Nemko Test Report: 12555RUS1Rev1

Applicant: Electronic Systems Technology, Inc.
415 N. Quay St., Bldg. 1
Kennewick, WA 99336 USA

Equipment Under Test: (E.U.T.) 195 Eg

In Accordance With: **FCC Part 15, Subpart C, 15.247**
Digital Transmission System Transmitter

Tested By: Nemko USA, Inc.
802 N. Kealy
Lewisville, Texas 75057-3136

TESTED BY: Brian Boyea **DATE:** **20, June, 2008**
Brian Boyea, Lab Manager

APPROVED BY: **DATE:** **20 June, 2008**
Tom Tidwell, Telecom Direct

Number of Pages: 63

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Section 1. Summary of Test Results

Manufacturer: Electronic Systems Technology

Model No.: 195 Eg

Serial No.: E-17255

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, Paragraph 15.247 for Digital Transmission Systems. Radiated tests were conducted is accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

☒ New Submission ☒ Production Unit

☐ Class II Permissive Change ☐ Pre-Production Unit

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".

NVLAP®
LAB CODE: 100426-0

Summary Of Test Data

NAME OF TEST	PARA. NO.	RESULT
Powerline Conducted Emissions	15.207(a)	Complies
Minimum 6 dB Bandwidth	15.247(a)(2)	Complies
Maximum Peak Power Output	15.247(b)(3)	Complies
Spurious Emissions (Antenna Conducted)	15.247(d)	Complies
Spurious Emissions (Restricted Bands)	15.247(d)/15.209(a)	Complies
Peak Power Spectral Density	15.247(e)	Complies

Footnotes:

Section 2. Equipment Under Test (E.U.T.)

General Equipment Information

Frequency Band (MHz):	902-928	2400-2483.5	5725-5850
	☐	☒	☐

Operating Frequency of Test Sample: 2412 – 2462 MHz

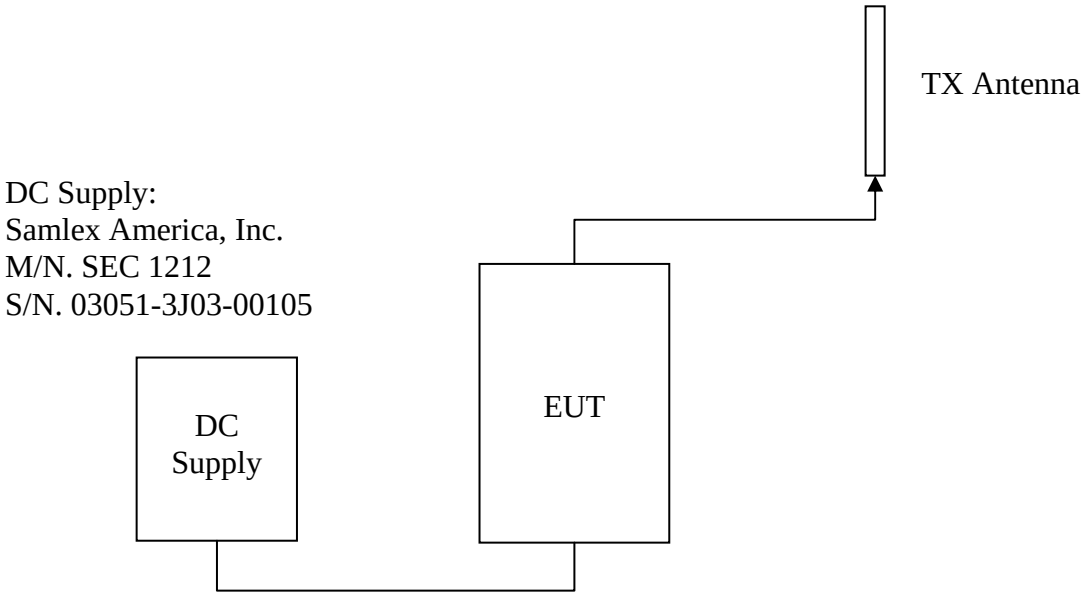
RF Power Output: +30 dBm at antenna port (maximum). Adjusted by installation technician when used with antennas with a greater gain than 6 dBi.

User Frequency Adjustment: Not adjusted by user.

Description of EUT

The EUT is a wireless LAN device used in Industrial, Public Safety, and Federal Government applications. Installation of the device is typically outdoors in a fixed location. Installation details are clearly outlined in the installation manual.

System Diagram



Antennas:

Part No.	Gain	Min. Separation	Type	Comment
AA01S	0 dBi	20 cm.	Omni (Rubber Duck)	Mounted directly on radio
AA20DMg	5 dBi	20 cm.	Omni (Rubber Duck)	Mounted directly on radio
AA20 Eg	6 dBi	20 cm.	Omni (Monopole)	Pole Mount. Integrated 3 ft. coaxial cable.
AA203 Eg	6 dBi	20 cm.	Directional	Pole Mount. Integrated 3 ft. coaxial cable.
AA204 Eg	19 dBi	50 cm.	Directional	Pole Mount. Integrated 3 ft. coaxial cable. Point-to-Point only.
AA20E	6 dBd (8.15 dBi)	20 cm.	Omni	Building Mount. Min. 25 ft. RG-8 or 50 ft. heliax
AA203 ES	7 dBd (9.15 dBi)	20 cm.	Directional	Building Mount. Min. 25 ft. RG-8 or 50 ft. heliax.
AA204 ES	11 dBd (13.15 dBi)	20 cm.	Directional	Building Mount. Min. 25 ft. RG-8 or 50 ft. heliax.

Section 3. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.247(a)(2)
TESTED BY: Brian Boyea	DATE: 24 April, 2008

Test Results: Complies.

Measurement Data: See 6 dB BW plot

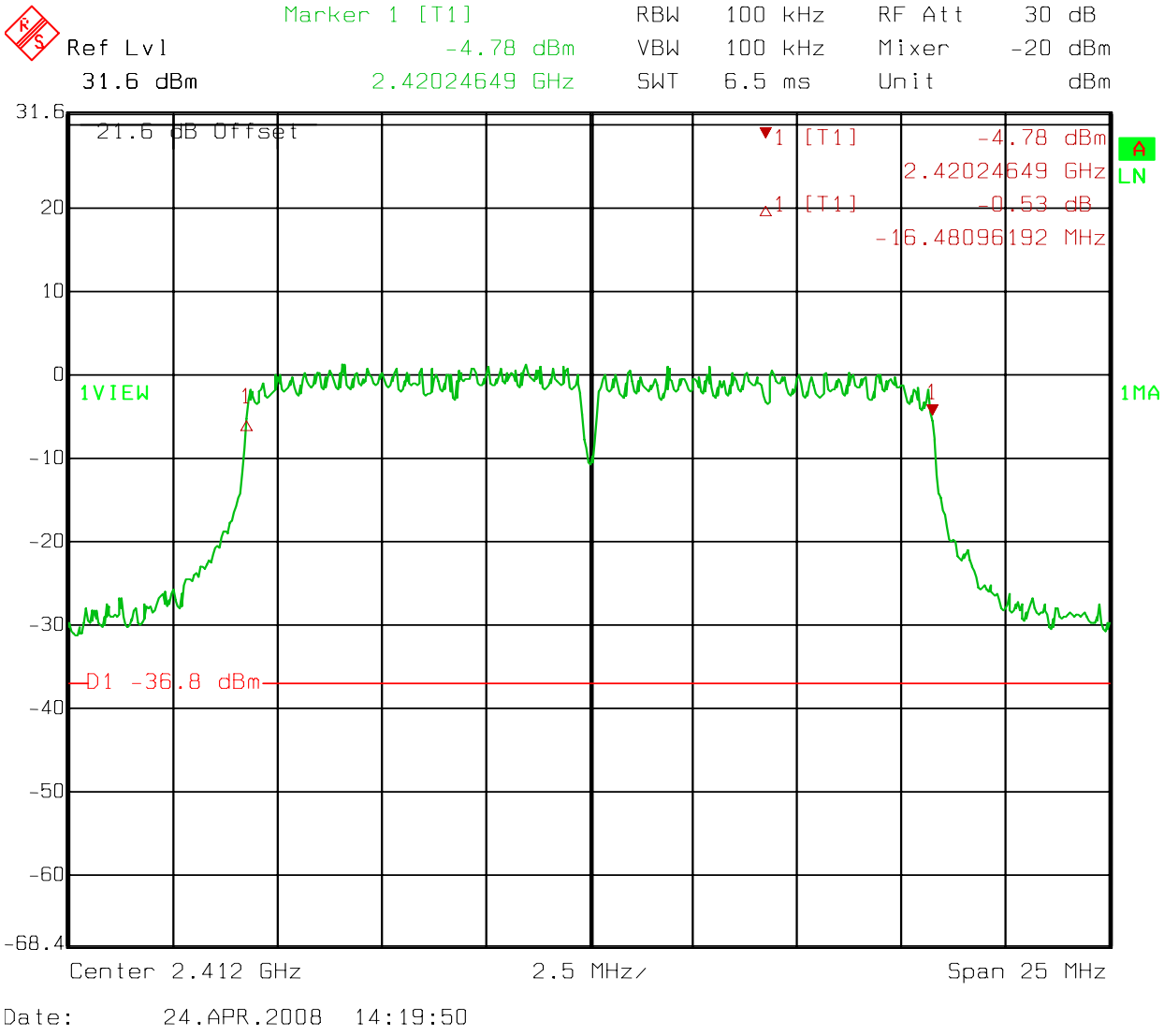
Modulation Mode	Data Rate	6 dB Bandwidth
OFDM	54 Mbps	16.48 MHz
OFDM	48 Mbps	16.53 MHz
OFDM	36 Mbps	16.53 MHz
OFDM	24 Mbps	16.53 MHz
OFDM	18 Mbps	16.53 MHz
OFDM	12 Mbps	16.53 MHz
OFDM	9 Mbps	16.53 MHz
OFDM	6 Mbps	16.53 MHz
CCK	11 Mbps	12.32 MHz
CCK	1 Mbps	12.32 MHz

Test Conditions: 27 %RH
23 °C

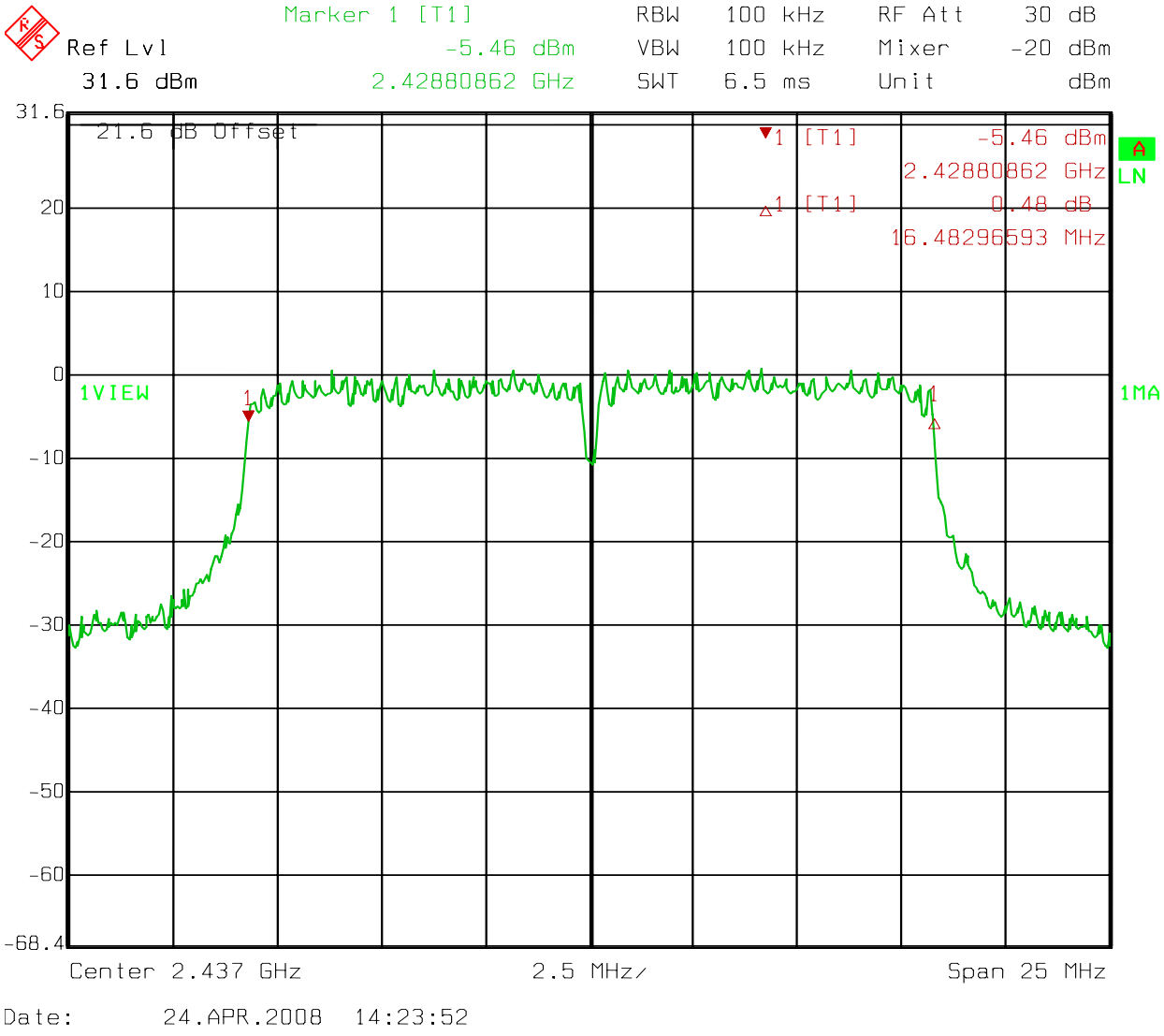
Measurement Uncertainty: +/-1x10^{-7} ppm

