EMC
TEST REPORT

Report No. : EME-051223
Model No. : G-260
Issued Date : Nov. 25, 2005

Applicant : ZyXEL Communications Corporation
6, Innovation Rd II, Science-Based Industrial Park,
Hsin-Chu, Taiwan

Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
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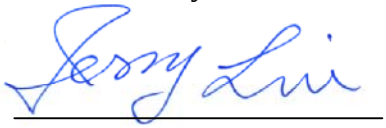
Project Engineer

Kevin Chen

Reviewed By



Jerry Liu

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Summary of Tests

802.11g Wireless USB2.0 Adapter-Model: G-260
FCC ID: I88G260

Test	Reference	Results
Minimum 6dB Bandwidth test	15.247(a)(2)	Complies
Maximum Output Power test	15.247(b)	Complies
Radiated Spurious Emission test	15.205, 15.209	Complies
Power Spectrum Density test	15.247(e)	Complies
Emission on the Band Edge test	15.247(d)	Complies
AC Power Line Conducted Emission test	15.207	Complies

1. General information

1.1 Identification of the EUT

Applicant	: ZyXEL Communications Corporation
Product	: 802.11g Wireless USB2.0 Adapter
Model No.	: G-260
FCC ID.	: I88G260
Frequency Range	: 2412MHz ~ 2462MHz
Channel Number	: 11 channels
Frequency of Each Channel	: 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz
Type of Modulation	: DSSS, OFDM
Rated Power	: 5Vdc
Power Cord	: N/A
Sample Received	: Nov. 2, 2005
Test Date(s)	: Nov. 14, 2005 ~ Nov. 16, 2005

A FCC DoC report has been generated for the client.

1.2 Additional information about the EUT

The ZyXEL G-260 is an IEEE 802.11g compliant wireless LAN USB adapter.
The following lists the main features of your ZyXEL G-260. See the product specifications in the appendix for detailed features.

- Automatic rate selection.
- Security: WEP (Wired Equivalent Privacy), IEEE 802.1x, WPA-PSK, WPA (Wi-FiProtected Access), WPA2-PSK and WPA2
- A built-in antenna
- Driver and utility support for Windows 98 Second Edition, Windows ME, Windows 2000 and Windows XP.

For more detail features, please refer to User's manual as file name “User Manual.pdf”

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 1dBi max
Antenna Type : Printed antenna
Connector Type : N/A

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
Notebook PC	IBM	1860	L3WM796	FCC DoC Approved
Printer	HP	C2642A	TH86K1N2ZB	FCC DoC Approved

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section §15.205、§15.207、§15.209、§15.247 and ANSI C63.4/2003.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT was supplied with 5Vdc from Notebook PC and it was running in operating mode.

Plug the EUT into Notebook PC via USB interface, then turn on the Notebook PC power and run the test program “Radioscope” under windows OS, which provide by manufacturer.

During conducted emission test, the EUT works in normal mode communication with AP. While in other test, it worked in the status of continuously transmitting.

With individual verifying, the maximum output power was found at 1Mbps data rate for 802.11b mode and 6Mbps data rate for 802.11g mode. The final tests were executed under these conditions and recorded in this report individually.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/17/2006
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	07/14/2005
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	07/13/2005
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	10/18/2005
Horn Antenna	SCHWARZBECK	1GHz~18GHz	BBHA 9120 D	EC371	12/22/2007
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	EC351	07/08/2007
Bilog Antenna	SCHWARZBECK	25MHz~2GHz	VULB 9168	EC347	12/23/2007
Pre-Amplifier	MITEQ	100MHz~26.5GHz	919981	EC373	12/30/2005
Pre-Amplifier	MITEQ	26GHz~40GHz	828825	EC374	01/28/2006
Wideband Peak Power Meter/ Sensor	Anritsu	100MHz~18GHz	ML2497A/ MA2491A	EC396	10/18/2005
Controller	HDGmbH	N/A	CM 100	EP346	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP347	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	01/13/2006

Note: 1. The above equipments are within the valid calibration period.
2. The test antennas (receiving antenna) are calibration per 3 years.

3. Minimum 6dB Bandwidth test

3.1 Operating environment

Temperature:	25	℃
Relative Humidity:	59	%
Atmospheric Pressure:	1023	hPa

3.2 Test setup & procedure

The minimum 6dB bandwidth per FCC §15.247(a)(2) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 100kHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel). The minimum 6-dB modulation bandwidth is in the following Table.

3.3 Measured data of Minimum 6dB Bandwidth test results

Test Mode: 802.11b operating mode

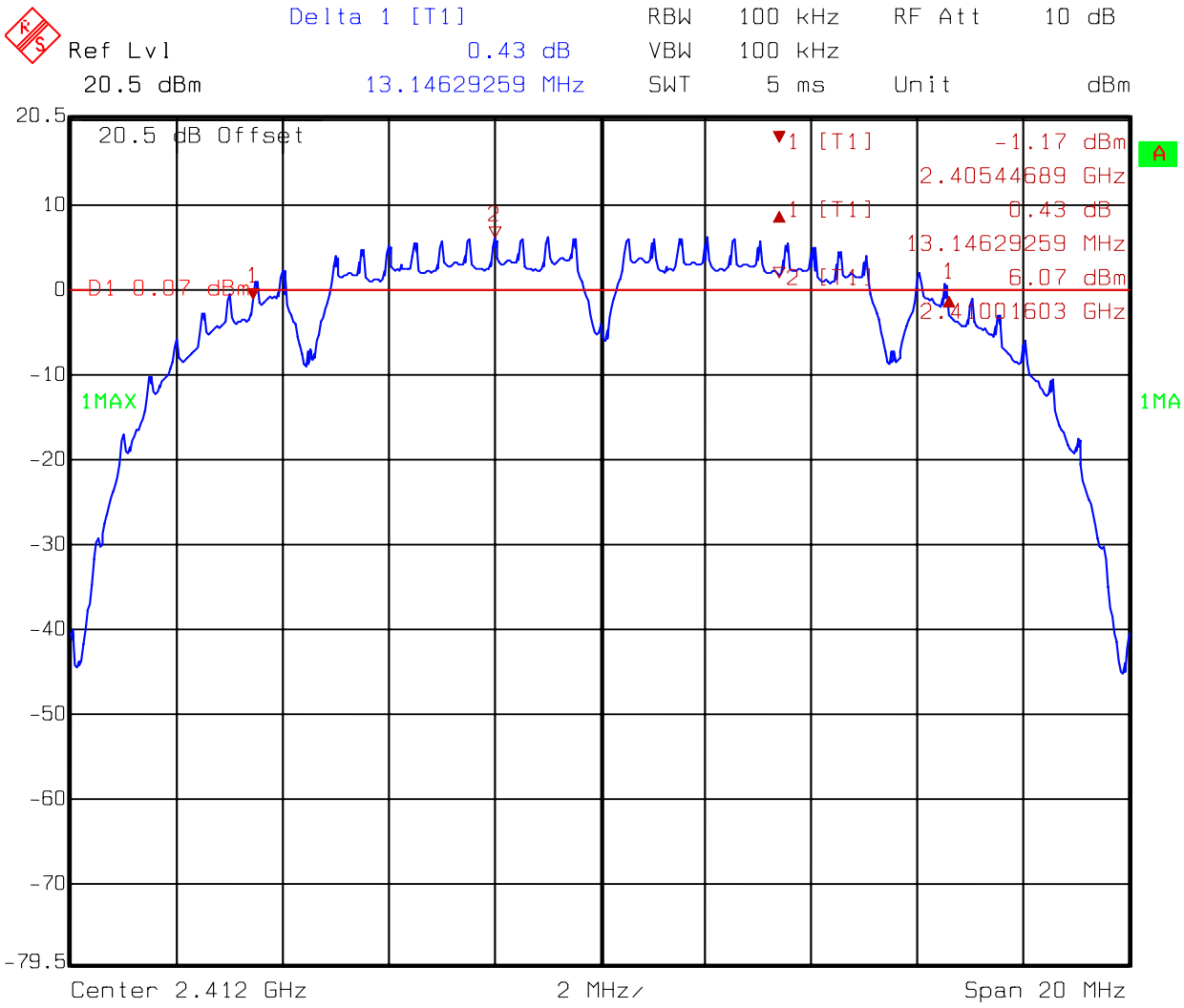
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1 (lowest)	2412	12.1463	＞500kHz
6 (middle)	2437	13.1062	＞500kHz
11 (highest)	2462	13.0661	＞500kHz

Test Mode: 802.11g operating mode

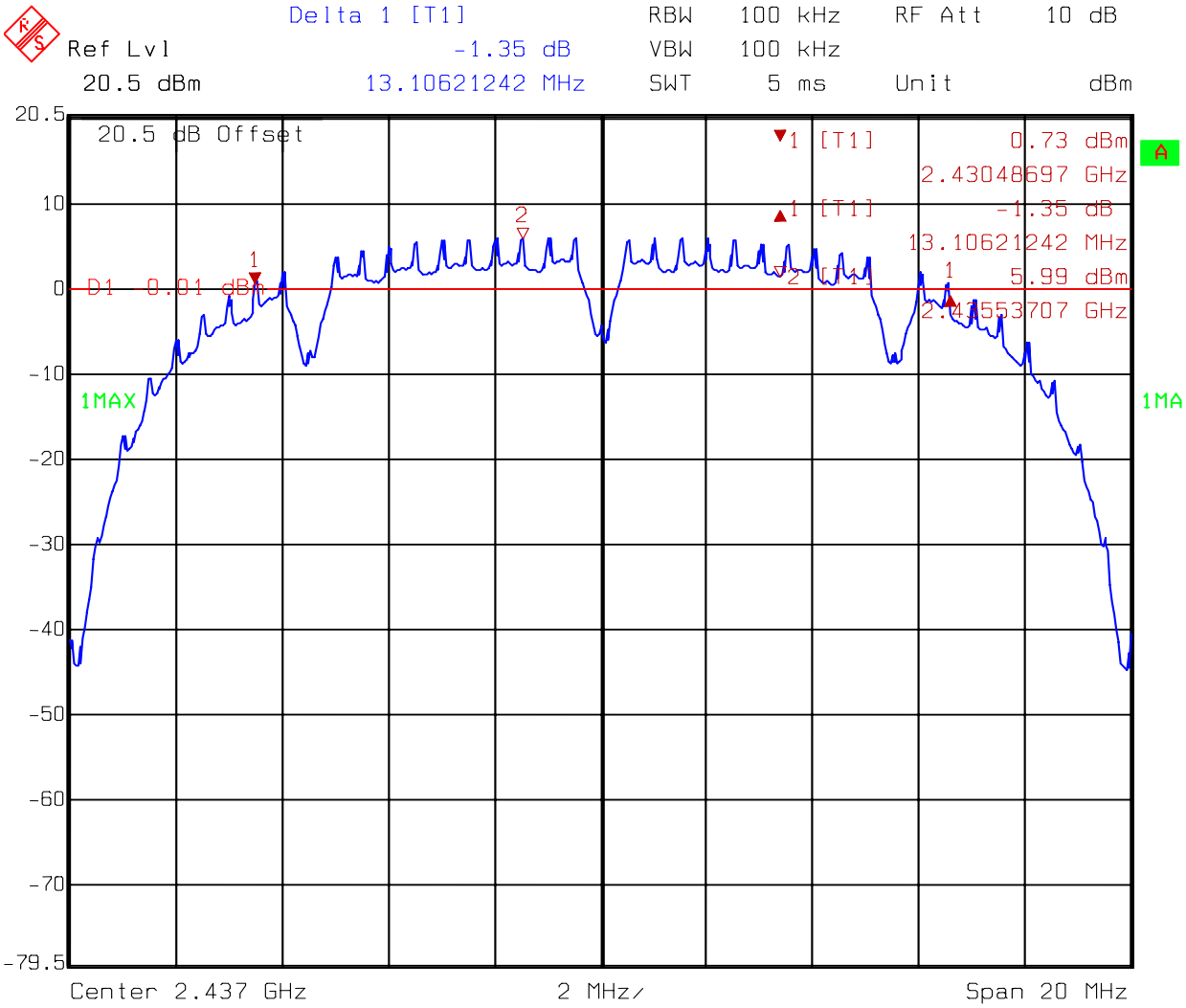
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1 (lowest)	2412	16.5531	＞500kHz
6 (middle)	2437	16.5531	＞500kHz
11 (highest)	2462	16.5531	＞500kHz

Please see the plot below.

