4.4.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to peak the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same peak reading on oscilloscope. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS (A)

EUT	WLAN 11g USB Adapter	**MODEL**	WL-2203
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23 deg. C, 67% RH, 991 hPa
TESTED BY	Leo Hung		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	11.066	10.44	30	PASS
6	2437	11.092	10.45	30	PASS
11	2462	11.143	10.47	30	PASS

4.4.8 TEST RESULTS (B)

EUT	WLAN 11g USB Adapter	**MODEL**	WL-2203
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23 deg. C, 67% RH, 991 hPa
TESTED BY	Leo Hung		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	11.143	10.47	30	PASS
6	2437	11.169	10.48	30	PASS
11	2462	11.169	10.48	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, 2005

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

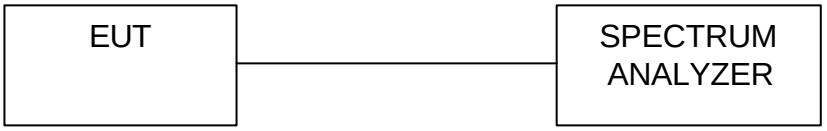
4.5.3 TEST PROCEDURE

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

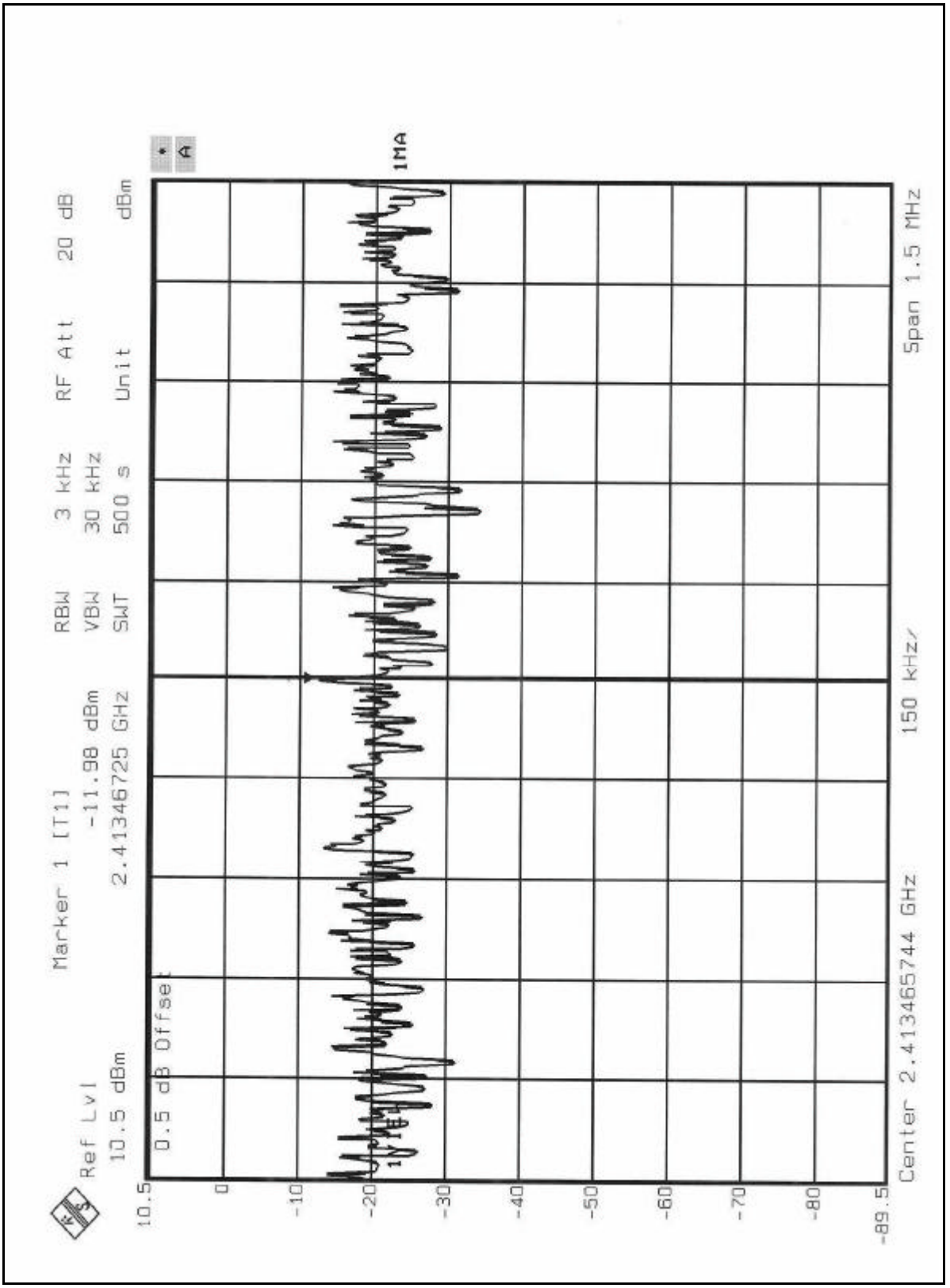
Same as 4.3.6

4.5.7 TEST RESULTS (A)

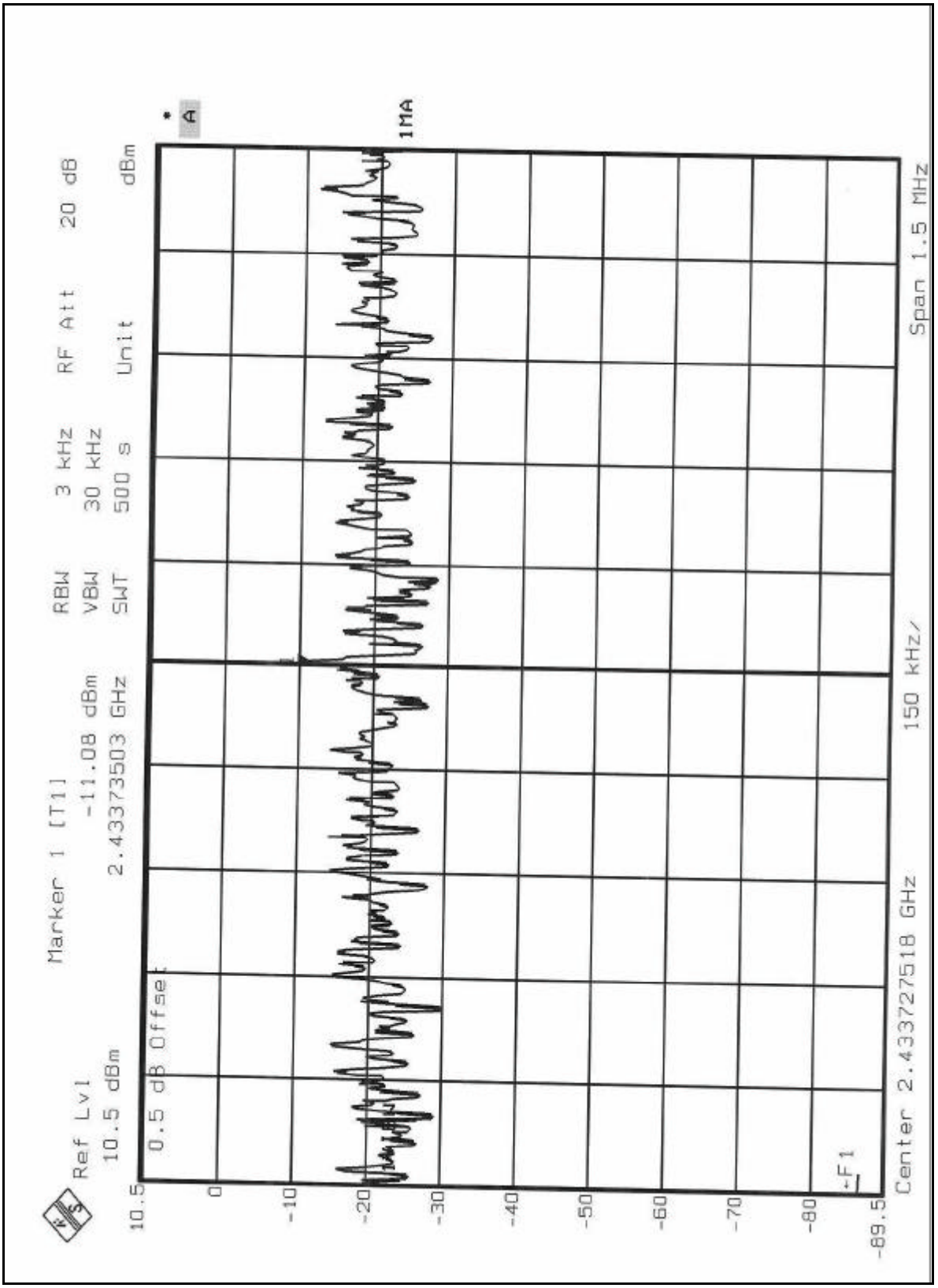
EUT	WLAN 11g USB Adapter	**MODEL**	WL-2203
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23 deg. C, 67% RH, 991 hPa
TESTED BY	Leo Hung		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-11.98	8	PASS
6	2437	-11.08	8	PASS
11	2462	-10.34	8	PASS

