Standards Council of Canada
Accredited Laboratory
Scope of Accreditation 75

Conseil canadien des normes
Laboratoire accrédité
Portée d'accréditation 75

TM

Test Report:	4W07871
Applicant:	Nortel Networks 3500 Carling Ave. Nepean, Ontario K2H 8E9
Equipment Under Test: **(EUT)**	NTE301AA Wireless Network Router
FCC ID:	AB6NTE301AA
In Accordance With:	**FCC Part 15.247, Subpart C**
Tested By:	Nemko Canada Inc. 303 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	Kevin Carr, EMC/EMI/Wireless Specialist
Date:	5 March 2004
Total Number of Pages:	50

Table of Contents

Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted is accordance with ANSI C63.4-1992. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

TESTED BY: _____ DATE: 5 March 2004
Glen Westwell, Wireless Technologist

Summary Of Test Data

Name Of Test	Para. No.	Result
Powerline Conducted Emissions	15.207(a)	Complies
6dB Bandwidth	15.247(a)(2)	Complies
Peak Output Power	15.247(b)(3)	Complies
Spurious Emissions (Antenna Conducted)	15.247(c)	Complies
Spurious Emissions (Radiated)	15.247(c)	Complies
Peak Power Spectral Density	15.247(d)	Complies

Test Conditions:

Indoor Temperature: 22°C
Humidity: 31%

Outdoor Temperature: 10°C
Humidity: 50%

Section 2. General Equipment Specification

Manufacturer:	Nortel Networks
Model No.:	NTE301AA
Serial No.:	NNTM536G0VD2
Date Received In Laboratory:	12 Feb. 2004
Nemko Identification No.:	#2
Operating Frequency(s):	2412-2462MHz 5740-5840MHz
Rated Power (maximum):	2.4GHz Band = 20dBm 5GHz Band = 20dBm
Modulation/Access Method:	802.11b/g & 802.11a
Antenna Data:	2.4GHz, 802.11b/g (1) Nearson Whip, Model 151 = 5dBi (2) PIFA Integral = 0dBi 5GHz, 802.11a (1) Integral = 10dBi (2) H&S SPA 5600140/14/0/V = 13dBi (3) Andrews #FPA5250D06-N = 18dBi (4) Andrews #FPA5250D12-N = 23.6dBi

Section 3. Powerline Conducted Emissions

Para. No.: 15.207 (a)

Test Performed By: Glen Westwell	**Date of Test: 16 Feb. 2004**

Test Results: Complies.

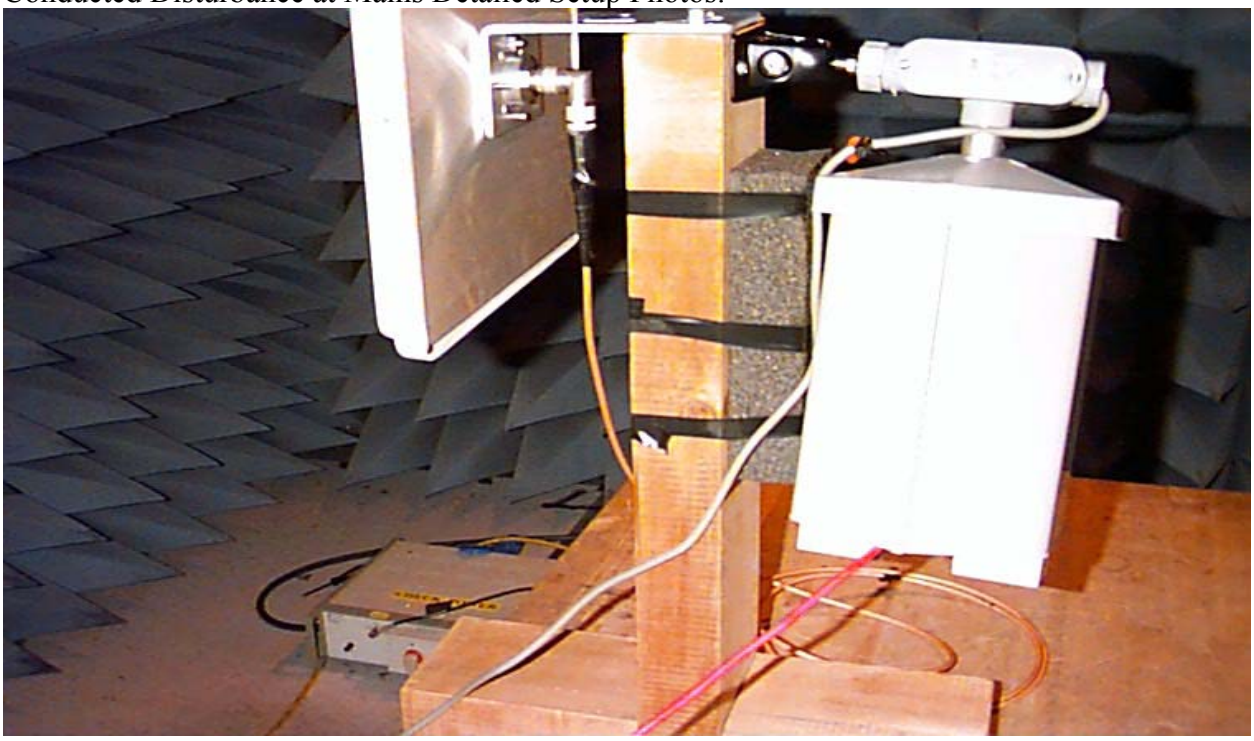
Measurement Data: See attached graph(s).

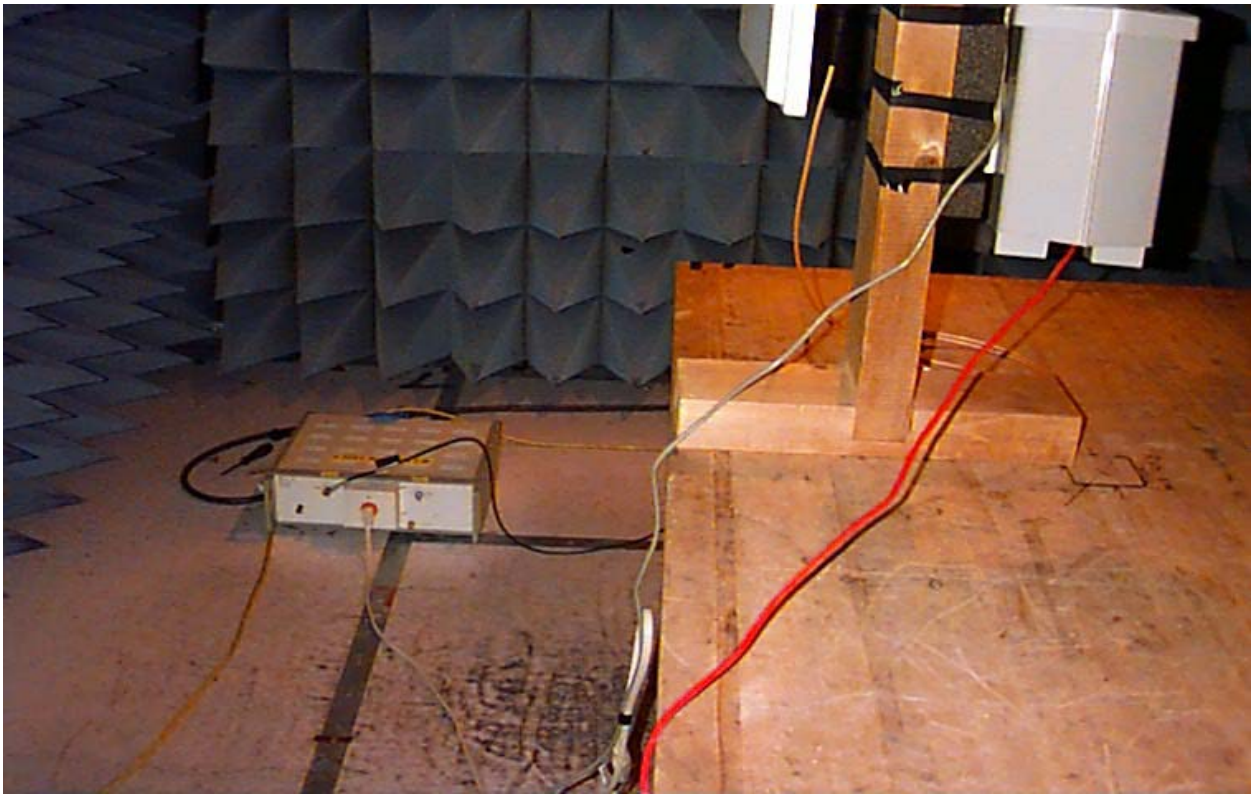
Limits For Conducted Disturbance At The Mains Ports Of Class B

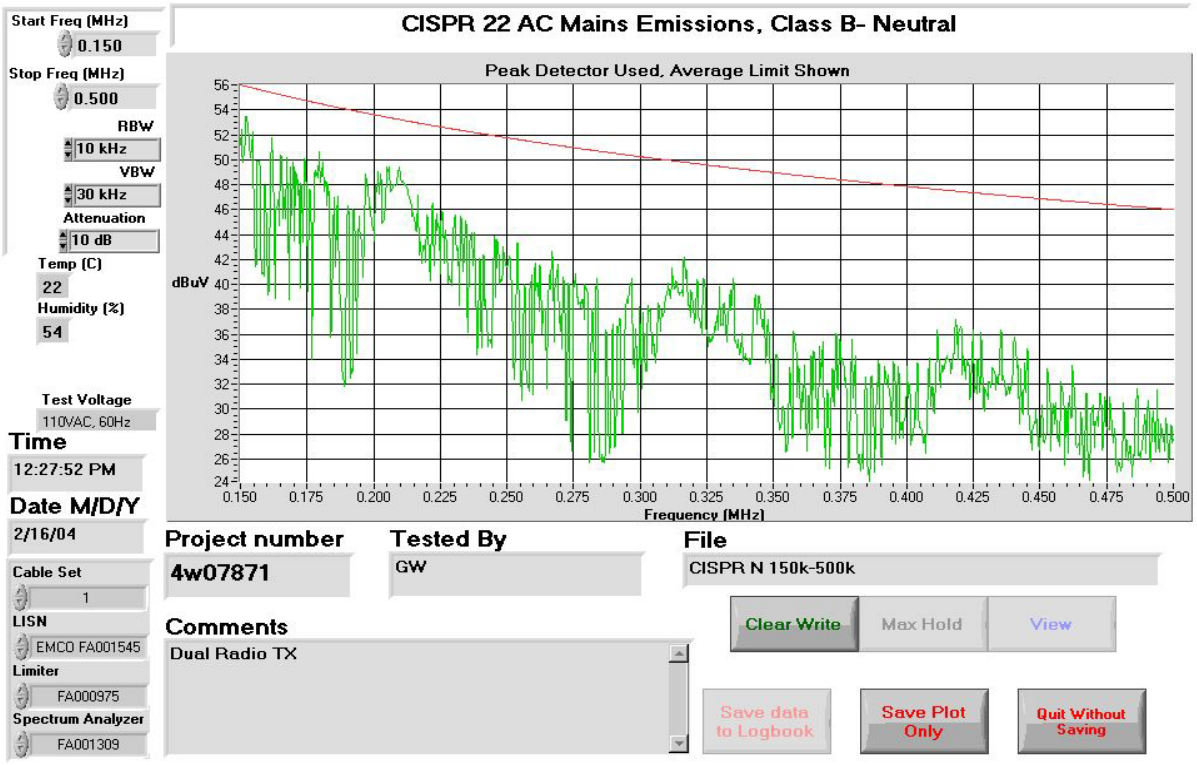
Frequency Range MHz	Limits dB(μV)		Result
	Quasi-Peak	Average	
0.15 to 0.50	66 to 56	56 to 46	Complies.
0.5 to 5	56	46	
5 to 30	60	50	

Note:
1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50MHz.

Conducted Disturbance at Mains Detailed Setup Photos:



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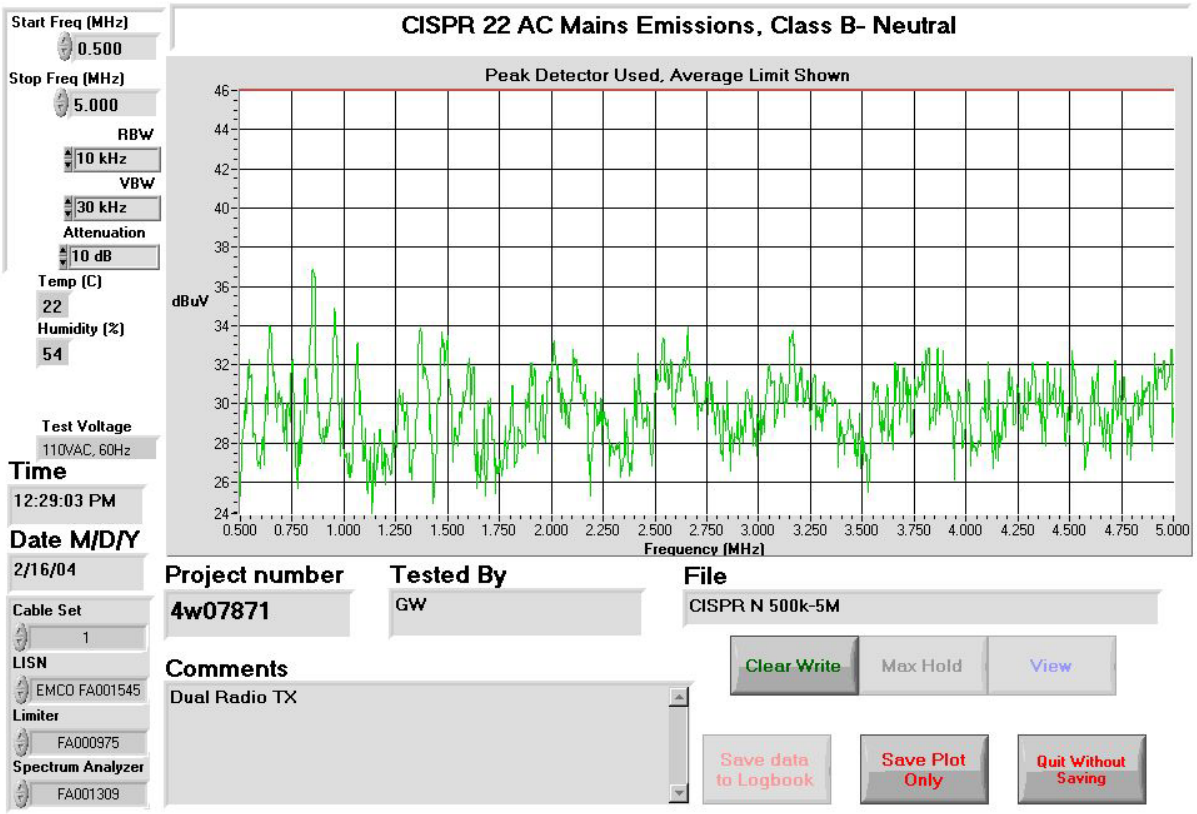
Stop Freq (MHz)
0.500
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
22
Humidity (%)
54
Test Voltage
110VAC, 60Hz
Time
12:27:52 PM
Date M/D/Y
2/16/04
Cable Set
1
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
CISPR 22 AC Mains Emissions, Class B- Neutral
Peak Detector Used, Average Limit Shown
dBuV
Frequency (MHz)
Project number
4w07871
Tested By
GW
File
CISPR N 150k-500k
Comments
Dual Radio TX
Clear Write
Max Hold
View
Save data to Logbook
Save Plot Only
Quit Without Saving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0.500
Stop Freq (MHz)
5.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
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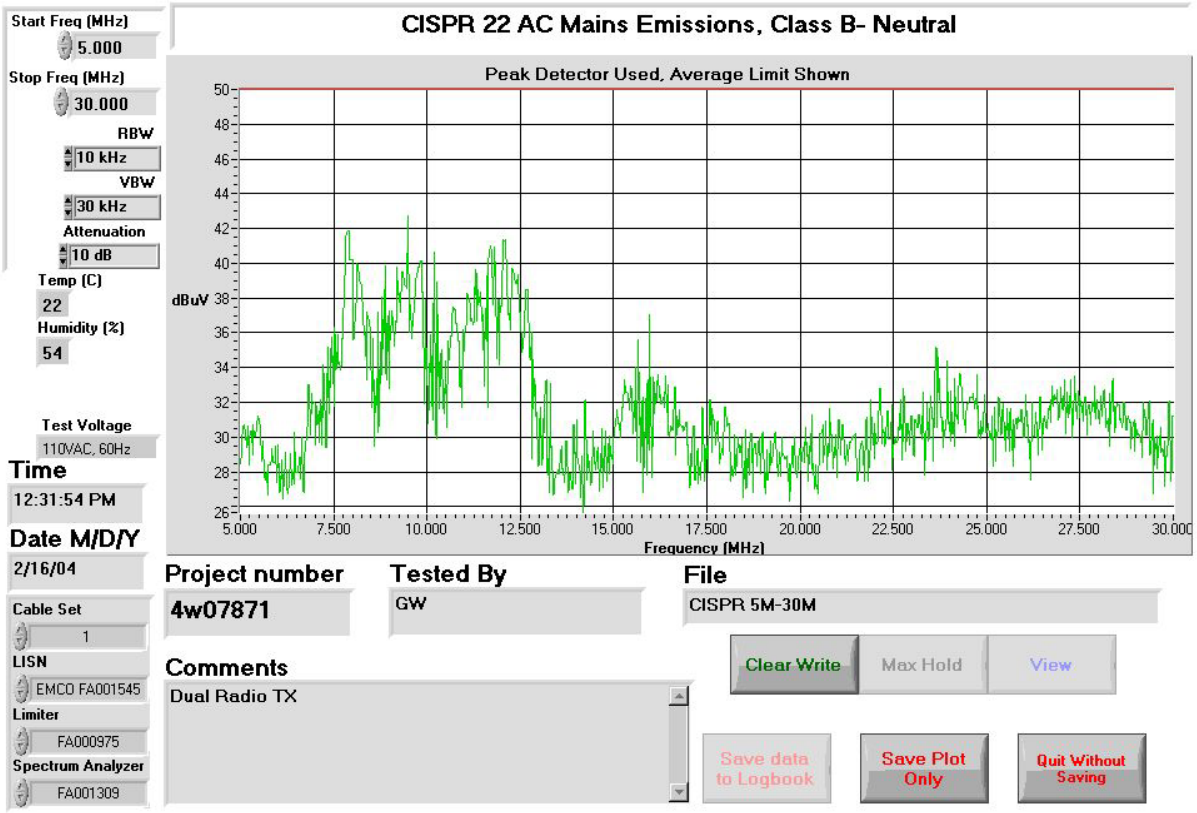
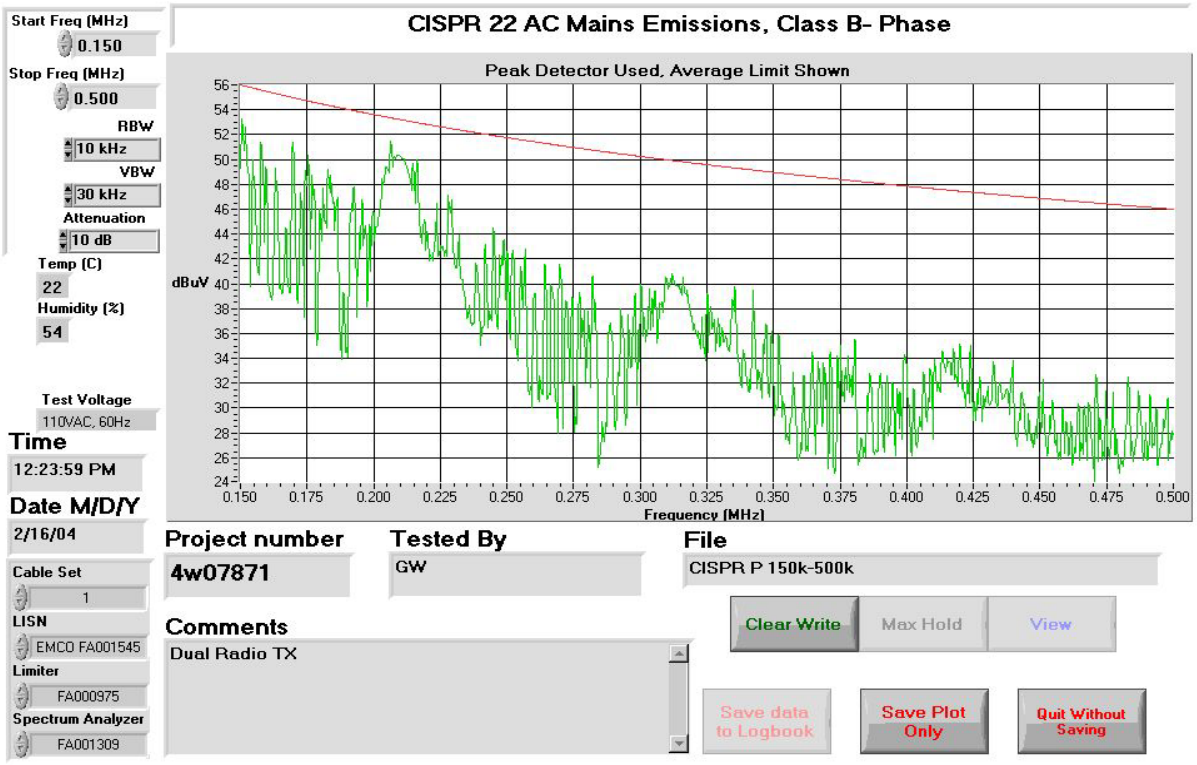
Humidity (%)
54
Test Voltage
110VAC, 60Hz
Time
12:29:03 PM
Date M/D/Y
2/16/04
Cable Set
1
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
CISPR 22 AC Mains Emissions, Class B- Neutral
Peak Detector Used, Average Limit Shown
dBuV
Frequency (MHz)
Project number
4w07871
Tested By
GW
File
CISPR N 500k-5M
Comments
Dual Radio TX
Clear Write
Max Hold
View
Save data to Logbook
Save Plot Only
Quit Without Saving


