

# FCC Test Report

## FCC ID: 2AAUI-GDIEXBDR310

**Product:** EcoBoulder Max

**Trade Name:** ECOXGEAR

**Model Number:** GDI-EXBDR310

**Family Model:** N/A

**Report No.:** S20031400605003

**Prepared for**

Grace Digital Inc.

Grace Digital Inc.10531 4S Commons Drive#166 Suite#430 · San Diego,CA  
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**Prepared by**

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TEST RESULT CERTIFICATION

Applicant's name : Grace Digital Inc.
Address : Grace Digital Inc.10531 4S Commons Drive#166 Suite#430,San Diego,CA 92127,USA
Manufacturer's Name : Xingtel Xiamen Group Co., Ltd.
Address : Xingtel Building,Chuangxin Road, Torch Hi-Tech Industrial District,Xiamen 361006, PR China
Factory 's Name : N/A
Address : N/A

Product description

Product name : EcoBoulder Max
Model and/or type reference : GDI-EXBDR310
FCC part 15C

Standards : ANSI C63.10:2013
KDB 680106 D01 RF Exposure Wireless Charging App v03

This device described above has been tested by Shenzhen NTEK Testing Technology Co., Ltd., 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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The test results of this report relate only to the tested sample identified in this report.

Date of Test :
Date (s) of performance of tests : 14 Mar. 2020 ~ 01 Jun. 2020
Date of Issue : 01 Jun. 2020
Test Result : Pass

Testing Engineer : [Signature: Allen Liu]
(Allen Liu)

Technical Manager : [Signature: Jason Chen]
(Jason Chen)

Authorized Signatory : [Signature: Sam Chen]
(Sam Chen)

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**1. TEST SUMMARY**

Test procedures according to the technical standards:

| EMC Emission                     |                     |           |         |          |        |
|----------------------------------|---------------------|-----------|---------|----------|--------|
| Standard                         | Test Item           | FCC Rules | Limit   | Judgment | Remark |
| FCC part 15C<br>ANSI C63.10:2013 | Conducted Emission  | §15.207   | Class B | PASS     |        |
|                                  | Radiated Emission   | §15.209   | Class B | PASS     |        |
|                                  | ANTENNA APPLICATION | §15.203   | /       | PASS     |        |
|                                  | 20dB bandwidth      | §15.215   | /       | 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 FACILITIES AND ACCREDITATIONS

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.

### 1.2 LABORATORY ACCREDITATIONS AND LISTINGS

#### Site Description

CNAS-Lab. : The Laboratory has been assessed and proved to be in compliance with  
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)  
The Certificate Registration Number is L5516.

IC-Registration : The Certificate Registration Number is 9270A-1.

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.

### 1.3 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

| Product Feature and Specification |  |
|-----------------------------------|--|
| Equipment                         | EcoBoulder Max   |
| Trade Name                        | ECOXGEAR   |
| FCC ID                            | 2AAUI-GDIEXBDR310  |
| Model No.                         | GDI-EXBDR310   |
| Family Model                      | N/A  |
| Model Difference                  | N/A  |
| Operating Frequency               | 110KHz~205KHz  |
| Modulation Technique              | Induction  |
| Antenna Type                      | Induction coil   |
| Power supply                      | <input checked="" type="checkbox"/> DC supply:<br>Input: 12V |
|                                   | <input type="checkbox"/> Adapter supply:                     |
| Output                            | Output:5V 1A   |
| Battery                           | 12V/7Ah from Battery or AC 100-240V 50/60Hz                  |
| HW Version                        | BT322-M-V1.4   |
| SW Version                        | V1.05  |

2.1.1 DESCRIPTION OF TEST MODES

EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

| Test Cases            |                       |
|-----------------------|-----------------------|
| Test Item             | Data Rate/ Modulation |
| AC Conducted Emission | Mode 1: Max load*     |
| Radiated Test Cases   | Mode 1: Max load      |

(\*)EUT can only access the specified load, can not adjust the size of the load

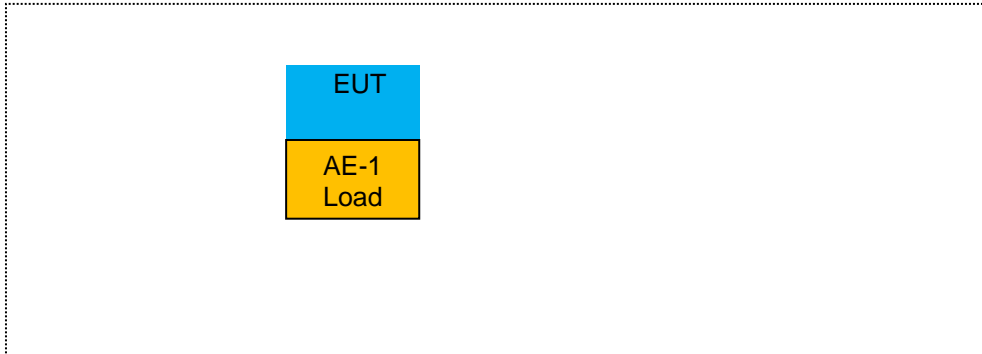
Carrier Frequency and test Channel:

| Channel | Frequency(MHz) |
|---------|----------------|
| 1       | 0.111          |
| 2       | 0.155          |
| 3       | 0.175          |