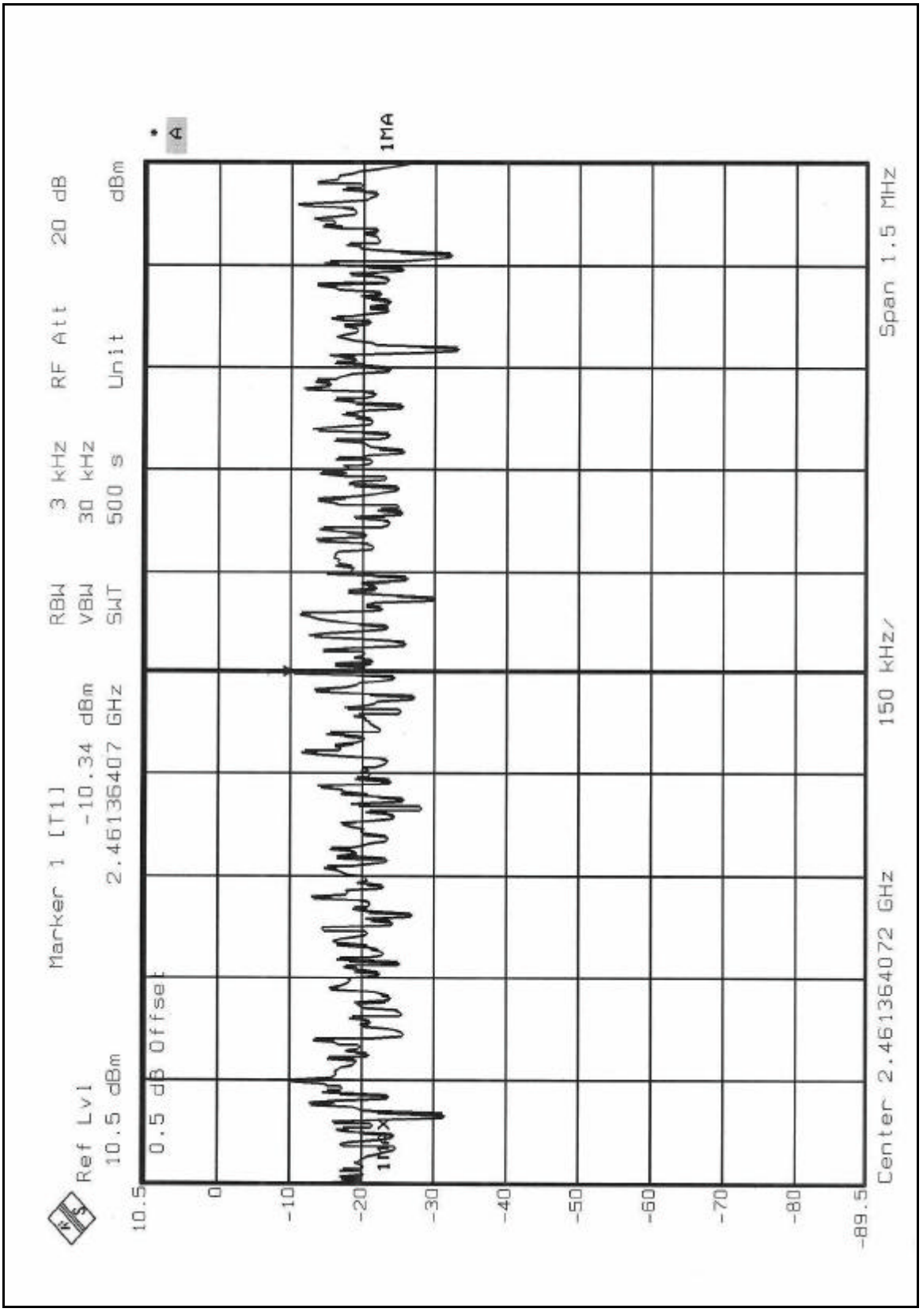
CH1


Ref Lvl
10.5 dBm
0.5 dB Offset
Marker 1 [T1]
-11.98 dBm
2.41346725 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 20 dB
Unit dBm
1MA
Center 2.413465744 GHz
150 kHz/
Span 1.5 MHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5

CH6


Marker 1 [T1]
-11.08 dBm
2.4373503 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
1MA
Span 1.5 MHz
150 kHz/
Center 2.43727518 GHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
F1

CH11

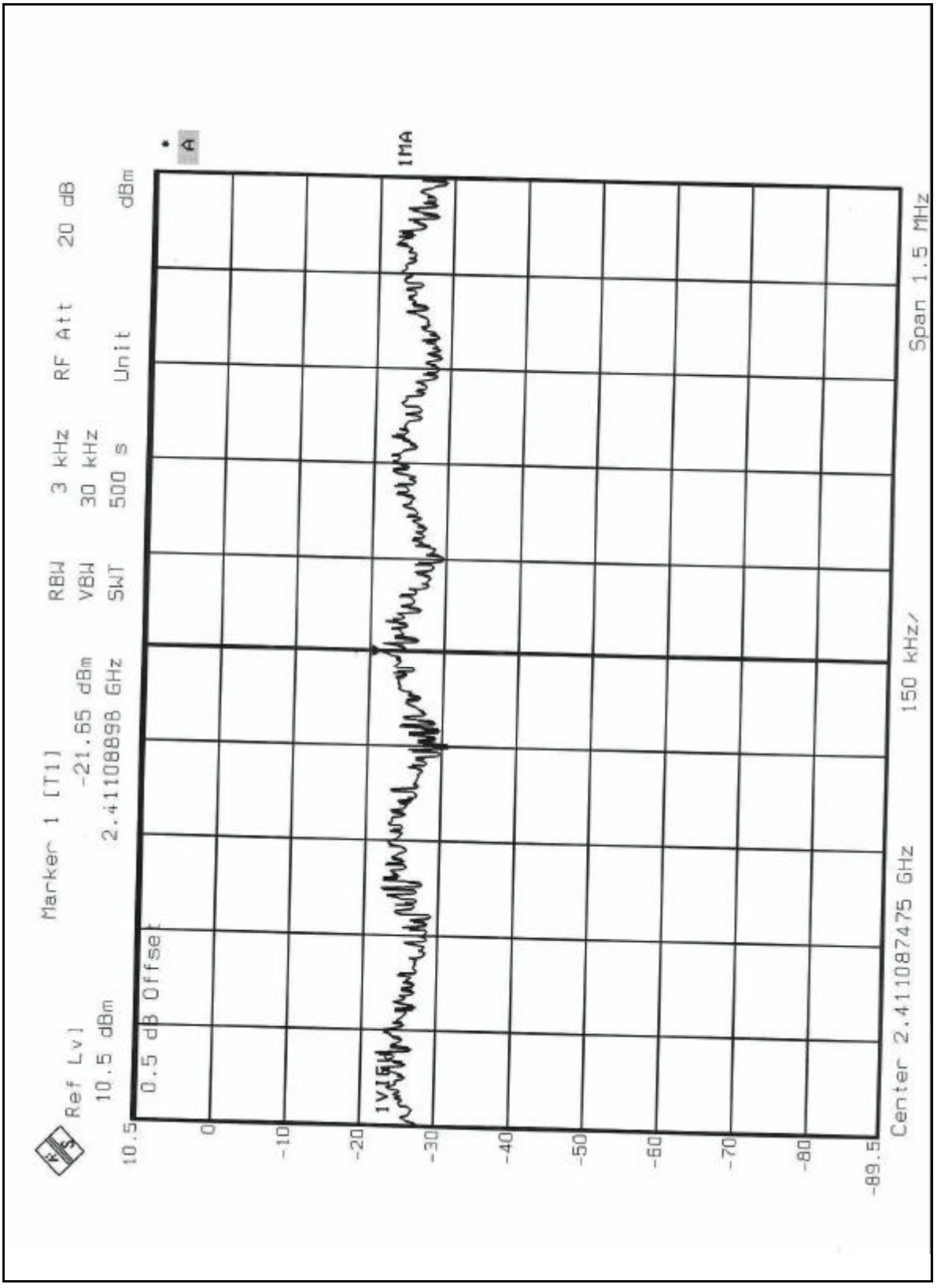

Ref Lvl
10.5 dBm
0.5 dB Offset
Marker 1 [T1]
-10.34 dBm
2.46136407 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 20 dB
Unit dBm
1MA
Center 2.46136407 2 GHz
150 kHz/
Span 1.5 MHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5

