



## 4.6 BAND EDGES MEASUREMENT

### 4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2005

**NOTE:**

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 TEST PROCEDURE

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

The spectrum plots (Peak RBW=VBW=100kHz ; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

### 4.6.4 EUT OPERATING CONDITION

Same as Item 4.3.5



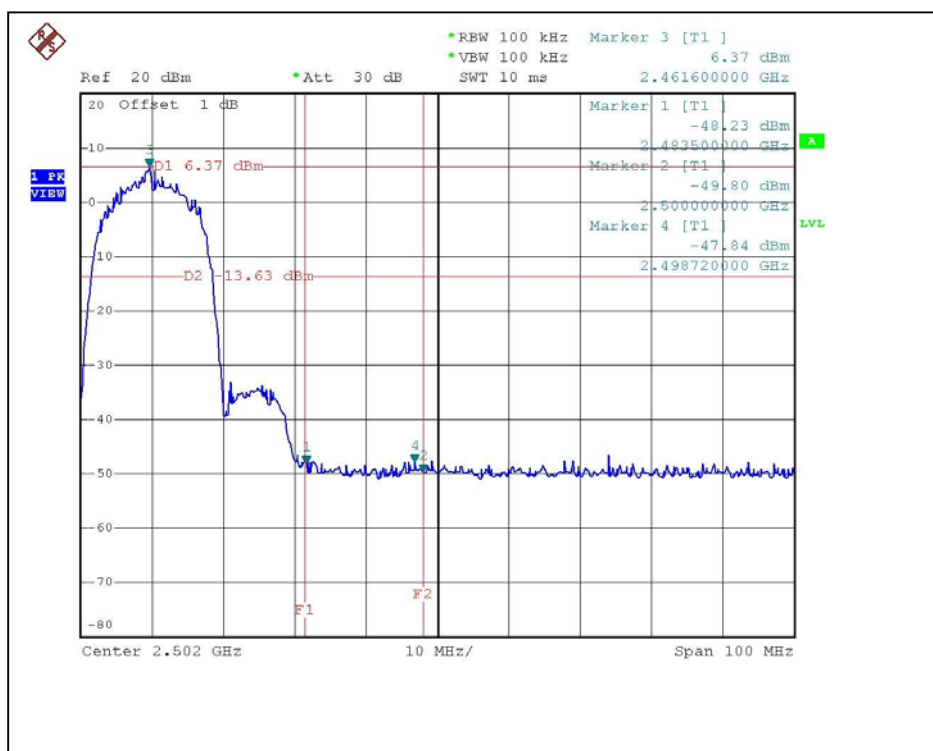
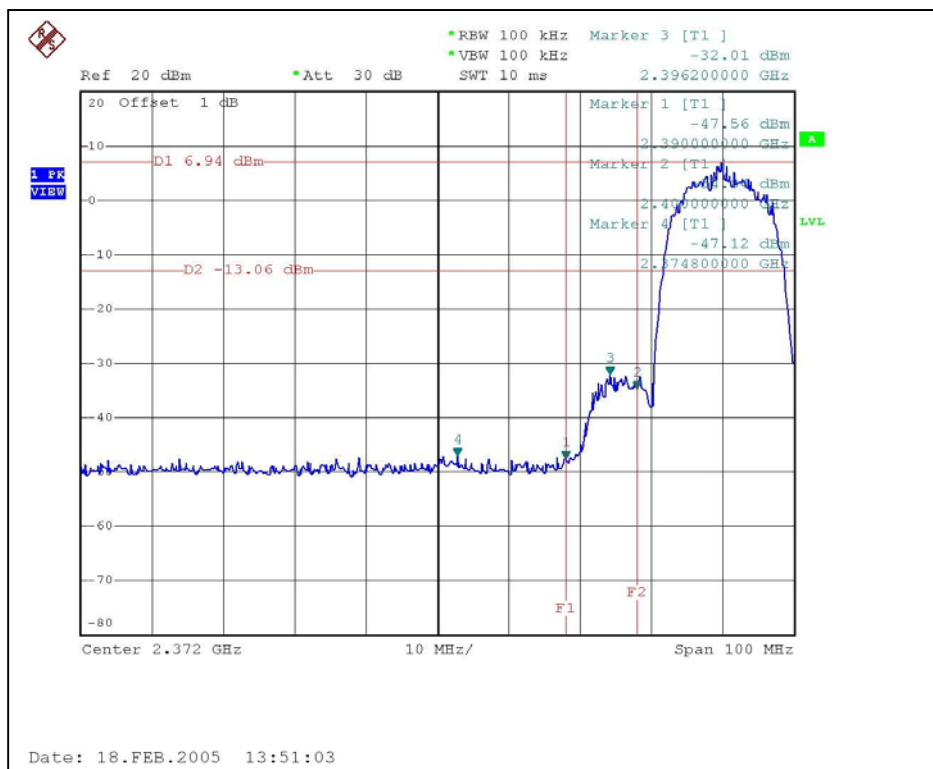
#### 4.6.5 TEST RESULTS (ANTENNA 1 – DSSS)

The spectrum plots are attached on the following page. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following page shows 54.5dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 112.10dBuV/m, so the maximum field strength in restrict band is  $112.10 - 54.5 = 57.60$ dBuV/m which is under 74 dBuV/m limit. (Peak)

**NOTE (2):** The band edge emission plot on the following page shows 54.60dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 113.20dBuV/m, so the maximum field strength in restrict band is  $113.20 - 54.60 = 58.60$ dBuV/m which is under 74 dBuV/m limit. (Peak)



