 | 32.70 | 10.51 | 0.11 | 43.32 | 56.00 | -12.68 | Peak |
| 4 | 1.04 | 31.25 | 10.52 | 0.14 | 41.91 | 56.00 | -14.09 | Peak |
| 5 pp | 3.42 | 33.10 | 10.52 | 0.15 | 43.77 | 56.00 | -12.23 | Peak |
| 6 | 7.10 | 28.87 | 10.46 | 0.32 | 39.65 | 60.00 | -20.35 | Peak |

Test mode: Data exchange by USB cable

LISN: Neutral



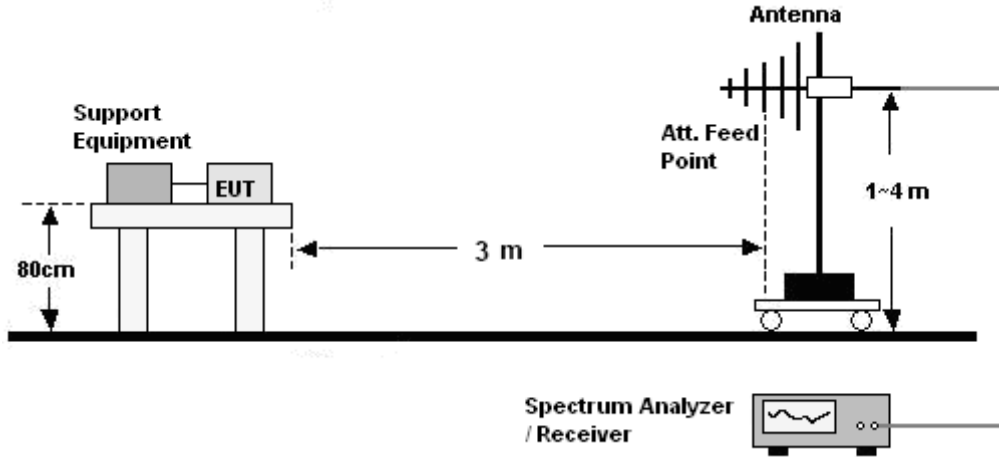
Site : chamber
 Condition : FCC P15 CLASS-B (QP) ENV216(N)-20120730 NEUTRAL
 EUT :
 Model Name :
 Temp/Humi : 24 °C / 53 %
 Power Rating: DC 3.7V
 Mode : USB Data Exchange
 Memo :

| | Read Freq | Level | LISN Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|-----------|-------|-------------|------------|---------------|-------|------------|------------|--------|
| | MHz | dBuV | dB | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.19 | 34.80 | 10.33 | 0.23 | 0.00 | 45.36 | 64.02 | -18.66 | Peak |
| 2 | 0.28 | 30.73 | 10.43 | 0.19 | 0.00 | 41.35 | 60.81 | -19.46 | Peak |
| 3 | 0.55 | 32.57 | 10.39 | 0.11 | 0.00 | 43.07 | 56.00 | -12.93 | Peak |
| 4 | 1.24 | 27.68 | 10.31 | 0.14 | 0.00 | 38.13 | 56.00 | -17.87 | Peak |
| 5 | 3.42 | 30.26 | 10.32 | 0.15 | 0.00 | 40.73 | 56.00 | -15.27 | Peak |
| 6 | 7.33 | 28.26 | 10.34 | 0.31 | 0.00 | 38.91 | 60.00 | -21.09 | Peak |

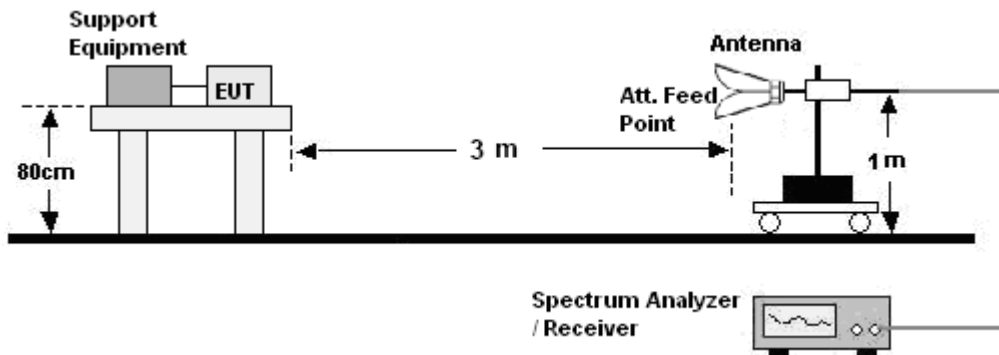
3. RADIATED DISTURBANCE (RE)

