# FCC Test Report

## Client Information:

Applicant: Formosa21 Inc.
Applicant add.: 8F-6, No.351, Sec. 2, Zhongshan Rd., Zhonghe Dist., New Taipei City 23504, Taiwan (R.O.C.)

## EUT Information:

EUT Name: Nano RF Receiver
Model No.: RF612; RF612x; RF612-xxx (x=0~9，A~Z)
Brand Name: aim Ahead in multimedia
FCC ID: ULI-CYRFRX05

## Prepared By:

Asia Institute Technology (Dongguan) Limited
Add. : No.6 Binhe Road, Tianxin Village, Huangjiang,
Dongguan, Guangdong, China.
Date of Receipt: Sep. 20, 2012 Date of Test: Sep. 21 ~ Oct. 15, 2012
Date of Issue: Oct. 16, 2012 Test Result: **Pass**

## Test procedure used: ANSI C63.4-2009

This device described above has been tested by Asia Institute Technology (Dongguan) Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
*This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

**Reviewed by:** Seal-Chen
Test director

**Approved by:** Jerson Wu
Technical director

# 1 Contents

# 2 Test Summary

## 2.1 Compliance with FCC Part 15 subpart C

| Test | Test Requirement | Stanadard Paragraph | Result |
|---|---|---|---|
| Antenna requirement | FCC Part 15 C:2008 | Section 15.203 | **PASS** |
| Conduction Emissions | FCC Part 15 C:2008 | Section 15.207(a) | **PASS** |
| Radiated Emissions | FCC Part 15 C:2008 | Section 15.249(a)<br>Section 15.249(d) | **PASS** |
| Band edges | FCC Part 15 C:2008 | Section 15.249(d) | **N/A** |
| Occupied Bandwidth | FCC Part 15 C:2008 | Section 15.215 | **PASS** |

## 2.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, The following measurements uncertainty Level have estimated based on ANSI C63.4:2003, the maximum value of the uncertainty as below

| No. | Item | Uncertainty |
|---|---|---|
| 1 | Conducted Emission Test | ±1.18dB |
| 2 | Radiated Emission Test | ±3.57dB |

# 3 Test Facility

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

**.FCC- Registration No: 248337**

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dong guan) Limited have been registered by Federal Communications Commission (FCC) on Nov.20, 2009.

**.Industry Canada(IC)-Registration No: IC6819A-1 & IC6819A-2**

The 3m Semi-Anechoic Chamber and 3m/10m Open Area Test Site of Asia Institute Technology (Dongguan) Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Nov.07, 2010.

**.VCCI- Registration No: 2705**

The 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dongguan) Limited have been registered by Voluntary Control Council for Interference on Jan.24, 2010 and Oct. 30, 2010. The Telecommunication Ports Conducted Disturbance Measurement of Asia Institute Technology (Dongguan) Limited have been registered by Voluntary Control Council for Interference on Sep. 06, 2011.

**.TUV Rhineland**

Asia Institute Technology (Dongguan) Limited has been assessed on Dec.29, 2011 that it can carry out EMC tests by order and under supervision of TUV Rhineland.

**.ITS- Registration No: TMPSHA031**

Asia Institute Technology (Dongguan) Limited has been assessed and included in Intertek Shanghai TMP Program regarding Laboratory facilities and test equipment on Jul.22, 2011.

## 3.1 Deviation from standard

None

## 3.2 Abnormalities from standard conditions

None

# 4 General Information

## 4.1 General Description of EUT

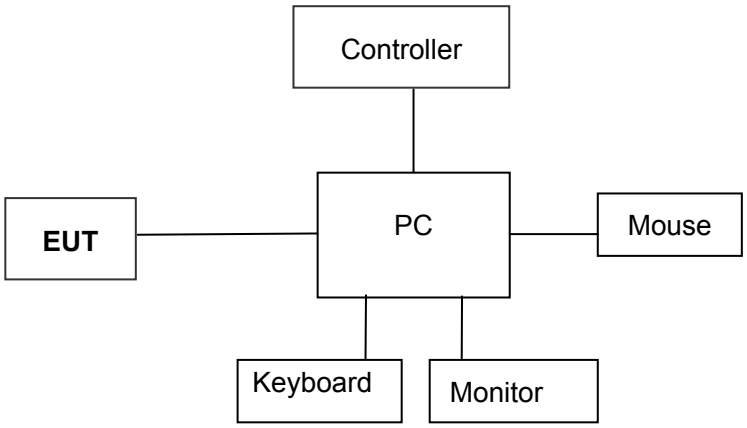
| | |
|---|---|
| **Manufacturer:** | Formosa21 Inc. |
| **Manufacturer Address:** | 8F-6, No.351, Sec. 2, Zhongshan Rd., Zhonghe Dist., New Taipei City 23504, Taiwan (R.O.C.) |
| **EUT Name:** | Nano RF Receiver |
| **Model No:** | RF612; RF612x; RF612-xxx (x=0~9，A~Z) |
| **Operation frequency:** | 2402 MHz to 2479MHz |
| **Channel Number:** | 78 |
| **Modulation Technology:** | DSSS |
| **Antenna Type:** | Printed on PCB |
| **Brand Name:** | aim Ahead in multimedia |
| **Serial No:** | N/A |
| **Power Supply Range:** | DC 5.0V |
| **Power Supply:** | DC 5.0V from PC |
| **Power Cord:** | N/A |
| **Model description:** The only different about RF612;RF612x;RF612-xxx(x=0~9，A~Z) exterior and printing. x may represent different alphabet (A-Z) or numeral (0-9). | |

