4.4.7 TEST RESULTS

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
ENVIRONMENTAL CONDITIONS	22deg. C, 68%RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TEST MODE	A	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.50	30	PASS
6	2437	17.50	30	PASS
11	2462	17.40	30	PASS

EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
ENVIRONMENTAL CONDITIONS	22deg. C, 68%RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TEST MODE	B	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	13.50	30	PASS
6	2437	13.40	30	PASS
11	2462	13.50	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2004

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

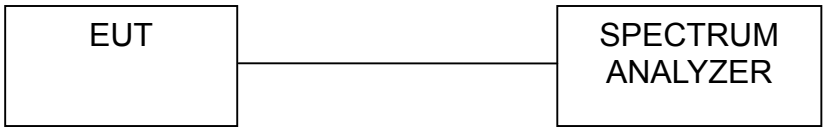
4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time=span/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

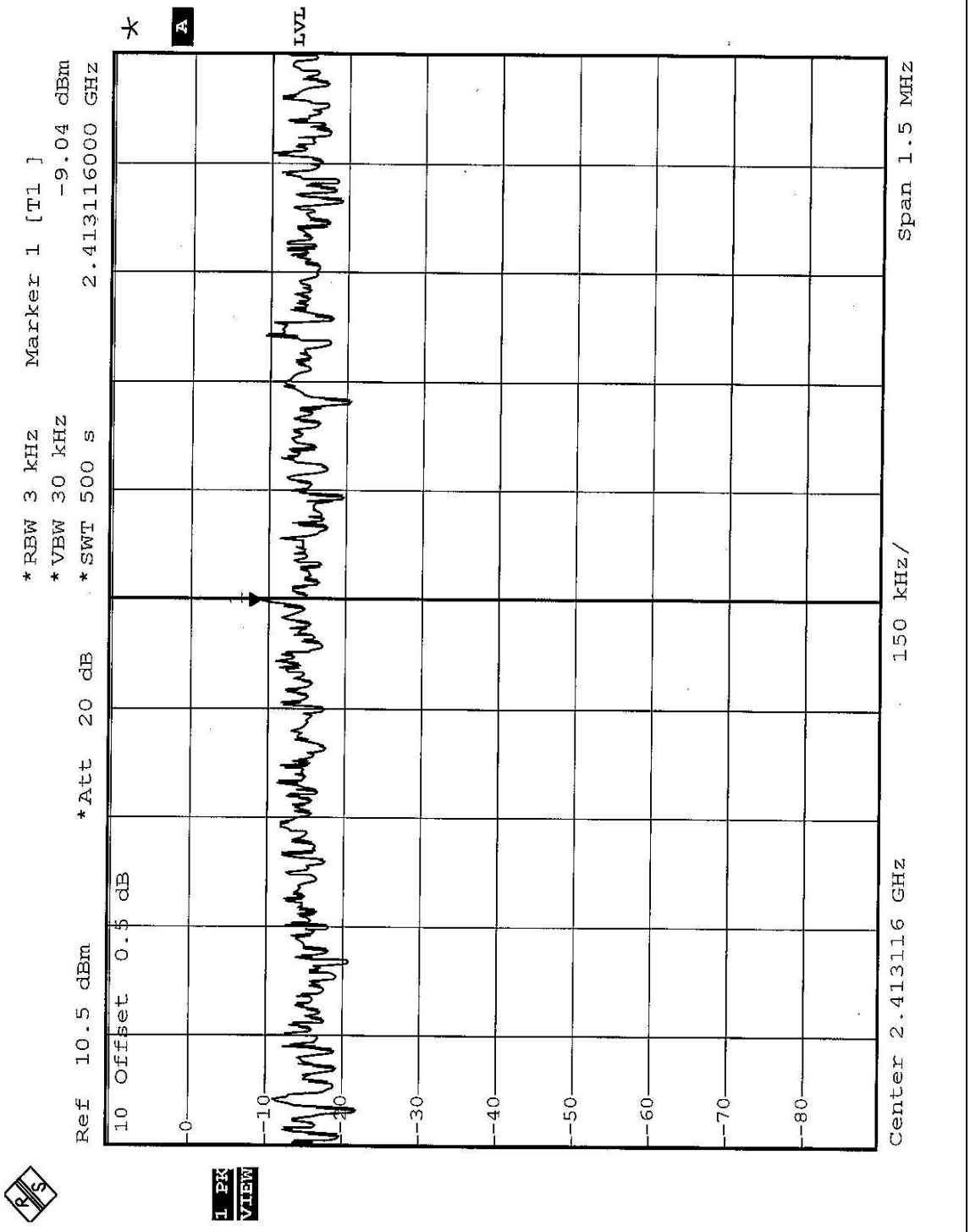
Same as 4.3.6

4.5.7 TEST RESULTS

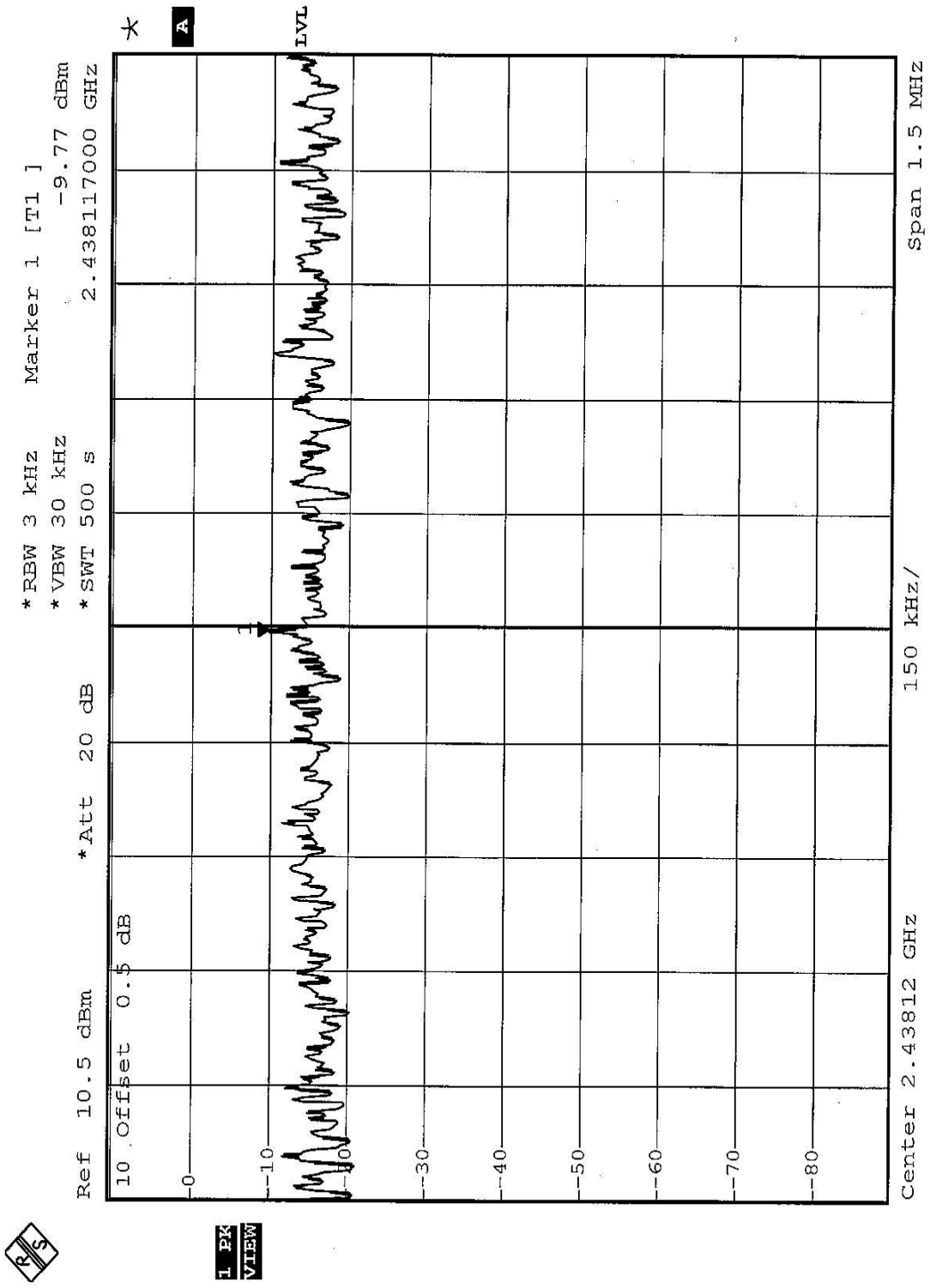
EUT	High-Speed 2.4GHz WLAN Mini PCI Card	**MODEL**	WMP-G04
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	22deg. C, 68%RH, 991 hPa
TEST MODE	A	**TESTED BY**	Steven Lu