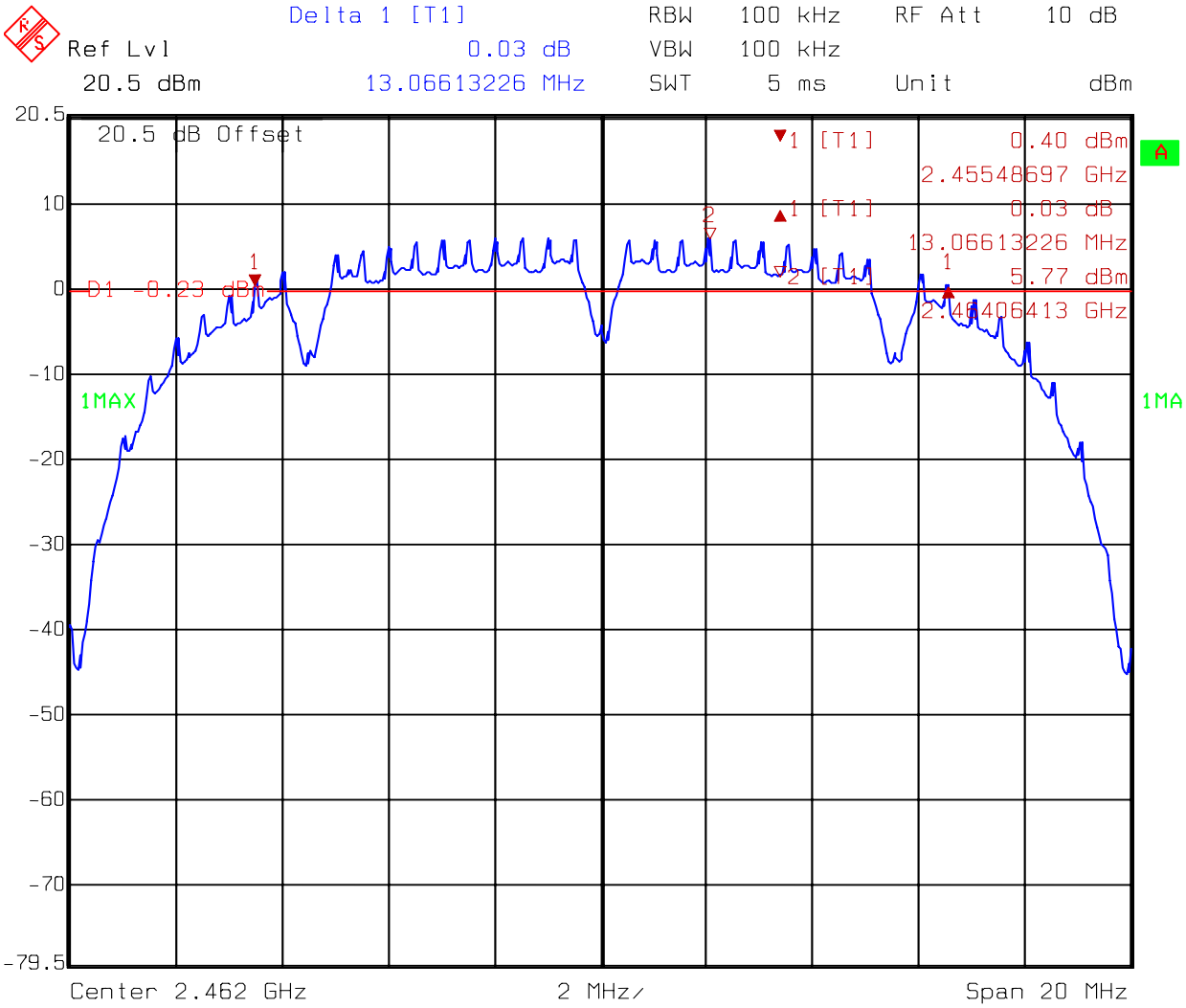
Test Mode: 802.11b operating mode



Comment A: 6dB BW at 11b_ch1
EC365
Date: 14.NOV.2005 18:13:29

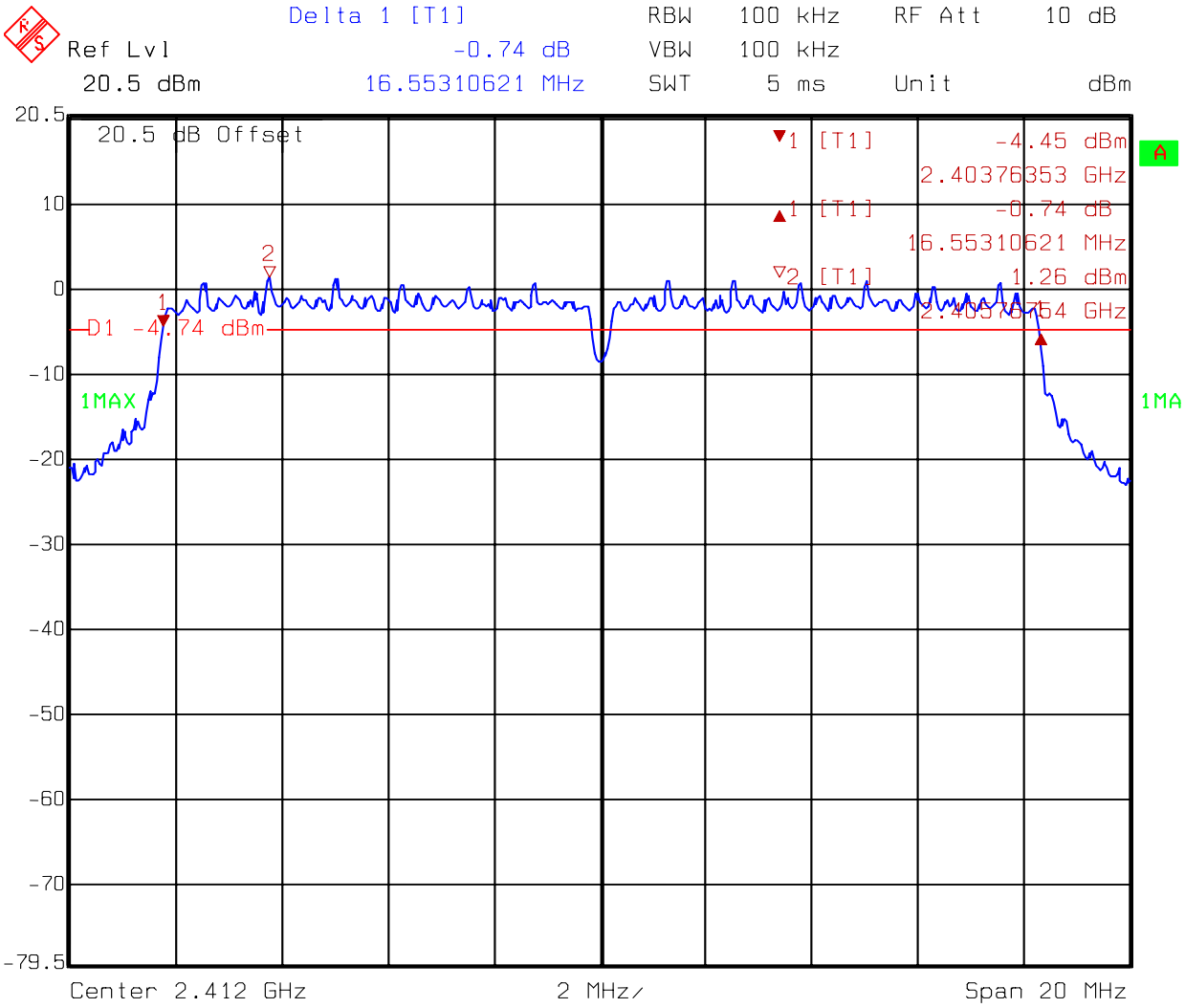


Comment A: 6dB BW at 11b_ch6
EC365
Date: 14.NOV.2005 18:18:04

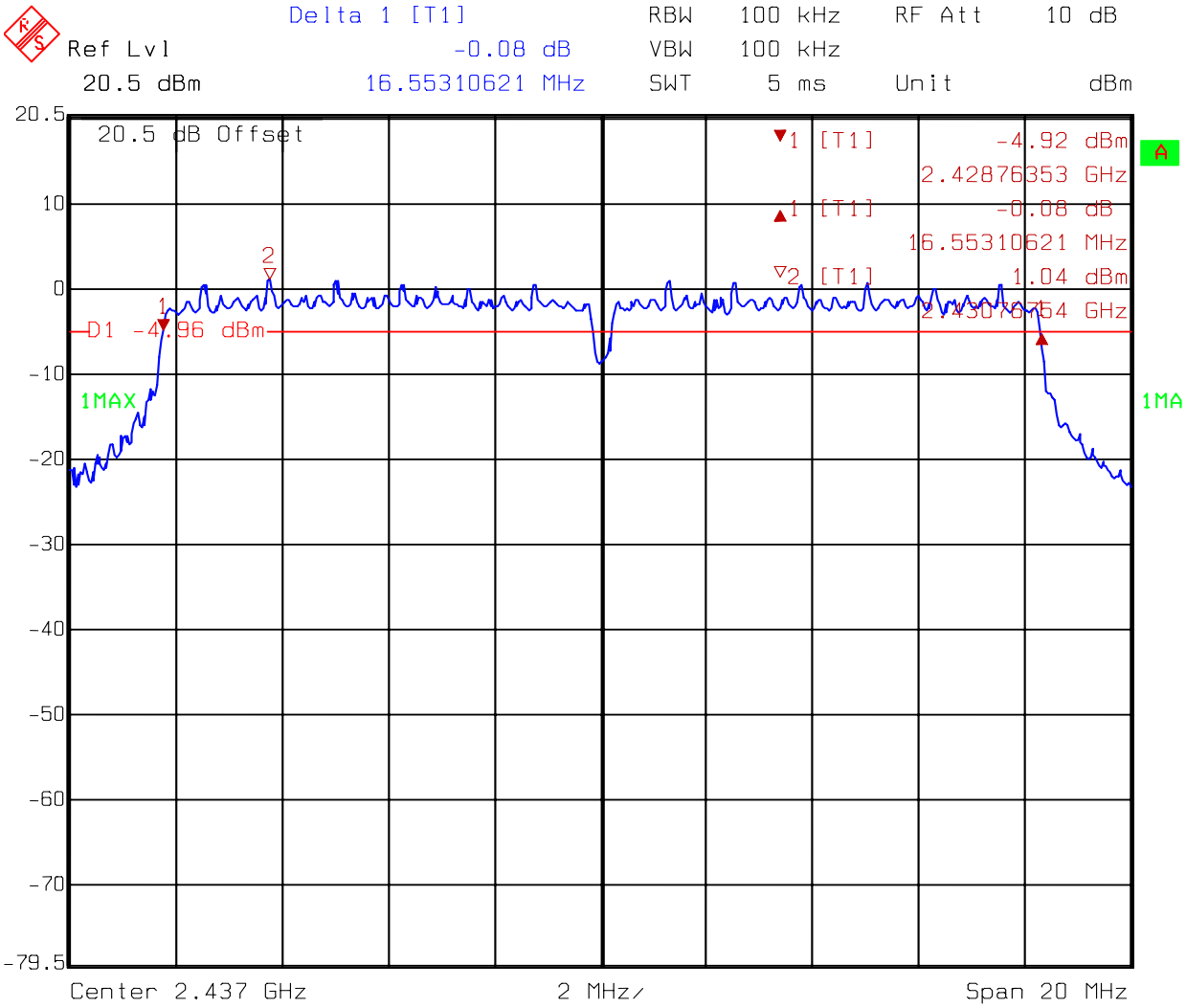


Comment A: 6dB BW at 11b_ch11
EC365
Date: 14.NOV.2005 18:23:24

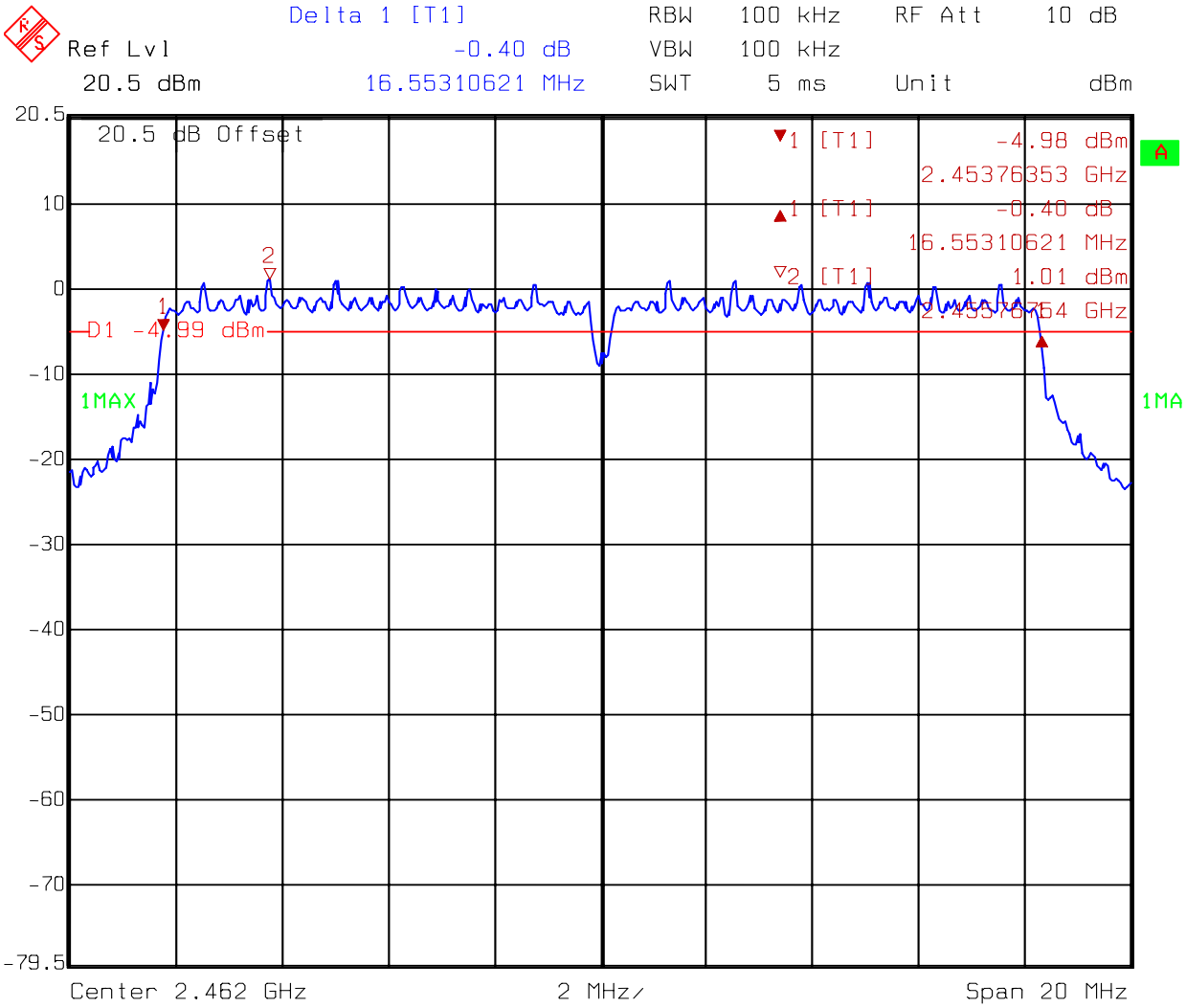
Test Mode: 802.11g operating mode



Comment A: 6dB BW at 11g_ch1
EC365
Date: 14.NOV.2005 18:37:30



Comment A: 6dB BW at 11g_ch6
EC365
Date: 14.NOV.2005 18:33:39



Comment A: 6dB BW at 11g_ch11
EC365
Date: 14.NOV.2005 18:27:22

4. Maximum Output Power test

4.1 Operating environment

Temperature: 23 ℃
Relative Humidity: 55 %
Atmospheric Pressure: 1023 hPa

4.2 Test setup & procedure

The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Power was read directly and cable loss correction (0.5 dB) was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel).

4.3 Measured data of Maximum Output Power test results

Test Mode: 802.11b operating mode

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (dBm)
				(dBm)	(mW)	
1 (lowest)	2412	0.5	19.01	19.51	89.33	30
6 (middle)	2437	0.5	18.83	19.33	85.70	30
11 (highest)	2462	0.5	18.78	19.28	84.72	30

Remark:

Conducted Peak Output Power = Reading + C.L.

Test Mode: 802.11g operating mode

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (dBm)
				(dBm)	(mW)	
1 (lowest)	2412	0.5	21.55	22.05	160.32	30
6 (middle)	2437	0.5	21.46	21.96	157.04	30
11 (highest)	2462	0.5	21.35	21.85	153.11	30

Remark:

Conducted Peak Output Power = Reading + C.L.

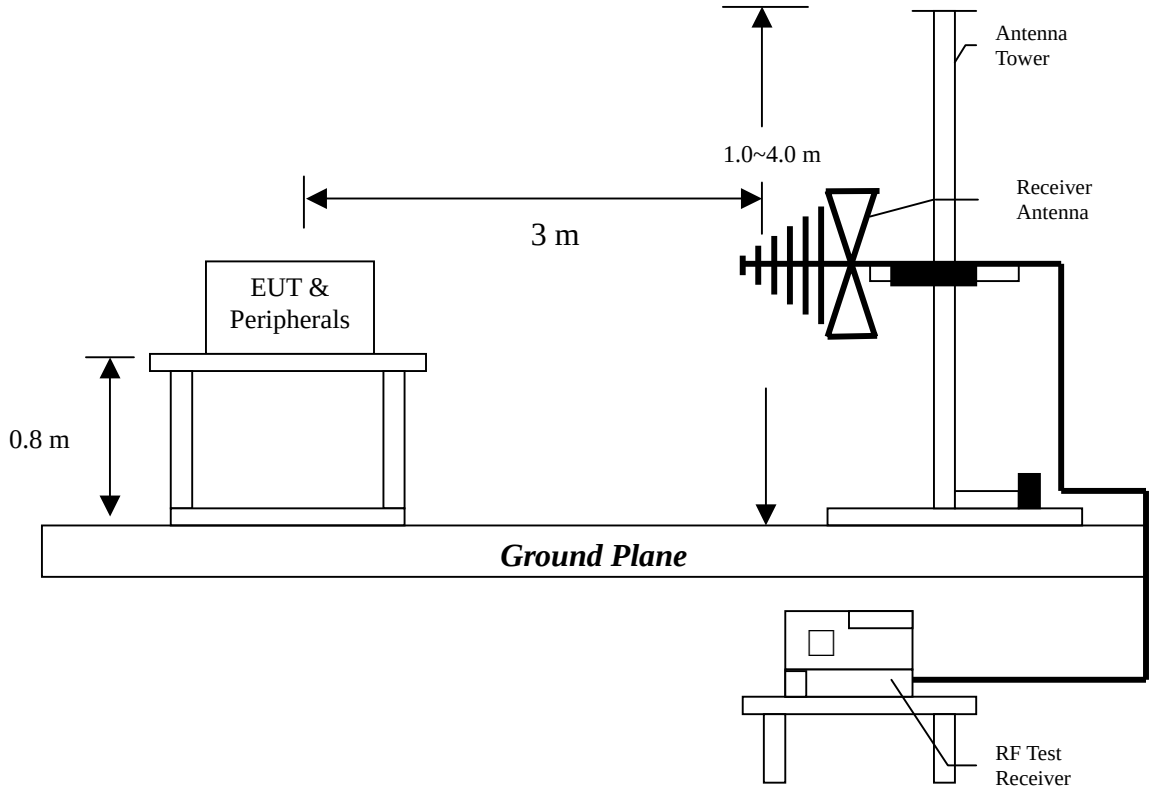
5. Radiated Emission test

5.1 Operating environment

Temperature:	23	℃
Relative Humidity:	53	%
Atmospheric Pressure:	1023	hPa

5.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emissions were invested cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent 3 meter reading using inverse scaling with distance.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

5.3 Emission limits

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of radiated emission measurement is 4.98 dB.

5.4 Radiated spurious emission test data

5.4.1 Measurement results: frequencies equal to or less than 1 GHz

EUT : G-260
Test Condition : 802.11b Tx at channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	187.140	QP	13.10	15.15	28.25	43.50	-15.26
V	299.660	QP	13.95	7.95	21.90	46.00	-24.10
V	449.040	QP	17.64	9.85	27.49	46.00	-18.51
V	600.360	QP	20.75	10.46	31.21	46.00	-14.79
V	699.300	QP	22.33	8.55	30.88	46.00	-15.13
V	831.220	QP	23.62	7.65	31.27	46.00	-14.73
H	198.780	QP	11.27	23.59	34.86	43.50	-8.65
H	212.360	QP	11.10	15.73	26.83	43.50	-16.68
H	299.660	QP	14.17	13.89	28.06	46.00	-17.95
H	449.040	QP	18.12	14.73	32.85	46.00	-13.15
H	499.480	QP	18.64	14.35	32.99	46.00	-13.01
H	579.020	QP	20.84	12.29	33.13	46.00	-12.88

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

EUT : G-260
Test Condition : 802.11b Tx at channel 6

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	187.140	QP	13.10	15.58	28.68	43.50	-14.83
V	299.660	QP	13.95	7.96	21.91	46.00	-24.09
V	365.620	QP	15.06	8.38	23.44	46.00	-22.56
V	449.040	QP	17.64	10.17	27.81	46.00	-18.19
V	600.360	QP	20.75	10.42	31.17	46.00	-14.83
V	695.420	QP	22.33	7.61	29.94	46.00	-16.07
H	198.780	QP	11.27	18.11	29.38	43.50	-14.13
H	299.660	QP	14.17	14.24	28.41	46.00	-17.60
H	431.580	QP	18.12	13.77	31.89	46.00	-14.11
H	449.040	QP	18.12	15.11	33.23	46.00	-12.77
H	503.360	QP	18.77	11.53	30.30	46.00	-15.70
H	579.020	QP	20.84	11.84	32.68	46.00	-13.33

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

EUT : G-260
Test Condition : 802.11b Tx at channel 11

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	187.140	QP	13.10	16.20	29.30	43.50	-14.21
V	299.660	QP	13.95	8.26	22.21	46.00	-23.79
V	365.620	QP	15.06	6.48	21.54	46.00	-24.46
V	449.040	QP	17.64	10.55	28.19	46.00	-17.81
V	561.560	QP	19.53	16.05	35.58	46.00	-10.42
V	600.360	QP	20.75	9.76	30.51	46.00	-15.49