| Description of Channel: | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 0 | 2402 | 21 | 2423 | 42 | 2444 | 63 | 2465 |
| 1 | 2403 | 22 | 2424 | 43 | 2445 | 64 | 2466 |
| 2 | 2404 | 23 | 2425 | 44 | 2446 | 65 | 2467 |
| 3 | 2405 | 24 | 2426 | 45 | 2447 | 66 | 2468 |
| 4 | 2406 | 25 | 2427 | 46 | 2448 | 67 | 2469 |
| 5 | 2407 | 26 | 2428 | 47 | 2449 | 68 | 2470 |
| 6 | 2408 | 27 | 2429 | 48 | 2450 | 69 | 2471 |
| 7 | 2409 | 28 | 2430 | 49 | 2451 | 70 | 2472 |
| 8 | 2410 | 29 | 2431 | 50 | 2452 | 71 | 2473 |
| 9 | 2411 | 30 | 2432 | 51 | 2453 | 72 | 2474 |
| 10 | 2412 | 31 | 2433 | 52 | 2454 | 73 | 2475 |
| 11 | 2413 | 32 | 2434 | 53 | 2455 | 74 | 2476 |
| 12 | 2414 | 33 | 2435 | 54 | 2456 | 75 | 2477 |
| 13 | 2415 | 34 | 2436 | 55 | 2457 | 76 | 2478 |
| 14 | 2416 | 35 | 2437 | 56 | 2458 | 77 | 2479 |
| 15 | 2417 | 36 | 2438 | 57 | 2459 | | |
| 16 | 2418 | 37 | 2439 | 58 | 2460 | | |
| 17 | 2419 | 38 | 2440 | 59 | 2461 | | |
| 18 | 2420 | 39 | 2441 | 60 | 2462 | | |
| 19 | 2421 | 40 | 2442 | 61 | 2463 | | |
| 20 | 2422 | 41 | 2443 | 62 | 2464 | | |

## 4.2 Description of Test conditions

(1) EUT was tested in normal configuration (Please See following Block diagram)

1. Block diagram of EUT configuration




(2) E.U.T. test conditions:

15.31(e): For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

(3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. Reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

| Frequency range over which device operates | Number of frequencies | Location in the range of operation |
|---|---|---|
| 1 MHz or less | 1 | Middle |
| 1 to 10 MHz | 2 | 1 near top and 1 near bottom |
| More than 10 MHz | 3 | 1 near top, 1 near middle and 1 near bottom |

(4) Frequency range of radiated measurements:

According to the 15.33, the test range will be up to the tenth harmonic of the highest fundamental frequency

## 4.3 Peripheral List

| No. | Equipment | Manufacturer | Model No. | Serial No. | Power cord | signal cable |
|---|---|---|---|---|---|---|
| 1 | N/A | N/A | N/A | N/A | N/A | N/A |

## 4.4 Test Peripheral List

| No. | Equipment | Manufacturer | EMC Compliance | Model No. | Serial No. | Power cord | signal cable |
|---|---|---|---|---|---|---|---|
| 1 | Personal computer | H P | CE 、FCC | DX2310 | CNG8250MZ3 | 1.8m/unshielded /detachable | N/A |
| 2 | Keyboard | DELL | CE、FCC | SK-8115 | CN-ONM432-71616-81M-OLKB | N/A | 1.5m/unshielded /undetachable |
| 3 | Mouse | Microsoft | CE、FCC | X800898 | 30603 | N/A | 1.5m/unshielded /undetachable |
| 4 | Monitor | DELL | CE、FCC | T980KACDK21SN | TWS20006045 | 1.8m/unshielded /detachable | 1.8m/shielded /detachable |
| 5 | Controller | Cypress | N/A | N/A | N/A | N/A | N/A |