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-9.04	8	PASS
6	2437	-9.77	8	PASS
11	2462	-8.20	8	PASS

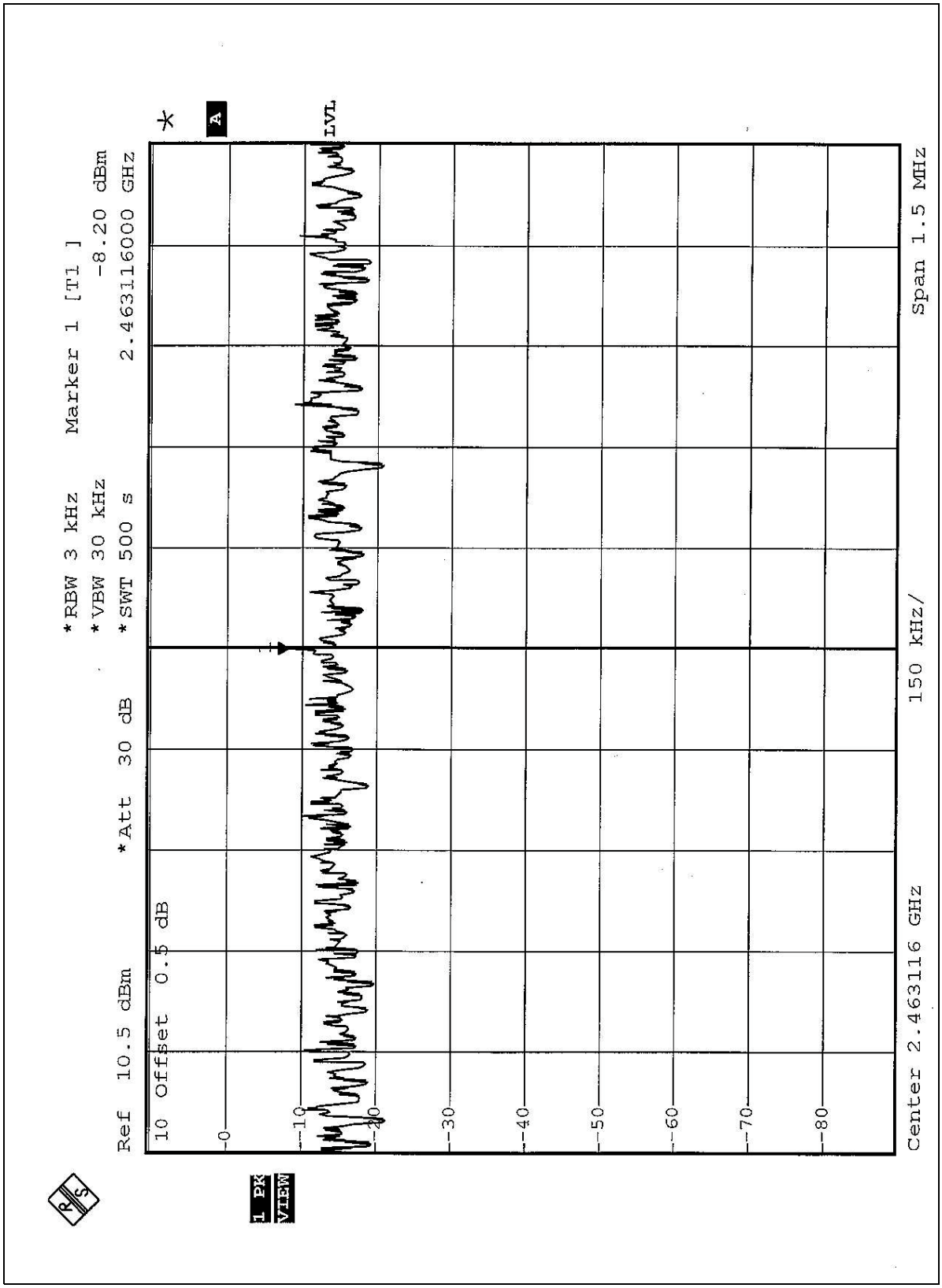
CH1


RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-9.04 dBm
2.413116000 GHz
Att 20 dB
Ref 10.5 dBm
Offset 0.5 dB
Center 2.413116 GHz
150 kHz/
Span 1.5 MHz
1 PK VIEW

CH6


Marker 1 [T1]
-9.77 dBm
2.438117000 GHz
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
*Att 20 dB
Ref 10.5 dBm
10 Offset 0.5 dB
Center 2.43812 GHz
150 kHz/
Span 1.5 MHz
1 PK
VIEW
A
LVL