Test Equipment Used: 1036, 1474, 1484

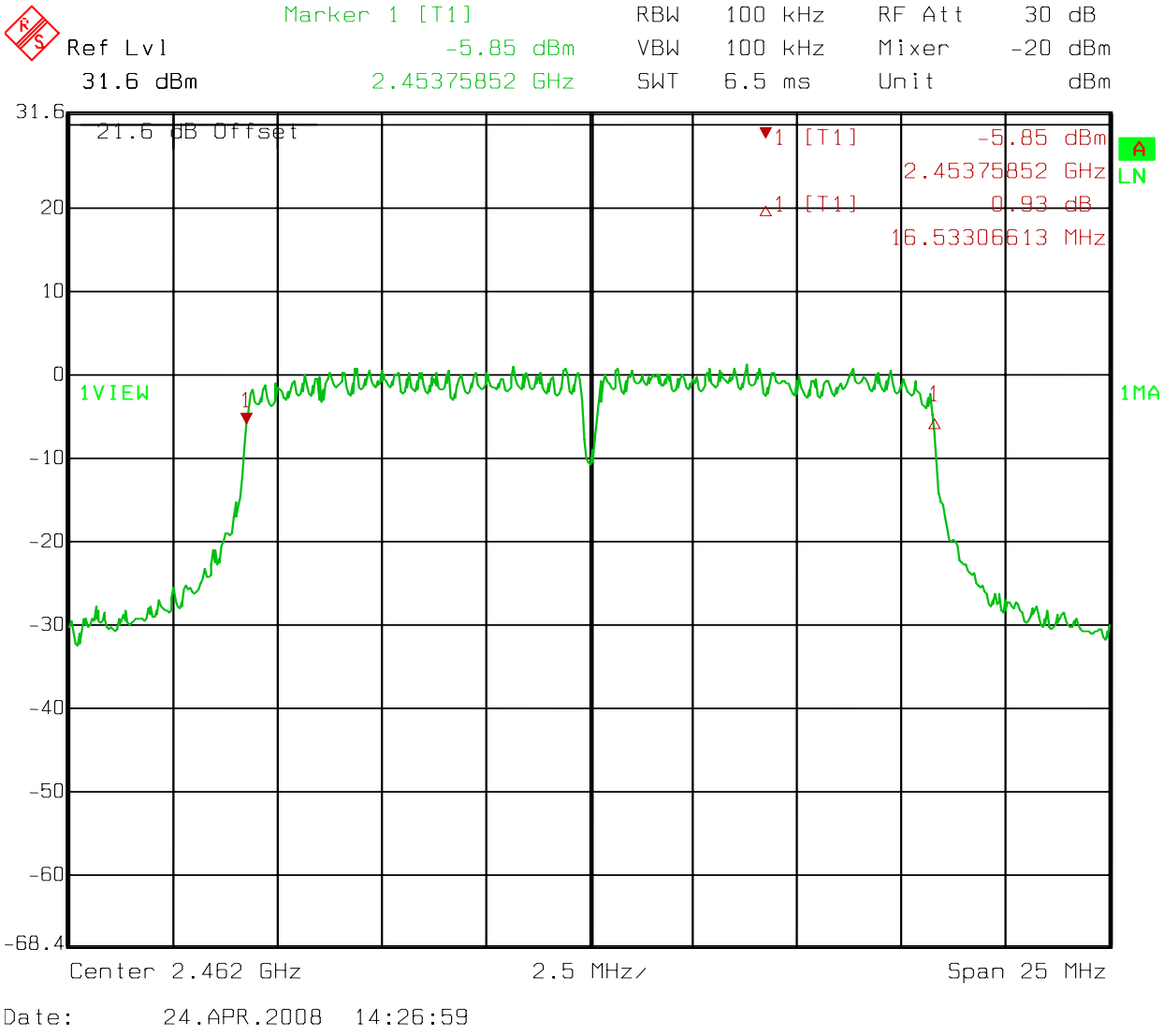
Test Data – Occupied Bandwidth, 2412 MHz, 54 Mbps, OFDM



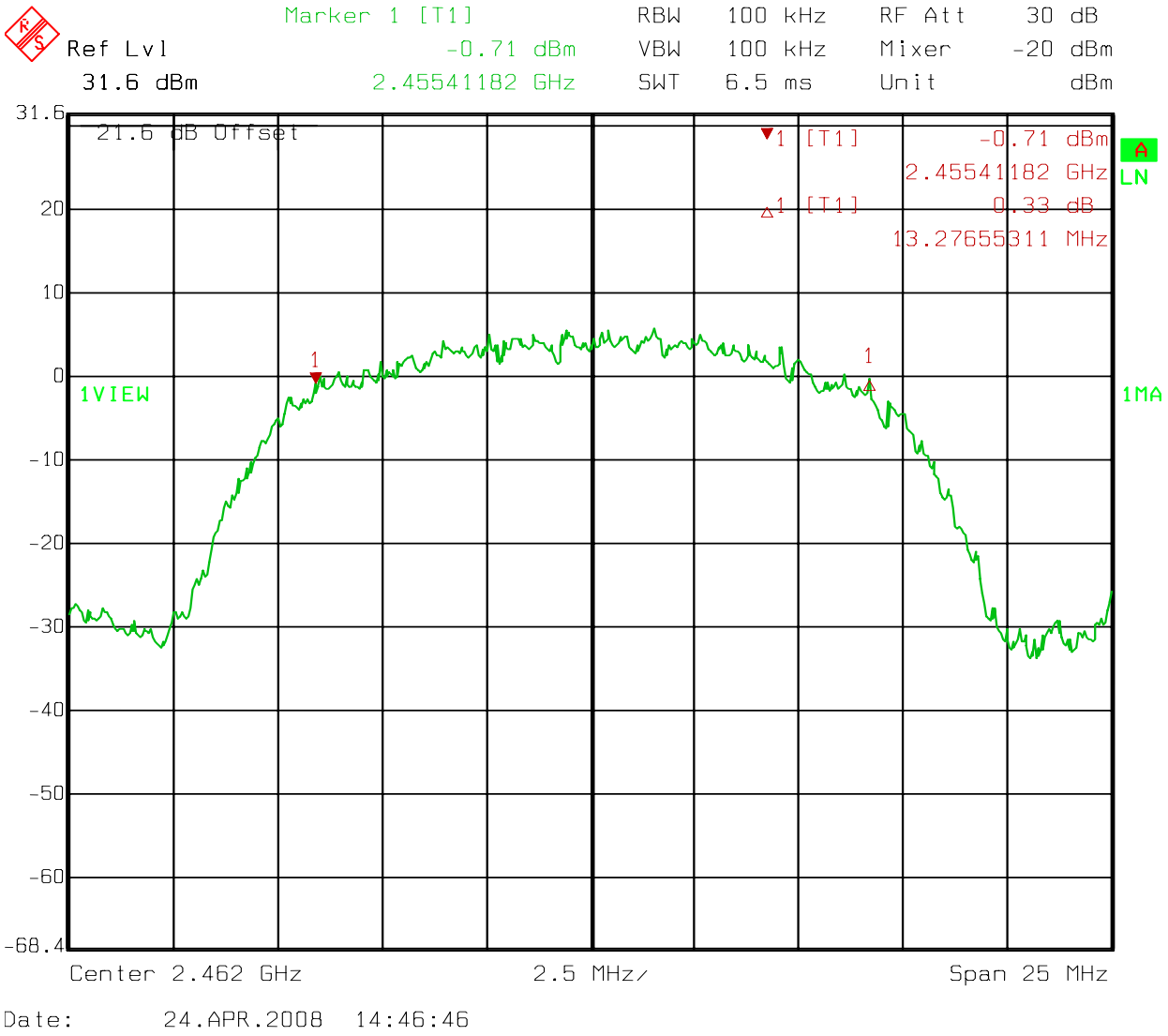
Test Data – Occupied Bandwidth, 2437 MHz, 54 Mbps, OFDM



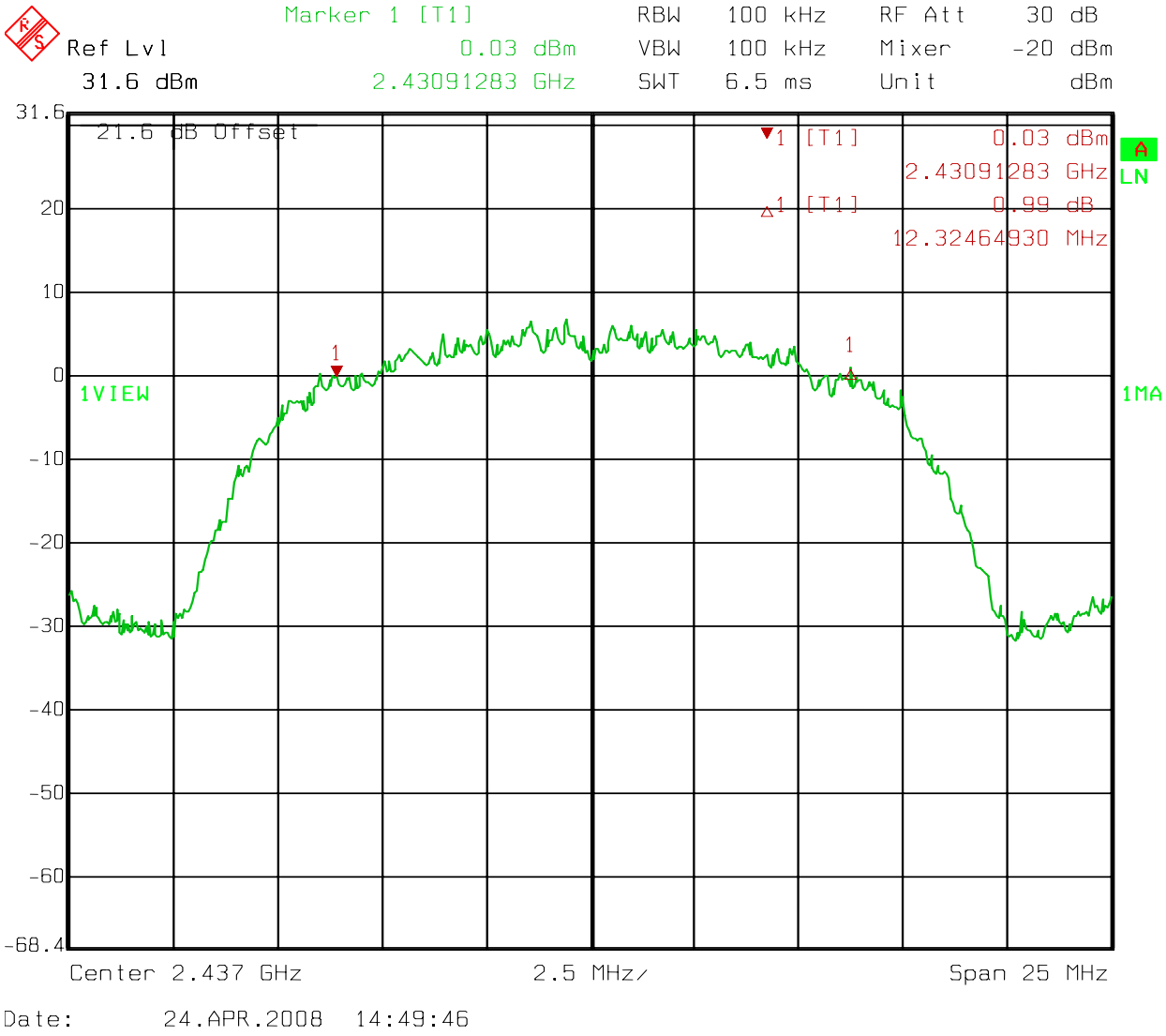
Test Data – Occupied Bandwidth 2462 MHz, 54 Mbps, OFDM



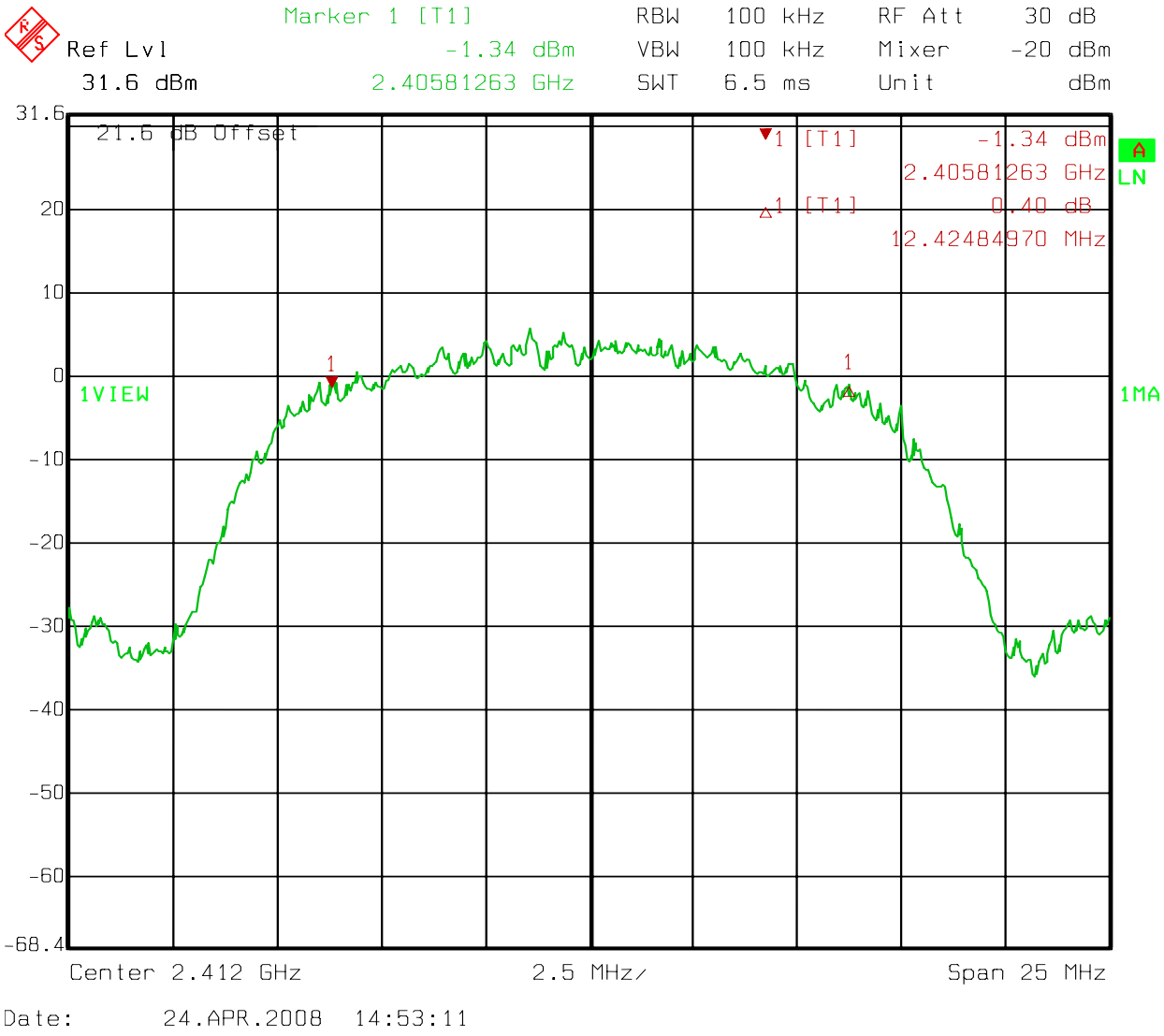
Test Data – Occupied Bandwidth 2462 MHz, 11 Mbps, CCK



Test Data – Occupied Bandwidth 2437 MHz, 11 Mbps, CCK



Test Data – Occupied Bandwidth 2412 MHz, 11 Mbps, CCK



Section 4. Maximum Peak Output Power

NAME OF TEST: Maximum Peak Output power	PARA. NO.: 15.247(b)(3)
TESTED BY: Brian Boyea	DATE: 24 April, 2008

Test Results: Complies.

Measurement Data: Refer to attached data

Test Conditions: 27 %RH
23 °C

Measurement Uncertainty: +/-1.7 dB

Test Equipment Used: 1029, 1030, 1474, 1475, 1484

☒ This device was tested at +/- 15% input power per 15.31(e), with no variation in output power. The nominal dc power was 12 Vdc.