CISPR 22 AC Mains Emissions, Class B- Neutral
Peak Detector Used, Average Limit Shown
dBuV
Frequency (MHz)
Start Freq (MHz)
5.000
Stop Freq (MHz)
30.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
22
Humidity (%)
54
Test Voltage
110VAC, 60Hz
Time
12:31:54 PM
Date M/D/Y
2/16/04
Cable Set
1
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
Project number
4w07871
Tested By
GW
File
CISPR 5M-30M
Comments
Dual Radio TX
Clear Write
Max Hold
View
Save data to Logbook
Save Plot Only
Quit Without Saving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0.150
Stop Freq (MHz)
0.500
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
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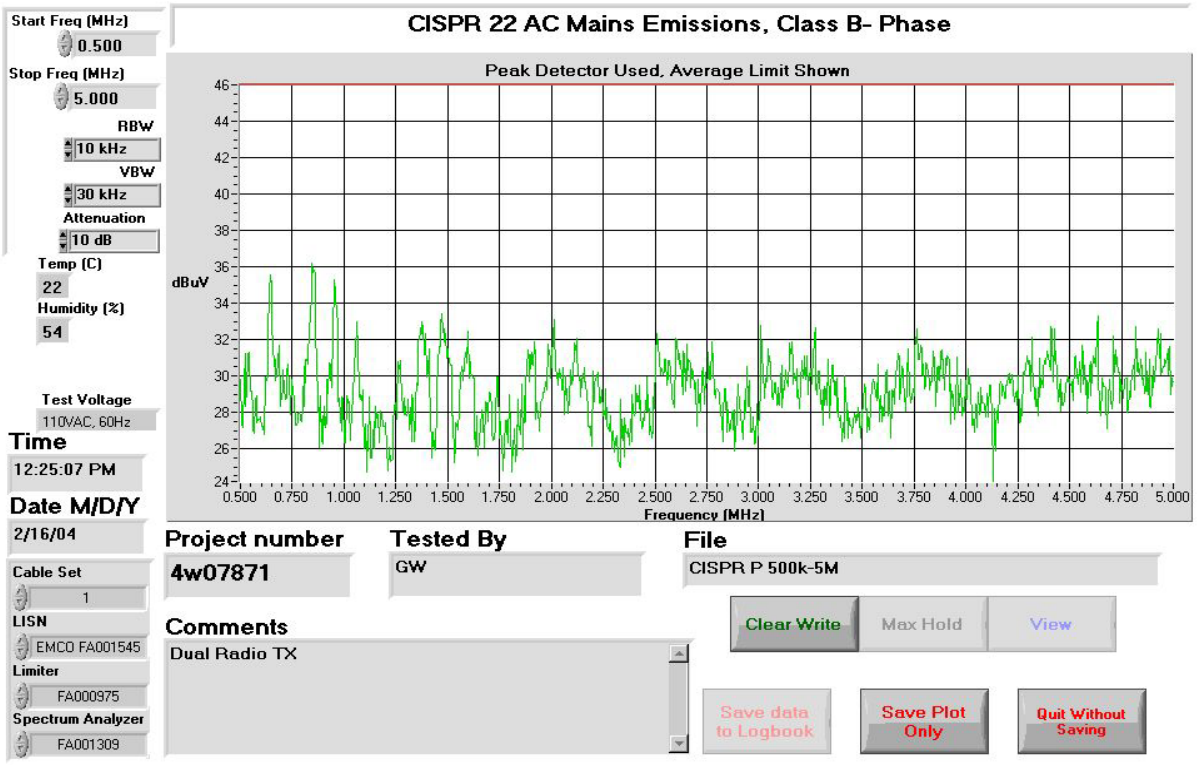
Humidity (%)
54
Test Voltage
110VAC, 60Hz
Time
12:23:59 PM
Date M/D/Y
2/16/04
Cable Set
1
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
CISPR 22 AC Mains Emissions, Class B- Phase
Peak Detector Used, Average Limit Shown
dBuV
Frequency (MHz)
Project number
4w07871
Tested By
GW
File
CISPR P 150k-500k
Comments
Dual Radio TX
Clear Write
Max Hold
View
Save data to Logbook
Save Plot Only
Quit Without Saving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0.500
Stop Freq (MHz)
5.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
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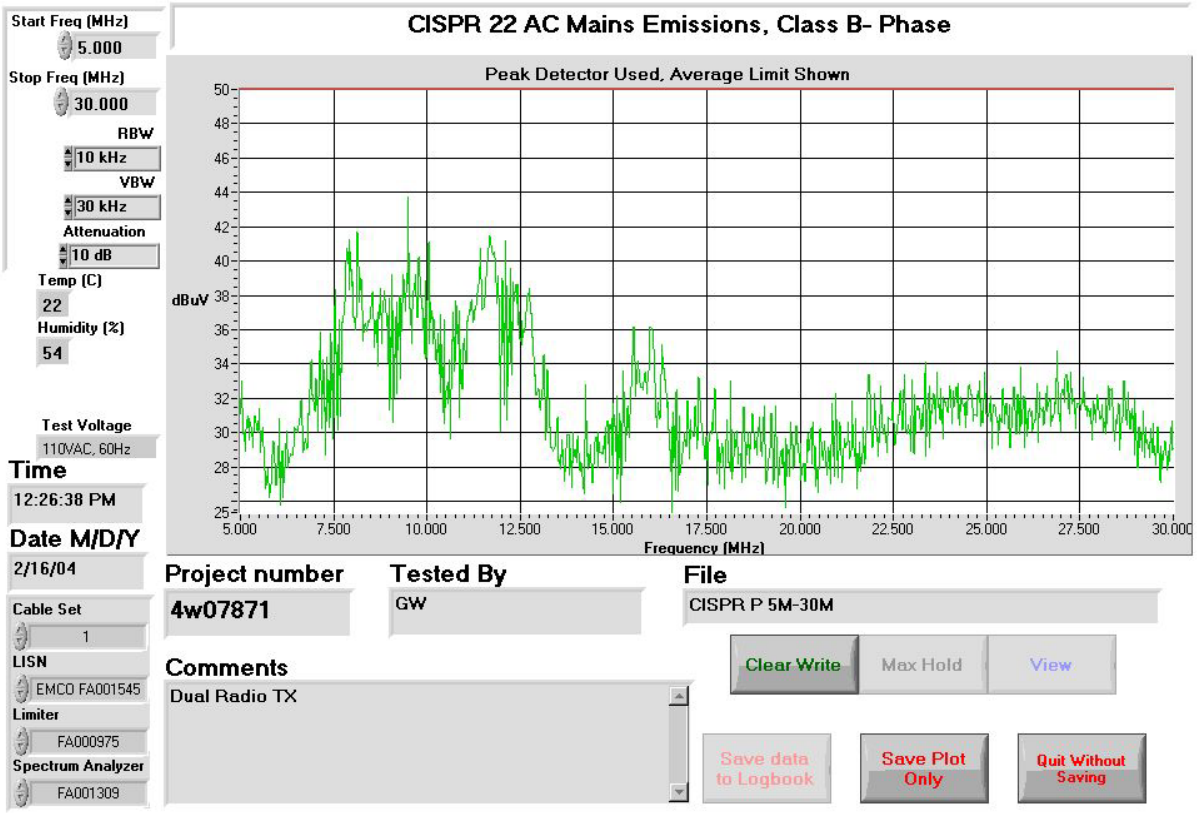
Humidity (%)
54
Test Voltage
110VAC, 60Hz
Time
12:25:07 PM
Date M/D/Y
2/16/04
Cable Set
1
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
CISPR 22 AC Mains Emissions, Class B- Phase
Peak Detector Used, Average Limit Shown
dBuV
Frequency (MHz)
Project number
4w07871
Tested By
GW
File
CISPR P 500k-5M
Comments
Dual Radio TX
Clear Write
Max Hold
View
Save data to Logbook
Save Plot Only
Quit Without Saving


CISPR 22 AC Mains Emissions, Class B- Phase
Peak Detector Used, Average Limit Shown
dBuV
Frequency (MHz)
Start Freq (MHz)
5.000
Stop Freq (MHz)
30.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
22
Humidity (%)
54
Test Voltage
110VAC, 60Hz
Time
12:26:38 PM
Date M/D/Y
2/16/04
Cable Set
1
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
Project number
4w07871
Tested By
GW
File
CISPR P 5M-30M
Comments
Dual Radio TX
Clear Write
Max Hold
View
Save data to Logbook
Save Plot Only
Quit Without Saving

Section 4. 6dB Bandwidth

Para. No.: 15.247 (a)(2)

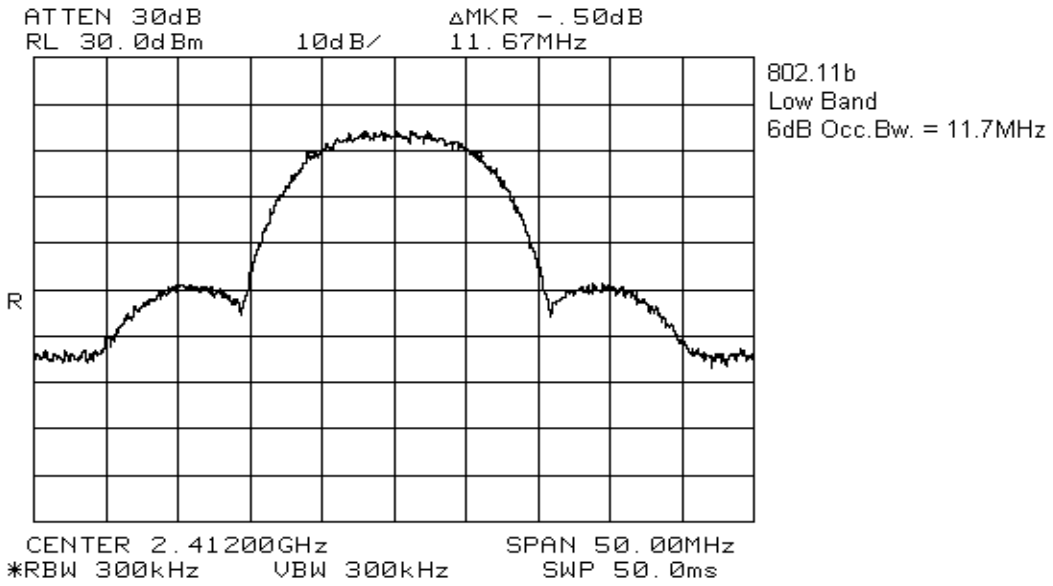
Test Performed By: Glen Westwell	**Date of Test: 18 Feb. 2004**