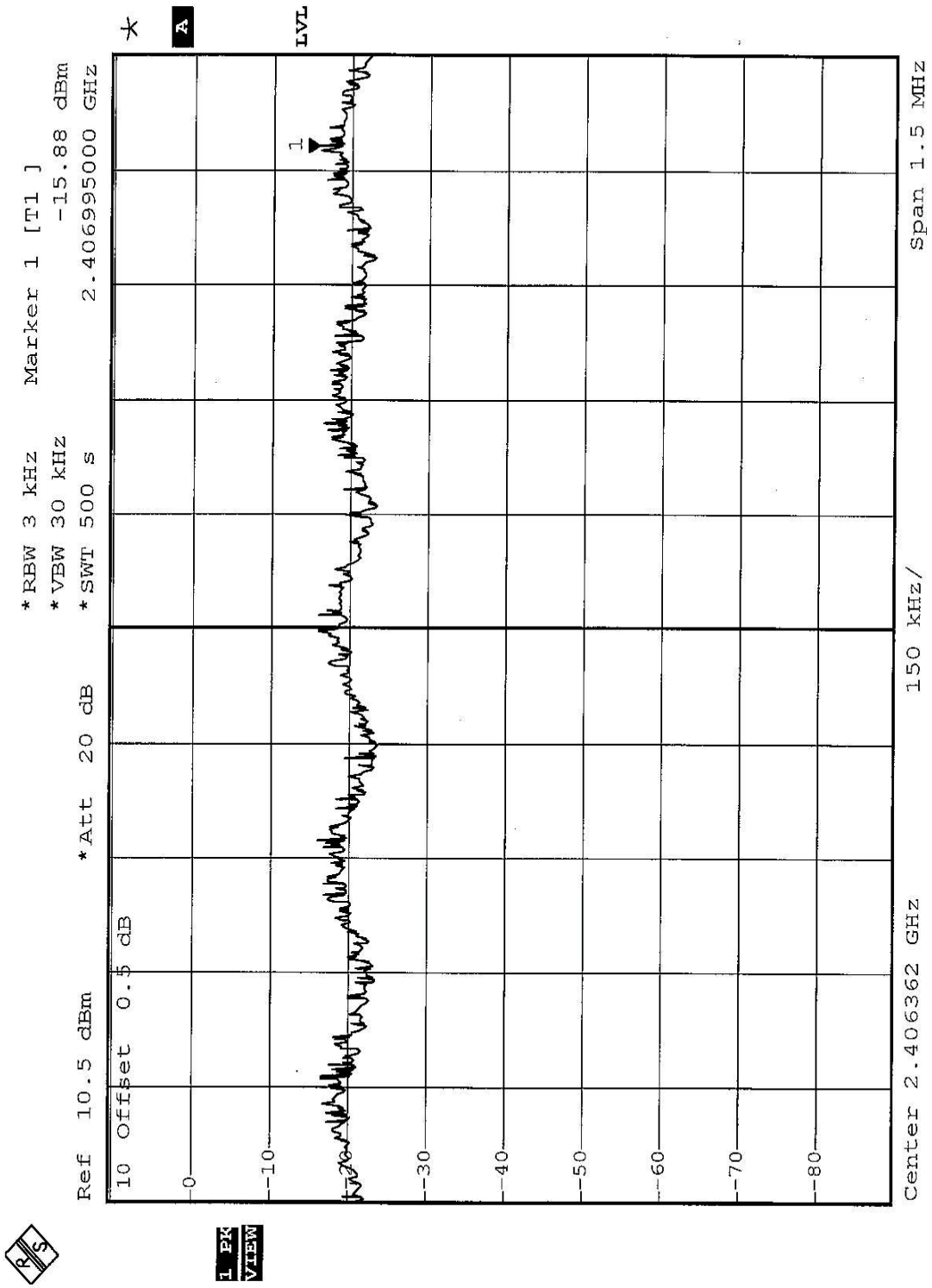
CH11


Ref 10.5 dBm
10 Offset 0.5 dB
*Att 30 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.20 dBm
2.463116000 GHz
A
LVL
Center 2.463116 GHz
150 kHz/
Span 1.5 MHz
1 PK
VIEW

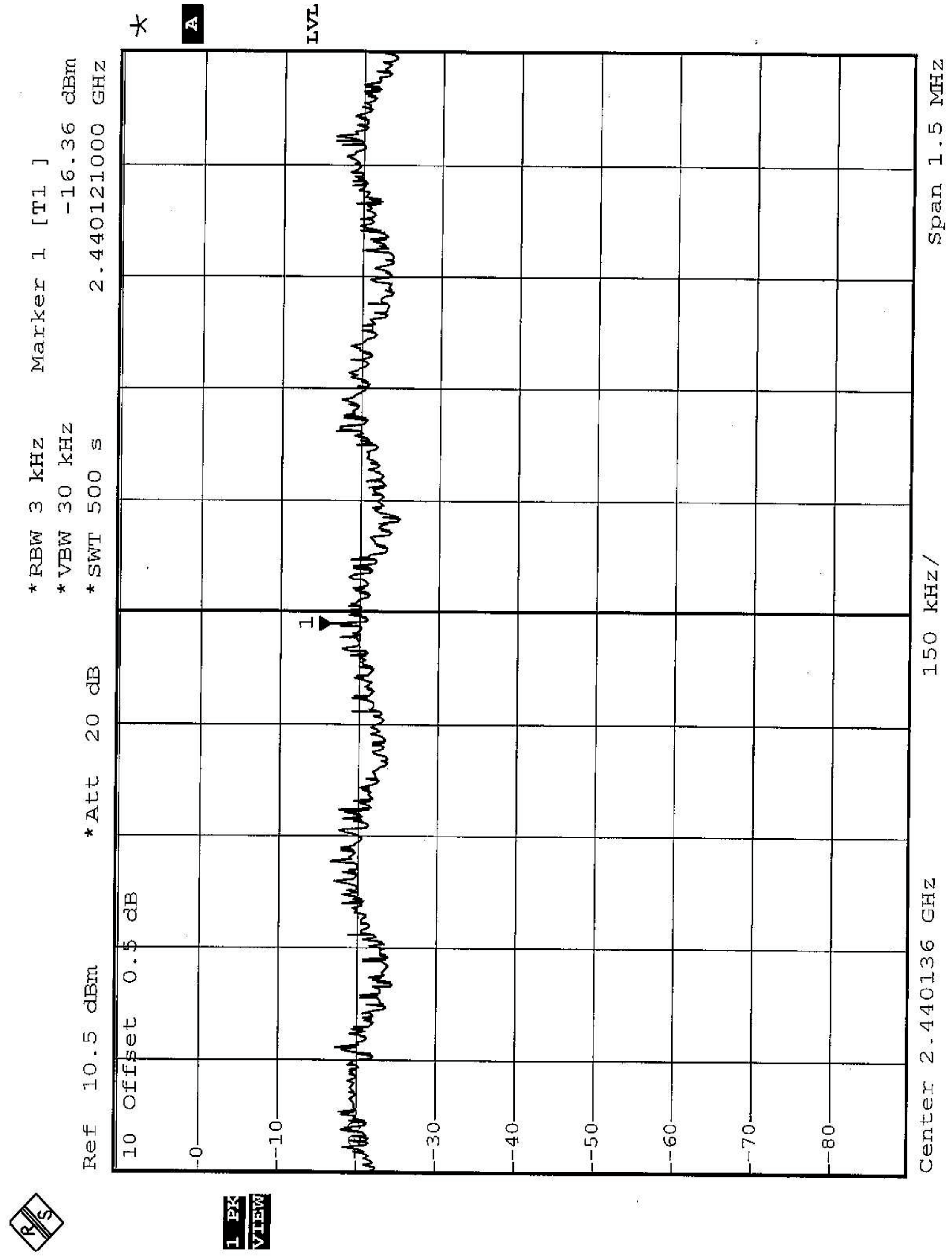
EUT	High-Speed 2.4GHz WLAN Mini PCI Card	MODEL	WMP-G04
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	22deg. C, 68%RH, 991 hPa
TEST MODE	B	TESTED BY	Jamison Chan

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-15.88	8	PASS
6	2437	-16.36	8	PASS
11	2462	-17.90	8	PASS

