

BUREAU
VERITAS

Test Report No.: FC120627N027

TEST REPORT



| | |
|------------|---|
| Applicant: | Disruptive Ltd. |
| Address: | Windsor House, Turnpike Road, High Wycombe, Bucks, HP12 3NR, UK |

| | | |
|--------------------------------------|---|---|
| Manufacturer or Supplier | Disruptive Ltd. |  |
| Address | Windsor House, Turnpike Road, High Wycombe, Bucks, HP12 3NR, UK | |
| Product: | HouseParty Rise Wireless | |
| Brand Name: | gear4 | |
| Model: | PG732US | |
| Additional Model & Model Difference: | See Section 3.1 | |
| Date of tests: | June 28 ~ July 23, 2012 | |

the tests have been carried out according to the requirements of the following standards:

☒ FCC Part 15, Subpart C (Section 15.249)

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

| | |
|---|---|
| Prepared by Glyn He Project Engineer / EMC Department | Approved by Sam Tung Manager / EMC Department |
|  |  |

Date: July 23, 2012

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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|------------------|--------------------------|--------------------|
| Original release | N/A | July 23, 2012 |



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249) | | | |
|---|------------------------------|--------|-----------|
| STANDARD SECTION | TEST TYPE AND LIMIT | RESULT | REMARK |
| §15.203 | Antenna Requirement | PASS | Compliant |
| §15.207 (a) | Conducted Emission | PASS | Compliant |
| §15.205 | Restricted Band of Operation | PASS | Compliant |
| §15.209 §15.249(a) | Radiated Emission | PASS | Compliant |
| §15.215(c) | 20dB Bandwidth Test | PASS | Compliant |

2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| MEASUREMENT | FREQUENCY | UNCERTAINTY |
|---------------------|-----------------|-------------|
| Conducted emissions | 9kHz~30MHz | 2.44dB |
| Radiated emissions | 30MHz ~ 200MHz | 3.19dB |
| | 200MHz ~1000MHz | 3.21dB |
| | 1GHz ~ 18GHz | 2.26dB |
| | 18GHz ~ 40GHz | 1.94dB |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|------------------------------|---|
| PRODUCT | HouseParty Rise Wireless |
| MODEL NO. | PG732US, PG732EUK, PG732RW |
| FCC ID | YNKPG732 |
| NOMINAL VOLTAGE | DC 9V By Adapter |
| MODULATION TECHNOLOGY | FHSS |
| MODULATION TYPE | GFSK, 8DPSK, $\pi/4$ DPSK |
| OPERATING FREQUENCY | 2402-2480MHz |
| ANTENNA TYPE | Integral PCB Antenna; 0dBi gain |
| I/O PORTS | DC input Port, AUX in Port, USB output Port |
| DATA CABLE SUPPLIED | N/A |

NOTE:

1. The EUT was powered by the following adapters:

| ADAPTER | |
|----------|-------------------------------|
| BRAND: | gear4 |
| MODEL: | SFF0900200U1BA |
| INPUT: | 100-240V~, 50/60Hz, 0.4A |
| OUTPUT: | 9.0V, 2.0A |
| DC LINE: | Unshielded, Undetachable 1.5m |

- 2 Additional models PG732EUK, PG732RW are identical with the test model PG732US except the model number for marketing purpose.
- 3 For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 4 For the test results, the EUT had been tested with all conditions. But only the worst case was showed in test report.



3.2 DESCRIPTION OF TEST MODES

Following channel(s) was (were) selected for the test as listed below.

| TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE | PACKET TYPE |
|-------------------|-----------------------|-----------------|-----------|-------------|
| Low, Middle, High | FHSS | GFSK | 1M/2M/3M | DH1/3/5 |
| Low, Middle, High | FHSS | 8DPSK | 1M/2M/3M | DH1/3/5 |
| Low, Middle, High | FHSS | $\pi/4$ DPSK | 1M/2M/3M | DH1/3/5 |

| CHANNEL NUMBER | TESTED CHANNEL | TESTED FREQUENCY |
|----------------|----------------|------------------|
| 0 | Low | 2402 MHz |
| 39 | Mid. | 2441 MHz |
| 78 | High | 2480 MHz |

After estimating all the combination of every test mode, the result shown as below is the worst case

| TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE | PACKET TYPE |
|-------------------|-----------------------|-----------------|-----------|-------------|
| Low, Middle, High | FHSS | GFSK | 3M | DH5 |



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.249)

ANSI C63.4-2003

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

NOTE: It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Verification). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

◆ FOR CONDUCTED EMISSION MEASUREMENT

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|-----|----------|-------|-----------|-------------|--------|
| 1 | iPhone 4 | APPLE | A1332 | 81124KCJA4S | N/A |

| NO. | DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|--|
| 1 | AC Line :Unshielded, Detachable 1.5m |
| 2 | Audio Cable: Unshielded, Detachable 1.2m |
| 3 | USB Cable: Unshielded, Detachable 1.2m |

NOTE:



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB μ V) | |
|-----------------------------|------------------------------|----------|
| | Quasi-peak | Average |
| 0.15 ~ 0.5 | 66 to 56 | 56 to 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

- NOTE:** 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|---|-----------------|------------|---------------------|-------------------------|
| EMI Test Receiver Rohde&Schwarz | ESU 26 | 100005 | May 15,12 | May 14,13 |
| Artificial Mains Network Rohde&Schwarz | ENV216 | 101173 | May 15,12 | May 14,13 |
| Artificial Mains Network Rohde&Schwarz | ESH2-Z5 | 100071 | May 15,12 | May 14,13 |
| Test software | ADT_Cond_V7.3.7 | N/A | N/A | N/A |

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA
2. The test was performed in Dongguan Shielded Room 553.



4.1.3 TEST PROCEDURES

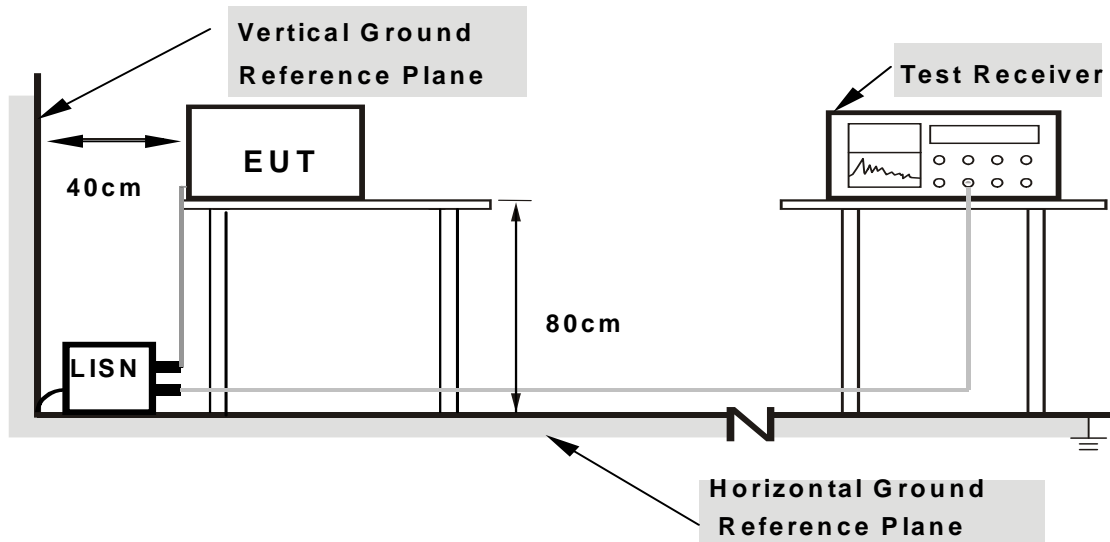
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- a. Set the EUT under full load condition and placed them on a testing table.
- b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.



