*Audix Technology Corp.*
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

*Tel: +886 2 26099301*
*Fax: +886 2 26099303*

# FCC 15.247 & RSS-247
# 2.4 GHz Test Report

## for

## LG Electronics Inc.

## 222, LG-ro, Jinwi-myeon Pyeongtaek-Si, Gyeonggi-Do, 17709 Republic of Korea

| | | |
|---|---|---|
| **Product Name** | **:** | **Notebook Computer** |
| **Model Name** | **:** | **(1)16Z90Q (2)16ZB90Q (3)16ZD90Q (4)16ZG90Q** |
| **Brand** | | **LG** |
| **FCC ID** | **:** | **BEJNT-16Z90Q** |
| **IC** | **:** | **2703H-16Z90Q** |

| | | |
|---|---|---|
| **Prepared by:** | **:** | **AUDIX Technology Corporation, EMC Department** |

Testing Laboratory
1724

The test report is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# TABLE OF CONTENTS

Description Page

TEST REPORT ..... 4
**1. REVISION RECORD OF TEST REPORT ..... 5**
**2. SUMMARY OF TEST RESULTS ..... 6**
**3. GENERAL INFORMATION ..... 7**
3.1. Description of Application ..... 7
3.2. Description of EUT ..... 8
3.3. Antenna Information ..... 9
3.4. EUT Specifications Assessed in Current Report ..... 10
3.5. Description of Key Components ..... 11
3.6. Test Configuration ..... 13
3.7. Output Power Setting ..... 14
3.8. Tested Supporting System List ..... 14
3.9. Setup Configuration ..... 15
3.10. Operating Condition of EUT ..... 15
3.11. Description of Test Facility ..... 16
3.12. Measurement Uncertainty ..... 17
**4. MEASUREMENT EQUIPMENTLIST ..... 19**
4.1. Conducted Emission Measurement ..... 19
4.2. Radiated Emission Measurement ..... 20
4.3. RF Conducted Measurement ..... 20
**5. CONDUCTED EMISSION ..... 21**
5.1. Block Diagram of Test Setup ..... 21
5.2. Conducted Emission Limit ..... 21
5.3. Test Procedure ..... 21
5.4. Test Results ..... 22
**6. RADIATED EMISSION ..... 23**
6.1. Block Diagram of Test Setup ..... 23
6.2. Radiated Emission Limits ..... 25
6.3. Test Procedure ..... 26
6.4. Measurement Result Explanation ..... 27
6.5. Test Results ..... 27
**7. 20dB/OCCUPIED BANDWIDTH ..... 28**
7.1. Block Diagram of Test Setup ..... 28
7.2. Specification Limits ..... 28
7.3. Test Procedure ..... 28
7.4. Test Results ..... 28
**8. CARRIER FREQUENCY SEPARATION ..... 29**
8.1. Block Diagram of Test Setup ..... 29
8.2. Specification Limits ..... 29
8.3. Test Procedure ..... 29
8.4. Test Results ..... 29
**9. TIME OF OCCUPANCY ..... 30**
9.1. Block Diagram of Test Setup ..... 30



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

9.2. Specification Limits ..... 30
9.3. Test Procedure ..... 30
9.4. Test Results ..... 30
**10. NUMBER OF HOPPING CHANNELS ..... 31**
10.1. Block Diagram of Test Setup ..... 31
10.2. Specification Limits ..... 31
10.3. Test Procedure ..... 31
10.4. Test Results ..... 31
**11. MAXIMUM PEAK OUTPUT POWER ..... 32**
11.1. Block Diagram of Test Setup ..... 32
11.2. Specification Limits ..... 32
11.3. Test Procedure ..... 32
11.4. Test Results ..... 32
**12. EMISSION LIMITATIONS ..... 33**
12.1. Block Diagram of Test Setup ..... 33
12.2. Specification Limits ..... 33
12.3. Test Procedure ..... 33
12.4. Test Results ..... 33
**13. DEVIATION TO TEST SPECIFICATIONS ..... 34**

APPENDIX A TEST DATA AND PLOTS
APPENDIX B TESTPHOTOGRAPHS



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# TEST REPORT

| | | |
|---|---|---|
| Applicant | : | LG Electronics Inc. |
| Manufacturer | : | LG Electronics Inc. |
| Factory | : | LG Electronics Nanjing New Technology Co., Ltd. |
| EUT Description | | |
| (1) Product | : | Notebook Computer |
| (2) Model | : | (1)16Z90Q (2)16ZB90Q (3)16ZD90Q (4)16ZG90Q |
| (3) Brand | : | LG |
| (4) Power Supply | : | DC 20V, 3.25A |

Applicable Standards:

Title 47 CFR FCC Part 15 Subpart C
RSS-Gen (Issue 5), Amendment 2, February 2021
RSS-247 (Issue 2), February 2017
ANSI C63.10:2013

***Audix Technology Corp.*** tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.
***Audix Technology Corp.*** does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Report: 2022. 01. 12

Reviewed by: Annie Yu (Annie Yu/Administrator)

Approved by: Johnny Hsu (Johnny Hsueh/Section Manager)



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 1. REVISION RECORD OF TEST REPORT

| Edition No | Issued Date | Revision Summary | Report Number |
|---|---|---|---|
| 0 | 2022. 01. 12 | Original Report | EM-F210906 |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 2. SUMMARY OF TEST RESULTS

| Rule | | Description | Results |
|---|---|---|---|
| FCC | IC | | |
| 15.207 | RSS-Gen §8.8 | Conducted Emission | **PASS** |
| 15.247(d)/15.205 | RSS-Gen §8.9<br>RSS-247 §5.5 | Radiated Band Edge and Radiated Spurious Emission | **PASS** |
| 15.247(a)(1) | RSS-247 §5.1(2) | 20dB/Occupied Bandwidth | **PASS** |
| 15.247(a)(1) | RSS-247 §5.1(2) | Carrier Frequency Separation | **PASS** |
| 15.247(a)(1)(iii) | RSS-247 §5.1(4) | Time of Occupancy | **PASS** |
| 15.247(a)(1)(iii) | RSS-247 §5.1(4) | Number of Hopping Channels | **PASS** |
| 15.247(b)(1) | RSS-247 §5.1(2) | Maximum Peak Output Power | **PASS** |
| 15.247(d) | RSS-247 §5.5 | Conducted Band Edges and Conducted Spurious Emission | **PASS** |
| 15.203 | --- | Antenna Requirement | **Compliance** |
| Note: The uncertainties value is not used in determining the result. | | | |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 3. GENERAL INFORMATION

