

FCC 15.247 2.4 GHz Test Report

for

Amino Communications Ltd.

**Buckingway Business Park, Anderson Road
Swaveeasy Cambridgeshire CB24 4UQ, United Kingdom**

Product Name : IPTV STB/PVR
Model Name : Kamai YYYYYYYYYYYY
Brand : amino
FCC ID : XVG500144BCBT

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



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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

TABLE OF CONTENTS

| Description | Page |
|--|-----------|
| TEST REPORT CERTIFICATION..... | 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 | 10 |
| 3.6. Test Configuration..... | 11 |
| 3.7. Tested Supporting System List..... | 12 |
| 3.8. Setup Configuration..... | 12 |
| 3.9. Operating Condition of EUT | 12 |
| 3.10. Description of Test Facility | 13 |
| 3.11. Measurement Uncertainty | 13 |
| 4. MEASUREMENT EQUIPMENT LIST..... | 14 |
| 4.1. Conducted Emission Measurement | 14 |
| 4.2. Radiated Emission Measurement | 14 |
| 4.3. RF Conducted Measurement | 14 |
| 5. CONDUCTED EMISSION..... | 15 |
| 5.1. Block Diagram of Test Setup | 15 |
| 5.2. Conducted Emission Limit | 15 |
| 5.3. Test Procedure | 15 |
| 5.4. Test Results | 16 |
| 6. RADIATED EMISSION..... | 17 |
| 6.1. Block Diagram of Test Setup | 17 |
| 6.2. Radiated Emission Limits..... | 18 |
| 6.3. Test Procedure | 19 |
| 6.4. Measurement Result Explanation..... | 20 |
| 6.5. Test Results | 20 |
| 7. 20dB BANDWIDTH | 21 |
| 7.1. Block Diagram of Test Setup | 21 |
| 7.2. Specification Limits..... | 21 |
| 7.3. Test Procedure | 21 |
| 7.4. Test Results | 21 |
| 8. CARRIER FREQUENCY SEPARATION | 22 |
| 8.1. Block Diagram of Test Setup | 22 |
| 8.2. Specification Limits..... | 22 |
| 8.3. Test Procedure | 22 |
| 8.4. Test Results | 22 |
| 9. TIME OF OCCUPANCY | 23 |
| 9.1. Block Diagram of Test Setup | 23 |
| 9.2. Specification Limits..... | 23 |

| | |
|---|-----------|
| 9.3. Test Procedure | 23 |
| 9.4. Test Results | 23 |
| 10. NUMBER OF HOPPING CHANNELS | 24 |
| 10.1. Block Diagram of Test Setup | 24 |
| 10.2. Specification Limits..... | 24 |
| 10.3. Test Procedure | 24 |
| 10.4. Test Results | 24 |
| 11. MAXIMUM PEAK OUTPUT POWER | 25 |
| 11.1. Block Diagram of Test Setup | 25 |
| 11.2. Specification Limits..... | 25 |
| 11.3. Test Procedure | 25 |
| 11.4. Test Results | 25 |
| 12. EMISSION LIMITATIONS | 26 |
| 12.1. Block Diagram of Test Setup | 26 |
| 12.2. Specification Limits..... | 26 |
| 12.3. Test Procedure | 26 |
| 12.4. Test Results | 26 |
| 13. DEVIATION TO TEST SPECIFICATIONS | 27 |

APPENDIX A TEST DATA AND PLOTS

APPENDIX B TEST PHOTOGRAPHS

TEST REPORT CERTIFICATION

Applicant : Amino Communications Ltd.

Manufacturer : Xavi Technologies Corp.

EUT Description

- (1) Product : IPTV STB/PVR
- (2) Model : Kamai XYYYYYYYYYYY
- (3) Brand : amino
- (4) Power Rating : DC 12V

Applicable Standards:

47 CFR FCC Part 15 Subpart C

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: 2019. 04. 15

Reviewed by:

(Tina Huang/Administrator)

Approved by:

(Ben Cheng/Manager)

1. REVISION RECORD OF TEST REPORT

| Edition No | Issued Data | Revision Summary | Report Number |
|------------|--------------|------------------|---------------|
| 0 | 2019. 04. 15 | Original Report | EM-F180126 |

2. SUMMARY OF TEST RESULTS

| Rule | Description | Results |
|-------------------|---|------------|
| 15.207 | Conducted Emission | PASS |
| 15.247(d)/15.205 | Radiated Band Edge and Radiated Spurious Emission | PASS |
| 15.247(a)(1) | 20dB Bandwidth | PASS |
| 15.247(a)(1) | Carrier Frequency Separation | PASS |
| 15.247(a)(1)(iii) | Time of Occupancy | PASS |
| 15.247(a)(1)(iii) | Number of Hopping Channels | PASS |
| 15.247(b)(1) | Maximum Peak Output Power | PASS |
| 15.247(d) | Conducted Band Edges and Conducted Spurious Emission | PASS |
| 15.203 | Antenna Requirement | Compliance |

3. GENERAL INFORMATION

3.1. Description of Application

| | |
|--------------|---|
| Applicant | Amino Communications Ltd. Buckingway Business Park, Anderson Road Swaveeasy Cambridgeshire CB24 4UQ, United Kingdom |
| Manufacturer | Xavi Technologies Corp. No. 468, Gu tang Road, Wu jiang city, Jiangsu province |
| Product | IPTV STB/PVR |
| Model | Kamai XYYYYYYYYYYY (Where "X" can be 6, 7, 8 or blank; "YYYYYYYYYYY" can be any combination of 0~9, A~Z, -, /, or blank; for marketing purpose only) |
| Brand | amino |

3.2. Description of EUT

| Test Model | Kamai 7B | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--|------|--|---------|--|--|--------|------|--|------------|------|--|--|-----|-----|---------|------|----|---------------------------------|------|------|---------------------------------|------|------|----------------|------|------|
| Serial Number | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power Rating | DC 12V | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RF Features | WLAN:802.11 a/n/ac Bluetooth: BT and BLE | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Transmit Type | <table border="1"><tr><td colspan="3">2.4 GHz</td></tr><tr><td>BT/BLE</td><td>1T1R</td><td></td></tr><tr><th>UNII Bands</th><th colspan="2">Mode</th></tr><tr><th></th><th>CDD</th><th>SDM</th></tr><tr><td>802.11a</td><td>4T4R</td><td>--</td></tr><tr><td>802.11n-HT20/ 802.11ac-VHT20</td><td>4T4R</td><td>4T4R</td></tr><tr><td>802.11n-HT40/ 802.11ac-VHT40</td><td>4T4R</td><td>4T4R</td></tr><tr><td>802.11ac-VHT80</td><td>4T4R</td><td>4T4R</td></tr></table> <p>This device not support beamforming mode.</p> | | | 2.4 GHz | | | BT/BLE | 1T1R | | UNII Bands | Mode | | | CDD | SDM | 802.11a | 4T4R | -- | 802.11n-HT20/ 802.11ac-VHT20 | 4T4R | 4T4R | 802.11n-HT40/ 802.11ac-VHT40 | 4T4R | 4T4R | 802.11ac-VHT80 | 4T4R | 4T4R |
| 2.4 GHz | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BT/BLE | 1T1R | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UNII Bands | Mode | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CDD | SDM | | | | | | | | | | | | | | | | | | | | | | | | | |
| 802.11a | 4T4R | -- | | | | | | | | | | | | | | | | | | | | | | | | | |
| 802.11n-HT20/ 802.11ac-VHT20 | 4T4R | 4T4R | | | | | | | | | | | | | | | | | | | | | | | | | |
| 802.11n-HT40/ 802.11ac-VHT40 | 4T4R | 4T4R | | | | | | | | | | | | | | | | | | | | | | | | | |
| 802.11ac-VHT80 | 4T4R | 4T4R | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sample Status | Production | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date of Receipt | 2018. 03. 05 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date of Test | 2018. 03. 20 ~ 04. 13 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Interface Ports of EUT | <ul style="list-style-type: none">● DC power In Port x1● S/PDIF optical output Port x1● USB 3.0 Port x1● HDMI Port x1● Ethernet Port x1● Analogue A/V Output Port x1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Accessories Supplied | <ul style="list-style-type: none">● AC/DC Adapter● Remote Control● 3.5mm jack to 3x RCA Cable● HDMI Cable | | | | | | | | | | | | | | | | | | | | | | | | | | |

3.3. Antenna Information

| WLAN Antenna | | | | | |
|---------------------|---------------------|-------------------------------|--------------|-----------------|----------------|
| No. | Antenna Part Number | Manufacture | Antenna Type | Frequency (MHz) | Max Gain (dBi) |
| 1 | Ant 5G-1 | Waisin Technology Corporation | PCB Antenna | 5150-5850 | 2.36 |
| 2 | Ant 5G-2 | | | | 2.31 |
| 3 | Ant 5G-3 | | | | 2.13 |
| 4 | Ant 5G-4 | | | | 2.35 |

| BT/BLE Antenna | | | | | |
|-----------------------|---------------------|-------------|--------------|-----------------|----------------|
| No. | Antenna Part Number | Manufacture | Antenna Type | Frequency (MHz) | Max Gain (dBi) |
| 1 | --- | --- | PCB Antenna | 2400-2500 | 1.4 |

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) |
|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
| 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 | | |

3.5. Description of Key Components

| Item | Supplier | Model/Type | Description |
|----------------|----------|----------------------------|--|
| AC/DC Adapter | MOSO | MSA-C2000IS 12.0-24Y-DE | Input: 100-240V~, 50/60Hz, 0.7A max. Output: DC 12V, 2A |
| Remote Control | N/A | N/A | N/A |

3.6. Test Configuration

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

| AC Conduction | |
|---------------|------------------|
| Test Case | Normal operation |

| Item | | Modulation | Data Rate | Test Channel |
|--------------------------------------|---|------------|-----------|--------------|
| Radiated Test Case | Radiated Band Edge ^{Note1} | 8-DPSK | 3Mbps | 00/78 |
| | Radiated Spurious Emission ^{Note1} | 8-DPSK | 3Mbps | 00/39/78 |
| Conducted Test Case ^{Note2} | 20dB 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.

3.7. Tested Supporting System List

3.7.1. Support Peripheral Unit

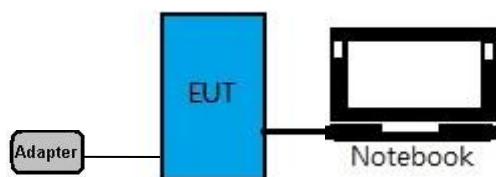
| No. | Product | Brand | Model No. | Serial No. | Approval |
|-----|-------------|-------|-----------|------------|--|
| 1. | Notebook PC | acer | N16Q2 | N/A | Contains FCC ID: PPD-QCNFA435 Contains IC: 4104A-QCNFA435 |

3.7.2. Cable Lists

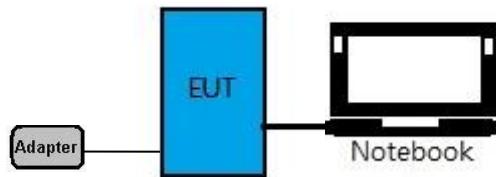
| No. | Cable Description Of The Above Support Units |
|-----|---|
| 1. | USB Cable : Unshielded, Detachable, 2.0m Adapter: Chicony, M/N A11-065N1A DC Cord : Shielded, Undetachable, 1.8m, Bonded a ferrite core AC Power Cord : Unshielded, Detachable, 1.0m |

3.8. Setup Configuration

3.8.1. EUT Configuration for Power Line & Radiated Emission



3.8.2. EUT Configuration for RF Conducted Test Items



3.9. Operating Condition of EUT

Test program “Tera term” is used for enabling EUT RF function under continues transmitting and choosing channel.

3.10.Description of Test Facility

| | |
|-------------------|---|
| Name of Test Firm | Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: attemc_report@audixtech.com |
| Accreditations | The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724 |
| Test Facilities | FCC OET Designation Number under APEC MRA by NCC is : TW1724 (1) No. 8 Shielding Room (2) Semi-Anechoic Chamber (IC Test Site Registration No.: 5183B-1) (3) Fully Anechoic Chamber (IC Test Site Registration No.: 5183B-4) |

3.11.Measurement Uncertainty

| Test Item | Frequency Range | Uncertainty |
|----------------------------------|-----------------|-------------|
| Conduction Test | 150kHz~30MHz | ±3.50dB |
| Radiation Test (Distance: 3m) | 30MHz~1000MHz | ± 3.68dB |
| | Above 1GHz | ± 5.82dB |

Remark : Uncertainty = $k_u c(y)$

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

4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|------|---------------------------|--------------|-----------|------------|--------------|---------------|
| 1. | Test Receiver | R&S | ESR | 101774 | 2018. 01. 24 | 1 Year |
| 2. | A.M.N. | R&S | ENV4200 | 100169 | 2017. 11. 12 | 1 Year |
| 3. | L.I.S.N. | Kyoritsu | KNW-407 | 8-855-9 | 2017. 12. 14 | 1 Year |
| 4. | Pulse Limiter | R&S | ESH3-Z2 | 100354 | 2018. 01. 16 | 1 Year |
| 5. | Digital Thermo-Hygrometer | iMax | HTC-1 | No.8 S/R | 2017. 04. 21 | 1 Year |
| 6. | Test Software | Audix | e3 | V.6.120424 | N.C.R. | N.C.R. |