H	198.780	QP	11.27	19.22	30.49	43.50	-13.02
H	224.000	QP	11.63	14.14	25.77	46.00	-20.24
H	299.660	QP	14.17	14.28	28.45	46.00	-17.56
H	431.580	QP	18.12	14.99	33.11	46.00	-12.89
H	449.040	QP	18.12	15.26	33.38	46.00	-12.62
H	480.080	QP	18.64	9.17	27.81	46.00	-18.19

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

EUT : G-260
Test Condition : 802.11g Tx at channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	185.200	QP	13.10	14.94	28.04	43.50	-15.47
V	299.660	QP	13.95	8.48	22.43	46.00	-23.57
V	363.680	QP	15.06	7.40	22.46	46.00	-23.54
V	449.040	QP	17.64	11.23	28.87	46.00	-17.13
V	600.360	QP	20.75	9.89	30.64	46.00	-15.36
V	833.160	QP	23.62	7.61	31.23	46.00	-14.77
H	198.780	QP	11.27	15.34	26.61	43.50	-16.90
H	224.000	QP	11.63	14.63	26.26	46.00	-19.75
H	299.660	QP	14.17	13.85	28.02	46.00	-17.99
H	449.040	QP	18.12	15.08	33.20	46.00	-12.80
H	703.180	QP	22.44	8.47	30.91	46.00	-15.09
H	895.240	QP	24.62	7.64	32.26	46.00	-13.75

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

EUT : G-260
Test Condition : 802.11g Tx at channel 6

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	181.320	QP	13.10	13.50	26.60	43.50	-16.91
V	299.660	QP	13.95	7.57	21.52	46.00	-24.48
V	369.500	QP	15.06	9.16	24.22	46.00	-21.78
V	449.040	QP	17.64	10.18	27.82	46.00	-18.18
V	491.720	QP	18.43	8.82	27.25	46.00	-18.76
V	978.660	QP	25.49	11.28	36.77	54.00	-17.23
H	224.000	QP	11.63	13.83	25.46	46.00	-20.55
H	299.660	QP	14.17	13.12	27.29	46.00	-18.72
H	365.620	QP	15.48	7.12	22.60	46.00	-23.41
H	449.040	QP	18.12	15.37	33.49	46.00	-12.51
H	480.080	QP	18.64	8.57	27.21	46.00	-18.79
H	829.280	QP	24.04	7.28	31.32	46.00	-14.69

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

EUT : G-260
Test Condition : 802.11g Tx at channel 11

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	181.320	QP	13.10	16.61	29.71	43.50	-13.80
V	299.660	QP	13.95	8.48	22.43	46.00	-23.57
V	365.620	QP	15.06	6.48	21.54	46.00	-24.46
V	449.040	QP	17.64	9.85	27.49	46.00	-18.51
V	600.360	QP	20.75	9.78	30.53	46.00	-15.47
V	699.300	QP	22.33	7.78	30.11	46.00	-15.90
H	198.780	QP	11.27	19.15	30.42	43.50	-13.09
H	299.660	QP	14.17	14.22	28.39	46.00	-17.62
H	466.500	QP	18.16	19.10	37.26	46.00	-8.74
H	499.480	QP	18.64	16.46	35.10	46.00	-10.90
H	800.180	QP	23.62	11.16	34.78	46.00	-11.22
H	899.120	QP	24.62	11.38	36.00	46.00	-10.01

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

5.4.2 Measurement results: frequency above 1GHz

EUT : G-260
Test : 802.11b & 802.11g Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874.00	PK	V	36.07	37.77	-	-	54	-
7311.00	PK	V	36.18	43.97	-	-	54	-
9748.00	PK	V	34.28	48.31	-	-	54	-
4874.00	PK	H	36.07	37.77	-	-	54	-
7311.00	PK	H	36.18	43.97	-	-	54	-
9748.00	PK	H	34.28	48.31	-	-	54	-

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : G-260
Test Condition : 802.11b & 802.11g Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874.00	PK	V	36.07	37.77	-	-	54	-
7311.00	PK	V	36.18	43.97	-	-	54	-
9748.00	PK	V	34.28	48.31	-	-	54	-
4874.00	PK	H	36.07	37.77	-	-	54	-
7311.00	PK	H	36.18	43.97	-	-	54	-
9748.00	PK	H	34.28	48.31	-	-	54	-

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : G-260
Test Condition : 802.11b & 802.11g Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924.00	PK	V	36.07	37.77	-	-	54	-
7386.00	PK	V	36.18	43.97	-	-	54	-
9848.00	PK	V	34.28	48.31	-	-	54	-
4924.00	PK	H	36.07	37.77	-	-	54	-
7386.00	PK	H	36.18	43.97	-	-	54	-
9848.00	PK	H	34.28	48.31	-	-	54	-

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

6. Power Spectrum Density test

6.1 Operating environment

Temperature:	25	℃
Relative Humidity:	59	%
Atmospheric Pressure	1023	hPa

6.2 Test setup & procedure

The power spectrum density per FCC §15.247(e) was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, the video bandwidth set at 10kHz, a span of 1.5 MHz, and the sweep time set at 500 seconds. Power Density was read directly correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel). The Power Spectral Density measured result is in the following table.