## 3.1. Description of Application

| | |
|---|---|
| Applicant | LG Electronics Inc.<br>222, LG-ro, Jinwi-myeon Pyeongtaek-Si, Gyeonggi-Do, 17709 Republic of Korea |
| Manufacturer | LG Electronics Inc.<br>222, LG-ro, Jinwi-myeon Pyeongtaek-Si, Gyeonggi-Do, 17709 Republic of Korea |
| Factory | LG Electronics Nanjing New Technology Co., Ltd.<br>No.346,Yaoxin Road, Economic & Technical Development Zone, Nanjing, China. |
| Product | Notebook Computer |
| Model | (1)16Z90Q (2)16ZB90Q (3)16ZD90Q (4)16ZG90Q<br>The difference between all models is different in the sales customers. |
| Brand | LG |


***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.2. Description of EUT

<table>
<tr><td>Test Model</td><td>16Z90Q</td></tr>
<tr><td>Serial Number</td><td>N/A</td></tr>
<tr><td>Power Rating</td><td>DC 20V, 3.25A</td></tr>
<tr><td>Software Version</td><td>XY (X, Y can be 0 to 9 for different SW version not influence RF parameter)</td></tr>
<tr><td>RF Features</td><td>WLAN:802.11 a/b/g/n/ac/ax<br>Bluetooth: BT and BLE (BT 5.1)</td></tr>
<tr><td>Transmit Type</td><td>
<table>
<tr><th colspan="2">2.4 GHz</th></tr>
<tr><td>802.11b</td><td>1T1R</td></tr>
<tr><td>802.11g</td><td>1T1R</td></tr>
<tr><td>802.11n-HT20</td><td>2T2R</td></tr>
<tr><td>802.11n-HT40</td><td>2T2R</td></tr>
<tr><td>802.11ax-HE20</td><td>2T2R</td></tr>
<tr><td>802.11ax-HE40</td><td>2T2R</td></tr>
<tr><td>BT/BLE</td><td>1T1R</td></tr>
</table>
<table>
<tr><th colspan="2">U-NII Bands</th></tr>
<tr><td>802.11a</td><td>1T1R</td></tr>
<tr><td>802.11n-HT20/802.11ac-VHT20/802.11ax-HE20</td><td>2T2R</td></tr>
<tr><td>802.11n-HT40/802.11ac-VHT40/802.11ax-HE40</td><td>2T2R</td></tr>
<tr><td>802.11ac-VHT80/802.11ax-HE80</td><td>2T2R</td></tr>
<tr><td>802.11ac-VHT160/802.11ax-HE160</td><td>2T2R</td></tr>
</table>
The MIMO is uncorrelated and supported SDM mode only.
</td></tr>
<tr><td>Test Sample</td><td>
<table>
<tr><th>Sample No.</th><th>Test Item</th><th>Firmware</th></tr>
<tr><td>03</td><td>AC Conduction</td><td>N/A</td></tr>
<tr><td>04</td><td>AC Conduction, RSE, RF Conducted</td><td>N/A</td></tr>
</table>
</td></tr>
<tr><td>Sample Status</td><td>Trial sample</td></tr>
<tr><td>Date of Receipt</td><td>2021. 12. 16</td></tr>
<tr><td>Date of Test</td><td>2021. 12. 22 ~ 2022. 01. 02</td></tr>
<tr><td>Interface Ports of EUT</td><td>• One Micro SD Card Slot<br>• Three USB 3.0 Ports<br>• One HDMI Port<br>• One USB Type C Port<br>• One Earphone Port<br>• One DC Input Port</td></tr>
<tr><td>Accessories Supplied</td><td>• AC Adapter<br>• LAN Gender</td></tr>
</table>



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.3. Antenna Information

| No. | Antenna Part Number | Manufacture | Antenna Type | Frequency (MHz) | Max Gain(dBi) | |
|---|---|---|---|---|---|---|
| | | | | | Main | AUX |
| 1. | WA-P-LELE-04-009 | INPAQ | Mono-Pole | 2400 | 2.3 | 2.0 |
| | | | | 2450 | 2.4 | **2.6** |
| | | | | 2500 | **3.2** | 2.4 |
| | | | | 5150 | 4.2 | 3.5 |
| | | | | 5400 | 4.2 | **3.6** |
| | | | | 5850 | **4.4** | 3.5 |
| | | | | 5925 | 4.1 | 3.4 |
| | | | | 6525 | 4.1 | 3.2 |
| | | | | 7125 | 4.2 | 2.3 |
| Note 1. 2.4G: Directional gain = $10 \log[(10^{3.2/10} + 10^{2.6/10})/2] = 2.91$dBi<br>Note 2. UNII Band: Directional gain = $10 \log[(10^{4.4/10} + 10^{3.6/10})/2] = 4.02$dBi | | | | | | |
| 2. | L1LRF008-CS-H | LUXSHARE-ICT | Mono-Pole | 2400 | **6.3** | 0.9 |
| | | | | 2450 | 5.7 | 1.6 |
| | | | | 2500 | 2.7 | **3.5** |
| | | | | 5150 | -1.5 | 2.3 |
| | | | | 5400 | 3.4 | 4.5 |
| | | | | 5850 | **3.3** | **5.8** |
| | | | | 5925 | 2.9 | 4.7 |
| | | | | 6525 | 3.4 | 1.3 |
| | | | | 7125 | -4.9 | -1.6 |
| Note 1. 2.4G: Directional gain = $10 \log[(10^{6.3/10} + 10^{3.5/10})/2] = 5.12$dBi<br>Note 2. UNII Band: Directional gain = $10 \log[(10^{3.3/10} + 10^{5.8/10})/2] = 4.73$dBi | | | | | | |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.4. EUT Specifications Assessed in Current Report

| Mode | Fundamental Range (MHz) | Channel Number | Modulation | Data Rate (Mbps) |
|---|---|---|---|---|
| Bluetooth | 2402-2480 | 79 | FHSS (GFSK, π/4 DQPSK, 8-DPSK) | 1/2/3 |