# 5 Equipments List for All Test Items

| No | Test Equipment | Manufacturer | Model No | Serial No | Cal. Date | Cal. Due Date |
|---|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | ADVANTEST | R3182 | 150900201 | 2011.12.30 | 2012.12.30 |
| 2 | EMI Measuring Receiver | R&S | ESPI | 1164.6407.03 | 2012.06.26 | 2013.06.25 |
| 3 | Low Noise Pre Amplifier | Tsj | MLA-10K01-B01-27 | 1205323 | 2012.06.26 | 2013.06.26 |
| 4 | Low Noise Pre Amplifier | Tsj | MLA-0120-A02-34 | 2648A04738 | 2012.06.26 | 2013.06.26 |
| 5 | TRILOG Super Broadband test Antenna | SCHWARZBECK | VULB9160 | 9160-3206 | 2012.01.06 | 2013.01.06 |
| 6 | Broadband Horn Antenna | SCHWARZBECK | BBHA9120A | 451 | 2012.01.06 | 2013.01.06 |
| 7 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200264416 | 2012.06.26 | 2013.06.26 |
| 8 | EMI Test Receiver | R&S | ESCI | 100124 | 2012.06.25 | 2013.06.25 |
| 9 | LISN | Kyoritsu | KNW-242 | 8-837-4 | 2012.06.25 | 2013.06.25 |
| 10 | LISN | Kyoritsu | KNW-407 | 8-1789-3 | 2012.06.25 | 2013.06.25 |
| 11 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200264417 | 2012.06.25 | 2013.06.25 |

# 6 Test Result

## 6.1 Antenna requirement

### 6.1.1 Standard requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### 6.1.2 EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement.

## 6.2 Conduction Emissions Measurement

### 6.2.1 Limit

| Frequency of Emission (MHz) | Conducted Limit (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

Note: Decreases with the logarithm of the frequency.

### 6.2.2 Test procedure

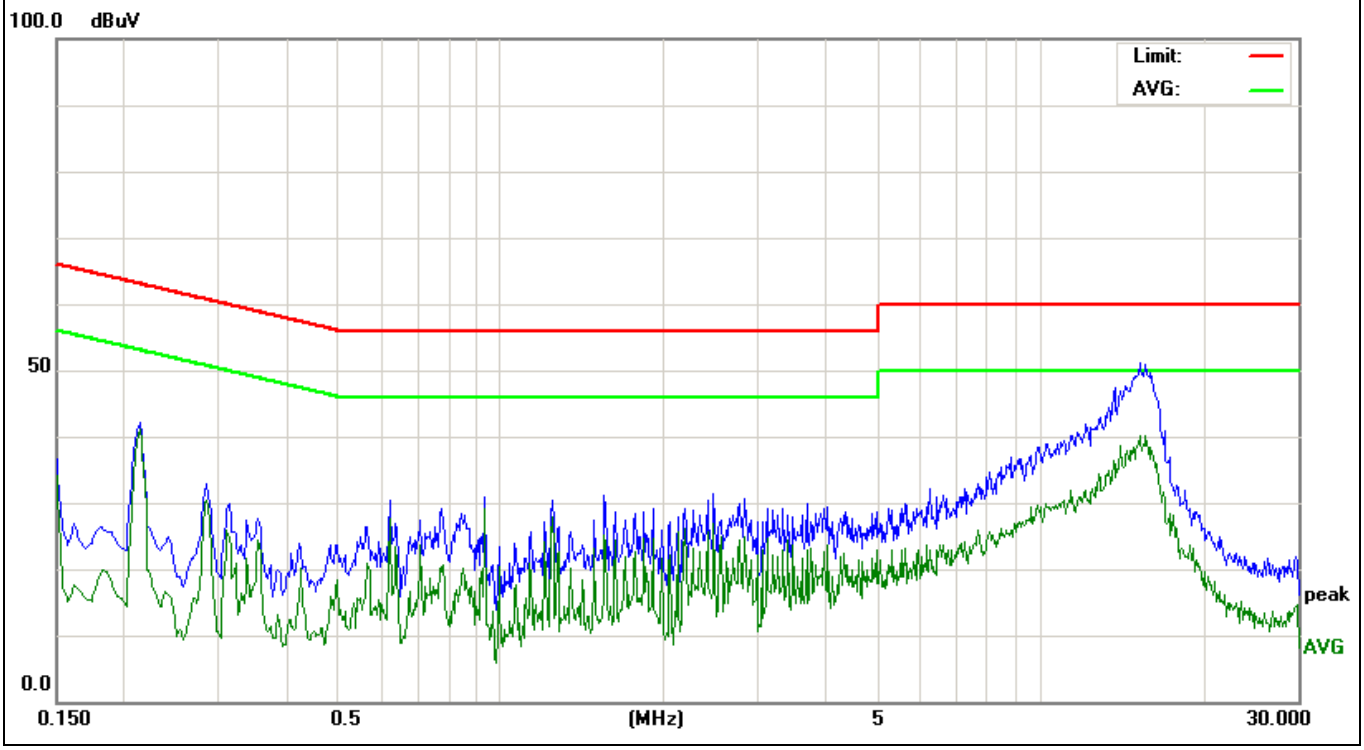
EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

