

## 4.7 BAND EDGES MEASUREMENT

### 4.7.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 07, 2007

**NOTE:**

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.7.2 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 1MHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

### 4.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

#### 4.7.4 TEST RESULTS (ANTENNA A)

For signals in the restricted bands above and below the 5.15 to 5.35GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak field strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW=1MHz, VBW=3MHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

## 802.11a OFDM modulation

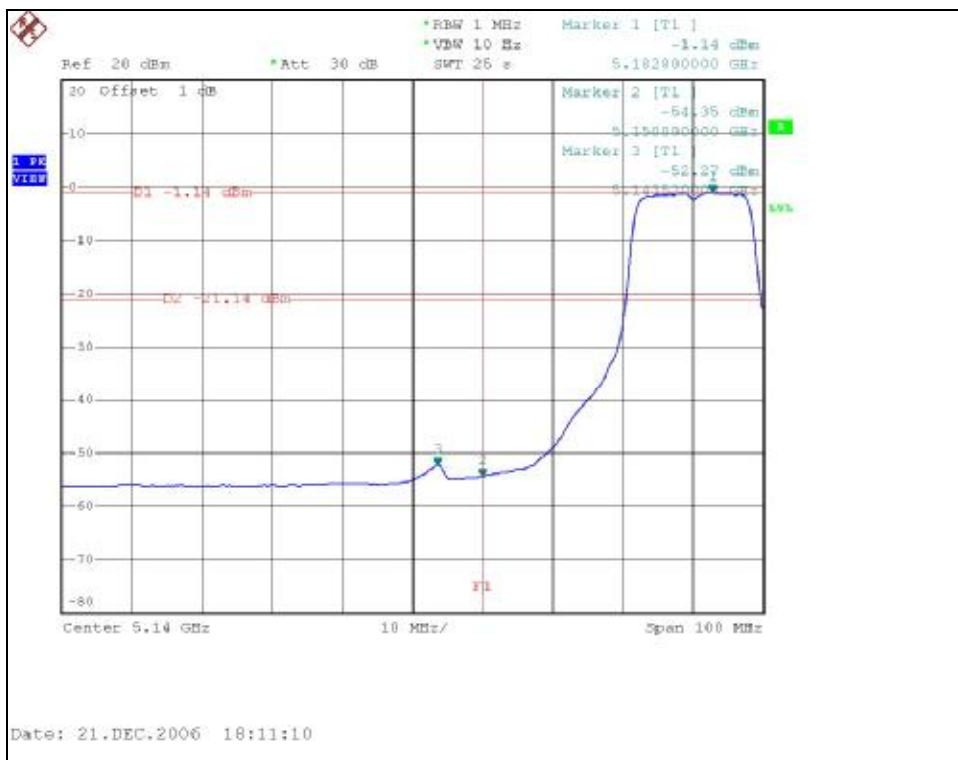
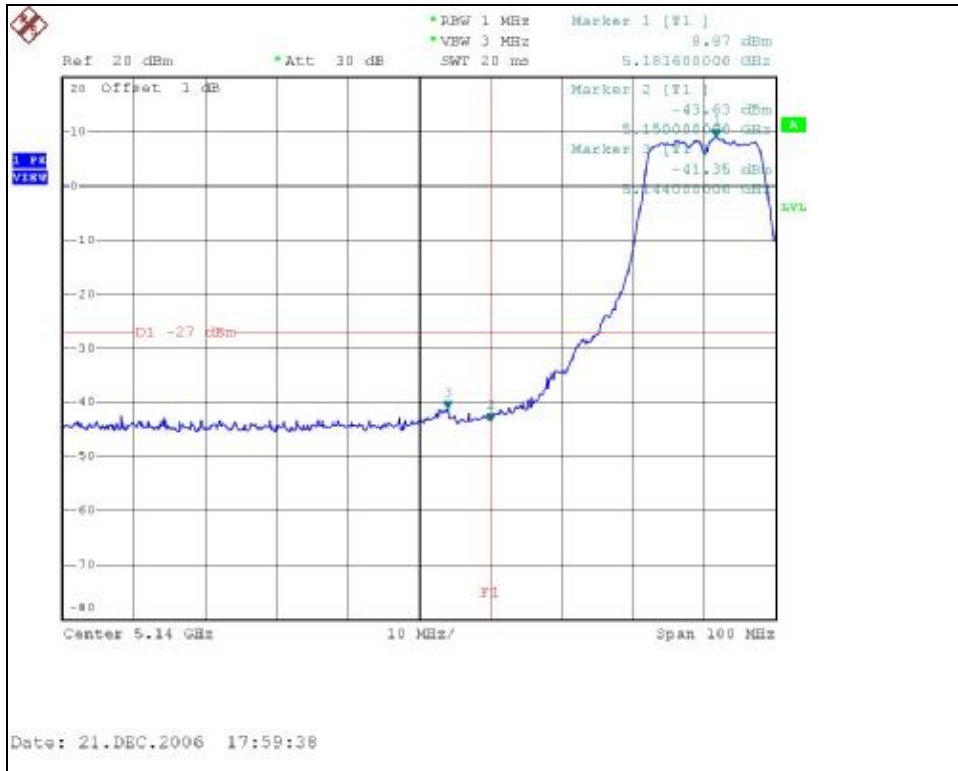
### NOTE (Peak):

The band edge emission plot on the following first page shows 52.5dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 115.0dBuV/m (Peak), so the maximum field strength in restrict band is  $115.0 - 52.5 = 62.5$ dBuV/m which is under 74dBuV/m limit.

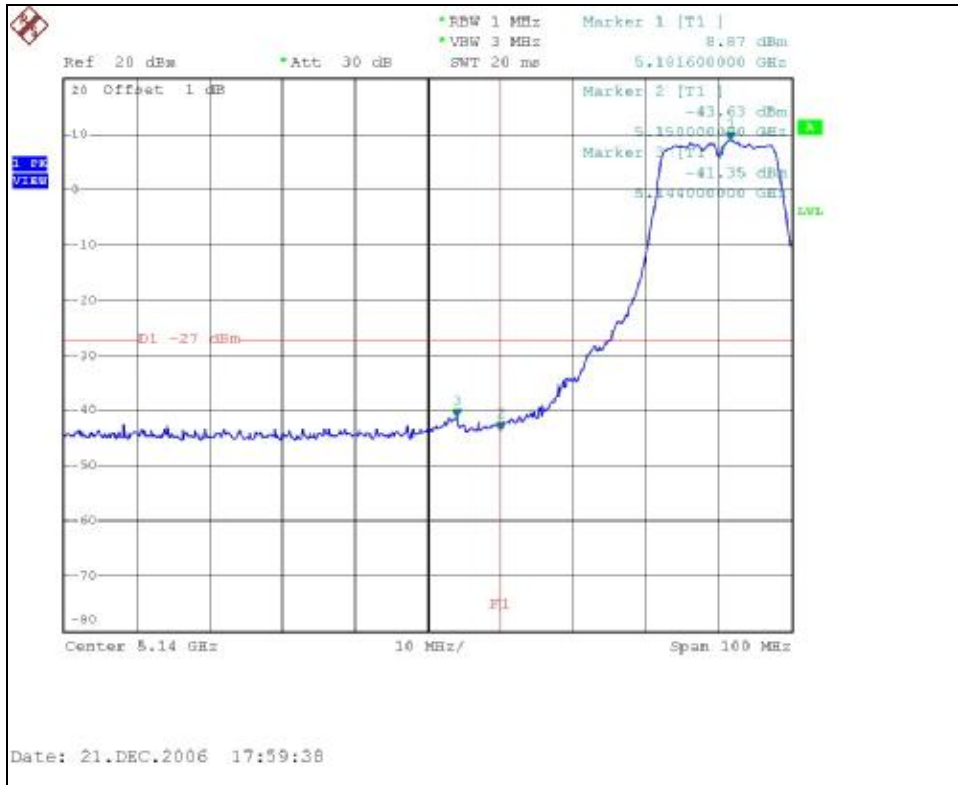
### NOTE (Average):

The band edge emission plot on the following second page shows 53.21dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 104.5dBuV/m (Average), so the maximum field strength in restrict band is  $104.5 - 53.21 = 51.29$ dBuV/m which is under 54dBuV/m limit.

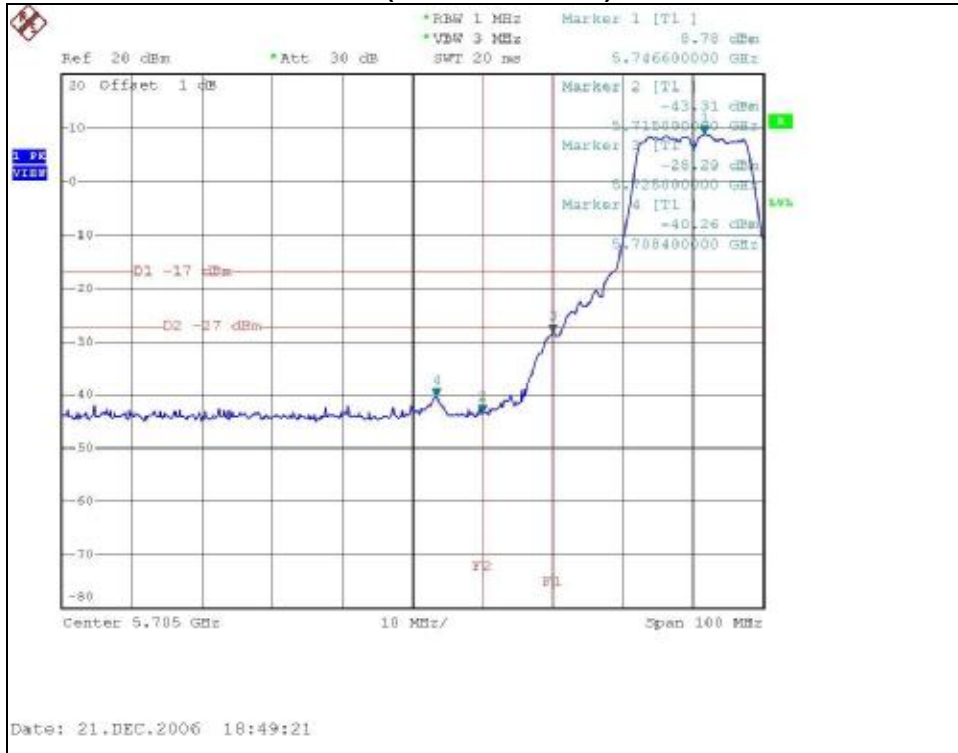
### 802.11a OFDM modulation (CH 1: 5180MHz)