| Channel List | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Number | Frequency (MHz) | Channel Number | Frequency (MHz) | Channel Number | Frequency (MHz) | Channel Number | Frequency (MHz) |
| 00 | 2402 | 20 | 2422 | 40 | 2442 | 60 | 2462 |
| 01 | 2403 | 21 | 2423 | 41 | 2443 | 61 | 2463 |
| 02 | 2404 | 22 | 2424 | 42 | 2444 | 62 | 2464 |
| 03 | 2405 | 23 | 2425 | 43 | 2445 | 63 | 2465 |
| 04 | 2406 | 24 | 2426 | 44 | 2446 | 64 | 2466 |
| 05 | 2407 | 25 | 2427 | 45 | 2447 | 65 | 2467 |
| 06 | 2408 | 26 | 2428 | 46 | 2448 | 66 | 2468 |
| 07 | 2409 | 27 | 2429 | 47 | 2449 | 67 | 2469 |
| 08 | 2410 | 28 | 2430 | 48 | 2450 | 68 | 2470 |
| 09 | 2411 | 29 | 2431 | 49 | 2451 | 69 | 2471 |
| 10 | 2412 | 30 | 2432 | 50 | 2452 | 70 | 2472 |
| 11 | 2413 | 31 | 2433 | 51 | 2453 | 71 | 2473 |
| 12 | 2414 | 32 | 2434 | 52 | 2454 | 72 | 2474 |
| 13 | 2415 | 33 | 2435 | 53 | 2455 | 73 | 2475 |
| 14 | 2416 | 34 | 2436 | 54 | 2456 | 74 | 2476 |
| 15 | 2417 | 35 | 2437 | 55 | 2457 | 75 | 2477 |
| 16 | 2418 | 36 | 2438 | 56 | 2458 | 76 | 2478 |
| 17 | 2419 | 37 | 2439 | 57 | 2459 | 77 | 2479 |
| 18 | 2420 | 38 | 2440 | 58 | 2460 | 78 | 2480 |
| 19 | 2421 | 39 | 2441 | 59 | 2461 | | |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.5. Description of Key Components

### 3.5.1. For the All Component Lists

| Item | Supplier | Model / Type | Character |
|---|---|---|---|
| System | Microsoft | Win11 Home | --- |
| Main Board | LG | Queen MAIN B/D PCB | Main Board (GM)<br>Manufacturer:<br>#1 Hannstar Board Tech(Jiang Yin) Corp.,Ltd.<br>#2 Elec & Eltek Company (MCO) Limited. |
| WLAN SUB Board | LG | 16Z90Q Sub B/D | Manufacturer:<br>#1 Hannstar Board Tech(Jiang Yin) Corp.,Ltd.<br>#2 Elec & Eltek Company (MCO) Limited.<br>#3 JiangSu HuaShen Electronic co.,ltd (HXF) |
| CPU<br>(Socket: BGA1744) | Intel | i7-1260P | 2.5GHz |
| | Intel | i5-1240P | 2.1GHz |
| 16” LCD Panel | LG Display | LP160WQ1(SP)(B2) | Resolution: 2560 x 1600, 60Hz<br>WQXGA IPS (Non Touch) |
| Storage (SSD) | SK hynix | HFM001TD3JX013N | 1TB |
| | | HFM512GD3JX013N | 512GB |
| | | HFM256GD3JX013N | 256GB |
| | Samsung | MZ-VL21T00 | 1TB |
| | | MZ-VL25120 | 512GB |
| | | MZ-VL22560 | 256GB |
| Memory (RAM) | Samsung | --- | 16GB LPDDR5x(On Board) |
| | | --- | 8GB LPDDR5x(On Board) |
| | SK Hynix | --- | 16GB LPDDR5x(On Board) |
| | | --- | 8GB LPDDR5x(On Board) |
| Battery Pack | LG | LBV7227E | 80Wh, DC 7.74V, 80Wh Typ 10336mAh |
| | LG | LBY122CM | 90Wh, DC 7.76V, 90Wh Typ 11600mAh |
| WLAN Combo Card | Intel | AX211D2W | WLAN and BT, 2x2 PCle M.2 1216 SD adapter card<br>FCC ID: PD9AX211D2<br>IC: 1000M-AX211D2 |
| WLAN Combo Antenna | LG<br>(INPAQ) | WA-P-LELE-04-009 | PCB, Mono-pole Type<br>Main: Black, Aux: Gray |
| | LG<br>(LUXSHARE-ICT) | L1LRF008-CS-H | PCB, Mono-pole Type<br>Main: Black, Aux: Gray |
| Keyboard | TIC | KT0120B8E | --- |
| | LITE ON | SN8101 | --- |
| Web Camera | Chicony | CKFLF26 | --- |
| | Luxvisions | 1BF225N3 | --- |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

| Item | Supplier | Model / Type | Character |
|---|---|---|---|
| LAN Gender (Type C to LAN) | SUZHOU MEC ELECTRONICS | 80-5946-111 | (White) 10/100 Megabit Ethernet |
| | | 80-5946-101 | (Black) 10/100 Megabit Ethernet |
| | | 80-5946-230 | (White) 10/100/1000 Megabit Ethernet |
| | | 80-5946-240 | (Black) 10/100/1000 Megabit Ethernet |
| | Type C to LAN: Shielded, Undetached, 0.12m | | |
| | ARIN TECH CO. LTD | GD-08MF-36-WH-LP10 | (White) 10/100 Megabit Ethernet |
| | | GD-08MF-36-BK-LP11 | (Black) 10/100 Megabit Ethernet |
| | | GD-08MF-50-WH-LP12 | (White) 10/100/1000 Megabit Ethernet |
| | | GD-08MF-50-BK-LP13 | (Black) 10/100/1000 Megabit Ethernet |
| | Type C to LAN: Shielded, Undetached, 0.12m | | |
| AC Adapter (65W) | LG (HONOR) | ADT-65DSU-D03-2 | I/P: AC 100-240V, 1.6A, 50-60Hz<br>O/P: DC 20V, 3.25A |
| | DC Power Cord: Non-Shielded, Undetached, 1.5m<br>AC Power Cord: Non-Shielded, Detached, 1.0m (2C) (For Other Countries)<br>AC Power Cord: Non-Shielded, Detached, 1.55m (2C) (For US, Canada, Mexico) | | |

Remark: For more detailed features description, please refer to the manufacturer's specifications or the user manual.