3.1 TEST SETUP

30MHz ~ 1GHz:



Above 1GHz:



3.2 LIMITS

Limits for Class B digital devices

| Frequency (MHz) | limits at 3m dB(μV/m) |
|-----------------|-----------------------|
| 30-88 | 40.0 |
| 88-216 | 43.5 |
| 216-960 | 46.0 |
| Above 960 | 54.0 |

- NOTE:**
1. The lower limit shall apply at the transition frequency.
 2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
 3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

3.3 TEST PROCEDURE

30MHz ~ 1GHz:

- a. The EUT and support equipment were placed on the non-conductive turntable 0.8m above the horizontal metal ground plane at a chamber. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna.
- b. The frequency range from 30MHz to 1GHz was checked. The RBW of the receiver was set at 120kHz. Set the receiver in Peak detector, Max Hold mode. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency receiver to QP Detector and record the maximum value.

Above 1GHz:

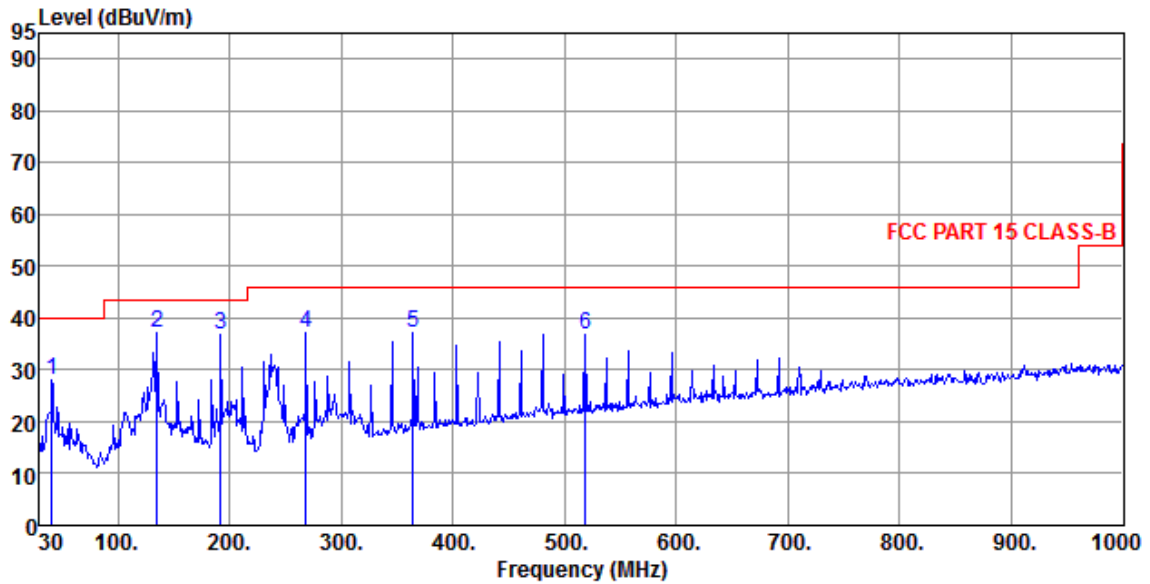
- a. The EUT and support equipment were placed on the non-conductive turntable 0.8m above the ground at a chamber. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Horn antenna was used as receiving antenna.
- b. The frequency range above 1GHz was checked. The RBW of the receiver was set at 1MHz. Set the receiver in Peak detector, Max Hold mode. Record the maximum field strength of all the pre-scan process in the full band when the antenna is 1m and varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its Average value: rotate the turntable from 0 to 360 degrees to find the degree where EUT radiated the maximum emission, then set the test frequency receiver to EMI Average Detector and record the maximum value.