6.3 Measured data of Power Spectrum Density test results

Test Mode: 802.11b operating mode

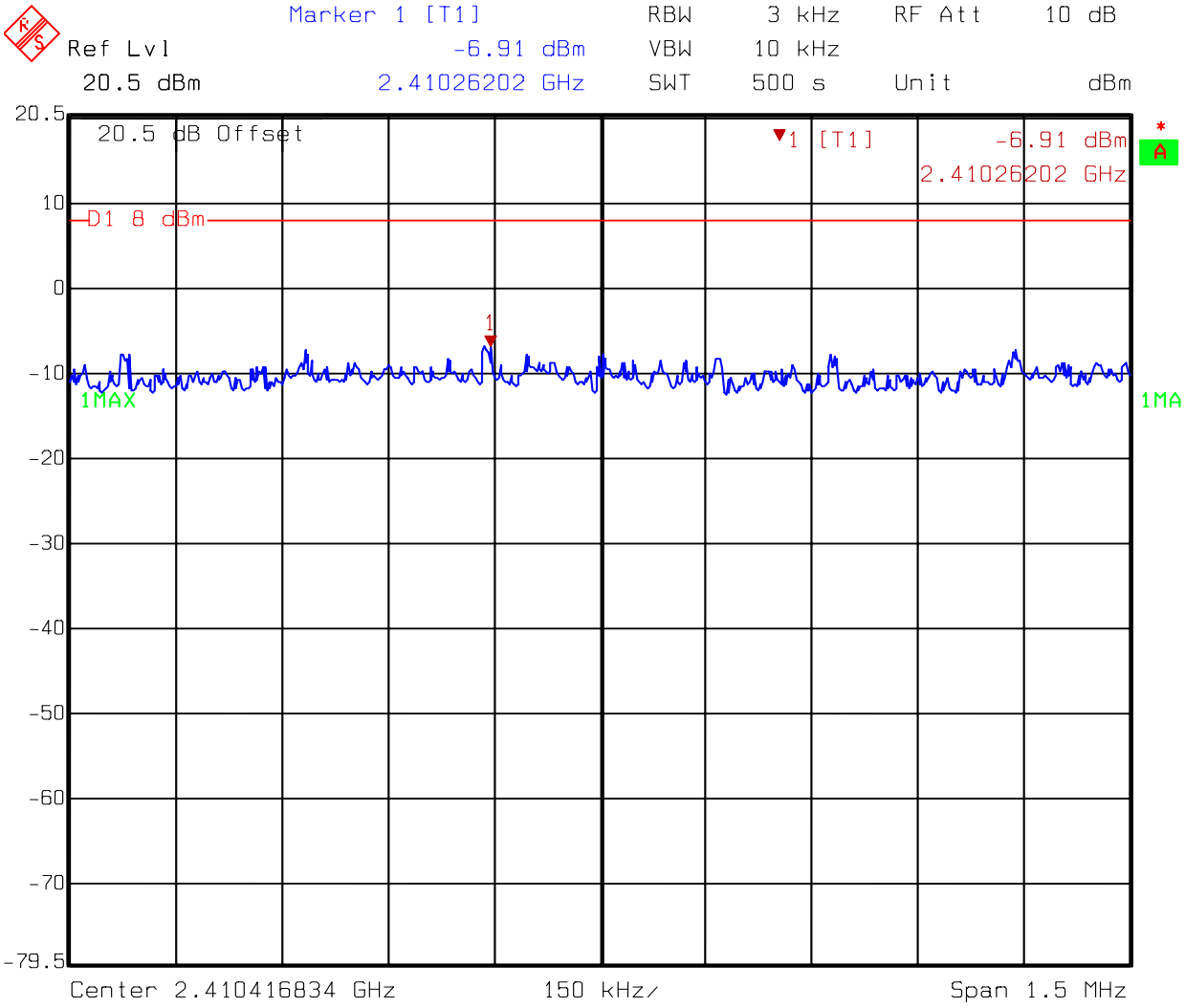
Channel	Frequency (MHz)	Power spectrum density (dBm)	Limit (dBm)
1 (lowest)	2412	-6.91	8
6 (middle)	2437	-6.68	8
11 (highest)	2462	-7.16	8

Test Mode: 802.11g operating mode

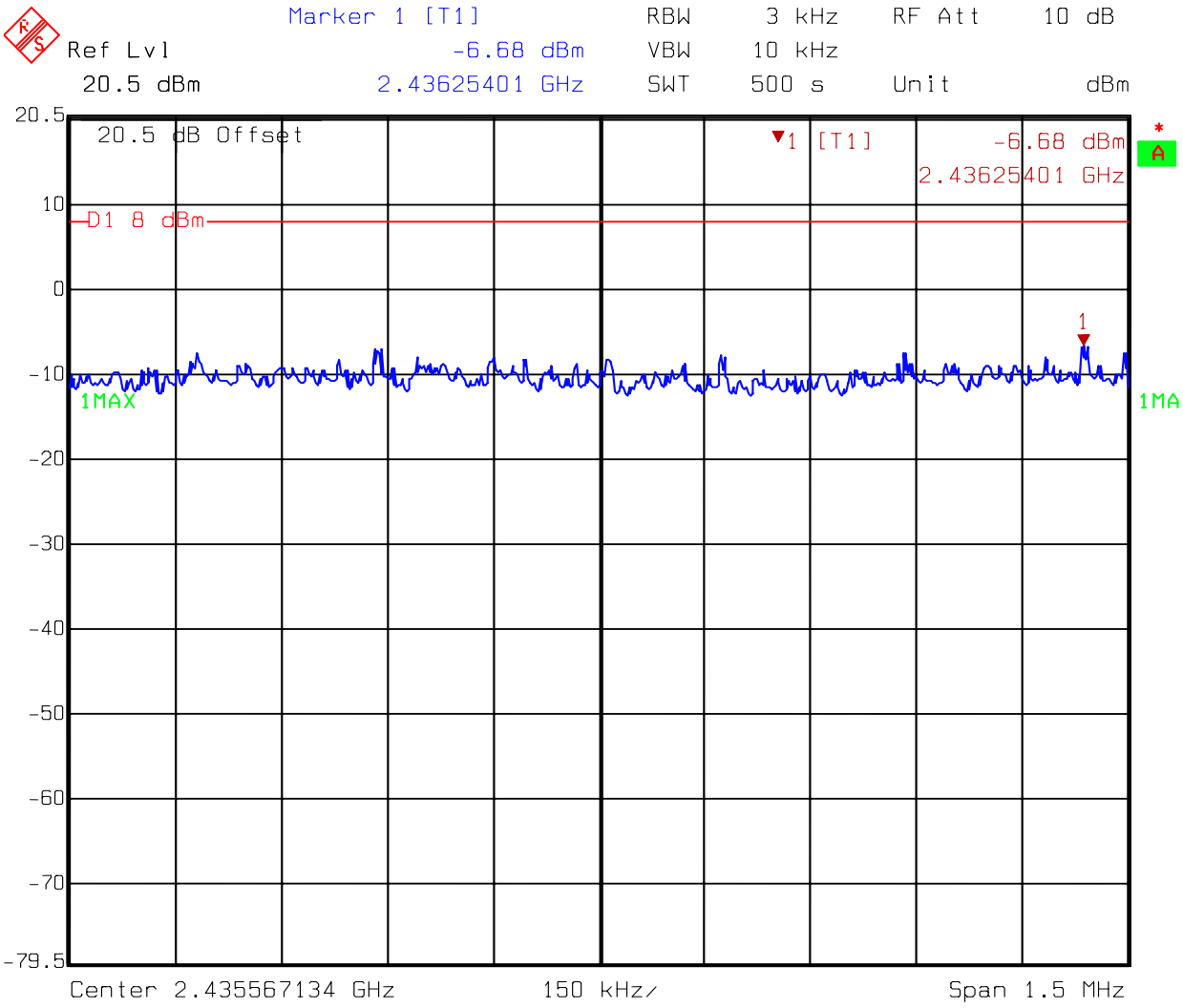
Channel	Frequency (MHz)	Power spectrum density (dBm)	Limit (dBm)
1 (lowest)	2412	-9.85	8
6 (middle)	2437	-11.47	8
11 (highest)	2462	-11.06	8

Please see the plot below.

