



**FCC TEST REPORT**  
**FCC ID: 2ADD2TBGL1017A**

On Behalf of  
Tband srl  
Android MiniPC Box  
Model No.: TBGL1017A

Prepared for : Tband srl  
Address : Via Battisti, 4, Mogliano Veneto (TV) TREVISO, 31021 Italy

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.  
Address : Building B, East Area of Nanchang Second Industrial Zone,  
Gushu 2<sup>nd</sup> Road, Bao'an District, Shenzhen 518126, P.R. China

Report Number : T1871484 07  
Date of Receipt : June 26, 2017  
Date of Test : June 26, 2017- July 10, 2017  
Date of Report : July 10, 2017  
Version Number : REV0

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## TEST REPORT DECLARATION

Applicant : Tband srl  
Address : Via Battisti, 4, Mogliano Veneto (TV) TREVISO, 31021 Italy  
Manufacturer : Artway Technology International Ltd.  
Address : 621, B3 Block, NO.168, Baoyuan Road, Bao'an D., Shenzhen, Guangdong, China  
EUT Description : Android MiniPC Box  
(A) Model No. : TBGL1017A  
(B) Trademark : N/A

Measurement Standard Used:

**FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2016,  
ANSI C 63.4-2014, ANSI C63.10-2013**

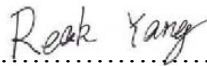
The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

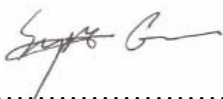
Tested by (name + signature).....:

Reak Yang  
Project Engineer

.....  


Approved by (name + signature).....:

Simple Guan  
Project Manager

.....  


Date of issue.....

July 10, 2017

**Revision History**

| Revision | Issue Date    | Revisions              | Revised By  |
|----------|---------------|------------------------|-------------|
| 00       | July 10, 2017 | Initial released Issue | Simple Guan |

## 1. General Information

### 1.1 Description of Device (EUT)

|                     |   |                                |
|---------------------|---|--------------------------------|
| EUT                 | : | Android MiniPC Box             |
| Model No.           | : | TBGL1017A                      |
| DIFF.               | : | N/A                            |
| Trade mark          | : | N/A                            |
| Power supply        | : | DC 5V From USB Port            |
| Radio Technology    | : | Bluetooth 4.0                  |
| Operation frequency | : | 2402-2480MHz                   |
| Channel number      | : | 40 Channels                    |
| Modulation          | : | GFSK                           |
| Antenna Type        | : | PCB Antenna, max gain 3.2 dBi. |

## 1.2 Accessories of device (EUT)

Accessories1 : Remote Control

Mode : N/A

## 1.3 Test Lab information

Shenzhen Alpha Product Testing Co., Ltd.

Building B, East Area of Nanchang Second Industrial Zone,  
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China

FCC Registered No.: 203110

## 2. Summary of Measurement

### 2.1. Summary of test result

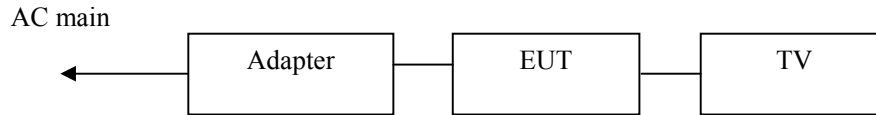
| Test Item           | Test Requirement | Standards Paragraph   | Result     |
|---------------------|------------------|-----------------------|------------|
| Spurious Emission   | FCC PART 15:2016 | Section 15.247&15.209 | Compliance |
| Conduction Emission | FCC PART 15:2016 | Section 15.207        | Compliance |
| Bandwidth Test      | FCC PART 15:2016 | Section 15.247        | Compliance |
| Peak Power          | FCC PART 15:2016 | Section 15.247        | Compliance |
| Power Density       | FCC PART 15:2016 | Section 15.247        | Compliance |
| Band Edge           | FCC PART 15:2016 | Section 15.247        | Compliance |
| Antenna Requirement | FCC PART 15:2016 | Section 15.203        | Compliance |

Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power  
(The adapter be used during Test)

### 2.2. Assistant equipment used for test

|               |   |                            |
|---------------|---|----------------------------|
| Description 1 | : | TV                         |
| Manufacturer  | : | TCL                        |
| Model No.     | : | L32F1510BN                 |
| Serial No.    | : | 2400109888                 |
| Description 2 | : | Adapter                    |
| Model No.     | : | LS-A01                     |
| Input         | : | AC 100-240V, 50/60Hz, 0.5A |
| Output        | : | DC 5V, 1000mA              |

### 2.3.Block Diagram



### 2.4.Test mode

| Tested mode, channel, and data rate information |              |                 |
|-------------------------------------------------|--------------|-----------------|
| Mode                                            | Channel      | Frequency (MHz) |
| GFSK                                            | Low :CH1     | 2402            |
|                                                 | Middle: CH20 | 2440            |
|                                                 | High: CH40   | 2480            |

### 2.5.Test Conditions

|                   |           |
|-------------------|-----------|
| Temperature range | 21-25°C   |
| Humidity range    | 40-75%    |
| Pressure range    | 86-106kPa |

### 2.6.Measurement Uncertainty (95% confidence levels, k=2)

| Item                                                                  | MU     | Remark      |
|-----------------------------------------------------------------------|--------|-------------|
| Uncertainty for Power point Conducted Emissions Test                  | 2.71dB |             |
| Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)   | 2.13dB | Polarize: V |
|                                                                       | 2.57dB | Polarize: H |
| Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz) | 3.90dB | Polarize: V |
|                                                                       | 3.92dB | Polarize: H |
| Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz) | 4.28dB | Polarize: H |
|                                                                       | 4.26dB | Polarize: V |
| Uncertainty for radio frequency                                       | 1×10-9 |             |
| Uncertainty for conducted RF Power                                    | 0.16dB |             |
| Uncertainty for temperature                                           | 0.2°C  |             |
| Uncertainty for humidity                                              | 1%     |             |
| Uncertainty for DC and low frequency voltages                         | 0.06%  |             |

### 3. EMC Equipment List

| Equipment              | Manufacture  | Model No.               | Serial No.        | Last cal.  | Cal Interval |
|------------------------|--------------|-------------------------|-------------------|------------|--------------|
| 3m Semi-Anechoic       | ETS-LINDGREN | N/A                     | SEL0017           | 2016.09.29 | 1Year        |
| Spectrum analyzer      | Agilent      | E4407B                  | MY46185649        | 2016.09.29 | 1Year        |
| Receiver               | R&S          | ESCI                    | 1166.5950K03-1011 | 2016.09.29 | 1Year        |
| Receiver               | R&S          | ESCI                    | 101202            | 2016.09.29 | 1Year        |
| Bilog Antenna          | Schwarzbeck  | VULB 9168               | VULB9168-438      | 2016.09.30 | 2Year        |
| Horn Antenna           | EMCO         | 3115                    | 640201028-06      | 2016.09.30 | 2Year        |
| Active Loop Antenna    | Beijing Daze | ZN30900A                | SEL0097           | 2016.09.30 | 2Year        |
| Cable                  | Resenberger  | N/A                     | No.1              | 2016.09.29 | 1Year        |
| Cable                  | SCHWARZBECK  | N/A                     | No.2              | 2016.09.29 | 1Year        |
| Cable                  | SCHWARZBECK  | N/A                     | No.3              | 2016.09.29 | 1Year        |
| Pre-amplifier          | Schwarzbeck  | BBV9743                 | 9743-019          | 2016.09.29 | 1Year        |
| Pre-amplifier          | R&S          | AFS33-18002650-30-8P-44 | SEL0080           | 2016.09.29 | 1Year        |
| Base station           | Agilent      | E5515C                  | GB44300243        | 2016.09.29 | 1 Year       |
| Temperature controller | Terchy       | MHQ                     | 120               | 2016.09.29 | 1Year        |
| Power divider          | Anritsu      | K240C                   | 020346            | 2016.09.29 | 1 Year       |
| Signal Generator       | HP           | 83732B                  | VS3449051         | 2016.09.29 | 1 Year       |
| Power Meter            | Anritsu      | ML2487A                 | 6K00001491        | 2016.09.29 | 1Year        |
| Power sensor           | Anritsu      | ML2491A                 | 32516             | 2016.09.29 | 1Year        |

|                 |                   |          |         |            |        |
|-----------------|-------------------|----------|---------|------------|--------|
| L.I.S.N.#1      | Schwarzbeck       | NSLK8126 | 8126466 | 2016.09.29 | 1 Year |
| L.I.S.N.#2      | ROHDE&SCHWAR<br>Z | ENV216   | 101043  | 2016.09.29 | 1 Year |
| 20db Attenuator | ICPROBING         | IATS1    | 82347   | 2016.09.29 | 1 Year |

