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FCC TEST REPORT

REPORT NO.: RF990501C03

MODEL NO.: PA3844D

RECEIVED: May 1, 2010

TESTED: May 4 ~ 7, 2010

ISSUED: May 11, 2010

APPLICANT: Toshiba Corporation

ADDRESS: Digital Media Network Company Ome Complex,
2-9, Suehiro-cho, Tokyo 198-8710k, Japan

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
Ltd., Taoyuan Branch

LAB LOCATION: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang,
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1. CERTIFICATION

PRODUCT: Nano receiver
BRAND NAME: TOSHIBA
MODEL NO.: PA3844D
APPLICANT: Toshiba Corporation
TESTED: May 4 ~ 7, 2010
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: FCC Part 15, Subpart C (Section 15.249)
ANSI C63.4-2003

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Jessica Cheng, **DATE:** May 11, 2010
(Jessica Cheng / Specialist)

**TECHNICAL
ACCEPTANCE** : Jamison Chan, **DATE:** May 11, 2010
Responsible for RF
(Jamison Chan / Supervisor)

APPROVED BY : Ken Liu, **DATE:** May 11, 2010
(Ken Liu / Assistant Manager)



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2. 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 |
| 15.207 | Conducted Emission Test | PASS | Minimum passing margin is -14.17dB at 0.173MHz |
| 15.209 15.249 15.249 (d) | Radiated Emission Test Band Edge Measurement Limit: 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 12.209 | PASS | Minimum passing margin is -4.7dB at 249.18MHz |

2.1 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:

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

| Measurement | Frequency | Uncertainty |
|---------------------|----------------|-------------|
| Conducted emissions | 150kHz ~ 30MHz | 2.41 dB |
| Radiated emissions | 30MHz ~ 1GHz | 3.67 dB |
| | Above 1GHz | 2.89 dB |



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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|----------------------------|--------------------------------|
| EUT | Nano receiver |
| MODEL NO. | PA3844RD |
| FCC ID | CJ6UPA3844RD |
| POWER SUPPLY | 5Vdc from host equipment |
| MODULATION TYPE | GFSK |
| OPERATING FREQUENCY | 2402MHz ~ 2480MHz |
| NUMBER OF CHANNEL | 79 |
| ANTENNA TYPE | PCB antenna with -2.97dBi gain |
| ANTENNA CONNECTOR | N/A |
| DATA CABLE | N/A |
| I/O PORTS | USB port |
| ASSOCIATED DEVICES | N/A |

NOTE:

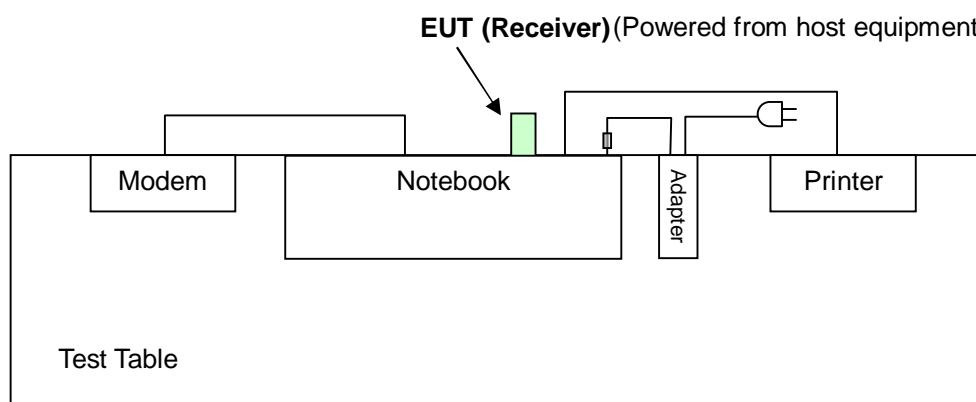
1. The EUT is a transceiver.
2. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

79 channels are provided to this EUT:

| CHANNEL | FREQ. (MHz) | CHANNEL | FREQ. (MHz) | CHANNEL | FREQ. (MHz) | CHANNEL | FREQ. (MHz) |
|---------|----------------|---------|----------------|---------|----------------|---------|----------------|
| 0 | 2402 | 20 | 2422 | 40 | 2442 | 60 | 2462 |
| 1 | 2403 | 21 | 2423 | 41 | 2443 | 61 | 2463 |
| 2 | 2404 | 22 | 2424 | 42 | 2444 | 62 | 2464 |
| 3 | 2405 | 23 | 2425 | 43 | 2445 | 63 | 2465 |
| 4 | 2406 | 24 | 2426 | 44 | 2446 | 64 | 2466 |
| 5 | 2407 | 25 | 2427 | 45 | 2447 | 65 | 2467 |
| 6 | 2408 | 26 | 2428 | 46 | 2448 | 66 | 2468 |
| 7 | 2409 | 27 | 2429 | 47 | 2449 | 67 | 2469 |
| 8 | 2410 | 28 | 2430 | 48 | 2450 | 68 | 2470 |
| 9 | 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 | | |

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST





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3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

| EUT configure mode | Applicable to | | | | Description |
|--------------------------|---------------|-------|--------------|----|-------------|
| | PLC | RE<1G | RE \geq 1G | BM | |
| - | ✓ | ✓ | ✓ | ✓ | - |

Where PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz

RE \geq 1G: Radiated Emission above 1GHz

BM: Bandedge Measurement

POWER LINE CONDUCTED EMISSION TEST:

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

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|-------------------|----------------|-----------------|
| 0 to 78 | 0 | GFSK |

RADIATED EMISSION TEST (BELOW 1 GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).

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

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|-------------------|----------------|-----------------|
| 0 to 78 | 0 | GFSK |

RADIATED EMISSION TEST (ABOVE 1 GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).