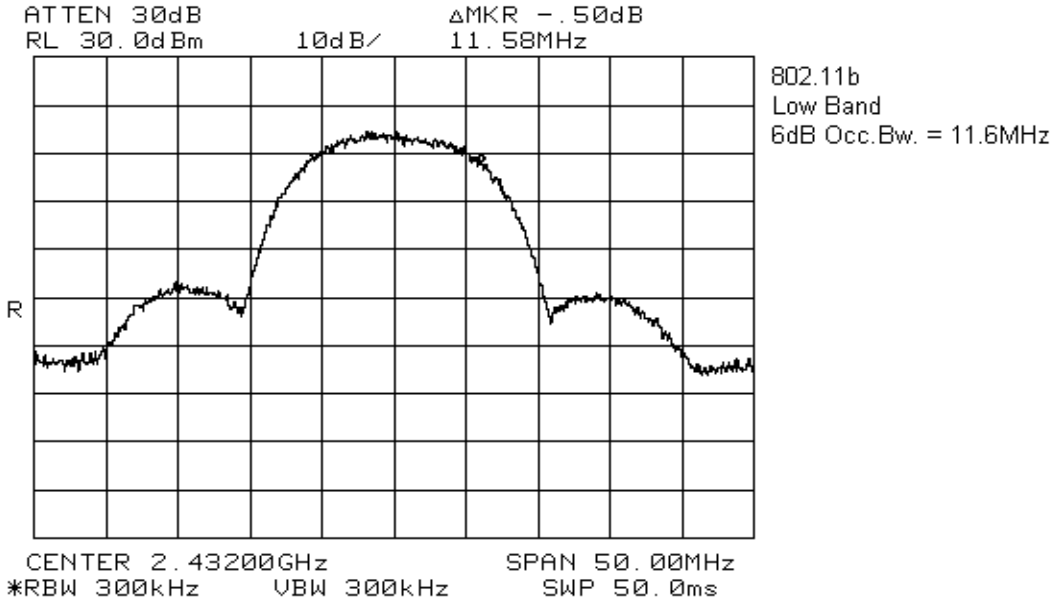
Limit: ≥ 500kHz

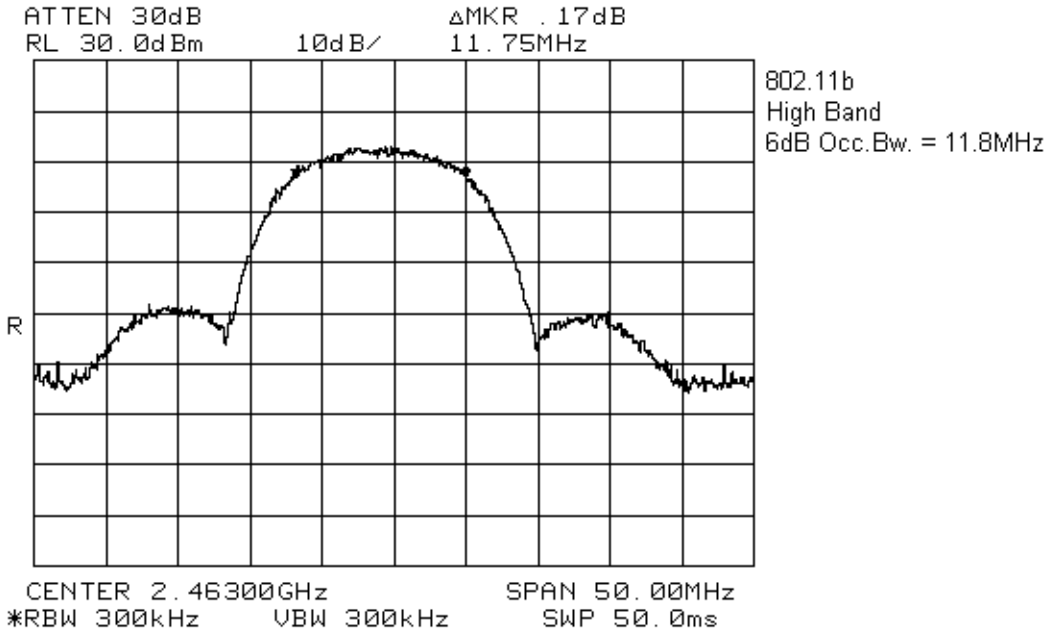
Test Results: Complies

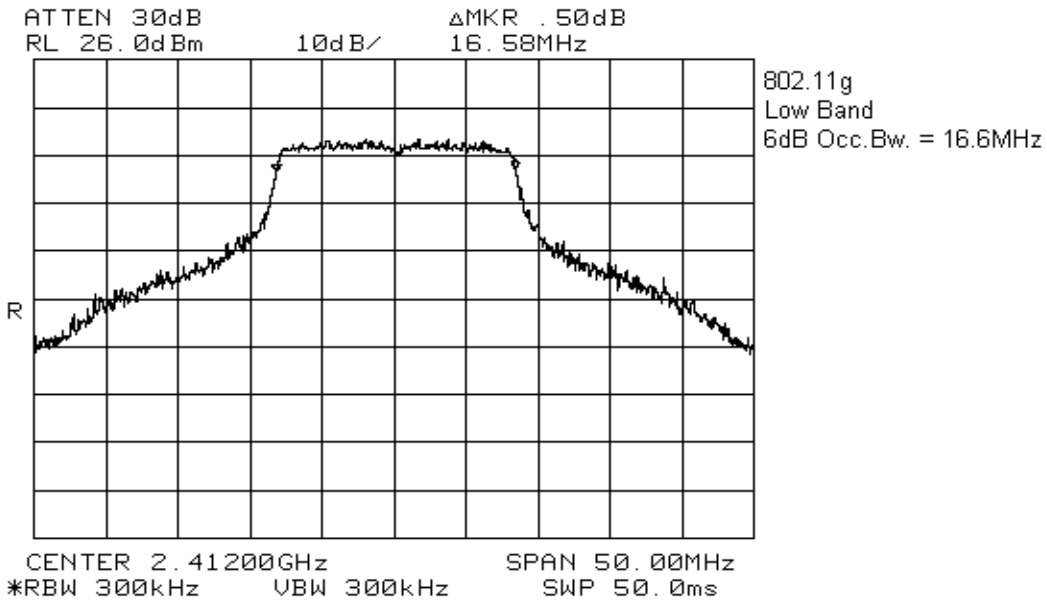
Measurement Data: See attached Plots

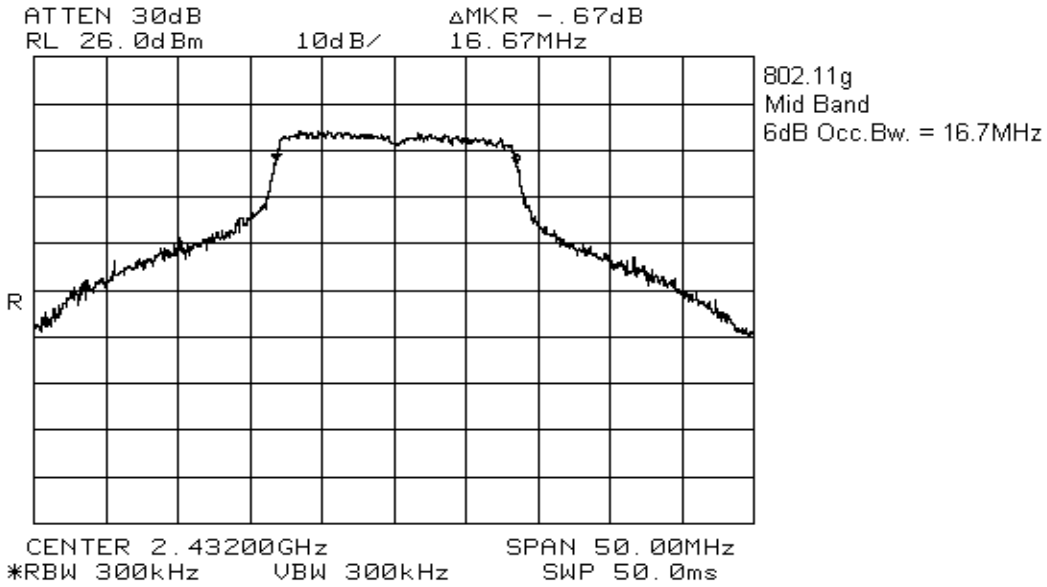
6dB Occupied Bandwidth			
802.11b	**2412MHz**	**2432MHz**	**2462MHz**
	11.7MHz	11.6MHz	11.8MHz
802.11g	**2412MHz**	**2432MHz**	**2462MHz**
	16.6MHz	16.7MHz	16.7MHz
802.11a	**5740MHz**	**5800MHz**	**5840MHz**
	16.7MHz	16.7MHz	16.7MHz

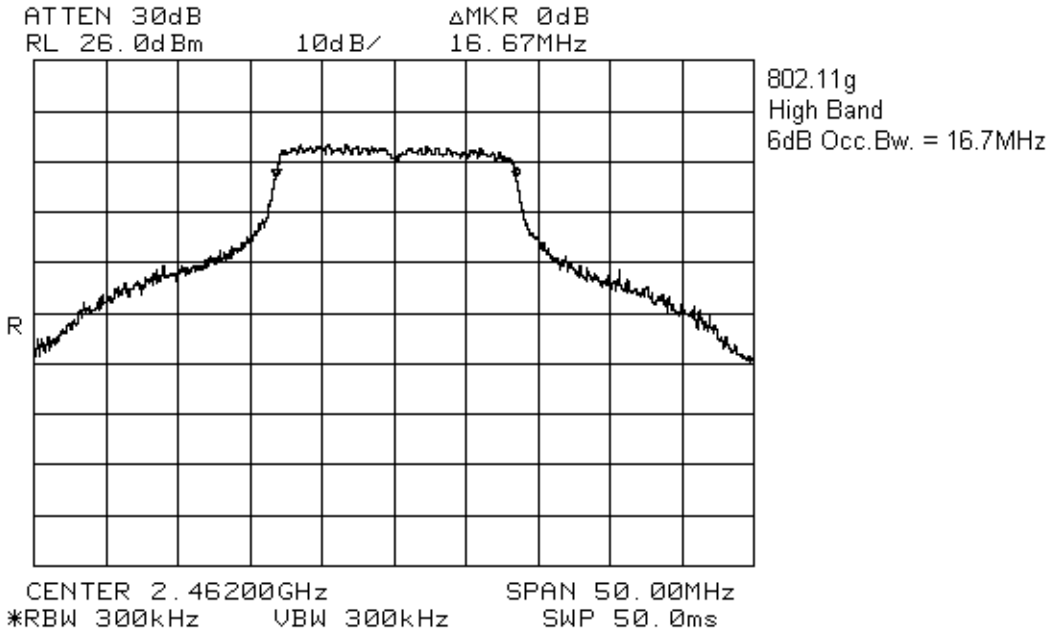

ATTEN 30dB
RL 30.0dBm
10dB/
ΔMKR -.50dB
11.67MHz
R
CENTER 2.41200GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms
802.11b
Low Band
6dB Occ.Bw. = 11.7MHz

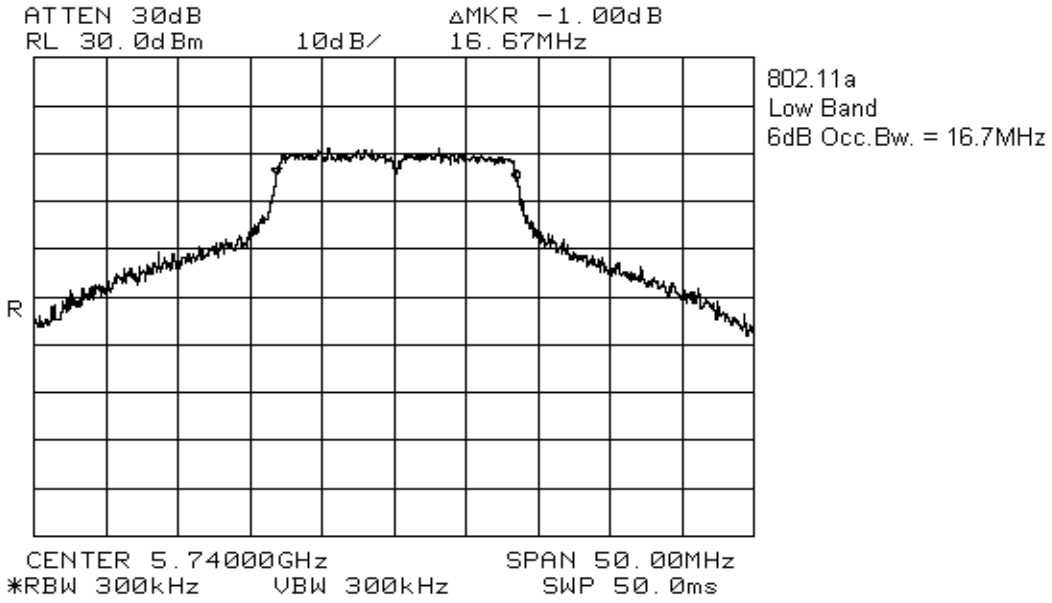

ATTEN 30dB
RL 30.0dBm
10dB/
ΔMKR -.50dB
11.58MHz
R
CENTER 2.43200GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms
802.11b
Low Band
6dB Occ.Bw. = 11.6MHz

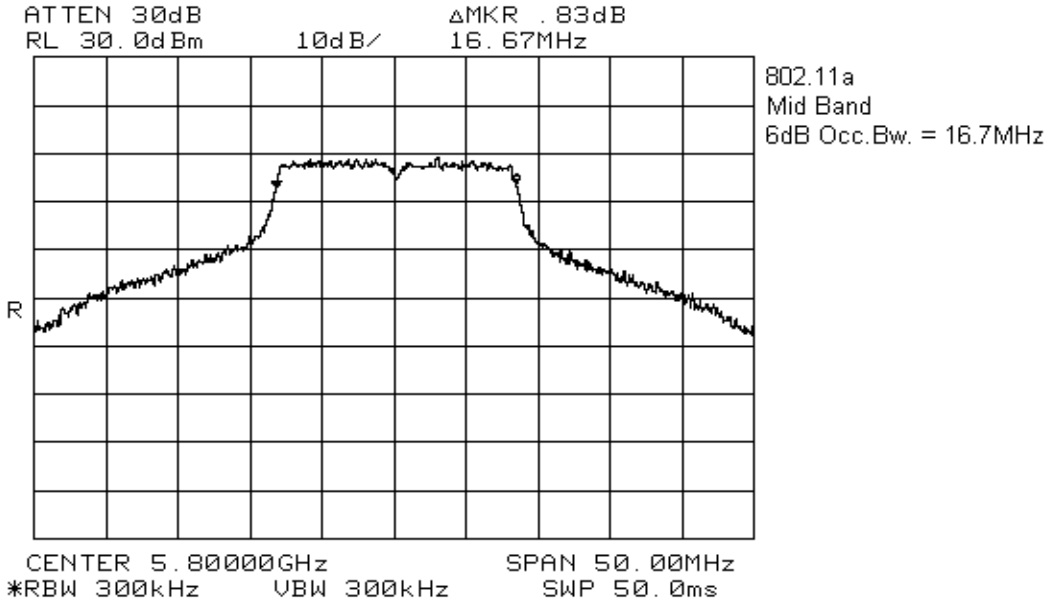

ATTEN 30dB
RL 30.0dBm
10dB/
ΔMKR .17dB
11.75MHz
802.11b
High Band
6dB Occ.Bw. = 11.8MHz
R
CENTER 2.46300GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms

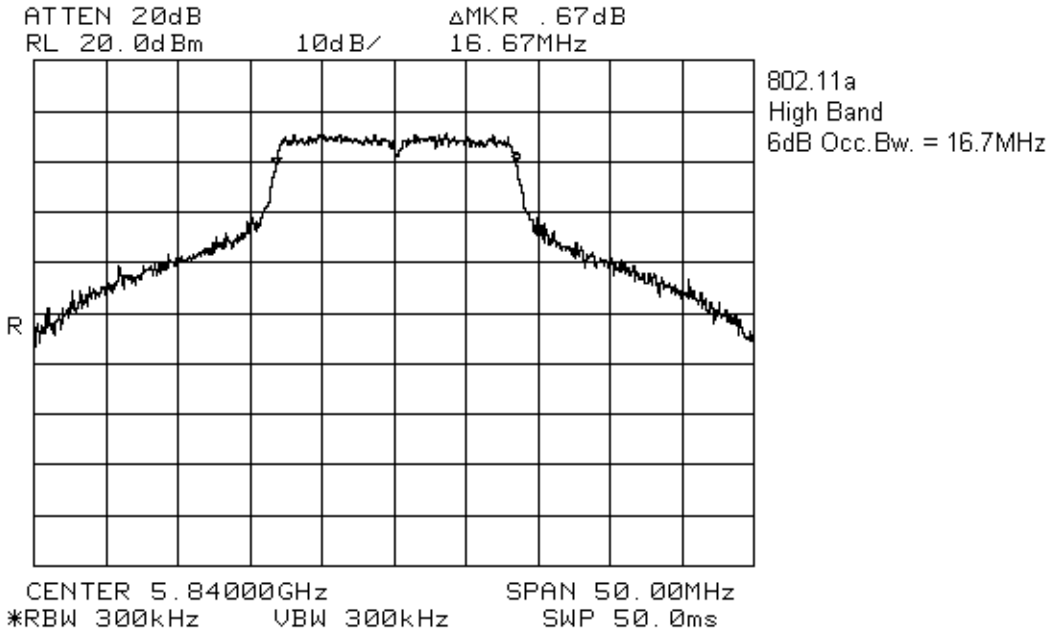

ATTEN 30dB
RL 26.0dBm
10dB/
ΔMKR .50dB
16.58MHz
802.11g
Low Band
6dB Occ.Bw. = 16.6MHz
R
CENTER 2.41200GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms


ATTEN 30dB
RL 26.0dBm
10dB/
ΔMKR -.67dB
16.67MHz
802.11g
Mid Band
6dB Occ.Bw. = 16.7MHz
R
CENTER 2.43200GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms


ATTEN 30dB
RL 26.0dBm
10dB/
ΔMKR 0dB
16.67MHz
802.11g
High Band
6dB Occ.Bw. = 16.7MHz
R
CENTER 2.46200GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms


ATTEN 30dB
RL 30.0dBm
10dB/
ΔMKR -1.00dB
16.67MHz
R
802.11a
Low Band
6dB Occ.Bw. = 16.7MHz
CENTER 5.74000GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms


ATTEN 30dB
RL 30.0dBm
10dB/
ΔMKR .83dB
16.67MHz
R
802.11a
Mid Band
6dB Occ.Bw. = 16.7MHz
CENTER 5.80000GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms


ATTEN 20dB
RL 20.0dBm
10dB/
ΔMKR .67dB
16.67MHz
802.11a
High Band
6dB Occ.Bw. = 16.7MHz
R
CENTER 5.84000GHz
SPAN 50.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms

Section 5. Peak Output Power

Para. No.: 15.247 (b)(3)

Test Performed By: Glen Westwell	**Date of Test: 21 Feb. 2004**

Limit: 1W, (30dBm)

Test Results: Complies

Measurement Data: See attached tables.

Note:
To achieve the bandedge requirement for emissions falling in the restricted bands, the power at the bandages has been reduced as detailed in the table on page 20. These power levels will automatically be set via firmware on selection of either bandedge channel #1 (2412MHz) or #11 (2462MHz).

802.11b/g Radio Antenna Port A, Conducted Power (dBm)								
	802.11b				802.11g			
Data Rate (Mbps)	1	2	5.5	11	6-24	36	48	54
2412MHz	13.6	13.5	13.5	13.2	13.0	13.2	13.3	13.2
2417MHz	20.2	20.0	20.2	19.7	18.9	18.2	17.2	16.0
2432MHz	19.8	19.9	20.5	20.8	18.8	18.0	17.3	15.8
2457MHz	19.6	19.6	20.0	20.0	18.7	17.8	16.8	15.7
2462MHz	10.8	11.2	11.3	11.1	10.9	10.9	10.9	10.8

802.11b/g Radio Antenna Port B, Conducted Power (dBm)								
	802.11b				802.11g			
Data Rate (Mbps)	1	2	5.5	11	6-24	36	48	54
2412MHz	13.6	13.4	13.7	13.7	13.2	13.2	13.2	13.2
2417MHz	20.0	19.0	19.7	19.8	18.4	17.4	16.5	15.5
2432MHz	20.0	19.9	20.1	20.2	18.9	17.9	16.7	15.5
2457MHz	19.5	19.1	19.2	19.4	18.0	17.0	16.0	15.0
2462MHz	11.2	11.2	11.2	11.0	10.7	10.9	10.9	10.6

Radio	Data Rate (Mbps)	Rated Power (dBm)
802.11b	ALL	20.0
802.11g	6-24	19.0
	36	18.0
	48	17.0
	54	16.0
802.11b/g Bandedge Reduced Power		
Ch.1	ALL	13.0
Ch. 11	ALL	11.0

Note: To achieve the bandedge requirement for emissions falling in the restricted bands, the power at the bandages has been reduced as detailed in the table above. These power levels will automatically be set via firmware on selection of either bandedge channel #1 (2412MHz) or #11 (2462MHz).

