EMC
TEST REPORT

Report No. : EME-030138
Model No. : B-120
Issued Date : Feb. 13, 2003

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Hsin-Chu, Taiwan

Test By : Intertek Testing Services Taiwan Ltd.
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Summary of Tests

Wireless Lan PC Card-Model: B-120
FCC ID: I88B120

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(d)	Complies
Power Line Conducted Emission test	15.207	Complies

1. General information

1.1 Identification of the EUT

Applicant	: ZyXEL Communications Corp.
Product	: Wireless Lan PC Card
Model No.	: B-120
FCC ID.	: I88B120
Frequency Range	: 2400MHz to 2483.5MHz
Channel Number	: 11
Frequency of Each Channel	: 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz
Type of Modulation	: CCK (11Mps, 5.5Mbps), DQPSK (2Mbps), DBPSK (1Mbps)
Power Supply	: 5Vdc from Notebook
Power Cord	: N/A
Sample Received	: Jan. 29, 2003
Test Date(s)	: Jan. 29, 2003 to Feb. 11, 2003

A FCC DoC report has been generated for the client.

1.2 Additional information about the EUT

The ZyAIR is an IEEE 802.11b compliant wireless PCMCIA card that fits into any type II PCMCIA slot. Its maximum 11 Mbps data rate, which gives Ethernet equivalent speed, is ideal in the corporate or home environment. Users enjoy the wireless mobility within the coverage area.

The EUT meets special requirements for full modular approval on FCC Public Notice DA 00-1407 and the device is only for OEM integrator, please refer the test result in this report.

The model ZyAIR B-120 and Telefonica B-120 are identical to model B-120 (EUT), the different model number serves as marketing strategy.

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

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : 2.5dBi
Antenna Type : Ceramic antenna
Connector Type : N/A

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
Notebook	IBM	2662-K1T	FX-BP820	FCC DoC Approved
Printer	HP	C2642A	TH86K1N2ZB	FCC DoC Approved
Modem	Dynalink	V1456VQE	00V230A00051494	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 C63.4/1992.

The AC power conducted emissions was invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz. (15.207 paragraph)

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 recorded also on the report.

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.

The EUT setup configurations please refer to the photo of test configuration in item.

2.2 Operation mode

Plug the EUT into Notebook via extend card, and turn on the power, then run the test program “ZDConfig” under Window OS.

The EUT was transmitted continuously during the test.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Series No.	Last Cal.Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	825788/014	May 24, 2002
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	825428/005	June 10, 2002
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	100137	July 10, 2002
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	100186	Oct. 9, 2002
Horn Antenna	EMCO	1GHz~18GHz	3115	9906-5890	Sep. 19, 2002
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	159	June 20, 2002
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	3111	June 20, 2002
Turn Table	HDGmbH	N/A	DS 420S	420/669/01	N/A
Antenna Tower	HDGmbH	N/A	MA 240	240/573	N/A
Microwave Amplifier	Agilent	2GHz~26.5GHz	8348A	3111A00567	Dec. 20, 2002
RF Power Meter	Boonton	10kHz~100GHz	4231A	79401	May 22, 2002
Power Sensor	Boonton	30MHz~8GHz	51011-EMC	32482	May 25, 2002

Note:
1. The calibration interval of the above instruments is 12 months.

3. Minimum 6dB Bandwidth test

3.1 Operating environment

Temperature:	22	℃
Relative Humidity:	60	%
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.

See Minimum 6dB Bandwidth plot as file name “Minimum 6dB Bandwidth plot.pdf”

3.3 Measured data of Minimum 6dB Bandwidth test results

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
Low	2412	10.12	＞500kHz
Middle	2437	10.12	＞500kHz
High	2462	10.12	＞500kHz

4. Maximum Output Power test

4.1 Operating environment

Temperature:	22	℃
Relative Humidity:	60	%
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 power meter via power sensor. Power was read directly and cable loss correction (2dB) 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

Channel	Frequency (MHz)	C.B.L. (dB)	Reading (dBm)	Power Output		Limit (W)
				(dBm)	(mW)	
Lowest	2412	2	15.12	17.12	51.523	1
Middle	2437	2	15.38	17.38	54.702	1
Highest	2462	2	14.99	16.99	50.003	1

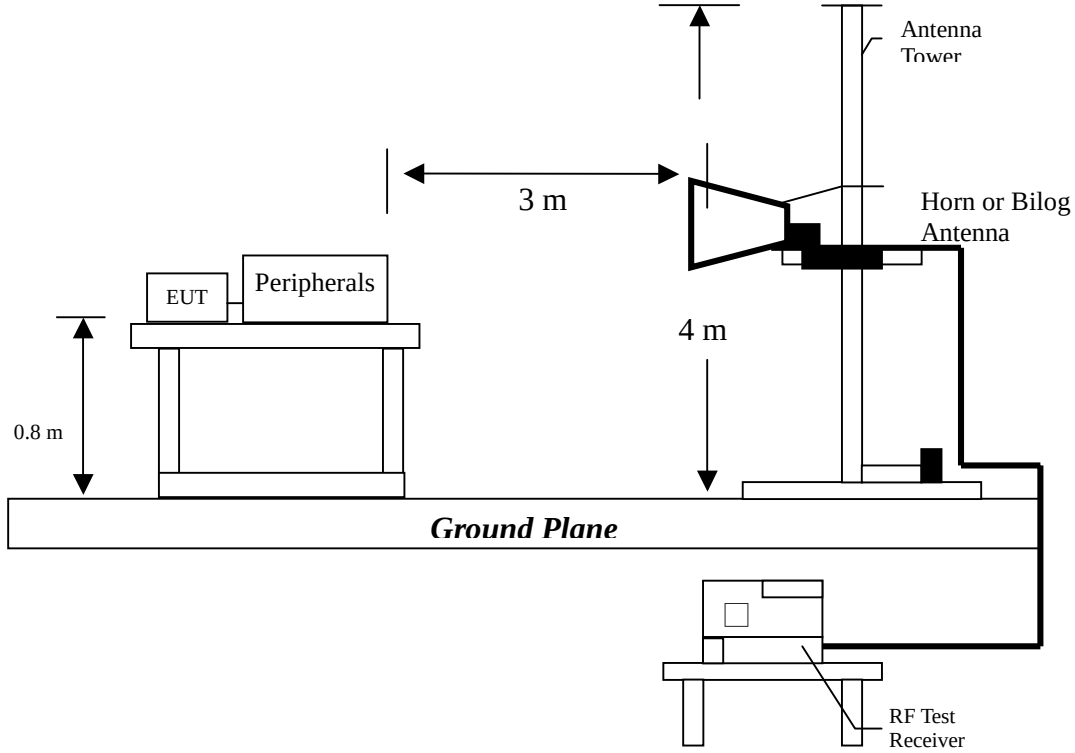
5. Radiated Emission test

5.1 Operating environment

Temperature:	22	℃
Relative Humidity:	60	%
Atmospheric Pressure	1023	hPa

5.2 Test setup & procedure

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



Radiated emission measurements were performed from 30MHz to 25GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, 1MHz – for frequencies above 1GHz.

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 three meter reading using inverse scaling with distance.

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 ±3.078 dB.
Expanded uncertainty (k=2) of conducted emission measurement is ±2.02 dB.

5.4 Radiated spurious emission test data

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

EUT : B-120
Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
133.10000	QP	V	13.36	16.94	30.30	43.50	-13.20
265.40000	QP	V	13.32	18.58	31.90	46.00	-14.10
299.50000	QP	V	14.39	19.61	34.00	46.00	-12.00
332.20000	QP	V	15.30	15.10	30.40	46.00	-15.60
498.80000	QP	V	18.90	11.20	30.10	46.00	-15.90
720.00000	QP	V	22.56	7.44	30.00	46.00	-16.00
199.60000	QP	H	12.03	25.17	37.20	43.50	-6.30
233.00000	QP	H	12.35	24.65	37.00	46.00	-9.00
263.80000	QP	H	13.32	23.08	36.40	46.00	-9.60
332.20000	QP	H	15.30	17.10	32.40	46.00	-13.60
398.00000	QP	H	16.67	15.53	32.20	46.00	-13.80
528.20000	QP	H	19.17	11.63	30.80	46.00	-15.20

Remark:
1.Corrected Level = Reading Level + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

EUT : B-120
Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
108.80000	QP	V	10.95	17.05	28.00	43.50	-15.50
240.10000	QP	V	12.86	16.74	29.60	46.00	-16.40
300.00000	QP	V	14.47	19.23	33.70	46.00	-12.30
399.40000	QP	V	16.67	14.43	31.10	46.00	-14.90
497.40000	QP	V	18.90	9.80	28.70	46.00	-17.30
720.00000	QP	V	22.56	8.44	31.00	46.00	-15.00
133.10000	QP	H	13.36	15.54	28.90	43.50	-14.60
199.60000	QP	H	12.03	23.07	35.10	43.50	-8.40
233.00000	QP	H	12.35	24.65	37.00	46.00	-9.00
263.80000	QP	H	13.32	23.48	36.80	46.00	-9.20
332.20000	QP	H	15.30	16.60	31.90	46.00	-14.10
665.40000	QP	H	21.70	10.80	32.50	46.00	-13.50

Remark:
1.Corrected Level = Reading Level + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

EUT : B-120
Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
132.60000	QP	V	13.36	16.64	30.00	43.50	-13.50
199.60000	QP	V	12.03	15.07	27.10	43.50	-16.40
220.10000	QP	V	11.82	16.48	28.30	46.00	-17.70
264.90000	QP	V	13.32	17.98	31.30	46.00	-14.70
300.00000	QP	V	14.47	16.73	31.20	46.00	-14.80
720.00000	QP	V	22.56	9.04	31.60	46.00	-14.40
133.10000	QP	H	13.36	16.34	29.70	43.50	-13.80
198.50000	QP	H	12.03	24.37	36.40	43.50	-7.10
220.10000	QP	H	11.82	22.48	34.30	46.00	-11.70
263.80000	QP	H	13.32	24.28	37.60	46.00	-8.40
332.20000	QP	H	15.30	18.70	34.00	46.00	-12.00
399.40000	QP	H	16.67	16.43	33.10	46.00	-12.90

Remark:
1.Corrected Level = Reading Level + Correction Factor
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

5.4.2 Measurement results: frequency above 1GHz

The radiated spurious emissions at

Frequency(MHz)	Margin
9648	-2.688

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : B-120
Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
4824	PK	V	32.496	35.47	-	-	74	-
4824	AV	V	32.496	35.47	-	-	54	-
7236	PK	V	34.32	38.42	51.41	55.51	74	-18.49
7236	AV	V	34.32	38.42	39.58	43.68	54	-10.32
9648	PK	V	35.808	41.35	52.76	58.302	74	-15.698
9648	AV	V	35.808	41.35	45.77	51.312	54	-2.688
12060	PK	V	35.4	43.38	-	-	74	-
12060	AV	V	35.4	43.38	-	-	54	-
4824	PK	H	32.496	35.47	-	-	74	-
4824	AV	H	32.496	35.47	-	-	54	-
7236	PK	H	34.32	38.42	50.27	54.37	74	-19.63
7236	AV	H	34.32	38.42	37.65	41.75	54	-12.25
9648	PK	H	35.808	41.35	51.02	56.562	74	-17.438
9648	AV	H	35.808	41.35	42.88	48.422	54	-5.578
12060	PK	H	35.4	43.38	-	-	74	-
12060	AV	H	35.4	43.38	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