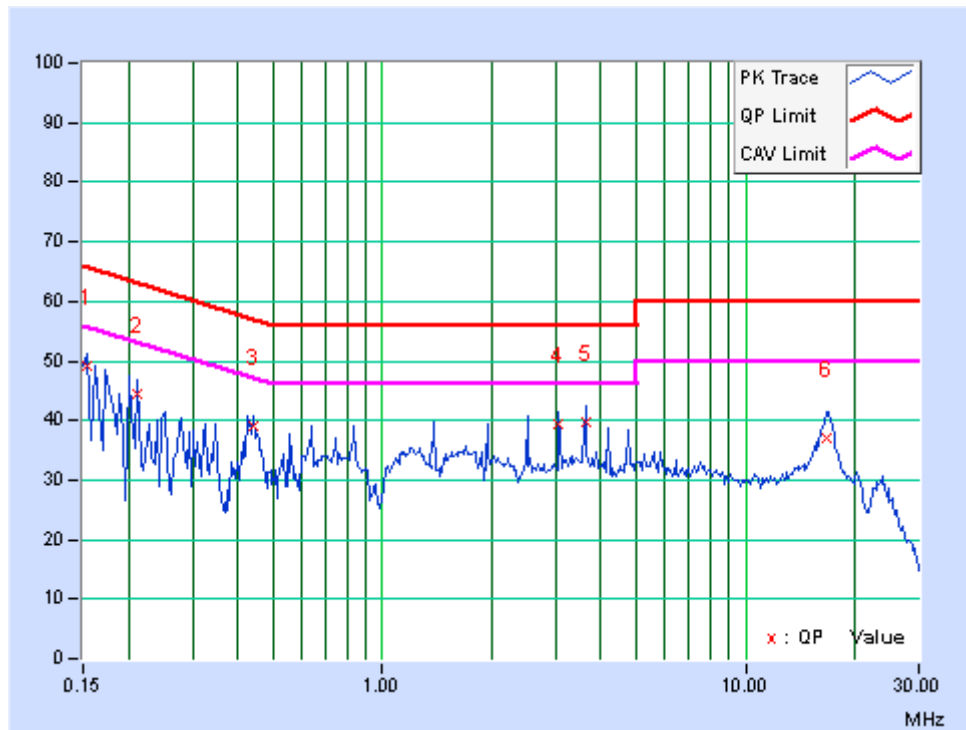
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA

| | | | |
|-------|--------|---------------|------|
| PHASE | Line 1 | 6dB BANDWIDTH | 9kHz |
|-------|--------|---------------|------|

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|----|-------------|-------------------|-------------------------|-------|--------------------------|-------|-----------------|-------|-------------|--------|
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15391 | 10.64 | 38.43 | 20.65 | 49.07 | 31.29 | 65.79 | 55.79 | -16.71 | -24.49 |
| 2 | 0.21256 | 10.45 | 34.07 | 19.65 | 44.52 | 30.1 | 63.1 | 53.1 | -18.58 | -23.00 |
| 3 | 0.43934 | 10.31 | 28.71 | 19.9 | 39.02 | 30.21 | 57.07 | 47.07 | -18.06 | -16.87 |
| 4 | 3.06579 | 9.96 | 29.41 | 24.12 | 39.37 | 34.08 | 56 | 46 | -16.63 | -11.92 |
| 5 | 3.62101 | 9.94 | 29.88 | 23.84 | 39.82 | 33.78 | 56 | 46 | -16.18 | -12.22 |
| 6 | 16.64522 | 10.12 | 26.9 | 21.63 | 37.02 | 31.75 | 60 | 50 | -22.98 | -18.25 |

- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

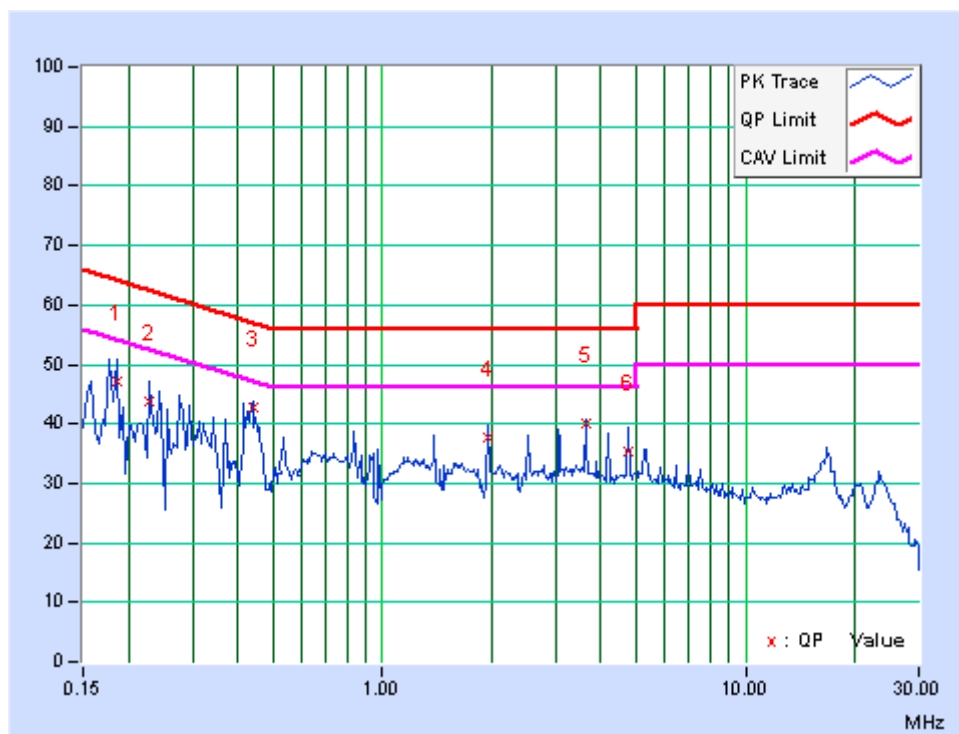




| | | | |
|-------|---------|---------------|------|
| PHASE | Neutral | 6dB BANDWIDTH | 9kHz |
|-------|---------|---------------|------|