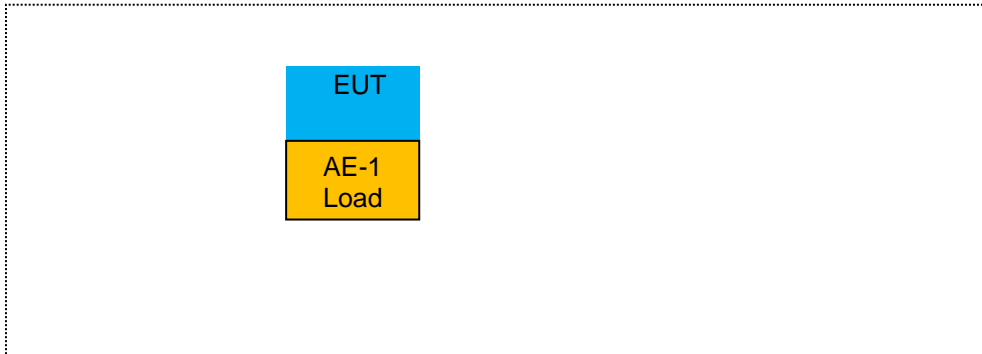


## 2.2 DESCRIPTION OF TEST SETUP

For AC Conducted Emission Mode



For Radiated Test Cases



**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 | Load      | N/A   | N/A            | N/A        | Peripherals |
|      |           |       |                |            |             |
|      |           |       |                |            |             |
|      |           |       |                |            |             |
|      |           |       |                |            |             |
|      |           |       |                |            |             |
|      |           |       |                |            |             |
|      |           |       |                |            |             |

| Item | Cable Type | Shielded Type | Ferrite Core | Length | Note |
|------|------------|---------------|--------------|--------|------|
|      |            |               |              |        |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |
|      |            |               |              |        |      |

**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

|    | Kind of Equipment       | Manufacturer | Type No.      | Serial No. | Last calibration         | Calibrated until         | Calibration period |
|----|-------------------------|--------------|---------------|------------|--------------------------|--------------------------|--------------------|
| 1  | Spectrum Analyzer       | Agilent      | E4407B        | MY45108040 | 2019.05.12<br>2020.05.11 | 2020.05.11<br>2021.05.10 | 1 year             |
| 2  | Spectrum Analyzer       | Agilent      | N9020A        | MY49100060 | 2019.05.12<br>2020.05.11 | 2020.05.11<br>2021.05.10 | 1 year             |
| 4  | Test Receiver           | R&S          | ESPI          | 101318     | 2019.05.12<br>2020.05.11 | 2020.05.11<br>2021.05.10 | 1 year             |
| 5  | Bilog Antenna           | TESEQ        | CBL6111D      | 31216      | 2019.04.12<br>2020.04.11 | 2020.04.11<br>2021.04.10 | 1 year             |
| 6  | 50Ω Coaxial Switch      | Anritsu      | MP59B         | 6200983705 | 2017.05.12<br>2020.05.11 | 2020.05.11<br>2023.05.10 | 1 year             |
| 7  | Amplifier               | EMC          | EMC051835 SE  | 980246     | 2019.08.05               | 2020.08.04               | 1 year             |
| 8  | Amplifier               | MITEQ        | TTA1840-35-HG | 177156     | 2019.08.05               | 2020.08.04               | 1 year             |
| 9  | Loop Antenna            | ARA          | PLA-1030/B    | 1029       | 2019.05.19               | 2020.05.18               | 1 year             |
| 10 | Test Cable (9KHz-30MHz) | N/A          | R-01          | N/A        | 2018.04.21               | 2021.04.20               | 3 year             |
| 11 | Test Cable (30MHz-1GHz) | N/A          | R-02          | N/A        | 2018.04.21               | 2021.04.20               | 3 year             |

### 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     | 2019.05.14<br>2020.05.13 | 2020.05.13<br>2021.05.12 | 1 year             |
| 2    | LISN                    | R&S          | ENV216    | 101313     | 2019.04.16<br>2020.04.15 | 2020.04.15<br>2021.04.14 | 1 year             |
| 3    | LISN                    | SCHWARZBECK  | NNLK 8129 | 8129245    | 2019.05.14<br>2020.05.13 | 2020.05.13<br>2021.05.12 | 1 year             |
| 4    | 50Ω Coaxial Switch      | ANRITSU CORP | MP59B     | 6200983704 | 2017.05.12<br>2020.05.11 | 2020.05.11<br>2023.05.10 | 3 year             |
| 5    | Test Cable (9KHz-30MHz) | N/A          | C01       | N/A        | 2018.04.21               | 2021.04.20               | 3 year             |
| 6    | Test Cable (9KHz-30MHz) | N/A          | C02       | N/A        | 2018.04.21               | 2021.04.20               | 3 year             |
| 7    | Test Cable (9KHz-30MHz) | N/A          | C03       | N/A        | 2018.04.21               | 2021.04.20               | 3 year             |

### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

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

| FREQUENCY (MHz) | limit      |           |
|-----------------|------------|-----------|
|                 | Quasi-peak | Average   |
| 0.15 -0.5       | 66 - 56 *  | 56 - 46 * |
| 0.50 -5.0       | 56.00      | 46.00     |
| 5.0 -30.0       | 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.

