



FCC TEST REPORT

REPORT NO.: RF900719R01

MODEL NO.: WR-2201, EW-2100, EW-2101, WA-601,
WA-2201, Wireless Router

RECEIVED: July 19, 2001

TESTED: July 12 ~ July 31, 2001

APPLICANT: ARGUS TECHNOLOGIES CO., LTD.

ADDRESS: 8F, No. 183, Kang Chien RD., Nei-Hu District,
Taipei, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Ling, Chia Pau Tsuen, Linkou Hsiang,
Taipei, Taiwan, R.O.C.

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0528



Lab Code: 200102-0



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1 CERTIFICATION

PRODUCT : Wireless Router
BRAND NAME : ARGUS
MODEL NO. : WR-2201, EW-2100, EW-2101,
WA-601, WA-2201, Wireless Router
APPLICANT : ARGUS TECHNOLOGIES CO., LTD.
STANDARDS : 47 CFR Part 15, Subpart C (Section 15.247),
ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from July 12, 2001 to July 31, 2001. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

TESTED BY: Gary Chang, **DATE:** Aug 7, 2001
Gary Chang

CHECKED BY: Demi Chen, **DATE:** Aug 7, 2001
Demi Chen

APPROVED BY: Alan Lane, **DATE:** Aug 7, 2001
Dr. Alan Lane
Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	REMARK
15.107	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is -5.66dBuV at 0.81778MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -2.7dBuV at 150.10 MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Router
MODEL NO.	WR-2201, EW-2100, EW-2101, WA-601, WA-2201, Wireless Router
POWER SUPPLY	5VDC from AC adapter
MODULATION TYPE	DSSS
RADIO TECHNOLOGY	BPSK/QPSK/CCK
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	14dBm
ANTENNA TYPE	dipole antenna
POWER CABLE	NA
I/O PORTS	WAN port, Serial port, LAN port
ASSOCIATED DEVICES	NA

NOTE:

1.The EUT is operated with the following power adapter.

Product:	AC/DC Adapter
Brand Name:	Touch
Model No. :	SP9715-A
Input Power :	100-240V, 0.6A, 20-60Hz
Output Power :	DC 5V, 2.0A

2.This EUT is a breakthrough for SOHO users who need to share a high speed broadband Internet connection to the Internet. The high-powered antenna design assures its wireless connection even in large building.

3.For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

NOTE: 1. Below 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless Router. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.247)
ANSI C63.4 : 1992

All tests have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Personal Computer	IBM	2187-12W	1S218714ABNA000V	FCC DoC APPROVED
2	21" COLOR MONITOR	HP	D2846	JP92233133	FCC DoC APPROVED
3	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110111	F4ZDA-104G
4	MOUSE	LOGITECH	M-S43	LZE00703207	DZL211106
5	PRINTER	HP	2225C+	3123S97230	DSI6XU2225
6	MODEM	ACEEX	1414	980020510	IFAXDM1414
7	NOTEBOOK	DELL	Inspiron 5000e	TW-012JXN-12961-0BP-2192	FCC DoC APPROVED
8	LAN CARD	3COM	3CLFE575CT-D	6ZE1316B4E	FCC DoC APPROVED

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
3	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
4	1.8 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
5	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
6	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
7	NA
8	NA

NOTE: All power cords of the above support units are non shielded (1.8m).



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.45 – 30	48	-

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 4, 2002
*ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 3, 2002
ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 28, 2001
ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 3, 2001
*EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	July 3, 2002
*Software	Cond-V2J	NA	NA
*RF cable (JYEBAO)	RG-58A/U	Cable-C02.01	July 9, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2002
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	NA

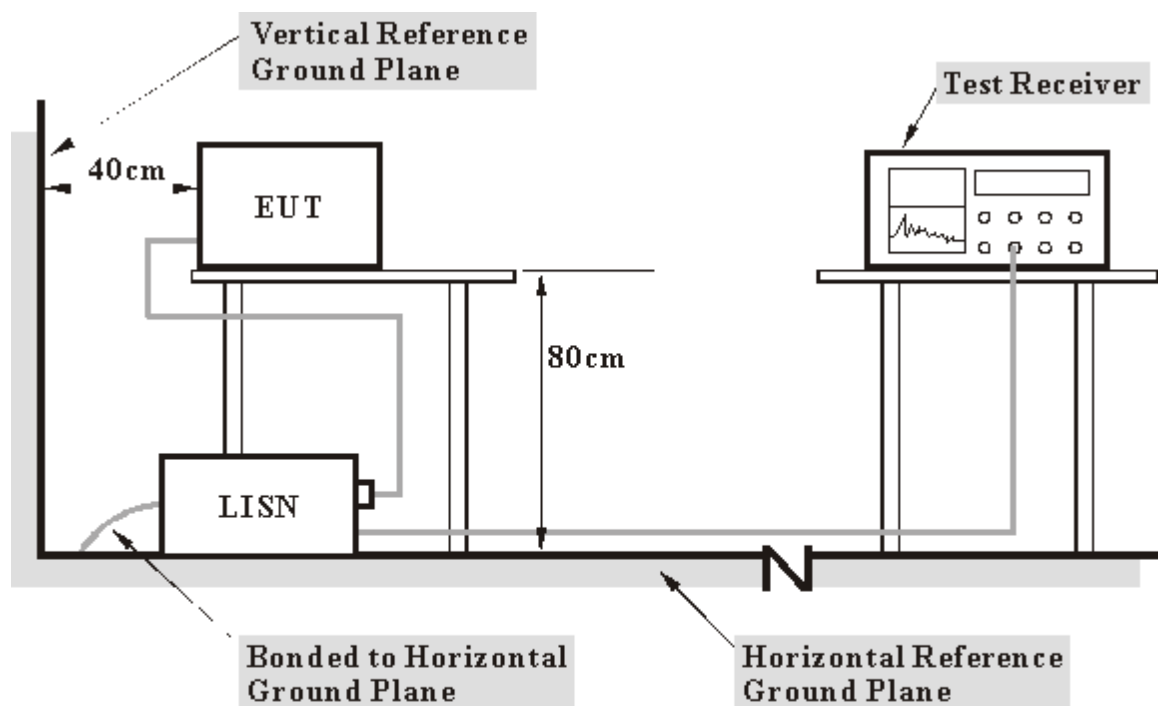
NOTE:

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.
3. “*” = These equipments are used for the final measurement.

