TEST REPORT

Report Number: 3071732-001
Project Number: 3071732

Evaluation of the Lexmark MarkNet N8050
Model Number: 4034-850
Dell 5210 / 5310 Wireless Option model number 4034-d50

FCC ID: *IYLN8050*

Industry Canada ID: *2376A-N8050*

Tested to the Criteria in
FCC Part 15 Subpart C (15.247)
ICES-003 and RSS-210 Issue 5

For

Lexmark International

Test Performed by:	Test Authorized by:
Intertek	Lexmark International
731 Enterprise Drive	740 West New Circle Road
Lexington, KY 40510	Lexington, KY 40550

Prepared By:_____ **Date:**____4/7/2005_____

Jason Centers, Project Engineer

Approved By:_____ **Date:**____4/7/2005_____

Bryan C. Taylor, EMC Team Leader

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1 JOB DESCRIPTION

1.1 Test Sample Information

The 4034-850 is an 802.11b and g wireless print server. It allows the printer it is installed in to be shared on a wireless network without the use of CAT5, USB, or Serial connections. It is sold as an option on some printer models.

This product is also marketed by Dell under the name "Dell 5210 / 5310 Wireless Option model number 4034-d50". Since both products are identical other than the name, all results in this report pertain to both products.

Company Information	
Manufacturer:	Lexmark International
Address:	740 West New Circle Road Lexington KY 40550
Contact Name:	Paul Ramey
Telephone Number:	(859)-825-4469
Fax Number:	(859)-232-7345
Email Address:	pramey@lexmark.com

Test sample		
Lexmark Model Number:	4034-850	
Dell Model Number	Dell 5210 / 5310 Wireless Option model number 4034-d50	
Serial Number:	Not Labled	
FCC ID:	IYLN8050	
Industry Canada ID:	2376A-N8050	
Device Category:	Mobile	
RF Exposure Category:	General Population/Uncontrolled Environment	
Transmission Modes:	**802.11b**	**802.11g**
Frequency Range, MHz:	2412MHz – 2462MHz	2412MHz – 2462MHz
Type of Transmission:	QPSK, BSK, CCK	BPSK, QPSK, 16QAM, 64QAM
Maximum Peak Conducted Output Power:	20.47dBm	20.86dBm
Antenna Type:	Nearson Model S152AH-2450S-X with 90 Degree Swivel Joint	
Antenna Location:	External Back Side of Printer	
Antenna Gain:	4dBi	
Sample Receive Date:	3/21/2005	

Test Signal Mode	
Test Commands:	X
Base Station Simulator:	

1.1.1 System Support Equipment

Table 1-1 contains the details of the support equipment associated with the Equipment Under Test during the testing.

Table 1-1: System Support Equipment

Description	Manufacturer	Model Number
Laptop	Dell	PP01L
Laptop Power Supply	Dell	AA20031
Printer	Lexmark	T644

1.1.2 Cables associated with EUT

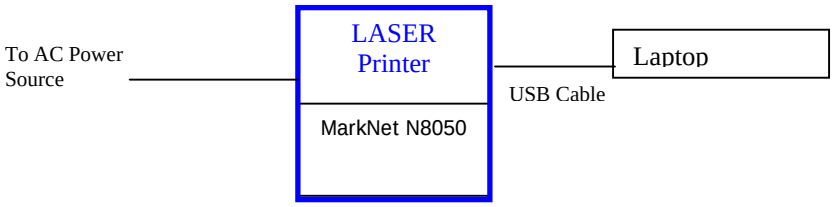
Table 1-2 contains the details of the cables associated with the EUT.

Table 1-2: Interconnecting cables between modules of EUT

Cables					
Description	Length	Shielding	Ferrites	Connection	
				From	To
USB Cable	5ft	Yes	Yes	USB Port	Laptop PC
AC Power Cord	5ft	None	None	AC Power Port on Printer	AC Power Source

1.1.3 System Block Diagram

The diagram shown below details the interconnection of the EUT and its accessories during the testing. The Laptop was used to configure force the MarkNet N8050 to transmit.



1.2 Justification

The EUT was evaluated in its normally installed configuration (installed in a printer). During the evaluation, the side panel of the printer was removed in order to allow easy access to the MarkNet N8050. Since this side panel is made of plastic, it absence was judged to have no effect on the results.

1.2.1 Mode(s) of operation

The MarkNet N8050 was powered by the AC to DC power converter contained in the printer. The printer itself was powered from 120VAC at 60Hz.

In order to force the MarkNet N8050 to transmit during the evaluation a Lexmark proprietary program was used to communicate with the printer via a usb cable. This software enabled the user to adjust the output power of the transmitter, change the transmission modulation scheme, and to select the transmit channel. During the evaluation the MarkNet N8050 was set to transmit at maximum output power which corresponded to a level setting of 120 on the control software.

1.3 Modifications required for compliance

No modifications were implemented by Intertek. All results in this report pertain to the un-modified sample provided to Intertek.

1.4 Related Submittal(s) Grants

None

2 EXECUTIVE SUMMARY

Testing performed for: Lexmark International

Equipment Under Test: 4034-850

Test Start Date: 3/21/2005

Test End Date: 3/24/2005

FCC RULE	IC RULE	DESCRIPTION OF TEST	RESULT	PAGE
§15.247(a)(b)(d)	RSS-210 §6.2.2(o)(b)	Conducted RF Power, 6dB Bandwidth, and Power Density	**Compliant**	11
§15.247(b)	RSS-210 §6.2.2(o)(b)	Radiated RF Power	**Compliant**	14
§15.247(b)(5)	RSS-102 §4.3	Maximum Permissible Exposure (MPE) Calculations	**Compliant**	15
§15.247(c)	RSS-210 §6.2.2(o)(e1)	Out of Band Emissions at Antenna Terminals	**Compliant**	17
c15.247(c) and §15.209(f)	RSS-210 §6.2.2(o)(e1)	Field Strength of Spurious Radiation (General Requirements and Restricted Band Requirements)	**Compliant**	18
§15.107, §15.207	ICES-003 §5.3	Power Line Conducted Emissions	**Compliant**	24
§15.109	ICES-003 §5.6	Receiver Spurious Emissions	**Compliant**	26

3 TEST FACILITY

The INTERTEK-Lexington is located at 731 Enterprise Drive, Lexington Kentucky, 40510. The radiated emission test site is a 10-meter semi-anechoic chamber. The chamber meets the characteristics of CISPR 16-1: 1993 and ANSI C63.4: 1992. For measurements, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters.

