4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Limit of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Aug. 04, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

Notes:

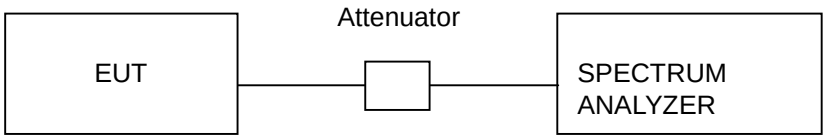
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 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 3 kHz RBW and 30 kHz 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 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

4.5.5 EUT OPERATING CONDITION

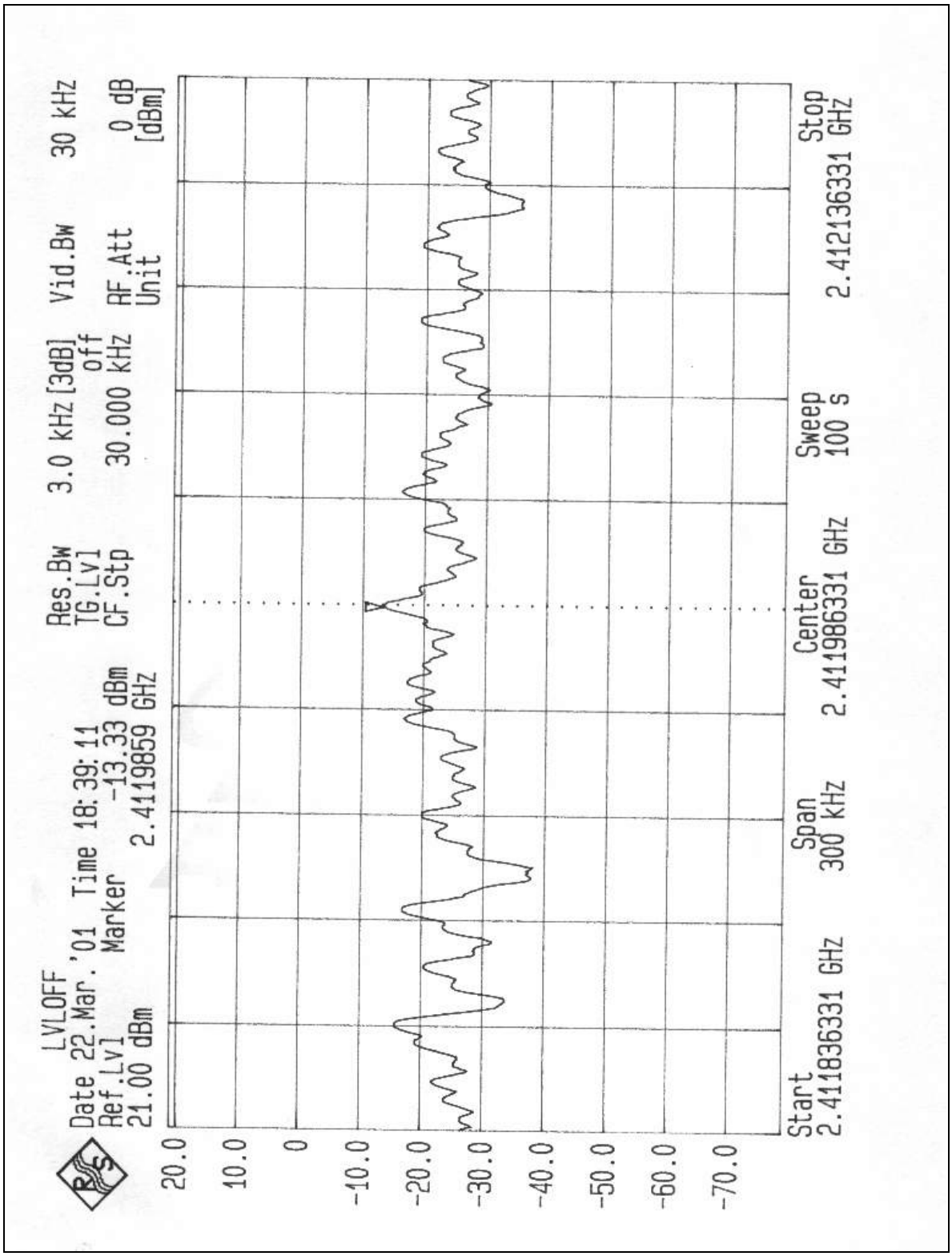
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.5.6 TEST RESULTS