The radiated spurious emissions at

Frequency(MHz)	Margin
9748	-2.678

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : B-120
Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
4874	PK	V	32.496	35.47	-	-	74	-
4874	AV	V	32.496	35.47	-	-	54	-
7311	PK	V	34.32	38.42	51.12	55.22	74	-18.78
7311	AV	V	34.32	38.42	39.25	43.35	54	-10.65
9748	PK	V	35.808	41.35	52.37	57.912	74	-16.088
9748	AV	V	35.808	41.35	45.78	51.322	54	-2.678
12185	PK	V	35.4	43.38	-	-	74	-
12185	AV	V	35.4	43.38	-	-	54	-
4874	PK	H	32.496	35.47	-	-	74	-
4874	AV	H	32.496	35.47	-	-	54	-
7311	PK	H	34.32	38.42	50.16	54.26	74	-19.74
7311	AV	H	34.32	38.42	38.27	42.37	54	-11.63
9748	PK	H	35.808	41.35	50.83	56.372	74	-17.628
9748	AV	H	35.808	41.35	41.02	46.562	54	-7.438
12185	PK	H	35.4	43.38	-	-	74	-
12185	AV	H	35.4	43.38	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

The radiated spurious emissions at

Frequency(MHz)	Margin
9848	-0.119

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

EUT : B-120
Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)
4924	PK	V	32.496	35.47	-	-	74	-
4924	AV	V	32.496	35.47	-	-	54	-
7386	PK	V	34.32	38.42	53.29	57.39	74	-16.61
7386	AV	V	34.32	38.42	40.99	45.09	54	-8.91
9848	PK	V	35.919	41.55	54.35	59.981	74	-14.019
9848	AV	V	35.919	41.55	48.25	53.881	54	-0.119
12310	PK	V	35.315	43.75	-	-	74	-
12310	AV	V	35.315	43.75	-	-	54	-
4924	PK	H	32.496	35.47	-	-	74	-
4924	AV	H	32.496	35.47	-	-	54	-
7386	PK	H	34.32	38.42	52.25	56.35	74	-17.65
7386	AV	H	34.32	38.42	40.22	44.32	54	-9.68
9848	PK	H	35.919	41.55	51	56.631	74	-17.369
9848	AV	H	35.919	41.55	44.3	49.931	54	-4.069
12310	PK	H	35.315	43.75	-	-	74	-
12310	AV	H	35.315	43.75	-	-	54	-

Remark:
1.Corrected Level = Reading Level + Correction Factor－Preamp
2.Correction Factor = Antenna Factor + Cable Loss
3. “-“ means the emission is below the noise floor.

6. Power Spectrum Density test

6.1 Operating environment

Temperature:	22	℃
Relative Humidity:	60	%
Atmospheric Pressure	1023	hPa

6.2 Test setup & procedure

The power spectrum density per FCC §15.247(d) 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 and cable loss (2dB)/external attenuator (3dB) 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.

See Power Spectrum Density plot as file name “Power Spectrum Density plot.pdf”

6.3 Measured data of Power Spectrum Density test results

Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
Low	2412.498	-6.21	8
Middle	2437.495	-6.53	8
High	2462.495	-7.00	8

7. Emission on the band edge §FCC 15.247(C)

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.

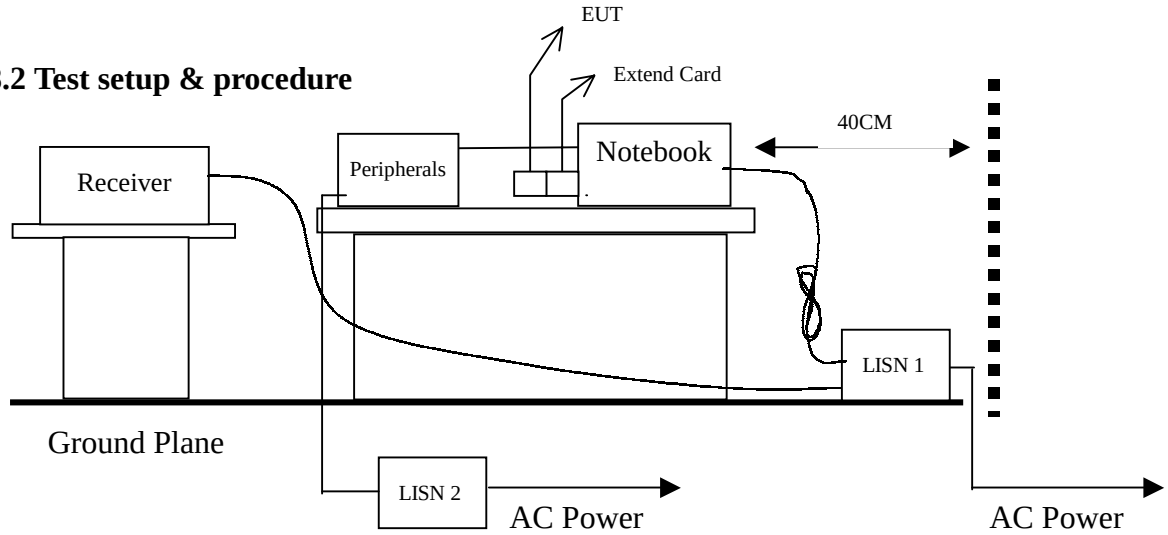
See band-edge plot as file name “Band-edge plot.pdf”.

8. Power Line Conducted Emission test §FCC 15.207

8.1 Operating environment

Temperature: 22 ℃
Relative Humidity: 60 %
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 C63.4/1992 on conducted measurement. The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

See Power Line Conducted Emission plot as file name “Power Line Conducted Emission plot.pdf”.

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.

8.3 Power Line Conducted Emission test data

(1) Line

EUT : B-120

Test Condition : Tx at low channel

Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Reading (dB μ V) AV	Limit (dB μ V) AV	Margin (dB)	
					QP	AV
0.15800	38.7	65.57	22.9	55.57	-26.87	-32.67
0.21400	41.6	63.05	30.0	53.05	-21.45	-23.05
0.35000	33.7	58.96	26.8	48.96	-25.26	-22.16
0.45400	27.3	56.81	24.6	46.81	-29.51	-22.21
1.27000	27.1	56.00	25.4	46.00	-28.90	-20.60
21.50200	34.8	60.00	34.8	50.00	-25.20	-15.20

(2) Neutral

EUT : B-120

Test Condition : Tx at low channel

Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Reading (dB μ V) AV	Limit (dB μ V) AV	Margin (dB)	
					QP	AV
0.20600	46.0	63.37	36.3	53.37	-17.37	-17.07
0.28600	30.6	60.64	6.9	50.64	-30.04	-43.74
0.41400	29.9	57.57	24.0	47.57	-27.67	-23.57
0.63000	25.7	56.00	18.0	46.00	-30.30	-28.00
1.05400	23.1	56.00	13.1	46.00	-32.90	-32.90
21.50200	29.4	60.00	29.3	50.00	-30.60	-20.70

Remark:

1. 1. The reading value included cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81.
   Expanded uncertainty (k=2) of conducted emission measurement is ±2.6 dB.

(1) Line

EUT : B-120

Test Condition : Tx at middle channel

Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Reading (dB μ V) AV	Limit (dB μ V) AV	Margin (dB)	
					QP	AV
0.15000	41.9	66.00	27.0	56.00	-24.10	-29.00
0.20600	42.8	63.37	30.4	53.37	-20.57	-22.97
0.45400	27.2	56.81	24.9	46.81	-29.61	-21.91
0.81400	25.6	56.00	20.4	46.00	-30.40	-25.60
1.37400	26.5	56.00	24.9	46.00	-29.50	-21.10
21.50200	37.3	60.00	37.3	50.00	-22.70	-12.70

(2) Neutral

EUT : B-120

Test Condition : Tx at middle channel

Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Reading (dB μ V) AV	Limit (dB μ V) AV	Margin (dB)	
					QP	AV
0.21400	39.9	63.05	28.0	53.05	-23.15	-25.05
0.35000	34.4	58.96	26.9	48.96	-24.56	-22.06
0.45400	25.9	56.81	23.7	46.81	-30.91	-23.11
0.70200	23.7	56.00	20.7	46.00	-32.30	-25.30
1.26200	24.4	56.00	20.0	46.00	-31.60	-26.00
21.50200	38.6	60.00	38.5	50.00	-21.40	-11.50

Remark:

1. 1. The reading value included cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81.
   Expanded uncertainty (k=2) of conducted emission measurement is ±2.6 dB.

(1) Line

EUT : B-120

Test Condition : Tx at high channel

Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Reading (dB μ V) AV	Limit (dB μ V) AV	Margin (dB)	
					QP	AV
0.23000	35.2	62.45	21.0	52.45	-27.25	-31.45
0.35000	33.5	58.96	28.1	48.96	-25.46	-20.86
0.45400	27.8	56.81	24.8	46.81	-29.01	-22.01
0.79800	19.6	56.00	10.1	46.00	-36.40	-35.90
1.26200	26.7	56.00	20.8	46.00	-29.30	-25.20
21.50200	39.0	60.00	38.8	50.00	-21.00	-11.20