4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 450 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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



4.1.5 EUT OPERATING CONDITIONS

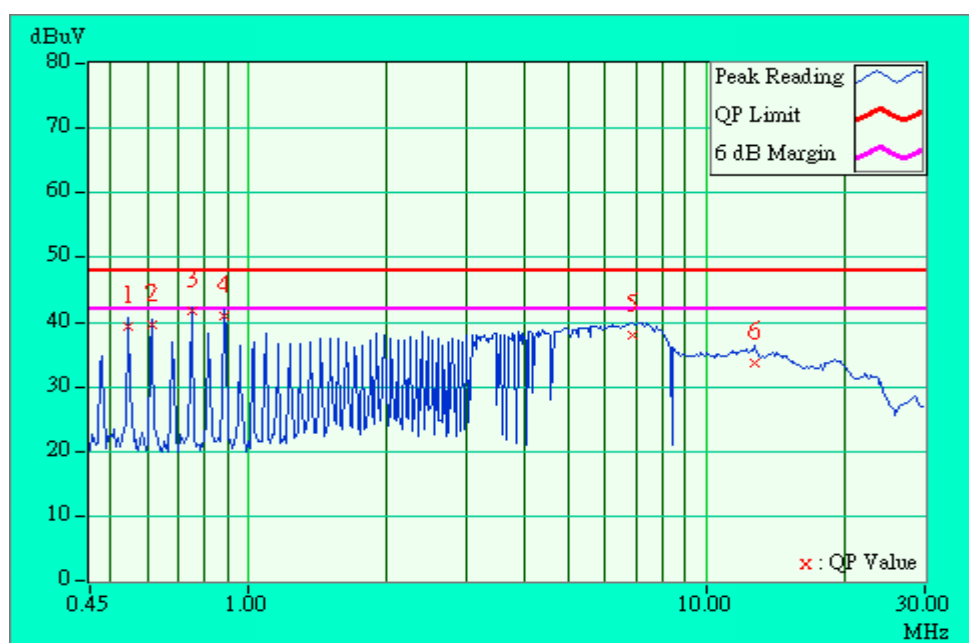
- a. Placed the EUT (with a computer system) on the testing table.
- b. The computer system sent data to EUT by command "PIN" via an RJ 45 cable.
- c. The computer system sent "H" messages to Color Monitor and Monitor displayed "H" patterns on its screen.
- d. The computer system sent "H" messages to modem.
- e. The computer system sent "H" messages to printer, and the printer prints them on paper.
- f. Prepared another computer system to act as a communication partner and placed it outside of testing area.
- g. The communication partner run a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency via an RJ 45 cable.
- h. The communication partner sent data to EUT by command "PIN".

4.1.6 TEST RESULTS

EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.54724	0.10	39.33	-	39.43	-	48.00	-	-8.57	-
2	0.61328	0.10	39.71	-	39.81	-	48.00	-	-8.19	-
3	0.75051	0.10	41.75	-	41.85	-	48.00	-	-6.15	-
4	0.88482	0.10	41.00	-	41.10	-	48.00	-	-6.90	-
5	6.89345	0.30	38.01	-	38.31	-	48.00	-	-9.69	-
6	12.76827	0.60	33.73	-	34.33	-	48.00	-	-13.67	-

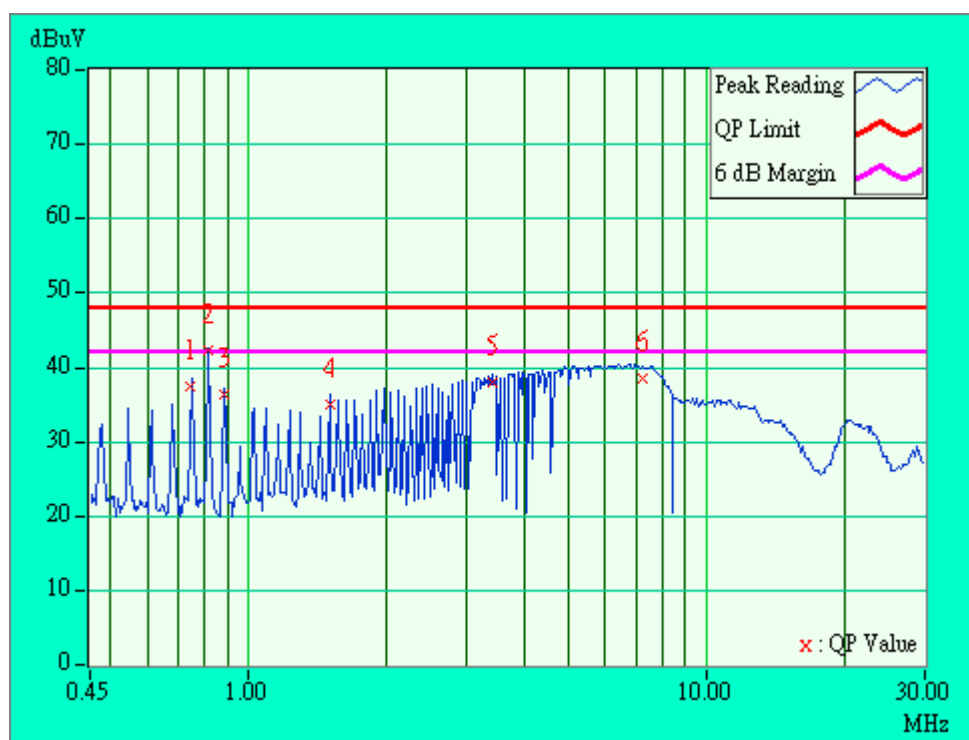
- Remarks:
1. "***": Undetectable
 2. QP. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": NA
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.74821	0.10	37.39	-	37.49	-	48.00	-	-10.51	-
2	0.81778	0.10	42.24	-	42.34	-	48.00	-	-5.66	-
3	0.88500	0.10	36.47	-	36.57	-	48.00	-	-11.43	-
4	1.50000	0.10	35.00	-	35.10	-	48.00	-	-12.90	-
5	3.41206	0.15	38.01	-	38.16	-	48.00	-	-9.84	-
6	7.23364	0.25	38.65	-	38.90	-	48.00	-	-9.10	-