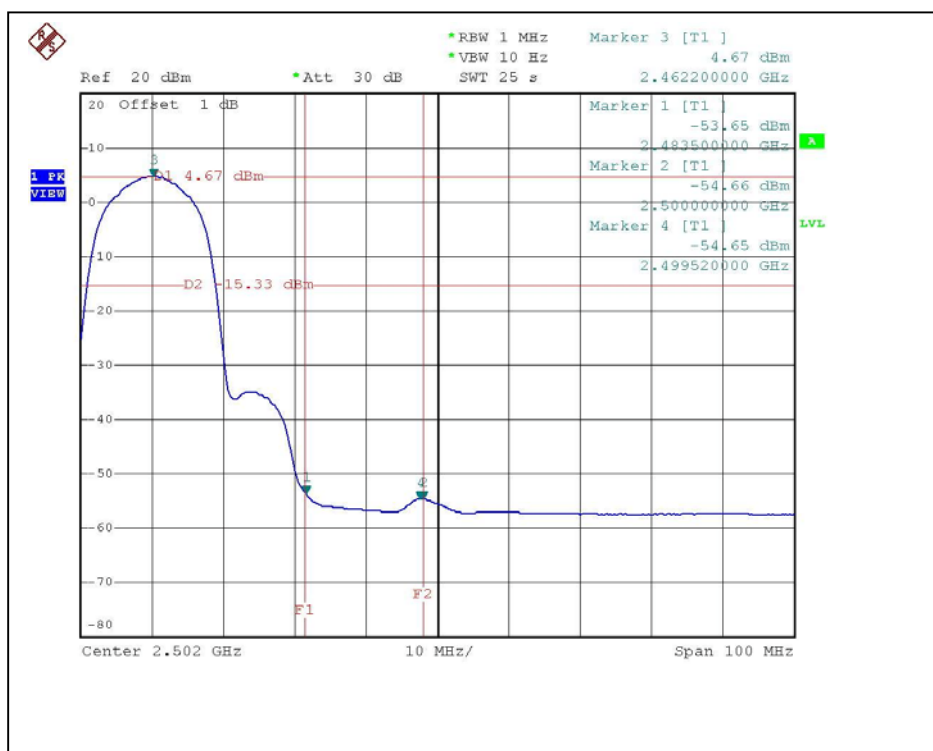
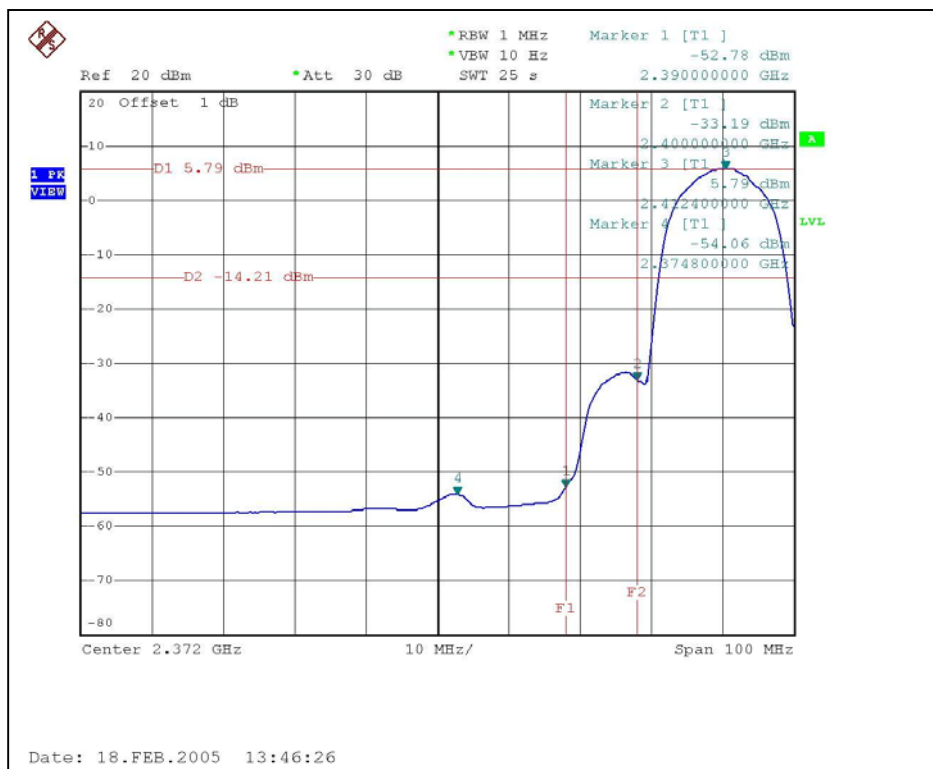


The spectrum plots are attached on the following page. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following page shows 58.57dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 105.10dBuV/m, so the maximum field strength in restrict band is  $105.10 - 58.57 = 46.53$ dBuV/m which is under 54 dBuV/m limit. (Average)

**NOTE (2):** The band edge emission plot on the following page shows 58.32dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 106.20dBuV/m, so the maximum field strength in restrict band is  $106.20 - 58.32 = 47.88$ dBuV/m which is under 54 dBuV/m limit. (Average)





