



## Test Report

Date : 2019-12-11  
No. : HMD19120004

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**Applicant** : Robby Gordon Entertainment/SST, Inc.  
10615 Twin Lakes Pkwy Charlotte NC USA

**Supplier / Manufacturer** : Robby Gordon Entertainment/SST, Inc.  
10615 Twin Lakes Pkwy Charlotte NC USA

**Description of Sample(s)** : Submitted sample(s) said to be  
Product: RC Car  
Brand Name: N/A  
Model No.: 144001  
FCC ID: 2AVCB144001

**Date Samples Received** : 2019-11-28

**Date Tested** : 2019-12-10 to 2019-12-11

**Investigation Requested** : Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 and ANSI C63.10: 2013 for FCC Certification.

**Conclusions** : The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks** : ---



  
CHEUNG Chi, Kenneth  
Authorized Signatory

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### **1.0 General Details**

#### **1.1 Test Laboratory**

The Hong Kong Standards and Testing Centre Ltd.  
EMC Laboratory  
10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong Kong  
Telephone: 852 2666 1888  
Fax: 852 2664 4353

#### **1.2 Equipment Under Test [EUT]**

##### **Description of Sample(s)**

|               |  |
|---------------|--|
| Product:      | RC Car   |
| Manufacturer: | Robby Gordon Entertainment/SST, Inc.<br>10615 Twin Lakes Pkwy Charlotte NC USA |
| Brand Name:   | N/A  |
| Model Number: | 144001   |
| Rating:       | 6Vd.c(Battery AA*4)  |

#### **1.3 Description of EUT Operation**

The Equipment Under Test (EUT) is a RC Car. It is a transceiver operating at 2407MHz~2478MHz and the RF signal was modulated by IC.

#### **1.4 Date of Order**

2019-11-28

#### **1.5 Submitted Sample(s):**

1 Sample

#### **1.6 Test Duration**

2019-12-10 to 2019-12-11

#### **1.7 Country of Origin**

China

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### 2.0 Technical Details

#### 2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10: 2013 for FCC Certification. The device was realized by test software.

#### 2.2 Test Standards and Results Summary Tables

| EMISSION<br>Results Summary                         |                  |                   |                     |                                     |                          |                                     |
|---|------------------|-------------------|---------------------|-------------------------------------|--------------------------|-------------------------------------|
| Test Condition                                      | Test Requirement | Test Method       | Class /<br>Severity | Test Result                         |                          |                                     |
|   |                  |                   |                     | Pass                                | Failed                   | N/A                                 |
| Field Strength of Fundamental & Harmonics Emissions | FCC 47CFR 15.249 | ANSI C63.10: 2013 | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| Radiated Emissions                                  | FCC 47CFR 15.209 | ANSI C63.10: 2013 | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| AC Mains Conducted Emissions                        | FCC 47CFR 15.207 | ANSI C63.10: 2013 | N/A                 | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Antenna requirement                                 | FCC 47CFR 15.203 | N/A               | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

Note: N/A - Not Applicable

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### **3.0 Test Results**

#### **3.1 Emission**

##### **3.1.1 Radiated Emissions**

Ambient temperature 25°C

Relative humidity 57%

Test Requirement: FCC 47CFR 15.249 & FCC 47CFR 15.209

Test Method: ANSI C63.10:2013

Test Date: 2019-12-10

Mode of Operation: Tx mode

#### **Test Method:**

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

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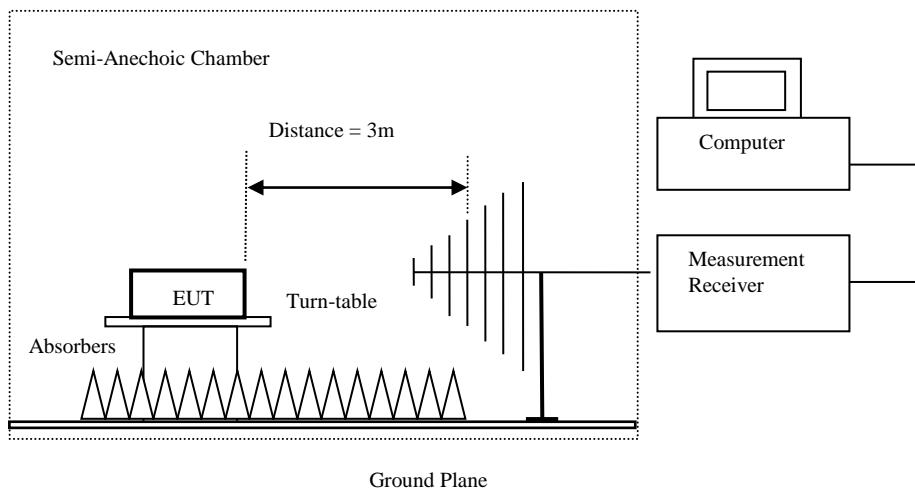
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### **Spectrum Analyzer Setting:**

|                        |   |
|------------------------|---|
| 9KHz – 30MHz (Pk & Av) | RBW: 10kHz<br>VBW: 30kHz<br>Sweep: Auto<br>Span: Fully capture the emissions being measured<br>Trace: Max. hold   |
| 30MHz – 1GHz (QP)      | RBW: 120kHz<br>VBW: 120kHz<br>Sweep: Auto<br>Span: Fully capture the emissions being measured<br>Trace: Max. hold |
| Above 1GHz (Pk)        | RBW: 1MHz<br>VBW: 1MHz<br>Sweep: Auto<br>Span: Fully capture the emissions being measured<br>Trace: Max. hold     |
| Above 1GHz (Av)        | RBW: 1MHz<br>VBW: 10Hz<br>Sweep: Auto<br>Span: Fully capture the emissions being measured<br>Trace: Max. hold     |

### **Test Setup:**



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used, 9kHz to 30MHz loop antennas are used.