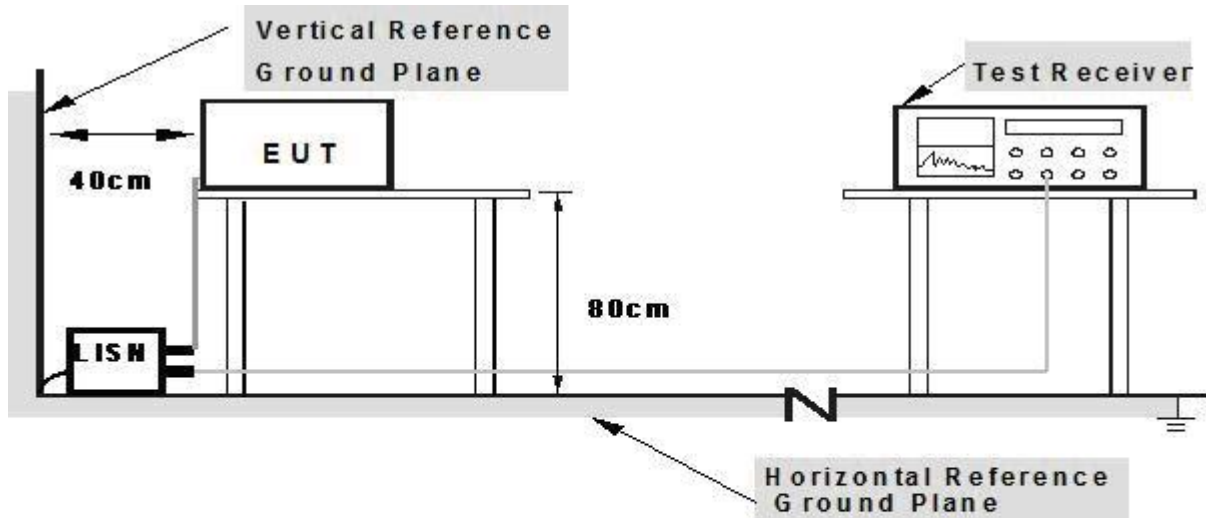
The following table is the setting of the receiver

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

### 3.1.2 TEST PROCEDURE

- a. 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.
- b. 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.
- c. 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.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. 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.

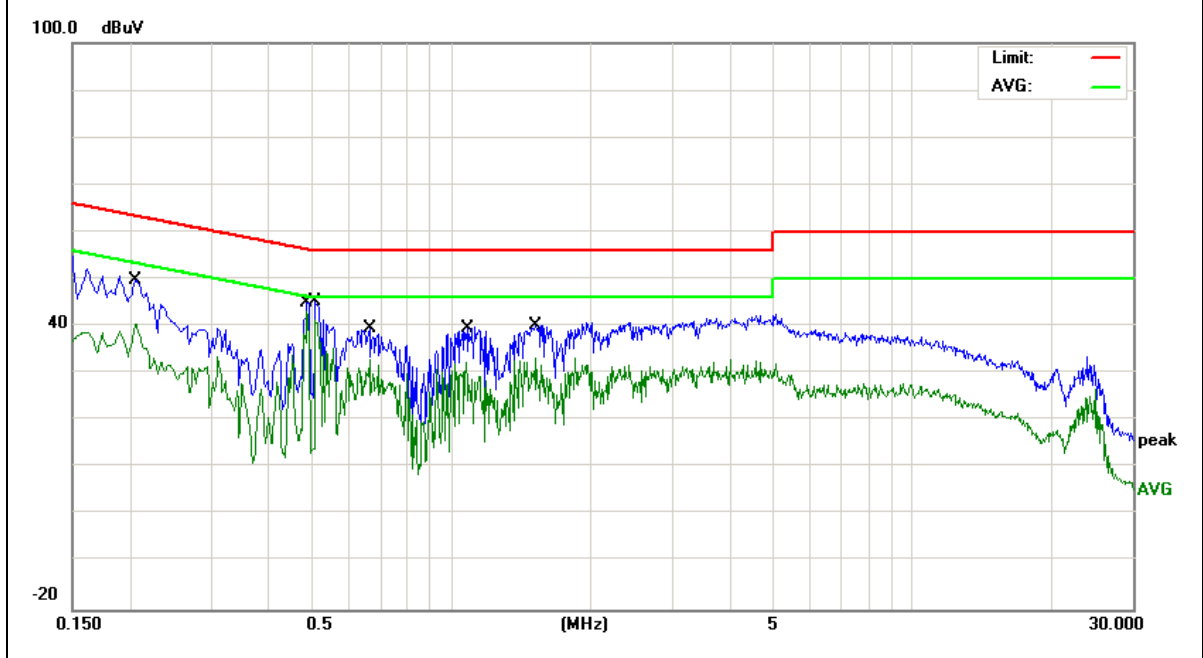
3.1.5 TEST RESULTS

|               |                     |                    |              |
|---------------|---------------------|--------------------|--------------|
| EUT:          | EcoBoulder Max      | Model Name. :      | GDI-EXBDR310 |
| Temperature:  | 26 °C               | Relative Humidity: | 54%          |
| Pressure:     | 1010hPa             | Test Date:         | 2020-03-14   |
| Test Mode:    | Mode 1(Normal link) | Phase :            | L            |
| Test Voltage: | AC 120V             |                    |              |