3.1 Test Equipment

Description	Manufacturer	Model Number	Serial Number	Calibration due date
RF Power Meter	Boonton	5232	13601	1/11/2006
Oscilloscope	Tektronix	TDS784D	B032780	9/15/2005
Signal Generator	Hewlett Packard	83620B	3614A00199	8/21/2005
Amplifier	Keltek	LR610-20	96637-05019	Verify at Time of Use
Environmental Chamber	Thermotron	SM-8C	32692	1/17/2006
EMI Receiver	Rohde & Schwarz	ESI 26	1088.7490	9/23/2005
EMI Receiver	HP	7405A	US39150114	7/29/2005
Horn Antenna	Antenna Research	DRG-118/A	1086	6/29/2005
Horn Antenna	EMCO	3115	6556	7/21/2005
Horn Antenna	EMCO	3116	9310-2222	3/4/2006
Bilog Antenna	Chase	CBL6112A	2245	4/22/2005
Preamplifier	HP	8449B	3008A00775	12/2005
High Pass Filter	Microwave Circuits	H3G020G2	3986-01 DC0408	2/2006
LISN	Solar Electronics	8616-50-TS-200-N	2146	1/13/2006
LISN	Solar Electronics	8616-50-TS-200-N	2147	1/13/2006

4 CONDUCTED RF POWER, 6DB BANDWIDTH, AND POWER DENSITY

4.1 Test Procedure (FCC Rule: §15.247(b), RSS-210 Rule §6.2.2(o)(b) Conducted RF Power)

The antenna port of the MarkNet N8050 was connected to the input of a peak power meter. The power was read directly from the power meter and corrected for cable loss to obtain the power at the antenna terminals. Conducted power was measured on the high, middle and low channels for all data rates and modulation modes.

4.1.1 Conducted Output Power Criteria

The maximum allowable transmitter power for antennas with gains of 6dBi or less is 1watt (30dBm).

4.2 Test Procedure (FCC Rule: §15.247(a), RSS-210 Rule §6.2.2(o)(b) 6dB Bandwidth)

The antenna port of the MarkNet N8050 was connected to the input of a spectrum analyzer. The analyzer amplitude was offset for the associated cable loss. The analyzer resolution and video bandwidths were set to 100kHz and the max hold function was turned on. A marker peak search was performed on the resultant trace to find the peak amplitude. Markers were then positioned on either side of the peak amplitude such that they were 6dB lower than that amplitude. The 6dB bandwidth was the frequency difference between the marker on the lower side and the marker on the higher side of the peak amplitude. The 6dB bandwidth was measured for the highest data rate for each possible modulation mode on the high, middle, and low channels.

4.2.1 6dB Bandwidth Criteria

The minimum 6dB bandwidth shall be at least 500kHz

4.3 Test Procedure (FCC Rule: §15.247(d), RSS-210 Rule §6.2.2(o)(b) Power Density)

The antenna port of the MarkNet N8050 was connected to the input of a spectrum analyzer. The analyzer amplitude was offset for the associated cable loss. The analyzer resolution and video bandwidths were set to 3kHz and the max hold function was turned on. The frequency span was set to 600kHz around the highest amplitude occurring in the peak emission envelope. The total sweep time was calculated as follows:

Sweep time (Sec.) = (Fstop – Fstart)/Resolution Bandwidth

Sweep time (Sec) = 600kHz / 3kHz

Sweep time (Sec) = 200 Seconds

A peak search was then performed on the resultant trace. The amplitude of that peak was recorded as the maximum power density in dBm. Power density was measured for all data rates and modulation modes on the middle channel. For the high and low channels, power density was measured at the data rate and modulation mode that resulted in the highest and lowest conducted power for that channel.

4.3.1 Power Density Criteria

The peak power spectral density shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

4.4 Test Results

The MarkNet N8050 met the RF power output, 6dB bandwidth, and power density requirements of FCC Part 15 Subpart C (15.247). The test results are located in Table 4-1.

Table 4-1 RF Output Power, 6dB Bandwidth, Power Density Measurements

Frequency MHz	Mode	Modulation	Data Rate (Mbps)	Conducted Power (dBm)	Conducted Power (mW)	Power Density (dBm)	6dB Bandwidth MHz
2437 Channel 6	802.11b	BPSK	1	20.47	111.43	-4.81	10.25
		QPSK	2	20.45	110.92	-3.502	10.25
		CCK	5.5	20.23	105.44	-6.04	
		CCK	11	20.28	106.66	-5.114	11.75
	802.11g	OFDM	6	20.85	121.62	-9.561	
		OFDM	9	20.86	121.90	-10.67	
		OFDM	12	20.66	116.41	-11.19	
		OFDM	18	20.54	113.24	-11.74	
		OFDM	24	20.21	104.95	-12.69	
		OFDM	36	19.9	97.72	-11.44	
		OFDM	48	18.04	63.68	-15.04	
		OFDM	54	19.04	80.17	-15.89	16.0
2412 Channel 1	802.11b	BPSK	1	17.73	59.29		10.25
		QPSK	2	17.63	57.94		10.375
		CCK	5.5	17.29	53.58	-9.265	
		CCK	11	17.46	55.72		11.125
	802.11g	OFDM	6	19.34	85.90		
		OFDM	9	19.35	86.10		
		OFDM	12	19.98	99.54		
		OFDM	18	19.83	96.16		
		OFDM	24	20.1	102.33	-12.79	
		OFDM	36	19.8	95.50		
		OFDM	48	18.1	64.57		
		OFDM	54	18.1	64.57		16.0
2462 Channel 11	802.11b	BPSK	1	16.17	41.40		10.25
		QPSK	2	16.11	40.83		10.0

		CCK	5.5	15.81	38.11	-10.67	
		CCK	11	15.87	38.64		10.25
	802.11g	OFDM	6	17.95	62.37		
		OFDM	9	18	63.10		
		OFDM	12	18.78	75.51		
		OFDM	18	18.6	72.44		
		OFDM	24	19.25	84.14	-14.34	
		OFDM	36	18.88	77.27		
		OFDM	48	17.96	62.52		
		OFDM	54	17.98	62.81		16.25

5 RADIATED RF POWER

5.1 Test Procedure (FCC Rule: §15.247(b), RSS-210 Rule §6.2.2(o)(b) Radiated RF Power)

The MarkNet N8050 was placed on a non-conductive turntable. It was then set to operate at the maximum output power and data rate that produced the highest conducted output power in both 802.11b and 802.11g modes.

The radiated emission at the fundamental frequency was measured at 3m with a test antenna and EMI receiver. This was performed with the antenna in both vertical and horizontal polarities.

During the measurement of the EUT, the receiver resolution bandwidth was set to 3 MHz and the video bandwidth was set to 3 MHz. The highest emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna. The receiver reading was recorded (E in dBuV).

The radiated power was measured using a substitution method as described in TIA-603-B Section 2.2.17 (Radiated Power Output). The EUT was replaced with a substitution antenna (tuned dipole below 1 GHz; Horn antenna above 1 GHz) and was fed with an input power from a signal generator set to output 15 dBm. The cable loss between the signal generator and substituting antenna was a known value. The receiver reading was recorded and EIRP was calculated as follows:

$$EIRP = E_1 - E_2 + Vsub + G$$

where,

E_1 is the receiver reading in dBµV when measuring the field strength of the EUT

E_2 is the receiver reading in dBµV when measured field strength from the generator

V_{sub} is the power delivered to the substitution antenna (generator output in dBm – cable loss between the generator and the substitution antenna)

G is the gain of the transmitting antenna in dBi.

5.1.1 Radiated Output Power Criteria

The maximum allowable transmitter power for antennas with gains of 6dBi or less is 1watt (30dBm).

5.2 Test Results

The MarkNet N8050 met the radiated power requirements of FCC §15.247(b). The test results are located in Table 5-1. All results are less than the 30dBm limit.