(2) Neutral

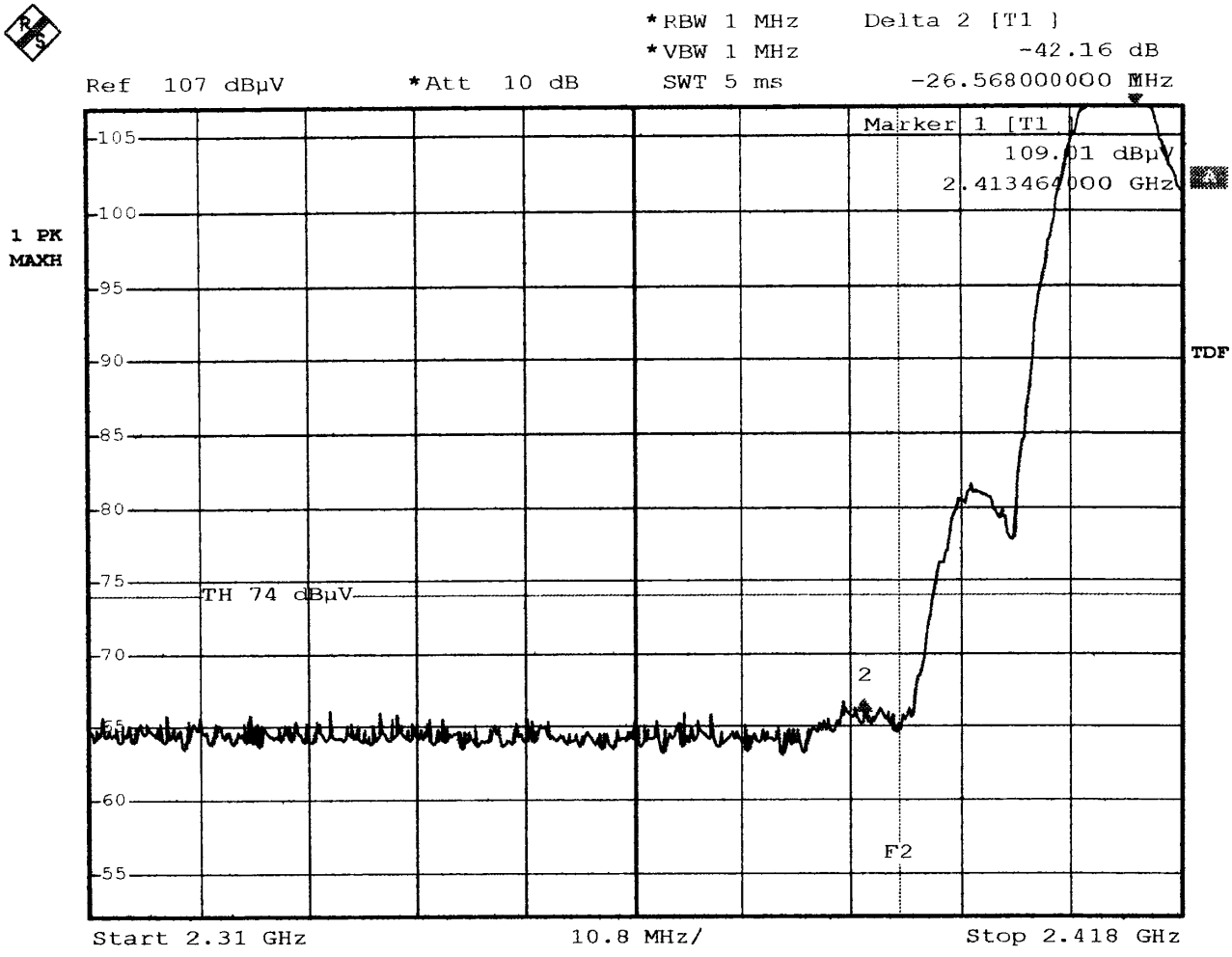
EUT : B-120

Test Condition : Tx at high channel

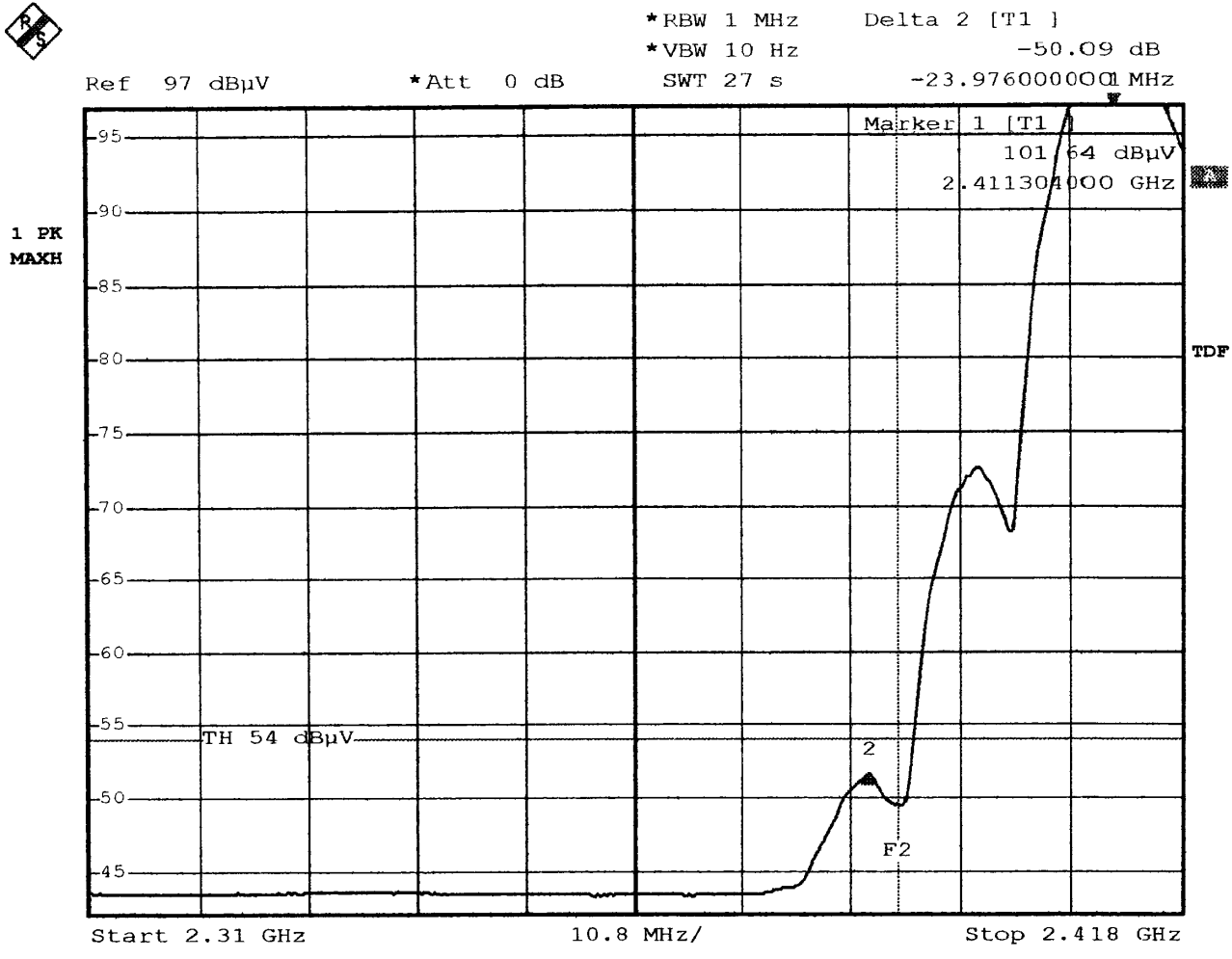
Freq. (MHz)	Reading (dB μ V) QP	Limit (dB μ V) QP	Reading (dB μ V) AV	Limit (dB μ V) AV	Margin (dB)	
					QP	AV
0.23000	37.3	62.45	29.7	52.45	-25.15	-22.75
0.31000	28.1	59.97	10.0	49.97	-31.87	-39.97
0.35000	34.0	58.96	24.4	48.96	-24.96	-24.56
0.45400	28.1	56.81	25.1	46.81	-28.71	-21.71
1.26200	25.8	56.00	22.8	46.00	-30.20	-23.20
21.50200	38.7	60.00	38.6	50.00	-21.30	-11.40

Remark:

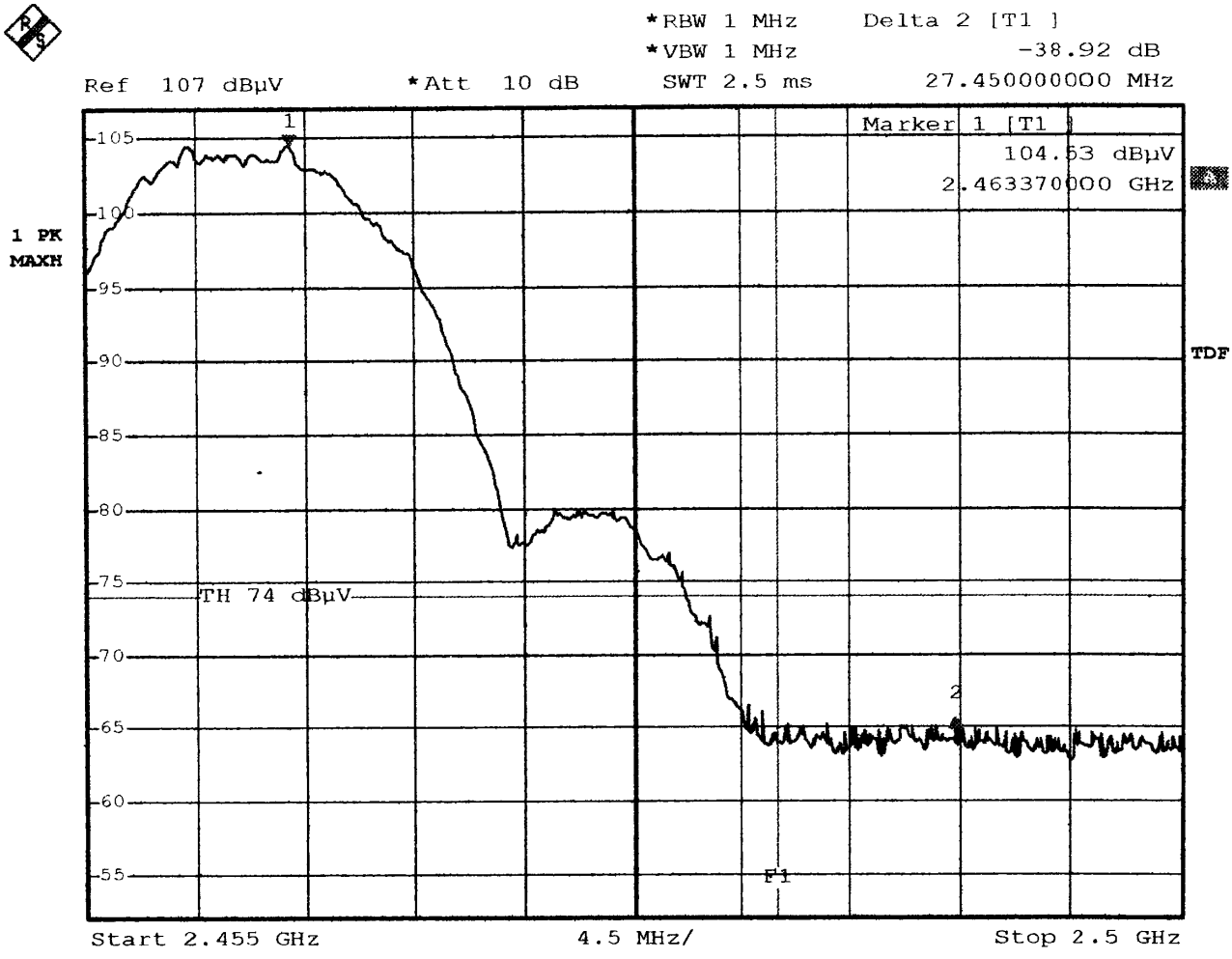
1. 1. The reading value included cable loss and LISN factor.
2. Uncertainty was calculated in accordance with NAMAS NIS 81.
   Expanded uncertainty (k=2) of conducted emission measurement is ±2.6 dB.