| Frequency (MHz) | Reading Level (dBμV) | Correct Factor (dB) | Measurement (dBμV) | Limits (dBμV) | Margin (dB) | Remark |
|-----------------|----------------------|---------------------|--------------------|---------------|-------------|--------|
| 0.206           | 40.07                | 9.76                | 49.83              | 63.36         | -13.53      | QP     |
| 0.206           | 30.84                | 9.76                | 40.6               | 53.36         | -12.76      | AVG    |
| 0.486           | 35.31                | 9.74                | 45.05              | 56.24         | -11.19      | QP     |
| 0.486           | 33.39                | 9.74                | 43.13              | 46.24         | -3.11       | AVG    |
| 0.506           | 35.49                | 9.74                | 45.23              | 56            | -10.77      | QP     |
| 0.506           | 31.48                | 9.74                | 41.22              | 46            | -4.78       | AVG    |
| 0.662           | 29.86                | 9.74                | 39.6               | 56            | -16.4       | QP     |
| 0.662           | 23.3                 | 9.74                | 33.04              | 46            | -12.96      | AVG    |
| 1.074           | 30.06                | 9.74                | 39.8               | 56            | -16.2       | QP     |
| 1.074           | 22.68                | 9.74                | 32.42              | 46            | -13.58      | AVG    |
| 1.522           | 30.43                | 9.77                | 40.2               | 56            | -15.8       | QP     |
| 1.522           | 23.58                | 9.77                | 33.35              | 46            | -12.65      | AVG    |

Remark:

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

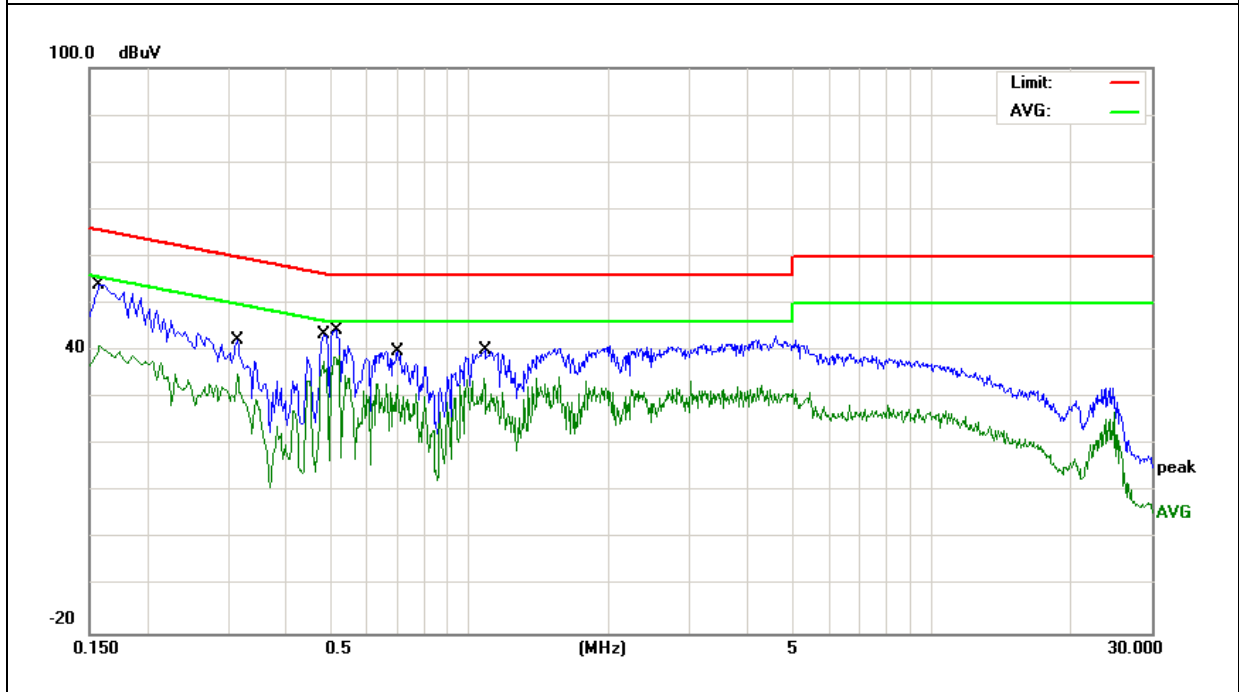


|               |                     |                    |              |
|---------------|---------------------|--------------------|--------------|
| EUT:          | EcoBoulder Max      | Model Name. :      | GDI-EXBDR310 |
| Temperature:  | 26 °C               | Relative Humidity: | 54%          |
| Pressure:     | 1010hPa             | Test Date:         | 2020-03-20   |
| Test Mode:    | Mode 1(Normal link) | Phase :            | N            |
| Test Voltage: | AC 120V             |                    |              |

| Frequency (MHz) | Reading Level (dBμV) | Correct Factor (dB) | Measure-ment (dBμV) | Limits (dBμV) | Margin (dB) | Remark |
|-----------------|----------------------|---------------------|---------------------|---------------|-------------|--------|
| 0.158           | 44.21                | 9.74                | 53.95               | 65.56         | -11.61      | QP     |
| 0.158           | 31.27                | 9.74                | 41.01               | 55.56         | -14.55      | AVG    |
| 0.314           | 32.36                | 9.74                | 42.1                | 59.86         | -17.76      | QP     |
| 0.314           | 25.38                | 9.74                | 35.12               | 49.86         | -14.74      | AVG    |
| 0.482           | 33.73                | 9.75                | 43.48               | 56.3          | -12.82      | QP     |
| 0.482           | 27.96                | 9.75                | 37.71               | 46.3          | -8.59       | AVG    |
| 0.514           | 34.72                | 9.75                | 44.47               | 56            | -11.53      | QP     |
| 0.514           | 29.19                | 9.75                | 38.94               | 46            | -7.06       | AVG    |
| 0.698           | 30.07                | 9.75                | 39.82               | 56            | -16.18      | QP     |
| 0.698           | 22.83                | 9.75                | 32.58               | 46            | -13.42      | AVG    |
| 1.074           | 30.38                | 9.75                | 40.13               | 56            | -15.87      | QP     |
| 1.074           | 24.52                | 9.75                | 34.27               | 46            | -11.73      | 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