3.5.2. The EUT collocates with following worst components, which are used to establish a basic configuration of system during test:

| **SKU (Mode)** | | | **1** | **2** |
|---|---|---|---|---|
| Main Board (GM) | | LG, Queen MAIN B/D PCB | V | V |
| SUB Board | | LG, 16Z90Q Sub B/D (Type A) | V | V |
| CPU | | Intel, i7-1260P | V | V |
| 16" LCD Panel | | LG Display, LP160WQ1(SP)(B2) | V | V |
| Storage (SSD) | | Samsung, 1TB | V | V |
| | | SK hynix, 1TB | V | V |
| Memory (RAM) | | 16GB | V | V |
| Battery Pack | | LG, 90Wh | V | V |
| Keyboard | | TIC, KT0120B8E | V | V |
| Web Camera | | Chicony, CKFLF26 | V | V |
| WLAN Combo Card | | Intel, AX211D2W | V | V |
| WLAN Combo Antenna | | LG (INPAQ), WA-P-LELE-04-009 | V | |
| | | LG (LUXSHARE-ICT), L1LRF008-CS-H | | V |
| Type C #1 | AC Adapter | LG (HONOR), ADT-65DSU-D03-2 | V | V |
| Type C #2 | Link to LAN Gender | MEC | V | V |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.6. Test Configuration

| Mode | Duty Cycle (x) | T (ms) | Duty Cycle Correction Factor (dB) |
|---|---|---|---|
| BT | N/A | 2.890 | N/A |

| AC Conduction | |
|---|---|
| SKU #1 | Normal operation (with INPAQ Antenna) |
| SKU #2 | Normal operation (with LUXSHARE-ICT Antenna) |

| Item | | | Modulation | Data Rate | Test Channel |
|---|---|---|---|---|---|
| Radiated Test Case | SKU #2 | Radiated Band Edge Note 1 & 2 | GFSK | 1Mbps | 00/78 |
| | | | 8-DPSK | 3Mbps | 00/78 |
| | | Radiated Spurious Emission Note1 | GFSK | 1Mbps | 00/39/78 |
| Conducted Test Case | | 20dB/Occupied Bandwidth | GFSK | 1Mbps | 00/39/78 |
| | | | 8-DPSK | 3Mbps | 00/39/78 |
| | | Carrier Frequency Separation | GFSK | 1Mbps | 00/39/78 |
| | | | 8-DPSK | 3Mbps | 00/39/78 |
| | | Time of Occupancy | GFSK | 1Mbps | 00/39/78 |
| | | | 8-DPSK | 3Mbps | 00/39/78 |
| | | Number of Hopping Channels | GFSK | 1Mbps | 39 |
| | | | 8-DPSK | 3Mbps | 39 |
| | | Maximum Peak Output Power | GFSK | 1Mbps | 00/39/78 |
| | | | 8-DPSK | 3Mbps | 00/39/78 |
| | | Band Edges | GFSK | 1Mbps | 00/78 |
| | | | 8-DPSK | 3Mbps | 00/78 |
| | | Spurious Emission | GFSK | 1Mbps | 00/39/78 |
| | | | 8-DPSK | 3Mbps | 00/39/78 |

Note 1: ☐Mobile Device

■Portable Device, and 3 axis were assessed. The worst scenario for Radiated Spurious Emission as follow:■ Lie ☐ Side ☐ Stand

Note 2: We performed testing of the highest and lowest data rate.



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.7. Output Power Setting

| Centre Frequency (MHz) | Power Setting | |
|---|---|---|
| | GFSK | 8-DPSK |
| 2402 | 12 | 7 |
| 2441 | 12 | 7 |
| 2480 | 12 | 7 |

## 3.8. Tested Supporting System List

### 3.8.1. Support Peripheral Unit

| No. | Product | Brand | Model No. | Serial No. | Approval |
|---|---|---|---|---|---|
| 1. | TV | LG | 22LK330-DB | N/A | N/A |
| 2. | USB Mouse | DENGEKI | P012 (MS-P12) | N/A | N/A |
| 3. | Earphone | APPLE | N/A | N/A | N/A |
| 4. | SD Card | ADATA | MicroSDHC Card | N/A | N/A |
| **Partner System** | | | | | |
| 5. | AP Server | ASUS | RT-AX88U | N/A | FCC ID: MSQ-RTAXHP00<br>IC: 3568A-RTAXHP00 |

### 3.8.2. Cable Lists

| No. | Cable Description Of The Above Support Units |
|---|---|
| 1. | HDMI Cable: Shielded, Detachable, 1.2m<br>AC Power Cord: Unshielded, Detachable, 1.8m |
| 2. | USB Cable: Unshielded, Undetachable, 1.5m |
| 3. | Earphone Cable: Unshielded, Undetachable, 1.2m |
| 4. | N/A |
| 5. | AC adapter: M/N:WA-30B12, Cable: Unshielded, Detachable, 1.2m<br>LAN cable: Unshielded, Detachable,3.0m |
| 6. | LAN cable: Unshielded, Detachable, 1.8m |



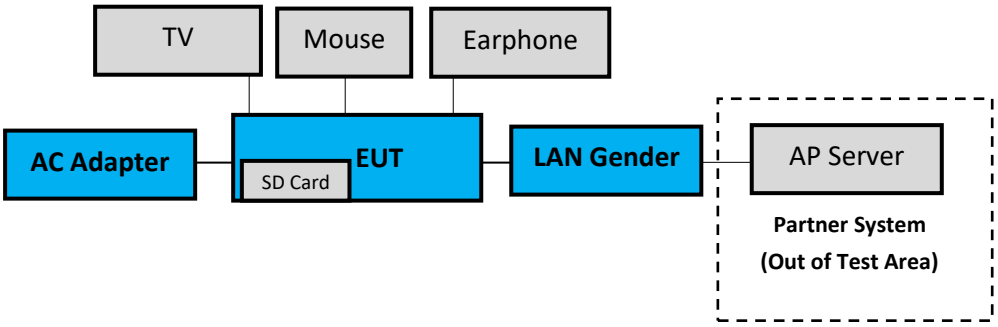
***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

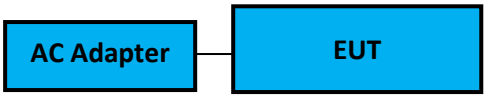
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.9. Setup Configuration

### 3.9.1. EUT Configuration for Power Line & Radiated Emission




### 3.9.2. EUT Configuration for RF Conducted Test Items




## 3.10. Operating Condition of EUT

Test program "DRTU" is used for enabling EUT BT function under continues transmitting and choosing data rate/ channel.