### 6.2.3 Test result

| EUT: | Nano RF Receiver | Model Name. : | RF612 |
|---|---|---|---|
| Temperature: | 22 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Test Date : | 2012-10-09 |
| Test Mode: | TX | Phase : | Line |
| **Test Voltage** : | DC 5.0V from PC | | |

| Frequency (MHz) | Meter Reading (dBμV) | Factor(dB) | Emission Level (dBμV) | Limits (dBμV) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|
| 0.2139 | 31.01 | 11.04 | 42.05 | 63.05 | -21.00 | Quasi-Peak |
| 0.2139 | 30.02 | 11.04 | 41.06 | 53.05 | -11.99 | Average |
| 0.9340 | 20.60 | 10.19 | 30.79 | 56.00 | -25.21 | Quasi-Peak |
| 0.9340 | 18.83 | 10.19 | 29.02 | 46.00 | -16.98 | Average |
| *15.2459 | 49.73 | 1.36 | 51.09 | 60.00 | -8.91 | Quasi-Peak |
| 15.6659 | 38.71 | 1.37 | 40.08 | 50.00 | -9.92 | Average |

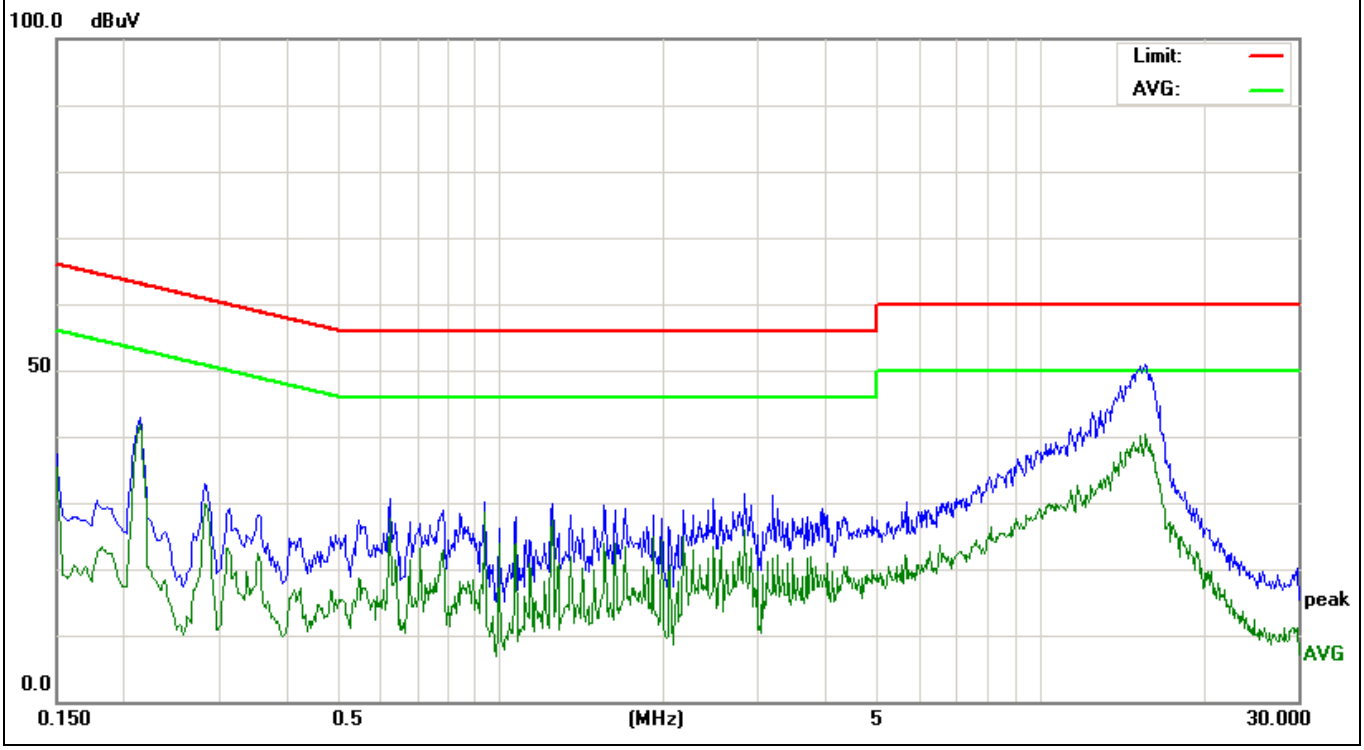
Remark:
1. Factor = Insertion Loss + Cable Loss.
2. '*' means the worst case.