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

| Frequency (MHz) | Field strength (microvolts/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                             |

#### 15.205 Restricted bands of operation

| MHz                      | MHz                 | MHz           | GHz         |
|--------------------------|---------------------|---------------|-------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15    |
| <sup>1</sup> 0.495-0.505 | 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          | 108-121.94          | 1718.8-1722.2 | 13.25-13.4  |
| 6.31175-6.31225          | 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              |                     |               |             |

**Notes:**

- (1) Measurement was performed at an antenna to the closed point of EUT distance of meters.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).
- (3) Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of 15.205, and the emissions located in restricted bands also comply with 15.209 limit.
- (4) 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



### 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 (Blow 30M, use loop 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.

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

Use the following receiver/spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW=200Hz for 9KHz to 150KHz,

RBW=9kHz for 150KHz to 30MHz,

RBW=120KHz for 30MHz to 1GHz

VBW  $\geq$  3\*RBW

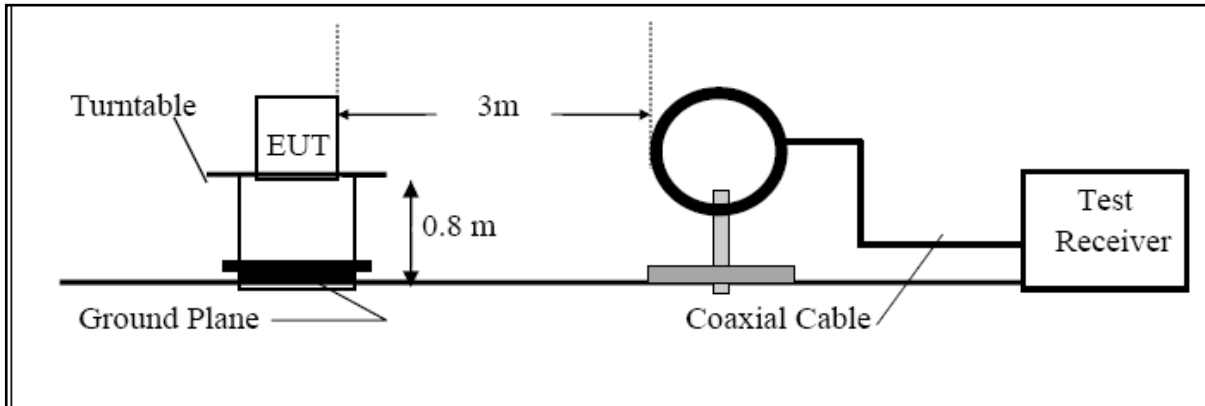
Sweep = auto

Detector function = QP

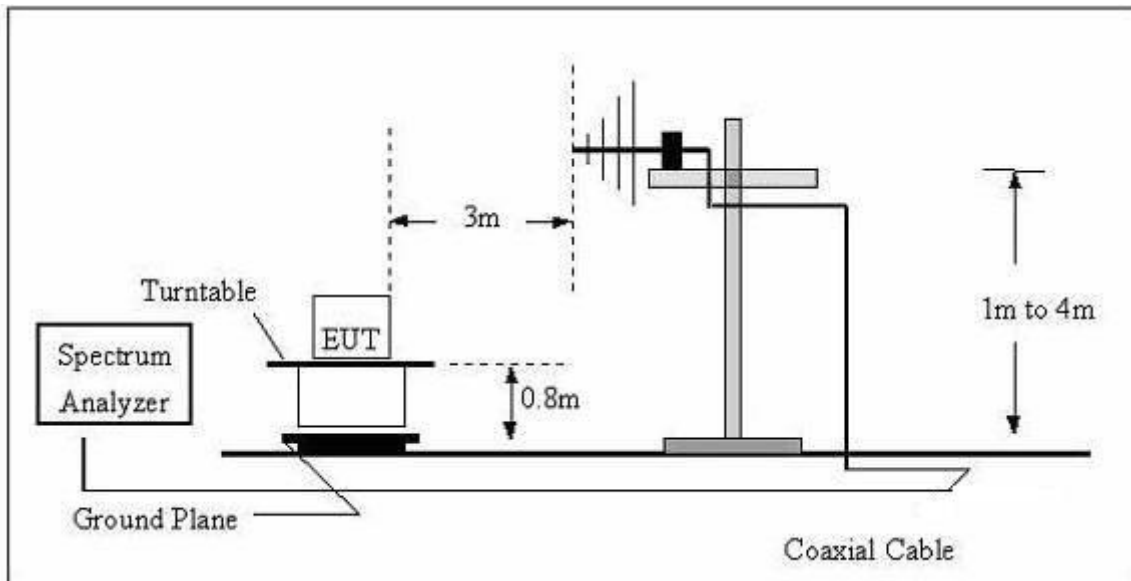
Trace = max hold

### 3.2.3 TEST SETUP

For Radiated Emission Test Set-Up, Frequency Below 30MHz



For Radiated Emission 30~1000MHz



### 3.2.4 TEST RESULTS

#### TEST RESULTS (9KHz~30MHz)

|              |                        |                    |              |
|--------------|------------------------|--------------------|--------------|
| EUT:         | EcoBoulder Max         | Model Name. :      | GDI-EXBDR310 |
| Temperature: | 24 °C                  | Relative Humidity: | 54%          |
| Pressure:    | 1010 hPa               | Test Date :        | 2020-03-14   |
| Test Mode :  | Low frequency/Max Load | Polarization :     | X            |
| Test Power : | DC 12V                 |                    |              |