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

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|-------------------|----------------|-----------------|
| 0 to 78 | 0, 46, 78 | GFSK |

BANDEdge MEASUREMENT:

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).

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

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE |
|-------------------|----------------|-----------------|
| 0 to 78 | 0, 78 | GFSK |



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TEST CONDITION:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER (SYSTEM) | TESTED BY |
|--------------------|---------------------------|----------------------|-----------|
| PLC | 25deg. C, 86% RH, 1008hPa | 120Vac, 60Hz | Nick Chen |
| RE<1G | 21deg. C, 73% RH, 1009hPa | 120Vac, 60Hz | Nick Chen |
| RE ³ 1G | 21deg. C, 73% RH, 1009hPa | 120Vac, 60Hz | Nick Chen |
| BM | 18deg. C, 75% RH, 1008hPa | 120Vac, 60Hz | Nick Chen |

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**

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

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.

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|-----|-------------------|-------|-----------|-------------|------------------|
| 1 | NOTEBOOK COMPUTER | DELL | PP05L | 20375526736 | FCC DoC Approved |
| 2 | PRINTER | EPSON | LQ-300+ | DCGY017054 | FCC DoC Approved |
| 3 | MODEM | ACEEX | 1414 | 980020520 | IFAXDM1414 |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|--|
| 1 | N/A |
| 2 | 1.8m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core |
| 3 | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core. |

NOTE: All power cords of the above support units are non-shielded (1.8m).



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. 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. | CALIBRATED DATE | CALIBRATED UNTIL |
|--|-----------------|--------------|-----------------|------------------|
| ROHDE & SCHWARZ Test Receiver | ESCS 30 | 100276 | Dec. 15, 2009 | Dec. 14, 2010 |
| ROHDE & SCHWARZ Artificial Mains Network (for EUT) | ESH3-Z5 | 100218 | Nov. 24, 2009 | Nov. 23, 2010 |
| LISN With Adapter (for EUT) | AD10 | C10Ada-001 | Nov. 24, 2009 | Nov. 23, 2010 |
| ROHDE & SCHWARZ Artificial Mains Network (for peripherals) | ESH3-Z5 | 100219 | Nov. 23, 2009 | Nov. 22, 2010 |
| Software | ADT_Cond_V7.3.7 | NA | NA | NA |
| Software | ADT_ISN_V7.3.7 | NA | NA | NA |
| RF cable (JYEBAO) | 5D-FB | Cable-C10.01 | Feb. 23, 2010 | Feb. 22, 2011 |
| SUHNER Terminator (For ROHDE & SCHWARZ LISN) | 65BNC-5001 | E1-010773 | Feb. 23, 2010 | Feb. 22, 2011 |

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 10.
3. The VCCI Site Registration No. C-1852.

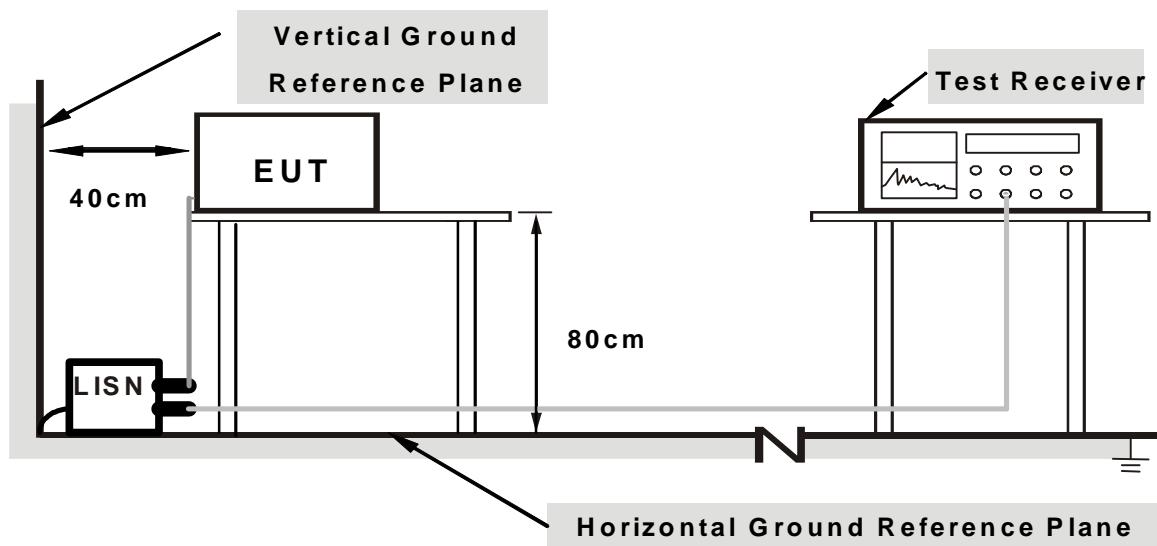
4.1.3 TEST PROCEDURES

- 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.

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 cm from other units and other metal planes

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.



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4.1.6 EUT OPERATING CONDITIONS

- a. Connected the EUT to a notebook placed on a testing table.
- b. The notebook ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The notebook sent messages to printer and the printer printed them out.
- d. The notebook sent messages to modem.
- e. Repeated c ~ e.