Antenna Gain & EIRP:

802.11b/g (1) Co-linear Whip Antenna = 5dBi
(2) PIFA Antenna (integral) = 0dBi

802.11b/g Maximum E.I.R.P = 20.8+5.0 = 25.8dBm

Limit = 30dBm conducted power + 6dBi antenna = 36.0dBm EIRP

802.11a Radio Antenna Port B, Conducted Power (dBm)								
Data Rate (Mbps)	6-24		36		48		54	
	Measured	Rated	Measured	Rated	Measured	Rated	Measured	Rated
5740MHz	19.4	20.0	18.5	19.0	16.2	17.0	15.2	16.0
5800MHz	19.5	20.0	18.9	19.0	17.0	17.0	15.9	16.0
5820MHz	20.0	20.0	19.5	19.0	16.7	17.0	16.0	16.0
5840MHz	17.5	18.0	16.3	17.0	13.8	15.0	12.6	14.0

802.11a Radio Antenna Port A, Conducted Power (dBm)								
Data Rate (Mbps)	6-24		36		48		54	
	Measured	Rated	Measured	Rated	Measured	Rated	Measured	Rated
5740MHz	19.7	20.0	18.5	19.0	16.4	17.0	15.3	16.0
5800MHz	20.0	20.0	18.8	19.0	16.9	17.0	16.0	16.0
5820MHz	19.9	20.0	19.7	19.0	17.1	17.0	16.3	16.0
5840MHz	17.5	18.0	17.0	17.0	14.5	15.0	13.5	14.0

Note: Power Levels in the above chart will be reduced by +4dBm for external antenna operation due to the loss between the radio module and the RF switch matrix.

Antenna Gain & EIRP:

802.11a (1) Integral antenna = 10dBi
(2) H&S SPA 5600140/14/0/V = 13dBi
(3) Andrews #FPA5250D06-N = 18dBi
(4) Andrews #FPA5250D12-N = 23.6dBi

(1) 802.11a Maximum E.I.R.P for Fixed P-P outdoor operation
= 20.0 – (4db) +23.6dBi = 39.6dBm
(2) 802.11a Maximum E.I.R.P for all applications
= 20.0 – (4db) +18dBi = 34.0dBm
(3) 802.11a Maximum E.I.R.P for integral antenna operation
= 20.0+10dBi = 30.0dBm

Limit
(1) P-P operation = 30dBm conducted power + antenna gain.
(2) All other applications = 30dBm conducted power + 6dBi antenna gain = 36dBi EIRP.

Section 6. Spurious Emissions

Para. No.: 15.247 (c)

Test Performed By: Glen Westwell	**Date of Test: 23 Feb. 2004**

Limit: 20dBc (conducted)
Radiated emissions that fall in the restricted bands must comply with 15.209

Test Results: Complies

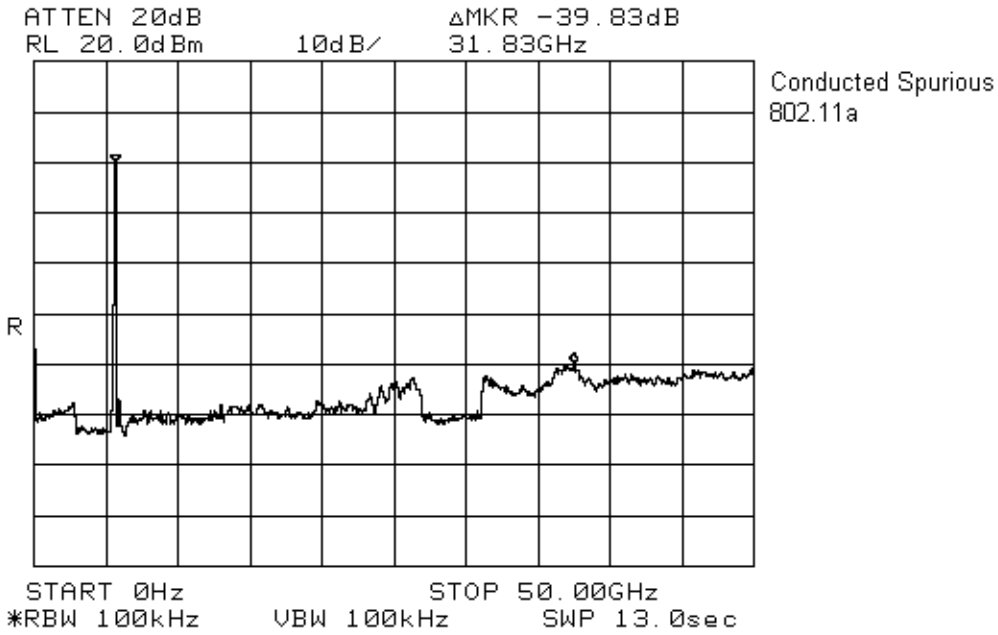
Note: To achieve the bandedge requirement for emissions falling in the restricted bands, the power at the bandages has been reduced as detailed in section 5 of this report. These power levels will automatically be set via firmware on selection of either bandedge channel #1 or #11 as follows:

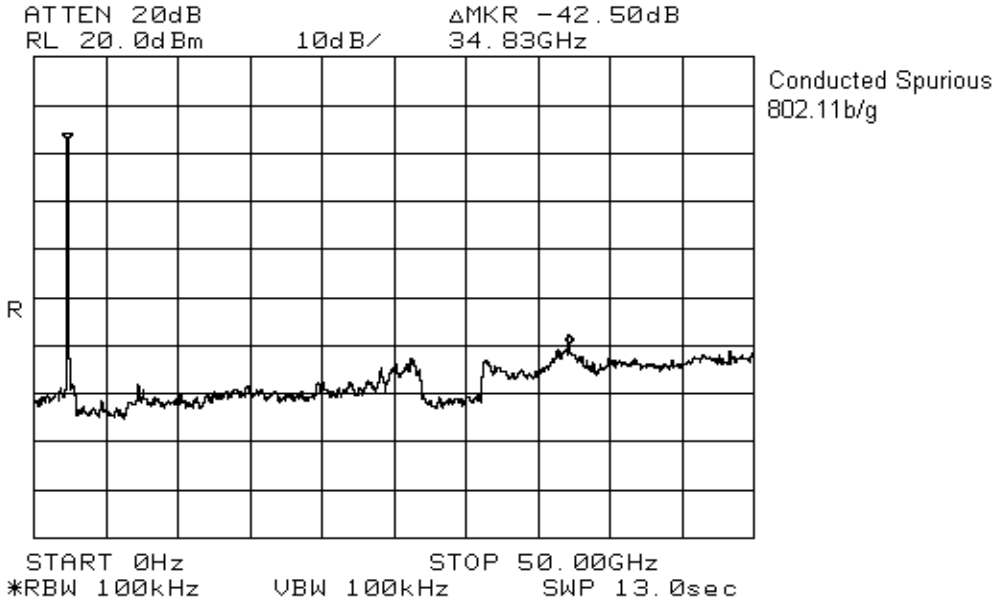
Ch. 1, 2412MHz = +13dBm
Ch.11, 2462MHz = +11dBm

Measurement Data: See attached Plots and table.

●Emissions were searched for all possible configurations. Worst case data has been presented.
●The DUT was searched to the 10^{th} harmonic for both the 2.4GHz & 5GHz bands. Only those emissions within 20dB of the limit were reported.
●The power supply source was varied +/-15% to verify worst case emissions.
● Radiated bandedge measurements in the restricted bands were verified using both the 0dBi PIFA antenna and the 5dBi Whip antenna. Worst case data was obtained using the 5dBi Whip antenna and presented in this report.

20dBc


ATTEN 20dB
RL 20.0dBm
10dB/
ΔMKR -39.83dB
31.83GHz
Conducted Spurious
802.11a
R
START 0Hz
STOP 50.00GHz
*RBW 100kHz
VBW 100kHz
SWP 13.0sec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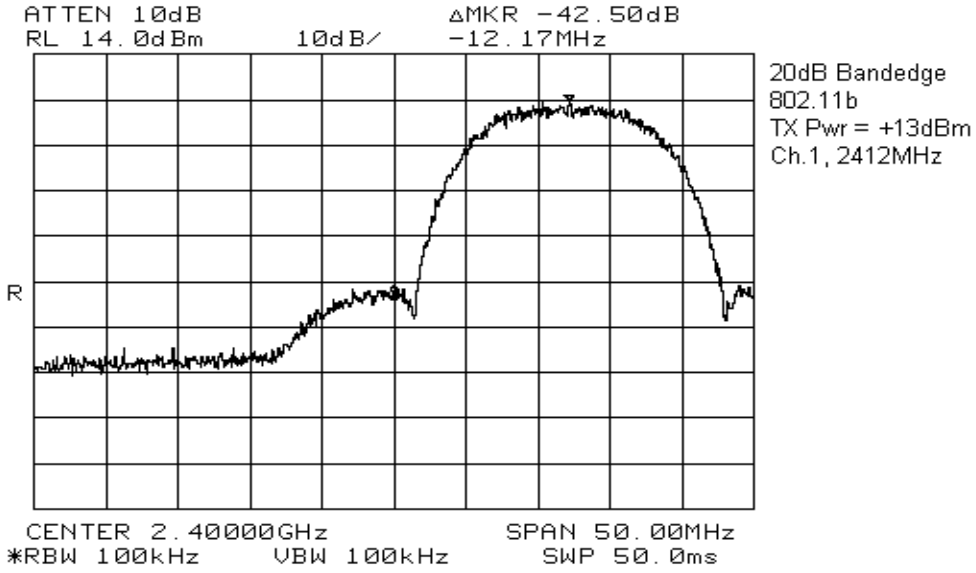
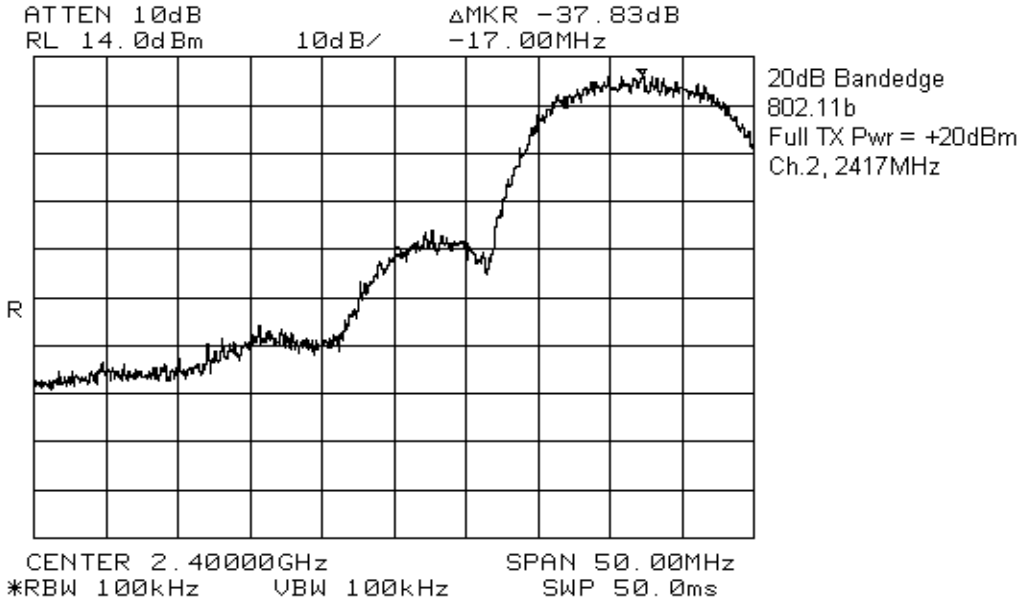
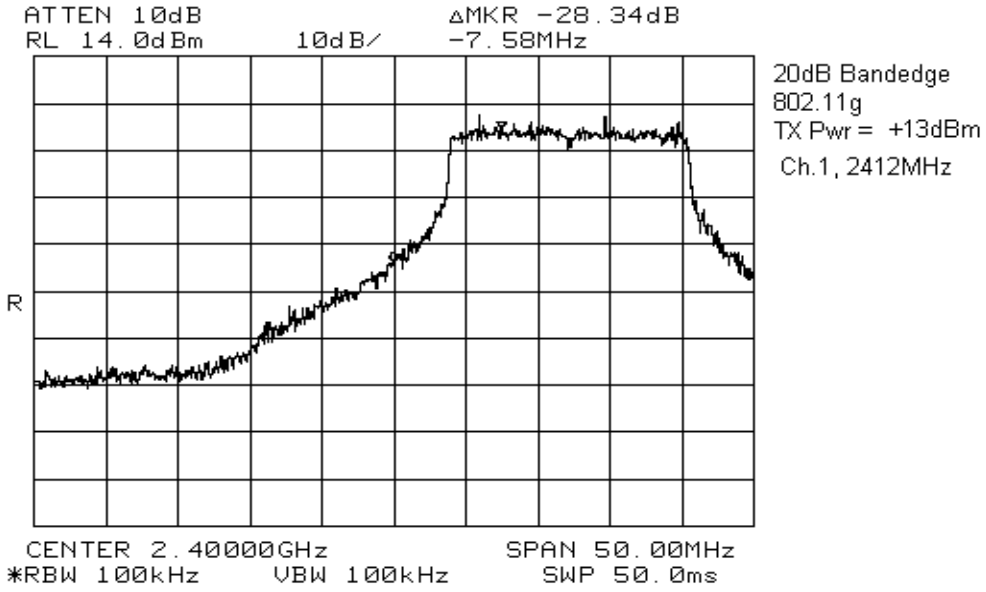
RL 20.0dBm
10dB/
ΔMKR -42.50dB
34.83GHz
Conducted Spurious
802.11b/g
R
START 0Hz
STOP 50.00GHz
*RBW 100kHz
VBW 100kHz
SWP 13.0sec

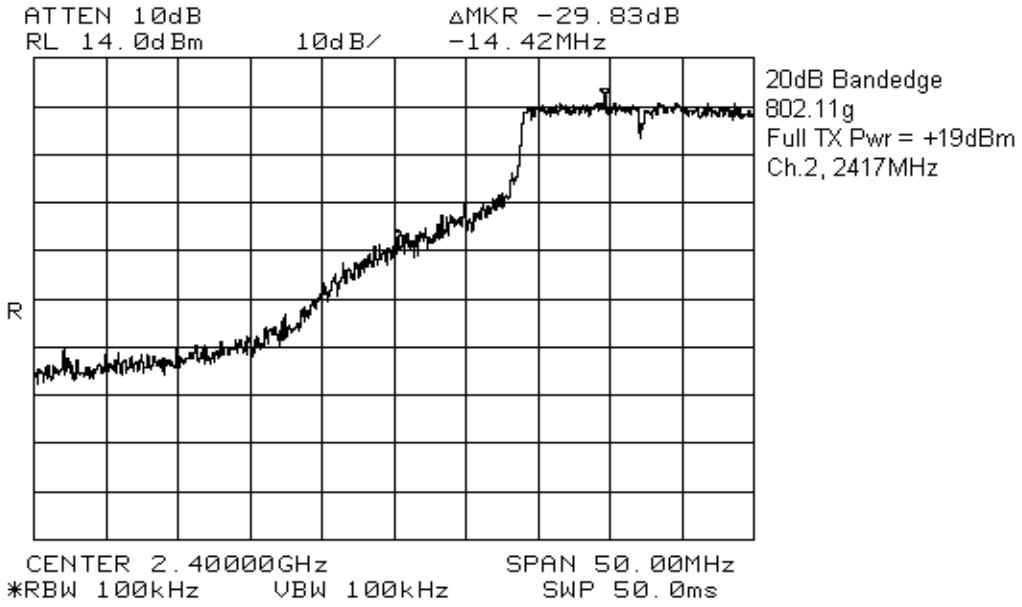
20dBc


ATTEN 10dB
RL 14.0dBm
10dB/
ΔMKR -42.50dB
-12.17MHz
R
CENTER 2.40000GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms
20dB Bandedge
802.11b
TX Pwr = +13dBm
Ch.1, 2412MHz

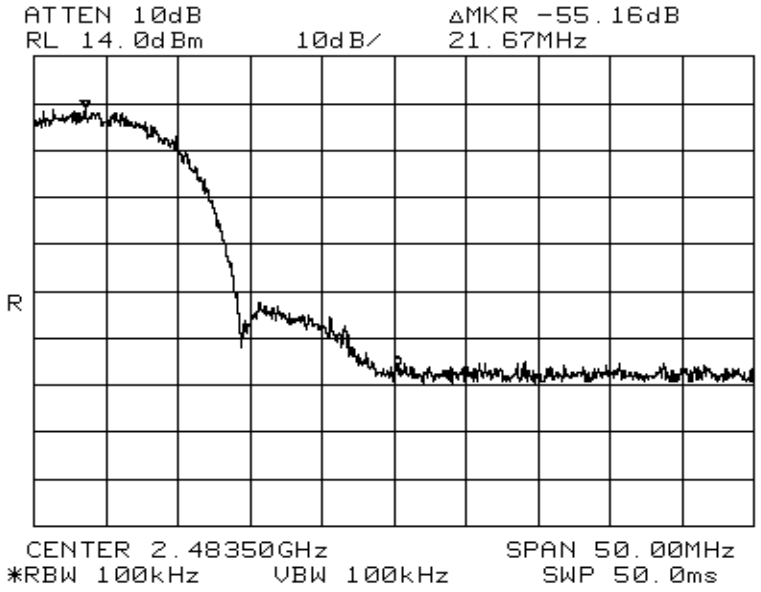

ATTEN 10dB
RL 14.0dBm
10dB/
ΔMKR -37.83dB
-17.00MHz
R
CENTER 2.40000GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms
20dB Bandedge
802.11b
Full TX Pwr = +20dBm
Ch.2, 2417MHz