☐ For battery powered equipment, the device was tested with a fresh battery per 15.31(e).

☒ The device was tested on three channels per 15.31(l).

☐ This test was performed radiated.

Measurements were made with a peak power meter at the rf output connector of the radio.

Test Data – Peak Power

Modulation Mode	Data Rate (Mbps)	Frequency (MHz)	Meas. Power (dBm)
CCK	1	2412	27.5
CCK	1	2437	28.2
CCK	1	2462	29.4
CCK	2	2412	27.7
CCK	2	2437	28.6
CCK	2	2462	29.4
CCK	5.5	2412	27.4
CCK	5.5	2437	27.9
CCK	5.5	2462	28.9
CCK	11	2412	26.7
CCK	11	2437	27.5
CCK	11	2462	28.6
OFDM	6	2412	27.4
OFDM	6	2437	28.0
OFDM	6	2462	29.2
OFDM	9	2412	28.4
OFDM	9	2437	28.9
OFDM	9	2462	29.4

OFDM	**12**	**2412**	**28.0**
OFDM	**12**	**2437**	**28.6**
OFDM	**12**	**2462**	**29.3**
OFDM	**18**	**2412**	**28.0**
OFDM	**18**	**2437**	**28.2**
OFDM	**18**	**2462**	**28.9**
OFDM	**24**	**2412**	**27.3**
OFDM	**24**	**2437**	**28.0**
OFDM	**24**	**2462**	**28.5**
OFDM	**36**	**2412**	**27.4**
OFDM	**36**	**2437**	**27.9**
OFDM	**36**	**2462**	**28.2**
OFDM	**48**	**2412**	**27.4**
OFDM	**48**	**2437**	**27.8**
OFDM	**48**	**2462**	**28.3**
OFDM	**54**	**2412**	**27.0**
OFDM	**54**	**2437**	**27.8**
OFDM	**54**	**2462**	**28.4**

Section 5 Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions at Antenna Terminals	PARA. NO.: 15.247 (d)
TESTED BY: Brian Boyea	DATE: 24 April, 2008

Test Results: Complies.

Measurement Data: See attached plots.

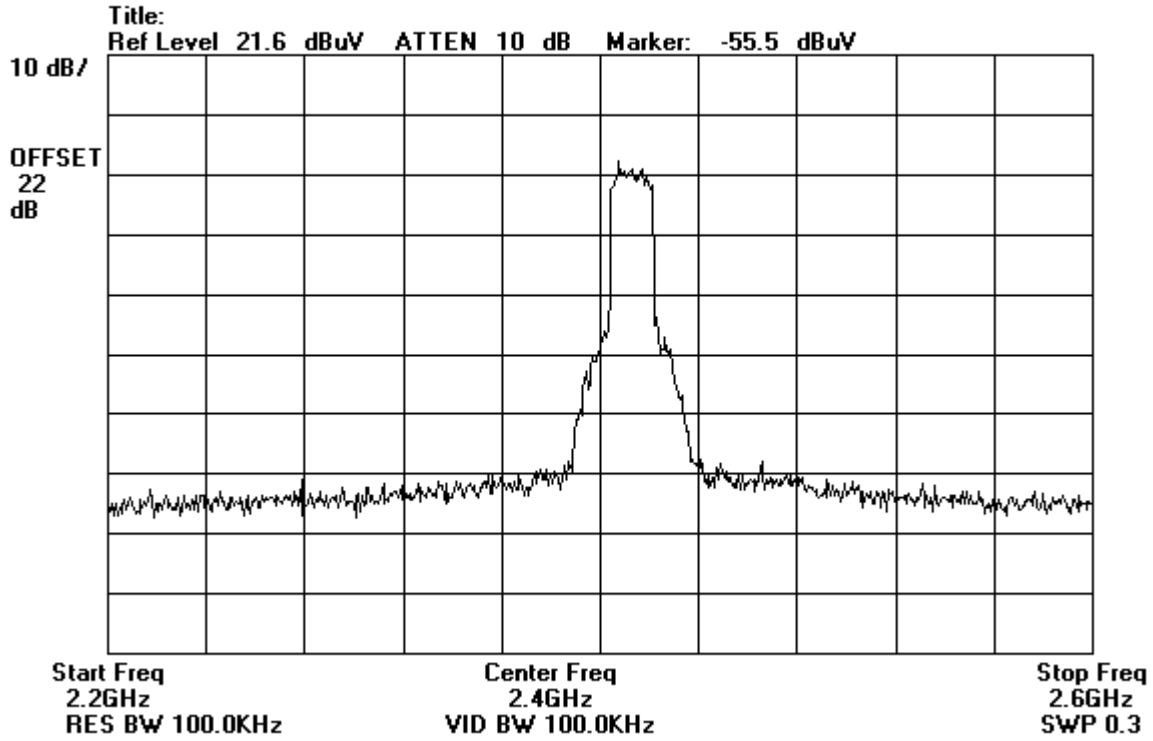
Test Conditions: 27 %RH
23 °C

Measurement Uncertainty: +/-1.7 dB

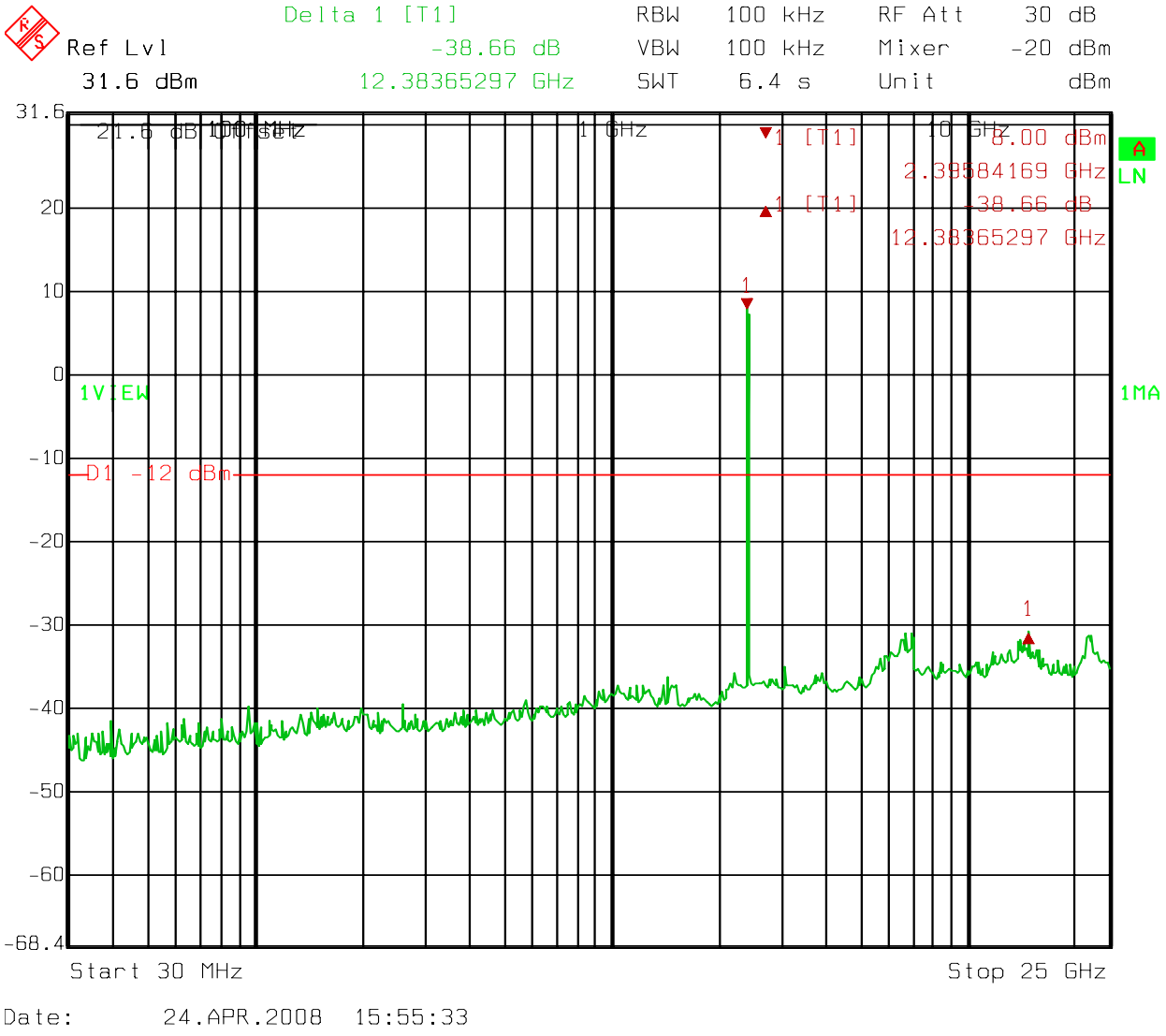
Test Equipment Used: 1036, 1474, 1484

Test Data – Spurious Emissions at Antenna Terminals

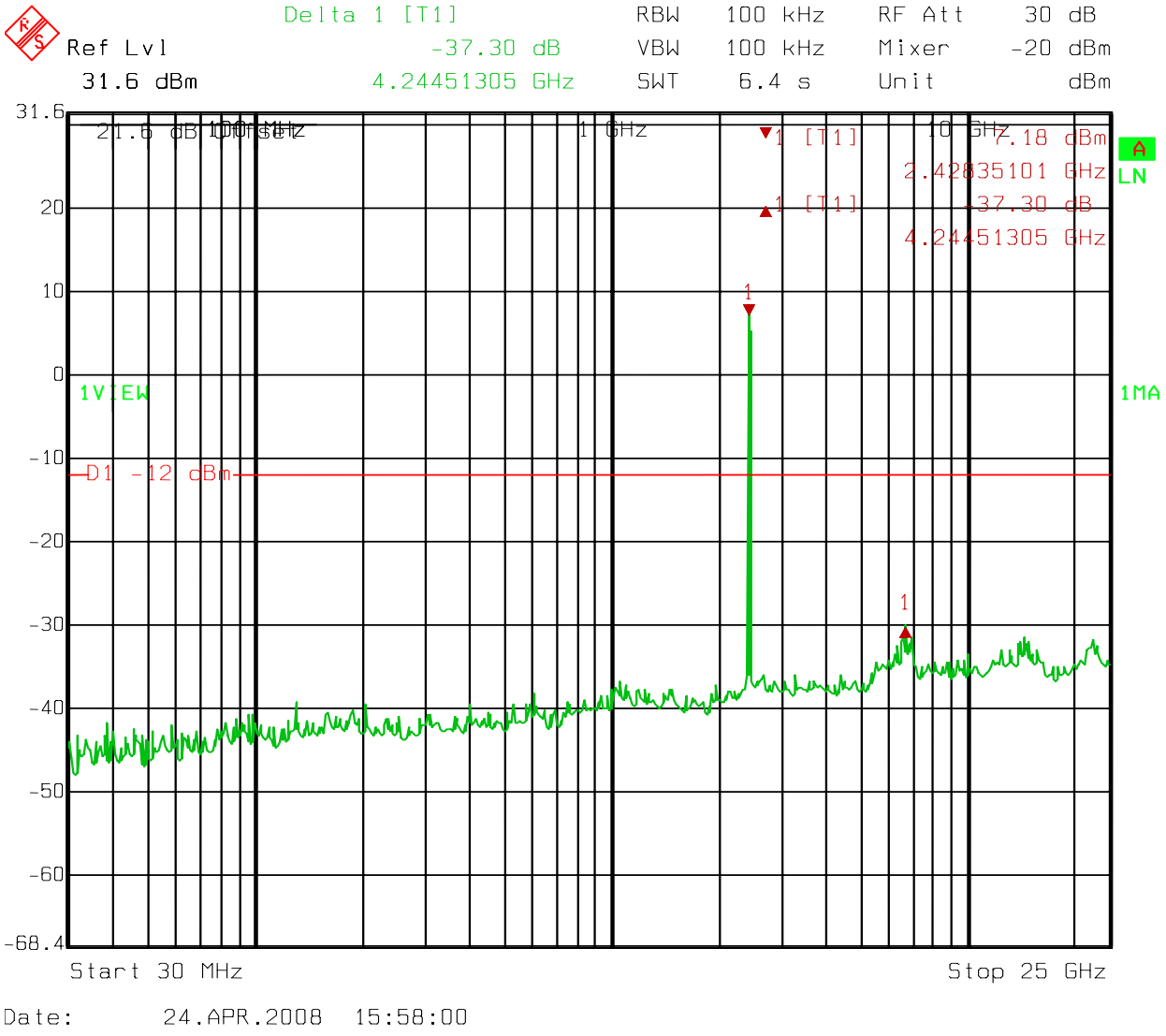
Lower Band Edge



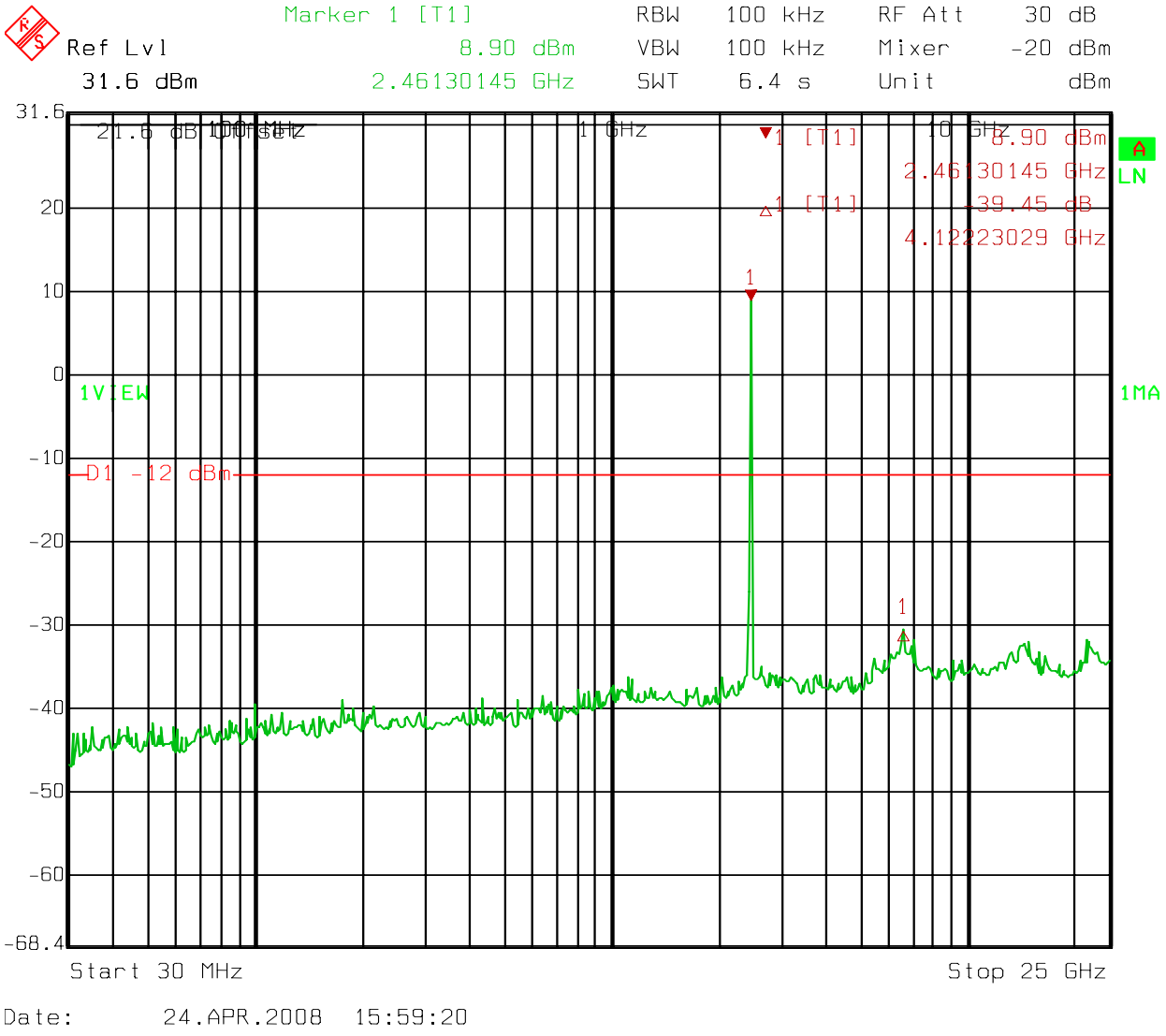
Test Data – Spurious Emissions at Antenna Terminals – 2412 MHz OFDM 54 Mbps



Test Data – Spurious Emissions at Antenna Terminals – 2437 MHz, OFDM, 54 Mbps



Test Data – Spurious Emissions at Antenna Terminals – 2462 MHz, OFDM, 54 Mbps



Section 6. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.247 (d)
TESTED BY: Brian Boyea	DATE: 22 April – 6 May, 2008

Test Results: Complies.