Table 5-1 Radiated RF Power

EUT Mode	TX Channel	Polarity	TX Frequency (MHz)	Device Reading (dBuV)	Sub. Reading (dBuV)	Cable Loss (dB)	Tx Antenna Gain (dBi)	Signal Generator Output (dBm)	EIRP (dBm)
1Mbps (802.11b)	1	V	2412	81.84	80.87	3.994	9.141	15	21.117
1Mbps (802.11b)	6	V	2437	84.89	80.87	4.029	9.211	15	24.202
1Mbps (802.11b)	11	V	2462	79.23	80.63	4.066	9.286	15	18.82
1Mbps (802.11b)	1	H	2412	73.03	82.6	3.991	9.1	15	10.539
1Mbps (802.11b)	6	H	2437	76.34	82.38	4.028	9.184	15	14.116
1Mbps (802.11b)	11	H	2462	70.92	82.02	4.066	9.27	15	9.104
24 Mbps (802.11g)	1	V	2412	83.6	80.87	3.994	9.141	15	22.877
9 Mbps (802.11g)	6	V	2437	85.63	80.87	4.029	9.211	15	**24.942**
24 Mbps (802.11g)	11	V	2462	81.64	80.63	4.066	9.286	15	21.23
24 Mbps (802.11g)	1	H	2412	74.82	82.6	3.991	9.1	15	12.329
9 Mbps (802.11g)	6	H	2437	76.48	82.38	4.028	9.184	15	14.256
24 Mbps (802.11g)	11	H	2462	72.54	82.02	4.066	9.27	15	10.724

6 MAXIMUM PERMISSIBLE EXPOSURE (MPE) CALCULATIONS

The § 1.1310 Radiofrequency radiation exposure limits are listed in the table below.

	Frequency Range (MHz)	Power Density Limit (mW/cm^2)
Limits for Occupational/Controlled Exposures	0.3-3.0	100
	3.0-30	900/ Frequency2
	30-300	1.0
	300-1500	Frequency/300
	1500-100,000	5.0
Limits for General Population/Uncontrolled Exposure	0.3-1.34	100
	1.34-30	180/Frequency2
	30-300	0.2
	300-1500	Frequency/1500
	1500-100,000	1.0

6.1 Test Procedure (FCC Rule: §15.247(b)(5), RSS-102 §4.3)

The ERP and EIRP were measured in section 5, Radiated RF Power The radiated RF power was used to calculate the maximum RF exposure at a 20 cm distance using the formula:

$$\text{Maximum RF Exposure at 20cm} = (\text{EIRP in mW})/(4\text{Pi}(20\text{cm})^2)$$

Where ERP was measured in section 5, Radiated RF Power, a 2.15dB conversion factor was added to the reading to convert it to EIRP before applying the Maximum RF Exposure formula above. Once the Maximum RF Exposure calculations were complete the results were compared to the MPE limits above.

6.2 Test Results

The following calculations show the Maximum RF Exposure from the MarkNet N8050 at 20cm for the worst case measured EIRP. The MPE level is well below the limits for the general population described in the table above.

$$\text{Maximum Measured EIRP} = 24.942\text{dBm} = 312.03\text{mW}$$

$$\text{MPE} = 312.03\text{mW} / (4\text{Pi}(20\text{cm})^2) = 0.062\text{mW/cm}^2$$

7 OUT OF BAND EMISSIONS AT ANTENNA TERMINALS

7.1 Test Procedure (FCC Rule §15.247(c), RSS-210 Rule §6.2.2(o)(e1))

The antenna port of the MarkNet N8050 was connected to the input of a spectrum analyzer. The analyzer resolution and video bandwidths were set to 3MHz. The MarkNet N8050 was set to transmit at its highest output power level and with the modulation scheme that produced the highest conducted output power level. The spectrum analyzer was scanned from 30MHz to 25GHz using the max hold function to detect any out of band spurious emissions. The resulting trace was corrected for the cable loss between the test sample and the spectrum analyzer.

7.1.1 Out of Band Emissions at Antenna Terminals Criteria

In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, the RF power shall be at least 20dB below that of the carrier.

7.2 Test Results

The MarkNet N8050 met the out of band emission at antenna terminal requirements. The following plots illustrate the output power of channels 1, 6, and 11and also show that there are no spurious emissions within 20dB of the peak carrier power.

Figure 7-1: Out of band emissions at antenna terminals – Channel 1, 6, and 11

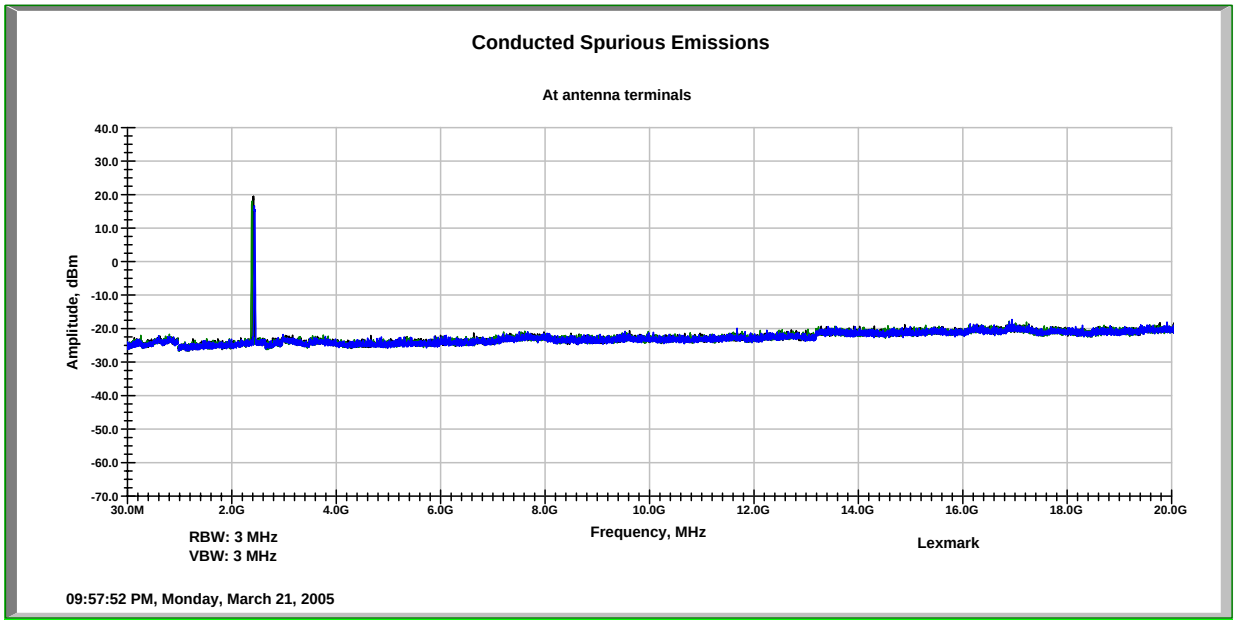
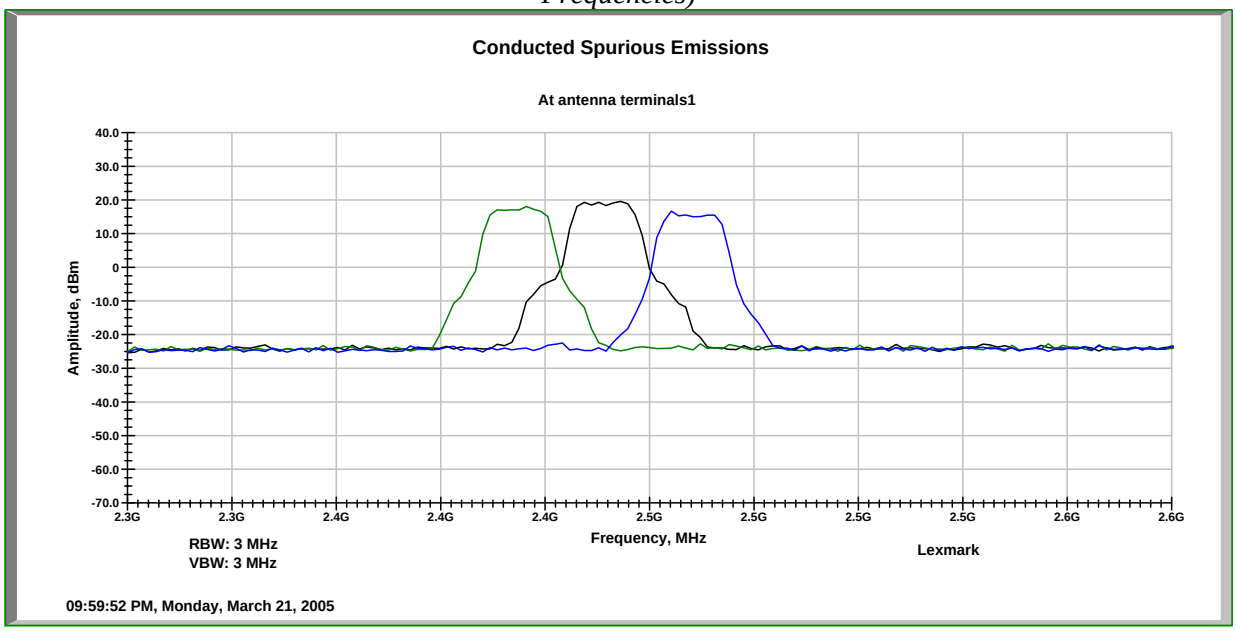