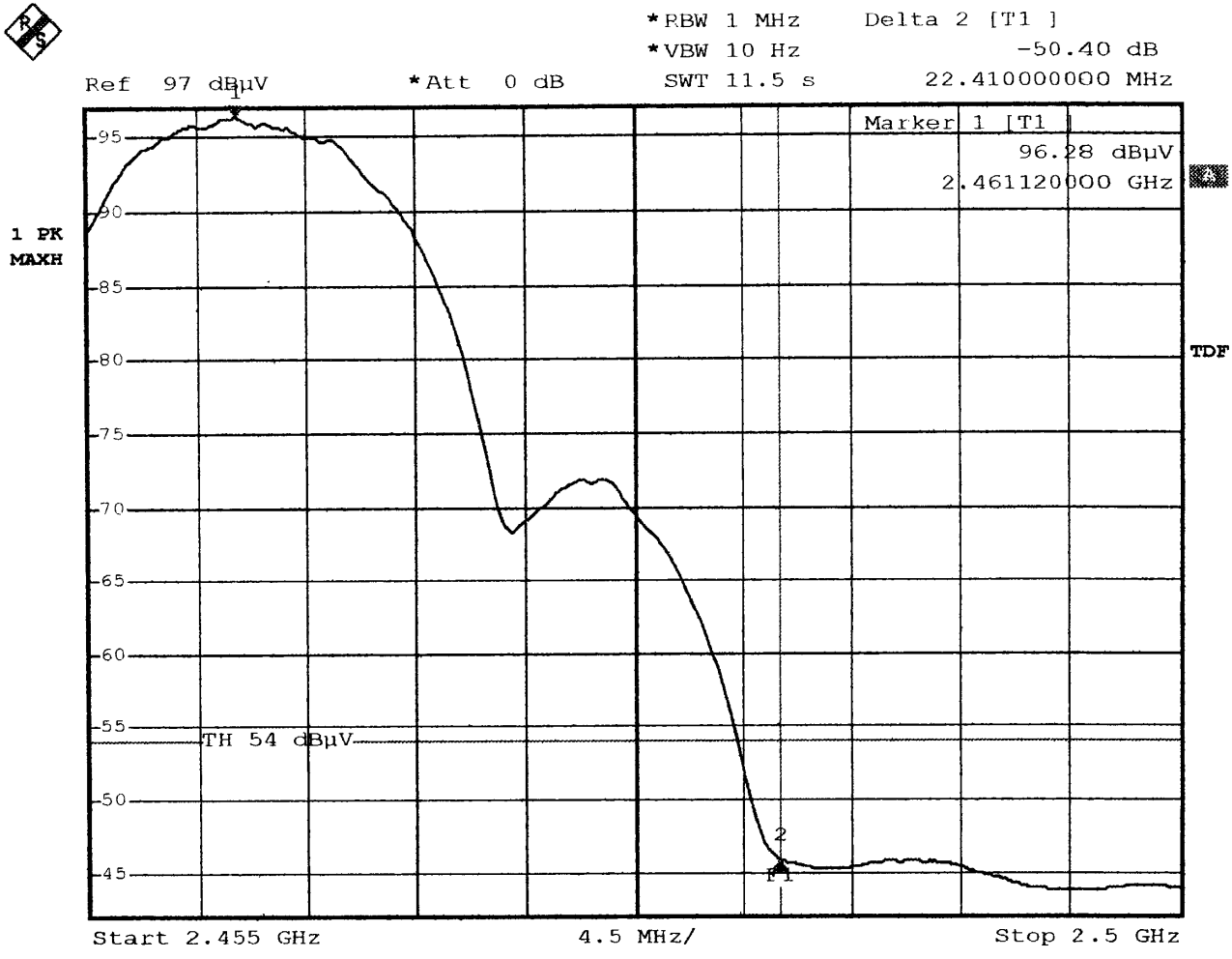
Comment A: Band-edge test at low channel0
Peak detector F2=2390MHz
Date: 5.FEB.2003 15:28:44



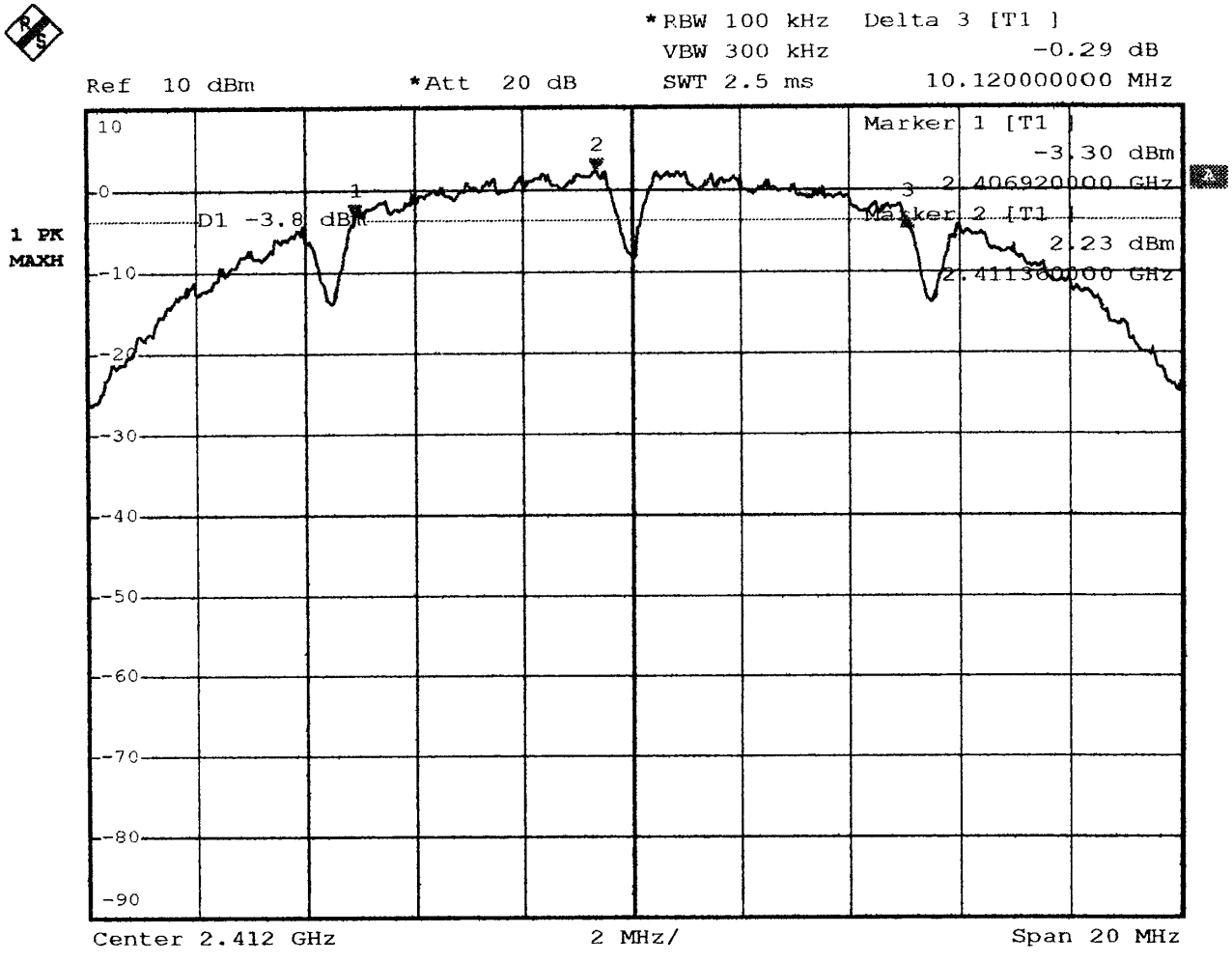
Comment A: Band-edge test at low channelEN B
Average detector F2=2390MHz
Date: 5.FEB.2003 15:26:25



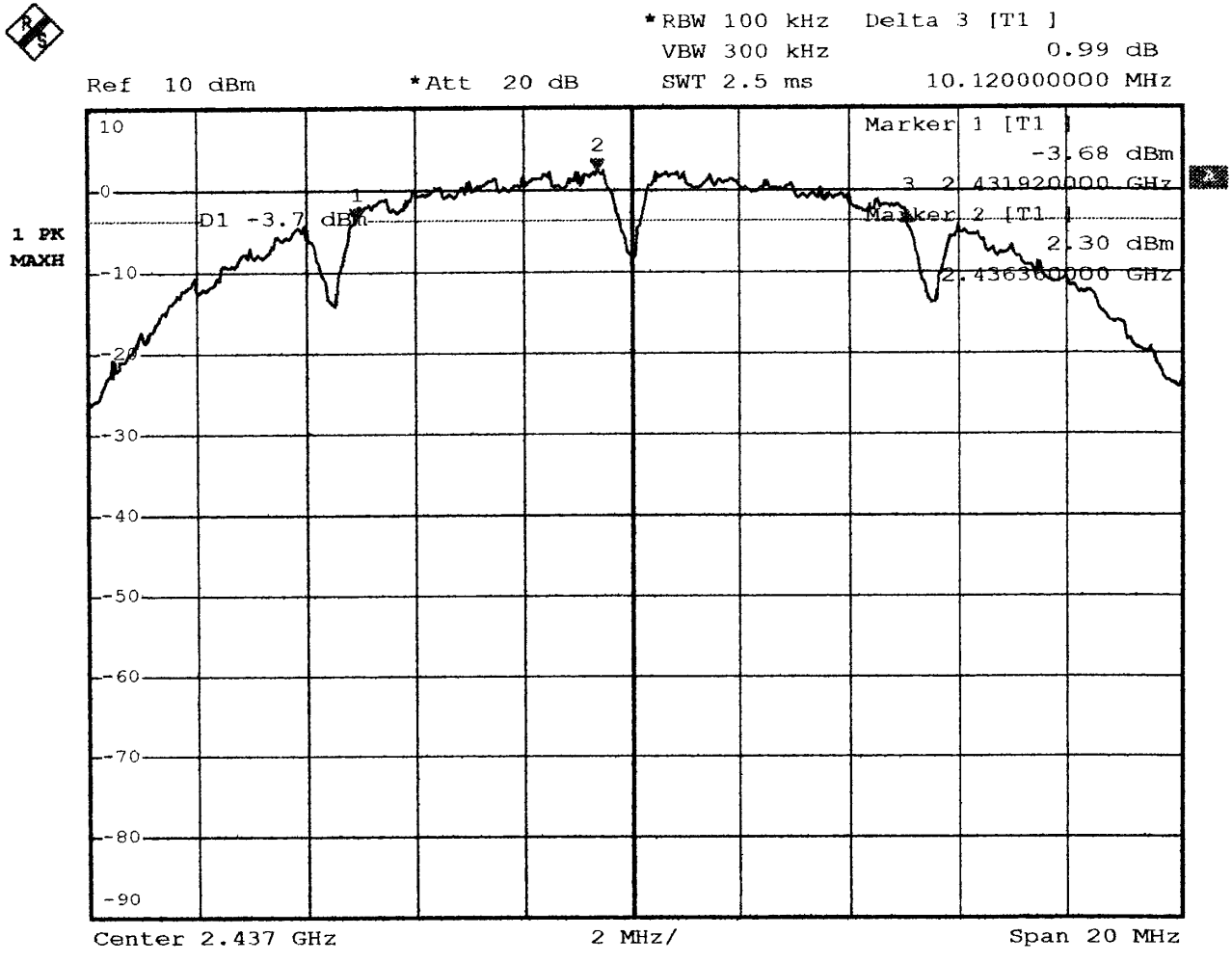
Comment A: Band-edge test at high channel
Peak detector F1=2483.5MHz
Date: 5.FEB.2003 15:34:14