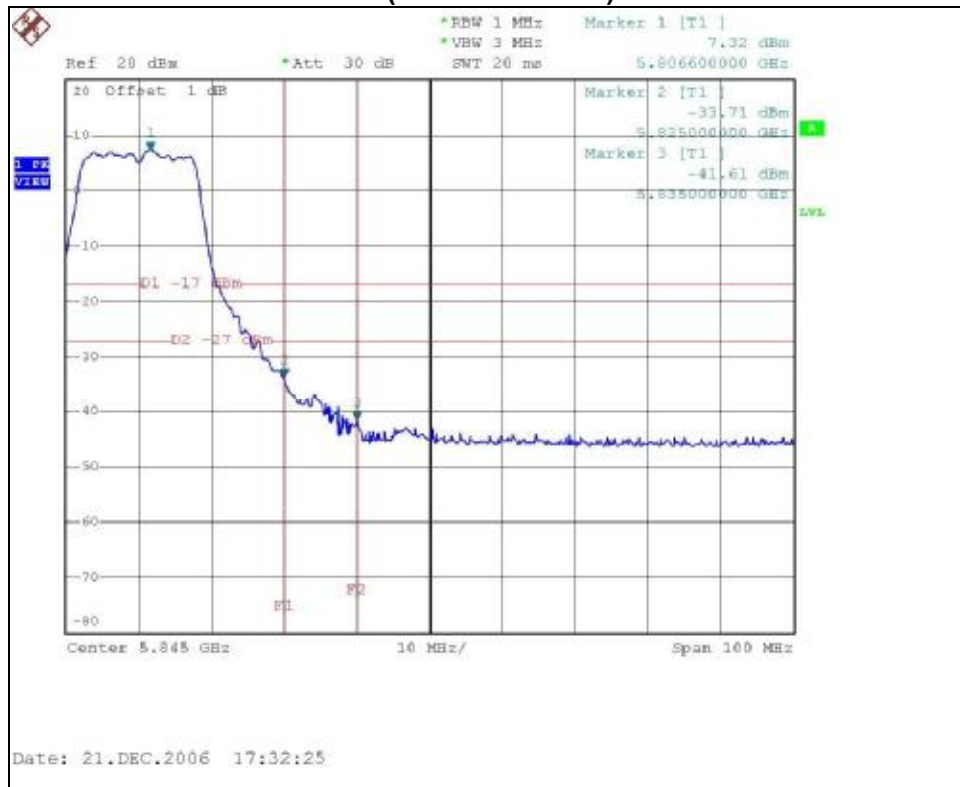
### 802.11a OFDM modulation (CH 4: 5240MHz)



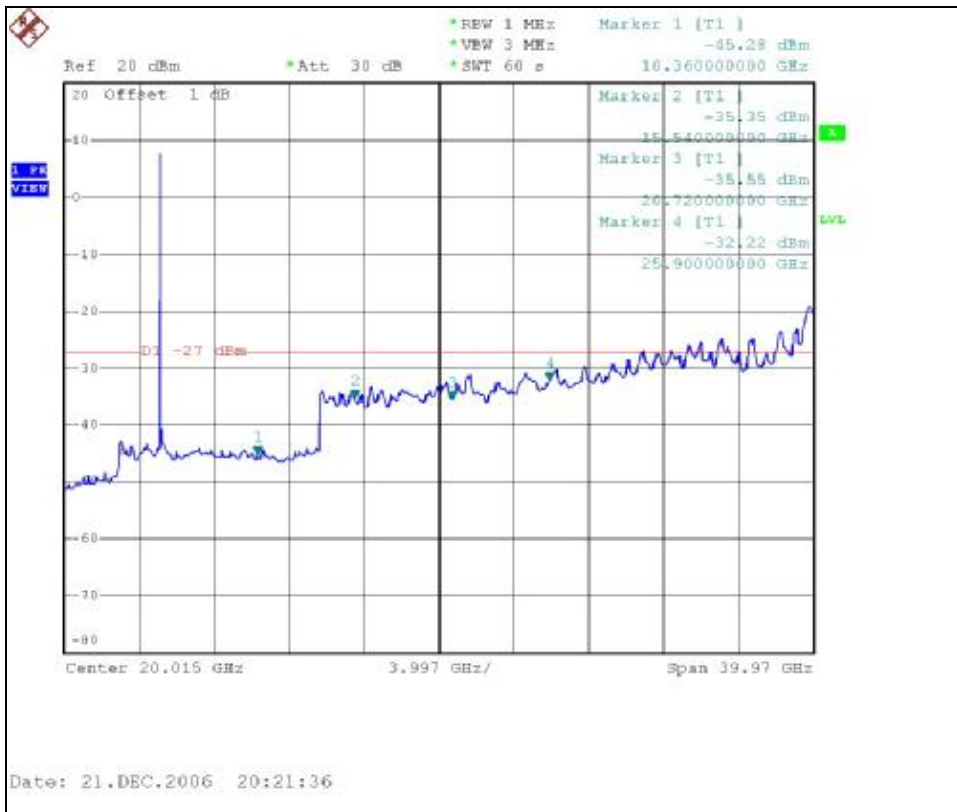
### 802.11a OFDM modulation (CH 5: 5745MHz)



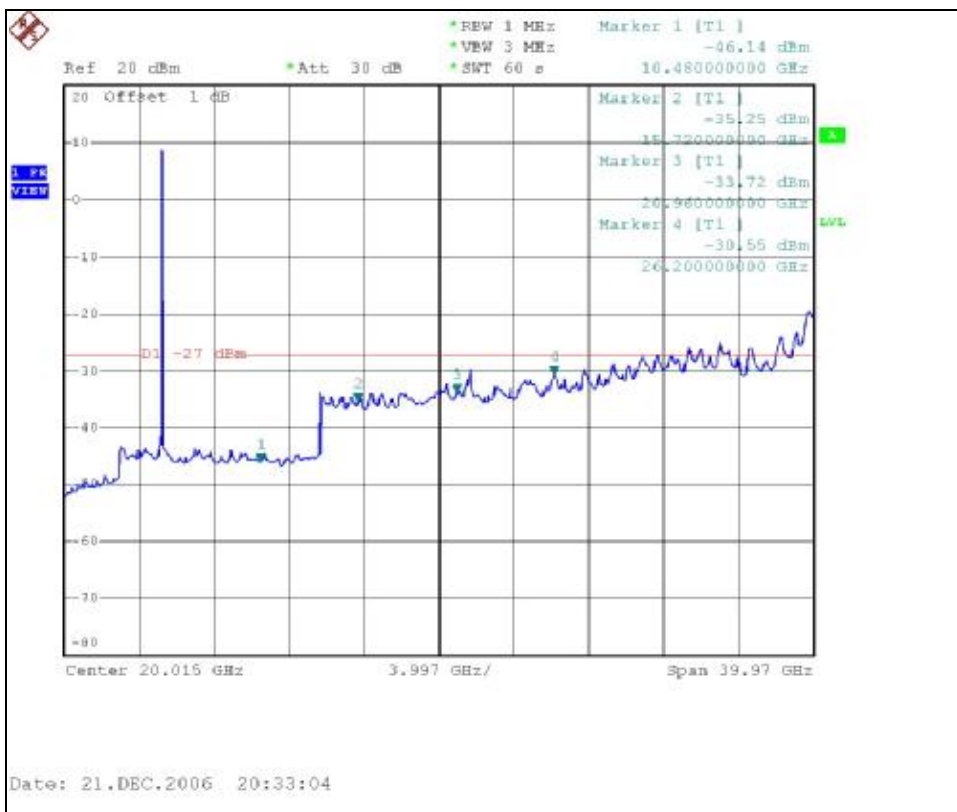
### 802.11a OFDM modulation (CH 8: 5805MHz)



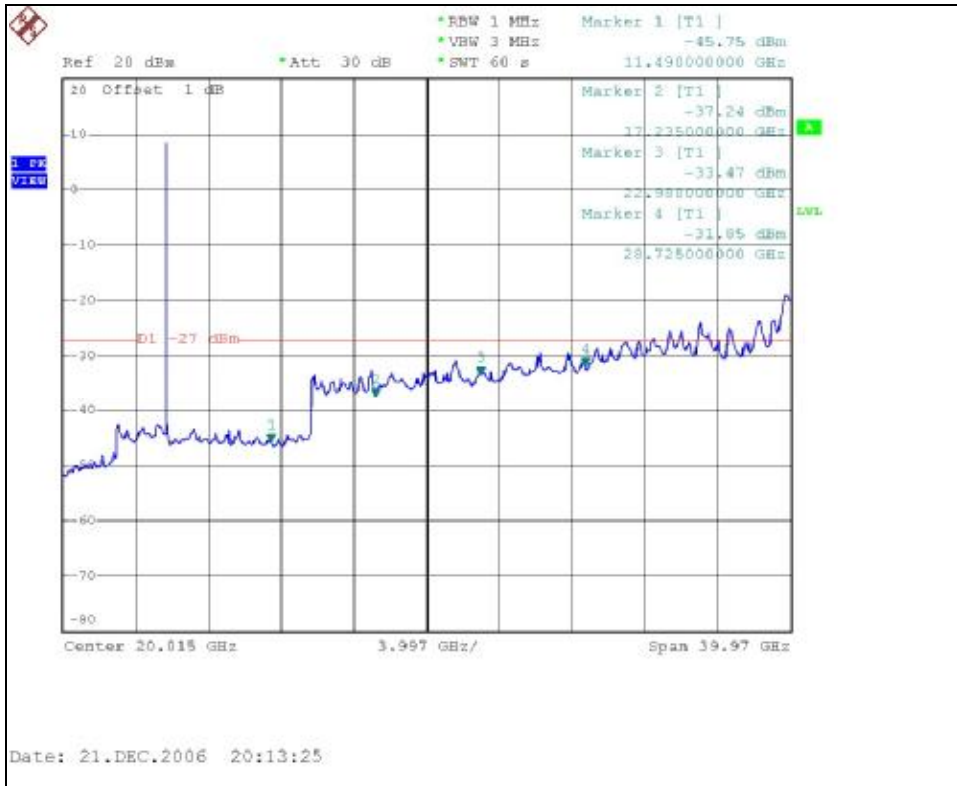
### CH1



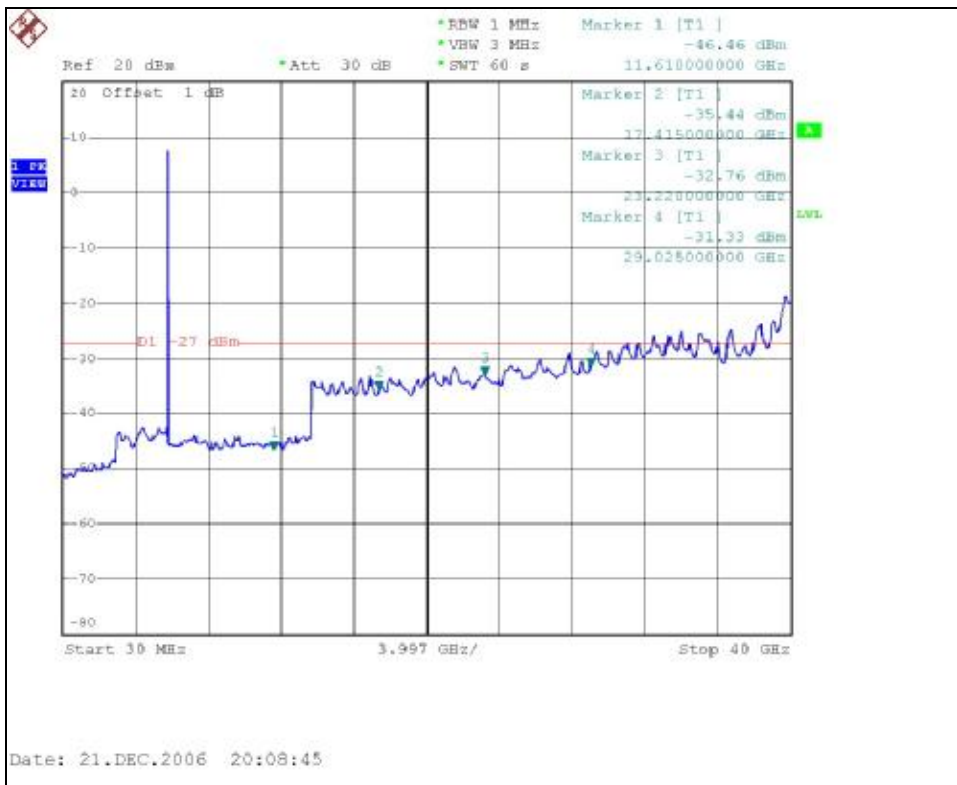
### CH 4



### CH5



### CH 8





#### 4.7.5 TEST RESULTS (ANTENNA B)

For signals in the restricted bands above and below the 5.15 to 5.35GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak field strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW=1MHz, VBW=3MHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

