Nemko Test Report:	5L0114RUS4Rev1
Applicant:	Motion Computing, Inc. 8601 RR 2222 Bldg 2 Austin, Texas 78730
Equipment Under Test: **(E.U.T.)**	LS800 TS01 with Atheros card
FCC ID.:	Q3QWMIA123AG
In Accordance With:	**FCC Part 15, Subpart E** UNII Band Transceiver
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	 Tom Tidwell, Frontline Group Manager
Date:	1 December, 2005

Table of Contents

Section 1. Summary of Test Results

Manufacturer: Motion Computing, Inc.

Model No.: TS01 w/ Atheros card

Name: LS800

Serial No.: Proto 8

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 E for UNII devices. 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. NONE
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
26 dB Bandwidth	15.407(a)	Complies
Maximum Peak Power Output	15.407(a)	Complies
Peak Excursion	15.407(b)	Comlies
Spurious Emissions (Antenna Conducted)	15.407(a)	Complies
Spurious Emissions (Restricted Bands)	15.407(a)	Complies
Peak Power Spectral Density	15.407(a)	Complies

Footnotes:

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

General Equipment Information

Frequency Band: ☒ 5170 – 5240 MHz
☒ 5260 – 5320 MHz

Channel Spacing: 5 MHz

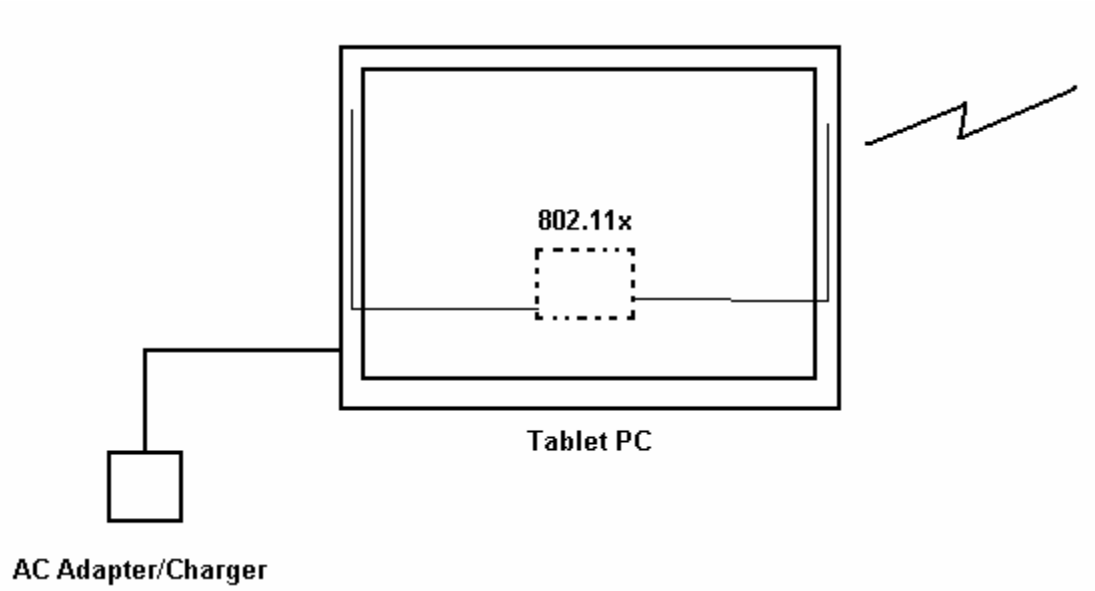
User Frequency Adjustment: Software controlled

Description of EUT

The LS800 TS01 is a portable computer platform based on ultra-portable tablet PC technology utilizing Microsoft's Tablet version of Windows XP. The PC is compatible with 802.11a, b and g technologies.

The PC also has Bluetooth capability.

System Diagram



Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)
TESTED BY: Brian Boyea	DATE: 4/19/05

Test Results: Complies.

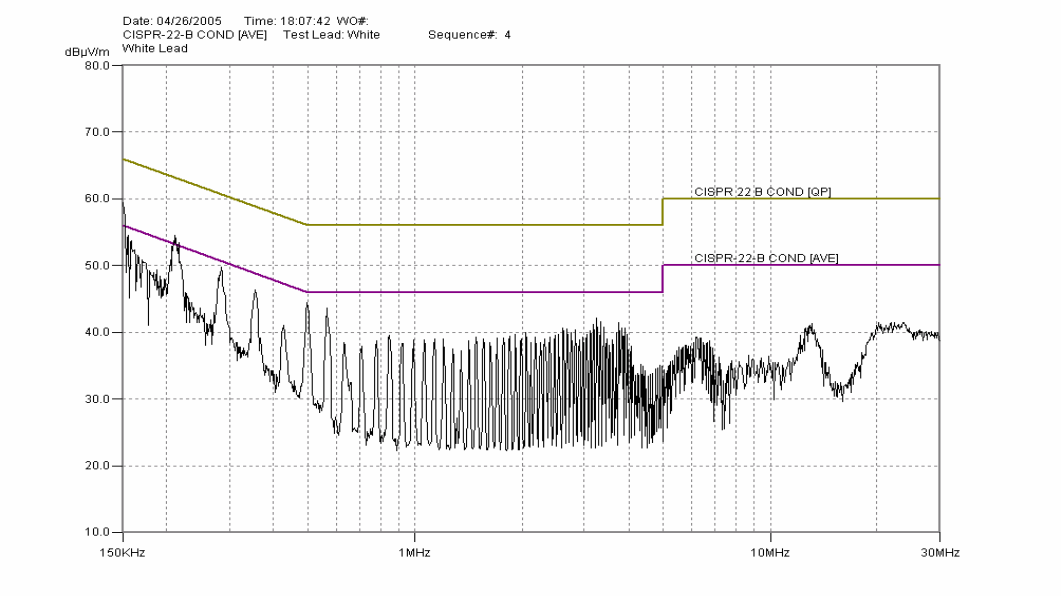
Measurement Data: See attached plots.

Measurement Uncertainty: +/- 1.7 dB

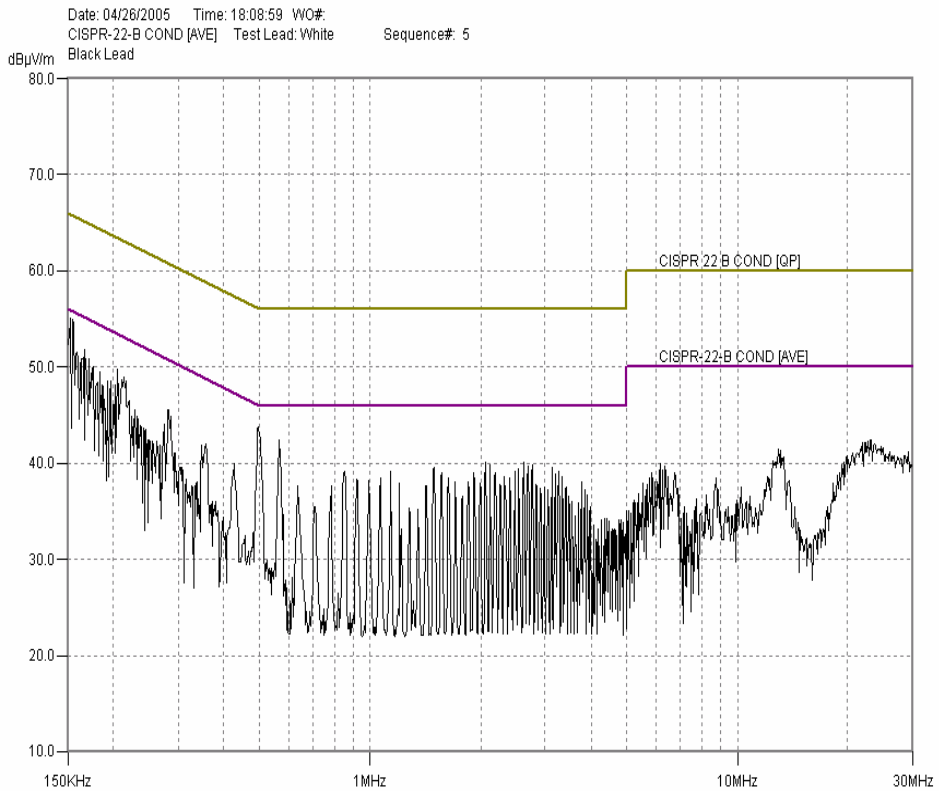
The worst case PEAK emission was 51 dBµV at 150 kHz on the neutral line. This is 5 dB below the AVERAGE spec limit of 56 dBµV.

Test Data – Powerline Conducted Emissions

Neutral



Hot



Photos – Powerline Conducted Emissions

Front

Side

Section 4. 26 dB Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.407(a)
TESTED BY: David Light	DATE: 03 May 2005

Test Results: Complies.

Test Data – 26 dB Bandwidth

Data Plot **Occupied Bandwidth**

Page 1 of 9 Complete X

Job No.: 5L0114 Date: 5/11/2005 Preliminary:

Specification: 15.407(a) Temperature(°C): 23

Tested By: David Light Relative Humidity(%) 45

E.U.T.: Tablet PC w/Atheros 802.11 a/b/g radio

Configuration: Tx

Sample Number: 1

Location: Lab 1 RBW: 300 kHz

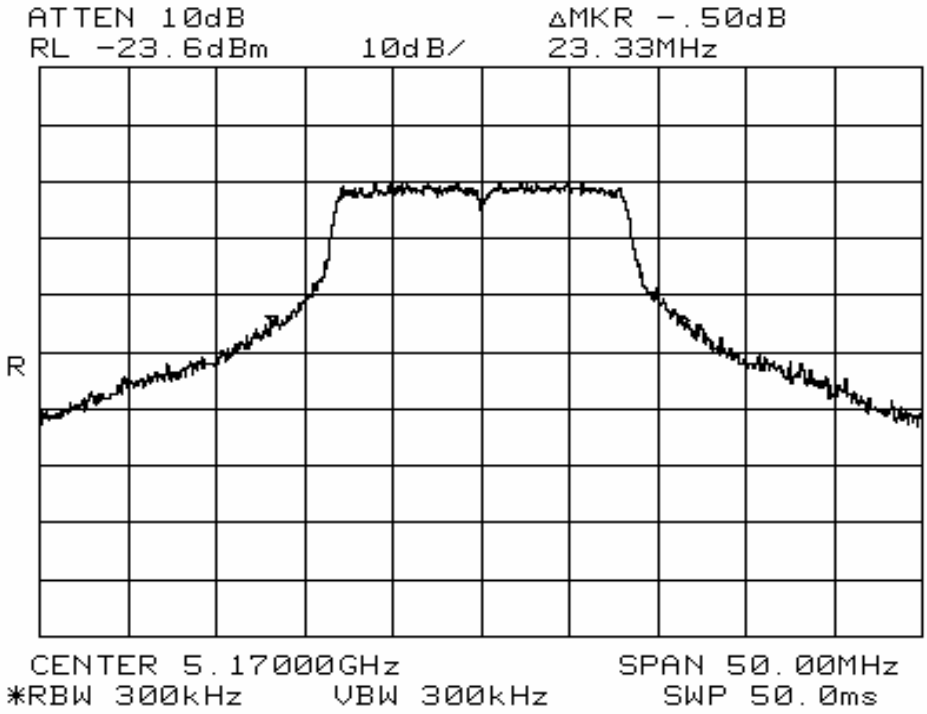
Detector Type: Peak VBW: 300 kHz

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1973
Filter:		Cable #2:	
Receiver:	1464	Cable #3:	
Attenuator #1	1472	Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



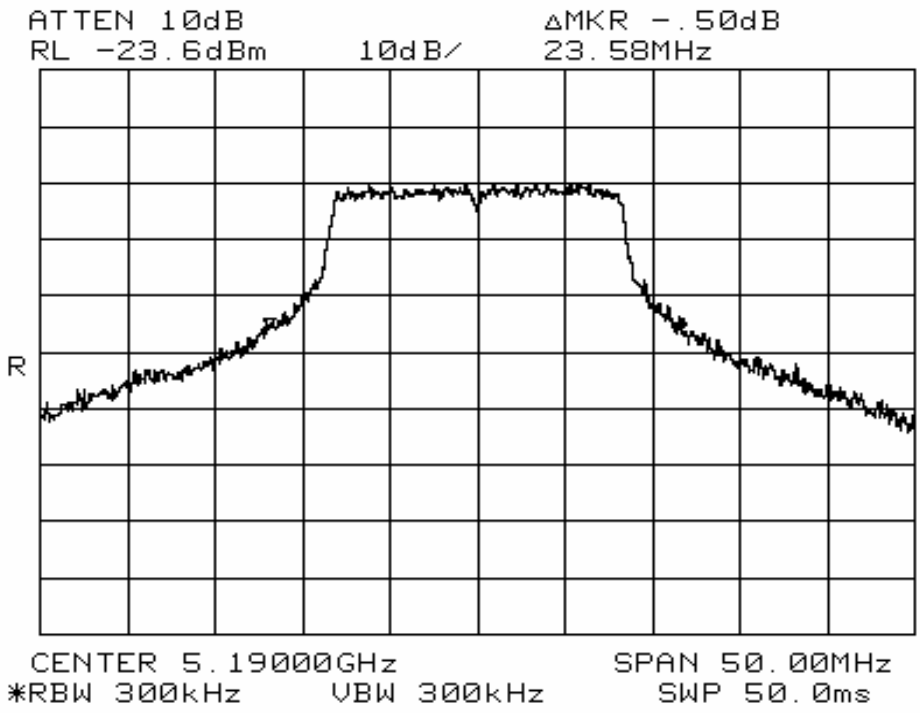
Notes:

Test Data – 26 dB Bandwidth

Data Plot **Occupied Bandwidth**

Page 2 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



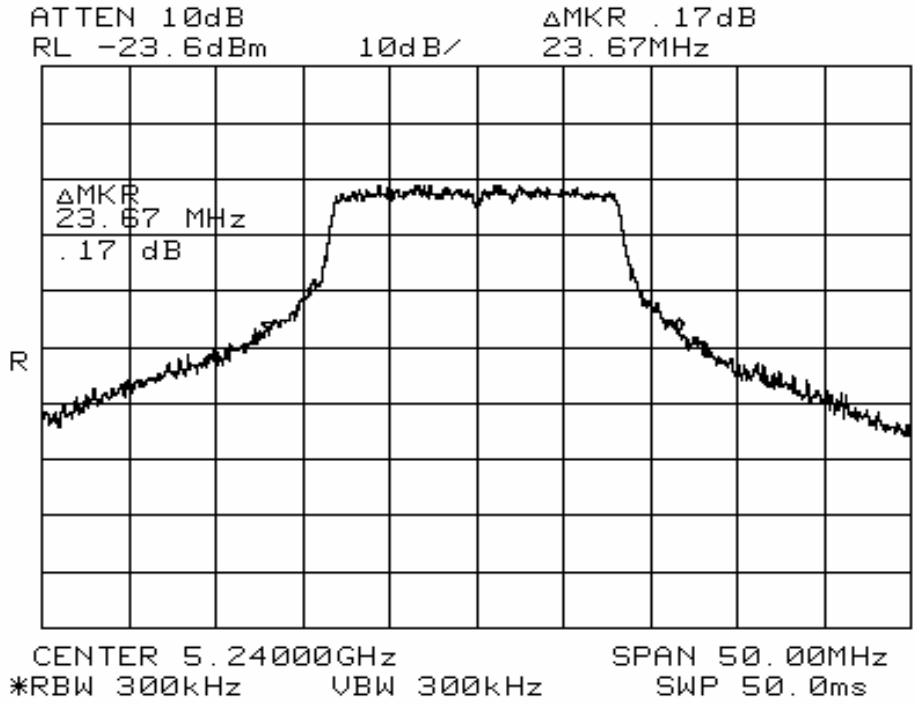
Notes:

Test Data – 26 dB Bandwidth

Data Plot **Occupied Bandwidth**

Page 3 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



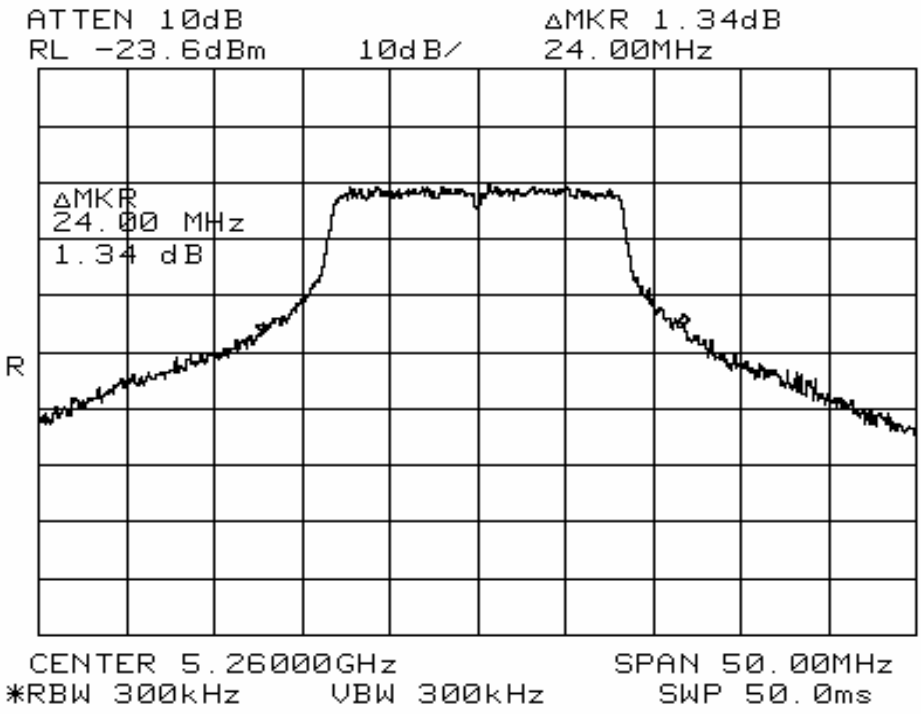
Notes:

Test Data – 26 dB Bandwidth

Data Plot **Occupied Bandwidth**

Page 4 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



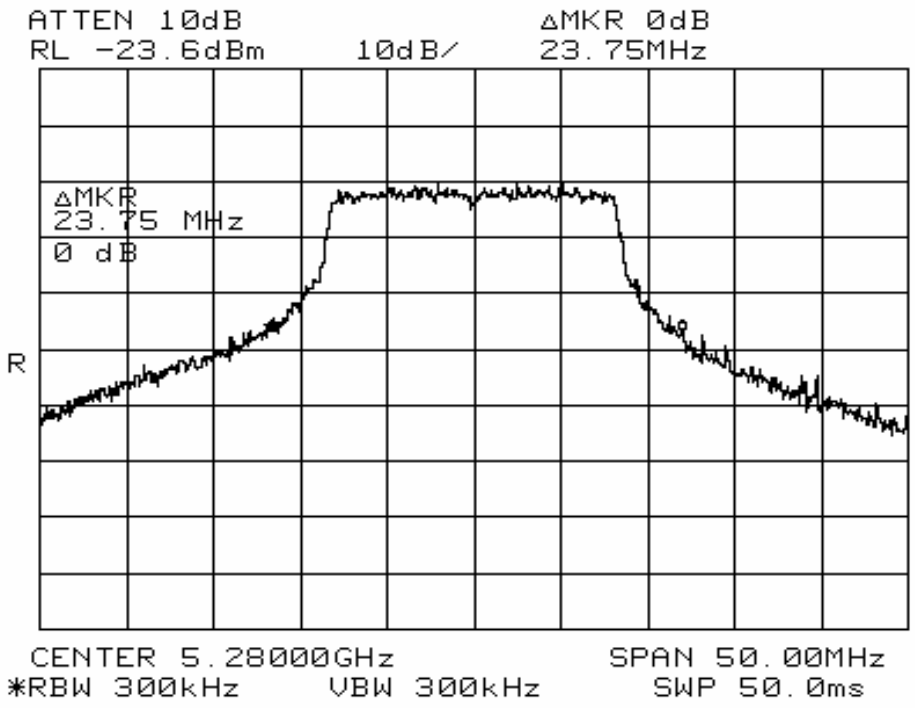
Notes:

Test Data – 26 dB Bandwidth

Data Plot **Occupied Bandwidth**

Page 5 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



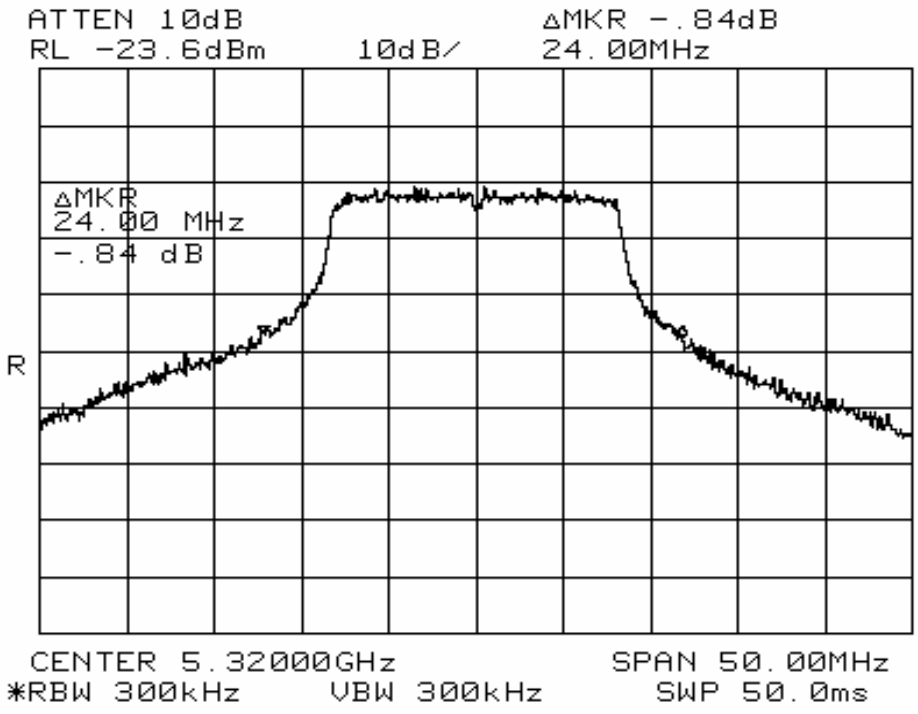
Notes:

Test Data – 26 dB Bandwidth

Data Plot **Occupied Bandwidth**

Page 6 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



Notes:

Section 5. Maximum Peak Output Power

NAME OF TEST: Maximum Peak Output power	PARA. NO.: 15.407(a)
TESTED BY: David Light	DATE: 03 May 2005

(1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz.

Limit = lesser of 50 mW(17 dBm) or 4 dBm + 10log(20) = 17 dBm
Limit = 50 mW(+17 dBm)

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.

Limit = lesser of 250 mW(24 dBm) or 11 dBm + 10log(20) = +24 dBm
Limit = 250 mW(+24 dBm)

(3) For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Limit = lesser of 1 W (30 dBm) or 17 dBm + 10log(20) = +30 dBm
Limit = 1 W(+30 dBm)

Test Results: Complies.

Measurement Data: Refer to attached data

The measurement was repeated at +/- 15% of nominal supply voltage with no variation noted in rf power output.

Maximum Peak Power:

Frequency (MHz)	Peak Power (dBm)	Peak Power (mW)
5150 – 5250 MHz band		
5170	17.3	54
5240	16.6	46
5250 – 5350 MHz band		
5260	17.3	54
5320	16.7	47

Test Equipment Used: 1464-1973-1472

Test Conditions: 20^{O}C
50% RH

The carrier is continuous and method #1 of FCC Public Notice DA 02-2138 was used to make the measurement.

Section 6. Peak Excursion

NAME OF TEST: Peak Excursion	PARA. NO.: 15. 407
TESTED BY: David Light	DATE: 13 May 2005

Test Results: Maximum excursion = 13.9 dB.

