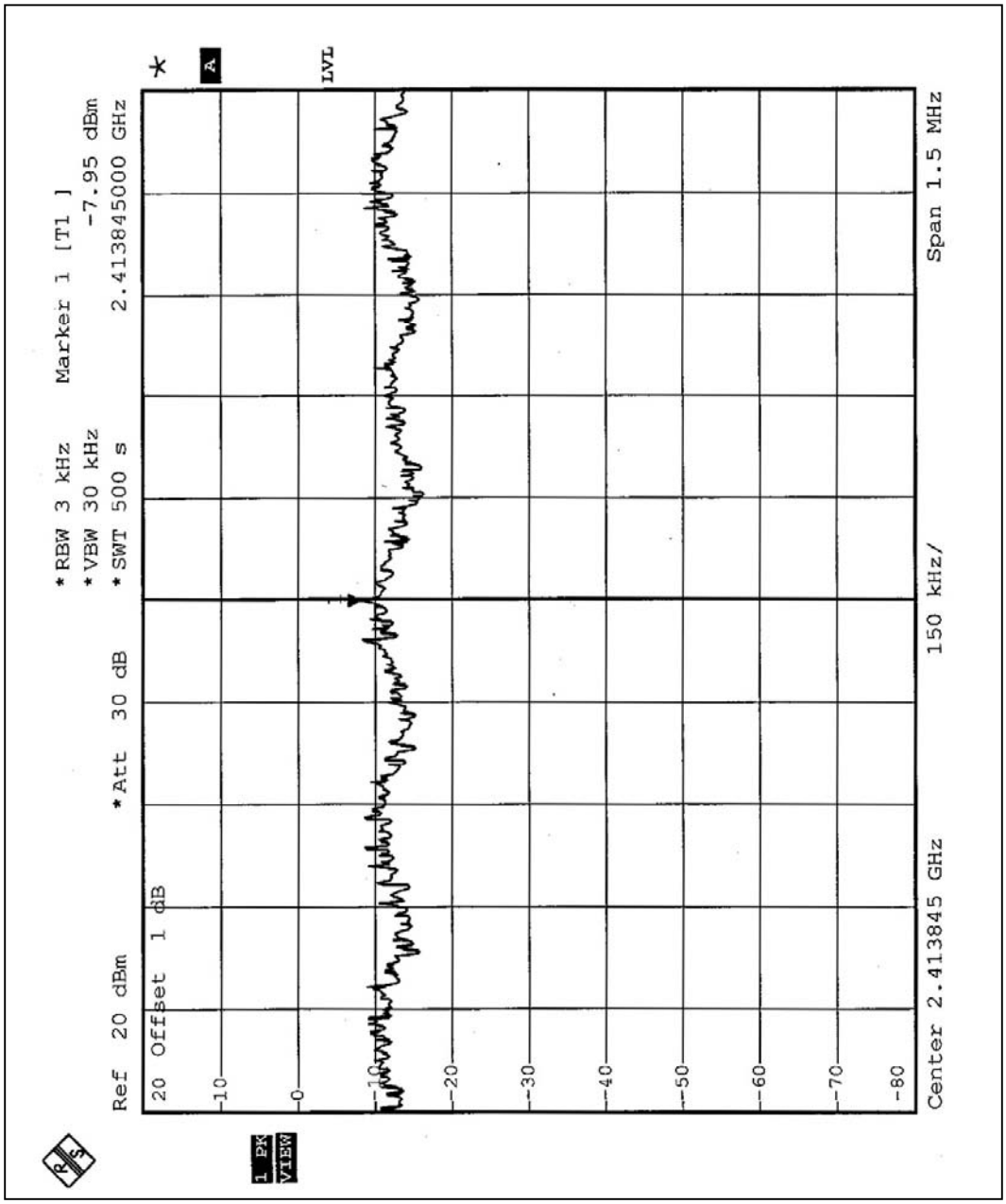
4.5.7 TEST RESULTS-OFDM

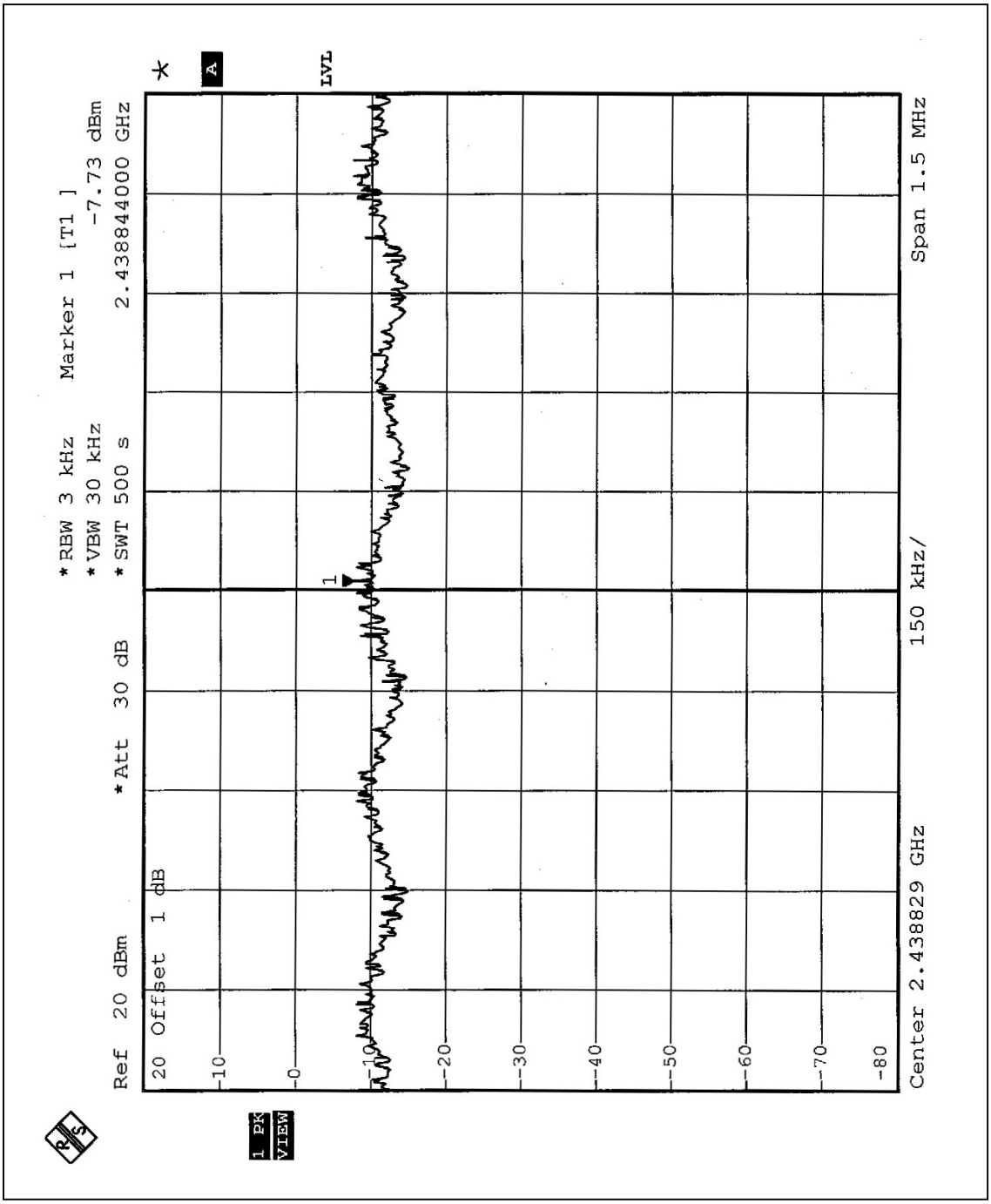
EUT	802.11 b/g Wireless USB Adapter		
MODEL	AT-WCU201G	**ENVIRONMENTAL CONDITIONS**	27 deg. C, 59%RH, 968 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Sky Liao

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-7.95	8	PASS
6	2437	-7.73	8	PASS
11	2462	-8.2	8	PASS
Turbo 6	2437	-9.95	8	PASS

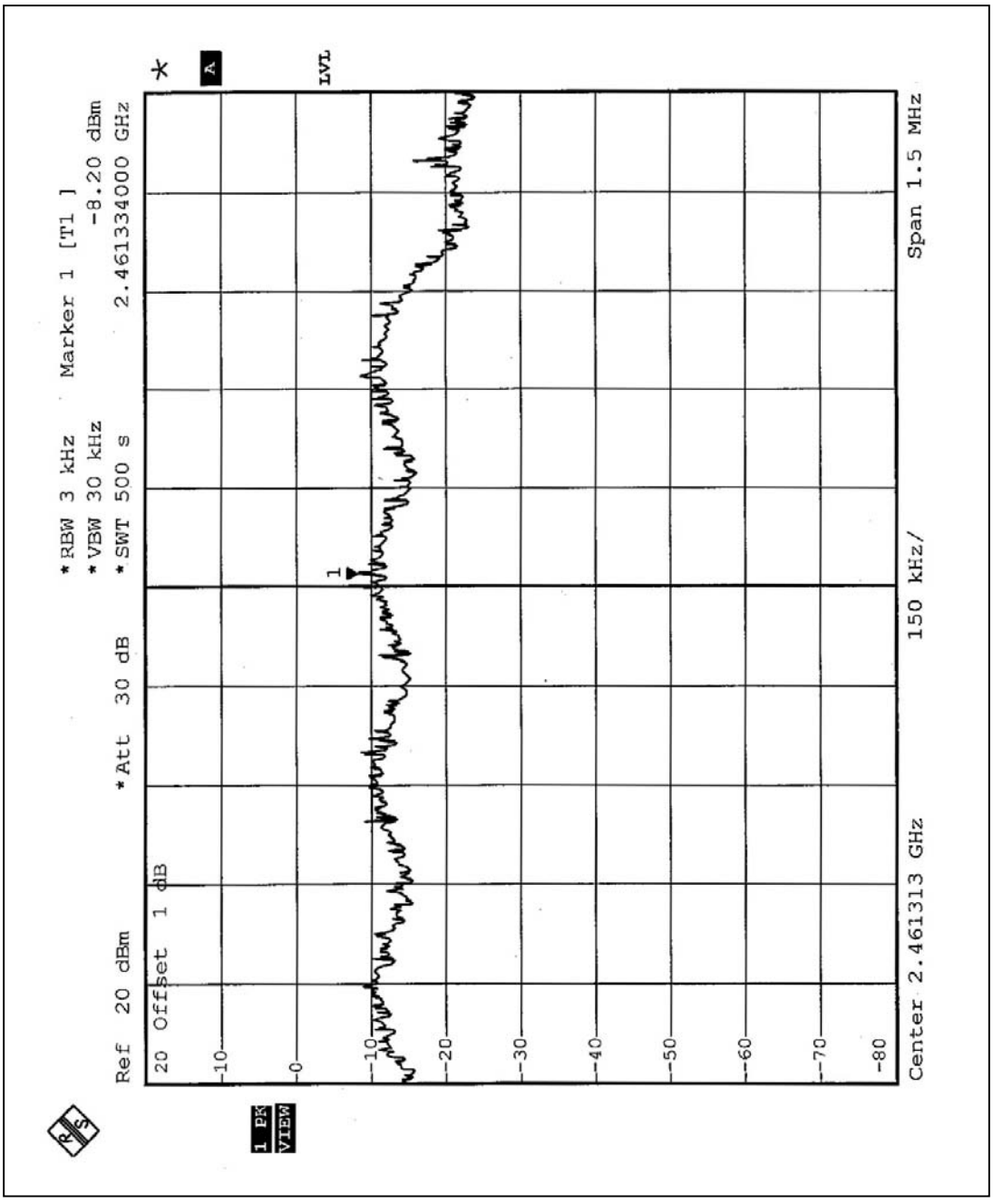
CH1


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-7.95 dBm
2.413845000 GHz
Center 2.413845 GHz
150 kHz/
Span 1.5 MHz
1 PK
VIEW