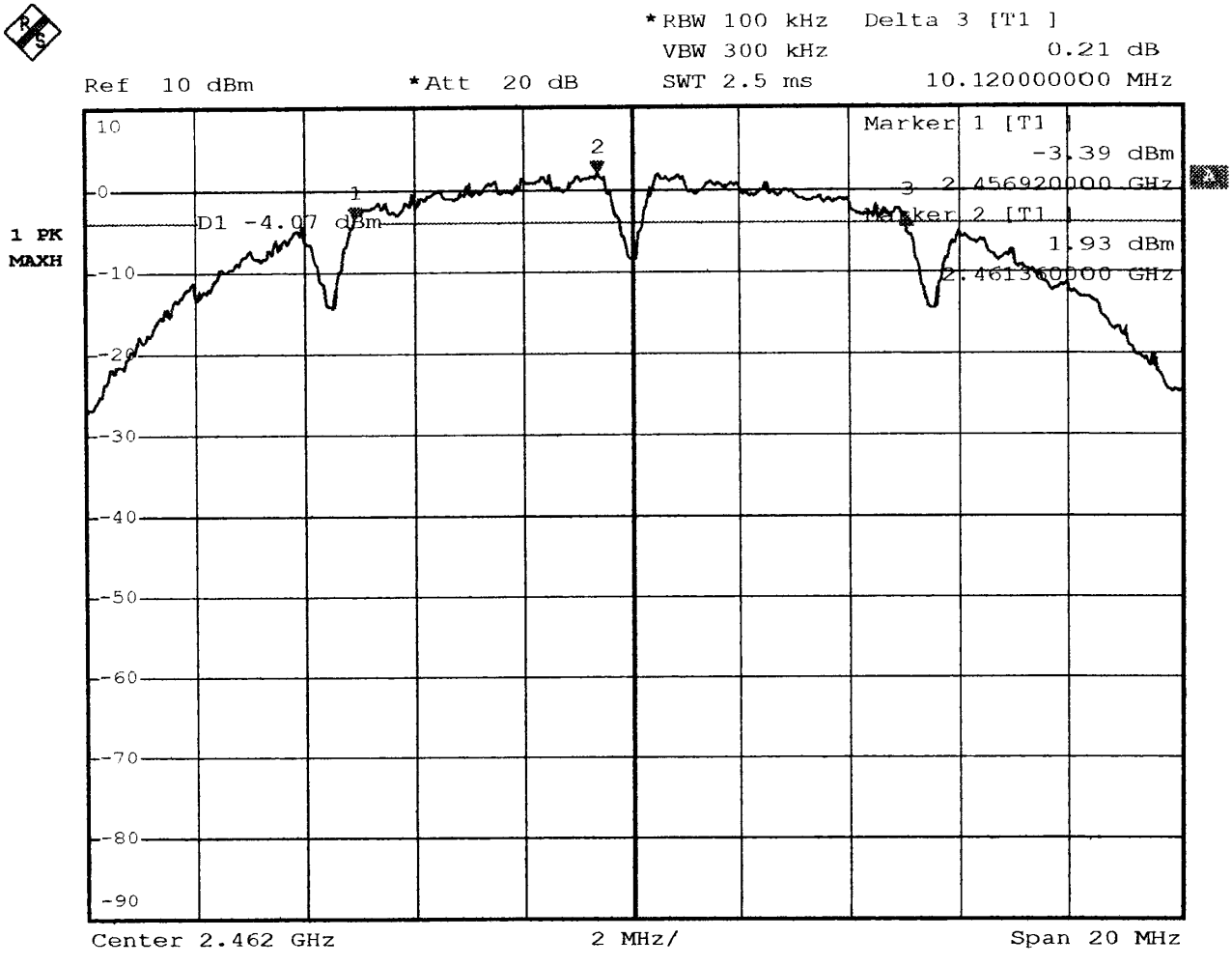
Comment A: Band-edge test at high channelF1=2483.5MHz
Average detector F1=2483.5MHz
Date: 5.FEB.2003 15:33:02



Comment A: 6dB bandwidth at low channel
Date: 6.FEB.2003 16:13:22



Comment A: 6dB bandwidth at middle channel
Date: 6.FEB.2003 16:18:30



Comment A: 6dB bandwidth at high channel
Date: 6.FEB.2003 16:22:41

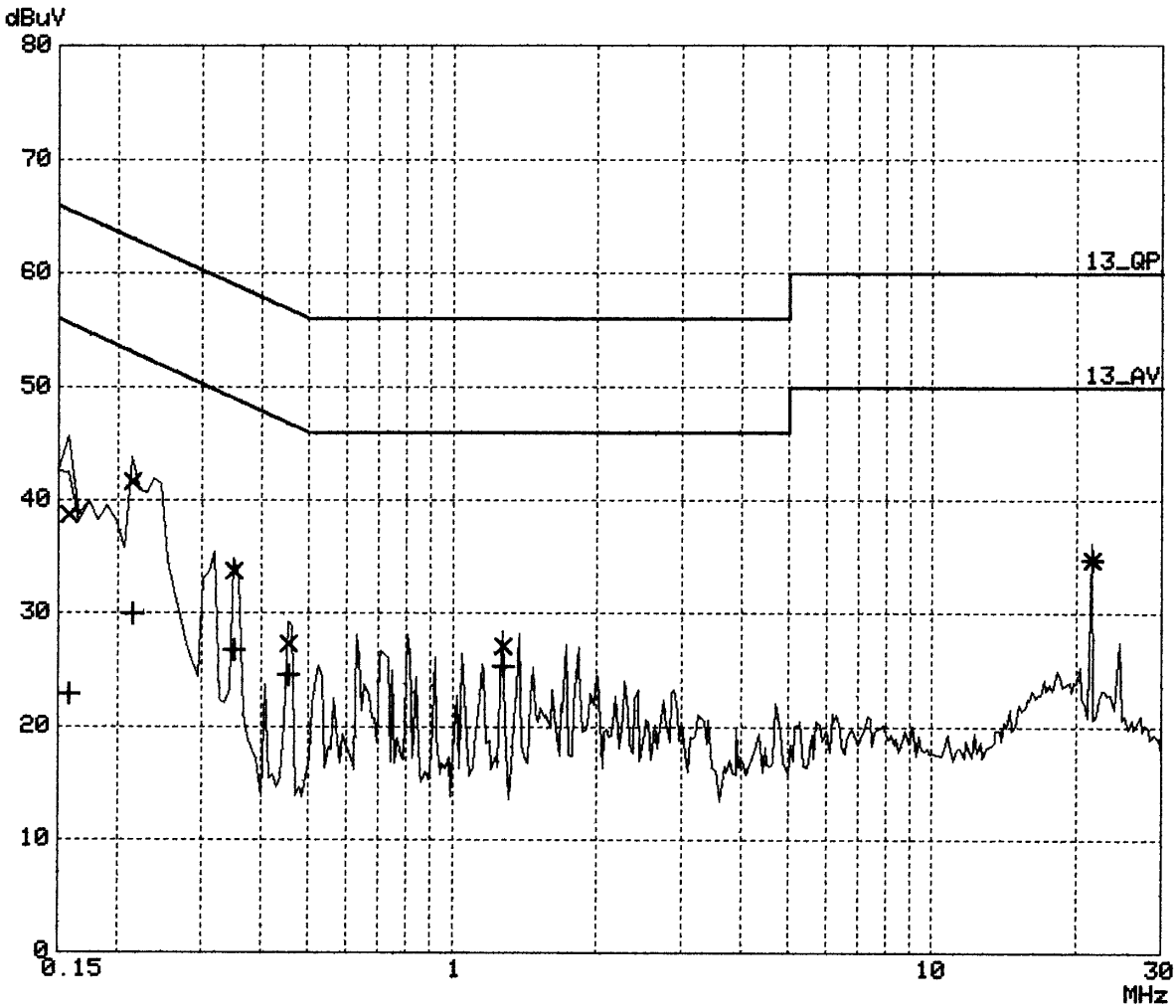
Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-L
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at low channel
Date: 11. Feb 03 10:06

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	8k	9k	PK	20ms	AUTO	LN OFF

Final Measurement: x QP / + AV
Meas Time: 1 s



Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-L
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at low channel
Date: 11. Feb 03 10:06

Final Measurement Results:

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.15800	38.7	-26.8	L1	gnd
0.21400	41.6	-21.4	L1	gnd
0.35000	33.7	-25.2	L1	gnd
0.45400	27.3	-29.5	L1	gnd
1.27000	27.1	-28.8	L1	gnd
21.50200	34.8	-25.1	L1	gnd

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.15800	22.9	-32.7	L1	gnd
0.21400	30.0	-23.0	L1	gnd
0.35000	26.8	-22.2	L1	gnd
0.45400	24.6	-22.2	L1	gnd
1.27000	25.4	-20.5	L1	gnd
21.50200	34.8	-15.1	L1	gnd

* limit exceeded

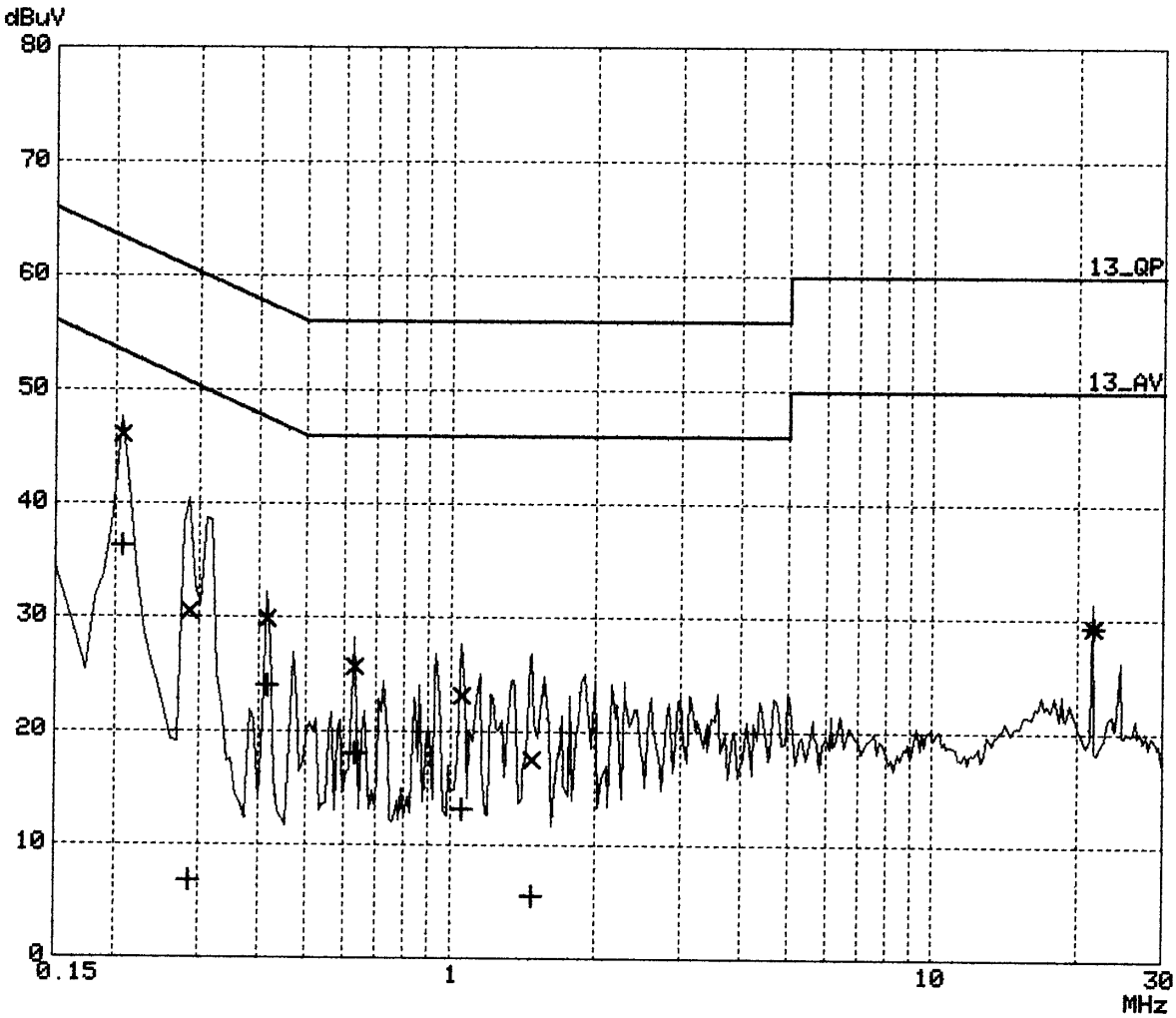
Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-N
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at low channel
Date: 11. Feb 03 09:51