## 4. Spurious Emission

### 4.1. Radiation Emission

### 4.2. Radiation Emission Limits(15.209)

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/meter) | Measurement Distance<br>(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                                |

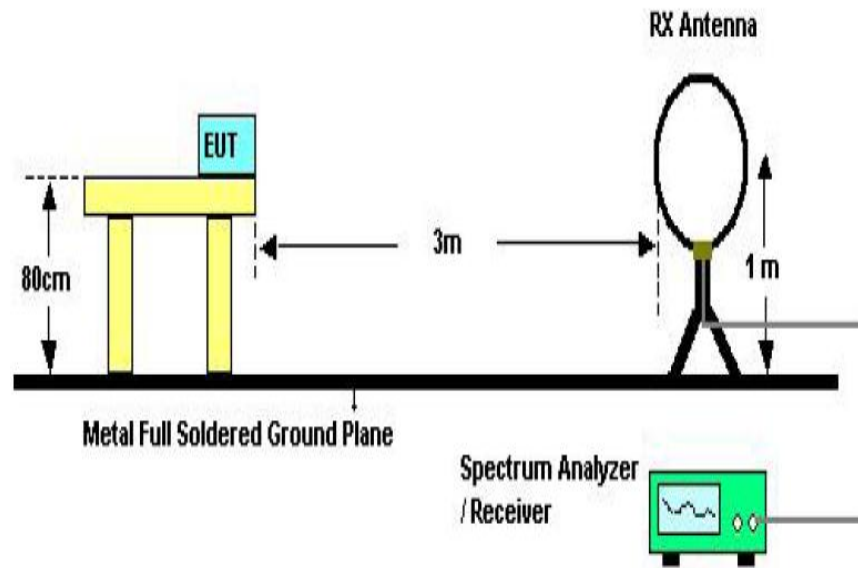
Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

**NOTE:**

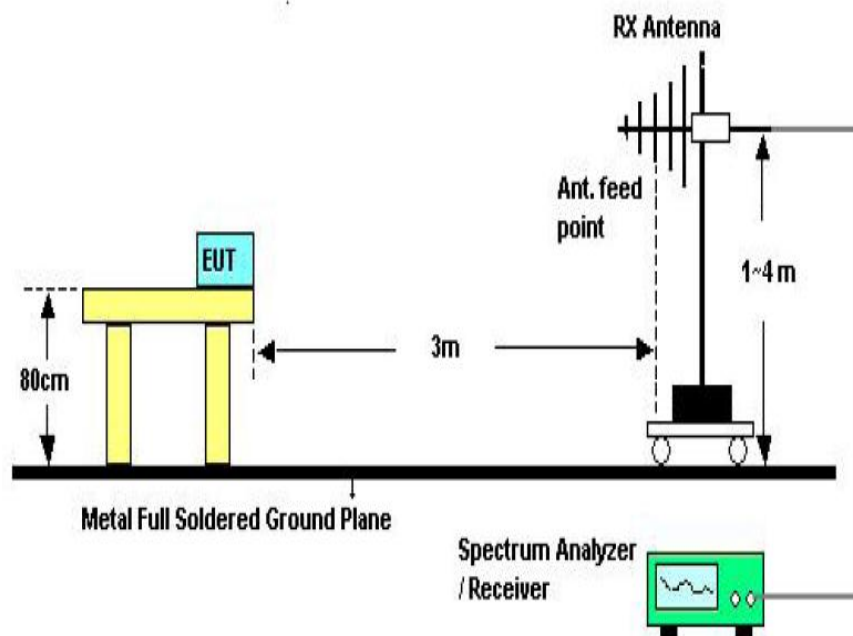
- a) The tighter limit applies at the band edges.
- b)  $\text{Emission Level(dB uV/m)} = 20 \log \text{Emission Level(uv/m)}$

### 4.3. Test Setup

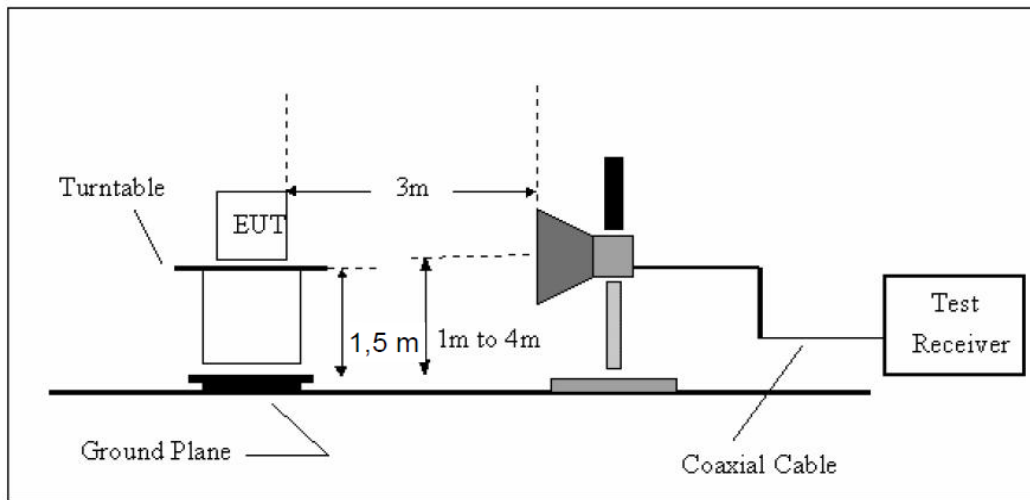
See the next page



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

#### 4.4. Test Procedure

- a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above 1GHz testing, The table was rotated 360 degrees to determine the position of the highest radiation
- b) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set of make measurement.
- c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Qusia Peak Detector mode premeasured
- d) If Peak value comply with QP limit Below 1GHz. The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
- e) For the actual test configuration, please see the test setup photo.

#### 4.5. Test Equipment Setting For emission test Result

|              |            |            |
|--------------|------------|------------|
| 9KHz~150KHz  | RBW 200Hz  | VBW 1KHz   |
| 150KHz~30MHz | RBW 9KHz   | VBW 30KHz  |
| 30MHz~1GHz   | RBW 120KHz | VBW 300KHz |
| Above 1GHz   | RBW 1MHz   | VBW 3MHz   |

#### 4.6. Test Condition

Continual Transmitting in maximum power.

#### 4.7. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.  
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Remark: Only show the test data of the worst Channel in this report.