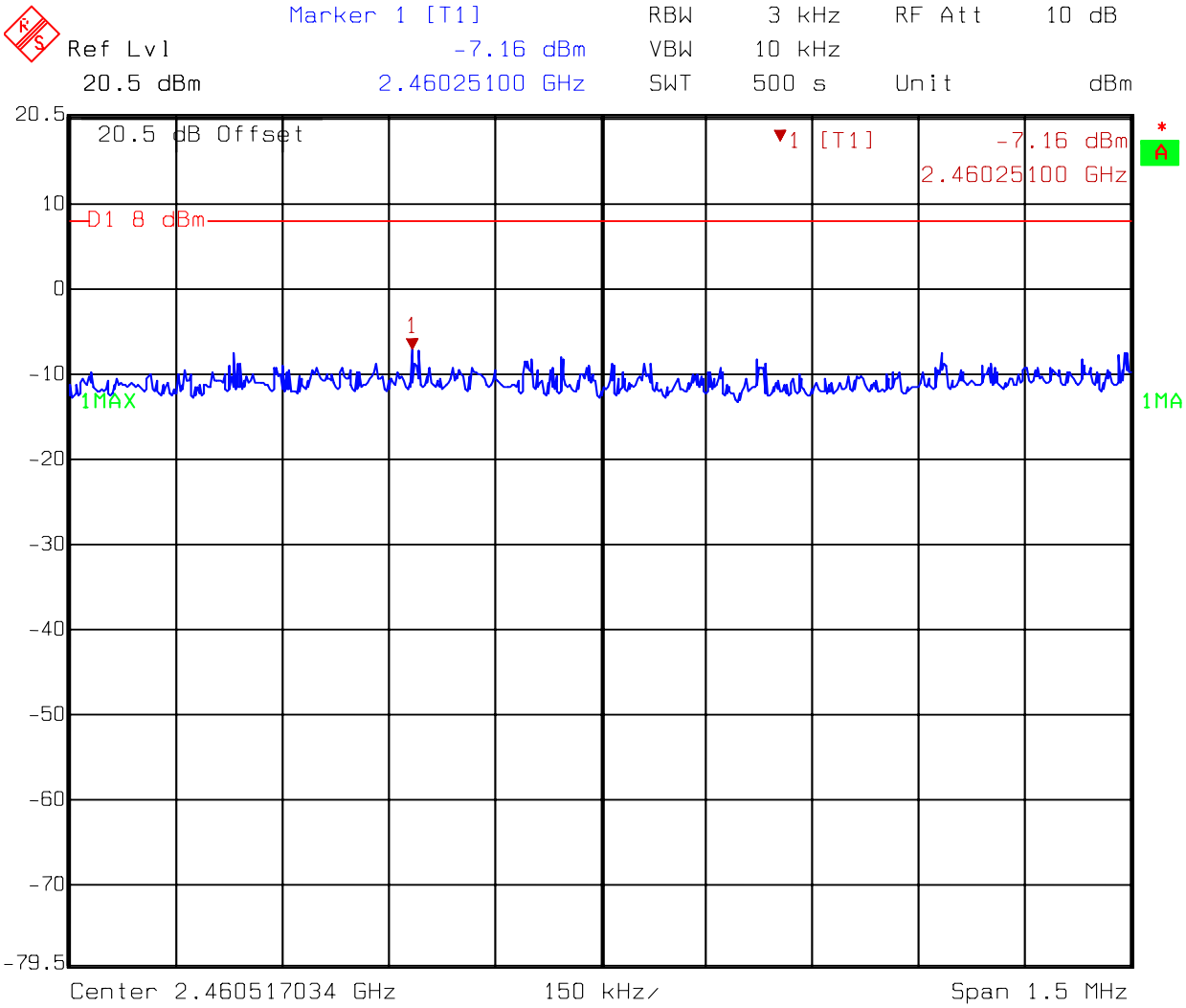
Test Mode: 802.11b operating mode



Comment A: Power Density at 11b_ch1
EC365
Date: 14.NOV.2005 18:54:03

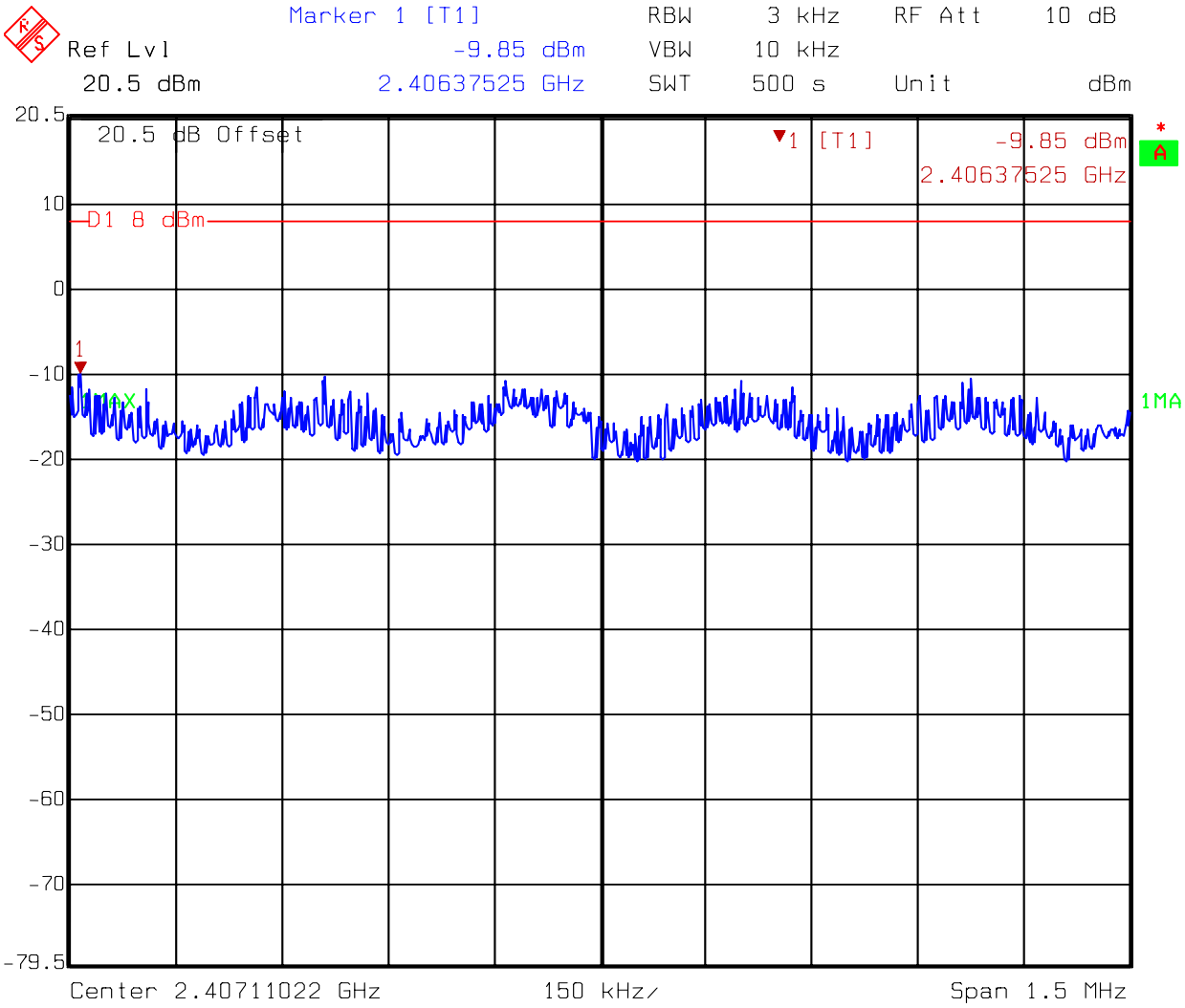


Comment A: Power Density at 11b_ch6
EC365
Date: 14.NOV.2005 18:51:46

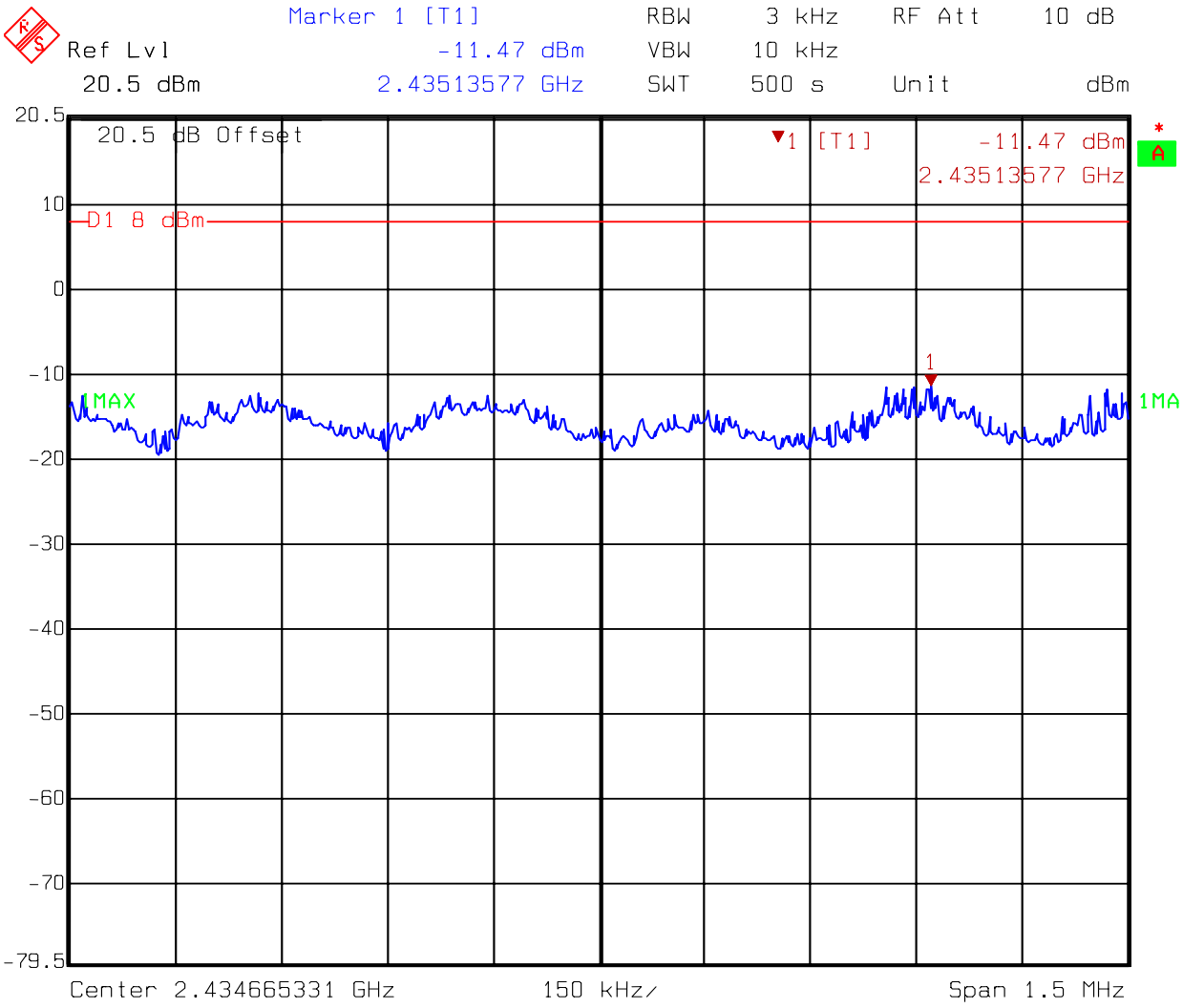


Comment A: Power Density at 11b_ch11
EC365
Date: 14.NOV.2005 18:49:33

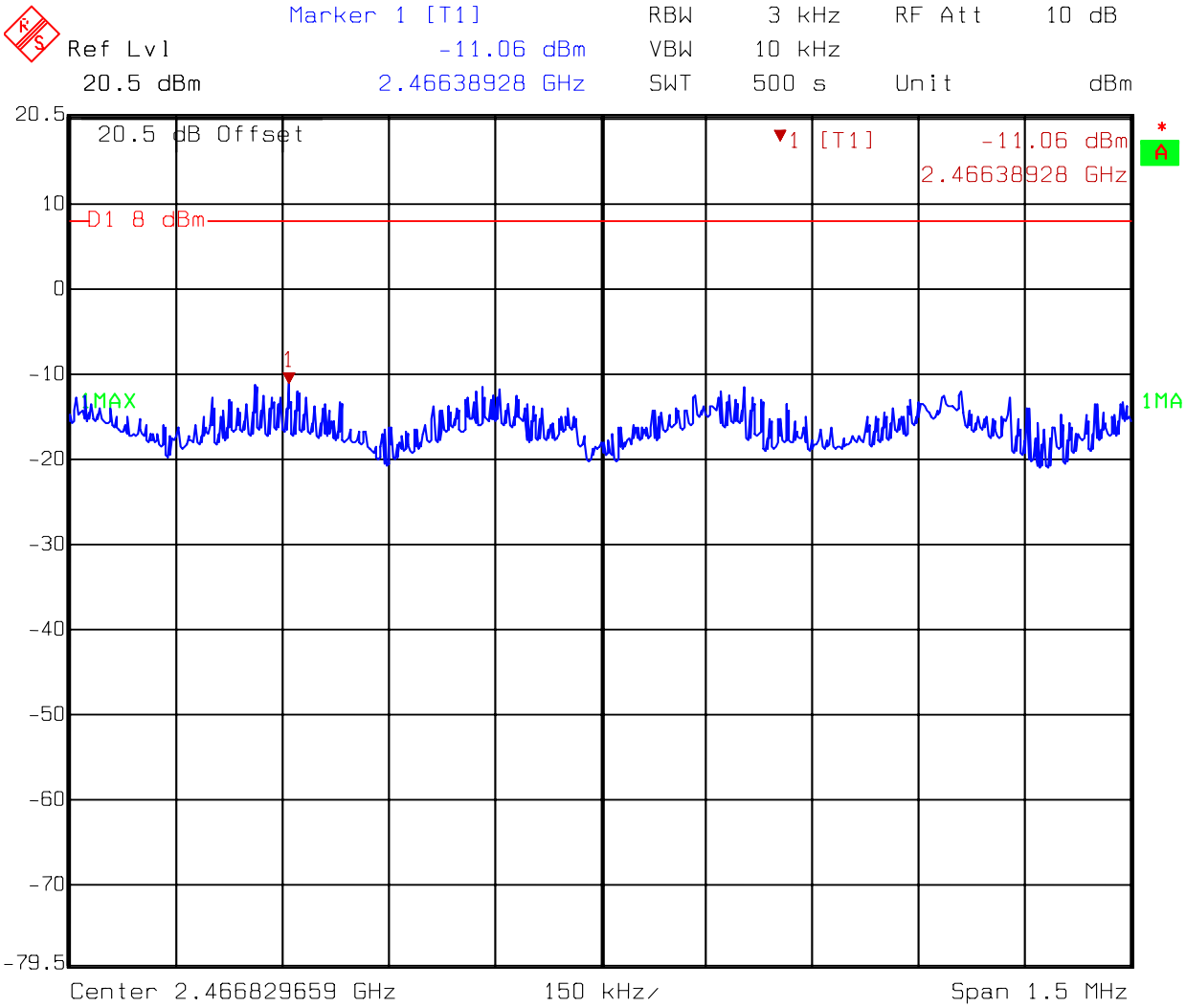
Test Mode: 802.11g operating mode



Comment A: Power Density at 11g_ch1
EC365
Date: 14.NOV.2005 18:41:15



Comment A: Power Density at 11g_ch6
EC365
Date: 14.NOV.2005 18:44:22



