Report No.: GTSE13070117301

# TEST REPORT

| | |
|---|---|
| **Applicant:** | Ambient, LLC dba Ambient Weather |
| **Address of Applicant:** | 6845 W. Frye Road Chandler, AZ 85226 |
| **Equipment Under Test (EUT)** | |
| Product Name: | Wireless Thermo-Hygrometer |
| Model No.: | WS08, WS08-C, WS10, WS10-C |
| **FCC ID:** | S2SWS08 |
| **Applicable standards:** | FCC CFR Title 47 Part 15 Subpart B:2012 |
| **Date of sample receipt:** | July 23, 2013 |
| **Date of Test:** | July 23-August 02, 2013 |
| **Date of report issue:** | August 02, 2013 |
| **Test Result :** | PASS * |

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

**Robinson Lo**
**Laboratory Manager**

## 2 Version

| Version No. | Date | Description |
|---|---|---|
| *00* | *August 02, 2013* | *Original* |
| | | |
| | | |
| | | |
| | | |

***Prepared By:*** hank. yan ***Date:*** *August 02, 2013*

***Project Engineer***

***Check By:*** Hans. Hu ***Date:*** *August 02, 2013*

***Reviewer***

# 3 Contents

Page

# 4 Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| Conducted Emission | Part15.107 | N/A |
| Radiated Emissions | Part15.109 | PASS |

*PASS: The EUT complies with the essential requirements in the standard.*

*N/A: not applicable.*

# 5 General Information

## 5.1 Client Information

| | |
|---|---|
| Applicant: | Ambient, LLC dba Ambient Weather |
| Address of Applicant: | 6845 W. Frye Road Chandler, AZ 85226 |
| Manufacturer: | Shenzhen Kello Sciece Technology Co., Ltd. |
| Address of Manufacturer: | 32nd Building Area B Tanglang Industrial Park Xili Shenzhen Guangdong China |
| Factory: | Shenzhen Kello Sciece Technology Co., Ltd. |
| Address of Factory: | 32nd Building Area B Tanglang Industrial Park Xili Shenzhen Guangdong China |

## 5.2 General Description of EUT

| | |
|---|---|
| Product Name: | Wireless Thermo-Hygrometer |
| Model No.: | WS08, WS08-C, WS10, WS10-C |
| Test Model No.: | WS08 |
| Remark: | *WS08, WS08-C, WS10 and WS10-C are identical in the same PCB layout, interior structure and electrical circuits. The only differences are the appearance color and model name for commercial purpose.* |
| Power supply: | DC 6.0V(4*1.5V(”AAA” Size battery)) |

## 5.3 Test mode

| | |
|---|---|
| Receiving mode | Keep the EUT in Receiving mode. |

## 5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

## 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
Tel: 0755-27798480
Fax: 0755-27798960

## 5.6 Description of Support Units

None

## 5.7 Deviation from Standards

None.

## 5.8 Abnormalities from Standard Conditions

None.

## 5.9 Other Information Requested by the Customer

None.

# 6 Test Instruments list

| Radiated Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.0(L)*6.0(W)* 6.0(H) | GTS250 | Mar. 29 2013 | Mar. 28 2014 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | ESU EMI Test Receiver | R&S | ESU26 | GTS203 | Jun. 29 2013 | Jun. 29 2014 |
| 4 | BiConiLog Antenna | SCHWARZBECK | VULB9163 | GTS214 | Jun. 29 2013 | Jun. 29 2014 |
| 5 | Double -ridged waveguide horn | SCHWARZBECK | 9120D | GTS208 | Jun. 29 2013 | Jun. 29 2014 |
| 6 | RF Amplifier | HP | 8347A | GTS204 | Jun. 29 2013 | Jun. 29 2014 |
| 7 | Preamplifier | HP | 8349B | GTS206 | Jun. 29 2013 | Jun. 29 2014 |
| 8 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 9 | Coaxial cable | GTS | N/A | GTS210 | Jul. 07 2013 | Jul. 06 2014 |
| 10 | Coaxial Cable | GTS | N/A | GTS211 | Jul. 07 2013 | Jul. 06 2014 |
| 11 | Thermo meter | N/A | N/A | GTS256 | Jul. 01 2013 | Jul. 01 2014 |

| General used equipment: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (dd-mm-yy)** | **Cal.Due date (dd-mm-yy)** |
| 1 | Barometer | ChangChun | DYM3 | GTS257 | Jul. 27 2013 | Jul. 27 2014 |