4.5.8 TEST RESULTS (B)

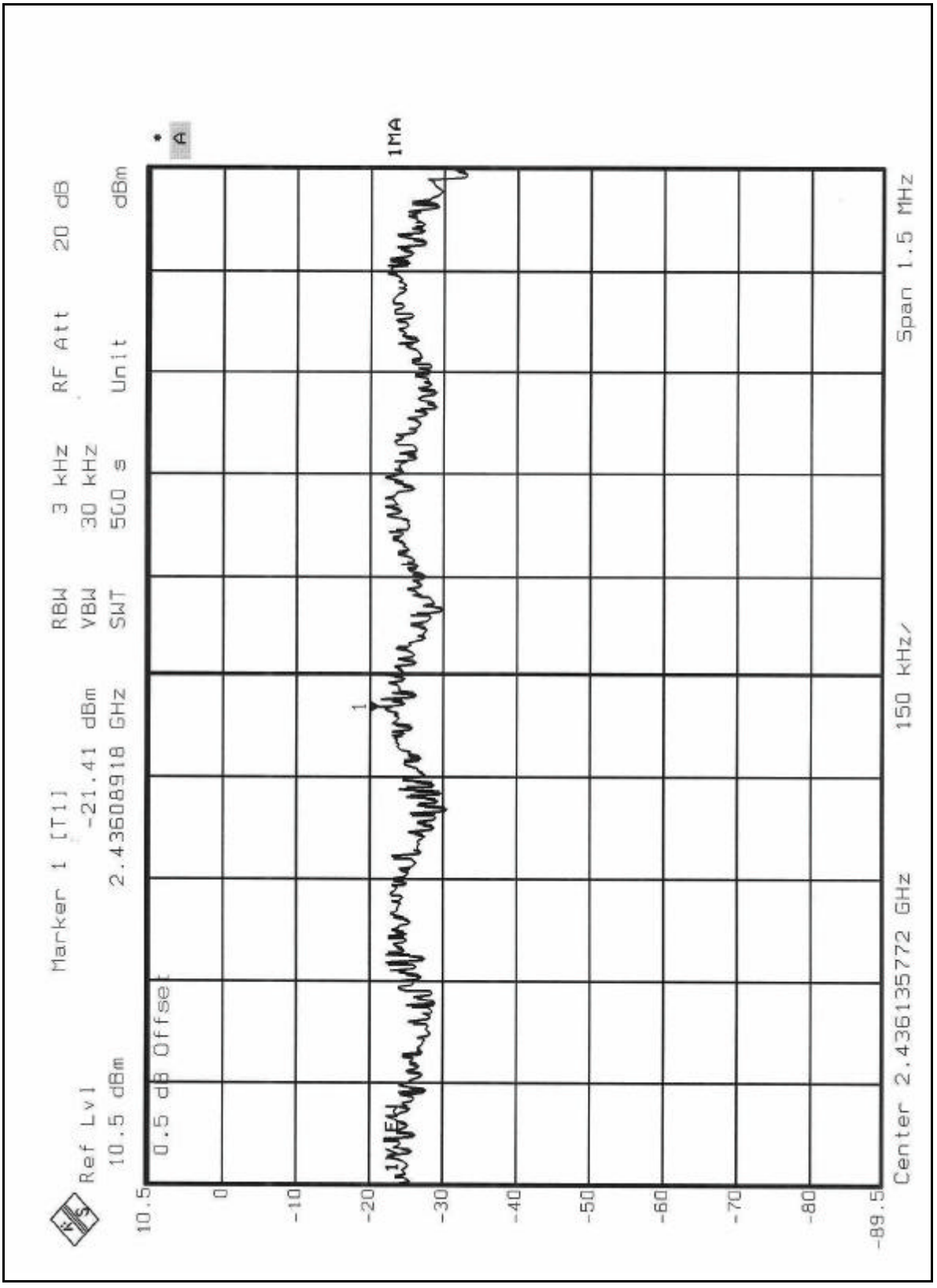
EUT	WLAN 11g USB Adapter	**MODEL**	WL-2203
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23 deg. C, 67% RH, 991 hPa
TESTED BY	Leo Hung		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-21.65	8	PASS
6	2437	-21.41	8	PASS
11	2462	-21.97	8	PASS

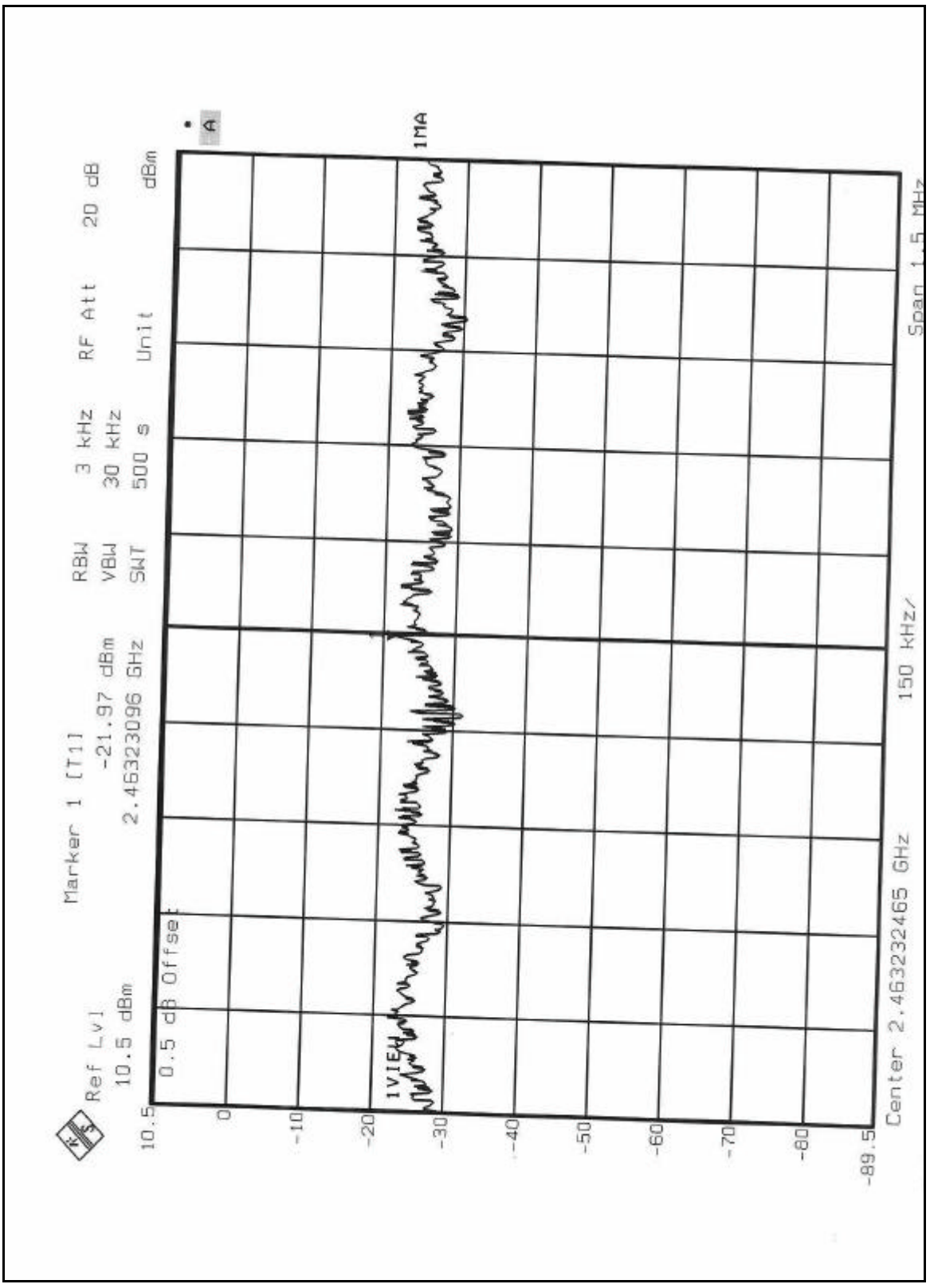
CH1


Marker 1 [T1]
-21.65 dBm
2.41108898 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
1MA
Center 2.41108475 GHz
150 kHz/
Span 1.5 MHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5

CH6


Marker 1 [T1]
-21.41 dBm
2.4360891 8 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
1MA
Span 1.5 MHz
150 kHz/
Center 2.436135772 GHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5

CH11


Ref Lvl
10.5 dBm
0.5 dB Offset
Marker 1 [T1]
-21.97 dBm
2.46323096 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 20 dB
Unit dBm
1MA
Center 2.463232465 GHz
150 kHz/
Span 1.5 MHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5

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, 2005

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 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

The spectrum plots are attached on the following 8 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).