From 30MHz to 1000MHz: Conclusion: PASS

Site LAB 966-2 Chamber  
 Limit: FCC Part 15 Class B Radiation  
 EUT: Android MiniPC Box  
 M/N: TBGL1017A  
 Mode:BT4.0  
 Note:

Polarization: **Horizontal**  
 Power: AC 120V/60Hz  
 Distance:

Temperature: 23.8  
 Humidity: 56 %

Engineer Signature:

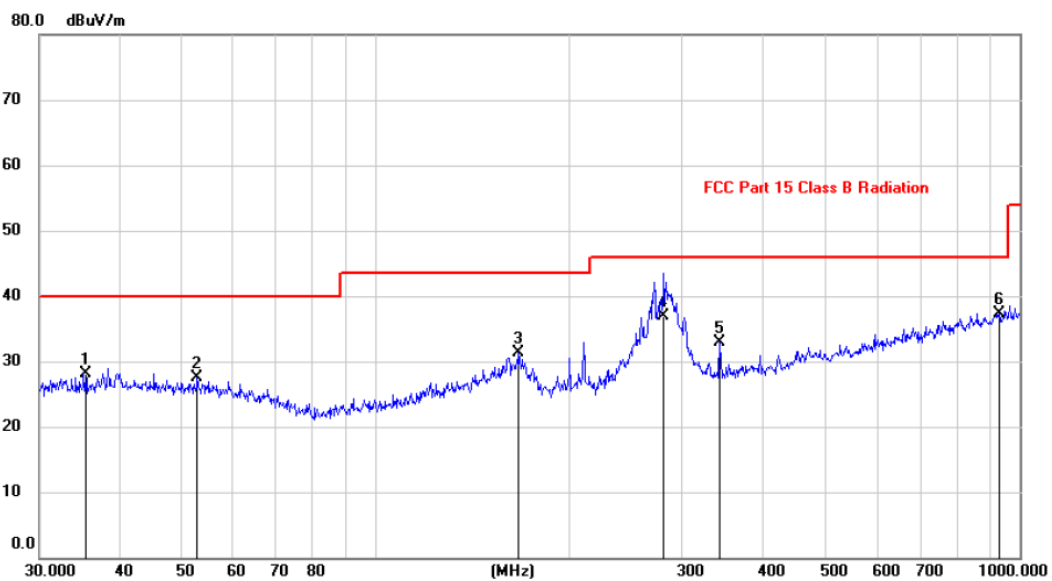
### Radiated Emission Measurement

File :TBGL1017A

Data :#1

Date: 2017/6/27

Time: 20:56:31



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Margin | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dBuV/m | dB     | cm             | degree       | Comment |
| 1   |     | 35.2512  | 14.60         | 13.51          | 28.11       | 40.00  | -11.89 |                |              | peak    |
| 2   |     | 52.7600  | 14.06         | 13.48          | 27.54       | 40.00  | -12.46 |                |              | peak    |
| 3   |     | 167.2368 | 17.21         | 14.00          | 31.21       | 43.50  | -12.29 |                |              | peak    |
| 4   |     | 280.0237 | 23.85         | 12.97          | 36.82       | 46.00  | -9.18  | 100            | 0            | QP      |
| 5   |     | 341.9786 | 18.45         | 14.43          | 32.88       | 46.00  | -13.12 |                |              | peak    |
| 6   | *   | 929.0082 | 14.05         | 23.31          | 37.36       | 46.00  | -8.64  |                |              | peak    |

Note: 1. \*:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Site LAB 966-2 Chamber  
 Limit: FCC Part 15 Class B Radiation  
 EUT: Android MiniPC Box  
 M/N: TBGL1017A  
 Mode: BT4.0  
 Note:

Polarization: **Vertical**  
 Power: AC 120V/60Hz  
 Distance:

Temperature: 23.8  
 Humidity: 56 %

Engineer Signature:

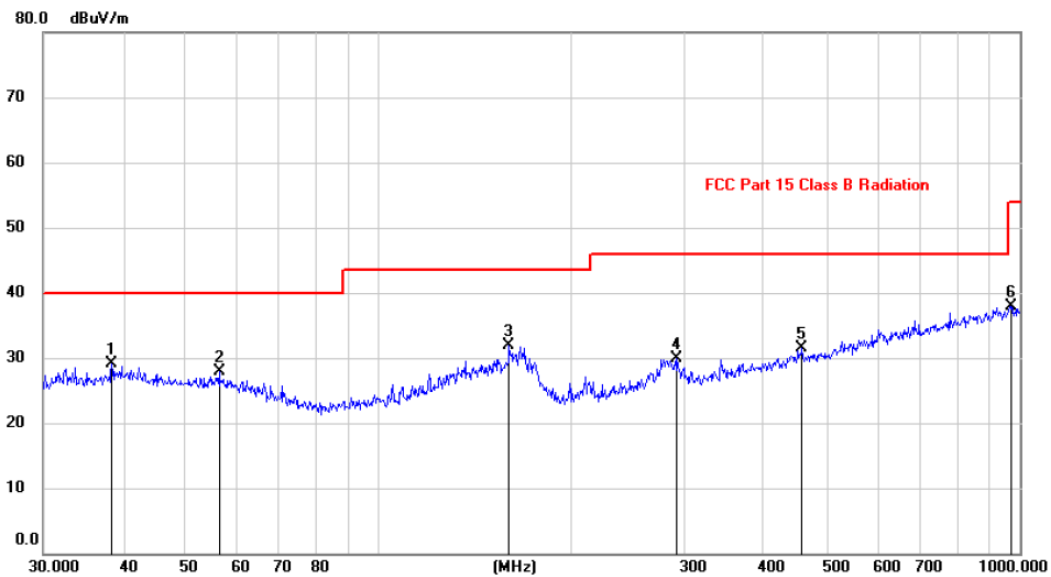
### Radiated Emission Measurement

File :TBGL1017A

Data :#2

Date: 2017/6/27

Time: 20:58:57



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Margin | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dBuV/m | dB     | cm             | degree       | Comment |
| 1   | *   | 38.3462  | 15.19         | 13.95          | 29.14       | 40.00  | -10.86 | peak           |              |         |
| 2   |     | 56.3948  | 14.82         | 13.16          | 27.98       | 40.00  | -12.02 | peak           |              |         |
| 3   |     | 159.7844 | 17.26         | 14.58          | 31.84       | 43.50  | -11.66 | peak           |              |         |
| 4   |     | 292.0583 | 16.79         | 13.20          | 29.99       | 46.00  | -16.01 | peak           |              |         |
| 5   |     | 457.5073 | 14.39         | 17.09          | 31.48       | 46.00  | -14.52 | peak           |              |         |
| 6   |     | 972.3374 | 14.13         | 23.77          | 37.90       | 54.00  | -16.10 | peak           |              |         |

Note:1. \*:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

**Notes:** Above is below 1GHz test data. This report only shall the worst case mode for TX 2402MHz.

|                    |                    |                          |                     |
|--------------------|--------------------|--------------------------|---------------------|
| <b>EUT</b>         | Android MiniPC Box | <b>Model Name</b>        | TBGL1017A           |
| <b>Temperature</b> | 24°C               | <b>Relative Humidity</b> | 56%                 |
| <b>Pressure</b>    | 960hPa             | <b>Test voltage</b>      | DC 5V From USB Port |
| <b>Test Mode</b>   | TX Low             |                          |                     |

| Antenna Polarity: Vertical   |            |                     |                       |                |                 |                 |                |             |        |
|------------------------------|------------|---------------------|-----------------------|----------------|-----------------|-----------------|----------------|-------------|--------|
| No                           | Freq (MHz) | Read Level (dBuV/m) | Antenna Factor (dB/m) | Cable loss(dB) | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 1                            | 4804       | 43.58               | 33.95                 | 10.18          | 34.26           | 53.45           | 74             | 20.55       | PK     |
| 2                            | 4804       | 34.92               | 33.95                 | 10.18          | 34.26           | 44.79           | 54             | 9.21        | AV     |
| 3                            | 7206       | /                   |                       |                |                 |                 |                |             |        |
| 4                            | 9608       | /                   |                       |                |                 |                 |                |             |        |
| 5                            | 12010      | /                   |                       |                |                 |                 |                |             |        |
| Antenna Polarity: Horizontal |            |                     |                       |                |                 |                 |                |             |        |
| 1                            | 4804       | 43.43               | 33.95                 | 10.18          | 34.26           | 53.30           | 74             | 20.70       | PK     |
| 2                            | 4804       | 33.89               | 33.95                 | 10.18          | 34.26           | 43.76           | 54             | 10.24       | AV     |
| 3                            | 7206       | /                   |                       |                |                 |                 |                |             |        |
| 4                            | 9608       | /                   |                       |                |                 |                 |                |             |        |
| 5                            | 12010      | /                   |                       |                |                 |                 |                |             |        |

Note:

