



# TEST REPORT

Report Reference No..... : TRE1801017104 R/C.....: 67477

FCC ID..... : 2AEY7-S8A003

Applicant's name..... : Bak USA Technologies Corp.

Address..... : 425 Michigan Avenue,Buffalo,New York 14203,USA

Manufacturer..... : Bak USA Technologies Corp.

Address..... : 425 Michigan Avenue,Buffalo,New York 14203,USA

Test item description ..... : Tablet PC

Trade Mark ..... : -

Model/Type reference..... : LTE Barcode 1.0

Listed Model(s) ..... : -

Standard ..... : FCC CFR Title 47 Part 15 Subpart C Section 15.225

Date of receipt of test sample..... : Jan.22,2018

Date of testing..... : Jan.23,2018- Feb.06,2018

Date of issue..... : Feb.07,2018

Result..... : PASS

Compiled by

( position+printedname+signature)....: File administrators Candy Liu

Supervised by

(position+printedname+signature)....: Project Engineer Edward Pan

Approved by

(position+printedname+signature)....: RF Manager Hans Hu

Testing Laboratory Name ..... : Shenzhen Huatongwei International Inspection Co., Ltd.

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

**Shenzhen Huatongwei International Inspection Co., Ltd. All rights reserved.**

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Huatongwei International Inspection Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen Huatongwei International Inspection Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

## Contents

|           |  |           |
|-----------|--|-----------|
| <u>1.</u> | <u>TEST STANDARDS AND TEST DESCRIPTION</u>     | <u>3</u>  |
| 1.1.      | Test Standards                                 | 3         |
| 1.2.      | Report version                                 | 3         |
| <u>2.</u> | <u>TEST DESCRIPTION</u>                        | <u>4</u>  |
| <u>3.</u> | <u>SUMMARY</u>                                 | <u>5</u>  |
| 3.1.      | Client Information                             | 5         |
| 3.2.      | Product Description                            | 5         |
| 3.3.      | EUT operation mode                             | 5         |
| 3.4.      | EUT configuration                              | 5         |
| 3.5.      | Modifications                                  | 5         |
| <u>4.</u> | <u>TEST ENVIRONMENT</u>                        | <u>6</u>  |
| 4.1.      | Address of the test laboratory                 | 6         |
| 4.2.      | Test Facility                                  | 6         |
| 4.3.      | Environmental conditions                       | 7         |
| 4.4.      | Statement of the measurement uncertainty       | 7         |
| 4.5.      | Equipments Used during the Test                | 8         |
| <u>5.</u> | <u>TEST CONDITIONS AND RESULTS</u>             | <u>10</u> |
| 5.1.      | Antenna requirement                            | 10        |
| 5.2.      | AC Power Conducted Emissions                   | 11        |
| 5.3.      | Radiated Emissions                             | 14        |
| <u>6.</u> | <u>TEST SETUP PHOTOS OF THE EUT</u>            | <u>17</u> |
| <u>7.</u> | <u>EXTERNAL AND INTERNAL PHOTOS OF THE EUT</u> | <u>17</u> |

## 1. **TEST STANDARDS AND TEST DESCRIPTION**

### 1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.225](#): Operation within the band 13.110-14.010 MHz

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

### 1.2. Report version

| Version No. | Date of issue | Description |
|-------------|---------------|-------------|
| 00          | Feb.07,2018   | Original    |
|             |               |             |
|             |               |             |
|             |               |             |
|             |               |             |

## **2. Test Description**

| Test Item                         | Section in CFR 47 | Result |
|-----------------------------------|-------------------|--------|
| Antenna requirement               | 15.203            | Pass   |
| AC Power Line Conducted Emissions | 15.207            | Pass   |
| Radiated Emission                 | 15.209            | Pass   |

Remark: The measurement uncertainty is not included in the test result.

### 3. **SUMMARY**

#### 3.1. Client Information

|               |  |
|---------------|--|
| Applicant:    | Bak USA Technologies Corp.                     |
| Address:      | 425 Michigan Avenue,Buffalo,New York 14203,USA |
| Manufacturer: | Bak USA Technologies Corp.                     |
| Address:      | 425 Michigan Avenue,Buffalo,New York 14203,USA |

#### 3.2. Product Description

|                      |   |
|----------------------|---|
| Name of EUT:         | Tablet PC   |
| Trade Mark:          | -   |
| Model No.:           | LTE Barcode 1.0   |
| Listed Model(s):     | -   |
| Power supply:        | DC 3.7V From exchange battery                           |
| Adapter information: | Input: 100-240Va.c., 50/60Hz, 0.6A<br>Output: 5Vd.c.,5A |
| Hardware version:    | 1.0   |
| Software version:    | 1607  |
| <b>NFC</b>           |   |
| Operation frequency: | 13.56MHz  |
| Channel number:      | 1   |
| Modulation Type:     | ASK   |
| Antenna type:        | Integral antenna  |
| Antenna gain:        | 2dBi  |

#### 3.3. EUT operation mode

|  |
|--|
| For RF test items  |
| The engineering test program was provided and enabled to make EUT continuous transmit. |
| For AC power line conducted emissions:   |
| The EUT was set to connect with large package sizes transmission.                      |

#### 3.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

|  |                |   |
|--|----------------|---|
|  | Manufacturer : | / |
|  | Model No. :    | / |
|  | Manufacturer : | / |
|  | Model No. :    | / |

#### 3.5. Modifications

No modifications were implemented to meet testing criteria.