4.1.7 TEST RESULTS

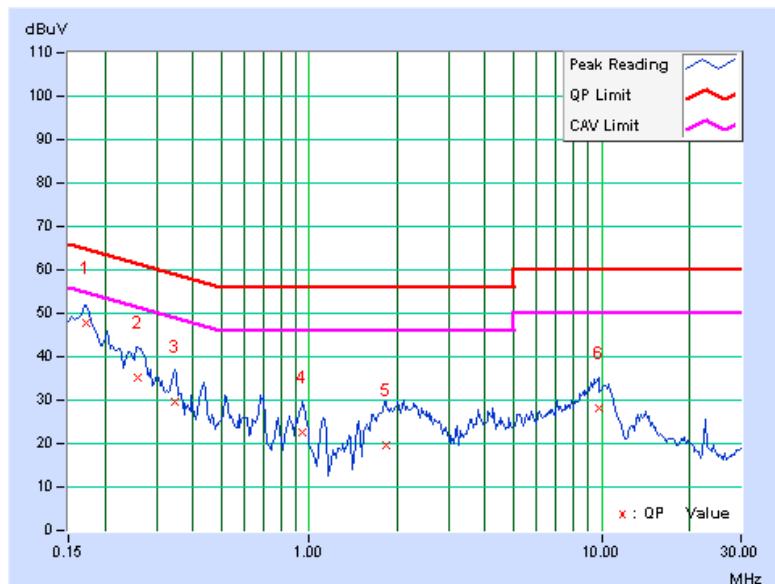
CONDUCTED WORST CASE DATA

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

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-------|-------------------|-------|-----------|-------|--------|--------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.172 | 0.19 | 47.61 | 30.48 | 47.80 | 30.67 | 64.86 | 54.86 | -17.06 | -24.19 |
| 2 | 0.259 | 0.22 | 34.87 | 24.54 | 35.09 | 24.76 | 61.45 | 51.45 | -26.36 | -26.69 |
| 3 | 0.345 | 0.27 | 29.53 | 21.25 | 29.80 | 21.52 | 59.07 | 49.07 | -29.27 | -27.55 |
| 4 | 0.951 | 0.31 | 22.20 | 16.41 | 22.51 | 16.72 | 56.00 | 46.00 | -33.49 | -29.28 |
| 5 | 1.833 | 0.33 | 19.25 | 11.81 | 19.58 | 12.14 | 56.00 | 46.00 | -36.42 | -33.86 |
| 6 | 9.793 | 0.70 | 27.32 | 21.58 | 28.02 | 22.28 | 60.00 | 50.00 | -31.98 | -27.72 |

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.

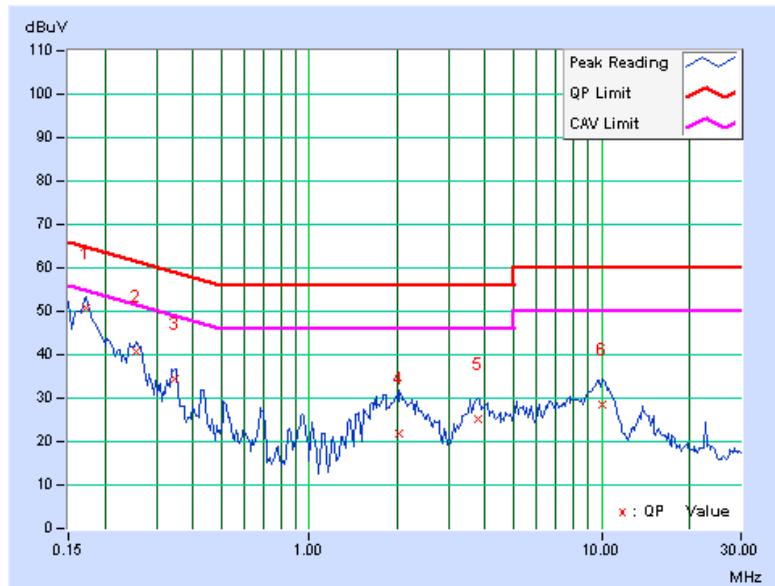


| | | | |
|-------|--------|---------------|-------|
| PHASE | Line 2 | 6dB BANDWIDTH | 9 kHz |
|-------|--------|---------------|-------|

| No | Freq. | Corr. | Reading Value | | Emission Level | | Limit | | Margin | |
|----|--------|-------|---------------|-----------|----------------|-----------|-----------|-------|--------|--------|
| | | | Factor | [dB (uV)] | [dB (uV)] | [dB (uV)] | [dB (uV)] | (dB) | | |
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.173 | 0.29 | 50.36 | 37.02 | 50.65 | 37.31 | 64.82 | 54.82 | -14.17 | -17.51 |
| 2 | 0.257 | 0.31 | 40.40 | 30.35 | 40.71 | 30.66 | 61.54 | 51.54 | -20.83 | -20.88 |
| 3 | 0.348 | 0.35 | 34.24 | 31.44 | 34.59 | 31.79 | 59.01 | 49.01 | -24.42 | -17.22 |
| 4 | 2.034 | 0.41 | 21.57 | 14.30 | 21.98 | 14.71 | 56.00 | 46.00 | -34.02 | -31.29 |
| 5 | 3.785 | 0.53 | 24.53 | 18.30 | 25.06 | 18.83 | 56.00 | 46.00 | -30.94 | -27.17 |
| 6 | 10.121 | 0.71 | 27.94 | 21.66 | 28.65 | 22.37 | 60.00 | 50.00 | -31.35 | -27.63 |

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.





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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, 15.249 as following:

| 15.209 Limit | | |
|--------------------------|--|--------------------------------------|
| 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 |

| 15.249 Limit | | |
|------------------------------|---|---|
| Fundamental Frequency | Field Strength of Fundamental (millivolts/meter) | Field Strength of Harmonics (microvolts/meter) |
| 902 ~ 928 MHz | 50 | 500 |
| 2400 ~ 2483.5 MHz | 50 | 500 |
| 5725 ~ 5875 MHz | 50 | 500 |
| 24 ~ 24.25 GHz | 250 | 2500 |

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB_{uV}/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.