1, Measuring frequency from 1GHz to 25GHz

2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto

Detector: PK

2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto

Detector: RMS

3, Result = Read level + Antenna factor + cable loss-Amp factor

4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

|             |                    |                   |                     |
|-------------|--------------------|-------------------|---------------------|
| EUT         | Android MiniPC Box | Model Name        | TBGL1017A           |
| Temperature | 24°C               | Relative Humidity | 56%                 |
| Pressure    | 960hPa             | Test voltage      | DC 5V From USB Port |
| Test Mode   | TX Mid             |                   |                     |

| Antenna Polarity: Vertical   |            |                     |                       |                 |                 |                 |                |             |        |
|------------------------------|------------|---------------------|-----------------------|-----------------|-----------------|-----------------|----------------|-------------|--------|
| No                           | Freq (MHz) | Read Level (dBuV/m) | Antenna Factor (dB/m) | Cable loss(d B) | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 1                            | 4880       | 41.62               | 33.93                 | 10.2            | 34.29           | 51.46           | 74             | 22.54       | PK     |
| 2                            | 4880       | 32.34               | 33.93                 | 10.2            | 34.29           | 42.18           | 54             | 11.82       | AV     |
| 3                            | 7320       | /                   |                       |                 |                 |                 |                |             |        |
| 4                            | 9760       | /                   |                       |                 |                 |                 |                |             |        |
| 5                            | 12200      | /                   |                       |                 |                 |                 |                |             |        |
| Antenna Polarity: Horizontal |            |                     |                       |                 |                 |                 |                |             |        |
| 1                            | 4880       | 42.01               | 33.93                 | 10.2            | 34.29           | 51.85           | 74             | 22.15       | PK     |
| 2                            | 4880       | 32.84               | 33.93                 | 10.2            | 34.29           | 42.68           | 54             | 11.32       | AV     |
| 3                            | 7320       | /                   |                       |                 |                 |                 |                |             |        |
| 4                            | 9760       | /                   |                       |                 |                 |                 |                |             |        |
| 5                            | 12200      | /                   |                       |                 |                 |                 |                |             |        |

Note:

1, Measuring frequency from 1GHz to 25GHz

2,Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto

Detector: PK

2,Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto

Detector: RMS

3, Result = Read level + Antenna factor + cable loss-Amp factor

4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

|             |                    |                   |                     |
|-------------|--------------------|-------------------|---------------------|
| EUT         | Android MiniPC Box | Model Name        | TBGL1017A           |
| Temperature | 26°C               | Relative Humidity | 56%                 |
| Pressure    | 960hPa             | Test voltage      | DC 5V From USB Port |
| Test Mode   | TX High            |                   |                     |

| Antenna Polarity: Vertical   |            |                     |                       |                 |                 |                 |                |             |        |
|------------------------------|------------|---------------------|-----------------------|-----------------|-----------------|-----------------|----------------|-------------|--------|
| No                           | Freq (MHz) | Read Level (dBuV/m) | Antenna Factor (dB/m) | Cable loss (dB) | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 1                            | 4960       | 42.19               | 33.98                 | 10.22           | 34.25           | 52.14           | 74             | 21.86       | PK     |
| 2                            | 4960       | 32.98               | 33.98                 | 10.22           | 34.25           | 42.93           | 54             | 11.07       | AV     |
| 3                            | 7440       | /                   |                       |                 |                 |                 |                |             |        |
| 4                            | 9920       | /                   |                       |                 |                 |                 |                |             |        |
| 5                            | 12400      | /                   |                       |                 |                 |                 |                |             |        |
| Antenna Polarity: Horizontal |            |                     |                       |                 |                 |                 |                |             |        |
| 1                            | 4960       | 42.67               | 33.98                 | 10.22           | 34.25           | 52.62           | 74             | 21.38       | PK     |
| 2                            | 4960       | 31.88               | 33.98                 | 10.22           | 34.25           | 41.83           | 54             | 12.17       | AV     |
| 3                            | 7440       | /                   |                       |                 |                 |                 |                |             |        |
| 4                            | 9920       | /                   |                       |                 |                 |                 |                |             |        |
| 5                            | 12400      | /                   |                       |                 |                 |                 |                |             |        |

Note:

- 1, Measuring frequency from 1GHz to 25GHz
- 2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector PK
- 2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector RMS
- 3, Result = Read level + Antenna factor + cable loss-Amp factor
- 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

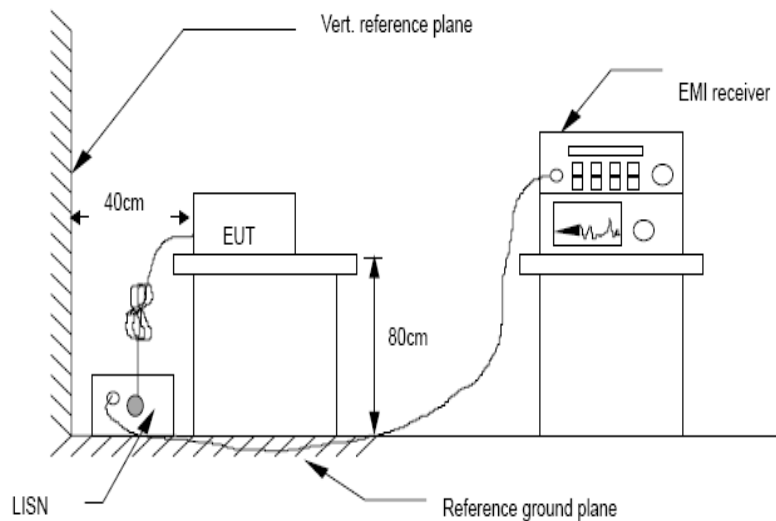
## 5. POWER LINE CONDUCTED EMISSION

### 5.1. Conducted Emission Limits(15.207)

| Frequency<br>MHz | Limits dB( $\mu$ V) |               |
|------------------|---------------------|---------------|
|                  | Quasi-peak Level    | Average Level |
| 0.15 -0.50       | 66 -56*             | 56 - 46*      |
| 0.50 -5.00       | 56                  | 46            |
| 5.00 -30.00      | 60                  | 50            |

- Notes: 1. \*Decreasing linearly with logarithm of frequency.  
 2. The lower limit shall apply at the transition frequencies.  
 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 5.2. Test Setup



### 5.3. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4:2014 on Conducted Emission Measurement. The bandwidth of test receiver (R & S ESCDLB ECHO 50) is set at 9 kHz.

### 5.4. Test Results

PASS. (See below detailed test data)

Site LAB

Phase: **L1**

Temperature: 24.2

Limit: FCC Part 15 CLASS B QP

Power: AC 120V/60Hz

Humidity: 53 %

EUT: Android MiniPC Box

M/N: TBGL1017A

Mode: BT4.0

Note:

Engineer Signature:

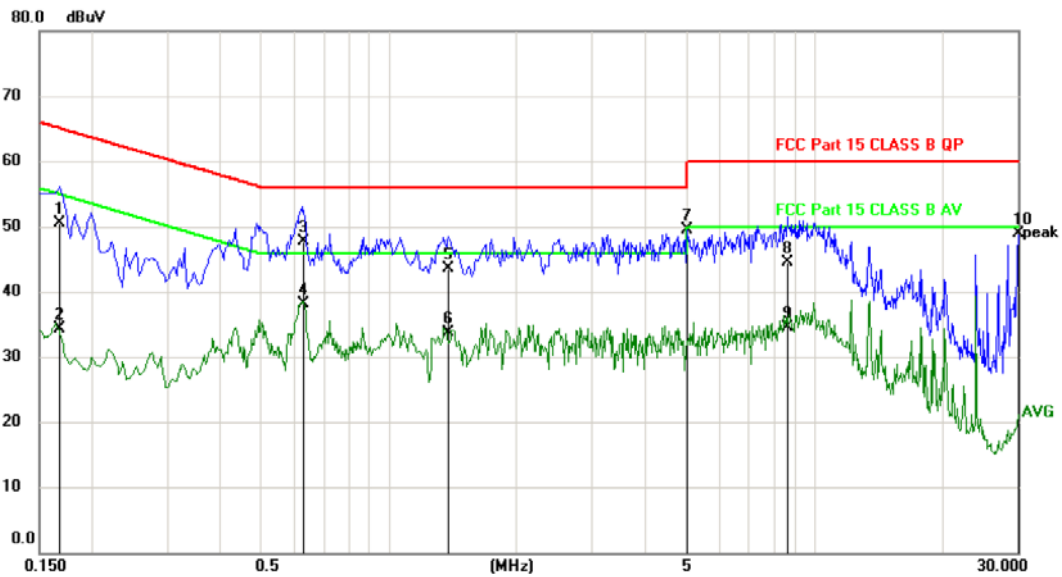
**Conducted Emission Measurement**

File :TBGL1017A

Data :#4

Date: 2017-6-26

Time: 11:26:54



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Margin<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|--------------|----------|---------|
| 1   |     | 0.1680       | 40.77                    | 9.73                    | 50.50                    | 65.06         | -14.56       | QP       |         |
| 2   |     | 0.1680       | 24.50                    | 9.73                    | 34.23                    | 55.06         | -20.83       | AVG      |         |
| 3   |     | 0.6270       | 38.01                    | 9.79                    | 47.80                    | 56.00         | -8.20        | QP       |         |
| 4   | *   | 0.6270       | 28.27                    | 9.79                    | 38.06                    | 46.00         | -7.94        | AVG      |         |
| 5   |     | 1.3805       | 33.74                    | 9.86                    | 43.60                    | 56.00         | -12.40       | QP       |         |
| 6   |     | 1.3805       | 23.88                    | 9.86                    | 33.74                    | 46.00         | -12.26       | AVG      |         |
| 7   |     | 5.0205       | 39.37                    | 10.19                   | 49.56                    | 60.00         | -10.44       | peak     |         |
| 8   |     | 8.6005       | 34.31                    | 10.29                   | 44.60                    | 60.00         | -15.40       | QP       |         |
| 9   |     | 8.6005       | 24.22                    | 10.29                   | 34.51                    | 50.00         | -15.49       | AVG      |         |
| 10  |     | 30.0000      | 37.71                    | 11.23                   | 48.94                    | 60.00         | -11.06       | peak     |         |

\*:Maximum data    x:Over limit    !:over margin

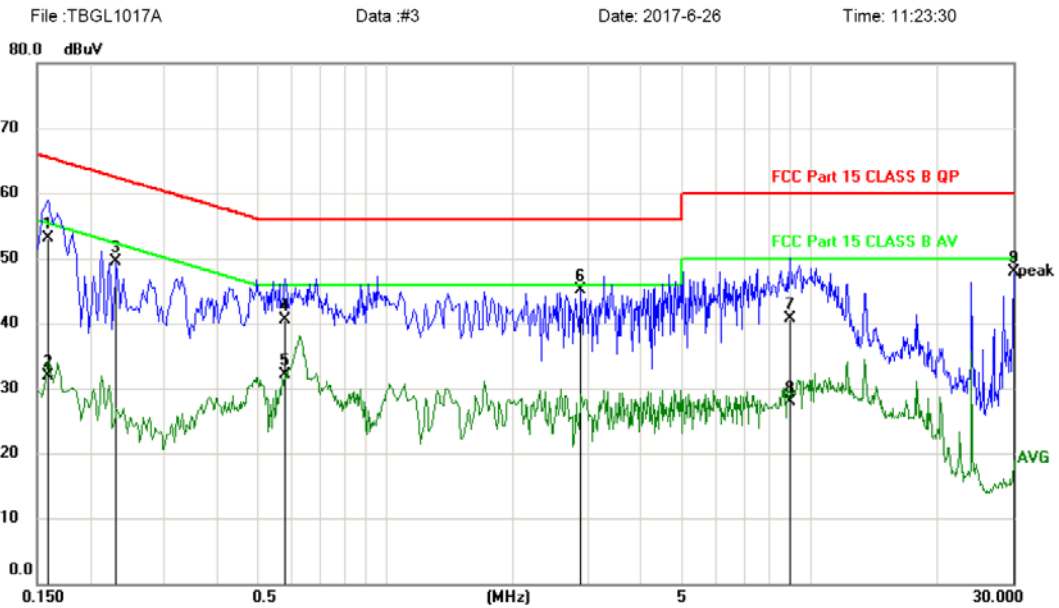
Note: Measurement=Reading Level+Correc Factor.    Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Site LAB  
 Limit: FCC Part 15 CLASS B QP  
 EUT: Android MiniPC Box  
 M/N: TBGL1017A  
 Mode: BT4.0  
 Note:  
 Engineer Signature:

Phase: **N**  
 Power: AC 120V/60Hz

Temperature: 24.2  
 Humidity: 53 %

### Conducted Emission Measurement



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Margin<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|--------------|----------|---------|
| 1   |     | 0.1590       | 43.47                    | 9.73                    | 53.20                    | 65.52         | -12.32       | QP       |         |
| 2   |     | 0.1590       | 22.10                    | 9.73                    | 31.83                    | 55.52         | -23.69       | AVG      |         |
| 3   |     | 0.2310       | 39.80                    | 9.75                    | 49.55                    | 62.41         | -12.86       | peak     |         |
| 4   |     | 0.5775       | 30.81                    | 9.79                    | 40.60                    | 56.00         | -15.40       | QP       |         |
| 5   |     | 0.5775       | 22.35                    | 9.79                    | 32.14                    | 46.00         | -13.86       | AVG      |         |
| 6   | *   | 2.8804       | 35.13                    | 10.03                   | 45.16                    | 56.00         | -10.84       | peak     |         |
| 7   |     | 8.9604       | 30.49                    | 10.31                   | 40.80                    | 60.00         | -19.20       | QP       |         |
| 8   |     | 8.9604       | 17.57                    | 10.31                   | 27.88                    | 50.00         | -22.12       | AVG      |         |
| 9   |     | 30.0000      | 36.64                    | 11.23                   | 47.87                    | 60.00         | -12.13       | peak     |         |

\*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

## 6. Conducted Maximum Output Power

### 6.1. Test limit

Please refer section RSS-247 & 15.247.

### 6.2. Test Procedure

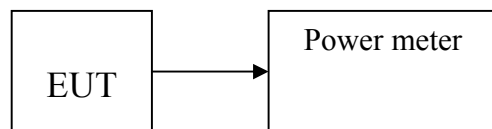
Details see the KDB558074 Meas Guidance V04

6.2.1 Place the EUT on the table and set it in transmitting mode.

6.2.2 Measure out each mode and each bands peak output power of EUT.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset. Details see the KDB558074 DTS Meas Guidance V04

### 6.3. Test Setup



### 6.4. Test Results

PASS

Detailed information please see the following page.

| Channel | Frequency (MHz) | PK Output Power (dBm) | PK Output Power (mW) | Limit (dBm) |
|---------|-----------------|-----------------------|----------------------|-------------|
| CH1     | 2402            | -2.215                | 0.600                | <30         |
| CH20    | 2440            | -1.311                | 0.739                | <30         |
| CH40    | 2480            | -1.601                | 0.692                | <30         |

## 7. PEAK POWER SPECTRAL DENSITY

### 7.1. Test limit

7.1.1 Please refer section RSS-247 & 15.247.

7.1.2 For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

7.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

### 7.2. Method of measurement

Details see the KDB558074 DTS Meas Guidance V04

7.2.1 Place the EUT on the table and set it in transmitting mode.

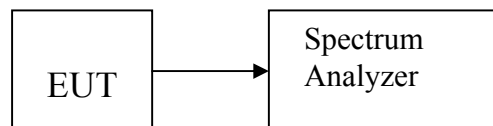
7.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

7.2.3 Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, span=5-30%EBW, detail see the test plot.