4.6.7 TEST RESULTS(A)

NOTE:

The band edge emission plot of CCK technique on the following 1~2 pages show 53.28dB delta between carrier maximum power and local maximum emission in restrict band (2.3869GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.8 is 98.88dBuV/m, so the maximum field strength in restrict band is 98.88-53.28=45.60dBuV/m which is under 54dBuV/m limit.

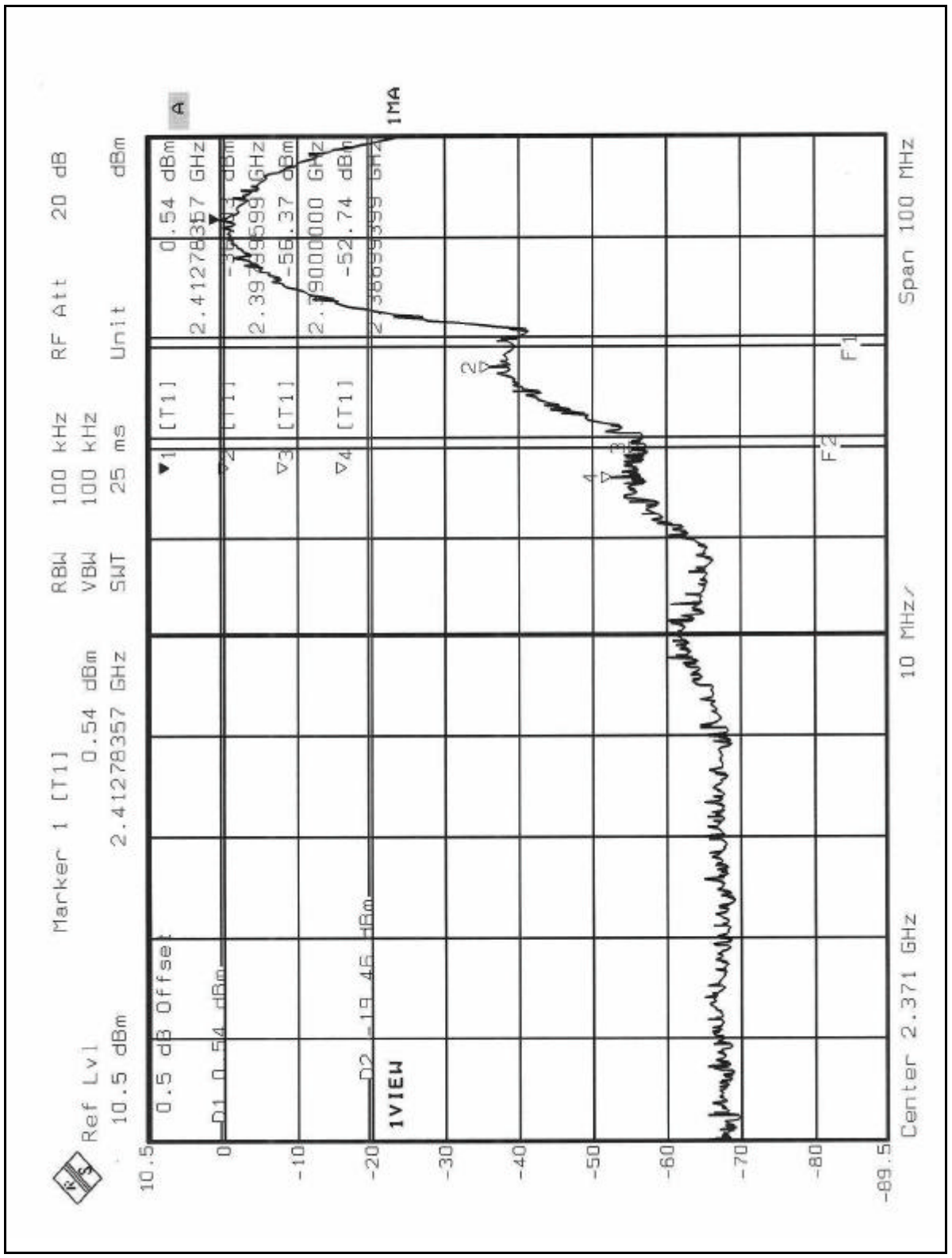
The band edge emission plot of CCK technique on the following 3~4 pages show 56.83dB delta between carrier maximum power and local maximum emission in restrict band (2.4885GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.8 is 97.24dBuV/m, so the maximum field strength in restrict band is 97.24-56.83=40.41dBuV/m which is under 54dBuV/m limit.

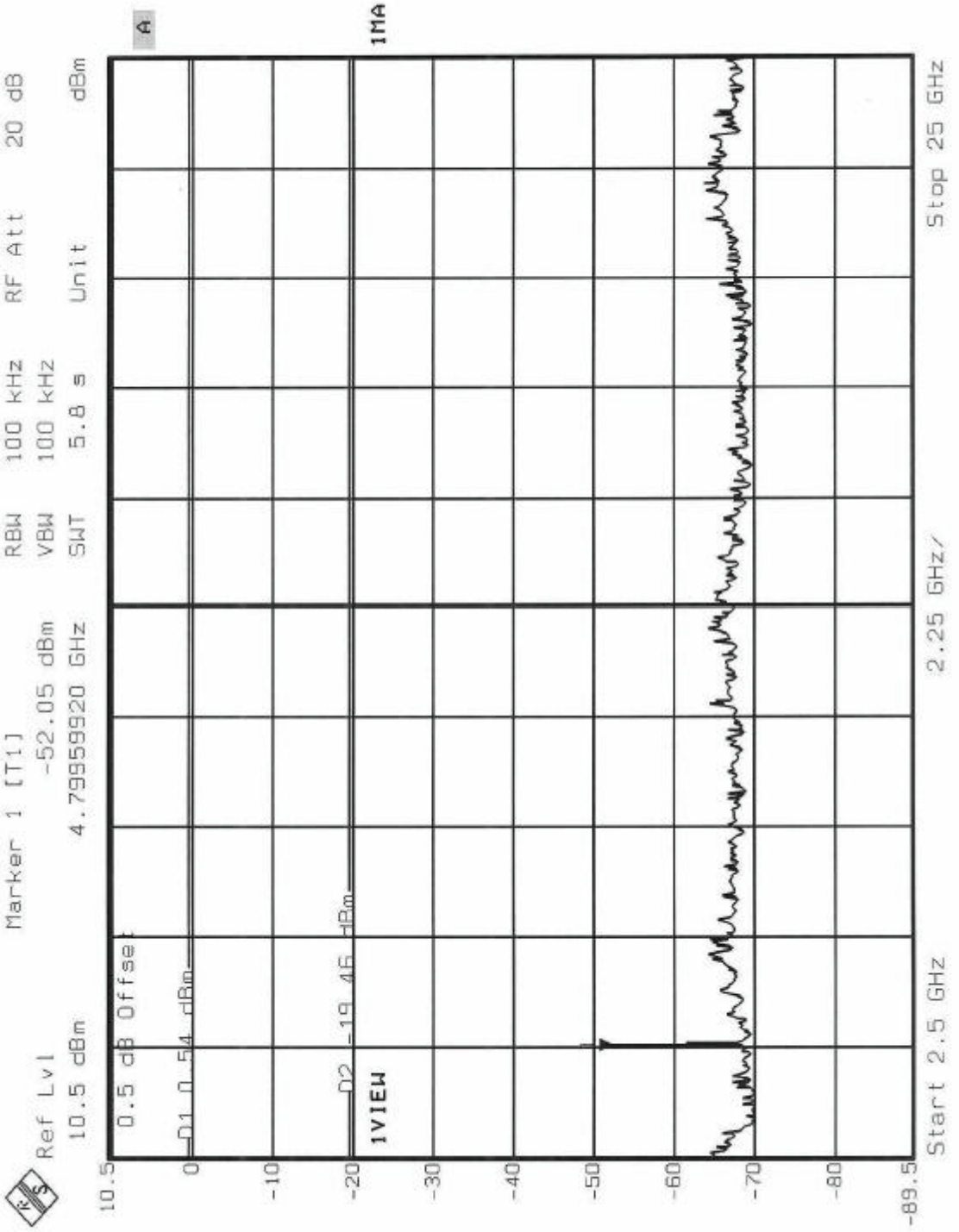
4.6.8 TEST RESULTS(B)