### 802.11a OFDM modulation

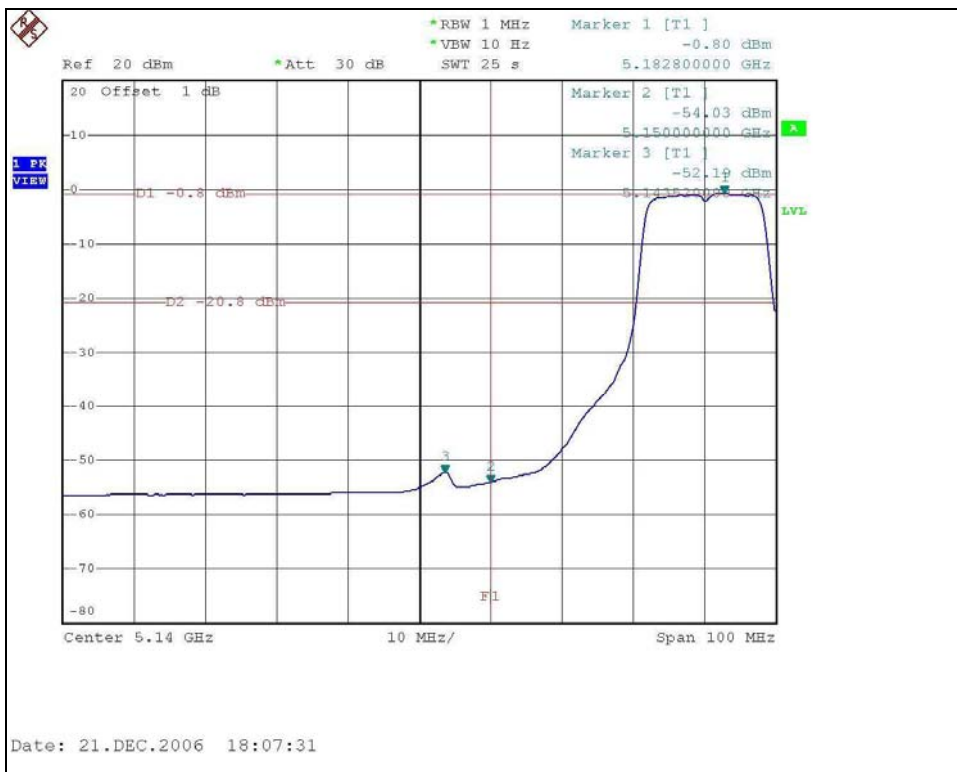
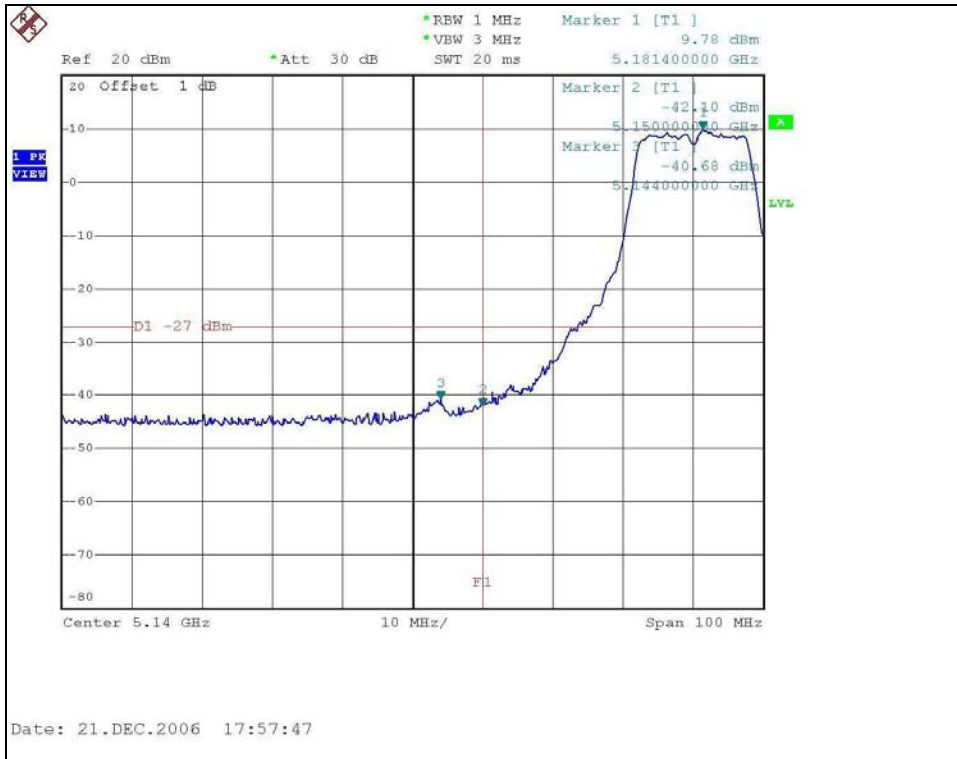
#### **NOTE (Peak):**

The band edge emission plot on the following first page shows 51.88dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 113.6dBuV/m (Peak), so the maximum field strength in restrict band is  $113.6-51.88=61.72$ dBuV/m which is under 74dBuV/m limit.

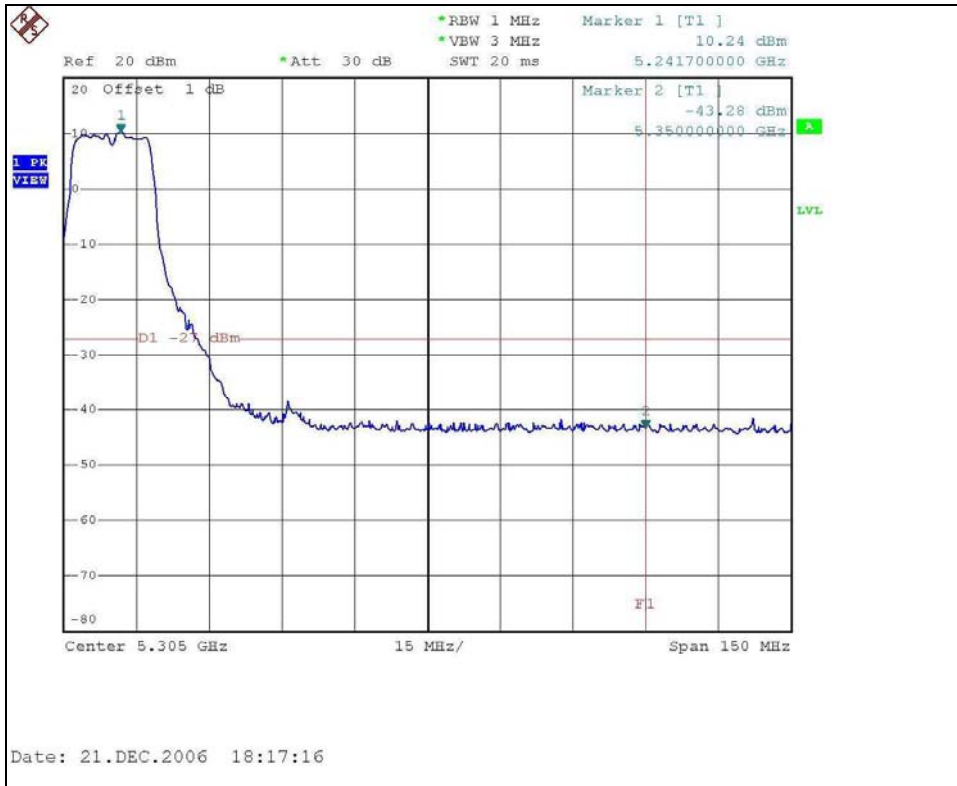
#### **NOTE (Average):**

The band edge emission plot on the following second page shows 53.23dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 102.9dBuV/m (Average), so the maximum field strength in restrict band is  $102.9-53.23=49.67$ dBuV/m which is under 54dBuV/m limit.

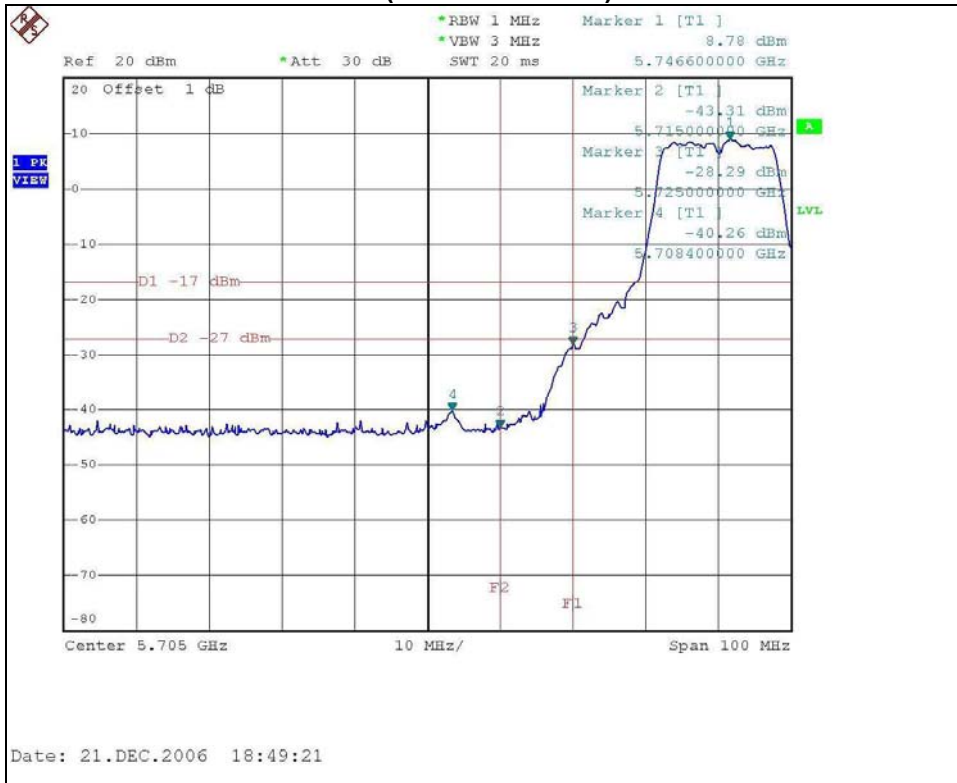
### 802.11a OFDM modulation (CH 1: 5180MHz)