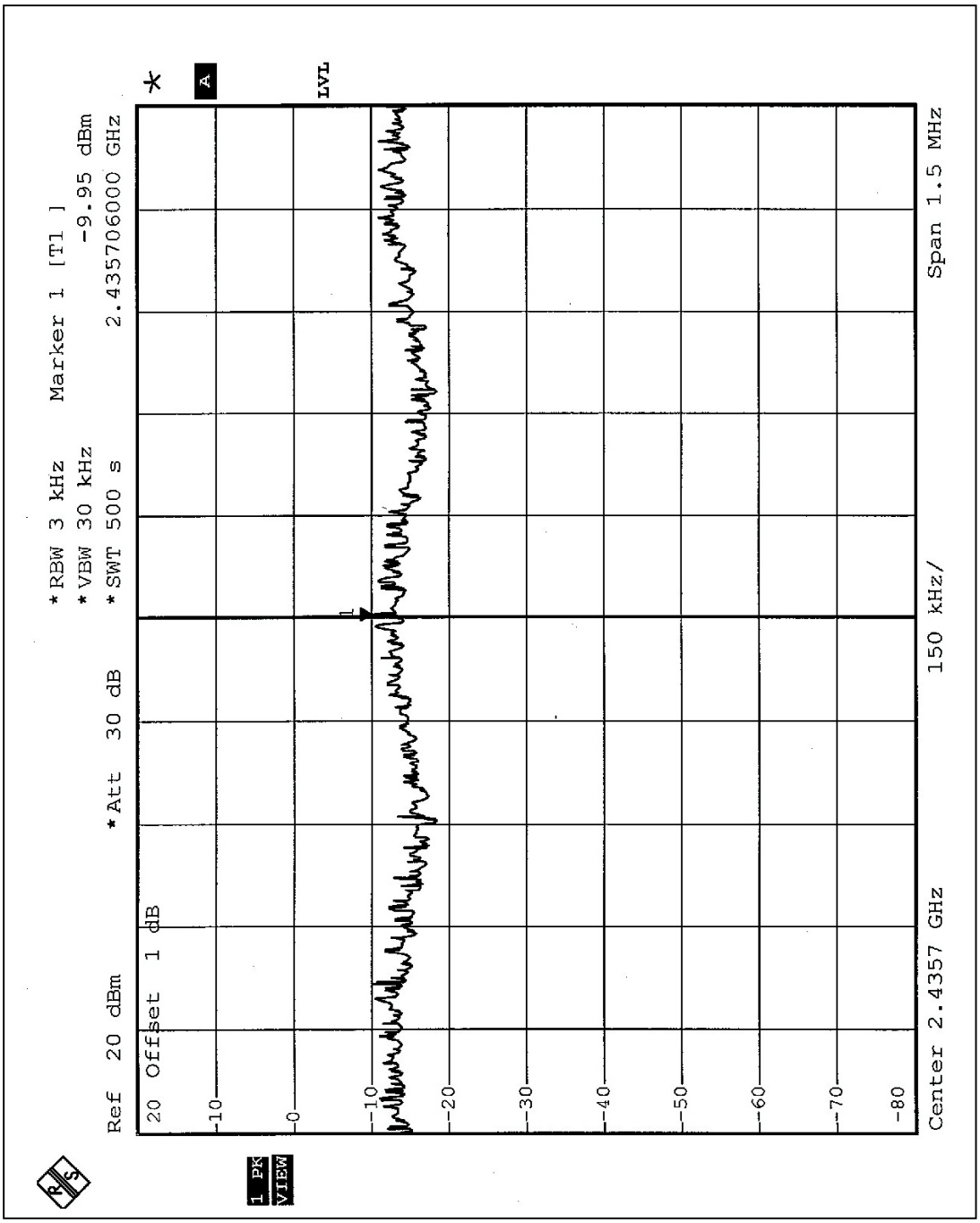
CH6


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-7.73 dBm
2.438844000 GHz
Center 2.438829 GHz
150 kHz/
Span 1.5 MHz
1 PK
VIEW

CH11


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.20 dBm
2.461334000 GHz
1 PK
VIEW
LVL
A
Center 2.461313 GHz
150 kHz/
Span 1.5 MHz

Turbo CH6


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-9.95 dBm
2.43570600 GHz
Center 2.4357 GHz
150 kHz/
Span 1.5 MHz
1 PK VIEW
LVL
A

4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 1 MHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

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 1 MHz and set VBW spectrum analyzer to 10 Hz with suitable frequency span including 1 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 –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.

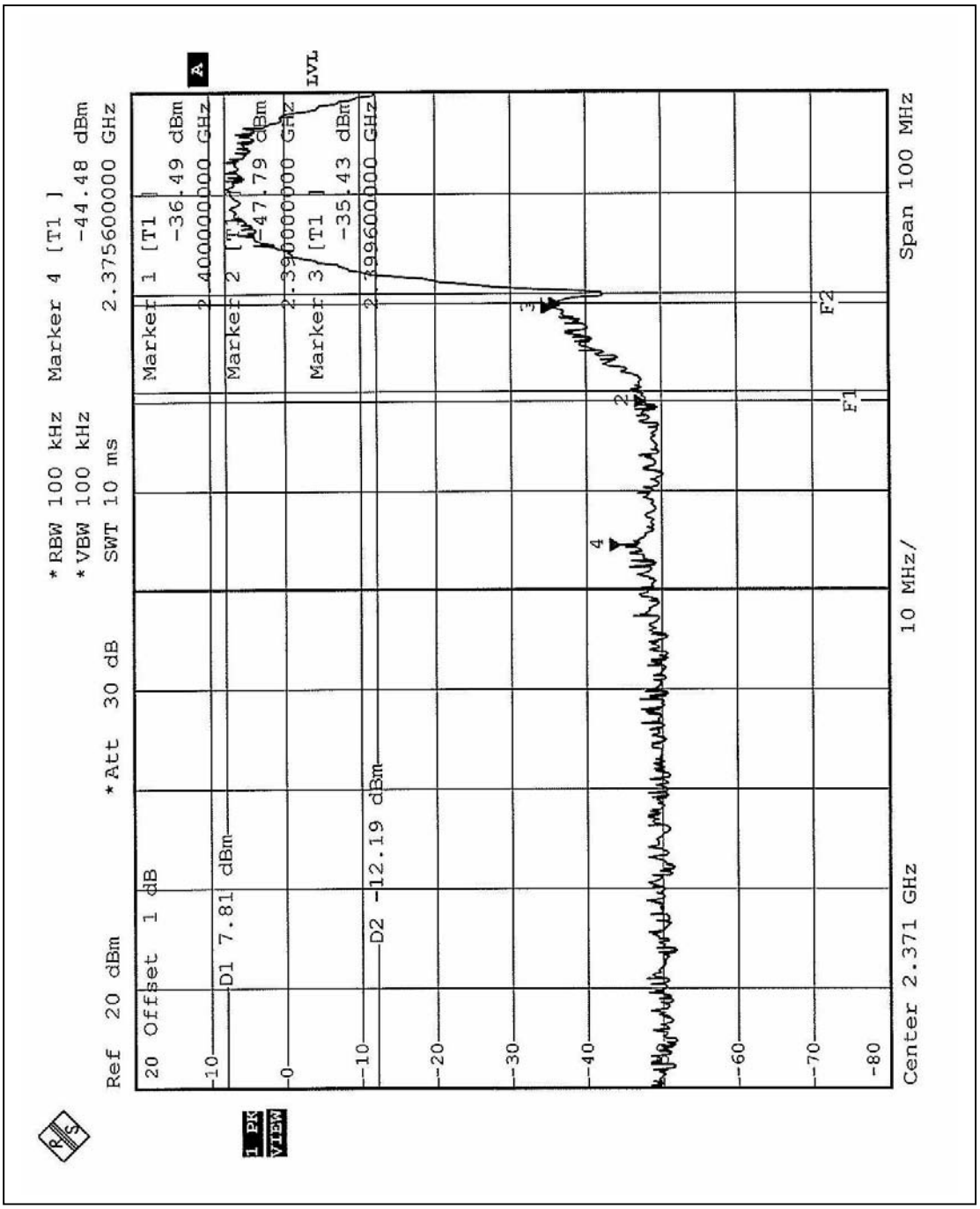
NOTE (Peak):
The band edge emission plot of DSSS technique on the following first page show 55.6dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 108.1dBuV/m, so the maximum field strength in restrict band is 108.1-55.6=52.5dBuV/m which is under 74 dBuV/m limit.

The band edge emission plot of DSSS technique on the following second page shows 57.63dB 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 109.6dBuV/m, so the maximum field strength in restrict band is 109.6-57.63=51.97dBuV/m which is under 74 dBuV/m limit.