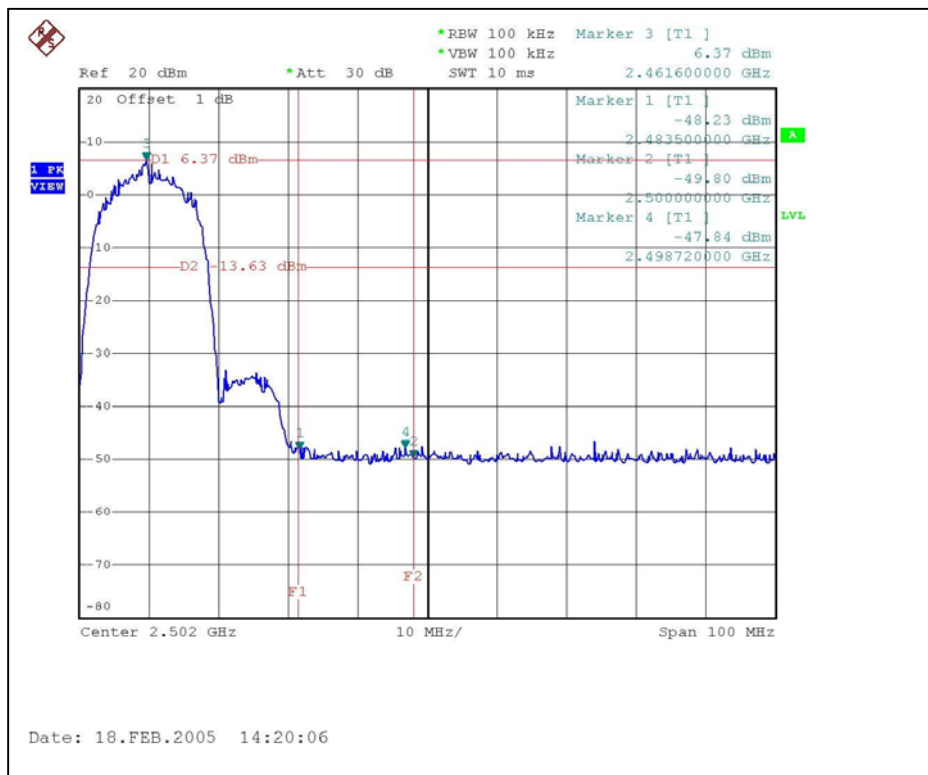
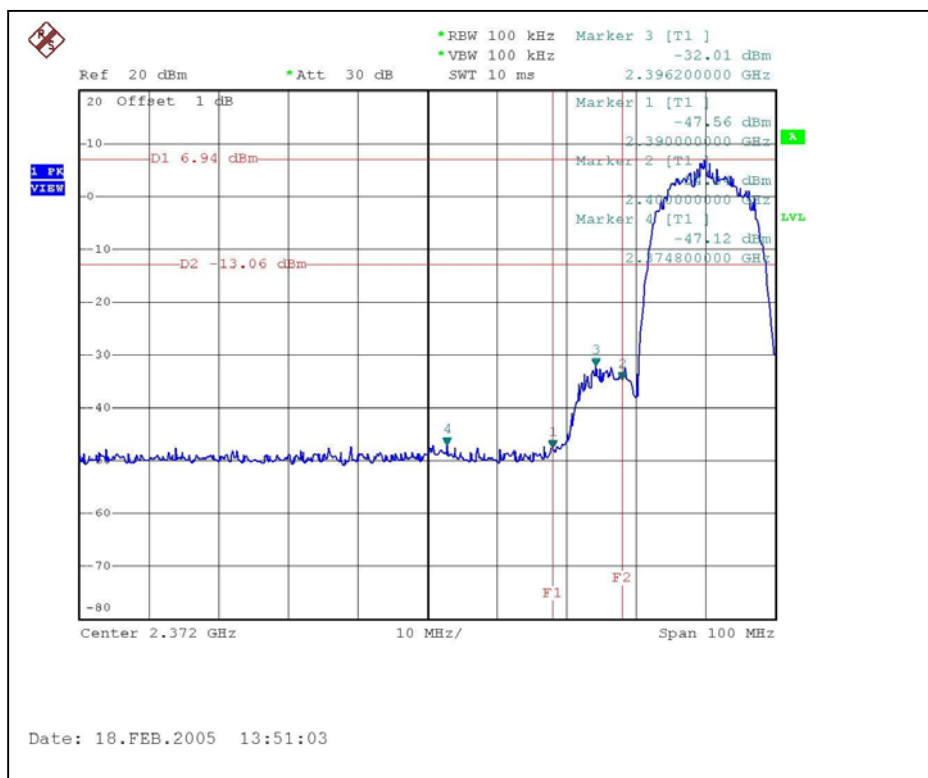
#### 4.6.6 TEST RESULTS (ANTENNA 2 – DSSS)

The spectrum plots are attached on the following page. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following page shows 54.5dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 111.0dBuV/m, so the maximum field strength in restrict band is  $111.0-54.5=56.5\text{dBuV/m}$  which is under 74 dBuV/m limit. (Peak)

**NOTE (2):** The band edge emission plot on the following page shows 54.60dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 111.0dBuV/m, so the maximum field strength in restrict band is  $111.0-54.60=56.4\text{dBuV/m}$  which is under 74 dBuV/m limit. (Peak)