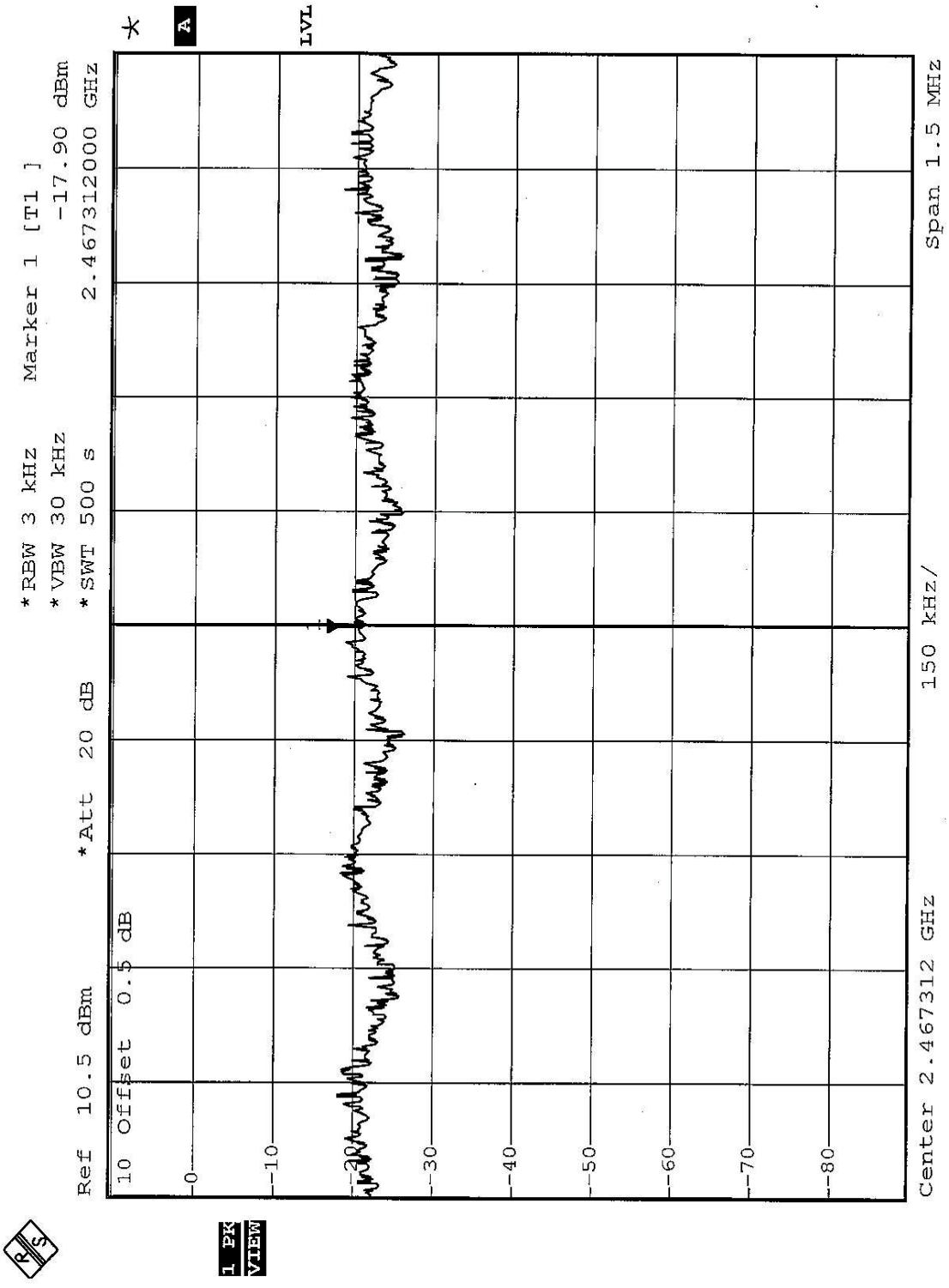
CH1


Ref 10.5 dBm
10 Offset 0.5 dB
*Att 20 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-15.88 dBm
2.406995000 GHz
Center 2.406362 GHz
150 kHz/
Span 1.5 MHz
1 PK VIEW
LVL
A

CH6


Marker 1 [T1]
-16.36 dBm
2.44012100 GHz
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Ref 10.5 dBm
*Att 20 dB
Offset 0.5 dB
A
LVL
1 PK
VIEW
Center 2.440136 GHz
150 kHz/
Span 1.5 MHz

CH11


Ref 10.5 dBm
10 Offset 0.5 dB
*Att 20 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-17.90 dBm
2.467312000 GHz
A
LVL
1 PK VIEW
Center 2.467312 GHz
150 kHz/
Span 1.5 MHz
0
-10
-20
-30
-40
-50
-60
-70
-80

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
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2004

NOTE: 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 both RBW and VBW of spectrum analyzer to 100kHz and 100kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.6 TEST RESULTS

TEST MODE A

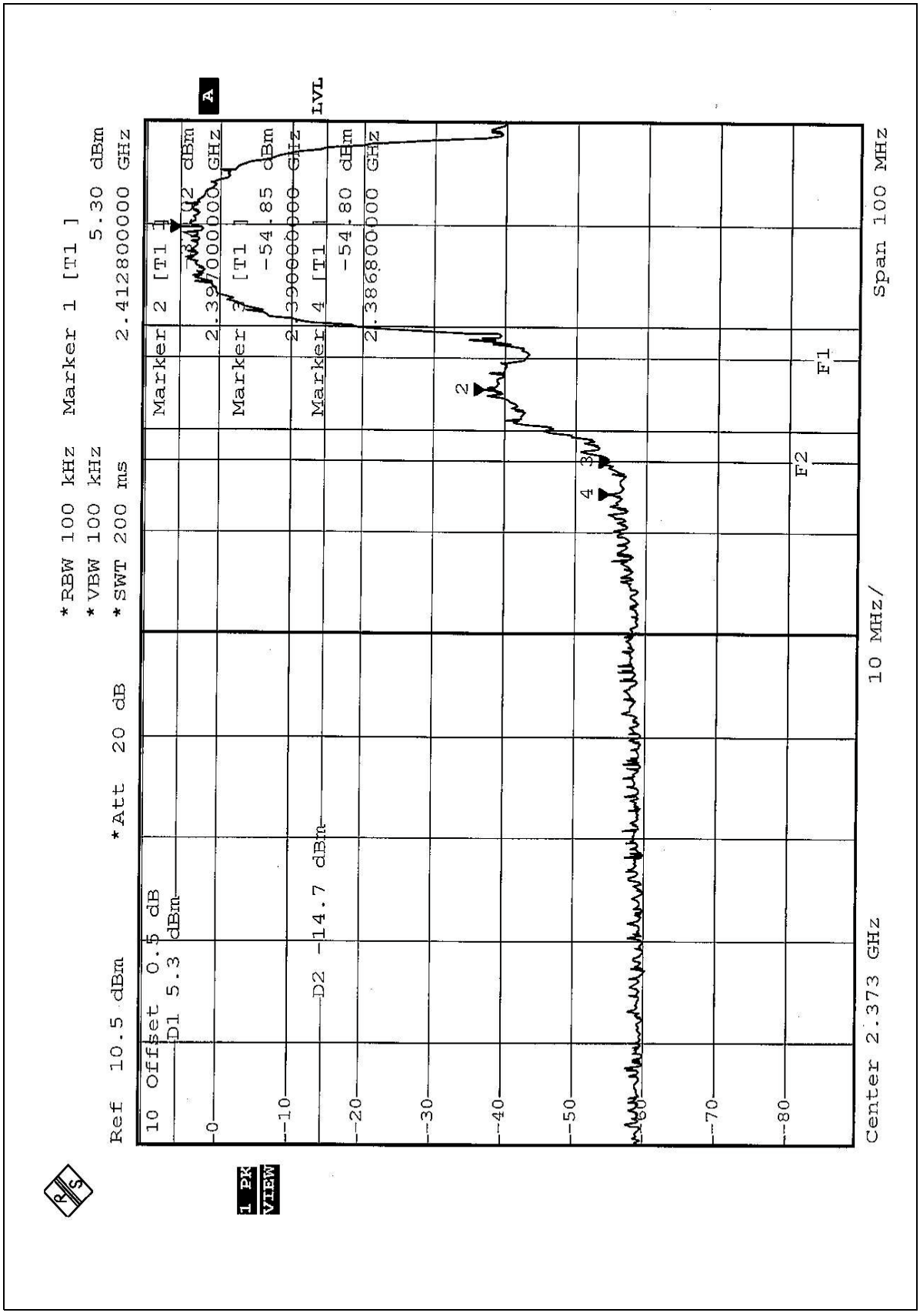
The spectrum plots are attached on the following 4 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

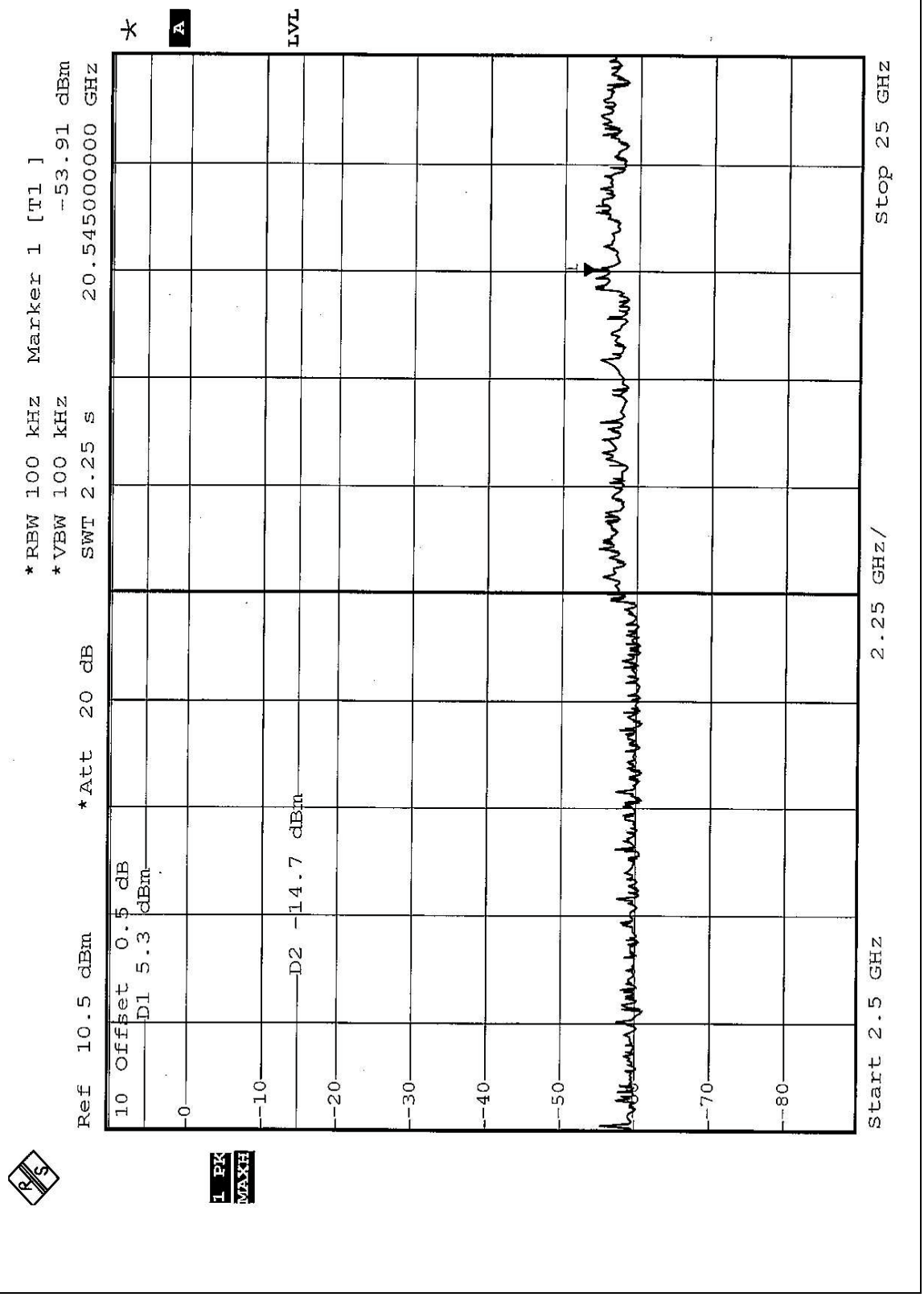
NOTE:

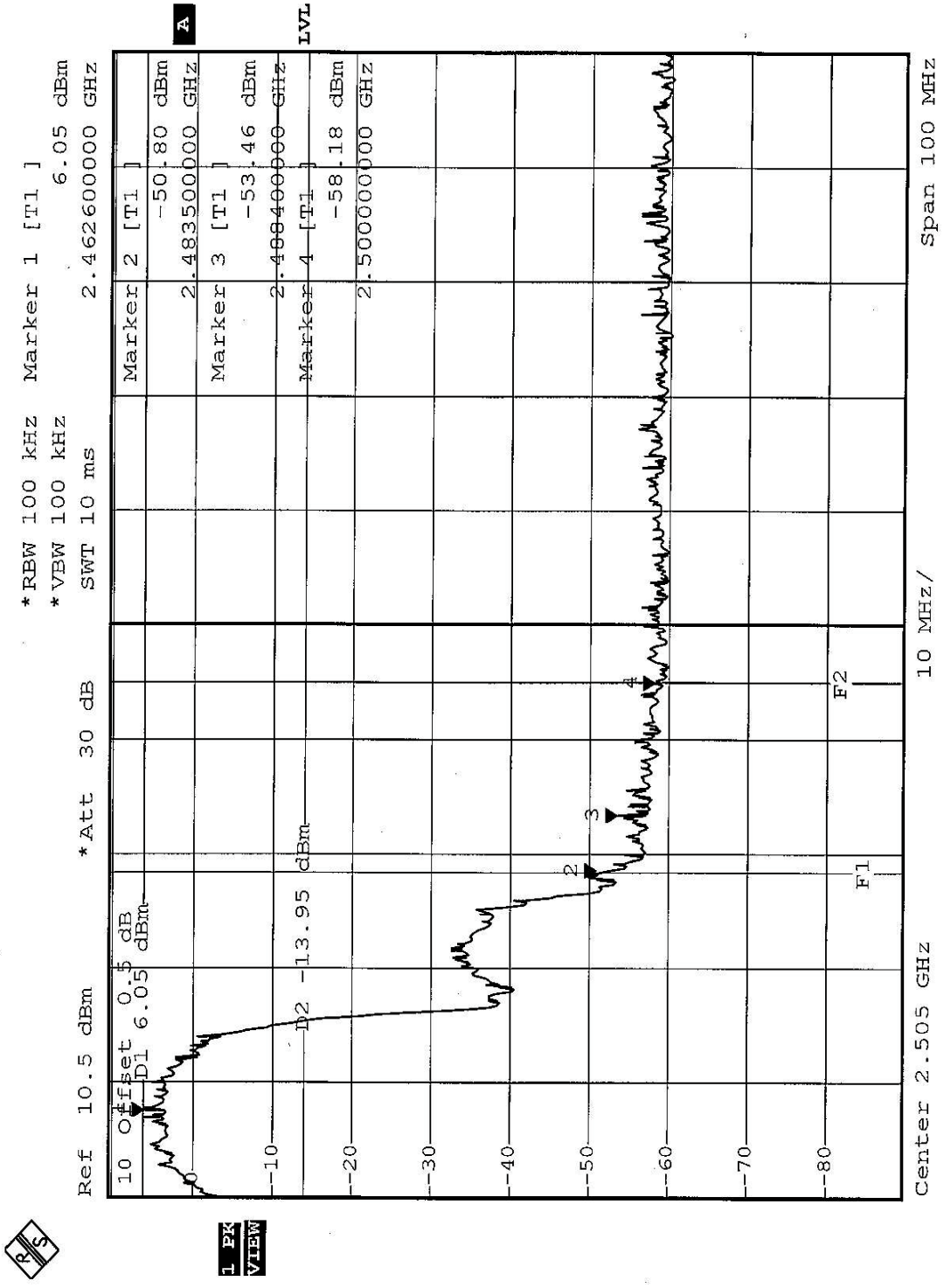
The band edge emission plot on the following 1 ~ 2 pages shows 60.1dB delta between carrier maximum power and local maximum emission in restrict band (2.3868GHz). The emission of carrier strength list in the test mode A of channel 1 at the item 4.2.7 is 101.92dBuV/m, so the maximum field strength in restrict band is 101.92 – 60.1 = 41.82dBuV/m which is under 54 dBuV/m limit.

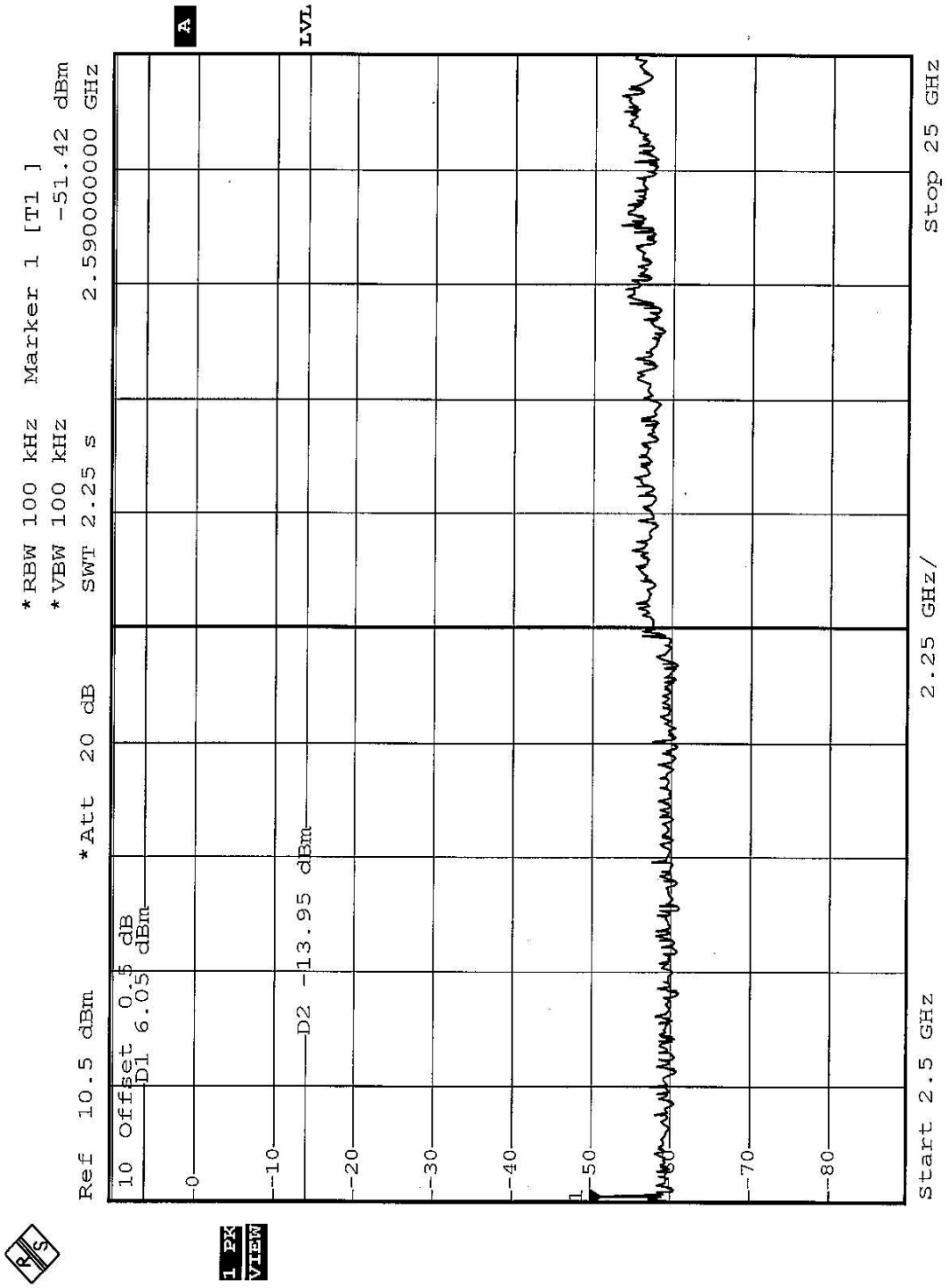
NOTE:

The band edge emission plot on the following 3 ~ 4 pages shows 56.85dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test mode A of channel 11 at the item 4.2.7 is 99.45dBuV/m, so the maximum field strength in restrict band is 99.45 –56.85 = 42.6dBuV/m which is under 54 dBuV/m limit.


Ref 10.5 dBm
10 Offset 0.5 dB
D1 5.3 dBm
D2 -14.7 dBm
*Att 20 dB
*RBW 100 kHz
*VBW 100 kHz
*SWT 200 ms
Marker 1 [T1]
5.30 dBm
2.412800000 GHz
Marker 2 [T1]
Marker 3 [T1]
-54.85 dBm
2.390000000 GHz
Marker 4 [T1]
-54.80 dBm
2.386800000 GHz
A
LVL
1 PK VIEW
Center 2.373 GHz
10 MHz/
Span 100 MHz
F1
F2


*RBW 100 kHz
*VBW 100 kHz
SWT 2.25 s
Marker 1 [T1]
-53.91 dBm
20.545000000 GHz
Ref 10.5 dBm
10 Offset 0.5 dB
D1 5.3 dBm
*Att 20 dB
D2 -14.7 dBm
1 PK MAXH
A
LVL
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz


RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Att 30 dB
Ref 10.5 dBm
Offset 0.5 dB
10 dB/
D1 6.05 dBm
D2 -13.95 dBm
Marker 1 [T1]
6.05 dBm
2.462600000 GHz
Marker 2 [T1]
-50.80 dBm
2.483500000 GHz
Marker 3 [T1]
-53.46 dBm
2.488400000 GHz
Marker 4 [T1]
-58.18 dBm
2.500000000 GHz
A
LVL
F1
F2
1 PK
VIEW
Center 2.505 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.25 s
Marker 1 [T1]
-51.42 dBm
2.590000000 GHz
Ref 10.5 dBm
*Att 20 dB
Offset 0.5 dB
D1 6.05 dBm
D2 -13.95 dBm
A
LVL
1 PK
VIEW
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz

TEST MODE B

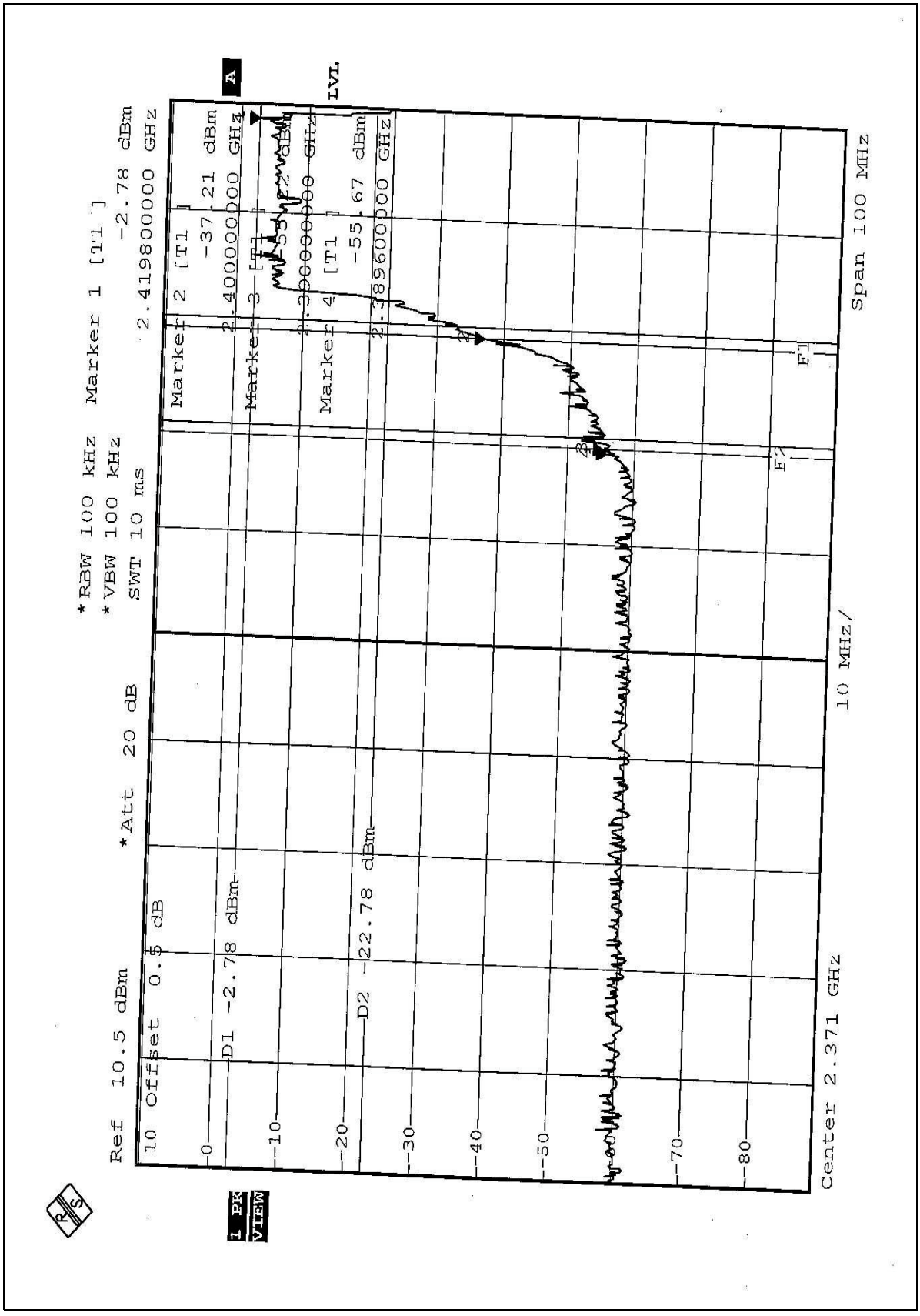
The spectrum plots are attached on the following 4 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