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### Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

| Frequency Range of Fundamental<br>[MHz] | Field Strength of Fundamental Emission<br>[microvolts/meter] | Field Strength of Harmonics Emission<br>[microvolts/meter] |
|---|--|--|
| 902-928                                 | 50,000 [Quasi-Peak]  | 500 [Average]  |
| 2400-2483.5                             | 50,000 [Average]   | 500 [Average]  |

### Results of Tx mode (Lowest Frequency Channel-2407 MHz): Pass

| Field Strength of Fundamental Emissions<br>Peak Value |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2407.00   | 61.4                                  | 36.8                                 | 98.2                              | 80,816.5                       | 500,000                | Vertical            |
| 2407.00   | 57.0                                  | 36.4                                 | 93.4                              | 46,935.3                       | 500,000                | Horizontal          |

| Field Strength of Fundamental Emissions<br>Average Value |                                       |                                      |                                   |                                |                        |                     |
|--|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Frequency<br>MHz   | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2407.00  | 45.2                                  | 36.8                                 | 82.0                              | 12,560.3                       | 50,000                 | Vertical            |
| 2407.00  | 42.4                                  | 36.4                                 | 78.8                              | 8,709.6                        | 50,000                 | Horizontal          |

| Field Strength of Harmonics Emission<br>Peak Value |                                       |                                      |                                   |                                |                        |                     |
|--|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 4814.0   | 14.7                                  | 41.5                                 | 56.2                              | 648.6                          | 5,000                  | Vertical            |
| 4814.0   | 13.0                                  | 42.4                                 | 55.4                              | 590.9                          | 5,000                  | Horizontal          |
| 7221.0   | 9.8                                   | 45.1                                 | 54.9                              | 552.7                          | 5,000                  | Vertical            |
| 7221.0   | 8.8                                   | 46.2                                 | 55.0                              | 559.8                          | 5,000                  | Horizontal          |
| 9628.0   | 7.2                                   | 48.0                                 | 55.2                              | 578.1                          | 5,000                  | Vertical            |
| 9628.0   | 6.4                                   | 48.8                                 | 55.2                              | 574.1                          | 5,000                  | Horizontal          |
| 12035.0  | 4.01                                  | 51.8                                 | 55.8                              | 617.3                          | 5,000                  | Vertical            |
| 12035.0  | 3.6                                   | 52.4                                 | 56.0                              | 632.4                          | 5,000                  | Horizontal          |

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| Field Strength of Harmonics Emission |                                       |                                      |                                   |                                |                        |                     |
|--------------------------------------|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Average Value                        |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                     | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 4814.0                               | 0.8                                   | 41.5                                 | 42.3                              | 130.8                          | 500                    | Vertical            |
| 4814.0                               | -1.7                                  | 42.4                                 | 40.7                              | 108.6                          | 500                    | Horizontal          |
| 7221.0                               | -5.3                                  | 45.1                                 | 39.8                              | 97.3                           | 500                    | Vertical            |
| 7221.0                               | -5.7                                  | 46.2                                 | 40.5                              | 105.7                          | 500                    | Horizontal          |
| 9628.0                               | -8.7                                  | 48.0                                 | 39.3                              | 92.6                           | 500                    | Vertical            |
| 9628.0                               | -9.1                                  | 48.8                                 | 39.8                              | 97.2                           | 500                    | Horizontal          |
| 12035.0                              | -11.4                                 | 51.8                                 | 40.5                              | 105.3                          | 500                    | Vertical            |
| 12035.0                              | -12.3                                 | 52.4                                 | 40.1                              | 101.5                          | 500                    | Horizontal          |

Results of Tx mode (Middle Frequency Channel- 2442MHz): Pass

| Field Strength of Fundamental Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Peak Value                              |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                        | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2442.00                                 | 61.1                                  | 36.8                                 | 97.9                              | 78,433.2                       | 500,000                | Vertical            |
| 2442.00                                 | 57.2                                  | 36.4                                 | 93.6                              | 47,973.3                       | 500,000                | Horizontal          |

| Field Strength of Fundamental Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Average Value                           |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                        | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2442.00                                 | 45.6                                  | 36.8                                 | 82.4                              | 13,137.1                       | 50,000                 | Vertical            |
| 2442.00                                 | 42.5                                  | 36.4                                 | 78.9                              | 8,820.6                        | 50,000                 | Horizontal          |