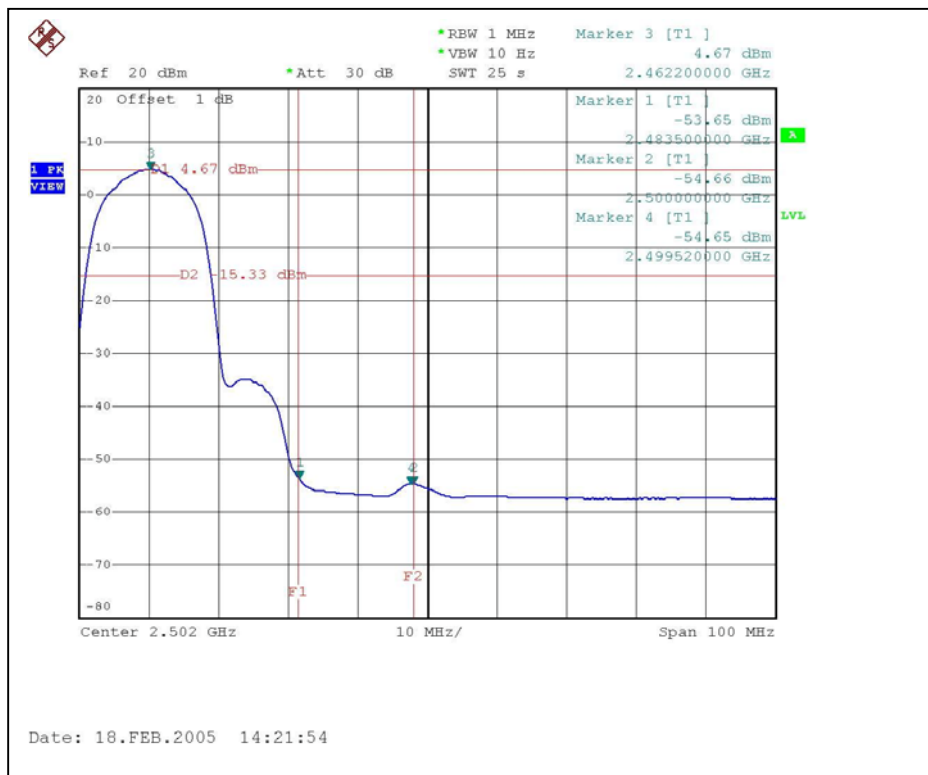
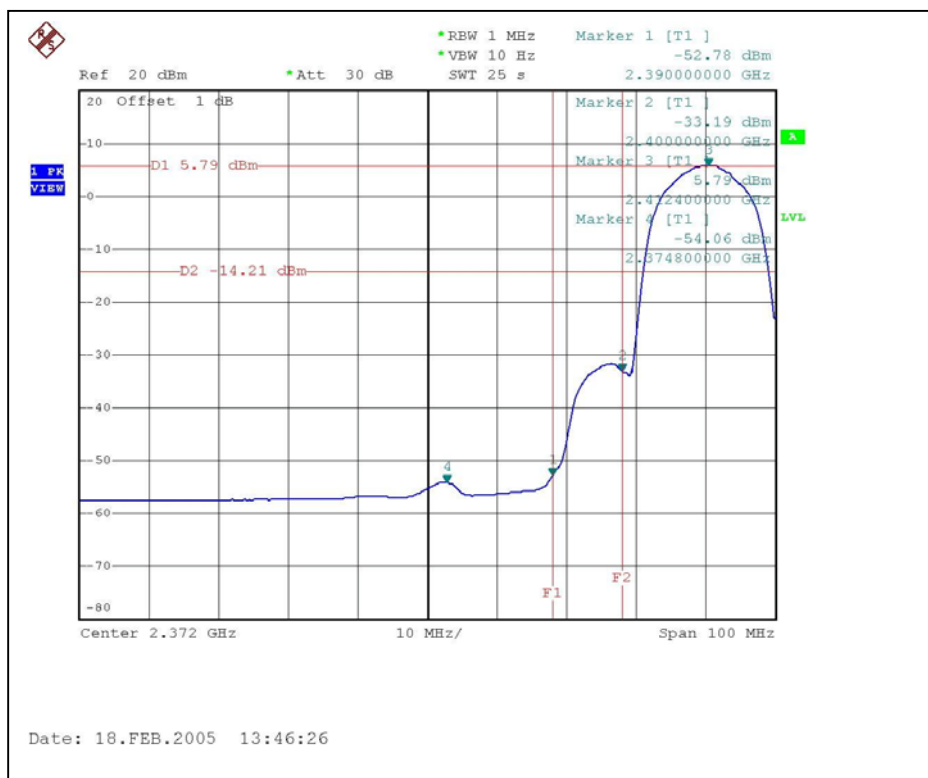
The spectrum plots are attached on the following page. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following page shows 58.57dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 103.60dBuV/m, so the maximum field strength in restrict band is  $103.60 - 58.57 = 45.03$ dBuV/m which is under 54 dBuV/m limit. (Average)

**NOTE (2):** The band edge emission plot on the following page shows 58.32dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 103.90dBuV/m, so the maximum field strength in restrict band is  $103.90 - 58.32 = 45.58$ dBuV/m which is under 54 dBuV/m limit. (Average)