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|----|----------------|-------------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|----------------|--------|
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.18519 | 10.48 | 36.75 | 22.19 | 47.23 | 32.67 | 64.25 | 54.25 | -17.02 | -21.58 |
| 2 | 0.2282 | 10.37 | 33.50 | 20.66 | 43.87 | 31.03 | 62.51 | 52.51 | -18.64 | -21.48 |
| 3 | 0.43934 | 10.45 | 32.18 | 23.15 | 42.63 | 33.60 | 57.07 | 47.07 | -14.45 | -13.48 |
| 4 | 1.95144 | 9.59 | 27.99 | 25.99 | 37.58 | 35.58 | 56 | 46 | -18.42 | -10.42 |
| 5 | 3.62492 | 9.65 | 30.40 | 24.49 | 40.05 | 34.14 | 56 | 46 | -15.95 | -11.86 |
| 6 | 4.73927 | 9.70 | 25.66 | 22.01 | 35.36 | 31.71 | 56 | 46 | -20.64 | -14.29 |

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| FREQUENCIES (MHz) | FIELD STRENGTH (microvolts/meter) | MEASUREMENT DISTANCE (meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 |
| 1.705 ~ 30.0 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental Frequency | Field strength of fundamental (milli-volts/meter) | Field strength of harmonics (micro-volts/meter) |
|--------------------------|---|---|
| 902-928 MHz | 50 | 500 |
| 2400-2483.5 MHz | 50 | 500 |
| 5725-5875 MHz | 50 | 500 |
| 24.0-24.25 GHz | 250 | 2500 |

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

**4.2.2 TEST INSTRUMENTS**

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|--|--------------------------|-----------------|---------------------|-------------------------|
| Spectrum Analyzer ROHDE & SCHWARZ | E4446A | MY46180622 | May 02, 12 | May 01, 13 |
| Test Receiver ROHDE & SCHWARZ | ESVD | 847398/003 | May 15,12 | May 14,13 |
| Bilog Antenna TESEQ | CBL 6111D | 27089 | July 16,12 | July 15,13 |
| Horn Antenna EMCO | 3117 | 00062558 | Nov.07,11 | Nov.07,12 |
| 10m Semi-anechoic Chamber ETS-LINDGREN | 21.4m*12.1m*8.8m | NSEMC006 | Mar 24,12 | Mar 23,13 |
| RF Cable IMRO | IMRO-400 | 10m Cable 1#10m | May 16,12 | May 15,13 |
| RF Cable IMRO | IMRO-400 | 10m Cable 2#3m | May 16,12 | May 15,13 |
| Signal Amplifier SONOMA | 310N | 186955 | Mar. 14,12 | Mar. 13,13 |
| Signal Amplifier HP | 8449B | 3008A00409 | May 31,12 | May 30,13 |
| RF Cable DRAKA | M06/25-RG102 | 10m Cable 2# | May 16,12 | May 15,13 |
| Test software ADT | ADT_Radiated_V7. 6.15 | N/A | N/A | N/A |

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.
 2. The test was performed in Dongguan Chamber 10m.
 3. The horn antenna are used only for the measurement of emission frequency above 1GHz if tested.



4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

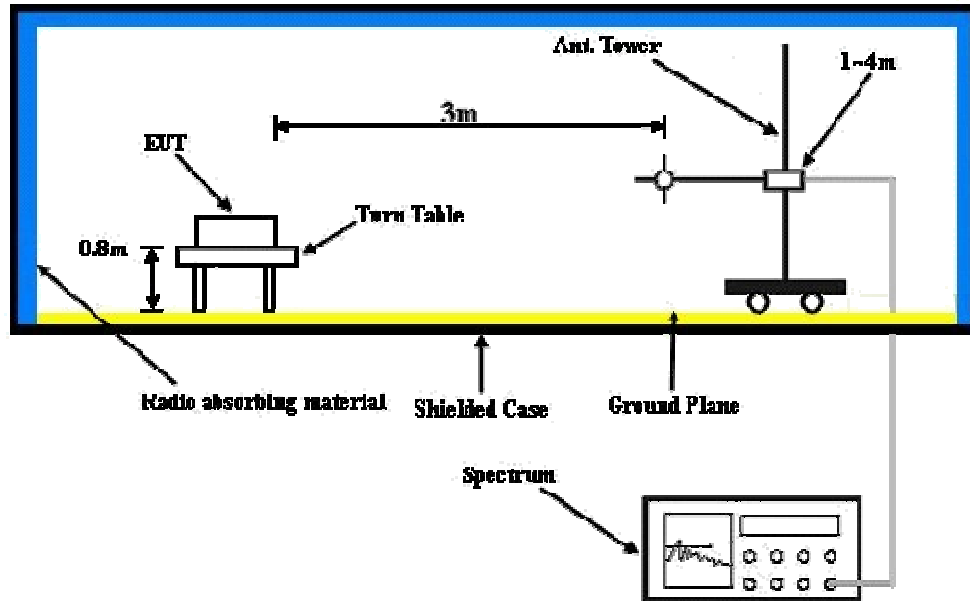
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

- Set the EUT under full load condition and placed them on a testing table.
- Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.