Comment A: Power Density at 11g_ch11
EC365
Date: 14.NOV.2005 18:46:00

7. Emission on the band edge

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

7.1 Operating environment

Temperature:	25	℃
Relative Humidity:	59	%
Atmospheric Pressure	1023	hPa

7.2 Test setup & procedure

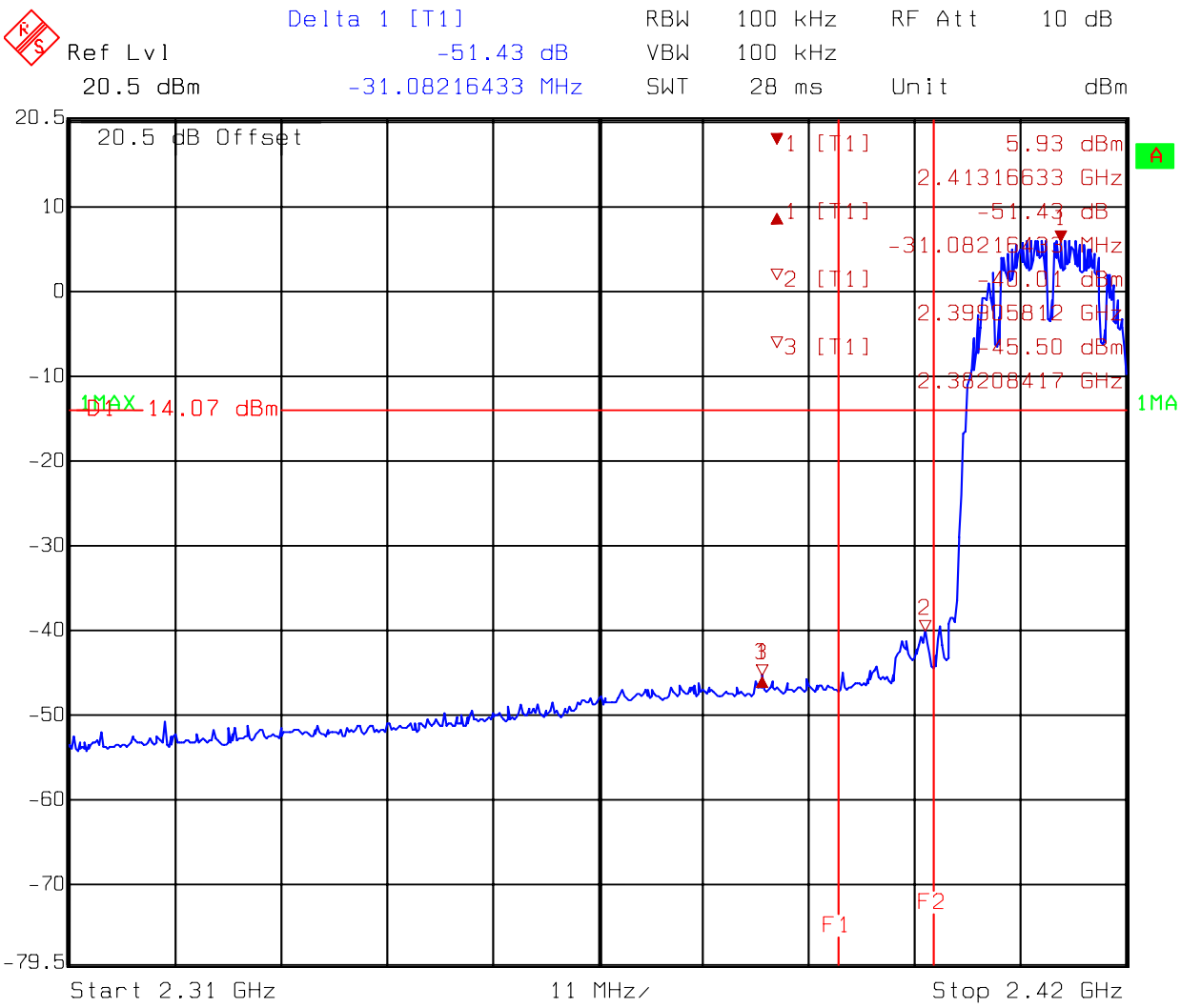
The output of EUT was connected to spectrum analyzer via a 50ohm cable.

The setting of spectrum analyzer is:

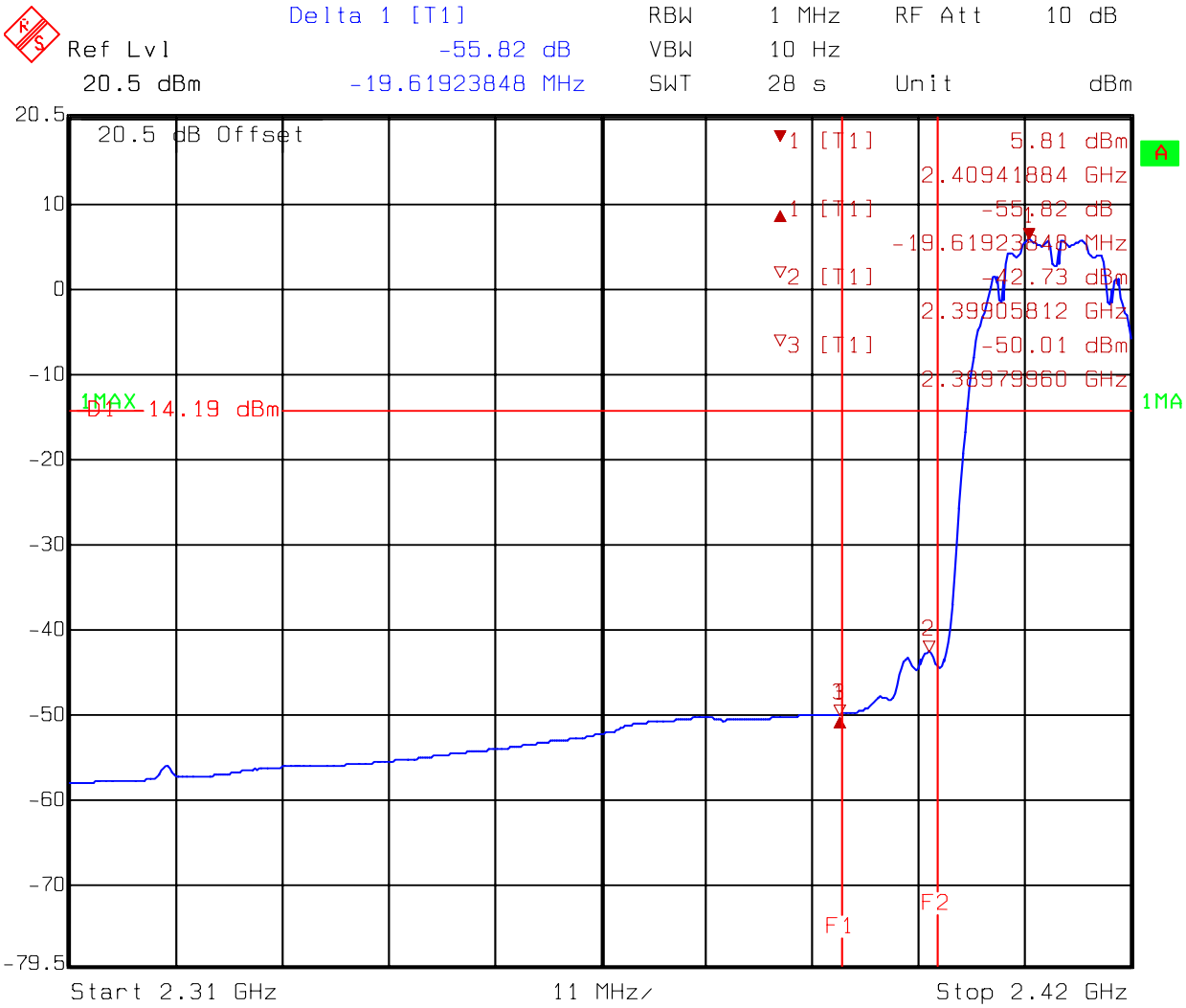
Peak:	RBW = 100kHz ;	VBW = 100kHz
Average:	RBW = 1MHz ;	VBW = 10Hz

Please see the test plot below.