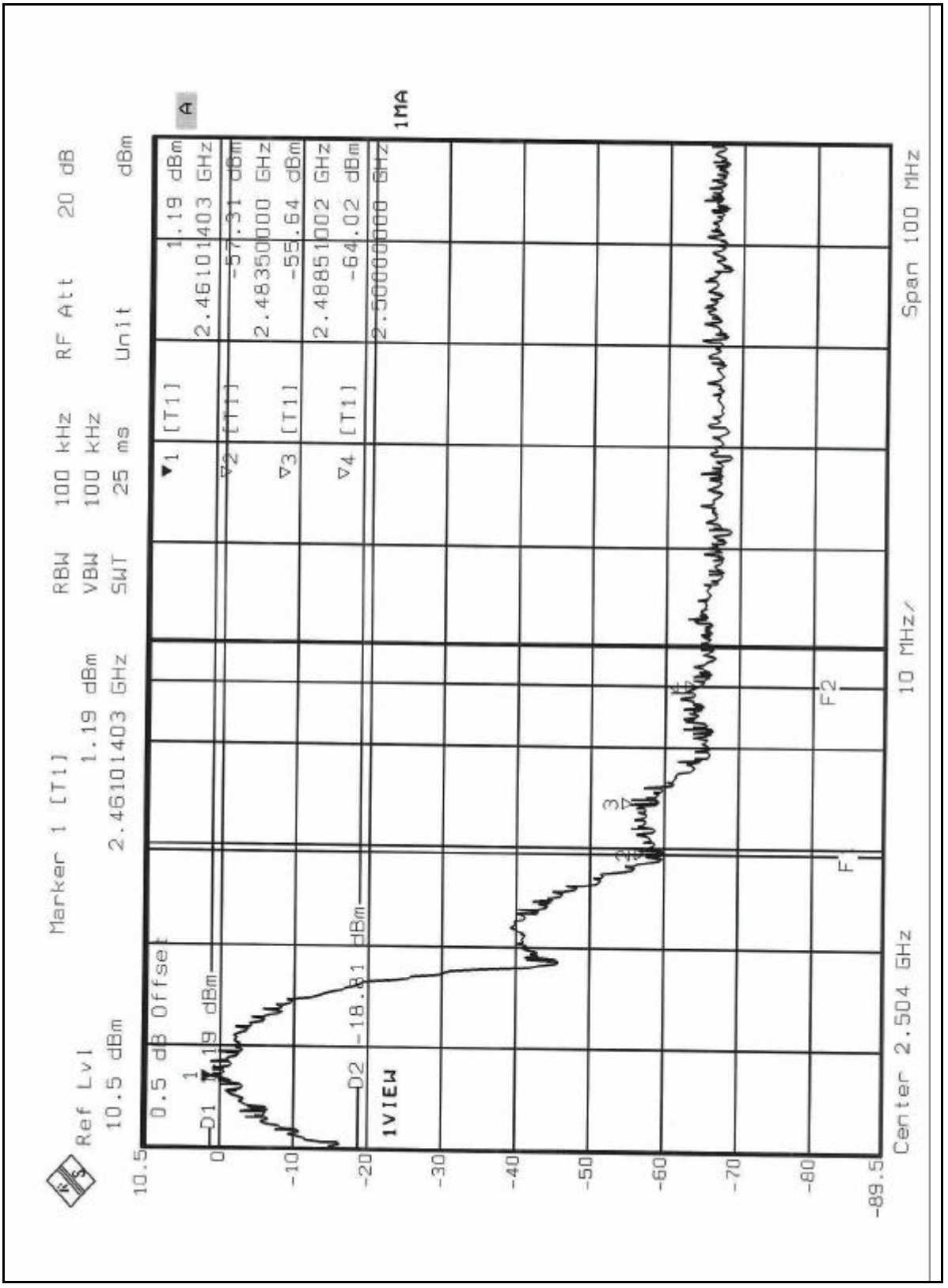
NOTE:

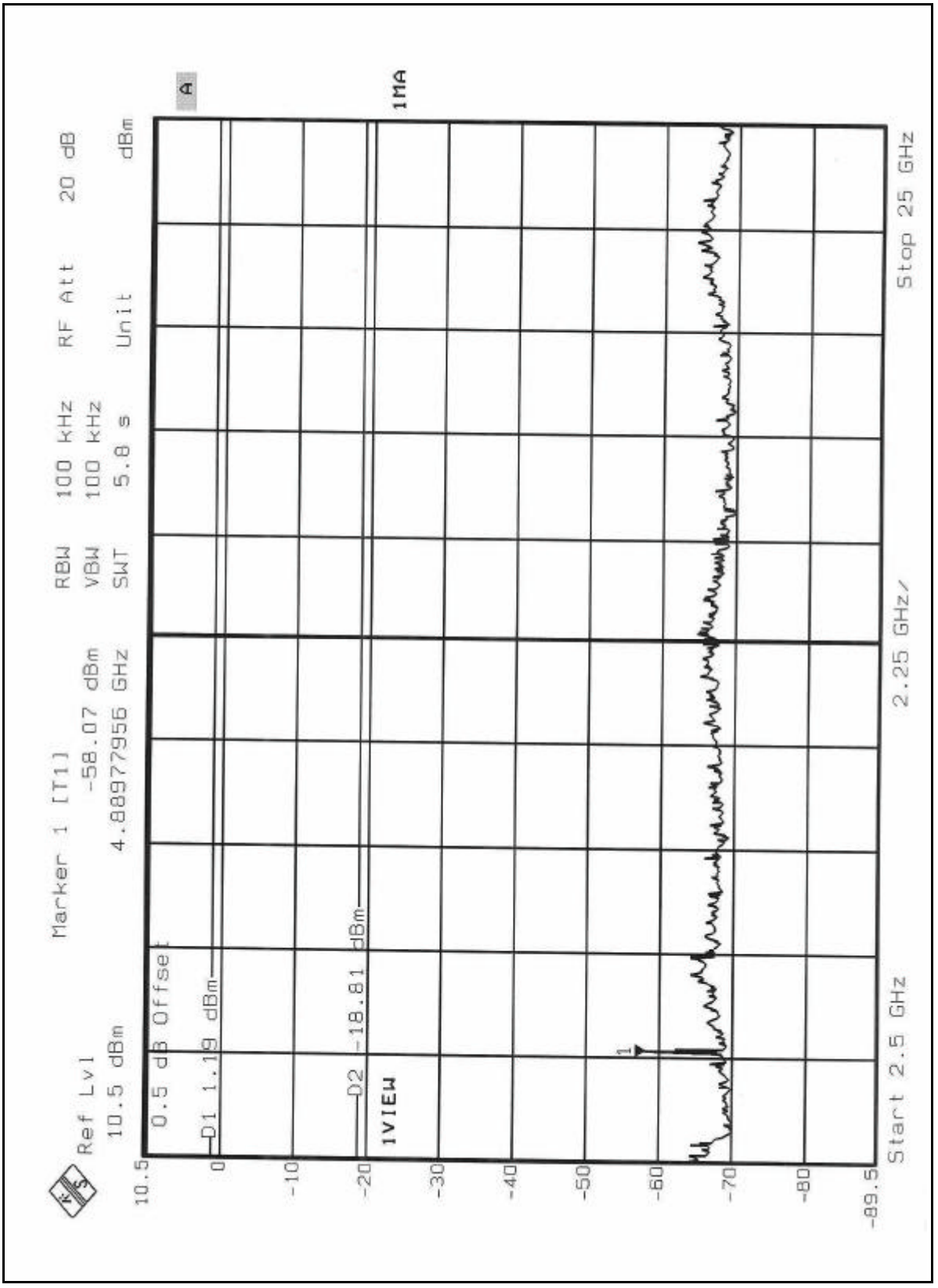
The band edge emission plot of OFDM technique on the following 5~6 pages show 42.49dB delta between carrier maximum power and local maximum emission in restrict band (2.3895GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.9 is 96.02dBuV/m, so the maximum field strength in restrict band is 96.02-42.49=53.53dBuV/m which is under 54dBuV/m limit.