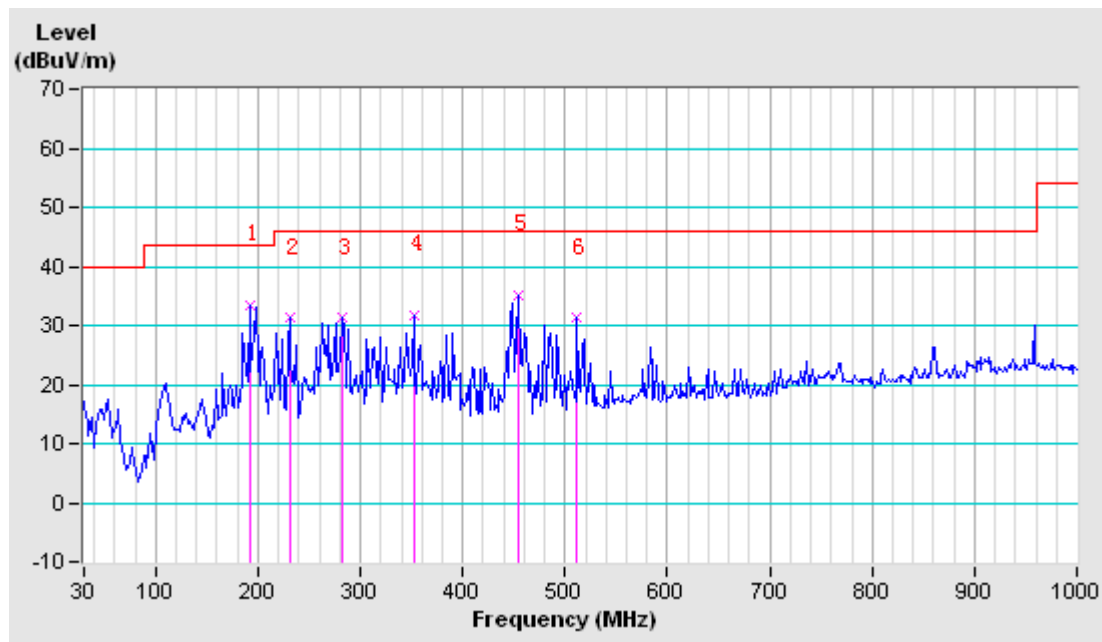


4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA: GFSK DH5

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------|
| CHANNEL | Channel 39 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH | TESTED BY | Glyn |

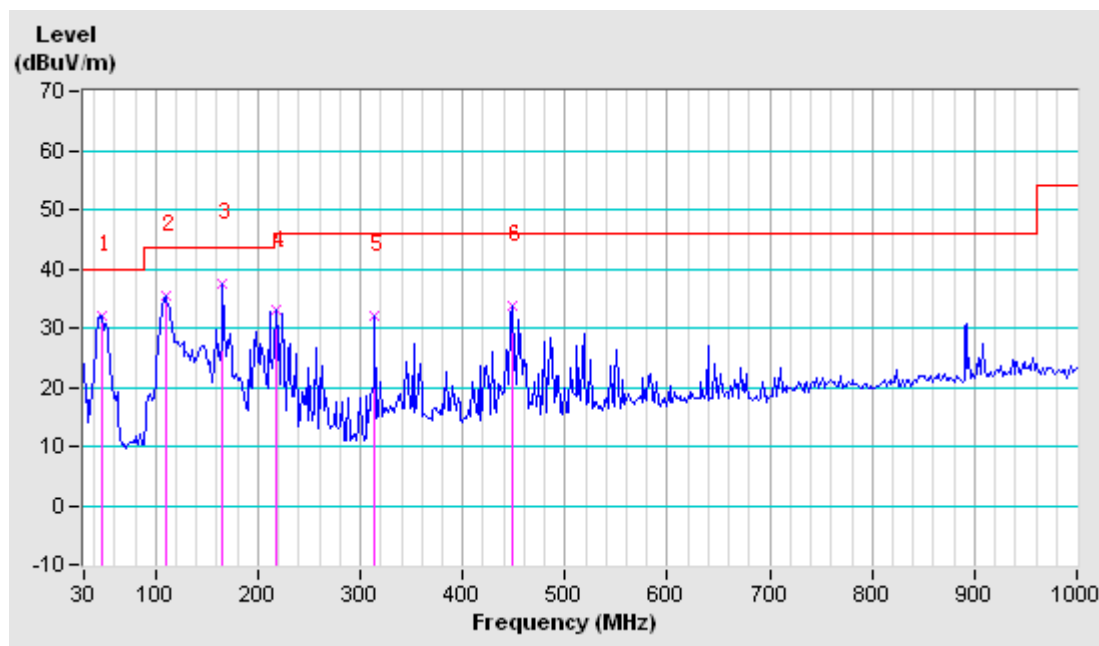
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M | | | | | | | | |
|--|-------------|--------------------------|------------------|-------------------------|----------------|-------------|---------------------|----------------------|
| No. | Freq. (MHz) | Correction Factor (dB/m) | Raw Value (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (cm) | Table Angle (Degree) |
| 1 | 191.67 | 10.26 | 23.22 | 33.48 | 43.5 | -10.02 | 315 | 69 |
| 2 | 230.47 | 11.84 | 19.39 | 31.23 | 46 | -14.77 | 400 | 224 |
| 3 | 282.2 | 14.84 | 16.37 | 31.21 | 46 | -14.79 | 367 | 129 |
| 4 | 351.72 | 16.42 | 15.34 | 31.76 | 46 | -14.24 | 397 | 164 |
| 5 | 455.18 | 19.22 | 15.83 | 35.05 | 46 | -10.95 | 340 | 98 |
| 6 | 511.77 | 20.51 | 10.72 | 31.23 | 46 | -14.77 | 400 | 266 |





| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------|
| CHANNEL | Channel 39 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH | TESTED BY | Glyn |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M | | | | | | | | |
|--|-------------|--------------------------|------------------|-------------------------|----------------|-------------|---------------------|----------------------|
| No. | Freq. (MHz) | Correction Factor (dB/m) | Raw Value (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (cm) | Table Angle (Degree) |
| 1 | 47.78 | 10.8 | 21.29 | 32.09 | 40 | -7.91 | 100 | 2 |
| 2 | 109.22 | 12.03 | 23.34 | 35.37 | 43.5 | -8.13 | 100 | 195 |
| 3 | 165.8 | 11.25 | 26.15 | 37.4 | 43.5 | -6.1 | 100 | 52 |
| 4 | 217.53 | 10.96 | 21.95 | 32.91 | 46 | -13.09 | 100 | 249 |
| 5 | 314.53 | 15.32 | 16.83 | 32.15 | 46 | -13.85 | 100 | 308 |
| 6 | 448.72 | 19.01 | 14.8 | 33.81 | 46 | -12.19 | 100 | 216 |



- REMARKS:**
1. Emission level (dBuV/m) = Reading (dBuV) + Factor (dB/m).
 2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



ABOVE 1GHz WORST-CASE DATA: GFSK DH5

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 0 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH | TESTED BY | Glyn |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390(PK) | 59.48 | 74 | -14.52 | 3.10 H | 0 | 23.07 | 36.41 |
| 2 | 2390(AV) | 38.65 | 54 | -15.35 | 3.10 H | 0 | 2.24 | 36.41 |
| 3 | *2402(PK) | 84.12 | 114 | -29.88 | 3.25 H | 325 | 47.6 | 36.52 |
| 4 | *2402(AV) | 54.02 | 94 | -39.98 | 3.25 H | 325 | - | - |
| 5 | 4804(PK) | 62.27 | 74 | -11.73 | 2.80 H | 85 | 13.02 | 49.25 |
| 6 | 4804(AV) | 32.17 | 54 | -21.83 | 2.80 H | 85 | - | - |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390(PK) | 59.57 | 74 | -14.43 | 1.0 V | 236 | 23.16 | 36.41 |
| 2 | 2390(AV) | 39.55 | 54 | -14.45 | 1.0 V | 236 | 3.14 | 36.41 |
| 3 | *2402(PK) | 85.22 | 114 | -28.78 | 1.0 V | 258 | 48.70 | 36.52 |
| 4 | *2402(AV) | 55.12 | 94 | -38.88 | 1.0 V | 258 | - | - |
| 5 | 4804(PK) | 63.58 | 74 | -10.42 | 1.0 V | 346 | 14.33 | 49.25 |
| 6 | 4804(AV) | 33.48 | 54 | -20.52 | 1.0 V | 346 | - | - |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ”: Fundamental frequency.
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: $20\log(3.125 / 100) = -30.1$ dB.
 7. Average value = peak reading + $20\log(\text{duty cycle})$.



| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 39 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH | TESTED BY | Glyn |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2441(PK) | 85.52 | 114 | -28.48 | 3.25 H | 135 | 48.65 | 36.87 |
| 2 | *2441(AV) | 55.42 | 94 | -38.58 | 3.25 H | 135 | - | - |
| 3 | 4882(PK) | 66.08 | 74 | -7.92 | 3.30 H | 228 | 16.85 | 49.23 |
| 4 | 4882(AV) | 35.98 | 54 | -18.02 | 3.30 H | 228 | - | - |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2441(PK) | 84.12 | 114 | -29.88 | 1.0 V | 33 | 47.25 | 36.87 |
| 2 | *2441(AV) | 54.02 | 94 | -39.98 | 1.0 V | 33 | - | - |
| 3 | 4882(PK) | 64.09 | 74 | -9.91 | 1.0 V | 165 | 14.86 | 49.23 |
| 4 | 4882(AV) | 33.99 | 54 | -20.01 | 1.0 V | 165 | - | - |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ”: Fundamental frequency.
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: $20\log(3.125 / 100) = -30.1 \text{ dB}$.
 7. Average value = peak reading + $20\log(\text{duty cycle})$.



| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 78 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 68%RH | TESTED BY | Glyn |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2483.5(PK) | 60.54 | 74 | -13.46 | 3.00 H | 144 | 24.83 | 35.71 |
| 2 | 2483.5(AV) | 43.19 | 54 | -10.81 | 3.00 H | 144 | 7.48 | 35.71 |
| 3 | *2480(PK) | 84.73 | 114 | -29.27 | 3.45 H | 325 | 47.52 | 37.21 |
| 4 | *2480(AV) | 54.63 | 94 | -39.37 | 3.45 H | 325 | - | - |
| 5 | 4960(PK) | 67.99 | 74 | -6.01 | 3.35 H | 65 | 18.78 | 49.21 |
| 6 | 4960(AV) | 37.89 | 54 | -16.11 | 3.35 H | 65 | - | - |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2483.5(PK) | 59.85 | 74 | -14.15 | 1.00 V | 185 | 24.14 | 35.71 |
| 2 | 2483.5(AV) | 42.46 | 54 | -11.54 | 1.00 V | 185 | 6.75 | 35.71 |
| 3 | *2480(PK) | 82.69 | 114 | -31.31 | 1.25 V | 355 | 45.48 | 37.21 |
| 4 | *2480(AV) | 52.59 | 94 | -41.41 | 1.25 V | 355 | - | - |
| 5 | 4960(PK) | 68.1 | 74 | -5.9 | 1.10 V | 0 | 18.89 | 49.21 |
| 6 | 4960(AV) | 38.0 | 54 | -16.0 | 1.10 V | 0 | - | - |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ”: Fundamental frequency.
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625×5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: $20\log(3.125 / 100) = -30.1$ dB.
 7. Average value = peak reading + $20\log(\text{duty cycle})$.



4.3 20dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|--|--------------------------|----------------|---------------------|-------------------------|
| Spectrum Analyzer ROHDE & SCHWARZ | E4446A | MY46180622 | May 02, 12 | May 01, 13 |
| Horn Antenna EMCO | 3117 | 00062558 | Oct.19, 11 | Oct.19, 12 |
| 10m Semi-anechoic Chamber ETS-LINDGREN | 21.4m*12.1m*8.8m | NSEMC006 | Mar 24,12 | Mar 23,13 |
| RF Cable IMRO | IMRO-400 | 10m Cable 2#3m | May 16,12 | May 15,13 |
| Signal Amplifier EMCI | EMC 012645 | 980077 | Nov 07,11 | Nov 07,12 |
| RF Cable DRAKA | M06/25-RG102 | 10m Cable 2# | May 16,12 | May 15,13 |
| Test software ADT | ADT_Radiated_V7. 6.15 | N/A | N/A | N/A |

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA

2. The test was performed in Dongguan Chamber 10m.



4.3.3 TEST PROCEDURE

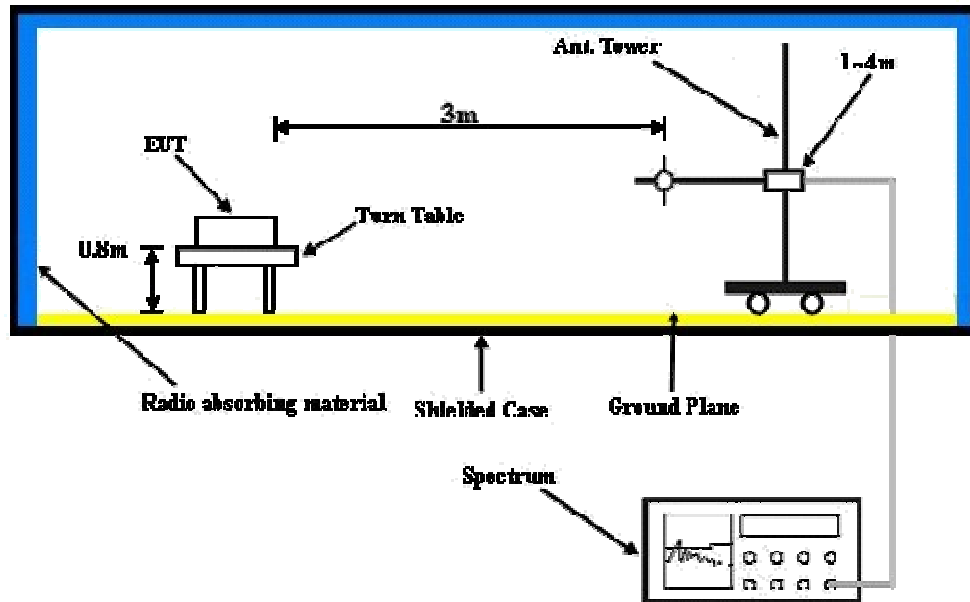
The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. At the frequency band of 30MHz to 1GHz, The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations.