Measurement Data: See attached plots

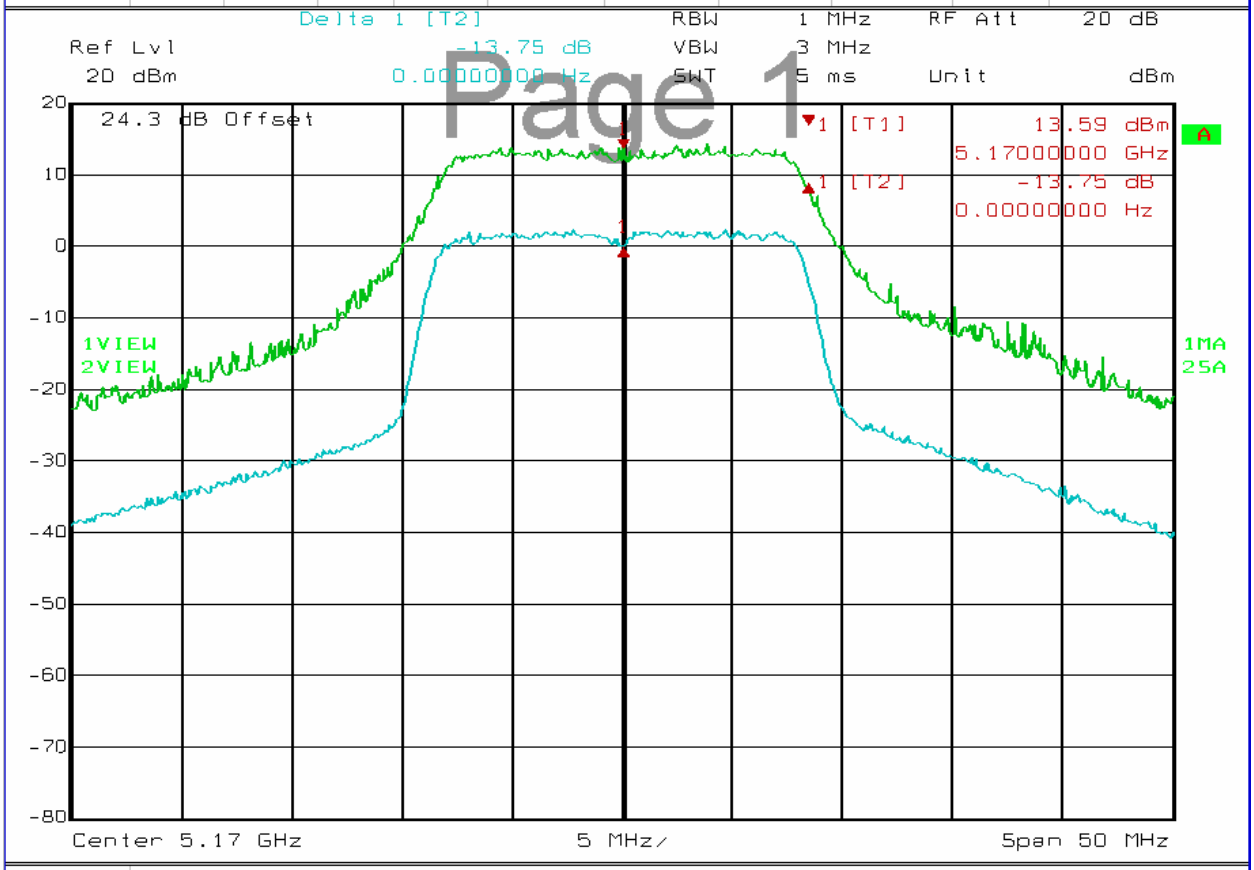
Test Data – Peak Excursion

Data Plot **Peak Excursion**

Page 1 of 9				Complete	X
Job No.:	5L0114	Date:	5/11/2005	Preliminary:	
Specification:	15.407(a)	Temperature(°C):	20		
Tested By:	David Light	Relative Humidity(%)	50		
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio				
Configuration:	Tx				
Sample Number:	1				
Location:	Lab 1	RBW:	Refer to plots		
Detector Type:	Peak	VBW:	Refer to plots		

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1081
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1472	Cable #4:	
Attenuator #2:		Mixer:	
Additional equipment used:			
Measurement Uncertainty:	+/-1.7 dB		

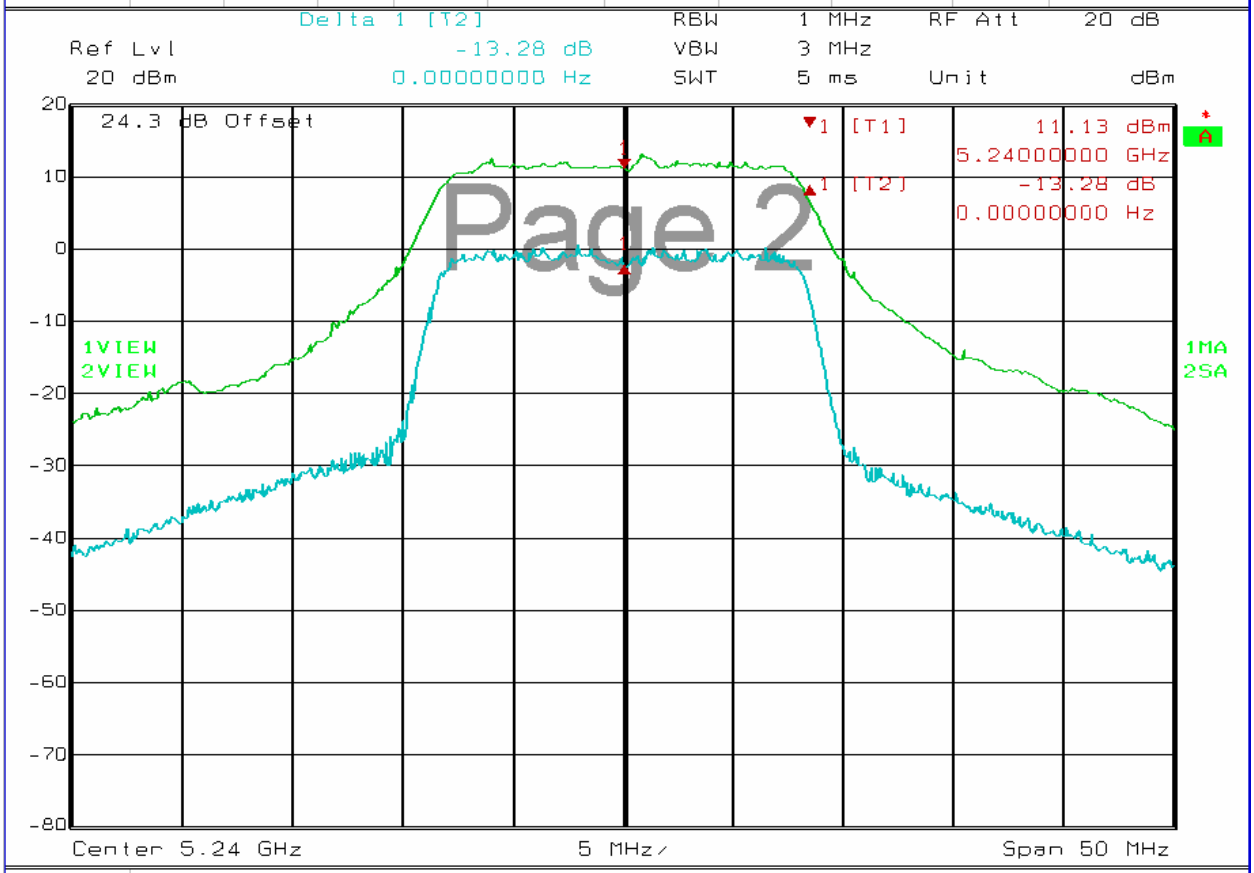


Notes:

Test Data – Peak Excursion

Data Plot **Peak Excursion**

Page 2 of 9			
Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	20
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		

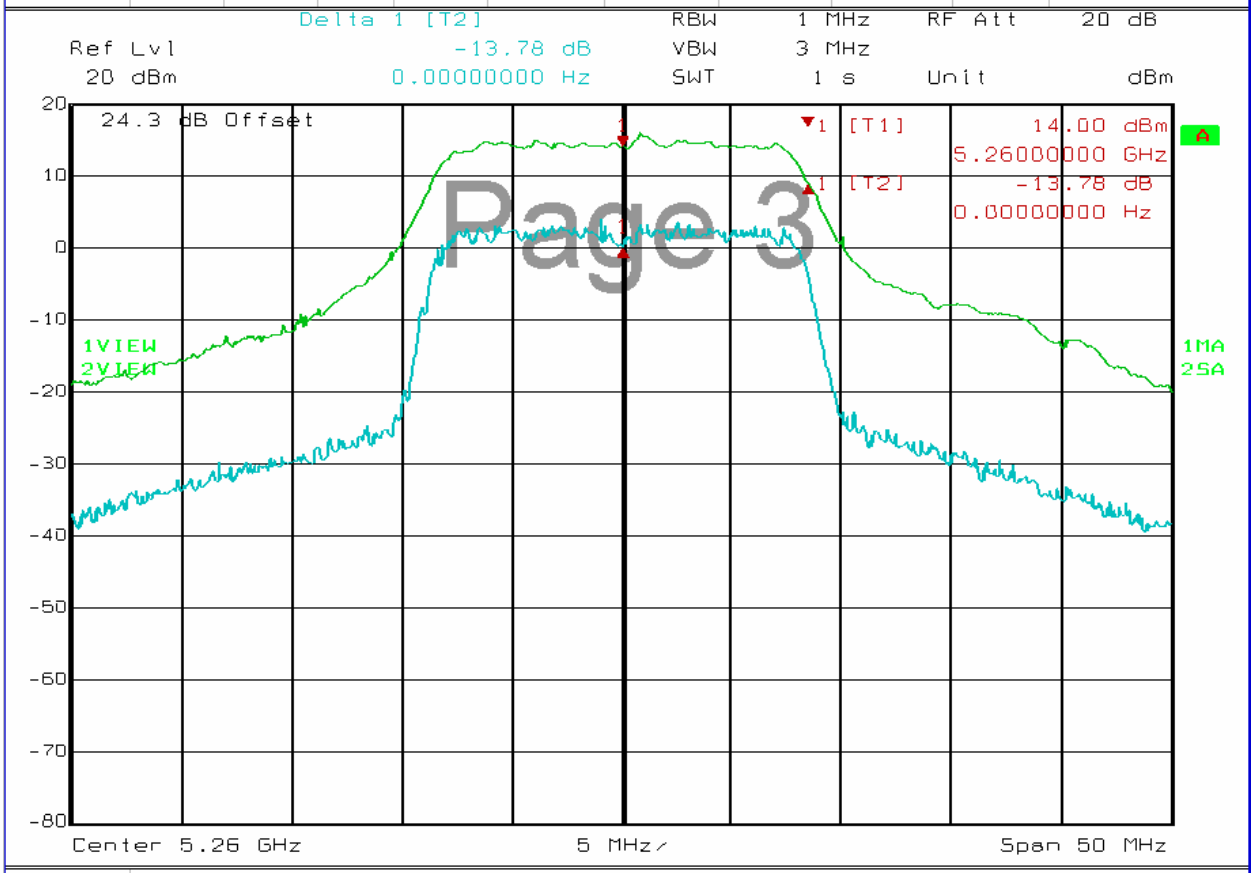


Notes:

Test Data – Peak Excursion

Data Plot **Peak Excursion**

Page 3 of 9			
Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	20
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		

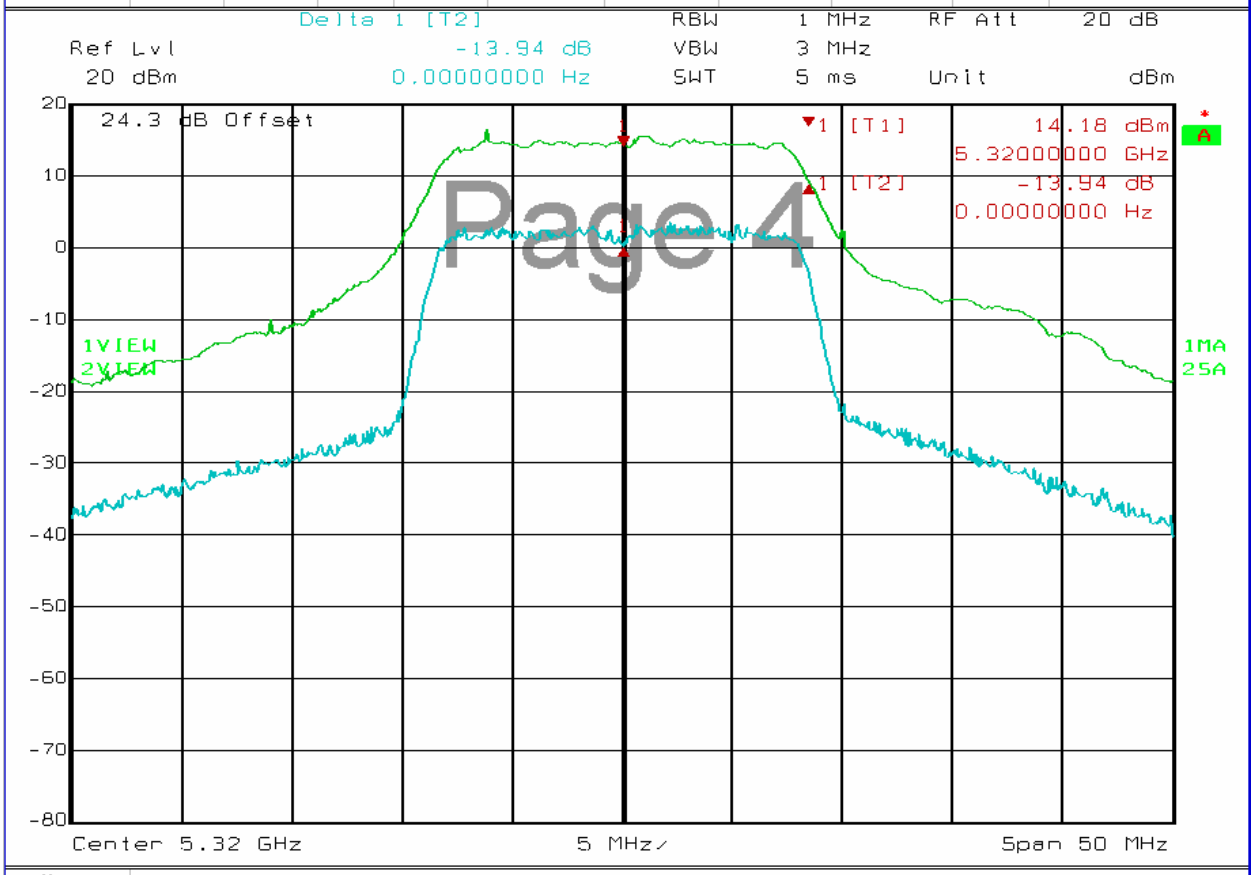


Notes:

Test Data – Peak Excursion

Data Plot **Peak Excursion**

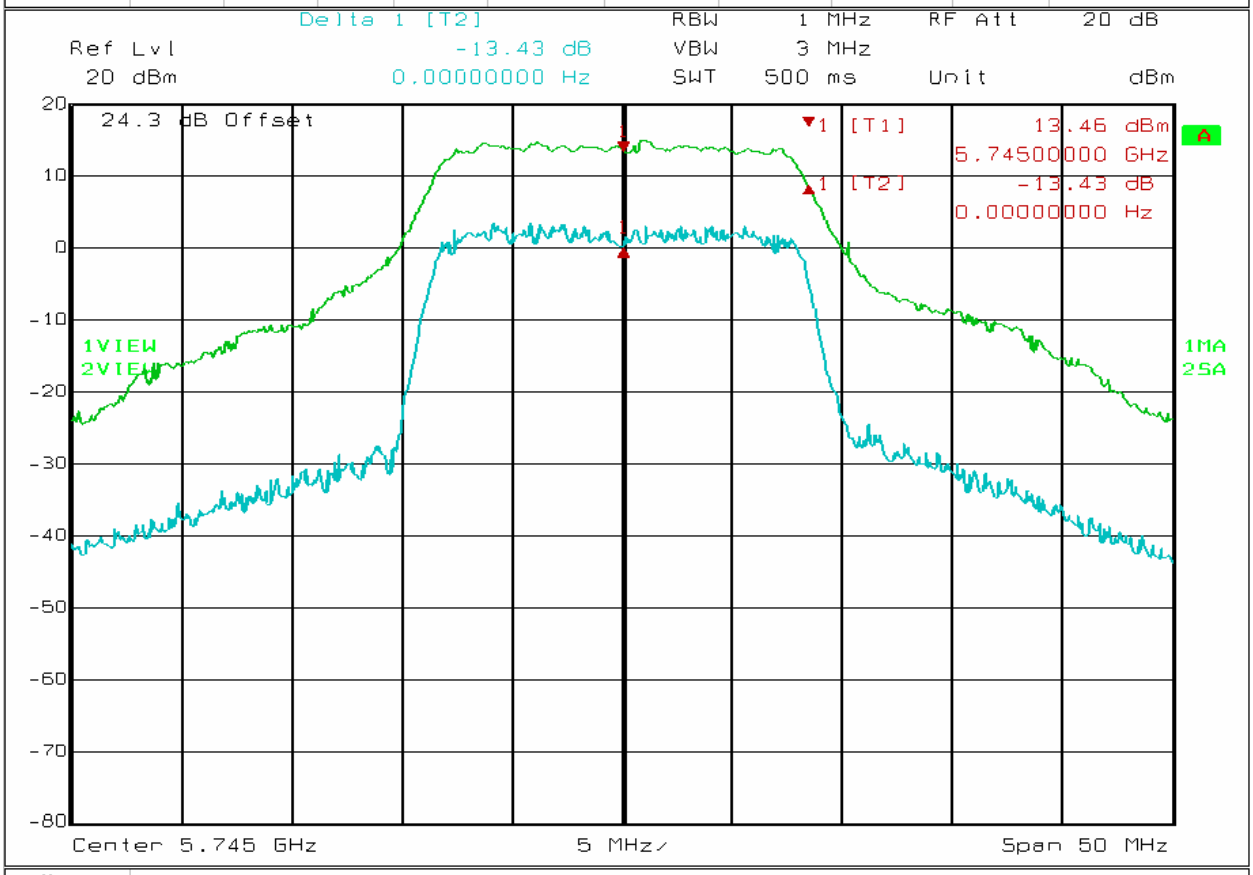
Page 4 of	9		
Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	20
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



Notes:

Test Data – Peak Excursion

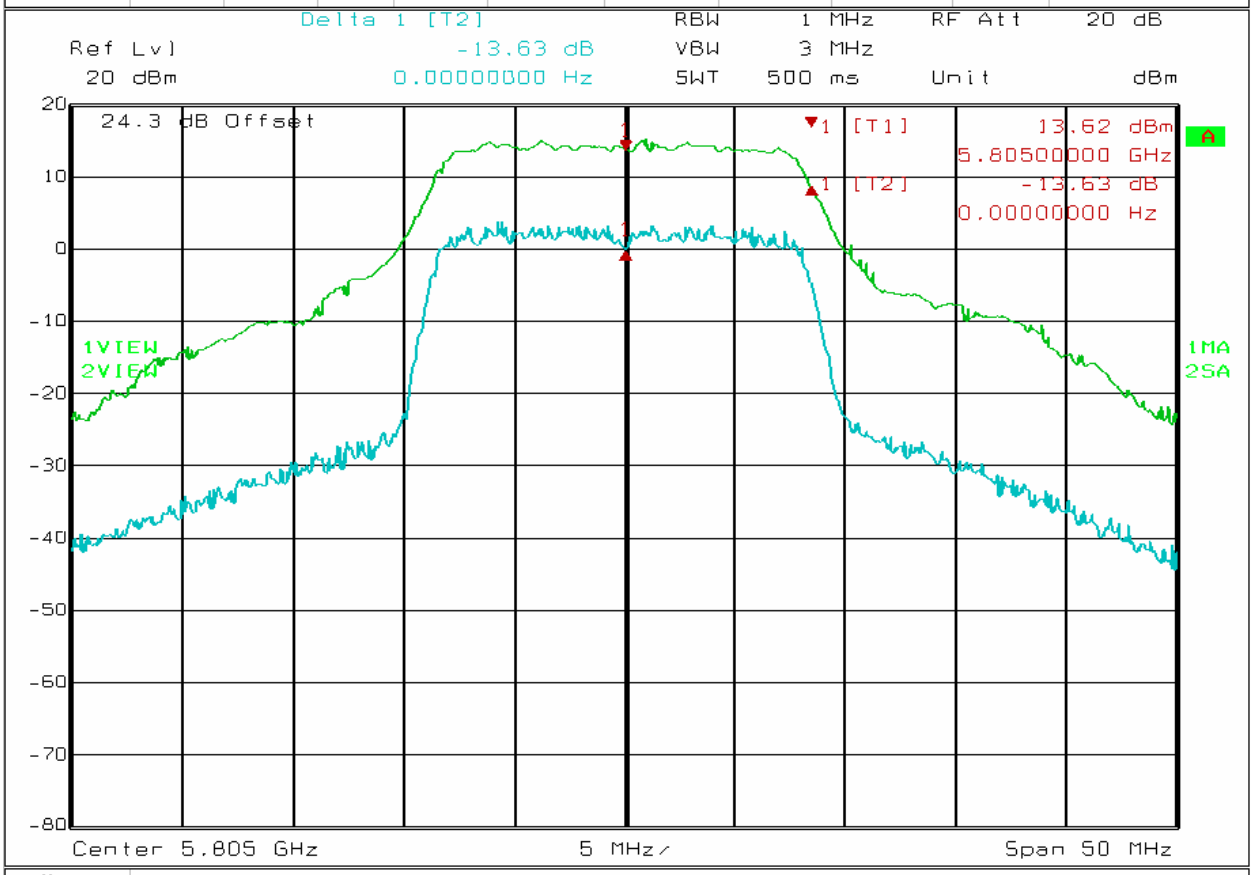
Data Plot	**Peak Excursion**		
Page 7 of 9			
Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	20
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



Notes:

Test Data – Peak Excursion

Data Plot	**Peak Excursion**		
Page 8 of 9			
Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	20
Tested By:	David Light	Relative Humidity(%)	50
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



Notes:

Section 7. Spurious Emissions (conducted)

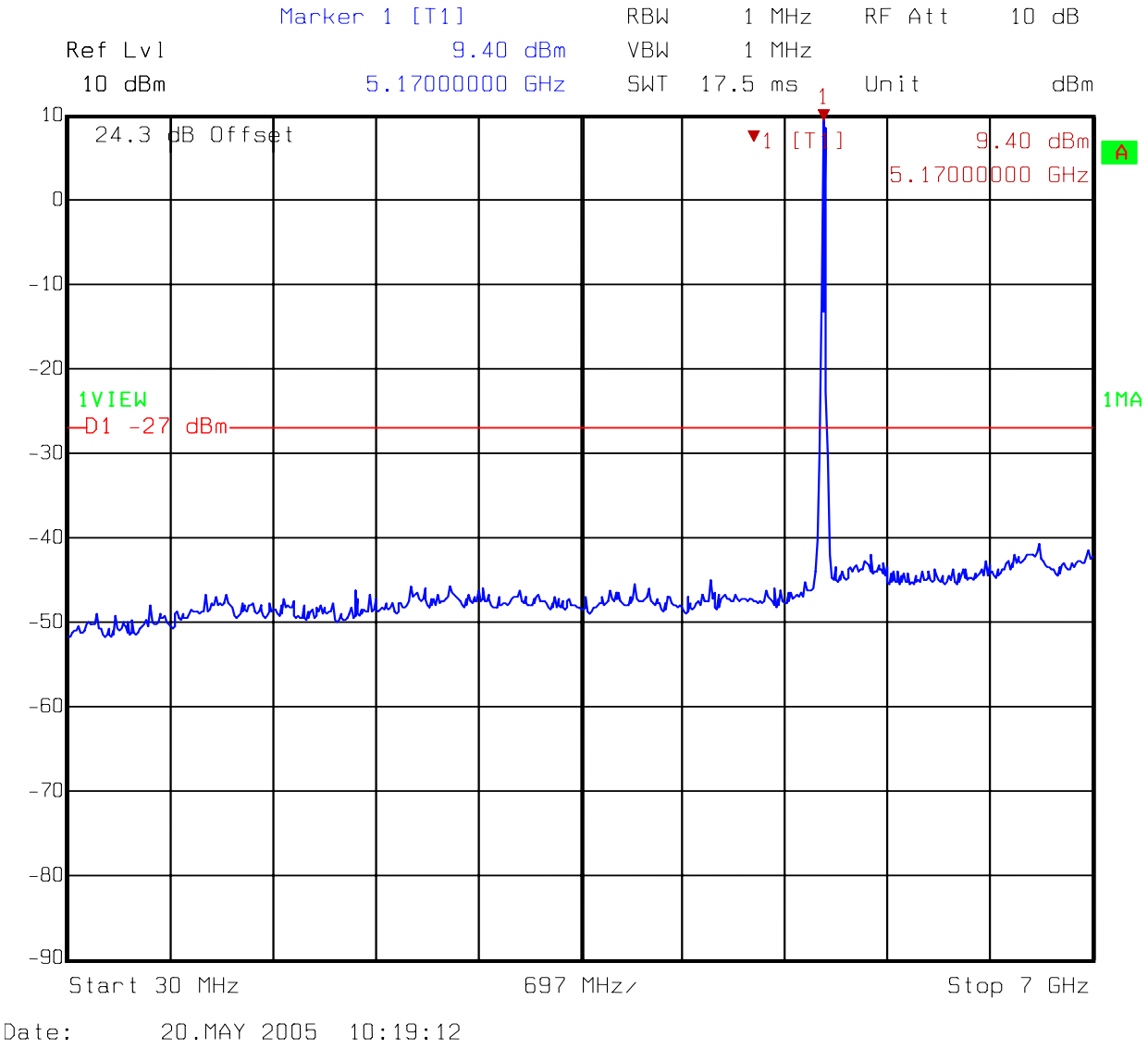
NAME OF TEST: Spurious Emissions (conducted)	PARA. NO.: 15.407
TESTED BY: David Light	DATE: 5/12/05

Test Results: Complies.