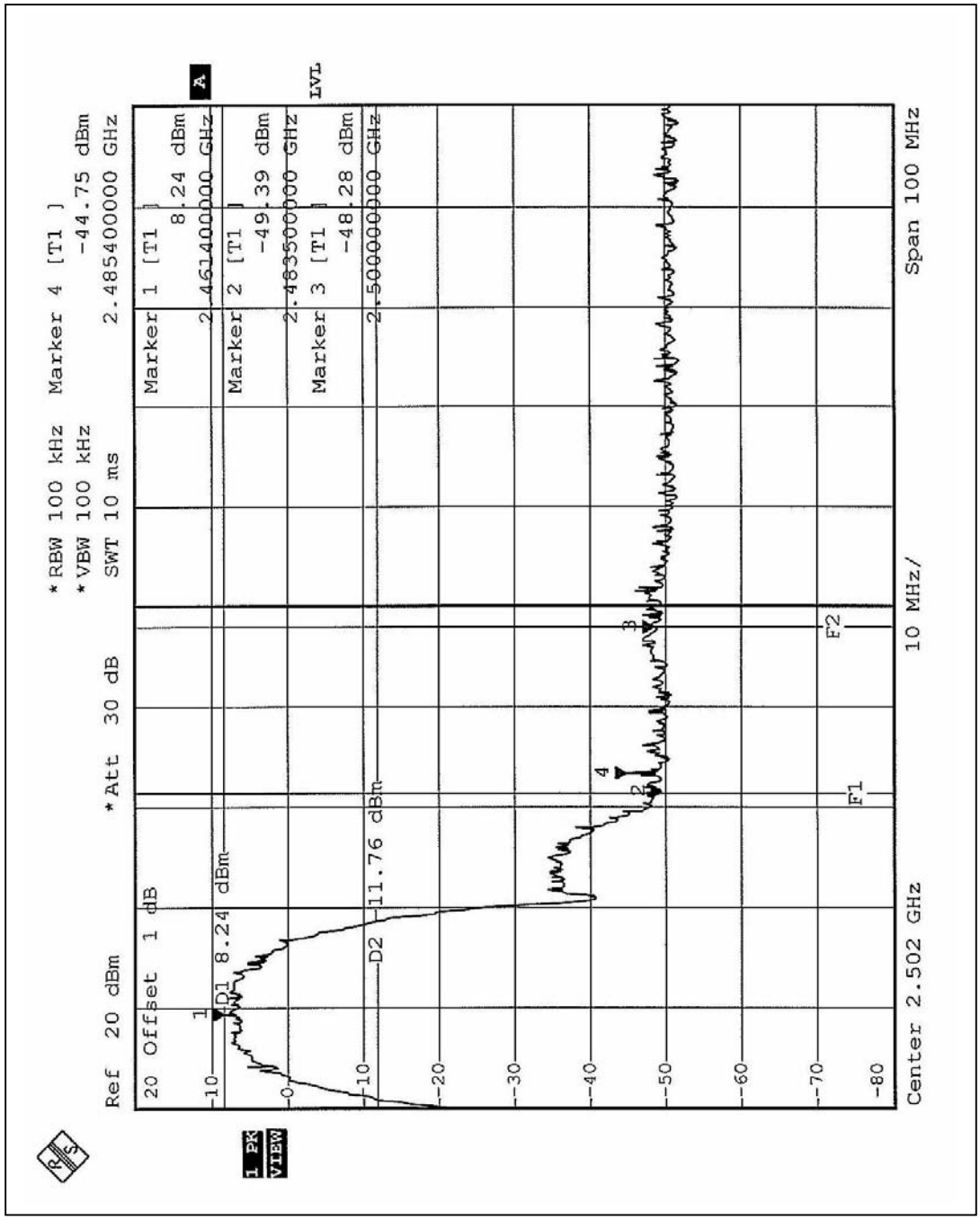
NOTE (Average):
The band edge emission plot on the following third page shows 58.83dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 102.3dBuV/m, so the maximum field strength in restrict band is 102.3-58.83=43.47BuV/m which is under 54 dBuV/m limit.

The band edge emission plot on the following fourth page shows 58.97dB 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 103.00dBuV/m, so the maximum field strength in restrict band is 103.00-58.97=44.03dBuV/m which is under 54 dBuV/m limit.

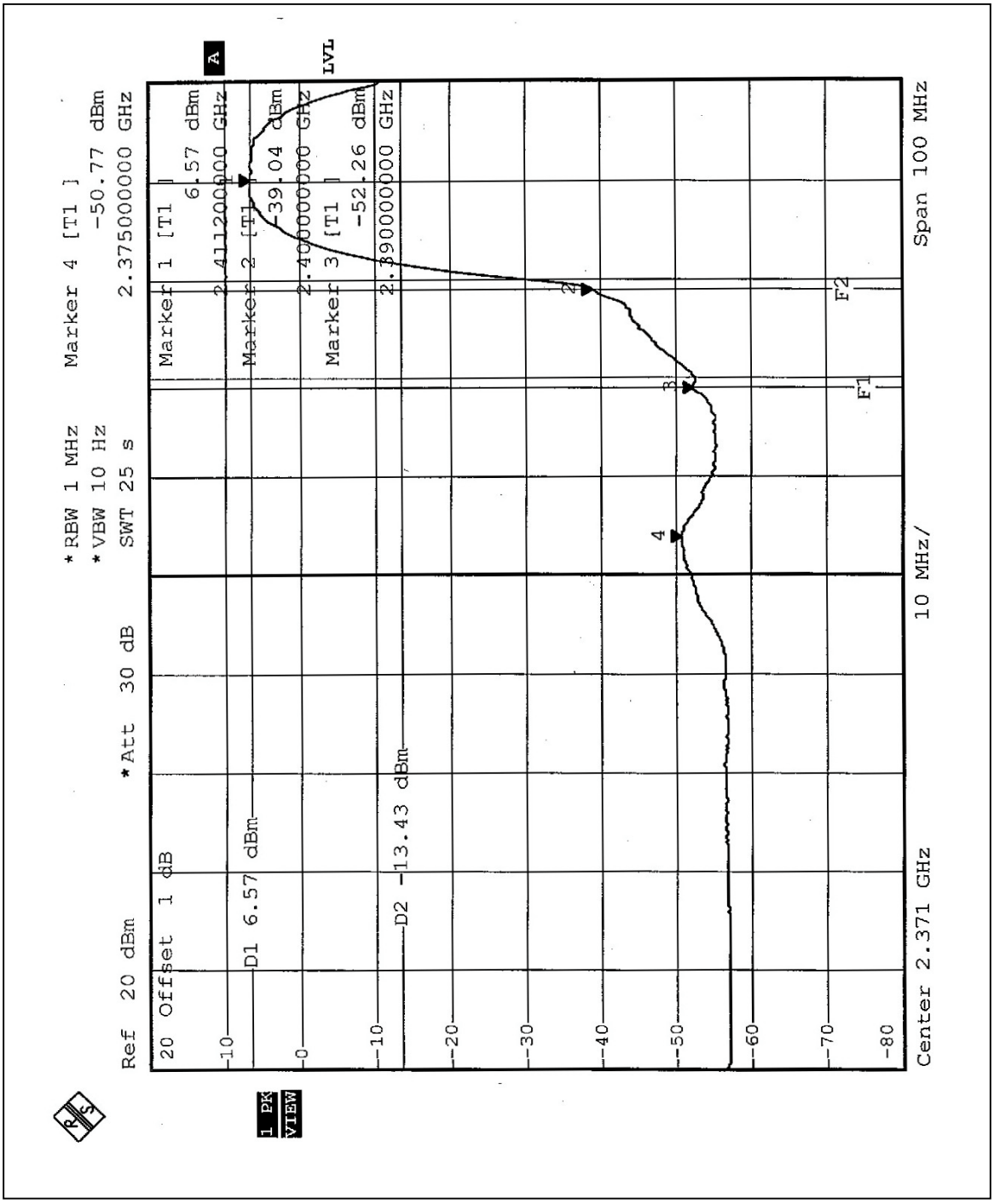
CH1


RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Marker 4 [T1]
-44.48 dBm
2.375600000 GHz
Ref 20 dBm
Att 30 dB
Offset 1 dB
D1 7.81 dBm
D2 -12.19 dBm
Marker 1 [T1]
-36.49 dBm
2.400000000 GHz
Marker 2 [T1]
-47.79 dBm
2.390000000 GHz
Marker 3 [T1]
-35.43 dBm
2.399600000 GHz
Center 2.371 GHz
10 MHz/
Span 100 MHz
F1
F2
1 PK
VIEW

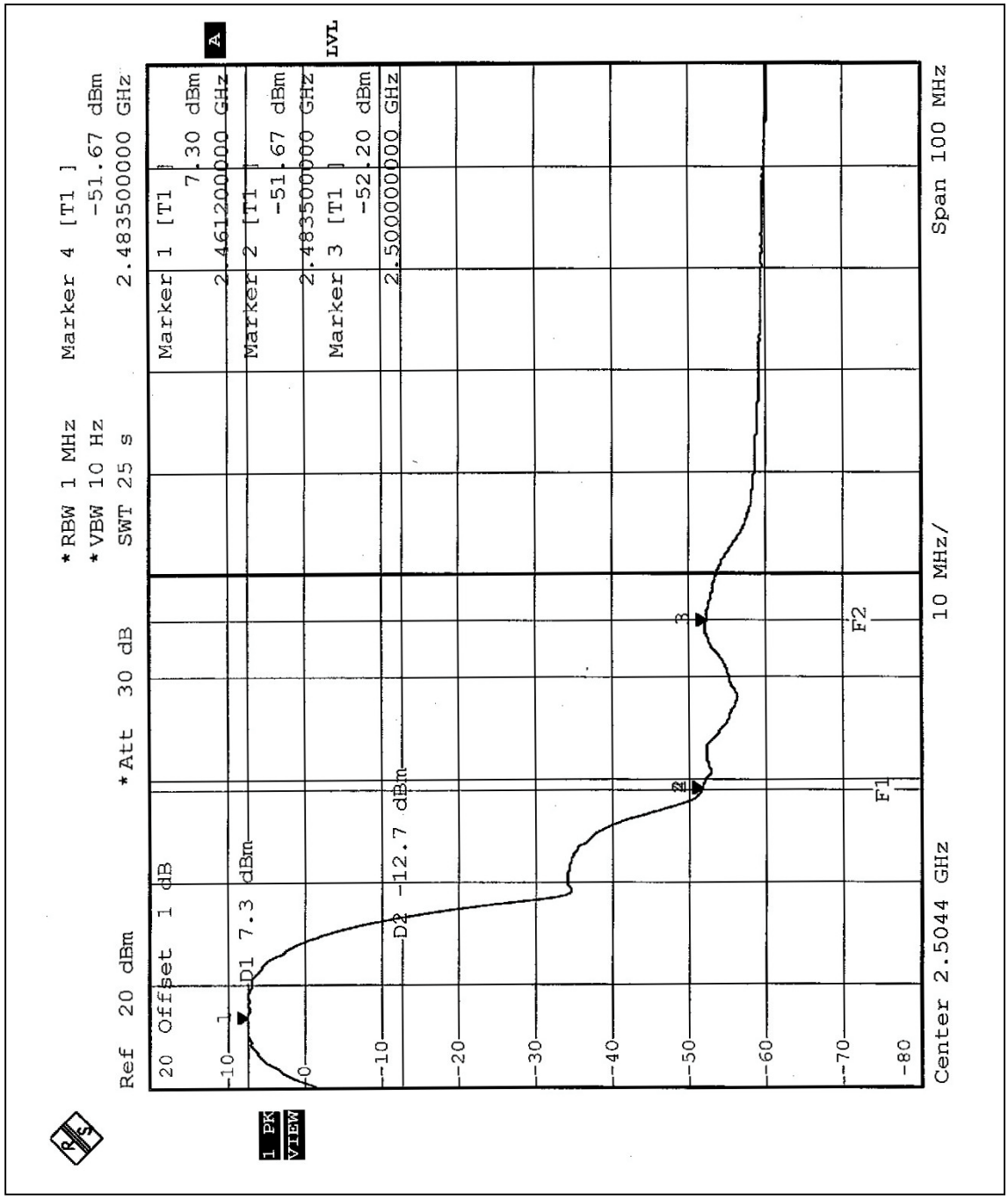
CH11


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 4 [T1]
-44.75 dBm
2.485400000 GHz
Ref 20 dBm
Offset 1 dB
*Att 30 dB
Marker 1 [T1]
8.24 dBm
2.461400000 GHz
Marker 2 [T1]
-49.39 dBm
2.483500000 GHz
Marker 3 [T1]
-48.28 dBm
2.500000000 GHz
D1 8.24 dBm
D2 11.76 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
1 PK VIEW