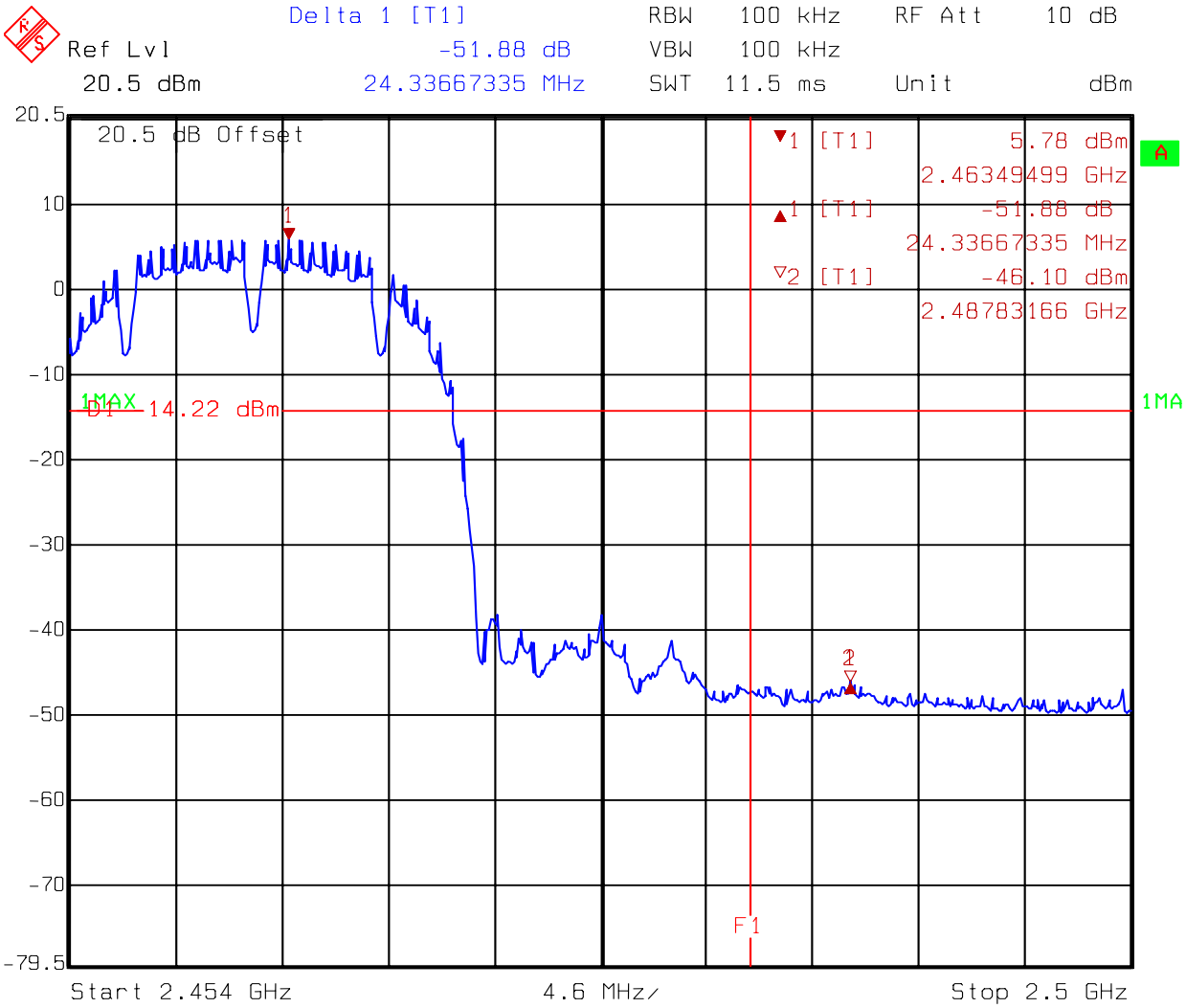
Test Mode: 802.11b operating mode



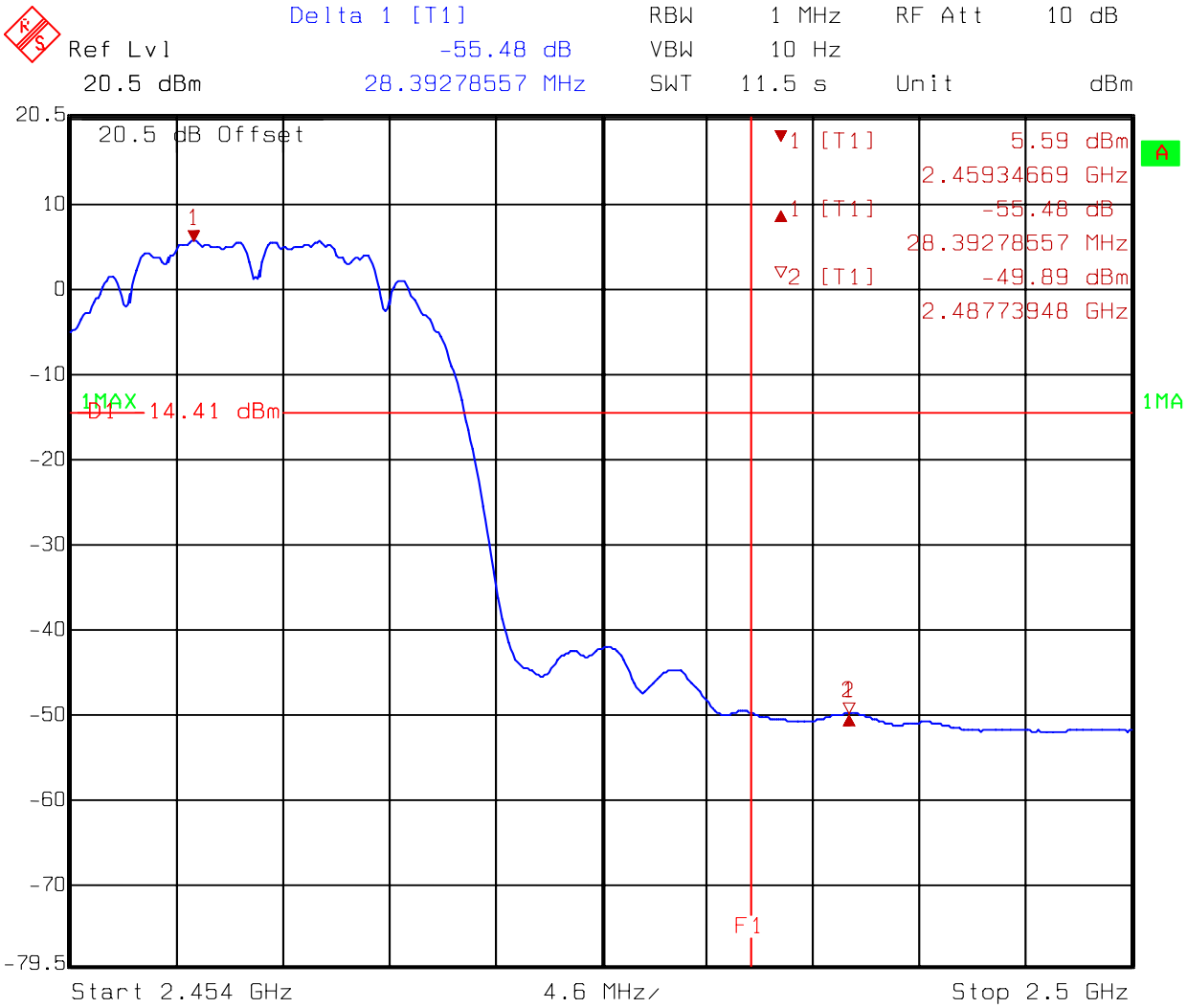
Comment A: Band edge at 11b_ch1
F1=2390MHz, F2=2400MHz(EC365)
Date: 14.NOV.2005 17:27:28



Comment A: Band edge at 11b_ch1
F1=2390MHz, F2=2400MHz(EC365)
Date: 14.NOV.2005 17:34:33