Measurement Data: See attached table.

Test Conditions: 27 %RH
23 °C

Measurement Uncertainty: +/-1.7 dB

Test Equipment Used: 1464, 1767, 1484, 1485, 0993, 1016, 983, 1766, 1763

Notes:

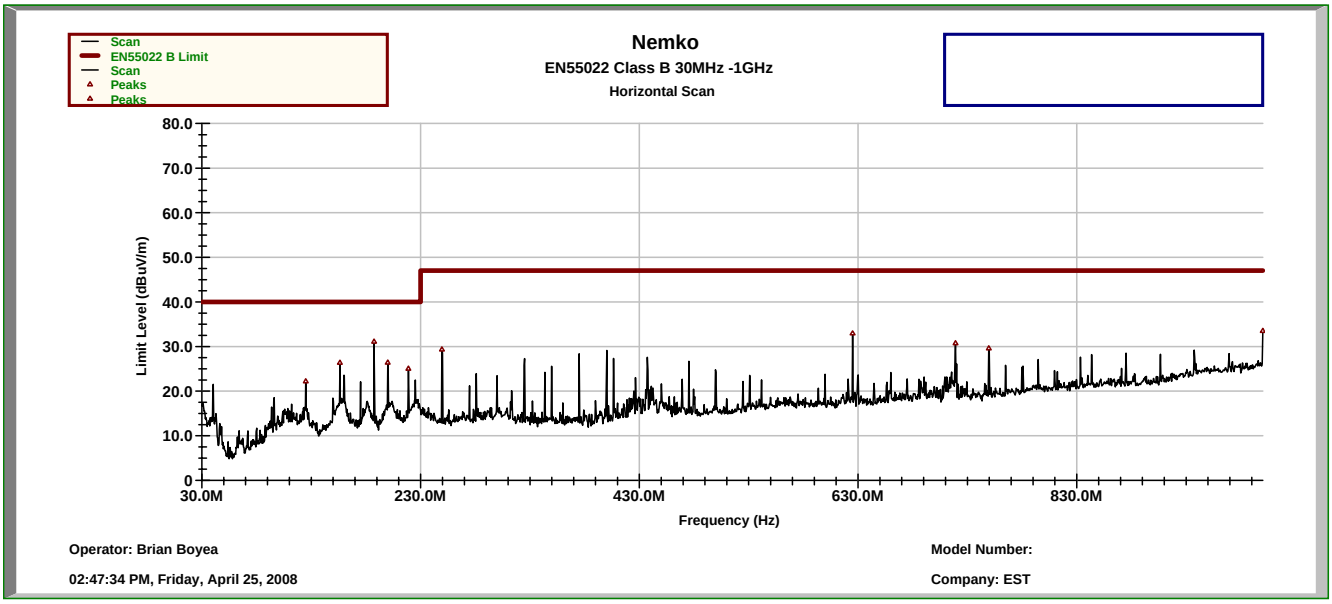
☐ For handheld devices, the EUT was tested on three orthogonal axis'

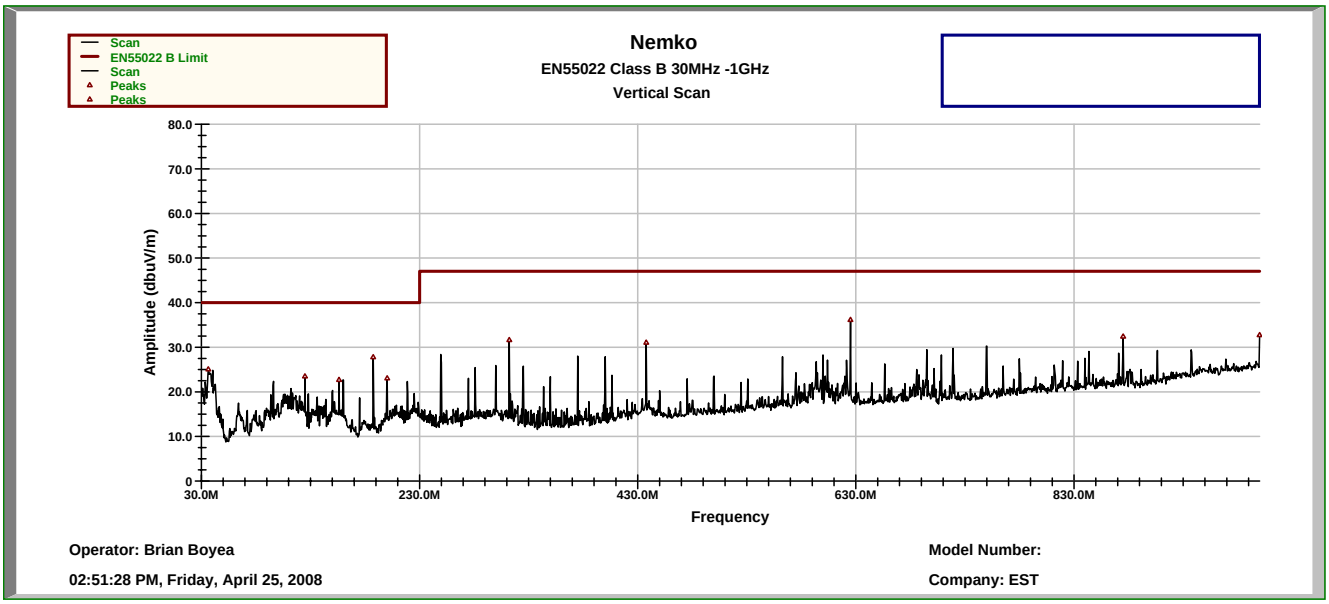
☒ The device was tested from 30 MHz to the tenth harmonic of the highest fundamental frequency per 15.33

☒ The device was tested on three channels per 15.31(l).

☐ No emissions were detected within 20 dB of the specification limit therefore none are reported per 15.31(o). Band edge data is presented below.

RBW=VBW=100 kHz below 1000 MHz
RBW=VBW=1 MHz above 1000 MHz (Peak)
RBW= 1 MHz VBW=10Hz (Average)


Scan
EN55022 B Limit
Scan
Peaks
Peaks
Nemko
EN55022 Class B 30MHz -1GHz
Horizontal Scan
Limit Level (dBuV/m)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
30.0M
230.0M
430.0M
630.0M
830.0M
Frequency (Hz)
Operator: Brian Boyea
02:47:34 PM, Friday, April 25, 2008
Model Number:
Company: EST


Scan
EN55022 B Limit
Scan
Peaks
Peaks
Nemko
EN55022 Class B 30MHz -1GHz
Vertical Scan
Amplitude (dbuV/m)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
30.0M
230.0M
430.0M
630.0M
830.0M
Frequency
Operator: Brian Boyea
02:51:28 PM, Friday, April 25, 2008
Model Number:
Company: EST

UPPER BANDEDGE – ANTENNA AA01s

Radiated Emissions

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Job No.:	12555	Date:			
Specification:	15.247/15.205	Temperature(°C):	24		
Tested By:	Brian Boyea	Relative Humidity(%)	31		
E.U.T.:	195 Eg				
Configuration:	Antenna AA01S RF power output 1W				
Sample Number:	1	Peak:		Avg.:	
Location:	AC 3	RBW:	1 MHz		1 MHz
Detector Type:	Peak	VBW:	1 MHz		10 Hz

Test Equipment Used

Antenna:	993	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1484
Filter:	#N/A	Cable #2:	1485
Receiver:	1464	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector / Polarity
2.4835	22.4	29.0	3.1	0.0	54.5	74	-19.5	Peak / Horizontal
2.4835	10.3	29.0	3.1	0.0	42.4	54	-11.6	Avg / Horizontal
2.4835	24.7	29.0	3.1	0.0	56.8	74	-17.2	Peak / Vertical
2.4835	15.3	29.0	3.1	0.0	47.4	54	-6.6	Avg / Vertical

UPPER BANDEDGE – ANTENNA AA20DMg

Radiated Emissions

Page 1 of 1

Job No.:	12555	Date:			
Specification:	15.247/15.205	Temperature(°C):	24		
Tested By:	Brian Boyea	Relative Humidity(%)	31		
E.U.T.:	195 Eg				
Configuration:	Antenna AA20DMg RF power output 1W				
Sample Number:	1	Peak:		Avg.:	
Location:	AC 3	RBW:	1 MHz	1 MHz	
Detector Type:	Peak	VBW:	1 MHz	10 Hz	

Test Equipment Used

Antenna:	993	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1484
Filter:	#N/A	Cable #2:	1485
Receiver:	1464	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector / Polarity
2.4835	21.1	29.0	3.1	0.0	53.2	74	-20.8	Peak / Horizontal
2.4835	14.4	29.0	3.1	0.0	46.5	54	-7.5	Avg / Horizontal
2.4835	28.5	29.0	3.1	0.0	60.6	74	-13.4	Peak / Vertical
2.4835	19.5	29.0	3.1	0.0	51.6	54	-2.4	Avg / Vertical

UPPER BANDEDGE – ANTENNA AA20 Eg

Radiated Emissions

Page 1 of 1

Job No.:	12555	Date:			
Specification:	15.247/15.205	Temperature(°C):	24		
Tested By:	Brian Boyea	Relative Humidity(%)	31		
E.U.T.:	195 Eg				
Configuration:	Antenna AA20Eg RF power output 1W				
Sample Number:	1	Peak:		Avg.:	
Location:	AC 3	RBW:	1 MHz	1 MHz	
Detector Type:	Peak	VBW:	1 MHz	10 Hz	

Test Equipment Used

Antenna:	993	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1484
Filter:	#N/A	Cable #2:	1485
Receiver:	1464	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector / Polarity
2.4835	23.4	29.0	3.1	0.0	55.5	74	-18.5	Peak / Horizontal
2.4835	16.7	29.0	3.1	0.0	48.8	54	-5.2	Avg / Horizontal
2.4835	30.1	29.0	3.1	0.0	62.2	74	-11.8	Peak / Vertical
2.4835	19.8	29.0	3.1	0.0	51.9	54	-2.1	Avg / Vertical

UPPER BANDEDGE – ANTENNA AA203 Eg

Radiated Emissions

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Job No.:	12555	Date:			
Specification:	15.247/15.205	Temperature(°C):	24		
Tested By:	Brian Boyea	Relative Humidity(%)	31		
E.U.T.:	195 Eg				
Configuration:	Antenna AA203Eg RF power output 1W				
Sample Number:	1	Peak:		Avg.:	
Location:	AC 3	RBW:	1 MHz		1 MHz
Detector Type:	Peak	VBW:	1 MHz		10 Hz

Test Equipment Used

Antenna:	993	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1484
Filter:	#N/A	Cable #2:	1485
Receiver:	1464	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector / Polarity
2.4835	20.2	29.0	3.1	0.0	52.3	74	-21.7	Peak / Horizontal
2.4835	14.7	29.0	3.1	0.0	46.8	54	-7.2	Avg / Horizontal
2.4835	28.5	29.0	3.1	0.0	60.6	74	-13.4	Peak / Vertical
2.4835	19.5	29.0	3.1	0.0	51.6	54	-2.4	Avg / Vertical

UPPER BANDEDGE – ANTENNA AA204 Eg

Radiated Emissions

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Job No.:	12555	Date:			
Specification:	15.247/15.205	Temperature(°C):	24		
Tested By:	Brian Boyea	Relative Humidity(%)	31		
E.U.T.:	195 Eg				
Configuration:	Antenna AA204 Eg. RF power output 500 mW				
Sample Number:	1	Peak:		Avg.:	
Location:	AC 3	RBW:	1 MHz	1 MHz	
Detector Type:	Peak	VBW:	1 MHz	10 Hz	

Test Equipment Used

Antenna:	993	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1484
Filter:	#N/A	Cable #2:	1485
Receiver:	1464	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector / Polarity
2.4835	24.2	29.0	3.1	0.0	56.3	74	-17.7	Peak / Horizontal
2.4835	14.2	29.0	3.1	0.0	46.3	54	-7.7	Avg / Horizontal
2.4835	18.5	29.0	3.1	0.0	50.6	74	-23.4	Peak / Vertical
2.4835	8.2	29.0	3.1	0.0	40.3	54	-13.7	Avg / Vertical

UPPER BANDEDGE – ANTENNA AA20E

Radiated Emissions

Page 1 of 1

Job No.:	12555	Date:			
Specification:	15.247/15.205	Temperature(°C):	24		
Tested By:	Brian Boyea	Relative Humidity(%)	31		
E.U.T.:	195 Eg				
Configuration:	Antenna AA20E RF power output 1W				
Sample Number:	1	Peak:		Avg.:	
Location:	AC 3	RBW:	1 MHz		1 MHz
Detector Type:	Peak	VBW:	1 MHz		10 Hz

Test Equipment Used

Antenna:	993	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1484
Filter:	#N/A	Cable #2:	1485
Receiver:	1464	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector / Polarity
2.4835	21.6	29.0	3.1	0.0	53.7	74	-20.3	Peak / Horizontal
2.4835	15.1	29.0	3.1	0.0	47.2	54	-6.8	Avg / Horizontal
2.4835	28.4	29.0	3.1	0.0	60.5	74	-13.5	Peak / Vertical
2.4835	19.7	29.0	3.1	0.0	51.8	54	-2.2	Avg / Vertical