| Frequency<br>(MHz) | Ant.Pol. | Emission Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark                     |
|--------------------|----------|----------------------------|--------------------|----------------|----------------------------|
| 0.054              | X        | 42.28                      | 113.0              | -70.7          | Avg                        |
| 0.110              | X        | 59.58                      | 106.8              | -47.2          | Avg                        |
| 0.111              | X        | 62.36                      | 106.7              | -44.3          | Avg(fundamental frequency) |
| 0.643              | X        | 44.21                      | 71.44              | -27.23         | QP                         |
| 2.925              | X        | 33.26                      | 69.54              | -36.28         | QP                         |
| 4.973              | X        | 42.02                      | 69.54              | -27.52         | 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.

|              |                        |                    |              |
|--------------|------------------------|--------------------|--------------|
| EUT:         | EcoBoulder Max         | Model Name. :      | GDI-EXBDR310 |
| Temperature: | 24 °C                  | Relative Humidity: | 54%          |
| Pressure:    | 1010 hPa               | Test Date :        | 2020-03-14   |
| Test Mode :  | Mid frequency/Max Load | Polarization :     | X            |
| Test Power : | DC 12V                 |                    |              |

| Frequency<br>(MHz) | Ant.Pol. | Emission Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark                     |
|--------------------|----------|----------------------------|--------------------|----------------|----------------------------|
| 0.036              | X        | 41.24                      | 116.48             | -75.24         | Avg                        |
| 0.155              | X        | 74.98                      | 103.80             | -28.82         | Avg(fundamental frequency) |
| 0.582              | X        | 37.52                      | 72.31              | -34.79         | QP                         |
| 0.815              | X        | 32.84                      | 69.38              | -36.54         | QP                         |
| 1.516              | X        | 31.62                      | 63.99              | -32.37         | QP                         |
| 7.132              | X        | 45.21                      | 69.54              | -24.33         | 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.

|              |                         |                    |              |
|--------------|-------------------------|--------------------|--------------|
| EUT:         | EcoBoulder Max          | Model Name. :      | GDI-EXBDR310 |
| Temperature: | 24 °C                   | Relative Humidity: | 54%          |
| Pressure:    | 1010 hPa                | Test Date :        | 2020-03-14   |
| Test Mode :  | High frequency/Max Load | Polarization :     | X            |
| Test Power : | DC 12V                  |                    |              |

| Frequency (MHz) | Ant. Pol. | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark                     |
|-----------------|-----------|-------------------------|-----------------|-------------|----------------------------|
| 0.047           | X         | 36.96                   | 114.16          | -77.20      | Avg                        |
| 0.175           | X         | 79.86                   | 102.74          | -22.88      | Avg(fundamental frequency) |
| 0.502           | X         | 39.65                   | 73.59           | -33.94      | QP                         |
| 1.416           | X         | 35.03                   | 64.58           | -29.55      | QP                         |
| 5.432           | X         | 34.23                   | 69.54           | -35.31      | QP                         |
| 8.154           | X         | 32.28                   | 69.54           | -37.26      | 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.

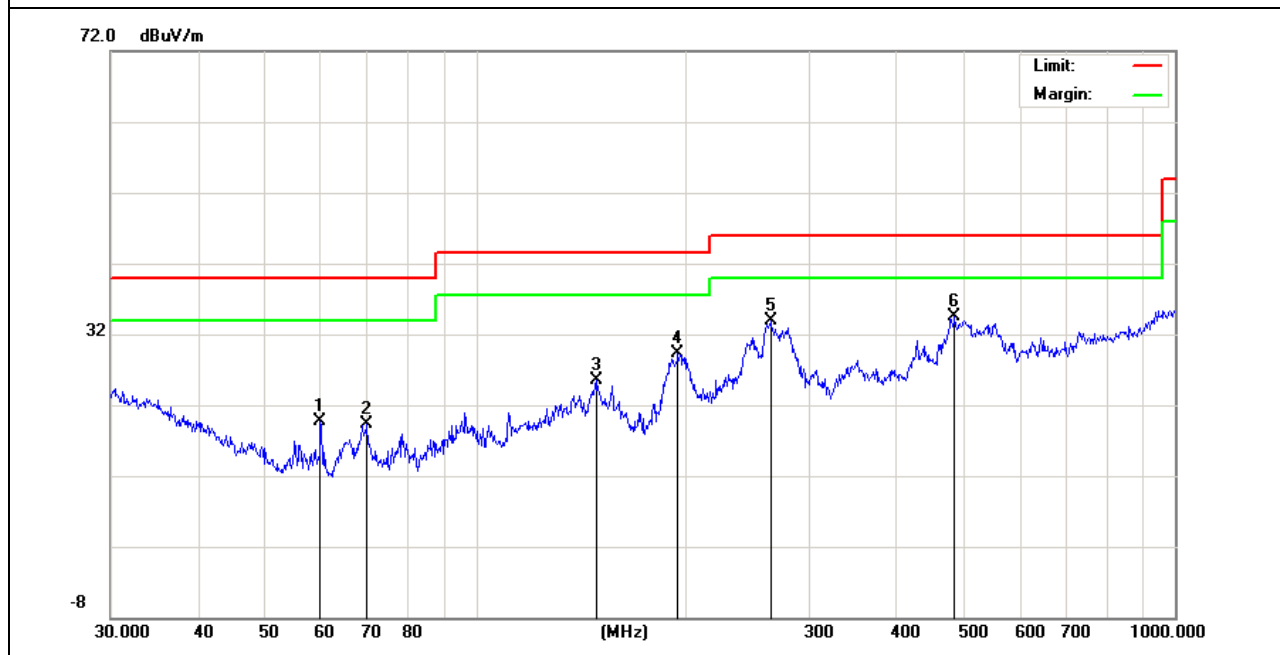
TEST RESULTS (30MHz ~1000MHz)