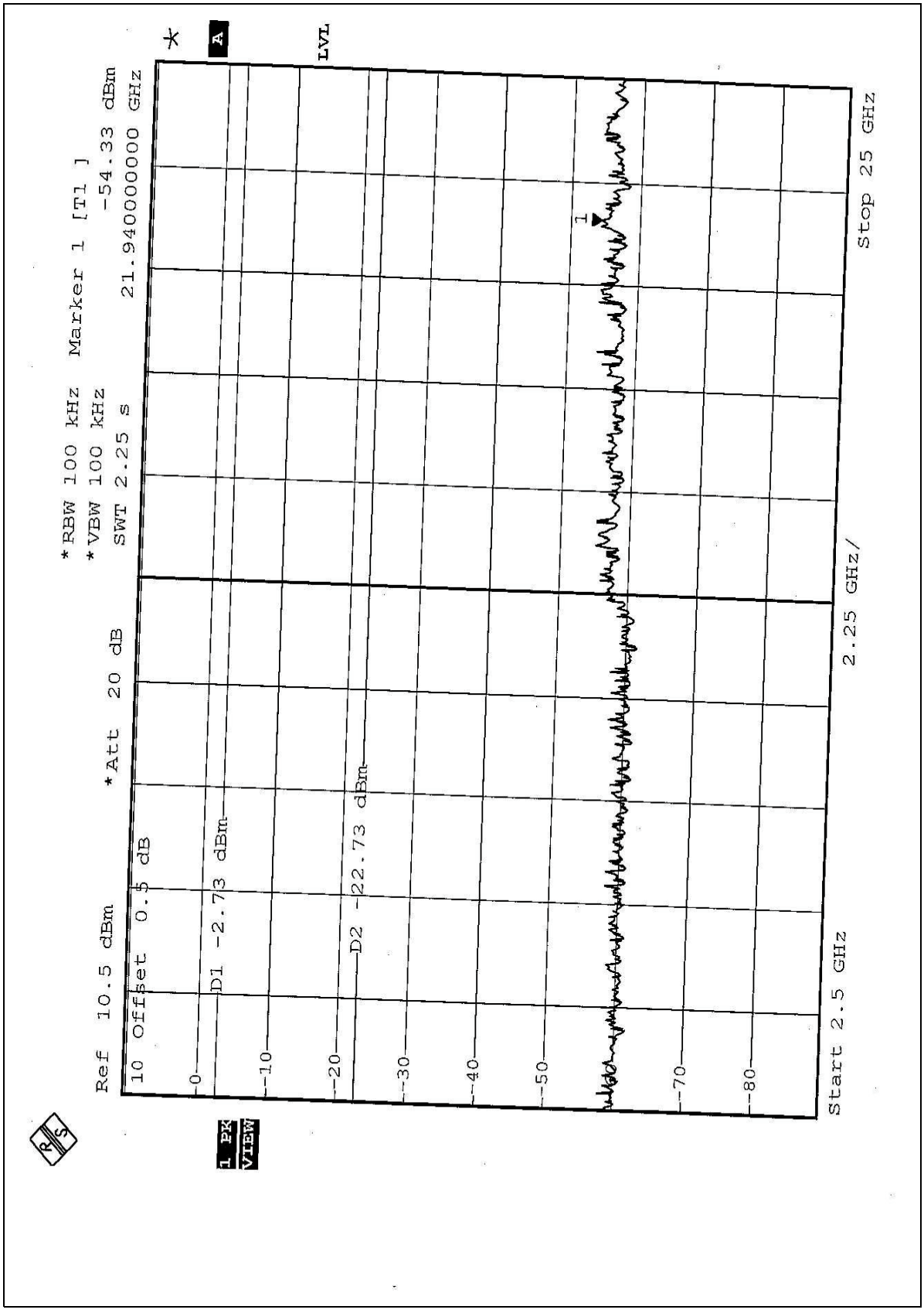
NOTE:

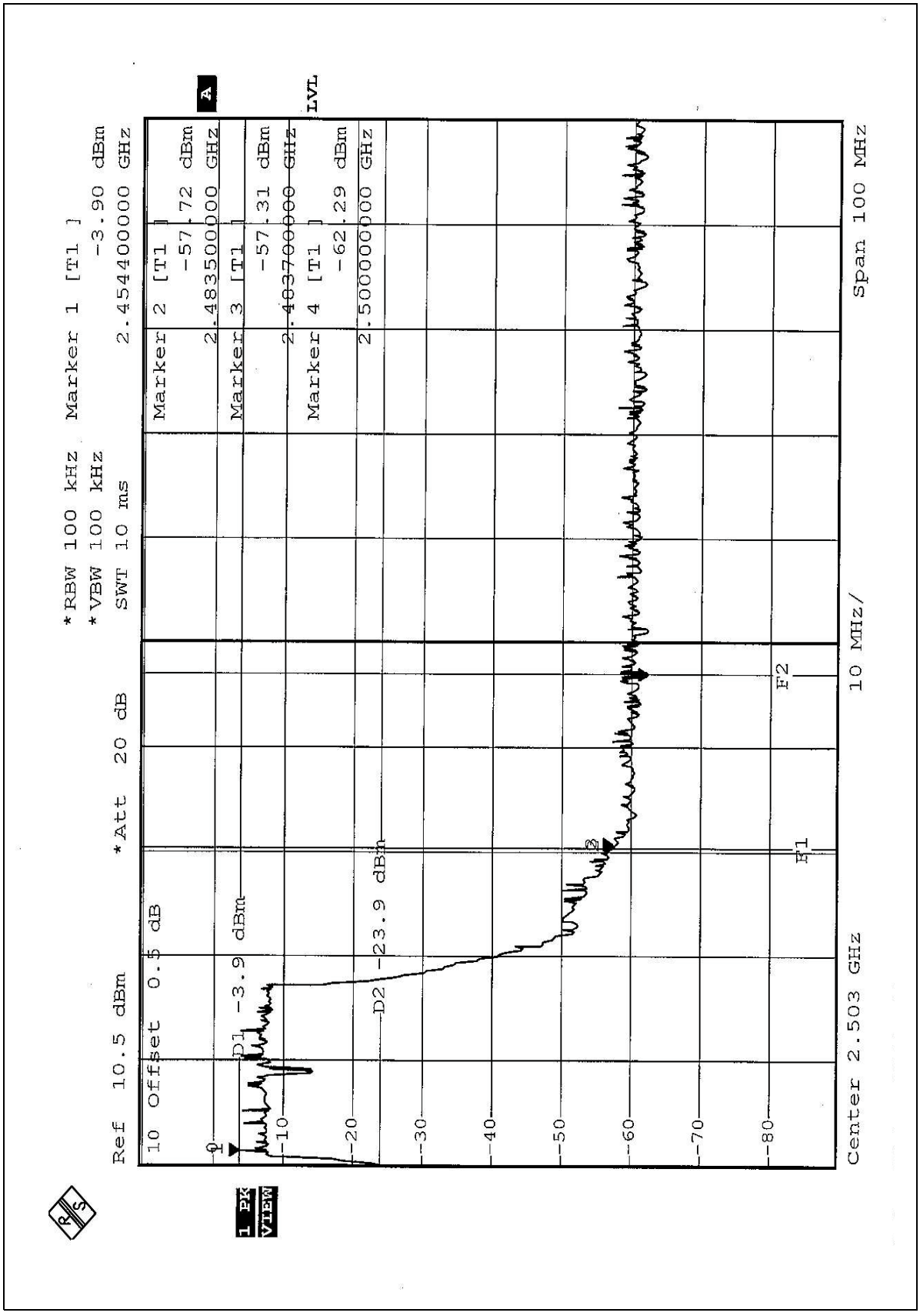
The band edge emission plot on the following 1 ~ 2 pages shows 52.44dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test mode B of channel 1 at the item 4.2.7 is 94.25dBuV/m, so the maximum field strength in restrict band is 94.25 – 52.44 = 41.81dBuV/m which is under 54 dBuV/m limit.