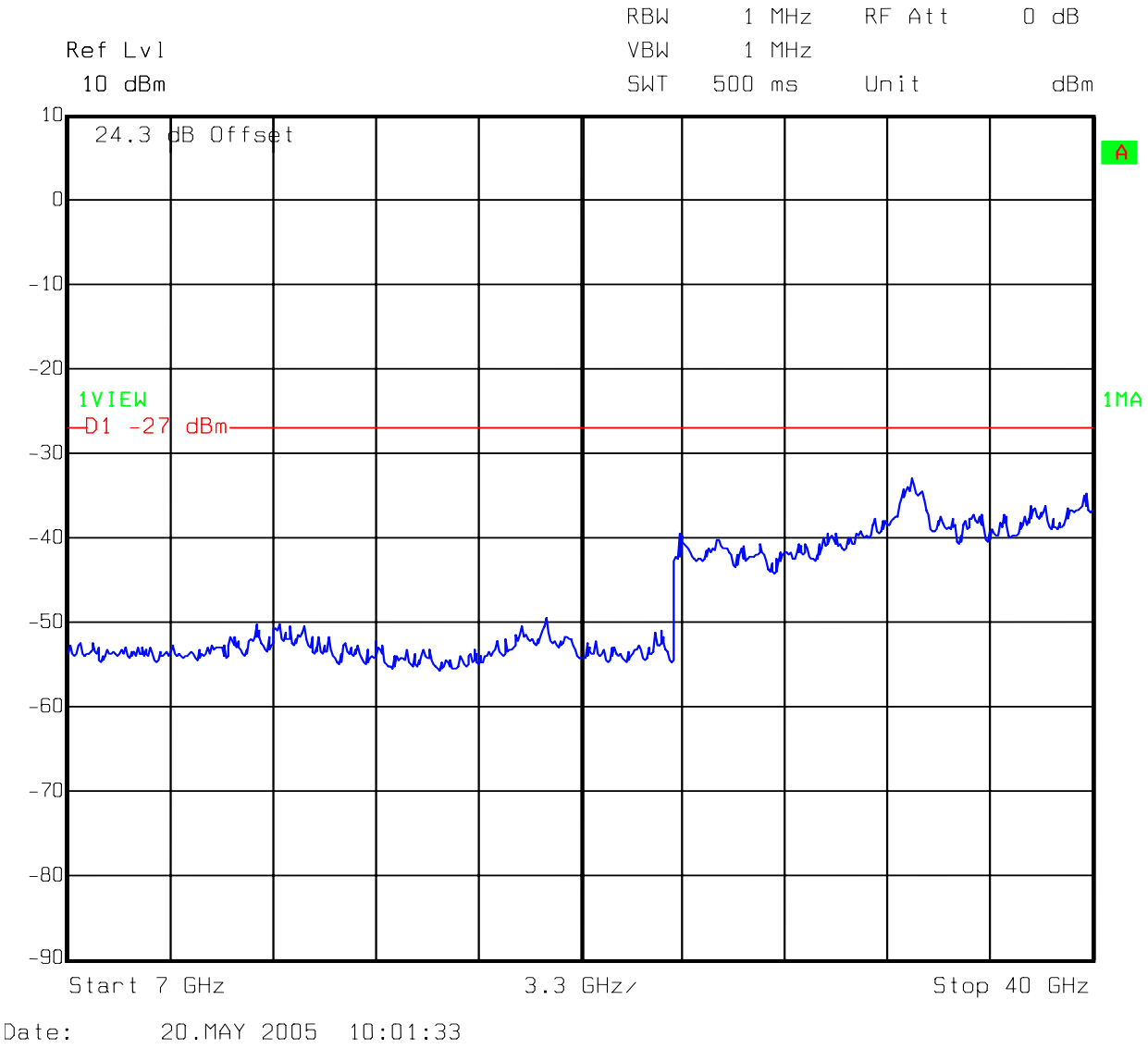
Measurement Data: Refer to attached plots

Test Equipment: 1036-1081-1472

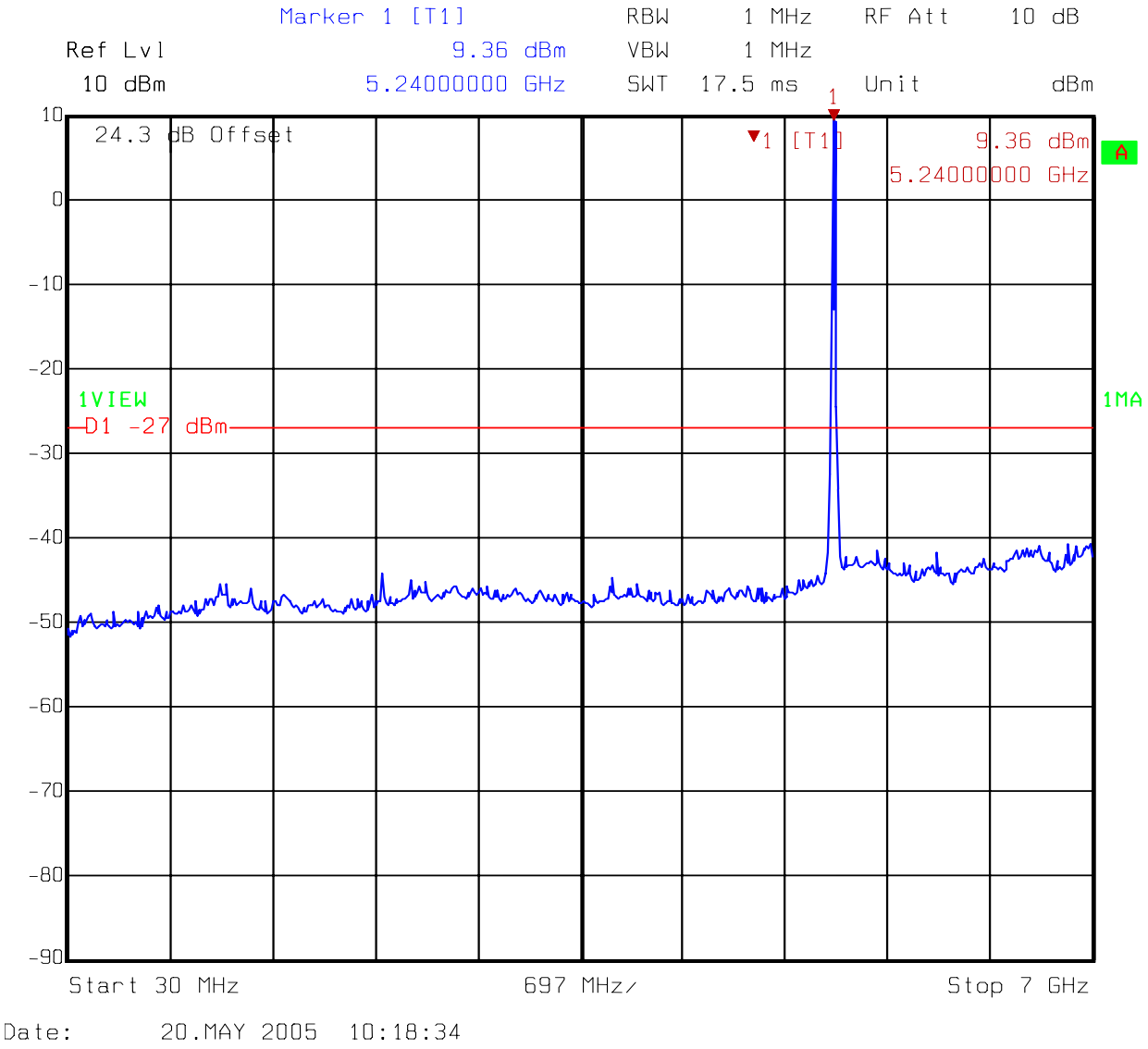
Test Data – Spurious Emissions (5170 MHz)



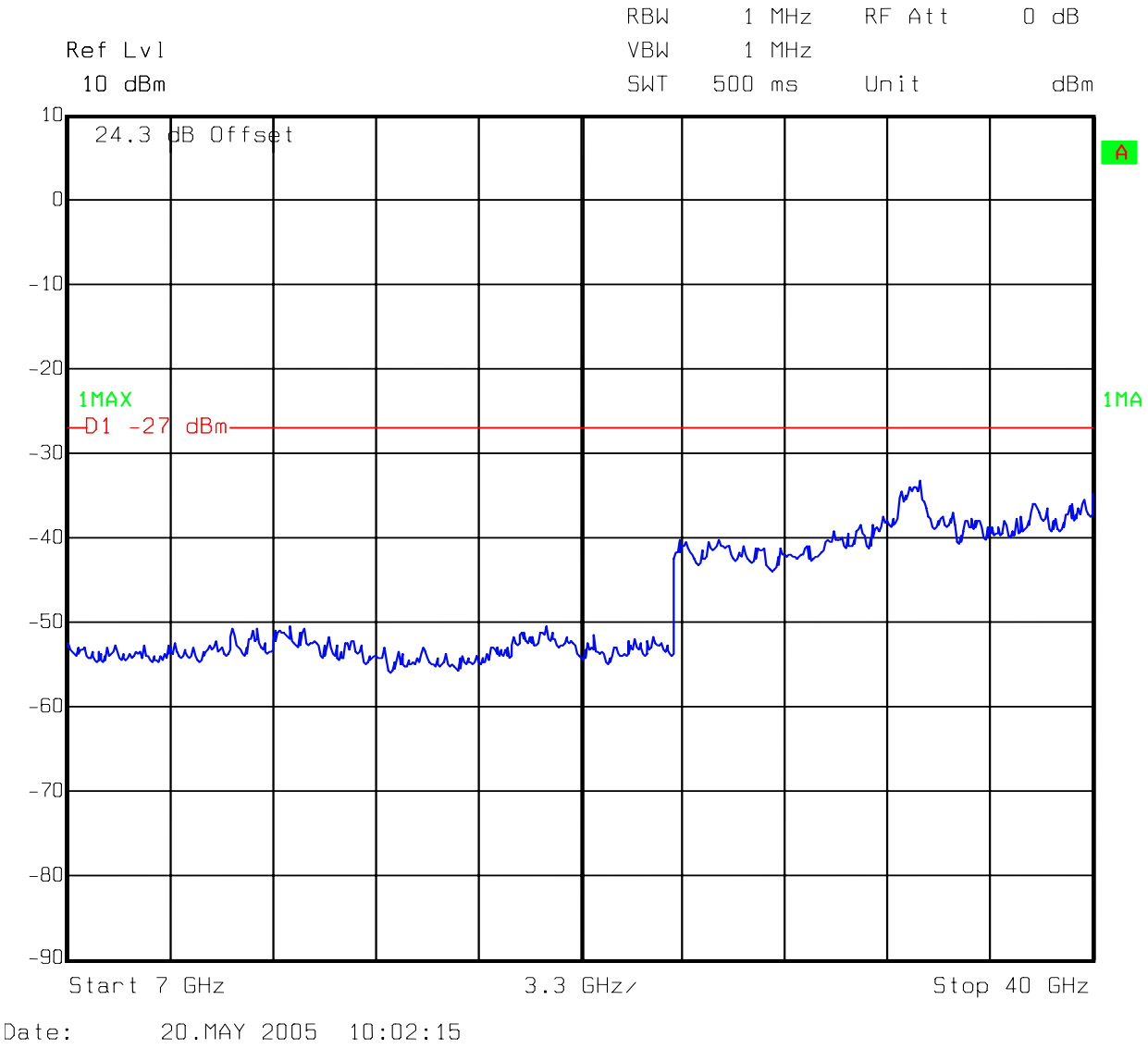
Test Data – Spurious Emissions (5170 MHz)