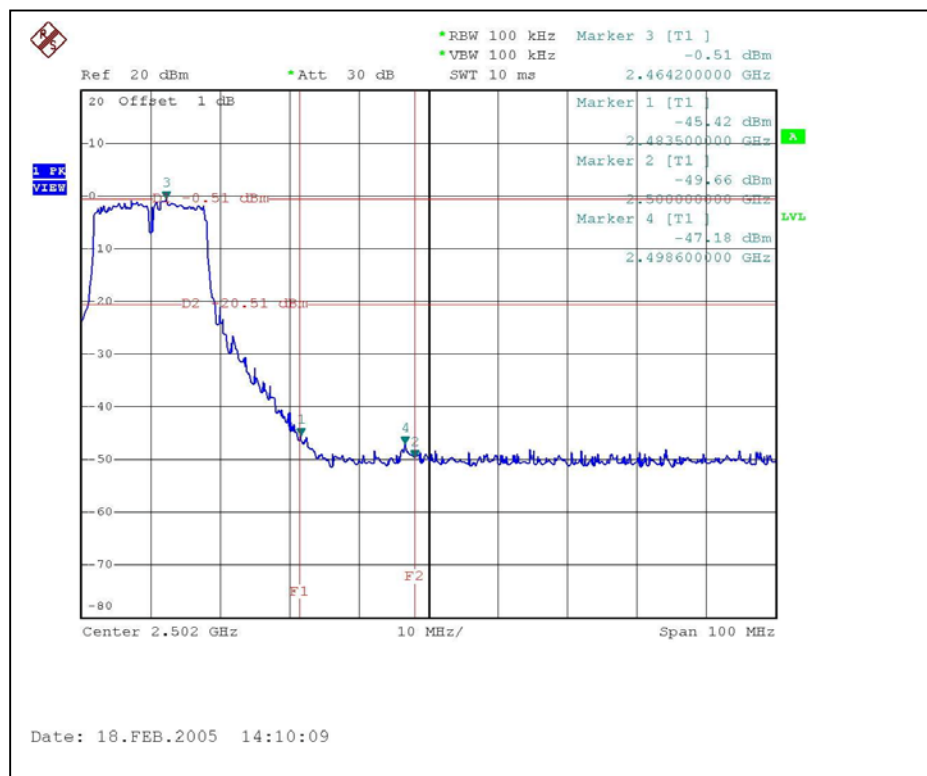
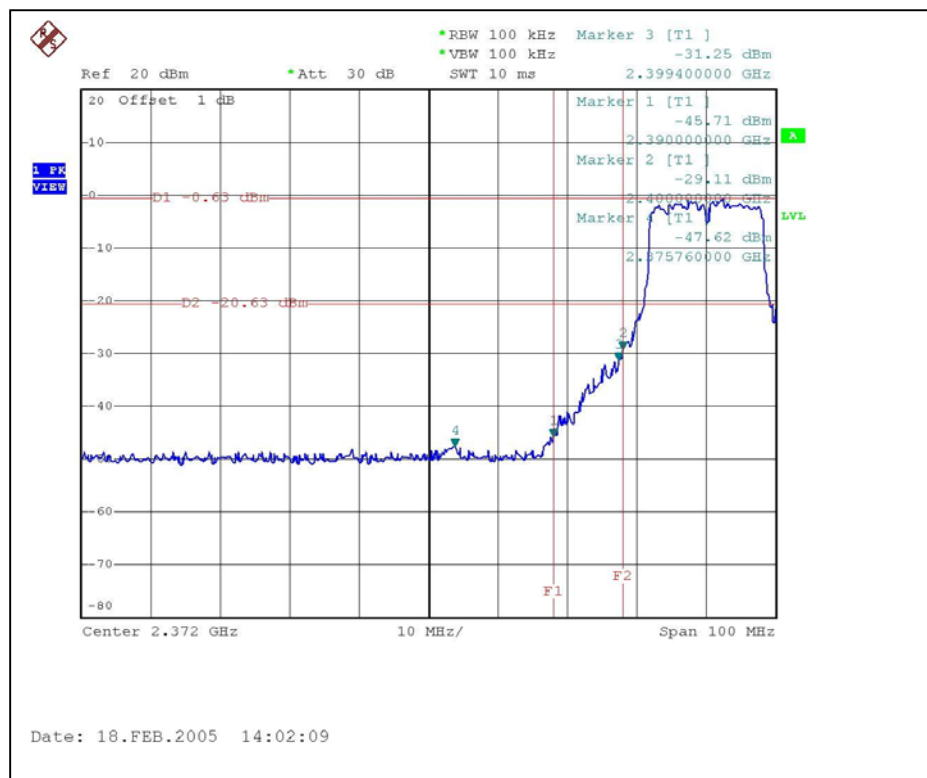
#### 4.6.7 TEST RESULTS (ANTENNA 1 – OFDM)

The spectrum plots are attached on the following page. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following page shows 45.08dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2. is 107.90dBuV/m, so the maximum field strength in restrict band is  $107.90 - 45.08 = 62.82$ dBuV/m which is under 74 dBuV/m limit. (Peak)

**NOTE (2):** The band edge emission plot on the following page shows 44.91dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 109.60dBuV/m, so the maximum field strength in restrict band is  $109.60 - 44.91 = 64.69$ dBuV/m which is under 74 dBuV/m limit. (Peak)