## **4. TEST ENVIRONMENT**

### **4.1. Address of the test laboratory**

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Phone: 86-755-26748019 Fax: 86-755-26748089

### **4.2. Test Facility**

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

#### **CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### **A2LA-Lab Cert. No. 3902.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### **FCC-Registration No.: 762235**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

#### **IC-Registration No.: 5377B-1**

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B-1.

#### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

### 4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

|                    |             |
|--------------------|-------------|
| Temperature:       | 15~35°C     |
| Relative Humidity: | 30~60 %     |
| Air Pressure:      | 950~1050mba |

### 4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system according to ISO/IEC 17025. Further more, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei is reported:

| Test Items                              | MeasurementUncertainty | Notes |
|---|------------------------|-------|
| Conducted spurious emissions 9KHz-30MHz | 3.39 dB                | (1)   |
| Radiated Emissions 30~1000MHz           | 4.24 dB                | (1)   |
| Radiated Emissions 1~18GHz              | 5.16 dB                | (1)   |
| Radiated Emissions 18-40GHz             | 5.54 dB                | (1)   |
| Occupied Bandwidth                      | -----                  | (1)   |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

#### 4.5. Equipments Used during the Test

| Conducted Emissions |                                  |              |                 |            |                      |                      |
|---------------------|----------------------------------|--------------|-----------------|------------|----------------------|----------------------|
| Item                | Test Equipment                   | Manufacturer | Model No.       | Serial No. | Last Cal. (mm-dd-yy) | Next Cal. (mm-dd-yy) |
| 1                   | EMI Test Receiver                | R&S          | ESCI            | 101247     | 11/11/2017           | 11/10/2018           |
| 2                   | Artificial Mains                 | SCHWARZBECK  | NNLK 8121       | 573        | 11/11/2017           | 11/10/2018           |
| 3                   | Pulse Limiter                    | R&S          | ESH3-Z2         | 101488     | 11/11/2017           | 11/10/2018           |
| 4                   | Test Software                    | R&S          | ES-K1           | N/A        | N/A                  | N/A                  |
| 5                   | RF Connection Cable              | HUBER+SUHNER | EF400           | N/A        | 11/21/2017           | 11/20/2018           |
| 6                   | Single Balanced Telecom Pair ISN | FCC          | FCC-TLISN-T2-02 | 20371      | 11/11/2017           | 11/10/2018           |
| 7                   | Two Balanced Telecom Pairs ISN   | FCC          | FCC-TLISN-T4-02 | 20373      | 11/11/2017           | 11/10/2018           |
| 8                   | Four Balanced Telecom Pairs ISN  | FCC          | FCC-TLISN-T8-02 | 20375      | 11/11/2017           | 11/10/2018           |
| 9                   | V-Network                        | R&S          | ESH3-Z6         | 100211     | 11/11/2017           | 11/10/2018           |
| 10                  | V-Network                        | R&S          | ESH3-Z6         | 100210     | 11/11/2017           | 11/10/2018           |
| 11                  | 2-Line V-Network                 | R&S          | ESH3-Z5         | 100049     | 11/11/2017           | 11/10/2018           |

| Radiated Emissions |                         |                              |           |            |                      |                      |
|--------------------|-------------------------|------------------------------|-----------|------------|----------------------|----------------------|
| Item               | Test Equipment          | Manufacturer                 | Model No. | Serial No. | Last Cal. (mm-dd-yy) | Next Cal. (mm-dd-yy) |
| 1                  | EMI Test Receiver       | R&S                          | ESCI      | 101247     | 11/11/2017           | 11/10/2018           |
| 2                  | Loop Antenna            | R&S                          | HFH2-Z2   | 100020     | 11/20/2017           | 11/19/2018           |
| 3                  | Ultra-Broadband Antenna | SCHWARZBECK                  | VULB9163  | 538        | 4/5/2017             | 4/4/2018             |
| 4                  | Horn Antenna            | SCHWARZBECK                  | 9120D     | 1011       | 3/27/2017            | 3/26/2018            |
| 5                  | Horn Antenna            | SCHWARZBECK                  | BBHA9170  | 25841      | 3/27/2017            | 3/26/2018            |
| 6                  | Preamplifier            | SCHWARZBECK                  | BBV 9743  | 9743-0022  | 10/18/2017           | 10/17/2018           |
| 7                  | Broadband Preamplifier  | SCHWARZBECK                  | BBV 9718  | 9718-248   | 10/18/2017           | 10/17/2018           |
| 8                  | High pass filter        | Compliance Direction systems | BSU-6     | 34202      | 11/11/2017           | 11/10/2018           |
| 9                  | Turntable               | MATURO                       | TT2.0     | /          | N/A                  | N/A                  |
| 10                 | Antenna Mast            | MATURO                       | TAM-4.0-P | /          | N/A                  | N/A                  |
| 11                 | EMI Test Software       | R&S                          | ESK1      | N/A        | N/A                  | N/A                  |
| 12                 | EMI Test Software       | Audix                        | E3        | N/A        | N/A                  | N/A                  |