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| Field Strength of Harmonics Emission<br>Peak Value |                                       |                                      |                                   |                                |                        |                     |
|--|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Frequency<br>MHz                                   | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 4884.0   | 15.1                                  | 41.6                                 | 56.7                              | 682.3                          | 5,000                  | Vertical            |
| 4884.0   | 12.4                                  | 42.5                                 | 54.9                              | 555.3                          | 5,000                  | Horizontal          |
| 7326.0   | 1.9                                   | 45.2                                 | 47.1                              | 227.2                          | 5,000                  | Vertical            |
| 7326.0   | 8.9                                   | 46.3                                 | 55.2                              | 574.8                          | 5,000                  | Horizontal          |
| 9768.0   | 7.1                                   | 48.1                                 | 55.2                              | 574.8                          | 5,000                  | Vertical            |
| 9768.0   | 6.4                                   | 48.9                                 | 55.3                              | 579.4                          | 5,000                  | Horizontal          |
| 12210.0  | 3.7                                   | 51.6                                 | 55.3                              | 582.8                          | 5,000                  | Vertical            |
| 12210.0  | 3.5                                   | 52.5                                 | 56.0                              | 631.0                          | 5,000                  | Horizontal          |

| Field Strength of Harmonics Emission<br>Avarage Value |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 4884.0  | -1.0                                  | 41.6                                 | 40.6                              | 107.5                          | 500                    | Vertical            |
| 4884.0  | -2.8                                  | 42.5                                 | 39.7                              | 97.1                           | 500                    | Horizontal          |
| 7326.0  | -5.1                                  | 45.2                                 | 40.1                              | 100.9                          | 500                    | Vertical            |
| 7326.0  | -7.0                                  | 46.3                                 | 39.3                              | 91.9                           | 500                    | Horizontal          |
| 9768.0  | -8.7                                  | 48.1                                 | 39.5                              | 93.9                           | 500                    | Vertical            |
| 9768.0  | -8.1                                  | 48.9                                 | 40.8                              | 109.3                          | 500                    | Horizontal          |
| 12210.0   | -11.1                                 | 51.6                                 | 40.5                              | 106.2                          | 500                    | Vertical            |
| 12210.0   | -11.3                                 | 52.5                                 | 41.2                              | 114.4                          | 500                    | Horizontal          |

### Results of Tx mode (Highest Frequency Channel – 2478MHz): Pass

| Field Strength of Fundamental Emissions<br>Peak Value |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2478.00   | 61.5                                  | 36.8                                 | 98.3                              | 82,224.3                       | 500,000                | Vertical            |
| 2478.00   | 58.0                                  | 36.4                                 | 94.4                              | 52,662.3                       | 500,000                | Horizontal          |

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| Field Strength of Fundamental Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Average Value                           |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                        | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2478.00                                 | 46.0                                  | 36.8                                 | 82.8                              | 13,819.7                       | 50,000                 | Vertical            |
| 2478.00                                 | 42.7                                  | 36.4                                 | 79.1                              | 8,964.0                        | 50,000                 | Horizontal          |

| Field Strength of Harmonics Emission |                                       |                                      |                                   |                                |                        |                     |
|--------------------------------------|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Peak Value                           |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                     | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 4956.0                               | 15.4                                  | 41.4                                 | 56.8                              | 687.9                          | 5,000                  | Vertical            |
| 4956.0                               | 12.5                                  | 42.7                                 | 55.2                              | 576.8                          | 5,000                  | Horizontal          |
| 7434.0                               | 9.6                                   | 45.6                                 | 55.2                              | 576.1                          | 5,000                  | Vertical            |
| 7434.0                               | 8.7                                   | 46.5                                 | 55.2                              | 572.8                          | 5,000                  | Horizontal          |
| 9912.0                               | 7.3                                   | 48.6                                 | 55.9                              | 623.0                          | 5,000                  | Vertical            |
| 9912.0                               | 6.1                                   | 49.7                                 | 55.8                              | 618.0                          | 5,000                  | Horizontal          |
| 12390.0                              | 3.5                                   | 51.7                                 | 55.2                              | 572.8                          | 5,000                  | Vertical            |
| 12390.0                              | 2.7                                   | 52.7                                 | 55.4                              | 590.2                          | 5,000                  | Horizontal          |

| Field Strength of Harmonics Emission |                                       |                                      |                                   |                                |                        |                     |
|--------------------------------------|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Avarage Value                        |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                     | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 4956.0                               | 0.0                                   | 41.4                                 | 41.4                              | 117.9                          | 500                    | Vertical            |
| 4956.0                               | -2.8                                  | 42.7                                 | 39.9                              | 99.0                           | 500                    | Horizontal          |
| 7434.0                               | -6.4                                  | 45.6                                 | 39.3                              | 91.7                           | 500                    | Vertical            |
| 7434.0                               | -6.2                                  | 46.5                                 | 40.3                              | 103.2                          | 500                    | Horizontal          |
| 9912.0                               | -9.2                                  | 48.6                                 | 39.4                              | 93.8                           | 500                    | Vertical            |
| 9912.0                               | -9.6                                  | 49.7                                 | 40.1                              | 100.9                          | 500                    | Horizontal          |
| 12390.0                              | -11.4                                 | 51.7                                 | 40.3                              | 103.9                          | 500                    | Vertical            |
| 12390.0                              | -12.5                                 | 52.7                                 | 40.2                              | 102.2                          | 500                    | Horizontal          |

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Calculated measurement uncertainty (9kHz-30MHz): 2.0dB

(30MHz -1GHz): 4.9dB

(1GHz -6GHz): 4.02dB

(6GHz -26.5GHz): 4.03dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### Radiated Emissions Measurement:

#### Limit :

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 to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### Result: RF Radiated Emissions (1GHz-26GHz) (Lowest)-GFSK

| Field Strength of Band-edge Compliance<br>Peak Value |                                     |                              |                                   |                              |                        |                           |
|--|-------------------------------------|------------------------------|-----------------------------------|------------------------------|------------------------|---------------------------|
| Frequency<br>MHz                                     | Measured<br>Level @3m<br>dB $\mu$ V | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB $\mu$ V/m | E-Field<br>Polarity       |
| 2400.0   | 13.38                               | 36.8                         | 50.18                             | 74.0                         | 23.8                   | Vertical +<br>Horizontal* |

| Field Strength of Band-edge Compliance<br>Average Value                  |                                     |                              |                                   |                              |                        |                     |
|--|-------------------------------------|------------------------------|-----------------------------------|------------------------------|------------------------|---------------------|
| Frequency<br>MHz   | Measured<br>Level @3m<br>dB $\mu$ V | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB $\mu$ V/m | E-Field<br>Polarity |
| The PK value is less than AV limit, AV value does not need to be tested. |                                     |                              |                                   |                              |                        |                     |

### Result: RF Radiated Emissions (1GHz-26GHz) (Highest) -GFSK

| Field Strength of Band-edge Compliance<br>Peak Value |                                     |                              |                                   |                              |                        |                           |
|--|-------------------------------------|------------------------------|-----------------------------------|------------------------------|------------------------|---------------------------|
| Frequency<br>MHz                                     | Measured<br>Level @3m<br>dB $\mu$ V | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB $\mu$ V/m | E-Field<br>Polarity       |
| 2,483.5  | 14.0                                | 36.4                         | 50.4                              | 74.0                         | 23.6                   | Vertical +<br>Horizontal* |

| Field Strength of Band-edge Compliance<br>Average Value                  |                                     |                              |                                   |                              |                        |                     |
|--|-------------------------------------|------------------------------|-----------------------------------|------------------------------|------------------------|---------------------|
| Frequency<br>MHz   | Measured<br>Level @3m<br>dB $\mu$ V | Correction<br>Factor<br>dB/m | Field<br>Strength<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB $\mu$ V/m | E-Field<br>Polarity |
| The PK value is less than AV limit, AV value does not need to be tested. |                                     |                              |                                   |                              |                        |                     |

-\* : The test results are accumulated in both vertical and horizontal directions.

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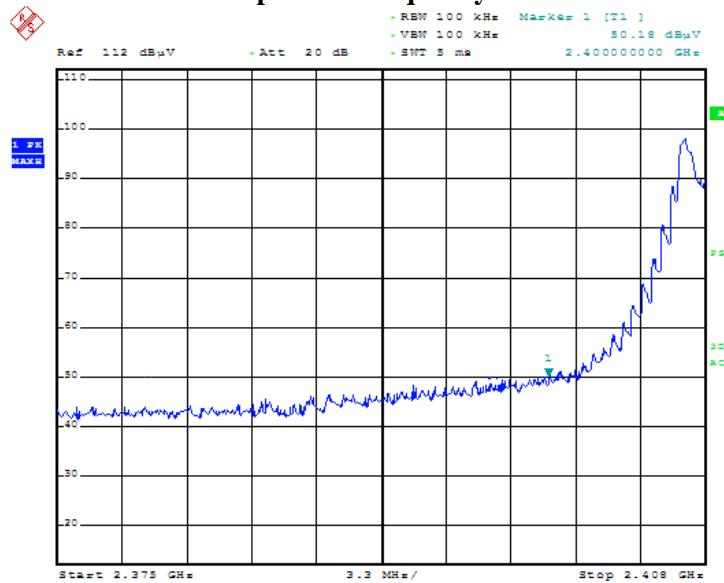
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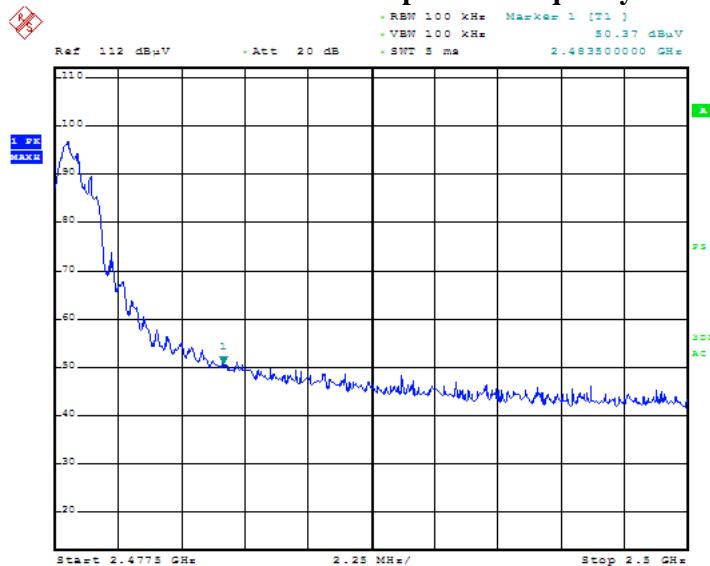
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### Emissions radiated outside of the specified frequency bands: 2407MHz