4.2. Radiated Emission Measurement

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|------|------------------------------|--------------|----------------------------|-------------|--------------|---------------|
| 1. | Spectrum Analyzer | Agilent | N9010A-526 | MY53400071 | 2017. 09. 13 | 1 Year |
| 2. | Spectrum Analyzer | Agilent | N9030A-526 | MY53310269 | 2018. 01. 04 | 1 Year |
| 3. | Test Receiver | R & S | ESCS30 | 100338 | 2017. 06. 19 | 1 Year |
| 4. | Amplifier | HP | 8447D | 2944A06305 | 2018. 01. 30 | 1 Year |
| 5. | Amplifier | HP | 8449B | 3008A02678 | 2018. 03. 06 | 1 Year |
| 6. | Bilog Antenna | CHASE | CBL6112D | 33821 | 2018. 01. 21 | 1 Year |
| 7. | Loop Antenna | R&S | HFH2-Z2 | 891847/27 | 2017. 12. 18 | 1 Year |
| 8. | Double-Ridged Waveguide Horn | ETS-Lindgren | 3117 | 00135902 | 2018. 03. 08 | 1 Year |
| 9. | Horn Antenna | EMCO | 3116 | 2653 | 2017. 12. 19 | 1 Year |
| 10. | 2.4GHz Notch Filter | K&L | 7NSL10-244 1.5E130.5-00 | 1 | 2017. 07. 26 | 1 Year |
| 11. | 3GHz Notch Filter | Microwave | H3G018G1 | 484798 | 2017. 08. 25 | 1 Year |
| 12. | Digital Thermo-Hygrometer | IMax | HTC-1 | No.1 3m A/C | 2017. 04. 21 | 1 Year |
| 13. | Digital Thermo-Hygrometer | EVERY DAY | E-512 | RF-02 | 2017. 04. 21 | 1 Year |
| 14. | Test Software | Audix | e3 | V.6.110601 | N.C.R. | N.C.R. |

4.3. RF Conducted Measurement

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Due |
|------|---------------------------|------------------------------|------------|------------|--------------|----------|
| 1. | Spectrum Analyzer | Keysight | N9010B-544 | MY55460198 | 2017. 04. 18 | 1 Year |
| 2. | Digital Thermo-Hygrometer | Shenzhen Datronn Electronics | KT-905 | RF | 2017. 04. 21 | 1 Year |

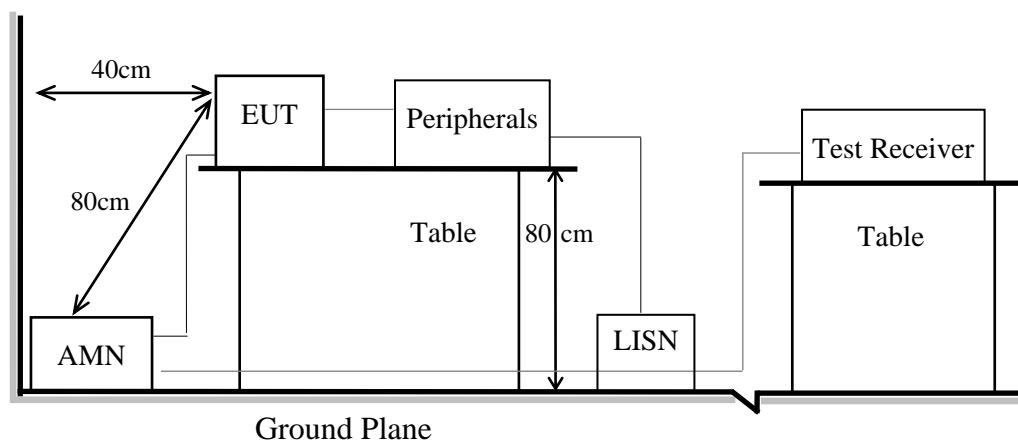
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.8

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

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

Remark 1.: 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 C 63.10. 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. To Check frequency range from 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Test Results

Please refer to Appendix A.

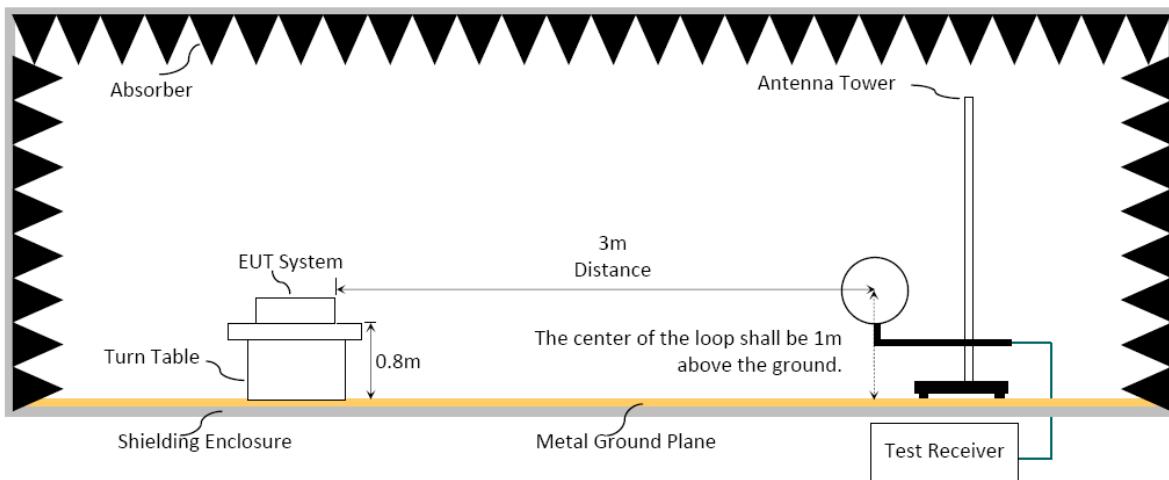
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

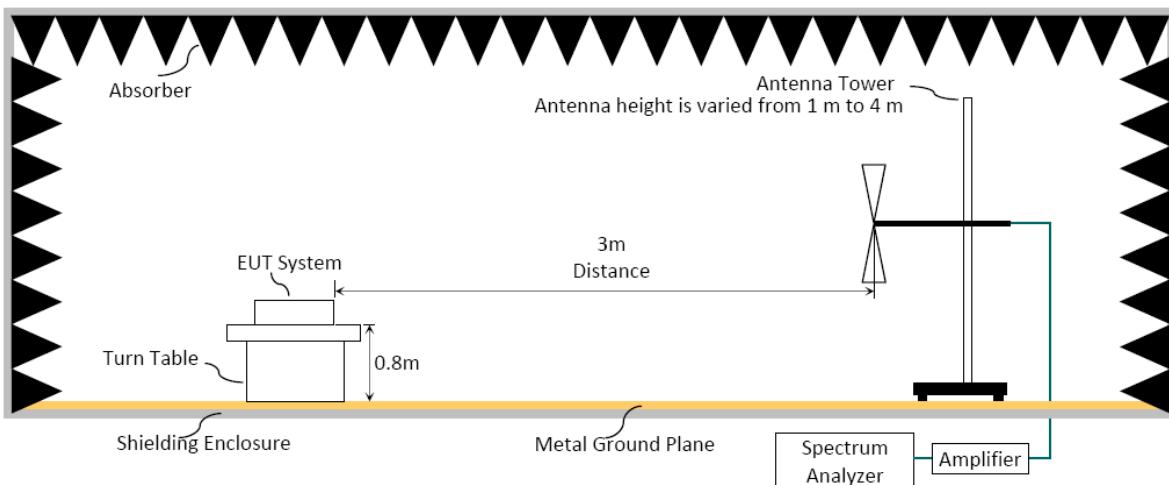
6.1.1. Block Diagram of EUT

Indicated as section 3.8

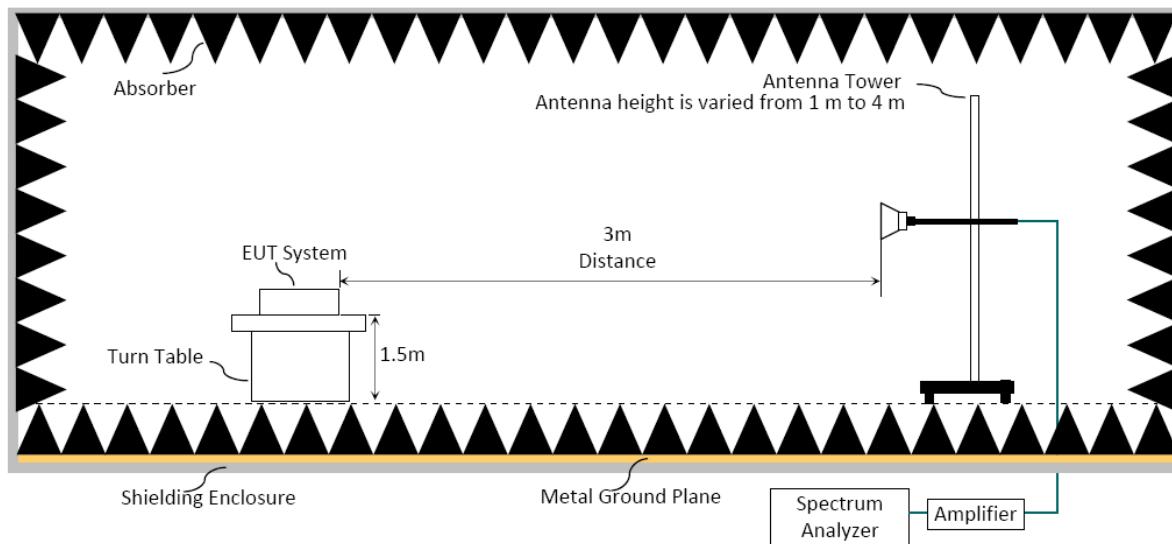
6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000 MHz



6.1.4. Setup Diagram for above 1GHz



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, must also comply with the radiated emission limits specified as below.

| Frequency (MHz) | Distance (m) | Limits | |
|-----------------|--------------|---|-------------|
| | | dB μ V/m | μ V/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 dB μ V/m (Peak) 54.0 dB μ V/m (Average) | |

Remark : (1) $\text{dB}\mu\text{V}/\text{m} = 20 \log (\mu\text{V}/\text{m})$

- (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.

6.3. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turn table 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 80 cm (for 30-1000 MHz) 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 1 GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1)RBW = 120KHz
- (2)VBW \geq 3 x RBW.
- (3)Detector = Peak.
- (4)Sweep time = auto.
- (5)Trace mode = max hold.
- (6)Allow sweeps to continue until the trace stabilizes.
- (7)When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required, otherwise using Q.P. for final measurement.

Frequency above 1GHz to 10th harmonic (up to 25 GHz):

Peak Detector:

- (1)RBW = 1MHz
- (2)VBW \geq 3 x RBW.
- (3)Detector = Peak.
- (4)Sweep time = auto.
- (5)Trace mode = max hold.
- (6)Allow sweeps to continue until the trace stabilizes.
- (7)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.

Average Detector:

Option 1:

- (1)RBW = 1MHz
- (2)VBW \geq 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

Average Emission Level l=Antenna Factor + Cable Loss + Meter Reading

Average Emission Level= Peak Emission Level+ DCCF

Duty Cycle Correction Factor (DCCF)= $20\log(\text{TX}_{\text{on}}/\text{TX}_{\text{on+off}})$ presented in section 3.6

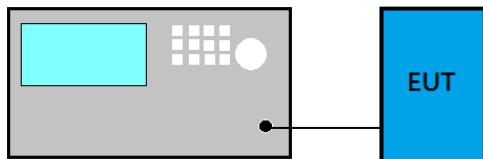
ERP= Peak Emission Level-95.2dB-2.14dB

6.5. Test Results

Please refer to Appendix A.

7. 20dB 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:

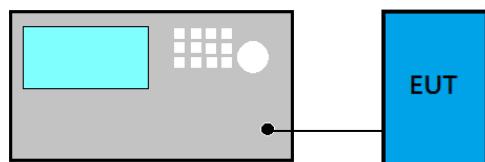
- (1) Set RBW close to 1% to 5% of OBW.
- (2) Set VBW \geq 3RBW.
- (3) Detector = Peak.
- (4) Trace mode = Max hold.
- (5) Sweep = Auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -20 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

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:

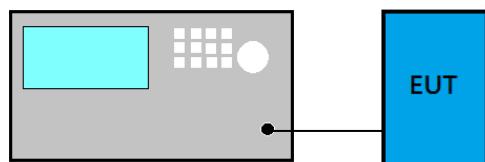
- (1) Span = Wide enough to capture the peaks of two adjacent channels
- (2) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- (3) VBW \geq RBW
- (4) Sweep = Auto
- (5) Detector function = Peak
- (6)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

8.4. Test Results

Please refer to Appendix A

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:

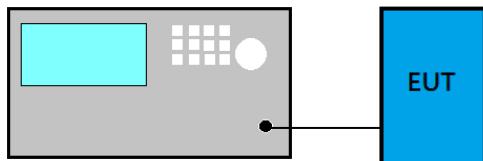
- (1) Span: Zero span, centered on a hopping channel.
- (2) RBW shall be \leq channel spacing and where possible RBW should be set $>> 1/T$, where T is the expected dwell time per channel.
- (3) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger 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

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:

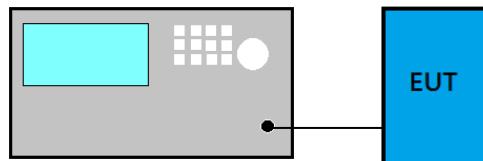
- (1) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
- (2) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- (3) $VBW \geq RBW$
- (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

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:

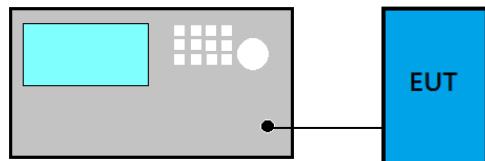
- (a) Use the following spectrum analyzer settings
 - (1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
 - (2) RBW > 20 dB bandwidth of the emission being measured.
 - (3) VBW \geq RBW
 - (4) Sweep: Auto
 - (5) Detector function: Peak
 - (6) Trace: Max hold
- (b) 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

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) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (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 10th harmonic.
- (2) RBW = 100 kHz
- (3) VBW \geq RBW
- (4) Sweep = Auto
- (5) Detector function = Peak
- (6) Trace = Max hold

12.4. Test Results

Please refer to Appendix A

13.DEVIATION TO TEST SPECIFICATIONS

【NONE】



*Audix Technology Corp.
No. 53-11, Dingfu, Linkou, Dist.,
New Taipei City244, Taiwan*