Figure 7-2: Out of band emissions at antenna terminals – Channel 1, 6, and 11 (Zoomed Around Carrier Frequencies)



8 FIELD STRENGTH OF SPURIOUS RADIATION (GENERAL REQUIREMENTS AND RESTRICTED BAND REQUIREMENTS)

8.1 Test Procedure (FCC Rule §15.247(c), RSS-210 §6.2.2(o)(e1) for Radiated Measurements)

The MarkNet N8050 was placed on a non-conductive turntable. It was then set to transmit at its highest output power level and with the modulation scheme that produced the highest conducted output power level. The 30MHz – 1GHz range was measured with a bilog antenna, no external preamplifier, and no external filtering in the measurement path. The 1GHz – 3GHz range was measured with a horn antenna with no external preamplifier, and no external filtering in the measurement path. The 3GHz-26GHz range was measured with an in line preamplifier and high pass filter with a pass band above 3GHz in order to keep the fundamental transmission from overloading the receiver. All measurements were performed with the receiving antenna 3 meters from the EUT with the exception of the 20-26GHz range which was performed at a distance of 1m. During the tests, the antenna height and EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle, and high channels) in each operating band. Once spurious emissions were identified, the power of the emission was determined using the substitution method described in TIA-603-B section 2.2.12 (Radiated Spurious Emissions).

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and at the spurious emissions frequency.

Also, a scan was performed looking specifically at the band edge of channel 11 in order to show that the restricted band ranging from 2483.5MHz to 2500 MHz was not intruded upon. To perform this measurement, the spectrum analyzer was manually set to show the band edge of channel 11 and the entire restricted band. The amplitude was offset to account for cable loss, antenna factor, and preamplifier gain. The turntable and tower were maximized with the analyzer set to max hold. This scan was performed in average detection mode.

8.1.1 Field Strength of Spurious Radiation Criteria

In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, the RF power shall be at least 20dB below that of the carrier. In addition, emissions within the restricted bands as specified in §15.205(a), must also comply with the limits specified in §15.209(a). Those Limits are in the table below.

Table 8-1 Radiated Emission Limit for FCC §15.209(a)

Radiated Emission Limits at 3 meters	
Frequency (MHz)	**Quasi-Peak limits, dB (µV/m)**
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
960 and up	54.0

8.2 Test Results

The MarkNet N8050 met the field strength of spurious radiation requirements of FCC §15.209 and §15.247(c). The following graphs in Figure 8-1 through Figure 8-6 show that all harmonics and spurious emissions are at least 20dB below the carrier and that there are no emissions within the restricted bands exceeding the limits specified in §15.209(a).

Figure 8-1: Field Strength of Spurious Radiation Channel 1 (30MHz – 26GHz) – 802.11b

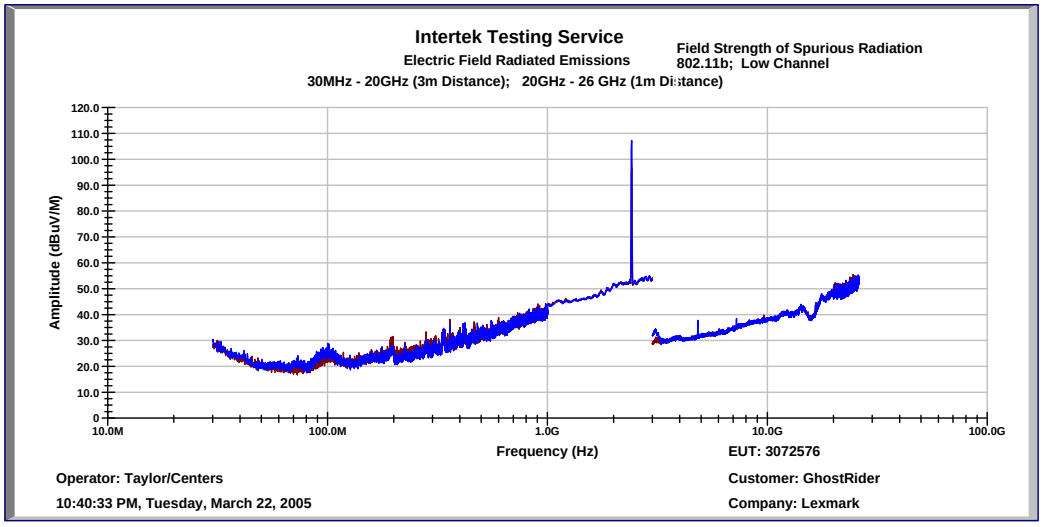


Figure 8-2: Field Strength of Spurious Radiation Channel 6 (30MHz – 26GHz) – 802.11b