|    |                     |              |            |     |            |            |
|----|---------------------|--------------|------------|-----|------------|------------|
| 13 | RF Connection Cable | HUBER+SUHNER | 3m 3GHz S  | N/A | 11/21/2017 | 11/20/2018 |
| 14 | RF Connection Cable | HUBER+SUHNER | 3m 3GHz RG | N/A | 11/21/2017 | 11/20/2018 |
| 15 | RF Connection Cable | HUBER+SUHNER | 6m 18GHz S | N/A | 11/21/2017 | 11/20/2018 |

## RF Conducted Method

| Item | Test Equipment          | Manufacturer | Model No. | Serial No. | Last Cal. (mm-dd-yy) | Next Cal. (mm-dd-yy) |
|------|-------------------------|--------------|-----------|------------|----------------------|----------------------|
| 1    | EXA Signal Analyzer     | Agilent      | N9020A    | 184247     | 9/22/2017            | 9/21/2018            |
| 2    | OSP                     | R&S          | OSP120    | 101317     | N/A                  | N/A                  |
| 3    | OSP                     | R&S          | OSP-B157  | 100890     | N/A                  | N/A                  |
| 4    | Signal generator        | R&S          | SMB100A   | 177956     | 11/11/2017           | 11/10/2018           |
| 5    | Vector signal generator | R&S          | SMBV100A  | 260790     | 7/20/2017            | 7/19/2018            |
| 6    | EXA Signal Analyzer     | Agilent      | N9020A    | 184247     | 9/22/2017            | 9/21/2018            |
| 7    | Power Meter             | Agilent      | U2021XA   | 178231     | 9/22/2017            | 9/21/2018            |
| 8    | DAQ Device              | Agilent      | U2531A    | 132812     | 9/22/2017            | 9/21/2018            |

The Cal.Interval was one year.

## 5. **TEST CONDITIONS AND RESULTS**

### 5.1. Antenna requirement

#### Requirement

##### FCC CFR Title 47 Part 15 Subpart C Section 15.203:

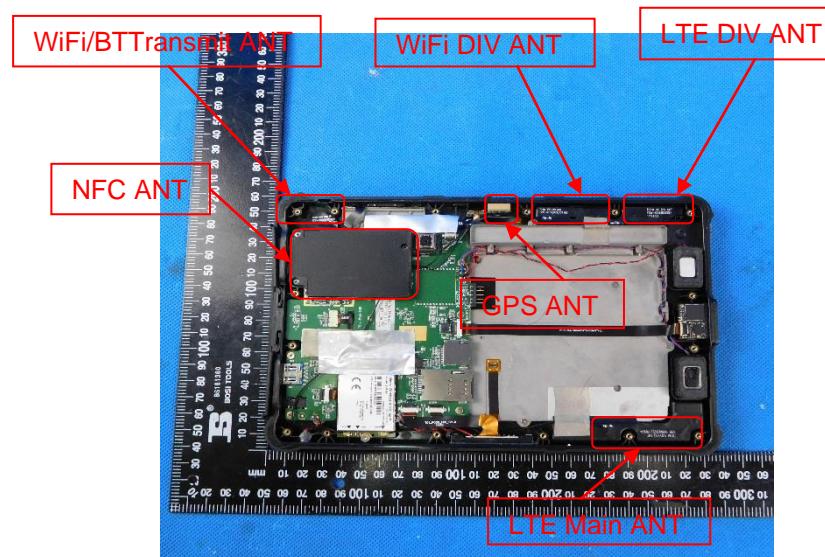
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### **Refer to statement below for compliance.**

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

#### **Test Result:**

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



## 5.2. AC Power Conducted Emissions

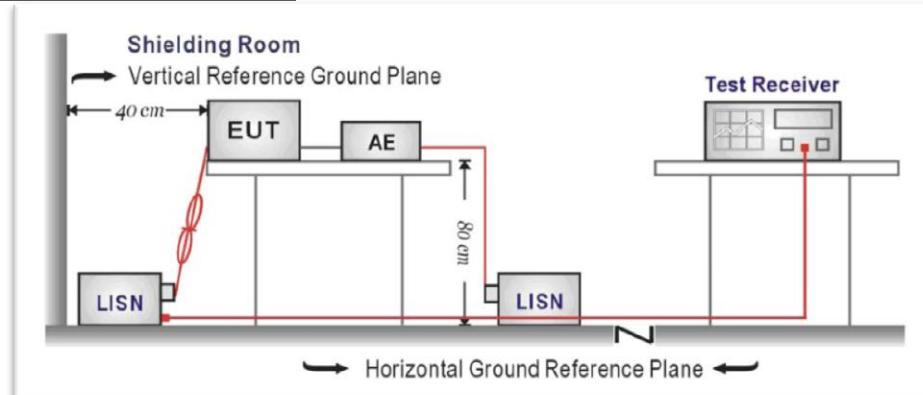
### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