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.11.Description of Test Facility

| | |
|---|---|
| Name of Test Firm | Audix Technology Corporation / EMC Department<br>No. 491, Zhongfu Rd., Linkou Dist., New Taipei City 244, Taiwan<br>Tel: +886-2-26092133<br>Fax: +886-2-26099303<br>Website : www.audixtech.com<br>Contact e-mail: attemc_report@audixtech.com |
| Accreditations | The laboratory is accredited by following organizations under ISO/IEC 17025:2017<br>(1) NVLAP(USA)<br>NVLAP Lab Code 200077-0<br>(2) TAF(Taiwan)<br>No. 1724 |
| Test Facilities | FCC OET Designation Number under APEC MRA by NCC is : TW1724<br>ISED CAB Identifier Number under APEC TEL MRA by NCC is TW1724<br>(1) No.8 Shielded Room<br>(2) No.1 3m Semi Anechoic Chamber |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 3.12.Measurement Uncertainty

| Test Items/Facilities | | | Frequency Range | Uncertainty |
|---|---|---|---|---|
| Conduction Test | | | 9kHz-150kHz | ±3.7dB |
| | | | 150kHz-30MHz | ±3.4dB |
| Radiation Test | ☒ | No.1 3m Semi Anechoic Chamber | 30MHz-200MHz, 3m, Horizontal | ±3.8dB |
| | | | 200MHz-1000MHz, 3m, Horizontal | ±4.1dB |
| | | | 30MHz-200MHz, 3m, Vertical | ±4.5dB |
| | | | 200MHz-1000MHz, 3m, Vertical | ±4.5dB |
| | | | 1GHz-6GHz, 3m | ±4.7dB |
| | | | 6GHz-18GHz, 3m | ±4.1dB |
| | | | 18GHz-40GHz, 3m | ±3.52dB |
| | ☐ | No.3 3m Semi Anechoic Chamber | 30MHz-200MHz, 3m, Horizontal | ±3.9dB |
| | | | 200MHz-1000MHz, 3m, Horizontal | ±4.2dB |
| | | | 30MHz-200MHz, 3m, Vertical | ±4.3dB |
| | | | 200MHz-1000MHz, 3m, Vertical | ±4.5dB |
| | ☐ | No.4 3m Semi Anechoic Chamber | 30MHz-200MHz, 3m, Horizontal | ±4.1dB |
| | | | 200MHz-1000MHz, 3m, Horizontal | ±4.5dB |
| | | | 30MHz-200MHz, 3m, Vertical | ±4.4dB |
| | | | 200MHz-1000MHz, 3m, Vertical | ±4.8dB |
| | | | 1GHz-6GHz, 3m | ±5.0dB |
| | | | 6GHz-18GHz, 3m | ±4.7dB |
| | ☐ | No.5 3m Semi Anechoic Chamber | 30MHz-200MHz, 3m, Horizontal | ±4.2dB |
| | | | 200MHz-1000MHz, 3m, Horizontal | ±4.3dB |
| | | | 30MHz-200MHz, 3m, Vertical | ±4.3dB |
| | | | 200MHz-1000MHz, 3m, Vertical | ±4.7dB |
| | | | 1GHz-6GHz, 3m | ±4.8dB |
| | | | 6GHz-18GHz, 3m | ±4.5dB |

Remark：Uncertainty = $ku_c(y)$



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

| Test Item | Uncertainty |
|---|---|
| 20dB Bandwidth | ±0.2kHz |
| 99% Occupied Bandwidth | ±0.38% |
| Carrier Frequency Separation | ±0.2kHz |
| Time of Occupancy | ±0.03sec |
| Maximum peak Output power | ± 0.52dB |
| Conducted Emission Limitations | ± 0.13dB |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 4. MEASUREMENT EQUIPMENTLIST

## 4.1. Conducted Emission Measurement

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Test Receiver | R&S | ESR3 | 101774 | 2021. 02. 02 | 1 Year |
| 2. | A.M.N. | R&S | ENV432 | 101567 | 2021. 04. 21 | 1 Year |
| 3. | L.I.S.N. | Kyoritsu | KNW-407 | 8-855-9 | 2020. 12. 10 | 1 Year |
| 4. | Pulse Limiter | R&S | ESH3-Z2 | 100354 | 2021. 01. 04 | 1 Year |
| 5. | Digital Thermo-Hygro Meter | iMax | HTC-1 | No.8 S/R | 2021. 04. 15 | 1 Year |
| 6. | Coaxial Cable | Yeida | RG/58AU | CE-08 | 2021. 09. 13 | 1 Year |
| 7. | Test Software | Audix | e3 | V6.120619c | N.C.R. | N.C.R. |


***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 4.2. Radiated Emission Measurement

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9010A-526 | MY53400071 | 2021. 09. 09 | 1 Year |
| 2. | Spectrum Analyzer | Agilent | N9030A-526 | MY53310269 | 2021. 01. 14 | 1 Year |
| 3. | Spectrum Analyzer | Keysight | N9010B-544 | MY55460198 | 2021. 04. 14 | 1 Year |
| 4. | Test Receiver | R&S | ESCI7 | 100923 | 2021. 03. 09 | 1 Year |
| 5. | Amplifier | Sonoma | 310N | 187161 | 2021. 05. 21 | 1 Year |
| 6. | Microwave Amplifier | Keysight | 83051A | MY53010042 | 2021. 07. 30 | 1 Year |
| 7. | Microwave Amplifier | Keysight | 83017A | MY53270365 | 2021. 05. 27 | 1 Year |
| 8. | Loop Antenna | ETS· LINDGREN | 6512 | 00035867 | 2021. 09. 29 | 1 Year |
| 9. | Bilog Antenna | TESEQ | CBL6112D | 33821 | 2021. 07. 16 | 1 Year |
| 10. | Double-Ridged Waveguide Horn | ETS-Lindgren | 3115 | 00114104 | 2021. 04. 02 | 1 Year |
| 11. | Horn Antenna | COM-POWER | AH-840 | 101092 | 2021. 01. 05 | 1 Year |
| 12. | 2.4GHz Notch Filter | K&L Microwave | 7NSL10-2441.5/E130.5-O/O | 2 | 2021 .07. 24 | 1 Year |
| 13. | 3GHz Notch Filter | Microwave | H3G018G1 | 484796 | 2021 .07. 24 | 1 Year |
| 14. | Coaxial Cable | MIYAZAKI | 5D2W | RE-11 | 2021. 01. 29 | 1 Year |
| 15. | Coaxial Cable | HUBER+SUHNER | SUCOFLEX 106 | RE-14 | 2021. 01. 29 | 1 Year |
| 16. | Coaxial Cable | HUBER+SUHNER | SUCOFLEX 102 | RE-30 | 2021. 05. 25 | 1 Year |
| 17. | Digital Thermo-Hygro Meter | iMax | HTC-1 | No.3 3m A/C | 2021. 04. 15 | 1 Year |
| 18. | Test Software | Audix | e3 | V6.120619c | N.C.R. | N.C.R. |