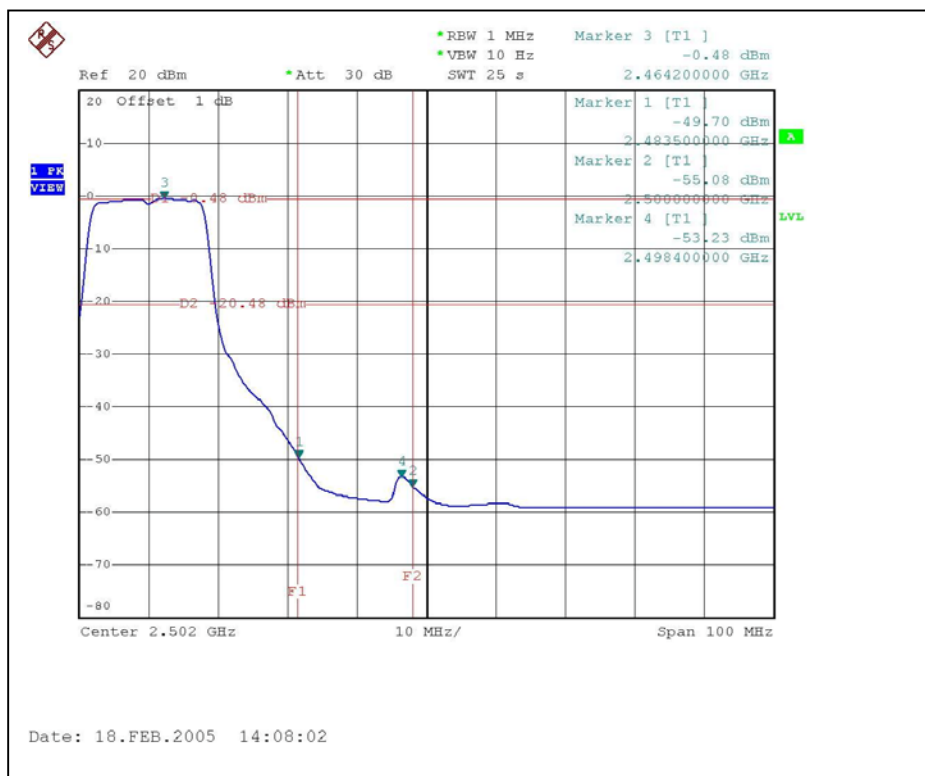
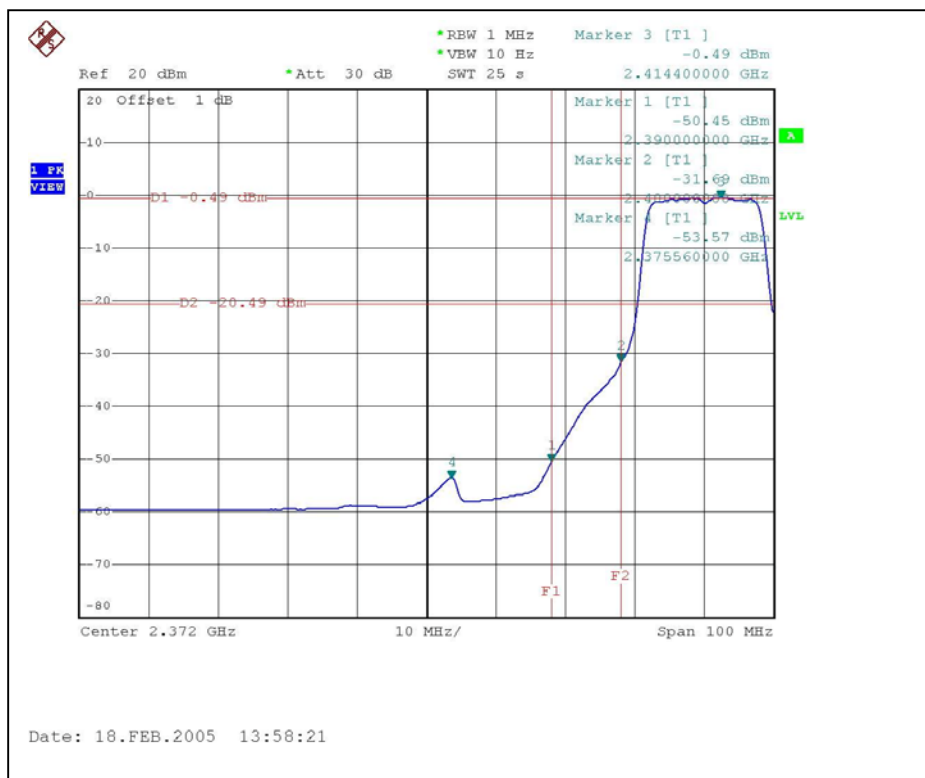


The spectrum plots are attached on the following page. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following page shows 49.96dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2. is 99.80dBuV/m, so the maximum field strength in restrict band is  $99.80 - 49.96 = 49.84$  dBuV/m which is under 54 dBuV/m limit. (Average)

**NOTE (2):** The band edge emission plot on the following page shows 49.22dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 101.50dBuV/m, so the maximum field strength in restrict band is  $101.50 - 49.22 = 52.28$  dBuV/m which is under 54 dBuV/m limit. (Average)