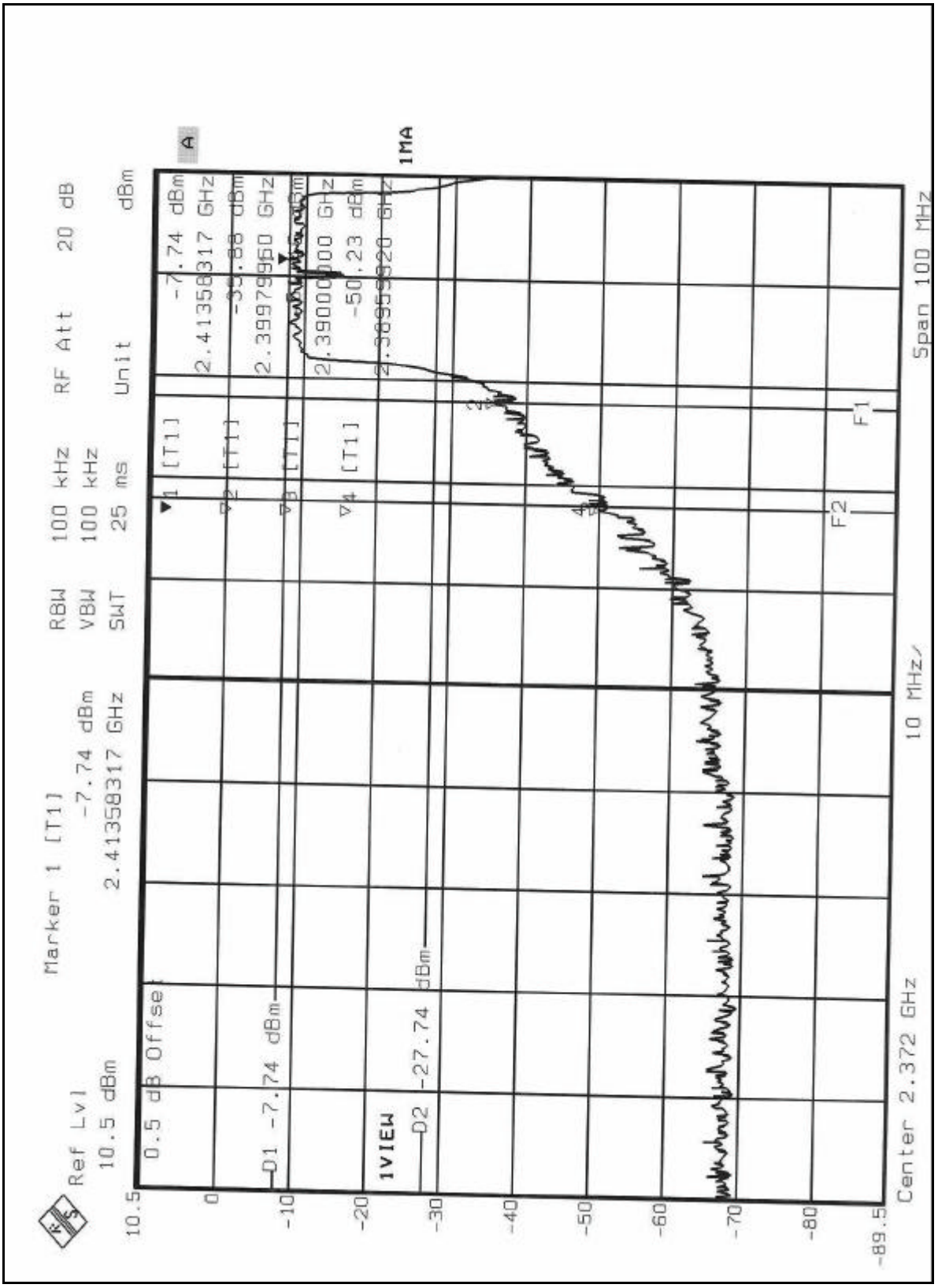
The band edge emission plot of OFDM technique on the following 7~8 pages show 45.17dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.9 is 95.14dBuV/m, so the maximum field strength in restrict band is 95.14-45.17=49.97dBuV/m which is under 54dBuV/m limit.

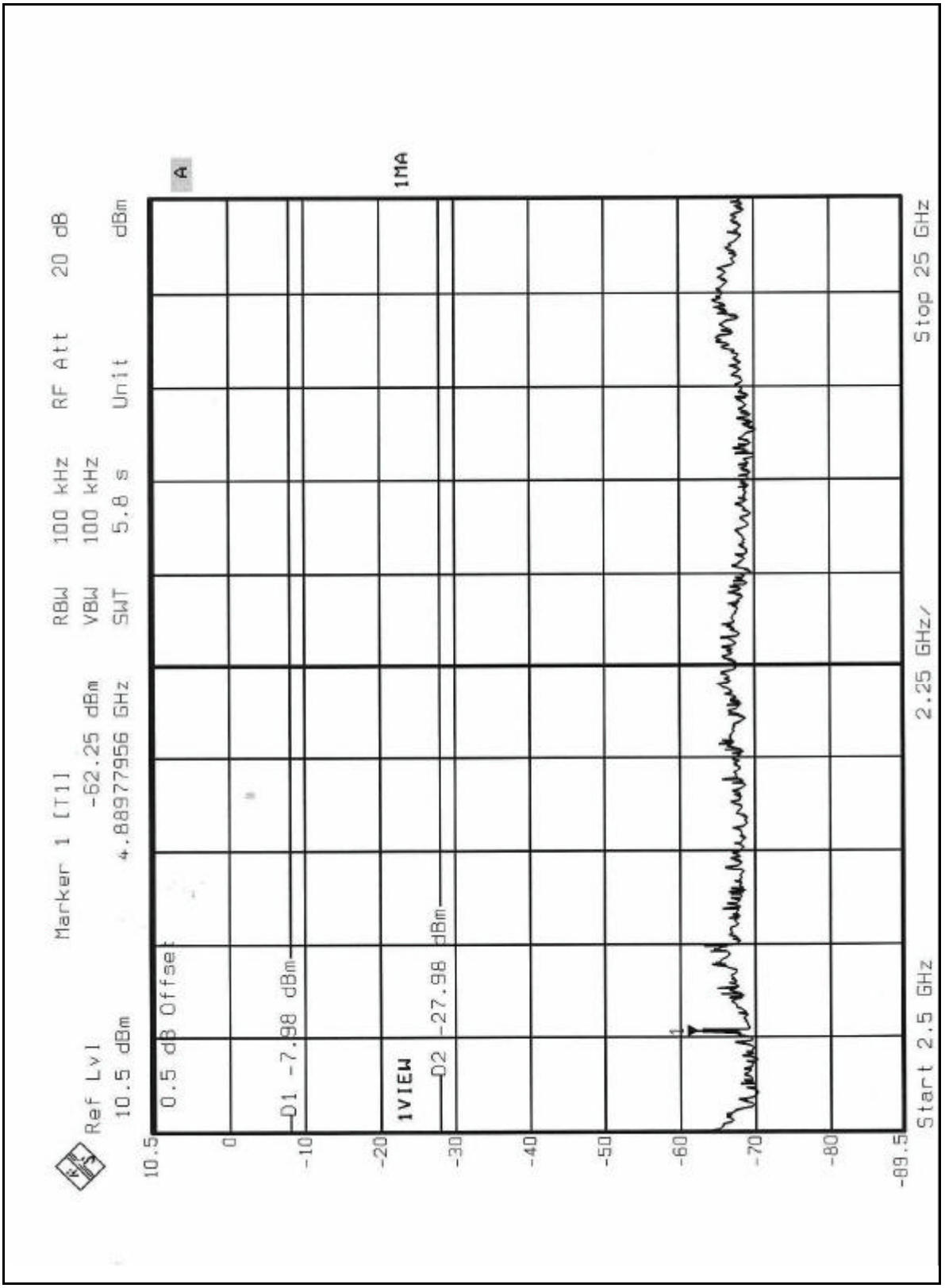

Marker 1 [T1]
0.54 dBm
2.41278357 GHz
RBW 100 kHz
VBW 100 kHz
SWT 25 ms
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
D1 0.54 dBm
D2 -19.46 dBm
1VIEW
1MA
Center 2.371 GHz
10 MHz/
Span 100 MHz