| Frequency range (MHz) | Limit (dBuV) |           |
|-----------------------|--------------|-----------|
|                       | Quasi-peak   | Average   |
| 0.15-0.5              | 66 to 56*    | 56 to 46* |
| 0.5-5                 | 56           | 46        |
| 5-30                  | 60           | 50        |

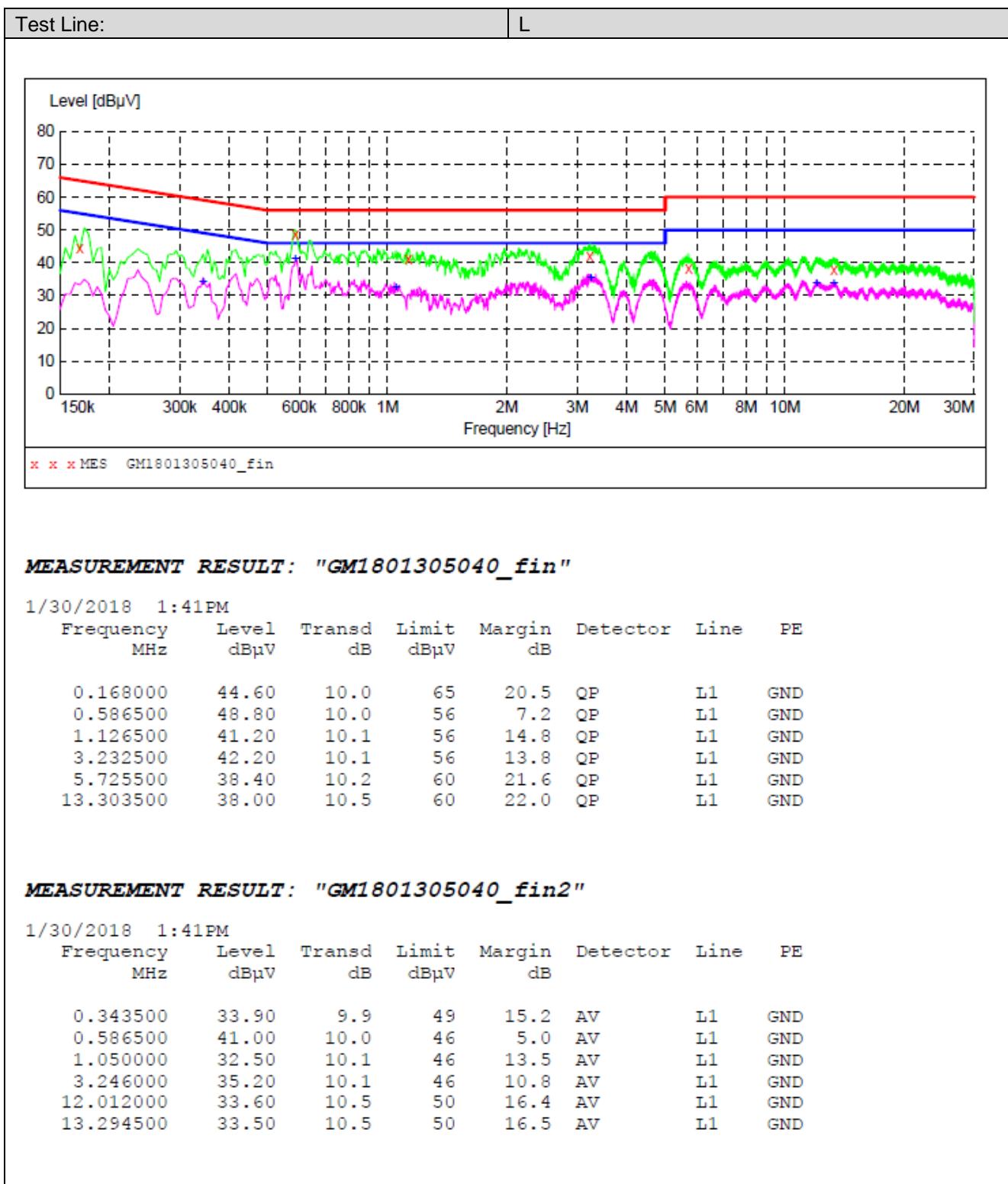
\* Decreases with the logarithm of the frequency.

