**Nemko Test Report:** 3L0353RUS1 Applicant: SyChip, Inc. 1700 Alma Drive Suite 240 Plano, TX 75075 **Equipment Under Test:** WLAN6065SD (E.U.T.) **FCC Part 15, Subpart C, 15.247** In Accordance With: Direct Sequence Spread Spectrum Transmitters Tested By: Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136 **Authorized By:** David Light, Lab Resource Manager Date: 20 October 2003 **Total Number of Pages:** 43

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Section 1.	<b>Summary of Test Results</b>		
Manufacturer:	SyChip, Inc.		
Model No.:	WLAN6065SD		
Serial No.:	None		
General:	All measurements are traceab	le to na	itional standards.
demonstrating com Sequence Spread with ANSI C63.4-19	conducted on a sample of the poliance with Part 15, Subpart Spectrum devices. Radiated te 992. Radiated emissions are most facility is on file with the FCC.	C, Pa sts wer	ragraph 15.247 for Direct e conducted is accordance
New S	Submission		Production Unit

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

Class II Permissive Change

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** 

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**Pre-Production Unit** 

## **Summary Of Test Data**

NAME OF TEST	PARA. NO.	SPEC.	RESULT
Powerline Conducted Emissions	15.207(a)	Mask	Complies
Minimum 6 dB Bandwidth	15.247(a)( 2)	>500 kHz	Complies
Maximum Peak Power Output	15.247(b)( 1)	<1 Watt	Complies
Spurious Emissions (Antenna Conducted)	15.247(c)	-20 dBc/100kHz	Complies
Spurious Emissions (Restricted Bands)	15.247(c)	< 74 dBuV/m Peak < 54 dBuV/m Avg	Complies
Peak Power Spectral Density	15.247(d)	+8 dBm/3kHz	Complies

### Footnotes:

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

**General Equipment Information** 

Frequency Band: 2412 to 2462 MHz

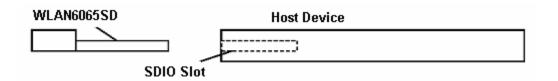
Channel Spacing: 4.5 MHz

User Frequency Adjustment: Software controlled

#### **Theory of Operation**

WLAN6065SD Card from SyChip Inc is a Secure Digital Card form factor Wireless LAN NIC (Network Interface Card) incorporating the popular wireless Ethernet standard 802.11b. It uses Direct Sequence Spread Spectrum (DSSS) Wireless LAN technology to provide bandwidths of up to 11Mbps at ranges of up to 400 feet. This card enables next generation Pocket PC/PDAs, and Ultra-thin notebook computers to access the internet, email, corporate networks and transfer streaming video or audio, images or large files from a WLAN-enabled environment. It allows an extension of the corporate resources by enabling the mobile workforce and telecommuters. The card is idea for vertical markets such as manufacturing floors, car rentals, retail spaces, hospitals etc. In the consumer market, this WLAN card is ideal for users of next generation Palms, Pocket PCs, printers and scanners. Additionally, the card gives users the ability to work whilst away from the office by connecting to the rapidly expanding public hotspot infrastructure. Such venues as coffee shops, airports, shopping malls, hotels, etc are offering this capability based on the IEEE802.11b standard. For mobile applications. battery life is extended through the use of enhanced power saving features, which reduce the current drain whilst in standby mode (the card is in this state for the majority of the time as it awaits data destined for it).

#### System Diagram



## Section 3. Powerline Conducted Emissions

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

TESTED BY: Eldon Berry DATE: 15Oct03

Test Results: Complies.

**Measurement Data:** See attached plots.

Measurement +/- 1.7 dB

Uncertainty: \_\_\_\_

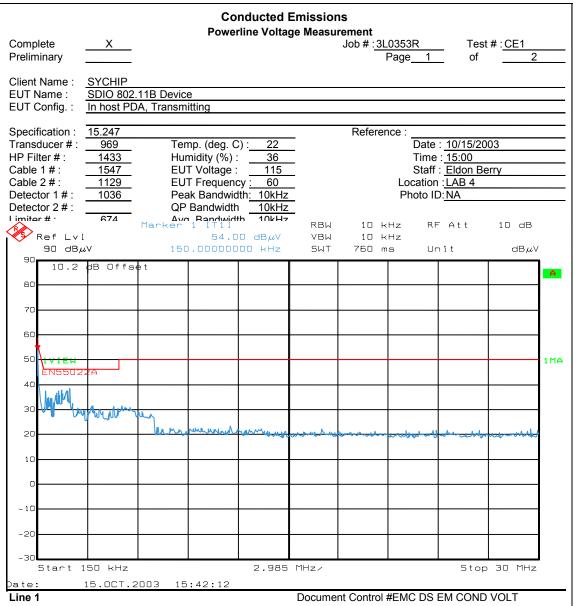
#### **Test Data - Powerline Conducted Emissions**