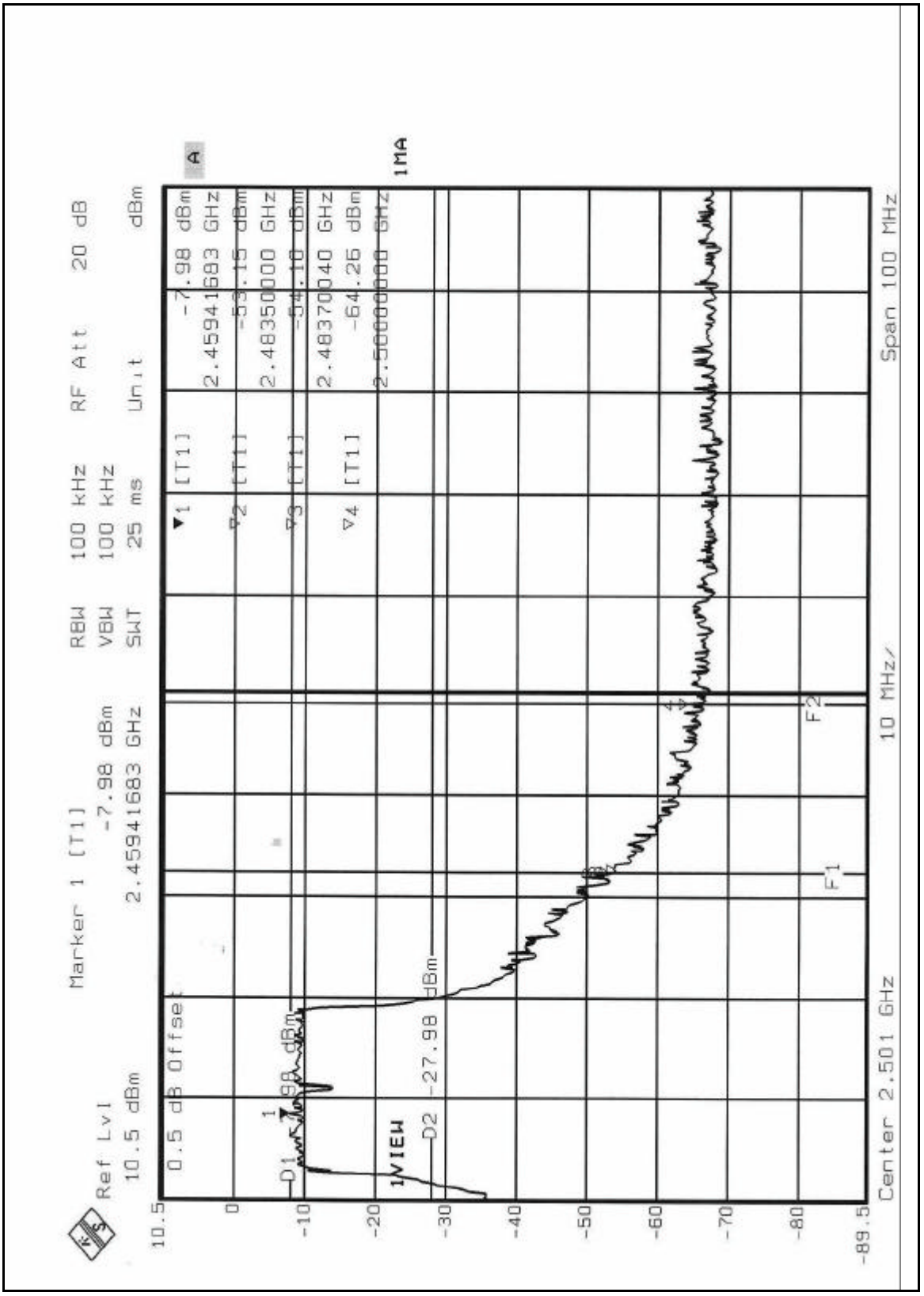

Marker 1 [T1]
-52.05 dBm
4.79959920 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
D1 0.54 dBm
D2 -19.46 dBm
1VIEW
1MA
A
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5

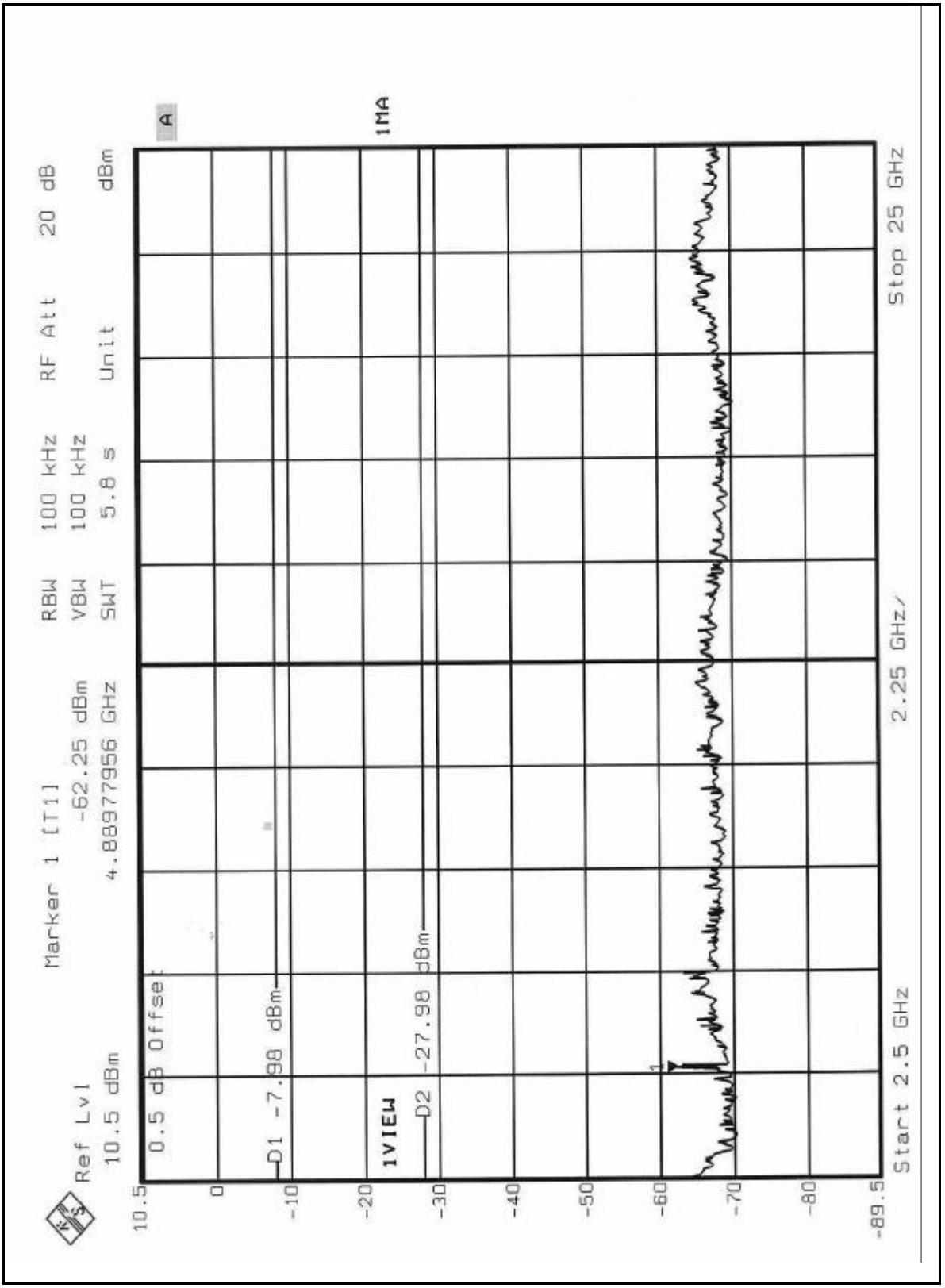

Marker 1 [T1]
1.19 dBm
2.46101403 GHz
RBW 100 kHz
VBW 100 kHz
SWT 25 ms
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
1.19 dBm
-18.81 dBm
1VIEW
1MA
Center 2.504 GHz
10 MHz/
Span 100 MHz
1 [T1] 1.19 dBm 2.46101403 GHz
2 [T1] -57.31 dBm 2.48350000 GHz
3 [T1] -55.64 dBm 2.48851002 GHz
4 [T1] -64.02 dBm 2.50000000 GHz


Marker 1 [T1]
-58.07 dBm
4.88977956 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
D1 1.19 dBm
D2 -18.81 dBm
1VIEW
1MA
A
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5


Marker 1 [T1]
-7.74 dBm
2.41358317 GHz
RBW 100 kHz
VBW 100 kHz
SWT 25 ms
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
D1 -7.74 dBm
D2 -27.74 dBm
1VIEW
1MA
A
F1
F2
Center 2.372 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
-62.25 dBm
4.88977956 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 20 dB
Unit dBm
Ref Lvl
10.5 dBm
0.5 dB Offset
D1 -7.98 dBm
1VIEW
D2 -27.98 dBm
1MA
A
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz


Ref Lvl
10.5 dBm
0.5 dB Offset
Marker 1 [T1]
-7.98 dBm
2.45941683 GHz
RBW 100 kHz
VBW 100 kHz
SWT 25 ms
RF Att 20 dB
Unit dBm
1MA
VIEW
D1 -7.98 dBm
D2 -27.98 dBm
F1
F2
Center 2.501 GHz
10 MHz/
Span 100 MHz


Ref Lvl
10.5 dBm
0.5 dB Offset
Marker 1 [T1]
-62.25 dBm
4.88977956 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 20 dB
Unit dBm
A
1MA
1VIEW
D1 -7.98 dBm
D2 -27.98 dBm
10.5
0
-10
-20
-30
-40
-50
-60
-70
-80
-89.5
Start 2.5 GHz
2.25 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.