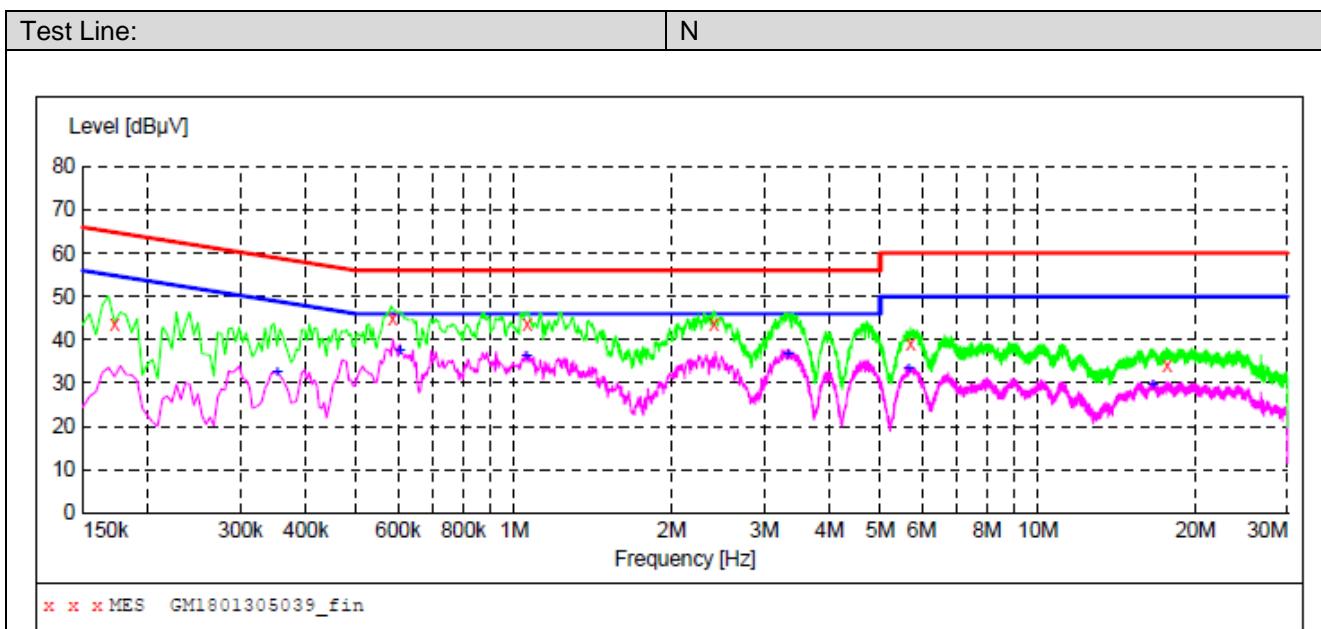
### TEST CONFIGURATION



### TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 10 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 10 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

**TEST RESULTS**



1/30/2018 1:38PM

| Frequency<br>MHz | Level<br>dB $\mu$ V | Transd<br>dB | Limit<br>dB $\mu$ V | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------------|--------------|---------------------|--------------|----------|------|-----|
| 0.172500         | 43.70               | 10.0         | 65                  | 21.1         | QP       | N    | GND |
| 0.586500         | 44.90               | 10.0         | 56                  | 11.1         | QP       | N    | GND |
| 1.059000         | 43.80               | 10.1         | 56                  | 12.2         | QP       | N    | GND |
| 2.409000         | 43.80               | 10.1         | 56                  | 12.2         | QP       | N    | GND |
| 5.712000         | 38.90               | 10.2         | 60                  | 21.1         | QP       | N    | GND |
| 17.655000        | 34.10               | 10.6         | 60                  | 25.9         | QP       | N    | GND |

**MEASUREMENT RESULT: "GM1801305039\_fin2"**

1/30/2018 1:38PM

| Frequency<br>MHz | Level<br>dB $\mu$ V | Transd<br>dB | Limit<br>dB $\mu$ V | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------------|--------------|---------------------|--------------|----------|------|-----|
| 0.352500         | 32.30               | 9.9          | 49                  | 16.6         | AV       | N    | GND |
| 0.604500         | 37.50               | 10.0         | 46                  | 8.5          | AV       | N    | GND |
| 1.054500         | 36.20               | 10.1         | 46                  | 9.8          | AV       | N    | GND |
| 3.331500         | 36.50               | 10.1         | 46                  | 9.5          | AV       | N    | GND |
| 5.667000         | 33.20               | 10.2         | 50                  | 16.8         | AV       | N    | GND |
| 16.588500        | 29.60               | 10.5         | 50                  | 20.4         | AV       | N    | GND |

### 5.3. Radiated Emissions

#### LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table:

| Frequency (MHz) | Distance(Meters) | Radiated(dB $\mu$ V/m)         | Radiated( $\mu$ V/m)  |
|-----------------|------------------|--------------------------------|-----------------------|
| 0.009 - 0.490   | 300              | $20*\log(2400/F(\text{kHz}))$  | $2400/F(\text{kHz})$  |
| 0.490 - 1.705   | 30               | $20*\log(24000/F(\text{kHz}))$ | $24000/F(\text{kHz})$ |
| 1.705 - 30.0    | 30               | 29.54                          | 30                    |
| 30-88           | 3                | 40.0                           | 100                   |
| 88-216          | 3                | 43.5                           | 150                   |
| 216-960         | 3                | 46.0                           | 200                   |
| Above 960       | 3                | 54.0                           | 500                   |