APPENDIX A

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

APPDNDIX A

TEST DATA AND PLOTS

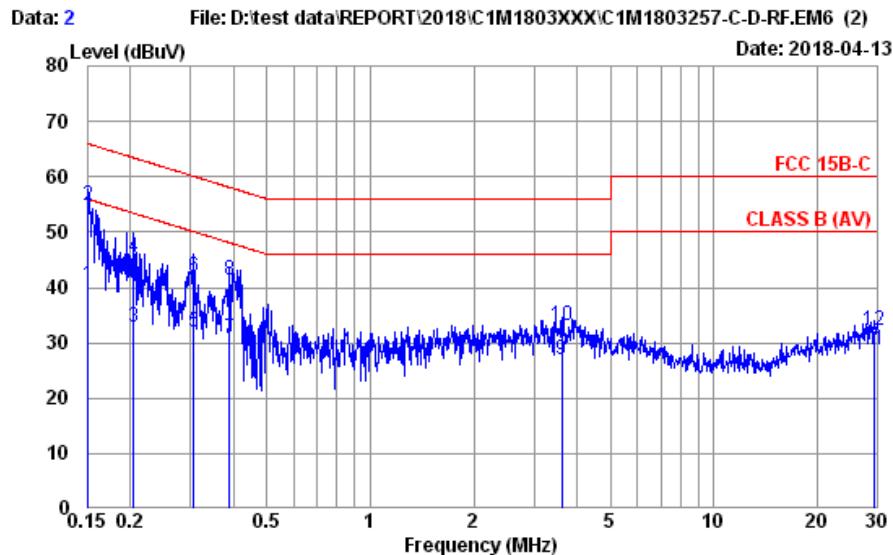
(Model: Kamai 7B)

TABLE OF CONTENTS

| | |
|---|-----------|
| A.1 CONDUCTED EMISSION..... | 2 |
| A.2 RADIATED EMISSION | 4 |
| A.2.1 Emissions within Restricted Frequency Bands..... | 4 |
| A.2.2 Emissions outside the frequency band:..... | 9 |
| A.2.3 Emissions in Non-restricted Frequency Bands:..... | 10 |
| A.3 20dB BANDWIDTH | 11 |
| A.3.1 6dB Bandwidth Result..... | 11 |
| A.3.2 Measurement Plots | 12 |
| A.4 CARRIER FREQUENCY SEPARATION | 13 |
| A.5 TIME OF OCCUPANCY..... | 15 |
| A.5.1 Time of Occupancy | 15 |
| A.6 NUMBER OF HOPPING CHANNELS | 25 |
| A.7 MAXIMUM PEAK OUTPUT POWER | 26 |
| A.7.1 Maximum Peak Output Power | 26 |
| A.7.2 Measurement Plots | 27 |
| A.8 EMISSION LIMITATIONS MEASUREMENT | 28 |
| A.8.1 Band Edge..... | 28 |
| A.8.2 Spurious Emission | 30 |

A.1 CONDUCTED EMISSION

| | | | |
|--------------|-------------------------------|------------|----------|
| Test Date | 2018/04/13 | Temp./Hum. | 25°C/56% |
| Test Voltage | AC 120V 60Hz (Via AC Adapter) | | |

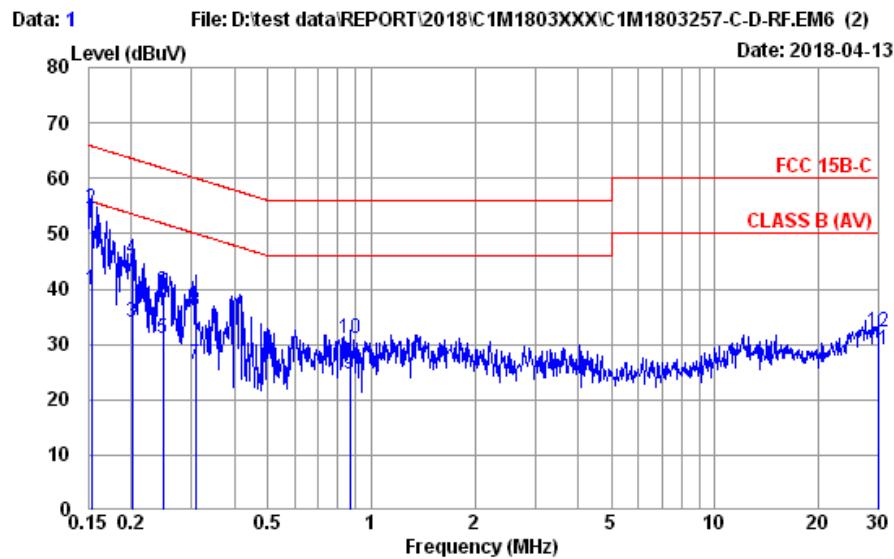


Site no. : No.8 Shielded Room Data no. : 2
 Condition : ENV4200 100169 LISN Phase : NEUTRAL
 Limit : FCC 15B-C
 Env. / Ins. : 25°C / 56% ESR3(1774) Engineer : Nick Du
 EUT : Kamai7B
 Power Rating : 120Vac/60Hz
 Test Mode : Operating

| Freq. (MHz) | AMN Factor (dB) | Cable Loss (dB) | Pulse Att. (dB) | Emission | | | | Margin (dB) | Remark |
|----------------|-----------------------|-----------------------|-----------------------|-------------------------|-----------------------|------------------------|-------|----------------|--------|
| | | | | Reading (dB μ V) | Level (dB μ V) | Limits (dB μ V) | | | |
| 1 0.151 | 10.57 | 0.03 | 9.86 | 20.09 | 40.55 | 55.96 | 15.41 | Average | |
| 2 0.151 | 10.57 | 0.03 | 9.86 | 34.25 | 54.71 | 65.96 | 11.25 | QP | |
| 3 0.205 | 10.52 | 0.03 | 9.86 | 12.43 | 32.84 | 53.40 | 20.56 | Average | |
| 4 0.205 | 10.52 | 0.03 | 9.86 | 25.12 | 45.53 | 63.40 | 17.87 | QP | |
| 5 0.307 | 10.46 | 0.04 | 9.86 | 11.46 | 31.82 | 50.06 | 18.24 | Average | |
| 6 0.307 | 10.46 | 0.04 | 9.86 | 21.68 | 42.04 | 60.06 | 18.02 | QP | |
| 7 0.389 | 10.43 | 0.04 | 9.86 | 10.46 | 30.79 | 48.08 | 17.29 | Average | |
| 8 0.389 | 10.43 | 0.04 | 9.86 | 20.89 | 41.22 | 58.08 | 16.86 | QP | |
| 9 3.603 | 10.57 | 0.11 | 9.87 | 6.55 | 27.10 | 46.00 | 18.90 | Average | |
| 10 3.603 | 10.57 | 0.11 | 9.87 | 12.57 | 33.12 | 56.00 | 22.88 | QP | |
| 11 29.371 | 16.12 | 0.33 | 10.00 | 2.28 | 28.73 | 50.00 | 21.27 | Average | |
| 12 29.371 | 16.12 | 0.33 | 10.00 | 5.92 | 32.37 | 60.00 | 27.63 | QP | |

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector,
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

| | | | |
|--------------|-------------------------------|------------|----------|
| Test Date | 2018/04/13 | Temp./Hum. | 25°C/56% |
| Test Voltage | AC 120V 60Hz (Via AC Adapter) | | |



Site no. : No.8 Shielded Room Data no. : 1
 Condition : ENV4200 100169 LISN Phase : LINE
 Limit : FCC 15B-C
 Env. / Ins. : 25°C / 56% ESR3(1774) Engineer : Nick Du
 EUT : Kamai7B
 Power Rating : 120Vac/60Hz
 Test Mode : Operating

| Freq. (MHz) | AMN Factor (dB) | Cable Loss (dB) | Pulse Att. (dB) | Emission | | | | Remark |
|----------------|-----------------------|-----------------------|-----------------------|-------------------------|-----------------------|------------------------|----------------|---------|
| | | | | Reading (dB μ V) | Level (dB μ V) | Limits (dB μ V) | Margin (dB) | |
| 1 | 0.153 | 10.62 | 0.03 | 9.86 | 19.48 | 39.99 | 55.82 | Average |
| 2 | 0.153 | 10.62 | 0.03 | 9.86 | 33.88 | 54.39 | 65.82 | QP |
| 3 | 0.202 | 10.56 | 0.03 | 9.86 | 13.56 | 34.01 | 53.54 | Average |
| 4 | 0.202 | 10.56 | 0.03 | 9.86 | 24.91 | 45.36 | 63.54 | QP |
| 5 | 0.248 | 10.53 | 0.03 | 9.86 | 10.61 | 31.03 | 51.82 | Average |
| 6 | 0.248 | 10.53 | 0.03 | 9.86 | 19.28 | 39.70 | 61.82 | QP |
| 7 | 0.308 | 10.49 | 0.04 | 9.86 | 5.90 | 26.29 | 50.02 | Average |
| 8 | 0.308 | 10.49 | 0.04 | 9.86 | 15.58 | 35.97 | 60.02 | QP |
| 9 | 0.866 | 10.44 | 0.06 | 9.86 | 4.19 | 24.55 | 46.00 | Average |
| 10 | 0.866 | 10.44 | 0.06 | 9.86 | 10.73 | 31.09 | 56.00 | QP |
| 11 | 29.841 | 16.31 | 0.34 | 10.01 | 2.26 | 28.92 | 50.00 | Average |
| 12 | 29.841 | 16.31 | 0.34 | 10.01 | 5.62 | 32.28 | 60.00 | QP |

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
 2. If the average limit is met when using a quasi-peak detector,
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

A.2 RADIATED EMISSION

| | | | |
|--------------|-----------------------------------|------------|----------|
| Test Date | 2018/04/10 | Temp./Hum. | 24°C/53% |
| Test Voltage | AC 120V, 60Hz (via AC/DC Adapter) | | |

A.2.1 Emissions within Restricted Frequency Bands

A.2.1.1 Frequency 9kHz~30MHz

The emissions (9kHz~30MHz) not reported for there is no emission be found.

A.2.1.2 Frequency Below 1 GHz

| Mode | 8-DPSK | Frequency | TX 2441MHz |
|------|--------|-----------|------------|
| | | | |

Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 35.82 | 21.82 | 1.33 | 1.12 | 24.27 | 40.00 | 15.73 | Peak |
| 127.97 | 18.39 | 2.60 | 7.94 | 28.93 | 43.50 | 14.57 | Peak |
| 291.90 | 19.44 | 4.23 | 10.73 | 34.40 | 46.00 | 11.60 | Peak |
| 638.19 | 24.73 | 6.88 | 2.96 | 34.57 | 46.00 | 11.43 | Peak |
| 874.87 | 26.60 | 8.04 | 3.59 | 38.23 | 46.00 | 7.77 | Peak |
| 975.75 | 27.59 | 8.68 | 1.25 | 37.52 | 54.00 | 16.48 | Peak |

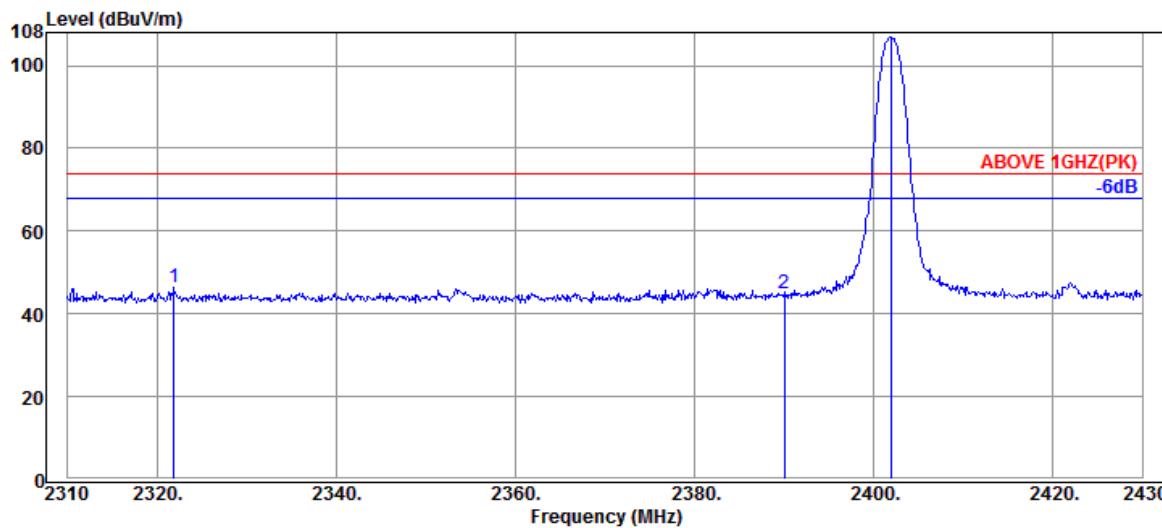
Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 31.94 | 23.76 | 1.25 | 7.75 | 32.76 | 40.00 | 7.24 | Peak |
| 107.60 | 18.02 | 2.36 | 14.57 | 34.95 | 43.50 | 8.55 | Peak |
| 296.75 | 19.47 | 4.28 | 8.92 | 32.67 | 46.00 | 13.33 | Peak |
| 647.89 | 24.75 | 6.91 | 4.55 | 36.21 | 46.00 | 9.79 | Peak |
| 747.80 | 25.39 | 7.34 | 2.59 | 35.32 | 46.00 | 10.68 | Peak |
| 991.27 | 27.73 | 8.76 | 1.50 | 37.99 | 54.00 | 16.01 | Peak |

A.2.1.3 Frequency Above 1 GHz to 10th harmonics

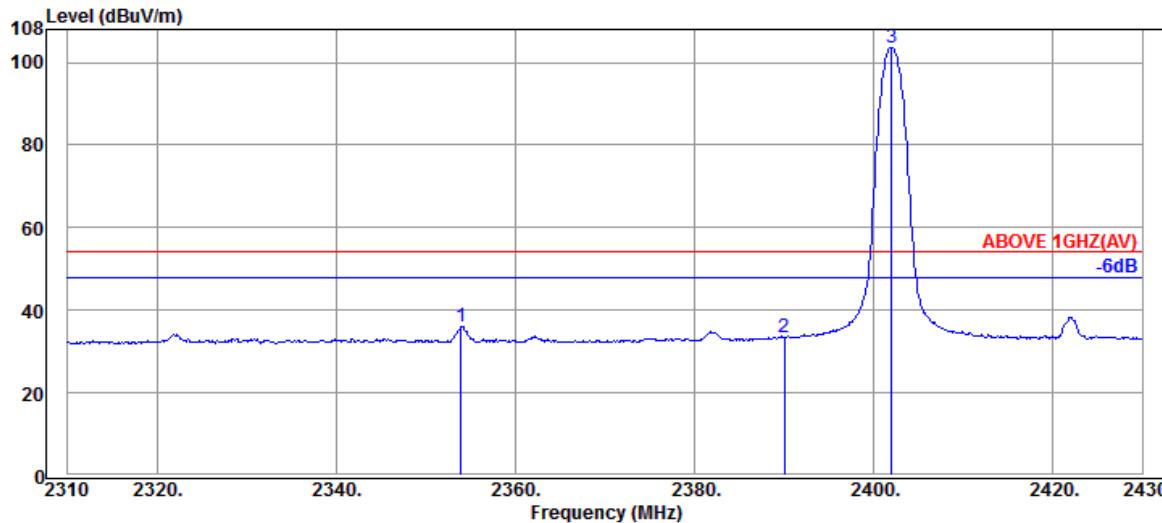
Band Edge:

| Mode | 8-DPSK | Frequency | TX 2402MHz |
|------|--------|-----------|------------|
|------|--------|-----------|------------|



Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dB μ V) | Emission Level (dB μ V/m) | Limits (dB μ V/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------------|-------------------------------|-----------------------|-------------|----------|
| 2321.88 | 32.06 | 6.49 | 7.67 | 46.22 | 74.00 | 27.78 | Peak |
| 2390.04 | 32.16 | 6.57 | 6.10 | 44.83 | 74.00 | 29.17 | Peak |
| 2401.92 | 32.16 | 6.57 | 68.12 | 106.85 | --- | --- | Peak |



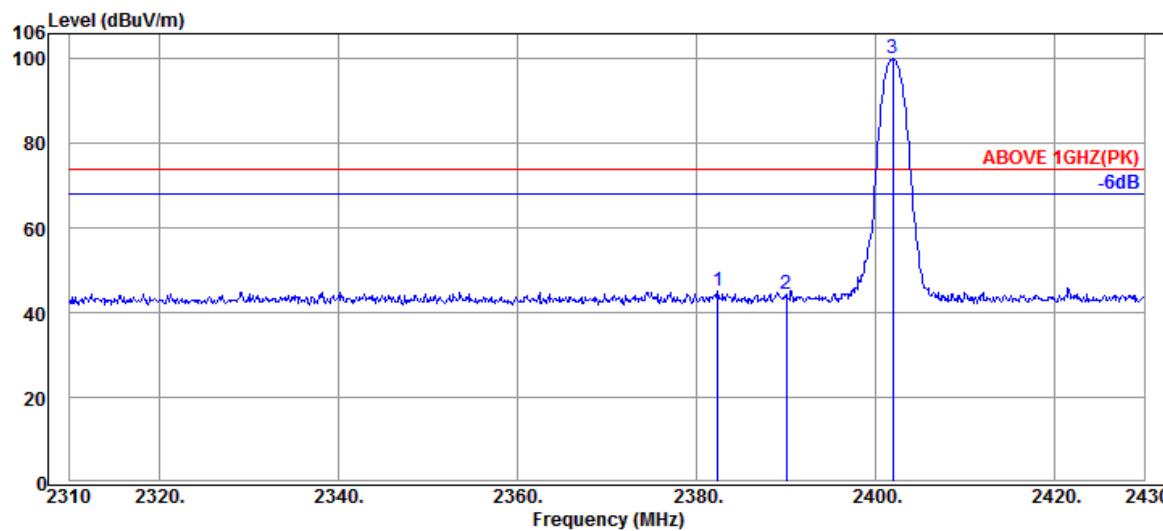
Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dB μ V) | Emission Level (dB μ V/m) | Limits (dB μ V/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------------|-------------------------------|-----------------------|-------------|----------|
| 2353.92 | 32.11 | 6.53 | -2.74 | 35.90 | 54.00 | 18.10 | Average |
| 2390.04 | 32.16 | 6.57 | -5.46 | 33.27 | 54.00 | 20.73 | Average |
| 2402.04 | 32.16 | 6.57 | 64.84 | 103.57 | --- | --- | Average |

AUDIX Technology Corp.
 No. 53-11, Dingfu, Linkou, Dist.,
 New Taipei City244, Taiwan

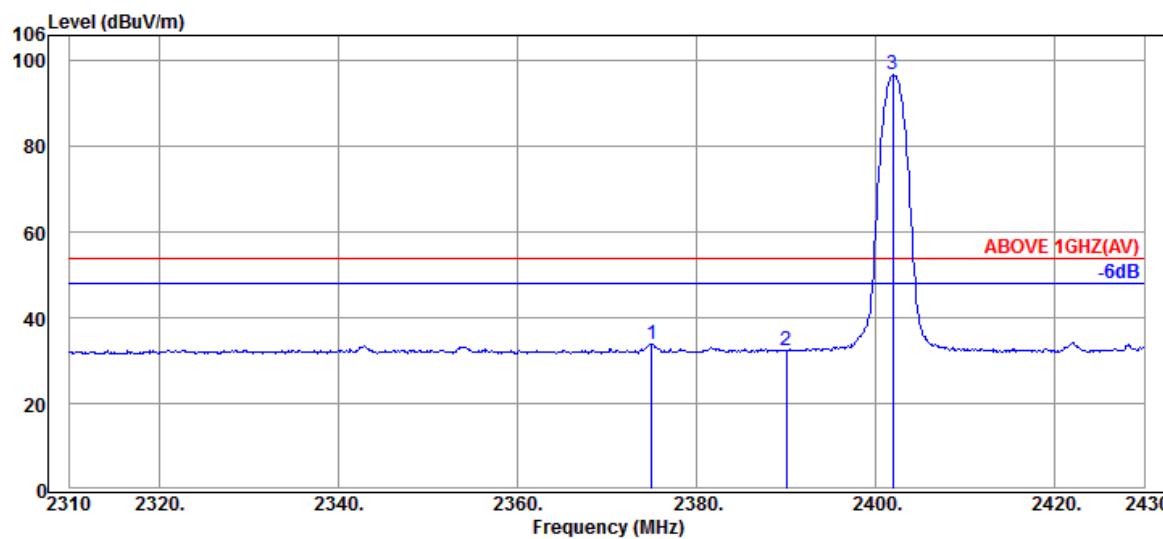
Tel: +886 2 26099301
 Fax: +886 2 26099303

| Mode | 8-DPSK | Frequency | TX 2402MHz |
|------|--------|-----------|------------|
|------|--------|-----------|------------|



Antenna at Vertical Polarization

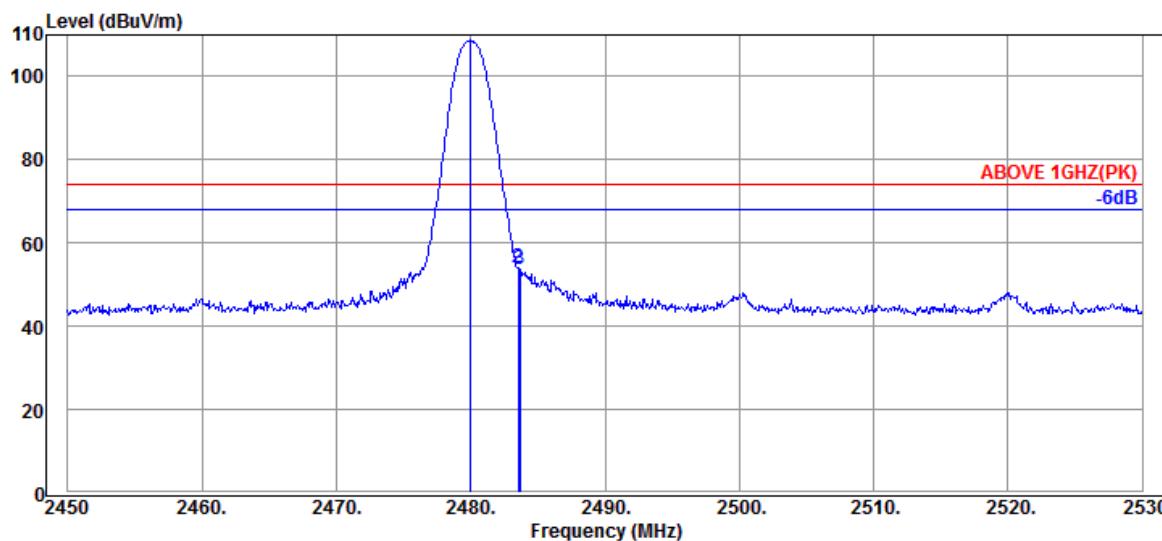
| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dB μ V) | Emission Level (dB μ V/m) | Limits (dB μ V/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------------|-------------------------------|-----------------------|-------------|----------|
| 2382.36 | 32.13 | 6.55 | 6.50 | 45.18 | 74.00 | 28.82 | Peak |
| 2390.04 | 32.16 | 6.57 | 5.73 | 44.46 | 74.00 | 29.54 | Peak |
| 2401.92 | 32.16 | 6.57 | 61.33 | 100.06 | --- | --- | Peak |



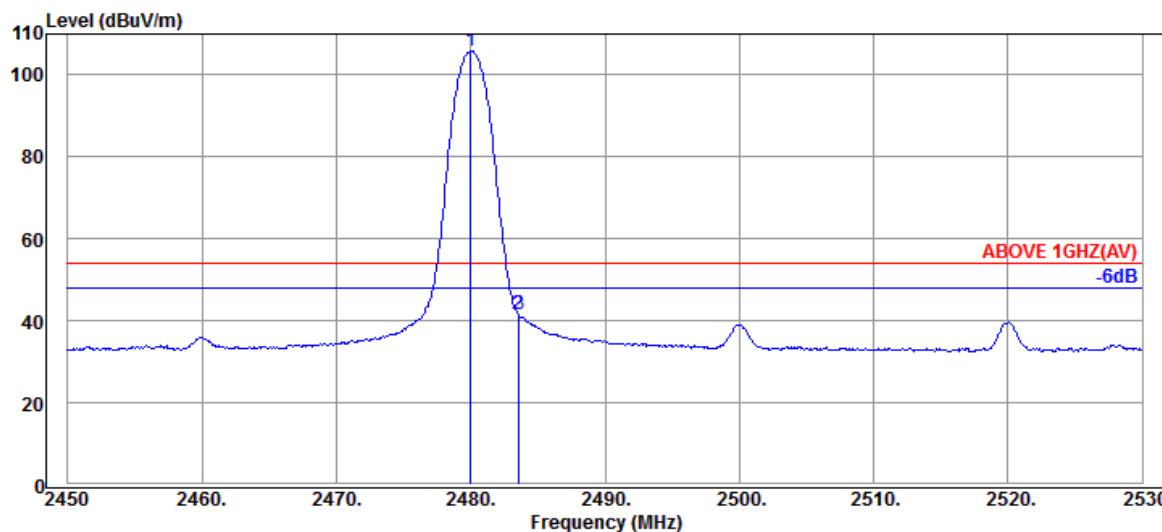
Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dB μ V) | Emission Level (dB μ V/m) | Limits (dB μ V/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------------|-------------------------------|-----------------------|-------------|----------|
| 2375.04 | 32.13 | 6.55 | -4.73 | 33.95 | 54.00 | 20.05 | Average |
| 2390.04 | 32.16 | 6.57 | -6.19 | 32.54 | 54.00 | 21.46 | Average |
| 2401.92 | 32.16 | 6.57 | 58.03 | 96.76 | --- | --- | Average |

| Mode | 8-DPSK | Frequency | TX 2480MHz |
|------|--------|-----------|------------|
|------|--------|-----------|------------|

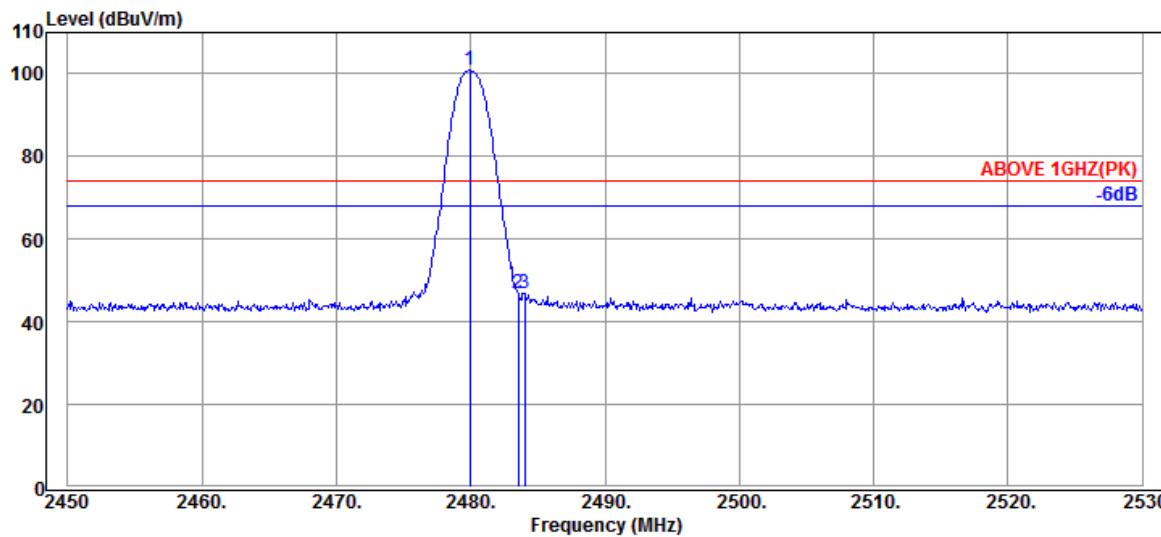

Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dB μ V) | Emission Level (dB μ V/m) | Limits | Margin | Detector |
|--------------------------|-----------------------|-----------------|----------------------------|-------------------------------|--------|--------|----------|
| 2480.00 | 32.28 | 6.67 | 69.78 | 108.73 | --- | --- | Peak |
| 2483.52 | 32.28 | 6.67 | 14.99 | 53.94 | 74.00 | 20.06 | Peak |
| 2483.68 | 32.28 | 6.67 | 14.69 | 53.64 | 74.00 | 20.36 | Peak |