The spectrum analyzer was receiving the maximum emission level. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

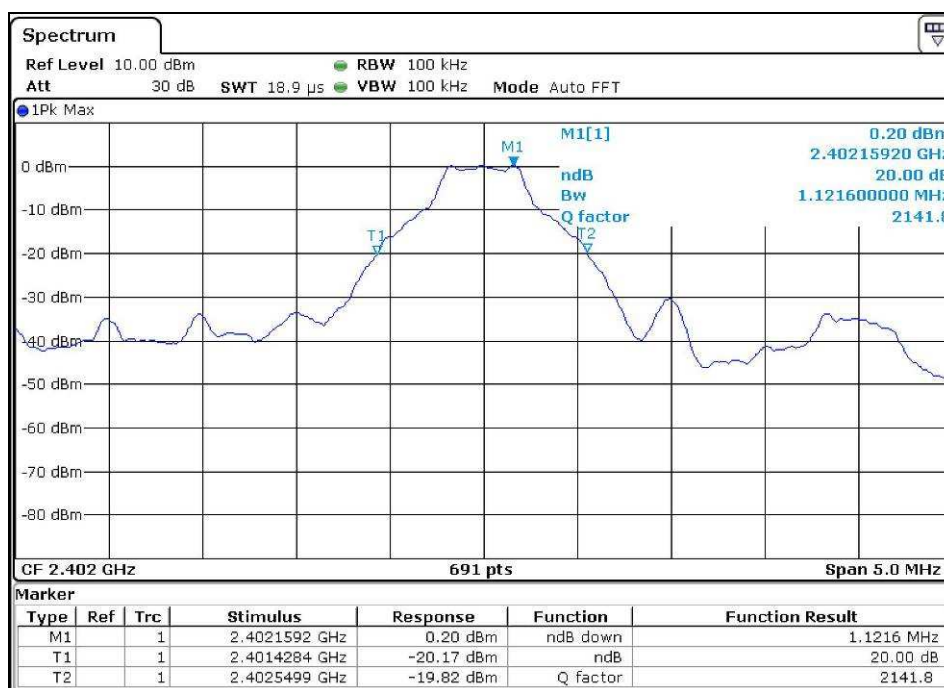
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

GFSK DH5

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (MHz) |
|---------|-------------------------|----------------------|
| Low | 2402 | 1.1216 |
| Middle | 2441 | 1.1216 |
| High | 2480 | 1.1216 |