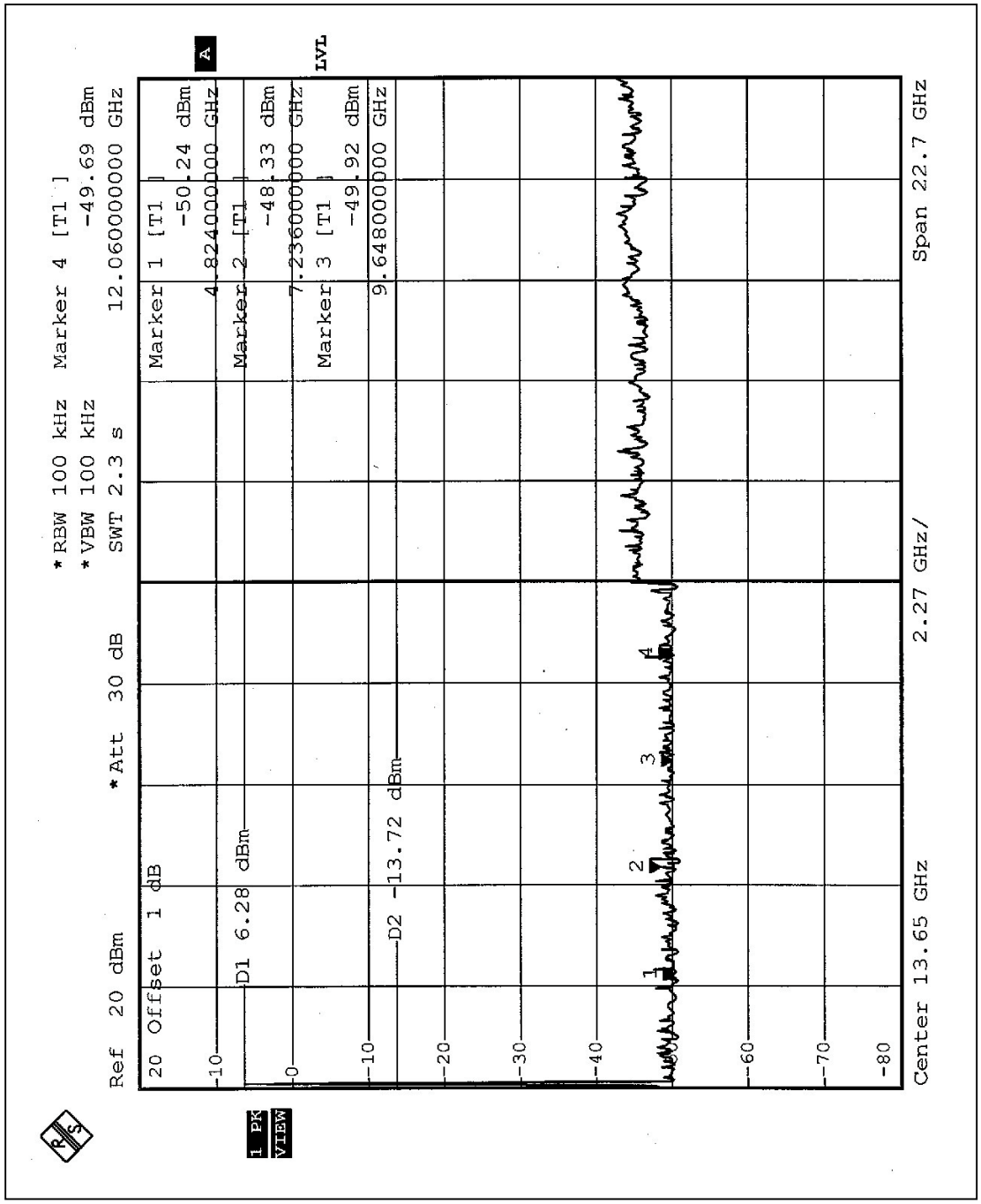
CH1


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 4 [T1]
-50.77 dBm
2.375000000 GHz
Marker 1 [T1]
6.57 dBm
2.411200000 GHz
Marker 2 [T1]
-39.04 dBm
2.400000000 GHz
Marker 3 [T1]
-52.26 dBm
2.390000000 GHz
D1 6.57 dBm
D2 -13.43 dBm
LVL
A
1 PK
VIEW
F1
F2
Center 2.371 GHz
10 MHz/
Span 100 MHz

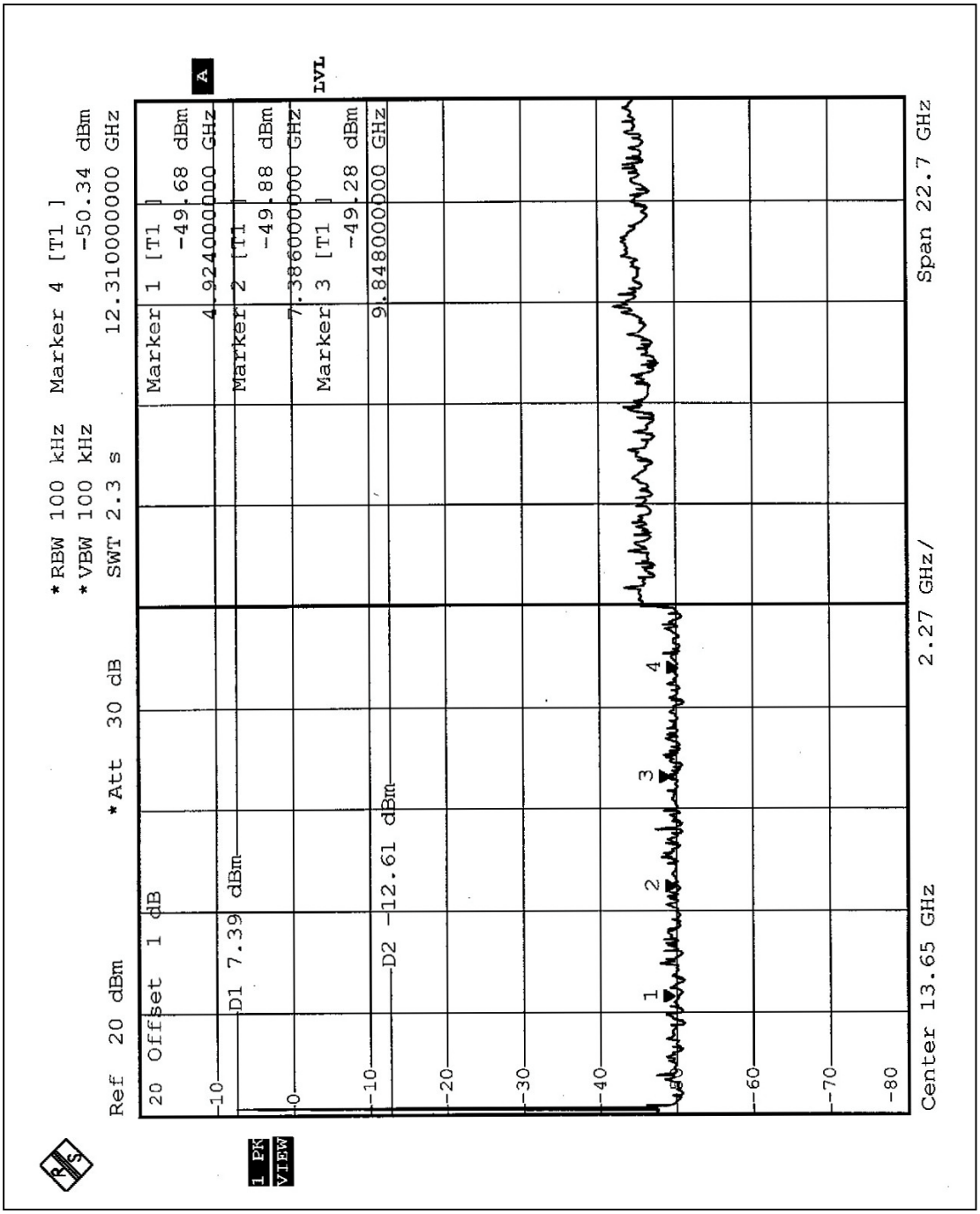
CH11


RBW 1 MHz
VBW 10 Hz
SWT 25 s
Marker 4 [T1]
-51.67 dBm
2.48350000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
Marker 1 [T1]
7.30 dBm
2.46120000 GHz
Marker 2 [T1]
-51.67 dBm
2.48350000 GHz
Marker 3 [T1]
-52.20 dBm
2.50000000 GHz
D1 7.3 dBm
D2 -12.7 dBm
Center 2.5044 GHz
10 MHz/
Span 100 MHz
F1
F2
1 PK VIEW

CH1


*RBW 100 kHz
*VBW 100 kHz
SWT 2.3 s
Marker 4 [T1]
-49.69 dBm
12.060000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 6.28 dBm
D2 -13.72 dBm
Marker 1 [T1]
-50.24 dBm
4.824000000 GHz
Marker 2 [T1]
-48.33 dBm
7.236000000 GHz
Marker 3 [T1]
-49.92 dBm
9.648000000 GHz
LVL
A
1 PK
VIEW
Center 13.65 GHz
2.27 GHz/
Span 22.7 GHz

CH11


*RBW 100 kHz
*VBW 100 kHz
SWT 2.3 s
Marker 4 [T1]
-50.34 dBm
12.310000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 7.39 dBm
D2 -12.61 dBm
Marker 1 [T1]
-49.68 dBm
4.924000000 GHz
Marker 2 [T1]
-49.88 dBm
7.386000000 GHz
Marker 3 [T1]
-49.28 dBm
9.848000000 GHz
1 PK VIEW
Center 13.65 GHz
2.27 GHz/
Span 22.7 GHz