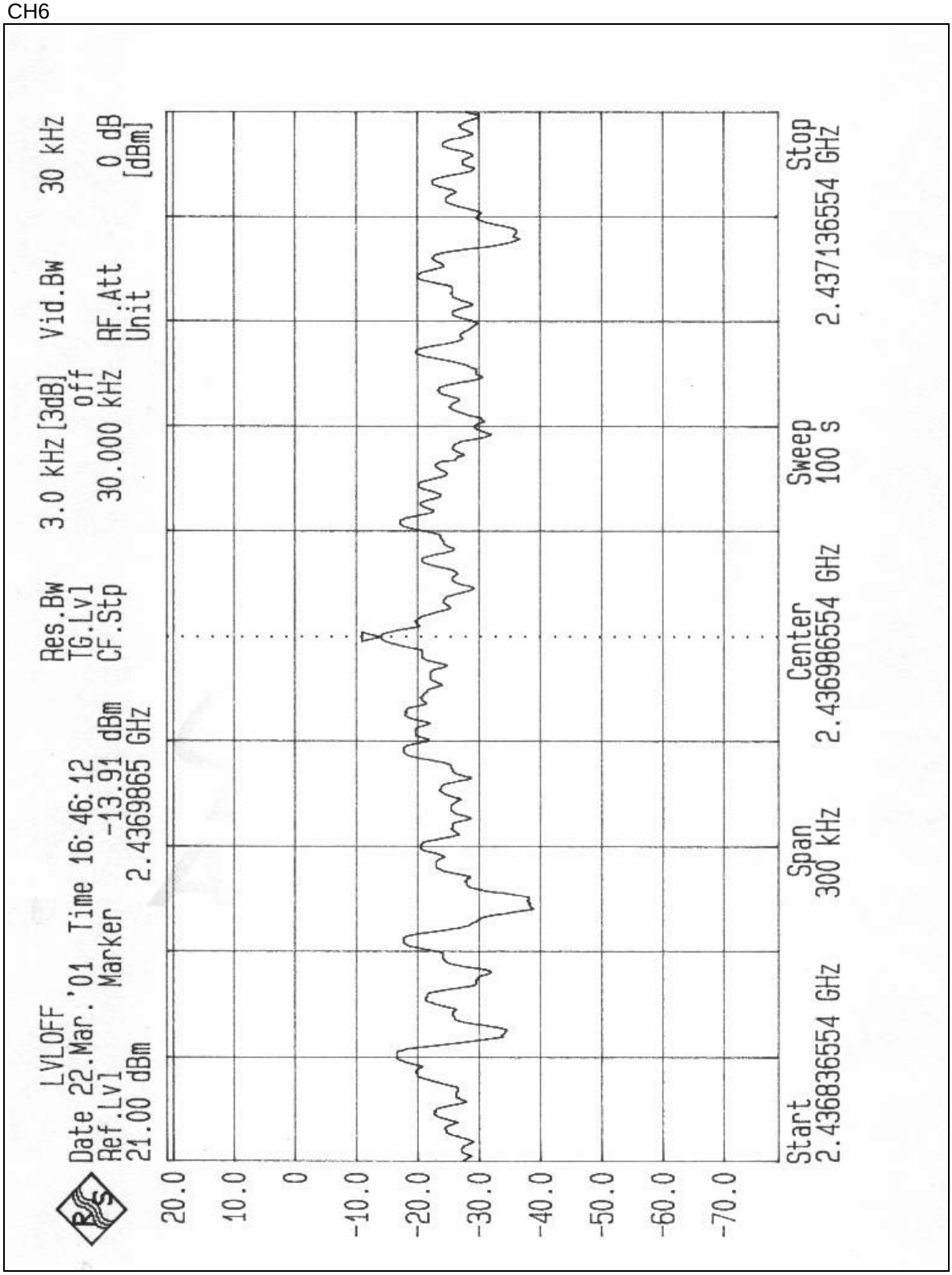
EUT	Wireless SOHO Router	**Model**	WX-2211
Environmental Conditions	24℃, 75%RH	**Tested By**	Steven Lu