UPPER BANDEDGE – ANTENNA AA203 ES

Radiated Emissions

Page 1 of 1

Job No.:	12555	Date:			
Specification:	15.247/15.205	Temperature(°C):	24		
Tested By:	Brian Boyea	Relative Humidity(%)	31		
E.U.T.:	195 Eg				
Configuration:	Antenna AA203ES RF power output 1W				
Sample Number:	1	Peak:		Avg.:	
Location:	AC 3	RBW:	1 MHz		1 MHz
Detector Type:	Peak	VBW:	1 MHz		10 Hz

Test Equipment Used

Antenna:	993	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1484
Filter:	#N/A	Cable #2:	1485
Receiver:	1464	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector / Polarity
2.4835	20.7	29.0	3.1	0.0	52.8	74	-21.2	Peak / Horizontal
2.4835	14.8	29.0	3.1	0.0	46.9	54	-7.1	Avg / Horizontal
2.4835	28.8	29.0	3.1	0.0	60.9	74	-13.1	Peak / Vertical
2.4835	18.7	29.0	3.1	0.0	50.8	54	-3.2	Avg / Vertical

UPPER BANDEDGE – ANTENNA AA204 ES

Radiated Emissions

Page 1 of 1

Job No.:	12555	Date:	
Specification:	15.247/15.205	Temperature(°C):	24
Tested By:	Brian Boyea	Relative Humidity(%)	31
E.U.T.:	195 Eg		
Configuration:	Antenna AA204ES RF power output 1W		
Sample Number:	1	Peak:	Avg.:
Location:	AC 3	RBW:	1 MHz 1 MHz
Detector Type:	Peak	VBW:	1 MHz 10 Hz

Test Equipment Used

Antenna:	993	Directional Coupler:	#N/A
Pre-Amp:	#N/A	Cable #1:	1484
Filter:	#N/A	Cable #2:	1485
Receiver:	1464	Cable #3:	#N/A
Attenuator #1	#N/A	Cable #4:	#N/A
Attenuator #2:	#N/A	Mixer:	#N/A

Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector / Polarity
2.4835	22.3	29.0	3.1	0.0	54.4	74	-19.6	Peak / Horizontal
2.4835	17.5	29.0	3.1	0.0	49.6	54	-4.4	Avg / Horizontal
2.4835	30.7	29.0	3.1	0.0	62.8	74	-11.2	Peak / Vertical
2.4835	19.9	29.0	3.1	0.0	52.0	54	-2.0	Avg / Vertical

NOTE: The following readings are all peak readings. The RBW and VBW are both seet to 1 MHz.

ANTENNA AA01S

Test Conditions / Notes:

Transmit Channel 2412 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA01S

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4823.977M	40.3	+1.0	+3.2	+33.2	+32.5	+0.0	45.2	54.0	-8.8	Horiz
2	4824.023M	39.8	+1.0	+3.2	+33.2	+32.5	+0.0	44.7	54.0	-9.3	Vert
3	7235.977M	35.7	+1.2	+3.9	+35.8	+32.2	+0.0	44.4	54.0	-9.6	Horiz
4	7236.023M	33.3	+1.2	+3.9	+35.8	+32.2	+0.0	42.0	54.0	-12.0	Vert

Test Conditions / Notes:

Transmit Channel 2437 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA01S

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4874.023M	38.0	+1.0	+3.3	+33.4	+32.6	+0.0	43.1	54.0	-10.9	Horiz
2	4874.023M	39.0	+1.0	+3.3	+33.4	+32.6	+0.0	44.1	54.0	-9.9	Vert
3	7311.023M	35.3	+1.2	+4.0	+35.8	+32.3	+0.0	44.0	54.0	-10.0	Horiz
4	7311.023M	35.8	+1.2	+4.0	+35.8	+32.3	+0.0	44.5	54.0	-9.5	Vert

Test Conditions / Notes:

Transmit Channel 2462 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA01S

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4924.012M	43.7	+1.0	+3.3	+33.5	+32.6	+0.0	48.9	54.0	-5.1	Vert
2	4924.023M	39.3	+1.0	+3.3	+33.5	+32.6	+0.0	44.5	54.0	-9.5	Horiz
3	7386.012M	35.5	+1.2	+4.0	+35.9	+32.4	+0.0	44.2	54.0	-9.8	Vert
4	7386.023M	35.3	+1.2	+4.0	+35.9	+32.4	+0.0	44.0	54.0	-10.0	Horiz

ANTENNA AA20DMg

Transmit Channel 2412 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20DMEg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4823.993M	43.0	+1.0	+3.2	+33.2	+32.5	+0.0	47.9	54.0	-6.1	Horiz
2	4823.993M	44.8	+1.0	+3.2	+33.2	+32.5	+0.0	49.7	54.0	-4.3	Vert
3	7235.993M	35.0	+1.2	+3.9	+35.8	+32.2	+0.0	43.7	54.0	-10.3	Horiz
4	7235.993M	34.7	+1.2	+3.9	+35.8	+32.2	+0.0	43.4	54.0	-10.6	Vert

Transmit Channel 2437 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20DMEg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4873.988M	42.5	+1.0	+3.3	+33.4	+32.6	+0.0	47.6	54.0	-6.4	Horiz
2	4873.993M	43.7	+1.0	+3.3	+33.4	+32.6	+0.0	48.8	54.0	-5.2	Vert
3	7310.988M	35.7	+1.2	+4.0	+35.8	+32.3	+0.0	44.4	54.0	-9.6	Horiz
4	7310.993M	34.8	+1.2	+4.0	+35.8	+32.3	+0.0	43.5	54.0	-10.5	Vert

Test Conditions / Notes:

Transmit Channel 2462 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20DMEg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4924.020M	45.7	+1.0	+3.3	+33.5	+32.6	+0.0	50.9	54.0	-3.1	Vert
2	4924.027M	41.2	+1.0	+3.3	+33.5	+32.6	+0.0	46.4	54.0	-7.6	Horiz
3	7386.020M	38.2	+1.2	+4.0	+35.9	+32.4	+0.0	46.9	54.0	-7.1	Horiz
4	7386.020M	36.2	+1.2	+4.0	+35.9	+32.4	+0.0	44.9	54.0	-9.1	Vert

ANTENNA AA20E

Test Conditions / Notes:

Transmit Channel 2412 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20E

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4824.012M	44.8	+1.0	+3.2	+33.2	+32.5	+0.0	49.7	54.0	-4.3	Vert
2	4824.020M	41.8	+1.0	+3.2	+33.2	+32.5	+0.0	46.7	54.0	-7.3	Horiz
3	7236.012M	35.3	+1.2	+3.9	+35.8	+32.2	+0.0	44.0	54.0	-10.0	Vert
4	7236.020M	35.0	+1.2	+3.9	+35.8	+32.2	+0.0	43.7	54.0	-10.3	Horiz

Test Conditions / Notes:

Transmit Channel 2437 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20E

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4874.012M	40.3	+1.0	+3.3	+33.4	+32.6	+0.0	45.4	54.0	-8.6	Horiz
2	4874.012M	42.7	+1.0	+3.3	+33.4	+32.6	+0.0	47.8	54.0	-6.2	Vert
3	7311.012M	34.8	+1.2	+4.0	+35.8	+32.3	+0.0	43.5	54.0	-10.5	Horiz
4	7311.012M	35.3	+1.2	+4.0	+35.8	+32.3	+0.0	44.0	54.0	-10.0	Vert

Test Conditions / Notes:

Transmit Channel 2462 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20E

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4924.020M	44.0	+1.0	+3.3	+33.5	+32.6	+0.0	49.2	54.0	-4.8	Vert
2	4924.022M	41.5	+1.0	+3.3	+33.5	+32.6	+0.0	46.7	54.0	-7.3	Horiz
3	7386.020M	36.0	+1.2	+4.0	+35.9	+32.4	+0.0	44.7	54.0	-9.3	Vert
4	7386.022M	36.7	+1.2	+4.0	+35.9	+32.4	+0.0	45.4	54.0	-8.6	Horiz

ANTENNA AA20Eg

Test Conditions / Notes:

Transmit Channel 2412 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4824.000M	43.0	+1.0	+3.2	+33.2	+32.5	+0.0	47.9	54.0	-6.1	Vert
2	4824.000M	41.0	+1.0	+3.2	+33.2	+32.5	+0.0	45.9	54.0	-8.1	Horiz
3	7236.000M	34.5	+1.2	+3.9	+35.8	+32.2	+0.0	43.2	54.0	-10.8	Vert
4	7236.000M	34.3	+1.2	+3.9	+35.8	+32.2	+0.0	43.0	54.0	-11.0	Horiz

Test Conditions / Notes:

Transmit Channel 2437 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4874.000M	40.5	+1.0	+3.3	+33.4	+32.6	+0.0	45.6	54.0	-8.4	Horiz
2	4874.000M	40.5	+1.0	+3.3	+33.4	+32.6	+0.0	45.6	54.0	-8.4	Vert
3	7311.000M	35.7	+1.2	+4.0	+35.8	+32.3	+0.0	44.4	54.0	-9.6	Horiz
4	7311.000M	36.0	+1.2	+4.0	+35.8	+32.3	+0.0	44.7	54.0	-9.3	Vert

Test Conditions / Notes:

Transmit Channel 2462 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA20Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4924.017M	44.7	+1.0	+3.3	+33.5	+32.6	+0.0	49.9	54.0	-4.1	Vert
2	4924.017M	42.8	+1.0	+3.3	+33.5	+32.6	+0.0	48.0	54.0	-6.0	Horiz
3	7386.017M	35.3	+1.2	+4.0	+35.9	+32.4	+0.0	44.0	54.0	-10.0	Vert
4	7386.017M	36.5	+1.2	+4.0	+35.9	+32.4	+0.0	45.2	54.0	-8.8	Horiz

ANTENNA AA203Eg

Test Conditions / Notes:

Transmit Channel 2412 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA203Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4824.032M	44.3	+1.0	+3.2	+33.2	+32.5	+0.0	49.2	54.0	-4.8	Vert
2	4824.032M	42.3	+1.0	+3.2	+33.2	+32.5	+0.0	47.2	54.0	-6.8	Horiz
3	7236.031M	34.8	+1.2	+3.9	+35.8	+32.2	+0.0	43.5	54.0	-10.5	Vert
4	7236.031M	35.2	+1.2	+3.9	+35.8	+32.2	+0.0	43.9	54.0	-10.1	Horiz

Test Conditions / Notes:

Transmit Channel 2437 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA203Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4874.032M	41.3	+1.0	+3.3	+33.4	+32.6	+0.0	46.4	54.0	-7.6	Horiz
2	4874.032M	44.5	+1.0	+3.3	+33.4	+32.6	+0.0	49.6	54.0	-4.4	Vert
3	7311.032M	36.2	+1.2	+4.0	+35.8	+32.3	+0.0	44.9	54.0	-9.1	Horiz
4	7311.032M	34.8	+1.2	+4.0	+35.8	+32.3	+0.0	43.5	54.0	-10.5	Vert
5	9748.031M	35.7	+1.1	+4.9	+37.2	+36.1	+0.0	42.8	54.0	-11.2	Horiz

Test Conditions / Notes:

Transmit Channel 2462 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA203Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4924.000M	43.0	+1.0	+3.3	+33.5	+32.6	+0.0	48.2	54.0	-5.8	Vert
2	4924.031M	42.0	+1.0	+3.3	+33.5	+32.6	+0.0	47.2	54.0	-6.8	Horiz
3	7386.000M	35.8	+1.2	+4.0	+35.9	+32.4	+0.0	44.5	54.0	-9.5	Vert
4	7386.032M	36.5	+1.2	+4.0	+35.9	+32.4	+0.0	45.2	54.0	-8.8	Horiz
5	9848.031M	36.8	+1.1	+5.0	+37.2	+35.9	+0.0	44.2	54.0	-9.8	Horiz

ANTENNA AA203ES

Test Conditions / Notes:

Transmit Channel 2412 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA203ES

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4824.008M	39.8	+1.0	+3.2	+33.2	+32.5	+0.0	44.7	54.0	-9.3	Horiz
2	4824.008M	35.7	+1.0	+3.2	+33.2	+32.5	+0.0	40.6	54.0	-13.4	Vert
3	7236.008M	34.8	+1.2	+3.9	+35.8	+32.2	+0.0	43.5	54.0	-10.5	Horiz
4	7236.008M	34.5	+1.2	+3.9	+35.8	+32.2	+0.0	43.2	54.0	-10.8	Vert

Test Conditions / Notes:

Transmit Channel 2437 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA203ES

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4874.009M	35.8	+1.0	+3.3	+33.4	+32.6	+0.0	40.9	54.0	-13.1	Vert
2	4874.009M	40.3	+1.0	+3.3	+33.4	+32.6	+0.0	45.4	54.0	-8.6	Horiz
3	7311.008M	34.3	+1.2	+4.0	+35.8	+32.3	+0.0	43.0	54.0	-11.0	Vert
4	7311.008M	34.5	+1.2	+4.0	+35.8	+32.3	+0.0	43.2	54.0	-10.8	Horiz

Test Conditions / Notes:

Transmit Channel 2462 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA203ES

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4924.042M	41.0	+1.0	+3.3	+33.5	+32.6	+0.0	46.2	54.0	-7.8	Horiz
2	4924.042M	36.3	+1.0	+3.3	+33.5	+32.6	+0.0	41.5	54.0	-12.5	Vert
3	7386.042M	34.7	+1.2	+4.0	+35.9	+32.4	+0.0	43.4	54.0	-10.6	Horiz
4	7386.042M	35.0	+1.2	+4.0	+35.9	+32.4	+0.0	43.7	54.0	-10.3	Vert

ANTENNA AA204Eg

Test Conditions / Notes:

Transmit Channel 2412 MHz, OFDM 54 Mbps, 0.5 watt at antenna terminal. Antenna AA204Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4824.015M	41.0	+1.0	+3.2	+33.2	+32.5	+0.0	45.9	54.0	-8.1	Horiz
2	4824.015M	36.0	+1.0	+3.2	+33.2	+32.5	+0.0	40.9	54.0	-13.1	Vert
3	7236.015M	35.5	+1.2	+3.9	+35.8	+32.2	+0.0	44.2	54.0	-9.8	Horiz
4	7236.015M	34.8	+1.2	+3.9	+35.8	+32.2	+0.0	43.5	54.0	-10.5	Vert
5	9648.016M	35.2	+1.1	+4.8	+37.1	+35.9	+0.0	42.3	54.0	-11.7	Horiz

Test Conditions / Notes:

Transmit Channel 2437 MHz, OFDM 54 Mbps, 0.5 watt at antenna terminal. Antenna AA204Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4873.992M	44.8	+1.0	+3.3	+33.4	+32.6	+0.0	49.9	54.0	-4.1	Horiz
2	4874.015M	36.7	+1.0	+3.3	+33.4	+32.6	+0.0	41.8	54.0	-12.2	Vert
3	7310.992M	35.0	+1.2	+4.0	+35.8	+32.3	+0.0	43.7	54.0	-10.3	Horiz
4	7311.015M	36.0	+1.2	+4.0	+35.8	+32.3	+0.0	44.7	54.0	-9.3	Vert