## 4.3. RF Conducted Measurement

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Keysight | N9020B-544 | MY57120357 | 2021. 01. 06 | 1 Year |
| 2. | Digital Thermo-Hygro Meter | iMax | HTC-1 | RF-03 | 2021. 04. 15 | 1 Year |



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

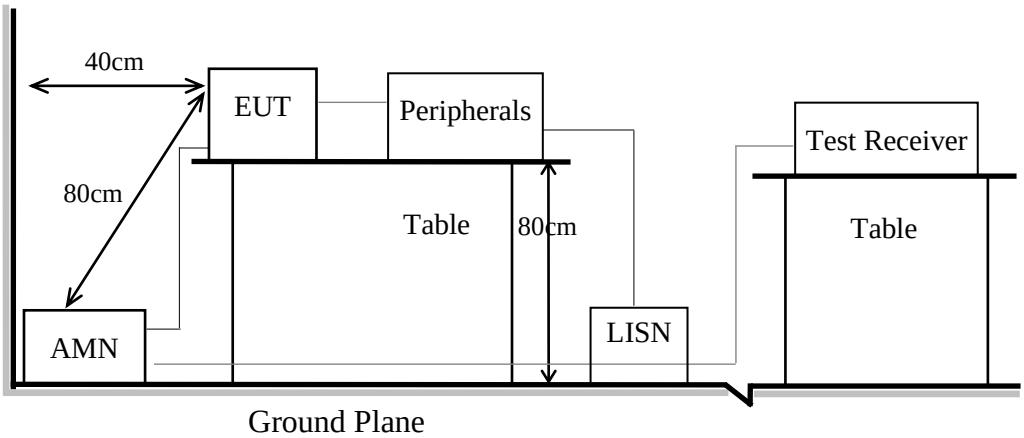
# 5. CONDUCTED EMISSION

## 5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.9

5.1.2. Shielded Room Setup Diagram




## 5.2. Conducted Emission Limit

| Frequency | Conducted Limit | |
|---|---|---|
| | Quasi-Peak Level | Average Level |
| 150kHz ~ 500kHz | 66 ~ 56 dBμV | 56 ~ 46 dBμV |
| 500kHz ~ 5MHz | 56 dBμV | 46 dBμV |
| 5MHz ~ 30MHz | 60 dBμV | 50 dBμV |

Remark1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.
2.: The lower limit applies to the band edges.

## 5.3. Test Procedure

5.3.1. To set up the EUT as indicated in ANSI C63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.

5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).

5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)

5.3.4. Checking frequency range from 150kHz to 30 MHz and record the emission which does not have 20 dB below limit.



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 5.4. Test Results

Please refer to Appendix A.