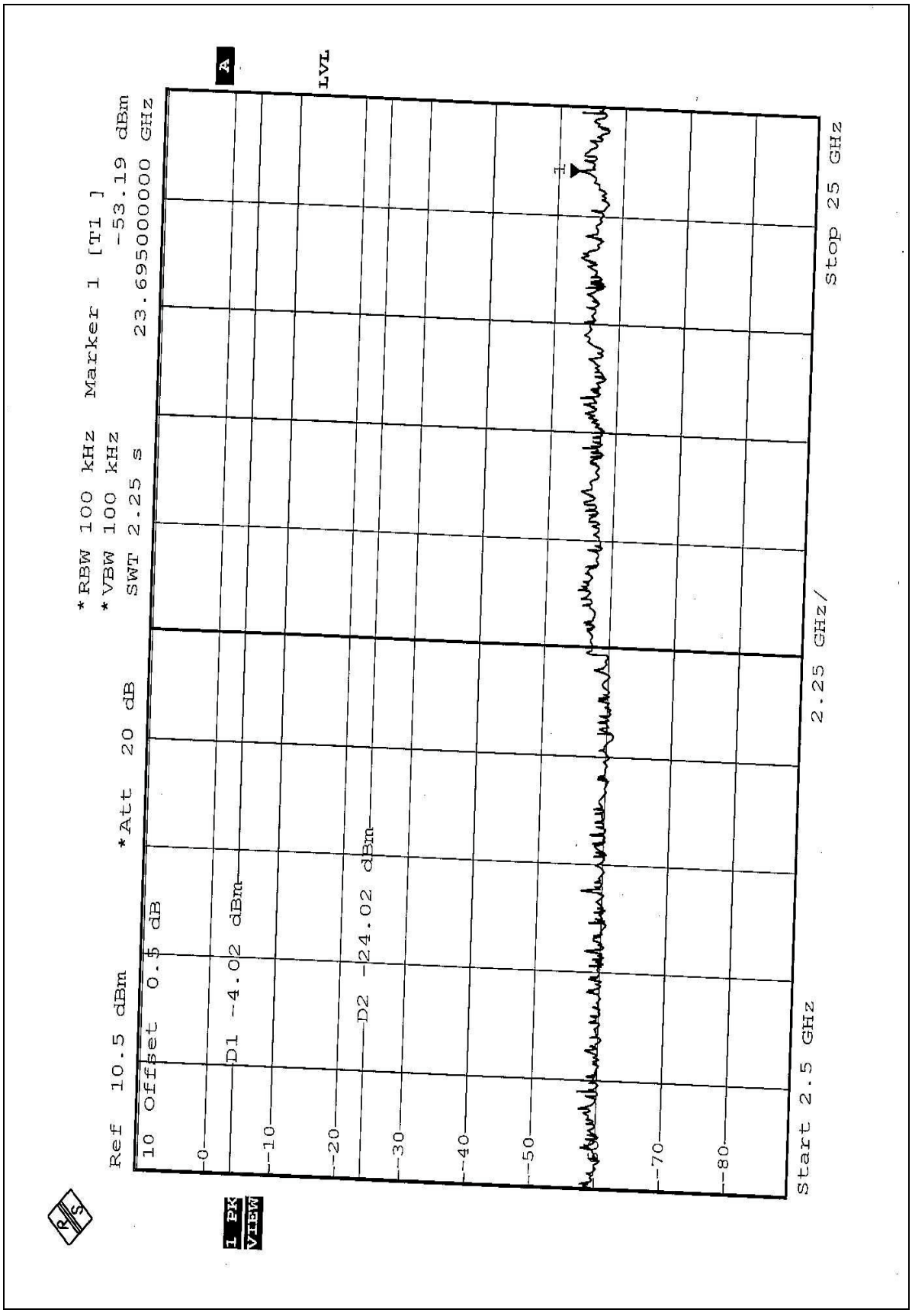
NOTE:

The band edge emission plot on the following 3 ~ 4 pages shows 53.41dB delta between carrier maximum power and local maximum emission in restrict band (2.4837GHz). The emission of carrier strength list in the test mode B of channel 11 at the item 4.2.7 is 92.75dBuV/m, so the maximum field strength in restrict band is 92.75 – 53.41 = 39.34dBuV/m which is under 54 dBuV/m limit.


Ref 10.5 dBm
10 Offset 0.5 dB
*Att 20 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-2.78 dBm
2.419800000 GHz
Marker 2 [T1]
-37.21 dBm
2.400000000 GHz
Marker 3 [T1]
Marker 4 [T1]
-55.67 dBm
2.389600000 GHz
D1 -2.78 dBm
D2 -22.78 dBm
Center 2.371 GHz
10 MHz/
Span 100 MHz
F1
F2
A
LVL
1 PK VIEW


Ref 10.5 dBm
10 Offset 0.5 dB
*Att 20 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 2.25 s
Marker 1 [T1]
-54.33 dBm
21.94000000 GHz
D1 -2.73 dBm
D2 -22.73 dBm
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz
1 PK VIEW
A
LVL


RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-3.90 dBm
2.454400000 GHz
Att 20 dB
Offset 0.5 dB
Ref 10.5 dBm
Marker 2 [T1]
-57.72 dBm
2.483500000 GHz
Marker 3 [T1]
-57.31 dBm
2.483700000 GHz
Marker 4 [T1]
-62.29 dBm
2.500000000 GHz
D1 -3.9 dBm
D2 -23.9 dBm
F1
F2
Center 2.503 GHz
10 MHz/
Span 100 MHz
1 PK VIEW


Ref 10.5 dBm
10 Offset 0.5 dB
*Att 20 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 2.25 s
Marker 1 [T1]
-53.19 dBm
23.695000000 GHz
D1 -4.02 dBm
D2 -24.02 dBm
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz
1 PK
VIEW
A
LVL

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.

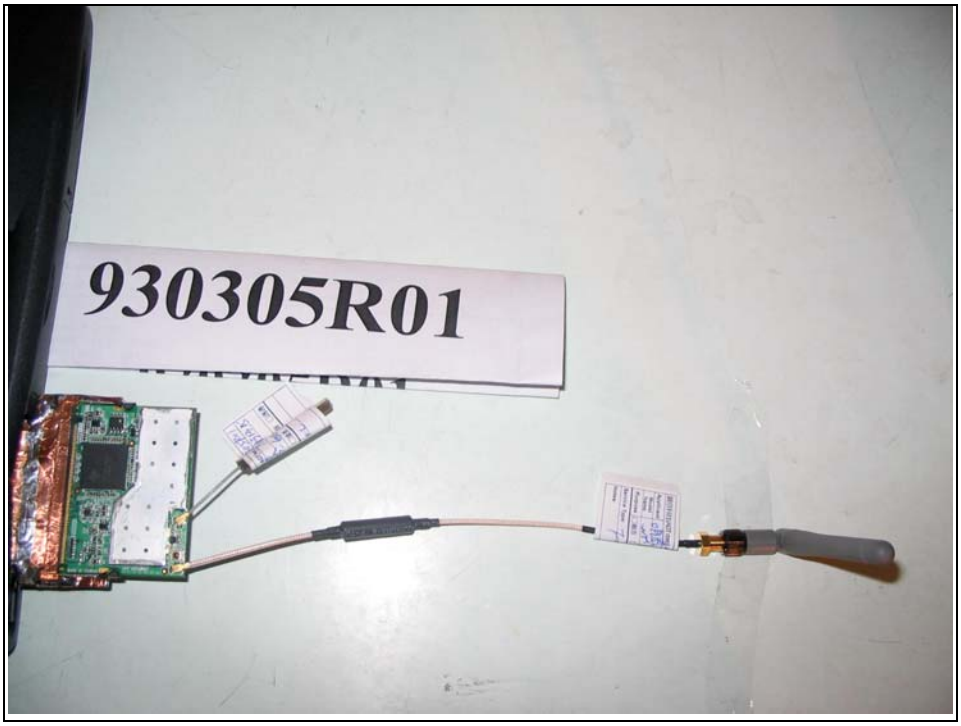
4.7.2 ANTENNA CONNECTED CONSTRUCTION

The maximum Gain antennas used in this product are PIFA antenna (Internal) and Swivel Dipole antenna (External) with UFL antenna connector. And the maximum Gain of these antennas is 2dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST


930305R01

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, NVLAP, UL
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:

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

Linko RF & Telecom Lab.
Tel: 886-3-3270910
Fax: 886-3-3270892

Email: service@mail.adt.com.tw
Web Site: www.adt.com.tw

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