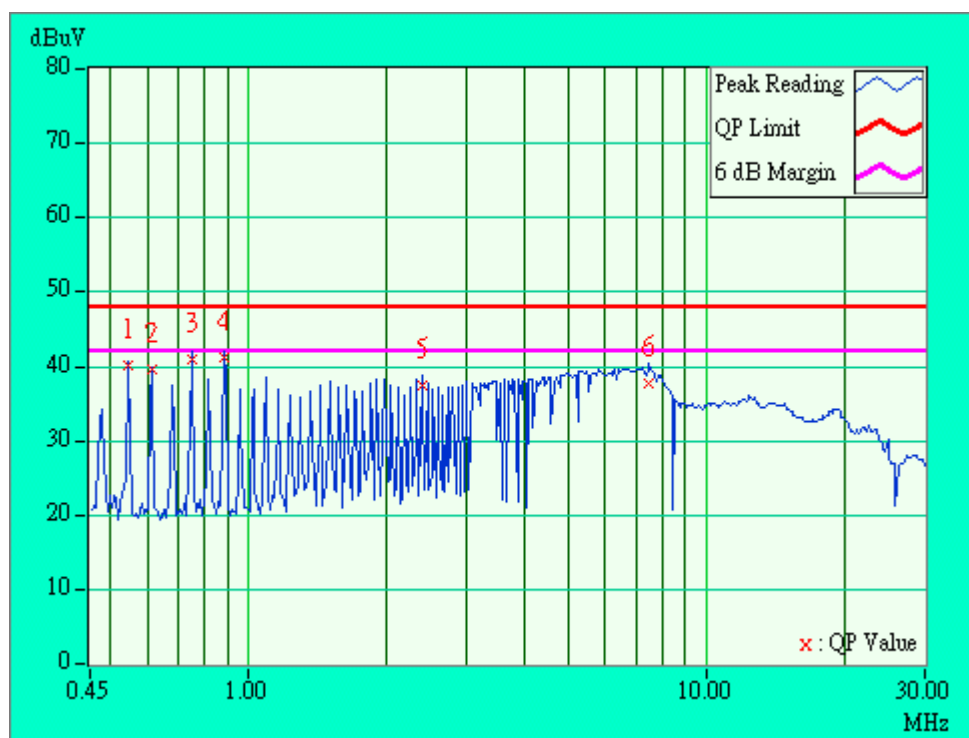
- Remarks:
1. "": Undetectable
 2. QP. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": NA
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.54468	0.10	40.07	-	40.17	-	48.00	-	-7.83	-
2	0.61450	0.10	39.61	-	39.71	-	48.00	-	-8.29	-
3	0.75253	0.10	40.96	-	41.06	-	48.00	-	-6.94	-
4	0.88520	0.10	41.14	-	41.24	-	48.00	-	-6.76	-
5	2.38927	0.10	37.37	-	37.47	-	48.00	-	-10.53	-
6	7.50914	0.30	37.67	-	37.97	-	48.00	-	-10.03	-

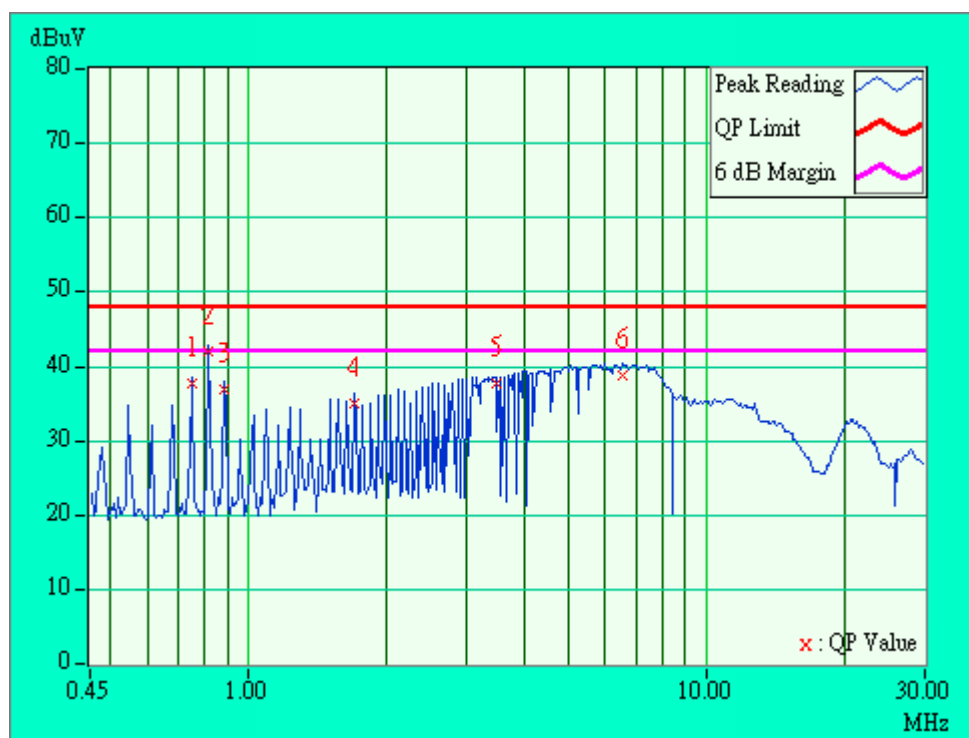
- Remarks:
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 2. QP. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": NA
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.75128	0.10	37.80	-	37.90	-	48.00	-	-10.10	-
2	0.81774	0.10	42.08	-	42.18	-	48.00	-	-5.82	-
3	0.88800	0.10	36.81	-	36.91	-	48.00	-	-11.09	-
4	1.70789	0.10	35.04	-	35.14	-	48.00	-	-12.86	-
5	3.48429	0.15	37.71	-	37.86	-	48.00	-	-10.14	-
6	6.55395	0.25	38.69	-	38.94	-	48.00	-	-9.06	-

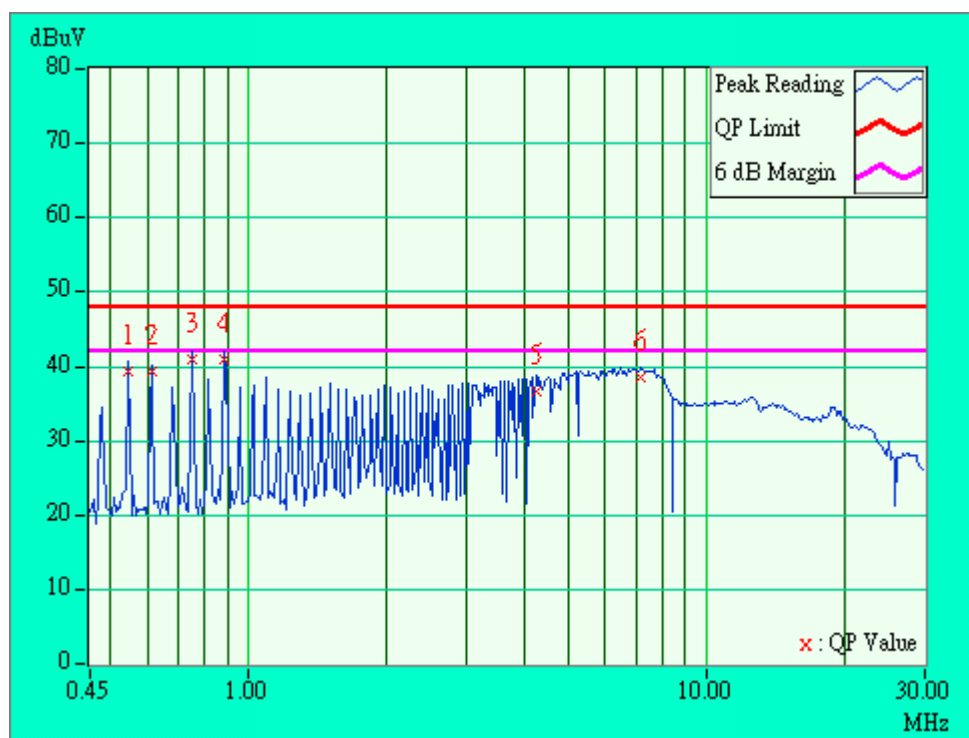
- Remarks:
1. "": Undetectable
 2. QP. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": NA
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 11	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.54347	0.10	39.37	-	39.47	-	48.00	-	-8.53	-
2	0.61200	0.10	39.21	-	39.31	-	48.00	-	-8.69	-
3	0.75258	0.10	41.06	-	41.16	-	48.00	-	-6.84	-
4	0.88500	0.10	40.92	-	41.02	-	48.00	-	-6.98	-
5	4.23555	0.20	36.54	-	36.74	-	48.00	-	-11.26	-
6	7.17200	0.21	38.46	-	38.67	-	48.00	-	-9.33	-