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

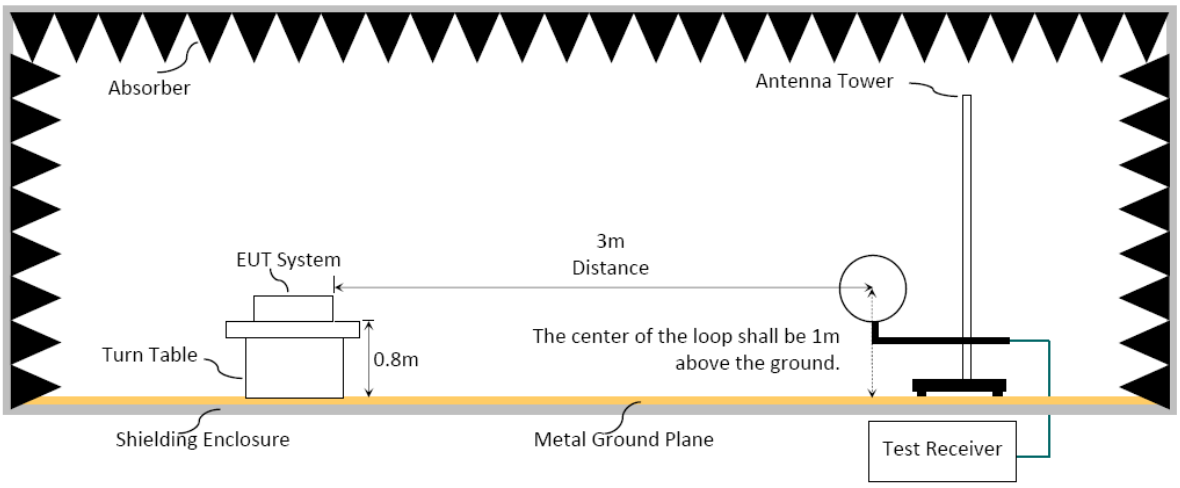
# 6. RADIATED EMISSION

## 6.1. Block Diagram of Test Setup

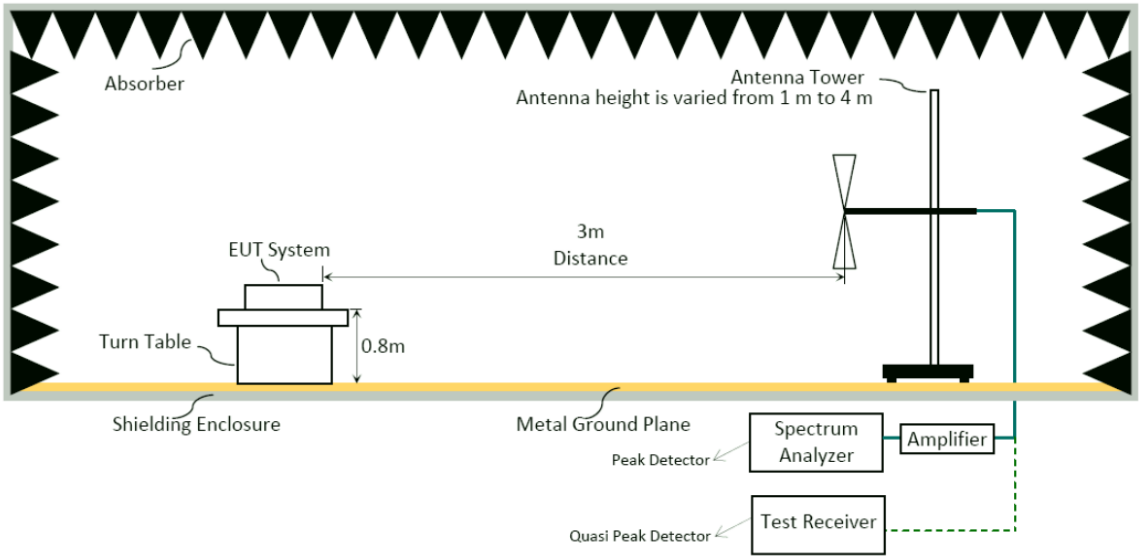
### 6.1.1. Block Diagram of EUT

Indicated as section 3.9

### 6.1.2. Setup Diagram for 9kHz-30MHz




### 6.1.3. Setup Diagram for 30-1000MHz



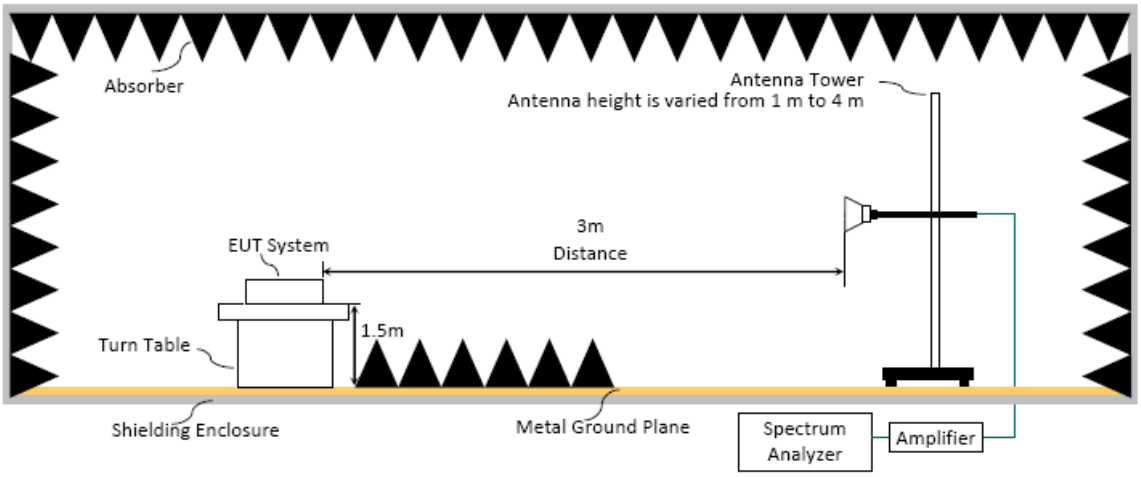



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

6.1.4. Setup Diagram for above 1GHz






***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 6.2. Radiated Emission Limits

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205/RSS-Gen Section 8.10 table 6, must also comply with the radiated emission limits specified as below.

| Frequency (MHz) | Distance(m) | Limits | |
|---|---|---|---|
| | | dBμV/m | μV/m |
| 0.009 - 0.490 | 300 | 67.6-20 log f(kHz) | 2400/f kHz |
| 0.490 - 1.705 | 30 | 87.6-20 log f(kHz) | 24000/f kHz |
| 1.705 - 30 | 30 | 29.5 | 30 |
| 30 - 88 | 3 | 40.0 | 100 |
| 88- 216 | 3 | 43.5 | 150 |
| 216- 960 | 3 | 46.0 | 200 |
| Above 960 | 3 | 54.0 | 500 |
| Above 1000 | 3 | 74.0 dBμV/m (Peak)<br>54.0 dBμV/m (Average) | |

Remark：(1) dBμV/m = 20 log (μV/m)
(2) The tighter limit applies to the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(4) Fundamental and emission fall within operation band are exempted from this section.
(5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

## 6.3. Test Procedure

**Frequency Range 9kHz~30MHz:**
The EUT setup on the turntable which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level.
In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

(1) RBW = 9kHz with peak and average detector.
(2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

**Frequency Range 30MHz ~ 25GHz:**
The EUT setup on the turn table which has 80cm (for 30-1000MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

**Frequency below 1GHz:**
Spectrum Analyzer is used for pre-testing with following setting:
(1)RBW = 120KHz
(2)VBW ≥ 3 x RBW.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.
Note 1: When peak-detected value is lower than limit that the measurement using theQ.P. detector is not required, otherwise using Q.P. for final measurement.
Note 2: When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds.

**Frequency above 1GHz to 10th harmonic(up to 25 GHz):**
**Peak Detector:**
(1)RBW = 1MHz
(2)VBW ≥ 3 x RBW.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.
Note: When peak-detected value is lower than limit that the measurement using the average detector is not required, otherwise using average detector for final measurement.


***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

**Average Detector:**

■**Option 1:**

(1)RBW = 1MHz
(2)VBW ≥ 1/ T.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.

□**Option 2:**

Average Emission Level= Peak Emission Level+ D.C.C.F.

## 6.4. Measurement Result Explanation

■Peak Emission Level=Antenna Factor + Cable Loss + Meter Reading (including Preamp factor if test used)

■Average Emission Level l=Antenna Factor + Cable Loss +Meter Reading (including Preamp factor if test used)

□Average Emission Level= Peak Emission Level+ DCCF
Duty Cycle Correction Factor (DCCF)= 20log($TX_{on}/TX_{on+off}$) presented in section 3.6

□ERP= Peak Emission Level-95.2dB-2.14dB

## 6.5. Test Results

Please refer to Appendix A.