Test Conditions / Notes:

Transmit Channel 2462 MHz, OFDM 54 Mbps, 0.5 watt at antenna terminal. Antenna AA204Eg

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4924.000M	40.3	+1.0	+3.3	+33.5	+32.6	+0.0	45.5	54.0	-8.5	Horiz
2	4924.000M	35.7	+1.0	+3.3	+33.5	+32.6	+0.0	40.9	54.0	-13.1	Vert
3	7386.000M	36.3	+1.2	+4.0	+35.9	+32.4	+0.0	45.0	54.0	-9.0	Horiz
4	7386.000M	34.7	+1.2	+4.0	+35.9	+32.4	+0.0	43.4	54.0	-10.6	Vert

ANTENNA AA204ES

Test Conditions / Notes:

Transmit Channel 2412 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA204ES

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4824.000M	37.5	+1.0	+3.2	+33.2	+32.5	+0.0	42.4	54.0	-11.6	Horiz
2	4824.000M	36.2	+1.0	+3.2	+33.2	+32.5	+0.0	41.1	54.0	-12.9	Vert
3	7236.000M	35.3	+1.2	+3.9	+35.8	+32.2	+0.0	44.0	54.0	-10.0	Horiz
4	7236.000M	35.0	+1.2	+3.9	+35.8	+32.2	+0.0	43.7	54.0	-10.3	Vert

Test Conditions / Notes:

Transmit Channel 2437 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA204ES

Transducer Legend:

T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4874.000M	36.7	+1.0	+3.3	+33.4	+32.6	+0.0	41.8	54.0	-12.2	Vert
2	4874.000M	36.2	+1.0	+3.3	+33.4	+32.6	+0.0	41.3	54.0	-12.7	Horiz
3	7311.000M	34.8	+1.2	+4.0	+35.8	+32.3	+0.0	43.5	54.0	-10.5	Vert
4	7311.000M	36.3	+1.2	+4.0	+35.8	+32.3	+0.0	45.0	54.0	-9.0	Horiz

Test Conditions / Notes:

Transmit Channel 2462 MHz, OFDM 54 Mbps, 1 watt at antenna terminal. Antenna AA204ES

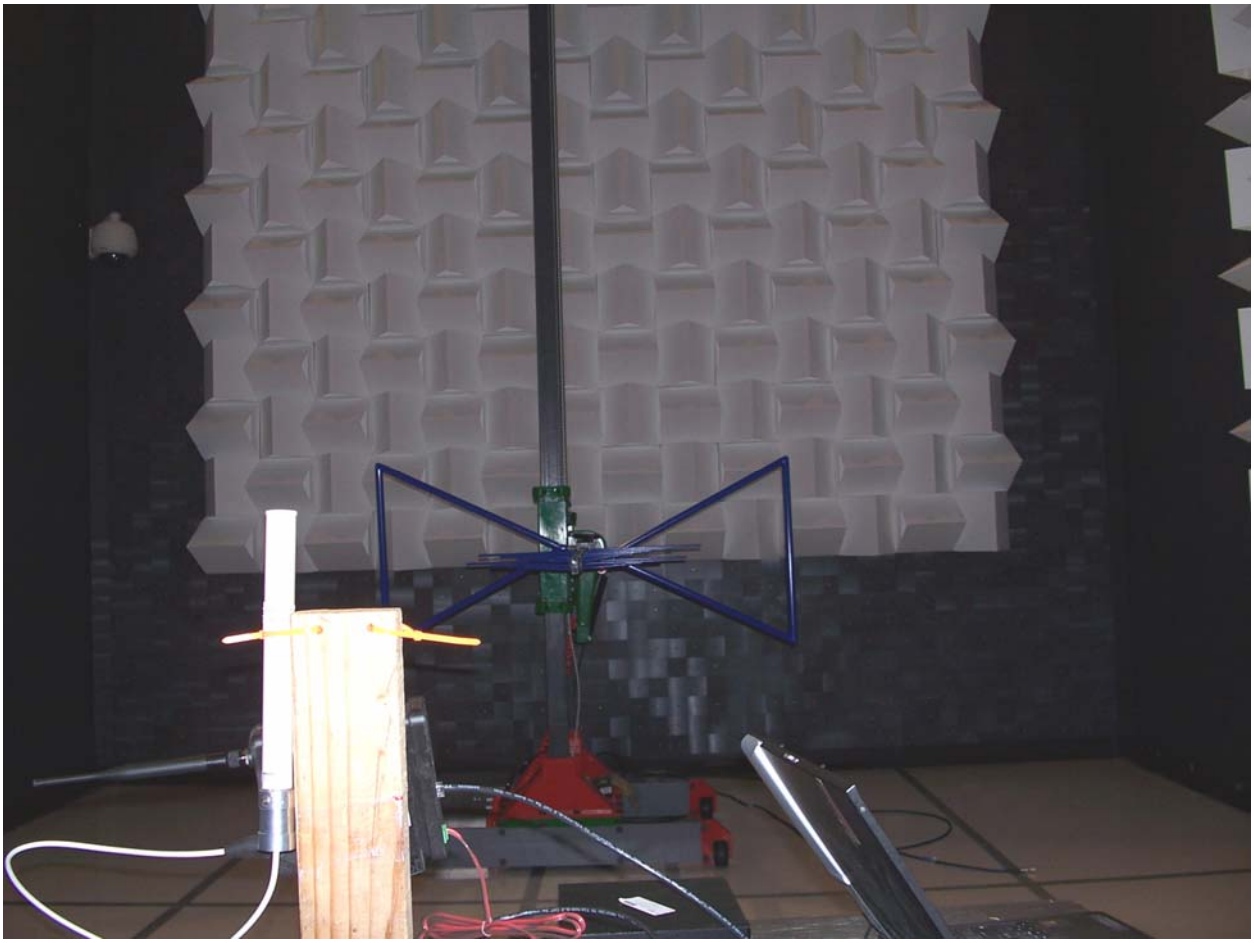
Transducer Legend:

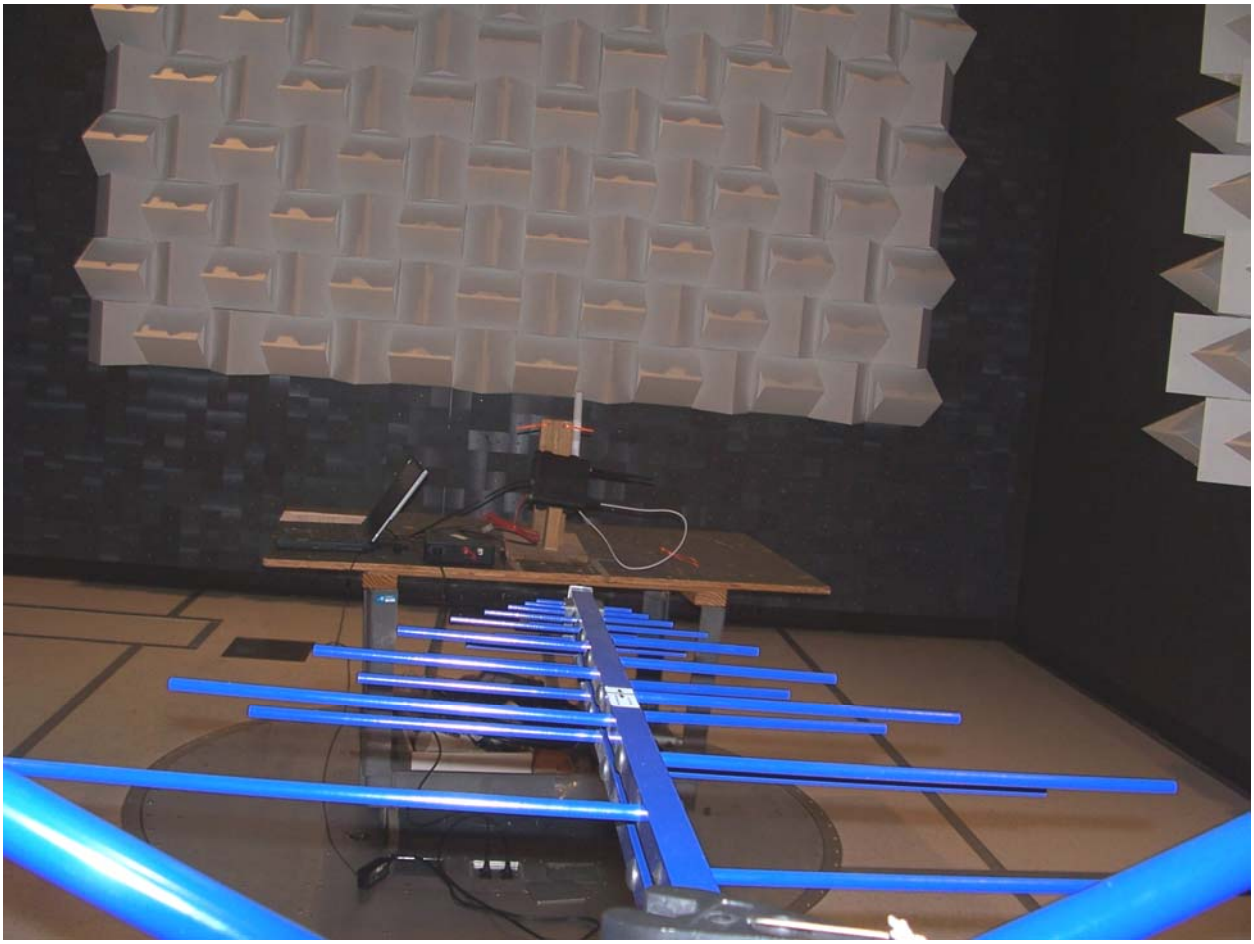
T1=Cable 1484 T3=Horn 0993 T2=Cable 1485 T4=Pre-Amp 1016

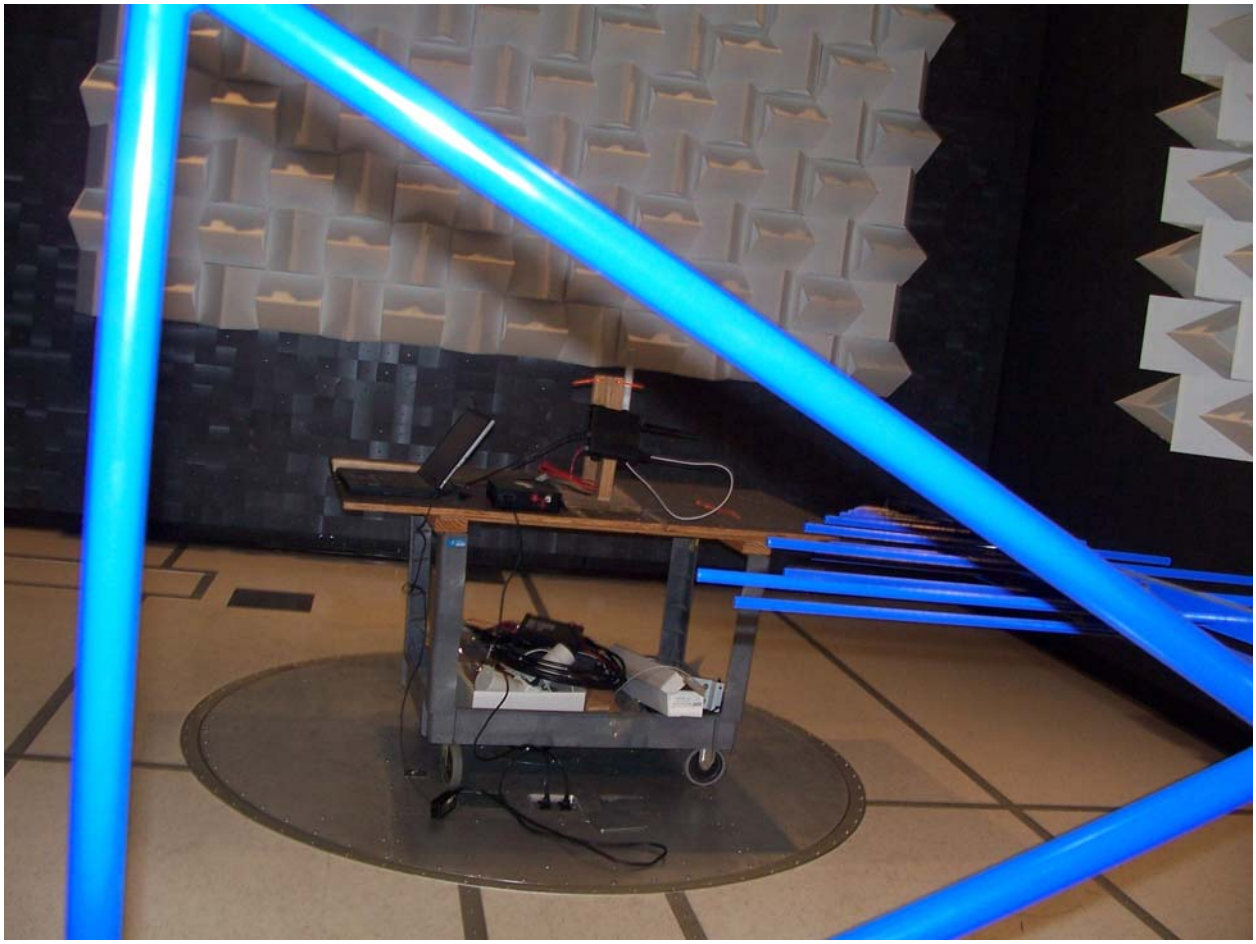
Measurement Data: Reading listed by frequency. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	4924.000M	38.0	+1.0	+3.3	+33.5	+32.6	+0.0	43.2	54.0	-10.8	Horiz
2	4924.000M	35.8	+1.0	+3.3	+33.5	+32.6	+0.0	41.0	54.0	-13.0	Vert
3	7386.000M	35.3	+1.2	+4.0	+35.9	+32.4	+0.0	44.0	54.0	-10.0	Horiz
4	7386.000M	35.7	+1.2	+4.0	+35.9	+32.4	+0.0	44.4	54.0	-9.6	Vert

Radiated Photographs







Section 7. Peak Power Spectral Density

NAME OF TEST: Peak Power Spectral Density	PARA. NO.: 15.247(e)
TESTED BY: Brian Boyea	DATE: 24 April, 2008

Test Results: Complies.

Measurement Data: See attached data..