| EUT： | Nano RF Receiver | Model Name. ： | RF612 |
|---|---|---|---|
| Temperature： | 22 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010hPa | Test Date : | 2012-10-09 |
| Test Mode： | TX | Phase : | Neutral |
| **Test Voltage** ： | DC 5.0V from PC | | |

| Frequency (MHz) | Meter Reading (dBμV) | Factor(dB) | Emission Level (dBμV) | Limits (dBμV) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|
| 0.2139 | 31.80 | 11.04 | 42.84 | 63.05 | -20.21 | Quasi-Peak |
| 0.2139 | 30.87 | 11.04 | 41.91 | 53.05 | -11.14 | Average |
| 0.6219 | 20.33 | 10.29 | 30.62 | 56.00 | -25.38 | Quasi-Peak |
| 0.6219 | 17.32 | 10.29 | 27.61 | 46.00 | -18.39 | Average |
| *15.6699 | 49.48 | 1.37 | 50.85 | 60.00 | -9.15 | Quasi-Peak |
| 15.6699 | 38.99 | 1.37 | 40.36 | 50.00 | -9.64 | Average |

Remark:
1. Factor = Insertion Loss + Cable Loss.
2. '*' means the worst case.



## 6.3 Radiated Emissions Measurement

### 6.3.1 Limit

Fcc part15.249 (a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Frequency of Emission (MHz) | Field Strength of fundamental (dBμV/m) | Field Strength of Harmonics(dBμV/m) |
|---|---|---|
| 902-928 | 94 | 54 |
| 2400-2483.5 | 94 | 54 |
| 5725-5875 | 94 | 54 |
| 24000-24250 | 108 | 68 |

Note: Field strength limits are specified at a distance of 3 meters. the above field strength limits in paragraphs of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Fcc part15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

| Frequency of Emission (MHz) | Field Strength | | Measurement Distance (meters) |
|---|---|---|---|
| | μV/m | dBμV/m | |
| 30-88 | 100 | 40 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

### 6.3.2 Test procedure

EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

### 6.3.3 Test Result

There is not detected blow 30MHz.

| EUT： | Nano RF Receiver | Model Name ： | RF612 |
|---|---|---|---|
| Temperature： | 23 ℃ | Test Data | 2012-09-28 |
| Pressure： | 1010 hPa | Relative Humidity： | 56% |
| Test Mode ： | TX | Test Voltage ： | DC 5.0 V from PC |
| Measurement Distance | 3 m | Frenqucy Range | 30MHz to 1GHz |
| RBW/VBW | 100KHz / 300KHz for spectrum, RBW=120KHz for receiver. | | |

(a) Antenna polarization: Horizontal

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 47.8260 | 27.43 | -13.60 | 13.83 | 40.00 | -26.17 | QUASIPEAK |
| 92.7871 | 37.20 | -15.05 | 22.15 | 43.50 | -21.35 | QUASIPEAK |
| 192.4185 | 32.91 | -14.82 | 18.09 | 43.50 | -25.41 | QUASIPEAK |
| 239.9874 | 36.73 | -11.86 | 24.87 | 46.00 | -21.13 | QUASIPEAK |
| 312.1792 | 35.76 | -9.56 | 26.20 | 46.00 | -19.80 | QUASIPEAK |
| ***701.7607** | **33.64** | **-1.30** | **32.34** | **46.00** | **-13.66** | **QUASIPEAK** |

(b) Antenna polarization: Vertical

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| ***48.8429** | **46.00** | **-15.42** | **30.58** | **40.00** | **-9.42** | **Quasi-Peak** |
| 71.5806 | 39.81 | -17.28 | 22.53 | 40.00 | -17.47 | Quasi-Peak |
| 93.1132 | 37.74 | -15.33 | 22.41 | 43.50 | -21.09 | Quasi-Peak |
| 216.0240 | 35.35 | -14.40 | 20.95 | 46.00 | -25.05 | Quasi-Peak |
| 312.1792 | 34.24 | -9.56 | 24.68 | 46.00 | -21.32 | Quasi-Peak |
| 801.7862 | 32.97 | -0.36 | 32.61 | 46.00 | -13.39 | Quasi-Peak |