20dBc

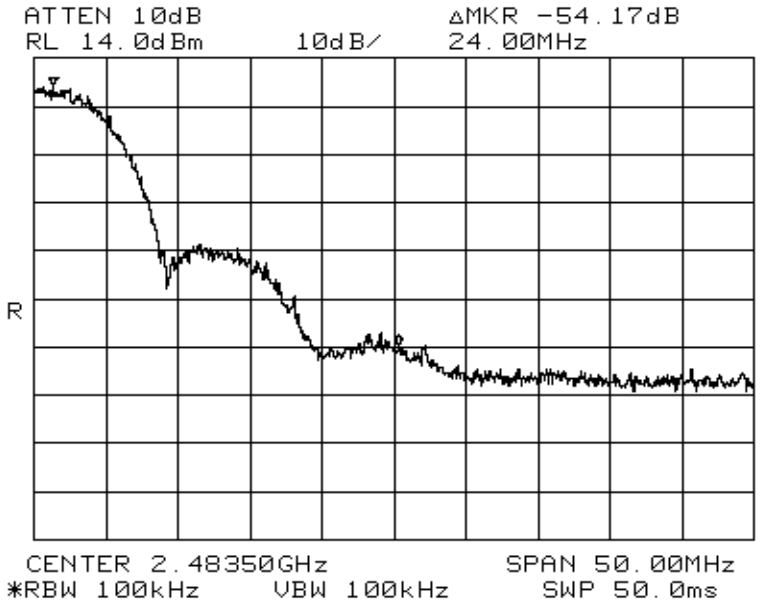

ATTEN 10dB
RL 14.0dBm
10dB/
ΔMKR -28.34dB
-7.58MHz
20dB Bandedge
802.11g
TX Pwr = +13dBm
Ch.1, 2412MHz
R
CENTER 2.40000GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 10dB
RL 14.0dBm
10dB/
ΔMKR -29.83dB
-14.42MHz
20dB Bandedge
802.11g
Full TX Pwr = +19dBm
Ch.2, 2417MHz
R
CENTER 2.40000GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

20dBc

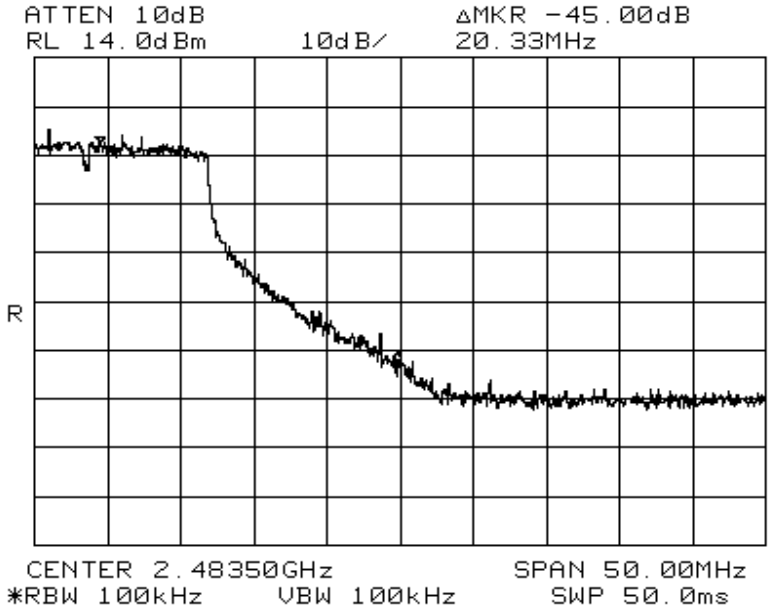


20dB Bandedge
802.11b
TX Pwr = +11dBm
Ch.11, 2462MHz

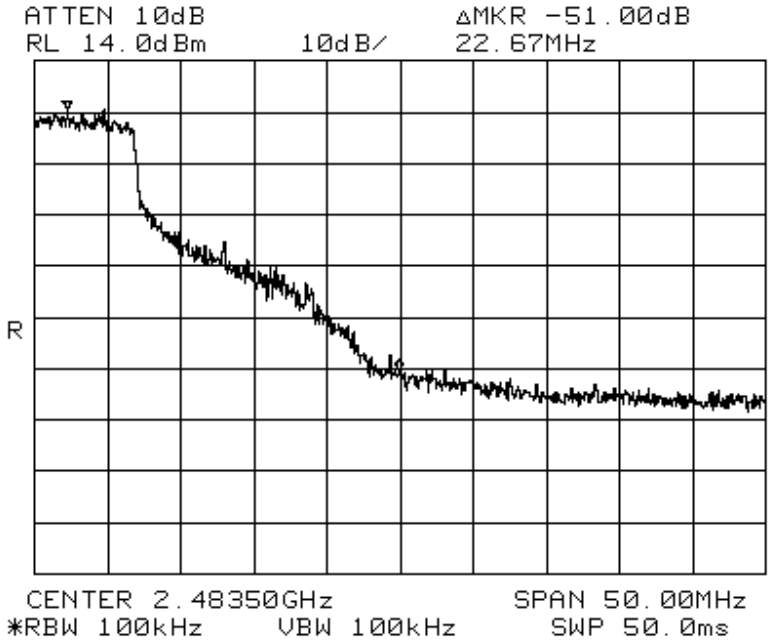


20dB Bandedge
802.11b
Full TX Pwr = +20dBm
Ch.10, 2457MHz

20dBc

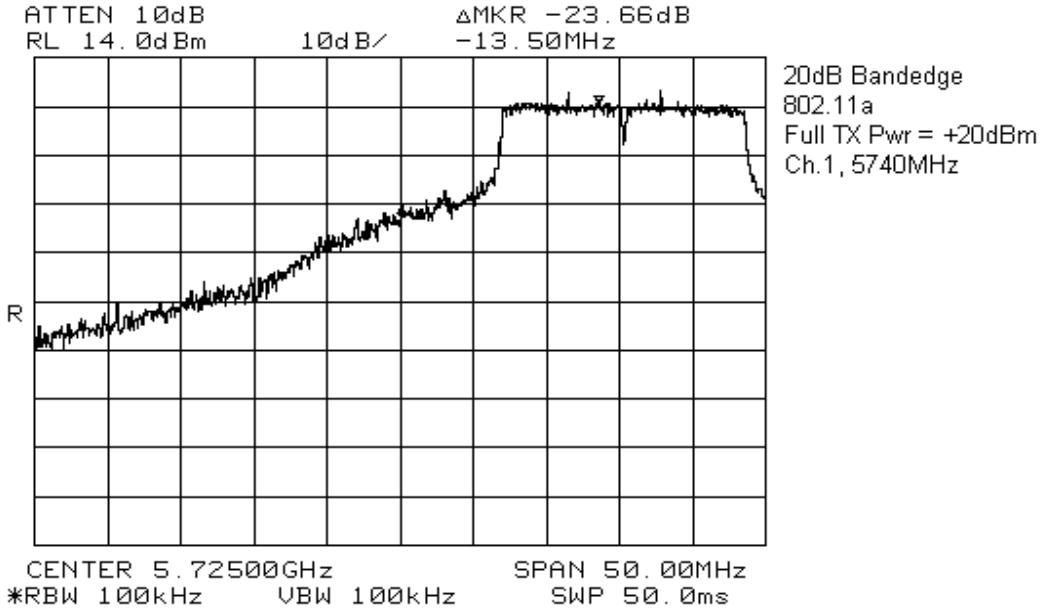


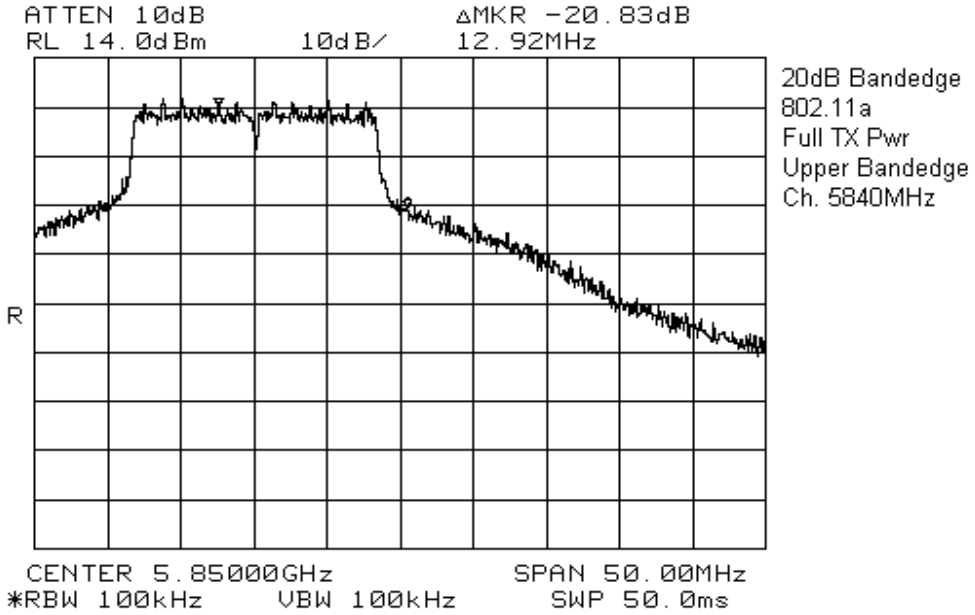
20dB Bandedge
802.11g
TX Pwr = +11dBm
Ch.11, 2462MHz



20dB Bandedge
802.11g
Full TX Pwr = +19dBm
Ch.10, 2457MHz

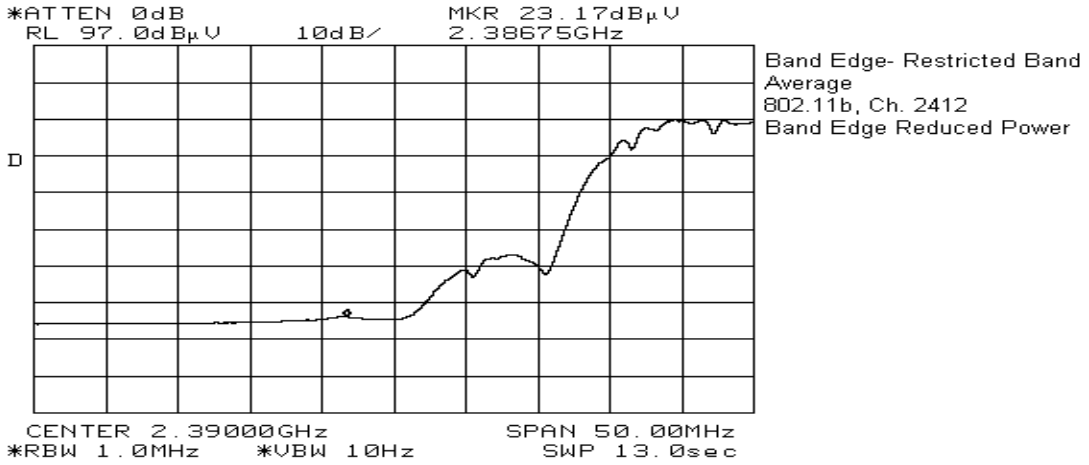
20dBc


ATTEN 10dB
RL 14.0dBm
10dB/
ΔMKR -23.66dB
-13.50MHz
R
CENTER 5.72500GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms
20dB Bandedge
802.11a
Full TX Pwr = +20dBm
Ch.1, 5740MHz

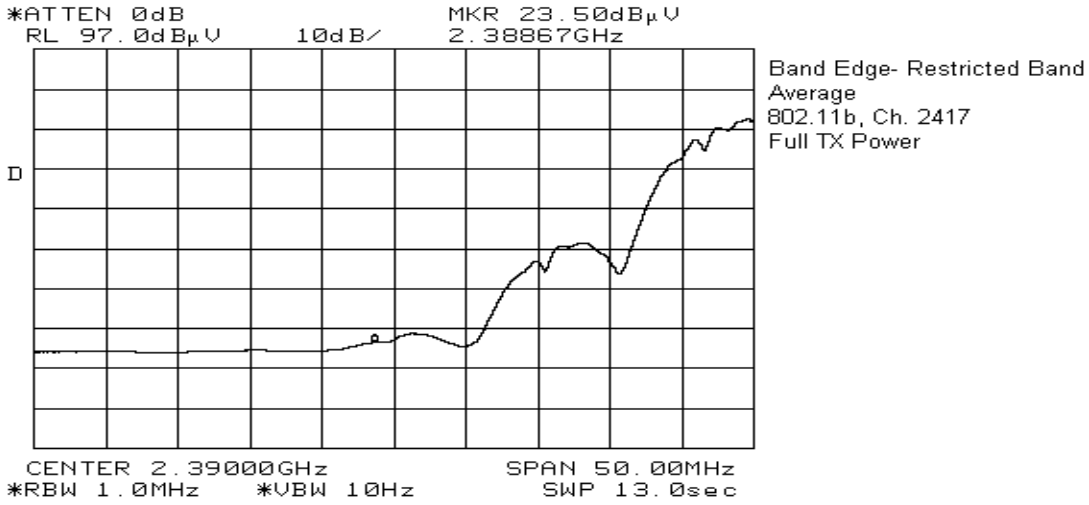

ATTEN 10dB
RL 14.0dBm
10dB/
ΔMKR -20.83dB
12.92MHz
R
CENTER 5.85000GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms
20dB Bandedge
802.11a
Full TX Pwr
Upper Bandedge
Ch. 5840MHz

Lower Band Edge, 802.11b

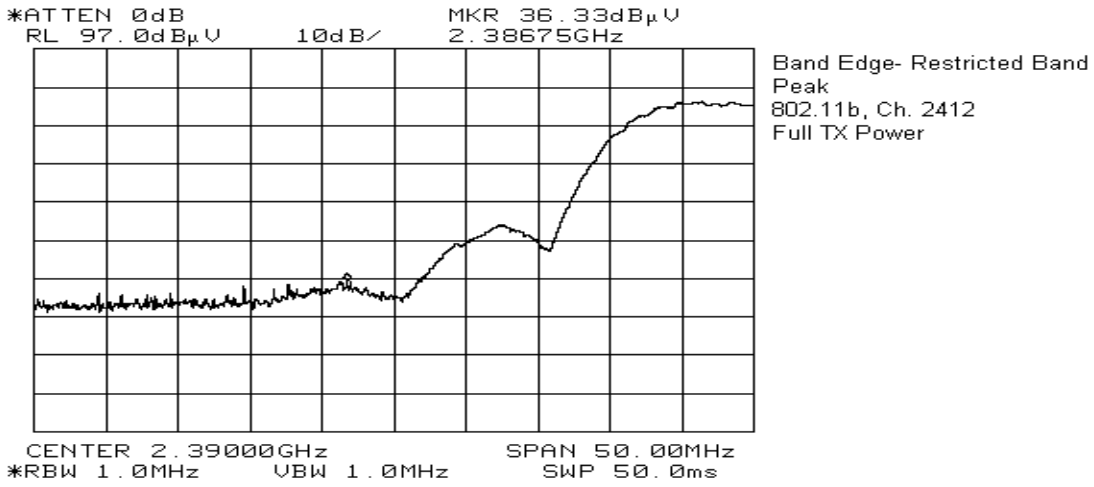
Band Edge Level (PK)	Af	Level	Limit
23.2dBuV	29.4dB	52.6dBuV	54dBuV



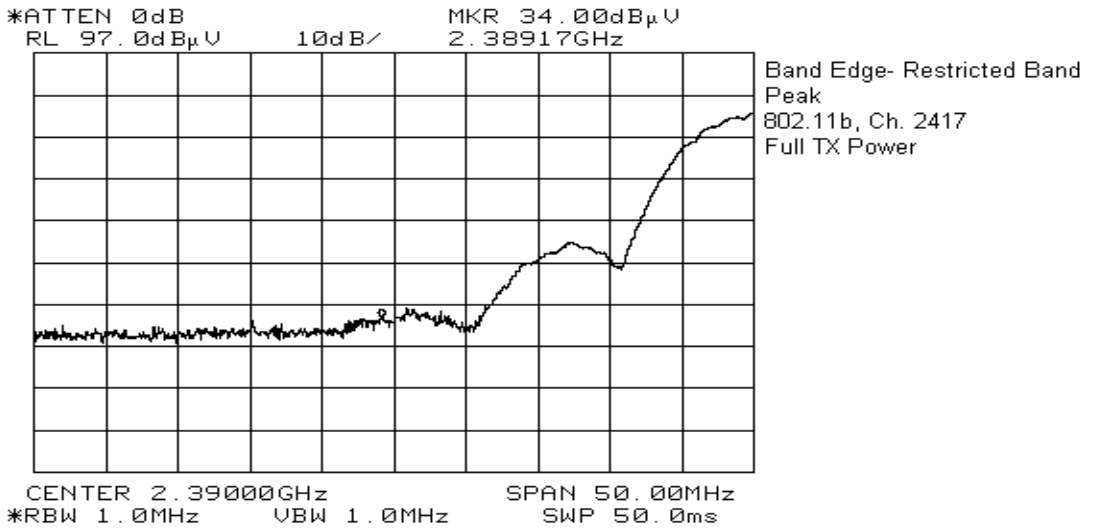
Band Edge Level (Avg)	Af	Level	Limit
23.5dBuV	29.4dB	52.9dBuV	54dBuV