### Emissions radiated outside of the specified frequency bands: 2478MHz



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### Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

| Frequency Range<br>[MHz] | Quasi-Peak Limits<br>[ $\mu$ V/m] |
|--------------------------|-----------------------------------|
| 0.009-0.490              | 2400/F (kHz)                      |
| 0.490-1.705              | 24000/F (kHz)                     |
| 1.705-30                 | 30                                |
| 30-88                    | 100                               |
| 88-216                   | 150                               |
| 216-960                  | 200                               |
| Above960                 | 500                               |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

### Results of TX mode (9kHz – 30MHz): PASS

Emissions detected are more than 20 dB below the FCC Limits

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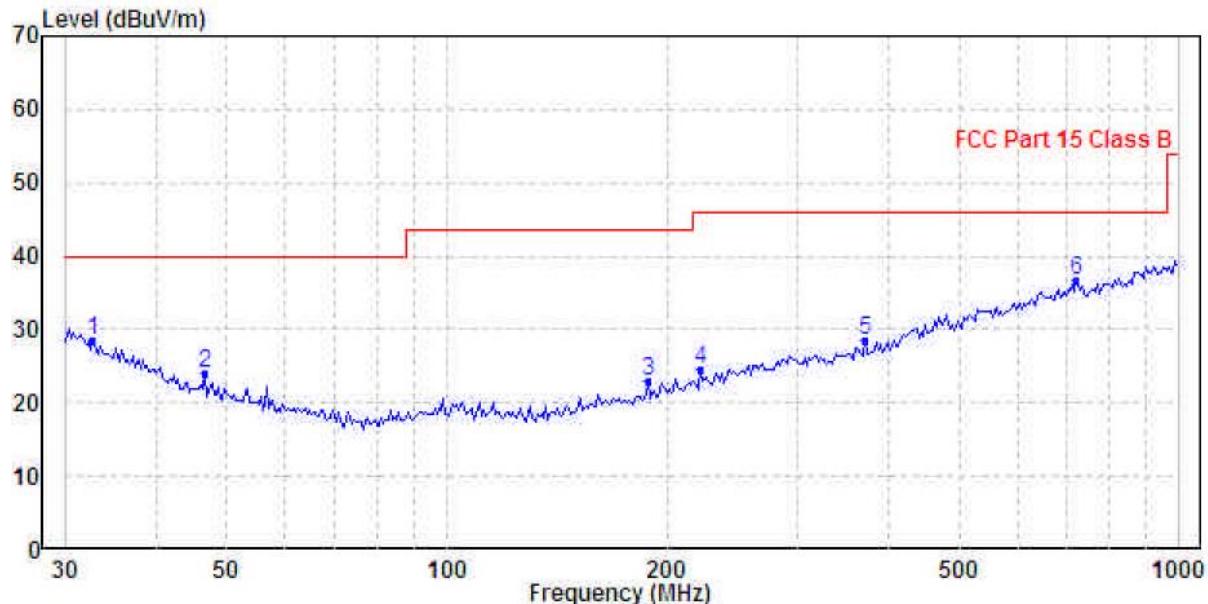
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Results of TX mode (30MHz – 1GHz)(2407MHz worst case): PASS

Horizontal



Ambient Temperature: 25C

Relative Humidity : 50%

| Freq | Level   | Limit | Over  | Remark    | Pol/Phase  |
|------|---------|-------|-------|-----------|------------|
|      |         | Line  | Limit |           |            |
| 1    | 32.864  | 28.64 | 40.00 | -11.36 QP | Horizontal |
| 2    | 46.666  | 24.15 | 40.00 | -15.85 QP | Horizontal |
| 3    | 188.413 | 23.03 | 43.50 | -20.47 QP | Horizontal |
| 4    | 221.392 | 24.54 | 46.00 | -21.46 QP | Horizontal |
| 5    | 372.005 | 28.40 | 46.00 | -17.60 QP | Horizontal |
| 6    | 724.261 | 36.73 | 46.00 | -9.27 QP  | Horizontal |

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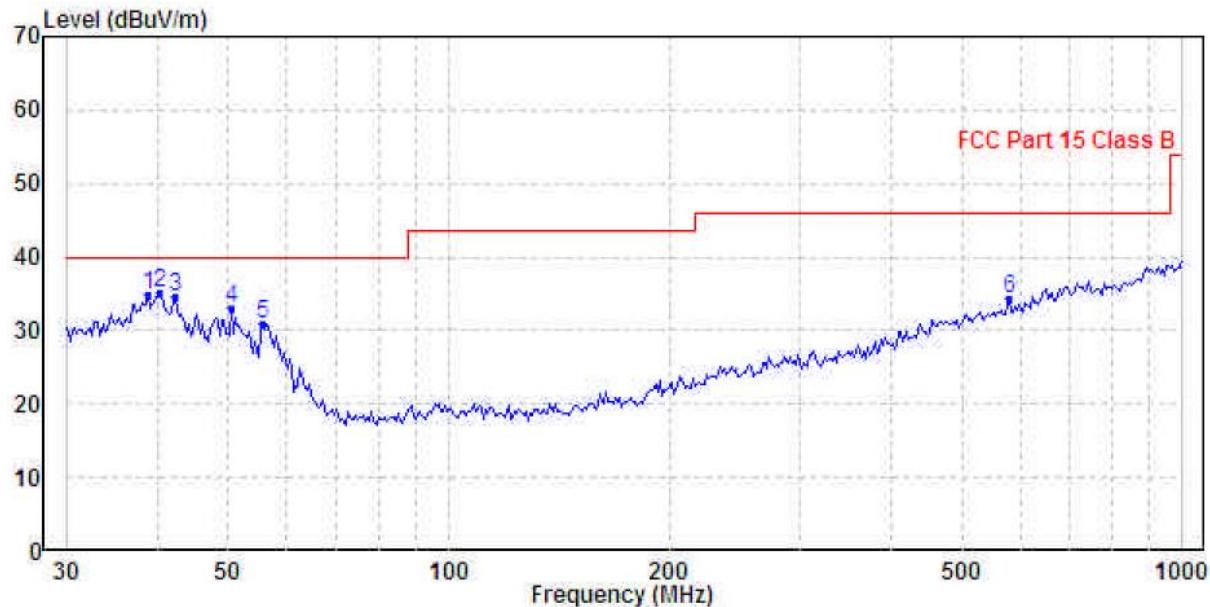
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### Results of TX mode (30MHz – 1GHz) (2407MHz worst case): PASS