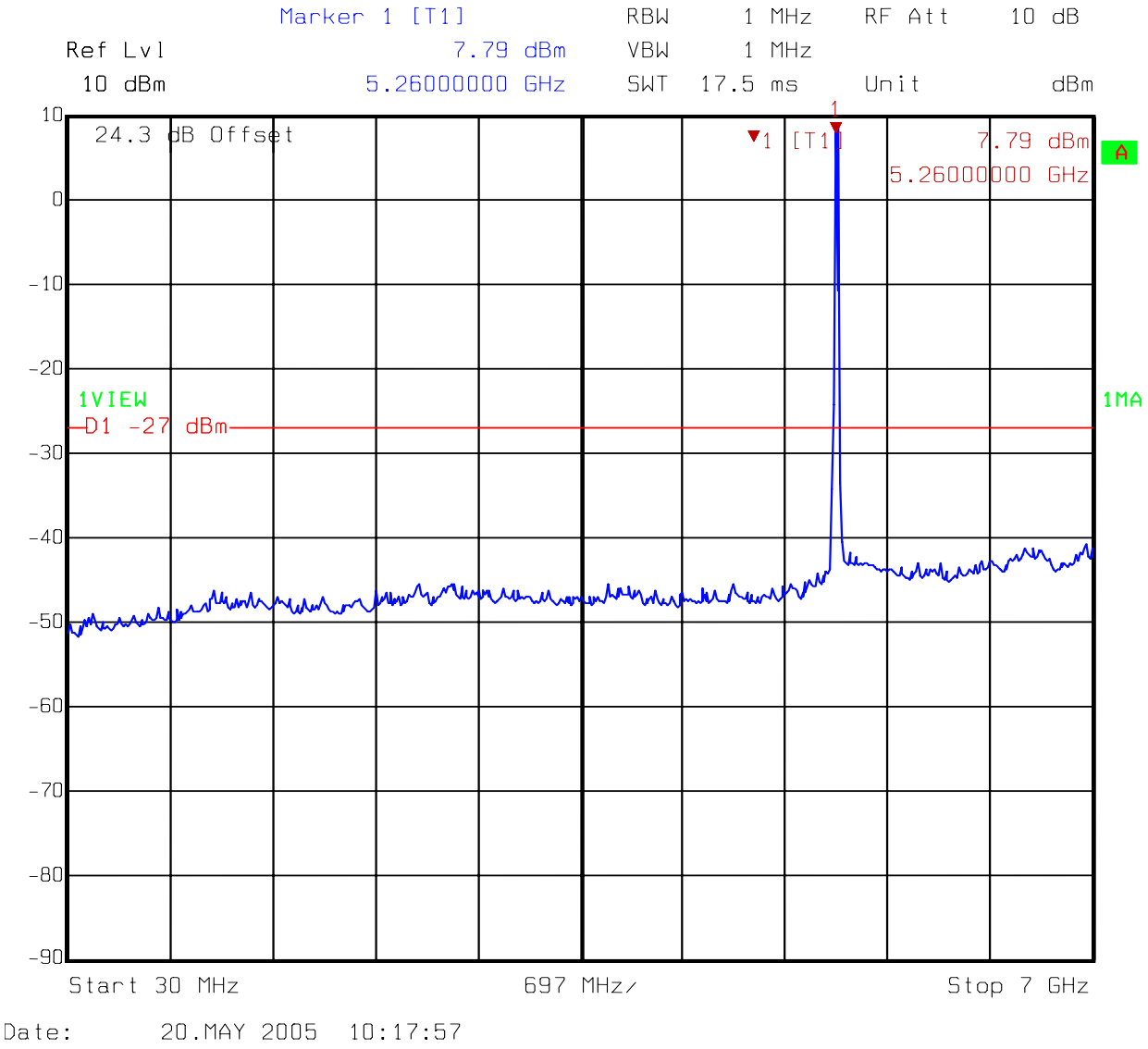
Test Data – Spurious Emissions (5240 MHz)



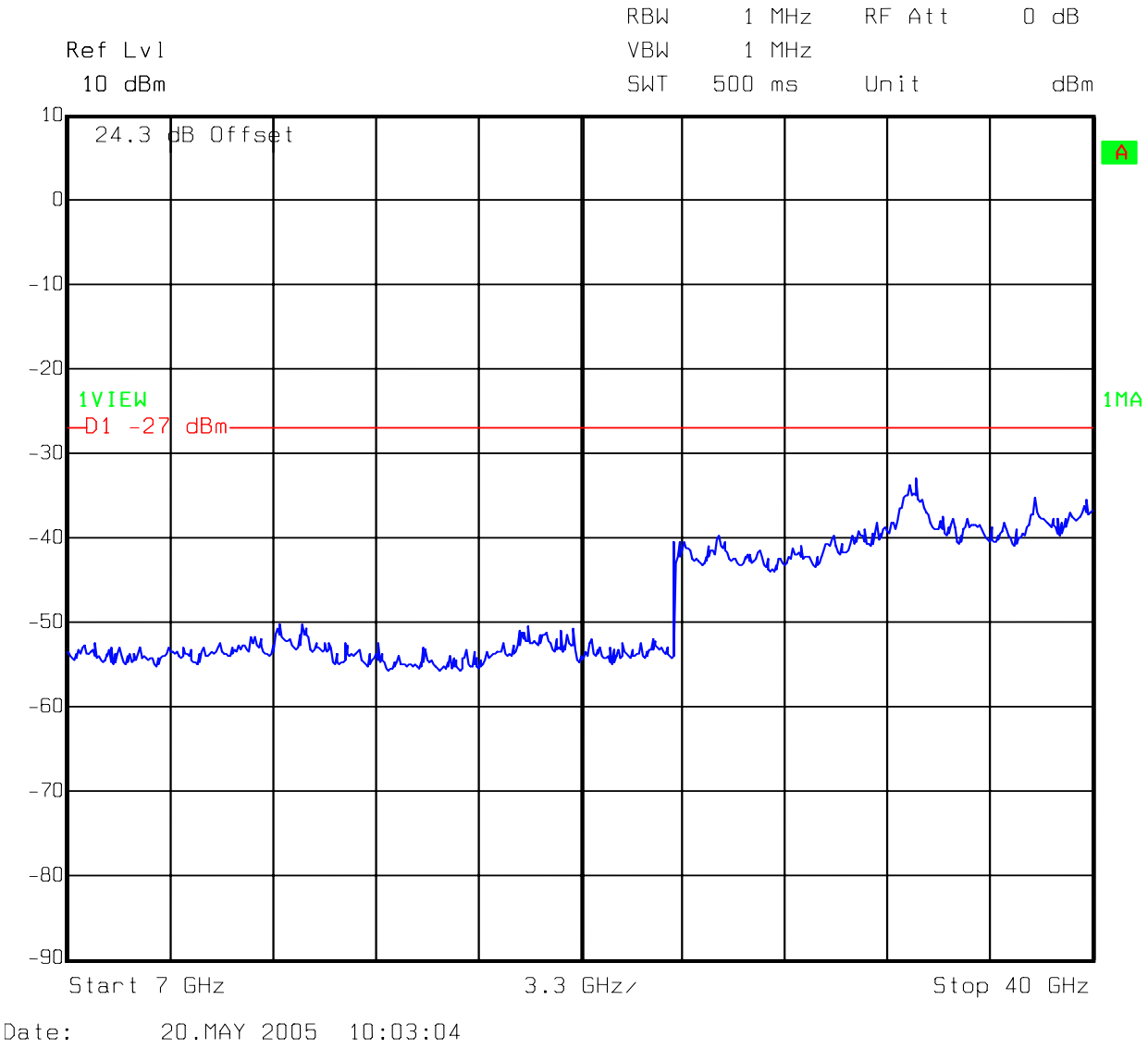
Test Data – Spurious Emissions (5240 MHz)



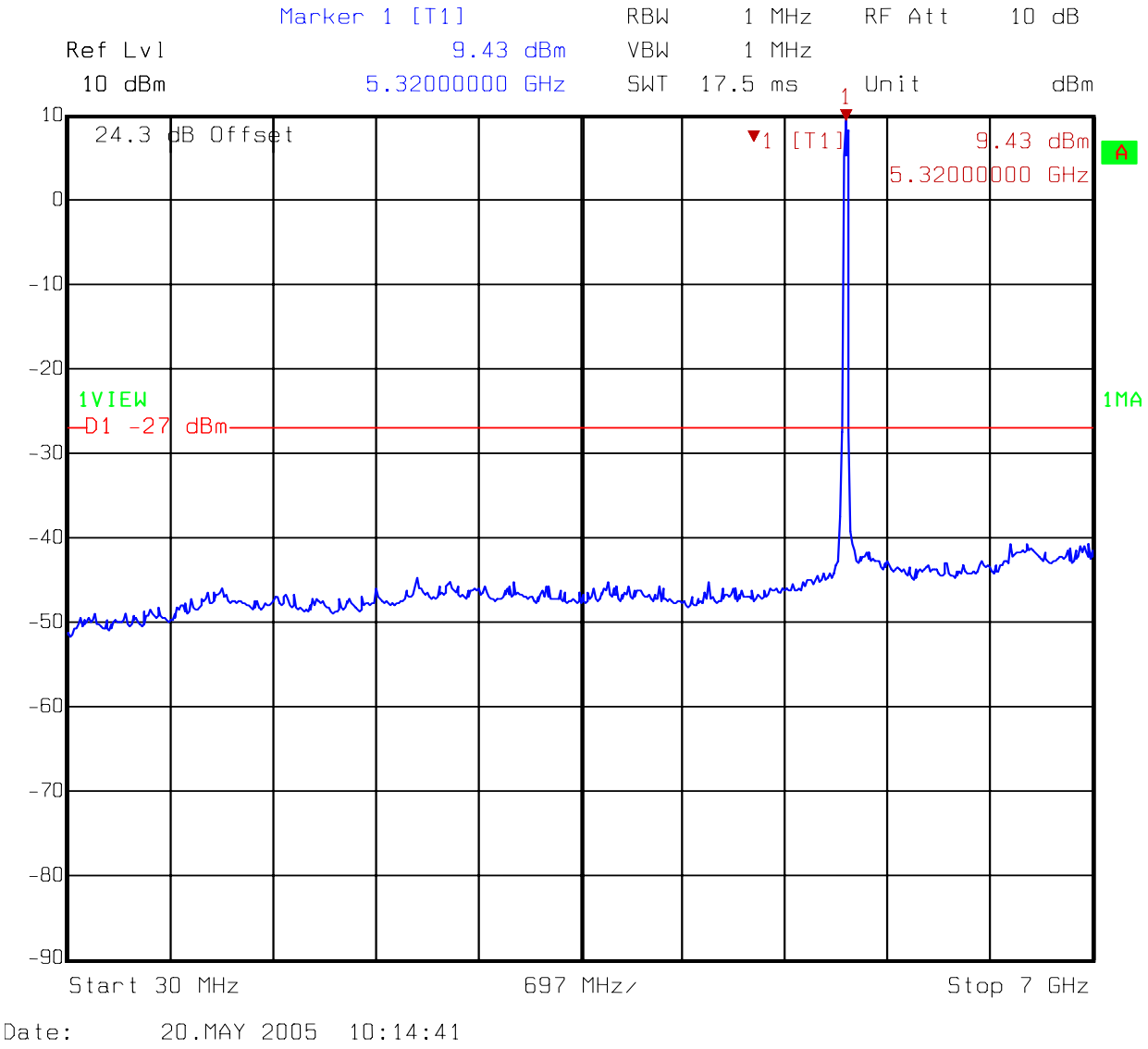
Test Data – Spurious Emissions (5260 MHz)



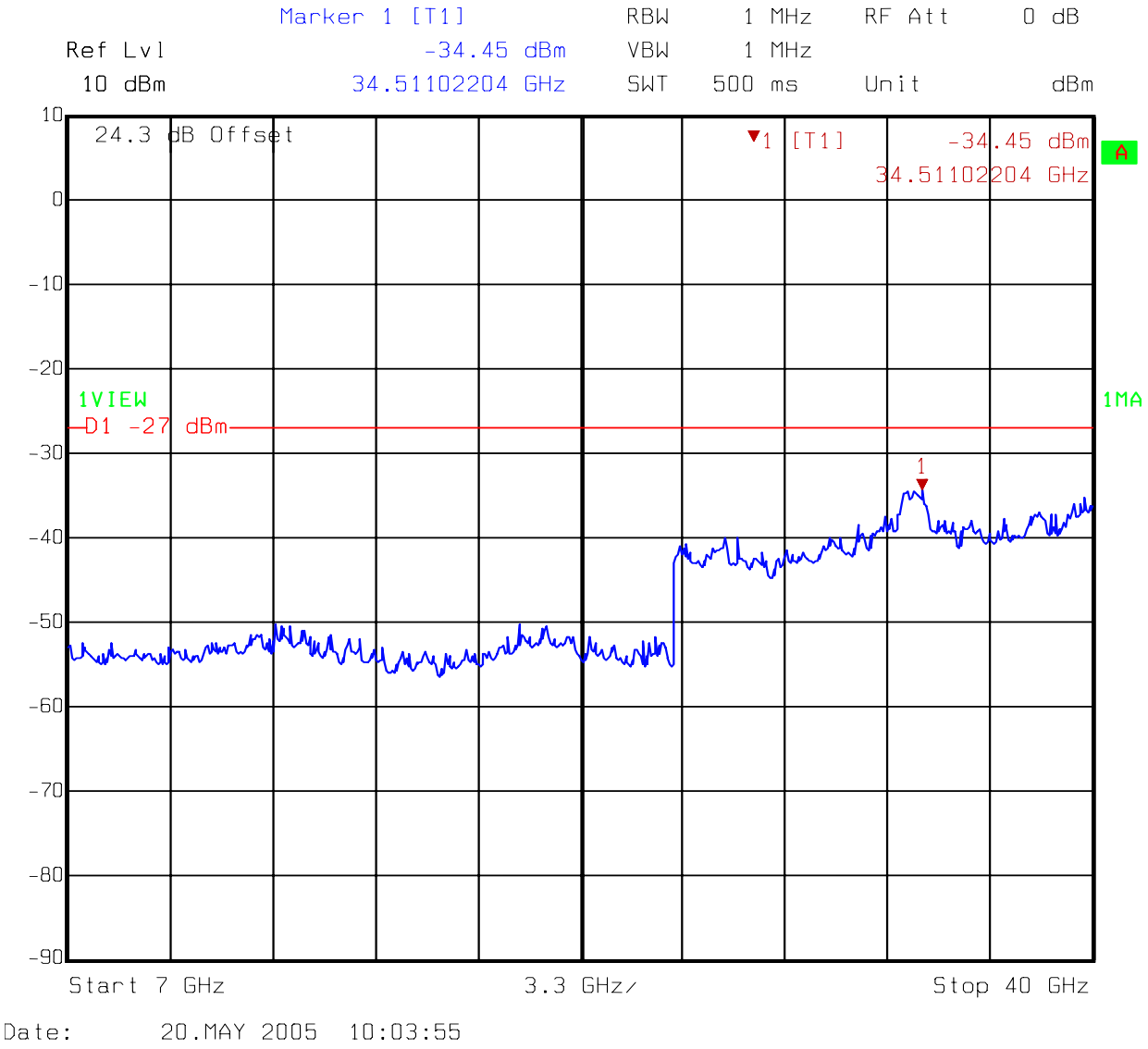
Test Data – Spurious Emissions (5260 MHz)