|              |                         |                    |              |
|--------------|-------------------------|--------------------|--------------|
| EUT:         | EcoBoulder Max          | Model Name. :      | GDI-EXBDR310 |
| Temperature: | 24 °C                   | Relative Humidity: | 54%          |
| Pressure:    | 1010 hPa                | Test Date :        | 2020-03-14   |
| Test Mode :  | High frequency/Max Load | Polarization :     | Horizontal   |
| Test Power : | DC 12V                  |                    |              |

| Polar (H/V) | Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Remark |
|-------------|-----------|---------------|--------|----------------|----------|--------|--------|
|             | (MHz)     | (dBuV)        | (dB)   | (dBuV/m)       | (dBuV/m) | (dB)   |        |
| H           | 59.8588   | 13.73         | 6      | 19.73          | 40       | -20.27 | QP     |
| H           | 69.8449   | 12.92         | 6.37   | 19.29          | 40       | -20.71 | QP     |
| H           | 148.441   | 13.47         | 11.99  | 25.46          | 43.5     | -18.04 | QP     |
| H           | 194.4534  | 20.45         | 8.79   | 29.24          | 43.5     | -14.26 | QP     |
| H           | 263.819   | 19.39         | 14.52  | 33.91          | 46       | -12.09 | QP     |
| H           | 483.9094  | 14.84         | 19.58  | 34.42          | 46       | -11.58 | QP     |

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

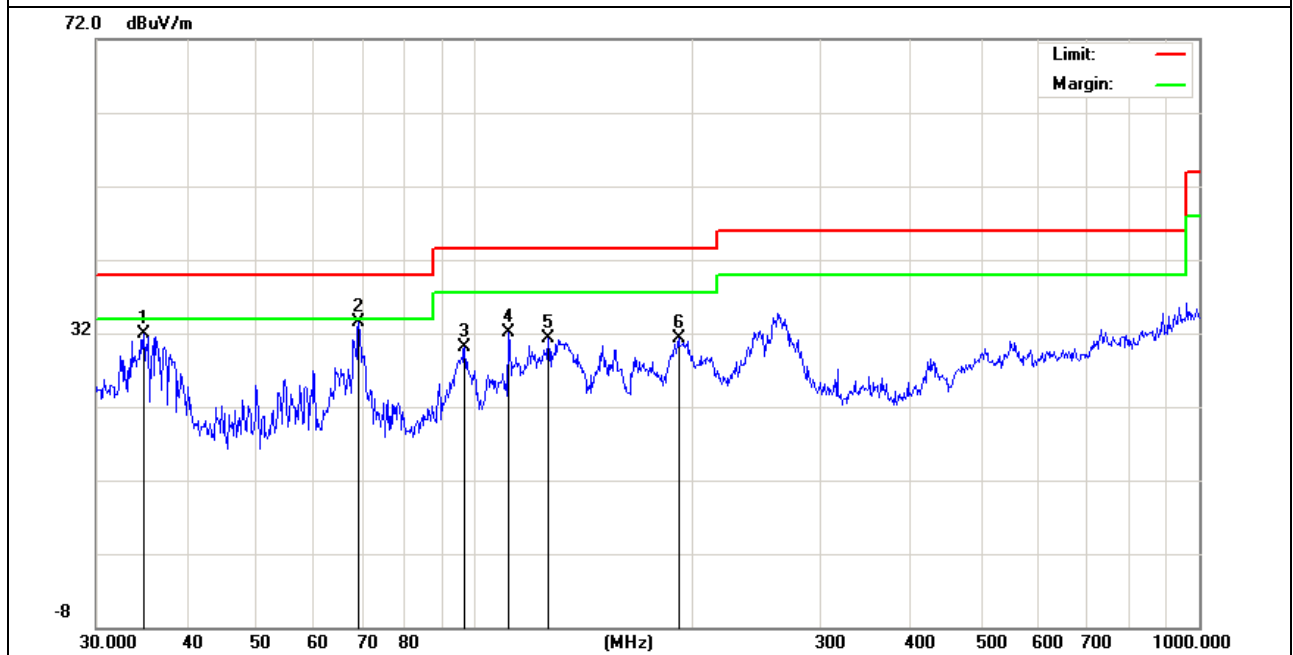


|              |                         |                    |              |
|--------------|-------------------------|--------------------|--------------|
| EUT:         | EcoBoulder Max          | Model Name. :      | GDI-EXBDR310 |
| Temperature: | 24 °C                   | Relative Humidity: | 54%          |
| Pressure:    | 1010 hPa                | Test Date :        | 2020-03-14   |
| Test Mode :  | High frequency/Max Load | Polarization :     | Vertical     |
| Test Power : | DC 12V                  |                    |              |