Test Data: Low channel

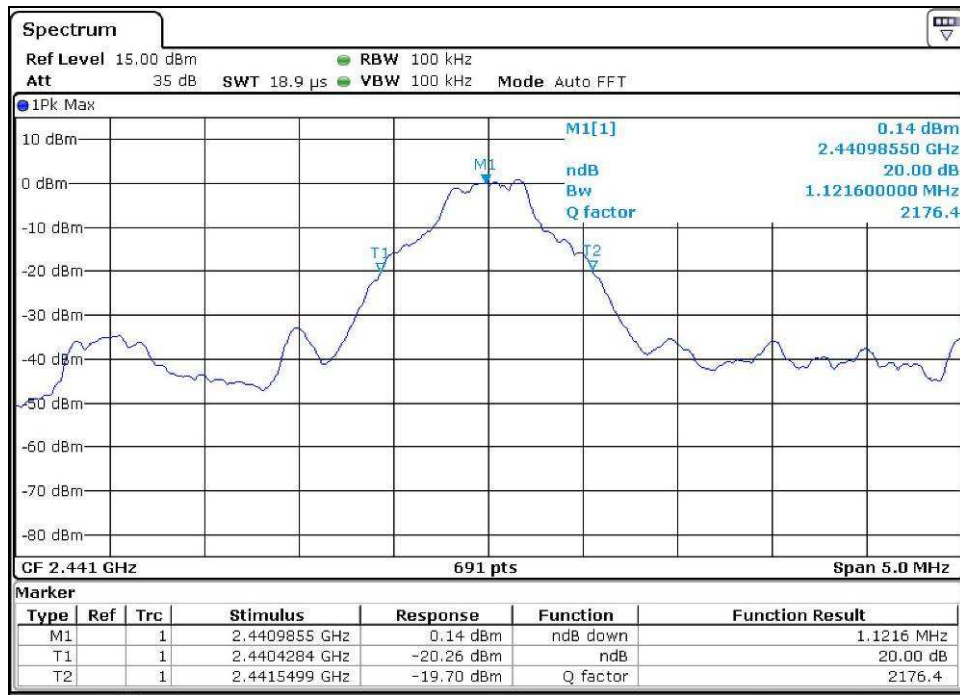




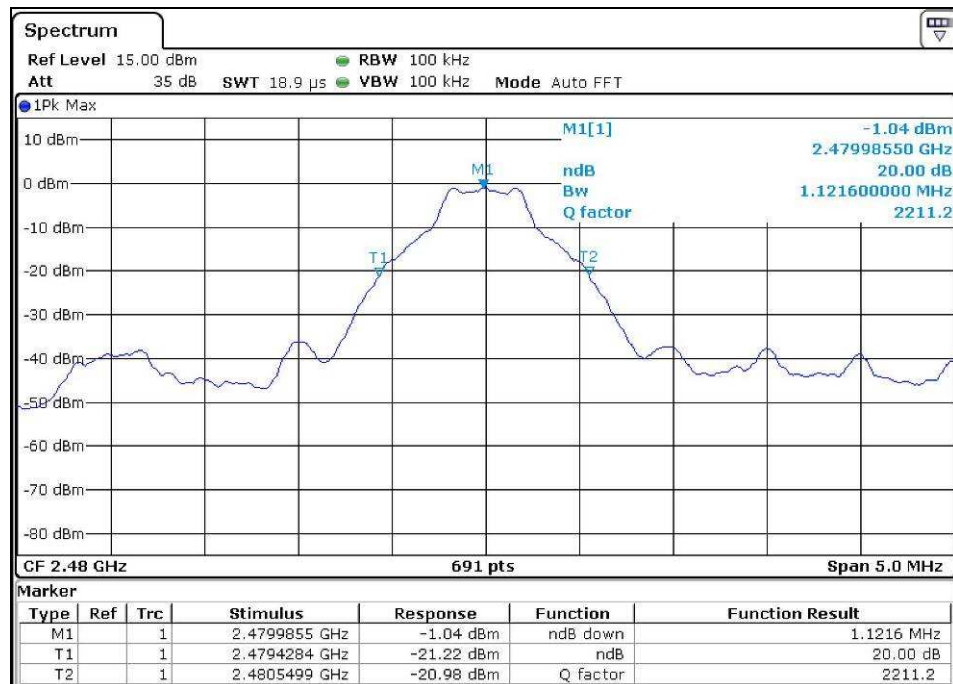
BUREAU
VERITAS

Test Report No.: FC120627N027

Test Data: Middle channel



Test Data: High channel

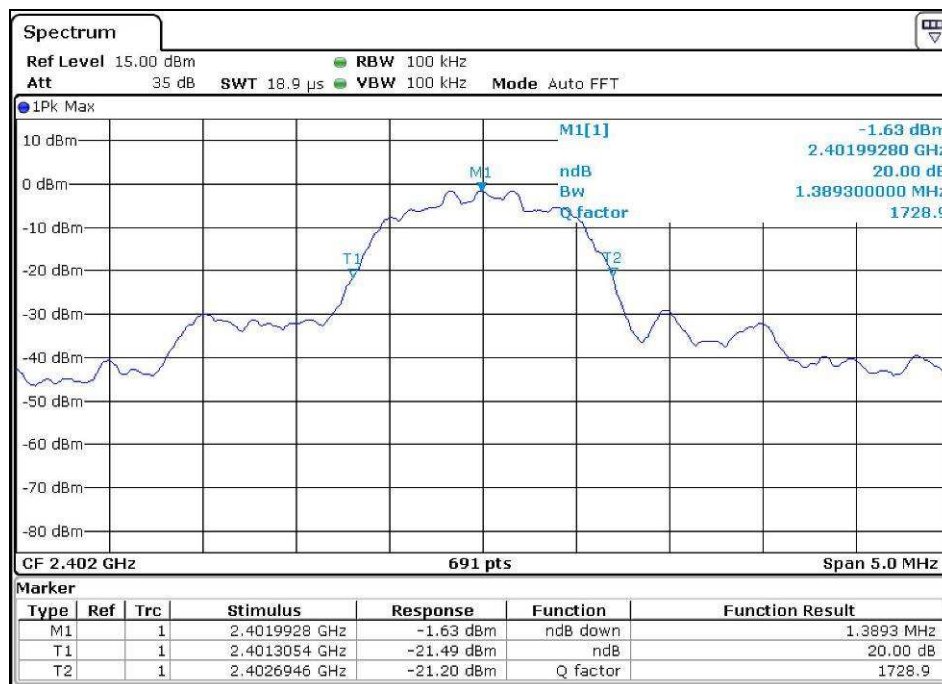




8DPSK DH5

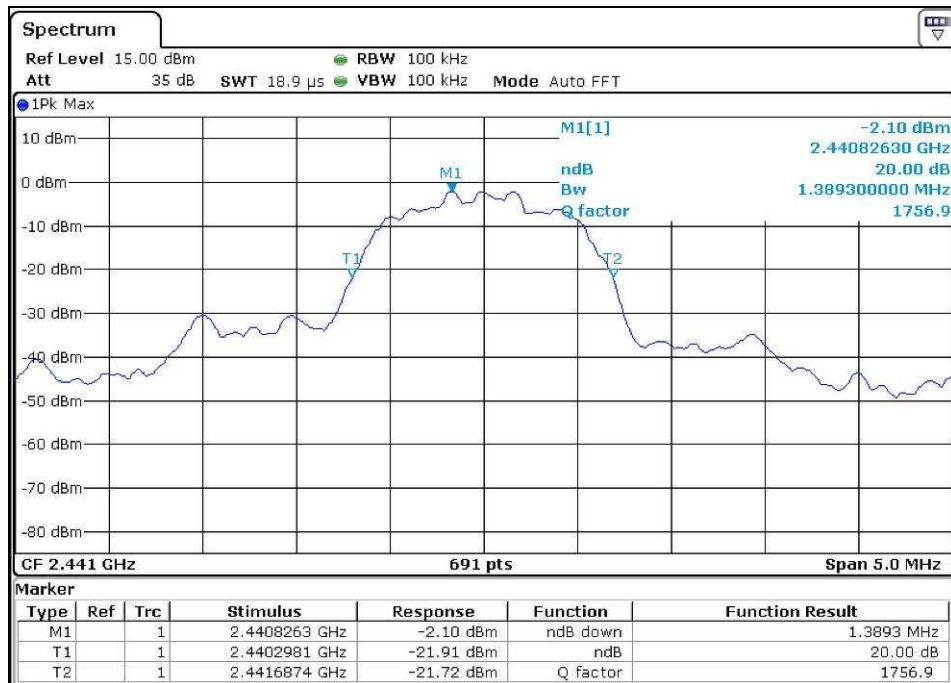
| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (MHz) |
|---------|-------------------------|----------------------|
| Low | 2402 | 1.3893 |
| Middle | 2441 | 1.3893 |
| Hight | 2480 | 1.3893 |