Test Conditions: 27 %RH
23 °C

Measurement Uncertainty: +/-1.7 dB

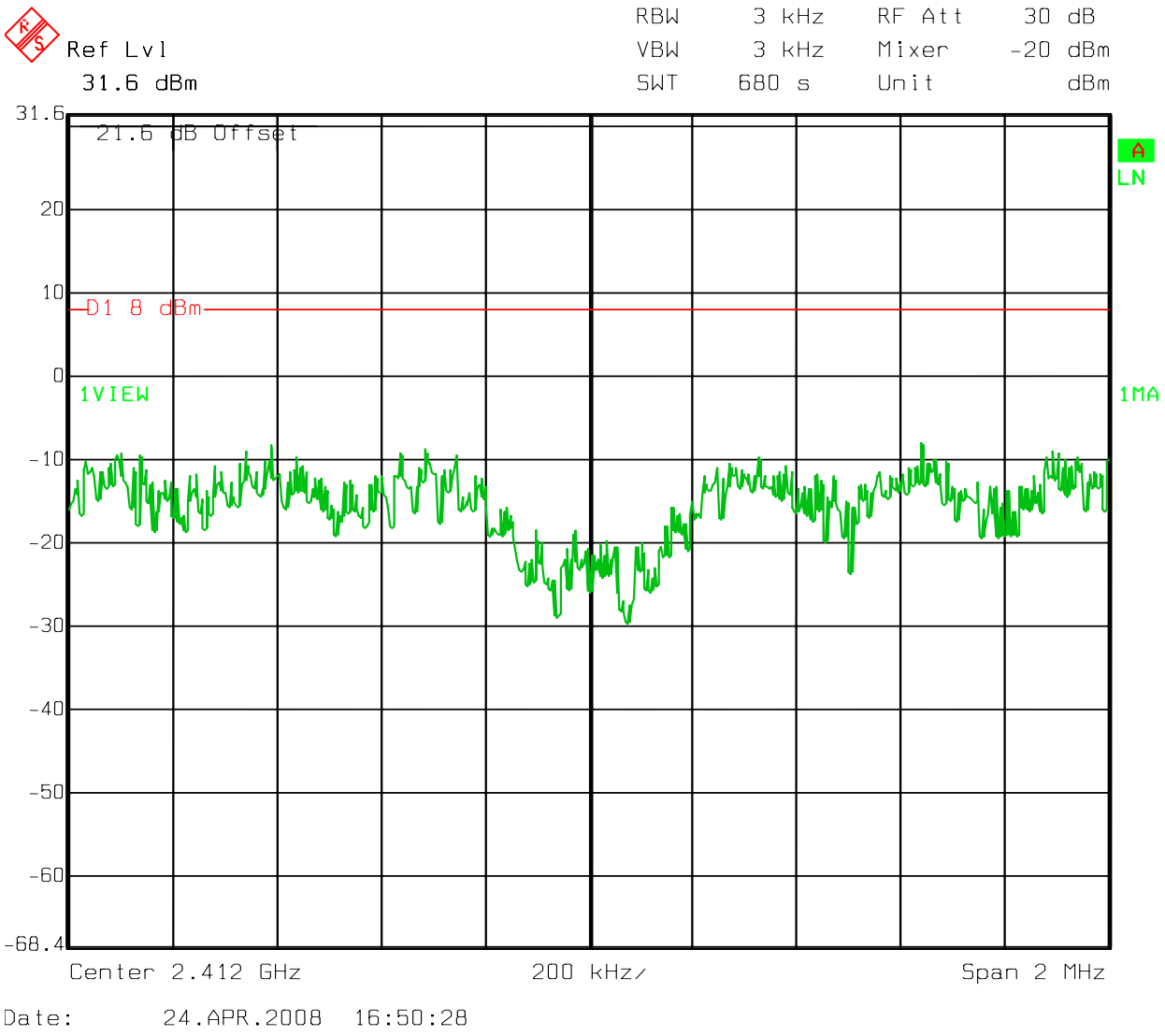
Test Equipment Used: 1036, 1474, 1484

NOTE: All peak power spectral density measurements were done with a maximum peak detector.

It was determined by measurement that the maximum peak power spectral density is when the radio is in OFDM mode with a data rate of 54 Mbps.

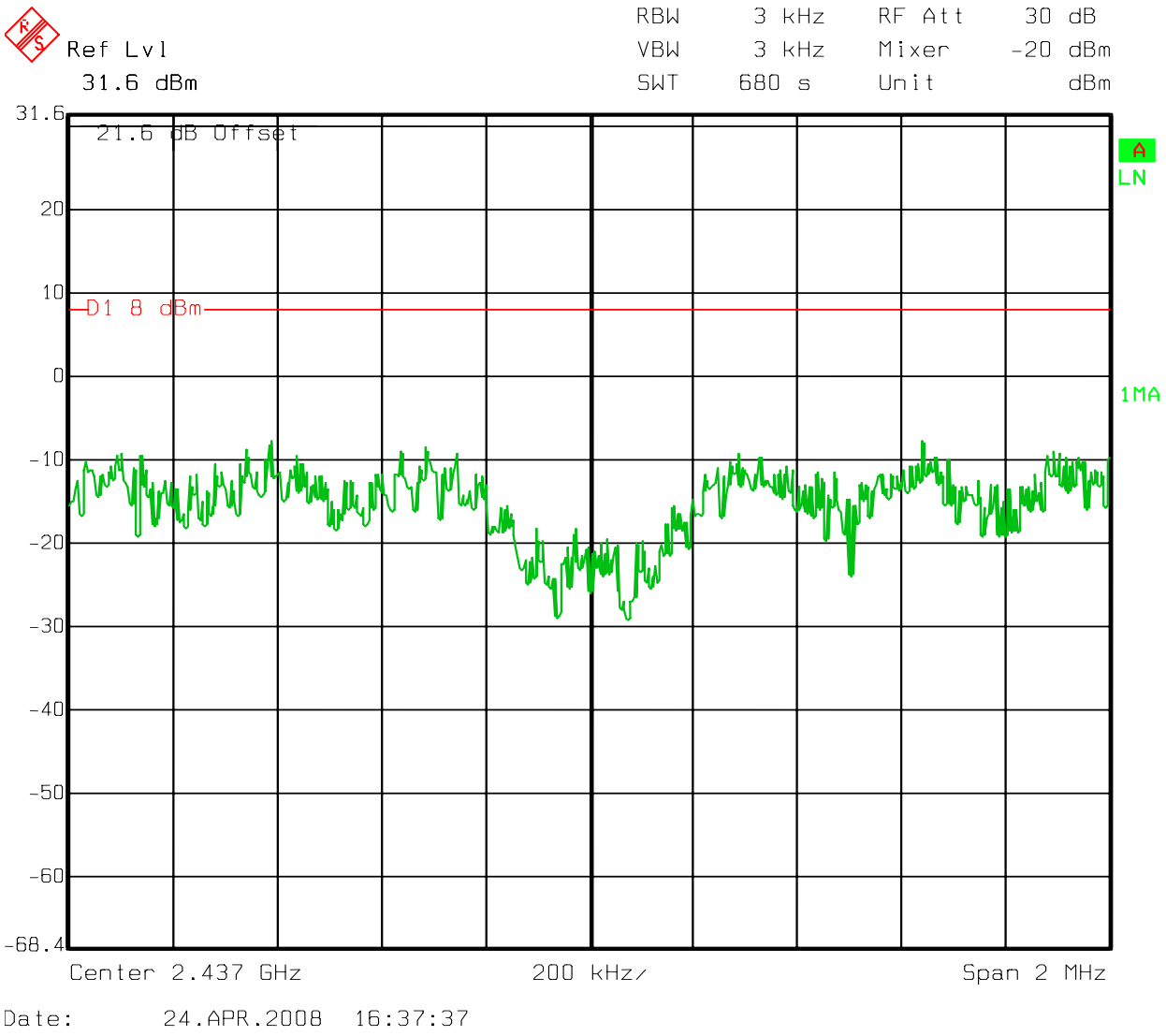
Peak Power Spectral Density

2412 MHz, 54 Mbsp



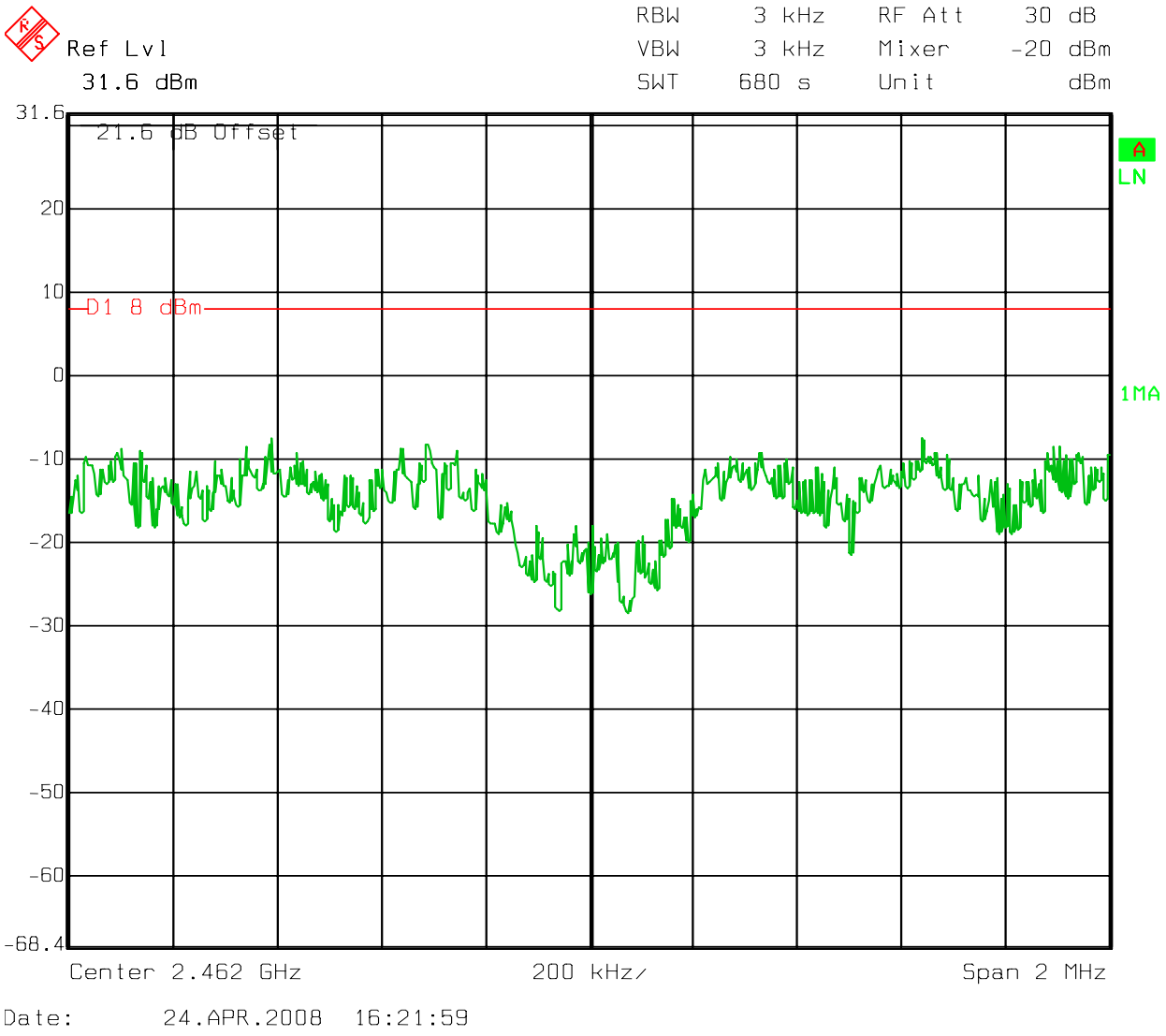
Peak Power Spectral Density

2.437 MHz, 54 MBPS



Peak Power Spectral Density

2.462 GHz 54MBPS



Section 8. Powerline Conducted Emissions

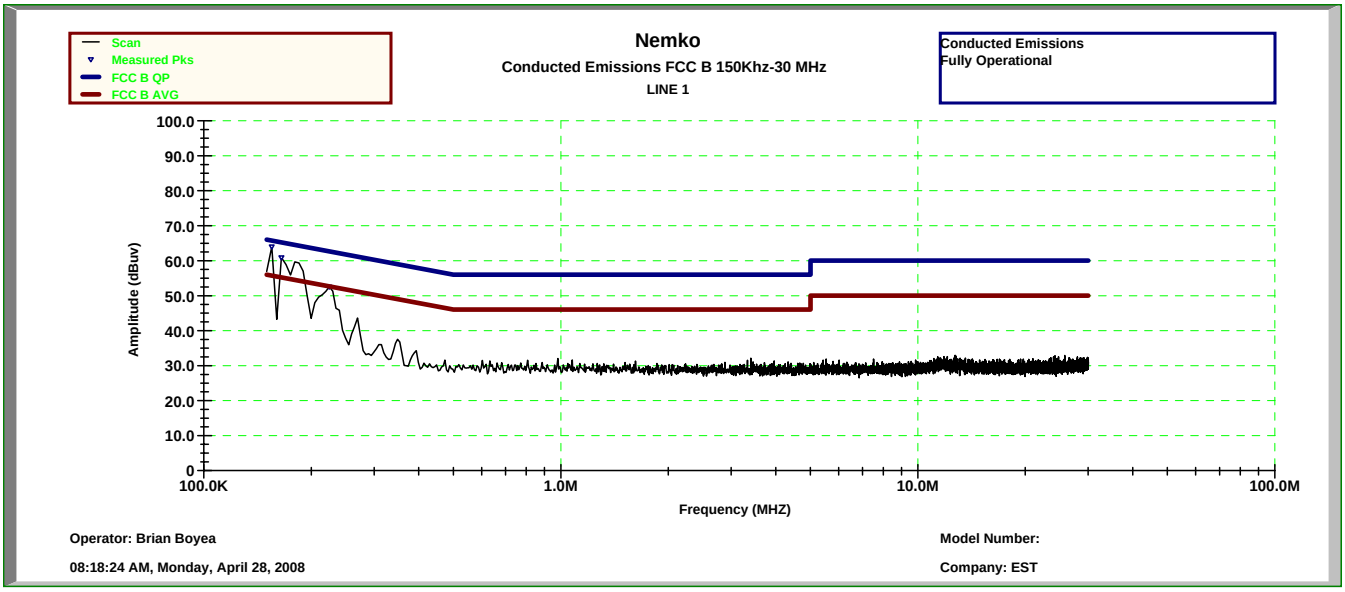
NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)
TESTED BY: Brian Boyea	DATE: 28 April, 2008

Test Results: Complies.

Measurement Data: See attached plots.

Measurement Uncertainty: +/- 1.7 dB

Test Data – Powerline Conducted Emissions



This plot shows the measured peak emission levels against the QPk and Avg. limits. The table below shows measured QPk and Avg. emission levels.