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4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------|---------------------------|-------------------|-----------------|------------------|
| HP Preamplifier | 8449B | 3008A01924 | Aug. 31, 2009 | Aug. 30, 2010 |
| HP Preamplifier | 8449B | 3008A01292 | Aug. 10, 2009 | Aug. 09, 2010 |
| ROHDE & SCHWARZ TEST RECEIVER | ESU26 | 100005 | Jun. 06, 2009 | Jun. 05, 2010 |
| Schwarzbeck Antenna | VULB 9168 | 137 | Apr. 29, 2010 | Apr. 28, 2011 |
| Schwarzbeck Antenna | VHBA 9123 | 480 | Apr. 29, 2010 | Apr. 28, 2011 |
| EMCO Horn Antenna | 3115 | 6714 | Oct. 26, 2009 | Oct. 25, 2010 |
| EMCO Horn Antenna | 3115 | 9312-4192 | Apr. 23, 2010 | Apr. 22, 2011 |
| ADT. Turn Table | TT100 | 0306 | NA | NA |
| ADT. Tower | AT100 | 0306 | NA | NA |
| Software | ADT_Radiated_V 7.6.15.9.2 | NA | NA | NA |
| SUHNER RF cable | SF104-26.5 | CABLE-CH6-17m -01 | Aug. 20, 2009 | Aug. 19, 2010 |
| ROHDE & SCHWARZ Spectrum Analyzer | FSP 40 | 100036 | Apr. 06, 2010 | Apr. 05, 2011 |

NOTE:

1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.



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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 3 meter semi- anechoic chamber room. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- 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 method or average method as specified and then reported in data sheet.

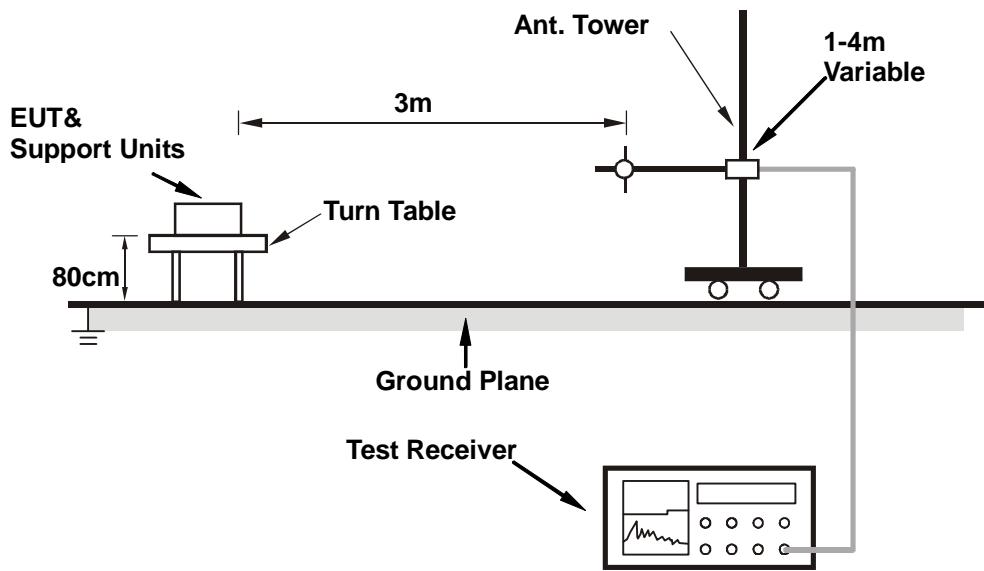
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz 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 related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Set the EUT under transmission condition continuously at specific channel frequency.



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4.2.7 TEST RESULTS

ABOVE 1GHz DATA

| EUT TEST CONDITION | | MEASUREMENT DETAIL | | |
|--------------------------|--|-----------------------------|--|---|
| CHANNEL | | Channel 0 | | FREQUENCY RANGE 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | | 120Vac, 60Hz | | DETECTOR FUNCTION Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | | 21deg. C, 73%RH 1009 hPa | | TESTED BY Nick Chen |

| 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 | 2390.00 | 57.8 PK | 74.0 | -16.2 | 1.04 H | 166 | 26.29 | 31.55 |
| 2 | 2390.00 | 45.8 AV | 54.0 | -8.2 | 1.04 H | 166 | 14.26 | 31.55 |
| 3 | 2400.00 | 48.9 PK | 74.0 | -25.1 | 1.04 H | 166 | 17.28 | 31.59 |
| 4 | 2400.00 | 16.9 AV | 54.0 | -37.1 | 1.04 H | 166 | -14.73 | 31.59 |
| 5 | *2402.00 | 94.0 PK | 114.0 | -20.0 | 1.04 H | 166 | 62.42 | 31.60 |
| 6 | *2402.00 | 62.0 AV | 94.0 | -32.0 | 1.04 H | 166 | 30.41 | 31.60 |
| 7 | 4804.00 | 56.1 PK | 74.0 | -17.9 | 1.03 H | 161 | 18.41 | 37.66 |
| 8 | 4804.00 | 24.1 AV | 54.0 | -29.9 | 1.03 H | 161 | -13.60 | 37.66 |

| 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 | 2390.00 | 59.3 PK | 74.0 | -14.7 | 1.10 V | 10 | 27.75 | 31.55 |
| 2 | 2390.00 | 46.1 AV | 54.0 | -7.9 | 1.10 V | 10 | 14.53 | 31.55 |
| 3 | 2400.00 | 46.6 PK | 74.0 | -27.4 | 1.10 V | 10 | 15.02 | 31.59 |
| 4 | 2400.00 | 14.6 AV | 54.0 | -39.4 | 1.10 V | 10 | -16.99 | 31.59 |
| 5 | *2402.00 | 91.8 PK | 114.0 | -22.2 | 1.10 V | 10 | 60.16 | 31.60 |
| 6 | *2402.00 | 59.8 AV | 94.0 | -34.2 | 1.10 V | 10 | 28.15 | 31.60 |
| 7 | 4804.00 | 51.1 PK | 74.0 | -22.9 | 1.03 V | 230 | 13.42 | 37.66 |
| 8 | 4804.00 | 19.1 AV | 54.0 | -34.9 | 1.03 V | 230 | -18.59 | 37.66 |

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 average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:

$$20 \log (\text{Duty cycle}) = 20 \log (0.192 \text{ ms} / 7.66 \text{ ms}) = -32.0 \text{ dB}$$
Please see page 21 for plotted duty.