Band Edge Level (PK)	Af	Level	Limit
36.33dBuV	29.4dB	65.7.0dBuV	74dBuV

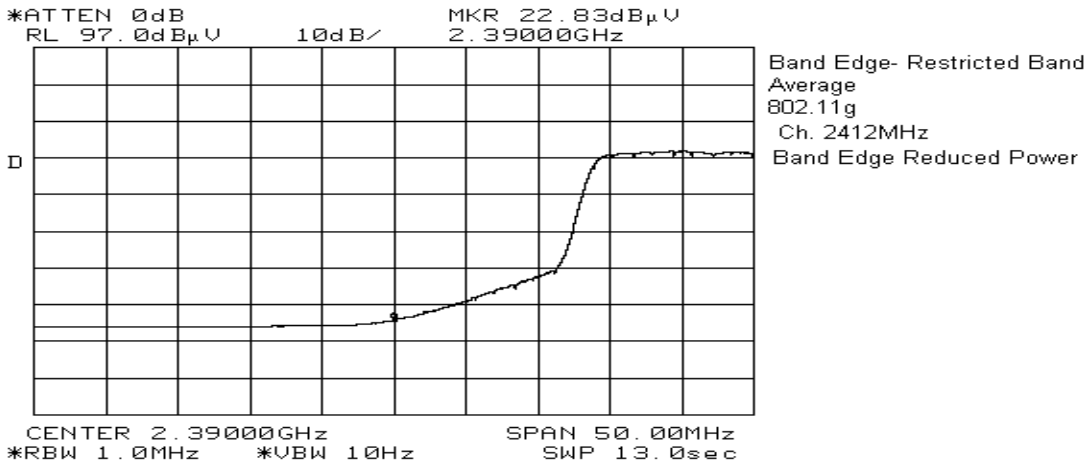


Band Edge Level (Avg)	Af	Level	Limit
34.0dBuV	29.4dB	63.4dBuV	74dBuV

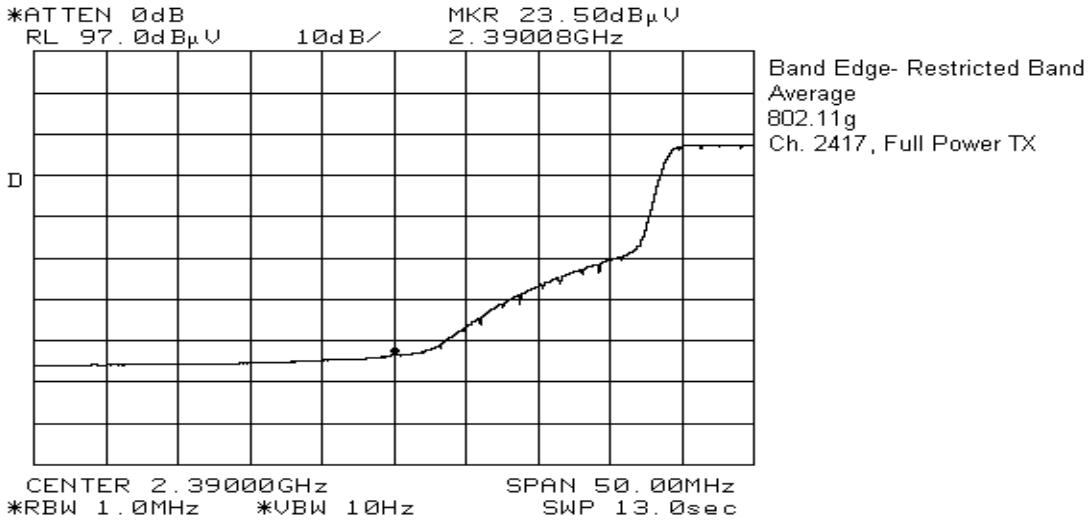


Lower Band Edge, 802.11g

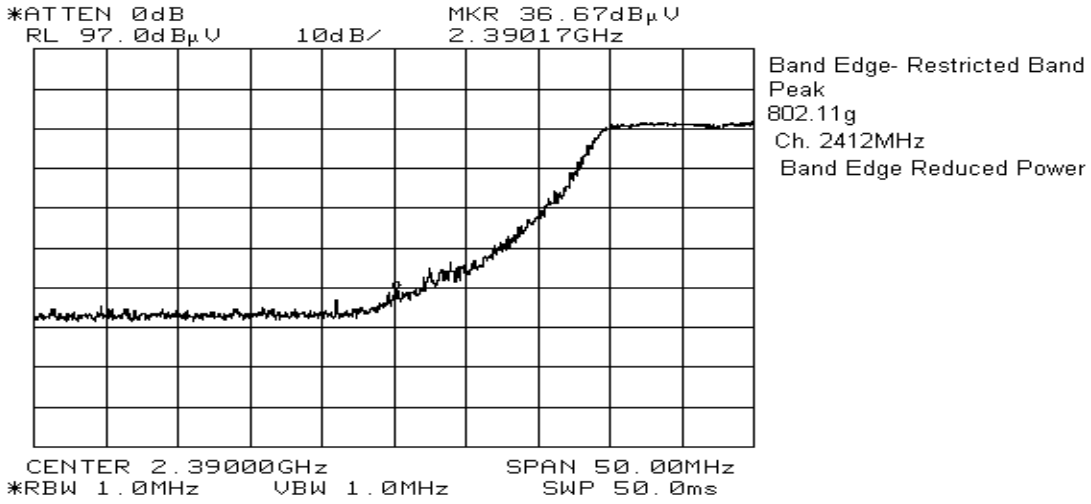
Band Edge Level (PK)	Af	Level	Limit
22.8dBuV	29.4dB	52.2dBuV	54dBuV



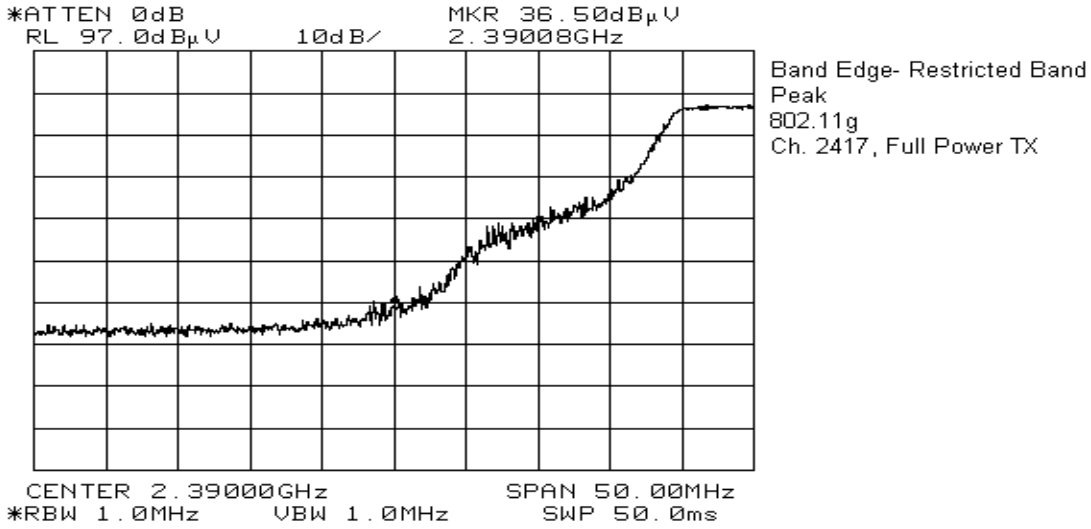
Band Edge Level (Avg)	Af	Level	Limit
23.5dBuV	29.4dB	52.9dBuV	54dBuV



Band Edge Level (PK)	Af	Level	Limit
36.7dBuV	29.4dB	66.1.0dBuV	74dBuV

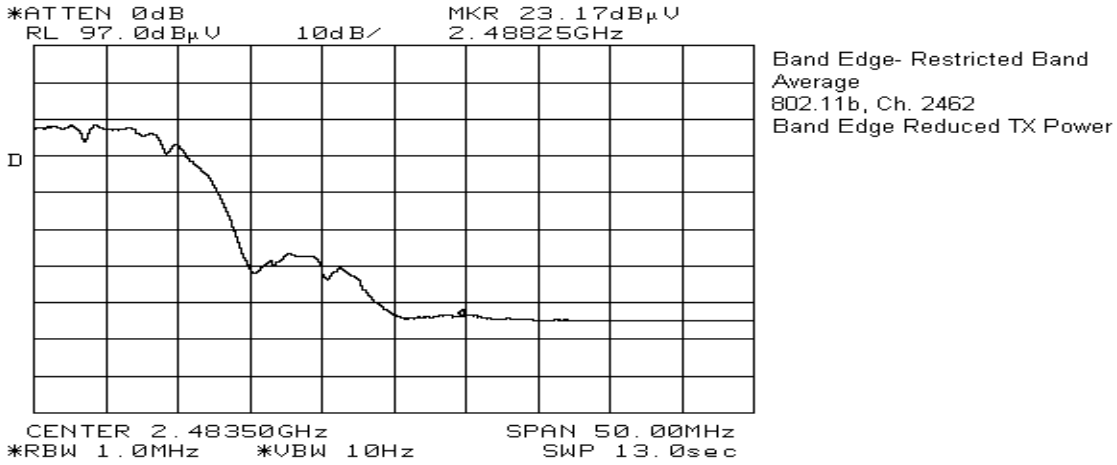


Band Edge Level (Avg)	Af	Level	Limit
36.5dBuV	29.4dB	65.9dBuV	74dBuV

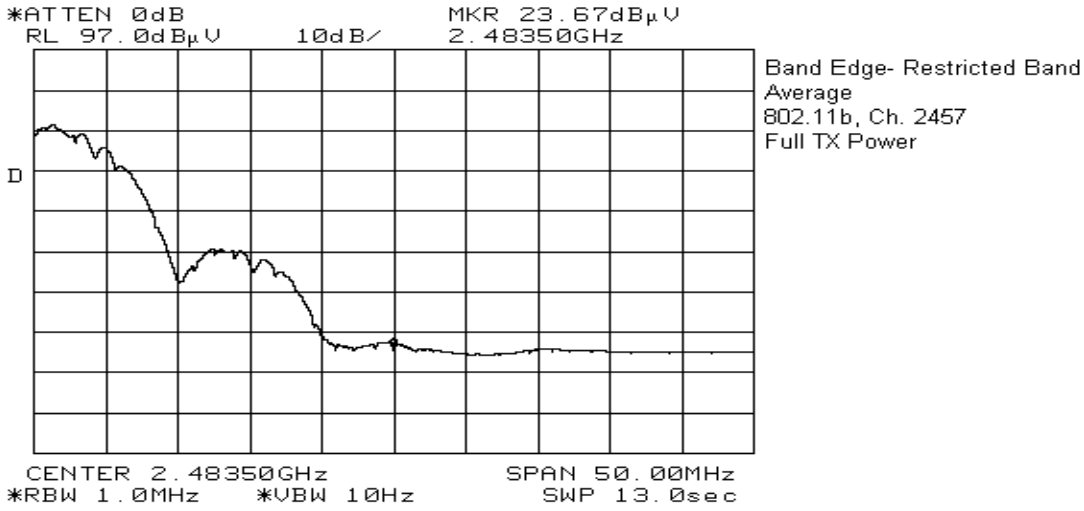


Upper Band Edge, 802.11b

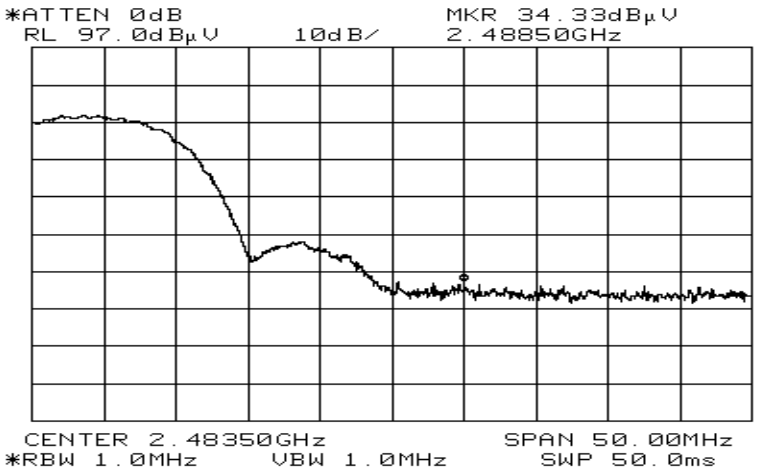
Band Edge Level (PK)	Af	Level	Limit
23.2dBuV	29.4dB	52.6dBuV	54dBuV



Band Edge Level (Avg)	Af	Level	Limit
23.7dBuV	29.4dB	53.1dBuV	54dBuV

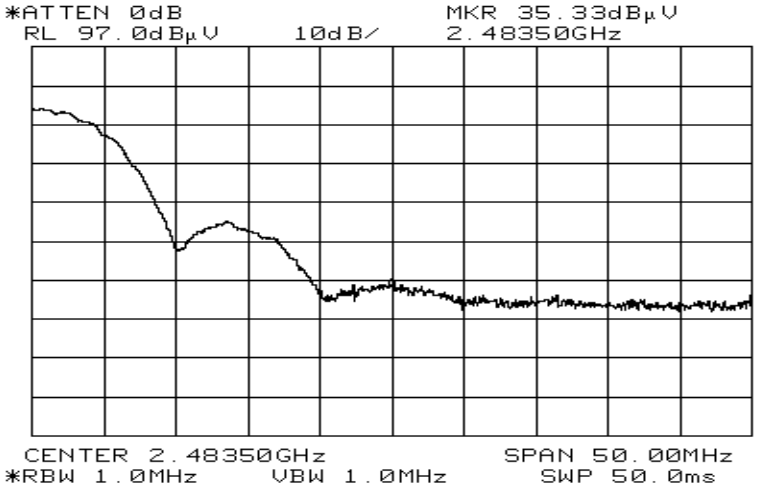


Band Edge Level (PK)	Af	Level	Limit
34.3dBuV	29.4dB	63.7dBuV	74dBuV



Band Edge- Restricted Band
Peak
802.11b, Ch. 2462
Band Edge Reduced TX Power

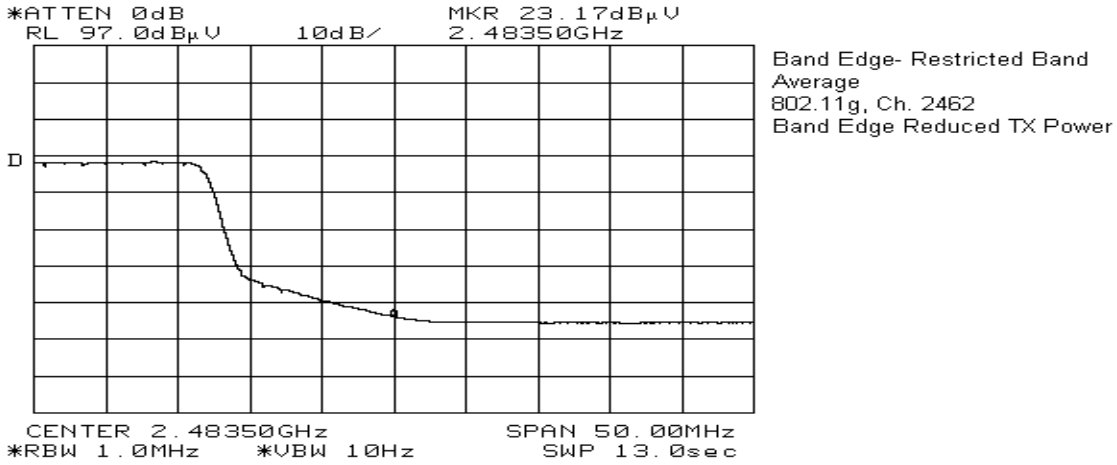
Band Edge Level (Avg)	Af	Level	Limit
36.5dBuV	29.4dB	65.9dBuV	74dBuV



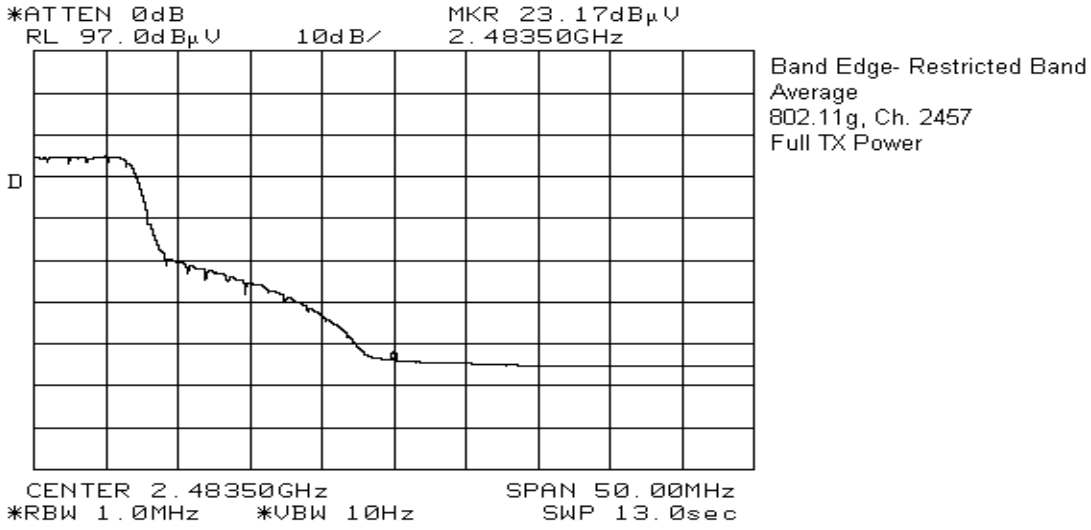
Band Edge- Restricted Band
Peak
802.11b, Ch. 2457
Full TX Power

Upper Band Edge, 802.11g

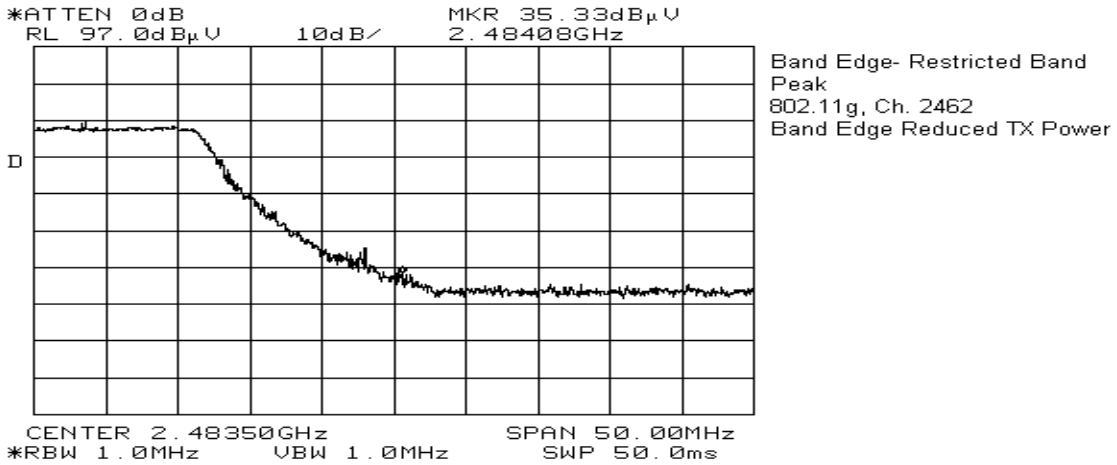
Band Edge Level (PK)	Af	Level	Limit
23.2dBuV	29.4dB	52.6dBuV	54dBuV