Vertical



Ambient Temperature: 25C

Relative Humidity : 50%

| Freq | Level   | Limit | Over  | Remark    | Pol/Phase |
|------|---------|-------|-------|-----------|-----------|
|      |         | Line  | Limit |           |           |
| 1    | 38.888  | 34.88 | 40.00 | -5.12 QP  | Vertical  |
| 2    | 40.276  | 35.17 | 40.00 | -4.83 QP  | Vertical  |
| 3    | 42.302  | 34.72 | 40.00 | -5.28 QP  | Vertical  |
| 4    | 50.409  | 33.13 | 40.00 | -6.87 QP  | Vertical  |
| 5    | 55.609  | 30.88 | 40.00 | -9.12 QP  | Vertical  |
| 6    | 578.670 | 34.21 | 46.00 | -11.79 QP | Vertical  |

### Remarks:

Calculated measurement uncertainty (30MHz – 1GHz): 4.9dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### **3.1.2 Antenna Requirement**

Ambient temperature 25°C

Relative humidity 57%

#### **Test Requirements: § 15.203**

#### **Test Specification:**

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.

#### **Test Results:**

This is copper pipe antenna. There is no external antenna, the antenna gain =2dBi. User is unable to remove or changed the Antenna.

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### 3.1.3 20dB Bandwidth of Fundamental Emission

Ambient temperature 25°C

Relative humidity 57%

Test Requirement: FCC 47 CFR 15.249  
Test Method: ANSI C63.10:2013  
Test Date: 2019-12-11  
Mode of Operation: Tx mode

#### **Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. 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.

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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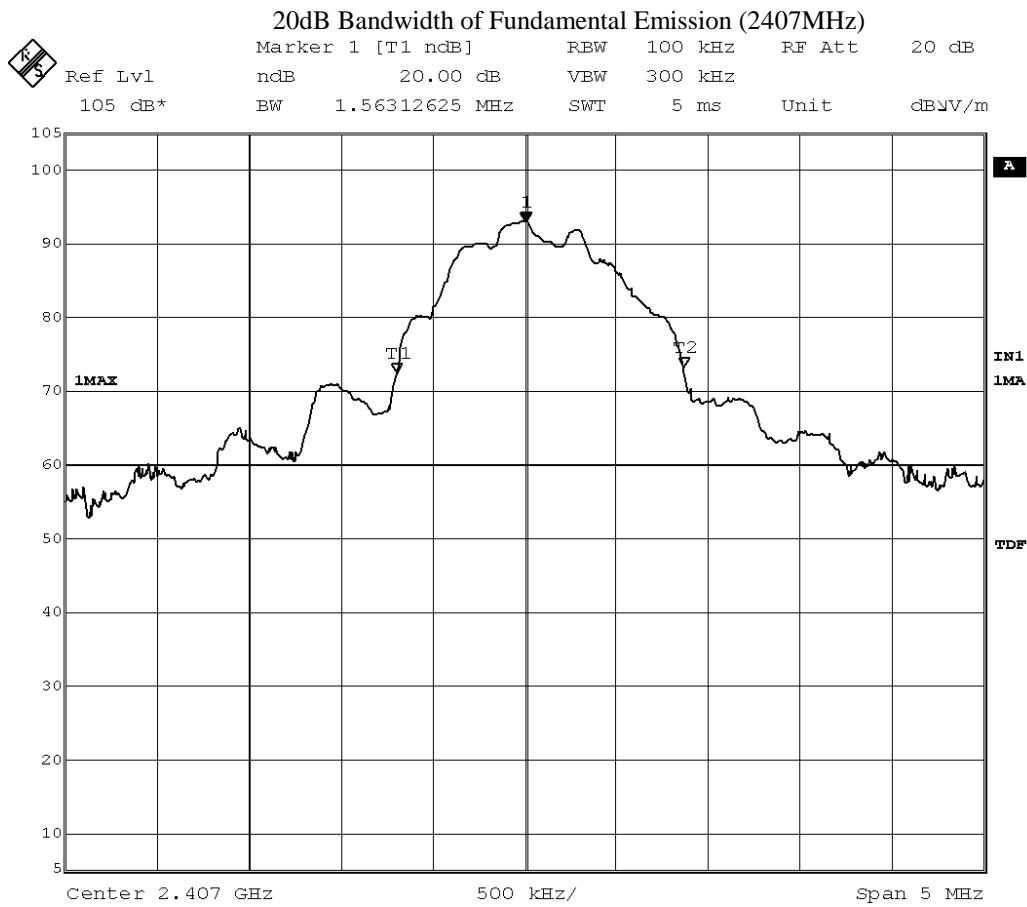
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**Limits for 20dB Bandwidth of Fundamental Emission (Low Frequency Channel):**

| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
|--------------------------|-------------------------|
| 2407.0                   | 1.56                    |