3.4 TEST RESULT

30MHz ~ 1GHz:

Test mode: Data exchange by USB cable

Antenna Polarity: Horizontal

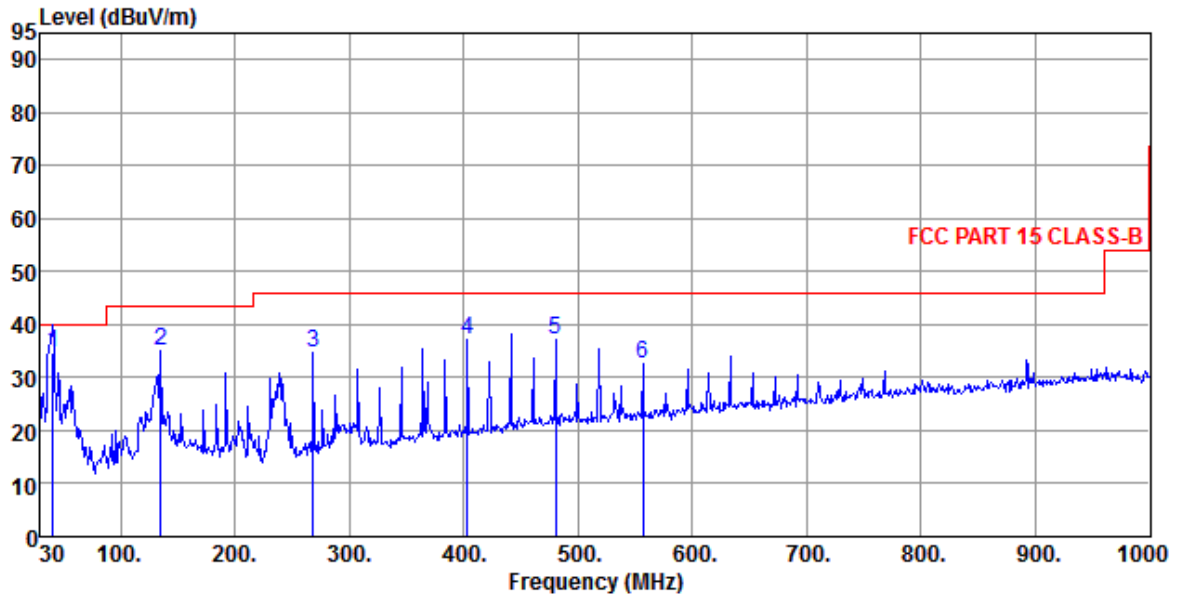


Site : chamber
 Condition : FCC PART 15 CLASS-B 3m VULB9160 HORIZONTAL
 EUT :
 Model Name :
 Temp/Humi : 24 °C / 53 %
 Power Rating: DC 3.7V
 Mode : USB Data Exchange
 Memo :

| | ReadAntenna | Cable | Preamp | Limit | Over | | | |
|------|-------------|--------|--------|--------|--------|--------|-------|-------------|
| Freq | Level | Factor | Loss | Factor | Level | Line | Limit | Remark |
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 40.67 | 14.66 | 12.71 | 0.83 | 0.00 | 28.20 | 40.00 | -11.80 Peak |
| 2 pp | 134.76 | 22.46 | 13.07 | 1.62 | 0.00 | 37.15 | 43.50 | -6.35 Peak |
| 3 | 191.99 | 23.96 | 10.96 | 1.89 | 0.00 | 36.81 | 43.50 | -6.69 Peak |
| 4 | 268.62 | 22.61 | 12.40 | 2.21 | 0.00 | 37.22 | 46.00 | -8.78 Peak |
| 5 | 364.65 | 20.04 | 14.49 | 2.68 | 0.00 | 37.21 | 46.00 | -8.79 Peak |
| 6 | 518.88 | 16.47 | 17.30 | 3.10 | 0.00 | 36.87 | 46.00 | -9.13 Peak |