4.6.6 TEST RESULTS –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.

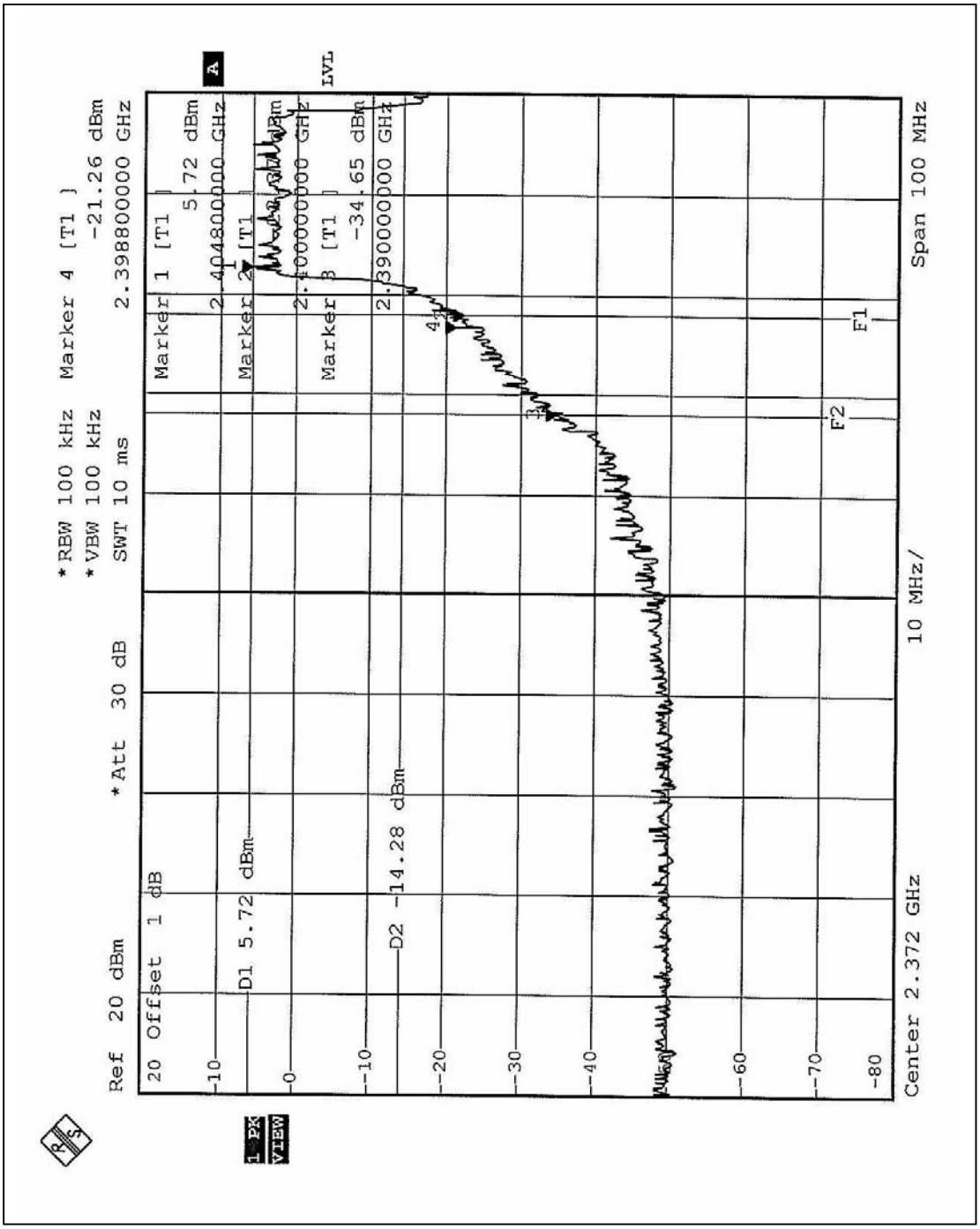
NOTE (Peak):
The band edge emission plot of OFDM technique on the following first page show 40.37dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 107.1dBuV/m, so the maximum field strength in restrict band is 107.1-40.37=66.73dBuV/m which is under 74 dBuV/m limit.

The band edge emission plot of OFDM technique on the following second page shows 41.01dB 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 107.3dBuV/m, so the maximum field strength in restrict band is 107.3-41.01=66.29dBuV/m which is under 74 dBuV/m limit.

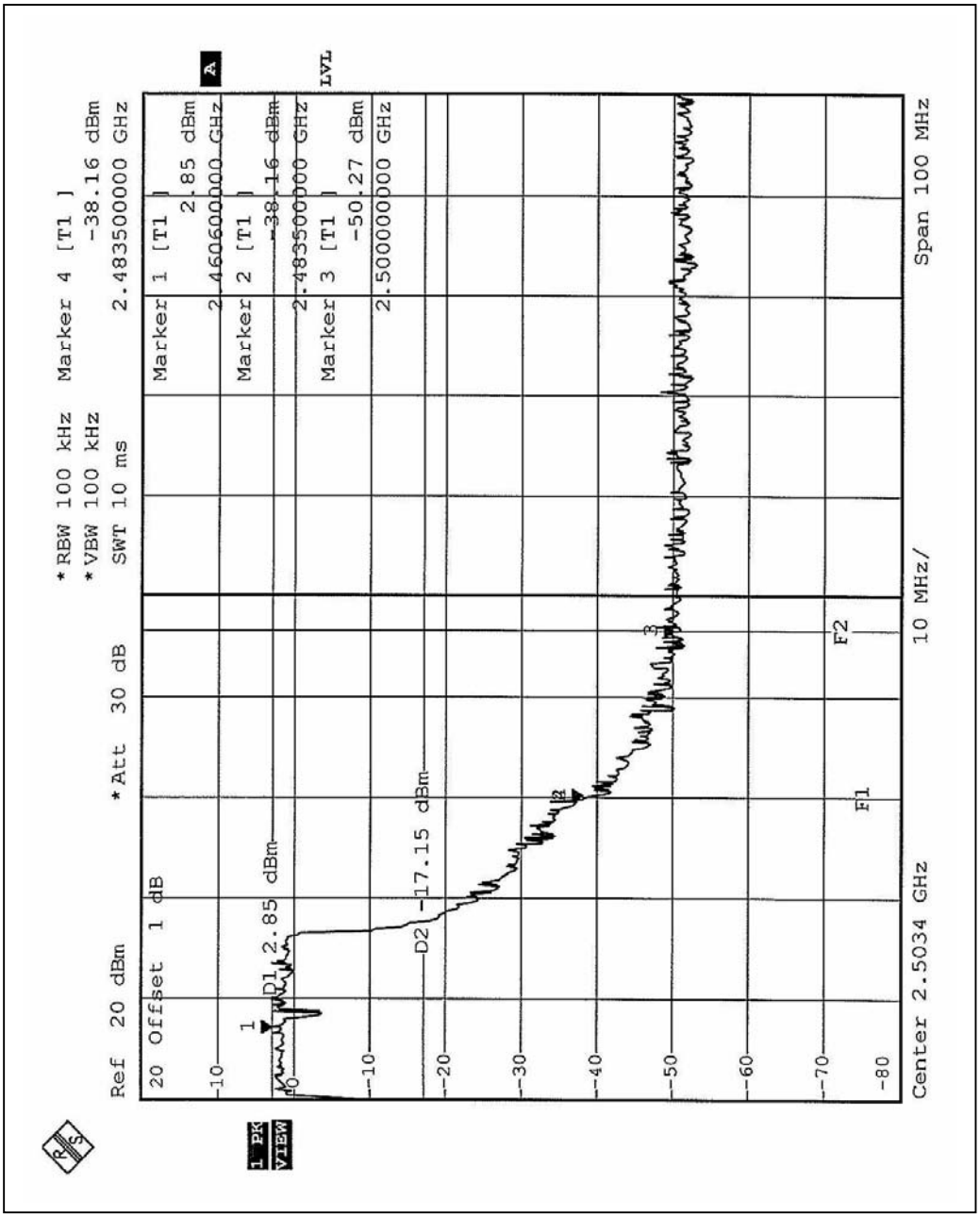
NOTE (Average):
The band edge emission plot on the following third page shows 50.66dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2. is 98.2dBuV/m, so the maximum field strength in restrict band is 98.2-50.66=47.54dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot on the following fourth page shows 49.77dB 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 98.2dBuV/m, so the maximum field strength in restrict band is 98.2-49.77=48.43dBuV/m which is under 54 dBuV/m limit.

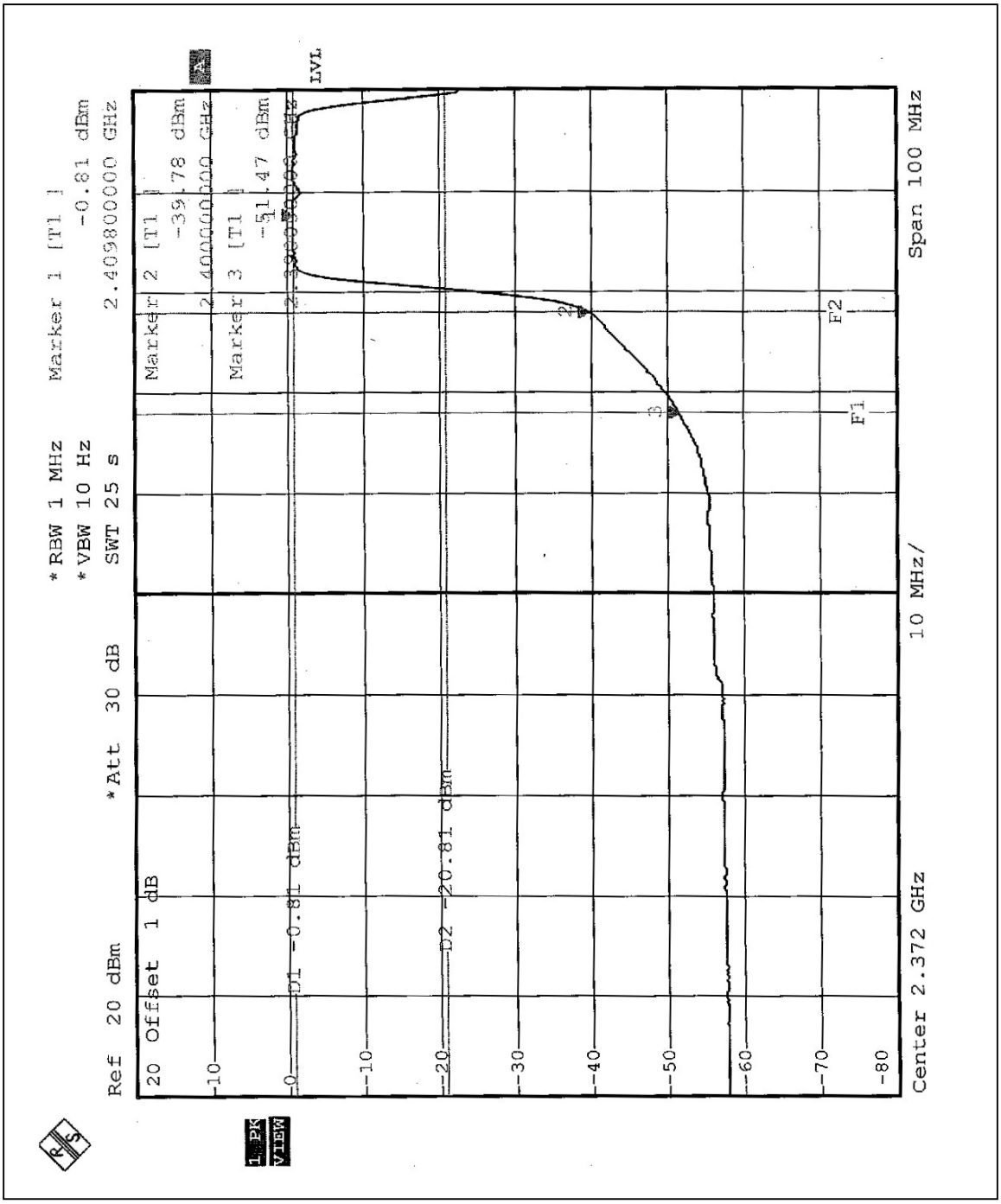
CH1


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 4 [T1]
-21.26 dBm
2.398800000 GHz
Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
Marker 1 [T1]
5.72 dBm
2.404800000 GHz
Marker 2 [T1]
Marker 3 [T1]
-34.65 dBm
2.390000000 GHz
D1 5.72 dBm
D2 -14.28 dBm
Center 2.372 GHz
10 MHz/
Span 100 MHz
F1
F2
1 PK
VIEW