Band Edge Level (Avg)	Af	Level	Limit
23.2dBuV	29.4dB	52.6dBuV	54dBuV

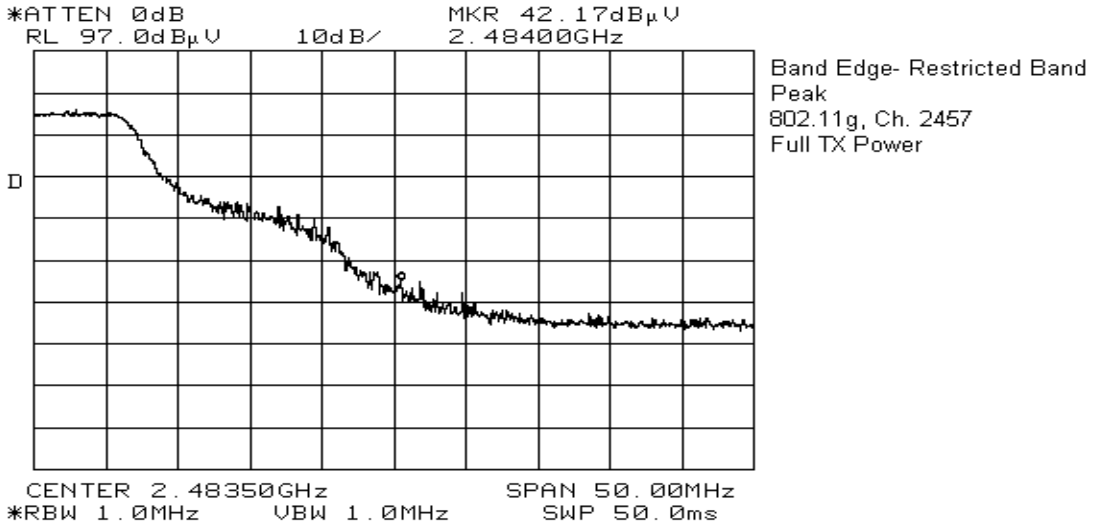


Band Edge Level (PK)	Af	Level	Limit
35.3dBuV	29.4dB	64.7dBuV	74dBuV



Band Edge- Restricted Band
Peak
802.11g, Ch. 2462
Band Edge Reduced TX Power

Band Edge Level (Avg)	Af	Level	Limit
42.2dBuV	29.4dB	71.6dBuV	74dBuV



Band Edge- Restricted Band
Peak
802.11g, Ch. 2457
Full TX Power

Tested as per (Table Top/Floor Standing): Table Top

Test Distance (meters): 3	Range: A

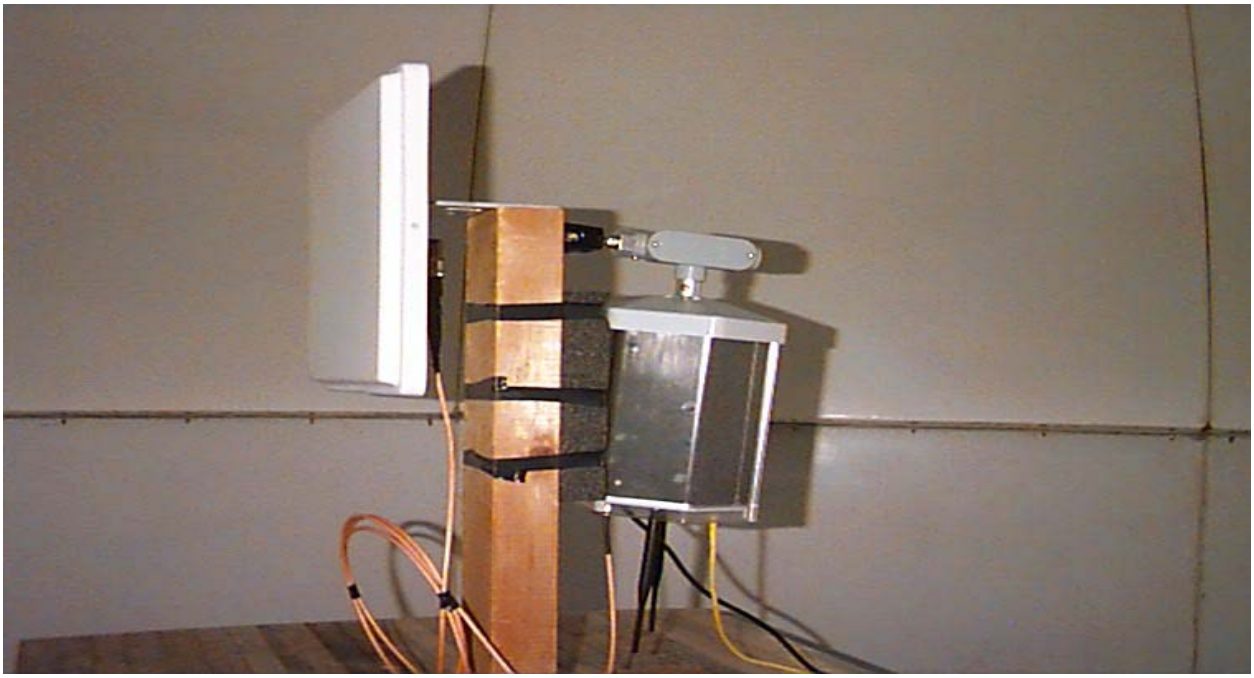
Emissions within 20 dB of the limit have been recorded.

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Amp.
Ch.1											
4824.0000	Horn2	V	61.0	34.3	53.0	8.3	50.6	54.0	3.4	**Peak**	4-8GHz
4824.0000	Horn2	H	55.0	34.2	53.0	8.3	44.4	54.0	9.6	**Peak**	4-8GHz
7236.0000	Horn2	V	59.0	36.5	53.7	11.3	53.1	54.0	0.9	**Peak**	4-8GHz
Ch.6											
4884.0000	Horn2	V	62.3	34.4	52.6	8.9	52.9	54.0	1.1	**Peak**	4-8GHz
4884.0000	Horn2	H	55.5	34.2	52.6	8.9	45.9	54.0	8.1	**Peak**	4-8GHz
Ch.11											
4924.0000	Horn2	V	62.0	34.4	52.4	8.8	52.8	54.0	1.2	**Peak**	4-8GHz
4924.0000	Horn2	H	56.0	34.2	52.4	8.8	46.6	54.0	7.4	**Peak**	4-8GHz

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW, 10Hz VBW, **Peak =1.0MHz RBW, 1.0MHz VBW**

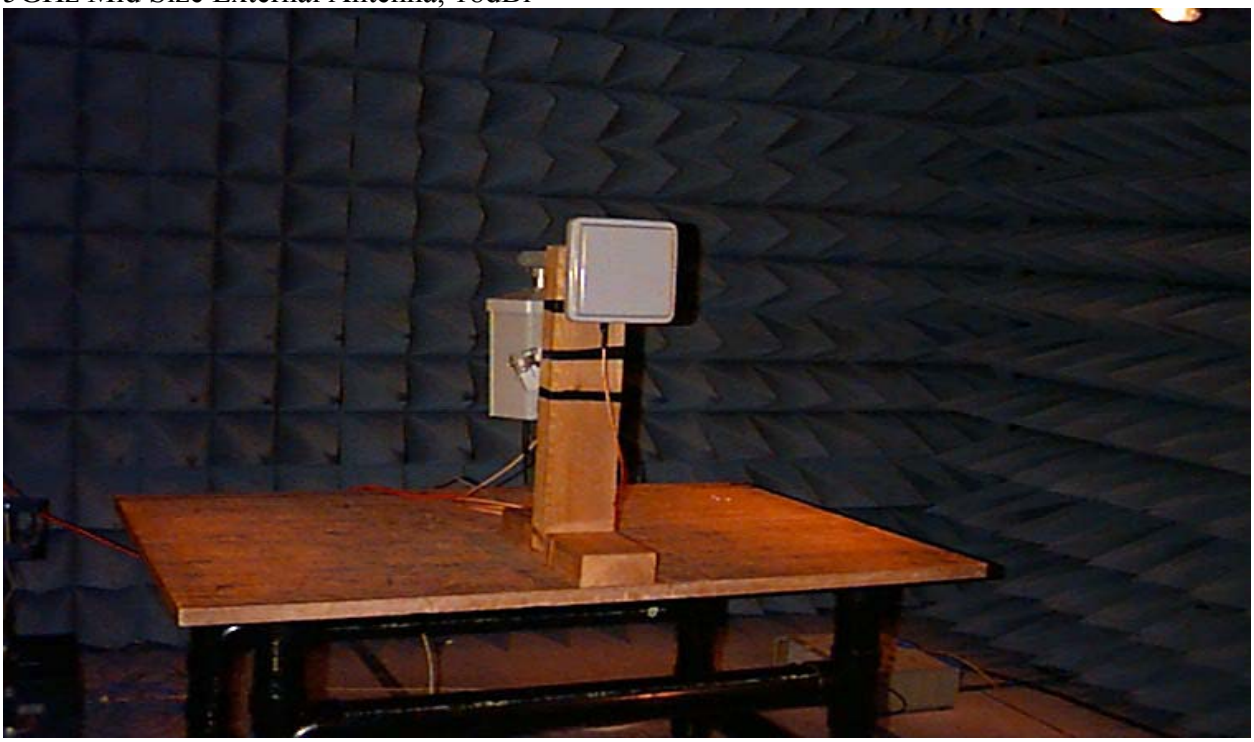
Notes:	Measurement data presented is for Ch. 1,6 & 11 respectively

Radiated Emissions



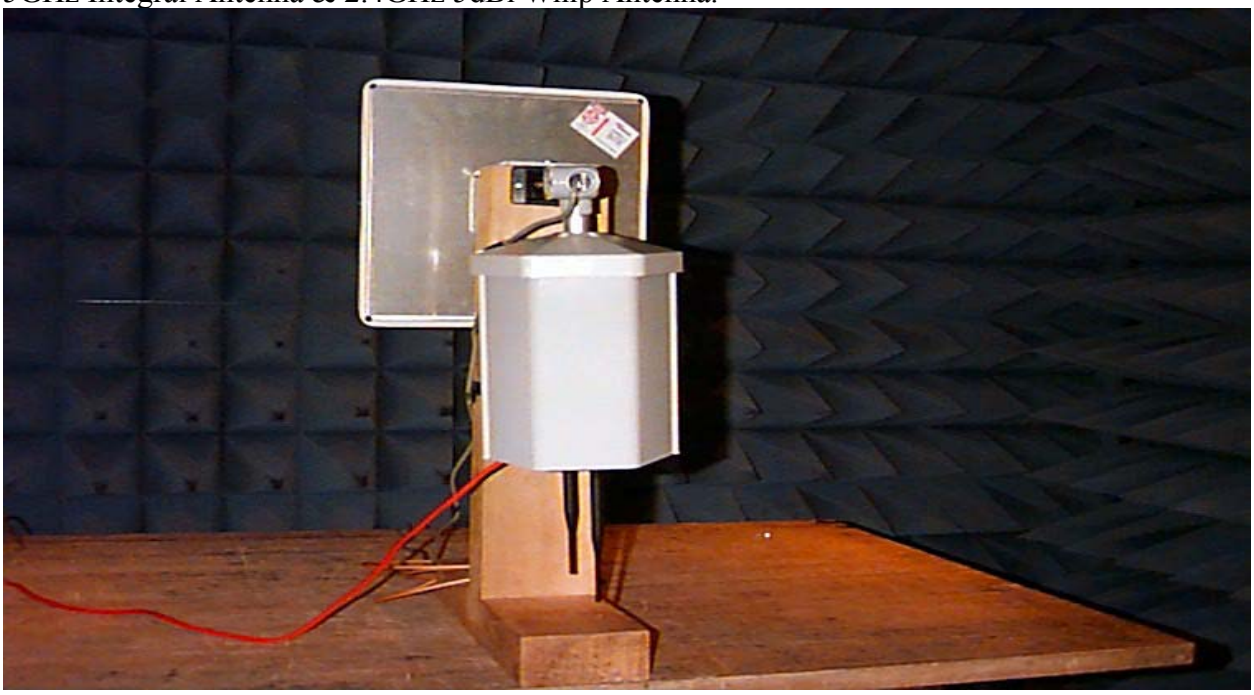
5GHz Large External Antenna, 23.6dBi

5GHz Mid Size External Antenna, 18dBi

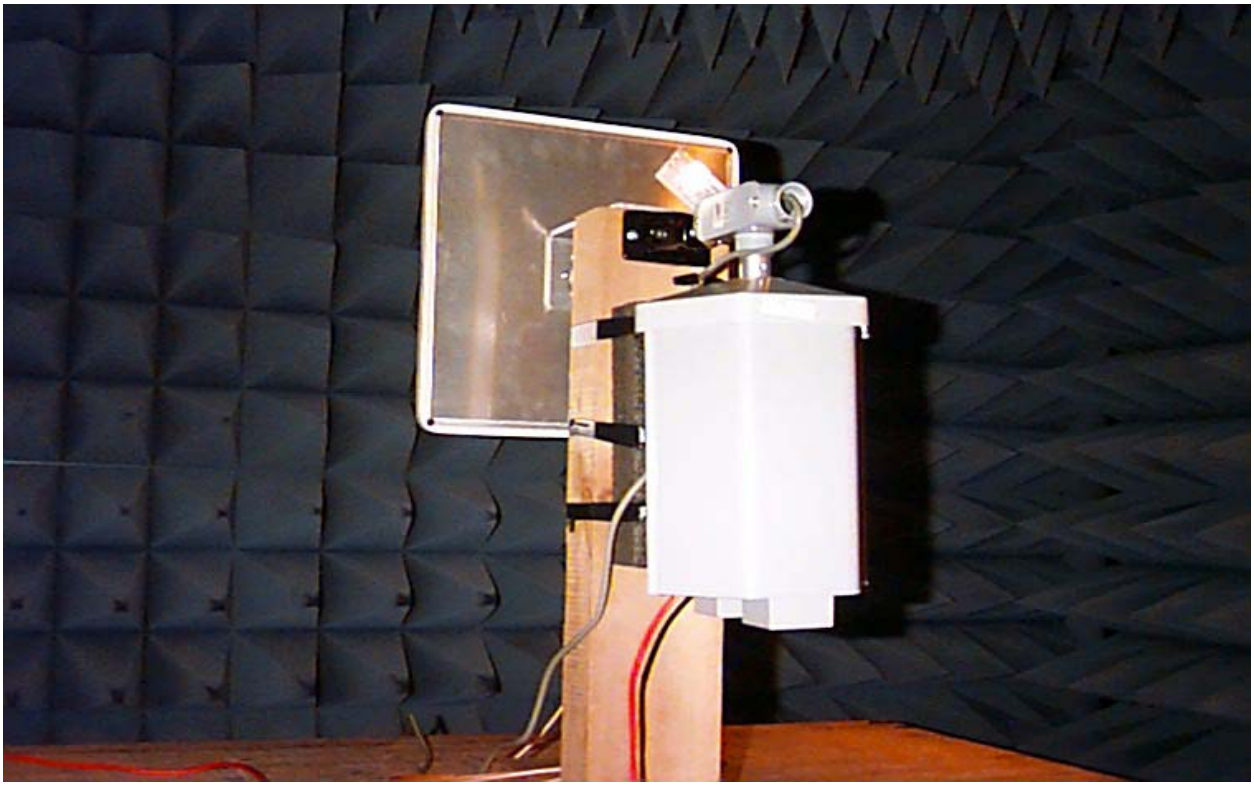


5GHz Small External Antenna, 13dBi

5GHz Integral Antenna & 2.4GHz 5dBi Whip Antenna.