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | | |
|--------------------------|--|-----------------------------|--|---|
| CHANNEL | | Channel 46 | | FREQUENCY RANGE 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | | 120Vac, 60Hz | | DETECTOR FUNCTION Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | | 21deg. C, 73%RH 1009 hPa | | TESTED BY Nick Chen |

| 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 | *2448.00 | 92.4 PK | 114.0 | -21.6 | 1.01 H | 166 | 60.60 | 31.77 |
| 2 | *2448.00 | 60.4 AV | 94.0 | -33.6 | 1.01 H | 166 | 28.59 | 31.77 |
| 3 | 4896.00 | 59.2 PK | 74.0 | -14.8 | 1.00 H | 175 | 21.20 | 37.99 |
| 4 | 4896.00 | 27.2 AV | 54.0 | -26.8 | 1.00 H | 175 | -10.81 | 37.99 |
| 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 | *2448.00 | 90.0 PK | 114.0 | -24.0 | 1.00 V | 267 | 58.23 | 31.77 |
| 2 | *2448.00 | 58.0 AV | 94.0 | -36.0 | 1.00 V | 267 | 26.22 | 31.77 |
| 3 | 4896.00 | 53.5 PK | 74.0 | -20.5 | 1.00 V | 303 | 15.51 | 37.99 |
| 4 | 4896.00 | 21.5 AV | 54.0 | -32.5 | 1.00 V | 303 | -16.50 | 37.99 |

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 average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:
 $20 \log (\text{Duty cycle}) = 20 \log (0.192 \text{ ms} / 7.66 \text{ ms}) = -32.0 \text{ dB}$
 Please see page 21 for plotted duty.



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | | |
|--------------------------|--|-----------------------------|--|---|
| CHANNEL | | Channel 78 | | FREQUENCY RANGE 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | | 120Vac, 60Hz | | DETECTOR FUNCTION Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | | 21deg. C, 73%RH 1009 hPa | | TESTED BY Nick Chen |

| 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 | *2480.00 | 91.2 PK | 114.0 | -22.8 | 1.00 H | 148 | 59.33 | 31.89 |
| 2 | *2480.00 | 59.2 AV | 94.0 | -34.8 | 1.00 H | 148 | 27.32 | 31.89 |
| 3 | 2483.50 | 39.0 PK | 74.0 | -35.0 | 1.00 H | 148 | 7.04 | 31.91 |
| 4 | 2483.50 | 7.0 AV | 54.0 | -47.0 | 1.00 H | 148 | -24.97 | 31.91 |
| 5 | 4960.00 | 59.5 PK | 74.0 | -14.5 | 1.00 H | 165 | 21.38 | 38.10 |
| 6 | 4960.00 | 27.5 AV | 54.0 | -26.5 | 1.00 H | 165 | -10.63 | 38.10 |
| 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 | *2480.00 | 88.7 PK | 114.0 | -25.3 | 1.00 V | 268 | 56.78 | 31.89 |
| 2 | *2480.00 | 56.7 AV | 94.0 | -37.3 | 1.00 V | 268 | 24.77 | 31.89 |
| 3 | 2483.50 | 36.4 PK | 74.0 | -37.6 | 1.00 V | 268 | 4.49 | 31.91 |
| 4 | 2483.50 | 4.4 AV | 54.0 | -49.6 | 1.00 V | 268 | -27.52 | 31.91 |
| 5 | 4960.00 | 54.1 PK | 74.0 | -19.9 | 1.05 V | 304 | 16.03 | 38.10 |
| 6 | 4960.00 | 22.1 AV | 54.0 | -31.9 | 1.05 V | 304 | -15.98 | 38.10 |

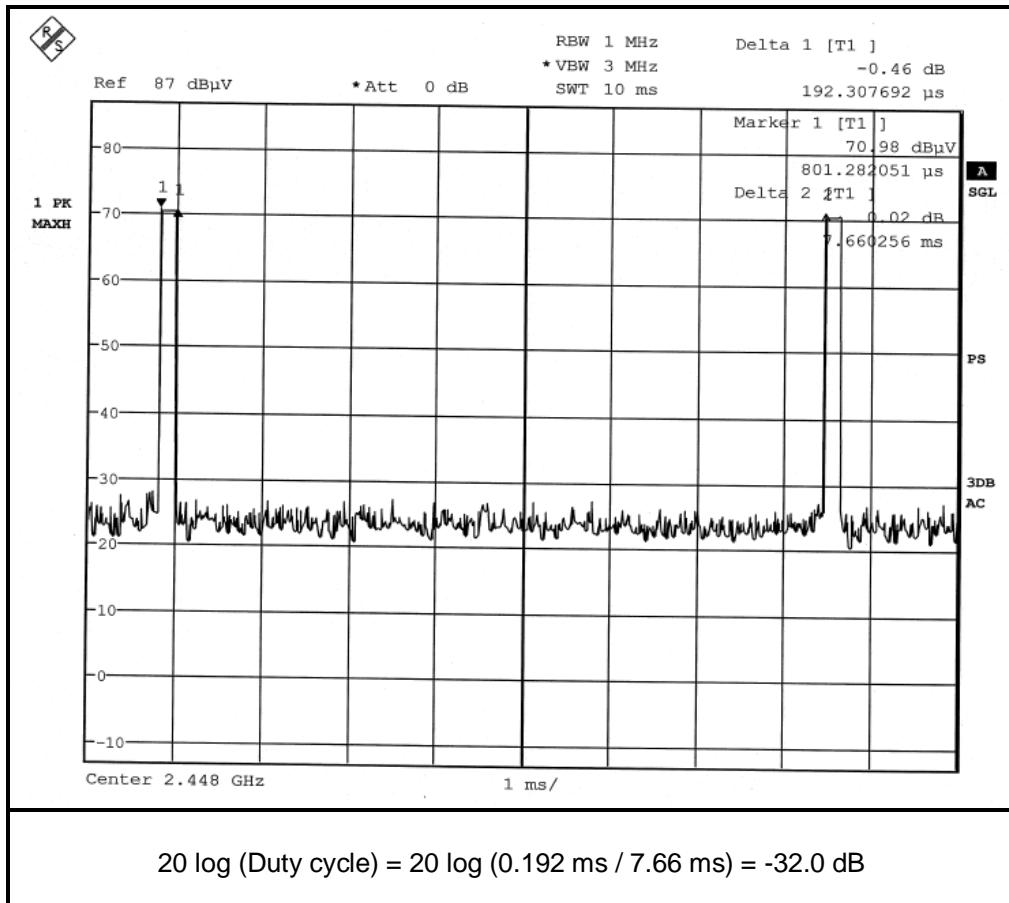
REMARKS:

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 average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:

$$20 \log (\text{Duty cycle}) = 20 \log (0.192 \text{ ms} / 7.66 \text{ ms}) = -32.0 \text{ dB}$$
Please see page 21 for plotted duty.



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BELOW 1GHz WORST-CASE DATA

| EUT TEST CONDITION | | MEASUREMENT DETAIL | | |
|--------------------------|--|-----------------------------|--|-------------------------------|
| CHANNEL | | Channel 0 | | FREQUENCY RANGE Below 1000MHz |
| INPUT POWER (SYSTEM) | | 120Vac, 60Hz | | DETECTOR FUNCTION Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | | 21deg. C, 73%RH 1009 hPa | | TESTED BY Nick Chen |

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 | 109.28 | 31.7 QP | 43.5 | -11.8 | 1.08 H | 88 | 21.62 | 10.04 |
| 2 | 159.02 | 33.0 QP | 43.5 | -10.5 | 1.09 H | 244 | 18.95 | 14.04 |
| 3 | 168.35 | 35.6 QP | 43.5 | -7.9 | 1.18 H | 244 | 21.77 | 13.86 |
| 4 | 194.78 | 33.2 QP | 43.5 | -10.3 | 1.19 H | 286 | 21.66 | 11.55 |
| 5 | 249.18 | 41.3 QP | 46.0 | -4.7 | 1.21 H | 79 | 28.24 | 13.02 |
| 6 | 521.22 | 36.6 QP | 46.0 | -9.4 | 1.21 H | 142 | 15.06 | 21.56 |
| 7 | 867.87 | 33.3 QP | 46.0 | -12.7 | 1.00 H | 10 | 5.66 | 27.63 |

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 | 61.09 | 29.0 QP | 40.0 | -11.0 | 1.06 V | 223 | 16.20 | 12.76 |
| 2 | 81.30 | 35.1 QP | 40.0 | -4.9 | 1.13 V | 178 | 25.59 | 9.54 |
| 3 | 104.62 | 34.8 QP | 43.5 | -8.7 | 1.28 V | 10 | 25.35 | 9.46 |
| 4 | 129.49 | 32.3 QP | 43.5 | -11.2 | 1.39 V | 166 | 19.95 | 12.39 |
| 5 | 166.79 | 35.4 QP | 43.5 | -8.1 | 1.03 V | 79 | 21.49 | 13.89 |
| 6 | 249.18 | 39.6 QP | 46.0 | -6.4 | 1.07 V | 169 | 26.56 | 13.02 |
| 7 | 399.97 | 33.6 QP | 46.0 | -12.4 | 1.22 V | 136 | 15.52 | 18.12 |
| 8 | 455.93 | 34.8 QP | 46.0 | -11.2 | 1.00 V | 118 | 14.98 | 19.80 |

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.



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4.3 BAND EDGES MEASUREMENT

4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Below –50dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| SPECTRUM ANALYZER | FSP 40 | 100036 | Apr. 06, 2010 | Apr. 05, 2011 |

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100 kHz and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots are attached on the following pages.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 EUT OPERATING CONDITION