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	8k	9k	PK	20ms	AUTO	LN OFF

Final Measurement: x QP / + AV
Meas Time: 1 s



Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-N
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at low channel
Date: 11. Feb 03 09:51

Final Measurement Results:

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.20600	46.0	-17.4	N	gnd
0.28600	30.6	-30.1	N	gnd
0.41400	29.9	-27.6	N	gnd
0.63000	25.7	-30.2	N	gnd
1.05400	23.1	-32.8	N	gnd
1.47000	17.5	-38.4	N	gnd
21.50200	29.4	-30.5	N	gnd

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.20600	36.3	-17.1	N	gnd
0.28600	6.9	-43.8	N	gnd
0.41400	24.0	-23.6	N	gnd
0.63000	18.0	-27.9	N	gnd
1.05400	13.1	-32.8	N	gnd
1.47000	5.5	-40.4	N	gnd
21.50200	29.3	-20.6	N	gnd

* limit exceeded

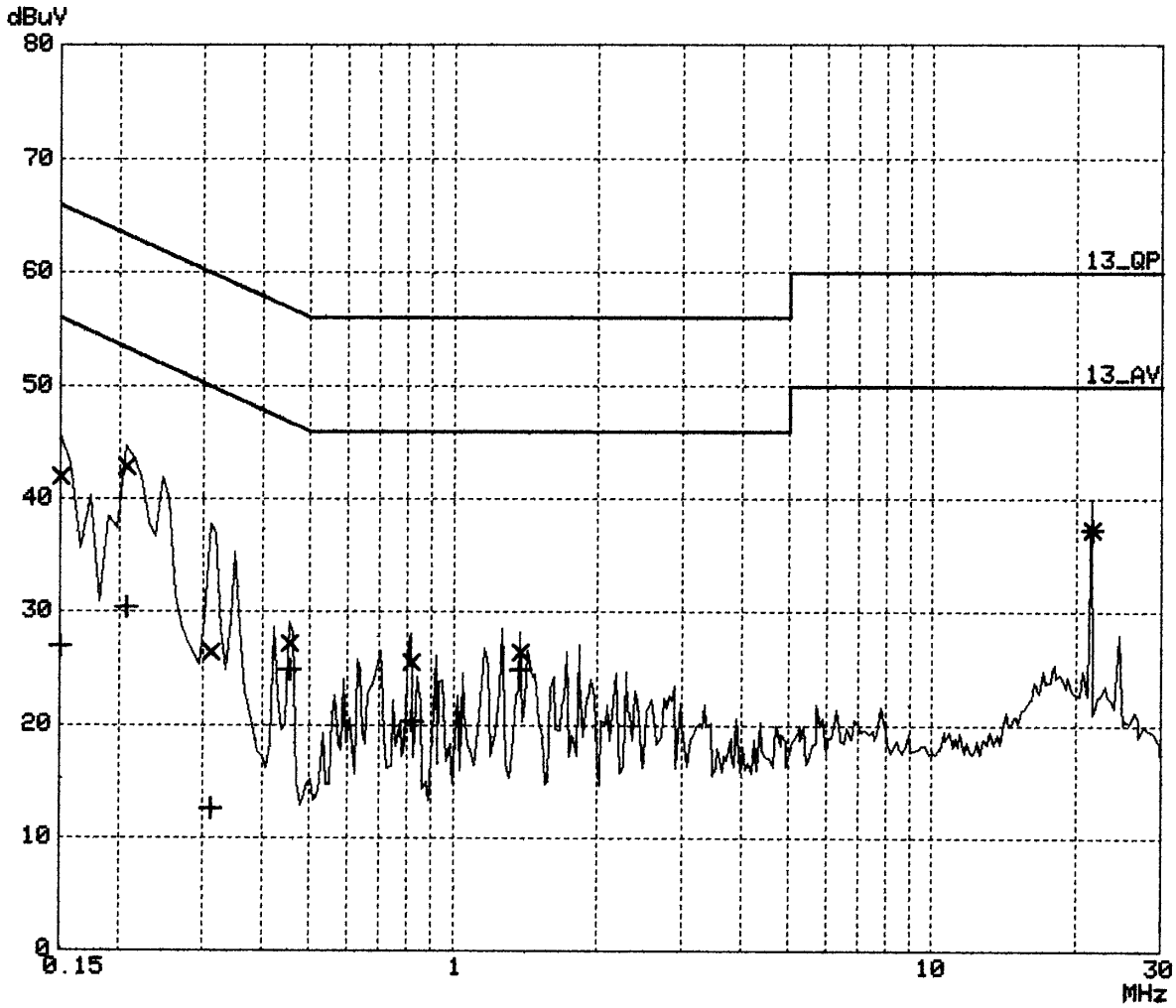
Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-L
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at middle channel
Date: 11. Feb 03 10:37

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	8k	9k	PK	20ms	AUTO	LN OFF

Final Measurement: x QP / + AV
Meas Time: 1 s



Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-L
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at middle channel
Date: 11. Feb 03 10:37

Final Measurement Results:

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.15000	41.9	-24.0	L1	gnd
0.20600	42.8	-20.5	L1	gnd
0.31000	26.5	-33.5	L1	gnd
0.45400	27.2	-29.6	L1	gnd
0.81400	25.6	-30.3	L1	gnd
1.37400	26.5	-29.4	L1	gnd
21.50200	37.3	-22.6	L1	gnd

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.15000	27.0	-28.9	L1	gnd
0.20600	30.4	-23.0	L1	gnd
0.31000	12.6	-37.3	L1	gnd
0.45400	24.9	-21.9	L1	gnd
0.81400	20.4	-25.5	L1	gnd
1.37400	24.9	-21.0	L1	gnd
21.50200	37.3	-12.6	L1	gnd

* limit exceeded

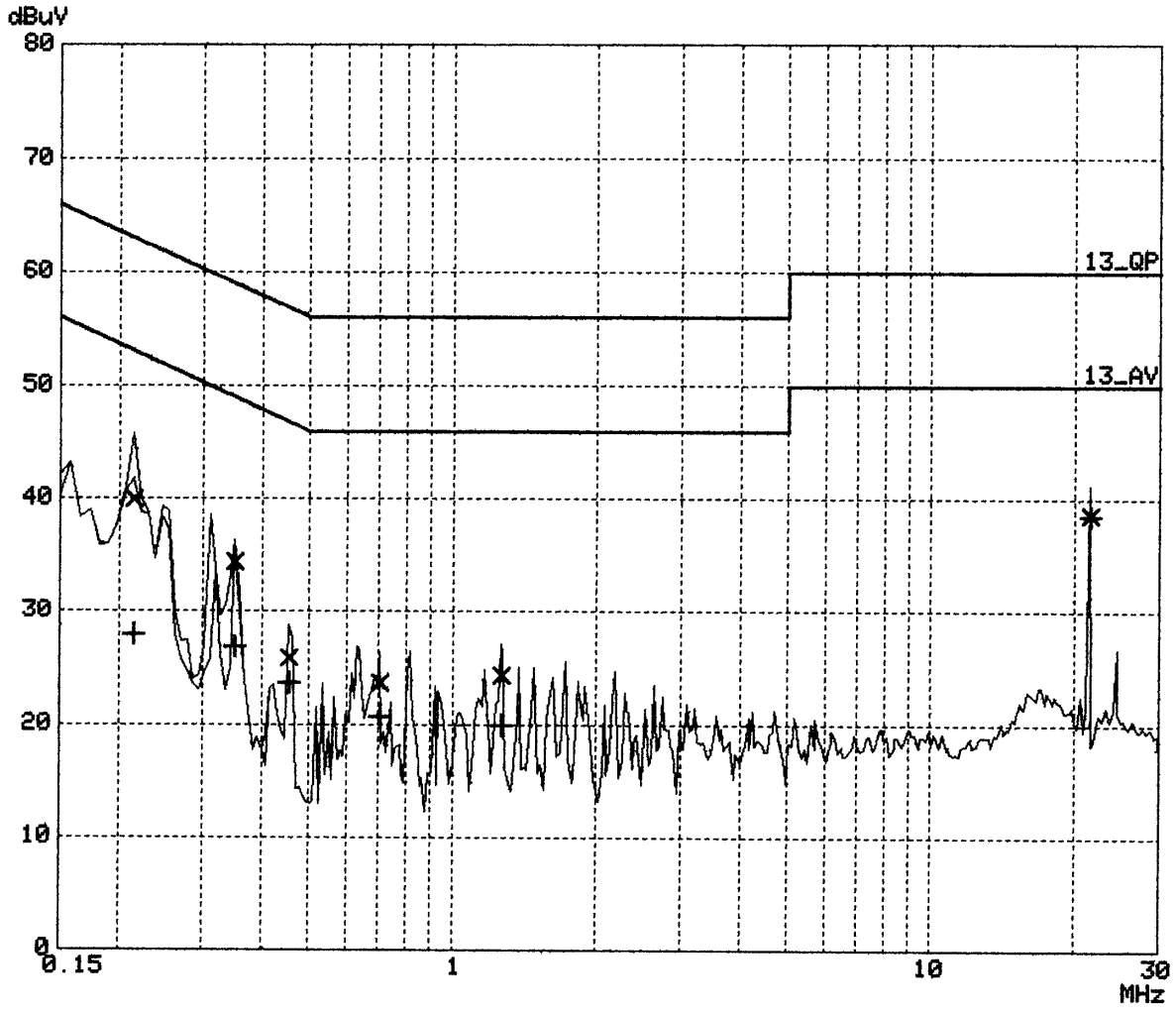
Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-N
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at middle channel
Date: 11. Feb 03 10:57