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-13.33	8	PASS
6	2437	-13.91	8	PASS
11	2462	-14.55	8	PASS

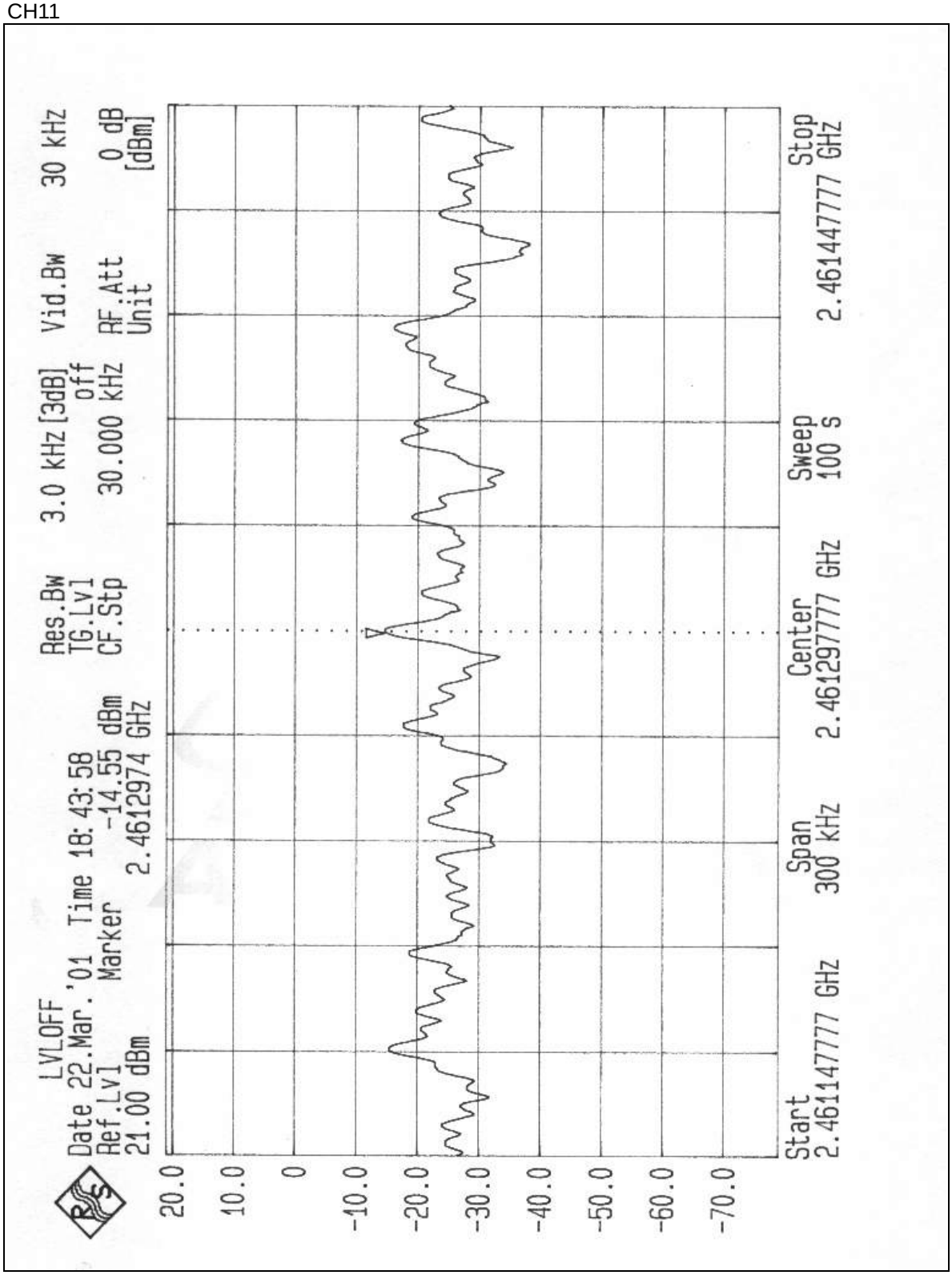
CH1


LVLOFF
Date 22.Mar.'01 Time 18:39:11
Ref.Lvl
21.00 dBm
Marker
-13.33 dBm
2.4119859 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.41136331 GHz
Span 300 kHz
Center 2.41986331 GHz
Sweep 100 s
Stop 2.42136331 GHz

CH6


LVLOFF
Date 22.Mar.'01 Time 16:46:12
Ref.Lvl
21.00 dBm
Marker
-13.91 dBm
2.4369865 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.436836554 GHz
Span 300 kHz
Center 2.436986554 GHz
Sweep 100 s
Stop 2.437136554 GHz

CH11


LVLOFF
Date 22.Mar.'01 Time 18:43:58
Ref.Lvl
21.00 dBm
Marker
-14.55 dBm
2.4612974 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.461147777 GHz
Span
300 kHz
Center
2.461297777 GHz
Sweep
100 s
Stop
2.461447777 GHz

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 RB).

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	848926/005 846839/018	Dec 03, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

Notes:

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

4.6.4 EUT OPERATING CONDITION

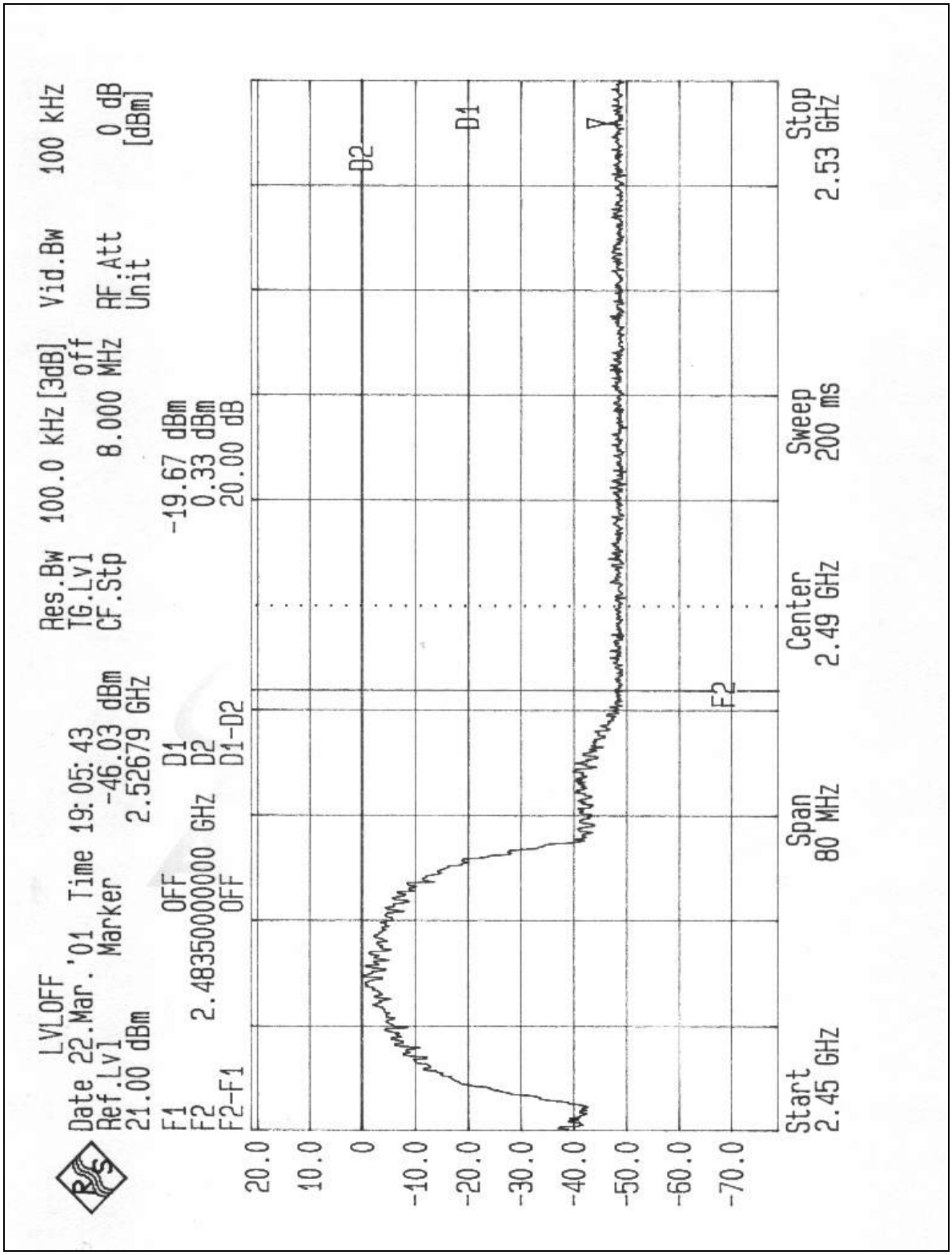
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