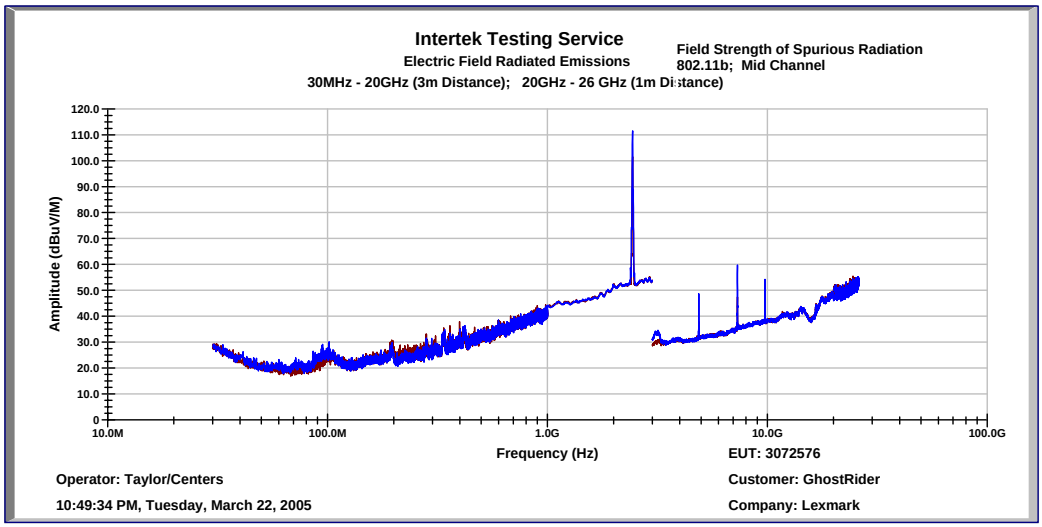


Figure 8-3: Field Strength of Spurious Radiation Channel 11 (30MHz – 26GHz) – 802.11b

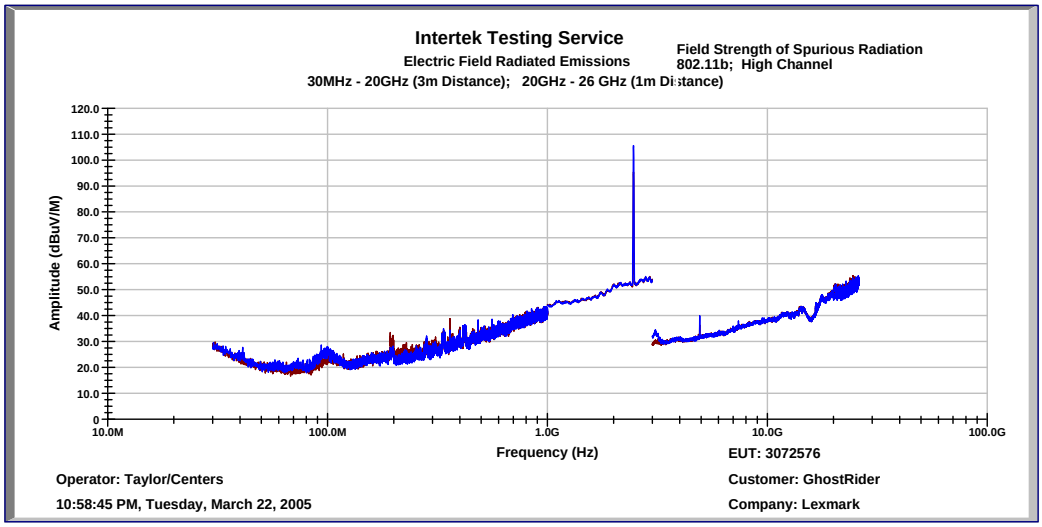


Figure 8-4: Field Strength of Spurious Radiation Channel 1 (30MHz – 26GHz) – 802.11g

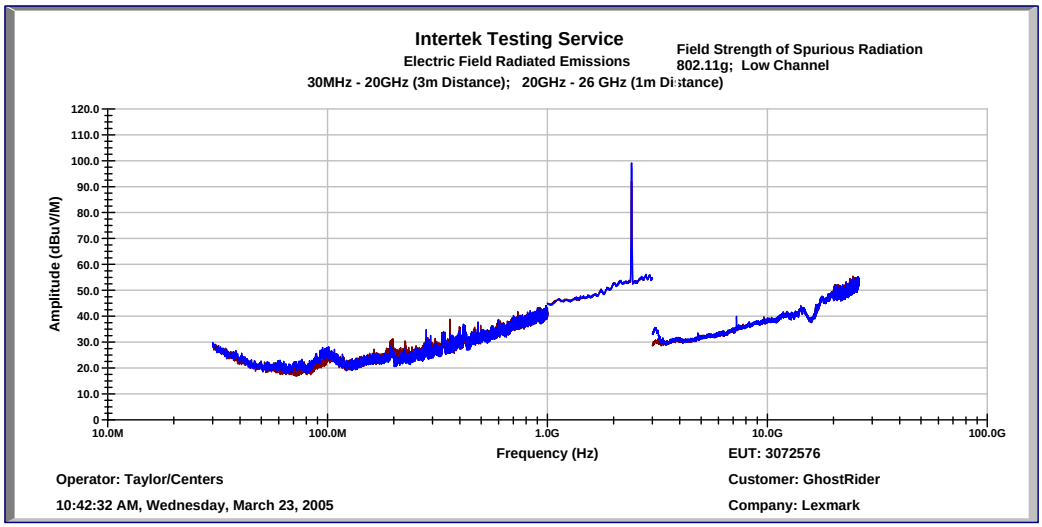


Figure 8-5: Field Strength of Spurious Radiation Channel 6 (30MHz – 26GHz) – 802.11g

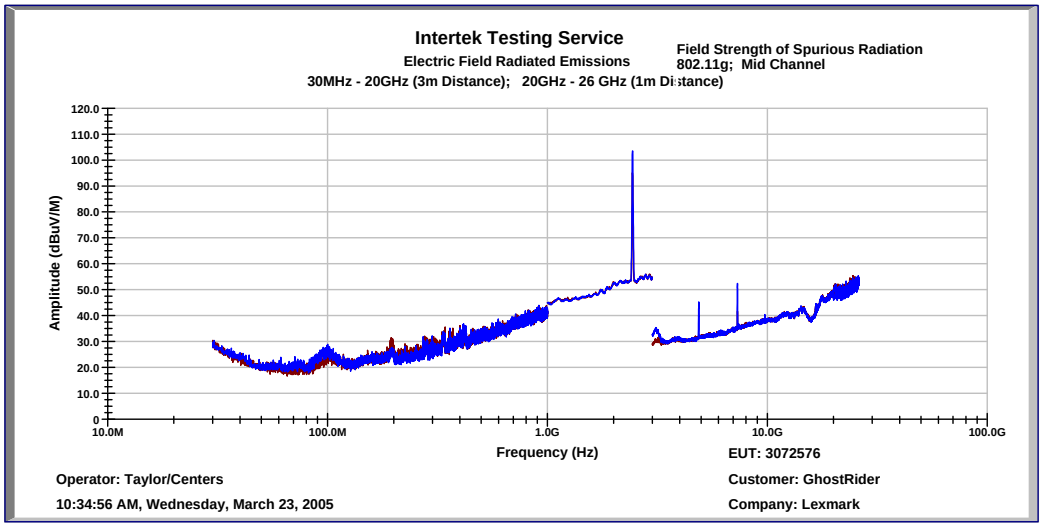


Figure 8-6: Field Strength of Spurious Radiation Channel 11 (30MHz – 26GHz) – 802.11g