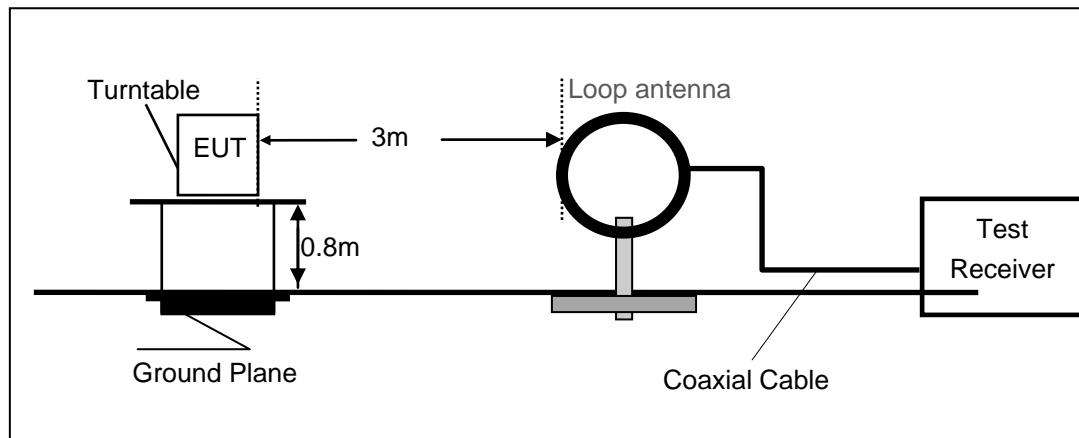
Remark:At frequencies below 30MHz, Limit 3m(dBuV)=Limit xm(dBuV)+20log(xm/3m);  
At frequencies below 30MHz, Limit 3m(dBuV)=Limit xm(dBuV)+40log(xm/3m),x replace the number 10.30.300.

In addition to the provisions of §15.249, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

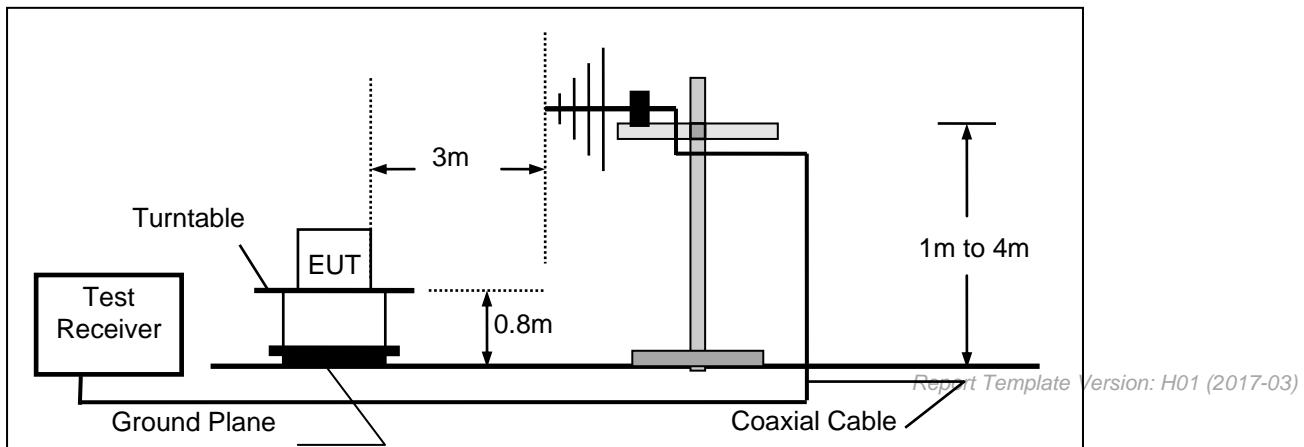
| Fundamental frequency | Field strength of fundamental<br>(millivolts/meter) | Field strength of harmonics<br>(microvolts/meter) |
|-----------------------|---|---|
| 902-928 MHz           | 50  | 500   |
| 2400-2483.5 MHz       | 50  | 500   |
| 5725-5875 MHz         | 50  | 500   |
| 24.0-24.25 GHz        | 250   | 2500  |