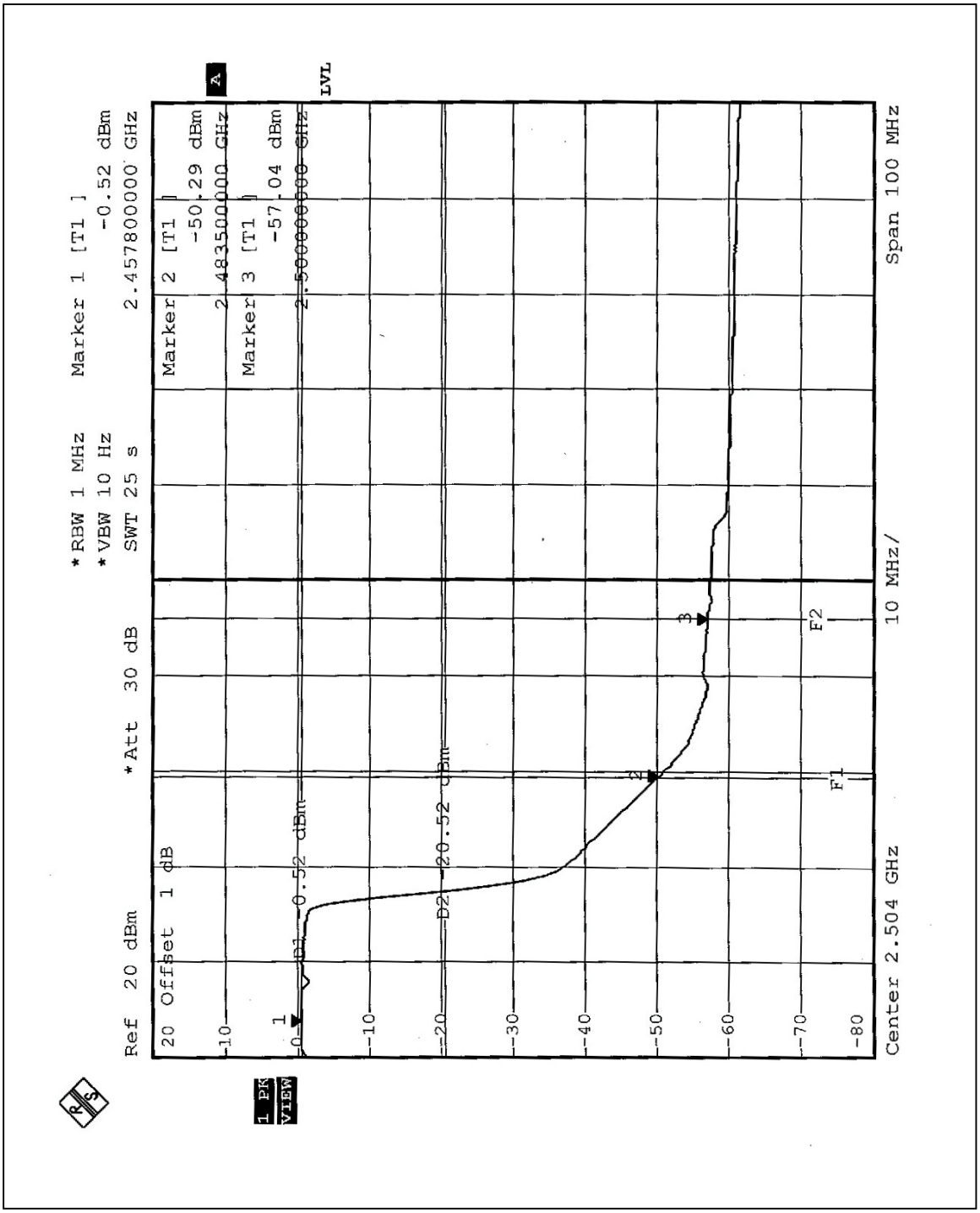
CH11


RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Marker 4 [T1]
-38.16 dBm
2.483500000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
Marker 1 [T1]
2.85 dBm
2.460600000 GHz
Marker 2 [T1]
-38.16 dBm
2.483500000 GHz
Marker 3 [T1]
-50.27 dBm
2.500000000 GHz
D1 2.85 dBm
D2 -17.15 dBm
F1
F2
Center 2.5034 GHz
10 MHz/
Span 100 MHz
1 PK VIEW
LVL

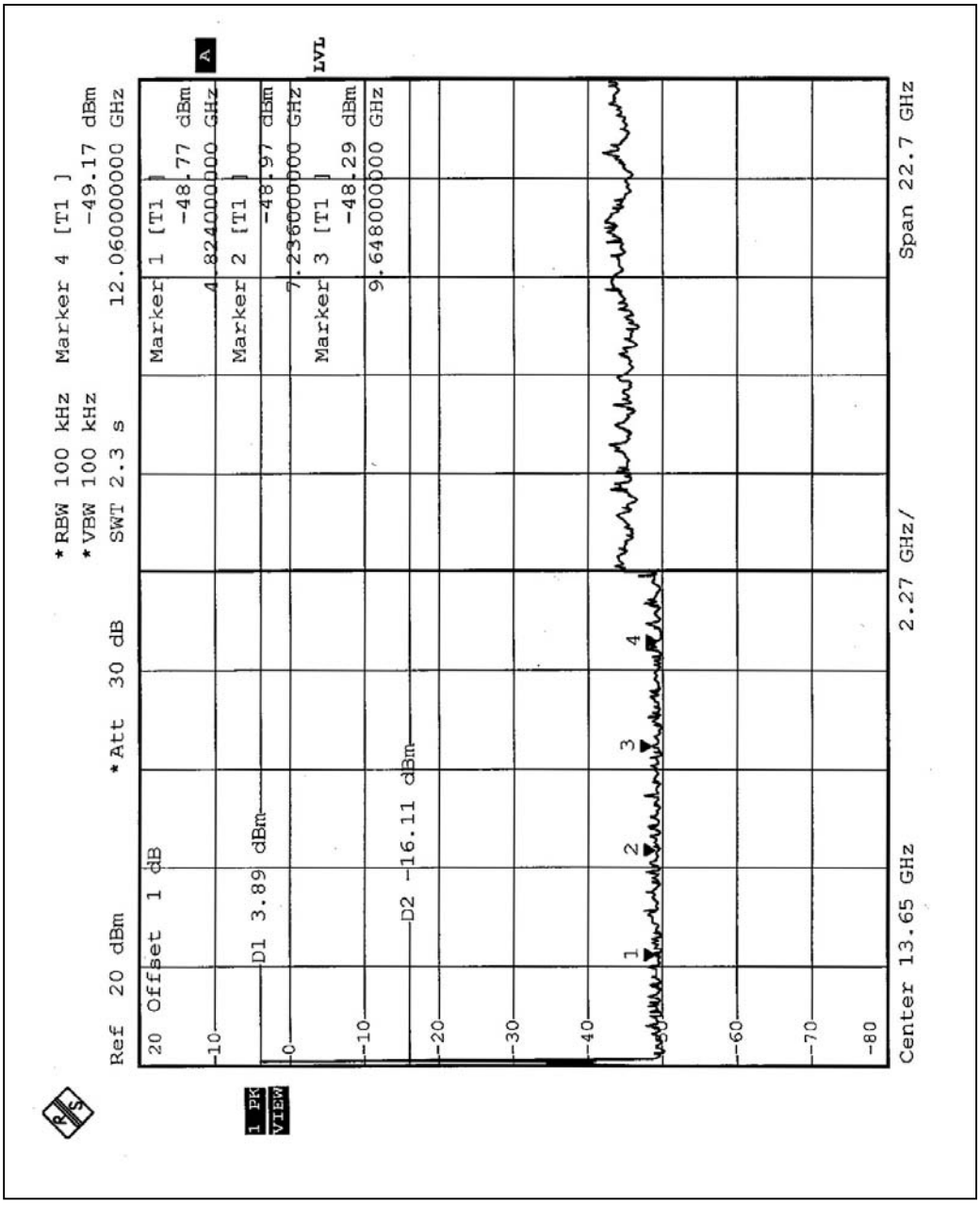
CH1


Marker 1 [T1]
-0.81 dBm
2.40980000 GHz
*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
*Att 30 dB
Ref 20 dBm
20 Offset 1 dB
Marker 2 [T1]
-39.78 dBm
2.40000000 GHz
Marker 3 [T1]
-51.47 dBm
2.33000000 GHz
D1 -0.81 dBm
D2 -20.81 dBm
Center 2.372 GHz
10 MHz/
Span 100 MHz
F1
F2
PK VIEW