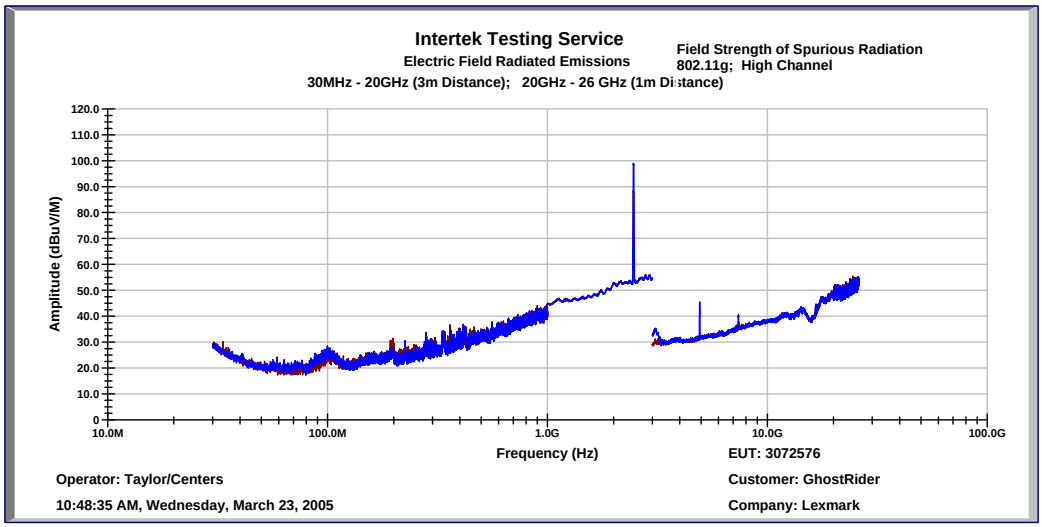


Figure 8-7: Channel 11 Band Edge Showing the Restricted Band from 2483.5 to 2500 MHz (802.11g)

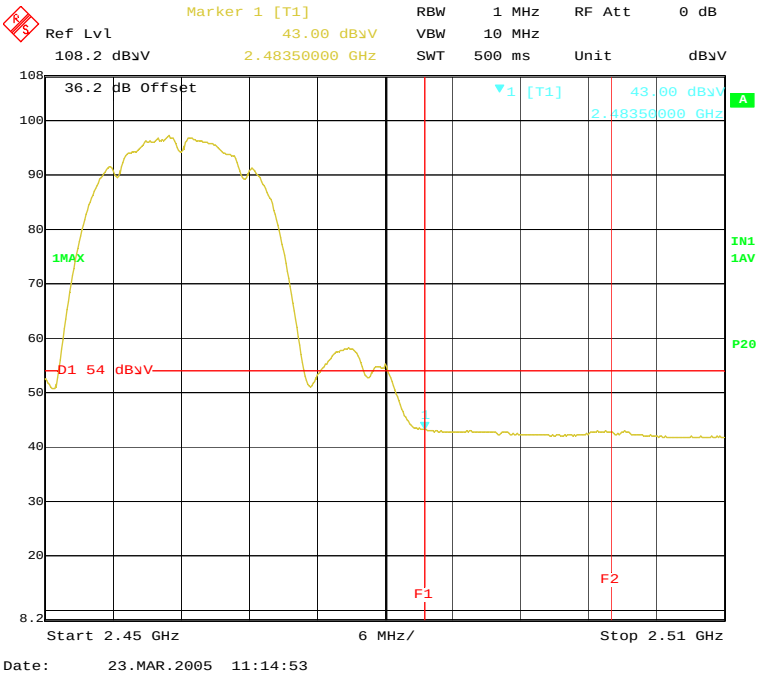
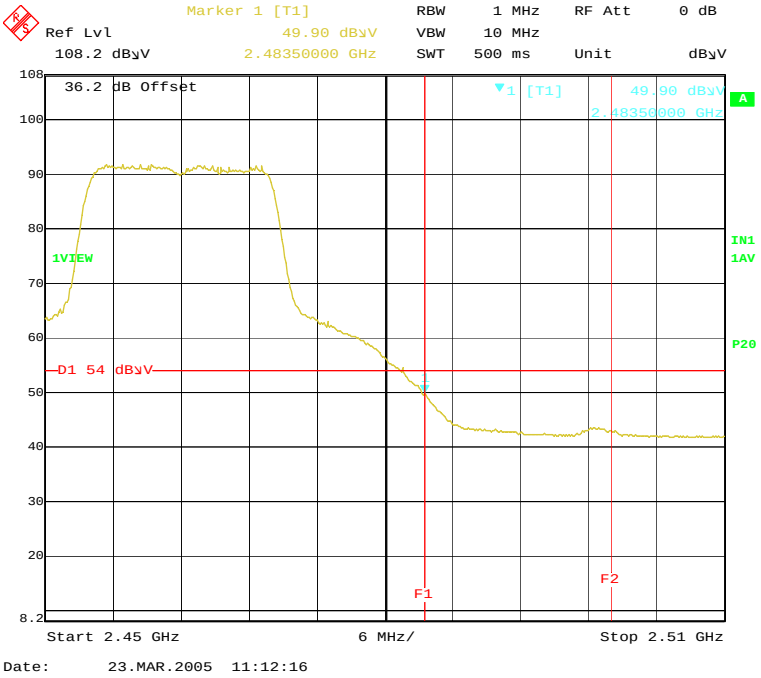


Figure 8-8: Channel 11 Band Edge Showing the Restricted Band from 2483.5 to 2500 MHz (802.11b)



9 POWER LINE CONDUCTED EMISSIONS

9.1 Test Procedure (FCC §15.207, ICES-003 §5.3)

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Floor standing EUTs are placed on a horizontal metal ground plane and isolated from the ground plane by 3 to 12 mm of insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

Equipment setup for conducted disturbance tests followed the guidelines of ANSI C63.4: 1992.

9.1.1 Power Line Conducted Emissions Criteria

The RF energy radiated back onto the public utility (AC Power Lines) shall not exceed the values in the following table when measured with the corresponding detector function.

Table 9-1 Conducted Emission Limit for FCC §15.207(a)

Frequency Range (MHz)	FCC Part 15.207(a) Quasi Peak Limit (dBuV)	FCC Part 15.207(a) Average Limit (dBuV)
0.15 – 0.5 MHz	66 to 56	56 to 46
0.5 – 5.0 MHz	56	46
5.0 - 30 MHz	60	50

9.2 Test Results

The MarkNet N8050 met the power line conducted emission requirements of FCC §15.107 and §15.207. The test results are located in Figure 9-1 through Figure 9-4. The graphical data, measured with peak detection, was all below the class B quasi-peak and average limits.