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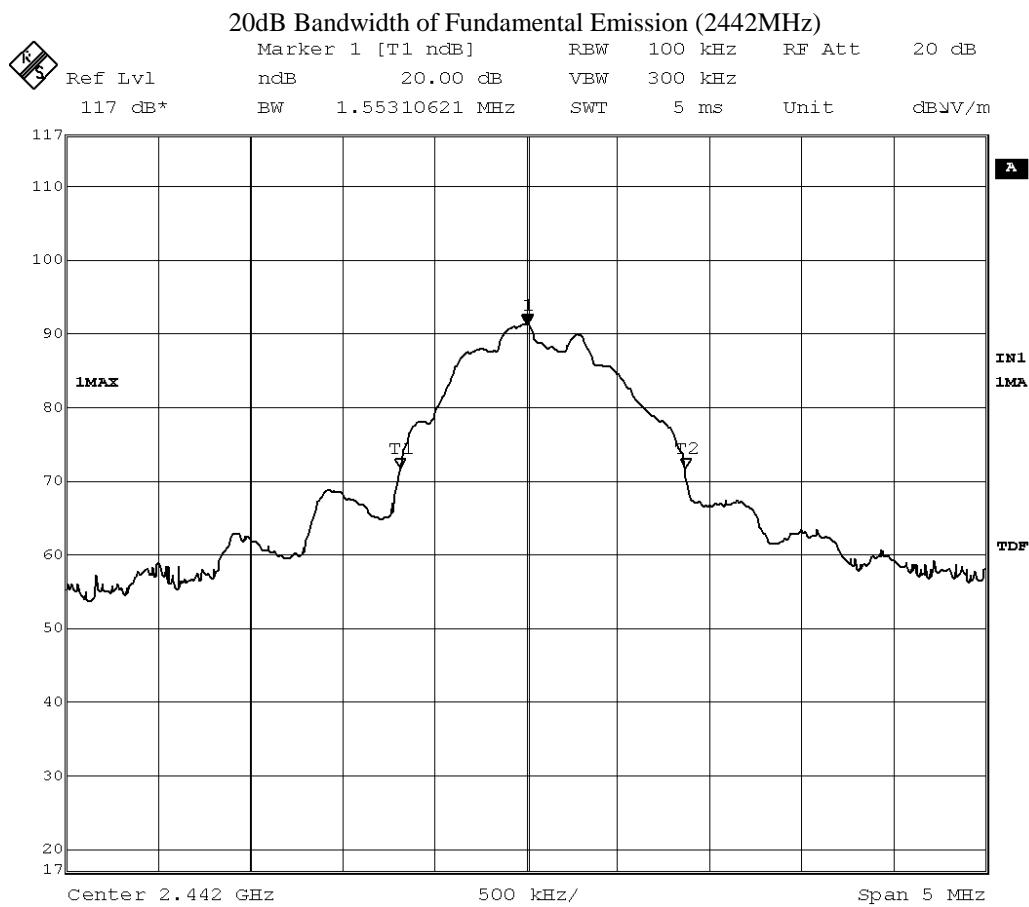
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Limits for 20dB Bandwidth of Fundamental Emission (Middle Frequency Channel):

| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
|--------------------------|-------------------------|
| 2442.0                   | 1.55                    |