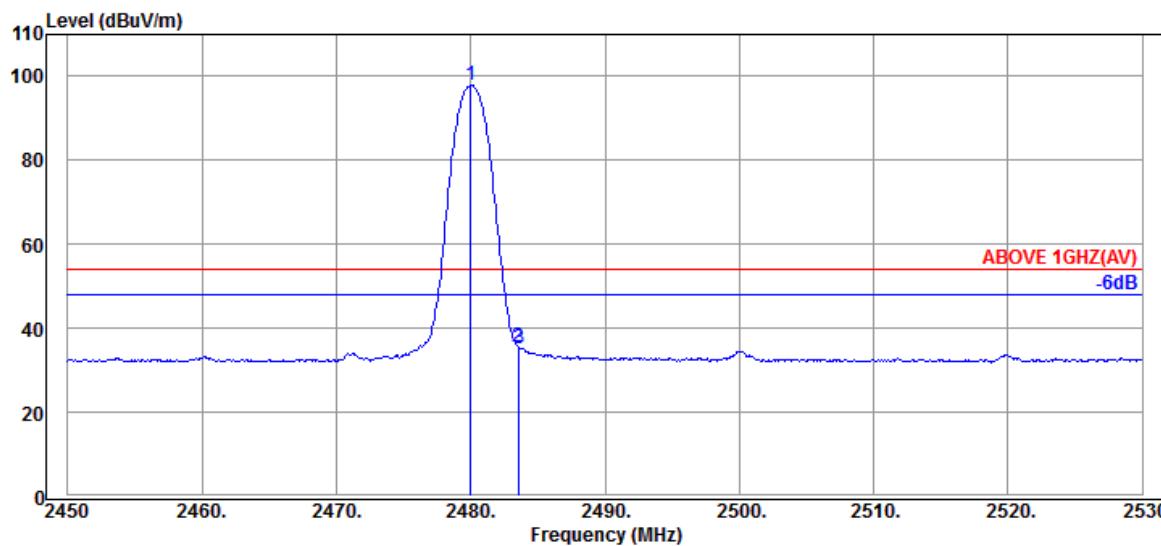

Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dB μ V) | Emission Level (dB μ V/m) | Limits | Margin | Detector |
|--------------------------|-----------------------|-----------------|----------------------------|-------------------------------|--------|--------|----------|
| 2480.00 | 32.28 | 6.67 | 66.82 | 105.77 | --- | --- | Average |
| 2483.52 | 32.28 | 6.67 | 2.67 | 41.62 | 54.00 | 12.38 | Average |
| 2483.60 | 32.28 | 6.67 | 2.49 | 41.44 | 54.00 | 12.56 | Average |

| Mode | 8-DPSK | Frequency | TX 2480MHz |
|------|--------|-----------|------------|
|------|--------|-----------|------------|


Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor | Cable Loss (dB) | Meter Reading (dB μ V) | Emission Level (dB μ V/m) | Limits | Margin | Detector |
|--------------------------|----------------|-----------------|----------------------------|-------------------------------|--------|--------|----------|
| 2479.92 | 32.28 | 6.67 | 61.90 | 100.85 | --- | --- | Peak |
| 2483.52 | 32.28 | 6.67 | 7.87 | 46.82 | 74.00 | 27.18 | Peak |
| 2484.00 | 32.28 | 6.67 | 7.96 | 46.91 | 74.00 | 27.09 | Peak |


Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor | Cable Loss (dB) | Meter Reading (dB μ V) | Emission Level (dB μ V/m) | Limits | Margin | Detector |
|--------------------------|----------------|-----------------|----------------------------|-------------------------------|--------|--------|----------|
| 2480.00 | 32.28 | 6.67 | 58.90 | 97.85 | --- | --- | Average |
| 2483.52 | 32.28 | 6.67 | -3.41 | 35.54 | 54.00 | 18.46 | Average |
| 2483.60 | 32.28 | 6.67 | -3.67 | 35.28 | 54.00 | 18.72 | Average |

A.2.2 Emissions outside the frequency band:

The emissions (up to 25GHz) not reported for there is no emission be found.

| Mode | 8-DPSK | Frequency | TX 2402MHz |
|------|--------|-----------|------------|
|------|--------|-----------|------------|

Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 4805.00 | 34.22 | 9.54 | -1.90 | 41.86 | 54.00 | 12.14 | Peak |

Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 4805.00 | 34.22 | 9.54 | -1.47 | 42.29 | 54.00 | 11.71 | Peak |

| Mode | 8-DPSK | Frequency | TX 2441MHz |
|------|--------|-----------|------------|
|------|--------|-----------|------------|

Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 4880.00 | 34.25 | 9.56 | -0.80 | 43.01 | 54.00 | 10.99 | Peak |

Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 4880.00 | 34.25 | 9.56 | -1.97 | 41.84 | 54.00 | 12.16 | Peak |

| Mode | 8-DPSK | Frequency | TX 2480MHz |
|------|--------|-----------|------------|
|------|--------|-----------|------------|

Antenna at Horizontal Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 4960.00 | 34.29 | 9.60 | -0.68 | 43.21 | 54.00 | 10.79 | Peak |

Antenna at Vertical Polarization

| Emission Frequency (MHz) | Antenna Factor (dB/m) | Cable Loss (dB) | Meter Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Detector |
|--------------------------|-----------------------|-----------------|----------------------|-------------------------|-----------------|-------------|----------|
| 4960.00 | 34.29 | 9.60 | -1.81 | 42.08 | 54.00 | 11.92 | Peak |

A.2.3 Emissions in Non-restricted Frequency Bands:

All emission levels below the FCC 15.209(a) general radiated emissions limits is not required.

A.3 20dB BANDWIDTH

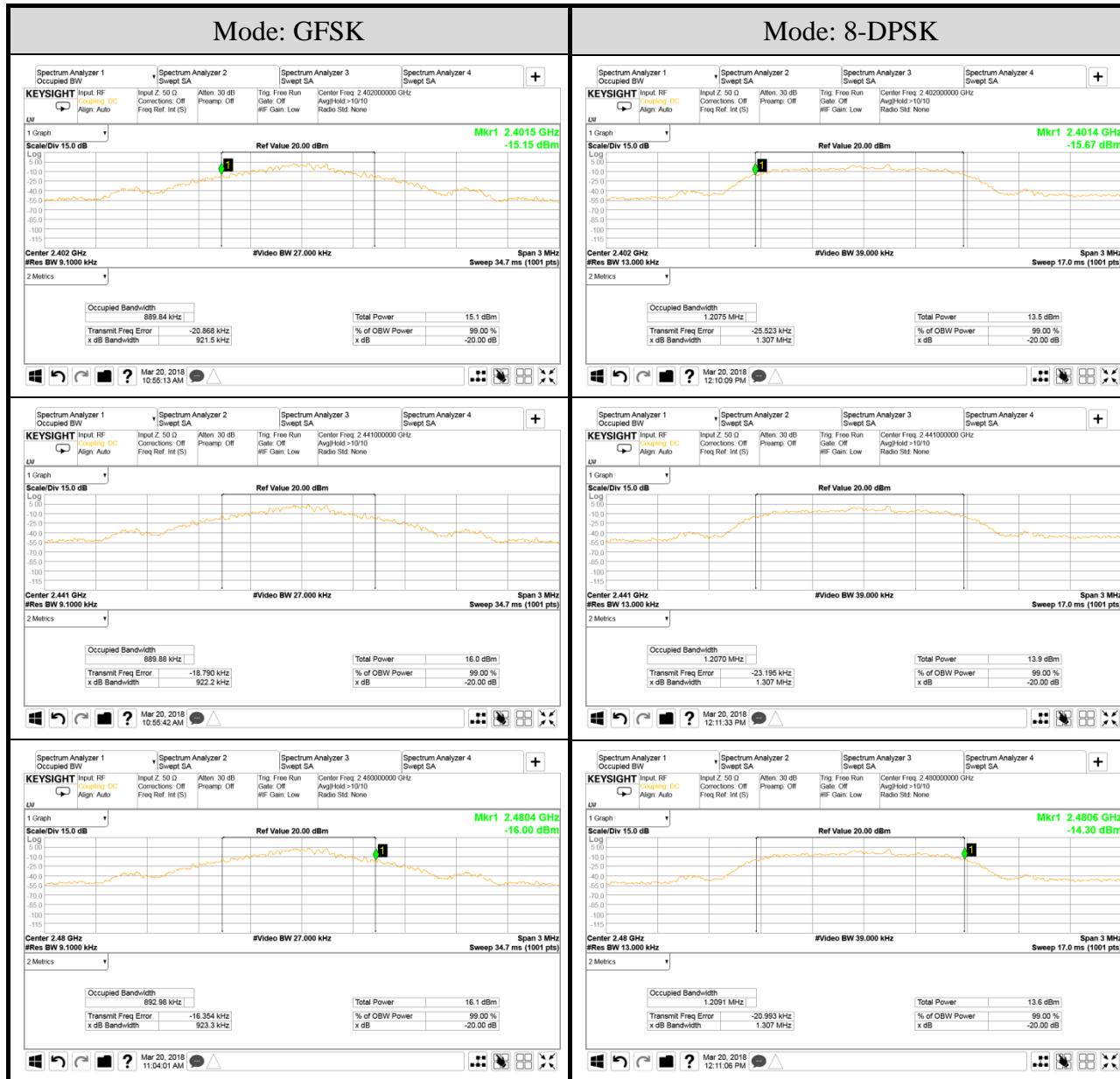
| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/03/20 | Temp./Hum. | 23°C/55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |

A.3.1 6dB Bandwidth Result

| Mode | Centre Frequency (MHz) | 20dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) (Reference only) | 2/3 (20dB Bandwidth) |
|--------|------------------------|----------------------|---|----------------------|
| GFSK | 2402 | 0.9215 | 0.88984 | 0.614 |
| | 2441 | 0.9222 | 0.88988 | 0.615 |
| | 2480 | 0.9233 | 0.89298 | 0.616 |
| 8-DPSK | 2402 | 1.307 | 1.2075 | 0.871 |
| | 2441 | 1.307 | 1.2070 | 0.871 |
| | 2480 | 1.307 | 1.2091 | 0.871 |

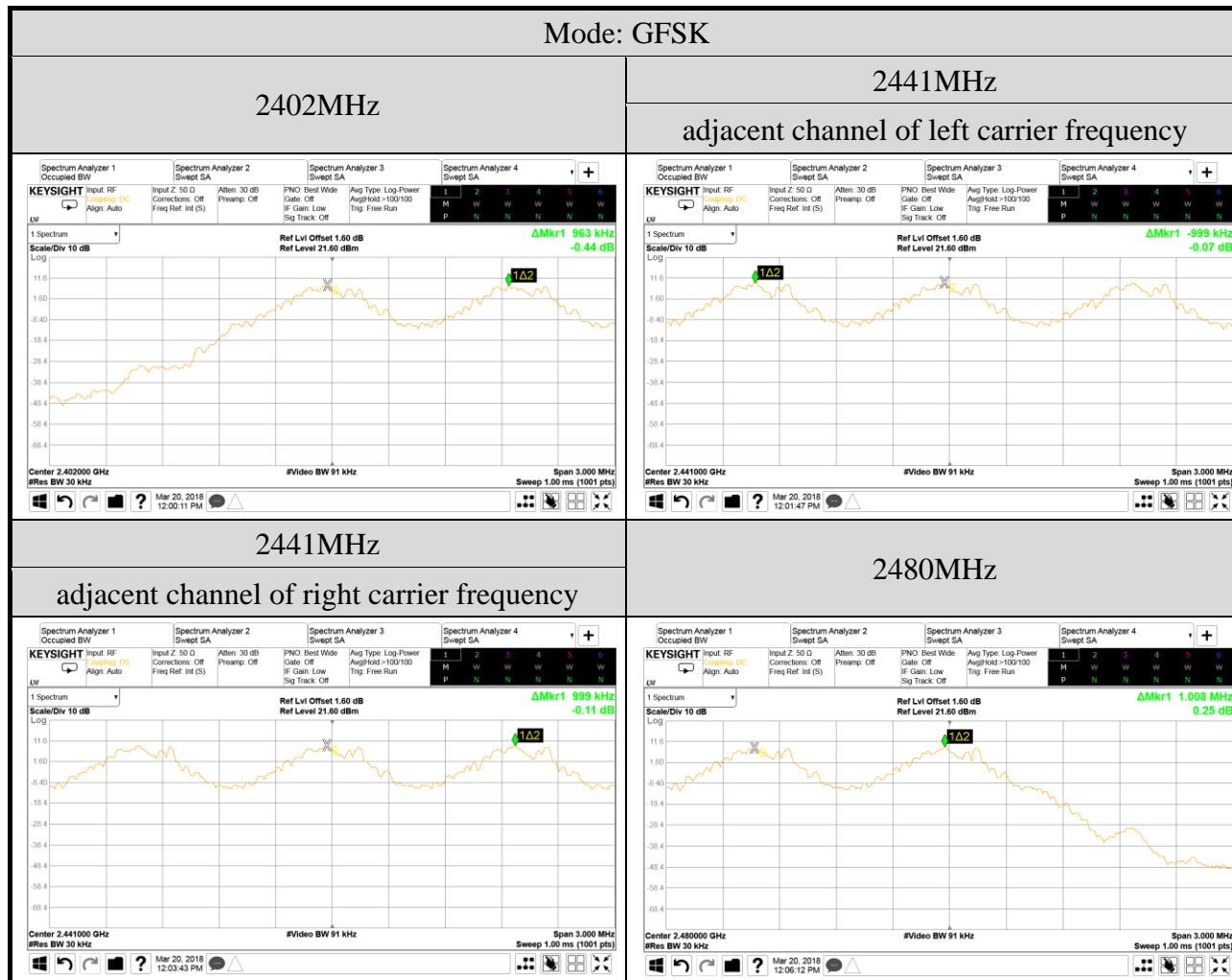
Remark: The maximum two-thirds of the 20dB bandwidth is the limit for carrier frequency separation presented.