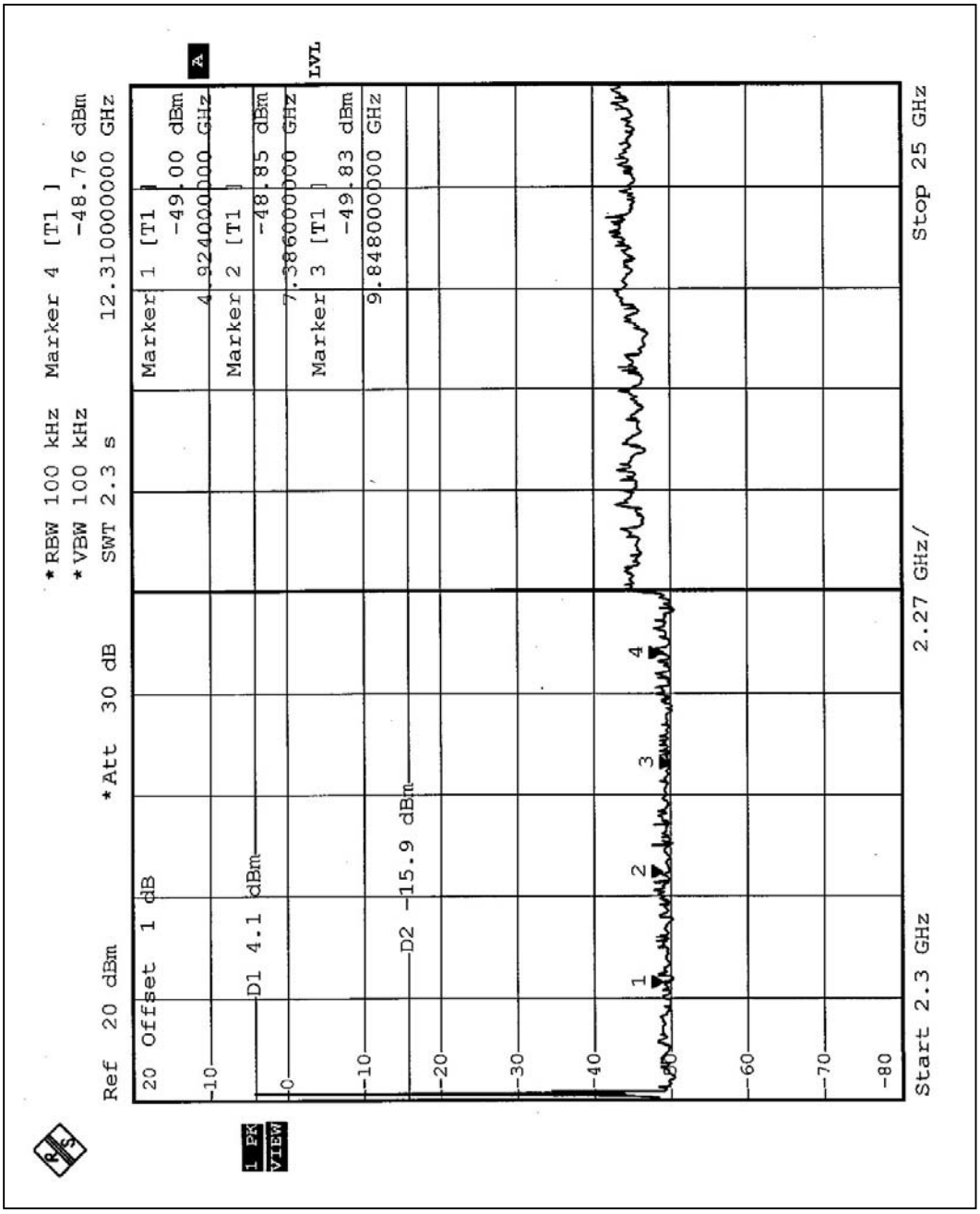
CH11


Ref 20 dBm
Offset 1 dB
*Att 30 dB
*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 1 [T1]
-0.52 dBm
2.457800000 GHz
Marker 2 [T1]
-50.29 dBm
2.483500000 GHz
Marker 3 [T1]
-57.04 dBm
2.500000000 GHz
D1 -0.52 dBm
D2 -20.52 dBm
Center 2.504 GHz
10 MHz/
Span 100 MHz
1 PK VIEW
LVL
A

CH1


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 2.3 s
Marker 4 [T1]
-49.17 dBm
12.060000000 GHz
Marker 1 [T1]
-48.77 dBm
4.824000000 GHz
Marker 2 [T1]
-48.97 dBm
7.236000000 GHz
Marker 3 [T1]
-48.29 dBm
9.648000000 GHz
D1 3.89 dBm
D2 -16.11 dBm
Center 13.65 GHz
2.27 GHz/
Span 22.7 GHz
1 PK VIEW

CH11


RBW 100 kHz
VBW 100 kHz
SWT 2.3 s
Marker 4 [T1]
-48.76 dBm
12.310000000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
Marker 1 [T1]
-49.00 dBm
4.924000000 GHz
Marker 2 [T1]
-48.85 dBm
7.386000000 GHz
Marker 3 [T1]
-49.83 dBm
9.848000000 GHz
D1 4.1 dBm
D2 -15.9 dBm
1 PK VIEW
Start 2.3 GHz
2.27 GHz/
Stop 25 GHz

802.11g Turbo OFDM modulation

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.

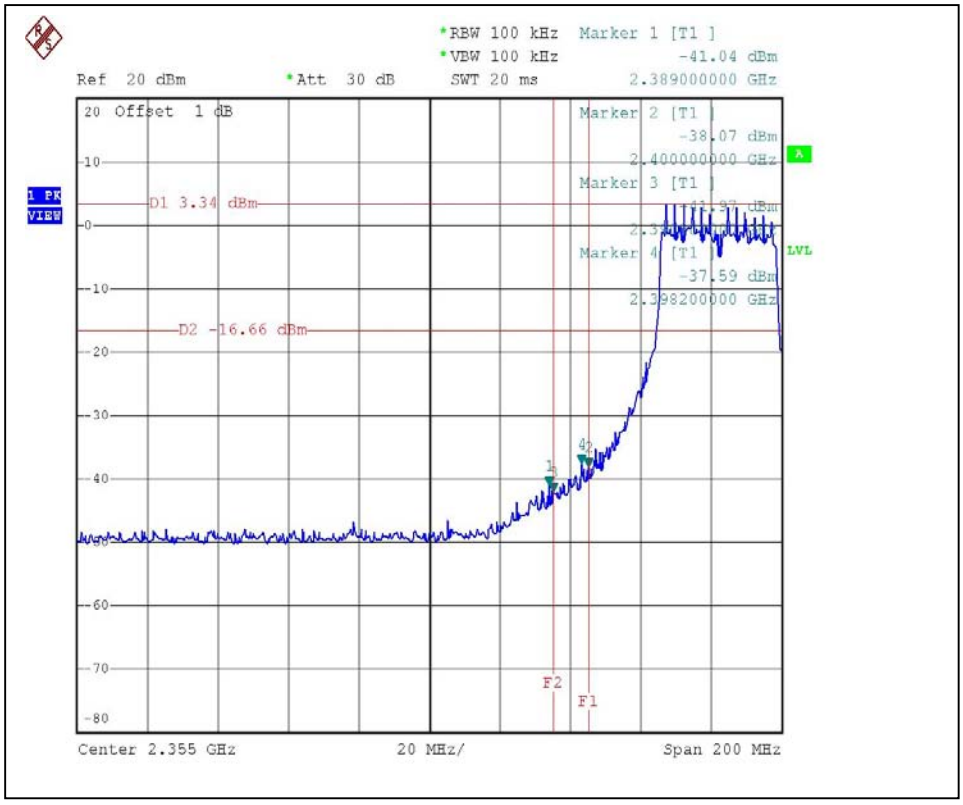
NOTE (Peak):
The band edge emission plot of OFDM technique on the following first page show 45.31dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 6 at the item 4.2 is 104.5dBuV/m, so the maximum field strength in restrict band is 104.5-45.31=59.19dBuV/m which is under 74 dBuV/m limit.

The band edge emission plot of OFDM technique on the following first page shows 46.42dB 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 6 at the item 4.2 is 104.5dBuV/m, so the maximum field strength in restrict band is 104.5-46.42=58.08dBuV/m which is under 74 dBuV/m limit.

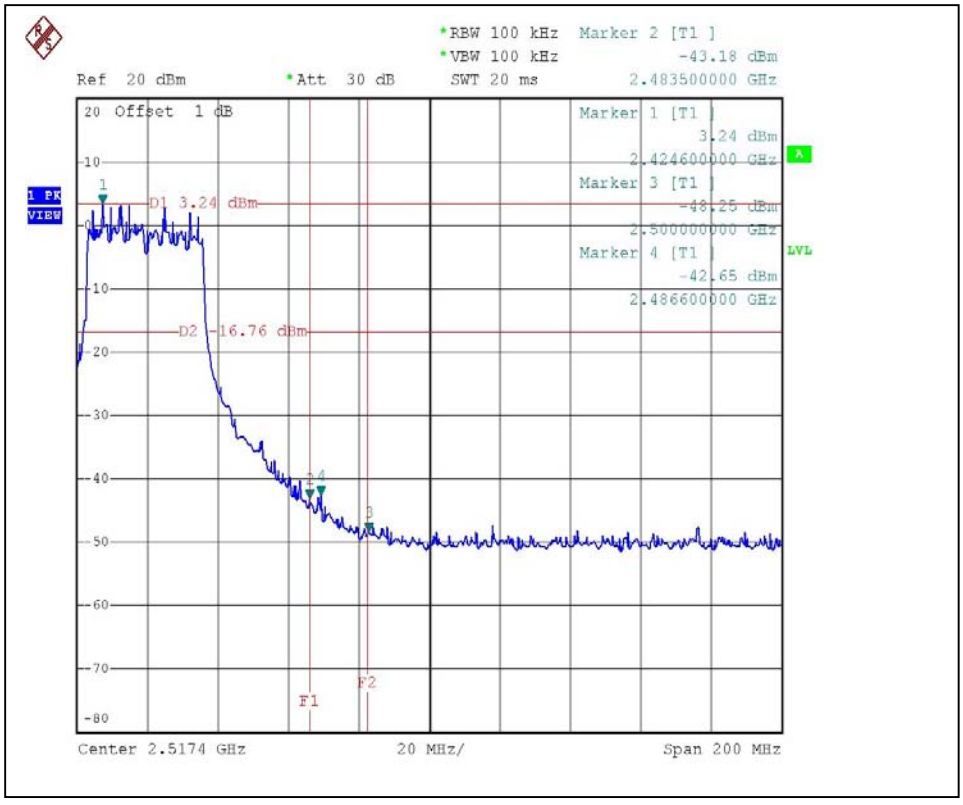
NOTE (Average):
The band edge emission plot of OFDM technique on the following second page shows 45.81dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 6 at the item 4.2 is 96.5dBuV/m, so the maximum field strength in restrict band is 96.5-458.81=50.69dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot of OFDM technique on the following second page shows 46.98dB 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 6 at the item 4.2 is 96.5dBuV/m, so the maximum field strength in restrict band is 96.5-45.81=50.69dBuV/m which is under 54 dBuV/m limit.