# 7 Test Results and Measurement Data

## 7.1 Radiated Emission

| | |
|---|---|
| Test Requirement: | FCC Part15 B Section 15.109 |
| Test Method: | ANSI C63.4:2003 |
| Test Frequency Range: | 30MHz to 2GHz |
| Test site: | Measurement Distance: 3m (Semi-Anechoic Chamber) |
| Receiver setup: | |

| Frequency | Detector | RBW | VBW | Remark |
|---|---|---|---|---|
| 30MHz-1GHz | Quasi-peak | 120kHz | 300kHz | Quasi-peak Value |
| Above 1GHz | Peak | 1MHz | 3MHz | Peak Value |
| | Peak | 1MHz | 10Hz | Average Value |

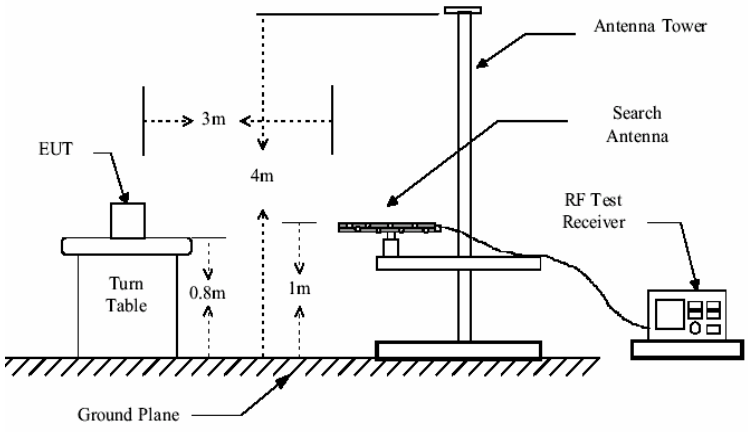
Limit:

| Frequency | Limit (dBuV/m @3m) | Remark |
|---|---|---|
| 30MHz-88MHz | 40.00 | Quasi-peak Value |
| 88MHz-216MHz | 43.50 | Quasi-peak Value |
| 216MHz-960MHz | 46.00 | Quasi-peak Value |
| 960MHz-1GHz | 54.00 | Quasi-peak Value |
| Above 1GHz | 54.00 | Average Value |
| | 74.00 | Peak Value |

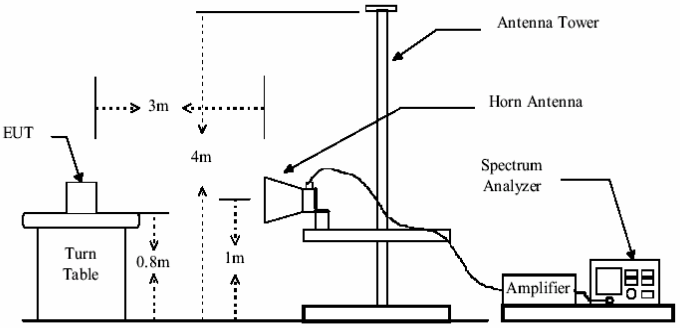
Test Procedure:

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna 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.
4. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Test setup: Below 1GHz




Above 1GHz




| | |
|---|---|
| Test environment: | Temp.: 25 °C Humid.: 52% Press.: 1 012mbar |
| Measurement Record: | Uncertainty: ± 4.5dB |
| Test Instruments: | Refer to section 6 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Pass |