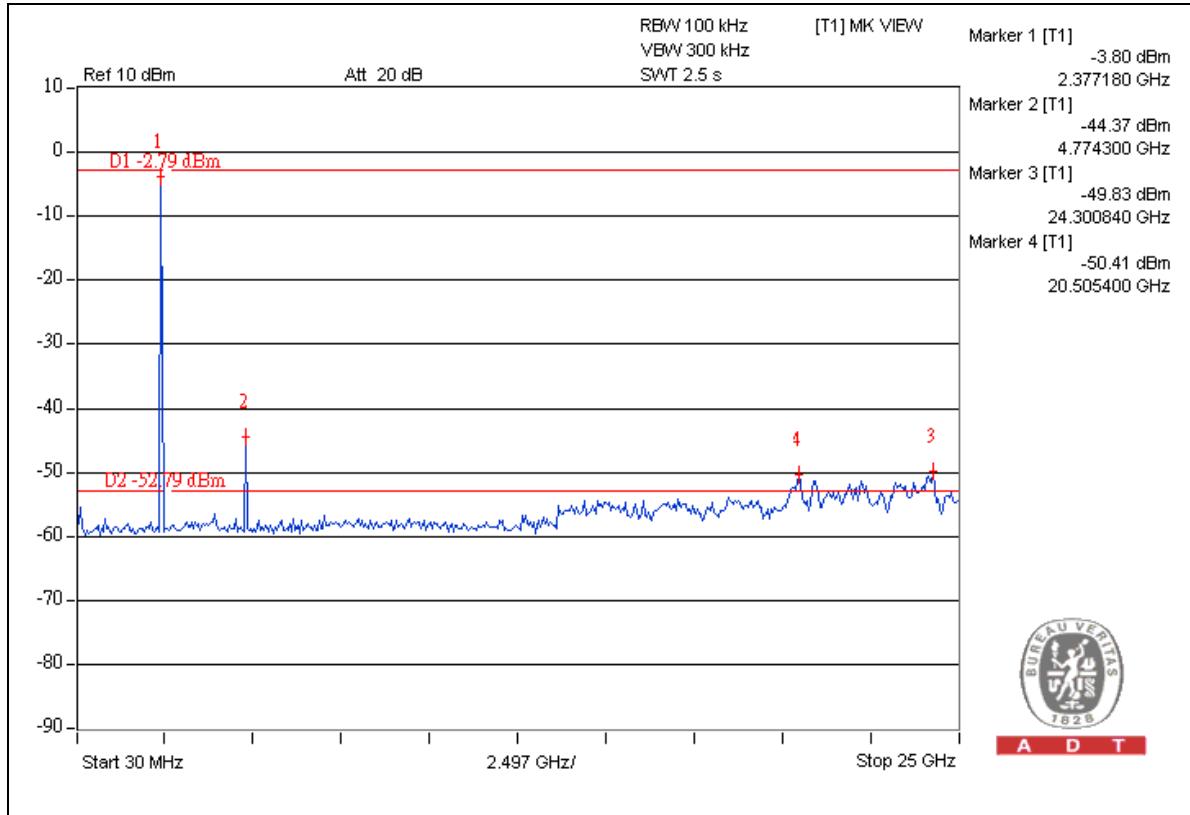
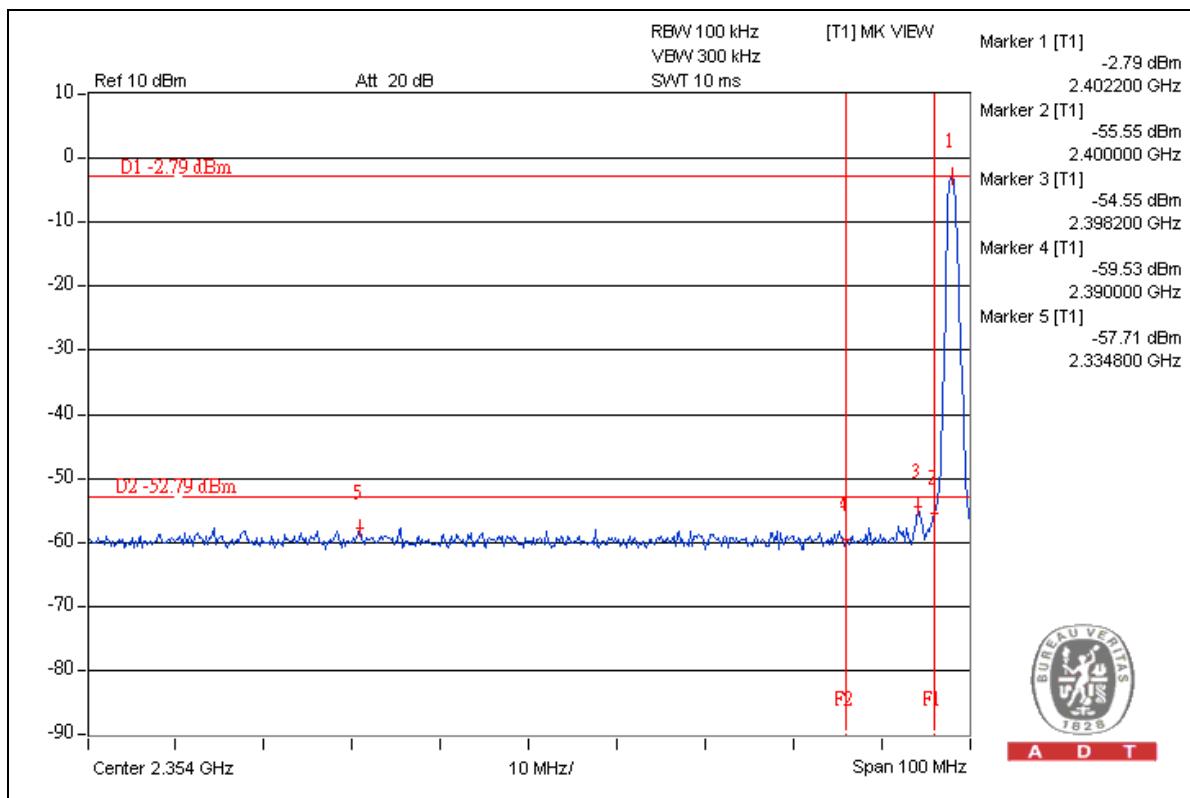
Same as Item 4.2.6

4.3.6 TEST RESULTS

The spectrum plots are attached on the following 4 images. D1 line indicates the highest level, and D2 line indicates the 50dB offset below D1. It shows compliance with the requirement in part 15.249(d).