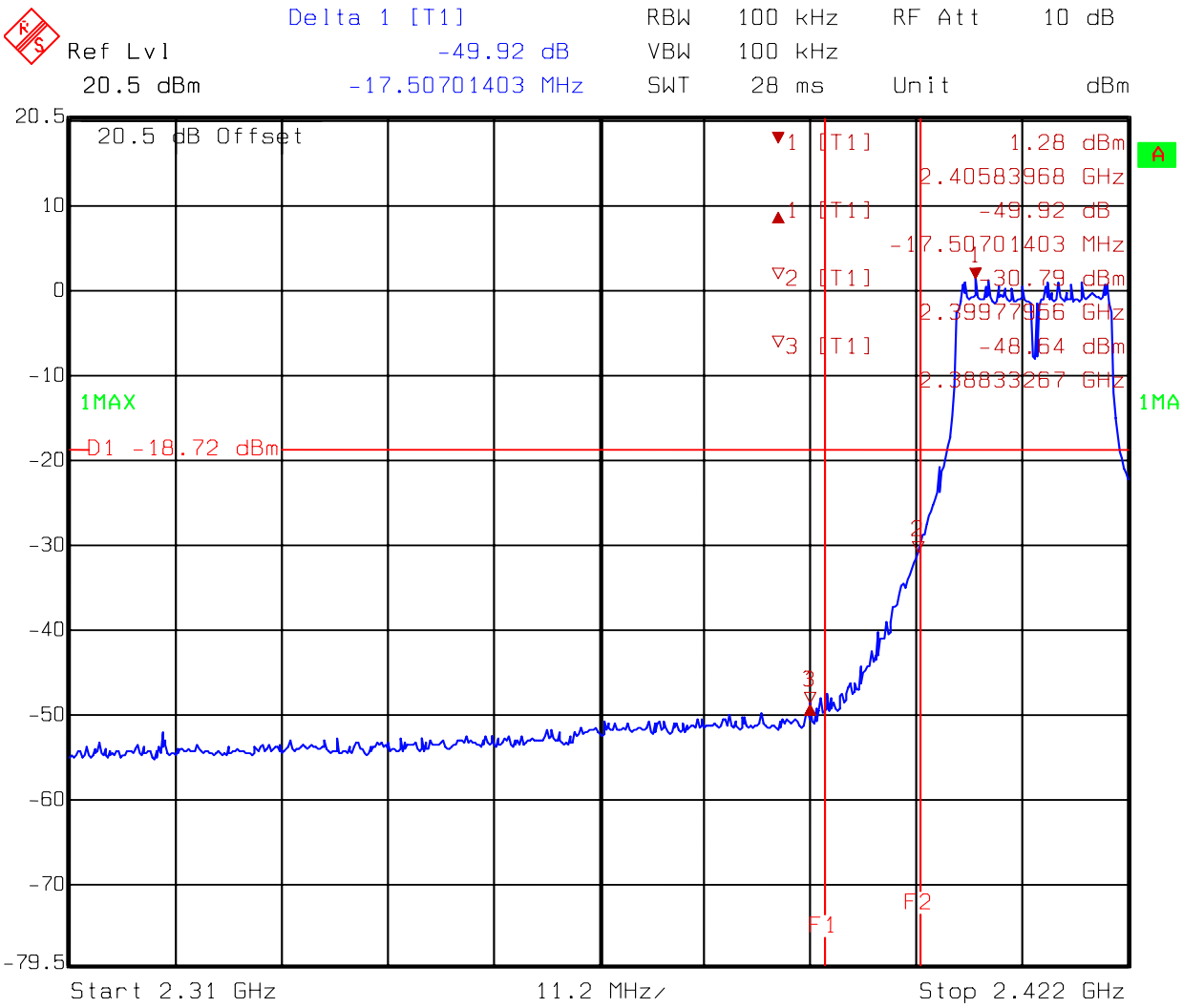


Comment A: Band edge at 11b_ch11
F1=2483.5MHz(EC365)
Date: 14.NOV.2005 17:45:22

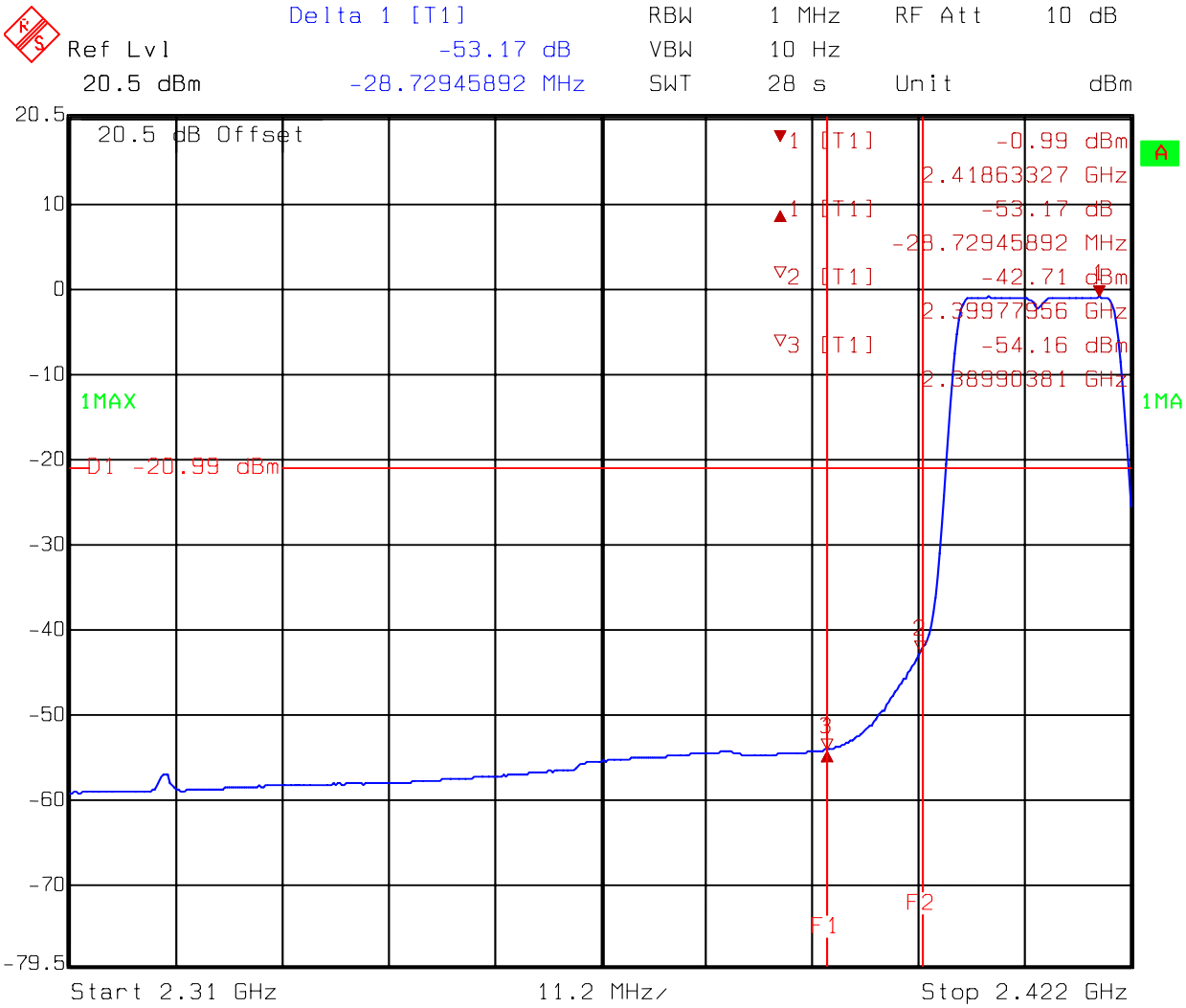


Comment A: Band edge at 11b_ch11
F1=2483.5MHz(EC365)
Date: 14.NOV.2005 17:49:03

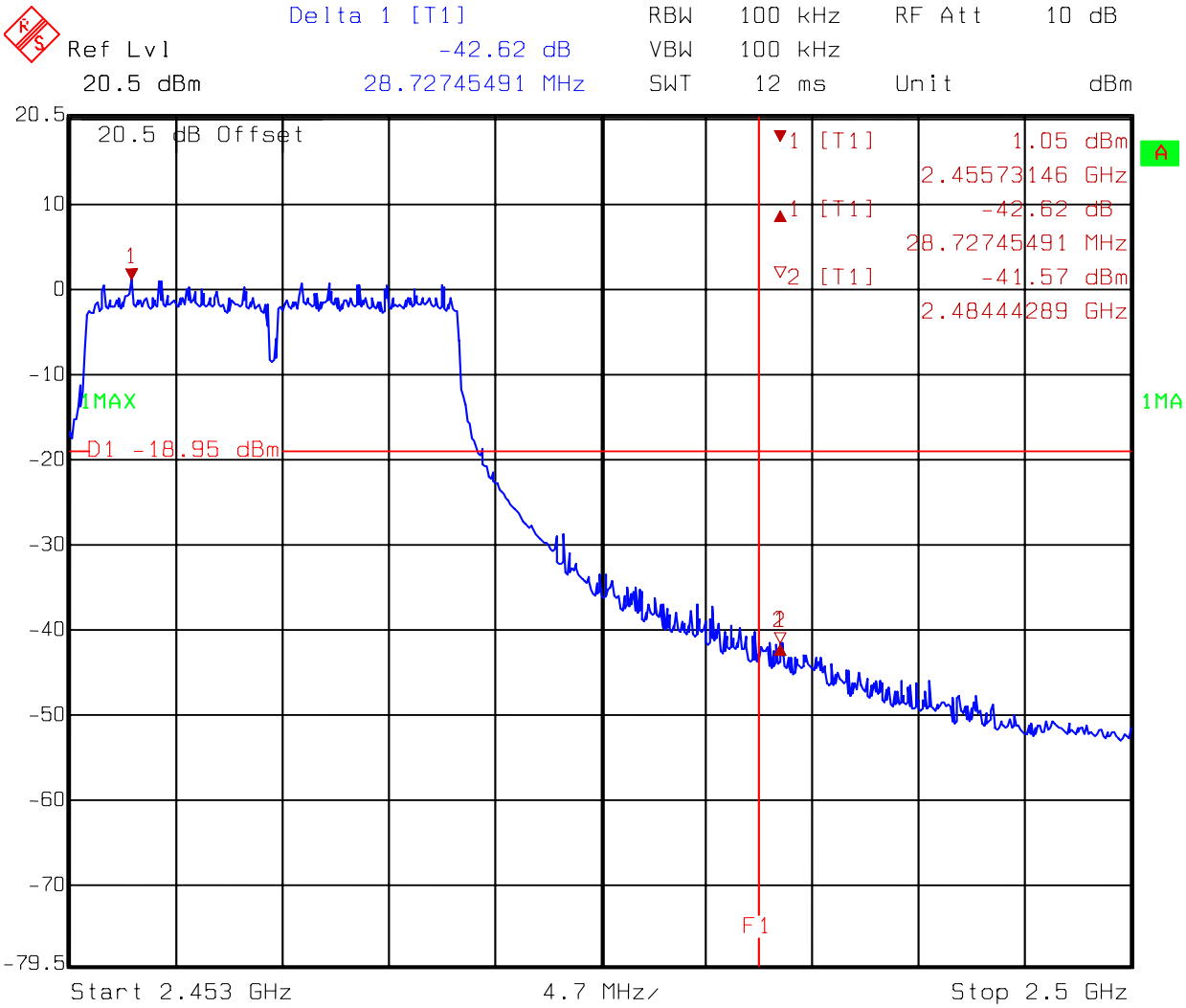
Test Mode: 802.11g operating mode



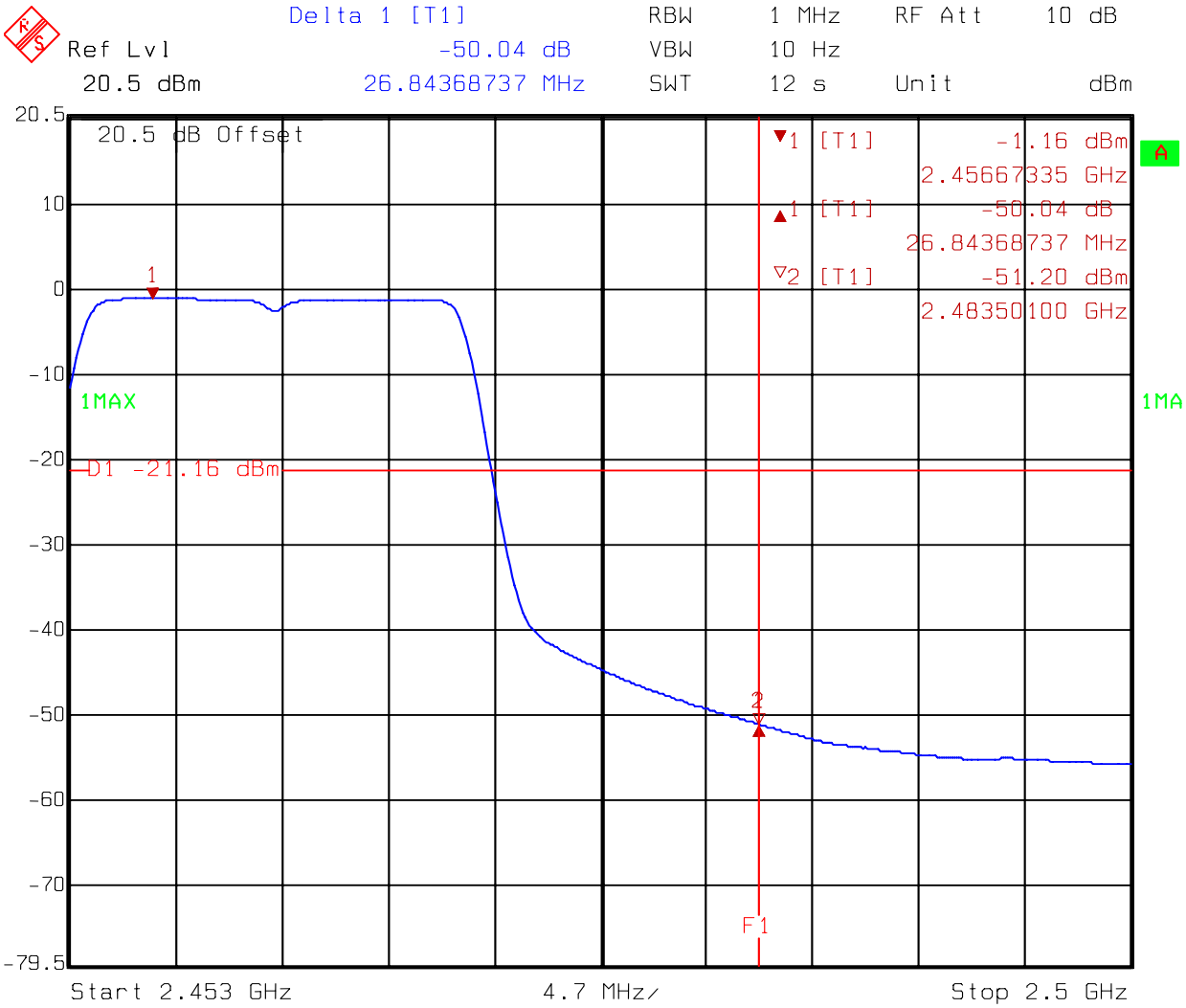
Comment A: Band edge at 11g_ch1
F1=2390MHz, F2=2400MHz(EC365)
Date: 14.NOV.2005 18:03:22



Comment A: Band edge at 11g_ch1
F1=2390MHz, F2=2400MHz(EC365)
Date: 14.NOV.2005 18:07:57



Comment A: Band edge at 11g_ch11
F1=2483.5MHz(EC365)
Date: 14.NOV.2005 17:59:01



Comment A: Band edge at 11g_ch11
F1=2483.5MHz(EC365)
Date: 14.NOV.2005 17:53:57

7.3 Test Result

Test Mode: 802.11b operating mode

Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
		Max. Field Strength of Fundamental @3m (dBuV/m)	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dBc)			
		A	B	C	D	E
1 (lowest)	PK	115.95	51.43	64.52	74	-9.48
	AV	107.99	55.82	52.17	54	-1.83
11 (highest)	PK	113.25	51.88	61.37	74	-12.63
	AV	105.09	55.48	49.61	54	-4.39

Remark: 1. C = A – B
2. E = C – D

Test Mode: 802.11g operating mode

Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
		Max. Field Strength of Fundamental @3m (dBuV/m)	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dBc)			
		A	B	C	D	E
1 (lowest)	PK	114.86	49.92	64.94	74	-9.06
	AV	104.28	53.17	51.11	54	-2.89
11 (highest)	PK	110.77	42.62	68.15	74	-5.85
	AV	100.21	50.04	50.17	54	-3.83

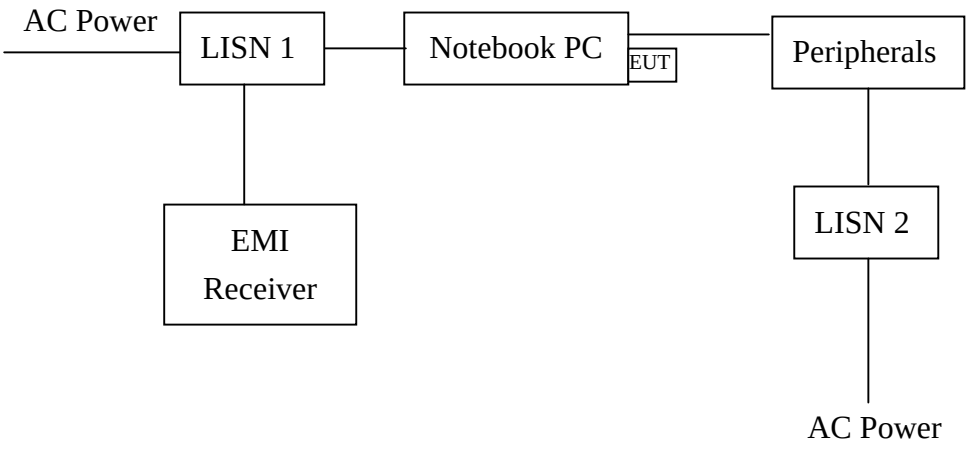
Remark: 1. C = A – B
2. E = C – D

8. Power Line Conducted Emission test §FCC 15.207

8.1 Operating environment

Temperature:	25	℃
Relative Humidity:	59	%
Atmospheric Pressure	1023	hPa

8.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

8.3 Emission limit

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

*Decreases with the logarithm of the frequency.

8.4 Uncertainty of Conducted Emission

Expanded uncertainty (k=2) of conducted emission measurement is ±2.6 dB.

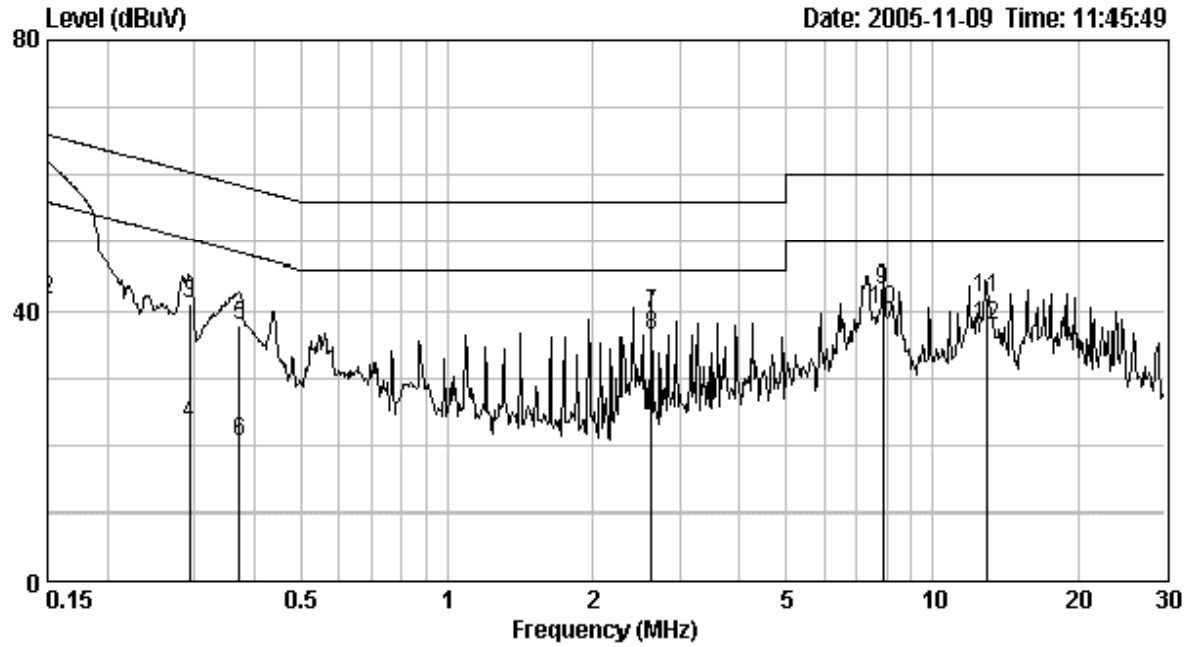
8.5 Power Line Conducted Emission test data

The test was performed on EUT under 802.11b and 802.11g continuously transmitting mode. Channel 1, 6, 11 were verified. The worst case occurred at 802.11b Tx channel 1.

Phase : Line
EUT : G-260
Worst Case : 802.11b Tx at channel 1

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.150	0.10	57.52	66.00	41.55	56.00	-8.48	-14.45
0.293	0.10	40.99	60.44	23.06	50.44	-19.45	-27.38
0.372	0.10	37.67	58.46	20.60	48.46	-20.79	-27.86
2.625	0.13	39.62	56.00	36.24	46.00	-16.38	-9.76
7.872	0.33	43.21	60.00	40.18	50.00	-16.79	-9.82
12.902	0.57	41.81	60.00	37.74	50.00	-18.19	-12.26

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase : Neutral
EUT : G-260
Worst Case : 802.11b Tx at channel 1

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.150	0.10	59.53	66.00	38.97	56.00	-6.47	-17.03
0.322	0.10	39.48	59.65	21.19	49.65	-20.17	-28.46
0.390	0.10	36.39	58.06	19.77	48.06	-21.67	-28.29
2.626	0.13	35.07	56.00	32.24	46.00	-20.93	-13.76
7.330	0.20	36.88	60.00	30.77	50.00	-23.12	-19.23
19.684	0.59	39.11	60.00	34.16	50.00	-20.89	-15.84

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)