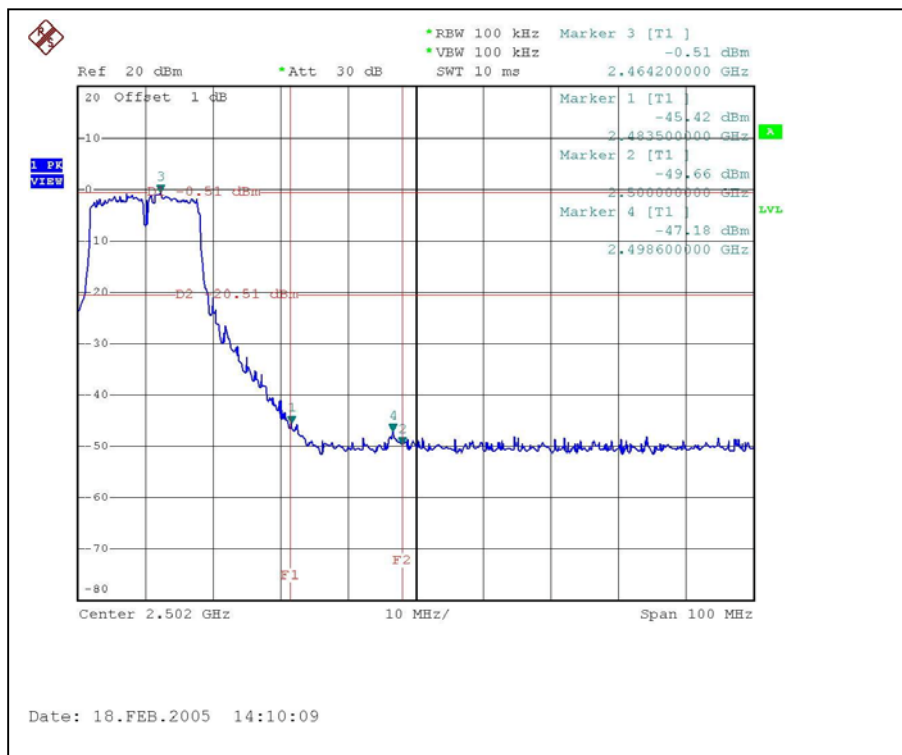
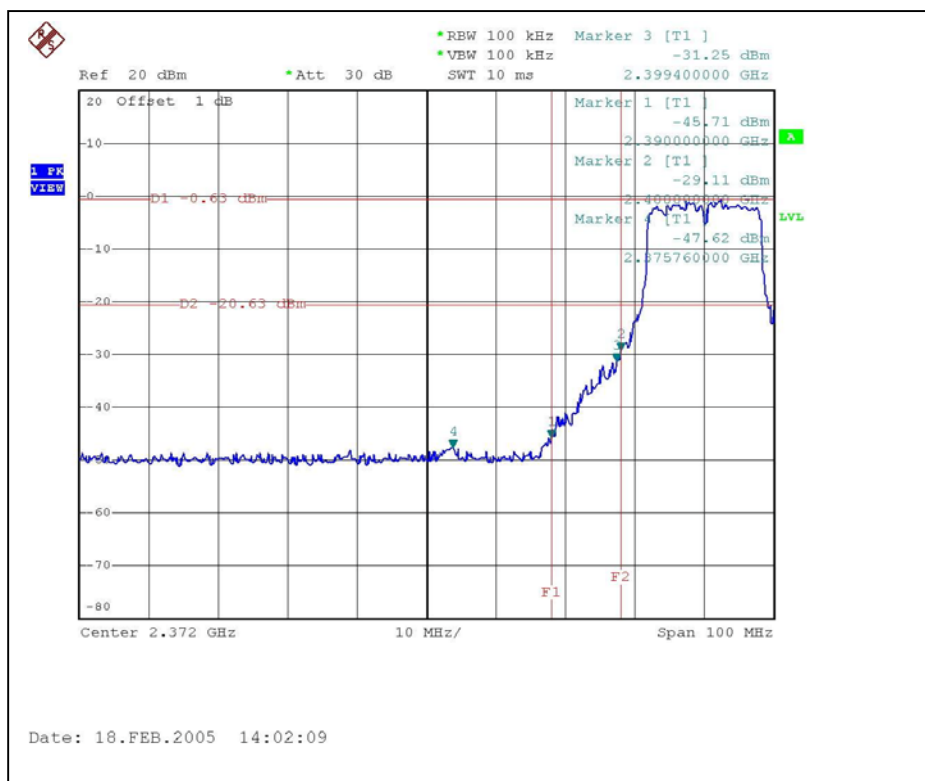
#### 4.6.8 TEST RESULTS (ANTENNA 2 – OFDM)

The spectrum plots are attached on the following page. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following page shows 45.08dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2. is 106.10dBuV/m, so the maximum field strength in restrict band is  $106.10 - 45.08 = 61.02$ dBuV/m which is under 74 dBuV/m limit. (Peak)

**NOTE (2):** The band edge emission plot on the following page shows 44.91dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 106.30dBuV/m, so the maximum field strength in restrict band is  $106.30 - 44.91 = 61.39$ dBuV/m which is under 74 dBuV/m limit. (Peak)