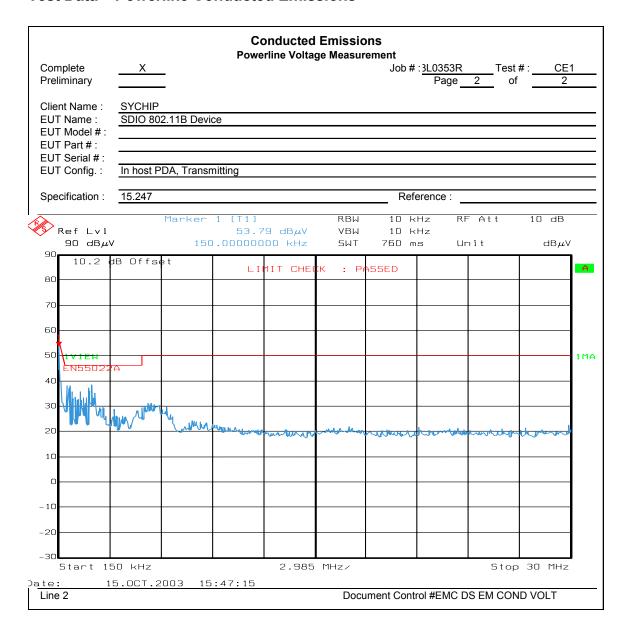
Lewisville, TX 75057

Tel: (972) 436-9600 Fax: (972) 436-2667

Dallas Headquarters: 802 N. Kealy



#### **Test Data - Powerline Conducted Emissions**



#### **Photos - Powerline Conducted Emissions**

Front



Rear



#### Nemko Dallas

## $\label{eq:fcc} FCC~PART~15,~SUBPART~C$ DIRECT SEQUENCE SPREAD SPECTRUM TRANSMITTER

EQUIPMENT: WLAN6065SD PROJECT NO.: 3L0353RUS1

### Section 4. Minimum 6 dB Bandwidth

NAME OF TEST: Minimum 6 dB Bandwidth PARA. NO.: 15.247(a)(2)

TESTED BY: Eldon Berry DATE: 15Oct03

Test Results: Complies.

**Measurement Data:** See attached plots

**Equipment** 1036, 1627, 1473

Used:

Measurement +/- 1.7 dB

Uncertainty:

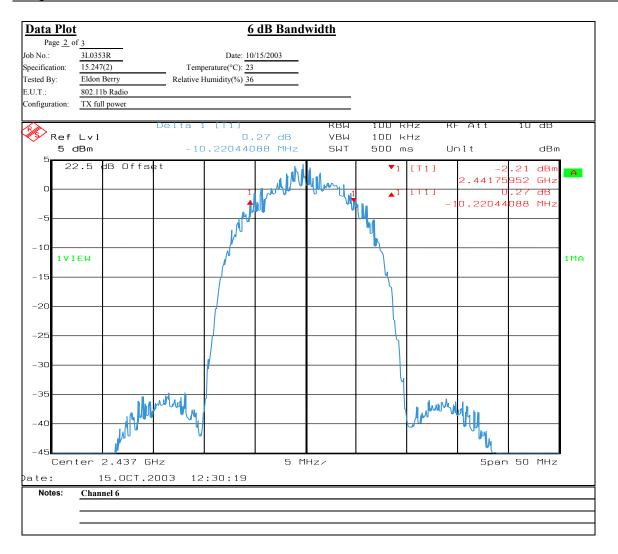
Temperature: 23 °C

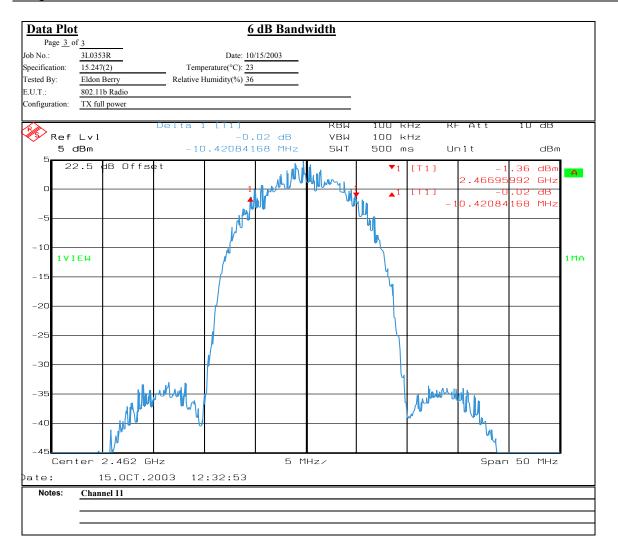
Relative 36 %

**Humidity:** 

#### **Test Plots-6 dB Bandwidth**

<u>Data Plot</u>	į			<u>6</u>	dB Band	<u>lwidth</u>						
Page 1	of <u>3</u>							Complete	<u>X</u>	_		
Job No.:	3L0353R			Date:	10/15/2003			Preliminary		_		
Specification:	15.247(2)		Temp	perature(°C):	23							
Tested By:	Eldon Berr	y	Relative I	Humidity(%)	36							
E.U.T.:	802.11b Ra	ndio										
Configuration:	TX full po	wer										
Sample Number	r: S01											
Location:	Lab 1				_	Refer to plots		Measuremen				
Detector Type:	Peak	_			VBW: <u>I</u>	Refer to plots		Distance		m		
Test Equipn	nent Used											
Antenna:		_		Directi	ional Coupler:							
Pre-Amp:		_			Cable #1:	1627						
Filter:		_			Cable #2:							
Receiver:	1036	_			Cable #3:							
Attenuator #1	1473	_			Cable #4:							
Attenuator #2:					Mixer:							
Additional equi	pment used:											
Measurement U	Incertainty:	+/-1.7 c	iB									
Ŕ			Delta 1	[[1]]		кви	1UU F	KHZ RI	- Att	1 U	aВ	
•	Lvl			Ο.	.00 dB	VBW	100 H	кHz				
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2	2.5 dB	Offse	e t		, ak		<b>▼</b> 1	[T1]	-:	2.14	dBm	Α
0						Millian .			2.4168		GHz	
Ğ				1	A CONTRACTOR	And Mary	<b>▲</b> 1	[T1]		0.00	dB	
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-5				1/4			₩. <u>.</u>			+		
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-45 <b>L</b>	ter 2.	412 GI	<b></b>	ļ	5 1	1Hz/	<u> </u>		Spai	n 50	MUZ	1
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			.000 12	.20.30								
Notes:	Channel	1										
	-											





### Section 5. Maximum Peak Output Power

NAME OF TEST: Maximum Peak Output power PARA. NO.: 15.247(b)(1)

TESTED BY: Eldon Berry DATE: 15Oct03

Test Results: Complies.

**Measurement Data:** 

Frequency (MHz)	Туре	Output at Antenna Terminal (dBm)	Gain (dBi)	E.I.R.P. (dBm)
2412	Integral	14.37	3	17.37
2437	Integral	14.34	3	17.34
2462	Integral	14.90	3	17.90
Peak power outpu	t (EIRP): 61.66 mV	V		

Note – The device was tested at +/- 15% supply voltage to host with no effect to output power.

Equipment

1036, 1627, 1473

Used:

Measurement Uncertainty: +/- 0.7 dB

Temperature: 23 °C

Relative Humidity: 36 %

### Nemko Dallas

## $\label{eq:fcc} FCC~PART~15,~SUBPART~C$ DIRECT SEQUENCE SPREAD SPECTRUM TRANSMITTER

EQUIPMENT: WLAN6065SD PROJECT NO.: 3L0353RUS1

Section 6. RF Exposure

NAME OF TEST: RF Exposure PARA. NO.: 15.247(b)(4)

**Test Results:** See Separate SAR report.

**Measurement Data:** 

See separate report for Body worn SAR.

## Section 7. Spurious Emissions (conducted)

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

TESTED BY: Eldon Berry DATE: 15Oct03

Test Results: Complies.