#### TEST CONFIGURATION

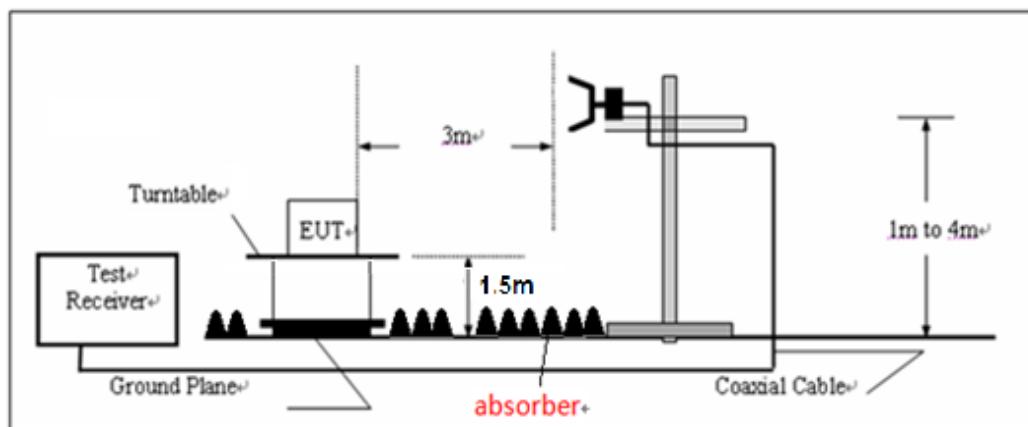
Radiated Emission Test Set-Up  
Frequency range 9KHz–30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



### TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8/1.5 meter above ground plane. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
5. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1GHz, RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - (3) Above 1GHz, RBW=1MHz, VBW=3MHz Peak detector for Peak value  
RBW=1MHz, VBW=3MHz RMS detector for Average value.