Note: '*' means the worst case
Measurement Level = Reading Level + Factor
Factor=Ant Factor + Cable Loss

| EUT： | Nano RF Receiver | Model Name ： | RF612 |
|---|---|---|---|
| Temperature： | 253 ℃ | Test Data | 2012-09-28 |
| Pressure： | 1010 hPa | Relative Humidity： | 60% |
| Test Mode ： | TX | Test Voltage ： | DC 5.0 V from PC |
| Measurement Distance | 3m | Frenqucy Range | 1GHz to 18GHz |
| RBW/VBW | 1MHz/1MHz for Peak, 1MHz/10Hz for Average. | | |

(a) Antenna polarization: Horizontal

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2402.000 | 106.68 | -5.68 | 101.00 | 114.00 | -13.00 | PEAK |
| 2402.000 | 96.54 | -5.68 | 90.86 | 94.00 | -3.14 | AVERAGE |
| | | | | | | |
| 2400.000 | 51.58 | -5.70 | 45.88 | 74.00 | -28.12 | PEAK |
| 2400.000 | 39.65 | -5.70 | 33.95 | 54.00 | -20.05 | AVERAGE |
| 4804.000 | 55.27 | 5.06 | 60.33 | 74.00 | -13.67 | PEAK |
| ***4804.000** | **43.02** | **5.06** | **48.08** | **54.00** | **-5.92** | **AVERAGE** |
| 7206.000 | 42.67 | 7.03 | 49.70 | 74.00 | -24.30 | PEAK |
| 7206.000 | 31.38 | 7.03 | 38.41 | 54.00 | -15.59 | AVERAGE |

(b) Antenna polarization: Vertical

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2402.000 | 106.47 | -5.68 | 100.79 | 114.00 | -13.21 | PEAK |
| 2402.000 | 95.99 | -5.68 | 90.31 | 94.00 | -3.69 | AVERAGE |
| | | | | | | |
| 2400.000 | 50.74 | -5.70 | 45.04 | 74.00 | -28.96 | PEAK |
| 2400.000 | 38.52 | -5.70 | 32.82 | 54.00 | -21.18 | AVERAGE |
| 4804.000 | 53.66 | 5.06 | 58.72 | 74.00 | -15.28 | PEAK |
| ***4804.000** | **42.19** | **5.06** | **47.25** | **54.00** | **-6.75** | **AVERAGE** |
| 7206.000 | 42.37 | 7.03 | 49.40 | 74.00 | -24.60 | PEAK |
| 7206.000 | 32.65 | 7.03 | 39.68 | 54.00 | -14.32 | AVERAGE |

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

Low Channel 0: 2402 MHz

(a) Antenna polarization: Horizontal

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2440.000 | 106.12 | -5.36 | 100.76 | 114.0 0 | -13.24 | PEAK |
| 2440.000 | 96.22 | -5.36 | 90.86 | 94.00 | -3.14 | AVERAGE |
| | | | | | | |
| 4880.000 | 54.08 | 5.14 | 59.22 | 74.00 | -14.78 | PEAK |
| ***4880.000** | **42.56** | **5.14** | **47.70** | **54.00** | **-6.30** | **AVERAGE** |
| 7320.000 | 40.88 | 7.52 | 48.40 | 74.00 | -25.60 | PEAK |
| 7320.000 | 28.94 | 7.52 | 36.46 | 54.00 | -17.54 | AVERAGE |

(b) Antenna polarization: Vertical

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2440.000 | 106.09 | -5.36 | 100.73 | 114.00 | -13.27 | PEAK |
| 2440.000 | 96.28 | -5.36 | 90.92 | 94.00 | -3.08 | AVERAGE |
| | | | | | | |
| 4880.000 | 53.12 | 5.14 | 58.26 | 74.00 | -15.74 | PEAK |
| ***4880.000** | **43.43** | **5.14** | **48.57** | **54.00** | **-5.43** | **AVERAGE** |
| 7320.000 | 42.65 | 7.52 | 50.17 | 74.00 | -23.83 | PEAK |
| 7320.000 | 31.19 | 7.52 | 38.71 | 54.00 | -15.29 | AVERAGE |

Note: '*' means the worst case
Measurement Level = Reading Level + Factor
Factor=Ant Factor + Cable Loss
Middle Channel 38: 2440 MHz

(a) Antenna polarization: Horizontal

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2479.000 | 104.81 | -5.02 | 99.79 | 114.0 0 | -14.21 | PEAK |
| 2479.000 | 95.13 | -5.02 | 90.11 | 94.00 | -3.89 | AVERAGE |
| | | | | | | |
| 2483.500 | 49.57 | -4.98 | 44.59 | 74.00 | -29.41 | PEAK |
| 2483.500 | 37.54 | -4.98 | 32.56 | 54.00 | -21.44 | AVERAGE |
| 4958.000 | 53.52 | 5.21 | 58.73 | 74.00 | -15.27 | PEAK |
| ***4958.000** | **42.18** | **5.21** | **47.39** | **54.00** | **-6.61** | **AVERAGE** |
| 7437.000 | 40.59 | 8.04 | 48.63 | 74.00 | -25.37 | PEAK |
| 7437.000 | 28.80 | 8.04 | 36.84 | 54.00 | -17.16 | AVERAGE |