**Measurement Data:** See attached plots.

**Equipment** 1036, 1627, 1473

Used:

Measurement +/- 0.7 dB

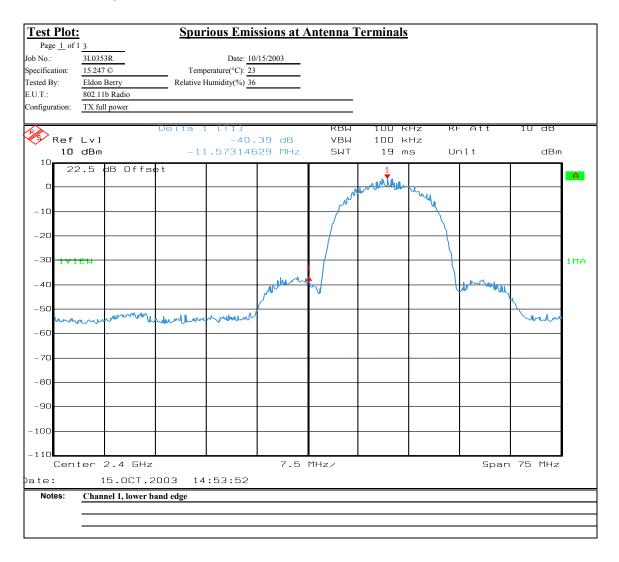
Uncertainty: \_\_\_\_

Temperature: 23 °C

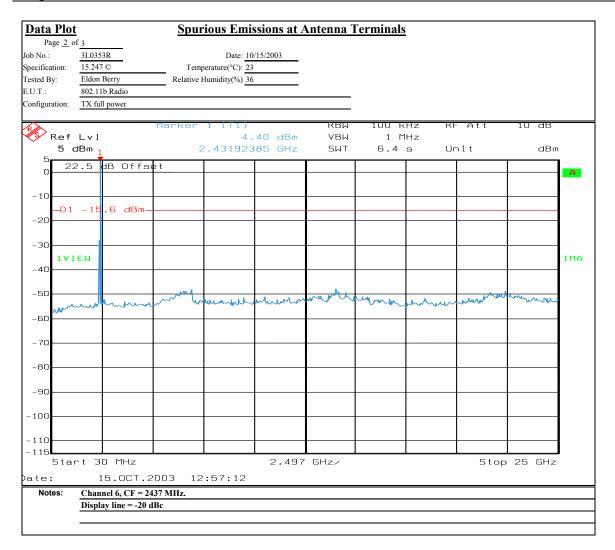
Relative 36 %

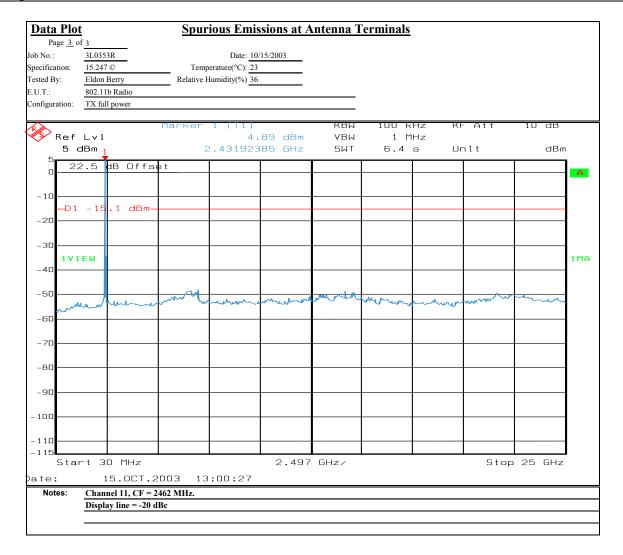
**Humidity:** 

### **Test Plots-Spurious Emissions at Antenna Terminal**



Data Plot			Spur	ious Emi	ssions at A	Antenna T	Terminals				
Page <u>1</u> o								Complete Preliminary:	X		
Job No.:	3L0353R			Date:	10/15/2003			Preliminary:			
Specification:	15.247 ©		Temp	erature(°C):	23						
Tested By:	Eldon Berry		Relative I	Iumidity(%)	36						
E.U.T.:	802.11b Radio										
Configuration:	TX full power					<u>.</u>					
Sample Number	S01										
Location:	Lab 1		,		RBW: F	lefer to plots		Measurement			
Detector Type:	Peak					tefer to plots		Distance	1	n	
Test Equipm	ent Used										
Antenna:	<u> </u>			Direct	ional Coupler:						
Pre-Amp:					Cable #1:	1627					
Filter:					Cable #2:						
Receiver:	1036				Cable #3:						
Attenuator #1	1473				Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	ment used:				Mixer.						
Measurement Ui		+/-1.7 dB									
ivicasurement Oi		1/-1./ UD									
Ŕ		Ma	rker	1 [11]		кви	100 K	Hz RE	- Att	10 aB	
<b>∜</b> Ref	∟∨l			3	.42 dBm	VBW	1 M	lHz			
5 (	dBm <sub>4</sub>		2	.381883	376 GHz	SWT	6.4	s Ur	nit	dBm	ı
5	2.5 dB 0	f f c d t				1	1	1		1	1
0	2.5 00 0	ffset					-				A
- 10						<del>                                     </del>					ł
D.1	-16.6 d	ID.m									
-20	-10.0 0										1
-30											]
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-40	- N										11114
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-50			Δ. 1						١.		
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-60											1
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-90	+				+	<b>+</b>					ł
-100					+	<b>+</b>					1
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-115											J
Sta	rt 29.99	9995 M	Hz	2	2.497000	0001 GHz	/		Stop	25 GHz	