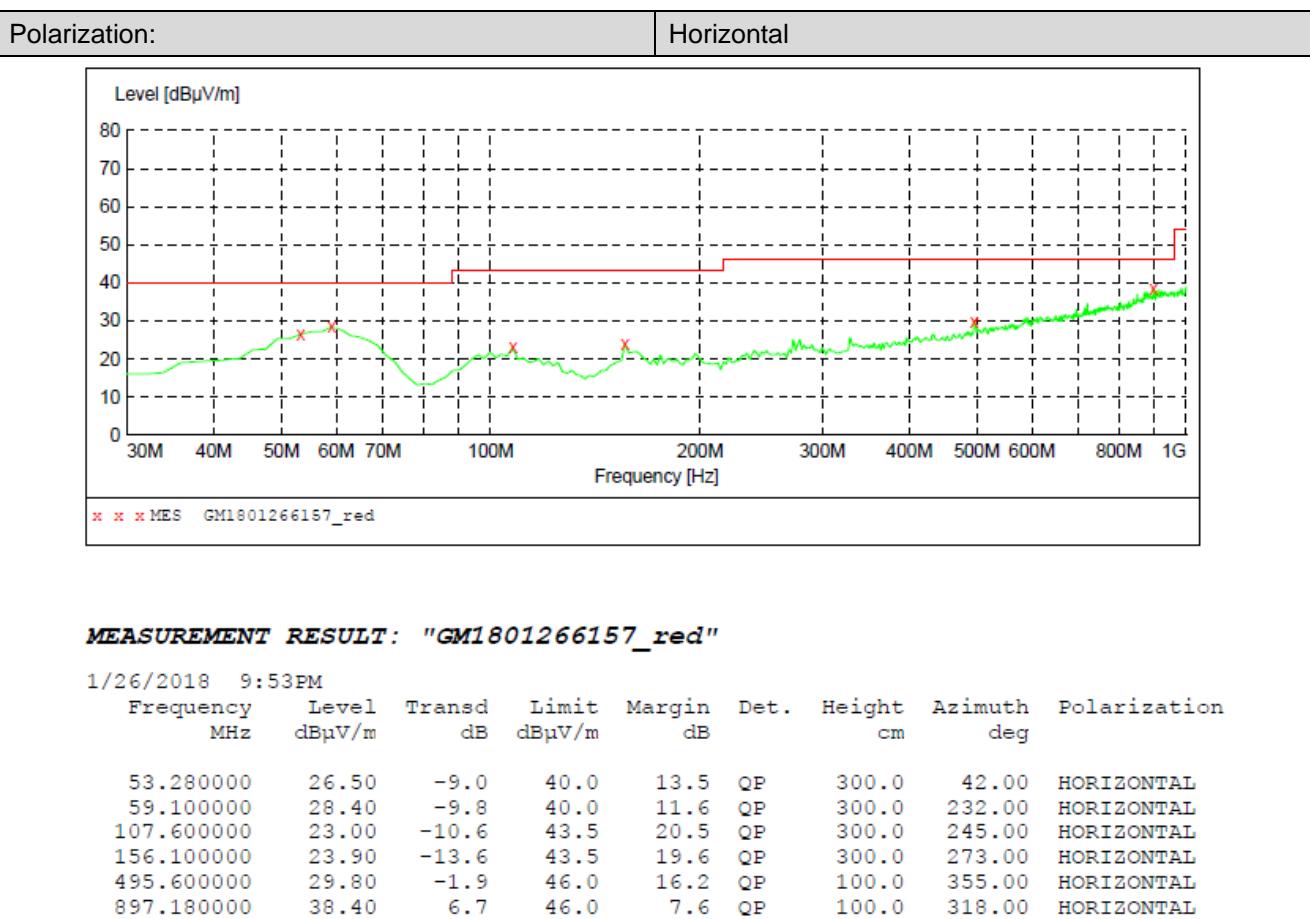
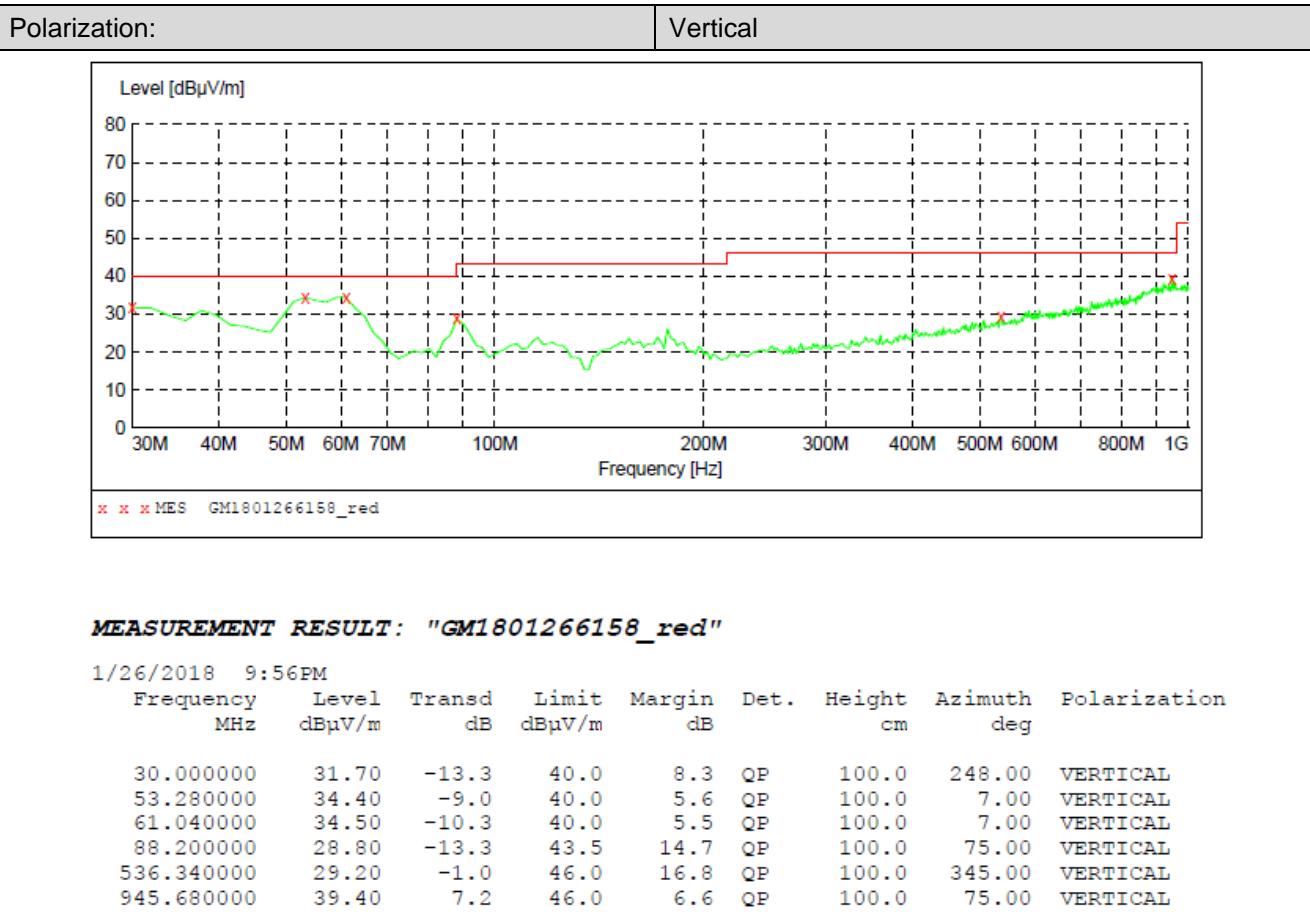
Remark: "floor-standing equipment" Where possible, the antenna(s) of the EUT shall be located at a height of 1.5 m above the floor, and the intentional radiator circuitry shall be located within the system at a height of at least 0.8 m above the floor.

### TEST RESULTS

#### ■ 9kHz ~ 30MHz

The EUT was pre-scanned the frequency band (9KHz~30MHz), found the radiated level lower than the limit, so don't show on the report.

## ■ 30 MHz ~ 1 GHz



## 6. Test Setup Photos of the EUT

Conducted Emissions (AC Mains)



Radiated Emissions



## 7. External and Internal Photos of the EUT

Reference to Test Report No.: TRE1801017101.

-----End of Report-----