Figure 9-1: FCC §15. Power Line Conducted Emissions Receiver Mode (Lines 1 and 2)

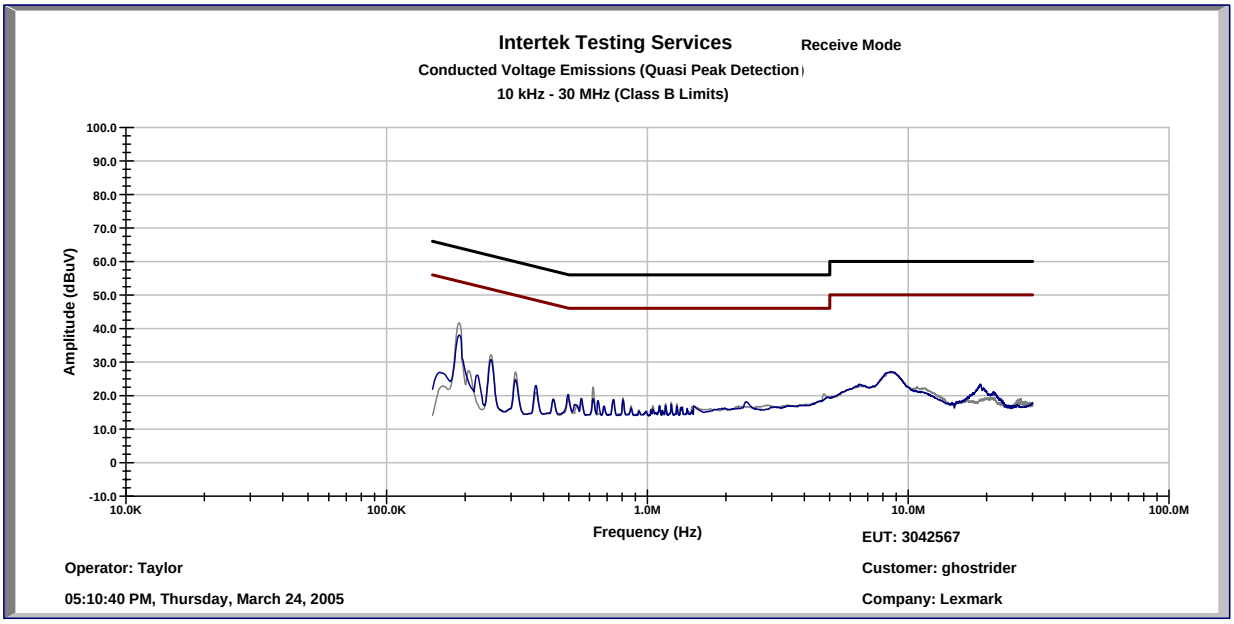


Figure 9-2: FCC §15. Power Line Conducted Emissions TX Channel 1 (Lines 1 and 2)

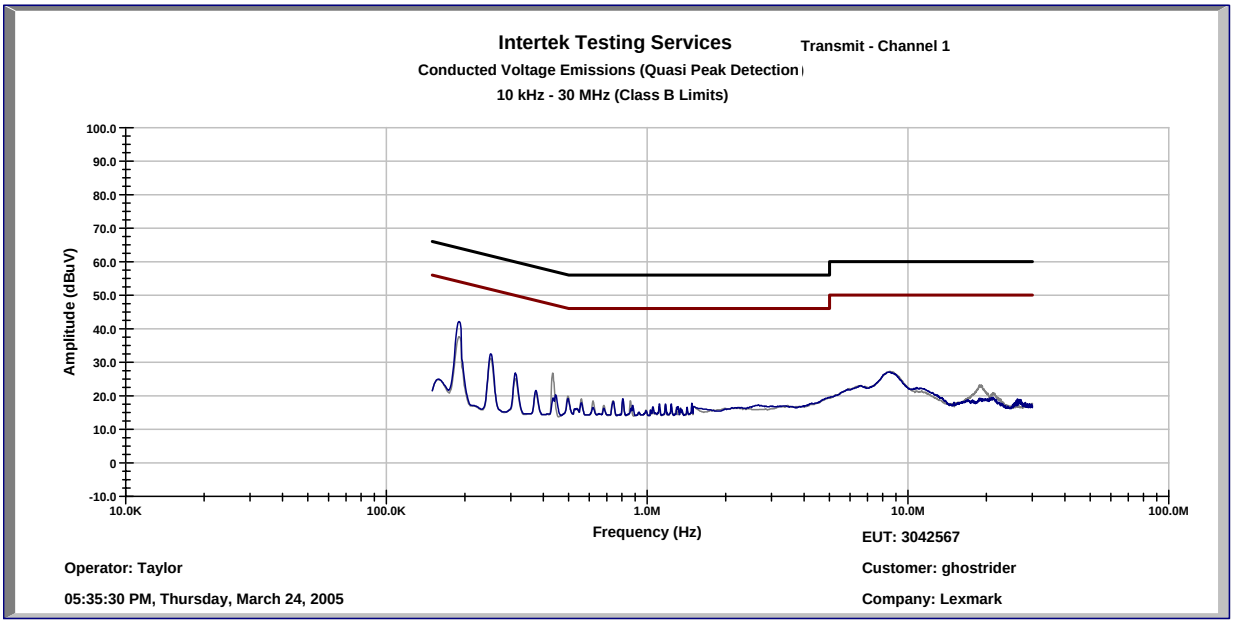


Figure 9-3: FCC §15. Power Line Conducted Emissions TX Channel 6 (Lines 1 and 2)