Date:	15.00	CT.2003	3 12	:49:59							
Notes:	Channel 1, C		Hz.								
	Display line =	= -20 dBc									





## Section 8. Spurious Emissions (radiated)

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

TESTED BY: Eldon Berry DATE: 13Oct03

Test Results: Complies.

**Measurement Data:** See attached table.

### **Duty Cycle Calculation:**

Duty Cycle correction factor (dB) = 20 log (rf<sub>ON</sub> in ms/100ms)

No duty cycle.

Note – The device was tested on three axis'.

#### Test Data - Radiated Emissions



#### Nemko Dallas, Inc.

#### **Dallas Headquarters:**

802 N. Kealy Lewisville, TX 75057 Tel: (972) 436-9600

Fax: (972) 436-2667

Radiated	Emissions

Temperature(°C): 22

Page 1 of 2

Job No.: 3L0353R Specification:

15.247

Eldon Berry

Relative Humidity(%) 41

SDIO 802.11B DEVICE TX FULL POWER

Configuration:

Tested By:

E.U.T.:

Sample Number:

Location:

Detector Type:

AC 3 Peak RBW:

Date: 10/13/2003

VBW:

#### **Test Equipment Used**

Antenna: 1304 Pre-Amp: 1016 1482

Filter: Receiver:

1464 Attenuator #1 1473 Attenuator #2: #N/A Directional Coupler: #N/A Cable #1: 1484 Cable #2: 1485

Mixer:

Cable #3: #N/A Cable #4: #N/A

#N/A

1 MHz

1 MHz

Measurement

Uncertainty: +/- 3.7 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Comment	
								Channel 11	
2.4835	45	28.9	3.1	12.6	64.4	74	-9.6	Horizontal-Peak	
2.4835	32.8	28.9	3.1	12.6	52.2	54	-1.8	Horizontal-Average	
4.924	44	33.9	4.7	32.7	49.9	54	-4.1	Horizontal-Average	
7.386	43	36.7	6.1	32.5	53.3	54	-0.7	Horizontal-Average	
12.31	46.3	42.1	8.3	35.1	61.6	74	-12.4	Horizontal-Peak	
12.31	32.8	42.1	8.3	35.1	48.1	54	-5.9	Horizontal-Average	
2.4835	44.2	28.9	3.1	12.6	63.6	74	-10.4	Vertical-Peak	
2.4835	33	28.9	3.1	12.6	52.4	54	-1.6	Vertical-Average	
4.9240	43.8	33.9	4.7	32.7	49.7	54	-4.3	Vertical-Average	
7.386	43.2	36.7	6.1	32.5	53.5	54	-0.5	Vertical-Average	
12.31	46.5	42.1	8.3	35.1	61.8	74	-12.2	Vertical-Peak	
12.31	32.8	42.1	8.3	35.1	48.1	54	-5.9	Vertical-Average	
Notes:	Notes: Scanned 30 MHz to 25 GHz								