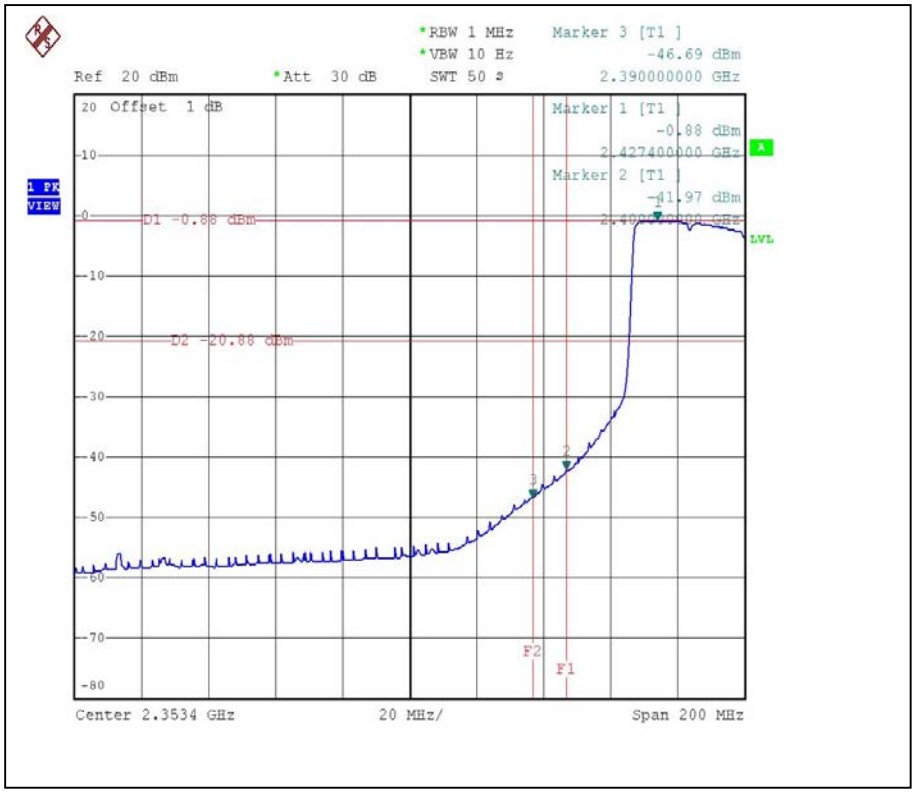
CH6


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
Marker 1 [T1]
-41.04 dBm
2.389000000 GHz
20 Offset 1 dB
Marker 2 [T1]
-38.07 dBm
2.400000000 GHz
Marker 3 [T1]
Marker 4 [T1]
-37.59 dBm
2.398200000 GHz
1 PK
VIEW
D1 3.34 dBm
D2 -16.66 dBm
LVL
F2
F1
Center 2.355 GHz
20 MHz/
Span 200 MHz

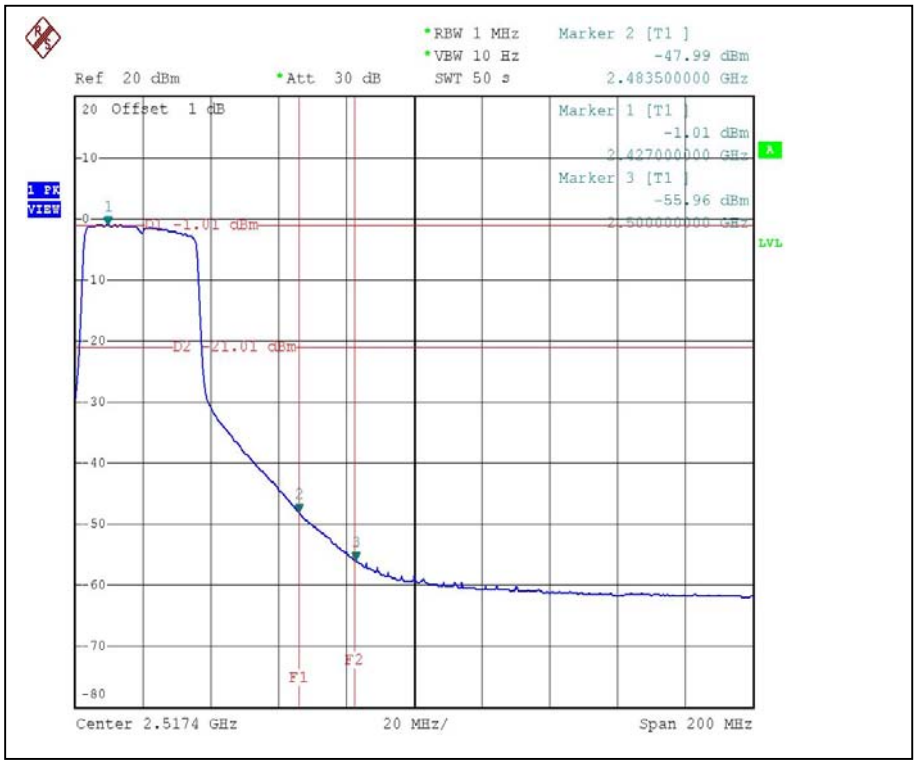
CH6


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
Marker 2 [T1]
-43.18 dBm
2.483500000 GHz
20 Offset 1 dB
Marker 1 [T1]
3.24 dBm
2.424600000 GHz
Marker 3 [T1]
-48.25 dBm
2.500000000 GHz
Marker 4 [T1]
-42.65 dBm
2.486600000 GHz
1 PK
VIEW
D1 3.24 dBm
D2 -16.76 dBm
LVL
F1
F2
Center 2.5174 GHz
20 MHz/
Span 200 MHz

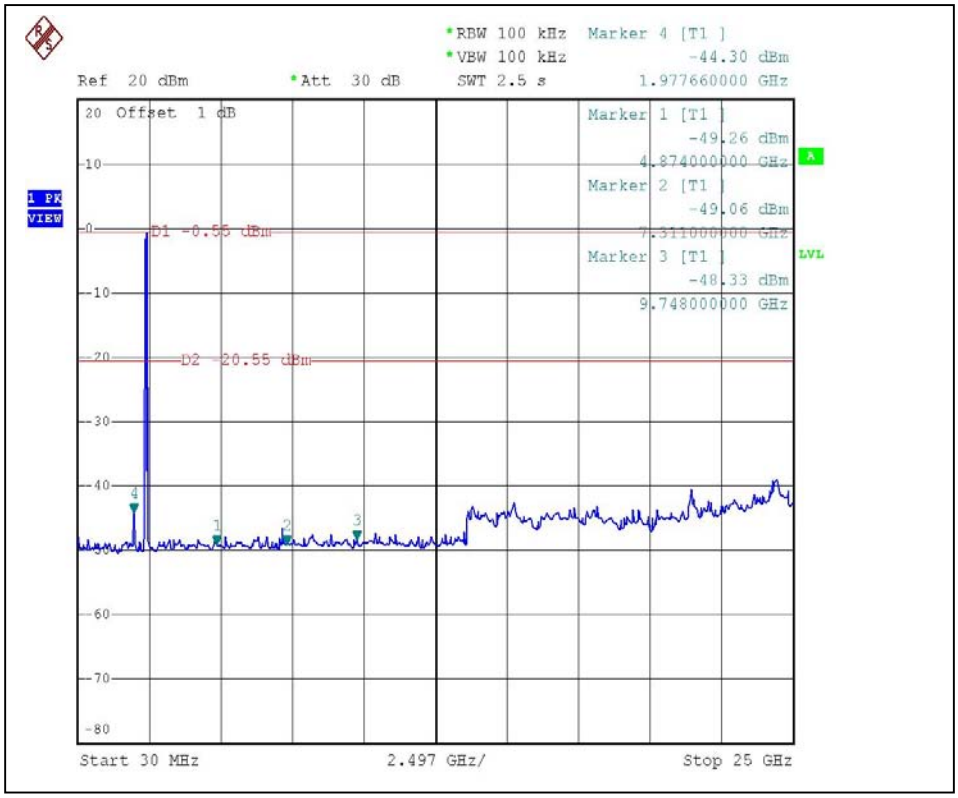
CH6


*RBW 1 MHz
*VBW 10 Hz
Ref 20 dBm
*Att 30 dB
SWT 50 s
Marker 3 [T1]
-46.69 dBm
2.390000000 GHz
20 Offset 1 dB
Marker 1 [T1]
-0.88 dBm
2.427400000 GHz
Marker 2 [T1]
-41.97 dBm
D1 -0.88 dBm
D2 -20.88 dBm
F2
F1
Center 2.3534 GHz
20 MHz/
Span 200 MHz

CH6


*RBW 1 MHz
*VBW 10 Hz
Ref 20 dBm
*Att 30 dB
SWT 50 s
Marker 2 [T1]
-47.99 dBm
2.483500000 GHz
20 Offset 1 dB
Marker 1 [T1]
-1.01 dBm
2.427000000 GHz
Marker 3 [T1]
-55.96 dBm
D1 -1.01 dBm
D2 -21.01 dBm
F1
F2
Center 2.5174 GHz
20 MHz/
Span 200 MHz

CH6


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 2.5 s
Marker 4 [T1]
-44.30 dBm
1.977660000 GHz
20 Offset 1 dB
Marker 1 [T1]
-49.26 dBm
4.874000000 GHz
Marker 2 [T1]
-49.06 dBm
7.311000000 GHz
Marker 3 [T1]
-48.33 dBm
9.748000000 GHz
1 PK
VIEW
D1 -0.55 dBm
D2 -20.55 dBm
LVL
Start 30 MHz
2.497 GHz/
Stop 25 GHz

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

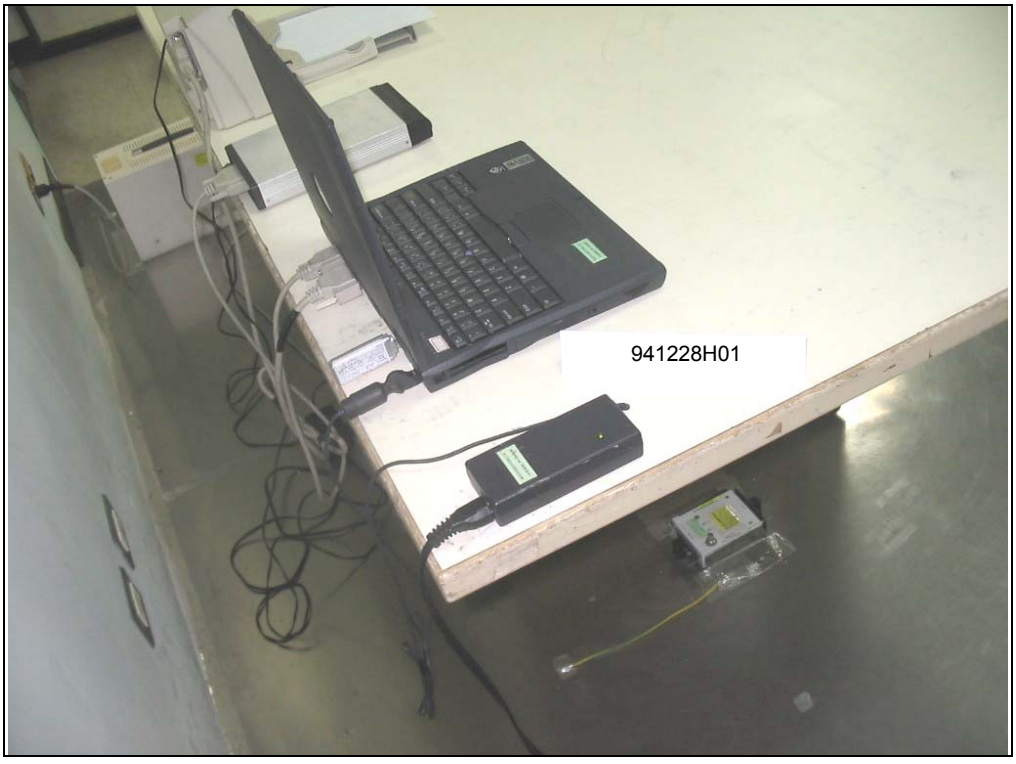
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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 is chip antenna without connector. The maximum Gain of the antenna is 0dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST (Without USB Cable)



RADIATED EMISSION TEST (With USB Cable)

RADIATED EMISSION TEST (Without USB Cable)

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, Guide 25 or EN 45001:

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	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. If you have any comments, please feel free to contact us at the following:

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

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