(b) Antenna polarization: Vertical

| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|
| 2479.000 | 107.46 | -5.02 | 102.44 | 114.00 | -11.56 | PEAK |
| 2479.000 | 95.26 | -5.02 | 90.24 | 94.00 | -3.76 | AVERAGE |
| | | | | | | |
| 2483.500 | 51.12 | -4.98 | 46.14 | 74.00 | -27.86 | PEAK |
| 2483.500 | 38.46 | -4.98 | 33.48 | 54.00 | -20.52 | AVERAGE |
| 4958.000 | 52.28 | 5.21 | 57.49 | 74.00 | -16.51 | PEAK |
| ***4958.000** | **41.49** | **5.21** | **46.70** | **54.00** | **-7.30** | **AVERAGE** |
| 7437.000 | 42.24 | 8.04 | 50.28 | 74.00 | -23.72 | PEAK |
| 7437.000 | 31.83 | 8.04 | 39.87 | 54.00 | -14.13 | AVERAGE |

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

High Channel 77: 2479 MHz

### 6.3.4 TEST RESULTS (Restricted Bands Requirements)

| | | | |
|---|---|---|---|
| EUT： | Nano RF Receiver | Model Name ： | RF612 |
| Temperature： | 25 ℃ | Test Data | 2012-09-28 |
| Pressure： | 1010 hPa | Relative Humidity： | 60% |
| Test Mode ： | TX | Test Voltage ： | DC 5.0 V from PC |
| Note： | 1. The transmitter was setup to transmit at the lowest channel. Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel. Then the field strength was measured at 2483.5-2500 MHz. | | |

| Test Mode | Ant.Pol. H/V | Freq. (MHz) | Reading | | Ant/CF CF(dB) | Act | | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Peak (dBuv) | AV (dBuv) | | Peak (dBuv/m) | AV (dBuv/m) | Peak (dBuv/m) | AV (dBuv/m) |
| TX | H | 2390.00 | 50.58 | 38.65 | -5.70 | 44.88 | 32.95 | 74.00 | 54.00 |
| | V | 2390.00 | 49.74 | 37.52 | -5.70 | 44.04 | 31.82 | 74.00 | 54.00 |
| | H | 2483.50 | 49.57 | 37.54 | -4.98 | 44.59 | 32.56 | 74.00 | 54.00 |
| | V | 2483.50 | 51.12 | 38.46 | -4.98 | 46.14 | 33.48 | 74.00 | 54.00 |

## 6.4 Band edges

### 6.4.1 Limit

Fcc part15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

### 6.4.2 Test procedure

(1) Connected the antenna port to the Spectrum Analyzer, set the Spectrum Analyzer as RBW=100KHz,VBW≧RBW, Sweep time=Auto, Detector Function=Peak

(2) The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.

(3) The above procedure shall be repeated at the lowest, and the highest frequency of the stated frequency range.

### 6.4.3 Test Result

Please refer to report section 6.2.3 which met the requirement of limits in 15.209

## 6.5 Occupied Bandwidth

### 6.5.1 Test procedure

(1) Connected the antenna port to the Spectrum Analyzer , set the Spectrum Analyzer as RBW=100kHz,VB𝕎≧RBW,Sweep time=Auto, Detector Function=Peak