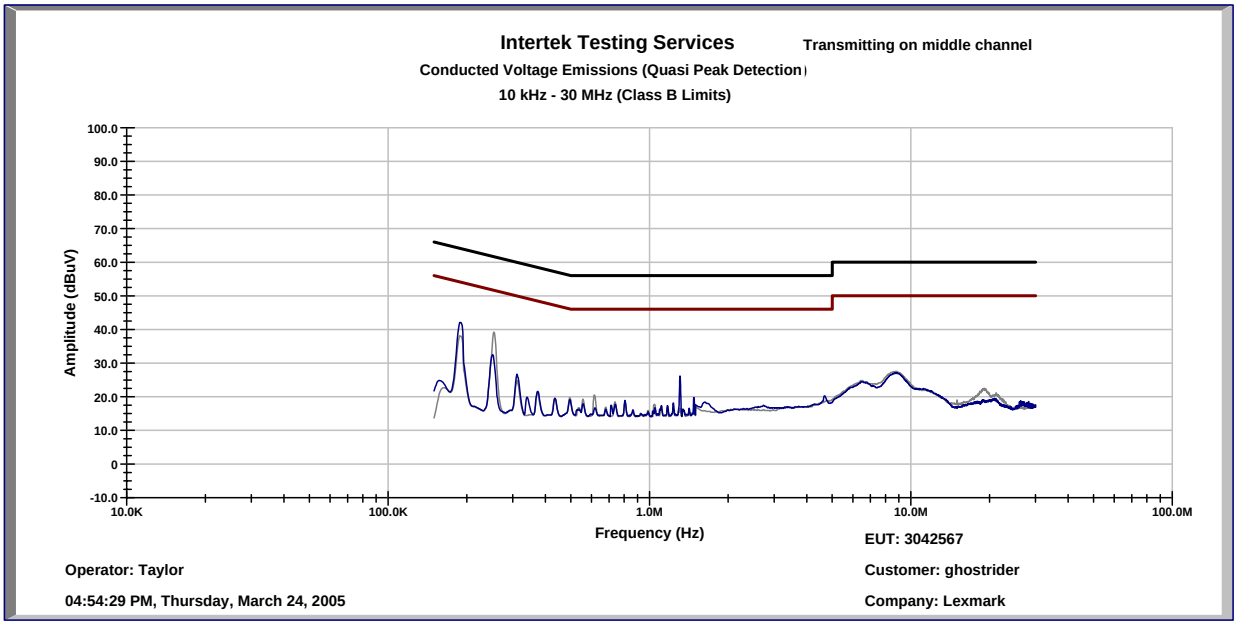
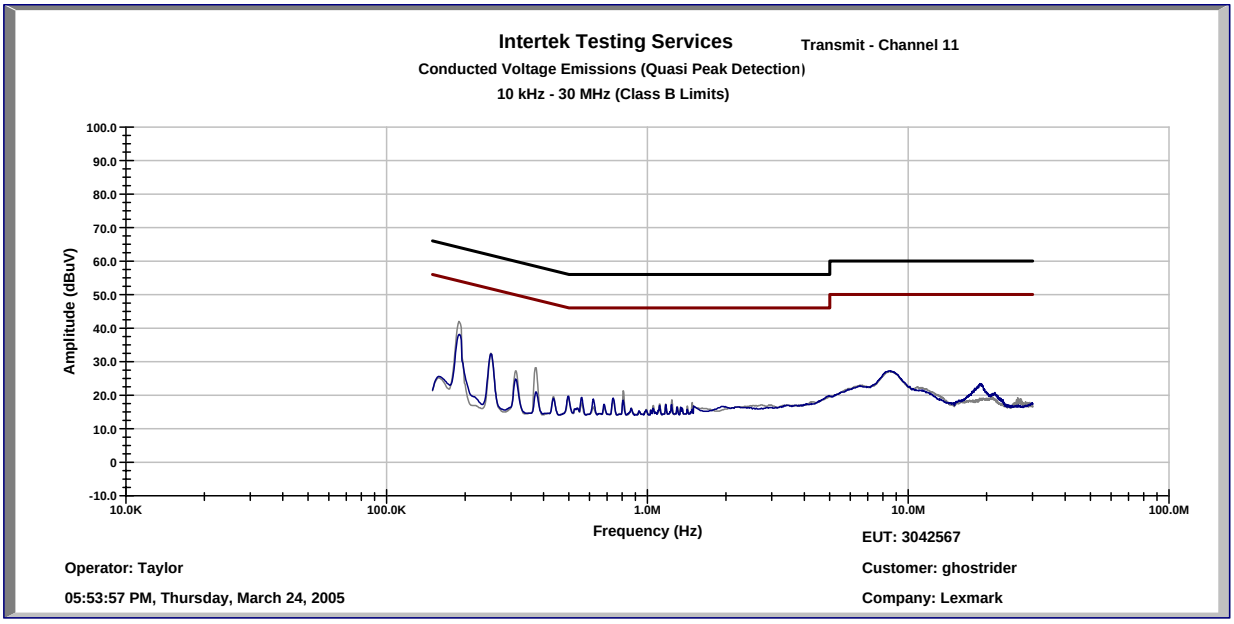


Figure 9-4: FCC §15. Power Line Conducted Emissions TX Channel 11 (Lines 1 and 2)



10 RECEIVER SPURIOUS EMISSIONS

10.1 Test Procedure (FCC §15.109, ICES-003 §5.6)

Measurements are made over the frequency range of 30 MHz to five times the highest frequency operating within the device. The measuring receiver meets the requirements of Section One of CISPR 16 and the measuring antenna correlates to a balanced dipole. From 30 to 1000 MHz, a quasi-peak detector was used for measurement. Above 1000 MHz, average measurements were performed.

Measurements of the radiated field are made with the antenna located at a distance of 3 meters from the EUT. If the field-strength measurements at 3m cannot be made because of high ambient noise level or for other reasons, measurements may be made at a closer distance, for example 1m. An inverse proportionality factor of 20 dB per decade should be used to normalize the measured data to the specified distance for determining compliance.

The antenna is adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.

The antenna-to-EUT azimuth is varied during the measurement to find the maximum field-strength readings.

The antenna-to-EUT polarization (horizontal and vertical) is varied during the measurements to find the maximum field-strength readings.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Equipment setup for radiated disturbance tests followed the guidelines of ANSI C63.4: 1992.

10.2 Receiver Spurious Emissions Criteria

Table 10-1 Radiated Emission Limit for FCC §15.109

Radiated Emission Limits at 3 meters	
Frequency (MHz)	**Quasi-Peak limits, dB (µV/m)**
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
960 and up	54.0

10.3 Test Results

The MarkNet N8050 is **compliant** with the radiated disturbance requirements of FCC §15.109 for a class B device as of 3/22/2005. The graphs in Figure 10-1 and Figure 10-2 show that there are no emissions above the limits specified in §15.109.

Figure 10-1 FCC §15.109Worse Case Receiver Spurious Emission (Horizontal)

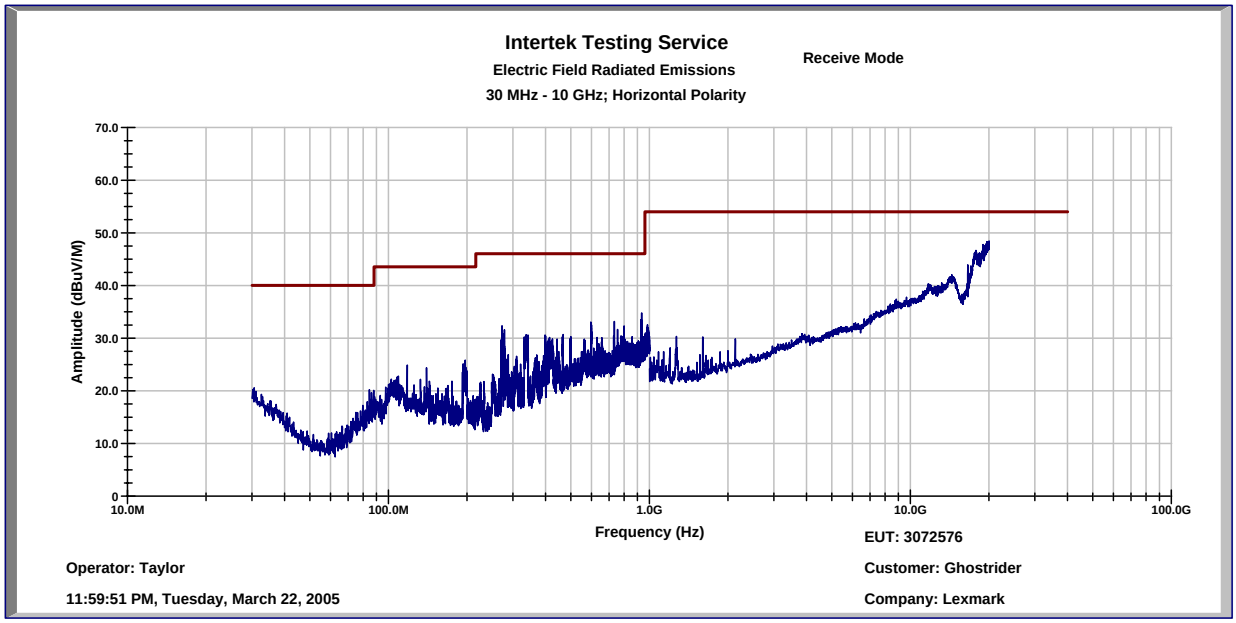


Figure 10-2 FCC §15.109Worse Case Receiver Spurious Emission (Vertical)