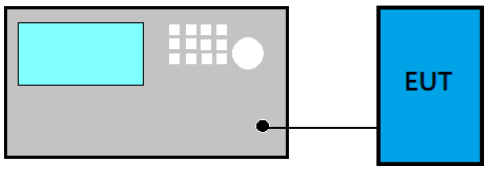
***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 7. 20dB/OCCUPIED BANDWIDTH

## 7.1. Block Diagram of Test Setup




## 7.2. Specification Limits

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

## 7.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

**For 20dB Bandwidth**

(1) Set Span range 2~5 times the OBW
(2) Set VBW≥3xRBW.
(3) Detector = Peak.
(4) Trace mode = Max hold.
(5) Sweep = Auto couple.
(6) Allow the trace to stabilize.
(7) Setting channel bandwidth function x dB to -20 dB to record the final bandwidth.

**For 99% Occupied Bandwidth**

(8) Set Span range 1.5~5 times the OBW
(9) Set RBW close to1% to 5% of OBW.
(10) Set VBW≥3xRBW.
(11) Detector = Peak.
(12) Trace mode = Max hold
(13) Sweep = Auto couple.
(14) Allow the trace to stabilize.

## 7.4. Test Results

Please refer to Appendix A



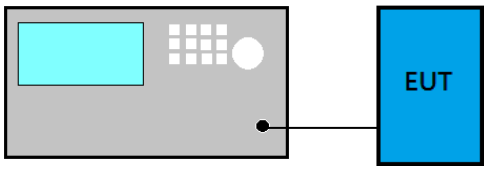
***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 8. CARRIER FREQUENCY SEPARATION

## 8.1. Block Diagram of Test Setup




## 8.2. Specification Limits

Alternatively, frequency hopping systems operating in the 2400-2483.5MHz band may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output no greater than 125mW.

## 8.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

(1) Span = Wide enough to capture the peaks of two adjacent channels
(2) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
(3) VBW≥ RBW
(4) Sweep = Auto
(5) Detector function = Peak
(6) Trace = Max hold
(7) Allow the trace to stabilize.

## 8.4. Test Results

Please refer to Appendix A



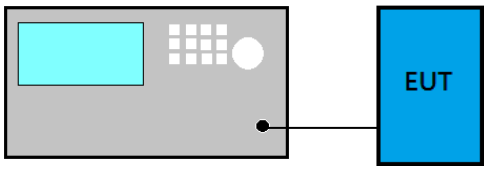
***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 9. TIME OF OCCUPANCY

## 9.1. Block Diagram of Test Setup




## 9.2. Specification Limits

Frequency hopping systems in the 2400-2483.5MHz shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by number of hopping channels employed.

## 9.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

(1) Span: Zero span, centered on a hopping channel.
(2) RBW shall be ≤ channel spacing and where possible RBW should be set >> 1/T, where T is the expected dwell time per channel.
(3) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
(4) Detector function = Peak
(5) Trace = Max hold

## 9.4. Test Results

Please refer to Appendix A



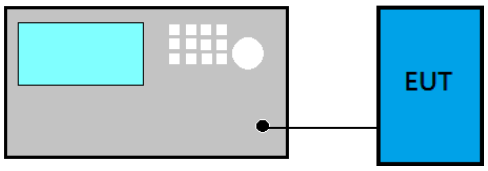
***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 10. NUMBER OF HOPPING CHANNELS

## 10.1. Block Diagram of Test Setup




## 10.2. Specification Limits

Frequency hopping systems which use fewer than 20 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels.

## 10.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

(1) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
(2) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
(3) VBW ≥ RBW
(4) Sweep = Auto
(5) Detector function = Peak
(6) Trace = m=Max hold
(7) Allow the trace to stabilize.

## 10.4. Test Results

Please refer to Appendix A



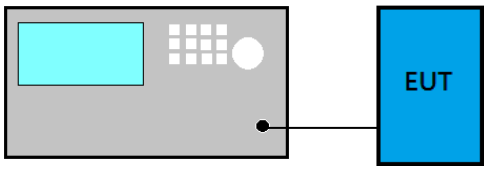
***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 11. MAXIMUM PEAK OUTPUT POWER

## 11.1. Block Diagram of Test Setup




## 11.2. Specification Limits

The Limits of maximum Peak Output Power for frequency hopping systems in 2400-2483.5MHz is: 0.125Watt. (21dBm)

## 11.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

(a) Use the following spectrum analyzer settings

(1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
(2) RBW > 20 dB bandwidth of the emission being measured.
(3) VBW ≥ RBW
(4) Sweep: Auto
(5) Detector function: Peak
(6) Trace: Max hold

(b) Allow trace to stabilize.

(c) Use the marker-to-peak function to set the marker to the peak of the emission.

## 11.4. Test Results

Please refer to Appendix A

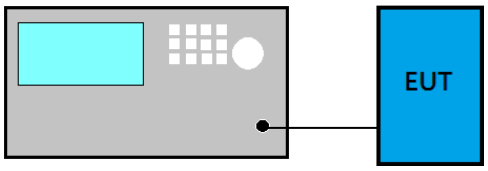


***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 12. EMISSION LIMITATIONS

## 12.1. Block Diagram of Test Setup




## 12.2. Specification Limits

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, that the required attenuation shall be 30 dB instead of 20 dB.
Attenuation below the general limits specified in Section 15.209(a)/RSS-Gen Section 8.9table 4is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a)/RSS-Gen Section 8.10 table 6,, must also comply with the radiated emission limits specified in Section 15.209(a)/RSS-Gen Section 8.9 table 4 (See Section 15.205(c)).

## 12.3. Test Procedure

Following measurement procedure is reference to ANSI C63.10:2013:

(1) Set span wide enough to capture the peak level of the in-band emission and all spurious emissions; up to $10^{th}$ harmonic.
(2) RBW = 100 kHz
(3) VBW ≥ RBW
(4) Sweep = Auto
(5) Detector function = Peak
(6) Trace = Max hold

## 12.4. Test Results

Please refer to Appendix A


***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*
**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# 13. DEVIATION TO TEST SPECIFICATIONS

【NONE】



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# APPDNDIX A

## TEST DATA AND PLOTS

(Model: 16Z90Q)



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***

**Audix Technology Corp.**
*No. 491, Zhongfu Rd., Linkou Dist.,*
*New Taipei City244,Taiwan*

**Tel: +886 2 26099301**
**Fax: +886 2 26099303**

# APPDNDIX B

## TEST PHOTOGRAPHS

(Model: 16Z90Q)



***This test report may be reproduced in full only. The document may only be updated by Audix Technology Corp. personnel. Any changes will be noted in the Document History section of the report.***