7.2.4 Record the max reading.

7.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

### 7.3. Test Setup



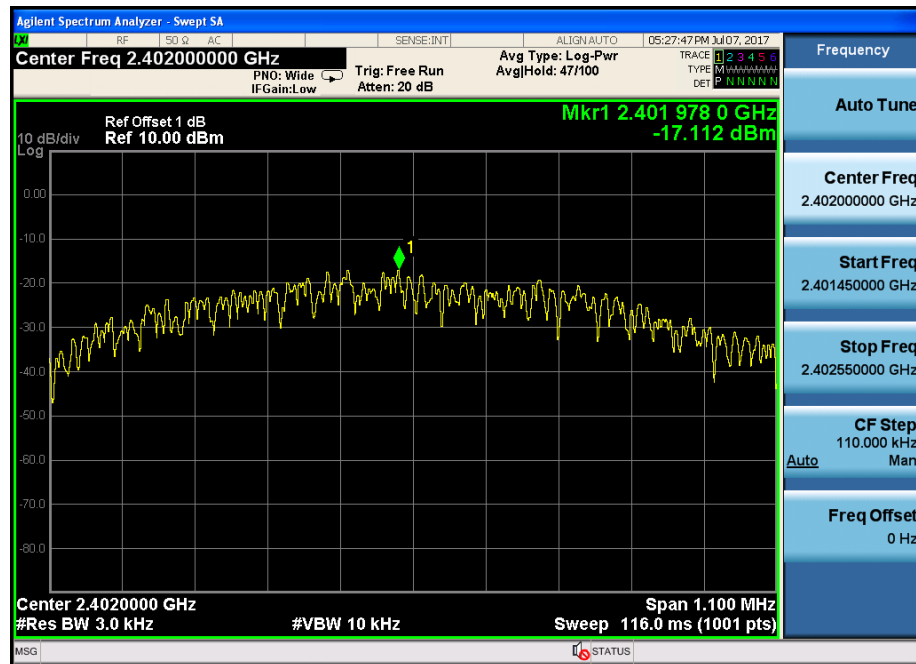
#### 7.4. Test Results

PASS.

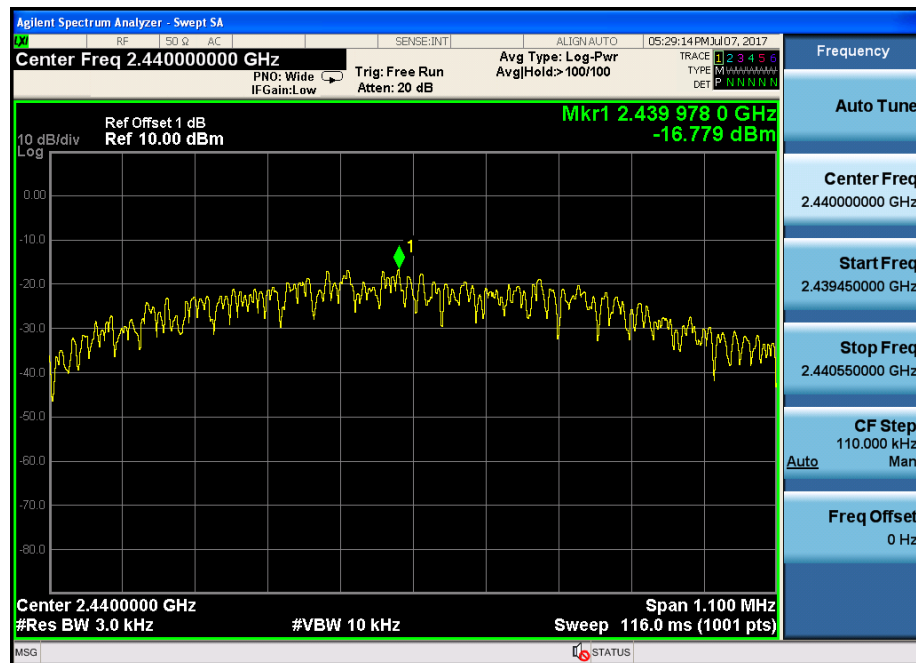
Detailed information please see the following page.

| Channel | Frequency<br>(MHz) | Power Spectral<br>Density<br>(dBm) | Limit<br>(dBm) | Result |
|---------|--------------------|------------------------------------|----------------|--------|
| CH1     | 2402               | -17.112                            | <8             | PASS   |
| CH20    | 2440               | -16.779                            | <8             | PASS   |
| CH40    | 2480               | -17.128                            | <8             | PASS   |

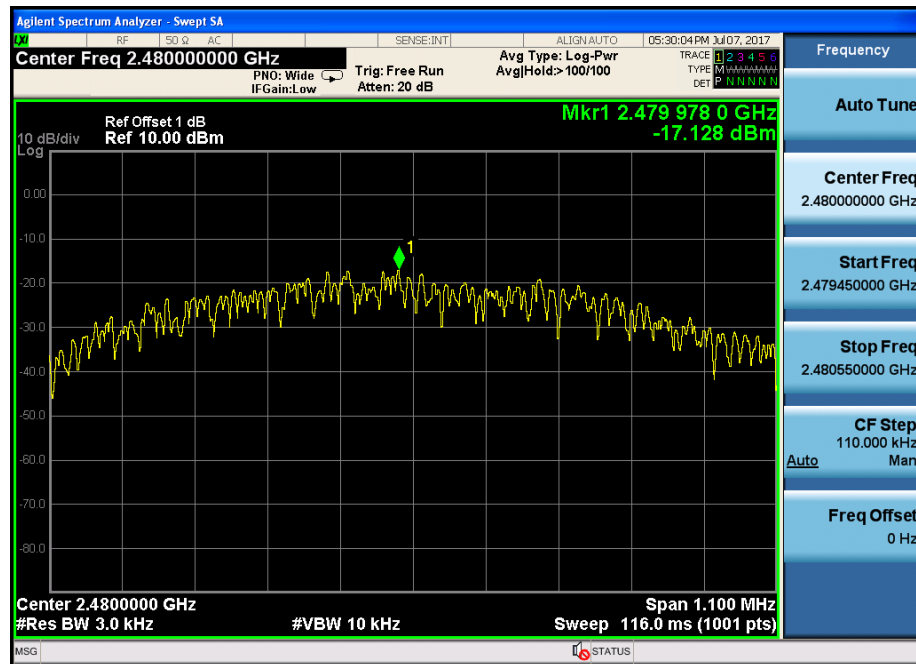
CH Low :



CH Mid:



CH High:



## 8. Bandwidth

### 8.1. Test limit

Please refer section RSS-247 & 15.247

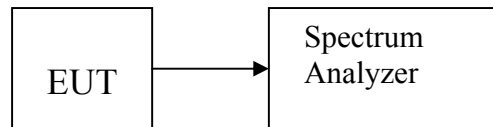
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

### 8.2. Method of measurement

Details see the KDB558074 D01 Meas Guidance V04

- a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
- b) The test receiver set RBW = 1-5 % EBW, VBW  $\geq$  3RBW, Sweep time set auto, detail see the test plot.

### 8.3. Test Setup



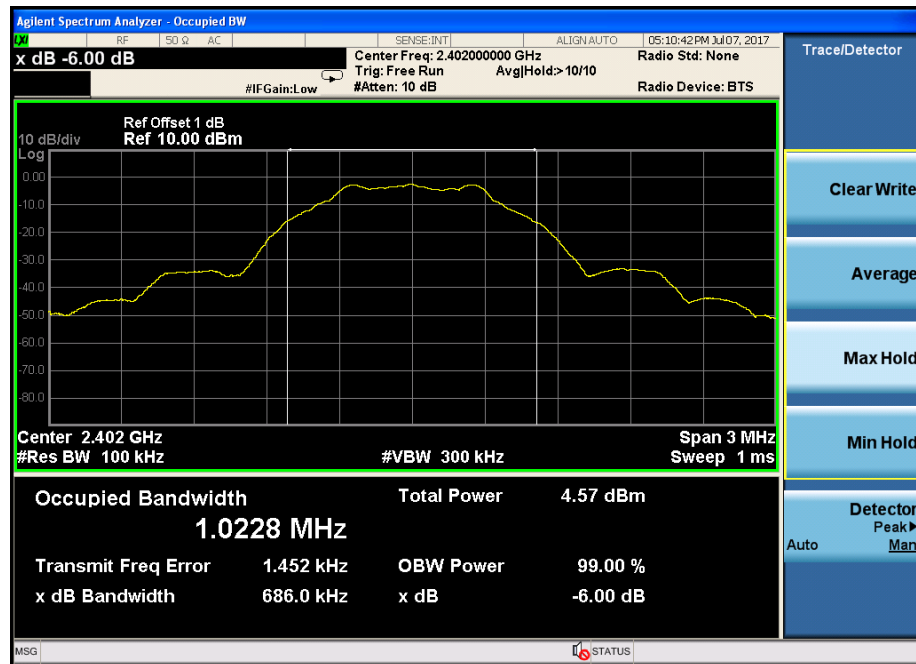
### 8.4. Test Results

PASS.