Test mode: Data exchange by USB cable

Antenna Polarity: Vertical



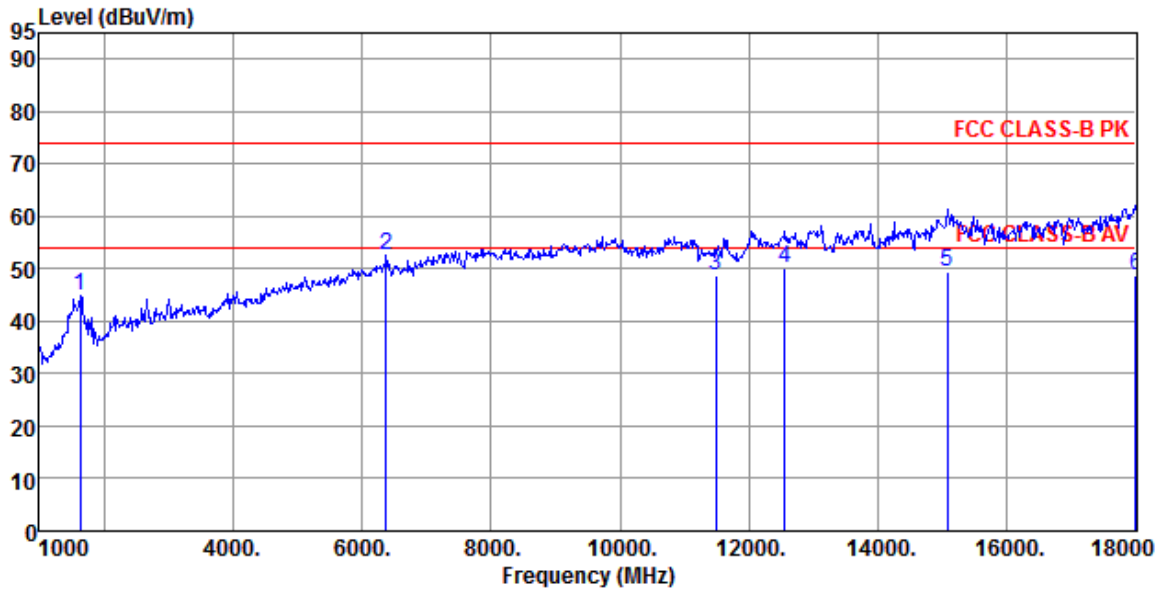
Site : chamber
 Condition : FCC PART 15 CLASS-B 3m VULB9160 VERTICAL
 EUT :
 Model Name :
 Temp/Humi : 24 °C / 53 %
 Power Rating: DC 3.7V
 Mode : USB Data Exchange
 Memo :

| | Read | Antenna | Cable | Preamp | | Limit | Over | |
|------|--------|---------|-------|--------|--------|--------|-------|---------------|
| Freq | Level | Factor | Loss | Factor | Level | Line | Limit | Remark |
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 pp | 40.67 | 21.06 | 12.71 | 0.83 | 0.00 | 34.60 | 40.00 | -5.40 Average |
| 2 pk | 134.76 | 20.32 | 13.07 | 1.62 | 0.00 | 35.01 | 43.50 | -8.49 Peak |
| 3 | 268.62 | 20.17 | 12.40 | 2.21 | 0.00 | 34.78 | 46.00 | -11.22 Peak |
| 4 | 403.45 | 19.21 | 15.40 | 2.69 | 0.00 | 37.30 | 46.00 | -8.70 Peak |
| 5 | 480.08 | 17.13 | 16.89 | 3.00 | 0.00 | 37.02 | 46.00 | -8.98 Peak |
| 6 | 556.71 | 11.33 | 18.07 | 3.22 | 0.00 | 32.62 | 46.00 | -13.38 Peak |

Above 1GHz:

Test mode: Data exchange by USB cable

Antenna Polarity: Horizontal

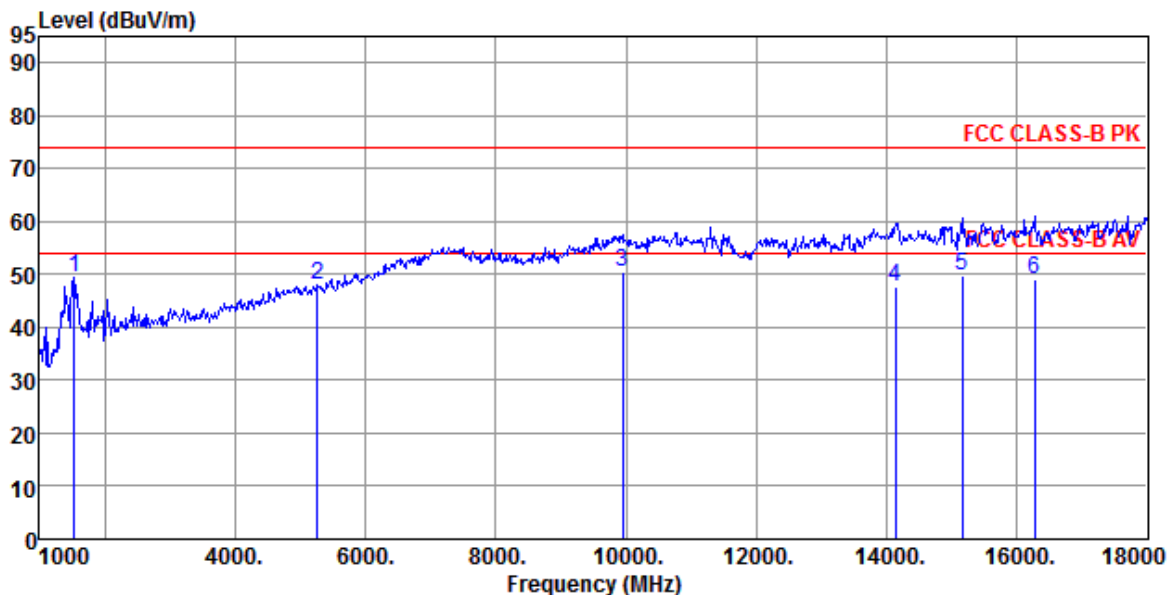


Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(942) HORIZONTAL
 EUT :
 Model Name :
 Temp/Humi : 24 °C / 53 %
 Power Rating: DC 3.7V
 Mode : USB Data Exchange
 Memo :

| | Freq | ReadAntenna Level | Cable Factor | Preamp Loss | Preamp Factor | Limit Level | Over Limit | Remark |
|------|----------|-------------------|--------------|-------------|---------------|-------------|------------|---------------|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB |
| 1 | 1629.00 | 52.74 | 24.90 | 5.83 | 38.46 | 45.01 | 74.00 | -28.99 Peak |
| 2 pk | 6372.00 | 43.19 | 33.80 | 12.04 | 36.61 | 52.42 | 74.00 | -21.58 Peak |
| 3 | 11489.00 | 31.61 | 40.25 | 16.02 | 39.15 | 48.73 | 54.00 | -5.27 Average |
| 4 pp | 12560.00 | 32.77 | 38.72 | 17.45 | 38.84 | 50.10 | 54.00 | -3.90 Average |
| 5 | 15076.00 | 28.86 | 40.58 | 17.68 | 37.76 | 49.36 | 54.00 | -4.64 Average |
| 6 | 18000.00 | 18.65 | 48.08 | 18.81 | 36.70 | 48.84 | 54.00 | -5.16 Average |

Test mode: Data exchange by USB cable

Antenna Polarity: Vertical



Site : chamber
 Condition : FCC CLASS-B PK 3m BBHA9120D(942) VERTICAL
 EUT :
 Model Name :
 Temp/Humi : 24 °C / 53 %
 Power Rating: DC 3.7V
 Mode : USB Data Exchange
 Memo :

| | ReadAntenna | Cable | Preamp | | Limit | Over | | |
|------|-------------|--------|--------|--------|--------|--------|-------|---------------|
| Freq | Level | Factor | Loss | Factor | Level | Line | Limit | |
| MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 pk | 1527.00 | 57.10 | 25.17 | 5.74 | 38.45 | 49.56 | 74.00 | -24.44 Peak |
| 2 | 5267.00 | 42.56 | 31.73 | 10.81 | 37.02 | 48.08 | 74.00 | -25.92 Peak |
| 3 pp | 9942.00 | 36.46 | 38.64 | 14.79 | 39.49 | 50.40 | 54.00 | -3.60 Average |
| 4 | 14141.00 | 26.07 | 42.15 | 17.99 | 38.56 | 47.65 | 54.00 | -6.35 Average |
| 5 | 15161.00 | 29.09 | 40.23 | 18.13 | 37.84 | 49.61 | 54.00 | -4.39 Average |
| 6 | 16266.00 | 31.18 | 38.47 | 17.93 | 38.55 | 49.03 | 54.00 | -4.97 Average |

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Please refer to the file named "GV500_Part15B Setup Photos".

APPENDIX 2 PHOTOGRAPHS OF EUT

Please refer to the two files named "GV500_EUT External Photos" and "GV500_EUT Internal Photos".

----End of the report----