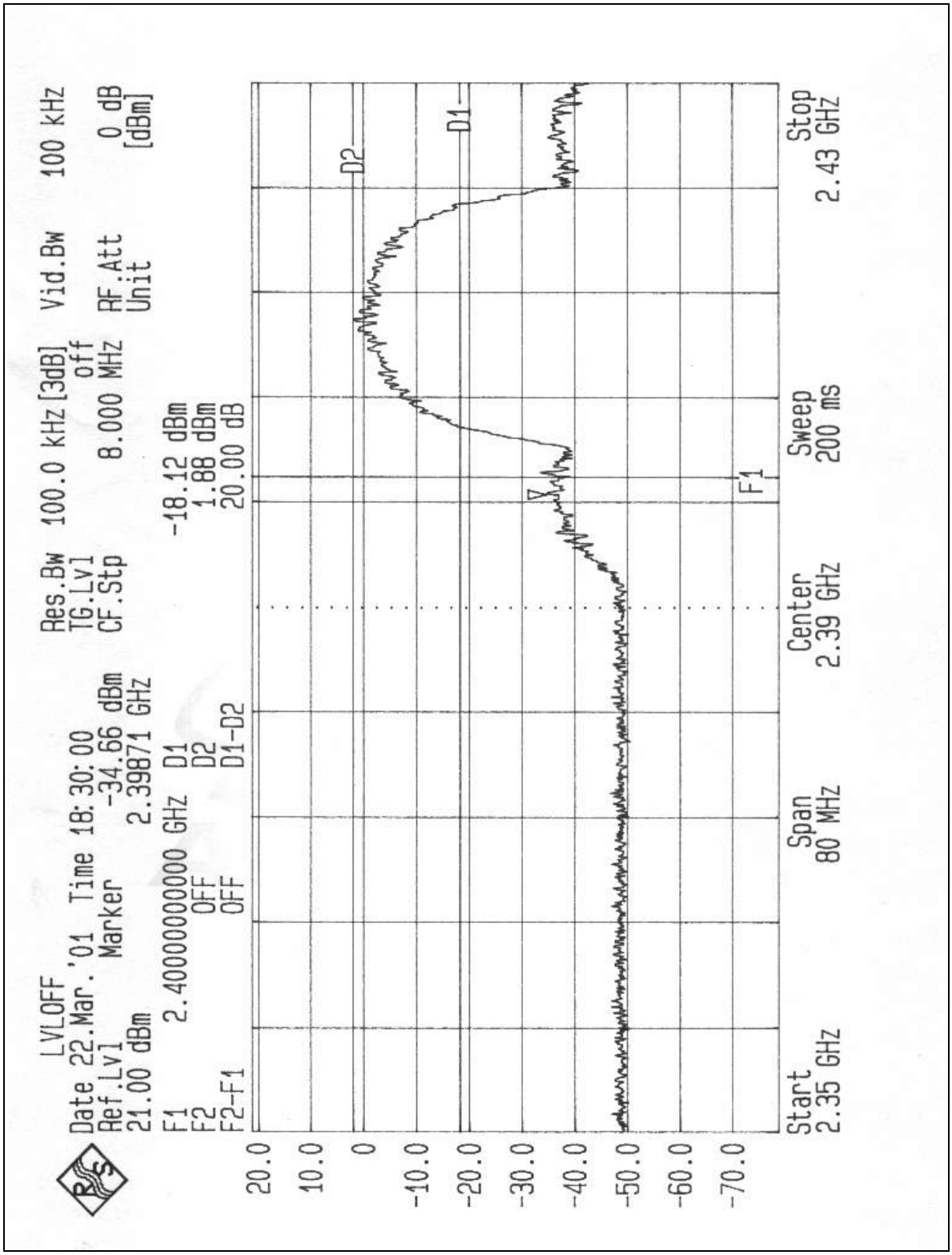
4.6.5 TEST RESULTS

The spectrum plots are attached below. 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).

4.6.6 NOTE ON BAND EDGE EMISSION

The band edge emission plot on page 43 shows 46.36dB delta between carrier maximum power and local maximum emission in restrict band (2.4834GHz). The emission of carrier strength list in table of page 24 is 97.5dB μ V/m, so the maximum field strength in restrict band is 97.5-46.36=51.54 dB μ V/m which is under 54 dB μ V/m limit.


LVLOFF
Date 22.Mar.'01 Time 19:05:43
Ref.Lvl Marker -46.03 dBm
21.00 dBm 2.52679 GHz
F1 OFF D1
F2 2.48350000000 GHz D2
F2-F1 OFF D1-D2
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 8.000 MHz RF.Att 0 dB
Unit [dBm]
-19.67 dBm
0.33 dBm
20.00 dB
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D2
D1
F2
Start 2.45 GHz
Span 80 MHz
Center 2.49 GHz
Sweep 200 ms
Stop 2.53 GHz


LVLOFF
Date 22.Mar.'01 Time 18:30:00
Ref.Lvl Marker -34.66 dBm
21.00 dBm 2.39871 GHz
F1 2.40000000000 GHz D1
F2 OFF D2
F2-F1 OFF D1-D2
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 8.000 MHz RF.Att 0 dB
Unit [dBm]
-18.12 dBm
1.88 dBm
20.00 dB
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D2
D1
F1
Start 2.35 GHz
Span 80 MHz
Center 2.39 GHz
Sweep 200 ms
Stop 2.43 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 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dual monopole antenna. The internal connector used inside the product is MMCX. And the maximum Gain of this antenna is only 1.5dBi.

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 and Safety consultation. Our laboratories are accredited by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
New Zealand	RFS
Norway	NEMKO, DNV
U.K.	INCHCAPE
R.O.C.	BSMI

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.

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