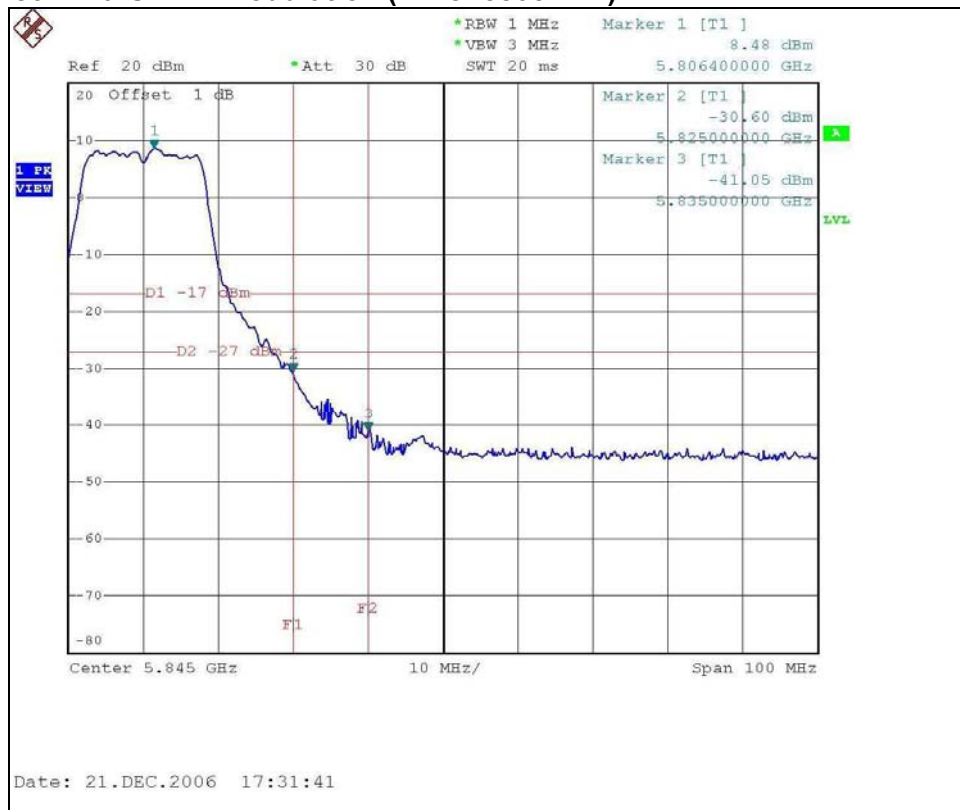
### 802.11a OFDM modulation (CH 4: 5240MHz)



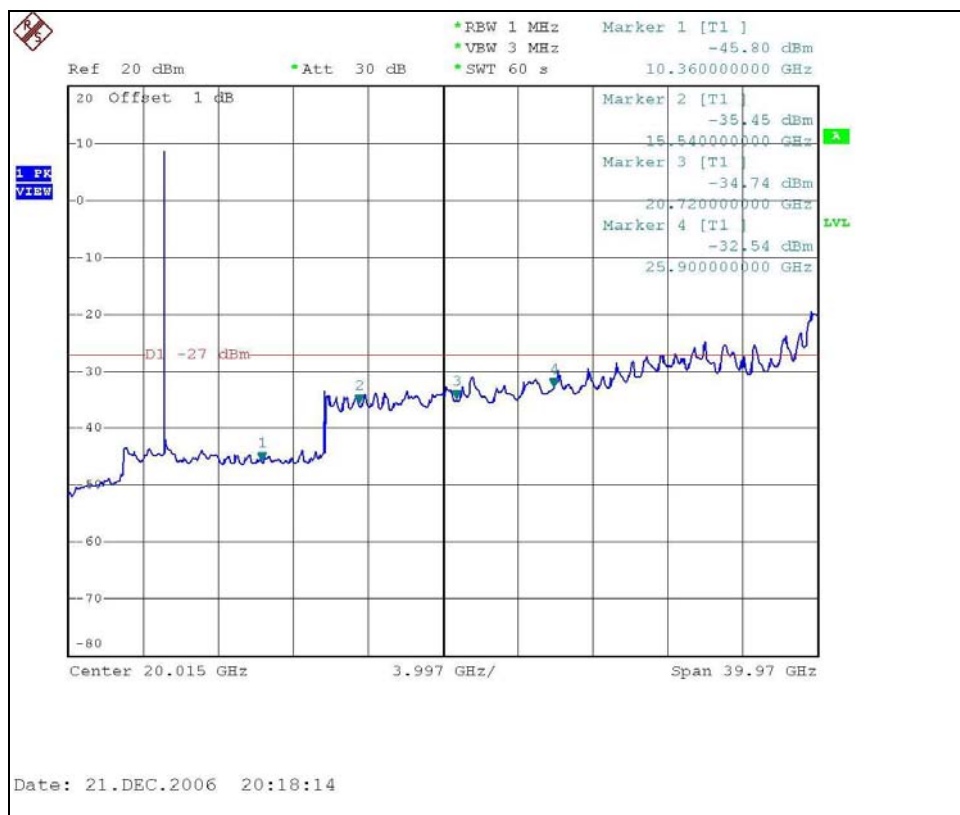
### 802.11a OFDM modulation (CH 5: 5745MHz)



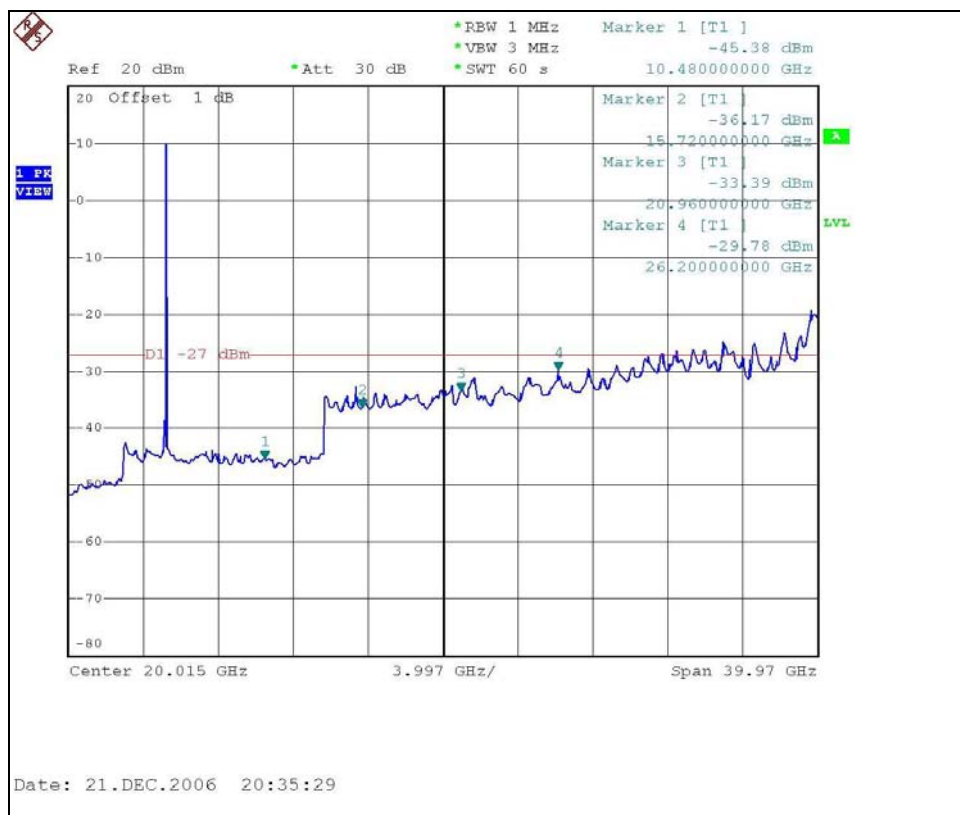
### 802.11a OFDM modulation (CH 8: 5805MHz)



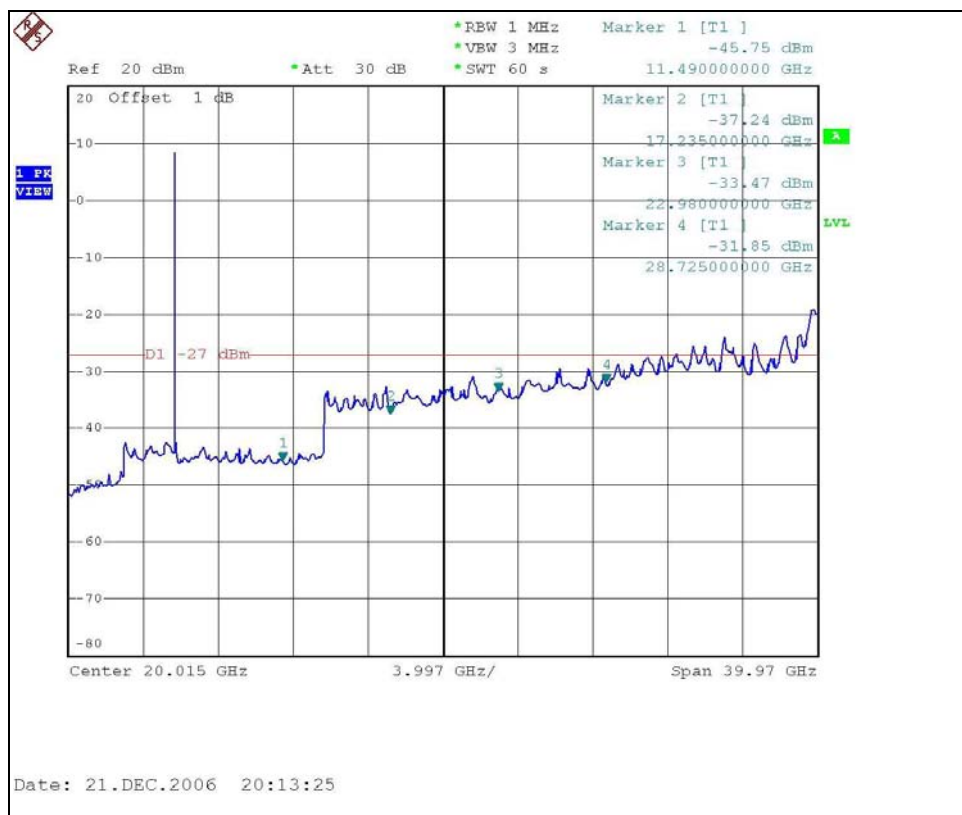
### CH1



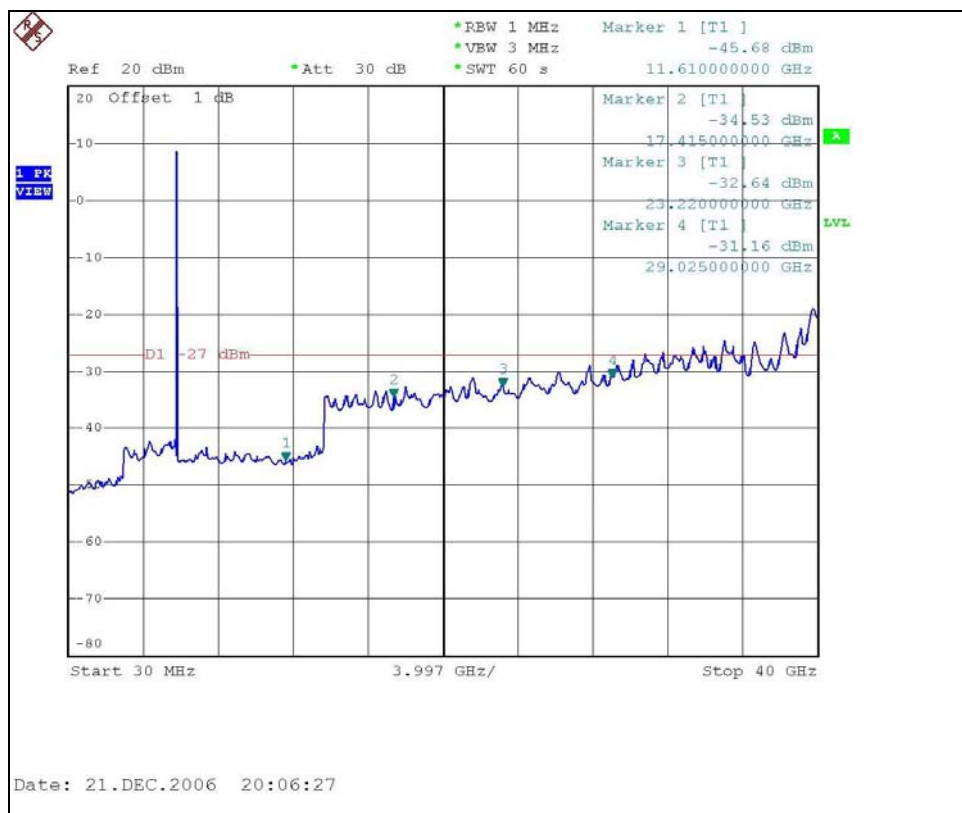
### CH 4



### CH5



### CH 8



#### 4.7.6 TEST RESULTS (ANTENNA C)

For signals in the restricted bands above and below the 5.15 to 5.35GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak field strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW=1MHz, VBW=3MHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.