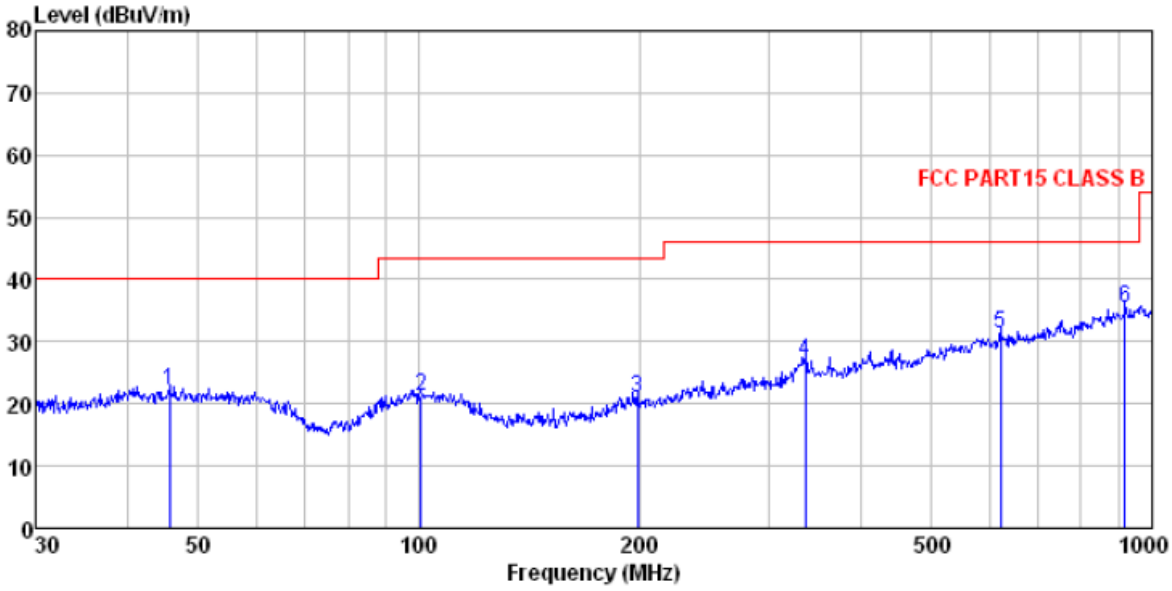
*Note:*
*The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:*

*Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor*

**Measurement Data**

Below 1GHz

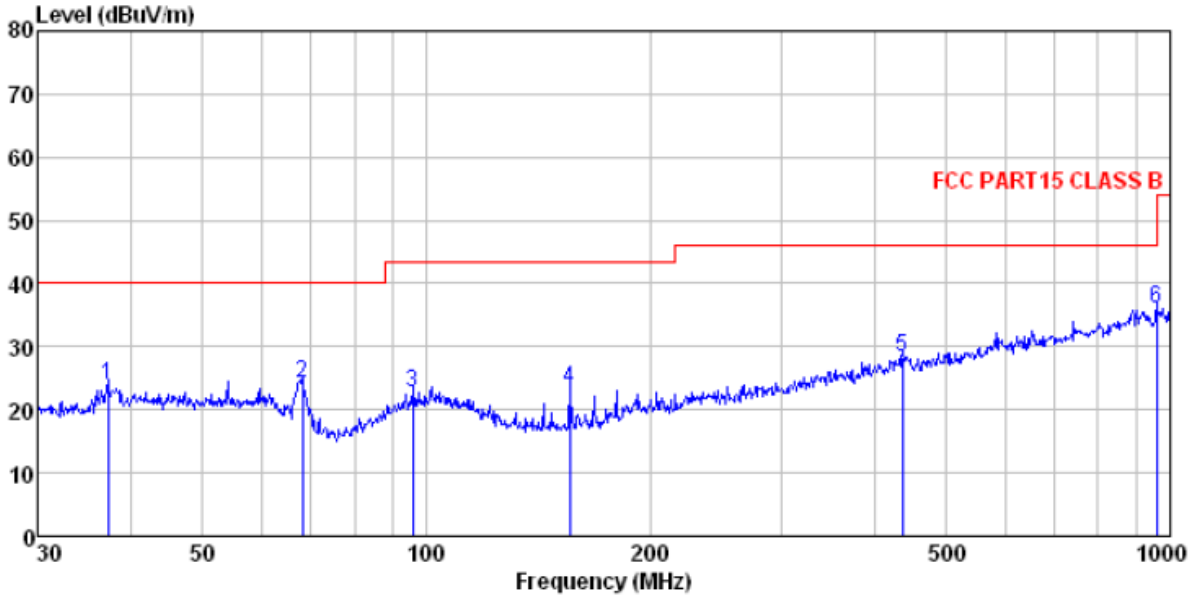
Horizontal:




Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163-2013M HORIZONTAL
Job No. : 1173RF
Test Mode : Receiving mode
Test Engineer: Hank

| | Freq | ReadLevel | Antenna Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 45.695 | 37.80 | 15.51 | 0.73 | 32.00 | 22.04 | 40.00 | -17.96 | QP |
| 2 | 100.581 | 36.58 | 15.11 | 1.19 | 31.76 | 21.12 | 43.50 | -22.38 | QP |
| 3 | 198.588 | 38.81 | 12.57 | 1.83 | 32.14 | 21.07 | 43.50 | -22.43 | QP |
| 4 | 336.035 | 40.29 | 15.99 | 2.55 | 32.07 | 26.76 | 46.00 | -19.24 | QP |
| 5 | 620.710 | 37.89 | 20.53 | 3.80 | 31.07 | 31.15 | 46.00 | -14.85 | QP |
| 6 | 919.287 | 38.38 | 23.21 | 4.93 | 31.19 | 35.33 | 46.00 | -10.67 | QP |

Vertical:

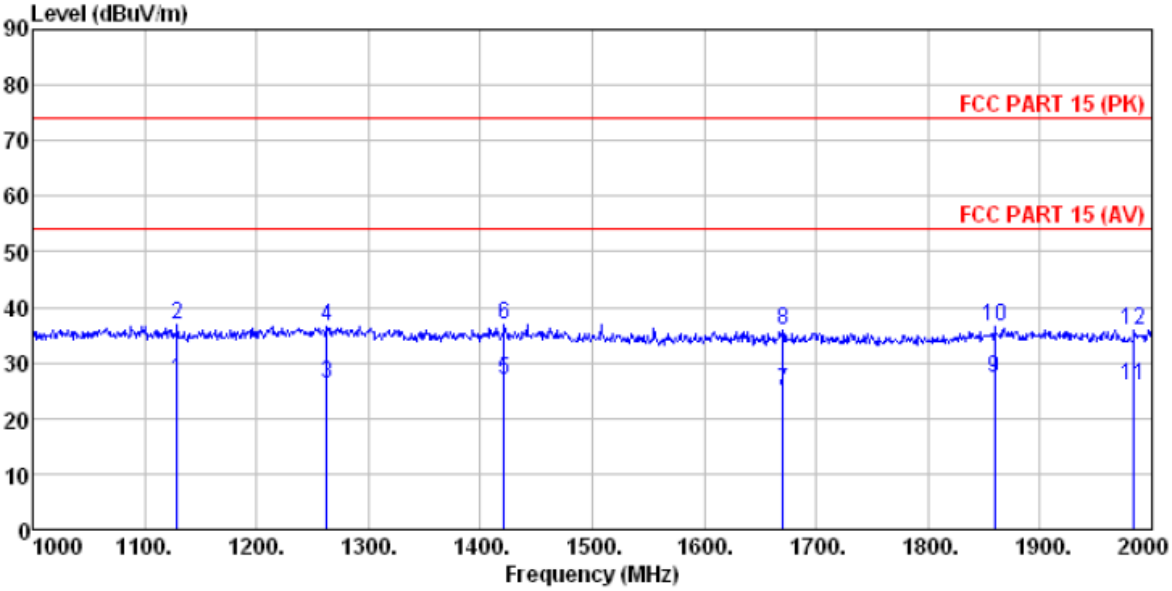