Test Data – Spurious Emissions (5320 MHz)



Test Data – Spurious Emissions (5320 MHz)



Section 8. Spurious Emissions (radiated)

NAME OF TEST: Spurious Emissions (Radiated)	PARA. NO.: 15.407
TESTED BY: David Light	DATE: 5/12/05

Test Results: Complies.

Measurement Data: Statement:
This transmitter was tested in 802.11a mode and at 5170, 5240, 5260, 5320, 5745, and 5805 MHz. There were no emissions detected above the noise floor. The ambient threshold of sensitivity is sufficient to detect signals within 20 dB of the specification limit. A high-pass filter was used to reject the fundamental transmission.

Test Equipment: 1464-1484-1485-1016-1304-760-759-791

Section 9. Peak Power Spectral Density

NAME OF TEST: Peak Power Spectral Density	PARA. NO.: 15.407
TESTED BY: David Light	DATE: 5/11/05

Test Results: Complies.

Measurement Data: See attached data.

Data Plot **Peak Power Spectral Density**

Page 1 of 9 Complete X

Job No.: 5L0114 Date: 5/11/2005 Preliminary:

Specification: 15.407(a) Temperature(°C): 23

Tested By: David Light Relative Humidity(%) 45

E.U.T.: Tablet PC w/Atheros 802.11 a/b/g radio

Configuration: Tx

Sample Number: 1

Location: Lab 1 RBW: 1 MHz

Detector Type: Peak VBW: 3 MHz

Test Equipment Used

Antenna: Directional Coupler:

Pre-Amp: Cable #1: 1973

Filter: Cable #2:

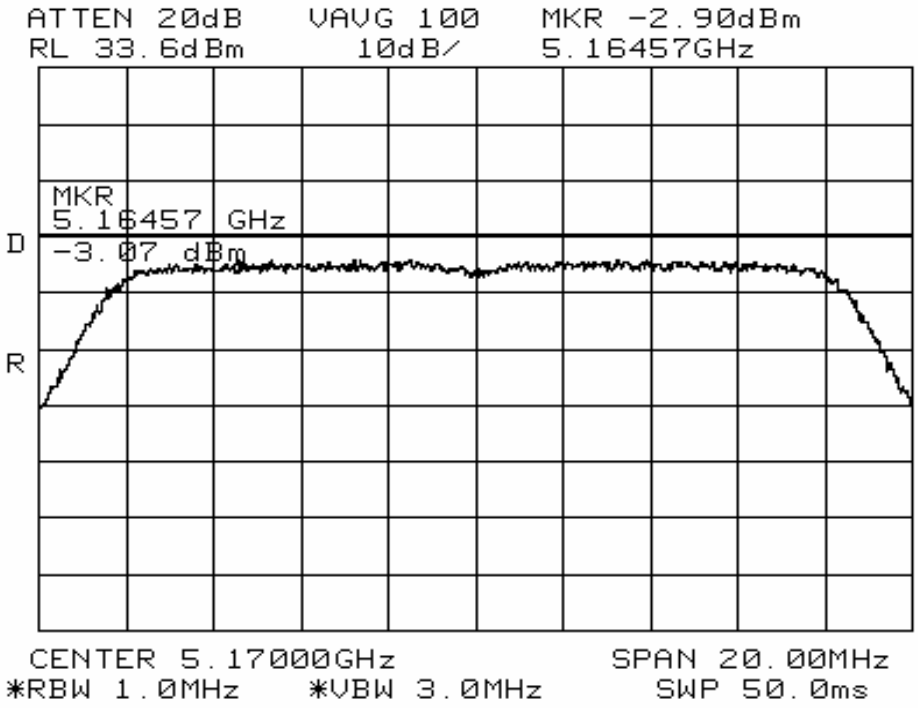
Receiver: 1464 Cable #3:

Attenuator #1 1472 Cable #4:

Attenuator #2: Mixer:

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB

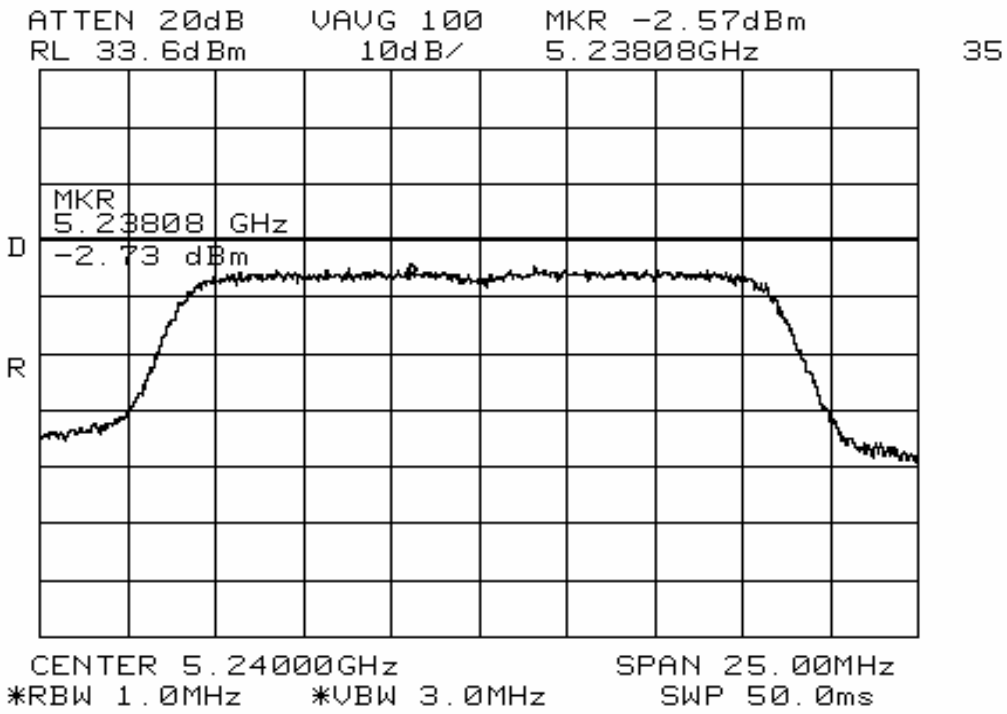


Notes:

Data Plot **Peak Power Spectral Density**

Page 2 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		

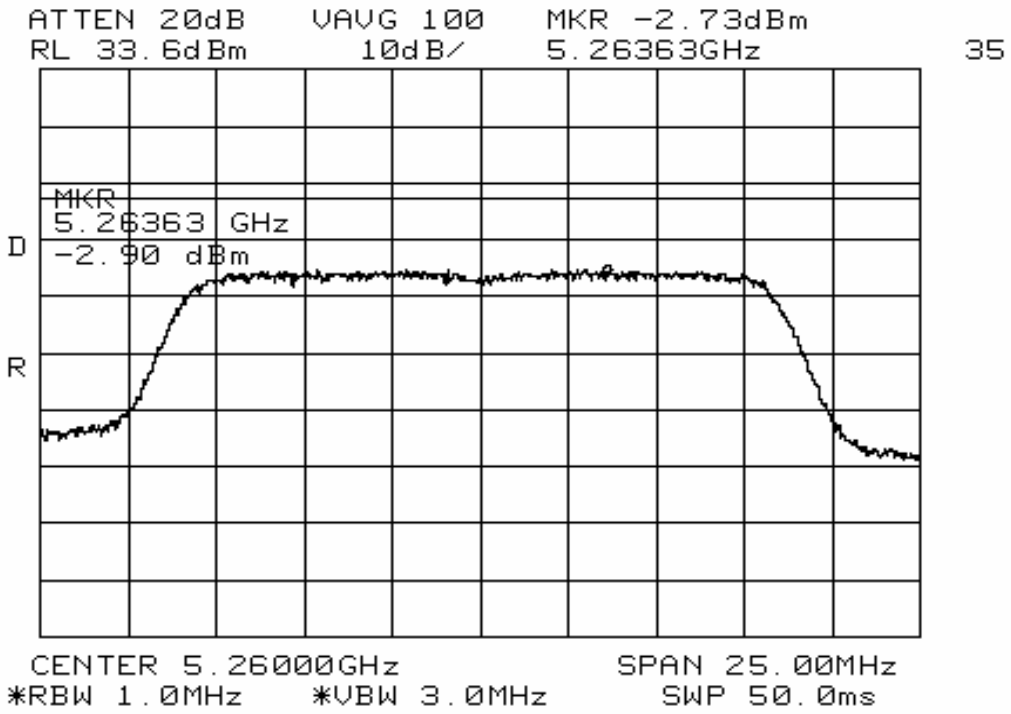


Notes:

Peak Power Spectral Density

Page 3 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		

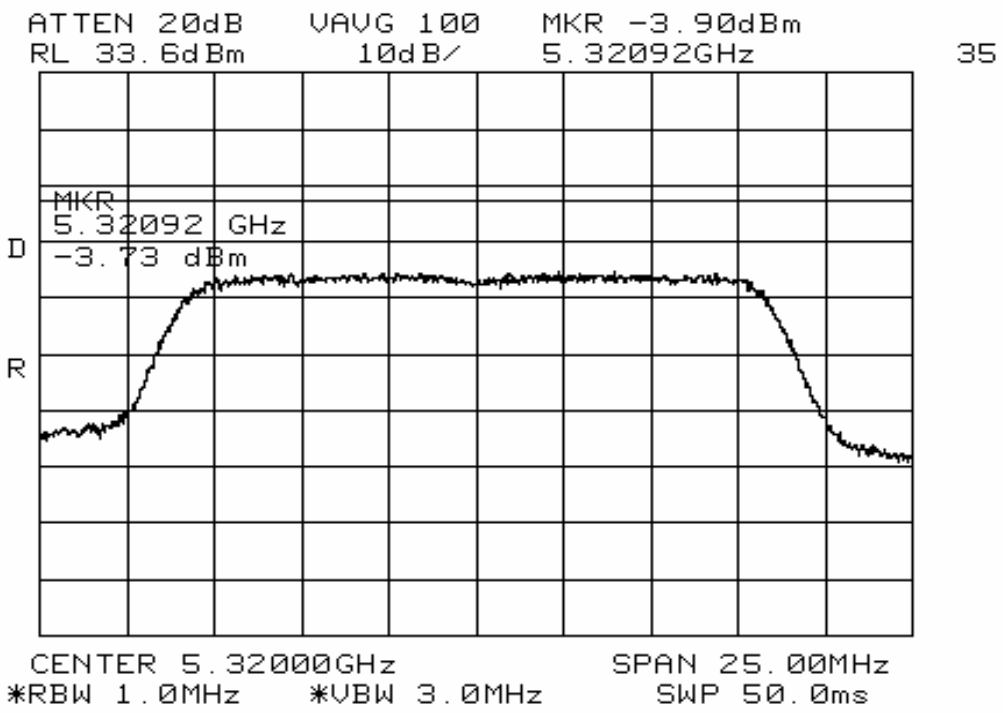


Notes:

Data Plot **Peak Power Spectral Density**

Page 4 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		

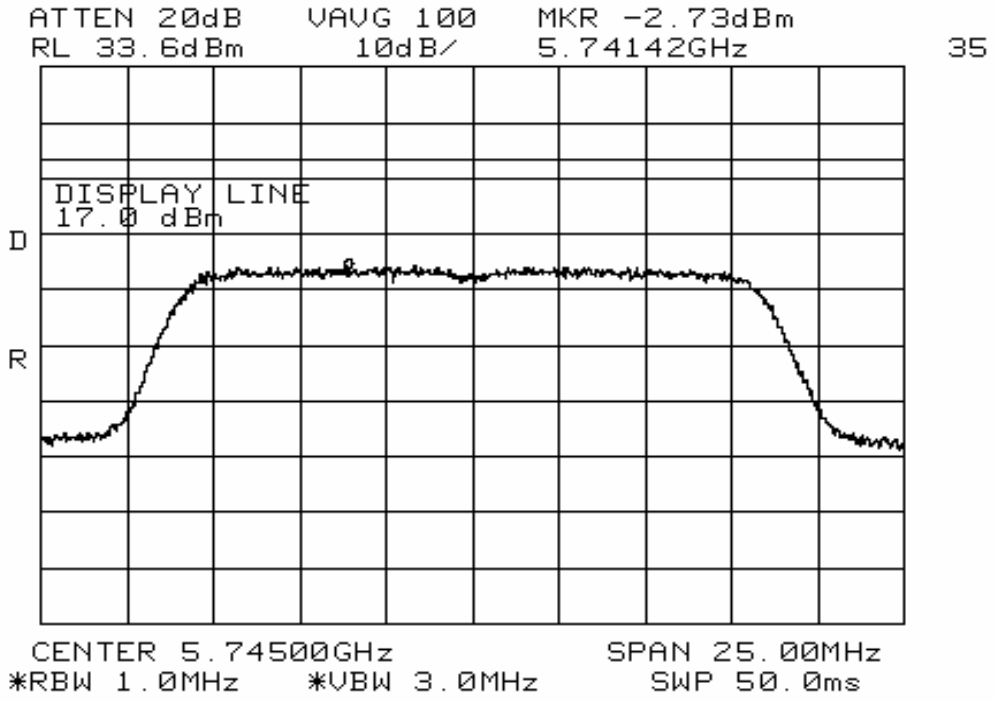


Notes:

Data Plot **Peak Power Spectral Density**

Page 7 of 9

Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



Notes:

Data Plot **Peak Power Spectral Density**

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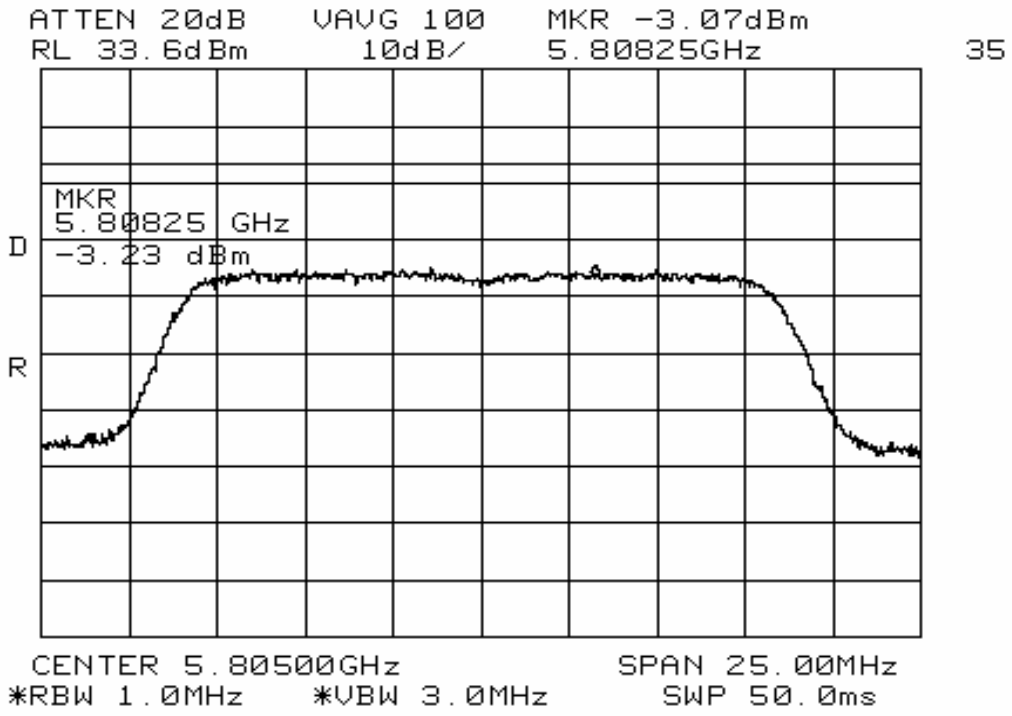
Job No.:	5L0114	Date:	5/11/2005
Specification:	15.407(a)	Temperature(°C):	23
Tested By:	David Light	Relative Humidity(%)	45
E.U.T.:	Tablet PC w/Atheros 802.11 a/b/g radio		
Configuration:	Tx		



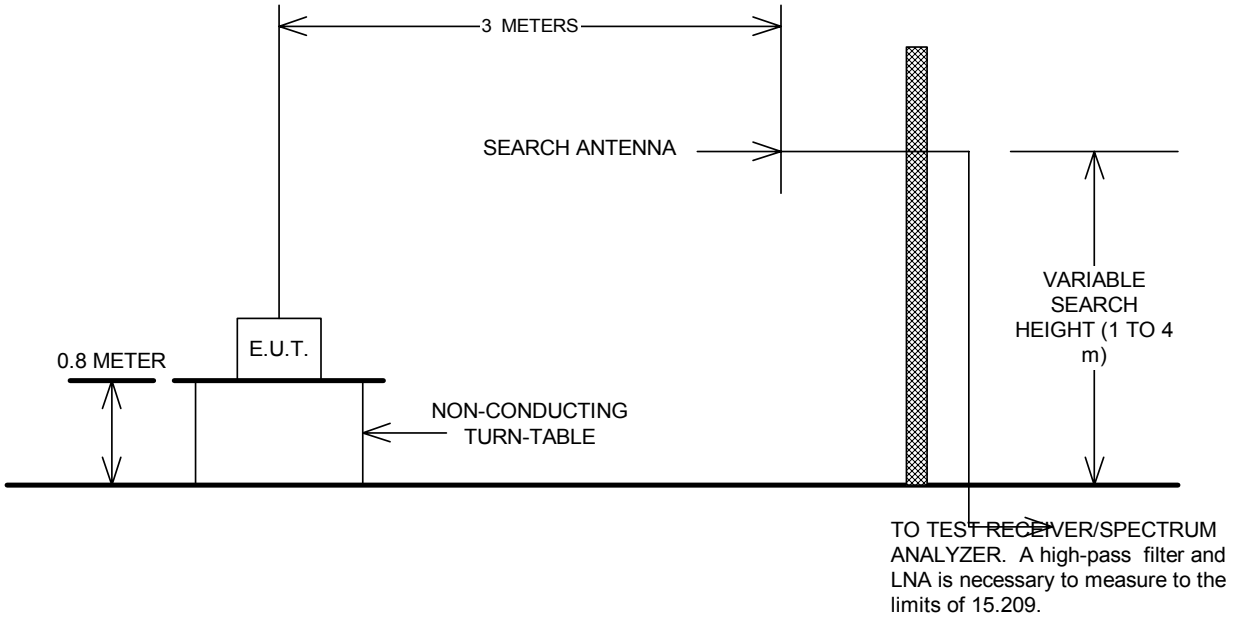
Notes:

Section 10. Test Equipment List

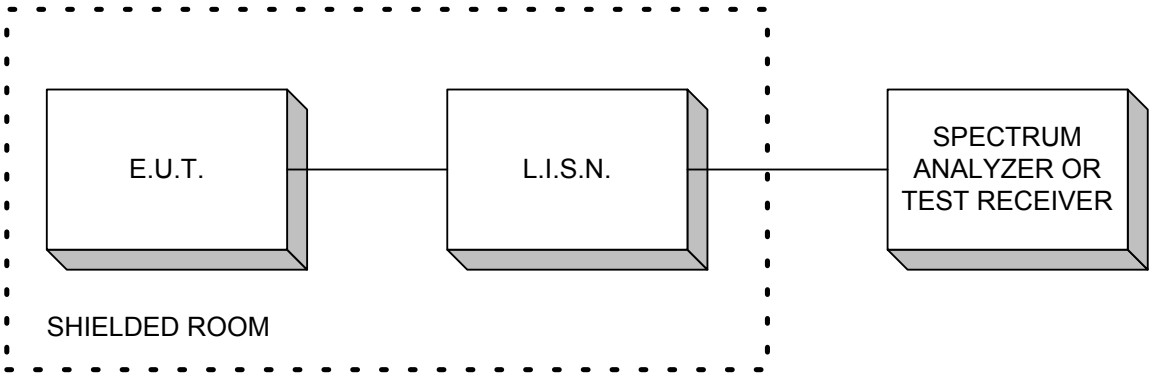
Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1973	CABLE, 1m	KTL 0	N/A	08/02/04	08/02/05
1472	20db Attenuator DC 18 Ghz	Omni Spectra 20600-20db	NONE	CBU	N/A
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/14/05	01/15/07
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	08/26/04	08/26/05
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	08/02/04	08/02/05
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	11/12/04	11/12/05
760	Antenna biconical	Electro Metrics MFC-25	477	06/22/04	06/22/05
759	ANTENNA, LOG PERIODIC	A.H. SYSTEMS SAS-200/510	556	07/23/04	07/23/05
791	PREAMP, 25dB	ICC LNA25	398	11/12/04	11/12/05
1081	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	08/26/04	08/26/05
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	03/22/04	03/23/06
969	lisn	Schwarzbeck 8120	8120281	09/17/04	09/17/05
1547	CABLE .6m	KTL RG223	N/A	06/09/04	06/09/05
1115	CABLE, 4.5m	KTL RG223	N/A	04/27/05	04/27/06
718	HP SPECTRUM ANALYZER	HEWLETT PACKARD 8591EM	3639A00980	04/06/05	04/06/06
966	Receiver	Rohde & Schwartz ESH2	880370/029	09/20/04	09/20/05
1193	LIMITER	FISCHER FCC-450B-1.25N	956	02/24/04	02/24/05
1555	Filter high pass 5KHz	Solar Electronics 7930-5.0	933125	04/20/05	04/20/06

ANNEX A - TEST DIAGRAMS

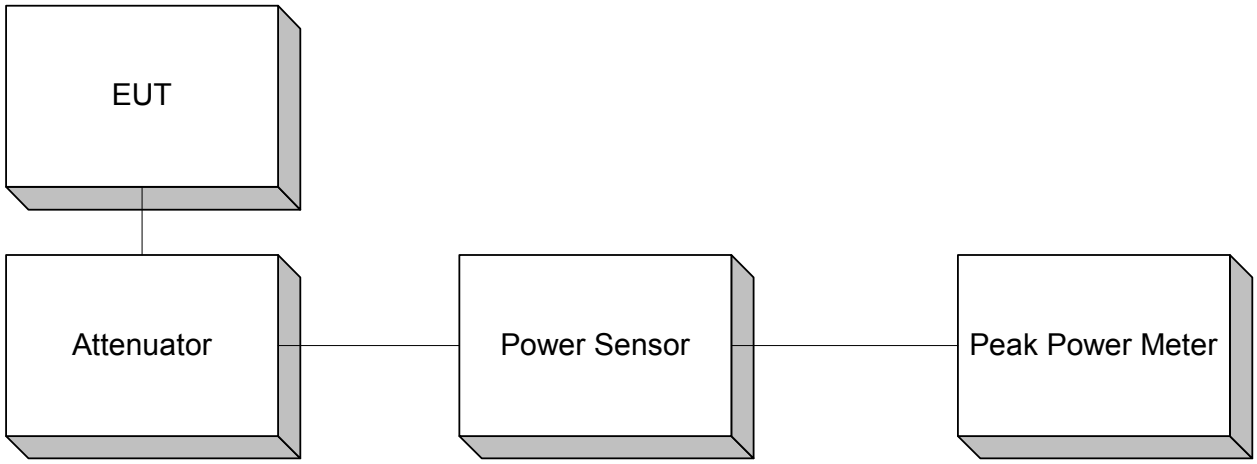
Test Site For Radiated Emissions



Conducted Emissions



Peak Power At Antenna Terminals



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