### 802.11a OFDM modulation

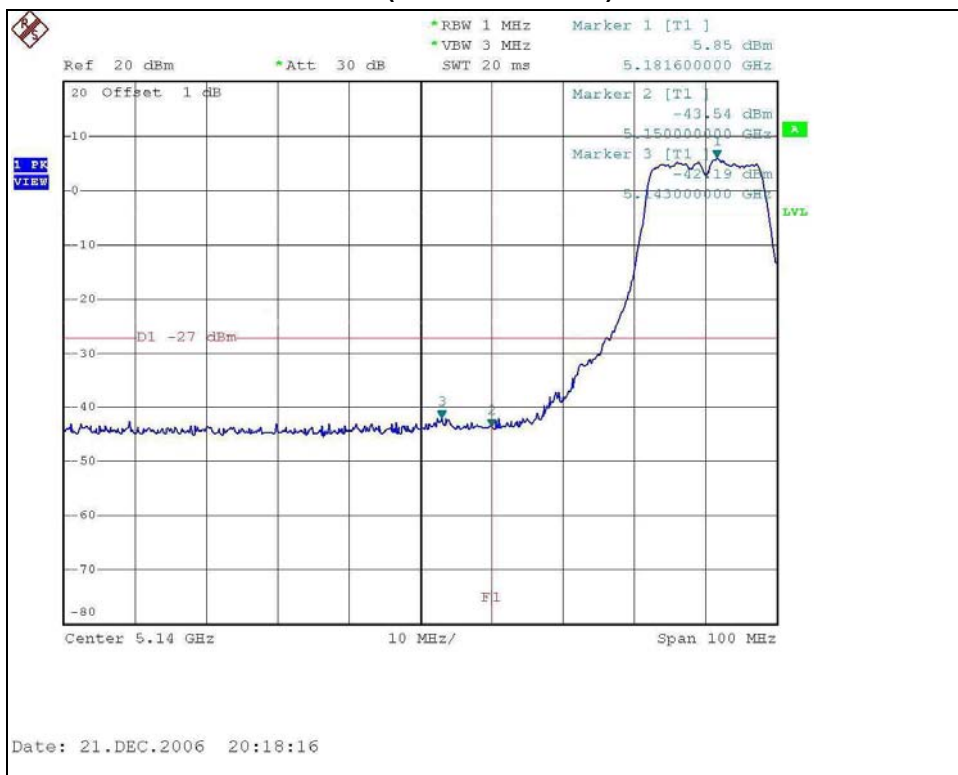
#### **NOTE (Peak):**

The band edge emission plot on the following first page shows 49.39dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 108.0dBuV/m (Peak), so the maximum field strength in restrict band is  $108.0 - 49.39 = 58.61$ dBuV/m which is under 74dBuV/m limit.

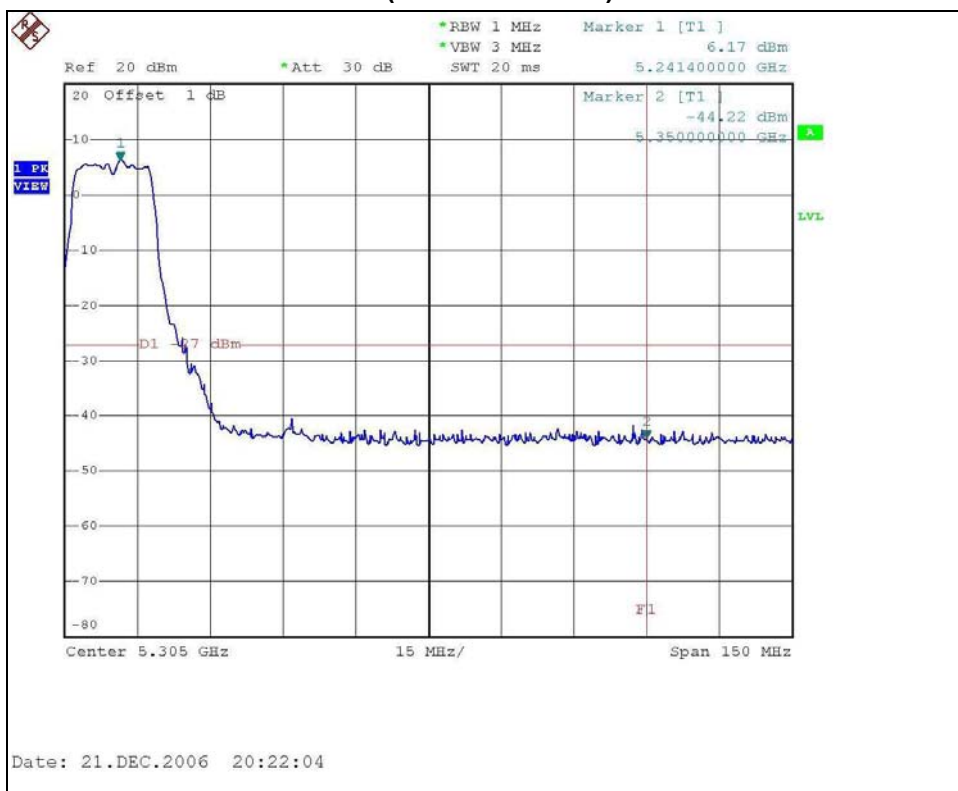
#### **NOTE (Average):**

The band edge emission plot on the following second page shows 51.26dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 97.6dBuV/m (Average), so the maximum field strength in restrict band is  $97.6 - 51.26 = 46.34$ dBuV/m which is under 54dBuV/m limit.

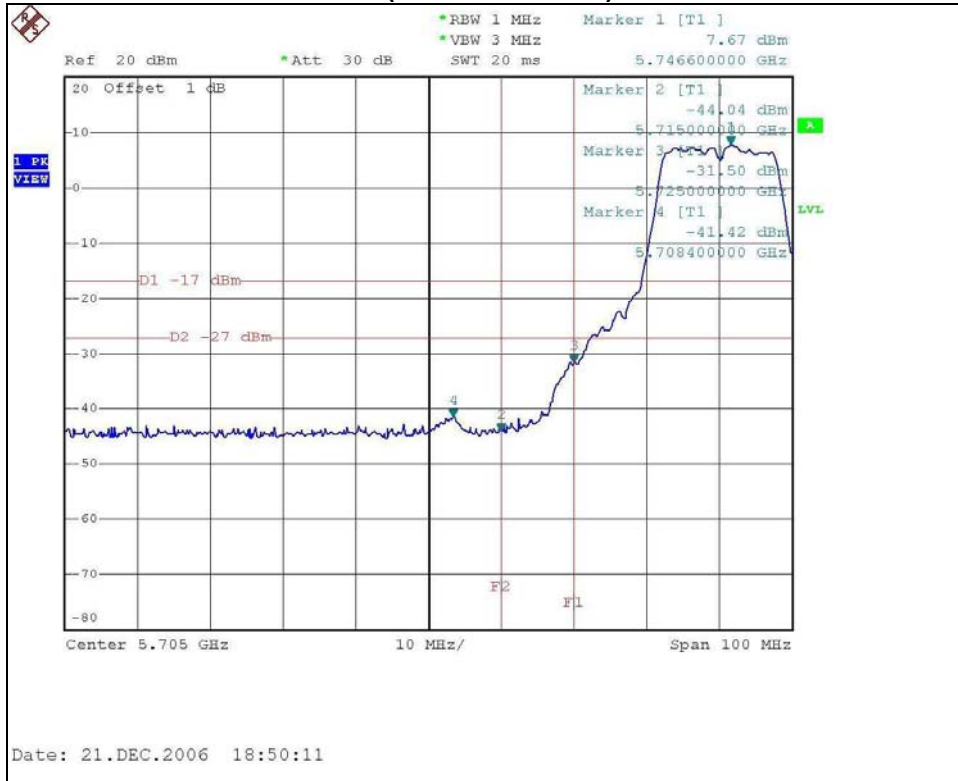
### 802.11a OFDM modulation (CH 1: 5180MHz)



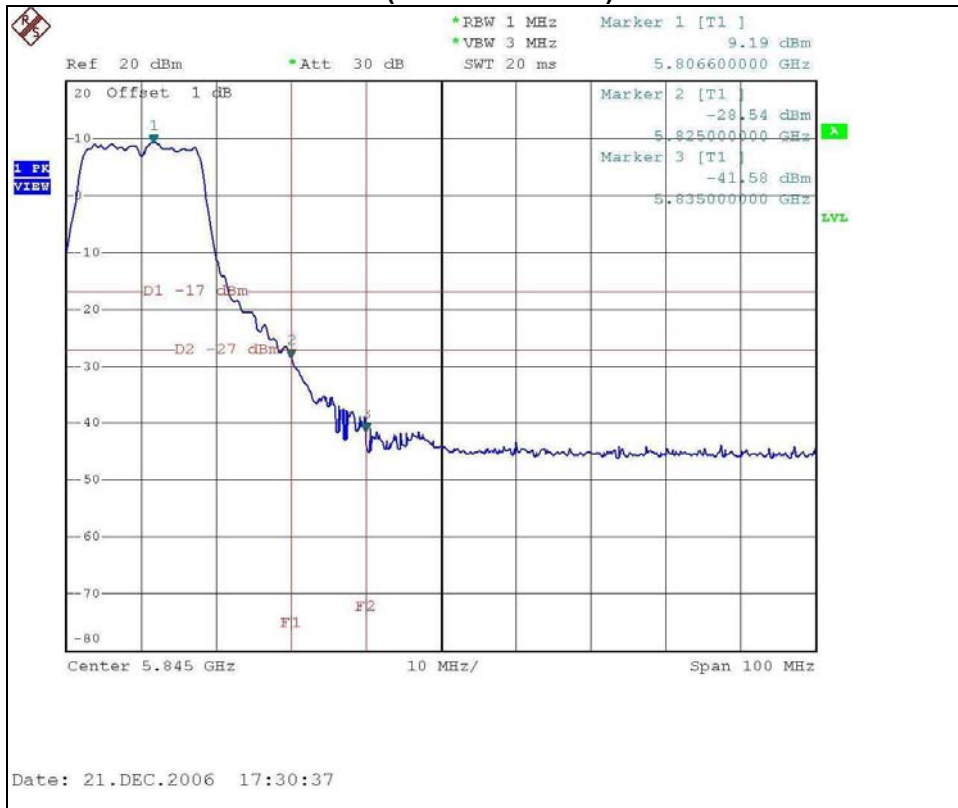
### 802.11a OFDM modulation (CH 4: 5240MHz)