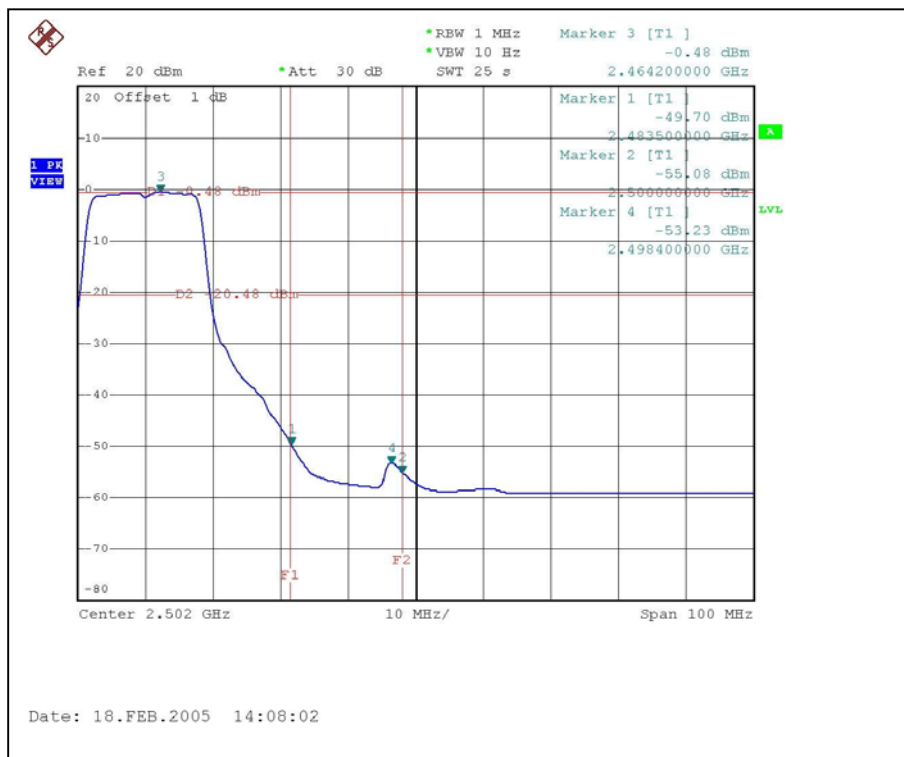
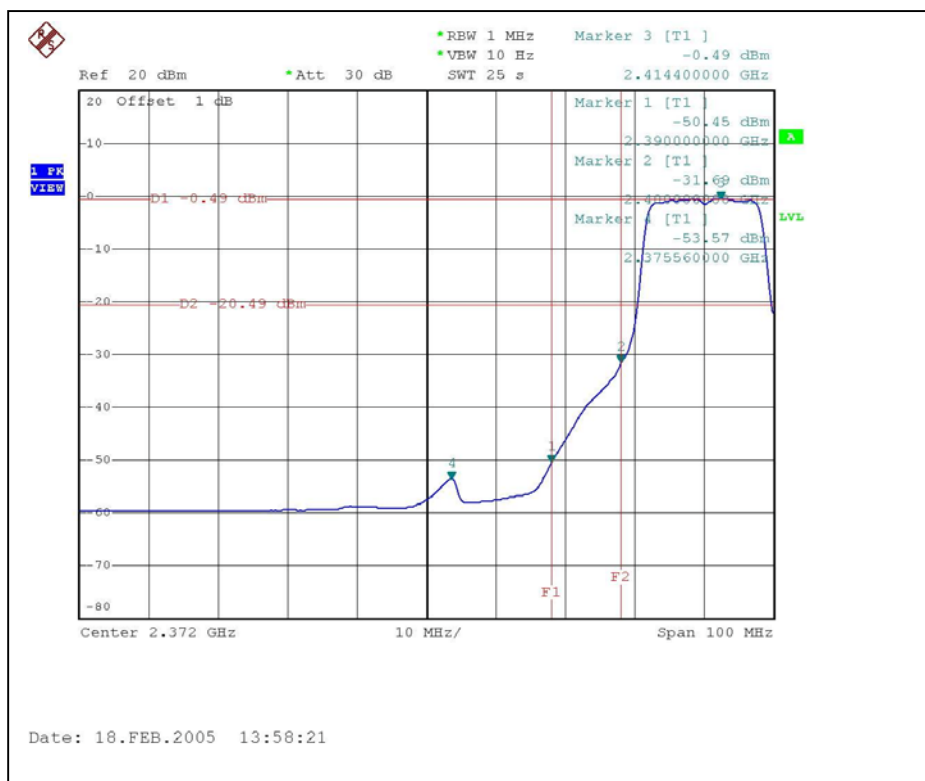
The spectrum plots are attached on the following page. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

**NOTE (1):** The band edge emission plot on the following page shows 49.96dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2. is 98.10dBuV/m, so the maximum field strength in restrict band is  $98.10 - 49.96 = 48.14$  dBuV/m which is under 54 dBuV/m limit. (Average)

**NOTE (2):** The band edge emission plot on the following page shows 49.22dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2. is 98.40dBuV/m, so the maximum field strength in restrict band is  $98.40 - 49.22 = 49.18$  dBuV/m which is under 54 dBuV/m limit. (Average)







## **4.7 ANTENNA REQUIREMENT**

### **4.7.1 STANDARD APPLICABLE**

For intentional device, according to FCC 47 CFR Section 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### **4.7.2 ANTENNA CONNECTED CONSTRUCTION**

The antenna used in this product are PIFA antenna with Hirose UFL connector and Dipole antenna with Reverse SMA Connector.

Antenna 1: The maximum Gain of the antenna is -2.0dBi.

Antenna 2: The maximum Gain of the antenna is 2.0dBi.

## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST





## RADIATED EMISSION TEST







## 6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:

<b>USA</b>	FCC, NVLAP, UL, A2LA
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA, CSA
<b>R.O.C.</b>	CNLA, BSMI, DGT
<b>Netherlands</b>	Telefication
<b>Singapore</b>	PSB, GOST-ASIA (MOU)
<b>Russia</b>	CERTIS (MOU)

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](http://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: 886-2-26052943

**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

**Email:** [service@adt.com.tw](mailto:service@adt.com.tw)

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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