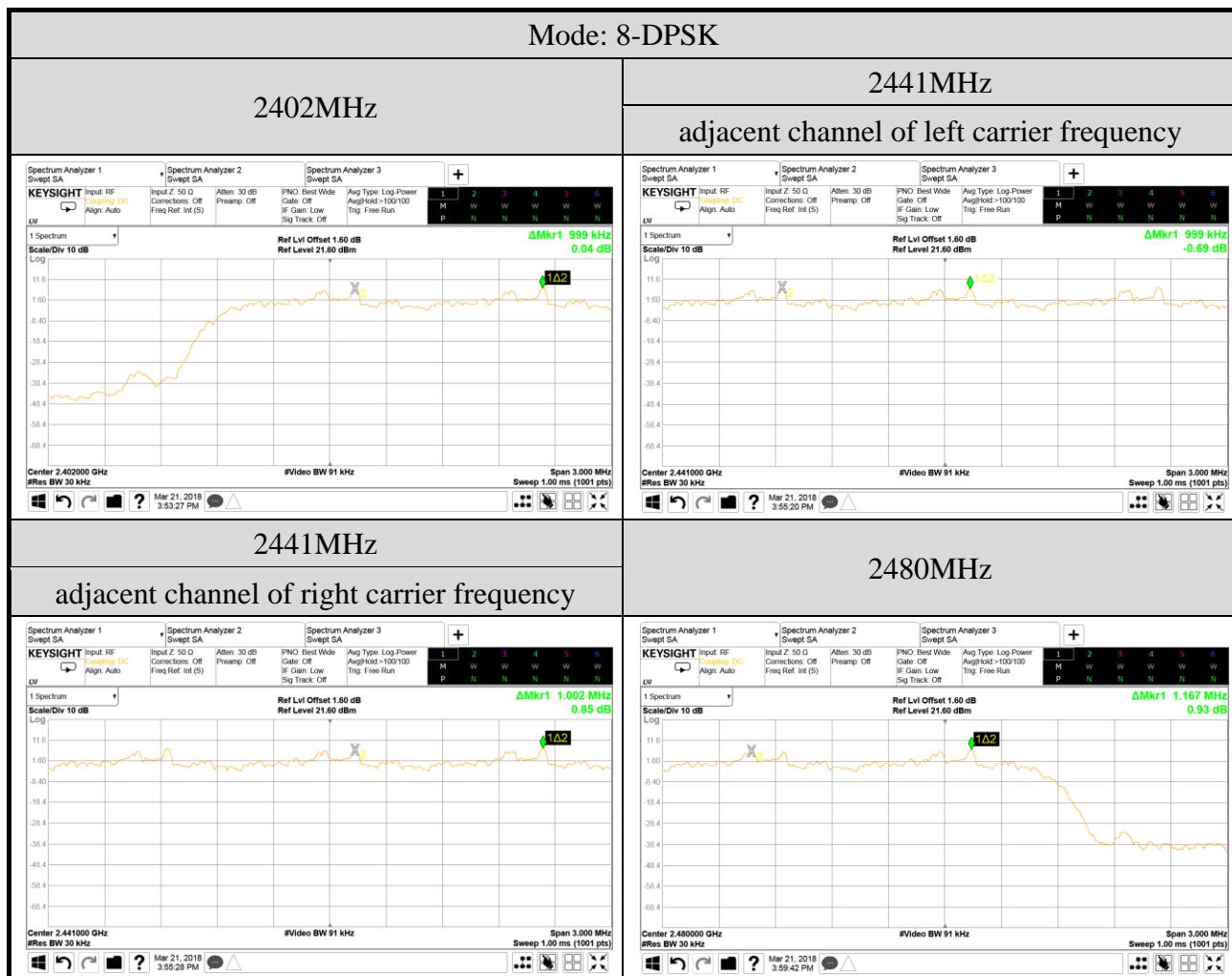
A.3.2 Measurement Plots



A.4 CARRIER FREQUENCY SEPARATION

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2017/03/20 | Temp./Hum. | 23°C/55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |





A.5 TIME OF OCCUPANCY

| | | | |
|------------|---------------|--------------|--------------------------------|
| Test Date | 2017/03/20~22 | Temp./Hum. | 23°C/55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |

A.5.1 Time of Occupancy

| Mode | Centre Frequency (MHz) | Mode | Each second appearance transmission | Time of Occupancy (ms) | Maximum accumulated Time of Occupancy (ms) | Limit (ms) |
|------|------------------------|------|-------------------------------------|------------------------|--|------------|
| GFSK | 2402 | DH1 | 10 | 0.380 | 120.080 | <400 |
| | | DH3 | 5 | 1.640 | 259.120 | <400 |
| | | DH5 | 3 | 2.890 | 273.972 | <400 |

Observation Period:

$$79 \text{ channels} * 0.4 \text{ seconds} = 31.6 \text{ seconds}$$

DH1 Mode

For each second of 10 transmission appearance, the longest time of occupancy is
 10 transmission * 31.6 seconds * 0.380 ms = 120.080 ms (<400ms)

DH3 Mode

For each second of 5 transmission appearance, the longest time of occupancy is
 5 transmission * 31.6 seconds * 1.640 ms = 259.120 ms (<400ms)

DH5 Mode

For each second of 3 transmission appearance, the longest time of occupancy is
 3 transmission * 31.6 seconds * 2.890 ms = 273.972 ms (<400ms)

| Mode | Centre Frequency (MHz) | Mode | Each second appearance transmission | Time of Occupancy (ms) | Maximum accumulated Time of Occupancy (ms) | Limit (ms) |
|------|------------------------|------|-------------------------------------|------------------------|--|------------|
| GFSK | 2440 | DH1 | 10 | 0.380 | 120.080 | <400 |
| | | DH3 | 5 | 1.640 | 259.120 | <400 |
| | | DH5 | 3 | 2.880 | 273.024 | <400 |

Observation Period:

$$79 \text{ channels} * 0.4 \text{ seconds} = 31.6 \text{ seconds}$$

DH1 Mode

For each second of 10 transmission appearance, the longest time of occupancy is
 10 transmission * 31.6 seconds * 0.380 ms = 120.080 ms (<400ms)

DH3 Mode

For each second of 5 transmission appearance, the longest time of occupancy is
 5 transmission * 31.6 seconds * 1.640 ms = 259.120 ms (<400ms)

DH5 Mode

For each second of 3 transmission appearance, the longest time of occupancy is
 3 transmission * 31.6 seconds * 2.880 ms = 273.024 ms (<400ms)

| Mode | Centre Frequency (MHz) | Mode | Each second appearance transmission | Time of Occupancy (ms) | Maximum accumulated Time of Occupancy (ms) | Limit (ms) |
|------|------------------------|------|-------------------------------------|------------------------|--|------------|
| GFSK | 2480 | DH1 | 10 | 0.380 | 120.080 | <400 |
| | | DH3 | 5 | 1.640 | 259.120 | <400 |
| | | DH5 | 3 | 2.890 | 273.972 | <400 |

Observation Period:

$$79 \text{ channels} * 0.4 \text{ seconds} = 31.6 \text{ seconds}$$

DH1 Mode

For each second of 10 transmission appearance, the longest time of occupancy is
 $10 \text{ transmission} * 31.6 \text{ seconds} * 0.380 \text{ ms} = 120.080 \text{ ms} (<400\text{ms})$

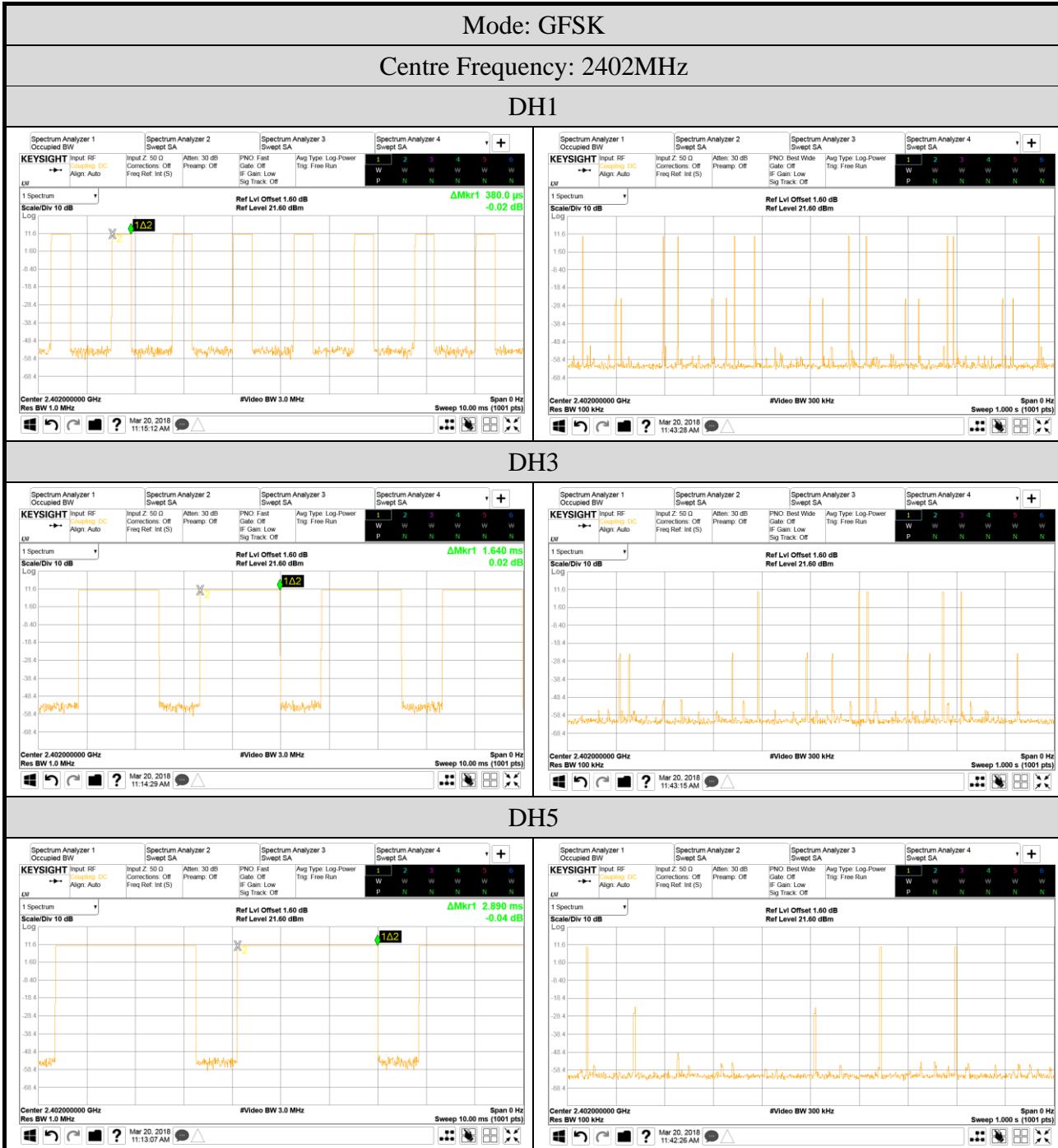
DH3 Mode

For each second of 5 transmission appearance, the longest time of occupancy is
 $5 \text{ transmission} * 31.6 \text{ seconds} * 1.640 \text{ ms} = 259.120 \text{ ms} (<400\text{ms})$

DH5 Mode

For each second of 3 transmission appearance, the longest time of occupancy is
 $3 \text{ transmission} * 31.6 \text{ seconds} * 2.890 \text{ ms} = 273.972 \text{ ms} (<400\text{ms})$

● Measurement Plots



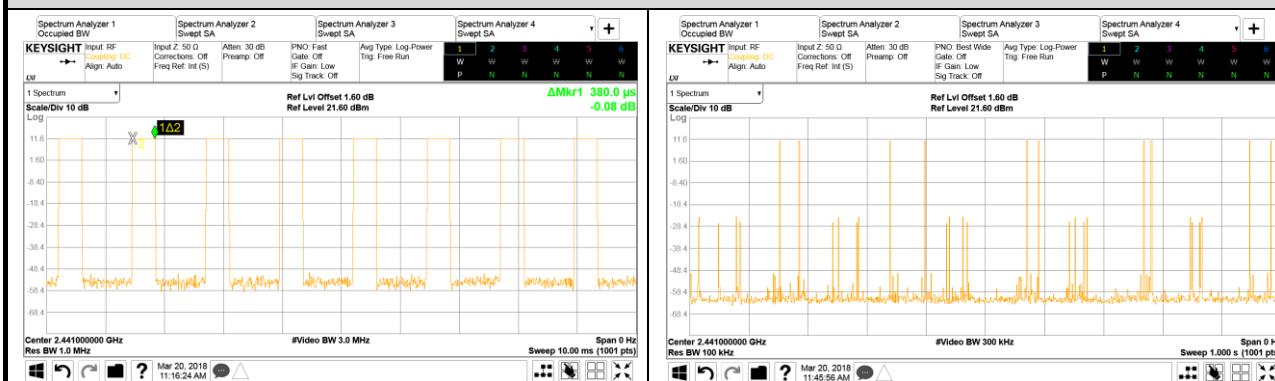
AUDIX Technology Corp.
 No. 53-11, Dingfu, Linkou, Dist.,
 New Taipei City244, Taiwan

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

Mode: GFSK

Centre Frequency: 2441MHz

DH1



DH3



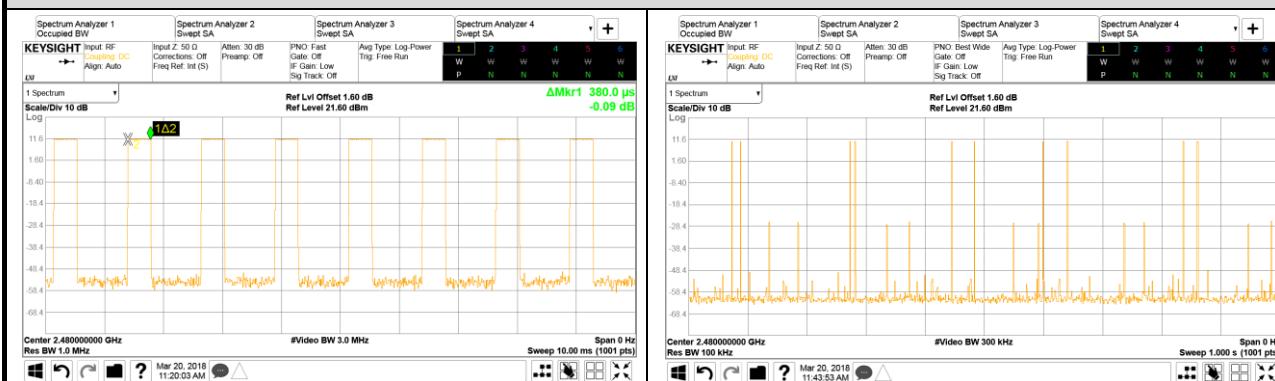
DH5



Mode: GFSK

Centre Frequency: 2480MHz

DH1



DH3



DH5



| Mode | Centre Frequency (MHz) | Mode | Each second appearance transmission | Time of Occupancy (ms) | Maximum accumulated Time of Occupancy (ms) | Limit (ms) |
|--------|------------------------|------|-------------------------------------|------------------------|--|------------|
| 8-DPSK | 2402 | 3DH1 | 10 | 0.350 | 110.600 | <400 |
| | | 3DH3 | 5 | 1.640 | 259.120 | <400 |
| | | 3DH5 | 3 | 2.890 | 273.972 | <400 |