| Polar (H/V) | Frequency | Meter Reading | Factor | Emission Level | Limits   | Margin | Remark |
|-------------|-----------|---------------|--------|----------------|----------|--------|--------|
|             | (MHz)     | (dBUV)        | (dB)   | (dBUV/m)       | (dBUV/m) | (dB)   |        |
| V           | 34.8823   | 15.11         | 16.77  | 31.88          | 40       | -8.12  | QP     |
| V           | 69.114    | 27.36         | 6.19   | 33.55          | 40       | -6.45  | QP     |
| V           | 96.7749   | 19.75         | 10.31  | 30.06          | 43.5     | -13.44 | QP     |
| V           | 111.3468  | 20.58         | 11.53  | 32.11          | 43.5     | -11.39 | QP     |
| V           | 126.3285  | 18.97         | 12.27  | 31.24          | 43.5     | -12.26 | QP     |
| V           | 191.0738  | 22.27         | 9.1    | 31.37          | 43.5     | -12.13 | QP     |

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



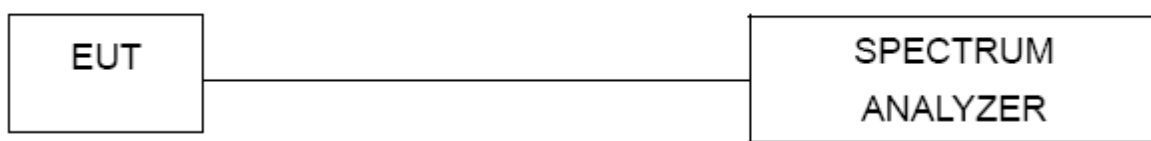
note: that all test channel has been tested, the high frequency is the worst case and the report just recorded the worst case data.

#### 4. BANDWIDTH TEST

##### 4.1 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.

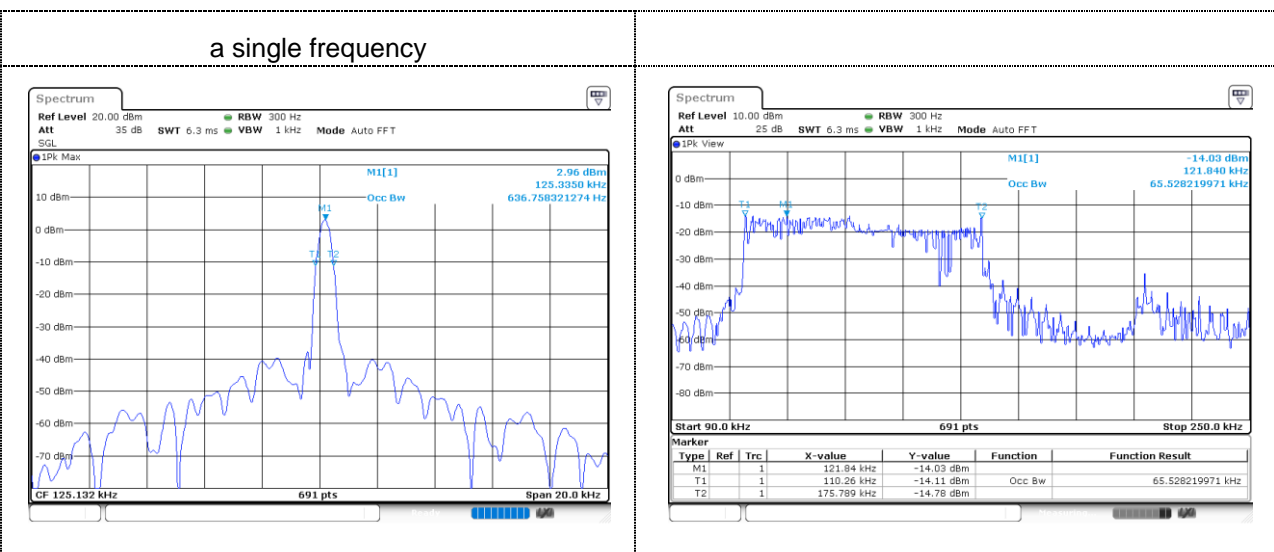
##### 4.2 TEST SETUP



##### 4.3 TEST RESULT

|              |                |                    |                   |
|--------------|----------------|--------------------|-------------------|
| EUT:         | EcoBoulder Max | Model Name. :      | GDI-EXBDR310      |
| Temperature: | 24 °C          | Relative Humidity: | 54%               |
| Pressure:    | 1010 hPa       | Test Mode :        | Operating maxload |
| Test Power : | DC 12V         |                    |                   |

|  |             |             |   |
|--|-------------|-------------|---|
| 99% Bandwidth- a single frequency (Hz) | $F_L$ (kHz) | $F_H$ (kHz) | Note: $F_L > 110\text{kHz}, F_H < 495\text{kHz}$ , compliance with the Restricted bands requirements according to Part 15.205 |
| 636.758                                | 110.26      | 175.789     |   |





## 5. ANTENNA APPLICATION

### 5.1 Antenna 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.

### 5.2 Result

The EUT antenna is Induction coil antenna. It comply with the standard requirement.

END REPORT