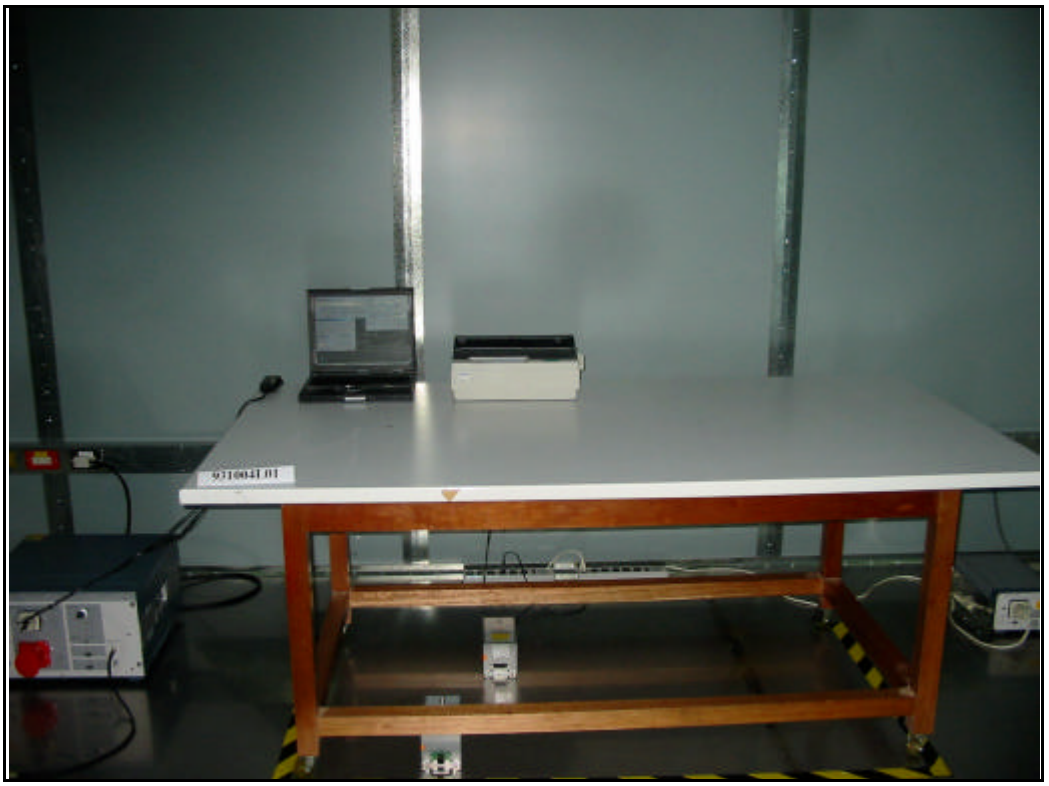
And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

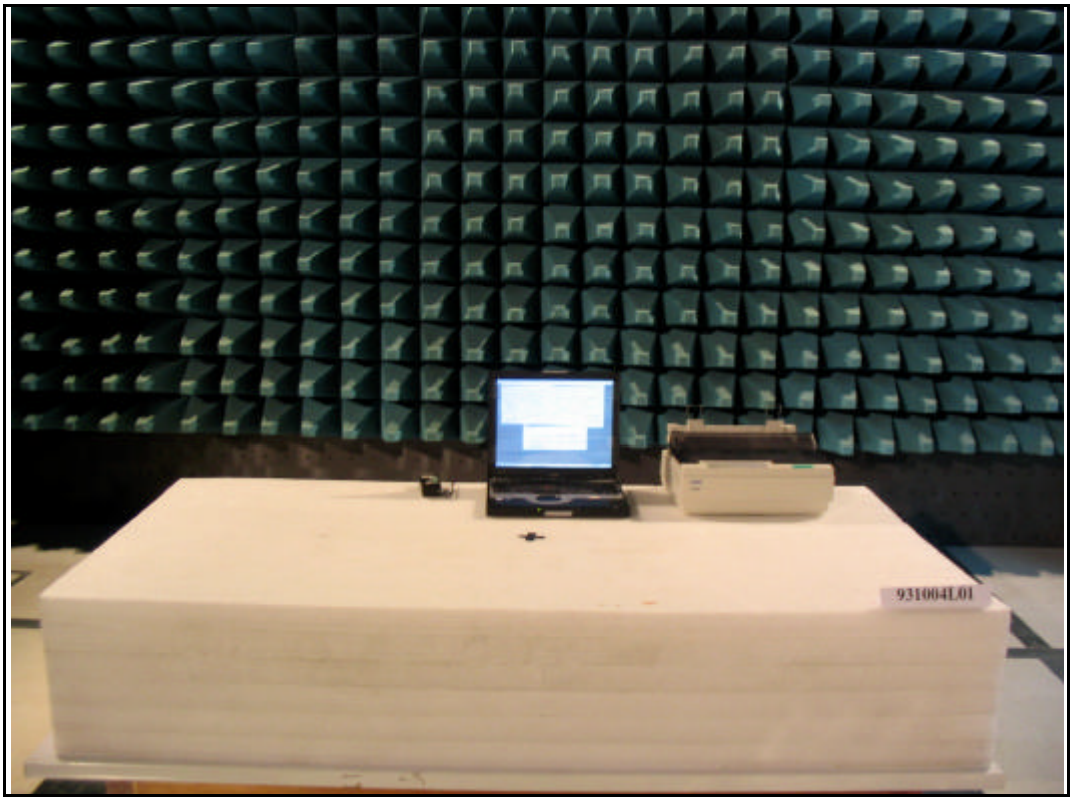
The antenna used in this product is chip antenna without connector. And the maximum Gain of this antenna is 1.98dBi.

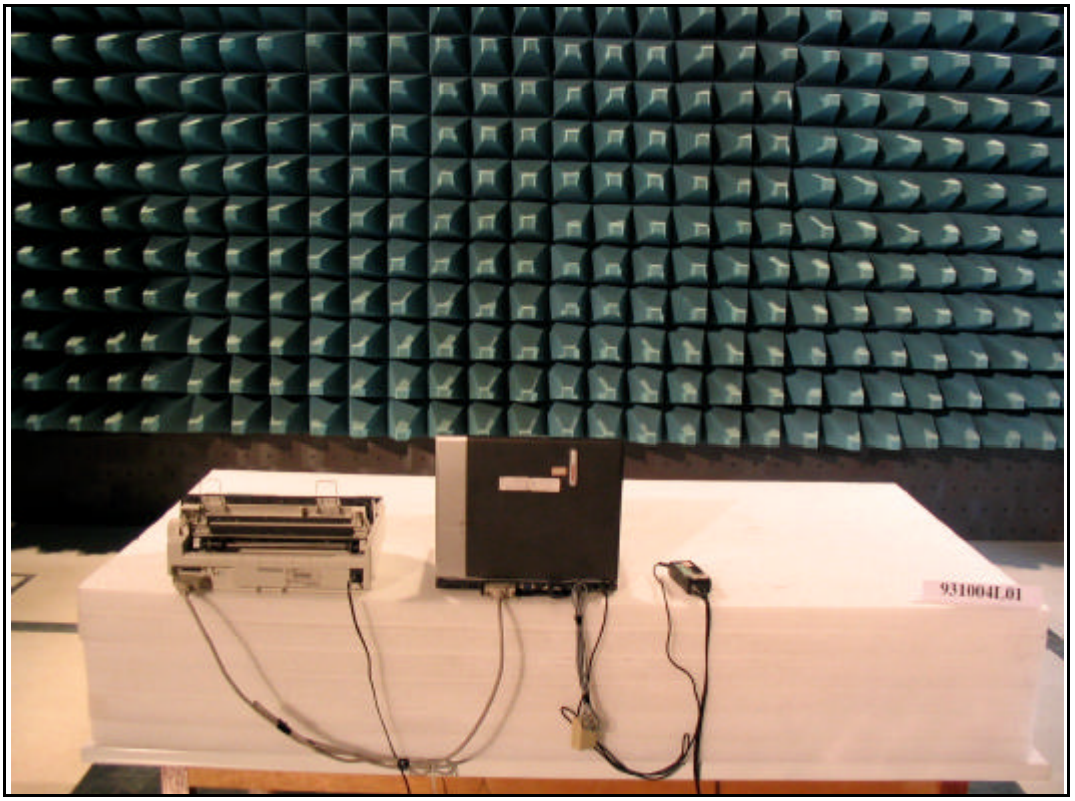
5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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, Guide 25 or EN 45001:

USA	FCC, NVLAP, 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:

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

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

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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