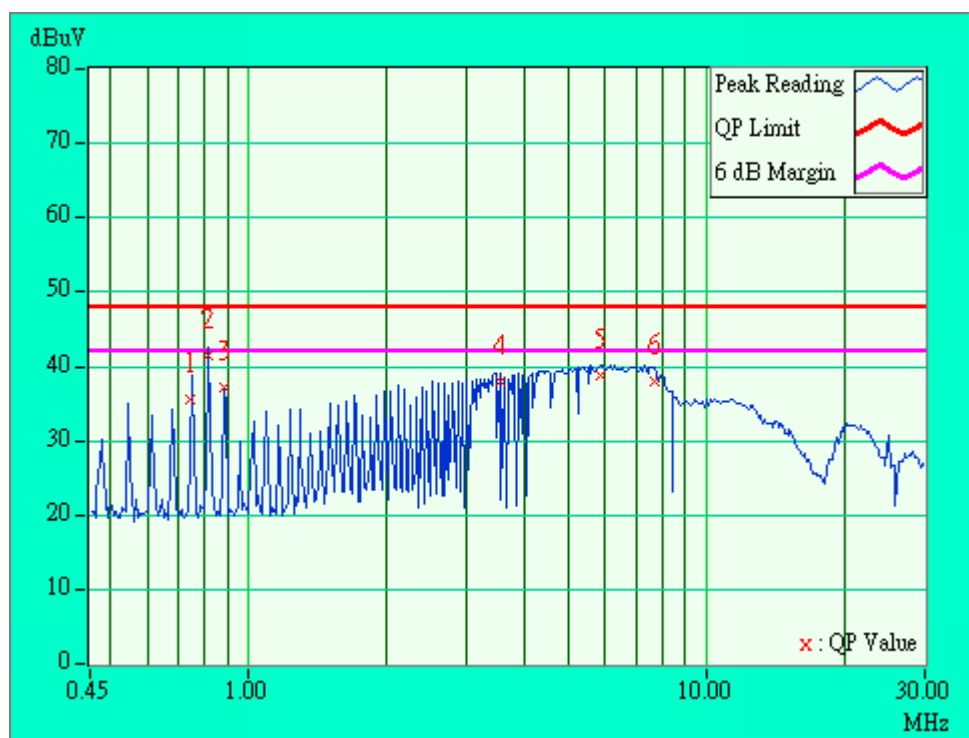
- Remarks:
1. "": Undetectable
 2. QP. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": NA
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.



EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 11	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.74727	0.10	35.52	-	35.62	-	48.00	-	-12.38	-
2	0.81649	0.10	41.41	-	41.51	-	48.00	-	-6.49	-
3	0.88627	0.10	37.13	-	37.23	-	48.00	-	-10.77	-
4	3.55073	0.15	37.94	-	38.09	-	48.00	-	-9.91	-
5	5.87173	0.20	38.71	-	38.91	-	48.00	-	-9.09	-
6	7.71672	0.20	37.86	-	38.06	-	48.00	-	-9.94	-

- Remarks:
1. "": Undetectable
 2. QP. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": NA
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*HP Spectrum Analyzer	8590L	3544A01176	May 7, 2002
*HP Preamplifier	8447D	2944A08485	Nov. 3, 2001
*HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
*HP Preamplifier	8449B	3008A01292	Aug. 21, 2001
*ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
*CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2002
*CHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 6, 2002
*EMCO Horn Antenna	3115	9312-4192	April 15, 2002
*EMCO Turn Table	1060	1115	NA
*SHOSHIN Tower	AP-4701	A6Y005	NA
*Software	AS61D4	NA	NA
*ANRITSU RF Switches	MP59B	M35046	Aug. 2, 2002
*TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 2, 2002
* Antenna (Horn)	BBHA9120-D	D130	July 10, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
Site Registration No.	FCC: 90422 VCCI : R-1039 Canada IC: IC 3789-5		

NOTE: 1.The measurement uncertainty is less than +/- 3.0dB, 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.

3. "*" = These equipments are used for the final measurement.



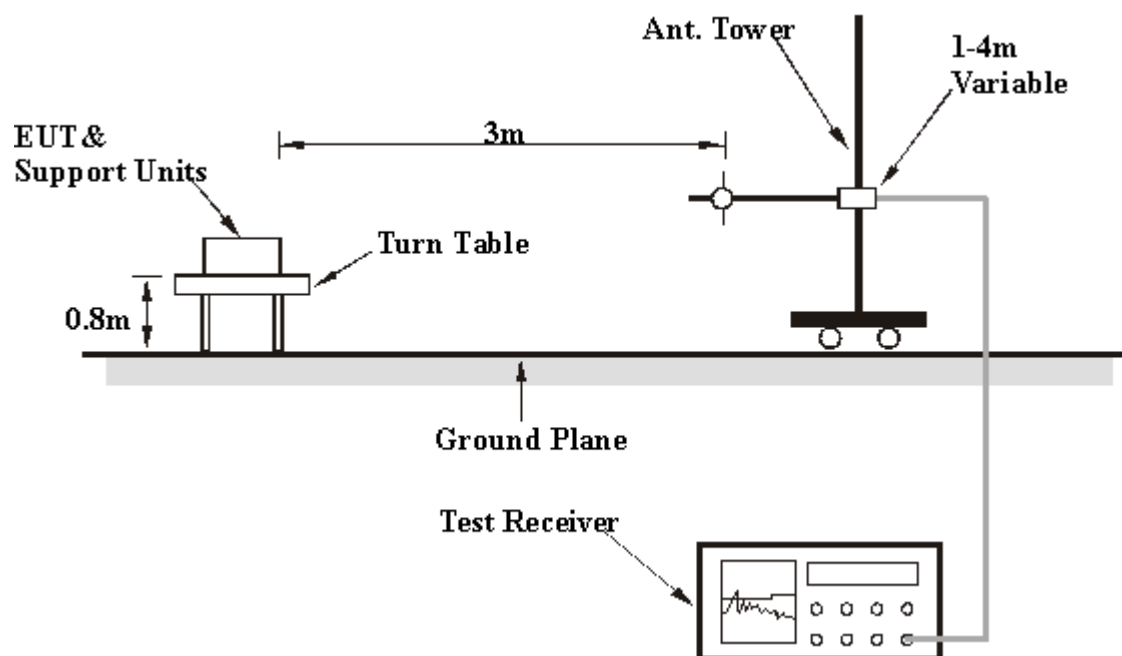
4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 TEST SETUP



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

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5.