Observation Period:

$$79 \text{ channels} * 0.4 \text{ seconds} = 31.6 \text{ seconds}$$

3DH1 Mode

For each second of 10 transmission appearance, the longest time of occupancy is
 10 transmission * 31.6 seconds * 0.350 ms = 110.600 ms (<400ms)

3DH3 Mode

For each second of 5 transmission appearance, the longest time of occupancy is
 5 transmission * 31.6 seconds * 1.640 ms = 259.120 ms (<400ms)

3DH5 Mode

For each second of 3 transmission appearance, the longest time of occupancy is
 3 transmission * 31.6 seconds * 2.890 ms = 273.972 ms (<400ms)

| Mode | Centre Frequency (MHz) | Mode | Each second appearance transmission | Time of Occupancy (ms) | Maximum accumulated Time of Occupancy (ms) | Limit (ms) |
|--------|------------------------|------|-------------------------------------|------------------------|--|------------|
| 8-DPSK | 2441 | 3DH1 | 10 | 0.390 | 123.240 | <400 |
| | | 3DH3 | 5 | 1.630 | 257.540 | <400 |
| | | 3DH5 | 3 | 2.890 | 273.972 | <400 |

Observation Period:

$$79 \text{ channels} * 0.4 \text{ seconds} = 31.6 \text{ seconds}$$

3DH1 Mode

For each second of 10 transmission appearance, the longest time of occupancy is
 10 transmission * 31.6 seconds * 0.390 ms = 123.240 ms (<400ms)

3DH3 Mode

For each second of 5 transmission appearance, the longest time of occupancy is
 5 transmission * 31.6 seconds * 1.630 ms = 257.540 ms (<400ms)

3DH5 Mode

For each second of 3 transmission appearance, the longest time of occupancy is
 3 transmission * 31.6 seconds * 2.890 ms = 273.972 ms (<400ms)

| Mode | Centre Frequency (MHz) | Mode | Each second appearance transmission | Time of Occupancy (ms) | Maximum accumulated Time of Occupancy (ms) | Limit (ms) |
|--------|------------------------|------|-------------------------------------|------------------------|--|------------|
| 8-DPSK | 2480 | 3DH1 | 10 | 0.390 | 123.240 | <400 |
| | | 3DH3 | 5 | 1.640 | 259.120 | <400 |
| | | 3DH5 | 3 | 2.890 | 273.972 | <400 |

Observation Period:

$$79 \text{ channels} * 0.4 \text{ seconds} = 31.6 \text{ seconds}$$

3DH1 Mode

For each second of 10 transmission appearance, the longest time of occupancy is
 $10 \text{ transmission} * 31.6 \text{ seconds} * 0.390 \text{ ms} = 123.240 \text{ ms} (<400\text{ms})$

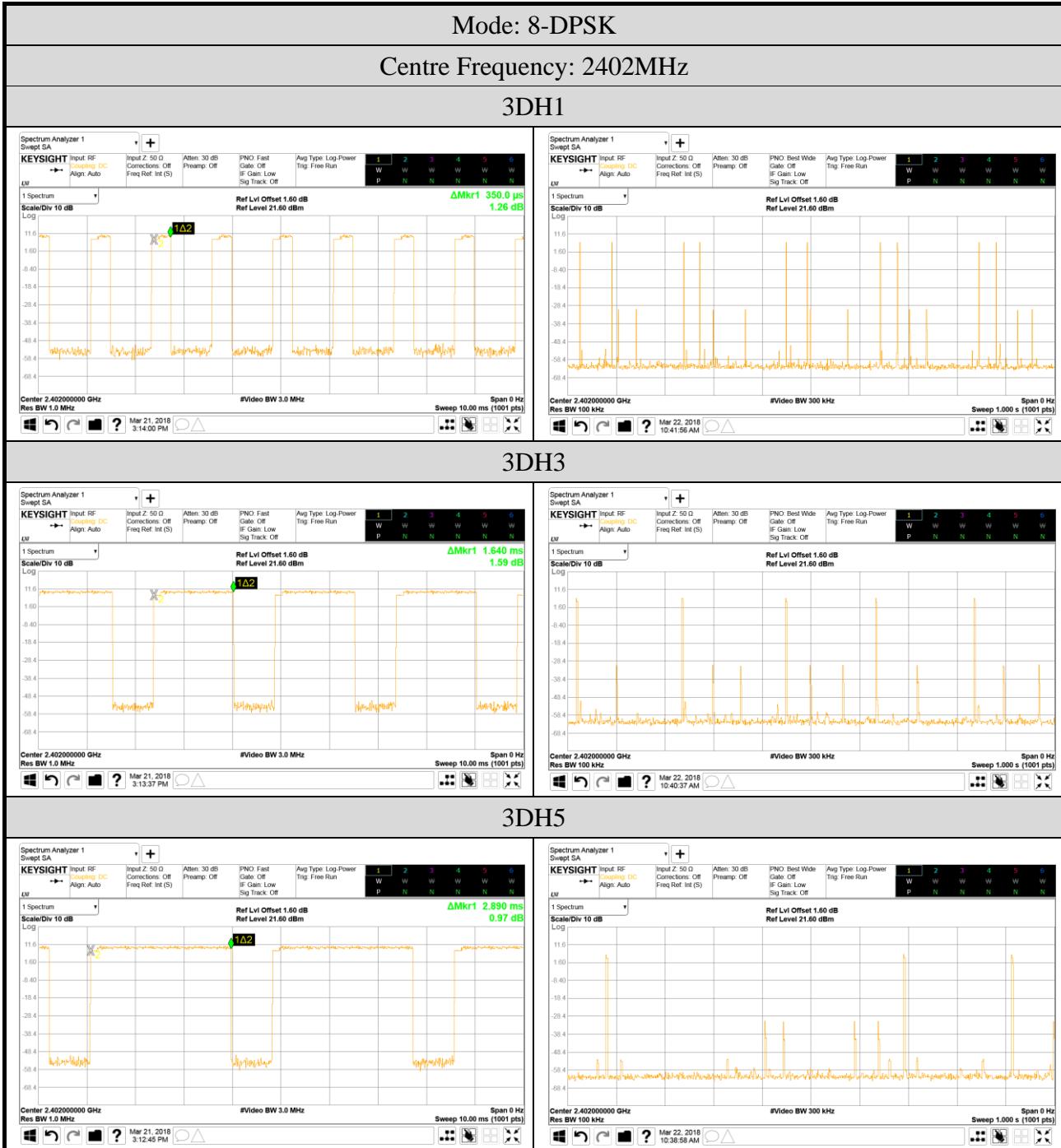
3DH3 Mode

For each second of 5 transmission appearance, the longest time of occupancy is
 $5 \text{ transmission} * 31.6 \text{ seconds} * 1.640 \text{ ms} = 259.120 \text{ ms} (<400\text{ms})$

3DH5 Mode

For each second of 3 transmission appearance, the longest time of occupancy is
 $3 \text{ transmission} * 31.6 \text{ seconds} * 2.890 \text{ ms} = 273.972 \text{ ms} (<400\text{ms})$

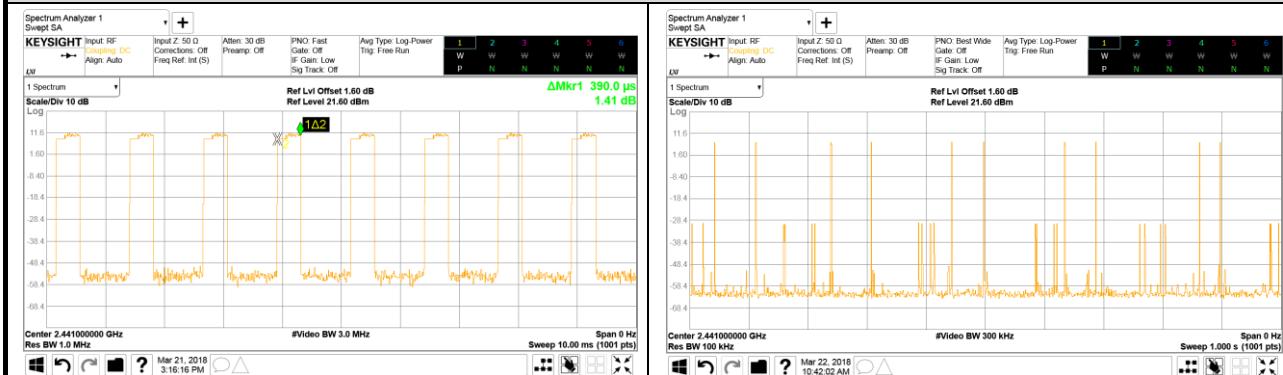
● Measurement Plots



Mode: 8-DPSK

Centre Frequency: 2441MHz

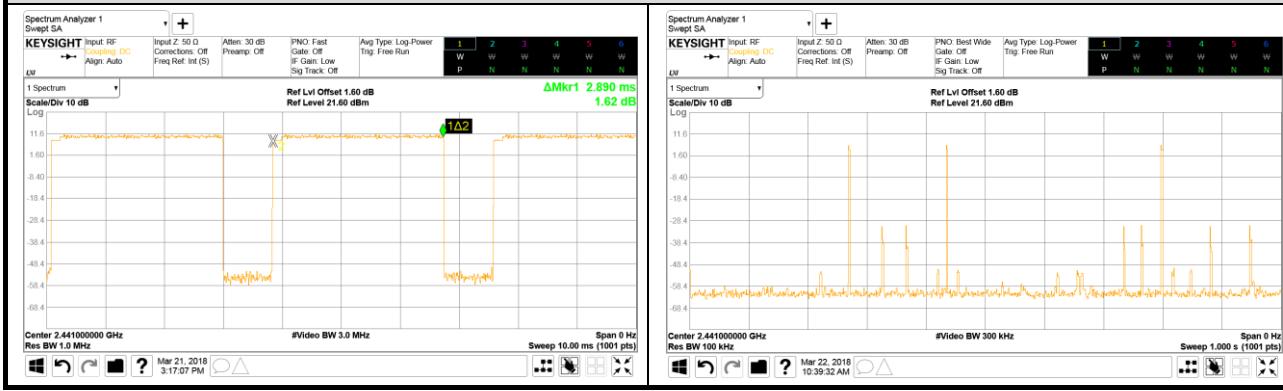
3DH1



3DH3



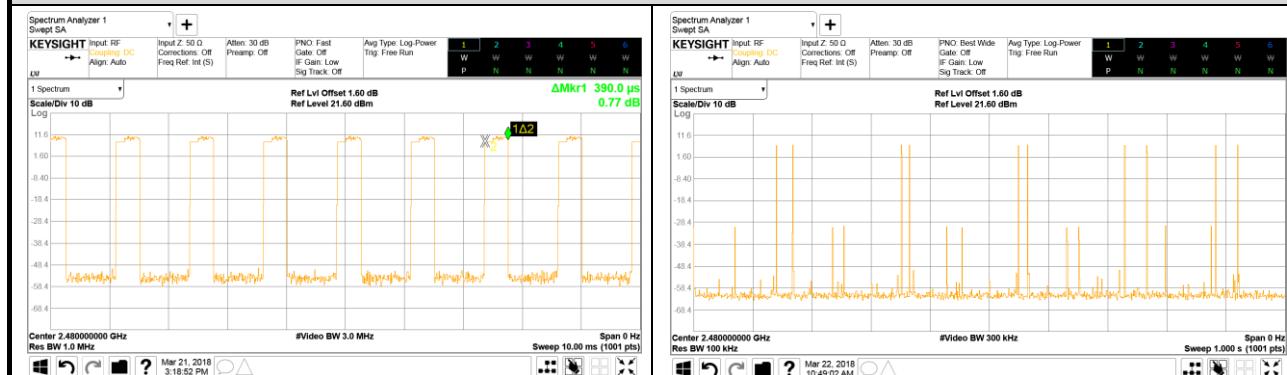
3DH5



Mode: 8-DPSK

Centre Frequency: 2480MHz

3DH1



3DH3

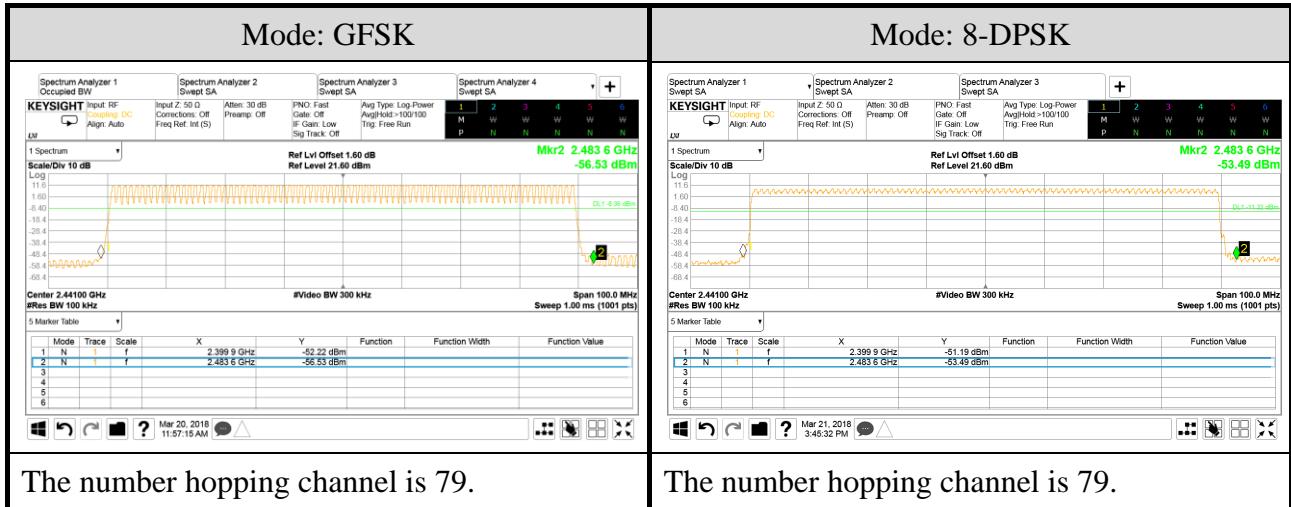


3DH5



A.6 NUMBER OF HOPPING CHANNELS

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/03/20 | Temp./Hum. | 23°C/55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |



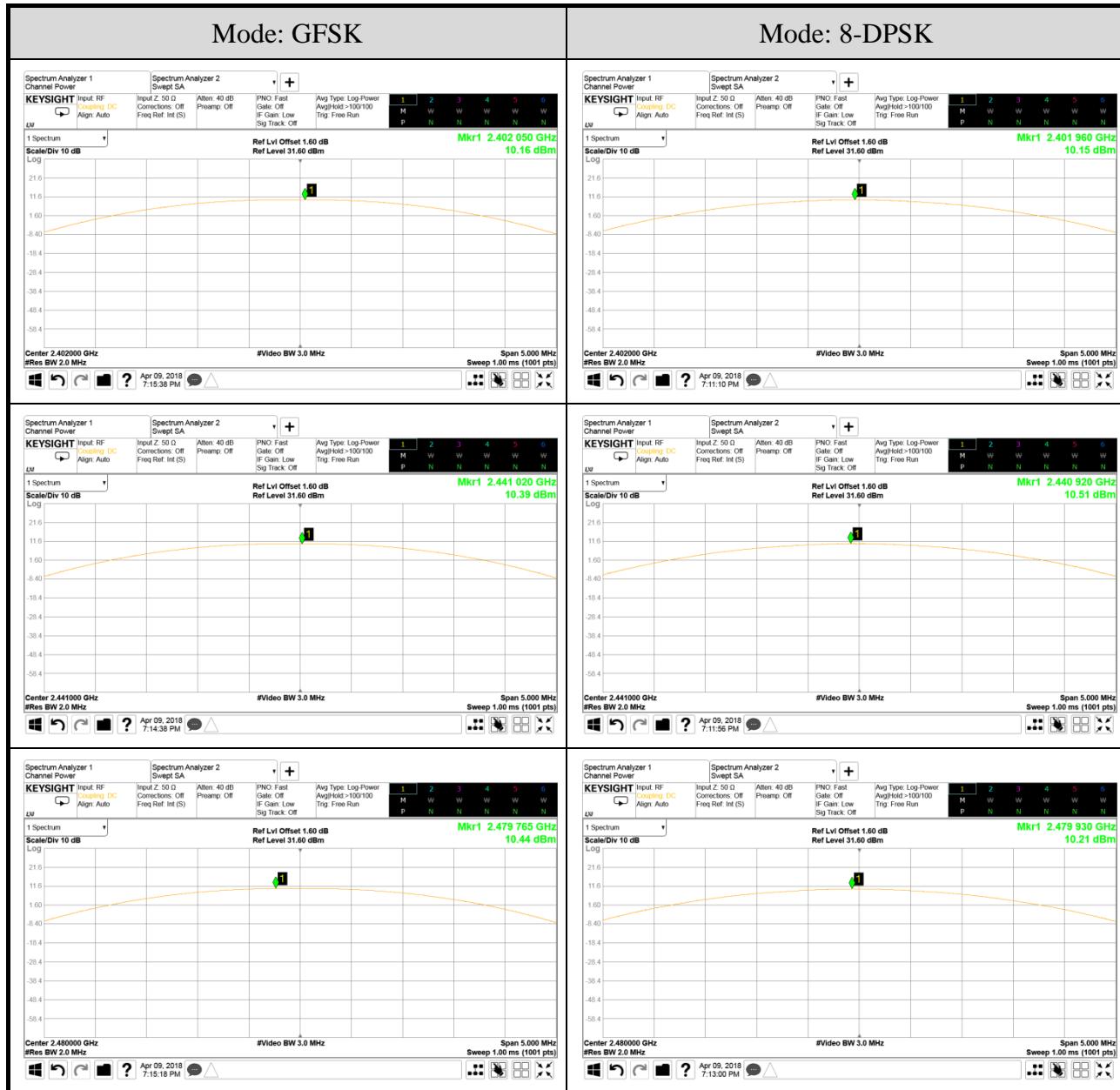
A.7 MAXIMUM PEAK OUTPUT POWER

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/04/10 | Temp./Hum. | 24°C/54% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |

A.7.1 Maximum Peak Output Power

| Mode | Centre Frequency (MHz) | Maximum Peak Output Power | | Limit |
|--------|---------------------------|---------------------------|--------|-------------------|
| | | dBm | W | |
| GFSK | 2402 | 10.16 | 0.0104 | 21dBm (0.125W) |
| | 2441 | 10.39 | 0.0109 | |
| | 2480 | 10.44 | 0.0111 | |
| 8-DPSK | 2402 | 10.15 | 0.0104 | |
| | 2441 | 10.51 | 0.0112 | |
| | 2480 | 10.21 | 0.0105 | |

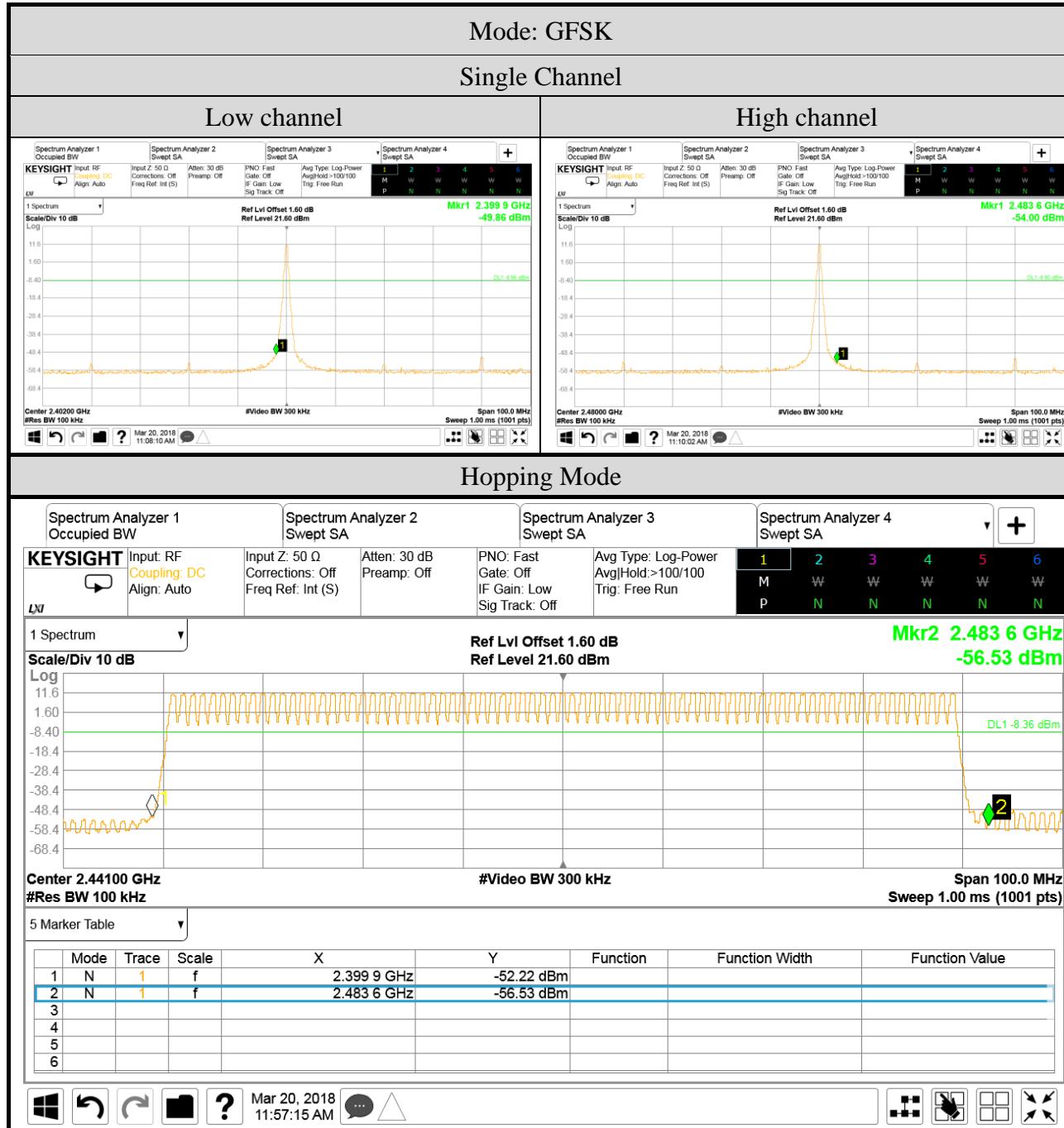
A.7.2 Measurement Plots



A.8 EMISSION LIMITATIONS MEASUREMENT

| | | | |
|------------|---------------|--------------|--------------------------------|
| Test Date | 2018/03/20~21 | Temp./Hum. | 23°C/55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |

A.8.1 Band Edge





A.8.2 Spurious Emission

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/03/20 | Temp./Hum. | 23°C /55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |
| Mode | GFSK | Frequency | 2402MHz |



Note: All results have been included cable loss.

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/03/20 | Temp./Hum. | 23°C /55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |
| Mode | GFSK | Frequency | 2441MHz |



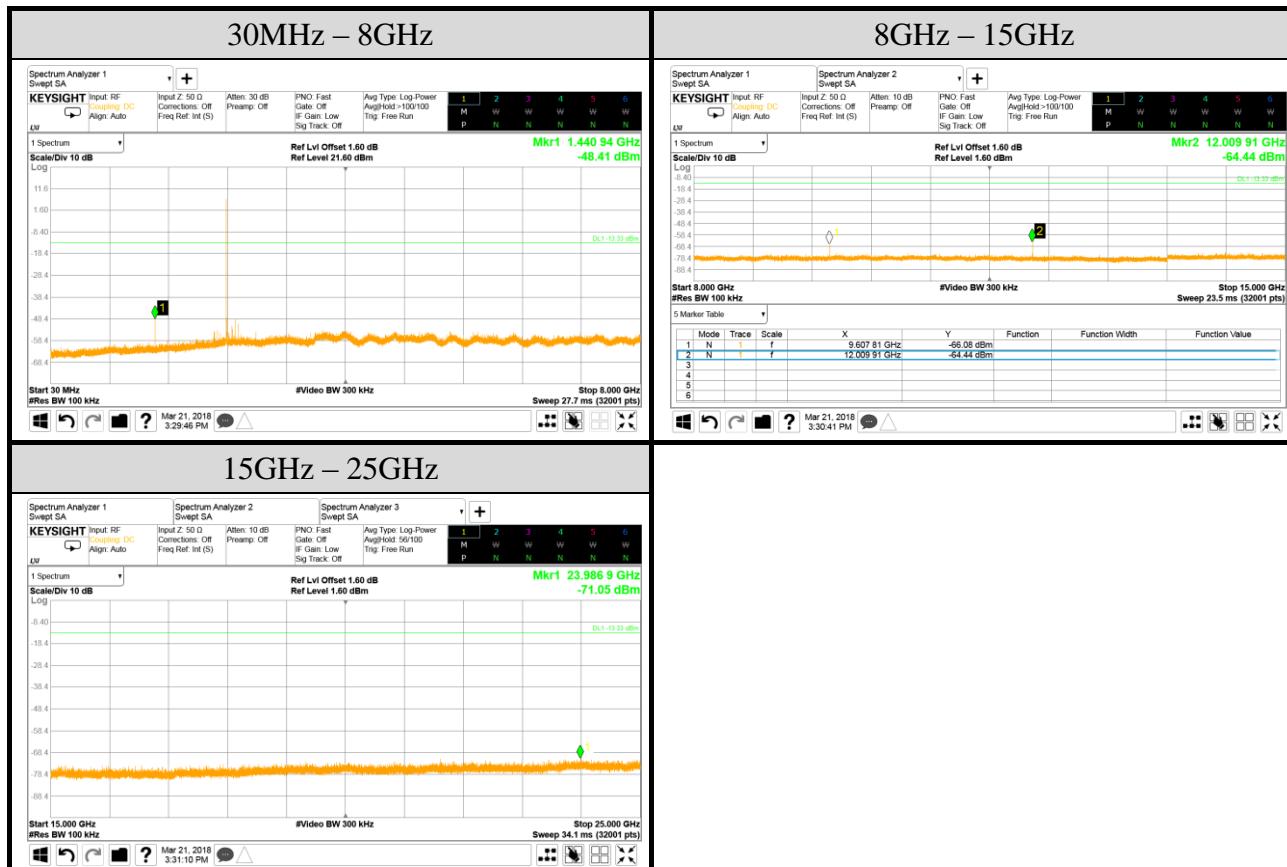
Note: All results have been included cable loss.

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/03/20 | Temp./Hum. | 23°C /55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |
| Mode | GFSK | Frequency | 2480MHz |



Note: All results have been included cable loss.

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/03/21 | Temp./Hum. | 23°C /55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |
| Mode | 8-DPSK | Frequency | 2402MHz |



Note: All results have been included cable loss.

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/03/21 | Temp./Hum. | 23°C /55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |
| Mode | 8-DPSK | Frequency | 2441MHz |



Note: All results have been included cable loss.

| | | | |
|------------|------------|--------------|--------------------------------|
| Test Date | 2018/03/21 | Temp./Hum. | 23°C /55% |
| Cable Loss | 1.6dB | Test Voltage | AC 120V, 60Hz (via AC Adapter) |
| Mode | 8-DPSK | Frequency | 2480MHz |



Note: All results have been included cable loss.



*Audix Technology Corp.
No. 53-11, Dingfu, Linkou, Dist.,
New Taipei City244, Taiwan*

APPENDIX B

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

APPDNDIX B

TEST PHOTOGRAPHS

(Model: Kamai 7B)

File Number: C1M1803257

Report Number: EM-F180126

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.