Nemko

Line 1 Final QP/AVG

LINE 1

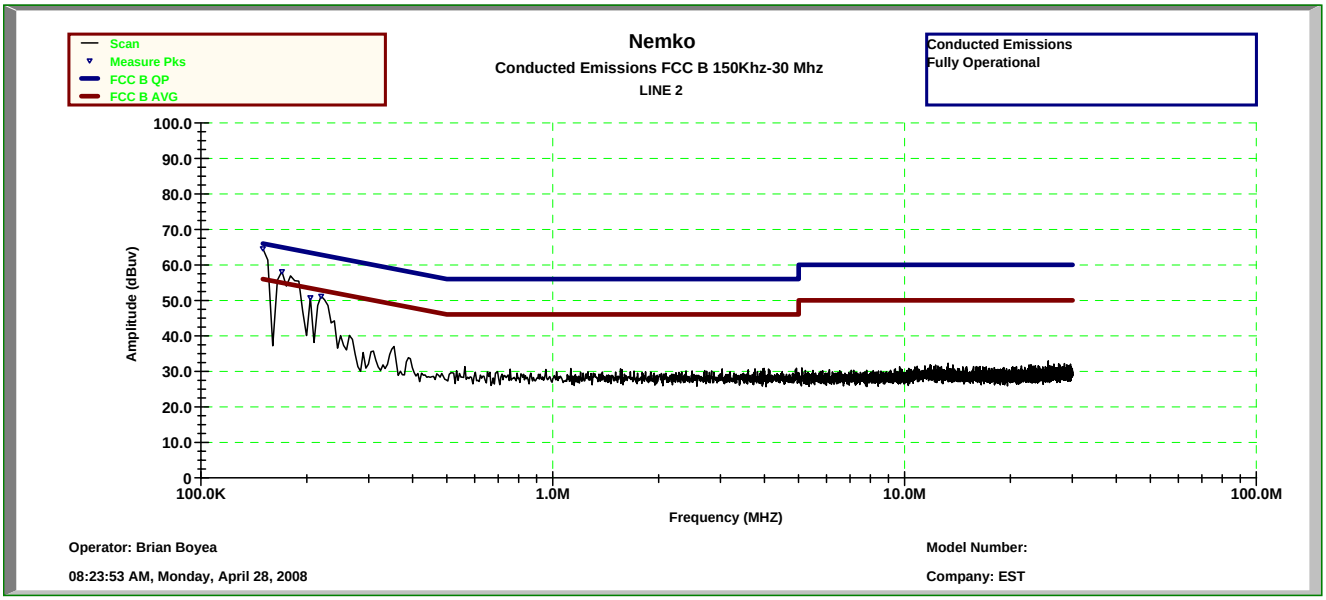
Operator: Brian Boyea

Company: EST

Model: 195 Eg

Monday April 28 2008

Frequency MHz	Class B QP LIMIT	Class B AVG LIMIT	AVG Meas	AVG Margin	QP Meas	QP Margin
0.1523	65.9	55.9	46.7	-9.2	58.5	-7.4
0.1644	65.6	55.6	39.6	-15.9	51.8	-13.8
0.2272	63.8	53.8	50.3	-3.5	51.7	-12.1



Nemko

Line 2 Final QP/AVG

Line 2

Operator: Brian Boyea

Company: EST

Model: 195 Eg

Monday April 28 2008

Frequency MHz	Class B QP LIMIT	Class B AVG LIMIT	AVG Meas	AVG Margin	QP Meas	QP Margin
0.1500	66.0	56.0	51.0	-5.0	61.7	-4.3
0.1691	65.5	55.5	37.4	-18.0	50.4	-15.0

Photos – Powerline Conducted Emissions

Front

Side

Section 9. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	05/26/06	05/26/08
1029	PEAK POWER METER	HP 8900D	3303U0012	12/18/07	12/17/08
1030	PEAK POWER SENSOR	HP 84811A	2539A03573	12/18/07	12/17/08
1474	20db Attenuator DC 18 Ghz	MCL Inc. BW-S20W2	NONE	CBU	N/A
1475	20db Attenuator DC 18 Ghz	MCL Inc. BW-S20W3	NONE	CBU	N/A
1481	Microwave Highpass Filter	K & L 3DH1-2000/T8000-0/0	4	Cal B4 Use	N/A
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/24/07	01/24/09
1484	Cable	Storm PR90-010-072	N/A	05/07/08	05/07/09
1485	Cable	Storm PR90-010-216	N/A	05/07/08	05/07/09
993	Horn antenna	A.H. Systems SAS-200/571	XXX	08/31/07	08/30/08
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	05/07/08	05/07/09
983	PRE-AMP, 18-40 GHz	Nemko USA, Inc. BB1	1	11/11/07	11/11/08
1767	EMI Test Receiver 20Hz - 26.5 GHz - 150 - +30 dBm LCD	ROHDE & SCHWARZ ESIB26	837491/0002	09/20/07	09/19/08
1763	Bilog Antenna	Schaffner CBL 6111D	22926	09/21/07	09/20/08
1766	Band Reject filter	Microtronics BRM50702	41	CBU	N/A

ANNEX A - TEST DETAILS

NAME OF TEST: Powerline Conducted Emissions PARA. NO.: 15.207(a)

Minimum Standard: §15.207 Conducted limits.

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 mH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Conducted Emission (MHz)	Limit (dBmV) Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current systems containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 mV within the frequency band 535-1705 kHz, as measured using a 50 mH/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits as provided in §15.205 and §§15.209, 15.221, 15.223, 15.225 or 15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.247(a)(2)

Minimum Standard: The minimum 6 dB bandwidth shall be at least 500 kHz

NAME OF TEST: Maximum Peak Output Power PARA. NO.: 15.247(b)(3)

Minimum Standard: The maximum peak output power shall not exceed 1 watt.

If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point to point operation may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceed 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operation may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Direct Measurement Method For Detachable Antennas:
If the antenna is detachable, a peak power meter is used to measure the power output with the transmitter operating into a 50 ohm load. The dBi gain of the antenna(s) employed shall be reported.

Substitution Antenna Method for Integral Antennas:
The peak field strength of the carrier is measured in a worst-case configuration with a RBW > 5 times the occupied bandwidth of the transmitted waveform. For cases where the RBW of the test instrument is not sufficient, the power is measured using a peak power meter instead of the spectrum analyzer.

The RBW of the spectrum analyzer shall be set to a value greater than the measured 6 dB occupied bandwidth of the E.U.T.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.247(a)(2)

Minimum Standard: Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Method Of Measurement:

The spectrum analyzer is set as follows:

RBW = VBW = 100 kHz.
Span: Sufficient to display 6 dB bandwidth
LOG dB/div.: 10 dB
Sweep: Auto

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Spurious Emissions(conducted) PARA. NO.: 15.247(d)

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength (μV/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

THE SPECTRUM IS SEARCHED TO THE 10th HARMONIC OF THE HIGHEST FREQUENCY GENERATED IN THE EUT.

Method Of Measurement:

30 MHz - 10th harmonic plot
RBW: 100 kHz
VBW: 300 kHz
Sweep: Auto
Display line: -20 dBc

Lower Band Edge
RBW: At least 1% of span/div.
VBW: >RBW
Span: As necessary to display any spurious at band edge.
Sweep: Auto
Center Frequency: 902 MHz, 2400 MHz, or 5725 MHz
Marker: Peak of fundamental emission
Marker Δ: Peak of highest spurious level below center frequency.

Upper Band Edge
RBW: At least 1% of span/div.
VBW: >RBW
Span: As necessary to display any spurious at band edge.
Sweep: Auto
Center Frequency: 928 MHz, 2483.5 MHz, or 5850 MHz
Marker: Peak of fundamental emission
Marker Δ: Peak of highest spurious level above center frequency.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Radiated Spurious Emissions PARA. NO.: 15.247(c)

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits:

Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength (μV/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

THE SPECTRUM WAS SEARCHED TO THE 10th HARMONIC

15.205 Restricted Bands

MHz	MHz	MHz	GHz
0.09-0.11	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.125-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41	1718		

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Transmitter Power Density	PARA. NO.: 15.247(d)

Minimum Standard: The transmitted power density averaged over any 1 second interval shall not be greater than +8 dBm in any 3 kHz bandwidth.

Method Of Measurement: The spectrum analyzer is set as follows:

RBW: 3 kHz
VBW: >3 kHz
Span: => measured 6 dB bandwidth
Sweep: Span(kHz)/3 (i.e. for a span of 1.5 MHz the sweep rate is 1500/3 = 500 sec.)
LOG dB/div.: 2 dB

Note: For devices with spectrum line spacing =< 3 kHz, the RBW of the analyzer is reduced until the spectral lines are resolved. The measurement data is normalized to 3 kHz by summing the power of all the individual spectral lines within a 3 kHz band in linear power units.

For Devices With Integral Antenna:

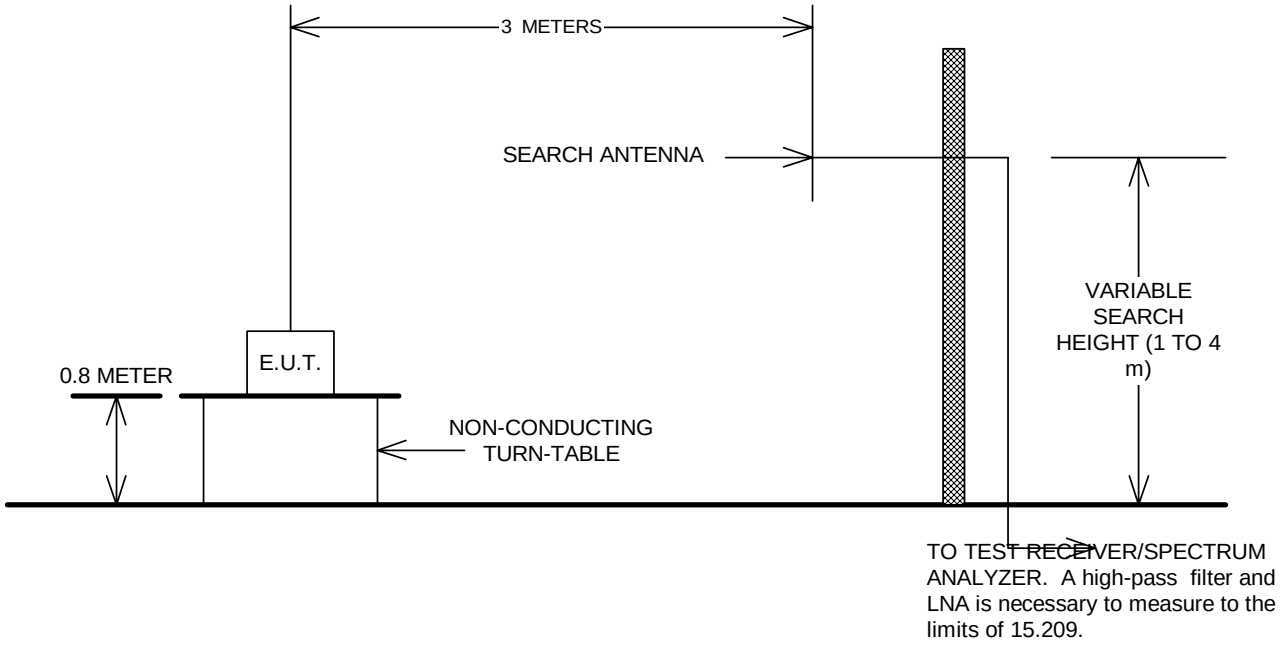
For devices with non-detachable antennas, the received field strength is peaked and the spectrum analyzer is set as above. The peak emission level is then measured and converted to a field strength by adding the appropriate antenna factor and cable loss. This field strength is then converted to an equivalent isotropic radiated power using the same method as described for Peak Power output.

Number of channels tested:

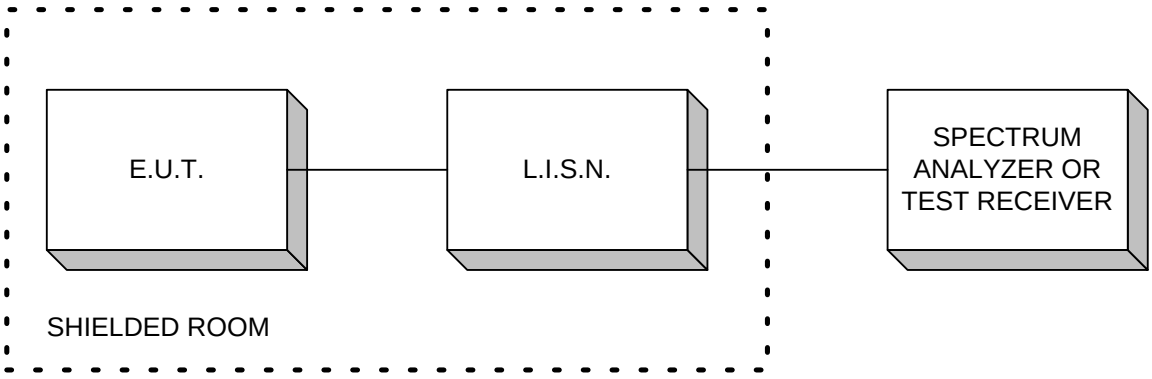
Tuning Range	Number Of Channels Tested	Channel Location In Band
1 MHz or Less	1	Middle
1 to 10 MHz	2	Top And Bottom
More Than 10 MHz	3	Top, Middle, Bottom

ANNEX B - TEST DIAGRAMS

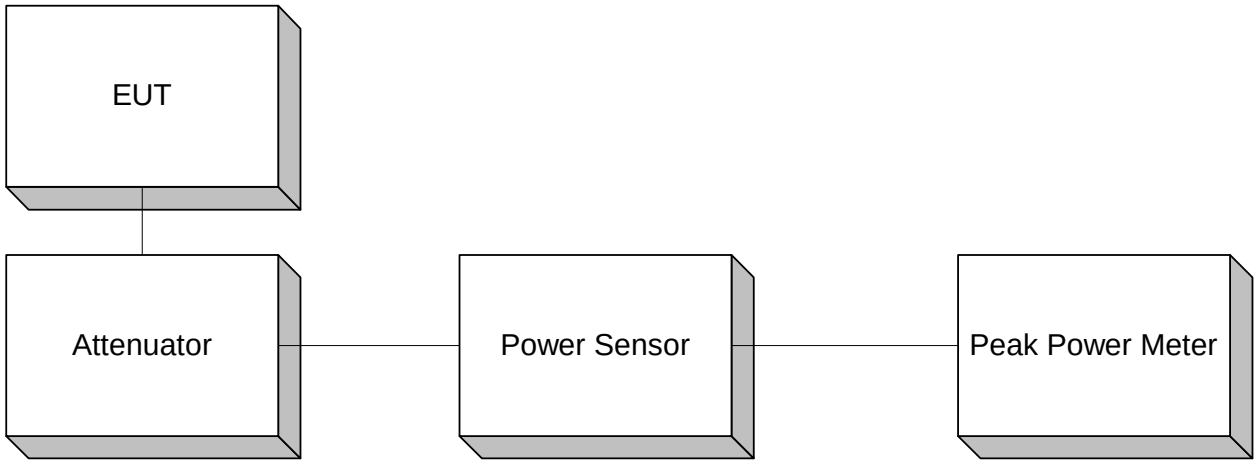
Test Site For Radiated Emissions



Conducted Emissions



Peak Power At Antenna Terminals



Minimum 6 dB Bandwidth
Peak Power Spectral Density
Spurious Emissions (conducted)