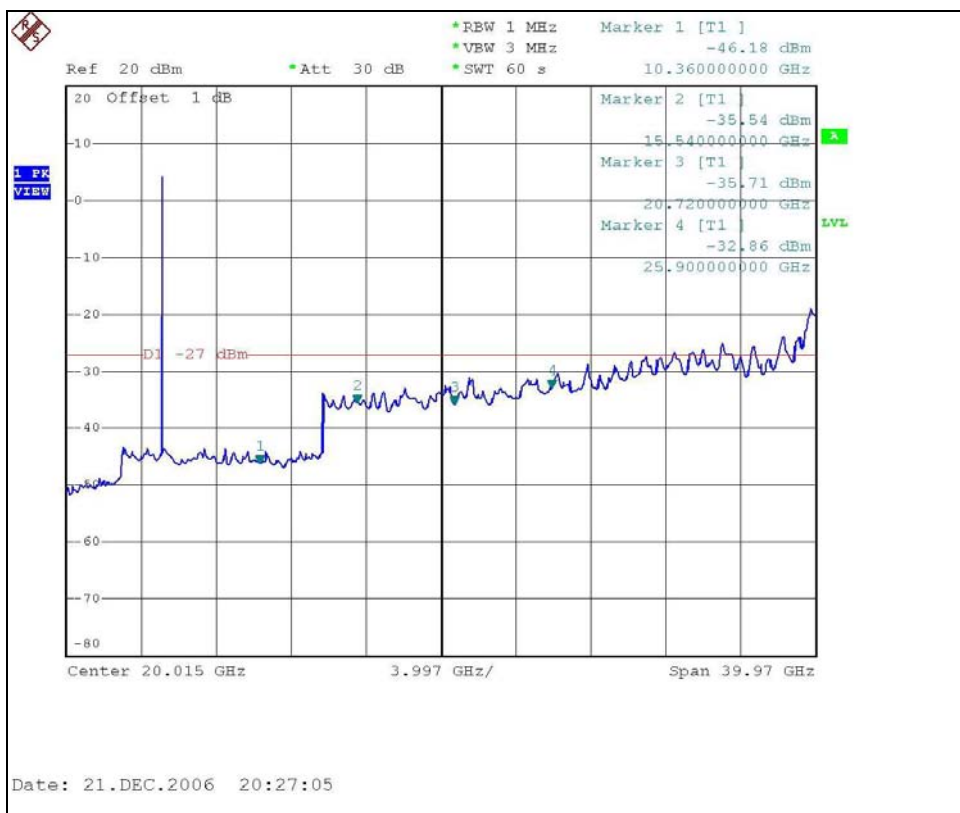
### 802.11a OFDM modulation (CH 5: 5745MHz)



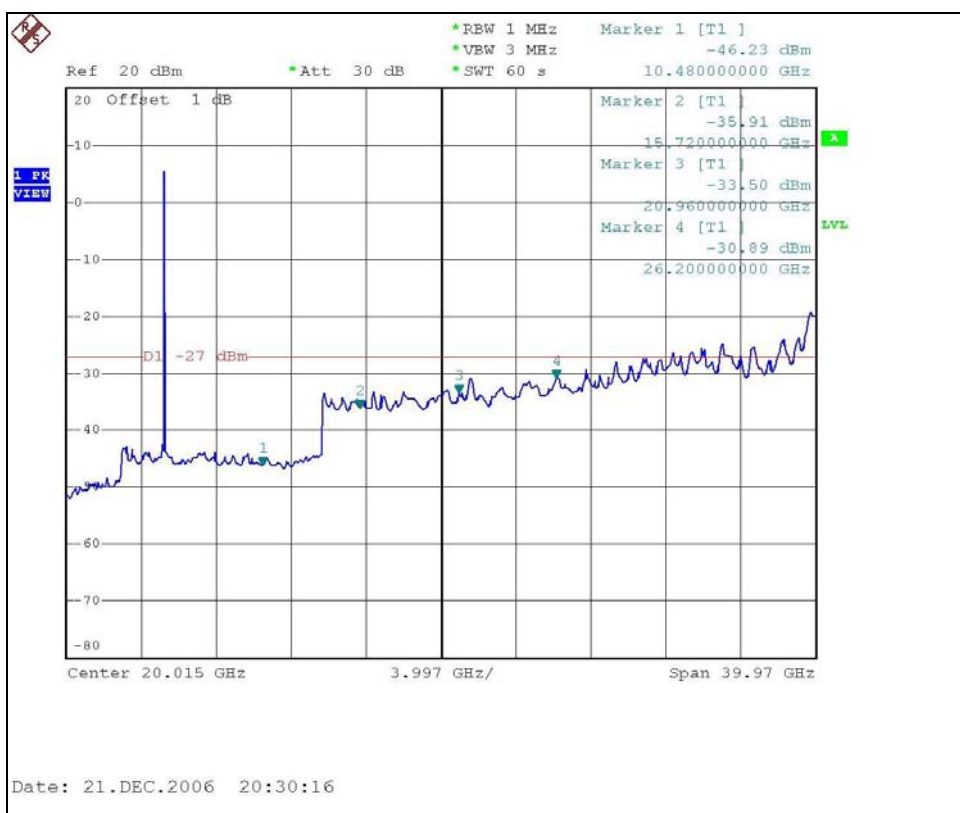
### 802.11a OFDM modulation (CH 8: 5805MHz)



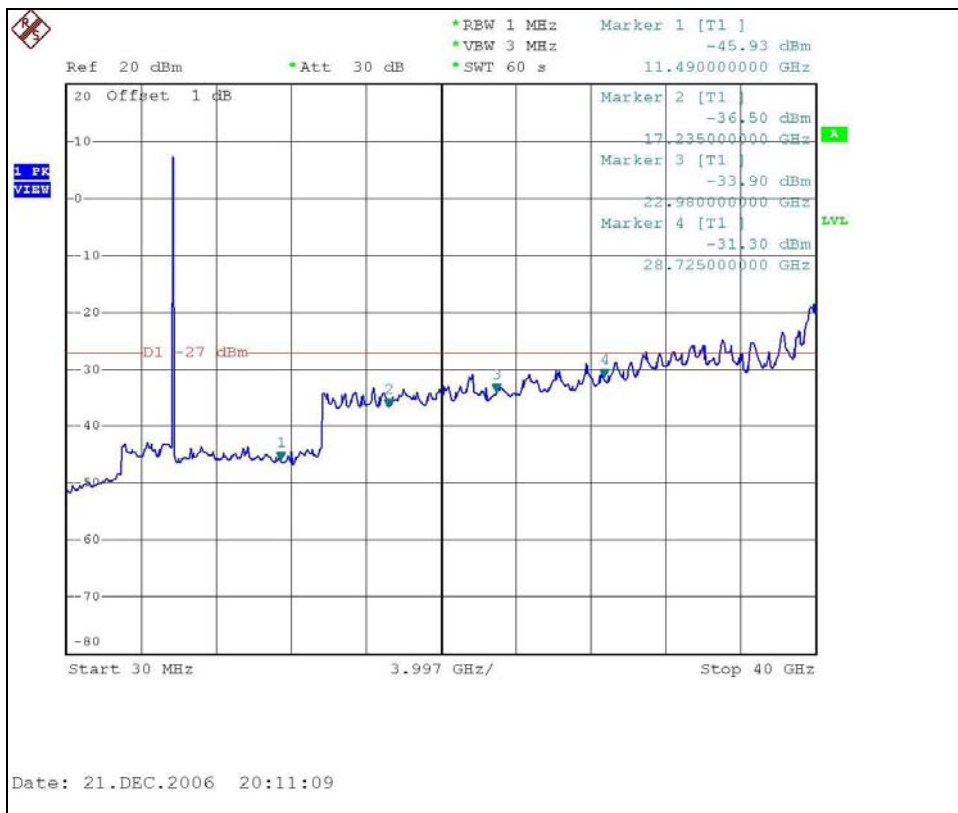
### CH1



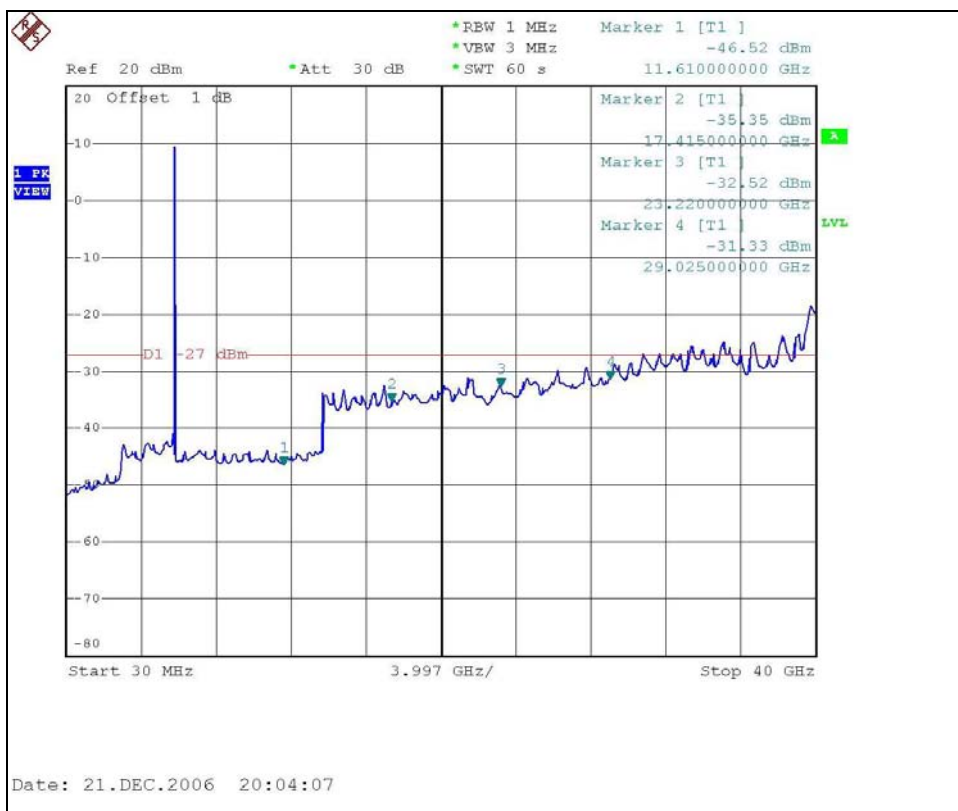
### CH 4



### CH5



### CH 8



#### 4.7.7 TEST RESULTS (ANTENNA D)

For signals in the restricted bands above and below the 5.15 to 5.35GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak field strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW=1MHz, VBW=3MHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