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	8k	9k	PK	20ms	AUTO	LN OFF

Final Measurement: x QP / + AV
Meas Time: 1 s



Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-N
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at middle channel
Date: 11. Feb 03 10:57

Final Measurement Results:

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.21400	39.9	-23.1	N	gnd
0.35000	34.4	-24.6	N	gnd
0.45400	25.9	-30.8	N	gnd
0.70200	23.7	-32.2	N	gnd
1.26200	24.4	-31.5	N	gnd
21.50200	38.6	-21.3	N	gnd

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.21400	28.0	-25.0	N	gnd
0.35000	26.9	-22.1	N	gnd
0.45400	23.7	-23.1	N	gnd
0.70200	20.7	-25.2	N	gnd
1.26200	20.0	-25.9	N	gnd
21.50200	38.5	-11.4	N	gnd

* limit exceeded

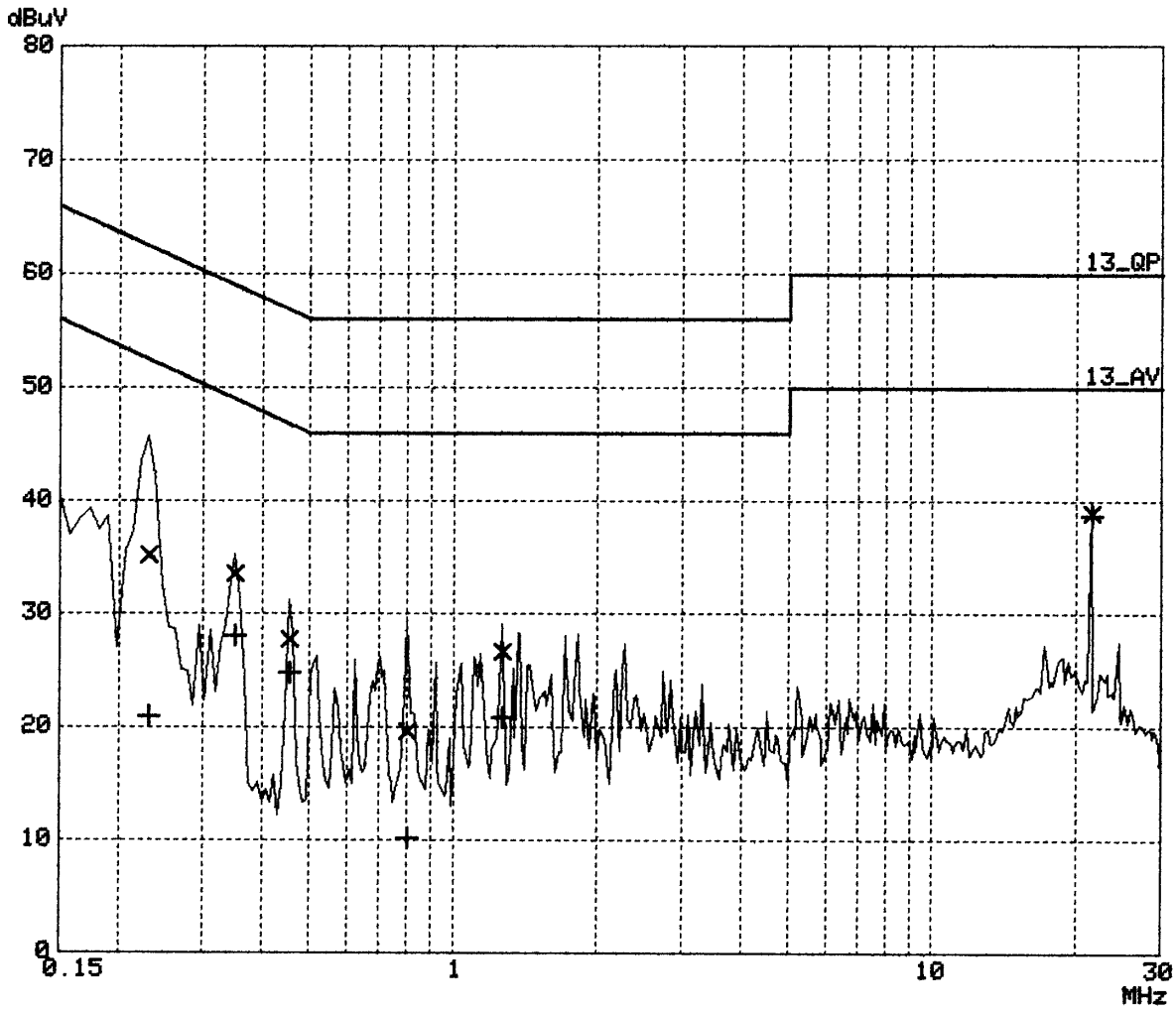
Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-L
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at high channel
Date: 11. Feb 03 11:17

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	8k	9k	PK	20ms	AUTO	LN OFF

Final Measurement: x QP / + AV
Meas Time: 1 s



Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-L
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at high channel
Date: 11. Feb 03 11:17

Final Measurement Results:

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.23000	35.2	-27.2	L1	gnd
0.35000	33.5	-25.5	L1	gnd
0.45400	27.8	-28.9	L1	gnd
0.79800	19.6	-36.3	L1	gnd
1.26200	26.7	-29.3	L1	gnd
21.50200	39.0	-20.9	L1	gnd

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.23000	21.0	-31.4	L1	gnd
0.35000	28.1	-20.9	L1	gnd
0.45400	24.8	-22.0	L1	gnd
0.79800	10.1	-35.8	L1	gnd
1.26200	20.8	-25.1	L1	gnd
21.50200	38.8	-11.1	L1	gnd

* limit exceeded

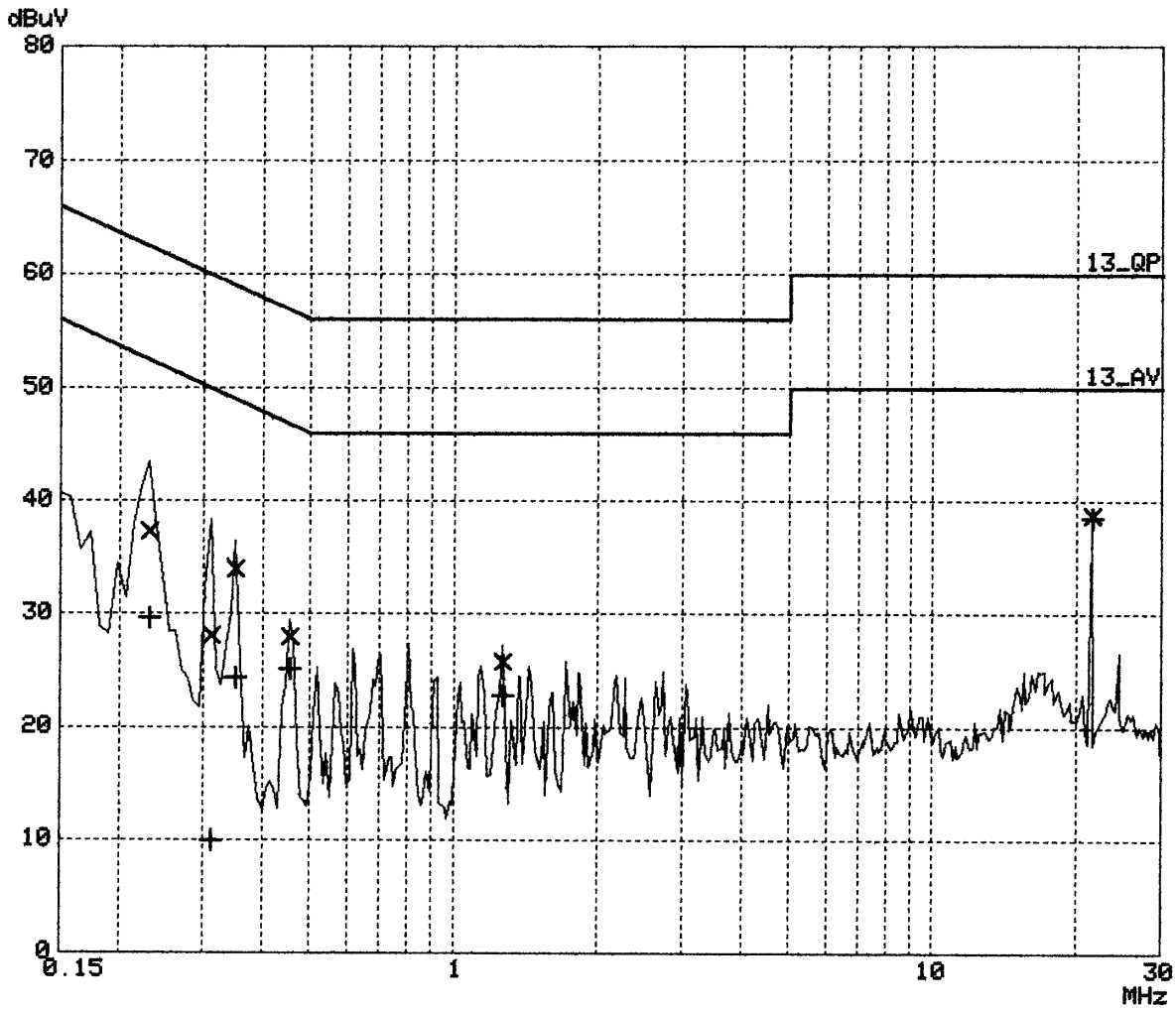
Intertek Testing Services
RF VOLTAGE

EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-N
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at high channel
Date: 11. Feb 03 11:09