#### **Test Data - Radiated Emissions**

**Radiated Spurious Emissions** 

Page <u>2</u> of 2 **Continuation Page**Job No.: 3L0353R Date: 10/13/2003

Specification: CFR 47, Part 15 Temperature(°C): 22

Tested By: Eldon Berry Relative Humidity(%) 41

E.U.T.: SDIO 802.11B DEVICE
Configuration: TX FULL POWER

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Comment
								Channel 6
4.874	46.3	33.9	4.7	32.7	52.2	54	-1.8	Vertical-Peak
7.311	43.5	36.8	6.1	32.5	53.9	74	-20.1	Vertical-Peak
7.311	30.5	36.8	6.1	32.5	40.9	54	-13.1	Vertical-Average
12.185	45.5	42.1	8.3	35.1	60.8	74	-13.2	Vertical-Peak
12.185	31.7	42.1	8.3	35.1	47.0	54	-7.0	Vertical-Average
4.874	45.2	33.9	4.7	32.7	51.1	54	-2.9	Horizontal-Peak
7.311	43.7	36.8	6.1	32.5	54.1	74	-19.9	Horizontal-Peak
7.311	30.5	36.8	6.1	32.5	40.9	54	-13.1	Horizontal-Average
12.185	45.5	42.1	8.3	35.1	60.8	74	-13.2	Horzontal-Peak
12.185	31.7	42.1	8.3	35.1	47.0	54	-7.0	Horizontal-Average
								Channel 1
4.824	43.8	33.9	4.7	32.7	49.7	54	-4.3	Horizontal-Peak
12.060	44.7	42.1	8.3	35	60.1	74	-13.9	Horizontal-Peak
12.060	33.2	42.1	8.3	35	48.6	54	-5.4	Horizontal-Average
14.472	42.8	41.4	8.5	32.4	60.3	74	-13.7	Horizontal-Peak
14.472	31.8	41.4	8.5	32.4	49.3	54	-4.7	Horzonal-Average
4.824	45.5	33.9	4.7	32.7	51.4	54	-2.6	Vertical-Peak
12.060	45.8	42.1	8.3	35	61.2	74	-12.8	Vertical-Peak
12.060	33.0	42.1	8.3	35	48.4	54	-5.6	Vertical-Average
14.472	43.7	41.4	8.5	32.4	61.2	74	-12.8	Vertical-Peak
14.472	31.8	41.4	8.5	32.4	49.3	54	-4.7	Vertical-Average
Notes:	Scanned 30	) MHz to 25	GHz					

If PEAK measurement met the AVERAGE limit, then an AVERAGE measurement was not taken.

## Radiated Photographs





## Section 9. Peak Power Spectral Density

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

TESTED BY: Eldon Berry DATE: 15Oct03

Test Results: Complies.

**Measurement Data:** See attached plots.

**Equipment** 1036, 1627, 1473

Used:

**Measurement** +/- 0.7 dB

Uncertainty:

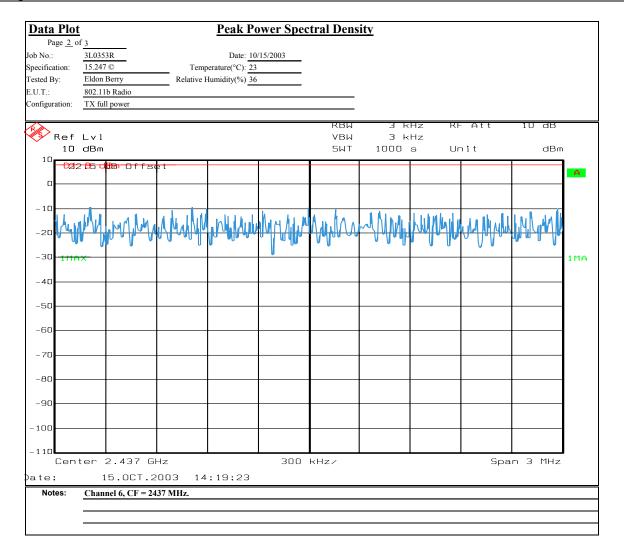
Temperature: 23 °C

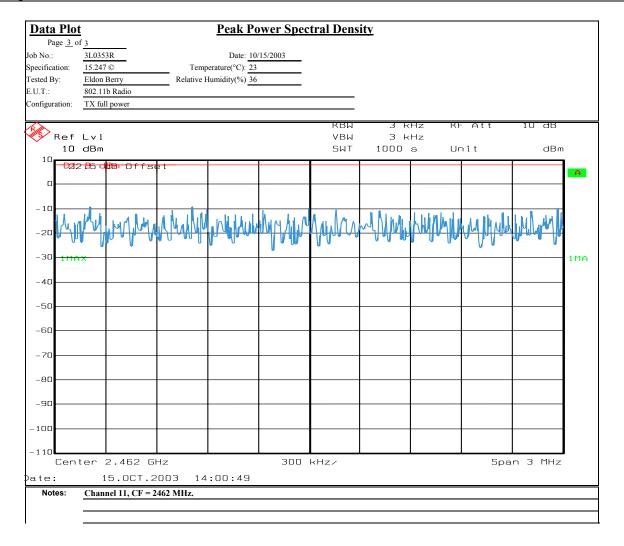
Relative 36 %

**Humidity:** 

## **Test Plots – Spectral Density**

Data Plot				Peak Po	wer Spec	tral Dens	<u>ity</u>				
Page <u>1</u> c	of <u>3</u>				<del>-</del>		<del>_</del>	Complete	X		
Job No.:	3L0353R			Date:	10/15/2003			Preliminary:			•
Specification:	15.247 ©		Temp	erature(°C):	23						
Tested By:	Eldon Berry		Relative F	Iumidity(%)	36						
E.U.T.:	802.11b Radio	)									
Configuration:	TX full power						a	a			
Sample Number	: S01										
Location:	Lab 1				RBW: R	efer to plots		Measurement			
Detector Type:	Peak				VBW: R	efer to plots		Distance	n	n	
Test Equipm	ent Used										
Antenna:				Directi	onal Coupler:						
Pre-Amp:					Cable #1:	1627					
Filter:					Cable #2:						
Receiver:	1036				Cable #3:						
Attenuator #1	1473				Cable #4:						
Attenuator #2:					Mixer:						
Additional equip	_	1/17/	ID.								
Measurement U	ncertainty:	+/-1.7 d	В								
F)						RBM		Hz R	Att	10 dB	
Ref						VBW	3 k				
	dBm					SWT	1000	s Ur	nit	dBm	1
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-70											
0.0											
-80											
-90											
-30											
-100											
-110											J
Cen	ter 2.43	12 GH	Hz		300	kHz/			Spa	n 3 MHz	
Date:	Date: 15.OCT.2003 14:37:48										
Notes:	Channel 1, C	CF = 24	12 MHz.	-	•	-					





## Section 10. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
674	LIMITER	HP 11947A	3107A02200	CBU Verified 10/15	NA
969	lisn	Schwarzbeck 8120	8120281	08/01/03	07/31/04
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	09/02/03	09/02/04
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	12/18/01	12/19/03
1129	CABLE, 9.5m	KTL RG58	N/A	06/18/03	06/17/04
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
1433	High pass filter	Solar 7930-5.0	933142	02/24/03	02/24/04
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	02/11/03	02/11/05
1473	20db Attenuator DC 18 Ghz	Midwest Microwave 290-20db	NONE	CBU Verified 10/15	N/A
1482	Band Pass Filter	K & L 11SH10-4000/T12000-0/0	2	CBU Verified 10/15	N/A
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	07/24/03	07/23/04
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	07/24/03	07/23/04
1547	CABLE .6m	KTL RG223	N/A	09/15/03	09/14/04
1627	CABLE, 5 ft	MEGAPHASE 10312 1GVT4	N/A	07/29/03	07/28/04
283	Environmental Chamber with controller # 1189006	ENVIROTRONICS SH27 & 2030-22844	129010083	04/22/03	04/21/04

## **ANNEX A - TEST DETAILS**

### Nemko Dallas

## FCC PART 15, SUBPART C DIRECT SEQUENCE SPREAD SPECTRUM TRANSMITTER

EQUIPMENT: WLAN6065SD PROJECT NO.: 3L0353RUS1

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

Minimum Standard: The R.F. that is conducted back onto the AC power

line on any

frequency within the band 0.45 to 30 MHz shall not exceed  $250\mu\text{V}$ 

(48 dB $\mu$ V) across 50 ohms.