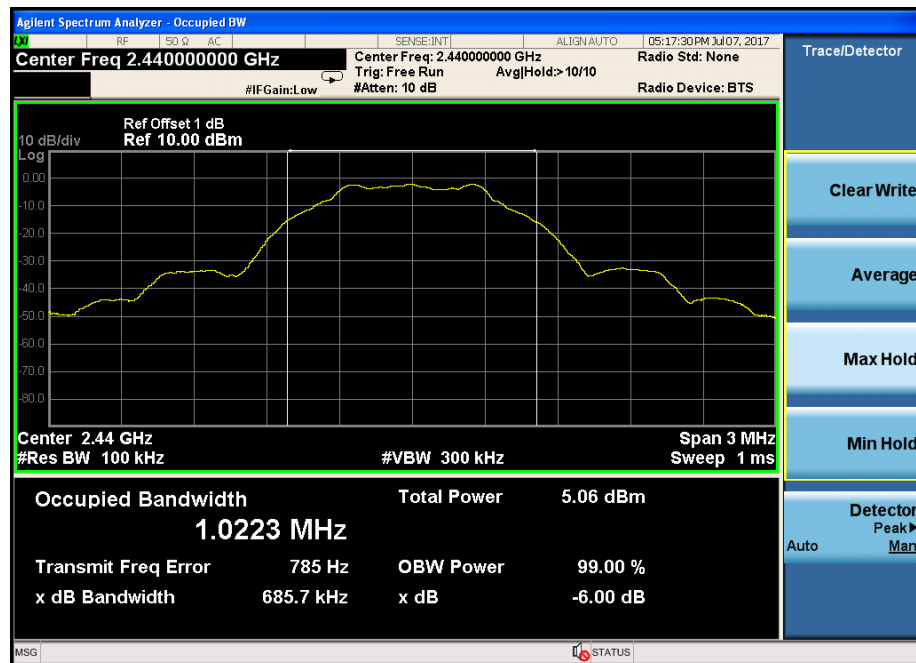
Detailed information please see the following page.

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (MHz) | Result |
|---------|-----------------|---------------------|-------------|--------|
| CH1     | 2402            | 0.6860              | 0.5         | PASS   |
| CH20    | 2440            | 0.6857              | 0.5         | PASS   |
| CH40    | 2480            | 0.6922              | 0.5         | PASS   |

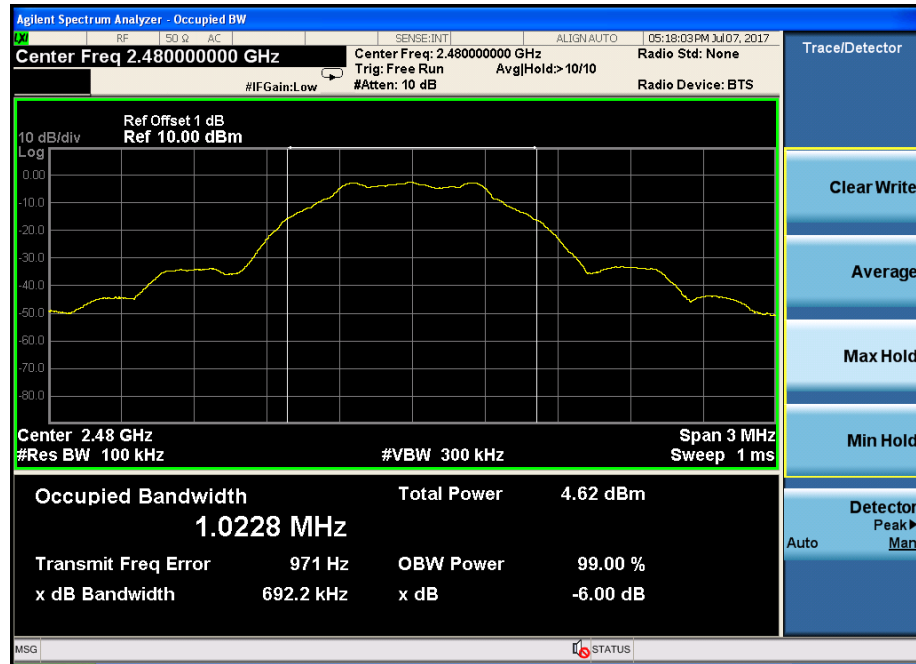
CH Low :



CH Mid :



CH High :



## **9. Band Edge Check**

### **9.1. Test limit**

Please refer section RSS-GEN&15.247.

### **9.2. Test Procedure**

9.2.1 Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission

9.2.2 Check the spurious emissions out of band.

9.2.3 RBW 1MHz ,VBW 3MHz ,peak detector for peak value , RBW 1MHz ,VBW 3MHz ,RMS detector for AV value.

### **9.3. Test Setup**

Same as 5.2.2.

### **9.4. Test Result**

PASS.

Detailed information please see the following page.