Test Data: Low channel

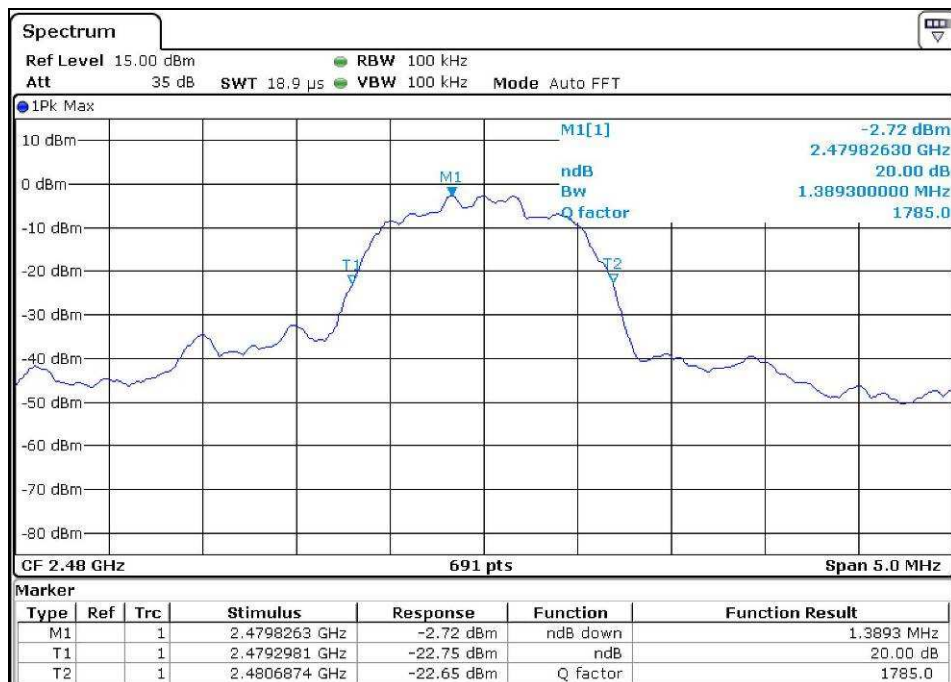




Test Data: Middle channel



Test Data: High channel

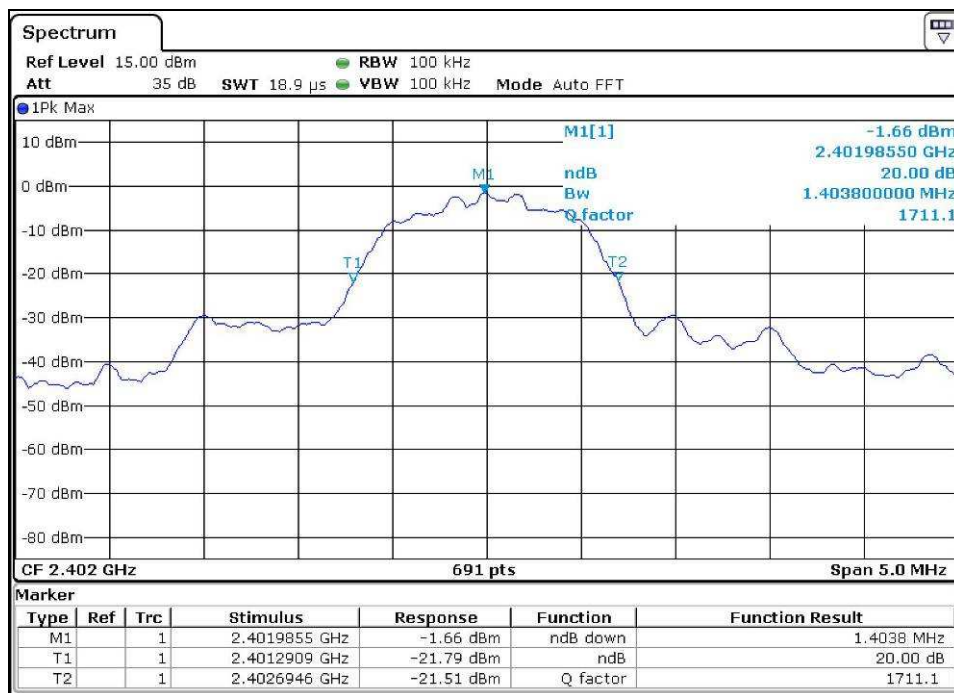




$\pi/4$ DPSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (MHz) |
|---------|-------------------------|----------------------|
| Low | 2402 | 1.4038 |
| Middle | 2441 | 1.4038 |
| Hight | 2480 | 1.4038 |

Test Data: Low channel

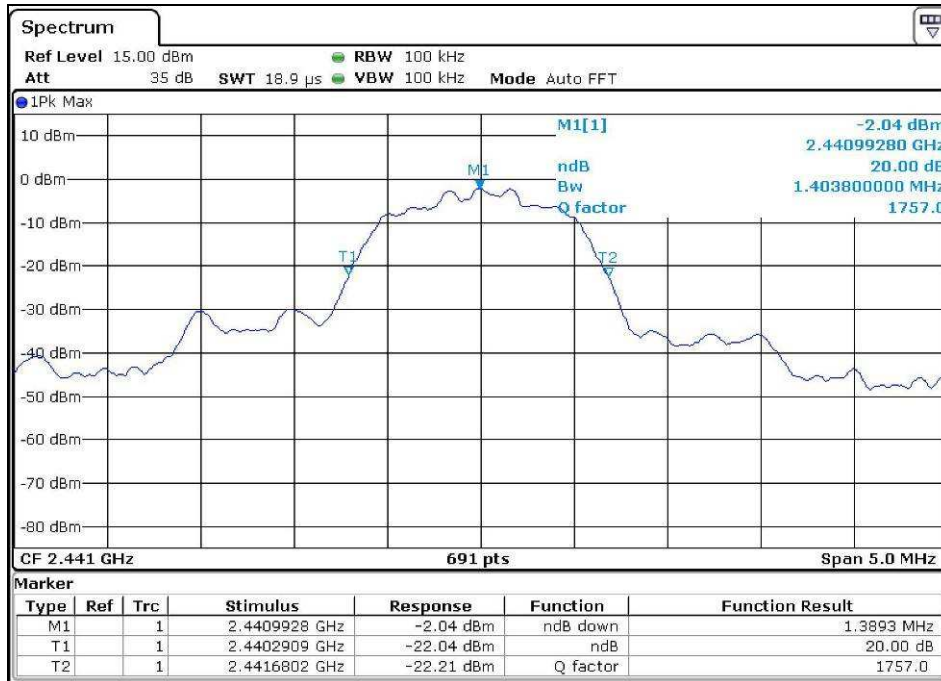




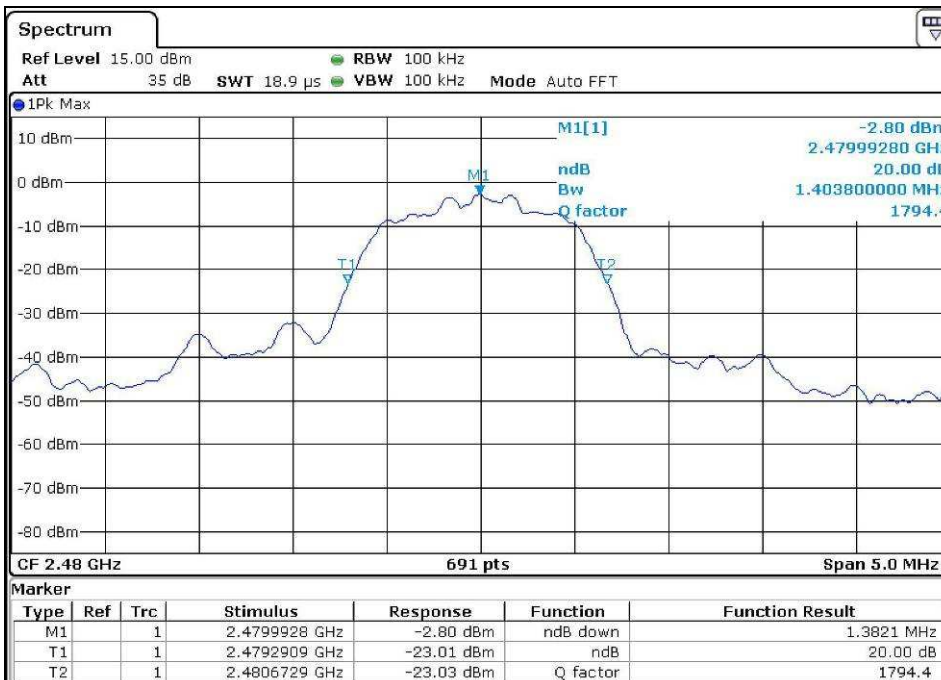
BUREAU
VERITAS

Test Report No.: FC120627N027

Test Data: Middle channel



Test Data: High channel





**BUREAU
VERITAS**

Test Report No.: FC120627N027

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



**BUREAU
VERITAS**

Test Report No.: FC120627N027

6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---