### 802.11a OFDM modulation

#### **NOTE (Peak):**

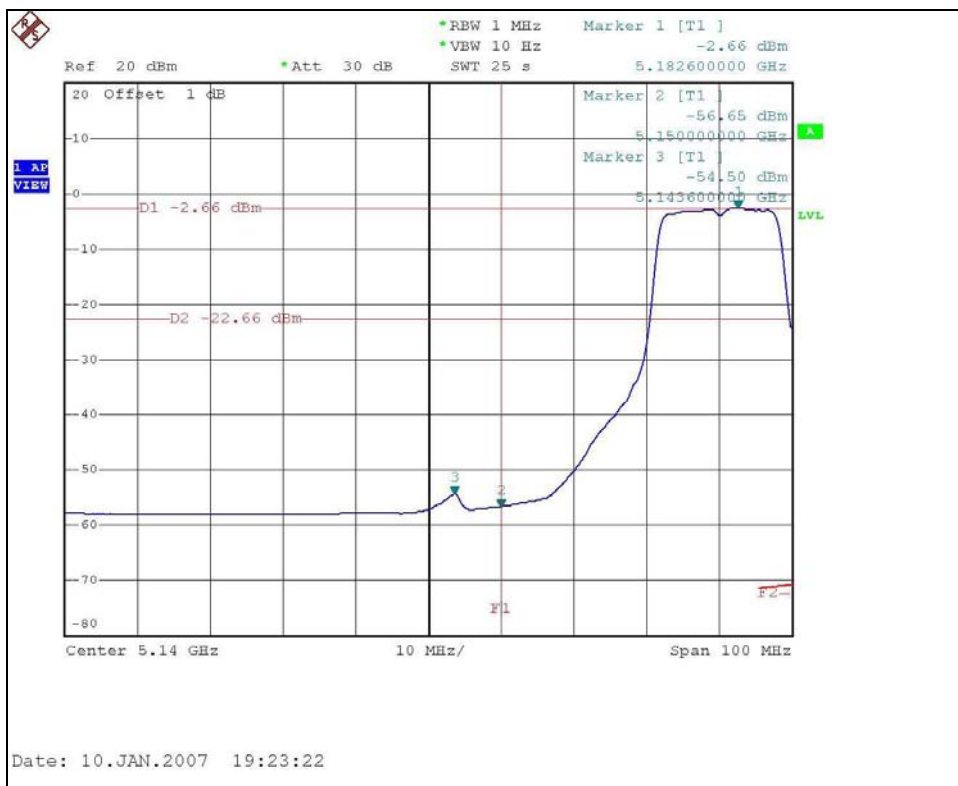
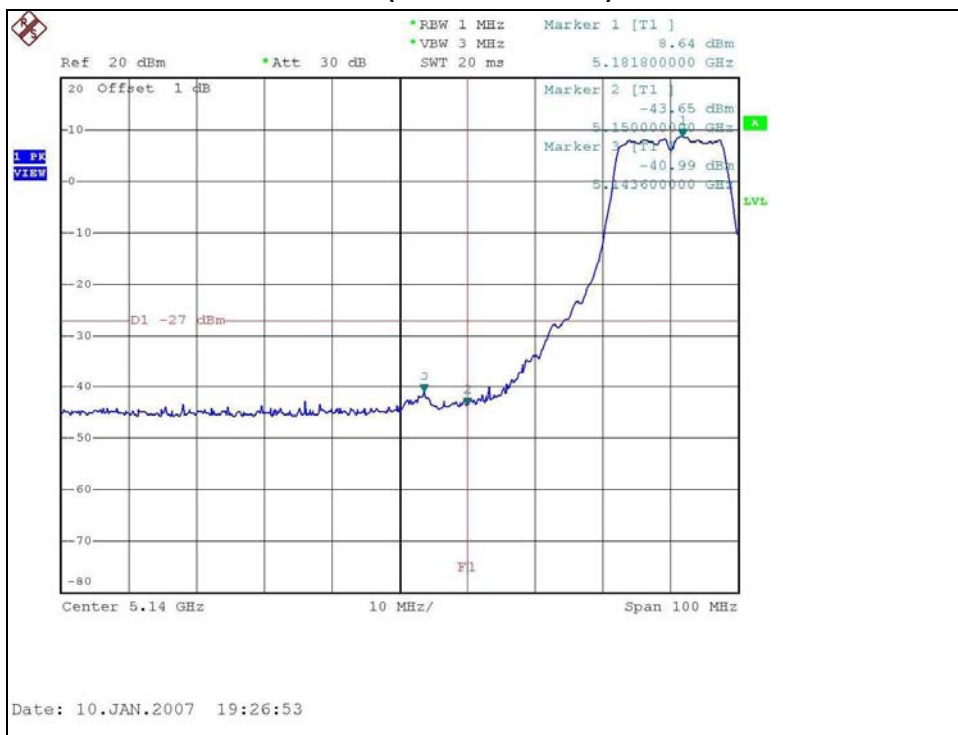
The band edge emission plot on the following first page shows 52.29dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 101.4dBuV/m (Peak), so the maximum field strength in restrict band is  $101.4 - 52.29 = 49.11$ dBuV/m which is under 74dBuV/m limit.

#### **NOTE (Average):**

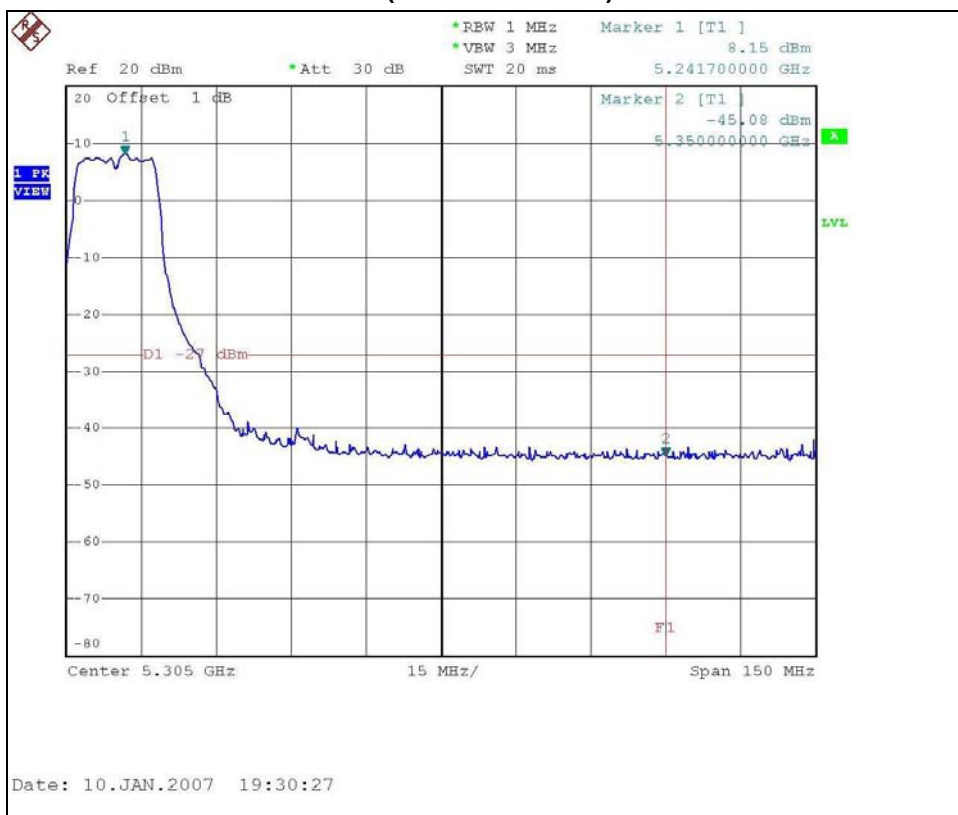
The band edge emission plot on the following second page shows 53.99dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 105.5dBuV/m (Average), so the maximum field strength in restrict band is  $113.0 - 53.99 = 59.01$ dBuV/m which is under 54dBuV/m limit.



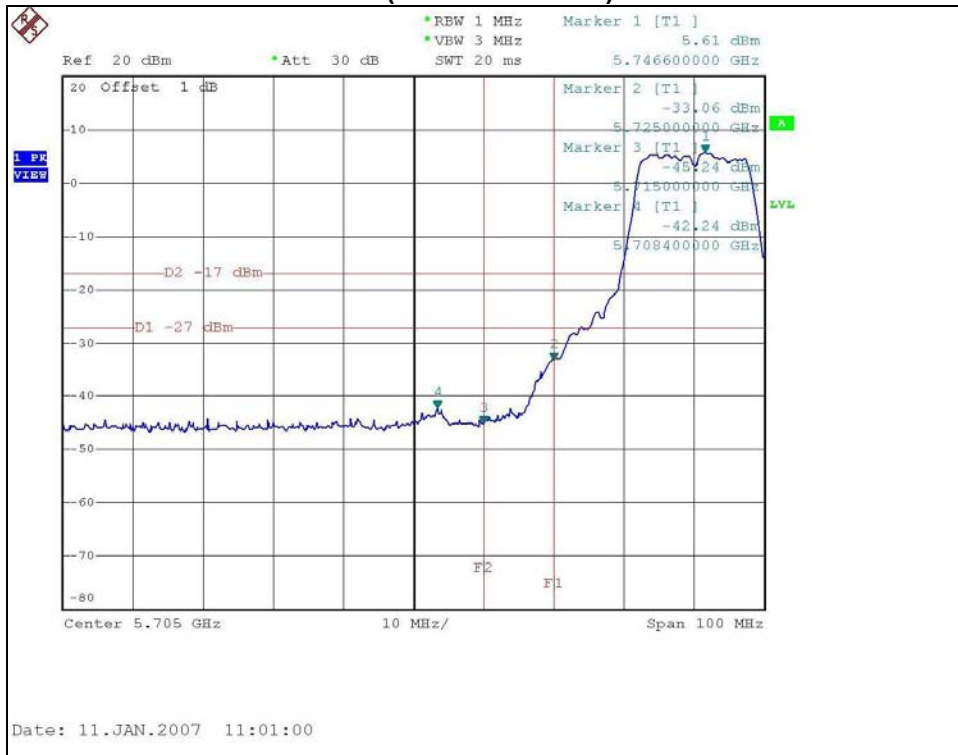
### 802.11a OFDM modulation (CH 1: 5180MHz)



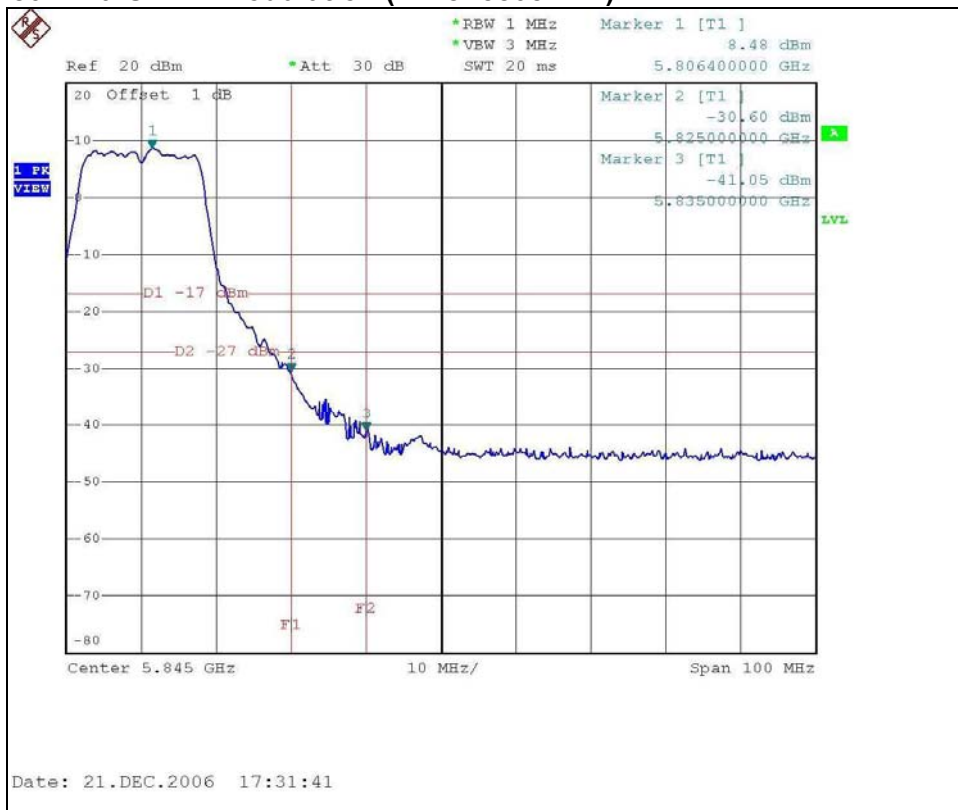
### 802.11a OFDM modulation (CH 4: 5240MHz)