4.2.6 TEST RESULTS

EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 11	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	150.47	40.0 QP	43.50	-3.50	2.18H	94	27.62	9.83	2.59	0.00	-12.43
2	200.75	29.9 QP	43.50	-13.60	1.87H	203	18.70	8.41	2.79	0.00	-11.20
3	350.14	33.7 QP	46.00	-12.30	1.97H	301	16.50	13.80	3.37	0.00	-17.17
4	400.47	36.7 QP	46.00	-9.30	1.59H	123	17.90	15.36	3.46	0.00	-18.83
5	500.04	40.0 QP	46.00	-6.00	1.49H	328	19.40	16.96	3.68	0.00	-20.65
6	550.03	39.5 QP	46.00	-6.50	1.18H	82	18.70	17.09	3.67	0.00	-20.76
7	650.47	39.2 QP	46.00	-6.80	1.67H	137	17.80	17.61	3.78	0.00	-21.41
8	748.53	38.4 QP	46.00	-7.60	1.79H	226	15.40	18.80	4.21	0.00	-23.03
9	750.15	38.2 QP	46.00	-7.80	1.75H	59	15.20	18.82	4.22	0.00	-23.04
10	800.05	40.5 QP	46.00	-5.50	1.35H	284	17.20	19.17	4.08	0.00	-23.26
11	850.00	39.5 QP	46.00	-6.50	1.58H	299	15.70	19.75	4.10	0.00	-23.86
12	900.14	39.1 QP	46.00	-6.90	1.37H	318	14.70	19.57	4.82	0.00	-24.39

- NOTE:**
- 1 Emission level = Raw Value - Correction Factor
 - 2 Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 - 3 The other emission levels were very low against the limit.
 - 4 Margin value = Emission level - Limit value



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	150.10	40.8 QP	43.50	-2.70	1.00V	268	28.41	9.83	2.59	0.00	-12.43
2	200.53	34.9 QP	43.50	-8.60	1.03V	282	23.70	8.41	2.79	0.00	-11.20
3	250.40	35.1 QP	46.00	-10.90	1.00V	55	20.70	11.50	2.89	0.00	-14.39
4	399.98	34.6 QP	46.00	-11.40	2.15V	321	15.80	15.36	3.46	0.00	-18.82
5	500.07	42.4 QP	46.00	-3.60	1.85V	6	21.80	16.96	3.68	0.00	-20.64
6	550.14	41.2 QP	46.00	-4.80	1.24V	266	20.40	17.09	3.67	0.00	-20.76
7	599.89	35.9 QP	46.00	-10.10	1.43V	194	14.70	17.72	3.53	0.00	-21.25
8	649.57	36.8 QP	46.00	-9.20	1.01V	244	15.40	17.60	3.77	0.00	-21.39
9	748.50	38.4 QP	46.00	-7.60	1.01V	342	15.40	18.80	4.21	0.00	-23.02
10	750.02	37.7 QP	46.00	-8.30	1.95V	26	14.70	18.82	4.22	0.00	-23.04

- NOTE:**
- 1 Emission level = Raw Value - Correction Factor
 - 2 Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 - 3 The other emission levels were very low against the limit.
 - 4 Margin value = Emission level - Limit value



EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 1	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2037.5	49.6 PK	74.00	-24.40	1.15H	338	18.70	27.57	3.29	0.00	-30.86
2	*2413.7	93.7 PK	-	-	1.72H	349	61.71	28.33	3.62	0.00	-31.96
3	*2413.7	86.2 AV	-	-	1.72H	349	54.20	28.33	3.62	0.00	-31.96
4	4075.8	51.5 PK	74.00	-22.50	1.10H	319	14.34	32.40	4.77	0.00	-37.17
5	4825.1	52.0 PK	74.00	-22.00	1.22H	62	13.80	32.99	5.21	0.00	-38.21

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2037.5	49.6 PK	74.00	-24.40	1.03V	338	18.76	27.57	3.29	0.00	-30.86
2	*2413.5	99.5 PK	-	-	1.61V	25	67.54	28.33	3.62	0.00	-31.95.
3	*2413.5	94.4 AV	-	-	1.61V	25	62.40	28.33	3.62	0.00	-31.95.
4	4074.2	51.7 PK	74.00	-22.30	1.23V	71	14.57	32.40	4.77	0.00	-37.18
5	4825.7	52.4 PK	74.00	-21.60	1.10V	309	14.20	32.99	5.21	0.00	-38.20

- NOTE:**
1. Emission level = Raw Value - Correction Factor
 2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency



EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 6	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2063.5	48.9 PK	74.00	-25.10	1.39H	27	17.95	27.61	3.31	0.00	-30.92
2	*2438.0	91.9 PK	-	-	2.12H	313	59.90	28.38	3.64	0.00	-32.02
3	*2438.0	84.3 AV	-	-	2.12H	313	52.31	28.38	3.64	0.00	-32.02
4	4126.5	52.6 PK	74.00	-21.40	1.28H	206	15.40	32.40	4.79	0.00	-37.19
5	4874.1	52.4 PK	74.00	-21.60	1.28H	184	14.04	33.07	5.25	0.00	-38.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2062.9	48.9 PK	74.00	-25.10	1.47V	348	18.02	27.61	3.31	0.00	-30.92
2	*2435.5	98.1 PK	-	-	1.60V	66	66.05	28.38	3.64	0.00	-32.02
3	*2435.5	89.1 AV	-	-	1.60V	66	57.10	28.38	3.64	0.00	-32.02
4	4126.5	51.3 PK	74.00	-22.70	1.20V	42	14.16	32.40	4.79	0.00	-37.19
5	4874.0	52.6 PK	74.00	-21.40	1.11V	188	14.29	33.07	5.25	0.00	-38.31

- NOTE:**
1. Emission level = Raw Value - Correction Factor
 2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency



EUT	Wireless Router	MODEL	EW-2101
MODE	Channel 11	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2088.7	47.9 PK	74.00	-26.10	1.34H	210	16.87	27.66	3.33	0.00	-30.99
2	*2463.1	91.8 PK	-	-	1.57H	320	59.69	28.42	3.66	0.00	-32.09
3	*2463.1	84.8 AV	-	-	1.57H	320	52.70	28.42	3.66	0.00	-32.09
4	2485.7	48.4 PK	74.00	-25.60	1.55H	185	16.22	28.47	3.68	0.00	-32.15
5	4176.4	51.3 PK	74.00	-22.70	1.18H	13	14.09	32.40	4.81	0.00	-37.22
6	4924.7	53.2 PK	74.00	-20.80	1.28H	335	14.80	33.15	5.28	0.00	-38.43

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2088.0	50.0 PK	74.00	-24.00	1.41V	127	19.01	27.66	3.33	0.00	-30.99
2	*2463.8	101.1 PK	-	-	1.43V	90	69.04	28.42	3.66	0.00	-32.08.
4	*2463.8	94.1 AV	-	-	1.43V	90	62.02	28.42	3.66	0.00	-32.08.
3	2484.5	55.0 PK	74.00	-19.00	1.37V	132	22.90	28.47	3.68	0.00	-32.15.
6	2484.5	40.1 AV	54.00	-13.90	1.37V	132	7.94	28.47	3.68	0.00	-32.15
5	4175.5	53.1 PK	74.00	-20.90	1.19V	357	15.86	32.40	4.81	0.00	-37.21
7	4924.1	53.7 PK	74.00	-20.30	1.23V	75	15.31	33.15	5.28	0.00	-38.43

- NOTE:**
1. Emission level= Raw Value - Correction Factor
 2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency



4.3 6DB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

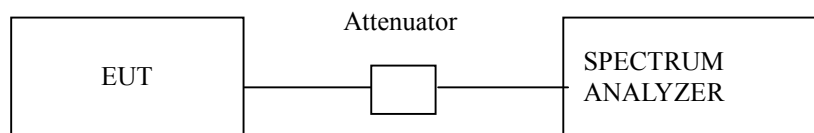
Notes:

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.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

4.3.4 TEST SETUP



4.3.5 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

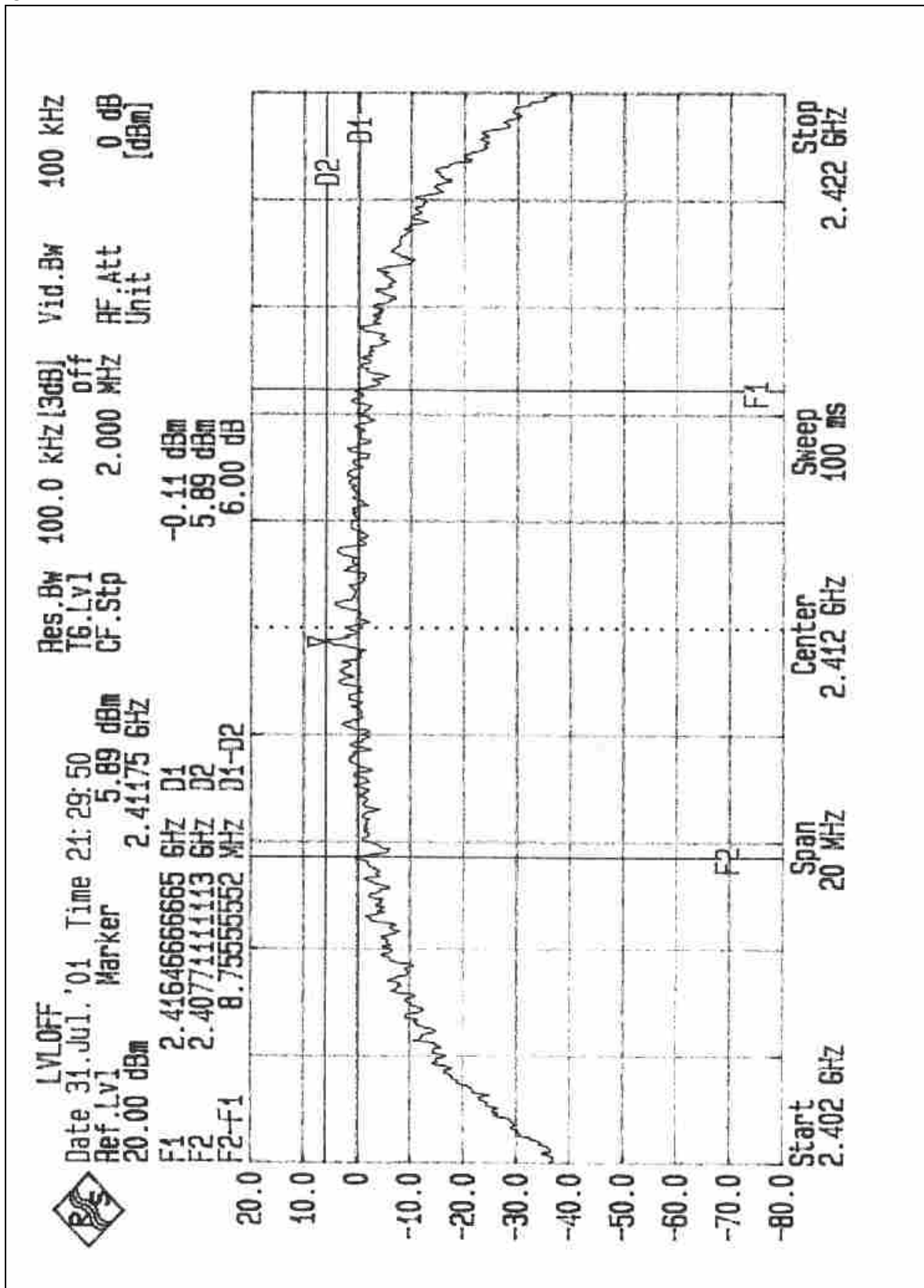


4.3.6 TEST RESULTS

EUT	Wireless Router	MODEL	EW-2101
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27 deg. C, 75%RH, 1005 hPa
TESTED BY: Gary Chang			