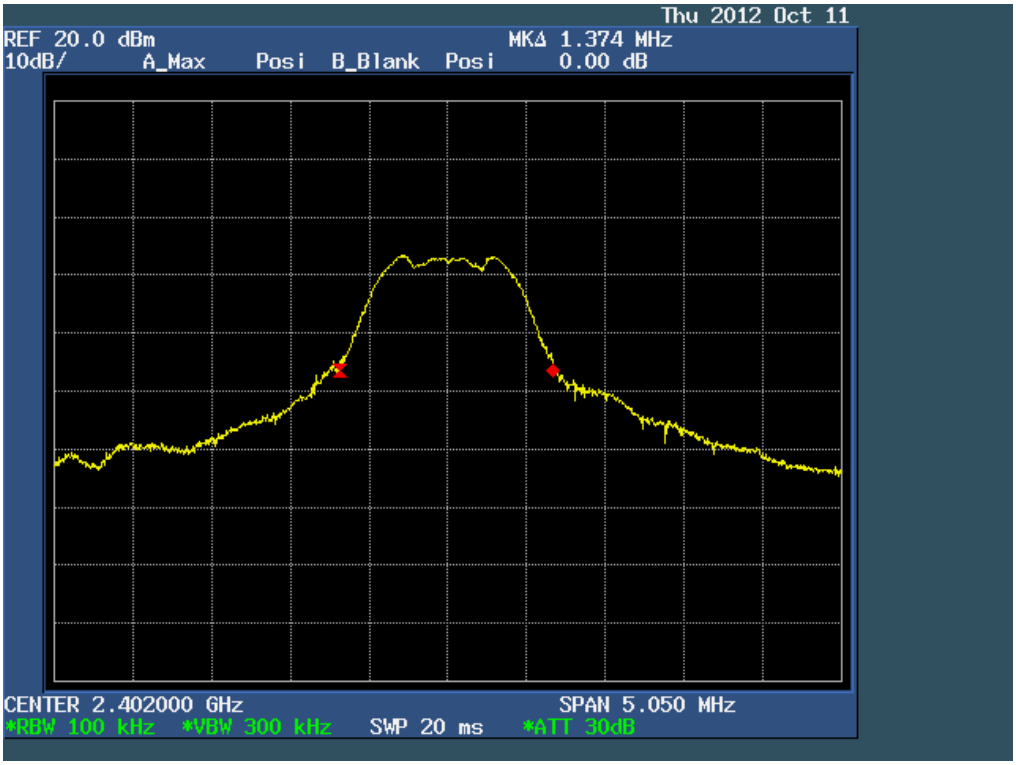
(2) The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission.

(3) The above procedure shall be repeated at the lowest, the middle, and the highest frequency of the stated frequency range with modulated mode. also shall be performed at different modes of operation

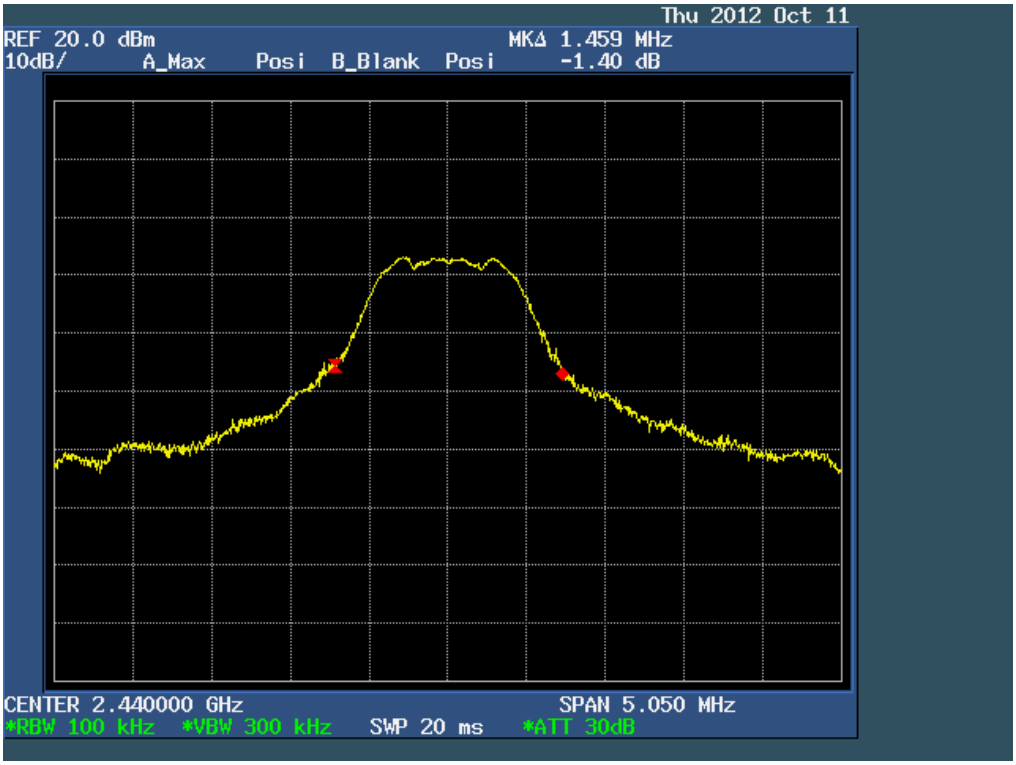
### 6.5.2 Test Result

| channel | Channel frenqucy (MHz) | 20dB bandwidth (MHz) | Limit (MHz) | Conclusion |
|---|---|---|---|---|
| Low | 2402 | 1.374 | N/A | Pass |
| Mid | 2440 | 1.459 | N/A | Pass |
| High | 2479 | 1.485 | N/A | Pass |

**The Lowest Channel 00: 2402MHz**




**The Middle Channel 38: 2440MHz**



**The High Channel 77: 2479MHz**