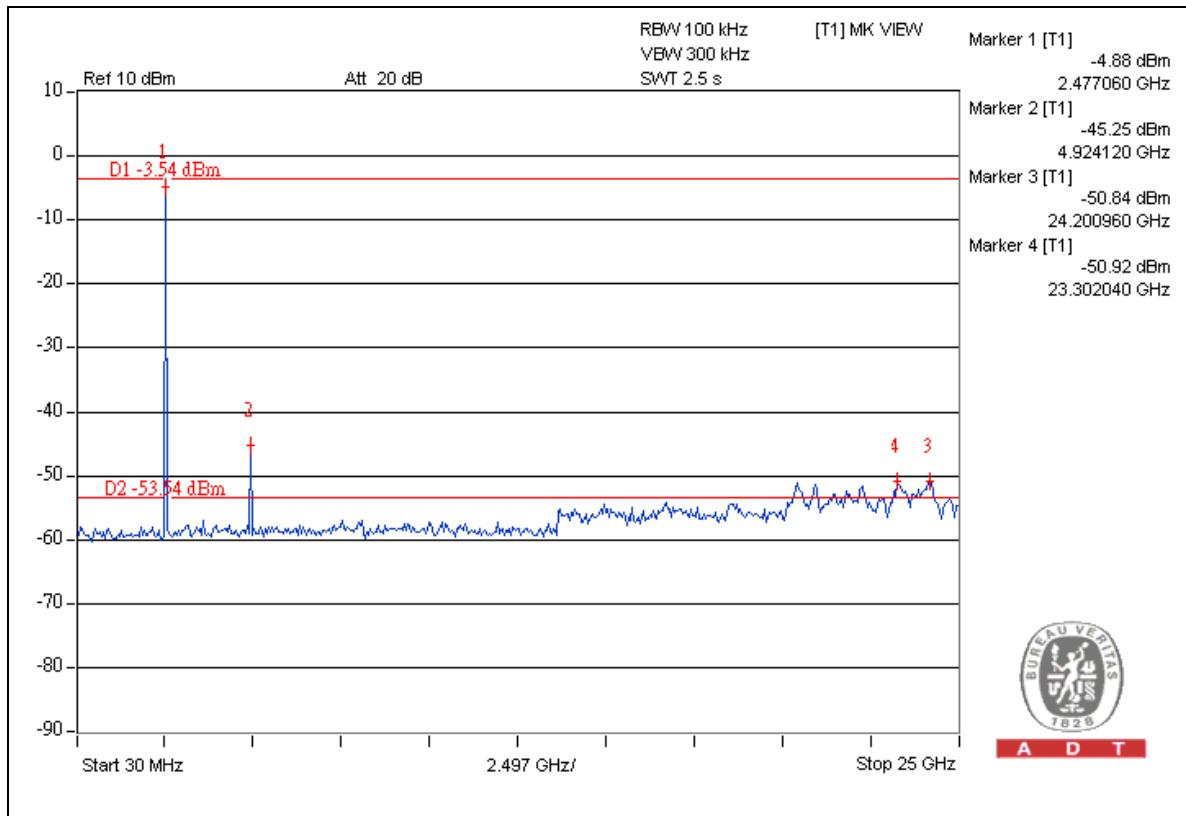
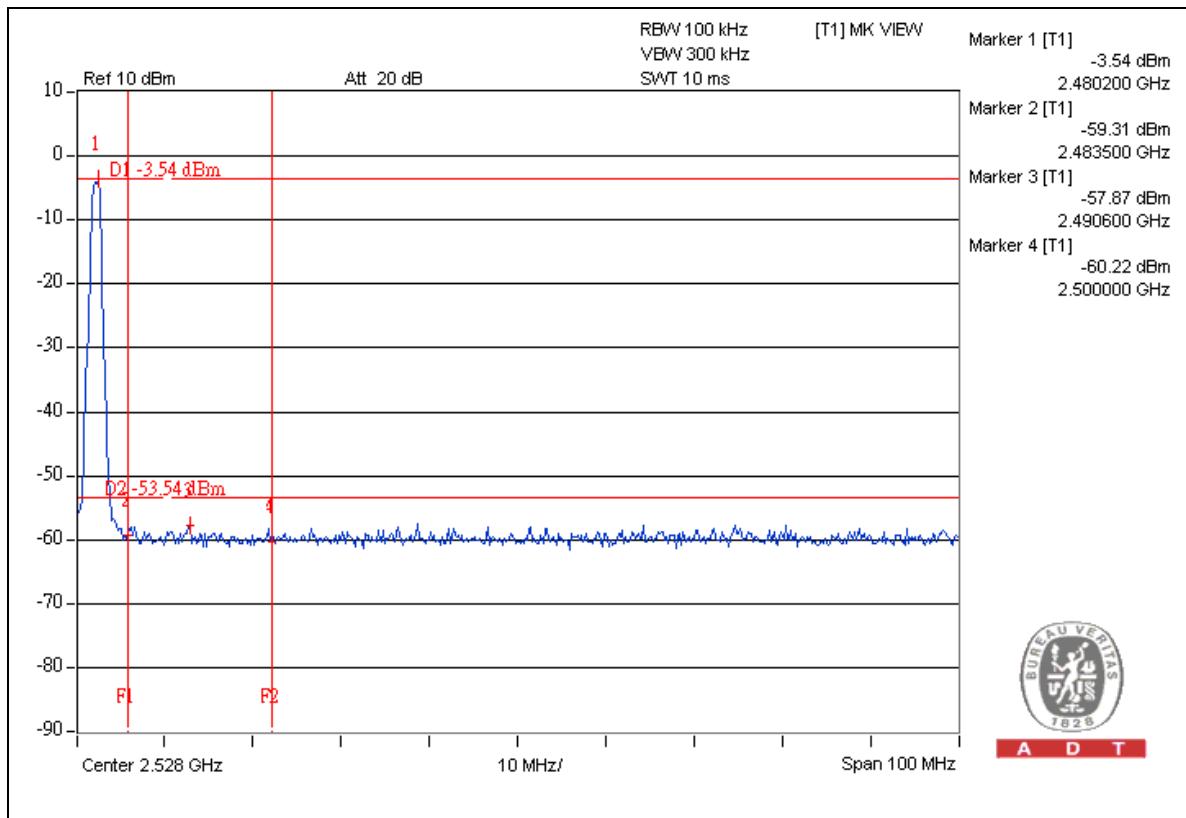


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5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.



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7. 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---