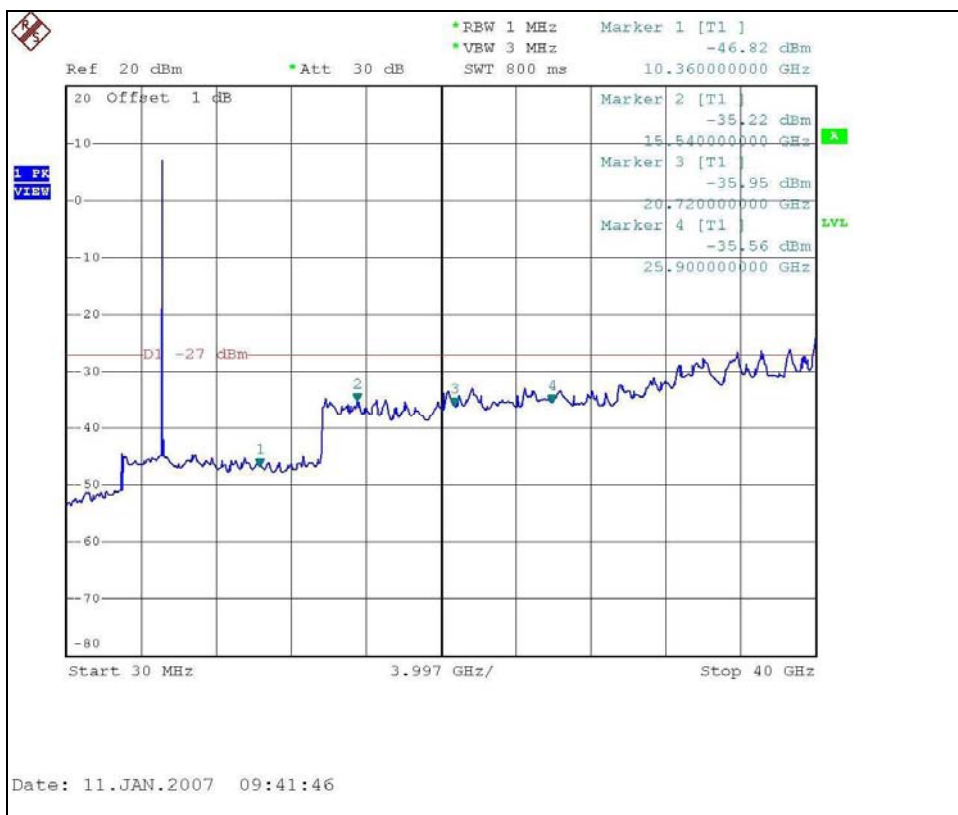
### 802.11a OFDM modulation (CH 5: 5745MHz)



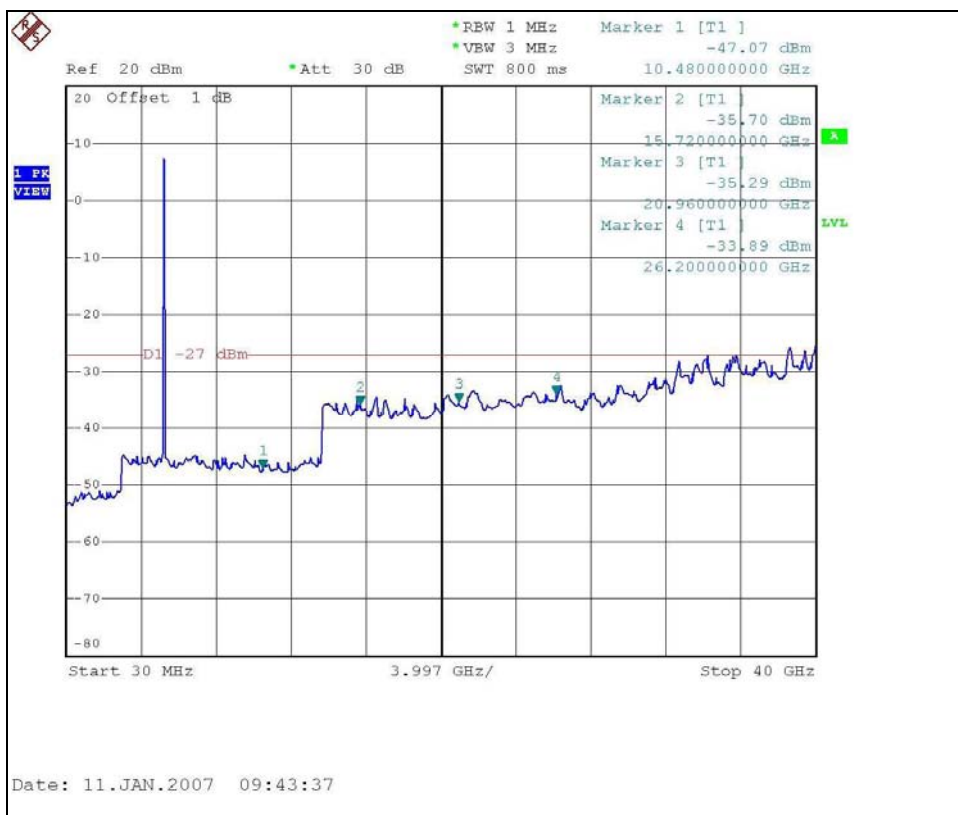
### 802.11a OFDM modulation (CH 8: 5805MHz)



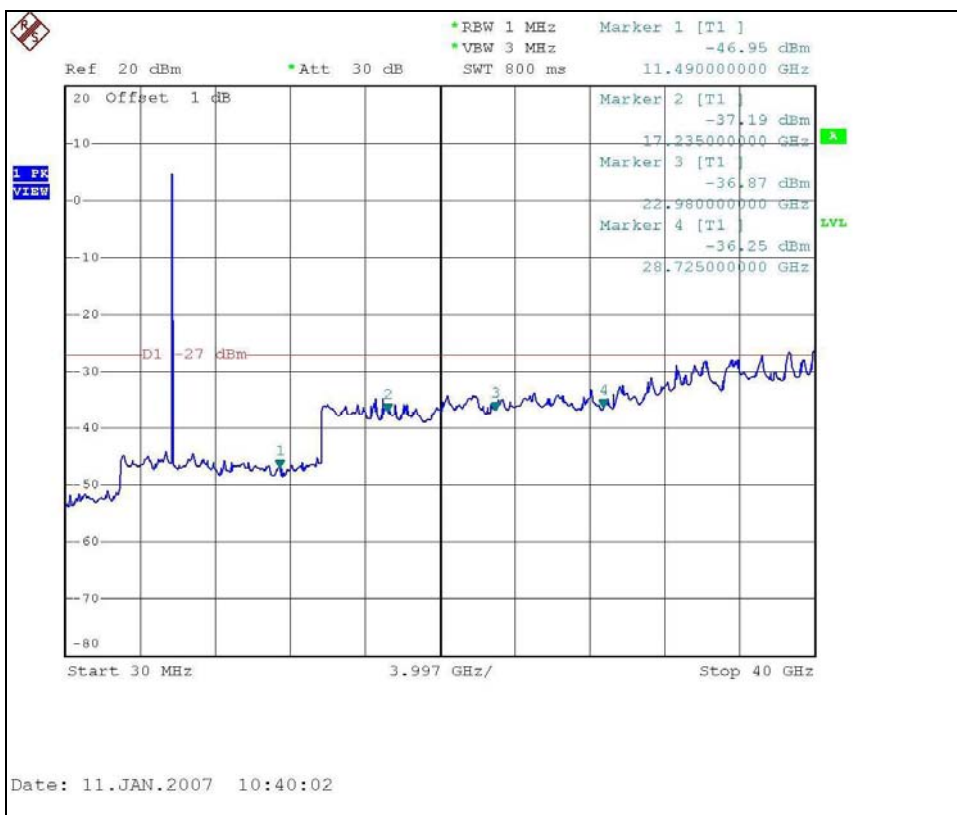
### CH1



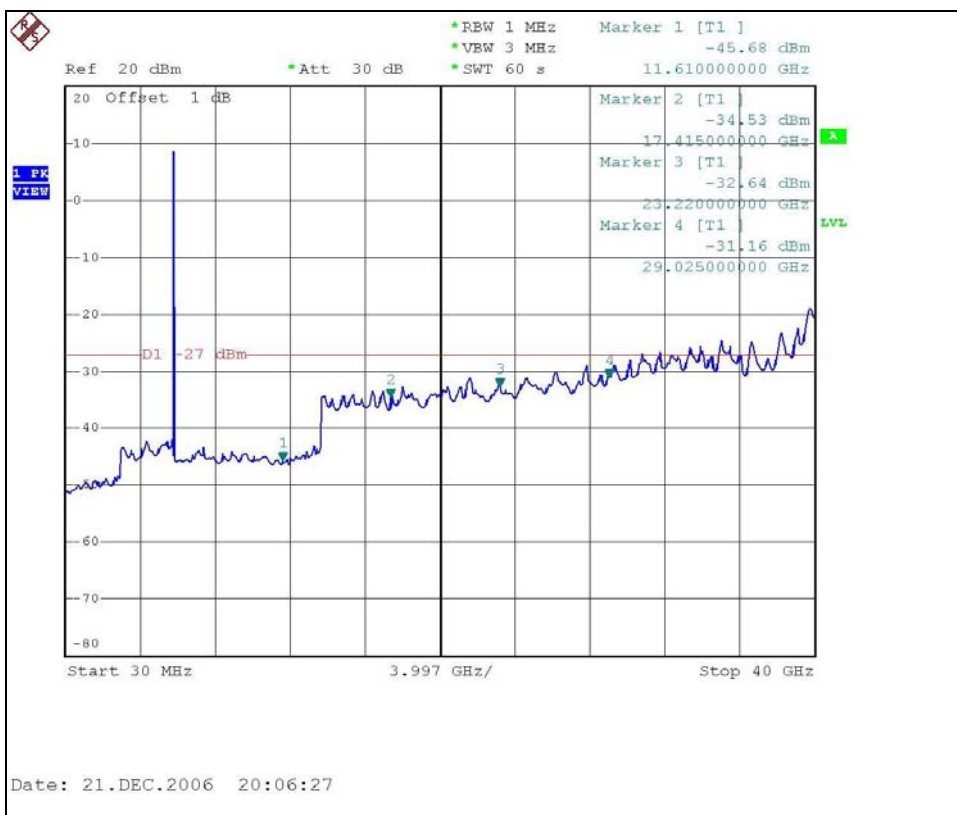
### CH 4



### CH5



### CH 8





## 4.8 ANTENNA REQUIREMENT

### 4.8.1 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 15.407(a), 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.

### 4.8.2 ANTENNA CONNECTED CONSTRUCTION

The antennas used in this product are as following:

No.	Model No.	Gain (dBi)	Antenna Type	Connector
A	L-2452-PNA7-01R	4.9-5.25: 7.0 5.25-5.9: 10.7	Panel	Type-N(m)
B	ML-2452-PNA5-01R	4.9-5.25: 5 5.25-5.9: 7.5	Panel	Type-N(m)
C	ML-5299-FHPA10-01R	10	Omni	Type-N(m)
D	ML-5299-FHPA6-01R	8	Omni	Type-N(m)



## 5. 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, 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, NCC
<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

**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



## **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.