Radiated Method:  
GFSK

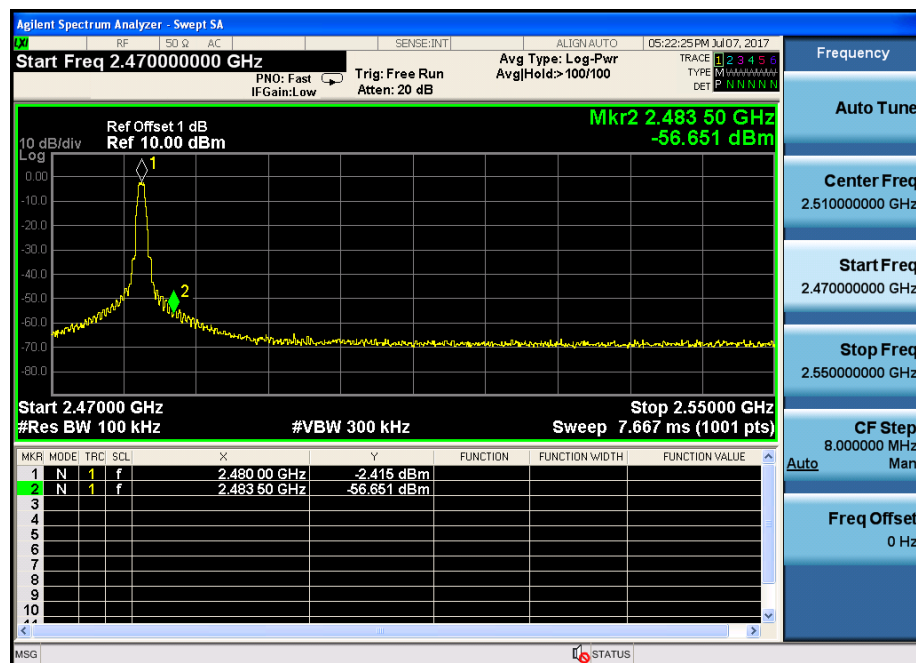
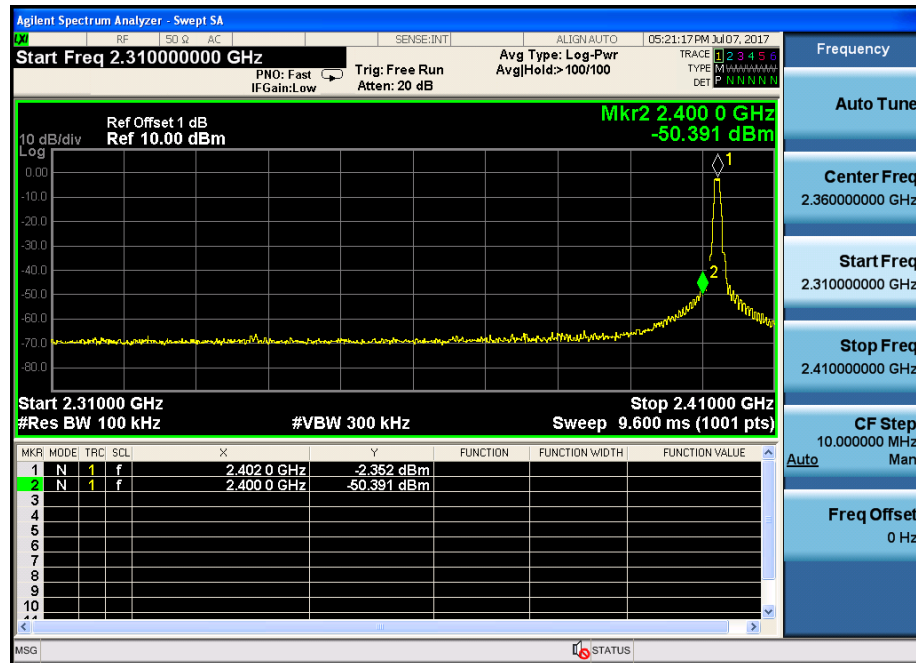
| Band Edge Test result        |                     |                       |                       |                 |                 |                |             |        |
|------------------------------|---------------------|-----------------------|-----------------------|-----------------|-----------------|----------------|-------------|--------|
| EUT: Android MiniPC Box      |                     |                       |                       | M/N: TBGL1017A  |                 |                |             |        |
| Power: DC 5V From USB Port   |                     |                       |                       |                 |                 |                |             |        |
| Test date: 2017-06-27        |                     |                       | Test site: 3m Chamber |                 | Tested by: Eric |                |             |        |
| Test mode: Tx Low            |                     |                       |                       |                 |                 |                |             |        |
| Antenna polarity: Vertical   |                     |                       |                       |                 |                 |                |             |        |
| Freq (MHz)                   | Read Level (dBuV/m) | Antenna Factor (dB/m) | Cable loss(dB)        | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 2390                         | 44.44               | 27.62                 | 3.92                  | 34.97           | 41.01           | 74             | 32.99       | PK     |
| 2390                         | --                  | 27.62                 | 3.92                  | 34.97           | --              | 54             | --          | AV     |
|                              |                     |                       |                       |                 |                 |                |             |        |
|                              |                     |                       |                       |                 |                 |                |             |        |
|                              |                     |                       |                       |                 |                 |                |             |        |
| Antenna Polarity: Horizontal |                     |                       |                       |                 |                 |                |             |        |
| 2390                         | 43.87               | 27.62                 | 3.92                  | 34.97           | 40.44           | 74             | 33.56       | PK     |
| 2390                         | --                  | 27.62                 | 3.92                  | 34.97           | --              | 54             | --          | AV     |
|                              |                     |                       |                       |                 |                 |                |             |        |
|                              |                     |                       |                       |                 |                 |                |             |        |
|                              |                     |                       |                       |                 |                 |                |             |        |

Note:  
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK  
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS  
3, Result = Read level + Antenna factor + cable loss-Amp factor  
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

| Band Edge Test result        |                     |                       |                       |                 |                 |                |             |        |
|------------------------------|---------------------|-----------------------|-----------------------|-----------------|-----------------|----------------|-------------|--------|
| EUT: Android MiniPC Box      |                     |                       |                       | M/N: TBGL1017A  |                 |                |             |        |
| Power: DC 5V From USB Port   |                     |                       |                       |                 |                 |                |             |        |
| Test date: 2017-06-27        |                     |                       | Test site: 3m Chamber |                 | Tested by: Eric |                |             |        |
| Test mode: Tx High           |                     |                       |                       |                 |                 |                |             |        |
| Antenna polarity: Vertical   |                     |                       |                       |                 |                 |                |             |        |
| Freq (MHz)                   | Read Level (dBuV/m) | Antenna Factor (dB/m) | Cable loss(dB)        | Amp Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
| 2483.5                       | 44.07               | 27.89                 | 4                     | 34.97           | 40.99           | 74             | 33.01       | PK     |
| 2483.5                       |                     | --                    | --                    | --              | --              | 54             | --          | AV     |
|                              |                     |                       |                       |                 |                 |                |             |        |
|                              |                     |                       |                       |                 |                 |                |             |        |
|                              |                     |                       |                       |                 |                 |                |             |        |
| Antenna Polarity: Horizontal |                     |                       |                       |                 |                 |                |             |        |
| 2483.5                       | 43.76               | 27.89                 | 4                     | 34.97           | 40.68           | 74             | 33.32       | PK     |
| 2483.5                       |                     | --                    | --                    | --              | --              | 54             | --          | AV     |
|                              |                     |                       |                       |                 |                 |                |             |        |
|                              |                     |                       |                       |                 |                 |                |             |        |
|                              |                     |                       |                       |                 |                 |                |             |        |

Note:  
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK  
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS  
3, Result = Read level + Antenna factor + cable loss-Amp factor  
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Conducted Method:  
GFSK



## **10. Antenna Requirement**

### **10.1. Standard Requirement**

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 shall be considered sufficient to comply with the provisions of this Section. 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.

### **10.2. Antenna Connected Construction**

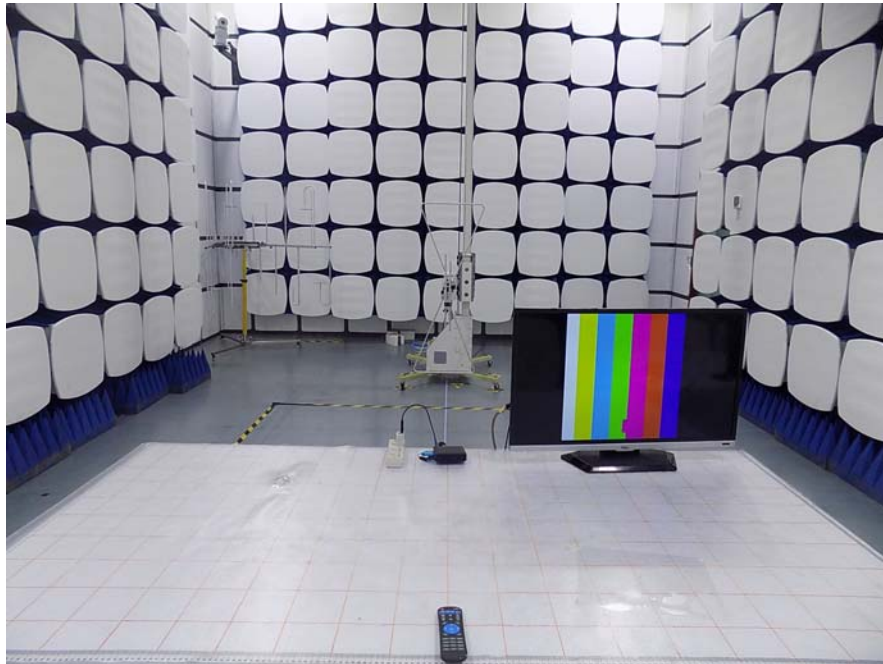
The antenna is PCB antenna and no consideration of replacement. Please see EUT photo for details.

### **10.3. Result**

The EUT antenna is PCB Antenna. It comply with the standard requirement.

## 11. Photographs of Setup

### 11.1.Photos of Radiated emission



### 11.2.Photos of Conducted Emission test



## **12. Photographs of EUT**

Please refer to the report T1871484 05.

**-----END OF REPORT-----**