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163-2013M VERTICAL
Job No. : 1173RF
Test Mode : Receiving mode
Test Engineer: Hank

| | Freq | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 37.285 | 40.37 | 14.92 | 0.63 | 32.06 | 23.86 | 40.00 | -16.14 | QP |
| 2 | 68.151 | 43.79 | 11.34 | 0.93 | 31.89 | 24.17 | 40.00 | -15.83 | QP |
| 3 | 95.762 | 38.35 | 14.90 | 1.16 | 31.74 | 22.67 | 43.50 | -20.83 | QP |
| 4 | 155.910 | 43.10 | 10.51 | 1.60 | 32.00 | 23.21 | 43.50 | -20.29 | QP |
| 5 | 437.120 | 39.56 | 17.55 | 3.03 | 31.76 | 28.38 | 46.00 | -17.62 | QP |
| 6 | 958.794 | 38.63 | 23.49 | 5.08 | 31.22 | 35.98 | 46.00 | -10.02 | QP |

Above 1GHz

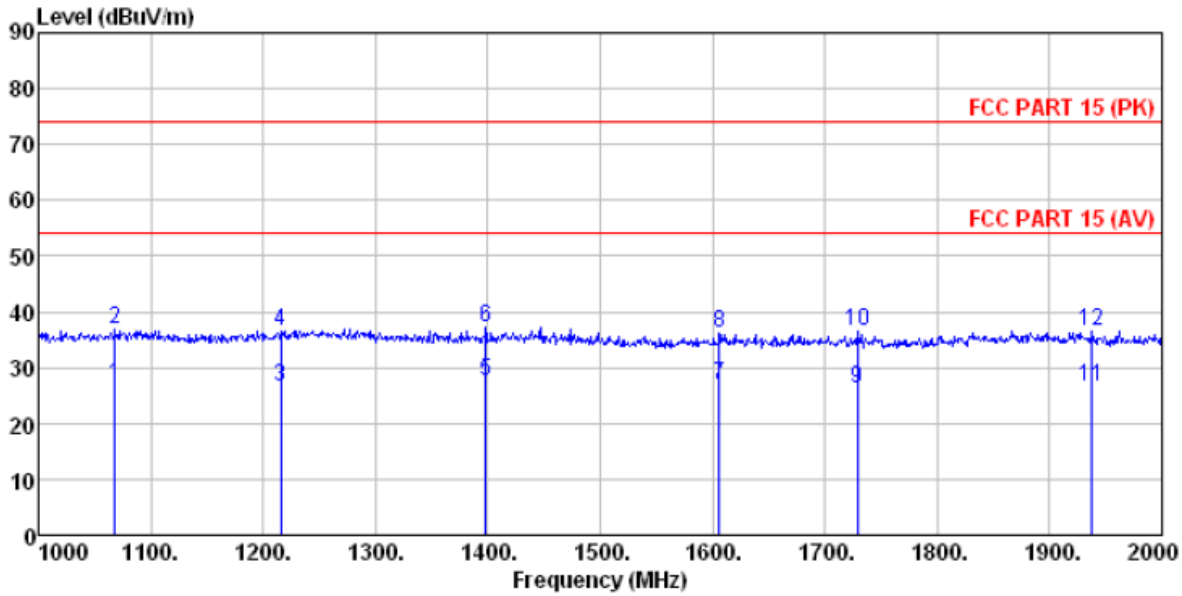
Horizontal:




Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120D ANT(>1GHZ) HORIZONTAL
Job No. : 1173RF
Test Mode : Receiving mode
Test Engineer: Hank

| | Freq | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1129.000 | 30.62 | 24.89 | 4.41 | 32.98 | 26.94 | 54.00 | -27.06 | Average |
| 2 | 1129.000 | 40.48 | 24.89 | 4.41 | 32.98 | 36.80 | 74.00 | -37.20 | Peak |
| 3 | 1263.000 | 29.27 | 25.55 | 4.52 | 33.18 | 26.16 | 54.00 | -27.84 | Average |
| 4 | 1263.000 | 39.52 | 25.55 | 4.52 | 33.18 | 36.41 | 74.00 | -37.59 | Peak |
| 5 | 1421.000 | 30.12 | 25.49 | 4.63 | 33.47 | 26.77 | 54.00 | -27.23 | Average |
| 6 | 1421.000 | 40.20 | 25.49 | 4.63 | 33.47 | 36.85 | 74.00 | -37.15 | Peak |
| 7 | 1670.000 | 29.22 | 24.91 | 4.78 | 33.88 | 25.03 | 54.00 | -28.97 | Average |
| 8 | 1670.000 | 39.95 | 24.91 | 4.78 | 33.88 | 35.76 | 74.00 | -38.24 | Peak |
| 9 | 1859.000 | 30.98 | 25.56 | 4.89 | 34.23 | 27.20 | 54.00 | -26.80 | Average |
| 10 | 1859.000 | 40.22 | 25.56 | 4.89 | 34.23 | 36.44 | 74.00 | -37.56 | Peak |
| 11 | 1984.000 | 29.38 | 26.06 | 4.95 | 34.43 | 25.96 | 54.00 | -28.04 | Average |
| 12 | 1984.000 | 39.42 | 26.06 | 4.95 | 34.43 | 36.00 | 74.00 | -38.00 | Peak |

Vertical:




Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120D ANT(>1GHZ) VERTICAL
Job No. : 1173RF
Test Mode : Receiving mode
Test Engineer: Hank

| | Freq | ReadAntenna Level | Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1068.000 | 30.70 | 24.67 | 4.35 | 32.87 | 26.85 | 54.00 | -27.15 | Average |
| 2 | 1068.000 | 40.62 | 24.67 | 4.35 | 32.87 | 36.77 | 74.00 | -37.23 | Peak |
| 3 | 1216.000 | 29.79 | 25.42 | 4.48 | 33.13 | 26.56 | 54.00 | -27.44 | Average |
| 4 | 1216.000 | 39.90 | 25.42 | 4.48 | 33.13 | 36.67 | 74.00 | -37.33 | Peak |
| 5 | 1398.000 | 30.89 | 25.58 | 4.61 | 33.42 | 27.66 | 54.00 | -26.34 | Average |
| 6 | 1398.000 | 40.55 | 25.58 | 4.61 | 33.42 | 37.32 | 74.00 | -36.68 | Peak |
| 7 | 1606.000 | 30.85 | 24.97 | 4.75 | 33.79 | 26.78 | 54.00 | -27.22 | Average |
| 8 | 1606.000 | 40.34 | 24.97 | 4.75 | 33.79 | 36.27 | 74.00 | -37.73 | Peak |
| 9 | 1729.000 | 30.36 | 25.04 | 4.82 | 34.00 | 26.22 | 54.00 | -27.78 | Average |
| 10 | 1729.000 | 40.52 | 25.04 | 4.82 | 34.00 | 36.38 | 74.00 | -37.62 | Peak |
| 11 | 1938.000 | 29.96 | 25.90 | 4.93 | 34.34 | 26.45 | 54.00 | -27.55 | Average |
| 12 | 1938.000 | 39.96 | 25.90 | 4.93 | 34.34 | 36.45 | 74.00 | -37.55 | Peak |