0dBi PIFA



Section 7. Peak Power Spectral Density

Para. No.: 15.247 (d)

Test Performed By: Glen Westwell	**Date of Test: 25 Feb. 2004**

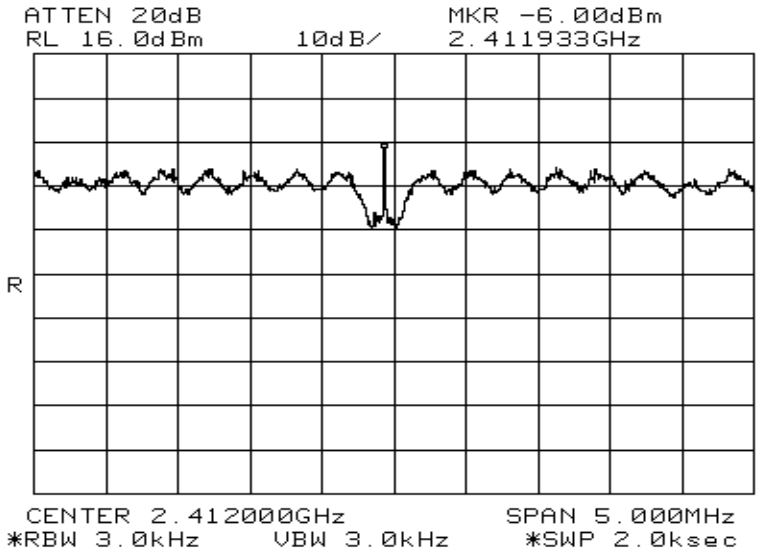
Limit: +8dBm/3kHz

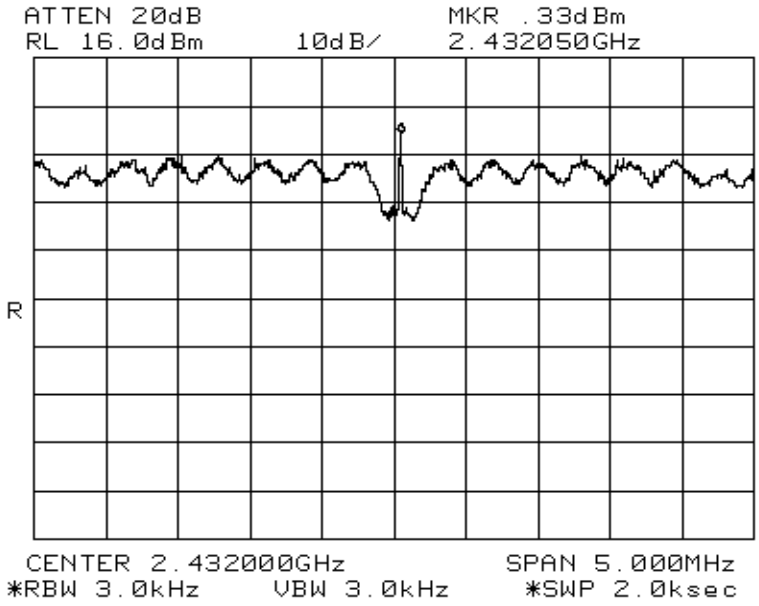
Test Results: Complies

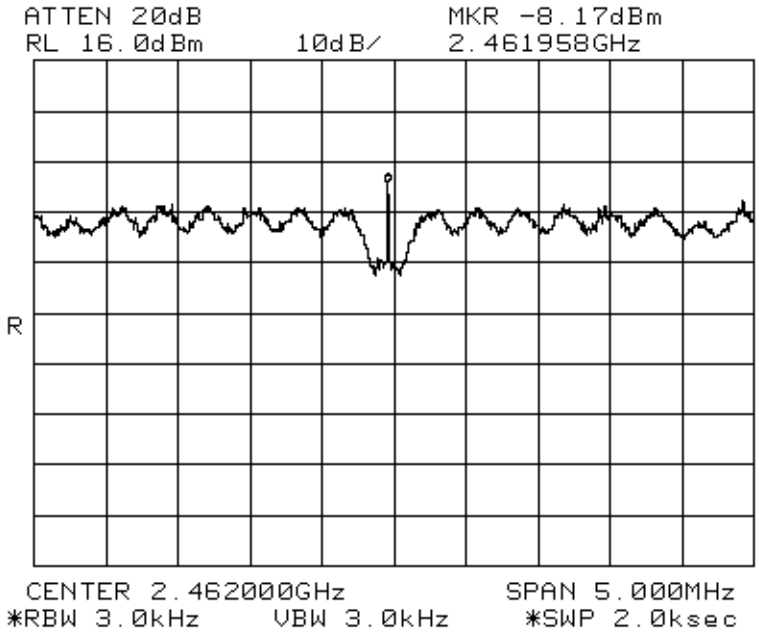
Measurement Data: See Attached Plots

PPSD (dBm/3kHz)			
802.11b/g	**2412MHz**	**2432MHz**	**2462MHz**
	-6.0dBm	0.33dBm	-8.7dBm
802.11a	**5740MHz**	**5800MHz**	**5840MHz**
	-5.0dBm	-6.2dBm	-8.7dBm

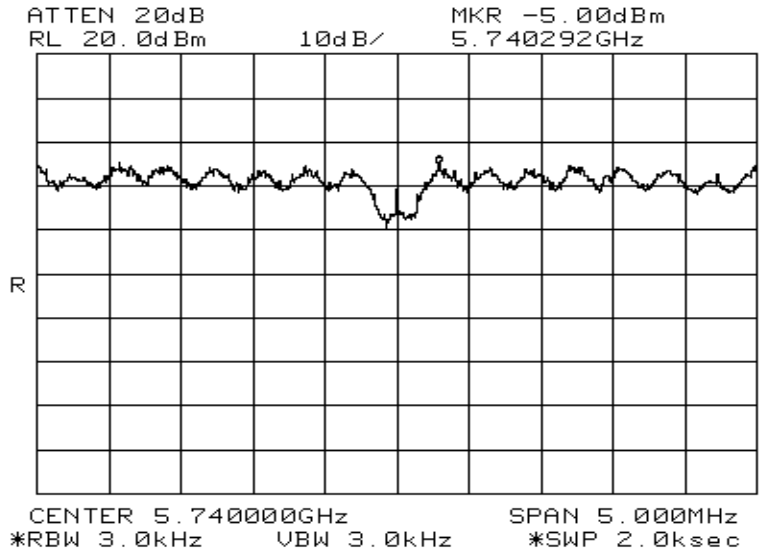
802.11b/g

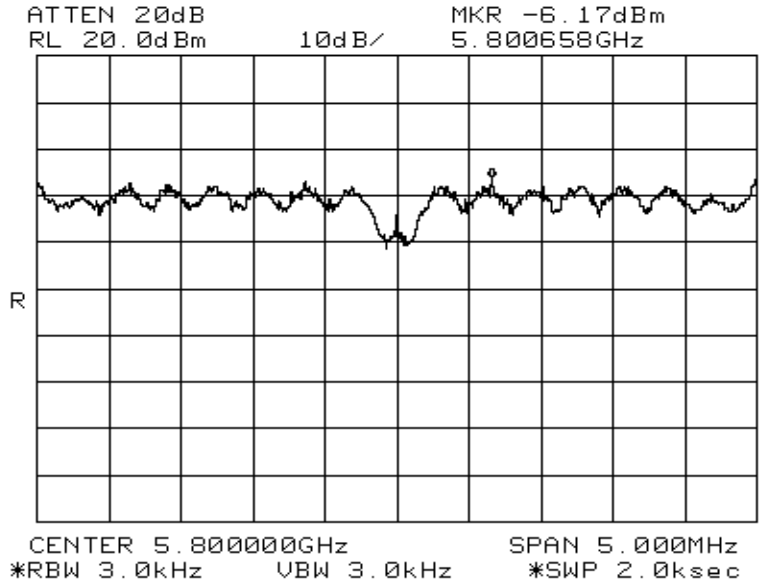

ATTEN 20dB
RL 16.0dBm
10dB/
MKR -6.00dBm
2.411933GHz
R
CENTER 2.412000GHz
SPAN 5.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 2.0ksec

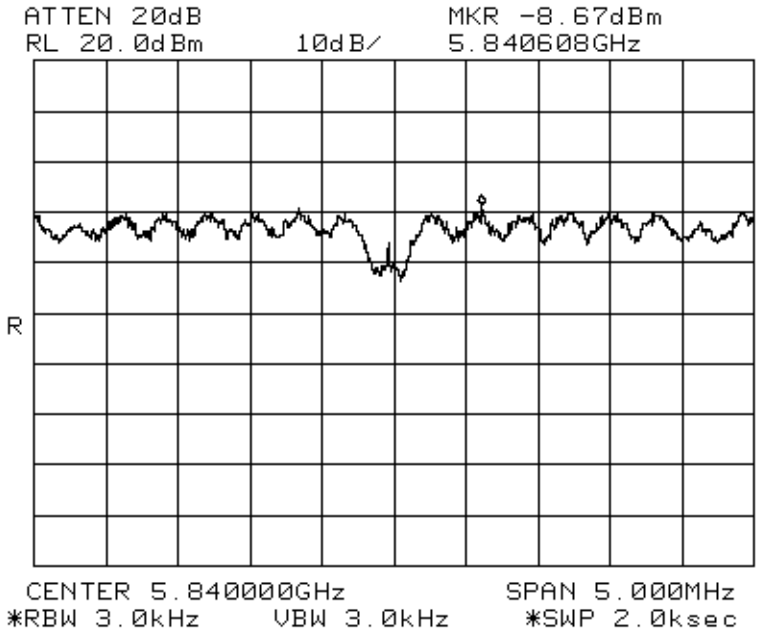

ATTEN 20dB
RL 16.0dBm
10dB/
MKR .33dBm
2.432050GHz
R
CENTER 2.432000GHz
SPAN 5.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 2.0ksec


ATTEN 20dB
RL 16.0dBm
10dB/
MKR -8.17dBm
2.461958GHz
R
CENTER 2.462000GHz
SPAN 5.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 2.0ksec

802.11a


ATTEN 20dB
RL 20.0dBm
10dB/
MKR -5.00dBm
5.740292GHz
R
CENTER 5.740000GHz
SPAN 5.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 2.0ksec


ATTEN 20dB
RL 20.0dBm
10dB/
MKR -6.17dBm
5.800658GHz
R
CENTER 5.800000GHz
SPAN 5.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 2.0ksec


ATTEN 20dB
MKR -8.67dBm
RL 20.0dBm
10dB/
5.840608GHz
R
CENTER 5.840000GHz
SPAN 5.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 2.0ksec

Section 8. RF Exposure Evaluation

(1) Co-location compliance for multiple frequency exposure criteria to the power density exposure limit is detailed in the table(s) below.

(2) This device will be professionally installed (Fixed) to provide a minimum separation distance of 20cm from all persons for indoor operation as detailed in the co-location compliance table below. This device will not be co-located or operated in conjunction with any other antenna or transmitter not described in this application.

(3) This device contains one 2.4GHz access radio and one 5GHz backhaul radio. This device will only be operated according to the exposure conditions described in this application. End users and installers will be provided with antenna installation and transmitter operating conditions for satisfying RF exposure compliance.

Co-location Compliance Table for Integrated 802.11b/g & 802.11a Radios Indoor/Outdoor Operation at 20cm							
802.11b/g Radio Power Density (mW/cm^2)		802.11a Radio Power Density (mW/cm^2)			Total Density for co-located radios (mW/cm^2)	General Exposure Limit (mW/cm^2)	
0dBi (integral)	5dBi	10dBi (integral)	13dBi	18dBi			
0.023918	----------	0.198944	----------	----------	0.222862	1.0	Complies
0.023918	----------	----------	0.158027	----------	0.181945	1.0	Complies
0.023918	----------	----------	----------	0.499724	0.523642	1.0	Complies
	0.075636	0.198944	----------	----------	0.274580	1.0	Complies
	0.075636	----------	0.158027	----------	0.233663	1.0	Complies
	0.075636	----------	----------	0.499724	0.575360	1.0	Complies

Note: The RF energy feed to the 5GHz 802.11a antenna for external antenna operation is +4dB lower than that feed to the integral antenna due to loss in the RF switch matrix.

2.4GHz, 802.11b/g
(1) Nearson Whip, Model 151 = 5dBi
(2) PIFA Integral = 0dBi

5GHz, 802.11a
(3) Integral = 10dBi
(4) H&S SPA 5600140/14/0/V = 13dBi
(5) Andrews #FPA5250D06-N = 18dBi

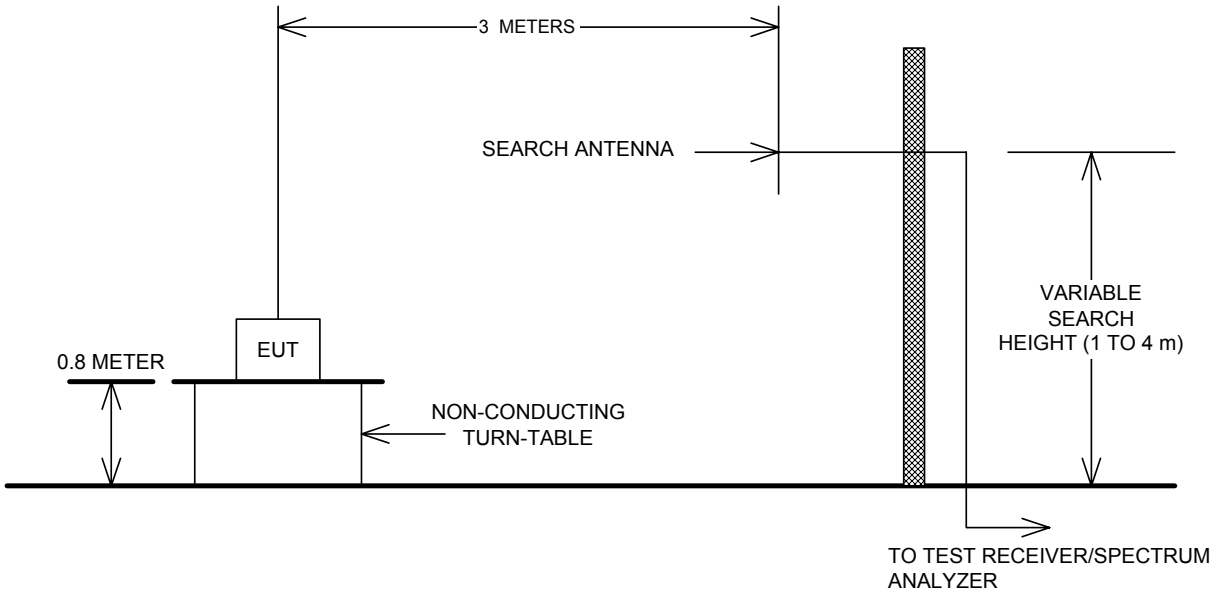
Co-location Compliance Table for Integrated 802.11b/g & 802.11a Radios Outdoor Operation at 30cm (Worst Case)				
802.11b/g Radio Power Density (mW/cm^2)	802.11a Radio Power Density (mW/cm^2)	Total Density for co-located radios (mW/cm^2)	General Exposure Limit (mW/cm^2)	
5dBi	23.6dBi			
0.033616	0.806395	0.840011	1.0	Complies

Note: The RF energy feed to the 5GHz 802.11a antenna for external antenna operation is +4dB lower than that feed to the integral antenna due to loss in the RF switch matrix.

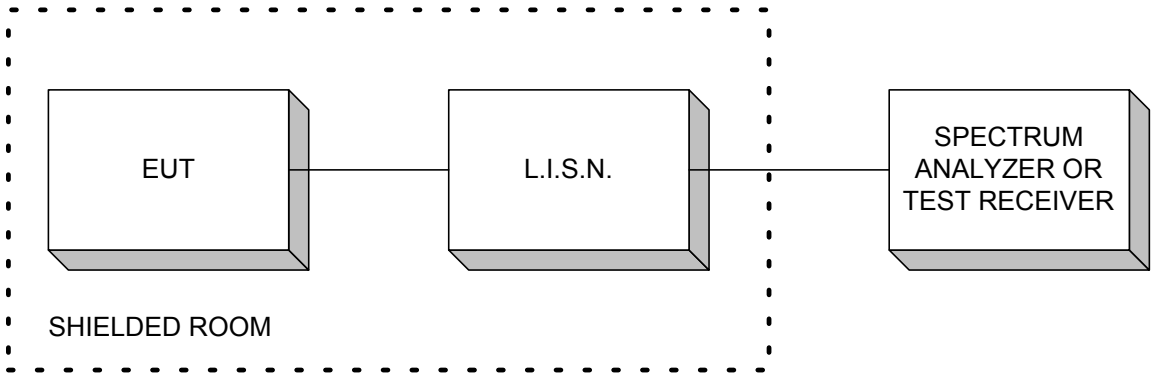
5GHz, 802.11a
(1) Andrews #FPA5250D12-N = 23.6dBi

Section 9. Block Diagrams

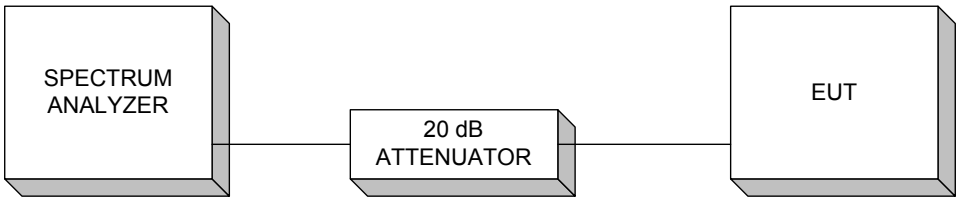
Test Site For Radiated Emissions



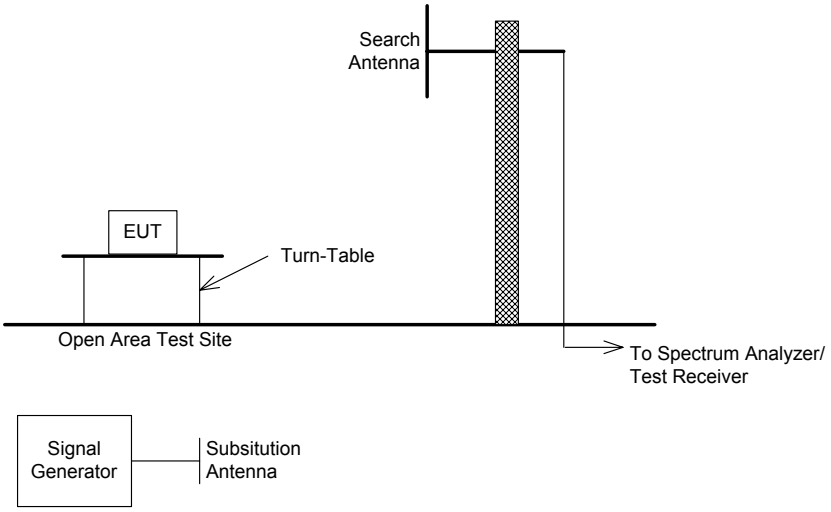
Conducted Emissions



Conducted Measurements



TIA/EIA 603, Signal Substitution Method



Section 10. Test Equipment List

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	03 Jul 03	03 Jul 04
3 Year	Signal Generator	Rhode & Schwarz	SM1Q03E	FA001269	09 Jan 04	09 Jan 05
1 Year	Power Meter	Hewlett Packard	E4418B	FA001413	08 May 03	08 May 04
1 Year	Power Sensor	Hewlett Packard	8487A	FA001419	15 May 03	15 May 04
1 Year	RF AMP	JCA	4-8 GHz	FA001497	18 June 03	18 June 04
1 Year	RF AMP	Narda	5 - 18GHz	FA001409	COU	COU
1 Year	Horn Antenna	EMCO #2	3115	FA000825	10 Dec 03	10 Dec 04
1 Year	Horn Antenna	EMCO #1	3115	FA000649	18 Dec 03	18 Dec 04
1 Year	High Pass Filter (3.9GHz)	K&L	11SH10-4000	FA001340	COU	COU
1 Year	High Pass Filter (9.6GHz)	Dorado	WR62	21-404	COU	COU
1 Year	LISN	EMCO	4825/2	FA001545	Oct. 30/03	Oct. 30/04
1 Year	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	June. 05/03	June. 05/04
1 Year	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	June. 05/03	June. 05/04
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	FA000975	June. 16/03	June. 16/04
NCR	Bilog	Schaffner	CBL6112B	FA001504	NCR	NCR

NA: Not Applicable
NCR: No Cal Required
COU: CAL On Use