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	8k	9k	PK	20ms	AUTO	LN OFF

Final Measurement: x QP / + AV
Meas Time: 1 s



Intertek Testing Services
RF VOLTAGE

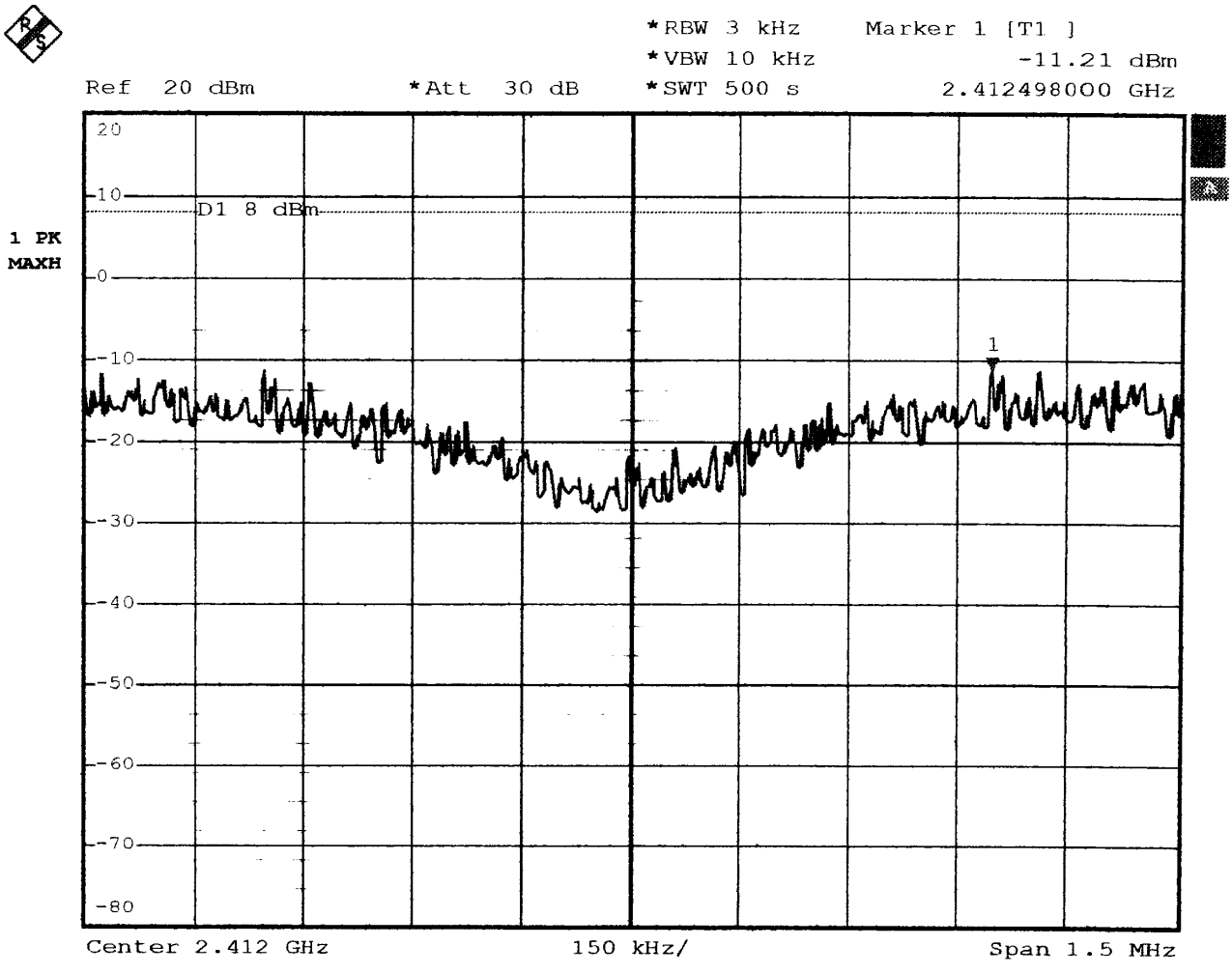
EUT: ZyAIR B-120
Manuf: ZyXEL Communications Corp.
Op Cond: AMN-N
Operator: kaysi
Test Spec: FCC Class B
Comment: EMI RCV:825788/015
120V 60Hz 22'c 60%RH tx at high channel
Date: 11. Feb 03 11:09

Final Measurement Results:

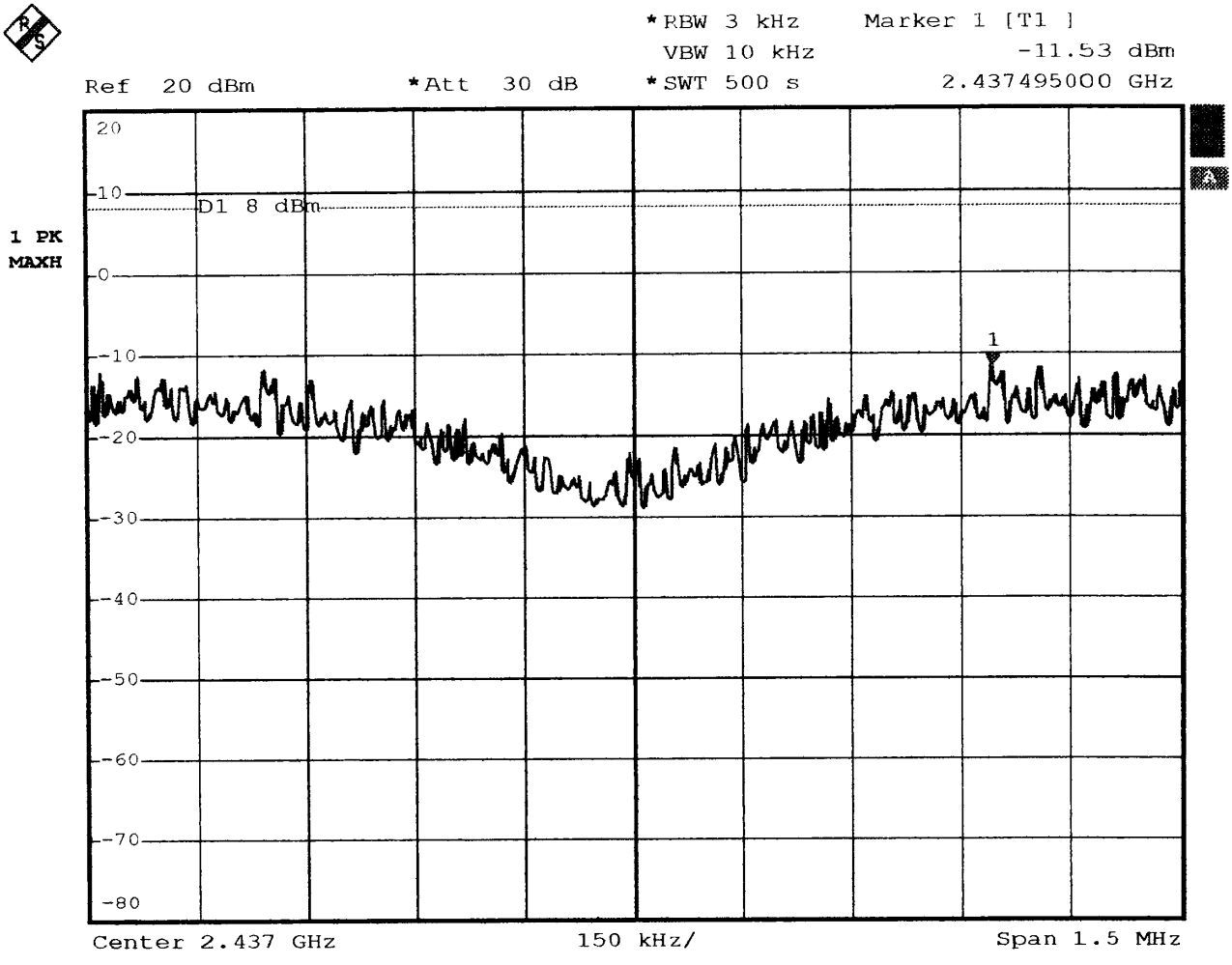
Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.23000	37.3	-25.1	N	gnd
0.31000	28.1	-31.9	N	gnd
0.35000	34.0	-25.0	N	gnd
0.45400	28.1	-28.7	N	gnd
1.26200	25.8	-30.1	N	gnd
21.50200	38.7	-21.2	N	gnd

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.23000	29.7	-22.7	N	gnd
0.31000	10.0	-40.0	N	gnd
0.35000	24.4	-24.6	N	gnd
0.45400	25.1	-21.7	N	gnd
1.26200	22.8	-23.1	N	gnd
21.50200	38.6	-11.3	N	gnd

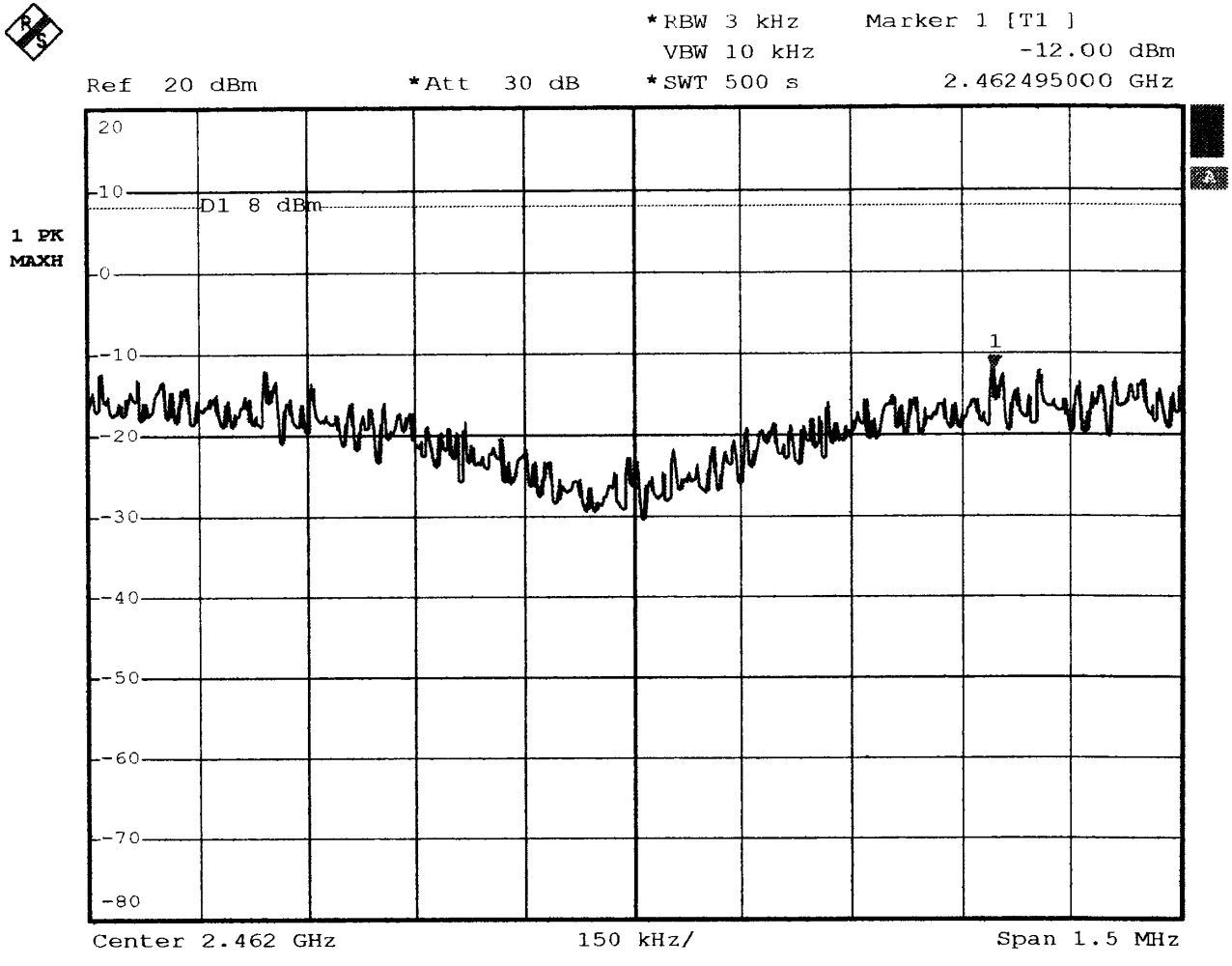
* limit exceeded



Comment A: Power spectrum density at low channel
ATT=3dB CL=2dB
Date: 8.FEB.2003 10:55:21



Comment A: Power spectrum density at middle channele\Rohde&Schwarz\FSE
ATT=3dB CL=2dB
Date: 6.FEB.2003 16:31:05



Comment A: Power spectrum density at high channelJ{
ATT=3dB CL=2dB
Date: 6.FEB.2003 16:28:26