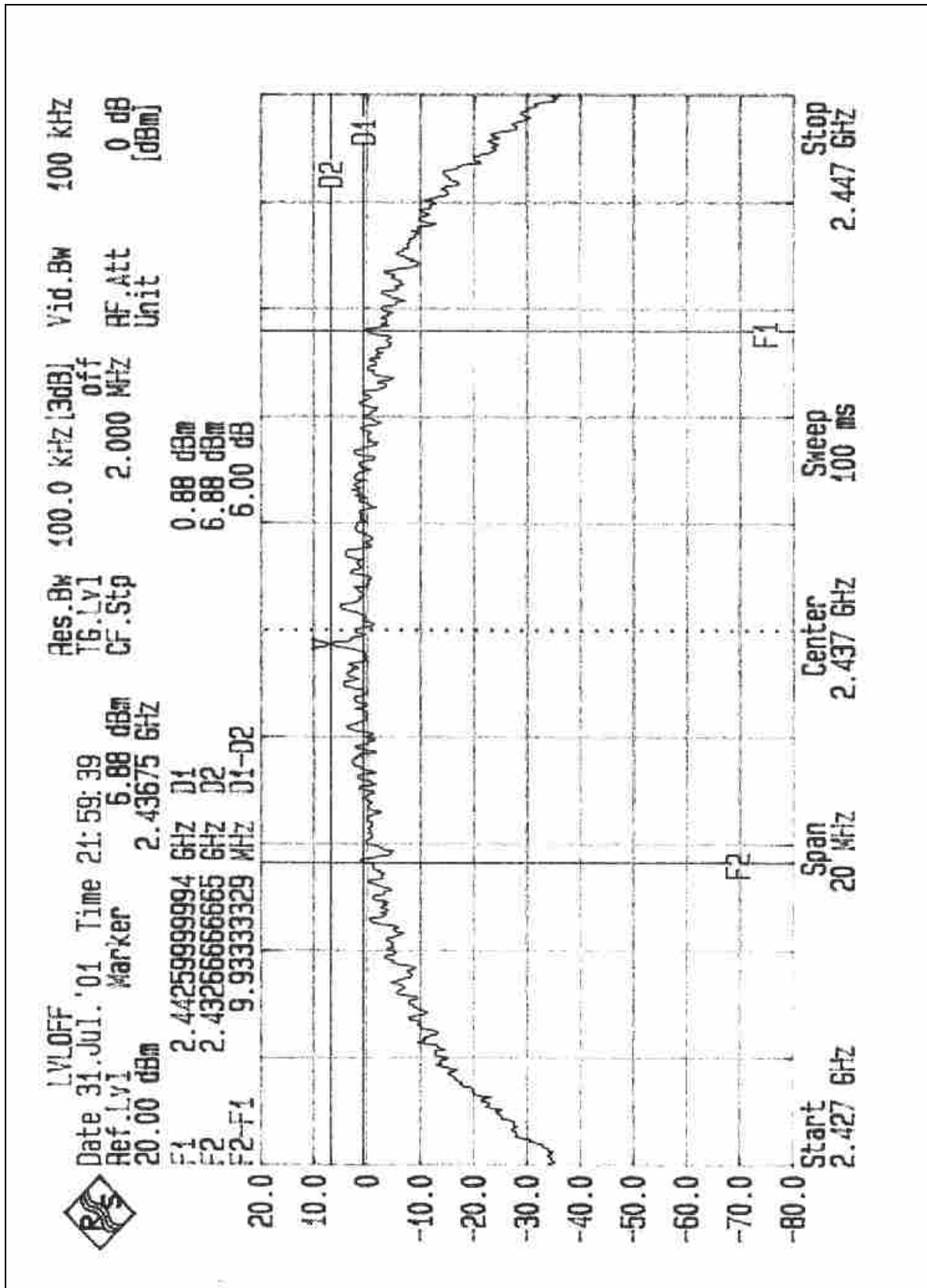
CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	8.76	0.5	PASS
6	2437	9.93	0.5	PASS
11	2462	8.80	0.5	PASS

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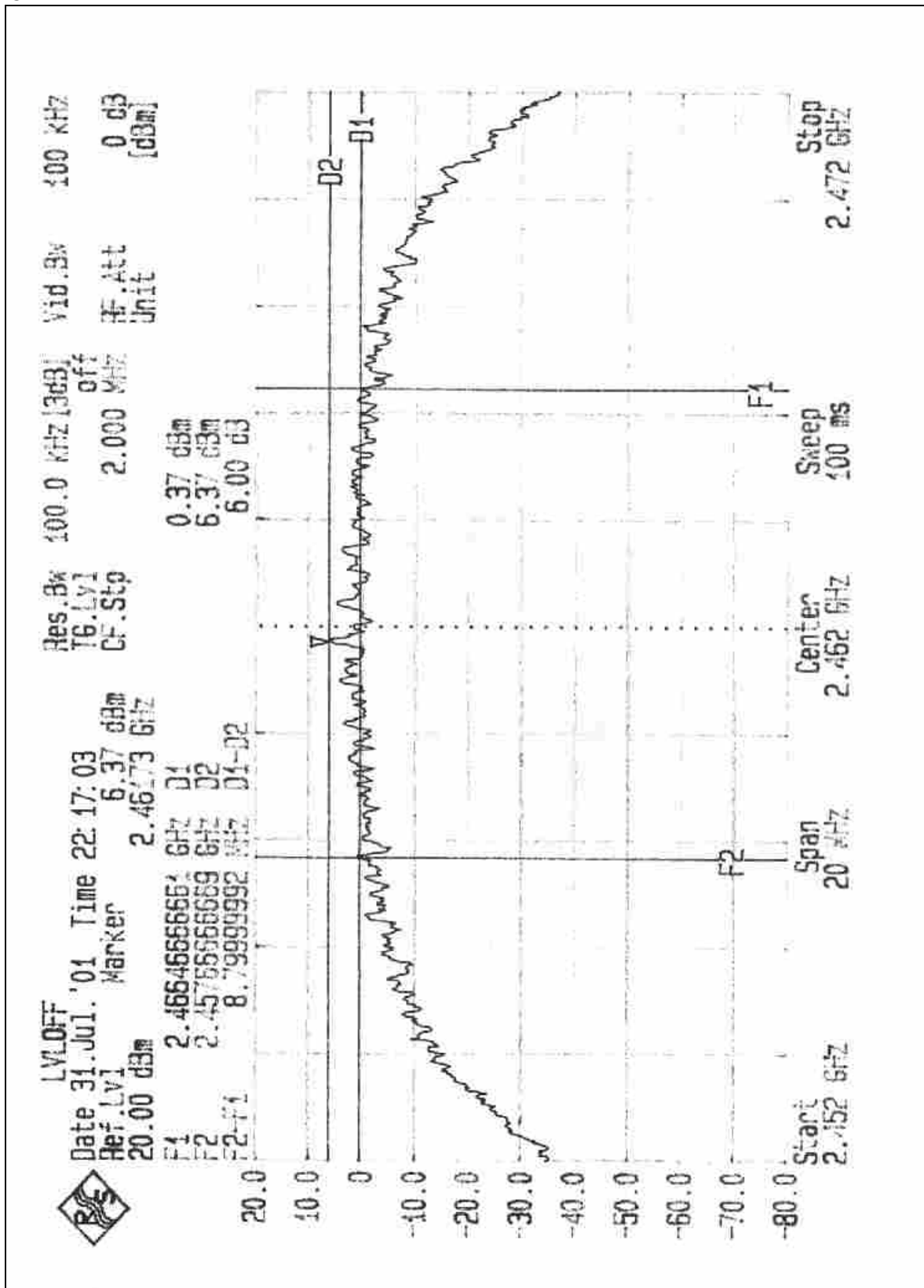