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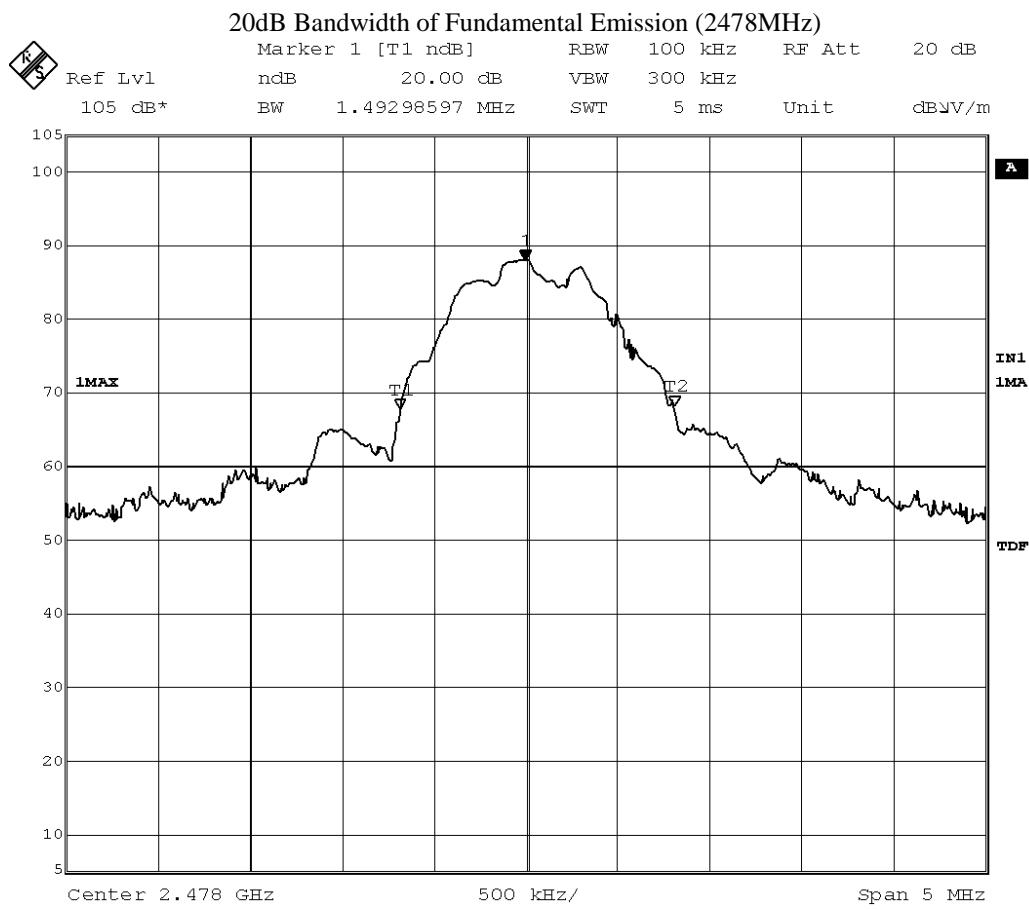
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### Limits for 20dB Bandwidth of Fundamental Emission (High Frequency Channel):

| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
|--------------------------|-------------------------|
| 2478.0                   | 1.49                    |



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### Appendix A

#### List of Measurement Equipment

##### Radiated Emission

| EQP NO. | DESCRIPTION                                  | MANUFACTURER             | MODEL NO.       | SERIAL NO.     | LAST CAL   | DUE CAL    |
|---------|--|--------------------------|-----------------|----------------|------------|------------|
| EM215   | MULTIDEVICE CONTROLLER                       | EMCO                     | 2090            | 00024676       | N/A        | N/A        |
| EM217   | ELECTRIC POWERED TURNTABLE                   | EMCO                     | 2088            | 00029144       | N/A        | N/A        |
| EM218   | ANECHOIC CHAMBER                             | ETS-LINDGREN             | FACT-3          | --             | 2018/04/20 | 2020/04/20 |
| EM356   | ANTENNA POSITIONING TOWER                    | ETS-LINDGREN             | 2171B           | 00150346       | N/A        | N/A        |
| EM355   | Biconilog Antenna                            | ETS-Lindgren             | 3143B           | 00094856       | 2018/05/24 | 2020/05/24 |
| EM229   | EMI TEST RECEIVER                            | R&S                      | ESIB40          | 100248         | 2018/06/01 | 2020/06/01 |
| EM276   | BROADBAND HORN ANTENNA                       | A-INFOMW                 | JXTXLB-10180-SF | J2031090903007 | 2018/04/27 | 2020/04/27 |
| EM300   | PYRAMIDAL STANDARD GAIN HORN ANTENNA         | ETS-LINDGREN             | 3160-09         | 00130130       | 2018/05/13 | 2020/05/13 |
| EM301   | PYRAMIDAL STANDARD GAIN HORN ANTENNA         | ETS-LINDGREN             | 3160-10         | 00130988       | 2018/05/13 | 2020/05/13 |
| EM302   | PRECISION OMNIDIRECTIONAL DIPOLE (1 – 6GHZ)  | SEIBERSDORF LABORATORIES | POD 16          | 161806/L       | 2018/05/11 | 2020/05/11 |
| EM303   | PRECISION OMNIDIRECTIONAL DIPOLE (6 – 18GHZ) | SEIBERSDORF LABORATORIES | POD 618         | 6181908/L      | 2018/05/11 | 2020/05/11 |
| EM353   | LOOP ANTENNA                                 | ETS_LINDGREN             | 6502            | 00206533       | 2018/04/16 | 2020/04/16 |
| EM045   | POWER METER                                  | ROHDE & SCHWARZ          | NRVD            | 843246/028     | 2018/06/01 | 2020/06/01 |

Remarks:-

N/A Not Applicable or Not Available

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### **Appendix B**

#### **Photographs of EUT**

**View of the product**



**View of the product**



**View of the product**



**View of the product**



**Inner Circuit Bottom View**



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### **Photographs of EUT**

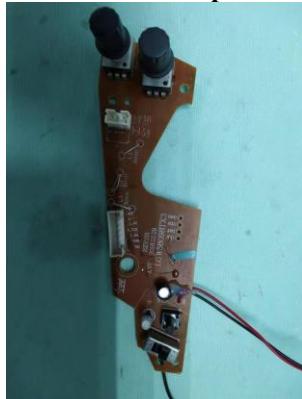
**Inner Circuit Top View**



**Inner Circuit Bottom View**



**Inner Circuit Top View**



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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up (9kHz – 30MHz)**



**Measurement of Radiated Emission Test Set Up (30MHz – 1000MHz)**



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### Photographs of EUT

Measurement of Radiated Emission Test Set Up (above 1000MHz)



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