## Nemko Dallas

## FCC PART 15, SUBPART C DIRECT SEQUENCE SPREAD SPECTRUM TRANSMITTER

EQUIPMENT: WLAN6065SD PROJECT NO.: 3L0353RUS1

NAME OF TEST: Minimum 6 dB 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)(1)

## 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.

#### **Calculation Of EIRP For Integral Antenna:**

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation  $GP/4\pi R^2 = E^2/120\pi$  and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to an isotropic radiator

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.

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

#### Nemko Dallas

## FCC PART 15, SUBPART C DIRECT SEQUENCE SPREAD SPECTRUM TRANSMITTER

EQUIPMENT: WLAN6065SD PROJECT NO.: 3L0353RUS1

NAME OF TEST: RF Exposure PARA. NO.: 15.247(b)(4)

Minimum Standard: Systems operating under the provisions of this section shall

be operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines stipulated in 1.1307(b)(1) of CFR

47.

NAME OF TEST: Spurious Emissions(conducted) 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 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  $\Delta$ : 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  $\Delta$ : Peak of highest spurious level above center frequency.

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		

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: of the

For devices with spectrum line spacing =< 3 kHz, the RBW

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.

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

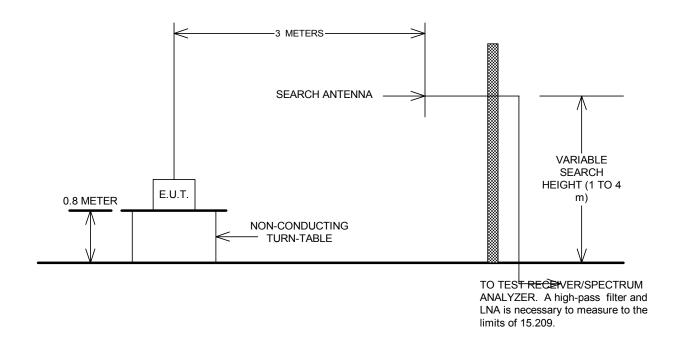
## Nemko Dallas

## $\label{eq:fcc} FCC~PART~15,~SUBPART~C$ DIRECT SEQUENCE SPREAD SPECTRUM TRANSMITTER

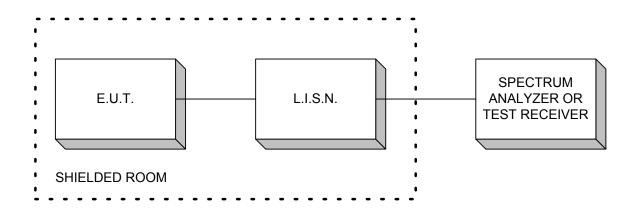
EQUIPMENT: WLAN6065SD PROJECT NO.: 3L0353RUS1

**ANNEX B - TEST DIAGRAMS** 

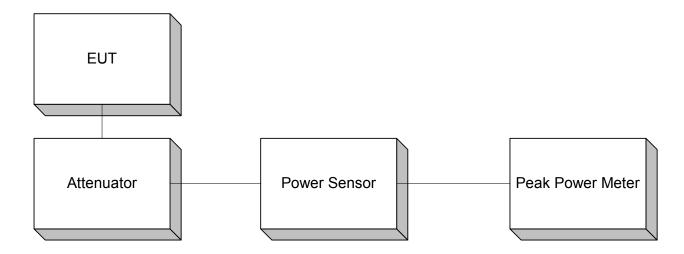
#### **Test Site For Radiated Emissions**



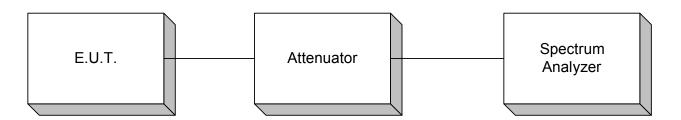
#### **Conducted Emissions**



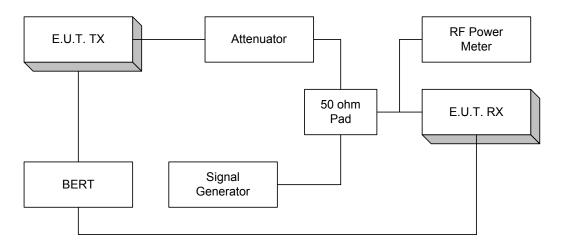
#### **Peak Power At Antenna Terminals**



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



### **Processing Gain**



NOTE: This is a typical setup. The setup may vary slightly since many devices have BER test functions built into the device.