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4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

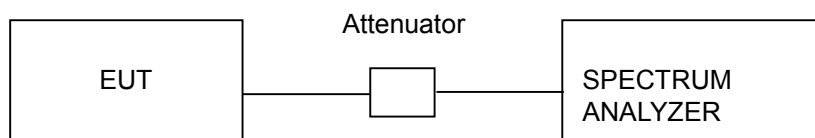
- NOTE:** 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. The center frequency of the spectrum analyzer was set to the fundamental frequency and using 3 MHz RBW and 3 MHz VBW.
3. The span of the spectrum analyzer was larger than 6dB BandWidth plus 10MHz.
4. Used Peak Search to read the peak power after Maximum Hold function is activated.
5. Shifted the marker to +/- 3MHz and +/-6MHz, and recorded the reading.
6. The Maximum Peak Output Power is the linear summation of the five readings in 4 and 5.

NOTE: This measurement is the total power of 12MHz bandwidth which is far more wider than 6dB bandwidth.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 3.4.5



4.4.6 TEST RESULTS

EUT	Wireless Router	MODEL	EW-2101
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27 deg. C, 75%RH, 1005 hPa
TESTED BY: Gary Chang			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.99	30	PASS
6	2437	18.57	30	PASS
11	2462	18.19	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
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

NOTE:1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

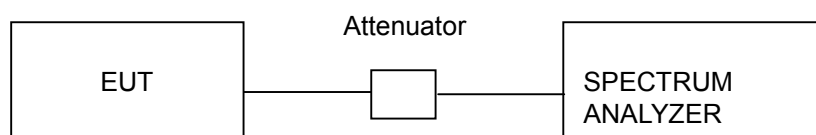
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

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/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITION

Same as Item 3.4.5



4.5.6 TEST RESULTS

EUT	Wireless Router	MODEL	EW-2101
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	27 deg. C, 75%RH, 1005 hPa
TESTED BY: Gary Chang			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-11.15	8	PASS
6	2437	-9.83	8	PASS
11	2462	-10.54	8	PASS

LVLOFF
 Date 31.Jul.'01 Time 21:49:28
 Ref.Lvl Marker -11.15 dBm
 20.00 dBm 2.4119802 GHz

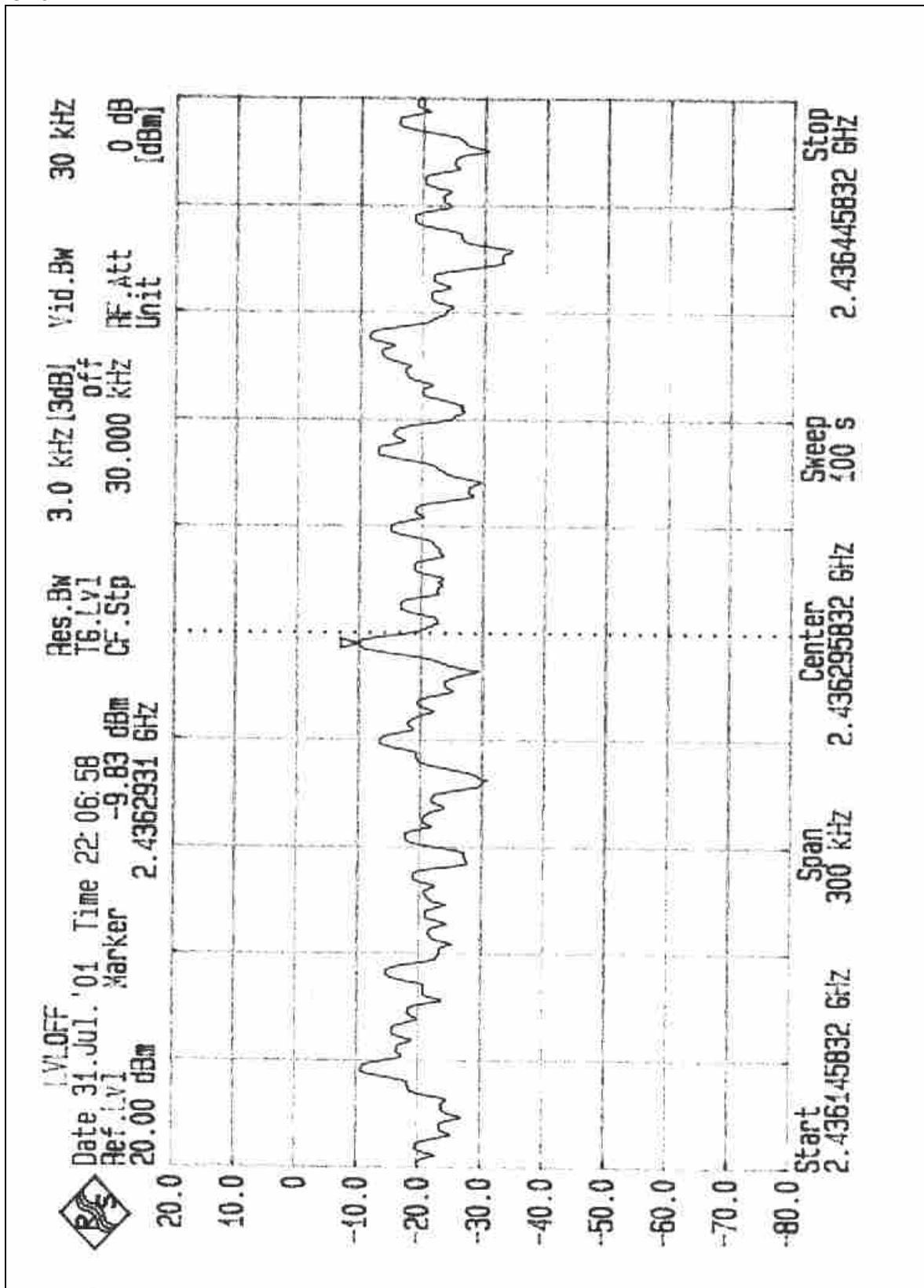
Res.Bw 3.0 kHz [3dB] off
 TG.Lvl CF.Stp
 Vid.Bw 30 kHz
 RF:Att 0 dB
 Unit [dBm]

Start 2.411836267 GHz
 Span 300 kHz
 Center 2.411986267 GHz
 Sweep 100 s
 Stop 2.412136267 GHz

The plot shows a noisy signal centered at 2.411986267 GHz. The y-axis represents power in dBm, ranging from -80.0 to 20.0. The x-axis represents frequency in GHz, ranging from 2.411836267 to 2.412136267. The signal is centered around -11.15 dBm.



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